IRE

DIRECTORY

1960

A Radio Engineer's Directory

A Comprehensive Listing of Manufacturers and Products

The Institute of Radio Engineers

FILTERS

FOR YOUR APPLICATION FROM STOCK...

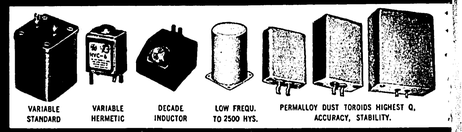
700 STOCK ITEMS to cover every electronic application

300 HERMETIC ITEMS proved to Mil T 27A, eliminates test delays

All with the UTC plus value

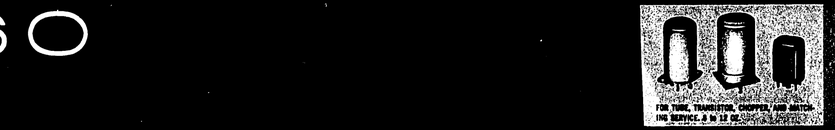
HIGHEST RELIABILITY IN THE FIELD

HIGH Q INDUCTORS

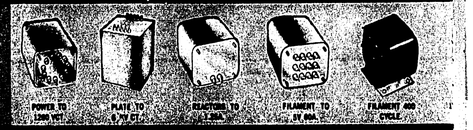


VARIABLE STANDARD | VARIABLE HERMETIC | DECADE INDUCTOR | LOW FREQU. TO 2500 NYS. | PERMALLOY DUST TOROIDS HIGHEST Q, ACCURACY, STABILITY.

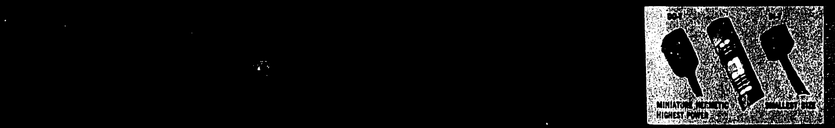
HERMETIC AUDIOS



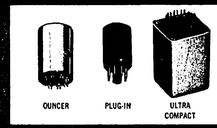
HERMETIC POWER COMPONENTS *Military, Industrial*



TRANSISTOR AUDIO

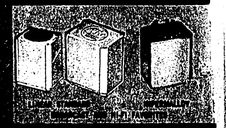


COMPACT WIDE RANGE

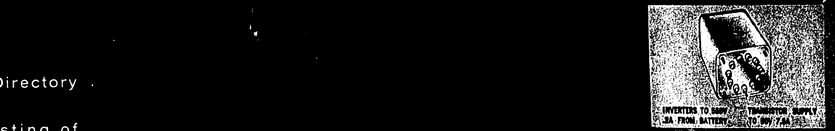


OUNCER | PLUG-IN | ULTRA COMPACT

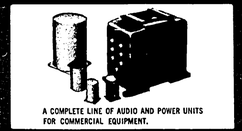
HIGHEST FIDELITY



TRANSISTOR POWER

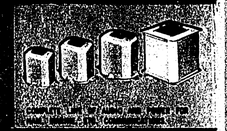


COMMERCIAL GRADE



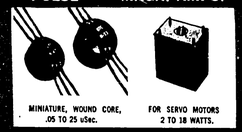
A COMPLETE LINE OF AUDIO AND POWER UNITS FOR COMMERCIAL EQUIPMENT.

AMATEUR SERIES



LINE ADAPTORS

PULSE MAGN. AMPS.



MINIATURE, WOUND CORE, .05 TO 25 μSec. | FOR SERVO MOTORS 2 TO 18 WATTS.

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UNITED TRANSFORMER CORPORATION

150 Varick Street, New York 13, N. Y.

PACIFIC MFG. DIVISION: 4008 W. JEFFERSON BLVD. LOS ANGELES 16, CALIF.

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1960 IRE DIRECTORY

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THE INSTITUTE OF RADIO ENGINEERS
1959

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THE IRE

THE INSTITUTE OF RADIO ENGINEERS, founded through the efforts of three far-seeing engineers, Dr. A. N. Goldsmith, J. V. L. Hogan, and R. H. Marriott, has grown from its original roster of less than fifty members gained by the merger of two small professional societies in 1912, to an international membership of 72,000. It is an incorporated, nonprofit organization established for the advancement of the theory and practice of radio and electronics, including allied branches of engineering and the related arts and sciences.

The IRE publishes technical papers, reports, and general information of interest to electronics engineers. It holds meetings and discussions throughout the United States, Canada, and several countries abroad, and maintains committees for collating and standardizing the results of technical research and development. Among the fields covered are radio communication, sound broadcasting, television, marine and aerial guidance, electron devices, radio-frequency measurements, engineering education, electron optics, sound and picture electrical recording and reproduction, power and manufacturing applications of radio and electronic technique, industrial electronic control and processes, medical electrical research and applications.

The management of the Institute of Radio Engineers resides in a Board of Directors selected from the body of Fellows and Senior Members, acting through an Executive Committee and the officers of the IRE. The President and Vice-Presidents are elected annually from the body of Fellows and Senior Members.

Membership in the IRE is contingent upon experience and achievement in radio engineering and allied fields. The grade of Fellow is one of distinction, and appointment thereto by the Board of Directors is made on the basis of eminence and distinguished service. The grade of Special Member is similarly conferred by invitation only. Other grades—Senior Member, Member, Associate, and Student—are filled from applicants whose age, experience, and attainments conform to the respective requirements set forth in the table below and in the Bylaws. An application blank follows page 6.

MEMBERSHIP REQUIREMENTS AND DUES

GRADE	EXPERIENCE* AND REFERENCES	ENTRANCE FEE	ANNUAL DUES
FELLOW	Awarded only. No application permitted.	$3.00	10.00[1] & 15.00
SENIOR MEMBER	a) Radio engineer or scientist—eight years of active practice and important technical radio or allied work and shall have performed or taken responsibility for important engineering or scientific work in these fields for at least three of these years. b) College teacher for eight years and in responsible charge of radio or allied subjects for at least three years. c) Eight years of active practice, with contributions to radio or allied engineering fields. d) Executive for eight years with direct supervision of important radio engineering or allied work. e) A person regularly employed in radio or allied technical work for at least sixteen years, who, by experience and education, has attained a standing equivalent to that required for Senior Member under paragraph "a" and shall have performed or taken responsibility for important technical work in these fields for at least six years. REFERENCES: Five Fellows, Senior Members, or other responsible individuals.	3.00	10.00[1] & 15.00
SPECIAL MEMBER	Conferred only by invitation of the Board of Directors.	3.00	10.00[1] & 15.00
MEMBER	a) Radio engineer or scientist—professionally competent and in active practice for three years. b) College teacher of radio or allied subjects for three years. c) A person regularly employed in radio or allied work for at least three years, who, by invention or by contribution to the advancement of engineering or science in radio or allied fields, or to the technical literature thereof, has attained a standing equivalent to that required for Member under paragraph "a." d) An executive who, for at least six years, has had under his direction important technical, engineering, or research work in radio or allied fields. e) A person regularly employed in radio or allied technical work for at least six years, who, by experience and education, has attained a standing equivalent to that required for Member under paragraph "a." REFERENCES: Four Fellows, Senior Members, Members, or other responsible individuals.	3.00	10.00[1] & 15.00
ASSOCIATE	Interest in radio engineering or allied field. REFERENCES: Three Fellows, Senior Members, Members, Associates, or other responsible individuals.	3.00	10.00[1] & 15.00
STUDENT[2]	College student pursuing regular 4-year engineering or science course for a degree, or student enrolled in approved technical institute. REFERENCE: Faculty Member.	—	5.00

* For more detailed information, see Bylaws. An application blank follows page 6.
[1] $10.00 per year for the first three years of membership. After three years dues automatically increase to $15.00.
[2] Special application blank required. When student status expires no entrance fee is required to transfer to Associate or Member.

COMMITTEES*

The IRE has established some twenty-five technical committees covering specialized fields of radio engineering. Through the IRE, these committees (sometimes in collaboration with technical committees of other engineering societies) publish standards of accepted definitions of terms, and methods of measurements of physical quantities used in radio engineering practices.

CONVENTIONS AND MEETINGS

Each year the IRE holds a national convention for its entire membership, during which technical papers are presented and the latest electronic equipment is displayed. Numerous additional meetings, many with exhibits, are held throughout the year by IRE Regions, Sections, and Professional Groups.

SECTIONS†

Sections have been established throughout the United States, Canada, Egypt, Israel, Japan, Argentina, Brazil, Colombia, Italy, and the Benelux countries, to hold meetings under the aegis of the IRE. The Sections of the IRE are grouped into eight Regions, and each Region is represented on the Board of Directors by a Regional Director elected bi-annually from, and by, the membership of the respective Region.

PROFESSIONAL GROUPS†

To serve many special fields of interest, Professional Groups have been formed on an Institute-wide basis in each of twenty-eight technical fields. These Groups organize meetings and conferences on subjects of special interest to their members. They issue technical publications called TRANSACTIONS to provide a means for ensuring their membership proper coverage of their fields in the publications of the IRE, and for promoting recognition of their leaders among the IRE membership at large.

PUBLICATIONS OF THE IRE

PROCEEDINGS OF THE IRE

Perhaps the most important single activity of the Institute is the publication of a technical journal. The first issue of the PROCEEDINGS OF THE INSTITUTE OF RADIO ENGINEERS appeared in 1913. Established first as a quarterly, since 1927 the PROCEEDINGS has been published in twelve numbers annually. In 1939, the name of the journal was shortened to PROCEEDINGS OF THE IRE.

The PROCEEDINGS OF THE IRE is the official publication of the Institute of Radio Engineers. In it appear technical papers, discussions, and communications approved by the Editorial Reviewers and Managing Editor, as well as IRE Standards prepared by the technical committees.

To date, about 7000 papers on advanced research topics have been published in PROCEEDINGS, including mathematico-physical analyses of engineering problems, current engineering developments of equipment and methods, and commercial applications of engineering methods and products, historical papers, and tutorial papers covering specific aspects of radio and electronic engineering. In addition, space is devoted to news, book reviews, new products, and abstracts of papers published in technical publications the world over. The PROCEEDINGS OF THE IRE is mailed gratis to all members; subscription price to nonmembers is $18.00 per year, $19.00 to foreign destinations.

IRE TRANSACTIONS

Each of the twenty-eight IRE Professional Groups publishes its own technical publication, called TRANSACTIONS, covering developments of particular interest within its own specialized field. The TRANSACTIONS is sent free to all paid members of the Professional Group. Frequency of issue varies from Group to Group, and ranges from one to six issues per year.

IRE CONVENTION RECORDS

The IRE annually publishes two Convention Records, one containing the papers presented at the IRE National Convention in New York, and the other for the WESCON meeting on the West Coast. They are known as the IRE NATIONAL CONVENTION RECORD and the IRE WESCON CONVENTION RECORD, respectively. Each RECORD is issued in several Parts.

YEARBOOKS AND DIRECTORIES

The first Yearbook was published in 1914, the second in 1916, and then annually between 1926 and 1932. Yearbooks were then published in 1937, 1942, and 1946. With the 1948 Yearbook, annual publication was resumed. In 1950 its name was changed to "Directory."

STANDARDS

Standardization reports have been issued since 1913. Early reports were confined to the definition of technical terms and standard graphical symbols. Current reports include methods of testing equipment and measuring electronics quantities, and letter symbols and mathematical notation. Starting in 1949, IRE Standards have been published in the PROCEEDINGS, rather than as separate reports, to make them available to all members at no extra charge. Also, they are available in reprint form.

* A list of Committees appears in the June and October issues of PROCEEDINGS OF THE IRE.

† A list of Sections and Professional Groups and their officers appears bi-monthly in PROCEEDINGS OF THE IRE.

AWARDS

The IRE bestows seven awards, six annual and one nonannual, in recognition of outstanding technical and administrative achievements in the field of radio communication.

MEDAL OF HONOR

The Medal of Honor is given annually in recognition of outstanding scientific or engineering achievements in the fields of activity of the IRE. The recipient is named by the Board of Directors upon the recommendation of the Awards Committee.

Recipients of the Medal of Honor

E. H. Armstrong	1917	A. G. Lee	1939
E. F. W. Alexanderson	1919	Lloyd Espenschied	1940
Guglielmo Marconi	1920	A. N. Goldsmith	1941
R. A. Fessenden	1921	A. H. Taylor	1942
Lee deForest	1922	William Wilson	1943
John Stone Stone	1923	Haraden Pratt	1944
M. I. Pupin	1924	H. H. Beverage	1945
G. W. Pickard	1926	R. V. L. Hartley	1946
L. W. Austin	1927	L. C. F. Horle	1948
Jonathan Zenneck	1928	Ralph Bown	1949
G. W. Pierce	1929	F. E. Terman	1950
P. O. Pedersen	1930	V. K. Zworykin	1951
G. A. Ferré	1931	W. R. G. Baker	1952
A. E. Kennelly	1932	John M. Miller	1953
J. A. Fleming	1933	William L. Everitt	1954
S. C. Hooper	1934	Harald T. Friis	1955
Balth. van der Pol	1935	John V. L. Hogan	1956
G. A. Campbell	1936	Julius A. Stratton	1957
Melville Eastham	1937	Albert W. Hull	1958
J. H. Dellinger	1938	E. Leon Chaffee	1959

FOUNDERS' AWARD

The Founders' Award is bestowed on special occasions only, for outstanding leadership in planning and administration of important technical developments. Recipient is named by the Board of Directors upon the recommendation of the Awards Committee.

Recipients of the Founders' Award

David Sarnoff	1953
Alfred N. Goldsmith	1954
Raymond A. Heising	1957
W. R. G. Baker	1958

VLADIMIR K. ZWORYKIN TELEVISION PRIZE

The Vladimir K. Zworykin Television Prize will be awarded annually for twenty (20) times beginning in 1952 to that member who makes the most important technical contribution to electronic television during the preceding three calendar years, or the importance of whose contribution to electronic television shall have been realized during this period.

The award consists of a citation and a check for $500 drawn from a fund of $10,000 donated to the Institute by Vladimir K. Zworykin to encourage outstanding technical developments in fully electronic television. Recipient is named by the Board of Directors upon recommendation of the Awards Committee.

Recipients of the Vladimir K. Zworykin Television Prize

B. D. Loughlin	1952	Frank J. Bingley	1956
Frank Gray	1953	Donald Richman	1957
Alda V. Bedford	1954	Charles P. Ginsburg	1958
Harold B. Law	1955	Paul Weiner	1959

MORRIS LIEBMANN MEMORIAL PRIZE

The Morris Liebmann Memorial Prize was originally based on an endowment by E. J. Simon to preserve the memory of Colonel Morris N. Liebmann, who gave his life in the first World War. The award consists of a certificate and a monetary award. It is given annually to a member of the Institute who, in the opinion of the Board of Directors, upon the recommendation of the Awards Committee, shall have made an important contribution to the radio art.

Recipients of the Morris Liebmann Memorial Prize

L. F. Fuller	1919	H. A. Wheeler	1940
R. A. Weagant	1920	P. T. Farnsworth	1941
R. A. Heising	1921	S. A. Schelkunoff	1942
C. S. Franklin	1922	W. L. Barrow	1943
H. H. Beverage	1923	W. H. Hansen	1944
J. R. Carson	1924	P. C. Goldmark	1945
Frank Conrad	1925	Albert Rose	1946
Ralph Bown	1926	J. R. Pierce	1947
A. H. Taylor	1927	S. W. Seely	1948
W. G. Cady	1928	C. E. Shannon	1949
E. V. Appleton	1929	O. H. Schade	1950
A. W. Hull	1930	R. B. Dome	1951
Stuart Ballantine	1931	William Shockley	1952
Edmond Bruce	1932	John A. Pierce	1953
Heinrich Barkhausen	1933	Robert R. Warnecke	1954
V. K. Zworykin	1934	Arthur V. Loughren	1955
F. B. Llewellyn	1935	Kenneth Bullington	1956
B. J. Thompson	1936	Oswald G. Villard, Jr.	1957
W. H. Doherty	1937	Edward L. Ginzton	1958
G. C. Southworth	1938	Nicolaas Bloembergen	1959
H. T. Friis	1939	Charles H. Townes	1959

BROWDER J. THOMPSON MEMORIAL PRIZE

The Browder J. Thompson Memorial Prize, established in 1945, is given annually to the author or joint authors under thirty years of age at date of submission of original manuscript for that paper of sound merit recently published in the technical publications of The Institute of Radio Engineers, and which, in the opinion of the Board of Directors, upon the recommendation of the Awards Committee, constitutes the best combination of technical contribution to radio and electronics, and presentation of the subject.

The award comprises the income from a fund established by voluntary contributions to preserve the memory of Browder J. Thompson, a Director of the Institute killed in action in World War II while on a special mission for the Secretary of War.

Recipients of the Browder J. Thompson Memorial Prize

G. M. Lee	1946	H. W. Welch, Jr.	1952
C. L. Dolph	1947	Richard C. Booton, Jr.	1953
W. H. Huggins	1948	R. L. Petritz	1954
R. V. Pound	1949	Blanchard D. Smith, Jr.	1955
J. F. Hull	1950	Jack E. Bridges	1956
A. W. Randalls	1950	Dudley A. Buck	1957
A. B. Macnee	1951	Arthur Karp	1958
		Franklin H. Blecher	1959

Harry Diamond Memorial Award

The Harry Diamond Memorial Award, established in 1949, is given annually to a person or persons in Government service for outstanding contributions in the field of radio or electronics, as evidenced by publication in professional society journals such as the Proceedings of the IRE, or journals of similar standing. The award consists of a certificate provided for from proceeds of a fund established by friends who felt that the professional life of Harry Diamond, a Fellow of the Institute, exemplified the highest type of scientific effort in government service. Recipient of the award is named by the Board of Directors upon the recommendation of the Awards Committee.

Recipients of the Harry Diamond Memorial Award

A. W. Haeff . . .	1950	Barnard Salzberg . .	1955
M. J. E. Golay . . .	1951	Wilbur S. Hinman . .	1956
Newbern Smith . . .	1952	Georg Goubau . . .	1957
Robert M. Page . .	1953	Edward W. Allen, Jr. .	1958
Harold A. Zahl . . .	1954	Jack W. Herbstreit .	1959

W. R. G. Baker Award

The W. R. G. Baker Award is given annually to the author or authors of the most outstanding paper published in the IRE Transactions of the Professional Groups. The award consists of a certificate and a monetary award derived from the income of a fund donated to the IRE by W. R. G. Baker, Chairman of the IRE Professional Groups Committee since 1950. The recipient of the award is named by the Board of Directors upon the recommendation of the Awards Committee.

Recipients of the W. R. G. Baker Award

Réymond J. Kircher .	1957	R. L. Kyhl	1958
Robert L. Trent . .	1957	H. F. Webster . . .	1958
D. Robert Fewer . .	1957	Richard D. Thornton .	1959

CUT HERE

FILL OUT BOTH SIDES OF THIS APPLICATION AND MAIL WITH REMITTANCE TO IRE HEADQUARTERS

THE INSTITUTE OF RADIO ENGINEERS, Inc.—1 East 79 Street, New York 21, N.Y.

Membership dues include $9.00 per year for the subscription to PROCEEDINGS, which amount is included in, but is non-deductible from dues.

Application for Membership

SENIOR MEMBER, MEMBER, AND ASSOCIATE GRADES

(For Student grade a special form of application is required.)

Transfer or Admission

CHECK GRADE FOR WHICH APPLICATION IS MADE

☐ Senior Member Grade ☐ Member Grade ☐ Associate Grade

TO THE BOARD OF DIRECTORS

Gentlemen: I hereby make application for membership Transfer or Admission in The Institute of Radio Engineers on the basis of my training and professional experience given herewith and refer to the references named, *who are personally familiar with my work.*

I certify that the statements made in the record of my training and professional experience are correct and agree, if elected, that I will be governed by the Constitution of the IRE as long as I continue a member. Furthermore, I agree to promote the objects of the IRE so far as shall be in my power.

DATE _____ SIGN FULL NAME WITH PEN _____

—IMPORTANT— APPLICATION MADE UNDER Sec. .....Clause.....
(Specify Section and Clause of Bylaws.)

Names of References

For Senior Member Grade. The names of at least five Fellow or Senior Member references are required.
For Member Grade. The names of at least four Fellow, Senior Member or Member references are required.
For Associate Grade. The names of three references of the Fellow, Senior Member, Member or Associate grades should be provided.

In exceptional circumstances, the Admissions Committee may accept other references than those stipulated, provided they are thoroughly familiar with the ability and experience of the applicant.

SIGNATURES ARE NOT NECESSARY, PRINT OR USE TYPEWRITER

Name of Reference _____ Mail Address _____

Name of Reference _____ Mail Address _____

Name of Reference _____ Mail Address _____

Name of Reference _____ Mail Address _____

Name of Reference _____ Mail Address _____

Name of Reference _____ Mail Address _____

Entrance fee .....$ 3.00
Annual dues .....$.....
Total remittance enclosed .....$.....

DO NOT USE THIS SPACE

Receipt Acknowledged .....Elected .....

No..... Notified.....
(For office use)

ADDRESS FOR *PROCEEDINGS* AND OTHER MAIL
Print or Use Typewriter

FULL NAME (First Name) (Middle Initial) (Family Name)

(Mailing Address) (Number) (Street)

(City) (Postal Zone) (State)

Record of Training and Professional Experience

(PLEASE TYPE OR LETTER ALL INFORMATION)

FULL NAME (First Name) (Middle Initial) (Family Name) BIRTHPLACE (State or Country) NATIONALITY (Of what country is applicant a citizen?) DATE OF BIRTH AGE Years

EDUCATION

SECONDARY SCHOOL — DATES

OTHER SCHOOLS (Names and Dates)

COLLEGE OR UNIVERSITY (1) — DATES to

MAJOR COURSE — DEGREES RECEIVED — DATE

COLLEGE OR UNIVERSITY (2) — DATES to

MAJOR COURSE — DEGREES RECEIVED — DATE

PRESENT OCCUPATION

Title or Position — Firm or Organization Name — Address

Nature of Work Done by Firm or Organization

Nature of Your Work

PROFESSIONAL EXPERIENCE

Present Occupation First, Followed by Previous Experience

Indicate nature of your own work and, for Senior Member or Member grade, clearly indicate degree of your responsibility for the particular work on which application is based.

Dates

Continue on separate sheet, if necessary

D-60 FILL OUT BOTH SIDES OF THIS APPLICATION AND MAIL WITH REMITTANCE TO IRE HEADQUARTERS

OFFICERS AND DIRECTORS, 1912–1959

Name	Office held
Akerman, Ben	Bd. of Dir., 1949–50.
Alexanderson, E. F. W.	Bd. of Dir., 1917–23; Pres., 1921; V. Pres., 1920.
Appleton, E. V.	Bd. of Dir., 1932; V. Pres., 1932.
*Armstrong, E. H.	Bd. of Dir., 1916–22; 1936–38.
Ashbridge, Sir Noel	Bd. of Dir., 1947; V. Pres., 1947.
*Austin, L. W.	Bd. of Dir., 1914–17; Pres., 1914.
Bailey, Austin	Bd. of Dir., 1940–42.
Bailey, S. L.	Bd. of Dir., 1943–55; Pres., 1949; Treas., 1948.
Baker, W. R. G.	Bd. of Dir., 1940; 1946–59; Pres., 1947; Treas., 1951–59.
*Ballantine, Stuart	Bd. of Dir., 1935–37; Pres., 1935.
Barclay, A. P. H.	Bd. of Dir., 1959.
Barkhausen, G. Heinrich	Bd. of Dir., 1935; V. Pres., 1935.
Barrow, W. L.	Bd. of Dir., 1943–45.
Barton, F. S.	Bd. of Dir., 1943; V. Pres., 1943.
Batcheller, Arthur	Bd. of Dir., 1928–32; 1934–36.
Batsel, M. C.	Bd. of Dir., 1933.
*Bennett, E. M.	Bd. of Dir., 1923–25.
Bennett, R. D.	Bd. of Dir., 1953.
Berkner, L. V.	Bd. of Dir., 1959.
Beveridge, H. H.	Bd. of Dir., 1936–39; Pres., 1937.
Black, K. C.	Bd. of Dir., 1952.
Boone, E. M.	Bd. of Dir., 1955–56.
Bown, Ralph	Bd. of Dir., 1926–29; 1937–39; Pres., 1927; V. Pres., 1926.
Brainerd, J. G.	Bd. of Dir., 1956–57.
Brown, G. S.	Bd. of Dir., 1958–59.
Brown, J. E.	Bd. of Dir., 1938; 1947.
Browning, G. H.	Bd. of Dir., 1952–53.
*Bullard, W. H. G.	Bd. of Dir., 1920–21.
Burrows, C. R.	Bd. of Dir., 1956.
Byrne, J. F.	Bd. of Dir., 1955–57.
Cady, W. G.	Bd. of Dir., 1928–29; 1932–34; Pres., 1932; Editor, 1929.
Caldwell, O. H.	Bd. of Dir., 1932–35.
Carter, E. F.	Bd. of Dir., 1943–45.
Chaffee, E. L.	Bd. of Dir., 1922; V. Pres., 1922.
Chamberlain, A. B.	Bd. of Dir., 1941–44.
Chambers, C. C.	Bd. of Dir., 1942.
Clark, T. H.	Bd. of Dir., 1950.
Clayton, J. M.	Bd. of Dir., 1928–29; Secy., 1928–29.
Clement, L. M.	Bd. of Dir., 1945.
Coggeshall, I. S.	Bd. of Dir., 1941–44; 1951–53; Pres., 1951.
Cole, R. I.	Bd. of Dir., 1958–59.
Coleman, J. B.	Bd. of Dir., 1948–49.
*Colpitts, E. H.	Bd. of Dir., 1921–23.
*Conrad, Frank	Bd. of Dir., 1927; V. Pres., 1927.
Cosentino, A. T.	Bd. of Dir., 1941; V. Pres., 1941.
Craven, T. A. M.	Bd. of Dir., 1937.
Crosby, M. G.	Bd. of Dir., 1947–49.
Cullum, A. E., Jr.	Bd. of Dir., 1948.
Cunningham, F. W.	Bd. of Dir., 1938–40.
Cutting, R. F.	Bd. of Dir., 1920–24; Pres., 1922; V. Pres., 1921.
Dart, H. F.	Bd. of Dir., 1951–52.
*Davis, G. S.	Bd. of Dir., 1915; 1917–19.
deForest, Lee	Bd. of Dir., 1930–32; Pres., 1930.
Dellinger, J. H.	Bd. of Dir., 1924–31; Pres., 1925; V. Pres., 1924.
Deloraine, E. M.	Bd. of Dir., 1946; V. Pres., 1946.
Doherty, W. H.	Bd. of Dir., 1951–53; 1958–59.
Dyer, J. N.	Bd. of Dir., 1955–56.
Eastham, Melville	Bd. of Dir., 1922–41; Treas., 1927–40.
Eastman, A. V.	Bd. of Dir., 1950–51.
Eckersley, P. P.	Bd. of Dir., 1937; V. Pres., 1937.
Edwards, C. P.	Bd. of Dir., 1931; V. Pres., 1931.
Engstrom, E. W.	Bd. of Dir., 1949.
Espenschied, Lloyd	Bd. of Dir., 1912–13; 1915–26; 1931.
Everitt, W. L.	Bd. of Dir., 1942–47; 1949–51; Pres., 1945.
Fay, Frank	Bd. of Dir., 1912.
Fink, D. G.	Bd. of Dir., 1949–51; 1956–59; Pres., 1958; Editor, 1956–57.
Fisk, E. T.	Bd. of Dir., 1938; V. Pres., 1938.
Forbes, E. D.	Bd. of Dir., 1912; Treas., 1912.
*Forbes, H. C.	Bd. of Dir., 1940.
Fowler, G. A.	Bd. of Dir., 1958–59.
Friis, H. T.	Bd. of Dir., 1941–43.
Fuller, L. F.	Bd. of Dir., 1928.
Gershon, J. J.	Bd. of Dir., 1956–57.
Goldsmith, Alfred N.	Bd. of Dir., 1912–59; Pres., 1928; Secy., 1918–27; Editor, 1912–28; 1930–53; Editor Emeritus, 1954—.
*Graf, A. W.	Bd. of Dir., 1952–53; 1957.
Graham, Virgil M.	Bd. of Dir., 1935–41; 1946–48.
Granqvist, C. E.	Bd. of Dir., 1958; V. Pres., 1958.
*Grebe, A. H.	Bd. of Dir., 1924–26; 1928.
*Gustafson, G. E.	Bd. of Dir., 1943.
Guy, R. F.	Bd. of Dir., 1944–48; 1950–52; Pres., 1950; Treas., 1947.
Hackbusch, R. A.	Bd. of Dir., 1938; 1944–46; V. Pres., 1944.
Hamburger, F., Jr.	Bd. of Dir., 1950–51; 1959.
Hammond, J. H., Jr.	Bd. of Dir., 1912–17; Treas., 1913–14.
Hanson, O. B.	Bd. of Dir., 1938–43.
Harp, C. E.	Bd. of Dir., 1959.
Hazeltine, Alan	Bd. of Dir., 1923–28; 1936–39; Pres., 1936.
Hegbar, H. R.	Bd. of Dir., 1957–58.
Heising, R. A.	Bd. of Dir., 1927–31; 1933–35; 1939–41; 1943–45; 1947–49; Pres., 1939; Treas., 1943–45.
Henderson, J. T.	Bd. of Dir., 1953–59; Pres., 1957.
Henney, Keith	Bd. of Dir., 1945–48.
Herold, E. W.	Bd. of Dir., 1956–58.
Hewlett, W. R.	Bd. of Dir., 1950–57; Pres., 1954.
*Hill, Guy	Bd. of Dir., 1914–16; 1918–20.
Hogan, J. V. L.	Bd. of Dir., 1912–36; 1948–50; Pres., 1920; V. Pres., 1916–19.
Hoover, P. L.	Bd. of Dir., 1951–52.
*Horle, L. C. F.	Bd. of Dir., 1934; 1936–42; 1944–46; Pres., 1940.
Horn, C. W.	Bd. of Dir., 1933–34.
Houck, H. W.	Bd. of Dir., 1931–42.
Howes, F. S.	Bd. of Dir., 1948.
*Hubley, Warren	Bd. of Dir., 1915–27; Treas., 1915–16; 1918–27.
Hull, L. M.	Bd. of Dir., 1929–35; Pres., 1933.
Hunter, T. A.	Bd. of Dir., 1948–50; 1956.
Hutcheson, J. A.	Bd. of Dir., 1948.
Jansky, C. M., Jr.	Bd. of Dir., 1929–42; Pres., 1934.
Jensen, A. G.	Bd. of Dir., 1954–56.

(Continued on page 8)

OFFICERS AND DIRECTORS, 1912–1959 (Cont'd)

Name	Office held
Jett, E. K.	Bd. of Dir., 1938.
Johnson, J. K.	Bd. of Dir., 1942.
Jolliffe, C. B.	Bd. of Dir., 1936–37; 1944.
Kaar, I. J.	Bd. of Dir., 1939; 1948.
Kantebet, S. R.	Bd. of Dir., 1953; V. Pres., 1953.
*Kennelly, A. E.	Bd. of Dir., 1916–18; Pres., 1916.
Kirke, Harold L.	Bd. of Dir., 1952; V. Pres., 1952.
*Kolster, F. A.	Bd. of Dir., 1933–35.
Kranz, H. E.	Bd. of Dir., 1949–50.
Krumm, L. R.	Bd. of Dir., 1917; 1921; Treas., 1917.
Lack, F. R.	Bd. of Dir., 1940; 1946–47.
*Langmuir, Irving	Bd. of Dir., 1923–25; Pres., 1923.
Lee, A. G.	Bd. of Dir., 1930; V. Pres., 1930.
Lewis, G. H.	Bd. of Dir., 1918–19; 1923–26; 1935.
Llewellyn, F. B.	Bd. of Dir., 1939–48; Pres., 1946.
Loughren, A. V.	Bd. of Dir., 1952–58; Pres., 1956.
*Lowenstein, Fritz	Bd. of Dir., 1912; V. Pres., 1912.
Manson, R. H.	Bd. of Dir., 1927–33; Pres., 1931.
*Marriott, R. H.	Bd. of Dir., 1912–16; 1920–22; 1926–32; Pres., 1912; V. Pres., 1913.
Marshall, C. J.	Bd. of Dir., 1954–55.
*McDonald, A. S.	Bd. of Dir., 1949; V. Pres., 1949.
McFarlan, R. L.	Bd. of Dir., 1957–59.
*McNicol, Donald	Bd. of Dir., 1919–28; Pres., 1926; V. Pres., 1925.
McRae, J. W.	Bd. of Dir., 1949–56; Pres., 1953.
*Meissner, Alexander	Bd. of Dir., 1929; V. Pres., 1929.
*Morecroft, J. H.	Bd. of Dir., 1922–26; Pres., 1924; V. Pres., 1923.
Murray, A. F.	Bd. of Dir., 1936–39.
*Nelson, E. L.	Bd. of Dir., 1932–36.
Newton, K. V.	Bd. of Dir., 1957–58.
Nichols, H. W.	Bd. of Dir., 1924–25.
Niwa, Y.	Bd. of Dir., 1957; V. Pres., 1957.
Noble, D. E.	Bd. of Dir., 1957–59.
Oliver, B. M.	Bd. of Dir., 1959.
Olson, H. F.	Bd. of Dir., 1959.
Oxley, A. B.	Bd. of Dir., 1951–52; 1957–58.
Packard, L. E.	Bd. of Dir., 1954–55.
*Pederson, P. O.	Bd. of Dir., 1939; V. Pres., 1939.
Pettit, J. M.	Bd. of Dir., 1954–55.
*Pickard, G. W.	Bd. of Dir., 1912–15; Pres., 1913.
*Pierce, G. W.	Bd. of Dir., 1915; 1918–21; Pres., 1918–19; V. Pres., 1915.
Pierce, J. R.	Bd. of Dir., 1954–55; Editor, 1954–55.
Piore, E. R.	Bd. of Dir., 1951.
Polkinghorn, F. A.	Bd. of Dir., 1957–58.
Ponte, M. J. H.	Bd. of Dir., 1954; V. Pres., 1954.
Poppele, J. R.	Bd. of Dir., 1947.
*Poulsen, Valdemar	Bd. of Dir., 1936; V. Pres., 1936.
Pounsett, F. H. R.	Bd. of Dir., 1949–50.
Pratt, Haraden	Bd. of Dir., 1935–59; Pres., 1938; Treas., 1941–42; Secy., 1943–59.
Priest, C. A.	Bd. of Dir., 1953–54.
*Pupin, M. I.	Bd. of Dir., 1917–19; Pres., 1917.
Ragazzini, J. R.	Bd. of Dir., 1953–54.
Rappaport, G.	Bd. of Dir., 1954–56.
Reich, H. J.	Bd. of Dir., 1944; 1948–51.
Reid, J. D.	Bd. of Dir., 1950–51.
*Reoch, A. E.	Bd. of Dir., 1924–27.
Rinia, Herre	Bd. of Dir., 1956; V. Pres., 1956.
Royden, G. T.	Bd. of Dir., 1946.
*Rush, W. A.	Bd. of Dir., 1942; V. Pres., 1942.
Rust, W. M.	Bd. of Dir., 1951–52.
Rybner, Jorgen	Bd. of Dir., 1951; V. Pres., 1951.
Ryder, J. D.	Bd. of Dir., 1952-59; Pres., 1955; Editor, 1958–59.
Sarnoff, David	Bd. of Dir., 1915–20; Secy., 1915–17.
Schulz, E. H.	Bd. of Dir., 1958–59.
Seely, Samuel	Bd. of Dir., 1957–59.
Shackelford, B. E.	Bd. of Dir., 1945–50; 1953–55; Pres., 1948.
Shepherd, J. E.	Bd. of Dir., 1948–50.
Shute, E. R.	Bd. of Dir., 1933–34.
Simon, E. J.	Bd. of Dir., 1912–15; Secy., 1912–14.
Sinclair, D. B.	Bd. of Dir., 1945–59; Pres., 1952; V. Pres., 1959; Treas., 1949–50.
Sink, R. L.	Bd. of Dir., 1952–53.
Smith, D. B.	Bd. of Dir., 1947.
Smith-Rose, R. L.	Bd. of Dir., 1948; V. Pres., 1948.
*Squier, G. O.	Bd. of Dir., 1918–22.
*Stone, J. S.	Bd. of Dir., 1912–19; Pres., 1915; V. Pres., 1914.
Straiton, A. W.	Bd. of Dir., 1953–54.
Stratton, J. A.	Bd. of Dir., 1948–51; 1954.
Swinyard, W. O.	Bd. of Dir., 1945–46.
Tank, F.	Bd. of Dir., 1955; V. Pres., 1955.
Taylor, A. H.	Bd. of Dir., 1929–31; Pres., 1929.
Teal, G. K.	Bd. of Dir., 1959.
Terman, F. E.	Bd. of Dir., 1940–43; 1948–49; Pres., 1941; V. Pres., 1940.
*Thompson, B. J.	Bd. of Dir., 1937–44.
Town, G. R.	Bd. of Dir., 1949; 1951–53.
Tucker, D. J.	Bd. of Dir., 1955–56.
Turner, H. M.	Bd. of Dir., 1933–46; Pres., 1944.
*van der Bijl, H. J.	Bd. of Dir., 1945; V. Pres., 1945.
van der Pol, Balth.	Bd. of Dir., 1934; V. Pres., 1934.
Van Dyck, A. F.	Bd. of Dir., 1930–35; 1939–44; Pres., 1942.
Vollum, C. H.	Bd. of Dir., 1955.
Watson-Watt, R. A.	Bd. of Dir., 1950; V. Pres., 1950.
Waynick, A. H.	Bd. of Dir., 1959.
*Weagant, R. A.	Bd. of Dir., 1913–17.
*Webb, W. L.	Bd. of Dir., 1946.
Weber, Ernst	Bd. of Dir., 1952–59; Pres., 1959.
Webster, E. M.	Bd. of Dir., 1946.
Wells, H. W.	Bd. of Dir., 1954–55.
Westman, H. P.	Bd. of Dir., 1930–42; Secy., 1930–42.
Wheeler, H. A.	Bd. of Dir., 1934; 1940–45.
*Wheeler, L. P.	Bd. of Dir., 1940–45; Pres., 1943.
Whinnery, J. R.	Bd. of Dir., 1956–58.
White, W. C.	Bd. of Dir., 1943–47; Treas., 1946.
Whittemore, L. E.	Bd. of Dir., 1926–29; 1935–37; V. Pres., 1928.
*Wilson, William	Bd. of Dir., 1932–36.
Wolcott, C. F.	Bd. of Dir., 1956–57.
Wolff, Irving	Bd. of Dir., 1952–53.
Zahl, H. A.	Bd. of Dir., 1949.
*Zenneck, Jonathan	Bd. of Dir., 1933; V. Pres., 1933.

* DECEASED.

MEMBERSHIP LISTS
Including
BIOGRAPHIES OF FELLOWS
AND
AN ALPHABETICAL ROSTER
AND
A GEOGRAPHICAL LISTING

NOTE

In the following pages are set forth the names of the members of The Institute of Radio Engineers. These have been disposed under three headings, as follows:

Biographies of Fellows; a list of all Fellows, with a short biographical note on each.

Membership Roster; a complete listing of all members (not including Students) on record as of May 31, 1959; giving membership grades and business affiliations.

Geographical Listing of Membership; by states and foreign countries, and by cities within such areas; including a designation of the present grade of each member.

All listings include appointments and elections up to May 31, 1959.

In the Roster the following symbols indicative of grade are used, along with numerals indicating the year of admission to that grade:

(F) *Fellow*
(SM) *Senior Member*
(M) *Member*
(A) *Associate*
(VA) *Voting Associate.* Those who were Associates on or before March 1, 1939, automatically became Voting Associates as of that time.
(S) *Student*
(J) *Junior.* This grade no longer exists.

The Board of Directors waives the dues of all members who have attained the age of 65 years and who have been members of the IRE for 35 years. The following symbol is used to indicate this status:

(L) *Life Member*

BIOGRAPHIES OF FELLOWS*

(As of May 31, 1959)

ABRAHAM, Leonard G. (SM'46—F'57), Director, Transmission Engineering, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: September, 1901, Watson, Ill. B.S.(E.E.), 1922, M.S. (E.E.), 1923, University of Illinois.

ACHESON, Marcus A. (A'36—M'37—F'41), Consulting Engineer, Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y.
Born: January 18, 1903, Denison, Tex. B.S.(E.E.), 1924, Rice Institute. **Committees:** Editorial Reviewer, 1954–59; Papers, 1937, Papers Review, 1951–53.

ADAIR, George P. (A'42—SM'44—F'47), Consulting Radio Engineer, 1610 I St., N.W., Washington 6, D.C.
Born: December 8, 1903, Rancho, Tex. B.S.(E.E.), 1926, Agricultural and Mechanical College of Texas. **Sections:** Washington, *secretary, 1946; vice-chairman, 1947; chairman, 1948;* Mid-Atlantic Regional, *vice-chairman, 1948.* **Awards:** Life Honorary Member, International Municipal Signal Association, 1944.

ADLER, Robert (A'42—SM'47—F'51), Associate Director of Research, Zenith Radio Corporation, 6001 W. Dickens Ave., Chicago 39, Ill.
Born: December 4, 1913, Vienna, Austria. Ph.D., 1937, University of Vienna. **Committees:** Awards, 1957; Editorial Reviewer, 1954–59; Fellow, 1958; Modulation Systems, 1948–50. **Professional Groups:** Electron Devices Administrative Committee.

AFFEL, Herman A. (A'14—M'40—SM'43—F'49), Retired. Consultant, RFD 2, Oakland, Me.
Born: August, 1893, Brooklyn, N.Y. S.B., 1914, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59; Meetings and Papers, 1930; New York Program, 1939–41, *chairman 1940;* Papers, 1931–45; Papers Review, 1946–56. **Awards:** Modern Pioneers Award, National Association of Manufacturers, 1940.

ALBERSHEIM, Walter J. (SM'48—F'57), Chief Engineer, Spencer-Kennedy Laboratories, Inc., 1320 Soldier's Field Rd., Boston 35, Mass.; Senior Consultant, in Radar, Electronics Research Laboratories, School of Engineering, Columbia University, New York 27, N.Y.
Born: April 22, 1897, Cologne, Germany. E.E., 1922, Eng.D. 1924, Institute of Technology, Aachen, Germany; Professional Engineer, 1936, New York. **Committees:** Editorial Reviewer, 1954–59; Papers, 1951–53. **Sections:** Monmouth County Subsection, Membership Committee, *chairman, 1949.* **Awards:** Journal Award, Society of Motion Picture Engineers.

ALBERT, Arthur L. (A'31—SM'47—F'50), Professor, Communication Engineering, Oregon State College, Corvallis, Ore.
Born: March 13, 1899, Forest Grove, Ore. B.S., 1923, M.S., 1926, E.E., 1938, Oregon State College. **Committees:** Membership, 1947–48. **IRE Representative:** Oregon State College, 1942–58. **Awards:** Fellow, AIEE, 1941.

ALEXANDER, Samuel N. (A'44—F'56), Chief, Data Processing Systems Division, National Bureau of Standards, Department of Commerce, Connecticut Ave. & Van Ness St., Washington 25, D.C.
Born: February 22, 1910, Wharton, Tex. A.B., B.S.(E.E. and Physics), 1931, University of Oklahoma; M.S.(E.E.), 1933, Massachusetts Institute of Technology. **Committees:** Electronic Computers, 1948–59, *chairman, 1954–55.* **Sections:** Washington, D.C., Electronic Computers Group, *chairman, 1954–55.* **Awards:** U. S. Department of Commerce Award for Exceptional Service, SEAC Staff, 1951; Silver Medal, Royal Academy of Engineering Sciences, Stockholm, 1956.

ALEXANDERSON, Ernest F. W. (A'13—M'13—F'15)(L), Retired. Consulting Engineer, 1132 Adams Rd., Schenectady, N.Y.
Born: January 25, 1878, Uppsala, Sweden. E.E., 1900, Royal Technical University; Sc.D., 1926, Union College; Ph.D., 1938, Uppsala University. Dr. Technology, 1948, Royal Technical University, Stockholm, Sweden. **IRE Offices:** Manager, 1917–19; Director, 1920–23; Vice President, 1920; President, 1921. **Committees:** Meetings and Papers, 1928; Standardization, 1916–24; Wave Length Regulation, 1916–17, 1919–20. **Awards:** IRE Medal of Honor, 1919; John Ericsson Gold Medal, American Society of Swedish Engineers, 1928; Edison Medal, American Institute of Electrical Engineers, 1944; Cedergren Gold Medal, Royal Swedish Technical University, 1944; Valdemar Poulsen Gold Medal, Royal Danish Technical University, 1947.

ALFORD, Andrew (A'35—M'40—F'42), Owner, Andrew Alford Consulting Engineers, 299 Atlantic Ave., Boston 10, Mass.; President, Alford Manufacturing Company.
Born: August 5, 1904, Samara, Russia. A.B., 1924, University of California. **Committees:** Annual Review, 1944–46; Antennas, 1946–49, *chairman, 1944–46;* Papers Procurement, 1947–50; Radio Transmitters, 1944–45; Standards, 1944–45; Transmitters and Antennas, 1943–44. **Awards:** Presidential Certificate of Merit, 1948.

ALLEN, Edward W., Jr. (M'44—F'53), Chief Engineer, Federal Communications Commission, 13 St. & Pennsylvania Ave., Washington 25, D.C.
Born: February 14, 1903, Portsmouth, Va. E.E., 1925, University of Virginia; LL.B., 1933, George Washington University. **Committees:** Papers Review, 1946–49; Wave Propagation, 1948–56. **Professional Groups:** Broadcast Transmission Systems Administrative Committee. **Awards:** IRE Harry Diamond Award, 1958.

ALMQUIST, Milton L. (A'43—SM'53—F'58), Director of Systems Engineering, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: August 7, 1895, San Francisco, Calif. B.Sc.(E.E.), 1920, University of California. **Awards:** Army-Navy Certificate of Appreciation, 1948; Fellow, American Institute of Electrical Engineers, 1951.

ANDERSON, A. Eugene (S'38—A'41—M'45—SM'58—F'59), Superintendent of Engineering, Western Electric Co., Inc., 555 Union Blvd., Allentown, Pa.
Born: April 22, 1916, Lima, Ohio. B.S.(E.E.), 1939, M.S.(E.E.), 1939, Ohio State University. **Committees:** Editorial Reviewer, 1954–59; Electron Devices, 1954–55; Solid State Devices, *chairman, 1954; 1956;* Symbols, 1946–47. **Professional Groups:** Electron Devices Administrative Committee, 1958–59. **Sections:** Pittsburgh, *secretary, 1957–58, vice-chairman, 1958–59.*

ANDERSON, Clifford N. (A'19—F'34), Teaching Staff, Electrical Engineering, Cornell University, Ithaca, N.Y. Home: 133 Summit Ave., Summit, N.J.
Born: September 22, 1895, Scandinavia, Wis. Ph.B., 1919; M.S., 1920, University of Wisconsin. **Committees:** Admissions, 1930–31; New York Program, 1932; Papers Review, 1953; Sections, 1941–44; Tellers, 1932–33.

* In listing membership on committees, years during which members served as chairmen or as other officers are indicated by italics.

ANDERSON, Earl I. (M'40—SM'43—F'54), Chief Engineer, Communication Products, Radio Corporation of America, Bldg. 1–5, Camden, N.J.
Born: April 19, 1907, Chicago, Ill. **Professional Groups:** Broadcast and Television Receivers, *vice-chairman, 1952–53; chairman, 1954–55,* Editor of *Transactions,* 1957–58.

ANDREW, Victor J. (A'25—M'40—SM'43—F'55), Chairman Board of Directors, Andrew Corporation, 363 E. 75 St., Chicago 19, Ill.
Born: August 31, 1902, Medina County, Ohio. B.S., 1926, College of Wooster; M.S., 1928, Ph.D., 1932, University of Chicago; D.S. (Honorary), 1949, College of Wooster. **Committees:** Membership, 1942–44; Sections, 1940. **Sections:** Chicago, *secretary, 1937–38; chairman, 1939–40.*

ANGELLO, Stephen J. (SM'52—F'59), Consulting Engineer, Westinghouse Research Laboratories, Beulah Rd., Pittsburgh 35, Pa.
Born: March, 1918, Haddonfield, N.J. B.S.(E.E.), 1939, M.S. (E.E.), 1940, Ph.D. (Physics), 1942, University of Pennsylvania. **Committees:** Solid State Devices, 1949–59; Task Group, *chairman, 1953–55.*

ANKENBRANDT, Francis L. (SM'50—F'57), Major General, USAF, Retired. Manager, Defense Projects, Radio Corporation of America, Front & Cooper Sts., Camden, N.J.
Born: January 27, 1904, Chicago, Ill. B.S., 1926, U. S. Military Academy: M.S., 1927, Yale University. **Professional Groups:** Military Electronics Administrative Committee, 1956–58.

ANTON, Nicholas G. (M'44—SM'44—F'56), President & Director of Research & Engineering, Anton Electronics Laboratories, Inc., 1226–1238 Flushing Ave., Brooklyn 37, N.Y.
Born: December 14, 1906, Trieste, Italy. Graduate of the Technical Institute Leonardo da Vinci; Columbia University, 1925–26. **IRE Representative:** EIA Nuclear Instrumentation and Control Committee, *chairman;* Advisory Nuclear Instrumentation Committee to the Federal Civil Defense Administration, *chairman;* Nuclear Instrumentation Manufacturers' Council of the EIA, *chairman.* **Awards:** Fellow, AAAS; Fellow, American Physical Society.

APSTEIN, Maurice (SM'51—F'59), Associate Director for Research, Diamond Ordnance Fuze Laboratories, Washington 25, D.C.
Born: May 5, 1910, Bridgeport, Conn. B.S.(E.E.), 1932, City College of New York. **Sections:** Washington Chapter, PGEM, *vice-chairman, 1957–58; chairman, 1958–59.* **Awards:** Department of Commerce Gold Medal for "Outstanding Contributions to Technology in Fields of Aviation Ordnance and National and International Standardization of Weapons," 1951.

ARNAUD, Jean P. (A'35—M'40—SM'43—F'53), Systems Engineer, RCA International, Clark Township, N.J.
Born: September 1, 1905, London, England, E.E., 1929, University of Buenos Aires. **Sections:** Buenos Aires, *vice-chairman, 1941, chairman, 1942–43, 1949–50.* **IRE Representative:** La Plata, 1942.

ASHBRIDGE, Sir Noel (F'38), Director, Marconi's Wireless Telegraph Company, Ltd., Marconi House, Strand, London, W.C. 2, England.
Born: December 10, 1889, Wanstead, Essex, England. B.Sc. (Engineering), 1911, King's College, London University. **IRE Offices:** Vice President, 1947; Director, 1947. **Awards:** Fellow of King's College, London; Knight of Royal Order of Dannebrog (Danish), 1934; Knighted, 1935; James Watt Medal, The Institution of Civil Engineers, 1937. President, The Institution of Electrical Engineers, 1941–42, Honorary Member, 1957; President, Junior Institution of Engineers, 1949–50; MICE; MIEE.

ASHBY, Robert M. (SM'51—F'55), Chief Engineer, Autonetics Div., North American Aviation, Inc., Downey, Calif.
Born: May 9, 1912, American Fort, Utah. B.A., 1934, M.A., 1939, Brigham Young University; Ph.D., 1942, University of Wisconsin. **Sections:** Pasadena, Subsection, *chairman, 1956.*

ASTIN, Allen V. (SM'50—F'54), Director, National Bureau of Standards, Washington 25, D.C.
Born: June 12, 1904, Salt Lake City, Utah. B.S., 1925, University of Utah; M.S. in Physics, 1926; Ph.D. in Physics, 1928, New York University; Sc.D. (Honorary), 1953, Lehigh University. **Awards:** President's Certificate of Merit, 1948; Exceptional Service Award, Dept. of Commerce, 1952.

AUERBACH, Isaac L. (S'46—M'49—SM'52—F'58), President, Auerbach Electronics Corporation, 109 N. Essex Ave., Narberth, Pa.
Born: October, 1921, Philadelphia, Pa. B.S.(E.E.), 1943, Drexel Institute of Technology; M.Sc. (Physics), 1947, Harvard University. **Committees:** National Convention Program, 1954; Professional Group, 1959. **Professional Groups:** Electronic Computers, Philadelphia Chapter, *chairman, 1952–53;* National Membership, *chairman, 1953;* Administrative Committee, 1954–57. **Sections:** Philadelphia, *treasurer, 1955–56; secretary, 1956–57; vice-chairman, 1957–58; chairman, 1958–59.* **IRE Representative:** JCC Technical Program Committee, 1957; U. S. Committee for UNESCO, First International Conference on Information Processing, *general chairman, 1959;* UNESCO, Consultant for Information Processing, 1957–59; UNESCO Consultant for Automation Travelling Exhibit, 1959–60.

AUSTIN, Arthur O. (F'30), Manufacturing Electrical Engineer, P.O. Box 109, Barberton, Ohio.
Born: December 28, 1879, Stockton, Calif. A.B., 1903, Stanford University.

AVINS, Jack (A'39—SM'49—F'57), Manager, Research Applications Laboratory, RCA Laboratories, Princeton, N.J.
Born: March 1911, New York, N.Y. A.B., 1932, Columbia University; M.E.E., 1949, Brooklyn Polytechnic Institute. **Committees:** Fellow, 1958–59; Radio Receivers, 1948–54, 1957–59; *chairman, 1955;* Standards, 1951–55, 1959; Member-at-Large, 1957–59; Intercarrier Sound TV Receivers, Subcommittee, *chairman, 1949–50;* TV Receiver Standards, chairman, Ad Hoc, 1957–58. **IRE Representative:** ASA Sectional Committee (C16) on Radio, 1953–55; Chief Delegate (C12–1) International Electrotechnical Committee, 1956.

BABITS, Victor A. (A'33—M'35—SM'49—F'59), Professor of Electrical Engineering, Rensselaer Polytechnic Institute, Troy, N.Y.
Born: March 14, 1900, Budapest, Hungary. B.E.E., 1922, D.Sc. (Eng), 1931, Decretum Habilitationis, 1938, University of Technical Sciences, Budapest. Fellow award by the Television Society, London, England, 1959. **Committees:** Education, 1953–56; Papers Review, 1952–53.

BACHMAN, Charles H. (S'32—A'35—VA'39—SM'54—F'55), Professor of Physics, Physics Dept., Steele Hall, Syracuse University, Syracuse, N.Y.
Born: December 8, 1908, Cedar Falls, Iowa. B.S.(E.E.), 1932, M.S., 1933, Ph.D., 1935, Iowa State College.

BACHMAN, William S. (S'32—A'36—M'45—SM'54—F'56), Director, Engineering & Development, Columbia Records, Inc., 799 7 Ave., New York 19, N.Y.
Born: October 29, 1908, Williamsport, Pa. E.E., 1932, Cornell University. **Committees:** Board of Editors, 1950–53; Editorial Reviewer, 1954–59. **Awards:** Emil Berliner Award, Audio Engineering Society, 1955.

BACK, George I. (SM'53—F'55), Major General, U. S. Army, Retired. 6211 3rd St., S., St. Petersburg 5, Fla. Assistant to the President and Director, International Resistance Company, 401 N. Broad, Philadelphia, Pa.
Born: February 25, 1894, Sioux City, Iowa. B.A., 1921, Morningside College; Post Graduate Communications Engineering Course, 1920–21, Yale University; Signal School, 1934, U. S. Army;

Command and General Staff College, 1939, U. S. Army. **Awards:** Honorary Life Member, Armed Forces Communications Electronics Assn., 1951; Silver Medal Award, Poor Richards Club, 1953. **U. S. Army Decorations:** Legion of Merit, 1944; Distinguished Service Medal with Oak Leaf Cluster, 1945, 1951; Commendation Ribbon, 1947; Air Medal, 1951; Silver Star, 1951. **Foreign Decorations:** Brazilian War Medal, 1945; Commander of the Order of the Crown of Italy, 1945; Commander of the Order of the British Empire, 1946; Cross of the Senior Knight Commanders of the Order of Phoenix (Greece), 1952.

BAILEY, Austin (A'25—M'25—F'36), Consulting Engineer, 193 Sagamore Rd., Millburn, N.J.
Born: June 9, 1893, Lawrence, Kan. A.B., 1915, University of Kansas; Ph.D., 1920, Cornell University. **IRE Offices:** Director, 1940–42. **Committees:** Admissions, 1934, *chairman, 1935;* Awards, 1945, 1949; Constitution and Laws, 1932–34, 1936–42, 1944–45, *chairman, 1942;* Convention Policy, 1947–50; Membership, 1941; National Convention, 1947–49; New York Program, 1930–34, 1937–40, *chairman, 1931, 1938;* Professional Groups, 1952–53, *vice-chairman, 1952;* Sections, 1929–33, *chairman, 1930;* Tellers, *chairman, 1939; 1940;* Winter Technical Meeting, *chairman, 1945; 1946.* **Professional Groups:** Vehicular Communications Administrative Committee, 1949–57, *chairman, 1950–51.* **IRE Representative:** ASA Sectional Committee on Graphic Symbols and Designations, 1940–58; ASA Sectional Committee (Y14) on Standards for Drawings and Drafting Room Practices, 1940–50, 1951–58; U. S. National Committee, IEC, Advisers on Symbols, 1952–57.

BAILEY, George W. (A'38—SM'46—F'56), Executive Secretary, Institute of Radio Engineers, Inc., 1 E. 79 St., New York 21, N.Y.
Born: May, 1887, Quincy, Mass. A.B., 1907, Harvard University; Sc.D. (Honorary), 1958, Lawrence College. **IRE Offices:** Executive Secretary, 1945–. **Committees:** IRE National Convention, *chairman, 1948–59;* Military Liaison, *chairman, 1949–;* Constitution and Laws, 1946–47; Office Quarters, 1947; Public Relations, 1945–48. **Awards:** Marconi Medal for Service, Veteran Wireless Operators Association, 1944; President's Certificate of Merit, 1946; Edison Award Citation, 1957.

BAILEY, Stuart L. (A'28—M'36—SM'43—F'43), President, Jansky and Bailey, Inc., 1339 Wisconsin Ave., N.W., Washington 7, D.C.
Born: October 7, 1905, Minneapolis, Minn. B.S.(E.E.), 1927, M.S., 1928, University of Minnesota. **IRE Offices:** President, 1949; Treasurer, 1948; Director, 1943–55. **Committees:** Admissions, 1943–44; Appointments, 1948; Awards, 1950–52; Broadcasting, 1931–32, 1934–35, *alternate, 1931–32;* Constitution and Laws, 1944, 1948, 1954–59; Executive, 1945–54, *vice-chairman, 1948, chairman, 1949;* Finance, 1948, 1950–51, 1953–54; National Convention, 1947–48, 1953–55, *vice-chairman, 1953–59;* Nominations, 1946–52, 1956–58, *chairman, 1946;* Office Practices, 1947; Planning, 1947; Policy Development, 1948, 1951; Professional Groups, 1950; Public Relations, 1950, *alternate, 1945–46; 1950;* Radio Wave Propagation, 1942–46; Radio Wave Propagation and Utilization, 1945–48; Sections, 1946–47; Special Publication Fund, 1947; Wave Propagation, 1937–42, 1948–55; Winter Technical Meeting, 1946. **IRE Representative:** ASA Sectional Committee (16) on Radio, *chairman, 1953–54;* Executive Council Central Radio Propagation Laboratory, 1949–51; International Scientific Radio Union (URSI) Executive Committee, 1951–59; IRE-RMA Coordination Committee, 1949–50; Joint IRE-AIEE Coordination Committee, 1950–54; IRE Advisory Committee to National Bureau of Standards for Central Radio Propagation Laboratory, 1954–56; Joint Technical Advisory Committee, 1940, 1950; National Bureau of Standards Technical Advisory Committee, 1958–59; RMA-IRE Problem No. 2, 1949–50; U.S.A. National Committee, URSI, 1949–59.

BAILEY, William F. (S'33—A'36—VA'39—SM'51—F'54), Assistant Director of Research, Hazeltine Research Corporation, 59–25 Little Neck Pkwy., Little Neck 62, L.I., N.Y.
Born: May 4, 1911, Buffalo, N.Y. M.E., 1933, M.S., 1941, Stevens Institute of Technology. **Committees:** Television, 1946–49; Television Systems 1949, *vice-chairman, 1955–58; chairman, 1958–59;* Standards, 1959; **Tellers, 1953–55;** *chairman, 1954.* **Sections:** Long Island, *chairman, 1954–55.*

BAKER, W. R. G. (A'19—F'28)(L), Vice President, Syracuse University; President, Syracuse University Research Corporation; Director, Syracuse University Research Institute.
Born: November 30, 1892, Lockport, N.Y. B.E., 1916, M.E.E., 1918, D.S. (Honorary), 1935, Union College; Dr. Engineering (Honorary), 1951, Syracuse University; Dr. Engineering (Honorary), 1955, Polytechnic Institute of Brooklyn. **IRE Offices:** President, 1947; Board of Directors, 1940, 1946–59; Treasurer, 1957–59; Standards Coordinator, 1948–50; Director, 1959. **Committees:** Admissions, 1941; Annual Review, 1948–49; Appointments, 1948; Awards, 1940; Broadcasting, 1935–36, 1948–51, *vice-chairman, 1951–52;* Executive, 1947–58, *chairman, 1947; vice-chairman, 1951–57, 1959; treasurer, 1958–59;* Finance, *chairman, 1948–57, 1959–60.* Meetings and Papers, 1926, 1928–29, *alternate, 1928;* Membership, 1928; Nominations, 1930, 1948; Nuclear Studies, 1947–49, *chairman, 1947–48;* Policy Development, 1948; Preparedness, 1940–41; Professional Groups, *chairman, 1950–59;* Public Relations, 1950; Sections, 1931–32; Standardization, 1925–26; Standards, 1938–41, 1948–50. **Sections:** Connecticut Valley, *secretary, 1938–40;* Philadelphia, *chairman, 1930–31.* **IRE Representative:** ASME Glossary Review Board, 1948–52. **Awards:** IRE Founders' Award, 1958.

BALDWIN, Millard W., Jr. (A'40—SM'45—F'48), Member, Technical Staff, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: December, 1902, Port Ewen, N.Y. E.E., 1925, Cornell University; M.A., 1928, Columbia University. **Committees:** Facsimile, 1941–42; Standards, 1949–59, *vice-chairman, 1951–56, chairman, 1956–59;* Television Systems, 1949–59; Video Techniques, 1949–52. **IRE Representative:** ASA Electrical Standards Board, 1957–59; ASA Sectional Committee (C16) on Radio, 1956–59; ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1951–59; International Radio Consultative Committee: Executive Committee of U. S. Delegation, Study Group XIV (Vocabulary), *alternate, 1952;* Joint IRE-RTMA-SMPTE-NARTB Committee for Inter-Society Co-ordination, *alternate, 1952–55; 1959;* U. S. National Committee of the International Electrotechnical Commission, 1957–59.

BALLARD, B. Guy (SM'47—F'55), Vice-President (Scientific), and Director, Radio & Electrical Engineering Division, National Research Council, Ottawa 2, Ont., Canada.
Born: June 19, 1902, Fort Stewart, Ont., Canada. B.Sc., 1924, D.Sc., 1956, Queen's University. **Awards:** Order of the British Empire, 1946; Ross Medal, Engineering Institute of Canada, 1949.

BARCO, Allen A. (A'40—SM'45—F'57), Director, Systems Research Laboratory, RCA Laboratories, Princeton, N.J.
Born: March, 1916, St. Louis, Mo. B.S.(E.E.), 1937, Washington University.

BARLOW, Harold M. (SM'54—F'56), Pender Professor of Electrical Engineering, University College, University of London, Gower St., London, England.
Born: November 15, 1899, London, England. B.Sc. (Engineering), 1922, Ph.D.(Science), 1924, University of London. **Awards:** Kelvin Premium, Fleming Premium and Extra Premiums of Institution of Electrical Engineers, 1930, 1952, 1954, 1957.

BARNES, John L. (A'27—SM'44—F'52), President, Systems Corporation of America, Los Angeles 24, Calif., Professor of Engineering, University of California, Los Angeles 24, Calif.
Born: October 16, 1906, Haddonfield, N.J. S.B.(E.E.), 1928, S.M.(E.E.), 1929, Massachusetts Institute of Technology; A.M. (Mathematics), 1930; Ph.D. ((Mathematics), 1934, Princeton University. **Committees:** Papers Review, 1948–50; Radio Wave Propagation, 1942–46. **Professional Groups:** Circuit Theory Administrative Committee, 1952–55. **IRE Representative:** Tufts University, 1941–42.

BARROW, Wilmer L. (A'28—VA'39—M'40—F'41), Vice President for Research & Development, Sperry Gyroscope Company, Great Neck, L.I., N.Y.
Born: October, 1903, Baton Rouge, La. M.S., 1929, Massachusetts Institute of Technology: Sc.D., 1931, Technische Hochschule, Munich, Germany. **IRE Offices:** Director, 1943–45. **Committees:** Antennas, 1945–48; Awards, 1944–45, 1948–49; Board of Editors, 1946–53; Constitution and Laws, 1943–44; Editorial Reviewer, 1954–59; Executive, 1945; Nominations, 1943, 1949–50; Papers, 1941–45; Papers Procurement, 1942–43; Professional Groups, 1948; Regular Papers, 1941; Research, 1946–47, 1949–50; Standards, 1938–42; Wave Guides, 1943–44; Wave Propagation, 1941–42. **Sections:** Boston, *chairman, 1939–41.* **IRE Representative:** Radio Technical Planning Board, 1946, *alternate, 1944–45;* RMA-IRE Co-ordinating Committee, 1948. **Awards:** IRE Morris Liebmann Memorial Prize, 1943.

BARSTOW, John M. (SM'47—F'59), Television Systems Engineer, Bell Telephone Laboratories, Murray Hill, N.J.
Born: July, 1901, Topeka, Kan. B.S., 1923, Washburn University; M.S., 1924, University of Kansas. **Committees:** Editorial Reviewer, 1954–59; National Television Systems Committee, *vice-chairman, 1952–; acting chairman, 1956–;* Video Signal Transmission Methods of Measurement, *chairman, 1956–59;* Video Techniques, 1955–59, *vice-chairman, 1959.*

BARTON, F. Sherbrooke (F'35), Chief Scientific Officer, Ministry of Supply, Shell Mex House, Strand, London, W.C. 2, England. Defense Supply Advisor, United Kingdom High Commissioner, Ottawa, Ont., Canada.
Born: May 13, 1895, Nottingham, England. M.A., 1920, University of Cambridge; B.Sc., 1920, University of London. **IRE Offices:** Vice President, 1943; Director, 1943. **IRE Representative:** IRE-IEE International Liaison, 1947, 1955–59. **Awards:** Fellow, Institute of Physics; Commander of the Order of the British Empire.

BARTON, Loy E. (M'29—SM'43—F'56), Radio Research Engineer, RCA Laboratories, Princeton, N.J.
Born: November 7, 1897, Fayetteville, Ark. B.E.E., 1921, E.E., 1925, University of Arkansas. **Awards:** Distinguished Alumnus Citation, University of Arkansas, 1947.

BATCHELDER, Laurence (A'29—SM'47—F'57), Staff Engineer, Raytheon Manufacturing Company, Wayland, Mass.
Born: October, 1906, Cambridge, Mass. A.B., 1928, M.S., 1929, Harvard University. **Professional Groups:** Ultrasonics Engineering Administrative Committee, 1956–59; *vice-chairman, 1957–59.* **Awards:** Fellow, Acoustical Society of America.

BATCHER, Ralph R. (J'16—A'18—M'22—SM'43—F'50), Electronics Consultant, Automatic Processes, 240-02 42 Ave., Douglaston, L.I., N.Y.
Born: June, 1897, Dysart, Iowa. B.S.(E.E.), 1920, Iowa State College. **Committees:** Annual Review, *chairman,* 1949–53; Board of Editors, 1928–53; Meetings and Papers, 1927–29; Public Relations, *chairman,* 1950–51; Standards, 1949–54; Symbols, 1940–48; Television, 1939–42; Television and Facsimile, 1937–39. **Professional Groups:** Production Techniques, *chairman, 1954–57.* **IRE Representative:** ASA Sectional Committee (C16) on Radio, 1951–52, *secretary, 1952.*

BATEMAN, Ross (A'42—M'55—F'59), Page Communications Engineers, Inc., 710 14 St., N.W., Washington, D.C.
Born: July 22, 1912, Toledo, Ore. B.S.(E.E.), 1934, Oregon State College.

BATSEL, Max C. (A'21—F'27), Chief Technical Administrator, Defense Electronic Products, Radio Corporation of America, Front and Cooper Sts., Camden, N.J. Residence: 525 Kings Highway, Moorestown, N.J.
Born: June 16, 1894, Fulton, Ky. B.M.E., 1915, University of Kentucky. **IRE Offices:** Director, 1933. **Committees:** Bibliography, 1930–32; Meetings and Papers, 1928–29; Membership, 1926–27; New York Program, 1931–33; Radio Receivers, 1927–28; Standardization, 1925–26, 1927–31; Use of Transmission Unit, 1928–29; Professional Groups, 1956. **Professional Groups:** Engineering Management, 1952–55, *vice-chairman, 1954–55, chairman, 1955–56;* Administrative Committee, 1955–58.

BAUER, Benjamin B. (S'27—A'39—SM'44—F'53), Vice President, Acoustics and Magnetics, CBS Laboratories, 227 High Ridge Rd., Stamford, Conn.
Born: June 26, 1913, Odessa, Russia. E.E., 1937, University of Cincinnati. **Committees:** Audio Techniques, 1958, Awards, 1955; Board of Editors, 1950–53; Editorial Reviewer, 1954–59; Electroacoustics, 1945–58, *vice-chairman, 1949–53, chairman, 1953–54, vice-chairman, 1954–55;* Papers Procurement, 1947–50; Professional Groups, 1952–53; Recording and Reproducing, 1959; Standards, 1954–56. **Professional Groups:** Audio, *vice-chairman, 1950, chairman, 1951–52, secretary, 1958;* Editor of *Transactions, 1952,* Associate Editor, 1953–58, *secretary, 1953–59.* **Awards:** Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; Eta Kappa Nu Honorable Mention Award, 1946; IRE Professional Group on Audio Achievement Award, 1955.

BAYLY, Benjamin deF. (M'43—SM'43—F'47), President, Bayly Engineering, Ltd., Ajax, Ont., Canada.
Born: June, 1903, London, Ont., Canada. B.A.Sc., 1930, University of Toronto, Professor, University of Toronto, 1930–51. **Committees:** Awards, 1940; Papers Review, 1947–49. **Sections:** Toronto, *chairman, 1936–37.* **IRE Representative:** University of Toronto, 1941–42. **Awards:** Member of the Order of the British Empire, 1946.

BEAM, Robert E. (S'37—A'41—SM'44—F'56), Professor of Electrical Engineering, Northwestern University, Evanston, Ill.
Born: July 11, 1914, Cambridge, Ohio. B.E.E., 1937, Ohio State University; Ph.D., 1940, Iowa State College. **Committees:** Education, 1945–51; Membership, 1947–48; Policy Development, 1949–50. **Professional Groups:** Microwave Theory and Techniques Administrative Committee, 1954–59. **IRE Representative:** Northwestern University, 1945–47; Southern Methodist University, 1947–45.

BECK, Alfred C. (A'30—SM'46—F'58), Member Technical Staff, Bell Telephone Laboratories, Inc., P.O. Box 107, Red Bank, N.J.
Born: July 26, 1905, Granville, N.Y. E.E., 1927, Rensselaer Polytechnic Institute. **Sections:** New York, *chairman, 1955–56.* **Professional Groups:** Microwave Theory and Techniques Administrative Committee, *chairman, 1955–56;* Administrative Committee, 1954–58.

BECK, Arnold H. W., (S'36—A'39—M'55—F'59), Cambridge University, Engineering Laboratory, Trumpington St., Cambridge, England.
Born: August, 1916, Norfolk, England. B.Sc.(Eng.), 1937, University College, London University; M.A., 1959, Queen's College, University of Cambridge.

BEDFORD, Alda V. (A'31—SM'46—F'50), Fellow, Technical Staff, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: January, 1904, Winters, Tex. B.S.(E.E.), 1925, University of Texas; M.S.(E.E.), 1929, Union College. **Sections:** Princeton Subsection, *secretary-treasurer, 1946, vice-chairman, 1947, chairman, 1948.* **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Incentive Awards, RCA Laboratories, 1949, 1951; IRE Vladimir K. Zworykin Television Prize, 1954.

BEDFORD, Leslie H. (M'34—SM'43—F'48), Director of Engineering, Guided Weapons Division, The English Electric Co., Ltd., Luton, Beds., England.
Born: June 23, 1900, London, England. B.Sc., 1919, B.Sc. (Engineering), 1921, University of London; M.A., 1924, Cambridge University. **Awards:** IEE Premium, Institute of Electrical Engineers, London, 1934; Officer of the Order of the British Empire, 1943; Commander of the Order of the British Empire.

BEERS, George L. (A'27—M'29—SM'43—F'47), Radio Corporation of America, Camden, N.J.
Born: May 13, 1899, Indiana, Pa. B.S.(E.E.), 1921, Sc.D. (Honorary), 1947, Gettysburg College. **Committees:** Papers Procurement, 1946; Radio Receivers, 1942–49; Receivers, 1949–51. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Fellow, Society of Motion Picture and Television Engineers.

BEGGS, James E. (SM'52—F'56), Electronic Engineer, General Electric Research Laboratory, P.O. Box 1088, Schenectady, N.Y.
Born: May 9, 1908, Omaha, Neb. B.S.(E.E.), 1931, Purdue University. **Awards:** Certificate of Commendation, U. S. Navy Bureau of Ships, 1947.

BEGUN, S. J. (S'46—F'52), Director of Marketing, Clevite Corporation, 17000 St. Clair Ave., Cleveland 10, Ohio.
Born: December 2, 1905, Danzig, Germany. M.S., 1929, Ph.D. (Engineering), 1933, Institute of Technology, Berlin, Germany. **Committees:** Audio and Video Techniques, 1948–49; Electroacoustics, 1941–50; Sound Recording and Reproducing Technique, 1950–57, *chairman, 1950–51;* Standards, 1949–50. **Sections:** Cleveland, *vice-chairman, 1952–53; chairman, 1953–54.* **Professional Groups:** Audio Administrative Committee, 1956–59. **IRE Representative:** ASA Sectional Committee (Z57) on Standards for Sound Recording, 1948–50.

BELL, John W. (M'46—F'53), Vice President, Engineering, Canadian Aviation Electronics, Ltd., Montreal, P.Q., Canada.
Born: September 2, 1911, Toronto, Ont., Canada. B.A.Sc., 1933, University of Toronto. **Awards:** Member of the Order of the British Empire, 1943.

BENNETT, Ralph D. (SM'44—F'52), General Electric Vallecitos Atomic Laboratory, P.O. Box 846, Vallecitos Rd., Pleasanton, Calif.
Born: June 30, 1900, Williamson, N.Y. B.S., 1921, M.S., 1923, Union College; Ph.D. (Physics), 1925, University of Chicago; Sc.D. (Honorary), 1945, Union College. **IRE Offices:** Director, 1953. **Committees:** Awards, 1954–55.

BENNETT, Rawson (A'36—M'43—SM'43—F'50), Rear Admiral, United States Navy, Chief of Naval Research, Navy Department, Washington 25, D.C.
Born: June, 1905, Chicago, Ill. B.S., 1927, United States Naval Academy; M.S., 1937; University of California. **Sections:** San Diego, *chairman, 1947.* **Awards:** Fellow, Acoustical Society of America, 1947.

BENNETT, William R. (SM'45—F'56), Technical Program Coordinator, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: June 5, 1904, Des Moines, Iowa. B.S., 1925, Oregon State College; M.A., 1928, Ph.D., 1949, Columbia University. **Committees:** Circuits, 1949–59, *vice-chairman, 1951–53, chairman, 1953–56;* Information Theory and Modulation Systems, 1952–58; Papers Review, 1951–52; Standards, 1953–59. **Professional Groups:** Circuit Theory Administrative Committee, 1956–59, Editor of *Transactions, 1957–59.*

BERANEK, Leo L. (S'36—A'41—SM'45—F'52), President, Bolt, Beranek & Newman, Inc., Consultants in Acoustics, 50 Moulton St., Cambridge 38, Mass.; Associate Professor of Communication Engineering, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: September 15, 1914, Solon, Iowa, B.A., 1936, D.Sc. (Honorary), 1946, Cornell College; M.S., 1937, D.Sc., 1940, Harvard University. **Committees:** Audio Techniques, 1949–51; Editorial Reviewer, 1954–59; National Convention, 1947; Professional Groups, 1948, 1951. **Professional Groups:** Audio, 1949–52, *chairman, 1949–51.*

BERESKIN, Alexander B. (A'41—M'44—SM'46—F'58), Professor of Electrical Engineering, University of Cincinnati, Cincinnati 21, Ohio.
Born: November 15, 1912, San Francisco, Calif. M.Sc.(Eng.), 1941, E.E., 1935, University of Cincinnati. **Committees:** Education, 1955–59; Sections, 1952. **Sections:** Cincinnati, *vice-chairman, 1949–50; chairman, 1950–51.* **Professional Groups:** Audio Administrative Committee, 1956–59; Editor of *Transactions,* 1957–58. **IRE Representative:** University of Cincinnati, 1947–59.

BERKNER, Lloyd V. (A'26—M'34—SM'43—F'47), President, Associated Universities, Inc., 10 Columbus Circle, New York 19, N.Y.; Board of Directors, Texas Instruments, Inc.; Member, President's Science Advisory Committee; Rear Admiral USNR, 1955–.
Born: February 1, 1905, Milwaukee, Wis. B.S.(E.E.), 1927, University of Minnesota; D.Sc. (Honorary), 1955, Brooklyn Polytechnic Institute; Ph.D. (Honorary), 1956, Uppsala University, Uppsala, Sweden; D.Sc. (Honorary), 1957, University of Calcutta, India; D.Sc. (Honorary), 1958, University of Notre Dame. **IRE Offices:** Director, 1959. **Committees:** Board of Editors, 1941–42; Editorial Reviewer, 1954–55; Papers, 1941; Professional Groups, 1954; Wave Propagation, 1937–42. **Professional Groups:** Nuclear Science Administrative Committee, *chairman, 1953.* **IRE Representative:** American Geophysical Union, *vice president;* International Council of Scientific Unions, Head of U. S. Delegation to VIIth General Assembly at Oslo, *president, 1955–58, past-president, 1958–61;* Special Committee on the International Geophysical Year, *vice president, 1953–59;* International Scientific Radio Union, *vice president, 1954–57; president, 1957–60;* Joint Technical Advisory, 1952, *vice-chairman, 1953, chairman, 1954.* **Awards:** Special Gold Medal of Congress, Silver Medal of the Aeronautical Institute, Gold Medal of the City of New York for Work on the Byrd Antarctic Expedition, 1930; Science Award, Washington Academy of Science, 1941; Legion of Merit, 1946; Honorary Officer, Order of the British Empire; Member, National Academy of Science, Space Science Board, *chairman, 1958–;* Fellow, American Institute of Electrical Engineers; Fellow, American Physical Society; Fellow, American Academy of Arts and Sciences; Fellow, Arctic Institute of North America.

BEVERAGE, Harold H. (A'15—M'26—F'28), Consultant, Communications. RCA Laboratories, Rocky Point, L.I., N.Y.
Born: October 14, 1893, North Haven, Me. B.S., 1915, D.E., 1938, University of Maine. **IRE Offices:** President, 1937; Director, 1936–39. **Committees:** Admissions, 1936, 1939, 1941–47; Awards, 1938–39, *chairman, 1938;* Board of Editors, 1932–37; New York Program, 1932–35; Nominations, 1942–43, *chairman, 1942;* Standards, 1934–35; Standardization, 1930–31; Wave Propagation, 1959. **Awards:** IRE Morris Liebmann Memorial Prize, 1923; Armstrong Medal, Radio Club of America, 1938; Signal Corps Certificate of Appreciation, 1944; IRE Medal of Honor, 1945; AIEE Lamme Medal, 1957; IRE PGCS Achievement Award, 1958.

BINGLEY, Frank James (A'34—M'36—SM'43—F'50), Television Research Engineer, Philco Corporation, C & Tioga Sts., Philadelphia 34, Pa.
Born: November 13, 1906, Bedford, Bedfordshire, England, B.Sc. (mathematics), 1926, B.Sc. (physics), 1927, University of London. **Committees:** Admissions, 1940, 1943; Awards, 1957, 1959; Fellow, 1958; Editorial Reviewer, 1954–59; Papers Review, 1946–53. **Awards:** Gold Medal, Television Broadcasters' Association, IRE Vladimir K. Zworykin Television Award, 1956.

BISHOP, Sir Harold (F'38), Director of Engineering, British Broadcasting Corporation, Broadcasting House, London, W.1, England.
Born: October 29, 1900, London, England. City and Guilds College (Imperial College of Science and Technology), 1917–20; B.Sc. (Engineering), University of London, 1920. **Awards:** Institution Premium, Institution of Electrical Engineers, 1935; Commander of the Order of the British Empire, 1938; Fellow, The City and Guilds Institute, 1947; Institution of Electrical Engineers, Vice President, 1948–53; President, 1953–54; Fellow, Imperial College of Science & Technology, 1954; Knight Bachelor, 1955; President, Association of Supervising Electrical Engineers, 1956–58; Vice President, Television Society, 1957–; Member, Institution of Mechanical Engineers.

BLACK, Harold S. (M'42—SM'43—F'48), Research Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: April 14, 1898, Leominster, Mass. B.S., 1921, Eng.D. (Honorary), 1955, Worcester Polytechnic Institute. **Committees:** Administrative, Board of Editors, 1951–53; Annual Review, 1948–49; Awards, 1948; Board of Editors, 1949–53; Editorial Administrative, 1948–50; Editorial Reviewer, 1957–59; Education, 1948; Frequency Modulation, 1946–47; Modulation Systems, 1947–50; *chairman, 1948–50;* Papers Review, 1947–48; Standards, 1948–50. **Awards:** Best Paper Prize, AIEE, 1934; Modern Pioneer Award, National Association of Manufacturers, 1940; John Price Wetherill Medal, The Franklin Institute, 1941; Certificate of Appreciation, U. S. War Department, 1946; Research Corporation Annual Award for Contribution to Science, 1952; Honorary Member, Audio Engineering Society, 1954; AIEE Lamme Medal, 1957; Fellow, AIEE; Fellow, American Association for the Advancement of Science.

BLACK, Knox Charlton (M'29—SM'43—F'49), Scientific Advisor to SACEUR, SHAPE, Paris, France.
Born: April 23, 1905, Cambridge, Mass. A.B., 1924, A.M., 1926, Ph.D., 1927, Harvard University. **IRE Offices:** Director, 1952. **Committees:** Awards, 1951–52, *chairman, 1952;* Electro-Acoustic Devices, 1930–31; Policy Advisory, 1953–54; Policy Development, 1949–50; Standardization, 1930–31. **Professional Groups:** Aeronautical and Navigational Electronics, *chairman, 1953–54.* **Awards:** President's Certificate of Merit, 1948.

BLACK, Leonard J. (A'31—SM'46—F'53), Professor of Electrical Engineering, University of California, Berkeley 4, Calif.
Born: July 29, 1904, Santa Clara, Calif. B.S., 1928, M.S., 1930, Ph.D., 1935, University of California. **Committees:** Education, 1949–51; Executive, 1937–42; 1949–52; Speakers and Papers, *chairman, 1937;* West Coast Convention, *general chairman, 1951.* **Sections:** San Francisco, *secreatry-treasurer, 1938–39; vice-chairman, 1940, chairman, 1941.* **IRE Representative:** University of California, 1941–52.

BLACKWELL, Otto B. (M'20—F'28)(L), Retired. 15 North Dr., Plandome, N.Y.
Born: August 21, 1884, Bourne, Mass. S.B., 1906, Massachusetts Institute of Technology. **Committees:** Standardization, 1920–24. **Awards:** Edison Medal, 1950.

BLOMBERG, Hugo (M'45—F'50), President, Svenska, Radioaktiebolaget, 12 Alstromergatan, Stockholm, Sweden.
Born: October 25, 1897, Stockholm, Sweden. E.E., 1920, Royal Technical University of Stockholm.

BODE, H. W. (M'41—SM'43—F'52), Vice President, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: December 24, 1905, Madison, Wis. A.B., 1924, M.A., 1926, Ohio State University; Ph.D., 1935, Columbia University. **Committees:** Annual Review, 1947–48; Circuits, 1944–48, *chairman, 1947–48;* Standards, 1947–48.

BOLLJAHN, John T. (A'43—SM'53—F'59), Executive Vice President, Granger Associates, 966 Commercial St., Palo Alto, Calif.
Born: June 10, 1918, Oakland, Calif. B.S.(E.E.), 1941, Ph.D., 1950, University of California. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Member, Antennas & Propagation Administrative Committee, 1953–56.

BOND, Donald S. (SM'46—F'54), Member, Technical Staff, Weapons Systems Evaluation Group, Office of the Secretary of Defense, Washington, D.C.
Born: June, 1909, Libertyville, Ill. B.S., 1929, S.M., 1931, University of Chicago. **Committees:** Papers Review, 1949–53.

BOOKER, Henry G. (SM'45—F'53), Director, School of Electrical Engineering; Professor, Department of Physics and Engineering Physics, Cornell University, Ithaca, N.Y.
Born: December, 1910, Barking, Essex, England. B.A., 1933, Ph.D., 1936, Cambridge University. **Committees:** Editorial Reviewer, 1954–59; Standards, 1949–52; Wave Propagation, 1949–56, 1959, *vice-chairman, 1949–50, chairman, 1950–52.* **IRE Representative:** National Bureau of Standards Technical Advisory Committee, chairman, 1958–59. **Professional Groups:** Antennas & Propagation, *vice-chairman, 1955–56, 1957–58.* **Awards:** Duddell, 1946; Institution, 1947; Kelvin, 1948; Premiums, I.E.E. (London).

BOONE, E. Milton (A'43—SM'46—F'56), Professor of Electrical Engineering, Director, Electron Device Laboratory, Ohio State University, Columbus 10, Ohio.
Born: February 17, 1903, Millersburgh, Ky. B.A.(Physics), 1926, M.S.(Physics), 1932, University of Colorado; M.S. (E.E.), 1937, University of Michigan. **IRE Offices:** Director, 1955–56. **Committees:** Education, 1956–59; Electron Devices, 1952–55; Electron Tubes, 1955–59; Electron Tubes and Solid State Devices, 1951–52; Fellow, 1958–60; Nominations, 1956; Papers Review, 1946; **Sections:** Columbus, *chairman, 1946–47.* **IRE Representative:** Ohio State University, 1946–50.

BOOTHROYD, Wilson P. (SM'47—F'56), Manager, Engineering, Philco Corporation, Tioga & C Sts., Philadelphia, Pa.
Born: February, 1916, Lawrence, Mass. B.S., 1937, Rhode Island State College. **Committees:** Radio Receiver, *vice-chairman, 1957–59.* **Professional Groups:** Broadcast and Television Receivers, *chairman, 1955.*

BORN, William T. (A'27—VA'39—SM'51—F'57), Vice President, Geophysical Research Corporation, 136 Mohawk Blvd., Tulsa 6, Okla.
Born: August 3, 1903, Chicago, Ill. B.S., 1925, University of Chicago. **Sections:** Sixth Southwestern IRE Conference, *chairman, 1954;* Southwestern IRE Conference Organization, *secretary, 1955.*

BOSOMWORTH, George P. (A'36—VA'39—F'57), Manager, Engineering Laboratories for the Tire Company and Chief Engineer for U. S. Liberia Radio Corporation, Firestone Tire and Rubber Company, 1200 Firestone Pkwy., Akron 17, Ohio.
Born: August 26, 1896, Gateshead, Durham, England. Whitworth Exhibition, 1916; Honors Diploma, E.E., 1917; Sunderland Technical College, England. **Committees:** Industrial Electronics, 1946–59, *chairman, 1947–58;* Standards, 1947–49; Annual Review, 1947–50. **Professional Groups:** Industrial Electronics Administrative Committee, 1951–58, *chairman, 1954–56.* **IRE Representative:** AIEE-IRE-NEMA Coordination Committee on Commercial Induction and Dielectric Heating Apparatus, 1948–49, *alternate, 1952–54.* **Awards:** Whitworth Bronze Medal, Board of Education, England, 1916.

BOSSART, Paul N. (A'29—SM'46—F'56), Senior Consulting Physicist, Union Switch and Signal Division, Westinghouse Air Brake Company, Pittsburgh 18, Pa.
Born: May 10, 1896, Buffalo, N.Y. B.S.(E.E.), 1916, Carnegie Institute of Technology; E.E., 1920, Columbia University; Ph.D., 1933, University of Pittsburgh. **Sections:** Pittsburgh, *vice-chairman, 1940–41, chairman, 1941–42.*

BOWIE, Robert M. (A'34—M'37—SM'43—F'48), Vice President, Sylvania Research Laboratories, Sylvania Electric Products, Inc., Bayside, L.I., N.Y.
Born: August 24, 1906, Table Rock, Neb. B.S., 1929, M.S. (Physics), 1931, Ph.D. (Physics), 1933, Iowa State College. **Committees:** Administrative Board of Editors, 1952–53; Admissions, 1945–48; Awards, 1953–55; Board of Editors, 1947–52; National Convention, 1950; Nuclear Studies, 1948–52; Papers Procurement, 1945–50; Research, 1946–47; Television, 1948–49; Television Systems, 1949–56, *vice-chairman, 1951–53.*

BOWLES, Edward L. (A'22—M'28—SM'43—F'47), Consulting Professor, School of Industrial Management, Massachusetts Institute of Technology, Cambridge 39, Mass. Consulting En-

gineer; Consultant to the President, Raytheon Manufacturing Company.
Born: December 9, 1897, Westphalia, Mo. B.S., 1920, Washington University; M.S., 1922, Massachusetts Institute of Technology; D.Sc. (Honorary), 1945, Norwich University. **Committees:** Membership, 1937–40; Papers Procurement, 1942–43; Regular Papers, 1941; Standardization, 1929–32; Standards, 1932–33. **Sections:** Boston, *chairman, 1935–37.* **Awards:** Distinguished Service Medal, 1945; Honorary Commander, Civil Division of the Most Excellent Order of the British Empire, 1948; Presidential Medal for Merit, 1948.

BOWN, Ralph (M'22—F'25)(L), 85 Pine St., Maplewood, N.J.
Born: February 22, 1891, Fairport, N.Y. M.E., 1913, M.M.E., 1915, Ph.D., 1917, Cornell University. **IRE Offices:** President, 1927; Vice President, 1926; Director, 1926–29, 1937–39. **Committees:** Admissions, 1926, 1939–40, *chairman, 1926;* Awards, 1928–31, 1938–42, 1946, *chairman, 1942, 1946;* Board of Editors, 1946–53; Constitution and Laws, 1929, 1937–40; Convention Policies, 1940; Finance, *chairman, 1926;* Meetings and Papers, 1929; Nominations, 1937, 1940–44, 1949–51, *chairman, 1944, 1949–51;* Receiving Sets, 1927–28; Research, 1949–50; Standardization, 1925–27, *chairman, 1925–26;* Standards, 1941–42. **IRE Representative:** IRE-RMA Joint Technical Advisory, 1948–58, *chairman, 1952–53;* IRE-IEE International Liaison, 1955–59. **Awards:** IRE Morris Liebmann Memorial Prize, 1926; IRE Medal of Honor, 1949.

BRADLEY, William E. (SM'45—F'53), Director of Research—Technical, Philco Corporation, 4700 Wissahickon Ave., Philadelphia 44, Pa.
Born: January 7, 1913, Lansdowne, Pa. B.S.(E.E.), 1936, Moore School, University of Pennsylvania. **Committees:** Editorial Reviewer, 1954–58. **Awards:** Certificate of Commendation, U. S. Navy, 1947; Citation, University of Pennsylvania Schools of Engineering, 1955.

BRAINERD, John G. (A'33—M'39—SM'43—F'51), Professor and Director, Moore School of Electrical Engineering, University of Pennsylvania, 200 S. 33 St., Philadelphia 4, Pa.
Born: August 7, 1904, Philadelphia, Pa. B.S.(E.E.), 1925, D.Sc., 1934, University of Pennsylvania. **IRE Offices:** Director, 1956–57, **Committees:** Annual Review, 1948–49; Circuits, 1947–59, *chairman, 1948–49;* Standards, 1948–59, *chairman, 1949–51,* Editorial Reviewer, 1955–59. **Professional Groups:** Circuit Theory, *chairman, 1950–51.* **Sections:** Philadelphia, *secretary, 1951–52; chairman, 1953–54.* **IRE Representative:** ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949–59; ASA Sectional Committee (C16) on Radio, 1950–51; ASA Standards Council, 1949–51; ASA Subcommittee (C42.1) on General Terms, 1948, 1952–59; AAAS Council, 1956–58; National Bureau of Standards Technical Advisory Committee, 1959.

BREIT, Gregory (SM'45—F'45), Donner Professor of Physics, Sloane Physics Laboratory, Yale University, New Haven 11, Conn.
Born: July 14, 1899, Russia. A.B., 1918, A.M., 1920, Ph.D., 1921, The Johns Hopkins University; D.Sc., 1954, University of Wisconsin. **Committees:** Research, 1949–50.

BREITWIESER, Charles J. (A'35—VA'39—SM'56—F'58), President, Metrolog Corporation, 169 N. Halstead St., Pasadena, Calif.; Vice President, Air Logistics Corporation, 3600 E. Foothill Blvd., Pasadena, Calif.
Born: September 23, 1910, Colorado Springs, Colo. B.S.(E.E.), 1930, University of North Dakota; M.Sc., 1931, California Institute of Technology; D.Sc. (Honorary), 1949, University of North Dakota. **Professional Groups:** Engineering Management Administrative Committee, 1951–58, *chairman, 1954.* **Awards:** AIEE, First Papers Award, 1945.

BRIDGES, James M. (SM'47—F'59), Director of Electronics, Office Director, Defense Research & Engineering, The Pentagon, Washington 25, D.C.
Born: August 29, 1906, Hancock, Me. B.S.(E.E.), 1928, University of Maine. **Awards:** Commendation for Contribution to Advancement of Naval Fire Control, 1945, U. S. Navy.

BRIGGS, Maynard R. (A'37—SM'46—F'54), Manager, Missile Ground Control Engineering, Westinghouse Electric Corporation, P.O. Box 1897, Baltimore 3, Md.
Born: July 19, 1904, St. Paul, Minn. B.S.(E.E.), 1929, University of Minnesota. **Committees:** Antennas, 1944–45; Professional Groups, 1948; Radio Transmitters, 1948–58, *chairman, 1951–53;* Standards, 1951–53; Symbols, 1940–48; Transmitters and Antennas, 1939–48. **Sections:** Baltimore Section, *vice-chairman, 1957, chairman, 1957–58.* **IRE Representative:** IRE-RTMA Problems #2 Committee, 1948–49; IRE-RTMA—SMPTE Coordinating Committee, 1949–52; ASA Sectional Committee (C16) on Radio, 1952.

BRONWELL, Arthur B. (A'39—SM'43—F'56), President, Worcester Polytechnic Institute, Worcester, Mass.
Born: August 18, 1909, Chicago, Ill. B.S., 1933, M.S., 1936, Illinois Institute of Technology; M.B.A., 1947; Northwestern University; LL.D. (Honorary), 1955, Northeastern University; D.Eng. (Honorary), Wayne State University. **Committees:** Education, 1944–47, *chairman, 1945–46;* Papers Procurement, 1945–47. **Sections:** Chicago, *chairman, 1943–44.* **IRE Representative:** Northwestern University, 1941–45.

BROOKS, Frederick E., Jr. (S'42—A'44—M'48—SM'54—F'58), Director of Research and Development, Collins Radio Company, 1930 HiLine Dr., Dallas, Tex.
Born: October 14, 1916, Mineola, L.I., N.Y. B.S.(E.E.), 1940, University of Kansas; D.Eng., 1944, Yale University.

BROTHERS, James T. (A'29—SM'45—F'59), Manager, Component Engineering Division, Philco Corporation, Tioga & C Sts., Philadelphia 34, Pa.
Born: April 30, 1908, New York, N.Y. Physics, New York University. **Committees:** Admissions, 1947–49; Papers Procurement, 1956; Sections, 1949–51; Standards, 1932–33; Symbols, 1948–50. **Professional Groups:** Component Parts Administrative Committee, 1953–59, *vice-chairman, 1958.* **Sections:** Philadelphia, *secretary-treasurer, 1947, vice-chairman, 1948, chairman, 1949.*

BROWN, Archibald S. (A'14—SM'47—F'56)(L), Special Assistant to Director of Engineering Research, Stanford Research Institute, Menlo Park, Calif.
Born: July 1, 1889, Minneapolis, Minn. B.S., 1910, Montana State College; E.E., 1915, University of Montana; Dr. Eng. (Honorary), 1958, Montana State College. **Sections:** San Francisco, *vice-chairman, 1933;* Engineering Management, San Francisco, *chairman, 1954.* **Professional Groups:** Administrative Committee, Aeronautical & Navigational Electronics, 1950–51; Administrative Committee, Engineering Management, 1957–60; Administrative Committee, Military Electronics, 1958–61. Military Electronics, San Francisco, *vice-chairman, 1957;* Technical Program Committee WESCON, 1959. **Awards:** U. S. Navy Commendation, 1946; Order of the British Empire, 1946.

BROWN, George H. (A'30—VA'39—F'41), Vice President, Engineering, Radio Corporation of America, Princeton, N.J.
Born: October 14, 1908, N. Milwaukee, Wis. B.S., 1930, M.S., 1931, Ph.D., 1933, E.E. (Professional), 1942, University of Wisconsin. **Committees:** Annual Review, 1947–48; Antennas, 1944–49; Papers Procurement, 1948–50. **Awards:** Fellow, AIEE.

BROWN, Gordon S. (SM'53—F'55), Professor and Head, Department of Electrical Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 39, Mass.
Born: August 30, 1907, Drummoyne, N.S.W., Australia. M.E. (E.E.), 1925, Melbourne Technical School; B.S., 1931, M.S., 1934, Sc.D., 1938, Massachusetts Institute of Technology. **IRE Offices:** Director, 1958–60. **Committees:** Nominations, 1959; Policy Advisory, 1959. **Awards:** Certificate for Distinguished Service to Naval Ordnance Development, 1945; President's Certificate of Merit, 1948; Fellow, American Academy of Arts and Sciences, 1950; Fellow, American Institute of Electrical Engineers, 1950; 7th George Westinghouse Award, American Society for Engineering Education, 1952.

BROWN, Jesse E. (A'24—M'28—SM'43—F'49), Vice President, Engineering, Zenith Radio Corporation, 6001 W. Dickens Ave., Chicago 29, Ill.
Born: September, 1902, Greenport, N.Y. Attended Cornell University, 1920–24. **IRE Offices:** Director, 1938, 1947. **Committees:** Admissions, 1940; Awards, 1940; Frequency Modulation, 1940–47; Industrial Electronics, 1947–49; Membership, 1949–50; Modulation Systems, 1947–48; Nominations, 1947; Papers Procurement, 1942–45; Public Relations, 1940; Radio Receivers, 1941–42, 1945–51; Receivers, 1949–51; Regular Papers, 1941; Sections, 1937; Special Publications Funds, 1947; Television, 1940–49; Television Systems, 1949–59. **Sections:** Chicago, *secretary, 1936–37, chairman, 1938–39.* **IRE Representative:** Army Signal Association, 1947.

BROWN, William C. (A'39—M'55—SM'58—F'59), Assistant Vice President, Raytheon Manufacturing Company, Foundry Ave., Waltham 54, Mass.
Born: May, 1916, Lewis, Iowa. B.S.(E.E.), 1937, Iowa State College; M.S., 1941, Massachusetts Institute of Technology. **Awards:** Naval Ordnance Development Award, 1945; Certificate of Commendation for Outstanding Service During World War II, 1947.

BROWNING, Glenn H. (A'24—M'28—SM'43—F'55), Retired, RFD 1, Sebago Lake, Me.
Born: March 9, 1897, Solon, Iowa. B.A., 1921, ScD. (Honorary), 1950, Cornell College. **IRE Offices:** Director, 1952–55. **Committees:** Nominations, 1955. **Sections:** Boston, *chairman, 1946–47.*

BRUECKMANN, Helmut L. (SM'49—F'58), Principal Research Scientist, U. S. Army Signal Engineering Laboratories, Fort Monmouth, N.J.
Born: May 2, 1906, Frankfurt (Main), Germany. Dipl. E., 1930, D.Eng., 1935, Technical University, Berlin, Germany.

BRUNETTI, Cledo (A'37—SM'46—F'49), Executive Assistant to Executive Vice President and Manager, Ordnance Division, Food Machinery and Chemical Corporation, 1105 Coleman Ave., San Jose, Calif.; Vice President and General Manager, Grand Rocket Company, Redlands, Calif.
Born: April, 1910, Virginia, Minn. B.E.E. (with High Distinction), 1932, Ph.D., 1937, University of Minnesota. **Committees:** Awards, 1957; Circuits, 1944–51, *vice-chairman, 1949–50;* Fellow, 1958; Industrial Electronics, 1955–58; Papers Procurement, 1948–50; Radio Transmitters, 1946–49. **Professional Groups:** Automatic Controls Administrative Committee, 1954. **Awards:** National Scholarship Key; National I.A. Civic League, 1937; Outstanding Young Electrical Engineer, Eta Kappa Nu, 1941; Certificate of Appreciation of Services, Office of Scientific Research and Development, 1945; Certificate for Outstanding Service, War Department, 1945; Naval Ordnance Development Award for Exceptional Service, United States Navy, 1945; Army-Navy Certificate of Appreciation for Outstanding Services during World War II, War and Navy Department, 1947. The Material and Methods Achievement Grand Award, Materials and Methods Magazine, 1947; Fellow, AIEE; Outstanding Achievement Award, University of Minnesota, 1958.

BRUSTMAN, Joseph A. (A'39—SM'48—F'59), Manager, Product Development and Design, Electronic Data Processing Engineering, Radio Corporation of America, Camden 2, N.J.
Born: March, 1913, Vienna, Austria. Dipl. Ing., 1938, Technical University, Vienna, Austria. **Awards:** Award from the Office of Scientific Research and Development, Washington, D.C., 1945.

BUDENBOM, Horace T. (A'40—SM'46—F'56), Retired from Bell Telephone Laboratories, Inc., Whippany, N.J. Associated with Stavid Engineering, Inc., Plainfield, N.J. Residence: 82 Wellington Ave., Short Hills, N.J.
Born: August 4, 1902, Brooklyn, N.Y. B.S.(E.E.), 1922, E.E., 1929, Purdue University. **Sections:** New York, *secretary, 1950–51, vice-chairman, 1951–52, chairman, 1952–53.*

BULLINGTON, Kenneth (A'45—SM'53—F'55), Transmission System Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: January 11, 1913, Guthrie, Okla. B.S.(E.E.), 1936, University of New Mexico; M.S.(E.E.), 1937, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59; Papers Review, 1949–53; Wave Propagation, 1954–56, 1959. **Awards:** IRE Morris Liebmann Memorial Prize, 1956; Stuart Ballantine Medal, Franklin Institute, 1956.

BURKE, Charles T. (A'25—M'27—F'37), Director of Planning, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: August 4, 1902, Watertown, Mass. S.B., 1924, S.M., 1924, Massachusetts Institute of Technology. **Committees:** Handbook, 1945–48; Papers Procurement, 1946; Power Supply, 1928–29; Radio Receivers, 1927–28; Standards, 1941–43.

BURNAP, Robert S. (A'30—F'47), Manager, Commercial Engineering, Electron Tube Division, Radio Corporation of America, 5 & Sussex Sts., Harrison, N.J.
Born: July 12, 1894, Monterey, Mass. S.B., 1916, Massachusetts Institute of Technology. **Committees:** Ad Hoc Committee to Make Critical Review of Organization of Committee, 1952–53; Administrative Committee of the Board of Editors, 1951–53; Annual Review, 1943–49; Awards, 1948; Board of Editors, 1944–53; Editorial Administrative, 1946–53; Editorial Reviewer, 1954; Electron Devices, 1952–56; Electronics, 1936–46, *chairman, 1942–46;* Electron Tubes, *chairman, 1946–49;* Electron Tubes and Solid State Devices, 1949–52; Handbook, 1945–48; Papers Procurement, 1942–44; Regular Papers, 1941; Standards, 1943–49; Symbols, 1940–41, 1943–48; Tellers, *chairman, 1942;* Vacuum Tubes, 1945–46. **IRE Representative:** ASA Subcommittee (C42.14) on Electronics, 1947–51.

BURROWS, Charles R. (A'24—M'38—SM'43—F'43), Vice President, Engineering, Radiation, Inc., Melbourne, Fla.
Born: June 21, 1902, Detroit, Mich. B.S.E.(E.E.), 1924, University of Michigan; A.M., 1927, Columbia University; E.E., 1935, University of Michigan; Ph.D., 1938, Columbia University. **IRE Offices:** Director, 1956. **Committees:** Annual Review, 1943–46; Appointments, 1956; Circuits, 1945–50; Editorial Reviewer, 1955–59; National Convention, 1948; Radio Wave Propagation, 1942–45, *chairman, 1943–45,* Radio Wave Propagation and Utilization, 1945–47; Standards, 1943–45, 1949–50; Symbols, 1940–52; Wave Propagation, 1937–59; *vice-chairman, 1948–49, chairman, 1949–50.* **Sections:** Ithaca, *chairman, 1953–54.* **Professional Groups:** Engineering Management, 1953–60, *vice-chairman, 1956–57, chairman, 1957–58.* **Awards:** Presidential Certificate of Merit; Distinguished Alumnus, University of Michigan; Fellow, AIEE; Fellow, American Physical Society.

BUSIGNIES, Henri (M'42—SM'43—F'45), President, International Telephone and Telegraph Laboratories, a division of International Telephone and Telegraph Corporation, 500 Washington Ave., Nutley, N.J.
Born: December 29, 1905, Seeaux, Paris, France. E.E., 1926, Institute Normal Electro-technique, Paris, France; D.Sc. (Honorary), 1958, Newark College of Engineering. **Committees:** Annual Review, 1948–49; Awards, 1955–56; Navigation Aids, 1946–51; *vice-chairman, 1947–48; chairman, 1948–50;* Standards, 1948–50. **Awards:** Presidential Certificate of Merit, 1948.

BUTTNER, Harold H. (M'27—SM'43—F'44), Retired, Vice President, International Telephone and Telegraph Corporation, 67 Broad St., New York 4, N.Y.; Director, Hewlett Packard Co., Palo Alto, Calif.; Director, F. L. Moseley Co., Pasadena, Calif.
Born: November 3, 1892, Port Costa, Calif. B.S.(E.E.), 1915, University of California. **Committees:** Electronics, 1940–41; Meetings and Papers, 1929; Standards, 1938–39.

BYRNE, John F. (SM'45—F'50), General Manager, Riverside

Research Laboratory, Motorola, Inc., Adams & Indiana Aves., Riverside, Calif.
Born: October 26, 1905, Cincinnati, Ohio. B.S., 1927, M.S. (E.E.), 1928, Ohio State University. **IRE Offices:** Director, 1955–57. **Committees:** Appointments, 1955; Awards, 1953–55; Policy Advisory, 1956–57; Tellers, 1949. **Awards:** United States Navy Certificate of Commendation, 1947; Presidential Certificate of Merit, 1948.

BYRNES, Irving F. (A'23—M'39—SM'43—F'54), Manager, Radiomarine Engineering, Radio Corporation of America, 75 Varick St., New York 13, N.Y.
Born: October, 1898, Beacon, N.Y. Union College Extension Courses in Electrical Engineering completed in 1926. **Committees:** Paper Procurement, 1947–50; Standardization, 1930–31. **IRE Representative:** ASA Sectional Committee on Electrical Installations on Shipboard, 1939–48. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; U. S. Navy Bureau of Ships Certificate of Commendation, 1947.

CADY, Walter G. (A'14—F'27)(L), Consultant, 3350 Calvert Rd., Pasadena 8, Calif.
Born: December 10, 1874, Providence, R.I. Ph.B., 1895, M.A., 1896, Brown University; Ph.D., 1900, University of Berlin; D.Sc., 1938, Brown University; 1958, Wesleyan University. **IRE Offices:** President, 1932; Editor, 1929; Director, 1929, 1932–34. **Committees:** Annual Review, 1942–50; Awards, 1928–30, 1933, *chairman, 1930;* Bibliography, 1930–31; Board of Editors, 1928–29, 1945, *chairman, 1929;* Institute Sections, 1928; Meetings and Papers, 1928–29; Nominations, 1930, 1933–34, 1939, *chairman, 1933;* Papers, 1931; Piezo-electric Crystals, 1941–59, *chairman, 1942–49;* Standards, 1943–51. **Sections:** Connecticut Valley, *chairman, 1927–28.* **Awards:** IRE Morris Liebmann Memorial Prize, 1928; Duddell Medal, Physical Society of London, 1936.

CAHOON, Roy D. (A'35—SM'47—F'56), Prairie Regional Engineer, Canadian Broadcasting Corporation, 541 Portage Ave., Winnipeg, Man., Canada.
Born: March 1, 1911, Cardston, Alta., Canada. B.A.Sc.(E.E.), 1934, University of Toronto; McGill University, 1943. **Sections:** Winnipeg Subsection, *chairman, 1949–50.*

CALDWELL, Orestes H. (M'28—SM'43—F'44), Editorial Consultant, Electronic Industries, Electronics Technician, Catrock Rd. at Bible Corners, Cos Cob, Conn.
Born: March 8, 1888, Lexington, Ky. B.S.(E.E.), 1908, E.E., 1931, D.E., 1933, Purdue University. **IRE Offices:** Manager, 1932; Director, 1932–33. **Committees:** Admissions, 1933; Annual Review, 1942–43; Board of Editors, 1946–53; Constitution and Laws, 1932–33, 1935; Nominations, 1934; Publicity, 1931–37, 1939, *chairman, 1934–36;* Public Relations, 1942–46, 1949–50; *chairman, 1942;* Tellers, 1932–33. **Awards:** Fellow, AIEE.

CALLAHAN, John L. (A'21—M'31—SM'43—F'53), Administrator, Radio Research Laboratory, RCA Laboratories, Rocky Point, L.I., N.Y.
Born: December 9, 1898, Minneapolis, Minn. 1919, Sorbonne, Paris; 1941, New York University. **Committees:** Admissions, 1944–48; Annual Review, 1940–45; Awards, 1951; Facsimile, 1939–46, *chairman, 1940–45;* Papers, 1942; Professional Groups, 1955; Standards, 1940–45; Symbols, 1940–41; Television and Facsimile, 1937–38; Tellers, 1949–51; *chairman, 1950.* **Professional Groups:** Communications Systems Administrative Committee, *secretary, 1952–54.* **Awards:** Army-Navy Certificate of Appreciation, 1948; Fellow, AIEE; Fellow, Radio Club of America.

CAMPBELL, Richard D. (A'34—SM'46—F'51), Point-to-Point Radio Engineer, American Telephone and Telegraph Company, 195 Broadway, New York, N.Y.
Born: May 26, 1899, St. Louis, Mo. B.S.(E.E.), 1922, George Washington University. **Committees:** Industrial Electronics, 1947–48; National Convention, 1947.

CAMRAS, Marvin (S'41—A'42—SM'48—F'52), Senior Physicist, Armour Research Foundation, 10 W. 35 St., Chicago 16, Ill.
Born: January 1, 1916, Chicago, Ill. B.S.(E.E.), 1940, Armour Institute of Technology; M.S.(E.E.), 1942, Illinois Institute of Teechnology. **Committees:** Recording and Reproducing, 1954–59. **Professional Groups:** Audio, 1951–59, *secretary, 1951–52, chairman, 1953–54;* Chapters, *chairman, 1956;* Nominating, *chairman, 1954–56;* Editor, *IRE Transactions on Audio,* 1958-59. **Awards:** Illinois Institute of Technology Alumni Association Distinguished Service Award, 1948; Eta Kappa Nu Award (Honorable Mention), 1948; U. S. Camera Award for Contribution to Motion Picture Photography, 1949; Fellow, Acoustical Society of America, 1951; John Scott Medal, 1955; Indiana Technical College Citation, 1958; IRE-PGA Achievement Award, 1958.

CARLIN, Herbert J. (M'47—SM'50—F'56), Research Professor and Associate Director, Microwave Research Institute of the Polytechnic Institute of Brooklyn, 55 Johnson St., Brooklyn 1, N.Y.
Born: May 1, 1917. B.S., 1938, Columbia College; M.S., 1940, Columbia University School of Engineering; D.E.E., 1947, Polytechnic Institute of Brooklyn. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Circuit Theory, *secretary, 1950–52; vice-chairman, 1953-55, chairman, 1955-56;* Instrumentation, *secretary, 1950–53.*

CARLSON, Wendell L. (A'36—SM'47—F'49), Technical Advisor, Patent Operations, Radio Corporation of America, Laboratories Division, Princeton, N.J.
Born: January, 1897, Jamestown, N.Y. **Committees:** Radio Receivers, 1946–47.

CARNAHAN, C. Wesley (A'34—SM'45—F'52), Technical Assistant to the President, Varian Associates, Palo Alto, Calif.
Born: July 4, 1907, Berkeley, Calif. B.A., 1927, M.A., 1931, Stanford University. **Committees:** Board of Editors, 1947-53; Papers Review, 1946. **Sections:** New Mexico, *chairman, 1949–53;* San Francisco, *director, 1957.*

CARSON, Victor S. (S'39—A'42—SM'51—F'55), Professor, Electrical Engineering, San Jose State College, San Jose, Calif.
Born: June 29, 1908, Pocatello, Idaho. B.S.(E.E.), 1938, Oregon State College; Engr., 1940, Ph.D., 1946, Stanford University. **Sections:** North Carolina-Virginia, *secretary-treasurer, 1950–51, vice-chairman, 1951, chairman, 1952.* **IRE Representative:** University of Connecticut, 1941–42; Stanford University, 1945.

CARTER, E. Finley (A'24—F'36), Director and Member of Board of Directors, Stanford Research Institute, Menlo Park, Calif.
Born: July 1, 1901, Elgin, Tex. B.S., 1922, Rice Institute. **IRE Offices:** Director, 1943–45. **Committees:** Admissions, 1944; Constitution and Laws, 1945, 1948; Editorial Administrative, 1949–50; Executive, 1944–45; National Convention, 1947–48. **Awards:** Professional Recognition, 1947.

CARTER, Philip S. (A'29—M'38—SM'43—F'49), Research Engineer, RCA Laboratories Division, Rocky Point, L.I., N.Y.
Born: July, 1896, Glastonbury, Conn. A.B. (Mechanical Engineering), 1918, Stanford University. **Committees:** Annual Review, 1945–48; Antennas, *chairman, 1945–48;* Antennas and Wave Guides, 1949–59; Board of Editors, 1937–46; Standards, 1945–59. **Professional Groups:** Antennas and Propagation, 1949–58, *chairman, 1953;* U.S.A. National Committee, URSI, 1953–56. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Citation for Overseas Work on Countermeasures "V" 2 Rocket, Secretary of War, 1947; Army-Navy Certificate of Appreciation, 1948.

CAWEIN, Madison (M'36—SM'43—F'54), Consultant in Television and Physics, 27 Hussa Pl., Denville, N.J.; Vice President, Grimson Color, Inc., 381 Fourth Ave., New York, N.Y.
Born: March, 1904, Louisville, Ky. B.S. (Physics), 1924, University of Kentucky; 1925, Cornell University; 1927–30, University of Kentucky. **Committees:** Papers Procurement, 1945–47.

CHAFFEE, E. Leon (M'17—F'21)(L), Professor, Applied Physics, Emeritus, Harvard University, Cambridge 38, Mass.
Born: April, 1885, Somerville, Mass. S.B., 1907, Massachusetts Institute of Technology; A.M., 1908, Ph.D., 1911, S.D. (Honorary), 1944, Harvard University; D.Engr. (Honorary), 1954, Case Institute of Technology. **IRE Offices:** Vice President, 1922; Director, 1922. **Committees:** Electron Tubes, 1946–47; Electronics, 1936–45; Membership, 1925; Papers, 1918–19; Papers Procurement, 1942–43; Regular Papers, 1941; Research, 1949–50; Standardization, 1927–31; Symbols, 1940–43, Vacuum Tubes, 1930–31, 1945–46. **Sections:** Boston, *chairman, 1932–35.* **IRE Representative:** Harvard University, 1941–53. **Awards:** Longstreth Medal of Merit, Franklin Institute, 1912; IRE Medal of Honor, 1959.

CHAFFEE, Joseph G. (A'26—M'40—SM'43—F'54), Member, Technical Staff, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: March, 1901, Hackensack, N.J. S.B., 1923, Massachusetts Institute of Technology.

CHAMBERLAIN, Adolph B. (A'27—M'30—F'41), Director of Engineering, CBS Television Network, 485 Madison Ave., New York 22, N.Y.
Born: February 3, 1901, Franklin, Mass. **IRE Offices:** Director, 1941–44. **Committees:** Admissions, 1940–41; Annual Review, 1947–48; Awards, 1942; Broadcast, *alternate, 1932–33;* Constitution and Laws, 1947; Frequency Modulation, 1940–41; Membership, 1949–50; National Convention, 1947; New York Program, 1938–42, *chairman, 1940;* Papers, 1942; Professional Groups, 1948–49; Public Relations, 1946; Radio Transmitters and Antennas, 1929–30; Regular Papers, 1941; Standardization, 1929–31; Standards, 1946–50, *chairman, 1947–48;* Tellers, *chairman, 1942;* Transmitters and Antennas, 1936–37. **Sections:** Buffalo-Niagara, *chairman, 1930–31;* Rochester, *chairman, 1928–29.* **IRE Representative:** ASA Standards Council, 1948–49; ASA Sectional Committee on Definitions of Electrical Terms, 1948–49. **Awards:** Legion of Merit, 1946.

CHAMBERS, Carl C. (A'30—M'42—SM'43—F'59), Vice President for Engineering Affairs, University of Pennsylvania, 107 Towne Building, 220 S. 33 St., Philadelphia 4, Pa.
Born: May 8, 1907, Philadelphia, Pa. B.S.(Math.), 1929, Dickinson College, Carlisle, Pa.; Sc.D.(Major E.E.), 1934, University of Pennsylvania. **IRE Offices:** Board of Directors, 1942. **Committees:** Annual Review, 1943–45; Awards, 1949; Board of Editors, 1948–53; Education, 1944–46, 1950–54; Frequency Modulation, 1941–43, *chairman, 1943–47;* Measurements and Instrumentation, 1949–52; Modulation Systems, 1947–50; Radio Frequency Interference, 1955–58; Standards, 1941–45. **Special Committees:** Professional Recognition, 1955–59. **Sections:** Philadelphia, *chairman, 1941–42.* **IRE Representative:** ASA Sectional Committee (C63) on Radio Electrical Coordination, 1948–51, 1954, *vice-chairman, 1955–56;* University of Pennsylvania, 1948–51; U. S. National Committee of the International Electrotechnical Commission—Member-at-Large; Member, U. S. Commission IV of URSI, International Scientific Radio Union, 1949–59. **Awards:** Fellow, American Institute of Electrical Engineers.

CHAMBERS, Dudley E. (M'41—SM'43—F'48), Manager, Engineering Services Research, General Electric Company, 1 River Rd., Schenectady 5, N.Y.
Born: November 27, 1905, Kansas City, Mo. B.A., 1927, E.E., 1928, Stanford University. **Committees:** Awards, 1948, 1950–51; Board of Editors, 1953; Education, 1953, Research, *chairman, 1949–50;* Standards, 1949–50. **Awards:** Fellow, AIEE, 1948.

CHAMBERS, Joseph A. (A'28—M'30—SM'43—F'55), Vice President, Motorola, Inc., General Manager, Motorola Western Military Electronic Center, 8201 E. McDowell, Phoenix, Ariz.
Born: August 1, 1903, Union, S.C. B.S., 1924, Clemson. **Committees:** Editorial Reviewer, 1954–59.

CHANCE, Britton (M'46—SM'46—F'54), Professor of Biophysics, Director of the Johnson Foundation for Medical Physics, 36 & Spruce Sts., Philadelphia 4, Pa.
Born: July 24, 1913, Wilkes-Barre, Pa. B.S., 1935, M.S., 1936, Ph.D., 1940, University of Pennsylvania; Ph.D., 1942, Sc.D., 1952, University of Cambridge. **Awards:** President's Certificate of Merit, 1949; Paul Lewis Award in Enzyme Chemistry, 1950, American Chemical Society; Fellow, Physical Society; Fellow, American Association for the Advancement of Science.

CHINN, Howard A. (A'42—SM'45—F'45), Chief Engineer, CBS Television, 485 Madison Ave., New York 22, N.Y.
Born: January 5, 1906, New York, N.Y. S.B., 1927, S.M., 1929, Massachusetts Institute of Technology. **Committees:** Admissions, 1945–48; Audio and Video Techniques, *chairman, 1948;* Constitution and Laws, 1952; Editorial Reviewer, 1954–59; Education, 1945; Membership, 1934, 1936–38; Papers, 1935–40, 1944–45; Papers Review, 1946–52; Professional Groups, 1948; Standards, 1948–49; Tellers, 1946–47, *chairman, 1947.* **Awards:** Presidential Certificate of Merit, 1949; John H. Potts Memorial Award, 1950; Fellow, Audio Engineering Society; Fellow, Acoustical Society of America; Fellow, Society Motion Picture and Television Engineers; Fellow, American Institute of Electrical Engineers.

CHIPP, Rodney D. (A'34—SM'43—F'55), Associate Laboratory Director, Radio Communication Laboratory, International Telephone and Telegraph Laboratories, 500 Washington Ave., Nutley, N.J.
Born: May 16, 1910, New Rochelle, N.Y. **Committees:** Constitution and Laws, 1950; Industrial Electronics Committee, 1956–58; National Convention, 1947–52; Video Signal Transmission: Methods of Measurement, 1952–55. **Sections:** New York, *secretary, 1948–49, vice-chairman, 1949–50, chairman, 1950–51.* **Professional Groups:** Engineering Management Administrative Committee, 1958–61. **Awards:** U. S. Navy Commendation, 1946.

CHITTICK, Kenneth A. (A'26—SM'49—F'53), Manager, TV Receivers, RCA Victor TV Department, Cherry Hill, Camden, N.J.
Born: November 6, 1903, Old Bridge, N.J. B.S., 1925, Rutgers University. **Committees:** Instruments and Measurements, 1949–50; Papers Procurement, 1947–50; Radio Frequency Interference, 1955–59; Radio Receivers, 1951–59; Television, 1945–48; Television Systems, 1949–59. **Awards:** Award of Merit, RCA, 1947; Certificate of Commendation, U. S. Navy, 1947.

CHODOROW, Marvin (A'43—SM'47—F'54), Professor, Applied Physics and Electrical Engineering, Stanford University, Stanford, Calif.
Born: July 16, 1913, Buffalo, N.Y. B.A., 1934, University of Buffalo; Ph.D., 1939, Massachusetts Institute of Technology. **Committees:** Awards, 1956–58. Editorial Reviewer, 1954–59.

CHRISTALDI, P. Samuel (S'35—A'40—SM'44—F'52), 132 Squire Hill Rd., Upper Montclair, N.J.
Born: November 26, 1914, Philadelphia, Pa. E.E., 1935, Ph.D. (Physics), 1938, Rensselaer Polytechnic Institute. **Committees:** Admissions, 1949–53, *chairman, 1950–51;* Measurements and Instrumentation, 1949–59, *vice-chairman, 1952–54, chairman, 1954–58;* Standards, 1954–58; Tellers, 1956. **Sections:** Northern New Jersey Subsection, *secretary, 1951–53, chairman, 1955–56.* **IRE Representative:** U. S. National Committee, International Electrotechnical Commission, Advisers on Electric Measuring Instruments, 1955; ASA Sectional Committee (C39) on Electrical Measuring Instruments, 1955–56; Joint IRE-AIEE Committee on High Frequency Measuring Instruments, 1956. **Awards:** Fellow, Radio Club of America.

CHU, Lan J. (A'39—VA'39—SM'48—F'52), Professor of Electrical Engineering, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: August 24, 1913, Hweiying, Kiangsu, China. B.S., 1934, Chiao Tung University; M.S., 1935, Sc.D., 1938, Massachusetts Institute of Technology. **Committees:** Antennas, 1948–49; Antennas and Wave Guides, 1949–51, *vice-chairman, 1949–50;* Editorial Reviewer, 1954–59; Technical Program, 1949–50.

CLAPP, James K. (A'24—M'28—F'33), Retired from General

Radio Company, 22 Baker Ave., West Concord, Mass.
Born: December 30, 1897, Denver, Colo. B.S., 1923, S.M., 1926, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–58; Papers, 1931–45; Papers Review, 1946–55; Piezoelectric Crystals, 1940–56; Standards, 1934–35.

CLARK, Ralph L. (A'29—SM'48—F'58), Manager, Washington Office, Stanford Research Institute, 711 14th St., N.W., Washington, D.C.
Born: June 2, 1908, East Jordan, Mich. B.S.(E.E.), 1930, Michigan State University. **Professional Groups:** National Administrative Committee, Military Electronics, 1955–57; Joint Technical Advisory Committee, 1959.

CLAVIER, André G. (M'30—F'39), Vice President and Technical Director; Scientific Adviser to the President, International Telephone and Telegraph Laboratories, 500 Washington Ave., Nutley 10, N.J.
Born: February 15, 1894, Cambrai, France. Licéncjé-ès-sciénces physiques et mathématiques, 1918, Sorbonne, Paris; Ingénieur diplôme de l'Ecole Supérieure d'Eléctricité, 1920, Paris, France; Professeur à l'Ecole Supérieure d'Eléctricité, 1942–47. **Committees:** Admissions, 1950–52; Professional Groups, 1955; Standards, 1951–59; Symbols, 1949–54, *vice-chairman, 1949–50, chairman, 1951–53;* Wave Propagation, 1959. **Professional Groups:** Communication Systems, Administrative Committee, 1953; Microwave Theory and Techniques, *chairman, 1953.* **IRE Representative:** ASA Drawings and Symbols Correlating Committee, *alternate, 1951–52;* ASA Graphic Standards Board, 1953; ASA Sectional Committee (Y10) on Letter Symbols, 1951–53; ASA Sectional Committee (Y14) on Standards for Drawings and Drafting Room Practice, *alternate, 1951–52;* ASA Sectional Committee (Y15) on Standards for Graphic Presentation, 1951; ASA Sectional Committee (Y15) on Preferred Practice for the Preparation of Graphs, Charts and Other Technical Illustrations, *alternate, 1952;* U. S. National Committee, International Electrotechnical Commission, Advisors on Symbols, 1955; ASA Sectional Committee (Y32) on Graphical Symbols and Designations, 1955–59. **Awards:** Fellow, AIEE; Member Lauréat de la Société Française des Eléctriciens; President, Fifth Section, Société des Radioélectriciens, Paris, 1945–47; Vice President, American Section of Société des Ingénieurs Civils de France, 1952–56.

CLEETON, Claud E. (A'41—SM'46—F'55), Superintendent, Applications Research Division, Naval Research Laboratories, Washington 25, D.C.
Born: December 11, 1907, Downing, Mo. B.S., 1928, Northeast Missouri State Teachers College; M.A., 1930, University of Missouri; Ph.D., 1935, University of Michigan. **Awards:** President's Certificate of Merit, 1946; Meritorious Civilian Service Award, 1947.

CLEMENT, Lewis M. (A'14—M'17—F'26)(L), Consultant, Reeves Instrument Company, Garden City, L.I., N.Y.
Born: January 25, 1892, Oakland, Calif. B.S.(E.E.), 1914, University of California. **IRE Offices:** Director, 1945. **Committees:** Board of Editors, 1941–53; Electro-Acoustic Devices, 1930–31; Meetings and Papers, 1929; Papers Procurement, 1948–50; Professional Groups, 1953–54; Radio Receivers, 1927–28; Regular Papers, 1941; Standardization, 1927–31; Vacuum Tubes, 1929–30. **Professional Groups:** Broadcast and Television Receivers, *secretary, 1953–55.* **Sections:** Cincinnati, *chairman, 1945.* **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Naval Ordnance Development Award, Bureau of Ordnance, USN, 1945; A Pioneer in the Field of Aircraft Electronic Development, Dayton Section IRE, 1950; Radio-Electronics-Television Manufacturers Association IRE Annual Award. Radio Fall Meeting Plaque, Syracuse, 1955.

CLEWELL, Dayton (M'49—SM'49—F'54), General Manager, Research Department, Socony Mobil Oil Co., Inc., 150 E. 42 St., New York, N.Y.
Born: December 15, 1912, Berwick, Pa. B.S., 1933, Ph.D., 1936, Massachusetts Institute of Technology.

COBINE, James D. (A'34—SM'44—F'57), Physicist Research Laboratory, General Electric Company, The Knolls, Schenectady, N.Y.
Born: May, 1905, Oklahoma City, Okla. B.S.(E.E.), 1931, University of Wisconsin; M.S.(E.E.), 1932, Ph.D.(E.E.), 1934, California Institute of Technology. **Committees:** Admissions, 1946–49; Board of Editors, 1945–54; Editorial Reviewer, 1954–57, 1959; Education, 1945–46. **Sections:** Schenectady, *secretary-treasurer, 1949–51.* **Awards:** Army-Navy Certificate of Appreciation, World War II, 1947; Fellow, American Physical Society.

COGGESHALL, Ivan, S. (A'26—M'29—F'42), Assistant Vice-President, International Communications, Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y.
Born: September 30, 1896, Newport, R.I. D.Eng. (Honorary), 1951, Worcester Polytechnic Institute. **IRE Offices:** President, 1951; Director, 1941–44, 1951–53. **Committees:** Admissions, 1934–35, 1941–42; Annual Review, 1944–47; Building Fund, *vice-chairman, 1945;* Constitution and Laws, 1942, 1945–50, 1953–59, *chairman, 1948, 1950;* Executive, 1942, 1951–52, *chairman, 1951;* Finance, 1948–52 *ex officio, 1951;* Membership, 1928–31, 1934–41, *chairman, 1929–30, 1934–35, 1941;* National Convention, *vice-chairman, 1948;* New York Program, 1938–40, *chairman, 1939;* Nominations, 1944, 1953; Papers, 1942–45; Papers Procurement, 1945–46, *chairman, 1945;* Papers Review, 1946–47; Professional Groups, 1950; Public Relations, 1943–46, *chairman, 1943–45;* Sections, 1933–35, 1938–42; Standards, 1945–46. **IRE Representative:** Joint IRE-RTMA Co-ordination Committee, 1951; Joint Technical Advisory Committee, 1951. **Awards:** Fellow, AIEE.

COHN, Seymour B. (S'41—A'44—M'46—SM'51—F'59), Laboratory Manager, Stanford Research Institute, Menlo Park, Calif.
Born: October 21, 1920, Stamford, Conn. B.E., 1942, Yale University, M.S., 1946, Ph.D., 1948, Harvard University. **Committees:** Antennas and Waveguides, 1951–53; Papers, 1945; Papers Review, 1945–53. **Professional Groups:** Microwave Theory and Technique Administrative Committee, 1955. **Awards:** Annual Award for Advancement of Basic and Applied Science, Yale Engineering Association, 1954.

COLE, Ralph I. (A'29—SM'46—F'58), Manager, Military Project Planning, Melpar, Inc., 3000 Arlington Blvd., Falls Church, Va.
Born: August, 1905, St. Louis, Mo. B.S.(E.E.), 1927, Washington University; M.Sc. (Physics), 1936, Rutgers University. **IRE Offices:** Director, 1958–59. **Committees:** Ad Hoc Committee on Manpower, 1958; National Convention, Technical Program, 1950–51; Policy Advisory Committee, 1959; Radio Receivers, 1937–40. **Awards:** Legion of Merit, 1947.

COLEMAN, John B. (A'25—M'29—SM'43—F'48), Administrator, High Power Transmitters, Defense Electronic Products, Radio Corporation of America, Front & Cooper Sts., Camden, N.J.
Born: August, 1899, Indiana County, Pa. B.S.(E.E.), 1923, Carnegie Institute of Technology. **IRE Offices:** Director, 1948–49. **Committees:** Broadcast, 1933–34; Constitution and Laws, 1952–55; Membership, 1949–51. **Sections:** Philadelphia, *chairman, 1942–43.*

COLLINS, Arthur A. (J'26—A'32—VA'39—SM'49—F'53), President, Collins Radio Company, 855 35 St., N.E., Cedar Rapids, Iowa.
Born: September 9, 1909, Kingfisher, Okla.

COLTMAN, John W. (SM'49—F'55), Manager, Electronics and Nuclear Physics Department, Westinghouse Research Laboratories, East Pittsburgh, Pa.
Born: July 19, 1915, Cleveland, Ohio. B.S., 1937, Case Institute of Technology; M.S., 1939, Ph.D., 1941, University of Illinois. **Committees:** Board of Editors, 1951–53; Editorial Reviewer, 1954–59; Research, 1949–50. **Sections:** Nuclear Science, Pittsburgh, *chairman, 1956.* **Awards:** Fellow, American Physical Society, 1954.

COLTON, Roger B. (SM'46—F'54), Major General, U. S. Army, Retired, 624 E. Hunting Towers, Alexandria, Va.
Born: December 15, 1887, Jonesborough, N.C. Ph.B., 1908, Sheffield Scientific School, Yale University; M.S., 1920, Massachusetts Institute of Technology; Graduate of following Army Schools: C. Artillery School, 1922; C. Artillery School, Advanced Course, 1927; C. & G. S. School, 1928; Army War College, 1938. **Awards:** Distinguished Service Medal, War Department, 1946; Legion of Merit, War Department, 1946; Fellow, American Institute of Electrical Engineers.

COMSTOCK, George C. (A'47—M'47—SM'51—F'57), Director, Research and Engineering Division, Airborne Instruments Laboratory, Inc., 160 Old Country Rd., Mineola, L.I., N.Y.
Born: May, 1911, Peoria, Ill. B.S., 1932, Bradley University; Ph.D. (Physics), 1938, University of Chicago. **Committees:** Navigation Aids, 1949–51. **Awards:** War-Navy Department Award of Appreciation, 1947.

CONDON, Edward U. (M'42—SM'43—F'53), Wayman Crow Professor of Physics, Washington University, St. Louis 5, Mo.
Born: March 2, 1902, Alamogordo, N.M. A.B., 1924, Ph.D., 1926, University of California; D.Sc. (Honorary), 1950, University of Delhi, India, and New Mexico School of Mines, 1952; Alfred University and American University. **Awards:** President, American Physical Society, 1946; Philosophical Society of Washington, 1951; American Association for Advancement of Science, 1953.

COOK, Ellsworth D. (A'21—VA'39—F'41), Manager Electronic Engineering, Electrical Engineering Laboratory, General Engineering Laboratory, General Electric Company, 1 River Rd., Schenectady, N.Y.
Born: June 17, 1898, Schenectady, N.Y. B.S.(E.E.), 1920 M.S. (E.E.), 1921, Ph.D.(E.E.), 1923, Union College. **Committees:** Admissions, 1944–48; Membership, 1936–40, 1942–48, *chairman, 1940, 1944–45;* Sections, 1935, 1937–47, *chairman, 1938–39, 1940–48;* Standards, 1932–33. **Sections:** Philadelphia, *chairman, 1934–35.* **IRE Representative:** ASA Sectional Committee on Acoustical Measurements and Terminology, 1936, 1939–46.

COOLEY, Austin G. (M'44—F'55), Executive Vice President and Director of Engineering, Times Facsimile Corporation, 540 W. 58 St., New York 19, N.Y.
Born: February 9, 1900, Seattle, Wash. **Committees:** Facsimile, 1945–57, *vice-chairman, 1953–55.* **Awards:** Certificate of Appreciation, War Department, 1946; Marconi Memorial Medal of Achievement, 1956.

CORCORAN, George F. (A'43—SM'53—F'56), Professor and Chairman, Department of Electrical Engineering, University of Maryland, College Park, Md.
Born: September, 1900, Redfield, S.D. B.S., 1923, South Dakota State College; M.S., 1926, University of Minnesota. **IRE Representative:** University of Maryland, 1950–53. **Awards:** Fellow, American Institute of Electrical Engineers, 1950.

CORRINGTON, Murlan S. (SM'49—F'54), Leader, RCA Defense Electronics Products, Camden 2, N.J.
Born: May 26, 1913, Bristol, S.D. B.S.(E.E.), 1934, South Dakota School of Mines and Technology; M.Sc., 1936, Ohio State University. **Committees:** Ad Hoc Committee on Spurious Radiation, 1954–55; Professional Groups, 1956–58; Radio Frequency Interference, 1955–59. Sound Recording and Reproducing, 1950–56, *vice-chairman, 1953–56.* **Professional Groups:** Audio Administrative Committee, 1952–59, *vice-chairman, 1954–56, 1958–59;* Philadelphia Chapter, *chairman, 1953–54;* Circuit Theory Administrative Committee, 1954–57. **Sections:** Philadelphia, *treasurer, 1953–54, secretary, 1954–55, vice-chairman, 1955–56, chairman, 1956–57.*

CORWITH, Howard P. (M'26—SM'43—F'52), Vice President, Development and Research, The Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y.
Born: December 3, 1892, Water Mill, L.I., N.Y. M.E., 1916, Cornell University. **Committees:** Admissions, 1949–54, *chairman, 1952–53;* Electronics, 1938–45; Tellers, 1941. **Awards:** Fellow, American Institute of Electrical Engineers, 1951.

COSENTINO, Adolfo T. (A'37—VA'39—F'40), Minister of Communications (Argentina) Palacio de Correos y Telegrafos, Buenos Aires, Argentina.
Born: November 18, 1898, Buenos Aires, Argentina. National School, Buenos Aires. **IRE Offices:** Vice President, 1941; Director, 1941. **Committees:** Sections, *ex-officio, 1940–41, 1947–48.* **Sections:** Buenos Aires, *chairman, 1940–41, 1947–48.*

COSTA, Helio (A'50—M'55—F'58), Major Brigadeiro Do Ar, Retired. Ave. Franklin Roosevelt 39, S. 1301, Rio de Janeiro, Brazil.
Born: September 19, 1910, Rio de Janeiro, Brazil. E.E., Stanford University, 1945.

CRAIG, Palmer M. (A'34—SM'45—F'54), Vice President, Engineering, Television and Radio Division, Philco Corporation, Tioga & C Sts., Philadelphia 34, Pa.
Born: January 29, 1904, Cherry Hill, Md. B.S.(E.E.), 1927, University of Delaware. **Sections:** Philadelphia, *secretary, 1945, vice-chairman, 1946, chairman, 1947.* **Awards:** Navy Ordnance Award, U. S. Navy, 1945; U. S. Certificate of Commendation, U. S. Navy, 1947.

CRAIN, Cullen M. (S'42—M'49—SM'54—F'58), Group Leader, Electronics Department, The Rand Corporation, 1700 Main St., Santa Monica, Calif.
Born: September 10, 1920, Goodnight, Tex. B.S.(E.E.), 1942, M.Sc.(E.E.), 1947, Ph.D., 1952, University of Texas. **Sections:** San Antonio, *chairman, 1952.* **IRE Representative:** University of Texas, 1950–52.

CRAVEN, Tunis A. M. (F'29), Commissioner, Federal Communications Commission, New Post Office Bldg., Washington 25, D.C. Mail: Langley, McLean P.O., Va.
Born: January 31, 1893, Philadelphia, Pa. Graduate, 1913, United States Naval Academy. **IRE Offices:** Director, 1937. **Committees:** Broadcast, 1934–35; Meetings and Papers, 1930–31; Papers, 1932–41; Radio Transmitters and Antennas, 1930–31; Standardization, 1929–31. **Professional Groups:** Communications Systems, 1957.

CRAWFORD, Arthur B. (A'29—SM'46—F'52), Technical Staff, Radio Research Engineer, Bell Telephone Laboratories, Inc., Box 107, Red Bank, N.J.
Born: February 26, 1907, Graysville, Ohio. B.S.(E.E.), 1928, Ohio State University. **Committees:** Editorial Reviewer, 1954–55; Wave Propagation, 1949–58, *vice-chairman, 1959.*

CROSBY, Murray G. (A'25—M'38—SM'43—F'43), President and Research Director, Crosby Laboratories, Inc., 299 Robbins Lane, Syosset, L.I., N.Y.
Born: September, 1903, Elroy, Wis. B.S., 1927, E.E., 1943, University of Wisconsin. **IRE Offices:** Director, 1947–49. **Committees:** Admissions, 1945–46; Annual Review, 1946–47; Appointments, 1947–48, *chairman, 1948;* Awards, 1950–52, *chairman, 1950;* Board of Editors, 1946–53; Editorial Administrative, 1946–50; Editorial Reviewer, 1954–59; Executive, 1949; Frequency Modulation, 1940–47, *chairman, 1946–47;* Modulation Systems, 1947–50, *chairman, 1947–48;* National Convention, 1948; Papers, 1941–45; Papers Procurement, 1945; Papers Review, 1946–51, *chairman, 1946–48;* Policy Development, 1948–50; Professional Groups, 1948; Standards, 1946–48. **IRE Representative:** IRE-RTMA, Problem No. 2, *chairman, 1951.* **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

CULLUM, A. Earl, Jr. (J'28—A'31—SM'45—F'48), Head, A. Earl Cullum, Jr., Consulting Engineers, Inwood P.O., Dallas 9, Tex.
Born: September, 1909, Abilene, Tex. B.S. (Communications Engineering), 1931, Massachusetts Institute of Technology. **IRE Offices:** Director, 1948. **Committees:** Annual Review, 1948–49; Nominations, 1949–50; Policy Development, 1949–50; Radio

Wave Propagation and Utilization, 1946–47; Standards, 1948–49; Wave Propagation, 1948–56, *chairman, 1948–49.* **Professional Groups:** Broadcast Transmission Systems Administrative Committee 1956–59. **Awards:** Presidential Certificate of Merit, 1948.

CULVER, Charles (M'20—SM'43—F'54)(L), Consulting Engineer, 740 W. Harrison Ave., Claremont, Calif.
Born: September 22, 1875, Preston, Minn. B.S., 1902, Carleton College; Ph.D., 1907, University of Pennsylvania; Research Fellow, 1917, Harvard University; 1930, University of Cambridge, England. **Sections:** Twin Cities, *chairman, 1941–42.* **IRE Representative:** Carleton College, 1941–45. **Awards:** Fellow, American Institute of Electrical Engineers.

CUTLER, C. Chapin (A'40—SM'53—F'55), Assistant Director of Electronics & Radio Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: December 16, 1914, Springfield, Mass. B.S., 1937, Worcester Polytechnic Institute. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Electron Tube Conference, 1950–54, *chairman, 1954.*

CUTTING, Fulton (M'15—F'21)(L), Trustee, Professor of Physics and Assistant to the President, Stevens Institute of Technology, Hoboken, N.J.
Born: December 27, 1886, New York, N.Y. **IRE Offices:** President, 1922; Vice President, 1921; Manager, 1920; Director, 1921–24. **Committees:** Education, 1944; Investments, 1944–46.

DARLINGTON, Sidney (SM'53—F'57), Member, Technical Staff, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: July, 1906, Pittsburgh, Pa. B.S., 1928, Harvard University; B.S.(E.E.), 1929, Massachusetts Institute of Technology; Ph.D., 1940, Columbia University. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Circuit Theory, *vice-chairman, 1957–58.*

DART, Harry F. (A'20—M'26—SM'43—F'59), Patent Engineer, Electronic Tube Division, Western Electric Corporation, P.O. Box 284, Elmira, N.Y.
Born: October 20, 1895, Forrest, Ill. E.E., 1917, Professional Degree of E.E., 1923, Purdue University. **IRE Offices:** Regional Director, 1951–52. **Committees:** Admissions, 1927–29; Broadcast, 1932–33; Editorial Administrative, 1949–50; Meetings and Papers, 1926; Membership, *chairman, 1926–28, 1938–40;* Nominations, 1933; Standardization, 1929–30; Symbols, 1945–51; Tellers, 1939, 1943; *chairman, 1944.* **Special Committees:** Professional Recognition, 1955–56, 1959. **Professional Groups:** Director, Electron Devices, 1951–55. **Awards:** Fellow, American Institute of Electrical Engineers, 1958.

DASHER, Benjamin J. (A'41—M'55—SM'57—F'59), Director, School of Electrical Engineering, Georgia Institute of Technology, 225 North Ave., Atlanta, Ga.
Born: December 1912, Macon, Ga. B.S.(E.E.), 1935, M.S.(E.E.), 1945, Georgia Institute of Technology; Sc.D.(E.E.), 1952, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Instrumentation Administrative Committee, 1958–. **IRE Representative:** Georgia Institute of Technology, 1943–57.

DAVENPORT, Wilbur B., Jr. (S'40—A'42—M'48—SM'54—F'58), Division Head, Lincoln Laboratory, Massachusetts Institute of Technology, P.O. Box 73, Lexington 73, Mass.
Born: July 27, 1920, Philadelphia, Pa. B.S.(E.E.), 1941, Alabama Polytechnic Institute; M.Sc.(E.E.), 1943, D.Sc., 1950, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–58; Information Theory and Modulation Systems, 1953–55. **Professional Groups:** Information Theory Administrative Committee, 1954–59, *vice-chairman, 1956–57; chairman, 1957–58.*

DAVIS, Harry I. (A'44—SM'49—F'55), Technical Director, Rome Air Development Center, Griffiss Air Force Base, 901 Turin St., Rome, N.Y.; Special Lecturer, Graduate Electrical Engineering, Columbia University, New York, N.Y.
Born: December, 1909, New York, N.Y. B.S., 1931, E.E., 1933, College of the City of New York; M.E.E., 1948, Polytechnic Institute of Brooklyn. **Committees:** Navigation Aids, 1950–55. **Sections:** Rome-Utica, *chairman, 1954.*

DAVIS, Thomas McL. (M'28—SM'43—F'56), Retired. 4302 Brandywine St., N.W., Washington 16, D.C.
Born: August 17, 1890, Farmington, Me. **Committees:** Registration and Arrangements, IRE National Convention, *chairman, 1929;* Standardization, 1929–31. **Sections:** Washington, *acting secretary, 1928–29, vice-chairman, 1929–30, chairman, 1934–35.* **Awards:** Distinguished Service Award of Washington Section, 1957; Navy Distinguished Civilian Service Award, 1957. RESA.

DAWSON, John W. (A'39—SM'52—F'55), Manager, Product Engineering, D. S. Kennedy & Company, Cohasset, Mass.
Born: February 22, 1901, Sumner, Iowa. B.S.(E.E.), 1926, Iowa State College; M.S.(E.E.), 1938, University of Pittsburgh. **Awards:** National Prize for Best Paper in the Field of Engineering Practice for 1937, AIEE.

DEARDORFF, Ralph W. (A'14—SM'44—F'51), Retired. 1831 N.W. Ramsey Dr., Portland 10, Ore.
Born: August 9, 1894, Portland, Ore. **Sections:** Portland, *chairman, 1942–43, vice-chairman, 1946–47.*

deBETTENCOURT, Joseph T. (A'50—M'55—F'59), Vice President, Research and Development, D. S. Kennedy & Company, Cohasset, Mass.
Born: June 9, 1912, Washington, D.C. B.E.E., 1932, M.S. (Physics), 1934, Catholic University of America; Sc.M.(Communications), 1937; Sc.D.(Communications), 1949, Harvard University. **Committees:** Wave Propagation, 1956–59. **Sections:** Boston, Antenna and Propagation, *chairman, 1956–57.* **Awards:** U.S.A. Delegate, National Academy of Sciences, National Research Council, to XI General Assembly of U.R.S.I., 1954, The Hague; XII General Assembly at Boulder, 1957.

DeCOLA, Rinaldo E. (A'37—SM'43—F'57), 21 N. Lincoln Ave., Park Ridge, Ill.
Committees: Radio Receivers, 1951–54. **Professional Groups:** Broadcast and Television Receivers Administrative Committee, 1956–57.

de FOREST, Lee (Charter Member)(A'12—M'14—F'18)(L), 8190 Hollywood Blvd., Los Angeles 46, Calif.
Born: August 26, 1873, Council Bluffs, Iowa. Ph.B., 1896, Ph.D., 1899, Yale University; Sc.D., 1919, Syracuse University; D.Sc., 1926, Yale University; D.Eng., 1937, Lewis Institute; LL.D., Talladega College, Beloit College; D.Sc., College of Osteopathic Surgery, 1951. **IRE Offices:** President, 1930; Director, 1930–32. **Committees:** Specifications for Steamship Radio Equipment, 1914–15; Wave Length Regulations, 1916–17. **Awards:** President, Society of Wireless Telegraph Engineers, 1909–10; Legion of Honor, 1921, Officer, 1956; IRE Medal of Honor, 1922; Edison Medal, 1947.

DEL CAMP, Scipione M. (A'48—M'55—F'59), Director and Vice President of Research and Development, Cinch Manufacturing Corporation, Chicago, Ill.
Born: San Marco, Italy. M.E., 1912, Polytechnic Institute, Foggia, Italy. **IRE Representative:** EIA-08C Committee, *chairman 1937–;* IEC 40-4 Committee, *chairman, 1955;* Member, ASA-C83 Sectional Committee on Components; Member, International Electro-Technical Commission. **Professional Groups:** Engineering Management, *chairman.*

DELLINGER, John Howard (F'23)(L), Radio Consultant and Adviser, 3900 Connecticut Ave., Washington 8, D.C.
Born: July 3, 1886, Cleveland, Ohio. A.B., 1908, George Washington University; Ph.D., 1913, Princeton University; D.Sc., 1932, George Washington University. **IRE Offices:** President, 1925; Vice President, 1924; Director, 1924–27; Manager, 1928–31. **Committees:** Annual Review, 1938–43; Awards, 1934, 1936; Bibliography, 1930–32, 1934, *chairman, 1931;* Meetings and Papers, *chairman, 1928;* Nominations, 1928, 1931, 1935, *chairman, 1931;* Radio Receivers, 1927–28; Radio Wave Propagation, 1942–45, *chairman, 1942–44;* Revision of the Constitution, *chairman, 1927;* Standardization, 1920–25, 1927–32, *chairman, 1929–31;* Standards, 1932–41, 1943–44; Symbols, 1940–41, 1943–48; Use of the Transmission Unit, 1928–29; Wave Propagation, 1959; *chairman, 1937–41, 1956–58.* **Sections:** Washington, D.C., *chairman, 1932–33.* **IRE Representative:** American Documentation Institute, 1944–52; ASA Sectional Committee (C60) on Electric and Magnetic Magnitudes and Units, 1936, 1939–48, 1950; International Electrotechnical Commission, Scandinavia, 1930. **Awards:** IRE Medal of Honor, 1938; Distinguished Service Award of Washington Section, 1956.

DELORAINE, Edmond M. (M'25—F'41), Vice President and Technical Director, International Standard Electric Corporation, 67 Broad St., New York 4, N.Y.; President, Le Materiel Telephonique; President, Laboratoire Central de Telecommunications, Paris, France.
Born: May 16, 1898, Clichy, Seine, France. B.S., 1920, Ecole de Physique et Chimie. Ingénieur-Docteur, University of Paris. **IRE Offices:** Vice President, 1946; Director, 1946. **Committees:** Board of Editors, 1944–45; Membership, 1927. **IRE Representative:** International Liaison Committee, 1947.

DEMPSTER, Burgess (A'31—M'44—SM'48—F'57), President Electronic Engineering Company of California, 1601 E. Chestnut Ave., Santa Ana, Calif.
Born: November, 1907, Berkeley, Calif. B.S.(E.E.), 1929, University of California. **Sections:** 7th Region, *secretary-treasurer, 1956–57. Cincinnati,* Membership Committee, *chairman, 1948.* Los Angeles, Research Committee, *chairman, 1957–58;* Los Angeles Section, *vice-chairman, 1958–59;* Los Angeles Section Awards Committee, 1958–59. **Professional Groups:** Los Angeles Chapter, *chairman,* Engineering Management, 1955–56. **IRE Representative:** Publicity Committee, IRE-WESCON, 1948; Visitors' Hospitality Committee, IRE-WESCON, *chairman, 1950;* Convention Registration Committee, IRE-WESCON, *chairman, 1952, 1954;* IRE-WESCON, *chairman, 1958,* Field Trips Committee.

DENNIS, James L. (SM'46—F'59), Consulting Engineer, 1420 Glendale Ave., Dayton 6, Ohio.
Born: July, 1915, Quincy, Ill. B.S.(E.E.), 1937, University of Illinois. **Professional Groups:** Aeronautical and Navigational Electronics Administrative Committee, *secretary-treasurer, 1954–55, chairman, 1956;* National Conference on Aeronautical Electronics, Board of Directors, 1955–57, *chairman, 1955.* **Sections:** Dayton, *chairman, 1952.* **Awards:** Department of the Air Force Exceptional Civilian Service Award, 1950.

deROSA, Louis A. (A'45—SM'51—F'52), Vice President, Electronic Countermeasures Laboratory, International Telephone and Telegraph Laboratories, a division of IT&T Corp., 500 Washington Ave., Nutley 10, N.J.
Born: September 10, 1910, Tenafly, N.J. B.S.(E.E.), 1932, Polytechnic Institute. **Committees:** Information Theory and Modulation Systems, 1951–59. **Professional Groups:** Information Theory, *vice-chairman, 1954–55, chairman, 1955–56.*

DEVORE, Lloyd T. (A'42—SM'44—F'52), Vice President and Director, Hoffman Science Center, 415 E. Montecito St., Santa Barbara, Calif.
Born: November 14, 1909, Monongahela, Pa. B.S., 1930, M.S., 1931, Ph.D., 1933, Pennsylvania State College. **Committees:** Awards, 1952–53; Papers Review, 1951–53; Program, *chairman, 1948–49, 1952–53.* **Professional Groups:** Engineering Management, *secretary, 1951–54.* **Awards:** Exceptional Civilian Service Award, 1947, War Department.

DeWITT, John H., Jr. (A'31—M'38—SM'43—F'51), President, WSM Incorporated, 301 7 Ave., N., Nashville 3, Tenn.
Born: February 20, 1906, Nashville, Tenn. **Committees:** Professional Groups, 1948.

DIEHL, William F. (A'19—F'36), Assistant Vice President, Dumont Airplane and Marine Instruments, Inc., Clearfield, Pa.
Born: December 18, 1896, New York, N.Y. **Committees:** Building Fund, 1945; Radio Receivers, 1928–29; Radio Transmitters and Antennas, 1929–30. **Sections:** Philadelphia, *chairman, 1933–34, convention chairman, 1934.* **Awards:** United States Navy Certificate Commendation P.E., Pa.

DIETZOLD, Robert L. (M'40—SM'43—F'55), Director, Military Systems Studies, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: August 3, 1904, Akron, Ohio. B.S., 1925, Massachusetts Institute of Technology; Ph.B., 1927, Yale University. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Board of Editors, 1951–53; Circuits, 1949–53; Circuit Theory, *chairman, 1952–53;* Editorial Administrative, *alternate, 1949–50;* Handbook, 1945–47; Papers Review, 1948–49.

DINGER, Harold E. (A'27—M'43—SM'43—F'58), Electronics Scientist, Naval Research Laboratory, Washington 25, D.C.
Born: May 7, 1905, Barberton, Ohio. **Committees:** Interference Measurements, 1959; Measurements and Instrumentation, 1952–53; Radio Frequency Interference, 1955–59; Wave Propagation, 1953–56. **Awards:** Meritorious Civilian Service Award, U. S. Navy, 1945; Service Appreciation Award, American Standards Association, 1946; Fellow, American Association for the Advancement of Science.

DINGLEY, Edward N., Jr. (A'28—M'43—SM'43—F'56), Senior Staff Engineer, Electronic Communications, Inc., 1501 72nd St., N., St. Petersburg 10, Fla.
Born: July 18, 1902, Kalamazoo, Mich. 1922–25, Massachusetts Institute of Technology; B.Sc.(E.E.), 1936, George Washington University. **Professional Groups:** Communications Systems, Administrative Committee, *vice-chairman, 1957–58, chairman, 1956–57; 1958–59;* Chapter Activities Sub-Committee, *chairman, 1956–57;* Washington Chapter PGCS, *vice-chairman, 1955–56, chairman, 1956–57, secretary, 1954–55;* Technical Papers Committee, PGCS National Symposium on Global Communications, Washington, *vice-chairman, 1954;* PGCS 2nd National Symposium on Communications Systems, St. Petersburg, Fla., *general-chairman, 1959.* **Sections:** Florida West Coast; Professional Groups Committee, *chairman, 1957–58.* **Awards:** Fellow, AIEE, 1957; Department of Defense Distinguished Civilian Service Medal, 1955.

DISHAL, Milton (A'41—SM'46—F'57), Senior Scientist, International Telephone and Telegraph Laboratories, 500 Washington Ave., Nutley 10, N.J.
Born: March, 1918, Philadelphia, Pa. B.S., 1939, M.A. (Physics), 1941, Temple University. **Committees:** Convention Record, 1955–56; Editorial Reviewer, 1953–59. **Professional Groups:** Circuit Theory, *secretary-treasurer, 1953–56;* Administrative, 1954–57.

DiTORO, Michael J. (A'37—SM'45—F'58), Director of Engineering, Polytechnic Research and Development Company, Inc., Brooklyn, N.Y.
Born: June 24, 1910, Campobasso, Italy. E.E., 1931, M.E.E., 1933, D.E.E., 1946, Polytechnic Institute of Brooklyn. **Committees:** Electroacoustics, 1946, 1951–52; Papers Review, 1945–53. **Professional Groups:** Administrative Committee Information Theory, *chairman, 1956.* **Awards:** Fellow, Acoustical Society of America.

DOHERTY, William H. (A'29—M'36—SM'43—F'44), Manager, Government Sales, Western Electric Company, 120 Broadway, New York 5, N.Y.
Born: August 21, 1907, Cambridge, Mass. S.B., 1927, S.M., 1928, Harvard University; Sc.D., 1950, Catholic University of America. **IRE Offices:** Director, 1951–53, 1958–60. **Committees:** Appointments, 1957; Editorial Reviewer, 1954–55; Membership, 1943–46; Nominations, 1952–53, *chairman, 1953;* Policy Advisory, 1952–53, 1959; Policy Development, 1951; Professional Groups, 1948–51. **IRE Representative:** Joint AIEE-IRE Student Activities Coordination Committee, 1958–59. **Awards:** IRE Morris Liebmann Memorial Prize, 1937.

DOME, Robert B. (A'27—M'38—SM'43—F'48), Consulting Engineer, Television Receiver Department, Major Appliance Division, Consumer Products Group, General Electric Company, Syracuse, N.Y.
Born: October 12, 1905, Tell City, Ind. B.S.(E.E.), 1926, Purdue University; M.S.(E.E.), 1929, Union University. **Committees:** Board of Editors, 1946–53; Editorial Reviewer, 1954–59; Papers, 1940–45. **Awards:** Coffin Award, 1936, 1948; IRE Morris Liebmann Memorial Prize, 1951; RESA, 1951.

DOOLITTLE, Franklin M. (A'13—M'30—F'54)(L), President, Connecticut Broadcasting Company, 869 Blue Hills Ave., Hartford 12, Conn.
Born: June, 1893, New Haven, Conn. Ph.B., 1915, Yale University. **Committees:** Modulation Systems, 1947–48; Standardization, 1927–28.

DORSEY, Herbert Grove (M'19—F'34)(L), Retired, 3708 33 Pl., N.W., Washington 8, D.C.
Born: April 24, 1876, Kirkersville, Ohio. B.S., 1897, M.S., 1898, Sc.D. (Honorary), 1937, Denison University; Ph.D., 1908, Cornell University. **Sections:** Washington, D.C., *secretary, 1930–32, chairman, 1933.* **Awards:** First Annual Award, Washington Society of Engineers, 1941; Fellow, Acoustical Society of America; AIEE; Fellow, American Association for the Advancement of Science.

DOW, Jennings B. (M'26—F'42), President, Hazeltine Electronics Division of Hazeltine Corporation, 58-25 Little Neck Parkway, Little Neck, L.I., N.Y.
Born: January 2, 1897, Bowling Green, Ohio. B.S., 1919, United States Naval Academy; M.S. 1926, Graduate School of Engineering, Harvard University.

DOW, William G. (M'39—SM'43—F'50), Professor and Chairman of the Department of Electrical Engineering, University of Michigan, Ann Arbor, Mich.
Born: September 30, 1895, Faribault, Minn. B.S.(E.E.), 1916, E.E., 1917, University of Minnesota; M.S.E.(E.E.), 1929, University of Michigan. **Committees:** Board of Editors, 1944–53; Electronics, 1939–45; Electron Tubes, 1946–47; Electron Tubes and Solid State Devices, 1949–52; Papers, 1941–44; Research, 1949–50; Vacuum Tubes, 1945–46. **Awards:** Fellow, American Institute of Electrical Engineers.

DRAKE, Frederick H. (A'25—M'28—SM'43—F'57), Inventor, Squire Rd., Roxbury, Conn.
Born: June, 1901, Watertown, Mass. A.B., 1923, A.M., 1925, Ph.D., 1926, Harvard University. **Committees:** Papers, 1933.

DRAPER, Charles S. (A'53—F'55), Professor and Head, Department of Aeronautics and Astronautics; Director of Instrumentation Laboratory, Massachusetts Institute of Technology, 68 Albany St., Cambridge 39, Mass.
Born: October 2, 1901, Windsor, Mo. B.A., 1922, Stanford University; B.S., 1926, M.S., 1928, Sc.D., 1938, Massachusetts Institute of Technology. **Committees:** Electronics Computers, 1948–49. **Awards:** IAS Sylvanus Albert Reed Award, 1946; Presidential Medal for Merit, 1946; Naval Ordnance Development, 1946; New England Award, Engineering Societies of New England, 1947; Exceptional Civilian Service Award, Department of the Air Force, 1951; Testimonial of Appreciation, Society of Mechanical Engineers, 1951; 43rd Wilbur Wright Memorial Lecturer, Royal Aeronautical Society, London, 1955; Navy Distinguished Public Service Award, 1956; Airpower Award of Massachusetts Wing of Air Force Association, 1957; Thurlow Award of Institute of Navigation, 1957; Airpower Trophy of Air Force Association, 1957; Holley Medal of American Society of Mechanical Engineers, 1957; Blandy Medal of the American Ordnance Association, 1958; American Honorary Fellowship, Institute of the Aeronautical Sciences, 1958.

DREHER, Carl (F'57), Writer, RD 3, Brewster, N.Y.
Born: February 16, 1896, Vienna, Austria. B.S., 1917, College of the City of New York. **Committees:** Board of Editors, 1928–29; Broadcasting, 1928–29; Meetings and Papers, 1926–29, Standardization, 1929–30.

DUBILIER, William (A'14—M'18—F'29)(L), Vice President and Technical Director, Cornell-Dubilier Electric Corporation; President, Radio Patents Corporation, P.O. Box 942, New Rochelle, N.Y.
Born: July 25, 1888, New York, N.Y. Attended Cooper Institute. **Awards:** Fellow, American Institute of Electrical Engineers, 1925; French Legion of Honor and Officer of the French Academy, 1949; Gano Dunn Medal, Cooper Union, New York, N.Y., 1955.

DUFFENDACK, Ora S. (SM'44—F'56), Consultant Physicist, Retired, 4110 Council Crest, Madison, Wis.
Born: May, 1890, Napoleon, Mo. B.S., 1917, University of Chicago; A.M., 1921, Ph.D., 1922, Princeton University. **Committees:** Papers Review, 1946–53. **Awards:** King's Medal for Service in the Cause of Freedom, 1948; President's Certificate of Merit, 1948.

DuMONT, Allen B. (M'30—F'31), Chairman of the Board, Allen B. DuMont Laboratories, Inc., 750 Bloomfield Ave., Clifton, N.J.
Born: January 29, 1901, Brooklyn, N.Y., E.E., 1924, D.Eng., 1944, Rensselaer Polytechnic Institute; D.Eng., Brooklyn Polytechnic Institute, 1949; D.Laws, Fairleigh Dickinson University, 1955; D.Science, New York University, 1955. **Committees:** Standardization, 1929–31; Standards, 1932; Television, 1939–45. **Awards:** Westinghouse Award, 1927; American Television Society Award, 1943; Television Broadcasters Award, 1944; Marconi Memorial Medal of Achievement, 1945; AAAA Gold Medal Award, 1947; American Schools and Colleges Awards; Chevalier in National Order of French Legion of Honor, 1952.

DUNN, William L. (M'41—S'43—F'54), Vice President, Director of Engineering and Research, Admiral Corporation, 3800 W. Cortland St., Chicago 47, Ill.
Born: December 19, 1903, Asheville, N.C. A.B., 1926, The Johns Hopkins University. **Committees:** Radio Receivers, 1940–47.

DUNNING, Orville M. (A'34—SM'44—F'55), Vice President, Engineering and Production Division, Airborne Instruments Laboratory, 160 Old Country Rd., Mineola, L.I., N.Y.
Born: February 21, 1904, St. Louis, Mo. B.S.(E.E.), 1925, Rose Polytechnic Institute. **Committees:** Admissions, 1946–47. **Sections:** Long Island Subsection, *chairman, 1949–50.*

DYER, John N. (J'30—A'32—SM'45—F'49), Vice President, Research and Engineering, Airborne Instruments Laboratory, 160 Old Country Rd., Mineola, L.I., N.Y.
Born: July, 1910, Haverhill, Mass. B.S., 1931, Massachusetts Institute of Technology. **IRE Offices:** Director, 1955–56. **Committees:** American Institute of Electrical Engineers—Institute of Radio Engineers Coordination Committee on Student Activities, 1955–56; Appointments, 1955–56; Education, 1955–59; Fellow, 1958, *chairman, 1959;* Navigation Aids, 1949–50; Nominations, 1956; Policy Advisory, 1955–57, *chairman, 1956.* **Sections:** Long Island Subsection, *vice-chairman, 1949–50, chairman, 1950–51.*

EARLY, James M. (A'48—SM'54—F'59), Transistor Development Engineer, Sub-Department Head, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: July, 1922, Syracuse, N.Y. B.Sc. (Pulp & Paper Manufacturing), New York State College of Forestry; M.Sc.(E.E.), Ph.D.(E.E.), 1951, Ohio State University. **Committees:** Semiconductor Devices, *chairman, 1957–59;* Solid State Devices, 1956–59.

EASTHAM, Melville (A'13—M'13—F'25)(L), 8 Graygardens, E., Cambridge, Mass.
Born: June 26, 1885, Oregon City, Ore. Dr.Eng., 1946 (Honorary), Oregon State College. **IRE Offices:** Treasurer, 1928–40; Manager, 1922–27; Director, 1927–41; Administrator, Building Fund, 1947–48. **Committees:** Admissions, 1937–39, 1941–42;

Awards, 1929, 1931, 1935, 1939, 1941–42, *chairman, 1929, 1941;* Bibliography, 1930–32, 1934, *chairman, 1932, 1934;* Constitution and Laws, 1930–31, 1933; Education, 1944–48; Electro-Acoustic Devices, 1929–30; History, 1954–57, 1959; Nominations, 1929–30, 1932, 1935–36, 1938–39, 1941, 1949–50, *chairman, 1929, 1935;* Papers, 1916–19; Revision of the Constitution, 1925; Sections, 1925; Standardization, 1925–31; Standards, 1936–38; Wave Length Regulation, 1916–17. **Sections:** Boston, *secretary, 1914–15, secretary-treasurer, 1916–29, secretary, 1930–32.* **IRE Representative:** Engineering Index National Committee, 1936, 1939–43; Radio Broadcasting Committee, American Engineering Council, 1930, 1936, 1939, 1940; United States National Committee, Advisers on Electrical Measuring Instruments, 1936, 1939–40, 1949–51. **Awards:** IRE Medal of Honor, 1937; Medal of Merit, 1948; New England Engineering Award, 1948.

EASTMAN, Austin V. (A'23—M'32—F'41), Professor and Head of Department of Electrical Engineering, University of Washington, Seattle 5, Wash.
Born: May 16, 1902, Seattle, Wash. B.S.(E.E.), 1922, M.S. (E.E.), 1929, University of Washington. **IRE Offices:** Director, 1950–51. **Committees:** Awards, 1951; Membership, 1941–48; Nominations, 1954; Papers Procurement, 1942–43; Policy Development, 1949–51; Regular Papers, 1941. **Sections:** Seattle, *chairman, 1929–30.* **IRE Representative:** University of Washington, 1941–47. **Awards:** Fellow, American Institute of Electrical Engineers, 1946.

ECKERSLEY, Peter Pendleton (F'25), Telephone Manufacturing Co., Ltd., West Dalwich, S.E. 21, London, England.
Born: January, 1892, La Puebla, Mexico. Certificate of Technology, 1915, Manchester School of Technology; Higher Certificate, 1910, Bedales School. **IRE Offices:** Vice President, 1937; Director, 1937. **Awards:** Premium Prize Award, Institution of Electrical Engineers, 1928, 1930.

ECKERT, John Presper (S'41—A'47—F'56), Vice President, Univac Engineering, Remington Rand, Inc., Remington Rand Univac, Division of Sperry Rand Corporation, 2300 W. Allegheny Ave., Philadelphia 29, Pa.
Born: April 9, 1919, Philadelphia, Pa. B.S.(E.E.), 1941, M.S. (E.E.), 1943, University of Pennsylvania. **Committees:** Electronic Computers, 1948–50. **Awards:** Howard W. Potts Medal, Franklin Institute, 1949.

EDGERTON, Harold E. (SM'55—F'56), Professor of Electrical Measurements, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: April 6, 1903, Fremont, Neb. B.S., 1925, University of Nebraska; M.S., 1927, D.Sc., 1931, Massachusetts Institute of Technology. **Awards:** Modern Pioneers Award, National Association of Manufacturers, 1940; Joseph A. Sprague Memorial Award, National Press Photographic Association, 1949; Franklin L. Burr Prize, National Geographic Society, 1953.

EDLEFSEN, Niels E. (SM'52—F'54), Vice President and Director of Engineering, Vickers, Inc., Division of Sperry Rand Corporation, Administrative and Engineering Center, Detroit 32, Mich.
Born: January 29, 1893. B.S. (physics), 1916, Utah State University; M.A. (physics), 1923, Ph.D. (physics), 1930, University of California. **Awards:** Fellow, American Physical Society; Fellowship Charles A. Coffin, 1928–30; Honorable Mention, Nobel Prize, Physics, 1939.

EDSON, William A. (M'41—SM'43—F'57), Consulting Engineer, General Electric Microwave Laboratory, 601 California Ave., Palo Alto, Calif.
Born: October, 1912, Burchard, Neb. B.S. and M.S., 1934–35, University of Kansas; Sc.D., 1937, Harvard University. **Committees:** Editorial Reviewer, 1953–59; Education, 1955–59; Papers, 1951–53; Piezoelectricity, 1949–58; Piezoelectric and Ferroelectric Crystals, 1959. **Sections:** Atlanta, *vice-chairman, 1947, chairman, 1948;* San Francisco, *director, 1955.* **IRE Representative:** WESCON, Technical Program Committee, 1955; Microwave Theory and Techniques National Symposium, Steering Committee; Member, WESCON, Technical Program Committee, 1959.

EDWARDS, Martin (SM'48—F'54), Manager of Engineering, X-Ray Department, General Electric Company, 4855 Electric Ave., Milwaukee 14, Wis.
Born: March 22, 1905, Chautauqua, Kan. B.S.(E.E.), 1928, B.S.(M.E.), 1929, M.E., 1934, D.Sc., 1946, Kansas State College. **Awards:** Fellow, AIEE, 1946.

EITEL, William W. (A'39—SM'52—F'53), President, Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif.
Born: January 16, 1908, San Jose, Calif. **Awards:** Distinguished Service Award, U. S. Navy, 1950.

ELIAS, Peter (S'48—A'51—M'56—F'59), Associate Professor of Electrical Engineering, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: November 26, 1923, New Brunswick, N.J. S.B., 1944, Massachusetts Institute of Technology; M.A., 1948, M.(Eng. Sci., 1949, Ph.D., 1950, Harvard University. **Committees:** Information Theory and Modulation Systems, 1953–56, *vice-chairman, 1957–58; chairman, 1958–59;* Standards, 1958–59. **Professional Groups:** Information Theory Symposium, *chairman, 1954;* Member, Information Theory Administrative Committee, 1958–59.

ELLEFSON, Bennett S. (A'38—M'44—F'48), Vice President, Engineering and Research, Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y.
Born: January 10, 1911, Canby, Minn. B.A., 1932, St. Olaf College; M.S., 1933, University of Minnesota; Ph.D., 1937, Pennsylvania State University. **Committees:** Annual Review, 1946–47.

ELLIOTT, Harold F. (M'25—SM'43—F'51), Consulting Engineer, 800 Westridge Dr., Menlo Park, Calif.
Born: June 17, 1892, Durango, Colo. A.B., 1916; Engineer, 1925, Stanford University.

ELWELL, Cyril F. (M'14—F'18)(L), Consulting Engineer, Hewlett-Packard Company, 275 Page Mill Rd., Palo Alto, Calif.
Born: August 20, 1884, of American Parents, Melbourne, Victoria, Australia. A.B., 1907, E.E., 1908, Stanford University. **Committees:** Increase of Membership, 1913–14. **Awards:** Honorary Life Member of the Institution of Radio Engineers, Australia, 1954.

ENGLEMAN, Christian L. (SM'46—F'54), President, Engleman and Company, Inc., 2480 16 St., N.W., Washington 9, D.C.
Born: April 3, 1906, Vancouver Clark County, Wash. B.S., 1930, United States Naval Academy College; M.S., 1938, Harvard University. **Committees:** Professional Groups, 1958–59. **Professional Groups:** Communications Systems National Committee, 1954–57, *vice-chairman, 1956;* Military Electronics National Committee, 1956–59, *national chairman, 1956, treasurer, 1958.* **Sections:** Washington Chapter, *chairman, 1954.*

ENGSTROM, Elmer W. (A'25—M'38—F'40), Senior Executive Vice President and Director, Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.; Director, National Broadcasting Company.
Born: August 25, 1901, Minneapolis, Minn. B.S.(E.E.), 1923, University of Minnesota; Sc.D. (Honorary), 1949, New York University. **IRE Offices:** Director, 1949. **Committees:** Awards, 1945–49, *chairman, 1946;* Board of Editors, 1940–51; Nominations, 1947; Public Relations, 1940; Regular Papers, 1941; Research, 1946–47, 1949–50; Television, 1939–40; Television and Facsimile, 1936–38.

ENGSTROM, Howard T. (SM'53—F'59), Vice President, Remington Rand, Division of Sperry Rand Corporation, 315 Fourth Ave., New York 10, N.Y.
Born: April 23, 1902, Boston, Mass. B.Ch.E., 1922, Northeastern

University; M., 1925, University of Maine; Ph.D., 1929, Yale University. **Awards:** Distinguished Service Medal, U. S. Navy; Officer of the British Empire; Naval Security Medal; Distinguished Civilian Service Award.

EPPERSON, Joseph B. (A'34—M'38—SM'43—F'58), Engineering Vice President, Scripps-Howard Radio, Inc., Euclid Ave. & E. 30 St., Cleveland 15, Ohio.
Born: May, 1910, Charleston, Tenn. **Committees:** Constitution and Laws, 1951; Sections, 1951–52. **Sections:** Cleveland, *secretary-treasurer, 1948–49, vice-chairman, 1949–50, chairman, 1950–51.* **Professional Groups:** Administrative Committee, Broadcast Transmission Systems, 1951–55; Annual Symposium, *chairman, 1954.* **Awards:** Award Certificate for Service as Chairman of National AIEE Committee on TV and Aural Broadcasting Systems, 1955–56; Fellow, American Institute of Electrical Engineers, 1958.

EPSTEIN, David W. (A'34—SM'43—F'52), Manager, Conversion Tube Operations, RCA Electron Tube Division, Radio Corporation of America, Lancaster, Pa.
Born: January 11, 1908, Russia. B.S. (Physics), 1930, Lehigh University; M.S.(E.E.), 1934; D.Sc.(E.E.), 1937, University of Pennsylvania. **Committees:** Editorial Reviewer, 1954–59.

ESPENSCHIED, Lloyd (IRE Charter Member) (A'12—M'13—F'24)(L), Retired from Bell Telephone Laboratories, Inc., Consultant, 99 82 Road, Kew Gardens 15, N.Y.
Born: April 27, 1889, St. Louis, Mo. Pratt Institute, 1909, D.Sc. (Honorary), 1957. **IRE Offices:** Manager, 1912–13, 1915–26, 1931. **Committees:** Admissions, 1942–47; Awards, 1919; Editing, 1914; History, 1954–59; Increase of Membership, 1917–18; Radio Telephone and Receiver Terminology, *chairman, 1924–25;* Revision of the Constitution, 1925; Standardization, 1924–25; Wave Length Regulation, 1916–17, 1919–20. **Sections:** New York, *chairman, 1914–15.* **IRE Representative:** National Advisory Council on Radio in Education, 1936–37, 1939–40; Committee on Engineering Developments, 1941–43. **Awards:** AIEE Award (co-receiver), 1935; IRE Medal of Honor, 1940; Medal Award, Television Broadcasters Association, 1944; Radio Pioneers, Citation, 1954.

ESPERSEN, George A. (A'34—VA'39—SM'51—F'56), Research Physicist, Philips Laboratories, Irvington-on-Hudson, N.Y.
Born: May 17, 1906, Jersey City, N.J. B.S. (Physics), 1931, New York University. **Committees:** Electron Devices, 1952–56; Electron Tubes, 1955–56, *vice-chairman, 1956–57, chairman, 1957–59;* Electron Tubes & Solid State Devices, 1951–52; Professional Groups, 1956; Standards, 1959. **Professional Groups:** Electron Devices, *vice-chairman, 1956–57, chairman, 1957–59.* **IRE Representative:** ASA Sectional Committee (C60) on Standardization on Electron Tubes, 1959; ASA Subcommittee (C42.14) on Electron Tubes, 1959. **Awards:** Samuel F. B. Morse Medal for Excellence in Physics, New York University, 1929; Mrs. Andrew Carnegie Scholarship, 1930.

ESPLEY, Dennis C. (SM'52—F'54), Chief Executive, Computer Developments, Ltd., Computer House, 390-394 Kenton Rd., Kenton, Middlesex, England.
Born: September 19, 1906, Wellington, Shropshire, England. B.Eng. (1st Class Honors), 1928; D.Eng., 1940, Liverpool University. **Awards:** Ambrose Fleming; Duddell; John Hopkinson; Officer of the Order of the British Empire, 1950.

EVANS, Porter H. (M'23—F'31), Retired from Technical Staff, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: January 11, 1891, Erie, Pa. B.S.(E.E.), 1914, M.S., 1920, University of Michigan. **Committees:** Standardization, 1930–31.

EVERITT, William L. (A'25—M'29—F'38), Dean of the College of Engineering, University of Illinois, Urbana, Ill.
Born: April 14, 1900, Baltimore, Md. E.E., 1922, Cornell University; M.S., 1926, University of Michigan; Ph.D., 1933, Ohio State University. **IRE Offices:** President, 1945; Director, 1942–47, 1949–51. **Committees:** Awards, 1943–44, 1948–49, *chairman, 1944;* Awards Coordination, *chairman, 1955;* Board of Editors, 1941–53; Circuits, 1944–51; Editorial Reviewer, 1954–59; Education, 1944, 1950, *chairman, 1944;* Executive, *chairman, 1945;* Frequency Modulation, 1941–45; Investments, 1945; Membership, 1942–43; Nominations, 1942, 1946, 1948–50, 1952, *chairman, 1948, 1952;* Papers, 1941; Papers Procurement, *vice-chairman, 1943–45;* Policy Development, 1948, 1950–51; Professional Groups, 1948–53, *chairman, 1949;* Public Relations, 1950–51; Regular Papers, *vice-chairman, 1941;* Research, 1946–47. **IRE Representative:** Ohio State University, 1941–42; Joint IRE-AIEE Co-ordination Committee, 1951; Committee on Evaluation of Bureau of Standards, 1953; Ad Hoc Committee on Coordination of Student Branches, 1954; Advisory Committee to National Bureau of Standards, 1954–58. **Awards:** IRE Medal of Honor, 1954.

EWING, Douglas H. (SM'46—F'54), Vice President, Research and Engineering, Radio Corporation of America, Princeton, N.J.
Born: June 24, 1915, Mitchell, Ind. A.B., 1935, Butler University; M.S., 1937, Ph.D., 1939, University of Rochester; D.Sc. (Honorary), 1955, Butler University. **Committees:** Education, 1953–55; Navigation Aids, 1948–49.

FANO, Robert M. (S'41—A'45—SM'48—F'54), Professor of Electrical Communications, Department of Electrical Engineering and Research Laboratory of Electronics, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 39, Mass.
Born: November 11, 1917, Torino, Italy. S.B., 1941, Sc.D., 1947, Massachusetts Institute of Technology. **Committees:** Antennas, 1949–50; Awards, 1956–57; Editorial Reviewer, 1954–59; Education, 1949–56; Papers Review, 1953. **Professional Groups:** Administrative Committee, Information Theory, 1951–58. Editorial Advisory Board of Transactions of the PGIT, *chairman.* **Awards:** Fellow, American Academy of Arts & Sciences.

FARNSWORTH, Philo T. (A'28—M'34—F'39), Technical Consultant, International Telephone & Telegraph Laboratories, 3700 E. Pontiac St., Fort Wayne, Ind.
Born: August 19, 1906, Beaver, Utah. D.Sc. (Honorary), 1951, Indiana Technical College. **Committees:** Television, 1940–41; Television and Facsimile, 1939–40. **Awards:** Honorable Mention Citation for Outstanding Young Electrical Engineers, Eta Kappa Nu, 1937; Distinguished Alumni Award, Brigham Young University, 1937; Durward Howes' list of ten most distinguished young men for "America's Young Men," 1940; Fellow, Society of Motion Picture and Television Engineers, American Association for the Advancement of Science; IRE Morris Liebmann Memorial Prize, 1941; First Award by Television Broadcasters Association, 1944.

FARRAND, Clair L. (A'14—M'23—F'31), President, Farrand Optical Company; President, Farrand Controls, Inc.; President, Inductosyn Corporation, Bronx Blvd. & E. 238 St., New York 70, N.Y.
Born: October 22, 1895, Newark, N.J.

FARRELL, John J. (A'43—SM'47—F'48), General Manager, Heavy Military Electronics Department, Defense Electronics Division, General Electric Company, Syracuse, N.Y.
Born: March, 1897, Watervliet, N.Y. **Committees:** Nominations, 1947. **IRE Representative:** ASA Sectional Committee (C16) on Radio, 1949–51; RMA-IRE Coordination, 1945–47.

FAULKNER, Harry (M'24—SM'43—F'53), Director, Telecommunications Engineering & Manufacturing Association, 40 Norfolk St., London, W.C. 2, England.
Born: April 17, 1892. Nottingham, England. B.Sc.(Eng.), London, 1911. **Awards:** Special Premium, IEE, 1927; Companion of the Order of St. Michael and St. George.

FAY, Clifford E. (A'26—SM'45—F'56), Member, Technical Staff, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: December 2, 1903, St. Louis, Mo. B.S.(E.E.), 1925, M.S. (E.E.) (Physics), 1927, Washington University, **Committees:** Electron Devices, 1952–53; Electron Tubes and Solid State Devices, 1949–52. **Professional Groups:** Electron Devices, *treasurer,* 1954–55. **IRE Representative:** ASA Sectional Committee (C60) on Standardization of Electron Tubes, 1949–55.

FELCH, Edwin P. (A'32—M'42—SM'43—F'54), Director of Military Systems Development, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: January, 1909, Madison, N.J., A.B., Physics, 1929, Dartmouth College. **Committees:** Awards, 1959.

FERRELL, Enoch B. (A'25—M'29—SM'43—F'53), Director, Communications Techniques Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: June 1, 1898, Sedan, Kan. B.A., 1920, B.S.(E.E.), 1921, M.A., 1924, University of Oklahoma. **Committees:** Awards, 1955–57, *chairman, 1956;* Awards Coordination, *chairman, 1958;* Papers, 1933–45. **Awards:** Fellow, American Society for Quality Control, 1948.

FERRIS, Warren R. (SM'46—F'53), Professor of Electrical Engineering, University of South Carolina, Columbia, S.C.
Born: May 14, 1904, Terre Haute, Ind. B.S.(E.E.), 1927, Rose Polytechnic Institute; M.S.(E.E.), 1932, Union College; Dr. E.E., 1946, Polytechnic Institute of Brooklyn. **Committees:** Electron Devices, 1952–56; Standardization, 1929–32; Standards, 1932–33.

FETT, Gilbert H. (SM'45—F'58), Professor of Electrical Engineering, University of Illinois, Urbana, Ill.
Born: June 19, 1909, Chicago, Ill. B.Sc.(E.E.), 1931, University of Illinois; M.Sc., 1932, Iowa State College; Ph.D., 1940, University of Illinois. **Committees:** Education; Fellow, 1959. **Awards:** Fellow, American Physical Society, 1950 .

FICK, Clifford G. (A'25—SM'46—F'51), Manager, Research Liaison Section, Research Application Department, Research Laboratory, General Electric Company, Schenectady, N.Y.
Born: December 13, 1904, Ida Grove, Iowa. B.Sc.(E.E.), 1925, Iowa State College. **Committees:** Annual Review, 1949–50; Television Systems, 1948–59.

FIELD, George S. (A'30—VA'39—SM'48—F'57), Chief Scientist, Defense Research Board, Department of National Defense, "A" Building, Elgin St., Ottawa, Ont., Canada.
Born: October 23, 1905, Wimbledon, Middlesex, England. B.Sc., 1929, M.Sc., 1930, D.Sc., 1937, University of Alberta. **Awards:** Fellow, Acoustical Society of America, 1943; Fellow, Royal Society of Canada, 1944; Member of the British Empire, 1946.

FIELD, Lester M. (M'48—F'52), Associate Director, Hughes Research Laboratories, Culver City, Calif.
Born: February 9, 1918, Chicago, Ill. B.S., 1939, Purdue University; Ph.D., 1941, Stanford University. **Committees:** Editorial Reviewer, 1954–58; Papers Review, 1950–53. **Professional Groups:** Electron Devices Administrative Committee, 1957. **IRE Representative:** California Institute of Technology, 1954–55. **Awards:** Honorable Mention, Outstanding Young Electrical Engineer, 1949, Eta Kappa Nu.

FIELD, Robert F. (A'18—M'30—SM'43—F'47) (L), Retired. 104 Church St., Watertown 72, Mass.
Born: July 10, 1885, Tuftonboro, N.H. A.B., 1906, A.M., 1907, Brown University; A.M., 1916, Harvard University. **Committees:** Meetings and Papers, 1930. **Sections:** Boston, *chairman, 1942–44.* **Awards:** Award of Merit, American Society for Testing Materials, 1954.

FINCH, William G. H. (J'16—A'18—M'25—SM'43—F'56), Capt., U.S.N.R., Retired. P.O. Box 44, Newtown, Conn.
Born: June 28, 1895, Birmingham, England. **Committees:** Annual Review, 1939–40; Board of Editors, 1945–53; Constitution and Laws, 1928–31; Facsimile, 1939–43, 1949–50, *chairman, 1939–40;* Meetings and Papers, 1927–28; Membership, 1926–27; Publicity, 1926–34, *chairman, 1926–30;* Standards, 1939–40. **Awards:** Legion of Merit, U. S. Navy, 1946.

FINK, Donald G. (A'35—SM'45—F'47), Director of Research, Philco Corporation, Tioga & C Sts., Philadelphia 34, Pa.
Born: November 8, 1911, Englewood, N.J. B.Sc., 1933, Massachusetts Institute of Technology; M.S., 1942, Columbia University. **IRE Offices:** President, 1958, Director, 1949–51, 1956–59; Editor, 1956–57. **Committees:** Annual Review, 1946–49; Appointments, 1948–49, 1957; Awards, 1947; Board of Editors, 1946–53; Editorial Board, *vice-chairman, 1954–55; chairman, 1956–57;* Executive, 1956–59, *chairman, 1958;* Finance, 1959; Handbook, 1945–47; Membership, 1942–48, *chairman, 1946;* Navigation Aids, 1946–51, *chairman, 1946–48;* Nominations, 1959; Papers, 1943–45; Policy Advisory, 1959; Preparedness, 1940–41; Professional Groups, 1956–57; Public Relations, 1940–42; Research, 1946–47; Standards, 1946–49, 1959; Television, 1946–48, *chairman, 1948–49;* Television Systems, 1949–59; Tellers, 1949. **IRE Representative:** ASA Sectional Committee (C16) on Radio, 1959; Joint Technical Advisory, 1948–53, 1956–57, *vice-chairman, 1948, chairman, 1949.* **Awards:** Medal of Freedom, War Department, 1946; Presidential Certificate of Merit, 1948; Fall Meeting Plaque, 1951; Journal Award, Society of Motion Picture and Television Engineers, 1955.

FINK, Lyman R. (SM'48—F'53), General Manager, Atomic Products Division, General Electric Company, 1 River Rd., Schenectady, N.Y.
Born: November, 1912, Elk Point, S.D. B.S.(E.E.), 1933, M.S. (E.E.), 1934–35, Ph.D.(E.E.), 1937, University of California. **Committees:** Awards, 1955–57, *chairman, 1957;* Sections, 1950–51. **Sections:** Syracuse, *vice-chairman, 1949–50, chairman, 1950–51.* **Professional Groups:** Administrative Committee, Broadcast and Television Receivers, 1954–59, *vice-chairman, 1955, chairman, 1956–58.*

FISK, Sir Ernest T. (M'15—F'26)(L), Consultant, Electronics Telecommunications, also Finance and Production, P.O. Box 9, Roseville, N.S.W., Australia.
Born: August 8, 1886, Sunbury-on-Thames, Middlesex, England. **IRE Offices:** Vice President, 1938; Director, 1938. **Awards:** Fellow, IRE, Australia; President, 1932–37, 1939–43; Honorary Member, Institution of Electrical Engineers, London; Honorary Member, British Institution of Radio Engineers; Silver Medalist, Royal Society of Arts (London); Honorary Member, Institution of Radio Engineers, Australia; Chartered Engineer, Australia.

FISK, James B. (SM'52—F'55), President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: August 30, 1910, West Warwick, R.I. B.S., 1931, Ph.D., 1935, Massachusetts Institute of Technology; M.A. (Honorary), 1947, Harvard University; Sc.D. (Honorary), 1956, Carnegie Institute of Technology; Sc.D. (Honorary), 1958, Williams College. **Awards:** Fellow, American Physical Society; National Academy of Sciences; Presidential Certificate of Merit.

FLORY, Leslie E. (A'35—SM'46—F'57), Research Engineer, RCA Laboratories, Princeton, N.J.
Born: March 17, 1907, Sawyer, Kan. B.S.(E.E.), 1930, University of Kansas. **Professional Groups:** Administrative Committee, Medical Electronics, 1955–59. **Awards:** Overseas Award, British Institute of Electrical Engineers, 1938; RCA Laboratories Award, 1949, 1950, 1958.

FORRESTER, Jay W. (SM'49—F'55), Professor of Industrial Management, Massachusetts Institute of Technology, Cambridge, Mass.
Born: July 14, 1918, Anselmo, Neb. B.S.(E.E.), 1939, University of Nebraska; M.S.(E.E.), 1945, Massachusetts Institute of Technology; Dr. of Eng. (Honorary), 1954, University of Nebraska. **Committees:** Editorial Reviewer, 1954–58; Electronic Computers, 1948–52, *chairman, 1949–51;* Instruments and Measurements, 1949–50; Papers Review, 1951–53; Standards, 1949–51. **Awards:** Honorable Mention Award for Young Engineers, 1948, Eta Kappa Nu.

FOSTER, Dudley E. (A'26—M'37—SM'43—F'50), Vice President, Hazeltine Research, Inc. of California, 3320 Burbank Blvd., Burbank, Calif.
Born: December 12, 1900, Newark, N.J. E.E., 1922, Cornell University. **Committees:** Annual Review, 1938–41, 1945–46; Awards, 1953–57; Building Fund, 1944–55; New York Program, 1937; Papers Procurement, 1942–43; Radio Receivers, 1936–48, *chairman, 1938–41, 1945–47;* Regular Papers, 1941; Standards, 1938–42, 1945–46; Television, 1939–47; Television and Facsimile, 1938–39. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

FOSTER, Ronald Martin (SM'53—F'54), Professor of Mathematics, Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn 1, N.Y.
Born: October 3, 1896, Brooklyn, N.Y. S.B., 1917, Harvard University. **Committees:** Circuits, 1947–59.

FOX, A. Gardner (A'40—SM'45—F'56), Radio Research Engineer, Bell Telephone Laboratories, Inc., P.O. Box 107, Red Bank, N.J.
Born: November 22, 1912, Syracuse, N.Y. B.S.(E.E.), 1934, M.S.(E.E.), 1935, Massachusetts Institute of Technology. **Committees:** Annual Review, 1949–50; Antennas, 1948–49; Antennas and Wave-guides, 1949–54, *chairman, 1949–52;* Editorial Reviewer, 1954–55; Instruments and Measurements, 1949–50; Radio Wave Propagation and Utilization, 1947–48; Standards, 1949–52; Wave Propagation, 1949–50. **Awards:** Naval Ordnance Development Award, U. S. Navy, 1945.

FRANKEL, Sidney (A'37—SM'44—F'57), Director of Engineering, Sierra Electronic Corporation, Menlo Park, Calif.
Born: October 6, 1910, New York, N.Y. B.S.(E.E.), 1931, M.S.(Math.), 1934, Ph.D. (Math.), 1936, Rensselaer Polytechnic Institute. **Committees:** Antennas, 1944–49; Antennas and Wave-guides, 1949–50, *vice-chairman, 1950–51, 1953–54;* Handbook, 1945–47; Transmitters, 1944–45; Transmitters and Antennas, 1943–44. **Sections:** West Coast Subcommittee on Antennas and Wave-guides, *chairman, 1952–54.*

FREDENDALL, Gordon L. (A'41—SM'46—F'55), Senior Member of Technical Staff, RCA Laboratories Division, Princeton, N.J.
Born: December 20, 1909, Kettle Falls, Wash. B.S., 1931, M.S., 1932, Ph.D., 1936, University of Wisconsin. **Committees:** Editorial Reviewer, 1954–57, 1959; Frequency Modulation, 1946–47; Measurements and Instrumentation, 1950–58; Standards, 1959; Video Techniques, 1949, *vice-chairman, 1957–58, chairman, 1959–.*

FRIEND, Albert (A'34—M'39—SM'43—F'54), Consulting Engineer and Physicist, P.O. Box 29, Bala-Cynwyd, Pa. Office: 1334 Montgomery Ave., Narberth, Pa.
Born: January 24, 1910, Morgantown, W.Va. B.S.(E.E.), 1932; M.S. (Physics), 1936, West Virginia University; S.D. (Communication Engr.), 1948, Harvard University. **Committees:** Sound Recording and Reproducing, 1948–59, *vice-chairman, 1950–51, chairman, 1952–56;* Standards, 1952–56. **IRE Representative:** ASA Sectional Committee (Z57) on Sound Recording, *alternate, 1952–59;* IRE-AIEE Committee on Noise Definitions, 1951–53. **Awards:** Fellow, American Physical Society; RCA Laboratories Award, 1951; Second National Electronics Conference Award, 1955.

FRIIS, Harald T. (A'18—M'26—F'29)(L), Consulting Engineer, 30 E. River Road, Rumson, N.J.
Born: February 22, 1893, Neastved, Denmark. E.E., 1916, Dr. Eng., 1938, Royal Technical College, Copenhagen. **IRE Offices:** Director, 1941–43. **Committees:** Admissions, 1941; Papers, 1941; Research, 1946–47. **Awards:** IRE Morris Liebmann Memorial Prize, 1939; Knight of the Danish Order of Dannebrog, 1954; Valdemar Poulsen Gold Medal, Danish Academy of Technical Sciences, 1954; IRE Medal of Honor, 1955; Franklin Institute's Stuart Ballantine Medal, 1958.

FRISCHE, Carl A. (SM'54—F'57), President, Sperry Gyroscope Company, Division of Sperry Rand Corporation, Great Neck, L.I., N.Y.
Born: August, 1906, Freeport, Kan. A.B., 1928, Miami University, Ohio; M.S. and Ph.D., 1932, Iowa State University; Research Fellowship, 1933, Columbia University; D.Sc. (Honorary), 1955, Miami University, Ohio.

FUBINI, Eugene G. (A'36—SM'46—F'54), Director, Research and Engineering Division, Airborne Instruments Laboratory, Inc., 160 Old Country Rd., Mineola, L.I., N.Y.
Born: April, 1913, Turin, Italy. Doctor of Physics, 1933, University of Rome, Italy. **Committees:** Editorial Reviewer, 1954–59; Papers Review, 1949–53; Tellers, 1948; Wave Propagation, 1949–53. **Sections:** Long Island, *vice-chairman, 1956–57, chairman, 1957–58.* **Awards:** Presidential Certificate of Merit.

FULLER, Leonard F. (A'14—M'14—F'25)(L), Retired. 2345 Waverly St., Palo Alto, Calif.
Born: August 21, 1890, Portland, Ore. M.E., 1912, Cornell University; Ph.D., 1919, Standford University. **IRE Offices:** Manager, 1928. **Committees:** Admissions, 1928–29; Radio Transmitters and Antennas, 1930–31; Sections, 1926–28; Specifications for Steamship Radio Equipment, 1914–15; Standardization, 1916–20, 1930–31; Transmitters and Antennas, 1929–30; Wave Length Regulation, 1916–17, 1919–20. **Sections:** San Francisco, *chairman, 1928–29.* **Awards:** IRE Morris Liebmann Memorial Prize, 1919.

GAFFNEY, Francis J. (A'38—M'45—SM'46—F'55), Executive Vice President and General Manager, FXR, Inc., Woodside, L.I., N.Y.
Born: June 27, 1912, Middleton, Lancashire, England. B.S. (E.E.), 1935, Northeastern University. **Committees:** Instruments and Measurements, 1949–50; Measurements and Instrumentation, *vice-chairman, 1950–51; chairman 1951–54;* Standards 1951–54. **IRE Representative:** ASA Sectional Committee (C39) on Electrical Measuring Instruments, 1953–55; ASA Subcommittee (C42.6) on Electrical Instruments, *alternate, 1953;* Joint IRE-AIEE Committee on High Frequency Measurements, 1952–56; U. S. National Committee, International Electrotechnical Commission, Advisers on Electrical Measuring Instruments, *alternate, 1953–55.* **Awards:** Certificate of Merit, 1947.

GANNETT, Danforth K. (M'31—SM'43—F'59), Supervisor of Members of Technical Staff, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: November, 1894, Minneapolis, Minn. B.S., 1916, E.E., 1917, University of Minnesota. **IRE Representative:** Member, ASA Technical Committee (C16), 1939; Member, Subcommittee (23.4), Video Signal Transmission Methods of Measurement, 1948–49. **Awards:** Letter of Appreciation for wartime service as Consultant to Office of Scientific Research and Development, May, 1944.

GARMAN, Raymond L. (A'39—SM'51—F'58), Vice President, Engineering and Research, General Precision Equipment Corporation, 92 Gold St., New York 38, N.Y.; Chairman of Board and Technical Director, General Precision Laboratory, Inc., Pleasantville, N.Y.
Born: July 21, 1907, Schoeneck, Pa. B.S., 1929, Franklin and Marshall; M.Sc., 1931, Ph.D., 1932, New York University. **Committees:** Video Techniques, *chairman, 1949–53.* **Awards:** Presidential Certificate of Merit, 1947; Fellow, SMPTE.

GEBHARD, Louis August (A'29—M'42—SM'43—F'49), Superintendent Radio Division, United States Naval Research Laboratory, Washington 25, D.C.
Born: June, 1896, Buffalo, N.Y. B.S.(E.E.), George Washington University; L.L.B., Georgetown University. **Awards:** Presidential Certificate of Merit, 1946; Fellow, American Physics Society; Scientific Research Society of America; American Association for the Advancement of Science; Armed Forces Communication Association; Naval Institute.

GERBER, Eduard A. (A'50—SM'56—F'58), Director, Frequency Control Division, U. S. Army Signal Research & Development Laboratory, Fort Monmouth, N.J.

Born: April 3, 1907, Fuerth, Bavaria, Germany. M.S., 1931, Ph.D., 1934, Technical University, Munich, Germany. **Committees:** Piezoelectric and Ferroelectric Crystals, *chairman, 1957–59;* Standards, 1957–59.

GERKS, Irvin H. (A'32—M'41—SM'43—F'58), Engineer, Collins Radio Company, 5225 C Ave., N.E., Cedar Rapids, Iowa.
Born: October 30, 1905, New London, Wis. B.Sc.(E.E.), 1927, University of Wisconsin; M.Sc.(E.E.), 1932, Georgia Institute of Technology. **Committees:** Wave Propagation, 1948–59. **Sections:** Atlantic, *chairman, 1935–37;* Dayton, *chairman, 1944.*

GIACOLETTO, Lawrence J. (S'37—A'42—M'44—SM'48—F'58), Research Manager, Scientific Laboratory, Ford Motor Company, 20000 Rotunda Blvd., Dearborn, Mich.
Born: November 14, 1916, Clinton, Ind. B.Sc.(E.E.), 1938, Rose Polytechnic Institute; M.Sc. (Physics), 1939, State University of Iowa; Ph.D.(E.E.), 1952, University of Michigan. **Committees:** Administrative Committee, Board of Editors, 1952–53; Editorial Reviewer, 1954–59; Papers Review, 1953. **Sections:** Monmouth Subsection, *chairman, 1944–45;* Princeton, *secretary, 1948–49; vice-chairman, 1949; chairman, 1950;* Detroit, *chairman, 1959.* **Awards:** Fellow, American Association for the Advancement of Science.

GILL, Archibald J. (M'20—F'40)(L), Chairman and Director, British Telecommunications Research, Ltd., Taplow, Buckinghamshire, England.
Born: May 13, 1889, Stoke-Sub-Hamdon, Somerset, England. B.Sc. (Eng.), 1909, University of London.

GILLETT, Glenn D. (A'22—M'27—F'34), Design Specialist, Lockheed Missiles System Division, Lockheed Aircraf; Corporation, 1122 Jagels Road, Sunnyvale, Calif.; Owner, Glenn D. Gillett, Electric Motors & Engineering, 1127 Whitham Rd., Los Altos, Calif.
Born: April 14, 1898, Sterling, Colo. A.B., 1919, Harvard University; S.B.(E.E.), 1921, Harvard Engineering School. **Committees:** Broadcast, 1935–38; Radio Wave Propagation, 1942–46; Wave Propagation, 1937–12.

GILMAN, George W. (A'29—SM'47—F'50), Director of Telegraph, Signaling and Special Systems Development, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: August, 1901, Salmon River, N.S., Canada. M.S., 1923, Massachusetts Institute of Technology. **Committees:** Board of Editors, 1944–48; Frequency Modulation, 1940–41; Public Relations, 1940–42; Publicity, 1941.

GINZTON, Edward L. (S'39—A'40—SM'46—F'51), Professor of Applied Physics and Electrical Engineering; Director, Microwave Laboratory, Stanford University, Stanford, Calif.; Member, Board of Directors, Varian Associates, Inc., Palo Alto, Calif.
Born: December 27, 1915, Ekaterinoslavsk, Russia. B.S., 1936, M.S., 1937, University of California; E.E., 1938, Ph.D., 1940, Stanford University. **Committees:** Awards, 1957. **Awards:** IRE Morris Liebmann Memorial Prize, 1958.

GIORDANO, Anthony B. (SM'46—F'58), Associate Dean in charge of the Graduate School; Professor, Electrical Engineering, Polytechnic Institute of Brooklyn, 85-99 Livingston St., Brooklyn 1, N.Y.
Born: February 1, 1915, New York, N.Y. B.E.E., 1937, M.E.E., 1939, D.E.E., 1946, Polytechnic Institute of Brooklyn. **Committees:** Antennas and Wave Guides, 1951–53; National Convention Papers, *secretary, 1946–47; vice-chairman, 1950–51.* **Sections:** New York, *secretary, 1952–53; vice-chairman, 1953–54; chairman, 1954–55;* Executive Committee, 1955–59; Long Island Program Committee, 1958–59. **IRE Representative:** Polytechnic Institute of Brooklyn, 1947–53. **Professional Groups:** Circuit Theory Symposium, *chairman, 1957–58;* Microwave Theory and Techniques, Microwave Prize Committee, 1957–58. **Awards:** New York Section Certificate of Appreciation, 1956; UNICO National, Gold Oscar for Science, 1957; Polytechnic Institute of Brooklyn, Certificate of Distinction, 1957; AIEE Certificate of Appreciation, 1957.

GLASGOW, Roy S. (M'26—SM'43—F'55), Dean, U. S. Naval Postgraduate School, Monterey, Calif.
Born: May 20, 1895, St. Louis, Mo. B.S., 1918, Washington University; M.S., 1922, Harvard University. **Sections:** St. Louis, *chairman, 1941–42.* **IRE Representative:** Washington University, 1941–42. **Awards:** Fellow, American Institute of Electrical Engineers; Distinguished Service Award, U. S. Army, 1951; Honorary Life Member, St. Louis Engineers Club, 1954; Alumni Citation, Washington University, 1955.

GLOVER, Alan M. (A'39—SM'46—F'56), Vice President and General Manager, Semiconductor and Materials Division, Radio Corporation of America, Somerville, N.J.
Born: September, 1909, Rochester, N.Y. B.A., 1930, M.A., 1932, Ph.D., 1935, University of Rochester. **Committees:** Electron Tubes, 1946–49; Electron Tubes and Solid State Devices, 1949–52; Electronics. 1943–46; Papers Procurement, 1946; Vacuum Tubes, 1945–46. **Sections:** Lancaster Subsection, *chairman, 1948–49.*

GOLDBERG, Harold (A'38—M'44—SM'44—F'55), Vice President, Emerson Radio & Phonograph Corporation, Emerson Research Laboratories, 1140 East West Highway, Silver Spring, Md.
Born: January 31, 1914, Milwaukee, Wis. B.S.(E.E.), 1935, M.S.(E.E.), 1936, Ph.D.(E.E.), 1937, Ph.D. (physiology), 1941; University of Wisconsin. **Committees:** Radio Transmitters, 1949–59, *vice-chairman, 1953–56, chairman, 1956–58;* Solid State Devices, 1955–58; Standards, 1956–58. **Sections:** Rochester, *secretary, 1944–45.* **Professional Groups:** Washington Chapter, Information Theory, *chairman, 1956.* **Awards:** Exceptional Service Award, U. S. Department of Commerce, 1953.

GOLDMAN, Stanford (A'36—M'43—SM'43—F'56), Professor of Electrical Engineering, Syracuse University, Syracuse 10, N.Y.
Born: November 14, 1907, Cincinnati, Ohio. B.A., 1926, M.A., 1928, University of Cincinnati; Ph.D. (Physics), 1933, Harvard University. **Committees:** Circuits, 1947–51; Information Theory and Modulation Systems, 1956–58; Papers, 1944–45; Papers Review, 1946–50. **IRE Representaitve:** IRE-AIEE Committee on Noise Definitions, 1949–53.

GOLDMARK, Peter C. (A'36—M'38—F'42), President and Director of Research, CBS Laboratories, a Division of Columbia Broadcasting System, Inc., High Ridge Rd., Stamford, Conn.
Born: December 2, 1906, Budapest, Hungary. B.Sc., 1930, Ph.D., 1931, Vienna Technical University. **Committees:** Board of Editors, 1941–50; Television, 1939–49; Television and Facsimile, 1938–39; Television Systems, 1949–59. **Awards:** Technical Progress Medal, Television Broadcasters' Association, 1944; IRE Morris Liebmann Memorial Prize, 1945.

GOLDSMITH, Alfred N. (IRE Founder and Charter Member), (A'12—F'15)(L), Consulting Engineer, 597 Fifth Ave., New York 17, N.Y.
Born: September, 1889, New York, N.Y. B.S., 1907, College of the City of New York; Ph.D., 1911, Columbia University; Sc.D., 1935, Lawrence College. **IRE Offices:** President, 1928; Secretary, 1918–27; Editor, 1912–28, 1930–53; Editor Emeritus, 1954–; Director, 1912–59 **Committees:** Administrative Committee of the Board of Editors, *chairman, 1951–53;* Admissions, 1925; Awards, 1919, 1930–33, 1935–38, *chairman, 1919, 1931;* Bibliography, 1934; Board of Editors, *chairman, 1928, 1930–53;* Circuit Elements, 1928–29; Constitution and Laws, 1935–40, *chairman, 1935;* Convention Policies, 1940; Editorial Administrative, *chairman, 1946–53;* Executive, 1942–53; Finance, 1914–15, *chairman, 1915;* Fiscal, 1947–48; Meetings and Papers, 1925–26; Membership Solicitation Policy, 1945; Nominations, 1929–31, 1936, 1940, *chairman, 1930, 1940;* Office Quarters, 1947; Papers, *chairman, 1913–19;* Planning, 1947; Special Papers, 1940–41; Standardization, 1913–31, *secretary, 1913; chairman, 1915–16;* Standards, 1932–36; Television and Facsimile, 1936–38; Tellers, *chairman, 1932;* Wave

Length Regulation, 1916, 1919. **IRE Representative:** ASA Sectional Committee on Radio, 1936, 1939-40, *chairman, 1942-48;* ASA Standards Council, 1936, 1939-46; ASA Subcommittee on Insulating Material Specifications for the Military Services, *chairman, 1943-48;* ASA War Committee on Radio, 1943-48; National Advisory Council on Radio in Education, 1936, 1939-40; National Advisory Council on Radio in Education, Committee on Engineering Developments, 1941-43; Joint IRE-AIEE, Co-ordination Committee, 1952; National Television Film Council, *president, 1957;* National Television Systems, 1940-43; Panel 2, *chairman, 1942-43.* **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; IRE Medal of Honor, 1941; Townsend Harris Medal, College of the City of New York, 1942; Medal Award, Television Broadcasters Association, 1945; IRE Founders' Award, 1954; Eminent Member, Eta Kappa Nu; Life Member New York Medico-Surgical Society; Fellow, International College of Surgeons; Pioneer Award, Society of Motion Picture and Television Engineers.

GOLDSMITH, Thomas T., Jr. (A'38—SM'46—F'49), Vice President, Engineering and Research, Allen B. DuMont Laboratories, Inc., 760 Bloomfield Ave., Clifton, N.J.
Born: January, 1910, Greenville, S.C. B.S., 1931, Furman University; Ph.D., 1936, Cornell University. **Committees:** Admissions, 1944-47; Electron Tubes, 1946-47; Electronics, 1942-46; Professional Groups, 1948; Regular Papers, 1941; Television, 1939-46; Tellers, 1944; Vacuum Tubes, 1945-46. **Sections:** Northern New Jersey, *chairman, 1958-59.* **Awards:** Fellow, Society of Motion Picture and Television Engineers.

GOLDSTEIN, Ladislas (SM'54—F'56), Professor of Electrical Engineering, University of Illinois, Urbana, Ill.
Born: February 6, 1906, Dombard, Hungary. B.A., 1925, Nagyvarad College, Hungary; M.S., 1928, D.Sc., 1937, University of Paris.

GOLDUP, Thomas E. (SM'52—F'55), Director, Mullard, Ltd., Mullard House, Torrington Pl., London, W.C. 1, England.
Born: April 30, 1894, London, England. **Awards:** Commander of the Order of the British Empire, 1954.

GOODALL, William McH. (A'29—M'37—SM'43—F'51), Technical Staff, Bell Telephone Laboratories, Inc., P.O. Box 107, Red Bank, N.J.
Born: September 7, 1907, Washington, D.C. B.Sc., 1928, California Institute of Technology. **Committees:** Editorial Reviewer, 1954-59; New York Program, 1939-41, 1949-50; Papers Review, 1946-53; Tellers, 1939, 1941, *chairman, 1939.* **Sections:** Monmouth, N.J. Subsection, *secretary-treasurer, 1950, vice-chairman, 1954, chairman, 1955.*

GOOD, William E. (M'45—SM'50—F'59), Development Engineer, Television Receiver Department, General Electric Company, Syracuse, N.Y.
Born: April 25, 1916, Hillsdale, Mich. A.B., 1937, Kalamazoo College; M.S. (Physics), 1939, University of Illinois; Ph.D. (Physics), 1946, University of Pittsburgh. **Sections:** Syracuse, *vice-chairman,* 1955-56.

GOODWIN, W. Nelson, Jr. (A'15—M'29—SM'43—F'57)(L), Consulting Engineer, Weston Electrical Instrument Corporation, Newark 12, N.J. Residence, R.D. 2, Box 126, New Hope, Pa.
Born: October, 1876, Philadelphia, Pa. B.S., 1897, E.E., 1908, University of Pennsylvania. **Awards:** Modern Pioneer Award, 1940, American Manufacturers Association; National Electrical Manufacturers Association, 1948; Fellow, American Institute of Electrical Engineers; Fellow, American Association for the Advancement of Science; Potts Medal for Science, The Franklin Institute, 1958.

GOUBAU, Georg J. E. (A'49—SM'56—F'57), Consultant, U. S. Army Signal Research & Development Laboratory, Ft. Monmouth, N.J.
Born: November 29, 1906, Munich, Germany. M.S., 1931, Ph.D. (Physics), 1932, Dr. habil., 1935, Institute of Technology, Munich. **Awards:** IRE Harry Diamond Memorial Award, 1957.

GRAHAM, Robert E. (M'45—SM'57—F'59), Engineer-in-Charge of Visual Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: October 4, 1916, Kansas City, Mo. Associate in Sc., 1935, Kansas City Junior College, B.S.(E.E.), 1937, Purdue University. **Committees:** Servo Systems, 1951-52; Video Techniques, 1951-53. **Awards:** Naval Ordnance Development Award, U. S. Navy Bureau of Ordnance, 1945.

GRAHAM, Virgil M. (A'24—M'27—F'35), Associate Director, Engineering Department, Electronic Industries Association, Room 650, 11 W. 42 St., New York 36, N.Y.
Born: January 22, 1902, Rochester, N.Y. Attended University of Rochester. **IRE Offices:** Director, 1935-41, 1946-48. **Committees:** Appointments, 1948; Awards, 1940, 1947-49; Broadcast and Television Receivers, 1949-52, *chairman, 1949-51;* Constitution and Laws, 1940, 1944; Executive, 1948; Meetings and Papers, 1928-29; Membership, 1949-50; National Convention, 1947-50; Nominations, 1940; Papers Procurement, 1942-43, 1946; Professional Groups, 1948-49; Public Relations, *chairman, 1940, 1947-48, 1951;* Publicity, 1935-36; Radio Receivers, 1927-28, 1936-40; Radio Receivers and Parts, 1929-30; Regular Papers, 1941; Sections, 1930-34, 1938-45, 1948, *chairman, 1936-37;* Standardization, 1925-26, 1929-30; Standards, 1932, 1935-43, 1945-48, 1954-57, 1959. **Professional Groups:** Broadcast and Television Receivers, *chairman, 1950.* **Sections:** Rochester, *chairman, 1926-27.* **IRE Representative:** ASA Sectional Committee on National Electrical Safety Code, Radio Broadcast Reception Equipment, *alternate, 1939-48, chairman, 1948-50;* ASA Sectional Committee on Radio (C16), *chairman, 1950;* RMA-IRE Co-ordinating Committee, *chairman, 1947-49.*

GRAMMER, George (A'49—F'59), Technical Director; Technical Editor, QST., American Radio Relay League, 38 LaSalle Rd., West Hartford 7, Conn.
Born: January 25, 1905, Philadelphia, Pa. 1923-26, Drexel Institute. **Committees:** Antennas, 1946-48; Electron Tubes, 1947-48; Membership, 1930, 1947-49; Modulation Systems, 1947-48; Public Relations, 1940-44; Radio Transmitters, 1947-48. **Sections:** Connecticut Valley, *secretary, 1931-32.*

GRANGER, John V. N. (S'42—A'45—M'46—SM'51—F'56), President, Granger Associates, 966 Commercial St., Palo Alto, Calif.
Born: September 14, 1918, Cedar Rapids, Iowa. A.B., 1941, Cornell College; M.S., 1942, Ph.D., 1948, Harvard University. **Committees:** Editorial Reviewer, 1954-59. **Sections:** Palo Alto Subsection, *secretary, 1952, chairman, 1954-55.* **Professional Groups:** Aeronautical and Navigational Electronics, Editor of *Transactions,* 1955-56. **Awards:** Eta Kappa Nu Recognition, Outstanding Young Electrical Engineer, 1952; Seventh Region Electronic Achievement Award, 1955.

GRANQVIST, Carl E. (A'46—F'55), Director, Svenska AB Gasaccumulator, Stockholm-Lidingö, Sweden.
Born: March 2, 1910, Ljungby, Småland, Sweden. M.A., 1933, Tekniska Högskolan, Stockholm. **IRE Offices:** Vice President, 1958.

GREEN, Estill I. (A'27—M'36—SM'43—F'55), Executive Vice President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: November 24, 1895, St. Louis, Mo. B.A., 1915, Westminster College; B.S.(E.E.), 1921, Harvard University; D.Sc. (Honorary), 1956, Westminster College. **Committees:** Institute Sections, 1928; Measurements and Instruments, 1950-53. **IRE Representative:** Joint IRE-AIEE Committee on High Frequency Measurements, 1950-52.

GRIEMSMANN, John W. E. (A'45—M'55—SM'57—F'59), Research Professor, Microwave Research Institute, Polytechnic Institute of Brooklyn; Associate Director of Microwave Research Institute, 55 Johnson St., Brooklyn 1, N.Y.

Born: May, 1916, Brooklyn, N.Y. B.(E.E.), 1936, M.(E.E.), 1938; D.(E.E.), 1946, Polytechnic Institute of Brooklyn.

GROSS, Gerald C. (A'27—M'30—SM'43—F'57), Assistant Secretary-General, International Telecommunication Union, Palais Wilson, Geneva, Switzerland.
Born: December 27, 1903, New York, N.Y. B.S.(E.E.), 1926, Haverford College. **Sections:** Washington, *secretary-treasurer, 1936-37, vice-chairman, chairman, 1939-40.*

GROVER, Frederick W. (M'17—SM'43—F'49)(L), Professor Emeritus of Electrical Engineering, Union College, Schenectady 8,, N.Y.
Born: September 3, 1876, Lynn, Mass. S.B., 1899, Massachusetts Institute of Technology; M.S., 1901, Wesleyan University; Ph.D., 1907, George Washington University; Ph.D., 1908; Ludwig Maximilian University, Munich, Germany. **Committees:** Board of Editors, 1932-53; Papers, 1941-45. **IRE Representative:** Union College, N.Y., 1941-48.

GRUEN, Wolf J. (M'47—SM'53—F'57), Senior Staff Member, Ramo-Wooldridge, a Division of Thompson-Ramo-Wooldridge, Inc., 5500 W. El Segundo Blvd., Hawthorne, Calif.
Born: September, 1914, Berlin, Germany. Dipl. Eng. (E.E.), 1940, Swiss Federal Institute of Technology, Zurich; M.E.E., 1952, Syracuse University.

GUÉNARD, Pierre R. (SM'50—F'55), Directeur Technique du Centre de Physique Electronique et Corpusculaire de la Compagnie Générale de T.S.F., Boite Postale n° 10, ORSAY (Seine et Oise), France, Professeur à l'Ecole Supérieure d'Electricité.
Born: January 22, 1914, Amiens, France. Licencié ès Sciences, 1935, Agrégé des Sciences Physiques, 1937, Ecole Normale Supérieure. **Awards:** Prix d'Aumale de l'Académie des Sciences de Paris, 1952; Médaille Ampère de la Société Française des Electriciens; Médaille Blondel, 1956.

GUILLEMIN, E. A. (A'41—SM'48—F'49), Professor of Electrical Communications, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: May, 1898, Milwaukee, Wis. B.S., 1922, University of Wisconsin; S.M.(E.E.), 1924, Massachusetts Institute of Technology; Ph.D., 1926, University of Munich, Germany (Saltonstall Fellow). **Committees:** Annual Review, 1944-47; Board of Editors, 1952-53; Circuits, 1944-51, *chairman, 1944-47;* Editorial Reviewer, 1954-59; Education, 1947-48; Standards, 1944-47. **IRE Representative:** Massachusetts Institute of Technology, 1945-54. **Awards:** Presidential Certificate of Merit, 1948.

GUNN, Ross (A'35—SM'47—F'49), Research Professor of Physics, American University, Washington 16, D.C. Assigned full time to the Controlled Thermonuclear Branch of the Atomic Energy Commission.
Born: May, 1897, Cleveland, Ohio. B.S.(E.E.), 1920, M.S., 1921, University of Michigan; Ph.D., 1926, Yale University. **Awards:** Exceptionally Distinguished Service Citation, United States Navy, 1945; Air Safety Distinguished Service Award, 1951; Distinguished Alumnus Citation, University of Michigan, 1953; Robert M. Losey Award, Institute of Aeronautical Sciences, 1956; U. S. Department of Commerce Gold Medal for Exceptional Service, 1957; Fellow, American Physical Society; National Academy of Sciences.

GUNTHER, Clarence (A'27—SM'48—F'54), Chief Defense Engineer, Defense Engineering Department, Defense Electronic Products, Radio Corporation of America, Camden 2, N.J.
Born: June 29, 1903, Los Angeles, Calif. B.S.E., 1926, Princeton University. **Sections:** Philadelphia, *secretary-treasurer, 1948-49, vice-chairman, 1950, chairman, 1950.* **Awards:** Award of Merit, 1952, Radio Corporation of America.

GUY, Raymond F. (A'25—M'31—F'39), Director, Radio Frequency and Allocations Engineering, National Broadcasting Company, Inc., 30 Rockefeller Plaza, New York 20, N.Y.
Born: July 4, 1899, Hartford, Conn. I.E.E., 1921, Pratt Institute. **IRE Offices:** President, 1950; Treasurer, 1947; Director, 1944-52. **Committees:** Admissions, 1958-59; Annual Review, 1943-47; Antennas, 1944-48; Broadcasting, 1929-33; Building Fund, *vice-chairman, 1948;* Constitution and Laws, 1945-53, *chairman, 1946;* Education, 1945-48; Executive, 1946-47, 1950-52, *vice-chairman, 1947, chairman, 1950;* Finance, 1951-52; Fiscal, 1947-48; Founders, *chairman, 1947, 1949-50;* Frequency Modulation, 1942-47; Investments, 1947, 1949, *chairman, 1949;* Membership, 1947-49, *chairman, 1949;* Modulation Systems, 1947-50; Nominations, 1951; Office Practices, *chairman, 1947;* Professional Groups, 1951-52; Public Relations, 1949, 1951-54; *chairman, 1949;* Radio Transmitters, *chairman, 1944-45;* Standards, 1943-46, *chairman, 1945-46;* Transmitters and Antennas, 1936-44, *chairman, 1943-44;* Winter Technical Meeting, 1946. **IRE Representative:** ASA Standards Council, *alternate, 1946-48;* Joint RMA-IRE Co-ordination Committee, 1950; Joint Technical Advisory Committee, 1950. **Awards:** President, Radio Pioneers, 1956; Marconi Memorial Gold Medal of Achievement, 1956.

HACKBUSCH, Ralph A. (A'26—M'30—F'37), President, Hackbusch Electronics, Ltd., 23 Primrose Ave., Toronto 4, Ont., Canada.
Born: September 18, 1900, Hamilton, Ont., Canada. **IRE Offices:** Vice President, 1944; Director, 1938, 1944-46. **Committees:** Admissions, 1940; Awards, 1947-49; Public Relations, 1940, 1947-51; Sections, 1936-37; Standards, 1949-59. **Sections:** Toronto, *secretary, 1930-31, chairman, 1932-33.* **Awards:** Fall Meeting Plaque, 1943.

HAEFF, Andrew V. (A'34—M'40—SM'43—F'49), Vice President, Director, Research Laboratories, Hughes Aircraft Company, Culver City, Calif.
Born: December, 1904, Moscow, Russia. E.E. and M.E., 1928, Russian Polytechnic Institute, Harbin, China; M.S.(E.E.), 1929, Ph.D., 1932, California Institute of Technology. **Committees:** Awards, 1956-59; Board of Editors, 1951-53; Editorial Administrative, 1949-51; Editorial Reviewer, 1954-59; Nuclear Studies, 1948-49. **Awards:** Special Research Fellowship, California Institute of Technology, 1932-33; IRE Harry Diamond Memorial Award, 1950.

HAFSTAD, Lawrence R. (SM'52—F'53), Vice President, General Motors Corporation, Director, Research Staff, P.O. Box 188, North End Station, Detroit 2, Mich.
Born: June 18, 1904, Minneapolis, Minn. B.S.(E.E.), 1926, University of Minnesota; Ph.D. (Physics), 1933, The Johns Hopkins University. **Committees:** Annual Review, 1949-50; Nominations, 1951; Nuclear Studies, *chairman, 1948-50.* **Professional Groups:** Nuclear Science, *chairman, 1952.* **Awards:** American Association for the Advancement of Science Award, 1931; U. S. Delegate to International Radio Union Conference in London, 1934; British "King's Medal in Defense of Freedom," 1946; Medal of Merit from Secretary of the Navy, 1946; Distinguished Service Award, U. S. Atomic Energy Commission, 1954.

HAGEN, John P. (A'37—SM'47—F'54), Chief, Vanguard Division, National Aeronautics and Space Administration, Washington 25, D.C.
Born: July, 1908, Amherst, N.S., Canada. A.B., 1929, Boston University; M.A., 1931, Wesleyan University; Ph.D., 1949, Georgetown University. **Awards:** President's Certificate of Merit for work in the early development of radar; RESA, Sigma Xi.

HAGGERTY, Patrick E. (A'45—SM'53—F'58), President and Director, Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex.
Born: March 17, 1914, Harvey, N.D. B.S.(E.E.), 1936, Marquette University. **Committees:** Awards, 1954-55. **Sections:** Dallas, *advisor, 1955-58.*

HALL, Albert C. (A'39—SM'46—F'58), Director of Research, The Martin Company, Denver Division, P.O. Box 179, Denver 1, Colo.
Born: June 27, 1914, Port Arthur, Tex. B.S.(E.E.), 1936, Texas A. & M.; M.Sc.(E.E.), 1938, S.D.(E.E.), 1943, Massachusetts

Institute of Technology. **Awards:** Naval Ordnance Development Award; Eta Kappa Nu, Outstanding Young Electrical Engineer Award.

HALL, Nathan I. (SM'47—F'56), Vice President, Engineering, Hughes Aircraft Company, Culver City, Calif.
Born: October, 1910, Elkins, W.Va. B.S.(E.E.), 1934, M.S. (E.E.), 1934, D.Sc. (Honorary), 1956, West Virginia University; E.E., 1937, Stanford University. **Committees:** Editorial Reviewer, 1955-59. **Awards:** Eta Kappa Nu, Outstanding Electrical Engineer, 1934.

HALL, Robert N. (SM'53—F'57), Physicist, General Electric Research Laboratory, The Knolls, Schenectady, N.Y.
Born: December 25, 1919, New Haven, Conn. B.S., 1942, Ph.D., 1948, California Institute of Technology. **Awards:** Predoctoral Fellowship, National Research Council, 1946.

HALLER, George L. (A'28—M'36—SM'43—F'50), Vice President and General Manager, Defense Electronics Division, General Electric Company, Syracuse, N.Y.
Born: May 8, 1907, Pittsburgh, Pa. B.S.(E.E.), 1927; E.E., 1934; M.S. (Physics), 1935, Ph.D. (Physics), 1942, Pennsylvania State University. **Committees:** Papers Review, 1946-50; Technical Program Committee National Convention, *chairman, 1958-59.* **Professional Groups:** Airborne Electronics Administrative Committee, 1951-53, *chairman, 1958-59;* Military Electronic Administrative Committee, 1956-57. **Sections:** Dayton, *chairman, 1944-45;* Centre County Subsection, *chairman, 1949-50.* **Awards:** Legion of Merit, United States Air Force, 1946.

HALLMAN, Ludlow B., Jr. (J'27—A'29—SM'44—F'52), Technical Director, C. and N. Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio.
Born: July 21, 1907, Sneads, Fla. B.S., 1929, E.E., 1934, Alabama Polytechnic Institute. **Committees:** Modulation Systems, 1948-50. **Sections:** Dayton, *chairman, 1945-46.* **Professional Groups:** Administrative Committee, Aeronautical and Navigational Electronics, 1951-53, 1956-59; National Conference on Aeronautical Electronics, *chairman, Board of Directors, 1954;* Papers Committee, Aeronautical and Navigational Electronics, *chairman, 1951-53.* **Awards:** War Department Commendation, 1946.

HAMBURGER, Ferdinand, Jr. (A'32—M'39—SM'43—F'53), Professor and Chairman, Electrical Engineering Department; Director, Radiation Laboratory, The Johns Hopkins University.
Born: July 5, 1904, Baltimore, Md. B.E., 1924, Dr. Eng., 1931, The Johns Hopkins University. **IRE Offices:** Director, 1950-51, 1959-61. **Committees:** Appointments, 1951, 1959; Editorial Board, 1956-59, *vice-chairman, 1958-59;* Education, 1955-59; Nominations, 1951; Policy Advisory, 1952-55. **Sections:** Baltimore, *chairman, 1940-41.* **IRE Representative:** The Johns Hopkins University, 1941-54. **Awards:** Fellow, American Institute of Electrical Engineers, 1949.

HAMMOND, John H., Jr. (M'36—SM'43—F'59) (L), President, Hammond Research Corporation, Gloucester, Mass.
Born: April 13, 1888, San Francisco, Calif. B.S., 1910, Sheffield Scientific School of Yale University; Sc.D., 1919, George Washington University. **IRE Offices:** Director, 1913-14; Treasurer, 1913-14; Member of First Board of Managers, 1915-17. **Committees:** Special Committee on Membership, *chairman, 1913-14;* Finance, *chairman, 1914.*

HANSEL, Paul G. (S'39—A'42—SM'50—F'57), Chief Radio Engineer, Servo Corporation of America, 20-20 Jericho Turnpike, New Hyde Park, L.I., N.Y.
Born: June, 1917, Grand Island, Neb. B.S., 1946, University of Kansas. **Committees:** Tellers, 1955-58. **Sections:** Long Island, *secretary, 1951, chairman, 1955-56.* **Awards:** War Department Commendation for Meritorious Civilian Service, 1946.

HANSELL, Clarence W. (A'26—M'29—SM'43—F'45), Fellow, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: January 20, 1898, Medaryville, Ind. B.S.(E.E.), 1919, D.E.E. (Honorary), 1952, Purdue University. **Awards:** Joint Modern Pioneer Award, National Association of Manufacturers, 1940.

HANSEN, Edmund H. (A'25—M'26—SM'43—F'59), Physicist, E. H. Hansen Laboratories, P.O. Box 6, Balboa Island, Calif.
Born: November 13, 1894, Springfield, Ill. **Committees:** Picture Transmission, 1922; Publicity, 1915-17, 1927-28. **Awards:** Motion Picture Academy of Arts & Sciences Sound Award, 1945.

HANSON, O. B. (A'18—M'27—F'41)(L), Retired. Consultant, Radio Corporation of America. Home: P.O. Box 244, Westport, Conn.
Born: February 11, 1894, Huddersfield, Yorkshire, England. **IRE Offices:** Director, 1938-43. **Committees:** Meetings and Papers, 1929; Members, 1950; Nominations, 1944-45, 1948; Papers, 1942-45; Papers Procurement, 1942-43; Papers Review, 1946-53; Public Relations, 1940-46; Regular Papers, 1941; Standardization, 1929; Tellers, *chairman, 1941.*

HARMON, Ralph N. (A'30—SM'45—F'52), Vice President, Engineering, Director, Westinghouse Broadcasting Company, Inc., 122 East 42nd St., New York 17, N.Y.
Born: August 29, 1905, California, Pa. B.S. in E.E., 1928, Carnegie Institute of Technology. **Committees:** Broadcast, 1935-38; Membership, 1950-51; Radio Transmitters, 1956-59; Television, 1945-49; Television Systems, 1949-58, *vice-chairman, 1959.* **Sections:** Baltimore, *chairman, 1945-46.* **Awards:** Award of Merit, U. S. Navy Bureau of Ships, U. S. Navy Ordnance, National Defense Research Council; Patent Awards, Westinghouse Electric Corporation.

HARNETT, Daniel E. (A'25—M'35—F'42), Engineer, General Electric Company, Syracuse, N.Y.
Born: July 20, 1899, Elmira, N.Y. A.B., 1922, E.E., 1925, Columbia University. **Committees:** Admissions, 1941-43; Awards, 1945-46; New York Program, 1940; Papers Procurement, 1947-48; Radio Receivers, 1936-41, 1953-59, *chairman, 1956;* Standards, 1956-59; Vacuum Tubes, 1929-30. **IRE Representative:** ASA Sectional Committee (C16) on Radio, 1957-59. **Awards:** U. S. Navy Certificate of Commendation, 1947.

HARRIS, Donald B. (SM'45—F'56), Senior Executive Engineer, Stanford Research Institute, Menlo Park, Calif.
Born: February 10, 1901, Minneapolis, Minn. B.A., 1922, Yale University. **Committees:** Awards, 1959-60; Board of Editors, 1950-53; Constitution and Laws, 1951; Editorial Reviewer, 1954-59; Mobile Communications, 1950-57, 1959; Railroad and Vehicular Communications, 1948-50; **Sections:** Cedar Rapids, *chairman, 1950;* San Francisco, *director, 1953-56.* **Professional Groups:** Electron Devices Administrative Committee; Awards Committee, *chairman.* **IRE Representative:** Western Electronics Show and Convention, *vice-chairman, 1955, chairman, 1957.* **Awards:** Certificate of Appreciation, Navy Department, 1948.

HARRIS, William A. (SM'50—F'55), Engineer, Advanced Development Group, RCA Victor Division, 415 S. 5 St., Harrison, N.J.
Born: January 9, 1907, Terre Haute, Ind. B.S., 1927, Rose Polytechnic Institute.

HARRISON, Arthur E. (A'41—SM'45—F'55), Professor, Electrical Engineering, University of Washington, Seattle 5, Wash.
Born: January 20, 1908, San Luis Obispo, Calif. B.S., 1936, University of California; M.S., 1937, Ph.D., 1940, California Institute of Technology. **Committees:** Awards, 1956; Editorial Reviewer, 1954-59; Education, 1949-58; Membership, 1951; Papers Procurement, 1945-46; Papers Review, 1946-53; **Sections:** Princeton Subsection, *secretary, 1947;* Princeton Section, *secretary, 1947, vice-chairman, 1948;* Seattle, *chairman, 1954-55.*

HARTIG, Henry E. (A'36—M'41—SM'43—F'52), Professor, Electrical Engineering Department, University of Minnesota, Minneapolis 14, Minn.

Born: January 28, 1892, Minneapolis, Minn. B.E.E., 1918, Ph.D., 1924, University of Minnesota. **Committees:** Awards, 1954-56; Education, 1952-57. **Sections:** Twin City, *chairman, 1945-46.* **IRE Representative:** University of Minnesota, 1941-42. **Awards:** Fellow, American Institute of Radio Engineers.

HARTLEY, Ralph V. L. (M'19—F'28)(L), Retired. 174 Summit Ave., Summit, N.J.
Born: November 30, 1888, Spruce, Nev. A.B., 1909, University of Utah; B.A., 1912, B.Sc., 1913, Oxford University. **Committees:** Sections, 1945. **Awards:** IRE Medal of Honor, 1946.

HARVEY, Norman L. (A'41—M'46—SM'48—F'54), Vice President, Engineering, CBS Electronics, a Division of the Columbia Broadcasting System, 100 Endicott St., Danvers, Mass.
Born: October 9, 1911, Ossian, Iowa. B.S.(E.E.), 1934, Iowa State College. **Committees:** Navigation Aids, 1947-48.

HAUSZ, Walter (A'44—SM'46—F'54), Technical Military Planning Operation, General Electric Company, Santa Barbara, Calif.
Born: May, 1917, Queens County, N.Y. B.S.(E.E.), 1937; M.S. (E.E.), 1938, Columbia University. **Committees:** Admissions, 1951-52; National Convention, Convention Record, *chairman, 1953-54;* Papers Review, 1951-53. **Sections:** Santa Barbara Subsection, *chairman, 1957-58.* **Awards:** Coffin Award, General Electric, 1952.

HAYES, John Edmund (A'39—VA'39—SM'53—F'54), Chief Engineer, Canadian Broadcasting Corporation, 5253 Decarie Blvd., Montreal, P.Q., Canada.
Born: February, 1910, Arcola, Sask., Canada, B.Sc., 1935, Queens University; M.Eng., 1947, McGill University. **Committees:** Educational, 1946-50; Television Systems, 1952-59.

HAYES, Leslie W. (F'38), Vice Director, International Radio Consultative Committee (C.C.I.R.), International Telecommunication Union, Palais Wilson, Geneva, Switzerland.
Born: May 31, 1896, London, England.

HAZELTINE, Alan (A'16—M'18—F'21)(L), Consulting Engineer, 15 Tower Dr., Maplewood, N.J.
Born: August 7, 1886, Morristown, N.J. M.E., 1906, Sc.D. (Honorary), 1933, Stevens Institute of Technology; A.M., 1938, Columbia University. **IRE Offices:** President, 1936; Manager, 1923-28, 1937-38; Director, 1936-39. **Committees:** Admissions, 1925-28; Awards, *chairman, 1937-38;* Education, 1945-47; Meetings and Papers, 1925, 1927; New York Program, 1935; Radio Receivers, 1927-28; Standardization, 1924-28; Vacuum Tube Terminology, *chairman, 1924-25;* Vacuum Tubes, *chairman, 1927-28.* **Awards:** Armstrong Medal, Radio Club of America, 1937.

HEADRICK, Lewis B. (A'36—M'38—SM'43—F'53), Staff Engineer, Kinescopes, RCA Tube Division, New Holland Pike, Lancaster, Pa.
Born: June 6, 1904, Chattanooga, Tenn. B.S. (Physics), 1926, University of Chattanooga; Ph.D. (Physics), 1930, University of Michigan. **Committees:** Board of Editors, 1944-53; Editorial Reviewer, 1954-59; Electron Tubes, 1946-49; Electron Tubes and Solid State Devices, 1949-50; Electronics, 1942-46; Membership, 1943-46; Vacuum Tubes, 1945-46. **Sections:** Philadelphia, Lancaster Subsection, *chairman, 1952.*

HEGBAR, Howard R. (S'41—A'42—SM'46—F'57), Manager, Avionics and Electronics, Goodyear Aircraft Corporation, Akron 15, Ohio.
Born: February 22, 1915, Valley City, N.D. B.S.(E.E.), 1937, North Dakota State College; M.S.(E.E.), 1938, Ph.D.(E.E.), 1941, University of Wisconsin. **IRE Offices:** Director, 1957-58. **Committees:** Awards, 1959; Nominations, 1958; Policy Advisory, 1958. **Sections:** Akron Subsection, *chairman, 1948-49;* Akron, *chairman, 1949-50.*

HEINTZ, Ralph M. (A'21—M'27—F'30)(L), Consulting Engineer; Owner, The Ramohs, P. O. Box 546, Los Gatos, Calif.
Born: April 20, 1892, St. Louis, Mo. A.B., 1920, Stanford University. **Committees:** Membership, 1938-40; New York Program, 1938; Papers Review, 1946; Sections, 1938-40. **Sections:** San Francisco, *chairman, 1931-32.* **Awards:** Fellow, American Institute of Electrical Engineers, 1945.

HEISING, Raymond A. (A'20—F'23)(L), Consulting Engineer and Patent Agent, 232 Oak Ridge Ave., Summit, N.J.
Born: August 10, 1888, Albert Lea, Minn. E.E., 1912, University of North Dakota; M.S., 1914, University of Wisconsin; D.Sc., 1947, University of North Dakota. **IRE Offices:** President, 1939; Treasurer, 1943-45; Manager, 1927-31; Director, 1933-35, 1939-41, 1943-45, 1947-49. **Committees:** Admissions, 1927-31, 1933, 1935-38, *chairman, 1928-30, vice-chairman, 1931;* Appointments, 1948; Constitution and Laws, 1930-34, 1941-59, *chairman, 1943-44, 1951-53, 1954-57;* Executive, *vice-chairman, 1943-45;* Investments, 1944-46, *chairman, 1944-45;* Meetings and Papers, 1926; Membership Solicitation Policy, 1945; New York Program, 1933, 1935-37; Nominations, 1933, *chairman, 1941, 1950;* Office Quarters, *chairman, 1945-47;* Planning, *chairman, 1947;* Policy Development, 1948-50; Preparedness, 1940-41; Professional Groups, 1948-59; Sections, 1941-52, *chairman, 1941-45;* Standardization, 1925-26. **Awards:** IRE Morris Liebmann Memorial Prize, 1921; Modern Pioneer Award, National Association of Manufacturers, 1940; Fellow, American Institute of Electrical Engineers; Fellow, American Physical Society; Armstrong Medal, 1953; IRE Founders Award, 1957.

HENDERSON, JOHN T. (A'28—SM'47—F'51), Principal Research Officer, National Research Council, Sussex St., Ottawa, Ont., Canada.
Born: December 9, 1905, Montreal, P.Q., Canada. B.S., 1927, M.S., 1928, McGill University; Ph.D., 1932, University of London. **IRE Offices:** Director, 1953-59; President, 1957. **Committees:** Appointments, 1954-57, *chairman, 1959;* Executive, 1958-59, *chairman, 1957;* Nominations, 1954, 1958, *chairman, 1959;* Policy Advisory, 1955-56, 1958, *chairman, 1955, 1959;* Professional Groups, 1954-59. **Sections:** Ottawa, *vice-chairman, 1949, chairman, 1950.* **Awards:** Member of the Order of the British Empire, 1943. Fellow, Royal Society of Canada, 1944.

HENNEY, Keith (A'18—M'26—SM'43—F'43), Consulting Editor, McGraw-Hill Publishing Company, Inc., 330 W. 42 St., New York, N.Y.
Born: October 28, 1896, McComb, Ohio. B.A., 1921, Western Reserve University; M.A., 1925, Harvard University. **IRE Offices:** Director, 1945-48. **Committees:** Annual Review, 1937-48; Awards, 1945-46, 1948-50, *chairman, 1949;* Editorial Board, 1958-59; Executive, 1946-47; History, 1954-59; Membership Solicitation Policy, 1945; New York Program, 1934, 1936-38, 1940-42, *chairman, 1942;* Nominations, 1950; Nuclear Studies, 1948-49; Planning, 1947; Policy Development, 1951; Publicity, 1937-39; Public Relations, 1943-50; Standards, 1945-49. **IRE Representative:** Advisory Committee on Industrial Information, Atomic Energy Commission, 1952-60; Joint IRE-RMA Co-ordination Committee, 1947-49, 1951.

HERBST, Philip J. (M'41—SM'43—F'53), 50 E. Oak Ave., Moorestown, N.J.
Born: January 24, 1903, Philadelphia, Pa. B.S. (Physics), 1925, St. Thomas College; M.S. (Physics), 1927, La Salle College. **Committees:** Editorial Reviewer, 1954-59; Radio Transmitters, 1952-58, *chairman, 1953-55;* Standards, 1953-56.

HERBSTREIT, Jack W. (A'40—SM'45—F'58), National Bureau of Standards, Boulder Laboratories, Boulder, Colo.
Born: September 7, 1917, Cincinnati, Ohio. E.E., 1939, University of Cincinnati. **Sections:** Denver, *vice-chairman, 1954-55; chairman, 1955-56.* **Professional Groups:** Administrative Committee, Antennas and Propagation, 1956-58, *chairman, 1958.* **IRE Representative:** Colorado Engineering Council, 1956. **Awards:** Harry Diamond Memorial Award, 1959

HERGENROTHER, Rudolf C. (A'37—VA'39—SM'52—F'56), Manager of Beam Tube Research and Development Laboratory,

Raytheon Manufacturing Company, Willow St., Waltham, Mass.
Born: September, 1903, Chemnitz, Germany, A.B., 1925, Cornell University; M.S., 1928, Pennsylvania State College; Ph.D., 1931, California Institute of Technology.

HEROLD, Edward W. (A'30—M'38—SM'43—F'48), Director, Electronic Research Laboratory, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: October 15, 1907, New York, N.Y. B.Sc., 1930, University of Virginia; M.Sc. 1942, Brooklyn Polytechnic Institute. **IRE Offices:** Director, 1956–58. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Appointments, 1956; Board of Editors, 1946–53; Editorial Administrative, 1946–51; Editorial Board, 1956–59; Education 1957–59; Membership, 1942; Nominations, 1957; Papers, 1944–45; Policy Advisory, 1956–58; Winter Technical Meeting, 1945. **Sections:** Princeton, *vice-chairman, 1948, chairman, 1949.* **IRE Representative:** Joint AIEE-IRE Student Activities Co-ordination Committee, 1957.

HERSHBERGER, W. D. (A'37—SM'45—F'54), Professor of Engineering, University of California, Los Angeles 24, Calif.
Born: May 10, 1903, Wellman, Iowa. A.B. (Math.), 1927, Goshen College; M.A. (Physics), 1930, George Washington University; Ph.D.(E.E.), 1937, University of Pennsylvania. **Committees:** Education, 1946; Subcommittee on Basic Wave Guide Symbols, 1947; Wave Propagation, 1957, 1959.

HERZOG, Edward F. (A'41—SM'48—F'59), Manager, Engineering, Heavy Military Electronics Department, General Electric Company, Syracuse, N.Y.
Born: March 26, 1907, Birmingham, Ala. B.S.(E.E.), 1929, Alabama Polytechnic Institute. **Awards:** Citation from Radio Technical Commission for Aeronautics, 1950; Charles A. Coffin Award from General Electric Co., 1956; Certificate of Commendation by U. S. Navy, Bureau of Ships, 1957.

HERZOG, Gerhard (SM'46—F'55), Assistant General Manager, Research and Technical Department, The Texas Company, P.O. Box 425, Bellaire, Tex. Consular Agent for Switzerland.
Born: April 30, 1904, Zurich, Switzerland. M.M., 1926, Ph.D., 1926, Swiss Institute of Technology. **Awards:** Fellow, American Physical Society.

HESSEL, John (A'31—VA'39—SM'48—F'53), Chief, Electronics Section, NATO International Staff, U. S. Embassy, Paris, France.
Born: March 15, 1908, Grand Rapids, Mich. B.S.(E.E.), 1929, M.S.(E.E.), 1930, University of Michigan. **Committees:** Papers Procurement, 1948–50; Tellers, 1956–57. **Professional Groups:** Communication Systems Administrative Committee, *chairman, 1953.* **Awards:** Legion of Merit with Oak Leaf Cluster; Distinguished Alumnus Citation, University of Michigan, 1953.

HEWLETT, William R. (S'35—A'38—M'47—F'48), Executive Vice President, Hewlett-Packard Company, 275 Page Mill Rd., Palo Alto, Calif.
Born: May 20, 1913, Ann Arbor, Mich. A.B., 1934, Stanford University; M.S., 1936, Massachusetts Institute of Technology; E.E., 1939, Stanford University. **IRE Offices:** President, 1954; Director, 1950–57. **Committees:** Appointments, 1954–55, *chairman, 1955;* Constitution and Laws, 1956–59; Editorial Board, 1955; Editorial Reviewer, 1955; Executive, 1953–55, *chairman, 1954;* Finance, 1953–55; Papers Review, 1952–53; Nominations, 1950–56, *chairman, 1956, 1958;* Policy Advisory, *chairman, 1952;* Policy Development, 1950–51. **Sections:** San Francisco, *vice-chairman, 1948–49, chairman, 1949–50.*

HIGHT, Stuart C. (A'31—M'39—SM'43—F'55), Data Processing Panel, Advanced Research Projects Agency, Department of Defense, The Pentagon, Washington, D.C.
Born: July 28, 1906, Berkeley, Calif. B.S.(E.E.), 1930, University of California; M.A., 1934, Columbia University. **Awards:** Naval Ordnance Award, 1945.

HIGINBOTHAM, William A. (SM'53—F'59), Head, Instrumentation Division, Brookhaven National Laboratory, Upton, L.I., N.Y.
Born: October 25, 1910, Bridgeport, Conn. A.B., 1932, Williams College. **Professional Groups:** Member, Nuclear Science Administrative Committee, 1954–57, *secretary-treasurer, 1954–55; vice-chairman, 1956–57;* Member, Nuclear Science Planning Committee, 1957–59. **IRE Representative:** National Bureau of Standards, Technical Advisory Committee, 1959.

HILL, Albert G. (SM'46—F'50), Director of Research, W.S.E.G., Vice President and Director of Research, Institute for Defense Analyses. The Pentagon, Washington 25, D.C.; Professor of Physics, Massachusetts Institute of Technology, on leave.
Born: January 11, 1910, St. Louis, Mo. B.S., 1930, M.S., 1934, Washington University; Ph.D., 1937, University of Rochester. **Awards:** Presidential Certificate of Merit, 1948; U.S.A.F. Distinguished Civilian Service Award, 1955; Yankee Post, American Ordnance Association, First Annual Distinguished Service Award, 1956; Meritorious Civilian Award of the Office of Secretary of Defense, 1959.

HILLIARD, John K. (A'25—M'29—SM'43—F'52), Vice President, Director of Advanced Engineering, Altec Lansing Corporation, 1515 S. Manchester Ave., Anaheim, Calif.
Born: October 22, 1901, Wyndmere, N.D. B.S., 1924, Hamline University; D.Sc.(Honorary) in E., University of Hollywood. **Committees:** Audio Techniques, 1950–54; Board of Editors, 1950–53; Editorial Reviewer, 1954–59; Professional Groups, 1952. **Professional Groups:** Audio, *vice-chairman, 1951–53;* Medical Electronics, Los Angeles Chapter, *chairman, 1955–56.* **Sections:** Los Angeles, *chairman, 1933–34.* **Awards:** Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; Fellow, Society of Motion Pictures and Television Engineers.

HILLIER, James (SM'55—F'57), Vice President, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: August 22, 1915. Brantford, Ont., Canada. B.A. (Math. and Physics), 1937, M.A. (Physics), 1938, Ph.D. (Physics), 1941, University of Toronto.

HINMAN, Wilbur S., Jr. (SM'46—F'57), Technical Director, Diamond Ordnance Fuze Laboratories, Ordnance Corps, U. S. Army, Connecticut Ave. at Van Ness St., N.W., Washington 25, D.C.
Born: March 14, 1906, Washington, D.C. Attended, 1922–23, George Washington University; B.S.(E.E.), 1926, Virginia Military Institute. **Awards:** Medal for Meritorious Service, Department of Commerce; Presidential Certificate of Merit; 1948; Merit Citation, National Civil Service League, 1955; IRE, Harry Diamond Memorial Award, 1956; Medal for Exceptional Civilian Service, U. S. Army, 1958.

HINNERS, Frank A. (IRE Charter Member) (A'12—M'15—F'26)(L), President, Hinners-Galanek Radio Corporation, (Manufacture Cavalier & Private Label Radios, Stereo Phonos), 66-02 Austin St., Forest Hills 74, L.I., N.Y.
Born: February 19, 1894, New York, N.Y. I.E.E., 1915, Pratt Institute. **Committees:** New York Program, 1941–42. **Awards:** Charter Member, Wireless Institute.

HIRSCH, Charles J. (M'39—SM'43—F'51), Executive Vice President, Hazeltine Research Corporation, 58-25 Little Neck Parkway, Little Neck, L.I., N.Y.
Born: October, 1902, Pittsburgh, Pa. A.B., 1923, Columbia College; E.E., 1925, Columbia University. **Committees:** Awards, 1956–58; Board of Editors, 1952–53; Editorial Reviewer, 1954–59; Navigation Aids, 1947–53, *vice-chairman, 1950–52.* **Sections:** Long Island Subsection, *chairman, 1952.* **Awards:** Certificate of Commendation, U. S. Navy, 1947.

HOBSON, Jesse E. (M'45—F'56), Vice President and Director of Research, United Fruit Company, 80 Federal St., Boston, Mass.
Born: May 2, 1911, Marshall, Ind. B.S.(E.E.), 1932, M.S.(E.E.), 1933, Purdue University; Ph.D., 1935, California Institute of Technology; D.Eng. (Honorary), 1957, Purdue University. **Awards:** Fellow, Tau Beta Pi Research, 1932–33; Fellow, Charles Coffin Foundation, 1933–34; Eta Kappa Nu, Outstanding Young Electrical Engineer, 1940.

HOEPPNER, Conrad H. (SM'47—F'58), Chief Scientist, Radiation, Inc., Melbourne, Fla.
Born: March, 1918, Spooner, Wis. B.Sc.(E.E.), 1939, M.Sc.(E.E.), 1940, E.E.(Professional), 1947, University of Wisconsin. **Professional Groups:** Telemetry and Remote Control, *secretary, 1953–55; chairman, 1955–57.* **Committees:** Professional groups, 1959. **Awards:** Fellow, Wisconsin Alumni Research, 1939–40; Fellow, Tau Beta Pi, 1940–41; Fellow, Massachusetts Institute of Technology, 1940–41.

HOGAN, John V. L. (IRE Founder and Charter Member) (A'12—M'12—F'15)(L), Founder and President, Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y.
Born: February 14, 1890, Philadelphia, Pa. D.Eng. (Honorary), 1957, Polytechnic Institute of Brooklyn. **IRE Offices:** President, 1920; Vice President, 1916–19; Manager, 1912–15, 1921–32; Director, 1916–20, 1932–36, 1948–50. **Committees:** Annual Review, 1927, 1947–51; Appointments, 1948; Awards, 1919, 1928, 1932–33, 1945, 1948, *chairman, 1928;* Broadcasting, 1929–38; Constitution and Laws, 1928–29, 1935–36, 1954–55, *chairman, 1932–34;* Constitutional Amendments, *chairman, 1915;* Editing, *chairman, 1914;* Facsimile, 1939–53, *chairman, 1947–51;* Finance, 1915; Financial Matters, 1915; Increase of Membership, 1916–19, *chairman, 1916;* Nominations, 1931, 1937–38, 1943–44, *chairman, 1945;* Papers, 1915–19, 1942–45; Papers Procurement, 1947; Papers Review, 1946; Policy Advisory, 1952; Policy Development, 1950–51; Professional Groups, 1950; Professional Recognition, 1947; Publicity, 1913–19, *chairman, 1913, 1915, 1916–19;* Radio Receivers, 1927–28; Revision of the Constitution, 1925–27, *chairman, 1925;* Sections, 1925; Specifications for Steamship Radio Equipment, 1914–15; Standardization, 1913, 1915–29, *chairman, 1916–20, 1929–30;* Standards, 1932–33, 1936–37, 1947–48, 1949–51; Use of the Transmission Unit, *chairman 1928; Vacuum Tubes, chairman 1927–28.* **IRE Representative:** ASA Sectional Committee on Electrical Installation on Shipboard, 1930, 1936; ASA Sectional Committee on Radio, 1930; ASA Sectional Committee on Radio Electrical Co-ordination, 1936, 1939–46; Joint Technical Advisory Committee, 1948-57. **Awards:** IRE Medal of Honor, 1956.

HOK, Gunnar (A'31—SM'46—F'57), Professor, Electrical Engineering, University of Michigan, Ann Arbor, Mich.
Born: March 29, 1903, Eskilstuna, Sweden, E.E., 1926, Royal Institute of Technology, Stockholm. **Committees:** Editorial Reviewer, 1955–59, Papers Review, 1952–59.

HOLLAND, Lewis N. (A'27—M'32—SM'43—F'59), Professor of Electrical Engineering, University of Michigan, College of Engineering, Ann Arbor, Mich.
Born: December, 1900, Jackson, Mich. B.S.E.(E.E.), 1923, M.S.(E.E.), 1926, University of Michigan. **Committees:** Education, 1945–49; Standards, 1930–31. **Sections:** Detroit, *chairman, 1930–32.* **IRE Representative:** University of Michigan, 1941–54.

HOLLMANN, Hans E. (A'48—F'53), Vice President, Dresser Dynamics, Inc., Northridge, Calif.
Born: November 4, 1899, Solingen, Germany. Ph.D., 1928; Dr. Habil., 1933, Technical University, Berlin; Dr. h.c. 1957, Technical University, Dresden, Germany.

HOLMES, Lynn C. (M'44—SM'49—F'49), Director of Research, Stromberg-Carlson Company, A Division of General Dynamics, 1400 N. Goodman St., Rochester 9, N.Y.
Born: April, 1904, Brookfield, N.Y. E.E., 1925, M.E.E., 1932, Rensselaer Polytechnic Institute. **Awards:** Fellow, American Institute of Electrical Engineers.

HOLMES, Ralph S. (A'25—SM'45—F'52), Director, Project Pangloss, Radio Corporation of America, David Sarnoff Research Center, RCA Laboratories, Princeton, N.J.
Born: May 26, 1902, Murray, Neb. B.S., 1923, University of Nebraska. **Committees:** Radio Receivers, 1938–41. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1937.

HONNELL, Pierre M. (A'27—A'29—M'41—SM'43—F'58), Professor of Electrical Engineering, Washington University, St. Louis 5, Mo.
Born: January 28, 1904, Longueville, France. B.S.(E.E.), 1930, Massachusetts Institute of Technology; E.E., 1938, The A. & M. College of Texas; M.Sc.(E.E.), 1939, Massachusetts Institute of Technology; M.Sc., 1940, California Institute of Technology; Ph.D.(Geophysics), 1950, St. Louis University. **Awards:** Legion of Merit, War Department, 1946; Marconi Premium, British Institution of Radio Engineers, 1957; Fellow, AAAS, 1957; Fellow, AIEE, 1958.

HORN, Charles W. (A'14—M'28—F'30), Partner and Manager, Radio Impulsora Mexicana, S.A.; Cia. Distribuidora Mercantil, S.A., Calle Rhin 33, Colonia Cuauhtemoc, Mexico City, D.F., Mexico.
Born: July 9, 1894, New York, N.Y. **IRE Offices:** Director, 1933–34. **Committees:** Admissions, 1933–37, 1940–42; Broadcast, 1933–38; Broadcasting, 1928–33; Institute Sections, 1929–33, *chairman, 1931–32;* New York Program, 1932–34, *chairman, 1933;* Public Relations, 1945–46; Television and Facsimile, 1936–39. **IRE Representative:** National Advisory Council on Radio in Education, 1936, 1939–40; Committee on Engineering Developments, 1941–43.

HORN, Heinz (SM-57—F'59), Dr.-Ing. E.h., Felten & Guilleaume Carlswerk AG, Koln-Mulheim, Germany.
Born: September 29, 1905, Koln, Germany. E.E., 1926, Staatliche Ingenieurschule, Koln, Germany.

HORNE, Charles F. (A'35—SM'53—F'58), Rear Admiral, Retired, Vice President and Division Manager of Convair-Pomona A Division of General Dynamics Corporation, P.O. Box 1011, Pomona, Calif.
Born: January 3, 1906, New York, N.Y. B.S., 1926, U. S. Naval Academy, Annapolis; M.Sc., 1935, Harvard University. **Professional Groups:** Engineering Management, Administrative Committee, 1956–58, *chairman, 1956–57.* **Awards:** International Region Medal, CAA.

HORNER, S. George L. (M'46—SM'50—F'57), Superintendent, Radio Division, Hudson Bay Company, Fur Trade Department, Hudson Bay Company Radio Laboratory, 487 Hay St., Winnipeg 13, Man., Canada.
Born: May 17, 1907, Limavady, County Derry, North Ireland. B.Sc.E., 1934, University of New Brunswick. **Sections:** Winnipeg Subsection, *secretary-treasurer, 1948–49, vice-chairman, 1949–50, chairman, 1950–51.*

HORTON, Arthur W., Jr. (SM'49—F'59), Technical Relations Manager, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: August 25, 1898, Philadelphia, Pa. A.B., 1920, E.E., 1922, Princeton University. **Awards:** Naval Ordnance Development Award, 1945.

HORTON, J. Warren (A'20—F'29)(L), Chief Consultant, United States Navy Underwater Sound Laboratory, New London, Conn.
Born: December 18, 1889, Ipswich, Mass. S.B., 1914, Sc.D., 1935, Massachusetts Institute of Technology. **Committees:** Awards, 1932; Board of Editors, 1930–31, 1935–40; Meetings and Papers, 1929–30, *chairman, 1930;* Membership, 1947–48; Standardization, 1929–31, *chairman, 1931;* Standards, *chairman, 1932–33;* Vacuum Tubes, 1929–30. **IRE Representative:** ASA Sectional Committee (C61) on Electric and Magnetic Magnitudes and Units, 1952–59; United States National Committee, Advisers on Symbols (International Electrotechnical Committee), 1936, 1939–51.

HOUCK, Harry W. (A'19—M'28—SM'43—F'57), Vice President, Thomas A. Edison Industries, McGraw-Edison Co., General Manager, Measurements Division; President and General Manager, Measurements Corporation of Canada, Ltd.; Vice President, Armstrong Memorial Research Foundation; Director, Sag Harbor Industries, Inc., Intervale Rd., Boonton, N.J.
Born: April 11, 1896, New Cumberland, Pa. Extension Course, 1931, Columbia University. **IRE Offices:** Manager, 1931–32; Director, 1932. **Committees:** Admissions, 1932; Constitution and Laws; History, 1954–59; Radio Receivers, 1928–29; Tellers, 1940; **Professional Groups:** Radio Club of New York, *director, 1928, recording secretary, 1930–32, vice president, 1933, president, 1934.* **Awards:** Armstrong Medal, Radio Club of America, 1941; Marconi Memorial Medal of Achievement, Veteran Wireless Operators Association, 1955.

HOWE, George W. O. (F'55), Professor, Lismore House, Kelvin Dr., Glasgow, Scotland.
Born: December 4, 1875, London, England. D.Sc., 1914, Durham University; D.Sc.(Honorary), 1914, Adelaide University (Australia); LL.D. (Honorary), 1948, Glasgow University.

HOWES, Frederick S. (A'37—M'43—SM'43—F'50), Professor of Electrical Engineering and Director, Department University Extension, McGill University, Montreal, P.Q., Canada.
Born: July 25, 1896, Paris, Ont., Canada. B.S.(E.E.), 1924, M.Sc.(E.E.), 1926, McGill University; Ph.D.(E.E.), 1929, Imperial College, University of London. **IRE Offices:** Director, 1948. **Committees:** Awards, 1950–51; Education, 1945–46, 1951–56. **Sections:** Montreal, *chairman, 1944–45;* Canadian Council, *chairman, 1947–48.* **IRE Representative:** McGill University, 1941–58.

HUGGINS, William H. (S'39—A'44—SM'55—F'57), Professor of Electrical Engineering, The Johns Hopkins University, Baltimore, Md.
Born: January 11, 1919, Rupert, Idaho, B.S., 1941, M.S., 1942, Oregon State College; Sc.D., 1953, Massachusetts Institute of Technology. **Committees:** Circuits, 1949–59; Editorial Reviewer, 1951–53, 1954–57, 1959; Papers, 1951–53. **Professional Groups:** Circuit Theory, *secretary, 1952–53; editor, 1954–57; vice-chairman, 1956–57; chairman, 1957–58.* **IRE Representative:** The Johns Hopkins University, 1955–58. **Awards:** IRE Browder J. Thompson Memorial Prize, 1948; Air Force Decoration for Exceptional Civilian Service, 1954; National Electronics Conference Award, 1956.

HULL, David R. (A'36—F'47), Captain, United States Navy, Retired. Vice President, Raytheon Manufacturing Company, The Solar Building, Suite 601, 1000 16th St., Washington 6, D.C.
Born: October, 1903, Newton, N.J. B.S., 1925, United States Naval Academy; M.S., 1933, Harvard University. **Committees:** Awards, 1956–59; Electron Tubes, 1946–47; Electronics, 1943–46; Vacuum Tubes, 1945–46. **Awards:** Fellow, Acoustical Society of America; Legion of Merit; Navy Commendation Ribbon.

HULL, Lewis M. (J'17—A'19—M'27—F'28), Consultant, Boonton, N.J.
Born: February 27, 1898, Great Bend, Kan. A.B., 1917, A.M., 1918, University of Kansas; Ph.D., 1922, Harvard University. **IRE Offices:** President, 1933; Manager, 1929–32; Director, 1932–35. **Committees:** Admissions, 1927–28; Awards, 1935–37, *chairman, 1935;* Broadcasting, 1928–32, *chairman, 1928–31;* Meetings and Papers, 1928–30; New York Program, 1931; Nominations, 1928, 1931, 1934–35, *chairman, 1934;* Papers, 1931; Radio Receivers, 1927–28; Registration of Engineers, 1940; Use of the Transmission Unit, 1928–29. **IRE Representative:** ASA Sectional Committee on Radio, 1930; National Advisory Council on Radio in Education, 1936, 1939–40; National Advisory Council on Radio in Education, Committee on Engineering Developments, 1941–43; Radio Advisory Committee, Bureau of Standards, Department of Commerce, 1930, 1936.

HUNT, Frederick V. (A'28—M'41—SM'43—F'47), Rumford Professor of Physics and Gordon McKay Professor of Applied Physics, 222 Lyman Laboratory, Harvard University, Cambridge 38, Mass.
Born: February 15, 1905, Barnesville, Ohio. B.A., 1924, B.E.E., 1925, Ohio State University; A.M., 1928, Ph.D., 1934, S.D. (Honorary), 1945, Harvard University. **Committees:** Audio Techniques, 1949–50; Electroacoustics, 1941–51; Papers, 1942–45; Papers Procurement, 1942–43, 1947–48; Papers Review, 1946–48; Regular Papers, 1941.

HUNTER, Theodore A. (A'29—M'45—SM'46—F'53), President, Hunter Manufacturing Company, 108 N. Linn St., Iowa City, Iowa; Research Professor at State University of Iowa.
Born: December 5, 1900, Dike, Iowa. B.S.(E.E.), 1922, M.S. (Physics), 1923, M.S.(E.E.), 1931, State University of Iowa. **IRE Offices:** Director, 1948–50, 1956; Editor, *Student Quarterly,* 1954–59. **Committees:** Editorial Board, 1954–59; Education, 1954–59; Nominations, 1949–50, *chairman, 1949;* Papers Procurement 1945–50; Policy Advisory, 1948–53; Policy Development, 1948–51; Sections, 1950. **Sections:** Cedar Rapids, *temporary chairman, 1945, chairman, 1946–47.* **Professional Groups:** Education, *Transactions* Editor, 1958–59.

HUNTOON, Robert D. (A'40—SM'47—F'54), Deputy Director also Associate Director for Physics, National Bureau of Standards, Washington 25, D.C.
Born: July, 1909, Waterloo, Iowa. B.A., in Education, 1932, Iowa State Teachers College; M.S. (Experimental Physics), 1935; Ph.D. (Nuclear Physics), 1938, State University of Iowa. **Awards:** Naval Ordnance Development Award, 1945, U. S. Navy Bureau of Ordnance; Washington Academy of Sciences Award, 1948, in Physical Sciences; Presidential Certificate of Merit, 1948; Exceptional Service Award, Department of Commerce, 1949; Fellow, American Physical Society, 1955.

HUTCHESON, John A. (A'28—M'30—SM'43—F'48), Vice President, Engineering, Westinghouse Electric Corporation, Pittsburgh, Pa .
Born: January, 1905, Park River, N.D. B.S., 1926, D.Sc. (Honorary), 1943, University of North Dakota. **IRE Offices:** Director, 1948. **Committees:** Board of Editors, 1946–50; Nominations, 1948; Nuclear Studies, 1948–49; Policy Development, 1948. **Sections:** Connecticut Valley, *chairman, 1935–36;* Pittsburgh, *chairman, 1945–46.*

HUTTER, Rudolf, G. (SM'46—F'54), Chief Engineer, Special Tube Operations and Manager, Mountain View Components Laboratories, Sylvania Electric Products, Inc., Mountain View, Calif.
Born: February 12, 1910, Berlin, Germany. State Examination, 1936, University of Berlin; Ph.D., 1944, Stanford University. **Committees:** Board of Editors, 1953; Editorial Reviewer, 1954–59.

HYLAND, Lawrence A. (A'29—VA'39—SM'53—F'55), Vice President and General Manager, Hughes Aircraft Company, Florence Ave. at Teale St., Culver City, Calif.
Born: August 26, 1897, N.S., Canada. D.E.(Honorary), 1954, Lawrence Institute of Technology. **Awards:** Medal for Distinguished Public Service, U. S. Navy, 1950.

IAMS, Harley A. (A'31—M'38—SM'43—F'50), Associate Director, Research Laboratories, Hughes Aircraft Company, Florence Ave. at Teale St., Culver City, Calif.
Born: March 13, 1905, Lorentz, W.Va. B.A.(M.E.), 1927, Stanford University. **Committees:** Papers, 1941–45; Papers Review, 1946–47. **Awards:** Joint Award, Modern Pioneers, National Association of Manufacturers, 1940.

ISBISTER, Eric J. (A'39—SM'45—F'53), Chief Engineer, Surface Armament Division, Sperry Gyroscope Company, Division of the Sperry Rand Corporation, Great Neck, L.I., N.Y.
Born: June 11, 1912, Brooklyn, N.Y. B.S.(E.E.), 1934, Massachusetts Institute of Technology; M.S.(E.E.), 1940, Polytechnic Institute of Brooklyn. **Committees:** Registration, 1952; Tellers, 1950–51, *chairman, 1951.* **Sections:** Long Island Sub-Section, *chairman, 1947–49;* New York, *treasurer, 1951–52.* Long Island Section Awards, *chairman, 1954–55.* **Professional Groups:** Military Electronics, *nominating committee, 1956.* **Awards:** U. S. Navy Certificate of Commendation, 1947; Polytechnic Institute of Brooklyn, Certificate of Distinction, 1956; New York Section Certificate of Appreciation, 1958.

ISRAEL, Dorman D. (A'23—M'30—F'42), Executive Vice President, Emerson Radio & Phonograph Corporation, 14 & Coles Sts., Jersey City, N.J.
Born: July 21, 1900, Newport, Ky. E.E., 1923, University of Cincinnati. **Committees:** Administrative, 1949–51; Awards, 1943–44, 1947; Editorial Reviewer, 1954–59; Membership, 1941; National Convention, 1947; New York Program, 1940–41; Nominations, 1946; Papers, 1940–41; Papers Procurement, *chairman, 1942–43, general chairman, 1944–47;* Professional Groups, 1953–54; Public Relations, 1940–44; Radio Receivers, 1938–42; Regular Papers, *chairman, 1941;* Television and Facsimile, 1936–37; Winter Technical Meeting, 1946. **Professional Groups:** Broadcast and Television Receivers, *chairman, 1951–53.* **Sections:** Cincinnati, *chairman, 1931–32.* **IRE Representative:** Joint Technical Advisory Committee, 1952, *chairman, 1955–56;* IRE-RMA Coordination Committee, 1947–48.

JACKSON, William E. (A'29—M'34—SM'43—F'51), Chief, Electronics Division, Federal Aviation Agency, Technical Development Center, Weir Cook Airport, Indianapolis 21, Ind.
Born: May 8, 1904, Bridgewater, Mass. B.S.(E.E.), 1925, Brown University. **Committees:** Antennas, 1944–47; Navigation Aids, 1947–48; Radio Transmitters, 1946–47; Transmitters, 1944–45; Transmitters and Antennas, 1938–44. **Awards:** Citation for service on Radio Technical Commission for Aeronautics Special Committee, SC 31; Cull Prize in Engineering, Brown University, 1925.

JACKSON, Sir Willis (SM'48—F'50), Director, Research and Education, Metropolitan Vickers Electrical Company, Ltd., Trafford Park, 33 Grosvenor Pl., London, S.W.1, England.
Born: October 20, 1904, Burnley, Lancashire, England. D.Sc., 1936, Manchester University; D.Phil., 1936, Oxford University; D.Sc. Tech. Zurich, 1955; D.Sc.(Eng.), 1956, Bristol. **IRE Representative:** IRE-IEE International Liaison Committees, 1955–59. **Awards:** Fellow, Royal Society, 1953.

JANES, Robert B. (A'37—M'50—SM'51—F'55), Manager, Industrial and Computer Development, Semi-conductor Division, Radio Corporation of America, Somerville, N.J.
Born: February 2, 1909, Burlington, Mass. B.S., 1928, Kenyon College; Ph.D., 1935, University of Wisconsin. **Committees:** Electron Devices, 1952–56; Electron Tubes and Solid Devices, 1950–52. **Sections:** Lancaster Subsection, *chairman, 1955–56.*

JANSKY, C. M., Jr. (A'18—M'25—F'28), Chairman of the Board, Jansky and Bailey, Inc., 1735 DeSales St., N.W., Washington 6, D.C.
Born: June 28, 1895, Delton, Mich. B.A., 1917, M.A., 1919, University of Wisconsin. **IRE Offices:** President, 1934; Manager, 1929–32; Director, 1932–42. **Committees:** Admission, 1929–33, 1936–40, *chairman, 1931, 1936–37;* Awards, 1942; Board of Editors, 1942–50; Broadcast, 1935–37, *chairman, 1937–38;* Broadcasting, 1931–34; Constitution and Laws, 1932–35, 1941; Convention Policies, 1940; Education, 1944; Frequency Modulation, 1940–46; Membership, 1925–28, 1941–43; Nominations, 1936–42, 1945, *chairman, 1937, 1939;* Preparedness, 1940–41; Public Relations, 1945–46; Publicity, 1936; Radio Receivers, 1928–29; Sections, 1925; Standardization, 1928–32; Standards, 1932–33; Use of the Transmission Unit, 1928–29. **IRE Representative:** American Council on Education, Planning Committee, National Conference on Educational Broadcasting, 1936–37, 1939–43; American Documentation Institute, 1939–43; ASA Sectional Committee on Radio Electrical Co-ordination, 1926, 1939–46; First National Conference on Educational Broadcasting, 1937; URSI Executive Committee, 1936, 1939–50.

JARVIS, Kenneth W. (A'24—M'27—F'34), Principle Staff Engineer, Missiles and Electronics Division, Martin Co., Baltimore 3, Md.; President, Jarvis Electronics Corporation. **Home:** 1140 Cherry St., Winnetka, Ill.
Born: October 18, 1901, Mansfield, Ohio. B.E.E., 1923, Ohio State University. **Committees:** Radio Receivers and Parts, 1930–32; Receivers, 1947–58; Receiver Sets, 1927–28. **Sections:** Chicago, *chairman, 1948–49.*

JASIK, Henry (A'40—SM'47—F'58), Consulting Engineer, Jasik Laboratories, 190 Shames Dr., Westbury, L.I., N.Y.
Born: March, 1919, New York, N.Y. B.S.(E.E.), 1938, Newark College of Engineering; M.E.E., 1951, D.E.E., 1953, Polytechnic Institute of Brooklyn. **Committees:** Antennas and Waveguides 1950–59, *vice-chairman, 1954, chairman, 1955–56;* Papers Review, 1950–53; Standards, 1955–56. **Professional Groups:** Microwave Theory and Techniques Administrative Committee, 1954–55.

JENSEN, Axel G. (A'23—M'26—F'42), Retired from Bell Telephone Laboratories; Consulting Engineer in TV Communications, 21 Mea Dr., Berkeley Heights, N.J.
Born: February 7, 1896, Copenhagen, Denmark. E.E., 1920, Royal Technical College; Post Graduate, 1921–22, Columbia University. **IRE Offices:** Director, 1954–56. **Committees:** Appointments, 1954–55; Audio and Video Techniques, 1948–49; Editorial Reviewer, 1954–59; Executive, 1955–56; Instruments and Measurements, 1949–50; Policy Advisory, 1954–56; Standards, 1948–56, 1959, *vice-chairman, 1950, chairman, 1951–54;* Television, 1939–48, *chairman, 1948–49;* Television and Facsimile, 1938; Television Systems, 1949–59, *vice-chairman, 1949, chairman, 1949–51.* **IRE Representative:** ASA Electrical Standards Board, 1953–58; ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949–58; ASA Sectional Committee (C16) on Radio (sponsored by IRE), 1951–57, *chairman, 1953–54, 1955–57;* ASA Standards Council, 1951–54, *alternate, 1955–56, 1959;* International Radio Consultative Committee: Executive Committee of U. S. Delegation, 1952–58; International Radio Consultative Committee, U. S. Study Group XIV (Vocabulary), *chairman, 1952–58;* IRE-AIEE Committee on Noise Definitions, 1951–52; IRS Steering Committee, 1951; Joint IRE-ASA (C42) Definitions Coordinating Committee, 1949–51; Joint IRE-RTMA-SMPTE-NARTB Committee for Inter-Society Co-ordination, 1952–55; U. S. National Committee of the International Electrotechnical Commission, 1953–57, *alternate, 1958.*

JESTY, Leslie C. (M'54—F'56), In Charge Colour Television Research, Sylvania-Thorn Colour TV Laboratories, Ltd., Great Cambridge Road, Enfield, Middlesex, England.
Born: August, 1907, Alresford, England. B.Sc.(Physics), 1927, B.Sc.(General), 1928, University College, Southampton, England. **Awards:** Fellow, Television Society, 1946; Fellow, British Kinematograph Society, 1954.

JETT, Ewell K. (A'29—M'38—F'39), Vice President and Director of Television, Baltimore Sunpapers, Baltimore, Md.; formerly, Chief Engineer and Commissioner, Federal Communications Commission.
Born: March 20, 1893, Baltimore, Md. **IRE Offices:** Director, 1938. **Committees:** Public Relations, 1945–46. **Sections:** Washington, D.C., *chairman, 1935–36.*

JOHNSON, J. Kelly (A'25—M'35—SM'43—F'49), Consulting Engineer, 184 South Ave., New Canaan, Conn.
Born: January, 1903, Oskaloosa, Iowa. A.B., 1924, B.S., 1926, E.E., 1927, Columbia University. **IRE Offices:** Director, 1942. **Committees:** Board of Editors, 1946–53; Nominations, 1942; Papers Procurement, 1944–45; Radio Receivers, 1936–37, 1941–49, 1954–57, 1959; Receivers, 1950–53; Registration of Engineers, 1940–43; Regular Papers, 1941; Sections, 1943–44. **Sections:** Chicago, *secretary, 1935–36, chairman, 1937–38;* New York, *treasurer, 1948–49.*

JOHNSON, John B. (M'40—SM'43—F'51), Head, Physics Department, Edison Laboratory, Thomas A. Edison, Inc., West Orange, N.J.

Born: October 2, 1887, Gothenberg, Sweden, B.S., 1913, M.S., 1914, University of North Dakota; Ph.D., 1917, Yale University. **Awards:** Longstreth Medal, 1957.

JOLLIFFE, Charles B. (M'25—F'30), Vice President and Technical Director, Radio Corporation of America, Princeton and Camden, N.J.
Born: November 13, 1894, Mannington, W.Va. B.S., 1915, M.S., 1920, West Virginia University; Ph.D., 1922, Cornell University; LL.D., 1942, West Virginia University. **IRE Offices:** Director, 1936–37, 1944. **Committees:** Admissions, 1938; Awards, 1942; Bibliography, 1930–32; Broadcast, 1932–33, 1936–37; Frequency Modulation, 1940–41; Meetings and Papers, 1930; Nominations, 1937, 1941; Piezoelectric Crystals, 1940–41; Policy Development, 1948; Preparedness, 1940–41; Radio Receivers, 1927–28; Standardization, 1925–27, 1929–30, *chairman, 1928;* Television and Facsimile, 1936–39; Vacuum Tubes, 1927–28, *chairman, 1928–29.* **Sections:** Washington, D.C., *chairman, 1929–30.* **IRE Representative:** American Council on Education, Planning Committee, National Conference on Educational Broadcasting, 1936, 1939–43.

JORDAN, Edward C. (S'36—A'39—SM'45—F'53), Professor and Head of Department of Electrical Engineering, University of Illinois, Urbana, Ill.
Born: December 31, 1910, Edmonton, Alta., Canada. B.S.(E.E.), 1934, M.S.(E.E.), University of Alberta; Ph.D.(E.E.), 1940, Ohio State University. **Committees:** Annual Review, 1949–51; Antennas, 1945–49; Antennas and Waveguides, 1949–52; Editorial Reviewer, 1954–59; Membership, 1950–51; Papers Review, 1951–53. **Professional Groups:** PGAP Awards Committee, *chairman, 1958–60.* **Sections:** Columbus Subsection, *chairman, 1945.* **IRE Representative:** Ohio State University, 1942–45; University of Illinois, 1946–50; National Bureau of Standards, Technical Advisory Committee, 1959.

JORDAN, John F. (A'40—M'45—SM'53—F'54), Vice President in charge of Manufacturing, The Baldwin Piano Company, 1801 Gilbert Ave., Cincinnati, Ohio.
Born: November 23, 1908, Pittston, Pa. E.E., 1932. University of Cincinnati. **Committees:** Awards, 1955–57; Sections, 1949–52, *chairman, 1950–51.* **Sections:** Cincinnati, *secretary-treasurer, 1945–46, vice-chairman, 1946–47, chairman, 1947–48, 1951–52.*

KAAR, Ira J. (J'22—M'29—F'41), Vice President and Engineering Director, Hoffman Electronics Corporation, Los Angeles, Calif.
Born: October 17, 1902, Dunsmuir, Calif. B.S.(E.E.), 1924, University of Utah. **IRE Offices:** Director, 1939, 1948. **Committees:** Admissions, 1940; Annual Review, 1940–46; Awards, 1947–48; Nominations, 1949–50; Public Relations, 1940, 1942; Standards, 1940–46; Television, 1939–48, *chairman, 1940–47;* Television Systems, 1949–58. **IRE Representative:** Joint Technical Advisory, 1950–56, *chairman, 1950–52.* **Awards:** Certificate of Commendation, U. S. Navy, 1947; Fellow, American Institute of Electrical Engineers, 1951, E.I.A. Engineering Award, 1957.

KALLMANN, Heinz E. (A'38—M'41—SM'43—F'59), Consulting Engineer, 417 Riverside Dr., New York 25, N.Y.
Born: March 10, 1904, Berlin, Germany. Ph.D.(Physics), 1929, Goettingen University, Germany. **Awards:** U. S. (O.S.R.D.) Certificate of Appreciation by N.D.R.C., 1945.

KALMUS, Henry P. (A'39—SM'45—F'56), Chief, Advanced Research Laboratory, Associate Director, Diamond Ordnance Fuze Laboratories, Washington 25, D.C.
Born: January 9, 1906, Vienna, Austria. Dipl. Ing., 1930, Technical University, Vienna. **Awards:** Award for Exceptional Service, U. S. Department of Commerce, 1954; Certificate of Achievement, U. S. Army, 1954.

KANDOIAN, Armig G. (S'35—A'36—SM'44—F'51), Vice President, Communication Systems, International Telephone and Telegraph Laboratories, 500 Washington Ave., Nutley, N.J.
Born: November 28, 1911, Van, Armenia. B.S., 1934, M.S., 1935, Harvard University. **Committees:** Papers Review, 1946–53. **Sections:** Northern New Jersey, *vice president, 1958–59.* **Awards:** Eta Kappa Nu, Honorable Mention, 1943.

KANTEBET, Shankar R. (A'25—M'31—SM'43—F'49), Director General, Retired. Overseas Communication Service, Eleventh Rd., Santa Cruz East, Bombay 25, India.
Born: December, 1900, Kanara, Bombay, India. B.A. (Honours), M.N.; Technical Scholar, 1922, Bombay University. **IRE Offices:** Vice President, 1953; Director, 1953. **Awards:** AMIEE, 1928; MIE (1), 1944; Marconi Veteran, 1951.

KARPLUS, Eduard (A'31—F'38), Engineer, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: September 7, 1899, Moedling, Austria. Ingenieur, 1923, Technische Hochschule, Vienna, Austria.

KATZIN, Martin (J'27—A'29—M'42—SM'43—F'55), President, Electromagnetic Research Corporation, 711 14 St., N.W., Washington 5, D.C.
Born: February 17, 1908, New York, N.Y. B.S.E.(E.E.), 1928, B.S.E.(Math.), 1929, M.S.E.(E.E.), 1929, University of Michigan. **Committees:** Editorial Reviewer, 1954–59; Papers Procurement, 1946–50; Papers Review, 1948–; Wave Propagation, 1954–59. **Awards:** Presidential Certificate of Merit, 1948; Distinguished Alumnus Citation for Contributions to Engineering, University of Michigan, 1953; Navy Meritorious Civilian Service Award, 1955.

KEAR, Frank G. (A'24—M'31—SM'43—F'53), Consulting Radio Engineer, 1302 18 St., N.W., Washington 6, D.C.
Born: October 18, 1903, Minersville, Schuykill County, Pa. E.E., 1926, Lehigh University; S.M.(E.E.), 1928, Sc.D.(E.E.), 1933, Massachusetts Institute of Technology. **Committees:** Radio Transmitters and Antennas, 1929–31; Standards, 1934–35.

KEISTER, James E. (A'41—SM'46—F'57), Manager, Engineering, General Electric Company, Electronic Components Division, Semiconductor Products Department, Syracuse, N.Y.
Born: July 11, 1914, Coburg, Iowa. B.S.(E.E.), 1935, Cornell University. **Committees:** Annual Review, 1949–50; Audio-Video Techniques, *vice-chairman, 1948–49;* Standards, 1949–51; Video Techniques, *chairman, 1949–51, 1951–53.* **Awards:** Navy "E," 1944; Navy Certificate of Commendation, 1947.

KELL, Ray D. (A'35—F'47), Fellow Technical Staff, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: June 7, 1904, Kell, Ill. B.S.(E.E.), 1926, University of Illinois. **Committees:** Editorial Reviewer, 1954–59; Television, 1941–42, 1946–49; Television Systems, 1949–59. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Stuart Ballantine Medal, Franklin Institute, 1948; David Sarnoff Gold Medal, SMPTE, 1954.

KELLY, Mervin J. (M'25—F'38), Retired President, Bell Telephone Laboratories, Inc.; Retired Chairman of the Board, Bell Telephone Laboratories, Inc.; Research Management Consultant, International Business Machines, Inc., and Bausch & Lomb Optical Company, 2 Windemere Ter., Short Hills, N.J.
Born: February 14, 1894, Princeton, Mo. B.S., 1914, Missouri School of Mines and Metallurgy; M.S., 1915, University of Kentucky; Ph.D., 1918, University of Chicago; D.Eng., 1936, University of Missouri; D.Sc., 1946, University of Kentucky; LL.D., 1954, University of Pennsylvania; D. Eng., 1955, New York University; D.Eng., 1955, Polytechnic Institute of Brooklyn; D.Sc., 1957, University of Pittsburgh; D.Honoris Causa, 1957, University of Lyons; D.Eng., 1958, Wayne State University; 1959 Honor Award, Stevens Institute of Technology. **Committee:** Vacuum Tubes, 1927–31. **IRE Repreentative:** ASA Technical Committee, Vacuum Tubes, 1930. **Awards:** Air Force Association Trophy, 1953; Presidential Certificate of Merit; Industrial Research Institute Medal, 1954; Christopher Columbus International Communication Prize, 1955; Air Force Exceptional Service Award, 1957; James Forrestal Memorial Award, 1958; John Fritz Medal, 1959.

KENNEDY, Maurice E. (A'41—SM'47—F'56), Director and Chief Engineer, Department of Communications, Los Angeles County, 234 N. Main St., Los Angeles 12, Calif.
Born: September 8, 1907, Galva, Ill. **Committees:** Professional Groups, 1955–58. **Professional Groups:** Administrative Committee, Vehicular Communications, 1954–60. **IRE Representative:** WESCON, *vice-chairman, 1950;* Technical Societies Council, 1947–48.

KETO, John E. (A'38—SM'46—F'48), Technical Director, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio.
Born: June 9, 1909, Maynard, Mass. E.E., 1932, M.S., 1935, University of Cincinnati. **Committees:** Awards, 1956–58; Wave Propagation, 1948–52. **Professional Groups:** Aeronautical and Navigational Electronics, *chairman, 1951.* **Sections:** Dayton, *chairman, 1946–47.* **Awards:** Presidential Medal of Merit, 1946.

KIEBERT, Martin V., Jr. (A'31—M'38—SM'43—F'59), Consulting Engineer, Electronic Research Corporation, 305 W. Foothill Blvd., Claremont, Calif.
Born: November, 1908, Wallace, Idaho. E.E., 1931, University of Idaho; Physics, 1934, Reed College. **Professional Groups:** Member, Radio Telemetry and Remote Control Administrative Committee, *chairman, 1952–54.* **Sections:** Orange Belt, Subsection, *chairman, 1955–56.* **Awards:** American Chemical Society, Idaho, 1928; Royal Aeronautical Society, 1947.

KILGORE, G. Ross (A'30—M'40—SM'43—F'57), Manager, Applied Research Department, Westinghouse Electric Corporation, P.O. Box 746, Baltimore 3, Md.
Born: January 31, 1907, Fremont, Neb. B.S.(E.E.), 1928, University of Nebraska; M.S.(E.E.), 1931, University of Pittsburgh. **Committees:** Electron Devices, 1952–54. **Professional Groups:** Electron Devices Administrative Committee, 1953, 1956–59, *chairman, 1958–59.*

KILLIAN, Thomas J. (A'47—SM'47—F'51), Deputy Chief and Chief Scientist, Office of Naval Research, Washington 25, D.C.
Born: August 4, 1904. Schenectady, N.Y. B.S., M.S., 1926, Massachusetts Institute of Technology; M.A., 1927, Ph.D., 1929, Princeton University. **Committees:** Nuclear Studies, 1947–51. **IRE Representative:** Washington Chapter, *program chairman, 1956–57.* **Awards:** Regional Prize, AIEE, 1936.

KIMBALL, Charles N. (A'34—M'40—SM'43—F'52), President, Midwest Research Institute, Kansas City, Mo.
Born: April 21, 1911, Boston, Mass. B.E.E., 1931, Northeastern University; S.M., 1932, Sc.D., 1934, Harvard University; Eng.D. (Honorary), 1955, Northeastern University; Sc.D.(Honorary), 1958, Park College. **Committees:** Awards 1956–59; Mobile Communication Systems, 1950–56; Railroad and Vehicular Communication, 1945–50. **Sections:** Kansas City, *vice-chairman, 1941–43.*

KING, Donald D. (M'46—SM'57—F'59), Vice President, Research, Electronic Communications, Inc., 1830 York Rd., Timonium, Md.
Born: August 7, 1919, Rochester, N.Y. A.B., 1942, A.M., 1944, Ph.D., 1946, Harvard University. **Professional Groups:** Antennas and Propagation Administrative Committee, 1954–57; Microwave Theory and Techniques Administrative Committee, 1952–57; Editor, *Transactions* on Microwave Theory and Techniques, 1959–.

KING, Ronold, W. P. (A'30—SM'43—F'53), Gordon McKay Professor of Applied Physics, Cruft Laboratory, Harvard University, Cambridge 38, Mass.
Born: September 19, 1905, Williamstown, Mass. B.A., 1927, M.S., 1929, University of Rochester; Ph.D., 1932, University of Wisconsin. **Committees:** Antennas, 1944–47; Papers Review, 1952–53; Transmitters, 1944–45; Transmitters and Antennas, 1942–44. **IRE Representative:** Harvard University, 1954.

KINN, Theodore P. (A'36—SM'45—F'59), President, Kinn Electronics Corporation, 4104 Pinkney Rd., Baltimore 15, Md.
Born: January, 1907, El Paso, Tex. B.S.(E.E.), 1928, Colorado University. **Committees:** Industrial Electronics, 1954–59; Papers Procurement, 1946. **Professional Groups:** Industrial Electronics Administrative Committee, 1950–59. **IRE Representative:** Joint IRE-AIEE-NEMA Coordination Committee on Induction and Dielectric Heating, 1947–50.

KLEEN, Werner J. (SM'50—F'57), Dr. Phil. Nat. Habil., Director, Electron Research Laboratory, Siemens and Halske, Balanstrasse 73, Munich 8, Germany.
Born: October 29, 1907, Hamburg, Germany. Dr.Phil.Nat., 1931, Dr.habil., 1940, University of Heidelberg. **Committees:** Electron Tubes, 1955–59. **Awards:** Medal of Svenska Teknologföreningen, Stockholm, 1950; Honorary Member Instituto Nacional de Electrónica, Madrid, 1952; Gauss-Weber Medal, University of Göttingen, 1955; Honorary Professor, Technische Hochschule, Munich, 1956.

KLOEFFLER, Royce G. (SM'46—F'53), Professor, Electrical Engineering, Kansas State College, Manhattan, Kan.; Engineer, National Security Agency, Washington, D.C.
Born: June 18, 1890, Armada, Mich. B.S.(E.E.), 1913, University of Michigan; S.M., 1930, Massachusetts Institute of Technology.

KNOBLAUGH, Armand F. (A'33—M'44—SM'54—F'58), Professor of Physics, University of Cincinnati.
Born: June, 1903, Cincinnati, Ohio, B.S.(Eng.), 1925, M.A., 1927, Ph.D., 1929, University of Cincinnati.

KNOWLES, Hugh S. (A'25—F'41), Consulting Engineer; President and Director of Research, Industrial Research Products, 9400 Belmont Ave., Franklin Park, Ill.; President, Knowles Electronics.
Born: September 23, 1904, Hynes, Iowa. A.B., 1928, Columbia University. **Committees:** Annual Review, 1938–41; Board of Editors, 1945–53; Editorial Reviewer, 1954–55; Electroacoustics, 1936–41, 1946–47, 1953–55, *chairman, 1938–42;* Papers, 1941; Papers Procurement, 1942–43; Regular Papers, 1941; Standards, 1938–42; Symbols, 1940–41, 1943–48. **Sections:** Chicago, *chairman, 1934–35.* **IRE Representative:** ASA Sectional Committee (Z24) on Acoustical Measurement and Terminology, 1954–56.

KNOX, James B. (A'34—SM'46—F'51), RCA Victor Company, Ltd., 1001 Lenoir St., Montreal 30, P.Q., Canada.
Born: November, 1910, Winnipeg, Man., Canada. **Committees:** Radio Transmitters, 1947–53.

KOCH, Winfield R. (A'28—SM'48—F'54), Engineer, RCA-Victor TV Division, Radio Corporation of America, Bldg. 101-2, Borton Landing Rd., Moorestown, N.J.
Born: December 23, 1903, Omaha, Neb. B.S.(E.E.), 1925, University of Minnesota. **Committees:** Receivers, 1951–59. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

KOCK, Winston E. (SM'45—F'52), Director & General Manager, Bendix Research Laboratories, Bendix Aviation Corp., P.O. Box 5115, Detroit 35, Mich.
Born: December 5, 1909, Cincinnati, Ohio, E.E., 1932, M.S. (Physics), 1933, University of Cincinnati; Ph.D., 1934, University of Berlin; D.Sc. (Honorary) 1952, University of Cincinnati. **Committees:** Administrative, 1956, Antennas, 1946–48, *alternate, 1946–47, 1947–48;* Antennas and Waveguides, 1950–51; Editorial Reviewer, 1953–59; Papers Review, 1951–53. **Professional Groups:** Audio, *chairman, 1955;* Administrative Committee, 1955. **Awards:** Outstanding Young Electrical Engineer, Eta Kappa Nu, 1938.

KOEHLER, Glenn (A'27—M'43—SM'43—F'56), Professor of Electrical Engineering, University of Wisconsin, Madison 6, Wis.
Born: November 30, 1894, Van Wert, Ohio. B.S., 1918, University of Illinois; M.S., 1928, University of Wisconsin. **Committees:**

Education, 1946, 1951–56. **IRE Representative:** University of Wisconsin, 1941–59.

KOGA, Issac (SM'54—F'57), Dean, School of Engineering, Tokyo University, Bunkyo-ku, Tokyo, Japan.
Born: December, 1899, Tosu City, Saga Province, Japan, B.E., 1923, Ph.D.(Eng.), 1930, Tokyo University. **Committees:** Papers, *chairman, 1956–57.* **Sections:** Tokyo, *vice-chairman, 1957–59; chairman, 1959.* **IRE Representative:** URSI, *vice president, 1957;* Japanese National Committee, *chairman, 1957;* University of Tokyo, 1959. **Awards:** Asano Memorial Prize, 1934; Army Technical Prize, 1939; Japan Academy of Science Prize, 1948; Memorial Prize, Institute of Electrical Communication Engineers of Japan, 1950; Medal of Honor, Japanese National Government, 1956.

KOHL, Walter H. (A'35—M'39—SM'43—F'58), Senior Engineering Specialist, Sylvania Electric Products, Inc., Mountain View Components Laboratory, Mountain View, Calif.; Consultant, Stanford Research Institute, Menlo Park, Calif.; Lecturer, Electronics Laboratories, Stanford University, Stanford, Calif.
Born: January 22, 1905, Kitzingen, Bavaria, Germany, Dipl. Ing., 1928, Dr. Ing., 1930, Technische Hochschule, Dresden, Germany.

KOMPFNER, Rudolf (F'50), Director of Electronics and Radio Research, Bell Telephone Laboratories, Inc., Holmdel, N.J.
Born: May 16, 1909, Vienna, Austria. Engineering Diploma, 1933, Technical College, Vienna; D.Phil., Oxford University. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Electron Devices Administrative Committee, 1955. **Awards:** Duddell Medal, Physical Society, London, 1955.

KORMAN, Nathaniel I. (S'38—A'39—SM'45—F'56), Director, Advanced Military Systems, Radio Corporation of America, Princeton, N.J.
Born: February 23, 1916, Providence, R.I. B.S.(E.E.), 1937, Worcester Polytechnic Institute; M.S.(E.E.), 1938, Massachusetts Institute of Technology; Ph.D.(E.E.), 1958, University of Pennsylvania. **Awards:** Charles A. Coffin Fellowship, 1937; Award of Merit, RCA, 1951.

KRAUS, John D. (A'32—M'43—SM'43—F'54), Professor, Electrical Engineering and Astronomy; Director, Radio Observatory, Ohio State University, Columbus 10, Ohio.
Born: June 28, 1910, Ann Arbor, Mich. B.S., 1930, M.S., 1931, Ph.D., 1933, University of Michigan. **Committees:** Board of Editors, 1940–52. **Sections:** Detroit, *chairman, 1940.*

KUPER, J. B. Horner (A'37—SM'45—F'54), Department Chairman, Brookhaven National Laboratory, Upton, L.I., N.Y.
Born: November 5, 1909, New York, N.Y. B.A., 1930, Williams College; Ph.D., 1938, Princeton University. **Committees:** Board of Editors, 1947–53; Editorial Reviewer, 1954–59; Instruments and Measurements, 1949–50; Nuclear Studies, 1948–49. **Professional Groups:** Nuclear Science, Administrative Committee, 1949–54. **Awards:** Fellow, American Physical Society, 1950.

LACK, Frederick R. (A'20—F'37), Vice President, Western Electric Company, Inc., 120 Broadway, New York 5, N.Y.
Born: July 18, 1895, Easthourne, England. S.B., 1925, Harvard University. **IRE Offices:** Director, 1940, 1946–47. **Committees:** Appointments, 1948; Awards, 1941, 1948; Board of Editors, 1946; Electronics, 1936–41; Executive, 1947; Fiscal, 1947–48; National Convention, 1947; Nuclear Studies, 1948–49; Office Practices, 1947; Papers, 1942–45; Special Publication Fund, 1947; Tellers, 1940. **IRE Representative:** ASA Board of Directors, 1945–51; RMA-IRE Coordinating Committee, 1948.

LAFFERTY, James (M'46—SM'48—F'54), Manager, Physical Studies Section, General Electric Research Laboratory, The Knolls, Schenectady, N.Y.
Born: April 27, 1916, Battle Creek, Mich. B.S.(Engr. Physics), 1939; M.S.(Physics), 1940; Ph.D.(E.E.), 1946, University of Michigan.

LAMB, James J. (A'28—SM'48—F'54), Consulting Engineer, Rock Ridge Dr., South Norwalk, Conn.
Born: November 30, 1900, Michigan, N.D. B.S.(E.E.), 1922, Catholic University of America. **Committees:** High Frequency Receivers, 1929–30; Nomenclature, Symbols and Definitions, 1929–30; Papers Review, 1948–53; Radio Transmitters and Antennas, 1929–30; Symbols, 1929–30; Functional Symbols, 1958–59. **Sections:** Connecticut, Awards Committee, *chairman, 1954–59;* Fairfield County Subsection, *vice-chairman, 1959.* **Awards:** O.S.R.D. Certificate, 1944; Fellow, Radio Club of America, 1958.

LAMSON, Horatio W. (A'15—M'27—F'33)(L), Engineer, General Radio Company, 22 Baker Ave., West Concord, Mass.; Faculty Member, Northeastern University, Boston, Mass.
Born: January 2, 1893, Somerville, Mass. S.B., 1915, Massachusetts Institute of Technology; A.M., 1917, Harvard University. **Sections:** Boston, *chairman, 1937–39.*

LANDON, Vernon D. (A'27—M'29—SM'43—F'51), Project Manager, RCA Astro Electronic Products, Princeton, N.J.
Born: May, 1901, Denver, Colo. Attended Detroit Junior College, 1920. **Committees:** Frequency Modulation, 1941–47; Information Theory and Modulation Systems, 1952–56; Modulation Systems, 1947–52; Papers Review, 1947–52.

LANGLEY, Ralph H. (A'12—M'16—F'29)(L), Consulting Engineer, 18 Prescott Ave., Bronxville, N.Y.
Born: January 5, 1889, New York, N.Y. E.E., 1913, Columbia University, Assistant Secretary, 1913. **Committees:** Admissions, 1945; Awards, 1934; Bibliography, 1930–32; New York Program, 1934; Radio Receivers and Parts, 1930–31; Radio Telegraph and Receiver Terminology, *chairman, 1924–25;* Registration of Engineers, 1940–41; Sections, 1930–33, 1935; Standardization, 1924–28; Standards, 1934–35; Wave Length Regulation, 1916–17. **Sections:** Cincinnati, *chairman, 1929–30.*

LAPORT, Edmund A. (A'25—M'27—SM'43—F'53), Director of Communications Engineering, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: July 2, 1902, Nashua, N.H. **Committees:** Annual Review, 1946–47; Policy Development, 1948; Radio Transmitters, 1946–48, *chairman, 1947–48;* Standards, 1946–56. **Sections:** Montreal, *chairman, 1940–43;* NNJ, *vice-chairman, 1955–56.* **IRE Representative:** ASA Electrical Standards Committee, 1948–52; U. S. National Committee of the International Electrotechnical Commission, 1949–51.

LAU, Harold B. (SM'46—F'52), Research Engineer, RCA Laboratories Division, Princeton, N.J.
Born: September 7, 1911, Douds, Iowa. B.S., 1934, Kent State University; M.S., 1936, Ph.D., 1941, Ohio State University. **Committees:** Editorial Reviewer, 1954–59. **Awards:** Television Broadcasters' Association Award, 1946; IRE Vladimir K. Zworykin Television Prize, 1955.

LAW, Russell R. (A'34—M'40—SM'43—F'53), Director, Electronics Laboratory, Research Laboratories, Hughes Aircraft Company, Culver City, Calif.
Born: January 11, 1907, Hampton, Iowa. B.S., 1929, M.S., 1931, Iowa State College; D.S., 1933, Harvard Engineering School. **Committees:** Editorial Reviewer, 1954–59; National Convention, 1956; Solid State Devices, *vice-chairman, 1956–57.* **Professional Groups:** Electron Devices, *vice-chairman, 1956, chairman, 1957.*

LEARNED, Vincent R. (A'38—M'40—SM'47—F'55), Director of Research and Development, Electronic Tube Division, Sperry Gyroscope Company, Great Neck, L.I., N.Y.
Born: January 21, 1917, San José, Calif. B.S.(E.E.), 1938, University of California; Ph.D., 1943, Stanford University. **Committees:** Editorial Reviewer, 1955–59; Electron Tubes, 1959; National Convention, 1954; Tellers, 1952–53, *chairman, 1953.* **Sections:** Long Island, *chairman, 1953;* Awards Committee, 1955–56, *chairman, 1956–57.*

LEDERER, Ernest A. (M'28—SM'43—F'55), Consulting Engineer, Fells Rd., Essex Fells, N.J.

Born: January 25, 1895, Prague, Austria. Ph.D., 1920, University of Vienna. **Awards:** Modern Pioneer Award, N.M.A., 1940.

LEE, Low K. (S'39—A'41—M'48—SM'51—F'59), Manager, Product Engineering, Space Technology Laboratories, Inc., P.O. Box 95001, Los Angeles 45, Calif.
Born: February 12, 1916, Oakland, Calif. B.S., 1937, M.S., 1939, University of California. **Professional Groups:** Member, Automatic Control Administrative Committee, 1954–55; Member, Component Parts Administrative Committee, 1953–59, *vice-chairman, 1956–57.*

LEE, Reuben (A'32—SM'45—F'54), Consulting Engineer, Electronics Division, Westinghouse Electric Corporation, P.O. Box 1897, Baltimore 3, Md.
Born: November, 1902, Shirland, Derbyshire, England. B.S. (E.E.), 1924, West Virginia University.

LEEDS, Laurance, M. (A'30—M'40—SM'43—F'57), Consulting Engineer, Technical Products Department, General Electric Company, Syracuse, N.Y.
Born: October, 1906, Tulsa Okla. B.S.(E.E.), 1934, Rutgers University. **Committees:** Television, 1940–47.

LEHDE, Pendleton E. (A'14—F'27)(L), President, Pendleton Terminal Corporation, 1050 Constance St., New Orleans, La.; President, Electron Equipment Company; President, Sunshine Buildings, Inc.
Born: October 2, 1892, New Orleans, La. B.E., 1914, M.E.E., 1926, Tulane University. **Committees:** Membership, 1927–29. **Sections:** New Orleans, *chairman, 1928–33.*

LEHOVEC, Kurt (SM'52—F'56), Director of Research, Sprague Electric Company, Marshall St., North Adams, Mass.
Born: June 12, 1918, Ladowitz, Czechoslovakia. Ph.D., 1940, Prague University. **Awards:** Fellow, American Physical Society, 1954.

LEIFER, Meyer (A'46—M'48—SM'50—F'55), Manager, Special Tube Operations, Sylvania Electric Products, Inc., Mountain View, Calif.
Born: April 18, 1914, New York, N.Y. B.S., 1933, Brooklyn College; M.A., 1935, Columbia University. **Committees:** Papers Review, 1951–53. **Sections:** San Francisco, *treasurer, 1955–56, vice-chairman, 1956–57, chairman, 1957–58.*

LePAGE, Wilbur R. (SM'46—F'59), Chairman, Electrical Engineering Department, Syracuse University, Syracuse 10, N.Y.
Born: November, 1911, Kearny, N.J. E.E., 1933, Cornell University; M.S., 1939, University of Rochester; Ph.D., 1941, Cornell University. **Committees:** Editorial Reviewer, 1954–59.

LEVERENZ, Humboldt W. (SM'54—F'56), Director of Research, RCA Laboratories, Princeton, N.J.
Born: July 9, 1909, Chicago, Ill. B.A. (Chemistry), 1930, Stanford University. **Awards:** Frank P. Brown Medal, Franklin Institute, 1954.

LEWIS, George (A'12—M'15—SM'43—F'51)(L), Retired. Formerly Assistant Vice President, International Telephone and Telegraph Corporation, 67 Broad St., New York, N.Y.
Born: September 15, 1887, Media, Pa. M.E.I., 1911, Bliss School of Applied Science. **IRE Offices:** Manager, 1918–19, 1923, 1926; Director, 1935. **Committees:** Admissions, 1929–30, 1942; Awards, 1935; Electronics, 1936–39; Facsimile, 1939–41; New York Program, 1935–36, *chairman, 1935;* Public Relations, 1947–48; Standardization, 1916–17, 1919–20, 1925–26, 1928–31; Symbols, 1940–41; Television, 1939–42; Vacuum Tubes, 1929–30.

LEWIS, Willard D. (A'44—SM'52—F'54), Director of Research, Communications Systems, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: January 6, 1915, Augusta, Ga. A.B. (Physics), 1935, Harvard University; B.A. (Math.), 1938, Oxford University; Ph.D. (Theoretical Physics), 1941, Harvard University. **Committees:** Editorial Reviewer, 1955–59. **Awards:** Rhodes Scholarship, 1935; Naval Ordnance Development Award, United States Navy, 1946.

LIBBY, Tyng M. (A'14—M'16—SM'43—F'55), Telecommunications Consultant, 1322 Woodbine Way, Seattle 77, Wash.
Born: August 9, 1899, Kingman, Kan. **Sections:** Seattle, *secretary-treasurer, 1917, chairman, 1927.* **Awards:** Bailey Medal, U. S. Navy, 1907.

LIDDEL, Urner (SM'49—F'55), Biophysicist, National Institutes of Health, Bethesda, Md.
Born: September 3, 1905, Butler, Mo. B.A., 1926, Central College; Ph.D., 1941, George Washington University. **Committees:** Awards, 1956–59, *chairman, 1959;* Nuclear Studies, 1948–49. **Professional Groups:** Medical Electronics, *vice-chairman, 1957–58, chairman, 1958–59;* Nuclear Science, *vice-chairman, 1950–51, secretary, 1953–54.* **IRE Representative:** ASME Glossary Review Board (Nuclear Physics), *alternate, 1952;* International Conference on Medical Electronics, 1959.

LINDENBLAD, Nils E. (M'34—SM'43—F'48), Research Engineer, RCA Laboratories Division, Princeton, N.J.
Born: October 30, 1895, Norrkoping, Sweden. M.E., 1915, Norrkoping Polytechnic Institute; E.E., 1919, Royal Institute of Technology, Stockholm. **Committees:** Antenna Subcommittee, 1940–41. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; RCA Laboratories Award for Pioneering in Slot Antennas, 1947; War Department Citation for Patriotic Service in Position of Trust and Responsibility, 1947; RCA Laboratories Awards for Development of Thermoelectric Refrigerator, 1955; Advances in Electronic Cooling, 1956; Fellow, Technical Staff RCA Laboratories, 1959; David Sarnoff Outstanding Achievement Award in Science, 1959.

LINDER, Ernest G. (A'40—SM'49—F'55), Administrator, Electronic Research Laboratory, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: May 16, 1902, Waltham, Mass. B.A., 1925, M.S., 1927. University of Iowa; Ph.D., 1931, Cornell University: **Awards:** Fellow, American Physical Society.

LINDSAY, William W., Jr. (A'24—M'26—F'39), Research and Development Scientist, Operations Research Division, Lockheed Aircraft Corporation, Burbank, Calif.; Consulting Engineer, 230 S. Thurston Ave., Los Angeles 49, Calif.
Born: November 16, 1899, Overbrook, Pa. Privately educated, equivalent "Doktor Ingenieur" degree. **Committees:** Nominations, 1942; Transmitters, 1946. **Sections:** Los Angeles, *secretary-treasurer, 1928–30, chairman, 1940–41.*

***LIPPINCOTT, Donald K. (M'28—SM'43—F'59),** Partner of Lippincott, Smith & Ralls, Patent Attorneys, 24 California St., San Francisco 11, Calif.
Born: December 3, 1889, Huntsville, Ala. B.S.(E.E.), 1913, University of California; San Francisco Law School; Hastings College of Law, Neb.; George Washington University, Washington, D.C. **Committees:** Board of Editors, 1946. **Sections:** San Francisco, *first vice-chairman, chairman, 1929–30.* **Awards:** Life Member, American Institute of Electrical Engineers.

LITTLE, Donald G. (A'20—M'27—F'29)(L), Retired. 408 Old Orchard Rd., Baltimore 29, Md.
Born: May 17, 1893, Kalamazoo, Mich. B.S.(E.E.), 1917, University of Michigan. **Committees:** Board of Editors, 1944–53; Meetings and Papers, 1928–29; Radio Transmitters and Antennas, 1929–30; Standardization, 1931–32; Standards, 1932–33; Transmitters and Antennas, 1936–39. **Sections:** Baltimore, *chairman, 1951.* **Awards:** Fellow, American Institute of Electrical Engineers.

LITTON, Charles V. (A'25—SM'44—F'47), President, Litton Engineering Laboratories, P.O. Box 949, Grass Valley, Calif.
Born: March 13, 1904, San Francisco, Calif. A.B., 1924, E.E.,

* Deceased.

1925, Stanford University. **Committees:** Editorial Reviewer, 1954; Papers, 1945; Papers Review, 1946–53. **Sections:** San Francisco, *chairman, 1932–33.*

LLEWELLYN, Frederick B. (A'23—F'38), Assistant to President, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: September 16, 1897, New Orleans, La. M.E., 1922, Stevens Institute of Technology; Ph.D., 1928, Columbia University. **IRE Offices:** President, 1946; Director, 1939–48. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Awards, 1942, 1947–48, *chairman, 1947;* Awards Coordination, 1956–58; Board of Editors, 1949–53; Constitution and Laws, 1947, 1950; Editorial Administrative, 1946–53; Editorial Reviewer, 1954–59; Electronics, 1939–44; Executive, 1942–44, 1946, *chairman, 1946;* Finance, 1948–51; Fiscal, 1947–48; Investment, 1946; IRE-IEE International Liaison, 1947, 1949, 1958; Membership, 1941, 1949–50; Membership Solicitation Policy, 1945; Nominations, 1944, 1947–48; Office Quarters, 1947; Papers, 1932–46, *vice-chairman, 1940–42, chairman, 1943–46;* Policy Advisory, 1952–53; Policy Development, 1949–51, *chairman, 1951;* Professional Groups, 1948; Public Relations, 1950; Symbols, 1940–41. **IRE Representative:** ASA Electrical Standards Committee, 1948–55; National Research Council, Division of Engineering and Industrial Research, 1948–56; United States National Committee of the International Electrotechnical Commissions, 1949–54; IRE-IEE International Liaison Committee, 1947, 1949, 1955–59. **Awards:** IRE Morris Liebmann Memorial Prize, 1935.

LODGE, William B. (A'34—M'37—SM'43—F'49), Vice President, Affiliate Relations and Engineering, CBS Television Network, 485 Madison Ave., New York 22, N.Y.
Born: August 17, 1907, Whitemarsh, Pa. B.S., 1930, M.S., 1931, Massachusetts Institute of Technology. **Committees:** Annual Review, 1946–49; Antennas, 1944–45; Awards, 1946; Transmitters, 1944–45; Transmitters and Antennas, 1940–41; Winter Technical Meeting, 1946.

LOOMIS, Alfred L. (M'28—SM'43—F'44), President, Loomis Institute for Scientific Research, 14 Wall St., New York, N.Y.
Born: November 4, 1887, New York, N.Y. A.B., 1909, Yale University; LL.B., 1912, Harvard University; D.Sc., 1932, Wesleyan University; M.Sc., 1933, Yale University; LL.D., 1941, University of California. **Awards:** John Price Wetherill Medal, The Franklin Institute, 1934.

LOUGHLIN, Bernard D. (A'40—M'45—SM'53—F'55), Electronic Research Consultant, Little Neck Rd., R.D. 5, Huntington, L.I., N.Y.
Born: May 19, 1917, New York, N.Y. B.E.E., 1939, E.E., 1945, Cooper Union Institute of Technology; M.S.(E.E.), 1946, Stevens Institute of Technology. **Committees:** Modulation Systems, 1947–49; Papers Review, 1948–50; Radio Receivers, 1948–51. **Awards:** IRE Vladimir K. Zworykin Television Prize, 1952; SMPTE David Sarnoff Gold Medal Award, 1955; PGBTR, 1957.

LOUGHREN, Arthur V. (A'24—M'29—SM'43—F'44), Vice President, Applied Research Division, Airborne Instruments Laboratory, Division of Cutler-Hammer, Inc., 160 Old Country Rd., Mineola, L.I., N.Y.
Born: September 15, 1902, Rensselaer, N.Y. B.A., 1923, E.E., 1925, Columbia University. **IRE Offices:** Director, 1952–55, 1957–58; President, 1956. **Committees:** Admissions, 1931–33; Appointments, 1956, *chairman, 1957;* Awards, 1949–55; Awards Coordination, 1955–57, *chairman, 1957;* Editorial Board, 1957; Editorial Reviewer, 1954; Executive, 1955–57, *chairman, 1956;* Finance, 1953, 1955–57; Membership, 1934: Nominations, 1957, *chairman, 1958;* Papers Procurement, 1947–50; Policy Advisory, 1953–54, *chairman, 1954, 1958;* Professional Groups, 1957; Radio Receivers, 1927–28; Standards, 1947–48; Television, 1940–46; Vacuum Tubes, 1927–28. **IRE Representative:** Joint Technical Advisory Committee, 1951–52, *chairman, 1953–55.* **Awards:** Fellow, Society of Motion Picture and Television Engineers; Fellow, American Institute of Electrical Engineers; U. S. Navy Certificate of Commendation, 1947; SMPTE David Sarnoff Gold Medal Award, 1953; IRE Morris Liebmann Memorial Prize, 1955.

LUBCKE, Harry R. (A'26—M'32—SM'43—F'51), Consulting Engineer and Registered Patent Agent, 2443 Creston Way, Hollywood 28, Calif.
Born: August 25, 1905, Alameda, Calif. B.S., 1929, University of California. **Committees:** Building Fund, 1945; Papers Review, 1946–47. **Awards:** "Best Branch Paper" Award, Institute of Electrical Engineers, 1930; Academy of Television Arts and Sciences Award, 1951; Certificate of Commendation, U. S. Navy, World War II; Certificate, War Department (U. S. Army), World War II; Fellow, American Association for the Advancement of Science, 1958.

LUCK, David G. C. (M'46—SM'50—F'51), Aviation Staff Engineer, Radio Corporation of America, Camden, N.J.
Born: July, 1906, Whittier, Calif. B.S., 1927, Ph.D., 1932, Massachusetts Institute of Technology.

LUSTED, Lee B. (A'45—SM'53—F'59), Assistant Professor of Radiology, University of Rochester School of Medicine, 260 Crittenden Blvd., Rochester 20, N.Y.
Born: May 22, 1922, Mason City, Iowa. B.A., 1943, Cornell College; M.D., 1950, Harvard Medical School. **Professional Groups:** Medical Electronics Administrative Committee, 1954–59, *vice-chairman, 1955–57; chairman, 1957–59.* **Awards:** Fellow, American Cancer Society, 1952.

LYONS, Harold (SM'50—F'58), Head, Atomic Physics Department, Research Laboratories, Hughes Aircraft Company, Culver City, Calif.
Born: February 16, 1913, Buffalo, N.Y. B.A. (Physics), 1933, University of Buffalo; M.A. (Physics), 1935, Ph.D. (Physics), 1939, University of Michigan. **Committees:** Joint AIEE-IRE Committee on High Frequency Measurements, *vice-chairman, 1950.* **Awards:** O.S.R.D.-N.D.R.C. Certificate of Effective Service, 1945; Arthur S. Fleming Government Award, 1949; First Prize, AIEE Prize Paper Competition, Washington, D.C., 1949; National Bureau of Standards Superior Accomplishment Award, 1949; U. S. Department of Commerce Gold Medal, 1949; Washington Academy of Sciences Award, 1952; University of Buffalo Citation, 1957; The Franklin Institute Certificate of Merit, 1958.

MacDONALD, J. Ross (S'44—A'48—SM'54—F'59), Director of Solid State Physics Research, Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex.
Born: February, 1923, Savannah, Ga. B.A. (Physics), 1944, Williams College; S.B.(E.E.), 1944, S.M.(E.E.), 1947, Massachusetts Institute of Technology; Ph.D. (Physics), 1950, Oxford University, England. **Committees:** Editorial Reviewer, 1954–59; Solid State Devices, 1956–58. **Professional Groups:** Electron Devices Committee, 1955–57; Audio Chapter's Committee: *chairman, 1958–59.* **Awards:** Fellow, American Physical Society, 1955; IRE Senior Paper Award, 1957.

MacDONALD, William A. (A'19—M'26—SM'43—F'53), Chairman and Director, Hazeltine Corporation, Little Neck, L.I., N.Y.
Born: December, 1895, New York, N.Y. Attended University of Paris, 1918–19. **Committees:** Radio Receivers and Parts, 1930–31; Standardization, 1930–31. **Awards:** Certificate of Merit, U. S. Government, 1947; Corporate Member, Institution of Engineers, Australia.

MacKINNON, Keith Abbott (SM'46—F'49), Consulting Engineer, P.O. Box 542, Ottawa, Ont., Canada.
Born: September, 1905, Kingston, Ont., Canada. B.Sc.(E.E.), 1926, B.Sc. (Physics), 1928, M.Sc. (Physics), 1929, Queens University. **Committees:** Antennas, 1946–49. **Sections:** Ottawa, *chairman, 1947.*

MALOFF, Ioury G. (M'27—F'36), Consulting Engineer, 100 Coolidge Ave., Collingswood, N.J.
Born: June 3, 1899, Vladivostok, Russia. **Committees:** Bibliography, 1928; Papers Procurement, 1947–50; Receiving Sets, 1928; Standardization, 1928; Tellers, 1940.

MALTER, Louis (A'37—SM'45—F'52), Director of Research, Varian Associates, Palo Alto, Calif.
Born: April 28, 1907, New York, N.Y. B.S., 1926, College of the City of New York; M.A., 1931, Ph.D., 1936, Cornell University. **Committees:** Electron Tubes, 1947–48; Electron Tues and Solid State Devices, 1949–50; Papers Review, 1947–49. **IRE Representative:** Semiconductor Devices Research Conference, 1956–57, *chairman, 1957;* Semiconductor Devices, 1957. **Awards:** Fellow, American Physical Society.

MANSON, Ray H. (M'23—F'50)(L), Retired. 373 Beresford Road, Rochester 10, N.Y.
Born: August 25, 1877, Bath, Me. B.S.(E.E.), 1898, E.E., 1901, D.Eng., 1933, University of Maine. **IRE Offices:** President, 1931; Manager, 1927–30; Director, 1931–33. **Committees:** Awards, 1932, 1940; Bibliography, 1930; Electro-Acoustic Devices, 1930; Nominations, 1929–30, 1932, 1934, 1940, *chairman, 1932;* Public Relations, 1940, 1947–48; Regular Papers, 1941; Standardization, 1926–31; Televisilon and Facsimile, 1936–39; Tellers, 1932–33. **IRE Representative:** ASA Electrical Standards Committee, 1936–39.

MARCUVITZ, Nathan (S'36—A'37—VA'39—M'55—SM'57—F'58), Professor, Polytechnic Institute of Brooklyn; Director, Microwave Research Institute, 55 Johnson St., Brooklyn 1, N.Y.
Born: December 29, 1913, Brooklyn, N.Y. D.E.E., 1947, Polytechnic Institute of Brooklyn. **Committees:** Editorial Reviewer, 1954–59.

MARKS, William S., Jr. (A'44—SM'44—F'52), Asst. to Vice President, Research, Radiation, Inc., P.O. Box 6904, Orlando, Fla.
Born: March 18, 1900, Nashville, Tenn. B.S.(E.E.), 1929, Louisiana State University. **Sections:** Fort Huachuca, Ariz., Awards Committee, *chairman, 1957–58;* Central Florida, Awards Committee, *chairman, 1959.* **Awards:** Legion of Merit; Army Commendation Medal with Oak Leaf Cluster; Commendation for Meritorious Civilian Service, U. S. Army; Certificate of Achievement, Chief Signal Officer, U. S. Army.

MARRISON, Warren A. (M'28—SM'43—F'58), Member of Technical Staff, Space Technology Laboratories, Inc., 5500 W. El Segundo Blvd., Los Angeles 45, Calif.
Born: May, 1896, Inverary, Ont., Canada. B.Sc., 1920, Queen's University; M.A., 1921, Harvard University; D.Sc. (Honorary), 1953, Queen's University. **Awards:** Gold Medal of the British Horological Institute, 1947; The Tompion Gold Medal, The Worshipful Company of Clockmakers of The City of London, 1955.

MARSHALL, Charles J. (J'31—A'33—SM'45—F'55), Staff Electronic Engineer, Aerial Reconnaissance Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio.
Born: March 27, 1912, San Antonio, Tex. B.S.(E.E.), 1939, E.E., 1946, University of Cincinnati. **IRE Offices:** Director, 1954–55. **Committees:** Nominations, 1955; Professional Groups, 1957. **Sections:** Dayton, *secretary, 1948–50, vice-chairman, 1949–50, chairman, 1950–51;* National Conference on Aeronautical Electronics, *secretary, 1948–50, president, 1950–51, director, 1955–57.*

MARSTEN, Jesse (J'17—A'18—M'25—SM'43—F'57), Senior Vice President, International Resistance Company, 401 N. Broad St., Philadelphia, Pa.
Born: January 1, 1897, Budapest, Hungary. B.S., 1917, College of the City of New York. **Committees:** Papers Procurement, 1945–46.

MARTIN, Daniel W. (M'50—SM'54—F'57), Assistant Chief Engineer, The Baldwin Piano Company, 1801 Gilbert Ave., Cincinnati, Ohio.
Born: November, 1918, Georgetown, Ky. A.B., 1937, Georgetown College; M.S., 1939, Ph.D., 1941, University of Illinois. **Committees:** Editor, IRE *Transactions on Audio,* 1953–55; Editorial, 1951–59. **Sections:** Cincinnati, *secretary, 1952–53, vice-chairman, 1954–55, chairman, 1955–56.* **Professional Groups:** Audio, *chairman, 1956–57;* PGA Administrative Committee, 1954–57; PGA Awards Committee, *chairman, 1955.* **IRE Representative:** ASA Sectional Committee (S1) on Acoustics, 1959. **Awards:** Fellow, Acoustical Society of America; PGA Senior Award, 1958; PGA Achievement Award, 1959.

MARVIN, Harry B. (M'31—SM'43—F'50), Retired. 485 Buckingham Ave., Syracuse 10, N.Y.
Born: August, 1894, Charleston, Pa. B.S.(E.E.), 1915, M.S.(E.E.), 1925, Union College. **Committees:** Admissions, 1940; Awards, 1940; Frequency Modulation, 1940–46; Papers, 1940; Papers Procurement, 1946–50.

MASON, Samuel J. (A'42—SM'52—F'59), Associate Professor of Electrical Engineering, Department of Electrical Engineering, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: June 16, 1921, New York, N.Y. B.Sc., 1942, Rutgers University; S.M., 1947, Sc.D., 1952, Massachusetts Institute of Technology. **Committees:** Circuits, *vice-chairman, 1953–55, 1956–60;* Editorial Reviewer, 1954.

MASON, Warren P. (A'36—VA'39—F'41), Research Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: September 28, 1900, Colorado Springs, Colo. B.S. (E.E.), 1921, University of Kansas; M.A., 1924, Ph.D., 1928, Columbia University. **Committees:** Editorial Reviewer, 1954–59; Papers Procurement, 1947–50; Papers Review, 1947–53; Piezoelectric and Ferroelectric Crystals, 1940–49, *vice-chairman, 1951–52, chairman, 1953–55;* Standards, 1953–55.

MASSA, Frank (A'30—M'55—F'59), President, Massa Division of Cohu Electronics, Inc.; Vice President, Cohu Electronics, 5 Fottler Rd., Hingham, Mass.
Born: April 10, 1906, Boston, Mass. B.S., 1927, M.Sc., 1928, Massachusetts Institute of Technology. **Committees:** Awards, 1958; Handbook, 1945–58, Nominating, *chairman, 1955–56, 1957–59.* **Professional Groups:** Ultrasonics Engineering Administrative Committee, 1954–55. **Awards:** Fellow, Acoustical Society of America.

MATHES, Richard E. (J'22—A'24—SM'46—F'57), Manager, Engineering Services Division, Burroughs Research Center, Paoli, Pa.
Born: April, 1902, Minneapolis, Minn. B.S.(E.E.), 1924, University of Minnesota. **Committees:** Admissions, 1950–51; Facsimile, 1940–43, 1947–49; Papers Review, 1947–53.

MATHIEU, Gaston A. (F'58), Consultant, Industrial and Communication, Alldelphi & Elektro Spezial GmbH, Hamburg, Germany.
Born: July 1, 1889, Namur, Belgium. **Awards:** Chevalier de l'Ordre Leopold, Belgium; Commandateur de l'Ordre de St. Sylvestre, Vatican; Ufficiale della Corona d'Italia, Italy.

MAUCHLY, John W. (A'42—M'56—F'57), Director, Applications Research Center, Remington Rand Univac, 2300 W. Alleghany Ave., Philadelphia 29, Pa.
Born: August 30, 1907, Cincinnati, Ohio. Ph.D. (Physics), 1932, The Johns Hopkins University. **Awards:** Potts Medal, Franklin Institute, 1949.

MAYER, Harry F. (A'36—SM'47—F'56), Manager, Advanced Electronics Center, General Electric Company, Tompkins County Airport, Ithaca, N.Y.
Born: January 19, 1912, Indianapolis, Ind. B.S.(E.E.), 1932, M.S.(E.E.), 1933, Purdue University. **Committees:** Papers Review, 1946–51. **Sections:** Rome-Utica, *vice-chairman, 1954–55, chairman, 1955–56.* **Awards:** Certificate of Commendation, U. S. Navy, 1947.

McARTHUR, Elmer D. (M'42—SM'43—F'45), Manager, High-

Frequency Electronics Section, General Electric Research Laboratory, P.O. Box 1088, Schenectady, N.Y.
Born: May 3, 1903, Salamanca, N.Y. B.S.(E.E.), 1925, M.S. (Physics), 1948, Union College. **Committees:** Board of Editors, 1945–53; Editorial Reviewer, 1954–59; Fellow, 1958–59. **Awards:** U. S. Navy Certificate of Commendation, 1947; National Electronics Conference Annual Papers Award, 1954.

McCOY, David O. (A'46—SM'50—F'59), Assistant Director of Research and Development, Collins Radio Company, 5225 'C' Ave., N.E., Cedar Rapids, Iowa.
Born: March 18, 1911, LaPorte City, Iowa. B.S.(M.E.), 1934, M.S. (Physics), 1936, Ph.D. (Applied Physics), 1938, Iowa State College. **Committees:** Circuits, 1948–50; Editorial Reviewer, 1954–59. **Sections:** Cedar Rapids, *vice-chairman, 1959.* **Awards:** U. S. Navy Meritorious Civilian Service Award, by The Naval Research Laboratory, 1945.

McCOY, Rawley, D. (A'40—M'55—SM'57—F'59), Vice President, Engineering, Reeves Instrument Corporation, Roosevelt Field, Garden City, L.I., N.Y.
Born: December 21, 1914, Nutley, N.J. B.M.E., 1937, Stevens Institute of Technology.

McCULLOUGH, Jack A. (A'39—SM'52—F'53), Vice President and Treasurer, Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, Calif. **Awards:** Civilian Distinguished Service Medal, U. S. Navy, 1950.

McCUTCHEN, Brunson S. (A'21—M'26—F'32)(L), 89 Olden Lane, Princeton, N.J.; Director, Applied Science Corporation of Princeton; Owner and President, Communication Measurements Laboratory, Inc.
Born: November 20, 1892, North Plainfield, N.J. Lit.B., 1915, E.E., 1917, Princeton University.

McELRATH, George (M'29—SM'43—F'56), Manager, Broadcast Central, National Broadcasting Company, 30 Rockefeller Plaza, New York 20, N.Y.
Born: January 23, 1899, Marlboro, N.Y. **Committees:** National Conventon, 1947–48.

McELROY, Paul K. (A'25—M'27—F'31), Engineering Consultant, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: August 7, 1899, Toledo, Ohio. A.B., 1920, A.M., 1921, Harvard University. **Committees:** Membership, 1940. **Sections:** Boston, *secretary, 1939–41.* **Professional Groups:** Reliability and Quality Control Administrative Committee, 1951–59; *vice-chairman, 1955–58, chairman, 1958–59;* Editor of *Transactions, 1957–58,* Component Parts Administrative Committee, 1957–59. **IRE Representative:** ASA Sectional Committee (C83) on Components for Electronic Equipment, 1954–59.

McFARLANE, Maynard D. (A'26—M'42—SM'43—F'56), Research Scientist, Robertshaw-Fulton Controls Company, Santa Ana Freeway & Euclid Ave., Anaheim, Calif.
Born: August 12, 1895, London, England. **Awards:** Fellow, American Institute of Electrical Engineers; Fellow, American Association for the Advancement of Science; Certificate of Appreciation, U. S. Armed Forces.

McILWAIN, Knox (A'31—M'40—SM'43—F'48), Manager, Special Products Division. Burroughs Research Center, Paoli, Pa.
Born: September 4, 1897, Philadelphia, Pa. B.S., 1918, Princeton University; B.S.(E.E.), 1921, E.E., 1930, University of Pennsylvania. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Admissions, 1944–45; Board of Editors, 1946–53; Circuits, 1944–45; Editorial Administrative, 1949–53; Editorial Reviewer, 1954–59; Education, 1945; Electroacoustics. 1936–46; Electronics, 1936–39; Fellow, 1959–60; Handbooks, 1945–48; Papers, 1942–45; Standards, 1945–46. **Sections:** Philadelphia, *chairman, 1935–36.* **IRE Representative:** National Television Systems Committee. Panel 8, 1940–43.

McKINLEY, Donald W. R. (A'39—SM'46—F'48), Assistant Director, Radio and Electrical Engineering Division, National Research Council, Ottawa, Ont., Canada.
Born: September 22, 1912, Shanghai, China. B.A., 1934, M.A., 1935, Ph.D., 1938, University of Toronto. **Committees:** Fellow, 1959. **Sections:** Ottawa-Ontario, *chairman, 1946–47.* **IRE Representative:** Canadian National Committee for U.R.S.I., *chairman, 1951–58.* **Awards:** Fellow, American Physical Society; Fellow, Royal Society of Canada; Order of the British Empire.

McNALLY, James O. (J'24—A'26—SM'44—F'57), Assistant Director of Development, Electron Devices, Bell Telephone Laboratories, Inc., Mountain Ave., Murray Hill, N.J.
Born: July 1, 1903, Fredericton, N.B., Canada. B.S.(E.E.), 1924, University of New Brunswick.

McRAE, James W. (A'37—F'47), Vice President, American Telephone & Telegraph Company, New York, N.Y.
Born: October 25, 1910, Vancouver, B.C., Canada. B.S. (E.E.), 1933, University of British Columbia; M.S., 1934, Ph.D., 1937, California Institute of Technology. **IRE Offices:** President, 1953; Director, 1950–56. **Committees:** Appointments, 1950, *chairman, 1955;* Awards, 1948–50; Board of Editors, 1946–52; Editorial Board, 1954; Executive, 1950–54, *chairman, 1953;* Finance, 1952 (ex officio, 1953), 1954; Nominations, 1954–57, *chairman, 1955;* Policy Development, 1948; Tellers, *chairman, 1948.* **Sections:** New York, *chairman, 1948–50.* **Awards:** Eta Kappa Nu, Honorable Mention, 1943; Legion of Merit, War Department, 1945.

MEACHAM, Larned A. (A'38—SM'45—F'48), Station Development Engineer, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: September, 1908, Denver, Colo. B.S.(E.E.), 1929, University of Washington; Certificate of Research, 1930, Cambridge University. **Committees:** Board of Editors, 1946–52; Information Theory and Modulation Systems, 1952–58; Modulation Systems, 1949–52. **Awards:** Eta Kappa Nu, Outstanding Young Electrical Engineer, 1939.

MERTZ, Pierre (SM'44—F'50), Consultant, 66 Leamington St., Lido, Long Beach, L.I., N.Y.
Born: April, 1897, Paris, France. A.B., 1918, Ph.D., 1926, Cornell University. **Committees:** Editorial Reviewer, 1954–58; Facsimile, 1939–56, *vice-chairman, 1957–58, chairman, 1958–59;* Papers Procurement, 1945–50; Standards, 1959; Television Picture Element, 1954–59. **Awards:** Army-Navy Certificate of Appreciation, Department of Defense, 1948; Army Certificate of Appreciation, Technical Industrial Intelligence Committeee, Joint Chiefs-of-Staff, 1951; Fellow, Society of Motion Picture and Television Engineers.

METCALF, George F. (A'34—M'38—F'42), Regional Vice President, Washington Defense Activities, General Electric Company, 777 14 St., N.W., Washington 5, D.C.
Born: December 7, 1906, Milwaukee, Wis. B.S.(E.E.), 1928, Ph.D.(Eng.), 1956, Purdue University. **IRE Offices:** Associate Editor, 1926–28. **Committees:** Board of Editors, 1946–53; Editorial Administrative, 1949–50; Electronics, 1936–42; Papers Review, *chairman, 1949–53;* Professional Groups, 1953; Tellers, 1948–49, *chairman, 1949.*

MIDDLETON, David (S'42—A'44—M'45—SM'53—F'59), Consultant, 23 Park Lane, Concord, Mass.
Born: April 19, 1920, New York, N.Y. A.B., 1942, Harvard College; M.A., 1945, Ph.D., 1947, Harvard University. **Awards:** Fellow, American Physical Society, 1950; National Electronic Conference Award, 1956.

MIEHER, Walter W. (A'40—M'44—SM'51—F'54), Engineering Manager, Electronic Countermeasures Division, Sperry Gyroscope Company, Great Neck, L.I., N.Y.
Born: October 30, 1916, St. Louis, Mo. B.S., 1938, Washington University. **Committees:** Antennas, 1947–49, *alternate, 1947;* Antennas and Wave Guides, 1947–50; Awards, 1957–58. **Sections:** Long Island, *vice-chairman, 1952–53.*

MIESSNER, Benjamin F. (A'37—F'37), President, Miessner Inventions, Inc., Van Buren Rd., Morristown, N.J.
Born: July 27, 1890, Huntingburg, Ind. Attended United States Naval Electrical School, 1908–09; Attended Purdue University, 1913–16.

MILLAR, Julian Z. (A'30—SM'45—F'56), Assistant Vice President, Development and Research, Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y.
Born: July 3, 1901, Mattoon, Ill. B.S.(E.E.), 1924, University of Illinois. **Committees:** Annual Review, *chairman, 1953–54;* IRE Convention Technical Program, *chairman, 1955;* Standards, 1953–54; Tellers, 1951–52, *chairman, 1952.* **Professional Groups:** Communications Systems, *chairman, 1954–55.*

MILLER, Burton F. (J'24—A'26—SM'44—F'56), Vice President, Advanced Systems Planning, Thompson-Ramo-Wooldridge, Inc., 5500 W. El Segundo Blvd., Los Angeles 45, Calif.
Born: July, 1905, Milwaukee, Wis. B.S.(E.E.), 1926, M.S. (Physics), 1927, Ph.D. (Physics), 1929, University of Wisconsin. **Sections:** Member, Los Angeles Section Award Committee, 1957–58, *chairman, 1959.* **Awards:** Two Technical Achievement Awards, Academy of Motion Picture Arts and Sciences, 1947.

MILLER, John H. (A'19—M'25—SM'43—F'50)(L), Retired. 205 Palmetto Lane, Harbor Bluffs, Largo, Fla.
Born: June 6, 1893, Oak Park, Ill. B.S.(E.E.), 1915, University of Illinois. **Committees:** Institute Sections, 1928; Sections, 1933–34, 1938–39, 1941–44, *chairman, 1940.* **Sections:** Chicago, *chairman, 1927–29, secretary, 1929–30.* **IRE Representative:** ASA Subcommittee (C42.6) on Electrical Instruments, 1948–51.

MILLER, John M. (A'17—F'20)(L), Retired, c/o Robert W. Miller, 6535 Abbington Dr., Washington 21, D.C.
Born: June, 1882,, Hanover, Pa. B.A., 1904, M.A. 1907, Ph.D., 1915, Yale University. **Awards:** Distinguished Civilian Service Award, United States Navy, 1945; IRE Medal of Honor, 1953; Medal of Honor, Institute of Electrical Engineers, 1953.

MILLER, Stewart E. (M'46—SM'53—F'58), Director of Guided Wave Research, Bell Telephone Laboratories, Inc., P.O. Box 107, Red Bank, N.J.
Born: September 1, 1918, Milwaukee, Wis. B.S., 1941, M.Sc., 1941, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59. **Awards:** U. S. Naval Ordnance Development Award, 1945.

MILLMAN, Jacob (A'41—SM'49—F'58), Professor of Electrical Engineering, Columbia University, 116 St. and Broadway, New York 27, N.Y.
Born: May 17, 1911, Russia. B.S., 1932, Ph.D., 1935, Massachusetts Institute of Technology. **Awards:** Fellow, American Physical Society, 1946.

MILLMAN, Sidney (A'48—SM'48—F'59), Director of Physical Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: March 15, 1908, Minsk, Russia. B.S., 1931, City College of New York; A.M., 1932, Ph.D., 1935, Columbia University.

MIMNO, Harry R. (A'31—VA'39—M'55—F'58), Gordon McKay Professor of Applied Physics, Harvard University, Cambridge, Mass.
Born: May 8, 1900, Chicago, Ill. E.E., Rensselaer Polytech, 1921; A.M., 1926, Ph.D., 1932, Harvard University. **Committees:** Annual Review, 1949–50; Editorial Reviewer, 1954–59; Fellow, 1959; Navigation Aids, 1946–49, *vice-chairman, 1949–54, chairman, 1954–59;* Papers, 1939–45; Papers Review, 1946–53; Radio Wave Propagation, 1942–46; Standards, 1954–59, Member-at-large, 1957–58; Wave Propagation, 1927–42, 1956. **Awards:** Fellow, American Physical Society; Fellow, American Academy.

MINNIUM, Byron B. (A'25—SM'50—F'59), Vice President, Research and Engineering, Erie Resistor Corporation, 644 W. 12 St., Erie 6, Pa.
Born: November 11, 1896, Cairo, W.Va. E.E., 1922, University of Cincinnati. **Committees:** Membership, 1935. **Sections:** Chicago Section, *chairman, 1930–31;* Chicago Convention, *chairman, 1931.* **Awards:** U. S. Navy Certificate of Commendation, 1947.

MINTON, John P. (F'39), Retired. 112 Wellesley Blvd., San Antonio, Tex., Research Adviser, Magnolia Petroleum Company, Field, Research Department, Dallas, Tex.; Research Associate, 1952–55. Department of Physics, University of California, Berkeley, Calif.
Born: November 7, 1889, Wapella, Ill. Engineering, 1910, Bradley University; B.S., 1912, Massachusetts Institute of Technology; Ph.D., 1921, University of Chicago; D.Sc. (Honorary) Bradley University, 1955. **Committees:** Electroacoustic Devices, 1927–28; Membership, 1941–43. **Awards:** Fellow in Physics, National Research Council, University of Chicago, 1921–22; Fellow, American Physical Society; Distinguished Alumni Award, Bradley University, 1953.

MITTELMANN, Eugene (A'38—SM'44—F'57), Consulting Engineer, 549 W. Washington, Chicago 6, Ill.
Born: May 29, 1903, Pressburg, Hungary. E.E., 1927, Vienna Institute of Technology; Ph.D., 1931, University of Vienna. **Committees:** Industrial Electronics, 1946–51, *vice-chairman, 1951–58, chairman, 1958–59;* Instrumentation and Control, *chairman, 1955–58;* Methods of Measurements, *chairman, 1951–57;* Standards, 1959. **Professional Groups:** Industrial Electronics, *chairman, 1950–54;* Administrative Committee, 1950–59. **Awards:** Special Award, American Congress of Physical Therapy, 1940.

MOE, Robert E. (S'33—A'35—SM'46—F'55), Manager of Engineering, Receiving Tubes Department, Electronic Components Division, General Electric Company, Owensboro, Ky.
Born: April 2, 1912, Appleton, Wis. B.S.(E.E.), 1933, University of Wisconsin. **Committees:** Papers Review, 1946–49. **Sections:** Connecticut Valley, *secretary, 1943, chairman, 1944;* Syracuse, *secretary, 1947;* Evansville, Owensboro, *chairman, 1950.* **Awards:** U. S. Navy Certificate of Commendation, 1947.

MOLLER, Rolf (SM'54—F'56), c/o Fernseh GmbH, Darmstadt, Germany.
Born: July 25, 1906, Altona, Germany, Dr. rer. nat., 1930, Hamburg University. **Awards:** President, Fernseh-Technische Gesellschaft, 1953.

MONTGOMERY, Alexander W. (M'31—SM'43—F'54), Director and Joint General Manager, Standard Telephones and Cables, Ltd., Connaught House, 63 Aldwych, London, W.C.2, England; Vice Chairman, Standard Telecommunication Laboratories, Ltd., Enfield, England; Director, International Marine Radio Co., Ltd., Croydon, England.
Born: December 14, 1896, Manchester, Lancashire, England. B.Sc., Tech., 1921, Manchester College of Technology. **Awards:** Order of the British Empire, 1945.

MOORE, John R. (SM'52—F'58), Vice President and General Manager, Autonetics, a Division of North American Aviation, Inc., 9150 E. Imperial Highway, Downey, Calif.
Born: July 5, 1916, St. Louis, Mo. B.Sc.(M.E.), 1937, Washington University.

MOORE, Robert C. (F'55), Section Engineer, TV Division, Philco Corporation, Tioga & C Sts., Philadelphia 34, Pa.
Born: January 3, 1912, Pontiac, Ill. B.S.(E.E.), 1933, University of North Dakota; M.S.(E.E.), 1934, Massachusetts Institute of Technology; B.A., 1936, Oxford University.

MORGAN, Howard K. (A'27—M'41—SM'43—F'57), Director of Commercial Aviation Systems, Bendix Aviation Corporation, Fisher Building, Detroit 2, Mich.
Born: February, 1906, New York, N.Y. B.S.(E.E.), 1929, University of California. **Committees:** Navigation Aids, 1947, 1950–51; Papers, 1941; Papers Procurement, 1942–43; Regular Papers, 1941. **Sections:** Kansas City, *chairman, 1941–43.* **Awards:** Radio Technical Commission for Aeronautics Citation.

MORRIS, Robert M. (A'26—M'42—SM'43—F'57), Radio Facilities Engineer, American Broadcasting Company, 7 W. 66 St., New York 23, N.Y.
Born: January 18, 1902, Washington, D.C. **Committees:** Frequency Modulation, 1941–42; Meetings and Papers, 1930; Membership, 1936; Papers Review, 1947–48; Standardization, 1929–30; Standards, 1938–41; Video Techniques, 1951–57. **Awards:** Exceptional Merit Medal, War Department, 1945.

MORRISON, John F. (A'29—M'36—SM'43—F'51), Technical Staff, Bell Telephone Laboratories, Inc., Morristown Rd., Whippany, N.J.
Born: March 14, 1906, Buffalo, N.Y. **Committees:** Annual Review, 1945–46; Antennas, 1944–45; Awards, 1951–54; Radio Transmitters, 1945–47, *chairman, 1945–46;* Standards, 1945–46; Transmitters, 1944–45; Transmitters and Antennas, 1938–44. **Professional Groups:** Aeronautical and Navigational Electronics, *vice-chairman, 1955.* **Sections:** Northern New Jersey Subsection, *chairman, 1951.*

MORTON, George A. (A'39—SM'46—F'51), Associate Director, Physical-Chemical Laboratory, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: March 24, 1903, New Hartford, N.Y. B.S., 1926, M.S., 1928, Ph.D., 1932, Massachusetts Institute of Technology. **Committees:** Measurements and Instrumentation, 1951–59; Nuclear Studies, 1948–49; Nuclear Techniques, 1955–59, *chairman, 1955–58;* Standards, 1955–59. **IRE Representative:** ASA Planning Committee on Nuclear Standards, 1955–58. **Awards:** Certificates of Commendation, Bureau of Ships, National Defense Research Council, United States Air Force; Overseas Premium Award, Institute of Electrical Engineers, 1937–38.

MORTON, Jack A. (A'36—SM'49—F'53), Vice President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: September 4, 1913, St. Louis, Mo. B.S., 1935, Wayne University; M.S., 1936, University of Michigan; D.Sc.(Honorary), 1954, Ohio State University; D.Sc.(Honorary), 1956, Wayne University. **Committees:** Electron Tubes, 1946–49; Electron Tubes and Solid State Devices, 1949–53; Electronics, 1943–46; Membership, 1943–44; Papers Review, 1953; Vacuum Tubes, 1945–46. **Awards:** Honorable Mention, Eta Kappa Nu, 1945; Alumni Award, Wayne University, 1951; University of Michigan Centennial Award, 1953.

MORTON, Paul L. (A'43—SM'45—F'55), Professor, Electrical Engineering Division, University of California, Berkeley 4, Calif.
Born: May 14, 1906, Silao, Guadalajara, Mexico. B.S.(E.E.), 1931, University of Washington; M.S.(E.E.), 1938, Massachusetts Institute of Technology; Ph.D., 1943, University of California.

MOSELEY, Francis L. (A'33—SM'47—F'57), President, F. L. Moseley Company, 409 N. Fair Oaks, Pasadena, Calif.
Born: August 2, 1908, St. Paul, Minn. **Committees:** Navigation Aids, 1948–49; Papers Review, 1946–48, 1950–52. **IRE Representative:** ANTC, 1948. **Sections:** Dayton, *vice-chairman 1943;* Pasadena Subsection, *vice-chairman, 1955.* **Awards:** Flight Safety Foundation Award, 1955.

MOUNTJOY, Garrard (A'37—M'40—SM'43—F'50), Assistant to the Executive Vice President, A.R. & T. Electronics, Inc., 5 St. & Cornish, North Little Rock, Ark.
Born: October 21, 1905, Boscobel, Wis. B.S., 1929, Washington University. **Committees:** Awards, 1956; Papers Review, 1953; Receivers, 1942–58; Television, 1945–48. **Sections:** Rochester, *secretary, 1948–49, vice-chairman, 1950–51, chairman, 1952–53.* **IRE Representative:** ASA War Standards Committee on Methods of Measuring Radio Noise, 1945–48. **Awards:** Modern Pioneer Award, National Association of Manufacturers.

MUELLER, Charles W. (S'35—A'36—SM'45—F'59), RCA Laboratories, Princeton, N.J.
Born: February 12, 1912, New Athens, Ill. B.S., 1934, University of Notre Dame; M.S., 1936, Sc.D., 1942, Massachusetts Institute of Technology. **Committees:** Semiconductor Devices, 1956–58; Solid State Devices, 1954–58. **Sections:** Princeton Subsection, *chairman, 1946–47.*

MULLIGAN, James H., Jr. (S'41—A'45—M'45—SM'54—F'59), Professor of Electrical Engineering, Chairman of Department, College of Engineering, New York University, University Heights, New York 53, N.Y.
Born: October, 1920, Jersey City, N.J. B.E.E., 1943, E.E., 1947, Cooper Union School of Engineering; M.S., 1945, Stevens Institute of Technology; Ph.D., 1948, Columbia University. **Committees:** Measurements and Instrumentation, *vice-chairman, 1954–57; chairman, 1957–59;* Tellers, 1953; Television Systems, 1948–54; Standards, 1957–59. **Professional Groups:** Circuit Theory, *secretary-treasurer, 1956–59;* Member, Circuit Theory Administrative Committee, 1958–61; Transistor and Solid State Circuits Conference, *general chairman, 1958.* **Sections:** New York, *vice-chairman, 1950–51, chairman, 1951–52.* **IRE Representative:** ASA Sectional Committee (C39) on Electrical Measuring Instruments, 1957–59.

MUMFORD, William W. (A'30—SM'46—F'52), Member Technical Staff, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: June 17, 1905, Vancouver, Wash. B.A., 1930, Willamette University. **Committees:** National Convention Program, 1950–57; Professional Groups, 1956. **Professional Groups:** Microwave Theory and Technique, Administrative Committee, *secretary, 1952, vice-chairman, 1953, chairman, 1954.* **Awards:** Burghart Prize, 1926, Willamette University.

MURRAY, Albert F. (A'20—M'26—F'38), Consulting Electronic and Television Engineer, 4900 Hillbrook Lane, N.W., Washington 16, D.C.
Born: June 22, 1894, Decatur, Ala. B.A., 1915, Maryville College; B.S., 1918, Harvard University; S.B., 1918, Massachusetts Institute of Technology; D.Sc., 1939, Maryville College. **IRE Offices:** Director, 1936–39. **Committees:** Awards, 1936; Electronics, 1937–41; Institute Sections, 1929–30, 1936; Membership, 1929–39; Papers, 1934–45; Papers Procurement, 1947–50; Papers Review, 1946–53; Television, 1939–46; Television and Facsimile, 1936–39; Television Systems, 1949–59. **Sections:** Philadelphia, *chairman, 1937–38.*

NERGAARD, Leon S. (A'29—M'38—SM'43—F'32), Associate Director, Electronic Research Laboratory, RCA Laboratories Division, Princeton 5, N.J.
Born: September 2, 1905, Battle Lake, Minn. B.S.(E.E.), 1927, University of Minnesota; M.S.(E.E., 1930, Union College; Ph.D. (Physics), 1935, University of Minnesota. **Committees:** Annual Review, 1948–50; Electron Devices, 1952–55; Electron Tubes, 1946–48, *vice-chairman, 1948;* Electron Tubes and Solid State Devices, *chairman, 1949–51;* Electronics, 1940–45; Measurement and Instrumentation, 1952; Standards, 1949–51; Vacuum Tubes, 1945–46. **Professional Groups:** Electron Devices, 1953–55, vice-chairman, 1953, chairman, 1953–54. IRE Representative: ASA Sectional Committee (C60) on Standardization of Electron Tubes, 1949–56; ASA Subcommittee (C42.14) on Electron Tubes, 1952–53.

NEWHOUSE, Russell C. (A'30—M'39—SM'43—F'56), Director of Missile Systems Development, Bell Telephone Laboratories, Inc., Whippany Rd., Whippany, N.J.
Born: December 17, 1906, Clyde, Ohio. B.E.E., 1929, M.Sc. (E.E.), 1930, Ohio State University. **Professional Groups:** Aeronautical and Navigational Electronics, *secretary-treasurer, 1956, vice-president, 1957.* **Awards:** Guggenheim Fellowship, Ohio State University, 1929; Lawrence Sperry Award, Institute of the Aeronautical Sciences, 1938.

NICHOLS, Williams A. (A'29—M'42—SM'43—F'55), Assistant Chief Engineer, Canadian Broadcasting Corporation, 5253 Decarie Blvd., Montreal, P.Q., Canada.
Born: November 14, 1903, Toronto, Ont., Canada, B.A.Sc., 1928, University of Toronto. **Committees:** Membership, 1940. **Sections:** Montreal, *secretary, 1939–42.*

NIWA, Yasujiro (A'53—F'54), President, Tokyo Electrical Enginnering College, 2, 2-chome, Kanda-Nishikicho, Chiyoda-Ku, Tokyo, Japan.
Born: April 1, 1893, Matsusaka, Miye Prefecture, Japan. Doctor of Engineering, 1926, Tokyo University. **IRE Offices:** Vice President, 1957; Director, 1957. **Sections:** Tokyo, *vice-chairman, 1955–56, chairman, 1957–.* **Awards:** Asano Prize from the Institute of Electrical Engineers of Japan, 1929; Imperial Prize from Japan Society of Invention, 1932; Imperial Prize from Japan Academy, 1937; Order of Rising Sun, Japanese Government, 1940; Medal of Merits from the Institute of Communication Engineers of Japan, 1942; President, the Institute of Communication Engineers of Japan, 1942–43; President, Japan Radio Society, 1943–44; President, Institute of Electrical Engineers of Japan, 1950–51; President, Television Society of Japan 1954–56; Medal of Cultural Merits, Japan Broadcasting Association, 1956; President, Acoustical Society of Japan. 1957.

NOBLE, Daniel E. (A'25—SM'44—F'47), Director and Executive Vice President in Charge of Industrial, Semiconductor and Military Electronic Divisions of Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill.
Born: October 4, 1901, Naugatuck, Conn. B.S., 1929, University of Connecticut. D.Sc.(Honorary), 1957, Arizona State College. **IRE Offices:** Director, 1957–59. **Committees:** Annual Review, 1941–43, 1946–47; Appointments, 1958; Frequency Modulation, *chairman, 1940–43;* Mobile Communication Systems, 1950–56; Nominations, 1958; Papers Procurement, 1942–43, 1947, 1949–50; Policy Advisory, 1958–59; Railroad and Vehicular Communication, 1945–47, 1949–50, *chairman, 1945–48;* Regular Papers, 1941; Standards, 1940–43, 1946–47. **Sections:** Connecticut Valley, *chairman, 1938.*

NOBLE, Harrell V. (A'34—M'35—SM'43—F'58), Technical Director, Electronic Components Laboratory, Wright Air Development Center, Air Research and Development Command, USAF, Wright-Patterson Air Force Base, Ohio.
Born: April, 1907: Noblesville, Ind. B.S.(E.E.), 1929, Purdue University.

NOIZEUX, Pedro J. (A'33—F'47), Assistant General Manager, Transradio Internacional, Compania Argentina de Telecommunicaciones, San Martin, 379, Buenos Aires 4, Argentina.
Born: 1900, France. **Sections:** Buenos Aires, Founder, 1939, *chairman, 1941–42.*

NORTH, Dwight O. (A'35—M'38—SM'43—F'43), Fellow, Technical Staff, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: September 28, 1909, Hartford, Conn. B.S., 1930, Wesleyan University; Ph.D., 1933, California Institute of Technology. **Committees:** Awards, 1948; Board of Editors, 1946–53; Editorial Reviewer, 1954– Papers, 1944–45.

NORTH, Harper Q. (A'51—SM'51—F'57), President, Pacific Semiconductors, Inc., 10451 W. Jefferson Blvd., Culver City, Calif.
Born: January 24, 1917, Los Angeles, Calif. B.S., 1938, California Institute of Technology; M.S., 1940, Ph.D., 1947, University of California at Los Angeles. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Electron Devices, *treasurer, 1952–53.* **IRE Representative:** Electron Devices, Pacific Coast IRE Convention, Long Beach, *program chairman, 1952;* Electron Devices, Los Angeles Chapter, *organizer* and *chairman, 1952;* Technical Papers Committee, Electron Devices, WESCON, Los Angeles, *chairman, 1954;* Session on Solid State Devices, WESCON, San Francisco, *chairman, 1955;* Papers Study and Procurement, Electron Devices, *co-chairman, 1955–56;* New York IRE National Convention, Transistor Session, *chairman, 1955.* **Awards:** Fellow, American Physical Society.

NORTON, Kenneth A. (A'29—M'38—SM'43—F'43), Chief Radio Propagation Engineering Division, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo.
Born: February 27, 1907, Rockwell City, Iowa, B.S., 1928, University of Chicago. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Awards, 1957–59; Board of Editors, 1951–53; Editorial Administrative, *alternate, 1949–50, 1951;* Editorial Reviewer, 1955–59; Fellow, 1958; Navigation Aids, 1950–54; Papers Procurement, 1949–50; Papers Review, 1946–51; Radio Wave Propagation, 1942–46; Radio Wave Propagation and Utilization, 1947–49; Wave Propagation, 1937–42, 1949–55. **Awards:** Stuart Ballantine Medal of the Franklin Institute, 1954; Fellow, American Physical Society; Fellow, American Association for the Advancement of Science; Fellow, American Institute of Electrical Engineers.

NOTTINGHAM, Wayne B. (A'37—SM'46—F'56), Professor of Physics, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: April, 1899, Tipton, Ind. B.S.(E.E.), 1920, M.A., 1926, Princeton University; E.E., 1929, Purdue University; Ph.D. 1929, Princeton University. **Committees:** Editorial Reviewer, 1954–58; Professional Groups, 1948. **Awards:** Louis E. Levy Medal, Franklin Institute, 1932.

NYQUIST, Harry (A'39—SM'47—F'52), Retired, as Assistant Director of Systems Studies, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: February 7, 1889, Nilsby, Sweden. B.S.(E.E.), 1914, M.S., 1915, University of North Dakota; Ph.D., 1917, Yale University.

O'CONNELL, James D. (SM'53—F'57), Lieutenant General, U. S. Army, Chief Signal Officer, Department of the Army, Office of the Chief Signal Officer, Room 2 E 254, The Pentagon, Washington 25, D.C.
Born: September 25, 1899, Chicago, Ill. B.S., 1922, U. S. Military Academy; M.S., 1930, Yale University. **Awards:** Poor Richard Club, Silver Medal, 1956; Legion of Merit.

ODARENKO, Todos M. (SM'45—F'59), Scientific Consultant, U. S. Government, 2430 E St., N.W., Washington 25, D.C.
Born: January 28, 1900, Poltave, Ukraine, Russia. 1919–21, University of Kamenetz, Podolsk, Ukraine; E.E.-Postgraduate, 1921–28, Polytechnical Institute, Prague, Czechoslovakia. **Committees:** Papers Procurement, 1947–50. **Awards:** Distinguished Civilian Service Award, U. S. Navy, 1945.

OHL, Russell S. (A'24—M'25—SM'43—F'55) Retired from Bell Telephone Laboratories, Inc., P.O. Box 306, Cambria, Calif.
Born: January 31, 1898, Macungie, Pa. B.S. in Ech.E., 1918, Penn State University; Post Graduate, University of Maryland, 1918; Post Graduate, University of Colorado, 1921–22.

OLIVE, Gordon W. (A'29—VA'39—F'51), Retired. R.R. #2, Gananoque, Ont., Canada; Formerly Director General of Engineering, Canadian Broadcasting Corporation.
Born: March 18, 1898, Montreal, P.Q., Canada. Attended McGill University, 1919–22. **Committees:** Frequency Modulation, 1946–47; Modulation Systems, 1947–48.

OLIVER, Bernard M. (A'40—M'46—SM'53—F'54), Vice President, Research & Development, Hewlett-Packard Company, 275 Page Mill Rd., Palo Alto, Calif.
Born: May, 1916, Santa Cruz, Calif. B.S., 1935, Stanford University; M.S., 1936, Ph.D., 1940, California Institute of Technology. **IRE Offices:** Director, 1959–61. **Committees:** Appointments, 1959; Editorial Reviewer, 1954–59; Nominations, 1959. **Sections:** San Francisco, *treasurer, 1953–54, vice-chairman, 1954–55, chairman, 1955–56.* **IRE Representative:** Joint IRE-AIEE Committee on High Frequency Measurements, 1955–56; WESCON Board of Directors, 1956; Executive Committee, *chairman,* WESCON Director-at-Large, 1959.

OLSON, Harry F. (A'37—VA'39—SM'48—F'49), Director, Acoustical Laboratory, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: December, 1902, Mount Pleasant, Iowa. B.E., 1924, M.S.,

1925, E.E., Professional, 1932, Ph.D., 1928, University of Iowa, **IRE Offices:** Director, 1959–60. **Committees:** Annual Review, 1949–51; Audio and Electroacoustics, 1959; Board of Editors, 1940–53; Editorial Reviewer, 1954–59; Electroacoustics, 1932–58, *chairman, 1934–39;* Papers Procurement, 1943–47; Standards, 1934–39. **Professional Groups:** Audio, *chairman, 1957–58.* **IRE Representative:** ASA Sectional Committee on Acoustical Measurements and Terminology, 1940–51, *alternate, 1952–56;* ASA Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1949–50. **Awards:** Fellow, American Physical Society; Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; Fellow, Society of Motion Picture and Television Engineers; President, Acoustical Society of America, 1952–53; John H. Potts Medal, Audio Engineering Society, 1952; Samuel L. Warner Medal, Society of Motion Picture and Television Engineers, 1955; John Scott Medal of the City of Philadelphia, 1956; Achievement Award of the Professional Group on Audio of the Institute of Radio Engineers, 1956.

OLSON, Robert W. (M'46—SM'53—F'59), Vice President, Research and Engineering, Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex.
Born: February 17, 1915, Preston, Minn. B.S.(E.E.), 1938, University of Minnesota. **Committees:** Airborne Electronics, 1953.

O'NEILL, George D. (A'28—SM'46—F'49), Research Engineer, Sylvania Electric Products, Inc., Bayside, L.I., N.Y.
Born: July, 1900, Montclair, N.J. B.S., 1924, University of Michigan. **Committees:** Admissions, 1959–; Board of Editors, 1952–53; Editorial Reviewer, 1954–59; Electron Devices, 1945–57, *vice-chairman, 1951–52, chairman, 1952–54;* Electron Tubes, 1946–49, 1955–57, 1959; Electronics, 1936–46; Standards, 1952–54; Vacuum Tubes, 1945–46. **Professional Groups:** Electron Devices, 1951–54, *chairman, 1951–52;* Membership, 1959. **IRE Representative:** ASA Subcommittee (C42.14) on Electron Tubes, 1954–55.

ORDUNG, Philip F. (S'40—A'43—M'48—SM'49—F'59), Professor of Electrical Engineering, Department of Electrical Engineering, Yale University, Dunham Laboratory, New Haven, Conn.
Born: August 12, 1919, Luverne, Minn. B.S., 1940, South Dakota State College; M.Eng., 1942, D.Eng., 1948, Yale University. **Committees:** Circuits, 1950–56; Editorial Reviewer, 1954–59; Education, 1958–59. **Sections:** Connecticut Valley, *secretary, 1953–54, vice-chairman, 1954–55; chairman, 1955–56.* **Awards:** Award for the Advancement of Basic and Applied Science, Yale Engineering Association, 1953.

OSBORNE, Harold S. (A'14—M'29—SM'43—F'45)(L), Consulting Engineer, 379 Highland Ave., Upper Montclair, N.J.
Born: August 1, 1887, Fayetteville, N.Y. B.S., 1908, Eng.D., 1910, Massachusetts Institute of Technology. **Committees:** Standardization, 1926–29.

OSWALD, Arthur A. (A'19—M'25—F'28)(L), Retired from Bell Telephone Laboratories, Inc., Home: 2 West Lane, Maplewood, N.J.
Born: March 3, 1891, Lake Linden, Mich. B.S.(E.E.), 1916, E.E., 1927, Illinois Institute of Technology. **Committees:** Papers Procurement, 1942–43; Regular Papers, 1941; Standardization, 1925–26.

OUIMET, J. Alphonse (A'39—SM'44—F'52), President, Canadian Broadcasting Corporation, P.O. Box 806, Ottawa, Ont., Canada.
Born: June 12, 1908, Montreal, P.Q., Canada. B.A., 1928, St. Mary's College; B.E.E., 1932, McGill University; D.Sc. (Honorary), 1958, University of Montreal. **Committees:** Education, 1944; Television, 1946–49; Television Systems, 1949–53. **Sections:** Montreal, *chairman, 1942–43.* **Awards:** Ross Medal, 1948, Engineering Institute of Canada.

OXLEY, Allan B. (A'25—M'33—SM'46—F'53), Reliability Coordinator, Special Weapons Division, Canadair, Ltd., P.O. Box 6087, Montreal, P.Q., Canada.
Born: July 7, 1901, London, England. **IRE Offices:** Director, 1951–52, 1957–58. **Committees:** Awards, 1953–56; Membership, 1953–56; Nominations, 1952–53; Policy Advisory, 1957–58. **Sections:** Toronto, *chairman, 1934–35;* Montreal, *chairman, 1939–40, 1949–50.* **Awards:** Member, Corporation of Professional Engineers of Quebec, Canada, 1953–54; Canadian Aeronautical Institute.

PACKARD, David (S'34—A'41—SM'47—F'48), President, Hewlett-Packard Company, 275 Page Mill Rd., Palo Alto, Calif.
Born: September 7, 1912, Pueblo, Colo. A.B., 1934, E.E., 1939, Stanford University. **Committees:** Awards, 1949; Instruments and Measurements, 1949–50. **Sections:** San Francisco, *secretary, 1943–44, chairman, 1945–46.*

PACKARD, Lucius E. (M'41—SM'43—F'57), Chairman of the Board, Technology Instrument Corporation, 531 Main St., Acton, Mass.
Born: January 21, 1914, Somerville, Mass. B.S.(E.E.), Massachusetts Institute of Technology. **Committees:** Appointments, 1955; Sections, 1946–47, **Professional Groups:** New England Radio Engineering Meeting, *first chairman, 1947.* **Sections:** Chicago, *secretary, 1945–46;* Boston, *vice-chairman, 1950, chairman, 1951–52;* North Atlantic Region, *regional director, 1954.*

PAGE, Chester H. (SM'48—F'56), Consultant to Director, National Bureau of Standards, Washington 25, D.C.
Born: November 13, 1912, Providence, R.I., A.B., 1934, Sc.M., 1934, Brown University; Ph.D., 1937, Yale University. **Committees:** Circuits, 1949–, *vice-chairman, 1950–51, chairman, 1951–54;* Editorial Reviewer, 1954–59; Electronic Computers, 1948–51; Papers Review, 1951–53; Standards, 1951; *vice-chairman,* Definitions Coordinator, 1956–. **IRE Representative:** ASA Sectional Committee (C42) on Definitions of Electrical Terms; ASA Subcommittee (C42.13) on Communications, 1959. **Professional Groups:** Circuit Theory, *chairman, 1953–54;* **Awards:** Certificate for Exceptional Service, Bureau of Ordnance; Gold Medal Award, Department of Commerce; Certificate of Appreciation, War Department, O.S.R.D.; Fellow, American Physical Society.

PAGE, Robert M. (SM'45—F'47), Director of Research, United States Naval Research Laboratory, Washington 25, D.C.
Born: June 2, 1903, St. Paul, Minn. B.Sc., 1927, Hamline University; M.S., 1932, George Washington University; D.Sc. (Honorary), 1943, Hamline University. **Committees:** Board of Editors, 1946–53; Editorial Reviewer, 1954–59. **Sections:** Washington, *treasurer, 1955–56, secretary, 1956–57, vice-chairman, 1957–58, chairman, 1958–59.* **Awards:** Distinguished Civilian Award, United States Navy, 1945; Citation O.S.R.D., 1946; Presidential Certificate of Merit, 1947; IRE Harry Diamond Memorial Award, 1953; Stuart Ballantine Medal, Franklin Institute, 1957; Captain Robert Dexter Conrad Award, 1959.

PALMER, Winslow (S'38—A'41—SM'50—F'56), Engineering Section Head, Sperry Gyroscope Company, Great Neck, L.I., N.Y.
Born: July, 1912, New Brunswick, N.J. B.S., 1937, University of Hawaii; E.E., 1939, Stanford University. **Committees:** Modulation Systems, 1951–54. Navigation Aids, 1951–58, *vice-chairman, 1954–56, chairman, 1957–58;* **Awards:** Certificate of Commendation, U. S. Navy, 1947.

PAN, Wen Y. (A'41—SM'46—F'58), Manager, Radio Corporation of America, Cherry Hill, Camden, N.J.
Born: July 15, 1912, Soochow, China. B.Sc., 1935, Chao-Tung University; E.E., 1939, Ph.D., 1940, Stanford University. **Awards:** Award of Merit by Ministry of Communications of the Chinese Government, 1937; Honorary Member, Veteran Wireless Operators Association, 1947.

PARKER, Ralzemond D. (A'16—SM'45—F'59)(L), Retired from Bell Telephone Laboratories. Consulting Engineer, 3606 Chesapeake St., N.W., Washington 8, D.C.
Born: December, 1881, Detroit, Mich. B.S.(E.E.), 1905, M.S., 1906, University of Michigan. **Awards:** Fellow, American Institute of Electrical Engineers.

PATTERSON, George W. (J'31—A'49—SM"54—F'59), Associate Professor and Head of Systems Logic Section, Moore School of Electrical Engineering and Graduate School of Arts and Sciences, University of Pennsylvania, 200 S. 33 St., Philadelphia, Pa.
Born: May 6, 1912, Rochester, N.Y. B.Sc.(E.E.), 1934, University of Vermont; M.A.(Physics), 1936, Columbia University; Ph.D.(Math.), 1958, University of Pennsylvania. **Committees:** Electronic Computers, 1949–59; Digital Computer Logic and Block Diagram Symbols, Subcommittee, *chairman, 1955–.* **Professional Groups:** Electronic Computers Administrative Committee, 1955–56. **Sections:** Philadelphia Chapter, Electronic Computers Group, *chairman, 1955–56.* **IRE Representative:** International Electrotechnical Commission, 1954. **Awards:** Naval Ordnance Development Award, U. S. Navy, 1945; Fellow, American Asscciation for the Advancement of Science.

PAYNE, Leonard S. (M'16—SM'43—F'49)(L), Retired. 104 Marine Parade, Worthing, West Sussex, England.
Born: February 28, 1886, London, England.

PETER, Rolf W. (A'47—SM'52—F'58), Director, Physical and Chemical Research Laboratory, RCA Laboratories, Princeton, N.J.
Born: August 20, 1920, Zurich, Switzerland. Dipl. E.E., 1944, Ph.D., 1948, Swiss Federal Institute of Technology. **Committees:** Editorial Reviewer, 1954–58.

PETERSON, Arnold P. G. (S'34—A'38—SM'46—F'58), Engineer, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: August 7, 1914, DeKalb, Ill. B.Eng., 1934, University of Toledo; M.Sc., 1937, Dr.Sc., 1941, Massachusetts Institute of Technology. **Committees:** Measurements and Instrumentation, 1949–54; Papers Review, 1946–52, Sound Recording and Reproduction, 1950–53. **Awards:** Fellow, Acoustical Society of America, 1951.

PETERSON, Eugene (M'30—SM'43—F'59), Consultant, 25 E. 9 St., New York 3, N.Y.
Born: August 26, 1894, New York, N.Y. E.E., 1917, Polytechnic Institute of Brooklyn; M.A., 1923, Ph.D., 1926, Columbia University.

PETERSON, Harold O. (A'22—M'31—F'41), Associate Laboratory Director, RCA Laboratories Division, Radio Corporation of America, 140 Moriches Rd., Riverhead, L.I., N.Y.
Born: November 3, 1899, Blair, Neb. B.Sc.(E.E.), 1921, Doctor of Engineering (Honorary), 1951, University of Nebraska. **Committees:** Advisory Committee to the National Bureau of Standards, 1954–56; Aircraft Receivers, 1930–31; Board of Editors, 1944–53; Editorial Reviewer, 1954–59; Industrial Electronics, 1947–51; Instruments and Measurements, 1949–50; Papers, 1934–44; Papers Study and Procurement for the *Transactions of* PGCS, *chairman, 1958–59;* Radio Receivers, 1936–48; Radio Wave Propagation, 1942–45; Radio Wave Propagation and Utilization, 1945–49; Standards, 1934–35; Transmitters and Antennas, 1936–37; Wave Propagation, 1937–42, 1949–56, 1959. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

PETRILLO, Salvatore E. (A'42—F'56), Director of Engineering, U. S. Army Signal Research and Development Laboratory, Ft. Monmouth, N.J.
Born: July, 1909, Waterbury, Conn. B.S.(E.E.), 1930, Yale University. **Sections:** Monmouth Subsection, *vice-chairman, 1948.* **Awards:** Legion of Merit, Department of the Army, 1945.

PETTIT, Joseph M. (S'39—A'40—M'45—SM'46—F'54), Dean of Engineering and Professor of Electrical Engineering and Associate Dean of Engineering, Electronics Research Laboratory, Stanford University, Stanford, Calif.
Born: July 15, 1916, Rochester, Minn. B.S., 1938, University of California. E.E., 1940, Ph.D., 1942, Stanford University. **IRE Offices:** Director, 1954–55. **Committees:** Editorial Reviewer, 1954–55; Education, 1949–59, *chairman, 1955–56;* Fellow, 1958–59; Policy Advisory, 1954–55; Radio Receivers, 1946–52. **Sections:** Palo Alto, *chairman, 1951–52.* **IRE Representative:** Stanford University, 1948–51. **Awards:** Presidential Certificate of Merit, U. S. Government, 1949; Electronics Achievement Award, Region 7, 1952.

PICKERING, William H. (A'41—SM'49—F'55), Director, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr., Pasadena 3, Calif.
Born: December 24, 1910, Wellington, New Zealand. B. S. 1932, M.S., 1933, Ph.D., 1936, California Institute of Technology. **Committees:** Editorial Reviewer, 1954–59; Education, 1949–51; Papers Review, 1946–53. **IRE Representative:** California Institute of Technology, *alternate, 1941–42, 1950–52.* **Awards:** Commendation for Meritorious Civilian Service, U. S. Air Force; Fellow, American Rocket Society, James Wyld Award, American Rocket Society; Decoration for Distinguished Civilian Service, Department of the Army.

PIERCE, John A. (SM'45—F'47), Senior Research Fellow, Cruft Laboratory, Harvard University, Cambridge 38, Mass.
Born: December 11, 1907, Spokane, Wash. B.A., 1937, University of Maine. **Committees:** Annual Review, 1948–49; Editorial Reviewer, 1954–59; Navigation Aids, 1947–50, *chairman, 1948–50;* Radio Wave Propagation and Utilization, 1945–49; Standards, 1949; Wave Propagation, 1949–50, 1956–59. **Awards:** Thurlow Award (Institute of Navigation), 1947; President's Certificate of Merit, 1948; IRE Morris Liebmann Prize, 1953; Fellow, American Academy of Arts and Sciences; Fellow, American Association for the Advancement of Science.

PIERCE, John R. (S'35—A'38—SM'46—F'48), Director of Research, Communications Principles, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: March 27, 1910, Des Moines, Iowa. B.S., 1933, M.S., 1934, Ph.D., 1936, California Institute of Technology. **IRE Offices:** Editor, 1954–55; Director, 1954–55. **Committees:** Editorial Board, *chairman, 1954–55;* Executive, 1954–55; Papers Procurement, *second vice-chairman, 1943.* **Awards:** Eta Kappa Nu, Outstanding Young Electrical Engineer, 1942; IRE Morris Liebmann Memorial Prize, 1947.

PIORE, Emanuel R. (A'38—M'42—SM'43—F'50), Director of Research, International Business Machines Corporation, 590 Madison Ave., New York 22, N.Y.
Born: July 19, 1908, Wilno, Russia. B.A., 1930, Ph.D., 1935, University of Wisconsin. **IRE Offices:** Director, 1951. **Committees:** Awards, 1949. **Professional Groups:** Nuclear Science Administrative Committee, 1953, *vice-chairman, 1955*

PIPES, Louis A. (M'52—SM'54—F'58), Professor of Engineering, University of California, Los Angeles 24, Calif.
Born: October 22, 1910, Mexico City, Mexico. B.S., 1933, M.Sc., 1934, Ph.D., 1936, California Institute of Technology.

POCH, Waldemar J. (A'28—VA'39—SM'48—F'56), Director, Product Development, RCA Laboratories, Princeton, N.J.
Born: July, 1905, London, England. B.S.(E.E.), 1928, University of Michigan; M.S., 1934, University of Pennsylvania. **Committees:** Annual Review, 1950–51; Audio and Video Techniques, 1948–49; Editorial Reviewer, 1954–59; Standards, 1951–56; Video Techniques, 1949–56, 1959, *vice-chairman, 1949–51, chairman, 1951–55.* **IRE Representative:** IRE-RETMA-SMPTE-NARTB Committee for Inter-Society Coordination (Television), 1954–59.

PODOLSKY, Leon (A'30—M'46—SM'53—F'57), Consultant and Technical Assistant to the President, Sprague Electric Company, Marshall St., North Adams, Mass.

Born: November, 1910, Philadelphia, Pa. E.E., 1934, Drexel Institute of Technology. **Committees:** Activities, 1955–60; Professional Groups, 1955–60. **Professional Groups:** Administrative Committee, Component Parts; Scholarship Committee. **IRE Representative:** National Bureau of Standards, Technical Advisory Committee, 1959. **Awards:** ASA War Standards Award, 1946; Certificate of Commendation, U. S. Navy, 1947; IRE-RETMA Fall Meeting Award, 1956; Fellow, AIEE, 1956.

POLKINGHORN, Frank A. (A'25—F'38), Technical Staff, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: July 23, 1897, Holbrook, Mass. B.S., 1922, University of California. **IRE Offices:** Director, 1957–58. **Committees:** Admissions, 1943–48, *vice-chairman, 1945–48;* High-Frequency Receivers, 1930–31; National Convention, 1948; Nominations, 1958; Policy Advisory, 1957–58; Radio Receivers, 1932–34; Sections, 1941–45. **Sections:** Northern New Jersey Subsection, *vice-chairman, 1953–54;* Northern New Jersey Section, *chairman, 1954–55.* **IRE Representative:** ASA Sectional Committee on Radio, 1935–38. **Awards:** Honorary Member, Denki Tushin Gakkai, (Institute of Electrical Communication Engineers of Japan).

PONTE, Maurice J. H. (SM'48—F'54), Managing Director, Compagnie Générale de Télégraphie Sans Fil, 79 Boulevard Haussmann, Paris, France.
Born: April, 1902, Voiron, Isère, France, Sciences Doctorship, Ecole Normale Supérieure of Paris (Sciences Division). **IRE Offices:** Vice President, 1954; Director, 1954.

POTE, Alfred J. (A'41—SM'48—F'59), Executive Vice President and Director of Engineering, Hycon Eastern, Inc., 75 Cambridge Pkwy., Cambridge 42, Mass.
Born: February, 1904, Boston, Mass. B.S.(E.E.), 1926, Massachusetts Institute of Technology; D.A.O. (Honorary), 1937, Staley College. **Committees:** Editorial Reviewer, 1954–59. **Sections:** Boston, *secretary, 1952; chairman, 1945.*

POTTER, James L. (A'31—SM'44—F'57), Professor and Chairman, Electrical Engineering Department, Rutgers State University, College of Engineering, New Brunswick, N.J.
Born: December 4, 1905, Carthage, Mo. B.S., 1928, M.S., 1930, E.E., 1939, Kansas State College. **Committees:** Education, 1955–57. **Sections:** Princeton, *secretary-treasurer, 1945–55, vice-chairman, 1955–56, chairman, 1956;* Education Subcommittee of Education Committee, *chairman, 1955–56.* **IRE Representative:** Rutgers University, 1941–54. **Awards:** First Prize Paper, Science Division National American Institute of Electrical Engineers Winter Convention, 1954.

POTTER, Ralph K. (A'25—M'26—F'41), Retired. Dogwood Dr., Route No. 17, Morristown, N.J.
Born: October 1, 1894, Elgin, Ill. B.S., 1917, Whitman College; E.E., 1923, Columbia University. **Committees:** Awards, 1944; Papers, 1931–41.

POUNSETT, Frank H. R. (A'26—SM'44—F'47), General Manager, Engineering & Manufacturing Radio & Television Division, Philips Electronics Industries, Ltd., 116 Vanderhoof Ave., Toronto 17, Ont., Canada.
Born: September 12, 1904, London, England, B.A.Sc., 1928, University of Toronto. **IRE Offices:** Director, 1949–50. **Committees:** Awards, 1952; Canadian Building Fund and Auditor, 1945; Membership, 1951–52; Nominations, 1948–50, 1955–56; Radio Receivers, 1946–52. **Sections:** Toronto, *chairman, 1945–46.*

PRATT, Haraden (A'14—M'17—F'29)(L), Consultant, Wake Robin Lane, Stamford, Conn.
Born: July 18, 1891, San Francisco, Calif. B.S., 1914, University of California. **IRE Offices:** President, 1938; Treasurer, 1941–42; Secretary, 1943–59; Director, 1935–59. **Committees:** Admissions, 1937; Annual Review, 1937; Appointments, *chairman, 1947;* Awards, 1937–41, 1944–45, 1948, *vice-chairman, 1945, chairman, 1939, 1948;* Board of Editors, 1941–53; Building Fund Administrator, 1947–48; Constitution and Laws, 1941, 1950–51; Editorial Administrative, 1947–50; Executive, *vice-chairman, 1941–42, secretary, 1943–59;* Finance, 1959; Fiscal, 1947–48, *chairman, 1947, 1955–57;* History, *chairman, 1954–59;* Investments, 1944–46; New York Program, 1933, 1935–37, *chairman, 1936–37;* Nominations, 1936, 1941–43, 1947–48, 1952–56, *chairman, 1943, 1947;* Office Quarters, 1947; Policy Development, 1950–51, *chairman, 1950;* Preparedness, *chairman, 1940–41;* Radio Transmitters and Antennas, 1930; Standardization, 1928–31; Standards, 1932, 1934–37, *chairman, 1934–35;* Tellers, *chairman, 1936.* **IRE Representative:** ASA Sectional Committee (C42) on Definition of Electrical Terms, 1936–46, 1949–55; ASA Sectional Committee on Definitions of Technical Terms, 1930; ASA Board of Directors, 1939–41; ASA Sectional Committee on Radio, 1936–48; Joint Technical Advisory Committee, 1948–51; Radio Technical Planning Board, 1944–48, *chairman, 1945–48.* **Awards:** IRE Medal of Honor, 1944.

PREISMAN, Albert (M'38—SM'43—F'53), Vice President in Charge-of-Engineering, Capital Radio Engineering Institute, 3224 16 St., N.W., Washington 10, D.C.; Consulting Engineer.
Born: February 8, 1901, New York, N.Y. A.B., 1922, E.E., 1924, Columbia University. **Committees:** Education, 1950–55; Membership, 1943–46; Papers Review, 1948–53. **Professional Groups:** Audio, *chairman, 1957–58.*

PRESSLEY, Jackson H. (A'20—F'31), Retired, 1036 San Diego Rd., Santa Barbara, Calif.
Born: June 8, 1896, Rio Vista, Calif. B.S.(E.E.), 1920, University of California. **Committees:** Radio Receivers, 1933–34.

PRICE, Lloyd M. (A'31—SM'46—F'49), Sales Representative and Engineering Consultant, 185 Poplar Plains Rd., Toronto 7, Ont., Canada.
Born: August, 1897, St. Thomas, Ont., Canada. B.A.Sc., 1923, University of Toronto. **Committees:** Electron Tubes, 1946–47. **Sections:** Toronto, *secretary, 1934–35, chairman, 1935–36.*

PRIEST, Conan A. (A'24—M'38—SM'43—F'47), Director, Electronics Division, Onondaga Pottery Company, Syracuse, N.Y.
Born: August 11, 1900, Solon, Me. B.S.(E.E.), 1922, E.E. Professional, 1925, University of Maine. **IRE Offices:** Director, 1953–54. **Committees:** Board of Editors, 1941–53. **Professional Groups:** Industrial Electronics, *secretary, 1954–58.* **Sections:** Syracuse, *chairman, 1947.*

PUGSLEY, Donald W. (A'39—M'45—SM'46—F'52), Staff Vice President in Charge-of-Engineering, Ramo-Wooldridge Division of Thompson-Ramo-Wooldridge Co., Los Angeles, Calif.
Born: December, 1912, Salt Lake City, Utah. B.S.(E.E.), 1935, University of Utah; M.S.(E.E.), 1954, Syracuse University. **Committees:** Radio Frequency Interference, 1956–58; Television, 1945–49; Television Systems, 1949–59. **Sections:** Syracuse Chapter, Professional Group on Engineering Management, *vice-chairman, 1955–56, chairman, 1956–57.* **Professional Groups:** Professional Group on Broadcast and Television Receivers, National Administrative Committee, 1958–59; Professional Group on Engineering Management, National Administrative Committee, 1958–59; Professional Group on Industrial Electronics; Professional Group on Medical Electronics. **Awards:** Eta Kappa Nu, Outstanding Young Electrical Engineer (Honorary Mention), 1944.

PUNCHARD, John C. R. (A'37—SM'45—F'53), Manager, Belleville Plant, Northern Electric Company, Ltd., 250 Sidney St., Belleville, Ont., Canada.
Born: April 13, 1911, Toronto, Ont., Canada. B.A.Sc., 1933, University of Toronto. **IRE Offices:** Awards, 1957. **Committees:** Awards, 1957; Fellow Awards, *chairman, 1958.* Radio Transmitters, 1947–51; **Sections:** Montreal, *secretary, 1941–44, chairman, 1946–47;* Canadian Council, I.R.E., *secretary, 1947–53;* Bay of Quinte, *chairman, 1955–56.*

QUARLES, Lawrence R. (M'42—SM'43—F'52), Dean of Engineering, Thornton Hall, University of Virginia, Charlottesville, Va.
Born: January 26, 1908, Charlottesville, Va. B.S.E., 1929, Ph.D. (Physics), 1935, University of Virginia. **Committees:** Awards, 1956; Education, 1949–56; Policy Development, 1948. **Sections:**

North Carolina-Virginia, *chairman, 1946–47;* **IRE Representative:** University of Virginia, 1943–50.

RABINOW, Jacob (SM'54—F'56), President, Rabinow Engineering Company, 7212 New Hampshire Ave., Washington 12, D.C.
Born: January 8, 1910, Kharkov, Russia. B.E.(E.E.), 1933, E.E., 1934, College of the City of New York. **Awards:** Naval Ordnance Development Award, 1945; Certificate of Merit, 1948; Certificate of Appreciation, War Department, 1949; Exceptional Service Award, Department of Commerce, 1949; Certificate of Commendation, National Defense Research Council, 1954.

RADFORD, William H. (A'41—SM'45—F'54), Professor of Electrical Communications, Massachusetts Institute of Technology; Associate Director, Lincoln Laboratory, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 39, Mass.
Born: May, 1909, Philadelphia, Pa. B.S., 1931, Drexel Institute of Technology; M.S., 1932, Massachusetts Institute of Technology; D.Eng. (Honorary), Drexel Institute of Technology, 1957. **Committees:** Editorial Reviewer, 1954–59; Education, 1945–48, *chairman, 1947–48;* Membership, 1947–48. **Sections:** Boston, *chairman, 1947.* **Professional Groups:** Joint Technical Advisory Committee, *vice-chairman, 1956, chairman, 1957–58.* **IRE Representative:** Massachusetts Institute of Technology, 1941–54; National Bureau of Standards—IRE Technical Advisory Committee, 1959.

RAGAZZINI, John R. (A'41—M'46—SM'52—F'55), Dean of the College of Engineering, Professor of Electrical Engineering, South Hall, New York University, New York 53, N.Y.
Born: January 3, 1912, New York, N.Y. B.S., 1932, E.E., 1933, College of the City of New York; M.A., 1938, Ph.D., 1941, Columbia University. **IRE Offices:** Director, 1953–54. **Committees:** Appointments, 1954; Audio and Video Techniques, 1948–49; Board of Editors, 1946–53; Editorial Administrative, 1948–50; Editorial Reviewer, 1954–59; Education, 1949–55; Modulation Systems, 1951–53; Nominations, 1953–54; Policy Advisory, 1954–55; Sound Recording, 1949–50. **Sections:** New York, *secretary, 1946–47, vice-chairman, 1948–49.* **IRE Representative:** Columbia University, 1945–52; ASA Subcommittee (Y10.14) on Nomenclature Feedback Control Systems, 1951–53.

RAJCHMAN, Jan A. (SM'46—F'53), Associate Director, Systems Research Laboratory, RCA Laboratories, Princeton, N.J.
Born: August 10, 1911, London, England. Dipl.E.E., 1935, Dr. Sc., 1938, Swiss Federal Institute of Technology. **Committees:** Editorial Reviewer, 1954–59; Electronic Computers, 1948–58; Papers Review, 1950–52, 1954–59. **Awards:** Levy Medal, Franklin Institute, 1948.

RAMBERG, Edward G. (M'53—SM'53—F'55), Research Physicist, RCA Laboratories Division, Princeton, N.J.
Born: June 14, 1907, Florence, Italy. B.A., 1928, Cornell University; Ph.D., 1932, University of Munich, Germany.

RAMBO, William R. (S'39—A'40—SM'46—F'59), Director, Stanford Electronics Laboratories; Professor of Electrical Engineering, Stanford University, Stanford, Calif.
Born: September 3, 1916, San Jose, Calif. A.B., 1938, E.E., 1941, Stanford University.

RAMEY, Robert A., Jr. (M'46—F'58), Manager, New Products Engineering Department, Westinghouse Electric Corporation, P.O. Box 10596, Pittsburgh 35, Pa.
Born: December 14, 1918, Wayne, W.Va. B.S.(E.E.), 1943, M.Sc., 1945, Dr.Sc., 1948, University of Cincinnati. **Awards:** Basic Science Committee Best Paper Award, AIEE, 1951.

RAMO, Simon (A'38—SM'44—F'50), President, Space Technology Laboratories, Division of The Ramo-Wooldridge Corporation, Los Angeles, Calif.; Research Associate, California Institute of Technology, Pasadena, Calif.
Born: May, 1913, Salt Lake City, Utah. B.S., 1933, University of Utah; Ph.D., 1936, California Institute of Technology. **Committees:** Board of Editors, 1946–53; Editorial Reviewer, 1954–55; Papers, 1941–45. **Awards:** Eta Kappa Nu, Honorable Mention, 1941; Electronic Achievement Award, Pacific Region, IRE, 1953; Raymond E. Hackett Award, 1955; W. Rupert Turnbull Memorial Award, IAS 1956 International Meeting.

RANGER, Richard H. (F'37)(L), President, Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.
Born: June 13, 1889, Indianapolis, Ind. B.S., 1911, Massachusetts Institute of Technology. **Committees:** Meetings and Papers, 1928–30; New York Program, *chairman, 1930–32;* Papers, 1931–33. **Sections:** Northern New Jersey, Membership Committee, *chairman, 1954–55;* Program Committee, *chairman, 1956–58;* Executive Committee, 1954–58; Member, 1959.

RAPPAPORT, George (A'41—M'44—SM'46—F'56), Vice President, Government Electronics Division, Emerson Radio and Phonograph Corporation, 1140 East West Highway, Silver Spring, Md.
Born: December 7, 1919, New York, N.Y. B.E.(E.E.), 1941, City College of New York; M.S.(E.E.), 1947, Ohio State University. **IRE Offices:** Director, 1954–56.; **Committees:** Annual Review, 1948–52; Membership, 1954–56; Sections, 1950–51; Standards, 1949–52. **Sections:** Dayton, *secretary, 1947–48, chairman, 1948–49.* **Professional Groups:** Aeronautical and Navigational Electronics, *chairman, 1952.*

RATCLIFFE, John A. (M'29—A'32—F'53), Cavendish Laboratory, Cambridge, England.
Born: December, 1902, Bacup, Lancashire, England. M.A., 1927, Cambridge. **Awards:** Fellow, The Royal Society.

RAYMOND, Richard C. (SM'52—F'58), Manager, Technical Military Planning Operation, General Electric Company, 735 State St., Santa Barbara, Calif.
Born: August, 1917, Spokane, Wash. B.S. (Physics), 1938, State College of Washington; Ph.D. (Physics), 1941, University of California.

REICH, Herbert J. (A'26—M'41—SM'43—F'49), Professor of Electrical Engineering, Dunham Laboratory, Yale University, New Haven, Conn.
Born: October, 1900, Staten Island, N.Y. M.E., 1924, Ph.D. (Physics), 1929, Cornell University. **IRE Offices:** Director, 1944, 1948–51. **Committees:** Admissions, 1944–46; Appointments, 1950; Awards, 1948; Board of Editors, 1943–53; Constitution and Laws, 1949–50; Education, 1945–53, *chairman, 1949–51;* Electron Tubes, 1946–49, 1956–58, *vice-chairman, 1959;* Electron Tubes and Solid State Devices, 1949–53; Electronics, 1941–46; Vacuum Tubes, 1945–46. **IRE Representative:** University of Illinois, 1941–43; Yale University, 1948–50. **Awards:** Fellow, American Physical Society; Fellow, American Institute of Electrical Engineers.

REID, John D. (A'41—M'44—SM'46—F'49), Executive Vice President, A.R.&T. Electronics, Inc., P.O. Box 627, North Little Rock, Ark.
Born: March, 1907, Morristown, N.J. Attended University of Pennsylvania, 1925–28. **IRE Offices:** Director, 1950–51. **Committees:** Awards, 1951–54; Board of Editors, 1947–51; Editorial Administrative, 1949–50; Membership, 1949–50; Papers Procurement, 1945–49, *chairman, 1948–49;* Papers Review, 1946; Policy Development, 1950–51; Professional Groups, 1948, 1950; Receivers, 1946–58, *vice-chairman, 1950–56.* **Sections:** Cincinnati, *chairman, 1946–47;* Little Rock, *chairman, 1957–58.* **IRE Representative:** National Electronics Conference, Board of Directors, 1950–51. **Awards:** Naval Ordnance Development Award, United States Navy, 1945; Presidential Certificate of Merit, 1948.

REINARTZ, John L. (M'32—SM'43—F'58), Captain, U.S.N.R., Retired. Manager, Amateur Service Department, Eitel-McCullough, Inc., San Bruno, Calif.
Born: March 6, 1894, Crefeld, Germany. **Awards:** Silver Cup, Second District Radio Council, 1923.

RETTENMEYER, Francis X. (A'26—M'29—SM'43—F'44), Engineering Department, Philco Corporation, 4700 Wissahickon Ave., Philadelphia 44, Pa.
Born: July 27, 1904, Kendrick, Okla. B.S.(E.E.), 1925, University of Colorado. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Board of Editors, 1946–53; Editorial Administrative, 1951–53; Membership, 1938–40; Papers, 1942–45; Papers Procurement, 1947–49; Public Relations, 1941–42; Publicity, 1939; Radio Receivers, 1936–37; Radio Receivers and Parts, 1929–30; Sections, 1936.

REUKEMA, Lester E. (A'30—SM'46—F'51), Professor of Electrical Engineering, Emeritus, 123 Cory Hall, University of California, Berkeley, Calif.
Born: August 31, 1891, Chicago, Ill. B.S., 1922, M.S., 1924, Ph.D., 1926, University of California. **Sections:** San Francisco, *secretary, 1946–47, vice-chairman, 1947–48; chairman, 1948–49.* **Awards:** Fellow, American Institute of Electrical Engineers, 1946.

RIBLET, Henry J. (A'45—M'55—F'58), President, Microwave Development Laboratories, Inc., 92 Broad St., Wellesley 81, Mass.
Born: July 21, 1913, Calgary, Alberta, Canada. B.S., 1935; M.A., 1937; Ph.D., 1939, Yale University. **Committees:** Editorial Reviewer, 1954–59; Technical Program Committee, PGMTT National Symposium, *chairman, 1959.*

RICE, Stephen O. (SM'47—F'53), Member of Technical Staff, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y.
Born: November, 1907, Shedds, Ore. B.S., 1929, Oregon State College. **Committees:** Papers Review, 1947.

RICHARDSON, Avery G. (A'25—M'29—SM'43—F'56), Manager, Technical Services, International Telephone & Telegraph Laboratories, Inc., 500 Washington Ave., Nutley 10, N.J.
Born: March, 1901, Brooklyn, N.Y. E.E., 1924, Brooklyn Polytechnic Institute. **Committees:** Navigation Aids, 1954–59. **Sections:** Northern New Jersey Subsection, *secretary, 1950, chairman, 1952.* **Awards:** Certificate of Commendation, U. S. Navy; National Defense Research Council Award.

RICHARDSON, William G. (A'36—SM'45—F'55), Director of Engineering, Canadian Broadcasting Corporation, 140 Wellington St., Ottawa, Ont., Canada.
Born: December 5, 1903, Watford, Ont., Canada. B.S.(E.E.), 1926, Queen's University.

RICHMOND, Harold B. (A'14—M'23—F'29)(L), Retired. Formerly Chairman of the Board of General Radio Company. Home: 100 Memorial Dr., Cambridge 42, Mass.
Born: March 22, 1892, Medford, Mass. S.B., 1914, Massachusetts Institute of Technology; D.Eng. (Honorary), 1947, Norwich University. **Committees:** Admissions: 1940; Nominations, 1940; Preparedness, 1940–41; Public Relations, 1947–48; Registration of Engineers, *chairman, 1940–43;* Standardization, 1928–31. **Awards:** Presidential Medal for Merit, Guided Missiles Development, 1947; Highest Honor Award, Scientific Apparatus Makers Association.

RICHTER, Walther (SM'44—F'53), Consulting Electrical Engineer, 8575 N. Hawthorne Rd., Milwaukee 17, Wis.
Born: May 17, 1900, Heidelberg, Germany. B.S., 1923, Institute of Technology, Karlsruhe, Germany. **Committees:** Industrial Electronics, 1947–58; Papers Procurement, 1946. **Professional Groups:** Instrumentation Administrative Committee, 1954–55; Industrial Electronics Administrative Committee, 1952–55. **Awards:** Fellow, American Institute of Electrical Engineers, 1942.

RINIA, Herre (SM'51—F'54), Director of Research, Phillips Research Laboratories, Kastanjelaan, Eindhoven, Netherlands.
Born: March 30, 1905. Cornwerd, Friesland, Netherlands. M.A. (E.E.), 1928, Delft Institute of Technology. **IRE Offices:** Vice President, 1956; Director, 1956. **Awards:** Member, Koninklijke Nederlandse Akademie van Wetenschappen, 1947; Officer of the Order of Orange, Nassau, 1955.

RIVES, Tom C. (SM'48—F'54), Director of Syracuse University Research Corporation, Bldg. B-5, Colvin Lane, Syracuse 10, N.Y. (Collendale).
Born: December 3, 1892, Montgomery, Ala. B.S.(E.E.), 1916, E.E., 1917, Alabama Polytechnic Institute; M.S., 1927, Sheffield Scientific School, Yale University. **Committees:** Professional Groups, 1958–59. **Professional Groups:** Engineering Management, 1951–54, *chairman, 1953–54;* Aeronautical and Navigational Electronics, *vice-chairman, 1956;* Administrative Committee, Military Electronics, 1957–58; Nominating Committee, Engineering Management, *chairman, 1957–58.*

ROBERTS, Walter van B. (A'22—F'29)(L), Retired. 155 Hodge Rd., Princeton, N.J., Consultant, Radio Corporation of America.
Born: November 13, 1893, Titusville, Pa. B.S., 1915, E.E., 1917, Ph.D., 1924, Princeton University. **Committees:** Use of the Transmission Unit, 1928.

ROCHESTER, Nathaniel (S'41—A'43—M'46—SM'49—F'58), Manager, Information Research, International Business Machines Corporation, Research Laboratory, Yorktown, N.Y.
Born: January 14, 1919, Buffalo, N.Y. B.Sc.(E.E.), 1941, Massachusetts Institute of Technology. **Committees:** PGIT Editorial Advisory Committee, 1959; Subcommittee on Definitions, 1951–54, *chairman, 1952–54;* Task Group on Pulse Definitions, 1952; Technical Committee on Electronic Computers, 1948–55, *vice-chairman, 1950–51, chairman, 1951–52.*

ROCKWELL, Ronald J. (A'25—M'31—SM'43—F'45), Vice President in Charge-of-Engineering, Crosley Broadcasting Corporation, 140 W. 9 St., Cincinnati, Ohio.
Born: February 5, 1904, Omaha, Neb. B.S.(E.E.), 1927, Iowa State College; E.E. Professional, 1946. **Committees:** Electroacoustics, 1951–55; Sections, exofficio, 1938–39. **Sections:** Cincinnati, *chairman, 1938–39.*

ROCKWOOD, Alan C. (A'25—M'30—SM'43—F'59), Manager of Design, Development & Specifications, Receiving Tube Division, Raytheon Manufacturing Company, Center St., Quincy, Mass.
Born: May 15, 1901, Iowa City, Iowa. B.A., 1921, B.E.(E.E.), 1922, M.S., 1923, State University of Iowa. **Committees:** Board of Editors, 1944; Electron Devices, 1952–56; Electron Tubes, 1946–49, 1955–58; Electron Tubes and Solid State Devices, 1949–52; Electronics, 1943–46; Vacuum Tubes, 1945–46. **Awards:** Naval Ordnance Development Award, 1945.

ROETKEN, Alfred A. (A'29—M'40—SM'43—F'53), Research Engineer, Bell Telephone Laboratories, Inc., Mountain Ave., Murray Hill, N.J.
Born: October, 1902, Covington, Ky. B.S.(E.E.), 1927, M.S., 1929, Ohio State University.

ROHDE, Lothar (M'55—F'56), Owner and Technical Director, Rohde and Schwarz, 7 Tassiloplatz, Munich 9, Germany.
Born: October 4, 1906, Leverkusen, Germany. Ph.D., 1931, University of Jena; Dr.Ing. (Honorary), 1953, Technische Hochschule, Munich, Germany.

ROSE, Albert (A'36—M'40—SM'43—F'48), Physicist, RCA Laboratories, Princeton, N.J.
Born: March, 1910, New York, N.Y. A.B., 1931, Ph.D. (Physics), 1935, Cornell University. **Committees:** Editorial Reviewer, 1954. **Awards:** Television Broadcasters Association Award, 1945; Journal Award, Society of Motion Picture Engineers, 1946; IRE Morris Liebmann Memorial Prize, 1946; David Sarnoff Gold Medal, SMPTE, 1958.

ROSE, George M., Jr. (A'31—M'38—SM'43—F'54), Manager, Receiving Tube Advanced Development, Tube Division, Radio Corporation of America, 415 S. 5 St., Harrison, N.J.
Born: November 22, 1907, Nashville, Tenn. B.S.(E.E.), 1928,

University of North Carolina. **Committees:** Admissions, 1954–59, *chairman, 1955–56.* **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

ROTHE, Horst (M'48—SM'55—F'59), Professor, Dr.Eng., Director of the Institute for High Frequency Technics and Physics, Technical University (Institute of Technology), Karlsruhe, Kaiserstr. 12, Karlsruhe, Germany.
Born: December, 1899, Hosterwitz/Dresden, Germany. Dipl. Eng., 1923, Dr.Eng., 1925, Technical University (Institute of Technology), Dresden, Germany. **Committees:** Electron Tubes, 1955–59.

ROYDEN, George T. (A'19—M'27—F'33), Retired. 912 Linger Lane, Phoenix, Ariz.
Born: June 20, 1895, Fort Clark, Tex. A.B., 1917, Engineer, 1924, Stanford University. **IRE Offices:** Director, 1946. **Committees:** Admissions, 1941–48, *chairman, 1943–48;* Awards, 1946; Constitution and Laws, 1944, 1949–50; Convention Record, 1953–56; National Convention, 1946; New York Program, 1938–42; Professional Groups, 1952–53; Sections, 1941–45. **Professional Groups:** Communications Systems, *chairman, 1952–53,* Administrative Committee, 1952–55. **Sections:** San Francisco, *chairman, 1933–34.*

ROYS, Henry E. (A'27—SM'47—F'55), Manager of Engineering, RCA Victor Record Division, Indianapolis, Ind.
Born: January 7, 1902, Beaver Falls, Pa. B.S.(E.E.), 1925, University of Colorado. **Committees:** Audio and Video Techniques, 1948–49; Editorial Reviewer, 1954–59; Papers Review, 1947–53; Sound Recording and Reproducing, 1949–56, *chairman, 1949–52;* Standards, 1950–52; Video Techniques, 1949–50. **IRE Representative:** ASA Sectional Committee (Z57) on Standards for Sound Recording, 1951–56, *chairman, 1957–59;* EIA Phonograph Combinations and Home Recordings (R7), *chairman, 1956–59.* **Awards:** Fellow, Audio Engineering Society, 1953; Fellow, Acoustical Society of America, 1954, IRE-PGA Achievement Award, 1957; The Emile Berliner Award, Audio Engineering Society, 1957.

RUSSELL, John B. (A'36—SM'45—F'58), Manager, Electronics Laboratory, General Electric Company, Syracuse, N.Y.
Born: March 10, 1907, Boston, Mass. B.S., 1928, M.Sc., 1931, D.Sc., 1950, Massachusetts Institute of Technology. **Committees:** Circuit Theory, 1944, 1947–51, *vice-chairman, 1948–49;* Electronics, 1943, 1954–56; Education, 1958–59. **Sections:** Syracuse, *chairman, 1958.* **Awards:** Fellow, AIEE; Fellow, New York Academy of Sciences.

RUST, William M., Jr. (SM'47—F'53), Assistant Chief Geophysicist, Humble Oil & Refining Company, 1200 Main, Houston 2, Tex.
Born: January, 1907, Liberty, Tex. B.A., 1928, M.A., 1929, Ph.D., 1931, The Rice Institute. **IRE Offices:** Director, 1951–52. **Committees:** Awards, 1953–55, *chairman, 1954;* Awards Coordination, 1955–56, *chairman, 1956;* Constitution and Laws, *chairman, 1958;* Professional Groups, 1953–56, 1958. **Awards:** President, Society of Exploration Geophysics, 1945.

RYAN, Francis M. (J'14—A'17—M'26—F'40), Radio Engineer, American Telephone and Telegraph Company, 195 Broadway, New York 7, N.Y.
Born: February 4, 1895, Seattle, Wash. B.S.(E.E.), 1919, University of Washington. **Committees:** Admissions, 1939; Meetings and Papers, 1930; New York Program, 1930; Papers, 1931–36; Railroad and Vehicular Communication, 1945–46; Tellers, 1938. **Professional Groups:** Communications Systems, *chairman, 1956.* **IRE Representative:** Aeronautic Radio Research, Department of Commerce, 1930; Liaison Committee on Aeronautic Radio Research, 1936, 1939–41.

RYBNER, Jorgen, C. F. (A'25—SM'47—F'53), Professor, Ostervoldgade 10 G, Copenhagen K, Denmark.
Born: November 26, 1902, Frederiksberg, Denmark. M.S.(E.E.), 1926, Royal Technical University of Denmark. **IRE Offices:** Vice President, 1951. **Awards:** Member, Danish Academy of Technical Sciences, 1937; President, Danish National Committee of URSI, 1948.

RYDER, John D. (A'29—SM'45—F'52), Dean, College of Engineering, Michigan State University, East Lansing, Mich.
Born: May 8, 1907, Columbus, Ohio. B.E.E., 1928, M.S., 1929, Ohio State University; Ph.D., 1944, Iowa State College. **IRE Offices:** President, 1955; Director, 1952–59; Editor, 1958–59. **Committees:** Appointments, 1954–57 (ex officio, 1955), *chairman, 1957;* Editorial Board, 1956, *chairman, 1958;* Editorial Reviewer, 1954–59; Education, 1945–46, 1949–59, *chairman, 1953–54;* Executive, 1954–59, *chairman, 1955;* Finance, 1954–57; Membership Relations Coordinator, 1954–57; Nominations, 1956–59, *chairman, 1957;* Papers Review, 1948–53; Policy Advisory, 1952–53, *chairman, 1953;* Professional Groups, 1956. **Professional Groups:** Education, *chairman, 1957–58.* **Sections:** Des Moines-Ames, *vice-chairman, 1948.*

RYDER, Robert M. (SM'45—F'57), Transistor Development Engineer, Bell Telephone Laboratories, Inc., Mountain Ave., Murray Hill, N.J.
Born: March, 1915, Yonkers, N.Y. B.S., 1937, Ph.D., 1940, Yale University. **Committees:** Advanced Developments, 1944–46; Conference Committee on Electron Tube Research, 1948–50, *chairman, 1951;* Editorial Reviewer, 1954–59; Electron Devices, 1949–56, *vice-chairman, 1952–54;* Electron Tubes, 1948–49; Semiconductor Devices, *chairman, 1949–53;* Task Force on Unit Definitions and Tests, *chairman, 1947–51.* **IRE Representative:** IRE-AIEE Committee on Noise Definitions, 1951.

SALINGER, Hans W. G. (A'37—SM'46—F'51), Scientific Advisor, Components and Instrumentation Laboratory, International Telephone & Telegraph Laboratories, 3700 E. Pontiac St., Fort Wayne, Ind.
Born: April 1, 1891, Berlin, Germany. Ph.D., 1915, University of Berlin. **Committees:** Papers Procurement, 1947–50. **Sections:** Fort Wayne, *chairman, 1949–50.*

SALISBURY, Winfield W. (SM'44—F'47), Technical Director, RACOF Division, Varo Manufacturing Co., Inc., 2201 Walnut St., Garland, Tex.
Born: December 27, 1903, Carthage, Ill. A.B., 1926, University of Iowa: D.S. (Honorary), 1950, Cornell College. **Committees:** Education, 1946; Nuclear Studies, 1948–50; Papers Review, 1946; Railroad and Vehicular Communications, 1945–48. **Sections:** East Bay Subsection, *chairman, 1953–54.*

SALZBERG, Bernard (J'25—A'30—M'38—SM'43—F'52), Chief Scientist, Research and Engineering Division, Airborne Instruments Laboratory, Inc., 160 Old Country Rd., Mineola, L.I., N.Y.
Born: July 22, 1907, New York, N.Y. E.E., 1929, M.E.E., 1933, D.E.E., 1941, Polytechnic Institute of Brooklyn. **Committees:** Electronics, 1943–46; Membership, 1938–46. **Professional Groups:** Military Electronics, Long Island, 1958; Electron Devices, New York, 1958–59. **Awards:** IRE Harry Diamond Memorial Award, 1955.

SAMUEL, Arthur L. (A'24—VA'39—SM'44—F'45), Research Advisor, International Business Machines Corporation, Poughkeepsie, N.Y.
Born: December 5, 1901, Emporia, Kan. A.B., 1923, College of Emporia; S.B., 1925, S.M., 1926, Massachusetts Institute of Technology; D.Sc. (Honorary), 1946, College of Emporia. **Committees:** Annual Review, 1950–51; Editorial Reviewer, 1955–59; Electronics, 1944–45; Electron Tubes, 1946–47; Electron Tubes and Solid State Devices, 1949–54, *vice-chairman, 1950–51, chairman, 1951–52;* Papers Review, 1952–53; Research, 1949–50; Standards, 1951–52; Symbols, 1950–52; Vacuum Tubes, 1945. **Sections:** Mid-Hudson Subsection, *chairman, 1951–52.* **Awards:** Paper Award, 1937.

SAMUELSON, Robert E. (SM'45—F'57), Engineering Manager, Motorola, Inc., Western Military Electonics Center, 8201 E. McDowell Rd., Phoenix, Ariz.

Born: February, 1911, St. Paul, Minn. B.Sc.M.E., 1933, University of Minnesota; M.S.(E.E.), 1947, Ph.D.(E.E.), 1949, Northwestern University. **Sections:** Phoenix, *chairman, 1952–53.*

SANDRETTO, Peter C. (A'30—M'40—SM'43—F'54), Vice President and Technical Director, Federal Telecommunication Laboratories, 500 Washington Ave., Nutley, N.J.
Born: April, 1907, Pont Canavese, Italy. Graduate, 1927, Joliet Junior College; B.S.(E.E.), 1930, E.E., 1938, Purdue University. **Committees:** Annual Review, 1950–51; Board of Editors, 1944–52; Industrial Electronics, 1947–48; Membership, 1940; Navigation Aids, 1946–55, *chairman, 1950–54;* Papers, 1942–44; Paper Procurement, 1942–43; Professional Groups, 1952–54; Regular Papers, 1941; Standards, 1950–54. **Professional Groups:** Aeronautical and Navigational Electronics, 1952–53, *vice-chairman, 1952–58.* **Sections:** Chicago, *secretary-treasurer, 1940.* **Awards:** Bronze Star, 1945; Brigadier General, U. S. Air Force Reserve, 1950.

SARNOFF, David (A'12—M'14—F'17)(L), Chairman of the Board and Chief Executive Officer, Radio Corporation of America, 30 Rockefeller Plaza, New York, N.Y.; Board Chairman, RCA Communications, Inc.; Director, National Broadcasting Co., Inc.
Born: February 27, 1891, Uzlian, Minsk, Russia. D.Sc. (Honorary), 1927, St. Lawrence University; D.Sc. (Honorary), 1935, Marrietta College; D.Lit. (Honorary), 1935, Norwich University; D.C.S. (Honorary), 1938, Oglethorpe University; D.Sc. (Honorary), 1939, Suffolk University; LL.D. (Honorary), 1946, Jewish Theological Seminary; LL.D. (Honorary), 1946, Bethany College; D.C.S. (Honorary), 1948, Boston University; LL.D. (Honorary), 1950, John Carroll University; L.H.D. (Honorary), 1950, University of Louisville; D.Sc. (Honorary), 1952, Pennsylvania Military College; LL.D. (Honorary), 1952, University of Pennsylvania; LL.D. (Honorary), 1953, Fairleigh Dickinson University; D.Eng. (Honorary), 1953, Drexel Institute of Technology; LL.D. (Honorary), 1954, University of Southern California; LL.D. (Honorary), 1954, Pratt Institute; D.Sc. (Honorary), 1955, University of Notre Dame; LL.D. (Honorary), 1955, Fordham University; LL.D. (Honorary), Dropsie College, 1957; LL.D. (Honorary), University of Rhode Island, 1957; D.Sc. (Honorary), 1958, Temple University. **IRE Offices:** Secretary, 1915–17; Director, 1915–17; Manager, 1918–20. **Committees:** Constitutional Amendments, 1915; Financial Matters, 1915; Increase of Membership, 1916–18; Publicity, 1915–19, *chairman, 1916–19;* Wave Length Regulation, 1916–17. **Sections:** San Francisco Representation, 1915. **Awards:** Peter Cooper Medal for Advancement of Science, 1949; Grand Medal of Association des Ingénieurs-Docteurs of France, 1950; National Chairman, 1951, Red Cross Fund Campaign; Honorary Life Member, Engineers Club of Philadelphia, 1952; Honorary Fellow, Weismann Institute of Science, Rehovoth, Israel, 1952; Appointed Brigadier General, Reserve Army of U. S., 1953; Member of Honor Société Française des Ingénieurs Téchniciens du Vide, 1953; IRE Founders Award, 1953; First Keynoter Award, National Association of Radio-Television Broadcasters, 1953; Medal of Merit, Liaison Center, Professional Engineers and Inventors of France, 1954; Gold Medal, The Hundred Year Association of New York, 1955; James Forrestal Memorial Medal of National Security Industrial Association, 1956; U. S. Army Medal for Exceptional Civilian Service, 1956; Certificate of Appreciation, Illuminating Engineering Society, 1956; Gold Pin Award, Radio Pioneers, 1957; Life Member (Honorary), IRE, Australia, 1957.

SCHADE, Otto H. (M'40—SM'43—F'51), Staff Engineer, RCA Tube Department, Radio Corporation of America, 415 S. 5 St., Harrison, N.J.
Born: April 27, 1903, Schmalkalden, Germany. Attended Technische Hochschule, Berlin-Carlottenberg, 1922–24; D.E.E. (Honorary), 1953, Rensselaer Polytechnic Institute. **Committees:** Editorial Reviewer, 1954–59. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; RCA Victor Award of Merit, Radio Corporation of America, 1946; IRE Morris Liebmann Memorial Prize, 1950; David Sarnoff Gold Medal, 1951; Fellow, Society of Motion Picture and Television Engineers, 1951.

SCHAIRER, Otto S. (M'43—SM'43—F'57), Consultant, 89 Battle Rd., Princeton, N.J.
Born: October 7, 1879, Saline, Mich. A.B., 1901, B.S.(E.E.), 1902, Dr. Eng. (Honorary), 1942, University of Michigan.

SCHELDORF, Marvel W. (A'36—SM'45—F'58), Research Engineer, Armour Research Foundation, 10 W. 35 St., Chicago 16, Ill.
Born: February 15, 1902, Westside, Iowa. B.Sc.(E.E.), 1923, Iowa State College. **Committees:** Antennas, 1946–50; Papers Review, 1946–51.

SCHELKUNOFF, Sergei A. (A'40—F'44), Assistant Vice President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: January 27, 1897, Samara, Russia. B.A., 1923, M.A., 1923, State College of Washington; Ph.D., 1928, Columbia University. **Committees:** Annual Review, 1947–48; Antennas, 1945–49; Antennas and Wave Guides, 1949–51; Editorial Reviewer, 1954; Papers, 1942–45; Papers Review, 1946; Radio Wave Propagation and Utilization, 1945–47, *chairman, 1947–48;* Standards, 1947–48. **IRE Representative:** ASA Sectional Committee (C61) on Electric and Magnetic Magnitudes and Units, 1949–59. **Awards:** IRE Morris Liebmann Memorial Prize, 1942; Stuart Ballantine Medal, Franklin Institute, 1949.

SCHELLENG, John C. (A'23—M'25—F'28)(L), Retired. Formerly Director of Radio Research, Bell Telephone Laboratories, Inc., Holmdel, N.J.
Born: November 12, 1892, Freeport, Ill. A.B., 1915, Cornell University. **Committees:** Annual Review, 1937–38; Antennas, 1944–49; Antennas and Wave Guides, 1949–50; Awards, 1943; Handbook, 1945–46; Methods of Testing Apparatus, Equipment and Devices, 1929–30; Radio Transmitters, 1945–48; Standardization, 1931–32; Standards, 1936–37; Transmitters, 1944–45; Transmitters and Antennas, 1936–45, *chairman, 1936–38.* **IRE Representative:** ASA Definitions Co-ordinating Committee, 1948; ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1948–50; ASA Subcommittee (C42.13) on Communications, 1948–58; Joint IRE-AIEE-ASA (C42) Definitions Co-ordinating Committee, 1949–51.

SCHLEIMANN-JENSEN, Arne (A'45—SM'47—F'48), Owner, Schleimann-Jensen Laboratoriet, Klingsta Skogsväg 26, Danderyd, Sweden.
Born: July 27, 1906, Randers, Denmark. Radio and Telephone Course, Royal Technical University of Denmark, 1925–31.

SCHLESINGER, Kurt (A'41—SM'51—F'54), Engineering Consultant, Cathode Ray Tube Department, General Electric Company, Syracuse, N.Y.
Born: April, 1906, Berlin, Germany. Dipl. Eng., 1928; Dr. Eng. (Physics), 1929, Technische Hochschule, Berlin. **Professional Groups:** Broadcast and Television Receivers, Administrative Committee, 1953–55. **Sections:** Chicago, *vice-chairman, 1953–54.*

SCHMIT, Dominic F. (A'25—M'38—SM'43—F'51), Vice President, Product Engineering, Radio Corporation of America, Camden, N.J.
Born: August 30, 1902, Port Washington, Wis. B.S.(E.E.), 1923, University of Wisconsin.

SCHMITT, Otto H. (SM'44—F'55), Professor, Zoology and Physics (Biophysics), University of Minnesota, Minneapolis 14, Minn.
Born: April 6, 1913, St. Louis, Mo. B.A., 1934, Ph.D., 1937, Washington University. **Professional Groups:** Medical Electronics, *vice-chairman, 1954–55.* **Awards:** Sigma Xi Award, 1935; National Research Council Fellowship, 1937; Sir Halley Stewart Fellowship, 1938; Government Citation, 1950; Fellow, American Physical Society, 1953.

SCHOLZ, Carl E. (M'26—SM'43—F'56), Vice President and Chief Engineer, American Cable and Radio Corporation, 67 Broad St., New York 4, N.Y.
Born: November 29, 1894, Campbell, Calif. B.A.(M.E.), 1917, Stanford University. **Committees:** Admissions, 1939, 1944–47; Constitution and Laws, 1938–40; Membership, 1934–40, *chairman, 1938–39;* Sections, 1938–40; Standardization, 1928–29; Tellers, 1941–44, *chairman, 1943–44.* **Professional Groups:** National Administration Committee on Communications Systems, 1955–58, *vice-chairman, 1956.* **Awards:** Fellow, American Institute of Electrical Engineers, 1955.

SCHOOLEY, Allen H. (A'35—SM'47—F'54), Associate Director of Research for Electronics, Naval Research Laboratory, Washington 25, D.C. During 1956, Research Adviser, Ministerio da Marinha, Rio de Janeiro, Brazil.
Born: December, 1909, Terril, Iowa. B.S.(E.E.), 1931, Iowa State College; M.S.(E.E.), 1932, Purdue University. **Professional Groups:** Engineering Management, Washington, D.C., Chapter, *vice-chairman, 1953–54, chairman, 1954–55.* **Sections:** Washington, D.C., *secretary, 1955–56, vice-chairman, 1956–57, chairman, 1957–58;* Organizer of Rio de Janeiro, Brazil Section in 1956. **Awards:** Navy Distinguished Civilian Service Award, 1946; Fellow, AAAS, 1950.

SCHRADER, Harold J. (A'31—M'38—SM'43—F'54), Staff Engineer, Missile & Surface Radar, Defense Electronic Products, Radio Corporation of America, Moorestown, N.J.
Born: May 2, 1900, Schuyler, Neb. Attended University of Nebraska, 1919–23. **Sections:** Philadelphia, *chairman, 1938–39, secretary, 1942–44.*

SCHREIBER, Ernst H. (A'28—M'32—SM'43—F'57), Engineering Education Activities, The Pacific Telephone and Telegraph Company, 403 W. 8 St., Los Angeles 14, Calif.
Born: August 22, 1900, Chicago, Ill. A.B. (Physics), 1922, M.A. (Physics), 1923, University of California. **Sections:** Los Angeles, *chairman, 1932–33.*

SCHRENK, Matthew H. (SM'46—F'57), Deputy Development Coordinator, Department of the Navy, Office of Naval Research, 17th St. & Constitution Ave., Washington 25, D.C.
Born: September 6, 1902, Naperville, Ill. B.A., 1922, North Central College; M.A., 1926, Syracuse University: **Professional Groups:** Administrative Committee, Military Electronics, 1957. **Sections:** Washington, *acting vice-chairman, 1952;* Membership Committee, *chairman, 1953.* **Awards:** Presidential Certificate of Merit, 1946; Fellow, American Physical Society, 1952.

SCHROEDER, Alfred C. (A'38—SM'46—F'54), Color Television Research Engineer, RCA Laboratories, Princeton, N.J.
Born: February 28, 1915, West New Brighton, N.Y. B.S., M.S., 1937, Massachusetts Institute of Technology. **Awards:** Radio Corporation of America Laboratory Awards, 1947, 1950, 1951, 1952, 1957.

SCHUCK, O. Hugo (A'34—M'44—SM'49—F'57), Director of Aeronautical Research, Minneapolis-Honeywell Regulator Company, 2600 Ridgeway Rd., Minneapolis 13, Minn.
Born: September 20, 1909, Philadelphia, Pa. B.S.(E.E.), 1931, M.S.(E.E.), 1932, Elect. Eng., 1938, University of Pennsylvania. **Sections:** Twin Cities, *vice-chairman, chairman, 1947.* **Awards:** Certificate of Appreciation, U. S. Navy, Department of Defense, 1947.

SCHULZ, Elmer H. (A'38—SM'46—F'58), Vice President, Armour Research Foundation of Illinois Institute of Technology, 10 W. 35 St., Chicago 16, Ill.
Born: October, 1913, Lockhart, Tex. B.S.(E.E.), 1935, M.Sc. (E.E.), 1936, University of Texas; Ph.D., 1946, Illinois Institute of Technology. **IRE Offices:** Director, 1959. **Committees:** Appointments, 1959; Education, 1945; Industrial Electronics, 1949–56; Policy Advisory, 1959. **Professional Groups:** Industrial Electronics Administrative Committee, 1953–56. **Sections:** Chicago, *chairman, 1949–50.* **IRE Representative:** National Electronics Conference, 1959. **Awards:** Fellow, AIEE, 1950.

SCHWAN, Herman P. (M'53—SM'55—F'59), Professor of Electrical Engineering, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia 4, Pa.
Born: August 7, 1915, Aachen, Germany. Ph.D. (Physics & Biophysics), 1940, Dr. habil (Biophysics), 1946, University of Frankfurt, Germany. **Professional Groups:** Executive Committee, Medical Electronics, 1955–58; Joint Executive Committee Medical Electronics, IRE-AIEE-ISA, 1955–57, *vice-chairman, 1958; chairman 1959.*

SCHWARZ, Bertram A. (M'29—SM'43—F'55), Technical Assistant to the General Manager, Delco Radio Division, General Motors Corporation, Kokomo, Ind.
Born: July 16, 1901, Cambridge, Mass.

SCOTT, Hermon H. (M'35—SM'43—F'52), President and Director of Engineering, Hermon Hosmer Scott, Inc., 111 Powdermill Rd., Maynard, Mass.
Born: March 28, 1909, Somerville, Mass. B.S., 1930, M.S., 1931, Massachusetts Institute of Technology. **Committees:** Audio Techniques, 1950–53, *vice-chairman, 1950–52;* Board of Editors, 1950–53; Editorial Reviewer, 1954; Electroacoustics, 1941–46. **Sections:** Boston, *vice-chairman, 1948–49, chairman, 1949–50.* **Awards:** Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; John Potts Memorial Medal, 1951.

SCOTT, James C. W. (M'47—F'57), Chief Superintendent, Telecommunications Establishment, Defense Research Board, Department of National Defense, Ottawa, Ont., Canada.
Born: March 1, 1901, Havre, France. B.Sc., 1930, University of Washington. **Committees:** Wave Propagation, 1956–59. **Sections:** Ottawa, *chairman, 1951.* **Professional Groups:** Canadian National Committee for URSI, *secretary, 1951–53;* Canadian Commission on Ionosphere for URSI, *chairman, 1951–57.*

SCOTT-TAGGART, John (A'18—F'35), Wynwood, Beaconsfield, Buckinghamshire, England.
Born: May 27, 1897, Balton, Lancashire, England.

SEDDON, J. Carl (A'41—SM'53—F'58), Consultant, National Aeronautics Space Administration, Washington 25, D.C.
Born: December, 1911, Schenectady, N.Y. B.S.(E.E.), 1933, B.Sc. (Physics), 1934, Union College; M.A., 1936, University of Buffalo. **Awards:** RESA Award in Pure Research, 1956.

SEELEY, Stuart W. (M'40—SM'43—F'43), Administrator, Microwave Communications Projects for Senior Executive Vice President of Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.
Born: June 23, 1901, Chicago, Ill. B.S.(E.E.), 1925, Michigan State College. **Committees:** Admissions, 1944–48; Awards, 1949; Board of Editors, 1947–53; Circuits, 1944–48; Editorial Reviewer, 1954–59; Modulation Systems, 1947–51; Professional Groups, 1948; Receivers, 1950–58. **Awards:** Modern Pioneers Award, 1940; War Department Citation, 1947; IRE Morris Liebmann Memorial Prize, 1948.

SEELY, Samuel (A'39—SM'45—F'55), Professor and Head, Department of Electrical Engineering, Case Institute of Technology, Cleveland 6, Ohio.
Born: May 7, 1909, New York, N.Y. E.E., 1931, Polytechnic Institute of Brooklyn; M.S., 1932, Stevens Institute of Technology; Ph.D., 1936, Columbia University. **IRE Offices:** Director, 1957–59. **Committees:** Appointments, 1959; Editorial Reviewer, 1954–59; Education, 1955–59, *chairman, 1957–58;* Nominations, 1959; Papers Review, 1946–58; Policy Advisory, 1957–59. **Sections:** Syracuse, *secretary-treasurer, 1950, secretary, 1951, chairman, 1952.* **IRE Representative:** University of Syracuse, 1949; Joint AIEE-IRE Student Activities Coordination Committee, 1957. **Awards:** Army-Navy Certificate of Appreciation, 1947.

SELVIDGE, Harner (A'31—M'40—SM'43—F'58), Staff Engineer, Bendix Aviation Corporation, 117 E. Providencia St., Burbank, Calif.
Born: October 16, 1910, Columbia, Mo. B.S., 1932, M.Sc., 1933, Massachusetts Institute of Technology; S.M., 1934, S.D., 1937, Harvard University. **Committees:** Papers Review, 1944–53; Professional Groups, 1951–54. **Professional Groups:** Nuclear Science,

chairman, 1950, secretary-treasurer, 1951–53. **Awards:** Naval Ordnance Development Award, 1945, Navy Department, USN.

SHACKELFORD, Benjamin E. (A'23—M'26—F'38)(L), 743 Mosswood Ave., Orange, N.J.
Born: August 12, 1891, Richmond, Mo. A.B., 1912, A.M., 1913, University of Missouri; Ph.D., 1916, University of Chicago. **IRE Offices:** President, 1948; Director, 1945-50, 1953-55. **Committees:** Appointments, 1948; Awards, 1941, 1943-44, 1950; Bibliography, 1930-31, *chairman, 1930;* Board of Editors, 1937-40; Building Fund, *chairman, 1944-45;* Constitution and Laws, 1946-47; *chairman, 1947;* Convention Policy, 1947-50; Education, 1949; Executive, 1948-49; *chairman, 1948;* Frequency Modulation, 1942-46; Institute Sections, 1929-34, *chairman, 1933;* Meetings and Papers, 1929; National Convention, 1947; New York Program, 1941-42; Nominations, 1949-50; Papers, 1932-36; Papers Procurement, 1942-43; Planning, 1947; Policy Development, 1949-50; *chairman, 1949;* Professional Groups, 1950; Sections, 1943-45, 1949-50; Special Papers, *chairman, 1940-41;* Special Publications Fund, 1947; Standardization, 1931-32; Standards, 1932-33; Winter Technical Meeting, *chairman, 1944.* **IRE Representative:** ASA Sectional Committee on Definition of Electrical Terms, Subcommittee on Vacuum Tubes, 1936, 1939-48; ASA Sectional Committee on Vacuum Tubes for Industrial Purposes, 1936, 1939-48.

SHANK, Robert J. (S'37—A'39—SM'49—F'58), Vice President, Systems Management, Hughes Aircraft Company, Culver City, Calif.
Born: March 19, 1914, LaJunta, Colo. A.B., 1935, Goshen College; B.Sc.(E.E.), 1937, Purdue University. **Sections:** Dayton NCAE, Director, 1955-57. **Professional Groups:** Administrative Committee, Aeronautical and Navigational Electronics, 1956-58; Airborne Electronics, 1951-53.

SHANON, Claude E. (S'36—M'48—SM'49—F'50), Research Mathematician, Bell Telephone Laboratories, Inc., Murray Hill, N.J.; Visiting Professor, Massachusetts Institute of Technology, 1956.
Born: April, 1916, Petoskey, Mich. B.S.(E.E.), 1936, University of Michigan; S.M.(E.E.), 1940, Ph.D. (Mathematics), 1940, Massachusetts Institute of Technology. **IRE Representative:** IRE-AIEE Committee on Noise Definitions, 1949-51. **Awards:** Alfred Nobel Prize, AIEE, 1940; IRE Morris Liebmann Memorial Prize, 1949; Stuart Ballantine Medal, Franklin Institute, 1955.

SHARPLESS, William M. (A'28—M'38—SM'43—F'58), Radio Research Engineer, Bell Telephone Laboratories, Inc., P.O. Box 107, Red Bank, N.J.
Born: September, 1904, Minneapolis, Minn. B.Sc.(E.E.), 1928, E.E., 1951, University of Minnesota. **Sections:** New York, Executive Committee, 1956-57; Monmouth Subsection, *chairman, 1956-57.* **Professional Groups:** Liaison for Antennas and Propagation, Microwave Theory and Techniques; National Symposium on Microwave Techniques, 1956.

SHAW, George R. (M'40—SM'43—F'54), Chief Engineer, Tube Division, Radio Corporation of America, 415 S. 5 St., Harrison, N.J.
Born: December 13, 1895, Frederick, Md. A.B., 1915, M.A., 1916, Washington and Lee University; Ph.D., 1920, University of Wisconsin.

SHAW, Henry S. (A'17—M'21—F'35)(L), Retired. 3048 Renatta Dr., Largo, Fla.
Born: November 29, 1884, Boston, Mass. A.B., 1906, Harvard University.

SHEA, Richard F. (A'29—M'32—SM'43—F'54), Consulting Engineer, Electronics, Power Plant Equipment, Knolls Atomic Power Laboratory, General Electric Company, Schenectady, N.Y.
Born: September 13, 1903, Boston, Mass. B.S., 1924, Massachusetts Institute of Technology. **Committees:** Admissions, 1947-48; Annual Review, 1950-51; Editorial Reviewer, 1954-59; Papers, Review, 1953; Radio Receivers, 1946-56, *vice-chairman, 1948-49, chairman, 1949-51;* Radio Frequency Interference, 1955; Standards, 1949-57, *vice-chairman, 1954-56, chairman, 1957-59.* **Sections:** Connecticut Valley, *secretary, 1943, vice-chairman, 1944, chairman, 1945;* Syracuse, *vice-chairman, 1952, chairman, 1953.* **IRE Representative:** ASA Committee (N-3), Nuclear Instrumentation, 1958-59; ASA Electrical Standards Board, 1958-59; I.E.C. U. S. National Committee, 1958-59; Editor of PGNS *Transactions,* Member of PGNS Administrative Committee.

SHELDON, John L. (SM'53—F'56), Staff Research Manager, Electrical Products Division, Corning Glass Works, Corning, N.Y.
Born: September, 1904, Battle Creek, Mich. B.S., 1935, Battle Creek College; M.S., 1938, Ph.D., 1940, University of Michigan. **Committees:** Admissions, 1955-56, *chairman, 1957-59.* **Sections:** Elmira-Corning, *vice-chairman, 1953-54, chairman, 1954-55.*

SHEPHERD, James E. (A'36—SM'44—F'48), Manager Electronic Tube Division, Sperry Gyroscope Company, Great Neck, L.I., N.Y.
Born: May 29, 1910, Houston, Tex. A.B.(Physics, E.E.), 1932, M.A.(E.E.), 1933, University of Missouri; M.S., 1935, D.Sc. (Communication Engineering), 1940, Harvard University. **IRE Offices:** Director, 1948-50. **Committees:** Admissions, 1945; Awards, 1951-53; Constitution and Laws, *chairman, 1949-50;* Convention Policy, *chairman, 1947-50;* Membership, 1943; National Convention, 1947-48, *chairman, 1947;* Sections, 1946-52; Tellers, 1946-47; Winter Technical Meeting, *vice-chairman, 1945-46.* **Sections:** New York, *secretary-treasurer, 1943-44, vice-chairman, 1945-47, chairman, 1947-49.*

SHEPHERD, William G. (A'42—SM'49—F'52), Professor and Head, Electrical Engineering, University of Minnesota, Minneapolis 14, Minn.
Born: August 28, 1911, Fort William, Ont., Canada. B.S.(E.E.), 1933, Ph.D., 1937, University of Minnesota. **Committees:** Electron Devices, 1952-56, *vice-chairman, 1954-56;* Electron Tubes, 1955-58; Electron Tubes and Solid State Devices, 1951-52; Fellow. **Professional Groups:** Electron Devices, Administrative Committee, 1955-58.

SHOCKLEY, William (SM'51—F'55), President, Shockley Transistor Corporation, Subsidiary of Beckman Instruments, Inc., Palo Alto, Calif.
Born: February 13, 1910, London, England, B.S., 1932, California Institute of Technology; Ph.D., 1936, Massachusetts Institute of Technology; D.Sc. (Honorary), 1955, University of Pennsylvania; D.Sc. (Honorary), 1956, Rutgers University. **Awards:** Medal of Merit, War Department, 1946; Citation of Honor, Air Force Association, 1951; IRE Morris Liebmann Award, 1952; Oliver E. Buckley Solid State Physics Prize, American Physical Society, 1953; Certificate of Appreciation, U. S. Army, 1953; Comstock Prize, National Academy of Sciences, 1954; Nobel Prize in Physics, 1956.

SHOUPP, William E. (SM'45—F'51), Technical Director, Westinghouse Atomic Power Department, P.O. Box 355, Pittsburgh, Pa.
Born: October 5, 1908, Troy, Ohio. B.A., 1931, Miami University; M.A., 1933, Ph.D., 1937, University of Illinois. **Committees:** Nuclear Studies, 1948-50; Papers Procurement, 1949-50; Professional Groups, 1955. **Professional Groups:** Nuclear Science, *chairman, 1956-57.* **IRE Representative:** ASA Nuclear Standards Board. **Sections:** Pittsburgh, *chairman, 1946-47.*

SILING, Philip F. (M'40—SM'43—F'51), Director, RCA Frequency Bureau, 30 Rockefeller Plaza, New York 20, N.Y. and 1625 K St., N.W., Washington 6, D.C.
Born: August 14, 1897, Oil City, Pa. Ph.B., 1917, Yale University. **Committees:** National Convention, *vice-chairman, 1947;* Nominations, 1946; Winter Technical Meeting, 1946. **IRE Representative:** Joint Technical Advisory Committee, 1948-58, *chairman, 1948, 1958.*

SILVER, Samuel (M'46—SM'50—F'54), Professor of Engineering Science and Director of the Electronics Research Laboratory, Department of Electrical Engineering, Cory Hall, University of California, Berkeley 4, Calif.
Born: February, 1915, Philadelphia, Pa. A.B., 1935, M.A. 1937, Temple University; Ph.D.(Physics), 1940, Massachusetts Institute of Technology. **Professional Groups:** Commission on Radio Waves and Circuits, International Scientific Radio Union, *president, 1954-60;* U.S.A. National Committee of I.S.R.U., *secretary, 1958-;* Member, PGAP and PGMTT. **Sections:** San Francisco, *director, 1956-58.* **Awards:** Guggenheim Fellowship, John Simon Guggenheim Memorial Foundation, 1953-54.

SILVERMAN, Daniel (A'42—SM'51—F'53), Geophysical Research Director, Pan American Petroleum Corporation, P.O. Box 591, Tulsa, Okla.
Born: June 24, 1905, Montreal, P.Q., Canada. B.S., 1927, University of California; M.S., 1929, Sc.D., 1930, Massachusetts Institute of Technology. **Committees:** Fellow, 1959; Papers Procurement, 1947-50. **Sections:** Tulsa, *chairman, 1951-52.* **Awards:** Medalist, 1927; Heller Travelling Fellow, 1928-30, University of California.

SIMON, Emil J. (IRE Charter Member)(M'12—F'15)(L), Consulting Engineer, 50 Church St., New York 7, N.Y.
Born: October 25, 1888, New York, N.Y. Attended Columbia University, 1905-09. **IRE Offices:** Secretary, 1912-14; Director, 1912-14; Manager, 1915. **Committees:** Publicity, 1913, 1915; Specifications for Steamship Radio Equipment, 1914-15; Standardization, 1914-15. **Awards:** Marconi Medal for Service; Veteran Wireless Operators Association, 1958.

SIMPSON, LeRoy C. (J'28—A'30—M'41—SM'43—F'59), Manager, Systems Projects, RCA International Division, Clark, N.J.
Born: April 24, 1908, Worcester, Mass. B.Sc., 1928, University of New Hampshire. **Sections:** Buenos Aires, *founding member, 1939, secretary-treasurer, 1941, vice-chairman, 1942-43, chairman, 1944.*

SINCLAIR, Donald B. (J'30—A'33—M'38—SM'43—F'43), Vice President, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: May 23, 1910, Winnipeg, Man., Canada. S.B., 1931, S.M., 1932, Sc.D., 1935, Massachusetts Institute of Technology. **IRE Offices:** President, 1952; Vice President, 1959; Treasurer, 1949-50; Director, 1945-54, 1958-59. **Committees:** Admission, 1948; Antennas, 1944-47; Appointments, 1958-59; *chairman, 1954;* Awards, 1951; Editorial Reviewer, 1955-59; Executive, 1948-50, 1952-53, 1959, *vice-chairman, 1949-50, chairman, 1952;* Finance, ex officio, 1949-50, 1952-53; Membership, 1947-48, 1953-56; National Convention, 1949; Nominations, 1948, 1953-54, *chairman, 1954;* Papers, 1941-45; Papers Procurement, 1945-46; Planning, 1947; Radio Transmitters, 1945-46; Special Publication Fund, 1947; Television, 1940-46; Transmitters, 1944; Transmitters and Antennas, 1941-44. **Professional Groups:** Administrative Committee Engineering Management, 1957-59. **IRE Representative:** Radio Technical Planning Board, 1947, *alternate, 1946;* Joint IRE-AIEE Co-ordination Committee, 1952 (ex officio). **Awards:** Fellow, American Institute of Electrical Engineers; President's Certificate of Merit, 1948.

SINCLAIR, George (A'37—SM'46—F'54), Professor (President, Sinclair Radio Laboratories, Ltd.), Electrical Building, University of Toronto, Toronto 12, Ont., Canada.
Born: November, 1912, Hamilton, Ont., Canada. B.Sc., 1933, M.Sc., 1935, University of Alberta; Ph.D., 1946, Ohio State University. **Committees:** Antennas, 1945-49; Antennas and Wave Guides, 1946-59; Awards, 1956-59; Editorial Reviewer, 1954-59; Education, 1951-59; Papers Review, 1951-53; Professional Groups, 1959; Wave Propagation, 1946-55; Wave Propagation and Utilization, 1946-49. **Professional Groups:** Antennas and Propagation, *chairman, 1951;* Administrative Committee, Microwave Techniques, 1957-59. **IRE Representative:** University of Toronto, 1948-58; Technical Program Committee, Canadian IRE Convention, *chairman, 1956-57;* Canadian IRE Convention, *general chairman, 1958.* **Sections:** Toronto, *vice-chairman, 1950, chairman, 1951.* **Awards:** U. S. War and Navy Departments, Certificate of Appreciation, 1948; Guggenheim Fellowship, 1958.

SINNETT, Chester M. (SM'52—F'55), Manager, Advanced Development Engineering Section, RCA Victor Television Division, Camden 8, N.J.
Born: January 19, 1900, Livermore Falls, Me. B.S.E.E., 1924, University of Maine. **Sections:** Philadelphia, *secretary-treasurer, 1950, chairman, 1952.*

SKELLETT, A. Melvin (M'44—SM'50—F'56), Director of Research, Tung-Sol Electric, Inc., 200 Bloomfield Ave., Bloomfield, N.J.
Born: July 14, 1901, St. Louis, Mo. A.B., 1924, M.S., 1927, Washington University; Ph.D., 1933, Princeton University. **Committees:** Accounting, 1949-50; Awards, 1950, 1958-59; Membership, 1949-50; Papers Procurement, 1945-46. **Sections:** Northern New Jersey, *chairman, 1956-57.*

SKIFTER, Hector R. (A'31—M'36—SM'43—F'51), President, Airborne Instruments Laboratory, Division of Cutler-Hammer, Inc., Mineola, L.I., N.Y.
Born: March 4, 1901, Austin, Minn. B.A., 1922, Sc.D., 1945, Saint Olaf College. **Committees:** Navigation Research and Development Board, *chairman, 1950-51.* **Sections:** New York Section for PGEM, *program chairman,* Member, Administrative Committee. **Awards:** Presidential Certificate of Merit, 1947.

SLATTERY, John J. (J'29—A'30—SM'46—F'56), Manager, West Coast Operations, Government and Industrial Divisions, The Magnavox Company, West Los Angeles, Calif.
Born: August 2, 1909, East Orange, N.J. B.S.(E.E.), 1930, Villanova College; M.S.(Physics and Math.), 1949, Stevens Institute of Technology. **Professional Groups:** Engineering Management, *secretary, 1955-56;* Military Electronics; Medical Electronics. **Awards:** Legion of Merit, U. S. Army, 1945.

SLEPIAN, Joseph (SM'45—F'45), Retired. 1115 Lancaster St., Pittsburgh 18, Pa.
Born: February 11, 1891, Boston, Mass. A.B., 1911, A.M., 1912, Ph.D., 1913, Harvard University; Dr. Eng. (Honorary), 1949, Case Institute of Technology; Dr.Sc. (Honorary) 1955, University of Leeds. **Awards:** John Scott Medal, 1932; AIEE Award, 1933; Benjamin Garver Lamme Medal, 1942, AIEE; Edison Medal, 1948, AIEE.

SLOAN, David H. (A'27—SM'50—F'59), Associate Professor, University of California, Berkeley 4, Calif.
Born: September 8, 1905, Lyman, Wash. B.S., 1928, M.S., 1929, Washington State College; Ph.D., 1941, University of California.

SMALE, J. A. (F'58), Retired from Cable and Wireless Ltd., London, England; Technical Consultant, Marconi's Wireless Telegraph Co., Ltd., Chelmsford, England; Chairman, Cyprus Luland Telecommunications Authority.
Born: February 16, 1895, Lydney, England. B.Sc.(E.E.), 1914, Bristol University. **Awards:** Commander of the Order of the British Empire, 1953.

SMITH, Carl E (A'30—M'39—SM'43—F'55), Proprietor, Carl E. Smith Consulting Radio Engineers; President, Smith Electronics, Inc., 8200 Snowville Rd., Brecksville, Ohio and 4501 West Pleasant Valley Rd., Cleveland 34, Ohio; President, Cleveland Institute of Radio Electronics, 4900 Euclid Ave., Cleveland 3, Ohio.
Born: November 18, 1906, Eldon, Iowa. B.S.(E.E), 1930, Iowa State College; M.S.(E.E.), 1932, E.E., 1936, Ohio State University. **Committees:** Board of Editors, 1946-53; Editorial Reviewer, 1954-59; Industrial Electronics, 1956-58; Professional Groups, 1955. **Professional Groups:** Industrial Electronics Administrative Committee, 1950-60, *secretary, 1951-54, vice-chairman, 1954-56, chairman, 1956-57;* Broadcasting Administrative Committee, 1955-57. **Sections:** Cleveland, *chairman, 1940-41;* Summer Con-

vention, *chairman 1942.* **Awards:** War Department Commendation for Exceptional Civilian Service, 1946; Fellow, American Institute of Electrical Engineers, 1956.

SMITH, David B. (A'35—SM'44—F'48), Vice President, Philco Corporation, Tioga & C. Sts., Philadelphia 34, Pa.
Born: December 3, 1911, Newton, N.J. S.B., 1933, S.M., 1934, Massachusetts Institute of Technology. **IRE Offices:** Director, 1947. **Committees:** Frequency Modulation, 1940–47; Membership, 1949–51; Public Relations, 1947–48; Special Publications Fund, 1947; Television, 1942–49; Television Systems, 1949–59. **Sections:** Philadelphia, *chairman, 1945–46.* **IRE Representative:** IRE-RMA Problem No. 2 Committee.

SMITH, J. Ernest (A'37—SM'47—F'55), Vice President and Director of Engineering, Datamatic Division, Minneapolis-Honeywell Regulator Company, 151 Needham St., Newton Highlands 61, Mass.
Born: July 9, 1908, Carrollton, Mo. B.A. 1932, Jamestown College; M.E.E., 1944, Polytechnic Institute of Brooklyn; D.Sc. (Honorary), 1959, Jamestown College. **Committees:** Annual Review, 1949–50; Membership, 1929–35, 1937–40; Papers Procurement, 1947–48; Papers Review, 1949–53; Radio Transmitters, 1949–50.

SMITH, Newbern (A'41—SM'46—F'52), Professor of Electrical Engineering, University of Michigan, Ann Arbor, Mich.
Born: January 21, 1909, Philadelphia, Pa. B.S.(Eng.), 1930, M.S.(Eng.), 1931, Ph.D.(Physics), 1935, University of Pennsylvania **Committees:** Administrative Committee of the Board of Editors, 1951–53; Board of Editors, 1951–53; Editorial Administrative, 1949–51; Professional Groups, 1948; Standards, 1952–56; Wave Propagation, 1948–56, *chairman, 1952–55.* **Professional Groups:** Antennas and Propagation, *chairman, 1950;* Communications Systems. **Awards:** IRE Harry Diamond Memorial Award, 1952.

SMITH, Otto J. M. (M'44—SM'51—F'59), Professor, University of California, Berkeley 4, Calif.
Born: August, 1917, Urbana, Ill. B.S.(Chemistry), 1938, Oklahoma A and M College; B.S.(E.E.), 1938, University of Oklahoma; Ph.D.(E.E.), 1941, Stanford University. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Automatic Control Administrative Committee, 1958–59. **Sections:** San Francisco, *secretary, 1952.* **Awards:** AIEE First Prize, Technical Paper Contest, 1953.

SMITH, Phillip H. (A'34—SM'46—F'52), Technical Staff, Bell Telephone Laboratories, Inc., Morristown Rd., Whippany, N.J.
Born: April 29, 1905, Lexington, Mass. B.S.(E.E.), 1928, Tufts College. **Committees:** Antennas, 1946–49; Antennas and Wave Guides, 1949–59, *vice-chairman, 1953–54, chairman, 1954–55;* Subcommittee 2.6, *chairman, 1959;* Standards, 1954–56. **Professional Groups:** Antennas and Propagation, *secretary-treasurer, 1953–54.*

SMITH-ROSE, Reginald L. (SM'44—F'44), Director of Radio Research, Department of Scientific and Industrial Research, Radio Research Station, Ditton Park, Slough, Buckinghamshire, England.
Born: April 2, 1894, London, England. B.Sc., 1914, M.Sc., 1922, Ph.D., 1923, D.Sc., 1926, Imperial College of Science and Technology. **IRE Offices:** Vice President, 1948; Director, 1948. **Committees:** Radio Wave Propagation, 1944–45; Radio Wave Propagation and Utilization, 1945–49; Wave Propagation, 1949–59. **IRE Representative:** IRE-IEE International Liaison Committee, 1955–59. **Awards:** Student Premium, 1917; Wireless Premium, 1925, 1938, 1939; Duddell Premium, 1942, Institution of Electrical Engineers, London; Coronation Medal, 1937, 1953; United States Medal of Freedom with Silver Palm, 1947; Fellow, City and Guilds Institute, 1951; Commander of the Order of the British Empire, 1952.

SMULLIN, Louis D. (S'39—A'40—SM'51—F'57), Associate Professor Electrical Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, Mass.
Born: February 5, 1916, Detroit, Mich. B.S.(E.E.), 1936, University of Michigan; M.S., 1939, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59. **Awards:** Army-Navy Certificate of Appreciation, 1948.

SMYTH, John B. (SM'52—F'56), Smyth Research Associates, 3555 Aero Court, San Diego 11, Calif.
Born: June 8, 1914, Pembroke, Ga. B.S., 1934, M.S., 1937, University of Georgia; Ph.D., 1942, Brown University, **Committees:** Wave Propagation, 1956–59. **Professional Groups:** Antennas and Propagation, Editor of *Transactions,* 1953–59; Administrative Committee, PGAP, 1952–59. **Awards:** Electronics Achievement Award, Seventh Region, IRE, 1954.

SNOW, Harold A. (A'24—VA'39—F'56), Senior Scientist, International Telephone and Telegraph Laboratories, 500 Washington Ave., Nutley, N.J.
Born: October, 1898, Santa Barbara, Calif. B.S.(E.E.), 1921, George Washington University.

SORIA, Rodolfo M. (S'38—A'43—M'46—SM'49—F'58), Vice President, Research & Engineering, Amphenol-Borg Electronics Corporation, 25th Avenue at Cermak, Broadview, Ill.
Born: May 16, 1917, Berlin, Germany. B.S.(E.E.), 1939, M.S., (E.E.), 1940, Massachusetts Institute of Technology; Ph.D. (E.E.), 1947, Illinois Institute of Technology. **Committees:** Antennas and Waveguides, 1950–51; Awards, 1959. **Sections:** Chicago, *treasurer, 1954–55, vice-chairman, 1955–56, chairman, 1956–57.* **Professional Groups:** Component Parts Administrative Committee, 1955–58, *chairman, 1956–58.* **IRE Representative:** National Electronics Conference, 1952–54; International Electrotechnical Commission, Advisor on high frequency cables and connectors, Philadelphia, 1954.

SOUTHWORTH, George C. (M'26—F'41), Technical Consultant, 19 Williams Rd., Chatham, N.J.
Born: August 24, 1890, Little Cooley, Pa. B.S., 1914, Grove City College; Ph.D., 1923, Yale University; Sc.D. (Honorary), 1931, Grove City College. **Committees:** Circuit Elements, 1928–29; Meetings and Papers, 1930; Papers, 1931–34; Standardization, 1928. **Awards:** IRE Morris Liebmann Memorial Prize, 1938; Louis Levy Medal, Franklin Institute, 1946; Stuart Ballantine Medal, Franklin Institute, 1947.

SPANGENBERG, Karl R. (A'34—SM'45—F'49), Engineering Consultant, 2100 Page Mill Rd., Palo Alto, Calif.
Born: April 1910, Cleveland, Ohio. B.S.(E.E.), 1932, M.S.(E.E.), 1933, Case Institute of Technology; Ph.D., 1937, Ohio State University. **Committees:** Awards, 1950; Education, 1946, 1949–51; Electron Tubes, 1955; Membership, 1941; Papers, 1943–45; Papers Procurement, 1942–43, 1945; Regular Papers, 1941. **Sections:** San Francisco, *secretary, 1940–43, chairman, 1943–44.* **IRE Representative:** Stanford University, 1942–47.

SPEAKMAN, Edwin A. (A'43—M'44—SM'48—F'54), Vice President and General Manager, Fairchild Guided Missiles Division, Wyandanch, L.I., N.Y.; Manager of Planning, RCA Defense Electronic Products, Camden, N.J.
Born: August 14, 1909, Gratz, Pa. B.S., 1931, Haverford College. **Committees:** IRE Symposium on Components, Planning Committee, 1950. **Professional Groups:** Military Electronics, National Administrative Committee, 1955–57, *chairman, 1958–59.* **Awards:** Naval Civilian Service Award, 1947; Naval Citation, U. S. Navy, 1948; Associate Fellow, Institute of Aeronautical Sciences, 1953.

SPENCER, Percy L. (A'53—SM'53—F'55), Senior Vice President and General Manager, Microwave and Power Tube Division, Raytheon Manufacturing Company, Waltham 54, Mass.
Born: July 9, 1894, Howland, Me. Sc.D. (Honorary) 1950, University of Massachusetts. **Awards:** Naval Ordnance Development Award, 1945; USN Certificate of Commendation, 1947; USN Distinguished Public Service, 1949; Fellow, American Academy of Arts and Sciences, 1955.

SPITZER, Edwin E. (A'28—M'38—SM'43—F'56), Manager, Power Tube Operations, Industrial Tube Products, Radio Corporation of America, Lancaster, Pa.
Born: February, 1905, Fitchburg, Mass. B.S., 1926, M.S., 1927, Massachusetts Institute of Technology. **Committees:** Papers Review, 1946–52. **Sections:** Lancaster Subsection, *vice-chairman, 1950–51, chairman, 1951–52.*

STEARNS, H. Myrl (S'39—A'40—SM'48—F'59), President, Varian Associates, 611 Hansen Way, Palo Alto, Calif.
Born: April, 1916, Kiesling, Wash. B.S.(E.E.), 1937, University of Idaho; E.E., 1939, Stanford University. **Committees:** Frequency Modulation, 1946–47. **Sections:** Palo Alto, Subsection, *secretary, 1951; chairman, 1953.* **Awards:** Certificate of Commendation, Secretary of Navy, 1946.

STEEL, W. Arthur (M'19—SM'43—F'50)(L), Director, Standard Telephones and Cables Manufacturing Company, Ltd., 9600 St. Lawrence Blvd., Montreal, P.Q., Canada.
Born: November, 1890, Castleton, Ont., Canada. B.A.Sc., 1915, Toronto University. **Committees:** Broadcast, 1936–37. **Sections:** Ottawa, *chairman, 1945–46.*

STEEN, Jerome R. (A'36—M'36—SM'43—F'50), Reliability Specialist, Sylvania Electric Products, Inc., 189 "B" Street, Needham 94, Mass.
Born: June 29, 1901, West Bloomfield, N.Y. B.S.(E.E.), 1923, University of Wisconsin. **Committees:** Annual Review, 1948–49; Editorial Reviewer, 1954–59; Electron Tubes, 1946–47; Electronics, 1944–45; Instruments and Measurements, 1949–50; Measurements and Instrumentation, 1950–55; Papers Review, 1948–55; Professional Groups, 1950–52; Standards , 1948–51; Symbols, 1945–47; Vacuum Tubes, 1945–46. **IRE Representative:** ASA Sectional Committee (C67) on Standardization of Voltages—Preferred Voltages—100 Volts and Under, 1951–53 (No IRE Voting Representative; Liaison, 1954, 1958–59). **Awards:** Fellow, American Society for Quality Control; Fellow, Radio Club of America.

STEVENS, Archie M. (A'12—M'25—F'31)(L), Radio Engineer, 539 Prospect Ave., Mamaroneck, N.Y.
Born: September 22, 1887, Glidden, Iowa. A.B., 1909, Leland Stanford Junior University. **Sections:** Buenos Aires, *chairman, 1940.*

STODDART, Richard R. (SM'45—F'58), President, Stoddart Aircraft Radio Co., Inc., 6644 Santa Monica Blvd., Hollywood 38, Calif.
Born: December 1, 1900, New York, N.Y.

STONE, Ellery W. (A'14—M'16—F'24)(L), Rear Admiral, United States Naval Reserve; Chairman of the Board, American Cable and Radio Corporation; Chairman of the Board, All America Cables and Radio, Inc.; Chairman of the Board, The Commercial Cable Company; Chairman of the Board, Mackay Radio and Telegraph Company; Vice President and Director, International Telephone and Telegraph Corporation; Director, International Marine Radio Company, Ltd. (England), 67 Broad St., New York, N.Y.
Born: January 14, 1894, Oakland, Calif. **Committees:** Meetings and Papers, 1930; Membership, 1925. **Awards:** Grand Officer, Crown of Italy, 1944; United States Army Distinguished Service Medal, 1945; Knight Commander of the British Empire, 1945; Knight of Grand Cross of St. Maurice and St. Lazarus, Italian Government, 1945; Knight of Grand Cross, San Marino, 1946; United States Navy Distinguished Service Medal, 1946, Marconi Medal of Achievement, VWOA, 1953.

STRAITON, Archie W. (M'47—SM'49—F'53), Professor of Electrical Engineering and Director, Electrical Engineering, Research Laboratory, Department of Electrical Engineering, University of Texas, Austin, Tex.
Born: August, 1907, Arlington, Tex. B.S.(E.E.), 1929, M.A. 1931, Ph.D., 1939, University of Texas. **IRE Offices:** Director, 1953–54. **Committees:** Appointments, 1954; Awards, 1956–58; Editorial Reviewer, 1955–59; Education, 1955–59; Nominations, 1953–54; Policy Advisory, 1953–54; Wave Propagation, 1949–59. **IRE Representative:** University of Texas, 1947–50.

STRANDBERG, Malcom W. P. (A'42—SM'51—F'59), Associate Professor of Physics, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: March 9, 1919, Box Elder, Mont. S.B., 1941, Harvard University; Ph.D., 1948, Massachusetts Institute of Technology.

STRATTON, Julius A. (M'42—SM'43—F'45), President, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: May 18, 1901, Seattle, Wash. S.B., 1923, S.M., 1925, Massachusetts Institute of Technology; Sc.D., 1927, Technische Hochschule, Zurich, Switzerland; D.Eng. (Honorary), 1955, New York University; D.Sc. (Honorary), 1957, St. Francis Xavier University; LL.D. (Honorary), 1957, Northeastern University; LL.D. (Honorary), 1958, Union College. **IRE Offices:** Director, 1948–51, 1954. **Committees:** Annual Review, 1945–46; Appointments, 1948; Board of Editors, 1946–53; Editorial Board, 1954–55; Education, 1945; IRE-IEE International Liaison, 1949, 1958–59; Membership, 1947–48; Policy Development, 1949–51; Professional Groups, 1954; Radio Wave Propagation and Utilization, 1945–48, *chairman, 1945–47;* Standards, 1945–46. **Awards:** Presidential Medal for Merit, 1946; IRE Medal of Honor, 1957.

STRONG, Charles E. (A'25—M'27—SM'43—F'49), Chief Radio Engineer, Standard Telephones and Cables, Ltd., Oakleigh Rd., New Southgate, N. 11, London, England.
Born: November, 1898, Omagh, Tyrone County, Northern Ireland. B.A., 1922, Trinity College, Dublin; B.A.I., 1922, University of Dublin. **Awards:** Officer of the Order of the British Empire, 1947.

STRUTT, Max J. O. (SM'46—F'56), Professor, Director, Institute of Advanced Electrical Engineering, Dean of Electrical Engineering, Swiss Federal Institute of Technology, Zurich, Switzerland.
Born: October, 1903, Surakarta, Java, Indonesia. E.E., 1926, d.Tech.Sc., 1927, Institute of Technology, Delft, Holland. **Awards:** Doctor (honoris causa,) Institute of Technology, Karlsruhe, Germany, 1950; Gauss Medal, Brunswick (Germany) Society of Sciences, 1954; Honorary Member, Brunswick Society of Sciences, 1955; Honorary Member, International Television Committee, 1956.

SUITS, C. Guy (SM'55—F'56), Vice President, Director of Research, General Electric Company, The Knolls, Schenectady, N.Y.
Born: March 12, 1905, Oshkosh, Wis. B.A., 1927, University of Wisconsin; D.Sc., 1929, Technische Hochschule, Zurich, Switzerland; D.Sc. (Honorary), 1944, Union College; D.Sc. (Honorary), 1946, Hamilton College; D.Eng. (Honorary), 1950, Rensselaer Polytechnic Institute; D.Sc. (Honorary), 1955, Drexel Institute of Technology. **Awards:** America's Young Men Award, 1940; His Majesty's Medal for Service in the Cause of Freedom, 1948; Medal for Merit, U. S. Government, 1948; Silliman Lecturer, Yale University, 1952; Procter Prize Award, Scientific Research Society of America, 1958.

SULZER, Peter G. (A'46—M'55—SM'56—F'58), Consulting Engineer, 5526A Dorsey Lane, Washington 16, D.C.
Born: August 3, 1922, Media, Pa. B.S.(E.E.), 1948, M.Sc.(E.E.), 1949, Pennsylvania State College.

SUNSTEIN, David E. (M'44—SM'51—F'58), President, General Atronics Corporation; Vice President, Atronic Products, Inc., One Bala Ave., Bala-Cynwyd, Pa.
Born: July 29, 1918, Pittsburgh, Pa. B.S.(E.E.), 1940, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1955–58. **Awards:** Army-Navy Individual Merit Certificate, U. S. Navy, 1945.

SWINYARD, William O. (A'37—M'39—SM'43—F'45), Vice President and Chief Engineer, Hazeltine Research, Inc., 5443 W. Diversey Ave., Chicago 39, Ill.

Born: July 17, 1904, Logan, Utah. B.S., 1927, Utah State University. **IRE Offices:** Director, 1945–46. **Committees:** Annual Review, 1947–48; Education, 1945–48; National Convention, 1947; Radio Receivers, 1946–54, 1954–59, *chairman, 1946–48, vice-chairman, 1956–57;* Sections, 1945–50, *chairman, 1946–47;* Standards, 1947–48. **Professional Groups:** PGBTR Administrative Committee, 1957, *vice-chairman, 1958.* **Sections:** Chicago, *secretary, 1943–44; chairman, 1944–45.* **IRE Representative:** National Electronics Conference, *president, 1946; chairman of the board, 1947;* TASO Panel 2, *chairman.* **Awards:** President, Radio Engineers Club of Chicago, 1945; Eta Kappa Nu (Professor Member), Fellow, Radio Club of America, 1956; Fellow, American Association for the Advancement of Science, 1958.

SYKES, Roger A. (A'41—M'42—SM'43—F'57), Transmission Apparatus Engineer, Bell Telephone Laboratories, Inc., North Andover, Mass.
Born: February 17, 1908, Windsor, Vt. B.S., 1929, M.S., 1930, Massachusetts Institute of Technology; 1930-34, Columbia University. **Committees:** Piezoelectric Crystals, 1945–59, *vice-chairman, 1948–51, chairman, 1951–56, 1957;* Standards, 1951–54.

SZEGHO, Constantin S. (A'41—SM'51—F'52), Vice President in Charge of Research, The Rauland Corporation, 4245 N. Knox Ave., Chicago 41, Ill.
Born: March 15, 1905, Hungary. Dr. of Engineering, 1932, Institute of Technology, Aachen, Germany; E.E., 1928, Institute of Technology, Munich, Germany. **Committees:** Papers Review, 1952–53.

SZIKLAI, George C. (A'41—M'43—SM'43—F'55), Assistant to the Vice President, Engineering, Wastinghouse Electric Corporation, Pittsburgh 30, Pa.
Born: July 9, 1909, Budapest, Hungary. Absolutorium, 1928, University of Budapest. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Board of Editors, 1951–53; Editorial Administrative, 1951–53; Editorial Reviewer, 1954–59; Papers Review, 1949–50. **Sections:** Princeton, *secretary-treasurer, 1953–54, vice-chairman, 1954–55, chairman, 1955–56.* **Awards:** Radio Corporation of America Laboratories Awards, 1947, 1951, 1952.

TANK, Franz (A'31—F'49), Professor of High-Frequency Techniques and Physics, Swiss Federal Institute of Technology, Sternwartstrasse 7, Zurich, Switzerland.
Born: March, 1890, Zurich, Switzerland. Ph.D., 1915, University of Zurich; Rector, Swiss Federal Institute of Technology, 1943–47; President, Swiss National Committee URSI, 1950–57; President, Swiss Electrotechnical Institution, 1952–56. **IRE Offices:** Vice President, 1955; Director, 1955. **IRE Representative:** Swiss Federal Institute of Technology, 1959.

TANNER, Robert H. (A'38—SM'48—F'58), Manager, Electronics Development, Northern Electric Research & Development Laboratories, P.O. Box 400, Belleville, Ont., Canada.
Born: July 22, 1915, London, England. B.Sc., 1935, Imperial College of Science, University of London.

TAYLOR, A. Hoyt (M'16—F'20)(L), Retired. 691 W. 12 St., Claremont, Calif.
Born: January 1, 1879, Chicago, Ill. B.S., 1902, Northwestern University; Ph.D., 1909, University of Göttingen, Germany; D.Sc. (Honorary), 1953, University of North Dakota. **IRE Offices:** President, 1929; Director, 1929–31. **Committees:** Awards, 1928–31; Institute Sections, 1928; Meetings and Papers, 1928. **Sections:** Washington, *chairman, 1919–28.* **Awards:** IRE Morris Liebmann Memorial Prize 1927; John Scott Medal and Premium, Board of City Trustees, Philadelphia, 1942; IRE Medal of Honor, 1942; Presidential Medal of Merit, 1944; Pioneer Award, Professional Group on Aeronautical and Navigational Electronics, 1952.

TAYLOR, Charles H. (M'13—F'15)(L), 390 Riverside Dr., New York 25, N.Y.
Born: August 22, 1875, Uxbridge, Middlesex, England. **Committees:** Antenna Terminology, *chairman, 1924–25;* Membership, 1925; Sections, 1925; Standardization, 1914–21, 1924–25.

TEAL, Gordon K. (SM'53—F'56), Assistant Vice President, Director of Research, Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex.
Born: January 10, 1907, Dallas, Tex. A.B., 1927, Baylor University; Sc.M., 1928, Ph.D., 1931, Brown University. **IRE Offices:** Director, 1959. **Committees:** Editorial Board, 1958–59; Editorial Reviewer, 1955–59; Section Publications, *chairman, 1957–59.* **Sections:** Dallas-Fort Worth, *secretary, 1953–54, vice-chairman, 1955–56;* Dallas, *chairman, 1956–57;* Board of Directors SWIRECO, 1957–59; Southwestern IRE Conference and Electronics Show, *vice-chairman, 1959.* **Awards:** Fellow, American Association for the Advancement of Science.

TEARE, Benjamin R., Jr. (A'41—SM'45—F'51), Dean, College of Engineering and Science, Carnegie Institute of Technology, Pittsburgh, Pa.
Born: January, 1907, Menomonie, Wis. B.S.(E.E.), 1927, M.S., 1928, University of Wisconsin; D.Eng., 1937, Yale University. **Committees:** Education, 1944. **Sections:** Pittsburgh, *vice-chairman, 1942–43, chairman, 1943–44.* **IRE Representative:** Carnegie Institute of Technology, 1944–45. **Awards:** George Westinghouse Award, American Society for Engineering Education, 1947.

TELLEGEN, B. D. H. (SM'52—F'55), Scientific Advisor, Philips Research Laboratories, Eindhoven, Netherlands; Professor, Electrical Engineering, Technical University, Delft, Netherlands.
Born: June 24, 1900, Winschoten, Netherlands. E.E., 1923, Technical University, Delft, Netherlands. **Awards:** Honorary Member, Netherlands Radio Institution, 1951; Honorary Life Member, Institution of Radio Engineers, Australia, 1953; Gold Research Medal, Royal Netherlands Institution of Engineers, 1954.

TELLIER, Joseph C. (S'35—A'37—SM'45—F'59), Manager, Circuit Research, Research Division, Philco Corporation, C & Tioga Sts., Philadelphia 34, Pa.
Born: June 24, 1914, Des Moines, Iowa. B.S.(E.E.), 1935, University of Pennsylvania. **Committees:** Editorial Reviewer, 1955–59. **Awards:** Certificate of Service, Office of Scientific Research and Development, 1943.

TERMAN, Frederick E. (A'25—F'37), Provost, Stanford University, Stanford, Calif.
Born: June 7, 1900, English, Ind. A.B., 1920, Eng. 1922, Stanford University; Sc.D., 1924, Massachusetts Institute of Technology; Sc.D. (Honorary), 1945, Harvard University; Sc.D. (Honorary), 1950, University of British Columbia; 1955, Syracuse University. **IRE Offices:** President, 1941; Vice President, 1940; Director, 1940–43, 1948–49. **Committees:** Admissions, 1940; Annual Review, 1946–47; Appointments, 1949; Awards, 1940, 1942–43; Constitution and Laws, 1944–47; Education, 1949–50; Handbook, 1945–48; Membership, 1939–40, 1942, 1949–50, *chairman, 1942;* Nominations, 1943, 1948–49, 1951, 1953, 1955, *chairman, 1951;* Policy Development, 1948–50; Professional Groups, 1948; Research, *chairman, 1945–49;* Standards, 1934–41, 1946–47. **Sections:** San Francisco, *secretary, 1931–32, chairman, 1939–40.* **IRE Representative:** Stanford University, 1941; National Research Council, Division of Engineering and Research, 1943–46. **Awards:** IRE Medal of Honor, 1950.

THAYER, Gordon N. (SM'47—F'51), Vice President, Operations, Ohio Bell Telephone Company, 750 Huron Rd., Cleveland 15, Ohio.
Born: October 6, 1908, Delta, Colo. Stevens Institute of Technology, 1926–30, M.E., 1946.

THOMAS, Henry P. (A'39—VA'39—M'44—SM'47—F'51), Engineer, Communication Products Department, General Electric Company, Lynchburg, Va.
Born: May, 1904, Boston, Mass. B.A., 1925, M.S., 1927, Harvard University. **Committees:** Editorial Reviewer, 1954–59; Papers Review, 1946–53; Radio Wave Propagation, 1942–46; Wave Propagation, 1940–41. **Awards:** Coffin Award, General Electric Company, 1948.

THOMPSON, Leland E. (A'35—SM'44—F'57), Engineer, Radio Corporation of America, Camden, N.J.
Born: September 18, 1905, Creighton, Neb. B.S.(E.E.), 1929, University of South Dakota.

TINUS, William C. (A'31—M'36—SM'43—F'51), Vice President, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: October 18, 1905, Chicago, Ill. B.S.(E.E.), 1928, Dr. Eng. (Honorary), 1954, Texas Agricultural and Mechanical College. **Committees:** Board of Editors, 1946–53.

TOLMIE, John R. (J'15—A'18—M'32—SM'43—F'55), Retired. 1624 Boren Ave., Seattle, Wash.; formerly Staff Supervisor, Pacific Telephone & Telegraph Co.
Born: March 19, 1897, Seattle, Wash. B.S.(E.E.), 1919, M.S. (E.E.), 1923, University of Washington. **Sections:** Seattle, *secretary, 1919–20, chairman, 1923–24.*

TOTH, Emerick (SM'48—F'58), Head of Radio Techniques Branch, U. S. Naval Research Laboratory, Washington 25, D.C.
Born: June, 1905, New York, N.Y. B.S.(E.E.), 1927, Newark College of Engineering. **Awards:** Meritorious Civilian Service Award, USN, 1946.

***TOULON, Pierre M. G. (SM'47—F'59),** Retired. 15 Frederic Passy, Neuilly on the Seine, France.
Born: January 15, 1892, Paris, France. B.S., Lycee Louis Le Grand, Paris, France; Dr.Eng., Sorbonne Faculte Des Sciences, Paris, France. **Awards:** Member, American Institute of Radio Engineers; Member, Society of Motion Picture Engineers; Member, Society Francais des Electriciens; Member, Societe des Ingenious Radio Electriciens.
* Deceased.

TOWN, George R. (A'37—SM'44—F'50), Dean of Engineering, Iowa State College, Ames, Iowa.
Born: May 26, 1905, Poultney, Vt. E.E., 1926, D.Eng., 1929, Rensselaer Polytechnic Institute. **IRE Offices:** Director, 1949–53. **Committees:** Appointments, 1952; Awards, 1948–49; Education, 1945–48; Frequency Modulation, 1946–47; Membership, 1953–55; Papers Procurement, 1947–50. **Sections:** Rochester, *secretary, 1942–44, chairman, 1944–46.* **Professional Group:** Broadcasting Administrative Committee, 1957.

TOWNER, Orrin W. (A'24—M'29—SM'43—F'58), Director of Engineering, WHAS, Inc., 525 W. Broadway, Louisville 2, Ky.
Born: March 29, 1903, Peterson, Iowa. A.A.(Eng.), 1924, Jr. College of Kansas City; B.Sc.(E.E.), 1927, E.E., 1933, University of Kansas. **Committees:** Broadcast Transmission Systems Group, *chairman, 1949.* **Sections:** Louisville, *chairman, 1947–49, 1956–57.* **Awards:** Presidential Certificate of Merit, 1948.

TRAVIS, Irven (SM'46—F'53), Vice President of Research and Engineering, Burroughs Corporation, 6071 Second Ave., Detroit 32, Mich.
Born: March, 1904, McConnellsville, Ohio. B.S.(E.E.), 1926, Drexel Institute of Technology; M.S.(E.E.), 1928, Sc.D.(E.E.), 1938, University of Pennsylvania. **Committees:** Awards, 1959; Fellow, 1958: **Sections:** Philadelphia, *vice-chairman, 1933–34.* **Awards:** Alumni Citation, Drexel Institute of Technology; Commendation, U. S. Navy, 1946.

TREVOR, Bertram A. (A'29—M'38—SM'43—F'53), Member of Technical Staff, Radio Corporation of America, Surface Communications Systems Laboratory, Tucson, Ariz.
Born: February, 1906, Ithaca, N.Y. E.E., 1928, Cornell University. **Committees:** Frequency Modulation, 1946–47; Membership, 1943–46; Modulation Systems, 1947–52, *vice-chairman, 1948–50, chairman, 1950–51;* Papers Review, 1946–53; Standards, 1950–51.

TRUXAL, John G. (S'47—A'48—SM'54—F'59), Head, Electrical Engineering Department, Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn, N.Y.
Born: February 19, 1924, Lancaster, Pa. A.B., 1944, Dartmouth College; B.S., 1947, Sc.D., 1950, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1954–59.

TUPPER, Bertram R. (A'36—SM'46—F'54), Chief Engineer of the British Columbia Telephone Company, 1955 Wylie St., Vancouver 10, B.C., Canada.
Born: April 15, 1906, Vancouver, B.C., Canada. B.S., 1928, University of British Columbia. **Sections:** Vancouver, *chairman, 1950.*

TURNER, George S. (A'22—M'28—SM'43—F'57), Chief, Field Engineering and Monitoring Bureau, Federal Communications Commission, Washington 25, D.C.
Born: June 25, 1900, Independence, Mo. LL.M., 1939, Atlanta Law School. **Committees:** Membership, 1927. **Sections:** Atlanta, *secretary, 1938–39, vice-chairman, 1940.*

TURNER, Hubert M. (A'14—M'30—F'37)(L), Associate Professor, Emeritus, Electrical Engineering, Yale University, New Haven, Conn.
Born: July 20, 1882, Hillsboro, Ill. B.S., 1910, M.S., 1915, University of Illinois. **IRE Offices:** President, 1944; Director, 1933–46. **Committees:** Admission, 1936, 1939–43, *chairman, 1941–42;* Annual Review, 1937–40, 1943–44; Awards, 1934, 1938–41, *chairman, 1934, 1940;* Bibliography, 1930–31; Circuit Elements, *chairman, 1927–28;* Constitution and Laws, 1936–43, *chairman, 1936–40;* Executive, *chairman, 1944;* Investments, 1944–46; Meetings and Papers, 1929; Member Examining Committee for the Connecticut Board of Registration for Professional Engineers, 1942–, *chairman, 1957–;* Nominations, 1938, 1941, 1945, *vice-chairman, 1945;* Papers, 1932–44; Papers Procurement, 1942–43; Preparedness, 1940–41; Regular Papers, 1941; Sections, 1952; Standardization, 1926–32; Standards, 1932–38, 1940–48; Symbols, 1940–44, 1946–48, *chairman, 1940–45;* Tellers, 1940. **IRE Representative:** Yale University, 1941–47; ASA Subcommittee on Letter Symbols for Radio, 1936–54; ASA Electrical Standards Committee 1939–46; ASA Sectional Committee (C-18) on Specifications for Dry Cells and Batteries, 1936–51; ASA Subcommittee on Communication Symbols of Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1939–48; ASA Sectional Committee (Y-10) on Letter Symbols, *chairman, 1940–58;* United States National Committee of the International Electrotechnical Commission, 1944–48; Technical Advisor, U. S. National Committee, International Electrotechnical Commission, Letter Symbols, 1946–58; Chief Delegate, United States National Committee on Letter Symbols for Electrical Quantities, International Electrotechnical Commission, Paris, France, 1950; Philadelphia, 1954; Stockholm, 1958; United States Paper Committee, World Power Conference, London, 1950.

TUSKA, Clarence D. (A'14—M'41—SM'43—F'57), Staff Consultant, Patents, Radio Corporation of America, David Sarnoff Research Center, Princeton, N.J.
Born: August 15, 1896, New York, N.Y. B.S., 1919, Trinity College; LL.B., 1934, La Salle Extension University.

TUTTLE, W. Norris (A'26—SM'46—F'49), Engineering Consultant, General Radio Company, 22 Baker Ave., West Concord, Mass.
Born: March 29, 1902, Croton-on-Hudson, N.Y. A.B., 1924, S.M. (Electrical Communication Engineering), 1926, Ph.D. (Physics), 1929, Harvard University. **Committees:** Annual Review, 1949–51; Circuits, 1944–59, *chairman, 1949–51;* Editorial Board, 1954–58; Education, 1953–59; Papers Review, 1948–52; Policy Development, 1948–50; Standards, 1949–51. **Awards:** Medal of Freedom, War Department, 1946.

TUVE, Merle A. (A'45—F'45), Director, Department of Terrestrial Magnetism, Carnegie Institution of Washington, 5241 Broad Branch Rd., N.W., Washington 15, D.C.
Born: June 27, 1901, Canton, S.D. B.S., 1922, A.M., 1923, University of Minnesota; Ph.D., 1926, The Johns Hopkins Univer-

sity; D.Sc., 1948, Case Institute; D.Sc., 1949, Kenyon College; D.Sc., 1949, Williams College; D.Sc., 1950, The Johns Hopkins University; D.Sc., 1953, University of Alaska. **Awards:** Fellow, American Physical Society; American Academy of Arts and Sciences; National Academy of Sciences; American Philosophical Society; American Association for the Advancement of Science Prize, 1931; Presidential Medal for Merit, 1946; Research Corporation Award, 1947; John Scott Award, 1948; Comstock Prize, 1949; Commander of the Order of the British Empire, 1949; Howard N. Potts Medal, Franklin Institute, 1950; Outstanding Achievement Medal University of Minnesota, 1950.

TYSON, Benjamin F. (S'36—A'39—VA'39—SM'49—F'58), Engineering Manager, Sylvania Electric Products, Inc., 208-20 Willets Point Blvd., Bayside, L.I., N.Y.
Born: November 18, 1913, Chatham, N.J. M.E., 1935, M.Sc., 1937, Stevens Institute of Technology. **Committees:** Tellers, 1954–56, *chairman, 1955;* Video Techniques, 1951–55. **Awards:** Certificate of Commendation, Bureau of Ships, USN, 1947.

ULLRICH, Edward H. (M'26—F'39), Standard Telephones and Cables, Ltd., Connaught House, Aldwych, London, W.C.2, England.
Born: December 8, 1894, Cardiff, Wales. Mechanical Sciences Tripos, 1921, Christ's College, Cambridge, England. **Committees:** Membership, 1927. **Awards:** Institution Premium, Institution of Electrical Engineers, 1936; Ex Gratia joint award by Royal Commission on Awards to Inventors for invention in 1941.

ULREY, Dayton (A'28—M'40—SM'43—F'50), Consultant, 324 Suwanee Ave., Ballantine Manor, Sarasota, Fla.
Born: September, 1884, North Manchester, Ind. B.A., 1911, M.A., 1912, Indiana University; Ph.D., 1917, Stanford University. **Committees:** Electronics, 1936–37; Papers, 1940–45; Papers Review, 1946–52.

VAN ATTA, Lester C. (M'42—SM'43—F'52), Director, Technical Information and Education, Hughes Aircraft Company, Culver City, Calif.
Born: April 18, 1905, Portland, Ore. B.A., 1927, Reed College; M.S., 1929, Ph.D., 1931, Washington University. **Committees:** Antennas, 1945–48, *vice-chairman, 1948–49;* Antennas and Waveguides, 1949–51, *chairman, 1949–50, 1950–51;* Awards, 1953; Editorial Reviewer, 1954–59; Membership, 1953; Papers Review, 1951–53; Professional Groups, 1951–59, *vice-chairman, 1953;* Research, 1946–47, 1949–51; Standards, 1949–51. **Professional Groups:** Antennas and Propagation Administrative Committee, 1951–55, *chairman, 1949–50.* **Sections:** Los Angeles Section, *chairman, 1958–59.*

VAN DER POL, Balthasar (M'20—F'29)(L), Director, International Radio Consultative Committee (C.C.I.R.), Palais Wilson, Geneva, Switzerland. Retired. 10 Zydeweg, Wassenaar, Netherlands.
Born: January 27, 1889. D.Sc., 1919, Utrecht. **IRE Offices:** Vice President, 1934; Director, 1945. **Committees:** Electronics, 1936–41; Meetings and Papers, 1929; Wave Propagation, 1937–40. **Awards:** Honorary Member, Netherlands Radio Society, 1920; Knight, Order of the Orange Nassau, 1927; IRE Medal of Honor, 1935; Knight, Order of the Netherlands Lion, 1946; Member, Dutch Royal Society, 1946; Honorary President, Union Radio-Scientifique Internationale (U.R.S.I.), 1952; Valdemar Poulsen Gold Medal, Danish Academy of Technical Sciences, 1953; Doctor (honoris causa), Technical University, Warsaw, 1956; Corresponding member of the French Academy of Sciences, 1957; Honorary Doctorate of University of Geneva, Switzerland, 1959.

VAN DER ZIEL, Aldert (SM'49—F'56), Professor of Electrical Engineering, University of Minnesota, Minneapolis 14, Minn.
Born: December 12, 1910, Zandeweer, Groningen, Netherlands. B.A. (Physics and Math.), 1930, M.A. (Physics and Math.), 1933, Ph.D. (Physics and Math.), 1934, University of Groningen.

VAN DEUSEN, George L. (SM'46—F'58), Major General, U. S. Army, Retired. Consultant, RCA Institutes, Inc., 350 W. 4 St., New York 14, N.Y.
Born: February 10, 1888, Passaic, N.J. B.Sc., 1909, United States Military Academy; M.Sc., 1921, Yale University. **Committees:** Annual Review, 1950–52. **Awards:** Distinguished Service Medal, U. S. Army, 1946.

VAN DYCK, Arthur F. (IRE Charter Member) (A'12—M'18—F'25)(L), Retired. 516 Bougainvillea Lane, Vero Beach, Fla.
Born: May 20, 1891, Stuyvesant Falls, N.Y. Ph.B., 1911, Yale University. **IRE Offices:** President, 1942; Manager, 1930–32; Director, 1932–35, 1939–44. **Committees:** Admissions, 1930–34; 1937–40, 1943, *chairman, 1932–33, 1940, 1943;* Annual Review, 1937–39, 1943–44, *chairman, 1937–40;* Awards, 1934, 1940, 1952–53; Bibliography, 1930–32; Constitution and Laws, 1933–34, 1943; Executive, 1942–43, *chairman, 1942;* New York Program, 1934–35, 1939–40, *chairman, 1934;* Nominations, 1932, 1951; Papers, 1940; Papers Procurement, 1942–43; Public Relations, 1940–41, 1943–46, *chairman, 1941;* Registration of Engineers, 1940; Regular Papers, 1941; Research, 1946–47; Standards, 1933–36; Tellers, 1932–33, 1935, *chairman, 1935.* **IRE Representative:** ASA Sectional Committee (Z-17) on Preferred Numbers, 1936, 1939–55; ASA Sectional Committee (Z-67) on Standardization of Voltage—Preferred Voltages 100 Volts and Under, 1949–50; Wesleyan University, 1958–59. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940; Legion of Merit, 1946.

VAN DYKE, Karl S. (A'15—M'26—SM'43—F'44)(L), Professor of Physics, Wesleyan University, Scott Laboratory, Middletown, Conn.
Born: December 8, 1892, Brooklyn, N.Y. B.S., 1916, M.S., 1917, Wesleyan University; Ph.D., 1921, University of Chicago. **Committees:** Admissions, 1929; Annual Review, 1941, 1949–51; Board of Editors, 1933–40, 1947–53; Editorial Reviewer, 1957–59; Meetings and Papers, 1929–31, *chairman, 1929;* Membership, 1942–47; Papers, 1932–33, 1944–45; Papers Procurement, 1945–48; Papers Review, 1946; Piezoelectric Crystals, 1940–43, 1945–59, *chairman, 1940–42, 1949–51;* Standards, 1941, 1949–51. **Sections:** Connecticut Valley, *secretary-treasurer, 1927, chairman, 1934–35.* **IRE Representative:** Wesleyan University, 1955–57.

VARIAN, Russell H. (A'40—SM'51—F'52), Chairman, Board of Directors, Varian Associates, 611 Hansen Way, Palo Alto, Calif.
Born: April 24, 1898, Washington, D.C. A.B., 1925, M.A., 1927, Stanford University; Dr.Eng. (Honorary), 1943, Polytechnic Institute of Brooklyn. **Awards:** Fellow, American Physical Society; John Price Wetherill Medal, Franklin Institute, 1950.

VILLARD, Oswald G., Jr. (S'38—A'41—SM'51—F'57), Professor, Electrical Engineering, Stanford University, Stanford, Calif.
Born: September 17, 1916, Dobbs Ferry, N.Y. B.A., 1938, Yale University; E.E., 1943, Ph.D., 1949, Stanford University. **Committees:** Editorial Reviewer, 1955–59; Wave Propagation, 1959. **Sections:** Palo Alto Subsection, *chairman, 1952.* **Awards:** Outstanding Young Bay Area Engineer, Bay Area Engineers' Week Committee, 1955; IRE Morris Liebmann Memorial Prize, 1957.

VOGELMAN, Joseph H. (M'46—SM'49—F'59), Technical Director, Communications, Rome Air Development Center, U. S. Air Force, Griffiss Air Force Base, New York, N.Y.
Born: August 18, 1920, New York, N.Y. B.S., 1940, City College of New York; M.(E.E.), 1948, D.(E.E.)., 1957, Polytechnic Institute of Brooklyn. **Committees:** Admissions, 1954. **Professional Groups:** Communications Systems Papers Study and Procurement Committee, 1 year; Communications Systems Awards Committee. **Sections:** Rome, Subsection, *chairman, 1953.*

VOLLUM, Howard (SM'50—F'55), President, Tektronix, Inc., P.O. Box 831, Portland 7, Ore.
Born: May 31, 1913, Portland, Ore. B.A., 1936, Reed College; Sc.D. (Honorary), 1953, Portland University. **IRE Offices:** Director, 1955. **Sections:** Portland, *chairman, 1954–55.* **Awards:** Legion of Merit, 1945; Oak Leaf Cluster, 1946.

vonBAEYER, Hans J. (SM'53—F'59), Dr.Phil., RCAF Telecommunications, Systems Engineer in Chief, Department of National Defence, Canada, RCAF Headquarters, Ottawa, Ontario, Canada.
Born: August, 1912, Munich, Germany. Dr.Phil., 1935, University of Heidelberg, Germany.

WAIDELICH, Donald L. (S'37—A'39—SM'44—F'58), Professor of Electrical Engineering, University of Missouri, Columbia, Mo.
Born: May 3, 1915, Allentown, Pa. B.Sc.(E.E.), 1936, M.Sc., 1938, Lehigh University; Ph.D., 1946, Iowa State College. **Committees:** Education, 1952–57. **Awards:** Eta Kappa Nu Honorable Mention Award, 1946; Fulbright Award, U. S. Government, 1951–52; Fellow, American Institute of Electrical Engineers.

WALLACE, James D. (A'29—SM'44—F'59), Section Head, Communication Systems Section, Radio Division, Naval Research Laboratory, Washington 25, D.C.
Born: March 6, 1904, Gloster, Miss. B.A., 1925, M.A., 1927, University of Mississippi. **Professional Groups:** Chapter Activities Committee, *chairman, 1957–58;* Communication Systems Administrative Committee, 1957–60. **Sections:** Washington, *secretary, 1942; chairman, 1944.*

WALLACE, Robert L., Jr. (SM'53—F'56), Director of Solid State Electronics Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: February 21, 1916, Coolidge, Tex. B.A. (Physics), 1936, M.A. (Physics), 1939, University of Texas. **Committees:** Editorial Reviewer, 1954–59.

WANG, Chao Chen (A'43—SM'49—F'57), Department Head, Microwave Tube Research, Sperry Gyroscope Company, Great Neck L.I., N.Y.
Born October 20, 1914, Changchow, Kiangsu, China. B.S., 1936, Chiao-Tung University, Shanghai; S.M., 1938, Sc.D., 1940, Harvard University. **Committees:** Editorial Reviewer, 1955–59.

WARNECKE, Robert R. (SM'48—F'50), Director, Centre de Physique Electronique et Corpusculaire, Compagnie Generale de Telegraphie Sans Fil, Domaine de Corbeville, B.P. N° 10, Orsay, Seine et Oise, France.
Born: November, 1906, Tours, France. Doctor, 1933, University of Paris; D.Eng. (Honorary), 1958, Polytechnic Institute of Brooklyn. **Committees:** Electron Tubes, 1955–56, 1959. **Professional Groups:** *President, 1958,* Societe Française des Ingenieurs et Techniciens du Vide. **Awards:** Ancel Prize, French Society of Electricians, 1943; Henri Becquerel Prize, Academy of Sciences of Paris, 1945; Blondel Medal, 1951; D'Aumale Prize, Academy of Sciences of Paris, 1952; IRE Morris Liebmann Memorial Prize, 1954; Member, French Society of Physics; French Society of Electricians; Society of Radioelectricians (President of the "Microwaves Section," 1953–57).

WATANABE, Yasushi, Y. W. (SM'57—F'59), Doctor of Engineering, Department of Electrical Engineering, Tohoku University, 5 Sakurakoju, Sendai, Japan.
Born: November 15, 1896, Kuji-machi, Hitachi, Ibaraki Pref., Japan. B.S., 1921, Tokyo University; D.Eng., 1926, Tohoku University. **Awards:** Asano Memorial Prize, by Institution of Electrical Enginers of Japan, 1939; Prize Medal, by Institution of Communication Engineers of Japan, 1941.

WATKINS, Dean A. (A'47—M'48—S'49—A'51—SM'55—F'58), Professor, Stanford University, Stanford, Calif.; President, Watkins-Johnson Company, Palo Alto, Calif.
Born: October 23, 1922, Omaha, Neb. B.S., 1944, Iowa State College; M.Sc., 1947, California Institute of Technology; Ph.D., 1951, Stanford University. **Committees:** Editorial Reviewer, 1955–59; Electron Tube Research Conference; Technical Program Committee, 1955–57. **Awards:** IRE Seventh Region Achievement Award, 1957.

WATSON-WATT, Sir Robert (SM'46—F'47), Governing Director, Sir Robert Watson-Watt and Partners, Ltd., London, W. 1, England; President, Adalia, Inc., New York. P.O. Box 323, Thornhill, Ont., Canada.
Born: April 13, 1892. U.K., C.B. D.Sc. LL.D., **IRE Offices:** Vice President, 1950; Director, 1950. **Awards:** Presidential Medal for Merit, U. S., 1946; Valdemar Poulsen Gold Medal, Danish Academy of Technical Sciences, 1947; Hughes Medal of the Royal Society of London, 1948; Elliott Cresson Medal of the Franklin Institute, 1957; Fellow of the Royal Society.

WAYNICK, Arthur H. (A'43—SM'46—F'57), Professor and Head, Electrical Engineering Department, Director, Ionosphere Research Laboratory, Pennsylvania State University, University Park, Pa.; Program Director, Engineering Sciences, National Science Foundation, Washington, D.C.
Born: November 9, 1905, B.S., 1935, M.S., 1936, Wayne University; 1937–39, University of Michigan Electronics Institute and Cambridge University, England; ScD., 1943, Harvard University. **IRE Offices:** Director, 1959–60. **Committees:** Editorial Board, 1959; Nominations, 1959; Professional Groups, 1954; Wave Propagation, 1949–59. **Professional Groups:** Propagation, *chairman, 1952.* **IRE Representative:** National Bureau of Standard Technical Advisory Committee, 1958–59; U.S.A. Technical Program Committee, 12th URSI General Assembly, *chairman;* U.S.A. National Committee of URSI, *past chairman;* U.S.A. National Committee of URSI, *treasurer;* Journal of Geophysical Research, *associate editor.* **Awards:** Navy Ordnance Development Award, 1945; Office of Scientific Research and Development Award, 1945; Guggenheim Fellow, Cambridge University, England, 1954–55; Distinguished Alumni Award, Wayne State University, 1957.

WEBB, Richard C. (A'41—M'46—SM'56—F'58), President, Colorado Research Corporation, 4697 E. Evans Ave., Denver 22, Colo.
Born: September 2, 1915, Omaha, Neb. B.Sc.(E.E.), 1937, University of Denver; M.Sc.(E.E.), 1944, Ph.D., 1951, Purdue University. **Committees:** Editorial Reviewer, 1953–54. **Sections:** Denver, *vice-chairman, 1955–56; chairman, 1956–57.* **Awards:** RCA Laboratories Awards, 1947, 1949.

WEBBER, Stanley E. (S'42—A'43—SM'49—F'59), Manager, High Power Traveling Wave Tube Section, General Electric Microwave Laboratory, 601 California Ave., Palo Alto, Calif.
Born: June 8, 1919, Boston, Mass. B.S.(E.E.), 1941, M.S.(E.E.), 1942, Massachusetts Institute of Technology. **Committees:** Editorial Reviewer, 1955–59; Electron Tubes, 1956–59; Microwave Tube Subcommittee, 1950–56; Tube Research Conference Committee, 1953–56.

WEBER, Ernst (M'41—SM'43—F'51), President, Polytechnic Institute of Brooklyn, 99 Livingston St., Brooklyn 1, N.Y.; President, Polytechnic Research & Development Company, Inc., 202 Tillary St., Brooklyn 1, N.Y.
Born: September 6, 1901, Vienna, Austria. Dipl. Eng.(E.E.), 1924, Technical University, Vienna; Ph.D., 1926, University of Vienna; Sc.D., 1927, Technical University. **IRE Offices:** Director, 1952–59; Board of Directors, Chairman, 1959; President, 1959. **Committees:** Administrative Committee of Board of Editors, 1951; Annual Review, 1950–51; Appointments, 1959; Awards, 1952–54, *chairman, 1953–54;* Awards Coordination, 1958; Board of Editors, 1949–53; Circuits, 1949–53; Editorial Administrative, 1949–51; Education, 1944–51; Executive, 1957–58, *chairman, 1959;* Finance, 1952, 1959; Instruments and Measurements, 1948–52, *chairman, 1949–51;* Membership, 1941–48; National Convention, 1947, 1951; Nominations, 1959; Policy Advisory, 1952, 1956; Professional Groups, 1951–53, *vice-chairman, 1954–55, 1956,* Eastern Division, *vice-chairman, 1957–59;* Standards, 1949–59, *vice-chairman, 1951–54, chairman, 1954–56, (ex-officio), 1957–58, 1958–59.* **Professional Groups:** Measurements and Instrumentation, *chairman, 1950–52.* **IRE Representative:** ASA Standards Council, 1952–59; ASA Electrical Standards Board, 1955–59; ASA Acoustical Standards Board, 1958–59; ASA Sectional Committee (C16) on Radio, 1954–55, *chairman, 1957–59;* ASA Subcommittee (C42.6) on Electrical Instruments, 1952–55; C.C.I.R., Executive Committee on U. S. Delegation, 1958–59; National Academy of

Sciences-National Research Council, Advisory Board of the Office of Critical Tables, 1959; United States National Committee, International Electrotechnical Commission, Adviser on Electrical Measuring Instruments (alternate, 1952, 1958–59); United States National Committee, URSI, 1956–59; Joint Technical Advisory Committee, *vice-chairman, 1955–56, chairman, 1956–57;* ASA Sectional Committee (C42) on Definition of Electrical Terms, 1955; International Radio Consultative Committee, Executive Committee of U. S. Delegation, 1955–57; International Scientific Radio Union, URSI, Executive Committee, *alternate, 1955–56;* U. S. National Committee of the International Electrotechnical Commission, 1955–59. **Awards:** Fellow, American Institute of Electrical Engineers; Fellow, American Physical Society; Presidential Certificate of Merit, 1948.

WEBER, Joseph (S'44—M'46—SM'53—F'58), Professor of Electrical Engineering and Professor of Physics, University of Maryland, College Park, Md.
Born: May 17, 1919, Patterson, N.J. B.S., 1940, U. S. Naval Academy; Ph.D. (Physics), 1951, Catholic University of America. **Awards:** Scientific Achievement, Washington Academy of Sciences, 1958.

WEBSTER, Edward M. (A'30—M'38—SM'43—F'44), Telecommunications Consultant, 9518 E. Stanhope Rd., Kensington, Md.; Commodore, U. S. Coast Guard, Retired. Formerly, Commissioner, Federal Communications Commission.
Born: February 28, 1889, Washington, D.C. **IRE Offices:** Director, 1946. **Committees:** Membership, 1940; Public Relations, 1945–46. **Sections:** Washington, *secretary, 1940, chairman, 1942.* **Awards:** Legion of Merit, Marconi Memorial Medal, VWCA, 1950; Distinguished Service Award, Washington Section IRE, 1956.

WEEKS, Paul T. (A'19—M'28—SM'43—F'54)(L), Engineer, Receiving and Cathode Ray Tube Operations, Raytheon Manufacturing Company, 148 California St., Newton, Mass.
Born: November, 1890, Clarksfield, Ohio. A.B., 1913, Oberlin College; Ph.D., 1917, Cornell University. **Committees:** Annual Review, 1938–42; Electronics, 1936–42, *chairman, 1938–42;* Meetings and Papers, 1927–29; Papers, 1938–41; Regular Papers, 1941; Standards, 1938–42. **Awards:** Fellow, American Association for the Advancement of Science; Naval Ordnance Development Award, 1945.

WEIHE, Vernon I. (SM'45—F'58), Director, Air Traffic Navigation Control Programs, General Precision Equipment Corporation, 777 14 St., N.W., Washington 5, D.C.
Born: March 3, 1909, Louisville, Ky. B.Sc.(E.E.), 1931, Speed Scientific School, University of Louisville. **Professional Groups:** Administrative Committee, Aeronautical and Navigational Electronics, 1956–57. **Awards:** Collier Trophy, Award for Civilian Achievement, 1948.

WEIL, Joseph (M'37—SM'43—F'57), Dean, College of Engineering; Director, Engineering and Industrial Experiment Station; Professor, Electrical Engineering, University of Florida, Gainesville, Fla.
Born: July 19, 1897, Baltimore, Md. 1911–15, Baltimore Polytechnic Institute; B.S.E., 1918, The Johns Hopkins University; M.S., 1926, University of Pittsburgh. **Committees:** Fellow, 1958–59. **Awards:** Presidential Medal, Florida Engineering Society, 1940; Honorable Mention, Florida Engineering Society, 1944; Certificate of Service, Office of Scientific Research and Development, 1945; Naval Ordnance Department Award, 1946; Honorable Membership, Southeastern Metermen's Association, 1948; Distinguished Service Certificate, National Council of State Boards of Engineers, 1955; Outstanding Service Award, Florida Engineering Society, 1956.

WEIMER, Paul K. (A'43—SM'51—F'55), Research Engineer, RCA Laboratories Division, Princeton, N.J.
Born: November 5, 1914, Wabash, Ind. B.A., 1936, Manchester College; M.A., 1938, University of Kansas; Ph.D., 1942, Ohio State University. **Committees:** Editorial Reviewer, 1954–59. **Sections:** Princeton, *secretary, 1956, vice-chairman, 1957, chairman, 1958.* **Awards:** Television Broadcasters Association Award, 1946; Vladimir K. Zworykin Television Prize, 1959.

WEINBERGER, Julius (A'13—F'25)(L), Retired. Consulting Engineer, 6 Carrington Dr., East Northport, N.Y.
Born: July 22, 1893, New York, N.Y. B.S., 1913, College of the City of New York. **Committees:** Industrial Electronics, 1946–58; Meetings and Papers, 1929; Research, 1946–48. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1940.

WEIR, Irvin Reed (A'25—M'41—SM'43—F'49), Manager, Engineering Administration C and G.E. Department, General Electric Company, Syracuse, N.Y.
Born: September, 1897, Prairie Creek, Ind. B.S., 1921, E.E., 1932, Rose Polytechnic Institute. **Committees:** Annual Review, 1950–51; Antennas, 1944–45; Radio Transmitters, 1945–59; Transmitters, 1944–45.

WELCH, H. William, Jr. (A'47—SM'52—F'58), Director of Research and Development and Assistant Manager, Military Electronics, Division, Motorola, Inc., 8201 E. McDowell St., Phoenix, Ariz.
Born: October 21, 1920, Beardstown, Ill. B. A. (Physics), 1942, DePauw University; M.Sc. (Physics), 1949, Ph.D.(E.E.), 1952, University of Michigan. **Awards:** IRE Browder J. Thompson Memorial Prize, 1952.

WELDON, James O. (A'26—SM'46—F'54), President, Continental Electronics Manufacturing Company, 4212 S. Buckner Blvd., Dallas 27, Tex.
Born: March 15, 1905, Canton, Mo. **Committees:** Editorial Reviewer, 1955–59.

WELLS, Frank H. (A'39—SM'48—F'58), Principal Scientific Officer, United Kingdom Atomic Energy Authority, Atomic Energy Research Establishment, Harwell, Berkshire, England
Born: March, 1915, London, England. B.Sc. (Eng.), 1935, M.Sc. (Eng.), 1936, Imperial College of Science and Technology.

WELLS, Harry W. (M'36—SM'43—F'53), Chairman, Upper Atmosphere Section, Carnegie Institution of Washington, Department of Terrestrial Magnetism, 5241 Broad Branch Rd. Washington 15, D.C.
Born: January 13, 1907, Washington, D.C. B.S.(E.E.), 1928, E.E., 1937, University of Maryland. **IRE Offices:** Director, 1954–55. **Committees:** Annual Review, 1950–51; Awards, 1953, 1956–58; Nominations, 1955–57; Policy Advisory, 1955; Radio Wave Propagation and Utilization, 1945–48; Wave Propagation, 1949–52 *vice-chairman, 1949–52.* **Professional Groups:** Antennas and Propagation, Editor, 1951–52; United States National Committee URSI, *chairman.* **Sections:** Washington, *secretary, 1948, vice-chairman, 1949, chairman, 1949–50.* **IRE Representative:** National Research Council, Division of Engineering and Industrial Research; Member, U.S.A. National Committee for International Geophysical Year (ex-officio); National Bureau of Standards Technical Advisory Committee, 1958–59. **Awards:** Scientific Achievement, Washington Academy of Sciences, 1947.

WENDELL, Edward N. (A'26—M'33—SM'43—F'47), Retired. Marmion Way, Rockport, Mass.
Born: August 11, 1903, Rockport, Mass. B.Sc., 1925, Massachusetts Institute of Technology.

WENDT, Karl R. (A'36—SM'46—F'54), Chief Engineer, Communications and Radar, The Martin Company, Denver 1, Colo.
Born: January, 1906, Coshocton, Ohio. **Committees:** Papers Review, 1951–53. **Sections:** Buffalo-Niagara, *secretary-treasurer 1949–50, chairman, 1950–51.* **Awards:** Radio Corporation of America Laboratories Award, 1947.

WHEELER, Harold A. (A'27—M'28—F'35), Consulting Radio Physicist; President, Wheeler Laboratories, Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y.

Born: May 10, 1903, St. Paul, Minn. B.S. (Physics), 1925, George Washington University. **IRE Offices:** Director, 1934, 1940–45. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Annual Review, 1937, 1940–48; Awards, 1942–44, *chairman, 1943;* Bibliography, 1930–32; Board of Editors, 1940–53; Broadcast, 1935–38; Circuits, 1944–47; Editorial Administrative, 1949–52; Editorial Reviewer, 1954–59; Executive, 1943–44; Handbook, *chairman, 1945–48;* Meetings and Papers, 1929–30; Membership, 1941–42; New York Program, 1931; Nominations, 1948; Papers, 1931–33, 1935–39; Papers Procurement, 1942–44; Professional Recognition, 1947; Public Relations, 1940; Radio Receivers, 1936–37, *chairman, 1937–38;* Regular Papers, 1941; Special Papers, 1940–41; Standardization, 1931–32; Standards, 1932–33, 1936–49, *chairman, 1940–45;* Symbols, 1946–47. **Sections:** Long Island Subsection, *chairman, 1948–49.* **IRE Representative:** ASA Sectional Committee (C-42) on Definitions of Electrical Terms, 1948, 1950–51; National Television Systems Committee, *alternate, 1940–43.* **Awards:** Fellow, American Institute of Electrical Engineers; Fellow, Radio Club of America; Modern Pioneer Award, National Association of Manufacturers, 1940; IRE Morris Liebmann Memorial Prize, 1940; United States Navy Certificate of Commendation, 1947.

WHINNERY, John R. (A'41—SM'44—F'52), Professor, Chairman of Electrical Engineering, University of California, 231 Cory Hall, Berkeley 4, Calif.
Born: July 26, 1916, Read, Delta County, Colo. B.S., 1937, Ph.D., 1948, University of California. **IRE Offices:** Director, 1956, 1957–58. **Committees:** Antennas, 1948–49; Awards, 1952; Board of Editors, 1946–53; Editorial Reviewer, 1954–59; Education, 1956–58; Handbook, 1945–48; Nominations, 1957–58; Papers, 1944–45; Papers Procurement, 1947–50; Policy Advisory, 1958. **Sections:** San Francisco, *secretary-treasurer, 1949–50, vice-chairman, 1950–51, chairman, 1953–54.*

WHITE, Edwin L. (A'24—M'31—SM'43—F'55), Retired. Colonel, United States Air Force; Consulting Engineer, 460 Coffee Pot Riviera, St. Petersburg 4, Fla.
Born: July 5, 1896, Valley City, N.D. B.A., 1922, M.S., 1925, George Washington University. **Committees:** Administrative PGVC, 1950-56. **Sections:** Florida West Coast Section, *chairman, 1956–57.* **Awards:** Bronze Star; Fellow, American Institute of Electrical Engineers, 1947.

WHITE, Warren D. (A'47—SM'48—F'57), Engineering Consultant, Airborne Instruments Laboratory, 160 Old Country Rd., Mineola, L.I., N.Y.
Born: July 7, 1915, Springfield, Mo. B.S., 1936, Drury College; B.S.(E.E.), 1938, Missouri School of Mines and Metallurgy. **Committees:** Editorial Reviewer, 1954–59; Frequency Modulation, 1942–46; Radio Wave Propagation, 1942–46; Transmitters and Antennas, 1942–45. **Professional Groups:** Information Theory, Administrative Committee, 1952–57.

WHITE, William C. (A'15—M'25—F'40)(L), Retired. 1422 Lowell Rd., Schenectady 8, N.Y.
Born: March 24, 1890, Brooklyn, N.Y. E.E., 1912, Columbia University. **IRE Offices:** Treasurer, 1946; Director, 1943–47. **Committees:** Awards, 1944–46, *chairman, 1945;* Bibliography, 1930–32; Board of Editors, 1930, 1944, 1946–53; Education, 1945–46; Executive, *vice-chairman, 1946;* Investments, *chairman, 1946;* Meetings and Papers, 1928–30; Membership, 1947, 1949–54, *chairman, 1953–54;* Nominations, 1933, 1940, 1944–46; Office Practices, 1947; Papers, 1931–44; Papers Procurement, 1944–50; Professional Recognition, *chairman, 1947;* Standardization, 1925–26, 1929–30; Vacuum Tubes, 1927–28. **IRE Representative:** National Electronics Conference, Board of Directors, 1947–50.

WHITTEMORE Laurens E. (A'16—M'25—F'27)(L), 31 Martindale Rd., Short Hills, N.J.
Born: August 20, 1892, Topeka, Kan. A.B., 1914, Washburn, College; M.A., 1915, University of Kansas. **IRE Offices:** Vice President, 1928; Manager, 1926–27, 1929; Director, 1928, 1935–37. **Committees:** Administrative Committee of the Board of Editors, 1951–53; Annual Review, 1927–40, *chairman, 1940–53;* Awards, 1937, 1948; Bibliography, 1930–32; Board of Editors, 1929–53; Broadcast, 1933–34, 1953; Direction Finding Terminology, *chairman, 1924–25;* Editorial Administrative, 1946–53; Electroacoustic Devices, 1927–28; History, 1956–59; Institute Sections, *chairman, 1926;* Meetings and Papers, 1929; Membership, *chairman, 1925;* Standardization, 1920–32, *chairman, 1926–29;* Standards, 1932–35, 1944–52, Symbols, *chairman, 1944–45;* Tellers, 1934. **IRE Representative:** ASA Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1939; ASA Sectional Committee on Radio, 1930, 1936, 1939–48; ASA Sectional Committee on Radio Electrical Co-ordination, 1936, 1939–46; ASA Sectional Committee on Standards for Drawings and Drafting Room Practices, 1930, 1936, 1939; ASA Subcommittee on Electrical Abbreviations, Including Radio, 1930; United States National Committee—Advisors on Symbols, 1936, 1939–51.

WIESNER, Jerome B. (S'36—A'40—SM'48—F'52), Professor and Director, Research Laboratory of Electronics, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 39, Mass.
Born: May 30, 1915, Detroit, Mich. B.S., 1937, M.S., 1938, Ph.D., 1950, University of Michigan. **Committees:** Awards, 1954–55; Board of Editors, 1949–53; Editorial Reviewer, 1954–59; Modulation Systems, 1949–50; Nuclear Studies, 1948–49; Professional Groups, 1955; Research, 1949–50. **IRE Representative:** National Bureau of Standards Technical Advisory Committee, 1958–59.

WILKINS, Arnold F. (A'30—SM'48—F'58), Senior Principal Scientific Officer, Department of Scientific and Industrial Research, Radio Research Station, Ditton Park, Slough, Buckinghamshire, England.
Born: February 20, 1907, Manchester, England. M.Sc.(Tech), 1928, University of Manchester. **Awards:** Officer of the Order of the British Empire, 1942.

WILLIAMS, Albert J., Jr. (A'30—VA'39—SM'49—F'55), Science Advisor, Leeds & Northrup Company, 4901 Stenton Ave., Philadelphia 44, Pa.
Born: February 28, 1903, Media, Pa. B.A.(E.E.), 1924, Swarthmore College. **Awards:** John Price Wetherill Medal, Franklin Institute, 1952.

WILLIAMS, Charles E. (J'15—A'17—M'24—SM'43—F'52), Retired. 2207 Broadway N., Seattle 2, Wash.
Born: March 15, 1896, Seattle, Wash. **Committees:** Sections, 1925; Standardization, 1929–30. **Sections:** Seattle, *secretary, 1920–24, 1935–36, chairman, 1925–26.*

WILLIAMS, Everard M. (S'36—A'41—SM'44—F'54), Professor and Head, Electrical Engineering, Carnegie Institute of Technology, Schenley Park, Pittsburgh 13, Pa.
Born: February 2, 1915, New Haven, Conn. B.E., 1936, Ph.D., 1939, Yale University. **Committees:** Awards, 1956–57, *chairman, 1958;* Awards Coordination, 1959; Sections, 1947–48. **Sections:** Pittsburgh, *chairman, 1947.* **IRE Representative:** Carnegie Institute of Technology, 1946–51. **Awards:** Presidential Certificate of Merit for Outstanding Civilian Service in World War II; Eta Kappa Nu Award, 1946.

WILLIAMS, Frederic C. (SM'54—F'57), Edward Stocks Massey Professor, Electrical Engineering, University of Manchester, Sandy Lane, Romiley, Cheshire, England.
Born: June, 1911, Romiley, Cheshire, England. B.Sc., 1932, M.Sc., 1933, D.Sc., 1939, Manchester University, England; D.Phil., 1936, Oxford University. **Awards:** Order of the British Empire, 1945; Fellow, The Royal Society, England, 1950; Benjamin Franklin Medal, 1957.

WILLIAMS, Samuel B. (A'47—SM'53—F'57), Consulting Electrical Engineer, 3701 Taylor St., Chevy Chase 15, Md.
Born: May 26, 1881, Dayton, Ohio. M.E.(E.E.), 1905, Ohio State University. **Committees:** Feedback Control Systems, 1959.

WILLIAMSON, Raymond H. (A'31—M'44—SM'46—F'51), Manager, Engineering Administration, Communication Prod-

ucts Department, General Electric Company, Lynchburg, Va. Born: April 6, 1907, Eagle Grove, Iowa. B.S.(E.E.), 1928, Iowa State College; M.S.(E.E.), 1935, Union College. **Committees:** Membership, 1945–56; Papers Procurement, 1947–50. **Sections:** Syracuse, *vice-chairman, 1948–49; chairman, 1949–50.*

WILMOTTE, Raymond M. (M'29—F'38), Consulting Engineer and President, Raymond M. Wilmotte, Inc., P.O. Box 397, Kendall Branch Post Office, Miami, Fla.
Born: August 13, 1901, Paris, France. M.A., 1921, Sc.D., 1958, Cambridge University, England. **Committees:** Handbook, 1945–47; Industrial Electronics, 1947–48; New York Program, 1933; Papers, 1932–33; Papers Review, 1946–52; Radio Receivers, 1940–47; Radio Transmitters and Antennas, 1929–30; Sections, 1932; Standardization, 1931; Standards, 1932. **Awards:** Premium for Research, Institution of Electrical Engineers, 1930; Bureau of Ordnance Development Award, 1945.

WILSON, James R. (M'31—SM'43—F'54), Assistant Vice President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: December 17, 1894, Spokane, Wash. B.A., 1919, Reed College; M.S., 1920, California Institute of Technology; M.S., 1923, Columbia University. **Committees:** Electronics, 1939–46. **Professional Groups:** Electron Devices; Reliability and Quality Control.

WING, Arthur K., Jr. (J'28—A'30—M'40—SM'43—F'57), Director, Electron Tube Laboratory, International Telephone & Telegraph Laboratories, 500 Washington Ave., Nutley 10, N.J.
Born: July 1, 1908, New York, N.Y. B.S.(E.E.), 1930, Yale University; M.S.(E.E.), 1931, Massachusetts Institute of Technology. **Committees:** Tellers, 1953. **Professional Groups:** New York, *chairman,* Electron Devices, *1955–56;* General Committee, 2nd Annual Technical Meeting, Electron Devices, *secretary, 1956;* General Committee, 3rd Annual Technical Meeting, Electron Devices, *chairman, 1957;* Administrative Committee, 1955–58, 1959–61; Administrative Committee, *secretary-treasurer, 1958–59.* 7.1 Subcommittee on Tubes in which Transit Time is Not Essential.

WINTER, David F. (SM'50—F'58), Chief Engineer, Vice President and Director of Research, Moloney Electric Company, 5390 Bircher St., St. Louis, Mo.
Born: November, 1920, St. Louis, Mo. B.S.(E.E.), 1942, Washington University; M.Sc., 1948, Massachusetts Institute of Technology.

WINTRINGHAM, William T. (A'26—SM'45—F'51), Engineer-in-Charge of Visual Systems Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: January 18, 1904, Brooklyn, N.Y. B.S.(E.C.E.), 1924, Harvard University. **Committees:** Papers Review, 1948–49; Standards, 1957–59; Television Systems, 1953–59, *vice-chairman, 1954–55, chairman, 1955–57.* **Sections:** New York, *treasurer, 1949–50.*

WOLCOTT, C. Frederick, Jr. (J'26—A'28—M'36—SM'43—F'57), Technical Consultant, Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
Born: January 11, 1907, Anderson, Ind. Northwestern University. **IRE Offices:** Director, 1956–57. **Committees:** Appointments, 1957–58; Nominations, 1956; Policy Advisory, 1956, *chairman, 1957;* Receivers, 1946–49. **Sections:** Los Angeles, *secretary, 1941, chairman, 1942;* Nominating Committee, *chairman, 1951;* Sections, Relations Committee, *chairman, 1954–56;* Fellow Nominating Committee, *chairman, 1958.* **IRE Representative:** Liaison Officer, IRE-WEMA West Coast Convention, 1948; Registration, *chairman,* West Coast Convention, 1950; Advisory Group, WESCON, *chairman, 1953;* WESCON Convention, *vice-chairman, 1954;* WESCON, Board of Directors, *chairman, 1956.*

WOLFF, Irving G. (A'27—VA'39—F'42), Vice President, Research, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: July, 1894, New York, N.Y. B.S., 1916, Dartmouth College; Ph.D., 1923, Cornell University. **IRE Offices:** Director, 1952–53. **Committees:** Appointments, 1952; Awards, 1954–56; *chairman, 1955;* Awards Coordination, 1958–59; Board of Editors, 1946–53; Editorial Reviewer, 1954–59; Education, 1945–46, 1948–52; Electroacoustic Devices, 1920–30; Electronics, 1943–46; Meetings and Papers, 1928–30; Nominations, 1952–54; Papers, 1931–45; Sections, 1937, 1953, *chairman, 1953;* Standardization, 1927–30; Use of Transmission Unit, 1928–29. **Sections:** Philadelphia, *chairman, 1936–37.* **IRE Representative:** ASA Sectional Committee on Acoustical Measurements and Terminology, 1936, 1939. **Awards:** Distinguished Public Service Award, United States Navy, 1949.

WOOLDRIDGE, Dean E. (SM'50—F'54), President, Ramo-Wooldridge Corporation, 5500 W. El Segundo Blvd., Los Angeles 45, Calif.
Born: May 30, 1913, Chickasha, Okla. B.A., 1932, M.S., 1933, University of Oklahoma; Ph.D. (Physics), 1936, California Institute of Technology. **Awards:** National Research Fellowship, California Institute of Technology, 1936; Citation of Honor Award for Outstanding Achievements in Field of Electronic Research and Development, Air Force Association, 1950; Raymond E. Hackett Award, 1955.

WOOLVERTON, Robert B. (A'13—M'13—F'15)(L), Retired. Colonel, United States Army, 654 12 Ave., San Francisco 18, Calif.
Born: September 22, 1884, Greensboro, Pa. B.S., 1912, Harvard University. **Committees:** Increase of Membership, 1914; Papers, 1915; Publicity, 1915–19. **Sections:** San Francisco, *chairman, 1915.*

WOONTON, Garnet A. (A'40—SM'44—F'51), Macdonald Professor of Physics; Director, Eaton Electronics Research Laboratory; Chairman, Department of Physics, McGill University, Montreal, P.Q., Canada.
Born: July, 1906, London, Ont., Canada. B.A., 1925, M.A., 1931, D.Sc., 1955, University of Western Ontario. **Committees:** Education, 1945–46. **Sections:** London, *chairman, 1945.* **IRE Representative:** University of Western Ontario, 1941–47. **Awards:** Fellow, Royal Society of Canada; International Vice President, URSI.

WRIGHT, Jay W. (A'42—SM'44—F'58), President, Radio Service Corporation of Utah, Station KSL-KSL-TV, 145 Social Hall Ave., Salt Lake City 11, Utah.
Born: November, 1909, Salt Lake City, Utah. A.B. (Physics), 1935, M.Sc. (Physics), 1936, University of Utah. **Committees:** Antennas, 1946–49; Constitution and Laws, 1940–41; Frequency Modulation, 1946–47; Modulation Systems, 1947–48; Papers, 1942–45; Papers Review, 1946–50; Radio Wave Propagation and Utilization, 1946–49; Wave Propagation, 1949–56. **Awards:** Navy Department Certificate of Appreciation, War Department, 1948.

WYCKOFF, Ralph D. (M'29—SM'43—F'55), Director, Instrument Development Division, Gulf Research & Development Company, P.O. Box 2038, Pittsburgh 30, Pa.
Born: December 10, 1897, Jacobsville, Mich. B.S.(E.E.), 1920, Michigan State. **Sections:** Pittsburgh, *chairman, 1935–36.* **Awards:** OSRD Certificate of Appreciation, 1945; War and Navy Departments' OSRD Certificates of Appreciation, 1946.

YAGI, Hidetsugu (F'53), President, Musashi College of Technology, Todoroki 1, Setagayaku, Tokyo, Japan.
Born: January 28, 1886, Osaka, Japan. M.Eng., 1909, Tokyo University; Dr.Eng., 1919, Tohoku University. **Committees:** Meetings and Papers, 1929; Standardization, 1927–31. **Sections:** Tokyo, *chairman, 1956.*

YOUNG, Charles J. (A'35—SM'45—F'53), Associate Laboratory Director, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: December 17, 1899, Cambridge, Mass. B.A., 1921, Harvard University. **Committees:** Annual Review, 1944–47; Board of Editors, 1941–46; Facsimile, 1939–46, 1948–56, *chairman, 1944–47, 1949–50, vice-chairman, 1948–51;* Papers Procurement, 1947; Standards, 1944–47; Television and Facsimile, 1936–39. **Awards:** Modern Pioneer Award, National Association of Manufacturers, 1946.

YOUNG, Leo C. (A'19—M'29—SM'43—F'43)(L), Consultant, Naval Research Laboratory, Washington 25, D.C.
Born: January 12, 1891, Danville, Ill. **Sections:** Washington, *secretary, 1938–39, chairman, 1940.* **Awards:** Presidential Certificate of Merit, 1946; Stuart Ballentine Medal, 1957; Distinguished Civilian Service, 1958.

ZADEH, Lotfi A. (S'45—A'47—M'50—SM'56—F'58), Professor of Electrical Engineering, Columbia University, New York 27, N.Y.
Born: February 4, 1921, Baku, Russia. B.S., 1942, University of Teheran; M.S., 1946, Massachusetts Institute of Technology; Ph.D., 1949, Columbia University. **Committees:** Editorial Reviewer, 1954–59. **Professional Groups:** Administrative Committee, Circuit Theory, 1954–57; Administrative Committee, Information Theory, 1958–.

ZAHL, Harold A. (A'39—SM'46—F'50), Director of Research, U. S. Army Signal Research & Development Laboratory, Fort Monmouth, N.J.
Born: August, 1904, Chatsworth, Ill. A.B., 1927, North Central College; M.S., 1929, Ph.D., 1931, State University of Iowa. **IRE Offices:** Director, 1949. **Committees:** Administrative Committee on the Board of Editors, 1951–53; Awards, 1956–58; Awards Coordination, *chairman, 1959;* Board of Editors, 1951–53; Editorial Administrative, 1949–53; Electroacoustics, 1936–37; Electronics, 1943–44. **Awards:** Legion of Merit, Department of the Army, 1945; IRE Harry Diamond Memorial Award, 1954.

ZENNECK, Jonathan A. W. (F'48)(L), Professor, Retired. Althegnenberg, Uber Mering 13B, Germany.
Born: April 15, 1871, Ruppertshofen, Wuerttemberg, Germany. D.Sc., 1894, University of Tuebingen, Germany; Dr.Ing. (Honorary), Institute of Technology, Dresden, 1928. **IRE Offices:** Vice President, 1933, Director, 1933. **Committees:** Standardization, 1915–18, 1927–28. **Awards:** Member, Bavarian Academy of Science, 1917; Gold Medal, Heinrich Hertz Gesellschaft, 1926; Medal of Honor, 1928; Goethe Medal for Art and Science, German Government, 1932; Gauss-Weber Medal, University of Goettingen, 1933; Member, German Aeronautical Academy, 1938; Honorary Member, German Physical Society, 1941; Honorary Member, German Society for Applied Physics, 1941; Corresponding Member, Academy of Science, Goettingen, 1941; Siemens-Stephan Memorial Plate, German Society of Electrical Engineers, 1943; Gold Medal, The City of Munich, 1946; Grashof Medal, Society of German Engineers, 1949; President, Union of German Physical Societies, 1950; Honorary Citizen, Institute of Technology, Stuttgart and Karlsruhe, 1951; Grosses Verdienstkreuz des deutschen Verdienstordens, 1952; Honorary President, Deutsches Museum, 1953; Ehrenkunde des Verbands deutschen Elektrotechniker, 1954.

ZOTTU, Paul D. (A'31—M'38—SM'43—F'44), President, Consulting Engineer, Industron Corporation, 55 Needham St., Newton Highlands 61, Mass.
Born: March 22, 1906, Bucharest, Roumania. B.A., 1931, Wesleyan University. **Committees:** Annual Review, 1945–46; Board of Editors, 1943; Industrial Electronics, 1945–47, *chairman, 1945–46;* Membership, 1947–48; Papers Procurement, 1946; Standards, 1945–46. **Awards:** Hyat Award, Plastics Industry.

ZWORYKIN, Vladimir K. (M'30—F'38), Honorary Vice President, Radio Corporation of America; Technical Consultant, RCA Laboratories, David Sarnoff Research Center, Radio Corporation of America, Princeton, N.J.
Born: July, 1889, Mourom, Russia. E.E., 1912, Petrograd Institute of Technology; Student Coll. de France, Paris, 1912–14; Ph.D., 1926, University of Pittsburgh; D.Sc., 1938, Polytechnic Institute of Brooklyn. **Committees:** Board of Editors, 1944–53; Medical Electronics, 1955–56. **Awards:** IRE Morris Liebmann Memorial Prize, 1934; Overseas Award, British Institution of Electrical Engineers, 1939; Modern Pioneer Award, National Association of Manufacturers, 1940; Rumford Medal, American Academy of Arts and Sciences, 1941; War Department Certificate of Appreciation, 1945; Howard N. Potts Medal, Franklin Institute, 1947; United States Navy Certificate of Commendation, 1947; Presidential Certificate of Merit, 1948; Lamme Award, 1948; Gold Medal of Achievement, Poor Richard Club, 1949; IRE Medal of Honor, 1951; Society of Motion Picture and Television Engineer Progress Medal Award, 1951; AIEE Edison Medal, 1952; Fellow, American Institute of Electrical Engineers; Fellow, American Physical Society; Fellow, American Association for the Advancement of Science; Charter Member, Electron Microscope Society of America; Fellow, National Academy of Sciences of U.S.A.; Fellow, American Philosophical Society; Chevalier Cross, French Legion of Honor; Officer of French Academy of Science; the New York Academy of Sciences; Affiliate Member of the Rockefeller Institute for Medical Research.

MEMBERSHIP ROSTER

The following list gives, in alphabetical order, the names of all members except those of student grade, as of May 31, 1959

A

AAGAARD, JAMES S. (S'48-A'53-M'57), Asst. Prof., Elec. Engrg., Northwestern Univ., Technological Institute, Evanston, Ill.

AALAND, KRIS (S'53-M'56), Elec. Engr., Univ. of California Radiation Lab., Livermore, Calif.

AALTONEN, TIM K. (S'49-A'53), Design & Project Engr., Panoramic Radio Prod., Inc., 10 S. 2nd Ave., Mt. Vernon, N.Y.

AARON, BERTRAM D. (S'40-A'45-M'48-SM'54), Engrg. Sales Consultant, Bomac Labs., Inc., Beverly, Mass.

AARON, M. ROBERT (S'49-A'52-M'57), Mem. Tech. Staff, Bell Tel. Labs., Murray Hill, N.J.

AARONS, JULES (S'44-A'51-M'58), Physicist, Propagation Lab., Cambridge Research Center, Hanscom Field, Bedford, Mass.

AARONSON, DAVID A. (S'46-A'53), Mem. Tech. Staff, Bell Tel. Labs., Murray Hill, N.J.

AARONSON, GERALD (S'56-M'59), Mem. Tech. Staff, RCA Surface Communications Systems Lab., 75 Varick St., New York 13, N.Y.

AAS, EUGENE A. (A'47-SM'55), Staff Mem., Sandia Corp., Livermore, Calif.

AAS, HERBERT G. (S'50-A'51-M'56), Elec. Engr., Research Dept., United Aircraft, 400 Main St., East Hartford, Conn.

AASEN, CURTIS L. (S'50-A'51-M'58), Electronics Engr., Hors. USMC, Washington 25, D.C.

AASEN, MARVIN D. (M'56), Dev. Engr., Westinghouse Elec. Corp., Friendship Internatl. Airport, Baltimore 3, Md.

AASGAARD, PER U. (M'54), Quality Control Supt., Canadian Marconi Co., 2442 Trenton Ave., Montreal 16, P.Q., Canada.

AASTERUD, JON P. (S'57-M'59), Electronics Engr., Motorola, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.

ABADERASH, TESSEMA K. W. (S'56-A'57), Instr., Elec. Engrg., Imperial Ethiopian Air Force, Box 1636, Addis Ababa, Ethiopia.

ABAJIAN, HENRY B. (M'46), Pres., Westbury Electronics, Inc., 300 Shames Dr., Westbury, L.I., N.Y.

ABASCAL, NESTOR (M'47), Engr., Servomechanisms, Inc., 1000 W. El Segundo Blvd., Hawthorne, Calif.

ABATE, ANTHONY (M'45), Plant Mgr., Melpar, Inc., 11 Galen St., Watertown 72, Mass.

ABATE, JOHN E., (M'56), Project Engr., Astronautics, Kearfott Co., Main St., Clifton, N.J.

ABBASI, ASLAM (S'57-A'58), 225-B N. 34 St., Milwaukee 8, Wis.

ABBE, RYUKEN (A'54), Radio Engr., Toyo Com. Equipment Co., Ltd., 3-484 Tsukagoshi, Kawasaki, Japan.

ABBENANTE, NICHOLAS (M'57), Mech. Engr., Raytheon Mfg. Co., Wayland, Mass.

ABBEY, CHARLES R. (S'54-M'58), Project Engr., Collins Radio Co., 2700 W. Olive Ave., Burbank, Calif.

ABBEY, GEORGE W. S. (M'59), Lt., USAF, Air Force Institute of Technology, Wright-Patterson AFB, Ohio.

ABBEY, KIRK (A'46-M'55-SM'56), Research Group Engr. Convair, San Diego 12, Calif.

ABBITT, CHARLES W. (A'50-M'55), Lt. Col., USAF, Range Plans Branch, Patrick AFB, Fla.

ABBOT, EDWARD A. (A'57-SM'58), Chief Engr., Ferrotran Electronics Co., Inc., 693 Broadway, New York 12, N.Y.

ABBOTT, CLAUDE C. (M'56), Sr. Engr., Test Instrumentation, Lockheed Missile & Space Div., Palo Alto, Calif.

ABBOTT, GEORGE F., JR. (M'56), Mem. Tech. Staff, Bell Tel. Labs., Murray Hill, N.J.

ABBOTT, HENRY H. (SM'57), Special Systems Dev. Engr., Bell Tel. Labs., Murray Hill, N.J.

ABBOTT, JAMES D. (M'59), Field Engr., Western Electric Co., Chatham Rd., Winston-Salem, N.C.

ABBOTT, JOHN R. (S'55-M'56), Research Engr., Hughes Aircraft Co., Culver City, Calif.

ABBOTT, RICHARD B. (A'58), Sales Mgr., Western Gear Corp., 132 W. Colorado, Pasadena 1, Calif.

ABBOTT, WILTON R. (M'45-SM'46), Mgr. XA System Integration, Lockheed Missiles & Space Div., Palo Alto, Calif.

ABBOUD, FUAD L. (S'50-A'52), Sr. Engr., Sylvania Home Electronics Div., Batavia, N.Y.

ABD-EL-AZIZ, MOHAMED EZZAT (M'59), Lecturer, Faculty of Engrg., Ain-Shams Univ., Cairo, Abbasiah, Egypt.

ABDUN-NABI, ZAKI (S'50-A'52-M'57), Elec. Engr., Epsco, Inc., 588 Commonwealth Ave., Boston, Mass.

ABEL, ADAM E. (A'41-SM'45), Genl. Mgr., Bendix Radio Div., E. Joppa Rd., Baltimore 4, Md.

ABEL, ALAN O. (A'55-M'56), Sales Engr., Genl. Radio Co., 1000 N. Seward St., Los Angeles 38, Calif.

ABEL, CHARLES F. (A'44), Chief Engr., Marietta Broadcasting Inc., 1405 S Ave., San Diego 1, Calif.

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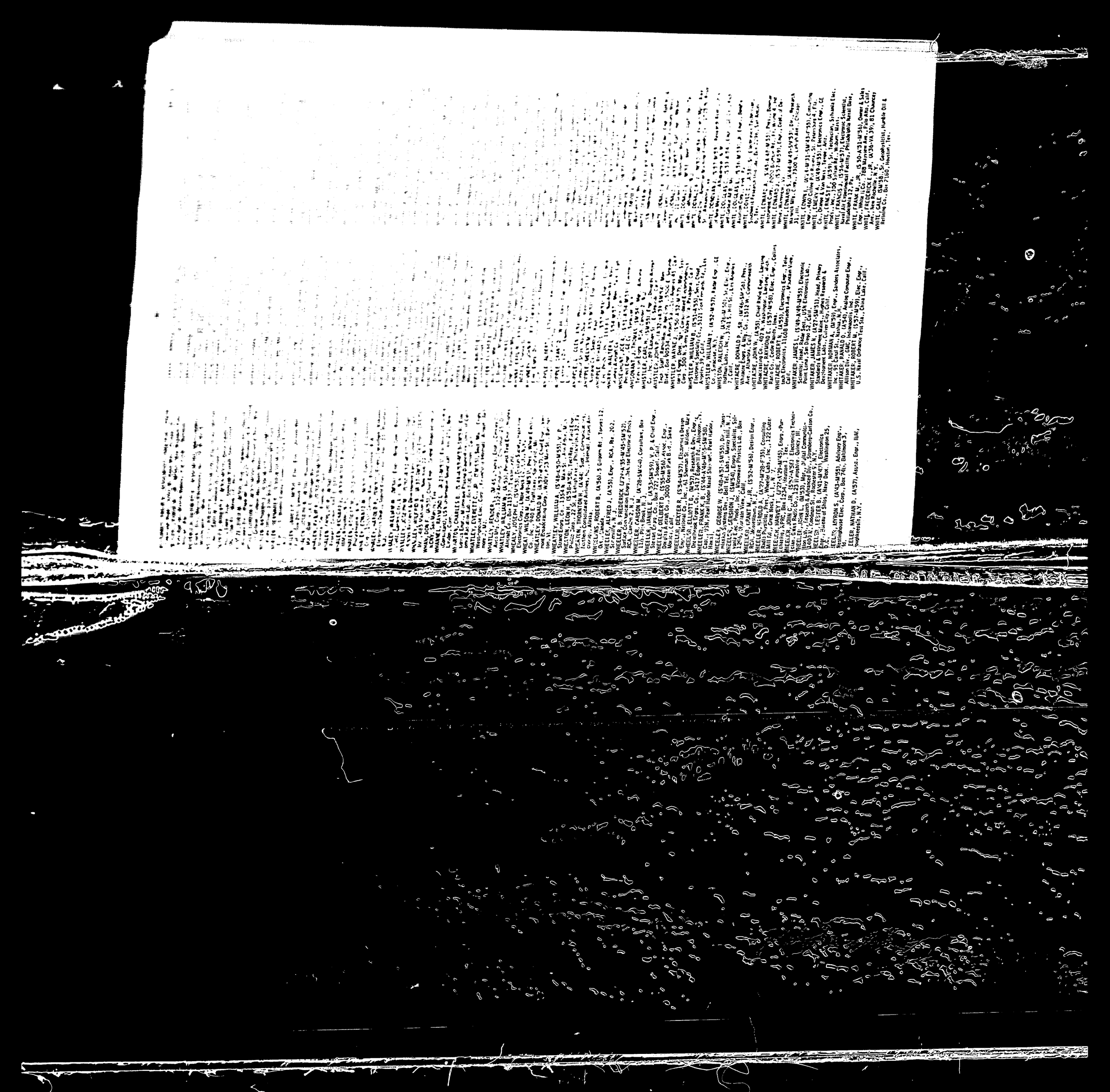

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BAY8 – Bay of Quinte
BI1 – Binghamton
BNI – Buffalo-Niagara
BOS1 – Boston
BP6 – Beaumont-Port Arthur
CF6 – Central Florida
CHI5 – Chicago
CIN4 – Cincinnati
CL4 – Cleveland
CL7 – China Lake
CO – Colombia
COL4 – Columbus
CP4 – Central Pennsylvania
CR5 – Cedar Rapids
CV1 – Connecticut Valley
DAL6 – Dallas
DAY4 – Dayton
DEN6 – Denver
DET4 – Detroit
EC1 – Elmira-Corning
EG – Egypt
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EO5 – Evansville-Owensboro
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IS – Israel
ITH1 – Ithaca
KC6 – Kansas City
LA7 – Los Angeles
LI2 – Long Island
LON8 – London
LOU5 – Louisville
LR6 – Little Rock
LUB6 – Lubbock
MI3 – Miami
MIL5 – Milwaukee
MON8 – Montreal
NAL8 – North Alberta
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NO6 – New Orleans
NWF3 – Northwest Florida
NY2 – New York
OC6 – Oklahoma City
OL5 – Omaha-Lincoln
ORL3 – Orlando
OT8 – Ottawa
PHI3 – Philadelphia
PHO7 – Phoenix
PIT4 – Pittsburgh
POR7 – Portland
PR12 – Princeton
QUE8 – Quebec
REG8 – Regina
ROC1 – Rochester
RUT1 – Rome-Utica
SA6 – San Antonio
SAC7 – Sacramento
SAL5 – South Alberta
SBM5 – South Bend-Mishawaka
SC4 – South Carolina
SCH1 – Schenectady
SD7 – San Diego
SEA7 – Seattle
SF7 – San Francisco
SHR6 – Shreveport
SL6 – Saint Louis
SLC7 – Salt Lake City
SY1 – Syracuse
TC5 – Twin Cities
TOK – Tokyo
TOL4 – Toledo
TOR8 – Toronto
TUC7 – Tucson
TUL6 – Tulsa
VA1 – Virginia
VAN8 – Vancouver
WA3 – Washington, DC
WIL4 – Williamsport
WIN8 – Winnipeg
WMA1 – Western Massachusetts
WMI4 – Western Michigan

UNITED STATES

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Frishman, M. A. (M)
Frost, W. D. (SM)
Garrison, J. P. (M)
Gassen, J. A. (M)
Gibson, M. (M)
Goff, H. B. (M)
Golden, H. (M)
Gourley, R. T. (A)
Graham, A. S. (A)
Gravlee, G. P. (M)
Green, O. C. (M)
Greenwood, T. L. (SM)
Gregory, L. C. (M)
Grivet, P. E. (M)
Haag, S. J. (SM)
Hallowes, J. P., Jr. (M)
Hammond, R. L. (A)
Haraway, R. C. (M)
Harper, J. W. (M)
Harris, G. G., Jr. (M)
Hartman, C. J. (M)
Haughey, J. W. (A)
Hirschler, O. H. (M)
Hoberg, O. A. (A)
Hobbs, F. G. (SM)
Hood, F. G. (SM)
Holeman, J. L. (M)
Holmes, G. F., Jr. (M)
Horn, H. J. (M)
Hosenthien, H. H. (M)
Howell, J. E., Jr. (A)
Huff, W. A. (M)
Jackson, C. M. (M)
Jarvis, J. W. (A)
Johnston, S. L. (SM)
Jones, C. H. (M)
Justus, J. R. (A)
Katter, O. E., Jr. (M)
Keeffe, T. A. (A)
Kellett, B. E. (M)
King, J. J. (A)
King, O. B. (M)
Lacker, H. F. (M)
Lakebrink, R. T. (M)
Landwehr, G. O. (M)
Lee, C. E. (M)
Lee, R. H. (M)
Lindberg, W. J. (M)
Loeb, W. S. (M)
Lowery, H. R. (M)
Malcolm, W. W. (M)
McGredc, A. D. (M)
Meador, D. X. (M)
Milbie, R. W. (A)
Miller, A. H. (M)
Miller, P. T. (M)
Moore, R. L. (M)
Morris, J. K. (M)
Murray, L. B., Jr. (A)
Muse, A. W. Jr. (M)
Norman, J. E. (M)
Otto, W. F. (M)
Parker, C. W. (M)
Paul, C. H. (A)
Paul, T. T., Jr. (M)
Peigler, F. K. (A)
Perry, B. A. (SM)
Perry, H. T. (SM)
Pittman, W. C. (M)
Reid, H. (M)
Reinbolt, E. J. (M)
Ritterhouse, C. L. (M)
Robinson, W. J., Jr. (M)
Ruge, H. C. (A)
Rush, D. R. (M)
Russell, C. H. (M)
Sachen, R. J. (M)
Salonimer, D. J. (M)
Saunders, G. H. (SM)
Schack, R. H. (M)
Schultz, D. N. (M)
Schwinghamer, R. J. (M)
Shaver, F. T. (M)
Siller, J. (M)
Smith, A. G. (A)
Smith, C. N. (M)
Smith, C. R. (M)
Sokol, S. (M)
Standish, M. M. (M)
Steinberg, A. (M)
Stevens, R. E. (A)
Stuhlz, E. F. (M)
Stuhlinger, E. (A)
Swindall, P. M. (M)
Taylor, H. M., Jr. (M)
Thomas, J. R. (M)
Thomas, L. J. (M)
Thornthwaite, W. L. (M)
Threlkeld, W. B., Jr. (M)
Unger, J. H. W. (M)
Vallely, D. P. (M)
Vernon, J. A. (M)
Vincent, H. F. (SM)
Wallace, R. E. (M)
Watanabe, A. S. (M)
Weimer, J. W. (M)
Wells, E. H. (SM)
Weyler, G. M., Jr. (M)
White, P. R. (M)
Williams, V. B. (M)
Willmg, W. R. (M)
Wilson, B. J. (M)
Wilson, M. L. (M)
Wolfe, A. J. (A)
Woodruff, L. C. (M)
Woodruff, L. D. (M)
Wooten, A. D. (A)
Yoakum, W. E. (A)

Maxwell AFB (ATL-3)
Johnson, J. G. (SM)
Lyle, W. H. (SM)

Meridianville (HUN-3)
Scofield, H. N. (M)

Mobile (NO-6)
Baucum, P. G. (M)
Burbanks, V. (M)
Catheron, J. D. (M)
Chason, J. H. (M)
Davis, M. H. (M)
Diamond, J. R. (M)
Felch, J. L. (M)
Givens, V. Y. (M)
Gurebrope, G. F. (M)
Horbin, T. F. (M)
Hicks, C. R. (M)
Jacobson, E. H. (M)
Mahan, O. C. (M)
Molyneux, M., Jr. (M)
Mazzone, W. H. (M)
O'Brien, D. J. (M)
Parish, J. P. (M)
Rountree, J. W. (M)
Schene, E. G. (M)
Seid, H. R. (M)
Van Aller, H. H. (M)

Montgomery (ATL-3)
Bridge, H. P. (M)
Evans, B. D. (M)
Hargreaves, L. D. (A)
Hayward, R. M. (A)
Herman, H. (SM)
Holliday, E. M. (M)
Holman, W. S. (M)
Jones, N. T. (M)
Lyons, E. C., Jr. (M)
MacDowell, J. E. (M)
Sturm, F. L. (A)
Wallner, F. S. (M)
Wilson, R. P. (A)

Muscle Shoals (HUN-3)
Wilson, R. B. (M)

Newsville (ATL-3)
Barefield, C. F. (M)

Prichard (NO-6)
Prewitt, J. L. (M)

Redstone Arsenal (HUN-3)
Ackerman, W. J. (M)
Barclay, J. A. (SM)
Best, W. D. (M)
Curran, R. J. (M)
Gentry, E. B. (M)
Johnson, M. H. (M)
Kimura, A. M. (M)
Medaris, J. B. (SM)
Porter, S. N. (A)
Seashore, C. R. (M)

Saraland (NO-6)
Rawls, M. L. (M)

Silas (ATL-3)
Odom, T. O. (M)

Silverhill (NWF-3)
Lacey, H. L. (M)

Thomasville (ATL-3)
Dover, H. N. (M)

Tuscaloosa (HUN-3)
Denton, D. E., Jr. (M)
Littlefield, J. T. (A)
McBiles, C. D. (M)
Ryan, P. J. (A)

University (HUN-3)
Whitehurst, R. N. (M)

Wetumpka (ATL-3)
Johnson, V. H. (M)

Whistler (NO-6)
Chenn, W. B. (M)

ALASKA

Anchorage (ANC-7)
Bacon, R. A. (M)
Baker, H. O., Jr. (A)
Brazil, H. D. (M)
Choate, W. C. (M)
Cochran, U. E. (M)
Darrah, G. L. (A)
De Lizza, D. O. (A)
De Voe, H. D. (SM)
Donnelly, R. S. (M)
Duncan, J. G. (M)
Ellis, J. V. (M)
Evanson, G. L. (A)
Franchell, W. R. (M)
Fulton, D. A. (M)
Gray, C. W. (A)
Hager, K. F. (M)
Hannon, G. A. (M)
Hirschel, J. (A)
Hutchinson, R. E. (A)
Jekel, W. W. (A)
Johnson, C. A. (M)
Johnson, R. L. (M)
Knox, W. E., Jr. (A)
Lee, W. (M)
Malloy, T. J., Jr. (A)
Martone, F. P. (A)
McLaughlin, R. B. (M)
Moore, F. J. (M)
Pappas, C. P. (M)
Pailey, T. N. (A)
Rohrer, F. D. (M)
Silven, J. W. (M)
Smith, C. H. (M)
Svarczkouf, G. J. (A)
Walden, J. M. (SM)
Wilker, R. E. (M)
Warren, K. A. (A)
Wayer, C. F., Jr. (M)
Weatherly, M. R. (M)
Wheaton, T. H. (A)
Whittaker, G. A. (A)
Wilson, L. S. (M)
Young, T. R. (SM)

Big Mountain (ANC-7)
Scott, R. C. (A)

College (ANC-7)
Hunsucker, R. D. (M)
Leentsch, H. (M)
Leonard, R. S. (A)
Merritt, R. P. (M)
Owen, L. (M)
Parthasarathy, R. (SM)
Rumi, G. (M)
Stanley, G. M. (M)
Stiltner, C. (M)
Tryon, J. G. (M)
Warman, N. E. (A)

Fairbanks (ANC-7)
Bertivegna, J. T. (A)
Bourque, A. R. (M)
Daniel, R. D. (A)
Edens, J. A. (A)
Hauck, R. A. (A)
Hermann, P. A. (A)
Kimball, W. H. (A)
Mazooonin, G. V. (A)
Shuttleff, C. H. (A)
Southall, A. M. (A)

Kenai (ANC-7)
Carruthers, C. M. (A)
Lancaster, T. W. (A)

King Salmon (ANC-7)
Banziger, W. T. (M)
Clark, T. D. (A)

McGrath (ANC-7)
Mangino, J. M. (A)

ALASKA

Mount Edgecumbe (ANC-7)
Long, J. E. (A)

Nome (ANC-7)
Sundstrom, L. C. (A)

Petersburg (ANC-7)
Pierce, E. R. (M)

Stewart (ANC-7)
Browne, C. W. (A)
Keller, B. W. (M)
Little, J. T. (M)
McCaskill, W. K. (M)
McKee, W. H. (M)
Shaw, W. R. (M)
Wright, M. E. (M)

Spencer (ANC-7)
Roberson, F. E. (M)

ARIZONA

Benson (FT-H-7)
Blom, B. V. (SM)
Campbell, R. E. (M)
Ehler, W. M. (M)
Johnson, H. G. (A)
Johnson, W. I. (M)
Spitle, S. E. (M)

Bisbee (FT-H-7)
Candiello, V. S. (M)
Diehl, F. A. (M)
Horne, J. H. (SM)
Knowles, E. R. (M)

Flagstaff (PHO-7)
Phillipon, E. C. (M)
Rice, L. S. (A)

Fort Huachuca (FT-H-7)
Aichholz, C. (M)
Albee, M. M. (SM)
Amington, J. R. (M)
Boyd, A. H. (M)
Bradski, M. (M)
Brown, G. J. (M)
Cameron, E. J. (SM)
Catlett, G. F. (M)
Crawford, G. A. (M)
Cronin, W. M. (SM)
Dietrich, J. P. (M)
Dillingham, J. H. (M)
Dominique, J. C. (M)
Domnino, J. P., Jr. (M)
Dyer, S. M. (M)
Eto, H. S. (M)
Fink, M. J. (M)
Flahie, T. J. (M)
Garcia, V. A. (SM)
Gibbins, J. F. (M)
Hanson, J. C. (M)
Hart, R. H. (SM)
Heinsen, D. E. (M)
Holfer, R. L. (M)
Jeys, F. H. (M)
Johnson, L. R. (M)
Johnson, R. M. (M)
Keller, H. A. (SM)
Kellers, F., III (M)
Knight, L. J. (A)
Low, F. J. (M)
Linnoer, T. C. (M)
Lobonse, C. J. (M)
Lundy, W. D. (M)
Lydon, D. A. (A)
Martin, T. H. (M)
Mayleben, E. F. (M)
Meiners, D. E. (M)
Monahan, G. F., Jr. (SM)
Mudgett, A. H. (SM)
Nover, E. P. (M)
Okada, R. F. (M)
Oliver, J. K. (SM)
Perry, W. S., Jr. (M)
Renwick, G. J. (M)
Risser, A. K. (M)
Ross, R. M. (A)
Scott, J. C. (M)
Shelton, W. C. (SM)
Silverman, B. S. (A)
Smith, M. P. (M)
Stone, E. P. (M)
Storch, H. C. (M)
Strawn, G. M. (M)
Stuemer, E. H. (SM)
Teolund, W. B. (M)
Trezise, E. A. (A)
Upton, F. R., Jr. (A)
Virden, J. W. (SM)
Walker, L. F. (SM)
Wilcox, C. S. (M)

Glendale (PHO-7)
Bliss, W. P. (M)
Caboon, A. M. (M)
Chauvin, D. M. (M)
Conwell, M. E. (M)
Cooper, G. P. (M)
Corwin, M. H. (M)
Eaton, A. W. (M)
Edwards, M. J. (M)
Elbinoer, L. P. (SM)
Halbirt, C. D. (M)
Lamb, W. G. (M)
Lee, H. P. (A)
Levine, D. (SM)
Martin, G. L. (A)
McNemar, C. W. (A)
Milford, R. E. (M)
Moman, H. L. (M)
Murray, P. W. (M)
Norman, H. W. (A)
Pratt, R. E. (M)
Rhodes, J. F. (M)
Shaffer, W. H. (M)

Goodyear (PHO-7)
Ash, H. O. (A)
Blount, E. M. (M)
Wood, B. G. (M)

Hereford (FT-H-7)
Folley, W. R. (SM)
Webster, R. G. (SM)

Huachuca City (FT-H-7)
Graham, R. W. (SM)
Jantz, M. A. (M)
Walther, G. P. (M)

Litchfield Park (PHO-7)
Belanger, F. (M)
Kelly, K. O. (M)
Robertson, S. D., Dr. (SM)
Sherwood, J. N. (M)

Maricopa (PHO-7)
Howe, R. B. (A)
Locke, R. B. (M)
Yuncic, J. F. (M)

Mesa (PHO-7)
Forrester, R. E. (M)
Howard, J. R. (M)
Sabin, W. D. (M)
Smith, D. A. (SM)

Miami (PHO-7)
Herrera, E. A. (M)

Phoenix (PHO-7)
Adams, G. E. (M)
Adams, W. L. (A)
Aden, A. L. (SM)
Ammerman, D. W. (SM)
Andeen, R. E. (M)
Anderson, W. J. (A)
Austad, R. W. (M)
Baeuchler, E. W. (A)
Baroch, G. F. (M)
Barth, J. A. (M)
Baum, R. V. (M)
Benham, M. J. (M)
Benson, R. A. (A)
Bernfield, W. F. (M)
Bettis, L. W. (M)
Betz, C. R. (M)
Bitter, C. R., Jr. (M)
Black, J. R. (M)
Blackert, R. O. (M)
Blair, L. R. (M)
Blatchford, R. C. (M)
Boat, R. M. (M)
Bower, F. H. (SM)
Bricker, N. P. (A)
Bridge, W. H. (M)
Burnett, K. N. (M)
Burns, C. L. (M)
Burns, J. J. (M)
Butcher, R. J. (A)
Cacheris, J. C. (SM)
Carden, M. W., Jr. (M)
Carter, D. F. (M)
Chadek, T. J. (M)
Chambers, J. A. (F)
Christman, J. (A)
Churlin, F. (A)
Clark, C. J. (M)
Clark, G. F. (M)
Cleary, E. P. (M)
Cook, M. F. (M)
Corby, R. B. (M)
Crain, T. A. (M)
Crawfis, E. D., Jr. (SM)
Crawford, R. A. (M)
Cubbage, J. F. (M)
Culver, J. E. (M)
Cummings, K. C. (SM)
Dalton, D. E. (M)
Denault, D. R. (M)
Dickson, D. C., Jr. (M)
Diehl, H. A. (M)
Dodge, P. O. (M)
Donovan, J. (A)
Drette, F. E. (SM)
Drillion, R. E. (M)
Dwork, L. E. (SM)
Eberhard, E. (SM)
Echols, R. A. (A)
Eckstein, R. J. (M)
Edson, G. I. (SM)
Ellstrom, R. V. (A)
Elsner, R. W. (SM)
Eme, K. J. (A)
Emmett, J. T. (A)
Enoelbardt, R. M. (M)
Esher, M. (A)
Fisher, D. H. (A)
Fitch, W. T. (M)
Flint, L. B. (M)
Fontenot, J. A. (M)
Fraser, D. E. (M)
Frazee, O. P. (M)
Freeman, G. H. (A)
Fnin, R. J. (M)
Fussell, L. B. (A)
Gaines, W. M. (SM)
Gamble, G. W. (M)
Gerrard, R. F. (M)
Gaylor, R. (M)
Gerould, L. D. (M)
Gleichauf, T. J. (M)
Glinn, A. F. (M)
Golder, R. L. (A)
Goldstein, R. (M)
Goodman, R. G. (M)
Graham, L. C. (M)
Gravel, J. J. (M)
Gray, G. E. (M)
Greenburg, A. R. (M)
Greer, P. H. (M)
Grimaila, A. G. (M)
Groves, S. (A)
Gundry, J. C. (A)
Hall, R. M. (M)
Hallen, J. (A)
Ham, N. C. (M)
Hammond, J. R. (A)
Hans, M. F. (M)
Hansen, R. O. (M)
Harris, F. L. (M)
Harris, T. L. (M)
Hartig, E. O. (SM)
Hembise, P. M. (A)
Hemoel, R. A. (A)
Hershey, L. M. (SM)
Hickman, J. E. (A)
Hill, R. S. (A)
Hittel, L. A., Jr. (A)
Hodson, R. B. (A)
Hofferber, H. E. (M)
Hoffman, R. Y., Jr. (M)
Hogan, A. W. (M)
Horan, C. L. (SM)
Hoover, B. (M)
Hostetter, J. M. (M)
Hronek, J. W. (M)
Hulet, J. F. (A)
Hume, A. S. (SM)
Hummels, D. R. (A)
Huntington, R. C. (M)
Hyder, H. R., III (SM)
Ittenbach, L. J., Jr. (A)
Jacobi, G. T. (SM)
Jacobsen, A. B. (SM)
Jarrad, D. S. (A)
Jensen, C. E. K. (M)
Jensen, R. E. (M)
Jones, A. C. (A)
Kaczanowski, W. (A)
Kees, H. (SM)
Kelly, H. M. (M)
Kenmeries, F. D. (SM)
Kenrich, C. M. (A)
Kerr, J. L. (M)
Kettlety, R. W. (M)
Kidwell, W. M. (SM)
Kline, A. J., Jr. (M)
Klontz, W. C. (M)
Knight, W. H. (M)
Knowles, W. N. (M)
Koch, F. L. (SM)
Koster, C. A. (M)
Kuleska, G. G. (SM)
La Prade, G. L. (A)
Lasher, C. C. (SM)
Lewis, R. E. (A)
Lightcap, J. L. (M)
Lindsay, J. D. G. (M)
Liska, R. W. (M)
Love, A. W. (M)
Lowney, S. W. (A)
Lundy, C. (SM)
Macmillian, T. S. (M)
Madland, G. R. (M)
Mannino, K. P. (M)
Mattausch, A. J. (M)
Maynard, F. B. (SM)
McCarv, R. O. (M)
McClanathan, G. L. (M)
McCov, E. C. (A)
McCrary, D. E. (A)
McCreary, W. J. (M)
McElroy, G. E. (SM)
McGovern, M. J. (M)
McGuire, H. G. (M)
McShane, J. P. (M)
Midnard, A., Jr. (A)
Miller, A. (M)
Miller, L. E. (A)
Mills, T. L. (M)
Montoomery, E. B. (A)
Moore, G. F. D. (M)
Morrison, F. (M)
Moss, C. H., Jr. (A)
Nelson, J. L. (M)
Nicholas, J. C. (SM)
Nichols, N. F. (A)
Nichols, R. H., Jr. (M)
Nielson, L. C. (M)
Nimmo, G. A. (M)
Noble, D. E. (F)
Nofrey, L. C. (A)
Norde, L. (SM)
Nyswander, R. E. (M)
Oldfield, H. R., Jr. (SM)
O'Sullivan, M. J. (M)
Palais, J. C. (M)
Parmet, D. S. (SM)
Peabody, S. J. (M)
Petersen, C. C. (M)
Peterson, M. E. (M)
Peterson, R. K. (SM)
Phillips, T. A. (M)
Phipps, J. P. (M)
Plotkin, L. E. (SM)
Porter, E. C. (M)
Porter, K. W. (M)
Prairie, I. C., Jr. (M)
Primale, D. L. (M)
Prooster, C. H., Jr. (A)
Rabowsky, I. (M)
Ranck, C. A. (A)
Reak, D. L. (M)
Reece, O. A. (M)
Reeves, D. B. (SM)
Reque, S. G. (M)
Reynolds, J. E., Dr. (A)
Reynolds, K. A. (M)
Risk, W. P., Jr. (M)
Robinson, R. D. (SM)
Romans, C. (M)
Rook, C. W. (M)
Ross, J. M. (SM)
Rudoloh, R. H. (M)
Russell, W. F. (M)
Rutherford, R. R. (M)
Sabel, A. R. (M)
St. Thomas, G. F. (M)
Samuelson, R. E. (F)
Sanborne, J. M. (M)
Sanders, C. H. (M)
Sanneman, R. W. (M)
Saxon, W. R. (M)
Shaefer, O. L. (M)
Schaffner, G. (M)
Schauer, H. L. (M)
Scherwhoerster, D. J. (M)
Schulte, F. E. (M)
Schwartz, J. W. (A)
Scott, D. E. (A)
Scrafford, R. L. (M)
Severns, R. A. (M)
Shaner, J. R. (M)
Sheffield, W. B. (SM)
Sheoard, E. S., Sr. (M)
Simpson, E. J. (A)
Skomal, E. N. (SM)
Smith, A. L. (M)
Smith, L. R. (M)
Sokoloff, P. W. (SM)
Solem, R. J. (M)
Staats, R. U. (A)
Stemer, E. L. (A)
Stevens, C. R. (M)
Stites, R. S. (A)
Stokely, R. G. (M)
Streae, R. J. (A)
Struble, L. G. (A)
Stubbe, L. H. (A)
Sutter, C. C. (M)
Tabor, R. F. (M)
Thibodeau, L. E. (M)
Thornnes, E. O. (A)
Tillman, W. F. (M)
Tinsley, C. G. (M)
Toberman, A. J. (SM)
Treao, D. G. (SM)
Trull, D. L. (M)
Urling, H. R. (M)
Vandiveer, P. R. (M)
Vanhorn, H. E. (A)
Van Ness, B. O. (M)
Van Pennelen, F. J. (A)
Vasquez, E. (A)
Vecchio, E. A. (M)
Voights, W. H. (A)
Waldvoael, J. (M)
Wallace, R. A. (M)
Washburn, R. P. (SM)
Weaver, W. B. (M)
Weiler, J. H. (M)
Welch, H. W., Jr. (F)
White, E. A. (M)
Wiley, C. A. (M)
Wilhelm, R. L. (A)
Williams, D. J. (M)
Winkler, M. R. (SM)
Witt, R. P. (M)
Wittenburg, C. W. (M)
Woodside, W. J. (M)
Wooley, R. L. (SM)
Wooten, J. R. (A)
Wunderlich, L. J. (M)
Yost, R. R., Jr. (M)
Zusman, D. (M)

Pima (FT-H-7)
Skinner, G. C. (M)

Prescott (PHO-7)
Harurove, B. E. (SM)
Henson, H. W. (M)

Scottsdale (PHO-7)
Attwood, S. W. (M)
Austin, F. H. (M)
Bailey, D. C. (A)
Barikmo, H. O. (M)
Barrow, D. M. (M)
Batts, B. F. (M)
Bebow, R. W. (M)
Beckwith, J. R. (SM)
Behringer, N. C. (M)
Berens, G. F. (SM)
Blixt, R. E. (M)
Boothe, A. M. (SM)
Bracken, W. H. (M)
Bremner, R. A. (M)
Brown, F. R. (M)
Carter, P. M. (M)
Chittenden, W. R. (A)
Cook, G. W. (M)
Connock, R. A. (M)
Cranston, H. J., Jr. (M)
Cuckler, V. A. (M)
Cusack, J. A. (M)
Dahl, W. F. (M)
Debaryshe, B. D. (M)
Deerhake, F. M. (SM)
Dendy, K. H. (SM)
Dimucci, V. A. (M)
Diven, L. (SM)
Edwards, E. D. (M)
Elliott, R. W. (M)
Englund, R. A. (M)
Estes, C. L. (SM)
Flemina, I. A. (A)
Flickinger, W. J. (M)
Gabrielsen, F. T. (M)
Gabrielson, R. G. (M)
Gaunt, A. E. (M)
Gazin, H. E. (M)
Gilpin, D. J. (M)
Gosswiller, R. O. (M)
Green, H. H. (M)
Groth, E. J., Jr. (SM)
Hale, R. E. (A)
Helber, C. (M)
Helms, G. W. (M)
Hinkelman, T. D. (A)
Hinsdale, J. G. (SM)
Kelting, W. M., Jr. (A)
Kempf, R. F. (M)
Kneale, A. T. (M)
Knowles, C. H. (M)
Koch, J. G. (M)
Kret, D. B. (M)
Krohn, C. A. (M)
Krueger, E. C. (M)
Kulb, B. A. (M)
La Vance, C. N. (M)
Le Gendre, H. P. (M)
Marion, T. M. (SM)
McKee, R. M. (A)
Mihalick, L. P. (M)
Minard, R. E., Jr. (A)
Milton, D. V. (A)
Moffat, D. (M)
Moore, W. C. (SM)
Muller, T. A. (M)
Murray, M. W. (SM)
Oates, H. W. (M)
Oliver, D. S. (M)
Paden, A. R. (M)
Paine, J. A. (A)
Palm, A. W. (M)
Penninoton, R. J. (M)
Pine, C. (M)
Putman, W. G. (A)
Quinn, T. J., Jr. (A)
Raile, J. D. (M)
Reynolds, R. H., Jr. (SM)
Rice, C. T. (SM)
Richman, M. A. (M)
Robbins, E. R. (A)
Roberts, R. E. (M)
Roehr, W. D. (M)
Ross, H. M. (M)
Shannon, C. V. (M)
Shapiro, M. D. (M)
Shedko, R. J. (M)
Steams, W. R. (A)
Steele, R. B. (M)
Strong, D. E. (A)
Vilios, V. V. (A)
Waller, K. L. (M)
Weiss, H. (M)
West, R. G. (A)
Whitworth, W. C. (M)
Wilkinson, C. O. (SM)
Williams, C. R. (M)
Winland, E. S. (M)
Woolsey, R. A. (M)
Wurzburger, R. R. (M)

Sierra Vista (PHO-7)
Blatchley, C. M. (M)
Buscall, D. C., Jr. (M)
Cork, L. E. (M)
Dell'Amico, J. D. (M)
Grady, G. E. (A)
Greoa, R. C. (M)
Hess, H. J. (M)
Hitchcock, R. B. (A)
Inman, F. W. (M)
McClellan, J. P. (M)
McComber, C. A. (A)
McNully, J. L. (A)
Montasser, A. S. (M)
Sherbundy, C. D. (A)
Ternow, H. G. (M)
Vidlak, L. (A)

Tempe (PHO-7)
Allard, G. A. (A)
Barkson, J. A. (SM)
Board, C. Z. (A)
Busler, J. C. (A)
Cachelin, D. B. (A)
Clark, P. S. (A)
Collmer, R. C. (M)
Cronshey, R. W. (M)
Dryer, L. E. (M)
Dupont, W. (A)
Goldman, W. W. (M)
Harkins, D. (A)
Hausman, D. I. (A)
Mayes, T. L., Jr. (M)
Merritt, C. H. (SM)
Miraglia, J. F. (A)
Morton, D. E. (M)
Russell, F. D. (M)

Tolleson (PHO-7)
Wood, A. E. (A)

Tombstone (FT-H-7)
Ferguson, L. N. (A)

Tucson (TUC-7)
Ajeman, M. S. (M)
Anderson, M. A. (A)
Andres, W. F. (M)
Armstrong, A. C. (A)
Baldwin, H. A. (M)
Balk, S. (M)
Bard, W. E. (A)

Battistelli, J. J. (M)
Bayless, C. R. (M)
Becker, C. L. (A)
Becker, S. (SM)
Bellee, E. C. (M)
Berstbach, A. J. (SM)
Bialkowski, M. (M)
Blanchard, J. W. (M)
Boulay, P. F. (M)
Boutin, C. U. (M)
Breeding, C. S. (SM)
Brown, T. R., Jr. (M)
Bundy, R. C. (M)
Burch, E. C. (M)
Burdick, E. J. (M)
Burkett, F. T. (M)
Byrd, R. E. (A)
Card, C. D. (M)
Carnevale, A. D. (A)
Carrick, G. R. (A)
Chinnock, R. S. (M)
Cinquemani, A. P. (M)
Clark, H. L. (SM)
Clinton, A. B. (M)
Cole, J. E. (A)
Constantinides, J. S. (A)
Cooper, R. N. (M)
Creinhton, A. M., Jr. (SM)
Crone, R. L. (SM)
Daly, W. E. (M)
Davis, R. G. (M)
De Bolt, A. L. (M)
De Long, H. C. (A)
De Marco, P. J. (A)
Dlouhy, F. W. (M)
Donaldson, J. W. (M)
Douglas, H. T. (M)
Dunnan, C. R. (M)
Dunn, E. J. (M)
Dusterdick, H. G. E. (M)
Eddy, R. C. (M)
Enloe, H. L. (M)
Evans, W. H. (M)
Featherston, J. R. (A)
Fessler, A. L. (M)
Fish, W. Y. (M)
Forcier, R. A. (SM)
Ford, J. W. (M)
Fraser, D. W. (SM)
Friedman, M. F. (A)
Gardiner, A. J. (M)
Gharis, W. J. (A)
Gillespie, C. M., Jr. (M)
Gimbel, J. O. (M)
Glaesser, E. (M)
Gravell, A. J. (M)
Hall, C. A. (M)
Hanoartner, J. E. (M)
Hansell, G. E. (SM)
Hanson, K. L. (M)
Hausenbauer, C. R. (M)
Hessemer, R. A., Jr. (M)
Hoehn, A. J., Jr. (SM)
Holladay, J. A. (M)
Houck, G. A. (M)
Howland, R. L. (A)
Huskins, D. W. (SM)
Jackson, J. J. (M)
Jorden, B. W., Jr. (M)
Jurich, S. (A)
Kachnic, J. E. (M)
Kasten, J. W. (M)
Kenna, L. A. (M)
Kennedy, B. M. (SM)
Kemkamp, C. F. (A)
Kinnie, I. G. (M)
Knickerbocker, J. L. (M)
Koenig, W. A. (SM)
Koerner, H. (M)
Larson, R. D. (M)
Lenzner, E. (SM)
Lindenberg, E. C. (SM)
Little, D. E. (M)
Livingston, W. C. (A)
Lockwood, V. M. (M)
Lynn, R. B. (A)
Marston, E. J. (M)
Martin, L. C. (M)
Martin, R. E. (M)
Martin, T. L., Jr. (M)
Martinson, G. O. (M)
McGehee, W. W. (M)
McIntyre, M. V. (M)
McNillis, J. F. III (M)
McSnadden, W. R., Jr. (M)
Mearls, W. J. (M)
Meyer, C. J. (M)
Meyer, R. J. (M)
Michalk, E. R. (M)
Miller, F. G. (SM)
Miller, R. J. (SM)
Morris, W. J. (A)
Morrison, E. L., Jr. (M)
Nabours, R. E. (M)
Nielson, R. M. (M)
Nozick, S. (M)
Oliver, J. K., Jr. (M)
Pascoe, D. (M)
Patterson, R. L. (M)
Peck, W. E. (M)
Perkins, A. N. (M)
Perkins, B. M. (A)
Perper, L. (SM)
Pestell, G. A. (SM)
Peterson, G. R. (M)
Philo, J. L. (M)
Pierce, E. P., Jr. (M)
Post, R. (A)
Powell, D. S. (SM)
Reinecke, B. E. (SM)
Richards, D. W. (A)
Rogers, P. H. (M)
Rudoloh, J. D. (M)
Russell, G. M. (SM)
Russell, P. E. (SM)
Shaver, H. N. (M)
Skinner, B. S., Jr. (M)
Smith, J. (A)
Soillane, J. K. (M)
Sooneo, L. R., Jr. (M)
Stewart, H. E., Prof. (SM)
Stinson, D. C. (M)
Stock, G. B. (A)
Storie, D. E. (M)
Stultz, L. R. (M)
Svien, A. J. (SM)
Swafford, J. E. (M)
Swartz, A. (A)
Talley, R. P. (M)
Tammima, E. D. (A)
Taylor, C. K. (M)
Treole, J. B. (A)
Theiss, J. B. (A)
Tilkan, G. (A)
Trevor, B. (F)
Vacherot, M. G. (M)
Wade, J. A. (M)
Walker, G. A. (SM)
Walker, R. L. (M)
Walsh, L. R. (A)
Ware, H. W., Jr. (SM)
Watson, C. L. (A)
Wendahl, R. E. (A)
Whatley, W. W. (A)
Whiteman, C. O. (M)
Wilde, N. (SM)
Williamson, A. K. (A)
Wilson, L. A., Jr. (M)
Wirdf, F. P. (M)
Wozniak, J. R. (A)
Wrinkt, K. F. (M)

Warren (FT-H-7)
Harris, J. R. (A)

Winslow (PHO-7)
Hart, P. C. (A)

Yuma (PHO-7)
Powers, F. W. (A)

Yuma Test Station (PHO-7)
Kundel, K. K. (M)

ARKANSAS

Arkadelphia (LR-6)
Sandlin, G. L. (M)

Cabot (LR-6)
Cordrey, E. E. (SM)

El Dorado (LR-6)
Bellew, R. W. (A)
Sorrells, W. E. (M)

England (LR-6)
McClanahan, W. J. (A)

Fayetteville (LR-6)
Brewster, E. J. (M)
Cannon, W. W. (M)
Gosnell, D. G. (A)
Green, J. W., Jr. (SM)
Lewis, F. W. (M)
Price, L. E. (M)
Purdy, J. A. (A)
Thompson, P. N. (A)
Walton, W. T. (M)

Fort Smith (LR-6)
Duvall, G. (M)

Gravette (LR-6)
Durkee, J. D. (M)

Hope (LR-6)
Klipsch, P. W. (SM)

Jacksonville (LR-6)
Gandler, B. R. (M)
Wheeler, T. J. (M)

Judsonia (LR-6)
Green, N. R. (A)

Little Rock (LR-6)
Allsopp, W. C., Jr. (A)
Anders, R. V. (SM)
Barr, J. C. (M)
De Chambrier, P. (M)
Dillablain, V. L. (SM)
Dodson, J. B. (A)
Edwards, J. M. (A)
Ellefson, G. E., Jr. (A)
Ferguson, J. L. (M)
Foley, N. D. (SM)
Hammll, R. B. (M)
Hardy, L. H. (M)
Hegar, E. A. (SM)
McDonald, A. E. (M)
Menees, W. (A)
Miller, C. H., Jr. (M)
Raedels, F. S., Jr. (A)
Raible, R. W. (M)
Reid, J. D. (F)
Warren, D. (A)
Weber, R. A. (M)
Wilson, F. J. (M)
Winn, D. L. (SM)
Wylie, J. E. (M)

Malvern (LR-6)
Beem, R. M. (SM)
North Little Rock (LR-6)
Kunkel, W. E. (A)
Lowery, H. J. (M)
Meyer, J. A. (A)
Mountiov, C. (F)
Packard, A. (SM)

Pine Bluff (LR-6)
Basinger, E. G. (M)

Prairie Grove (LR-6)
Schraer, L. J. (M)

Quitman (LR-6)
Tarver, A. (M)

Scott (LR-6)
McRae, J. P. (M)

Searcy (LR-6)
Bennett, H. W. (M)

Siloam Springs (LR-6)
Smith, C. E. (M)

Sorinndale (LR-6)
Anderson, M. K. (M)

Stuttgart (LR-6)
Burrow, W. R. (M)

Texarkana (SHR-6)
Beall, L. S. (A)

CALIFORNIA

Agnew (SF-7)
Duggan, J. E. (M)

Alameda (SF-EB-7)
Calvin, L. D. (M)
Hall, T. D. (M)
Hansen, H. M. (M)
Lessem, M. (M)
McNulty, J. W. (M)
Yarborough, J. R. (M)

Alamo (SF-EB-7)
Bundrick, R. J. (A)
Dorr, R. (SM)

Albany (SF-EB-)
Andresen, J. S. (M)
Knapp, W. S. (M)
Olivares, J. E., Jr. (A)
Pope, J. C. (A)
Williamson, S. R. (M)
Wing, C. (M)

Alhambra (LA-P-7)
Bunker, E. R., Jr. (M)
Cary, H. H. (M)
Glenn, R. A. (M)
Gum, J. D. (M)
Hauerwaas, R. V. (M)
Hoffman, T. S. (A)
Horton, D. K. (M)
Jones, C. E. (M)
Kirk, C. E., Jr. (M)
Ludekens, L. E. (M)
Miller, W. A. (SM)
Ponazzo, R. J. (SM)
Seidner, O. R. (M)
Silk, N. R. (SM)
Telleson, N. (M)
Ulle, L. A. (SM)
Weeks, A. D. (M)
Whitacre, D. P., Sr. (SM)
Wiker, G. A. (M)

Alondra (LA-7)
Cornell, J. R. (M)

Altadena (LA-P-7)
Acord, J. D. (M)
Alrich, J. C. (M)
Atwood, J. R. (M)
Bailey, G. E. (SM)
Biedebach, M. C. (M)
Black, L. (SM)
Braun, T. H. (M)
Bruns, R. A. (M)
Carter, R. C. (A)
Cox, W. F. (A)
Davids, L. H. (M)
Davis, F. W. (M)
Easterlinn, M. F. (M)
Eichwald, W. F. (M)
Evaud, J. P. (M)
Fearman, E. L. (A)
Gillelriest, C. E. (M)
Gossland, J. K. (SM)
Hare, G. H. (M)
Hartel, C. F., Jr. (M)
Hartin, D. E. (M)
Heacock, R. L. (A)
Heath, G. F. (M)
Junend, J. (M)
Kalbach, J. F. (SM)
Kimmel, R. O. (M)
Lane, J. H. (M)
Laub, J. L. (M)
Leflang, W. G. (M)
Lewis, R. S. (A)
Linnes, K. W. (M)
Locanthi, B. N. (M)
Lolass, A., Jr. (M)
Mallino, L. R. (VA)
Martel, H. C. (A)
Mathison, R. P. (M)
Mauk, L. H. (M)
McCarthy, E. R. (A)
Moore, T. O. (SM)
Morris, R. V. (M)
Pedroo, J. Y. (M)
Peverill, W. L. (M)
Pugh, M. D. (M)
Ramstedt, C. F. (M)
Riedel, J. C. (M)
Ross, I. (A)
Schuster, D. (M)
Schwab, H. (M)
Shuey, C. W. (A)
Sinnette, J. T., Jr. (M)
Slocomb, G. M. (M)
Small, R. H. (M)
Steinke, F. C. (SM)
Szirmay, S. Z. (A)
Tehan, M. F. (A)
Thurman, R. V. (M)
Vincent, D. A. A. (M)
Watkins, K. S. (A)
West, L. F. (SM)
Westlake, P. R. (M)
Whitney, M. G. (A)
Willhard, W. J. (M)
Worlock, R. M. (M)

Anaheim (LA-SA-7)
Acker, W. W. (M)
Akers, R. C. (A)
Allerete, C. T. (A)
Bailey, B. G. (A)
Beck, L. (M)
Bills, G. W. (M)
Bostwell, E. O., Jr. (M)
Brewer, H. E. (M)
Brown, J. H. (M)
Brown, L. B. (A)
Butler, D. S. (M)
Caglia, A. J. (A)
Canobianed, J. A. (M)
Chadburn, W. J. (A)
Chavannes, T. E. (M)
Clark, T. L. (M)
Cole, C. E. (A)
Combs, M. E. (A)
Comer, F. F. (SM)
Conrad, E. (SM)
Cooney, K. B. (M)
Cooper, G. L. (M)
Cox, H. N. (A)
Cramston, E. M. (M)
Curry, W. S., Jr. (M)
Deurafferoeid, D. L. (M)
Shanial, K. S. (M)
Doss, R. F. (M)
Dotv, R. L. (SM)
Edds, J. D. (M)
Evanger, H. W. (A)
Ewing, D. L. (M)
Fairley, D. D. (M)
Finley, W. S. (M)
Fleming, R. W. (M)
Flock, D. C. (M)
Geiger, A. E. (M)
Glowacki, W. V., Jr. (SM)
Glowalla, J. (M)
Graham, H. E. (A)
Greenfield, A. R. (M)
Hall, R. E. (M)
Hendrickson, H. C. (M)
Hinrichs, K. (SM)
Hirdler, R. D. (SM)
Hobart, H. H. (A)
Hoffman, M. (SM)
Hormann, J. F. (M)
Horwitz, H. C. (M)
Horwitz, L. B. (SM)
Houck, R. D. (M)
Jenkins, J. F., Jr. (SM)
Jeschke, A. W. (M)
Johnson, R. W. (SM)
Katz, L. (SM)
Keifer, L. F., Jr. (M)
Kersch, C. J. (M)
Kidd, R. A. (A)
Kinnsburv, A. D. (M)
Kittiver, L. I. (M)
Klein, W. J. J. (M)
Klimowski, F., Jr. (SM)
Knepper, R. C. (M)
Laubach, R. A. (M)
Leifeste, K. W. (M)
Lewis, J. D. (M)
Lewis, K. E. (A)
Lopez, R. L. (M)
Lordan, T. G. (M)
Love, R. R. (M)
Lulofs, J. R. (M)
Lynch, F. W. (SM)
Malik, O. J. (A)
Marable, W. T., Jr. (M)
Masenten, W. K. (M)
Masin, G. F. (SM)
McCoia, K. W. (A)
McCone, G. L. (M)
McFarlane, J. D. (F)
Medak, M. M. (M)
Mellas, A. (M)
Michael, H. (M)
Miller, R. D. (M)
Milligan, H. I. (M)
Morton, W. B., Jr. (M)
Myers, O. D. (A)
Nealey, C. C. (M)
Nicholson, W. O. (M)
Nielsen, C. L. (SM)
Onata, A. I. (M)
Olson, C. P., Jr. (M)
Pariser, J. J. (M)
Paschal, E. A. (M)
Payne, D. W. (M)
Perkel, D. (M)
Peterson, C. A. (M)
Peterson, H. C. (A)
Phelps, J. F., Jr. (M)
Pinson, J. C. (M)
Potter, R. G. (A)
Potwardowski, B. (M)
Pride, E. W. (SM)
Rament, R. L. (A)
Ramsay, S. P. (SM)
Ranalli, R. (M)
Rassier, D. B. (M)
Reamer, E. D. (M)
Redden, F. T. (A)
Reid, H. J. (M)
Reinhard, C. J. (M)
Rhead, E. J. (SM)
Robinson, D. E. (A)
Rosenthal, R. N. (M)
Sampeant, H. I. (SM)
Sawyers, J. H. (M)
Schalk, N. (M)
Schenck, S. R. (A)
Schiavoni, D. W. (M)
Schmitz, J. F. (M)
Schoenholtz, J. L. (A)
Shapin, T., Jr. (M)
Shapiro, H. (A)
Sierra, J. G. (M)
Sisco, W. B. (M)
Smith, A. J. (M)
Smith, S. L. (M)
Spencer, G. W. (M)
Squires, J. R. (A)
Stanton, W. A. (M)
Stephens, E. J. (A)
Stiengelmar, L. R. (A)
Stone, J. A. (A)
Storch, H. (SM)
Thomas, P. M. (M)
Thompson, M. W. (M)
Tillens, G. C. (M)
Ullrich, W. J. (A)
Wack, C. B. (M)
Wanonner, B. A. (A)
Webster, G. C. (M)
Wendt, J. R. (M)
Wenick, R. L. (A)
Wilbur, D. I. (SM)
Williamson, R. J. (M)
Wilson, S. L., Jr. (M)
Yenton, G. W. (SM)
Yowell, C. O. (A)
Zike, W. L. (A)

Anjuan (SF-7)
Neilsen, I. R. (M)

Apple Valley (LA-7)
Ball, L. G. (A)
Cook, W. E. (M)
White, J. L. (M)

Arcadia (LA-P-7)
Anderson, R. I. (A)
Askren, P. S. (A)
Babeaux, A. G. (A)
Backus, R. A. (A)
Beatty, C. G. (M)
Breitwieser, C. J. (F)
Chandler, J. A. (A)
Cramer, P. W., Jr. (A)
Dietz, D. P. (A)
Dryden, E. H. (M)
Eland, R. C. A. (SM)
Fiske, J. J. (M)
Foster, J. F. (M)
Fritz, W. (M)
Galavan, T. P. (A)
Grobecker, A. J. (M)
Hadady, R. E. (M)
Horton, E. J. (M)
Johnson, R. E. (M)
Lano, D. W. (A)
Martin, G. M., Jr. (M)
Maxwell, G. D. (M)
Mulock, R. B. (M)
Neumeyer, B. W. (M)
Nielsen, J. J., Jr. (SM)
Nienstedt, D. A. (M)
Orr, R. A. (M)
Paquin, J. H. (SM)
Patterson, A. R. (A)
Pitzer, R. L. (M)
Potter, P. D. (M)
Price, J. F. (M)
Qua, W. C. (A)
Schenkel, L. F. (M)
Schindler, R. A. (M)
Schwarzmann, W. A. (SM)
Seiler, R. C. (SM)
Shaw, W. C., Jr. (M)
Sorne, B. W. (SM)
Speck, G. (M)
Sundberg, G. G. (M)
Swan, M. L. (SM)
Waldschmidt, N. E. (M)
Walo, R. M. (M)
Whistler, W. J. (M)
Wilkinson, B. L. (M)
Wood, A. M. (A)

Arlington (LA-OB-7)
Baker, W. L. (M)
Besel, H. W. (M)
Bishop, B. E. (M)
Bonue, H. (A)
Borunda, G. S. (M)
Bradford, W. C. (A)
Campbell, F. D. (M)
Daniel, D. D. (A)
Espeland, R. H. (M)
Frederiksen, T. M. (M)
Galbraith, H. J. (M)

CALIFORNIA

Garrison, G. W. (M)
Grinlus, L. L. (M)
Hoyt, E. P. (A)
Kolden, J. R. (M)
Lawlor, K. A. (M)
Lott, L. R. (A)
Macafee, J. W. (M)
Makinson, F. H. (M)
Ralatos, P. A. (M)
Todd, B. J. (M)
Weiss, J. G. (M)

Arroyo Grande (LA-SB-7)
Barringer, E. E. (M)
Hilliard, D. R. (M)

Artesia (LA-SA-7)
Seldeen, D. J. (M)

Atherton (SF-7)
Allison, J. E. (M)
Blanchard, H. P. (M)
Borden, H. C., Jr. (M)
Byrne, P. F. (SM)
Chaskin, W. S. (A)
Crabuchettes, P. W. (M)
Johnston, H. H., IV (M)
Jones, R. M. (SM)
Kane, R. W. (M)
McCullough, J. V. (A)
Moore, N. H. (SM)
Rist, A. E. (SM)
Ross, D. H. (M)
Scofield, P. F. (SM)
Walters, G. A. (SM)

Auburn (SAC-7)
Chesney, A. P. (SM)
Davenport, W. L., Jr. (M)
Moquin, A. E. (A)

Azusa (LA-OB-7)
Clark, P. A. (M)
Clark, W. L. (M)
Jamieson, J. A. (M)
Moss, J. F., Jr. (A)
Peck, J. W. (A)
Roark, G. L. (SM)
Zauman, B. (M)

Bakersfield (LA-7)
Andress, E. A. (M)
Hoffman, R. D. (A)
Welsh, N. R. (M)
Westall, C. L. (M)
Whiting, W. E. (M)

Balboa (LA-SA-7)
Gardner, R. S. (SM)

Balboa Island (LA-SA-7)
Hansen, E. H. (F)

Baldwin Park (LA-OB-7)
Michie, G. C. (M)

Barstow (LA-SB-7)
Chase, H. E. (M)

Beaumont (LA-7)
Hotine, W. (M)

Bell (LA-7)
Barquist, W. S., Jr. (M)
Loule, W. (A)
Zelenay, J. (A)

Bellflower (LA-SA-7)
Bailey, E. L. (M)
Bean, R. C. (M)
Brannlan, W. R. (M)
Cone, R. D. (M)
Cresswell, J. C. (M)
Hohenhaus, H. A. (M)
Mielke, J. J. (M)
Minckle, R. T. (M)
Noar, R. (A)
Pierce, K. W. (M)
Richter, W. A. (M)
Thomoson, M. F. (SM)
Woo, B. B. (M)

Bell Gardens (LA-7)
Adams, R. L. (A)
Rickard, L. D. (A)
Roper, M. M. (M)

Belmont (SF-7)
Blanco, J. D. (M)
Carter, J. M. (SM)
Curphey, D. G. (M)
Damonte, J. B. (M)
Eakin, J. H. (SM)
Ellison, T. A. (M)
Ferris, W. C., Jr. (A)
Gates, W. F. (M)
Hack, W. L. (A)
Huebler, M. A. (M)
Hyne, A. D. (SM)
Johnstone, F. C. (M)
Lee, S. (M)
Leonard, W. D. (M)
Renton, W. L. (M)
Stark, R. D. (M)
Towne, A. E. (M)
Zellmer, N. A. (M)

Belvedere-Tiburon (SF-7)
Brazeal, R. H., Jr. (M)
McFadden, R. R. (M)
Shumway, J. L. (M)

Ben Lomond (SF-7)
Fulmer, R. F. (A)

Berkeley (SF-EB-7)
Acker, R. C. (SM)
Adachi, T. (SM)
Adams, R. D. (M)
Angelakos, D. J. (SM)
Anger, H. O. (M)
August, G. (M)
Barbano, N. (M)
Bardly, D. E. (M)
Bergen, A. R. (M)
Birdsall, C. K. (SM)
Bonner, H. W. (M)
Bourne, H. C., Jr. (SM)
Brown, L. E. (M)
Brown, M. (M)
Bryson, J. D. (M)
Bulfum, J. H. (A)
Bullock, J. B. (A)
Carlyle, J. W. (M)
Criter, L. J., Jr. (A)
Chen, Y. M. (M)
Chernoff, R. C. (M)
Clapp, F. D. (SM)
Collins, C. C. (A)
Corey, V. B. (M)
Desoer, C. A. (SM)
Edwards, L. Z. (A)
Ellsworth, R. L. (M)
Evans, F. (SM)
Everhart, T. E. (M)
Evkhoff, P. (M)
Farly, G. M. (SM)
Freeman, E. D. (M)
Freeman, J. R. (A)
George, A. J. (M)
Gorham, D. H. (M)
Gullford, E. C. (M)
Grasselli, A. (A)
Hadek-Barkocsy, A. B. (M)
Harris, B. J. (M)
Harvey, M. J. (M)
Heard, H. G. (M)
Hill, L. O. (A)
Hoskin, A. M. (A)
Hopkins, D. B. (M)
Hunter, J. (A)
Huskey, H. D. (M)
Jenkins, K. D. (M)
Joroe, C. D. (A)
Jury, E. I. (SM)
Keeney, R. B. (M)
Kuh, E. S. (M)
Lichtenberg, A. J. (M)
Linder, I. W. (M)
Lipman, J. F. (M)
Lutz, I. C. (SM)
Mack, D. A. (SM)
Manabe, S. K. (M)
Melvin, R. M. (A)
Mikhail, S. L. (SM)
Monuki, A. T. (M)
Morris, R. J. (M)
Morton, P. L. (F)
Nakamura, M. (M)
Nelson, W. H. (SM)
Nishizaki, R. (M)
Noller, W. E. (SM)
Pederson, D. O. (M)
Reukema, L. E. (F)
Rumsey, V. H. (SM)
Russell, J. A. G. (M)
Scott, D. A. (A)
Scott, H. J. (SM)
Shephard, R. W. (SM)
Shiu, P. D. C. (A)
Silver, S. (F)
Sinoer, J. R. (SM)
Sloan, D. H. (F)
Smith, B. H. (SM)
Smith, O. J. M., Dr. (F)
Soule, W., Jr. (A)
Soltzer, N. S. (A)
Stout, G. H. (A)
Strothman, R. A. (M)
Susskind, C. (SM)
Taskett, D. A. (M)
Thomasian, A. J. (M)
Thornton, D. D. (M)
Turner, S. E. (A)
Wang, S. (M)
Westwick, O. B. (M)
Whinnery, J. R. (F)
Williams, C. S. (A)
Windsor, A. A. (M)
Wong, R. B. (M)
Woodward, J. R. (M)
Yee, P. K. (M)

Beverly Hills (LA-7)
Albin, F. G. (A)
Atkinson, J. M. (M)
Cannon, H. L. (M)
Cohen, L. B. (M)
Cooper, B. R. (M)
Croosey, D. V. (M)
Edelson, R. H. (M)
Elsler, G. (M)
Ellis, D. O. (M)
Fisch, M. W. (A)
Glanoolus, A. S. (M)
Green, D. J. (SM)
Harmon, W. S. (SM)
Hatch, M. M. (M)
Heft, C. P. (M)
Holmen, R. E. (M)
Jacobi, W. J. (M)
Korn, I. I. (M)
Krack, J. J. (A)
Lichterman, G. (M)
Magnuson, R. W. (M)
McWaid, J. A. (A)
Mullin, J. T. (M)
Nut, J. H. (A)
Pederson, W. O. (M)
Phillips, H. D. (M)
Pinol, D. G. (M)
Rutherford, C. E. (SM)
Sardo, R. L. (A)
Schott, W. L. (SM)
Silverman, I. (M)
Stuckelman, R. M. (M)
Terry, R. L. (SM)
Waser, J. W. (M)
Wilson, T. A. (SM)
Winchell, R. W. (M)
Wise, J. A. (M)
Wolcott, C. F. (F)

Buena Park (LA-SA-7)
Armstrong, T. J. (A)
Benedetti, F. J., Jr. (M)
Bunnell, C. D. (M)
Cornelius, W. B. (A)
Cuninoham G. W. (A)
Damoier, W. P. (M)
Demeter, J. P., Jr. (M)
Dooley, R. (M)
Fenwalt, W. H. (A)
Fleischmann, F. A. (A)
Hovda, R. E. (A)
Humphreys, T. I. (SM)
Kemper, D. M. (A)
Metzner, H. E. (M)
Nickerson, H. H. (A)
Rose, T. L. (A)
Ross, D. L. (M)
Sperling, R. W. (M)
Stack, T. K. (M)
Underwood, T. W. (A)
Webb, J. O. (M)
White, S. A. (M)

Burbank (LA-SF-7)
Askins, J. J., Jr. (M)
Baworouski, J. (A)
Beans, J. B. (M)
Bly, S. W. (M)
Brockway, D. C. (VA)
Brown, C. W. (M)
Bukhdud, J. (A)
Bunce, J. W. (M)
Bush, L. A. (A)
Cambell, D. E. (SM)
Carmel, H. H. (M)
Casey, J. D. (M)
Chang, W. H. K. (M)
Clabaugh, R. G. (M)
Clarke, F. H., Jr. (SM)
Coe, W. G. (SM)
Coosan, J. H. (SM)
Drahelm, K. P. (A)
Edgerton, A. K. (M)
Everett, F. A. M. (VA)
Fawcett, K. D., Jr. (A)
Fox, C. W. (M)
Fredendall, B. F. (M)
Ganzenhuber, J. H. (SM)
Gilbert, E. M. (SM)
Girouard, L. O., Jr. (M)
Goldman, R. F. (M)
Goodale, D. M. (M)
Harber, C. D. (M)
Hathaway, J. C. (SM)
Henning, E. S. (A)
Hoff, K. (SM)
Humphrey, J. F. (M)
Hunt, J. H., Jr. (SM)
Huston, Q. E. (M)
Hutchinson, W. M. (M)
Johnson, L. Z. (M)
Jones, W. F. (M)
Kolalowicz, A. M. (M)
Lelven, C. M. (M)
Lewis, H. O. (M)
Markley, J. E., Jr. (A)
Martin, W. R. (SM)
Matthews, C. (SM)
McAdam, J. C. (M)
McMuller, P. L. (M)
Miller, J. A. (M)
Mintz, F. (M)
Mitchell, J. A. (M)
Monfort, R. A. (SM)
Mont, C. H. (M)
Morioke, F. K. (A)
Mosier, R. R. (SM)
Moss, A. R. (M)
Motley, D. M. (M)
Moyer, J. N. (SM)
Mullich, G. L. (M)
Mullin, J. L. (A)
Muret, R. N. (M)
Naatz, R. C. (M)
Nicol, R. A. (M)
Powell, J. A. (M)
Primozich, F. G. (A)
Quist, R. C. (M)
Rolz, E. F. (M)
Romandia, R. R. (A)
Salers, J. L. (M)
Sassman, R. W. (M)
Schreiber, W. F. (M)
Schwartz, H. (SM)
Schwartz, N. A. (M)
Seltz, F. R. (VA)
Sehridge, H. (F)
Shahan, O. (M)
Slingerland, K. D. (M)
Smith, C. A., Jr. (A)
Smith, H. T. (M)
Staats, A. A. (SM)
Starr, A. R. (A)
Stewart, E. W. (M)
Taylor, V. L. (M)
Vinton, B. W. (M)
Wainscott, D. M. (A)
Walker, H. L. (M)
Warrington, W., Jr. (A)
Weatherford, R. V. (A)
Williamson, C. N. (SM)
Woodard, T. C. (M)
Woodrina, R. L. (M)
Young, R. A. (M)
Zilm, C. F. (M)

Big Bear Lake (LA-OB-7)
Black, J. M. (A)

Bishop (CL-7)
Rudolph, E. (A)

Blisthl (LA-OB-7)
Dawson, J. E. (M)

Boron (CL-7)
Cummings, J. C. (M)

Boron AFB (CL-7)
Johnson, C. C. (M)

Boulder Creek (SF-7)
Thorne, L. R. (M)

Brawley (SD-7)
Korbe, A. J. (M)

Brea (LA-SA-7)
Balluff, R. L. (M)
Donner, W. (M)
Kirk, R. J. (M)
Wolking, D. H. (SM)

Burlingame (SF-7)
Boss, L. J. (M)
Diesselhorst, G. A. (A)
Haines, W. D. (M)
Helseth, R. S. (M)
Morin, G. A. (M)
Petllean, A. E. (A)
Reinartz, J. L. (F)
Turkot, A. (A)
Wespiser, H. J. (M)
Wilke, R. R. (SM)

Calabasas (LA-SF-7)
Chandler, C. W. (M)
Clavin, A. (M)
Elliott, R. S. (SM)
Krausz, R. (SM)
Rosen, S. A. (M)
Schetne, H. A. (M)
Snyder, W. A. (SM)

Calexico (SD-7)
Lacarra, A. A. (A)

Camarillo (LA-B-7)
Angle, E. E. (M)
Dame, R. O. (M)
Dowling, K. T. (M)
Hamilton, W. T. (M)
Harvey, J. P. (M)
Jennett, N. E., Jr. (M)
Jones, B. R. (M)
Keller, E. G. (A)
Lund, F. H. (M)
Ogden, D. E. (M)
Wood, L. E. (SM)

Cambria (LA-SB-7)
Ohl, R. S. (F)

Camino (SAC-7)
Ozment, W. L. (M)

Campbell (SF-7)
Allen, F. K. (M)
Dye, R. E. (M)
Fredman, N. E. (M)
Gorman, E. B. (A)
Kahn, H. (M)
Mathis, W. H. (M)
Thompson, A. J. (M)

Camp Pendleton (SD-7)
Selby, D. F. (M)

Canoga Park (LA-SF-7)
Aiken, W. S. (SM)
Anole, S. L. (A)
Asa, F. E. (A)
Baker, B. W. (M)
Baton, R. L. (A)
Bauman, V. R. (A)
Bemis, P. S. (M)
Benbrooks, L. A. (M)
Benson, C. E. (M)
Bertucci, J. F. H. (M)
Bohl, R. J. (M)
Buchholz, C. W. (M)
Carson, D. G. (M)
Chapman, H. R. (A)
Conway, J. P. (M)
Cooper, H. V. (M)
Crawford, D. B. (A)
Cutler, W. D. (M)
Danner, D. H. (M)
Deuser, D. A. (M)
Dorrell, V. A., Jr. (M)
Durant, J. R. (M)
Flint, J. C. (A)
Ford, J. P. (SM)
Forrester, A. T. (SM)
Geary, L. W. F. (SM)
Gebel, J. L. (A)
Gehrke, R. A. (M)
Gleason, M. J. (M)
Goldstein, A. (M)
Graham, R. F. (M)
Graham, W. (M)
Grant, P. M. (M)
Gregory, G. D. (M)
Hart, J. P. (A)
Hartmann, S. (M)
Hamilton, L. E. (M)
Heald, E. T. (SM)
Henrikson, A. E. (M)
Heyne, M. W. (M)
Hitz, G. D. (M)
Hoefener, C. E. (A)
Hoff, R. G. (M)
Homer, E. G. (M)
Horak, R. J. (M)
Hund, E. (M)
Jacobsen, D. W. (A)
Kime, K. L. (M)
Kina, J. E. (A)
Kline, K. H. (SM)
Landwald, A. (M)
Laubenstein, R. A. (M)
Leach, H. L. (M)
Lieberman, J. L. (A)
Littlefield, K. E. (M)
Loh, R. E. (M)
Makush, W. S. (M)
McKeown, B. F. (A)
Milham, R. F., Jr. (M)
Moraan, T. M., Jr. (M)
Nauss, B. M. (M)
Olson, J. B. (M)
Pinckney, K. R. (A)
Powell, W. K. (M)
Pratt, J. W., Jr. (M)
Priest, E. J. (M)
Ramsauer, F. J. (A)
Rice, S. M. (M)
Robertson, R. G. (M)
Ross, H. H., Jr. (M)
Ross, W. E. (M)
Schlowitz, H. H. (A)
Silverstein, M. M. (M)
Sisson, A. R. (SM)
Soadaro, F. G. (M)
Steavenson, C. C. (M)
Sutton, W. R. (M)
Tenney, J. E. (M)
Thomas, R. (M)
Trenholm, R. B. (M)
Tucker, A. E. (M)
Van Doorne, J. R. (M)
Weatherford, A. V. (M)
Webb, C. C. (A)
Weber, D. R. (M)
Weinhouse, N. P. (A)
Welborn, K. M. (A)
Westenhaver, J. L. (M)
Wilson, F. V. (A)
Wood, R. J., Jr. (A)

Cardiff By the Sea (SD-7)
Graham, J. P. (A)
Woodworth, J. D. (M)

Carlsbad (SD-7)
Murdock, C. E. (M)

Carmel (SF-7)
Brown, C. M. (SM)
Pastel, M. P. (M)

Carmichael (SAC-7)
Ashley, A. B. (M)
Bills, C. R. (A)
Hendrickson, R. J. (M)
Jenkins, O. D. (A)
Kelliher, J. E. (VA)
McKeehan, M. B. (M)
Wilson, J. T. R. (M)

Carpinteria (LA-SB-7)
McCabe, A. P. (M)
Scholz, P. A. (SM)

Castro Valley (SF-EB-7)
Browning, G. D. (M)
Diamond, A. M. (M)
Kloeenhan, D. O. (M)
Roulette, R. E. (M)
Rufer, R. P. (M)
Slocum, R. L. (M)
Sorensen, R. W. (M)

Central Valley (SAC-7)
Makl, P. J. (A)

Chatsworth (LA-SF-7)
Babbe, E. L. (M)
Benson, S. A. (A)
Bowers, E. O. (A)
Butler, J. E. (A)
Chesnut, M. G. (A)
Cooper, J. A. (M)
Cowden, L. F. (M)
Gaoe, N. C. (A)
Haas, R. W. (A)
Harper, R. B. (M)
Paulson, E. T. (SM)
Rodine, J. C. (M)
Schaefer, J. H. (M)
Shlonsky, L. P. (A)
Smith, J. D. (M)
Tondreau, H. J. (M)
Weems, S. (A)

Chico (SAC-7)
Clausnitzer, F. W. (A)

Cordray, R. E. (M)

China Lake (CL-7)
Afendykiw, M. (M)
Arnold, P. G. (M)
Ashbrook, F. M. (SM)
Atkinson, R. E. (M)
Beresford, D. R. (M)
Berryman, A. R. (A)
Bolland, P. E. (A)
Boyd, R. V. (M)
Boyle, J. M. (M)
Breitenstein, R. E. (M)
Bryant, L. D. (M)
Carlisle, F. L. (M)
Crawford, J. A. (M)
Creusere, M. C. (M)
Davis, G. W. (M)
De Groot, N. F. (M)
Deyoe, D. C. (M)
Dorsey, S. E. (M)
Ducoff, G. (M)
Dull, M. J. (M)
Everett, J. A. (A)
Farrington, H. W. (A)
Ferris, A. B. (A)
Field, W. A. (M)
Foster, F. N. (M)
Freeman, C. F. (M)
Gates, D. E. (M)
Glatt, B. (A)
Glennon, R. E. (M)
Harris, J. F. (A)
Heeke, G. D. (M)
Hennan, R. W. (M)
Hilker, H. V. V., Jr. (A)
Ikendyana, F. K. (M)
Jeung, J. L. (M)
Johanboeke, R. B. (M)
Kermode, D. W. (M)
Kim, P. K. S. (M)
Lawrence, R. E. (M)
Loper, W. E. (M)
Lowe, N. (M)
McLane, J. J. (M)
McLean, W. B. (SM)
Merriam, R. T. (M)
Miller, J. H. (M)
Neal, C. L. (M)
Ostenso, A. S. (A)
Paulsen, A. J. (M)
Phillips, M. L. (M)
Rand, R. L. (M)
Robinson, G. G. (M)
Rockwell, R. E. (A)
Ronning, H. N. (A)
Rosenberg, H. W. (M)
Rountree, W. R. (A)
Ruggieri, F. A. (M)
Schoenbaum, W. J. (M)
Seibold, J. M. (M)
Sewell, R. G. S. (SM)
Skeeters, R. N. (M)
Stevenson, D. D. (A)
Sykes, L. (A)
Thomas, A. H. (M)
Thomsa, D. W. (A)
Trimble, J. (M)
Vore, W. E. (M)
Warr, G. D. (M)
Weber, J. E. (A)
Whitaker, R. M. (M)
Wickenden, R. C. (M)
Zellmer, W. G. (M)
Zilmer, D. E. (A)

Chino (LA-OB-7)
McKoy, G. C. (M)
Warren, J. R. (M)

Chula Vista (SD-7)
Billstrom, R. A. (M)
Chiles, J. R., Jr. (A)
Courtright, J. A. (M)
Creel, J. W. (A)
Daniel, W. A. (M)
Hart, J. M. (M)
Rockwood, J. B. (M)
Senn, J. C. (M)
Takacs, S. J. (M)
Taylor, W. G. (M)
Varian, R. H. (A)
Wilson, W. R. (M)

Citrus Heights (SAC-7)
Blair, G. (M)
Hartman, K. L. (M)

Claremont (LA-OB-7)
Agerholm, M. (M)
Andrew, V. J. (F)
Antul, J. J. (SM)
Block, K. A. (M)
Carroll, L. R. (M)
Chrystie, H. (M)
Coulombe, R. A. (SM)
Culver, C. A. (F)
Depew, H., Jr. (M)
Easton, J. D. (A)
Gaddis, L. W. (M)
Gibbons, T. J. (SM)
Gott, A. H. (M)
Grumbein, P., Jr. (M)
Guay, J. F. (A)
Hansen, O. B. (M)
Harry, H. E. (SM)
Heaviside, M. G. (SM)
Hennings, H. H. (M)
Holtum, A. G., Jr. (SM)
Hostetler, R. R. (M)
Irvine, R. G. (M)
Jacobson, O. M. (M)
Keith, I. W. (M)
Kiebert, M. V., Jr. (F)
Kuntz, G. L. (A)
Lindquist, J. R. (A)
Lloyd, A. T. (M)
Martin, R. L. (M)
McDowell, D. E. (M)
Michaels, E. L. (SM)
Moore, D. H. (M)
Newbold, R. F. (M)
Pile, D. H. (SM)
Romeo, D. J. (M)
Schlock, J. O. (SM)
Sell, W. B. (SM)
Sly, W. G. (M)
Taylor, A. H. (F)
Utman, R. E. (M)
Wellino, R. L. (A)
Wildman, R. C. (SM)
Woods, W. A. (M)
Young, C. W. (SM)

Colton (LA-OB-7)
Hollinrake, J. M. (M)

Compton (LA-7)
Duarte, S. R. (M)
Hauschild, R. L. (M)
Hitterdal, A. B. (M)
Isaacs, J. P. (M)
Pritchette, T. J. (A)
Russell, A. W. (SM)
Schneider, R. L. (M)
Smyth, L. E. (A)
Steele, R. W. (M)
Willcocks, S. J. (A)

Concord (SF-EB-7)
Armstrong, R. S. (M)
Billinghurst, E. M. (M)
Bogdanoff, A. G. (M)
Castanera, T. E. (A)
Clemens, G. W., Jr. (M)
Hyde, W. E., Jr. (M)
Kimes, R. E. (A)
Landeck, O. (A)
Mancuso, V. (A)
Rossi, F. J. (M)
Thomas, C. L. (A)

Corona (LA-OB-7)
Adrian, D. J. (M)
Bastedo, G. R. (SM)
Batchelder, D. D. (M)
Bell, D. E. (M)
Berry, J. J. (M)
Blank, S. (M)
Boque, P. N. (M)
Dealy, M. E. (A)
Dorn, C. G. (A)
Emerson, R. R. (M)
Freydl, E. J., Jr. (M)
Ganahl, P. J. (SM)
Hamilton, R. E. (M)
Harris, E. A., Jr. (M)
Heywood, N. A. (M)
Husten, B. F. (SM)
Kimball, F. L. (M)
McCormick, E. M. (SM)
McCroskey, A. A. (SM)
Meggers, W. F., Jr. (M)
Munn, R. E. (M)
Nordseth, M. P. (M)
Peringer, P. (M)
Sakamoto, R. (M)
Scharp, G. A. (A)
Scheets, D. F. (SM)
Snoke, C. E., Jr. (SM)
Strother, C., Jr. (M)
Talbot, R. V. (A)
Thomas, M. G. (M)
Weiss, A. (A)
Weiss, R. E. (M)
Whiteley, T. B. (M)
Wieder, H. H. (M)
Wood, B. C. (M)

Coronado (SD-7)
Franks, B. W. (M)
Held, R. W. (M)
Holmes, W. R. (M)
King, L. E. (SM)
Leavenworth, R. A. (M)
Mathews, A. E. (A)
Siebert, J. A. (M)

Costa Mesa (LA-SA-7)
Akers, R. (M)
Barber, W. S., (M)
Benafel, R. C. (M)
Braden, J. R. (M)
Brown, R. E. (M)
Carroll, R. V. (M)
Edmonds, A. (M)
Goodman, K. (M)
Howard, R. C. (SM)
McClay, M. (M)
O'Donoghue, H. J., Jr. (M)
Pyle, W. I. (A)
Robinett, D. B. (A)
Rueffer, H. F. (M)
Schneider, S. (A)
Schupak, L. (M)
Seymour, R. A. (A)
Smith, J. D. (M)

Covina (LA-OB-7)
Anderson, R. W. (M)
Bender, D. W. (M)
Bertness, P. N. (A)
Bewley, L. L. (A)
Buryn, E. C. (A)
Carlson, H. (A)
Cooper, R. G. (A)
Gilliam, D. (M)
Grossman, J. J. (M)
Johnson, C. W. (M)
Johnston, D. L. (A)
Jones, E. L. (M)
Joyce, J. H. (M)
Little, B. W. (A)
Lord, D. S. (SM)
Lothringer, R. C. (M)
Lowe, M. E. (M)
Luxy, R. C., Jr. (A)
MacDonald, D. A. (M)
McAllister, M. W., Jr. (A)
Mleczko, E. L. (M)
Neal, F. A. (A)
Powers, K. G. (M)
Richmond, C. D. (M)
Stolte, J. J. (A)
Sylvester, G. E. (M)
Teomney, G. H., Jr. (SM)
Weatherall, T. Q. (M)

Crannel (SF-7)
Kidder, R. T. (A)

Culver City (LA-7)
Adcock, M. D. (SM)
Adoonian, G. (SM)
Althaus, E. J. (A)
Asendorf, R. H. (M)
Austrian, R. B. (SM)
Bailey, J. C. (M)
Baldwin, L. W. (SM)
Barlow, D. S. (SM)
Barnes, S. H. (M)
Barry, T. S. (M)
Bataman, L. J. (M)
Bates, D. J. (M)
Beecher, D. E. (M)
Berk, A. D. (SM)
Bernath, J. (A)
Bertorello, R. J. (M)
Bleoel, E. C. (M)
Bimbaum, G. (M)
Buchman, W. W. (M)
Burns, J. D. (M)
Bylington, P. W. (SM)
Campbell, G. (M)
Campbell, R. A. (SM)
Carlile, R. N. (A)
Chalfin, N. L. (M)
Chernin, M. G. (SM)
Chouinard, R. J. (A)
Christoffers, W. H. (M)
Clapp, M. F. (A)
Clark, M. A. (SM)
Cohen, J. (M)
Constant, J. N. (M)
Cooper, D. L. (M)
Craven, W. A., Jr. (SM)
Curl, G. W. (A)
Curtis, M. R. (SM)
Day, R. A. (A)
Dean, C. F. (M)
De Villier, J. (M)
Dibos, R. A. (M)
Dimbach, P. H. (M)
Dodak, M. (M)
Doig, A., Jr. (SM)
Doshay, I. (SM)
Dunn, R. A. (M)
Eastman, R. S. (A)
Euler, K. C. (A)
Fafaman, A. (M)
Felber, J. F. (M)
Field, L. M. (F)
Fujitsubo, W. S. (M)
Fuller, R. H. (A)
Gilbert, W. N. (M)
Glaser, P. S. (M)
Gold, A. R. (M)
Goldman, S. J. (A)
Goldstein, S. (M)
Gould, L. M. (SM)
Greenberg, E. L. (M)
Grunsky, C. E. (SM)
Guptill, H. R. (A)
Gurley, L. T. (M)
Hall, N. I. (F)
Hanna, C. C. (M)
Hansen, J. M. (SM)
Hansen, R. C. (SM)
Hellwarth, R. W. (M)
Herrlin, J. M. (M)
Hemfeld, F. P. (SM)
Hersh, M. (M)
Hiehle, M. E. (SM)
Hill, D. A. (SM)
Hippensteel, M. H. (M)
Hirshson, R. M. (M)
Hull, R. E. (M)
Hunt, C. R. (M)
Hyland, L. A. (F)
Hyneman, R. F. (M)
Jameson, J. C. (SM)
Jensen, R. D. (M)
Jensen, S. K. (M)
Jemems, A. S. (SM)
Johnson, C. C. (M)
Johnson, D. H. (SM)
Julian, R. S. (SM)
Kanawyer, W. N. (M)
Kaplan, L. M. (M)
Kazan, B. (SM)
Kelly, D. S. (M)
Kelly, P. M. (M)
King, C. G., Jr. (M)
Klein, E. A. (M)
Klein, S. I. (M)
Klestadt, B. (SM)
Knechtl, R. C. (M)
Knowlton, C. S. (M)
Koda, N. J. (M)
Kramer, A. G. (A)
Ksienski, A. (M)
Le Coco, V. L. (M)
Leibman, M. H. (M)
Levin S. (SM)
Lew, C. (SM)
Lieber, M. (M)
Lillo, C. L. (M)
Livesay, M. A. (SM)
Long, M. C. (M)
Looram, J. R. (A)
Lotterman, C. (A)
Lunn, W. B. (A)
Lym, V. W. (M)
Lyons, H. (F)
Mak, S. (M)
Martin, E. H. (M)
Maserlian, J. (M)
Maxey, T. J. (SM)
Mayger, V., Jr. (M)
McFadden, B. W. (M)
McKinney, D. J. (M)
Medow, A. (M)
Mendel, J. T. (M)
Menold, G. A. (M)
Metcalf, D. E. (M)
Miya, K. (A)
Munushian, J. (A)
Nelson, C. E. (M)
Nelson, J. S. Jr. (A)
Nevins, J. E., Jr. (SM)
North, H. Q. (F)
Odlum, F. H. Jr. (A)
Parode, L. C. (SM)
Paul, P. F. (M)
Piecia, L. M. (M)
Pierce, C. G. (SM)
Pilrainen, C. A. (M)
Pitta, G. G. (A)
Plummer, D. (SM)
Possner, L. (M)
Poulos, P. S. (SM)
Pribenow, F. C. (M)
Price, O. R. (SM)
Proud, W. H. (M)
Rantil, R. M. (SM)
Regal, W. J. (A)
Rice, R. P. (M)
Richie, W. C., Jr (M)
Richter, R. E. (M)
Riley, R. L. (M)
Rodgers, V. P., Jr. (M)
Root, C. S. (SM)
Rosien, R. A. (M)
Rubel, J. H. (M)
Rush, J. M. (M)
Sayo, T. A. (M)
Schemmer, D. L. (M)
Schnauss, E. R. (M)
Schneider, H. Jr. (M)
Schneppie, W. F. (M)
Schoen, S. (M)
Scholnick, S. A. (M)
Schonlau, F. K. (M)
Schwartz, E. V. (M)
Senf, C. A. (A)
Shamban, W. S. (A)
Shank, R. J. (F)
Shein, S. (A)
Shelton, R. E. (M)
Sklar, S. (SM)
Steplan, P. (SM)
Smith, H. M. (SM)
Smith, H. F. Jr. (M)
Solia, A. F. (M)
Stauss, E. G. (M)
Stear, E. B. (A)
Stevens, S. (M)
Stich, M. L. (SM)
Stone, E. S. (M)
Swanson, G. W. (A)
Swarts, L. E. Jr. (SM)
Talcott, G. P. (SM)
Talle, C. A. (M)
Tate, W. R. (M)
Tauber, R. W. (M)
Thomas, A. H. Jr. (M)
Thompson, B. V. (SM)
Todd, E. G. (M)
Traoeur, R. E. (M)
Vall, A. E. (M)
Van Atta, L. C. (F)
Van Horne, T. B. (M)
Von Lanken, J. R. (M)
Wager, M. C. (M)
Warren, J. R. (A)
Watanabe, E. (M)
Weber, G. J. (M)
Wegman, R. S. (SM)
Wilcox, C. H. (M)
Wilkening, C. F. (M)
Williams, J. V. Jr. (SM)
Wolfson, H. (M)
Wong, K. L. (M)
Woodruff, M. J. (M)
Young, G. O. (SM)

Cupertino (SF-7)
Abbott, C. C. (M)
Bettendorff, O. A. (M)
Blessing, R. L., Jr. (M)
Brennan, R. D. (M)
Burnside, C. J. (SM)
Cottrell, C. J. (A)
Forge, C. O. (M)
Forget, T. W. (M)
Gillmeister, F. W. (VA)
Hawkins, S. R. (M)
Henry, E. W. (M)
Holaday, R. E. (A)
Le Vezu, C. G. (A)
Malaun, W. R. (M)
Martin, C. E. (A)
Norans, M. (M)
Patterson, K. P. (SM)
Perry, R. L. (M)
Rickey, R. G. (A)
Theisner, W. G. (A)
Varian, R. H. (F)

Cutler (SF-7)
Walston, A. G. (M)

Daly City (SF-7)
Kunzman, J. (A)
Tudor, B. J. (A)
Wiesner, J. C. (M)

Danville (SF-EB-7)
Barlow, O. M. (M)
Bunn, H. L. (SM)
Kestell, D. L. (M)
Laine, E. F. (SM)
Nish, J. G. (SM)
Norris, N. J. (A)
Sorenson, G. P. (A)
Thompson, F. C. (M)

Davis (SAC-7)
Jacob, F. C. (M)

Davis Creek (SAC-7)
Dolan, R. P. (M)

Del Mar (SD-7)
Boelens, J. (A)
Flite, T. E. (M)
Jones, W. C. (M)
Levy, G. S. (M)
Schick, H. F. (M)
Widenmann, J. A. (M)

Del Paso Heights (SAC-7)
Pahrson, C. R. (A)

Denair (SAC-7)
Sayre, M. B. (M)

Diablo (SF-EB-7)
Gallaher, J. F. (SM)

Downey (LA-SA-7)
Asalsoff, J. (A)
Altman, G. G. (M)
Auday, W. S. (M)
Baggao, J. J. (A)
Beall, A. (M)
Bell, H. Jr. (A)
Bower, J. L. (SM)
Bruemmer, R. K. (M)
Bunker, R. S. (M)
Busse, C. A. (A)
Buterbaugh, J. N. (M)
Butler, A. G. (M)
Campbell, A. T. (M)
Chambers, G. P. (M)
Clements, Z. S. (A)
Clifford, A. (M)
Comyns, L. S. (M)
Decker, O. T. (A)
Deutsch, W. F. (M)
Dudler, D. R. (M)
Duncan, D. B. (SM)
Epstein, H. C. (M)
Friest, D. T. (M)
Hailey, R. D. (A)
Harper, C. E. (A)
Haynes, J. (M)
Henry, J. L. Jr. (SM)
Hochwald, W. (SM)
Hodson, W. G. (SM)
Hoskins, H. T. (M)
Je Schonek, A. A. (A)
Johnson, M. W. (M)
Kennel, J. M. (SM)
Kilroy, J. J. (SM)
Kleyn, P. A. (M)
Knobbe, L. J. (M)
Larsen, H. F. (M)
Leicester, J. F. III (M)
Markson, J. L. (A)
Marosz, M. J. (M)
Marshall, R. L. (M)
Maticich, J. R. (M)
Matuszewski, H. E. (M)
McDonald, C. E. (A)
Melgaard, J. L. (SM)
Morgan, V. T. (M)
Morton, L. H. (A)
Nameth, J. F. (A)
Nelson, R. A. (M)
Nishioka, N. S. (A)
Palmer, W. E. (M)
Paynter, E. J. (SM)
Pierson, D. N. (M)
Pollack, W. (SM)
Pope, W. S. (M)
Popp, D. R. (A)
Rasmussen, C. F. (M)
Rogers, W. J. (M)
Sandberg, G. L. (M)
Sandusky, Z. A. (M)
Schmid, R. C. (SM)
Schmick, J. N. (M)
Shelley, R. G. (SM)
Singleton, H. E. (SM)
Smyth, R. K. (M)
Stember, L. H. Jr. (M)
Stoll, P. J. (M)
Stull, R. J. (SM)

Szabo, J. F. (A)
Tarca, E. L. (M)
Tenoelsen, W. E. (M)
Thoms, C. W. (M)
Trousdale, R. B. (M)
Tuney, R. J. (M)
Varanay, C. J. (M)
Weber, R. L. (M)
Williams, N. (M)
Wilcron, L. A. (M)
Wone, D. W. (M)
Worden, D. M. (M)

Duarte (LA-P-7)
Bain, M. B. (M)
Braun, V. J. (SM)
Canova, G. M. (M)
Herman, N. H. (M)
Hooper, P. B. (A)
Rodriquez, P. T. (M)
Sear, A. W. (SM)
Sitler, G. W. (A)
Tong, S. R. (M)
Williams, G. E. (A)

East Palo Alto (SF-7)
Dickey, D. R. (M)
Henderson, K. W. (M)
Iseri, C. H. (A)
Leamard, H. P. (A)
Reif, P. A. (M)

East Whittier (LA-SA-7)
Sanders, L. L. (M)
Sorensen, E. G. (M)

Edwards AFB (CL-7)
Applegate, B. E. (M)
Clarke, J. M. (M)
Davis, J. E. (M)
Freeman, W. L. (A)
Head, N. M. Jr. (M)
Heldrich, A. J. (M)
Lathrop, R. C. (M)
Luisi, J. A. (M)
Porter, L. K. (M)
Starr, E. A. (M)
Wills, W. L. (M)
Young, D. D. (M)

El Cajon (SD-7)
Alexander, W. G. (SM)
Andersen, G. R. (M)
Barley, L. B. Jr. (A)
Burton, K. M. (A)
Chazotte, M. M. Jr. (A)
Cunningham, E. E. (M)
Dana, J. J. (M)
Foster, C. B. (M)
Goulart, S. J. (A)
Gramman, E. G. (M)
Hardy, W. G. (M)
Harris, R. C. (M)
Hawkins, J. K. (M)
Holly, C. M. (A)
Howell, J. E. (M)
Jacobson, R. (SM)
Kasoar, E. J. (M)
Mason, J. R. (M)
Mayekawa, M. (A)
Meierbachtol, C. J. (M)
Moore, J. E. (A)
Oliver, E. F. (A)
Petersen, V. W. (M)
Pitt, C. J. (M)
Quintana, I. M. (M)
Rees, B. A. (M)
Sherburne, C. J. (M)
Smith, G. W. (M)
Soltesz, E. S. (M)
Steiner, F. A. (M)
Turner, P. M. (M)
Ward, J. P. (M)
Wells, T. C. (M)
Williams, A. A. (A)

El Centro (SD-7)
Hesse, J. F. (M)
Schulze, C. D. (M)

El Cerrito (SF-EB-7)
Bender, R. G. (A)
Binnall, E. P. (M)
Dimmick, R. R. (M)
Gray, H. F. Jr. (SM)
Lavrischeff, J. T. (M)
Lawrence, M. J. (M)
McClard, H. H. (A)
Patterson, S. J. (A)
Scott, N. B. (A)
Soleoel, L. (M)
Veburo, J. C. (M)
Veilfort, T. E. Jr. (A)
Vooelsberg, F. E. (A)
Watson, H. M. (M)

El Granada (SF-7)
Underwood, W. B. (M)

El Monte (LA-P-7)
Atherton, C. A. (A)
Thomas, R. L. (M)

El Segundo (LA-7)
Arsenault, W. R. (M)
Beard, M. R. (SM)
Black, J. (M)
Drendecka, W. H. Jr. (A)
Buczek, C. J. (M)
Byck, D. M. (M)
Diamond, P. (SM)
Eaton, C. F. (A)
Ervin, H. D. (M)
Garon, R. J. (M)
Gould, G. P. (M)
Kellogg, C. H. (M)
De La Garrigue, J. E. Jr. (M)
Linquist, W. I. (A)
Lushinsky, G. A. (A)
Medina, L. G. (M)
Mesak, C. (M)
Mondy, H. C. (SM)
Monos, S. (M)
Mousel, G. W. (A)
Pedersen, R. J. (M)
Petersen, L. D. (M)
Rodgers, J. W. Jr. (A)
Rutherford, D. H. (M)
Severs, W. W. (A)
Sinclaire, L. W. (A)
Sodaro, J. A. (A)
Walent, P. M. (M)

El Sobrante (SF-EB-7)
Corl, J. L. (SM)
Farrell, S. R. (A)
Kalder, H. J. (M)
Weinstein, D. A. (A)

El Toro (LA-SA-7)
Mongan, A. J. (M)

Emeryville (SF-EB-7)
Cowley, P. E. A. (M)
Fyler, N. F. (M)

Encinitas (SD-7)
Ward, T. C. (A)

Ecino (LA-SF-7)
Anderson, G. W. (M)
Anderson, R. E. (M)
Berwin, T. W. (A)
Brown, B. J. (M)
Cain, G. A. (M)
Carroll, C. T. (M)
Clark, F. J. (M)
Clark, T. C. (SM)
Creacy, J. N. (M)
Destau, H. R. (M)
Ferber, D. (M)
Fifield, R. K. (M)
Garcia, E. M. (M)
Gilder, G. (M)
Glaser, P. F. (M)
Goldstick, G. H. (M)
Hadden, F. A. (M)
Hall, R. D. (M)
Harris, K. W. (A)
Hedgerle, C. M. (SM)
Hoover, J. R. (A)
Jur, C. J. (A)
Kesselman, M. S. (A)
Lacy, R. R. W. (M)
Mann, A. (A)
Marsh, J. A. (SM)
McCann, J. G. (SM)
McCusker, R. W. (A)
Mintz, E. (M)
Murphy, M. H. (SM)
Nibbe, G. H. (SM)
O'Halloran, J. F. (SM)
Paine, N. W. (M)
Perrine, C. D. Jr. (A)
Pfeffer, I. (M)
Riege, R. C. (M)
Sabaroff, S. (M)
Schertle, W. B. (A)
Schroder, R. D. (SM)
Scott, H. A. (SM)
Seltzer, L. J. (A)
Senf, H. R. (SM)
Sharpe, L. E. (A)
Stewart, R. M. (SM)
Swift, C. W. (A)
Von Buelow, R. (A)
Widell, C. D. (M)

Escondido (SD-7)
Baum, R. H. (M)
Franevsky, M. (M)
Hall, J. T. (M)
Hitney, C. J. (M)
Howe, D. H. (M)
Peek, G. E. (A)
Seabaugh, D. A. (M)
Wick, M. R. (M)
Woodward, E. O. (M)

Etna (SAC-7)
Dannenbrink, H. A. Jr. (M)

Eureka (SF-7)
Olson, A. E. (A)
Smullin, W. B. (A)

Fairfax (SF-7)
Gray, P. G. (VA)

Fairfield (SF-7)
Finhill, M. (M)
Walsh, J. F. (A)

Fair Oaks (SAC-7)
Beeman, J. L. (M)
Bissett, J. C. (M)
Tucker, S. L. (M)

Fallbrook (SD-7)
Clark, J. H. (SM)

Felton (SF-7)
Dann, J. A. (M)
Morris, G. H. (A)

Fillmore (LA-B-7)
Alker, C. A. (A)

Florin (SAC-7)
Tahara, G. R. (A)

Fontana (LA-OB-7)
Riggins, M. R. (A)
Saez, R. G. (M)
Zinn, S. D. (M)

Fort Jones (SAC-7)
Fowler, J. A. B. (M)

Fort Ord (SF-7)
Melnik, R. P. (M)
Miyahira, H. Y. (M)

Fremont (SAC-7)
Weed N. M. (M)

Fresno (SF-7)
Bartlett, P. R. (M)
Clark, J. F. III (M)
Crecelius, P. H. Jr. (M)
Foin, O. F. Jr. (M)
Foreman, R. E. (A)
Hancock, J. B. (A)
Lamkin, K. R. (A)
Mealey, K. L. (M)
Whitby, E. R. (M)

Fullerton (LA-SA-7)
Adamson, P. A. (SM)
Andrews, R. C. (A)
Asher, R. W. (M)
Baker, D. L. (M)
Baran, P. (A)
Barter, L. D. (A)
Becker, D. R. (M)
Begovich, N. A. (M)
Berger, J. E. (A)
Billington, C. H. (M)
Bishop, J. F. (M)
Blum, L. M. (M)
Brunn, K. R. (M)
Calkins, W. R. (M)
Cannon, D. R. (M)
Carlson, R. L. (M)
Chang, Y. N. (M)
Chapman, C. W. (SM)
Chute, R. D. (M)
Clanton, R. A. (M)
Clark, C. M. (M)
Clary, W. T. Jr. (SM)
Cole, E. J. (SM)
Collins, J. W. (A)
Cother, R. H. (A)
Cronin, W. J. (M)
Cunningham, R. E. (A)
Dawirs, N. L. (M)
Dixon, R. G. (M)
Dolezal, R. T. (A)
Dufault, D. J. (M)
Ellades, J. (M)
Ellas, J. (M)
Ennis, F. L. (M)
Eschner, A. Jr. (SM)
Fahnestock, R. J. (M)
Fischer, J. J. (M)
Fischer, P. F. (SM)
Flatten, O. H. (M)
Fletcher, T. C. (M)
Foster, H. E. (M)
Foster, R. A. (M)
Fursa, A. (M)
Gade, D. W. (SM)
Garcia, E. E. (M)
Gayton, C. F. Jr. (A)
Geisel, D. H. (A)
Gray, R. W. (SM)
Green, R. J. (M)
Gunning, W. F. (M)
Harding, G. A. (A)
Hart, M. T. (M)
Hartenstine, R. M. (M)
Hearne, J. Jr. (M)
Heebner, D. R. (M)
Henderson, F. B. (M)
Horrocks, S. W. (M)
Hunt, E. B. (M)
Janeway, R. K. (M)
Joerner, J. C. (M)
Jones, P. D. (SM)
Karaolanis, L. G. (M)
Kazebee, C. R. (SM)
Kerber, S. M. (M)
Kerr, A. (M)
King, S. (SM)
Knipe, W. M. (A)
Knudsen, A. C. (M)
Kohlenberger, C. W. (M)
Komrosky, G. L. (M)
Kramer, R. F. (M)
Leisz, G. W. (SM)
Lessley, T. D. (M)
Lewis, B. G. (M)
Lewis, H. F. (M)
Lillie, G. L. (M)
Lo Cascio, R. J. (M)
Lubell, A. H. (M)
Mankinen, E. J. (A)
Mannino, R. E. (M)
Marshall, B. (M)
Mayor, W. G. (A)
McClellan, D. H. (A)
McFall, W. A. (M)
McKinster, R. G. (M)
Meyer, A. W. (M)
Mickelson, J. R. (M)
Moore, J. R. (F)
Morgan, R. C. (SM)
Oatt, R. L. Jr. (M)
Pease, N. H. (SM)
Redlich, H. S. (M)
Reed, R. H. (M)
Richter, E. M. Jr. (A)
Roberts, J. H. (A)
Roe, G. J. (M)
Rogers, J. G. (M)
Romanelli, J. (M)
Sampson, H. I. (A)
Schmidt, B. F. (M)
Shohara, S. (M)
Silva, L. M. (M)
Simon, H. S. (M)
Smedley, J. A. (A)
Snyder, E. H. (M)
Snyder, R. M. (M)
Sollenberger, T. E. (SM)
Solres, F. B. Jr. (SM)
Stameson, S. A. (A)
Starzec, F. J. (M)
Sutherland, C. W. (M)
Tang, R. (M)
Thomas, D. L. (M)
Toco, H. A. Jr. (M)
Tracey, J. R. (M)
Vail, W. A. (M)
Valentine, R. H. (M)
Vogel, V. H. (M)
Vrana, N. (M)
Walters, W. H. (M)
Way, G. B. (M)
Weber, W. R. (M)
Weir, W. R. (M)
White, L. M. (M)
Wilson, J. W. (M)
Wittels, I. M. (M)
Woods, L. A. (M)
Yaru, N. (SM)
Young, C. E. (SM)

Gardena (LA-7)
Albin, N. E. (A)
Andrews, L. J. (M)
Appelman, J. F. (A)
Baker, F. A. (M)
Berry, D. C. (A)
Boe, D. P. (M)
Boscia, A. F. (SM)
Brown, W. A. (M)
Buzzelli, T. S. (A)
Campbell, D. A. (M)
Carroll, J. D. (M)
Cohen, M. (A)
Coltin, A. H. (M)
Cully, R. A. Jr. (SM)
Currie, D. E. (M)
Determan, J. D. (M)
Dillon, M. M. (A)
Dillon, R. S. (M)
Doyle, R. E. (M)
Du Vall, W. E. (M)
Ehrlich, M. J. (SM)
Elck, M. K. (A)
Evans, G. L. (M)
Evans, W. S. (M)
Fine, E. (M)
Fleeman, P. J. (M)
Fujimoto, T. Y. (M)
Geisert, F. W. (M)
Giese, C. (M)
Ginsburg, S. (M)
Graham, D. K. (A)
Grier, M. B. (SM)
Grimmett, C. A. (SM)
Guffin, R. M. (A)
Hack, N. R. (M)
Halliday, R. G. (M)
Hans, E. (A)
Haronoye, R. O. (A)
Harkins, S. F. (A)
Harris, A. W. (M)
Haves, J. E. (M)
Honda, F. S. (M)
Hrubv, R. J. (M)
Inouye, G. T. (M)
Johns, J. F. (M)
Kawahara, M. (M)
Kelly, K. C. (M)
Kennann, J. E. (A)
Kersker, G. (M)
Ketl, L. G. (M)
Kino, H. E. (SM)
Knoop, G. L. (M)
Koster, R. A. (A)
Krause, C. A. (M)
Lachenmeier, G. E. (A)
Lowe, J. R. (M)
Lutze, D. L. (M)
Maonuson, V. P. (M)
Malbrain, J. P. (A)
Manelis, R. E. (M)
Manklewicz, E. J. (A)
Martin, A. P. (M)
Maxson, S. H. (M)
Maxson, V. G. (M)
McGhee, R. B. (M)
McGregor, G. L. (M)
McKenzie, J. N. (A)
Middleton, B. A. (M)
Minka, G. F. (M)
Moller, R. T. (M)
Najemnik, G. F. (A)
Nakatsukasa, F. Y. (M)
Nelson, C. E. (SM)
Nishball, J. L. (M)
Nissim, W. (M)
Olsen, L. V. (M)
Osborn, R. H. (A)
Pinsky, D. D. (A)
Plummer, R. E. (SM)
Quick, T. C. (M)
Reading, J. (M)
Rose, D. J. (M)
Rothwell, T. L. Jr. (A)
Ruhl, W. T. Jr. (M)
Sandberg, A. J. Jr. (M)
Schauwecker, H. E. (M)
Schroeder, W. (M)
Scott, A. W. (M)
Seehof, J. M. (SM)
Shlowitz, M. (M)
Skinner, M. R. (M)
Slaughter, R. G. (A)
Soanier, B. (M)
Taber, J. E. (M)
Thompson, W. C. Jr. (M)
Tong, K. C. (A)
Urlovic, W. C. (A)
Walker, N. L. (M)
Walsh, J. F. (M)
Webb, J. R. (A)
Winfield, R. J. (M)
Wizelman, A. (M)
Worrall, J. W. (M)
Yonemoto, N. (M)
Young, G. L. (M)
Zdanowich, C. A. (M)

Garden Grove (LA-SA-7)
Ames, M. D. (M)
Anton, F. C. (A)
Bertrem, C. J. (M)
Bishop, R. I. (M)
Clithero, W. H. Jr. (M)
Colean, A. R. (A)
Cresap, W. A. (SM)
Del Duca, A. (M)
Deloit, R. J. Jr. (M)
Dierken, K. C. (M)
Dunklee, L. H. (M)
Eno, R. F. (M)
Frarey, J. L. (M)
Freeman, R. E. (M)
Gebhardt, C. C. (M)
George, R. E. (M)
Guthrie, J. W. (A)
Hendrick, J. Jr. (M)
Hickman, W. L. Jr. (M)
Jacklin, E. M. (A)
Jones, W. R. (M)
Jungolas, E. E. Jr. (M)
Kasten, C. L. (M)
Katzenberger, H. S. (M)
Knecht, R. O. (M)
Lindley, C. J. (A)
Linton, T. B. (A)
Lucas, F. G. (M)
Lum, M. A. (M)
Meyers, L. J. (M)
Nelson, F. E. (M)
Ostrem, R. E. (A)
Packard, D. F. (SM)
Patterson, G. D. (A)
Prather, R. D. (M)
Rabbin, I. G. (M)
Reeves, J. J. (SM)
Reimherr, R. N. (A)
Richards, E. S. (A)
Sandhu, M. S. (A)
Schnitger, A. W. (M)
Stewart, A. A. (A)
Swenson, R. L. (A)
Vandal, W. L. Jr. (M)
Wyatt, W. C. (A)

George AFB (LA-7)
Castelluccl, A. H. E. (A)
Fair, E. G. (A)

Glendale (LA-SF-7)
Ambrose, J. R. (SM)
Archer, W. L. (A)
Assaf, E. J. (M)
Auerbach, M. (A)
Bailey, K. D. (SM)
Bertolet, E. C. (M)
Bible, R. E. (M)
Bray, G. L. (M)
Bridges, R. L. (M)
Bronstein, L. M. (A)
Brouillette, D. A. (M)
Buchanan, H. R. (M)
Clark, R. W. Jr. (M)
Collins, D. L. (M)
Curran, G. W. (SM)
Davis, J. S. (A)
Deen, J. R. (M)
De Witz, G. H. (SM)
Dixon, A. M. (M)
Emolish, R. B. (M)
Ericson, R. L. (A)
Feland, R. F. Jr. (A)
Foodim, C. (SM)
Foster, D. E. (F)
Fung, L. E. (A)
Gates, H. A. (SM)
Geist, W. K. (M)
Ghose, R. N. (SM)
Glassford, H. A. (A)
Glaze, R. H. (A)
Griffins, W. R. (A)
Grill, F. J. (A)
Hamilton, H. J. (SM)
Hand, F. W. Jr. (M)
Insall, W. E. (M)
Insalaco, J. J. (M)
Kindt, D. H. (M)
Kiser, A. J. (A)
Krill, C. K. (SM)
Ladine, D. A. (M)
Larter, T. C. (SM)
Lehan, F. W. (SM)
Lienhard, J. T. (M)
Marcolis, J. (M)

Masline, E. J. (M)
Meek, T. J. Jr. (SM)
Mzersman, R. J. (M)
Michael, C. (A)
Mras, R. J. (M)
Newberry, A. W. (SM)
Newcomb, R. (SM)
Nasi, A. (M)
Ockene, N. J. (M)
Ohlson, G. A. (M)
Parzl, R. C. (M)
Paul, F. A. (SM)
Pope, G. S. (M)
Pressman, G. L. (M)
Prout, D. B. (M)
Royer, R. N. (M)
Sanders, R. W. (SM)
Satinsky, S. (M)
Schmidt, L. M. (SM)
Scott, W. F. (M)
Scoville, R. R. (SM)
Selzer, R. H. (M)
Simpson, B. L. (M)
Slack, C. B. (M)
Smith, C. H. Jr. (M)
Snell, J. L. (M)
Spencer, R. L. (A)
Spray, W. D. (M)
Steele, E. E. (M)
Stefanov, B. (M)
Sweetnam, G. E. (M)
Swenson, A. N. Jr. (M)
Trostrud, A. T. Jr. (M)
Tzschentke, H. A. (M)
Valiquette, D. J. (M)
Vallar, T. F. (M)
Wallis, D. E. Jr. (M)
Whitehead, E. H. (A)

Glendora (LA-OB-7)
Bennett, J. R. (M)
Burk, P. O. (M)
Doeleman, H. (SM)
Friend, J. O. (SM)
Gehring, J. E. (M)
Grinnell, A. L. (M)
Hodder, W. K. (M)
Jones, J. G. (VA)
Kneen, W. (SM)
Kreager, P. H. (M)
Kuwahara, D. J. (M)
McDonald, J. A. (A)
McElwee, J. F. (A)
McGee, H. A. (SM)
Montgomery, D. H. (M)
Pohlman, D. W. (M)
Reilly, M. (A)
Schroeder, R. L. (A)
Schultz, R. T. (M)
Schwank, R. T. (A)
Seeger, J. A. (M)
Snodgrass, D. D. (M)
Spurling, W. N. (M)
Tallman, C. R. (A)
Waltz, D. M. (M)
Wardein, H. E. (M)
Wolfe, C. M. (M)
Worthy, N. M. (SM)
Coleta (LA-SB-7)
Ainsworth, M. J. (SM)
Bera, F. J. (M)
Bode, D. E. (SM)
Bradley, D. K. (M)
Browder, J. W. (SM)
Brown, W. P. (M)
Cohan, L. (M)
Frasure, L. R. (M)
Glancy, D. R. (SM)
Hill, D. R. (M)
Larsen, R. A. Jr. (M)
Llechty, W. (M)
McBurney, M. D. (M)
McVay, F. C. (M)
Miller, C. E. Jr. (M)
Ooheim, L. E. (A)
Paul, A. D. (M)
Reid, J. R. (M)
Robbins, W. M. Jr. (A)
Wanless, C. B. (M)
White, R. L. (M)
Wolthausen, L. H. (A)

Granada Hills (LA-SF-7)
Absher, G. E. (M)
Aleshire, T. S. (M)
Allen, R. J. (M)
Allison, G. R. (A)
Aloine, P. E. (SM)
Axtelle, G. E. (M)
Bartman, R. Jr. (SM)
Bellman, H. C. (M)
Bucklev, J. R. (M)
Canfield, L. D. (M)
Carl, R. J. (M)
Cassidy, C. J. (M)
Chang, B. (M)
Cole, B. M. (SM)
Dalton, R. A. (M)
Davis, W. K. (M)
Deaser, F. J. (M)
Dell, B. H. (M)
Eckel, K. G. (M)
Edwards, R. O. (A)
Felthousen, A. Q. (SM)
Fletcher, F. L. (M)
Fortune, A. F. (A)
Fuller, F. J. (SM)
Galati, V. J. (M)
Gautney, L. (A)
Gillespie, E. S. (M)
Howard, W. J. (A)
Jackson, R. D. (M)
Kalavitan, J. Jr. (M)
Keiser, J. A. (A)
Kerr, S. A. (M)
Kohn, I. A. (M)
Komacker, J. M. (M)
Levine, S. E. (A)
Lombardo, C. P. (A)
Loveless, R. M. (M)
Mac Coll, J. B. (A)
Machlis, J. (M)
Martin, D. R. (M)
McCutcheon, S. R. (M)
McDoude, R. H. (M)
Mentzer, S. C. (M)
Meyer, D. R. (M)
Mildcalf, W. A. (A)
Mooney, G. F. (A)
Morrow, H. W. (M)
Nelson, G. A. (M)
Nowak, R. F. O. (M)
Olson, O. P. (M)
Patterson, M. A. (SM)
Pekrul, P. J. (M)
Perlman, M. (M)
Phillips, G. A. (M)
Plaut, A. S. (A)
Reich, J. E. (M)
Robertson, D. C. (SM)
Rudy, E. W. (A)
Schulte, R. W. (A)
Seello, G. (SM)
Seldon, M. (M)
Sherman, R. W. (A)
Sisler, H. R. Jr. (SM)
Smith, S. W. (A)
Stoy, K. E. Jr. (A)
Thomson, B. Jr. (M)
Troutman, A. F. (M)
Vaterv, N. A. (S)
Walsh, B. L. (M)
Ward, B. M. Jr. (M)
Welch, W. E. (SM)
Williams, W. E. (M)
Wittels, J. R. (M)
Wolf, S. M. (M)
Zeitzew, H. (M)

Grass Valley (SAC-7)
Litton, C. V. (F)

Gridley (SAC-7)
Moore, W. L. (M)

Grossmont (SD-7)
Applin, R. H. (M)

Hamilton AFB (SF-7)
Parrott, J. H. Jr. (M)
Richter, W. C. (A)
Roberts, R. W. (M)
Whalen, A. D. (M)

Hanford (SF-7)
Nelson, R. A. (M)

Harbor City (LA-7)
Hamilton, W. J. (A)
Volth, W. L. (M)

Hawthorne (LA-7)
Abascal, N. (M)
Arcluch, J. P. (M)
Asnicar, D. V. (A)
Barnes, J. G. (M)
Bloom, L. (M)
Brian, W. T. Jr. (M)
Bryan, D. H. (A)
Campbell, H. G. (A)
Cavanazoh, J. R. (SM)
Christensen, A. V. (M)
Chu, H. (M)
Clark, G. L. (M)
Cole, W. R. (M)
Collins, W. C. (SM)
Dao, T. T. (A)
Endo, F. Y. (M)
Erznoznik, F. Jr. (SM)
Evans, B. H. (A)
Foxman, E. (A)
Galle, H. P. (A)
Gee, L. C. (M)
Geisert, W. O. (M)
George, R. D. (M)
Gerson, H. (M)
Gillespie, D. P. (A)
Gillis, D. E. (M)
Girvin, R. A. (M)
Goodell, E. M. (M)
Griffin, J. W. (A)
Griswold, T. W. (M)
Haoerty, R. J. (M)
Ieram, R. G. (M)
James, E. (M)
Johnson, D. G. (A)
Kail, L. T. (M)
Kilpinen, R. M. (M)
Kincaid, N. L. (A)
Knoll, D. W. (M)
Lamedon, J. G. (M)
Loynes, O. H. (VA)
Mac Garvey, E. R. (M)
Malin, L. J. (A)
Martes, G. E. (M)
McCann, F. A. (M)
McNeely, T. L. (M)
Medeiros, W. P. (A)
Mikkelson, M. E. (M)
Miller, B. C. (M)
Nishimura, R. K. (A)
Norsell, H. C. (M)
Ortiz, R. R. (A)
Osborn, C. R. (SM)
Parker, L. W. (M)
Paschke, M. J. (M)
Pisher, R. W. (SM)
Price, G. O. (A)
Proctor, C. A. Jr. (A)
Robertson, R. E. (SM)
Rufus, D. (M)
Sabol, R. W. (SM)
Saoey, W. E. (M)
St. John, E. E. (SM)
Savant, C. J. Jr. (M)
Schneberger, E. J. (M)
Shedd, I. A. (M)
Sirbola, G. (M)
Sloan, A. B. (M)
Smith, E. A. (A)
Staoer, D. N. (M)
Steam, E. A. (M)
Stein, S. (M)
Stewart, G. R. (M)
Switzer, W. L. (M)
Tucknott, T. P. (M)
Twohig, P. E. (A)
Van Winkle, D. M. (SM)
Weber, J. W. (M)
Wendel, D. R. (M)
Wilkinson, J. H. (M)
Williams C. E. (SM)
Winchell, W. L. (M)
Woerdemann, H. H. (SM)
Yahiro, R. K. (M)
Yost, E. A. (M)
Young, J. W. Jr. (A)

Hayward (SF-EB-7)
Brenkwitz, J. M. (M)
Brown, A. E. (A)
Cook, R. A. (M)
Floyd, G. M. (M)
Fort, J. R. (A)
Gausmann, W. H. (A)
Kees, A. A. (M)
Kivoi, G. T. (M)
Leavitt, C. A. (M)
Prosser, T. F. (M)
Rudkin, R. L. (M)
Ruzic, J. (A)
Smith, E. E. (A)

Hermosa Beach (LA-7)
Anderson, R. W. (M)
Branch, E. (M)
Brown, D. (M)
Browne, J. D. (M)
Clapp, G. V. Jr. (M)
Cleary, J. D. (A)
Dennis, P. A. (A)
Develet, J. A. Jr. (A)
Donnelly, J. E. (A)
Gardner, J. A. (A)
Hansen, J. R. (A)
Jones, L. E. (M)
Lentz, T. (A)
Mann, D. A. (M)
Pateuk, C. J. (M)
Pierson, J. E. (M)
Rousseau, A. L. (M)
Russell, W. J. (M)
Schulz, D. P. (M)
Slaole, W. R. (M)
Toffler, J. E. (M)
Zanites, C. J. (M)

Highland Park (LA-OB-7)
Banta, R. P. (M)

Hillsborough (SE-7)
Erickson, L. G. (SM)
Hellman, C. G. (M)
Ogilvie, A. R. (SM)

Hollydale (LA-SA-7)
Brown, B. L. (A)
Hesford, N. A. (M)
Stone, L. M. (M)

Hollywood (LA-7)
Aronowitz, A. (M)
Beamish, J. G. (M)
Benham, E. E. (M)
Benson, A. L. (M)
Bielek, A. D. (M)
Binkev, R. A. (M)
Bolton, D. D. (M)
Bryant, H. L. (A)
Chamberlain, A. T. (M)
Cooke, N. C. (A)
Davis, A. (SM)
De Cristoforo, E. J. (A)
Denechaud, R. G. (VA)
Dennev, B. H. (A)
Ehrlich, J. (A)
Estkowski, M. H. (M)
Farel, V. M. (SM)
Fuoate, K. O. (M)
Garabedian, A. (M)
Gilbert, J. D. (M)
Glaze, G. O. (M)
Greaorv, E. C. (SM)
Grenier, T. B. (M)
Heinke, C. B. R. (M)
Hushev, A. H. (A)
Kabuss, N. C. (SM)
Kellogg, W. A. (M)
Kern, R. D. (A)
Knobb, G. B. (SM)
Kuofer, R. C. (SM)
Lanoecker, H. G. F. (A)
Lubcke, H. R. (F)
Luvtx, J. D. (A)
Malssner, K. H. (SM)
Miller, G. B. (VA)
Moody, R. C. (SM)
Noorland, M. (SM)
Oslck, W. R. (A)
Regan, E. D. (M)
Riek, F. O., Jr. (A)
Ross, H. E. (M)
Sandv, R. J. (A)
Schroter, R. E. (A)
Schwartz, N. (M)
Scott, P. (M)
Scott, P. (M)
Small, J. N. (A)
Solomon, B. D. (A)
Solow, B. (M)
Stafford, J. W. (M)
Stoddart, R. R. (F)
Tasker, H. G. (SM)
Taylor, W. U. (M)
Temolin, E. W. (SM)
Terry, R. E. (M)
Thatcher, R. (M)
Uecke, E. H. (A)
Urev, G. M. (M)
Werst, H. J. (M)
Woltz, R. L. (A)

Huntington Park (LA-7)
Allee, R. V. (M)
Allen, R. M. (A)
Dowers, A. A. (VA)
Norris, P. P., Jr. (A)
Olson, W. J. (M)
Tingley, R. G. (M)

Imperial Beach (SD-7)
Curtis, G. D. (M)
Hodoes, P. (M)
Kercher, T. C. (M)

Indio (LA-7)
Edwards, B. G. (M)

Inglewood (LA-7)
Adams, W. (M)
Anderson, A. T. (M)
Arand, E. M. (M)
Barker, R. D. (M)
Barrett, C. W. (M)
Belhl, P. A. (M)
Beleskas, S. M. (A)
Berline, G. P. (A)
Bernstein, H. L. (M)
Bernstein, P. P. (SM)
Berry, G. L. (A)
Berube, J. L. (M)
Black, H. L. (M)
Borsch, K. S. (SM)
Box, F. M. (A)
Brady, R. E. (SM)
Brands, C. W. (M)
Brueckner, G. A. (M)
Brown, J. L. (M)
Burns, B. E. (A)
Clark, S. F. (M)
Cole, G. (M)
Crickmav, C. J. (M)
Cunningham, O. J. (M)
Danta, R. C. (M)
Delninoer, C. F. (M)
Dinsmore, S. H. (M)
Durand, T. S. (M)
Dwver, R. E. (M)
Eads, J. J., Jr. (A)
Easlev, C. R. (M)
Ellison, M., Jr. (M)
Enoel, P. F. (M)
Field, J. O. (M)
Floeder, T. O. (M)
Fowler, R. H. (M)
Galles, C. E. (M)
Garland, W. J. (A)
Gillmer, A. H. (SM)
Gluth, N. P. (M)
Goodman, R. L. (M)
Greaory, C. N., Jr. (M)
Hall, G. D. (M)
Hammer, I. W. (M)
Hannum, A. J. (SM)
Harrington, L. M. (M)
Harrison, W. (A)
Hassel, R. R. (M)
Herrst, L. R. (M)
Hino, R. H. B. (M)
Hollowav, V. C. (SM)
Holm, W. E. (A)
Holthenrichs, P. D. (M)
Howes, R. E. (M)
Hughes, H. M. (M)
Johnson, W. A. (M)
Kavmer, H. J. (SM)
Keenan, O. B. (A)
Kellner, M. (A)
Kircher, R. J. (SM)
Kirchoff, W. L. (M)
Kirkpatrick, T. I. (M)
Koeneker, D. B. (A)
Komatsu, G. A. (A)
Kotlerski, J. R. (M)
Kuefler, P. M. (M)
Kunivuki, R. M. (M)
Lanoan, J. C. (A)
Lawrence, A. F. (M)
Lee, H. E. (M)
Lias, R. B. (SM)
Liebeskind, J. A. (M)
Lorentz, N. A., Sr. (M)
Lou, C. B. (M)
Lowrance, L. W. (A)
Luce, R. W. (M)
Luck, R. (M)
Lynch, N. F. (A)
MacKenzie, L. G. (A)
Malone, H. L. (A)
Manlowe, W. R. (A)
Marable, H. E. (M)
Martin, D. (SM)
Mayberry, L. A. (SM)
McInnis, J. H., Jr. (M)
McKechnie, R. M. (M)
Meckfessel, E. F. (A)
Meier, D. A. (M)
Moore, L. W. (A)
Mortensen, R. E. (M)
Nakatsu, G. Y. (M)
Noland, J. W. (M)
O'Neil, W. F. (M)
Osuel, J. H. (M)
Patruskv, N. (SM)
Pelline, P. E. (M)
Peterson, L. A. (A)
Pol, W. F. (M)
Pomerov, D. (A)
Raines, R. F. (M)
Raits, E. J. (M)
Redmond, J. G. (M)
Reid, C. T. (M)
Rhodes, J. P. (M)
Richesson, R. W. (M)
Robinson, J. A. (M)
Roland, L. F. (A)
Rush, T. D. (M)
Ryan, L. E. (M)
Ryder, R. R. (M)
Sambuco, A. J. (M)
Schnurr, M. J. (SM)
Schwab, B. B. (M)
Seaton, A. F. (A)
Seid, E. (M)
Shapiro, S. S. (M)
Sherry, J. J. (M)
Shestag, L. N. (M)
Shumate, M. S. (M)
Silva, W. (M)
Spencer, P. F. (M)
Sorinoer, K. E. (M)
Stacev, J. M. (M)
Stevens, J. E. (M)
Stockhoff, K. K. C. H. (M)
Stokes, L. S. (M)
Stooek, S. (M)
Taylor, E. N. (M)
Thrall, G. P. (M)
Tomkins, F. H., Jr. (M)
Torre, R. C. (A)
Trainer, R. E. (M)
Trostle, J. E. (A)
Ulrich, D. A. (M)
Wade, J. P. (M)
Waltmire, W. A. (A)
Washburn, B. W. (M)
Wedin, A. G. (SM)
Weiss, B. S. (M)
Whirrv, W. L. (M)
Widenhoefer, J. G. (A)
Wiaains, D. G. (M)
Williams, H. M. (A)
Winter, J. A. (A)
Womack, R. H. (A)
Wright, H. B. (A)
Wylie, J. A. (M)
Wylie, P. A., Jr. (M)
Yerearce, R. A. (SM)
Zak, E. T. (A)

Inverness (SF-7)
Thompson, H. K. (M)

Irvington (SF-EB-7)
Bennett, R. D. (F)
Leach, D. P. (M)

Jackson (SAC-7)
Thiel, J. V. (VA)

Joshua Tree (LA-OB-7)
Easter, W. A. (M)

Kelseyville (SF-7)
Quarfoot, H. B. (M)

Kentfield (SF-7)
Conrad, R. C. (M)

Kenwood (SF-7)
Hosmer, E. A. (SM)

Kerman (SF-7)
Anson, C. T. (VA)

Kingsburg (SF-7)
Kidd, T. L. (M)
Wilson, F. H., III (M)

Knights Landing (SAC-7)
Harris, W. B., Jr. (M)

La Canada (LA-P-7)
Barclav, W. F. (A)
Barnes, R. B. (M)
Batson, D. D. (M)
Brewer, D. R. (SM)
Brewer, M. S. (M)
Brown, W. E., Jr. (A)
Butlork, R. E. (M)
Cane, M. P. (A)
Chase, W. P. (M)
Curtis, H. A. (M)
Faris, E. M. (M)
Fullmer, M. D. (M)
Goodwin, P. S. (SM)
Henry, D. S. (A)
Herron, J. R. (SM)
Higgins, S. F. (M)

Kenkel, H. H. (SM)
Kevser, J. H., Jr. (SM)
Koerner, T. W. (M)
MacMillan, R. S. (M)
McFadden, W. C. (M)
Moore, M. H. (M)
Parks, R. J. (M)
Peoples, J. E. (A)
Read, G. W. (M)
Rhoads, J. A. (SM)
Rodine, R. R. (M)
Schor, F. W. (SM)
Seeley, W. M., Jr. (SC)
Seufert, F. J., Jr. (SM)
Shadle, P. W. (SM)
Simi, N. (M)
Weil, F. M. (SM)
Whistler, W. B. (A)
Wieland, C. W. (M)
Wolfe, H. (M)
Younger, U. E. (M)

La Crescenta (LA-P-7)
Adams, J. A. (M)
Boensel, D. W. (M)
Ermatinger, C. E. (A)
Frilot, R. J. (A)
Geib, D. G. (M)
Holt, D. E. (A)
Lange, G. E. (A)
Linsley, A. O. (A)
Lorens, C. S. (M)
Markonis, W. C. (A)
Meyer, H. (M)
Meyercord, J. H., Jr. (SM)
Nantoni, F. N. (M)
Noland, A. R. (M)
O'Neil, W. T. (M)
Pirouman, M. A. (M)
Reinholtz, W. H. (M)
Staggaro, J. A. (SM)
Thompson, R. W. (M)

Lafayette (SF-EB-7)
Buchanan, L. R. (M)
Keller, J. E. (M)
Kirsten, F. A. (M)
Krueger, R. E. (M)
Martin, W. L. (M)
Montalbano, M. (A)
Morrison, G. E. (M)
Morrison, K. G. (M)
Norton, J. S. (SM)
Smith, L. C. (M)
Steed, W. P. (A)
Waddell, J. F. (SM)

Laguna Beach
Demy, J. C. (M)
Heaton, G. C. (M)
Holmes, P. J. (A)

La Habra (LA-SA-7)
Bechtold, I. C. (SM)
Bennett, J. R. (A)
Blake, F. G., Jr. (SM)
Chester, M. E. (M)
Clark, A. R. (M)
D'Evelyn, R. P. (A)
Gronlund, R. A. (M)
Hawkins, W. J. (M)
Himler, G. (SM)
Horst, C. W. (A)
Husman, P. A. (A)
Karsh, H. (M)
Laird, R. R. (M)
Linder, C. O. (M)
Low, L. L. (A)
Pellemans, J. T. (M)
Rollins, R. C. (M)
Shade, R. R. (M)
Stelsslinger, H. R. (A)
Struve, L. M. (M)
Tilley, A. E. (M)
Trorey, A. W. (A)
Unterberger, R. R. (M)

La Jolla (SD-7)
Bentley, A. W. (A)
Bishop, H. O. (SM)
Bramhall, E. H. (SM)
Bunar, D. G. (A)
Chadbourne, H. L. (M)
Cotcher, A. L. (SM)
Erickson, W. A. (M)
Flaxity, W. H. (M)
Fox, E. M. (M)
Hafstrom, J. R. (SM)
Hamann, O. F. (A)
Hoon, J. A. (SM)
Ikerd, H. M. (M)
Jones, C. E. (M)
Lanaston, J. F. (M)
Liddiard, G. E. (M)
Madsen, R. G. (M)
Markle, R. L. (M)
Maynard, J. H. (M)
McLeod, J. H., Jr. (A)
Michael, F. J. (M)
Miller, P. G. (M)
Naive, J. A. (M)
O'Neal, K. R. (M)
Otis, E. J. (M)
Patten, S. F. (SM)
Ritchart, R. C. (M)
Robbins, D. L. (A)
Sadler, E. J. (M)
Slaale, W. C. (M)
Theobald, D. J. (M)
Tucker, D. P. (SM)
Vasques, H. A. (M)
Beck Von Peccoz, S. G. W. (M)

Lakeside (SD-7)
Rogers, T. E. (M)

Lakewood (LA-SA-7)
Ashcraft, W. D. (M)
Beard, G. W. (M)
Beau, J. F. (M)
Bonem, E. J. (M)
Cain, G. H., Jr. (M)
Coombs, W. J. (A)
Dahlin, R. K. (A)
Eskridge, T. P. (M)
Fonda-Bonardi, G. (SM)
Francis, T. F. (A)
Frankiewich, C. (M)
Gerhard, F. H. (M)
Guggenheim, R. W. (M)
Hawley, A. E. (M)
Havman, W. H. (M)
Lee, R. E. (A)
McKown, S. J. (M)
Oehlke, A. E. (M)
Overmier, C. S. (A)
Pane, R. K. (M)
Ross, T. A. (M)
Walker, H. E. (M)

La Mesa (SD-7)
Ackerman, S. L. (SM)
Carberry, J. F. (A)
Cary, R. J., Jr. (M)
Clapp, E. B. (M)
Delo, R. E. (A)
De Mers, E. F. (SM)
Evey, R. R. (M)
Ferner, R. O. (M)
Fisher, H. G. (A)
Folland, D. F. (SM)
Ford, J. R. (M)
Hill, D. M. (M)
Hulbert, S. G. (M)
Lebduska, R. L. (M)
Linnenfelder, C. C. (M)
Lovebera, A. G., Jr. (M)
Lowe, D. M. (M)
Madsen, E. C. (M)
Masterman, H. W. (M)
Mathisen, W. D. (A)
Miller, R. H., Jr. (SM)
Moody, D. G. (M)
Moore, W. E. (M)
Olesen, C. E. (M)
Pike, F. R. (M)
Raper, A. J. (A)
Ratkevich, A. E. (M)
Runyan, T. W. (A)
Schart, W. J. (A)
Schmidt, M. A. (A)
Schoonover, M. R. (A)
Smith, D. I. (M)
Smyth, J. B. (F)
Torrible, A. W. (A)
Trolese, L. G. (SM)
Tweed, G. C., Jr. (M)
Walker, W. D. (A)
Welch, O. R. (M)
Whitaker, J. L. (M)
Wolfe, F. H. (M)

La Mirada (LA-SA-7)
Alfrey, P. R. (M)
Balsenorth, G. V. (M)
Benlamin, F. (M)
Bennett, J. L. (M)
Bruder, R. M. (M)
Cain, E. L. (M)
Carlson, R. S. (M)
Chemey, R. W. (M)
Davis, K. J. (M)
Elsner, W. (M)
Gaston, J. B. (M)
Gillen, T. W. (M)
Gilmore, D. A. (M)
Gordon, A. I. (M)
Grieve, W. R. (M)
Hauschwost, J. H. (M)
Holt, W. L. (A)
James, B. B. (A)
Kino, D. L. (A)
Kraemer, W. H. (M)
Kreager, P. C. (A)
Kruger, F. W. (M)
Looo, D. M. (SM)
Marsh, S. V. (SM)
McClure, D. H. (A)
Molloy, J. M. (M)
Myers, W. A. (M)
Parsons, J. H. (M)
Peterson, W. R. (SM)
Robertson, S. D. (M)
Sandoval, F. O. (A)
Simmons, J. W., III (M)
Smith, G. C. (M)
Sward, W. O. (M)
Thompson, K. A. (M)

Lancaster (LA-7)
Adams, W. C. (M)
Allison, C. H. (A)
Barbour, L. D. (M)
Barry, R. N. (M)
Belcher, A. C. (A)
Bero, R. L., Jr. (M)
Bolino, H. E. (A)
Christianson, W. O. (A)
Collins, D. H. (A)
Durham, S. C. (M)
Eckard, P. E. (A)
Eisenman, T. W. (M)
Green, F. W. (M)
Hertz, R. G. (M)
Inskeep, J. Z. (A)

Kimble, C. B. (M)
Long, L. M. (M)
Maguire, J. P. (M)
Milewsky, J. A. (A)
Miller, J. R. (A)
Mintz, R. M. (M)
Natenstedt, H. (M)
Parks, K. W. (A)
Rassoe, D. E. (M)
Rea, W. P., Jr. (M)
Rowe, J. B., Sr. (M)
Saponington, H. M. (M)
Schnert, P. J. (M)
Shumate, C. L. (M)
Skene, R. A. (M)
Steinbrenner, E. W. (A)
Sweeley, G. K. (A)
Walters, G. E. (A)
Wolfe, A. E., Jr. (M)

La Puente (LA-OB-7)
Gerlach, A. B. (A)
Green, A. W. (M)
Griffin, D. J., Jr. (M)
Shearer, G. W. (M)
Thomas, J. B. (M)
Wade, E. P. (M)

La Verne (LA-OB-7)
Buehler, M. E. (A)
Crofts, G. B. (M)
Flanders, A. E. (M)
Hoenfritz, N. H. (M)
Nelson, E. K. (M)
Riley, O. V. (M)
Schertz, C. W. (A)

Lawndale (LA-7)
Ahlbero, W. E. (A)
Alvarez, A. R. (M)
Dennis, J. (M)
Frederick, J. W. (M)
Hansen, C. B. (M)
Hollinosworth, V. N. (A)
Kennedy, F. D. (M)
Lambert, T. C. (M)
Lee, L. E. (M)
Linn, D. L. (A)
Mann, G. A. (M)
Parker, H. F. (M)
Pearson, R. E. (M)
Polzin, E. M. (M)
Schmid, A. A. (M)
Swan, R. L. (M)
Zobel, E. R. (M)

Lemon Grove (SD-7)
Kogan, J. C. (A)
Leitner, P. R. (M)
Loucks, H. D. (M)

Livermore (SF-EB-7)
Aaland, Kris (M)
Aas, E. A. (SM)
Alander, N. E. (A)
Anderson, J. S. (M)
Bandtel, K. C. (M)
Bostwick, W. E. (M)
Branum, D. R. (SM)
Brown, D. W. (A)
Carlson, B. V. (A)
Carstensen, H. K. (M)
Cometon, P. D., Jr. (M)
Cumminos, D. B. (SM)
Enos, R. C. (M)
Finnigan, R. E. (M)
Francis, H. D., Jr. (SM)
Fumbero, C. M. (M)
Greeson, D. E. (M)
Hamm, T., Jr. (M)
Iiams, R. K. (M)
Inami, F. K. (M)
Kaifer, R. C. (SM)
Katz, J. E. (M)
Krause, O. H. (M)
Laudeman, J. A. (M)
Loth, B. M. (M)
Martinell, R. E. (M)
McDonald, H. C., Jr. (SM)
McFarlane, H. B. (SM)
McMaster, W. J. (A)
Molzahn, D. W. (M)
Moore, J. M. (M)
Nelson, G. G. (M)
Nuoent, T. J., Jr. (M)
Olken, H. (M)
Owren, H. M. (A)
Peschel, D. J. (M)
Pheios, P. L., Jr. (M)
Potthoff, C. M. (M)
Price, W. C. (M)
Rau, W. B., Jr. (M)
Rodrigues, R. M. (M)
Rouse, J. C. (M)
Schreiber, O. W. (M)
Short, H. G. (M)
Sikorsky, E. (A)
Skinner, F. L. (M)
Skinrood, D. A. (SM)
Smith, V. L. (SM)
Sorensen, H. D. (A)
Solnella, J. D. (M)
Stiles, D. H. (A)
Tackev, R. J. (A)
Walker, H. C. (M)
Werner, R. E. (A)
Whitten, C. L. (SM)
Willows, J. L., Jr. (M)
Wright, J. B. (M)

Loma Linda (LA-OB-7)
Woods, R. W. (SM)

Loma Mar (SF-7)
Bennion, D. R. (M)

Lomita (LA-7)
Chesire, F. C., Jr. (M)
Edwards, J. L. (A)
McWald, F. N. (M)
Palmerson, P. J. (M)
Rooze, W. J. (M)

Lomoc (LA-SB-7)
Anderson, W. H. (A)
Arford, F. W. (M)
Billihart, M. F. (A)
Corvese, R. D. (M)
Fix, O. W. (SM)
Griswold, F. B. (M)
Hearn, O. (SM)
Jenkins, R. A., Jr. (M)
Lestick, A. P. (A)
Schmidt, R. F. (A)
Wornom, R. G., Jr. (A)

Long Beach (LA-7)
Andersen, E. A. (M)
Andreoskv, E. (M)
Ashcraft, A. E., Jr. (M)
Barlow, J. T. (A)
Beamsley, G. V. (A)
Bement, W. A. (M)
Blakely, L. (A)
Brandes, R. E. (M)
Bretherton, S. E. (M)
Brombero, R. S. (M)
Brown, K. H. (M)
Browne, K. R. (A)
Burr, K. L. (A)
Camoora, M. T. (M)
Carev, G. D. (M)
Chavarria, J. N. (SM)
Cole, B. T. (M)
Conrad, E. G. (A)
Dale, E. E. (M)
Drake, W. H. (M)
Duffy, B. A. (M)
Emery, S. (A)
Enholm, E. C. (M)
Farrand, C. E. (M)
Ferreira, R. (A)
Feither, W. B. (A)
Flinnin, J. B. (M)
Friebero, M. (A)
Gall, C. E. (M)
Gardner, F. H. (SM)
Grammes, E. G., Jr. (A)
Greaney, E. J. (M)
Hainik, A. T. (A)
Harbour, D. H. (M)
Hardy, R. M. (M)
Havden, R. J. (A)
Hetlinger, F. J. (M)
Hevman, E. R. (A)
Howard, R. D. (A)
Huddleston, R. R. (M)
Humphries, D. H. (M)
Hutcherson, J. V. (M)
Jenkins, A. F., Jr. (A)
Jimenez, J. W. (M)
Katzman, H. J. (M)
Kennel, R. A. (SM)
Kollanse, D. C. (M)
Krov, W. H., Jr. (M)
Kubo, E. Y. (M)
Landis, V., Jr. (M)
Littenbere, W. (M)
Loewenstein, C. N. (M)
Lutterell, J. A., Jr. (M)
Mackey, E. F. (M)
Maher, R. C. (A)
Mitsufomi, T. (A)
Moorhouse, T. R. (A)
Muhlestein, R. W. (M)
Nicholas, R. V., Jr. (SM)
Nickel, P. W. (M)
Pelc, T. (SM)
Pelteson, F. M. (M)
Peterson, E. L. (M)
Poff, A. C., Jr. (M)
Porter, B. W. (M)
Porter, R. J. (A)
Price, E. L. (M)
Ramer, F. H., Jr. (M)
Reichenthal, A. (M)
Roberts, H. M., Jr. (M)
Robinson, L. M. (M)
Rohland, A. E. (M)
Rumsev, W. E., Jr. (A)
Ruuert, M. J. (M)
Salisburv, D. L. (M)
Samuellan, B. (M)
Schmied, W. F., Jr. (M)
Schwab, A. H. (M)
Schwartz, M. J. (M)
Siegel, J. C. (M)
Sims, J. L. (M)
Smith, R. G. (A)
Souter, R. E. (M)
Soecht, W. A., Jr. (M)
Stearns, W. R. (M)
Steohens, H. M. (A)
Strasburoer, T. J. (M)
Taoo, J. E. (M)
Thomsen, G. A. (M)
Thresh, J. L. (A)
Titcomb, R. D. (M)
Trloodi, C. (M)
Uebele, G. S. (M)
Ulrich, R. J. (M)
Vuillet, P. O. (M)
Wakaniva, Y. (M)
Wilcox, W. R. (M)
Wilev, F. L. (M)
Yee, G. (M)
Young, J. A. (M)

Los Alamitos (LA-SA-7)
Anderson, F. A. (A)
Lavin, J. H. (M)
Moulton, J. A. (M)
Romano, A. J. (M)
Schandl, E. (M)
Swain, P. F. (A)

Los Altos (SF-7)
Abwussleman, W. (SM)
Adams, M. B. (SM)
Addleman, L. A. (M)
Aiken, W. R. (M)
Alberding, R. C. (A)
Allen, T. L., Jr. (M)
Anderson, W. W. (M)
Anost, D. C. (M)
Avis, A. J. A. (SM)
Awes, W. P. (M)
Baoley, A. S. (SM)
Baird, H. S. (M)
Baldwin, E. M. (M)
Barchenoer, B. W. (A)
Barnes, J. W. (M)
Bastow, W. R. (M)
Beeson, R. H. (M)
Berte, D. W. (M)
Blasi, E. A. (SM)
Blioki, A. F., Jr. (M)
Blumberg, M. (M)
Booth, W. T. (M)
Boswau, H. P. (SM)
Bourouin, K. R. (M)
Browning, S. D. (M)
Bureess, J. E. (M)
Burkhard, F. J. (M)
Butterfield, F. E. (M)
Cape, J. M., Prof. (SM)
Carlvle, J. K. (SM)
Christensen, W. V. (M)
Clements, B. C. (A)
Cockrill, J. T. (M)
Cooshall, P. D. (M)
Cooswell, W. P., Capt. (SM)
Corduan, A. E. (SM)
Corson, D. K. (A)
Cox, J. E. (M)
Dahl, J. D. (M)
Damron, S. S. (M)
Densmore, M. E. (A)
De Young, M. W. (M)
Doersam, P. D. (SM)
Dolohin, L. T., Jr. (M)
Donnelly, M. E. (M)
Dorney, P. E. (SM)
Dunwoodie, D. E. (A)
Earle, D. H. (M)
Edbero, E. B. (M)
Ehret, R. J. (SM)
Elbinoer, B. (M)
Eldredoe, E. E. (SM)
Ellis, A. R. (SM)
Elster, S. (M)
Elwell, C. F. (F)
Everson, C. T. (A)
Ferguson, S. A. (SM)
Ferri, G. (M)
Fitzgerald, P. M. (M)
Flemino, H. A. (M)
Fluose-Lotz, I., Dr. (M)
Fowler, B. (M)
Freeman, G. V. H. (A)
Frohman, R. (M)
Gamara, N. J. (M)
Gardner, B. C. (SM)
Gillett, G. D. (F)
Ginsburo, C. P. (M)
Giulie, J. D. (M)
Good, D. C. (SM)
Gunnell, G. T. (VA)
Hackley, G. E. (SM)
Hall, S. C. (A)
Hantsch, W. R. (M)
Hanson, R. A. (M)
Harper, P. T. (M)
Harrison, H. W. (A)
Hathaway, E. C. (M)
Heintz, R. M., Jr. (M)
Helwig, N. C. (M)
Helstand, N. P. (M)
Hilbiber, D. F. (M)
Hill, C. M. (A)
Hill, O. R. (M)
Hilton, E. A. (SM)
Hix, R. C. (M)
Hockett, S. W. (M)
Hodges, E. B. (M)
Hoog, J. E. (M)
Holly, J. A. (M)
Hornvak, F. J. (A)
Humfeld, J. B. (SM)
Hunter, P. B. (SM)
Hussey, J. G. (M)
Irick, J. (SM)
Jensen, P. A., Jr. (M)
Johannesen, O. M. (SM)
Johnson, L. W. (M)
Johnson, P. M. (M)
Johnson, R. T. (M)
Kellogg, H. A. (M)
Kendall, J. W., Jr. (M)
Kent, R. C. (SM)
Kevet, J. C. (SM)
Koch, G. E. (M)
Koehler, L. K. (M)
Kruesi, G. G. (M)
Kyle, W. F., Jr. (M)
Laforge, L. H., Jr. (SM)
Lamsinger, J. M. (M)
Larse, G. L. (M)

La Rue, A. D. (SM)
La Tourrette, P. M. (M)
Lauler, L. J. (M)
Leuraans, R. W. (M)
Lind, J. N. (A)
Lindseth, C. O. (M)
Mansur, F. (SM)
Marietta, R. A. (M)
Marshall, N. K. (SM)
Masher, D. P. (M)
Matschke, A. M. (M)
May, R. W. (M)
Mavenhofer, S. R. (M)
McGuloan, W. D. (SM)
McKee, L. H. (M)
McMenomev, J. M. (M)
Melchor, J. L. (SM)
Mever, C. F., Jr. (SM)
Mever, J. C. (M)
Miller, H. C. (M)
Mills, M. E. (M)
Moreno, T. (M)
Morris, F. W., Jr. (SM)
Morris, G. R. (SM)
Murphy, E. J. (SM)
Myers, W. D. (SM)
Nasler, C. J. (SM)
Nawocki, J. T. (SM)
Nelson, B. E. (M)
Nelson, J. W., Jr. (SM)
Nikonenko, P. V. (SM)
Norgaard, D. E. (SM)
Norris, C. B. (M)
Nurmela, G. E. (M)
O'Keefe, W. J. (SM)
Overacker, H. E. (SM)
Paloe, D. R. (M)
Pallakoff, O. E. (A)
Palmoulst, N. B., Jr. (SM)
Patterson, H. R. (SM)
Peshel, R. L. (M)
Peterson, A. M. (M)
Peterson, C. J. (M)
Pfister, G. H. (M)
Price, G. W. (SM)
Pruett, J. W. (M)
Rhodes, R. D. (A)
Rich, G. C. (SM)
Rockiltz, H. C. (M)
Rockwood, C. G. (M)
Rodoers, J. L. (M)
Roumbanis, T. (M)
Rubenson, J. G. (SM)
Sackman, R. (A)
Scal, R. K-F (SM)
Shockley, W. (F)
Schrock, N. B. (SM)
Schulke, G. F. (M)
Secard, E. L. (M)
Sedlacek, W. C. (M)
Sheriff, D. R. (SM)
Shields, R. E. (M)
Show, O. C. (A)
Sifford, B. M. (M)
Simpson, O. T. (SM)
Smith, C. A. (M)
Smith, D. I. (M)
Soderstrom, H. W. (M)
Sorensen, R. J. (M)
Sorvaaa, C. M. (SM)
Solvev, J. F. (M)
Stanley, C. B. (SM)
Stone, J. E. (M)
Strehlow, R. J. (M)
Summers, J. W. (M)
Sweeney, J. F. (M)
Teall, D. E. (M)
Tweraky, V. (M)
Vader, R. L. (SM)
Van Rensselaer, C. (SM)
Varenhorst, V. D. (SM)
Vincent, W. R. (A)
Walters, A. M. (M)
Wambsaanss, B. A. (SM)
Ward, C. E. (SM)
Ward, R. B. (M)
Waagaard, G. A. (M)
Webb, J. A. (M)
Weber, P. J. (M)
Weckler, G. P. (M)
Weismann, R. J. (SM)
Westcott, J. P. (SM)
Wheeler, G. J. (SM)
Whitacre, R. N. (A)
Whitmer, R. F. (M)
Wholev, W. B. (SM)
Wilcox, D. D., Jr. (M)
Wilder, K. T. (M)
Wilkerson, J. R. (SM)
Wohl, J. (A)
Wood, F. P. (M)
Woodward, R. F. (A)
Woolsey, S. W. (M)
Zaphiropoulos, R. (M)

Los Altos Hills (SF-7)
Anderson, J. R. (M)
Baker, R. H. (M)
Bowler, G. E. (SM)
Dawlev, J. R., Jr. (M)
Doak, R. S. (SM)
Fonda, R. D. (M)
Hoover, W. G. (M)
Kirchner, A. A. (SM)
Libby, L. L. (SM)
Main, W. F., Jr. (M)
McCullough, J. A. (F)
Richter, E. O. (A)
Robertson, O. F. (SM)
Rockwell, R. G. (SM)
Spitzer, C. F. (SM)

Los Angeles (LA-7)
Abel, A. O. (M)
Abeson, I. S. (A)
Ackerman, C. L. (M)
Adler, S. L. (M)
Ahloott, B. T. (M)
Ahrensdorf, R. E. (A)
Alcantara, I. W. (M)
Alider, J. R. (M)
Allen, F. W. (SM)
Allen, W. L. (M)
Alloever, G. O. (A)
Aloer, S. M. (M)
Aloerin, N. I. (M)
Ambrosio, A. (M)
Anderson, D. N., Jr. (M)
Anderson, K. W. (SM)
Anderson, R. S. (M)
Anderson, W. J. (M)
Anowin, B. S. (SM)
Anker, E. R. (M)
Antell, S. (M)
Anzel, B. M. (M)
Anpleton, H. (A)
Arakawa, W. J. (M)
Aranv, R. (M)
Artsel, J. (M)
Armstrong, H. R. (M)
Arn, S. F. (SM)
Arnold, F. M. (M)
Arnold, J. R. (A)
Arnold, W. O. J. (A)
Arnstein, G. P. (M)
Arrowsmith, E. B. (A)
Aseltine, J. A. (M)
Atkinson, W. R. (M)
Aunost, J. D. (M)
Aurich, W. G. (M)
Ausbourne, R. K. (SM)
Avnet, R. H. (A)
Awrech, N. (M)
Axelband, E. I. (M)
Avers, R. D. (M)
Azama, J. T. (M)
Azarl, E. (M)
Babin, R. S. (SM)
Baol, R. R. (M)
Bailev, H. J., Jr. (M)
Baillin, L. L. (SM)
Bakeman, D. C. (M)
Baker, C. L. (M)
Baker, E. E. (M)
Baker, J. J. (M)
Baker, M. L. (M)
Baker, R. G. (M)
Balakrishnan, A. (M)
Balden, S. B. (M)
Baldwin, R. C. (M)
Ball, L. D. (M)
Ballard, K. C. (M)
Balueo, J. J. (A)
Banks, L. (M)
Banks, R. E. (A)
Barbari, I. I. (M)
Barcus, E. D. (SM)
Barnes, J. L. (F)
Barnett, L. (M)
Barnett, R. S. (M)
Barnum, J. F. (M)
Baston, B. H. (M)
Bath, H. M. (M)
Battocletti, J. H. (SM)
Bauer, W. F. (A)
Bauerschmidt, D. K. (M)
Bavlev, R. M. (M)
Becker, H. (M)
Behrens, A. D. (A)
Bell, A. F. (M)
Bell, W. H. (SM)
Benassai, B. D. (A)
Benetler, L. E. (M)
Bennett, R. G. (M)
Bennett, R. R. (M)
Bennino, F. N. (M)
Bennorth, D. W. (A)
Bentley, J. H. (M)
Bercsi, J. A. (M)
Bera, A. M. (M)
Berkson, M. A. (M)
Berman, B. (M)
Bernard, R. H. (M)
Bernhard, H. A. (M)
Bernstein, R. (M)
Bernuv, J. F. (M)
Beroza, P. P. (SM)
Berrv, B. F., Jr. (M)
Berrv, R. P. (M)
Bertuch, C. J. (M)
Bialek, J. (SM)
Bice, W. O. (M)
Bilveu, R. P. (M)
Bird, R. N. (A)
Blackman, B. G. (SM)
Blackman, W. H. (M)
Blake, J. B. (M)
Blanc, S. L. (M)
Blair, L. L. (M)
Block, J. M. (M)
Bocast, D. R. (M)
Bodenstein, J. (M)
Boekelheide, A. W. (M)
Boost, C. A. (SM)
Bohlke, P. G. (SM)
Bomeisler, R. E. (M)
Bonebreak, R. L. (SM)
Bonner, P. R. (M)
Bonness, O. L. (M)
Bonnev, L. A. (M)
Booher, C. F., II (A)
Bootwood, J. H. (A)
Booton, R. C. (M)
Borks, M. D. (M)
Bouse, G. B. (A)
Bowman, L. H. (SM)
Boykin, T. R., Jr. (M)
Bradley, J. L. (SM)
Bradv, M. E. (M)
Brandt, R. (M)
Brauer, G. W. A. (SM)
Braun, E. L. (SM)
Bravo, A. (M)
Break, D. A. (M)
Breitwieser, G. F., Jr. (SM)
Bridt, D. C. (SM)
Britton, C. W. (A)
Brooks, W. O. (SM)
Browdv, A. A. (M)
Brown, E. L. (SM)
Brown, F. R. (M)
Brown, P. M. (M)
Brownstone, N. (M)
Broyles, R. S. (M)
Brubaker, G. P., Jr. (M)
Bruoma, F. C. (M)
Bruoman, W. E. (M)
Budnick, J. A. (M)
Bullock, D. W. (M)
Burbeck, D. W. (M)
Burch, J. E., Jr. (A)
Burd, E. M. (M)
Burdick, D. D. (M)
Burk, W. A. (M)
Burkhardt, G. N. (M)
Burnett, J. R. (SM)
Burnham, J. (M)
Burnsweig, J., Jr. (M)
Burt, R. A. (M)
Burton, C. A., Jr. (M)
Bussell, B. (M)
Byrd, D. J. P. (SM)
Cahn, C. R. (M)
Cahn, J. M. (A)
Campbell, F. L. (SM)
Campbell, S. (M)
Campillo, W. J. (M)
Cannino, R. G. (M)
Cannon, H. E. (A)
Carelli, S. E. (A)
Carlson, C. O. (M)
Carlson, E. H., Jr. (M)
Carlson, R. D. (M)
Carnahev, L. B. (M)
Carpenter, R. L. (A)
Carroll, F. E. (SM)
Carroll, G. R. (M)
Carson, J. W. (M)
Carter, E. C. (M)
Cataldo, J. T. (M)
Cate, F. M. (M)
Caulkins, D. C. (M)
Causey, G. D. (M)
Chalfant, D. A. (A)
Chamorro, R. D. (M)
Chan, C. F. (M)
Chano, D. (M)
Chann, H. H. C. (SM)
Chapman, A. C. (M)
Chapman, B. R. (M)
Chaosky, J. (M)
Chew, T. W. (SM)
Chieffo, A. B. (SM)
Childers, D. G. (M)
Chow, A. V. (M)
Christian, B., Jr. (M)
Churchill, O. R. (A)
Cirbo, A. J. (A)
Clair, D. E. (M)
Clark, A. C. (A)
Clark, B. L. (M)
Clark, D. R. (M)
Clark, D., Jr. (M)
Clark, R. D. (M)
Clark, R. W. (SM)
Clock, D. P. (M)
Coerver, L. E., Jr. (A)
Conner, D. D. (A)
Considine, J. M. (A)
Conviser, H. (VA)
Cook, I. M. (M)
Cook, L. (SM)
Cook, W. M. (A)
Cooke, R. M. (M)
Cooper, L. (M)
Cooper, P. V. (A)
Cohen, M. (A)
Coll, E. A. (M)
Colby, F. K. (M)
Cole, E. M., Sr. (M)
Collins, D. L. (A)
Collins, M. H. (M)
Colombano, L. (M)
Connell, A. D. (A)
Coneland, W. H. (SM)
Corlett, H. G. (A)
Cornwall, E. A., Jr. (M)
Costanza, S. T. (M)
Court, P. R. J. (SM)
Crabb, R. C. (SM)
Crato, L. J. (M)
Crisp, R. F. (SM)
Crooke, V. E. (SM)
Cross, E. F. (M)
Crowder, H. A. (SM)
Crown, L. (M)
Croyle, J. C. (M)
Cryden, J. (SM)
Culbertson, G. T. (M)
Cullumber, G. L. (M)
Culver, W. H. (A)
Cunningham, E. W. (M)
Currie, J. D. (M)
Currie, W. D. (M)
Curtiss, A. N. (SM)
Dalton, M. M. (A)
Daniels, J. A. (A)
Darling, J. K. (A)
D'Asta, J. (A)
Dautremont, J. L., Jr. (M)
Davenport, E. J. (A)
Davie, W. C. (A)
Davies, L. F. (M)
Davis, A. F. (M)
Davis, E. H. (M)
Davis, H. G., Jr. (M)
Davis, H. (SM)
Davis, J. F. (M)
Davis, J. J. (M)
Davis, J. L. (SM)
Davis, M. G., Jr. (M)
Dawson, S. L. (SM)
De Florio, G. P. (A)
De Forest, L. (F)
De Kimoe, R. A. (M)
De Micco, A. (A)
Demosev, D. J. (M)
Denny, W. I. (A)
Denner, D. M. (M)
Derchan, H. L. (M)
Dernham, C. R. (M)
Deruz, L. M. (A)
Deschamps, T. (M)
Dethlefsen, D. G. (M)
Dexter, G. W. (SM)
Dexter, P. F. (A)
Deyo, R. J. (A)
De Zube, L. H. (M)
Dhein, D. D. (M)
Diamond, D. M. (M)
Dibble, T. R. (M)
Di Blas, R. L. (M)
Diemer, F. P. (M)
Digby, J. F. (SM)
Dine, F. E. (A)
Diusatch, I. (SM)
Dobbertin, W. H. (SM)
Doll, E. B. (SM)
Domike, D. A. (SM)
Donahue, T. H. (A)
Doolittle, K. H. (A)
Douglas, D. L. (SM)
Dover, J. J. (SM)
Downes, L. C. (SM)
Dresselhouse, P. H. (M)
Drommerhausen, D. G. (SM)
Dudek, M. J. (M)
Dulin, J. J. (M)
Dunnigan, F. A. (SM)
Du Waldt, B. J. (M)
Dye, R. C. (A)
Dzilvelis, A. A. (M)
Eaton, J. J. (SM)
Eckert, J. A., Jr. (M)
Eckstein, J. (M)
Eddy, T. G. (SM)
Edelsohn, C. R. (M)
Edelson, L. (M)
Edgerton, D., Jr. (M)
Edson, M. (M)
Eiermann, R. R. (A)
Eisenscher, E. S. (M)
Eisenstein, A. M. (M)
Ekparian, J. (M)
Elliott, R. T. (A)
Ellsworth, A. R. (M)
Endo, M. T. (SM)
Enenstein, N. H. (M)
Enright, F. E. (A)
Erway, D. D. (M)
Estep, C. R. (VA)
Estrih, G. (M)
Estrin, T. A. (M)
Euler, L. J., Jr. (A)
Evans, H. W. (A)
Exner, W. L. (SM)
Fabian, S. H. (M)
Farhat, D. G. (M)
Farely, J. J. (M)
Farvolden, E. (M)
Fatton, G. A. (SM)
Faulkner, A. H. (SM)
Feigus, J. J. (A)
Feldman, N. E. (M)
Feldman, R. E. (M)
Fenn, W. H. (SM)
Fernandez, F. (M)
Fields, L. G. (A)
Filkoff, H. L. (SM)
Fineoold, L. (A)
Finney, B. W. (A)
Fith, E. (M)
Fischer, B. (SM)
Fischer, C. H. (A)
Fish, K. L. (A)
Fishback, K. H. (M)
Fitting, G. M. (A)
Fitzgerald, G. E. (M)
Fitzwater, H. L. (M)
Fleary, W. K. (A)
Fletcher, J. C. (M)
Flock, W. L. (M)
Floyd, G. W. (A)
Fluhrer, A. C. (A)
Fodor, F. H. (VA)
Ford, R. G. E. (M)
Fordyce, S. W. (M)
Forrest, C. B. (M)
Fort, J. E. (M)
Foulon, F. (SM)
Fraenkel, A. S. (A)
Frank, M. E. (M)
Frankel, S. P. (M)
Fraser, R. H. (M)
Fredricks, R. W. (M)
Freytag, R. C. (A)
Friedman, P. (M)
Frink, F. W. (SM)
Froelich, R. W. (M)
Fry, B. L. (A)
Fujimoto, B. (M)
Fujimoto, J. (M)
Fujimoto, K. K. (A)
Fujimoto, Y. (M)
Fulmis, M. J. (A)
Funderburg, J. D. (SM)
Fusfield, R. L. (M)
Futterman, M. (M)
Gabler, R. T. (SM)
Gaines, B. R. (SM)
Gallagher, H. E. (M)
Galloway, W. J. (M)
Gamson, E. R. (SM)
Gangi, A. F. (M)
Gapasin, F. G. (M)
Garblik, A. M. (SM)
Garraus, W. E. (SM)
Gasper, C. A. (A)
Gaston, J. L. (M)
Gates, H. P., Jr. (SM)
Gaude, W. G. (M)
Gayford, R. S. (M)
Gebhardt, H. W., Jr. (M)
Geddes, R. N. (M)
Geer, W. (SM)
Geiger, A. A. (M)
Geissinger, G. I. (M)
Gelman, D. S. (A)
Genco, F. (M)
Gerardi, F. R. (A)
Gerlough, D. L. (M)
Gerson, G. (M)
Gertsch, E. P. (SM)
Gertz, J. S. (A)
Gibbs, L. C. (A)
Gichtin, A. L. (A)
Gigante, V. (M)
Gillmann, H. E. (M)
Gilson, R. J. (SM)
Gimpel, D. J. (M)
Gladstone, B. E. (M)
Gloor, R. D. (M)
Goad, R. J. (M)
Golf, R. H. (M)
Gooolinski, J. A. (A)
Golbert, S. A. (M)
Gold, D. (M)
Goldenstern, G. M. (SM)
Goldman, H. (SM)
Goldman, S. (M)
Goldshine, K. B. (M)
Goodell, C. E. (SM)
Goodwin, F. E. (M)
Goodwin, J. W. (M)
Gordon, G. (M)
Gordy, H. M. (M)
Goris, E. N. (M)
Gorman, J. M. (M)
Gossland, S. (A)
Gottler, T. L. (SM)
Gould, E. W. (M)
Gould, R. E. (M)
Gourrich, G. E. (M)
Gozzi, E. J. (M)
Grabbe, E. M. (A)
Grady, R. J. (M)
Graham, J. M., Jr. (M)
Grant, E. W. (M)
Gray, W. H. (M)
Gray, W. W. (M)
Green, J. S. (SM)
Greenbaum, M. (M)
Gregory, E. M. (M)
Greif, H. D. (M)
Greif, L. (M)
Griest, R. H. (SM)
Griffith, M. H. (VA)
Griffith, S. D. (M)
Griggs, J. R., D. SC. (SM)
Grignon, L. D. (SM)
Grimes, W. J. (A)
Griner, L. A., III, (M)
Grove, J. L. (M)
Gruber, K. (M)
Gozon, W. J. (F)
Guerrero, E. S. (SM)
Gulness, H. A. (A)
Gunny, E. R. (A)
Gutcheon, W. Y. (M)
Haag, E. J. (M)
Haberland, E. R. (M)
Haeff, A. V., Dr. (F)
Hageman, D. H. A. (A)
Hagen, D. H. (M)
Hagerott, R. E. (M)
Haggal, T. F. (M)
Hahn, A. C. (M)
Haines, C. S. (M)
Hajjar, N. S. (M)
Hall, E. C. (M)
Hall, K. A. (M)
Hall, T. S. (M)
Halter, J. E., Jr. (M)
Hamilton, R. F. (A)
Hammond, N. B. (A)
Hanish, H. M. (A)
Hanover, P. N. (M)
Hant, W. (M)
Harberts, H. H. (A)
Hardin, R. H. (M)
Harpenau, R. L. (M)
Harrington, V. L. (M)
Harris, D.

CALIFORNIA

Hatchl, S. (M)
Haubrichs, F. P. (SM)
Hayashida, B. N. (M)
Hayata, T. (M)
Hayes, W. T. (A)
Hayman, G. O. (M)
Haymond, H. R. (M)
Haywood, V. M. (M)
Hecht, B. (SM)
Heffner, E. K. (A)
Heilfron, J. (A)
Helm, F. A. (M)
Heimiller, R. C. (A)
Heitzman, R. E. (M)
Helland, J. C. (SM)
Hendricks, M. (A)
Hendrix, C. E. (M)
Henry, J. A. (M)
Herrick, T. A., Jr. (M)
Hershberger, W. D. (F)
Heskel, J. H. (M)
Hetland, G. ., Jr. (M)
Hickey, R. E. (M)
Hiraishi, A. K. (A)
Hiraishi, P. (M)
Hiroton, R. V. (SM)
Hill, B. E. (A)
Hill, D. M. (M)
Hillard, W. R. (M)
Hillsdale, F. A. (A)
Hindin, M. J. (A)
Hitchcock, D. R. (M)
Hodges, W. J. (M)
Hoffman, H. L. (SM)
Hoffman, L. A. (SM)
Holcomb, D. R. (SM)
Holdsworth, D. M. (A)
Hollev, A. E. (M)
Holliday, I. M. (SM)
Holmes, F. M., Jr. (M)
Holmes, J. L. (M)
Holt, D. G. (M)
Holtrichier, J. (M)
Holtzman, J. C. (M)
Hom, F. M. (SM)
Honey, J. F. (SM)
Honor, H. I. (M)
Hoo, E. (M)
Hopkins, R. C. (M)
Horowitz, I. M. (M)
Horton, B. W. (M)
Horvath, J. S. (M)
Hosbach, G. H. (A)
Houghton, H. V., Jr. (M)
Howard, J. W. (A)
Howard, R. A., Jr. (M)
Howell, F. S. (SM)
Hoy, E. C. (M)
Hoyt, M. W. (M)
Hughes, F. (M)
Hultberg, D. E. (M)
Humphrey, W. L. (M)
Hundley, T. C. (M)
Huntley, W. P. (A)
Hyndman, R. W., Jr. (M)
Iannelli, E. (M)
Imhoff, J. J. (SM)
Ireland, R. O. (A)
Irish, J. B. (M)
Isbell, C. H. (M)
Ishii, G. M. (M)
Iwamoto, I. (M)
Izuel, A. G. (M)
Izzo, A. J. (A)
Jackman, R. W. (M)
Jackson, B. B. (M)
Jackson, K. R. (SM)
Jacob, D. M. (SM)
Jacobs, J. E. (SM)
Jacobson, R. E. (SM)
Jaffe, J. S. (M)
Jahns, E. R. (SM)
Jamison, J. W., Jr. (M)
Jamison, R. S. (A)
Janeira, A. J. (M)
Janssen, R. R. (A)
Jarrett, H. F. (M)
Jeffs, C. R., Jr. (M)
Jensen, T. L. (M)
Jevons, L. O. (M)
Johanson, E. H. (M)
Johnson, G. (SM)
Johnson, J. H. (M)
Johnson, J. S. (M)
Johnson, R. E. (M)
Johnson, R. M. W. (SM)
Johnston, W. R. (M)
Jones, I. (A)
Jones, L. E. (M)
Jones, R. M. (A)
Jordan, K. E. (A)
Joseph, D. (M)
Joseph, H. (A)
Judge, W. J. (A)
June, R. M. (A)
Jurmain, J. H. (M)
Kaar, I. J. (F)
Kado, R. T. (M)
Kanan, M. F. (SM)
Kahne, L. (A)
Kalliblan, R. (M)
Kane, P. M. (M)
Kaneko, G. S. (A)
Kanoler, M. D. (SM)
Kazarlian, Z. A. (M)
Karplus, W. J. (M)
Karr, P. R. (SM)
Karwan, H. P. (M)
Kassino, G. M. (M)
Kato, M. M. (M)
Kato, P. S., Jr. (A)
Kaufman, A. B. (M)
Kaufman, S. (M)
Kavanaugh, E. V. (M)
Kawafuchi, P. M. (M)
Kawahata, B. I. (M)
Kawana, H. V. (A)
Kaye, R. (A)
Keast, D. N. (M)
Keeran, R. V. (SM)
Kehrer, H. R. (M)
Kelt, H. A. (M)
Kelleman, D. (M)
Kelly, D. A. (SM)
Kelsey, D. L. (A)
Kelso, J. M. (SM)
Kemanis, G. (M)
Kennedy, C. B. (M)
Kennedy, F. M. (SM)
Kennedy, M. E. (F)
Kerr, J. S. S. (SM)
Kibler, P. J. (SM)
Kieman, E. F. (SM)
Kierulff, C. T. (SM)
Kiesel, R. H. (M)
Kilchenman, L. ., Jr. (A)
Kilpatrick, H. N. (M)
Kim, B. (M)
Kimball, M. A. (A)
Kinaga, T. (SM)
Kind, D. E. (M)
Kino, E. (M)
Kino, E. F. (SM)
Kino, R. E., Jr. (SM)
Kinsell, W. L. (SM)
Kirsch, H. A. (M)
Kishi, F. H. (M)
Kitabayashi, T. (A)
Klapoer, E. (M)
Klein, F. A. (M)
Klein, G. H. (A)
Klein, H. E. (M)
Klein, W. S. (M)
Klimek, J. C. (M)
Kline, M. B. (SM)
Kline, R. L. (A)
Klinge, W. H. (M)
Knaul, J. E. (M)
Knauss, R. G. (M)
Knell, E. A. (M)
Kobayashi, J. T. (M)
Kobayashi, R. (M)
Kober, B. K. (M)
Kodera, C. F. (M)
Kohlmeyer, R. B. (M)
Koski, L. H. (M)
Kost, B. F. (M)
Koueiter, M. N. (M)
Koukol, J. F. (SM)
Kovach, L. D. (M)
Krafft, W. R. (SM)
Krawiec, J. C. (M)
Krebs, J. H. (A)
Kreinheder, D. E. (M)
Kreismanis, M. V. (M)
Kroemer, J. R. (A)
Krone, I. (M)
Kros, K. W. J. (M)
Kruger, B. E. (M)
Kryske, L. E. (M)
Kukel, J. M. (M)
Kummelshuh, K. J. (M)
Kuos, E. F. (SM)
Kurahashi, D. K. (M)
Kuratani, K. K. (A)
Kurek, N. R. (M)
Kuretich, J. W. (SM)
Kurkjian, L. H. (M)
Lader, L. J. (SM)
La Face, D. T. (M)
Lambert, J. D. (M)
Lambros, J. G. (SM)
Lance, A. L. (M)
Landman, R. M. (A)
Landon, R. B. (M)
Lane, C. A. (M)
Lane, S. D. (M)
Lang, P. A. (M)
Lark, E. J. (M)
Larks, S. D. (M)
Larsen, R. P. (M)
Larson, D. E. (M)
Larson, R. L. (M)
Lash, E. (M)
Latimer, D. T., Jr. (M)
Latt, H. A. (M)
La Violette, R. F. (A)
Lawlor, R. C. (SM)
Lazovick, P. B. (M)
Leach, R. E. (M)
Lee, E. K. (M)
Lee, E. C. F. (M)
Lee, L. K. (F)
Lee, R. L. (M)
Lee, R. M. (M)
Lee, R. E. (M)
Leedy, C. A. (M)
Leekino, A. M. (M)
Le Grand, C. (M)
Lehr, S. N. (SM)
Lehrer, N. H. (M)
Leitch, W. S. (SM)
Leitner, R. G. (SM)
Lem, H. N. (A)
Lane, R. B. (SM)
Lenavel, B. A. (SM)
Leonard, T. J., Jr. (M)
Leondes, C. T. (SM)
Leventis, G. T. (M)
Levine, L. (SM)
Levinson, R. M. (A)
Levonian, P. V. (M)
Levy, E. C. (M)
Levy, L. S. (M)
Levy, P. G. (M)
Lew, H. W. (A)
Lewi, J. B. (SM)
Libaw, W. H. (A)
Lichtman, S. W. (SM)
Lichty, J. R. (M)
Lieberknecht, J. A. (A)
Lim, H. (M)
Lind, H. V. (M)
Lindell, E. (M)
Lindenbero, S. (M)
Lindholm, P. A. (A)
Lindsay, W. W., Jr. (F)
Lindstrom, G. M. (M)
Lioman, C. E. (M)
Lissauer, S. (SM)
Lockwood, R. A. (A)
Loller, R. D. (M)
Lontka, R. E. (M)
Lonney, B. W. (SM)
Loos, H. L. (M)
Lorenz, R. O. (M)
Losh, S. J. (M)
Lourenz, M. F. (M)
Lowell, R. J. (M)
Lowitz, G. E. (SM)
Lowry, J. M. (M)
Lov, Y. S. (M)
Lucas, A. (A)
Luce, D. W. (M)
Ludwig, D. E. (A)
Lund, R. E. (M)
Lund, W. W. (M)
Lusk, J. R. (M)
Lith, P. A., Jr. (M)
Lutz, S. G. (SM)
Lydick, J. D. (M)
Lyman, J. (M)
Lyons, L. J. (A)
Lytle, A. C., Jr. (SM)
Macaluso, F. A. (A)
Mac Crone, C. R. (A)
Macid, M. (SM)
Maguire, W. W. (M)
Maher, R. A. (SM)
Mallison, J. A. (M)
Mallon, T. A. (A)
Mancini, U. S. (M)
Mandefeld, E. C. (SM)
Manley, R. W. (SM)
Manly, R. (A)
Manner, H. (M)
Manov, F. S. (M)
Mar, W. A. (A)
Marcellini, R. P. (M)
Marcel, L. (M)
Marcellis, M. (M)
Marcowsky, H. M. (M)
Markowitz, S. (A)
Marks, R. R. (M)
Marshall, F. C. (M)
Marshank, D. N. (A)
Marston, G. A. (M)
Martin, K. B. (M)
Martin, R. A. (M)
Mason, C. W. (SM)
Massey, M. T. (M)
Masuda, H. B. (M)
Mathews, E. (M)
Mathews, W. E. (SM)
Matsubara, G. S. (M)
Matsumoto, T. E. (A)
Maure, D. R. (SM)
Maxaner, L. (SM)
McAllister, J. T. (A)
McCaldin, J. O. (SM)
McCaron, S. I. (M)
McCharles, J. R. (SM)
McCluno, R. R. (M)
McCov, R. E. (SM)
McDermid, F. A., Jr. (M)
McDonald, W. W. (M)
McDougall, M. E. (SM)
McGauchey, J. R. (SM)
McKee, W. S., Jr. (M)
McKenzie, J. A. (A)
McKesson, L. J. (SM)
McKnight, B. E. (M)
McLaughlin, J. R. (M)
McLean, J. D. (SM)
McLeod, M. G. (M)
McQuerry, W. H. (SM)
McRuer, D. T. (SM)
McVay, R. D. (SM)
Mead, C. E. (M)
Medow, J. (SM)
Meerschert, C. M. (M)
Mehrbach, E. (M)
Meier, E. H. (SM)
Meisels, G. (SM)
Messinger, H. F. (SM)
Metnick, R. A. (M)
Merrill, H. M. (M)
Messner, G. P. (M)
Mettler, R. F. (M)
Meyer, A. W. (SM)
Meyer, J. C. (M)
Meyers, R. C. (A)
Michaels, E. C. (A)
Michels, L. S. (M)
Micka, E. Z. (M)
Miallaccio, A. (M)
Milby, B. C. (M)
Miller, D. S. (A)
Miller, R. A. (M)
Miller, T. (M)
Miller, W. B. (SM)
Millstone, S. D. (M)
Milunas, Z. (M)
Minskentz, A. (A)
Mitchell, B. B. (M)
Mitchell, C. A., II (A)
Mitchell, J. M. (A)
Miwa, T. M. (M)
Mivata, J. J. (M)
Mockbee, R. L. (M)
Modlinski, W. M. (M)
Mohr, M. E. (SM)
Moller, J. K. (SM)
Molnar, A. W. (M)
Molnar, V. K. (M)
Monroe, J. C. (M)
Moore, D. W. (M)
Moore, P. G. (A)
Moore, R. T. (M)
Moore, W. J. (A)
Moreno, C. A. (SM)
Morita, J. T. (M)
Morris, J. B. (M)
Morris, J. O. (M)
Morrison, R. (M)
Morrison, S. C. (M)
Morrow, C. T. (M)
Moskalo, V. G. (M)
Moss, F. W. (M)
Moss, J. F. (A)
Mount, T. E. (A)
Mueller, G. E. (SM)
Mueller, G. J. (SM)
Mueller, W. A. (M)
Mueller, W. M. (M)
Munoer, J. C. (M)
Munson, J. E. (SM)
Murad, E. M. (M)
Mural, A. I. (M)
Murakami, E. T. (M)
Murakami, P. K. (M)
Murray, R. M. (SM)
Myers, K. E. (M)
Naoel, R. (M)
Nakabe, J. Y. (M)
Nakano, H. (M)
Nash, H. (M)
Neal, F. R. (A)
Nedland, E. H. (A)
Needlands, R. (M)
Nell, A. L. (M)
Nelson, K. L. (M)
Neumann, H. J. (M)
Neumann, J. W. (A)
Newmark, ?. (M)
Newhoffer, F. L. (A)
Newman, B. R. (M)
Newton, C. P. (M)
Nichols, C. A. (SM)
Nichols, F. J. (M)
Niebuhr, J. E. (M)
Nichime, F. S. (M)
Nordstrom, G. J. (SM)
Norman, L. S., Jr. (M)
Norton, J. L. (M)
Norton, R. M. (M)
Norwood, L. R. (SM)
Norwood, V. T. (SM)
Notvest, R. A. (M)
Nourse, R. B. (M)
Nuttall, H. V. (SM)
Nyder, R. C. (M)
Oberholtzer, J. M. (M)
O'Brian, E. D. (A)
O'Connor, G. J. (M)
Oazawa, K. (M)
Oolesby, W. D. (M)
O'Hara, C. L. (A)
Okafuil, S. (A)
Okimoto, J. Y. (M)
Okino, T. Y. (M)
Okubo, G. H. (M)
Oleesky, S. S. (SM)
Olson, M. W. (M)
Olson, N. L. (A)
Olson, R. E. (M)
Olson, T. H. (M)
Orr, J. A. (M)
Ort, D. L. (A)
Oslake, J. J. (M)
Ota, T. T. (M)
Otoide, J. K. (A)
O'Toole, J. B. (M)
Otoshi, T. Y. (M)
Ovitt, M. D. (M)
Padwa, M. N. (A)
Palmer, D. L., Jr. (M)
Pamler, R. G. (M)
Panttala, H. N. (M)
Panas, C. H. (M)
Pane, M. (A)
Pariskv, R. N. (A)
Parker, A. T. (M)
Parkinson, R. W. (A)
Parsons, G. W. (A)
Pascoe, T. S. (M)
Paskusz, G. F. (M)
Pass, H. R. (M)
Patel, B. D. (A)
Patton, W. L. (M)
Paul, D. I. (M)
Pedersen, C. R. (M)
Perkins, L. G. (M)
Perkins, L. M. (M)
Perry, E. D. (M)
Perry, R. H. (M)
Perry, W. C. (A)
Peterson, N. J. (M)
Pett, L. E. (M)
Pew, J. M. (SM)
Phiffner, H. J. (A)
Phillipson, L. L. (SM)
Phillips, A. H. (M)
Phinizy, R. B. (M)
Pickens, D. H. (SM)
Pieper, R. P. (SM)
Pinckernell, H. (M)
Pincknev, C. B. (M)
Pincus, L. (M)
Pinczower, H. J. (M)
Piott, C. J. (M)
Pizer, C. A. (SM)
Pizes, L. A. (F)
Plass, S. (SM)
Plotkin, S. C. (M)
Poirier, J. P. A. (A)
Pool, C. G. (M)
Poppen, L. W. (M)
Porter, R. L. (M)
Porter, W. J., Jr. (M)
Post, G. (M)
Potts, D. L. (M)
Pourtales, J. R. (M)
Preber, W. J. (M)
Premo, A. F., Jr. (M)
Price, R. L. (SM)
Pritchard, P. G. (M)
Pro, S. (A)
Purdum, L. C. (M)
Quan, J. (A)
Quan, N. (M)
Quinn, R. F. (M)
Quinn, T. B. (A)
Quirk, R. W. (SM)
Radant, M. E. (M)
Rainville, L. E. (M)
Ramo, S. (F)
Ramos, A. A. (M)
Rapoaport, R. B. (M)
Rath, E. D. (M)
Rau, E. C. (M)
Raymond, J. L. (M)
Reade, R. B. (M)
Reber, E. E. (M)
Reddine, F. W., Jr. (M)
Redheffer, R. M. (SM)
Redwood, R. C., Jr. (A)
Reed, A. C. (M)
Reed, R. V. (M)
Reanier, N. J. (M)
Rehbein, N. W. (A)
Reichert, D. G. (M)
Reimer, R. H. (M)
Reiner, G., Jr. (A)
Reinsch, F. J. (M)
Rennes, J. A. (SM)
Rescoe, J. M. (SM)
Retzlaff, E. E. (A)
Revnolds, G. W. (SM)
Richards, W. S. (VA)
Rickords, T. J. (M)
Ridout, G. W. (M)
Riewald, R. J. (M)
Riffind, J. (A)
Ritzenbacher, J. E. (M)
Roach, W. E. (A)
Roast, R. G. (M)
Robb, E. J. (M)
Roberts, P. S. (M)
Rocks, J. K. (A)
Rodman, N. (M)
Rogers, T. A. (M)
Rosa, G. N. (M)
Rose, W. (M)
Rosen, P. J. (M)
Rosenbloom, F. H. (M)
Rosenstein, A. B. (M)
Ross, D. H. (M)
Ross, W. L. (M)
Roth, A. R. (M)
Rothe, C. W. (M)
Rothrock, J. H. (SM)
Rovell, A. (M)
Rowlands, B. O. (SM)
Royal, E. L. (M)
Rubinstein, R. (A)
Ruderman, M. (M)
Rudin, M. B. (A)
Rudin, S. (M)
Rukman, S. (SM)
Rulz, M. L. (M)
Rumble, B. E. (M)
Ruoo, V. T. (A)
Ruppenthal, W. (A)
Russell, W. T. (SM)
Rutishauser, R. W. (M)
Sabiskv, E. S. (M)
Sackett, L. C. (M)
St. John, R. P. (M)
Sakai, Y. (M)
Saltzberg, B. (SM)
Samuelson, H. A. (M)
Samulon, H. A. (SM)
Sander, W. B. (M)
Sanderson, K. W. (M)
Sandoval, K. A. (M)
Sandoval, R. (M)
Sato, B. T. (M)
Satterthwaite, G. M., Jr. (M)
Saturensky, G. (SM)
Saul, R. S. (M)
Sauter, P. J. (A)
Saworotnow, I. P. (M)
Sawyer, G. E. (VA)
Sayano, K. F. (M)
Savlor, W. R. (SM)
Scapple, R. Y. (SM)
Schaefer, W. C. (A)
Schafer, N. B. (A)
Scharfeld, L. P. (A)
Schillino, M. O. (M)
Schmidt, L. W. (A)
Schoenduve, H. W. (A)
Schonheinz, E. J. (SM)
Schott, F. W. (M)
Schreiber, E. H. (F)
Schultz, H. R. (M)
Schultz, P. R. (M)
Schulz, P. (A)

CALIFORNIA

Schuster, D. H. (M)
Schwartz, A. (A)
Schwartz, B. (M)
Schwartz, W. L. (M)
Scoffone, R. G. (M)
Scope, S. (M)
Scott, R. G. (M)
Scott, W. H., Jr. (M)
Sears, R. E. (M)
Seoal, R. E. (M)
Seoel, D. L. (A)
Seidman, J. J. (SM)
Seitz, S. S. (M)
Selleck, R. S. (M)
Semel, D. (M)
Senseman, R. W. (M)
Senslaer, S. (SM)
Seomever, L. W. (SM)
Setzer, L. E. (SM)
Shaboo, J., Jr. (M)
Shallon, S. C. (SM)
Shameson, L. (M)
Shanahan, E. F. (M)
Shannon, F. J., Sr. (SM)
Shapiro, A. (M)
Shaw, R. G. (M)
Shearer, R. W. (M)
Sher, B. L. (M)
Shimabukuro, G. T. (M)
Shimizu, K. (M)
Shinoda, K. (M)
Shoemaker, H. L. (A)
Shoemaker, H. M. (A)
Shohet, N. (M)
Shnno, W. F. (M)
Shore, H. G. (M)
Shoulders, H. D. (M)
Shrum, L. R. (A)
Shufflebarger, J. R. (M)
Shuler, M. H. (M)
Shulsinoer, E. R. (M)
Sidio, G. J. (M)
Sioal, B. C. (M)
Siamon, L. C. (SM)
Sianer, R. M. (M)
Silliman, W. B. (M)
Silva, B. (M)
Silvem, L. C. (A)
Silvers, A. (M)
Simmons, V. J., Jr. (A)
Simon, A. (SM)
Simpson, W. P. (SM)
Sinn, G. (A)
Sion, E. (M)
Sizemore, L. E. (M)
Skelton, P. (M)
Sklar, B. (SM)
Skoller, M. (SM)
Slattery, J. J. (F)
Slee, J. E. (M)
Sloaar, J. W. (M)
Smead, H. J. (M)
Smeton, W. L. (M)
Smith, C. C. (M)
Smith, C. H., Jr. (M)
Smith, C. L. (A)
Smith, F. E (M)
Smith, G. F. (SM)
Smith, H. A. (M)
Smith, J. R. (M)
Smith, L. D. (SM)
Smith, L. J. (M)
Smith, R. T. (SM)
Smuckler, E. J. (SM)
Snapp, K. M. (A)
Snell, H. R. (M)
Snitzer, T. L. (M)
Snow, V. M. (M)
Sodaro, J. F. (SM)
Sollars, R. C. (M)
Soltys, G. H. (A)
Somers, F. J. (SM)
Sommer, J. G. (M)
Sommers, C. E. (M)
Sorensen, A. A. (M)
Soux, L. B. (M)
Soarks, B. O. (M)
Soector, A. N. (M)
Spellmire, R. J. (M)
Sperbeck, J. H. (A)
Sperling, P. (SM)
Spira, H. (M)
Spriestersbach, R. C. (M)
Sprinz, E. (M)
Stahl, J. (SM)
Stan, J. (M)
Stankevich, P. A., Jr. (A)
Stassinos, J. (M)
Staudhammer, J. (M)
Steams, G. W. (M)
Steams, L. D. (A)
Steele, E. L. (SM)
Steele, S. L. (M)
Steenson, B. O. (M)
Stein, R. L. (M)
Steinbera, R. (A)
Steinkolk, R. B. (M)
Stellmacher, D. D. (SM)
Stephenson, R. G. (SM)
Stern, J. M. (M)
Stevenson, E. (M)
Steward, M. H. (M)
Steward, R. H. (A)
Stewart, R. K. (A)
Stone, D. (M)
Stone, D. (M)
Stone, R. J. (M)
Stork, J. E. (M)
Stout, T. M. (SM)
Strandbera, J. E. (SM)
Strawn, G. A. (A)
Strem, S. E. (M)
Striebv, M. (M)
Stringer, R. B. (M)
Strumwasser, F. (M)
Stuart-Williams, R. (SM)
Stuver, H. J. (A)
Sussex, G. R. (M)
Sussman, R. J. (M)
Svioals, J. (M)
Swanson, E. R. (SM)
Swarthe, E. (SM)
Swiceoood, X. T. (M)
Szerllo, A. (SM)
Talima, G. K. (SM)
Takahashi, A. Y. (M)
Takahashi, K. (A)
Talbot, J. J. (M)
Tanlellan, G. (M)
Tanke, H. F. (SM)
Tantel, D. C. (M)
Tateoka, H. (M)
Tatsuzawa, S. (M)
Taylor, E. K. (M)
Taylor, J. C. (M)
Taylor, V. (A)
Tellez, J. M. B. (M)
Terzian, R. C. (M)
Teske, J. A. (M)
Tesler, A. (M)
Theodore, C. (M)
Thoma, F. J. (M)
Thomas, R. L. (M)
Thomoson, D. M. (M)
Thomoson, G. L. (M)
Thomoson, R. B. (M)
Thorensen, R. (M)
Thorne, M. F. (A)
Tidus, D. B. (M)
Tinsley, W. E. (M)
Tobin, G. C. (A)
Toeooen, M. K. (SM)
Toman, J. R. (M)
Tomash, E. (SM)
Tomikawa, K. B. (A)
Tomita, H. H. (M)
Tomokins, J. S. (A)
Tomal, Y. (M)
Tracev, B. P. (A)
Trachinger, R. (M)
Triplett, W. R. (SM)
Traoo, R. R. (M)
Troeger, F. R. (M)
Trukken, H. R. (M)
Tudor, J. E. (M)
Turin, G. L. (SM)
Tum, R. (M)
Tyson, G. (A)
Udalov, S. (M)
Uncasher, K. W. (M)
Uvetani, B. (M)
Vaictunas, A. A. (M)
Valader, F. D. (M)
Valentine, D. T. (A)
Vallant, J. G. (M)
Van Curen, V. (M)
Varoas, R., Jr. (M)
Veach, C. W. (SM)
Vega, C. J. (A)
Velasco, B. M. (M)
Venator, T. J. (M)
Veneklasen, P. S. (M)
Vesser, W. C. (M)
Villa, R. (A)
Vincent, L. R. (A)
Visotskv, V. M. (A)
Viterbi, A. J. (M)
Vizelio, R. B. (A)
Vondran, J. W. (SM)
Voss, J. H. (A)
Wada, J. Y. (M)
Waksman, A. (SM)
Walker, E. S. (M)
Walker, V. M. (M)
Wall, J. E. (A)
Wallace, D. C. (M)
Wallev, B. (M)
Walsherg, G. A. (M)
Wano, F. (M)
Ward, R. A. (M)
Wardak, H. (M)
Ware, C. H. (A)
Warren, W. B. (M)
Wasshauer, J. A. (M)
Warshaw, M. (M)
Waterman, H. B. (A)
Waters, W. P. (SM)
Watson, G. G. (M)
Weber, F. V. (A)
Wealein, R. D. (SM)
Weidemann, R. F. (M)
Weinbera, L. (SM)
Weinberoer, H. L. (SM)
Weiner, E. L. (M)
Weinoarten, R. (M)
Weinstein, E. M. (A)
Weis, J. P. (M)
Weis, W. G. (M)
Weiss, P. H. (SM)
Weldon, J. C. (M)
Weloe, V. (SM)
Welliver, C. L. (M)
Wells, C. A. (SM)
Wells, J. H., Jr. (M)
Weltv, R. M. (M)
Wenslev, D. C. (M)
Wenters, R. L. (M)
Wersen, D. T. (M)
Werts, L. C., S. J., Rev. (M)
Wessel, R. E. (M)
West, J. E. (A)
Westman, J. J. (M)
Whallev, J. M. (M)
Wheelon, A. D. (SM)
Whiston, R. W. (M)
Whitcomb, H. W. (M)
White, C. R. (M)
White, W. H. (M)
Whitford, R. K. (M)
Whitino, L. (M)
Whitten, M. G. (A)
Wiggins, E. T. (M)
Wilbur, E. T. (M)
Wilke, W. E. (A)
Wilkins, J. R. (A)
Willis, J. (A)
Willis, M. R. (M)
Wills, C. F. (M)
Wilmot, R. D. (M)
Wilson, A. E. (A)
Wilson, H. G. (M)
Wilson, J. A. (M)
Wilson, L. W. (SM)
Winkler, T. (M)
Winston, H. (SM)
Winters, B. C. (M)
Winters, M. N. (M)
Wires, G. A. (M)
Witherwax, H. E. (M)
Wolfe, R. E. (M)
Wolff, A. F. (A)
Woolrich, A. E. (M)
Wono, D. S. (M)
Wono, F. (A)
Wono, H. Y. (M)
Woo, C. (M)
Wood, G. D. (A)
Wooldridge, D. E. (F)
Woolever, H. S. (M)
Woster, S. H., Jr. (M)
Wrestler, G. R. (M)
Wright, P. B. (A)
Writer, P. L. (M)
Wunsalter, S. S. (A)
Wybrow, E. (SM)
Yabitsu, C. T. (M)
Yamamoto, T. G. (M)
Yamasaki, R. G. (M)
Yasuda, J. K. (M)
Yatskin, G. C. (SM)
Yee, W. W. B. (M)
Yim, G. W. (M)
Yoder, D. R. (M)
York, J. M. (M)
York, R. L. (M)
Young, R. D. (M)
Young, W. D. (M)
Zacharias, R. (M)
Zander, T. A. (M)
Zeh, R. J. (SM)
Zemanek, J., Jr. (M)
Zeoli, G. W. (SM)
Zieoler, R. M. (M)
Zillman, J. R. (A)
Zimmerman, F. M. (A)
Zinoel, G. A. (A)
Zisk, S. H. (M)
Zuccaro, S. J. (A)
Zuckerbera, H. (M)
Zukerman, L. G. (SM)
Zukin, A. S. (M)

Los Banos (SF-7)
Hunt, M. D. (A)

Los Gatos (SF-7)
Burns, W. E. (M)
Byrnes, P. J. (M)
Craddock, W. O. (M)
Critchlow, A. J. (M)
Drake, J. M. (M)
Dresbach, G. R. (M)
Glass, F. W. (M)
Goddard, W. A. (M)
Gross, T. W. (M)
Heintz, R. M. (F)
Henschke, R. A. (SM)
Hummel, K. H., Jr. (A)
Irvina, D. W. (M)
Kownacki, S. (SM)
McLaughlin, J. A. (M)
McQuade, E. J. (M)
Meidell, P. I. (A)
Mills, J. J. (M)
Morrison, H. L. (M)
Orrick, R. L., Jr. (M)
Poole, J. R. (A)
Schultz, O. T. (SM)
Stokes, B. C. (M)
Stoner, F. E. (SM)
Sund, H. E. (M)
Tritton, R. F. (A)
Vindino, J. P. (A)
Wear, G. L. (A)
Weeks, R. W. (M)
Wilds, R. B. (M)

Lower Lake (SF-7)
Wunderlich, G. F. (SM)

Lynwood (LA-7)
Albon, R., Jr. (A)
Audick, G. C. (A)
Davidson, J. K. (A)
England, R. E. (M)
Jeffrey, H. S. (M)
Lavson, W. L. (A)
Miller, D. E. (M)
Roth, E. L. (M)
Yoder, A. A. (A)

Malibu (LA-7)
Chatfield, M. B. (SM)
Dill, J. M. (A)
Hill, C. R. (SM)
Hudseoth, T. (M)
Ivev, L. I. (M)
Kino, G. L. (M)
Knowles, W. S. (SM)
Koontz, D. E. (A)
Law, R. R. (F)
Lewis, D. E. (M)
Linvill, W. K. (M)
Love, C. E. (M)
Morse, J. H. (M)
Peirce, T. F. (M)
Purdy, W. E. (A)
Yearsley, W. A. C. A. (M)

Manhattan Beach (LA-7)
Alessi, V. J. (M)
Andrews, G. B. (M)
Aroyan, G. F. (M)
Bartholomew, H. R. (M)
Beachler, R. R., Jr. (SM)
Booth, F. T. (A)
Boroeson, P. W. (M)
Bower, G. G. (SM)
Buell, F. D. (A)
Burke, H. W. (M)
Cardiff, D. L. (M)
Clav, J. D. (M)
Clunis, K. (M)
Conover, W. V. (M)
Crapotta, F. C. (M)
Curtis, C. W. (M)
Curtis, E. I. (M)
Destabelle, R. (M)
Dobbins, W. E. (M)
Downey, E. J., Jr. (M)
Drake, W. E. (M)
Ellis, A. (M)
Evans, J. C. (M)
Fisher, R. C. (M)
Fisk, J. W. (M)
Fountain, J. G. (A)
Frost, F. K. (A)
Frvsinoer, E. B. (M)
Fuhrman, T. A. (A)
Fulton, A. S. (M)
Gelbwaks, N. L. (M)
Georoe, L. C. (M)
Glascock, R. D. (M)
Grabowski, K. P. (M)
Graham, J. D. (M)
Greoory, H. D. (M)
Grumich, J. (SM)
Gustafson, L. A. (M)
Harris, J. W. (SM)
Hartmann, E. C. (M)
Heikkinen, R. R. (M)
Hell, J. F. (M)
Hendricks, J. T. (A)
Hiekel, W. H. (A)
Hlohstrete, B. A. (M)
Holmes, J. S. (M)
Hook, W. R. (M)
Kelly, R. S. (M)
Kenny, P. C. (M)
Kind, D. E. (M)
Kirkland, V. D. (M)
Knittle, D. L. (A)
Le Moin, F. M. (A)
Leooer, R. (M)
McCann, M. J. (M)
Meline, P. J. (M)
Moore, J. M. (M)
Mullins, W. H. (M)
Norsell, P. E. (A)
Obrav, D. C. (A)
Ohst, R. J. (M)
O'Neal, W. C. (M)
Orr, W. D. (M)
Partin, J. N. (M)
Pelzman, G. P. (M)
Putter, K. (M)
Ridinoer, H. J., Jr. (M)
Rodman, S. B. (M)
Rooers, R. G. (M)
Rudich, R. (M)
Rvan, J. W. C. (M)
Rvan, W. R., Jr. (M)
Shore, J. D. (M)
Simpson, C. H. (M)
Sinclair, J. G., Jr. (SM)
Smith, W. B. (M)
Sokol, J. L. (M)
Sparlino, A. J. (A)
Sorino, L. K. C. (A)
Starkev, M. J. (M)
Stodder, D. J. (A)
Stolze, R. M. (M)
Sur, J. (M)
Tallon, W. J. (A)
Thrall, L. L. (M)
Tucker, V. L. (A)
Vandeorift, R. B. (SM)
Van Velzer, V. C. (M)
Vutz, P. (M)
Walters, R. F. (A)
Washburn, D. M. (M)
Washinoton, L. P., Jr. (A)
Webb, R. C. (A)
Welcome, W. W. (M)
Whelan, D. E. (SM)
Yancey, S. H. (M)

Manteca (SAC-7)
Arwine, R. (A)

Martinez (SF-EB-7)
Bumpass, R. C. (A)

Mar Vista (LA-7)
Alford, W. H. (A)
Allen, B. C. (A)
Hanna, R. E. (M)

Mather AFB (SAC-7)
Marquez, A. (M)

Maywood (LA-7)
Hansen, H. R. (M)
Jatras, S. J. (M)

McClellan AFB (SAC-7)
Friday, R. G. (A)
Haines, R. S. (M)

Menlo Park (SF-7)
Alcorn, C. L. (SM)
Aldous, C. N. (M)
Ault, C. E. (M)
Aver, W. E. (SM)
Babcock, D. F. (SM)
Badoer, G. M. W. (M)
Baer, J. A. (SM)
Barnes, C. W., Jr. (SM)
Bartelink, D. J. (M)
Bell, D. T., Jr. (M)
Bell, D. L. T., Jr. (M)
Benedict, D. L. (SM)
Bero, M. R. (M)
Billev, J. C., Jr. (M)
Black, F. R. (M)
Bourne, C. P. (M)
Brain, A. E. (SM)
Brandon, E. T. (M)
Brennan, P. A. (M)
Brierly, F. A. (M)
Brooks, H. B. (SM)
Brown, O. H. (SM)
Cameron, E. G. (SM)
Carter, E. F. (F)
Chellstorp, T. S. (M)
Christie, T. A., Jr. (SM)
Clarke, L. G. (SM)
Cohn, S. B. (F)
Cone, W. H. (SM)
Connor, T. J. (A)
Corr, J. W. (M)
Cox, B. (SM)
Crandon, L. H. (SM)
Crane, H. D. (SM)
Cromack, J. C. (M)
Dawson, J. B. (M)
Dav, J. P. (M)
De Liban, R. M. (M)
Demere, R. M., Jr. (M)
Dodge, C. A., Jr. (A)
Dry, J. H. (A)
Dunbar, A. S. (SM)
Durfey, C. K. M. (M)
Dyce, R. B. (M)
Elam, J. M. (M)
Eldred, W. N. (SM)
Eldredge, K. R. (SM)
Elliott, H. F. (F)
Evans, W. F., Jr. (SM)
Farles, A. M. (M)
Farrand, W. R. (M)
Fisher, L. L. (M)
Fitterer, C. E. (M)
Fleio, W. J. (M)
Frankel, S. (F)
Gano, L. D. (A)
Gardiner, K. W. (M)
Gillette, P. R. (SM)
Goldberg, J. (M)
Gould, R. G. (SM)
Grass, J. W. (M)
Greco, N. A. (A)
Green, C. A. (A)
Griffith, C. G. (M)
Hall, E. G. (M)
Hamilton, R. H. (M)
Hansen, J. F. (M)
Harris, D. B. (F)
Haruvama, B. K. (M)
Hauoe, P. S. (M)
Haves, M. H., Jr. (SM)
Helsey, D. D. (A)
Hennles, S. R. (M)
Hilman, J. (M)
Hirotsu, G. S. (M)
Hollmon, M. H. (M)
Honey, R. C. (SM)
Householder, D. B. (SM)
Hunter, S. P. (A)
Isbero, R. A. (SM)
Jacobsen, G. C. (M)
Johnson, B. M. (A)
Johnson, R. R. (M)
Jones, E. D. (M)
Jones, E. M. T. (SM)
Juno, G. C. (A)
Kaar, J. M. (M)
Kamhoefner, F. J. (SM)
Kautz, W. H. (M)
Krobv, M. H. (M)
Keller, N. E. (A)
Kennedy, H. D. (M)
Kino, R. C. (M)
Kleanford-Smith, C. A. (M)
Klurnick, R. P. (M)
Knuse, C. J. (M)
Leadabrand, R. L. (M)
Lennert, F. G., Jr. (SM)
Licht, R. H. (A)
Lone, R. A. (M)
Lucke, W. S. (SM)
Luckenbach, R. R. (M)
Lynch, W. M. (M)
Manhart, R. A. (SM)
Mattern, M. F. (M)
Matthael, G. L. (M)
Matthew, T. B. (M)
McCullouch, W. R. (M)
McWhorter, W. M. (A)
Meader, H. W. (A)

Meisling, T. H. (SM)
Melville, R. W. (M)
Mensch, J. R. (M)
Meyer, H. M., Jr. (A)
Monson, J. E. (M)
Moore, E. J. (SM)
Moore, L. (M)
Morita, T. (SM)
Morrin, T. H. (SM)
Mosley, R. B. (M)
Muehlner, J. W. (SM)
Nelson, R. A. (M)
Noe, J. D. (SM)
North, D. O. (A)
Nothhoff, A. P., Jr. (M)
Olson, H. D. (A)
Papoas, R. L. (SM)
Parsons, W. L. (M)
Patton, W. R. (M)
Paulsen, W. C. (A)
Petrak, J. R. (SM)
Popaduk, G. F. (M)
Post, E. A. (SM)
Presnell, R. I. (M)
Priedkekelt, J. H. (SM)
Proctor, E. K., Jr. (SM)
Reynolds, W. E. (M)
Rice, P. J., Jr. (SM)
Ridley, F. E. (SM)
Ritzer, E. W. (SM)
Robbiano, P. P. (M)
Robertson, D. M. (M)
Rogers, J. H. (A)
Ropa, R. L. (SM)
Rosen, C. A. (SM)
Rothman, H. S. (A)
Salmon, V. (SM)
Scarborough, D. S. (M)
Scharfman, W. E. (A)
Schlobohm, J. C. (A)
Shuster, J. W. (M)
Silhavy, W. M. (A)
Sleeper, G. E., Jr. (SM)
Sphar, C. H. (VA)
Staats, R. L. (M)
Stansch, H. C. (M)
Stoft, P. E. (M)
Stolaroff, M. J. (M)
Stoltz, P. G. (M)
Stone, W. F. (M)
Swain, J. R. (M)
Symons, R. S. (M)
Tanner, R. L. (SM)
Templeton, T. H. (SM)
Thille, R. W. (M)
Thompson, N. P. (A)
Trumbull, A. F. (A)
Valdes, L. B. (SM)
Valino, A. R. (M)
Vane, A. B. (M)
Wallace, D. L. (M)
Wallner, R. A. (M)
Weltbrecht, R. H. (M)
Wemil, J. M. (M)
Whitby, O. (SM)
White, R. E. (SM)
Whitehorn, R. M. (SM)
Wiesenbach, R. B. (A)
Willoughby, D. E. (A)
Willrodt, M. J. (M)
Wilson, L. H. (A)
Wing, R. V. (M)
Winkelman, R. E. (M)
Worley, O. C. (M)
Worth, G. E. (M)
Yoder, E. R. (M)
Younker, E. L. (M)

Merced (SF-7)
Hintz, H. F. (A)
Pinsky, B. (A)
Semeniuk, B. G. (M)

Millbrae (SF-7)
Bean, T. C. (M)
Calvert, C. C. (A)
Moore, K. A. (M)
Reed, J. M. (M)
White, H. A. (M)

Mill Valley (SF-7)
Behringer, D. S. (M)
Davidson, J. D. (A)
Feeney, W. G. (M)
Harbridge, E. A. (A)
Jacobs, H. N. (M)
Kotzum, J. (A)
Smith, H. H. (M)
Vreeland, R. W. (M)

Milpitas (SF-7)
Anderson, R. D. (M)
Bridges, J. C. (M)
Burkhart, R. N. (A)
Zobel, F. J., Jr. (M)

Mission San Jose (SF-EB-7)
Hostetter, D. M. (M)
McGee, M. E. (M)

Modesto (SAC-7)
Bates, W. H., Jr. (VA)
Patmore, R. A. (M)

Mojave (CL-7)
Notar, C. A. (A)

Monrovia (LA-P-7)
Ambrose, E. G. (A)
Bell, N. W. (M)
Brandes, R. A. (M)
Brenner, D. S. (A)
Carney, D. E. (A)
Gillespie, H. R., Jr. (M)
Goodman, F. R. (M)
Hawes, R. C. (A)
Lawler, R. H. (M)
Livezey, J. A. (M)
McGill, J. J. (M)
Perrault, R. E. (M)
Petraglia, N. E. (A)
Petry, C. B. (SM)
Pfund, E. T., Jr. (M)
Skelrik, R. M. (M)

Montara (SF-7)
Booker, J. P. (M)

Monta Vista (SF-7)
Barr, I. (M)
Evans, K. R. (M)
Hochman, D. (SM)

Montclair (LA-OB-7)
Grigg, J. W. (A)
Jameson, C. J. (M)
Lindstrom, R. G. (A)
Lock, R. W. (M)
Montgomery, J. D., Jr. (M)
Smith, P. E. (M)

Montebello (LA-7)
Emerson, R. W. (A)
Nakamura, M. (M)
Sakamoto, R. T. (M)

Monterey (SF-7)
Anderson, R. W. (M)
Barnhart, R. W. (M)
Bauer, W. M. (M)
Chaney, J. G. (SM)
Church, R. (M)
Conroy, T. P. (M)
Conroy, T. R. (M)
Frey, A. R. (SM)
Glet, G. R. (SM)
Glasgow, R. S. (F)
Holsington, D. B. (SM)
Klamm, C. F., Jr. (M)
Lane, L. O., Jr. (M)
Marment, G. H. (M)
McArdle, O. L. (A)
Murray, R. P. (M)
Norris, W. E. (M)
Oler, C. B. (SM)
Peterson, J. W. (M)
Rightmyer, J. M. (M)
Rothauge, C. H. (M)
Ruggles, K. W. (A)
Sheingold, A. (M)
Smith, W. C. (M)
Spears, R. W. (M)
Wilcox, M. L. (M)
Wilson, O. B., Jr. (M)
Wilson, R. V., Jr. (M)
Wythe, D. H., Jr. (M)

Monterey Park (LA-7)
Bacon, W. L. (A)
Brown, S. P. (A)
Carlin, J. H. (M)
Crispen, C. E. (SM)
Davis, E. F. (M)
Eykholt, A. L. (M)
Fucile, F. B. (M)
Gong, H. (M)
Kaluger, M. M. (M)
Kasai, G. S. (M)
Kaspin, S. (M)
Klein, R. (SM)
Kliment, P. (A)
Kopp, E. H. (M)
Leff, B. (M)
Lockhart, R. W. (SM)
Morrison, R. T. (M)
Perry, J. T. (M)
Robertson, G. R. (M)
Shenk, J. W. (M)
Stanton, G. (M)
Steuer, V. F. (M)
Vincent, W. K. (M)
Wong, H. (M)

Montrose (LA-P-7)
Christilaw, J. S. (M)
Cooper, R. K. (M)
Cox, J. A. (M)
Fitzgerald, R. W. (M)
Jensen, A. K. (M)
McClure, G. E. (M)
Sorensen, C. A. (M)

Moraga (SF-EB-7)
Tibbetts, D. R. (SM)

Morgan Hill (SF-7)
Yoshii, H. (A)

Morro Bay (LA-SB-7)
Waltz, K. E. (M)

Mountain View (SF-7)
Aitchison, D. C. (M)
Allen, S. E., Jr. (M)
Amlinger, P. R. (M)
Augustine, A. F. (SM)
Bannick, R. E. (M)
Beard, C. I. (SM)
Bellamy, J. L. (SM)
Bert, J. E. (A)
Blickensderfer, J. A. (SM)
Bonsejneur, P. J., Jr. (A)
Booth, R. E. (M)
Borghi, R. P. (A)
Bradley, E. J. (A)
Bravo, M. V. (A)
Brede, D. W. (M)
Brennan, J. J. (M)
Bridgman, A. D., Jr. (M)
Briskin, H. B. (SM)
Britton, J. W., Jr. (M)
Broekemeier, A. E. (M)
Byrne, G. C. (SM)
Cancio, P. (A)
Card, A. A. (M)
Caryotakis, G. (M)
Chang, N. (M)
Clark, C. B. (M)
Clifton, J. K. (M)
Clinton, W. R. (M)
Cook, P. D. (M)
Cooley, R. E. (M)
Corbell, P. I., Jr. (M)
Cross, H. V. (M)
Danforth, J. A. (M)
Davis, J. H. (M)
Dickson, J. D. (M)
Diessner, O. G. (M)
Dilley, L. E. (A)
Don Carlos, J. E. (M)
Dore, B. V. (M)
Erling, H. J. (M)
Fanjul, E. L. (M)
Farlow, C. C. (M)
Fire, P. (M)
Fischbound, H. (M)
Fleenor, E. G. (M)
Flowerday, T. W. (M)
Franklin, L. R. (M)
Frincke, P. O. (M)
Frohbach, H. F. (M)
Fuller, R. L. (M)
Fuller, T. D. (M)
Gaenzle, J. B. (M)
Garriott, O. K. (M)
Gates, J. P. (M)
Gibson, J. G. (A)
Gielow, D. E. (M)
Gifford, J. T. (M)
Gilman, V. V. (M)
Goodwin, V. D. (M)
Graham, R. E. (M)
Gray, E. E. (M)
Greener, A. E. (M)
Grimm, R. A. (SM)
Guglielotta, P. A. (SM)
Gunn, T. L. (M)
Hargrove, P. E. (A)
Harley, J. M. (SM)
Harvey, J. A. (M)
Heinzinger, J. P. (A)
Henden, J. R. (M)
Herlop, M. F. (M)
Hoffman, R. J. (A)
Holmelster, L. A. (A)
Horsley, G. S. (M)
Hughes, F. J. (SM)
Humphries, J. (M)
Hunter, L. W. (M)
Hupfer, D. L. (M)
Isabeau, J. G. (M)
Jakstys, V. J. (M)
Jirp, J. (M)
Johnson, D. Q. (M)
Joste, T. R. (M)
Kearns, R. J. (M)
Kelch, R. D. (M)
Kellar, W. J. (M)
Kennedy, P. (SM)
Kent, G. R. (A)
Klein, W. F. (M)
Knapp, R. L. (M)
Knowles, L. (A)
Kohl, W. H. (F)
Koski, T. H. (M)
Leifer, M. (F)
Lemson, J. (M)
Lepoff, J. H. (SM)
Lewis, P. L. (M)
Lincoln, E. T. (A)
Lipkin, L. (SM)
Livingstone, R. H. (M)
Long, J. A. (M)
Lovik, M. H. (M)
Maccono, F. I. (SM)
MacKenzie, M. H. (M)
Maninger, L. L. (M)
Mansur, D. W. (M)
Minella, M. J., Jr. (A)
Marcum, W. F. (M)
Markum, J. A., Jr. (M)
Mathers, G. C. (M)
McAllister, W. H. (A)
McClintock, R. K. (SM)
McMillin, N. D. (SM)
McMurtry, B. J. (M)
Medlin, J. E. (A)
Meinheit, C. E. (M)
Melton, J. F. (M)
Miller, M. R. (M)
Miller, W. F. (A)
Milwit, W. (SM)
Morse, E. W. (M)
Needle, J. S. (SM)
Nelson, K. D. (M)
Nord, R. H. (M)
Oberg, E. A. (A)
O'Neill, J. R. (M)
Pace, N. M. (M)
Palmer, R. N. (SM)
Patch, C. S. (SM)
Peavey, W. W. (M)
Penwell, J. R. (M)
Peters, D. W. (M)
Peters, E. O. (A)
Peters, R. L. (M)
Pfost, R. F. (M)
Phillips, R. R. (M)
Pramann, R. F. (M)
Raju, P. S. (M)
Ramsay, W. R. (M)
Randall, K. K. (M)
Rasmussen, W. R. (M)
Regenos, K. M. (A)
Reis, C. S. (A)
Rice, J. E., Jr. (M)
Riley, R. B. (M)
Rinaudo, R. F. (A)
Roney, E. L. (SM)
Rourke, C. R. (M)
Ruddock, K. A. (M)
Sah, C. (M)
Santamaria, S. (M)
San Vicente, R. (M)
Sarquis, R. H. (M)
Saunders, C. L. (M)
Schiffman, B. M. (M)
Schoderbek, J. J. (M)
Schomer, J. W. (A)
Schorr, F. W. (M)
Schrumph, D. A. (M)
Schultz, W. R. (M)
Schwartz, J. R. (M)
Shipley, D. W. (M)
Simon, D. H. (M)
Sinclair, K. F. (SM)
Sklar, H. (M)
Sorenson, L. E. (M)
Sperry, A. B. (M)
Stephens, R. A. (M)
Stone, R. E. (M)
Storer, T. S. (M)
Swanson, C. A. (M)
Swanson, W. E. (M)
Swiadek, S. F. (SM)
Tannenbaum, M. (M)
Taylor, J. J. (A)
Thomas, A. C. (M)
Thon, W. H. (SM)
Tisue, J. G. (M)
Tomlin, W. T. (M)
Turenchalk, H., Sr. (M)
Van Duzer, V. E. (M)
Van Zuuk, D. A. (M)
Vehn, R. E. (SM)
Voyles, R. L. (M)
Walden, L. H. (M)
Walker, L. F. (M)
Weber, L. C. (M)
Weindorf, D. R. (M)
Weiss, R. (M)
Weissman, J. G. (SM)
Wesenberg, G. M. (M)
Wheeler, W. R. (M)
Wickersham, A. F., Jr. (M)
Wiktol, W. (A)
Wildanger, E. G. (M)
Wilson, A. L. (M)
Winn, C. B. (M)
Woodbury, R. C. (M)
Wright, R. B., Jr. (M)
Wunderman, I. (SM)
Yamada, D. A. (M)
Yoskowitz, L. K. (M)
Young, R. K. (M)
Zimmerman, H. G. (A)

Mount Wilson (LA-P-7)
Knight, J. B., Jr. (SM)

Napa (SF-7)
Bulce, G. S. (M)
Mingst, H. C. (SM)
Morgenstern, H. S. (A)
Morris, W. S. (M)
Shelton, R. G. (M)
Shephard, C. S. (A)
Sorensen, A. G. (A)

National City (SD-7)
Vawter, V. E. (M)

Nevada City (SAC-7)
Hickerson, R. L. (A)

New Almaden (SF-7)
Engle, C. G. (M)
Perham, D. M. (SM)

Newport Beach (LA-SA-7)
Amdahl, G. M. (M)
Barton, D. C. (M)
Ceccarini, R. E. (M)
Clark, E. C. (M)
Cole, F. H. (VA)
Counter, J. M. (M)
Diamond, A. (M)
Ducati, A. C. (A)
Eng, S. T. (M)
Gehlke, D. A. (SM)
Gudmundsen, R. A. (SM)
Hammerslag, J. G. (M)
Helgerin, J. (A)
Herbert, C. (SM)
Hood, H. E. (A)
Kitchens, W. L. (M)
Myer, J. H. (SM)
Steiger, W. (M)
Weekes, B. B. (M)
Wilderman, L. F. (M)

North Fork (SF-7)
Pearson, D. R. (M)

North Highlands (SAC-7)
Bothwell, D. C. (M)
Ness, R. J. (M)
North Hollywood (LA-SF-7)
Anderson, W. E. (M)
Bailey, F. W. (M)
Barnett, R. L., Jr. (M)
Batsel, C. N., Jr. (M)
Bauman, H. W. (M)
Beaudine, D. M. (M)
Beiler, E. G. (SM)
Berns, H. L. (A)
Bishop, G. W. (M)
Bookee, J. R. (M)
Braddock, R. C. (M)
Breiteneger, L. G. (M)
Brink, E. W. (M)
Brown, R. M. (A)
Burkart, E. H., Jr. (A)
Burrell, J. E. (M)
Call, U. R. (M)
Camp, L. W. (SM)
Campbell, B. K. (A)
Chester, W. H. (SM)
Cochran, E. D. (M)
Combes, R. M. (SM)
Compton, R. L. (M)
Conway, J. N. (M)
Craven, T. E. (M)
Curtis, J. P. (M)
Daniel, R. L. (SM)
Dickerson, D. H. (M)
Dite, W. (M)
Dobson, T. M. (A)
Droesch, F. A., III (A)
Elsohn, I. A. (M)
Farnsworth, H. D. (SM)
Filbert, W. B. (M)
Fillzola, V. F. (M)
Fuller, C. L. (M)
Fuller, R. E. (A)
Garbowitz, L. (A)
Gardner, L. B. (M)
Gilroy, J. W. (M)
Goldsmith, L. T. (M)
Gonsett, F. R. (SM)
Gove, E. L. (SM)
Guilford, J. R. (M)
Haigh, W. B. (M)
Hale, J. R. (M)
Hamilton, R. E. (SM)
Hansen, R. L. (M)
Hedene, T. H. (SM)
Helper, R. E. (M)
Hickman, D. D. (A)
Horning, T. D. (A)
Horth, T. C. (M)
Hudson, C. A. (M)
Hughes, R. L. (A)
Hughes, W. A. (SM)
Huntsman, H. F. (M)
Jackson, J. A. (M)
Jensen, K. L. (SM)
Kidd, L. G. (M)
Klenast, D. J. (A)
King, E. J. (M)
Krausz, C. (A)
Kubicek, C. B. (M)
Lagomarsini, G. C. (M)
Laslo, M. Z. (M)
Lauritzen, L. (M)
Leonard, N. E. (M)
Looney, J. M., Jr. (M)
Loski, R. R. (A)
Lyons, L. F. (SM)
Marlowe, J. R. (M)
Marshall, N. P. (M)
Marti, N. F. (A)
Martin, R. F. (M)
Masters, W. N. (M)
Mather, T. S. (M)
Merrill, J. A. (A)
Miller, D. C. (M)
Mohr, R. W. (SM)
Molloy, C. T. (SM)
Momjian, E. A. (A)
Montgomery, D. R. (M)
Moore, V. (SM)
Morgan, R. L. (M)
Morrow, J. E. (M)
Myers, J. L. (M)
Neely, N. B. (M)
Newton, W. P. (M)
Oliverio, A. P. (M)
Parry, H. J. (M)
Pearlman, J., Jr. (M)
Ross, J. R. (M)
Schaffer, A., Jr. (M)
Schieke, P. F. (M)
Schneider, W. J., Jr. (M)
Schollard, R. J. (M)
Seplow, S. (M)
Shigemoto, J. M. (M)
Shon, A. (A)
Showalter, G. L. (M)
Sloan, C. S. (A)
Spelling, A. D. (A)
Stalford, W. E. (M)
Stockett, T. E. (M)
Sullivan, J. R. (M)
Sumner, T. B. (M)
Sutliff, C. N. (M)
Taylor, E. H. (A)
Thomas, F. M. (M)
Vodovoz, E. (A)
Vrooman, D. H. (A)
Warner, D. E. (SM)
Watanabe, K. (M)
Weaver, J. H. (M)
White, A. A. (M)
Wichmann, T. F. (M)
Williams, R. W. (M)
Winkler, J. L. (A)
Winter, F. J., Jr. (A)
Wise, D. D., Jr. (M)

Witt, R. E. (SM)
Wolf, M. B. (M)
Wolman, L. L. (M)
Wright, J. T. (M)

Northridge (LA-SF-7)
Allmandinger, E. F. (SM)
Ashley, C. A. (A)
Baake, D. W. (M)
Bass, L. J. (M)
Berlin, W. N. (M)
Bindewald, E. R. (M)
Burton, E. B. (A)
Carl, W. J. (M)
Clement, A. J. F. (M)
Coleman, H. B. (M)
Cox, G. C. (A)
Daush, A. A., Jr. (M)
Daverio, A. J. (SM)
Deming, A. F. (M)
De Voll, J. L. (M)
Doelz, M. L. (SM)
Dunwell, R. D. (M)
Easley, G. P. (M)
Edling, D. C. (A)
Forman, J. (SM)
Fortenberry, C. H. (A)
Greenwood, P. E., Jr. (SM)
Guarrera, J. J. (SM)
Hammond, J. G. (SM)
Icenbice, P. J. (SM)
Johnson, R. D. (SM)
Jones, A. H. (M)
Khoury, N. (M)
Kline, S. R. (A)
Kriz, K. H. (SM)
Lane, A. B. (M)
Lawrence, D. H. (M)
Lazarus, A. (M)
Lester, V. R. (M)
Liu, F. F. (M)
Mancini, A. R. (M)
Marsh, K. W. (SM)
Martin, D. L. (M)
Metcalf, D. F. (SM)
Olson, A. B. (SM)
Oltiveer, D. P., Jr. (M)
Pasanelli, A. C. (M)
Paulos, L. B. (M)
Perry, C. L. (M)
Peterson, E. J. (M)
Phillips, F. R. (M)
Randolph, R. C. (M)
Rice, R. E. (M)
Rieman, F. C. (M)
Rohrer, G. W. (M)
Rothman, R. H. (A)
Sarture, C. W. (M)
Sherwood, D. M. (SM)
Sior, A. D. (M)
Sofen, I. A. (M)
Thomas, D. C. (A)
Tillotson, J. H. (M)
Tooreck, E. R. (SM)
Van Vliet, W. H. (A)
Waxman, M. J. (M)
Wessel, H. J. (A)
Whitely, R. L. (M)
Wiggins, C. P. (A)
Wyland, G. P. (SM)
Wynhoff, F. J. (M)
Zimmerman, R. L. (M)

Norwalk (LA-SA-7)
Campbell, D. H. (A)
Collier, G. H. (M)
Greaves, H. L. (A)
Gregory, J. H. (SM)
Martin, T. E. (A)
Mund, M. A. (M)
Roehl, E. R. (M)
Thurman, E. J. (M)
Yingst, H. E. (M)

Novato (SFH07)
Alley, W. D. (A)
Yeager, R. J. (M)

Oakland (SF-EB-7)
Arne, R. E. (A)
Averv, H. T. (A)
Barale, J. J. (SM)
Black, L. J. (F)
Caale, D. S. (M)
Chew, B. H. (A)
Chin, C. S. (M)
Cone, D. R. (SM)
Downey, C. E. (SM)
Drake, H. B. (M)
Efstathiou, J. (A)
Forbes, A. C. (SM)
Gennett, D. F., Jr. (A)
Gilliland, W. D. (M)
Glassner, J. M. (M)
Gunst, M. A., Jr. (M)
Heine, R. A. (M)
Isakson, S. E. (M)
Jones, M. H. (A)
Kan, G. (A)
Kannelaud, J. (M)
Kenny, J. W. (M)
Lar Rieu, E. A., Jr. (SM)
Little, C. P. (A)
Lothron, P. H. G. (M)
Loule, P. Y. (M)
Mac Leod, D. A. (M)
Maanuson, H. R. (M)
Malone, W. C., Jr. (M)
Mizuno, E. (M)
Murr, W. C. (A)
Olson, S. R. (A)
Park, C. W. (SM)
Penther, C. J. (SM)
Perrin, J. L. (M)
Pioozzi, L. J. (M)
Rioley, J. N., Jr. (M)
Rosenberg, J. M. (SM)
Ross, A. (A)
Schwemin, A. J. (A)
Siefert, D. G. (M)
Slutman, A. C. (M)
Starr, L. (M)
Strigelka, A. J. (SM)
Thunen, G. W. (M)
Upham, F. T. (A)
Wahlgren, W. W. (SM)
Waldo, F. E. (M)
Watt, R. M., Jr. (SM)
Wixson, R. L. (M)
Wolfe, H. T. (M)
Wong, E. L. (M)
Wong, R. H. (M)

Oceanside (SD-7)
Sutherland, J. J. (SM)
Ulmer, H. W. (SM)

Oildale (CL-7)
Hall, H. R. (M)
Oestreicher, D. L. (M)
Snyder, W. G. (M)

Ontario (LA-OB-7)
Adams, F. L. (M)
Avelin, S. (A)
Baird, W. H. (M)
Bessette, A. (M)
Corrons, B. F. (M)
Cupo, J. D. (A)
Davis, H. H. (M)
De Diemar, J. L. (SM)
Howland, R. W. (A)
June, R. H. (M)
La Porte, R. J. (M)
Odekirk, M. D. (SM)
Olcovich, T. A. (A)
Oliverson, M. (A)
Pollock, R. D. (M)
Resnik, A. F. (M)
Ritchie, R. W. (A)
Ritter, E. (SM)
Schwenker, R. (M)
Stephens, F. M. (M)
Warner, S. D. (A)
Wesley, G. H. (M)

Orange (LA-SA-7)
Billingsley, S. V. (M)
Bunce, W. R. (A)
Dunn, J. (M)
Eatough, C. D. (A)
Flaco, D. J. (M)
Gardner, F. M. (SM)
Geiger, R. F. (M)
Lephakis, A. J. (M)
Link, W. F. (M)
Little, F. A. (SM)
Mayfield, J. D. (A)
McElveen, K. H. (M)
Pentecost, E. E. (SM)
Riffle, L. V. (A)
Shawda, F. E. (A)
Spradlin, K. M. (M)
Toeppe, W. J., Jr. (M)

Orangevale (SAC-7)
Jones, A. F. (M)
Petersen, M. C. (M)

Orinda (SF-EB-7)
Brobeck, W. M. (SM)
Dexter, W. L. (SM)
Greeg, P. E. (M)
Maeshner, E. (M)
Werlin, J. H. (A)

Oxnard (LA-B-7)
Ackley, R. M. (A)
Allen, P. S. (M)
Alton, B. D., Jr. (M)
Benninger, B. G. (M)
Bergman, R. L. (A)
Bosmajian, C. P. (M)
Bosnikell, J. F. (SM)
Bowen, W. A., Jr. (SM)
Bradford, W. O. (SM)
Burnett, W. B. (A)
Dewey, D. C. (M)
Dunham, D. C. (M)
Dunham, D. J. (M)
Dvoracek, F. H. (A)
Eagan, J. T. (M)
Fields, M. H. (M)
Frederick, J. A. (M)
Ginn, A. (M)
Gleason, J. L. (M)
Gomez, P. D. (A)
Gregory, R. M. (M)
Haidle, L. L. (M)
Hill, C. V. (M)
Howe, W. F. (M)
Hughes, D. D. (A)
Ishii, F. K. (M)
Jones, M. S. (M)
Keihner, J. K. (M)
Kopp, G. W. (M)
Marvin, P. K. (M)
Miller, J. W. (M)
Miller, W. A. (M)
Moore, G. H. (M)
Murray, H. J., Jr. (M)
Newman, W. P. (A)
O'Bryan, R. L. (M)
Olson, M. H. (M)
Pike, B. W. (SM)
Pike, J. M. (M)
Sakazaki, Y. (M)
Schneider, P. R. (A)
Shroyer, H. M. (A)
Solferino, T. A. (M)
Sorden, L. V. (M)
Sykes, C. B. (M)
Tendick, C. B. (SM)
Waddell, T. P. (M)
Ward, W. E. (M)
Webber, A. F. (M)
Wright, D. B. (M)
Ziheri, E. J. (M)

Oxnard Beach (LA-B-7)
Ritz, W. A. (M)

Pacific Grove (SF-7)
Bayless, H. (A)
Bum, J. W., Jr. (A)
Cowan, B. (A)
Mace, J. C. (SM)

Pacific Palisades (LA-7)
Abzug, M. J. (M)
Alberts, W. A. (SM)
Albrecht, A. (SM)
Arndt, W. F. (SM)
Barker, C. B., Jr. (SM)
Beagles, R. (SM)
Bedrosian, E. (SM)
Berman, H. (SM)
Block, D. E. (M)
Boehmer, H. W. (SM)
Boykin, E. M. (SM)
Bradshaw, H. B. (M)
Brain, M. D. (M)
Brainerd, R. A., Jr. (M)
Brewer, A. F. (SM)
Brigden, J. K. (M)
Carroll, C. F., Jr. (SM)
Carlson, C. G. (SM)
Cochran, K. W. (A)
Cohen, A. (M)
Collup, D. O. (SM)
Curtis, J. S. (M)
Danenberg, L. W. (M)
Dodge, W. A., Jr. (SM)
Doyle, E. J. (SM)
Dumas, R. E. (A)
Edmundson, H. P. (SM)
Erdley, H. F. (M)
Fisher, B. E. (M)
Friedman, T. B. (SM)
Garber, R. S. (M)
Giffin, K. A. (SM)
Grantham, R. W. (A)
Graves, R. E. (SM)
Greene, G. M. (SM)
Griffiths, R. W. (M)
Halenbeck, A. D. (M)
Hance, H. V. (SM)
Hartmann, W. A., Jr. (M)
Harvey, G. C. (A)
Hathaway, B. (M)
Helms, C. J. (M)
Herman, E. E. (SM)
Hertzberg, A. (M)
Hevne, J. B. (SM)
Hill, J. H. (M)
Ho, E. (A)
Hollander, F. H. (M)
Hollands, L. C. (SM)
Holt, W. J., Jr. (M)
Howard, L. W. (SM)
Iams, H. (F)
Jacobson, R. E., Jr. (SM)
John, F. T. (A)
Johnston, J. M. (M)
Justice, L. E. (M)
Kahn, B. S. (M)
Kauke, J. R. (SM)
Loretz, N. F. (A)
Macklin, T. G. (M)
Mallett, J. D. (M)
Mayner, G. S. (M)
Mazurkiewicz, H. G. (M)
McCloud, W. W. (M)
Middleton, M., Jr. (M)
Miller, B. F. (F)
Miller, K. M. (SM)
Muchmore, R. B. (SM)
Newlon, A. E. (SM)
Oser, E. A. (SM)
Paddock, O. K. (SM)
Parker, S. E. (M)
Pelta, E. R. (A)
Pemick, L. J. (M)
Perry, C. S. (SM)
Robbins, P. M. (SM)
Rodriguez, R. A. (M)
Romig, H. G. (SM)
Rosenberg, J. (M)
Roth, W. E. (M)
Sarkissian, H. H. (M)
Siegel, W. (M)
Smith, O. K. (M)
Snider, R. C. (M)
Spandau, E. P. (SM)
Speer, J. H., Jr. (M)
Steidlev, J. W. (SM)
Symonds, R. J. (SM)
Tramov, J. W. (A)
Tyson, O. A. (A)
Van Ackere, M. G. (M)
Vernon, S. J. (M)
Walkuo, L. A. (M)
Wennerberg, G. (SM)

Pacoima (LA-SF-7)
Bassett, D. M. (M)
Brlggs, J. G. (M)
Brownstein, G. (SM)
Cattle, K. J. (M)
Choleva, H. L. (M)
Clintsman, R. B. (M)
Cowart, B. E. (M)
Deitz, J. L. (M)
Devo, A. E. (A)
Dixon, T. P. (M)
Dunn, G. R. (M)
Emus, H. (A)
Elnoerett, J. A. (M)
Franco, M. (M)
Griffith, C. D. (M)
Kendle, J. P. (M)
Krulish, R. G. (M)
Mandel, W. (M)
McKee, W. W. (M)
Morton, P. G. (M)
Nelson, D. F. (M)
Neuron, E. (M)
Pitkin, R. S. (M)
Reed, D. S. (SM)
Schmidt, D. V. (M)
Shovlowsky, M. (M)
Swarthout, W. M. (SM)
Swedberg, P. W. (A)
Torbron, J. T. (M)
Tumbull, J. S., Jr. (M)
Weaks, K. C. (M)
Weiss, L. F. (A)
Zechiel, W. J. (M)

Palm City (SD-7)
Trenholm, K. S. (A)

Palmdale (LA-7)
Bennett, A. (A)
Chernol, J., Jr. (M)
Crossman, T. F. (M)
Hinnson, G. D. (A)
Johnson, V. C. (A)
Kollar, T. J. (A)
McLarin, M. (M)
Neelev, J. C. (M)
Nelson, F. R. (A)
Trloodi, R. F. (A)
Turner, J. G. (A)

Palo Alto (SF-7)
Abbott, W. R. (SM)
Abraham, W. G. (SM)
Acker, A. E. (A)
Adam, S. F. (M)
Ahloren, W. E. (M)
Aine, H. E. (A)
Allison, D. F. (M)
Andersen, C. V. (A)
Andersen, R. A. (M)
Anderson, T. C. (M)
Anderson, V. R. (A)
Anderson, W. A. (A)
Andrews, R. E. (M)
Arnold, C. A. (M)
Arnold, D. T. (M)
Arnold, J. R. (M)
Athey, S. W. (SM)
Auld, B. A. (M)
Austin, G. E. (M)
Austin, N. A. (M)
Bacon, L. C. (M)
Baker, R. D. (A)
Ballieu, H. L. (M)
Barrett, J. C. (M)
Barry, F. N. (VA)
Bartholomew, C. S. (M)
Bauder, G. E. (A)
Bauer, B. (SM)
Bav, T. H. (M)
Beatie, R. N. (M)
Beaver, W. L. (M)
Bederka, S. E. (A)
Bell, R. L. (M)
Beneteau, P. J. (A)
Benware, R. T. (SM)
Berman, R. S. (M)
Bernier, L. E. (M)
Besag, E. T. (A)
Besag, P. L. (M)
Blackham, D. K. (M)
Bodily, L. T. (M)
Boaley, P. C. (M)
Bollahn, J. T. (F)
Bothun, R. B. (M)
Bowes, J. D. (M)
Bradley, J. L. (A)
Brandels, E. P. (M)
Braverman, D. J. (M)
Brichta, E. C. (A)
Brittain, G. H. (SM)
Britton, R. H., Jr. (M)
Broderick, D. L. (M)
Brodersen, L. K. (M)
Broner, M. A. (SM)
Brown, A. S. (F)
Brown, C. S. (A)
Brown, B. H. (M)
Brunn, J. (A)
Burkhart, L. M. (M)
Burt, R. F. (M)
Byerlzy, H. L. (SM)
Campbell, W. E. (M)
Card, D. R. (M)
Carlin, P. W. (M)
Carlson, A. R. (M)
Carnahan, C. W. (F)
Carstoiu, J. (SM)
Carter, M. B. (M)
Chan, W. W. (A)
Chao, S. (M)
Cherry, D. D. (M)
Chiang, F. C. (M)
Chown, J. B. (M)
Christensen, P. C. (A)
Chudacoff, N. E. (M)
Clifford, D. G. (SM)
Cline, J. F. (SM)
Colburn, D. S. (A)
Coleman, B. H. (M)
Colvin, R. S. (M)
Cone, D. I. (SM)
Conklin, J. L. (M)
Conquest, E. A. (M)
Constable, R. A. (M)
Cook, R. M. (M)
Cotterill, M. J. (M)
Coulter, H. N. (M)
Crain, N. R. (M)
Crews, J. B. (M)
Cumming, R. C. (SM)
Curtis, E. C. (M)
Cutler, L. S. (M)
Dahinden, D. T. (M)
Daniels, E. (M)
Daniels, T. M. (M)
Davies, R. S. (SM)
Davis, R. A. (SM)
De Boekert, J. C. (M)
Debs, R. J. (SM)
Deck, R. O. (M)
Dell, H. R. (M)
Dellino, H. W. (SM)
Demo, B. L. (M)
Dere, D. J. (M)
Desposito, C. J. (A)
Disman, M. (M)
Dixon, S. T. (A)
Dodds, W. (SM)
Doten, E. F. (M)
Downing, J. J. (M)
Drake, A. L., Jr. (M)
Duer, S. J. (M)
Duncan, C. E. (M)
Dwight, H. M., Jr. (M)
Eaves, H. H. (SM)
Edson, W. A. (F)
Elsenberg, M. (A)
Eldon, C. A. (M)
Eldridge, D. F. (M)
Elliott, H. A. (M)
Elsass, R. (M)
Enoelbart, D. C. (M)
Enslev, C. G. (M)
Erickson, G. L. (M)
Etteridge, V. L. (M)
Evetts, S. G. (SM)
Faithorn, N. R. (M)
Falconer, R. (M)
Fank, F. B. (M)
Fawlev, W. W., III (SM)
Fawcett, R. G. (SM)
Fein, L. (SM)
Feinstein, L. (M)
Ferguson, J. S. (M)
Filmer, J. C. (M)
Fischler, M. A. (M)
Fisher, G. (SM)
Fishman, H. M. (M)
Fitzgerald, J. F. (A)
Florant, L. E. (M)
Flovd, W. D., Jr. (A)
Flynn, J. E. (A)
Foalesono, R. L. (M)
Fono, A. (SM)
Forrer, M. P. (SM)
Foss, R. C. (A)
Fossum, R. R. (M)
Foster, C. P., Jr. (SM)
Fov, R. H. (M)
Frank, L. E. (A)
Franke, R. T. (A)
Frater, G. D. (A)
Fuller, K. K. (M)
Fuller, L. F. (F)
Fuller, W. D. (SM)
Fulton, F. F., Jr. (M)
Gado, L. G. (M)
Gann, R. E. (M)
Gerio, J. S. (A)
Gessert, E. C., Jr. (M)
Getsinger, W. J. (M)
Gilden, M. (M)
Gillan, M. A. (M)
Ginsilino, A. (A)
Gleason, C. A. (A)
Gola, A. S. (A)
Goddard, E. G. (SM)
Goldfarb, E. M. (SM)
Goodman, D. H. (SM)
Grande, V. J. (M)
Granger, J. V. N. (F)
Grinich, V. H. (M)
Grioni, W. B. (A)
Hass, I. (M)
Haonnian, R. H. (M)
Halina, J. W. (M)
Hand, B. P. (M)
Hans, W. J. (A)
Hapo, W. W. (SM)
Harden, O. C. (M)
Harman, W. A. (M)
Hauser, J. R. (A)
Heckinger, R. G., Jr. (M)
Heckler, C. H., Jr. (A)
Heinzmann, F. C. (A)
Henninns, W. C. (M)
Hewld, H. L. (M)
Herr, J. R. (M)
Hewlett, W. R. (F)
Hiehtower, W. D. (M)
Hilbers, G. R. (A)
Hlavka, L. F. (M)
Hoerni, J. A. (M)

Holden, G. R. (M)
Holland, E. R. (M)
Holser, A. F. (SM)
Hoover, L. R. (A)
Horn, H. S. (SM)
Huffman, G. A. (M)
Hughes, J. M. (M)
Hunt, J. M. (SM)
Hurlton, J. K. (SM)
Hurd, E. C. (M)
Janken, S. (A)
Jarvis, W. E. (M)
Jave, W. E. (M)
Jenkins, J. (SM)
Jensen, F. J. (M)
Jensen, R. C. (M)
Jeosen, R. L. (SM)
Jeter, I. E. (M)
Johnson, H. R. (SM)
Johnson, L. E. (A)
Johnson, R. B. (SM)
Johnson, R. R. (M)
Jones, C. B. (SM)
Jones, J. W. (A)
Jones, P. B. (M)
Joy, O. H. (M)
Kabell, J. (M)
Kaisel, S. F. (SM)
Karabats, C. (M)
Keitel, G. H. (M)
Kirkwood, R. L. (M)
Klein, A. L. (M)
Knano, S. L. (A)
Koenio, E. M. (M)
Konino, A. P. (M)
Kortman, C. M. (SM)
Kovalevski, N. N. (M)
Krakauer, S. M. (A)
Krause, R. A. (SM)
Krenz, J. H. (M)
Kromer, A. P. (SM)
Kruse, F. W., Jr. (M)
Kuhn, N. J. (M)
Kuoslik, F. M. (M)
Lanoevin, R. Z. (M)
Larsen, G. J. (A)
Last, J. T. (M)
Lathrop, R. J. (SM)
Lavin, R. D. (A)
Lawhorn, R. D. (M)
Lawrence, G. H. (M)
Lee, R. J. (A)
Lease, R. B. (M)
Leibfried, W. P. (M)
Leo, R. F. (M)
Levinthal, E. C. (SM)
Lewandowski, F. P. (M)
Lin, C. M. (M)
Lincicome, D. C. (A)
Lindley, J. P. (M)
Linnafelter, D. P. (M)
Lob, C. G. (M)
Logan, J. S. (M)
Lomax, J. B. (M)
Lounbry, D. C. (M)
Lowhurst, H. G. (SM)
Luedtke, R. L. (M)
Lynch, H. S. (A)
Maaill, D. T. (M)
Mahurin, C. R. (SM)
Malter, L. (F)
Mannas, R. G. (M)
Markakis, M. J. (M)
Marsh, C. J. (M)
Marshall, D. (M)
Martin, D. W. (M)
Martin, J. A. (A)
Maschino, R. C. (SM)
Masters, D. W. (M)
Maudens, L. C. (M)
Mauldin, C. W. (A)
Mays, A. S. (A)
McCann, J. E. (M)
McClellan, C. E. (SM)
Mc Connell, R. A. (M)
McKev, D. B. (SM)
McKibbin, D. D. (M)
McLaunhlin, J. (A)
Mevk, R. V. R. (A)
Metcalfe, J. D. (M)
Metz, N. J. (M)
Meyer, D. W. (M)
Milazzo, C., Jr. (M)
Miller, R. E. (SM)
Miller, S. W. (M)
Miller, T. A. (M)
Mohr, H. J. (M)
Moroan, E. C. (M)
Morris, A. J. (SM)
Morris, D. J., Jr. (M)
Morris, R. E. (M)
Morris, R. J. (M)
Mullen, T. R. (M)
Muller, M. W. (SM)
Murphy, R. T. (M)
Murphy, R. E., Jr. (M)
Nalos, E. J. (SM)
Nauer, M. J. (M)
Neal, R. B. (M)
Nelson, E. A. (M)
Nelson, F. A. (M)
Nelson, R. B. (M)
Newlon, R. M. (M)
Nitz, I. C. (M)
Novle, E. V. (M)
Nowick, G. (M)
Nowce, R. N. (M)
Numan, C. S. (SM)
Oale, H. M. (SM)
Oka, A. K. (M)
Oliver, B. M. (F)
Olson, V. E. (M)
Otsuka, S. P. (M)
Ottem, I. E. (M)
Packard, D. (F)
Palvinen, J. O. (M)
Palmer, D. L. (M)
Palmer, J. K. (M)
Papoas, N. L. (SM)
Pearson, P. A. (M)
Pettegrew, J. B. (M)
Pillsbury, A. F., Jr. (M)
Pitsenbarger, G. A. (M)
Plough, C. T., Jr. (A)
Pomo, E. D. (M)
Porter, N. E. (SM)
Poulter, H. C. (M)
Powers, G. L. (M)
Price, V. G. (M)
Prickett, R. J. (M)
Prommer, A. (A)
Pruitt, F. L. (M)
Purl, O. T. (SM)
Putz, J. L. (M)
Ratie, A. W. (A)
Ramsay, J. D. (M)
Rathien, K. R. (M)
Ratner, M. (M)
Rawlins, R. E. (SM)
Razi, S. (M)
Rector, R. H. (SM)
Reiche, L. P. (M)
Rendall, A. H. (M)
Reynolds, R. J. (A)
Rice, B. G. (M)
Riley, J. M. (A)
Roberts, C. S. (M)
Roberts, J. K. (SM)
Roberts, L. A. (A)
Robinson, A. L. (SM)
Rockwell, W. S. (M)
Roder, A. (A)
Rogers, R. M. (M)
Rolzen, J. (M)
Rolfe, J. J. (M)
Rooney, J. P. (M)
Rorden, L. H. (M)
Rorden, R. J. (M)
Rosenstein, M. D. (M)
Rosenthal, H. A. (A)
Roth, I. (M)
Ruetz, J. A. (M)
Russell, E. B., Jr. (M)
Rust, D. C. (A)
Ryan, A. H. (SM)
Sailor, D. E. (M)
Sailor, R. W., Jr. (SM)
St. Clair, M. W. (M)
Salisbury, W. W. (F)
Samuels, A. H. (M)
Scheuch, D. (SM)
Schonberg, R. G. (SM)
Schreiner, R. J. (M)
Schreiner, R. W. (M)
Schubert, R. A. (M)
Schulz, R. F. (M)
Schumacher, F. M. (M)
Seaward, P. E. (M)
Sedin, J. W. (A)
Serano, A. M. (SM)
Shaolro, L. (M)
Sharo, E. D. (M)
Shaw, T. M. (SM)
Shear, H. (A)
Sherk, P. M. (M)
Sherman, J. E. (M)
Sherrill, P. N. (A)
Shimizu, J. K. (M)
Sholes, A. E. (SM)
Siblev, C. E. (SM)
Siera, M. M. (A)
Simons, W. S. (A)
Singleton, R. C. (M)
Smith, A. R. (M)
Smith, G. A. (SM)
Smith, K. E. (A)
Smith, S. R. (A)
Smith, S. L. (M)
Snyder, W. (M)
Sorensen, H. O. (M)
Sorenson, K. G. (A)
Sorn, L. F. (M)
Sosnenhero, K. (F)
Soarks, H. (M)
Soilker, J. J., Jr. (M)
Soraoins, J. D., Jr. (M)
Stachiewicz, B. R. S. (M)
Stanley, G. C., Jr. (M)
Stanley, S. M. (M)
Stead, D. A. (M)
Steams, H. M. (F)
Steele, C. W. (M)
Stelter, E. C. (A)
Stennel, V. M. (M)
Stephenson, J. M. (M)
Sterrett, J. E. (M)
Stevens, J. C. (A)
Storke, F. P., Jr. (M)
Stovall, H. E. (M)
Streleski, T. L. (M)
Strinner, L. W. (M)
Strum, P. D. (SM)
Suddlian, S. L. (M)
Sullivan, J. W. (M)
Swanson, J. A. (M)
Szeremeta, P. J. (M)
Tallmadge, G. E. (M)
Tanaka, R. I. (M)
Tanner, W. O., Jr. (M)
Tatum, I. G. (M)
Thompson, K. I. (M)
Thornahlen, W. H. (M)
Tomas, S. M. (M)
Tomivasu, K. (SM)
Torleh, M. A. (A)
Towle, R. W. (M)
Trout, R. C. (M)
Turker, C., Jr. (A)
Tucker, K. C. (M)
Turner, G. K. (M)
Turner, T. F. (M)
Ullman, P. J. (M)
Umar, A. J. (M)
Ura, F. (M)
Vanderbeek, H. B. (M)
Van De Riet, E. K. (M)
Vartanian, P. H., Jr. (SM)
Vea, T. H. (M)
Veselovsky, L. R. (M)
Villard, O. G., Jr. (F)
Voorhaar, F. R., Jr. (M)
Wada, G. (M)
Waoener, W. G. (SM)
Wahrhaftig, W. H. (M)
Wallace, J. M., Jr. (M)
Walsh, W. P. (M)
Walter, R. L. (SM)
Waters, W. E., Jr. (M)
Watson, R. H. (SM)
Watson, W. H. (M)
Webber, S. E. (F)
Weissenstem, M. (M)
Whitburn, R. A. (M)
White, F. M., Jr. (M)
Whitestine, P. W. (M)
Whitson, A. L. (M)
Wiktol, A. (M)
Wilkens, M. W. (M)
Williams, R. R. (A)
Wilse, W. L. (M)
Wisniewski, J. H. (M)
Withersoon, J. T. (M)
Wolfson, A. S. (M)
Wono, E. C. (M)
Wood, J. F. (A)
Wve, R. E. (M)
Yadavalli, S. V. (M)
Yocom, W. H. (M)
Zeidler, H. M. (M)
Zitelli, L. T. (M)

Palos Verdes Estates (LA-7)
Armi, E. L. (SM)
Barrett, J. T. (M)
Bebrow, E. N. (M)
Bourshton, E. M. (M)
Brewer, G. R. (SM)
Caldwell, J. J., Jr. (SM)
Chambers, J. T. (M)
Dazev, M. H. (SM)
Defenbach, R. W. (M)
Durrell, C. R. (M)
Dutton, O. B. (SM)
Eckdahl, D. E. (SM)
Eikelman, J. A., Jr. (M)
Flvnt, F. V. (A)
Gleahorn, G. J. (M)
Hannum, D. E. (M)
Hart, P. R. (A)
Haves, W. B. (M)
Hebenstreit, W. B. (SM)
Holzer, N. T. (A)
Hummer, J. L. (M)
Islev, C. T., Jr. (A)
Johnson, L. P. (SM)
Jonas, K. L. (M)
Kino, C. F. (M)
Kirkman, R. A. (SM)
Krooh, R. A. (M)
Lavertv, N. P. (M)
Leone, W. C. (A)
Mallinckrodt, C. O. (SM)
Marrison, W. A. (F)
Martin, W. R. (M)
McCov, R. T. (SM)
McRae, F. B. (M)
McDonald, J. B. (M)
McKenna, O. C. (SM)
McLaunhlin, G. (SM)
Meader, G. S., (SM)
Mitchell, E. (M)
Moore, H. E. (SM)
Muldoon, W. J. (SM)
Owens, A. T. (SM)
Peterson, W. E. (SM)
Phister, M., Jr. (M)
Pitman, G. R., Jr. (M)
Raffensoerger, M. J. (SM)
Scarbrouah, A. D. (M)
Shedd, J. L. (M)
Speer, W. S. (A)
Stevens, F., Jr. (SM)
Thorn, W. E. (SM)
Van Patten, W. D. (SM)
Vitum, W. M. (M)
Waoensell, W. (SM)
Walnon, C. G. (SM)
Whistler, J. P. (SM)
Wieneke, J. R. (SM)
Wilson, W. E. (A)
Withers, J. W. (M)

Panorama City (LA-SF-7)
Barnhart, W. H. (A)
Berri, R. E. (A)
Buie, J. L. (M)
Flvr, J. G. (A)
Fritts, R. E. (A)
Hawkins, W. R. (A)
Kleinschmit, C. J. (A)
Rosenthal, W. F. (M)
Tyler, R. T. (M)

Paramount (LA-SA-7)
Cahn, L. (SM)
Child, C. H. (SM)
Green, C. S. (A)
Greer, J. G. (M)
Lev, E. W. (A)
Noble, J. G. (M)
Prvoa, S. A. (M)
Wam, K. L. (M)

Pasadena (LA-P-7)
Abbott, R. B. (A)
Adler, J. A. (A)
Allen, D. A. (M)
Ames, W. S. (M)
Andres, A. J. (M)
Anel, W. C. (M)
Apolewhite, T. H., Jr. (M)
Arms, W. E. (M)
Ashby, R. M. (F)
Atherton, T. L., Jr. (M)
Bacon, R. N. (M)
Barasch, M. V. (SM)
Barton, L. R. (M)
Benis, R. C. B. (A)
Benioff, H. (VA)
Betzer, W. E. (M)
Beuner, J. C. (M)
Blatterman, H. L. (M)
Bradburn, J. R. (SM)
Bradlev, W., Jr. (M)
Breckenridge, W. G., Jr. (A)
Brockman, M. H. (SM)
Brown, D. E. (M)
Cady, W. G. (F)
Caldwell, P. G. (SM)
Cartwright, V. F. (M)
Chafin, R. L. (M)
Charpentier, D. E. (M)
Chase, N. C. (M)
Cherniack, A. E. (M)
Choate, R. L. (M)
Clarkson, W. K. (M)
Clement, W. G. (A)
Cogan, S. (M)
Coker, F. B. (M)
Cowan, M. A. (M)
Cowley, J. P. (M)
Cromleigh, R. G. (A)
Cutlino, E. (A)
Darlino, H. R., Jr. (M)
David, J. R. (SM)
Davis, D. C. (M)
Dennison, P. R. (M)
Diercks, A. D. (M)
Dixon, W. J. (M)
Dow, D. G. (M)
Ebertin, M. A. (M)
Eckstein, E. A. (A)
Ellis, A. T. (M)
Erdman, D. C. (A)
Escher, P. H. (M)
Flino, J. J. (M)
Fullerton, R. W. (SM)
Garber, L. F. (M)
Gates, C. R. (M)
Georoe, N., Jr. (M)
Gerrie, A. L., Jr. (A)
Gilbertson, B. I. (M)
Glaser, E. L. (M)
Goldsmith, P. (M)
Gould, R. W. (M)
Gratton, R. E. (M)
Gregory, W. W., Jr. (A)
Grove, H. G. (A)
Hale, C. R. (M)
Hamilton, R. C. (M)
Harden, P. A. (M)
Harker, R. B. (M)
Harriman, T. J. (M)
Hawes, M. K. (M)
Hawn, L. R., Jr. (M)
Herber, J. C. (SM)
Heyser, R. C. (M)
Hiaa, W. H. (SM)
Hill, R. E. (M)
Hiraoka, F. A. (M)
Hollis, W. C. (SM)
Holmes, K. G. (M)
Homsv, J. A. (SM)
Hoskins, E. E. (SM)
Howes, E. T. (M)
Huth, W. R. (SM)
Hutton, L. G. (M)
Ireland, F. (SM)
Jack, R. W. (M)
James, G. C. (M)
Joslas, C. S. (M)
Kawano, K. (M)
Kennedy, C. J. (SM)
King, R. C. (A)
Knickrehm, A. F. (A)
Kowallis, O. K. (A)
Kreuz, W. E. (A)
Krossa, K. D. (M)
Kuehn, R. L. (SM)
Kuta, G. (SM)
Lang, J. A. (A)
Langmuir, R. V. (M)
Lawrence, J. F., Jr. (SM)
Le Vay, T. C. (M)
Linderman, O. E. (SM)
Lindley, P. L. (M)
Maass, C. F. (A)
Marshall, R. (M)
Martin, B. D. (M)
McCann, G. D. (SM)
McCool, J. M. (M)
Menetrey, W. R. (M)
Middlebrook, R. D. (SM)
Miller, G. J. (M)
Minnick, R. C. (M)
Moran, R. B., Jr. (SM)
Morison, R. (M)
Moseley, F. L. (F)
Mott, J. S. (M)
Motta, N. (A)
Mullin, F. J. (M)
Mundt, E. (M)
Musty, C. V. (M)
Neff, G. A. (M)
Newhouse, G. B. (M)
Nothman, M. H. (M)
O'Dell, G. M. (SM)
Owen, R. P. (SM)
Pera, J. E. (A)
Pickerina, W. H. (F)
Piereson, R. G. (M)
Porter, J. C., Jr. (M)
Post, G. E. (M)
Powell, R. V. (M)
Radhakrishnan, V. (M)
Ranks, J. E. (M)
Rau, J. M., Jr. (M)
Reaser, R. L. (SM)
Rechtin, E. (SM)
Reilly, R. R. (M)
Richter, H. L., Jr. (SM)
Riddle, F. M. (M)
Rieth, H. F. (A)
Rinaland, R. F. (M)
Robinson, L. P. (SM)
Sandefur, K. L. (M)
Scharer, M. E. (M)
Sefton, W. E. (M)
Seigle, R. K. (M)
Shaffer, P. A., Jr. (M)
Shaw, R. A. (A)
Sherer, P. N. (M)
Shimabukuro, F. I. (M)
Shultise, Q. M. (M)
Sidle, C. D. (M)
Silvertooth, E. W. (M)
Simmons, E., Jr. (M)
Sink, R. L. (SM)
Slavin, M., III (A)
Smith, H. A. P. (M)
Smith, W. A. (M)
Sorensen, T. C. (M)
Stack, G. C. (M)
Stensoaard, C. P., Jr. (M)
Stevens, R. A. (A)
Stevens, R. (M)
Stott, R. F. (M)
Stuart, J. L. (A)
Sugimoto, K. G. (M)
Talmo, R. E. (M)
Titsworth, R. C. (M)
Toukdarian, R. Z. (SM)
Vail, R. W. (M)
Vant Hul, L. L. (M)
Vaughan, V. Z. (A)
Vernon, F. L., Jr. (M)
Wagner, D. W. (A)
Walker, F. R. (SM)
Waller, R. L. (M)
Ward, E. B. (M)
Watts, E. W. (M)
Wedel, J. J., Jr. (M)
Weigel, W. G. (SM)
Weiss, S. K. (A)
Wertz, C. C. (M)
Wilson, M. C. (SM)
Wilson, G. P. (SM)
Wilts, C. H. (M)
Winsor, K. L. (M)
Winter, A. R. (A)
Wood, D. O. (M)
Wriaht, H. D. (SM)
Zabusky, N. J. (M)
Zarem, A. M. (SM)
Zeman, J. A. (A)

Paso Robles (LA-SB-7)
Ramey, J. C. (A)

Pebble Beach (SF-7)
Menneken, C. E. (M)
Pfenning, R. A. (M)

Pedro Valley (SF-7)
Meunzer, R. H. (M)

Penryn (SAC-7)
Yoshizuka, R. K. (A)

Petaluma (SF-7)
Boutz, F. E. (M)
Ravenscroft, H. A. (M)

Pico (LA-SA-7)
Fuller, C. A. (A)
Rioos, P. F. (M)
Swanson, R. L. (M)

Piedmont (SF-EB-7)
Cole, C. H. (VA)
Criolar, J. J. (M)
Evans, C. P. (M)
Flieaner, A. F. (A)
Forster, A. G. (M)
Lasky, P. G. (M)
Mac Mahon, A. E. (SM)
Palmer, D. H. (A)

Pinole (SF-EB-7)
Airhart, R. V. (M)

Placentia (LA-SA-7)
Kjerulff, E. R. (M)

Playa Del Rey (LA-7)
Bainbridge, B. O. (M)
Barhydt, H. (A)
Beckman, J. A. (SM)
Beveridge, J. M. (M)

Block, E. B. (A)
Cadman, A. O. (M)
De Wolf, J. L. (M)
Eckelmann, R. R. (M)
Erickson, R. L. (A)
Eshbaugh, R. L. (M)
Fenton, A. N. (SM)
Fisher, M. K. (M)
Foster, T. J. (SM)
France, R. W. (A)
Gaul, E. R. (SM)
Hammel, J. P. (M)
Hasin, S. L. (A)
Haves, E. A. (SM)
Hesse, V. L. (M)
Horrell, M. W. (SM)
Johnson, R. P. (SM)
Kaufman, B. A. (M)
Lobb, C. W. (M)
Mackie, W. L. (M)
McConnell, R. W. (M)
McIntosh, D. (M)
McJunkin, F. C. (M)
Miller, E. F. (M)
Nesheim, D. A. (M)
Nuban, E. (M)
Roval, D. E. (A)
Ruch, D. E. (M)
Scholtz, R. A. (M)
Shepard, W. (M)
Sirvis, G. S. (M)
Stephenson, A. L. (M)
Strom, R. L. (SM)
Waoner, R. E. (M)
Weed, H. L. (M)
Witten, E. L. (M)
Wooldridge, E. J. (M)
Wyllie, W. W. (M)

Pleasant Hill (SF-EB-7)
Davis, R. W. (M)
Nielsen, G. A. (M)
Roush, G. E. (SM)
Single, C. H. (M)
Skiff, E. W. (SM)
Voelker, F., III (SM)

Pleasanton (SF-EB-7)
Casterson, R. H. (M)
Curry, C. R. (M)
Heloeson, G. L. (M)
Inqledue, E. F. (M)
Wharton, C. B. (SM)

Point Mugu (LA-B-7)
Barncastle, L. (M)
Corvi, J. A. (M)
Flemino, F. L., Jr. (M)
Githens, D. P., Jr. (M)
Greene, W. E. (M)
Heron, D. J. (M)
Holmes, R. E. (M)
Isenson, R. S. (M)
Lacev, M. R. (M)
Murphy, C. H. S. (SM)
Reins, E. R., Jr. (M)
Richardson, B. (M)
Schreier, W. J. (M)
Toohill, D. L. (M)

Point Reyes (SF-7)
Reid, I. H. (VA)

Pomona (LA-OB-7)
Allen, J. W. (SM)
Armbruster, K. L. (M)
Ashley, G. W., Jr. (M)
Bailey, N. A. (M)
Balslev, L. L. (M)
Barnett, W. C. (M)
Bell, B. G. (M)
Birch, R. S. (A)
Black, L. M. (A)
Blackwell, M. B. (M)
Bomar, R. L. (M)
Bredon, A. D. (M)
Brewer, C. P. (SM)
Brvla, L. (M)
Bullock, W. W. (M)
Burenko, O. (M)
Callot, S. (A)
Clifford, R. F. (M)
Collins, W. G. (M)
Covington, L. R. (M)
Cralo, F. D. (SM)
Davis, O. R. (M)
Domen, S. L. (M)
Donnelly, R. W. (M)
Drake, W. A. (M)
Dunn, C. E. (A)
Edsinger, L. E. (M)
Eoelino, F. W. (M)
Eqqeman, D. J. (M)
Ellis, G. M. (SM)
Elzie, D. G. (M)
Evendorff, S. (M)
Feather, J. B. (M)
Froessel, C. H. (M)
Garvin, J. A. (M)
Gastineau, L. (M)
Goff, I. O. (SM)
Gottler, R. L. (M)
Gross, F. A. (M)
Hanson, M. E. (M)
Harris, H. F. (A)
Hartke, D. H. (M)
Hasenbeck, H. W. (SM)
Hindi, M. (M)
Hino, R. H. (A)
Home, C. F., Jr. (F)
Ivev, R. W. (M)
Jackson, J. C. (A)
Karish, J. A. (M)
Kazelis, A. J. (M)
Kirk, C. N. (M)
Kniskt, J. D. (M)
Lambert, J. (M)
Lee, H. J. (M)
Low, R. G. (M)
Lubeck, R. V. (M)
Lunohofer, E. P. (M)
Madsen, C. A. (A)
Maonenat, R. A. (M)
Marino, L. A., Jr. (A)
Marshall, R. R. (M)
Maudal, I. (M)
Mavs, C. H. (A)
McDaniel, C. E. (A)
McLachlan, G. W., Sr. (M)
Morell, C. S. (M)
O'Brien, J. C. (SM)
Omiva, R. Y. (M)
Overall, G. D. (A)
Patterson, T. C. (SM)
Pemberton, T. (M)
Pizzuti, A. D. (A)
Porter, J. W. (A)
Ranish, H. (M)
Ravbin, M. W. (SM)
Rea, D. E. (A)
Reeves, J. T. (M)
Runvan, R. W. (A)
Sandler, B. (M)
Schanino, R. (M)
Shimada, G. (M)
Smith, C. R., Jr. (M)
Smith, R. D. (M)
Soraoue, D. L. (A)
Soulres, D. C. (A)
Stenhan, A. (M)
Sticht, R. J. (SM)
Stone, R. E. (M)
Sutton, A. A., Jr. (M)
Tamolco, J. (SM)
Taylor, C. A., Jr. (M)
Terakowski, E. A. (M)
Thacker, C. L. (M)
Thomnson, R. J. (A)
Thomvson, R. J. (M)
Thorne, R. W. (SM)
Turner, W. L. (M)
Van Deventer, J. A. (M)
Villere, A. C. (SM)
Walters, R. L. (M)
Ward, W. S. (M)
Wells, G. H. (M)
Wellxand, R., Jr. (A)
Wessels, P. S. (SM)
Winaard, C. G. (M)
Worden, D. W. (SM)
Zeller, H. R. (M)
Zusag, R. J. (M)

Porterville (SF-7)
Maroot, A. T. (M)
Poundstone, J. R. (M)

Port Hueneme (LA-B-7)
Guyton, C. W. (M)
Hazel, W. C. (M)
McCasland, R. S. (M)
Rich, A. P. (M)
Senesac, D. E. (A)

Portola Valley (SF-7)
Battelle, R. B. (A)
Burke, R. J. (SM)
Coale, F. S. (A)
Davies, L. E. (SM)
Dawson, P. F. (M)
Hancock, N. (M)
Larkin, K. T. (SM)
Reyling, G. F. (M)
Rock, A. J. (M)
Swanson, J. P. (M)
Ter Veen, L. A. G. (SM)
West, R. A. (M)

Poway (SD-7)
Brunt, N. F. (M)
Dershem, E. R. (M)
Grindle, C. E. (SM)
McFadden, E. R. (M)
McLauchlan, J. M. (A)

Puente (LA-OB-7)
Allison, R. E. (SM)
Berkley, W. H. (A)
Gilliam, T. J. (M)
McMahon, J. E. (M)
Poirier, G. R. (M)
Pulsipher, L. C. (M)
Yamashiro, J. M. (A)

Quartz Hill (LA-7)
Sutherland, L. C. (A)

Quincy (SAC-7)
Moss, R. A. (A)

Ramona (SD-7)
Broome, P. W., Jr. (M)

Rancho Cordova (SAC-7)
Bose, K. W. (M)
Ganowsky, W. B. (M)
Harding, J. R. (M)
North, N. B. (M)

Rancho Santa Fe (SD-7)
Gardner, B. R. (SM)
Haflinger, D. J. (M)
Herbert, W. J. (M)
Red Bluff (SAC-7)
Boer, P. E. (A)

Redding (SAC-7)
Banks, D. B. (A)
Bechtle, C. R. (A)
Hoeflich, A. F. (SM)
Machin, E. K. (A)
Maxey, G. S. (M)
Olsen, L. F. (A)

Redlands (LA-OB-7)
Crowley, J. J. (SM)
Herman, J. B. (A)

Redondo Beach (LA-7)
Ake, T. E. (M)
Albright, A. R. G. (M)
Amdahl, L. D. (A)
Apple, J. S. (M)
Appleton, D. T. (M)
Baker, J. N. (A)
Barrar, R. B. (M)
Bettinelli, K. F. (M)
Brown, K. H. (M)
Burton, J. R. (M)
Clapp, R. W. (SM)
Cohen, A. V. (M)
Covington, A. W. (M)
Dahl, E. E. (M)
Davis, C. H. (M)
Diehl, R. T. (A)
Egan, J. J. (M)
Eckess, W. S., Jr. (M)
Evans, N. T. (M)
Fiet, O. (SM)
Fontana, J. A. (M)
Gaston, R. N. (A)
Gibbs, F. R. (M)
Gordon, M. F. (M)
Hildreth, D. E. (A)
Howard, S. L. (M)
Jelley, N. A. (SM)
Jones, C. R. (A)
Kino, G. J. (A)
Kirlin, E. V. (M)
Kolostyak, J. (M)
Lerum, L. R. (M)
Lewison, G. L. (M)
Lindberg, H. E. (M)
McClellan, L. D. (M)
Messenger, G. C. (SM)
Morgan, H. C. (SM)
Morrison, H. E. (A)
Oess, F. G. (M)
Osborn, A. J. (M)
Owens, W. W. (A)
Pearce, C. R. (A)
Pregler, R. A. (M)
Pruden, H. K. (A)
Reddicks, J. E. (M)
Reiter, G. S. (M)
Russell, B. J. (M)
St. John, J. L. (M)
Salmi, T. W. (M)
Shackleton, J. R. (M)
Steinhoff, H. W., Jr. (M)
Tucker, R. E. (M)
Walsh, J. J. (A)
Weir, K. O. (M)
Williams, F. R. (A)
Winner, R. N. (M)
Wolverton, R. W. (M)

Redwood City (SF-7)
Alll, W. H. Jr. (M)
Allen, D. P. (M)
Amara, R. C. (A)
Anissimov, B. A. (M)
Ashman, R. R. (M)
Barkley, J. W. Jr. (A)
Barnard, G. A. (SM)
Benz, B. D. (M)
Berry, B. H. (A)
Black, G. (A)
Bleasdale, E. J. (M)
Bloom, G. (A)
Boboricken, S. (A)
Bond, C. H. (SM)
Bradford, C. W. (M)
Cernuti, B. A. (M)
Chenev, C. (A)
Christie, J. W. (M)
Conti, E. A. (M)
Covell, D. F. (M)
Czerwinski, S. D. (M)
Data, C. D. (M)
Edson, D. J. (M)
Elfvina, C. T. (A)
Elliott, P. C., Jr. (M)
Ellis, I. M. (M)
Eshleman, V. R. (SM)
Farinon, W. B. (SM)
Ferouson, J. M. (M)
Fletcher, M. W. (M)
Freise, W. H. (A)
Gerlina, J. E. (M)
Gulick, E. C. (SM)
Gundv, P. L. (M)
Hamilton, D. J. (A)
Hardina, V. C. (M)
Harris, A. (M)
Haves, A. E. Jr. (SM)
Hill, L. E. (M)
Hinmers, K. J. (M)
Hoch, O. L. (M)
Hollabaugh, J. F. (M)
Holtmann, E. H. (A)
Hopkins, A. R. (SM)
Hulett, H. R. (A)
Ice, G. E. (M)
Kanvtsky, W. (M)
Kazanilan, H. A. (A)
Kreiss, W. T. (M)
Lacy, P. D. (SM)
Laudenschlaoer, W. (M)
Leslie, F. E. (SM)
Long, C. R. (M)
Luebke, W. R. (SM)
Mathias, M. L. (A)
McAlpine, W. N. (M)
Morwood, R. C. (M)
Murphy, H. E. (M)
Navy, G. (SM)
Nve, W. H. (M)
Orr, J. E. (M)
Patterson, G. K. (SM)
Phillips, R. M. (A)
Plothnikoff, G. P. (M)
Redeker, R. G. (M)
Reed, D. E. (M)
Rich, P. L. (M)
Riddell, A. J. (A)
Roberts, W. L. (M)
Rolfy, W. J. (A)
Romander, H. (SM)
Rudee, E. (M)
Sansum, V. H. (A)
Schmidt, R. C. (SM)
Selsted, W. T. (SM)
Short, R. A. (M)
Silverstein, P. K. (A)
Smaha, N. F. (A)
Soler, C. G. (M)
Stahl, R. J. (M)
Stallman, H. E. (M)
Stewart, J. A. (M)
Stoddard, D. J. Jr. (M)
Stratton, B. L. (A)
Swisher, C. F. (M)
Tarrodavchik, P. (SM)
Thompson, R. E. (M)
Tipping, C. C. Jr. (M)
Tuck, E. F. (M)
Valles, B. V. (M)
Walter, C. A. Jr. (M)
Warner, D. B. (M)
Wattenbarger, J. W. (M)
Wilder, T. W. III (M)
Woldow, A. F. (M)
Wood, J. R. (M)
Youngstron, J. R. (M)

Reseda, (LA-SF-7)
Abernathy, O. R. (A)
Barcock, R. L. (A)
Berger, J. B. (M)
Blanton, M. J. (A)
Bowling, J. S. (M)
Briel, L. A. (A)
Busenkell, C. C. (SM)
Chamberlain, W. S. (M)
Colander, R. E. (SM)
Countis, T. J. (SM)
Elberger, M. (A)
Frank, C. E. (M)
Freedman, L. M. (A)
Garland, M. D. Jr. (M)
Goulet, T. A. (M)
Green, R. D. (M)
Hancock, T. W. (SM)
Harlan, R. E. (M)
Held, H. (SM)
Henrion, W. S. (A)
Hughes, R. A. (M)
Kaplan, A. J. (M)
Kitchen, R. L. (M)
Lavine, R. (M)
Lerman, N. (M)
Mackey, R. C. (M)
Markowski, E. (M)
Mock, R. E. (M)
Mumma, J. W. (M)
Murray, R. W. Jr. (M)
Pasonski, G. E. (M)
Pedersen, F. C. (M)
Pedroo, W. R. (M)
Peterson, J. A. (A)
Plank, J. (M)
Politi, E. Y (M)
Politis, S. (M)
Saltzman, H. (M)
Schuster, N. J. (M)
Schv, S. (A)
Selerian, R. K. (M)
Sundbera, R. A. (M)
Thaler, S. (A)
Thomas, R. L. (M)
Underberger, G. M. (M)
Welch, D. K. (M)
Wills, J. D. (M)
Woods, J. R. (M)

Rialto (LA-OB-7)
Cool, P. E. (M)

Richmond (SF-EB-7)
Chisholm, H. C. (M)
Hamilton, E. P. (A)
Hom, N. P. (A)
Jensen, R. H. (A)
Krivohlavek, G. M. (M)
Larsh, A. E. Jr. (M)
Lovell, E. L. (A)
Metz, G. F. (M)
Nelson, O. A. (A)
Pritchett, W. (SM)
Schrader, G. F. (M)
Smith, H. L. (M)
Thomason, T. H. (A)

Ridgecrest (CL-7)
Burkey, C. E. Jr. (M)
Crawforth, J. E. (M)
Dolce, S. L. (M)
Fowler, T. C. (M)
Jenkins, C. E. (M)
Kasoer, D. P. (A)
Larsen, C. L. (A)
Schneider, N. J. (M)
Schnur, S. T. (A)
Sessions, S. H. (M)
Tkachuk, J. J. (M)
Zobrist, G. W. (M)

Rio Vista (SF-7)
Bird, J. R. (SM)

Rivera (LA-SA-7)
Crosby, J. (M)
Jones, K. E. (A)
Samo, T. A. (M)
Witt, A. N. (M)

Riverside (LA-OB-7)
Atchison, F. S. (SM)
Barton, R. W. (SM)
Bauer, R. L. (A)
Berns, K. L. (A)
Bever, J. J. (M)
Blasio, M. H. (M)
Blutman, E. (SM)
Bradley, J. (M)
Brown, D. W. (M)
Brown, L. E. (SM)
Brown, M. H. (M)
Buchanan, W. D. (SM)
Buchfelter, J. E. (A)
Button, W. E. (M)
Byrne, J. F. (F)
Casey, S. D. (A)
Christensen, L. E. (M)
De Marco, R. J. (A)
Dick, J. O. (M)
Feeney, J. E. (M)
Fletcher, R. C. (A)
Friedmann, E. (M)
Grove, R. C. (M)
Grvcko, S. R. (SM)
Halic, E. J. (M)
Heberling, E. D. (SM)
Hoover, M. C. Jr. (M)
Jackson, T. B. (SM)
Jacobs, J. Jr. (M)
Jemigan, E. D. (SM)
Johns, R. R. (SM)
Johnson, E. J. (M)
Kelley, S. B. (M)
Kelsey, L. L. (A)
Kinzer, G. E. (M)
Kino, S. G. (M)
Kopulsky, S. (M)
Kritanovich, N. J. (A)
Lindberg, A. C. (M)
Lundquist, C. R. (SM)
Macadam, J. F. (M)
Morehouse, G. D. (SM)
Muncy, W. A. (M)
Osinski, W. M. (A)
Parvin, J. A. (M)
Pawley, M. G. (SM)
Powers, A. B. (SM)
Pratt, S. L. (M)
Rowe, D. E. (SM)
Seeley, E. W. (A)
Smith, R. P. (SM)
Taylor, T. T. (M)
Van Vorhis, J. L. (M)
Verano, F. (M)
Wall, R. A. (SM)
Waltner, C. Jr. (M)
Wells, R. E. (M)
Whalen, P. K. (M)
Witbeck, L. H. (M)

Rocklin (SAC-7)
Brown, V. J. (A)

Rolling Hills (LA-7)
Anderson, M. J. (M)
Angel, A. M. (M)
Ankerstar, R. H. (M)
Ball, K. E. (SM)
Bar, M. (M)
Berqman, S. G. (M)
Boland, C. D. Jr. (M)
Bond, F. E. (SM)
Borcham, N. P. (A)
Chambers, G. R. (M)
Conklin, D. E. (A)
Cummins, J. W. (SM)
Daniel, R. E. (M)
Dea, D. Y. F. (SM)
Edwards, R. F. (M)
Ellinaboe, J. K. (M)
Ellis, T. O. (M)
Emerson, M. R. (A)
Finley, W. A. (A)
Geduld, A. (M)
Gilkison, C. A. (M)
Gillies, M. A. (M)
Hall, C. A. (A)
Harris, K. L. (M)
Hoaan, J. D. (M)
Holland, J. E. (A)
Hubbard, J. W. (M)
Jackson, B. B. (M)
Kaufman, F. H. (M)
Kaufman, I. (M)
Kazarian, D. G. (M)
King, E. N. (M)
King, W. J. (M)
Kluehe, W. (M)
Koehler, F. H. (M)
Ladd, A. W. (M)

Lilienstein, M. (SM)
Little, T. D. (A)
Lucas, E. D. Jr. (A)
Matson, D. L. Jr. (M)
McAllister, D. R. (SM)
McMahon, G. V. (M)
McMahon, R. E. (M)
McNary, B. D. (M)
McPherson, R. G. (M)
McNott, R. N. (M)
Meyer, H. F (SM)
Meyer, J. C. (M)
Moolewer, S. (M)
Nilsson, B. G. (M)
Olson, E. R. (M)
Peckham, D. D. (M)
Rioos, D. D. (SM)
Sacks, J. M. (M)
Schnoor, J. E. (A)
Shibuya, Y. (M)
Shulsinger, J. (M)
Stephan, P. W. (A)
Stone, M. M. (A)
Swloer, J. M. (A)
Tarbot, A. (A)
Walker, V. D. (M)
Walquist, R. L. (M)
Wannlund, A. L. Jr. (M)
Ward, R. C. (M)
West, G. P. (A)
Zaremba, J. G. (M)

Rolling Hills Estates (LA-7)
McClintock, D. G. (M)
Trapp, J. A. (SM)

Rosamond (CL-7)
Kibler, L. S. (M)
Orrick, T. W. (M)

Rosemead (LA-P-7)
Ferl, R. H. (A)

Roseville (SAC-7)
Hunzeker, W. R. (M)

Running Springs (LA-OB-7)
Sutton, O. D. Jr. (M)

Sacramento (SAC-7)
Bairos, C. A. (M)
Baker, D. F. (M)
Baldwin, W. A. (A)
Ballard, R. B. (M)
Bennett, R. C. (M)
Beroer, E. W. (SM)
Blue, K. D. (A)
Bolander, P. E. (M)
Bouroet, L. (M)
Breuer, H. J. (M)
Broderson, L. V. (A)
Buroess, R. A. (M)
Camerzell, P. L. (M)
Cook, G. V. (A)
Cook, R. H. II (M)
Corrigan, B. G. (M)
Croker, K. S. (M)
Dickinson, I. E. (M)
Downing, M. K. (A)
Enzler, A. J. (M)
Feller, A. S. Jr. (A)
Field, S. E. Jr. (A)
Friedlander, S. (A)
Fukuda, S. I (M)
Garcia, L. V. W. Jr. (M)
Glum, D. E. (A)
Godfrey, X. W. (M)
Guest, W. T. (SM)
Hartman, W. H. (M)
Henrioe, C. W. III (M)
Hill, W. C. (SM)
Honda, J. S. (M)
Kapandritis, G. N. (M)
Karpisek, W. J. (M)
Kempson, A. Jr. (M)
Klibbey, M. B. (A)
Klinke, E. R. (M)
Koch, W. F. (M)
Kowalczyk, J. R. (M)
Lane, C. A. (M)
Lang, C. T. (M)
Leecina, R. W. (A)
Liviakis, G. J. (M)
McKinnon, R. J. (A)
Naschke, S. E. (M)
Oates, T. L. (M)
Onnielan, P. R. (SM)
Polaar, E. A. (A)
Poucher, R. A. Jr. (M)
Pound, A. W. (M)
Quackenbush, H. H. (M)
Renard, W. J. (M)
Roberts, E. A. Jr. (A)
Rockey, G. H. (SM)
Rohde, A. O. (M)
Schrader, F. S. (M)
Scotch, C. (A)
Shaolro, H. L. (M)
Sinkler, C. I. (M)
Slater, A. P. (A)
Slater, H. C. (M)
Smart, M. E. (SM)
Spadoni, A. F. (A)
Sronce, G. S. (M)
Starrec, J. S. (A)
Thomson, R. L. (M)
Tiedeman, C. R. (M)
Watson, H. (A)
Watson, J. E. (A)
Williams, H. T. (M)
Williams, L. H. (A)
Wilson, L. I. (A)
Wing, J. (M)
Young, M. E. (A)
Zander, C. E. (A)

Salinas (SF-7)
Horton, J. A. (M)
Johnson, R. M. Jr. (A)
Shepherd, M. J. (M)
Wright, O. N. (A)

San Anselmo (SF-7)
Berryhill, J. L. (M)
Kaufman, J. (SM)
Oberg, V. H. (M)

San Bernardino (LA-OB-7)
Adamson, L. B. (M)
Dyer, E. H. (M)
Ewing, G. W. (M)
Featherstone, S. J. (M)
Huddleston, J. C. (M)
Joe, R. H. (M)
Pierce, C. C. (M)

San Bruno (SF-7)
Baker, B. J. (A)
Carr, E. A. (M)
Corbett, W. F. (A)
Czelkowitz, R. F. (M)
Fuller, H. H. (A)
Hawkins, E. R. (M)
Kavanaugh, J. C. (M)
McDade, J. J. Jr. (A)
Mizuhara, A. (M)
Olson, R. E. (M)
Preist, D. H. (M)
Thomson, O. E. (M)
Woodward, W. J. (A)

San Carlos (SF-7)
Anderson, C. E. (M)
Bramhall, F. B. (SM)
Breymaver, K. E. (SM)
Bristol, T. R. (SM)
Carter, R. W. Jr. (M)
Chamberlin, R. H. (SM)
Christian, E. (M)
Combellick, T. A. (SM)
Conn, M. L. (M)
Cool, L. R. (M)
Corcoran, J. W. (M)
Culbertson, A. F. (SM)
Cumminos, K. M. (SM)
Davis, C. C. (A)
Dodd, C. (SM)
Doyka, S. F. (M)
Fisher, W. C. (SM)
Gelleman, R. F. (M)
Gillen, D. A. (M)
Graves, H. F. (SM)
Greene, H. A. Jr. (SM)
Grobero, L. R. (M)
Gross, E. H. (M)
Hahn, G. A. (M)
Hall, J. W. (M)
Hesselorave, D. H. (SM)
Hull, J. F. (M)
Inoersoll, J. C. (M)
Johnson, J. B. (A)
Johnson, L. B. (SM)
Joliv, J. A. (SM)
Joseph, W. F. (M)
Kahmann, H. C. Jr. (M)
Kiessling, R. C. (M)
Knoroo, J. L. Jr. (M)
Lewenstein, H. J. (M)
Lichtenstein, M. I. (M)
Lohr, D. (SM)
Maltzer, I. (SM)
Matovich, M. J. (M)
McGibbon, G. D. (A)
Meacham, D. D. (M)
Miller, R. J. (M)
Mueller, M. T. (M)
Nauale, J. B. Jr. (M)
Palthe, R. W. (M)
Patton, P. B. (SM)
Pelrce, J. A. (M)
Pitts, J. E. Jr. (M)
Robbins, C. M. Sr. (SM)
Ross, A. T. (M)
Rovaliv, M. C. (M)
Salihi, J. T. (M)
Savarin, A. (M)
Schussele, J. H. (M)
Seymour, A. M. (SM)
Strassner, R. M. (M)
Struven, W. C. (SM)
Stuart, G. S. (A)
Swartz, P. C. (M)
Weber, J. H. (M)
Winerow, R. E. (M)
Wyand, D. L. (M)

San Clemente (LA-SA-7)
Casad, T. A. (A)

San Diego (SD-7)
Abbey, K. (SM)
Abel, C. F. (A)
Abele, R. J. (M)
Adams, O. E. (M)
Asbulos, E. C. (A)
Ahrens, H. R. (M)
Albert, S. L. (A)
Alfano, W. A. (M)
Allen, W. Jr. (M)
Althouse, J. E. (M)
Altman, D. E. (M)
Anders, J. R. (M)
Anderson, D. L. (M)
Anderson, J. S. (M)
Anderson, V. C. (SM)
Anthony, D. J. (M)
Arnett, W. (SM)
Asato, C. K. (A)
Atkinson, W. H. (A)
Austin, R. W. (M)
Avfott, A. J. (M)
Babbitz, H. B. (M)
Bachman, C. R. (M)
Bailey, D. G. (M)
Bailey, R. E. (M)
Ball, N. E. (M)
Banoo, E. E. (M)
Barber, G. D. (A)
Barley, C. E. (A)
Barnard, J. C. (M)
Barnes, H. R. (A)
Bauer, J. A. (M)
Beaulieu, J. P. (A)
Bebak, V. F. (A)
Bell, E. (M)
Bennett, V. M. (M)
Bennett, W. E. (M)
Bentrott, D. W. (A)
Beroant, G. G. (M)
Bertolino, T. R. (M)
Betsworth, R. K. (M)
Birkett, B. T. (M)
Bishop, D. E. (M)
Biornson, W. G. Sr. (SM)
Blair, W. L. (SM)
Bloschies, F. H. (M)
Bocchio, T. R. R. (A)
Bonham, J. F. (A)
Bowers, J. L. (SM)
Bowers, R. W. (VA)
Boyce, W. E. L. (M)
Brackett, R. T. (M)
Bradford, W. R. (M)
Branson, E. C. (M)
Braun, S. (A)
Breeding, C. R. (A)
Breeze, J. R. (M)
Brissenden, P. (A)
Brock, P. A. (M)
Brokaw, H. R. (M)
Brown, W. R. (M)
Bunce, D. S. (A)
Burbank, C. J. (SM)
Burgi, C. E. (M)
Burke, A. T. (SM)
Burnett, W. L. (M)
Buskirk, J. F. (M)
Butler, B. L. (A)
Campbell, C. C. (M)
Campbell, R. (M)
Campbell, W. D. (M)
Caooraletti, G. A. (M)
Carlson, E. W. (M)
Carson, A. C. (M)
Carson, D. E. (M)
Casal, F. G. (A)
Caspers, J. W. (M)
Cawley, J. H. Jr. (M)
Celto, J. E. (M)
Cervenka, A. J. (M)
Chadwick, R. F. (A)
Chang, G. M. (M)
Chasinowitz, G. (M)
Chatelain, M. G. (M)
Cheney, A. G. (A)
Cherry, W. Jr. (M)
Cherry, W. R., Jr. (M)
Chevron, R. R. (A)
Christensen, M. M. (SM)
Christensen, N. T. (M)
Christensen, R. J. (SM)
Clack, H. W. (A)
Clare, E. T. (SM)
Clark, E. N. (A)
Clark, M. R. (M)
Clarke, A. G. (A)
Clarke, G. W. (M)
Coates, J. R. (M)
Coleman, G. M. (M)
Collier, R. (M)
Comstock, R. L. (M)
Cook, M. (M)
Corkhill, J. M. (M)
Cram, C. C. (M)
Creutz, E. C. (SM)
Criscell, H. L. (SM)
Crocker, W. F. (A)
Crotinger, R. M. (M)
Culnan, D. E. (M)
Curl, G. H. (M)
Cutler, M. (SM)
Cvr, K. C. H. (M)
Daoue, L. P. (M)
Dalins, I. (M)
Daly, W. A. (A)
Dameson, L. G. Jr. (M)
Danielson, F. H. (M)
Davis, J. T. (M)
Day, S. M. (A)
Deavenport, J. E. (M)
De Haas, D. G. (M)
De Kozar, R. L. (M)
Delicath, R. C. (M)
Dellinger, K. A. (A)
Demuth, H. P. (M)
Denny, F. J. (M)
Derenthal, R. J. (A)
Detwiler, R. (M)
Dickenman, R. L. (M)
Dickstein, H. D. (SM)
Dobyne, J. C. Jr. (M)
Dodd, G. M. (M)
Dois, J. H. (VA)
Donahue, J. (M)
Donahue, J. (M)
Dowell, R. J. (M)
Doyle, J. W. (A)
Draymer, A. H. (SM)
Drews, G. E. (M)
Driskell, R. O. (M)
Duoaan, J. R. (SM)
Dyess, C. H. (A)
Ehrlich, C. I. (M)
Ely, M. D. (A)
Emmerich, L. (M)
Enoh, P. B. (SM)
Entermann, R. C. (M)
Erickson, P. R. (M)
Evans, A. R. (M)
Evans, D. S. (M)
Evans, W. O. (A)
Farmer, A. A. Jr. (A)
Fay, W. J. (M)
Fazenbaker, P. J. (A)
Fenn, R. W. (M)
Finch, J. W. (SM)
Fischer, J. F. Jr. (M)
Fiske, P. E. (SM)
Fixsen, R. E. (M)
Fogel, L. J. (SM)
Frech, R. A. (M)
Freres, C. H. (M)
Friedman, S. (M)
Frost, J. W. (M)
Fuhrer, D. L. (M)
Gadbois, R. D. (M)
Garcia, G. E. (A)
Gatlin, B. R. (M)
Geren, K. E. (M)
Giddings, K. L. (M)
Gilbreath, J. A. (M)
Gillette, A. J. Jr. (A)
Goddard, W. R. Jr. (M)
Godfrey, W. C. (M)
Gordon, R. A. (SM)
Gottwald, C. H. (M)
Grafa, J. B. (M)
Granoer, H. (SM)
Greelev, A. C. (M)
Greenstein, J. L. (A)
Greenwood, O. D. (M)
Grigg, R. W. (M)
Gross, W. (A)
Grvoar, R. A. (M)
Gulbrandsen, F. O. (M)
Guthrie, W. R. (A)
Haak, D. K. (M)
Hallman, A. D. (M)
Halonen, C. A. (A)
Hamblv, M. E. (A)
Hamilton, E. A. (M)
Hansen, H. J. Jr. (M)
Hansen, P. G. (M)
Hansen, W. C. (A)
Harrington, M. W. (M)
Harris, J. L. (M)
Harris, L. G. (M)
Harrison, J. F. (M)
Hartin, W. J. (A)
Hatch, A. R. (M)
Hatchett, C. (SM)
Hatchett, S. E. (SM)
Hauser, J. H. (M)
Hayes, J. C. (SM)
Hayth, W. D. (M)
Hedlund, K. W. (M)
Hedrick, W. (A)
Henkel, R. M. (M)
Heritage, D. P. (M)
Heritage, J. L. (M)
Herman, J. J. (M)
Hernandez, E. R. (M)
Herz, E. (M)
Hicks, C. N. (M)
Hicks, P. A. (M)
Hiogins, V. M. (A)
Hill, C. A. (M)
Hively, R. R. (SM)
Hodoson, V. R. (A)
Holcomb, D. E. Jr. (A)
Holman, F. P. (A)
Honer, R. E. (SM)
Hood, I. A. (M)
Hooven, P. J. (M)
Hopkins, R. U. F. (M)
Hose, E. (M)
Howe, C. J. (A)
Huoain, F. E. (SM)
Huches, L. R. (M)
Humphrey, R. D. (M)
Inoram, C. J. (M)
Inoram, J. B. (M)
Ivans, W. S. Jr. (SM)
Jahn, R. C. (M)
Jallu, F. M. (M)
Janos, W. A. (M)
Johantoen, J. S. (M)
Johnson, J. F. (M)
Johnson, S. Jr. (M)
Johnston, D. L. (A)
Jones, H. G. (M)
Jones, K. N. (M)
Jones, L. K. Jr. (M)
Justice, R. (SM)
Kalitz, P. H. (M)
Kalbfell, D. C. (SM)
Kallmann, G. T. (M)
Karcher, E. R. (SM)
Karel, L. G. (M)
Kamazin, W. R. (M)
Kasal, K. (M)
Kaswen, M. (M)
Kelley, D. P. (M)
Kerr, C. H. Jr. (A)
Kerr, H. C. Jr. (A)
Kestler, G. (M)
Kilpatrick, D. D. (M)
Kimball, J. L. (M)
Klee, H. J. (M)
Klinbera, J. (A)
Kluck, J. H. (M)
Knox, R. M. (M)
Koehn, W. A. (M)
La Gue, T. L. (M)
Lalusoa, A. S. (M)
Lakins, B. B. (A)
La Motte, K. E. (M)
Larkin, R. L. (M)
Larsen, H. L. (M)
Lay, P. D. (M)
La Zelle, L. L. (M)
Lee, J. E. (M)
Lee, R. G. (M)
Lee, W. L. (M)
Leffler, R. (M)
Leoer, R. M. (SM)
Leona, A. L. T. (M)
Levy, E. S. (A)
Linsey, G. D. (M)
Lisak, L. R. (M)
Lively, J. D. (M)
Lodoe, C. R. (M)
Loeb, M. (M)
Loebe, L. V. (M)
Loque, S. H. (M)
Long, J. V. (M)
Lonochamo, W. F. (M)
Lowenstein, J. F. (SM)
Luebben, R. G. (M)
Makinson, H. O. (M)
Manning, C. S. (SM)
Marenholtz, P. E. (SM)
Martin, C. Jr. (M)
Martin, G. E. (SM)
Martin, L. E. (M)
Martinez, M. Jr. (M)
Massengale, W. B. (A)
Matsunoto, T. (M)
Maughmer, J. M. (M)
Mayer, A. (M)
McAllister, J. A. (SM)
McAuliffe, J. J. (M)
McCrary, G. W., Jr. (M)
McCue, D. E. (A)
McDaniel, G. A. (A)
McGehee, C. R. (M)
McGrath, R. P. (M)
McKnight, C. L. (A)
McLaughlin, R. G. (A)
McLernan, J. D. (M)
McLennan, R. A. (M)
McManus, R. P. (M)
McNaney, J. T. (SM)
Mealev, G. J. (A)
Medved, D. B. (SM)
Mehner, E. C. (A)
Miodal, P. (M)
Mildice, J. W. (M)
Miller, C. J. (A)
Miller, C. N. (M)
Millican, F. M. (M)
Mills, W. N. (M)
Moe, C. R. (SM)
Moffatt, V. J. (M)
Molnar, S. (A)
Montalvo, E. (M)
Moore, E. J. (M)
Morgan, A. W. (M)
Morgan, L. A. (M)
Moser, J. L. (M)
Mott, M. H. (M)
Mulvey, J. X., Jr. (M)
Murray, J. H. (M)
Nakamura, C. M. (M)
Nelson, A. W. (M)
Nelson, J. A. (M)
Nelson, P. C. (M)
Newberry, D. A. (M)
Nichols, B. B. (M)
Niderost, C. R. (M)
Nizvborski, E. S. (M)
Noll, F. R. (M)
Norris, B. J. (M)
Norton, H. N. (M)
Novak, E. K. (M)
Noves, A. E. (M)
Nuese, C. (M)
Ogram, R. L. (M)
Oliver, G. W. (M)
Omiya, C. I. (M)
Ong, A. M. (A)
Onstad, R. C. (M)
Oranoe, E. S. (M)
Ott, W. R. (M)
Ozaki, G. K. (A)
Pagels, W. (A)
Paine, S. T. (M)
Parisa, S. G. (A)
Parker, A. B. (M)
Parker, B. E. (SM)
Parker, R. O. (M)
Pass, J. H. (M)
Pavela, H. W. (M)
Peterson, C. H. (A)
Peterson, D. M. (M)
Peterson, R. M. (M)
Petit, J. G. (A)
Pfender, W. H., Jr. (M)
Phelps, J. M. (SM)
Phillips, C. E. (M)
Phillips, E. T. (M)
Phnlnsa, H. R. (M)
Plini, E. W. (M)
Pine, T. G. (M)
Pitts, K. J. (M)
Poe, C. M. (A)
Pokorny, F. A. (M)
Pollard, W. A. (A)
Porter, J. B. (M)
Prager, R. H. (M)

Prather, A. W. (M)
Prim, D. C. (SM)
Prochoda, R. (M)
Proctor, D. (M)
Push, E. L. (M)
Quiog, K. R. (M)
Rathbone, R. R. (A)
Ratte, J. P. G. (A)
Ravey, D. L. (M)
Rayburn, D. A. (A)
Redelings, J. T. (M)
Redington, E. D. (SM)
Reel, L. S. (M)
Renteria, R. (M)
Reynolds, Z. D. (M)
Rhamy, J. D. (A)
Rice, G. D. (SM)
Richman, R. L. (M)
Rider, K. B. (A)
Roark, L. A. (M)
Robinson, E. B., (SM)
Roeser, R. W. (M)
Rogers, R. M. (M)
Rogers, S. (SM)
Root, D. E. (M)
Roshon, A. H. (M)
Roth, J. R. (M)
Rush, O. A., Jr. (M)
Saarl, E. S. (M)
Salfran, L. (M)
Samaw, W. J. (M)
Sattro, R. L., Sr. (SM)
Scarborough, C. S. (A)
Scarborough, R. C. (A)
Schaefer, J. V. V. (M)
Schillinger, R. F. (SM)
Schindelin, J. W. (M)
Schlesinger, R. J. (M)
Schmidt, L. C., (M)
Schmitz, D. W. (M)
Schneebeck, D. A. (M)
Schoenarth, M. D. (A)
Schroeder, R. R. (A)
Schubert, U. L. (M)
Schukantz, J. H. (M)
Schweizer, E. G. (M)
Schwidetzky, W. H. (M)
Scott, J. E., Jr. (M)
Seaman, H. K. (M)
Senterfitt, A. D. (A)
Shaw, F. W. (M)
Shaw, L. L., Jr. (M)
Shechet, M. L. (A)
Sherertz, P. C. (M)
Shiolev, T. D., Jr. (M)
Short, D. W. (M)
Silberman, R. T. (M)
Simmons, J. M., Jr. (M)
Sinnott, F. T. (M)
Siperly, B. H. (M)
Skaoerberg, W. A. (M)
Skillman, B. D. (M)
Skolil, L. L. (SM)
Slote, D. M. (A)
Small, B. I. (M)
Snyder, D. R. (M)
Somes, G. W. (A)
Spillane, T. F. (A)
Spilmer, B. H. (M)
Squibb, W. F. (M)
Squire, R. W. (M)
Stalcup, T. L. (M)
Staroste, O. (A)
Steen, J. E. (M)
Steppler, R. V. (M)
Stewart, W. A. (M)
Stoeckert, E. D. (M)
Stone, K. A. (A)
Story, H. O. (M)
Stovall, D. J. (M)
Stover, E. R. (A)
Strobach, F. (M)
Strowlo, K. W. (A)
Sturtevant, H. B., Jr. (M)
Sunlin, W. M. (M)
Swann, E. S. (M)
Swedlund, L. E. (SM)
Tabler, J. G. (SM)
Tamura, Y. (M)
Taylor, H. M. (A)
Taylor, S. V. (M)
Thaanum, O. (M)
Thatcher, E. W. (SM)
Thiel, W. H. (M)
Thoman, R. E. (M)
Thomas, H. A. (SM)
Thomas, H. A. (AM)
Thomoson, W. J. (SM)
Tibballs, L. (VA)
Tidwell, G. L. (M)
Tirrell, C. W. (M)
Tracy, H. H., Jr. (M)
Trader, J. E. (A)
Tricoles, G. P. (M)
Trochanowski, A. J. (A)
Troodon, W. H. (A)
Turnage, R. W., Jr. (M)
Tver, A. A. (M)
Ubrv, L. E., Jr. (M)
Underhill, J. T. (SM)
Underwood, W. H. (M)
Undesser, K. (SM)
Uvehara, M. (M)
Van Caster, J. C. (M)
Van Meter, E. E. (A)
Varson, W. P. (A)
Velasco, J. W. (M)
Vette, W. J. (M)
Viles, F. L. (M)
Vinnell, L. F. (M)
Voell, R. F. (M)
Volbera, H. W. (M)
Waddell, B. L. (M)
Wade, E. (SM)
Wade, O. (M)
Walker, W. B. (M)
Ward, D. M. (M)
Warzecha, T. D. (M)
Wasserman, P. D. (A)
Watkins, V. D. (M)
Watson, L. E. (A)
Weisbrod, S. (M)
Wells, A. T. (A)
Wells, R. J. (M)
Werner, H. C. (SM)
Werner, R. V. (SM)
Wert, R. M. (M)
Westerfield, E. C. (M)
Westfall, W. D. (M)
Wetherill, C. A. (SM)
Wiodahl, E. E. (M)
Wilhelm, C. G. (M)
Wilkins, R. G. (A)
Willard, F. H., III (M)
Williamson, G. H. S. (A)
Willinoham, J. D. (A)
Wilson, D. (SM)
Wilson, R. E. (M)
Wilson, W. D. (M)
Winans, G. L. (M)
Wirth, H. J. (M)
Witzel, A. B. (M)
Wolfe, G. W. (A)
Wolff, H. G. (M)
Woodfill, W. H. (M)
Woodlwiss, D. E. (A)
Worden, H. W. (M)
Yaoer, E. K. (M)
Yearlev, L. E. (M)
Young, T. P. (M)
Younoberg, B. E. (M)
Zable, W. J. (M)
Zimmerman, J. K. (M)

San Dimas (LA-OB-7)
Montcalm, M. T. (A)

San Fernando (LA-SF-7)
Axel, S. J. (M)
Bailey, C. C. (M)
Bauer, J. A. (M)
Beolev, W. W. (M)
Berglund, A. O. (M)
Bucher, F. X. (SM)
Cicchetti, J. B. (SM)
Clinger, E. C. (A)
De Nicolai, M. B. (M)
Denise, W. J. (M)
Diem, C. W. (M)
Duel, D. M. (M)
Esmond, J. V. (A)
Ellis, J. W. (M)
Fairbanks, G. G. (M)
Friedman, J. A. (A)
Graber, R. E. (SM)
Hoskins, W. L. (A)
Larson, C. C. (SM)
Laub, R. E. (SM)
Looee, D. B. (M)
Marchese, T. J. (SM)
Martin, R. W. (M)
McCormick, W. G. (M)
McLaughlin, F. G. (A)
Moore, J. G. (M)
Moriartv, J. J. (M)
Peterson, R. L. (M)
Riser, C. R. (M)
Rosenberg, R. E. (A)
Rouser, W. A. (A)
Schlenker, J. H. (A)
Seoal, C. M. (A)
Sohlaren, C. E. (M)
Stankovich, D. (A)
Starr, I. M. (M)
Toomin, H. (M)
Vincent, R. C. (M)
Walters, L. G. (M)
Warne, V. J. (VA)
White, G. S. (M)
White, R. H. (M)

San Francisco (SF-7)
Alcorn, R. C. (A)
Anmuth, M. (M)
Baldwin, E. B. (M)
Baldwin, R. S. (M)
Berthold, W. L. (M)
Blodoet, R. (SM)
Bolitier, J. (A)
Brinton, R. L. (SM)
Brown, R. L. (A)
Buntenbach, R. W. (M)
Cahn, B. L. (M)
Cambell, A. F. (A)
Cazanilan, R. S. (M)
Cheu, E. D. (SM)
Conrov, C. L. (A)
Cooke, J. G. (M)
Cowdrey, H. R. (A)
Danielson, E. G. (VA)
Davv, L. H. (M)
Dent, W. U. (M)
Dessent, J. E. (A)
Dona, A. S. (M)
Dunlao, H. B. (M)
Durakov, J. S. (A)
Duste, G. H. (M)
Dutoff, D. A. (M)
Eachus, W. J. (M)
Edens, R. L. (M)
Edison, E. (SM)
Egan, W. F. (M)
Emerv, R. M. (A)
Fong, W. L. (A)
Fong, W. W. (M)
Forrest, W. S. (A)
Fort, L. R (M)
Fowler, E. B., Jr. (M)
Frear, R. B. (A)
Freiermuth, V. J. (M)
Froman, J. (SM)
Gallo, F. J. (M)
Gee, H. W. (A)
Given, I. (M)
Gregorian, R. P. (M)
Gunn, L. W. (M)
Hallbeck, R. F. (M)
Hallnan, A. H (SM)
Hammett, R. L. (M)
Harrington, R. R. (A)
Haskell, H. B. (M)
Haus, R. (A)
Held, H. E. (VA)
Hoag, E. D. (M)
Holloway, J. (SM)
Holmes, D. K. (A)
Howe, G. A. (A)
Howland, R. S. (M)
Jensen, T. A. (M)
Jobson, C. B. (A)
John, E. J. (A)
Kafaflan, J. (M)
Kalb, H. N. (M)
Kaufman, A. W. (M)
Kellev, T. B. (M)
Kerbs, G. (M)
Knutsen, H. L., Jr. (M)
Koch, J. F. A. (M)
Kochenderfer, W. E., Jr. (M)
Koloboff, G. J. (M)
Kramer, J. F. (VA)
Kuhn, H. G. (SM)
Landells, J. H. (A)
Lee, D. Y. (M)
Lee, F. (A)
Lee, F. B. (M)
Lee, J. A. (A)
Lee, R. W. (A)
Lee, W. (A)
Leono, L. L. F. (A)
Lewis, E. L. (A)
Link, B. G. (M)
Little, W. A. (A)
Low, S. (A)
Luther, G. M. (A)
Mackav, R. S. (SM)
Maddison, F. E. (M)
Malinovsky, V. V. (M)
Marshall, E. G. (M)
Marshall, E. L. (M)
Martin, C. E. (M)
Massoolla, F. P. (A)
McBride, W. J., Jr. (SM)
McKav, H. B. (M)
Mendoza, A. A. (M)
Mever, J. H. (SM)
Miller, C. W. (M)
Morrison, A. C. (M)
Most, N. (M)
Mvers, J. S (A)
Nelson, L. O. (M)
Newell, R. R. (A)
Noble, M. I., Jr. (M)
Nvbero, R. A. (A)
Oden, D. E. (M)
Ollnoer, A. M., Jr. (A)
O'Nell, J. A. (M)
O'Rourke, J. B. (M)
Pacher, F. A. (A)
Pallas, C. M. (A)
Panaoes, T. S. (M)
Paull, J. O. (A)
Pinkney, J. L. (A)
Plummer, R. T. (M)
Potasz, P. J. (A)
Price, W. J. (A)
Purvis, R. O. (A)
Ralls, J. W. (M)
Raudco, R. (M)
Rea, P. G. (M)
Roberts, L. L. (M)
Rutkin, B. B. (M)
Scheetz, R. E. (A)
Schwarzschild, B. (A)
Scrievers, B. J. (A)
Sharman, H. M. (M)
Simoson, R. O. (M)
Solomon, S. S. (A)
Speer, J. G. (SM)
Spillane, L. W. (A)
Staoranc, A. (M)
Steele, R. E. (M)
Stortz, R. A. (A)
Stroganoff, R. P. (M)
Tanaka, G. J. (A)
Tau, J. C. (A)
Test, A. J. (M)
Tourville, G. A. (M)
Tzvtovitch, M. A. (A)
Unsworth, R. G. (M)
Utter, D. H. (M)
Velzades, N. (M)
Voronoff, G. N. (M)
Ward, S. A. (M)
Whitehead, E. A. (M)
Wholev, C. W. (A)
Williams, N. H. (SM)
Williams, P. A. (VA)
Wolcik, B. M. (M)
Wollenbera, H. A. (M)
Wono, D. S. (A)
Wono, E. (A)
Wono, H. F. (A)
Wono, P. (A)
Wono, W-K. C. (M)
Woo, F. (M)
Wood, G. V. (M)
Woodruff, R. L. (M)
Woolverton, R. B. (F)
Yamamoto, N. (M)
Yee, A. W. (A)
Yee, P. (M)
Zipf, A. R. (A)

San Gabriel (LA-P-7)
Agadoni, C. A. (M)
Burtner, R. K. (A)
Crosby, J. C. (M)
Dysinoer, C. W. (A)
Fitzwater, W. Jr. (M)
Franklin, P. G. (M)
Holmes, R. B. (M)
Karsten, J. A. (M)
Kizer, D. E. (M)
Le Gette, M. A. (A)
Leonett, D. A. (M)
Mason, J. L. (A)
Merryman, W. R. (M)
Ross, I. (M)
Seeley, E. M. (A)
Street, N. C. (M)
Weaver, C. E. (SM)
Wells, J. L. (M)
York, E., Jr. (M)

San Jose (SF-7)
Ackerman, F. G. (M)
Allgaier, J. R. (A)
Anderson, D. L. (M)
Anderson, R. A. (M)
Aoolemuist, J. E. (M)
Astrahan, M. M. (SM)
Athens, A. S. (M)
Atkinson, J. H. (M)
Austad, H. (M)
Bailey, S. H. (A)
Bain, R. A. (A)
Barlow, B. R. (M)
Bartling, M. H. (A)
Bass, J. E. (M)
Battles, C. R. (M)
Batv, D. L. (M)
Beck, J. W. (M)
Beers, W. D. (A)
Bell, R. L. (M)
Benedict, L. P. (M)
Bennett, B. J. (SM)
Benoit, R. E. (A)
Benz, W. G. (M)
Bixby, L. H., Jr. (M)
Boenniohausen, R. A. (M)
Bramlev, N. V. (SM)
Bridges, D. B. J. (M)
Brown, C. J. (M)
Brown, R. W. (M)
Brown, R. G. (M)
Brunetti, C. (F)
Bueno, I. (M)
Cain, D. C. (M)
Cantoni, C. W. (M)
Carson, V. S. (F)
Carter, D. (M)
Cesar, L. G. (M)
Chandler, R. T (M)
Chaney, M. E. (M)
Chase, A. B. (M)
Christensen, W. H. (M)
Christooherson, W. A. (M)
Clauer, C. K. (M)
Clousb, R. W. (M)
Conrod, C. D. (M)
Couden, D. V. (SM)
Crenshaw, H. L. (M)
Cresoo, J. M. (A)
Croad, J. G. (M)
Cummins, E. L. (A)
Daly, J. J. (M)
Daniels, J. W. (A)
Danielson, D. W. (M)
Davenoort, K. R. (M)
Di Napoli, G. W. (A)
Dodd, P. D. (M)
Dodsworth, W. F. (M)
Dowling, R. H. (M)
Downham, H. A. (M)
Duba, L. (A)
Dudley, C. P., Jr. (A)
Dve, W. G. (M)
Eooers, R. E. (M)
Eldridge, A. J. (M)
Eliezer, D. E. (A)
Enowicht, H. (SM)
Erdman, J. P. (M)
Faulkner, H. E. (M)
Fernandez, J. P. (M)
Fine, W. P. (A)
Fletcher, B. J. (M)
Flynn, F. J. (SM)
Fowler, W. J. (M)
Franks, R. E. (M)
Freiberg, L. (A)
Fuoua, R. R. (M)
Gan, M. (A)
Geddes, D. A. (M)
Gee, L. S. (A)
Genoert, D. V. (SM)
Glever, J. H. (M)
Grano, N. J. (M)
Grav, K. B. (A)
Grav, R. D. (SM)
Hagoolan, J. J. (M)
Harries, G. V. (M)
Hasen, J. E. (M)
Hefte, C. B. (A)
Helt, I. M. (M)
Heller, R. M. (M)
Hill, L. W. (M)
Hoaoland, A. S. (SM)
Hoolo, J. L. (M)
Hooner, E. (M)
Housman, B. (M)
Howard, A. B. (A)
Hurlbut, G. N. (M)
Idehara, R. K. (M)
Ihlv, F. J. (M)
Isaak, M. E. (M)
Jacobs, I. M. (M)
Jakubowski, M. C. (M)
Jennings, J. E. (SM)
Jesse, E. (M)
Johnson, D. R. (M)
Johnson, W. G. (M)
Johnson, W. J., Jr. (A)
Jones, D. F. (A)
Kiely, D. J., Jr. (M)
Kirkland, J. A. (M)
Klein, E. A. (A)
Larson, R. C., Jr. (M)
Larson, R. D. (M)
Lazzarini, R. F. (M)
Lloomenides, P. A. (M)
Loeber, N. C. (M)
Machol, G. K. (M)
Manchester, O. F. (M)
Markev, H. G. (A)
Martin, V. G. (SM)
Martini, R. F. (A)
Massey, H. N. (A)
McCulloush, J. S. (SM)
McQueenev, K. A. (M)
Mendez, I. O. (M)
Mever, C. C. (M)
Miller, H. P. III (M)
Miller, J. C. (A)
Moe, C. R. (SM)
Molzahn, V. L. (M)
Monaeon, R. W. (M)
Moore, J. D. (A)
Morrill, R. A. (M)
Mundrick, E. L. (M)
Nelson, K. L. (M)
Niedrauer, J. J. (M)
Norby, M. E. (M)
Nve, R. L., Jr. (M)
O'Brien, G. A. (M)
O'Keefe, E. W. (A)
Olson, R. F. (M)
Palm, R. A. (M)
Paulson, J. N. (A)
Perkins, C. R. (M)
Pfaff, R. J. (M)
Phillos, D. W. (M)
Phillios, W. J. (M)
Potter, R. W. (A)
Prather, R. E. (M)
Publicover, J. V., (A)
Quement, F. J. (VA)
Rambo, W. R. (F)
Reinhardt, P. M. (M)
Reiser, R. R. (M)
Reynolds, W., Jr. (M)
Riendel, J. (M)
Riley, R. T. (M)
Rinsler, L. (M)
Rioolinger, T. L. (M)
Roberts, T. E., Jr. (SM)
Robinson, J. D. (M)
Robinson, W. H. (M)
Rodda, E. N. (M)
Romans, W. E. (A)
Ross, H. C. (SM)
Rothe, W. E., Jr. (M)
Roux, W. L. (M)
Sanawa, S. S. (M)
St. Clair, H. K. (M)
Samario, E. J. (M)
Savlor, R. A. (A)
Schlaefer, C. E. (A)
Shaolro, M. A. (M)
Shioemoto, F. H. (M)
Shillinburo, T. D. (A)
Sleoel, F. G. (M)
Sierra, H. M. (M)
Slooach, R. W. (M)
Smith, P. F. (M)
Sordal, C. D. (M)
Soades, J. F. (M)
Soecht, D. F. (M)
Steadino, T. W., Jr. (M)
Stevens, L. D., Jr. (SM)
Steward, L. B., Jr. (M)
Stillman, E. H. (M)
Stock, J. A. (M)
Strinoall, W. S. (A)
Sutton, J. G., Jr. (M)
Sutton, J. S. (M)
Takata, M. M. (A)
Toschi, E. A. (M)
Townsend, C. K. (A)
Tralle, G. E. (M)
Treseder, R. C. (M)
Turner, E. L. (M)
Ulfusa, R. L. (M)
Van Hook, R. G. (M)
Viallet, J. L., Jr. (M)
Voge, F. (A)
Walker, J. H. (SM)
Warshaw, H. D. (M)
Watson, K. J. (M)
Weoer, R. E. (M)
Wenoert, R. A. (M)
Widener, M. W. (M)
Willard, D. D. (SM)
Williams, B. W. (M)
Wilshinsky, I. (M)
Wilson, R. E. (M)
Winchell, J. A. (M)
Wise, C. D. (M)
Wise, G. C. (A)

Wood, F. B. (M)
Worster, J. R. (M)

San Leandro (SF-EB-7)
Albrecht, J. F. (A)
Andersen, R. L. (M)
Borrelli, R. N. (M)
Haubrock, F. W. (M)
Herendeen, C. E. (M)
Holloman, C. J. (M)
Jones, F. W. (M)
Kritzer, E. A. (A)
Sanders, J. G. (A)
Silverman, B. P. (M)
Snyder, C. K. (M)
Still, J. G. (A)

San Lorenzo (SF-EB-7)
Donahue, W. J. (A)
Jacobs, H. L. (A)
Murray, J. L. (A)

San Luis Obisoo (LA-SB-7)
Brown, C. F. (M)
Cloonan, C. B. (M)
Fisher, C. E. (A)
Hendriks, H. J. (SM)
Herald, C. A. (M)
Jones, G. D. (A)
Landyshev, A. (SM)
Nelson, P. H. (SM)
Radius, C. (SM)
Roberts, M. E. (A)
Smothers, W. C. (A)
Wills, J. R. (M)
Wolf, H. K. (SM)
Zimmerman, H. S. (M)

San Marino (LA-P-7)
Baumgartner, W. S. (SM)
Beswick, W. A. (A)
Bucknell, W. H. (VA)
Gauldin, C. B. (M)
Irwin, E. M. (M)
Metzger, H. W. (M)
Moore, R. L. (A)
Pfeiffer, P. W. (M)
Pfeiffer, W. F. (A)
Sanders, L., Jr. (M)
Sievers, E. S. (M)
Spaulding, C. P. (SM)
Stewart, J. L. (SM)
Stimson, J. D. (M)
Thatcher, J. W. (SM)
Wright, W. V., Jr. (M)

Santa Maria (LA-SB-7)
Elam, O. R., Jr. (M)
Greene, A. A. (A)
Hill, A. J. (M)
Holbrook, J. G. (M)
Hughes, C. J. (M)
Kring, J. D., Jr. (M)
Lane, L. M. (M)
Maurer, R. S. (M)
Mrazek, D. A. (A)
Patterson, A. F. (M)
Paulos, P. J. (M)
Pefferle, D. L. (M)
Pierson, J. L. (A)
Seymour, E. E. (M)
Teeter, W. L. (SM)
Thomson, L. G. (M)
Wallace, P. R. (M)
Zerfas, G. J. (A)

San Martin (SF-7)
Sylvain, E. F. (M)

San Mateo (SF-7)
Andrews, W. F. (M)
Armstrong, P. S. (A)
Bartholomew, H. C. (M)
Batten, H. W. (M)
Bauer, F. (M)
Bennett, K. (M)
Bennett, W. S. (SM)
Chow, B. (M)
Condie, M. A. (SM)
Coyne, K. M. (A)
De Lorimier, J. B. (M)
Downie, W. A. (M)
Ballonardo, C. M. (M)
Fieldine, B. L. (M)
Flanley, W. F. (SM)
Flord, W. S., Jr. (A)
Fulli, W. M. (M)
Havlock, F. B. (M)
Heller, R. E. (SM)
Hong, K. G. (M)
Jones, H. R. (A)
Kimbell, G. D. (A)
Kreutzer, M. L. (M)
Leonhardt, M. W. (M)
Line, G. D. (M)
Lorino, C. M., Jr. (M)
Lott, T. M. (M)
Mackenzie, R. G. (SM)
Maninger, R. C. (M)
Martinez, H. M. (A)
Miller, C. L. (A)
Miller, C. M. (M)
Newman, H. F. (M)
Newman, R. J. (A)
Ooden, J. E. (M)
Orsak, L. E. (M)
Oshima, K. (M)
Peck, C. D. (SM)
Robinson, W. H. (M)
Ruh, R. L. (M)
Saver, W. H., Jr. (SM)
Shaw, L. W. (A)
Simmons, G. J. (M)
Soderstrum, J. C. (SM)
Snoddy, R. E. (M)
Sutherland, R. I. (M)
Taylor, E. D. (M)
Taylor, R. A. (M)
Wilber, L. E. (A)
Williams, J. A., Jr. (M)
Woodward, D. E. (M)
Zweifel, F. A. (M)

San Pablo (SF-EB-7)
McDaniel, R. F. (A)

San Pedro (LA-7)
Albro, P. W. (M)
Baines, E. L. (M)
Barina, E. J. (M)
Breeskin, S. D. (M)
Brodek, W. J. (M)
Clyne, W. E. (SM)
Conant, J. L., Jr. (M)
Conn, R. B. (M)
Deaver, J. M. (A)
Dye, R. R. (M)
Gibson, S. J. (M)
Goforth, J. L. (M)
Gustin, J. T. (A)
Hamren, S. D. (A)
Hawley, G. K. (M)
Heaverlo, H. D. (A)
Hettich, J. J. (M)
Holland, R. J. (A)
Howard, C. T. (A)
Jiu, R. (M)
Kelly, R. D. (M)
Kercher, R. B. (M)
Klein, E. F. (M)
Llewellyn, J. R. (SM)
Llllibridge, E. H. (A)
Lowe, R. R. (SM)
Martin, E. D., Jr. (M)
McCord, H. L. (A)
McCready, K. F. (M)
McWilliams, J. D. (SM)
Moore, M. E. (M)
O'Brien, W. C. (A)
Oliver, R. B., Jr. (M)
Ransom, D. H. (M)
Reiss, R. I. (M)
Robinson, J. H., III (SM)
Robinson, N. O., Jr. (M)
Rosenberg, H. S. (A)
Schmid, L. H. (A)
Scott, E. W. (A)
Stroud, S. G. (M)
Thomas, D. W. (M)
Weisz, P. H. (M)
Wershoven, G. A. (A)
Worch, A. B. (M)
Yoder, R. F. (M)
Young, H. A. (SM)

San Rafael (SF-7)
Catania, C. J. (M)
Etten, K. W. (M)
Fitzroy, D. C. (A)
Hallick, J. A (A)
Marshall, F. M. (M)
Matthews, D. W. (A)
Miles, C. W. (M)
Paulson, G. A. (A)
Schaub, L. E. (A)
Watkinson, J. B. (M)
Wood, R. W. (A)

Santa Ana (LA-SA-7)
Akrell, C. A. S. (SM)
Anderson, S. E. (M)
Arnold, H. J. (SM)
Baranoff, A. J. (SM)
Berothold, F. M., Jr. (M)
Bixler, O. C. (SM)
Blair, D. R. (A)
Bonnev, R. B. (SM)
Brown, C. A. (SM)
Buchanan, R. A. (M)
Buck, J. H. (SM)
Buehner, M. R. (SM)
Burke, J. J. (SM)
Cacos, J. W. (M)
Cobb, H. A., Jr. (M)
Crafts, C. A. (SM)
Demoster, B. (F)
Deutsch, J. (SM)
Elliott, M. S. (A)
Fieldsted, N. B. (A)
Foutz, C. G. (A)
Fradv, W. E. (M)
Galas, T. A. (SM)
Gannones, A. V. (SM)
Gels, E. R. (SM)
Giannini, G. M. (SM)
Goodman, H. C. (M)
Gordon, J. F. (SM)
Grady, T. J. (M)
Greulich, H. J. (A)
Haack, R. W. (M)
Haglund, H. H. (A)
Herkimer, K. W. (A)
Hilliard, J. K. (F)
Hobbs, L. C. (M)
Holly, R. H. (M)
Hom, R. H. (SM)
Hughes, G. E. (M)
Hunter, R. T. (M)
Jamie, T. W. (SM)
Johnson, H. B. (A)
Koser, G. W. (M)
Lambert, L. M., Jr. (M)
Lander, R. F. (A)
Larson, H. T. (M)
Laughlin, J. G., Jr. (M)
Leverino, C. A. (VA)
MacIntyre, R. M. (A)
Mallinckrodt, A. J. (SM)
McCandless, J. B. (M)
McDonough, S. L. (M)
McGuire, T. B. (A)
Morrison, A. I. (SM)
Newman, C. (M)
Noble, J. J. (M)
Noe, L. B. (M)
Persons, L. D. (M)
Porter, W. R. (M)
Preston, L. S. (SM)
Proctor, D. R. (SM)
Prothers, L. T. (M)
Reedy, P. H. (SM)
Ross, F. L. (M)
Sander, M. H. (M)
Schumann, W. A. (M)
Scullion, G. M. (M)
Seeley, E. S. (SM)
Shannon, J. B. (M)
Shaw, L. B. (A)
Sherwin, J. S. (M)
Sisson, R. L. (M)
Skagos, E. R. (M)
Slaughter, D. W. (M)
Smith, C. C. L. (M)
Smith, R. R. (SM)
Smith, W. K. (M)
Snyder, R. L. (SM)
Strong, W. J. (M)
Suthers, B. H., Jr. (M)
Sykora, G. E. (A)
Tackett, W. F. (SM)
Timothy, K. O. (M)
Trammell, F. S., Jr. (M)
Tucker, C. T. (M)
Vogel, O. F., Jr. (SM)
Wanlass, S. D. (M)
Warhurst, J. W. (M)
Wheeler, R. W. (A)
Wood, W. S. (M)
Young, S. (M)

Santa Barbara (LA-SB-7)
Agaabetian, V. (SM)
Baltz, L. E. (SM)
Bartolini, E. (SM)
Benton, R. F. (M)
Beraman, C. W., Jr. (A)
Beveridge, H. N. (SM)
Bock, M. J. (M)
Boxer, R. (M)
Bovle, S. R. (M)
Brodv, R. H. (M)
Brown, F. W. (M)
Brun, G. E. (M)
Bun, C. R. (A)
Buttschardt, C. C., Jr. (M)
Crinoa, E. R. (M)
Cruse, P. M. (M)
Dawley, R. L. (M)
De Vore, L. T. (F)
Dickey, W. S. (SM)
Forster, M. C. (M)
Gabrielsen, H. R. (M)
Gannaway, R. (SM)
Gordon, B. E. (M)
Gullatt, S. P. (A)
Hacke, J. B., Jr. (SM)
Hannah, D. C. (A)
Hanson, O. W. (M)
Hausz, W. (F)
Haville, D. (M)
Hedges, C. P. (SM)
Hummer, R. F. (M)
Hutcheon, R. S. (SM)
Inoue, N. S. (M)
Irwin, C. P. (M)
Janeway, W. F. (M)
Kalstrom, R. D. (M)
Kinaman, G. M. (M)
Koenitzer, R. D., Jr. (M)
Kuerschner, H. A. (M)
Kvaas, T. A. (SM)
Lansing, J. C., Jr. (M)
Larson, R. W. (M)
Little, D. R. (M)
Looman, J. R. (M)
Malka, C. J. (M)
Maki, G. J. (SM)
Mark, R. A. (M)
Markin, J. (SM)
Mattiat, O. E. (SM)
McCaughna, J. R. (M)
Melnema, H. (A)
Merrill, J. R. (SM)
Monroe, P. P. (A)
Moore, J. A. (M)
Moseley, J. A. (M)
Mover, J. W. (SM)
Nash, C. C., Jr. (M)
Nistler, G. C. (M)
Olmsted, D. T. (SM)
Padgett, E. P., Jr. (M)
Panec, G. A. (SM)
Patchell, J. T. (M)
Peterson, C. E. (A)
Phillips, R. G. (M)
Plake, W. C. (M)
Podlesny, R. F. (A)
Pressley, J. H. (F)
Rauch, S. E. (SM)
Raymond, R. C. (F)
Ream, S. M. (M)
Reed, J. C. (M)
Schwartz, A. J. (M)
Scott, R. C. (SM)
Sears, J. F. (SM)
Shlers, G. (M)
Smith, H. W. (A)
Smith, R. A. (M)
Smith, W. E. (M)
Snyder, J. F. (SM)
Snyder, R. W. (M)
Solomon, P. S. (SM)
Steinhoff, E. A. (SM)
Stoll, C. N. (M)
Swift, I. H. (M)
Tanhauser, A. J. (M)
Taras, S. M. (A)
Taylor, D. H. (M)
Thompson, R. L. (A)
Thomsen, P. H. (SM)
Thomsen, R. N. (M)
Thoren, C. A. (M)
Tornheim, H. (SM)
Trammell, A. K. (M)
Urbach, K. (SM)
Villers, D. (M)
Walker, B. G. (M)
Wall, V. W. (SM)
Watkins, R. A. (SM)
Weber, H. J. (M)
Weiss, M. (M)
Wildman, A. J. (M)
Witten, A. L. (SM)
Woerner, J. J. (M)
Wolfe, G. M. (SM)
Wright, D. (M)
Zopf, D. O. (M)

Santa Clara (SF-7)
Adams, W. H. (SM)
Adelson, M. B. (M)
Alford, C. H., Jr. (M)
Altermatt, R. B. (M)
Anderson, E. P. (SM)
Bennion, J. L. (M)
Bilv, J. J. (SM)
Bird, P. F. (M)
Black, S. H. (M)
Blatt, E. L., Jr. (M)
Brown, J. S. (M)
Bryson, J. (M)
Budd, W. E. (M)
Bustamante, H. A. (M)
Butt, N. C. (M)
Cannon, R. A. (M)
Carney, D. A. (M)
Carr, J. W. (M)
Chenoweth, A. G. (M)
Chesley, B. E. (M)
Cobb, G. L. (A)
Conner, C. C. (SM)
Convertino, R. O. (M)
Dalley, D. G. (M)
Dill, G. D. (M)
Dill, J. J. (M)
Dutton, I. L. (M)
Ellis, W. (M)
Estrada, M. S. (A)
Fillebrown, S. M. (M)
Fitzpatrick, J. P. (SM)
Fleming, H. B. (M)
Forster, R. L. (M)
Gaubatz, D. C. (M)
Geloes, K. S. (SM)
Gluck, J. E. (M)
Griese, R. H. (A)
Gutelle, E. E. (A)
Haddad, J. D. (M)
Hall, T. F (M)
Hall, T. W. (A)
Heim, J. L. (M)
Henry, R. A. (M)
Hillesland, C. B. (M)
Ingwerson, D. R. (M)
Jackson, C. F. (M)
Johnson, R. W. (M)
Johnston, M. H. (A)
Katzman, H. (M)
Kaufmann, J. (M)
Killion, D. G. (M)
Kroener, D. F. (M)
Kuhlman, F. M. (M)
Kikoshima, R. T. (A)
La Gasse, S. G. (SM)
Lally, J. P. (M)
Lambertv, B. J. (M)
Lewis, F. V. (M)
Linn, F. S., Jr. (M)
Littler, D. (M)
Lynch, W. L. (M)
Lyon, D. B. (M)
Lyon, D. J. (M)
Manarlan, J. D. (M)
Matsumoto, L. Y. (M)
McClary, D. A. (M)
McCune, E. W. (M)
McPhail, J. H. (A)
McRae, R. C. (M)
Meader, R. O. (M)
Miller, S. K. (A)
Moraan, L. C. (M)
Neorete, M. R. (M)
Ne Smith, W. W. (M)
Newman, H. L. (SM)
Palmer, W. F. (M)
Pea, R. O. (A)
Pershina, P. D. (M)
Peterson, K. F. (A)
Pickert, C. E (M)
Poulsen, J. E. (A)
Roots, W. K. (SM)
Rudolf, S. (M)
Schulz, D. F. (M)
Scism, W. A. (SM)
Seoulveda, R. E. (M)
Shew, L. F. (M)
Soesock, G. J. (M)
Sturdevant, J. T. (M)
Sullivan, J. M., Jr. (M)
Sundbera, V. C. (M)
Swayze, D. W. (M)
Tenney, H. D. (M)
Thornburg, R. O. (M)
Todd, L. L. (A)
Trumoler, J. H. (M)
Van Ess, J. C. (M)
Wasielewski, S., Jr. (M)
Weiner, A. (M)
Welch, J. R. (SM)
Whitmore, G. L. (A)
Whitten, G. A. (SM)
Wright, B. (SM)
Yagi, H. S. (A)

Santa Cruz (SF-7)
Gerhart, R. E. (M)
Hubbard, A. L. (SM)
Jackson, C. L. (A)
Janitschke, E. O. (VA)
Mattson, D. F. (SM)
Wilson, D. R. (M)

Santa Fe Springs (LA-7)
Kerlan, R. D. (A)
Tossoon, A. E. (M)
Wood, G. D. (M)

Santa Monica (LA-7)
Alexander, B. H. (SM)
Alexander, M. A. (M)
Anderson, T. G. (M)
Andreasson, R. I. (M)
Avers, J. L. (M)
Banhael, E. W. (A)
Banhan, J. (M)
Batten, H. B. (SM)
Becker, L. E. (M)
Beintema, C. D. (M)
Bekev, I. (M)
Bell, A. E. (M)
Birminoham, D. J. (M)
Blodoett, W. G. (M)
Blount, W. A. (M)
Blue, R. M. (M)
Blumenthal, I. S. (M)
Boucher, R. J. (M)
Breneman, H. M. (M)
Brennan, L. E. (M)
Brewster, R. A. (M)
Broadwell, W. B. (M)
Brubaker, J. W. (M)
Butt, C. (M)
Callan, R. W. (SM)
Carne, J. B. (SM)
Carneale, G. A. (M)
Carver, F. R. (SM)
Chamoness, N. A. (SM)
Childs, R. D., III (M)
Clark, J. W. (SM)
Combs, W. E. (M)
Conklin, J. L. (M)
Cooke, C. W., Jr. (SM)
Crain, C. M. (F)
Cribb, W. W., Jr. (M)
Daoult, J. L. (M)
Davie, M. C. (SM)
De Lucia, V. E. (SM)
Demarest, J. W. (M)
Denton, R. F., Jr. (M)
Difford, L. A. (A)
D'Nellv, G. O. (SM)
Durieux, C. W. (A)
Endler, H. M. (M)
Enolish, D. L. (A)
Everest, F. A. (SM)
Filman, N. J. (SM)
Ford, G. M. (M)
Fox, A. J. (M)
Francis, G. A. L. (A)
Gauronskas, P. P. (M)
Georoe, V. L. (M)
Georoes, L. (A)
Goodvkoontz, J. R. (SM)
Gumbart, H. E. (M)
Guver, E. (M)
Hadlock, C. K. (SM)
Haladel, M. A (M)
Harbaugh, A. W. (M)
Heinrich, F. (M)
Herr, D. L. (SM)
Hilliard, J. T. (M)
Hobbs, G. H. (M)
Horl, K. (M)
Jamieson, H. W. (SM)
Judge, F. W. (M)
Karalukas, J. (A)
Kidd, A. T. (M)
Kiner, L. F. (A)
Kraeoelien, H. Y. (M)
Krantz, C. H. (M)
Lakatos, E. (SM)
Lalande, B. H., Jr. (A)
Lanomuir, D. B. (SM)
Lauham, O. J. (M)
Lavery, W. J., Jr. (M)
Lear, W. P. (SM)
Lewis, R. A., Jr. (M)
Lindholm, C. R. (M)
Linsulti, A. A. (A)
Lioos, E. A. (M)
Lukenbill, R. S. (M)
Lustaarten, M. N. (SM)
Lvons, L. H. (M)
Mackav, C. R. (SM)
Malone, E. P. (M)
Manser, D. E., Jr. (M)
Marsh, A. H. (M)

McLaughlin, W. J. (M)
Melara, J. D. (M)
Miller, E. M. (A)
Miller, M. L. (A)
Million, J. W., Jr. (SM)
Minert, H. D, (M)
Moltov, H. R. (M)
Moody, R. D. (M)
Morries, B. E. (M)
Neideffer, C. R. (A)
Nolde, G. V. (SM)
Nutten, D. C. (M)
Oda, D. J. (SM)
Orlando, N. M. (M)
Pacini, E. J. (M)
Parkin, T. R. (A)
Parkinson, C. B., Jr. (SM)
Pendleton, W. H. (A)
Plew, H. E., Jr. (M)
Push, R. A. (M)
Quandt, R. L. (M)
Randall, L. B. (A)
Reese, R. F. (SM)
Rehler, K. M. (M)
Reloer, S. H. (SM)
Renaud, H. G. (A)
Robertson, V. H. (M)
Rolt, G. H., Jr. (A)
Ronev, R. K. (M)
Rosen, H. A. (M)
Rosenbaum, J. L. (A)
Rosenbero, A. L., Jr. (SM)
Rosenbera, M. (M)
Rubin, E. R. (M)
Salzer, J.M. (SM)
Sanford, R. C. (SM),
Schindler, M. (M)
Schneidewind, N. F. (M)
Schull, G. R. (M)
Scultto, T. J. (M)
Smith, L. C. (A)
Snow, W. B. (SM)
Sohler, J. F. (M)
Sollev, J. C. (M)
Soltwedel, E. B. (SM)
Stahl, R. (A)
Stark, H. P. (A)
Stewart, W. F. (SM)
Stineman, V. E. (M)
Sweetino, P. (M)
Tatum, F. A. (A)
Thomas, D. H. (M)
Tor, W. G. (M)
Trov, P. (M)
Valette, H. C. (M)
Van Dvke, W. D. (SM)
Vickerv, B. L. (M)
Vuilleumier, R. F. (M)
Waostrom, R. G. (M)
Ware, W. H. (SM)
Weber, R. I. (VA)
Wehner, R. S. (M)
Wennerstrom, D. O. (M)
Wheeler, D. D. (M)
Whitaker, J. N. (SM)
Wileman, R. A. (M)
Wilson, D. W. (M)
Woods, H. D. (M)
Woods, R. L. (A)
Yoshida, M. (M)
Zweizig, J. R. (M)

Santa Paula (LA-B-7)
Sharn, J. M. (M)
Wasmansdorff, C. (SM)
Wymore, R. H. (M)

Santa Rosa (SF-7)
Merrill, G. E. (M)
Parker, J. F. (A)
Tavernia, G. B. (A)

Santa Ynez (L-SB-7)
Shannon, W. W. (M)

Santee (SD-7)
Freedman, S. (SM)
Smith, W. R. (A)

San Ysidro (SD-7)
Zint, K. E. (SM)

Saratoga (SF-7)
Ackerlind, E. (SM)
Aubry, J. D. (A)
Belleville, L. M. (SM)
Black, R. J., Sr. (M)
Bowen, D. A. (M)
Bover, B. E. (SM)
Brolly, A. H. (SM)
Chromy, B. J. (VA)
Dawson, E. C. (M)
Dinaooli, F. C. (M)
Frizzell, C. E. (SM)
Hammack, C. M. (SM)
Hart, L. (M)
Hartke, D. E. (M)
Heninoer, G. O. (M)
Hermstad, J. A. (M)
Hexem, J. (M)
Hodoe, M. H., Jr. (M)
Horvath, A. (SM)
Imboden, G. J. (A)
Jones, R. E. (M)
Law, L. R. (A)
Marandino, N. J. (M)
McEuen, A. H. (SM)
Melae, C. M. (M)
Mever, W. E. (M)
Meats, R. R. (SM)
Muntz, W. E. (SM)
Nettesheim, H. P. (SM)
Nylander, R. F. (A)
Palmer, W. G. (M)
Pease, M. C., III (SM)
Rancil, R. J. (M)
Rolph, D. B. (M)
Seader, L. D. (M)
Smith, P. G. (SM)
Stone, A. H. (A)
Teel, L. D. (M)
Tyminski, W. V. (M)

Sausalito (SF-7)
Dixon, F. C. (A)

Seal Beach (LA-SA-7)
Cosgrave, S. J. (M)

Sepulveda (LA-SF-7)
Ahmann, J. J. (M)
Anderson, J. G. (A)
Baker, C. R. (SM)
Bass, L. F. (M)
Bock, E. L. (SM)
Borofka, R. P. (M)
Bryant, J. E. (M)
Buckley, J. W. (A)
Carpenter, S. L. (M)
Casarow, L., Jr. (M)
Clarke, D. R. (M)
Conant, J. A. (M)
Corey, E. J. (A)
Davis, M. E. (M)
Decuir, L. E. (M)
Dored, W. (A)
Erhardt, K. D. (M)
Gardner, J. M. (SM)
Heidbrink, M. E. (M)
Holly, R. (M)
Hughes, E. L. (M)
Ingebretsen, E. E. (SM)
Larrimer, J. K. (A)
Lesch, S. (M)
Lords, F. V. (A)
Menasco, L. C. (A)
Miller, D. E. (SM)
Montilo, R. E., Jr. (M)
Nesbit, E. E. (SM)
Norby, H. A. (SM)
Palmquist, M. L., Jr. (M)
Patin, O. E. (SM)
Peterson, R. W. (M)
Reaver, R. R. (M)
Richards, C. B. (M)
Rioa, G. L. (SM)
Ritter, B. S. (SM)
Speen, G. B. (SM)
Straube, G. F. (M)
Swales, S. (M)
Wylie, L. (A)

Sherman Oaks (LA-SF-7)
Abbott, J. R. (M)
Allen, F. C. (M)
Beekman, R. E. (SM)
Bloombero, R. A. (M)
Blumbero, N. (M)
Bockwoldt, W. H. (M)
Butts, L. E. (M)
Caldwell, W. D. (M)
Carrobell, E. J. (A)
Carfagno, S. J. (M)
Chalt, H. N. (A)
Childs, H. A. (SM)
Dean, J. P. (M)
Derderian, N. (A)
Deutsch, R. (SM)
Dickinson, H. B. (A)
Duda, R. O. (M)
Emerling, R. A. (M)
Epstein, S. (A)
Ferrel, D. W. (M)
Foote, S. H. (M)
Froehlio, G. M. (M)
Garafalo, J. J. (M)
Gaul, T. W. (M)
Glasspool, W. T. G. (M)
Goodrich, P. E. (M)
Grossfield, S. (SM)
Herlinger, L. F. (A)
Hoover, B. E. (M)
Johnson, H. (M)
Jones, B. J. (A)
Krinsky, S. S. (A)
Lamm, R. A. (SM)
Lebell, D. (M)
Lees, A. B. (M)
Leon, H. I. (SM)
Maroerum, D. L. (SM)
Markin, N. (M)
Neuman, G. O. (A)
Puosley, D. W. (F)
Rolnik, J. A. (M)
Ross, M. N. (M)
Russell, D. C. (M)
Rutland, D. F. (A)
Ryoinski, C. A., Jr. (M)
Scanlan, J. A. (SM)
Sheldon, P. H. (M)
Silberberg, R. W. (M)
Spranger, P. B. (A)
Sorono, D. C. (M)
Suffield, F. G. (SM)
Thier, P. (M)
Troolia, J. F. (M)
Wahlstrom, J. W. (M)
Waller, R. W. (M)
Wanselow, R. D. (M)
Webb, P. S. (M)
Wiltsey, G. C. (M)
Zuehlke, E. R. (M)

Sierra Madre (LA-P-7)
Burke, H. E., Jr. (SM)
Carpenter, F. C., Jr. (M)
Da Silva, E. G. (M)
Kelley, J. R. (A)
Phillips, E. V. (M)
Posthill, B. N. (A)
Rosenblum, P. (M)
Sham, R. S. (A)
Sleemeth, A. J. (SM)
Stefansson, R. (M)
Tahl, J. E. (A)
Wheelon, W. E. (A)
Zeuschner, R. F. (SM)

Solana Beach (SD-7)
Blum, M. (M)
Cannon, J. W. (A)
Gibb, R. F. (M)
Held, P. R. (M)
Mellwraith, C. G. (A)

Solvang (LA-SB-7)
Essen, O. E. (M)
Pischel, E. F. (SM)

Sonoma (SF-7)
Hurley, R. B. (SM)
Sievert, G. F. (M)

Soquel (SF-7)
Wheeler, D. E. (SM)

South Gate (LA-7)
Dickinson, H. (A)
Fullmoto, M. (A)
Gaal, I. G. (M)
Gilliam, C. E. (A)
Maurer, R. A. (M)
Rogers, J. M. (A)
Rosland, T. A., Jr. (M)
Solie, A. J. (A)
Wilaus, D. S. (M)
Yoshioka, G. (A)

South San Francisco (SF-7)
Bowie, R. L. (A)
Elkins, C. E. (M)
Garzoli, F. F. (M)
Jenkins, C. D., Jr. (M)
Johnston, J. G. (A)
Karo, P. W. (M)
Rumble, G. F. (A)
Tribo, A. L. (M)
Tudor, H. (M)

South San Gabriel (LA-P-7)
Fairbanks, A. F. (M)
Painchaud, P. A. (M)

South Palo Alto (SF-PA-7)
Huynen, J. R. (M)

South Pasadena (LA-P-7)
Bartel, W. B. (A)
Blasler, H. E. (VA)
Card, J. B. (M)
Downs, G. W., Jr. (SM)
Epstein, R. A. (M)
Farzan, J. (M)
Freel, C. L. (A)
Holmes, W. T. (M)
Holt, T. C. (A)
Horiuchi, H. H. (M)
Houdyshell, H. H. (M)
Keller, R. G. (M)
Kuck, R. G. (SM)
Mack, D. R. (M)
Olsen, H. G. (M)
Sell, D. D. (M)
Shapiro, H. (M)
Tracy, T. (M)
Trzyna, T. S. (A)

Spring Valley (SD-7)
Blalock, J. N. (A)
Brunswick, H. D. (A)
Smith, H. C. (M)

Stanford (SF-7)
Avers, W. R. (M)
Bahrs, G. S. (M)
Barnett, E. F. (A)
Bevensee, R. M. (M)
Bishoo, F. W. (M)
Bolle, V. W. (M)
Bracewell, R. N. (SM)
Bryan, J. H. (M)
Buss, R. R. (SM)
Chang, W. S. C. (M)
Chodorow, M. F. (M)
Coates, D. B. (M)
Craig, R. A. (SM)
Crane, M. (M)
Crary, J. H. (M)
Davis, K. S. (M)
Drapkin, P. E. (M)
Dunn, D. A. (SM)
Dunn, V. E. (M)
Egan, R. D. (M)
Fontana, J. (M)
Franklin, G. F. (M)
Gallagher, P. B. (M)
Ginzton, E. L. (F)
Goldsmith, A. (M)
Grace, D. J. (SM)
Grigsby, J. L. (SM)
Hare, M. D. (SM)
Harper, G. E. (M)
Harris, D. P. (M)
Heffner, H. (SM)
Helliwell, R. A. (SM)
Holmes, C. H. (A)
Hsu, J. (M)
Huntley, W. H., Jr. (M)
Jasbera, J. H. (M)
Jaynes, E. T. (SM)
Keehn, D. G. (M)
Kincheloe, W. R., Jr. (SM)
King, C. S. (A)
Klotter, K. (SM)
Laoerstrom, R. P. (M)
Lebacoz, J. V. (SM)
Linden, D. A. (M)
Linvill, J. G. (M)
Ma, L. N. (M)
MacGinitie, G. (A)
Manning, L. A. (SM)
McCrate, J. G. (M)
Moll, J. L. (M)
Musser, M. H. (M)
Nelson, C. G. (M)
Nelson, D. (M)
Pantell, R. H. (A)
Petzll, J. M. (F)
Scarlett, R. M. (M)
Shaw, H. J. (M)
Shoens, C. J. (M)
Sleaman, A. E. (M)
Sonkin, S. (SM)
Steed, E. C. (M)
Sutton, G. L. (M)
Taussig, N. W. (M)
Teman, F. E. (F)
Turner, F. M. (M)
Tuttle, D. F., Jr. (SM)
Wade, G. (SM)
Waterman, A. T., Jr. (SM)
Watkins, A. (F)
Wichman, B. A. (M)
Winslow, D. K. (SM)

Stanton (LA-SA-7)
Kramer, R. J. (A)

Stockton (SAC-7)
Dausman, R. H. (M)
Echandi, J. (M)
Fegan, A. A. (M)
Greene, M. B. (A)
Lazaro, S. A. (A)
Welch, H. E. (M)

Studio City (LA-SF-7)
Allen, F. W. (M)
Berntsen, P. L. (M)
Fox, M. (M)
Hollmann, H. E. (F)
Kaeburn, L. K. (SM)
Klotz, E. S. (SM)
McGauohey, R. P. (M)
Moon, R. B. (M)
Nelson, C. S., Jr. (M)
Norwalt, R. H. (A)
Rich, K. J. (M)
Schick, H. G. (M)
Smith, W. W. (A)

Sunland (LA-SF-7)
Buland, R. N. (M)
Kaplan, M. N. (M)
Koontz, R. H. (A)
Muir, H. M. (A)
Saunders, C. F. (A)

Sunnyvale (SF-7)
Andrews, C. A., Jr. (M)
Antony, C. (M)
Armann, D. E. (M)
Arnold, J. B. (M)
Barnett, R. M. (SM)
Barr, G. L. (M)
Barrett, L. S. (M)
Bauman, R. E. (M)
Becker, H. A. (M)
Benjaminson, A. (M)
Bensen, R. F. (M)
Benson, S. (SM)
Bollard, D. I. (M)
Boucher, W. G. (A)
Bower, D. A. (A)
Boysen, J. A. (M)
Brooks, W. (A)
Brown, A. E. (M)
Brown, J. W. (A)
Bumstead, C. R. (M)
Burley, C. H. (M)
Burlingame, L. G. (SM)
Calhan, C. L. (M)
Carpe, B. (M)
Carter, P. S., Jr. (M)
Case, M. D. (M)
Chaffee, B. J. (M)
Chalmers, P. H. (M)
Choo, A. (M)
Cirimele, E. F. (M)
Clemo, C. B. (A)
Cohen, S. A. (A)
Contos, P. A. (M)
Cooper, R. D. (M)
Cornwell, R. C. (SM)
Craine, W. P. (M)
Cullen, D. E. (M)
Curtis, T. J. (M)
Davies, R. W. (M)
Daw, E. H. (A)
De Lorenzo, R. J. (M)
Delo, R. H. (M)
Demoster, R. J. (M)
De Vault, R. L. (M)
Dickerson, L. W. (A)
Di Giuseppe, A. (M)
Dorset, D. E. (A)
Downey, J. P. (M)
Earl, H. O. (M)
Eckert, H. R. (M)
Endsley, J. P. (A)
Enslow, G. M. (M)
Erickson, G. G. (M)
Ericson, E. E. (M)
Ferrin, K. S. (M)
Fields, R. L. (M)
Finney, D. J. (SM)
Fishman, M. (M)
Flora, J. (A)
Flowers, W. P. (M)
Foxard, D. C. (M)
Fox, J. W. (M)
Freshour, S. G. (M)
Fritchie, F. P. (M)
Frosolone, A. (M)
Gabrielson, H. C. (M)
Gallichotte, J. H. (M)
Garcia, G. F. (M)
Giddis, A. R. (A)
Gillard, C. W. (M)
Graham, B. (SM)
Grushkin, M. (M)
Haag, M. W. (M)
Hammond, E. B., Jr. (SM)
Hammond, G. P., Jr. (M)
Hankel, E. M. (M)
Hansen, H. W., Jr. (M)
Harper, J. W. (M)
Harrison, B. H. (M)
Hasert, C. (M)
Hassell, D. M. (M)
Hedbera, H. E. (M)
Hermilla, A. (M)
Hiogins, D. H. (M)
Holmes, W. M. (M)
Horowitz, R. B. (A)
Houston, W. B. (M)
Hoving, H. R. (M)
Huggins, R. A. (SM)
Hughes, H. H. (SM)
Hughes, L. T. (A)
Isaacs, R. A. (A)
Isaacson, R. G. (M)
Jenkins, L. E., Jr. (M)
Jensen, P. E. T. (M)
Jobbins, C. W. (M)
Johnson, D. E. (M)
Johnston, R. J. (A)
Jones, M. R. (M)
Katt, D. R. (M)
Kean, D. W. (SM)
Kenney, B. D. (A)
Kerwin, W. J. (SM)
Kimple, K. W. (M)
Kinney, E. L. (M)
Kleist, R. A. (M)
Kilnaman, W. A. (M)
Kluge, J. E. (M)
Koppel, R. L. (M)
Kroll, W. (M)
Labno, J. J. (A)
Lang, R. B., Jr. (M)
Lark, J. E. (M)
La Rue, J. S. (SM)
Leslie, J. M., Jr. (SM)
Levinthal, J. G. (M)
Linders, T. E. (M)
Lonomire, R. C. (M)
Lopes, R. R. (A)
Lundstrom, O. C. (M)
Lusk, T. D. (M)
MacKerrow, D. E. (M)
Maollo, M. W. (A)
Malasky, S. W. (SM)
Marshall, J. A. (A)
Maurer, C. D. (A)
McClain, W. J. (M)
Metevia, E. E. (M)
Miller, K. E. (M)
Milner, L. L. (A)
Moleski, T. G. (A)
Moore, G. O. (SM)
Morgan, R. B. (SM)
Morse, F. A. (M)
Nash, J. P. (SM)
Nassie, T. A. (A)
Neilly, E. C. (A)
O'Connor, D. G. (SM)
Ohlemacher, R. F. (A)
Ohlmann, G. A. (A)
Paoel, F. W. (M)
Paulson, C. R. (M)
Peterson, D. A. (A)
Peterson, D. G. (M)
Pound, A. E. (M)
Prue, W. W., Jr. (M)
Reinhold, W. D. (M)
Reisman, S. J. (M)
Romano, V. J. (M)
Root, K. E. (M)
Rosenberg, S. (SM)
Rudin, B. D. (M)
Ruqoteri, D. J. (M)
Sackman, D. A. (M)
Saini, R. C. (A)
Schneider, R. F. (M)
Schulthels, H. B., Jr. (SM)
Shaw, G. W. (A)
Shepherd, J. H., Jr. (M)
Showen, L. (SM)
Smaus, L. H. (SM)
Smith, D. L. (M)
Smith, H. E. (A)
Smith, J. I. (M)
Smith, R. T. (M)
Spencer, J. M., Jr. (M)
Stefanelk, R. J. (M)
Steiner, F. W. (M)
Stenger, F. J. (M)

CALIFORNIA

Stewart, R. J. (SM)
Stoltz, J. R. (M)
Stone, R. H., Jr. (M)
Szatrowski, Z. (A)
Tanoney, J. F. (M)
Taylor, J. M. (A)
Taylor, N. J. (M)
Tetenbaum, S. J. (M)
Thon, J. C. (SM)
Trainer, R. F. (M)
Troetschel, W. O. (M)
Tyrrell, R. A. (A)
Usiin, W. (M)
Vernon, F. C. (M)
Waldman, M. D. (M)
Wallis, D. W. (M)
Weir, R. A. (M)
West, S. F. (A)
White, J. W. (M)
Whiteley, R. B. (SM)
Whitten, J. R. (M)
Wielenga, L. J. (M)
Wilkins, W. H. (M)
Williams, W. F. (M)
Wood, R. A. (A)
Yueh, J. H. (M)
Ziegler, F. W. (SM)

Sun Valley (LA-SF-7)
Abbey, C. R. (M)
Crystal, D. G. (A)
Friebura, H. E. (A)
Gold, C. H. (M)
Grossman, M. B. (M)
Johnson, C. E. (M)
Marvoold, G. E. (A)
Stoehr, W. F. (M)

Sylmar (LA-SF-7)
Halfouist, G. W. (M)
Hill, J. E. (M)
Hughes, W. R. (SM)
Jones, J. M. (A)
Raines, O. E. (A)
Smith, N. J. (A)
Vanderford, W. H. (A)

Tahoe Valley (SAC-7)
Tucker, M. (M)

Tarzana (LA-SF-7)
Adams, E. S., Jr. (A)
Ambrosio, B. F. (M)
Anderson, H. R. (SM)
Bartlome, R. D. (A)
Beck, G. R. (SM)
Benson, R. S. (M)
Braverman, R. (M)
Brown, N. M., Jr. (M)
Brunner, R. H. (SM)
Chesebro, E. L. (M)
Connor, J. A. (SM)
Dadant, P. M. (M)
Debaun, J. R. (A)
De Lano, R. H. (SM)
Dickinson, G. R. (M)
Favors, H. A. (SM)
Felsman, W. O. (M)
Gion, J. A. (A)
Hodgson, R. W. (SM)
McVey, I. M. (M)
Means, P. S. (M)
Pierson, K. E. (SM)
Porter, J. H. (SM)
Rozas, F. (M)
Russell, R. M. (SM)

Torrance (LA-7)
Ajioka, J. S. (M)
Akin, P. A. (M)
Barker, L. H. (SM)
Beneteau, B. A. (M)
Biddle, J. M. (M)
Bolton, M. W. (A)
Botos, R. A. (M)
Bowlus, M. A. (M)
Braman, M. D. (M)
Breatch, N. L. (M)
Brosal, J. (A)
Burr, R. L. (M)
Busuttil, H. L. (M)
Chankin, H. M. (A)
Chaoin, R. G. (M)
Cole, C. C. (M)
Colino, F. L. (M)
Collins, R. F. (M)
Cooper, T. W. (M)
Cowan, C. F. (M)
Coy, L. H., Jr. (A)
Crovts, H. W. (M)
Dain, H. W. (M)
Dizinno, R. E. (M)
Edgerton, A. D. (M)
Egger, A. (A)
Ekbera, J. V. (M)
Elkin, H. S. (A)
Enz, R. E. (M)
Fachtmann, R. R. (M)
Fiden, W. H. (A)
Field, F. W. (M)
Flower, D. W. (M)
Fogel, R. L. (SM)
Forster, D. C. (M)
French, H. M. (M)
Frith, L. O. (M)
Funk, J. D. (M)
Funk, R. E. (M)
Gabloffsky, H. (M)
Gallndo, V. (M)
Garritson, F. K. (A)
Golightly, R. T. (A)
Gottfried, R. E. (M)
Griffin, E. F. (A)
Griggs, R. W. (M)
Gustason, E. R., Jr. (M)
Hakala, P. E. (M)
Harmon, W. G. (A)
Hartzell, W. M. (M)
Henderson, M. C. (M)
Hewitt, E. W. (M)
Heyliger, G. E. (M)
Hevnino, J. M. (M)
Hilbero, R. P. (A)
Hon, H. K. (A)
Hunter, R. D., Jr. (M)
Ives, G. M. (SM)
Janer, R. (M)
Jessen, W. E. (A)
Jicha, A. J. (A)
Judae, H. (M)
Kanter, E. (M)
Keach, B. C. (M)
Kern, W. W. (A)
Kinsman, R. G. (M)
Kobetich, E. A. (M)
Leonard, D. L. (M)
Linhart, T. F., Jr. (A)
Low, H. (M)
Mason, C. D. (M)
Martin, D. P. (M)
Martin, W. W. (A)
Matheny, L. E. (M)
McCarthy, J. W. (M)
McComb, B. J. (M)
McCoy, H. L. (M)
McDonald, W. H. (M)
McRee, B. R. (M)
Mehner, E. W. (A)
Mellor, J. R. (A)
Meronek, D. F. (M)
Mills, R. A. (M)
Monroe, F. R. (M)
Moody, H. L. (M)
Murdock, L. C. (SM)
Nolde, R. C. (M)
Norris, R. M. (M)
Nussbaum, O. N. (A)
Oliver, J. R. (M)
Olson, R. D. (M)
O'Neil, C. E. (M)
Perry, C. L. (M)
Peters, R. C. (M)
Pitt, G. E. (A)
Pixley, N. S., Jr. (M)
Rash, K. H. (M)
Rogers, R. R. (M)
St. John, D. E. (SM)
Saunders, S. R. (M)
Seckinger, W. C. (A)
Shea, R. S. (M)
Shibata, A. M. (A)
Silence, N. C. (M)
Simone, L. A. (M)
Skiervem, K. D. (M)
Smeltzer, J. C. (M)
Smithbera, S. B. (M)
Snee, F. J. (M)
Spencer, D. J. (M)
Stasch, J. E. (M)
Stephens, C. W. (M)
Steohenson, R. O. (M)
Thomas, W. M. (A)
Trew, J. W. (A)
Trumbo, D. E. (A)
Uberman, S. (M)
Velasco, F. C. (M)
West, D. B. (M)
Whistler, C. H. (SM)
Williams, J. B., Jr. (M)
Winterstrom, R. L. (M)
Wrench, R. G. (A)
Woodbury, E. J. (A)

Taylorsville (SAC-7)
Wilson, R. P. (A)

Temple City (LA-P-7)
Ballino, R. A. (M)
Canonic, K. D. (M)
Snykers, A. B. (M)

Thousand Oaks (LA-B-7)
Albone, N. G. (M)
Nelson, R. S., Jr. (M)

Topanga (LA-SF-7)
Jacobson, A. D. (M)
Stephenson, H. B., Jr. (A)
Young, R. G. (A)

Tracy (SAC-7)
Albertson, W. R. (A)

Travis AFB (SF-7)
London, R. E. (A)

Treasure Island (SF-7)
McCarley, H. H. (SM)

Tulunga (LA-SF-7)
Aziz, R. A. (M)
Gannon, M. T. (SM)
Honey, F. J. (M)
Kreuder, N. L. (SM)
Kruse, R. C. (M)
Marcy, W. J. (A)
Pilkington, W. C. (SM)
Ure, G. R. (A)
Walcek, E. J. (M)
Wills, R. V., Jr. (M)

Tustin (LA-SA-7)
Cavness, R. L. (A)
Crawford, V. L. (M)
Davis, R. (SM)
De Bord, M. J. (A)
Dorsett, J. W., Jr. (M)
Isaac, K. N. (M)
Jay, H. A. (SM)
Kamsler, W. F. (SM)
McQuiston, W. R. (SM)
Ryland, M. E. (A)
Samoson, W. F. (SM)
Sublett, C. R. (M)
Temple, F. J. (SM)
Umlauf, E. W. (M)
Woods, E. L. (A)
Zurn, J. T. (M)

Twenty-Nine Palms (LA-OB-7)
Fitzoerald, B. P. (M)
Haves, R. W. (M)
Smith, E. F. (M)

Upland (LA-OB-7)
Hardin, C. A. (M)
Hemov, R. L. (M)
Hitchcock, R. W. (M)
Smith, R. E. (M)
Stokes, L. C. (M)
Takenaka, G. (M)
Watkins, E. L. (SM)
Whitcomb, L. A. (M)

Vacaville (SAC-7)
Carroll, J. C. (A)
Young, C. W. (M)

Vallejo (SF-7)
Andrews, B. H. (M)
Decker, K. M. (M)
Ekstrand, P. A. (SM)
Elam, E. M. (M)
Hanlev, R. J. (M)
Hartman, A. G. (M)
Kalamaras, G. A. (A)
Lenihan, J. E. (A)
Ricketts, D. B. (M)
Traver, J. W. (A)
Upton, J. W., Jr. (M)
Watson, A. R. (M)

Valley Center (SD-7)
Newburgh, H. (M)

Vandenberg AFB (LA-SB-7)
Booaess, J. W. (A)
Dobbs, W. (A)
Haulboskv, W. B. (A)
Heldoen, B., Jr. (M)
Herman, R. E., Jr. (M)
Lee, D. H. (M)
Luce, R. R. (M)
Madson, G. A. (M)
Moore, E. F. (M)
Nav, J. N. (M)
Nickel, W. (M)
Nielson, R. W. (M)
Poulson, W. A. (M)
Reed, R. C. (SM)
Schmidt, H. W. (A)
Williams, R. O. (M)
Zazulak, R. R. (M)

Van Nuys (LA-SF-7)
Abstein, H. T., Jr. (M)
Anderson, G. R. (M)
Arndt, L. A. (SM)
Banos, G. A., Jr. (M)
Barlett, F. R. (A)
Becker, J. T. (M)
Bemds, E. L. (M)
Blaine, R. F. (A)
Blancher, D. W. (M)
Boandl, J. S. (M)
Bovd, J. C. (A)
Brechwald, R. D. (M)
Brockway, W. W. (SM)
Chase, L. R. (M)
Checketts, D. A. (M)
Cohen, J. E. (M)
Coler, B. A. (M)
Cutler, S. (M)
Dahlbera, A. W. (A)
Dau, W. K., Jr. (SM)
Davis, J. W. (M)
Davis, S. W. (M)
Drukaroff, I. (M)
Entin, A. J. (M)
Ericson, C. W., Jr. (M)
Exner, H. G. (A)
Fanwick, C. (SM)
Farley, E. J. (SM)
Fives, J. J. (M)
Funfstuck, H. (M)
Gallenson, L. (M)
Gieseke, G. R. (M)
Gioante, G. A. (M)
Gilbert, H. L. (A)
Goda, O. S. (A)
Goldberg, J. J. (M)
Goltz, A. D. (M)
Goltner, G. W. (M)
Green, A. P. (M)
Guerre, C. L. (M)
Haloern, R. L. (SM)
Hammond, J. R. (A)
Hemolino, N. G. (M)
Herter, V. E., Jr. (SM)
Hewitt, G. E. (SM)
Hidv, J. H. (SM)
Hirschbera, W. J. (M)
Hirschfield, G. A. (M)
Hoffman, W. C. (M)
Hvden, I. F. (M)
Jacobson, S. (M)
Kirk, R. A. (M)
Klein, M. L. (SM)
Klemens, W. P. (SM)
Korson, I. (M)
Kramer, R. G. (M)
Krause, W. B. (M)
Locus, S. S. (SM)
Lovick, E., Jr. (SM)
Lvon, R. E. (A)
Malcolm, L. (SM)
Mallach, L. W. (SM)
Mancini, R. A. (A)
Mann, M. (M)
Marcollin, A. R. (SM)
Maxey, D. C. (M)
McClanahan, R. T. (M)
Miller, C. E. (SM)
Monderer, D. A. (M)
Naef, C. A. (M)
Nelson, R. M. (M)
Nielsen, D. B. (A)
Ohrenstein, S. B. (A)
Olsefskv, C. C. (SM)
Paller, J. L. (M)
Panoborn, H. W. (SM)
Parker, W. H., Jr. (SM)
Pastor, G. J. (M)
Radmacher, D. S. (M)
Reichenbach, H. F. (M)
Remst, H. F. (SM)
Richards, J. A. K. (SM)
Rosenman, L. (M)
Ross, W. J. (M)
Savory, W. A. (M)
Selditz, N. (M)
Sleorist, R. F. (A)
Smith, J. C. (M)
Smith, J. E. (SM)
Smokler, M. I. (M)
Steoen, R. J. (SM)
Stewart, C. O. (A)
Strassman, A. J. (SM)
Tasker, R. B. (SM)
Timinerl, A. A. (M)
Urman, B. S. (M)
Van Emden, B. M. (A)
Vanous, P. J. (M)
Wachowski, H. M. (SM)
Wagner, H. B. (A)
Walker, P. B. (SM)
Wallick, W. L. (M)
Walz, D. A. (M)
Wasmer, W. F. (A)
Wasnev, A. (M)
Watstein, J. I. (M)
Weller, D. B. (M)
Whitman, K. C. (M)
Wick, O. F. (A)
Wilson, R. A. (M)
Wintroub, H. J. (M)
Worth, F. L. (A)
Zboril, F. R. (SM)

Venice (LA-7)
Beerman, S. D. (A)
Bekey, G. A. (M)
Damon, N. E. (M)
Elder, C. B. (A)
Engels, L. H. (A)
Force, D. C. (M)
Ganstwig, M. (SM)
Gurley, J. G. (M)
Hauffe, G. S. (M)
Howard, G. L. (A)
Huggins, W. G. (M)
Leish, J. (M)
Noda, M. (M)
Reedy, J. F. (M)
Roberts, A. N. (M)
Wayment, K. D., Jr. (M)

Ventura (LA-B-7)
Andersen, J. F. (M)
Arnold, W. F. (M)
Baugh, H. W. (M)
Bernhardt, E. C. (M)
Braam, R. M. (M)
Browning, R. A. (M)
Case, D. M. (M)
Dember, A. B. (A)
Doss, D. R. (A)
Focke, A. B. (SM)
Hauselman, K. R. (M)
Hudson, R. (A)
Kirch, J. H. (A)
La Plante, O. (SM)
Larey, B. W. (A)
Lash, J. R. (A)
Leiper, J. H. (M)
MacDonald, W. L. (M)
Mack, P. H. (A)
Markell, J. H. (SM)
McIntyre, R. D. (A)
Newman, D. B. (SM)
Quan, H. L. (M)
Scott, R. P. (M)
Shellabarger, J. N. (M)
Skoog, H. A. (M)
Snow, R. B. (M)
Sturm, T. F. (SM)
Tauchert, L. C. (M)
Timm, J. D. (A)
Timmerman, H. A. (SM)
Weidemann, H. K. (M)
Whybark, D. L. (M)
Williams, R. G. (M)
Ziegler, T. A. (M)

Victorville (LA-OB-7)
Galvean, M. W. (A)
Wolf, J. E. (M)
Visalia (SF-7)
Eklund, M. H. (M)
Sheehan, R. P. (M)

Vista (SD-7)
Conrad, R. A. (M)

Walnut Creek (SF-EB-7)
Chase, R. C. (M)
Coakley, T. P. (M)
Elsken, R. H. (M)
Eukel, W. W. (M)
Graham, R. H. (M)
Hartwig, E. C. (SM)
Horton, M. C. (M)
Mitchell, J. R. (M)
Sterne, K. E. (A)
Van Ness, H. W. (SM)

Watsonville (SF-7)
McClure, D. E. (M)

West Covina (LA-OB-7)
Abramis, D. (M)
Allen, J. R. (M)
Auletti, R. L. (M)
Barr, H. J. (SM)
Bass, J. W. (M)
Bazard, R. J. (M)
Bethard, C. T. (M)
Bickhart, E. C. (M)
Brown, R. E. (A)
Brown, W. A. (A)
Delaney, H. J. (M)
Dickey, R. G. (M)
Fithian, D. H. (M)
Foster, W. H. (M)
Garcia, G. (A)
Glser, H. W. (A)
Gore, M. R. (M)
Grantham, G. W. (M)
Hotchkin, E. E. (M)
Jacobs, H. M. (M)
Johnson, H. A. (SM)
Kemp, G. H. (M)
Kempf, W. F., Jr. (M)
Kirsten, C. C. (M)
McCormick, G. F. (M)
Ming, D. L. (M)
Mulvey, J. A. (A)
Nadel, L. (M)
Nestlerode, C. D., Sr. (M)
Quackenbush, R. E. (M)
Ross, H. (M)
Samoson, J. C. F. (M)
Seamer, C. W. (M)
Shaffer, A. (M)
Shield, R. G., Jr. (M)
Smith, R. A. (M)
Steinback, E. A. (M)
Swain, L. D. (A)
Taylor, A. D. (A)
Taylor, L. A. (M)
Tucker, M. C. (M)
Walley, W. E. (A)
Wells, M. A. (M)
Winner, R. J. (M)

West Los Angeles (LA-7)
Bottomley, R. O. (M)
Byrne, D. A. (A)
Chapman, D. M. (M)
Cohn, R. M. (M)
Drucker, A. N. (M)
Glazer, C. R. (M)
Kelly, D. H. (M)
Maxfield, R. C. (M)
Mizell, M. H. (SM)
Nakayama, H. (M)
Neudorfer, W. L. (M)
Pearce, P. F. (M)
Perez, A. A. (M)
Reed, R. A. (M)
Reiter, A. M. (SM)
Rockey, R. J. (M)
Rogers, J. A. (M)
Schonbrun, L. M. (M)
Smith, M. V. (A)
Walle, A. C. (A)
Weed, G. E. (M)
Wright, E. C. (M)

Westmorland (SD-7)
Boyer, M. J. (A)
Johnson, R. L. (M)
Kurlinski, R. L. (A)
Stout, D. J. (M)

West Sacramento (SAC-7)
Fuller, G. R. (A)

West Van Nuys (LA-SF-7)
Corbin, G. C. (A)

Whittier (LA-SA-7)
Amendt, L. E. (M)
Anderson, D. B. (M)
Antista, B. A. (M)
Bashore, C. E. (A)
Becker, W. C. (M)
Blaski, M. F. (A)
Bowman, J. Y. (M)
Boyer, R. J. (M)
Breece, R. C. (M)
Brown, H. R., Jr. (SM)
Carroll, W. P. (M)
Corley, C. F. (M)
Darlington, H. T., Jr. (M)
Davenport, C. M. (M)
Downey, W. F. (M)
Gillings, J. W. (M)
Gow, K. P. (SM)

Hall, C. R. (M)
Harriman, D. E., Jr. (SM)
Hodge, J. (M)
Hoffmann, H. J. (M)
Holmes, E. A., III (SM)
Hooper, G. E. (M)
Jackson, M. O. (A)
Jennings, B. R. (M)
Kent, S. S. (M)
Kleinhofer, B. A. (SM)
Kleplnger, L. H. (SM)
Kreider, P. A. (M)
Laiklin, M. (M)
Lanzinger, D. J. (M)
Lent, W. C. (SM)
Lockhart, E. H. (M)
Lucero, R. C. (M)
Martin, P. W. (M)
McClure, L. W. (SM)
McGaffey, H. F. (M)
McMillin, D. W. (M)
Meros, V. C. (A)
Miller, J. F. (M)
Moody, R. E. (M)
Munsey, C. J. (M)
Nilsson, W. P. (M)
O'Brien, E. J. (SM)
Ontiveros, P. C. (SM)
Overton, C. B. (M)
Parker, N. F. (A)
Polder, J. H. (M)
Randall, G. N. (A)
Reed, R. C. (A)
Savant, C. A. (M)
Sawyer, H. F. (M)
Scheets, B. R. (M)
Schmidt, F. W. (SM)
Schulz, K. S. (M)
Shutt, S. G. (M)
Simkins, E. D. (M)
Sterner, J. F. (SM)
Sterns, W. G. (M)
Sterrett, J. P. (M)
Stoney, W. E. (M)
Thatcher, R. B. (M)
Thomas, E. E. (M)
Tice, A. R. (SM)
Tladen, L. L. (M)
Triman, E. L. (M)
Vorle, I. N. (VA)
Wagner, E., Jr. (M)
White, J. V. (M)
Wunderlich, F. J. (M)
Yetter, W. P. (A)
Zemenick, C. J. (A)
Zoller, C. J. (M)

Winnetka (LA-SF-7)
McAfee, P. (M)

Woodland Hills (LA-SF-7)
Anderson, T. J. (SM)
Armer, P. (M)
Bendar, J. A. (M)
Blakford, D. (A)
Brown, R. J. (A)
Cervini, R. A. (A)
Chaiken, L. (M)
Crinklaw, R. H. (M)
Crowe, J. W. (M)
Davidson, E. D. (M)
Davis, K. A. (A)
Davis, M. R. (M)
Drummond, E. J. (M)
Edwards, J. N. (M)
Eills, J. W., Jr. (M)
Engel, H. L. (A)
Eslinger, R. L. (M)
Falls, W. A. (M)
Foole, J. A. (M)
Fortier, R. E. (M)
French, R. L. (M)
Gaskins, F. J. (A)
Gerken, G. H. (M)
Halloran, R. G. (M)
Hammill, C. W. (M)
Harrison, J. F. (M)
Harrison, W. H. (M)
Hicks, A. R. (M)
Hirschl, L. (M)
Insalls, P. A. (M)
Inoersoll, E. R. (SM)
Kanze, A. J. K. (M)
Kouba, J. T. (M)
Kurtz, L. A. (M)
La Fetra, F. E. (M)
Lamb, W. X., Jr. (M)
Levy, G. F. (SM)
McKee, W. P., Jr.
Miller, M. H. (M)
Mitchell, W. C. (M)
Nyberg, J. J. (M)
Oltman, H. G., Jr. (SM)
Owens, J. E. (M)
Oyster, D. E. (M)
Payne, G. H. (A)
Perry, R. E. (M)
Peterson, F. V. (M)
Pratt, J. H. (SM)
Reilly, P. E. (M)
Robbins, B. A. (M)
Rosenbloom, A. (M)
Scott, L. W. (M)
Secretan, F. (M)
Sibilio, R. A. (M)
Smith, B. N. (A)
Sorensen, C. E. (A)
Soulres, W. K. (SM)
Staub, D. W. (M)
Strauss, D. J. (M)
Stumpf, R. J. (M)
Sturm, W. A. (M)
Summerfield, A. R. (A)
Tetherow, R. C. (M)
Tinney, P. (SM)
Udry, J. J. (SM)
Van Bemmelen, H. M. (M)
Van Groos, J. C. (SM)
Wanlass, C. L. (A)
Williams, F. K. (SM)
Wilson, K. M. (M)
Woodson, W. L. (M)

Woodside (SF-7)
Abramson, N. M. (M)
Broccini, S. M. (A)
Eitel, W. W. (F)
Eldredge, A. L. (SM)
McAulay, W. H. (M)
Seaman, W. E. (M)
Smith, H. W., Jr. (M)

COLORADO

Akron (DEN-6)
Cooley, H. M. (A)

Arvada (DEN-6)
Johler, J. R. (SM)
Lonahart, C. C. (M)
Robertson, A. L. (M)
Sargent, R. E. (A)
Spano, A. J. (A)

Aurora (DEN-6)
Fredricks, I. E. (M)
Ventrees, J. D. (A)

Boulder (DEN-6)
Allred, C. M. (M)
Applegate, C. J. (M)
Barclay, C. (A)
Barghausen, A. F., Jr. (A)
Barnes, F. S. (M)
Barsis, A. P. (M)
Bean, B. R. (A)
Beattv, R. W. (SM)
Belvent, L. [illegible] (M)
Berry, I. S. (M)
Bowles, K. [illegible]
Brown, F. W. (A)
Brown, M. J. (A)
Brunner, R. C. (M)
Burkhard, D. G. (SM)
Bussey, H. E. (SM)
Byrne, W. J. (M)
Carney, J. A. (M)
Carpenter, R. J. (M)
Case, J. (M)
Cohen, R. S. (M)
Conda, A. M. (M)
Cook, C. C. (M)
Coombs, W. C. (SM)
Coon, R. M. (M)
Cottony, H. V. (SM)
Cowell, P. K. (M)
Crichlow, W. Q. (SM)
Culshaw, W. (SM)
Dalke, J. L. (SM)
Daniels, W. H. (M)
Davies, K. (M)
Davis, T. L. (M)
Decker, M. T. (M)
De Gregorio, J. F. (M)
Erni, J. B. (M)
Estin, A. J. (M)
Florman, E. F. (M)
Freudenbera, H. O. (A)
Gatterer, L. E. (M)
Georoe, W. D. (M)
Glerhart, G. D. (M)
Goble, R. W. (A)
Goerke, V. H. (M)
Greene, F. M. (M)
Haller, F. B. (A)
Harrington, R. D. (A)
Heaton, V. E. (SM)
Herbstreit, J. W. (F)
Hombera, K. O. (SM)
Hubbard, R. W. (M)
Hudson, P. A. (M)
Janes, H. B. (M)
Jean, A. G., Jr. (M)
Jicklina, R. M. (M)
Johnson, D. S., Jr. (A)
Jones, R. N. (M)
Kindia, N. B. (M)
Kirby, R. C. (SM)
Kirby, R. S. (SM)
Kirkpatrick, A. W. (A)
Koch, J. W. (M)
Kraus, A. (M)
Kriner, J. I. (A)
Krueoer, R. E. (M)
Lance, H. W. (SM)
Larsen, E. B. (M)
Larson, R. E. (SM)
Little, C. G. (M)
Longley, A. G. (A)
Maloney, L. J. (M)
Martinez, J. L. (A)
Marvin, C. E. (M)
McGavin, R. E. (M)
McQuate, P. L. (M)
Merrill, R. G. (M)
Miller, L. W., Jr. (M)
Morgan, A. H. (M)
Munahata, S. (M)
Nicoloff, C. C. (M)
Niesen, E. (A)
Norton, K. A. (F)
Ochs, G. R. (M)
Ostrow, S. M. (SM)
Phelps, F. P. (A)
Posankony, G. J. (M)
Powell, R. C. (M)
Rathburn, R. H. (M)
Reed, D. R. (M)
Rice, P. L. (M)
Richardson, J. M. (SM)
Ries, F. X. (M)
Rumfelt, A. (M)
Salaman, R. G., Jr. (A)
Schafer, C. E. (SM)
Schiffmacher, E. R. (M)
Scott, W. W., Jr. (M)
Selby, M. C. (SM)
Shoaf, J. H. (M)
Silberstein, R. (SM)
Simoson, P. A. (M)
Slutz, R. J. (M)
Smith, E. K., Jr. (SM)
Snyder, W. F. (SM)
Soracklen, R. K. (A)
Stacey, D. S. (SM)
Stroud, J. C. (A)
Sugar, G. R. (M)
Sykes, J. A. (M)
Taoaan, H. E. (M)
Tary, J. (M)
Thompson, M. C., Jr. (SM)
Trembath, C. L., Jr. (M)
Twombly, J. C. (M)
Utlaut, W. F. (SM)
Viezbicke, P. P., Jr. (A)
Vooler, L. E. (A)
Wait, J. R. (SM)
Walters, L. C. (SM)
Wassink, H. W. (A)
Waters, D. M. (M)
Watkins, J. S. (M)
Watt, A. D. (SM)
Watts, J. M. (M)
Wells, P. I. (A)
Whelan, E. H. (M)
Wicks, P. (SM)
Wilber, R. W. (M)
Wilson, A. C. (M)
Wolzien, E. C. (M)
Woodward, M. W. (SM)
Worcester, W. G. (SM)

Broomfield (DEN-6)
Kemper, J. A. (M)
Mulligan, M. A. (A)
Peterson, S. B. (M)
Webb, R. C. (F)

Colorado Springs (DEN-6)
Adams, C. W. (M)
Behnke, A. O. (SM)
Boland, J. N. (M)
Brethauer, L. G. (M)
Dillon, J. R. (SM)
Donegon, R. E. (M)
Gallagher, J. J. (M)
Gardner, O. K. (M)
Green, L. V. (A)
Holmoren, W. A. (M)
Howard, W. G. (M)
Howell, H. R. (M)
Kuehn, R. J. (M)
Kver, F. E. (A)
Linke, K. W. (A)
Mohr, D. B. (A)
Mooney, R. E. (M)
Nash, H. F., Jr. (M)
Quinn, T. J. (A)
Quirk, W. J. (A)
Russell, J. D. (M)
Rynning, J. L. (M)
Sinoer, L. M. (M)
Stees, H. S., Jr. (A)
Temoyan, J. O. (M)
Thomas, D. H. (A)
Uhehane, F. F. (SM)
Victoreen, J. A. (SM)
Wilson, L. H. (M)

Denver (DEN-6)
Ackworth, D. L. (M)
Adams, E. L. (M)
Allen, M. A. (M)
Anderson, C. R. (A)
Bachman, M. N. E. (M)
Bahlay, A. (SM)
Barnett, B. E. (M)
Barnett, R. H. (M)
Beaver, H. E. (M)
Bertram, S. (SM)
Bills, E. S. (M)
Bishop, H. L., Jr. (M)
Blanchard, R. R. (M)
Blankenship, L. F. (M)
Boardman, J. L. (M)
Bowen, R. G. (M)
Bowie, W. S. (M)
Bromberoer-Barnea, B. (A)
Butts, J. H. (A)
Capehart, M. E. (M)
Cateora, J. V. (M)
Chaney, N. H. (M)
Clark, L. R. (SM)
Clawson, L. F., Jr. (A)
Cole, A. E., Jr. (A)
Collins, P. B. (A)
Cooper, R. R. (M)
Cotter, J. B. (A)
Cottrell, D. E. (M)
Crawford, G. N. (M)
Davidson, S. (M)
Davis, J. R. (A)
Detwiler, W. L. (M)
Deutsch, K. T. (M)
Dosch, E. L. (M)
Drury, S. F., Jr. (M)
Edwards, H. T. (M)
Farrell, J. W. (M)
Farrell, R. J. (A)
Ferketich, G. (A)
Finnado, F. H. (M)
Flaharty, C. L. (A)
Fleming, C. W. (A)
Foley, W. V. (SM)
Frank, J. L. (A)
Fuqua, C. (M)
Garretson, H. W. (M)
Gibson, W. R. (A)
Goddard, A. A., Jr. (A)
Green, E. H. (A)
Grigsby, T. N. (M)
Guild, C. P. (M)
Hall, A. C. (F)
Harrison, J. L. (M)
Hart, W. G., Jr. (M)
Haskins, L. E. (SM)
Hedberg, C. A. (SM)
Hedrick, W. M. (M)
Hodson, L. M. (M)
Houseoo, J. W. F. (M)
Hroch, H. J. (M)
Hurlbut, J. F. (SM)
Jackson, G. A. (M)
James, V. N. (SM)
Johnson, H. S. (A)
Just, G. D. (A)
Kardos, M. (M)
Kennedy, J. E., Jr. (A)
Kerver, N. E. (A)
Knight, S. J., Jr. (M)
Koch, R. C. (M)
Lahana, P. (M)
Lambert, W. E. (A)
Leighou, R. D. (M)
Lover, G. L., Jr. (M)
Maer, C. M., Jr. (A)
Messler, F. J. (M)
Meyer, D. E., Jr. (M)
Mielziner, W. (A)
Milburn, D. L. (M)
Mintz, M. (A)
Missler, C. W. (M)
Moravec, C. T. (A)
Morrissey, T. G. (SM)
Morroni, D. J. (M)
Murray, J. M. (A)
Neale, D. J. (M)
Neff, R. W. (M)
Nelson, A. J. (A)
Nissim, S. (M)
Nold, F. D. (M)
Norton, F. R. (SM)
Olson, C. G. (M)
Ostwald, L. T. (A)
Paige, A. E. (SM)
Parks, C. H. (M)
Parrish, V. L. (M)
Peterson, C. F. (M)
Petterson, W. N., Jr. (M)
Pieper, G. E. (SM)
Plywaski, M. J. (A)
Pochop, D. R. (M)
Posakony, P. R. (M)
Pyle, J. C. (A)
Raymond, K. N. (A)
Rector, J. D. (M)
Reed, J. E. (M)
Reno, H. (M)
Robinson, M. E. (A)
Rosine, L. L. (A)
Roth, T. A. (A)
Ruehle, R. A. (A)
Salomone, L., Jr. (M)
Schaaf, M. W. (A)
Shewe, T. S. (M)
Shumaker, M. J. (A)
Sjostrom, R. W. (M)
Smilley, J. D. (A)
Smith, A. D. (M)
Smith, W. F., Jr. (M)
Spafford, L. J. (M)
Stoss, E. G., Jr. (A)
Sturgill, C. L. (M)
Swanson, R. E. (M)
Terbush, H. W. (SM)
Throop, L. L. (M)
Tlemann, R. F. (M)
Tiller, J. L., Jr. (M)
Todd, F. J. (M)
Turnquist, E. R. (M)
Vance, E. F. (M)
Venditti, F. P. (M)
Wagner, G. D. (M)
Walter, J. H. (M)
Wang, C. S. (M)
Watson, J. E. (M)
Weeks, W. A., Jr. (M)
Well, W. W. (M)
Wickersham, P. D. (M)
Williams, A. J., Jr. (M)
Winters, D. (SM)
Wolfsev, D. (A)
Yaeger, T. E. (M)
Zanboorie, M. H. (M)

Englewood (DEN-6)
Brownell, F. P., Jr. (A)
Cobbs, D. M. (M)
Dachtler, F. E. (A)
Davidson, R. L. (A)
Dingman, E. H. (M)
Finch, M. D. (M)
Greene, J. F. (A)
Heckel, W. (M)
Hilleary, H. W. (A)
Hyde, R. A. (A)
Jones, W. G. (M)
Lavin, J. F. (A)
Masters, M. R. (A)
Mueller, A. G. (A)
Plantz, V. C. (M)
Richers, L. (A)
Skeels, H. V. (A)
Sorengeler, D. F. (M)
Thaxton, H. A. (M)

Ent AFB (DEN-6)
Koffer, E. J. (M)

Fort Carson (DEN-6)
Kilmer, D. E. (A)

Fort Collins (DEN-6)
Britton, C. C. (SM)
Budak, A. (M)
Davis, I. F. (M)
Dean, J. E. (M)
Ebner, G. A. (A)
Faris, J. J. (M)
Haoen, H. H. (M)
Terman, T. A. (M)

Fort Morgan (DEN-6)
Doogett, J. W. (A)
Zambo, J. W. (M)

Gardner (DEN-6)
Sanborn, R. H. (M)

Glenwood Springs (DEN-6)
Baker, B. Z. (A)

Golden (DEN-6)
Coors, J. (A)
Fletcher, H. E. (SM)
Hoover, D. B. (A)
Maras, R. G. (M)
Visiisel, R. L. (A)

Grand Junction (DEN-6)
Howell, R. G. (SM)
Lawton, K. G. (A)
Mc Cornick, C. E. (A)
Van Houten, R. G. (M)

Greeley (DEN-6)
Balamonte, F. L. (A)
Leiter, W. R. (A)
Stewart, S. J. (A)

Lakewood (DEN-6)
Cook, G. V. O. (M)
Daniels, R. G. (M)
Woodard, H. L. (A)

Littleton (DEN-6)
Ayre, T. P. (M)
Beckley, T. L. (M)
Bender, E. R. (M)
Berliner, H. J. (A)
Bliss, W. R. (M)
Bradt, A. J. (M)
Braunagel, M. V. (M)
Brebrick, R. J. (M)
Case, C. W. (M)
Clausen, R. H. (SM)
Cleveland, W. C., Jr. (SM)
Crooley, B. M. (A)
Daggett, C. C. (M)
Danner, R. V. (SM)
Davis, V. M. (SM)
Douglass, W. D., Jr. (M)
Duddy, E. M., Jr. (A)
Earles, D. R. (M)
Elam, T. W. (SM)
Eldridge, A. J. (SM)
Foster, F. L. (A)
Goldino, L. N. (M)
Grassia, C. C. (M)
Gyger, C. E. (M)
Helt, S. L. (A)
Hughes, E. S. (A)
James, D. C. (SM)
Janusz, J. S. (A)
Jensen, H. R. (M)
Jones, E. R., Jr. (A)
Kaaz, F. W. (M)
Mallory, G. L. (M)
Marizza, D. S. (A)
Maxwell, T. M., Jr. (SM)
Metz, E. W., Jr. (A)
Olson, C. E. (A)
Parish, M. L. (M)
Perrin, B. J. (M)
Rice, R. B. (A)
Robel, M. C. (M)
Schafer, H. G. (M)
Schiffelbein, W. L. (M)
Seestedt, H. C. (SM)
Sladkev, R. J. (M)
Smith, G. H. (M)
Sykes, R. P. (M)
Vomund, L. E. (A)
Washburne, B. P. (M)
Weber, J. P., Jr. (M)
Wendt, K. R. (F)
Wiseman, S. D. (M)
Wolfe, C. E. (A)
Wood, E. E. (M)

Lonamont (DEN-6)
Davis, R. L. (M)
Grant, W. B. (M)

Loveland (DEN-6)
Davis, B. E. (SM)
Follmer, G. C. (A)
Kelley, E. K. (SM)

COLORADO

Pueblo (DEN-6)
Schaefer, R. C. (M)

Salida (DEN-6)
Stout, J. E. (A)

Sterling (DEN-6)
Henderson, F. R. (A)

Thornton (DEN-6)
Rothman, H. L. (A)

Westminster (DEN-6)
Dougherty, H. T. (M)

Wheat Ridge (DEN-6)
Forsman, E. H. (M)
Haase, A. H. (A)
Howard, R. E. (A)
Marshall, G. B. (M)
Whitcomb, J. P. (M)
Yost, H. T. (A)

CONNECTICUT

Andover (CON-1)
Anson, Y. (A)

Ansonia (CON-1)
Wallionis, R. J. (A)

Avon (CON-1)
Boehm, A. R., Jr. (M)
Bussolini, J. J. (M)

Bethel (CON-F-1)
Briscoe, F. J. (M)
Pearlman, L. S. (M)
Tuska, J. W. (M)
Warner, F. C. (M)

Bloomfield (CON-1)
Gillie, A. C. (M)
Hall, G. M. (M)
Hendrickson, H. S. (A)
Norkin, H. (M)
Von Kummer, F. G. (M)
Wasem, E. F. Jr. (M)
Whitney, D. J. (M)

Bridgeport (CON-F-1)
Autuori, V. A. (M)
Calvert, T. J. (M)
Duncan, E. T. (M)
Evans, R. E. (M)
Hettinger, M. (A)
Jensen, H. T. (A)
Jones, J. O. (M)
Koch, R. L. (M)
Kocsor, J. A. (A)
Kosowsky, L. H. (M)
Krok, T. J. (M)
Lasinski, C. S. (A)
Lemkin, H. J. (A)
Levy, S. N. (M)
Mike, J. G. (M)
Mikusky, C. J. (M)
Nelson, R. A. (M)
Rosenberg, H. A. (A)
Silverstone, D. M. (M)
Von Behren, W. P. (SM)
Winquist, R. T. (M)
Ziller, M. A. (A)

Bristol (CON-1)
Jones, M. C. (M)
Kavanaugh, R. J. (M)
Nelson, A. B. (SM)
Plantoni, G. L. (M)
Scherff, L. S. (M)
Snowdon, A. E. (SM)
Vaughan, E. W. (SM)

Broad Brook (CON-1)
Lutz, C. H. (SM)
Yamron, J. (M)

Brookfield (CON-F-1)
Gordon, T. M., Jr. (M)

Brooklyn (CON-1)
Halford, J. H. Jr. (M)
Vroom, E. (SM)

Byram (CON-F-1)
Rorant, J. H. (A)

Canaan (CON-1)
Wildenberg, H. I. (M)

Canton (CON-1)
Whitney, C. A. (M)

Central Village (CON-1)
Poremba, J. J. (M)

Cheshire (CON-1)
Grebe, A. H. (M)
Hines, J. E. Jr. (A)
Hoffmann, G. O. (A)
Perkins, A. R. (M)
Rhein, G. W. (M)
Thomas, A. R. (A)
Warren, R. E. (M)

Colchester (CON-1)
Stag, R. C. (A)

Cos Cob (CON-F-1)
Bukowski, C. P. (M)
Fingerle, W. Jr. (SM)

Cromwell (CON-1)
Swetz, T. J. (A)

Danbury (CON-F-1)
Arendt, E. J. (A)
Ashford, C. R. (A)
Boesch, A. H. (A)
Breden, W. W. (M)
Campbell, C. A. (M)
Conceiman, C. W. (M)
Estelle, W. E. (M)
Henriques, J. B. (M)
Johns, N. H. (M)
Lowy, M. A. (SM)
Moran, J. H. (A)
Olha, W. R. (M)
Ott, O. J. (M)
Payne, M. P. (SM)
Quatrocchi, V. F. (A)
Runyan, R. A. (M)
Schatzle, F. D. (A)
Schmidt, E. (M)
Van Valkenburg, H. E. (M)
Webb, R. H. (M)
Willey, F. G. (M)

Darien (CON-F-1)
Bartram, J. F. (SM)
Bowley, R. J. (M)
Bozak, R. T. (SM)
Flower, G. Jr. (A)
Goodnow, A. C. (VA)
Hubbard, E. S. (M)
Kunkel, B. M. (M)
Mac Gregor, R. R. (M)
Mack, C. L. (M)
McElrath, G. (F)
Moffat, W. H. (SM)
Savoca, R. C. (A)
Smith, P. B. (A)
Townsend, R. (SM)

Deep River (CON-1)
Desnoyers, R. W. (M)

Derby (CON-1)
Clark, M. C. (M)
Keefe, E. M. (M)

Devon (CON-1)
O'Connell, P. R. (A)

Durham (CON-1)
Schilling, C. R. (M)

East Hartford (CON-1)
Aas, H. G. (M)
Anderson, P. G. (M)
Crooks, W. D. Jr. (M)
Gorton, R. E. (A)
Guyton, B. T. (A)
Kemble, T. H. (M)
Main, R. C. (SM)
Searle, P. C. (M)

East Hartland (CON-1)
Neill, G. W. (M)

East Norwalk (CON-F-1)
Hamme, R. D. (M)
Vancura, R. A. (M)
Warner, E. J. (SM)
Yellin, H. (SM)

Easton (CON-F-1)
Cummings, C. S. (A)

East Woodstock (CON-1)
Dixon, E. O. (SM)

Ellington (CON-1)
Jensen, J. (M)
McKinney, J. G. (M)

Elmwood (CON-1)
Marchese, J. H. (M)

Fabyan (CON-1)
O'Brien, B. Jr. (M)

Fairfield (CON-F-1)
Bishop, N. (SM)
Brooks, F. A. Jr. (M)
Dellenbaugh, F. S. (M)
Di Mattia, A. L. (A)
Gilchrist, E. S. (M)
Mitchell, W. F. (A)
Roberts, F. W. (SM)
Stern, P. D. (A)

Forestville (CON-1)
Forman, J. (M)

Gales Ferry (CON-1)
Dugan, D. J. (M)
Dutton, F. L. Sr. (M)

Georgetown (CON-F-1)
Lyuta, G. R. (A)

Glastonbury (CON-1)
Humphrey, C. D. (A)
Miller, R. A. (M)
Speed, D. K. (M)
Swain, R. S. (M)
Taylor, D. S. (M)
Waterman, A. (M)

Glenbrook (CON-F-1)
Edmondson, R. H. (SM)
Lewis, S. M. (M)
Wadhams, S. C. (M)

Granby (CON-1)
Brockett, R. I. (A)
White, J. A. (M)

Greenwich (CON-F-1)
Anderson, W. C. (SM)
Burroughs, G. (M)
Fetherolf, J. M. (M)
Haanstra, J. W. (M)
Hallenbeck, R. A. (M)
Hollywood, J. M. (SM)
Kimes, R. A. (SM)
Mallory, H. R. (SM)
Marchand, N. (SM)
Mee, C. D. (SM)
Michel, P. C. (SM)
Mills, C. A. (M)
Morse, J. L. (M)
Peterson, E. F. (M)
Petrucelly, V. J. (M)

Groton (CON-1)
Blaisdell, K. L. (SM)
Bowes, H. N. (SM)
Bowlby, R. E. (A)
Comiskey, J. M. (M)
Davison, E. F. (M)
Dolan, O. F. (M)
Latham, W. S. (M)
Mall, P. (M)
Martinson, C. D. (A)
Matthews, C. I. (A)
Rose, A. E. Jr. (M)
Stephanz, G. H. (M)
Watkins, F. T. Jr. (M)

Guilford (CON-1)
Fisher, E. H. (M)

Hamden (CON-1)
Bogan, S. C. (M)
Davidson, R. B. (A)
Fricker, S. J. (M)
Goclowski, C. F. (M)
Goldenthal, S. (M)
Hewitt, C. D. (M)
Hovey, D. P. (A)
Light, R. J. (M)
Lyons, W. J. Jr. (M)
Mapes, T. J. (A)
McNamara, F. T. (M)
Mulligan, R. J. (M)
Quackenbush, E. C. (A)
Reich, H. J. (F)
Smith, R. E. (A)
Smoko, J. F. (A)
Stancliff, V. A. (M)
Temple, L. M. (SM)

Hartford (CON-1)
Black, J. E. (M)
Boak, I. S. (M)
Britton, R. C (A)
Broderick, H. M., Jr (M)
Coleman, G. A. (A)
Doolittle, F. M. (F)
Dorschug, H. A. (SM)
Duncan, L. B. (M)
Hettinger, S. (M)
Jarrett, M. A. (A)
Lescarbeau, R. F. (M)
Lesinski, L. C. (M)
Mazurkiewicz, R. J. (A)
Moses, S. (M)
Platt, D. R. (SM)
Piskor, J. (M)
Rioux, V. A. (M)
Roth, W. (M)
Sapeca, A. E. (M)
Shor, N. (M)
Stuber, P. (M)
Thorley, B. V. (M)
Tuttle, R. W. (M)
Waffle, W. M. (M)
Ward, S. I. (A)
Weissman, D. (A)
Wentz, J. L. (A)

Hazardville (CON-1)
Kelly, G. E., Jr. (M)
Sandelin, M. P. (SM)

Kensington (CON-1)
Dickon, A. J. (M)

Kent (CON-1)
Ewald, L. H. (M)

Lebanon (CON-1)
Smith, A. G. (M)
Stocking, M. H. (A)

Litchfield (CON-1)
Palmer, H. R. (A)
Zurich, W. G. (A)

Long Hill (CON-F-1)
Kaiser, A. (M)

Manchester (CON-1)
Anton, R. F. (M)
Baker, R. G. (A)
Biffmyer, C. M. (M)
Dean, C. M. (M)
Fray, L. L. (M)
Hubbard, R. G., Jr. (M)
Mohr, W. L. (A)
Nicola, R. N. (M)
Rathbun, W. F. (M)
Russell, A. A., Jr. (M)
Schettler, R. B. (A)

Stanek, W. F. (A)
Young, W. H., Jr. (A)

Mansfield Center (CON-1)
Preston, R. J. (M)

Meriden (CON-1)
Lavin, H. (M)
Rettenmeyer, P. F. (M)
Winn, E. C., Jr. (M)

Middlebury (CON-1)
Fullaro, R. (A)

Middletown (CON-1)
Heinzmann, J. D. (M)
Snow, C. A., Jr. (M)
Thomoson, L. (M)
Tuccio, M. S. (A)
Van Dyke, K. S. (F)

Milford (CON-1)
Baldwin, A. L., Jr. (M)
Cutler, L. H. (M)
Lyman, H. T. (SM)
Moffitt, G. R., Jr. (M)

Monroe (CON-1)
Tavella, R. P. (A)

Mount Carmel (CON-1)
Pagano, E. L. (M)

Mystic (CON-1)
Cook, D. R. (M)
Kirby, T. H. (SM)
Pryor, W. L., Jr. (SM)

Naugatuck (CON-1)
Scranton, W. J. (M)

New Britain (CON-1)
MacMullen, J. H. (M)
Maino, A. G. (M)
Nachilly, John L. (M)
Slenklewicz, H. S. (A)
Tabor, S. A. (A)

New Canaan (CON-F-1)
Bancroft, C. (A)
Benedict, T. W. (M)
Castle, D. H. (SM)
Conron, C. F. (M)
Conron, W. H. (SM)
Frame, N. R., Jr. (M)
Johnston, J. K. (F)
Lebel, J. D. (M)
Offenhauser, W. H., Jr. (A)
Raviola, G. (M)
Sutherland, E. F. (A)
Walker, J. B. (M)
Weeks, J. T. (A)

New Haven (CON-1)
Bergmann, H. M. (M)
Bradley, K. M. (A)
Brett, G. (F)
Bridges, W. S. (A)
Bucksbaum, J. L. (A)
Cannon, J. F. (M)
Carlson, E. F. (M)
Chimitch, J. M. (M)
Conrad, A. G. (SM)
Cunningham, W. J. (M)
Curtis, R. C. (SM)
Genera, V. A. (A)
Grew, L. B. (SM)
Hall, B. A. (M)
Henry, H. E. (M)
Hon, E. H. G. (M)
Izenour, G. C. (M)
Izzo, N. F. (M)
Jacobson, E. R. (M)
Kelly, H. S. (A)
Krauss, H. L. (SM)
Kushner, A. M. (M)
Lupoldi, P. J. (M)
May, J. C. (SM)
Merriam, S. W. (A)
Murray, G. J., Jr. (M)
Orduno, P. F. (F)
Rohloff, H. E. (SM)
Roth, R. S. (A)
Rubin, H. B. (VA)
Ruchkin, D. S. (M)
Schultheiss, P. M. (M)
Shank, R. R. (M)
Schlank, W. I. (A)
Skalnik, J. G. (M)
Soans, H. A., III (M)
Soano, T. C. (M)
Sundis, H. W. (SM)
Thomas, L. E., Jr. (M)
Thomoson, G. S. (M)
Turner, H. M. (F)
Tustin, W. (M)
Tuteur, F. B. (M)
Usher, T., Jr. (M)
Wessenberg, H. W. (A)
Woerin, C. A. (M)
Zweig, F. (M)

Newington (CON-1)
Bilharz, O. W., Jr. (A)
Bliss, P. (SM)
Cenci, A. A. (M)
Lawczyk, E. A. (M)
Wellock, R. R. (M)

New London (CON-1)
Adams, W. S. (M)
Ansel, F. F. (A)
Calabrese, J. F. (M)
Desmond, W. C., Jr. (M)

Gannon, E. C. (M)
Hazard, W. R. (M)
Hoag, J. B. (SM)
Horton, J. W. (F)
Ide, J. M. (SM)
Menard, M. E., Jr. (M)
Miller, K. K. (M)
Mullarkey, W. E. (M)
Nash, H. E. (SM)
Newlin, T. G. (A)
Reisner, G. H. (M)
Ruble, H. E. (SM)
Shaver, F. W. (M)
Sibold, A. P., Jr. (M)
Sussman, H. (SM)
Turner, R. W. (M)
Wardle, W. F. (M)
Woollett, R. S. (SM)

New Milford (CON-1)
Rowley, W. E., Jr. (A)

Newtown (CON-F-1)
Finch, W. G. H. (F)
Henry, E. A. (M)

Niantic (CON-1)
Bishop, H. M. (M)
Saars, W. F. (M)
Suneca, E. M. (M)
Von Winkle, W. A. (A)
Wilkes, R. C. (A)

Noank (CON-1)
Lapenson, S. (M)

Noroton Heights (CON-1)
Mason, H. L. (A)
Becker, J. P. (M)
Horan, J. J. (M)

North Branford (CON-1)
Johnstone, P. N. (M)

Northford (CON-1)
Baker, R. R. (A)
Stone, F. A. (M)

North Haven (CON-1)
Barker, R. C. (M)
Davidson, D. S. (M)
Utting, G. R. (M)
Valley, R. A. (M)

North Stamford (CON-F-1)
Doolittle, H. D. (M)
Rabin, R. (M)

North Woodbury (CON-1)
Petit, F. W. (M)

Norwalk (CON-F-1)
Barr, F. M. (M)
Beattie, J. M. (M)
Bernard, P. (A)
Bertram, J. J. (M)
Brunhart, W. (A)
Bruntil, I. M. (M)
Buckley, R. E. (M)
Clark, J. L. (SM)
Courchene, E. E., Jr. (M)
Coutermash, L. E. (A)
Curtiss, R. H. (A)
Damsteadt, A. L. (M)
Georgi, E. A., Jr. (A)
Gettner, D. A. (M)
Grimstad, E. J. (A)
Heinold, E. F. (M)
Kay, M. (M)
Keats, G. H. (M)
Levy, E., Jr. (M)
Mehr, M. H. (M)
Milinowski, A. S. (M)
Miller, E. F. (M)
Miller, T. W. (M)
Muchnick, P. (M)
Neuman, G. J. (M)
Polak, R. (A)
Poland, W. L. (A)
Pritkin, L. (A)
Raposki, F. A., Jr. (M)
Rodgers, L. M. (SM)
Russo, J. J. (A)
Scherer, B. L. (M)
Shea, J. E. (M)
Slaker, F. A. (A)
Smith, P. J. (M)
Smith-Vaniz, W. R., Jr. (M)
Stein, H. S. (M)
Steinberg, G. N. (M)
Theall, C. E., Jr. (A)
Tulsan, S. S. (M)
Weesner, A. F. (M)
Williamson, R. G. (M)
Wines, W. R. (M)
Woodcock, E. L. (SM)

Norwich (CON-1)
Henry, W. O. (A)
Keltonic, F. J. (A)

Oakdale (CON-1)
Whannel, R. L. (M)

Old Greenwich (CON-F-1)
Fenn, W. W. (M)
Fulton, O. H., Jr. (M)
Harrington, R. H., Jr. (M)
Harris, J. S. (SM)
Janik, C. L. (A)
Lott, A. L. (M)

Murphy, J. L. (SM)
Palmer, J. H. (A)

Old Lyme (CON-1)
Haglund, B. R. (M)
Simoneau, E. P. (M)
Webb, H. R. (M)

Old Saybrook (CON-1)
McBrian, J. E. (M)
Radom, R. (M)

Orange (CON-1)
Jamison, A. F. (M)
Riccio, L. A. (A)
Sandner, C. A. (SM)

Pawcatuck (CON-1)
Crandall, C. P., Jr. (M)

Plainville (CON-1)
Cutler, M. A. (A)

Plantsville (CON-1)
Thayer, D. C. (A)

Pouquonnock Bridge (CON-1)
Chapman, R. Y. (M)

Portland (CON-1)
Pulda, A. H. (A)

Putnam (CON-1)
Bernier, E. J. (M)
Bosworth, C. D. (A)
Bove, K. G. (M)
Roller, E. R. (A)

Quaker Hill (CON-1)
Coogan, E. A. (M)
Pallanoe, E. P. (A)
Scannell, E. H., Jr. (A)
Sentell, F. N. (M)

Redding Ridge (CON-F-1)
Rand, P. S. (SM)

Ridgefield (CON-F-1)
De Chambrier, P. (M)
Danuff, M. L. (A)
Davis, P. F. (A)
Delany, E. B. (M)
Doll, H. G. (SM)
Edlohoffer, E. A. (SM)
Ferre, M. C. (M)
Grant, M. L. (A)
Heller, J. H. (A)
Herino, K. W. (M)
Kunz, K. S. (M)
Miller, G. K. (SM)
Reoloole, F. S., JR. (SM)
Rhyins, R. W. (M)
Seoesman, F. F. (M)
Shooren, J. (A)
Smith, J. S. (M)
Wesley, C. A. (M)
Williams, G. C. (A)

Riverside (CON-F-1)
Burns, R. F. (A)
Didriksen, J. B. (A)
Ellsworth, W. C. (SM)
Huckel, O. W., JR. (A)
Rvan, W. R. (M)
Unger, J. W. (M)

Rockville (CON-1)
Davids, W. (A)
Lanadon, D. H. (M)
Schneider, R. W. (A)

Rocky Hill (CON-1)
Friedman, S. (SM)
Meios, D. H. (M)
Warren, J. A. (M)

Rowayton (CON-F-1)
Fredrick, R. E., JR. (M)
Ramage, W. W. (A)

Roxbury (CON-1)
Drake, F. H. (F)
Farr, H. K. (SM)

Saugatuck (CON-1)
Van Der Veen, H. (VA)

Seymour (CON-1)
Dana, A. S. (SM)
Fryncko, P. (M)

Shelton (CON-F-1)
Aiello, E. M. (M)
Zaskalicky, J. J. (M)

Short Beach (CON-1)
Maki, C. E. (M)

Simsbury (CON-1)
Oole, J. D. (A)
Schulz, H. R. (SM)
Shinn, C. E. (SM)
Smyers, B. A. (M)
Wood, R. H. (M)

Southington (CON-1)
Perkins, R. W. (A)
Raymond, G. H. (SM)

South Norwalk (CON-F-1)
Aoule, G. J. (A)

Singer, E. (M)
Skehan, J. W. (M)
Sontheimer, C. G. (M)
Sprague, R. E. (M)
Steinberg, E. B. (SM)
Stockman, W. E. (M)
Teichman, S. (M)
Trott, B. S. (SM)
Veremakis, C. (A)
Wachowski, H. P. (M)
Wahlberg, E. C. (SM)
Watts, D. E. (M)
Weiner, S. L. (M)
Wienski, S. E. (A)
Wilder, M. P. (SM)
Wischnia, H. F. (SM)
Wohl, J. G. (SM)
Yaeger, V. M. (M)
Zarkower, B. (A)
Zukowsky, W. S. (M)

Stepney (CON-F-1)
Weller, B. L. (M)

Stonington (CON-1)
Sherman, D. A. (M)
York, E. P. (A)

Storrs (CON-1)
Crompton, R. H. (M)
Haas, V. B., Jr. (M)
Hart, B. E. (M)
Knapp, C. H. (M)
Knauss, H. P. (M)
Kochenburger, R. J. (SM)
Lindorff, D. P. (M)
Lof, J. L. C. (SM)
Lucal, H. M. (M)
Melchy, M. A. (SM)
Northrop, R. B. (M)
Schultz, C. W. (M)
Timoshenko, G. S. (SM)
Torquersen, H. (M)
Torrance, J. H. (M)

Stratford (CON-1)
Craig, G. F. (SM)
Detar, D. R. (SM)
Fox, F. J. (M)
Keouch, E. C. (A)
Lolacono, J. V. (M)
Nelson, E. P. (SM)
Platt, W. G. (A)
Richard, R. L. (A)
Ryckman, W. D., Jr. (M)
Simko, R. S. (A)
Sweet, R. D. (A)

Suffield (CON-1)
Landers, T. P. (M)

Talcottville (CON-1)
Howard, L. L. (M)

Tariffville (CON-1)
Sluis, M. H. (M)

Terryville (CON-1)
Krenicki, J. (M)

Thomaston (CON-1)
Reynolds, A. C., Jr. (M)

Thompsonville (CON-1)
Hurley, A. F. (A)
Jackson, C. H. (SM)
Tavidian, E. (M)
Vesce, A. J. (A)
Ziegler, I. A. (M)

Tolland (CON-1)
Penney, A. W. (M)
Weston, F. B. (VA)

Torrington (CON-1)
Geer, D. A. (A)
Gerbi, H. S. (M)
Silver, L. (A)
Wilczenski, A. M. (A)

Trumbull (CON-F-1)
Angel, H. R. (M)
Balooh, J. J., Jr. (M)
Dresser, W. R. (SM)
Howard, N. S. (A)
Raonese, F. L. (A)
Schiro, A. J. (A)
Schweitz, E. P. (M)
Zahn, E. (M)

Wallingford (CON-1)
Brazee, J. A. (M)
Davis, R. B., Jr. (A)
Hoff, P. T. (M)
MacDonald, D. H. (A)
Palmero, A. (M)
Schaefer, R. W. (M)

Waoaine (CON-1)
Cronin, C. E. (M)
Lahr, O. A. (A)
Martin, H. E. (M)
Stoker, W. C. (SM)

Warehouse Point (CON-1)
Henry, W. L. (M)
Lovkzy, J., Jr. (M)

Waterbury (CON-1)
Biamonte, R. L. (M)
Boisvert, G. R. (M)
Busby, A. E. (A)

Cannizzaro, M. (M)
Finelli, P. C. (A)
Garrity, G. E. (A)
Hales, F. B. (M)
Koren, S. (SM)
Martinelli, A. A. (A)
McLeod, K. A. (A)
Migliaro, B. J. (A)
Pannullo, F. T. (A)
Pesce, W. J. (S)
Pichard, L. A. (SM)
Platt, F. L., Jr. (A)
Quinn, Q. Q. (M)
Somers, D. L. (M)
Staneski, W. (M)

Waterford (CON-1)
Dunn, C. M. (M)
Hawfner, S. J. (SM)
Henrikson, F. R. (M)
Jellerson, F. R. (M)
Jucksch, W. J. (M)
Olson, R. C. (M)
Stevens, A. M., Jr. (A)
Weatherlow, H. R. (M)
White, D. M. (M)
Whiteside, R. E. (M)
Wilms, H. J., Jr. (M)

Watertown (CON-1)
Bryson, R. W. (A)

Weatogue (CON-1)
Hildebrandt, W. J. (M)

Westbrook (CON-1)
Wren, W. M. (A)

West Hartford (CON-1)
Andersen, W. A. (M)
Bonrret, C. J. (M)
Chase, A. E. (A)
Cohen, M. H. (M)
Ferla, S. J. (M)
Galin, J. L. (M)
Grammer, G. (F)
Handy, F. E. (M)
Harris, D. J. (M)
Hattan, A. T. (A)
Holland, J. H. (M)
Hornett, H. (M)
Jopson, J. L. (M)
Kendall, D. E. (M)
Lalanne, R. L. (A)
McCrae, A. W. (M)
Perkins, W. W. (SM)
Rich, L. G. (M)
Salow, S. R. (A)
Smith, N. F., Jr. (SM)
Southworth, M. P. (M)
Stanley, P. F. (M)
Sultes, C. W. (A)
Warner, S. E. (SM)
Williams, H. V. (A)
Witte, R. (M)
Woodward, R. W. (SM)
Zaslow, J. (M)

West Haven (CON-1)
Corvari, J. (M)
Coxeter, G. W. (M)
Fidler, H. E. (A)
Kricek, J. V. (M)
Rougelot, R. S. (M)

Weston (CON-1)
Chadwick, M. P. (SM)
Kruse, J. R., Jr. (M)
Willis, P. A. (M)

Westport (CON-F-1)
Aylor, R. P., Jr. (VA)
Cassidy, M. E. (M)
Coop, W. C. (M)
Ellinger, L. (SM)
Gaffney, F. J. (F)
Goodyear, W. (M)
Haoooti, J. C. (A)
Hanson, O. B. (F)
Johnson, A. F. (M)
Levine, S. (M)
Mason, F. G. (A)
Masterson, E. (M)
Rackey, C. A. (SM)
Roshkind, H. (M)
Steinhardt, L. (A)
Stone, C. G., Jr. (M)
Swift, W. C. G. (A)
Wolff, G. (M)

West Redding (CON-F-1)
Rahal, N. S. (M)

West Suffield (CON-1)
Boring, J. W. (A)

Wethersfield (CON-1)
Beal, E. W. (M)
Bernard, D. T. (A)
Harden, L. R. (A)
House, L. C. (M)
Latina, M. S. (M)
Manoanelli, F. D., Jr. (M)
Mitchell, J. A. (M)
Paquette, G. A. (A)
Rhodes, P. G. (M)
Santucci, A. H. (M)
Strempfer, W. L. (A)

Wilton (CON-F-1)
Dibner, D. (M)

Duore, H. P. (M)
Erstad, J. (M)
Godefroy, A. F. (M)
Heck, R. F. (A)
Levick, H. (M)
Riley, A. J. (M)
Ruckstuhl, C. E., Jr. (M)
Van Collie, H. A. (A)

Windham Center (CON-1)
Miller, A. C. (SM)

Windsor (CON-1)
Hanlin, J. W. (M)
Harrington, C. F., Jr. (M)
Intalliata, S. J. (A)
Nelson, G. E. (M)
Shohara, R. (M)
Van Vliet, W. G. (A)

Windsor Locks (CON-1)
Grav, N. L. (M)
Kidwell, N. E. (M)

Winsted (CON-1)
Bolus, J. J. (M)

Wolcott (CON-1)
Winchell, A. M. (SM)

Woodbridge (CON-1)
Montgomery, R. H., Jr. (A)

Woodbury (CON-1)
Harris, W. T. (SM)
Nye, J. R. (SM)

DELAWARE

Camden (PHI-3)
Davison, C. R. (M)

Claymont (PHI-3)
DaGrosa, V. (A)
McEowen, J. R. (M)

Dover (PHI-3)
De Rosa, J. H., Jr. (M)
Duff, T. O. (A)
Miller, R. E. (M)
Yeager, R. L. (M)

Hockessin (PHI-3)
Morris, J. M. (SM)

Lewes (PHI-3)
Bierwirth, R. A. (M)

Marshallton (PHI-3)
Graebe, R. H. (M)

Milford (PHI-3)
Drummond, W. D. (A)

Newark (PHI-3)
Albright, C. M., Jr. (M)
Arnold, N. W. (M)
Bolaiano, L. P., Jr. (M)
Dell, C. G. (M)
Freeman, L. A. (M)
Gottschalk, W. M. (M)
Hellerman, H. (M)
Hill, D. L. (M)
Lutz, B. C. (M)
McClure, R. W. (A)
Robinson, D. M. (A)
Van Name, F. W., Jr. (SM)
Young, M. G. (SM)

New Castle (PHI-3)
Christiansen, G. H. (M)
Cushing, C. J. (M)
Hampton, L. R. (A)

Newport (PHI-3)
Rick, C. E. (A)

Wilmington (PHI-3)
Bauman, M. C. (M)
Bowyer, K. M. (A)
Carter, E. P. (M)
Conner, H. G. (M)
Couser, W. D. (M)
Dills, W. L. (M)
Faulhaber, M. E. (M)
Gallagher, G. J. (M)
Hughes, R. M. (A)
Kelly, N. B. (M)
Kisko, R. P. (A)
Liddicoat, C. A. (M)
Lovett, R. S. (M)
Mandas, J. J. (M)
McDaniel, F. (M)
McMillen, R. C. (SM)
Meyer, G. E. (A)
Miller, T. M. (M)
Moore, J. T., Jr. (A)
Myette, R. F. (A)
Nicholson, D. W. (M)
Noonburg, W. I., Jr. (A)
Owens, J. E. (M)
Paris, R. (A)
Pastell, D. L. (M)
Perkins, J. R. (SM)
Petze, C. L., Jr. (SM)
Seer, H. G. (M)
Shashous, F. E. (M)
Swarter, P. H., Jr. (A)
Swearer, H. F. (M)
Walsh, R. R. (A)

Weir, D. G. (M)
Williams, T. R. (M)

DELAWARE

Wright, R. R. (SM)
Yetter, E. W. (M)

DISTRICT OF COLUMBIA

Anacostia (W-DC-3)
Riccobono, S. (VA)

Washington (W-DC-3)
Abel, R. L. (M)
Abraham, G. (SM)
Abromavage, M. M. (M)
Adair, G. P. (F)
Adams, R. J. (SM)
Ahearn, J. L., Jr. (SM)
Albertson, F. W. (SM)
Alexander, J. A., Jr. (M)
Alexander, L. K. (A)
Algor, M. M. (M)
Allen, J. H. (SM)
Allen, P. J. (SM)
Allman, F. L. (VA)
Altomare, R. E. (M)
Arent, W. S. (SM)
Anders, F. W. (M)
Anderson, D. J. (SM)
Anderson, L. D. (M)
Anderson, R. V. (M)
Andrasco, C. J. (M)
Andrew, W. M. (M)
Andrias, J. (M)
Ankney, L. J. (A)
Antesberger, E. A. (A)
Anthony, A. R. (M)
Antonov, A. F. (A)
Apperson, D. D. (M)
Apuli, J. A. (SM)
Arnaldo, A. F. (A)
Arnett, H. D. (SM)
Astholz, P. T. (SM)
Atmore, R. G. (M)
Au, B. D. (M)
Awramik, J., Jr. (SM)
Ayer, W. T. (M)
Bago, T. C. (M)
Bailey, S. O. (M)
Bailey, S. L. (F)
Bain, W. F. (M)
Ball, N. T. (SM)
Ball, R. H. (A)
Bank, W. J. (M)
Banning, W. C. (M)
Barker, D. E. (M)
Barlow, G. E. (A)
Bass, C. A. (M)
Batdorf, S. B. (SM)
Bates, E. L. (A)
Bauer, P. S. (VA)
Baxter, L. M. (M)
Bearce, L. S. (A)
Beasley, W. A. (SM)
Beck, H. M. (M)
Begue, G. P. (M)
Behrens, W. V. (M)
Belcher, H. P. (A)
Bell, O. K. (SM)
Bengston, P. S. (A)
Benjamin, V. E. (M)
Benns, W. E., Jr. (M)
Benton, L. A. (M)
Berg, W. B., Jr. (M)
Bergeson, A. H. (SM)
Berilla, D. (M)
Bernard, W. B. (SM)
Betts, J. F. (M)
Birmingham, H. P. (SM)
Bistrup, J. H. (M)
Black, R. R. (SM)
Blake, L. V. (M)
Blumberg, W. J. (M)
Boesch, P. W. (A)
Bohnert, J. I. (SM)
Booth, R. M., Jr. (M)
Bostick, B. E. (M)
Bourland, L. T. (SM)
Boymel, B. R. (SM)
Brady, F. B. (SM)
Brantley, W. W. (M)
Breen, J. M. (A)
Breetz, L. D. (SM)
Brennan, J. X. (M)
Brenner, M. (M)
Breslauer, A. F., Jr. (M)
Brester, W. A. (VA)
Brody, H. I. (A)
Brodzinsky, A. (M)
Brooden, J. W. (SM)
Brown, H. W. (SM)
Brown, H. E. (A)
Brown, R. M. (M)
Brown, S. R. (M)
Brown, T. H. (VA)
Bryant, F. B. (M)
Buck, C. U., Jr. (A)
Buckberg, M. L. (M)
Bullington, E. W. (M)
Bullock, G. M. (M)
Bullock, R. N. (M)
Bumpus, W. W. (M)
Burke, A. A. (SM)
Burkett, J. A. (M)
Burns, R. D. (SM)
Butenhoff, R. L. (M)
Byers, J. N. (A)
Callaway, H. D. (M)
Campagna, J. H. (SM)
Carnes, W. T., Jr. (SM)
Carpenter, H. E., Jr. (M)
Carpenter, M. B. (M)
Carpenter, R. A. (A)
Carter, J. M. (A)
Carter, J. M. (M)
Cauffman, J. A. (M)
Cavanaugh, J. P. (M)
Celander, B. (A)
Chan, W. K. W. (M)
Chandler, C. E. (M)
Chappelle, C. K. (SM)
Chernikoff, R. (M)
Chi, A. R. (M)
Chrzanowski, P. (SM)
Clark, G. L. (M)
Clark, H. L. (M)
Clark, N. M. (M)
Clark, R. J. (M)
Clarke, A. S. (SM)
Clarke, F. H. (SM)
Clasen, S. M. (M)
Claydon, R. G. (A)
Cleeton, C. E. (F)
Clement, L. M. (F)
Clements, S. E. (SM)
Clemons, T. C., Jr. (A)
Coates, R. J. (SM)
Codel, M. (M)
Cohen, L. R. (M)
Colalanni, J. V. (M)
Colligan, F. S. (A)
Conrad, G. T., Jr. (M)
Cooley, R. W. (M)
Corkill, J. F. (M)
Cosby, L. A. (M)
Counts, S. T. (M)
Courtis, R. P. (VA)
Crabill, P. F., Jr. (A)
Cranshaw, R. H. (A)
Craven, T. A. M. (F)
Crenca, J. J. (M)
Crenshaw, C. M. (SM)
Creveling, C. J. (SM)
Crickman, C. W. (M)
Croarkin, J. A. (M)
Cubbage, H. D. (M)
Cuellar, O. L. (A)
Cullen, F. H. (A)
Culver, R. H. (M)
Cumings, R. G. (M)
Cunningham, J. A. (M)
Cushing, R. E. (M)
Damelin, J. (A)
Danner, B. L. (M)
Dame, F. R. (M)
Daubenheyer, H. W. (M)
Davies, R. C. (M)
Davis, B. L. (SM)
Davis, E. H. (A)
Davis, G. C. (SM)
Davis, R. C. (A)
Davis, T. McL. (F)
Davis, W. L. (M)
Davis, W. J. (A)
Dawson, L. R. (SM)
Day, H. M. (M)
Decker, K. M. (M)
Dellinger, J. H. (F)
De Milla, J. (M)
Demmerle, A. (M)
Deolan, L. (SM)
Diels, J. C. (M)
Dietz, A. P. (M)
Dillard, E. L. (A)
Dillon, J. C., Jr. (M)
Di Masso, R. T. (A)
Dinger, H. E. (F)
Dinnick, G. M. (M)
Dix, E. L. (M)
Doane, J. E. (SM)
Dodrill, G. E. (SM)
Doheny, J. F. (M)
Dohne, C. F. (M)
Dolle, W. C. (M)
Donovan, E. J. (M)
Doong, H. (M)
Dorrell, R. E. (SM)
Dorsey, H. G. (F)
Downing, K. D. (M)
Doyle, W. T. (M)
Draper, C. A. (M)
Dressin, S. A. (M)
Dropkin, H. A. (M)
Dubesteanu, I. (A)
Duncan, F. B. (B)
Duncan, J. R. (M)
Duncanson, A. B. (A)
Dunn, J. H. (SM)
Dupree, F. F., Jr. (M)
Easton, R. L. (M)
Eaton, W. W. (SM)
Elliott, H. H., Jr. (M)
Ellis, B. J. (M)
Emile, P., Jr. (M)
Evalle, A. S. (A)
Evans, S. (A)
Eveleman, C. L. (F)
Ennis, A. G. (M)
Eustace, R. J. (M)
Fahy, E. J. (SM)
Falk, M. B. (A)
Falvey, J. P. (M)
Fedak, J. (M)
Ferris, C. D. (M)
Fine, H. (M)
Fine, S. (A)
Finney, W. J. (SM)
Fleming, H. D. (M)
Fleming, H. P. (A)
Fleming, J. J. (M)
Floegel, M. E. (A)
Flores, R. A. (M)
Fluhr, F. R. (M)
Fong, L. B. C. (SM)
Foreman, A. H. (M)
Forrest, H. S. (SM)
Fowler, R. W. (M)
Franklin, P. J. (SM)
Franza, A. L. (M)
Fratianni, S. V. (SM)
Fraumann, J. W. (A)
Frazier, H. S. (SM)
French, C. G. (M)
Friedberg, I. S. (M)
Friedman, D. C. (M)
Friedman, G. F. (M)
Friel, F. J., Jr. (VA)
Fuchs, W. C. (M)
Fuller, I. W., Jr. (M)
Fulper, R., Jr. (M)
Gabriel, W. F. (M)
Galane, I., B. (SM)
Galicinao, I. Y. (A)
Gall, J. E. (VA)
Gancie, J. J. (A)
Garcia, S. C. (M)
Garner, L. H. (A)
Gautney, G. E. (M)
Gaylord, R. E. (M)
Gebhard, L. A. (F)
Gee, W. S. (SM)
George, S. F. (SM)
Gephart, C. L. (M)
Gerber, H. (M)
Gerharz, R. J. (SM)
Gerstenberg, H. M. (M)
Gibson, T. J. (M)
Gieseler, W. L. (M)
Gignoux, F. E., Jr. (A)
Gilbert, L. H. (VA)
Gillette, K. G. (M)
Gleason, R. F. (M)
Glenn, L., Jr. (A)
Golden, T. S., Jr. (SM)
Goldina, E. I. (M)
Goodman, A. I. (M)
Goodman, S. I. (M)
Goutos, A. (M)
Grant, F. W. (SM)
Graves, F. V. (A)
Greathouse, D. E. (A)
Grebenkemper, C. J. (SM)
Green, W. C. (VA)
Greenberg, D. L. (M)
Greene, R. M. (M)
Gregory, C. M. (A)
Grider, J. M. (M)
Griffith, K. E. (M)
Griffiths, F. J. (M)
Grisamore, N. T. (M)
Grobowski, Z. V. (SM)
Groverman, A. B. (M)
Gunn, R. (F)
Gunshinan, T. B. (M)
Gustafson, C. E. (A)
Guthrie, R. C. (M)
Gwaltney, C. M. (A)
Haoen, J. P. (F)
Halsilo, D. T. (M)
Hall, T. G. (A)
Hall, W. H. C. (M)
Hamilton, C. R. (SM)
Hamrick, J. D. (M)
Hanley, T. E. (SM)
Harlan, W. E. (A)
Harris, D. S. (M)
Harris, F. D. (A)
Harris, W. P. (M)
Harrison, J. H. (M)
Harter, J. R. R. (M)
Hastings, H. F. (SM)
Hauptman, G. (M)
Hayden, L. O. (M)
Haynes, A. P. (A)
Hays, N. P. (M)
Hazelwood, C. A. (M)
Head, H. T. (SM)
Hedge, L. B. (M)
Heinz, K. E. (A)
Hemenway, D. F. (M)
Hennessey, F. L. (M)
Henry, W. O. (M)
Henson, R. F. (A)
Hepler, D. S. (M)
Herbert, T. O. (M)
Herman, H. (M)
Herman, J. (SM)
Herndon, P. H., Jr. (SM)
Hesse, A. W. (M)
Higgins, R. E. (M)
Hill, J. S. (SM)
Hill, R. L. (M)
Hinds, J. E., Jr. (M)
Hine, M. K., Jr. (M)
Hobbis, C. E. W. (M)
Hodges, M. F. (SM)
Holmes, C. M. (A)
Hooker, R. H. (A)
Horan, E. F. (SM)
Horava, A. P. (A)
Horman, F. L. (M)
Horne, R. C., Jr. (SM)
Howard, C. I. (M)
Howard, D. D. (SM)
Howard, E. G. (M)
Howe, W. E. W. (SM)
Hull, D. R. (F)
Hunt, C. M. (SM)
Huntoon, R. D. (F)
Hurvitz, H. (M)
Hymowitz, E. W. (M)
Ihnat, J. (M)
Inoles, H. C. (SM)
Irons, H. R. (M)
Irvine, J. S. (M)
Israel, L. J. (SM)
Jacocks, T. B. (SM)
Jaffe, G. (M)
James, G. E. (SM)
Jansky, C. M., Jr. (F)
Jansky, M. M. (M)
Jenkins, J. W. (M)
Jenkins, J. L. (SM)
Jennings, M. H. (SM)
Jesswein, A. J., Jr. (A)
Joffe, N. (M)
Johanningsmeier, W. F. (M)
Johansen, G. N. (SM)
Johnson, C. V. (M)
Jones, C. T. (A)
Jones, G. (A)
Jones, H. S., Jr. (M)
Jones, U. T. (A)
Julian, O. K. (M)
Kahal, R. (SM)
Kahler, F. C. (SM)
Kaiser, H. F. (A)
Kales, M. L. (M)
Kalmus, H. P. (F)
Kaputa, E. J. (M)
Katzin, M. (F)
Kaufman, J. (SM)
Kaufman, M. G. (SM)
Keachie, J. H. (SM)
Kear, F. G. (F)
Keenan, R. J. (A)
Keller, J. E. (SM)
Kellerman, K. F. (SM)
Kennedy, R. L. (SM)
Kershner, S. W. (M)
Killian, T. J. (F)
King, A. F. (A)
King, A. M. (M)
King, E. S. (M)
King, W. J. (M)
Kinsey, L. F. (M)
Kirby, P. S. (A)
Kirshner, J. M. (A)
Klass, P. J. (M)
Klise, K. W. (M)
Kloeffler, R. G. (F)
Knight, G. L. (M)
Knowles, R. C. (M)
Knox, C. B. (M)
Kohler, H. W. (SM)
Kolkedy, J. G. (M)
Kouchnerkavich, T. A. (M)
Kowalski, C. L. (M)
Kramer, E. R. (A)
Kramer, E. (A)
Krawczewicz, S. T. (M)
Krupen, P. (SM)
Kube, H. D. (A)
Kuch, B. L. (M)
Kuder, M. J. (A)
Kuhnle, R. C. (A)
Kulback, S. (SM)
Kurner, C. J. (M)
Kyser, R. H. (M)
Laker, E. F. (A)
Lantz, P. A. (SM)
Larison, J. F. (A)
La Rue, C. E. (M)
Lawsine, L. (M)
Leavitt, W. E. (M)
Ledley, R. S. (M)
Lee, F. M. (A)
Lee, F. P., Jr. (A)
Leidy, K. L. (M)
Leifer, J. C. (SM)
Leiner, A. L. (M)
Leiphart, J. P. C. (M)
Leone, J. M. (M)
Leppert, M. L. (M)
Lesko, N. J. (M)
Le Tellier, J. M. (M)
Lewis, C. H. (SM)
Lewis, J. E. (M)
Lewis, J. I. (M)
Lieberman, T. (A)
Light, L. (M)
Lilmatainen, T. (SM)
Link, J. H. (A)
Link, J. C. (SM)
Lipscomb, J. L. (M)
Liss, F. T. (M)
Little, R. P. (M)
Loeber, C. W. (SM)
Lohnes, G. M. (SM)
Looney, C. H., Jr. (M)
Lorentz, E. F. (M)
Lorenzen, H. O. (M)
Loucks, P. G. (M)
Lovell, W. A. (M)
Lowe, M. J., Jr. (A)
Lutrell, N. H., Jr. (M)
Mabry, J. H. (A)
Macneill, R. K. (A)
Maddox, C. H. (SM)
Maddox, R. G. (M)
Malden, R. M. (SM)
Mantek, P. A. (A)
March, J. W., Jr. (A)
Marini, J. W. (M)
Marsh, E. V. (M)
Martin, A. P., Jr. (M)
Martin, J. F. (M)
Martin, K. L. (A)
Martin, P. J. (M)
Marzullo, S. (A)
Maskaleris, C. L. (M)
Masterson, J. P. (M)
Matacotta, M. (A)
Mathes, R. H. (M)
Mathews, R. L. (A)
Mayer, C. H. (M)
Mayewsky, V. Y. (M)
Mayo, R. D. (M)
Mayo-Wells, W. J. (SM)
McCallum, J. D. (M)
McClain, E. F. (SM)
McClenon, D. (SM)
McGowan, J. E. (M)
McGunigal, W. E. (A)
McIntosh, F. H. (M)
McIntosh, W. L. (A)
McKenna, J. A., Jr. (A)
McKinney, J. C. (M)
McLain, T. E. (M)
McLaughlin, D. J. (SM)
McMann, I. H. S. (SM)
McNary, J. C. (SM)
Meads, S. K. (M)
Mechling, E. P. (SM)
Medrow, K. R. (M)
Melton, G. H. (M)
Meltzer, A. C. (M)
Merritt, E. A. (A)
Metcalf, G. F. (F)
Metz, H. I. (SM)
Miles, P. D. (SM)
Miller, F. P. (SM)
Miller, J. E. (M)
Mindedal, J. (M)
Mischler, E. F. (SM)
Misner, R. D. (SM)
Mitchell, F. T., Jr. (SM)
Mitchell, G. J. (M)
Mitchell, J. H., Jr. (M)
Mitchell, M. B., Jr. (M)
Molander, A. B. (A)
Montgomery, G. F. (SM)
Montgomery, G. T. (A)
Moore, A. H. (M)
Moore, N. N. (M)
Moore, W. J. (A)
Moreau, F. E. (A)
Morgan, E. D. (M)
Morris, H. (A)
Morse, N. A. N. K. (M)
Muchmore, T. F. C. (M)
Mullaney, J. H. (SM)
Muncy, C. F. (M)
Muncy, J. H. (M)
Murray, A. F. (F)
Nallor, D. J. (A)
Naylor, D. A. (M)
Neely, G. M. (M)
Nelson, D. H. (M)
Nichols, W. A. (M)
Niedbalski, N. B. (A)
Nolan, T. H. (M)
Nordenberg, H. M. (M)
Nowakoski, D. B. (M)
O'Brien, B. C. (M)
O'Brien, J. R. (SM)
O'Brien, V. T. (M)
Ochoa, A. S. (M)
O'Connell, J. D. (F)
Odarenko, T. M. (F)
Oelke, H. J. (M)
Oertel, M. F. (A)
Ohman, G. P. (SM)
Oltunen, K. E. (A)
Olin, W. C. (M)
Ornstein, E. (M)
Oscar, I. S. (A)
Otto, E. D. (SM)
Ould, R. S. (M)
Over, J. J., Jr. (M)
Owens, R. B. (SM)
Packard, A. C. (SM)
Page, E. C. (SM)
Page, I. H. (SM)
Page, R. M. (F)
Page, V. E. (M)
Paine, H. G. (M)
Palik, F. (M)
Palmer, C. E., Jr. (A)
Parpas, P. (M)
Parls, H. B., Jr. (M)
Parker, R. D. (F)
Parks, A. O. (M)
Parry, C. A. (SM)
Passerini, H. J. (M)
Pease, C. H. (A)
Peaslee, J. R. (M)
Pelzman, L. (M)
Perritte, J. L. (M)
Perry, J. E. (A)
Peselnick, L. (A)
Peterkin, E. W. (M)
Peters, C. W. (SM)
Peterson, H. L. (SM)
Petry, C. A. (SM)
Pfund, C. E. (M)
Philactos, C. J. (M)
Pickar, A. D. (M)
Pike, E. H. (M)
Pitsenberger, J. W. (A)
Plavnieks, E. (SM)
Plummer, C. B. (SM)
Plummer, W. E. (SM)
Ponklous, C. E. (M)
Poris, D. C. (SM)
Postove, H. (M)
Potter, R. S. (M)
Powers, W. F. (A)
Powles, F. T. (SM)
Powley, A. T. (M)
Pratt, H. A. (M)
Pulvari, C. F. (SM)
Pyle, E. J., Jr. (M)
Pynn, G. W. (M)
Queen, F. D. (M)
Rabinow, J. (F)
Radkowsky, L. (M)
Raker, S. K. (M)
Ramos, E. (M)
Ramos, P. A. L. (A)
Randall, C. R. (A)
Ransom, R. A. (M)

Rasmussen, A. R. (M)
Ray, H. A., Jr. (SM)
Read, A. H. (SM)
Redcay, P. W. (M)
Reed, O. W. B., Jr. (SM)
Reed, S. F. (M)
Regarth, C. G. B. (A)
Reid, D. G. (M)
Renner, J. J. (M)
Reynolds, D. E. (M)
Richardson, D. J. (M)
Richardson, W. M. (SM)
Rickerson, D. M. (SM)
Rietzke, E. H. (SM)
Riley, L. A. (A)
Rine, A. D. (VA)
Ringler, D. H. (A)
Ringwalt, D. L. (M)
Robertson, B. S., Jr. (A)
Robinson, C. A., Jr. (M)
Robinson, H. H. (SM)
Robinson, K. L. (M)
Robinson, R. E. III (M)
Robson, A. B., Jr. (M)
Rogers, E. B. (M)
Rohlfs, D. C. (M)
Rohrer, R. E. (SM)
Rohrich, G. J. (VA)
Rollo, R. T. (A)
Rooker, W. T., Jr. (M)
Rosen, H. H. (M)
Rosenberg, A. (A)
Rosenblatt, A. B. (A)
Rothenberg, W. B. (M)
Rothrock, H. B. (M)
Rouse, R. E. (A)
Royano, R. J. (A)
Rozak, D. T. (A)
Rubin, L. A. (M)
Rubin, S. (M)
Rumyantsev, Z. A. (A)
Ruscus, P. V. (A)
Russ, J. A. (M)
Russell, G. M. (M)
Russell, P. H., Jr. (A)
Ryan, W. E. (M)
Salisbury, L. L., Jr. (M)
Samuel, J. (A)
Sands, W. C. (M)
Sappe, N. G. (A)
Sarbacher, G. W., Jr. (A)
Schairer, N. J. (M)
Schenck, H. H. (SM)
Schenk, P. J. (SM)
Scherer, E. H. (M)
Schleter, G. C. (M)
Schmalbach, S. (M)
Schmidt, R. D. (M)
Schneider, W. H. (M)
Schooley, A. H. (F)
Schrack, R. A. (M)
Schrenk, M. H. (F)
Schurr, E. J. (A)
Schuti, V. L. (M)
Schuyler, W. E., Jr. (M)
Schwarz, K. M. (A)
Scott, D. G. (M)
Seaman, E. F. (SM)
Segal, P. M. (SM)
Segal, R. L. (M)
Seljo, E. (M)
Shamo, D. J. (M)
Sharp, N. S. (A)
Sharwin, N. S. (A)
Sheets, G. (A)
Sheets, M. J. (M)
Sherman, W. K. (SM)
Sherrill, H. P. (M)
Shields, W. T. (A)
Shimabukuro, K. (A)
Shoreman, A. (M)
Shumaker, J. F., Jr. (M)
Sibul, L. H. (A)
Sigman, M. (M)
Silling, P. F. (F)
Silins, A. (A)
Silliman, R. M. (SM)
Silver, S. H. (M)
Simas, V. R. (SM)
Singer, C. H. (SM)
Skaggs, G. A. (M)
Skramstad, H. K. (SM)
Small, C. F. (M)
Smeby, L. C. (SM)
Smith, E. R. (A)
Smith, F. A. B. (M)
Smith, J. E. (SM)
Smith, P. L. (SM)
Snow, R. F. (A)
Snyder, E. O. (M)
Snyder, S. S. (SM)
Southall, T. W., II (M)
Spalding, J. P. (SM)
Sprigos, A. J. (SM)
Sreb, J. H. (M)
Stahl, B. E. (VA)
Stair, R. (SM)
Stansbury, C. (SM)
Stanwick, T. (SM)
Starr, F. E. (A)
Steel, D. L., Sr. (M)
Stelar, H. P. (SM)
Stein, E. S. (M)
Stern, M. (M)
Steward, C. (M)
Stewart, R. B. (SM)
Stine, P. T. (M)
Stoleson, H. N. (A)
Stone, H. B. (M)
Stone, R. O. (M)
Stoops, C. W. (M)
Stout, C. M. (M)
Street, N. H. (M)
Sturno, W. D., Jr. (M)
Sturm, P. J. (SM)
Sullivan, A. H. (SM)
Sullivan, L. D. (M)
Sumoski, A. W. (SM)
Suski, H. M. (SM)
Svendsen, E. C. (M)
Swan, N. C. (A)
Sweet, R. A. (M)
Talshoff, S. J. (SM)
Talkin, A. I. (M)
Tall, R. E. (M)
Talmadge, H. G., Jr. (M)
Taylor, F. V. (SM)
Taylor, W. T. (SM)
Temple, F. B. (A)
Terauds, J. J. (M)
Tersoff, A. I. (SM)
Thacker, J. U. (M)
Thomas, L. W. (SM)
Thompson, R. T., Jr. (M)
Thorp, M. B. (A)
Thrift, S. R. (M)
Tiltcomb, F. C. (M)
Titus, D. C. (M)
Tozzi, L. M. (M)
Trexler, J. H. (A)
Trexler, R. C. (M)
Troutman, J. S. (M)
Trautner, J. R. (M)
Tschiego, C. E. (SM)
Tsuda, R. Y. (A)
Tuckerman, L. P. (SM)
Turner, G. S. (F)
Tuve, M. A. (F)
Ulrick, W. J. (M)
Vallin, J. M. (M)
Van Allen, L. N. (M)
Van Every, A. (M)
Van Horn, J. W. (M)
Van Leunen, P., Jr. (A)
Van Voorhis, S. N. (SM)
Vest, S. E. (M)
Vogel, H. O. (M)
Volpht, D. A. (M)
Votaw, M. J. (M)
Voznak, E. (M)
Wald, B. (SM)
Walden, G. R. (M)
Waldschmitt, J. A. (SM)
Walker, A. P. (SM)
Wallace, J. D. (F)
Warner, T. R. (A)
Waterman, H. H. (M)
Waterman, P. (M)
Watkins, W. H. (M)
Weathers, B. F. (A)
Weber, W. J., Jr. (M)
Webster, M. B. (M)
Weedman, W. F. (SM)
Weestein, J. H. (M)
Wehbe, E. A. (A)
Welmer, E. W. (M)
Weiss, F. (M)
Wellino, C. G. (A)
Wells, H. W. (F)
Wells, P. E. (A)
Wenger, F. E. (A)
Werth, M. W. (M)
Wetmore, G. C. (M)
White, C. F. (M)
White, W. A. (M)
Whitelock, L. D. (SM)
Whittemore, P. B. (SM)
Wilcox, R. H. (M)
Wilcox, R. L., Jr. (M)
Wilkinson, D. A. (M)
Williams, C. H. (M)
Williams, D. (SM)
Williams, E. I., Jr. (A)
Williams, J. R. (M)
Williams, M. P. (M)
Willis, J. W. (M)
Willston, S. S. (M)
Willoughby, J. A. (SM)
Wilson, M. W. (M)
Wimer, A. G., Jr. (SM)
Winn, O. D. (M)
Winston, G. C. (M)
Winter, W. T. (M)
Winters, J. N. (A)
Withington, F. G. (M)
Wood, G. W. (SM)
Works, H. A. (A)
Worne, B. E. (M)
Wright, J. H. (M)
Wright, R. B. (M)
Wynne, J. J. (A)
Yaoelowich, J. J. (M)
Yannarell, N. T. (M)
Yashir, A. A. (A)
Yatman, T. (A)
Yeazer, A. G. (M)
Youmans, A. B. (A)
Young, L. C. (F)
Young, P. J. (M)
Young, R. T., Jr. (SM)
Younger, H. C. (M)
Younson, E. J. (M)
Yovits, M. C. (M)
Yunk, G. W. (M)
Zakowski, L. F. (M)
Zastrow, K. D. (M)
Zeek, R. W. (SM)
Zinn, R. R. (M)

FLORIDA

Avon Park (MIA-3)
Williamson, E. P. (M)

Barton (F-WC-3)
Morrison, H. G. (A)
Williams, L. E. (M)

Bellair Beach (F-WC-3)
Andrews, E. F. (VA)

Boynton Beach (MIA-3)
Sayre, E. E. (M)

Bradenton (F-WC-3)
Brackmann, W. J. (SM)
Brand, P. M. (SM)
Dannals, E. W. (SM)
Hauber, E. N. (M)
Lampkin, G. F. (VA)
Schnell, F. H. (SM)
Whitehead, C. C., Jr. (M)

Brandon (F-WC-3)
Brodie, W. A. (A)

Brooker (CF-3)
Rhoads, A. S., Jr. (A)

Carrabelle (NWF-3)
Dykes, W. E. (A)

Clearwater (F-WC-3)
Adkisson, W. M. (M)
Ainsworth, F. W. (M)
Andrews, J. E. (M)
Billingsley, F. C. (SM)
Blakeslee, K. L. (M)
Bozardt, W. R. (A)
Bromander, G. C. (M)
Brown, P. F. (M)
Cleotells, H. J. (M)
Dale, C. H., Jr. (M)
Dubendorff, H. H. (M)
Duncan, B. J. (M)
Eckert, G. F. (A)
Ely, P. C., Jr. (M)
Farina, J. S. (M)
Fowler, H. V., Jr. (M)
Friebele, E. J. (M)
Gaillard, H. L. (A)
Gore, L. D. (M)
Grimes, E. S., Jr. (M)
Henning, R. E. (M)
Hunt, H. W. (M)
Inman, T. F. (SM)
Jansen, J. N. (M)
Kampe, E. A. (M)
Keeler, R. J. (SM)
Littlejohn, C. E. (M)
Morris, C. C. (M)
Parkes, D. A. (M)
Pate, G. W., Jr. (A)
Petersen, M. E. (M)
Pippin, J. E. (M)
Remond, F. X. (M)
Reynolds, G. E., Jr. (M)
Ryan, J. J. (M)
Scott, D. C. (M)
Seiler, N. C. (M)
Sloan, S. C., Jr. (M)
Smith, R. W. (A)
Southerly, N. D. (M)
Sparks, J. R. (M)
Sullivan, D. J. (M)
Summers, D. D. (M)
Swem, L. (SM)
Taft, D. R. (M)
Thomas, M. U. (M)
Tiller, W. H. (M)
Vergon, T. F. (SM)
Wells, J. D. (M)
Williamson, J. V. (A)
Wimberly, W. B. (M)
Wooten, W. W., Jr. (A)
Wright, J. C. (M)

Clearwater Beach (F-WC-3)
Miller, R. J. (M)

Cocoa (CF-3)
Adams, R. N. (A)
Bailey, C. W., Jr. (A)
Benn, D. G. (A)
Betts, P. H. (SM)
Blasingame, J. J. (M)
Burton, H. L. (M)
Collier, R. W., Jr. (A)
Cox, P. D. (M)
Edgerly, J. J. (SM)
Fowler, C. D. (M)
Gasparovitch, S. (A)
Ginn, R. (M)
Gotcher, R. W. (M)
Gray, J. O. (M)
Graziadio, S. J. (M)
Kwiatkowski, J. M. (A)
Lahr, N. L. (M)
Lesh, M. A., Jr. (M)
Lynerly, E. E. (A)
Mattor, C. E. (SM)
McMath, D. C., Jr. (A)
Melton, B. R. (M)
Payne, R. E. (SM)
Peeples, J. W., Jr. (A)
Rehwinkel, J. A., Jr. (M)
Spicer, W. H., Jr. (M)
Sweat, R. E. (A)
Terek, A. A. (A)
Toole, P. C. (SM)
Valentine, L. (A)
Wright, C. J., Jr. (SM)
Zimmerman, M. G. (A)

Cocoa Beach (CF-3)
Allen, M. H. (M)
Baldini, E. A. (M)
Brown, W. R. (M)
Campbell, R. L. (SM)
Carpenter, R. D. (A)
Chaltoff, M. (A)
Corte, R. L. (A)
Ducker, J. D. (A)
Eaton, H., Jr. (M)
Ellington, J. E. (A)
Elliott, J. O. (M)
Glermundson, G. J. (M)
Goldberg, G. A. (M)
Gould, M. J. (SM)
Guelzow, C. W. (A)
Hasner, D. R. (M)
Hartman, R. E. (A)
Hiers, K. G. (A)
Jackson, R. H. (M)
Jester, A. H., Jr. (M)
Keener, N. A. (A)
Mackey, A. J., Jr. (M)
Mead, M. C., Jr. (A)
Myers, W. A. (M)
Noone, J. R. (A)
Parker, J. E. (M)
Pasley, E. W. (A)
Pope, A. E. (M)
Ritter, L. M. (A)
Sandhofer, E. R. (M)
Scott, J. H. (M)
Stelff, D. L. (A)
Sustare, B. A. (M)
Telcha, C. K. (A)
Terry, J. F. (M)
Thibodeau, R. A. (M)
Thoman, C. A. (M)
Vallurat, A. J. (M)
Warner, H. V. (A)
Wever, L. R. (M)
White, J. R. (M)
Wilson, C. B. (SM)
Wood, R. E. (M)
Wright, T. R. (M)

Coconut Grove (MIA-3)
Rosenson, A. H. (A)

Coral Gables (MIA-3)
Birch, R. S., Jr. (M)
Christochel, G. H. (M)
Clarke, V. E. (M)
Eubanks, J. M. (M)
Graves, H. B. (A)
Haeger, J. R. (M)
Harrell, S. R. (M)
Lang, L. B. (A)
Macklin, F. R. (M)
Ray, P. R. (M)
Roberts, F. G., Jr. (VA)
Ryan, C. M. (SM)

Cross City (CF-3)
Carr, C. E. (A)

Dade City (F-WC-3)
Touchton, C. F., III (M)

Daytona Beach (CF-3)
George, E. H. (SM)
La Tour, J., Jr. (M)
Siegel, J. J. (A)

Deerfield Beach (MIA-3)
Vigil, A. E. (M)

Destin (NWF-3)
Eddy, H. C. (A)
Pierce, W. E. (SM)

Doctor's Inlet (CF-3)
Mason, W. A. (M)

Dunedin (F-WC-3)
Aird, A. W. (M)
Barton, G. R. (SM)
Blincoe, H. P. (M)
Day, W. B. (M)
Dorrell, W. B., Jr. (M)
Funke, W. G. (M)
Greenwood, R. E. (M)
Hinchee, A. E. (A)
Karnath, N. A. (M)
Kelly, W. C. (M)
McLaren, D. C. (A)
Venaglia, E. J. (SM)
Wilson, L. K. (A)

Eau Gallie (CF-3)
Allman, D. L. (M)
Alvarez, J. (M)
Baker, R. C. (M)
Beach, A. R. (SM)
Bickeler, D. H. (M)
Bivans, R. W. (M)
Bond, J. F. (M)
Bradford, G. E. (M)
Brown, R. S. (M)
Brown, W. H. (M)
Cahill, W. J. (M)
Castello, R. C. (M)
Clark, F. J. (SM)
Cossman, J. W. (SM)
Cockerham, F. E. (A)
Cook, R. M. (A)
Dahlmann, V. R. (A)
De Jonche, J. J. (M)
De Mars, S. A. (M)
Dibble, H. L. (M)
Doane, H. J. (M)
Downs, J. W. (SM)
Dozier, E. C. (A)
Du Bose, R. L., Jr. (A)
Duryee, J. B. (M)
Eaton, C. B. (M)
Eckenrode, A. H. (SM)
Finley, J. D. (M)
Foole, R. E. L., Jr. (M)
Griffith, M. E. (SM)
Hafer, F. L. (M)
Hallenbeck, S. M. (A)
Harris, B. E., Jr. (M)
Harris, C. F. (A)
Hatcher, E. T. (M)
Herring, R. W., Jr. (M)
Hickman, R. S. (M)
Hill, D. R. (M)
Hines, W. S. (A)
Hlavaty, E. M. (M)
Holmes, T. G. (M)
Johnson, R. A. (SM)
Johnson, R. J. (M)
Jonas, A. (M)
Jones, A. E. (M)
Jones, R. B. (M)
Kaeser, J. M. (SM)
Kahlenberg, A. H. (A)
Kasser, H. N. (A)
Katalva, F. B. (M)
Knowles, D. M. (M)
Korsal, J. W. (A)
Lindemann, N. L. (A)
MacGregor, W. R. (SM)
Madrid, D. C. (M)
Mann, M. E., Jr. (A)
McCarthy, E. A. (M)
Miller, R. T. (A)
Mock, B. H. (M)
Muller, R. M. (M)
Nordbusch, J. L. (M)
Ollinkkala, E. E. (M)
Paul, H. C. (A)
Pierce, J. R. (M)
Poehler, H. A. (SM)
Powell, L. W. (M)
Rathbone, W. M. (M)
Rector, C. V. (M)
Richardson, E. W. (M)
Robbins, L. S. (M)
Shem, I. (M)
Shirley, R. C. (M)
Simpson, E. M., Jr. (M)
Smith, A. E. (A)
Smith, C. E. (M)
Smith, J. J. (M)
Spurling, A. G. (SM)
Stallworth, A. W., Jr. (A)
Stoklas, F. P. (M)
Sundberg, G. A. (A)
Thomas, D. H. (M)
Turley, R. N. (M)
Turner, S. D., Jr. (M)
Vice, V. W. (M)
Votava, Y. (M)
Walker, D. H. (A)
Walker, J. R. (M)
Weiss, B. J. (M)
Weiss, E. J. (M)
Wesp, I. H. (M)
West, K. A. (SM)
Wilson, H. C. (M)
Wooded, K. M. (M)
Wynn, J. B., Jr. (M)
Young, C. H. (M)
Young, L. R. (M)

Eglin AFB (NWF-3)
Albright, R. E. (M)
Armstrong, J. L. (M)
Baxter, W. D. (M)
Ellis, J. R., Jr. (M)
Fortner, E. G. (M)
Hanson, G. B. (M)
Hendrix, C. E. (M)
Hohman, V. R. (M)
Holman, W. E. (M)
Locklair, J. M. (M)
Meeker, J. I. (M)
Romiti, V. L. (M)
St. Germain, A. A. (A)
Scheible, W. R. (M)
Schofield, D. F. (M)
Shanks, F. B. (M)
Sites, F. J. (M)
Somerset, R. D. (M)
White, A. R. (M)

Englewood (F-WC-3)
Clapp, J. K. (F)

Floral City (F-WC-3)
Palka, F. M. (M)

Fort Myers (F-WC-3)
Lynch, A. H. (SM)
Stiles, J. E. (M)

Fort Myers Beach (F-WC-3)
Dashiell, E. V. (SM)

Fort Lauderdale (MIA-3)
Bassett, R. E., Jr. (VA)
Clippard, R. W. (M)
Cook, H. A. (M)
Cummings, M. M. (M)
De Hass, T. M. (A)
Dice, W. H. (M)
Dondlinger, R. W. (M)
Evans, C. L. (M)
Everhart, M. R. (M)
Gorder, L. O. (A)
Granucci, F. P. (A)
Harding, K. P. (M)
Hieronymus, T. G. (SM)
Mazzeo, B. A. (M)

Needs, W. R. (A)
Nugent, J. A. (A)
Pritchard, W. S. (M)
Richardson, M. S. (M)
Schmidt, F. G. (A)
Schwartz, H. C. (A)
Stetson, H. T. (M)
Thompson, H. V. (SM)
Vlasak, W. R. (A)
Walker, M. C. (M)
Wisner, C. V., Jr. (A)

Fort Pierce (CF-3)
Goldsborough, P. (SM)

Fort Walton (NWF-3)
Bloomquist, J. C. (A)
Brown, M. J. (M)
Falkenberg, H. R. (M)
Fowler, L. O. (M)
Howard, F. E., Jr. (M)

Fort Walton Beach (NWF-3)
Allen, K. J. (M)
Atkinson, R. L. (M)
Butler, F. M., Jr. (A)
Coe, R. B. (M)
Combs, J. W. (A)
Cooper, M. J. (M)
Cox, E. R. (M)
Ellis, R. J. (M)
Elmore, H. J. (M)
Fleming, G. C. (M)
Gamel, W. W. (M)
Hammack, J. W. (M)
Hartmann, D. W. (M)
Herold, R. R. (M)
Hicks, W. S. (A)
Hilson, E. A. (M)
Howe, J. W. (A)
Hufnagle, H. H. (M)
Huntley, K. L. (SM)
Jackson, W. E. (M)
Kirlin, W. F. (M)
Lane, J. H. (M)
Leach, F. W. (M)
Locher, J. P., III (M)
Long, C. E., Jr. (M)
Longaker, C. D. L. (M)
Lucas, H. B. (A)
McCuale, J. E. (M)
Post, R. H. (M)
Reuther, C. R. (M)
Schneider, C. R. (A)
Tedeschi, A. (A)
Todd, M. A. (M)
Wallace, J. E. (M)
Wierenga, W. B. (A)
Wilson, L. L. (M)
Zwaska, J. F. (M)

Gainesville (CF-G-3)
Abernathy, J. L. (M)
Akre, R. O. (SM)
Arvin, R. J. (M)
Barvisi, M. W. (A)
Bean, E. W., Jr. (A)
Brenner, J. C. (SM)
Bridoland, T. F., Jr. (M)
Chambers, R. P. (M)
Chen, W. H. W. (M)
Cisne, L. E. (M)
Day, W. R., Jr. (M)
Dickinson, P. C. (M)
Eaker, L. C. (M)
Eisenberg, M. F. (M)
Elfe, T. B. (SM)
Elgerd, O. I. (SM)
Erickson, E. E. (M)
Fisk, H. V. (SM)
Forsman, M. E. (M)
Frerking, H. W. (M)
Fuller, K. H. (M)
Garrott, W. L. (SM)
George, T. S. (SM)
Halley, W. M. (M)
Hines, M. M. (M)
Konino, R. E. (M)
Kundel, T. (SM)
Lally, P. M. (SM)
Lanoston, C. A. (M)
Larsen, M. J. (SM)
Latour, M. H. (SM)
Lear, W. E. (SM)
Massey, W. A. (M)
Mathews, B. E. (A)
McManus, W. K. (M)
Minkel, M. S. (M)
Montoomery, H. R. (M)
Neidert, J. H. (SM)
Newhall, S., Jr. (M)
Perry, A. D. (A)
Peterson, W. W. (M)
Price, W. A. (M)
Raczynski, A. T. (M)
Reichert, K. R., Jr. (M)
Renkiewicz, H. F. (M)
Rich, C. E. (SM)
Richmond, R. E. (A)
Rolfe, F. R. (M)
Rosier, N. E. (A)
Russ, D. S. (M)
Schrader, G. F. (SM)
Schwartz, L. (M)
Schwartz, S. (M)
Searles, C. B. (M)
Shaffer, C. V. (SM)
Sias, F. R., Jr. (M)
Silas, L. W. (M)
Smith, S. B. (M)
Sterling, R. W. (A)
Strauss, R. (SM)
Stubbs, J. E. (M)
Sutherland, A. D. (M)
Swearingen, J. D. (M)
Tierney, D. R. (M)
Veronda, C. M. (SM)
Walters, J. H. (M)
Warner, F. W. (M)
Weil, J. (F)
Westmeyer, J. A. (M)
Wing, A. H., Jr. (SM)
Winters, B. C. (A)
Zetrouer, W. F., II (M)

Green Cove Springs (CF-3)
Haselwood, D. E. (M)

Greenville (CF-3)
Bailey, J. W. (A)

Gulf Breeze (NWF-3)
Coleman, D. T., Jr. (M)

Gulfport (F-WC-3)
Lindtner, J. (A)

Hialeah (MIA-3)
Fossler, D. E. (M)

Holly Hill (CF-3)
Bodnar, J. M. (M)

Hollywood (MIA-3)
Cook, H. A. (A)
Fraser, H. B. (A)
Lane, H. K. (A)

Homestead AFB (MIA-3)
Knight, J. R. (SM)

Indialantic (CF-3)
Gilbreath, R. E., Jr. (A)
Kearney, R. J. (M)
McKee, J. F. (A)
Moore, P. H. (M)
Shaw, G. S. (SM)
Westphal, F. C. (M)

Indian River City (CF-3)
Boone, K. E. (M)
Haydon, R. E. (SM)
Herring, H., Jr. (SM)
Jacobus, R. G. (A)
Moreyn, H. J. (M)
Phillips, M. J. (M)

Indian Rocks Beach (F-WC-3)
Ble, E. W. (M)
Schenck, G. C. (M)

Jacksonville (CF-3)
Acosta, E. (A)
Bean, J. O. C. (M)
Binnix, R. G. (A)
Carruth, D. C. (M)
Crowell, L. J. (A)
Dandelake, J. (M)
Ffoulkes, C. E. (M)
Ficke, H. C. (A)
Helmsing, L. C. (A)
Hill, A. L. (A)
Holman, J. C. (M)
Kray, J. F., Jr. (A)
Martindale, N. B. (A)
McClure, G. F. (M)
Meadow, W. L. (M)
Mullins, R. M. (M)
Osmundsen, G. A. (A)
Strandberg, P. R. (M)
Shirvis, R. A. (A)
Vordermark, E. B. (SM)
Weber, D. C. (M)
Welmer, R. H. (A)
Wilcoxon, L. (A)

Jupiter (MIA-3)
Maxwell, C. D. (A)

Key West (MIA-3)
Anderson, B. G., Jr. (M)
Bajus, J. C. (M)
Braun, P. A. (M)
Brooks, J. F. (SM)
Cobb, A. D. (M)
Conable, J. H. (M)
Cook, H. B. (SM)
Dame, A. M. (M)
De Noon, N. L. (A)
Ervi, W. L., Jr. (M)
Fitch, G. E. (M)
Lenkerd, J. P. (M)
McMasters, P. A. (SM)
Myers, C. B. (A)
Payne, V. E. (M)
Phelps, R., Jr. (A)
Simpson, W. E. (M)
Small, D. G. (M)
Snyder, R. D., Jr. (M)
Swafford, L., Jr. (A)
Waller, E. C. (M)
Yowell, G. M., Jr. (M)

Kissimmee (ORL-3)
Greenman, L. R. (M)
Ramer, J. P. (M)

La Belle (MIA-3)
Williamson, H. L. (A)

Lakeland (F-WC-3)
Allen, J. G. (SM)
Clorey, F. J. (A)
Polskin, L. J. (A)

Lake Wales (F-WC-3)
Kimbrel, G. F. (A)

Lake Worth (MIA-3)
Baran, A. S. (M)
Elam, L. A. (A)
Goudeau, J. P., Jr. (M)
Larkin, J. P. (M)
Wood, W. H. (M)

Lantana (MIA-3)
Paslay, L. C. (M)

Largo (F-WC-3)
Abernathy, T. C. (M)
Bailey, R. L. (M)
Berry, H. W. (SM)
Christensen, T. W. (M)
Cyphers, V. M. (A)
Denison, J. W. (A)
Eadie, D. (SM)
Edwards, N. L. (A)
Finegan, E. F., Jr. (M)
Fryer, R. B. (M)
Humphrey, B. E. (M)
Lazarchik, R. E. (M)
Lewis, H. R. (M)
Macomber, G. R. (A)
Marion, J. F. (M)
Miller, J. H. (F)
Nations, C. T. (M)
Parker, R. F. (M)
Savalli, F. P. (A)
Schmidt, A. P. (M)
Shaw, H. S. (F)
Steele, F. E. (M)
Weems, N. T., Jr. (M)
Woodruff, D. L. (M)

Leesburg (ORL-3)
Ball, I. D. (SM)

Lockhart (ORL-3)
Hoeft, E. R. (M)

Lutz (F-WC-3)
Wallace, S. K. (A)

Lynn Haven (NWF-P-3)
Barry, C. J. (M)
White, P. K. (M)

Madeira Beach (F-WC-3)
Day, F. R. (SM)
Hassell, J. E. (M)
Wenner, R. G. (M)

Maitland (CF-3)
Bales, C. W. (M)
Bayston, T. E. (M)
Byerly, E. H. (A)
Duquet, E. A. (M)
Goldsmith, J. (SM)
Holmes, L. G. (M)
Johnson, R. E. (M)
Malysek, J. J. (A)
Nelson, L. (M)
Raboy, B. (SM)
Spleoel, S. S. (M)
Staub, H. R. (SM)
Taglauer, E. R. (M)
Williams, H. M. (SM)
Willard, M. W. (M)
Yancey, J. L. (M)

Margate (MIA-3)
Nemetz, R. (A)

Marianna (NWF-3)
Poulsen, N. R. (M)
Saunders, E. N. (A)

Mary Esther (NWF-3)
Atherly, D. H. (A)
Bennich, E., Jr. (M)
McCarthy, D. W. (M)
Nichols, J. (A)

Melbourne (CF-3)
Anderson, B. E., Jr. (M)
Apriletti, C. A. (M)
Barbee, G. S., Jr. (M)
Barkes, R. L. (M)
Barton, R. H. (M)
Berube, G. N. (A)
Booth, R. Y. (M)
Boska, R. (M)
Burns, M. C. (SM)
Burrows, C. R. (F)
Dym, R. L. (M)
Cauthen, I. L. (M)
Clark, L. P. (SM)
Clarke, R. L. (A)
Conerly, P. (M)
Davenport, F. S. (M)
Davis, H. B. O. (M)
Denius, H. R. (SM)
Detweiler, J. E. (A)
Dickerson, J. P., Jr. (M)
Dodgson, W. W., Jr. (A)
Doughty, S. D. (M)
Duggan, G. S. (M)
Eddins, W. T. (M)
Falls, M. P. (SM)
Farabee, L. B. (M)
Ferguson, R. E. (A)
Fisher, H. F., Jr. (M)
Fleming, J. S. (M)
Fletcher, R. C. (M)
Frausto, B. (A)
Friedland, M. S., (SM)
Glass, W. F. (M)
Griffin, C. E. (M)
Grover, D. W. (M)
Half, M. C. (M)
Harris, L. (M)
Hartley, J. T., Jr. (M)
Hartzog, G. R., Jr. (M)
Haygood, W. D. (M)
Hazel, W. M. (M)
Hoeppner, C. H. (F)
Houghton, R. A. (M)
Howard, D. C., Jr. (M)
Hyde, K. C., Jr. (M)
Jackson, C. H. (M)
Jaffe, A. P. (M)
Jones, J. R. (M)
Knight, J. P. (A)
Lenke, R. H. (M)
Leonard, S. E. (SM)
Mahaffey, R. F. (M)
Marquand, R. E. (M)
Martin, J. W. (A)
McLamb, F. D. J. (M)
McMillian, L. S., Jr. (M)
McRae, D. D. (M)
Mederos, T. S., Jr. (M)
Merwin, R. L., Jr. (SM)
Meyer, E. G. (SM)
Murray, R. V. (M)
Myers, C. E. (M)
O'Kelley, H. E. (SM)
Pace, A. J. (M)
Pelchat, G. M. (M)
Petiljohn, R. E. (M)
Petiler, P. R. (M)
Petty, T. D., Jr. (M)
Pickover, H. (M)
Plaisted, R. O. (M)
Preece, B. P. (A)
Preece, R. G. (M)
Quinlivan, W. F. (M)
Ragsdale, R. G., Jr. (M)
Ratliff, M. (M)
Rawnsley, J. A. (M)
Robinson, J. A. (M)
Scharia-Nielsen, H. (SM)
Searcy, J. H. (A)
Sellers, J. D. (M)
Shingler, D. F. (A)
Talbott, D. C. (M)
Tomlinson, J. W. (M)
Tommerdahl, J. B. (M)
Toolan, W. W. (A)
Vansant, F. T. (M)
Walter, J. M., Jr. (M)
Wang, C. C. (SM)
Wentzel, M. G. (A)
West, C. F. (M)
Wicker, G. E. (M)
Widerquist, V. R. (SM)
Wiener, W. A. (M)
Williams, L. E. (SM)
Williamson, F. R., Jr. (M)
Work, R. A., Jr. (M)
Yatauro, P. (A)
York, L. M. (A)
Young, J. (A)
Young, P. D. (A)

Melbourne Beach (CF-3)
Dodson, L. F. (SM)
Fox, R. A. (SM)
Glover, E. B. (M)
Jory, J. H. (M)
Kolderup, L. E. (A)
Wren, A. W., Jr. (A)

Melrose (CF-G-3)
Gano, O. R. (M)

Merritt Island (CF-3)
Ciaffardini, A. N. (A)
Cooper, W. H. (SM)
Damme, M. C. (A)
Danihor, C. E. (A)
Martin, J. D. (M)
Metts, L. W. (A)
Morris, H. N. (SM)
Noda, T. T. (A)
Raulins, K. R. (M)
Shupe, P. G. (M)
Sorrell, D. (M)
Thomas, W. A., Jr. (M)
Turbeville, W. L. (M)

Miami (MIA-3)
Adcock, S. E. (SM)
Alter, J. E. (M)
Bernard, H. E. (M)
Bledsoe, R. E. (M)
Brookes, K. E. (A)
Brookfield, R. F. (A)
Bryant, C. S. (A)
Camus, G. E. (M)
Cates, D. R. (M)
Cheng, K. Y. (M)
Craig, P. H. (SM)
Dale, K. N. (A)
Danielsen, D. A. (M)
Dann, R. (M)
Drexel, A. (A)
Dupree, J. N. (M)
Easterbrook, L. J., Jr. (M)
Embree, L. O. (M)
Epperson, W. H. (SM)
Evans, H. (A)
Francis, J., Jr. (M)
Gordon, L. L. (SM)
Gussow, S. S. (A)
Hall, G. L. (M)
Ham, B. D. (A)
Hamrick, W. H. (M)
Hannum, E. W. (M)
Hardesty, G. A. (M)
Heilings, F. J. (M)
Herrmann, N. P. (M)
Jeffcoat, T. D. (M)
Johnson, W. H., Jr. (M)
Johnson, W. L., Jr. (M)
Jones, R. M. (M)
Jones, T. J. (M)
Jorgensen, O. J. (M)
Keller, J. W., Jr. (SM)
Kimball, E. W. (SM)
Kinney, W. E. (M)
Kitson, J. E., Jr. (A)
Kraft, F. J. (M)
Larkins, G. L. (M)
Lehfeldt, H. J. (A)
Lewis, E. W. (VA)
Lledholz, G. A. (M)
Livingston, I. (M)
Lockwood, E. C. (SM)
Loring, B. L. (M)
Magee, T. T. (A)
Mangus, G. (A)
Martin, S. (M)
Mason, E. C. (A)
McLeod, B. F. (SM)
Middleton, T. F., Jr. (A)
Miller, M. A. (SM)
Naim, J. B. (M)
Nirenberg, A. (M)
Paasch, R. H. (M)
Palmer, R. P. (A)
Perkinson, J. A. (M)
Pohl, J. S. (M)
Pollack, B. H. (M)
Pollack, M. (M)
Randolph, H. D. (M)
Reid, T. D. (M)
Rider, F. E. (SM)
Rogers, E. R. (M)
Rondel, V. D. (A)
Shamblin, H. D. (M)
Shattuck, J. C. (M)
Shay, J. A. (M)
Silva, C. (A)
Smith, R. L. (M)
Sneed, J. O. (M)
Soltesz, A. (M)
Soukaras, K. M. (M)
Spragg, L. A. (M)
Stephens, F. H., Jr. (M)
Ware, P. (SM)
Weber, G. L. (M)
White, K. M. (M)
Wollin, E. (M)
Wright, A. (M)
Yeager, H. R. (SM)
Young, P. A. (M)
Young, W. E. (M)
Zahniser, R. W. (M)

Miami Beach (MIA-3)
Boundy, G. G. (SM)
Kantor, R. R. (M)
May, B. M. (A)
Rechter, R. J. (M)
Richter, H. L. (A)
Sanfield, S. H. (M)
Senauke, A. (SM)
Shrooshire, A. W. (VA)
Square, A. L. (A)

Miami Shores (MIA-3)
Shearer, S. L. (A)

Miami Springs (MIA-3)
Atkins, G. T. (SM)
Cook, C. (A)
Mehrling, H. W. (M)
Morgan, W. R., Jr. (A)
Murr, V. E. (VA)
Rose, R. M. (M)
Stanphill, J. R. (M)

Milton (NWF-3)
Farrar, R. L. (A)
Johnson, C. I. (M)

Monticello (NWF-3)
Groves, C. L. (A)

New Smyrna Beach (CF-3)
Dinwiddie, E. W. (M)
Kimmell, R. G. (M)
McNatt, E. J. (M)

North Fort Myers (MIA-3)
Hollenback, H. G. (A)

North Miami (MIA-3)
Castle, C. X. (M)
Parsons, E. G. (M)
Sawyer, J. L. (A)

North Miami Beach (MIA-3)
Fischer, A. J. (M)
Ostheimer, E. J. (M)
Rifkin, M. S. (M)

North Palm Beach (MIA-3)
Adams, V. F., Jr. (A)
Cordell, B. P., Jr. (M)
Craver, J. N. (M)
Lefka, M. (M)

Oldsmar (F-WC-3)
Miller, L. S. (A)
Wilt, R. E. (M)

Ona Locka (MIA-3)
Goetz, O. E. (A)

Orlando (ORL-3)
Alexander, J. E. (M)
Anderson, E. B. (A)
Anderson, G. F. (A)
Arbuckle, W. L. (M)
Barnett, F. M., Jr. (A)
Barrett, J. W. (SM)
Basch, A. L. (M)
Bauer, J. A. (SM)
Bauer, L. H. (A)
Beers, W. T. (A)
Bendett, R. M. (M)
Bishon, R. P. (M)
Blumenstein, O. J. (M)
Bobber, R. J. (M)
Boeard, J. R. (M)
Bolt, A. T., Jr. (A)
Boulist, T. A. (M)
Bradbury, L. D. (A)
Bramble, C. A., Jr. (A)
Branch, W. D. (M)
Brantley, J. Q., Jr. (SM)
Brell, R. I. (M)
Brisham, R. C. (A)
Browder, L. P. (M)
Brown, J. O. (A)
Browning, R. N. (A)
Buchan, J. F. (A)
Buchanan, D. B. (M)
Camolon, H. H. (M)
Carlson, W. J. (A)
Carnahan, P. G. (M)
Carr, S. O. (M)
Chasteen, J. W., Jr. (SM)
Clarke, W. H. B. (M)
Clifford, R. F. (A)
Clutterham, D. R. (SM)
Collins, H. P. (A)
Conley, J. W., III (M)
Criddle, W. S. (M)
Cullman, F. A. (SM)
Darling, R. E. (A)
Davis, V. L. (M)
Day, W. R. (M)
Decino, A. (SM)
Dement, J. F. (M)
Dickinson, R. H. (SM)
Doroshow, S. R. (SM)
Dudley, W. A. (A)
Duke, J. B., III (M)
Duval, A. N. (A)
Eagle, G. R. (A)
Eastman, M. R. (M)
Epperton, W. H. (M)
Etzold, D. J. (M)
Everingham, L. R. (SM)
Fisk, N. H. (M)
Flaherty, J. B., Jr. (M)
Ford, R. E. (SM)
Gardner, N. H. (M)
Garrard, J. T. (M)
Gass, C. A. (M)
Gernt, R. L. (M)
Godlewski, V. J. (A)
Grab, F. W. (M)
Green, R. E., Jr. (M)
Grimes, J. W., Jr. (M)
Gryder, W. L. (M)
Haney, D. W. (M)
Hardison, C. W. (M)
Hawley, D. T. (M)
Hazel, H. K. (M)
Heffner, R. W. (A)
Herbeck, A. E. (M)
Herndon, J. W. (SM)
Hickman, D. A. (M)
Hill, G. R. (SM)
Hoover, K. W. (M)
Horton, W. H. (SM)
Houston, E. E., Jr. (M)
Hughes, E. A. (SM)
Isaacson, S. (M)
Jaramillo, I. G. (M)
Johnson, C. W. (M)
Johnson, L. M. (M)
Johnson, P. B. (M)
Jones, A. H. (A)
Kaiser, C. J. (M)
Kaolan, S. M. (SM)
Karkeck, P. (A)
Kasowski, S. E. (M)
Katis, C. W. (A)
Kaufmann, W. (SM)
Keating, T. J. (M)
Kehoe, A. V. (A)
Keith, C. E. (SM)
Kent, R. (SM)
Keoner, W. E. (SM)
Kirkley, E. L., Jr. (A)
Klaasen, B. J. (M)
Koch, C. P. (M)
Koeosell, E. M. (A)
Korn, R. A. (A)
Kowalski, R. (A)
Lang, E. E., Jr. (M)
Langnaui, E. A. (M)
Lanzkron, R. W. (M)
Larson, K. T. (SM)
Layfield, L. C. (M)
Le Grand, H. R. (M)
Levy, A. J. (A)
Lewis, R. D. (M)
Linden, A. E. (SM)
Lipowitz, E. (A)
Lioten, B. (M)
Longley, R. M., Jr. (M)
Lowrie, R. W. (M)
Marks, W. S., Jr. (F)
McDirmit, E. L. (M)
McGinnis, C. E. (SM)
Merrill, J. (M)
Mesa, A. M., Sr. (A)
Metz, D. F. (M)
Mills, L. W. (A)
Minderman, P. A. (M)
Mixsell, S. A. (M)
Moody, W. R. (M)
Moore, T. A. (M)
Morgan, J. C. (A)
Moss, B. B. (A)
Myers, A. C., Jr. (M)
Ness, J. W. (M)
Newberry, V. A. (M)
Newell, R. A. (M)
Nilson, M. N. (A)
Norris, C. H. (M)
O'Donnell, G. H. R. (SM)
Painter, P., Jr. (SM)
Panzitta, J. (A)
Parker, C. D. (M)
Patrick, W. S. (SM)
Paxton, R. K. (M)
Payne, R. C. (M)
Pennanen, V. W. (A)
Perich, M. (A)
Phillips, R. L. (M)
Poole, H. H. (M)
Powers, D. M. (M)
Reed, E. F. (M)
Reel, W. R. (M)
Rhodes, D. R. (SM)
Richard, S. J. (M)
Robinson, B. H., Jr. (M)
Rollins, J., Jr. (M)
Rothar, D. E. (M)
Ruthenberg, W. G. (M)
Ryder, A. V. (M)
Saltsburg, S. S. (M)
Sasser, T. (M)
Schisler, C. W. (M)
Schleider, N. (A)
Schneider, V. A. (M)
Schwartz, C. J. (A)
Scofield, B. L. (A)
Severance, F. D. (M)
Shaw, W. H. (M)
Sheffield, T. W. (M)
Shreckengost, R. C. (SM)
Smith, G. S. (SM)
Smythe, R. C. (M)
Snyder, L. J. (A)
Solis, W. M. (M)
Starling, W. H. (M)
Staschke, R. A. (A)
Stateler, D. V. (M)
Stelene, L. H., Jr. (A)
Sternbach, S. J. (A)
Stevenson, G. D. (A)
Stuco, R. L. (M)
Suganuma, P. K. (A)
Summer, C. F., Jr. (M)
Tanguay, A. R. (SM)
Tims, E. F. (SM)
Tioton, R. W. (A)
Tracy, J. E. (M)
Trioce, W. D. (M)
Trutter, J. A. (A)
Tucker, R. W., Jr. (M)
Turner, R. E. (M)
Uzel, F., Jr. (M)
Van Nostrand, P. B. (M)
Von Pahlen-Fedoroff, G. (A)
Watts, H. M. (SM)
Weaver, W. R. (M)
Webber, H. E. (SM)
Weber, R. L. (SM)
Williams, W. T. (M)
Wilson, G. D. (A)
Wilson, S. J. (A)
Wona, J. B. (A)
Wooldridge, A. L. (SM)
Woolsey, W. O. (M)
Yarbrough, J. E. (SM)
Yokomoto, R. K. (A)
Young, R. L., Jr. (A)

Palatka (CF-3)
Yelverton, C. W. (M)

Palm Bay (CF-3)
Mesa, J. O. (SM)

Palm Beach (MIA-3)
Sarbacher, R. I. (SM)

Palm Harbor (F-WC-3)
Everitt, B. A. (M)

Panama City (NWF-P-3)
Ault, J. F. (M)
Bell, L. W. (M)
Buffkin, W. R. (M)
Bryant, W. E., Jr. (M)
Cartwright, C. C. (M)
Crosby, A. E. (M)
Davey, S. W. (A)
Davis, A. J. (M)
De Coutouly, G. C. (SM)
Evjen, H. M. (SM)
Galloway, R. T. (M)
Goodrich, R. F. (M)
Hagemann, J. (SM)
Harper, F. M. (M)
Haulman, C. A. (SM)
Hill, J. W. (M)
Holm, C. H. (M)
Kleinfelder, D. S. (M)
Koesy, C. B. (M)
Lloyd, B. H. (M)
Lowry, R. C. (M)
Marley, S. B. (M)
Mathis, G. P. (M)
Miller, C. E., Jr. (M)
Mire, P. (M)
Moody, J. G. C. (M)
Murohree, F. J., Jr. (M)
Naas, H. M. (M)
Naeseth, M. H. (A)
Partridge, A. B. (M)
Penton, H. H. (M)
Rhyne, W. A. (M)
Soratt, R. E. (M)
Steffen, G. P. (M)
Teel, W. A. (M)
Thomas, A. M. (M)
Wells, W. E. (M)
Wheeler, R. H. (M)
Whittaker, C. A. (M)

Patrick AFB (CF-3)
Abbit, C. W. (M)
Anderson, J. P. (M)
Black, R. L. (A)
Blake, J. T. (M)
Borders, C. R. (SM)
Burgen, J. G., Jr. (M)
Campbell, C. C. (A)
Cloher, J. A. (M)
Day, R. W. (M)
Fada, C. V. (M)
Galloway, J. A. (M)
Haberhern, W. J., Jr. (M)
Hamerman, L. (M)
Hart, C. L. (A)
Hewett, C. W. (A)
Hoener, H. B. (A)
Knauf, G. M. (M)
Leal, C. V. (A)
Leonard, W. E. (M)
Lietzan, A. A. (M)
McCoy, S. E. (M)
Mitchell, R. W. (M)
Moran, F. D. (SM)
Nelson, R. V. (M)
Perkins, F. M., Jr. (A)
Piseky, S. (M)
Quotidonine, F. (M)
Richardson, W. A. (M)
Ross, J. A., Jr. (M)
Rowland, M. O. (M)
Schum, E. J. (A)
Sellars, R. F. (M)
Smallwood, W. O. (M)
Spontak, J. (M)
Thomoson, W. W. (A)
Van Iderstine, T. J. (A)
Wiss, G. (A)
Yates, D. N. (SM)
Young, W. L. (M)
Zinn, T. B., Jr. (M)

Pensacola (NWF-3)
Dunham, R. E. (M)
Evans, E. W. (A)
Fisher, D. W. (M)
Hixson, W. C. (M)
Kohr, C. M. (A)
Moore, B. G., Jr. (A)
Owen, W. A. (M)
Reither, S. I. (M)
Simpson, E. S., Jr. (A)
Williamson, K. A. (A)

Pine Castle (ORL-3)
Chin, W. Y. (M)

Pinecastle AFB (ORL-3)
Duvoisin, P. F. (A)

Pinelas Park (F-WC-3)
Cozart, A. B. (M)
Kuckler, G. C. (M)
Ross, R. J. (A)

Plant City (F-WC-3)
Cockrell, J. H. (A)
Kendrick, F. D. (M)

Pompano Beach (MIA-3)
Burt, J. M. (A)
Johnson, T. B. (M)
Miller, J. M. (F)

Port Canaveral (CF-3)
Bryant, J. D. (A)
Ellis, G. W. (M)
Goff, H. C. (M)
Jacoby, M. C. (M)
Sanders, A. W. (M)
Sheppard, D. C. (M)

Port St. Joe (NWF-3)
Mefford, C. W. (M)

Redington Beach (F-WC-3)
Ebeling, W. (M)

Rockledge (CF-3)
Childers, F. M. (A)
Gallo, L. F. (A)
Horchler, F. W. (M)
Rawls, O. B. (M)
Smith, D. L. (M)

Safety Harbor (F-WC-3)
Farrar, H. B. (A)
Lego, H. F. (A)

St. Augustine (CF-3)
Berger, M. (A)

St. Petersburg (F-WC-3)
Aucremann, R. C. (M)
Bare, C. C. (M)
Bartlum, G. C., Jr. (A)
Bellare, D. (SM)
Benfield, C. W. (SM)
Boulay, R. R. (A)
Britton, E. R. (SM)
Brown, D. C. (M)
Carlson, K. L. (A)
Carnevale, M. D. (A)
Carnevale, V. D. (M)
Carr, G. W. (SM)
Codding, W. J. (M)
Colbert, D. C. (M)
Cooper, C. B. (A)
Councilman, C. L. (SM)
Davis, J. H. (M)
Dingley, E. N., Jr. (F)
Donaldson, M. R. (SM)
Durham, B. H. (M)
Dyer, J. H. (M)
Ellason, M. C. (SM)
Fazio, F. (A)
Feldhusen, R. L. (A)
Felton, L. E. (SM)
Findley, L. K. (SM)
Garver, R. H. (A)
Goldberg, H. L. (A)
Goldie, S. P. (M)
Gonzalez, R. E. (M)
Grieder, E. A. (A)
Griesi, R. N. (A)
Halem, N. (A)
Hamblin, L. A. (A)
Hart, W. F. (A)
Hauohton, W. B., II (A)
Hemmer, F. A., Jr. (M)
Hoffman, R. S. (M)
Horner, G. F. (M)
Jelen, M. J. (SM)
Johnson, B. (M)
Johnson, R. E. (M)
Karmen, A. (M)
Katelansky, P. (M)
Kimberlin, D. E. (A)
Klein, M. S. (SM)
Kraxberger, G. S. (A)
Langmack, C. E. (M)
Lawton, G. P. (SM)
Levine, A. (M)
Lindtner, E. G. (A)
Ludwick, C. A. (A)
Martoccia, F., Jr. (M)
Munday, T. W. (A)
Myers, R. T. (M)
Paparello, P. J. (A)
Paris, H. T. (A)
Parvin, R. H. (M)
Peacock, W. T., Jr. (A)
Pelton, E. A. (A)
Phillips, E. M. (SM)
Phillips, J. E. (M)
Randolph, G. L. (M)
Rasmussen, R. M. (M)
Robinson, A. J. (M)
Rowlinson, D. E. (M)
Saraydar, R. A. (M)
Sawyers, E. R. (A)
Schieferstin, R. W. (M)
Schinski, D. L. (A)
Sibley, R. C. (A)
Simon, L. H. (M)
Smith, M. P. (M)
Snipes, W. C. (A)
Snyder, H. Z. (SM)
Soldwedel, H. T. (SM)
Sollie, S. A. (SM)
Stebbins, R. S. (A)
Sullivan, A. W. (SM)
Sumpter, R. C. (A)
Taylor, J. R. (A)
Tuthill, A. F. (A)
Underwood, O. J. (SM)
Versteeg, D. A. (A)
Vincent, H. B. (SM)
Voissem, N. H. (M)
Wahlman, J. E. (A)
Walker, R. G. (M)
Wallis, A. V. (A)
Wallis, E. R. (M)
Wasserlein, H. G. (A)
Watson, R. D. (A)
Wells, E. L. (A)
Wenz, C. P. (SM)
White, E. L. (F)
Wilcox, H. J., Jr. (M)
Willert, A. F. (M)
Willing, H. A. (M)

St. Petersburg Beach (F-WC-3)
Koechel, W. P. (VA)
Landry, W. J. (SM)
Monahan, H. J. (A)
Wilson, R. G. (A)

Samoset (F-WC-3)
Kramer, A. W. (SM)

Sanford (ORL-3)
Cobb, A. E. (SM)
Farrell, C. (M)
Knight, L. A. (M)
Levy, S. L. (M)
Osborne, W. H. (A)
Taylor, J. C. (M)
Woodruff, M. W. (M)

Sarasota (F-WC-3)
Belkin, M. (M)
Blesse, H. O. (M)
Cannon, R. S., Jr. (M)
Ensall, T. (M)
Fisher, S. (SM)
Harry, J. B. (A)
Janda, F. J. (A)
Looer, L. E. (A)
Magnin, J. P. (M)
Peck, W. D. (A)
Seltner, J. E. (M)
Slaughter, G. S. (SM)
Spencer, L. V. (M)
Stewart, T. E., Jr. (A)
Swain, W. H. (A)
Thorpe, C. R. (A)
Tisdale, G. E. (M)
Uglow, K. M., Jr. (SM)
Ulrey, D. (F)

Shalimar (NWF-3)
Bonner, J. R. (M)
Lowe, B. W. (A)
Markey, W. F. (M)
Null, F. E. (M)
Overton, B. H. (SM)
Pfeiffer, D. A. (A)
Roth, A. Q. (M)
Shea, J. H. (A)
Von Wegern, F. C. (A)
Wagner, W. F. (M)

Sharpes (CF-3)
Malcolm, A. (A)
Olson, R. E. (M)

South Merritt Island (CF-3)
Bass, D. C. (M)

South Miami (MIA-3)
Andres, L. J. (SM)
Lucas, F. B. (SM)
Rich, R. S. (A)

Stuart (MIA-3)
Berydahl, L. A. (M)

Surfside (MIA-3)
Lurie, E. M. (SM)

Tallahassee (NWF-3)
Clifton, C. L. (M)
Grafe, R. W. (A)
Hall, H. (SM)
Kromhout, O. M. (A)
Ragsdale, W. E. (M)
Rieker, J. P. (A)
Saffer, R. A. (M)

Tamoa (F-WC-3)
Abremski, M. C. (A)
Anders, A. W., Jr. (M)
Bailey, D. C. (M)
Bascome, P. L. (A)
Beque, E. (M)
Bellavia, L. J. (A)
Boyd, R. M. (A)
Brice, J. R. (M)
Brown, L. C. (A)
Chandler, W. G. (M)
Ferguson, H. S. (A)
Glenn, R. (A)
Hackert, W., Jr. (A)
Hogue, D. C. (M)
Husbands, C. L. (M)
Jean, R. P. (M)
King, C. J. (M)
Kolze, J. (A)
Landry, E. P. (A)
Martin, B. W. (M)
May, T. W. (A)
McDaniel, C. B. (A)
Meksraitis, J. J. (A)
Miller, M. P. (A)
Mitchell, J. H. (M)
Moore, W. P. (SM)
Murphy, R. (SM)
Neeb, C. H. (A)
Nores, R. P. (M)
Nott, J. H. (M)
Prendes, J. R. (A)
Quinones, D. E. (A)
Raines, R. M. (A)
Randell, R. R. (M)
Rich, J. C. (A)
Rosenzvalg, J. E. (M)
Schnuman, J. D. (M)
Stoutenburg, A. H. (A)
Tolan, D. J. (M)
Turner, R. D. (A)
Uranga, E. (A)
Wascher, M. A. (M)
Weldon, J. W. (M)
Winfree, W. C., Jr. (A)

Tarpon Springs (F-WC-3)
Ball, M. T. (M)
Jones, E. W. (M)

Titusville (CF-3)
Amos, C. D. (A)
Blum, F. W. (M)
Brown, W. A. (M)
Byrne, F. (A)
Cortright, P. W. (A)
Crager, J. A. (M)
D'Albora, J. B., Jr. (SM)
Davidson, H. K. (M)
Davidson, J. K. (M)
Drake, J. C. (SM)
Endl, W. J. (A)
Fah, P. J. (A)
Gilmore, Q. E. (M)
Griesser, T. J. (M)
Grimm, E. M. (M)
Herndon, W. F. (A)
Hickey, J. R. (A)
Jackson, K. J. (M)
Klemm, H. L. (M)
La Joie, Z. A. (M)

FLORIDA

Schenck, A. K. (M)
Siemen, H. A., Sr. (SM)
Stroud, A. A. (A)
Wheeler, W. P. (M)

Treasure Island (F-WC-3)
Arena, F. G. (A)
Augustine, E. F. (A)

Tyndall, AFB (NWF-P-3)
Adair, B. M. (M)

Umatilla (ORL-3)
Hierholzer, E. L. (M)
Vostberg, C. A. (M)
Wingfield, J. D. (M)

Valparaiso (NWF-3)
Golden, R. J. (M)
Sapp, E. F., Jr. (M)
Watts, R. N. (M)
Womack, K. K. (M)

Vero Beach (CF-3)
Chorpening, C. M. (M)
Paddock, D. G. (M)
Van Dyck, A. F. (F)

West Hollywood (MIA-3)
Quackenbush, F. R. (A)

West Miami (MIA-3)
Konter, P. (A)
Speirs, G. E. (A)

West Palm Beach (MIA-3)
Cohen, M. J. (SM)
Edleman, V. W. (A)
Field, J. S., Jr. (M)
Gibson, H. C., Jr. (M)
Good, L. F. (M)
Holdren, E. H. (M)
Wemlund, R. F. (M)

Windermere (ORL-3)
Towles, W. B. (SM)

Winter Garden (ORL-3)
Gray, A. R. (SM)
McKee, M. L. (M)

Winter Haven (F-WC-3)
Ahern, H. G. (A)
Craig, L. O. (M)
Potter, F. N. (M)

Winter Park (CF-3)
Barney, J. M. (SM)
Birge, W. A. (A)
Boutwell, E. D. (M)
Bowers, R. S. (SM)
Boyles, G. W. (M)
Bradmiller, R. W. (A)
Center, M. (SM)
Chaney, H. L. (M)
Cooper, G. (M)
De Pasquale, N. D. (A)
Doolittle, J. H. (SM)
Dryden, R. E. (SM)
Ebel, D. G. (A)
Enostrom, R. H. (A)
Ferguson, J. K. (M)
Gennett, K. A. (M)
Gimon, E. E. (M)
Harrison, P. W. (SM)
Holmes, G. A. (A)
Johnson, R. J. (A)
La Care, J. M. (SM)
Luckock, W. J. (M)
Lyden, J. A., Jr. (M)
Matzinger, J. R. (SM)
Meyerson, M. (SM)
Mockus, J. M. (SM)
Munk, R. (M)
Neil, W. C., Jr. (M)
Pearson, J. R., Jr. (M)
Pierson, C. D., Jr. (SM)
Riley, C. L., Jr. (M)
Romano, G. F. (M)
Sheppard, J. H., Jr. (SM)
Simmons, C. A. (SM)
Trioo, B. R. (M)
Vargo, F. J. (A)
Williams, A. G. (M)
Williams, R. M. (A)
Wood, R. M., Jr. (SM)

GEORGIA

Albany (ATL-3)
Carman, H. B., Jr. (M)
Freund, K. M. (A)
Harris, J. W., Sr. (A)
Leger, P. P. (A)
McClung, W. C. (M)

Athens (ATL-3)
Graham, E., Jr. (M)

Atlanta (ATL-3)
Adamson, H. D. (A)
Aderhold, H. J. (M)
Badgett, A. F. (M)
Bangs, P. C. (M)
Bass, H. W. (M)
Bennett, A. L. (SM)
Benson, J. W., Jr. (A)
Bezaire, W. A. (A)
Bivans, G. A., Jr. (M)
Bivins, W. P. (M)
Blackwell, T. E. (A)
Blaine, W. E. (A)
Blakely, C. E. (M)
Bondy, H. A. (VA)
Boufflou, C. L. (M)
Boyd, J. E. (SM)
Bradley, W. H. (M)
Bryant, D. J. (M)
Carr, R. T. (A)
Carter, J. V., Jr. (M)
Chastain, J. B. (M)
Chick, E. B. (M)
Clayton, L., Jr. (M)
Cloninger, W. C. (M)
Coker, Q. W. (M)
Corriher, H. A., Jr. (M)
Craddock, H. C., Jr. (M)
Craver, L. W. (M)
Crenshaw, B. M. (M)
Crowe, W. H. (M)
Daniel, E. L. (M)
Dasher, B. J. (F)
Daugherty, C. F. (M)
Dean, H. G., Jr. (M)
Duggan, R. S., Jr. (M)
Ecker, H. A. (M)
Ellis, R. L., Jr. (M)
Fatilo, W. L. (M)
Fausett, F. (SM)
Fears, C. D. (M)
Fielder, D. C. (SM)
Finn, D. L. (M)
Flynt, E. R. (SM)
Foster, H. O. (M)
Glass, S. N. (M)
Glenn, L. E. (M)
Golsen, C. H. (A)
Guy, D. V. (M)
Haertig, M. M. (M)
Hammond, J. L., Jr. (M)
Hawthorne, G. B., Jr. (M)
Hayes, R. D. (M)
Holbrook, R. A. (M)
Hollis, J. S. (M)
Holmes, E. G. (SM)
Hurd, F. K. (M)
Hutchison, P. T. (M)
Jacobs, C. J. (M)
Jenkins, S. P., Jr. (M)
Johnson, R. C. (M)
Jones, C. T. (M)
Jones, C. E., Jr. (A)
Jones, W. B., Jr. (SM)
Jordan, J. H., Jr. (A)
Kleinman, R. L. (M)
Kresge, P. A. (M)
Lichtenstein, H. (M)
Lindsey, E. B., Jr. (M)
Long, J. T. (M)
Long, M. W. (SM)
Lord, C. R. (M)
Marsh, W. (M)
Mayo, H. L. (A)
McCorvey, A. (M)
McKinley, H. L. (SM)
Meek, R. E. (M)
Miller, W. B., Jr. (SM)
Minton, R. (M)
Montgomery, B. E. (SM)
Morris, K. G. (M)
Morrissey, D. J. (M)
Nuttall, A. F. (A)
Olsson, C. O. (M)
Oole, A. (SM)
Overcash, F. J. (SM)
Paris, D. T. (M)
Parkins, F. A. (M)
Penney, A. T. (A)
Pidgeon, R. E., Jr. (M)
Prince, M. D. (SM)
Ragsdale, H. W. (SM)
Randall, T. M. (A)
Reid, H. L. (VA)
Riegleman, D. D. (A)
Rivers, T. A. (M)
Roberts, A. P. (A)
Robinette, S. L. (M)
Robinson, G. P., Jr. (SM)
Rymer, R. H. (A)
Shultz, O. L. (M)
Skelly, P. G. (A)
Smith, J. B. (A)
Smith, S. R. (SM)
Strain, C. E. (M)
Su, K. L. (SM)
Sylvester, R. C. (M)
Syn, W. M. (M)
Teegardin, H. H. (A)
Turner, C. J., Jr. (M)
Turvey, F. P., Jr. (M)
Vaughn, C., Jr. (SM)
Walker, A. H. (M)
Walker, P. D. (A)
Wallace, J. M., Jr. (M)
Walsh, J. R., Jr. (M)
White, T. M., Jr. (M)
White, W. H. (M)
Witt, S. N., Jr. (SM)
Wright, W. W. (M)

Augusta (S-CAR-3)
Cook, L. H., Jr. (A)
Cooper, L. D., Jr. (M)
Crosby, G. E. (M)
Eberl, R. C. (A)
Galloway, R. E., Sr. (SM)
Hudson, C. A. J. (A)
Pignataro, J. A. (M)
Smith, B. M. (M)
Swink, J. E. (A)
Tarpley, M. W. (M)
Walker, J. E. (M)
White, B. F. (A)
Williamson, W. A. (A)
Austell (ATL-3)
Bowles, M. K., Jr. (M)

Bainbridge (ATL-3)
Polone, R. W. (A)

Brunswick (ATL-3)
Smith, J. E. (M)
Welland, E. H. (M)
Zax, J. A. (M)

Carrollton (ATL-3)
Crawford, E. W. (M)

Chamblee (ATL-3)
Baran, M. (SM)
Carter, R. C. (M)
Duncan, C. L. (SM)

Cochran (ATL-3)
Roth, F. P. (M)

College Park (ATL-3)
Billings, R. H. (M)

Columbus (ATL-3)
Des Portes, C. (M)
Gullatt, G. E. (M)
Hogencamp, H. C. (SM)
Knowles, R. G. (A)

Dalton (ATL-3)
Andrews, J. S. (A)

Decatur (ATL-3)
Berry, G. C. (A)
Currie, C. H. (A)
Glenn, W. L., Jr. (M)
Harvey, J. (A)
Johnson, T. F. (M)
Moore, W. H. (M)
Robertson, D. W. (SM)
Seanor, J. C., Jr. (M)
Warren, W. B., Jr. (M)
Wilson, J. C. (M)

Dewy Rose (ATL-3)
Rule, R. M. (A)

Doraville (ATL-3)
Chupp, E. W. (M)
Goodwin, J. P., Jr. (M)
Shockley, T. D., Jr. (M)

Dunwoody (ATL-3)
Dozier, W. A. (M)

East Point (ATL-3)
Cutler, E. C., Jr. (A)
Hunt, J. N. (A)
Brewer, R. V. (A)

Elberton (ATL-3)
Palce, K. M. (A)

Fayetteville (ATL-3)
Day, J. T., Jr. (M)

Forest Park (ATL-3)
Schmidt, H. H. (M)

Fort Benning (ATL-3)
Clemons, J. K. (M)
Kost, M. (A)

Fort Gordon (S-CAR-3)
Grayton, R. F. (M)
Rice, J. S. (M)
Ullman, H. L. (A)
Williams, H. C. (A)
Wurdemann, W. H., Jr. (SM)

Fort McPherson (ATL-3)
Buchak, K. (SM)

Fort Stewart (ATL-3)
Caffey, T. W. H. (M)

Griffin (ATL-3)
Blasingame, J. R. (M)
Imes, G. C., III (A)

Hapeville (ATL-3)
Almand, A. F. J. (A)

Kennesaw (ATL-3)
Borman, A. P. (A)

Macon (ATL-3)
Farber, E. (M)
Hildreth, H. J. (A)

Marietta (ATL-3)
Cory, W. E. (SM)
Davis, C. C. (M)
Dunphey, H. B., Jr. (M)
Erwin, E. (SM)
Freeman, E. R. (M)
Griffin, C. H., Jr. (M)
Haley, D. C. (A)
Hatmaker, D. B. (M)
Holder, F. P. (SM)
Holliday, F. S. (M)
Jackson, J. C. (M)
Levine, R. B. (M)
Nash, J. T., Jr. (A)
McCurley, E. A. (M)
Moseley, R. E. (M)
Nicolaides, M. E. (M)
Stebbins, C. W. (M)
Stiltz, H. L. (M)
Watz, N. P. (M)
Whiffen, M. C. (A)
Wilkinson, L. E. (A)
Wrigley, W. B. (SM)

Milledgeville (ATL-3)
Rosser, B. M. (A)

North Atlantic (ATL-3)
Gunson, D. O. (M)

Pooler (S-CAR-3)
Newham, H. E. (A)

Powder Springs (ATL-3)
Luedtke, A. (M)

Reynolds (ATL-3)
Bond, D. E. (M)

Rome (ATL-3)
Starr, R. A. L. (M)

Savannah (S-CAR-3)
Baker, F. E. (A)
Bigbie, E. F. (A)
Chambers, D. T. (A)
Goodman, K. E. (M)
Leggett, A. G., Jr. (M)
Love, W. R. (A)
Miller, C. C. (M)
Nilsson, W. H., Sr. (M)
Orr, J. P. (M)
Turner, J. I. (A)

Smyrna (ATL-3)
Blanks, B. L. (M)
Brown, W. E. (A)
Haire, D. E., Jr. (M)
Hurst, H. C. (M)
Reagh, W. L. (M)
Speer, T. K. (M)
Spencer, J. M., Jr. (M)
Weingarten, R. (M)

Summerville (ATL-3)
Stowers, J. S. (M)

Thomasville (ATL-3)
O'Quinn, P. D. (A)
Totman, S. (M)

Thunderbolt (S-CAR-3)
Zipperer, J. B. (A)

Tifton (ATL-3)
Dozier, W. A. (M)

Valdosta (ATL-3)
Ferguson, J. V. (M)

Warner Robins (ATL-3)
Bugg, K. W. (SM)
Burnett, T. H., Jr. (SM)
Gilfillen, L. J. (M)
Jeffries, C. E. (M)
Kahrs, E. R. (M)
Parris, R. D. (A)
Wallis, C. L. (A)
Watts, E. B. (A)

West Point (ATL-3)
Hogg, J. C., Jr. (M)
Strother, F. P. (M)

HAWAII

Hilo (TH-7)
Neilert, K. G. (A)

HAWAII KAUAI

Naalehiu (TH-7)
Okuna, T. M. (A)
Row, R. J. (A)

HAWAII MAUI

Kahului (TH-7)
Katahara, S. (M)

Kihei (TH-7)
Honea, L. W. (M)

Lahaina (TH-7)
Nakamoto, M. (A)

HAWAII OAHU

Aiea (TH-7)
Kelly, V. (M)
Nishimura, K. K. (A)

Ewa (TH-7)
Lawlis, R. L. (A)

Ewa Beach (TH-7)
Witt, A. J. B. (M)

Honolulu (TH-7)
Alden, R. M. (M)
Anderson, J. W. (A)
Arrington, R. A. (A)
Asato, M. (A)
Atherton, J. B. (M)
Bell, R. E. (M)
Bekins, D. M. (A)
Baker, C. A. (M)
Brittle, D. F. (M)
Britton, J. R. (M)
Chang, D. C. (M)
Chang, R. H. M. (M)
Ching, R. T. K. (M)
Chun, R. H. C. (M)
Dillinger, W. D. (SM)
Edwards, N. R. (SM)
Ellison, J. L. (A)
Fenner, P. R. (A)
Fuchikami, A. H. (A)
Fujimura, T. M. (A)
Gilroy, R. B. (M)
Goo, J. F. S. (M)
Grubb, D. L. (M)
Harada, S. (M)
Harger, E. J., Jr. (A)
Harlan, R. A. (M)
Higa, K. (M)
Hooper, W. O. (A)
Hosokawa, K. (M)
Ing, J. C. Y. (M)
Iwai, K. G. (A)
Izumi, G. Y. (A)
James, F. L. (A)
Johnson, W. F. (M)
Jones, R. C., Jr. (A)
Kam, B. W. (M)
Kam, P. Y. T. (A)
Kang, Y. O. (M)
Kato, R. S. (A)
Kobayashi, H. K. (M)
Krutish, R. C. (A)
Kung, L. (A)
Lewbel, S. H. (M)
Lindemann, E. G. (A)
McLeod, J. S. (M)
McMenamin, S. B. (M)
Mercer, I. G. (M)
Metzger, J. F. (A)
Miller, R. W. (A)
Miyake, I. (M)
Nakamura, O. S. (M)
Osumi, S. Y. (M)
Pang, D. L. (M)
Partridge, R. E. (SM)
Plety, E. A. (M)
Pires, M. D. (A)
Sanders, J. R. (A)
Schoen, E. C. (A)
Schultz, J. E. (A)
Shak, H. K. Y. (A)
Shigetomi, S. S. (A)
Short, R. C. (M)
Stagner, G. H. (M)
Swain, H. L. (M)
Takase, R. H. (VA)
Tamura, L. T. (A)
Vaughan, V. (M)
Warren, H. E. (M)
Weiss, J. D. (M)
Wouters, A. P. (A)
Yasaka, E. K. (A)
Young, M. F. (M)
Yuen, C. M. F. (M)

Kailua (TH-7)
Brenessel, A. (M)
Clark, G. W. (SM)
Collins, M. F. (SM)
Cornez, A. L. (M)
Dashiell, D. H. (M)
Elderkin, C. D. (M)
Lane, H. (A)
Powell, R. M. (M)
Rotolo, N. V. (M)
Springel, M. (M)
Vitum, M. S. (SM)

Kaneohe (TH-7)
Andrews, F. D. (A)
Buterman, H. M. (A)
Lee, R. T. S. (A)
Tanigawa, N. F. (M)
Turner, H. E. (M)

Lanikai (TH-7)
Hughes, G. R. (M)

Luaiualei (TH-7)
Bruce, C. A. (A)

Pearl Harbor (TH-7)
Hiser, E. F., Jr. (M)
Maertz, W. A. (M)
Mason, F. L. (SM)

Wahiawa (TH-7)
Hahn, G. K. P. (A)
Janda, E. G. (A)
Lachman, D. (M)

Waianae (TH-7)
Buxbaum, S. J. (A)
Florez, H. (SM)
Hoag, D. S. (M)
Murphrey, I. G. (M)

Waimanlo (TH-7)

IDAHO

Arco (SLC-7)
Pope, B. K. (M)

Bayview (SEA-7)
Huckle, D. R. (M)

Boise (SLC-7)
Beadles, R. V. (M)
Betebenner, G. W. (M)
Oberbillig, D. D. (M)
Roberts, V. (A)
Ryman, J. L. (M)
Sternling, A. J. (M)

Bonners Ferry (SEA-7)
Gowen, R. J. (M)

Idaho Falls (SLC-7)
Anderson, S. D. (A)
Blitch, M. G. (M)
Brockett, G. F. (M)
Criddle, C. B. (M)
Faller, J. H. (M)
Kendron, J. H. (M)
Kukowski, J. F. (M)
McCollom, K. A. (M)
Melchle, F. A. (A)
Purcell, R. B. (M)
Thompson, J. B. (A)
Wells, C. V. (M)

Lewiston (SEA-7)
Neumann, W. E. (M)
Olin, R. W. (M)

Moscow (SEA-7)
Beattie, L. A. (M)
Maxwell, L. M. (M)
McKean, G. A. (M)

Mountain Home (SLC-7)
Judge, E. M. (A)
Minich, C. E. (M)
Ward, J. R. (M)

Pocatello (SLC-7)
Gilmour, G. A. (M)
Kleffner, R. E. (A)

Rockford Bay (SEA-7)
Webb, H. J. (M)

Twin Falls (SLC-7)
Foss, M. L. (M)

Welser (SLC-7)

ILLINOIS

Addison (CHI-5)
Bartlett, P. G. (SM)
Davis, E. J. (A)
Krause, E. H. (M)
Lindsay, W. R. (M)
Roberts, E. L. (M)

Algonquin (CHI-5)
Peterson, W. G. (SM)

Alton (SL-6)
Alexander, W. (M)
Day, R. T., Jr. (M)
Schwandt, W. (A)
Ulirich, D. P. (A)

Antioch (CHI-5)
Balsamello, J. (A)
Peckhousek, T. W. (A)

Arlington Heights (CHI-5)
Babcock, L. V. (M)
Carmody, L. M. (M)
Coblenz, A. (SM)
Coolidge, J. E. (M)
Gerlach, A. A. (SM)
Hammel, W. J. (M)
Heisle, G. J. (M)
Koeritz, K. W. (M)
Koos, C. J. (M)
McCarty, J. M. (A)
Melvin, D. K. (A)
Mueller, A. A. (M)
Patterson, W. S. (M)
Raef, A. J. (A)
Remley, H. L. (M)
Revor, R. J. (M)
Ross, E. O. (M)
Saxe, R. E. (M)
Schroeder, K. W. (A)
Stout, E. R. (M)
Walker, L. G. (SM)
Weewert, J. (M)
Weirich, E. M. (SM)
Weltin, O. K. (SM)
White, J. F., Jr. (M)

Atlanta (CHI-5)
Speciale, J. S. (A)

Aurora (CHI-5)
Golz, H. C. (A)
Gramley, W. D. (M)
Lamb, C. (M)
Schultz, R. J. (M)
Ziegler, A. A. (A)

Barrington (CHI-5)
Adler, W. A. (A)
Avara, N. W. (M)
Faullin, R. R. (M)
Gelzer, J. R. (M)
Krumhardt, C. (A)
Landeck, J. H. (M)
McNabb, L. A. (SM)
Nasrine, F. G. (M)
Reichenbach, R. K. (M)
Stroh, W. J. (SM)

Bartlett (CHI-5)
Irelan, H. F. (M)
Tapoan, P. W. (M)

Batavia (CHI-5)
Siekman, W. J., Jr. (A)

Beeleville (SL-6)
Belanger, D. S. (A)
Bright, J. A. (M)
Friedlich, W. J. (M)
Jarvis, A. B. (M)
Martinez, D. C. (A)
Mueller, T. E. (M)
Nance, M. E. (A)
Nance, W. F. (M)
Nevenner, R. J. (A)
Pfister, R. C. (M)
Reinloer, R. A. (A)
Scharringhausen, R. L. (M)
Stewart, J. H. (A)
Swantz, F. W. (SM)

Bellwood (CHI-5)
Baltezore, R. C. (M)
Castor, R. W. (M)
Lafferty, V. C. (M)
Marik, E. (A)
Molzahn, H. W. (M)
Novy, C. A. (M)
Sellen, D. E. (A)

Benld (CHI-5)
Bertorello, T. A. (M)

Bensenville (CHI-5)
Bernstein, J. M. (M)
Druz, W. S. (SM)
Hilton, F. L. (SM)
Houghton, M. E. (A)
Hynes, E. A. (M)
Ozarka, R. J. (A)
Sauer, R. L. (A)
Saudinaitis, E. (A)
Sullivan, E. F. (M)
Swanson, C. W. (A)
Uhl, M. H. (M)
Whiting, R. F. (SM)

Benton (SL-6)
Munday, T. M. (M)

Berkeley (CHI-5)
Drobish, R. W. (A)
Eckmann, L. G. (A)

Berwyn (CHI-5)
Biss, M. W. (A)
Brazda, J. C. (M)
Cermak, C. W. (M)
Fanta, F. A., Jr. (M)
Glozer, A., Jr. (A)
Hevda, K. C. (M)
Holman, W. J. (A)
Jarrette, V. (SM)
Jendrzejczyk, J. A. (A)
Johnston, R. G. (M)
Kovar, G. F. (M)
Mrazek, W. F. (M)
Niman, G. J. (M)
Overzet, J. K. (M)
Prentiss, J. G. (SM)
Russ, W. E. (M)
Sladek, N. J. (M)

Bloomingdale (CHI-5)
Knechtel, R. E. (M)

Bloomington (CHI-5)
Moulic, W. E., Jr. (M)
Schweikert, W. R. (M)

Blue Island (CHI-5)
Damm, G. J. (A)
Engelland, G. C. (A)
Lamcha, F. J. (A)
Lawler, J. A. (M)
Quade, A. G., Jr. (M)

Bonfield (CHI-5)
Demmer, L. T. (M)

Broadview (CHI-5)
De Both, R. F. (M)
Gaoo, W. J. (M)
Grav, R. O. (SM)
Wood, R. D. (M)

Brookfield (CHI-5)
Holouch, D. J. (M)
Miller, J. O. (A)
Ruther, H. E. (M)
Vuchetich, J. B. (A)

Calumet City (CHI-5)
Maolnot, J. J. (M)
Oorisko, A. F. (A)

Carbondale (SL-6)
Crosby, H. A. (M)
Harbison, J. L. (M)

Carlock (CHI-5)
Detweiler, H. L. (M)

Carpentersville (CHI-5)
McGann, W. E. (M)
Ross, K. B. (M)

Cary (CHI-5)
Fuglestad, K. R. (M)

Casevville (SL-6)
Poston, H. J. (A)

Chameleon (CHI-5)
Albright, W. G. (SM)
Babcock, M. L. (M)
Bliss, R. W. (A)
Coleman, P. D. (M)
Divilbiss, J. L. (M)
Ernst, E. W. (SM)
Grosvenor, H. D. (M)
Harlan, J. R. (M)
Hassler, S. S. (A)
Hotchkiss, S. E. (M)
Kabrisky, M. J. (M)
Kirkwood, B. D. (M)
Kreer, J. B. (A)
Leichner, G. H. (M)
Lewis, P. H. (M)
Lo, Y-T. (M)
Mayes, P. E. (A)
Meagher, R. E. (M)
Myers, R. L. (M)
Neal, J. P., III (M)
Nelson, G. L. (M)
Novick, R. (M)
Patton, W. T. (M)
Salvatore, J. (A)
Skaperdas, D. O. (M)
Smith, R. S. (M)
Wainscott, J. M. (M)

Chasin (CHI-5)
Fricke, K. M. (A)

Chicago (CHI-5)
Abraham, J. (M)
Adamson, A. C. (A)
Addison, W. G. (M)
Adler, R. (F)
Affrunti, A. J. (M)
Ahring, F. E. (A)
Alto, I. (M)
Akimoto, W. M.
Aklinski, M. J. (A)
Alessio S. A. (A)
Allen, H. A. (A)
Allen, P. J. (M)
Allibone, F. L. (M)
Alsaough, K. E. (A)
Ambos, C. (M)
Anagnost, A. L. (A)
Anagnost, J. T. (SM)
Anderson, D. L. (M)
Anderson, R. C. (M)
Anderson, R. S. (A)
Anderson, T. W. Jr. (M)
Annett, J. C. (M)
Anton, A. J. (A)
Apfelbaum, J. G. (M)
Argall, G. J. (M)
Argy, T. W. (M)
Arndt, R. L. (M)
Arnow, C. L. (M)
Aronson, H. A. (M)
Ashenhurst, R. L. (M)
Atzard, A. E. (A)
Avizienis, A. A. (M)
Backstrom, E. F. C. Jr. (A)
Balikov, M. H. (M)
Bartimes, G. F. (M)
Bass, S. (M)
Bates, W. J. (M)
Battigelli, L. M. (A)
Baum, J. W. (A)
Bean, J. A. (A)
Beck, R. R. (M)
Becker, H. W. (M)
Becker, W. R. (M)
Beler, L. W. (M)
Bell, I. I. (M)
Bell, K. R. (M)
Berg, A. A. (M)
Bergen, H. A. (M)
Berger, J. (SM)
Berkowitz, H. (A)
Bernat, L. (M)
Bialek, S. T. (M)
Biberman, L. M. (SM)
Bieszczad, E. S. (M)
Bilek, R. W. (M)
Bird, E. H. (A)
Blahna, C. (SM)
Blinoff, W. J. (A)
Blomberg, R. C. (A)
Bloomenthal, S. (M)
Bloomquist, L. A. (A)
Bluza, C. R. (A)
Bodoh, A. G. (SM)
Borkovitz, H. S. (M)
Borovik, D. I. (M)
Bory, R. A. (A)
Bowen, J. L. (VA)
Boyd, G. M. (M)
Boyll, L. O. (A)
Bracha, M. F. (A)
Branscome, E. O. (A)
Bristol, S. M. (M)
Brock, W. R. (M)
Brown, J. S. (SM)
Brown, L. E. (M)
Bruce, C. R. (M)
Brunllera, V. G. (M)
Buchholz, F. G. (M)
Buckler, R. A. (A)
Buckley, J. K. (A)
Burgwald, G. M. (M)
Burmeister, M. A. (M)
Buschke, H. A. (M)
Camillo, C. (SM)
Capoels, J. L. (SM)
Carino, R. A. (A)
Carlson, G. I. (M)
Carter, A. A., Jr. (A)
Carter, R. (A)
Carter, R. W. (SM)
Casey, E. A. (A)
Cassettari, F. (M)
Castro, P. S. (M)
Cederberg, R. D. (A)
Chalmers, E. D. (M)
Chandler, J. F. (SM)
Chapman, R. H. (M)
Cherskov, J. S. (A)
Chittenden, G. W. (M)
Chiu, P. (M)
Choncholas, J. J. (M)
Christensen, R. T. (M)
Chulsky, I. (M)
Cinelli, G. J. (M)
Claras, C. W. (M)
Clardy, L. (M)
Clark, F. J. Jr. (M)
Clark, R. A. Jr. (M)
Cleveland, V. K. (A)
Cody, R. W. (A)
Cohen, L. M. (M)
Cohen, T. A. (SM)
Cohn, C. M. (A)
Cohn, G. I. (SM)
Cohn, S. I. (SM)
Colbert, J. R. (M)
Cole, W. J. (M)
Cololan, J. (A)
Contos, P. G. (M)
Contri, A. (A)
Cook, R. H. (M)
Cooke, K. R. (A)
Cooper, H. K. (A)
Copeland, P. L. (M)
Corcoran, V. J. (M)
Cord, J. H. (M)
Correia, F. Jr. (A)
Cortright, R. D. (M)
Coulter, W. H. (M)
Cox, C. R. (SM)
Cramer, G. T. Jr. (M)
Cranston, G. W. (M)
Crane, W. S. (M)
Crites, A. B. (A)
Crossley, A. (SM)
Crumly, C. B. (SM)
Cunliffe, P. R. Jr. (M)
Currier, M. G. (M)
Dahlin, E. K. (M)
Dalling, J. L. (M)
Dalletos, S. A. (A)
Dalton, R. C. (M)
Daniels, H. B. (A)
Davidson, P. (A)
Davis, J. R. (M)
Davis, R. V. (A)
Decho, K. R. (M)
Deck, G. J. (A)
De Haan, J. (A)
Del Ciello, R. R. (A)
Demasy, J. (A)
Demos, G. T. (M)
Deutsch, K. J. (A)
De Rose, R. A. (M)
Desmares, P. G. J. (M)
Dezeltel, L. M. (A)
Diederichs, J. K. (A)
Dirsa, E. F. (M)
Djordjevic, M. Z. (M)
Doland, G. D. (M)
Draus, A. R. (M)
Drogosz, D. W. (M)
Drust, P. (A)
Du Fau, W. R. (M)
Duke, A. D. (M)
Du May, E. C. (A)
Duncan, C. W. (M)
Dupuis, J. J. (M)
Ebstein, B. (M)
Egan, A. (M)
Eldem, R. H. (A)
Eisenberg, H. (A)
Ellett, A. (SM)
Ellis, C. O. (M)
Ellison, R. M. (M)
Elsner, R. F. (M)
Ellsworth, M. J. (SM)
Eness, O. W. (M)
Engel, J. E. (M)
Engelbrecht, L. R. (M)
Epstein, M. (M)
Erlandson, P. M. (SM)
Eul, E. A. Jr. (M)
Fabsits, E. J. Jr. (A)
Faklis, J. J. (A)
Ferris, W. T. (VA)
Fetterman, D. M. (VA)
Fields, T. (SM)
Fiuel, W. G. (M)
Fillo, M. (A)
Filips, R. P. (A)
Finlay, G. E. (A)
Fischer, A. J. (A)
Fischer, E. W. (A)
Fisher, B. A. (SM)
Fix, W. G. (M)
Flesher, G. T. (M)
Flocken, L. H. (SM)
Fluskey, C. J. (M)
Foecking, D. A. (M)
Foley, R. R. (M)
Fonte, G. (M)
Foss, H. (A)
Foster, G. E. (M)
Frank, D. H. (M)
Franklin, C. W. (M)
Franklin, W. S. (SM)
Freeman, R. L. (SM)
Freiheit, H. H. (A)
Freymodsson, J. B. (A)
Friedman, I. B. (M)
Frye, J. W. (A)
Fujimoto, J. J. (A)
Gallagher, F. H. (A)
Gallucci, A. J. (M)
Gamache, L. J. (SM)
Gardberg, J. (M)
Gassner, F. (A)
Gawel, E. W. (A)
Gayes, F. J. (M)
Gehrlich, A. P. (A)
Genoverse, A. N. (A)
Gens, H. J. (M)
Gerber, H. L. (M)
Germain, J. (SM)
Gershon, J. J. (SM)
Gerson, I. V. (M)
Giacchetti, A. D. (M)
Gjertsen, E. J. (A)
Glentzer, K. V. (SM)
Glyptis, N. (A)
Goedeke, R. C. (M)
Goldman, H. J. (A)
Goldstein, M. (M)
Goldsworthy, W. T. (A)
Goncharoff, N. (M)
Gordon, E. S. (SM)
Gottfried, P. (SM)
Graham, F. E. (M)
Gray, D. (VA)
Grazybeal, W. E. (A)
Greenberg, C. J. (M)
Greenebaum, E. N. Jr. (A)
Greenspan, P. (M)
Grimme, H. J. (M)
Grosse, K. E. (A)
Grossman, W. S. (A)
Gruenlon, G. J. (A)
Gudmundson, R. R. (A)
Guzzey, J. E. (M)
Haaland, C. M. (M)
Haas, Z. A. (A)
Haeer, W. C. (SM)
Hallinton, H. (M)
Halligan, W. J. (M)
Halverson, S. L. (M)
Hamilton, S. (A)
Hamre, H. G. (M)
Hanan, J. P. (A)
Hanberg, S. W. (M)
Hanft, K. E. (M)
Hanik, P. (M)
Hankln, R. B. (A)
Hansen, T. A. (SM)
Hansen, W. H. (VA)
Harding, J. H. (M)
Hardy, H. C. (SM)
Harrigan, G. S. (SM)
Harris, E. F. (M)
Haslett, J. W. (M)
Hassel, K. E. (SM)
Hassler, E. B. (SM)
Hay, E. (A)
Hayes, H. D. (SM)
Heemans, C. J. (M)
Henkle, H. H. (A)
Hennino, F. B. Jr. (A)
Heppner, D. R. (M)
Hercher, F. J. (A)
Hessler, W. G. (M)
Higgins, P. W. (A)
Himmelstein, S. (M)
Hiralwa, D. S. (A)
Hjermstad, H. (VA)
Hoffman, H. E. (M)
Holley, M. V. (M)
Holpuch, C. J. (M)
Holubow, H. (M)
Homer, W. F. (M)
Horn, L. H. (SM)
Howe, J. K. (M)
Hull, H. L. (SM)
Hunt, G. J. (M)
Hutson, D. E. (M)
Imerson, H. E. (A)
Indra, J. J. (A)
Ingram, C. (A)
Inman, J. F. (SM)
Insel, C. H. (M)
Iwaoka, I. S. (M)
Jacob, F. N. (SM)
Jacobsen, I. (A)
Jacobsohn, D. H. (M)
Jacobson, L. (M)
Janowiak, L. M. (M)
Jauniskis, K. P. (M)
Jensen, K. A. (A)
Jeschke, D. R. (M)
Johnson, J. H. (M)
Johnstone, W. E. (M)
Jones, A. H. (A)
Jones, T. L. (M)
Jonic, B. B. (M)
Juchnevicius, V. H. (M)
Jung, F. T. (A)
Jurewicz, R. E. (M)
Jurriaans, G. F. (A)
Kahn, B. (A)
Kahn, L. (VA)
Kale, G. W. (A)
Kamn, D. A. (M)
Kane, J. R. (M)
Kantner, H. H. (M)
Kapoun, R. (M)
Karpinski, E. W. (A)
Kazel, S. (A)
Keefe, J. T. (M)
Kehm, C. H. (M)
Kelo, M. W. (A)
Keller, W. P. (A)
Kelly, E. P. Jr. (M)
Kelser, L. C. (A)
Kemnitz, W. F. (A)
Kennedy, J. P. (SM)
Kennedy, J. A. (M)
Kenney, M. W. (SM)
Kiefer, J. C. (SM)
Kletzer, J. E. (A)
Kiheri, A. (M)

Kilburn, A. B. (M)
Kingwill, H. S. Jr. (A)
Kirchner, L. P. (A)
Kite, M. N. (M)
Klapperich, A. J. (M)
Kloza, P. J. (M)
Klyce, B. H. (SM)
Kmiec, W. J. (A)
Knackstedt, G. (A)
Koda, A. J. (A)
Koerner, F. A. (SM)
Kohn, E. B. (M)
Kolbe, R. J. (A)
Kolberg, E. G. (M)
Konecki, T. E. (A)
Kott, W. O. (SM)
Kotter, A. S. (A)
Kottmeier, F. A. (M)
Kowitz, A. E. (SM)
Kowols, G. J. (A)
Kraitsik, N. I. (M)
Krakora, J. J. Jr. (SM)
Krc, P. S. (M)
Krefft, H. H. (M)
Krenbiel, K. O. (M)
Kroll, J. B. (M)
Krstenansky, J. S. (A)
Krueger, R. M. (SM)
Krueger, W. F. (M)
Kruse, H. J. (A)
Kuhr, K. F. (A)
Kuhse, B. G. (M)
Kulosa, A. Jr. (A)
Kundrotas, A. P. (A)
Kurinsky, J. S. (M)
Kurland, J. J. (A)
Kvitek, G. L. (A)
Lace, M. A. (M)
Lagges, P. N. Jr. (M)
Lange, J. R. (M)
Lanostaff, R. H. (M)
Larson, R. J. (M)
Larson, W. L. (SM)
Leahy, P. J. (M)
Leatherman, J. E. (A)
Lee, D. K. K. (M)
Lee, W. (A)
Leedy, H. A. (SM)
Leitich, A. J. (M)
Lencioni, C. C. Jr. (M)
Leono, S. L. (M)
Leong, S. P. (M)
Leonhardi, J. O. (M)
Leopold, L. (M)
Lesko, L. W. (A)
Lesnick, R. N. (SM)
Leu, T. W. (M)
Levi, J. S. (M)
Levin, H. (M)
Levine, J. M. (A)
Lewin, N. L. (A)
Lewis, W. A. (SM)
Leysath, W. Q. (M)
Lezak, M. S. (M)
Liberman, A. (SM)
Lieberman, M. D. (M)
Lieopold, R. B. (M)
Lilja, R. F. (A)
Lizak, H. E. (A)
Logan, D. J. (A)
Loos, R. J. (M)
Lund, V. M. (M)
Lysaught, T. F. (M)
Malinowski, S. (M)
Malone, P. P. (M)
Mansfield, R. (M)
Manzala, A. J. (M)
Marinakos, L. C. (M)
Marsland, H. W. (A)
Marszalek, H. L. (A)
Martin, C. B. (SM)
Martin, R. D. (A)
Martin, W. S. (M)
Martini, R. G. (M)
Marx, A. C. (M)
Masters, E. W. (SM)
Matela, E. V. (A)
Matthews, A. R. (SM)
Matthews, L. E. (M)
Matzek, L. T. (SM)
Maximoff, D. S. (M)
May, R. L. (A)
McCall, T. C. (A)
McCarrell, S. G. (M)
McClelland, W. B. (M)
McDonald, D. C. (SM)
McDonnell, J. P. (A)
McDougall, D. S. (M)
McGibbon, D. A. (M)
McGrail, J. G. (A)
McManus, J. E. (M)
Mc Norton, S. L. (A)
Meagher, E. (M)
Meehan, E. L. (A)
Meixner, E. J. (M)
Mercker, A. J. (M)
Merrifield, L. A. (M)
Messinger, H. P. (M)
Meyer, A. (A)
Meyers, F. (A)
Mikos, E. J. (M)
Miller, B. J. (SM)
Miller, C. G. (A)
Miller, E. L. (M)
Mills, G. G. (M)
Minkus, F. (M)
Miska, J. K. (M)
Mitchell, F. R. (M)
Mitchell, J. F. (SM)
Mitchell, L. W. (M)
Mitchell, T. E. (A)
Mittelmann, E. (F)
Miyasaki, J. K. (A)
Molyneaux, R. J. (A)
Montemayor, J. U. (M)
Moon, R. J. (SM)
Moore, H. E. (M)
Morgan, G. M. (M)
Morris, L. P. (VA)
Morrison, R. E. (M)
Moulton, H. A. (A)
Moynihan, J. F. (M)
Mueller, E. L. (M)
Mueller, F. L. (M)
Mueller, R. W. (M)
Munn, R. J. (A)
Murphy, T. C. (A)
Myse, A. G. Jr. (A)
Nail, J. J. (SM)
Neben, H. M. (SM)
Nelles, M. (M)
Nelson, R. A. (A)
Nerwin, H. N. Jr. (M)
Ness, W. H. (M)
Newman, J. E. (M)
Niederman, B. (SM)
Nierman, L. G. (M)
Niklas, W. F. (M)
Noskowicz, T. S. (M)
Novak, J. F. (M)
Obog, L. F. (M)
O'Brien, E. (VA)
O'Connor, J. F. (A)
O'Connor, M. J. (M)
Oddson, I. G. (A)
Odell, W. D. (M)
Oeste, R. A. (M)
O'Grady, J. J. (M)
Oldfield, R. L. (A)
Olshan, S. (M)
Olson, G. A. (M)
O'Neill, R. M. (M)
Ore, G. A. (M)
Orr, B. B. (A)
Orvedahl, W. (M)
Ouimet, F. A. (M)
Owca, A. E. (M)
Palm, H. A. Jr. (M)
Pankos, J. F. (A)
Pantalone, W. N. (M)
Pape, L. W. (A)
Parchim, N. J. (M)
Park, G. Jr. (M)
Parkinson, J. A. (M)
Pawlus, J. (M)
Peach, L. C. (A)
Peacock, J. T. (A)
Pearce, G. R. (M)
Pearl, B. (M)
Pedersen, R. V. (M)
Pellock, L. E. (M)
Peterson, C. D. (M)
Peterson, R. W. (M)
Peth, R. (M)
Pfaff, E. R. (SM)
Pfister, R. A. (M)
Phinney, T. W. (A)
Pickering, T. A. (A)
Pinnell, R. M. (A)
Pipes, C. P. (A)
Plait, A. O. (M)
Plice, G. W. (M)
Poczwardowski, S. J. (M)
Podlusky, M. V. (SM)
Poel, L. R. (M)
Pohl, R. G. (SM)
Popo, J. V. (M)
Posen, L. M. (M)
Potocki, E. A. (M)
Powell, C. S. (M)
Powell, J. M. (M)
Pratt, R. E. (A)
Prince, R. T. (M)
Proctor, D. E. (A)
Prysi, T. S. (SM)
Pshaenich, A. L. (M)
Puldak, H. (M)
Quinn, J. L. (M)
Race, R. T. (A)
Radcliffe, A. J. Jr. (M)
Radtke, J. F. (A)
Ramirez, L. (A)
Rasins, W. L. (A)
Ratliff, C. D. Jr. (A)
Rattray, A. I. (M)
Rausch, W. D. (M)
Rees, W. L. (M)
Reichart, E. C. (M)
Reiling, G. E. (M)
Rekowski, M. J. (A)
Rennick, J. L. (SM)
Retz, H. C. (M)
Ribner, M. (M)
Rice, P. L. (A)
Richter, F. A. (M)
Riddel, O. A. (VA)
Rieger, W. H. (M)
Rini, J. S. (M)
Risky, F. A. (M)
Robins, H. M. (A)
Robinson, D. E. (A)
Rodriquez, A. E. (VA)
Rogers, A. A. (M)
Ronning, H. (A)
Roschke, E. M. (SM)
Rose, G. C. (M)
Rose, L. L. (A)
Rosenczranz, R. (M)
Ross, E. H. (SM)
Ross, K. B. (VA)
Rossi, C. V. (M)
Rossi, J. B. (A)
Rotter, A. (M)
Rounsaville, G. D. (M)
Rous, W. H. (A)
Rowe, T. L. (SM)
Rupp, H. R. (M)
Rusnak, M. (M)
Russell, B. J. (M)
Rutkowski, C. (A)
Ryan, L. J. (SM)
Rymas, S. J. (A)
Sabel, C. L. (A)
Saffro, Y. L. (M)
Sakamoto, M. (M)
Saltzberg, T. (M)
Samocki, C. J. (M)
Sances, A. Jr. (A)
Sandgren, G. E. (SM)
Saunders, H. O. Jr. (M)
Scanlan, T. J. (A)
Scannell, N. F. (M)
Schafer, W. W. (A)
Scherer, P. J. (A)
Schlesinger, W. A. (M)
Schlueter, A. W. (A)
Schmaus, R. H. (A)
Schmidt, E. M. (M)
Schmidt, W. E. (M)
Schranz, R. J. (M)
Schrot, E. H. (SM)
Schuck, R. P. (M)
Schultz, P. D. (M)
Schulz, R. (A)
Schulz, R. B. (M)
Schur, R. C. (M)
Schurak, K. M. (M)
Schwartz, B. S. (A)
Schwartz, J. (M)
Schwartz, S. L. (M)
Sciaky, A. M. (M)
Sciurba, J. L. (M)
Seehawer, J. E. (M)
Shallcross, G. P. (M)
Shapira, F. M. (M)
Shapiro, L. (A)
Shaver, J. M. Jr. (M)
Sherman, J. (A)
Shonerock, R. C. (M)
Shulman, A. (M)
Shutock, J. (A)
Sienkiewicz, S. V. (M)
Siff, A. W. (A)
Sikorski, F. J. (A)
Silberbauer, J. A. (A)
Silberg, S. (M)
Sinclair, D. C. (M)
Sivin, L. (A)
Skowron, A. J. (A)
Skubal, L. E. (A)
Sloan, A. C. (A)
Slugodzki, L. K. (VA)
Slusser, W. S. (A)
Smith, E. E. (A)
Smith, H. E. (A)
Smith, S. B. (SM)
Smoots, C. W. Jr. (M)
Snick, J. A. (M)
Solomon, J. L. (SM)
Solomon, S. S. (M)
Soma, R. (M)
Soria, R. M. (F)
Soufal, F. H. (A)
Spano, A. (A)
Spisak, G. C. (M)
Split, F. G. Jr. (SM)
Stanula, W. F. (A)
Staral, R. (A)
Steinberg, E. E. (A)
Steinberg, P. S. (M)
Stemm, R. E. (M)
Stengel, C. W. (A)
Stern, M. (M)
Sternlight, L. (M)
Stettler, C. O. (M)
Stolcers, K. (A)
Stone, C. H. (SM)
Stone, R. S. (A)
Stonevic, V. R. (M)
Surowiec, D. S. (M)
Suson, I. (M)
Sussman, M. (A)
Suzuki, E. (A)
Suzuki, T. (M)
Swan, L. L. (A)
Swanson, W. G. (A)
Swinyard, W. O. (F)
Switzenberg, E. A. F. (M)
Sydejko, J. F. (A)
Szegho, C. S. (F)
Tado, A. T. (A)
Tanner, D. J. (A)
Teder, H. (M)
Tegmeyer, J. R. (A)
Tellefsen, H. E. (A)
Thomas, G. E. (M)
Thompson, D. H. (M)
Thompson, J. E. (M)
Thompson, O. I. (SM)
Timmings, G. H. (SM)
Tlapa, J. A. (M)
Todd, S. R. (SM)
Toledo, R. E. (A)
Tono, F. F. (M)
Toy, T. G. (A)
Trittenbach, J. M. (SM)
Turek, C. W. (M)
Tutle, E. G. (A)
Uelsmann, W. G. (A)
Ulaszek, J. J. Jr. (A)
Unger, E. E. (M)
Uretz, E. F. (M)
Uyeda, M. M. (M)
Vaccaro, A. C. (M)
Valcik, L. (A)
Vance, G. (A)
Van Zeeland, W. A. (M)
Verbanec, W. R. (M)
Viskanta, V. Z. (M)
Vitz, R. J. (A)
Volpe, R. C. (M)
Vrzan, S. J. (A)
Wakabayashi, G. J. (M)
Wallin, G. (M)
Warczynski, R. G. (M)
Warren, C. S. (M)
Waska, W. E. (M)
Watkins, D. M. (A)
Watters, N. T. (M)
Wazlo, C. J. (A)
Webb, E. M. (A)
Weber, L. J. (SM)
Weberu, K. H. (M)
Wegener, J. S. (A)
Well, E. A. (A)
Weisberg, A. M. (A)
Weise, D. (M)
Weisehburger, F. M. (M)
Weishar, W. J. (M)
Weiss, H. H. (A)
Weissman, R. M. (SM)
Welker, J. J. (M)
Weninger, F. L. (M)
Wessling, R. (M)
Westerlund, C. T. (M)
Western, C. (A)
Wexler, J. S. (M)
Weyganck, P. A. (M)
Weyrich, R. N. (M)
Whinna, E. W. (A)
White, R. J. (M)
White, W. J. (A)
Whitmer, M. H. (A)
Whitmore, R. C. (A)
Whitney, S. D. (A)
Wickline, B. D. (M)
Widuqiris, W. Jr. (M)
Wiedro, S. B. (A)
Wigginton, R. J. (A)
Williams, J. J. (M)
Winter, G. L. (M)
Wisnowski, W. C. (M)
Wlassow, S. (M)
Wolfe, F. R. Jr. (SM)
Wolff, J. R. (M)
Wolken, I. I. (M)
Wollack, N. J. (M)
Woo, K. W. (M)
Wood, C. E. (M)
Woods, A. A. (VA)
Woronowicz, E. M. (M)
Wray, P. G. (M)
Wu, H. H. (M)
Yahalom, J. Y. (M)
Yello, J. F. (M)
Yuen, P. C. (M)
Zaida, W. L. (A)
Ziemer, E. H. (A)
Zimbler, F. B. (M)
Zimmerman, D. A. (A)
Zitkus, A. J. (A)
Zucker, H. (M)
Zuehls, E. J. (A)

Chicago Heights (CHI-5)
Easterwood, H. W. Jr. (A)
Vellender, G. C. (M)
Warner, D. L. (A)

Chicago Ridge (CHI-5)
Ferre, G. E. (M)

Cicero (CHI-5)
Atkinson, J. E. (M)
Bielsik, F. J. (M)
Borowski, R. E. (A)
Cech, E. J. (M)
Dubauskas, S. (M)
Gritton, R. D. (A)
Hajek, A. F. (M)
Herling, D. L. (M)
Jezek, J. E. (A)
Jucius, S. W. (M)
Karkiys, J. (M)
Kliore, A. J. (M)
Mitchell, D. F. (A)
Padgett, W. J. (A)
Slad, G. F. (A)
Tanana, E. J. (M)
Tsimbidis, J. J. (M)
Vlach, G. (A)
Wein, F. (A)

Clarendon Hills (CHI-5)
Casey, P. J. (A)
Dawson, J. W. (A)
Harols, R. N. (M)
Knox, J. G. (M)
Marks, M. (SM)
Sayles, H. L. (A)
Valihora, S. M. (A)

Clinton (CHI-5)
Rein, J. J. Jr. (M)

Collinsville (SL-6)
Austin, L. S. (M)
Roschke, T. H. Jr. (M)
Sobotka, H. J. (A)
Weber, J. E. (M)

Crystal Lake (CHI-5)
Falk, B. (A)
Hawkins, B. C. (M)
Smith, G. B. (A)
Wells, J. G. (M)
Danville (CHI-5)
Booth, R. C. (M)
Thiede, P. W. (M)

Decatur (CHI-5)
Abfalter, H. F. (SM)
Barber, M. W. (A)
Cupp, E. W. (M)
Dikinis, D. V. (M)
Koenig, H. G. (A)
Sarikas, R. H. (M)
Williams, D. A. (M)

Deerfield (CHI-5)
Clough, K. (VA)
Gertz, N. M. (A)
Haas, W. F. (A)
Mirkin, M. (M)
O'Neal, C. D. (M)
Petzing, E. W. (M)
Phillips, W. E. (M)
Schlote, R. H. (M)

De Kalb (CHI-5)
Andersen, C. W. (SM)
Ritland, R. B. (M)
Tsao, P. Y. S. (M)

Des Plaines (CHI-5)
Adams, E. C. (M)
Beeson, W. E. (A)
Bendell, C. B. (M)
Boyd, D. M. Jr. (SM)
Bushman, S. F. (M)
Carr, R. W. (A)
Carver, R. L. (M)
Collins, F. V. (SM)
Doering, J. H. Jr. (A)
Gifford, G. D. (A)
Githens, T. A. (SM)
Godawski, T. J. (A)
Hanen, R. K. (M)
Henrich, C. A. (A)
Himebrook, F. C. (M)
Koenig, G. (A)
Kritzanosky, A. (A)
Lassila, A. A. (A)
Lauffenburger, H. A. (A)
Laughran, R. H. (A)
Maine, C. P. (A)
Makinson, G. E. (M)
Meyers, K. W. (M)
Naslund, R. S. (VA)
Payne, R. A. (A)
Rathbun, E. R. Jr. (M)
Smith, P. A. (A)
Stanonis, A. F. (M)
Steele, A. J. (M)
Sunde, E. V. (SM)
Swain, J. E. Jr. (A)
Swanson, C. R. (M)
Utter, R. A. (A)
Walding, E. C. (M)
Weinberg, M. (A)

Dixon (CR-5)
Albright, L. E. (A)

Dolton (CHI-5)
Jezewski, J. E. (M)
Pendleton, A. D. (A)
Wajda, J. P. (M)

Downers Grove (CHI-5)
Bateman, L. A. (A)
Brookshier, W. K. (M)
Courchene, H. B. (SM)
Daniels, R. E. (M)
Eddy, W. L. (M)
Fitzsimmons, W. L. (A)
Frauens, W. R. (A)
Goertz, R. C. (M)
Harder, R. B. (M)
Hess, D. C. (M)
Johnson, A. R. (A)
Kamof, H. A. (SM)
Kikka, D. C. (A)
McDonell, W. J. (SM)
Miller, E. A. (SM)
Peckhart, M. A. (M)
Rohde, R. E. (M)
Sieth, H. P. (A)
Van Keulen, A. J. (M)
White, R. F. (M)
Wood, R. E. (SM)

Dundee (CHI-5)
Spiro, S. J. (M)
Wendt, R. H. (A)

Du Quoin (SL-6)
Millunzi, P. T. (A)

Dwight (CHI-5)
Seabert, F. (A)

East Dubuque (CHI-5)
Walsh, W. J. (M)

East St. Louis (SL-6)
Barnard, G. E. (M)
Bauer, F. W. (A)
Mutchek, J. H. (A)
Sintak, R. V. (M)
Wagner, M. L. (M)
Wise, H. G. (SM)

Elgin (CHI-5)
Brandes, W. M. Jr. (M)
Butzman, L. E. Jr. (A)
Crago, P. H. (M)
Kercher, M. K. (A)

Lang, G. W. (M)
Mitchell, R. M. (A)
Peterson, E. K. (SM)
Schimpf, R. G. (M)
Soper, G. T. (SM)
Walters, P. M. (A)

Elk Grove Village (CHI-5)
Fullerton, W. T. (M)
Hrbek, G. W. (M)
Teslik, J. A. (M)

Elmhurst (CHI-5)
Aberer, J. C. (M)
Anderson, W. J. (A)
Bajars, E. (A)
Balhorn, D. W. (A)
Beck, V. R. (SM)
Beler, M. G. (SM)
Belville, J. R. (M)
Berg, H. (M)
Chelpren, A. E. (SM)
Cox, B. O. (M)
Curry, A. A. (SM)
Davis, J. (SM)
De Shong, J. A., Jr. (SM)
Deterville, R. J. (M)
De Vries, A. J. (M)
Disney, V. H. (SM)
Funk, J. C. (M)
Foot, N. J. (A)
Gelb, R. L. (M)
Gula, H. E. (M)
Gurtz, W. J. (M)
Haines, D. G. (SM)
Huston, P. D. (A)
Kearney, L. E. (M)
Keranen, E. W. (M)
Kocsis, L. L. (M)
Kroger, M. G. (SM)
Kutschke, E. F. (A)
La Taste, G. D. (A)
Liepelt, E. (M)
Liston, K. L. (A)
Marshall, F. R. (A)
McGee, C. G. (M)
Mingle, R. F. (A)
Nettifee, G. R. (M)
Orme, D. T. (A)
Probeck, C. (SM)
Rogers, C. H. (SM)
Ronzheimer, S. P. (SM)
Sandberg, E. L. (M)
Schultz, C. J. (M)
Shea, G. J. (M)
Smith, L. L., Jr. (A)
Spademan, C. F. (M)
Starek, R. A. (M)
Thielen, L. R. (A)
Troxel, R. E. (A)
Vogt, A. L. (M)
Von Fredersdorff, G. C. (SM)
Weber, V. F. (A)
Webster, S. K. (M)
Wellestat, C. E. (A)
Williams, J. T. (M)
Winemiller, H. R. (M)
Wray, W. C. (SM)

Elmwood Park (CHI-5)
Balsamello, J. (M)
Casper, R. (M)
Clark, D. K. (M)
Coon, W. B. (A)
D'Orio, A. F. (SM)
Griffith, F. W., II (M)
Lindeman, R. J. (M)
Pakan, J. J. (M)
Van Berkum, P. A. (M)
Wilson, M. J. (M)
Wolf, A. (A)

Energy (SL-6)
McSherry, J. H. (A)

Evanston (CHI-5)
Aagaard, J. S. (M)
Beam, R. E. (F)
Bennett, R. E. (M)
Bowman, J. R. (SM)
Brauer, H. R. (SM)
Brodwin, M. E. (M)
Brown, A. C. L. (M)
Busch, A. E. (M)
Childs, A. F. (M)
Cozzens, W. B. (SM)
Cudahy, M. J. (M)
Davis, G. L. (A)
Endo, C. M. (A)
Flan, A. (M)
Frank, W. K., Jr. (A)
Frerichs, R. (SM)
Gage, D. S. (M)
Garbarino, H. L. (SM)
Graham, J. M. (M)
Haase, J. A. (M)
Handy, R. M. (A)
Hart, J. W. (M)
Hollander, A. (M)
Horwitz, S. J. (M)
Hupp, C. E. (A)
Huxtable, C. K. (SM)
Jenness, R. R. (SM)
Jones, R. W. (SM)
Kalman, J. (M)
Kao, L. (M)
King, G. A., Jr. (A)
Levine, M. B. (M)
Lyon, J. A. M. (SM)
MacDonald, W. F. (M)
Maltby, A. I. (A)
Maxon, E. K. (M)
Murphy, G. J. (M)
Omer, R. J. (M)
Paradise, M. E. (SM)
Paterson, W. L. (M)
Pinz, G. J. (M)
Potter, J. D. (A)
Prince, M. B. (SM)
Prisekin, C. (M)
Rockwood, C. H. (M)
Rollefson, K. E. (SM)
Saberson, C. J. (A)
Sabin, E. R. (A)
Schmidt, G. W. (M)
Schroeder, J. J., Jr. (M)
Shevick, P. (M)
Shure, S. H. (M)
Speck, L. P., Jr. (M)
Stauverman, R. J. (A)
Sugarman, M. L., Jr. (SM)
Thacher, L. A. (A)
Toth, W. S. (M)
Upadhyaya, S. P. (M)
Vanlesmond, H. K. (A)
Van Ness, J. E. (SM)
Ziegler, G. E. (SM)

Evergreen Park (CHI-5)
Hirsch, A. (M)
Kostyal, S. P. (M)
Lux, G. R. (M)
Venema, R. E. (A)

Fairbury (CHI-5)
Eilers, C. G. (M)

Flossmoor (CHI-5)
Caywood, T. E. (M)

Forest Park (CHI-5)
Fasick, R. C. (SM)
Semmer, J. W. (M)

Fox Lake (CHI-5)
Johnson, G. A. (M)

Franklin Park (CHI-5)
Brewster, F. C. (SM)
Brockett, D. F. (A)
Brumbach, J. F. (M)
Lucas, D. T. (M)
Niemoller, J. F. (M)
Padolit, K. W. (M)
Passow, L. F. (A)
Schoeneck, W. H. (A)

Freeport (CHI-5)
Barker, V. S. (SM)
Coleman, J. J. (M)
Ebert, F. C. (M)
Greene, K. D. (A)
Harrington, J. (M)
Lincoln, J. K. (A)
O'Connell, G. (VA)
Wincovitch, D. (A)

Geneva (CHI-5)
Clarke, R. E. (M)
Gruen, H. E. (M)
Junkins, A. H. (M)
Robbins, R. W. (SM)
Soderquist, R. K. (M)
Winston, R. H. (SM)

Genoa (CHI-5)
Wylie, J. R. (A)

Georgetown (CHI-5)
Snyder, D. A. (M)

Glencoe (CHI-5)
Brown, J. E. (F)
Camras, M. (F)
Ferry, J., Jr. (A)
Heuer, C. H. (M)
Kurland, J. J. (A)
Soiegel, G. W. (M)
Thompson, C. W. N. (M)
Whitman, M. R. (A)

Glen Ellyn (CHI-5)
Christensen, A. (SM)
Davis, R. H. (M)
Dyer, R. A. (M)
Harris, B. J. (M)
Kidd, W. E. (SM)
Kleker, J. H. (A)
Knowles, H. S. (F)
Krieg, B. E. (M)
Lincicome, J. R. (SM)
Managan, W. W. (M)
Mohler, R. D. (M)
Pearson, O. A. (M)
Pozdol, A. J. (M)
Rebeschini, I. C. (M)
Sharp, E. M. (M)
Shelton, E. D. (A)
Shoebridge, R. C. (M)
Stewart, J. R. (SM)
Tingley, E. M., Jr. (M)
Whiteside, J. R. (A)
Woolsey, R. J. (M)

Glenview (CHI-5)
Blyth, R. A. (M)
Bodnar, L. L. (M)
Burns, G. K. (SM)
Byrnes, W. P. (M)
Carlson, R. D. (M)
Carroll, P. F. (M)
Casciotti, R. J. (A)
Cushman, E. A. (A)
Darsch, A. P. (M)
Dunn, W. L. (F)
Fulenwider, J. E. (M)
Goss, C. G. (M)
Gough, G. L. (M)
Hayes, W. R. (M)
Hoffsuemmer, M. A. (A)
How, F. B. (A)
Iversen, R. L. (M)
Jorgensen, C. M. (SM)
Kelley, W. A. (SM)
Leslie, W. G. (M)
Lewis, G. E. (A)
Loh, G. M. (M)
Magnuski, H. (SM)
Magnuson, R. J. (M)
Masek, J. R. (A)
McFarland, R. B. (M)
Palmquist, J. F. (SM)
Pfeiffer, H. F. (M)
Siwy, D. J. (M)
Slayton, R. D. (SM)

Golf (CHI-5)
Boyajian, J. A. (SM)

Granite City (SL-6)
Metcalf, W. L., Jr. (M)
Pender, P. S., Sr. (SM)

Grayslake (CHI-5)
Perkins, H. T. (M)

Great Lakes (CHI-5)
Dzierski, M. P. (M)
Ferri, J. F. (M)
Fischer, D. W. (A)
Hudson, C. A. (A)
Jones, A. V. (SM)
Trio, R. E. (M)

Harvey (CHI-5)
Karlson, A. T. (M)
Nieckula, E. W. (A)
Swain, L. T. (M)

Hazelcrest (CHI-5)
Berry, R. F. (A)
Brown, W. H. (A)

Highland Park (CHI-5)
Arnolt, A. K. (A)
Cherry, W. L., Jr. (M)
Durkee, C. E. (M)
Firestone, W. L. (SM)
Hirshberg, W. L., Jr. (M)
Kiver, M. S. (M)
Laoin, S. P. (SM)
Lee, W. W. (A)
Penoerberg, L. E. (SM)
Rose, J. K. (M)
Schover, D. S. (SM)
Schwalm, W. A. (SM)
White, E. S. (SM)

Hillside (CHI-5)
Anderson, R. L. (M)
Biba, R. J. (A)
Huisjen, A. J. (M)

Hinsdale (CHI-5)
Clark, J. M. (SM)
Dumanowski, R. J. (A)
Frederico, J. C. B. (M)
Giessner, F. W. (M)
Hemminger, D. H. (M)
Hummel, J. P. (M)
Jackson, A. S. (A)
Mac Donald, A. A. (SM)
Neely, O. P. (A)
Perkins, E. S. (SM)
Wesselman, E. (VA)

Hollywood (CHI-5)
Poll, V. M. (A)

Homewood (CHI-5)
Bickel, R. C. (M)
Bielenin, A. (A)
Bremioan, R. O. (M)
Crotty, R. E., Jr. (M)
Koeppen, W. J. Jr. (M)
Krahe, L. R. (SM)
Walovich, J. J. (M)

Hoopeston (CHI-5)
Chorney, P. L. (M)

Hubbard Woods (CHI-5)
Miller, H. N. (M)

Ingleside (CHI-5)
Reese, K. E. (M)

Itasca (CHI-5)
Trzyna, J. (A)
Van Anrooy, P. H. (M)

Joliet (CHI-5)
Gerdes, R. C. (A)
Marcelis, W. R. (M)
Novy, J. F. (SM)
Shuba, J. P. (M)
Soerelakis, P. (M)
Szeoda, A. (M)
Ulisse, T. J. (A)

Kankakee (CHI-5)
Bernier, V. A. (A)
Palermo, P. A. (A)

Kenilworth (CHI-5)
Petersen, R. P. (SM)
Kewanee (CHI-5)
Cook, D. J. (A)

Kilbourne (CHI-5)
Green, J. L. (M)

Knoxville (CHI-5)
Wood, D. H. (M)

La Grange (CHI-5)
Allen, H. E. (SM)
Brodie, G. H. (M)
Brown, P. E. (A)
Collins, E. A. (M)
Cox, W. C. (A)
Fox, J. H. (M)
Gellatly, J. S. (SM)
Hohmann, C. R. (M)
Kikta, J. (A)
Knouf, R. J. (SM)
Lubin, M. (M)
Medill, J. W. (M)
Miller, J. M. (SM)
Raiser, E. N. (M)
Read, R. A. Jr. (M)
Schulz, E. H. (F)
Snelling, E. A. (SM)
Stephens, R. L. (A)
Unroe, J. L. (A)

La Grange Park (CHI-5)
Anderson, C. J. (M)
Bouska, J. F. (M)
Chambers, H. L. (M)
Frihart, H. N. (M)
Kash, R. M. (M)
May, F. D. (M)
Orwin, R. J. (M)
Vogele, F. C. (M)
Wehrle, R. (A)

Lake Bluff (CHI-5)
Glasel, W. B. (M)
Kramer, A. W. (M)
La Rose, A. P. (M)

Lake Forest (CHI-5)
Barrett, A. M., Jr. (M)
Byrne, W. C., Jr. (M)
Faulks, H. R. (M)
Galitz, R. J. (A)
Peugh, W. E. (M)

Lake Villa (CHI-5)
Ruck, R. C. (M)

Lake Zurich (CHI-5)
Ives, R. D. (SM)
Krueger, E. P. (A)

Lansing (CHI-5)
Burdeau, J. R. (A)
Huitema, R. L. (M)
Wells, J. F. (M)

La Salle (CHI-5)
Kobold, J. W. (A)
Lemanski, A. B. (M)

Lemont (CHI-5)
Anderson, T. T. (M)
Brar, S. S. (M)
Brill, T. (SM)
Connor, D. W. (M)
Frigerio, N. A. (A)
Lovoff, A. (SM)
Rame, R. L. (A)
Richards, H. K. (VA)
Rockwood, C. C. (A)
Ryan, H. T. (A)
Vianna, A. C. (A)

Lenzburg (SL-6)
Krause, H. J. (A)

Libertyville (CHI-5)
Bottorff, P. A. (M)
Bruna, R. F. (M)
DeWitt, W. H. (A)
English, W. C. (M)
Law, J. M. (A)
Reickert, E. A. (M)
Samelson, L. R. (A)
Weil, G. M. (M)

Lincoln (CHI-5)
Clemens, R. L. (A)
Ernst, R. F. (M)

Lincolnwood (CHI-5)
Dervishian, E. (M)
Dithardt, A. R. (M)
Fenton, M. J. (M)
Fiege, E. E. (M)
Goldfus, S. M. (SM)
Herst, R. J. (M)
Kaluzna, I. J. (M)
Roberts, E. A. (SM)
Solfert, M. L. (M)
Unick, J. L. (M)
Waterman, H. C. (M)

Lisle (CHI-5)
McMahon, D. W. (A)
Prokes, P. H. (M)
Yeoman, S. J. (A)

Lockport (CHI-5)
Nystrom, A. V. (M)

Lombard (CHI-5)
Abrath, C. E. (A)
Addy, J. R. (M)
Bartha, S. J. (A)
Beebe, C. W. (A)
Berry, R. E. (M)
Borchardt, R. L. (M)
Buckley, G. F. (A)
Caldwell, J., Jr. (SM)
Canell, G. P. (A)
Combs, J. P. (M)
Curtis, R. H. (M)
Dunbar, E. A. (A)
Fyler, G. W. (SM)
Grisanti, J. L. (A)
Gunn, D. L. (A)
Hartley, R. L. (M)
Hotchkiss, C. S. (M)
Jackson, W. C. (SM)
Laub, R. W. (A)
Lomasney, J. M. (SM)
Martino, L. J. (A)
Mattinoly, L. J. (A)
McCreary, H. J. (SM)
Orszula, N. R. (SM)
Pomon, J. D. (M)
Puhalski, D. (A)
Smith, A. P. (M)
Smith, D. W. (M)
Tschannen, R. F. (SM)
Van Geen, J. (M)
Williams, P. B. (SM)
Witt, C. E. (M)

London Mills (CHI-5)
Benson, L. G. (A)

Loves Park (CHI-5)
Eksten, D. G. (M)

Lyons (CHI-5)
Bratschun, R. C. (M)
Petzini, A. A. (A)
Polich, W. J. (M)

Macon (CHI-5)
Fathauer, G. H. (SM)

Maolewood (SL-6)
Burton, F. E. (A)

Marenoo (CHI-5)
Arnold, R. M. (VA)
Lewis, H. A. (M)
Parnell, R. A. (A)
Van De Houten, R. S. (M)

Marion (SL-6)
Levesque, J. J. (A)
McCormick, J. E. (M)

Marissa (SL-6)
Church, C. J. (M)

Markham (CHI-5)
Hunt, M. L. (A)
Mayoros, W. A. (A)

Marquette Heights (CHI-5)
Miller, W. B. (A)

Matteson (CHI-5)
Feehery, J. T. (A)

Mattoon (CHI-5)
Betz, J. D. (M)

Maywood (CHI-5)
Bastian, O. W. (M)
Bliss, G. B. (SM)
Del Camo, S. M. (F)
Donaldson, R. J. (SM)
Forst, P. P., Jr. (M)
Hall, H. R. (A)
Jakobsons, A. (M)
Komn, P. M. (VA)
Laube, W. C., Jr. (M)
Lee, C. (M)
Little, T. P. (M)
Maoes, L. J. (M)
Richards, H. F. (A)
Ruby, E. S., Jr. (M)

McHenry (CHI-5)
Lonolev, J. K. (A)
Palmer, F. J. (M)

Melrose Park (CHI-5)
Bachhuber, R. A. (M)
Backman, K. E. H. (SM)
Bell, R. W. (A)
Carson, G. B. (A)
Cohoon, R. L. (M)
Crainow, A. (A)
Earlv, J. M. (A)
Eckhardt, D. C. (M)
Fetzner, R. W. (M)
Flioel, F. J. (A)
Fullerton, P. L. (M)
Haas, J. K. (A)
Hesser, C. B. (M)
Jaster, D. R. (A)
Kowalik, R. F. (M)
Maza, G. M. (M)
McCarrell, R. H. (M)
Nemcek, G. M. (A)
Pope, A. E. (A)
Ravaneti, R. M. (M)
Ruths, E. P. (M)
Schwaoer, A. C. (M)
Vokoun, R. C. (A)
Zimmerman, J. (M)

ILLINOIS

Midlothian (CHI-5)
Browne, R. A. (M)

Modesto (CHI-5)
Launer, W. H. (M)

Mokena (CHI-5)
Book, E. G. (SM)
Collins, L. R. (A)

Moline (CR-5)
Martensen, M. D. (A)
Oppenheimer, E. P. (M)
Parthurst, J. E. (A)
Steffes, R. M. (A)

Monee (CHI-5)
Turner, J., Jr. (VA)

Monticello (CHI-5)
Cummins, R. L. (M)

Morris (CHI-5)
Kang, K. H. (A)

Morrison (CHI-5)
Van Osdol, R. L. (M)

Morton Grove (CHI-5)
Ackerman, N. A. (M)
Beneke, E. H. (M)
Burns, R. P. (A)
Cohn, J. (M)
Dal Corobbo, B. V. (M)
Dennis, R. J. (M)
Duvall, T. E. (A)
Frank, R. B. (M)
Gallagher, J. A. (SM)
Gillespie, N. R. (A)
Gould, E. (A)
Lanoe, W. W. (M)
Michel, W. A. (M)
Neukuckatz, A. (A)
Neumark, J. (A)
Olsen, R. M. (M)
Rahnert, R. G. (A)
Schneider, L. L. (M)
Sieoelman, A. (SM)
Smithana, D. R. (M)
Sokolov, J. (A)
Stastny, C. F. (SM)
Steiner, G. F. (M)
Trowbridge, F. (A)
Weiss, P. A. (M)
Wittkop, C. F. (M)
Wolter, F. A. (M)

Mt. Olive (CHI-5)
Strien, G. W. (M)

Mt. Prospect (CHI-5)
Bastian, E. (M)
Bero, H. O. (A)
Bernin, V. M. (M)
Bryner, D. B. (M)
Bull, R. W. (M)
Burton, J. W. (M)
Cromer, E. G. (M)
Czerooski, W. P., Jr. (M)
Evans, K. T. (M)
Goldstein, R. (M)
Huber, R. H. (M)
Johnson, J. T. (M)
Joy, W. F. (M)
Karres, G. E. (M)
Krempel, F. M. (SM)
Mac Askill, R. B., Jr. (SM)
Mann, R. W. (A)
Medal, R. J. (M)
Mokate, G. M. (M)
Raioh, J. T. (M)
Schumacher, J. H. (SM)
Shemanske, R. (M)
Temnka, J. A. (M)
Wallace, H. S. (M)
Whalen, J. A. (A)
Wieneke, R. G. (M)

Mundelein (CHI-5)
Bore, A. N. (M)
Chudd, R. G. (M)
Fitz-huch, C. D., Jr. (M)
Mitchell, C. A. (M)
Musal, H. M. (M)
Nation, J. E. (A)
Nienaber, F., Jr. (M)
Pacholke, F. (SM)

Naperville (CHI-5)
Bowman, B. J. (M)
Fancher, J. R. (M)
Haworth, D. F. (SM)
Johnson, M. C. (M)
Nider, M. E. (M)

New Lenox (CHI-5)
Johanson, E. W. (M)
Whalen, J. F. (M)

Niles (CHI-5)
Bere, S. (M)
Borman, W. M. (M)
Bruellers, F. J. (A)
Burl, F. J. (M)
Costello, L. B. (M)
Del Vento, J. M. (M)
Greenway, R. J. (SM)
Kahover, C. R. (A)
Klammer, R. W. (M)
McMullen, C. W. (M)
Pullis, J. H. (SM)
Schwartzbach, E. E. (M)

Normal (CHI-5)
Ewald, E. R. (M)
Johnston, J. L. (M)
Olson, B. (M)
Wilcox, S. R. (A)

Norridge (CHI-5)
Lakowski, F. (M)

North Aurora (CHI-5)
McIlvaine, O. T. (M)

Northbrook (CHI-5)
Amdursky, M. E. (A)
Conway, P. W. (A)
Crimp, J. G. (SM)
Hill, C. F. (A)
Pivan, D. B. (SM)
Pospisil, J. F. (M)
Sherrick, D. C. (M)

North Chicago (CHI-5)
Cormack, J. G. (M)
Hudson, T. B., Jr. (A)
Kasouf, G. (A)
Novak, P. D. (M)
Unitis, E. R. (A)
Welrich, H. P. (A)
Youngquist, D. (M)

Northfield (CHI-5)
Clark, R. V. (M)
Green, L. F. (A)

Northlake (CHI-5)
Cawthon, E. F. (M)
Clark, D. E. (SM)
Dimmer, R. P. (SM)
Molnar, I. (SM)

North Lake City (CHI-5)
Dolhar, J. L. (A)
Romano, S. S. (A)

North Riverside (CHI-5)
Beck, J. H. (M)
Sklom, G. M. (A)

Oak Lawn (CHI-5)
Blevins, E. L. (A)
Grace, B. J. (M)
Hansen, L. H. (M)
Hultberg, R. M. (M)
Jann, E. G. (M)
Kasper, F. S. (M)
Marsh, E. N. (M)
Martin, R. B. (A)
McKinney, R. L. (M)
Poncinie, D. J. (A)
Schardine, R. M. (M)
Thomas, C. B. (A)

Oak Park (CHI-5)
Alliot, E., Jr. (M)
Anderson, C. M. (A)
Armstrong, M. M. (M)
Bard, R. E. (SM)
Beoss, W. C. (A)
Beitz, R. E. (SM)
Benson, A. L. (M)
Benson, R. W. (M)
Benzuly, H. J. (M)
Bier, D. (M)
Bryan, R. H. (M)
Cotsworth, A., III (SM)
Delzell, R. P. (M)
Duffy, E. J. (M)
Dunlap, J. F. (M)
Fitch, W. M., Jr. (M)
Fockens, P. (M)
Fricke, L. C. (M)
Gammell, H. C. (A)
Goebel, E. S. (M)
Gooch, M. W. (M)
Grazlano, V. (SM)
Guay, A. J. (M)
Hanson, G. R. (A)
Ihde, W. M. (SM)
Jeffery, T. H. (M)
Knoblock, G. C. (A)
Larson, R. P. (M)
Le Baron, T. (M)
Leiner, F. C. (A)
Lenox, W. S. (A)
Linell, C. S. (A)
Maier, R. H. (SM)
Marsh, R. E. (SM)
Martin, J. W., Jr. (M)
May, H. E. (SM)
Mednieks, Z. (M)
Mehaffey, W. R. (SM)
Morawetz, F. (M)
Nemeth, W. E. (M)
Pallissard, J. W. (A)
Peterson, R. M. (M)
Pye, H. C. (VA)
Redfield, S. I. (A)
Russell, W. D. (M)
Rypkema, J. N. (SM)
Sinninger, D. V. (SM)
Sprunger, R. W. (M)
Staunton, J. J. J. (SM)
Travis, W. (A)
Van Scoyoc, J. N. (SM)
Vitous, J. P. (A)
Wise, G. H. (M)
Wunderlich, N. E. (M)
Yoder, R. S. (SM)
Zender, R. G. (SM)

Oblong (SL-6)
Kocher, D. G. (M)

O'Fallon (SL-6)
Hansarough, F. G. (M)
Schaefer, R. J. (A)

Orland Park (CHI-5)
Green, R. E. (SM)
Morrison, P. (A)
Stroik, R. G. (A)
Woodbury, H. L. (M)
Yang, F. F. H. (SM)

Ottawa (CHI-5)
Flacek, J. J. (A)
Meyer, C. H. (A)

Palatine (CHI-5)
Belschel, J. R. (A)
Currey, C. H. (M)
Medek, J. D. (M)
Powers, J. S. (M)
Ryan, R. J. (SM)
Sahl, G. R. (M)
Schreiner, L. W. (SM)
Thompson, R. T. (M)

Palos Heights (CHI-5)
Brown, M. H. (A)
Scheldorf, M. W. (F)
Sommerla, M. R. (A)

Palos Park (CHI-5)
Calmes, W. E. (SM)
Lloyd, W. P. (M)
Weiss, M. (M)

Pana (CHI-5)
Castle, C. A., Jr. (A)

Park Forest (CHI-5)
Bond, M. E. (M)
Christian, A. M. (M)
Clements, L. D. (M)
Hartman, R. B., II (M)
Keller, C. W., II (A)
Kozel, M. S. (A)
Maravich, R. (A)
Schulherr, R. M. (SM)
Schwartz, E. S. (M)
Voqt, A. R. (A)
White, O. (M)

Park Ridge (CHI-5)
Ashby, A. T. (M)
Boe, R. E. (A)
Boesen, G. F. (M)
Bridges, J. E. (SM)
Brown, J. M. (M)
Brown, W. (M)
Clark, J. T. (SM)
Crow, R. P. (M)
Daul, R. M. (M)
De Cola, R. (F)
Edwards, F. W. (M)
Erwood, J. (SM)
Farnsworth, G. W. (M)
Figlewicz, R. C. (A)
Griffith, B. G. (SM)
Hooper, W. D. (M)
Johnson, H. A. (A)
Kusack, W. P. (A)
Middleton, R. G. (SM)
Mroz, M. (SM)
Mueller, A. J. (M)
Nitschke, W. J. (M)
Passow, E. B. (SM)
Perry, J. T. (M)
Reukauf, D. C. (M)
Schoman, S. W. (M)
Schumacher, H. W. (A)
Shaw, J. R. (A)
Silver, J. F. (M)
Smith, P. S. (SM)
Stenerson, C. K. (M)
Thrun, A. G. (VA)
Van Bosse, J. G. (A)
Wertwijn, G. (SM)
Wiszowaty, C. B. (M)
Zenner, R. E. (SM)

Pecatonica (CHI-5)
Antwerp, M. C. (VA)

Peoria (CHI-5)
Bishop, J. W. (A)
Costa, P. J. (SM)
Hammond, W. M. (M)
Weinberg, P. (M)

Philo (CHI-5)
Hohn, F. E. (A)

Plainfield (CHI-5)
Hartong, H. H. (M)

Piano (CHI-5)
Beetham, R. B. (M)

Prospect Heights (CHI-5)
Bergman, E. J. (A)
Carlson, E. V. (SM)
Jackson, J. J. (A)
Kongable, L. S. (M)
Wiecek, E. J. (M)

Quincy (CHI-5)
Bush, R. S. (SM)
Butcher, J. H. (A)
Cooper, R. L. (M)
Delacy, E. M. F. (M)
Fortman, N. C. (M)
Hackbarth, H. R. (M)
Hoyt, W. A. (M)
Jochem, N. L. (SM)
Rolling, J. T. (M)
Stratman, H. G. (M)
Welbler, C. T. (SM)
Wheeler, J. C., Jr. (A)
Wilder, E. J. (A)

River Forest (CHI-5)
Devale, D. P. (M)
D'Orlo, P. A. (SM)
Hilbert, F. H. (M)
Hupert, J. J. (SM)
Schultz, A. A. (M)

River Grove (CHI-5)
Bousky, S. (SM)
Dunn, J. R. (A)
Green, L. H. (A)
Henke, W. G. (SM)
Tarantur, S. (M)
Wolf, M. (SM)

Riverside (CHI-5)
Brooks, R. D. (SM)
Cihak, W. E. (A)
Filpel, W. P. (M)
Hajek, R. J. (M)
Kean, W. F. (SM)

Robinson (SL-6)
Moore, R. W. (A)

Rochester (CHI-5)
Kessler, W. D. (M)

Rockford (CHI-5)
Appelgren, J. W. (A)
Armstrong, J. E. (A)
Berglund, D. B. (A)
Bowie, D. L. (M)
Bullen, C. V. (M)
Bullitt, L. J. (A)
Campbell, R. H. (A)
Conrad, R. S. (SM)
Dempster, J. H. (M)
Falk, W. R. (M)
Hand, C. A. (M)
Hausvick, R. L. (M)
Johnson, T. W. (M)
Kyburz, D. L. (M)
Leber, D. A. (A)
Marcolini, V. H. (M)
Massey, J. (A)
Peck, R. E. (M)
Steiner, J. E. (M)
Tveit, T. J. (M)
Welherman, R. J. (M)
Woolums, L. L. (A)
Zarembski, A. T. (A)

Rock Island (CR-5)
Elliott, H. R. (M)
Scott, A. R. (A)
Sinnett, R. J. (SM)
Stapp, E. B. (M)

Rolling Meadows (CHI-5)
Bonnell, D. W. (M)
Panec, D. O. (M)
Stecker, J. W. (A)
Wiencek, Z. (M)

Roselle (CHI-5)
Callahan, B. E. (M)
Goodrich, P. D. (M)
Hovinen, R. W. (M)
Nakata, C. K. (SM)
Oppenheimer, D. S. (SM)
Roenitz, R. K. (A)

Round Lake (CHI-5)
Meuer, A. (M)
Steffee, J. W. (A)

St. Beardstown (CHI-5)
Pickett, R. E. (A)

St. Charles (CHI-5)
Block, A. F. (M)
Chodl, C. Jr. (M)
Prescott, F. H., Jr. (M)
Sunitilov, M. C. (SM)
Taylor, E. H. (SM)
Wohlert, A. M. (M)
Wolhowe, M. V. (M)

Savanna (CHI-5)
Smith, D. A. (A)

Savoy (CHI-5)
Wood, W. W. (M)

Schiller Park (CHI-5)
Offner, F. (SM)
Ranke, K. R. (M)

Scott AFB (SL-6)
Bovle, J. A. (M)
Campbell, D. L. (A)
Gikas, G. N. (M)
Kover, M. M. (SM)
Thrush, T. W. (M)
Watts, H. T., Jr. (A)

Shirley (CHI-5)
Alley, R. P. (M)

Skokie (CHI-5)
Adler, H. J. (SM)
Axelrod, L. R. (M)
Blen, F. I. (M)
Carlson, D. A. (A)
Carter, R. W. (A)
Coover, M. (M)
Dols, J. M. (M)
Everett, J. E. (M)
Fain, D. L. (A)
Flower, W. (M)
Franklin, H. B. (M)
Frantz, N. (A)
Fruth, H. F. (SM)
Gordon, D. (A)
Hemstreet, D. C. (A)
Kaminsky, L. M. (M)
Lemmer, J. S. (M)
Lense, H. E. (SM)
Levine, W. E. (M)
Loizzo, V. J. (M)
Michals, R. A. (M)
Moskow, H. J. (M)
Moss, J. I. (A)
Mullen, R. L. (A)
Nitchals, J. L. (A)
O'Callaghan, J. J. (SM)
Osborn, R. L. (SM)
Pawlowski, F. L. (A)
Pierce, C. B. (M)
Purkis, R. E. (M)
Quateman, M. H. (SM)
Royston, M. F. (SM)
Sager, J. (M)
Segal, A. A. (M)
Stiefel, P. (M)
Sussman, M. (M)
Thomas, R. G. (A)
Toback, P. L. (M)
Warnke, G. F. (M)
Wayne, H. A. (SM)
Welsz, W. J. (M)
Wickstrom, S. T. (M)
Woods, H. (A)
Wrioht, F. R. (A)
Wynstock, S. (A)
Yofsky, S. A. (M)

Soarta (SL-6)
Huss, J. W. (M)

Sorinofield (CHI-5)
Bowers T. N. (A)
Hem, R. J. (A)
Leach, E. A. (SM)
McGee, K. (SM)
Oram, D. K. (VA)
Owens, D. A. (A)
Pline, R. A. (M)
Stock, B. L. (M)
Thomas, C. C. (M)
Vesoer, M. C. (A)
Wilson, H. C. (M)

Steoer (CHI-5)
Holmes, H. H. (M)

Sterlino (CHI-5)
Drane, R. L. (M)

Strasbura (CHI-5)
Risser, F. G. (A)

Streator (CHI-5)
Gotch, J. X. (A)

Stronghurst (CHI-5)
Wilson, D. L. (A)

Summit (CHI-5)
Berberek, W. J. (A)

Taylorville (CHI-5)
Smith, W. D. (A)

Tinley Park (CHI-5)
Peterson, J. W. (M)

Urbana (CHI-5)
Allen, J. S. (A)
Allington, R. W. (M)
Bailey, A. D. (SM)
Auth, L. V., Jr. (M)
Anner, G. E. (SM)
Bauman, P. A. (M)
Becker, R. C. (M)
Brown, R. M. (M)
Burtness, R. W. (SM)
Costa, M. J. (A)
Crothers, M. H. (SM)
Davidson, R. A. (M)
Deschamps, G. A. (SM)
Dimond, J. (M)
Dougal, A. A. (M)
Dyson, J. D. (M)
Emery, W. L. (SM)
Everitt, W. L. (F)
Fett, G. H. (F)
Fry, W. J. (M)
Goldstein, L. (F)
Gooch, J. D. (M)
Hayden, E. C. (M)
Hedvio, T. I. (M)
Hendricks, C. D., Jr. (M)
Holshouser, D. F. (M)
Hudson, P. K. (SM)
Isbell, D. E. (A)
Jensen, R. S. (M)
Joehlin, N. C. (M)
Jones, E. C., Jr. (A)
Jorden, E. C. (F)
Kamvon, R. J. (M)
Knoebel, H. W. (A)
Kuo, B. C. I. (M)
Lanoir, S. P., Jr. (M)

Mast, P. E. (M)
Mayeda, W. (M)
McVay, M. S. (SM)
Mittra, R. (M)
Muwle, J. L. (A)
Murrell, T. A. (M)
Myers, B. R. (SM)
Myers, J. J. (SM)
Poooelbaum, W. J. (A)
Rev, S. R. (A)
Ricketts, L. W. (M)
Robertson, J. E. (M)
Ruina, J. (M)
Sandquist, J. W. (A)
Schwarzlose, P. F. (SM)
Sinclair, G. (F)
Soubler, H. A. (M)
Strain, R. J. (M)
Swartwout, R. E. (SM)
Swenson, G. W., Jr. (SM)
Tetzlaff, F. L. (M)
Troodon, R. L. (M)
Tvkociner, J. T. (SM)
Van Valkenburo, M. E. (SM)
Voth, B. W. (M)
Wax, N. (M)
Webb, H. D. (SM)
Weeks, W. L. (A)
Westlund, C. D. (SM)
Yeh, K. C. (M)

Verona (CHI-5)
Dix, F. W. (A)

Villa Park (CHI-5)
Carr, J. E., Jr. (M)
Fackenthal, D. F. (A)
Fernandez, D. T. (A)
Gorbunoff, A. (SM)
Mathews, C. A., Jr. (M)
Norbero, L. R. (M)
Sebastian, R. W. (A)
Soarf, W. H. (M)
Todd, A. C. (SM)
Walters, A. R. (M)
Zaruba, E. J. (SM)

Virden (CHI-5)
Carr, H. E. (A)

Warren (CHI-5)
Townsend, H. D. (M)

Washington (CHI-5)
Newell, J. S., Jr. (M)
Overley, J. P. (A)
Pfaner, R. M. (M)

Waukegan (CHI-5)
Anderson, C. A. (M)
Beane, E. A. (M)
Biscomb, L. I., Jr. (M)
Caln, R. J. (M)
Jensen, G. (M)
Krasovec, A. C. (A)
Nevin, M. E. (A)

Westchester (CHI-5)
Binkis, A. M. (M)
Davies, D. C. (M)
Floyd, E. C. (SM)
Frankart, W. F. (M)
Gabriel, R. R. (M)
Morgan, R. E. (M)
Pecina, R. J. (M)
Stones, A. E. (M)

West Chicago (CHI-5)
Hessler, O. G. (SM)
Hummel, H. J. (M)
Merda, W. R. (A)
Rullman, E. E., Jr. (A)
Scandora, A. E. (A)

Western Springs (CHI-5)
Bracken, J. F. (M)
Cannon, C. D. (M)
Dondanville, R. V. (SM)
Gray, G. E. (SM)
Hungerford, N. C. (A)
Kramer, K. (SM)
Scott, W. S. (M)
Swanson, B. E. (M)
Turke, B. A. (M)
Valach, C. F. (M)
Wernecke, H. W. (A)

West Melrose Park (CHI-5)
Dietz, L. A. (A)

West Salem (EO-5)
Maas, J. L. (A)

Wheaton (CHI-5)
Batts, R. L. (SM)
Calobrisi, P. (A)
Doemer, R. C. (A)
Duncan, D. C. (M)
Emaus, J. L. (SM)
Frank, C. W. (M)
Gaskins, S. M. (M)
Hausten, D. R. (A)
Hoekle, J. W. (M)
Jensen, R. E. (M)
Jepson, M. R. (A)
Joyner, A. A. (SM)
Klem, R. F. (SM)
Matthews, G. D. (M)
Nelson, W. H. (M)
Olson, R. H. (SM)
Parker, N. W. (A)
Quist, W. G. (M)
Rohrer, C., Jr. (M)
Savage, L. E. (M)
Sawada, F. H. (SM)
Smith, R. H., Jr. (M)
Squires, E. G. (M)
Thompson, D. C. (M)
Upton, E. C., Jr. (M)
Van Slyck, W. S. (SM)
Venema, H. J. (SM)
Ward, A. G. (SM)
Willyard, C. H. (A)

Wheeling (CHI-5)
Coomes, P. S. (M)
Naber, J. S. (M)

Wildwood (CHI-5)
Jarvis, G. R. (M)

Wilmette (CHI-5)
Bell, J. F. (SM)
Bercaw, O. M., Jr. (M)
Bosshart, R. F. (M)
Canning, T. B. (A)
Crossley, R. C. (M)
Cutlip, S. B. (M)
Di Ceclo, S. A. (M)
Edens, G. E. (M)
Freeman, W. H. (M)
Keller, E. A. (SM)
Kline, L. M., Jr. (SM)
MacLean, N. W. (M)
McJohnston, C. A. (M)
Nordby, R. M. (SM)
Paglee, E. H. (M)
Papler, J. H. (M)
Plonkowski, E. F. (M)
Schnell, W. J. (SM)
Shuey, L. S. (A)
Smith, E. L. (M)
Sorsen, S. L. (A)
Steel, F. R., Jr. (A)
Stewart, C. H., II (SM)
Stott, H. G. (A)
Thomas, L. R. (M)
Warshawsky, J. (M)
Waterfall, F. E. (SM)
Wexler, J. S. (SM)

Winfield (CHI-5)
Teske, H. O. (A)

Winnetka (CHI-5)
Berglund, A. O., Jr. (M)
Carlson, G. R. (A)
Howell, E. R., Jr. (A)
Ward, R. W. (M)

Wonder Lake (CHI-5)
Thompson, A. C. (M)

Wood Dale (CHI-5)
Gardner, R. O. (M)
Maldak, A. M. (M)

Woodstock (CHI-5)
Kiclak, C. J. (A)

Zion (CHI-5)
Albert, A. A. (A)
McDowell, J. L. (M)

INDIANA

Anderson (IND-5)
Carothers, F. S., Jr. (M)
Gardner, R. A. (A)
Heller, R. E. (M)
Holt, D. L. (M)
Liston, W. S. (M)
Merritt, D. E. (A)
Phlegar, C. L., Jr. (M)
Rath, G. A. (M)
Reynolds, B. G. (A)
Snowden, J. L. (M)
Soeller, A. L., Jr. (M)

Angola (FT-W-5)
Abaderash, T. K. W. (A)
Ax, L. S. (SM)
Farbach, J. R. (A)
Hanson, L. G. (A)
Southern, C. D. (A)
Stevens, D. R. (A)
Westenhaver, M. E. (A)
Worden, L. E. (A)

Arcadia (IND-5)
Nightenhelser, K. W. (M)

Auburn (FT-W-5)
Capen, G. A. (M)

Aurora (CIN-4)
Achatz, R. V. (M)

Beech Grove (IND-5)
Achzehner, R. Q. (M)

Bloomington (IND-5)
Bahr, W. B. (M)
Berman, M. (M)
Bough, J. N. (A)
Dixon, L. W. (SM)
Gribben, J. C., Jr. (A)
Hackemeyer, R. F. (A)
Krepps, J. E., Jr. (SM)
Presti, B. (M)
Siddons, G. F. (SM)
Svanascini, A. L. (SM)
Tarzian, S. (SM)

Chalmers (IND-5)
Banes, D. E. (A)

Chesterton (CHI-5)
Olson, E. H. (A)

Clarksville (LOU-5)
Yochem, J. F. (A)

Columbus (IND-5)
Dugan, J. M. (M)
Harden, R. D. (A)
Kelly, J. R. (A)
Selenius, O. E. (M)
Silva, A. D., Jr. (M)
Silva, L. F. (M)
Stambaugh, D. W. (M)

Connersville (CIN-4)
Rose, G. C. (M)
Whatley, R. L. (M)

Crane (EO-5)
Finley, R. W. (M)

Crown Point (CHI-5)
Skoog, R. E. (M)
Graiber, R. S., Jr. (M)

Culver (SB-M-5)
Hannabach, J. (M)

Cumberland (IND-5)
Keeling, C. J. (M)

Danville (IND-5)
Behymer, D. E. (M)
Miller, W. E. (A)

Dayton (IND-5)
Yost, K. E. (M)

Demotte (CHI-5)
Johnson, R. C. (A)

East Chicago (CHI-5)
Nesbitt, E. P. (A)

East Gary (CHI-5)
Johnson, J. A. (M)
Mundell, E. H. (A)

Elkhart (SB-M-5)
Best, J. G. (A)
Budd, W. H. (M)
Dailv, A. M. (M)
Doty, J. S. (M)
Fabert, W. M., Sr. (M)
Gaddie, G. E. (M)
Houck, H., Jr. (A)
Kent, E. L. (SM)
Kieffer, G. H., Jr. (A)
Klinoer, J. E. (A)
Krauss, S. L. (M)
Lindahl, H. C. (M)
McDonald, L. J. (M)
Moore, C. C. (M)
Nicely, W. A. (A)
Osburn, C. M. (M)
Roberts, M. W. (M)
Smith, R. A. (A)
Turner, B. S. (M)
Vaksvik, A. J. (M)

Evansville (EO-5)
Caraway, J. B. (SM)
Caster, M. S. (M)
David, C. E. (M)
Dufford, R. T. (SM)
Fischer, N. C. (A)
Flackbert, W. D. (M)
Gennes, F. A. (SM)
Gordon, J. M. (A)
Greeson, J. H. (A)
Hatfield, P. E. (M)
Hennel, J. R. (M)
Herendeen, O. V. (A)
Kappes, A. V. (A)
Koonce, C. W. (M)
Krueoer, O. H. (A)
Malor, J. R. (M)
Miegel, A. K. (SM)
Miles, K. G. (M)
Quirk, J. A. (A)
Schoene, R. L. (SM)
Schoeny, E. P. (A)
Schultz, W. F. (A)
Stoltz, G. F. (M)
Williams, W. A. (SM)

Fort Wayne (FT-W-5)
Amos, B. (M)
Artman, R. L. (M)
Bardonner, W. J., Jr. (M)
Barranger, J. P. (M)
Beach, H. W. (M)
Beaulieu, B. A. (A)
Bennett, F. Y., Jr. (M)
Bireley, R. L. (M)
Blake, J. A. (A)
Blake, N. A. (M)
Brady, F. H. (A)
Broseohini, B. L. (M)
Bryant, W. D. (M)
Cain, R. F. (M)
Carpenter, D. L. (M)
Casteel, B. G. (M)
Chambers, D. R. (A)
Clark, J. R. (SM)
Clements, L. F. (M)
Close, E. F. (M)
Coatney, A. E. (M)
Coles, D. K. (SM)
Collins, G. E. (SM)
Cook, D. W. (M)
Cramer, L. F. (SM)
Cronkwright, R. F. (M)
Davis, D. W. (M)
Dean, W. A. (A)
Decker, S. M. (M)
Dees, J. W. (M)
Dreisbach, R. H. (M)
Dve, N. E. (M)
Edobert, J. D. (SM)
Emery, R. C. (A)
Farnsworth, P. T. (F)
Fisher, D. E. (A)
Folks, R. C. (A)
Fonn, S. G. (SM)
Freimann, F. (SM)
Garrett, L. A. (M)
Giffin, G. S. (M)
Gotschall, W. O. (M)
Gough, L. E. (SM)
Gramer, E. E., Jr. (M)
Grant, R. L. (SM)
Haddock, D. E. (M)
Hambrook, H. E. (M)
Hamilton, R. J. (M)
Hardwick, C. L. (SM)
Harner, R. L. (A)
Harris, A. S. (M)
Harrison, R. E. (M)
Hawkins, E. S. (M)
Hedeen, F. D. (A)
Helmreich, L. W. (SM)
Hendryx, W. B. (M)
Herke, F. P., Jr. (A)
Hertzob, W. K. (M)
Hessler, J., Jr. (SM)
Hine, S. H. (A)
Holmquist, J. A. (M)
Houser, N. W. (M)
Howe, D. R. (A)
Humphries, R. G. (M)
Jacobson, A. J. (M)
Jensen, C. W. (M)
Johnson, D. L. (A)
Johnson, L. (M)
Jones, R. R. (M)
Juroensen, V. L. (A)
Kaat, S. L. (M)
Kardan, R. (M)
Kelleher, W. J. (M)
Keller, V. L. (M)
Kendall, P. E. (SM)
Kiltie, O. (M)
Knarr, C. E. (M)
Knauer, P. E. (M)
Koenio, F. W. (M)
Kuffel, L. A. (M)
Lawburoh, R. H. (M)
Loftin, R. A. (M)
Lovegren, P. B. (M)
Malor, T. (M)
Malmleaf, W. R. (M)
Mannino, G. C., Jr. (A)
Martin, R. F. (A)
Mason, C. F. (A)
Mast, P. L. (M)
Mavle, A. T., Jr. (SM)
Mavle, L. F. (SM)
McFadden, J. H. (A)
McGregor, R. B. (M)
McKeand, R. W. (M)
Meadows, H. R. (M)
Miller, H. E. (M)
Mills, R. W. (M)
Moore, K. F. (A)
Mount, E. V. (M)
Muniz, R. (SM)
Murphy, L. W. (M)
Neal, J. D. (M)
O'Connor, R. A. (M)
Pavlik, R. J. (M)
Peoo, B. B. (A)
Poole, R. E. (M)
Pritchard, H. T. (M)
Pufahl, E. R. (M)
Rasley, D. R. (SM)
Reels, L. J. (M)
Rexroad, R. A. (A)
Richards, C. A. (M)
Richeson, W. E. (M)
Robertson, G. D. (SM)
Rodoers, P. D. (M)
Rogers, M. A. (A)
Rov, W. R. (M)
Russell, R. S. (M)
Rust, M. F. (A)
Sabo, J. (M)
Sallnoer, H., W. G. (F)
Sanders, R. W. (SM)
Schlichemeier, K. H. (M)
Schneider, S. S. (SM)
Seaman, D. L. (M)
Seiv, M. E. (SM)
Sessler, J. G. (M)
Sharo, J. W. (SM)
Silver, J. O. (M)
Sinish, R. D. (SM)
Slater, T. L. (M)
Slick, E. P. (M)
Sloan, W. R. (A)
Snell, J. W. (A)
Solomon, R. M. (M)
Southern, P. D. (M)
Spurrow, E. L. (M)
Statler, S. W. (A)
Stein, E. F. (M)
Stewart, C. W. (A)
Stoakes, W. L. (M)
Stone, R. F. (A)
Sutton, J. R. (A)
Swanson, E. S. (A)
Teeter, T. S. (A)
Thompson, J. L. (A)
Tleszen, D. J. (M)
Tonhio, M. F. (M)
Torenin, W. J. (M)
Torzvn, N. T. (M)
Trimarchi, J. (M)
Valentine, F. C. (M)
Wade, W. D. (SM)
Wallace, C. E., Jr. (M)
Watkins, G. C., Jr. (M)
White, F. A. (M)
Wibel, D. (A)
Wible, P. E., Jr. (A)
Williams, W. J., Jr. (M)
Wolfoano, L. G. (M)
Wolk, T. E. (M)
Zbacnik, E. V. (M)

Franklin (IND-5)
Reuss, R. E. (M)

Galveston (IND-5)
Buehler, E. R. (A)

Gary (CHI-5)
Barancyk, V. (A)
Biro, D. J. (A)
Buccicone, V. S. (M)
Donahey, H. E. (A)
Ireland, R. P. (M)
Jauch, K. E. (M)
Philbin, J. A. (A)
Rado, J. A. (SM)
Ratkay, S. (A)
Shirk, K. C. (VA)
Theodore, J. A. (A)

Goshen (SB-M-5)
Corporan, R. P. (M)
Harrison, E. F. (A)

Grabill (FT-W-5)
Phillips, T. H. (M)

Granger (SB-M-5)
Ammon, J. A. (A)
Rach, R. D. (A)

Greenwood (IND-5)
Marshall, C. L. (M)

Griffith (CHI-5)
Vereb, A. J. (A)

Hagerstown (CIN-4)
Vanderbilt, V. C., Jr. (SM)

Hammond (CHI-5)
Dwyer, R. J. (M)
Findling, M. J. (M)
Janik, J. L. (M)
Severson, M. L. (A)

Hobart (CHI-5)
Spangler, R. (A)

Hope (IND-5)
Keller, L. P. (M)

Hudson (FT-W-5)
Tressler, J. B. (M)

Huntertown (FT-W-5)
Ordas, A. F. (M)

Huntington (FT-W-5)
Chambers, W. A. (A)
Cozad, J. W. (A)
Fisher, C. C. (SM)
Kaufman, A. R. (A)
Smart, R. E. (A)
Terry, C. B. (M)

Indianapolis (IND-5)
Alden, E. E. (M)
Aldred, E. D. (M)
Anderson, S. R. (M)
Arbuckle, R. D. (A)
Arfman, R. W. (M)
Arvin, M. J. (SM)
Axmann, G. F. (M)
Barrelle, R. J. (M)
Bergeman, R. H. (M)
Bell, D. L. (A)
Bennett, W. H. (M)
Bertler, J. C., Jr. (M)
Bernsen, W. H. (M)
Blacklidge, R. A. (A)
Booher, W. R. (M)
Bouchard, E. N. (A)
Braunlin, R. J. (A)
Brockway, R. M. (M)
Brodrick, L. G. (M)
Butts, C. B. (A)
Carpenter, M. M., Jr. (M)
Carson, H. E. (SM)
Carter, H. A. (A)
Cobb, L. J. (M)
Cook, L. R. (M)
Cross, K. R. (A)
Da Prato, B. F. (M)
Davis, C. B. (M)
De Voe, L. M. (M)
Drilling, N. G. (M)
Dumbacher, J. (M)
Ervin, E. E. (M)
Evans, A. G. (M)
Evans, R. A. (SM)
Everhart, C. W. (M)
Faog, W. H. (A)

Fallowes, R. W. (A)
Fitch, H. E. (A)
Fraser, G. R. (SM)
French, A. B. (M)
Gamble, M. E. (SM)
Gary, A. H. (M)
Gautzler, R. L. (M)
Givan, D. E. (M)
Goodier, G. N. (A)
Gresham, S., Jr. (SM)
Grimmett, L. J. (M)
Hall, J. M., Jr. (M)
Hand, J. E. (M)
Harden, J. G. (SM)
Haycraft, D. L. (M)
Hofeld, J. G. (M)
Holland, H. A. (A)
Hostetler, W. E. (M)
Hromada, J. C. (SM)
Huetten, C. (SM)
Hurley, H. C. (M)
Jackson, W. E. (F)
Jordan, H. G. (M)
Kennedy, W. H. (M)
Kevill, J. F. (M)
Knipp, C. W. (M)
Kovalcik, E. (M)
Kraft, R. W. (A)
Macnabb, V. C. (M)
Manning, W. L. (SM)
Marasco, F. A. (M)
Marshall, L. C. (SM)
Maxwell, J. W. (SM)
McMinn, E. R. (M)
Mogle, R. E. (M)
Montoya, E., Jr. (SM)
Morone, J. P., Jr. (SM)
Moyer, R. C. (SM)
Myers, W. D. (M)
Nelson, J. B. (A)
Olsen, R. C. (A)
Peden, J. E. (A)
Phillips, R. M. (M)
Purnett, L. J. (SM)
Raub, R. D. (A)
Ray, J. (A)
Reager, A. M. (VA)
Roeschlein, E. R. (A)
Rosser, T. N. (SM)
Roys, H. E. (F)
Sauerlie, F. H. (M)
Schaper, R. J. (M)
Schmitt, D. L. (M)
Schoch, H. B. (M)
Schooley, C. E. (SM)
Schultz, A. J. (SM)
Schulz, E. A. (A)
Skinner, G. M. (M)
Slater, I. M. (SM)
Sorensen, R. L. (M)
Spencer, R. L. (M)
Stanley, E. R. (M)
Stembel, J. E. (M)
Stone, H. R. (A)
Stuart, D. M. (SM)
Sukup, J. P. (M)
Taggart, S. E. (M)
Taque, B. D. (SM)
Thomas, J. G. (A)
Thomas, J. W. (A)
Thorn, W. D. (M)
Trout, C. C. (M)
Tudor, E. C. (M)
Tulauskas, L. (SM)
Turnbaugh, C. C. (M)
Tyler, R. D. (M)
Vaughn, D. C. (M)
Viere, A. J. (M)
Walker, R. S. (M)
Welsh, L. F. (M)
Whitaker, R. O. (A)
White, B. J., Jr. (A)
Widrikis, I. (A)
Willey, V. E. (M)
Williams, J. E. (A)
Windsor, R. N. (A)
Wisner, H. L. (SM)
Wolff, H. R. (SM)
Wulfekuhl, R. J. (M)
Wuster, W. L. (A)
Young, E. A. (A)

Jeffersonville (LOU-5)
Monroe, C. M. (M)

Jonesboro (IND-5)
Konrad, R. J. (M)

Kokomo (IND-5)
Atkinson, J. R. (M)
Bickel, S. O. (A)
Blossey, C. W. (M)
Brandon, W. S. (M)
Brinkerhoff, D. E. (A)
Brown, L. E. (A)
Brown, R. B. (M)
Bunch, D. L. (M)
Calabro, J. E. (M)
Carlson, E. C. (A)
Carr, W. J. (M)
Chassin, C. A. (M)
Cory, C. D., Jr. (M)
Cory, N. L. (A)
Dean, R. J. (A)
Doversberger, K. W. (M)
Engle, D. E. (A)
Gerlandt, B. J. (M)
Guglietta, A. J. (A)
Guyton, J. H. (M)
Heckert, W. F. (M)
Hein, P. H. (M)
Jaumot, F. E., Jr. (SM)
Jenkins, R. L. (M)
Khan, F. R. (A)
Laitinen, L. K. (M)
Latsinger, W. C. (M)
Manahan, M. J. (SM)
Martin, D. W. (M)
Mason, J. M. (M)
McCaughan, H. M. (A)
Miller, R. F. (M)
Naylor, M. W. (M)
Nellans, K. L. (M)
Nelson, D. L. (M)
Paskell, E. (A)
Prewitt, T. A. (M)
Pyle, H. (M)
Rittman, A. D. (SM)
Ruff, D. O. (M)
Runyan, W. G. (M)
Schaffner, J. S. (SM)
Schwarz, B. A. (F)
Scott, L. E. (M)
Stefken, R. M. (M)
Snead, J. R. (A)
Stahl, K. L. (M)
Stelzl, H. M. (M)
Tritt, E. M. (M)
Vogt, K. S. (M)
Votava, C. J. (M)
Wagner, R. F. (M)
Wright, H. E. (M)
Zeps, H. (A)

Lafayette (IND-5)
Adams, W. L. (M)
Evans, C. M. (M)
Evans, H. R. (M)
Freeman, S., Jr. (M)
Friedlaender, F. J. (A)
Gibson, J. E. (M)
Halsey, M. R. (M)
Hancock, J. (M)
Hemdal, J. F. (M)
Kamal, A. D. (M)
Landgrebe, D. (M)
Murphy, R. D. (M)
Sage, A. P., Jr.
Samuels, J. C. (M)
Schultz, F. V. (SM)
Seo, H. (M)
Siskind, R. P. (SM)
Stanley, P. E. (M)
Tou, J. (SM)

La Porte (SB-M-5)
Tuck, F. A. (A)

Lawrence (IND-5)
May, C. W. (A)

Lebanon (IND-5)
Thoman, J. E. (M)

Logansport (IND-5)
Harrell, D. H. (M)
Munson, A. L. (A)

Marion (IND-5)
Ballard, D. C. (SM)
Benway, R. E. (M)
Saunders, R., Jr. (SM)

Michigan City (SB-M)
Ailnsky, J. W. (SM)
Demercurio, C. D. (M)
Groendyke, R. W. (M)
Hillmann, R. E. (A)
Honda, M. (A)
Horvath, J. W. (A)
Kolster, W. K. (A)
Lee, W. (A)
Livingstone, J. K. (M)
Matter, L. E. (M)
Meadows, F. D. (SM)
Middleton, J. A. (M)
Page, O. D. (SM)
Sievers, S. S. (M)
Spangler, S. T. (SM)

Mishawaka (SB-M-5)
Arakelian, G. P. (M)
Armstrong, C. N. (M)
Arthur, A. A. (M)
Bellows, R. K. (M)
Bigelow, A. F. (M)
Bregantini, J. S. (SM)
Cooney, J. J. (M)
Crosby, E. L., Jr. (M)
Cunningham, D. L. (M)
Eberlein, C. W. (M)
Garrow, S. H. (M)
Haigh, R. B. (M)
Hansen, A. G., Jr. (M)
Janosik, J. R. (M)
Jones, P. W. (M)
Kindt, N. O. (M)
Koch, W. J. (A)
Kracman, M. (A)
Kutz, R. W. (M)
Lawrence, W. G. (M)
Lottes, J. J. (M)
Marshall, R. E. (M)
McGuffey, G. W. (M)
McGuire, H. E. (M)
Miller, A. E. (A)
Neff, D. L. (A)
Ombers, A. C. (SM)
Patlen, R. B. (A)
Paulson, E. E. (M)
Pilcher, R. M. (M)
Piess, L. C. (M)
Schmidt, M. D. (M)
Schmiedeler, F. J., Jr. (M)
Small, G. L. (M)
Sollies, P. D. (M)
Sprouse, P. J. (A)
Steele, N. D., Jr. (M)
Turner, O. G. (M)
Vogtmann, H. W. (M)
Wagner, R. J. (M)
Walenga, J., Jr. (M)
Whiffen, R. E. (SM)

Mooresville (IND-5)
Fenimore, G. E. (SM)

Mount Vernon (EO-5)
Wintemheimer, C. G. (M)

Muncie (IND-5)
Burton, D. A. (A)
Green, H. L. (A)
Hayes, M. E. (A)
Springer, G. P. (A)

Munster (CHI-5)
Brander, R. (M)
Gillis, D. J. (A)
Miner, J. H. (A)
Roedel, J. (M)
Sane, J. M. (A)

New Albany (LOU-5)
Jennings, S. V. (M)

New Carlisle (SB-M-5)
Evancich, E. (M)

New Haven (FT-W-5)
Allen, R. E. (M)
Buckley, J. E. (M)
Elden, G. E. (M)
Guichard, R. S. (M)
Hallmark, C. E. (SM)
Klessling, C. E., Jr. (A)
Koppin, A. A. (M)
Murphy, F. J. (M)
Swank, G. D. (A)

Notre Dame (SB-M-5)
Cooves, E. A. (SM)
Ellithorn, H. E. (SM)
Evers, A. J. (M)
Foecke, H. A. (A)
Hodes, I. (M)
Morgan, D. R. (M)
Stauder, L. F. (M)

Orestes (IND-5)
Gilliam, D. W. (A)

Oriole (EO-5)
Frakes, S. E. (A)

Osceola (SB-M-5)
Cox, P. G. (SM)
Ludwig, A. R. (M)
Moulton, G. E. (M)

Peru (IND-5)
Myers, J. R. (M)
See, W. E. (A)

Pittsboro (IND-5)
Lightbume, D. N. (A)

Plainfield (IND-5)
Guthrie, A. K. (M)
Wright, C. R. (M)

Plymouth (SB-M-5)
Kennedy, P. R. (A)
Zyzys, E. A. (M)

Princeton (EO-5)
Havill, C. N. (M)
Smith, Z. R. (M)

Richmond (CIN-4)
Maddox, R. D. (M)
Schlewe, A. J. (M)
Young, K. W. (A)

Roanoke (FT-W-5)
Yoder, L. E. (M)

Russiaville (IND-5)
Fred, J. A. (M)

St. Meinrad (EO-5)
Ringeman, O. E. (M)

Seymour (IND-5)
Cupp, J. C. (A)

Sheridan (IND-5)
Neal, S. M. (M)

South Bend (SB-M-5)
Bademian, L. (M)
Beazell, H. L. (M)
Bedford, J. S. (M)
Beehler, L. A. (M)
Blong, V. J. (M)
Borkowski, J. A. (A)
Bowersox, F. L. (M)
Colten, J. L. (SM)
Dart, D. E. (M)
De Ruyck, A. R. (M)
Durbin, H. M. (M)
Falco, M. F. (SM)
Feaster, J. A. (M)
Firner, J. F. (M)
Follen, R. J. (M)
Goodwin, W. V. (SM)
Grant, J. H. (M)
Heller, D. M. (SM)
Hicks, C. S. (M)
Hoffman, C. H. (SM)
Hollis, R. H. (M)
Hunt, A., Jr. (A)
Jacks, J. T. (M)
Jaffe, B. (A)
Kaiser, R. P. (M)
Kemph, K. R. (M)
Kunz, W. J., Jr. (SM)
Lancaster, R. G. (M)
La Salle, E. (M)
Leslie, C. B. (A)
Llepa, L. V. (M)
Link, A. G. (M)
Loprestl, P. V. (M)
Loring, L. W. (A)
Mansfield, K. I. (A)
Marz, P. A. (M)
Masteller, B. L. (M)
McWhortor, W. F. (M)
Metsker, W. E. (SM)
Miller, R. B. (M)
Miller, R. D. (M)
Modesitt, M. B. (M)
Mossman, R. B. (SM)
Nymberg, R. J., Jr. (M)
O'Neil, A. R. (M)
Patterson, J. M. (A)
Pauwels, K. G. (A)
Puca, Q. J. (M)
Quigley, A. J. (M)
Root, R. E. (M)
Rushing, A. A. (M)
Secor, B. K. (M)
Siegal, R. P. (M)
Soleta, G. S. (M)
Svorec, R. S. (A)
Swisher, P. E. (SM)
Voss, J. R. (M)
Walton, P. E., Jr. (A)
Weller, G. (M)
Weissert, R. K. (M)
Welsh, C. A. (M)
West, E. B. (M)

Speedway (IND-5)
Wacker, K. F. (A)

Spencer (IND-5)
Langley, H. M. (M)

Tell City (EO-5)
Churchill, P. K. (SM)
Groves, S. K. (SM)
Hammond, R. F. (SM)

Terre Haute (IND-5)
McCrocklin, R. E. (M)
Moench, H. A. (SM)
Smith, P. D. (M)
White, J. (M)

Union City (IND-5)
Resor, J. D. (M)

Valparaiso (IND-5)
Baker, F. C. (A)
Bullis, E. E. (A)
Gast, D. A. (A)
Hiatt, H. E. (M)
Luecki, E. J. (M)
Maynard, C. A. (SM)
McCasland, G. R. (A)
Oldham, K. W. (M)
Patton, R. C. (A)
Peaslee, W. D. A. (SM)
Shewan, W. (M)
Vocke, M. C. (M)
Weber, G. P. (M)

Wabash (IND-5)
Thurlow, M. P. (M)

Waldron (IND-5)
Miller, D. C. (A)

Walkerton (SB-M-5)
Shaffer, C. W., Jr. (A)

Washington (EO-5)
Creager, B. H. (M)

Waterloo (FT-W-5)
Hamman, H. L. (A)

West Lafayette (IND-5)
Austin, G. A. (M)
Bolle, D. M. (M)
Butterworth, J. E. (M)
Chane, Y. E. (M)
Chatt, H. H. (M)
Cooper, G. R. (M)
Czaracata, A. H. (M)
Donaher, T. P. (M)
Donovan, R. F. (M)
El-Ablad, A. H. (M)
George, R. H. (SM)
Grant, M. P. (M)
Haoeell, G. E. (SM)
Havt, W. H., Jr. (SM)
Helm, H. J. (SM)
Hesselberth, W. M. (M)
Holub, J. L. (M)
Jones, T. F., Jr. (SM)
Joseph, P. D. (M)
Kenyon, R. R. (M)
Kinnen, E. (SM)
Kozin, C. H. (M)
Machol, R. E. (SM)
Marsy, A. E. (A)
Osborn, L. L. (A)
Pitt, P. E. (A)
Runvan, R. E. (M)
Sabbach, E. M. (SM)
Sabbach, H. A. (M)
Sheoward, E. M. (M)
Silva, R. F. (M)
Sims, S. D. (M)
Walter, E. R. (A)
Waitman, W. B. (M)
Wyman, R. H., Jr. (M)

Whiting (CHI-5)
Bell, J. E. (M)
Kaminsky, V. J. (A)
Oster, W. (A)
Slivka, F. P. (A)

Winslow (EO-5)
Vaughan, J. D. (A)

Woodburn (FT-W-5)
Bertsche, G. (M)

Zionsville (IND-5)
Woodruff, A. E. (M)

Bellville, W. H. (M)
Benning, G. L. (A)
Beranek, W. J. (M)
Bero, C. H. (A)
Berry, D. G. (M)
Binger, K. B. (M)
Bishop, G. E. (M)
Blackwell, W. C. (A)
Boebel, L. A. (A)
Born, A. S. (SM)
Bowles, C. H., Jr. (A)
Bradford, F. H. (A)
Brav, W. E. (M)
Brega, L. B. (A)
Briner, C. D. (A)
Britton, R. W. (SM)
Broadhead, S. L., Jr. (SM)
Brobst, J. D. (M)
Brower, H. P. (M)
Brown, H. R. (M)
Brown, K. L. (M)
Bruce, R. A. (M)
Bruene, W. B (SM)
Burdick, L. R. (M)
Burton, R. E. (M)
Cannov, M. K. (M)
Caouelin, M. W. (SM)
Carson, D. N. (A)
Cattol, R. L. (A)
Chenev, J. O. (M)
Christensen, A. A. (M)
Collins, A. A. (F)
Combellick, J. D. (M)
Conrad, E. R. (M)
Coulliard, L. W. (SM)
Cowan, C. D. (M)
Cox, R. T. (SM)
Craft, L. M. (SM)
Crailelow, R. L. (M)
Cramer, R. L. (M)
Cribbs, R. D. (M)
Culp, J. C. (M)
Cumminos, F. M. (M)
Dalton, J. L. (SM)
Decker, D. L. (M)
Dedich, J. J. (M)
De Long, V. R. (SM)
Devool, C. W. (M)
Donaldson, R. V. (M)
Duff, R. E., Jr. (M)
Duhamel, R. H. (M)
Duncan, J. W. (SM)
Dunn, R. S. (A)
Eichenberger, D. L. (M)
Elliott, W. S. (SM)
Enoholm, K. J. (M)
Enoland, L. C. (A)
Erickson, G. A. (A)
Essio, R. D. (SM)
Fedde, C. D. (M)
Fellhauer, H. E. (M)
Fells, W. E. (M)
Finger, P. R. (M)
Fisher, R. J. (A)
Fletcher, K. L. (SM)
Fluent, W. J., Jr. (M)
Ford, D. W. (M)
Fredrickson, D. L. (M)
Freskino, M. E. (M)
Frev, H. B. (M)
Friedrichs, J. P. (M)
Fritze, E. H. (SM)
Fuller, R. C. (M)
Funston, S. S. (M)
Gallagher, D. C. (M)
Gates, R. S. (M)
Gerks, I. H. (F)
Gibson, J. G. (M)
Girard, L. J. (M)
Glandon, A. E. (M)
Glynn, L. A. (M)
Goetz, J. L. (SM)
Goldman, B. M. (M)
Graham, N. L. (M)
Graves, W. H. (M)
Green, D. H. (A)
Greenwell, R. E. (A)
Griswold, W. R. (M)
Habeeger, E. A. (M)
Haines, G. L. (M)
Hancock, J. R. (A)
Hanns, G. W. (A)
Heath, J. W. (M)
Hedocock, W. T., Jr. (M)
Herzog, W. E. (M)
Hixenbauch, G. P. (M)
Hodoin, D. M., Jr. (SM)
Hoarabe, H. J. (A)
Hogue, N. E. (SM)
Holec, V. P. (M)
Holmes, D. W. (M)
Hoskinson, M. F. (M)
Hubbard, M. R. (SM)
Hudek, V. R. (SM)
Hunneford, L. D. (M)
Hykes, G. R. (M)
Innis, J. P. (M)
Jaycox, R. L. (A)
Johannes, J. V. (M)
Johnson, D. E. (M)
Johnson, F. W. (M)
Johnson, L. E. (A)
Kennedy, W. A. (M)
Kinlev, K. S. (M)
Kintzel, C. K. (M)
Kirkpatrick, C. H. (M)
Kitsner, H. L. (M)
Kishiuin, W. C. (M)
Koch, H. A. (M)
Kooo, R. W. (M)
Krebs, D. W. (M)
Kurlowr, W. L. (M)
Lieske, E. W. (M)
Long, W. G., Jr. (M)
Looo, D. E. (M)
Lowder, C. M. (M)
Ludvieson, M. T. (M)
Lulk, I. (M)
Lulken, D. G. (M)
Maierus, J. B. (M)
Mansur, G. F., Jr. (M)
March, G. W. (M)
Marshall, F. C. (M)
Marshall, K. R. (M)
Marston, R. J. (M)
Martin, E. L. (SM)
Mc Connell, T. E. (SM)
McCov, D. O. (F)
McCreary, R. L. (SM)
McDaniel, I. V. (M)
McElroy, J. C. (SM)
McGraw, R. C. (M)
Mcinerney, J. F. (M)
McKinley, P. A. (SM)
McMichael, R. W. (M)
Meier, J. C. (A)
Merritt, J. R. (M)
Metcalf, C. E. (M)
Mever, D. H. (SM)
Michael, H. C. (M)
Miedke, R. C. (M)
Minerva, V. P. (M)
Mitchell, R. M. (SM)
Mollman, W. G. (M)
Moody, J. M. (M)
Morrison, S. M. (SM)
Mortimore, R. L. (M)
Mortimore, T. N. (M)
Moseman, P. (A)
Mext, N. S. (M)
Murel, L. G. (M)
Myers, G. G. (M)
Myhre, P. K. (SM)
Nelson, J. H. (M)
Newell, D. E. (M)
Nelson, J. H. (M)
Newell, D. E. (M)
Nielson, J. (M)
Olson, R. L. (SM)
Noon, J. R. (M)
Oppedahl, C. A. (M)
Ore, F. R. (M)
Papoenfus, E. (SM)
Paul, V. L. (M)
Pearson, C. C. (A)
Perkins, W. C. (M)
Perry, R. A. (M)
Perry, V. G. (M)
Pellit, J. G. (M)
Pickering, R. F. (M)
Pierce, C. H. (M)
Pierce, R. J. (SM)
Price, J. F. (M)
Rapp, R. N. (A)
Rennekamp, E. E. (M)
Riigland, J. F. (A)
Ringoen, R. M. (SM)
Rockwell, C. A. (M)
Rowley, R. J. (M)
Schminke, R. E. (A)
Schuster, H. E. (M)
Scott, A. J. (A)
Sellers, G. W. (SM)
Senti, E. C. (SM)
Sheafor, J. D. (M)
Sherwood, J. R. (SM)
Simmons, W. J. (M)
Skar, R. C. (M)
Slay, L. G. (M)
Smith, J. W. (SM)
Snyder, R. E. (M)
Sprengeler, J. H. (M)
Stansbury, R. H. (M)
Steinacker, R. B. (M)
Stevens, D. R. (M)
Stewart, C. (SM)
Stimson, R. L. (A)
Stockwell, G. M. (M)
Stover, H. A. (M)
Stryker, E. M., Jr. (A)
Taylor, R. C. (A)
Thompson, P. (M)
Thran, D. P. (M)
Thurier, J. M. (A)
Tinch, C. S., Jr. (A)
Tollefson, R. D. (SM)
Truesdell, R. M. (M)
Turner, J. F. (A)
Tweedt, O. C. (A)
Ulstad, N. S. (M)
Vander-Hamm, R. L. (M)
Van Der Wal, E. A. (M)
Vanous, J. A. (SM)
Vaughn, K. E. (M)
Vick, E. K. (SM)
Viterisi, D. P. (A)
Vrbik, J. (A)
Wainwright, L. F. (M)
Wales, G. A. (M)
Weber, D. W. (SM)
Weeks, R. R. (SM)
Welch, J. D. (A)
Westcot, J. L. (SM)
Westerberg, G. E. (M)
Western, R. E. (M)
Wetzel, G. N. (M)
Whitacre, R. E. (M)
White, R. C. (M)
White, R. T. (SM)
Wilson, J. A. (M)
Wilson, M. F. (M)
Wilson, W. D. (M)
Windus, W. A. (M)
Winkle, S. E. (A)
Winters, R. K. (A)
Wollan, R. W. (SM)
Wulfsberg, A. H. (SM)
Wulfsberg, P. G. (SM)
Zinkus, J. V. (A)

Central City (CR-5)
Hart, R. W. (RB)

Clarinda (CR-5)
Kelley, J. M. (A)

Council Bluffs (OM-L-5)
Davidson, S. (M)
Markussen, R. L. (A)
Meyermann, G. W. (A)
Paluka, J. R. (M)
Petersen, W. P. (A)
Schroeder, R. C. (A)
Stewart, A. C. (SM)

Crawfordsville (CR-5)
Cherryholmes, C. D. (M)

Cresco (CR-5)
Polashek, E. J. (A)

Davenport (CR-5)
Andrews, L. W. (M)
Brown, G. G. (M)
Dove, D. E. (M)
Frater, G. A. (M)
Hayes, C. W. (M)
Hendrickson, H. T. (M)
Lenker, P. E. (A)
Petersen, V. L. (M)
Pfannenstiel, D. A. (A)
Snyder, E. F. (A)

Denver (CR-5)
Schumacher, M. W. (A)

Des Moines (CR-5)
Camosino, M. J. (M)
Celsi, C. J. (M)
Coleman, F. C. (A)
Eastman, J. W. (M)
Gamble, G. R. (A)
Goss, J. E. (M)
Harris, V. M. (A)
Houvenagle, T. L. (M)
Johnson, W., Jr. (M)
Lovet, P. A. (SM)
Luther, R. E. (A)
Naney, R. P. (M)
Parrott, A. D. (M)
Quentin, C. F. (M)
Rissler, H. D. (VA)
Rothrock, R. B. (M)
Schoke, J. A. (SM)
Sharp, R. R. (A)
Stauffer, R. E. (VA)
Stevens, J. C. (A)
Tennant, O. A. (M)
Vitols, V. A. (M)

Fort Dodge (CR-5)
Diab, K. M. (M)
Kreuger, G. B. (M)
Tunwall, C. S. (A)

Grinnell (CR-5)
Cox, C. L. (M)
Denny, W. B. (M)

Harcourt (CR-5)
Lindgren, T. D. (M)

Hawarden (OM-L-5)
Otis, J. C. (A)

Hiawatha (CR-5)
Bebee, M. G. (M)
Curley, R. E. (A)
Daniels, A. A. (M)
Forrest, R. L. (M)
Griffin, N. J. (M)
Hadley, C. E. (M)
Tector, R. J. (M)

Independence (CR-5)
Blank, W. A. (M)

Iowa City (CR-5)
Allon, E. D. (M)
Curtis, J. F. (A)
Edberg, R. A. (M)
Hunter, T. A. (F)
Leiling, M. C. (A)
Lockwood, W. H. (A)
Lowenberg, E. C. (M)
Massey, W. R. (A)
McMillin, J. V. (M)
Menzer, C. H. (SM)
Small, A. M., Jr. (M)
Streib, W. J. (M)
Thissell, J. D. (M)
Van Allen, J. A. (SM)
Ware, L. A. (SM)
Wood, D. L. (M)

Le Claire (CR-5)
Keefe, J. W. (A)

Lisbon (CR-5)
Nosley, C. C. (M)

Marion (CR-5)
Baxter, C. W. (M)
Bergemann, G. T. (M)
Breed, W. M. (A)
Bruns, H. E. (M)
Caldwell, K. M. (M)
Canfield, R. E. (A)
Carney, C. S. (M)
Chihak, P. P. (M)
Damm, F. (SM)
Davison, W. W. (M)
Day, W. E. (M)
Dill, F. J. (M)
Fankhauser, J. E. (SM)
Flint, R. L. (M)
Follensbee, W. M. (M)
Frye, E. O. (M)
Gjertson, R. D. (M)
Haerle, J. M. (M)
Hanson, H. L. (A)
Hartsock, R. D. (M)
Herlestad, V. (A)
Hirsch, H. D. (M)
Hocker, D. E. (M)
Hotchkiss, J. H. (A)
Houston, R. H. (A)
Hudock, E. (SM)
Jessen, M. F. (M)
Krogh, R. S. (M)
Lehman, H. W. (SM)
Leverington, R. D. (M)
Marner, G. R. (SM)
Mayer, A. F. (M)
McCune, H. K. (M)
McManis, D. L. (M)
Miller, J. R. (M)
Moorhead, P. E. (M)
Newhouse, V. L. (A)
Peterson, D. L. (A)
Pool, R. H. (M)
Read, E. F. (M)
Rodes, W. D. (SM)
Rooks, H. B. (M)
Searl, E. P. (M)
Smith, M. S. (SM)
Sprague, C. H. (M)
Strebe, A. C., Jr. (A)
Tuthill, E. G. (M)
Van Tilbury, J. D. (SM)
Wise, R. S. (M)

Mitchellville (CR-5)
Melloh, C. I. (A)

Mount Vernon (CR-5)
Hartong, G. S. (M)

Muscatine (CR-5)
Havercamp, R. P. (M)
Lister, E. C. (M)

Oelwein (CR-5)
McGinnis, S. E. (M)
McMurray, D. D. (M)
Sawvelle, E. V. (M)

Sioux City (OM-L-5)
Call, G. R. (A)
Lasensky, M. M. (M)
Rudenbusch, M. A. (A)
Scott, L. D. (A)
Smith, A. H. (M)

Solon (CR-5)
Chansky, W. C. (A)

Tabor (OM-L-5)
Adamson, P. (M)

Tama (CR-5)
Penhollow, J. O. (M)

Toddville (CR-5)
Dicken, H. K. (M)
Vance, A. G. (M)

Waterloo (CR-5)
Kirksey, T. W. (M)
Tink, E. M. (M)

West Burlington (CR-B-5)
Collins, J. H. (M)
Musolino, J. M. (M)

Whiting (OM-L-5)
Bearce, E. J. (A)

KANSAS

Abilene (WIC-6)
Gay, G. L. (A)

Bethel (KC-6)
Andrews, L. G. (A)
Barnes, O. C. (M)

Boicourt (KC-6)
Witcher, J. F. (M)

Cherryvale (WIC-6)
McGinness, C. C. (M)

Colby (WIC-6)
Unruh, S. W. (A)

Colwich (WIC-6)
Dopp, V. S. (A)

Derby (WIC-6)
Gearhart, J. J. (A)
Hickey, L. F. (A)
Knowlton, R. F. (M)

Fort Leavenworth (KC-6)
Adkisson, G. O. (M)
Caffrey, J. V., Jr. (M)
Cavanna, A. R., Jr. (M)
Grady, J. H. (M)

Fort Riley (WIC-6)
Robertson, M. A. (M)

Gardner (KC-6)
Gault, W. E. (M)
Gay, W. D. (M)
Reed, D. M. (M)

Hays (WIC-6)
Chapman, D. C. (M)
O'Loughlin, J. B. (M)

Haysville (WIC-6)
Loman, J. W. (M)
Rhoten, C. J. (A)

Hiawatha (KC-6)
Legler, H. E. (A)

Hutchinson (WIC-6)
Cook, K. H. (M)
Emmons, G. T. (A)
Kopels, I. (A)
Schwertfeger, A. W. (A)

Independence (WIC-6)
Benton, W. J. (M)
Johnson, R. W. (A)
Stedman, J. D. (A)
Swartz, G. A. (A)
Thornton, J. A. (M)

Junction City (WIC-6)
Harts, W. G. (M)

Kansas City (KC-6)
Choo, W. J., Jr. (A)
Cooper, J. R. (A)
Craycraft, K. S. (A)
Davies, J. I. (A)
Dellinger, C. E., Jr. (A)
Fischer, E. (M)
Fisher, G. F. (A)
Hoover, W. C. (A)
Jones, G. R. (M)
Mathews, V. M., Jr. (SM)
Molby, L. H. (M)
Petersen, G. B. (A)
Pusch, J. H. (A)
Richards, A. (A)
Stillson, J. W. (A)
Watt, E. M. (A)
Wilson, D. R. (A)

Lawrence (KC-6)
Beck, C. H. (M)
Breyfogle, L. D., III (M)
Ellermeier, R. D. (A)
Frye, G. J. (M)
Gaddv, D. L. (M)
Gareis, G. E. (M)
Hayes, R. E. (M)
Hill, R. D. (M)
Lansdown, W. D. (M)
Nalman, N. S. (SM)
Patton, P. C. (M)
Robb, D. D. (M)
Rummer, D. I. (M)
Shackelford, R. B. (A)
Shirer, H. W. (A)
Unz, H. (M)
Warfield, J. N. (SM)

Leavenworth (KC-6)
Vanderstaay, T. F., Jr. (A)
Whitlock, R. L. (A)

Lenexa (KC-6)
Wade, M. E. (M)

Liberal (WIC-6)
McGrath, H. E. (A)

Manhattan (KC-6)
Buatte, L. A., Jr. (A)
Dawson, S. L. (M)
Green, R. R. (SM)
Hallak, C. A. (M)
Heeler, B. E. (M)
Kerchner, R. M. (SM)
Reister, K. W., Jr. (M)
Van Der Maas, G. J. (A)

McPherson (KC-6)
Hedquist, T. G. (M)

Merriam (KC-6)
Favman, D. L. (M)
Humphreys, J. L. (A)
Rudisill, K. R. (A)
Walter, G. W. (M)

Mission (KC-6)
Avres, R. C. (SM)
Broders, E. L. (A)
Curtis, G. L. (M)
Gleissner, B. F. (A)
Grev, T. G. (A)
Guthrie, J. E. (M)
Miller, H. G. (SM)
Obera, M. F. (M)
Omer, C. L. (SM)
Robb, L. S. (M)
Thorne, H. G. (M)
Wearth, A. W. (M)
Wilson, R. G. (A)

Mulvane (WIC-6)
Persels, D. M. (A)
Ruppe, K. E. (M)

KANSAS

Olathe (KC-6)
Spieker, D. A. (A)

Overland Park (KC-6)
Betros, L. A. (M)
Christy, J. O. (M)
Clark, J. S. (M)
Fetter, R. W. (SM)
Files, C. O. (M)
Gloole, C. A. (M)
Hyer, F. K. (M)
James, R. T. (M)
Kunde, W. W., Jr. (M)
Lloin, B. (M)
Mayse, R. L. (M)
Otto, H. G. (M)
Patrick, D. J. (A)
Peopel, T. R. (A)
Rauch, E. L. (M)
Shipe, J. J. (A)
Shirley, J. H. (A)
Wagner, F. R. (M)

Parsons (WIC-6)
Tierney, P. V. (A)

Pittsburg (KC-6)
Nuckolls, R. G. (SM)

Prairie Village (KC-6)
Babbit, E. B. (M)
Chester, W. G. (M)
Dalton, R. C. (A)
Findley, L. D. (M)
Grooper, G. M. (A)
Hadley, J. F. (M)
Hax, D. H. (SM)
Hoffman, G. R. (M)
Inderwiesen, F. H., Jr. (SM)
Johnson, D. E. (A)
Kennedy, J. L. (M)
Kroencke, E. A., Jr. (M)
Love, B. E. (VA)
Martin, R. L. (SM)
Marx, T. I. (M)
Millberger, W. E. (M)
Nipp, D. J. (M)
Proost, H. R. (A)
Rolfert, C. R. (M)
Sommerville, D. I. (A)
Tyler, S. R. (SM)
VanZant, R. R. (M)

Salina (KC-6)
Affeldt, W. A. (A)
Baer, M. T. (M)
Kelsey, D. B. (M)
Mallia, W. A. (M)
Marts, M. P. (M)
Musick, J. P. (A)
Stucky, N. P. (M)

Sharon Springs (WIC-6)
Mantey, J. P. (M)

Shawnee (KC-6)
Goll, W. E. (M)
Jaedicke, E. R. (M)

Topeka (KC-6)
Brown, E. B. (M)
Costelow, J. A. (A)
Frazee, J. W. (M)
Grantham, R. B. (M)
Hammeke, E. M. (M)
Heitlinger, L. J. J. (M)
Joy, I. L. (A)
Mannell, L. H. (M)
Moran, E. J. (M)
Rostkowski, G. J. (A)
Sooer, G. T. (A)
Totten, G. A. (A)
Varvel, W. M. (M)
Volles, G. E. (A)

Valley Center (WIC-6)
Cord, C. E. (A)
Depew, H. H. (A)

Wichita (WIC-6)
Aksamit, E. M. (M)
Allen, L. S. (M)
Arens, V. R. (M)
Ayres, W. R. (SM)
Bereman, E. W. (A)
Brown, J. W. D. (M)
Byers, H. O. (M)
Carttar, G. L. (M)
Cunningham, J. C. (A)
Damaskos, N. J. (M)
Davis, H. C. (A)
Day, W. R. (M)
Dunlap, M. E. (M)
Egbert, D. E. (M)
Evans, J. D. (M)
Flucard, W. B. (A)
Forrest, J. G., Jr. (M)
Francis, J. W. (M)
Gamm, C. J. (A)
Gozinsky, J. R. (M)
Hall, A. E. (M)
Harper, J. M. (M)
Hay, R. E. (A)
Heavy, C. E. (M)
Hink, K. G. (M)
Hinshaw, V. G. (A)
Hutchison, D. P. (M)
Johnson, V. N. (M)
Johnson, W. A. (M)
Johnson, W. R. (M)
Keene, A. W., Jr. (M)
Kinneman, R. L. (A)
Klatt, W. K. (M)
Kraus, D. R. (A)
Lamel, M. B. (A)
Leighton, C. P. (M)
Little, H. H., Jr. (A)
Livingston, W. D. (M)
Louis, W. G. (M)
Lundoren, P. L. (M)
McAlearney, P. H. (A)
McDonald, F. W. (M)
McDougal, J. R. (M)
Mecke, R. M. (M)
Murphy, A. T. (A)
Murray, W. A. (M)
Newby, H. H. (M)
Patterson, D. L. (M)
Patterson, J. W. (M)
Piper, E. (M)
Rogers, K. O. (M)
Rogers, L. W. (A)
Schrag, R. L. (M)
Sheppard, G. E. (M)
Simpson, L. F. (M)
Steiner, K. E. (M)
Stephens, G. B. (A)
Strain, R. A. (A)
Studebaker, J. E., Jr. (A)
Swift, H. G. (M)
Thiel, J. E. (M)
Vandegrift, A. E. P. (M)
Wencel, M. L. (M)
Williams, D. G. (M)

KENTUCKY

Ashland (CIN-4)
Pack, B. L. (M)

Bellevue (CIN-4)
Rohrer, R. S. (M)

Bowling Green (LOU-5)
Gott, A. M. (A)
Hendrick, R. J. (M)

Columbia (LOU-5)
Owens, L. M. (M)

Covington (CIN-4)
Dreyer, G. C. (M)
Munch, W., Jr. (M)

Cumberland (LOU-5)
Cornett, R. (A)

Cornett, V. (A)

Fern Creek (LOU-5)
Henson, C. E. (M)
Tiska, C. C. (M)

Fort Campbell (HUN-N-5)
Babros, R. E. (M)
O'Keefe, R. W. (M)
Scott, T. R. (M)

Fort Knox (LOU-5)
Winterberger, H. P. (A)

Fort Thomas (CIN-4)
Fischler, P. E. (M)
Fowler, N. B. (SM)
Kolo, R. E. (SM)
Sims, T. W. (A)
Stratman, J. W. (M)
Wermann, C. A. (A)

Franklin (LOU-5)
Wakefield, F. H. (A)

Glasgow (LOU-5)
Sadler, C. C. (A)

Harlan (LOU-5)
Johnson, M. E. (A)

Henderson (EO-5)
Johns, W. D. (M)

Independence (CIN-4)
McGraw, H. E. (M)

Jeffersontown (LOU-5)
Hewitt, L. G. (M)
Lyle, I. W., Jr. (M)

Lexington (LOU-5)
Albanes, N. J. (M)
Allison, N. B. (M)
Beattie, H. S. (SM)
Curry, J. W. (M)
Daily, H. J. (M)
Ebaugh, D. P. (A)
Erdman, B. K. (M)
Fackler, C. M., Jr. (M)
Goldsberry, P. E. (A)
Hickerson, J. E. (M)
Kooplus, O. G. (M)
Lahr, R. J. (M)
Locklar, H. C. (M)
May, J. K. (M)
Musto, T. L. (M)
Perkins, N. K. (A)
Pray, E. B. (M)
Ross, B. (SM)
Thompson, R. L. (M)
Wayman, R. L. (M)
Wilford, R. O., III (M)
Wu, P. (M)
Yount, W. R. (A)

Louisville (LOU-5)
Bischof, C. C., Jr. (M)
Childers, T. A. (M)
Covert, J. L. (M)
Fife, S. T. (SM)
Fitzmayer, L. H. (M)
Gates, S. H. (A)
Hope, C. R. (M)
Kimmel, E. J. (A)
Kohler, M. L. (A)
Koller, O., Jr. (M)
La Vielle, W. R. R. (M)
Logsdon, H. E. (A)
Marven, E. L., Sr. (M)
McAfee, C. S. (A)
Morrison, W. J. (M)
Neher, B. (A)
Nevitt, R. G. (M)
Palmer, R. (A)
Probst, M. C. (M)
Ross, W. H. (M)
Ryan, W. J. (M)
Scales, H. S. (A)
Skaggs, E. P. (A)
Sweets, F. M. (M)
Towner, O. W. (F)
Weipel, F. W., Jr. (M)

Middletown (LOU-5)
Williams, L. A. (M)

Newport (CIN-4)
Fields, G. S. (M)
Merrell, C. H. (M)

Nicholasville (LOU-5)
Quillen, W. F. (M)

Olive Hill (CIN-4)
Barker, E. E. (M)

Owensboro (EO-5)
Albrecht, C. E. (SM)
Barron, J. L. (A)
Basham, J. L. (A)
Bertke, H. J. (M)
Bond, E. G. (A)
Bowles, L. T., Jr. (SM)
Boxx, J. P. (M)
Bristow, S. C. (SM)
Bryant, J. A. (A)
Buren, W. E. (M)
Byars, W. F. (M)
Campbell, J. D., Jr. (A)
Carter, F. M. (A)
Carter, M. C. (SM)
Chul, J. W. (M)
Connelly, J. M. (A)
Cullen, W. F. (M)
Davies, J. A. (M)
Davis, L. B. (SM)
De Walt, K. C. (SM)
Dickerson, A. F. (SM)
Dillon, L. C. (M)
Doris, R. M. (A)
Edwards, M. W. (SM)
Ellis, L. C. (A)
Estes, R. M. (A)
Fitts, S. M. (SM)
Freeman, H. H. (M)
Fritschel, E. H. (SM)
Graves, M. B. (M)
Hasse, A. P. (SM)
Hamilton, M. W. (M)
Hayes, F. L. (M)
Hopper, C., Jr. (SM)
Horne, O. P. (A)
Horton, C. E. (SM)
Hughes, R. M. (SM)
Jackson, J. E. (M)
Johnson, K. D. (SM)
Jordan, J. D. (M)
Lammers, D. E. (M)
Latlin, W. J. (M)
Le Clear, M. W. (A)
Lemaster, S. W. (M)
Lemaster, W. H. (M)
Madole, J. F. (SM)
Maginn, L. J. (M)
Martin, J. E. (M)
McCool, C. D. (SM)
McDuff, O. P. (M)
McKinnis, C. E. (M)
Metelmann, C. (A)
Meyer, R. H. (M)
Mickey, D. D., Jr. (SM)
Millis, W. T. (SM)
Moe, R. E. (F)
Mullersman, F. H. (M)
Mumford, L. G. (M)
Owen, L. D. (M)
Quirk, J. B. (SM)
Reynolds, C. L. (SM)
Rickerson, W. B. (M)
Robb, J. H. (A)
Roberts, L. E., Jr. (M)
Rush, J. W. (SM)
Russell, M. W. (A)
Shipley, W. U. (M)
Smith, H. D., Jr. (M)
Snyder, F. R. (M)
Somerville, J. R., Jr. (M)
Stephens, J. F. (A)
Stephenson, E. L. (SM)
Taylor, C. L. (SM)
Trautwein, J. W. (M)
Tucker, J. G. (M)
Walker, R. J. (A)
Ware, C. M. (M)
White, R. G. (M)
Wofford, D. R. (A)
Wood, G. C. (A)

Paris (LOU-5)
Miller, L. W. (A)
Salvisa (LOU-5)
Gritton, D. M. (M)

Somerset (LOU-5)
Thompson, B. G. (A)

South Fort Mitchell (CIN-4)
Hughes, J. B. (M)
Odenthal, L. H. (M)
Reynolds, D. J. (M)
Schipper, R. J. (M)
Wayne, W. C., Jr. (M)

Stanley (EO-5)
Jackson, S. G. (M)

Valley Station (LOU-5)
Hedgecock, R. G. (M)

Walton (CIN-4)
Smith, A. W. (M)

LOUISIANA

Alexandria (NO-6)
Glaco, V. J. (A)

Arabi (NO-6)
Pechon, A. J. (A)

Barksdale AFB (SHR-6)
Asendorf, J. A. (M)
Beard, E. M. (A)
Buckelew, W. F., Jr. (M)
Elchak, J. Jr. (M)

Bastrop (NO-6)
Green, W. M., Jr. (M)

Baton Rouge (NO-6)
Campos, L. F. (M)
Case, E. E. (A)
Haas, G. M. (M)
Kothman, E. B. (A)
McLean, L. V. (SM)
Nethken, R. T. (M)
Owen, W. E. (M)
Perry, G. H. (M)
Rabom, R. L. (M)
Stracenor, R. M. (A)
Verzet, J. P., Jr. (M)
Vinet, P. B., Jr. (M)

Belle Chasse (NO-6)
Hero, G. A. III (A)

Bossier City (SHR-6)
Carmichael, H. C. (A)
Culling, E. J. (M)
Laurens, B. W. (A)
McQueeney, L. G. (A)
Prescott, C. W. (A)
Wagner, F. D., Jr. (M)

Centerville (NO-6)
Young, R. L. (M)

De Quincy (B-PA-6)
Shackelford, L. R. (A)

Golden Meadow (NO-6)
Brady, J. A., Sr. (A)

Harahan (NO-6)
Drake, R. L. (M)

Houma (NO-6)
Hayworth, R. G. (A)

Lacombe (NO-6)
Rust, J. J. (A)

Lafayette (NO-6)
Allen, J. J. (A)
Billingsley, L. H. (M)
Goss, W. C., Jr. (A)
Laurents, V. T. (A)
Mayeux, R. (M)
Pereda, E. F. (M)
Phillips, S. L. (A)
Prejean, J. C. (M)
Wynne, M. P. (M)

Lake Charles (B-PA-6)
Burkett, A. C. (M)
Dreyer, R. F. E. (A)
Fuller, M. M., Jr. (M)
Mass, R. R. (M)
Moses, E. C. (A)
Neal, G. H. (A)
Powers, T. G. (M)
Sennevilie, L. O. (M)
Vincent, R. S. (M)
Warner, R. D. (A)
White, R. A. (A)

Jennings (B-PA-6)
Bailey, C. L. (A)

Keatchie (SHR-6)
Womack, F. L. (A)

Longville (B-PA-6)
Nelson, W. C. (A)

Mangham (NO-6)
Duncan, H. P. (A)

Maplewood (B-PA-6)
O'Shaughnessy, C. A. (M)

Metairie (NO-6)
Adkins, J. M. (M)
Chigoy, W. A. (M)
Dobbs, M. G. (M)
Hulteen, C. K. (A)
Kirkley, D. E., Jr. (M)
Ritchey, L. C., Jr. (A)
Tong, E. (M)

Monroe (SHR-6)
Boyd, R. L. (M)

Natchitoches (SHR-6)
Bailey, B. H., Jr. (M)

New Iberia (NO-6)
Sitomer, A. A. (A)

New Orleans (NO-6)
Allen, G. (A)
Andrews, W. E., Jr. (M)
Atkins, R. E. (A)
Becker, H. C. (M)
Bloom, J. D., Jr. (SM)
Bordenave, L. R. (A)
Bullock, J. C. (M)
Coleman, J. L. (M)
Crane, J. D. (M)
Cronvich, J. A. (SM)
Delhom, L. A. (M)
Dobbs, C. I. (SM)
Dowe, R. J. (A)
Dulcich, L. N. (M)
Dureau, L. D. (M)
Du Trell, L. J. N. (SM)
Fahrmeier, M. L. (M)
Freeland, W. T. (M)
Frosch, J. A. (M)
Gadsden, C. P. (A)
Hennett, R. B. (A)
Hart, W. S. (M)
Heymann, H. (A)
Jenkins, E. W., Jr. (SM)
Jesclard, G. P. (M)
Landry, A. P. (A)
Landry, N. R. (M)
Lehde, P. E. (F)
Lodato, J. S. (M)
Lund, J. E. (A)
Malny, J. F. (A)
Martin, G. I. (SM)
Mayoral, G. A. (SM)
Morris, J. C. (M)
O'Donnell, C. F. (M)
Often, C. G. (A)
Otto, J. L. (A)
Pace, W. H., Jr. (M)
Peirce, G. H. (VA)
Reid, P. Z., Jr. (M)
Reinhard, V. (M)
Riddle, L. G. (SM)
Robertson, J. L., Sr. (M)
Roussel, G. A. (M)
St. Romain, J. B. (A)
Scheffler, F. A. (M)
Schiele, E. A. (A)
Smith, E. S. (M)
Spencer, J. C. (SM)
Spery, C. J., Jr. (SM)
Talbot, W. S. (A)
Tunis, I. L. (M)
Venters, J. B. (M)
Woods, T. D. (M)
Wulff, F. A., III (M)
Yacich, P. J. (M)

Ruston (SHR-6)
Cole, C. F., Jr. (A)
Fowler, J. (M)
Johnson, D. L. (SM)
Johnson, M. R., Jr. (SM)
Steere, R. M. (SM)
Tarbutton, J. S. (SM)

Shreveport (SHR-6)
Amaltis, E. J. (A)
Ashe, H. B. (M)
Bains, R. W. (M)
Barton, M. C., Jr. (A)
Craig, W. H. (M)
Driver, C. B. (M)
Fant, J. P. (A)
Freiberger, H. A. (M)
Friedman, H. G. (A)
Garrett, E. D. (A)
Goff, R. J. (M)
Goff, W. H. (M)
Gordon, E. (M)
Herring, J. J., III (M)
Hitz, J. E. (A)
Hurley, L. (M)
Hurley, L. (M)
Long, F. V. (SM)
MacFarlane, J. S. (A)
Maddox, C. H. (SM)
Nuttall, E. O. (SM)
Nuttall, J. E. (M)
Porter, H. R. (M)
Randolph, A. M. (M)
Rudisill, D. R. (A)
Scott, G. R. (M)
Scurlock, J. T. (M)
Strickland, E. G. (M)
Williams, L. T. (M)
Wilson, C. R. (M)
Woodard, T. A. (M)
Wright, L. L. (M)

Slidell (NO-6)
Bowen, L. M. (A)

Sulphur (B-PA-6)
Albright, A. L. (M)
Mc Namara, J. E. (M)

West Monroe (SHR-6)
Mulling, L. C. (M)
Steele, R. M. (M)

MAINE

Auburn (BOS-1)
Anderson, P. B. (A)

Augusta (BOS-1)
McLean, D. I. (M)
Parker, R. H. (M)

Bangor (BOS-1)
Creamer, W. J. (SM)
Libbey, W. M. (M)

Biddeford (BOS-1)
Deters, A. A. (A)

Brunswick (BOS-1)
Brackett, M. (A)
Faust, D. W. (M)
Gulledge, D. B. (A)
Little, N. C. (M)
Nace, C. E. (M)

Calais (BOS-1)
Reynolds, J. C. (M)

Camden (BOS-1)
Tibbetts, G. C. (M)

Cape Elizabeth (BOS-1)
Gray, L. E., Jr. (M)

Caribou (BOS-1)
Bell, L. H., Jr. (A)
Beveridge, R. W., Jr. (A)

Dover-Foxcroft (BOS-1)
Schide, C. C., Jr. (M)

Dow AFB (BOS-1)
Lauver, R. M. (M)
Riordan, E. R. (M)

Freeport (BOS-1)
Hall, R. T. (M)

Gorham (BOS-1)
Chandler, V. H. (SM)

Harrison (BOS-1)
Carlson, A. W. (A)

Kennebunk (BOS-1)
Kotlewski, J. P. (M)

Limerick (BOS-1)
Brackett, H. H. (M)

Lisbon Falls (BOS-1)
Porter, G. D. (A)

Loring AFB (BOS-1)
Bettenhausen, L. H. (M)
Kotulak, J. J. (M)
Miller, D. C. (M)
Mulder, H. E. (M)
Ott, W. F. (M)

Moody (BOS-1)
Cunningham, T. R. (A)

Mount Vernon (BOS-1)
Ford, W. W. (M)

Oakland (BOS-1)
Alfel, H. A. (F)

Oldtown (BOS-1)
Moulton, A. B. (M)

Orono (BOS-1)
Bowles, L. W. (M)
Brown, C. M. (A)
Mac Farland, H. T. (A)

Portland (BOS-1)
Brewer, L. F. (SM)
Chandler, J. (M)
Hodgkins, R. W. (SM)
Kozinesk, W. (A)
Ono, R. D. (M)
Ottinger, G. L. (M)

Presque Isle (BOS-1)
Isemann, L. W. (A)

Randolph (BOS-1)
Newell, G. R. (A)

Raymond (BOS-1)
Marshall, J. R. (M)

Rockport (BOS-1)
Drisko, B. B. (M)

Saco (BOS-1)
Kozlor, J. (M)

Sebago Lake (BOS-1)
Browning, G. H. (F)

South Casco (BOS-1)
Shively, E. H. (M)

Topsham (BOS-1)
Bohn, J. T. (M)
Hornby, D. A. (M)

Union (BOS-1)
Whitney, L. E. (M)
Waldoboro (BOS-1)
Cooney, J. R. (M)

Westbrook (BOS-1)
Athas, A. P. (M)

Yarmouth (BOS-1)
Brown, C. R. (M)

York (BOS-1)
Lee, C. B. (M)

MARYLAND

Aberdeen (BAL-3)
Beardsley, H. S. (M)
Byrod, R. B. (M)
Conley, J. M. (M)
Hallman, J. L. (A)
Haskin, R. H. (M)
Hodge, A. H. (M)
Hunsicker, J. E. (M)
Hutt, C. E. (A)
Leeder, J. (A)
Shuppert, G. W. (M)
Stoller, M. D. (M)
Terashi, T. (A)
Wallin, C. H. (A)
Wrublewski, M. (M)
Zancanata, H. W. (M)

Aberdeen Proving Grounds (BAL-3
Dlouhy, G. J. (M)
Hayden, L. E. (M)
Smith, C. V. L. (SM)
Truell, F. (M)

Accokeek (W-DC-3)
Harris, F. H. (M)
Thornhill, A. F. (M)

Adelphi (W-DC-3)
Barnes, H. R. (M)
Campbell, L. E. (M)
Carr, F. P., Jr. (M)
Hare, C. M. (M)
Hott, R. D. (M)
Hudson, L. B. (M)
Hulfish, W. S. (M)
Hutchinson, E. M. (M)
Jewell, J. J. (M)
Keating, T., Jr. (M)
Knodle, R. L. (M)
Marchetta, P. (M)
McGraw, H. (M)
Navarro, R. C. (M)
Neill, G. M. (M)
Pan, P. M. (M)
Peters, P. E. (M)
Richers, E. E. (M)
Roberts, G. L., Jr. (M)
Schmidt, D. J. L. (M)
Schuhardt, W. F. (M)
Smith, L. G., Jr. (M)
Stead, N. A. (A)
Stonsdill, M. R. (M)
Thomas, E. (M)
Weeks, W. A., Jr. (M)
Wood, C. R., Jr. (M)

Annapolis (BAL-3)
Albright, E. L. (M)
Allard, L. C., Jr. (M)
Baker, R. A. (A)
Bly, T. S. (M)
Bremer, J. W. (A)
Carter, W. G. (A)
Caudill, L. O. (M)
Clark, T. H. (SM)
Daley, J. L. (M)
Dalrymple, H. C. (M)
Dick, D. N. (M)
Dickey, J. L. (M)
Dziedzic, W. T. (M)
Eberhardt, F. J. (M)
Felk, R. L. (SM)
Friedel, J. E., Jr. (A)
Goodhue, W. W. (M)
Hemmick, K. S. (M)
Johnson, N. C. M., Jr. (A)
Leyford, G. E. (M)
Lindow, R. L. (M)
Maher, P. D., III (M)
Maling, H. F., Jr. (M)
Merritt, P. R. (M)
Poston, M. H. (M)
Powers, E. W. (M)
Ray, H. B. (SM)
Schuttig, L. A. (SM)
Seymour, C. P. (M)
Sinex, C. H. (SM)
Skilling, J. K. (M)
Sverdrup, E. F. (M)
Wylde, R. J. (M)

Arbutus (BAL-3)
Hiscox, H. C. (M)

Army Chemical Center (BAL-3)
Chalcraft, J. C. (A)

Arnold (BAL-3)
Gould, G. T., Jr. (SM)
Greqory, L. W. (SM)
Humiston, H. A. (SM)
Kellam, J. C., Jr. (A)
Parnell, W. S. (M)
Scarbro, R. L. (M)
Spink, F. G. (A)

Baldwin (BAL-3)
Church, G. W. (SM)
Wentworth, F. L. (A)

Baltimore (BAL-3)
Abel, A. E. (SM)
Abel, P. F. (M)
Abell, C. S., III (M)
Aleman, M. M. (M)
Albright, J. D. (M)
Allen, J. E. (M)
Allen, R. J. (M)
Allinder, R. H. (M)
Alpert, I. S. (A)
Amato, W. P. (A)
Andersen, A. (M)
Anderson, C. F. W. (SM)
Aprahamian, J. (A)
Armstrong, J. E., Jr. (M)
Ashmead, H. E. (SM)
Austfresser, H. D. (M)
Aviles, H. N. (A)
Bachmann, J. F. (SM)
Baida, S. (M)
Bailey, R. T. (M)
Baker, C. E. (A)
Baker, R. H. (M)
Ballentine, R. (A)
Bamberger, J. E. (A)
Basil, I. T. (M)
Bath, C. C. (SM)
Bauer, R. J. (M)
Becker, C. H. (M)
Beckman, N. W. (A)
Behm, G. T. (M)
Bell, J. L., Jr. (A)
Bellman, B. M. (M)
Bender, W. W. (SM)
Bendz, W. I. (M)
Bennett, J. W. (M)
Bentley, F. C. (M)
Berry, A. E. (M)
Betsh, K. W. (SM)
Beynon, D. J. (M)
Bickart, T. A. (M)
Billin, W. V. (A)
Bingham, H. W. (M)
Blasbalg, H. (SM)
Bloemker, L. J. (A)
Bloom, L. (M)
Bloomer, T. M. (SM)
Boogrs, C. F. (M)
Boin, K. L. (M)
Booth, J. D. (VA)
Bosse, M. L. (A)
Bouquet, J. A. (M)
Boykin, J. R. (SM)
Brach, J. P., Jr. (M)
Briggs, M. R. (F)
Brook, C. R. (A)
Brooks, N. E., Jr. (M)
Brown, D. (M)
Bucclero, J. (A)
Buck, J. R. (M)
Buco, P. A. (A)
Buehler, G. V. (M)
Burn, J. M., Jr. (M)
Caldwell, E. E. (M)
Camoas, W. (M)
Carpenter, J. W. (M)
Carroll, T. J. (M)
Carter, C. E., Jr. (M)
Carter, J. C. G. (SM)
Cassedy, E. S., Jr. (M)
Cheek, R. C. (M)
Chiarenza, P. P. (M)
Choksy, N. H. (M)
Claus, O. R., Jr. (A)
Cleaves, W. E. (SM)
Cochran, G. C. (M)
Cockaday, L. M. (M)
Cohen, H. A. (M)
Cohn, M. (M)
Cole, E. B., Jr. (SM)
Cole, R. C. (M)
Collins, A. D. A. (M)
Conklin, W. S. (M)
Conley, P. (SM)
Crotty, W. J., Jr. (M)
Csepely, J. A. (SM)
Dalling, C. J. (M)
Dalle Mura, P. H. (M)
Dantzig, H. P. (SM)
Darr, J. E. (M)
Daskalakis, A. (M)
Davies, E. R. (A)
Davis, J. W. (M)
Daz, P. R. (M)
Delse, L. F. (M)
Denburg, D. L. (M)
Der, C. F. (M)
Desi, G. R. (M)
De Socio, G. (SM)
Digillo, R. C. (A)
Di Loreto, C. D. (M)
Disney, J. G., Jr. (A)
Donsbach, W. R. (SM)
Douglass, H. H. (M)
Dozier, J. W. (A)
Duff, J. V. (A)
Eckels, A. E. (VA)
Edmiston, W. H. (M)
Edwards, J. D. (M)
Edwards, R. L., Jr. (M)
Egger, C. P. (A)
Elseman, W. F. (M)
Ekstrom, J. L. (M)
Ellert, C. A. (M)
Epstein, J. M. (M)
Evans, R. F. (M)
Evans, R. E. (M)
Fallon, G. P. (SM)
Farkas, I. (A)
Farkas, J. (M)
Farmer, W. C., Jr. (A)
Felleman, K. D. (M)
Fenichel, I. (M)
Fero, A. P. (A)
Ferris, H. (M)
Flalkowski, F. A. (M)
Finke, R. S. (M)
Finlayson, J. A. (M)
Fischbach, J. T. (A)
Fischer, P. P. (M)
Fitta, E. R. (M)
Fitzhugh, H. S., II (M)
Fleishman, S. R. (M)
Flink, T. O. (M)
Floam, J. S. (A)
Foerster, R. P. (M)
Fownes, R. F. (A)
Fox, R. C. (M)
Fox, R. K. (M)
Franchi, A. J. (A)
Frankenfield, C. C. (M)
Frattali, F. A. V. (M)
Friedman, D. S. (M)
Friedmann, D. C. (A)
Galloway, J. V. (M)
Galway, W. G. (M)
Gambrill, R. D. (M)
Garbutt, H. E. (A)
Garove, F. P. (A)
Garrison, C. P., Jr. (M)
General, J. (SM)
Getsner, J. (A)
Gilbert, G. B., Jr. (M)
Giller, M. (M)
Gilmore, D. B. (M)
Giordano, J. R. (M)
Girismen, M. F. (M)
Giszlel, J. W., Jr. (A)
Glaser, E. M. (M)
Glover, C. C. (M)
Glucksman, R. M. (SM)
Goff, J. D. (M)
Goldstein, B. L. (A)
Goodloe, R. R. (A)
Goodman, S. N. (M)
Gore, W. C. (SM)
Gott, E. (SM)
Graf, H., Jr. (VA)
Grandinetti, A. F. (M)
Grauling, C. H., Jr. (M)
Green, E. E. (A)
Green, P. S. (M)
Greenslit, C. L. (SM)
Griffith, B. H., Jr. (SM)
Griffiths, W. W., Jr. (M)
Grimes, J. S. (M)
Grosser, A. J., Jr. (A)
Gunter, F. B. (SM)
Hagan, F. R., Jr. (A)
Hagelgans, E., Jr. (M)
Hallo, M. (SM)
Hall, O. C. (M)
Hall, R. J. (M)
Haller, E. J. (A)
Ham, D. W. (M)
Hamburger, F., Jr. (F)
Hamburger, T. (A)
Hamby, J. O. (M)
Hancock, E. C. (M)
Hankey, R. L. (M)
Hanna, R. E. (M)
Harper, J. T. (A)
Harper, M. J. (M)
Harris, B. L. (M)
Harris, H. N. (M)
Harris, J. F. (SM)
Hartka, J. J. (M)
Hartley, H. F., Jr. (SM)
Hauck, V. D. (SM)
Haul, J. C., III (A)
Hayden, H. P. (M)
Haynes, F. B. (SM)
Heck, J. R. (SM)
Hemphill, A. (M)
Hendershot, J. H. (M)
Henderson, R. J. (SM)
Henf, G. (M)
Hennessey, J. E. (M)
Henry, F. E. (M)
Henry, G. L. (M)
Henry, R. M., Jr. (M)
Herrmann, R. H. (A)
Hill, D. E. (M)
Hoffmanner, G. H. (M)
Hooe, H. H. (M)
Hogge, C. R., Jr. (M)
Holman, J. G. (M)
Holzgang, W. F. (M)
Hooke, J. T. (A)
Hoover, E. H. (M)
Horsman, J. O. (A)
Hotz, M. (M)
Houghton, R. B. (M)
Houston, G. P., 3rd. (SM)
Houston, J. A. (SM)
Huckins, C. E. (M)
Hudgins, J. L., Jr. (M)
Huffman, H. R., Jr. (A)
Huggins, W. H. (F)
Humphrey, A. L., Jr. (A)
Hunt, V. R. (A)
Hunt, W. W. (M)
Hutchinson, F. W. (M)
Ichniowski, F. C. J. (M)
Jackson, H. L. (SM)
Jacomini, O. J. (M)
Jarvis, K. W. (F)
Jenkins, J. L. (M)
Jenks, J. C. (M)
Jensen, A. S. (SM)
Jett, E. K. (F)
Johnson, M. P. (M)
Johnson, P. A. (M)
Jones, H. H. (M)
Jones, L. G. F. (SM)
Jones, M. L. (SM)
Jones, O. J., Jr. (SM)
Jones, R. K. (M)
Jones, R. E. (M)
Jory, W. H. (M)
Kahl, F. A. (SM)
Kalman, R. E. (A)
Kammerman, P. E. (A)
Kammeyer, R. A. (A)
Karnis, L. W. (M)
Kanna, P. (A)
Karpinski, A. L. (M)
Katz, M. (A)
Katz, R. E. (SM)
Keary, H. F. (M)
Keoel, A. G. (SM)
Kempf, R. A. (M)
Kenny, B. C. (M)
Kernan, P. (SM)
Kerr, D. E. (VA)
Kerr, D. W. (M)
Kiley, W. H., Jr. (M)
Kilgore, G. R. (F)
Kim, K. S. (M)
King, R. H. J. (M)
King, T. J. (M)
Kinn, T. P. (F)
Kitces, S. (M)
Kittredge, P. E. (M)
Klein, G. I. (SM)
Kline, C. R. (M)
Knight, R. M. (M)
Knouse, G. H. (M)
Konigsberg, R. L. (M)
Kott, M. A. (M)
Kovasznay, L. S. G. (SM)
Kozlara, E. H. (M)
Krakau, W. S. (A)
Kratz, G. L. (M)
Kraybill, M. E., Jr. (M)
Kronlage, R. B., Jr. (A)
Krushinski, W. (A)
Kudo, F. M. (M)
Kuegler, G. K. (M)
Kumm, W. H. (M)
Kvarda, J. C. (M)
La Bree, C. T. (A)
Laing, J. T. (M)
Lamb, W. G. (M)
Lande, A. J. (M)
Lau, C. B. (A)
Lauderdale, L. K. (M)
Lavin, H. D. (M)
Lawson, E. J. (M)
Leahy, F. N. (A)
Leap, G. A. (A)
Lee, F. G. (M)
Lee, M. (M)
Lees, R. E. (M)
Leifer, M. S. (M)
Lenz, H. G. (A)
Levin, W. S. (M)
Levine, S. (SM)
Levy, D. S. (M)
Limansky, I. (M)
Lindemann, H. B. (M)
Lindenthal, M. W. (A)
Linder, H. S. (A)
Linsenbardt, A. E. (M)
Lisbin, D. M. (M)
Little, D. G. (F)
Logan, W. F. (A)
Lomax, S. E. (SM)
London, C. (SM)
Longuemare, R. N., Jr. (M)
Lord, P. H. (M)
Lory, H. J. (M)
Lubbert, G. L. (M)
Lynch, D. S. (SM)
Macaleby, B. D. (M)
MacKenzie, J. E. (SM)
Macken, D. V. (M)
Mackey, J.E. (A)
Mackey, J. R. (M)
Mackey, W. M. (A)
Maher, C. E. (M)
Mahoney, D. F. (M)
Malloy, J. J. (M)
Manganelli, C. F. (A)
Mann, W. C. (M)
Margolin, P. (SM)
Margulies, H. H. (A)
Markham, A. S. (SM)
Marshall, P. J., Jr. (A)
Martin, G. M. (M)
Martin, J. A. (M)
Masters, H. M. (M)
Mauro, E. A. (A)
Maxwell, D. J. (M)
Maxwell, R. F., Jr. (SM)
May, H. A. (A)
Mayer, R. H. (M)
Mayhew, J. A., Jr. (A)
McAdie, C. H. (M)
McAuliffe, G. K. (M)
McCley, W. C. (M)
McClure, C. B., Jr. (M)
McCombe, D. H. (M)
McCord, R. D. (M)
McIver, D. A. (A)
McIver, N. E. (M)
McJunkin, W. D. (M)
McLeod, B. C. (M)
McMullen, C. G. (SM)
McNally, H. R., Jr. (A)
McPherson, L. G. (M)
Mealey, R. M. (A)

Meier, W. M. (M)
Meren, L. F. (M)
Messner, R. W. (M)
Mester, J. C. (A)
Middleton, F. H. (M)
Mikuckis, J. S. (A)
Millar, R. I., Jr. (M)
Miller, A. A. (A)
Miller, C. F. (M)
Miller, L. A. (M)
Miller, W. H., Jr. (M)
Misey, J. J. (M)
Mohr, G. A., Jr. (M)
Molz, K. F. (SM)
Monaco, M. (M)
Moore, C. R., Jr. (A)
Moore, D. D., Jr. (M)
Moore, W. H., IV (M)
Mordecai, M. J. (M)
Morris, E. W. (M)
Morris, V. B., Jr. (M)
Morsfield, A. W. (M)
Mosher, R. M. (A)
Mott, O. B. (M)
Muehldorf, E. I. (M)
Mueller, E. J. (A)
Mullinix, N. E. (M)
Mullins, F. G., Jr. (SM)
Murphy, M. R. (M)
Murphy, R. E. (M)
Murray, J. B. (M)
Mutch, J. J. (M)
Myers, F. G. (SM)
Naughton, D. J. (M)
Newcomb, W. H., Jr. (A)
Newton, C. E., Jr. (M)
Nims, A. A., Jr. (SM)
Nobles, C. E. (SM)
Nolen, J. C. (M)
Nopper, C. G. (A)
Norris, R. N. (A)
Norris, V. L. (A)
O'Connor, W. A., Jr. (M)
O'Donnell, R. J. (SM)
Offermann, F. B. (M)
Ogg, F. C., Jr. (M)
Ogland, J. W. (SM)
Olson, W. R. (A)
O'Neill, L. A. (M)
Orr, R. V. (M)
Osborne, E. F. (M)
Oster, E. W., Jr. (A)
Owens, T. W. (M)
Owra, W. M. (M)
Papanicolaou, N. M. (M)
Park, A. R. (M)
Park, J. H., Jr. (A)
Parks, H. L. (A)
Parrish, W. F. (SM)
Parsons, D. W. (A)
Paskalakis, L. G. (M)
Pearce, J. M. (SM)
Pearre, S., Jr. (M)
Pecci, A. C. (M)
Penabad, J., Jr. (A)
Perlin, A. I. (M)
Peters, H. J. (M)
Phillips, B. E. (SM)
Pipkin, J. E. (M)
Plante, K. L. (M)
Plugge, R. J. (M)
Podraza, G. V. (M)
Poehler, T. O. (M)
Powell, C. (M)
Pratt, A. (SM)
Pridgen, W. L. (M)
Pruess, W. C. (M)
Puckett, H. R., Jr. (M)
Pulford, W. M. (M)
Pulitano, F. J. (M)
Pursel, H. H., Jr. (M)
Quigley, W. W. (M)
Rado, L. G. (M)
Rainal, A. J. (M)
Rakoske, D. T. (A)
Ralston, G. (SM)
Rambo, S. I. (SM)
Randall, J. I. (M)
Ransom, J. R. (M)
Rasch, C. F., Jr. (A)
Raynes, H. D. (M)
Real, P. (A)
Reis, H. J. (M)
Rhodes, W. H. (A)
Richard, R. H. (SM)
Richards, J. (M)
Richardson, W. R. (M)
Riley, R. N. (M)
Ripnitz, A. (M)
Roberts, H. D. (A)
Roedel, S. (M)
Rogers, M. (M)
Rohner, A. J. (M)
Roode, R. J. (A)
Rosen, A. A. (M)
Rosenberg, H. C. (M)
Rosenblatt, H. (M)
Rosenblum, I. I. (M)
Rosenthal, R. E. (A)
Rosetti, E. (M)
Roulston, N., Jr. (M)
Roush, R. G. (SM)
Royce, H. W. (M)
Ruegsegger, W. (M)
Ruehl, G. C., Jr. (M)
Ruge, J. W. (M)
Rutstein, H. S. (A)
Rutter, F. J. (SM)
Ryan, C. C. (M)
Sachs, H. A. (M)
Sacks, L. H. (M)
Safren, H. G. (M)
Salcedo, R. V. (M)
Sammons, F. L. (M)
Sample, D. R. (A)
Sander, W. E. (M)
Sanford, R. W. (M)
Sanner, G. E. (M)
Sargent, C. R. (M)
Sarris, R. A. (A)
Sass, D. J. (M)
Sauceman, J. A. (M)
Scattergood, R. (A)
Scheffel, A. G. (M)
Scheiner, S. R. (SM)
Scheneman, E. E. (SM)
Schell, E. L., Jr. (M)
Schillo, T. B. (SM)
Schlicher, K. G. (M)
Schubert, C. J., Jr. (M)
Schulkin, M. (SM)
Schullery, E. D. (A)
Schulmeyer, R. M. (M)
Schutz, H. (SM)
Scott, D. H. (SM)
Scott, D. M. (A)
Scott, J. K. (M)
Sefton, H. B., Jr. (M)
Segal, M. (M)
Seidl, R. H. (A)
Seman, A. E., Jr. (M)
Shagam, E. M. (M)
Shannon, H. H. (M)
Shapiro, G. (M)
Shaw, G. D. (M)
Shawker, C. H. (M)
Shirey, D. C. (M)
Shoenberger, G. C. (M)
Shchelstiel, B. A. (M)
Siedband, M. P. (M)
Sieron, E. M. (M)
Silva, F. A. (M)
Sima, R. L. (M)
Sims, D. S. (SM)
Sluss, W. C., Jr. (M)
Smith, E. L., Jr. (M)
Smith, E. G., Jr. (M)
Smith, J. W. (M)
Smith, R. J. (M)
Smoot, W. L. (A)
Smythe, D. S. (A)
Solley, J. D. (M)
Sones, W. K. (M)
Soroka, B. (M)
Spear, J. R. (M)
Spencer, P. H. (M)
Spicer, W. T. (M)
Steckel, T. G., Jr. (M)
Steele, R. C. (M)
Stefan, R. S. (M)
Stein, L. E. (M)
Stout, G. P. (SM)
Strull, G. (M)
Stull, K. S., Jr. (M)
Sukhia, D. E. (M)
Sussman, S. M. (M)
Tablsz, S. C. (M)
Taragin, S. (M)
Tashjian, D. R. (SM)
Tates, R. (M)
Taylor, J. S. (M)
Taylor, M. (M)
Taylor, W. R. (M)
Telen, E. (A)
Thomas, A. G. (A)
Thomas, J. F. (M)
Thompson, E. H. (A)
Thompson, J. E. (M)
Tice, D. P. (M)
Timm, F. W. (A)
Tischler, M. (M)
Tisdale, S. E. (A)
Tilen, H. (M)
Titus, C. K. (M)
Todes, R. S. (M)
Tolos, G. (M)
Tribble, H. L. (M)
Trinter, V. E. (M)
Tunell, J. C. (M)
Turlington, T. R. (A)
Tuttle, L. (M)
Tyaack, F. H. (M)
Tylor, H. L. (SM)
Urbanski, E. T. (M)
Valenzuela, G. R. (M)
Van Meter, J. L. (M)
Varcoe, R. F. (M)
Veazie, C. E. (A)
Vester, B. H., Jr. (SM)
Voot, G. L. (M)
Vore, M. P. (M)
Wagner, J. L. (M)
Walch, R. C., Jr. (M)
Walker, B. F. (M)
Wallace, H. E. (A)
Walls, A. B. (M)
Walters, J. L. (M)
Washburn, F. L., Jr. (M)
Waters, R. H. (M)
Watson, T. E. (M)
Weyt, H. J. (M)
Webb, G. N. (M)
Weber, D. J. (M)
Weems, C. M., Jr. (M)
Weingarten, M. (SM)
Weitz, M. R. (M)
Welsted, I. G. (M)
Wenig, J. (M)
Wexler, M. P. (M)
Wheeler, M. S. (M)
Whitcomb, M. F. (A)
White, B. (A)
Whitney, A. (SM)
Wiley, L. G. (M)
Wilkes, L. D. (M)
Willey, R. E. (M)
Williams, A. D. (A)
Wilner, J. T. (SM)
Wintle, M. R., Jr. (M)
Wittenberg, E. C. (M)
Wolf, F. H. (M)
Wolfe, B. (M)
Wolfe, R. E. (M)
Wolpert, M. L. (M)
Wolsey, L. G. (M)
Woodard, W. W. (SM)
Wooman, G. H. (M)
Worrell, E. A. (M)
Wyble, J. J. (M)
Yaffe, T. H. (SM)
Yeich, V. B. (A)
Yolken, B. S. (M)
Yorganjian, J. J., Jr. (M)
Young, L. (SM)
Zabawa, J. J. (M)
Zacharia, H. (M)
Zamoyta, J. A. (A)
Zeman, P. A. (A)
Zimmerman, S. E. (M)
Zindler, G. F. (M)
Zins, W. A. (M)
Zukauskas, P. J. (A)
Zweier, I. (M)

Bel Air (BAL-3)
Davis, J. M. Sr. (A)
Delaney, R. P. (M)

Beltsville (W-DC-3)
Beyer, G. L., Jr. (M)
Biggerstaff, W. F. (M)
Butler, P. (M)
Cummings, K. C. (M)
Dew, N. R. (A)
Dyer, J. W. (M)
Kilscher, G. A. (M)
Lines, S. R. (M)

Berwyn Heights (W-DC-3)
Walton, W. W. (M)

Bethesda (W-DC-3)
Adams, P. R. (SM)
Affelder, C. (SM)
Ahem, C. R. (M)
Alex, D. G. (M)
Andelson, R. P. (A)
Apolenis, C. J. (M)
Apstein, M. (F)
Arsem, C. (M)
Astin, A. V. (F)
Baluta, R. E. (M)
Batten, J. C., Jr. (M)
Baxter, J. L. (A)
Becker, C. H. (M)
Berman, M. (M)
Birochak, E. (M)
Bode, G. F. (M)
Boese, W. C. (SM)
Bollum, C. W., Sr. (SM)
Bowman, R. L. (SM)
Brown, J. R. (M)
Burnett, B. B. (M)
Bush, G. P. (SM)
Cahn, L. (M)
Cahn, R. H. (M)
Canal, A. P. (M)
Cannon, R. E., Jr. (M)
Carley, W. S. (SM)
Cochran, L. D. (SM)
Diehl, L. G. (A)
Distad, M. F. (SM)
Dougherty, J. G., Jr. (M)
Drews, W. A. (M)
Dunn, W. F. (M)
Eldson, R. A. (M)
Elbourn, R. D. (M)
Fetridge, P. V. S. (A)
Fey, H. F. (M)
Finch, J. B. (A)
Flinnegan, F. J. (SM)
Fischer, J. R. (M)
Frederick, C. L. (SM)
Frederick, C. L., Jr. (A)
French, J. C. (M)
Gerlach, H. W. A. (SM)
Gerwin, H. L. (SM)
Gnau, D. V. (M)
Goumas, N. P. (M)
Grant, C. R. (SM)
Grantham, R. E. (SM)
Grimm, R. E. (M)
Guarino, P. A. (SM)
Hartz, J. E. (SM)
Haydon, G. W. (M)
Hedrich, A. L. (SM)
Held, J. C. (M)
Henry, J. H. (M)
Hoff, R. S. (SM)
Jenkins, K. A. (M)
Jenkins, M. (M)
Jodon, F. R. (A)
Johnston, P. A. (M)
Kambouris, G. N. (M)
Keery, W. J. (M)
Klima, W. M. (M)
Landis, P. E. (SM)
Levine, I. (SM)
Levy, J. E. (M)
Liddel, U. (F)
Mahaffey, G. N. (M)
Mann, D. O. (SM)
Marthens, A. S. (M)
McBimey, H. R. (M)
McDowell, W. E. (M)
McFall, R. W. (SM)
Meade, K. R. (M)
Meissner, P. (M)
Merer, G. E. (SM)
Messenheimer, A. D. (M)
Mickey, L. (SM)
Millbranth, D. R. (A)
Moore, J. W. (SM)
Morris, A. D. (M)
Murphy, R. E. (A)
Nelson, M. W. (A)
Nigro, J. P. (M)
Noble, F. W. (SM)
Osborn, M. E. (A)
Pearce, H. U. (A)
Pepper, W. H. (M)
Portmann, P. A. (M)
Queen, J. L. (M)
Ream, D. L. (A)
Richards, A. P. (SM)
Ridenour, W. S. (A)
Roddy, V. S. (VA)
Rudigier, J. J., Jr. (M)
Rutz, E. M. (SM)
Saunders, E. R. Jr. (M)
Saunders, W. K. (A)
Savage, J. W. (M)
Sawitz, P. H. (M)
Seymour, G. B. (M)
Shazil, J. M. (SM)
Shultz, R. S. (M)
Skinner, J. A. (SM)
Smith, K. A. H. (M)
Sommer, H. (M)
Spiegelthal, E. S. (M)
Stewart, J. L. (M)
Stinchfield, J. M. (SM)
Tal, J. Y. (M)
Taylor, P. E., Jr. (M)
Thomas, T. L. (A)
Thompson, R. H. (A)
Timm, R. S. (SM)
Tomberlin, J. L. (M)
Tripp, A. E. (A)
Tripoel, W. G. (A)
Trump, B. C. (A)
Walters, C. S. (A)
Ware, R. S. (A)
Weaver, W. C. (M)
Webster, E. (M)
Weinschel, B. O. (SM)
Wenzinger, C. J., Jr. (M)
West, J. P. (M)
Wheeler, L. B. (M)
Williams, W. K. (M)
Wilson, C. A. (M)
Winter, D. W., Jr. (M)
Wolfand, D. (M)
Wright, W. E. (A)
Yost, W. E., Jr. (SM)
Young, H. M. (M)

Bladensburg (W-DC-3)
Kuzminsky, I. (M)
Talcott, J. W., Jr. (M)

Brookeville (W-DC-3)
Femiano, D. J. (A)
Lundquist, G. A. (M)

Brooklandville (BAL-3)
Lankford, N. B. (M)

Burtonsville (W-DC-3)
Claypool, W. S. (VA)
Herbert, L. G. (M)
Peterson, R. E. (M)
Waltz, W. R. (M)

California (W-DC-3)
Browne, W. M. (SM)
Wilder, J. M. (M)

Cambridge (BAL-3)
Anapol, J. (M)
Heisler, W. D. (A)
Holck, D. H. (M)
Massey, W. S. (M)

Cascade (W-DC-3)
Wassenberg, J. F. (M)

Catonsville (BAL-3)
Anderson, J. F. (M)
Behler, R. J. (SM)
Boenning, C. B. (SM)
Bowen, J. R. (M)
Bush, A. G., Jr. (M)
Calhoon, C. D. Sr. (M)
Chapin, E. W. (SM)
Cole, D. P. (A)
Crutchfield, R. C., Jr. (M)
Des Lauriers, E. L. (A)
Francis, J. P. (M)
Getz, W. W. (A)
Hoddinott, E. V. (A)
Hoffman, H. C., Jr. (SM)
Jacob, M. I. (SM)
Johnson, H. W. (M)
Kinsman, W. D. (M)
Mattern, J. (M)
Meyer, A. W. (SM)
Nickerson, P. E. (M)
Pheips, G. H. (SM)
Raven, R. S. (SM)
Reyes, J. A. (M)
Ruth, H. O. (M)
Singel, J. B. (SM)
Smith, H. B. (M)
Taylor, C. J. (M)
Vierling, H. D. (M)
Whatley, E. C., Jr. (SM)
Chase (BAL-3)
Kelly, L. J. (A)
Schultz, R. L. (A)

Chesapeake Beach (BAL-3)
Grosvenor, A. C. (SM)
Read, L. C. (SM)
Rozier, C. P. (M)

Cheverly (W-DC-3)
Beegle, D. H. (SM)
Bosley, H. L. (M)
Brincka, L. J. (M)
Davis, R. E. (M)
Franks, H. J., Jr. (M)
Gill, A. B. (A)
Gipe, R. C. (A)
Grayson, R. R. (M)
Raskhodoff, N. M. (M)
Sly, R. D. (M)
Waldo, G. V. (VA)
Weaver, C. E. (A)
Whitney, F. G. (M)
Young, C. E. (M)

Chevy Chase (W-DC-3)
Ainsworth, E. F. (A)
Alexander, S. N. (F)
Bay, Z. L. (SM)
Blumberg, M. (SM)
Brady, J. B. (SM)
Caldwell, C. M. (SM)
Caporale, P. (SM)
Carter, H. J. (SM)
Caswell, G. L. (SM)
Clapper, H. T. (A)
Conlon, J. M. (M)
Engel, F. H. (SM)
Felker, E. A. (M)
Gebhart, J. H. (M)
Gordon, D. I. (SM)
Hall, E. L. (SM)
Herson, J. L. (M)
Hill, L. P. (M)
Hutchins, W. R. (SM)
Ikelman, G. J. (A)
Jarvis, E. R. (SM)
Kelley, G. W., Jr. (VA)
Larsen, P. J. (SM)
Lavler, E. C. (M)
Lee, P. H. (SM)
Little, J. L. (M)
McIntosh, K. H. (A)
McKay, R. L. (SM)
McKenna, J. R. (A)
Mills, M. H. (SM)
Moon, R. F. (M)
Morse, M. S. (SM)
Neal, P. L. (SM)
Ohlsson, A. (A)
Parkhurst, R. A. (M)
Quigley, C. E. (M)
Red, A. G. (M)
Reggia, F. (SM)
Rockwell, P. (SM)
Saito, S. (M)
Schnoor, K. G. (A)
Settersten, R. A. (M)
Seymour, H. A. (SM)
Tellman, H. A. (SM)
Voyles, J. E. (SM)
Wilcomb, E. F. (SM)
Williams, S. B. (F)
Young, E. W. (A)

Chillum (W-DC-3)
Epstein, A. M. (SM)
Marcotte, P. G. (M)
Turner, W. R. (M)

Clarksville (BAL-3)
Bush, G. B. (M)
Ellis, R. T., Jr. (M)
Howard, K. M., Jr. (M)
Johnson, J. L. (SM)

Clearspring (W-DC-3)
Swope, C. S. (M)

Clinton (W-DC-3)
Barnes, L. L. (A)
Conner, L. M. (M)
Hortman, J. D. (M)
Kennedy, C. A., Jr. (M)

Cockeysville (BAL-3)
Damall, E. B. (M)
Flagg, D. G. (A)
Healey, D. J., III (M)
Hurley, W. A. (M)
Jackson, E. L., Jr. (M)
McComas, A. D., Jr. (SM)
Redifer, J. L. (M)
Sartorio, D. R. (M)
Wells, R. W. (SM)

College Park (W-DC-3)
Barton, R. (M)
Boyd, J. E. (A)
Bricout, P. A. (M)
Britner, R. O., Jr. (M)
Chase, R. H. (A)
Corcoran, G. F. (F)
Ginnings, R. M. (M)
Haynes, J. M. (A)
Headrick, J. M. (M)
Headrick, W. C. (M)
Koch, C. F. (M)
Lepper, W. E. (M)
Lewis, J. K. (SM)
Lupton, W. H. (M)
Mack, W. F. (M)

Man, E. M., Jr. (M)
Marshall, F. S., Jr. (A)
Masek, R. C. (SM)
Miller, J. W. (SM)
Morgan, R. (M)
Paden, D. R. (M)
Pal, S. M. (M)
Payne, E. B. (SM)
Price, H. W., Jr. (M)
Reed, H. R. (SM)
Ringenbach, M. E. (M)
Rybon, J. C. (A)
Scibilia, W. R. (M)
Smith, C. J. (M)
Starbuck, F. (M)
Svanholm, J. K. V. (SM)
Sweeney, J. S. (M)
Tallerico, A. (A)
Thompson, D. G. (M)
Turnbull, H. A. (SM)
Weber, J. (F)
Wyman, F. E. (M)

Crisfield (BAL-3)
Lawson, W. M., Jr. (M)

Crownsville (BAL-3)
Brown, T. A. (A)
Germain, R. C. (M)
Martin, G. E. (M)
Willner, W. H. (A)

Cumberland (PIT-4)
Stem, H. (SM)

Damascus (W-DC-3)
Campbell, W. S. (M)
Frelenmuth, W. L. (SM)

Deer Park (PIT-4)
Mirick, C. B. (SM)

District Heights (W-DC-3)
Lauman, E. O. (M)

Drayden (W-DC-3)
Kennedy, J. B. (M)

Dundalk (BAL-3)
Colvin, R. (VA)

Easton (BAL-3)
Wightman, P. E. (M)

East Riverdale (W-DC-3)
Kantor, A. C. (A)
McCann, R. T. (M)
Owen, E. A. (SM)
Pincus, R. (M)
Retsky, H. (A)
Smith, E. D. (SM)

Edgewater (BAL-3)
Fox, L. F. (A)
Jones, H. H., Jr. (A)
Rosenberry W. W. (SM)

Edgewood (BAL-3)
Frasher, M. M. (M)

Edmonston (W-DC-3)
Cannon, R. A. (M)

Elkridge (BAL-3)
Bean, L. M. (M)

Ellerton (W-DC-3)
Alexander, F. C. (SM)

Ellicott City (BAL-3)
Ap Rhys, T. L. (M)
Balthis, D. L. (M)
Barlow, A. D. (M)
Brady, C. L. (SM)
Crocker, G. M., Jr. (M)
Frazier, R. M., Jr. (M)
Froggatt, J. W., Jr. (M)
Hoque, G. E. (M)

Hutchinson, J. O. (M)
Jones, L. S. (M)
Kimball L. L. (M)
Koudelka, H. A. (M)
Leister, R. E. (SM)
Mabry F. S. (SM)
McDonough, J. T. (M)
Tharp, N. B. (SM)
Ulman, L. J. (M)
Windley, W. D. (M)
Ziegler, R. E. (M)

Fallston (BAL-3)
Marcroft, H. C. (SM)

Ferndale (BAL-3)
Bell, J. E. (M)
Neau, O. T. (M)
Smith, K. W. (A)

Forest Hill (BAL-3)
Barthel, D. R. (M)

Fort Meade (BAL-3)
Barlow, H. C. (SM)
Barton, J. H. (M)
Brown, H. S. (M)
Burgess, A. G. (M)
Gold, N. (M)
Guyton, J. A. (M)
Kunkle, A. J. (M)
Keeler, R. E. (M)
Miller, C. H. (M)

Frederick (W-DC-3)
Alexander, N. E. (SM)
Daugherty, E. J. (M)
Hankey, I. L. (M)
Kolsrud, E. R. (M)
Lockwood, E. H. (SM)
Martin, J. T. (M)
Miller, L. F. (A)
Price, O. I., Jr. (M)
Roushan, J. V. (M)
Shaw, N. C. (M)
Staley, I. B. (M)
Thompson, R. C. (A)

Fullerton (BAL-3)
Friesser, J. M. (M)
Rubis, C. J. (M)
Wells, L. C. (M)

Galthersburg (W-DC-3)
Johnson, R. N. (M)
White, J. W. (M)
Youden, W. W. (M)

Glenarm (BAL-3)
Brownell, D. C. (M)
Dudeney, P. N. (M)
Hershfield, S. (SM)
Packard, R. F. (M)
Smith, D. W. (SM)
Spiker, R. A. (M)
Sturtevant, C. E. (SM)

Glen Burnie (BAL-3)
Aasen, M. D. (M)
Andreatta, J. H. (M)
Arnold, D. E. (M)
Asaki, G. G. (M)
Bevan, W. R. (M)
Bickel, C. A. (M)
Birch, G. F. (M)
Bolt, C. A., Jr. (M)
Booth, T. L. (M)
Borchers, N. L. (M)
Boykin, C. R. (M)
Boyles, C. W. (A)
Brannon, D. L. (M)
Brown, E. A. (M)
Burr, W. E. (M)
Castruccio, P. A. (SM)
Clany, M. C. (M)
Crossen, M. W. (M)
Dale, J. D. (A)
Demougeot, G. M. (A)
Driggers, B. H. (A)
Eckstein, G. (M)
Ewuss, J. W. (M)
Fiege-Kollmann, H. (SM)
Flitpowsky, R. (SM)
Frame, T. E. (M)
Gilbo, A. W. (M)
Goodman, A. B. (A)
Goulden, D. E. (M)
Hale, L. N. (M)
Hamburger, J. (M)
Hedgecock, D. M. (M)
Hockett, S. H., Jr. (M)
Jentilet, A. (M)
Jones, E. E. (M)
Knudson, B. C. (M)
Koether, G. H., Jr. (M)
Lawton, H. D. (M)
Mackey, J. F. (M)
McBride, J. F. (A)
McCartney, W. B. (M)
Medlin, R. O., Jr. (A)
Merchant, S. A., Jr. (M)
Meunier, M. B. (A)
Moore, R. A. (M)
Moss, K. S., Jr. (M)
Musk, H. A. (M)
Myers, F. S., Jr. (M)
Parris, W. J. (M)
Pearson, J. L. (A)
Pitts, F. T. (M)
Plath, R. H. (M)
Popodi, A. E. (SM)
Potter, N. S. (SM)
Ragot, R. L. (M)
Range, M. A. (M)
Raymond, W. F. (M)
Renwick, W. H., Jr. (M)
Rogers, C. L., Jr. (A)
Sorrell, P. A. (M)
Stebbins, W. J. (M)
Stewart, N. H. (SM)
Sullivan, J. D. (M)
Svensson, E. L. (A)
Thompson, G. A. (A)
Tomlinson, C. C. (SM)
Truske, T. N. (M)
Walker, B. J. (M)
Walsh, D. W. (M)
White, J. E. (M)
Wood, C. H., Jr. (M)
Yanko, R. J. (A)
Zrubek, W. E. (M)

Glen Echo (W-DC-3)
Gaze, R. H. (M)

Glencoe (BAL-3)
Manson, P. S. (M)

Great Mills (W-DC-3)
Stitch, B. D. (A)

Greenbelt (W-DC-3)
Becker, C. M. (A)
Dawson, W. C. (A)
Hanyok, A. (A)
Hess, F. R. (A)
Jones, G. R. (A)
O'Connor, T. M. (A)
Parsons, P. H. (M)
Salzberg, I. M. (M)
Zanin, B. P. (M)

Hagerstown (W-DC-3)
Fuller, B. K. (M)
Maycock, J. C. (M)
McIntire, G. W. (A)
Philpot, J. W., Jr. (M)
Pitzer, H. B. (M)
Schick, L. M. (M)

Halethorpe (BAL-3)
Becker, J. A. (SM)
Clemson, D. B. (M)

Hanover (BAL-3)
Evans, G. E. (M)
Quinn, B. O. (M)
Strong, J. L. (A)

Havre De Grace (BAL-3)
Bryant, W. L. (M)
Putnam, R. E. A. (M)
Richard, V. W. (M)
Welk, M. H., Jr. (A)

Highland (BAL-3)
Iribe, P. (A)

Hillcrest Heights (W-DC-3)
Beatrez, R. (A)
Lynch, D. W. (M)

Huntingtown (BAL-3)
Volsich, J. (A)

Hyattsville (W-DC-3)
Adams, T. E. (M)
Apfelbeck, C. A. (A)
Ashcraft, C. D. (A)
Bacon, J. K. (M)
Barclett, R. C. (M)
Bell, B. D. (M)
Berry, J. E. (A)
Blanks, R. T., III (M)
Blum, H. E. (A)
Boenning, W. R. (M)
Burns, J. C. (A)
Chadwell, W. L. (M)
Chernikoff, H. (M)
Chu, Y. (SM)
Cirincione, G. V. (M)
Cohen, C. L. (M)
Conley, J. W. (M)
Cooper, H. W., III (SM)
Crawford, G. D. (M)
Didra, W. E. (A)
Dowd, J. F. (A)
Evans, W. H. (M)
Fadden, B. J. (M)
Flanagan, J. D. (M)
Florescu, S. G. (A)
Fulcher, C. S. (A)
Gager, F. M. (SM)
Gandy, C. L. (M)
Garner, W. E. (M)
Giles, J. W. (SM)
Gouge, J. R., Jr. (M)
Gray, J. C., Jr. (M)
Greenhouse, S. C. (M)
Greenwald, S. (M)
Hannon, J. R. (A)
Harjess, R. E. (M)
Harris, G. T. (M)
Hausman, A. H. (M)
Hengen, J. G., Jr. (M)
Hepfer, J. W. (M)
Hicks, H. H. (M)
Hoffman, H. F. (M)
Hogan, G. D. (M)
Holden, S. E. (A)
Houser, H. R. (M)
Izard, C. B. (M)
Jackson, E. H., Jr. (M)
Johnson, P. T. (M)
Jones, J. J. (M)
Kain, J. (M)
Keller, T. B., Jr. (A)
Khu, E. B. C. (M)
Kohout, R. J. (A)
Kuilkowski, E. F. (SM)
Lane, T. B., Jr. (M)
Latham, D. C. (M)
Marquis, D. C. (M)
Merkel, M. A. (A)
Moltrup, G. R. (M)
Morse, W. R. (SM)
Moseley, J. C., Jr. (M)
Mysing, J. O. (M)
Nace, P. E. (M)
Oelke, P. O. (M)
Orr, G. M. (M)
Palmer, L. C. (M)
Pamphilon, L. E. (SM)
Pendleton, T. A. (M)
Pike, W. N. (M)
Plumley, C. (M)
Popowsky, W. J. (M)
Potts, R. B. (M)
Pritchard, J. C. (M)
Rayburn, R. A. (M)
Restivo, F. S. (M)
Reuss, M. L., Jr. (M)
Richie, S. M. (SM)
Robinson, C. H. (M)
Rogal, S. J. (A)
Rowe, J. J. (A)
Ryan, D. C., Jr. (A)
Sennewald, P. F. (M)
Shrader, J. R. (M)
Silverstein, A. (M)
Sorensen, G. L. (M)
Starobin, A. F. (M)
Stuntz, J. W. (M)
Sturdevant, W. H. (M)
Summers, C. R. (A)
Sumpter, E. J. (A)
Tennant, H. R. (M)
Thwaites, D. F. (M)
Tippett, J. T. (M)
Tolliver, J. S. (M)
Valkenburg, E. P. (M)
Ware, R. B. (M)
White, J. W. (A)
Wychorski, H. J. (M)
Yaplee, B. S. (M)
Yates, W. A., Jr. (M)

Indian Head (W-DC-3)
Anderson, R. A. (M)
Henderson, J. E. (M)
Ryon, J. C. (M)
Squire, R. K. (M)

Jessups (BAL-3)
Grace, E. H., Jr. (A)

Keedysville (W-DC-3)
Lent, F. E. (A)

Kensington (W-DC-3)
Alldredge, L. R. (M)
Anderson, W. H. (M)
Barline, F. E. (M)
Becker, W. E., Jr. (M)
Bell, W. S. (M)
Bigelow, H. L., Jr. (M)
Brooks, M. M. (A)
Burcham, D. P. (SM)
Carpenter, R. C. (M)
Clair, J. D. (M)
Cooperman, J. I. (M)
Davis, J. J. (A)
Doring, R. C. (A)
Hekimian, N. C. (M)
Hiltz, F. F. (A)
Horton, B. M. (M)
Hulse, W. H. (M)
Joseph, H. M. (SM)
Kaiser, J. A., Jr. (M)
Kaiser, Q. C. (M)
Klein, J. (A)
Landau, R. M. (M)
Lilly, R. G. (M)
Mac Quivey, D. R. (M)
Meadows, L. A. (SM)
Miller, F. B. (A)
Mitoma, E. Y. (M)
Morey, F. C. (M)
Morse, A. D. (M)
Nolz, W. A. (M)
Ostaff, W. A. (SM)
Peters, M. W. (M)
Petrie, G. W., III (SM)
Pincus, S. (M)
Porreca, G. (M)
Radabaugh, E. L. (M)
Redmond, J. J. (SM)
Riblet, H. B. (SM)
Ridgely, N. R., Jr. (M)
Rosenberg, R. S. (M)
Schappals, E. A. (SM)
Segal, B. R. (M)
Shepperd, I. J. (M)
Spinks, A. W. (M)
Sprinkle, M. C. (M)
Van Brunt, F. (M)
Vurek, G. G. (M)
Wears, L. R. (A)
Webster, E. M. (F)
West, E. B. (M)
Whipple, L. G. (A)
Woodside, G. E., Jr. (M)
Yaffee, P. (SM)

Kingsville (BAL-3)
Davis, H. P. (M)
Frazier, R. V. (M)
Pullen, K. A., Jr. (SM)

Landover (W-DC-3)
Bradley, J. W. (M)
Fisher, R. H. (M)

Landover Hills (W-DC-3)
Painter, J. E. (M)

Lanham (W-DC-3)
Andrick, C. A. (A)
Henry, V. F. (M)
Lyon, E., III (M)
Pfelmeier, C. R. (M)
Robertson, R. E. (A)
Van Lunen, R. D. (M)
Wagner, R. B. (M)

La Plata (W-DC-3)
Richardson, K. C. (M)

Lansdowne (BAL-3)
Travers, J. F., Jr. (M)

Laurel (W-DC-3)
Bell, H. P. (A)
Blanchard, M. K. (M)
Bradley, S. R. (M)
Clifton, R. B. (M)
Collier, W. W. (M)
Craig, A. G. (M)
Gallaway, E. N. (M)
Hughes, W. E. (M)
Manning, G. C. (M)
Maxson, R. R. (M)
May, C. (M)
McConnell, V. (A)
Meares, C. W. (A)
Medley, M. C. (M)
O'Connor, G. S. (SM)
Pless, R. L. (M)
Renwick, R. L. (M)
Roberts, W. K. (M)
Romaine, W. R. (M)
Schreyer, S. D. (M)
Shinn, E. N. (A)
Souder, G. H. (M)
Straughn, J. B. (M)
Worden, H. W. (M)

Lexington Park (W-DC-3)
Appleberry, T. K. (M)
Bartels, W. S. (SM)
Gardner, J. C. (M)
Hopkins, P. L. (M)
Jayson, E. L. (A)
Jenkins, D. A. (M)
Leopard, G. W. (SM)
Lupton, A. O. (M)
Norkus, B. S. (M)
Stockwell, E. J. (M)
Wilson, R. T. (SM)

Linthicum (BAL-3)
Coulter, E. L. (M)
Fisk, W. J. (M)
Hardesty, S. J. (A)
Hrybyk, W. L. (M)
Kuehn, H. S. (SM)
Porter, H. D. (A)
Ramsay, J. H. (M)
Rustad, L. W. (M)

Linthicum Heights (BAL-3)
Blas, G. H., Jr. (M)
Cichanowicz, H. J. (M)
Collins, Z. L. (SM)
De Andrade, W. C. (M)
Dyer, E. F. (M)
Eastland, F. M. (M)
Garrett, C. L. (A)
Goetz, L. P. (SM)
Hill, W. W., III (M)
Lee, R. (F)
Lee, R. E. (M)
Lungo, A. J. (A)
Mera, S. M. (A)
Newhouse, P. D. (A)
Rogers, C. H. (M)
Rossi, A. D. (M)
Teiller, J. (M)
Woll, J. E. (M)
Woll, S. (A)

Lutherville (BAL-3)
Albin, F. I. (M)
Allison, D. M., Jr. (SM)
Biddlecomb, R. W. (M)
Brockway, A. L., Jr. (M)
Carpenter, L. B. (A)
Claborn, K. D. (M)
Cunningham, F. J. (M)
Eby, J. T. (M)
Freeland, A. F. (M)
Hart, E. D. (SM)
Henck, E. D. (M)
Hom, W. R. (M)
Howard, B. F., Jr. (M)
Jackson, J. H. (M)
Jakiltsch, F. J. (M)
Kent, L. L. (M)
Knox, P. C. (SM)
Kochevar, H. J. (M)
Maurer, D. S. (M)
Noll, R. E. (M)
Phillips, W. D. (M)
Raudsep, I. G. (M)
Rausa, G. J. (M)
Reed, W. L., Jr. (M)
Roberts, C. D., Jr. (M)
Scanga, W. A. (SM)
Schoenwetter, H. K. (M)
Selberlich, J. S. (M)
Senger, F. A. (M)
Tewksbury, J. M. (M)
Tolj, H. D. (M)
Vergara, W. C. (SM)
Washburn, H. H. (M)
Williams, R. L. (M)

Mayo (BAL-3)
Williams, W. S. (M)

Middle River (BAL-3)
Cook, A. R. (A)
Pumer, R. C. (A)

Millersville (BAL-3)
Dempsey, M. E. (A)
Horn, R. E. (A)
Mooney, D. H., Jr. (SM)
Valenta, M. F. (SM)
Welken, R. L. (M)
Wood, K. E. (M)

Monkton (BAL-3)
Thompson, F. J. (A)

Mount Airy (BAL-3)
Nikirk, H. S. (A)

Mount Rainier (W-DC-3)
Anderson, R. C. (M)
Beckham, J. N. (M)
Clark, J. G. (M)

MARYLAND

Greenhouse, L. (M)
Hurley, C. N. (A)
Kurtzman, S. P. (M)
Shelteiman, H. D. (M)
Slominski, T. V. (A)

North Linthicum (BAL-3)
Albright, R. K. (A)
Axelby, G. S. (SM)
Butala, E. F. (A)
Haner, E. G. (SM)
Houston, D. R. (M)
James, C. L. (A)
Mack, K. M. (M)
Pape, R. B. (M)
Sutherland, D. (A)
Temple, J. M. (SM)

North Severna Park (BAL-3)
Christie, C. J. (SM)

Odenton (BAL-3)
Perko, E. M. (M)

Owings Mills (BAL-3)
Borisky, A., Jr. (M)
Carter, A. J., Jr. (A)
Lowe, W. H. (A)
Mercer, W. T. (A)
Thomas, C. R. (A)
Wilson, C. L. (A)

Pasadena (BAL-3)
Miller, C. J. (SM)
Pegg, B. A. (M)
Shepherd, S. G., Jr. (A)

Patuxent River (W-DC-3)
Bonham, R. E. (M)
Hannah, G. B. (A)
Lamm, L. M. (A)
Ottensmeyer, R. M. (M)
Sweeney, C. J., Jr. (M)

Phoenix (BAL-3)
Bernighof, R. H. (SM)
Davis, R. J. (SM)
Johnson, P. S. (M)
Munson, L. A. (M)
Randall, M. W. (M)

Pikesville (BAL-3)
Barrack, C. M. (M)
Clark, M. C. (M)
Gilbert, E. M. (A)
Kasinolf, H. A. (M)
Kravetz, H. T. (M)
Marie, C. S. (M)
Schrank, H. E. (SM)
Thomas, C. Y. (M)
Wright, R. E. (M)
Youninger, E. J. (M)

Point of Rocks (W-DC-3)
Loucks, I. H. (SM)

Potomac Heights (W-DC-3)
Bissett, E. B. (M)

Prince Frederick (BAL-3)
King, B. (A)

Randallstown (BAL-3)
Broady, S. N. (SM)
Burns, J. E. (M)
Dietz, J. H. (M)
Dokas, J., Jr. (M)
Lennard, J. K. (M)
Moskowitz, C. (M)

Reisterstown (BAL-3)
Duncan, R. S. (A)

Relay (BAL-3)
Reynolds, D. W. (M)
Taylor, D. (M)

Riderwood (BAL-3)
Benjamin, H. J. (M)
Ellen, S. T. (M)
Hammond, J. W. (M)
Pruitt, A. F. (M)

Riverdale (W-DC-3)
Costanza, F. V. (M)
Raffel, J. M. (M)
Smith, J. C., Jr. (A)
Withrow, W. E. (M)

Rockville (W-DC-3)
Aucremanne, M. J. (M)
Austin, J. H. (A)
Bacon, E. J. (M)
Barnard, G. L. (A)
Beck, W. L. (M)
Beecher, D. W. (M)
Benjamin, R. P. (A)
Biser, M. H. (SM)
Bowman, J. E. (A)
Brodie, A. H. (M)
Bruns, H. B. (M)
Brush, J. W. (A)
Burnside, E. D. (M)
Cohen, G. S. (M)
Cole, W. M., Jr. (M)
Copeland, A. L. (M)
Dellasanta, O. (M)
Dozier, J. J., Jr. (A)
Dye, J. E. (M)
Eisenberg, R. M. (M)
Elam, F. E. (M)
Fitzgerald, R. T. (M)
Frizzell, O. E. (M)
Gammill, R. A., Jr. (A)
Gardenhour, A. J., Jr. (M)
Garver, R. V. (M)
Gerasis, A. J. (M)
Gilliland, H. W. (A)
Gleason, R. J. (SM)
Haltiwanger, J. C. (A)
Hardin, C. D. (M)
Harris, E. M. (A)
Heilprin, L. B. (M)
Hoffman, L. (M)
Insley, R., Jr. (A)
Jones, R. H., Jr. (M)
Kelley, J. R. (M)
Kelly, J. J. (M)
Kendall, F. H., Jr. (M)
Kenney, W. D. (M)
Kiley, W. P. (M)
Kingsbury, J. L. (M)
Kinnamon, J. G. (M)
Lang, E. T. (M)
Larson, R. C. (M)
Lehman, J. E. (M)
Luke, G. W., Jr. (M)
Marsden, C. P., Jr. (M)
McCall, T. D. (M)
McGolrick, J. E. (M)
Morison, C. T. (A)
Morris, G. T. (M)
Noelcke, C. L., Jr. (SM)
Norris, R. F. (M)
Olewine, W. P. (M)
Paradis, R. J. (M)
Parkison, E. R. (A)
Poor, V. D. (M)
Rapalus, H. W. (A)
Roccali, A. J. (A)
Rolfe, R. G. (M)
Salerno, J. (SM)
Self, C. T. (A)
Sledge, O. D. (SM)
Smith, R. F. (A)
Sorger, G. U. (M)
Sulzer, P. G. (F)
Swanekamp, J. E. (A)
Swanson, E. E. (M)
Teres, B. W. (A)
Tynan, W. A. (A)
Udelson, B. J. (M)
Veraa, C. F. (M)
Viera, F., Jr. (A)
Wagner, T. C. G. (M)
Waters, J. A., Jr. (M)
Watkins, C. F. (A)
Watkins, P. L. (M)
Welker, R. A. (M)
Wennberg, H. A., Jr. (A)
Whitlock, M. B., Jr. (A)
Whybrew, J. W. (M)

Rogers Heights (W-DC-3)
Dodgson, J. G. (M)

Ruxton (BAL-3)
Fell, T. T. (M)
King, D. D. (F)
Martin, A. C. (M)

St. Michaels (BAL-3)
Lewis, G. (F)

Seabrook (W-DC-3)
Ellis, D. G. (A)
Frame, R. H. (A)
Gray, J. W. (M)
Skaggs, J. W. (A)
Sutton, J. C., II (M)

Severn (BAL-3)
Blouch, D. H. (M)
Heltman, E. H., Jr. (A)

Severna Park (BAL-3)
Adams, L. C. (M)
Bauman, R. E. (A)
Butler, H. J. (M)
Carr, R. W. (M)
Chapman, R. W. (M)
Coleman, S. D., Jr. (M)
Gedance, A. R. (M)
Gray, M. G. (M)
Hastings, M. S. (M)
Hayes, M. E. (SM)
Hetrich, G. R. (M)
Hoffman, C. P. (A)
Hume, P. D. (M)
Jones, W. N. (SM)
Koenig, P. E. (SM)
Kramo, J. J. (M)
La Febre, D. C. (A)
Mathieu, R. E. (M)
McKechnie, J. S. (SM)
Mooney, M., Jr. (A)
Munro, J. R. (M)
Parody, C. L. (M)
Praeger, W. C. (M)
Roeder, J. R. (M)
Shafer, M. W. (M)
Strong, M. E. (M)
Thomason, J. E. (M)
Van Duzer, K. W., Jr. (M)
Winter, G. W. (M)
Young, A. F. (M)

Shady Side (BAL-3)
La Fevre, L. M. (M)
Wickman, M. (M)

Silver Spring (W-DC-3)
Abramovich, M. N. (SM)
Adams, R. (SM)
Akle, R. O. (A)
Allen, U. L., Jr. (M)
Anderson, H. W. (SM)
Anderson, H. C. (M)
Anspacher, W. B. (SM)
Applebaum, A. (M)
Armistead, W. H., Jr. (M)
Ashour, G. B. (A)
Bailey, A. W. (A)
Baldini, B. P. (A)
Ballard, R. C. (M)
Barnard, E. H. (M)
Barse, G. R. (A)
Bassett, R. S. (M)
Baughn, C. E. (M)
Beach, E. H. (M)
Beaulieu, A. J. (A)
Beck, E. A. (M)
Bennett, P. L. (M)
Bernard, R. L. (M)
Bernstein, B. (M)
Blanco, D. R. (SM)
Blosca, L. F. (M)
Blosca, L. F. (M)
Blackburn, C. A. (M)
Blackwell, W. C., Jr. (A)
Blair, C. R. (SM)
Blankenship, A. C. (M)
Blevins, H. R. (M)
Bond, M. L. (SM)
Bonwit, K. S. (M)
Bonwit, S. E. (M)
Bowman, H. A. (M)
Boyle, D. R. (M)
Braum, C. M. (SM)
Brimberg, M. M. (SM)
Brooks, J. W. (M)
Brown, C. W. (SM)
Brownstein, H. (SM)
Bryan, S. (SM)
Buckingham, S. A. (M)
Buckley, R. O. (A)
Burger, R. M. (M)
Byer, D. L. (M)
Calhoon, T. G. (M)
Cancro, C. A. (M)
Cantor, J. M. (M)
Carleton, H. (M)
Carruth, D. E. (M)
Chambre, C. S. (M)
Chandler, H. G. (M)
Chapin, H. E. (M)
Cheston, T. C. (SM)
Chwastyk, A. M. (M)
Clark, J. F. (SM)
Cohen, J. (M)
Collins, J. R. (M)
Collins, J. (M)
Cook, F. W. (VA)
Cooper, H. W. (SM)
Coscarelli, E. (M)
Cosman, A. (M)
Costolo, C. L., Jr. (A)
Costrell, L. (SM)
Cote, A. J., Jr. (M)
Cotts, A. C. (SM)
Coyle, R. J. (A)
Craig, P. M., Jr. (M)
Crone, J. L. (SM)
Davies, G. L. (SM)
Davis, G. W. (M)
Dean, F. A. (A)
Deitz, J. (SM)
De Luca, L. A. (A)
Diambra, H. M. (A)
Dinsmoor, T. E. (SM)
Dipaoli, R. E., Jr. (M)
Dobbins, B. D. (M)
Duning, K. E. W. (M)
Dunkelman, L. (A)
Dukovic, J. E. (SM)
Du Tell, R. Z. (M)
Dye, R. E. (M)
Early, D. M. (A)
Edlen, G. G. (M)
Emch, G. F. (A)
Eshleman, P. W. (M)
Evans, R. J. (A)
Evans, T. R. (M)
Ewing, J. H. (M)
Fallon, C. (A)
Faram, H. D. (M)
Ferree, H. B. (A)
Fink, C. (M)
Finkel, A. (M)
Fischer, E. H. (M)
Fischer, W. (A)
Fischman, M. (M)
Fisher, C. A. (M)
Fisher, E. M. (M)
Fitzgerald, J.P. (M)
Flato, M. (M)
Flyer, I. N. (SM)
Freeburger, B. P. (A)
Freeman, J. J. (SM)
Friedman, S. N. (M)
Fullen, W. E. (M)
Fund, S. R. (SM)
Funkhouser, R. E., Jr. (M)
Gadbois, G. A. (M)
Gale, M. (A)
Gamertsfelder, H. E. (M)
Garberson, J. R. (A)
Gaynor, N. (M)
Geist, J. C. (SM)
Gessner, R. J. (A)
Gibson, H. T. (M)
Gilbert, J. N. (SM)
Gillean, M. E. (M)
Glassco, P. B. (SM)
Glorioso, A. R. (M)
Godsey, W. J. (M)
Goldberg, H. (F)
Goldfarb, B. J. (SM)
Goldstein, G. D. (M)
Gordon, S. H. (M)
Gorordos, R. E. (M)
Gossard, W. H. (M)
Gould, W. L., Jr. (M)
Gray, W. M. (M)
Greene, C. R., Jr. (M)
Greene, E. E. (M)
Gridley, C. J. (M)
Gulda, J. A. (SM)
Hacker, P. S. (A)
Halev, I. (SM)
Halvorsen, H. W. (A)
Hamblen, J. W. (M)
Hardy, A. O. (A)
Harrison, C. J. (SM)
Harrison, C. W. (M)
Harrison, H. (SM)
Heil, M. M. (M)
Heller, A. (M)
Herider, E. D. (M)
Hermach, F. L. (M)
Hibbard, W. D., Jr. (M)
Hickley, T. J. (SM)
Hickok, C. H. (A)
Hillstrom, W. B. (M)
Hiltner, R. P. (A)
Hirschel, L. R. (M)
Hoadley, J. C. (SM)
Hoffman, C. W. (M)
Hogan, D. L. (SM)
Holbrook, R. O. (SM)
Hollis, J. L. (SM)
Holt, A. W. (M)
Hoover, E. T. (M)
Hopkins, J. R. (M)
Hosea, M. E. (M)
Huber, C. E. (M)
Hunker, W. (M)
Hurlburt, E. H. (SM)
Inscoe, R. A. (M)
Jacobs, G. (SM)
James, J. L. (M)
Jaques, C. M. (A)
Jesurun, M. M. (M)
Johannessen, H. R. (M)
Johnson, R. M. (A)
Johnston, T. F. (M)
Jones, R. E. (M)
Jordan, S. A., Jr. (SM)
Josephson, G. C. (A)
Joslow, J. (A)
Kanter, J. I. (M)
Karl, C. R. (M)
Karo, M. A. (SM)
Katz, I. (SM)
Kerney, R. W. (M)
Kiebler, J. W. (M)
Kimball, J. J., Jr. (M)
King, C. L. (M)
King, R. G. (M)
King, W. P. (SM)
Kirkland, G. I. (M)
Klamm, G. E. (M)
Klein, M. H. (M)
Klink, G., Jr. (A)
Knowles, R. B. (A)
Koutsandreas, J. D. (M)
Kraus, R. W. (M)
Krebs, W. N. (VA)
Kreis, A. L. (VA)
Kreithen, A. (SM)
Kreitzer, H. M. (M)
Kuck, J. H. (SM)
Laine, R. O. (M)
Lambidakis, P. G. (A)
Latson, F. W. (M)
Laughlin, C. R., Jr. (A)
Le Blanc, R. E. (A)
Lebowitz, P. H. (A)
Lee, F. N. (A)
Lee, J. D. (M)
Lefkowitz, H. (M)
Leibowitz, R. C. (M)
Leitma, G. (A)
Leonard, F. M. (M)
Leslie, C. B. (M)
Levine, S. (A)
Levy, I. J. (M)
Liben, W. (SM)
Lieberman, G. (A)
Lombardo, A. (A)
Looney, H. C. (M)
Lord, J. B. (A)
Love, R. G. (M)
Lun, M. J. (M)
Machlin, A. (M)
Mack, S. J. (A)
Mackenzie, C. M. (M)
Mader, L. W. (A)
Mallin, J. A. (M)
Maloney, R. S. (M)
Marsh, D. S. (M)
Marshburn, C. E. (SM)
Martin, K. H. (SM)
Mawhood, S. A. (M)
May, G. L. (M)
McCarhy, L. J., Jr. (M)
McDonald, L. W. (A)
McDuffie, G. E., Jr. (M)
McKeel, P. D. (SM)
McLaurin, T. S. (A)
Melvin, E. A. (M)
Mengel, J. T. (SM)
Merchant, W. J. (SM)
Messera, J. R. (M)
Michelsen, P. F. (M)
Montgomery, J. D. (M)
Moore, K. A. (M)
Morris, C. S. (M)
Moser, E. B. (A)
Munson, H. B. (SM)
Myrick, J. C. (M)
Nagrant, J., Jr. (M)
Nagy, A. W. (SM)
Nalley, W. M. (M)
Nathanson, F. E. (M)
Neeland, F. (M)
Neillis, R. E. (M)
Newman, N. (A)
Norvell, J. B. (M)
Nucci, E. J. (SM)
Oakes, J. B. (M)
Ober, H. E. (SM)
O'Hara, J. J., Jr. (M)
Olin, I. D. (M)
Oliver, M. E. (M)
Otto, W. C., Jr. (M)
Page, C. H. (F)
Palasky, E. C. (M)
Pales, J. C. (M)
Parker, M. J. (SM)
Parks, J. N. (A)
Paul, A. W. (M)
Pear, C. B., Jr. (M)
Phelps, R. W. (M)
Pickering, R. W. (M)
Plotkin, G. N. (M)
Pollow, C. H. (M)
Poritzky, S. B. (M)
Preisman, A. (F)
Prentiss, S. R. (M)
Proudley, R. E. (A)
Prugh, T. A. (SM)
Pugh, M. E. (M)
Pulliam, S. B. (A)
Quaikinbush, D. N. (A)
Quick, G. R. (M)
Randolph, J. P., Jr. (SM)
Rappaport, G. (F)
Rattner, S. (SM)
Reagen, D. J. (M)
Redden, M. S., Jr. (M)
Reed, H. Z. (M)
Regnier, R. C. (A)
Rice, L. W. (VA)
Robel, R. B. (SM)
Robertson, T. M. (SM)
Robinson, R. O. (SM)
Rogers, A. L. (A)
Rolinski, A. J. (A)
Rosenberg, J. D. (M)
Rosenhaft, M. (A)
Ross, J. A. (A)
Ross, R. R. (M)
Rotkin, I. (SM)
Rowland, R. W. (M)
Rozanski, R. R. A. (M)
Rueger, L. J. (SM)
Sanders, W. E. (A)
Sasse, J. (M)
Schmidt, B. H. (M)
Schroeder, A. J. (A)
Schuchard, E. A. (M)
Schulman, J. R. (M)
Schweitzer, A. J. (A)
Scillian, G. L. (SM)
Seaton, J. W. (M)
Sera, F. (M)
Shade, K. E. (A)
Shapiro, G. (SM)
Shaw, H. F. (M)
Sheppard, T. W. (M)
Shuck, L. G., II (A)
Silberg, P. A. (SM)
Silverman, H. M. (M)
Silverman, S. (SM)
Simms, A. (A)
Simon, A. (M)
Simons, D. E. (SM)
Simpson, M. E. (M)
Slife, J. F. (A)
Small, H. (M)
Smith, C. B. (M)
Smith, C. N. (A)
Smith, J. B. (A)
Smith, W. J. (M)
Smittenaar, G. H. (M)
Smollett, R. J. (M)
Snow, C. E. (M)
Snowberger, A. A. (M)
Soler, A. (M)
Solow, M. (M)
Sorrows, H. E. (A)
Spenser, C. W. (M)
Spetner, L. M. (SM)
Spool, J. (M)
Staake, D. B. (SM)
Star, J. (A)
Steggerda, C. A. (M)
Stein, M. (M)
Stott, W. T. (M)
Srasser, T. J. (A)
Street, H. W. L. (A)
Sullivan, J. J. (M)
Sures, A. H. (SM)
Sutton, E. D. (M)
Tate, R. T. (M)
Taylor, R. E. (SM)
Terrell, R. L. (VA)
Toense, E. R. (A)
Toense, R. A., Jr. (M)
Torpy, D. J. (M)
Toth, E. (F)
Treglosa, A. C. (SM)
Unkenholz, W. C. (M)
Upchurch, L. M., Jr. (M)
Upton, C. R. (M)
Urban, W. D. (M)
Van Hoesen, R. W. (A)
Vann, W. L. (M)
Varhus, H. H. (M)
Vilas, E. T. (M)

Wales, R. O. (M)
Walsh, G. W. (M)
Walters, F. M., III (M)
Walters, L., Jr. (M)
Watson, R. D. (SM)
Webster, K. R. (A)
Welchbrod, J. (SM)
Weinberger, A. (M)
Weinstein, M. S. (M)
Welser, S. (A)
Weltzel, R. L. (M)
Westerfield, E. E. (M)
Wetmore, G. B. (M)
White, N. (SM)
White, P. E.P. (M)
Willard, J. M. (M)
Williams, E. M. (SM)
Williams, W. E., Jr. (SM)
Willis, F., Jr. (SM)
Wilson, R. R., Jr. (A)
Winkler, S. (SM)
Wilow, M. I. (M)
Witte, J. J. (M)
Worsley, C. C. (A)
Worsley, G. (SM)
Wuertenberg, W. E. (A)
Wyman, R. C. (M)
Yates, W. A. (SM)
Yost, C. F. (M)
Young, J. D. (SM)
Zimmerman, S. (M)

Sparks (BAL-3)
MacNichol, E. F., Jr. (M)

Spencerville (W-DC-3)
Smith, W. L. (SM)

Spring City (W-DC-3)
Ottolini, D. F. (A)

Springfield (W-DC-3)
Doyle, E. M. (M)

Stevensville (BAL-3)
Wise, H. J. (SM)

Suitland (W-DC-3)
Chapdelaine, A. J. (A)
Fleischer, A. (M)
Gustavus, H. (M)

Takoma Park (W-DC-3)
Anderson, W. R. (A)
Black, C. J. (M)
Cove, M. (M)
Donovan, P. F. (M)
Johnson, C. L., Jr. (M)
Lubore, S. H. (M)
Puttcamp, R. R. (M)

Timonium (BAL-3)
Baker, D. A. (M)
Barbour, C. W., Jr. (SM)
Bream, H. C. (SM)
Brown, W. R., Jr. (M)
Clark, F. K., Jr. (M)
Colvin, J. W. (M)
Corbett, H. W. (A)
Davison, F. A. (M)
Dawson, S. R. (SM)
De La Cova, P. V. (SM)
Diersing, C. B., Jr. (M)
Faber, D. C. (A)
Franz, W. J. (M)
Fuller, W. C., Jr. (M)
Hart, A. C. (M)
Jones, W. R. (A)
Lee, R. A. (M)
MacGlashan, D. W. (M)
Martin, J. W. (M)
Mills, L. R., Jr. (M)
Mitchell, D. L. (A)
Petrou, N. V. (SM)
Pribble, N. F. (M)
Reel, G. M. (M)
Rice, C. I. (SM)
Scherbarth, R. A. (M)
Shelor, E. G., Jr. (M)
Shepherd, R. T. (M)
Smeltzer, R. F. (A)
Spencer, R. C. (SM)
Strickroth, G. J. (SM)
Vanderlipp, R. R. (M)
Varone, R. A. (SM)
Visher, W. A. (A)
Wedel, J. O., Jr. (A)
Weidner, E. J. (M)
Wild, T. A. (SM)
Wiltse, J. C., Jr. (A)
Zutkoff, A. I. (A)

Towson (BAL-3)
Ackerman, W. W. (A)
Adams, R. L. (M)
Bang, B. A. (M)
Barclay, A. S. (M)
Barnes, A. E. (M)
Barnhill, R. B. (M)
Brugger, R. D. (M)
Bulik, C. (M)
Campbell, R. R. (A)
Campbell, W. O. (M)
Chrisman, D. W. (SM)
Christianson, C. L. (M)
Clark, M. C. (M)
Cope, R. W. (A)
Cosby, J. R. (M)
Covington, M. B., Jr. (M)
Dullinger, A. G., Jr. (A)
Easton, T. T. (SM)
Edwards, R. B. (M)
Esher, J. R., Jr. (SM)
Fales, D., III (M)
Frome, M. K. (M)
Gage, D. D. (SM)
Gebhardt, R. C. (A)
Gibson, R. L. (A)
Graffis, L. F. (SM)
Gruenberger, H. S. (M)
Hafstrom, W. F. (M)
Hall, H. S. (M)
Hammel, A. E. (M)
Hammond, J. W. (SM)
Hanks, H. G., Jr. (SM)
Hartwiosen, C. K. (M)
Hatcher, J. H. (M)
Hatfield, C. I. (M)
Hayes, E. G. (M)
Henthorn, J. E. (SM)
Hoffman, P. A. (M)
Hollis, T. W., Jr. (A)
Houck, J. W. (A)
Hulce, R. L. (M)
Johnson, G. M. (M)
Kaltenbacher, D. M. (M)
Killilon, R. H. (SM)
King, N. P., Jr. (M)
Kirmer, E. O. (SM)
Kwiatkowski, S. W. (A)
Lambdin, W. S. (SM)
Lanino, W. A. (M)
Larkins, E. B. (M)
Levine, R. J. (M)
McDade, J. G. (A)
McEntyre, D. E. (M)
Meador, A. B., Jr. (M)
Namey, A. E. (SM)
Phalen, F. W. (M)
Pickens, R. A. (M)
Purinton, H. G. (M)
Randolph, G. W. (M)
Riggs, R. N. (SM)
Ruth, J. K. (M)
Schaitke, C. H. (M)
Schenck, T. M. (M)
Silbert, W. C. (M)
Sinclair, A. L., III (M)
Slavin, M. (M)
Smith, H. E. (M)
Stephenson, J. O. (M)
Stoddard, H. R. (A)
Stout, D. R. (A)
Surila, A. T. (M)
Taylor, J. H. (SM)
Thomas, C. E., Jr. (M)
Thomas, R. K. (SM)
Vana, C. J. (M)
Vinson, R. R. (M)
Walter, G. M. (SM)
Ware, J. L. (SM)
White, G. P. (SM)
Whitney, M. E. (SM)
Wilkenson, R. L. (A)
Woodrow, G. V., Jr. (SM)
Wulff, L. H. (A)
Yates, L. R. (M)

University Park (W-DC-3)
Burke, J. K. (A)
Coker, R. H. (M)
Privat, H. G. (M)

Walkersville (W-DC-3)
Carstensen, E. L. (SM)

Welcome (W-DC-3)
Lamm, C. M., Jr. (A)

West Hyattsville (W-DC-3)
Almquist, J. F. (A)
Bitz, E. A. (M)
Ferrara, A. A. (A)
Fine, C. E. (M)
Kessler, S. (A)
Kunetz, G. J. (M)
La Pointe, J. C. (SM)
Marzetta, L. A. (M)
Mitchell, G. S. (M)
Pittard, G. S., Jr. (M)
Roberts, P. M. (M)
Rothschild, S. (M)
Schwartz, R. J. (M)
Trezona, G. E. (M)
Vouch, S. D. (M)
Walter, R. J. (A)
Wolff, E. A. (M)

Westminster (BAL-3)
Morgan, R. H. (M)

West Severna Park (BAL-3)
Cowan, K. D. (A)
Heazel, V. M., Jr. (M)
Pincoffs, P. H. (M)
Wojcicki, F. J. (A)

Wheaton (W-DC-3)
Cook, T. B. (M)
Doctor, N. J. (M)
Grasnani, O. J. (M)
Lepkowski, M. J. (A)
Luff, F. T. (M)
Marks, M. M. (SM)
Molcan, J. F. (A)
Patton, R. E. (M)
Petes, J. (M)

Wheaton Heights (W-DC-3)
Baechtel, A. R. (M)

White Marsh (BAL-3)
Francis, J. P. (A)

MASSACHUSETTS

Abington (BOS-1)
Mielke, E. S. (A)
Pihl, G. E. (SM)

Acton (BOS-1)
Casey, R. F. (A)
Packard, L. E. (F)
Sawyer, C. E. (A)
Searle, R. W. (A)
Sletten, C. J. (M)

Adams (WM-1)
McRae, W. J. (A)
Starsiak, R. S. (A)
Zabawa, E. P. (A)

Agawam (WM-1)
Metcalf, W. C. (M)
Rackliffe, R. J. (A)

Allston (BOS-1)
Allen, D. F. (M)
Futran, S. M. (M)
Belkin, A. (A)
Finkelstein, A. B. (M)
Herzberg, R. F. (M)
Labitz, B. H. (M)
Land, H. R. (M)
Lee, R. C. (M)
Max, S. M. (M)
Mongold, G. E., Jr. (M)
Orange, A. S. (M)
Werner, C. P. (A)
Whiteside, H. M. (M)

Amesbury (B-MV-1)
Hambleton, P. N. (SM)

Amherst (WM-1)
Laestadius, J. E. (M)
Langford, J. W., Jr. (M)

Andover (B-MV-1)
Cadran, L. R. (M)
Elowe, E. N. (M)
Fadden, J. J. (M)
Finley, A. D. (M)
Garfield, O. R. (SM)
Gearin, J. H., Jr. (M)
Goyette, P. E. (M)
Heiselin, J. T. (A)
Hensel, V. G. (SM)
Hooson, R. W. (A)
Jordan, D. R. (M)
King, R. A. (M)
Koch, A. A. (M)
Kordos, R. W. (M)
Newman, D. J. (M)
Rounds, W. A. (A)
Roundy, G. H. (A)
Salvo, R. A. (M)
Schmidt, R. E. (SM)
Terranova, D. S. (M)
White, J. R. (SM)
Welson, R. S. (M)
Word, J. A. (SM)
Yeiter, M. R. (M)

Arlington (BOS-1)
Abell, G. R. (M)
Ames, B., Jr. (M)
Arsenault, J. R. (M)
Astulfi, S. O. (A)
Bailey, D. L. (M)
Ben-Or, Y. (M)
Binsack, J. H. (M)
Bogart, R. M. (M)
Brooks, R. O. (M)
Bouck, W. P. (M)
Campbell, D. J. (A)
Castelli, J. P. (M)
Champ, S. H. (SM)
Chisholm, V. T. (M)
Cole, B. R. (M)
Collins, W. E. (M)
Cosman, R. J. (A)
Davis, E. S. (M)
Defandorf, J. P. (M)
Delaney, W. P. (M)
De Lisle, J. E. (M)
Dibiase, V. L. (M)
Earsy, R. M. (M)
Ferguson, J. B. (M)
Forgie, J. W. (M)
Galocin, A. (M)
Gano, J. J. (SM)
Gorton, L. W. (M)
Graham, J. W. (M)
Granlund, J. (M)
Gronbery, F. T. (M)
Gustaff, A. J. (M)
Hadlock, C. F. (SM)
Haire, P. F. (M)
Hammond, R. A. (SM)
Hansen, J. T. (M)
Hatzery, W. V. (M)
Hawkins, R. S. (M)
Hofmann, E. J. (A)
Hovannesian, A. S. (M)
Kiesling, P. W., Jr. (M)
Knight, H. M. (M)
Levy, A. O., Jr. (M)
Lovenstein, A. J. (SM)
Lyon, H. A. (M)
Mager, H. (M)
Maguire, J. N. (M)
McCabe, H. P. (M)
McCann, J. F. (A)
McKendree, J. D. (M)
Mills, A. L., Jr. (M)
Nuttall, A. H. (M)
Pasho, E. I. (M)
Pechacek, R. E. (M)
Perry, K. E. (A)
Pierce, J. A. (F)
Plotts, E. L. (SM)
Ploussios, G. (M)
Prue, H. W. (A)
Rizzi, S. R. (A)
Robinson, W. H. (M)
Rowe, A. J. (M)
Sauber, J. W. (SM)
Schreuer, W. (SM)
Schweppe, F. C. (M)
Sheridan, W. F. (A)
Smoll, A. E. (SM)
Soron, H. I. (M)
Stanfield, R. B. (A)
Stephenson, L. (M)
Sulahian, H. S. (M)
Tassinari, S. P. (M)
Telch, W. W. (SM)
Theiss, C. M. (A)
Thompson, E. D. (M)
Tilton, C. S. (SM)
Trunflo, A. P. (M)
Valentine, L. F. (M)
Von Recklinghausen, D. R. (M)
Wagner, C. A. (M)
Warren, R. M. (A)
Watson, P. C. (M)
Wexler, H. T. (SM)
Zantos, N. G. (M)

Arlington Heights (BOS-1)
Cleveland, L. (M)
Lamson, H. W. (F)

Ashby (BOS-1)
Coleman, D. L., Jr. (M)

Ashland (BOS-1)
Boughnou, T. R. (M)
Cook, W. J. (M)
Deluski, E. F. (M)
Distler, R. C. (M)
Lipinoga, L. (M)
Pathe, J. F. (SM)
Petterutl, A. J. (M)
Prager, M. (M)
Sonnabend, J. S. (M)
Spellos, J. S., Jr. (A)
Zeller, H. R., Jr. (M)

Attleboro (BOS-1)
Allen, D. J. (A)
Athanas, D. (M)
Bliss, B. J. (A)
Boulanger, H. J. (M)
Flad, F. R. (M)
Gustafson, D. W. (A)
Logan, C. A. (M)
Pulleston, R. B. (A)
Vetter, E. O. (M)

Attleboro Falls (BOS-1)
Lerner, I. S. (M)

Auburn (BOS-1)
Beschle, R. G. (M)
La Brie, R. H. (A)

Auburndale (BOS-1)
Conway, J. W. (M)
Day, P. F. (M)
Finneran, W. J. (A)
Harper, S. D. (SM)
Hartman, C. J. (M)
Henriksen, L. L. (M)
Ingalls, R. P. (M)
Janis, P. (SM)
Lutz, M. W. (M)
Merrill, B. (M)
Moritz, K. C. (SM)
Owen, J. Q. (M)
Ryan, C. E. (M)
Sheppard, L. E. (M)
Talambiras, R. P. (M)

Avon (BOS-1)
Chappell, I. C. (A)
Edwards, E. W. (A)
Hourihan, A. M. (A)

Babson Park (BOS-1)
Horton, W. P. (M)
Riblet, H. J. (F)

Ballard Vale (B-MV-1)
Zink, A. J., Jr. (SM)

Bedford (BOS-1)
Adolph, E. H. (M)
Alexander, R. M. (M)
Anderegg, J. S. (M)
Angus, R. B., Jr. (SM)
Ashenfelter, T. E. (M)
Baker, A. L. (M)
Baker, R. H. (M)
Band, H. E. (SM)
Barabush, A. (M)
Barker, H. R., Jr. (M)
Barrett, R. M. (M)
Barlee, T. C. (M)
Basman, E. J. (M)
Beaumariage, D. C. (M)
Bishop, W. B. (M)
Brown, D. M. (M)
Brown, R. B. III (M)
Bruck, D. B. (M)
Burbo, J. H. (M)
Canty, W. J. (A)
Capen, E. B. (M)
Carr, C. E. (A)
Carr, K. L. (A)
Claflin, R. E., Jr. (M)
Craft, A. M. (M)
Crandell, P. A. (M)
Del Guercio, J. V. (M)
De Vita, A. J. (M)
Drew, D. B. (A)
Fadiman, J. R. (M)
Fernald, R. A. (A)
Field, W. G. (M)
Fischer, H. L. (M)
Fonoroff, B. (M)
Fricks, R. E. (M)
Friedman, M. (M)
Gerhardt, R. H. (M)
Gioca, F. A. (M)
Glindberg, J. (SM)
Hammond, G. H. (SM)
Hanks, E. C., Jr. (M)
Harris, R. G. (M)
Harrison, J. R. (M)
Harwood, A. (M)
Hawes, A. R. (SM)
Healy, B. H. (A)
Hearn, K. F., Jr. (M)
Hinckley, K. M. (M)
Hodgson, J. C. (A)
Ingrao, H. C. (A)
Johnson, P. C. (M)
Jones, G. C. (M)
Joyce, C. C., Jr. (M)
Jungielewicz, S. S. (A)
Kellett, J. D. (M)
Kent, A. J. (A)
Kimball, J. A. (M)
Konkle, K. H. (A)
Lee, J. H. (M)
Libby, W. B. (M)
Liske, D. W. (M)
Love, R. E., Jr. (M)
May, W. Jr. (A)
McCurley, E. P. (M)
McMurtrie, D. L. (SM)
Micciolli, A. R. (M)
Morin, J. O. (M)
Mudyett, W. L. (M)
Nagy, F., Jr. (M)
Owen, P. H. (M)
Peeler, G. D. M. (M)
Perkins, J. F., Jr. (M)
Procunier, R. W. (M)
Rasmussen, J. E. (M)
Reinecke, H., Jr. (M)
Rey, T. J. (SM)
Rodman, A. K. (M)
Romano, A. (A)
Sauer, H. S. (M)
Sen, H. K. (SM)
Shapiro, M. L. (M)
Sherburne, A. E. (M)
Smith, C. L. (SM)
Smith, W. C. (M)
Stevens, R. T. (M)
Sykes, C. A. (M)
Tetley, W. H. (M)
Thornton, D. P. (M)
Vance, W. H., Jr. (M)
Ward, J. H. R., III (A)
Warner, E. R. R. (M)
Williams, A. R. (M)
Willis, J. T. (M)
Wold, D. C. (A)
Wulfsberg, K. N. (M)

Belmont (BOS-1)
Albert, B. (A)
Barry, J. G. (SM)
Blackburn, J. F. (M)
Chatterton, E., Jr. (M)
Cox, W. W. (M)
Crapo, S. T. (M)
Crosby, R. G. (M)
Cullington, E. H. (M)
Davidson, D. (M)
Deutsch, D. E. (M)
Dolbear, B. L. (SM)
Dudley, B. (SM)
Duncan, N. L. (M)
Edgerton, H. E. (F)
Fried, C. (M)
Glennan, T. K., Jr. (M)
Gram, H. R., Jr. (M)
Gray, H. L. (A)
Gray, P. E. (M)
Handy, R. A. (A)
Hellenbrand, C. M. (M)
Hilderbrand, J. G., Jr. (M)
Hill, A. G. (F)
Hulburt, H. J., Jr. (M)
Hunt, F. V. (F)
Klein, J. A. (A)
Klemperer, H. (M)
Kondl, S. E. (M)
Levison, W. H. (M)
Looney, W. P. (A)
Luschei, R. W. (A)
Macrakis, M. (A)
Mercer, W. R. (SM)
Moore, G. M., Jr. (M)
Moreth, W. J. (A)
Murphy, J. E. (M)
Nesline, F. W., Jr. (M)
O'Day, M. D. (M)
O'Hara, F. J. (A)
Peters, A. T. (A)
Reed, J. (SM)
Reinkes, J. F. (SM)
Restaino, A. D. (M)
Richardson, A. S. C. (M)
Riegelhaupt, N. H. (M)

Rines, R. H. (SM)
Ringer, M. (M)
Rona, T. P. (SM)
Saunders, A. C. W. (M)
Seaver, W. H. (M)
Simons, J. C., Jr. (SM)
Stein, J. (A)
Taber, R. N. (M)
Travis, J. S. (M)
Vogan, E. L. (M)
Wagner, R. W. (M)
Walker, L. H. (M)
Ward, H. R. (A)
Woodward, R. H. (M)

Berkshire (WM-1)
Lord, R. W. (M)

Berlin (BOS-1)
Krackhardt, R. H. (A)

Beverly (B-MV-1)
Biggs, O. H. (M)
Brown, N. J. (M)
Cattely, J. A., Jr. (A)
Carr, E. G. (M)
Dillaby, E. F. (SM)
Ferris, P. A. (A)
Finneault, W. I. (M)
Galluzzi, N. P. (M)
Ghen, W. R. (M)
Gustafson, E. M. (A)
Hangstefer, J. B. (M)
Heins, H. (A)
Juhola, C. (SM)
Kraeuter, L. D. (M)
Krinsky, B. D. (M)
Lesch, F. A. (M)
McCarthy, H. J. (SM)
McKinley, J. J. (A)
O'Brien, C. A. (M)
Perron, R. R. (M)
Pierce, D. H. (M)
Prescott, G. A. (A)
Preston, A. C. (M)
Rudenberg, H. G. (SM)
Ryan, H. G. (M)
Safran, L. (M)

Billerica (BOS-1)
Brooking, B. M. E. (M)
Charnley, E. (A)
Danko, J. J. (M)
Dixon, L. H., Jr. (M)
Fucci, E. A. (A)
Helser, W. W. (M)
Masi, J. L. (M)
Mohr, M. C. (M)
Nickless, H. C. (A)
Norviel, H. D. (SM)
Parker, E. D., Jr. (M)
Rand, J. C. (A)
Williamson, R. S. (M)

Bolton (BOS-1)
Mechlin, R. N. (M)
Slade, C. B. (A)
Wilson, H. M. (SM)

Boston (BOS-1)
Albersheim, W. J. (F)
Alford, A. (F)
Bachman, W. S., Jr. (M)
Bailey, R. B. (A)
Baird, H. S. (A)
Balmsfather, R. R. (M)
Bakalar, D. (M)
Ball, G. F. (M)
Bardfield, M. L. (M)
Barnes, R. P., Jr. (M)
Baron, R. C. (M)
Belvin, F. (M)
Berg, H. C. (A)
Berman, J. (M)
Bistany, F. A. (A)
Blitz, D. (M)
Bordewieck, R. W. (A)
Bothwell, T. P. (M)
Bramson, M. (M)
Brandt, P. W. (M)
Bress, C. (M)
Bretller, B. J. (M)
Brilliant, M. B. (M)
Carpenter, R. O. (M)
Chandler, C. H. (SM)
Cheatham, T. P., Jr. (SM)
Chopra, A. (A)
Christian, J. W., Jr. (M)
Chung, Y. T. (M)
Copps, E. M., Jr. (M)
Czukrasz, Z. P. (A)
Darsch, C. G., Jr. (M)
Davidson, F. T. (M)
DeFigueiredo, R. J. P. (M)
Detrick, D. M. (M)
De Wolf, N. (M)
Doane, R. C. (A)
Dougherty, J. D. (A)
Downes, A. B. (A)
Eaton, L. G. (M)
Edle, J. L. (M)
Ertman, W. M. (M)
Essigmann, M. W. (SM)
Evans, R. R. (M)
Farnsworth, E. P. V. (SM)
Favaloro, C. J. (A)
Fenter, W. S. (A)
Finke, H. E. J. (M)
Foundas, G. J. (M)
Friend, P. A. (M)
George, G. F. (M)
Germeshausen, K. J. (SM)
Glanoukos, W. A. (M)
Glass, W. G. (M)
Goldberg, H. B. (M)
Gordon, B. M. (M)
Green, B. (M)
Grossimon, H. P. (A)
Grumman, G. S. (A)
Gunders, E. (M)
Gutzman, S. S. (SM)
Haberstroh, A. (SM)
Haque, W. M., Jr. (M)
Hallenstein, N. A. (M)
Hamilton, S. R. (M)
Hardsog, H.N. (SM)
Hart, F. W. (A)
Hartman, R. H. (M)
Hastings, T. M., Jr. (SM)
Hetherington, J. S. (M)
Hieken, C. (M)
Hobson, J. E. (F)
Hofstetter, E. M. (M)
Hoelick, P. H. (M)
Hughes, A. M. (A)
Jensen, J. W. (M)
Johnsen, N. B. (M)
Johnson, A. H. (M)
Jones, R. N. (A)
Kaminski, W. A. (M)
Katz, L. (M)
Kearsley, W. A. (M)
Keiner, R. C. (A)
Kerk, C. T. (A)
Kilroy, H. P. (M)
Kim, Y. S. (M)
Klein, R. D. (M)
Kostecki, W. (M)
Ladd, R. E. (M)
Lee, F. (M)
Lee, S. W. (M)
Levine, M. W. (M)
Lewis, G. A. (M)
Liszewski, T. M. (M)
Littleboy, H. S. (SM)
Loewenthal, M. (M)
Lundberg, T. H. (A)
Macdonald, C. J. (A)
McLaughlin, R. J. (M)
Metro, A. C. (M)
Miller, H. E. (M)
Mott-Smith, J. C. (M)
Murachver, J. (M)
Noyes, B. I. (M)
Offner, M. M. Y. (M)
Owen, S. (M)
Palmer, R. T. (M)
Phelps, L. I. (A)
Pick, G. G. (M)
Pratt, H. J., Jr. (M)
Ramler, D. A. (A)
Randall, D. S. (A)
Reinitz, A. (M)
Rice, J. E. (SM)
Richman, P. L. (M)
Rines, D. (M)
Roberts, L. W. (SM)
Rose, J. E. (M)
Rynard, J. P. (A)
Schindler, J. A. (A)
Schmitt, J. W. (M)
Schochet, J. R. (A)
Schwartz, S. (SM)
Scieglenny, J. (M)
Scott, R. E. (M)
Sheingold, D. H. (M)
Shortell, A. V., Jr. (M)
Smith, A. D. (M)
Smith, B. H. (M)
Smith, R. D. (SM)
Smith, T. B. (M)
Sokal, N. O. (SM)
Stirmling, W. E. (M)
Thomas, A. S. (A)
Toperzer, R. S. (M)
Wagner, P. S. (M)
Wayne, G. H. (SM)
Weaver, D. V. (M)
Weingarten, J. (M)
Whiteside, F. S. (A)
Wilson, G. M. (A)
Winn, H. L. (M)
Woodward, J. H. (SM)
Wozencraft, J. M. (SM)

Boxford (B-MV-1)
Fulton, R. O. (A)
Kuczun, C. G. (M)

Braintree (BOS-1)
Brennan, J. E. (M)
Myrbeck, E. R. (SM)
Polachowski, B. A. (A)
St. Andre, G. O. (A)

Bridgewater (BOS-1)
Wilber, L. C. (M)

Brighton (BOS-1)
Bernstein, H. (M)
Carpenter, D. P. (M)
Chan, M. C. H. (M)
Daly, W. G., Jr. (M)
Gillis, J. E. (M)
Goldman, E. M. (M)
Hanopol, L. (M)
Huggan, A. J. (M)
Jacob, F. (M)
Johnson, K. R. (A)
Kaufman, L. J. (M)
Larkin, J. D. (M)
Lemack, A. G. (M)
MacDonald, F. D. (A)
Margolin, M. C. (M)
Masse, D. J. (A)
Meyrowitz, P. E. (M)
Montanari, R. E. (M)
O'Neil, R. E., Jr. (M)
Romano, D. S. (SM)
Rotman, W. (M)
Rubinovitz, J. I. (SM)
Schwartz, R. J. (M)
Sussenguth, E. H., Jr. (M)
Talley, W. K. (M)
Tsacoyeanes, C. W. (M)
Weiner, G. (M)
Wolf, S. M. (A)
Yurt, X. (VA)

Brockton (BOS-1)
Bianco, F. P. (M)
Bryant, R. L. (M)
Casey, A. A., Jr. (M)
Dulskis, R. (M)
Ewell, R. M., Jr., (A)
Fortier, O. V. (M)
James, P. G., Jr. (A)
Loughlin, B. J. (A)
Mac Leod, A. D. (M)
Mazeiko, C. K. (M)
Price, C. W. (A)
Ronis, W. J. (M)
Rubin, H. L. (A)
Samoson, E. J. (A)
Shuck, T. L. (A)
Stratoti, A. R. (M)
Swanson, H. A. (M)
Tang, A. Y. C. (A)
Uses, E. P. (M)
Ward, A. G. (M)

Brookline (BOS-1)
Ackerman, R. L., Jr. (M)
Andreika, J. T. (M)
Anlenger, E. (M)
Baer, J. (SM)
Bergmann, S. M. (M)
Bloom, J. H. (M)
Bow, B. H. (A)
Chemikoff, L. (A)
Cohler, E. U. (SM)
Crystal, M. I. (M)
Debski, J. M. (M)
De Mattos, R. F. (M)
Doctor, D. E. (A)
Doctor, D. E. (A)
Dunn, A. G. (M)
Feldman, H. (M)
Frewald, W. J. (A)
Goldberg, S. H. (M)
Goldman, D. J. (M)
Green, A. I. (M)
Hart, W. H. (M)
Hersh, A. I. (M)
Hoffman, S. (M)
Jordan, K. L., Jr. (M)
Kaminow, I. P. (M)
Kaplan, B. J. (M)
Kodis, R. D. (SM)
Lewis, G. S. (A)
Lorant, C. R. (M)
Malizia, J. P. (M)
Miller, A. (SM)
Monks, G. G. (A)
Nathan, P. M. (M)
Neumann, H. D. (A)
Newberg, I. L. (A)
Parks, J. T. (M)
Patralko, J. (M)
Peluso, D. J. (A)
Polayes, M. B. (A)
Proman, J. N. (A)
Reichner, A. J. (M)
Rosenes, O. (M)
Roth, C. H., Jr. (M)
Sakrison, D. J. (M)
Segel, H. P. (A)
Seligman, R. I. (M)
Shapiro, A. R. (M)
Sikoryak, W. J. (A)
Silver, R. (M)
Stern, M. M. (M)
Straehley, E. H. (M)
Studstill, H. F. (A)
Sudduth, W. B. (A)
Teragawa, R. T. (M)
Weiner, M. M. (M)
Weinstein, I. J. (M)
White, D. H. (M)
Wolfson, A. H. (SM)
Zabludowsky, A. (M)

Burlington (BOS-1)
Boucher, G. F. (M)
Brown, C. J. (M)
Carruthers, C. W. (M)
Clougherty, J. F. (M)
Collins, J. A. (M)
Collins, R. B., Jr. (M)
Corrigan, J. P. (M)
Dion, D. F. (A)
Etane, B. (A)
Ellis, W. R. (M)
Fuller, R. L. (M)
Gibson, R. E. (M)
Gill, M. S. (A)
Granger, C. E. (M)
Harris, F. S. (SM)
Hennessey, T. J. (M)
Hergenrother, R. M. (M)
Hopkins, C. H. (A)
Houlding, N. (SM)
Jolly, J. B. (M)
Lally, R. D. (M)
Lovell, R. W. (M)
Lund, R. W. (A)
Marino, P. F. (M)
Mark, R. B. (A)
Markow, E. W. (SM)
McCully, R. G. (A)
Miller, J. S. (M)
Morrison, C. D. (M)
Neidorf, E. (M)
Nevins, J. L., Jr. (M)
Nickerson, D. E. (A)
Nygard, J. C. (M)
Peterson, D. E. (M)
Preston, J. L. (M)
Rasmanis, E. (A)
Reece, D. L. (A)
Ross, D. A. (M)
Rudolph, H. W., Jr. (M)
Sandholm, R. G. (M)
Schmidt, W. G., Jr. (M)
Schoenberger, W. J. (SM)
Schorr, M. G. (M)
Scotney, J. H. (M)
Seamans, R. C., Jr. (SM)
Sferrino, V. J. (M)
Sievers, W. E. (M)
Smyth, R. R. (SM)
Sorli, G. B. (M)
Sullivan, J. L. (A)
Tanner, W. E. (M)
Thomassen, N. E. (M)
Uhlir, A., Jr. (SM)

Buzzards Bay (BOS-1)
Anderson, R. W. (A)
Engstrom, H. T. (F)

Byfield (B-MV-1)
Jacomb, R. A. (M)

Cambridge (BOS-1)
Adams, G. J. (SM)
Adler, R. B. (SM)
Aiken, H. H. (SM)
Akhurst, D. O. (M)
Alberts, P. L. (A)
Alonso, R. L. (A)
Applegate, C. E. (SM)
Apsokardos, E. (A)
Arthurs, E. (M)
Bagley, P. R. (M)
Ball, J. H. (M)
Baruch, J. J. (M)
Basch, M. W. (M)
Batchelder, L. L. (F)
Beecher, A. E. (M)
Benfield, A. E. (SM)
Bers, A. (M)
Bertolini, A. (M)
Bixby, H. O. (SM)
Blair, J. (M)
Blankenbaker, J. V. (A)
Bloembergen, N. (SM)
Blood, B. E. (A)
Bolt, R. H. (SM)
Bose, A. G. (M)
Bowles, E. L. (F)
Bradspies, S. (A)
Brennan, D. G. (SM)
Brown, G. S. (F)
Brown, R. M. (M)
Broxmeyer, C. (M)
Burdine, B. H. (M)
Bussgang, J. J. (SM)
Cairns, H. E. (A)
Callingaert, P. (M)
Caplan, D. (M)
Carpenter, C. H. (M)
Centanni, F. A. (M)
Chaffee, E. L. (F)
Chu, T. (M)
Clapp, R. E. (M)
Clayton, J. M. (SM)
Coll, D. C. (M)
Collard, J. R. G. (M)
Comstock, D. F., Jr. (M)
Congleton, W. L. (M)
Cook, J. H. (SM)
Cooper, B. F. (M)
Cooper, P. W. (M)
Cooper, R. S. (A)
Corey, B. W. (A)
Craven, R. B. (M)
Crawford, C. H. (M)
Crousel, L. E. (M)
Davidson, G. A. (M)
De Marco, V. R. (M)
Dennis, J. B. (M)
Dietrich, C. W. (M)
Donovan, A. C. (M)
Downing, J. L. (M)
Downing, R. E. (M)
Draper, C. S. (F)
Dunn, B. C., Jr. (M)
Eastham, M. (F)
Eddy, F. N. (A)
Eisenstadt, B. M. (M)
Elias, P. (F)
Elkind, J. I. (M)
Engel, J. S. (M)
Epstein, H. I. (M)
Fallows, E. M. (A)
Fano, R. M. (F)
Field, M. D. (M)
Fitzgerald, J. J. (SM)
Forsen, G. E. (M)
Gavin, J. M. (SM)
Gildea, H. (M)
Gilman, M. A. (M)
Glassmeyer, J. M. (M)
Goldstein, M. H., Jr. (M)
Grande, D. I. (A)
Gray, D. A. (M)
Gray, D. J. (M)
Gray, J. C. (M)
Gray, T. S. (SM)
Greene, D. (A)
Greenough, H. V., Jr. (M)
Grim, W. M., Jr. (M)
Grossi, M. D. (M)
Guillemin, E. A. (F)
Hagan, T. G. (A)
Hamilton, D. H., Jr. (A)
Hanley, L. D. (A)
Haring, D. R. (M)
Harmer, J. D. (A)
Harney, P. J. (M)
Harris, S. M. (M)
Hathaway, G. M. (A)
Hazen, H. L. (SM)
Heart, F. E. (M)
Heinz, J. M. (M)
Heller, P. N. (A)
Hersh, J. F. (M)
Hickman, R. W. (SM)
Hillman, H. D. (M)
Hills, F. B. (M)
Hirsch, H. R. (M)
Hogan, W. D. (M)
Holzman, R. E. (M)
Hom, R. N. G. (M)
Hopkins, A. L., Jr. (M)
Howard, D. J. (M)
Howard, R. A. (M)
Hubbard, M. M. (SM)
Hughes, G. W. (M)
Humphrey, W. M. (M)
Irons, F. H. (M)
Iverson, K. E. (A)
Jayne, A. W. (M)
Jedynak, L. (M)
Johansen, D. E. (M)
Johnson, E. P., Jr. (A)
Jokinen, R. A. (M)
Jones, R. V. (M)
Kain, R. Y. (M)
Kaiser, J. F. (A)
Kay, A. F. (M)
Kaye, M. G. (M)
Keller, C. C. (A)
Kennedy, F. (SM)
Kerwin, E. M., Jr. (SM)
Kessler, J. A. (SM)
Khambaty, M. B. (M)
King, R. W. P. (F)
Kinner, H. R. (M)
Kirsch, R. A. (M)
Knight, G., Jr. (M)
Kohlenberg, A. (SM)
Kramer, J. D. R., Jr. (M)
Kurtz, A. D. (M)
Kusko, A. (SM)
Kyhl, R. L. (M)
Lahanas, C. J. (SM)
Langberg, E. (M)
Laymor, J. E. (M)
Lee, Y. W. (SM)
Leon, B. J. (A)
Leonhard, J. (M)
Lerner, R. M. (SM)
Levi, P. R. (M)
Levy, D. M. (M)
Lewis, L. J. (SM)
Lincoln, A. J. (M)
Litwin, R. (M)
Lovell, B. W. (M)
Lyman, F., Jr. (M)
Macalka, M. P. J. (M)
Mack, R. B. (A)
Maling, G. C., Jr. (A)
Maling, R. (M)
Malme, C. I., Jr. (A)
Margolin, B. (M)
Mason, S. J. (F)
Mason, W. (M)
Matz, C. H. (SM)
McCulloch, W. S. (SM)
McGowan, E. A. (M)
Mednick, R. (M)
Menzel, D. H. (SM)
Michaelis, M. (SM)
Michelini, R. D. (M)
Mimno, H. R. (F)
Minsky, M. L. (M)
Moizeau, C. J. (A)
Mooers, C. N. (M)
Myers, O. C., Jr. (M)
Narud, J. A. (M)
Nelson, C. (M)
North, D. K. (A)
Nottingham, W. B. (F)
O'Connor, C. (M)
Oddson, J. K. (M)
Oettinger, A. G. (M)
Ogden, S. (M)
Olson, R. E. (A)
Olsson, E. A. (M)
Owens, R. H., Jr. (A)
Pastan, H. L. (M)
Peake, W. T. (M)
Peterson, R. K. (M)
Pinckney, R. P. (M)
Pokorny, V. J. (M)
Pompian, S. D. (M)
Popp, F. G. (M)
Pote, A. J. (F)
Powers, D. A. (M)
Pugh, A. L. III (M)
Ramsey, W. H. (M)
Randell, T. C. (M)
Raney, W. P. (M)
Reem, G. M. II (M)
Remillard, W. J. (A)
Richmond, H. B. (F)
Richmond, R. B. (SM)
Rigby, S. (M)

Robichaud, A. W. (M)
Robinson, K. W. (M)
Rodgers, F. A. (M)
Roehrig, J. R. (SM)
Roellke, D. A. (M)
Ronat, E. E. (M)
Rosen, G. (M)
Rosenberg, A. E. (A)
Rothfusz, R. W. (M)
Rubenstein, A. H. (A)
Russell, L. (A)
Salerno, J. (M)
Salton, G. (M)
Sarles, F. W., Jr. (M)
Scheidenhelm, R. (M)
Schmit, H. J. (A)
Schoeffler, J. D. (M)
Schwab, W. C. (M)
Schwarzkopf, D. B. (M)
Scott, A. C. (M)
Sear, H. (A)
Searcy, J. B. (M)
Sears, N. E., Jr. (M)
Semon, W. L. (SM)
Sengupta, D. L. (M)
Shapiro, L. D. (M)
Shapiro, R. I. (A)
Sheehan, J. A. (A)
Shein, N. P. (M)
Shiels, P. B. (A)
Siebert, W. M. (M)
Sklar, S. J. (M)
Smith, L. R. (A)
Smith, M. K. (A)
Smullin, L. D. (F)
Solano, J. (M)
Solomonoff, R. J. (M)
Spencer, R. H. (M)
Spitzer, E. (M)
Sponsler, J. W. (A)
Stevens, H. C. (A)
Stevens, K. N. (M)
Stoddart, H. F. (M)
Strandberg, M. W. P. (F)
Stratton, J. A. (F)
Sullivan, L. T. (M)
Susskind, A. K. (M)
Sutro, L. L. (M)
Szulewski, E. P. (A)
Thiessen, A. E. (SM)
Thornton, C. L. (M)
Tisdale, J. W. (A)
Trantham, H., Jr. (M)
Troll, J. H. (SM)
Troxel, D. E. (M)
Tucker, C. E. (SM)
Tucker, J. A. (M)
Turner, A. S. (M)
Valley, G. E., Jr. (SM)
Vander Velde, W. E. (M)
Van Meter, D. (SM)
Verzuh, F. M. (M)
Vilbig, F. (SM)
Ward, J. E. (M)
Wasserman, R. (A)
Webster, F. A. (A)
Weiss, H. R. (M)
Westphal, W. B. (M)
Whelan, C. R. (M)
White, D. C. (SM)
White, S. A. A. (A)
Wiener, F. M. (SM)
Wiesner, J. B. (F)
Widrow, B. (M)
Wildes, K. L. (SM)
Willenbrock, F. K. (M)
Williams, F. E. (A)
Winston, A. W. (M)
Wissmann, H. B. (M)
Woodson, H. H. (M)
Woodward, C. E. (M)
Worthen, C. E. (SM)
Wright, W. D. (SM)
Young, F. M. (SM)
Youngblood, W. A. (M)
Youtz, P. (M)
Zacharias, J. R. (SM)
Zoll, D. J. (M)

Canton (BOS-1)
Blumenthal, S. P. (A)
Buckley, E. F. (SM)
Burgoyne, C. L. (M)
Burr, G. S. (M)
Cahill, T. C. (A)
Callahan, R. J. (M)
Cuming, W. R. (M)
Dorian, J. M. (M)
Dunleavey, F. S. (A)
Keller, A. L. (A)
Slawsby, N. (M)
Volk, M. C. (A)
Wissenbach, F. O. (A)

Carlisle (BOS-1)
Dabis, J. C. (M)
Gillette, J. S. (M)
Macmillan, R. R. (M)
Malech, R. G. (A)
Parke, N. G., III (M)

Charlestown (BOS-1)
Gibbons, J. F. (M)

Chelmsford (BOS-1)
Chutchian, Z. S. (M)
Drury, W. H. (M)
Kahan, S. D. (A)
Lin, H. C. (M)
Manahan, G. F. (M)
Manahan, J. F. (M)
Manty, W. A. (SM)
Marcotte, A. G. (A)
Martin, R. A. (M)
Palmer, W. F. (A)
McCormack, T. L. (M)
Sanderson, A. E. (M)
Smithson, G. (SM)
Toth, W. E. (M)
Wade, C. E. (SM)
Wallace, N. E. (A)

Chelsea (BOS-1)
Baravella, J. G. (A)
Gallant, R. M. (A)
Rosen, S. (M)
Scudney, B. V. (M)
Sokolove, M. G. (M)

Cheshire (WM-1)
Davis, A. J. (M)
Leonard, S. C. (SM)

Chestnut Hill (BOS-1)
Bezuszka, S. J. (M)
Blanchard, R. L. (SM)
Cooper, G. (M)
Frank, W. I. (A)
Gansler, J. S. (M)
Golembe, S. N. (M)
Gould, L. A. (M)
McFarlan, R. L. (SM)
Richards, P. I. (A)
Schiffman, M. M. (M)
Zieper, S. M. (M)

Chicopee (WM-1)
Stasiowski, C. M. (M)
Szczepanski, J. J. (A)
Zdeb, S. E. (M)

Chicopee Falls (WM-1)
Dulchinos, J. (M)
Grooms, W. G. (A)

Clinton (BOS-1)
Gottlieb, D. C. (M)
Surprenant, A. H. (A)

Cochituate (BOS-1)
Bean, O. E. (M)
Billig, L. S. (SM)
Brown, K. E. (M)
Donner, J. B. (SM)
Falgen, I. M. (SM)
Higgins, W. F. (M)
Hudson, K. (M)
Humphrey, W. S. (SM)
Johnson, S. L. (A)
Krasnick, B. (M)
Kroenert, J. T. (SM)
Kurth, H. H. (SM)
Lucas, E. J. (M)
Marcley, W. E. (M)
Sharaf, H. M. (M)
Wilkinson, C. W. (M)

Cohasset (BOS-1)
Ainslie, H. W., Jr. (M)
Copson, D. A. (M)
Lippitt, K. H. (SM)
Massa, E. A. (SM)
Palmiter, R. B. (SM)
Rowland, H. J. (SM)

Concord (BOS-1)
Anderson, H. E. (M)
Bibbins, L. L. (M)
Blemson, G. A. (M)
Blacksmith, P., Jr. (M)
Borton, J. T., Jr. (M)
Bosch, F. M. (M)
Briggs, N. W. (A)
Burley, R. M. (A)
Burton, E. T., Jr. (M)
Cayouette, R. L. (A)
Chu, G. Y. (SM)
Connelly, M. E. (M)
Cottle, H. O. (A)
Craig, J. W., Jr. (M)
Daniels, R. (A)
Davenport, W. B., Jr. (F)
Dickson, A. W. (M)
Dolan, R. P., Jr. (A)
Donnelly, F. J., Jr. (A)
Doran, R. W. (M)
Drake, W. W., Jr. (M)
Edelberg, S. (M)
Ehrenfried, A. D. (SM)
Enticknap, R. G. (SM)
Forrester, J. W. (F)
Fritsch, P. C. (M)
Galbraith, J. S. (M)
Gunn, K. C. C. (M)
Hall, P. R. (M)
Harper, R. (M)
Heuchling, T. P. (SM)
Hollingsworth, L. M. (SM)
Kilham, L. F., Jr. (SM)
Kirshner, H. J. (A)
Kline, J. (SM)
Lambert, J. C. (A)
Logemann, H., Jr. (SM)
Long, H. S. (A)
Long, J. B., Jr. (M)
Lush, M. J. (M)
Macdonald, W. S. (M)
Mack, C. L., Jr. (A)
Mack, R. A. (M)
Marsh, H. S. (M)
Martin, L. H. (A)
McCauch, C. P. (SM)
Middleton, D. (F)
Montgomery, D. B. (M)
Newman, P. (SM)
Patterson, R. F., Jr. (M)
Penfield, H. (M)
Pickering, R. L. (M)
Roberts, G. T. (M)
Rotondo, P. A. (M)
Sallet, A. P. (M)
Schenck, J. (M)
Seamans, J. O. (M)
Slade, H. L. (M)
Slade, M. G. (M)
Smith, R. L. (M)
Snay, R. J. (M)
Sullivan, D. L. (M)
Temme, D. H. (M)
Tisdle, W. N. (F)
Tyler, V. M., II (M)
Ursch, R. R. (M)
Vance, P. R. (A)
Walen, R. S. (M)
Watt, C. W., Jr. (SM)
Westcott, V. C. (M)
Wingate, S. A. (M)
Youch, E. A. (M)
Zorzy, J. (M)

Dalton (WM-1)
Allen, J. J. (M)
Maguire, M. F. (M)
Newsham, C. D. (M)
Schuler, R. L. (M)
Van Patten, R. A. (M)

Danvers (B-MV-1)
Bevitt, W. D. (M)
Bimle, B. A. (M)
Brandt, J. L. (M)
Carter, G. E., Jr. (M)
Carter, G. W. (M)
Caskin, D. D. (A)
Chernyshov, V. N. (M)
Cotter, W. L. (A)
Dirks, L. H. (M)
Dominick, F. J. (M)
Farmer, J. W. (SM)
Franzen, G. H. D. (A)
Frohock, W. S. (M)
Gibson, R. E. (A)
Glasberg, M. (M)
Hecht, B. P. (M)
Hull, J. A. (A)
Kem, R. H. (M)
Koen, F. T. (M)
Kowalski, R. M. (M)
Record, F. A. (M)
Sokolov, D. A. (M)
Spiliotis, P. J. (A)
Straney, K. O. (M)
Weinburg, E. F. (A)
Wroblewski, T. (SM)
Yee, T. G. (M)

Dedham (BOS-1)
Dantas, C. E. (M)
Fiola, W. J. (M)
Kearns, T. M. (M)
Levesque, P. J. (M)
Nackley, J. F., Jr. (M)
Spadoni, E. R. (A)
Tahan, E. N. (SM)

Dennis (BOS-1)
Zopatti, R. C. (M)

Dorchester (BOS-1)
Castellani, A. E. (M)
Chin, B. M. (A)
Cochrane, D. O. (M)
Cohen, T. J. (M)
Gudmore, A. F. (M)
Czechowski, E. W. (M)
Devine, W. L. (A)
Docherty, E. E. (A)
Donovan, W. C. (M)
Ellins, V. (M)
Epstein, M. A. (A)
Fistal, M. S. (M)
Fox, R. M. (A)
Galante, E. T. (M)
Goldstein, D. S. (A)
Gray, E. L. (A)
Hartford, W. J. (M)
Jones, W. C., Jr. (M)
Kalakowsky, C. B. (M)
Kamenski, S. A. (A)
Krinsky, M. L. (M)
Meister, M. (A)
Mikulec, T. E. (M)
Morris, J. P. (A)
Nenortas, K. (M)
Renner, G. W. (M)
Shear, H. (A)
Sims, B. S. (M)
Tessari, V. P. (M)
Tiflebaum, B. M. (M)
Tursky, B. (A)

Dover (BOS-1)
King, J. G. (M)
Melancon, L. (M)

Dracut (B-MV-1)
Fairweather, D. R. (M)

Dudley (BOS-1)
Swana, M. R. (A)

East Boston (BOS-1)
Berni, L. W. (M)
Capobianco, A. A. (M)
Cunha, J. A. (A)
D'entremont, A. O., Jr. (M)
Mastromarino, J. A. (A)
Wellins, A. J. (M)
East Brookfield (BOS-1)
Houlihan, R. P. (M)

East Dedham (BOS-1)
Hamilton S. J. (A)

East Falmouth (BOS-1)
Bierman, C. W. (A)

Easthampton (WM-1)
Gnacek, W. J. (M)
Mesh, T. J. (SM)

East Longmeadow (WM-1)
Fugere, D. G. (M)

East Lynn (BOS-1)
Kazules, A. J. (M)

Eastondale (BOS-1)
Ray, K. B. (A)

East Walpole (BOS-1)
Ackerman, S. (M)

East Weymouth (BOS-1)
Chevli, N. A. (A)
Fulton L. G. (A)
Karalan, E. (A)
McLaughlin, A. J. (M)

Egypt (BOS-1)
Frank, L. G. (M)
Salsgiver, J. P. (A)
Versoy, I. R., Jr. (M)

Everett (BOS-1)
Breen, P. T. (M)
Ganitt, E. D. (A)
Klewicz, F. A. (M)
Massaro, R. P. (M)
Murphy, T. F. (A)
Newell, B. C. (A)
Veal, J. E. (M)

Fairhaven (BOS-1)
Robinson, W. M. (SM)

Fairview (WM-1)
Austin, J. B., Jr. (SM)

Fall River (BOS-1)
Buchan, R. (A)
Buchanan, J. R. (A)
Buckley, A. E., Jr. (A)
Desilets, D. J. (M)
Horvitz, S. (A)
Mignealit, R. G. (M)
Roy, J. R. (M)
Ryan, J. E. (A)

Falmouth (BOS-1)
Johnston, A. T. (M)
Landry, S. G. (M)
Le Roy, R. C. (M)
Stimson, P. B. (A)

Falmouth Foreside (BOS-1)
Edwards, B. H. (M)

Fayville (BOS-1)
Dunnet, W. J. (M)
Poullot, L. J. (A)

Feeding Hills (WM-1)
Call, S. S. (A)
Zucco, V. S. (M)

Fitchburg (BOS-1)
Arthur, G. M. (M)
Lundberg, R. E. (M)
Moran, J. M. (SM)
Pandiscio, A. A. (M)
Snyder, D. C. (M)
White, D. A. (A)

Florence (BOS-1)
Rachals, R. (M)

Fort Devens (BOS-1)
Florelli, M. C. (M)
Folkestad, G. T. (M)
Townsend, N. L. (A)

Foxboro (BOS-1)
Bristol, E. H. (M)
Soderstrom, R. E. (A)
Spector, F. L. (M)
Sturgeon, S. S. (M)
Terrell, G. C. (M)
Wells, C. H. (A)

Framingham (BOS-1)
Abdun-Nabi, Z. (M)
Abrams, S. M. (M)
Appleman, M. A. (M)
Archambault, R. E. (M)
Beals, E. H. (M)
Bennett, H. W. (SM)
Bond, E. E. (SM)
Boubli, E. J. (A)
Bovill, A. W. (M)
Bowers, W. A. (M)
Brecken, J. R. (M)
Breitbord, J. L. (M)
Brundage, E. J. (M)
Caldicott, J. K. (M)
Clymas, G. (A)
Coker, G. F. (M)
Coppernoll, R. W. (M)
Daly, R. H. (M)
Denman, J. G. (M)
Dushman, A. (M)
Earl, R. J. (M)
Fangmann, G. (A)
Floridia, M. S. (M)
Forglone, E. A. (M)
Garber, T. A. (A)
Gilmore, A. R. (M)
Ginsberg, I. (A)
Greenfield, S. E. (M)
Guy, S. A. (M)
Hamilton, W. H. (M)
Hoffer, J. M. (M)
Hoogasian, H. (M)
Irish, F. E., Jr. (M)
Jamieson, J. B., Jr. (M)
Johnson, A. B. (M)
Kallin, R. L. (A)
Kates, R. (M)
Kohnle, A. P., Jr. (M)
Kokidko, A. (M)
Kopeloff, B. G. (M)
Kross, V. (M)
Krulee, R. L. (M)
Lacey, N. F. (A)
Lindberg, J. E. (M)
Long, F. (M)
MacDougall, J. S. (M)
Mellen, G. L. (SM)
Mercurio, J. F., Jr. (M)
Meretsky, P. L. (M)
Michelson, M. (SM)
Miller, M. M. (M)
Miller, S. J. (M)
Nordquist, P. L. (M)
O'Gorman, J. B. (SM)
Palughi, J. F., Jr. (A)
Parad, L. I. (A)
Postema, G. B. (M)
Rahilly, J. P. (M)
Randles, W. C. (M)
Redmond, J. G. (M)
Remington, R. C. (M)
Rideout, H. A. (M)
Rosen, L. (SM)
Salzberg, E. (A)
Sawyer, D. S. (A)
Scyocurka, S. (A)
Sherman, D. (M)
Tenenholtz, R. (M)
Timms, A. S. (A)
Traub, A. C. (M)
Ungvary, R. L. (M)
Vartanian, V. (M)
Walbridge, C. E. (M)
Weisman, J. B. (A)
Williams, R. (A)
Woodley, G. V. (M)
Yalen, S. (M)
Zwerling, M. (A)

Framingham Center (BOS-1)
Charasz, J. G. (M)
Danforth, W. C., Jr. (A)
Driscoll, W. G. (SM)
Gerdes, J. W. (M)
Hadfield, B. M. (SM)
Hammond, C. R. (M)
Hurlbut, W. A. (A)
Iffland, J. J. (SM)
Keleher, A. E., Jr. (M)
Riel, R. W. (M)
Schwartz, E. R. (A)

Franklin (BOS-1)
Deerfield, A. J. (A)

Gardner (BOS-1)
Neunhertz, R. K. (M)

Georgetown (B-MV-1)
Gammle, J. (M)
Nunan, K. W., Sr. (A)
Petraitis, A. J. (M)

Gloucester (B-MV-1)
Duffy, J. M. (A)
Hammond, J. H., Jr. (F)
Ktistes, P. J. (M)
Moore, A. S. (A)
Paschal, H. A. (M)
Poole, J. F. (A)
Purington, E. S. (SM)
Short, J. A., Jr. (A)

Great Barrington (WM-1)
Hemmes, R. T. (M)

Greenbush (BOS-1)
Brooks, G. W. (M)

Greenwood (BOS-1)
Bird, G. L., Jr. (A)
Wheeler, D. R. (M)

Groton (BOS-1)
Pineo, V. C. (A)
Thibeau, C. E. (A)
Woodsum, S. P. (M)
Young, K. A. (SM)

Groveland (B-MV-1)
Bradley, H. L. (M)

Hamilton (BOS-1)
Boise, E. B. (A)
Hammann, R. K. (M)
Nichols, H. F., Jr. (A)
Rowlands, E. R. (M)
Street, E. L. (A)

Hanover (BOS-1)
Jacobson, R. E. (M)
McGrath, J. L. (M)

Harvard (BOS-1)
Burton, G. L. (M)
Goldstein, S. J., Jr. (M)
Hammett, T. F. (M)
Hymes, R. T. (M)
Lee, R. F. (M)
Osborn, A. (M)
Strang, D. B. (SM)
Whitfield, W. D. (M)

Haverhill (B-MV-1)
Atwood, D. J., Jr. (M)
Feldman, E. J. (A)
Halloran, T. F. (A)
Krawiec, J. P. (M)
Santarelli, M. J. (M)
Servetnick, J. (M)

Hawthorne (BOS-1)
Nichols, N. P. (M)

Haydenville (WM-1)
Curtis, L. F. (SM)

Hingham (BOS-1)
Brooker, G. S. (M)
Cary, T. R., Jr. (M)
Craigie, S. M. (SM)
Davies, H. E. (A)
Dawson, J. W. (F)
Hall, I. A. (M)
Hyland, R. C. (A)
Massa, F. (F)
Murphy, A. L. (M)
Pinel, A. F. (A)
Pratt, F. (VA)
Vander Wolk, W. W., Jr. (M)
Wood, J. O. (M)

Holbrook (BOS-1)
Coughlin, J. J. (A)
Stone, I. M. (A)
Wisneski, W. F. (M)
Worobey, E. (M)

Holden (BOS-1)
Andreasen, I. (M)
Wilder, F. H., Jr. (A)
Wise, D. P. (SM)

Holliston (BOS-1)
Dahlem, R. K. (A)
Gordon, R. R. (M)
La Shomb, S. D. (A)
Nobles, F. L. (A)
Peters, J. D. Jr. (A)
Sharpe, D. (A)
Thomas, H. J., Jr. (A)
Valpey, R. S., Jr. (A)
Wyckoff, R. L. (M)

Holyoke (WM-1)
Hampson, F. W. (A)
Junkins, C. E., Jr. (A)
Kennedy, D. J. (A)
King, F. H. (M)
Marek, L. W. (A)
Marek, M. B. (A)
Paszko, H. A. (A)
Wernick, H. (M)

Hopedale (BOS-1)
Sample, R. F. (M)
Tinkham, M. E. (A)

Hopkinton (BOS-1)
Cleverley, D. S. (M)
Fraleigh, R. V. (A)
Moylan, J. D. (M)
Scott, W. A. (M)

Hudson (BOS-1)
Burdick, G. E. (M)
Cleary, R. W. (A)
Dobrowolski, E. P. (A)
Pauplis, L. M. (M)

Hyannis (BOS-1)
Swift, W. H., Jr. (M)

Hyde Park (BOS-1)
Burke, W. T. (M)
Cushman, G. F. (M)
Kuperstein, M. S. (A)
Nucefora, M. A. (M)

Indian Orchard (WM-1)
Aykanian, A. A. (M)

Ipswich (B-MV-1)
Blair, G. R. (M)
Foss, D. W. (M)
Mavroides, W. G. (M)
Gholson, A. H. (M)
McMillan, E. B. (SM)
Moran, J. G. (M)
Plaisted, A. H. (A)
Sweetser, L. R. (M)

Islington (BOS-1)
Hedlund, D. A. (M)
Root, W. L. (SM)
Saltmarsh, H. J. (A)

Jamaica Plain (BOS-1)
Arenberg, D. L. (M)
Beaudette, C. G. (M)
Cetanuk, W. K. (A)
Claflin, B. B. (M)
Kee, R. C. (M)
Matarazzo, T., Jr. (A)
Pengeroth, P. P. (A)
Phillips, C. M. (M)
Root, W. F. (M)

Lakeville (BOS-1)
Hancock, J. D. (M)

Lawrence (B-MV-1)
Ameen, S. J. (M)
Auger, J. J. (M)
Bancroft, R. W. (M)
Blanchette, C. F. (M)
Bowen, M. J. (A)
Buotte, J. R. (A)
Callahan, J. F. (M)
Chakmanian, J. A. (A)
D'Auteuil, R. J. (M)
Hanley, J. J. (A)
Kauders, E. (A)
Kugelman, F. (M)
Meehan, D. J. (A)
Meekins, M. C. (M)
Mercer, B. H. (A)
Pappas, J. (M)
Perkins, E. H. (SM)
Powers, R. E. (A)
Talbot, R. R. (A)
Zusman, A. G. (M)

Lee (WM-1)
Klos, E. R. (M)

Leicester (BOS-1)
Day, L. R. (M)

Lenox (WM-1)
De Tolly, G. E. B. (A)
Hartwell, R. L., Jr. (A)

Leominster (BOS-1)
Ross, H. E. (M)

Lexington (BOS-1)
Abel, W. G. (M)
Aldrich, F. W., Jr. (M)
Allen, T. J., Jr. (A)
Arden, D. N. (M)
Axelbank, M. (M)
Bandes, H. (SM)
Barker, D. B. (M)
Bean, R. H. (M)
Benkley, F. G. (M)
Berg, R. S. (M)
Blake, C. (M)
Blatt, H. (A)
Block, A. V. (M)
Bolinder, E. F. (SM)
Bosinoff, I. (M)
Bougas, A. C. (M)
Bragar, P. (M)
Bramley, F. A. (M)
Brick, D. B. (SM)
Brossok, W. C. (M)
Brown, C. J. (M)
Budd, A. E. (M)
Burgess, L. M. (M)
Burwen, R. S. (SM)
Byers, W. F. (M)
Carson, E. L. (M)
Chao, S. K. (M)
Chute, D. H. (M)
Clark, A. (M)
Clark, D. L. (M)
Clark, W. A., Jr. (A)
Cobum, W. K. (SM)
Cohen, M. S. (M)
Cohen, S. H. (A)
Crane, J. D., Jr. (M)
Crowther, T. S. (M)
Currier, J. R, Jr. (M)
Daggett, N. L. (M)
Dalrymple, G. F. (A)
Dearborn, F. K. (M)
Demetrick, J. S. (SM)
Demuth, R. L., Jr. (M)
Dentler, C. E. (M)
Dinozzi, A. D. (M)
Domenichini, C. P. (SM)
Doyle, W. (SM)
Dumanian, J. A. (M)
Elliott, W. G. (M)
Fallick, C. E. (A)
Farley, B. G. (M)
Farr, C. W. (A)
Fernandez-Rivas, L. A. (A)
Foster, J. A. (M)
Fowle, E. N. (M)
Fox, H. M. (M)
Frankovich, J. M. (M)
Frazer, J. F. (M)
Freeman, L. D. (M)
Freimer, M. L. (M)
Friedman, A. L. (A)
Galejs, J. (M)
Gallagher, R. D. (M)
Galvin, A. A. (M)
Gaposchkin, E. M. (M)
Gardner, W. L. (SM)
Glick, A. L. (M)
Globe, S. (SM)
Goldberg, S. (M)
Goldstein, I. (M)
Gray, H. L., Jr. (M)
Grayzel, A. I. (M)
Guditz, E. A. (M)
Gurley, B. M. (M)
Hackenberger, R. B. (A)
Hadley, F. P. (M)
Hall, W. M. (SM)
Halpern, J. (M)
Harcher, A. J. (M)
Haroules, G. G. (M)
Harrington, J. V. (SM)
Harris, J. N. (M)
Hauser, W. H. (M)
Hawthorne, E. I. (SM)
Hay, N. (A)
Hazel, F. P., Jr. (M)
Hirman, L. E. (A)
Holden, W. E. (M)
Horowitz, S. (M)
Huang, C. (SM)
Huffman, D. A. (M)
Hufton, C. D. (A)
Hurney, P. A., Jr. (M)
Huseland, N. (M)
Hyde, G. M. (M)
Hynek, D. P. (M)
Jackson, W. D. (SM)
James, J. C. (M)
Jeffery, L. R. (A)
Jenkinson, J. V. (A)
Jervis, E. W., Jr. (SM)
Johnson, B. F. (M)
Johnston, R. C. (M)
Keeping, K. J. (M)
Kendall, R. (SM)
Key, E. L. (M)
Kingston, R. H. (SM)
Kinnard, K. F. (M)
Klein, G. A. (M)
Knauss, H. C. (SM)
Knubbe, H. (M)
Koffman, H. J. (M)
Kohler, H. M. (M)
Kostriza, J. A. (M)
Kramp, K. M (M)
Kriegsman, B. A. (M)
Kuhn, B. G. (M)
Kushner, H. J. (M)
Labitt, M. (M)
Labonte, R. C. (M)
Lambert, J. R. (M)
Lane, J. F., Jr. (M)
Lehr, C. G. (SM)
Lemnios, W. Z. (SM)
Lemer, H. A. (M)
Lewis, R. W. (M)
Lin, C. (M)
Litsios, S. (M)
Lyon, W. W. (A)
MacDonald, D. A. (M)
Manasse, R. (M)
Marshall, R. C. (M)
Mayer, R. P. (M)
McCue, J. J. G. (SM)
McCully, G. R. (M)
McLeod, W. W., Jr. (M)
McWhorter, A. L. (M)
Mikulski, J. J. (A)
Mitchell, J. L. (M)
Moore, R. L. (SM)
Morelli, A. (M)
Mowatt, A. Q. (M)
Mullen, J. P. (M)
Naka, F. R. (SM)
Nelson, E. A. A. (A)
Neumann, L. (M)
Nilssen, R. H. (M)
Nordhal, J. G. (M)
Northrop, P. A. (M)
Ogden, W., Jr. (SM)
O'Neil, S. J. (M)
Packard, R. H. (M)
Paolan, W. N. (SM)
Parker, A. C. (M)
Parker, H. H. (A)
Parsons, G. C. (M)
Pascalar, H. G. (M)
Paton, C. D (M)
Pease, R. L. (SM)
Peck, C. B., III (M)
Peterson, H. P. (A)
Petrosh, A. (M)
Phillips, J. H. (M)
Pilkington, E. J. (VA)
Plemenos, F. A. (M)
Plumridge, R. F. (A)
Prescott, R. S. (M)
Pullis, F. D. (A)
Purinton, R. M. (SM)
Rabinowitz, S. J. (A)
Radford, W. H. (F)
Raffel, J. I. (A)
Rauscher, H. C. (A)
Redliker, R. H. (SM)
Reiffen, B. (M)
Ring, W. F. (M)
Roberts, W. (M)
Roche, J. F. (M)
Rosato, F. J. (SM)
Santelmann, W. F., Jr. (M)
Schapiro, H. A. (A)
Scharfman, H. (M)
Seed, R. G. (M)
Selikson, B. (A)
Shefman, F. I. (M)
Sheldon, E. J., Jr. (M)
Sherman, H. (SM)
Silverman, E. (M)
Skolnik, M. I. (SM)
Sokol, G. M. (SM)
Spearin, F. W., Jr. (M)
Sproul, R. W. (M)
Stark, L. (M)
Stockebrand, T. C. (A)
Stuassberg, D. D. (M)
Sussman, J. P. (M)
Terkanian, H. (M)
Therrien, H. J. (M)
Tillman, J. E. (A)
Tobin, F. H., Jr. (M)
Towle, D. M. (M)
Uskavitch, C. W. (M)
Vanderburgh, A., Jr. (M)
Walter, C. M. (M)
Wathen-Dunn, W. (SM)
Weatherbee, W. H. (M)
Webster, A. L. (A)
Weiss, H. G. (SM)
Weiss, W. R., Jr. (M)
Wells, W. I. (M)
Whitney, D. B. (M)
Williams, S. B. (SM)
Wilson, P. B., Jr. (A)
Wolf, E. W. (SM)
Wolfe, R. (A)
Wong, G. W. (M)
Yakulis, A. J. (A)
Yewell, P. G. (SM)
Zieman, H. E. (M)
Zraket, C. A. (SM)
Zucker, F. J. (M)

Lincoln (BOS-1)
Atchley, D. W., Jr. (M)
Caswell, J. R. (A)
Edmonds, D. S., Jr. (M)
Fraser, R. M. (SM)
Fullerton, A. L., Jr. (SM)
Long, L. B. (M)
Scott, H. H. (F)
Wang, A. (SM)

Littleton (BOS-1)
Chu, L. J. (F)
Gallagher, P. N. (M)
Girouard, M. R. (M)
Hollis, C. C. (M)
Mayer, D F. (M)
McElroy, T. R. (M)
Meyers, D. E. (M)
Nieman, F. G. (M)
Nixon, N. E. (A)
Paquette, N. A. (M)
Root, H. G. (M)
Taylor, H. P. (M)
Wall, R. B. (M)
Williams, D G. (M)

Longmeadow (WM-1)
Bassett, E. D. (M)
Cohen, M. (M)
Dorshimer, R. C. (M)
Gostyn, E. (M)
Lutz, L. E. (M)
Wellman, P. H., Jr. (M)

Lowell (B-MV-1)
Aslanian, A. (M)
Depolito, M. J (A)
Dukakis, S. G. (M)
Hlavacek, A. R. (M)
Karas, N. V. (M)
Klewin, G. J. (M)
Landry, L. H. (VA)
Laskin, R. S. (M)
McFarland, F. H. (A)
Michaels, A. G. (M)
Mingins, C. R. (SM)
Tyros, G. (A)
Zygadlo, F. (M)

Lynn (BOS-1)
Ajootian, G. (A)
Andrews, H J. (A)
Auger, E. P. (M)
Barnes, D. J. (M)
Cole, L. L., Jr. (A)
Demrow, R. I. (M)
Deradourian, C. (A)
Eklund, A. M. (M)
Flerston, S. A. (M)
Haggis, J. C. (A)
Murphy, M. F. (M)
Whittaker, H. F., Jr. (M)

Lynnfield (BOS-1)
Cronburg, C. I., Jr. (M)
Jones, R. E. (SM)
Kremheller, W. G. (M)
Lapham, E. G. (SM)
Leavy, P. M., Jr. (M)
Quayle, G. (M)
Zimmermann, H. J. (SM)

Lynnfield Center (BOS-1)
Benkus, P. D. (M)
Brown, O. C., Jr. (M)
Clapp, C. W. (M)
Nettleton, E. L. (M)
Perkins, K. C. (M)
Trenholme, W. M. (SM)

Magnolia (B-MV-1)
Swanson, G. W. (A)

Malden (BOS-1)
Amis, C. W. (M)
Buckley, J. P. (M)
Cook, C. G. (M)
Cutler, C. I. (M)
Fast, S. (SM)
Fennessy, P. Q. (M)
Fenton, L. F. (SM)
Frusztajer, B. B. (M)
Gurman, B. S. (M)
Hartman, R. E. (M)
Hughes, A. D. (M)
Kapteyn, P. (A)
Kinzinger, W. C. (M)
Linell, A. E. (A)
Lydiard, C. E. (A)
Micale, V. A. (A)
Norlund, B. (M)
O'Brien, A. E., Jr. (M)
Osman, M. H. (M)
Rutledge, P. D. (A)
Schwarzlander, H. (M)
Shear, L. (M)
Shelton, C. H. (M)
Skoda, G. I. (A)
Sloan, E. L., Jr. (M)
Stone, J. H. (M)
Strickholm, G. E. (M)
Tepper, M. (A)
Thompson, R. H. (M)
Tortorella, A. (A)
Williams, E. E. (M)
Zigelbaum, J. G. (A)

Manchester (B-MV-1)
Culkay, R. S. (M)
Falconer, S. (A)
Martin, J. E. (M)
Taft, E. A., Jr. (A)
Wolfe, R. W. (M)

Manomet (BOS-1)
Martin, R N. (M)

Mansfield (BOS-1)
Sabin, E. A. (M)

Marblehead (BOS-1)
Bach, R. E., Jr. (M)
Chun, H. H. (M)
Copithorne, A. R. (A)
Grant, E. F. (SM)
Hallett, J. L , Jr. (M)
Ivarvey, N. L. (F)
Irwin, T. D., Jr. (M)
Kilham, R. E. (SM)
Mills, E D (M)
Roberts, F.B. (SM)
Stromeyer, C. F. (M)

Marion (BOS-1)
Ayer, W H. (M)
Francis, S. A. (M)
Smiley, E. L. (M)
Warriner, R. R. (SM)

Marlboro (BOS-1)
Boyle, D. A. (M)
Clark, F. E. (M)
Fay, F. H. (M)
Macdonald, C. A. (M)
Osborne, W. B. (M)
Smith, R. V. (M)

Mattapan (BOS-1)
Arabian, J. H. (M)
Breen, M. R. (M)
Fertig, K. (M)
Hannon, J. J. (A)
Millen, S. G. (A)
Siegal, E. F. (M)
Wilkie, L. E. (A)

Mattapoisett (BOS-1)
Collins, J. L. (SM)

Maynard (BOS-1)
Adair, R. P., Jr. (M)
Best, R. L. (M)
Billups, R. R. (M)
Campbell, B. D. (M)
Chapell, H. F. (M)
De Turris, J. M. (M)
Dworshak, F. G. (M)
Dyett, E. G., Jr. (M)
Freier, L. J. (M)
Ginsburg, G. S. (M)
Hetlich, R. E. (M)
Kemp, J. A. (M)
Lund, R. T. (A)
O'Hare, W. S. (M)
Olsen, K. H. (A)
Pomper, V. H. (SM)
Priest, W. G. (M)
Seay, W. B. (M)
Walsh, J. J. (M)

Medfield (BOS-1)
De Clue, J. L. (M)
Hurd, P. A. (M)
Jacobs, C. E., Jr. (M)
Jewell, R. L., Jr. (M)
Marcille, R. E. (SM)
Meader, P. W. (M)
Peardon, A. P. (M)
Walker, C. E. (M)

Medford (BOS-1)
Anderson, A. F. (A)
Bellnski, A. M. (A)
Boudreau, J. M. C. (M)
Brady, J. T. (M)
Connolly, G. E. (M)
Di Silva, C. F. (A)
Fifield, D. (M)
Fiorello, E. A. (M)
Hagopian, N. D. (M)
Hobbs, C. F. (SM)
Howell, A. H. (SM)
Kosowsky, D. I. (M)
Loforen, F. W. (M)
Lyon, R. E. (M)
Menzies, R. W. (A)
Moriarty, R. A. (A)
Pennelli, A. P. (M)
Pike, A. L. (M)
Pote, W. J. (M)
Powers, E. J., Jr. (M)

Rago, K. A. (M)
Rollins, J. A. (M)
Rosen, G. (M)
Schell, A.C. (M)
Stevens, W. J. (SM)
Thaxter, J. H., Jr. (M)
Twombly, B. B. (M)

Melrose (BOS-1)
Berg, R. (M)
Bjork, A. P. (M)
Christenson, E.C. (A)
Girlunas, J. J. (M)
Gradilan, J. R. (M)
Greene, R. D. (M)
Harrington, E. W. (M)
Hassett, F. C. (M)
Jenkins, R. J. (A)
Kiams, C. H. (M)
Kotowski, J. P. (M)
Lewis, E. W. (A)
MacDowell, R. F. (M)
McCoubrey, A. O. (SM)
McGeoch, C. R., Jr. (M)
Meader, R. B. (M)
Morgenstern, J. C. (A)
Mrose, J. E. (M)
Nicoll, P. A. (M)
Orenberg, A. (M)
Rogers, W. S. (A)
Rowell, W. G. (M)
Snell, C. T. (M)
Wong, W. G. (M)
Young, N. H. (A)

Melrose Highlands (BOS-1)
Braden, R. S. (A)

Methuen (B-MV-1)
Baron, R. N. (M)
Buck, R. E. (M)
Chontolan, P. (SM)
Dinsmore, C. H. (M)
Floodfelter, W. K. (M)
Hicks, W. J. (M)
Kennedy, W. F. (M)
Mallison, R. E. (M)
Ryan, J. W., Jr. (A)
Simoes, C. R. (A)
Woodburn, E. S., Jr. (M)

Middleton (B-MV-1)
Hayden, P. C. (A)

Milford (BOS-1)
Kurlansky, S. (A)

Millis (BOS-1)
Allen, R. S. (M)
Bannister, L. H. (M)
Blagiotti, R. J. (A)
Sanders, E. W. (SM)

Milton (BOS-1)
Arnold, C. E. (M)
Bloom, M. I. (M)
Bradshaw, D. B. (M)
Day, W. J. (M)
Emery, R. A. (M)
Garber, A.M. (M)
Gerber, A. (M)
Haus, H. A. (SM)
Jeffries, D. (SM)
Kaupp, D. R. (M)
Malmberg, R. A. (A)
Metcalfe, I. J. (M)
Mullen, J. A. (SM)
O'Connell, J. J., Jr. (M)
Patl, R. B. (A)
Scheffler, E. C. (M)
Shnitzler, R. K. (M)
Smith, W. A., Jr. (SM)
Soltz, H. S. (A)
Sternick, S. H. (M)
Wernick, D. H. (A)

Minot (BOS-1)
Mongeau, R. A. (M)

Nabnasset (BOS-1)
Russell, E. D. (M)

Nantucket (BOS-1)
Brown, H. W. (VA)

Natick (BOS-1)
Balekdjian, K. (M)
Batcheller, A. (SM)
Bennett, R. K. (M)
Benoit, G. F. (M)
Bittel, M. M. (SM)
Blaisdell, A. A. (M)
Bram, J. M. (M)
Brosnahan, R. E., Jr. (M)
Carson, C. H. (A)
Channing, W., Jr. (A)
Child, J. W. (M)
Devane, M. E. (A)
Dixon, R. A. (M)
Driscoll, J. F. (M)
Fenzel, F. A. (M)
Geler, L. W. (SM)
Grelm, R. E. (A)
Harden, C. M. (M)
Heaton, R. G. (M)
Hilliard, I. W. (SM)
Hunt, D. G. (M)
Ious, H. O., Jr. (M)
James, F. E. (M)
Kamens, B. R. (SM)
Kane, G. (M)
Kassel, B. (M)
Kopelman, J. (A)
Korenberg, S. (SM)
Korn, S. J. (M)
Levin, M. H. (A)
Lockhart, H. H. (M)
Long, R. G. (M)
Luftman, A. S. (M)
McCullough, J. H. (A)
Meyer, M. A. (M)
Miller, H. A. (SM)
Nord, R. F. (M)
Nye, J. H. (M)
O'Keefe, B. J. (SM)
Platt, H. J. (SM)
Porter, A. D. (M)
Pughe, E. W., Jr. (M)
Repella, N. (SM)
Rosenthal, M. L. (A)
Rubin, R. (M)
Savell, R. E. (M)
Schontzler, J. G. (M)
Sobel, H. S. (M)
Symons, F. E. (M)
Thesing, R. H. (A)
Tocol, S. (A)
Towle, W. C. (M)
Washington, L., Jr. (M)
Weiss, B. J. (M)
Weiss, H. R. (M)
Whitcraft, W. A., Jr. (SM)
White, D. J. (M)
White, M. M. (M)
Yelsey, A. (A)
Zens, R. G. (M)
Zimmer, J. T. (M)

Needham (BOS-1)
Adams, H. E. (A)
Alden, J. M. (A)
Alessi, P. A. (M)
Allen, G. W. (M)
Alpert, E. (M)
Arnesen, R. F. (M)
Ayoub, M. A. (M)
Baldwin, P. K. (SM)
Bello, P. A. (A)
Bullard, A. H., Jr. (M)
Craig, R. B. (M)
Cross, H. H. (SM)
De Miglio, F. J. (M)
Dench, E. C. (SM)
Dinowitz, E. E. (M)
Duffy, M. P. (SM)
Eckhardt, D. L. (SM)
Ewen, H. I. (SM)
Feuerstein, E. (M)
Giddings, O. M. (M)
Goldberg, O. D. (SM)
Grablec, J. J. (M)
Hadge, E. (M)
Handly, E. J. (M)
Henry, J. M. (VA)
Hill, D. G. (M)
Hunt, W. H. (M)
Kadet, J. (SM)
Keane, L. M. (M)
Keay, D. M. (M)
Kinne, C. B. (M)
Landall, L. B. (M)
Lees, J. W. (A)
Lowe, M. E. (SM)
Mahoney, T. F. (M)
Paananen, R. A. (A)
Parker, M. S. (M)
Rattman, W. J. (M)
Ross, C. H. (M)
Rote, W. A. (SM)
Rymsha, A. F. (M)
Sargent, H. P., Jr. (A)
Shelton, E. J., Jr. (M)
Sleeper, G. B., Jr. (M)
Smith, H. J. (M)
Stacy, J. E. (SM)
Steen, J. R. (F)
Tiffany, G. B. (SM)
Turner, J. L. (M)
Weston, W. E. (A)
Whipple, R. L. (M)
Wolfe, J. A. (M)
Wyke, A. A. (M)

Needham Heights (BOS-1)
Barber, W. D. (M)
Bowen, R. A. (A)
Brodhead, W. M. (M)
Colbourne, R. H. (SM)
Cowperthwait, F. N., Jr. (A)
Crocker, D. C. (A)
Crowley, D. J., Jr. (M)
Dean, F. R. (M)
Dolan, F. J. (A)
Fuller, H. W. (M)
Harris, H. C., Jr. (M)
Herre, J. (M)
Lazuk, A. V. (SM)
MacNeil, G. E. (A)
Martel, C. W. (SM)
Nolan, W. (A)
Pucel, R. A. (M)
Rubinflen, D. (M)
Selfert, R. E. (M)
Smith, H. A. (A)
Spencer, G. R. (M)
Stanney, W. J. (M)
Works, A. R. (M)
Yarbrough, S. L. (SM)

New Bedford (BOS-1)
Bailey, W. M. (SM)
Collins, E. D. (A)
Da Cruz, A. M. (M)
Grad, P. P. (A)
Klemm, G. H. (A)
Milner, J. J. (A)
Picard, H. E. (M)
Pickett, J. H. (M)
Silva, C. C., Jr. (M)

Newbury (B-MV-1)
Christiansen, D. (M)
Wright, M. E. III (M)

Newburyport (B-MV-1)
Adams, J. R., Jr. (M)
Bryn, S. L. (A)
Hodge, T. P. (M)
Lynch, R. E. (M)

Newton (BOS-1)
Aarons, J. (M)
Arnold, W F. (M)
Austin, C. S. (M)
Balmuth, N. (M)
Beedle, R. H. (A)
Blitzer, S. D. (SM)
Brown, H. B. (A)
Carey, W. M., Jr. (M)
Cerfer, M. M. (M)
Coolidge, C. A., Jr. (A)
Craig, A. G., Jr. (M)
Dean, W. B. (A)
Diblase, A. F. (M)
Eachus, J. J. (SM)
Gazlano, J. S. (M)
Golahny, Y. (A)
Grossman, M. C. (M)
Gruber, S. (M)
Gutman, A. S. (A)
Hagman, H. B. (SM)
Heaton, M. W. (A)
Hobbs, F. W. (A)
Israel, D. R. (SM)
Kraemer, J. H. (M)
Kundert, W. R. (M)
Lagnado, I. (M)
Lourie, N. M. (M)
Malone, M. H. (A)
McCormack, R. L. (SM)
Medoff, J. L. (A)
Nugent, W. R. (M)
Pierce, J. N. (M)
Plaisance, S. F. (M)
Rajasekhar, P. S. (M)
Rockwood, A. C. (F)
Rubin, M. D. (M)
St. George, P. W. (M)
Stasey, C M. (M)
Stutsman, P. W. (M)
Urbanetti, J. J. (A)
Weltl, G. R. (M)
Whelden, J. W. (M)
Wilson, R. D. (SM)
Wright, R. E. (M)

Newton Center (BOS-1)
Burke, A. W. (M)
Cudlitz, S. (M)
Harrison, R. J. (SM)
Hill, D. C. (M)
Jacobs, B. S. (M)
Kannalr, C. J., Jr. (A)
Kellner, R. L. (M)
Krin, N. B. (M)
Linsky, A. B. (M)
Lipplncott, S. (M)
MacGregor, N. (A)
Mandell, A. (SM)
McLean, A. S. (A)
Mintzer, L. (M)
Moakler, E. J. (M)
Riceman, S. (M)
Robinson, S. (A)
Rothstein, J. (SM)
Saret, J. (M)
Schlueter, P. J. (M)
Segal, S. (M)
Smith, M. D. (M)
Stein, S. (SM)
Tafapolsky, B. (M)
Whigham, T. J. (M)
Wolfson, J. A. (M)
Woo, W. D. (SM)
Zottu, P. D. (F)

Newton Corner (BOS-1)
Kotsarlis, C. J. (A)

Newton Highlands (BOS-1)
Boehme, R. M. (M)
Dorfman, J. (M)
Fallows, R. S. (M)
Friree, F. L. (M)
Gorman, R. K. (M)
Holst, W. F. (M)
Kahn, W. M. (M)
Leonard, R. R. (M)
Muckenhoupt, F. W. (M)
Osman, M. S. (M)
Patton, J. E. (M)
Ramamoorthy, C. V. (M)
Sawyer, P. B. (M)
Sheinooll, L. S. (SM)
Singer, T. (M)
Spitz, M. E. (M)
Strohmeier, W. (M)
Thomas, J. (M)
Ward, W. W. (M)
Wise, N. (M)
Yamins, H. G. (M)

Newton Lower Falls (BOS-1)
Mork, R. P. (M)

Newton Upper Falls (BOS-1)
Dokken, G. O. (M)
Smith, L. C. (SM)

Newtonville (BOS-1)
Adams, R. E. (M)
Altman, N. G. (M)
Amum, M. (M)
Berkeley, E. C. (M)
Blanton, H. E. (SM)
Freeman, H. (SM)
Goldberg, W. L. (A)
Gravel, C. L. (M)
Gronosky, C. F. (M)
Lukianov, R. E. (A)
Madeson, A. H. (A)
Oszy, A. J. (M)
Phillips, R. E. (M)
Roossin, N. (M)
Smith, D. C. (M)
Woodward, C. A. (A)
Wright, B. D. (M)

North Abington (BOS-1)
Stucke, E. A. (A)

North Adams (WM-1)
Allison, W. M. (SM)
Brafman, H. E. (M)
Cushman, N. (SM)
Devey, G. B. (M)
Dorst, S. (M)
Fabricius, J. H. (M)
Henry, A. L. (M)
Hooks, A. K. (M)
Johansson, E. W. (M)
Lamoureaux, R. A., Jr. (A)
Lazier, W. A. (A)
Lehovec, K. (F)
Mead, E. S. (A)
Mulford, J. E. (M)
Novacek, W. G. (M)
Peterson, R. C. (A)
Provencher, W. C. (A)
Purpura, E. (A)
Raina, K. A. (M)
Robinson, P. (M)
Sprague, R. C. (SM)
Tiezzi, A. A. (SM)
Tremblay, G. V. (M)
Tyler, R. H. (A)
Zuleeq, R. (M)

Northampton (WM-1)
Comble, A. A. (A)
King, A. D. (M)

North Andover (B-MV-1)
Anderson, R. E. (M)
Backard, E. M. (A)
Banton, W. E. (SM)
Berger, U. S. (SM)
Coleman, S. B. (SM)
Custer, C. J. (M)
Edwards, P. G. (SM)
Friis, R. W. (SM)
Graham, R. S. (SM)
Griffiths, H. D. (M)
Hallenbeck, F. J. (SM)
Kerwien, A. E. (SM)
King, F. H. (M)
Mischler, W. D. (M)
Monell, F. B. (SM)
Owens, C. D. (SM)
Penick, D. B. (SM)
Pomeroy, A. F. (SM)
Sagaser, D. D. (M)
Sandsmark, P. I. (M)
Smith, R. S. (M)
Somers, L. (M)
Stansel, F. R. (SM)
Sykes, R. A. (F)
Taylor, E. R. (M)
Thulin, C. W. (SM)
Wells, H. G., Jr. (M)
Williams, O. L. (M)
Yaeger, R. E. (M)
Yeutter, C. S. (M)

North Attleboro (BOS-1)
Scanlon, W. C. (M)

North Beverly (BOS-1)
Briggs, R. S. (M)

North Billerica (BOS-1)
Crist, A. H. (M)
Sloan, G. H. (M)
Videberg, J. I. (SM)

Northboro (BOS-1)
O'Brien, H. F. (A)
Wiedenbauer, G. J. (M)

North Chelmsford (B-MV-1)
Benjamin, C. R. (M)

North Dartmouth (BOS-1)
Burbank, R. W., Jr. (A)
Kahn, L. (SM)
Luse, J. D. (M)
Simmons, F. A. (M)

North Easton (BOS-1)
Allen, L. W. (M)
Ames, D. (M)
Anderson, A. L. (M)
Gorvela, J. F. (A)
Dudley, T. C. (M)

North Egremont (WM-1)
Allison, R. F. (M)
Christman, I. H. (A)

North Hanover (BOS-1)
Howes, B. S. (M)

North Natick (BOS-1)
Getter, C. M. (M)
Randolph, R. V. (M)

North Randolph (BOS-1)
Flaherty, F. E., Jr. (M)

North Reading (BOS-1)
Donnelly, F. E., Jr. (M)
Harkless, L. B. (M)
Millen, J. (VA)
Rex, F. J., Jr. (M)
Ross, T. C. (A)
Rubin, S. (A)

North Scituate (BOS-1)
Creaser, C. W., Jr. (M)
Kennedy, D. S. (M)

North Westport (BOS-1)
Cardozo, D. J. (A)

North Weymouth (BOS-1)
Copeland, R. C. (M)

North Wilmington (B-MV-1)
Duffy, J. F. (M)
Gunning, F. A. (A)
Hallorin, T. W. (M)
Zaino, A. L. (A)

North Woburn (BOS-1)
Goldberg, W. P. (M)

Norton (BOS-1)
Winsor, D. M. (A)

Norwell (BOS-1)
Cann, J. D. (A)
Harris, C. C. (SM)
Hills, W. L. (M)
Maglathlin, R. N. (SM)

Norwood (BOS-1)
Arnstein, P. B. (M)
Bazzy, W. (M)
Benson, R. A. (M)
Burns, H. S. (M)
Cronan, P. H. (M)
Erb, D. R. (M)
Fitzgerald, T. J., Jr. (M)
Flaherty, J. J. (M)
Glynn, J. J. (M)
Gronroos, E. (A)
Hennessey, C. W. (A)
Johnson, H. A. (M)
Kleps, E. W. (A)
Larsen, R. L. (M)
Martinson, R. M. (M)
McDonough, J. C. (M)
Monahan, A. M. (M)
Race, H. C. (M)
Stone, I. C. (M)
Tucker, J. E., Jr. (M)
Van Wechel, R. J. (M)
Vuozzo, A. J. (A)
Waddell, R. B. (A)
Winitzer, A. J. (M)

Otis (WM-1)
Santos, P. J. (M)

Otis AFB (WM-1)
Craig, W. H., Jr. (M)
Marvin, A. L., Jr. (M)

Oxford (BOS-1)
Zieper, H. S. (M)

Palmer (WM-1)
Calkins, D. F. (M)

Paxton (BOS-1)
Alexander, D. C. (SM)
Stannard, G. E. (M)

Peabody (B-MV-1)
Alexander, H. C. (M)
Anderson, V. H. (A)
Cherwek, R. A. (M)
Dodge, R. B. (A)
Giuffrida, J. (M)
Gregory, N. (M)
Maguire, W. M. (SM)
O'Brient, E. J., Jr. (M)
Senges, W. (M)
Shapiro, I. (A)
Shapiro, J. M. (M)
Taylor, J. C. (M)

Pembroke (BOS-1)
Sullivan, D. R. (M)

Pepperell (BOS-1)
Wood, R. (SM)

Pinehurst (BOS-1)
Murano, L. (M)

Pittsfield (WM-1)
Ackerson, R. D. (M)
Aruffo, R. (M)
Borgese, A. J. (M)
Boyajian, A. (SM)
Canfield, E. B. (M)
Chertok, S. L. (M)
Claschini, W. (M)

Canover, W. B. (M)
Corman, D. (M)
Danison, J. (M)
Egan, W. E. (M)
Elvan, M. (M)
Fleischer, K. M. (M)
Forman, A. H., Jr. (SM)
Hardy, E. R. (A)
Harris, L. B. (M)
Hoeke, F. W. (M)
Hucko, H. (M)
Landers, J. J. (M)
Long, J. H. (M)
Luoma, R. A. (M)
Mackey, E. F. (M)
Musbach, M. W. (M)
Neff, J. W. (M)
Neubert, W. E. (A)
Pack, E. L. (M)
Petkofsky, L. (M)
Pierce, J. L. (M)
Podolsky, L. (F)
Reynolds, W. J. (M)
Ringlee, R. J. (M)
Samsel, R. W. (M)
Shepard, B. R. (SM)
Taniguwa, G. (M)
Tanner, E. G. (M)
Tichenor, W. B. (M)
Valda, S. J. (M)
Velkers, G. D. (A)
Weatherhead, W. R. (M)
Wiley, R. J. (M)

Plainville (BOS-1)
Negus, L. E. (M)

Plymouth (BOS-1)
Roy, A. G., Jr. (M)

Quincy (BOS-1)
Brown, R. S. K. (A)
Burak, M. (M)
Della Lucca, L. E. (M)
Dewey, W. P. (A)
Grass, A. M. (M)
Hudson, H. K. (SM)
Kramer, R. (M)
Langeller, G. P. (A)
Loomis, G. L. (SM)
McAuley, J. A. (M)
McLaughlin, W. C. (M)
Obreza, W. S. (A)
Scolamiero, D. M. (M)
Tsao, C. K. H. (M)

Randolph (BOS-1)
Heaton, L. B. (A)
Kaiser, J. A. (A)
Klabis, R. A. (M)
Mann, A. M. (M)
Pasciuto, R. D. (A)
Rice, K. L. (A)
Roeber, F. W. (M)
Trott, J. E., Jr. (M)
Wolf, S. H. (A)

Reading (BOS-1)
Alter, R. S. (M)
Blottman, J. B., Jr. (M)
Butcher, S., Jr. (M)
Caywood, R. W. (SM)
Chess, R. B. (SM)
Collins, R. M. (M)
Conary, W. R. (A)
Danehy, R. T. (M)
Dratch, J. E. (A)
Ellis, C. E., Jr. (M)
Fasiano, E. R. (A)
Freeman, R. I. (A)
Gates, E. K. (M)
Grande, G. C. (M)
Guy, H. D. (SM)
Hagan, R. A. (M)
Hingston, A. J. (M)
Leslie, M. B. (M)
Loesch, B. (M)
Morrison, D. A. (M)
Murray, R. B. (M)
Nichols, R. P. (A)
O'Brien, J. A. (SM)
Parsons, R. L. (M)
Robbins, L. W. (A)
Rosenthal, R. E. (A)
Skitzki, P. (M)
Smith, W. R. (M)
Spongberg, R. C. (M)
Taylor, N. H. (SM)
Van De Stadt, W. (M)
Vant, L. M. (SM)
Zitzow, H. P. (M)

Revere (BOS-1)
Abel, F. (M)
Carrabes, M. J. (M)
Freedman, I. M. (A)
Haas, E. W. (M)
Harwood, E. (A)
Romano, L. P. (A)
Siegel, M. (M)
Storm, M. L. (A)
Trantalis, T. E. (A)
Vecchia, E. F. (A)
Williams, A. H. (M)

Rockland (BOS-1)
Conley, F. M. (M)
Edlun, W. O. (M)
Masison, C. J., Jr. (M)
Thayer, W. D. (M)
Westhaver, R. O. (M)

Rockport (B-MV-1)
Betts, M. D. (M)
Johnson, L. F., Jr. (M)
Wendell, E. N. (F)

Roslindale (BOS-1)
Amante, V. J. (A)
Catalano, A. L. (A)
Di Giorgio, J. A. (M)
Doyle, F. A. (A)
Falor, O. K. (M)
Goodway, J. T. (M)
Pamaglan, H. R. (A)

Rowley (B-MV-1)
Jackson, A. R. (M)
Potts, T. J., Jr. (SM)

Roxbury (BOS-1)
Ellis, B. E. (M)
Ellsworth, E. A., Jr. (A)
Goldman, H. N. (A)
Magnani, B. J. (A)
Metten, W. H. (M)
Pengeroth, I. E. (M)
Reynolds, J. H., Jr. (A)
Schwartz, F. L. (M)
Tomass, J. (A)
Walker, R. M. (SM)

Rutlands Heights (BOS-1)
Clark, G. L. (A)

Salem (B-MV-1)
Bowman, J. W. (A)
Cannon, J. H. (M)
Clark, W. H., Jr. (M)
Coggins, D. I. (M)
Jackson, W. E. (M)
Olbrych, J. E. (A)
Ralnville, L. P. (A)
Rotstein, J. (M)
Solodiuk, A. (M)
Wiederhold, P. R. (A)

Sandwich (BOS-1)
Kerr, W. B. (M)

Saugus (BOS-1)
Arkins, E. R. (A)
Bailey, A. D. (M)
Bradbury, R. A. (M)
Cummings, W. C. (M)
Cunningham, J. E. (M)
Marle, C. G. (A)
Moulton, W. D. (M)

Saxonville (BOS-1)
Baker, T. E., Jr. (M)
Belling, T. E. (A)
Breslow, D. H. (A)
Brunelly, J. J., Jr. (A)
Brunton, R. H. III (A)
Carter, L. W. (M)
Crossley, W. P. (M)
Engman, G. E. (M)
Hevesh, A. H. (SM)
Hosmer, B. E. (M)
Kern, D. R. (A)
Levy, M. R. (M)
Mannette, R. T. (M)
Ponte, A. G. (A)
Rocheleau, G. S. (M)
Sebestyen, G. S. (M)
Spergel, P. (M)
Waltzer, B. (A)

Scituate (BOS-1)
Lennon, W. S. (SM)
Morton, G. E. (A)
Williams, H. G. (SM)

Sharon (BOS-1)
Bartlett, E. R. (M)
Bresnick, H. L. (M)
Carey, J. S. (A)
Clements, W. S. (M)
Cushman, R. W. (A)
Kessinger, H. E. (A)
Laschever, N. L. (SM)
Lawlor, J. A. (M)
Press, M. (SM)
Rochefort, J. S. (M)
Rosenthal, M. H. (A)
Sallen, M. J. (A)
Van Veen, F. T. (M)
Zeull, E. A. (A)

Sherborn (BOS-1)
Rockwell, C. F. (M)

Shrewsbury (BOS-1)
Harrington, E. W. (A)

Somerset (BOS-1)
Ironfield, R., Jr. (M)

Somerville (BOS-1)
Amann, L. H. (A)
Bosco, J. (M)
Bradley, C. L. (M)
Cagliuso, G. G. (M)
Clark, R. A. (M)
Fitzgerald, W. D. (M)
Francis, E. A. (A)
Jelalian, A. V. (M)
Matthewson, A. (M)
Maurer, H. E. (M)
McNamara, W. E. (A)
Noonan, J. T. (A)
Pantazelos, P. G. (A)
Richter, G. H. (A)

Rubino, C. F. (A)
Simmons, A. J. (A)
Solomon, A. N. (A)
Spignese, E. E. (M)
Thomas, K. J. (M)
Torras, F. (M)
Vaccaro, P. (M)
Ventura, R. A. (A)
White, R. J. (M)
Zullo, W. J. (M)

South Acton (BOS-1)
Boole, R. A. (A)
Herskovitz, S. B. (M)
Janvrin, W. A., Jr. (SM)
MacMullen, A., Jr. (M)
Moritz, C. (M)
Pfeiffer, H. F. (M)
Powers, R. J. (M)
Ruze, J. (SM)
Young, B. L. (M)

South Berlin (BOS-1)
Beauregard, W. G. (M)

Southboro (BOS-1)
Borghetti, J. C. (A)
Dobson, A. M. (A)
Speers, D. F. (M)

South Boston (BOS-1)
Gibson, C. W. (A)
Karossa, R. (M)
O'Donnell, W. J. (A)
Stevens, E. F. (M)
Vitkus, P. L. (M)

South Braintree (BOS-1)
Goodwin, R. C. (M)
Hirtle, A. C. (M)

Southbridge (BOS-1)
Chace, H. E. (A)
Frey, H. B., Jr. (M)
Johnston, J. E. (A)
Tillyer, E. D. (SM)
Wells, J. M. (SM)

South Chatham (BOS-1)
O'Day, A. C. (A)

South Dartmouth (BOS-1)
Borg, W. N. (M)
Davis, S. L. (SM)
Fitzsimmons, T. J. (M)
Golenpaul, C. (A)
Hoover, H. H., Jr. (A)
Underwood, J. S. (A)

South Hamilton (B-MV-1)
Hamlin, W. O. (A)
Peek, S. C. (SM)
Wolfskill, J. R. (SM)

South Hingham (BOS-1)
Bird, W. S. (A)

South Lincoln (BOS-1)
Brown, D. R. (M)
Faran, J. J., Jr. (SM)
Gibbs, N. E. (M)
Gross, T. A. O. (M)
Jorgensen, S. W. (M)
Row, R. V. (A)
Shansky, D. (M)
Stevens, F. R. (M)
Willis, A. H. (M)

South Natick (BOS-1)
Horan, W. H. (A)
Paska, R. A. (A)

South Sudbury (BOS-1)
Armstrong, D. G. (M)
Blanchard, J. M. (M)
Bobroff, D. L. (M)
Caldwell, R. J. (SM)
Cphen, H. I. (M)
Duncan, K. W. (M)
Fickett, M. M. (M)
From W. H. (M)
Gronemeler, H. J. (A)
Haworth, L. D. (M)
Houghton, R. W. (M)
Ivesdal, T. A. (M)
Klokland, R. E. (M)
McAleer, H. T. (M)
McCoy, A. M., Jr. (M)
Ostroff, E. D. (M)
Pritchard, W. L. (SM)
Reach, R. W., Jr. (M)
Rich, E. A. (M)
Warner, G. L. (M)
Waters, R. A. (SM)

Southville (BOS-1)
Chenez, R. D. (M)

South Weymouth (BOS-1)
Cook, W. M. (M)
Hill, H. F. (VA)
Matteson, D. W. (M)
McMonagle, D. B. (M)
Stefanowicz, S. S. (A)

Southwick (WM-1)
Lee, W. K. F. (M)

Springfield (WM-1)
Andrews, W. J. (A)
Bookman, R. E. (SM)
Bushey, R. A. (M)
Cameron, J. A. (M)
Cushing, T. F. (VA)
Oldeum, M. A. (A)
Donner, W. (A)
Fratar, F. J. (M)
Hellenday, F. W. (M)
Houck, S. C. (A)
Huntoon, V. J. (A)
Keams, R. F. (M)
Kitty, F. J. (M)
Laliberte, E. J. (M)
Lyman, J. R. (A)
Mongeon, R. J. (M)
Richardson, H. M. (SM)
Salame, G. (M)
Salmond, D. A. (A)
Townsend, G. R. (M)
Zinchuk, M. (M)

Stoneham (BOS-1)
Bassett, J. D. (SM)
Boyd, H. R. (SM)
Burke, N.W. (M)
Cayer, R. E. (M)
De Agazio, E., Jr. (M)
Halchak, J. R. (M)
Herrera, J. C. (M)
Jamgochian, E. (SM)
Lucy, R. F. (M)
Perry, B. D. (M)
Puorro, T. A. (M)
Riska, G. G. (M)
Rojak, F. A. (M)
Sorbye, K. E. (M)
Stone, M. L. (M)
Westbrook, E. P. (M)
Williams, J. J. (M)

Stoughton (BOS-1)
Gluda, H. W. (M)
Lang, K. T. (M)
Litchfield, P. O. (A)
McDonnell, J. Q. (M)
McGarvey, J. P. (A)
Nichols, R. F. (M)
Ostis, J. N. (M)
Ross, B. F., Jr. (M)
Scripture, F. R. (SM)

Stow (BOS-1)
Corzine, R. H. (A)
Mong, R. C. (M)

Sudbury (BOS-1)
Bell, J. W. (SM)
Bobak, E. T. (A)
Bradley, G. G. (M)
Brooks, R. S. (M)
Burgarella, J. P. (M)
Bylington, R. E. (M)
Chase, D. G. (M)
Cotterman, J. W. (M)
Crocker, C. F. (M)
Dahlstrom, R. D. (M)
Edwards, L. C. (M)
Ellinthorpe, A. W. (A)
Emerson, W. P. (A)
Falkowitz, M. (M)
Fraim, E. G. (M)
Guethlen, V. J. (M)
Hand, S. E. (SM)
Hathaway, S. W. (SM)
Hathaway, W. E. (A)
Kalisky, A. (A)
Keith, W. W. (M)
Kile, R. L. (M)
Kirshner, D. R. (SM)
Lloyd, J. W. F. (M)
Luck, A. J. (M)
Mackin, R. N., III (M)
Mazzarese, N. J. (M)
McCarthy, D. J. (M)
Partridge, G. R. (M)
Petrishen, J. (A)
Plum, L. W. (M)
Sarratt, E. R. (M)
Sims, J. C., Jr. (SM)
Smith, A. H., Jr. (M)
Steudel, F. (M)
Stromsted, E. A. (M)
Thomas, E. K. (A)
Thornton, W. M., Jr. (A)
Throckmorton, K. L. (M)
Ward, R. L. (M)
Wargo, J. J. (M)
Watson, J. C., Jr. (M)
Whelpton, J. P. (A)
Willey, J. C. (M)

Swampscott (BOS-1)
Beman, I. (SM)
Creighton, J. E. (A)
Ludlam, W. A. (M)
Manna, E. E. (M)
Miasnick, J. D. (M)
Quint, A. S. (M)
Strongylos, M. L. (A)
Williamson, R. J. (A)

Swansea (BOS-1)
Taylor, R. W. (M)

Taunton (BOS-1)
Snell, C. R., Jr. (A)

Templeton (BOS-1)
Aukstulkalnis, T. J. (A)

Tewksbury (B-MV-1)
Brent, P. (A)
Cohen, A. (M)
Goldstein, A. L. (M)
Gregg, S. (M)
McCarthy, J. D. (A)
Montague, L. L. (M)
Wholey, L. T. (A)

Topsfield (B-MV-1)
Gage, G. H., Jr. (M)
Goddard, C. T. (SM)
Harrington, E. C. (M)
Jansen, J. J. (M)
McKenney, G. M., Jr. (M)
Norton, G. A. (M)
Roche, T. F. (A)
Wilder, J. E. (M)
Wimpy, E. K. (SM)

Townsend (BOS-1)
Jackman, C. A. (M)
Morey, P. E. F. (M)

Turo (BOS-1)
Wagner, P. E. (A)

Tyngsboro (B-MV-1)
Du Bois, W. E. (M)
Spindell, F. A. (SM)

Uxbridge (BOS-1)
Tancrell, R. H. (M)

Waban (BOS-1)
Antman, M. A. (SM)
Apelbaum, J. H. (A)
Berg, A. L. (A)
Berner, A. S. (M)
Ellis, R. H. (M)
Friedman, B. L. (M)
Hall, R. E. (M)
Hunter, W. H. (M)
McDade, H. J. (A)
Mofenson, J. (SM)
Morrison, L. H. (SM)
Parisi, F. E. (M)
Salzer, E. (M)
Spencer, P. L. (F)
Ward, A. E. (SM)

Wakefield (BOS-1)
Baker, W. F. (M)
Blanco, J. F. (SM)
Burnett, E. F. (A)
Cicciarella, C. (M)
Clark, N. F. (A)
Gagnon, R. L. (M)
Gallagher, P. A.
Gardella, C. E. (M)
Heft, E. J. (M)
Howe, S. E. (A)
Jones, R. C., Jr. (M)
Lynch, E. E. (SM)
Navon, D. H. (M)
Peet, A. R. (A)
Reid, E. (M)
Rich, E. S. (SM)
Savage, J. E. (M)
Schunk, H. F. (M)
Slusher, W. E. (M)
Somerset, S. J. (M)
Stein, H. (SM)
Willis, E. M. II (M)

Walpole (BOS-1)
Davis, W. F. (A)
Esthimer, W. F. (M)
Fisher, R. E. (M)
Lord, J. S. (A)
Vagge, A. A. (M)

Waltham (BOS-1)
Alexander, R. (SM)
Allen, J. L. (M)
Allschuler, S. (M)
Aron, N. (SM)
Arslan, H. (M)
Ashford, F. L. (M)
Bartlett, R. P. (M)
Bath, W. A. (M)
Brady, J. P., Jr. (SM)
Brady, M. M. (M)
Brody, G. H. (A)
Brown, D. F. (M)
Brunton, D. A. (A)
Bucher, K. H. (A)
Carroll, I. (M)
Casanave, C. L. (M)
Charles, R. E. (SM)
Chernosky, E. J. (M)
Childs, H. W. (M)
Chittenden, K. M. (M)
Colten, B. (SM)
Cooperstein, M. (M)
Coronili, S. C. (SM)
Crosby, R. E. (M)
Crosthwait, J. L. (M)
Daniel, F. H. (A)
Delano, A. B. (M)
Devereux, J. G. (A)
Di Lorenzo, B. A. (M)
Dombrowski, G. E. (M)
Dukat, F. M. (SM)
Dunbar, E. E. (M)
Dunlap, W. C., Jr. (SM)
Dusault, A. J. (M)
Ehrlich, S. L. (M)
Engelberger, J. K. (A)
Englund, E. T. (A)
Faulkner, W. H., Jr. (SM)
Fillpov, A. M. (M)
Findels, W. J. (M)
Forderhase, R. S. (M)
Foster, R. P. (A)

Funke, R. W. (M)
Gaither, T. B. (M)
Gerrig, E. (A)
Gibson, S. K. (M)
Gillen, R. M. (A)
Gitelman, E. (M)
Gostenhofer, G. (M)
Granger, E. A. (M)
Greene, A. H. (M)
Gregory, J. G. (SM)
Gross, H. G. (SM)
Grund, J. B. (SM)
Gulney, R. J. (A)
Hafer, T. W. (M)
Hall, H. S. (SM)
Hamant, D. (M)
Hannon, S. (SM)
Hines, P. P. (A)
Hobby, J. L. (A)
Hostbjor, A. (M)
Hosterman, C. W. (M)
Huntley, W. F. (M)
Jackson, S. R. (M)
Jacobs, R. M. (M)
Johnson, T. G. (A)
Jones, G. M., Jr. (M)
Jones, R. V., Jr. (M)
Joyal, M. W. (M)
Keilson, J. (SM)
Kelly, T. J. (M)
Knapp, G. P. (SM)
Koskinen, G. K. (M)
Kreindel, B. (A)
Landow, I. S. (M)
Langmuir, D. B. (A)
Lavine, J. M. (SM)
Leney, H. G. (M)
Lester, D. R. (M)
Leverton, W. F. (SM)
Lewis, P. M., II (M)
Longo, P. (M)
Lyon, E. F. (M)
Mac Master, G. H. (A)
Manley, H. J. (A)
Melanson, F. J. (M)
Milano, U. (A)
Mitchell, D. A. (M)
Morey, R. F. (M)
Morgenthaler, F. R. (M)
Morley, H. B. (M)
Naylor, T. K. (M)
Nelson, R. E. (M)
Nersesian, R. W. (A)
Nielsen, C. E., Jr. (M)
O'Brien, D. G. (M)
Osepchuk, J. M. (M)
Parkinson, G. B. (A)
Pearson, A. L. (M)
Peterman, J. H. (A)
Peters, C. J. (M)
Plumb, D. R. (M)
Pollack, D. (SM)
Price, B. F. (M)
Price, R. A. (A)
Primpas, L. V. (M)
Principotta, M. A. (M)
Randall, J. E. (M)
Ratts, B. H. (SM)
Rea, W. W. (SM)
Reed, R. D. (M)
Regan, W. T. (A)
Reifel, H. (M)
Rex, R. A., Jr. (M)
Ricard, A. J. (M)
Ricciardi, F. (M)
Rittenburg, S. E. (M)
Rogers, T. F. (SM)
Sallen, R. P. (M)
Salzberg, W. (M)
Santa, M. M. (M)
Santangelo, J. (SM)
Saunders, N. B. (SM)
Schrimpf, H. W. (A)
Schwartz, R. T. (M)
Sedik, J. J. (M)
Shafer, C. G. (M)
Shannon, J. R. (A)
Shaw, G. J. (M)
Skowron, J. F. (A)
Smith, B. K. (M)
Soltes, A. S. (M)
Sookikian, V. (M)
Stauffer, F. K. (M)
Stickley, C. M. (M)
Stockman, H. (SM)
Stoddard, J. C. (M)
Stone, H. S. (M)
Storer, J. E. (SM)
Taylor, K. A. (M)
Terry, G. H. (A)
True, W. A. (SM)
Ullman, H. A. (M)
Vacca, R. H. (SM)
Vafiades, B. C. (M)
Waldman, A. (A)
Welchman, W. G. (SM)
Welles, S. B. (SM)
Welts, J. (M)
Wilson, E. F. (M)
Windsor, R. B. (SM)
Winsor, D. L. (M)
Zeender, R. J. (SM)
Zettler, W. R. (A)

Watertown (BOS-1)
Altman, J. L. (A)
Aronow, S. (M)
Avakian, A. (SM)
Bagnall, J. J. Jr. (SM)
Beloungle, L. W. (A)
Bowness, C. (M)
Brooks, P. R., Jr. (M)
Burke, J. J. (M)
Russell, N. H. (M)
Campbell, R. G. (A)
Capek, S. J. (M)
Chacran, J. J. (M)
Champeny, J. C. (M)
Clements, D. F. (M)
Colby, G. V., Jr. (A)
Cosentino, A. V. (M)
Czerwonka, H. V. (A)
Deranian, M. (A)
De Shon, H. C. (M)
Epstein, D. J. (M)
Field, R. F. (F)
Gallongo, S. J. (A)
Ginns, H. (M)
Goldstein, B. S. (M)
Griffin, W. J. (M)
Haate, K. H. (M)
Hampson, E. R. (M)
Harris, M. R. (M)
Higgins, W. T. (M)
Hobbs, J. D. (SM)
Hood, L. F. (M)
Kahalan, C. H. (M)
Kasparian, K. D. (A)
Lambert, T. A. (M)
Lazarkis, P. J. (M)
Lechner, R. J. (A)
Lenhardt, L. J. (M)
Leonard, M. V. (A)
Little, E. P. (M)
Lowenstein, H. L. (A)
Mallumian, L. (A)
McGinn, J. F. (M)
Micol, R. L. (M)
Perloff, G. (M)
Petraitis, J. A. (A)
Pettersen, R. J. (M)
Plonsky, A. T. (M)
Rawlinson, P. E. (M)
Read, V. H. (A)
Reichard, R. W. (M)
Riceman, E. A. (M)
Riley, W. E. (A)
Robinson, M. P. (M)
Roche, T. E., Jr. (M)
Ruthazer, L. B. (M)
Samson, E. W. (SM)
Schnall, E. (M)
Sherry, M. E. (M)
Teager, H. M. (M)
Tierney, J. (M)
Toman, K. (M)
Wang, S. C. (M)
William, D. K. (M)
Wong, M. S. (SM)
Wood, R. M. (A)
Woolf, J. (A)

Waverley (BOS-1)
Mekota, J. E., Jr. (M)

Wayland (BOS-1)
Allen, D. C. (A)
Alstad, N. J. (M)
Anderson, F. J. (SM)
Barker, H. J. (M)
Boris, R. B. (SM)
Conard, R. W. (A)
Davis, L., Jr. (SM)
De Bruyn, P. R. (M)
Dutton, R. H. (A)
Fahringer, G. S. (A)
Ferrante, D. (M)
Fye, D. L. (M)
Gardner, H. A. (SM)
Gillespie, C. N. (M)
Hodgkinson, W. S. (M)
Hough, H. O. (M)
Humphrey, G. S. (A)
Jenks, F. A. (SM)
Jordon, C. E. (M)
Kather, E. N. (M)
Leake, B. W. (M)
Letaw, H., Jr. (SM)
Lowery, W. E. (SM)
Mac Kenzie, A. K. (A)
Mathews, K. C. (M)
Mathis, G. (M)
McNally, I. L. (SM)
Michaelis, H. P. (M)
Minicucci, R. P. (M)
Naugler, A. W. (M)
Ohman, J. (SM)
Phillips, T. L. (M)
Pike, R. W. (M)
Pontecorvo, P. J. (SM)
Porter, R. R., Jr. (M)
Prendergast, W. R. (M)
Proctor, H. E., Jr. (A)
Raduziner, D. M. (A)
Reed, R. R. (M)
Rider, D. V. (M)
Robertson, C. L. (M)
Serotta, N. (M)
Sharpe, W. P., Jr. (M)
Smith, H. L. (M)
Smulowicz, B. (SM)
Soorscorian, S. A. (M)
Stewart, R. F. (A)
Tandy, P. C. (M)
Trotter, G. C. (M)
Unger, R. M. (SM)
White, A. D. (M)
Whitham, G. E. (A)
Wilson, M. S. (M)
Zeichner, M. L. (M)

Webster (BOS-1)
Jolda, J. M. (M)
Lanman, T. W. (A)
Szczepanski, J. R. (M)

Wellesley (BOS-1)
Barrett, B. W. (M)
Baumann, A. (M)
Berger, R. (M)
Brainerd, H. B. (SM)
Bristol, H. B. (M)
Buckbee, J. A. (M)
Camp, W. W. (M)
Charow, W. J. (M)
Crosby, R. L. (SM)
Dolansky, L. O. (SM)
Frellch, P. D. (A)
French, R. F. (SM)
Gerlach, A. M. (M)
Hajko, H. J. (M)
Hart, H. M. (SM)
Hartley, M. S. (SM)
McDowell, S. (SM)
McKinley, W. D. (M)
Minichiello, R. (M)
Newton, G. C., Jr. (M)
O'Donnell, A. J., Jr. (SM)
Palmer, P. J. (M)
Pease, W. M. (SM)
Plouffe, R. H. (A)
Reed, W. O. (M)
Saad, T. S. (SM)
Saunders, W. F. (A)
Sparacino, R. R. (M)
Stewart, S. W. (M)
Thomson, E. C. (M)
Tucker, N. (A)
Weeks, P. T. (F)
Weil, T. A. (M)
Wels, J. L. (M)
Williams, J. B., Jr. (M)

Wellesley Hills (BOS-1)
Anderson, C. W. (M)
Banks, D. S. (M)
Blasdel, F. G., Jr. (M)
Chaffee, R. E. (SM)
Cron, A. C. (M)
Eager, M. (SM)
Galagan, S. (SM)
Goldsborough, R. R., Jr. (SM)
Gould, L. (SM)
Hatton, W. L. (M)
Helck, B. K. (M)
Hiller, E. R. (M)
Hinckley, G. A. (A)
Kline, F. S. (VA)
Kriz, J. (A)
Maples, T. K. (SM)
Murphy, W. M., Jr. (M)
Nichols, B. E. (M)
O'Donnell, T. F. (SM)
Peyser, P. (A)
Pierce, G. B. (A)
Porter, H. J. (M)
Reddan, E. D. (M)
Ricardi, L. J. (M)
Rochester, N. (F)
Rodimon, C. C. (M)
Seeley, P. E. (A)
Ulrich, V. K. (SM)
Voutselas, T. (A)
Walsh, J. E. (M)

Wenham (BOS-1)
Gysan, R. L. (A)
Schafer, E. W. (SM)

West Acton (BOS-1)
Armstrong, G. R. (M)
Attridge, C. C. (M)
Bowe, J. J. (M)
Broadwell, H. S. (M)
Bunting, J. H. (A)
Campbell, R. T. (M)
Enemark, R. B. (M)
Fischer, R. F. (M)
Fordon, W. A. (M)
Guha, R. F. (M)
Hodgdon, H.W. (M)
Ivanov, A. (M)
Janes, C. W. (SM)
Lawton, D. C. (M)
Newcombe, D. A. (M)
Oliver, D. S. (M)
Panetta, A. R. (M)
Pensyl, J. F. (M)
Perry, J. P. (M)
Petrucci, S. J. (M)
Pusch, G. A. (M)
Richter, E. (M)
Roedloer, F. E. (SM)
Shuppert, R. C. (M)
Sims, J. R. (M)
Stewart, A.K. (M)

Westboro (BOS-1)
De Poy, M. L. (M)
Quick, J. H. (SM)

West Bridgewater (BOS-1)
Nelson, F. W. (A)

West Concord (BOS-1)
Austin, H. A. (M)
Berostad, P. A. (SM)
Bousquet, A. G. (SM)
Burke, C. T. (F)
Cady, C. A. (SM)
Cambell, L. J. (M)
Chitouras, C. G. (A)
Cleveland, A. W. (M)
Dawes, H. H. (M)
De Blois, S. W. (M)
Dioolitto, P. W. (M)
Eames, A. M., Jr. (M)
Easton, I. G. (SM)
Frank, R. W. (SM)
Games, J. E. (M)
Gross, E. E., Jr. (SM)
Hall, H. P. (M)
Hatch, R. M., Jr. (M)
Holtle, M. C. (SM)
Johnson, G. O. (M)
Karplus, E. (F)
Leballister, D. C. (A)
Lewis, F. D. (SM)
Littlejohn, H. C. (M)
McElroy, P. K. (F)
Murphy, C. F. (M)
Nelson, R. R. (M)
Peterson, A. P. G. (F)
Pilkington, D. W. (M)
Plunk, T. E. (M)
Romaine, G. E. (M)
Ruclenas, R. J. (M)
Sebring, P. B. (M)
Sinclair, D. B. (F)
Smith, M. T. (SM)
Soderman, R. A. (SM)
Stuart, R. W. (A)
Thurston, W. R. (SM)
Webb, H. A. J. (M)
Webster, W. G. (SM)
Wentworth, A. M. (A)
Whitman, J. A. (M)
Woodward, C. A., Jr. (SM)
Zawada, F. A. (M)

West Falmouth (BOS-1)
Austin, J. F. (A)

Westford (B-MV-1)
Cann, A. J. (M)
Chace, W. G. (SM)
Ignatowicz, J. B. (M)

West Granville (WM-1)
Hodsdon, J. S. (M)

West Medway (BOS-1)
Surette, L. T. (M)

West Medford (BOS-1)
Cook, A. S. (M)
Knapp, G. (M)
Lanciani, D. A. (SM)
McCarthy, J. F. (M)

Westminster (BOS-1)
Nesman, E. F. (M)

West Natick (BOS-1)
Sessions, A. E. N. (SM)

West Newton (BOS-1)
Brown, B. D. (M)
D'Arcento, F. R. (M)
De Bettencourt, J. (F)
Dixon, R. K. (M)
Eakman, S. L. (M)
Elkan, J. (M)
Franklin, B. (M)
Freedman, N. (SM)
Halder, G. W. (M)
Hersenrother, R. C. (F)
Hollis, W. T., III (M)
Inober, L. K. (M)
Jones, W. J. (SM)
Kaliszewski, T. (M)
Kaufman, D. L. (M)
MacDowell, K. M. (M)
Manning, C. J. (A)
Myers, H. L. (M)
Neider, F. V. (M)
Pekin, H. T. (SM)
Smith, J. E. (F)
Stifter, F. J. (M)
Stone, S. H., Jr. (A)
Teixeira, P. A. (M)
Vano, J. P. (M)
Wilcox, R. B. (M)
Woo, W. G. (SM)
Wyckoff, P. H. (M)
Young, P. T. K. (A)

West Lynn (BOS-1)
Horlick, A. M. (A)
Laurent, J. A., Jr. (M)
White, A. (A)

West Newbury (BOS-1)
Anderson, W. R. (M)
Fidler, R. R. (M)

Weston (BOS-1)
Abate, A. (M)
Alcade, H. (A)
Baghdady, E. J. (M)
Bark, A. (M)
Bickford, W. J. (M)
Brown, W. C. (F)
Burt, W. G., Jr. (M)
Crowley, A. H. (M)
Dairiki, S. (M)
Dewey, O. L. (M)
Eames, R. D. (M)
Erickson, P. W. (SM)
Fellows, G. E. (SM)
Finison, H. J. (SM)
Freedman, J. (SM)
Green, P. E., Jr. (SM)
Gross, F. A. (VA)
Havinga, J. C. (A)
Hebditch, E. A. (M)
Holt, R. B. (SM)
Kahler, R. C. (M)
Kelly, T. J. (M)
Morrow, W. E. (M)
Phillips, W. E., Jr. (SM)
Ryland, B. G. (M)
Searle, C. L. (M)
Stoffel, F. T. (M)
Underhill, B. B. (SM)
Warren, B. J. (M)

West Peabody (BOS-1)
Clark, N. M. (M)
Genett, W. F. (A)
Goldberg, D. (A)
Grant, J., Jr. (A)
Lessin, I. (M)
Porter, R. A. (M)
Simon, E. (M)
Simons, S. C. (A)
Snow, S. D. (A)
White, C. E. (SM)

Westover AFB (WM-1)
Brigham, J. C. (M)
Henneke, J. T. (A)
Woodward, W. E. (M)

West Roxbury (BOS-1)
Bonica, J. S. (M)
Downing, J. T. (M)
Duross, C. J. (M)
Fairbanks, C. G. (A)
Fay, S. (M)
Haddad, S. G. (M)
McCarthy, J. G. (M)
Parsons, A. (M)
Sullivan, P. A. (A)
Thomas, J. E. (M)

West Somerville (BOS-1)
Cross, A. H. (A)
Tringale S. R. (A)

West Springfield (WM-1)
Burnett, K. H. (M)
Mattson, A. E., Jr. (A)
Sheehan, J. J. (A)
Smith, R. D. (M)

Westwood (BOS-1)
Abrahamsen, F. H. (M)
Aridsen, M. J. (M)
Arlin, M. N. (SM)
Brock, G. W., Jr. (M)
Gere, A. J. (SM)
Harrington, W. L. (A)
Hildebrant, B. M. (A)
Keegan, R. F. (M)
Lane, C. R. (SM)
Manseau, H. L. (M)
Paddock, R. B. (M)
Smith, L. W. (M)
Spears, M. F. (SM)
Talanian, W. B. (A)
Trocchi, R. F. (M)
Ward, A. A. (M)
Wasley, R. L. (A)
Westbom, A. C., Jr. (SM)
Wilson, R. T. (M)
Wiren, J. (M)

Weymouth (BOS-1)
Hamm, G. M. (SM)
Hughes, J. W. (A)
Mori, H. (SM)
Spencer, F. J. (M)

Winchester (BOS-1)
Babaklan, J. (M)
Bacon, F. S., Jr. (M)
Bassett, D. E. (SM)
Beranek, L. L. (F)
Blakely, J. R. (SM)
Blanchard, J. T. (M)
Brown, C. B. (M)
Christman, T. J. (M)
Corderman, C. L. (SM)
De Young, J. A. (SM)
Dieterich, E. J. (M)
Djonuo, R. S. (M)
Durage, A. H. (M)
Fernandez, L. E. (A)
Fritch, D. J. (SM)
Glendon, R. E. (M)
Hanson, P. R. (M)
Heyck, H. D. (M)
Hilliger, R. E. (SM)
Holdam, J. V., Jr. (SM)
Ivers, J. H. (SM)
Kelbley, L. W. (M)
Lamontagne, R. S. (SM)
Larson, C. O. (SM)
Leach, H. H. (A)
Mainberger, W. A. (SM)
Marino, D. J. (A)
McCusker, J. H. (A)
McFarlane, D. J. (SM)
McVicar, K. E. (M)
Memishian, J. (M)
Metzgar, K. J. (M)
Parks, F. B. (SM)
Phaneuf, C. A. (M)
Purrington, R. L. (M)
Redpath, G. C. (M)
Rice, D. H. (A)
Robinson, T. B. (M)
Ruoin, L. G. (SM)
Schiener, J. E. (A)
Schroeder, R. K. (A)
Segerstrom, C. A., Jr. (SM)
Shannon, C. E. (F)
Smith, W. B. (M)
Stevens, C. A. (SM)
Thornton, R. D. (M)
Tunnicliffe, W. W. (M)

MASSACHUSETTS

Unger, D. M. (M)
Wilcox, J. F. (M)
Wundt, R. M. (SM)

Whitman (BOS-1)
Gallimore, J. W. (M)
Simmons, E.C. (M)

Wilbraham (WM-1)
Dewey, C. S. (M)
Webber, F. G. (SM)

Williamstown (WM-1)
Brandt, O. G. (M)
Curry, J. R. (M)
Hansen, R. C. (A)
Hardy, H. G. (A)
Lull, R. E. (M)
Ness, O. A. (M)
Paine, B. B. (M)
Peck, D. B. (M)
Postle, A. H. (M)
Powell, R. F. (M)
Rotast, N. L. (M)
Rowland, W. H. (A)
Scarborough, F. S. (A)
Schenker, B. (M)
Schimmel, J., III (M)
Stabler, H. P. (SM)
Stoneham, C. E. (M)
Wellcome, F. L., Jr. (M)
White, J. A. (M)

Wilmington (B-MV-1)
Acton, D. J. (M)
Arnold, K. F. (A)
Brindley, W. E. (M)
Crane, J. J. (M)
Di Rocco, J. V. (M)
Hartwell, H. G. (M)
Hooper, W. G., Jr. (M)
Hovnanian, H. P. (SM)
Kyros, W. (A)
Merenda, F. S. (M)
Montgomery, J. L. (SM)
Page, H. M. (A)
Rich, G. H. (A)
Rose, E. P. (A)
Vasileff, H. D. (SM)
Waters, M. L. (A)

Winthrop (BOS-1)
Altshuler, E. E. (M)
Diaz, L. V. (A)
Esakov, D. A. (M)
Mac Gregor, D. F. (A)
McDonald, F. J. (A)
Nardone, L. J. (M)
Newton, D. J. (M)
Peterson, D. G. (M)
Rivers, R. A. (M)

Woburn (BOS-1)
Bayliss, R. E. (M)
Bettencourt, J. P. (M)
Briana, A. M. (M)
Brown, H. E. (A)
Chrusciel, M. R. (M)
Driscoll, V. (M)
Engel, A. (M)
Gallagher, E. F. (M)
Gupta, M. P. (M)
Jeffrey, R. F. (M)
Katz, L. (SM)
Kolp, J. S. (M)
Kritter, E. L. (M)
Mac Donald, K. J. (A)
McMakin, W. B. (M)
McManus, R. O. (M)
Mead, D. C. (SM)
Merrill, R. B. (M)
Molica, A. J. (A)
O'Connor, L. J. (M)
Pietenpol, W. J. (SM)
Ray, G. H., Jr. (M)
Rice, J. F. (M)
Sabo, J. D. (M)
Seifert, W. W. (SM)
Shaw, G. B. (SM)
Stoddard, R. D. (M)
Turgiss, W. W. (M)
Ulm, E. H. (M)
Walters, S. H. (SM)

Wollaston (BOS-1)
Bixby, W. L. (M)
Despathy, R. G. (M)
Di Loreto, A. A. (A)
Edmonston, A. S. (M)
Kliman, G. B. (M)
McNamara, T. J. (M)
Moore, C. (M)

Woods Hole (BOS-1)
Hervey, J. P. (M)

Worcester (BOS-1)
Anderson, R. M. (A)
Bronwell, A. B. (F)
Browning, E. A. (M)
Connolly, J. (M)
Diamond, M. (A)
Didio, R. E. (A)
Edinburg, M. W. (A)
Engelsted, J. (A)
Eteson, D. C. (M)
Forsberg, C. A. (M)
Grogan, W. R. (SM)
Hirvi, H. E. (M)
Hoogasian, L. (M)
Howe, D. W., Jr. (M)
Howes, D. E. (M)
Karazia, R. J. (M)
Kasper, J. P., Jr. (M)
Kirsch, I. H. (A)
Lloyd, A. L. (M)
Manoog, J. C. (M)
Millar, E. (M)
Morgan, T. H. (SM)
Newell, H. H. (SM)
Newman, H. C. (A)
Pareseau, P. H. (M)
Richardson, G. A. (SM)
Riordan, W. J. (A)
Sawyer, D. E. (M)
Stoupis, T. (M)
Wadsworth, W. B. (M)
Wolniewicz, R. S. (A)
Wright, M. W. (M)

MICHIGAN

Alger (DET-4)
Ernst, C. E. (A)

Allegan (W-MIC-4)
Borst, P. N. (A)

Allen Park (DET-4)
Bailey, K. V. (SM)
Bledsoe, J. A. (A)
Granlund, D. L. (A)
Hogle, R. C. (M)
Tosh, W. M. (M)

Alma (W-MIC-4)
George, E. E. (M)
Schwartz, H. (A)
Smith, R. P. (A)

Ann Arbor (DET-4)
Attwood, S. S. (SM)
Bartman, F. L. (M)
Barton, B. F. (M)
Becher, W. D. (M)
Beutler, F. J. (M)
Blythe, R. (M)
Boers, J. E. (M)
Boggess, R. L. (M)
Boyd, J. A. (M)
Bozolan, M. (M)
Browder, J. E. (M)
Brown, J. (SM)
Brown, R. K. (M)
Brown, W. M. (M)
Bublitz, A. T. (A)
Burdett, G. L. (M)
Burns, J. A. (A)
Butler, T. W., Jr. (M)
Buzzard, R. D. (A)
Carlsen, R. A. (A)
Cath, P. G. (M)
Chaney, L. W. (M)
Chuang, K. (M)
Clayton, J. F. (SM)
Cohen, G. S. (M)
Collard, R. S. (M)
Collins, A. B. (M)
Connors, T. L. (M)
Cooley, P. (M)
Crane, R. B. (SM)
Cubrona, L. J. (SM)
De Hart, W. R. (M)
De Voll, R. L. (SM)
Dow, W. G. (F)
Dute, J. C. (M)
Dye, R. H. (M)
Early, H. C. (SM)
Earshen, J. J. (M)
Eschelbach, R. E. (M)
Exley, L. (M)
Farrell, T., Jr. (A)
Farris, H. W. (M)
Fensler, W. E. (M)
Ferris, C. C. (M)
Fife, D. W. (M)
Firschein, O. (M)
Frese, R. E. (M)
Gandhi, O. P. (M)
Garner, H. L. (M)
Gaskill, R. A. (M)
Gilbert, E. G. (M)
Gilbert, E. O. (M)
Goode, H. H. (SM)
Graham, R. R. (M)
Grant, E. C. (A)
Greenwood, D. T. (M)
Grimes, D. M. (M)
Gunderman, R. J. (SM)
Haddock, F. T. (M)
Hall, G. O. (M)
Hamilton, R. E., Jr. (M)
Hansen, R. J. (M)
Harper, R. O. (M)
Harmon, S. T. (M)
Harokopus, W. P. (M)
Hawkins, W. G. (SM)
Hazeltine, B. (M)
Heerema, C. E. (M)
Henry, E. E. (M)
Hiatt, R. E. (SM)
Hok, G. (F)
Holland, L. N. (F)
Homic, S. G. (M)
Horvath, W. J. (SM)
Howe, R. M. (M)
Jellison, K. A. (M)
Johansen, E. L. (A)
Johnston, R. W. (M)
Kaufman, L. (M)
Kazda, L. F. (M)
Kent, C. E. (M)
Kerr, W. (SM)
Klingler, D. E. (M)
Kulper, J. W. (M)
Larson, R. W. (M)
Lasher, R. W. (M)
Lazarus, D. H. (M)
Lewis, D. C. (M)
Liang, D. Y. (M)
Lillie, R. E. A. (M)
Lindsay, W. J. (A)
Loughry, B. W., Jr. (M)
Macnee, A. B. (SM)
Martin, E. A. (M)
Mason, D. R. (M)
Masten, S. C. (A)
McMillan, S. H. (A)
McNabb, J. W. (M)
McPherson, R. R. (M)
Metzelaar, P. N. (A)
Miller, M. H. (M)
Miller, R. E. (M)
Mollard, W. N. (M)
Monroe, K. E. (M)
Moore, A. W., Jr. (M)
Morakis, J. C. (M)
Morris, K. R. (A)
Mouzon, J. C. (SM)
Mullison, J. L. (A)
Naylor, A. W. (A)
Nichols, A. D. (M)
Nolte, L. W. (M)
Nunn, W. M., Jr. (SM)
O'Connell, R. J. (A)
Ohtomo, R. H. (M)
Olte, A. (M)
O'Neal, R. D. (SM)
Orr, L. W. (M)
Otterman, J. (M)
Pantek, H. R. (M)
Paul, L. E. (M)
Peterson, G. E. (SM)
Petrowski, J. P., Jr. (M)
Ploughman, T. L. (M)
Pollard, W. J. (M)
Pool, M. H. (A)
Porcello, L. J. (M)
Potter, W. H. (A)
Rauch, L. L. (SM)
Raymond, W. W. (M)
Relher, H. F. (M)
Remley, F. M., Jr. (M)
Richards, D. B. (A)
Ristow, H. E. (M)
Roberts, G. A. (M)
Robinson, G. H. (M)
Robinson, R. C. (M)
Rock, A. L. (M)
Rollin, R. A., Jr. (M)
Roth, P. F. (M)
Rothschild, D. R. (A)
Rowe, J. E. (M)
Rowe, R. J. (M)
Rupke, E. (M)
Sattinger, I. J. (SM)
Schaefer, E. J. (M)
Schmidt, R. A. (M)
Schorsch, R. H. (M)
Schulte, H. F., Jr. (M)
Schultz, G. C. (SM)
Schupp, A. A., Jr. (M)
Scott, N. R. (SM)
Sellers, E. E. (SM)
Sharpe, C. B. (M)
Siegel, K. M. (SM)
Simms, R. J. (M)
Smith, B. A. (M)
Sondeen, P. (M)
Spencer, N. W. (SM)
Spengos, A. (M)
Steinmann, W. L. M. (SM)
Stone, J. L. (M)
Stout, M. B. (SM)
Strand, J. (M)
Sutton, W. A. (A)
Tantzen, R. G. (M)
Theofil, D. V. (M)
Thompson, T. E. (M)
Tleman, C. R. (SM)
Tleng, K. (M)
Umpleby, K. F. (SM)
Vander Kool, L. R. (M)
Wallace, V. L. (M)
Ward, J. W. (M)
Zaltzeff, E. M. (M)

Auburn (DET-4)
Engelhardt, L. J. (M)

Battle Creek (W-MIC-4)
Arrowsmith, R. (M)
Bisko, T. (A)
Brown, H. M. (M)
Burton, E. T. (SM)
Dewey, C. E., Jr. (M)
Hallsman, L. C. (M)
Jude, R. L. (A)
Kennemer, J. R. (A)
Rose, C. E. (A)
Shaw, R. A. (M)
Summerford, D. A. C. (SM)

Bay City (DET-4)
Bowden, F. J. (M)
Dunlap, G. R. (A)
Malzahn, D. F. (A)
Matko, J. W. (M)
Sackett, W. T., Jr. (M)
Woody, F. (A)

Belleville (DET-4)
Kranz, H. E. (SM)
Lund, T. J. (A)

Benton Harbor (SB-M-5)
Flebich, E. C. (A)
Hanson, B. B. (M)
Martz, A. F., Jr. (M)

Berkley (DET-4)
Blumenberg, A. (M)
Farls, W. R. (M)
Norris, W. J. (M)

Berrien Springs (SB-M-5)
Lashier, H. M. (M)

Big Rapids (W-MIC-4)
Hurst, N. K. (A)
Pozniak, J. H. (A)
Zimmerman, G. E. (A)

Birmingham (DET-4)
Arnull, R. W. (A)
Baird, G. A. (M)
Benaglio, R. V. (M)
Burge, F. L. (M)
Chapin, W. R. (SM)
Chapman, F. W. (SM)
Christensen, R. E. (M)
Craig, A. D. (A)
Dearth, G. E. (M)
Fisher, L. P., Jr. (A)
Fisk, R. H. (M)
Gudaitis, W. V. (M)
Hawley, G. H. (M)
Holmes, W. E. (M)
Kreglow, G. L. (M)
Lovelk, D. J. (M)
Leydorf, G. F. (SM)
Mika, H. S. (SM)
McDonnell, W. F. (M)
Michaels, C. L. (SM)
Miller, R. C. (M)
Morgan, H. K. (F)
Olson, D. R. (M)
Ragsdale, W. H. (M)
Roggenbuck, R. A. (SM)
Sanderson, A. G. (M)
Scherba, M. B. (SM)
Somerville, A. (M)
Toton, E. J. (M)
Weller, E. F., Jr. (SM)
Wendt, F. S. (M)
Whiteside, A. E. (M)

Bloomfield Hills (DET-4)
Fahringer, W. H. (A)

Buchanan (SB-M-5)
Beaverson, W. A. (M)
Burrouchs, L. R. (A)
Freathy, R. E. (A)
Hagey, L. P. (M)
Mosier, H. F. (M)
Shipman, L. E. (M)
Tomcik, D. J. (M)
Wood, J. F. (M)

Byron Center (W-MIC -4)
Jager, A. J. (A)

Cannonsburg (W-MIC-4)
Hart, W. N. (A)

Center Line (DET-4)
Reh, J. J. (M)

Charlotte (W-MIC-4)
Fox, M. L. (A)
Rypstra, B., Jr. (M)

Chesaning (DET-4)
Stimpfl, E. J. (A)

Clarkston (DET-4)
Bartek, R. J. (M)

Clawson (DET-4)
Dougherty, R. H. (M)
Quin, W. J. (M)

Climax (W-MIC-4)
Griffin, R. E. (M)

Coldwater (FT-W-5)
Munn, E. H., Jr. (M)

Coloma (SB-M-5)
Williams, D. K. (M)

Dearborn (DET-4)
Anger, L. E. (M)
Becker, F. C. (M)
Best, F. G. (M)
Boltz, H. A. (SM)
Boyer, W. D. (M)
Calladine, G. T. (M)
Chall, L. E., Jr. (M)
Chiarenza, J. B. (M)
De Camillis, M. (M)
Doyle, W. J. (M)
Emery, R. R. (M)
Ference, M., Jr. (SM)
Giacoletto, L. J. (F)
Harrigan, P. M. (M)
Higgins, N. S. (A)
Huber, P. (M)
Lien, C. E. (VA)
McKelvey, E. J. (M)
McLaren, I. H. (M)
Newell, C. J. (M)
Nuber, S. E. (A)
Olson, R. G. (M)
Popkiewicz, F. (A)
Pressede, D. J. (M)
Saigeon, N. D. (M)
Sather, R. O. (SM)
Sims, R. C. (M)
Spinner, C. R. (A)
Stoner, M. J. (A)
Stretanski, P. A. (A)
Taylor, C. I. (M)
Urban, L. R. (A)
Ward, D. B. (A)
Williams, C. E. (M)

Detroit (DET-4)
Altmpich, N. (M)
Almas, S. L. (M)
Amber, P. S. (M)
Andrews, G. B. (M)
Asuncion, J. F. (M)
Atems, E. (M)
Bandolan, P. (A)
Barich, T. J. (M)
Blett, E. B. (VA)
Bolling, G. D. (M)
Brabant, C. E. (A)
Brede, E. F. (M)
Brosch, H. T. (A)
Browne, J. F. X., Jr. (A)
Bryant, J. H. (SM)
Buchanan, A. B. (SM)
Butchart, R. D. (A)
Butcher, J. H. (M)
Cannon, R. C. (M)
Carr, A. E. (M)
Caschera, J. (M)
Chow, H. (M)
Chute, G. M. (SM)
Cindric, G. T. (SM)
Clark, E. H. (A)
Conroy, K. S. (M)
Cook, W. M. (A)
Coombs, S. H. (M)
Cotton, R. J. (SM)
Cowles, E. D. (A)
Craig, H. I. (M)
Crane, R. R. (M)
Currie, J. H. (M)
Da Roza, F. G. (M)
Datwyler, W. F. (A)
Davis, C. (M)
De Baker, J. L. (M)
Denstaedt, E. C. (SM)
De Tar, J. B. (M)
Dickerhoof, R. M. (M)
Diddens, P. A. (M)
Diem, C. W. (A)
Dixon, J. K. (A)
Donelson, L. E. (A)
Donovan, R. (M)
Drane, H. (M)
Dubois, R. C. (M)
Duda, E. M. (A)
Edielsen, N. E. (F)
Egger, R. J. (M)
Erhart, D. L. (M)
Erway, P. B. (M)
Estes, H. H. (M)
Farrah, R. R. (M)
Ferguson, D. R. (A)
Fontaine, A. P. (SM)
Forgacs, R. L. (M)
Forsythe, E. H. (M)
Franklin, R. M. (M)
Friedenthal, A. (M)
Garelis, C. (A)
Goldstone, G. H. (A)
Goodman, G. (M)
Griffith, W. A. (A)
Griffith, W. A. (M)
Gundersen, R. E. (A)
Hafstad, L. R. (F)
Hale, H. W. (SM)
Hartz, F. M. (M)
Hein, D. W. (M)
Heiser, E. S. (SM)
Hess, H. M. (SM)
Hill, F. E. (M)
Houston, C. D., Jr. (M)
Howard, L. R. (M)
Hubbard, W. B. (A)
Johnson, J. S. (SM)
Johnson, K. E. (A)
Johnson, S. M. (A)
Jones, R. E. (M)
Jones, T. N. (A)
Kahle, F. L. (A)
Kaiser, E. E. (M)
Kamm, V. C. (M)
Katioua, I. E (A)
Keever, D. B. (M)
King, L. E. (VA)
Klimek, T. F. (M)
Kocher, C. F. (SM)
Kock, W. E. (F)
Kossuth, A. K. (M)
Kraguljac, N. (M)
Krulitoski, S. J., Jr. (M)
Kubala, A. M. (M)
Kudela, A. F. (M)
Kurzyk, E. (A)
Lamey, J. L. (A)
Lawrence, S. C. (M)
Lax, B. (A)
Le Fevre, H. P. (M)
Leggatt, G. E., Jr. (A)
Lesinsky, F. (M)
Licht, G. L. (A)
Lipsmann, S. A. (M)
Lipski, D. B. (M)
Longerich, E. P. (M)
Loughridge, D. H. (SM)
Lovalenti, S. (M)
Love, E. J. (SM)

Luzer, H. J. (M)
Macewka, N. (M)
Madgett, W. H. (A)
Malafouris, T. (A)
Mathamel, F. A. (M)
Matherly, C. W. (M)
McCartin, L. M. (A)
McDonald, L. R. (M)
McDonough, T. (M)
McFatridge, J. E. (M)
McGlinn, E. J. (M)
McKelvie, J. L. (M)
Melchior, A. D. (A)
Milek, H. (M)
Miller, K. L. (A)
Millett, L. F. (M)
Mills, A. J. (M)
Mills, R. J. (A)
Miwa, G. Y. (A)
Monroe, R. E. (M)
Monticello, W. A. (M)
Morgan, J. J. (M)
Nagy, J. R. (M)
Nartonis, W. C. (A)
Nutter, M. J. (M)
O'Brien, D. J. (M)
Ogletree, W. A. (M)
Osborne, R. L. (VA)
Parker, D. G. (M)
Patton, H. W. (SM)
Pecar, A. J. (A)
Peifer, A. G. (M)
Penhollow, H. A. (VA)
Popow, G. L. (M)
Poppe, P. A. (M)
Rees, D. W. (M)
Reiss, N. D. (M)
Renklewicz, R. (M)
Retko, E. (M)
Rissi, T. L. (A)
Robb, D. E. (SM)
Rockafellow, S. C. (M)
Ross, H. G. (A)
Ross, P. A. (M)
Rosselot, G. A. (M)
Rothfuss, J. C. (A)
Roush, F. H. (M)
Rubin, B. Z. (M)
Runkel, W. E. (M)
Runkle, E. G., Jr. (M)
Ryan, G. E. (VA)
Rykala, T. P. (A)
Rymarz, L. E. (M)
Scanlan, R. J. (VA)
Schlachter, H. J. (A)
Schmalzriedt, T. T. (A)
Schmeisser, K. R. (SM)
Scott, D. P. (M)
Sefcik, M. J. (M)
Shockley, L. A. (A)
Simanyi, A. I. (M)
Smale, P. V. (M)
Sobolak, S. J. (M)
Sterling, S. (M)
Stewart, J. A. (SM)
Stewart, J. N. (M)
Stiebel, A. (M)
Stocker, D. V. (M)
Stone, E. W. (A)
Tanney, R. B. (M)
Tarpinian, H. D. (A)
Taylor, K. J. (A)
Tevlin, R. J. (M)
Thomas, J. E., Jr. (SM)
Thomas, R. A. (M)
Tompos, S. F. (A)
Travis, I. (F)
Turkish, M. C. (M)
Tumquist, D. W. (M)
Van Den Ende, H. (M)
Van Remmes, A. B. (SM)
Vatcher, B. A. (A)
Wait, W. H. (M)
Walker, S. H. (M)
Walton, E. D. (M)
Wamke, U. J. C. (M)
Webb, A. E. (A)
Webber, H. C. (A)
Webster, G. J. (M)
Weidman, J. S. (A)
Welsand, J. B. (A)
Williams, R. P. (M)
Williams, W. B. (SM)
Winters, C. S. (A)
Wojciak, J. A. (A)
Wolber, W. G. (A)
Wong, A. (M)
Yaskoff, R. (M)
Youkstetter, F. (M)
Zebrowski, M. S. (A)
Zettel, D A. (M)

Dowagiac (SB-M-5)
Rowe, C. R. (SM)

Drayton Plains (DET-4)
Bellairs, G. H. (M)
Clark, R. K. (M)
Lima, E. J. T. (M)
Rosbury, F. H. (A)

East Detroit (DET-4)
Boyda, M. C. (A)
Stricker, L. J. (A)
Wodtke, W. H. (A)

East Lansing (DET-4)
Baccus, I. B. (SM)
Blackwell, W. A. (M)
Ebert, I. O. (SM)
Edgington, G. E. (M)
Eldson, J. C. (M)
Eng, R. A. (M)
Evans, R. J. (M)
Hiedemann, E. A. (SM)
Howard, L. L. (M)
Keeney, M. G. (M)
Koenig, H. E. (SM)
Larue, J. J. (M)
McMahon, E. L. (M)
Reed, M. B. (SM)
Reid, R. J. (M)
Ryder, J. D. (F)
Smith, A. E. (M)
Stretzoff, J. A. (SM)
Tokad, Y. (A)
Von Tersch, L. W. (SM)
Weeg, G. P. (M)
Wilcox, L. C. (M)
Wolla, M. L. (M)

Edmore (W-MIC-4)
Chater, M. L. (A)

Erie (DET-4)
Bushroe, G. A. (A)

Farmington (DET-4)
Brengle, A. S. (M)
Dubois, D. A. (M)
Gardner, D. C. (M)
Hartford, T. W. (M)
Hoge, R. R. (M)
Karwas, F. C. (M)
Niehaus, D. J. (A)
Schafer, R. H. (M)
Thomsen, T. R. (A)

Ferndale (DET-4)
Amman, E. A. (A)
Ludwig, C. J. (A)
Payne, D. V. (M)
Searle, L. M. (M)
Seleno, A. A. (M)
Wagoner, C. E., Jr. (M)

Flint (DET-4)
Anderson, H. J. (M)
Bunch, J. I. (M)
Colosi, A. (A)
Common, C. A. (A)
Driver, J. P. (M)
Grimm, R. A. (A)
Halcin, V. T. (M)
Hoop, R. E. (M)
Johnson, H. G. (M)
Jones, M. N. (M)
Kemmerly, J. E. (M)
McBride, W. J. (M)
Parker, W. J. (A)

Flushing (DET-4)
Clark, P. R. (A)
Loshbough, P. A. (A)

Fraser (DET-4)
Cameratta, P. J. (M)
Costello, R. E. (M)
Hoehn, A. M. (M)

Fremont (W-MIC-4)
Bouwsma, W. J. (A)

Garden City (DET-4)
Donald, D. K. (M)
McGregor, A. D. (M)
Taplin, L. B. (M)

Grand Junction (W-MIC-4)
Krieger, H. C. (M)

Grand Rapids (W-MIC-4)
Barfuss, J. D. (M)
Bateman, G. H. (SM)
Berg, R. C. (A)
Brown, C. S. (M)
Brunsting, A. W. (A)
Croft, W. S. (M)
Davis, R. L. (M)
De Jong, P. G. (M)
Detweiler, D. C. (A)
Gaydos, G. J. (M)
Giardina, J. F. (M)
Gorton, E. D. (M)
Hekker, T. L. (A)
Huff, J. F., Jr. (M)
Kenoyer, H. W. (M)
Lundberg, R. L. (M)
Marcinko, A. M. (A)
Mort, V. A. (M)
Nold, D. E. (A)
Olson, V. E. (A)
Rehwoldt, J. V. (M)
Robison, C. F. (M)
Scott, H. R. (M)
Stevens, R. R. (SM)
Sullivan, W. J. (A)
Teachman, G. E. (M)
Van Oort, G. W. (A)
Voice, C. C. (M)
Waldner, R. G. (M)
Wick, A. E. (A)
Wolters, D. G. (M)
Zwiep, T. C. (M)

Grass Lake (DET-4)
James, F. M. (M)

Greenville (W-MIC-4)
Marquis, A. (M)

Grosse Pointe (DET-4)
MacKenzie, E. P. (A)

Grosse Pointe Farms (DET-4)
Book, E. (A)
Odenweller, C. (M)
Smale, V. E. (A)

Grosse Pointe Park (DET-4)
Griffith, A. T. (A)

Grosse Pointe Woods (DET-4)
Bober, E. P. (M)
Dacken, L. L. (M)
Delmege, A. H. (M)
Halgh, J. B. (A)
Hamman, P. E. (A)
Irwin, S. N. (M)
Sullivan, R. P. (M)

Hamtramck (DET-4)
Kozinski, R. E. (A)
Maslowski, R. S. (M)
Szewczyk, Z. I. (M)

Hancock (MIL-5)
Moses, H. J. (M)

Harbert (SB-M-5)
Thurston, E. G. (M)

Harper Woods (DET-4)
Ensley, C., Jr. (A)

Haslett (DET-4)
Hedges, H. G. (M)

Hastings (W-MIC-4)
Branch, R. (VA)

Hazel Park (DET-4)
Kilian, D. J. (A)
Kuzara, S. W. (M)
Nutter, H. G. (A)
Schubring, N. W. (M)

Highland Park (DET-4)
Stinson, R. C. (VA)

Hillsdale (DET-4)
Zaiser, J. E. (A)

Holland (W-MIC-4)
McKenney, J. G. (A)
Tysse, H. L. (VA)

Holt (DET-4)
Hemmye, J. h. (A)

Houghton (MIL-5)
Jones, R. J. (SM)
Lind, M. S. (A)
McMillin, K. M. (M)
Oswald, J. A. (M)
Soper, J. A. (M)

Huntington (DET-4)
Conrath, L. R. (SM)
Van Dusen, H. J. (M)
Wilton, V. A. (M)

Inkster (DET-4)
Cheal, J. (M)
Cleveland, A. J. (M)
Dolsen, J. A. (M)
Le Baron, G. M. (M)
Wickman, C. R. (M)
Wood, T. A. (M)

Jackson (DET-4)
Arasim, J., Jr. (A)
Baker, F. J. (A)
Bush, C. H., Jr. (A)
Carlson, H. W. (M)
Devereaux, R. N. (A)
Foy, S. (A)
Holda, N. E. (A)
Hungerford, R. S. (M)
Leedham, R. K. (M)
Longman, E. R. (M)
Owen, D. R. (A)
Paorocki, C. R. (M)
Probert, D. C. (M)
Swartzel, K. D. (SM)
Troup, E. O. (M)
Westrate, M. C. (M)
Zieger, C. H. (M)

Kalamazoo (W-MIC-4)
Alway, C. D. (M)
Burke, R. H. (M)
Fetzer, J. E. (SM)
Lee, C. E. (A)
Marburger, W. G. (M)
Morse, F. L. (M)
Van Campe, F. M. (SM)
Woods, O. R. (M)

Lakeland (DET-4)
Willett, R. M. (M)

Lansing (DET-4)
Bennett, C. T. (A)
Brooke, C. E. (A)
Buxton, C. E. (M)
Finch, B. G. (M)
Hewitt, J. E. (A)
Kateley, J., Jr. (M)
Kruger, V. (A)
Pennington, R. B. (M)
Simons, H. C. (A)
Taylor, L. C. (A)
Whitacre, J. W. (A)
Winters, L. C. (A)
Lathrup Village (DET-4)
Williams, K. S. (M)

Leslie (DET-4)
Stansfield, S. J. (M)

Lincoln Park (DET-4)
Bradley, R. W. (A)
Scott, R. E. (M)
Tank, H. F. (VA)

Livonia (DET-4)
Humphreys, D. M. (A)
Manoold, R. R. (A)
Michaels, P. A. (M)
Nilssen, O. K. (M)
Porter, C., Jr. (A)
Stout, C. D. (A)
Sullivan, J. E. (M)
Sweet, J. (A)
Thomas, T. R. (M)
Veit, N. J. (M)
Waltz, F. M. (A)
Weiss, M. (A)

Ludington (W-MIC-4)
Petters, J. F. (A)
Plank, R. A. (A)
Ramussen, R. (A)

Madison Heights (DET-4)
Clements, H.R. (A)
Oshima, W. Y. (A)
Risko, F. D. (M)
Thomas, T. (A)

Manton (W-MIC-4)
Sherman, V. W. (SM)

Marne (W-MIC-4)
Vanderveen, G., Jr. (A)

Marquette (MIL-5)
Jackson, W. G. (M)
Rutherford, J. W. (A)

Marshall (W-MIC-4)
Brownell, G. T. (SM)

Melvindale (DET-4)
Christ, D. R. (A)
Stinson, E. R. (M)
Zinluk, M. A. (M)

Midland (DET-4)
Adler, S. E. (M)
Allen, J. B. (M)
Bauss, H. H. (A)

Milford (DET-4)
Sink, W. C. (A)
Stark, M. K. (M)
Talaski, C. E. (M)

Monroe (DET-4)
Stearns, G. D. (A)

Montague (W-MIC-4)
MacDonald, B. I. (M)

Morenci (W-MIC-4)
Cottrell, M. (M)

Mount Clemens (DET-4)
Baker, J. T. (A)
Brunals, E. G. (A)
Burrows, R. M., Jr. (M)
Child, R. W. (M)
Christman, C. J. (M)
Donovan, M. A., Jr. (A)
Hunter, J. S., Jr. (A)
Lewis, P. L. (A)
MacMillan, R. C. (M)
Miller, C. E. (M)
Morrison, D. O. (SM)
Pfannkuche, T. E. (M)

Muskegon (W-MIC-4)
Castenholz, F. E. (SM)
Czerniak, J. L. (A)
De Vries, D. H. (M)
Hammer, R. V. (M)
McElvee, W. W. (M)
Rickels, H. E. (A)
Saums, H. L. (A)
Schecter, C. W., Sr. (A)
Tsaggaris, J. N. (M)

Negaunee (MIL-5)
Sauer, G. R. (M)

New Boston (DET-4)
Niswonger, B., Jr. (A)

Niles (SB-M-5)
Corey, F. B. (A)
Cusick, D. H. (M)
Diehl, J. G. (M)
Kennedy, R. L. (A)
Miller, J. M., Jr. (SM)
Pawlowski, R. J. (A)
Ramsey, R. C. (M)
Wiggins, A. M. (SM)
Wise, O. R. (A)

Northville (DET-4)
Thomas, B. M. (A)
Young, A. E. (SM)

Oak Park (DET-4)
Antoniou, M. I. (M)
Barcus, R. (M)
Breiksa, I. P. (M)
Burr, J. A. (M)
Hutchinson, R. W. (M)
Le Barre, S. D. (M)
Nichols, A. C. (M)
Soerber, W. (M)
Theodoroff, T. J. (A)
Warnick, A. (M)
Zimmerman, W. A. (M)

Orchard Lake (DET-4)
Gibbs, D. E. (A)

Oscoda (DET-4)
McMurdie, T. E. (A)
Nusbaum, R. E. (M)

Petoskey (DET-4)
Homiman, N. L. (M)
Vargo, R. J. (A)

Pleasant Ridge (DET-4)
Leland, R. D. (M)

Plymouth (DET-4)
Amick, R. H. (A)
Armstrong, R. H. (M)
Baumgartner, W. H. (M)
Griggs, J. O., Jr. (M)
Smith, E. H. (M)
Yakas, J. (M)

Pontiac (DET-4)
Anderson, T. V. (A)
De Haan, R. F. (M)
Fisher, M. R., Jr. (M)
Lawrence, B. T. (A)
McCall, W. A. (M)
Sanders, W. J. (A)
Smith, L. G., Jr. (A)
Wilcox, L. L. (M)

Presque Isle (DET-4)
Wesser, C. H. (SM)

Pullman (W-MIC-4)
Robinson, G. D. (M)

Ravenna (W-MIC-4)
Korson, A. W. (A)

River Rouge (DET-4)
Shepley, L. (A)

Rives Junction (DET-4)
Monroe, D. G. (M)

Rochester (DET-4)
Albert, A. H. (M)
Allured, R. B. (SM)
Collier, A. F. (A)
Hart, D. E. (M)
Joupol, A. (A)
Kublak, T. H. (A)
McKenney, H. F. (SM)
Onla, J. (M)
Ostrander, L. V., Jr. (M)
Oxford, C. J., Jr. (M)
Ranke, E. K. (M)
Shott, A. J. (M)
Wantzala, G. E. (M)

Romeo (DET-4)
Smith, A. M. (M)
Turrell, P. T. (M)

Roscommon (DET-4)
Klemetti, R. O. (A)

Roseville (DET-4)
Bartell, V. T. (M)
Cumeralto, Q. C. (M)
Hughes, R. M. (M)
Meltvedt, H. (M)

Royal Oak (DET-4)
Allwine, H. S. (A)
Ansorge, H. W. (M)
Badger, A. H. (A)
Barber, L. E. (M)
Beck, E. R. (A)
Berg, R. E., Jr. (A)
Boyd, D. R. (A)
Brown, L. R. (A)
Buttery, R. N. (A)
Chadwick, R. T. (M)
Chapelle, W. E. (M)
Chiavarini, E. W. (M)
Edwards, C. M. (SM)
Grundberg, R. K. (A)
Hanysz, E. A. (M)
Johnson, A. C. (M)
Johnson, E. C., Jr. (SM)
Kubota, J. (M)
Larime, L. H. (SM)
Lukawski, E. L. (M)
Mackenzie, W. G. (A)
Neu, J. D. (A)
Patrick, J. L. (M)
Phillips, W. E. (M)
Ray, W. S. (M)
Reinhold, H. W. (M)
Robinson, D. F. (M)
Robinson, R. P. (A)
Satullo, A. R. (M)
Schlorff, R. F. (M)
Schmid, F. L. (M)
Schooley, M. H. (A)
Schroer, R. B. (A)
Solley, S. W. (A)
Tuksal, M. A. (M)
Troll, W. C. (A)
Walker, J. C. (M)
Wilmot, W. R. (M)

MICHIGAN

Saginaw (DET-4)
Loucks, J. W. (A)
McKittrick, T. R. (M)
Rigda, G. (A)
Wagenseller, G. W. (A)

St. Clair Shores (DET-4)
Adkins, H. T. (SM)
Antzack, T. G. (M)
Brauning, T. W. (M)
Jones, H. E. (M)
Membery, A. H. (A)
Salomone, S. M. (M)
Stevens, J. E. (M)
Weagel, K. D. (A)
Wooster, A. F. (M)

St. Joseph (SB-M-5)
Moore, D. G. (SM)
Phillips, G. D. (M)
Ramer, J. S. (M)
Rankin, J. A. (SM)
Robertson, C. A. (M)
Schaefer, D. E. (A)
Wennerberg, A. L. (M)
Wilson, D. L. (M)

Saline (DET-4)
Brace, L. H. (A)
Lawrence, W. H. (M)

Sault Ste. Marie (MIL-5)
Achard, F. H., Jr. (M)
Klingler, R. R. (M)
McPherson, R. T. (A)

Selfridge AFB (DET-4)
Clarkson, H. E., Jr. (M)
Hirvela, R. J. (M)
Thompson, R. B. (M)

Spalding (MIL-5)
Johnson, H. W. (M)

Spring Lake (W-MIC-4)
Miller, K. W. (M)

Stevensville (SB-M-5)
Capes, B. U. (A)
Gardner, E. E. (M)
Hammond, R. J. (M)

Taylor (DET-4)
Liskiewicz, W. T. (M)
Zacharopoulos, G. (A)

Three Oaks (S-BM-5)
Snyder, D. R. (A)

Three Rivers (FT-W-5)
Perkins, M. L. (VA)
Fife, R. D. (M)
Fife, G. E., Jr. (M)

Traverse City (W-MIC-4)
Biederman, L. M. (M)
Harwood, F. E. (M)
Hoogesteger, J. R. (M)
Krug, E. G. (M)
Petritz, G. K. (A)

Trenton (DET-4)
Buehler, F. A. (M)
Mills, G. L. (A)
Thornton, C. H. (A)

Troy (DET-4)
Lindberg, E. E. (A)

Utica (DET-4)
Boucher, A. L. (M)
Calabro, A. D. (M)
Green, H. V. (A)
Hollak, A. F. (A)
McDermott, J. P. (M)
Payne, G. J. (M)
Pulliam, P. E. (M)
Rossman, J. E. (A)
Swartz, E. E. (A)
Vachon, R. J. (M)

Vermontville (W-MIC-4)
Moehring, W. D. (M)

Walled Lake (DET-4)
Belprez, G. R. (M)
Ganschow, D. C. (SM)
Hart, A. D. (M)

Warren (DET-4)
Burley, H. A. (M)
Craig, J. P. (M)
Habolan, P. (A)
Heinrich, B. F. (M)
Kucera, D. G. (A)
Lisiecki, M. (A)
Marshall, J. (A)
McKee, J. M. (M)
Petto, R. A. (M)
Poswiatowski, W. C. (A)
Schwartz, R. E. (M)
Varner, D. S. (M)
Zukowski, J. A. (M)

Watervliet (SB-M-5)
Fuller, G. L. (A)

Wayne (DET-4)
Haddad, M. T. (M)
Hoft, R. A. (A)
Looser, J. A. (A)
Mann, D. W. (M)
Miller, H. (A)
Tackett, R. W. (M)

Welston (DET-4)
Thunder, L. C. (M)

Whitmore Lake (DET-4)
Pedewitls, N. R. (A)

Wyandotte (DET-4)
Blowers, R. C. (A)
Foulkrod, R., Jr. (M)
Kraft, G. R. (A)
Moore, J. B. (VA)
Wesser, C., Jr. (A)

Ypsilanti (DET-4)
Amble, H. A., Jr. (M)
Augustus, L. M. (M)
Birdsall, T. G. (M)
Blikken, W. A. (M)
Breymaier, R. W. (M)
Doll, R. E. (M)
Douglas, W. J. (M)
Early, C. D. (M)
Evans, H. L. (A)
Harbaugh, R. D. (M)
Harding, W. G. (M)
Hoagbin, J. E. (M)
Keyser, R. W. (M)
King, L. G. (A)
Kroll, R. T. (A)
Larrowe, B. T. (M)
Lawson, A. C., Jr. (A)
Maes, R. E., Jr. (M)
Morita, Y. (M)
Ohlsson, R. L. (M)
O'Neill, J. E. (M)
Rudoloh, I. W. (A)
Sherman, H. W. (M)
Smith, D. F. (A)
Smith, N. (F)
Smith, W. (M)
Stewart, M. J. (A)
Van Valkenburg, E. S. (SM)
Weinert, B. R. (M)
Wheatley, W. A. (M)
Wilcox, G. A (A)
Williams, R. O. (SM)
Wooley, G. J. (A)
Yeh, C. (SM)

MINNESOTA

Anoka (TC-5)
Collier, C. X. M. (VA)
Hornsby, J., Jr. (M)
Kimberly, H. D. (M)
Longfellow, R. C. (SM)

Austin (TC-5)
Holan, J. L. (A)

Baudette (TC-5)
Bell, B. A. (M)

Bloomington (TC-5)
Martin, A. L., Jr. (A)
Meyer, B. L. (M)

Cold Spring (TC-5)
Weber, K. C. (A)

Columbia Heights (TC-5)
Baker, G., Jr. (A)

Coon Rapids (TC-5)
Kittridge, C. E. (M)
Smersh, C. K., Jr. (A)
Wyllie, C. E. (M)

Duluth (TC-5)
Affrontl, A. P. (M)
Dettman, R. A. (A)
Domchick, S. J. (M)
Hall, R. P. (M)
Moore, H. I. (M)
Stackhouse, A. (M)
Weed, J. R. (A)
Wilz, J. P. (A)

East Grand Forks (TC-5)
Yaeger, E. C. (A)

Edina (TC-5)
Carlson, K. J. (M)

Ely (TC-5)
Persons, C. B. (SM)

Excelsior (TC-5)
Maass, C. A. J. (A)
Pappas, P. E. (SM)
Pree, W. G. (SM)

Falcon Heights (TC-5)
Foeste, W. E. (SM)

Faribault (TC-5)
Folson, D. E. (M)

Fergus Falls (TC-5)
Nesting, J. W. (A)

Forest Lake (TC-5)
Bolengaugh, J. E. (M)

Glen Lake (TC-5)
Blitz, F. J. (M)

Grand Rapids (TC-5)
Erickson, E. A. (M)
Hastings (TC-5)
Karpen, R. L. (M)

Hopkins (TC-5)
Aske, V. H. (M)
Bearinger, V. W. (A)
Blakemore, J. S. (SM)
Boyle, R. J. (M)
Johnson, R. G. (M)
Larsen, F. J. (SM)
McWilliams, R. R. (M)
Motchenbacher, C. D. (M)
Nichols, R. F. (M)
Nussbaum, A. (A)
Palmer, D. R. (M)
Sauck, G. L. (M)
Stuetzer, O. M. (SM)
Trent, J. E. (M)

Isle (TC-5)
Scherf, A. L. (M)

Lake Wilson (TC-5)
Sraders, G. (M)

Mankato (TC-5)
Lease, L. R. (M)

Marshall (TC-5)
Ahmann, R. M. (A)

Minneapolis (TC-5)
Adams, G. E. (SM)
Alderson, R. C. (M)
Alterman, F. J. (M)
Anderson, D. E. (M)
Anderson, E. M. (A)
Anderson, G. P. (M)
Anderson, L. I. (A)
Anderson, L. T. (M)
Anderson, P. M. (M)
Anderson, R. E. (M)
Andrs, W. L. (M)
Arnold, D. E. (M)
Baker, H. E. (M)
Bakken, E. E. (M)
Baldwin, J. M. (SM)
Baller, H. (SM)
Bergan, K. N. (SM)
Blist, R. P. (M)
Boatman, L. R. (M)
Bell, H. J. (M)
Bolmgren, L. N. (M)
Bonde, R. L. (M)
Bonrud, L. O. (M)
Borth, J. W. (M)
Branstad, D. H. (M)
Brekhus, E. H. (A)
Buettner, H. L. (M)
Bukosky, J. R. (A)
Burrell, W. P. (M)
Buss, J. L. (M)
Callen, M. W. (M)
Cartwright, P. A. (M)
Casale, C. T., II (M)
Casey, T. J. (M)
Champlin, K. S. (M)
Christensen, V. E. (A)
Churchill, R. W. (M)
Clark, N., Jr. (M)
Clifford, D. E. (M)
Coffin, W. R. (M)
Cohen, A. (SM)
Corbett, J. A. (M)
Cray, S. R. (M)
Croze, M. W. (M)
Davis, W. W. (M)
Des Lauriers, E. D. (A)
Disser, C. J. (M)
Donahue, C. D. (A)
Dorosh, M. (A)
Dubbe, R. F. (M)
Dundovic, J. F. (M)
Ebert, R. F. (M)
Eglite, J. A. (M)
Eller, A. H. (M)
Engelman, C. W. (M)
Englund, R. M. (M)
Ewing, R. D. (SM)
Featherstone, R. P. (M)
Field, B. W. (A)
Fink, J. S. (M)
Flaskerud, K. A. (A)
Flumerfelt, R. L. (A)
Fong, I. J. (M)
Fosseen, I. J. (M)
Frazier, H. N. (M)
Gannett, A. C. (A)
Gaughran, G. W. (M)
Gergen, J. L. (M)
Gise, F. G., Jr. (A)
Grabowski, J. H. (A)
Granberg, M. L. (M)
Grashorn, G. N. (M)
Green, S. S. (M)
Gridley, D. H. (M)
Griffith, E. S. (M)
Grindheim, E. A. (M)
Grosz, W. S. (M)
Gustafson, H. A. (M)
Gutman, D. C. (M)
Halland, L. J. (A)
Hamel, G. E. (A)
Hansen, G. F. (A)
Harding, E. W. (M)
Harrington, D. C. (M)
Hartig, H. E. (F)
Harvey, P. O. (M)
Hasby, B. V. (M)
Headen, H. V. (M)
Heer, W. G. (M)
Hill, B. M. (A)
Hill, E. L. (SM)
Hinz, D. I. (SM)
Hird, F. S. (SM)
Hogle, W. I. (M)
House, E. A. (M)
Hutton, W. I. (SM)
Ingvaldsen, R. E. (A)
Jacobsen, E. L. (M)
Johnson, G. H. (M)
Johnson, J. N. (M)
Johnson, K. R. (M)
Johnson, R. E. (M)
Johnson, R. R. (A)
Johnson, W. R. (M)
Kalb, R. M. (SM)
Kanda, A. F. (M)
Kelar, J. (SM)
Kellough, S. H. (M)
Kennedy, E. J. (M)
Kershaw, J. A. (M)
Ketchum, J. R. (M)
Kiene, R. C. (M)
Kinsman, R. B. (M)
Krantz, K. B. (A)
Kries, A. R. (A)
Kubicek, W. G. (M)
Kuhlmey, E. S. (M)
Laegreid, N. (A)
Laitinen, W. R. (M)
Lambert, R. F. (M)
Lamm, J. L. (M)
Langlie, L. O. (M)
Lasarsky, S. G. (M)
Lehnert, W. E. (M)
Limberg, A. C. (M)
Lindberg, D. W. (A)
Lindemann, W. W. (M)
Lisowski, J. R. (M)
Lockwood, R. L. (M)
Lode, T. (M)
Lorenz, R. (A)
Ludwig, J. T. (A)
Luh, J. Y. S. (A)
Lundahl, W. N. (M)
Lundstrom, D. E. (M)
Lundy, P. E. (M)
Lutz, B. C. (M)
Malcolm, D. H. (M)
Maloney, P. G. (M)
Markusen, D. L. (M)
Marshall, J. F. (M)
Martin, R. T. (M)
Matthys, R. J. (A)
McCabe, F. C. (M)
McElroy, W. J. (M)
McGinnis, W. J. (M)
McKinney, J. W. (A)
Mellon, G. E. (A)
Miller, F. V. (M)
Moe, W. B. (M)
Mogen, D. C. (M)
Moore, A. R. (M)
Morrish, A. H. (SM)
Muckenhim, O. W. (SM)
Nelson, E. J. (M)
Nelson, R. H. (M)
Nelson, W. G. (M)
Newman, M. M. (M)
Nordloef, A. E. (M)
Nordstrom, J. E. (A)
Norman, J. C. (M)
Nunn, E. C. (M)
Nygard, C. A. (A)
O'Brien, H. G. (A)
Olson, K. A. (M)
Orenstein, E. D. (M)
Ormsby, R. D. (A)
Ostberg, E. H. (M)
Ott, J. T. (A)
Park, G. L. (M)
Patch, R. J. (M)
Pedersen, I. C. (SM)
Pence, C. J. (M)
Perchshyn, E. S. (M)
Pernula, M. J. (A)
Persson, E. K. (M)
Peterson, C. K. (M)
Pettigrew, J. L. (M)
Phelps, B. (A)
Pidcock, R. E. (M)
Pierce, W. R. (A)
Poole, J. A. (M)
Premack, J. (M)
Pribble, J. D. (M)
Priebe, N. F. (M)
Prince, J. P. (M)
Prom, G. J. (M)
Quinn, R. D. (M)
Raasch, F. D. (SM)
Randall, R. H. (M)
Rebne, H. K. (M)
Reiher, D. C. (M)
Reinke, J. A. (M)
Reinke, R. F. (M)
Renk, B. J. (M)
Reuvi, J. S. (M)
Rittman, W. R. (M)
Rohner, T. G. (A)
Rue, K. M. (A)
Runkle, L. D. (M)
Sadler, B. L. (M)
Saprasa, A. G. (M)
Schaumberg, W. H. (M)
Schiebe, F. R. (M)
Schindler, R. P. (M)
Schmitt, O. H. (F)
Schott, O. A. (M)
Schuck, O. H. (F)
Schulz, D. G. (M)
Schulz, S. W. (M)
Sells, H. A. (M)
Sell, R. L. (SM)
Senstad, P. D. (M)
Shabatura, D. P. (M)
Sharp, J. C. (M)
Shepherd, W. G. (F)
Sheppard, H. F., Jr. (M)
Sherman, J. M. (SM)
Shoquist, M. C. (M)
Smith, A. J., Jr. (M)
Spencer, W. H. (M)
Sprecher, N. D. (M)
Stankosky, J. J. (M)
Steele, T. S. (M)
Stone, N. T. (M)
Storm, J. F. (M)
Swanlund, G. D. (M)
Swanson, L. F. (M)
Talarczyk, A. R. (A)
Thomas, N. L. (M)
Thompson, V. L. (A)
T'Kach, H. V. (M)
Tobin, R. D., Jr. (M)
Toth, D. H. (M)
Trimmer, J. P. (M)
Tsui, Y. T. (A)
Tuma, J. C. (M)
Valenty, G. E. (M)
Valo, H. L. (A)
Van Der Zlel, A. (F)
Venne, R. E. (A)
Volk, H. M. (M)
Warhol, N. (M)
Weber, R. G. (A)
Wehner, G. K. (M)
Weiner, P. J. (M)
Werner, W. (A)
Weyrauch, H. E. (M)
Wicks, A. A. (M)
Williams, G. I. (M)
Wilson, W. R. (M)
Wolf, P. I. (A)
Woll, L. J. (M)
Zimmer, E. D. (M)
Zimmerman, A. J. (M)
Zimmerman, S. L. (A)
Zirkle, R. E., Jr. (A)
Zmeskal, A. (SM)

New Brighton (TC-5)
Bulleyment, K. J. (M)
Halverson, R. P. (M)
Karsten, J. P. (A)
Lind, A. L. (M)
Olsen, M. R. (M)
Palo, A. M. (M)
Petersen, J. F. (M)
Schwanles, R. C. (M)

Northfield (TC-5)
Jensen, M. C. (M)
Rossing, T. D. (SM)

North St. Paul (TC-5)
Erpelding, K. T. (M)
Hill, J. L. (M)

Osseo (TC-5)
Fay, T. E. (M)

Owatonna (TC-5)
Eccles, W. J. (M)

Princeton (TC-5)
Sanford, D. C. (M)

Red Wing (TC-5)
Jelatis, D. G. (M)
Lee, G. M. (M)
Ricketi, R. J. (M)

Richfield (TC-5)
Barbour, R. E. (A)
Carlson, R. A. (M)
Doherty, R. P. (M)
Vint, J. L. (A)

Rochester (TC-5)
Anderson, J. A. (M)
Brown, L. M. (M)
Cain, J. C. (A)
Casanova, W. J. (M)
Cross, R. W. (A)
Floyd, R. A., Jr. (M)
Gmeiner, P. (M)
Herrick, J. F. (M)
Isaacson, J. (M)
Jacobsen, H. J. (M)
Jenkins, K. W. (M)
Jones, R. E. (SM)
McCarthy, C. E. (SM)
Sanders, J. J. (A)
Shaw, D. G. (M)
Stoltenberg, K. D. (A)
Zandall, R. R. (A)

Rosemount (TC-5)
Chiswell, E. (M)
Geronime, R. L. (A)

St. Louis Park (TC-5)
Miller, C. B. (A)

St. Paul (TC-5)
Alman, J. (M)
Alton, J. M. (A)
Anderson, S. E. (M)
Arndt, R. B. (M)
Baldy, G. A. (M)
Barnes, J. C. (SM)
Bartlett, V. W. (A)
Baumann, G. M. (M)
Beck, V. W. (M)

Beckler, H. E. (M)
Beltz, C. A. (M)
Benassi, D. A. (M)
Block, E. J. (M)
Bookin, M. L. (M)
Bowar, R. L. (M)
Bratschi, R. W. (M)
Bronkala, H. J. (A)
Brown, J. L. (M)
Brunker, L. A. (M)
Buchanan, K. J. (A)
Campbell, H. S. (M)
Campbell, R. N. (M)
Chapin, G. G. (M)
Christpau, M. A. (A)
Christman, R. D. (M)
Christofferson, A., Jr. (M)
Coil, N. B. (SM)
Compton, C. G. (M)
Coon, R. R. (M)
Cooper, C. E. (M)
Deeb, E. P. (M)
De Vir, J. F. (A)
Dubbel, W. C. (A)
Dyal, J. O., Jr. (A)
Edam, D. M. (M)
Edblund, A. J. (A)
Engel, E. (M)
Erickson, R. S. (M)
Erickson, V. M. (M)
Ess, A. J. (M)
Eulberg, R. J. (SM)
Fishburn, H. R. (M)
Foreman, J. J. (M)
Fultwiler, F. K. (M)
Gadler, S. J. (SM)
Gehring, R. D. (M)
Gille, W. H. (SM)
Gist, W. W. (M)
Glenwee, C. W. (M)
Glick, A. D. (M)
Gustafson, T. L. (M)
Hanson, G. N. (M)
Harrington, D. A. (M)
Hartman, J. C. (M)
Haselhorst D. D. (M)
Hass, E. G. (A)
Hawley, C. L., Jr. (M)
Hendry, A. J. (M)
Herfeld, V. E. (A)
Hildyard, V. G. (A)
Hill, B. F. (M)
Hoglund, K. M. (M)
Holdsway, D. R. (M)
Hough, W. E. (M)
Jallen, G. A. (A)
Jensen, W. (M)
Jestice, A. L. (A)
Johnson, C. A. (M)
Kahnke, J. (M)
Kaszynski, A. Z. (M)
Keating, D. J. (M)
Keefer, D. E. (M)
Keel, B. G. (M)
Kelsey, J. R. (A)
Khambata, A. J. (A)
Kidder, H. F. (M)
Kimlinger, J. A. (A)
Kissling, R. T. (A)
Kleason, D. B. (M)
Kliewer, D. L. (A)
Knoblauch, A., Jr. (M)
Knox, W. B. (M)
Koenig, J. D. (M)
Kolbert, D. E. (M)
Kolling, J. A. (M)
Kovachik, E. (A)
Krauser, J. L. (M)
Kucera, F. M. (A)
Kuller, L. (M)
Kukuk, H. S. (M)
Lahue, P. M. (M)
Larson, J. A. (A)
Lee, M. E. (M)
Linsley, S. E. (M)
Macaulay, M. (A)
Malone, R. J. (M)
Marble, J. E. (M)
Marks, H. L. (A)
Mayo, P. M. (M)
Maze, R. O. (M)
McDonald, R. E. (M)
McLane, R. C. (M)
McMahon, R. F. (M)
McNaughton, R. J. (M)
Mellus, F. G. (M)
Miller, L. B. (A)
Moe, W. J. (M)
Moen, J. W. (M)
Moerke, R. W. (M)
Mulholland, K. H. (M)
Mullaney, F. C. (SM)
Murray, D. A. (M)
Navoichick, C. (M)
Neese, J. L. (M)
Nellis, W. M. (M)
Neumann, W. J. (M)
Oen, J. A. (A)
Oman, R. M. (A)
Osofsky, H. (M)
Overas, R. E. (M)
Overdier, D. F. (M)
Pallas, C. E. (M)
Paluka, C. F. (SM)
Paup, R. E. (M)
Pearson, R. P. (A)
Peterson, L. E. (M)
Peterson, N. C. (M)
Pierce, A. J. (M)
Poveda, H. (A)
Raabe, H. P. (SM)
Robinson, C. J. (M)
Robinson, T. O. (M)
Roble, A. R. (M)
Rogers, J. R. (SM)
Rolfs, J. R. (M)
Rowan, T. D., Jr. (M)
Rowland, C. A., Jr. (M)
Sabine, L. E. (M)
Sanders, R. M. (M)
Sandstrom, D. L. (M)
Schellenberg, A. G. (M)
Shekels, H. D. (SM)
Smythe, G. R. (M)
Somermeyer, H. F. (M)
Stahmann, J. R. (M)
Strand, H. D. (M)
Swyryd, M. (A)
Thews, R. F. (M)
Tu, J. C. (M)
Tufte, R. C. (A)
Turnquist, R. D. (M)
Vido, E. F., Jr. (M)
Vogel, J. P. (M)
Von Behren, R. A. (M)
Wells, W. S. (M)
Wesman, C. (M)
Wesslund, R. E. (M)
Wiedman, R. E. (M)
Wiles, J. K. (M)
Williamson, W. R. (M)
Wilson, D. L. (M)
Winget, W. F. (M)
Wolfe, E. K., Jr. (M)
Wychor, W. (A)
Youngquist, R. J. (M)
Zuercher, D. H. (A)

St. Paul Park (TC-5)
Brackett, C. R. (M)

Savage (TC-5)
Pearsall, P. J. (M)

Scandia (TC-5)
Nelson, H. E. (M)

Wadena (TC-5)
Denyer, D. B. (M)

Waseca (TC-5)
Bruring, W. E. (M)
Hager, F. M., Jr. (SM)
Johnson, E. F. (M)
Kozan, F. J. (A)

Wayzata (TC-5)
Johnson, L. E. (M)
Larson, V. D. (M)
Mooers, H. T. (SM)
Neveaux, R. J. (M)
Thompson, R. H. (M)
Wagner, F. C. (M)
Young, S. B. (VA)

West St. Paul (TC-5)
Engelhardt, R. R. (A)

White Bear Lake (TC-5)
Chapek, H. T. (M)
Crampton, W. M. (M)
Edstrom, C. A. (A)
Enyeart, T. L. (A)
Morse, D. C., Jr. (M)
Pool, K. C. (M)

Winona (TC-5)
Chisholm, R. G. (SM)

MISSISSIPPI

Baldwyn (HUN-M-3)
Williams, T. J. (M)

Bay Springs (NO-6)
Fleming, B. R. (M)

Biloxi (NO-6)
Davison, R. E. (A)
Dove, R. L. (A)
Ellmer, P. J. (M)
Funk, J. W. (A)
Glowa, D. S. (M)
Jackson, L. J. (M)
Johnson, P. B. (M)
Shoemaker, W. J. (A)
Van Loon, R. M. (A)
Vaughan, D. G. (A)

Columbus (HUN-3)
Stewart, D. E. (M)

Corinth (HUN-M-3)
Holman, H. E. (A)
Propp, R. R. (M)

Crystal Springs (NO-6)
Burleson, C. T. (M)
Forehand, R. R. (A)
Lyon, W. T. (M)
Osgood, R. C. (M)

Ethel (HUN-3)
Kimbrough, W. R. (A)

Greenwood (HUN-3)
Johnson, H., Jr. (M)

Grenada (HUN-3)
Nail, W. L., Jr. (M)

Gulfport (NO-6)
Rebenstorff, C. A. (M)
Wallis, J. C. (M)

Hattiesburg (NO-6)
McDaniel, E. A. (M)
McLemore, B. B. (M)
Watson, J. N. (M)

Hollandale (HUN-3)
Andrews, W. R. (M)
Thomas, E. C. (M)

Holly Springs (HUN-M-3)
Lollar, H. C. (M)
Vizzler, B. A. (M)

Jackson (NO-6)
Bates, F. E. (M)
Courtenay, J. A. (SM)
Harper, A. Y. (M)
Hussar, G. (A)

Keesler AFB (NO-6)
Miles, V. J., Jr. (M)
Polk, I. D. (M)

Laurel (NO-6)
Wright, W. W., Jr. (M)

Long Beach (NO-6)
Patton, F. T. (M)

Mississippi City (NO-6)
Rasche, D. O. (M)
Roemer, J. S. (M)

Natchez, (NO-6)
Bowers, D. E. (M)

Ocean Springs (NO-6)
Otis, G. E. (A)

Pass Christian (NO-6)
Helwick, B. A. (A)

Quitman (NO-6)
McKay, R. A. (M)

Saltillo (HUN-M-3)
Peach, S. E. (M)

Starkville (HUN-3)
Guyton, R. D. (M)

State College (HUN-3)
Ball, B. J. (M)
Fitzgerald, D. F. (M)
Hight, H. H. (M)
McCown, H. H. (A)
Murray, M. P. (M)
Roberts, G. E. (M)
Simmons, R. F. (M)
Sinrall, H. C. (SM)
Woods, H. G. (M)

University (HUN-M-3)
Cullen, A. B., Jr. (A)
Herring, R. A., Jr. (M)

Vicksburg (NO-6)
Hanes, F. P. (M)
Smollen, J. W., III (M)

MISSOURI

Afton (SL-6)
Brickler, J. B. (M)
Fuerst, R. J. (M)
Nurre, H. H. Jr. (M)
Shilling, G. K. (M)
Wulfmeyer, J. A. (SM)

Altenburg (SL-6)
Fischer, F. E. (M)

Belton (KC-6)
Brownfield, A. W. (A)
Hopp, H. W. (M)
Howard, R. M. (A)
Schmitendorf, J. A. (M)
Schulz, R. H. (M)
Verploegen, A. W. (A)

Berkeley (SL-6)
Anderson, K. M. (A)
Crowe, E. W. (A)
Esker, A. T. (M)
Vaughn, J. E. (A)

Blue Springs (KC-6)
Dreisoerner, D. A. (A)

Boonville (KC-6)
Lang, R. H. (A)

Brentwood (SL-6)
Brodkowicz, J. S. (M)
Droege, R. F. (A)
Gillerman, L. (M)
Gosselin, B. G. (A)
Hegner, H. R. (M)
Johnson, A. B. (A)
Kuhlman, E. A. (A)
Luedde, W. J. (A)
Wiese, A. H. (M)

Bridgeton (SL-6)
Hall, R. S. (M)
Liuzza, V. (A)

Brunswick (SL-6)
Mason, D. E. (M)

Cape Girardeau (SL-6)
Brennan, R. D. (M)
Hawkins, D. L. (M)
Hirsch, O. C. (M)
Hirsch, R. D. (M)
Poe, H. E. (A)
Walter, D. R. (M)

Carthage (KC-6)
Carter, C. R. Jr. (M)

Chesterfield (SL-6)
Marble, T. F. (M)

Clayton (SL-6)
Esterson, G. L. (M)
Fiedler, G. J. (SM)
Frager, A. M. (A)
Gildenberg, D. I. (M)

Clinton (KC-6)
Underwood, S. W. (A)

Columbia (SL-6)
Benninghield, L. M. (A)
Hogan, J. C. (M)
Lago, G. V. (M)
Lamb, J. F. (M)
Randall, J. E. (M)
Tudor, J. R. (M)
Waldelich, D. L. (F)
Wallis, C. M. (SM)

Concordia (KC-6)
Pape, R. L. (M)

Crestwood (SL-6)
Boman, W. T. Jr. (M)
Ebert, W. J. Jr. (M)

Creve Coeur (SL-6)
Andersen, A. R. (A)
Downing, T. S. (M)
Hemler, C. E. (M)
Hiestand, D. W. (M)
Miller, R. A. (M)

Deerborn (KC-6)
Boydston, M. C. (A)

Deepwater (KC-6)
Shaffner, L. D. (A)

Des Peres (SL-6)
Clayton, G. H. (A)

Doniphan (SL-6)
Rice, G. M. (M)

Ferguson (SL-6)
Anderson, R. C. (M)
Cave, J. H. (A)
Davis, R. T., Jr. (M)
Harward, J. E. (M)
Henderson, H. W. (M)
Hobbs, E. W. (SM)
Miller, G. L. (M)
Reed, D. L. (M)
Reiser, W. (A)
Rekart, A. F. (VA)
Schultz, R. E. (M)
Sudfeld, C. C. (M)
Wolf, C. P. (M)

Flat River (SL-6)
Smith, T. C. (M)

Florissant (SL-6)
Bell, J. H. (A)
Bott, M. E. (M)
Burnett, N. C. (A)
Cherer, M. J. Jr. (M)
Clemens, J. F. (SM)
Doll, J. W. (M)
Du Charme, M. D. (M)
Estes, B. H. (M)
Fiedler, R. A. (A)
Fenton, R. J. (A)
Gardner, B. H. (M)
Graves, G. L. (M)
Grubbs, W. H. (A)
Hamilton, R. H. (A)
Haselwood, S. (M)
Hinrichs, C. A. (M)
Houston, W. C. (M)
Jugend, H. E. (M)
Klein, E. J. Jr. (M)
Kouba, E. R. Jr. (M)
Lundberg, B. E. (M)
Mackin, R. J. (M)
Payne, J. E. (M)
Pyle, H. S. (A)
Rowton, E. E. (M)
Russell, N. E. (SM)
Schaible, A. V. (M)
Schulze, G. H. (M)
Smith, D. E. (M)
Spillman, R. M. Jr. (M)
Twombly, J. W. Jr. (M)
Vicedomine, D. A. (M)
Vieth, R. V. (M)
Willard, B. A. (A)
Withington, J. G. (M)
Yarian, E. L. (A)
Zurbriggen, J. H. (M)

Fulton (SL-6)
Nickles, R. W. (M)

Glascow Village (SL-6)
Longshore, J. F. (M)

Glendale (SL-6)
Malsbary, J. S. (M)
Rustemeyer, G. L. (A)

Grandview (KC-6)
Bahm, D. H. (M)
Damon, F. A. (A)
Froggo, W. F. (A)
Gallagher, D. M. (SM)
Heartz, L. C. (M)
Schlesselman, L. A. (A)
Stone, D. W. (M)
Ware, J. F. (M)

Greenfield (KC-6)
Brooking, C. P. (M)

Hamilton (KC-6)
Perkins, W. E. (M)

Hazelwood (SL-6)
Fish, G. D. (M)
Hentges, V. W. (M)
Meyer, R. L. (M)
Nesheim, W. L. (M)

Hickman Mills (KC-6)
Hailey, W. (M)
Long, E. D. (M)
Mason, R. E. (M)
May, R. C. (A)
Mayfield, B. D. (A)
McCallen, P. M. (SM)
Orr, R. E. (A)
Smith, F. M. (M)
Witte, W. E. (M)

Independence (KC-6)
Beebe, J. A. (M)
Benedict, K. D. (M)
Borgman, K. W. (A)
Canning, D. C. (A)
Denman, E. D. (M)
Forristal, J. A. (M)
Koontz, F. A. (M)
Leibold, F. H. (A)
McCall, E. A. (M)
McDole, M. M. (A)
Richey, J. O. (M)
Riegle, G. W. (A)
Vaughan, L. D. (A)
Willinger, K. G. (A)

Ironton (SL-6)
Sutton, D. A. (M)

Jefferson City (KC-6)
Belshe, R. D. (M)

Jennings (SL-6)
Litton, V. M. (A)

Kansas City (KC-6)
Anderson, R. W. (M)
Ashley, W. H. Jr. (M)
Barclay, J. C. (M)
Barman, J. E. Jr. (A)
Benzon, C. G. (M)
Bergren, A. L. (SM)
Berry, F. M. (M)
Bettis, M. E. (A)
Bland, F. K. (M)
Bossert, A. J. Jr. (M)
Boutros, O. L. (M)
Bower, W. M. (M)
Boyles, J. O. (M)
Brink, D. K. (M)
Brosky, K. T. (A)
Brumley, A. R. (M)
Butler, R. W. (SM)
Camden, K. E. (A)
Catalano, S. J. (M)
Chinn, F. T. (M)
Clarke, E. L. (A)
Clarke, R. L. (M)
Cleary, D. R. (M)
Collins, J. J. (M)
Constant, P. C. Jr. (SM)
Crissman, L. R. (M)
Davis, S. E. (A)
Day, D. H. (A)
Devine, W. F. (SM)
Dillon, R. B. (M)
Donovan, R. W. (M)
Easterday, M. R. (M)
Ellis, T. H. (A)
Epstein, S. (A)
Few, F. A. (M)
Finlay, R. S. (A)
Fitzgerald, J. A. (M)
Foster, C. L. (SM)
Fouts, A. L. (M)
Fry, L. D. (A)
Fry, W. E. (A)
Garrett, W. A. (A)
Gessley, D. (M)
Glass, A. H. (M)
Goldenberg, H. E. (M)
Gordon, J. M. (M)
Grimsley, J. E. (A)
Haefele, G. V. (A)
Hall, W. H. (M)
Harris, J. B. (M)
Hathhorn, W. R. (M)
Hearson, L. T. (A)
Heffelfinger, J. B. (SM)
Helsey, W. H. (A)
Heyde, H. C. (M)
Hoefer, J. J. (M)

MISSOURI

Hollister, B. L. (A)
Jensen, L. J. (A)
Johnson, D. W. (M)
Johnson, L. R. (M)
Jones, C. L. (A)
Jones, F. S. (M)
Jones, I. J. (M)
Jones, M. R. (SM)
Kaine, A. A. Jr. (M)
Karns, K. B. (M)
Kay, J. R. (A)
Kay, J. P. (A)
Keith, J. M. (A)
Kimball, C. N. (F)
Kirk, W. J. Jr. (M)
Kling, J. J. (SM)
Kolen, N. (A)
Kring, C. I. (M)
Lane, J. W. (A)
Lanier, W. T. (A)
Lemke, J. R. (M)
Lewis, W. R. (SM)
Loewer, H. C. (A)
Lutes, R. K. (M)
Lutz, J. W. (SM)
Mackie, S. P. (A)
Maricttl, A. L. (M)
Marks, W. A. (A)
Martin, E. J. Jr. (SM)
Martinez, J. (A)
Mayer, A. B. (A)
McAllister, M. J. (A)
McDowell, J. B. (A)
McKnight, H. P. (A)
Meador, B. M. (SM)
Meltzer, A. A. (M)
Miller, C. V. (M)
Modrcin, M. R. (A)
Moore, H. H. (M)
Morrow, R. S. (M)
Musburger, R. B. (A)
Nall, P. L. (M)
Neidenberger, T. A. (A)
Newton, K. V. (SM)
Newsham, N. G. (A)
Parks, J. V. (M)
Pascuzzi, C. A. (A)
Perkins, J. L. (A)
Peters, N. S. (M)
Porter, B. L. (A)
Ptacek, J. F. (M)
Redlingshafer, R. A. (A)
Rheaume, R. D. (M)
Rhodes, M. H. (M)
Rohs, A. H. (M)
Ross, F. C. Jr. (M)
Ruby, D. P. (M)
Runge, L. (M)
Salzer, C. E. (VA)
Schell, R. H. (A)
Schmidt, A. F. (M)
Schnakenberg, K. L. (A)
Schwerin, E. B. (SM)
Scott, C. H. (SM)
Scribner, N. (M)
Shapiro, E. (A)
Shontz, L. A. Jr. (SM)
Slusher, R. W. (A)
Smeltzer, V. J. (M)
Smith, C. B. (A)
Soldanels, R. M. (A)
Solomon, K. E. (A)
Somers, R. M. (SM)
Spies, F. A. (A)
Starlin, H. E. (A)
Stemer, W. J. (A)
Stone, J. B. (A)
Stout, H. L. (SM)
Stubbs, D. L. (M)
Swafford, J. H. (A)
Tomcak, J. F. (A)
Troeglen, K. (SM)
Uhrig, R. B. (M)
Van Gundy, C. G. (VA)
Vasen, G. (A)
Verhyden, L. C. (A)
Vilander, N. E. (M)
Waite, W. P. (M)
Watson, J. F. (M)
Welborn, D. L. (A)
Werner, W. T. (M)
White, J. D. Sr. (A)
White, R. N. (SM)
Wielenga, W. G. (M)
Wilcox, J. V. (SM)
Wolfskill, R. F. (SM)
Young, C. D. Jr. (M)

Kirkwood (SL-6)
Barnes, J. A. (M)
Binzel, M. S. (M)
Dubuque, T. J. (M)
Henrichs, M. W. (M)
Hermon, R. (M)
McAllister, J. C. (M)
Phillips, J. B. (A)
Risk, J. E. (M)
St. Vrain, W. E. (M)
Susek, J. F. Jr. (A)
Vamum, J. B. (M)
Vosburg, L. E. (SM)
Watson, G. A. (M)
Yount, T. L. (SM)

La Due (KC-6)
Zak, S. J. (SM)

La Grange (SL-6)
Hobbs, L. L. (M)

Lathrop (KC-6)
Austin, J. E. (M)

Lee's Summit (KC-6)
King, E. J. Jr. (SM)

Liberty (KC-6)
Hilton, W. A. (M)
Lovan, J. E. (M)
Roehrman, K. E. (M)

Macon (SL-6)
Rogers, H. D. (A)

Manchester (SL-6)
Keil, E. W. (A)

Maplewood (SL-6)
Fricke, L. H. Jr. (A)

Moberly (SL-6)
Stroup, R. E. (A)

Mosby (KC-6)
Plumlee, B. L. (A)

Moscow Mills (SL-6)
Humphrey, D. D. (M)

Neosho (KC-6)
Bolinger, N. C. (A)

Nevada (KC-6)
Linquist, G. A. (A)

North Kansas City (KC-6)
Bishop, W. T. (SM)
Tuttle, W. R., Jr. (A)

Normandy (SL-6)
Makela, L. V. (A)
Murty, E. H. (M)
Stephens, E. T. (A)
Volk, J. A. (SM)

Northwoods (SL-6)
Bossert, J. A. (A)
Ridings, R. V. (M)

Olivette (SL-6)
Schwarz, R. M. (SM)
Trugman, J. (M)

Overland (SL-6)
Iwan, R. D. (M)
Kubischta, P. B. (M)
Llenhard, O. W. (A)
Mosley, C. E. (SM)
Nordling, W. K. Jr. (M)
Schrimp, E. E. (A)

Parkville (KC-6)
Clark, W. B. (M)
Robertson, A. J. L. (M)

Parkwood (KC-6)
Herde, E. E. (A)

Perry (SL-6)
Davis, C. L. (SM)

Perryville (SL-6)
Short, L. E. (A)

Pine Lawn (SL-6)
Munson, R. D. (M)

Platte City (KC-6)
Hanson, D. K. (A)

Raytown (KC-6)
O'Neal, W. O. (M)
Repper, O. C. (M)

Richards-Gebaur AFB (KC-6)
Fernane, J. (SM)
Sneddon, J. H. (M)

Richmond (KC-6)
Basham, R. (M)

Richmond Heights (SL-6)
Cummings, G. M. (SM)
Harris, R. L. Jr. (M)
Lynch, F. R. (M)
Schmedel, J. H. (M)

Robertson (SL-6)
Kline, R. M. (M)

Rock Hill (SL-6)
Frazier, R. L. (M)
Pallozola, M. F. (A)
Wilson, L. V. (M)

Rolla (SL-6)
Bardon, D. G. (M)
Brown, P. O. (M)
Campbell, L. G. (M)
De Woody, R. T. (M)
Gooding, D. J. (M)
Mitchum, M. M. (M)
Nau, R. H. (SM)
Nolte, R. E. (SM)
Rivers, J. L. (A)
Skitek, G. G. (M)
Thompson, D. (M)
Tingley, F. T. (M)

St. Ann (SL-6)
Hall, J. T. (M)
Osha, C. K. (A)
Schepflin, D. J. (A)
Walsh, G. J. (M)

St. Charles (SL-6)
Benner, B. (SM)
Boschert, R. J. (M)
Bosworth, V. O. Jr. (A)
Bromberg, B. G. (SM)
Cotterman, J. D. (M)
Cross, G. E. (A)
Crow, R. K. (M)
Finke, H. G. (M)
Flickinger, P. R. (A)
Hannon, D. L. (M)
Hercules, F. P. (M)
Hommes, H. E. (M)
Metle, R. J. (M)
Roder, N. D. (M)
Wagner, F. R. (A)

St. John (SL-6)
Butler, J. G. Jr. (M)

St. Joseph (KC-6)
Carroll, J. C. (M)
Koelling, A. J. Jr. (M)
Lux, K. E. (A)
Moss, D. E. (A)
Simonds, R. L. (M)

St. Louis (SL-6)
Abkemeier, L. R. (M)
Adams, C. B. (A)
Appleton, E. R. (A)
Augustine, R. J. (M)
Auld, S. D. (M)
Aurin, R. N. (M)
Babka, F. J. (M)
Baker, C. E. (M)
Baxter, D. D. (M)
Beller, E. H. (A)
Bennetsen, W. J. (M)
Betzold, E. J. Jr. (M)
Beuc, R. Jr. (M)
Bitzer, R. J. (M)
Black, D. R. (M)
Brent, L. L. (SM)
Brnjac, J. B. (M)
Browde, A. (SM)
Brown, J. (M)
Bundschuh, W. A. (M)
Carlson, P. D. (M)
Cassidy, R. E. (M)
Cerles, R. E. (M)
Chambers, R. M. Jr. (M)
Chapin, M. F. (M)
Chenoweth, J. A. (M)
Clodfelter, G. C. (M)
Combs, J. F. (M)
Condon, E. U. (F)
Connell, J. B. (M)
Cornell, J. I. (SM)
Cox, J. R. Jr. (A)
Darwin, F. A. (SM)
Detchemendy, J. A. (M)
Deutschmann, F. C. (M)
Dicknelte, A. J. (A)
Dietrich, R. G. (M)
Dowdle, E. E. (M)
Dreifke, G. E. (M)
Duchek, H. W. (A)
Dusin, A. J. Jr. (M)
Elfhim, C. (M)
Ehlers, E. A. (M)
Ellis, G. A. (A)
Emmerich, C. M. (M)
Fahey, J. R. (M)
Fenci, J. G. (M)
Fennewald, R. W. (A)
Fillmore, F. A. (SM)
Fisher, C. L. (M)
Fixman, G. (M)
Fox, G. W. (SM)
Furline, A. L. (M)
Germeroth, J. H. (M)
Giola, S. C. (M)
Glaeser, D. H. (M)
Goodberiet, E. F. (M)
Griffiths, O. H. (M)
Hamm, H. W. (A)
Hanford, R. W. (SM)
Hansen, M. E. (M)
Harris, H. H. (M)
Harrison, C. E. (SM)
Heembrock, M. R. (SM)
Heltzeberg, C. H. A. (SM)
Herchenreder, H. (M)
Herries, D. G. (M)
Hicks, H. J. (M)
Honnell, P. M. (F)
Hubenschmidt, W. E. (A)
Jackson, J. R. (M)
Jacobsmeyer, H. T. (SM)
Kathrinus, N. W. (A)
Kelly, L. A. Jr. (M)
Kling, N. (A)
Kosfeld, W. H. (M)
Langston, J. C. (A)
Lauher, V. A. (M)
Lawson, R. G. (A)
Lowell, B. W. (A)
Lowell, T. B. (A)
Mayer, M. F. Jr. (M)
McAninch, C. H. (M)
McCabe, W. M. (M)
McDaniel, O. S. (SM)
McGary, W. T. (A)
McHoney, L. M. (SM)
McKinney, H. F. (A)
Meehan, R. F. (A)
Meyer, G. L. (M)
Million, T. E. (A)
Min, H. S. (M)
Mohrman, R. F. (A)
Mollman, L. A. (M)
Mundel, E. F. (M)
Nienhaus, H. A. (M)
Ordinachev, M. D. (A)
Ozment, R. (A)
Parsons, D. E. (M)
Polk, G. D. (M)
Pultman, L. (M)
Reed, P. J. (M)
Richter, R. J. (A)
Roberts, E. M. Jr. (M)
Roche, J. M. (M)
Rodgers, D. L. (M)
Rosenkoetter, E. A. (M)
Ross, D. K. (M)
Sack, V. M. (M)
Sayer, J. D. (M)
Schaeperkoetter, L. C. (A)
Scherz, C. J. (M)
Schewe, R. W. (M)
Schmidt, E. C. Jr. (M)
Schwarz, C. J. (SM)
Severt, R. (M)
Sheehan, J. S. (M)
Shepard, W. D. (M)
Siepman, A. B. (A)
Small, F. R. (SM)
Stanhope, R. D. (A)
Steenhausen, D. R. (A)
Steinmeyer, D. J. (A)
Stenmann, W. E. (A)
Stokely, R. J. (A)
Swartz, C. W. (M)
Taylor, J. J. (M)
Taylor, W. (M)
Thielen, H. H. (A)
Thomas, R. M. (A)
Upton, L. (A)
Veras, J. A. (A)
Vogel, E. H. (M)
Volpe, S. J. (A)
Wall, H. Jr. (A)
Waters, J. I. (M)
Waller, J. L. (M)
Weinstock, G. Jr. (M)
Welsler, H. J. (M)
White, C. E. (A)
Withers, J. S. (A)
Wolf, N. F. (M)
Wolin, S. (SM)
Wright, W. D. (A)
Zaborszky, J. (SM)
Zehr, N. J. (SM)

Sappington (SL-6)
Schillinger, E. J. (M)

Sedalia (KC-6)
Morrison, M. M. (M)

Sheridan (KC-6)
Hahn, J. H. (M)

Springfield (KC-6)
Curry, W. F. (A)
Gentges, F. H. (A)
Summers, D. H. Jr. (M)
Trotter, C. E. (M)
Wheat, W. M. (M)

Tina (KC-6)
Plummer, T. S. (M)

University City (SL-6)
Bulger, M. V. (M)
Goldberg, J. G. (M)
Hieken, M. H. (M)
Joerger, C. D. (M)
Liddle, W. C. (M)
Motchan, M. L. (SM)
Scheer, M. L. (M)
Sherman, S. M. (M)
Szukalski, D. J. (M)
Tucker, M. F. (M)
Watson, S. E. Jr. (A)

Warson Woods (SL-6)
Weigle, D. M. (M)

Webster Groves (SL-6)
Hanaway, P. R. (M)
Hill, R. D. Jr. (SM)
Jeter, W. C. (M)
Sigman, H. M. (M)
Smith, H. N. (M)

Whiteman AFB (KC-6)
O'Connor, L. T., Jr. (M)

Wright City (SL-6)
Meyers, J. W. (A)

MONTANA

Billings (SEA-7)
Behrendt, R. T. (A)
Kilchli, J. A. (M)
Lundquist, F. E. (M)
Mills, N. W. (M)
Porter, H., Jr. (A)

Bozeman (SEA-7)
Kilmer, W. L. (M)
Nickerson, J. F. (M)
Seibel, R. C. (M)
Shyne, N. A. (M)
Weaver, D. K., Jr. (M)
Weir, T. T. (M)

Butte (SEA-7)
Kems, R. L. (A)
McCourt, A. R. (M)

Great Falls (SEA-7)
Andersen, V. O. (M)
Haefer, J. A. (A)
Lopuch, A. J. (M)
Parker, J. E. (VA)
Watrous, D. S. (M)

Helena (SEA-7)
Lynch, H. N. (M)

Livingston (SEA-7)
Littleton, D. A. (A)

Miles City (SEA-7)
Genge, R. E. (M)

Missoula (SEA-7)
Hodgskiss, W. L. (M)
Taylor, A. S. (SM)

Ophelm (SEA-7)
Day, J. B. (A)
Tomaszewicz, J. S. (M)

NEBRASKA

Alliance (OM-L-5)
Kiesner, J. L. (A)

Beatrice (OM-L-5)
Emerson, W. R. (M)

Bellevue (OM-L-5)
Logue, H. L., Jr. (M)

Columbus (OM-L-5)
Carter, G. W. (M)
Field, T. D. (M)
Matejka, J. (M)
Risk, G. (SM)
Theisinoer, L. P. (A)
Watley, O. D. (M)

Dakota City (OM-L-5)
Shadbolt, M. H. (A)

Genoa (OM-L-5)
Edwards, C. E. (M)

Grand Island (OM-L-5)
Collins, H. C. (M)
Farrall, W. R. (M)
Lynch, U. L. (M)
Runyon, R. E. (A)

Hastings (OM-L-5)
Allison, D. B. (M)
Pearson, J. A. (M)

Hay Springs (OM-L-5)
Jellnek, G. S. (A)

Hebron (OM-L-5)
Uphoff, R. D. (M)

Humphrey (OM-L-5)
Weis, V. A. (M)

Kearney (OM-L-5)
Beshore, P. S. (VA)
Pace, R. A. (M)

Kimball (OM-L-5)
Henry, J. C. (A)

Lexington (OM-L-5)
Bitner, R. J. (M)

Lincoln (OM-L-5)
Barry, R. W. (M)
Bashara, N. M. (M)
Church, A. K. (A)
Ebel, A. J. (SM)
Edison, A. R. (M)
Elwell, W. G. (M)
Estes, J. F. (A)
Gallamo, R. L. (M)
Gatliff, H. H. (A)
Hlavaty, L. F. (M)
Hyde, C. M. (M)
Marts, B. C. (M)
Mientka, W. E. (M)
Norris, F. W. (SM)
Palmer, D. R. (M)
Park, L. C. (M)
Revay, A. W., Jr. (M)
Richardson, M. J. (M)
Robison, W. C. (M)
Savells, A. (M)
Soderholm, L. H. (M)
Sohl, L. H. (M)
Taylor, D. R. (M)
Watson, G. W. (M)
Winkler, C. W. (VA)

Lincoln AFB (OM-L-5)
Barile, T. M. (M)

McCook (OM-L-5)
Lenwell, L. W. (M)

Norfolk (OM-L-5)
Cettman, W. C. (M)
Glover, L. L. (M)

North Platte (OM-L-5)
Griffin, D. C. (A)
Seide, J. H. (M)

Offutt AFB (OM-L-5)
Cramond, W. R. (M)
Hausman, L. R. W. (M)

Marks, J. B. (M)
McDavid, J. A. (SM)
Smith, D. W. (M)

Osallala (OM-L-5)
Huntley, C. W. (M)
Oakes, R. E. (M)
Pestel, T. L. (A)
Wainwright, R. M. (SM)
Wiles, Q. T. (A)

Omaha (OM-L-5)
Barmore, J. L. (M)
Barnett, R. D. (M)
Bates, A. G. (M)
Becker, H. W. (SM)
Beenken, H. G. (M)
Blomberg, V. J. (M)
Borcher, E. J. (A)
Chamberlain, I. J. (SM)
Curry, H. D. (M)
Doll, C. L. (M)
Dunbar, B. L. (M)
Dunn, A. L. (SM)
Dunn, F. L. (SM)
Edgerton, M. J. (A)
Furlong, J. (A)
Gaeth, A. R. (M)
Hadsell, G. C. (SM)
Hagman, C. O. (A)
Hansen, C. L. (M)
Hartman, A. E. (M)
Hill, R. L. (M)
Hower, P. A. (M)
Jett, C. O. (SM)
Joy, H. H. (M)
Kopel, L. F. (A)
Kotera, W. J. (SM)
Kozicki, L. J. (A)
Krogstad, M. O. (A)
Kuklin, H. S. (A)
Kumagai, D. J. (M)
Larsen, W. M. (A)
Latta, L. O., Jr. (SM)
Loch, R. D. (A)
Maloney, J. P. (M)
McGowan, M. L. (M)
Moss, T. L. (VA)
Murnick, A., Jr. (M)
Peterson, L. P. (M)
Petrik, J. S. (SM)
Ralls, R. H. (SM)
Risley, M. I. (A)
Rogers, J. A. (M)
Rogers, W. M. (M)
Ryba, F. J. (A)
Scheel, L. W. (A)
Schneider, A. A. (A)
Sedlak, L. J. (A)
Sibilla, L. (M)
Smith, F. R. (A)
Snyder, J. D. (A)
Stafford, B. H. (M)
Stanohill, J. R. (A)
Stitt, T. D. (SM)
Stratbucker, R. A. (M)
Vickland, R. J. (M)
Wayne, J. W., III (M)
Welna, R. E. (A)
Winkler, G. E. (M)
Zink, R. L. (A)

Overton (OM-L-5)
Wycoff, K. H. (M)

Papillion (OM-L-5)
Doll, R. E. (A)

Seward (OM-L-5)
Osborn, L. W. (A)

Sutherland (OM-L-5)
Townsend, J. G. (M)

Tobias (OM-L-5)
Bamer, W. J. (M)

NEVADA

Las Vegas (LA-7)
Floering, K. S. (A)
Helgeson, B. P. (A)
Karlson, E. L. (M)
Looez, D. (M)
Patten, R. B. (A)
Rollins, D. F. (A)
Shrock, J. B. (SM)
Stephenson, P. L. (A)
Young, F. W. (M)

Mercury (SAC-7)
Erickson, P. B. (M)

North Las Vegas (LA-7)
Hopkinson, E. A. (M)
Montelth, R. B. (A)

Reno (SAC-7)
Cann, R. W. (M)
Carter, C. J. (M)
Conly, E. R. (A)
Domingos, H. (M)
Mattingly, C. D. (A)
Murphy, J. L. (A)
Pendleton, L. S. (A)
Sandorf, I. J. (SM)
Speir, F. H. (SM)

Sparks (SAC-7)
Carlson, A. L. (M)

Tonopah (SAC-7)
Pickles, S. (SM)

NEW HAMPSHIRE

Amherst (B-NH-1)
Martin, P. E. (M)
Orth, R. T. (SM)
Wenzel, J. H. (A)

Atkinson (B-NH-1)
Perryman, N. A. (M)

Brookline (B-NH-1)
Sommers, D. J. (A)

Canterbury (B-NH-1)
Grace, G. M. (M)

Charlestown (B-NH-1)
Buckland, F. A. (M)

Chester (B-NH-1)
Greenway, T. H. (M)
Minks, F. A. (SM)
White, H. B. (A)

Concord (B-NH-1)
Brew, R. A. (M)
Dwyer, J. J. (M)
Evans, C. B. (M)
Femanian, A. (M)
Frost, D. F. (M)
Hermansen, L. A. (M)
Katz, R. P. (M)
Longley, M. R. (A)
Meyer, R. R. (A)
Murray, W. J. (A)
Oleson, D. R. (M)
Weeks, R. F. (M)
Zilberstein, R. M. (M)

Derry (B-NH-1)
Dollinger, K. (M)

Dover, (B-MV-1)
Armitage, P. E., Jr. (A)
Mucher, G. J. (SM)
Neal, W. S. (M)
Youngblood, I. J. (SM)

Durham (B-MV-1)
Clark, R. R. (M)
Falman, R. N. (SM)
Frost, A. D. (SM)
Heller, M. W., Jr. (M)
Melvin, D. W. (M)
Winn, A. L. (M)

East Rochester (B-NH-1)
Ashton, D. (M)

Epping (B-MV-1)
Karandanis, S. M. (M)

Exeter (B-NH-1)
Carbonneau, V. J. (M)
Emanovsky, A. E. (M)
Matthews, C. M. (A)

Francestown (B-NH-1)
Bailey, A. B. (SM)

Gilmanton (B-NH-1)
Wilkens, W. B. (SM)

Hampton (B-MV-1)
Leoutsakos, G. N. (M)
Outten, R. E. (A)

Hanover (B-NH-1)
Curtis, H. W. (M)
Heckbert, A. I. (SM)
Morgan, M. G. (SM)
Pratt, B. (M)
Wellman, B. (M)

Hillsboro (B-NH-1)
Carruth, R. O. (M)
O'Loan, W. R. (SM)
Wood, J. A. (M)

Hudson (B-NH-1)
Casey, R. J. E. (A)
Whitaker, N. A. (M)

Jackson (B-NH-1)
Stone, A. P. (M)

Keene (B-NH-1)
Cloutier, D. L. (M)
Robarge, E. T. (M)

Laconia (B-NH-1)
Campbell, R. H., Jr. (M)
Greene, G. C. (SM)
Hadden, G. H. (M)
Newcomb, R. E. (M)

Lakeport (B-NH-1)
Pattison, W. L., Jr. (A)

Lebanon (B-NH-1)
Spencer, M. C. (M)

Lyme (B-NH-1)
Johnson, C. L. (SM)
Wood, J. A., Jr. (SM)

Manchester (B-NH-1)
Allard, E. L. (M)
Apostolos, T. (M)
Baer, R. H. (M)
Banker, J. A. (M)
Barr, P. (M)
Bean, F. E. (M)
Bellucci, F. A. (M)
Bouchard, J. G. F. (M)
Brous, D. W. (SM)
Cassidy, J. A. (M)
Castor, A. H. (M)
Chagaris, C. N. (M)
Chamberland, M. H. (A)
Dabrowski, S. A. (M)
Dugre, M. L. (A)
Gabor, W. D. (M)
Halle, C. F. (A)
Haselton, E. F. (A)
Lamere, B. E. (A)
McCluskey, J. L. (M)
Mondor, L. E. (M)
Nadeau, R. U. (M)
Rust, W. F., Jr. (SM)
Tilton, D. S. (M)
Westlake, N. L., Jr. (M)
Whelan, F. X., Jr. (A)
Wilkinson, H. W. (M)

Milford (B-NH-1)
Romney, E. (A)
Williston, R. L. (M)

Nashua (B-NH-1)
Akselsen, N. (M)
Ayer, D. R. (M)
Barrett, A. J. (A)
Bostwick, L. S., Jr. (M)
Bradley, D. J. (M)
Butler, J. L. (M)
Clement, C. M., Jr. (A)
Drescher, D. C. (M)
Eggerding, H. B. (A)
Forcier, F. O. (A)
Gagne, F. W. (M)
Gallagher, L. R. (M)
Gilligan, L. H. (M)
Goodwin, R. O. (A)
Goulder, M. E. (M)
Greenspan, L. E. (M)
Hawes, R. B. (SM)
Huntington, W. J., Jr. (M)
Jackson, W. E. (M)
Jacobi, R. J. (M)
Kaplan, P. D. (M)
Klaman, K. J. (M)
Le Blanc, R. A. (A)
Le Van, J. D. (M)
Low, R. C. (A)
Lowe, W. R., Jr. (M)
Mackowiak, J. K. (M)
Manoogian, H. (SM)
Misek, V. A. (M)
Morgan, W. E., Jr. (M)
Newsom, E. G. (A)
Newton, L. W. (SM)
O'Neil, J. F., Jr. (A)
Pothier, R. G. (M)
Putnam, H. (A)
Rathje, E. (M)
Richmond, M. R. (M)
Rusch, W. T. (M)
Safford, F. J. (SM)
St. Jean, L. E. (SM)
Sanders, R. C., Jr. (M)
Sheftelman, E. H. (M)
Steeg, G. F. (A)
Sweenie, G. C. (M)
Uhrich, W. J. (SM)
Urslin, B. E. (M)
Wilson, W. J. (M)
Woodruff, T. E. (M)
Woods, R. E. (M)

New Ipswich (B-NH-1)
Cole, I. H. (M)

Newmarket (B-NH-1)
George, J. A. (A)

Pease, AFB (B-NH-1)
Bloom, V. A. (M)
Fitts, R. E. (M)

Penacook (B-NH-1)
Brock, J. M. (M)

Pittsfield (B-MV-1)
Adams, P. L. (M)

Plaistow (B-MV-1)
Backard, M. J. (M)
Minnich, E. L. (M)

Portsmouth (B-MV-1)
Acton, E. E. (M)
Cox, D. D. (M)
De Veaux, E. C. (M)
Jutras, P. D. (M)
Molla, J. J. (M)
Sorkin, I. J. (M)

Salem (B-NH-1)
Falkenham, G. A. (A)
Trusty, D. C. (A)

Salem Depot (B-NH-1)
Savage, R. P. (M)
Taylor, F. N. (M)

Somersworth (B-MV-1)
Greene, P. J. (M)

South Merrimack (B-MV-1)
Comstock, D. C. (M)

Westville (B-NH-1)
Diffin, K. S. (M)

Wilton (B-NH-1)
Dickinson, R. V. C. (A)

Windham (B-NH-1)
Nakasato, J. (M)

NEW JERSEY

Allendale (NNJ-2)
Havstad, H. (SM)
Robinson, A. S. (M)
Simoni, F. R. (A)
Strauch, G. R. (M)

Allenhurst (NJ-M-2)
Dickinson, D. B. (M)
Greer, W. R., Jr. (SM)
Haddock, J. W. (M)
Nagy, Z. S. (M)
Wiener, A. (M)

Allentown (NY-M-2)
Murad, R. V. (M)

Allwood (NNJ-2)
Koch, S. J. (A)

Alpha (NNJ-2)
Schaefer, J. B. (SM)

Alpine (NNJ-2)
Merry, J. M. P. (A)

Andover (NNJ-2)
Ostlund, E. M. (SM)

Ardsley (NY-W-2)
Busharis, J. G. (M)

Arlington (NNJ-2)
Bremer, F. V. (SM)
Durie, J. C., Jr. (A)

Asbury Park (NY-M-2)
Bauer, P. S., Jr. (M)
Bauer, S. J. (A)
Belmont, E. (M)
Berl, S. (M)
Dravneek, W. R. (M)
Dworzak, D. C. (A)
Ercolino, M. D. (A)
French, H. H. (A)
Filtz, M. G. (M)
Gisonno, G. L. (M)
Goldstein, S. (M)
Gottlieb, R. M. (M)
Greenblum, C. (M)
Halpern, R. E. (M)
Jones, J. D. (M)
Kolchin, R. I. (M)
Lelnkram, C. Z. (M)
Mannel, W. M. (M)
Relch, B. (M)
Reilly, V. E. (M)
Resnick, A. (M)
Rokaw, L. (M)
Salvano, D. P. (A)
Sarlo, L. M. (M)
Schelleng, J. C. (F)
Schodowski, S. S. (A)
Stampfl, R. A. (A)
Steinberg, J. (A)
Strasser, S. (M)
Swenarton, E. W. (A)
Tobias, W. T. (M)
Welmer, R. B. (M)
Weltz, S. (M)

Ashland (PHI-3)
Harmon, G. B. (A)
Kingsbury, S. R. (A)
Kowalski, L. E. (A)
Mahland, E. W. (M)

Atco (PHI-3)
Liebold, F. A. (A)
Stanko, E. (SM)

Atlantic City (PHI-3)
Bremmer, L. F. (SM)
Gieseche, H. (A)
Hill, J. H. (M)
Martin, W. A., Jr. (M)
Mouradian, H. (VA)
Newman, S. (M)
Ricketts, P. E. (SM)
Scott, R. M. (SM)
Williamson, J. H. (M)
Yulo, C. (M)

Atlantic Highlands (NY-M-2)
Barrell, L. C., Jr. (A)
Brown, S. P. (SM)
Durrer, J. H. (A)
Jacobsen, T. L. (M)
Knauss, D. L. (A)
Petersen, P. B. (M)
Popovich, R. G. (A)

Audubon (PHI-3)
Beers, R. A. (SM)
Haining, L. E. (M)
Kozanowski, H. N. (SM)
Massari, J. P. (A)
Michel, C. A. (M)
Murphy, J. J. (M)
Noakes, G. L. (M)
Rolf, T. E. (M)
Rutherford, R. O. (M)
Ryan, J. G. (M)
Slate, M. W. (M)
Smalts, F. W. (M)
Stasz, C. E. (M)

Avenel (PRI-2)
Shuskus, J. M. (A)

Avon (NY-M-2)
Egley, T. H. (A)

Avon-by-the-Sea (NY-M-2)
Child, T. M. (SM)

Barnegat (NY-M-2)
Morrison, J. G. (A)

Barrington (PHI-3)
Caldwell, H. R. (M)
Capron, R. W. (M)
Johnson, C. W. (M)
Thompson, J. R. (M)
Zabriskie, W. G. (M)

Basking Ridge (PRI-2)
Berg, G. M. (M)
Engelbrecht, R. S. (A)
Farmer, W. B. (M)
Ford, G. T. (SM)
Glauber, J. J. (SM)
Hasley, A. D. (SM)
Hull, R. W. (M)
Jacobus, H. R. (SM)
Pierce, W. L. (M)
Power, D. W. (SM)
Rosson, J. W. (M)
Talpey, T. E. (M)
Uhler, K. W. (SM)

Bay Head (NY-M-2)
Parker, J. A. (M)

Bayonne (NNJ-2)
Eager, G. S., Jr. (M)
Leslie, J. P. (M)
Parowski, G. C. (M)
Pettegrove, G. G. (A)
Schnipper, A. (M)
Silbermann, G. F. H. (M)
Skibneski, C. E. (M)
Szmerda, R. J. (A)
Zacharellis, G. (A)

Beachwood (NY-M-2)
Jennings, R. L. (M)

Bedminster (PRI-2)
Gateka, F. A. (M)
Geils, J. W. (M)

Belford (NY-M-2)
Collom, P. W., Jr. (M)
Cowgill, R. M. (M)
Glendinning, W. B. (M)
Motsek, M. (A)

Belle Mead (PRI-2)
Pressey, C. W. (A)
Smith, H. B. (M)

Belleville (NNJ-2)
Bagno, S. M. (SM)
Copeland, M. (M)
Forshay, D. W. (A)
Frank, A. (M)
Franklin, D. E. (M)
Greene, V. A. (M)
Grundler, H. L. (M)
Klein, M. S. (M)
Lebleboojian, G. (A)
Marchese, N. (M)
Mock, W. C., Jr. (SM)
Moreno, C. N. (M)
Presto, A. F. (M)
Reilly, R. A. (A)
Richards, G. P. (M)
Roeloffs, E. H. (M)
Salz, H. (M)
Scherer, M. (A)
Senio, N. (M)
Singer, F., Jr. (SM)
Spiro, N. J. (M)
Wallace, F. C. (SM)
Warren, J. E. (M)
Winship, T., Jr. (M)
Woodman, R. A., Jr. (M)
Woodson, R. D. (M)
Yellen, S. (A)

Belmar (NY-M-2)
Boxer, V. (M)
Brookins, R. U. (M)
Davidson, G. G. (M)
Gartner, W. W. (M)
Gordon, F., Jr. (M)
Hambleton, G. E. (M)
Jarema, E. D. (M)
Kamplnsky, A. (M)
Kosmahl, H. G. (SM)
Lee, A. St. J. (SM)
Pfaff, D. L. (M)
Rush, C. J. (M)
Stone, H. A. G. (A)
Stone, M. V. H. (A)
Thelssing, H. H. (SM)
Townes, W. D. (SM)
Wagner, H. M. (SM)

Bellmawr (PHI-3)
Balchaitis, A. V. (M)
King, E. (M)
Melby, K. (M)

Belvidere (NNJ-2)
Hunsicker, R. K. (A)

Bergenfield (NNJ-2)
Abend, I. J. (M)
Anolik, B. S. (M)
Bright, T. F. (A)
Crawford, A. R. (M)
Fee, D. R. (M)
Franklin, W. S. (M)
Frimzis, R. (M)

Losher, M. I. (M)
Meadow, S. (M)
Musselman, H. (A)
Rudd, C. D. (M)
Rusch, H. (A)
Schmidt, C. J. (SM)
Taylor, R. G. (M)

Berkeley Heights (NNJ-2)
Abbott, G. F., Jr. (M)
Andrews, H. W. (M)
Austin, J. E. (M)
Chruney, M. (M)
Estoppey, R. F. (M)
Greven, P. J. (M)
Gupey, J. W., Jr. (A)
Hall, R. E. (M)
Hart, O. P., Jr. (M)
Heacock, B. E. (SM)
Humerick, S. M. (M)
Jensen, A. G. (F)
Klessling, E. H. (M)
Kozicki, H. (M)
Maher, T. P. (M)
Mann, H. (A)
Maul, L. L. (M)
Mayo, J. S. (A)
Newland, E., Jr. (M)
Olander, W. O. (M)
Olson, H. M. (M)
Orlando, A. J. (M)
Schade, F. W. (A)
Seley, E. L. (M)
Smith, F. B. (A)
Williams, C. E. (M)
Zilis, G. S. (M)

Berlin (PHI-3)
Erichsen, H. K. (M)
Moore, W. L. (M)
Wiseman, P. E., Jr. (M)

Bernardsville (PRI-2)
Coddington, G. H. (M)
Green, N. H. (M)
Hedel, K. K. (M)
Larsen, J. (SM)
Levine, S. (M)
Murphy, J. A., Jr. (M)
Rager, G. T. (M)

Beverly (PHI-3)
Chaffin, R.B. (M)
Cottone, C. V. (A)
Day, R. F. (M)
Hain, J. L. (M)
Horton, P. R. (M)
Leahy, T. D. (M)
Newcomb, R. H. (M)
Rapp, A. K. (M)
Soohoo, E. L. (A)
Steudel, W. R. (M)
Taylor, D. M. (M)
Walker, K. E. (SM)
Wolcott, R. G. (M)

Blackwood (PHI-3)
Kaufmann, D. C. (M)
Swedloff, B. (A)

Blairstown (NNJ-2)
Maffenbeier, J. B. (M)
Widenor, P. E., Jr. (SM)

Bloomfield (NNJ-2)
Accardo, N. A. (M)
Allen, M. M. (A)
Ashbrook, J. M. (M)
Atkins, C. E. (SM)
Bates, J. K., Jr. (A)
Baxter, H. R. (M)
Bilinas, J. (M)
Cerone, J. R. (M)
Comerci, F. A. (SM)
Coon, C. E. (M)
Crowley, J. F. (A)
Elson, G. F. (SM)
Everett, L., Jr. (SM)
Fortin, R. C. (SM)
Frank, E. D. (M)
Grandmont, P. E. (M)
Hacker, S. J. (M)
Hansen, J. A. (M)
Hawk, W. H. (M)
Hayes, W. A. (M)
Heberling, W. W., Jr. (M)
Heney, J. F. (M)
Hobbs, J. (A)
Ivey, H. F. (SM)
Jamick, R. J. (M)
Johnson, V. L. (M)
Johnson, W. C. (SM)
Kelso, R. J. (M)
Kerwin, B. D. (A)
Knochel, W. J. (SM)
Kreer, J. G., Jr. (SM)
McMurtrie, C. L. (M)
McNall, J. W. (SM)
Menne, R. S. (M)
Meyers, K. F. (M)
Mitchell, A. V. (M)
Mitchell, C. D. (SM)
Moltz, A. J. (M)
Nussear, J. G. (SM)
Przywozny, W. C. (A)
Quickel, T. E. (A)
Rhodes, H. A. (M)
Rosenthal, M. S. (M)
Schotland, R. M. (A)
Sifre, R. A. (A)
Simon, R. T. (M)
Skellett, A. M. (F)
Sloan, F. M. (A)
Sullivan, J. F. (M)
Wallace, P. A. (M)
Wasklewicz, L. R. (A)
Weber, R. M. (A)
Wetzel, K. C. (A)
Whelan, W. R. (A)
Widell, E. G. (SM)
Williams, N. T. (SM)
Wilmarth, R. W. (SM)
Wolfe, T. R. (M)
Wood, G. R., Jr. (M)
Zelen, H. J. (A)

Bogota (NNJ-2)
Gilcher, V. (A)
Hafermaier, H. F. (M)
Hearn, E. F. (M)
Hellmann, P. E. (A)

Boonton (NNJ-2)
Anderson, N. J. (A)
Bailey, H. (M)
Benning, H. H. (SM)
Bidlack, R. H. (M)
Bozer, R. (M)
Christensen, H. (M)
Cook, L. (VA)
Downsbrough, G. A. (M)
Engert, G. W. (M)
Erickson, L. E. (M)
Houlroyd, G. F. (M)
Hoyt, W. F. (M)
Hull, C. J. (A)
Hull, L. M. (F)
Jacobus, W. M. (A)
Jones, J. J. (M)
Kenney, C. M. (A)
King, P. B., Jr. (SM)
Kuller, K. K. (M)
Mannik, G. (A)
March, P. S. (VA)
Molnar, J. T. (A)
Montcalm, S. R. (SM)
Newell, R. A. (M)
Parkes, A. W., Jr. (SM)
Peters, D. P. (M)
Pittenger, A. W. (M)
Pittenger, R. C. (A)
Plahn, R. W. (M)
Redington, J. H. (SM)
Rheams, C. J. B. (M)
Richardson, A. G. (F)
Richardson, S. A. (M)
Schanz, W. H. (M)
Seabury, E. S. (A)
Weinberg, J. (A)
White, W. F. (M)
Zayac, F. R. (M)

Boonton Township (NNJ-2)
Black, W. L. (SM)

Bordentown (PHI-3)
Gutterson, M. A. (A)
Meier, D. J. (M)

Bound Brook (PRI-2)
Brown, W. A. R. (A)
De Luzuriaga, E. R. (M)
De Versterre, W. I. (M)
Gerhardt, G. E. (A)
Prednis, L. J. (M)
Witherell, C. E. (M)

Bradley Beach (NY-M-2)
Brown, M. A. (M)
Capam, C. (M)
Levy, S. J. (SM)
Macallister, A., Jr. (A)
Steward, R. L. (M)

Brainards (NNJ-2)
Slampyak, S., Jr. (M)

Bridgeton (PHI-3)
Avellino, W. R. (M)
Deal, J. H. (A)

Brielle (NY-M-2)
Eason, C. R. (A)
Schor, H. (M)

Brooklawn (PHI-3)
Hong, J. C. T. (A)

Brookside (NNJ-2)
Adams, E. W., Jr. (M)

Browns Mills (PHI-3)
Tellier, J. C. (F)

Burlington (PHI-3)
Bechtold, G. W. (M)
Cole, D. A. (A)
Dubrow, W. (A)
Escriba, C. F. (M)

Butler (NNJ-2)
Bradford, D. C. (M)
Gordon, J. P. (SM)
Gradjelick, T. J., Sr. (M)
Greenleaf, J. L. (M)
Hoagland, K. A. (SM)
Wachter, J. E. (M)
Wild, R. F. (SM)
Wolter, H. R. (M)

Caldwell (NNJ-2)
Graff, E. S. (A)
Horner, J. E. W. (A)
Hotopp, A. H., Jr. (SM)
Janes, A. W. (M)
McBrair, H. C. (M)
McKeeby, R. W. (M)
Melzell, O. S. (SM)
Neu, E. C. (M)
Schoenbaum, J. R. (SM)
Schwerin, R. L. (SM)
Speelle, T. F. (A)
Sur, J. D. Y. (M)
Sutherlin, L. (SM)
Vogel, W. H., Jr. (M)

Caldwell Township (NNJ-2)
Digrindakis, M. (M)
Dulac, J. P. P. (M)

Camden (PHI-3)
Altken, K. M. (SM)
Ankenbrandt, F. L. (F)
Annus, L. E. (A)
Arthur, G. R. (SM)
Baker, L. (M)
Benoliel, I. (SM)
Berg, C. O. (M)
Berges, W. P. (A)
Bock, J. J. (M)
Boenecke, C. A. (M)
Bolden, E. L. (M)
Bonshock, S. N. (M)
Booth, A. T., Jr. (M)
Bowen, D. C. (SM)
Casey, R. H. (M)
Chen, D. (M)
Christopher, A. J., Jr. (M)
Ciarrocchi, J. A. (M)
Clay, B. R. (SM)
Colton, R. M. (A)
Cooperman, M. (M)
Corrington, M. S. (F)
Courtney, J. E. (M)
Cramer, R. E., Jr. (M)
Crosby, D. R. (SM)
Curtis, W. C. (A)
Davis, N. L., Jr. (M)
Dickens, B. L. (M)
Di Paolo, L. A. (A)
Domin, F. J. (A)
Eagan, J. F., Jr. (A)
Edwards, N. E. (M)
Farber, K. L. (M)
Felbel, R. L. (M)
Fese, H. K. (M)
Feyerherm, M. P. (SM)
Finkelstein, M. B. (SM)
Fricke, R. H. (M)
Galanek, G. J. (A)
Gelchis, M. V., Jr. (M)
Gleerup, R. E. (M)
Gleitman, J. (M)
Glenn, A. B. (SM)
Gloates, E. (A)
Guerin, M. (M)
Gunther, C. A. (F)
Guthrie, P. L., Jr. (M)
Harel, A. (M)
Harris, S. J. (SM)
Harris, W. A. (SM)
Heacock, D. P. (SM)
Hendrickson, J. R., Sr. (M)
Hertzberg, I. (M)
Hills, V. E. (M)
Hodge, J. D. (A)
Holdridge, G. R. (M)
Howard, D. V., Jr. (A)
Hunt, A. E. (M)
Johnson, E. O. (SM)
Jolliffe, C. B. (F)
Jones, L. F. (SM)
Kent, W. S. (M)
Kidd, M. C. (SM)
Klessling, G. A. (M)
Koenig, M. (A)
Kunstadt, G. H. (SM)
Lacy, W. H. (A)
Lazarus, F. F. (M)
Lemberg, A. E. (M)
Maguire, J. A. (A)
Mann, H. T. (M)
Martin, H. B. (SM)
Matsumura, G. K. (M)
McCasland, G. P. (M)
McDonnell, F. M., Jr. (M)
McGee, A. K. (M)
McGough, R. P., Jr. (M)
McNicol, F. R. (A)
Miller, E. H. (M)
Monshaw, V. R. (M)
Moody, W. L. (M)
Moore, C. E. (SM)
Morse, E. (A)
Moy, R. G. (A)
Myers, B. D., Jr. (A)
Nelson, M. D. (M)
Patterson, T. T., Jr. (SM)
Peebles, P. Z. (M)
Plofker, M. H. (M)
Rao, G. V. (M)
Reed, P. B. (M)
Reeves, T. C. (M)
Richter, R. (M)
Russell, K. H. (M)
Schlegelmilch, H. K. (M)
Schulbach, A. (M)
Scull, W. E., Jr. (SM)
Sendler, N. J. (A)
Shenoy, R. P. (M)
Smith, A. L. (A)
Smith, C. L. (M)
Smith, T. A. (SM)
Stech, G. (M)
Suther, G. A. (M)
Taylor, J. I., Jr. (M)
Terris, D. (M)
Tourshou, S. (SM)
Tracy, E. C. (M)
Trainer, M. A. (SM)
Trebing, G. W. (M)
Vilkomerson, B. S. (SM)
Walter, J. C. (SM)
Wasiski, E. B. (A)
Waters, G. B. (M)
Wem, D. W., Jr. (A)
Wirtz, E. L. (A)
Wolfe, W. R. (M)
Woods, W. E. (A)
Wright, S. L. (A)
Zarnoch, E. J. (M)

Carlstadt (NNJ-2)
Christaldi, P. S. (F)
Ederer, N. (M)
Kaiser, A. W. (SM)
Kim, Y. C. (M)
Lowers, C. E. (SM)

Carteret (PRI-2)
Goyena, S. R. (A)

Cedar Grove (NNJ-2)
Altman, H. (M)
Balas, P., Jr. (A)
Beckers, A. E. (M)
Brown, W. G. (M)
Bulkley, A. W. (M)
Clarke, A. F., Jr. (M)
Davis, R. C. (M)
Dooner, J. L. (M)
Fichter, W. C., Jr. (M)
Glass, W. (A)
Golick, G. (M)
Gordon, R. F. (A)
Gorss, C. G., Jr. (M)
Grieg, D. D. (SM)
Harris, R. J. (A)
Hartmann, J. C. (M)
Himmel, L. (SM)
Keim, F. J., Jr. (M)
Kettmann, H. W. (A)
Klein, A. M. (M)
Kramer, A. S. (SM)
Kuras, H. F. (M)
Lawrence, J. T. (SM)
Lenker, J. N. (M)
Luongo, J. (M)
Magdeburger, P. E. (M)
Moskowitz, S. (M)
Petruzzelli, R. T. (A)
Pogoda, A. L. (M)
Reeves, E. H. (M)
Reichert, W. G., Jr. (M)
Shackelford, C. L. (SM)
Sutton, L. E., III (A)
Trim, M. E. (M)
Van Brunt, L. B. (M)
Van Duyne, J. P. (M)
Weber, W. N. (SM)
Weltmann, D. (SM)

Cedar Knolls (NNJ-2)
Eden, B. F. (M)
Hetzel, G. L. (M)

Chatham (NNJ-2)
Albrecht, H. W. (SM)
Andrew, H. B. (M)
Arnold, C. G. (SM)
Babcock, W. C. (M)
Bishop, J. D. (M)
Bobeck, A. H. (M)
Bondy, M. (M)
Bryant, N. W. (SM)
Cousins, V. M. (M)
Edwards, J. R. (M)
Ellis, R. G. (A)
Felch, E. P. (F)
Filo, J. P. (M)
French, H. N. (M)
Funk, D. L. (M)
Hangley, R. M. (M)
Herud, E. C. (M)
Higgs, R. E. (M)
Hilberg, E. A., Jr. (M)
Hofmockel, D. L. (A)
Hopper, K. D. (M)
Houghton, E. W. (SM)
Kay, E. D. (M)
Kinaman, E. W. (M)
Klesse, W. R. (M)
Koch, D. G. (M)
Lambert, D. W. (M)
Lynch, J. A. (A)
McLean, D. A. (SM)
Moorhead, G. H. (M)
Morrow, S. R. (A)
Neltzert, C. (M)
Peterson, A. C., Jr. (SM)
Radcliffe, F. E. (SM)
Rehrig, E. S. (M)
Rohn, W. B., (M)
Rose, R. H., II (M)
Rupp, O. R. (A)
Sagan, E. A. (A)
Schnebbe, A. D. (M)
Smoot, A. W. (M)
Southworth, G. C. (F)
Sproul, P. T. (SM)
Sweeny, C. P. (SM)
Taylor, P. H. (M)
Vaughan, H. E. (SM)
Vaughan, V. N., Jr. (SM)
Von Der Linden, M. A. (SM)
Wahlig, R. L. (M)
Wintringham, W. T. (F)
Wirsz, N. C. (M)
Yariv, A. (M)

Chatham Township (NNJ-2)
Singer, F. J. (SM)
Stone, R. C., Jr. (M)

Chester (NNJ-2)
Hubbell, B. (M)
Mortlock, C. E., Jr. (M)
Ruff, J. A. (A)

Cinnaminson (PHI-3)
Wamick, G. E. (M)

Clark (NNJ-2)
Basarab, J., Jr. (M)
Collazo, J. L. (M)
Hall, R. W. (A)
Rizzoni, E. M. (SM)
Seymour, J. W. (SM)
Whitty, M. S. (M)

Clementon (PHI-3)
Connelly, J. J. (M)
Ross, M. D. (M)
Vargo, A., Jr. (M)

Cliffside Park (NNJ-2)
Strole, J. C. (M)

Clifton (NNJ-2)
Arditi, M. (SM)
Arp, R. H. (A)
Ault, C. F. (M)
Bearman, A. L. (A)
Blake, D. L. (M)
Brady, J. F. (SM)
Brady, L. J. (M)
Brockel, E. P. (A)
Callanan, W. F. (M)
Carpenter, D. J. (M)
Casabona, A. M. (M)
Clemens, J. R. (M)
Davidson, G. M. (M)
De Bell, J. M., Jr. (M)
Dolan, F. J. (M)
Dumont, A. B. (F)
Dzula, B. (M)
Elbert, C. H. (M)
Fahnestock, D. L. (M)
Feldt, R. (SM)
Fillman, J. J. (M)
Foster, H. (M)
Glomb, W. L. (M)
Goldstein, R. L. (A)
Green, M. W. (M)
Haefeli, J. E. (M)
Heins, P. N. (M)
Hilton, J. J. (M)
Hoberman, M. J. (SM)
Hoechner, I. L. (M)
Hogan, M. J. (A)
Hval, H. N. (M)
Jeans, J. R. (M)
Katzmann, F. L. (M)
Krehbiel, K. K. (M)
La Piana, W. P. (A)
Lappin, D. (M)
Legramp, J. S. (M)
Librizzi, P. N. (SM)
Moron, M. (A)
Morrow, R. A. (M)
Munroe, P. C. (SM)
Murphy, G. G. (SM)
Nelson, J. E. (SM)
Oglesby, J. D. (SM)
Osilchin, N. (A)
Oswald, R. L. (M)
Otis, A. N., Jr. (A)
Pollack, L. (SM)
Postal, R. H. (A)
Romano, J. A. (A)
St. Louis, R. A. (M)
Salzer, R. M. (M)
Sanford, E. E. (A)
Schneider, A. E. (M)
Schneiderman, M. (A)
Schroeder, J. O. (SM)
Schwartz, P. L. (M)
Smith, C. B., Jr. (A)
Snadyc, A. M. (SM)
Snell, P. A. (M)
Stein, S. (M)
Tobias, J. (M)
Weinshanker, J. (M)
Yaroshko, P. (A)
Yetsley, W. F. (M)
Zahner, C. F. (M)
Zwelbel, J. (M)

Clinton (NNJ-2)
Carlson, R. (A)

Closter (NNJ-2)
Cagney, W. M. (A)
Slawson, W. J. (M)
White, L. E. (A)

Collingswood (PHI-3)
Ackerman, M. J. (SM)
Aron, S. (M)
Aurand, J. A. (M)
Avella, N. R. (A)
Baker, W. W. (M)
Bancroft, H. S. (M)
Beauchemin, A. (M)
Beaulieu, D. E. (A)
Boef, D. D. (A)
Booth, G. W. (M)
Brotzman, E. S. (SM)
Brown, E. M. (M)

Buck, D. G. (M)
Burke, M. D. (M)
Caron, E. J. (SM)
Chin, G. D. (M)
Chope, R. E. (A)
Clark, E. L. (SM)
Cohen, K. J. (A)
Colander, G. E. (M)
Corey, C. P. (A)
Crawford, R. D. (M)
Davis, C. E. (M)
Desrochers, R. E. (M)
Di Russo, E. (M)
Dobbins, L. W. (M)
Dougherty, J. P. (M)
Douglas, J. W. (A)
Duffin, J. D. (M)
Elseleln, J. E. (SM)
Field, G. R. (SM)
Erdmann, R. G. (A)
Farnett, E. C. (M)
Freedman, D. D. (A)
Genetta, T. L. (M)
Gilmore, J. P. (SM)
Glazer, B. G. (M)
Gluyas, T. M. (SM)
Gluyas, T. M., Jr. (SM)
Goodman, H. (SM)
Goodrich, H. C. (SM)
Green, L. S. (M)
Grier, E. W. (M)
Hall, J. R. (M)
Homan, A. A. (M)
Honda, H. (M)
Houck, G. S. (M)
Hurford, W. L. (M)
Katz, E. S. (M)
Kolar, R. F. (M)
Kouns, W. D., Jr. (M)
Kowal, A. (A)
Lapidos, R. W. (M)
Lauer, H. (M)
Lefczik, S. W. (A)
Lynn, S. (SM)
MacInnes, N. A. (M)
Malitz, E. (A)
Maloff, I. G. (F)
Marra, T. (M)
Marsten, R. B. (SM)
McGiffney, D. Z. (M)
Meeker, W. F. (M)
Nagy, T. (M)
Neubauer, J. R. (SM)
Olson, C. L. (M)
Orendac, B. M. (A)
Pandorf, R. D. (M)
Pettengill, G. W. (M)
Phillips, L. B. (M)
Rezek, G. (A)
Robertson, J. Y. (M)
Roe, J. H. (SM)
Schatz, S. (A)
Schwarz, H. G. (M)
Selby, E. O. (M)
Sharp, R. F. (M)
Shelton, C. T. (M)
Shoaf, J. R., II (SM)
Siukola, M. (M)
Skorup, G. E. (SM)
Smith, A. E. (M)
Southworth, W. T. (M)
Stanislzewski, J. R. (M)
Stupp, R. W. (VA)
Thomas, A. R. (M)
Thompson, E. E. (M)
Thomsen, C. M. (A)
Tice, G. Y. (M)
Turner, A. H. (M)
Underwood, J. F. (SM)
Varsos, S. G. (M)
Venters, D. C. (M)
Ver Wys, G. A. (M)
Wang, T. (A)
Watson, F. M. (A)
White, R. J. (M)
Wolf, R. R. (M)
Woll, R. E. (M)
Woodward, B. J. (VA)
Yin, H. (M)
Young, H. D. (M)

Colonia (PRI-2)
Anderson, E. C. (A)
Click, C. L. (M)
Gegenheimer, R. F. (M)
Levine, J. (M)
Sheffield, B. (SM)
Zeier, A. J. (A)

Coytesville (NNJ-2)
Boychuk, B. (M)
Kertesz, Z. J. (A)
Robin, G. W. (A)
Spock, R. E. (M)

Cranbury (PRI-2)
Herzfeld, F. (M)
Matheson, R. M. (M)
Morgan, J. M. (SM)
Rodda, W. E. (M)
Scholz, K. W. (A)
Shankweiler, R. G. (SM)
Wysocki, J. J. (M)
Zonis, F. I. (M)

Cranford (NNJ-2)
Abrams, H. (M)
Backinoff, B. (M)
Di Giovanni, A. E. (A)
Fanarjian, R. C. (M)
Herzer, W. P. (M)
Hillyer, C. (M)
Jacobus, L. A., Jr. (M)
Jagerman, D. L. (M)
Jakub, J. J. (M)
Kolts, R. C. (M)
Lee, H. C. (M)
Linzer, G. M. (A)
Madan, R. W. (A)
Reymond, W. K. (M)
Roesel, W. C. (M)
Sansalone, F. J. (M)
Schaner, F. A. (SM)
Shenk, J. J. (M)
Silverman, D. (A)
Sullivan, H. J. (M)
Widmann, E. (M)
Williams, H. R. (M)

Cresskill (NNJ-2)
Liponer, B. (A)
Stebbins, M. D. (M)

Deal (NY-M-2)
Bennett, H. S. (SM)
Klayton, M. H. (SM)
Reingold, I. (SM)

Delanco (PHI-3)
Hermann, P. E. (M)
Phillips, J. W. (A)
Potter, E. H. (SM)

Delawanna (NNJ-2)
Salmen, L. M., Jr. (M)

Demarest (NNJ-2)
Foster, D. (M)
Furrer, C. G. (A)
Sapiro, A. M. (M)
Thompson, R. G. (A)

Denville (NNJ-2)
Baker, R. A. (M)
Beckmann, U. L. (A)
Bemis, A. R. (M)
Farbanish, E. (A)
Fifer, W. C. (M)
Gilbert, E. A. (M)
Jamba, D. M. (M)
Koch, H. J. (M)
Kodner, J. L. (A)
Kruger, H. A. (M)
Langdon, G. G. (M)
Littlefield, D. F. (M)
Mindes, A. S. (M)
Munson, V. E. (M)
Novick, W. (M)
Porter, E. A. (M)
Renwick, E. B., Jr. (M)
Van Winkle, D. (A)

Dover (NNJ-2)
Backer, L. A. (SM)
Benson, R. K. (M)
Brown, A. F. (M)
Calafati, S. S., Jr. (SM)
Frank, J. E. (M)
Glass, L. H. (M)
Grenier, T. J. (M)
Grinoch, A. (M)
Hart, R. E. (A)
Helm, G. D. (SM)
Hotvedt, A. (M)
Hughes, T. A. (M)
Lightcap, E. T. (M)
Marsh, W. A. (A)
McCrory, J. R. (M)
McKechnie, K. H., Jr. (M)
Nielsen, M. I. (M)
Pereiko, H. T. (M)
Postemak, H. (A)
Prehn, G. G. (M)
Ritterman, S. A. (M)
Schwartz, A. J. (M)
Shurley, R. M. (M)
Snyder, E. C., Jr. (M)
Waxler, D. (SM)
Zenk, G. E. (M)

Dumont (NNJ-2)
Apfel, G. J. (A)
Auld, J. S. (A)
Benamy, D. A. (A)
Eland, P. D. (M)
Garrison, R. J. (M)
Hahn, J. (A)
Hammerstein, H. A. (M)
Kerner, S. J. (M)
Kompass, E. J. (M)
Leahy, G. F. (A)
Mossa, F. P. (M)
Schwerin, P. (SM)
Strain, M. (M)
Sundberg, A. (A)

Dunellen (PRI-2)
Canavan, J. J. (M)
Chabrak, T. A. (M)
Geigel, A. A. (M)
Helenek, A. R. (M)
Longo, C. V. (SM)
Povich, J. (A)
Ross, A. J. (SM)
Schmidt, S. J. (M)

Durham Park (PRI-2)
Meltzner, A. C. (A)

East Brunswick (PRI-2)
Vaccaro, F. E. (M)

East Orange (NNJ-2)
Armstrong, T. D. (M)
Carlat, B. (SM)
Coen, R. T. (M)
Conrad, T. E., Jr. (M)
Forman, J. A. (M)
Gawler, H. C. (SM)
Gonzalez, C. (M)
Greenberg, H. (M)
Henry, T. J. (SM)
Hodowanec, G. (M)
Kendall, B. W. (SM)
Lachocki, E. (A)
Lardieri, G. (A)
Lindon, J. (A)
Loomis, D. C. (A)
Meyers, S. T. (SM)
Nelson, R. S. (M)
Riegler, R. L. (A)
Ruston, J. (M)
Sandretto, P. C. (F)
Schulz, F. J. (A)
Scott, F. I., Jr. (M)
Simpson, J. E. (M)
Smith, H. H. (M)
Smith, W. P. (A)
Solek, L. R. (M)
Soles, D. (A)
Stalker, F. B. (M)
Tanguay, G. R. (M)
Weible, N. R. (VA)
Westbury, R. (M)
Worthington, R. L. (A)
Zich, M. M. (M)

East Paterson (NNJ-2)
Benewicz, T. F. (M)
Brennan, J. E. (M)
De Filco, N. J. (M)
Dehoney, R. J. (M)
Deichert, R. W. (M)
Fomin, M. (A)
Gardner, J. L. (A)
Grosbaum, E. (M)
Grower, B. B. (M)
Hamer, W. A. (A)
Hatchwell, J. A. (M)
Hesse, H. R. (SM)
Hoffman, P., Jr. (A)
Holley, J. J. (A)
Kendall, K. J. (M)
Koenig, J. A. (A)
Krell, J. (A)
Lapham, C. J. (A)
Maron, M. (M)
Northoe, D. T. (M)
Woodward, R. J. (M)

East Rutherford (NNJ-2)
Painter, J. G. (M)
Skalski, W. A. (M)

East Vineland (PHI-3)
Konrad, L. (M)

Eatontown (NY-M-2)
Abercrombie, G. D. (A)
Barlow, J. E. (M)
Burkhard, H. F. (M)
Curtis, M. W. (M)
Davis, M. I. (M)
Deblasio, C. (A)
Dill, F. H., Jr. (M)
Feehan, J. D. (M)
Felbish, H. L. (A)
Fentress, T. D., Jr. (SM)
Gaskell, R. J. (A)
Goubau, G. J. E. (F)
Gray, G. A. (M)
Haley, R. G. (M)
Hanson, E. D. (M)
Heiman, E. F. (M)
Heinlein, J. V. (A)
Hughes, R. A. (M)
Kelly, B. M. (SM)
Kesselman, W. A. (M)
Landberg, A. (M)
Lasher, D. R. (M)
Laugesen, T. C. (A)
Lucyk, J. (M)
Lupinski, A. M. (M)
McNaul, J. P. (M)
Occhiogrosso, T. (M)
Petrillo, S. E. (F)
Shanahan, J. C. (M)
Shirley, T. L. (M)
Smidowicz, T. Z. (M)
Strange, M. G. (M)

Edgewater (NNJ-2)
Harris, C. D. (A)

Elberon (NY-M-2)
Austin, H. R. (M)
Bady, I. (SM)
Blum, M. S. (M)
Brand, F. A. (M)
Burke, M. H. (M)
Elliott, C. T. (M)
Elser, A. C. (A)
Fontana, W. J. (SM)
Fullerton, G. R. (M)
Gould, W. B., III (A)
Hanna, P. D. (A)
Hiskin, L. (M)
Hill, J. F. (M)
Hooten, M. G. (M)
Ikrath, K. (A)
Jacoby, D. L. (M)
Krueger, T. O. (M)
Malkin, S. (M)
Prichard, A. C. (SM)
Schafer, J. P. (SM)
Scialfa, J. (A)
Sussdorff, R. R. (M)
Tanzman, H. D. (M)
Woodworth, J. D. (M)
Wynne, W. M. (VA)
Ziegler, H. K. (SM)

Elberon Park (NY-M-2)
Hecker, H. F. (M)
Trauben, W. (M)

Elizabeth (NNJ-2)
Baird, D. R. (A)
Bellis, V. L. (A)
Blaisdell, W. C. (SM)
Burton, D. M. (M)
Chasek, M. B. (A)
Cooper, C. G. (A)
Dixon, V. E. (M)
Garfinkel, B. D. (M)
Glassman, S. H. (M)
Green, L. N. (M)
Hirsch, F. (M)
Hold, H. W. (A)
Kent, R. A. (A)
Macina, N. A. (A)
Nellis, S. (A)
Nelson, D. E. (M)
Pecina, R. G. (A)
Peitzer, H. E. (SM)
Perez, C. P. (SM)
Peterson, T. A., Jr. (SM)
Pietrantonio, F. V. (M)
Rosen, H. (M)
Scaturo, C. (M)
Walsh, L. (SM)
Weinberg, M. (M)

Elmer (PHI-3)
Tipton, W. F. (M)

Emerson (NNJ-2)
Boyens, R. D. (SM)
Freid, J. (M)
Kelley, J. R. (M)
Long, J. H. (SM)
MacVeety, R. C., Jr. (M)
Reinish, G. B. (M)
Rubino, J. W. (SM)
Sacco, V. (M)
Swiggett, W. O. (A)

Englewood (NNJ-2)
Anick, G. (A)
Craig, J. A. (M)
Dem, H. (SM)
Elders, D. S. (M)
Garthwaite, J. L. (A)
Gruber, A. E. (A)
Haagens, D. (M)
Hillman, L. (M)
Hughes, K. E. (M)
Press, M. (SM)
Roselli, D. J. (A)
Saliba, G. J. (SM)
Saliba, J. R. (M)
Sargeant, C. E. (VA)
Smith, P. C. (A)
Stiefel, E. (A)
Thomas, E. R. (M)

Englewood Cliffs (NNJ-2)
Parker, S. R. (M)

Erlton (PHI-3)
Blaisdell, H. L. (SM)
Blombaum, H. M. (M)
Carignan, R. J. (M)
Casotaro, R. N. (M)
D'Amato, E. J. (M)
Foley, T. U. (M)
Hanson, R. E. (M)
Mechler, E. A. (SM)
Mone, C. C. (M)
Mullen, C. V. (A)
Pearson, R. W. (M)
Schottenfeld, I. A. (A)
Smith, C. J. (M)
Sperling, I. (A)
Weisbecker, J. A. (M)

Erskine Lakes (NNJ-2)
Cosgrove, T. (SM)

Essex Fells (NNJ-2)
Blancke, T. B. (A)
Henneberger, T. C., Jr. (M)
Lederer, E. A. (F)

Fair Haven (NY-M-2)
Aronoff, M. (SM)
Chappell, J. F. (M)
Corkran, D. H. (SM)
Dickson, F. H. (M)
Evans, E. D., Jr. (M)
Gale, R. J. (M)
Hanley, J. F. (SM)
Harrison, D. J. H. (A)
Kelley, L. C. (M)
Kolar, E. F. (SM)
Lartaud, H. R. (SM)
Loud, V. F. (A)
O'Neil, J. J. (M)
Priebe, F. K. (M)
Puzio, P. S. (A)
Riehs, R. C. (SM)
Russell, W. J., Jr. (M)
Ruthroff, C. L. (M)
Schedlbauer, C. M. (SM)
Triolo, F. J. (M)
Van Deusen, G. L. (F)
White, W., Jr. (A)
Young, J. A., Jr. (M)
Zahl, H. A. (F)

Fair Lawn (NNJ-2)
Bawer, L. I. (SM)
Bradburd, E. M. (M)
Brodsky, J. L. (M)
Carlin, B. (M)
Carpenter, P. J. (M)
Chao, J. (A)
Cooper, B. (M)
Diepeveen, N. (M)
Eckstein, N. A. (A)
Feit, L. (A)
Feller, M. (M)
Fischer, L. O. (VA)
Fruchter, C. L. (M)
Gaines, R. I. (M)
Grabois, B. (M)
Gulack, J. G. (SM)
Hill, E. (M)
Hill, E. R. (A)
Johnson, A. C. (M)
Kaylin, R. R. (M)
Lafferty, R. E. (SM)
Le Vine, D. J. (SM)
Levitsky, J. (M)
Luoo, F. J. (SM)
Maloy, M. (A)
Marrone, P. C. (M)
Moulton, J. H. (M)
Perry, M. A. (M)
Rabb, M. (M)
Reilly, N. B. (M)
Rizzo, J. E. (M)
Rosenberg, L. (A)
Sachs, H. S. (A)
Scarr, H. F. (SM)
Schacher, D. L. (M)
Schwartz, E. I. (M)
Sherman, H. (A)
Silver, M. (M)
Smolen, A. (M)
Spector, M. (A)
Stein, E. (M)
Torrey, L. W., Jr. (M)
Zerkin, M. (M)

Fairview (NNJ-2)
Hammerle, F. H. (M)
Larena, S. F. (A)
Meo, M. (A)
Pattan, B. A. (M)

Fanwood (NNJ-2)
Henley, E. J. (A)
Howes, M. M. (M)
Isaacson, A. M., Jr. (A)
Roberts, D. C. (A)
Rustako, A. J., Jr. (A)
Seidel, H. (M)
Thomas, A. W. (M)
Walter, R. A. (A)
Whaley, H. R. (SM)
Wise, W. H. (SM)

Far Hills (PRI-2)
Grissler, H. W. (M)
James, D. B. (M)
Owen, R. W. (M)
Peery, W. E. (M)
Serig, H. W. (SM)

Farmingdale (NY-M-2)
Hartley, J. H. (M)
Rock, F. E. (M)

Fayson Lakes (NNJ-2)
Duncombe, W. M. (A)

Flanders (NNJ-2)
Habib, N. (M)
Hauck, G. (M)
Johnson, J. R. (M)

Flemington (PRI-2)
Hoffmann, K. G. (M)

Florham Park (NNJ-2)
Ambruster, W. S. (A)
Chapman, C. M. (M)
Coonce, H. E. (M)
Fultz, K. E. (A)
Gaunt, W. B., Jr. (M)
Giffin, D. A. (M)
Greenwood, T. S. (A)
Hensperger, E. S. (M)
Kudlich, R. A. (SM)
McKersie, A. D. (M)
Meinholtz, H. J. (A)
Paull, M. (A)
Richardson, F. A. (A)
Simone, C. F. (M)
Sullivan, M. V. (SM)
Tarrant, S. R. (A)

Fords (PRI-2)
Glickman, V. (M)
Goldberg, H. (M)
Gumbs, J. (A)
Helm, R. J. (A)
Hoedemaker, R. W. (M)
Kalista, S. A. (A)
Kenash, A. E. (M)
Zapotocky, A. C. (M)

Fort Dix (PRI-2)
Kannawin, W. I. (A)

Fort Lee (NNJ-2)
Conerly, F. L. (A)
Frisch, F. W. (M)
George, W. P. (M)
Goldberg, S. R. (M)
Goldsman, J. L. (M)

Grant, M. S. (M)
Hodde, F. W. (M)
Levy, S. Y. (M)
Lieberman, H. (M)
Kidus, L. S. (A)
Sullivan, V. J. (A)
Unold, R. W. (SM)

Fort Monmouth (NY-M-2)
Bechmann, R. (SM)
Brazee, G. (SM)
Brown, H. M. (SM)
Burke, A. L. (SM)
Cranston, R. B. (M)
Curry, D. D. (M)
Dickey, V. F. (M)
Driggs, B. W. (M)
Fair, R. D. (M)
Freiberos, E. (M)
Garber, J. F., Jr. (SM)
Grube, J. C. (M)
Hirst, W. B., Jr. (M)
Lewin, J. (M)
Malone, W. R. (M)
Meyer, R. G. H. (SM)
Myers, R. F. (M)
Rood, R. S. (M)
Rouge, L. J. D. (SM)
Standley, R. D. (M)
Thiede, H. T. (M)
Vesey, J. B. (M)
Watters, J. E. (SM)
White, H. E. (M)
Wilson, J. L., Jr. (SM)

Franklin (NNJ-2)
Segarra, J. (A)

Franklin Lakes (NNJ-2)
Gottfried, N. J. (M)
Houghton, T. F. (M)
Piccoli, P. E. (M)
Pulchlopek, E. S. (M)
Scoskie, A. T. (A)

Franklin Park (PRI-2)
Braun, M. (M)
Brown, H. R. (A)
Familletti, B. L. (A)
Moore, T. H. (M)

Freehold (NY-M-2)
Buck, D. T. (M)
Hersh, H. J. (SM)
Kaiser, E. J. (M)
Katz, S. (M)
Lawn, F. (M)
Pochmerski, D. (M)

Garfield (NNJ-2)
Horvath, S. J. (M)
Krzych, L. J. (A)
Mayurnik, G. (A)
Mihal, J. (A)
Ozarowski, A. J. (M)
Pannacciulli, F. R. (A)
Paradise, R. Y. (M)
Puskas, W. E. (M)
Sadvary, J. W. (A)
Sukilch, W. J. (A)

Gibbsboro (PHI-3)
Elliopoulos, A. J. (A)
Neely, W. J. (A)
Nikolayuk, N. (A)

Gillette (NNJ-2)
Kannenberg, W. F. (SM)
Rist, R. E. (M)
Rystedt, T. (M)
Spector, C. J. (M)
Turrin, R. H. (M)
Villars, C. P. (M)
Vitkovits, S., Jr. (M)

Glassboro (PHI-3)
Atherton, D. G. (M)
Demi, A. J. (M)
Katinos, L. J. (A)
Loeb, P. (M)
Riggs, D. L. (M)
Saganowich, J. T. (M)

Glendora (PHI-3)
Currey, W. J. (A)
Jack, D. E. (M)

Glen Ridge (NNJ-2)
Brubaker, P. M. (M)
Dorff, L. A. (SM)
Hamilton, G. E. (SM)
Heinzerling, E. W. (M)
Hopgood, R. C. (SM)
Lasort, E. A. (F)
Mandel, M. (M)
Olsen, E. U. (M)
Polyzou, J. (M)
Reveal, P. A. (M)
Tambling, R. L. (SM)
Tresnak, R. F. (M)
Waite, G. F. (A)

Glen Rock (NNJ-2)
Abrams, I. (M)
Ballou, F. M. (M)
Becken, E. D. (M)
Browne, R. (M)
Clark, L. E. (VA)
Cotellessa, R. F. (SM)
Fischer, L. G. (SM)
Graebner, J. C. (M)
Green, R. C. (A)
Kloster, D. E. (A)
Lotte, R. E., Jr. (M)
Lukas, W. (M)
McGovern, J. J. (M)
Rinoer, R. L., Jr. (M)
Sanoer, R. B. (A)
Senator, R. S. (A)
Singer, E. (M)
Willes, R. L. (A)

Gloucester (PHI-3)
Baltz, C. K. (M)
Cornet, E. (SM)
Dunn, D. C. (M)
Fisher, D. M. (A)
Hirsch, S. C. (A)
Leung, T-C. (M)
Mosher, B. H. (M)
Osler, S. J. (M)
Quan, K-K. (M)

Great Notch (NNJ-2)
Berkley, C. (A)
Denney, J. M. (M)
Godley, P. F. (VA)
Godley, P. F., Jr. (M)

Grenloch (PHI-3)
Barton, H. R., Jr. (A)
Henuset, F. V., III (A)

Guttenberg (NNJ-2)
Brackett, J. J. (A)

Hackensack (NNJ-2)
Arcidiacono, J. (M)
Bastian, A. L. (M)
Davis, H. M. (A)
Gambuti, P. F. (A)
Helwege, G. (A)
Hirschinoer, K. (M)
Kaszerman, P. (M)
Lumbert, J. S. (A)
Maasik, C. (A)
Mate, H. (M)
McKenzie, A. A. (SM)
Roemisch, J. L. (SM)
Samuelson, C. D. (SM)
Schentes, M. J. (SM)
Siltanen, J. C. (M)
Wertman, R. C. (M)
Wylde, W. N. (M)

Hackettstown (NNJ-2)
Dinzl, R. A. (A)
Glass, J. F. (A)
Ouellette, L. A. (A)

Haddonfield (PHI-3)
Achenbach, J. C. (SM)
Adams, R. L. (M)
Alexander, E. M. (M)
Alter, A. C. (SM)
Anderson, E. I. (F)
Anderson, J. B. (M)
Andrews, K. E. (M)
Anisoe, J. J. (A)
Arian, L. (A)
Armbruster, G. J. (A)
Ashton, H. A. (M)
Ball, J. W. (M)
Bailey, R. E. (M)
Baker, A. B. (M)
Bantle, D. W. (A)
Barnes, R. W., Jr. (M)
Barton, D. K. (SM)
Batterman, S. (A)
Bauer, W. R. (M)
Beard, A. D. (M)
Beck, F. X., Jr. (M)
Beers, G. L. (F)
Benner, A. H. (SM)
Berge, R. G. (SM)
Bergquist, P. (M)
Bessette, O. E. (M)
Binzer, C. (M)
Blaustein, H. D. (M)
Blodgett, E. D. (SM)
Boerner, T. J. (SM)
Bowen, O. N. (M)
Bowman, S. T. (A)
Bradburn, R. C., Jr. (A)
Braddock, E. (M)
Bragdon, J. H. (M)
Brandt, M. M. (M)
Breckman, J. (M)
Brock, F. M. (M)
Brooks, C. L., Jr. (A)
Brown, H. W., Jr. (SM)
Brown, L. (A)
Brown, W. J. (M)
Bry, J. C. (M)
Bucklin, E. P., Jr. (M)
Bullock, J. B. (M)
Burton, N. H. (A)
Butler, J. G. (A)
Campanella, M. J. (M)
Campobano, C. N. (M)
Cantaflo, L. J. (A)
Carter, G. W. (SM)
Cashwell, R. G., Jr. (M)
Castleberry, J., Jr. (M)
Cederbaum, L. R. (M)
Chaba, P. (M)
Cheetham, R. P. (M)
Chiabrando, J. C. (A)
Chiel, F. D., Jr. (M)
Chittick, K. A. (F)
Christensen, J. L. (M)
Cimerman, I. (A)
Cohen, P. (SM)
Cole, D. D. (SM)
Coleman, J. B. (F)
Coleman, R. E. (M)
Connor, W. J., Jr. (M)
Cook, M. E. (M)
Cooper, R. H., III (M)
Cooper, S. (M)
Covely, F. D., III (SM)
Crawford, C. F. (SM)
Crooks, H. N. (SM)
Cubert, J. S. (M)
Cunningham, O. B. (SM)
Daniels, A. J. (M)
Davidson, J. J. (M)
Dehm, R. E. (M)
Denton, B. E. (SM)
Desautels, G. L. (M)
Dewitt, C. C. (A)
Diehl, D. W. (M)
Dishler, J. J. (A)
Donze, D. W. (M)
Douma, T. (M)
Drake, A. H. (A)
Ehrich, W. G. (M)
Elliott, H. M. (M)
Ernsberger, R. E. (M)
Erwin, G. E. (M)
Facer, R. S. (A)
Fedak, J. F., Jr. (A)
Federlin, H. M. (M)
Felix, E. H. (SM)
Ferron, J. A. (M)
Fine, R. S. (SM)
Fink, M. (M)
Flore, R. E. (M)
Fitzpatrick, A. G. (M)
Flint, R. J. (M)
Fogleboch, J. R. (M)
Fong, T. T. (M)
Forrester, C. A. (A)
Forte, S. R. (M)
Foster, H. B. (M)
Fox, R. I. (M)
Frary, R. S. (M)
Frost, C. R. (M)
Funk, K. A. (M)
Furnstahl, J. S. (M)
Gallo, J. E. (SM)
Gallo, L. (M)
Gay, A. C. (SM)
Gensel, W. L. (M)
Gerardi, V. A. (M)
Goyer, R. B. (M)
Graham, R. C. (M)
Gray, F. D. (M)
Grever, J. L. (M)
Gross, D. T. (M)
Guerber, H. P. (M)
Gutsmuth, H. R. (M)
Haddad, R. A. (M)
Halpern, S. (M)
Hammel, R. A. (A)
Harwood, L. A. (M)
Haynes, H. E. (SM)
Heizer, J. T. (M)
Hermelling, G. C., Jr. (SM)
Herrmann, F. J. (SM)
Hill, N. R. (M)
Hillmen, E. L. (A)
Hodson, L. A. (SM)
Holshouser, J. R., Jr. (M)
Horton, J. B. (M)
Housey, L. J. (M)
Howard, T. B. (M)
Hubbard, B. L. (M)
Hunt, R. W. (M)
Hymas, D. G. (M)
Into, A. N., Jr. (A)
Isom, W. R. (SM)
Janz, D. W. (M)
Joffe, I. (M)
Johnson, R. V. (A)
Kalkman, E. C. (M)
Kamof, R. J. (A)
Kasmar, R. A. (M)
Katz, A. (M)
Keefe, J., Jr. (A)
Kellon, B. K. (A)
Kessler, B. L. (M)
Kettler, A. H. (SM)
King, R. E. (M)
Kingan, J. (M)
Kirkwood, L. R. (SM)
Kita, R. K. (M)
Klawsnik, F. (SM)
Kleinberg, H. (M)
Kolesnik, M. (M)
Koros, L. L. (SM)
Krasney, S. (A)
Krell, A. I. (M)
Kropp, G. W. (A)
Krueger, I. D. (M)
Krugman, L. M. (SM)
Larson, K. E. (M)
Lawler, J. J. (A)
Lee, R. H. (SM)
Lesko, J. (M)
Lev, S. N. (M)
Levy, A. S. (M)
Lewis, E. S. (M)
Lewis, R. J. (SM)
Liebermann, J. (A)
Lind, A. H. (M)
Lindheim, F. H. (M)
Lindner, G. H. (A)
Linhardt, R. J. (SM)
Lisicky, A. J. (M)
Logan, W. L. (M)
Lowe, M. H. (SM)
Luber, L. (M)
Luddy, E. N. (M)
Luksch, J. A. (M)
Lundgren, D. L. (SM)
Lundon, J. J. (M)
Lyndon, W. L. (SM)
Magyarics, R. F. (A)
Major, R. P. (M)
Maldoon, L. M. (M)
Mannino, A. J. (SM)
Marks, T. P. (A)
Maron, I. (M)
Martin, F. F. (M)
Mascoli, V. J. (A)
Mathwich, H. R. (M)
Matson, L. E., Jr. (M)
Mayer, D. B. (M)
Mayo, A. L. (A)
McAllister, H. M. (M)
McCoy, J. F. (SM)
McGahey, E. W., Jr. (M)
McGaughey, P. C. (SM)
McKee, D. M. (A)
Meisenheimer, R. L. (RM)
Meng, D. R. (M)
Mertz, H. W. (M)
Messina, M. F. (M)
Milewski, C. A. (M)
Miller, G. F. (M)
Minzer, A. I. (M)
Mitchell, W. T. (M)
Monro, C. R. (M)
Moule, W. N. (M)
Munson, I. K. (SM)
Muolo, A. W. (M)
Murakami, T. (SM)
Nacke, C. C., Jr. (M)
Nahay, L. P. (M)
Nessmith, J. T., Jr. (SM)
Neumann, K. L. (M)
Nicholson, B. E. (SM)
Nishimura, G. H. (M)
Noel, R. Y. M. (M)
Noguchi, R. Y. (A)
Nordyke, H. W., Jr. (M)
Nossen, E. J. (A)
Obenland, D. K. (M)
Oberle, G. W. (SM)
Ohler, A. E. (M)
O'Neil, P. T. (M)
Osborne, J. M. (SM)
Paley, L. I. (M)
Palmer, J. E. (A)
Paris, A. A. (A)
Pearson, D. D. (A)
Perreault, W. J., Jr. (M)
Perry, S. V. (SM)
Pessin, L. (M)
Peterson, C. E. (M)
Peterson, R. A. (SM)
Petri, W. H., Jr. (SM)
Phelps, D. E. (A)
Pickus, L. C. (A)
Poehls, V. J. (M)
Potras, D. J. (M)
Poorte, G. E. (M)
Potts, J. B. (A)
Pratt, D. C. (SM)
Price, W. E. (SM)
Pritchard, E. M. (SM)
Pyle, M. O. (M)
Reed, D. S. (M)
Reimertz, R. R. (M)
Reinert, D. O. (M)
Rettig, A. S. (SM)
Riccio, A. H. (SM)
Ringo, K. A. (SM)
Rocamora, R. L. (M)
Rodeman, G. A. (M)
Rose, H. E. (M)
Rose, W. A. (M)
Rosenberg, N. (A)
Ross, G. T. (M)
Roth, J. H. (SM)
Rudner, M. A. (SM)
Rumble, W. G. (M)
Ryan, V. F., Jr (M)
Rydz, J. S. (M)
Ryerson, C. M. (SM)
Sable, J. D. (M)
Sall, C. W. (SM)
Samartino, R. F. (M)
Sander, S. (M)
Satiler, E. W., Jr. (A)
Scearce, F. T. (M)
Scharff, L. (SM)
Schneider, H. T. (A)
Schrader, H. J. (F)
Schwartz, B. K. (M)
Scott, P. B. (M)
See, C. J. (A)
Shapiro, L. (M)
Shectman, M. (M)
Shectman, N. (M)
Shelton, J. A. (M)
Sheridan, E. W. (A)
Siegal, M. E. (M)
Singer, G. A. (M)
Skarbek, I. R. (M)
Skidmore, W. S. (M)
Smith, E. B. (SM)
Smith, J. N. (M)
Sonnenfeldt, R. W. (SM)
Spiegel, S. S. (M)
Stafford, R. H. (A)
Stanford, C. E. (M)
Starner, C. J. (M)
Starr, S. C., Jr. (M)
Staton, M. G. (M)
Stockton, E. M. (M)
Stone, F. B. (SM)
Stover, R. A. (A)
Strickland, K. T. (M)
Strio, J. (SM)
Subletie, I. H. (M)
Sullivan, J. L. (A)
Taylor, J. P. (A)
Taylor, W. E. (A)
Thomas, L. P. (SM)
Tissot, T. P., Jr. (M)
Toscano, P. M. (SM)
Trachtenberg, R. (SM)
Traub, W. F. (M)
Trouant, V. E. (SM)
Truesdell, R. L. (A)
Turecki, A. (M)
Tumbull, S. W. A. (M)
Turner, R. R. (M)
Tyson, H. B. (A)
Ubben, R. C. (M)
Wahlstrom, R. N. (A)
Waite, J. H., Jr. (SM)
Wald, S. (SM)
Waldron, R. E. (M)
Walter, C. E., III (SM)
Walters, W. R. (M)
Warren, C. S. (M)
Watson, S. H. (SM)
Webb, R. B. (A)
Weir, W. T. (M)
Welse, R. C. (VA)
Weiss, M. V. (M)
Weiss, S. L. (M)
Welsh, R. R. (SM)
Welsher, C. E. (SM)
Wenger, W. D. (SM)
Wentworth, J. W. (M)
West, L. G. (M)
Westwood, D. H. (SM)
Wheeler, B. F. (SM)
Widmann, F. W. (SM)
Wilcox, R. C. (SM)
Wilder, M. K. (M)
Willman, R. C. (SM)
Wilson, H. S. (A)
Wolf, L. J. (SM)
Wooten, L. B. (M)
Yanis, E. M. (M)
Yao, Y. L. (M)
Zoltan, I. N. (M)

Haddon Heights (PHI-3)
Altel, M. L. (M)
Arrowood, W. E. (M)
Auerbach, B. (M)
Barger, J. R. (M)
Beckhart, G. H. (M)
Boehm, P. P. (M)
Boyd, E. A. (M)
Burke, A. M. (M)
Carlson, D. J. (SM)
Conroy, G. J. (M)
Darnell, W. E. (SM)
Eulo, G. L. (M)
Goodman, G. H. (SM)
Gunter, D. L. (M)
Hartmann, H. (A)
Harwood, F. E. (A)
Hoger, D. T. (A)
Hoyle, W. E. (M)
Leighton, A. K. (M)
Latham, N. D. (M)
Lawson, J. O. (M)
Link, J. M. (M)
McMorrow, C. F. (M)
Moore, E. E. (M)
Pan, W. Y. (F)
Parker, J. R. (M)
Phillips, C. R. (M)
Solomon, K. (M)
Steoger, J. E. (A)
Wolf, L. (SM)
Woll, H. J. (SM)

Hamburg (NNJ-2)
Tomey, J. G. (M)

Hamilton Square (PRI-2)
Edwards, L. M. (A)
Miller, J. C (M)
Pantuso, A. J., Jr. (M)

Hammonton (PHI-3)
Reber, P. W. (A)

Hanover (NNJ-2)
Byrne, E. R. (M)
Conway, W. H. (M)
Doll, W. E. (M)
Leonard, T. H. (M)
Wunch, E. R. P. (M)

Harbourton (PRI-2)
Reed, R. D. (SM)

Harrington Park (NNJ-2)
Aron, M. (SM)
Burnano, S. J. (SM)
Vieth, W. G. (M)

Harrison (NNJ-2)
Austin, W. M. (M)
Bahls, W. E. (SM)
Bertin, E. P. (M)
Burke, L. P. (M)
Bumap, R. S. (F)
Carrona, J. J. (M)
Cimorelli, J. T. (SM)
Cranmer, W. S. (SM)
Dunn, R. F. (M)
Eberly, H. L. (SM)
Freedman, N. S. (SM)
Freeling, M. R. (M)
Gutowski, J. L. (SM)
Hirlinger, J. F. (SM)
James, W. M. (SM)
Johnk, O. (A)
Kauzmann, A. P. (SM)
Kelly, R. L. (SM)
Kleinman, B. (M)
Koustas, P. (SM)

Levine, B. (M)
Maguire, J. T. (M)
McElwee, E. M. (SM)
McMurrough, R. W. (M)
McPartland, J. F. (A)
Mead, W. H. (M)
Meyer, C. A. (SM)
Middings, S. (M)
Morris, C. M. (SM)
Nelson, J. N. (M)
Novak, G. (M)
Nowogrodzki, M. (M)
Perkins, T. B. (M)
Reusch, R. K. (M)
Rose, G. M., Jr. (F)
Scholz, L. C. (M)
Shaw, G. R. (F)
Shuttleworth, E. (A)
Smith, D. Y. (SM)
Stein, V. J. (M)
Talpey, R. G. (SM)
Troy, E. M. (M)
Wanchow, J. J., Jr. (M)

Hasbrouck Heights (NNJ-2)
Bucholtz, M. N. (M)
Drew, R. E. (A)
Henn, W. (M)
Lasch, W. H. (M)
Lazos, N. J. (A)
Nagl, J. L. (M)
Zorel, A. S. (A)

Haworth (NNJ-2)
Clausen, R. W., Jr. (M)
Guy, R. F. (F)
Osborn, P. H. (M)
Terry, F. B. (A)

Hawthorne (NNJ-2)
Carlson, E. S. (M)
Constantin, L. L. (M)
Madle, P. J. (SM)

Hazlet (NY-M-2)
Angel, K. W. (M)
Bryson, W. B. (M)
Hancock, G. H. (A)
Harries, W. (M)
Morgan, R. L. (M)
Przybylski, T. P. (A)
Vernon, R. R. (M)

High Bridge (PRI-2)
Bartles, E. K. (A)

Highland Park (PRI-2)
Bocchieri, A. J. (A)
Goldin, S. M. (M)
Lipnick, R. (M)
Molony, D. A. (SM)
Nelson, J. L. (M)
Stephenson, M. L. (A)

Highlands (NY-M-2)
Ferrar, R. C. (SM)
Rohrle, T. A. (A)

Highlands Air Force Station (NY-M-2)
Korn, W. (M)

Hightstown (PRI-2)
Bowker, J. D. (M)
Marriner, A. W. (M)
Murr, J., Jr. (A)

Hillsdale (NNJ-2)
Crooke, A. W. (A)
Conroy, R. J. (M)
Klein, M. E. (M)
Lapham, F. K., Jr. (A)
Marsh, C. O., Jr. (M)
Sullinger, W. B. (SM)
Teitler, A. (SM)

Hillside (NNJ-2)
Alelxo, A. (M)
Breunig, J. J. (M)
Cohen, H. (M)
Hood, C. N., II (SM)
Hrusovsky, S. (A)
Kahant, C. G. (A)
Wilner, G. (A)
Zentmaler, K. H. (M)

Hoboken (NNJ-2)
Ficken, W. H. (M)
Gilmore, A. C., Jr. (M)
Hahn, R. F. (M)
Hauser, E. B. (M)
Koenig, H. C. (M)
Merrill, L. L. (SM)
Rossi, S. (A)
Shouf, J. C. (M)
Simberkoff, J. A. (A)
Simberkoff, S. W. (A)
Sullivan, W. L. (SM)

Hohokus (NNJ-2)
Ebersol, E. T., Jr. (M)
Mangels, L. A. (A)
Markus, J. (SM)
Saul, E. R. (M)
Seggebruch, R. L. (A)
Spaulding, H. K. (A)

Holmdel (NY-M-2)
De Lange, O. E. (M)
Marcatili, E. A. J. (M)
Hopewell (PRI-2)
Presser, A. (M)
Townsend, C. C., Jr. (M)

Interlaken (NY-M-2)
Krassner, G. N. (M)
Todd, W. (M)

Ironia (NNJ-2)
Brown, R. E. (M)
Fogarty, L. L. (A)
Markle, R. E. (A)
Weiss, A. A. (A)

Irvington (NNJ-2)
Angello, J. P. (M)
Baron, H. M. (M)
Barosin, S. (M)
Caspar, C. W., Jr. (M)
Goldberg, D. L. (A)
Goldshine, A. D. (M)
Gropp, B. P. (M)
Heber, J. F. (M)
Hibbett, R. M. (M)
Huetil, K. W. (A)
Kosmaczewski, L. (M)
Meisel, H. R. (M)
Meister, P. T. (M)
Mommo, E. J. (VA)
Nesselroth, M. D. (M)
Reich, R. F. (M)
Stevens, Z. J. (M)
Sutton, R. H. (A)
Walters, W. L. (M)

Iselin (PRI-2)
Fryer, W. R. (M)
Kvedaras, A. P. (M)
Libes, S. (A)

Jersey City (NNJ-2)
Balter, L. (M)
Bemstein, E. (A)
Brogan, J. M. (M)
Caputo, W. R. (M)
De Rosa, J. J., Jr. (A)
Faber, M. J., Jr. (A)
Foley, J. J. (A)
Gaudiosi, J. V. (A)
Graul, G. D. (M)
Hawkins, F. T. (A)
Howell, W. J. (SM)
Israel, D. D. (F)
Kunin, L. (M)
Lee, T. J. (M)
Leslie, F. (M)
Loiteman, L. (M)
Marchand, O. P. (A)
Mayor, R. (A)
McAndrew, T. V. (M)
Olin, R. P. (M)
Polcyn, S. J., Jr. (M)
Putt, D. R. (A)
Raffel, L. (A)
Scherzer, K. (M)
Seel, M. (A)
Sickles, C. E. (A)
Slurzberg, N. (A)
Smith, J. A. (M)
Swieluk, S. (M)
Tenten, R. C. (A)
Womcke, W. (M)
Yaworsky, Y. J. (M)
Yurechko, J. J. (A)

Kearny (NNJ-2)
Belamarich, J. P. (M)
Bondon, L. A. (SM)
Gerulat, T. G. (A)
Helwig, W. J. (SM)
Lewis, R. F. (M)
McCaffery, W. W. (M)
McKeon, E. F. (M)
Percival, W. R. (SM)

Keasbey (PRI-2)
Albers-Schoenberg, E. (SM)
Snyder, C. L. (SM)

Kenilworth (NNJ-2)
Gams, T. C. (M)
Mayer, J. H. (A)
McCarroll, A. K. (A)

Kenvil (NNJ-2)
Lanning, H. E. (M)
McIntyre, J. W. (A)

Keyport (NY-M-2)
Bernhardt, W. L. (M)
Blumberg, L. (M)
Schlaack, N. F. (SM)
Schmeling, A. M. (A)
Slobodin, L. (M)
Tetreault, N. E. (M)

Kinnelon (NNJ-2)
Gaw, N. W. (M)

Lake Hiawatha (NNJ-2)
Brener, H. A. (VA)
Calzaretta, R. G. (M)
Greenberg, A. H. (M)
Obee, R. A. (A)
Rosenbusch, F. (A)

Lakehurst (NY-M-2)
Kapeghian, R. H. (M)
Lake Parsippany (NNJ-2)
Nasto, S. N. J. (A)

Lake Pine (PHI-3)
Gavinski, V. A. (M)

Lake Rockaway (NNJ-2)
Saxe, H. A. (A)

Lakewood (NY-M-2)
Bell, J. (A)
La Cava, E. (A)
Ringel, M. (A)

Laurel Springs (PHI-3)
Coffey, E. W. (M)
Smith, W. J. (A)

Laurelton (NY-M-2)
Kasper, H. W. (A)
Vorwerk, F. A. (A)

Lawrenceville (PRI-2)
Kihn, H. (SM)
Olive, G. A. (M)
Snedeker, E. K., Jr. (M)

Lebanon (PRI-2)
Daskam, S. W. (M)
Mortimer, A. J. (M)

Lenonia (NNJ-2)
Burger, F. J. (A)
Christie, F. W. (M)
Dietsch, C. G. (SM)
Grube, W. O. (M)
Kennedy, T. R., Jr. (SM)
Kerman, M. (M)
Klenk, R. L. (M)

Levittown (PHI-3)
Amemiya, H. (M)
Cox, A. L. (M)
Davis, R. S. (A)
Goldberg, M. L. (A)
Goldman, H. B. (A)
Kreitzer, H. M. (A)
Mayhew, T. R. (M)
Mogensen, H. (M)
Mohr, H. F. (M)
Riley, R. L. (A)
Srolovitz, H. B. (A)
Vrattos, G. P. (M.
Yeh, L. P. (M)

Lincoln Park (NNJ-2)
Quinlan, D. E. (A)

Lincroft (NY-M-2)
Bawden, H. G. (M)
Ceres, C. V. (A)
Duffy, J. P. (M)
Koehls, A. R. (A)
Sher, H. T. (M)
Wagner, L. H. (M)

Linden (NNJ-2)
Braun, L. (A)
Garshelis, I. J. (A)
Gladden, C. J. (A)
Goldstein, M. I. (A)
Jordan, C. J. (M)
Kashork, E. F. (M)
Levin, R. M. (A)
Macovski, A. (SM)
Meyer, S. F. (M)
Poarch, M. F. (M)
Redd, T. M. (M)
Riley, G. B. (SM)
Tkach, G. D. (M)
Turner, C. R. (M)
Wexler, B. (A)

Lindenwold (PHI-3)
Murdock, W. G. (A)

Linwood (PHI-3)
Rogers, D. C. (M)
Russell, C. M. (SM)
Saadeh, D. (M)
Shanteau, N. G. (M)

Little Falls (NNJ-2)
Beukers, J. M. (M)
Bluhm, R. W. (A)
Bondy, J. O. (A)
De Ryder, H. (VA)
Edwards, R. A. (M)
Hintikka, I. (M)
Huetiner, O. A. (M)
Nord, H. H. (M)
Russo, O. L. (A)
Thiergartner, G. J. (A)
Turkheimer, P. M. (M)

Little Ferry (NY-M-2)
Rostan, R. J. (M)

Little Silver (NY-M-2)
Borgeson, C. A. (SM)
Bracken, J. R. (M)
Brueckmann, H. L. (F)
Butler, H. (M)
Craig, L. H. (SM)
Daniels, F. B. (SM)
Fox, K. H. (SM)
Garoff, K. (M)
Goldsmith, B. M. (SM)
Griffiths, R. J. (SM)
Havel, J. M. (M)
Huebner, D. L. (M)
Jensen, A. M. (M)
King, H. D. (SM)
Klenk, L. M. (SM)
Krevsky, S. (SM)
Lowry, L. R. (SM)
Mack, A. (M)
Miller, L. (SM)
Mond, L. I. (M)
Morris, M. M. (SM)
Paschetto, E. J. (M)
Pick, L. A. (M)
Pollock, D. (M)
Poteet, D. P. (VA)
Reynolds, M. R. (M)
Sharp, C. E. (SM)
Shive, S. L. (SM)

Livingston (NNJ-2)
Augenblick, M. A. (M)
Baker, D. (A)
Bishoo, J. B. (SM)
Bogner, I. (SM)
Broekhuysen, W. C. (SM)
Bystrycky, W. (M)
Chen, R. K. (M)
Cunningham, T. M. (M)
Dorros, I. (M)
Engelmann, H. F. (SM)
Feinstein, J. (M)
Fressola, B. C. (A)
Galanty, H. (SM)
Hatch, R. W. (M)
Hetherington, R. W. (A)
Hoeh, F. W. (M)
Hoemer, E. F. (M)
Jandoli, L. R. (M)
Kafalas, C. (M)
King, J. H., Jr. (M)
Kronacher, G. (SM)
Kulik, V. A. (M)
Markosian, V. (SM)
Mawhinney, D. D. (M)
Membury, P. J. (M)
Mennie, J. H. (M)
Newman, L. (A)
Nordlin, H. G. (SM)
Normando, N. J. (M)
Ost, S. B. (M)
Plouffe, R. L., Jr. (SM)
Prawdzik, C. A. (M)
Richardson, A. L. (M)
Sanger, D. M. (M)
Steinhoff, R. (M)
Stineheifer, H. E., Sr. (M)
Sussman, E. B. (M)
Treuhaft, M. A. (SM)
Ussery, P. W. (M)
Vadersen, C. W. (M)
Voorhis, W. B. (SM)
Zacharais, E. M., Jr. (M)

Lodi (NNJ-2)
Booth, H. H. (M)
Brand, E. G. (M)
Burkey, E. L. (M)
Conrad, R. J. (M)
Doniger, J. (M)
Edelman, G. (M)
Gage, L. W. (A)
Gelenter, A. (M)
Jackson, E. B. (M)
Meyer, R. W. (M)
Seda, O. L. (A)
Sidari, P. J. (A)

Long Branch (NY-M-2)
Adamson, A. L. (SM)
Alexander, J. M. (M)
Allen, J. A. (M)
Ballon, I. A. (M)
Barr, H. (M)
Brown, A. (SM)
Caldwell, W. C. (SM)
Chernow, M. (M)
Christian, J. R. (M)
Christianson, L. F. (SM)
Coffin, W. W. (A)
Coulbourn, D. W. (M)
Dwin, D. (A)
Eaton, K. O. (M)
Gall, R. C. (A)
Gelernter, B. (M)
Gougoulis, G. H. (M)
Greenspan, S. (M)
Grubman, S. (M)
Gubin, L. L. (A)
Hamer, H. (SM)
Hanel, R. A. (A)
Holsclaw, R. F. (A)
Humbel, B. F. (M)
Insterman, H. E. (M)
Kardauskas, E. (M)
Klein, T. J. (M)
Kravitz, M. L. (M)
Marsh, C. J. (M)
Martinson, F. L. (SM)
Mattes, A. J. (A)
Meller, R. R. (SM)
Mullen, J. F. (M)
Munn, K. J. (M)
Perlman, S. (SM)
Rauffer, W. M. (A)
Ross, P. (M)
Sacks, F. A. (A)
Reder, F. H. (A)
Schmickley, J. H. (M)
Schwab, D. (M)
Silberman, A. (M)
Silva, A. A. (M)
Smith, P. O., Jr. (A)
Swan, R. A. (A)
Theibault, J. E. (A)
Trouard, R. L. (M)
Ulfers, H. E. (M)
Weinstock, M. (A)

Long Valley (NNJ-2)
Stiles, M. G. (M)

Lyndhurst (NNJ-2)
Cucci, M. J. (M)
Di Stadio, D. (M)
Domanico, P. T. (M)
Fribero, V. (A)
Horbach, S. (M)
Kelmis, K. J. (A)
La Medica, K. O. (A)
Robinson, G. D. (A)
Ruckl, D. H. (M)

Madison (NNJ-2)
Alexander, E. J. (M)
Aster, A. K. (M)
Barney, H. L. (SM)
Carter, H. T. (SM)
Coultas, R. A. (A)
Cude, H. H. (A)
D'Asaro, L. A. (M)
Diederich, P. A. (M)
Dineck, P. V. (SM)
Elcock, G. C. (A)
Ellis, B. T., Jr. (SM)
Grantoes, R. F. (M)
Gross, F. J. (M)
Hartzell, J. W. (M)
Howard, E. J. (SM)
Lanford, L. D. (A)
Leppert, J. H. (M)
Livera, A. L. (M)
Lundin, J. A. (A)
Martin, E. O. (M)
Mearns, A. B. (M)
Melville, J. R. (A)
Muller, E. E. (M)
Munk, P. R. (M)
Neunzig, R. C. (A)
Okean, H. C. (M)
Ossanna, J. F., Jr. (M)
Oster, F. J. (M)
Peterson, R. N. (SM)
Reed, J. F., Jr. (M)
Roetken, A. A. (F)
Ross, A. T. (SM)
Ruckelshaus, J. G. (SM)
Schwarz, G. R. (M)
Smith, J. W. (SM)
Strandt, E. R. (M)
Swain, R. G. (M)
Taylor, C. D. (M)
Taylor, H. E. (M)
Thompson, C. F. (A)
Van Dine, G. A. (M)
Van Tassel, E. K. (SM)
Vodopia, S. N. (A)
Vogelsong, J. H. (M)
Weppler, H. E. (M)
Wilson, W. F. (M)

Magnolia (PHI-3)
Bretz, R. E. (M)
Guertin, R. J. (M)
Holt, J. M. (M)
Lawton, R. S. (M)

Mahwah (NNJ-2)
Constantine, A. (A)
Constantine, P. M. (A)
Humphrey, R. M. (M)
Neill, W. E. (M)
Sielski, A. T. (M)

Manahawkin (NY-M-2)
Taylor, J. W. (A)

Manasquan (NY-M-2)
Cline, D. E. (M)
May, M. M. (M)
Teetsel, W. P. (M)

Manasquan Park (NY-M-2)
Gibbons, D. R. (M)

Maple Shade (PHI-3)
Freed, A. J. (M)
Hoover, E. W. (M)
Kemof, B. E. (M)
Keys, D. D. (A)
Kramer, N. R. (M)
Matonak, L. A. (M)
Morgan, W. L. (A)
Nauberelt, H. (M)
O'Donnell, J. J. (M)
Parmer, M. E. (M)
Ramsell, J. L. (M)
Rosenblatt, M. (M)
Scheuer, H. J. (M)
Singleback, G. W. (A)
Small, H. E. (A)
Twinam, J. R. (A)

Maplewood (NNJ-2)
Almquist, M. L., Jr. (M)
Barkley, H. F. (M)
Borden, D. C. (M)
Cohen, D. (M)
Dickey, D. W. (SM)
Fromer, M. (M)
Gardner, P. S. (A)
Hankinson, F. K. (SM)
Hazeltine, A. L. (F)
Helfrich, J. H. (M)
Humphrey, H. C. (M)

Koskos, P. (SM)
Murphy, W. F., Jr. (M)
Oswald, A. A. (F)
Prosser, T. C. (A)
Pruden, H. M. (SM)
Schulz, W. J. (A)
Sherman, A. E., Jr. (A)
Steinmetz, C. M. (M)
Vance, H. C. (SM)
Wallenstein, J. P. (M)
Wilhelm, J. F. (SM)
Youngstrom, N. C. (M)

Margate (PHI-3)
Justman, S. (M)

Margate City (PHI-3)
Thron, B. K. (M)

Marlboro (NY-M-2)
Bernard, J. L., Jr. (VA)
Hindin, A. (A)

Marlton (PHI-3)
Barber, F. H. (M)
Brown, B. W. (A)
Cochran, S. W. (SM)
Franke, J. L. (SM)
Fulroth, W. H. (M)
Garrott, L. O. (M)
Gaskill, M. L. (A)
Glauberman, M. H. (M)
Koch, W. R. (F)
Shaffer, R. C. (M)
Thowless, E. A. (A)

Masonville (PHI-3)
Lesser, R. H. (SM)

Matawan (NY-M-2)
Ronson, H. T. (A)
Stout, J. E. (M)

Mays Landing (PHI-3)
Van Dyke, C. H. (M)

Maywood (NNJ-2)
Fichtl, R. R. (A)
Halpern, E. L. (M)
Koehler, J. A. (M)
Savisaar, A. (M)
Seibert, J. L. (SM)
Shapiro, S. (M)

Medford (PHI-3)
Hess, W. J. (A)
Malvin, M. A. (A)
Welse, D. S. (M)

Medford Lakes (PHI-3)
Cichon, H. P. (M)
Fink, W. R. (M)
Frazier, R. M. (M)
Liddle, R. W., Jr. (A)
McCoy, J. W. (M)
Snyton, S. A. (A)
Stepchiw, J. (A)

Mendham (NNJ-2)
Brooks, R. E. (M)
Hallinc, E. G. (A)
Hires, J. B. (M)
Lewis, W. D. (F)
Murray, J. L. (M)
Ong, F. C. (SM)
Poclus, C. F. (A)
Saltus, G. E. (A)
Wilder, K. T. (M)
Wintemitz, T. W. (M)

Merchantville (PHI-3)
Abeyta, I. (M)
Andrews, D. R. (M)
Barkow, W. H. (M)
Bartlett, T. L. (M)
Baumgardner, P. E. (M)
Blasberg, L. A. (SM)
Brown, I. (M)
Cafaro, J. A. (M)
Carey, G. R. (M)
Combellack, E. M. (M)
Coston, H. E. (SM)
Darling W. (M)
Deal, H. B. (SM)
Dordick, H. S. (M)
Farkas, C. E. (M)
Farkas, L. (M)
Fell, W. F. (M)
Franks, T. A. (M)
Gainey, L. L. (M)
Gallo, P. (SM)
Gaynor, E. (SM)
Gewant, S. (SM)
Gihring, H. E. (SM)
Gilmore, W. C. (A)
Goldman, L., Jr. (M)
Graham, R., Jr. (SM)
Grim, E. D. (M)
Groff, J. H. (M)
Halpern, H. M. (M)
Hamm, N. G. (SM)
Heacock, R. M. (M)
Hobbs, C. A., Jr. (M)
Holter, F. W., Jr. (M)
Hoyt, C. W. (SM)
Keeler, C. E. (SM)
Keller, E. W. (M)
Kimmel, J. (M)
Lakin, G. A. (M)
Lappin, L. S. (SM)
Law, C. K. (SM)
Lawrence, W. L. (VA)
Layer, J. H. (A)
Lending, R. D. (A)
Llewellyn, A. D. (M)
Luther, A. C., Jr. (M)
MacDermid, B. W. (A)
Malpass, D., Jr. (M)
Marsh, D. R. (M)
Mayer, L. J. (A)
McKinney, R. S. (A)
Miller, J. P. (VA)
Mittelman, W. (M)
Musto, W. C. (M)
Oman, N. J. (M)
Orr, J. R. (M)
Patterson, E. B. (SM)
Pendred, C. R. (M)
Quinn, W. H. (M)
Reese, J. S. (VA)
Sanborn, J. W. (SM)
Schach, S. (M)
Schwartz, A. J. (M)
Shepherd, R. C. (A)
Sheppard, W. H. (M)
Steagall, W. F. (M)
Stokes, I. (SM)
Stokes, P. F. (M)
Story, T. H. (SM)
Swierczak, P. C. (SM)
Thompson, L. E. (F)
Trinkle, R. C. (A)
Vonderschmitt, B. V. (A)
Warren, M. V. (A)
Weltz, M. K. (M)
Wuerfel, H. L. (SM)
Young, J. E. (SM)

Metuchen (PRI-2)
Aderente, A. A. (M)
Becchina, J. A. (M)
Brereton, C. H. (SM)
Cook, R. W. (M)
Dineen, J. J. (M)
Downie, D. E. (M)
Fernstrom, C. H. (M)
Ford, R. W. (M)
Ginsberg, L. H. (SM)
Grill, C. (A)
Haeseler, P. R. (M)
Hautzik, R. M. (SM)
Heffron, C. B. (M)
Jordan, J. P. (SM)
Kasner, E. (M)
Kedrowsky, G. V. (M)
Knosko, J. A. (A)
Kometz, N. S. (SM)
Lemelson, J. H. (A)
Lempert, I. E. (SM)
Lemer, A. M. (M)
Mac Donald, A. F. (SM)
Mathews, R. H. G. (SM)
McClane, C. T. (M)
Reynolds, J. L. (M)
Russell, G. H. (M)
Sampson, F. A. (A)
Scheer, F. H. (SM)
Schiffmayer, G. F. (M)
Schofield, C. R. (A)
Sienkiewicz, L. J. (SM)
Silliman, D. (SM)
Skinner, K. R. (M)
Staffin, R. (A)
Thomas, D. G. (M)
Toft, H. L. (M)
Wasseman, J. (A)
Weaver, B. M. (A)
Welkowitz, W. (M)
Whitney, G. H. (A)

Middlesex (PRI-2)
Guerino, M. (M)
Hans, M. W. (M)
King, M. L. (A)
Schreiber, O. P. (M)
Warren, R. E. (A)

Middletown (NY-M-2)
Baumann, D. A. (M)
Brenner, M. M. (M)
Clark, H. R. (M)
Hayes, F. A. (A)
Keen, H. J. (A)
Klein, G. E. (M)
Luebbert, W. F. (SM)
Martin, J. E. (M)
Mikkelsen, W. R. (A)
Miller, S. E. (F)
Pallett, H. E. (M)
Patterson, R. A. (M)
Stanley, A. M. (M)
Wyman, J. H. (SM)

Midland Park (NNJ-2)
Bertram, H. A. (A)
Brophy, W. T. (A)
Ellison, B. (M)
Solms, S. J. (M)
Swanson, V. D. (A)

Millburn (NNJ-2)
Bailey, A. (F)
Bown, R. (F)
Freeman, R. H. (A)
Halstead, W. K. (SM)
Higgins, W. H. C. (SM)
Johnson, J. B. (F)
Linn, G. A. (M)
Maurushat, J., Jr. (M)
Mazer, W. M. (SM)
Morris, R. M. (F)
Nyquist, H. (F)
Shackleton, S. P. (SM)
Strieby, M. E. (SM)
Millington (NNJ-2)
Alexander, A. A. (M)
Bodmer, M. G. (M)
Boschen, A. C. (M)
Dettman, M. C. (M)
Drenick, R. (SM)
Frost, H. B. (M)
Harrison, C. W. (M)
James, G. W. (M)
Morelock, J. (SM)
Schwenker, J. E. (M)

Monmouth Beach (NY-M-2)
Ballato, A. D. (M)
Menzel, H. W. (M)

Montclair (NNJ-2)
Baker, C. I. (SM)
Baudin, J. A. (A)
Baurle, H. F. (M)
Busignes, H. (F)
Corradi, F. J., Jr. (A)
Cromble, K. F. (A)
Dooley, M. N. (M)
Du Bois, J. H. (SM)
Freeman, L. C. (M)
Gage, W. M. (A)
Goodfriend, L. S. (SM)
Harmon, H. D. (M)
Haynes, H. S. (M)
Hillman, S. (M)
Johnson, R. E. (A)
Jones, D. M. (A)
Josephson, P. R. (A)
Kauffman, C. W. (M)
Kirchner, K. F. (SM)
Lane, F. A. (M)
Leighton, H. W. (M)
Maginnis, W. J. (M)
Maginnis, W. P. (SM)
Miller, H. P., Jr. (SM)
Organ, W. H. (SM)
Peck, J. L. (M)
Razdow, A. (M)
Rose, F. C. (M)
Schmookler, M. S. (M)
Sprague, V. G. (M)
Steinbrecher, E. E. (M)
Thomas, H. E. (SM)
Townsend, R. L. (A)
Trackman, J. C. (M)
Vosburgh, M. C. (SM)
Weiss, W. I. (M)
Whitley, E. G. (A)
Whittle, R. L. (SM)
Wolff, F. M. (M)
Yamagami, Y. (M)
Zitzmann, F. R. (M)

Montvale (NNJ-2)
Corcoran, D. G. (M)
Hoyns, G. W., Jr. (A)
Nelson, B. W. (M)
Scherer, D. R. (M)
Taylor, H., Jr. (A)

Montville (NNJ-2)
Atwood, H., Jr. (M)
Higgins, L. A. (A)
Rathjen, P. (M)

Moonachie (NNJ-2)
Barnes, D. B. (M)
Mason, H. J., Jr. (A)

Moorestown (PHI-3)
Alexander, W. R. (M)
Anderson, T. E. (A)
Anderson, W. G. (M)
Andros, L. R. (A)
Baker, H. F. (M)
Baker, R. H. (SM)
Ballentine, E. C. (SM)
Batsel, M. C. (F)
Brelsford, H. A. (SM)
Brostrand, A. C. (SM)
Buchanan, J. P. (M)
Bucher, T. T. N. (M)
Buder, S. H. (M)
Butt, H. R. (M)
Colby, N. C. (M)
Coleman, J. T. (M)
Conant, L. C., Jr. (M)
Conner, R. W. (M)
Corum, D. R. (M)
Curtin, W. A. (M)
Deskins, C. E. (SM)
Dobson, D. B. (M)
Duszak, H. (M)
Evans, L. L. (SM)
Fischbeck, K. H. (A)
Fisher, R. M. (A)
Flodman, L. J. (SM)
Foley, A. A. (A)
Gibo, E. (A)
Gillespie, H. C. (M)
Graham, M. L. (SM)
Greenwood, H. T., III (SM)
Grossman, H. W. (M)
Gruber, R. (M)
Hadlock, W. O. (SM)
Hammel, D. G. (M)
Hannan, W. J. (M)
Hartnett, E. J. (M)
Hawley, M. E. (SM)
Heinly, W. A. (M)
Herbst, P. J. (F)
Hinckley, R. H. (SM)
Hofoe, W. H. (M)
Holmes, D. B. (SM)
Hopkins, G. C. (M)
Howery, R. W. (M)
Ireland, F. H. (SM)
Jackson, A. (A)
Jacobs, L. (M)
Jose, R. S. (M)
Kanter, I. (M)
Kline, S. M. (A)
Kilday, J. C., III (M)
Korman, N. I. (F)
Krouna, H. F. (M)
Ladof, L. G. (SM)
Laurlat, P. R. (M)
Lerch, Q. A., Jr. (M)
Lewis, W. P. (M)
MacQueene, P. H. (SM)
Matthews, E. W., Jr. (M)
McCall, E. G., Jr. (M)
McChesney, P. E. (M)
McCulley, J. M. (A)
Mertens, L. E. (M)
Mills, H. J. (M)
Moll, A. P. (A)
Morrison, W. C. (SM)
Mulle, W. A. (M)
Naole, J. J. (M)
Nichino, H. H. (SM)
Nyden, R. C. (SM)
Oseas, J. (M)
Palss, M. H. (SM)
Palester, J. (SM)
Palm, K. E. (SM)
Palmer, J. B., Jr. (M)
Perecinic, W. S. (M)
Poch, J. (F)
Porter, J. W. (M)
Price, J. F. (M)
Purdue, R. E. (M)
Rawdin, E. (A)
Ray, R. H. (M)
Renfrow, R. J. (M)
Rettenmeyer, F. X. (F)
Robinson, J. E. (M)
Rodman, M. D. (M)
Rogers, G. F. (SM)
Rulifson, R. R. (M)
Schmit, D. F. (F)
Sevian, E. A. (M)
Sheeder, A. M. (A)
Sherman, S. M. (SM)
Smith, R. S. (M)
Smith, R. M. (SM)
Snyder, R. L. (SM)
Sobolewski, F. (M)
Sommer, W. G. (M)
Sonntag, W. A. (M)
Sprowls, P. H. (M)
Stevens, R. W. (M)
Stevens, W. T., Jr. (M)
Taenzer, E. (SM)
Talamini, A., Jr. (SM)
Tall, M. M. (M)
Taylor, L. A. (SM)
Taylor, M. L. (SM)
Taylor, T., Jr. (A)
Tesch, W. L. (SM)
Twitchell, H. D., Jr. (M)
Tysenn, W. J. (M)
Vance, D. H. (M)
Vick-Rose, W. (SM)
Weoe, H. R. (SM)
Wheeler, G. M., Jr. (M)
Whisonant, J. T. (SM)
Whitman, C. L. (A)
Williams, E. A. (M)
Wills, W. P. (SM)
Wilson, R. E. (M)
Wing, D. H. (M)

Morgan (NNJ-2)
O'Connor, E. J. (A)

Morganville (NY-M-2)
Lavole, S. D. (A)

Morris Plains (NNJ-2)
Andrews, R. J. (M)
Blair, B. W. (M)
Brown, V. L. (M)
Campbell, M. E. (SM)
Dougherty, H. J. (M)
Freeman, W. C., Jr. (SM)
Gibbon, J. (M)
Gretsch, W. R. (M)
Hofmann, H. R. (M)
Johannesen, J. D. (M)
King, G. L. (M)
Linhart, D. J. (M)
Nyberg, R. G. (SM)
Raddin, F. M. (A)
Reynolds, R. B. (M)
Rhoden, V. C., Jr. (M)
Robertson, J. P. (M)
Schauler, V. A. (A)
Torpey, G. J. (A)
Townley, R. C. (M)
Underwood, M. D. (A)
Van Kerstine, A. (SM)
Vreeland, J. B. (A)
Waldhauer, F. D. (M)
Wantuch, E. (M)
Wehr, K. C. (M)
Wilde, A. E., Jr. (SM)
Young, J. M. (M)

Morristown (NNJ-2)
Baldwin, J. M. (M)
Barz, S. (M)
Bethge, C. E. (M)
Bohning, J. R. (M)
Caparrola, L. J. (M)
Cohen, R. M. (SM)
Cooper, D. I. (SM)
Crowell, M. H. (M)
Davis, C. G. (M)
Ehrlich, N. (SM)
Elgin, J. H. (M)
Evans, P. H. (F)
Filmer, W. L. (M)
Gerth, J. H. (SM)
Githens, J. A. (M)
Goldfarb, S. (M)
Hagelbarger, D. (M)
Hammer, H. (M)
Harkless, E. T. (M)
Harris, J. R. (M)
Hines, J. N. (M)
Holcomb, W. G. (M)
Howard, W. A. (M)
Huyck, W. J., Jr. (M)
Irvine, M. M. (SM)
Jacobs, O. B. (M)
Jewell, A. G. (A)
Klenzle, H. G. (A)
Klingsland, D. H., Jr. (A)
Lancia, T. (M)
Larisch, R. W. (M)
Lennon, F. W. (A)
Levinson, J. (SM)
Lunney, R. E. (M)
Maughmer, R. W. (M)
McDaniel, W. J. (M)
Meltzler, A. H. (M)
Miessner, B. F. (F)
Minter, J. B. (M)
Mohr, A. E. (M)
Morrison, H. (SM)
Mowery, V. O. (A)
Perow, J. (M)
Peskin, E. (SM)
Peterson, R. B. (M)
Poage, J. F. (M)
Poole, N. K. (A)
Potter, R. K. (F)
Priebe, H. F., Jr. (A)
Roxberry, R. C. (M)
Shaw, H. M. (A)
Slana, M. F. (M)
Smith, G. W., Jr. (A)
Stewart, J. B. (M)
Straube, E. P. (M)
Strong, W. A. (M)
Sund, E. T. (M)
Taylor, F. F. (M)
Timm, W. C. (A)
Unger, S. H. (M)
Van Beuren, J. M. (A)
Voeller, R. L. (M)
Wakefield, P. R. (M)
Walecki, V. (M)
Willett, R. J. (A)

Mountain Lakes (NNJ-2)
Armstrong, J. H. (M)
Barelss, M. (SM)
Beck, R. J. (M)
Bender, W. G. (M)
Dodington, S. H. M. (SM)
Doremus, J. A. (SM)
Gabel, W. (M)
Hughes, R. W. (SM)
Jackson, F. R., Jr. (SM)
Jenny, H. K. (SM)
Krist, H. K. (SM)
Leef, G. R. (M)
Locke, A. S. (SM)
Marble, F. G. (SM)
Merriam, F. F. (SM)
Naugle, R. B. (A)
Nordstrom, B. H. (SM)
Noyes, A., Jr. (SM)
Osterland, E. (SM)
Tyzzer, H. J. (SM)
Webster, F. D. (SM)
West, J. M. (SM)

Mountainside (NNJ-2)
Anderson, T. N. (SM)
Browne, G. W. (M)
Kniazuk, M. (M)
Marx, A. F. (M)
Rowe, H. C. (SM)
Vreeland, W. E. (A)
Wagner, S. J. (SM)

Mount Ephraim (PHI-3)
Anzalone, P. J. (M)
Dalber, E. M. (A)
Taylor, J. M., Sr. (M)

Mount Holly (PHI-3)
Blau, W. (A)
Cornell, J. A. (SM)
Custer, C. W. (M)
Dressler, J. W. (M)
Fessler, W. H. (M)
Fogelberg, A. E., Jr. (SM)
Goldberg, E. (M)
Gorman, J. (M)
Griffith, B. D. (M)
Gubin, S. (SM)
Guhn, D. K. (M)
Heyer, E. M. (A)
Johnson, M. C. (M)
Langelo, V. A. (A)
Love, K. E. (A)
Pruitt, D. L. (SM)
Taylor, J. R. (A)

Mullica Hill (PHI-3)
Siddall, W. J. (M)

Murray Hill (NNJ-2)
Aaron, M. R. (M)
Aaronson, D. (A)

Abbott, H. H. (SM)
Abraham, L. G. (F)
Allen, T. E. (SM)
Andrews, F. T., Jr. (M)
Andrews, J. L. (A)
Armstrong, F. O. (M)
Autrey, S. W. (A)
Badgley, R. H. (SM)
Baldwin, G. L. (SM)
Baldwin, M. W., Jr. (F)
Bangert, J. T. (SM)
Barnett, W. T. (M)
Barstow, J. M. (F)
Becker, F. K. (SM)
Becker, G. E. (SM)
Bennett, W. R. (F)
Bishop, W. M. (A)
Bissell, H. M. (A)
Black, D. M. (SM)
Bleisch, G. W. (M)
Blye, P. W. (SM)
Boesch, F. T. (M)
Bomba, J. S. (A)
Bowker, M. W. (A)
Braga, F. J. (M)
Bridges, T. J. (M)
Brown, A. B., Jr. (SM)
Brunson, R. B., Jr. (M)
Bryan, G. E. (A)
Bullington, K. (F)
Bullock, D. B. (M)
Burford, T. M. (M)
Carbrey, R. L. (M)
Carlson, D. E. (M)
Chapman, R. C., Jr. (A)
Chisholm, D. A. (A)
Chislow, J. H. (M)
Church, S. E. (M)
Ciccolella, D. F. (SM)
Clement, F. J. (M)
Cleveland, H. M. (M)
Cocker, J. T. (M)
Cohen, E. (M)
Cook, J. S. (M)
Cornell, W. A. (M)
Cranna, N. G. (M)
Crawford, R. V. (SM)
Crowley, T. H. (M)
Cutler, C. C. (F)
Dacey, G. C. (SM)
Daggett, E. H. (M)
Darlington, S. (F)
David, E. E., Jr. (SM)
Day, C. M., Jr. (M)
De Grasse, R. W. (M)
Dennis, F. R. (M)
Depp, W. A. (SM)
Dickieson, A. C. (SM)
Dillon, T. E. (M)
Doba, S., Jr. (SM)
Dollard, P. M. (M)
Doucette, E. I. (M)
Drazy, E. J. (M)
Drexler, J. (M)
Dubosky, D. D. (A)
Durkee, A. L. (SM)
Ebbe, G. L. (M)
Eglin, J. M. (M)
Ehrbar, R. D. (SM)
Elmendorf, C. H. (SM)
Fagen, M. D. (SM)
Farney, G. K. (M)
Fay, C. E. (F)
Felker, J. H. (SM)
Ferrell, E. B. (F)
Finch, T. R. (M)
Fischer, H. B. (SM)
Fisher, H. J. (SM)
Fisk, J. B. (F)
Flanagan, J. L. (M)
Flegal, J. R. (SM)
Fletcher, R. C. (SM)
Fraser, J. M. (SM)
Fulmer, R. J. (M)
Gannett, D. K. (F)
Gewartowski, J. W. (M)
Giger, A. J. (SM)
Giguere, W. J. (M)
Glaser, J. L. (SM)
Glass, M. S. (SM)
Goldey, J. M. (M)
Goodale, W. D., Jr. (M)
Graham, R. E. (F)
Gray, M. C. (M)
Green, E. I. (F)
Grossman, A. J. (SM)
Gryb, R. M. (M)
Haas, H. H. (M)
Hall, W. G. (M)
Hamming, R. W. (A)
Harker, K. J. (A)
Hartman, C. D. (VA)
Harvey, F. K. (M)
Hathaway, J. W. (A)
Hefele, J. R. (SM)
Hempstead, C. F. (M)
Herr, F. J. (M)
Hohleymar, W. H. (M)
Hines, M. E. (M)
Hirsch, A. E., Jr. (M)
Hohmann, L. A., Jr. (M)
Holland, F. C. (M)
Hopkins, H. F. (SM)
Hopper, A. L. (SM)
Hornbeck, J. A. (SM)
Horton, A. W., Jr. (F)
Howson, L. (M)
Hudack, J. M. (SM)
Humphrey, F. B. (M)
Ingram, S. B. (SM)
Irvin, H. D. (SM)
Israel, J. O. (SM)
Iwersen, J. E. (M)
Jaeger, R. P. (SM)
Johanson, A. E. (M)
Joseph, D. F. (M)
Julesz, B. (M)
Jutson, R. P. T. (SM)
Kaenel, R. A. (M)
Kamentsky, L. A. (M)
Kammerer, F. W. (VA)
Karlin, J. E. (M)
Karnason, M. (M)
Kaylor, R. L. (M)
Keith, C. R. (SM)
Keller, W. H. (M)
Kelley, R. A. (M)
Kerney, I. (SM)
Kersta, L. G. (SM)
Kimme, E. G. (M)
Kinariwala, B. K. (M)
Kinsburg, B. J. (M)
Kinzer, J. P. (SM)
Kirkpatrick, W. E. (SM)
Kluver, B. (A)
Knowlton, A. D. (SM)
Koenen, K. H. (A)
Kolding, A. R. (M)
Komofner, R. (F)
Kretzmer, E. R. (SM)
Kummer, O. (SM)
Lebert, A. W. (M)
Leed, D. (SM)
Levin, S. A. (SM)
Lewis, H. A. (SM)
Lindsey, P. D. (M)
Loar, H. H. (A)
Logan, B. F., Jr. (M)
Loman, G. T. (M)
Long, N. G. (M)
Looney, D. H. (M)
Louis, R. A. (M)
MacIntosh, I. M. (M)
Madsen, R. L. (M)
Mallery, P. (M)
Manasse, F. K. (M)
Manley, J. M. (SM)
Mason, W. P. (F)
Mathews, M. V. (A)
Matlack, R. C. (A)
Maunsell, H. I. G. (M)
Maybach, W. J. (M)
McDaniel, W. L., Jr. (M)
McDavitt, M. B. (SM)
McDonald, H. S. (M)
McEntee, J. A., Jr. (M)
McGuigan, J. H. (M)
McKay, K. G. (SM)
McLeod, B. A. (A)
McNally, J. O. (F)
Meacham, L. A. (F)
Meadows, H. E., Jr. (M)
Mehring, A. C. (M)
Mendenhall, H. E. (SM)
Merrill, J. L., Jr. (M)
Michaels, S. E. (SM)
Miedema, H. (SM)
Miller, R. A. (M)
Millman, S. (F)
Misenheimer, H. N. (SM)
Moore, E. F. (M)
Moore, G. E. (M)
Morgan, S. P. (SM)
Morrison, B. A. (M)
Morton, J. A. (F)
Mottram, E. T. (SM)
Mounts, F. W. (A)
Myers, P. B. (M)
Nei, K. J. (A)
Newhall, E. E. (A)
Noll, J. C. (SM)
Norton, E. L. (SM)
Norwine, A. C. (SM)
Nylund, H. W. (SM)
Packard, G. N. (M)
Pardee, S. (M)
Pellegrinelli, A. (M)
Perletti, P. V. (M)
Pierce, J. R. (F)
Porter, P. T. (M)
Powers, T. L. (M)
Pryor, J. G. (M)
Pyle, E. L. (M)
Raisbeck, G. (SM)
Raleigh, J. T. (M)
Rea, W. T. (SM)
Reiling, P. A. (VA)
Rice, L. P. (M)
Rice, S. O. (F)
Riesz, R. R. (SM)
Rigrod, W. W. (M)
Riley, R. M. (M)
Roberts, L. R. (M)
Rosenthal, C. W. (M)
Ross, I. M. (SM)
Rowen, J. H. (SM)
Runyon, J. P. (M)
Ruocrecht, E. G. (M)
Ryder, E. J. (SM)
Ryder, R. M. (F)
Saari, V. R. (A)
Sauseng, O. G. (A)
Schachtman, M. G. (M)
Schelkunoff, S. A. (F)
Schimel, L. G. (SM)
Schneider, H. A. (M)
Schott, L. O. (A)
Schultz, W. J., Jr. (M)
Segers, R. G. (M)
Shaolen, E. B. (M)
Sharp, W. O. (M)
Sharpe, G. E. (M)
Shive, J. N. (SM)
Simkins, O. W. (M)
Simmonds, T. H., Jr. (A)
Spress, J. M. (M)
Sleolan, D. (M)
Slonczewski, T. (SM)
Sparks, M. (SM)
Spencer, A. E., Jr. (M)
Spencer, E. G. (SM)
Steenaart, W. J. D. (M)
Stickle, R. L. (A)
Stillwell, A. L. (SM)
Stone, H. A., Jr. (SM)
Stoughton, M. D. (M)
Straube, H. M. (SM)
Sumner, E. E. (SM)
Sunde, E. D. (SM)
Terman, F. W. (M)
Thatcher, T. W., Jr. (M)
Thomas, D. E. (SM)
Thurston, R. N. (A)
Tien, P. K. (M)
Tilley, J. H. (M)
Townsend, M. A. (SM)
Toy, W. N. (M)
Trofatter, K. F. (A)
Tucker, R. S. (SM)
Uzunoglu, V. (M)
Van Haste, W. (SM)
Varnerin, L. J., Jr. (SM)
Veazie, E. A. (SM)
Von Roesgen, C. A. (M)
Waddell, R. E. (M)
Warner, R. M., Jr. (SM)
Weller, D. C. (SM)
Wentz, J. F. (SM)
Wertz, H. S. (SM)
Wetzel, L. B. (M)
Wheeler, G. W. (SM)
White, L. D. (M)
Whitehead, H. G. (M)
Wickliffe, P. J., Jr. (M)
Williams, R. D. (M)
Willis, F. H. (M)
Wilson, J. R. (F)
Winnicky, A. P. (SM)
Winter, H. F. (M)
Winter, R. A. (M)
Wolfe, R. M. (M)
Wolman, E. (M)
Wood, I. E. (M)
Young, C. H. (SM)

Neptune (NY-M-2)
Ackerman, J. C. (M)
Alexander, L. D. (A)
Armstrong, R. W. (SM)
Benardi, M. A. (A)
Danko, S. F. (M)
Dennis, L. F. (M)
De Paola, G. E. (A)
Evers, J. T. (M)
Foderaro, J. V. (A)
Hannon, L. F. (A)
Kegel, R. A. (M)
Kramer, N. (A)
Lehner, L. L. (M)
Lloetz, N. (M)
Matthei, W. G. (M)
Pokorny, G. E. (A)
Ruzzis, A. G. (M)
Smith, A. W. (M)
Speaker, B. (A)
Swingle, D. M. (M)
Warner, F. N. (M)
Woodyard, O. C. (M)

Neshanic Station (PRI-2)
Barnard, D. F., Jr. (M)

Netcong (NNJ-2)
Relchard, W. C. (SM)

Newark (NNJ-2)
Ackerly, R. J. (A)
Acosta, F. B. (A)
Bagley, D. S. (M)
Barabutes, T. (M)
Berger, J. (M)
Bizon, M. J. (A)
Blonder, I. S. (M)
Bortkiewicz, J. (A)
Boyson, C. V. (A)
Bricker, C. H. (A)
Brunje, R. M. (M)
Carlucclo, J. (SM)
Carreon, D. G. (M)
Cerf, A. E. (A)
Clement, G. (A)
Cohen, H. (M)
Cohen, S. (SM)
Coppola, A. A. (M)
Crabill, W. B. (A)
D'Agostini, D. (M)
D'Allegro, G. (A)
Elizondo, E. L. (M)
Engelberg, C. (M)
Fernandes, J. G. (A)
Fishman, S. (SM)
Furman, J. (M)
Gilbert, R. W. (M)
Giordano, A. F. (SM)
Glickman, M. N. (SM)
Goldino, J. (A)
Gross, J. I. (A)
Heldrick, C. P. (M)
Heiner, A. J. (M)
Holdman, M. (M)
Hooven, M. D. (SM)
Jalajas, A. A. (M)
Jordan, C. A. (M)
Kalfus, P. I. (M)
Karcher, E. A. (M)
Katz, M. (A)
Kaufman, A. S. (M)
Kopoelon R. (SM)
Kosonocky, W. F. (M)
Kozimor, M. (M)
Kubilins, E. T. (A)
Kwast, V. B. (M)
Lakshmanan, T. K. (M)
Lamb, F. X. (M)
La Verda, F. R. (M)
Lemeshka, M. B. (M)
Lender, A. (M)
Manz, A. F. (M)
Matthews, T. N. (A)
McClelland, W. R. (A)
McCormick, D. A. (M)
Meier, W. L. (M)
Mellen, E. R. (SM)
Meyer, H. G., Jr. (A)
Mohsen, A. (A)
Moore, E. P. (A)
Morgan, W. H. (M)
Mutschler, E. C. (M)
Olson, J. W. (M)
Pema, P. J. (A)
Peterson, D. A. (M)
Polsinelli, V. (A)
Purdy, D. R. (M)
Ranger, R. H. (F)
Richardson, E. A. (M)
Ross, P. L. (M)
Russell, F. A. (SM)
Scharkss, H. (M)
Schwartzberg, I. G. (A)
Selden, N. (M)
Shankle, S. B. (M)
Shaw, N. K. (M)
Silzer, V. (M)
Snyder, G. H. (M)
Sosna, V. (A)
Spengler, R. G. (M)
Steers, W. F. (SM)
Steinkamp, W. H. (M)
Tiffin, C. M. (A)
Tilson, B. A. (M)
Tonque, B. H. (SM)
Wacker, W. F., III (A)
Waddell, R. G. (M)
Walker, R. D. (M)
West, N. H. (M)
Wolkstein, H. J. (M)
Zlydak, V. J. (M)

New Brunswick (PRI-2)
Amtsen, A. P. (M)
Baumunk, J. F. (M)
Bohnstedt, C. E. (M)
Butenko, J. W. (M)
Cahill, R. M. (M)
Claypool, H. W. (A)
Dahlke, H. E. (A)
Degan, J. J. (A)
Della-Torre, E. (M)
Dienst, J. F. (M)
Fernald, O. H. (M)
Fich, S. (SM)
Frisch, J. A. (A)
Handen, J. (M)
Hertz, K. L. (A)
Lebowitz, L. (M)
Meyerhoff, A. A. (SM)
Pierce, W. B. (M)
Polgar, M. S., Jr. (M)
Potter, J. L. (F)
Rodkin, D. L. (M)
Rosenthal, L. (SM)
Rubin, A. (M)
Ruble, G. B. (M)
Siekanowicz, W. W. (M)
Sirkis, M. D. (A)
Uphoff, E. C. (M)
Van Derveer, E. J. (M)
Williams, M. E. (M)

Newfoundland (NNJ-2)
Goebel, R. J. (M)

New Gretna (PHI-3)
Foll, W. A. (SM)

New Market (PRI-2)
Street, W. D. (M)

New Milford (NNJ-2)
Alexander, S. B. (M)
Bailin, R. C. (M)
Ewert, A. C. (M)
Franzel, I. H. (M)
Gartner, G. W. (M)
Hammerich, H. A. (A)
Jones, M. E. (A)
Lang, A. H. (A)
Llucci, C. A. (A)
Olson, R. E. (SM)
Phelps, R. B. (M)
Reich, P. J. (M)
Roth, H. (M)
Shaw, A. B. (M)
Shaw, W. (M)
Sokol, S. (A)
Umles, M. S. (M)
Vergoz, R. A. (A)

New Monmouth (NY-M-2)
Brehn, J. H. (M)

New Shrewsbury (NY-M-2)
Govinsky, W. (A)
MacPherson, D. H. (SM)
Nelson, M. (A)
Schallerer, J. W. (M)
Newton (NNJ-2)
Kellogg, W. M. (SM)
Langstroth, R. W. (A)
Langstroth, T. A. (A)
Schneider, B. K. (A)

New Vernon (NNJ-2)
Clark, O. (SM)
D'Heedene, A. R. (SM)

Nixon (PRI-2)
Bernstein, A. L. (A)
Cameron, J. A. (M)
Farhi, S. (M)
Feder, E. I. (M)
Fisher, J. B. (A)
Gote, J. T. (M)
Irby, H. C. (M)
Neidig, K. E. (M)
Re Corr, K. H. (M)
Unger, R. J. (A)

New Providence (NNJ-2)
Booth, D. L. (M)
Bowyer, L. R. (M)
Brown, H. E. (M)
Capranica, R. R. (M)
Griswold, D. M. (M)
Himmel, R. N. (M)
Johnson, H. C. (M)
Keder, V. (M)
Kocan, J. (M)
Latter, R. F. (M)
Lee, E. B. (M)
Levenbach, G. J. (M)
Lindsay, M. H. A. (SM)
Malthaner, W. A. (SM)
May, J. P. (M)
Nast, D. W. (M)
Nielsen, E. G. (A)
O'Neill, M. P. (M)
Poole, K. M. (A)
Robey, E. E. (A)
Simonds, R. E. (SM)
Thatch, R. A. (A)
Welber, I. (M)
Zmolek, C. R. (M)

Nixon Park (PRI-2)
Sable, A. A. (A)

North Arlington (NNJ-2)
Bruning, J. M. (M)
Winkowski, R. (M)

North Bergen (NNJ-2)
Adam, E. P., Jr. (A)
Assadourian, F. (SM)
Belland, E. N. (M)
Bowab, L. G. (M)
Cox, J. L. (M)
Decker, W. J. (M)
Feucht, R. E. (M)
Fullington, H. J. (A)
Genser, A. (A)
Harms, F. G. (A)
Heflich, G. B. (M)
Hollopeter, W. C. (M)
Kalin, F. (A)
Kirsch, A. F. (M)
Nordman, E. G. (M)
Nordman, O. D. (M)
Norton, M. L. (M)
Perils, H. J. (M)
Pizzigoni, A. (A)
Prente, J. G. (M)
Shahin, E. S. (A)
Sherman, S. (A)
Sherwood, H. R. (SM)
Sigman, M. (M)
Solomon, S. M. (M)
Sparacio, F. J. (M)
Walowitz, H. L. (M)

North Branch Depot (PRI-2)
Peldunas, A. P. (M)

North Brunswick (PRI-2)
Morris, M. J. (A)

North Caldwell (NNJ-2)
Adamson, A. A. (SM)
Fregan, E. J. (A)
Goldman, H. (A)
Light, H. A. (M)
Moore, E. B. (SM)
Muller, C. R. (SM)
Peet, E. C. (SM)
Poff, J. K. (M)
Rennenkampf, L. J. (M)
Schade, O. H., Jr. (A)
Schneider, P. C. (A)
Siemens, R. H. (SM)
Smith, P. G. (A)
Sokolowski, E. M. (A)

Northfield (PHI-3)
Headstrom, R. L. (SM)

North Plainfield (NNJ-2)
Beehler, J. (M)
Blicher, A. (SM)
Cooke, J. P. (A)
Deeley, P. M. (SM)
Frank, R. J. (M)
Grover, A. C., Jr. (A)
Keane, J. B. (M)
Kettering, H. V. (M)
Larson, B. D. (M)
Ottobre, J. N. (M)
Perry, J. L. (A)
Pike, N. (A)

Quinlan, R. V. (M)
Shupack, M. H. (A)
Wamsley, D. H. (SM)
Wehof, H. (M)
Wenett, P. A. (M)
Williams, A. D. (M)

Northvale (NNJ-2)
Arlesohn, E. R. (M)

Norwood (NNJ-2)
Brick, F. R., Jr. (SM)
Griffin, A. T. (A)
Haas, K. A. (A)

Nutley (NNJ-2)
Adams, R. T. (SM)
Alexander, B. (M)
Beisel, F. A. (A)
Blanchard, R. J. (M)
Bolakas, J. A. (M)
Boyer, J. T. (M)
Brandes, N. J. (A)
Brush, J. M. (M)
Campbell, D. R. (M)
Capen, H. N. (SM)
Carey, E. D. (A)
Cater, J. R. (SM)
Chapman, R. F. (M)
Cirulis, U. (M)
Clark, J. T., Jr. (A)
Clavier, A. G. (F)
Colin, R. I. (SM)
Conaway, D. W. (M)
Cookson, A. E. (SM)
Cullari, C. C. (M)
D'Amanda, A. W. (M)
Davis, R. C. (SM)
De Maio, S. J. (M)
De Vany, B. V. (M)
De Witt, R. G. (M)
Ellis, R. (M)
Feldman, J. (M)
Felsenheld, R. A. (M)
Finocchi, A. J. (M)
Fletcher, I. L. (M)
Girgus, S. D. (M)
Goldan, T. J. (A)
Gray, R. E. (M)
Groce, J. C. (SM)
Gronberg, H. C. (VA)
Happe, W. H., Jr. (M)
Harvey, J. B. (SM)
Helman, D. R. (M)
Herbin, L. (A)
Himes, D. T. (M)
Hollis, R. P. (M)
Jeffers, N. L. (SM)
Kandolan, A. G. (F)
Khanna, S. M. (A)
Kiss, M. L. (M)
Kunkel, E. A., Jr. (M)
Landfear, G. F. (A)
Liljegren, J. C. (M)
Lundburg, F. J. (SM)
Macalpine, W. W. (SM)
Manders, A. M. (M)
Mangolds, D. (M)
Margets, H. S. (M)
Masonson, M. (M)
Mavromatis, A. (M)
McMullen, E. W. (A)
Meyers, S. J. (M)
Mills, H. J. (M)
Mindes, B. M. (M)
Mount, E. (M)
Odess, L. R. (M)
Perry, D. P. (M)
Place, H. (A)
Rogoff, M. (M)
Rutherford, R. E. (SM)
Rutherford, R. E., Jr. (M)
Schildknecht, R. O. (SM)
Schmidt, W. M. (M)
Schreiner, S. M. (SM)
Shames, J. (M)
Shapiro, O. (M)
Sichak, W. (SM)
Silverman, M. L. (M)
Soukup, J. (SM)
Spahr, P. K., Jr. (M)
Steinberg, S. (M)
Streisand, J. L. (M)
Surenian, D. (M)
Swinney, J. G. C., Jr. (SM)
Taplin, R. H. (M)
Taylor, A. R. (A)
Tomaszewski, J. A. (M)
Van Vechten, R. K. (A)
Ware, P. M., Jr. (M)
Weber, F. J. (M)
West, C. B. (M)
White, H. R. (M)
Wickersham, W. H. (SM)
Wing, A. K., Jr. (F)
Wirth, C. H. (M)
Young, N. H. (SM)
Zablocki, H. S. (M)
Zaret, M. E. (SM)
Zeliff, R. J. (A)

Oakhurst (NY-M-2)
Whelan, C. D. (M)

Oakland (NNJ-2)
Dzula, G. (M)
Edge, W. H. (M)
Hoffman, D. (SM)
Noble, R. B. (M)
Sandahl, C. R. (SM)
Thomas, G. N. (M)
Yohai, I. (M)

Oaklyn (PHI-3)
Buroojy, T. J. (M)
Christiansen, W. G. (A)
Endy, W. M. (A)
Forbes, E. J. (M)
Gerber, P. D. (M)
Giordano, R. L. (M)
Gore, E. M. (M)
Henderson, R. A. (SM)
Korbin, A. D. (M)
Pappas, C. (M)
Putzrath, F. L. (A)
Rudolph, R. L. (M)
Scheldorf, R. D. (M)
Torbert, J. C., Jr. (M)
Watts, E. R. (M)

Ocean Grove (NY-M-2)
Ewald, H. W. (M)

Oceanport (NY-M-2)
Brown, C. B. (SM)
Bryan, J. F. (SM)
Doelger, R. J., Jr. (M)
Edgerton, R. D. (M)
Nylander, G. A. (M)
Sherburne, F. B. (A)
Stromberg, R. E. (M)
Turner, H. (SM)
Waite, A. H., Jr. (SM)

Old Bridge (PRI-2)
Brown, I. A. (A)
Striednig, L. J. (M)

Old Tappan (NNJ-2)
Bass, S. D. (A)

Oradell (NNJ-2)
Anthony, I. B. (M)
Bruce, W. D. (A)
Canty, E. T. (M)
Howard, J. S., Jr. (A)
Levine, A. M. (SM)
Oberholtz, L. P. (M)
Podell, R. L. (A)
Rauch, L. R. (M)

Orange (NNJ-2)
Boivin, P. B., Jr. (M)
Burkhart, W. H. (M)
Christen, A. L. (M)
Gruenberg, H. S. (M)
Hardwick, F. (M)
La Manna, R. J. (M)
Lloyd, A. G. (A)
Masson, F. Y. (SM)
Oliwa, W. S. (A)
Shackelford, B. E. (F)
Sumpter, P. B. (M)
Suydam, C. H. (M)
Terris, I. (M)
Van Lidth de Jeude, C. P. (M)
Wells, G. W. (M)
Yaeger, W. O. (A)

Oxford (NNJ-2)
Edson, J. O. (SM)

Packanack Lake (NNJ-2)
Lang, H. J. (M)
Mutz, H. R. (SM)
Seergy, C. M. (M)

Palisade (NNJ-2)
Andrews, E. (M)
Lefebvre, R. E. (A)
Rover, R. R., Jr. (M)

Palisades Park (NNJ-2)
Ackerman, B. F., Jr. (M)
Fassberg, M. (A)
Kam, E. W. (M)
Keller, E. F. (A)
Levine, O. M. (M)
Lima, T. F. (A)
Marks, G. J. (A)
Packer, S. S. (M)
Richards, E. G. (M)
Schmied, J. W. (M)
Takakjian, J. S. (A)

Palmyra (PHI-3)
Brewster, P. J. (M)
Ennis, F. J. (A)
Flacco, A. F. (A)
Foerster, W. (M)
Galton, E. B. (SM)
Hilbourn, C. L. (M)
Ramner, C. A. (M)
Ringer, H. N. (M)
Robinson, H. A. (SM)
Smith, W. I. (A)
Waring, J. W. (M)
Weimer, A. G. (M)
Yendall, G. E. (SM)

Paramus (NNJ-2)
Ankenbrock, C. A. (A)
Bodeen, G. S. (SM)
Brown, R. I. (M)
Brown, T. G. (SM)
Campanale, A. J. (M)
Chalmers, W. G. (M)
Chanes, H. (M)
Conway, J. F., Jr. (SM)
Deiss, E. W. (A)
De Vincent, J. (A)
Donaldson, W. G. (SM)
Dufour, G. L. (M)
Evander, H. S. (SM)
Hague, R. Z. (A)
Hardy, O. C. (A)
Honeiser, V. P. (M)
Karz, A. R. (M)
Kashar, A. S. (M)
Kovarik, H. (A)
Kriss, C. J. (M)
Levin, M. S. (M)
Manoly, A. E. (M)
McSweeny, P. (SM)
Neu, W. J. (M)
Petrina, R. J. (A)
Plehr, A. D. (M)
Reed, S. J. (M)
Sakas, P. S. (M)
Sattem, I. (M)
Schenkel, F. W. (M)
Schmidt, L. D. (M)
Sclar, N. (SM)
Stahl, P. D. (SM)
Taylor, R. G., Jr. (M)
Trager, B. L. (M)
Weber, G. A. (A)
Wehrlin, R. F. (A)
Werth, J. J. (M)
Wotton, R. C. (A)
Young, R. (M)
Zitovsky, S. A. (M)

Park Ridge (NNJ-2)
Bellis, H. M. (A)
Murphy, A. W. (A)
Norton, E. A. (M)
Stansfield, F. H. (M)

Parlin (PRI-2)
Berkery, E. A. (A)
Howard, F. S. (M)
Panos, R. J. (A)
Pike, G. W. (A)
Zaratkiewicz, E. A. (M)

Parsippany (NNJ-2)
Anders, J. V. (M)
Bliss, E. E. (A)
Darden, P. S. D. (M)
Goeller, L. F., Jr. (M)
Hendrickson, A. H. (M)
Janik, J., Jr. (A)
Kalish, H. M. (M)
Krause, C. K. (M)
Lawton, B. E. (M)
Mandzik, M. M. (M)
Marco, G. E. (M)
Meola, R. R. (SM)
Nervik, J. M. (A)
Stanton, S. W. (M)
Waters, H. S. (M)
Wing, J. M. (M)

Passaic (NNJ-2)
Brussel, E. H. (M)
Currier, P. J. (A)
Goldstein, H. (M)
Gordon, M. J. (M)
Kratsch, P. H. (M)
Larkin, J. P. (M)
Masavage, I. R. (A)
Muench, W. H. (A)
Rosenthal, J. E. (SM)
Schuman, L. C. (A)
Seats, P. (A)
Sommermeyer, O. R. (A)
Stem, M. M. (M)
Stol, F. R. (M)
Suszek, E. J. (A)
Wakeman, R. P. (SM)
Yu, Y. P. (M)
Zavoda, J. P. (M)

Paterson (NNJ-2)
Bell, D. J. (M)
Binneveld, H. A. J. (A)
Bring, J. A., Jr. (M)
Butterworth, J. W. (SM)
Carlson, O. E. (M)
Cohen, M. R. (A)
De Franco, J. J. (M)
Earnshaw, E. F., Jr. (M)
Gold, M. (A)
Janowsky, S. (M)
Kohler, E. (A)
Kuehler, H. R. (M)
Lane, W. M. (M)
Lavorgna, M. P. (M)
Levin, H. L. (A)
Lome, J. B. (M)
Malone, M. (M)
Noveko, N. (A)
Papa, B. F. (M)
Papanou, D. S. (M)
Potash, J. (M)
Rich, P. A. (A)
Shapiro, F. J. (A)
Sledge, L. L. (M)
Star, M. (M)
Trifari, E. F. (A)
Weinberg, H. C. (M)
Winters, H. (A)

Paulsboro (PHI-3)
Gross, S. D. (M)

Pennington (PRI-2)
Bamford, H. S. (SM)

Pennsauken (PHI-3)
Bogush, A. J., Jr. (A)
Bordogna, A. C. (M)
Brady, T. J., Jr. (M)
Brummer, C. H., Jr. (A)
Clasen, C. P. (M)
Eddy, K. C. (M)
Fabbioli, L. F. (M)
Fedorka, R. T. (M)
Fisher, C. D. (M)
Givens, R. C. (M)
Hanway, W. F. (M)
Hobson, N. L. (A)
Homann, A. J. (M)
Kay, F. T. (M)
Knapschaefer, D. H. (M)
Krawitz, L. J. (A)
Landis, J. V. (SM)
Mavity, W. C. (M)
Montemuro, A. T. (M)
Nelson, G. A. (A)
Nickel, G. C., Jr. (M)
Oberlander, F. M. (SM)
Oberman, J. R. (M)
Obert, M. J. (SM)
Pearson, A. W. (M)
Purvis, R. E. (M)
Quinlan, E. J. (M)
Rende, A. M. (M)
Rosenberg, N. A. (M)
Rosenzweig, G. E. (M)
Rudd, R. B. (M)
Saeger, W. (M)
Sie, C. H. (M)
Solomon, S. (SM)
Skavicus, A. J. (M)
Stander, L. (M)
Troxel, D. I. (M)
Willey, J. R. (M)
Wyant, E. D. (M)

Penns Grove (PHI-3)
Garrett, L. B., Jr. (A)

Pennsville (PHI-3)
Fisher, C. (A)
Loeffler, T. F. (M)

Pequannock (NNJ-2)
Altonji, E. R. (M)
Bergeron, W. F. (M)
Goldman, I. (M)
Kearney, J. J. (M)
Richard, C. A., Jr. (A)
Schkolnick, H. (M)
Schmidt, C. R. (M)

Perth Amboy (PRI-2)
Chizmadia, R. A. (M)
Ernst, W. P. (M)
Houser, B. E. (A)
Jesse, S. A. (A)
Mosolgo, R. E. (A)

Phillipsburg (NNJ-2)
Englehardt, W. K. (M)
Hollander, A. M. (M)

Pine Brook (NNJ-2)
Wheeler, C. M. (SM)

Pine Hill (PHI-3)
Burns, D. C. (A)

Pine Lake (NNJ-2)
Petersen, H. J. (A)

Pitman (PHI-3)
Andrade, L. (M)
Brown, N. (SM)
Sloan, R. H. (M)

Pittstown (PRI-2)
Bennett, A. F. (SM)

Plainfield (NNJ-2)
Aiello, M. (M)
Arons, L. D. (M)
Babcock, W. E. (SM)
Barash, M. (M)
Bethke, J. R. (A)
Bez, R. O. (A)
Chandler, R. D., Jr. (M)
Cohen, B. G. (M)
Cormier, R. J. (A)
Cowperthwait, W. L., Jr. (M)
Coxhead, H. B. (SM)
Fels, L. (A)
Fisher, J. H. (M)
Flavin, M. A. (A)
Hardin, L. L., Jr. (SM)
Hamon, L. D. (M)
Harris, S. (A)
Harris, W. T. (M)
Hayda, G. K. (A)
Hesse, H. R. (M)
Homer, R. G. (M)
Horowitz, L. (M)
Hunter, W. B. (A)
Husenita, J. (A)
Kuchinsky, S. (SM)
Kuhn, E. F. (M)
Lee, R. F. (A)
Lott, D. H. (A)
Lyon, Z. G., Jr. (M)
Malkin, I. I. (M)
Masnaghetti, R. K. (M)
May, C. J., Jr. (M)
Mazur, S. (M)
Melhose, A. E. (M)
Nussbaum, E. (M)
Pelc, J. I. (M)
Perks, A. F. (A)
Renick, R. C. (SM)
Rossig, E. W. (M)
Sampson, S. F. (M)
Schneider, W. A. (SM)
Smith, A. E. (M)
Sweeney, H. E. (M)
Sweeney, W. R. (M)
Townsend, W. H., Jr. (A)
Wallace, R. L., Jr. (F)
Warren, C. A. (SM)
Wehrle, A. W. (A)
Weingarten, I. R. (A)
Woody, M. W. (A)

Pleasantville (PHI-3)
Dogantzis, B. E. (M)

Point Pleasant (NY-M-2)
Diebold, B. A. (M)
Friedlein, J. G. (M)
Lucier, O. S. (A)
Schamann, L. E. (M)

Point Pleasant Beach (NY-M-2)
Szafranski, J. J. (M)

Pompton Lakes (NNJ-2)
Carlson, L. C. (M)
Chmiel, B. A. (A)
Gorman, R. T. (A)
McEwan, A. W. (SM)
Miller, H. W. (M)
Plummer, R. J. (M)
Romain, D. O. (A)
Solomon, K. (M)

Pompton Plains (NNJ-2)
Abrahams, R. P. (SM)
Arnold, A., Jr. (A)
Cavanagh, R. T. (SM)
Dall, A. B. (M)
Egan, T. R. (M)
Engler, C. F. (M)
Gitter, R. E. (M)
Hansen, N. W. (A)
Hollberg, R. W. (M)
Lang, C. W. (M)
Lynch, R. G. (A)
McAdams, B. (SM)
Millard, J. W. (M)
Muller, F. A. (SM)
Nielsen, A. H. (M)
Palmer, R. C. (M)
Pauloski, S. H. (M)
Porta, A. (M)
Stern, W. (A)
Urban, A. (A)

Preakness (NNJ-2)
Kearns, W. P. (M)

Princeton (PRI-2)
Amarel, S. (SM)
Avins, J. (F)
Awschalom, M. (M)
Bach, H. M. (M)
Barco, A. A. (F)
Barton, L. E. (F)
Baugh, C. W., Jr. (M)
Beam, W. R. (SM)
Beck, G. A. (M)
Bedford, A. V. (F)
Behrend, W. L. (SM)
Belohoubek, E. F. (M)
Binstock, P. L. (M)
Blattner, D. J. (SM)
Bliss, W. H. (SM)
Bond, D. S. (F)
Borgelt, W. E. (M)
Borkan, H. (SM)
Braden, R. A. (SM)
Briggs, G. R. (SM)
Brinster, J. F. (SM)
Brown, G. H. (F)
Burns, L. L., Jr. (SM)
Burrill, C. W. (SM)
Carlson, W. L. (F)
Chambers, F. T., III (M)
Chaykowsky, O. C. (M)
Cheeseman, P. R. (A)
Christian, S. M. (SM)
Clark, A. N. (A)
Clement, P. R. (M)
Cohen, S. (M)
Cooke, H. L. (A)
Cowan, E. J. (M)
Creager, F. L. (M)
Davey, J. R. (M)
De Vore, H. B. (SM)
Dickey, E. T. (SM)
Dodge, S. W. (SM)
Donal, J. S., Jr. (SM)
Donath, E. (SM)
Donley, H. L. (SM)
Dow, O. E. (SM)
Eckenhoff, W. B. (A)
Epstein, J. (SM)
Ewing, D. H. (F)
Favreau, R. R. (M)
Fischer, J. T. (M)
Flory, L. E. (F)
Flory, R. E. (M)
Forgue, S. V. (SM)
Fredendall, G. L. (F)
Freedman, L. A. (M)
Gamblin, R. L. (M)
Garretson, E. B. (M)
George, R. W. (SM)
Glaimo, E. C., Jr. (A)
Gibson, J. J. (M)
Gibson, W. G. (M)
Gold, R. D. (M)
Goldstine, H. E. (SM)
Goodale, E. D. (SM)
Grasberg, A. G. (M)
Greenblatt, M. H. (SM)

Gross, J. (M)
Hackley, R. A. (M)
Hammer, L. H. (M)
Hansell, C. W. (F)
Hart, H. C. (M)
Harvey, R. L. (SM)
Hatke, F. L. (A)
Hauser, G. G. (A)
Heald, M. A. (M)
Herkart, P. G. (M)
Herman, F. (M)
Herold, E. W. (F)
Herzog, G. B. (M)
Hillibrand, J. (M)
Hilllier, J. (F)
Hinsdale, E. M., Jr. (SM)
Holmes, R. S. (F)
Hook, H. O. (SM)
Houghton, W. D. (SM)
Hoyler, C. N. (SM)
Hubbard, B. R. (M)
Hutter, E. C. (M)
Jenny, D. A. (M)
Johnson, E. O. (SM)
Johnson, H. (SM)
Johnson, W. C. (SM)
Johnston, L. B. (A)
Kams, M. E. (SM)
Karstad, K. (SM)
Kelser, B. E. (SM)
Kelzer, E. O. (SM)
Kell, R. D. (F)
King, C. J., Jr. (SM)
Kingsley, B. (SM)
Klopfenstein, R. W. (SM)
Kreuzer, B. (M)
Kurshan, J. (SM)
Landon, V. D. (F)
Larrabee, R. D. (M)
Law, H. B. (F)
Leverenz, H. W. (F)
Leyton, E. M. (SM)
Lindenblad, N. E. (F)
Linder, E. G. (F)
Lindgren, J. B. (A)
Lindsay, F. A. (A)
Lo, A. W. (SM)
Loebner, E. E. (SM)
Lugannani, R. (M)
Mac Lean, K. G. (SM)
Maitra, K. K. (M)
Marshall, T. G., Jr. (M)
Mather, N. W. (M)
Martinelli, C. C. (SM)
McCormick, S. T., Jr. (M)
Mesner, M. H. (SM)
Metzger, S. (SM)
Miller, H. L. (M)
Morton, G. A. (F)
Mueller, C. W. (F)
Myhre, R. (A)
Nergaard, L. S. (F)
Newman, A. W. (M)
Nicoll, F. H. (SM)
Norman, F. H. (M)
North, D. O. (F)
Ochs, S. A. (M)
O'Connell, J. H. (A)
Olson, C. V. (M)
Olson, H. F. (F)
Panagos, P. (M)
Pankove, J. I. (SM)
Pensak, L. (SM)
Peter, R. W. (F)
Petersen, D. W. (M)
Pilp, A. T. (SM)
Plummer, C. H. (M)
Polk, C. (SM)
Poor, E. W., Jr. (M)
Powers, K. H. (SM)
Pritchard, D. H. (M)
Pyne, I. B. (M)
Quiogue, V. J. (M)
Rajchman, J. A. (F)
Ramberg, E. G. (F)
Rankin, J. B. (M)
Reickord, A. W. (M)
Remis, B. R. (M)
Roberts, T. C. W. (A)
Roberts, W. V. (F)
Robinson, J. G. (M)
Rose, A. (F)
Ross, C. W. (SM)
Rynn, N. (SM)
Samuelson, D. S. (M)
Sanford, R. F. (A)
Schairer, O. S. (F)
Schnitzler, P. M. (M)
Schorr, H. (M)
Serrell, R. (SM)
Shahbender, R. A. (M)
Shatzkin, J. (SM)
Sklansky, J. (SM)
Smith, B. (M)
Smith, J. P. (SM)
Smith, P. T. (SM)
Sommer, A. H. (SM)
Stanas, H. (SM)
Stemberg, S. (SM)
Sterzer, F. (M)
Surber, W. H., Jr. (M)
Thomas, J. B. (M)
Thompson, R. D. (M)
Truitt, T. D. (M)
Tults, J. (M)
Tuska, C. D. (F)
Vose, C. H. (SM)
Wadlin, M. L. (M)
Wall, M. E. (M)
Wallmark, J. T. (SM)
Webster, W. M. (SM)
Weimer, P. K. (F)
Westneat, A. S., Jr. (SM)
Wilkinson, W. C. (SM)
Williams, C. H. (A)
Williams, T. R. (M)
Witt, H. R. (A)
Wittke, J. P. (M)
Wolff, I. (F)
Wolff, S. S. (M)
Woodbridge, D. E. (M)
Woodward, J. G. (SM)
Woodward, O. M., Jr. (SM)
Young, C. J. (F)
Zworykin, V. K. (F)

Princeton Junction (PRI-2)
Aronson, A. L. (M)
Chandler, H. M., Jr. (M)
De Remer, K. R. (M)
Keigler, J. E. (M)
Kritman, I. M. (M)
Szekely, M. E. (M)

Prospect Park (NNJ-2)
Serra, E. M. (M)

Radburn (NNJ-2)
Eaton, R. D. (M)

Rahway (NNJ-2)
Bellingham, L. C. (A)
Dipole, W. M. (A)
Homeck, J. F. (M)
Jones, E. L. (A)
Olesky, M. (A)
Robinson, G. D. (A)
Rogers, R. E. (M)
Sarullo, M. J. (M)

Ramsey (NNJ-2)
Buyer, E. M. (SM)
Cymanon, J. J. (A)
Dubbs, W. M. (M)
Gray, L. F. (M)
Helser, W. H. (SM)
Lynch, D. J. (M)
Maillet, A. J. (A)
Mason, R. S. (M)
Pardovich, J. T. (M)
Price, J. M. (M)
Stryker, H. J. (M)
Wood, H. F. (A)
Yurasek, J. F. (M)

Raritan (PRI-2)
Ditrick, N. H. (M)
Kleppinger, R. E. (M)
Koch, O. F. (A)
Newman, J. J. (M)
Ollis, J. H. (M)
Pearson, D. B. (M)
Troiano, A. (A)

Red Bank (NY-M-2)
Allen, M. R. (A)
Anderson, E. C. (SM)
Bagwell, C. E. (SM)
Barrios, A. A. (A)
Bassler, S. G. (M)
Beck, A. C. (F)
Belzer, H. H. (SM)
Benowitz, R. B. (M)
Billick, P. (M)
Budenkaye, A. C. (M)
Bush, J. A. (A)
Chasek, N. E. (M)
Crawford, A. B. (F)
Crivello, A. A., Sr. (M)
Dathe, L. C. (A)
Dawson, R. W. (M)
De Loach, B. C., Jr. (M)
Demko, J. G. (M)
Domidion, W. G., Jr. (A)
Edwards, C. F. (M)
Egli, J. J. (SM)
Ehrhart, E. H. (M)
Ehrlich, W. E. (A)
Elsenberger, A. J. (M)
Fox, A. G. (F)
Frankel, H. C. (SM)
Gaus, E. L. (M)
Gerhold, R. A. (M)
Gioggia, A. E. (A)
Goodall, W. M. (F)
Hawley, R. C. (M)
Hogg, D. C. (SM)
Homa, S., Jr. (M)
Hunt, D. W. (M)
Hunt, L. E. (SM)
Hutchinson, H. P. (SM)
Jakes, W. C., Jr. (SM)
Johnson, G. D., Jr. (M)
Kane, B. P. (M)
Kaprelian, E. K. (A)
Kelly, L. H. (A)
Kibler, L. U. (M)
King, A. P. (SM)
Kinney, W. R. (M)
Kulinyi, R. A. (M)
Kummer, W. H. (SM)
Lacy, R. E. (SM)
Lamar, K. (M)
Lang, L. M. (SM)
Li, T. (M)
Lindner, H. G. (SM)
Loffer, G. W. (M)
Macilroy, A. P., Jr. (A)
Marcuse, D. (M)
Marcy, S. P. (M)
Marx, D. H. (M)
Massell, E. (SM)
Menhennett, G. H. (M)
Moody, C. S. (M)
Moore, J. C., Jr. (M)
Moyers, R. K. (M)
Ohm, E. A. (A)
Perkins, O. D. (SM)
Pustelnyk, M. (M)
Rauch, A. (A)
Ring, D. H. (SM)
Rose, C. F. P. (SM)
Rowe, H. E. (M)
Sardo, W. (M)
Schmidt, R. A. (M)
Senn, G. F. (SM)
Sharpless, W. M. (F)
Siderman, J. A. (M)
Stanley, H. T. (M)
Tillotson, L. C. (SM)
Turner, E. H. (SM)
Unger, H. G. (SM)
Vogt, G. F. (SM)
Weiss, M. T. (SM)
Wopat, J. W., Jr. (A)
Wright, D. S. (M)
Wurthmann, G. E. (A)
Zalesky, S. J. (M)

Ridgefield (NNJ-2)
Ackerman, H. I. (M)
Bishop, P. (M)
Dardano, L. B. (A)
Dolinko, L. (M)
Finkelstein, D. (M)
Fristensky, C. A. (M)
Mittman, E. E. (SM)
Ross, G. G. (M)
Spitz, T. S. (M)
Sutherland, E. F. (M)

Ridgefield Park (NNJ-2)
Foster, R. M. (A)

Ridgewood (NNJ-2)
Bailey, E. M. (A)
Boldridge, A. G., Jr. (M)
Boyle, G. G. (M)
Clay, A. N. (M)
De Leon, J. (M)
Deliefs, H. (SM)
Engel, G. C. (M)
Feldkamp, L. P. (A)
Fitts, W. F. (M)
French, H. A. (SM)
Holt, A. C. (SM)
Howite, R. (M)
James, S. D. (SM)
Johnson, F. H. (M)
Labagh, E. L. (M)
Mihalik, J. J. (M)
Mueller, J. F. (M)
Mulligan, J. H., Jr. (F)
Oliverio, A. D. (M)
Pratt, T. B., Jr. (M)
Puckette, C. M., Jr. (M)
Ricca, R. F. (M)
Rogers, T. I. (SM)
Sands, L. G. (SM)
Scarpone, J. B. (M)
Schmalz, H. H. (M)
Simpson, L. C. (F)
Streich, R. J. (M)
Stubner, J. W. (M)
Taylor, E. C. (A)
Troell, R. E. (M)
Wahlquist, W. (M)
Willis, J. S. (SM)

Riverdale (NNJ-2)
Hogeman, B. L. (A)

River Edge (NNJ-2)
Balter, S. A. (M)
Baum, E. (M)
Biagi, A. D. (M)
Ennis, F. T. (VA)
Garfunkel, A. C. (M)
Grybowski, T. M. (M)
Howitz, G. (M)
Izzo, A. J. M. (A)
Kumble, A. S. (M)
La Rue, C. L. (M)
Mazzola, J. R. (SM)
O'Connor, R. A. (SM)
Schumacher, H. L. (M)
Slack, S. J. (M)

Riverside (PHI-3)
Gardner, R. K. (M)
Katella, A. J. (M)

Riverton (PHI-3)
Allen, C. D. (M)
Alperin, N. N. (M)
Baron, A. S. (M)
Bergman, R. H. (M)
Bilcon, R. F. (SM)
Blumenstein, W. C. (M)
Brown, L. (SM)
Bryson, H. C., Jr. (SM)
Burton, G. T. (M)
Canavan, T. P. (M)
Chapman, L. J. (M)
Child, P. J. (M)
Collings, F. C., Jr. (M)
Corr, J. J. (A)
Curran, G. M., Jr. (M)
Davidson, R. C. (A)
Delker, A. G., Jr. (M)
Dudziak, C. (M)
Falvey, T. L., Jr. (M)
Faust, A. C. (M)
Faustini, C. (M)
George, M. E. D. (A)
Gold, A. (SM)
Good, L. H. (M)
Gray, R. K. (A)
Hartshorne, F. A. (M)
Howells, J. A. (A)
Hunt, G. W., Jr. (M)
Kitchens, L. E. (M)
Kreitzberg, S. B. (A)
Lavedan, L. J., Jr. (M)
Lawrence, W. J. (M)
Long, K. G. (M)
Mandelkehr, M. M. (M)
Norcross, J. S., Jr. (A)
Penfield, A. W. (A)
Reardon, L. J. (M)
Ress, T. I. (A)
Schira, J. C., Jr. (M)
Sidnam, R. D. (M)
Small, C. E. (M)
Smith, B. D. (M)
Snead, C. R. (M)
Spoelstra, R. J. (M)
Stangler, D. M. (A)
Stelpelman, W. H., Jr. (M)
Strinkowski, N. W. (A)
Turnow, W. F. (M)
Vendeland, R. N. (M)
Westcott, H. H. (M)
Wieder, E. J., Jr. (M)
Woodward, C. P. (SM)

River Vale (NNJ-2)
Battel, F. A. (A)
Bettlejewski, F. J. (M)
Brain, B. (A)

Rochelle Park (NNJ-2)
Auerbach, A. (M)
Brannagan, T. H. (M)
Carroll, J. M. (A)
De Yoreo, R. (M)
Farber, D. J. (M)
Feoranz, F. J. (M)
Ferrando, H. J. (M)
Flanagan, J. R. (M)
Grudus, W. S. (M)
Jones, G. E., Jr. (SM)

Rockaway (NNJ-2)
Greene, K. (SM)
Kurtz, D. P. (M)
Magel, A. (M)
McFann, H. L. (M)
Morgen, M. (M)
Ross, W. C. (M)
Santos, J. S. (M)
Uiga, E. (SM)
Zyskowski, J. J. (M)

Rockaway Township (NNJ-2)
Kunnes, H. (M)

Rocky Hill (PRI-2)
Fralpont, D. F. (M)
Warter, P. J., Jr. (A)

Roosevelt (NY-M-2)
Rips, E. M. (A)

Roseland (NNJ-2)
Grey, A. J. (M)
Nichols, P. A. (A)
Richardson, G. G. (SM)

Roselle (NNJ-2)
Boycks, E. C. (M)
Frank, L. H. (A)
Ostrow, H. (M)
Preuss, E. A. (A)
Saccente, J. C. (M)

Roselle Park (NNJ-2)
Cohen, E. (M)
Darpue, F. B. (A)
Hanselman, K. J. (M)
Lee, T. (A)

Rumson (NY-M-2)
Deisler, J. D. (M)
Friis, H. T. (F)
Golay, M. J. E. (SM)
Gruol, J. W. (SM)
Kennedy, J. D. (A)
Kimmel, L. D. (M)
Kruse, E. S. (M)

Runnemede (PHI-3)
Copeland, W. O. (M)
Eckel, C. C. (M)
Haworth, R. F. (M)
Jones, G. C. (A)
McCollor, R. L. (SM)
Nieh, N. Y. (M)
Perilli, R. R. (M)
Williamson, W. H., Jr. (M)

Rutherford (NNJ-2)
Ackley, J. N. (M)
Edmunds, J. J., Jr. (M)
Foster, J. E. (M)
Henzel, G. L. (A)
Keller, W. N. (A)
Lohrenz, C. A. (M)
Loorestl, A. P. (A)
Loorestl, M. (A)
Merrill, J. B. (M)
Rau, A., Jr. (SM)
Reenstra, W. A. (M)
Sammon, A. C. (A)
Scott, G. R. (M)
Simkovich, J. R. (M)
Simpson, W. F. (M)
Stalter, K. J. (M)
Van Winkle, E. W. (SM)
Walker, D. J. (A)
Walter, C. W. P. (SM)
Wattson, H. B. (SM)
Weidman, B. (A)
Zemanian, A. H. (SM)

Salem (PHI-3)
Bailey, L. W. (SM)
Morton, R. S. (VA)
Perisweig, A. M. (M)

Scotch Plains (NNJ-2)
Ballinger, L. H. (M)
Bell, J. S. (M)
Bird, S. P. (A)
Butler, W. E. (A)
Carhoun, D. O. (M)
Cummins, R. L. (M)
Dranetz, A. (M)
Elwood, A. A. (SM)
Greene, W. J. (SM)
Hergenhan, O. (M)
Jensen, C. A. (M)
McLean, J. B. (M)
Montllor, J. A. (M)
Mueller, P. L. (M)
Schultz, J. L. (SM)
Sensenig, W. A. (M)
Shipoen, H. T. (M)
Swenson, R. A. (A)
Young, C. B., Jr. (SM)

Sea Bright (NY-M-2)
Schnabolk, H. L. (M)

Seabrook (PHI-3)
Superior, W. J. (A)

Sea Isle City (PHI-3)
Bechler, W. C., Jr. (VA)

Seaside Park (NY-M-2)
Sinn, R. S. (M)

Secaucus (NNJ-2)
Tonn, J. L. (A)

Sewell (PHI-3)
Woodward, J. D. (SM)

Short Hills (NNJ-2)
Alexander, R. B. (SM)
Brown, J. T. L. (M)
Bucklin, K. G. (SM)
Budenbom, H. T. (F)
Carroll, M. J. (SM)
Dabrowski, H. L. (A)
Dore, A. J. (A)
Doyle, E. J. (SM)
Gerber, G. V. (M)
Giese, R. C. (SM)
Huber, G. H. (SM)
Jones, H. B., Jr. (A)
Kelly, M. J. (F)
Klehm, W. G., Jr. (M)
Olson, N. K. (M)
Tucker, J. P. (VA)
Vanderbilt, S. (A)
Wall, G. B., III (M)
Whittemore, L. E. (F)
Wright, A. K. (SM)
Ziegler, A. W. (SM)

Shrewsbury (NY-M-2)
Covici, W. (M)
Czerwinski, W. P. (M)
Edmunds, E. E. (SM)
Goodwin, H. C. (A)
Johnstone, J. H. (SM)
Keipher, B. J. (M)
Layden, O. P. (A)
Maloney, T. E. (M)
Michael, L. M. E. (A)
Rehm, W. L. (M)
Ross, A. H. (SM)

Sicklerville (PHI-3)
Ayers, J. J. (M)
Berry, R. L. (A)

Singac (NNJ-2)
Fetko, J. F. (A)

Somerdale (PHI-3)
Callahan, J. F. (M)
Howell, M. (M)
Kliseiski, J. M. (A)
Kolodin, L. (A)
Kurchin, A. (M)
Metzler, M. A. (M)
Sweeney, J. E. (M)
Symbalisty, S. (M)
Warren, W. L. (A)
Weisenfeld, S. (M)

Somers Point (PHI-3)
Baker, R. L. (SM)
Curtis, V. F. (A)

Somerville (PRI-2)
Ahrons, R. W. (M)
Armstrong, L. D. (M)
Buehler, R. K. (M)
Cadra, V. J. (M)
Chinery, J. J. (A)
Coburn, R. D. (A)
Coe, D. H. (M)
Di Stefano, R. T., Jr. (M)
Fa, C. H. (M)
Fournier, R. V. (SM)
Gifford, J. S. (M)
Giuliano, M. N. (M)
Glover, A. M. (F)

Gobat, A. R. (SM)
Greig, W. J., Jr. (A)
Handjani, H. (M)
Hornstein, M. B. (M)
Imrie, R. W. (M)
Iverson, J. H. (M)
Janes, R. B. (F)
Kestenbaum, A. L. (M)
Kleinman, H. M. (M)
Levin, B. B. (M)
Levy, D. T. (M)
Lloyd, R. H. F. (M)
Lohman, R. D. (M)
Long, W. T. (M)
Luedicke, E. (M)
Meltzer, G. (M)
Painter, R. R. (M)
Pinto, R. C. (M)
Plus, L. (M)
Sands, W. F. (SM)
Santilli, R. A. (M)
Schooley, R. W., Jr. (M)
Schwartz, B. (A)
Stiasny, R. (M)
Thanos, H. (M)
Thorne, D. (M)
Toth, S., Jr. (A)
Wheeler, A. J. (A)
Wybrands, K. (M)
Zuk, B. (M)

South Amboy (PRI-2)
Kaluzny, E. F. (A)
O'Brien, R. E. (M)
Rauth, R. G. (M)
Thomas, G. W. (A)

South Belmar (NY-M-2)
Fimmel, R. O. (M)

South Bound Brook (PRI-2)
Dobrowolski, R. M. (M)
Kalish, I. H. (M)

South Hackensack (NNJ-2)
Krauss, E. (A)
Sherman, E. W. (A)

South Orange (NNJ-2)
Bonanno, J. L. (SM)
Crowley, H. L. (SM)
Harris, W. A. (F)
Miller, H. J. (SM)
Myers, G. H. (A)
Quinn, K. C. (M)
Robison, R. M. (M)
Royden, G. T. (F)
Stanwick, C. A. (VA)
Wooldridge, A. C. (SM)

South Plainfield (NNJ-2)
Bellew, F. N. (M)
Greenman, R. (M)
Grob, L. W. (A)
Hunter, F. L., Jr. (M)
Lipnick, J. (A)
Rogers, H. D., Jr. (A)
Shalvoy, R. E. (M)
Soja, M. (SM)
Sykes, R. T. (A)
Tesno, R. R. (SM)
Wolfe, R. W. (M)

South River (PRI-2)
Bakaj, E. A. (A)
Blanchard, C. K. (M)
Fisher, W. W. (M)
Griffee, F. M. (M)

Sparta (NNJ-2)
Hussey, L. W. (SM)
Lundstrom, A. A. (SM)

Spotswood (PRI-2)
Nachbar, M. S. (M)

Springfield (NNJ-2)
Bruner, M. (A)
Cunningham, F. W. (SM)
Emmel, L. L. (M)
Field, W. T. (VA)
Harts, W. W. (A)
Krall, W. F. (M)
Liberman, M. E. (M)
McDowell, H. L. (M)
Ollendorf, J. (M)
Ozsvath, D. R. (M)
Pollacek, E. H. (A)
Rawicz, H. C. (M)
Rogers, A. W. (SM)
Smith, R. C., Jr. (M)
Wilcox, E. J. (M)
Wolfe, G. (SM)

Spring Lake (NY-M-2)
Huber, W. A. (SM)
Volpt, G. (A)

Spring Lake Heights (NY-M-2)
Acker, R. E. (A)

Stanhope (NNJ-2)
Carmichael, R. L. (M)

Stewartsville (NNJ-2)
Belanger, E. D. (A)

Stirling (NNJ-2)
Hirmann, J. (SM)

Stratford (PHI-3)
Shellock, J. V. (A)
Welman, W. W. (M)
Westcott, E. J. (M)

Succasunna (NNJ-2)
Johnson, L. C. (A)
Martin, S. J. (M)
Morgan, T. W., Jr. (M)
Willibald, G. E. (SM)

Summit (NNJ-2)
Anderson, C. N. (F)
Baker, P. A. (A)
Black, H. S. (F)
Carne, G. G. (SM)
Cavelos, A. A. (M)
Cohen, G. (M)
Corey, P. J. (M)
Crabtree, T. H. (A)
Davis, R. E. (M)
De Costanzo, J. R. (A)
Dudley, H. W. (SM)
Early, J. M. (F)
Evans, H. W. (SM)
Ewoldt, H. J. (M)
Farley, J. E. (M)
Grierson, C. A. W. (SM)
Griffin, W. F. (SM)
Hammell, R. (M)
Hanchett, G. D., Jr. (SM)
Harley, J. B. (SM)
Hartley, R. V. L. (F)
Hasdorff, L. (M)
Hathaway, S. D. (M)
Haynie, G. D. (M)
Helsing, R. A. (F)
Hensel, M. L. (M)
Higgins, R. H. (M)
Hoth, D. F. (SM)
Johnson, R. L. (M)
Kaiser, E. T. (SM)
Kelly, H. P. (M)
Kingsbury, B. A. (SM)
Koslov, S. (A)
Long, M. B. (M)
Loumeau, R. F. (M)
Lundry, D. W. (M)
Lundry, W. R. (SM)
Marshall, R. W. (M)
Martinson, L. W. (M)
McMillan, J. D. (M)
Means, W. J. (SM)
Meise, H. A., Jr. (M)
Michael, F. R. (M)
Moore, R. F., Jr. (M)
Moster, C. R. (M)
Nardone, R. L. (A)
Nordahl, J. G. (SM)
Pain, D. H. (A)
Perry, I. D. (M)
Preston, K., Jr. (M)
Prysiak, N. E. (SM)
Quinby, E. J. (M)
Raynsford, C. K. (M)
Richards, P. C. (M)
Rollman, R. F. (M)
Rose, A. C. (A)
Samuel, R. (M)
Shepard, F. H., Jr. (M)
Slover, W. L. (A)
Snedeker, D. E. (M)
Steiger, B. F. (M)
Steiner, G. B. (M)
Stevens, F. J. (M)
Talt, W. F. (A)
Tendick, F. H., Jr. (M)
Thomas, G. B., Jr. (SM)
Treftel, W. S. (M)
Uenohara, M. (M)
Unglaub, R. K. (M)
Waxenhals, E. R. (M)
Witt, F. J. (M)
Yost, L. A. (SM)

Surf City (NY-M-2)
Bollinger, W. P. (SM)

Sussex (NNJ-2)
Bliss, D. C. (A)

Teaneck (NNJ-2)
Atlas, Z. (M)
Bonner, J. T. (M)
Borg, R. H. (A)
Calderone, M. L. (M)
Chin, E. (M)
Dunn, W. J. (A)
Eckenfelder, R. C. (M)
Galbraith, J. E. (M)
Gannett, E. K. (SM)
Greenquist, R. E. (M)
Jacobs, B. H. (M)
Kulesha, K. J. (M)
Lawrence, C. W. (M)
Ludwig, M. L. (M)
Luhrs, C. H. (M)
Luskin, B. (M)
Merzer, G. R. (SM)
Pearl, S. L. (M)
Polack, M. M. (M)
Pulley, A. A. (VA)
Quance, F. R. (M)
Rennie, E. (A)
Sather, O. J. (SM)
Sheer, C. (SM)
Tsao, T. C. (SM)
Verseput, P. C. (A)
Weber, S. (M)

Tenafly (NNJ-2)
Anthony, R. L. (SM)
Border, B. (A)
Del Ben, R. A. (M)
Engel, J. S. (M)
Hull, R. E. (M)
Hutchinson, C. C. (A)
Iwahashi, K. K. (A)
Litsios, J. (A)
Parrott, R. D. (M)
Sciorra, A. F. (M)
Shotliff, L. A. (SM)
Unger, W. H. (M)

Teterboro (NNJ-2)
Boronow, E. L. (M)
Hughes, M. J. (M)
Keetch, W. A. (A)
McCaul, J. N. (A)
Nietsch, H. E. (A)
Robinson, C. S. (M)
Shangraw, C. C. (SM)
Sprung, R. A. (M)

Toms River (NY-M-2)
Dreessen, W. B. (M)
Helmus, D. H. (A)
Mangold, E. J. (M)
Steel, H. W. (M)

Totowa Borough (NNJ-2)
Gutleber, F. S. (M)
Heinis, F. W. (A)
Kuyper, D. M. (M)
Le Vine, H. D. (SM)
Monsees, W. A. (M)
Unger, A. (M)
Wehner, J. H. (M)

Towaco (NNJ-2)
Bird, H. H. (A)

Trenton (PRI-2)
Ballard, R. C. (SM)
Carver, L. A. (M)
Clancy, J. E. (M)
Cole, W. Y. (M)
De Mott, J. (SM)
Ferber, L. R. W. (SM)
Harris, F. M. (M)
Heller, M. E. (A)
Inslee, J. A. (M)
Kang, C. L. (M)
Kerbec, M. J. (M)
Klotz, C. G. (M)
Kucker, J. A. (M)
Langer, G. O. (M)
Lipinski, Z. J. (M)
Lorber, H. W. (M)
Marquardt, C. S. (A)
McCoy, D. S. (M)
Miller, H. S. (M)
Miller, R. (M)
Molnar, J. G. (A)
Power, J. B. (A)
Raser, E. G. (SM)
Ratz, A. G. (M)
Rogers, A. E. (M)
Seideman, I. M. (M)
Sowlak, M. M. (M)
Strother, J. A. (A)
Szwedo, S. G. (A)
Wentzel, A. G., Jr. (M)
Woolston, J. R. (M)
Yard, E. M. (M)
Zarzeckl, F. S. (M)

Union (NNJ-2)
Anderson, N. E. (M)
Barr, W. J. (M)
Chartoff, M. (M)
D'Agostino, V. F. (M)
Davis, E. S. (M)
Edwards, J. B. (VA)
Faughnan, J. F. (M)
Frank, D. N. (A)
Hemmendinger, B. G. (M)
Jahn, C. W. (A)
Lambert, G. W. (A)
Mason, C. R. (A)
Metzler, R. (A)
Nagy, J., Jr. (M)
Penk, C. (A)
Polkosnik, C. F., Jr. (A)
Sakatos, M. J. (M)
Sandoz, R. W. (M)
Sapoff, M. (M)
Snyder, V. A. (A)
Uebelhoer, H. K. (M)
Weintraub, N. (SM)

Union City (NNJ-2)
Campanaro, P. L. (A)
Corson, D. E. (SM)
Cuny, J. J. (M)
Delquidice, T. F. (M)
Genzel, S. (A)
Heuston, T. J. (M)
Markunas, J. P. (M)
Matto, V. G. (A)
Vaughan, C. B. (A)
Yelick, N., Jr. (A)

Upper Montclair (NNJ-2)
Benner, T. A. (M)
Borden, E. W. (SM)
Buck, T. F. (A)
Burnett, J. H. (SM)
Chipp, R. D. (F)
De Rosa, L. A. (F)
Dishal, M. (F)
Dunn, J. G. (A)
Fawcett, D. G. (M)
Ferguson, J. G. (SM)
Goldsmith, T. T., Jr. (F)
Hamilton, R. D. (M)
Harries, W. L. (SM)
Hicks, B. A. (SM)
Hunkins, H. R. (M)
Kaye, G. A., Sr. (M)
Osborne, H. S. (F)
Peer, G. C. (A)
Rutter, J. H., Jr. (SM)
Siegel, R. (A)
Stanton, F. T., Jr. (A)
Terhune, H. R. (SM)
Warner, H. M. (A)

Upper Saddle River (NNJ-2)
Bochet, F. J. (M)
Sereno, C. A. (SM)
Weiner, M. J. (M)

Vaux Hall (NNJ-2)
Seldon, C. (M)

Ventnor City (PHI-3)
Braverman, N. (SM)

Verona (NNJ-2)
Baxter, C. L. (A)
Beltz, W. F. (SM)
Beste, H. E. (SM)
Boronow, F. S. (A)
Butler, H. R. (SM)
Caruso, C. (SM)
Curtis, L. B. (M)
Curtis, L. W. (M)
Fisher, G. C. (M)
Gauthier, R. V. (A)
Hoops, H. W. (A)
Hulst, G. D. (SM)
Jacobs, G. W. (M)
Janoff, A. (A)
Koerner, C. T. (SM)
Kram, W. (A)
Lewinter, S. W. (SM)
McDonough, V. T. (M)
Polkinghorn, F. A. (F)
Polkinghorn, R. W. (M)
Scheraga, M. G. (SM)
Smith, E. J. (M)
Smith, H. R. (M)
Tobler, C. R. (M)
Tompson, E. C. (A)
Wohlgemuth, A. C. (M)

Vineland (PHI-3)
Lolli, A. V. (M)
Waugh, J. R., Jr. (M)

Waldwick (NNJ-2)
Atkin, J. (M)
Bailey, R. S. (SM)
Broderick, N. E. (SM)
Certner, A. (A)
Graney, J. F., Jr. (A)
Priest, R. B. (M)
Shaler, D. (SM)

Wallington (NNJ-2)
Van Savage, J. (M)

Wallpack (NNJ-2)
Houck, H. W. (F)

Wanamassa (NY-M-2)
Acker, M. (M)
Carp, G. (M)
Goldberg, B. (SM)
Halprin, L. H. (M)
Kuhnapfel, R. H. (SM)
May, A. (A)
Miller, M. (M)
Treston, P. (M)

Washington (NNJ-2)
Aten, D. C. (M)
Carlson, R. F. (SM)
Feindel, A. (M)
Neuls, C. W. (A)
Schmidt, A. F., Jr. (A)

Watchung (NNJ-2)
Hellstrom, M. J. (SM)

Waterford (PHI-3)
Connaught, P. M. (M)

Wayne (NNJ-2)
Armstrong, T. R. (M)
Bentley, A. Y. (SM)
Bonazza, W. J. (M)
Brown, A. T., III (M)
Bruggeman, J. T. (M)
Davis, E. L. (SM)
Des Jardins, R. A. (A)
Dilatush, E. (M)
Dyne, J. H. (A)
Ecklund, E. E. (SM)
Evans, N. L., Jr. (M)
Fockler, W. G. (SM)
Fosher, W. A. P. (M)
Gregory, L. A., Jr. (A)
Haenichen, J. C. (A)
Hamlin, J. C. (M)
Junckes, J. R. (M)
Kass, J. S. (M)
Katz, A. J. (SM)
Kazuk, W. F. (A)
Kern, G. A. (SM)
Lay, C. A., Jr. (A)
Lehman, G. C. (A)
Lucas, E. F. (M)
Mumford, E. L. (M)
Murphy, D. F. (M)
Nunzich, F. H. (SM)
Peters, G. J. (A)
Ryan, H. J. (M)
Schmidt, L. (M)
Shea, R. A. (SM)
Silco, R. O. (M)
Struck, H. E. (M)
Thompson, W. T. (M)
Underhill, E. M. (SM)
Washburn, C. L. (M)
Williams, R. J. (A)
Wilson, F. C. (SM)
Wolfish, H. H. (M)

Wayne Township (NNJ-2)
Grimes, W. M., Jr. (M)

Weehawken (NNJ-2)
Armstong, D. T. (A)
Mahony, J. P. (M)
McKee, F. J. (M)
Petersen, W. P. (M)

Wenonah (PHI-3)
Eldridge, G. C., Jr. (A)
Robinson, J. L. (M)

West Allenhurst (NY-M-2)
Brockel, H. W. (A)
Friedrich, V. L. (SM)
Levine, R. H. (SM)
Lewis, H. M. (SM)
Ramella, P. R. (M)
Sugarman, R. H. (SM)
Steelman, K. C. (A)

West Belmar (NY-M-2)
Fliegler, E. (A)

West Berlin (PHI-3)
Trimble, J. E. (A)

West Caldwell (NNJ-2)
Beyer, F. J. (M)
Brundage, J. H. (SM)
Capodanno, R. T. (SM)
Clark, T. G. (M)
Cole, H. W. (M)
Crumo, E. E. (M)
Dunn, R. H. (M)
Eberhard, L. E. (VA)
Friedman, S. L. (M)
Hampshire, R. A. (M)
Knight, M. B. (SM)
Knoop, W. A., Jr. (SM)
Levine, S. B. (A)
Lynn, P. R. (M)
Myers, R. H. (A)
Olivier, R. M. R. (M)
Reiner, R. L. (A)
Richardson, R. J. (A)
Rusinow, K. (M)
Schade, O. H. (F)
Schoenwald, G. (A)
Shepard, R. H. (M)
Stalder, J. J. (M)
Toepel, W. A. (A)
Walzer, F. (M)
Wilson, L. F. (M)

West Collingswood (PHI-3)
Barker, D. W. (M)
Cummings, J. J. (SM)
Laskey, J. M. (M)
O'Brien, J. A. (SM)
Orth, R. B. (M)
Perry, R. A. (M)
Ramanis, O. (M)
Sapp, D. H. (M)
Tannenbaum, D. A. (M)

West Deal (NY-M-2)
Berger, R. M. (SM)

West End (NY-M-2)
Baars, R. D. (M)
Epstein, M. (M)
Kahn, D. (M)
McMillen, J. D. (M)
Winters, A. L. (A)

West Englewood (NNJ-2)
Bitner, R. E. (M)
Boehm, G. W. (A)
Gelling, H. F. (M)
Godofsky, M. (M)
Kralnin, S. (M)
Kuss, P. W. (M)
Pitchholtz, R. L. (A)
Schnoll, N. (SM)
Scott, D. A. (A)
Shenk, E. R. (SM)
Walsh, A. A. (SM)
Watts, G. J. (M)
Wilbur, E. C. (SM)

Westfield (NNJ-2)
Augstadt, H. W. (SM)
Bachrach, H. E. (A)
Bacon, D. R. (M)
Barker, R. A. (M)
Bergan, M. D., Jr. (A)
Bumiller, G. B. (M)
Cafarelli, N. J., Jr. (M)
Cunniff, T. W. (M)
Edwards, R. (SM)
Follingstad, H. G. (M)
Foster, R. M. (F)
Goldsmith, A. S. (M)
Hayward, W. S., Jr. (A)
Hopkins, C. H. (M)
Ingalls, D. (M)
Jackson, W. H. (M)
Jensen, T. F. (A)
Leeds, M. (M)

Leggett, E. P. (M)
MacGill, L. T., Jr. (A)
Massey, R. P. (A)
Moons, A. G., Jr. (M)
Nein, H. R. (M)
Peterson, L. J. (M)
Pulley, L. A. (VA)
Shepard, R. M. (A)
Siegelin, C. O. (SM)
Smith, J. W. (SM)
Smith, K. D. (SM)
Suchomel, M. (A)
Warner, H. K. (M)
Welsh, W. A. (SM)
Wier, J. M. (M)
Wolf, B. H. (SM)
Wohlgemuth, A. J. (M)
Worley, A. R. (M)
Young, C. E. (M)

West Long Branch (NY-M-2)
Anderson, B. S. (SM)
Barbour, T. M. (M)
Berman, G. (M)
Delsinger, D. A. (SM)
Doxey, W. L. (M)
Farlee, R. J. (M)
Fotladi, N. T. (A)
Gerber, E. A. (F)
Gilow, E. (SM)
Gore, T. S., Jr. (M)
Gormley, R. S. (SM)
Griffith, P. E. (SM)
Guttwein, G. K. (SM)
Huckaby, J. R. (M)
Kublin, V. J. (M)
Kullback, I. (M)
Labanca, D. L. (M)
La Marca, P. J. (M)
Lipoel, B. (M)
Lipton, M. H. (A)
McKenna, F. A. (SM)
O'Brien, J. F. (M)
O'Dwyer, M. S. (M)
Portantino, A. (M)
Pritchard, C. A. (M)
Segner, S. M. (M)
Spergel, J. (M)
Vleweger, A. L. (SM)
Vogler, J. G. (M)
Wolinsky, A. (A)

West Millington (NNJ-2)
Jamison, H. M. (A)

Westmont (PHI-3)
Aldrich, J. L. (A)
Beezer, J. E. (M)
Benton, H. B. (A)
Burke, T. J. (M)
Carrell, R. M. (M)
Cepas, P. J. (M)
Cox, R. L. (M)
Dennison, R. C. (M)
Dilley, J. E. (M)
Fast, H. (M)
Fish, C. A. (M)
Garabedian, H. B. (A)
Grundmann, G. L. (SM)
Helbig, W. A. (A)
Ito, R. A. (M)
Knapp, J. E. (A)
Leidy, H. W. (A)
Morris, R. E. (A)
Mozzi, E. J. (M)
Mullen, D. J. (M)
Pierce, D. L. (A)
Pierce, J. A. (A)
Sinnett, C. M. (F)
Sloan, J. E. (M)
Van Keuren, E., III (M)
Walker, R. B. (M)
Witt, L. R. A. (A)
York, A. (A)
Yourich, A. A. (A)
Ziehm, R. T. (M)

West Orange (NNJ-2)
Abate, J. E. (M)
Adler, A. W. (A)
Albanese, D. F. (M)
Bernstein, B. (M)
Blanchard, W. A. (A)
Booth, R. P. (SM)
Coan, E. M. (SM)
Dzik, A. (SM)
Edison, T. M. (M)
Fishbein, S. B. (SM)
Garten, L. A. (M)
Goldstein, M. K. (SM)
Grady, C. B., Jr. (M)
Grayson, E. L. (M)
Greenfield, G. (M)
Hershoff, L. (SM)
Hess, R. C. (M)
Hetherington, G. V. (A)
Kahn, H. S. (M)
Kantrowitz, W. (A)
Kishpaugh, A. W. (SM)
Kretchmar, P. R. (M)
Lander, F. (A)
Langford, R. C. (SM)
Mann, O. J. (M)
Milner, C. M. (M)
Mohn, D. L. (M)
Newman, R. J. (SM)
Padalino, J. J. (SM)
Panker, P. F. (SM)
Pfersch, G. H., Jr. (M)
Puder, R. K. (A)
Reed, E. D. (M)
Reise, H. A. (SM)
Riemenschneider, N. L. (M)
Robinson, W. A. (A)
Ryan, F. M. (F)
Schottland, F. D. (SM)
Scully, J. F. (SM)
Shamis, S. S. (M)
Shimo, G. H. (A)
Smith, J. F. (A)
Snow, H. A. (F)
Tulchin, H. (SM)
Wagner, R. L. (M)
Zmuda, E. J. (M)

West Paterson (NNJ-2)
Bidermann, W. R. (M)
Knight, R. T. (M)
Mozek, G. J. (A)
Woncik, M. (A)

West Trenton (PRI-2)
Kunicki, H. R. (M)

Westwood (NNJ-2)
Dunn, W. J. (A)
Duschka, W. A. (M)
Elwell, H. G., Jr. (M)
Gregory, G. S. (SM)
Gunderson, L. C. (M)
Hammerschmidt, A. L. (SM)
Hirsch, R. M. (SM)
O'Connell, E. P., Sr. (M)
Scharp, G. A. (A)
Spanos, W. M. (M)
Trlantafellow, W. (A)
Warden, F. W. (SM)
Ware, D. H. (M)
Woodin, R. H. (M)
Zangenberg, H. E. (M)

Wharton (NNJ-2)
Klapach, P. (A)
Krueger, P. C. (M)
Vandak, R. F. (M)

Whippany (NNJ-2)
Alley, R. E., Jr. (M)
Alsberg, D. A. (SM)
Anderson, A. B. (M)
Anderson, G. M. (SM)
Andrews, E. G. (M)
Apostolakis, G. C. (M)
Bachman, W. J. (SM)
Baird, J. A. (SM)
Baker, G. H. (M)
Baker, J. D. (M)
Balash, F. J. (M)
Baldwin, E. G. (M)
Barstow, J. M., Jr. (M)
Bearer, P. J. (SM)
Becraft, C. E. (A)
Bedell, E. H. (M)
Beeler, T. L. (M)
Belford, J. F. (M)
Bercaw, J. D. (M)
Blair, R. R. (SM)
Bode, H. W. (F)
Bohren, A. K. (SM)
Bollman, J. H. (SM)
Bower, M. M. (M)
Boyhan, J. W. (A)
Boysen, A. P., Jr. (M)
Braun, C. G. (M)
Brenneman, D. (M)
Brown, D. J. (M)
Brown, L. O., Jr. (M)
Budlong, W. A. (M)
Burger, M. J. (SM)
Busch, K. J. (M)
Byrum, E. J. (SM)
Cagle, W. B. (A)
Carretta, P. M. (M)
Carter, F. W. (M)
Churchill, L. S. (M)
Civello, J. R. (M)
Clarke, D. R. (M)
Clement, A. W. (SM)
Clutts, C. E. (M)
Cocchiaro, M. (A)
Compton, H. B. (SM)
Connell, J. B. (M)
Coulter, D. M. (M)
Crater, T. V. (A)
Dale, G. V. (M)
Daly, I. W. (M)
Danylchuk, I. (M)
Darnell, P. S. (SM)
De Graaf, D. A. (A)
De Motte, F. E. (SM)
Diamond, E. H. (A)
Dietzold, R. L. (F)
Dintenfass, J. (A)
Dobkowski, J. T. (A)
Dominick, J. B. (SM)
Dom, R. J. (A)
Dudek, S. J. (M)
Dungan, M. R. (M)
Dunlap, K. S. (M)
Ebert, R. H. (A)
Elias, L. G. (SM)
Engstrom, O. D. (SM)
Fair, I. E. (M)
Fairweather, B. A. (M)
Field, J. M. (M)
Fleckenstein, W. O. (M)
Fleming, C. C. (M)
Fleming, H. C. (SM)
Flowers, D. E. (M)
Franke, H. C. (M)
Frantz, D. R. (SM)
Frantz, G. R. (SM)
Frasco, W. V. (M)
Friedrich, J. M. (M)
Fuss, P. S. (M)
Gallant, R. J. (A)
Gamble, G. L. (M)
Ghiron, H. (A)
Giloth, P. K. (A)
Guercio, A. M. (M)
Gunderson, D. C. (M)
Haber, K. H. (M)
Hall, W. N. (M)
Hammann, P. L. (SM)
Harding, P. A. (A)
Haught, D. E. (M)
Hays, F. R. (A)
Heber, E. (A)
Heberlein, A. A. (SM)
Helm, H. A. (M)
Hewitt, W. H., Jr. (SM)
Hibbert, J. J. (M)
Hirsch, P. (M)
Hoffmann, E. H. (M)
Hohmann, G. D. (M)
Hunter, R. A. (A)
Jacobs, I. (M)
Janiszewski, F. A. (M)
Joel, A. E., Jr. (A)
Johnson, G. D. (SM)
Johnson, J. E. (M)
Jones, L. W. (M)
Karger, G. (M)
Kellogg, L. H. (SM)
Ketchledge, R. W. (SM)
Kindberg, E. V. (M)
Kirkwood, L. W. (SM)
Klahn, R. (M)
Koenig, W. A., Jr. (A)
Koerner, L. F. (M)
Kovach, L. D. (M)
Krauss, W. N. (M)
Krieger, R. W. (A)
Kuck, B. M. (M)
Lane, R. F. (SM)
Lappl, U. T. (A)
Larsen, L. F. (M)
Leavitt, J. R. (M)
Lee, C. Y. (M)
Lenihan, T. E. (M)
Lowell, R. (M)
Lowry, G. M. (A)
Lowry, T. N. (M)
Lozier, J. C. (SM)
Lucas, R. M. (M)
Lund, N. (M)
Mac Williams, W. H., Jr. (SM)
Manship, J. F. (M)
Marston, W. J. (M)
Martin, J. F. P. (M)
Matthews, J. G. (M)
Mattinely, R. L. (SM)
May, J. E., Jr. (SM)
Mayhew, D. K. (M)
Mc Cann, T. A. (SM)
Mc Cluskey, E. J., Jr. (M)
Mc Coy, J. C. (SM)
Mc Cune, R. J. (A)
Mc Millan, B. (SM)
Mc Whan, B. (M)
Mc Williams, J. E. (M)
Meade, R. (A)
Mealy, G. H. (M)
Medwin, A. H. (M)
Menard, J. Z. (M)
Meyer, W. C. (A)
Miller, W. F. (M)
Moore, R. M. (SM)
Morrison, E. D. (M)
Morrison, J. F. (F)
Morrison, L. W. (SM)
Mraz, W. L. (SM)
Mumford, W. W. (F)
Munn, A. J. (SM)
Nebel, C. N. (M)
Nehama, I. D. (M)
Newhouse, R. C. (F)
Nicodemus, K. L. (M)
Nielsen, G., Jr. (M)
Nyser, H. J. (M)
Och, H. G. (SM)
Olmstead, N. C. (SM)
Otey, C. R. (A)
Pardee, S., Jr. (M)
Paul, C. E. (M)
Petrich, L. G. (M)
Pettijohn, C. L. (M)
Price, A. C., Jr. (M)
Priefer, C. E. (A)
Pustarfi, H. S., Jr. (A)
Ranucci, J., Jr. (M)
Reed, S. C. (M)
Reichle, W. E. (SM)
Replogle, J. O. (M)
Rice, R. V. (A)
Richman, G. H. (A)
Robertson, G. H. (A)
Ronne, J. S. (M)
Rudoloh, J. G. (M)
Rumpel, C. H. (A)
Rundstedt, R. J. (M)
Runge, W. A., Jr. (M)
Sandberg, I. W. (M)
Schaefer, F. J., Jr. (M)
Schafersman, R. L. (A)
Schmidt, E. F. (M)
Schramm, C. W. (SM)
Schunneman, R. F. (M)
Sears, P. R. (M)
Sears, R. W. (SM)
Seckler, H. N. (M)
Seidler, R. L. (M)
Sellers, G. A., Jr. (A)
Shaffer, R. A. (M)
Shaller, A. (M)
Siegel, E. H., Jr. (M)
Simons, B. H. (M)
Sinclair, R. O., Jr. (SM)
Smith, C. A. (SM)
Smith, L. M. (M)
Smith, P. H. (F)
Souders, E. R. (M)
Spence, P. W. (M)
Splees, W. G. (M)
Staehler, R. E. (A)
Stammerjohn, L. W. (M)
Stiefel, K. E. (M)
Sturdy, W. W. (SM)
Sturges, R. P. (M)
Suozzi, J. J. (M)
Swift, R. A. (SM)
Taft, C. R. (SM)
Tatsuguchi, I. (A)
Teeters, D. R. (A)
Thatcher, W. H. (SM)
Thompson, T. H. (M)
Tidd, E. D. (M)
Tidd, W. H. (SM)
Tikolan, P. (A)
Tinus, W. C. (F)
Townley, R. K. (SM)
Ulrich, W. (M)
Von Aulock, W. H. (A)
Wade, R. J. (M)
Warner, A. W., Jr. (SM)
Weeks, G. E. (M)
Weiss, M. M. (M)
White, D. L. (M)
Wiggins, J. J. (A)
Wiley, B. (M)
Willson, F. E. (M)
Winans, R. C. (M)
Wise, R. O. (SM)
Wittels, J. L. (M)
Woodmansee, B. S. (SM)
Yokelson, B. J. (M)
Yostollie, J. J. (M)
Zimmerman, A. P. (M)

White House Station (PRI-2)
Berkowitz, M. D. (M)
Brough, J. R. (SM)

White Meadow Lake (NNJ-2)
Goldstein, M. (M)

Wickatunk (NY-M-2)
Grubb, W. C., Jr. (SM)

Wildwood (PHI-3)
Eberle, H. (M)
Kendall, L. B. (SM)
Malm, R. F. (M)
Pohle, C. G., Jr. (M)

Wildwood Crest (PHI-3)
Barrett, C. S. (M)

Williamstown (PHI-3)
Roberts, M. J. (M)

Windsor (PRI-2)
Jamison, R. P. (A)

Woodbridge, (PRI-2)
Benko, G. M. (A)
Caton, W. J. (M)
Melnick, R. (M)
Morgenson, E. O., Jr. (A)
Rugg, D. A. (A)

Woodbury (PHI-3)
Bailey, E. S. (M)
Billstein, R. W. (A)
Cominos, D. A. (M)
De Credico, R. J. (A)
Frank, A. J. (M)
Frantz, E. C. (M)
Garcia, A. (M)
Hafket, D. R. (M)
Kapust, L. A. (M)
Lapp, D. N. (SM)
Neubert, H. A., Jr. (M)
Priestley, D. M. (M)
Rittman, M. C. (M)
Seeberger, L. M. (SM)
Skinner, R. L. (M)
Stark, J., Jr. (M)
Torre, A. J. (SM)
Wasson, H. M. (SM)

Woodcliff Lake (NNJ-2)
McNally, J. P. (A)
Swanson, C. A. (M)
Von Kunits, P. (M)

Woodlynne (PHI-3)
Mancino, V. J. (M)

Wood Ridge (NNJ-2)
Robinson, K. P. (M)
Yockel, A. P. (M)

Wycoff (NNJ-2)
Baasch, H. C. (M)
Benenson, C. A. (M)
Braun, W. E. (M)
Chambers, A. B. (A)
Davis, S. J. (M)
Foley, R. M. (M)
Lorenzo, A. M. (A)
Marshall, R. A. (A)
Menes, H. (M)
Oesterle, A. G., Jr. (M)
Perry, M. F. (A)
Poch, S. (M)
Samson, R. L. (M)
Troast, W. H. (A)
Watson, W. E. (A)

NEW MEXICO

Alameda (A-LA-7)
Hopkins, L. A., Jr. (M)

Alamogordo (ALA-H-7)
Alfie, C. L. (SM)
Arnold, N. E. (A)
Baker, R. E. (M)
Berg, B. V. (M)
Birkholz, R. L. (A)
Boedy, D. D. (M)
Bowman, W. G. (M)
Breunig, K. H. (M)
Christensen, R. L. (M)
Clark, C. E. (A)
Cloon, R. E. (A)
Crawford, J. E. (A)
Crowther, E. E. (M)
Decker, D. D. (M)
Dodd, S. C. (M)
Driscoll, M. W. (SM)
Du Bose, T. I. (M)
Ebersole, H. R. (M)
Ehnl, F. P. (A)
Gatton, H. F. (SM)
Gibbs, T. M. (M)
Gladkowski, E. R. (M)
Green, M. C. (SM)
Guenthner, F. K. (A)
Hammer, W. H. (A)
Harris, L. M. (A)
Hawn, A. V. (M)
Helmich, R. E. (M)
Hess, E. M. (M)
Hibben, A. T. (M)
Hodgson, D. J. (M)
Howard, J. R. (M)
Huston, E. E. (M)
Jaenke, M. G. (A)
Johnson, R. R. (SM)
Jones, M. W. (M)
Keller, P. A. (A)
Klessig, R. J. (SM)
Lanfair, B. B. (M)
La Pierre, A. F. (SM)
Lieske, N. K. (A)
Lindewall, G. W. (M)
Lopez, O. C. (A)
Loudermilk, B. E. (A)
Lovell, R. E. (SM)
Lux, M. O. (SM)
Lynch, A. J., Jr. (M)
Lynch, V. J. (SM)
Martin, W. T. (M)
Mulberger, J. G. (A)
Nicholson, T. (M)
Parmelee, S. W. (M)
Price, H. J. (SM)
Pykosz, T. F. (M)
Robison, R. B., Jr. (M)
Rokes, N. W. (A)
Rudy, C. E., Jr. (M)
Saylor, R. R. (M)
Shook, G. R. (M)
Small, P. (M)
Smith, H. D. (M)
Steele, O. A. (M)
Stokes, J. W. (M)
Stotts, W. S. (A)
Tell, W. K. (A)
Thompson, M. L. (A)
Trout, E. M. (A)
Tuttle, J. B. (M)
Vellliquette, H. R. (A)
Wall, D. E. (M)
Warnock, R. L. (SM)
Webb, R. C. (M)
Weber, M. E. (M)
Wegman, R. L. (M)
Weinstein, G. E. (M)
Weissenborn, H. E. (M)
Wells, B. D. (A)
Whitley, G. E. (M)
Wlant, R. C. (M)
Wilkie, R. O. (A)
Williamson, C. A. (A)
Wlth, M. T. (M)
Woody, W. C. (M)
Yanick, S. J. (A)
Zagone, P. V. (M)
Zimmerman, B. L. (A)

Albuquerque (A-LA-7)
Abeyta, G. A. (M)
Adams, R. E. (M)
Aden, R. D. (A)
Ahearne, J. F. (M)
Allen, B. O. (A)
Allen, L. J. (M)
Alls, C. R. (M)
Ames, J. R. (M)
Anderson, G. W., Jr. (M)
Anderson, H. L. (M)
Anderson, W. L. (M)
Arnold, J. A. (M)
Arnot, G. A., Jr. (M)
Arquette, D. W. (M)
Austin, H. B. (M)
Bachand, G. (SM)
Bacher, J. R. (M)
Bailey, V. A. (A)
Baerwald, H. G. (SM)
Baker, R. P. (M)
Banks, T. G., Jr. (SM)
Barlow, W. J. (M)
Barranger, B. J. (A)
Basore, B. L. (SM)
Belote, J. C. (M)
Bentz, R. D. (A)

Bemer, R. R. (M)
Bessent, C. L., Jr. (M)
Bidwell, C. H. (SM)
Bircher, P. H. (M)
Bishop, R. H. (M)
Bitner, B. J. (SM)
Bivens, H. M. (M)
Black, H. (M)
Bliss, S. A., Jr. (M)
Bluemoulst, J. L. (A)
Boatwright, L. T., Jr. (M)
Boettcher, G. E. (A)
Bourgeois, N. A., Jr. (M)
Brassfield, J. R. (M)
Briggs, G. U. (M)
Briggs, J. B. (A)
Brooks, E. P. (M)
Brown, W. L. (M)
Bryan, W. C. (M)
Bueffel, B. H., Jr. (SM)
Bunker, G. B. (A)
Bunn, J. R. (A)
Burley, F. E. (SM)
Burns, W. W. (A)
Butler, K. L. (M)
Canute, A. J. (A)
Carlson, W. F. (M)
Carman, W. H. (SM)
Carter, A. G., Jr. (M)
Catalano, A. A. (M)
Catlett, L. E. (A)
Chapp, J. M. (M)
Checketts, E. L. (A)
Church, A. B. (M)
Church, T. S. (SM)
Cilke, H. J. (M)
Clark, R. E. (A)
Clement, W. L. (M)
Cnare, E. C. (M)
Cohen, A. C. (M)
Cole, L. L. (M)
Collier, J. R. (SM)
Commons, D. W. (A)
Connell, J. C. (M)
Cook, K. W. (M)
Cooper, R. L. (M)
Cooper, W. K. (M)
Corcoran, H. B., II (A)
Cordova, N. A. (M)
Cravens, M. N., Jr. (M)
Crevelling, R. (SM)
Daly, W. J. (A)
Dankworth, J. F. (M)
Daugherty, T. J. (M)
Davis, E. C. (M)
Davis, G., Jr. (M)
Denton, D. H., Jr. (M)
De Pew, R. T. (A)
Dickerson, T. J. (A)
Dieruf, B. E. (M)
Dike, S. H. (SM)
Dodds, L. F. (A)
Donohoe, R. W. (M)
Dossey, J. L. (M)
Dowling, E. C. (M)
Downs, G. G. (M)
Doyle, W. A. (M)
Drake, K. W. (M)
Edmonds, S. C. (A)
Ehman, L. (M)
Elkins, E. P. (M)
Ellingson, A. C. (M)
Elliott, N. J. (M)
Ellis, J. W. (M)
Ellis, P. R., Jr. (M)
Endsley, D. L. (A)
Engquist, A. R. (M)
Erteza, A. (M)
Estes, S. E. (M)
Farrell, R. W. (A)
Fernandez, H. M. (M)
Finch, H. D. (M)
Findlay, J. H. (SM)
Fisher, H. V., Jr. (M)
Flanagan, T. J. (M)
Fleissner, C. L. (M)
Fletcher, E. E. (M)
Fletcher, E. R. (M)
Fligner, O. M. (M)
Flynn, K. D. (M)
Ford, R. M. (M)
Fortman, K. R. (SM)
Fossum, D. E. (SM)
Foster, C. E. (M)
Fowler, G. A. (SM)
French, G. (SM)
French, R. R. (A)
Frenkel, L. J., Jr. (SM)
Fry, D. R. (SM)
Furlow, D. B. (M)
Gablehouse, R. H. (M)
Garlington, A. R., Jr. (A)
Gatlin, H. E. (M)
Gebert, C. T. (M)
Gelt, P. A. (M)
Gerwin, H. J. (M)
Given, F. J. (SM)
Glass, R. E. (SM)
Glaze, E. W. (M)
Goldenberg, H. B. (SM)
Gomel, C. L. (SM)
Goss, F. A., Jr. (SM)
Grannemann, W. W. (M)
Greene, G. A. (M)
Greenwood, S. B. (M)
Griffith, R. D. (M)
Gross, J. E. (SM)
Grover, R. K. (M)
Gulliford, R. P. (A)
Hagedorn, J., Jr. (M)
Halliday, J. R. (M)
Hampy, R. E. (M)
Hansen, V. W. (M)
Hanson, R. E. (M)
Hardin, K. D. (M)
Harrell, C. D. (M)
Harrison, C. W., Jr. (SM)
Harrison, S. E. (M)
Harroun, T. V. (M)
Hart, A. S., Jr. (A)
Henry, D. E. (M)
Henry, T. J. (M)
Henry, W. E. (M)
Herrmann, R. W. (M)
Herron, R. G. (M)
Hicks, C. W. (SM)
Higgins, P. B. (M)
Hinde, J. E. (A)
Hinds, D. R. (M)
Hodges, E. M. (M)
Hoffman, J. R. (M)
Hogue, L. H. (A)
Holck, D. K. (M)
Holcomb, M. E. (M)
Holden, J. M. (M)
Holladay, R. E. (M)
Hollinger, E. C. (A)
Holmes, J. J. (M)
Houts, H. E. (SM)
Hunter, A. L. (A)
Hunter, W. C. (SM)
Hurford, A. F. (SM)
Huska, J. (A)
Huters, A. F. (M)
Hyde, W. L. (M)
Hymer, R. L. (M)
Ingersoll, C. E. (M)
Ingham, S. A. (A)
Iverson, M. M. (A)
Ives, E. E. (M)
Jackson, H. J. (A)
Jacobs, E. L. (M)
Janza, F. J. (SM)
Jean, F. H. (M)
Jeske, H. O. (M)
Jesse, P. C. (A)
Jessen, P. L. (M)
Johnson, G. S. (M)
Johnson, R. O. (A)
Jones, L. E. (M)
Jones, M. C. (M)
Jones, R. D. (M)
Jordan, J. C. (M)
Jorgensen, R. W. (M)
Katzenstein, J. (M)
Keagy, R. B. (M)
Keck, L. J. (M)
Kellom, A. W. (M)
Kelly, R. D. (A)
Kieffer, E. W. (A)
Kimball, G. S. (M)
King, C. J. (M)
Kinoshita, G. S. (A)
Klink, E. J. (M)
Knapp, T. W., Jr. (M)
Komen, P. J., Jr. (SM)
Koschmann, A. H. (A)
Koskela, A. C. (M)
La Cosa, W. D. (M)
Lambert, R. P. (M)
Laster, J. A. (A)
Lathrop, L. L. (M)
Lawrence, A. F. (M)
Lawrence, B. J. (SM)
Laycock, H. S. (M)
Lee, C. K. (M)
Lemm, R. S. (M)
Lenhert, D. H. (M)
Lewis, C. E. (M)
Lincoln, R. A. (M)
Lindsay, L. D. (A)
Linsenmayer, G. R. (M)
Littleford, A. C. (M)
Livingston, P. E. (A)
Lodge, L. L. (A)
Lommasson, T. E. (M)
Long, C. M. (M)
Long, W. R. (M)
Longerot, C. D. (M)
Love, W. D. (M)
Lucas, A. E. (A)
Luchter, D. (M)
Lung, H. R. (M)
Lytle, C. W. (SM)
Madlener, M. J., Jr. (A)
Marker, T. F. (SM)
Mason, H. (M)
Mattison, M. T. (M)
Max, A. J. (SM)
Maxon, J. S. (M)
McCampbell, C. B. (M)
McCann, R. P. (SM)
McCarthy, F. M. (VA)
McCord, W. O., Jr. (SM)
McCracken, H. J. (M)
McGehee, R. M. (SM)
McLay, J., Jr. (SM)
Mellick, L. M. (M)
Melloh, A. W. (SM)
Merlan, R. F. (M)
Merren, G. T. (A)
Miller, E. G., Jr. (SM)
Miller, W. R. (A)
Mills, G. S. (A)
Milton, O. (M)
Minnear, L. H. (SM)
Mitchell, J. C., Jr. (M)
Mock, T. D. (M)
Moffat, W. T. (A)
Molnar, J. P. (SM)
Montoya, E. K. (A)
Moore, R. K. (SM)
Morrison, D. M. (M)
Morton, W. B. (M)
Moy, L. L. (M)
Myers, R. D. (A)
Myers, V. V., Jr. (M)
Myre, W. C. (M)
Naley, N. C. (M)
Newlin, G. C. (M)
Newman, J. J. (M)
Newman, W. E. (M)
Newsom, M. M. (M)
Noble, R. P. (M)
Nowlin, D. K. (A)
O'Hara, G. F. (A)
O'Nan, R. L. (M)
Osborn, W. F. (M)
Ouverson, C. D. (M)
Pace, E. C. (A)
Pace, T. L. (SM)
Paddison, L. J. (M)
Padilla, D. J. (A)
Pafford, W. B. (M)
Palmer, J. E. (SM)
Palmer, P. R. (M)
Patterson, H. H., Jr. (SM)
Paulus, W. K. (M)
Peckham, V. D. (A)
Peemueller, A. D. (A)
Petty, W. E. (M)
Peurifoy, R. L., Jr. (M)
Phinney, E. S. (M)
Polakowski, W. G. (M)
Porter, J. R. (M)
Poufsen, H. L. (A)
Powell, R. L. (M)
Price, H. J. (A)
Purdue, C. H. (M)
Quate, C. F. (M)
Radman, N. T. (A)
Ray, B. M. (SM)
Ray, H. K. (M)
Read, G. R., Jr. (M)
Reese, J. D. (M)
Rehberg, J. C. (M)
Reineke, R. G. (A)
Reintjes, L. C. (M)
Reyes, J. R. (A)
Reynolds, R. S. (SM)
Rhodes, H. T. (M)
Ridinger, J. J. (M)
Riggins, G. L. (A)
Rinker, E. A. (M)
Roberts, R. W. (SM)
Roble, D. D. (A)
Roby, E. M. (A)
Rogers, J. L. (A)
Rogers, W. J., Jr. (A)
Ross, F. A. (M)
Rudolph, R. J. (M)
Russell, J. F. (SM)
Rust, R. F. (M)
Sabisch, K. A. (M)
Sander, H. H. (M)
Scebold, R. D. (A)
Schaefer, J. (A)
Scharff, J. H. (A)
Schatrer, R. G. (M)
Schauer, J. D. (SM)
Scheele, P. F. (A)
Scheibner, J. E. (M)
Schelby, F. (M)
Schiess, M. C. (M)
Schinabeck, J. R. (M)
Schreiner, D. G. (A)
Schroeder, E. F. (A)
Schwarz, A. C. (M)
Scott, J. C. (M)
Scranton, W. A. (M)
Seavey, R. W. (M)
Sedlack, B. F. (A)
Senter, C. H. (SM)
Sewell, B. L. (M)
Shaum, R. L. (SM)
Shoemaker, F. J. (M)
Shoemaker, W. F. (M)
Shoup, J. P. (SM)
Simmons, G. J. (M)
Simmons, R. E. (M)
Singleton, H. A. (A)
Sinnott, N. F. (A)
Sirwinski, V. (M)
Skousen, O. K. (M)
Slumway, K. J. (A)
Smart, T. E. (M)
Smith, G. K. (A)
Smith, J. D. (M)
Smith, R. L. (M)
Smith, V. K. (M)
Smoll, L. A. (M)
Snyder, L. G. (A)
Sonnenberg, R. E. (M)
Sparks, D. (A)
Spence, R. C. (SM)
Spokas, F. J. (M)
Stockley, C. H., Jr. (A)
Stone, T. E. (A)
Swain, R. R. (M)
Syler, R. P. (M)
Szeman, P. (M)
Thomas, J. A. (M)
Thorn, D. C. (M)
Tidwell, R. M. (M)
Tillery, R. J. (M)
Tillman, J. E. (SM)
Todd, J. L., Jr. (M)
Torres, H. S. (A)
Turner, D. H. (M)
Tynes, R. A. (SM)
Uhl, J. E. (A)
Vayer, R. M. (M)
Vulgan, E. J. (A)
Walker, H. E. (SM)
Walsh, J. P. (M)
Warner, B. D. (M)
Watkins, L. C., Jr. (SM)
Watson, D. E. (M)
Weber, M. (SM)
Weimer, R. E. (A)
Weingarten, D. H. (M)
Wentz, J. L. (A)
West, R. E. (A)
Westcott, H. S. (M)
Westman, W. W., Jr. (A)
Weston, B. J. (M)
Whaley, E. W. (M)
Whitaker, W. A. (M)
White, D. J. (M)
Whitford, R. E. (M)
Widenhoefer, N. C. (A)
Wilde, R. L. (M)
Williams, C. S., Jr. (M)
Williams, L. E. (A)
Williams, R. H. (A)
Worden, O. L. (A)
Wright, O. L. (M)
Wright, P. H. (M)
Wyatt, J. C. (M)
Yrisarri, E., Jr. (A)
Zeller, T. R. (A)

Belen (A-LA-7)
Douglass, T. F. (M)

Cannon AFB (A-LA-7)
Bellmore, M. (M)

Caprock (EP-6)
Croft, C. E. (A)

Cedar Crest (A-LA-7)
Miller, G. L. (M)
Roeschke, C. W. (SM)

Cimarron (A-LA-7)
Kohlhousen, C. J. (M)

Cloudcroft, (ALA-H-7)
Benton, C. U. (M)

Continental Divide AFS (A-LA-7)
Evitt, W. B. (A)

Farmington (A-LA-7)
Bowles, M. E. (M)

High Rolls (ALA-H-7)
Billups, E. E. (M)
Willard, D. S. (M)

Hobbs (EP-6)
Terry, W. D. (A)

Holloman AFB (ALA-H-7)
Artery, H. D. (M)
Ashmore, T. G. (M)
Bean, H. T. (M)
Carlson, H. A. (M)
Chick, W. G. (M)
Doherty, J. M. (M)
Godwin, C. B. (M)
Johnson, C. L. (A)
Johnson, W. H. (M)
Klefer, C. F., Jr. (M)
Koellner, K. H. (A)
Liston, D. H. (M)
Miller, J. C. (M)
Mock, R. E. (M)
Montgomery, R. L. (M)
Morris, P. L. (A)
Nolte, U. C. (M)
Stith, G. A. (M)
Tomlinson, Z. G. (A)
Vicek, D. H. (SM)
Wagner, H. E. (M)
Waterman, A. (A)
Wenk, R. L. (A)
Whited, C. R. (M)

Kirtland AFB (A-LA-7)
Gayron, G. S. (M)
Kennedy, M. J. (M)
Kuras, A. C. (M)

Las Cruces (EP-WS-6)
Barton, J., Jr. (M)
Bennett, A. O. (A)
Boone, B. B. (A)
Bone, S., Jr. (M)
Brown, C. K. (M)
Carbine, I. L. (A)
Castillo, H. T. (M)
Clary, B. J. (M)
Coffee, T. A. (M)
Coleman, H. (SM)
De Rosa, A. L. (A)
Ecklund, R. E. (A)
Embree, O. D. (M)
Fels, F. E. (A)
George, J. E. (A)
Goldin, M. (M)
Haas, H. W. (M)
Hemingway, F. S., Jr. (M)
Hill, P. D. (M)
Jensen, W. V. (M)
Johnson, G. E. (M)
Kimball, V. L., Jr. (SM)
Kreitler, C. E. (M)
Linn, R. B. (M)
Maestas, J. F. (M)
Malone, C. P. (M)
Miller, V. L. (M)
Mills, J. C. (M)
Nelson, C. A. (M)
Owen, R. L. (M)
Pearson, M. R. (M)
Perdue, J. D. (SM)
Pickel, A. B. (A)
Prado, D. (M)
Reid, J. G. (M)
Roberson, C. F. (M)
Sedillo, J. N. (A)
Smith, M. E. (M)
Taylor, H. V. (M)
Taylor, L. S. (M)
Wagner, N. (A)
Welch, C. M. (SM)
Wood, L. S. (M)
Young, R. J. (M)

Las Vegas (A-LA-7)
Proctor, B. M. (A)

Los Alamos (A-LA-7)
Aiello, W. P. (M)
Asprill, G. P. (M)
Baker, D. A. (M)
Boyd, T. J., Jr. (A)
Briscoe, W. L. (SM)
Charmatz, A. W. (M)
Crew, W. H. (SM)
Deal, J. B., Jr. (M)
Demuth, H. B. (M)
Doremire, F. E. (SM)
Fagan, P. (SM)
Field, W. R. (M)
Freyman, R. W. (SM)
Gilland, J. R. (M)
Glascock, R. B. (M)
Glore, J. P. (M)
Grant, L. P. (M)
Gray, R. W. (SM)
Greenwood, A. H. (A)
Hale, L. C. (M)
Hayes, B. (M)
Helmer, R. J. (A)
Hiebert, R. D. (SM)
Hull, D. E. (SM)
Janney, D. H. (M)
Jennings, H. K. (M)
Kemp, E. L., Jr. (M)
Koelle, A. R. (M)
Kraker, K. P. (M)
Lamb, J. K. (SM)
Landahl, C. E. (M)
Lang, H. J. (M)
Lewis, R. E. (M)
Lilienthal, J. R. (SM)
Malmberg, A. F. (M)
McCloud, B. J. (M)
Michell, A., Jr. (M)
Mohler, R. R. (M)
Peck, R. C. (M)
Rawcliffe, A. S. (SM)
Rudnick, P. (SM)
Schulze, H. T. (M)
Singer, S. (SM)
Slager, D. M. (M)
Spack, W., Jr. (M)
Standring, H. A. (M)
Stapleton, R. E. (M)
Stephenson, D. L. (M)
Stevens, R. R., Jr. (M)
Tesche, F. R. (SM)
Trexler, V. L. (M)
Watts, R. J. (SM)
Weber, W. (M)
Weintraub, L. (A)
Wilson, A. E. (M)
Winston, J. G. (M)
Wittman, F. E. (M)

Portales (A-LA-7)
Johnson, C. K. (M)

Raton (A-LA-7)
Maciszewski, A. H. (SM)

Roswell (EP-6)
Harrison, P. L. (M)
Hill, D. L. (A)
Kendall, R. N. (M)
McKee, C. W. (VA)

Sandia Park (A-LA-7)
Yearout, D. K. (A)

Sandoval (A-LA-7)
Smith, W. T. (SM)

Santa Fe (A-LA-7)
Bickford, K. F. (A)
Bookwalter, E. C. (A)
Brown, E. A. (A)
Cockran, R. E. (A)
Doles, A. E. (M)
Fisher, R. C. (A)
Ford, W. R. (M)
Gardiner, T. (M)
Heyman, H. (SM)
Martin, C. F. (M)
Wilcoxon, H. O. (M)

Socorro (A-LA-7)
Loftus, R. P. (A)
Manley, D. W. (M)
McFarland, J. H. (A)
Pawkett, L. E. (M)
Pickett, H. (M)

Springer (A-LA-7)
McDowell, J. K. (M)

State College (EP-WS-6)
Duncan, R. H. (M)
Kepner, P. E. (M)
La Fleur, W. (M)
Miller, G. W., Jr. (M)

Tijeras (A-LA-7)
Caldes, W. E. (SM)
Middelton, A. D. (SM)
Stout, K. D. (M)

Tucumcari (A-LA-7)
Larltson, L. P. (M)

Tularosa (ALA-H-7)
Lecrone, J. G. (A)
Suska, J. T., Jr. (M)

White Sands Missile Range (EP-WS-6)
Albert, J. A. (M)
Andelin, D. R. (M)
Anderson, E. E. (A)
Boor, R. A. (M)
Crocker, B. G. (A)
Ender, A. (M)
Enright, D. J. (M)
Hubbell, P. G. (M)
Lipske, B. R. (M)
Mayfield, W. H. (M)
Moore, T. E. (M)
Moss, E. C. (M)
Paul, R. H. (A)
Polking, U. H. (M)
Pollock, C. (M)
Pyle, C. A. (A)
Rodgers, S. M. (M)
Schwartz, O. A. (M)
Smith, W. G. (M)
Stomberg, G. W. (M)
Taylor, L. H. (M)

NEW YORK

Accord (NY-MH-2)
Pagel, R. W. (M)

Afton (BING-1)
Lavender, R. W. (M)

Akron (BN-1)
Mech, H. D. (A)
Neubauer, R. A. (M)

Albany (SCH-1)
Anastas, D., Jr. (M)
Blau, C. C. (A)
Bloomsburg, R. A. (M)
Bogosslan, Z. (M)
Byrne, C. J. (M)
Carleton, L. K. (M)
Christo, N. (A)
Dalrymple, J. A. (M)
Dowire, D. S. (SM)
Lessen, M. (M)
Levitas, A. (M)
Lorch, J. (M)
Maurer, J. W. (M)
Muth, J., Jr. (M)
Portanova, M. C. (M)
Schaffer, C. A. (M)
Schwedock, B. (M)
Smith, D. H. (SM)
Tewell, J. R., Jr. (M)
Wade, W. T. (M)

Albertson (LI-2)
Corrado, V. M. (A)
Defore, G. E. (A)
Georges, M. J. (A)
Kelvin, W. (M)
Shimer, R. B. (M)
Sullivan, G. D. (M)
Westman, H. P., Jr. (M)

Alden (BN-1)
Allen, J. K. (M)

Alfred (ELM-C)
Burzycki, M. (M)

Allegany (BN-1)
Stelger, A. E. (A)

Alplaus (SCH-1)
Robinson, D. (M)
Story, R. W. (M)

Altamont (SCH-1)
Bleichner, C. W. (SM)
Fortington, W. H. (M)
Hutchinson, D. F. (M)
Pennoyer, R. T. (SM)

Amityville (LI-2)
Baker, W. G. (M)
Barone, S. A. (SM)
Brockner, C. E. (SM)
Chadwick, J. H., Jr. (M)
Cosmas, A. (M)
Forsberg, A. W. (SM)
Frank, F. P. E. (A)
Isherwood, H. (M)
Kryger, G. (SM)
Martin, J. L. (M)
Minto, E. W. (A)
Palmer, W. (F)
Pearsall, C. H., Jr. (M)
Peckens, D. F. (M)
Schabbehar, E. A. (M)
Sibley, S. R. (M)
Stuart, A. F. (M)
Wolber, R. R. (M)
Zeluff, I. S., Jr. (SM)

Amsterdam (SCH-1)
Bohinske, T. A. (M)
Borck, C. A. (SM)
Brown, J. E. (M)
Garratt, P. M. (M)
Warren, D. W. (M)
Wright, P. H. (M)

Angola (BN-1)
Olney, V. W. (M)
Riker, C. E. (A)

Apalachin (BING-1)
Betts, W. K. (M)
Bird, C. M. (M)
Frank, D. E. (M)
Frizzell, J. H. (M)
Jones, R. W. (M)
Joseph, D. L. (A)
Obsharsky, P. (M)
Park, D. M. (A)
Schaaf, F. W. (A)
States, D. M. (A)
Sweet, M. E. (M)
Taylor, P. R. (SM)
Walter, R. K. (M)
Wood, E. W. (M)

Ardsley (NY-W-2)
Graveson, R. T. (M)
Presiholdt, O. (M)

Armonk (NY-W-2)
Hector, L. G. (SM)
Lawton, L. M., Jr. (M)
Northen, W. C. (M)
Porterfield, E. A. (M)

Astoria (LI-2)
Arzenall, M. H. (A)
Benesch, E. J. (M)
Breitzer, D. I. (M)
Chitlick, C. (A)
Davis, J. T. (M)
Fitzgerald, D. J. (A)
Flax, M. J. (M)
Iversen, R. J. (SM)
Lubell, P. D. (M)
Mitchell, J. R. (A)
Odabashian, H. (A)
Perini, H. R. (A)
Perreira, D. G. (A)
Petrocelli, V. (M)
Phanos, S. (M)
Pighi, L. H. (M)
Proscia, J. L. (A)
Slouris, G. M. (A)
Spiralis, P. (M)
Strauss, H. J. (M)
Taylor, A. (M)
Termini, F. A. (A)

Atlantic Beach (LI-2)
Harvey, A. J. (A)

Attica (ROC-1)
Frazer, A. W., Jr. (SM)

Auburn (SYR-1)
Blanchard, J. W. (M)
Boedicker, D. J. (M)
Byrns, R. E. (M)
Driskill, R. D. (M)
Dyer, R. F., Jr. (A)
Grenier, G. H. (M)
House, H. J. (A)
Neppel, W. C. (M)
O'Connor, C. R. (A)
Richardson, T. F., Jr. (M)
Wagner, B. F. (M)
Wellman, C. E., Jr. (M)
Wolf, G. T. (M)

Aurora (SYR-1)
Willy, J. R. (M)

Avon (ROC-1)
Malone, W. J. (A)

Babylon (LI-2)
Anderson, R. G. (M)
Biggs, E. M., Jr. (M)
Biell, F. J. (SM)
Brown, M. W., Jr. (M)
Dudick, G. R. (M)
Dudley, D. J. (M)
Gollhofer, P. J. (M)
King, R. E. (M)
Lindberg, R. (A)
Lory, J. (M)
Lotz, J. C. (M)
Morfin, H. W. (A)
Nelson, O. A. (A)
Picone, J. D. (M)
Rafferty, W. G. (M)
Siegel, L. I. (M)
Sullane, L. R. (M)
Szuchy, N. C. (M)
Trinkle, F. J. (M)
Walsh, C. (SM)

Baldwin (LI-2)
Allen, H. E. (SM)
Brown, W. J. (M)
Constable, R. C. (M)
Dayton, F. R. (M)
Fogelberg, J. E. (A)
Karron, G. A. (M)
Lautenberger, H. W. (M)
MacHill, J. (SM)
McConaughy, R. L. (M)
McCoy, L. L. (A)
McGowan, T. C. (M)
Ozolins, I. (A)
Plotkin, A. A. (A)
Rhodes, B. S. (M)
Seide, L. M. (A)
Shelton, P. W. (A)
Solbis, A. L. (A)
Thomson, H. C. (M)
White, C. E. (A)
Wohleking, W. G. (M)

Baldwin Harbor (LI-2)
Krieger, K. C. (M)

Baldwinsville (SYR-1)
Blodgett, A. R. (M)
Bloomquist, R. C. (M)
Bunker, W. M. (M)
Burris, H. A. (M)
Chapin, W. T. (SM)
Christensen, W. M. (M)
Clinton, T. G. (M)
Connolly, T. E. (M)
Cottle, D. W. (M)
Cowan, F. C. (A)
Craig, E. L. (M)
Cummings, S. J. (M)
Custin, T. G. (M)
Dodge, P. A. (M)
Downey, R. L. (M)
Fincher, J. C. (M)
Goetter, W. F. (M)
Harshbarger, J. H., Jr. (M)
Hildebrandt, H. J. (M)
Jensen, R. C. (SM)
Jones, D. V. (SM)
Jones, W. H. (A)
Lavin, H. P. (M)
Lester, B. E. (SM)
Maicher, C. L. (M)
Mathis, V. P. (SM)
North, S. M. (M)
Powell, R. A. (A)
Putschi, H. N. (M)
Rhodehamel, A. J. W. (M)
Schiro, A. R. (M)
Stearns, H. F. (M)
Vahle, J. (M)
Walnright, J. A. (SM)
Winchester, D. S. (M)
Wood, R. F. (M)
Young, G. G. (SM)

Ballston Lake (SCH-1)
Beattie, C. L. (A)
Blume, A. E. (SM)
Coffey, W. N. (M)
Jachym, T. M. (M)
Krueger, D. H. (M)
Pinkstaff, J. R. (A)
Spalding, J. F. (M)
Stokoe, R. H. (M)
Truax, C. J. (M)
Whitten, J. R. (M)

Ballston Spa (SCH-1)
Harrison, C. L. (A)

Barneveld (RU-1)
Galge, J. C. (M)

Batavia (ROC-1)
Abboud, F. L. (A)
Balshiki, S. (M)
De Marinis, J. V. (M)
Drummeter, W. (M)
Henry, F. T. (M)
Kwit, C. J. (A)
Lanzo, F. J. (A)
Lofton, J. H. (M)
Pleck, H. (M)
Richardson, D. A. (M)
Taylor, D. R. (M)
Thainer, R. R. (SM)

Bath, (ELM-C-1)
Barney, W. H., Jr. (M)
Evon, J. (M)
Fink, J. H. (M)
Fleck, W. (SM)
Haley, A. J. (M)
Massey, W. F. (M)
Merritt, S. (M)
Overholts, R. W. (M)
Payne, W. J. (A)
Szilasi, A. (SM)
Wise, L. J. (A)

Bayport (LI-2)
Walson, R. F. (M)

Bayshore (LI-2)
Koch, E. J. (M)
Kopp, R. E. (M)
Lalty, I. A., Jr. (M)
Melliger, A. W. (M)
Robertson, C. A. (A)
Rosenthal, R. F. (M)
Schindwolf, R. (A)
Sears, R. A. (A)
Weersing, N. O. (A)

Bayside (LI-2)
Averett, S. S. (M)
Baasch, T. L. (SM)
Bartram, R. H. (A)
Battaglia, C. V. (M)
Battle, R. P. (SM)
Berman, R. F. (A)
Bernstein, J. L. (M)
Blass, J. (M)
Bloom, L. R. (SM)
Blum, R. J. (A)
Bodenburg, J. F. (SM)
Bohn, R. (A)
Bracco, D. J. (M)
Caffiaux, J. A. (SM)
Canadeo, G. N. (A)
Carver, F. (A)
Cohen, B. (A)
Cohen, J. (M)
Cortizas, A. P. (M)
Costa, T. A. (M)
Crowhurst, N. H. (SM)
D'Alvola, S. B. (M)
De Piola, F. J. (M)
Doyle, E. J. (M)
Dzik, S. (M)
Ellefson, B. S. (F)
Eng, J. W. (SM)
Engle, D. C. (M)
Fabricant, B. S. (M)
Fezy, D. I. (M)
Feltzin, A. (M)
First, D. (SM)
Friedrich, S. (SM)
Gardiner, C. E. (M)
Gatti, W. (M)
Gellert, J. (M)
Glasser, H. (A)
Goldman, I. (SM)
Golick, S. (A)
Gorowitz, M. (M)
Grazda, E. E. (M)
Gross, J. (M)
Gross, L. (M)
Gross, V. (A)
Harrison, R. I. (M)
Harrison, S. W. (SM)
Hollander, J. M. (M)
Howell, D. M. (M)
Hurley, E. T. (M)
Hyatt, A. J. (M)
Jacob, G. W. (M)
Jacobson, N. (M)
Jenkins, P. R., Jr. (M)
Keck, P. H. (M)
Kleinberg, H. (A)
Krimsky, W. J. (M)
Kyrnopoulos, L. (M)
Leole, R. E. (M)
Lewis, B. F. (M)
Lieber, S. (M)
Ligori, J. (M)
Livingston, D. C. (SM)
Lowenschuss, O. (SM)
Lubkin, S. (SM)
Malang, A. W. (A)
Marx, J. (SM)
Mazzochi, J. J. (M)
McEvoy, J. A. (M)
Mealy, J. T. (M)
Mohr, R. J. (M)
Moody, J. R. (M)
Nadler, B. D. (SM)
Nakamura, D. S. (A)
Novick, P. B. (M)
O'Neill, G. D. (F)
Paulisen, H. (M)
Podeyn, G. J., Jr. (A)
Pollack, S. (A)
Poteracke, J. L. (M)
Ralidis, G. W. (A)
Ramirez, E. V. (M)
Reinhard, G. (A)
Reiis, M. J. (M)
Ressler, H. C. (SM)
Romano, M. (A)
Rook, S. (A)
Rosen, B. (M)
Rosenstein, M. (M)
Ross, A. (M)
Saalborn, O. E. (M)
Schaetzl, F. R. (A)
Schoen, G. G. (M)
Shaler, G. J. (M)
Siegel, R. (M)
Sonnenschein, A. H. (SM)
Spero, W. I. (A)
Staschover, L. (M)
Sulto, T. (A)
Sutkin, S. (M)
Taylor, I. R. (M)
Tellerman, J. (M)
Trinkaus, J. W. (SM)
Troxler, L. J. (SM)
Tylinski, F. V. (A)
Villahane, F. (A)
Whalley, W. B. (SM)
Zwack, H. W. (M)

Bayville (LI-2)
Bartolomei, G. G. (M)
Finn, E. C. (A)
Forker, L. W. (A)
Krumbein, J. (A)
Morenz, P. W. (A)
Porter, S. T. (M)
Savino, R. T. (A)
Yee, H. (M)

Beacon (NY-MH-2)
Conover, D. G. (A)
Craft, J. L. (M)
Cummings, C. E. (M)
Zakarias, I. (M)

Beaver Dams (ELM-C-1)
Marshall, D. E. (A)

Bedford Village (NY-W-2)
Miccioll, A. A. (M)

Beechhurst (LI-2)
Coundjeris, A. (SM)
Seetoo, T. F. (M)
Bellaire (LI-2)
Amato, J. A. (M)

Belle Harbor (LI-2)
Schure, A. (M)
Williamson, R. T. (A)

Bellerose (LI-2)
Albert, A. D. (M)
Altman, D. (A)
Biss, R-E. P. (M)
Bond, D. A. (A)
Burger, J. H. (A)
Daly, J. M. (M)
Farber, H. (SM)
Frey, H. E. (M)
Geyer, R. E. (M)
Greenberg, D. R. (M)
Homeyer, W. (M)
Kashkin, R. (M)
Lewis, M. B. (M)
Loeffler, W. J., Jr. (M)
Malchman, F. L. (A)
Marcus, S. (A)
McDonald, J. F., Jr. (M)
Matson, D. L. (M)
Merchant, C. C. (M)
Peters, F. H. F. (A)
Tramposch, W. J. (M)
Wengryn, M. (M)

Bellerose Manor (LI-2)
Buchsbaum, W. H. (SM)

Bellmore (LI-2)
Briggs, E. Z. (A)
Deller, P. P. (A)
Dvorak, C. J. (M)
Glaser, E. M. (SM)
Jackson, C. H. (M)
Leopold, R. (SM)
Parke, H. G. (M)
Tocci, D. P. (M)
Wellman, F. C. (M)

Bellport (LI-2)
Madey, R. (M)

Bethpage (LI-2)
Alpase, L. I. (SM)
Barlowe, M. (A)
Bogner, R. D. (M)
Bronstein, F. (A)
Cantarella, V. J. (A)
Cullen, F. P. (M)
Fried, G. (A)
Gamble, J. H. (M)
Gioia, J. (A)
Gruber, R. E. (A)
Jones, M. W. (A)
Lipset, L. B. (M)
Madigan, J. P. (A)
Marrara, C. (M)
Morrow, P. F. (M)
Nelson, V. H. (M)
Nielsen, P. (M)
Nosal, P. (M)
Olah, J. (A)
Propster, J. A. (M)
Rice, J. (M)
Rinkel, S. A. (M)
Roglch, S. G. (M)
Russell, D. H. (M)
Schenck, H. F. (M)
Schlemm, N. H., Jr. (M)
Schumacher, J. H., Jr. (M)
Sivilli, J. M. (A)
Trock, R. (SM)
Yarnell, W. M. (A)

Big Flats (ELM-C-1)
Howe, L. H. (M)

Binghamton (BING-1)
Angehrn, T. W. (M)
Baatz, A. C. (M)
Barrentine, W. M. (M)
Bartholy, F. E. (M)
Bechtol, H. D. (SM)
Bishop, R. J. (M)
Burton, W. E. (M)
Carpenter, M. L. (A)
Corderman, S. A. (M)
Day, R. C. (M)
Decker, D. M. (M)
Decker, G. A. (VA)
Dibb, G. (M)
Foss, F. A. (M)
Gilbert, H. G. (SM)
Hallinan, C. (M)
Harger, W. W. (SM)
Hemstreet, H. S. (SM)
Herzfeld, G. M. (M)
Hicken, J. (SM)
Higgs, P. T. (A)
Hilburn, E. D. (A)
Jumbeck, G. I. (A)
Klinko, E. H. (A)
Kornbluh, A. J. (A)
Lahey, P. J. (M)
Laws, L. C. (A)
Ling, O. T. (SM)
Lockhart, B. W. (M)
Mahoney, R. E. (A)
Mailhot, P. J. (M)
Mason, R. K. (A)
McPheeters, D. W. (M)
Merchant, J. H. (M)
Mitchell, J. (A)
Naglerais, R. J. (A)
Nash, R. W. (M)
New, R. F. (M)

Northrup, R. M. (M)
Oldwine, C. V. (A)
Potts, R. (A)
Pratt, R. J. (A)
Reed, G. G. (A)
Ricciardelli, G. (M)
Richter, K. E. (M)
Rowley, R. A. (M)
Saeman, C. D. (A)
Sanneman, R. A. (A)
Schmid, H. (A)
Schwarm, E. G. (SM)
Sitterlee, L. J. (SM)
Stantz, L. H. (SM)
Stasiak, R. J. (A)
Vignos, J. P. (M)
Warner, D.P. (M)
Webster, J. E. (M)
West, J. L. (SM)
Whitmore, J. H. (M)
Wilkinson, R. H. (M)
Zimmerman, D. O. (M)

Black Creek (ELM-C-1)
Lewis, R. M. (M)

Bloomington (NY-MH-2)
Loekle, O. J. (A)

Blossvale (RU-1)
Vogel, G. J. (A)

Blue Point (LI-2)
Field, P. L. (M)
McCullough, T. (A)

Bohemia (LI-2)
Hajek, S. J. (M)

Boston (BN-1)
Drankhan, V. C. (M)

Bowmansville (BN-1)
Lindberg, E. (M)

Breesport (ELM-C-1)
Scullin, C. H. (M)

Brentwood (LI-2)
Carroll, J. J. (A)
Gould, G. B. (M)
Johnson, D. E. (A)

Brewerton (SYR-1)
Tooley, C. E. (A)

Brewster (NY-2)
Blumenfeld, A. (M)
Dreher, C. (F)
Dunford, W. (A)
Hemming, C. B. (M)
Lauer, E. K. (M)
Siegert, R. R. (M)

Briarcliff Manor (NY-W-2)
Brooks, L. P. (M)
Burditt, W. F. (A)
Campbell, J. P. (SM)
Drubin, M. (M)
Edwards, A., Jr. (M)
Ellen, N. A. (SM)
Fried, W. R. (SM)
Grossman, R. (M)
Henderson, N. C. (A)
Marinace, R. C. (A)
Petrillo, B. J. (M)
Stavis, G. (SM)
Stitzer, J. (M)
Strumer, J. H. (A)
Sutherland, C. M. (M)
Urban, C. (M)

Briarwood (LI-2)
Nemeroff, I. (A)
Ney, A. L. (M)
Podall, B. A. (M)
Schnebelk, R. J. (M)

Brightwaters (LI-2)
Becker, S. (M)
Faikin, J. W. (SM)
Geiger, J. M. (M)
Hansen, J. P. (SM)
Kramer, S. I. (SM)
Lang, J. G. (VA)
Margolin, J. (M)

Bronx (NY-2)
Abrevaya, E. (M)
Ackerman, D. D. (M)
Alfieri, G. J. (A)
Altamuro, F. V. (A)
Anaya, F. J. (M)
Asher, R. L. (M)
Aubrey, G. (M)
Auerbach, V. (M)
Balter, I. (A)
Barlian, H. (M)
Barkey, R. (M)
Baumoel, D. (M)
Beattie, J. W. (M)
Berger, L. (A)
Bertan, H. S. (M)
Blanco, S. G. (A)
Birenbaum, L. (M)
Blaustein, S. E. (M)
Blumenstock, A. (M)
Boles, S. (M)
Boorstyn, R. R. (M)
Braes, H. A. (M)
Bregman, M. W. (M)
Byrnes, I. F. (F)
Campbell, G. M. (A)
Caracenl, J. S. (M)
Cash, W. I. (M)
Chanzit, L. (M)
Chellik, P. (M)
Cheng, T. (M)
Cohen, A. B. (M)
Cohen, M. L. (M)
Cohn, M. R. (A)
Crawford, J. J. (M)
Crowley, T. J. (M)
D'Amico, V. J. (A)
Damovsky, A. (M)
Davidson, G. M. (M)
Derby, S. J. (M)
De Salvo, A. F. (SM)
Dickstein, M. (M)
Divins, B. (A)
Dolan, D. T. (M)
Donaghy, J. F. (A)
Doyle, F. H. (M)
Dugandzic, P. F. (A)
Dunn, E. J., Jr. (A)
Egar, W. E. (A)
Elkort, D. S. (M)
Facio, V. J. (M)
Factor, S. (A)
Farrand, C. L. (F)
Farrago, R. J. (A)
Federino, A. M. (M)
Feldberg, I. (A)
Ferri, R. I. (A)
Fisch, R. A. (M)
Fleming, M. E. (M)
Flynn, C. W. (M)
Friedman, E. H. (M)
Friedman, O. (SM)
Gaines, A. M. (M)
Gall, E. J. (A)
Gelfond, N. A. (A)
Gerson, M. (A)
Gerstein, M. G. (A)
Giannattasio, A. R. (M)
Ginsberg, M. (M)
Ginsburg, L. (M)
Giordano, A. M. (A)
Glatt, G. M. (M)
Golden, H. (A)
Gonzalez, C. M. (A)
Good, S. (A)
Goodman, A. (SM)
Gordon, S. (A)
Grabel, A. (M)
Greenberg, E. P. (M)
Greenblatt, E. (M)
Greenblatt, S. (M)
Grontkowski, R. B. (A)
Guthalt, M. (A)
Halms, M. J. (M)
Hanau, R. (A)
Handler, H. (M)
Hanft, J. (M)
Haran, P. P. (M)
Harmatuk, S. N. (M)
Harris, B. (SM)
Hastings, J. J. (M)
Henlon, T. Y. (M)
Isaacson, H. B. (A)
Johannes, V. I. (A)
Josefsberg, M. B. (M)
Kaden, P. A. (M)
Kahn, A. A. (M)
Kalet, M. L. (M)
Kane, J. R. (M)
Kantrowitz, P. (M)
Kaplan, L. J. (M)
Kass, E. J. (M)
Katz, L. W. (M)
Kirschner, M. (A)
Kirshbaum, B. D. (M)
Kline, B. H. (A)
Klipper, H. (A)
Knapp, J. Z. (M)
Knowles, R. D. (M)
Kovensky, D. J. (M)
Kram, B. (M)
Lampert, L. (M)
Landau, E. (A)
Lannary, J. (M)
Lastig, W. (M)
Lerman, H. (M)
Linder, A. (M)
Low, F. (M)
MacFarlane, W. F. (M)
Machorro, R. A. (M)
Makris, C. J. (M)
Mangieri, G. A. (M)
Manlere, N. E. (A)
Matarese, J. (M)
McDonald, D. F. (M)
Meyers, J. G. (SM)
Miller, D. A. (M)
Moore, J. E. (A)
Moss, A. M. (M)
Munt, I. (A)
Murphy, J. J. (M)
Muscolino, J. V. (M)
Newdow, I. (M)
Nissman, I. J. (M)
O'Brien, R. J. (A)
O'Hare, T. F. (M)
Olick, J. (A)
Oppenheim, J. (M)
Oppenheimer, H. N. (A)
O'Sullivan, T. J. (M)
Palatinus, A. C. (A)
Pechner, B. J. (A)
Pelltzen, A. D. (M)
Periman, D. J. (M)
Pintall, R. H. (SM)
Portnoy, A. (M)
Ratti, J. J. (A)
Rashid, M. (M)
Reich, S. M. (M)
Reiss, E. V. (A)
Rieders, A. T. (A)
Rimal, E. (M)
Rivers, R. D. (M)
Roberts, H. (SM)
Rocchio, J. J., Jr. (M)
Roher, N. J. (A)
Rosenfeld, A. (M)
Rosenheck, B. M. (A)
Rossnick, M. (M)
Roth, R. F. (M)
Rothbart, A. (M)
Rubinstein, R. B. (M)
Ruttenberg, K. A. (M)
Sachs, G. I. (A)
Sales, M. (M)
Sallt, M. (M)
Saltzberg, B. R. (M)
Sandler, A. (M)
Schachter, H. (M)
Scharf, G. (M)
Schick, W. (M)
Schischa, E. (M)
Schmeltzer, R. A. (M)
Schneider, G. (M)
Schneider, P. S. (M)
Schneider, S. (M)
Schreiner, E. H. (M)
Schutzman, E. (A)
Schwartz, J. H. (M)
Schwartz, M. E. (A)
Schwartz, S. (M)
Schwartz, W. J. (M)
Seidman, H. A. (M)
Selden, N. (M)
Shegirian, P. (M)
Sigal, H. (M)
Slavin, M. J. (M)
Smith, G. J. (A)
Smith, H. E. (A)
Sonder, E. (A)
Spector, G. (A)
Spiegel, R. E. (M)
Spielberg, J. R. (A)
Sporty, S. (A)
Stangel, J. J. (M)
Steigerwald, J. W. (M)
Steinberg, I. (M)
Stiefel, A. A. (M)
Sullivan, E. (M)
Sweeney, D. J. (M)
Trampel, K. M. (M)
Trott, G. G. (M)
Victor, H. W. (SM)
Vogel, S. (A)
Wald, A. S. (M)
Wasserman, A. (M)
Weinstein, J. M. (A)
Weinstein, R. L. (A)
Welsman, I. (M)
Weiss, S. R. (A)
Weltman, I. (M)
Wexelbaum, R. I. (M)
Woelgesy, J. D. (M)
Worthen, G. B. (M)
Yabion, M. (M)
Zadanovsky, L. (A)
Zaslavsky, S. (M)
Zechnowitz, A. L. (M)
Zenchoff, P. (M)
Zinn, A. W. (M)
Zupan, B. (M)
Zuschin, H. L. (A)

Bronxville (NY-W-2)
Angevine, R. A. (M)
Asian, E. E. (M)
Bein, W. (SM)
Davis, M. (M)
Golden, D. (M)
Grossman, H. (SM)
Halsall, M. (A)
Langley, R. H. (F)
McCoy, R. D. (F)
Oscoff, A. (A)
Rie, C. L. (A)
Whittemore, D. B. (A)
Zimnoch, J. J. (M)

Brookhaven (LI-2)
Handloser, J. S. (M)

Brooklyn (NY-2)
Aaronson, G. (M)
Abllock, S. (M)
Abrams, S. J. (A)
Adams, H. G. (M)
Adlerstein, S. A. (M)
Albanese, A. P. (M)
Albanese, P. (A)
Alperin, N. E. (M)
Alster, S. D. (A)
Alterman, M. E. (M)
Altomare, V. A. (A)
Amling, J. L. (M)
Amster, G. S. (A)
Anderson, C. L. (A)
Anderson, E. E. (M)
Angelari, R. D. (A)
Angelastro, S. P. (A)
Angelo, E. J., Jr. (SM)
Anton, N. G. (F)
Anzalone, A. T. (M)
Appleman, S. (M)
Aran, R. A. (A)
Aronoff, M. (M)
Arrow, A. (M)
Arzt, G. D. (A)
Asclone, N. R. (M)
Asclone, R. (A)
Axelrod, A. (M)
Aymar, E. (VA)
Baade, E. C. (A)
Bader, B. (M)
Baggia, M. E. J. (M)
Baker, L. C. (A)
Ball, I. R. (A)
Bambara, J. E. (SM)
Banner, L. (M)
Barth, A. M. (A)
Basilico, C. (A)
Baskin, H. B. (M)
Bayer, I. (M)
Beach, R. (SM)
Becker, L. (M)
Beidler, S. (M)
Belluck, R. E. (A)
Belove, C. (A)
Berger, M. (M)
Bergstein, L. E. (A)
Berk, M. A. (M)
Berkovits, B. V. (M)
Berkowitz, B. (A)
Berkowitz, P. S. (A)
Berlin, J. (M)
Berliner, J. M. (M)
Berman, H. (A)
Bernfeld, M. (M)
Bernstein, J. L. (M)
Bernstein, K. (A)
Bernstein, M. H. (M)
Bertolino, A. P. (M)
Besmertnik, J. (A)
Bessen, A. S. (A)
Bethea, J. W. (A)
Biederman, A. B. (M)
Bierman, H. (M)
Birnbaum, J. (M)
Blaustein, P. H. (M)
Blauvelt, A. J. (A)
Blazek, W. J. (M)
Blecher, F. (M)
Blichfeldt, E. (M)
Bligh, E. J. (A)
Bloomberg, H. (M)
Bollen, I. (M)
Bologovsky, G. (M)
Borowski, E. (A)
Bower, J., Jr. (VA)
Boyle, B. (A)
Brahwalla, A. (A)
Bressler, A. D. (SM)
Bressi, N. P. (M)
Bressner, G. (M)
Brill, H. A. (M)
Broder, L. J. (M)
Broman, H. F. (M)
Brown, P. R. (A)
Brown, R. J. (A)
Brownstein, M. (A)
Brubaker, A. E. (M)
Bryant, C. D. (M)
Bullwinkel, E. C. (M)
Burmil, S. (M)
Butler, W. I. (M)
Butts, R. S. J. (A)
Callghari, H. J. (M)
Camer, H. J. (A)
Camrer, H. R. (M)
Cancemi, J. S. (A)
Candell, R. L. (M)
Cane, P. (M)
Canfora, A. E. (A)
Caplan, N. (M)
Caretto, H. L. (M)
Carlin, H. J. (F)
Cassidy, F. T. (M)
Castagnaro, D. (SM)
Catanese, J. P. (A)
Cattelona, J. A. (M)
Chays, S. (SM)
Clsek, T. G. (M)
Cocuzza, P. J. (M)
Cohen, A. N. (M)
Cohen, B. E. (M)
Cohen, G. (M)
Cohen, H. (M)
Cohen, L. (A)
Cohen, L. D. (M)
Cohen, M. (A)
Cohn, E. M. (M)
Cohn, H. (SM)
Coleman, G. E. (A)
Coltun, L. (A)
Colucci, J. A. (A)
Cominos, R. (M)
Conroe, A. H. (A)
Cooper, N. (M)
Corbin, S. A. (A)
Cottam, R. W. (A)
Crump, J. F. (A)
Curcio, A. T. (A)
D'Amato, R. J. (SM)
Danziger, A. (M)
Datillo, W. P. (M)
Davidson, S. R. (M)
Davis, I. J. (A)
Davis, M. C. (M)
Day, G. (SM)
De Angelis, D. P. (M)
Defilippis, L. S. M. (M)
De Grande, R. S. (M)
Del Giorgio, J. A. (M)
Demilla, J. J. (M)
Deoul, N. (M)
De Sanick, S. (M)
Deutsch, S. (A)
Diamond, J. M. (M)
Dickman, B. G. (M)
Dieli, A. P. (A)
Di Fusco, F. J. (M)
Digiulio, E. M. (A)
Di Santi, N. (M)
Di Stefano, A. J. (M)
Dolkas, C. (A)
Doll, G. G. (A)
Dorf, H. (M)
Dorwitt, S. J. (M)
Doulos, N. P. (A)
Drosin, A. B. (M)
Drossman, M. M. (M)
Druckerman, M. (M)
Drum, W. A. (A)
Dudgeon, D. E. (A)
Dzingelis, V. F. (A)
Edelmann, R. (M)
Edwards, D. S. (A)
Egolf, R. S. (SM)
Eisenstadt, H. J. (A)
Elssberg, D. (A)
Elkin, B. P. (M)
Elovic, A. (M)
Engelson, I. (A)
Engelson, M. (M)
Englander, B. (A)
Epstein, S. (M)
Ettenberg, M. (SM)
Fass, S. (M)
Fauvell, R. T. (M)
Feinland, S. (A)
Feldman, S. (M)
Felsen, L. B. (SM)
Fetsch, J. T. (SM)
Fink, F. G. (M)
Fink, S. B. (M)
Finke, H. A. (M)
Fishman, T. (M)
Flamenbaum, M. (M)
Fleischer, V. (M)
Flomenbaum, H. S. (A)
Forman, I. (A)
Forman, P. (M)
Fossum, T. T. (M)
Fox, J. (SM)
Franco, A. G. (M)
Frank, L. M. (A)
Fredericks, A. C. (A)
Freed, R. M. (A)
Frey, J. J. (M)
Frey, W. W. (M)
Friedland, B. (M)
Friedman, E. M. (M)
Friedman, H. (M)
Friedman, L. (M)
Friedman, R. (M)
Friedman, W. (A)
Galligan, T. J. (M)
Garbato, S. F. (M)
Gardner, R. K. (A)
Garshman, G. (M)
Gartner, J. K. (M)
Gatzke, F. W. (A)
Geismar, G. G. (A)
Geldston, S. (M)
Genlot, A. G. (M)
George, D. E. (M)
Gershuny, M. M. (A)
Gerston, C. (M)
Giampiccolo, P. M. (A)
Gilbert, G. Y. (M)
Gindoff, M. (M)
Ginzburg, S. (A)
Giordano, A. B. (F)
Giordano, P. J. (A)
Giosils, P. W. (A)
Glantz, L. M. (SM)
Glazer, E. (M)
Glick, H. (M)
Glickman, M. (A)
Glist, S. (M)
Globus, L. A. (M)
Godfrey, P. (M)
Goetz, H. (M)
Goldberg, E. (M)
Goldberg, P. B. (M)
Goldberg, R. J. (M)
Golden, D. (M)
Goldstein, A. (A)
Goldstein, H. (M)
Goldstein, J. D. (A)
Golosteln, J. L. (M)
Goldstein, S. E. (A)
Goldwag, S. (M)
Goodman, H. A. (A)
Gorczycki, E. (M)
Gordon, A. (A)
Gordon, R. S. (M)
Goronin, A. (M)
Gouyet, J. P. J. (M)
Gray, G. A. (A)
Grebler, M. (A)
Green, B. W. (M)
Green, E. H. (M)
Green, S. N. (A)
Greenberg, S. (M)
Greene, E. (A)
Greenidge, G. (M)
Greenspan, J. (M)
Gralck, H. L. (M)
Groder, M. L. (SM)
Gruenberg, E. L. (SM)
Grushkin, A. G. (M)
Guardino, R. C. (M)
Gurian, S. D. (M)
Gusman, L. (M)
Gussak, M. (A)
Guthart, H. (M)
Haas, M. F. (A)
Hachemeister, C. A. (SM)
Haft, P. S. (M)
Hallen, E. (M)
Hanft, A. J. (M)
Hanon, J. (M)
Harris, L. (SM)
Harrison, G. S. (M)
Hartmann, P. (A)
Hauerstock, C. (M)
Haviland, R. T. (SM)
Hawkins, R. (A)
Heller, J. I. (SM)
Heller, T. (A)
Hembrooke, E. F., Jr. (VA)
Herman, H. B. (A)
Hershowitz, D. B. (M)
Hessel, A. (M)
Hinrichsen, E. N. (M)
Hirsch, B. (M)
Hirsh, J. (A)
Hittner, C. (SM)
Hobbs, M. (SM)
Hoberman, I. (A)
Hoekstra, R., Jr. (M)
Hofmanis, I. A. (M)
Holmes, A. J. (M)
Honig, W. M. (M)
Hopfer, S. (SM)
Hoskins, E. J. (VA)
Horn, I. (M)
Horowitz, I. (A)
Horowitz, J. (M)
Howard, R. W. (M)
Huang, H. (M)
Hughes, E. (A)
Hunt, D. F. (M)
Hutson, L. S. (M)
Iacono, V. C. (A)
Isaacson, A. (M)
Israel, D. (M)
Jacenko, D. (M)
Jackson, F. D. (M)
Jacobs, D. M. (A)
Jagodowski, S. J. (M)
Janhsen, H. K. (A)
Jaworski, A. M. (A)
Jazwa, E. C. (M)
Johnson, A. E., Jr. (M)
Johnson, B. F. (A)
Johnson, W. H. (A)
Jongberg, J. B. (A)
Jorysz, A. (M)
Kadin, J. (M)
Kagan, H. N. (M)
Kahn, W. K. (SM)
Kanton, L. B. (A)
Kaplan, A. B. (M)
Kaplan, G. L. (M)
Kaplan, I. (A)
Kaplan, K. R. (M)
Kaplowitz, M. (A)
Karson, A. (M)
Kassel, A. (A)
Katz, G. M. (M)
Katz, J. (A)
Katz, L. (M)
Katz, M. (M)
Katz, M. D. (M)
Kaye, R. S. (M)
Keefe, G. (A)
Keely, J. F. (A)
Kempler, A. R. (A)
Kenney, D. P. (M)
Kerdock, A. M. (M)
Keremyi, G. R. (M)
Kessler, A. (M)
Kiel, J. H. (A)
King, B. H. (M)
Kirdahy, E. (M)
Kirtman, F. (M)
Klavens, N. I. (M)
Kline, M. (M)
Klipper, S. (M)
Klug, S. H. (M)
Knowles, C. C. (A)
Koffer, M. (M)
Korkes, H. (M)
Kornbluth, S. E. (M)
Korrol, C. R. (M)
Kozitzky, W. J. (M)
Kramarenko, P. (M)
Kramer, M. (M)
Krieger, P. (M)
Kultunen, M. O. (M)
Kunis, S. R. (M)
Kuo, F. F. (M)
Kurland, N. (M)
Kuras, H. (SM)
Kurtz, J. A. (VA)
Kuzmyak, M. G. (M)
Lacher, D. (M)
Laifer, E. (M)
Lampert, L. (M)
Landstein, M. (A)
Laskin, H. J. (M)
Latorre, F. N. (M)
Laviano, V. R. (M)
Lawrence, S. (SM)
Leadbeater, C. J. (A)
Lebowitz, R. A. (M)
Lederich, A. (M)
Lederhandler, S. R. (A)
Lederman, S. (A)
Lelbowitz, M. R. (M)
Leonard, J. P. (M)
Letzter, A. O. (A)
Levey, L. (M)
Levin, S. (M)
Levine, E. L. (M)
Levine, R. I. (M)
Levine, S. N. (SM)
Levy, H. B. (A)
Lewis, R. K., Jr. (M)
Lichota, A. J. (A)
Liebman, P. M. (M)
Liebreich, E. (A)
Likel, H. C. (SM)
Lindell, L. (M)
Lipschitz, N. L. (M)
London, M. M. (M)
Lopez, A. R. (M)
Lorenzo, J. J. (M)
Loshin, A. M. (A)
Lowen, I. B. (A)
Luger, H. P. (A)
MacLean, W. (SM)
Magul, J. A. (M)
Mahrous, H. (SM)
Malina, M. (M)
Mamon, G. (M)
Manfredi, J. R. (M)
Manoukis, D. N. (A)
Marantz, S. A. (M)
Marcinkiewicz, S. V. (A)
Marcinkowski, C. J. (M)
Marcus, S. M. (M)
Marder, H. S. (A)
Marderstein, S. (A)
Maretzo, C. M. (M)
Marshall, S. L. (A)
Matta, B. M. (A)
Mattisinko, N. S. (M)
Mazziotti, I. J. (M)
McCormick, L. P. (A)
McCoy, R. J. (A)
McGowan, J. F., Jr. (M)
McGrath, J. M. (M)
Meixner, R. P. (M)
Menganl, C. M. (A)
Menkes, E. D. (A)
Merkler, F. T. (M)
Mermelstein, E. I. (M)
Messina, A. S. (A)
Messina, J. (A)
Messineo, R. H. (A)
Meyer, R. L. (M)
Meyers, G. S. (A)
Meyers, S. (SM)
Michelson, M. B. (M)
Michitsch, J. J. (M)
Milazzo, S. (M)
Miles, F. A. (M)
Milotta, S. S. (A)
Mineroff, S. A. (A)
Minerva, L. P. (A)
Misciagna, J. J. (A)
Mishkin, E. (SM)
Mitchell, L. E. (A)
Mitchell, S. L. (A)
Moderacki, E. J. (A)
Monacchio, E. N. (A)
Monteleone, T. A. (A)
Montuori, A. V. (M)
Moore, J. B. (SM)
Mordkowitz, I. (M)
Morgan, E. K. (A)
Moriwaki, Y. (SM)
Morris, A. A. (A)
Morrison, J. A. (M)
Morton, A. R. (SM)
Moses, A. I. (M)
Moskowitz, N. (A)
Moskowitz, S. (M)
Musacchio, A. A. (M)
Nachtgall, S. (SM)
Navon, V. (M)
Nelson, H. C. (M)
Nelson, W. (A)
Nelson, W. F. (M)
Neveroski, W. J. (M)
Newdorf, A. S. (A)
Nicolosi, J. P. (M)
Nisteruk, C. J. (M)
O'Donnell, J. P. (M)
Ogonlak, T. J. (A)
Oguchi, B. (SM)
Okada, S. (M)
Oliner, A. A. (SM)
Ortolani, F. P. (M)
Ostrov, B. (M)
Oswald, H. J. (M)
Oxley, J. E. (M)
Ozdoba, M. (A)
Palkoff, B. L. (A)
Papoulis, A. (SM)
Pazer, J. (M)
Pearlman, L. (M)
Pecoraro, C. J., Jr. (M)
Pelltsch, E. J. (M)
Penikas, G. (M)
Periman, I. (M)
Perry, L. (M)
Petroulakis, S. G. (A)
Phillimore, H. R. (A)
Piccione, N. A. (M)
Plvnik, S. I. (A)
Pizzirusso, A. J. (M)
Pizzulli, D. (M)
Pizzutiello, R. (M)
Platzman, M. M. (M)
Plavsky, M. I. (M)
Polen, E. (M)
Pollack, H. W. (SM)
Poor, L. D. (M)
Popper, J. N. (M)
Posklensky, G. (A)
Posner, W. (M)
Post, B. S. (A)
Prensky, S. D. (M)
Pries, J. J. (M)
Principe, A. J. (A)
Propper, M. (A)
Pugliese, L. (M)
Quinn, J. C., Jr. (A)
Rafale, M. J. (SM)
Rall, H. L. (M)
Rappoport, J. F. (M)
Reader, M. (M)
Reichfield, S. (M)
Reid, J. J. (M)
Rekort, W. (M)
Rente, F. A. (M)
Richmond, J. F. (A)
Rifkind, H. M. (M)
Ritter, R. E. (A)
Roberts, R. P. (M)
Robinson, L. (M)
Robinson, R. M. (M)
Rogers, F. A. (A)
Romano, S. A., Jr. (M)
Rose, L. (M)
Rosenberg, D. (M)
Rosenthal, M. P. (M)
Roth, E. J. (M)
Rothenstein, S. (M)
Rowe, I. (M)
Roy, R. J. (M)
Rubertone, A. (M)
Rubin, A. (A)
Rubin, I. S. (M)
Ruderfer, M. (M)
Rudner, B. S. (SM)
Rudofsky, B. I. (M)
Ryan, E. H. (M)
Sackson, M. M. (A)
Salmon, F. A. (A)
Salzman, D. (A)
Sandler, H. M. (A)
Sandstrom, W. H. (M)
Sarter, L. B. (M)
Sawelson, A. I. (SM)
Schechner, C. B. (M)
Scherr, J. L. (M)
Schillinger, A. G. (M)
Schlatter, W. J. (A)
Schnall, E. (A)
Schneider, I. (M)
Schornstein, M. L. (M)
Schwartz, P. (A)
Schwartz, R. (A)
Schwartzman, L. (M)
Schwarz, N. (M)
Scinto, L. L. (A)
Scire, F. J. (M)
Seewald, E. J. (M)
Segal, J. B. (A)
Segreto, A. J. (M)
Semmelhaack, C. F. (M)
Sezack, S. K. (M)
Shaffnoff, H. (SM)
Shalev, Y. (M)
Shapiro, P. (M)
Sherman, H. (A)
Shinners, S. M. (A)
Shmoys, J. (SM)
Shooman, M. L. (M)
Shore, B. (M)
Shostack, S. (A)
Shufer, M. (M)
Shuhandler, M. B. (M)
Sicluri, V. (A)
Sigona, J. F. (M)
Silberman, B. (M)
Silver, A. N. (M)
Silver, B. L. (VA)
Silver, D. (M)
Silver, M. (M)
Silvera, R. V. (M)
Silverberg, J. (M)
Silverberg, M. (M)
Silverman, D. (M)
Silversmith, G. B. (M)
Simberg, R. S. (M)
Simon, H. (A)
Sinclaire, F. S. (M)
Sisskind, S. G. (M)
Sistino, F. J. (A)
Skeltved-Jensen, E. (A)
Sklar, S. (M)
Slatic, G. A. (A)
Smilen, L. I. (SM)
Smith, E. J. (M)
Smith, E. T. (A)
Smith, J. S. (SM)
Smola, H. (M)
Smykowski, C. P. (M)
Snyder, J. B. (M)
Soares, M. L. (M)
Sobel, A. (SM)
Sochet, E. (A)
Sokol, L. L. (M)
Sonkin, R. M. (M)
Soreny, E. V. (A)
Sottile, M. R. (M)
Spector, L. (M)
Spierer, E. D. (M)
Sterman, I. I. (M)
Stern, S. (M)
Sternberg, M. (M)
Strahlberg, K. (A)
Strassberg, I. D. (A)
Strauss, L. (SM)
Sullivan, J. P. (A)
Summerville, R. W. (A)
Susman, L. (M)
Sweet, L. D. (M)
Talish, I. M. (M)
Talley, D. (SM)
Tamir, T. (M)
Tashjian, A. (M)
Teltelbaum, M. (A)
Temple, W. J. (A)
Temoleman, L. I. (A)
Thomas, R. O. (M)
Tomasulo, V. D. (M)
Travis, E. (M)
Treanor, E. F. (M)
Trendowski, C. R. (A)
Trusinoff, B. (A)
Truxal, J. G. (F)
Tscherne, R. A. (M)
Turano, M. J. (A)
Turchin, M. J. (M)
Turczyn, W. A. (M)
Ur, H. (M)
Urevith, S. J. (A)
Usian, S. D. (M)
Vallese, L. (SM)
Van Der Bokke, L. (M)
Van Deusen, R. B. (M)
Varrone, E. (M)
Veder, A. (M)
Viola, R. D. (M)
Viola, V. (M)
Vitrogan, D. (SM)
Volk, J. (A)
Waas, G. J. (M)
Wade, G. A. (A)
Wagner, R. C. (M)
Wambold, R. F. (M)
Warnock, H. P. (M)
Watine, M. N. (A)
Weber, E. (F)
Well, J. L. (A)
Weinberger, R. C. (M)
Weiner, L. H. (A)
Weingarten, A. (M)
Weinman, M. M. (A)
Weinstein, D. C. (M)
Weinstein, S. M. (M)
Weinstein, H. M. (M)
Weintraub, S. (A)
Weiss, J. (M)
Weiss, D. (M)
Werman, H. M. (M)
Wertheim, L. A. (M)
Wexler, I. (M)
Wheeler, R. R. (A)
Williams, L. (M)
Wilson, S. I. (A)
Wilson, F. B. (A)
Wishna, S. (M)
Wllln, J. J. (A)
Wolf, E. M. (M)
Wolff, E. J. (A)
Wolk, N. (SM)
Wolsky, M. (M)
Wong, Y. O. (A)
Wood, J. D. (M)
Yost, D. E. (M)
Young, K-P. (M)
Zadro, A. P. (A)
Zambarelon, J. T. (A)
Zaretsky, A. (M)
Zarount, A. (M)
Zawacki, E. C. (M)
Zetakoff, A. (M)
Zecca, A. A. (M)
Zelger, L. B. (M)
Zeman, J. (M)
Zivotofsky, B. (M)
Zohar, S. (A)
Zourides, V. G. (M)
Zupnick, I. N. (M)

Brooktondale (ITH-1)
Robbins, R. (M)

Buchanan (NY-W-2)
Foln, W. C. (A)

Buffalo (BN-1)
Alnes, F. G. (M)
Ames, R. W. (A)
Atkins, W. J. (M)
Bachman, C. G. (M)
Barczys, D. A. (A)
Bargman, M. (A)
Barrowcliff, T. A. (A)
Bartnik, J. C. (A)
Bauman, N. C. (M)
Beach, J. B. (M)
Beneke, J. (A)
Bernhardt, C. C. (M)
Bock, D. H. (M)
Brenner, C. H. (M)
Burdette, L. R. (M)
Burke, J. J. (M)
Carroll, T. J. (M)
Caserta, J. N. (M)
Catalino, F. M. (M)
Chapman, S. (SM)
Chimera, A. J. (M)
Chudzik, M. W. (M)
Clark, D. C. (M)
Clune, E. F. (M)
Cummings, J. R. (M)
Cuthill, W. R. (M)
Cutter, R. H. (A)
Dalson, G. T. (A)
Davis, J. E. (M)
De Joseph, A. (M)
Diehl, J. H. (M)
Dole, L. H. (M)
Doyle, W. C. (M)
Dybowski, A. J. (VA)
Eames, F. M. (A)
Eckert, E. H. (M)
Ess, H. E. (M)
Falk, T. (M)
Farber, M. (A)
Fischer, F. P. (SM)
Flood, W. A., Jr. (A)
Forbath, F. P. (SM)
Freeman, R. W. (A)
Freund, H. G. (M)
Gavin, R. F. (M)
Gerber, W. J. (M)
Hayman, R. A. (A)
Hill, L. L. (A)
Hoffman, K. B. (SM)
Holfelder, R. G. (M)
Holmes, W. S. (SM)
Horton, A. B., Jr. (M)
Horvath, J. O. (A)
Hoyler, E. T. (A)
Huber, C. W. (VA)
Hunt, R. A. (M)
Huthmacher, J. E. (A)
Jacobson, L. (M)
Jackson, R. W. (A)
Jocoy, E. H. (M)
Johnson, A. B. (M)
Johnson, R. C. (A)
Jondle, J. J. (M)
Kahn, D. A. (M)
Kell, R. E. (M)
Kingsley, R. J. (M)
Kitchin, H. W. (SM)
Klemoerer, W. K. (M)
Lampone, D. J. (M)
Lauer, C. A. (A)
Lautz, C. F., Jr. (M)
Leipold, W. H. (M)
Lemer, T. (M)
Levin, K. L. (SM)
Levitt, M. (A)
Maim, R. (SM)
Mancone, J. G. (M)
Marshall, J. F. (M)
Martin, F. C. (M)
McClanahan, J. M. (M)
Meany, J. E. (SM)
Meese, H. F. (A)
Meldenbauer, K. G. (M)
Michaelis, T. D. (M)
Michnik, L. (M)
Mitscher, R. W. (A)
Moncton, H. S. (M)
Odden, R. B. (M)
Okonski, C. B. (M)
Okonski, E. S. (A)
Olmstead, J. A. (M)
Palne, L. W. (M)
Petz, J. R. (A)
Phillips, J. (M)
Plummer, D. K. (M)
Powell, F. D. (SM)
Pritchard, F. E. (A)
Putlck, A. W. (A)
Raney, J. J. (SM)
Ratajczak, R. A. (M)
Ridgeway, F. B. (M)
Rowe, W. D. (M)
Rusnak, W. (M)
Rynaski, E. G. (M)
Salz, N. P. (SM)
Savl, L. (M)
Schultze, W. J. (A)
Schwartz, E. C. (A)
Schwartz, R. N. (A)
Shub, L. (SM)
Siegel, V. H. (M)
Smith, K. F. (M)
Solsnes, L. B. L. (A)
Spooner, M. G. (M)
Stafford, W. F., Jr. (A)
Steeb, E. C., Jr. (M)
Steger, D. J. (A)
Stengel, C. J., Jr. (A)
Stieber, A. (SM)
Stock, R. M. (M)
Taylor, F. E. (M)
Testa, J. S. (M)
Torres, J. F. (A)
Unger, W. J. (M)
Van Every, B. (M)
Veath, M. S. (A)
Wagner, R. W. (M)
Ward, V. E., Jr. (A)
Ware, P. H. (M)
Watson, W., II (M)
Weber, F. A. (M)
Welch, D. P. (SM)
Welkner, J. C. (A)
Welsh, J. P. (SM)
Weponer, B. H. (M)
Werlink, R. (A)
Wilder, L. D. (M)
Wilson, J. E. (M)
Wolf, E. H. (M)
Wright, T. O. (M)
Zimmerman, E. A. (A)

Burnt Hills (SCH-1)
Hesse, M. H. (M)
Hilton, R. T. (M)
Speck, R. S. (M)
Welch, D. I. (M)

Caledonia (ROC-1)
Allen, S. E. (M)
Angevine, O. L., Jr. (SM)
Lawson, H. W., Jr. (M)

Cambria Heights (LI-2)
Gach, L. M. (M)
Koenig, R. H. (M)
Kruk, R. J. (SM)
Pyros, I. E. (M)
Rekzel, C. I. (A)
Smith, P. (M)
Swain, J. A. (A)
Zelnes, B. (SM)

Camden (RU-1)
Hickey, J. B. (A)

Camillus (SYR-1)
Cleary, J. F. (A)
Cooner, W. M. (M)

Gordon, R. T. (M)
Lambert, J. M. (M)
Marlatt, R. L. (M)
Petrie, A. F. (M)
Pfeiffer, A. W. (M)
Place, J. F. (M)
Rabehl, W. C. (A)
Schweers, O. H. (SM)
Strawn, R. K. (A)
Swenson, C. F. (A)
True, T. T. (M)

Campbell Hall (NY-MH-2)
Martin, G. B., Sr. (A)

Canandaigua (ROC-1)
Harrold, G. B. (M)
Knapp, A. J. (A)

Candor (BING-1)
Glenn, H. L. (A)

Carle Place (LI-2)
Bossinger, A. L. (SM)
Chesnes, G. J. (M)
Drasney, G. C. (A)
Genaserilly, T. (A)
Hekaros, J. S. (A)
Jefferies, K. D. (M)
Lincoff, W. (M)
Smolak, J. P. (A)
Vadus, J. R. (SM)

Carmel (NY-2)
Fredrick, A. H. (M)
Lewinski, J. (SM)

Castleton-On-Hudson (SCH-1)
Bradley, B. F., Jr. (M)

Cazenovia (SYR-1)
Chamberlain, P. L. (A)
Hodges, G. W. (A)
Learned, A. J. (M)
Morse, H. W. (M)
Winslow, W. R. (M)

Cedarhurst (LI-2)
Dick, T. M. (M)
Durbin, E. (M)
Goodman, J. D. (M)
Mercier, A. E. (SM)
Merlin, A. G. (A)
Norris, S. (M)
Ross, B. R. (M)
Shapiro, D. L. (M)

Cementon (NY-MH-2)
Krisniski, S. V. (M)

Centereach (LI-2)
Clark, M. J. (A)
Mussmann, G. F. (A)
Tierney, T. J. (M)

Centerport (LI-2)
Dergane, W. (M)
Klaus, G. H. (SM)
Pichert, J. (M)
Rezek, R. M. (M)

Central Islip (LI-2)
O'Donohue, R. E., Jr. (M)
Samoluk, P. (A)

Central Square (SYR-1)
Cooper, C. W. (A)

Central Valley (NY-MH-2)
Arnold, R. G. (M)

Chadwicks (RU-1)
Kapfer, V. C. (A)

Chappaqua (NY-W-2)
Bechcr, W. E. (M)
Buttolph, J. D. (M)
Edwards, N. P. (M)
Femmer, M. E. (SM)
Hunt, W. A. (M)
Kellogg, D. S. (SM)
Little, J. S. (SM)
Novak, W. D. (M)
Speller, J. B. (SM)
Taggart, C. E. (M)
Vladmir, L. O. (SM)
White, R. A. (A)

Cheektowaga (BN-1)
Bacugher, L. C. (M)
Celer, R. R. (M)
Feinberg, E. J. (M)
Lewicki, W. M. (A)
Maclag, W. J. (M)
Myers, J. F. (SM)
Slaker, R. H. (M)

Chenango Bridge (BING-1)
Carpenter, J. F. (A)
Jones, H. E. (M)

Chittenango (SYR-1)
Bray, T. E. (A)
Little, D. W. (M)

Churchville (ROC-1)
Chapin, D. W. (M)
Jackson, R. W. (A)

Clarence (BN-1)
Bennett, J. E. (M)
Greatbatch, W. (M)
Kellerman, R. E. (M)
Neerud, R. N. (SM)
Semiuk, W. (SM)
Varacore, T. (M)

Clarence Center (BN-1)
Schantz, J. D. (SM)

Clay (SYR-1)
Boyd, L. E. (M)
Brady, D. J. (M)
Brown, P. H. (M)
Carlson, E. R. (SM)
Collins, J. L. (A)
Knickerbocker, L., Jr. (M)
Marshall, J. C. (M)
Smith, E. E. (A)

Cleverdale (SCH-1)
Mead, M. S., Jr. (SM)

Clifton Springs (ROC-1)
Morris, I. A. (M)

Clinton (RU-1)
Amway, H. E. (M)
Baldwin, G. F. (SM)
Blumberg, D. (M)
Crockett, G. R. (M)
Goodman, I. (M)
Obery, A. C. (M)
Pearlston, C. B., Jr. (M)
Rasmussen, C. P. (M)
Sears, C. B. (M)
Smith, A. E. (M)
Turner, M. L., Jr. (M)

Clyde (ROC-1)
Durso, J. L. (M)
Hauge, K. (A)
York, R. A. (SM)

Cohocton (ELM-C-1)
Fox, R. A. (A)

Cohoes (SCH-1)
Pimlca, W. M. (M)

Cold Spring Harbor (LI-2)
Burr, R. P. (SM)
Tyndall, R. M. (M)

College Point (LI-2)
Belock, H. D. (SM)
Dubin, L. (M)
Friedensohn, G. (A)
Fury, A. E., Jr. (A)
Hoffman, R. A. (A)
Oranges, D. F. (M)
Rilling, J. C. (A)
Shostak, M. (A)
Sleven, M. O. (M)
Stiepel, G. W. (A)

Commack (LI-2)
Brady, J. P. (M)
Bryant, B. L., Jr. (A)
Cataldo, T. J. (M)
Di Nardo, A., Jr. (A)
Farina, D. E. (M)
Feldman, S. (A)
Ferry, J. B. (M)
Frimet, S. H. (A)
Kelley, E. J. (M)
Levine, B. (SM)
Loss, M. B. (M)
Lynch, J. T. (A)
Maffei, E. V. (A)
Matylewich, T. D. (A)
Michitson, P. A. (M)
Offutt, W. B. (M)
Paulson, J. O. (M)
Rigby, R. T. (M)
San Giovanni, C., Jr. (M)
Tiger, H. S. (M)
Whaley, W. W. (M)
Wrobel, R. E. (M)

Congers (NY-2)
Levy, G. (A)

Conklin (BING-1)
Emmons, D. W. (M)

Constantia (SYR-1)
Day, R. G. (SM)
Elhoff, W. C. (A)
Reguelro, W. R. (A)

Copiague (LI-2)
Hyland, J. R. (M)
Mautner, R. S. (SM)
Pull, H. L. (M)
Renwick, F. B. (M)

Corinth (SCH-1)
Willman, E. S. (A)

Corning (ELM-C-1)
Allen, R. E. (M)
Bell, A. N. (M)
Benjamin, L. P. (A)
Brouneus, H. A. (M)
Cammen, M. M. (M)
Crasmer, H. S. (A)
Dates, H. F. (M)
Davis, J. K. (SM)
Deegan, G. M. (M)
Gordon, P. E. (M)
Griest, E. M. (M)
Guyer, E. M. (SM)
Hanlan, R. V. (M)
Herczog, A. (M)
Hocker, J. P. (M)
Hunt, M. H. (M)
Jenkins, W. H. (M)
Leffel, P. C., Jr. (M)
Lineweaver, J. L. (M)
Mann, R. H. (A)
Munier, J. H. (M)
Nitsche, J. E. (M)
Pinkston, J. C., III (M)
Rexford, H. E. (M)
Sucklinger, J. P. (M)
Sheldon, J. L. (F)
Smith, G. P. (M)
Sprague, L. G. (M)
Szupillo, R. E. (A)
Wetmore, W. L. (A)

Cornwall (NY-MH-2)
Lynch, F. T. (M)

Cornwall-on-Hudson (NY-MH-2)
Peck, N. D. (M)

Corona (LI-2)
Balacki, S. J. (A)
Barbasso, S. (M)
Blanchini, P. J. (M)
Boychenko, O. (M)
Germano, G. (A)
McGovern, F. X. (M)
Pafundi, M. T. (A)
Silbar, J. I. (A)
Spatz, S. (M)
Vafiades, W. (A)

Cortland (SYR-1)
Ciccoricco, F. A. (M)

Cowlesville (ROC-1)
Wightman, C. W., Jr. (M)

Crestwood (NY-W-2)
Krauer, O. (A)

Croton-On-Hudson (NY-W-2)
Albert, M. P. (M)
Halbk, L. (A)
Thorpe, R. A. (M)

Cuba (ELM-C-1)
Griffin, S. J. (M)
Miller, E. A. (M)

Dansville (ROC-1)
Blum, R. J. (M)

Deansboro (RU-1)
Palmer, P. D. (M)

Deer Park (LI-2)
Axel, A. J. (M)
Buff, C. (SM)
Burghard, A. R. (M)
Castellano, J. G. (A)
Levine, A. M. (M)
Schlesinger, J. (M)
Tressa, F. J. (M)
Warren, S. D. (A)

Depew (BN-1)
Bordner, G. W. (M)
Diener, H. C., Jr. (M)
Herold, C. D., Jr. (M)
Hyer, H. C. (M)
Newton, D. J., Jr. (M)
Trabka, E. A. (M)
Whitbeck, R. F. (M)

De Witt (SYR-1)
Berkley, J. B. (SM)
Briggs, A. S. (M)
Burroughs, E. H. (M)
Clark, H. T. (SM)
Copp, J. H. (SM)
Coulbourn, J. M. (M)
Davids, H. H. (SM)
Davis, R. J. (M)
Desi, D. L. (M)
Dickey, F. R., Jr. (SM)
Dominguez, M. J. (A)
Flashner, G. (M)
Grisetti, R. S. (M)
Harnett, D. E. (F)
Hyde, H. I. (M)
Jacobson, I. J. (M)
Kovacs, F. M. (M)
Kralman, H. (M)
Lothes, R. N. (M)
Lowry, H. R. (A)
Marin, I. L. (SM)
Perkins, D. W. (M)
Records, J. K. (M)
Shain, E. (M)
Silverman, B. (M)
Simon, C. J. (M)
Slaughter, J. E. (M)
Stillwell, H. R. (M)
Taylor, F. W. (M)
Watts, D. E. (SM)
Wilson, G. G. (M)
Woods, C. R. (M)

Dobbs Ferry (NY-W-2)
Byrnes, F. X. (M)
Eyster, J. A. (SM)
Ham, D. L. (M)
Miller, D. H. (M)
Mitchell, D. D. (M)
Newman, L. (M)
Welchardt, H. H. (M)

Douglastown (LI-2)
Adams, A. T. (M)
Batcher, R. R. (F)
Cohen, S. A. (M)
Collard, A. C. (M)
Dumaresq, J. (A)
Dunn, S. B. (M)
Grover, H. G. (SM)
Hertzberg, R. E. (A)
McClellan, G. B. (SM)
Milkman, N. (M)
Neeck, J. E. (A)
Pollack, A. S. (SM)
Shanck, R. B. (SM)
Sherman, P. (A)
Tyson, B. F. (F)
Weinstein, G. (A)

Dryden (ITH-1)
Shelton, G. L., Jr. (M)

Dunkirk (ERI-1)
Niles, R. O. (A)

East Aurora (BN-1)
Ballantine, J. H. (M)
Frazier, R. E. (M)
Hopkins, J. E. (M)
Roess, L. G. (M)
Tribou, P. W. (M)

Eastchester (NY-W-2)
Collison, P. B. (SM)
Lundgren, P. R. (A)
Masucci, C. (M)
McGinnis, F. (SM)
Sarahan, B. L. (M)
Schimmel, H. (M)

East Elmhurst (LI-2)
Capon, J. (M)
Gordon, S. M. (A)
Inmarco, A. E. (M)
Segota, A. S. (M)

East Greenbush (SCH-1)
Merry, F. J. (M)

East Hampton (LI-2)
Fidanza, W. (A)

East Islip (LI-2)
Bolum, D. R. (A)
Weiss, E. H. (A)

East Meadow (LI-2)
Basil, A. (M)
Brownman, H. L. (M)
Burgess, E. G., Jr. (M)
Byron, M. (A)
Cerino, R. (M)
Colbert, P. (A)
Conigliaro, S. A. (SM)
Cornier, R. A. (M)
Drogin, E. M. (A)
Farber, B. (M)
Frost, S. (M)
Garrett, B. R. (A)
Glasser, H. (A)
Goldstein, I. (A)
Grob, B. (M)
Grodzinsky, S. (SM)
Gruber, P. (M)
Herzel, J. S. (M)
Iorio, S. A. (M)
Kaplan, M. (M)
Kunz, A. B. (A)
La Cascia, N. (A)
McGowan, J. G. (M)
Newman, S. O. (SM)
Nichik, J. J. (M)
Northfield, W. E. (M)
Novikoff, E. B. (M)
Parker, S. (M)
Pollard, R. E. (M)
Redovian, M. (M)
Reizes, H. N. (A)
Rosenthal, S. A. (M)
Scordato, M. (A)
Silbiger, R. J. (M)
Sills, M. M. (M)
Smith, C. R. (M)
Turner, G. C. (M)
Weisfeld, B. R. (A)
Wohl, C. (M)
Yuni, W. (M)

East Northport (LI-2)
Andersen, A. H. (M)
Benz, J. K. (M)
Chonset, M. (M)
Clinton, R. E. (A)
Cope, R. H., Jr. (SM)
Croxville, W. B. (M)
Cullen, W. P. (M)
Di Paola, R. G. (M)
Hallock, H. B. (SM)
Helf, W., Jr. (M)
Holland, J. W. (M)
Knothe, C. H. (M)
Kos, S. M. (A)
Krasnick, S. (M)
Kulper, C. R. (M)
Leary, J. B. (M)
Mahoney, T. J., Jr. (A)
Marcus, M. S. (A)
Masak, R. J. (A)
Miller, J. S. (M)
Ness, C. H. (M)
Nowak, M., Jr. (A)
Oakes, R. E. (M)
Oswald, L. H. (M)
Phagan, R. J. (M)
Philbin, J. P. (M)
Reynolds, L. C. (M)
Rumph, G. F. (M)
Salmon, H. A. (A)
Smith, K. M. (A)
Spann, R. C. (M)
Tepper, H. H. (M)
Wallace, R. A. (M)
Weinberger, J. (F)
Yourdon, F. R. (M)
Zinke, R. L. (M)

East Norwich (LI-2)
Barry, H. P., Jr. (M)
Boecker, A. (M)
Boyd, P. C., Jr. (M)
Churchill, E. B. (M)
Davis, S. (M)
Fishman, G. N. (M)
Fowler, C. A. (M)
Garretson, C. M. (SM)
Mogul, E. (SM)
Plunkett, R. (A)
Salzberg, B. (F)

East Rochester (ROC-1)
Bass, G. A. (M)
Numann, G. W. (A)

East Rockaway (LI-2)
Albert, A. M. (M)
Brown, W. (M)
Cohen, G. (M)
Greenberg, I. G. (SM)
Heimer, R. L. (M)
Mahnken, W. J. (M)
Riall, R. T. (M)
Wallach, D. M. (M)
Wind, M. (SM)

East Syracuse (SYR-1)
Arnold, D. W. (M)
Chamberlain, L. W. (M)
Downie, J. W. (SM)
Faulkenberry, B. K. (M)
Haynes, J. S. (M)
Hlavin, J. M. (M)
Isert, I. L. (M)
Jobes, S. S., Jr. (M)
Johnson, M. A. (M)
Juhlin, J. A., Jr. (M)
Kim, J. C. S. (A)
Kinsey, R. R. (M)
Krenitsky, P. (M)
Lindsay, G. A. (M)
Morrison, R. H. (M)
Mueller, W. J. (M)
Segale, R. O. (M)
Smith, W. E., Jr. (A)
Ventura, J. J. (M)
Whisenhunt, J. A. (M)
Williams, G. R. (M)
Zellmer, L. R. (M)

East Williston (LI-2)
Brannin, R. S. (SM)
Brunet, W. J. (A)
Doucette, A. R. (SM)
Fay, A. H. (M)
Galella, P. F. (SM)
Johnson, J. H. (M)
McProud, C. G. (M)
Packer, L. (M)
Rebeck, C. S. (M)

Ebenezer (ERI-1)
Boelter, G. L. (M)

Eden (BN-1)
Pontius, J. C. (M)
Steele, K. P. (A)

Edgemere (LI-2)
Muskatos, A. (M)

Eggertsville (BN-1)
Borkowski, C. J. (M)
Harvey, R. F. (M)
McCord, W. M. (SM)
Mergner, C. C. (M)
Rizzo, S. J. (A)
Rosenfelder, G. S. (M)
Schneeberger, R. F. (M)

Ellenville (NY-MH-2)
Green, J. (M)
Schwartz, J. (M)

Elma (BN-1)
Reinnagel, R. E. (SM)
Weise, R. W. (SM)

Elmhurst (LI-2)
Aisberg, H. (A)
Avignone, A. J. (A)
Beaton, H. F. (M)
Blumenstock, N. R. (M)
Callendo, P. J. (M)
Carides, T. (M)
Erdman, A. (A)
Erlichson, H. (M)
Feldstein, S. (A)
Fitzgerald, P. J. (A)
Flattau, W. (M)
Francoeur, G. R. (M)
Frisbie, F. L. (M)
Gala, D. C. (M)
Ghiglietti, R. (M)
Kearns, W. J., Jr. (M)
Kenneth, F. (A)

Kestenbaum, H. S. (A)
Linder, A. J. (M)
Morrone, J. J. (M)
Peltzer, B. (A)
Perliss, R. E. (M)
Scheuermann, R. J. (M)
Shapiro, L. C. (SM)
Stern, M. L. (M)
Strachan, A. G. (M)
Stuhler, R. E. (A)
Tamasi, A. P. (A)
Tomberg, V. T. (SM)
Toufexis, S. (M)
Wahl, G. J. (A)
Wolfson, R. B. (M)

Elmira (ELM-C-1)
Airey, R. K. (M)
Aldrich, D. F. (SM)
Argyle, L. C. (A)
Buck, D. C. (M)
Cherry, S. J. (SM)
Cox, G. L. (M)
Dart, H. F. (F)
Dovi, A. C. (M)
Duhl, J. E. (M)
Freegens, R. A. (M)
Gillies, W. (M)
Hall, J. A. (SM)
Hayter, W. R., Jr. (A)
Hostetler, C. L. (M)
Husson, C. (M)
Keeton, T. G. (M)
Kilcoyne, M. K. (M)
Kilpatrick, H. B. (A)
Knowles, D. D. (SM)
Lasrose, A. C. (M)
Lindequist, P. T. (M)
Link, V. F. (M)
Lovell, L. L. (A)
Mapeoch, N. H. (M)
Martin, L. (SM)
McCurdy, W. H. (SM)
Miller, C. F. (SM)
Millett, R. G. (M)
Moran, W. G. (A)
Mulligan, J. M. (M)
Murphy, D. L. (M)
Okress, E. C. (SM)
Ramich, C. E. (SM)
Riggen, T. K. (M)
Riggs, J. O. (A)
Rogell, P. S. (M)
Shafer, C. R. (A)
Sheehe, J. M. (M)
Simpson, K. R. (M)
Stadnik, T. J. (A)
Stoddard, R. N. (A)
Stow, R. L. (M)
Townsend, F. H. (SM)
Upshaw, V. (SM)
Washburn, G. W. (M)
White, L. E. (M)

Elmira Heights (ELM-C-1)
Foreman, R. J. (M)
Heath, E. R. (M)

Elmont (LI-2)
Brown, J. J. (M)
Chapel, I. J. (SM)
Coniglio, P. J. (A)
Dong, J. G. (M)
Dressler, R. (SM)
Franceschini, J. B. (M)
Gould, S. (M)
Greenberg, L. (A)
Griffen, K. A. (A)
Griffing, W. W. (M)
Hanover, A. M. (A)
Kilsheimer, R. L. (M)
Kuck, G. P. (M)
La Mantia, R. (M)
Lutz, C. J. (A)
Melsar, M. (M)
Rhodes, M. L. (A)
Riemenschneider, W. W. (A)
Seidman, A. H. (SM)

Elmsford (NY-W-2)
Carlisle, R. W. (SM)
Enoch, D. G. (A)
Greenbaum, W. H. (M)
Myers, H. W. (M)
Pearson, H. A. (M)
Von Baudissin, J. (M)

Endicott (BING-1)
Abou-Taleb, N. M. (SM)
Ackerman, T. E. (M)
Adams, D. A. (M)
Akmenkalns, I. G. (M)
Anoevine, A. R. (M)
Baldauf, D. R. (M)
Batty, R. A. (M)
Berge, R. (A)
Bernstein, R. (M)
Bloom, E. M. (M)
Brannen, P. M. (M)
Branning, H. F. (M)
Brooke, A. W. (M)
Cloud, H. A. (M)
Conner, C. D. (M)
Deskur, K. J. (A)
Dial, A. R. (M)
Dodge, H. E. (M)
Dornell, C. E. (A)
Dondator, R. H. (A)
Essinger, P. (A)
Evans, B. O. (M)
Farbanish, P. (M)
Ferraro, D. (M)
Forbes, R. E. (M)
Frehsee, R. (M)
Fruci, N. A. (M)
Ginerich, W. G. (M)
Goetz, J. A. (M)
Grace, C. H. (M)
Grimmer, R. C. (M)
Hack, G. E. (M)
Hamburgen, A. (M)
Hazlett, W. T. (M)
Hess, G. (M)
Higley, R. J. (M)
Hill, Y. M. (SM)
Hollandsworth, W. J. (SM)
Howder, J. M. (M)
Ivy, R. C. (M)
Jensen, H. R. (M)
Johnson, R. M. (M)
Jones, H. L. (M)
Kapur, K. N. (M)
Klimer, F. G. (M)
Kirchoff, R. J. (A)
Klotz, H. J. (SM)
Knight, D. E. (M)
Kobb, T. J. (M)
Kostyshyn, B. (A)
Kovajchick, N. (M)
Lanpathakis, K. E. (M)
Leimer, J. J. (M)
Lewis, T. B. (M)
Loggie, T. W. (A)
Lohman, I. H., Jr. (M)
Lyon, R. L. (M)
Markarian, H. (M)
Mathers, H. W. (M)
McNabb, R. E. (M)
McNellis, P. J. (M)
Mertz, E. H. (A)
Miller, W. C. (M)
Mulock, L. E. (M)
Oi, I. (M)
Ottoson, P. E. (M)
Pachuta, J. R. (M)
Pasternak, E. (M)
Patch, F. D. (M)
Patzer, W. J. (M)
Pawletko, J. P. (M)
Pedlow, L. M. (M)
Peercy, R. L., Jr. (M)
Pipkorn, J. H. (A)
Pyle, C. L. (M)
Quick, J. R. (M)
Riner, W. L. (M)
Roehrs, F. J. (M)
Ruball, I. H. (SM)
Ruoff, C. E. (M)
Ruppert, J. R. (M)
Schneider, J. (A)
Scott, G. L. (M)
Sculley, G. A., Jr. (M)
Shatz, J. R. (M)
Shell, E. F. (M)
Shield, C. F., Jr. (M)
Short, R. B. (M)
Shoultes, D. P. (M)
Sih, K. Y. (M)
Steen, W. J. (SM)
Steglitz, C. B. (M)
Stott, C. B. (A)
Strup, C. F., Jr. (M)
Swanson, R. E. (A)
Swanton, W. L. (M)
Tate, R. G. (M)
Taub, S. (M)
Troutman, B. C. (A)
Tunis, C. J. (M)
Wilfinger, R. J. (M)
Yurgaitis, W. C. (A)

Endwell (BING-1)
Adams, L. R. (M)
Burshnick, J. D. (M)
Dickinson, M. M., Jr. (M)
Greene, T. A. (M)
Hamilton, L. L. (M)
Holderman, C. C. (M)
Hutchison, H. W. (M)
James, R. F. (M)
Maslak, M. (M)
Miles, R. J. (M)
Mlukas, J. (A)
Mueller, C. F. (M)
Simek, J. G. (M)
Southard, C. D. (A)
Stamos, C. G. (M)
Wagner, J. L. (SM)
Wilson, H. R. (M)
Yeager, C. J. (A)

Etna (ITH-1)
Stillman, M. (M)

Fairport (ROC-1)
Cunningham, G. E. (A)
Hamlin, N. B. (M)

Farmersville (BN-1)
Wiley, V. H. (A)

Farmingdale (LI-2)
Anderson, D. K. (M)
Aronowitz, L. (M)
Bellenkes, W. A. (A)
Buble, F. L. (M)
Cap, S. T. (M)
Clothier, C. M. (M)
Coppola, A. S. (M)
De Gennaro, R. (A)
Dery, G. F. (M)
Greses, M. I. (M)
Goon, R. (M)
Hart, J. E. (M)
Kantenman, A. (M)
Kaufman, D. (M)
Kauper, L. T. (M)
Lo Giudice, T. F. (M)
Maguire, J. P. (SM)
Niewenhous, J. H. (M)
Otten, H. C. (M)
Rosenthal, M. M. (SM)
Rubenstein, C. F. (SM)
Schwab, C. E. (M)
Schwartz, M. (SM)
Sicuranza, A. J., Jr. (A)
Spector, A. (M)
Stolov, S. E. (M)
Tchimnis, M. F. (A)
Van Schoor, J. (A)
Vinkman, V. V. (A)
Wildfeuer, D. (SM)
Wolfe, M. L. (M)
Woodward, A. E. (M)

Far Rockaway (LI-2)
Bernstein, S. S. (M)
Crandell, S. (M)
Edelstein, H. N. (SM)
Glass, H. W. (M)
Haynes, N. M. (M)
Kulp, E. I. (M)
Liegey, P. R. (M)
McPhee, A. J. (M)
Mentcher, I. (M)
Rutter, A. (A)
Shapiro, R. A. (A)
Slemrod, J. L. (A)
Smith, S. (A)
Weiner, G. (A)

Fayetteville (SYR-1)
Altes, S. K. (M)
Ballard, E. J. (M)
Beckwith, R. W. (M)
Brown, E. O. (M)
Campbell, C. M. (M)
Costas, J. P. (SM)
Degan, J. J.
Deitzler, R. P. (M)
Doane, J. T. (M)
Doolittle, W. T., Jr. (M)
Doxey, G. A. (A)
Eliot, A. B. (M)
Face, G. D. (M)
Fancher, H. B. (SM)
Fesko, J., Jr. (M)
Fye, R. P. (M)
Gangberg, F. (M)
Gehmann, R. B. (M)
Gildersleeve, R. E. (SM)
Goor, D. (M)
Grabowski, S. J. (M)
Haller, G. L. (F)
Hannah, W. M. (A)
Hansen, R. E. (M)
Hartman, D. K. (M)
Jones, J. L. (SM)
Kidder, M. S. (A)
Kordalewski, A. P. (M)
Liddle, W. A. (A)
Locke, J. R., Jr. (SM)
Manke, A. G. (SM)
Messer, H. G. (SM)
Mushrush, R. S., Jr. (SM)
Perry, E. V., Jr. (SM)
Presbrich, G. D. (M)
Purser, C. W. (M)
Reinsmith, G. M. (M)
Reverends, H. E. (SM)
Rivas, F. M. (SM)
Rousuit, C. L. (SM)
Russell, J. B., Jr. (F)
Ryerson, J. D. (A)
Schlesinger, K. (F)
Sinback, W. R. (M)
Totten, H. Q. (M)
Vadasz, A. J. (SM)
Varga, J. A. (M)
Waugh, G. T. (M)
West, A. J. (SM)
Xenakis, S. N. (A)

Fernwood (SYR-1)
Manwarren, T. E. (M)

Fishkill (NY-MH-2)
Allen, G. W. (M)
Curtis, R. T. (A)
Dill, H. C. (M)
Farrell, A. C. (A)
McQuaid, W. K. (M)
Stahl, W. L. (SM)
Templeton, H. S. (A)
Wohr, T. E. (M)

Floral Park (LI-2)
Adams, J. C. (M)
Bocchetti, F. J. (A)
Bellantoni, J. (M)
Berenbero, O. (M)
Chimowitz, I. (M)
Eberle, E. E. (M)
Ely, F. E. (M)
Fabbricatore, L. (A)
Garrand, L. W. (SM)
Halliden, F. C. (SM)
Knudson, D. R. (M)
Laspina, C. A. (M)
Lemanczyk, J. C. (M)
Lynch, T. J. (M)
Lyon, R. W. (A)
Marshall, T. A. (M)
Meyer, J. W. (M)
Mooney, V. J. (SM)
Nixon, G. M. (SM)
Peaceman, H. T. (M)
Pollack, P. (M)
Proctor, D. W. (M)
Schutz, D. W. (M)
Sines, J. C. (M)
Slysh, P. (M)
Snitzer, M. S. (M)
Spittal, W. R. (M)
Troupp, L. B. (A)
Vladella, J. W. (A)
Winton, H. J. (M)
Wolf, E. (A)
Yoeckel, R. E. (A)
Zimmerman, G. (A)
Zopf, V. R. (M)

Flushing (LI-2)
Absatz, S. (M)
Adolph, A. R. (M)
Albin, A. L. (SM)
Althmann, S. (A)
Apicella, L. C. (M)
Arany, D. M. (SM)
Auerbach, L. (M)
Auerbach, M. (SM)
Aull, W. (SM)
Barber, A. W. (SM)
Barron, K. F. (M)
Barry, S. (A)
Berkowitz, M. W. (M)
Bernhardt, C. A. (M)
Bettan, M. I. (M)
Blickstein, M. J. (M)
Boate, J. G. H. (A)
Bogdan, A. (M)
Boltan, M. (A)
Boyd, C. H. (M)
Brody, J. (M)
Burns, E. P. (SM)
Cammarata, J. (A)
Carlan, L. B. (M)
Carpenter, J. J., Jr. (M)
Castro, S. J. (A)
Catterson, W. A. (M)
Chaskin, H. (M)
Chin, H. C. (A)
Cifu, J. L. (M)
Climent, L. J. (M)
Corrigan, J. P. (M)
Del Giorno, A. E. (M)
Densaresi, C. J. (A)
Deveau, E. J. (M)
Devine, J. H., Jr. (M)
Dick, A. I. (M)
Donegan, E. V. (A)
Duffy, J. J. (M)
Elefant, J. (M)
Erenburg, S. A. (M)
Feinman, G. (M)
Feldman, L. L. (M)
Fleischman, M. (A)
Franklin, J. I. (A)
Fredricks, I. (M)
Freeman, A. B. (SM)
Fugazzi, C. (M)
Galanter, W. J. (SM)
Garbarini, G. S. (M)
Geiger, R. H. (A)
Gerber, M. M. (SM)
Gershen, B. J. (M)
Gethin, S. A. (A)
Golding, L. S. (M)
Goldstein, S. (A)
Gordon, F. (M)
Gottshrer, E. M. (M)
Granoff, H. W. (M)
Granoff, N. H. (A)
Grevious, J. S. (M)
Grill, J. J. (M)
Grossman, A. S. (A)
Groudan, A. I. (M)
Guarino, P. A. (M)
Harrison, S. (M)
Hatfield, L. N. (SM)
Havemeyer, F. H. (A)
Hertz, S. (A)
Hille, P. F., Jr. (M)
Hillman, K. (M)
Hoffmann, R. R., Jr. (M)
Holleman, E. M. (M)
Jasik, H. (F)
Juhas, L. A. (M)
Kachuck, I. J. (M)
Kalteris, C. P. (M)
Kaplan, R. A. (M)
Kaplan, S. J. (A)
Katz, I. N. (M)
Kaufman, L. (M)
Kent, L. I. (SM)
King, M. (M)
Klein, H. (M)
Koppenhaver, J. T. (A)
Kuehn, C. W. (M)
Kupferberg, K. M. (M)
Lang, R. M. (A)
Langer, P. L. (M)
Lanzisero, N. T. (M)
La Placa, A. P. (A)
Laskin, R. (M)
Lavaglio, D. A. (A)
Lavella, D., Jr. (A)
Leavitt, L. E. (M)
Leck, D. E. (A)
Lee, D. H. (M)
Leibowitz, B. (M)
Lenczowski, T. M. (M)
Levene, L. F. (M)
Levine, J. (A)
Ley, B. J. (M)
Lipperman, L. (M)
Lippmann, J. S. (A)
Liss, M. (M)
Lustig, H. E. (M)
Lynch, W. J. (A)
Lyons, W. (SM)
Marsocci, V. A. (M)
Martin, P. S. (M)
Medici, N. (M)
Melmed, A. (A)
Merson, L. (A)
Mesard, R. A. (M)
Moe, J. L. (M)
Monroe, J. (A)
Murphy, T. J. (M)
Natchipolsky, M. (A)
Nelson, H. H. (M)
Nigro, A. F. (M)
O'Donnell, E. J. (M)
Paradis, B. (A)
Partner, A. I. (A)
Pater, O. C. (A)
Peritz, R. A. (M)
Pillinger, L. (M)
Ranky, B. (SM)
Redisch, M. S. (M)
Rosin, A. (A)
Roberts, G. (A)
Rothmel, B. J. (M)
Rubin, S. (M)
Rubin, S. (A)
Rush, M. (M)
Russ, B. H. (VA)
Sammon, P. J. (M)
Sander, W. M. (M)
Sanial, A. J. (SM)
Scherer, R. L. (M)
Schneiderman, S. (M)
Schwartz, E. (M)
Seda, L. E. (A)
Sherman, D. (M)
Shivack, I. M. (M)
Shoh, A. (M)
Siegmann, M. J. (M)
Sleminski, E. (SM)
Silverlicht, J. W. (M)
Silvermetz, D. (M)
Small, B. (M)
Smilowitz, S. N. (A)
Smith, L. (A)
Sohne, G. C. (A)
Solzberg, S. (M)
Sorensen, S. E. (A)
Sprague, G. J. (A)
Strauss, K. J. (A)
Stump, J. W. (M)
Tangredi, G. F. (M)
Teitelbaum, M. G. (A)
Tucker, M. H. (A)
Uhran, J. J., Jr. (M)
Valente, J. G. (M)
Walrath, D. J. (A)
Wasserman, J. (M)
Weiland, G. H. (M)
Weinshenker, T. J. (M)
Weiss, G. (SM)
Wolf, F. E., Jr. (M)
Youdin, M. (M)
Zadoff, S. A. (A)
Zion, H. (M)
Zivitofsky, F. I. (A)
Zunitch, D. M. (M)
Zuroff, C. A. (M)

Flushing Manor (LI-2)
Belser, L. (A)
Grunet, A. (A)

Forest Hills (LI-2)
Abbot, E. A. (SM)
Aguado, M. M. (M)
Altman, R. B. (A)
Badoyannis, G. M. (M)
Balaban, P. (M)
Baum, S. H. (SM)
Berkin, A. M. (A)
Bronmer, C. J. (M)
Canavaciol, F. E. (SM)
Chamberlain, L. J. (M)
Conn, J. A. (A)
Eng, J. (M)
Fonseca, A. P. (M)
Frankfort, M. J. (M)
Fridshal, R. (A)
Friedlander, E. (A)
Garfinkel, A. R. (M)
Geller, M. (M)
Gister, S. (M)
Gleiner, L. (M)
Goodman, I. (M)
Goodman, S. (M)
Grayson, K. B. (M)
Gunzenhauser, A. (A)
Hausmann, H. C. (SM)
Herbistman, M. I. (M)
Hersch, W. (M)
Hogan, J. V. (SM)
Jacobson, J. (M)
Jankowski, J. R. (A)
Julie, J. (SM)
Katz, S. (M)
Kearny, D. H. (M)
Kent, J. S. (M)
Kniecik, J. E. (M)
Krasny, J. A. (M)
Kustin, S. (M)
Laudon, H. (M)
Margosian, J. W. (SM)
Mariotti, P. G. (SM)
Meth, I. (M)
Mitchell, W. M. (SM)
Mittman, S. A. (M)
Moritz, F. G. (M)

Newton, A. (A)
Ocheret, R. (M)
Ohran, B. V. (M)
Parzen, P. (SM)
Pavane, M. M. (M)
Petrossian, G. (M)
Sandor, A. (SM)
Saphin, H. N. (M)
Schindler, J. P. (M)
Schlechter, I. (A)
Scott, J. E. (M)
Seltz, H. J. (A)
Smith, F. W. (M)
Smith, G. J. (A)
Spiecens, C. P. (M)
Teitscher, E. S. (M)
Tevonian, R. B. (M)
Violette, W. R. (M)
Vivenzio, L. J. (A)
Weber, I. J. (M)
Weiss, E. (A)
Wills, A., Jr. (A)
Winzemer, A. M. (SM)
Woldt, F. R. (M)
Wyle, H. (M)
Yudin, B. (M)
Zimmerman, H. (M)

Fort Edward (SCH-1)
Grahame, F. W. (M)

Fort Tilden (LI-2)
Hauke, F. E. (M)

Frankfort (RU-1)
Carr, E. Q. (M)
Cockburn, C. D. (M)
Krueger, A. R. (M)

Franklin Springs (RU-1)
Kramer, R. S. (M)

Franklin Square (LI-2)
Affias, I. M. (SM)
Avallone, A. (M)
Balogh, J. (M)
Berinsky, M. (M)
Biberacher, R. (A)
Brody, H. H. (A)
Comenzo, L. F. (M)
Daskam, E., Jr. (M)
Dresner, A. (M)
Engelson, B. (A)
Haillsey, R. J. (M)
Harris, S. M. (M)
Holmes, A. P. (A)
Kirwan, J. P. (M)
Kraemer, E. H. (M)
Lee, V. C. (M)
Lipson, W. (M)
Mahler, L. J. (M)
McNealus, A. L. (M)
Moss, L. A. (M)
Rand, G. (M)
Richards, J. A. (A)
Schmerler, S. (M)
Schmidt, R. Q. (M)
Schwalbe, J. H. (M)
Schwartz, L. J. (M)

Fredonia (BN-1)
Bellitto, R. R. (A)
Blohm, C. F. (A)

Freeport (LI-2)
Agopian, A. (A)
Beck, G. S. (M)
Baldarok, H. C. (A)
Bridgeman, T. H. (SM)
Burger, R. L. (M)
Campani, L. M. (M)
Carlson, W. A. (M)
Coggins, W. J. (M)
Di Russo, J. C. (M)
Dolphy, E. L. (VA)
Furst, R. E. (M)
Goldman, J. M. (M)
Gottlieb, H. B. (M)
Henke, G. W. (M)
Kahn, L. R. (SM)
Knox, R. W. (M)
Liquori, F. (M)
Prichard, J. S. (M)
Russell, G. A. (M)
Smedes, R. L. (M)
Sparso, J. S. (A)
Steinberg, C. A. (M)
Stephenson, G. E. (SM)
Tricamo, V. A. (M)
Washton, A. A. (A)
Weiss, F. L. (M)

Freeville (ITH-1)
Wood, R. H. (A)

Fresh Meadows (LI-2)
Feingold, W. (M)
Gebhardt, J. W. (M)
Jude, G. F. (SM)
Marino, J. (M)
Meyer, D. P. (M)
Mulholland, E. J. (A)
Newman, H. (M)
Phillips, A. H. (A)
Pirone, C. (M)
Regis, R. (SM)
Richman, D. (SM)
Shaft, P. D. (A)
Stern, D. L. (M)
Walsh, F. C. (M)

Galway (SCH-1)
David, W. R. (M)

Garden City (LI-2)
Allen, W. T. (M)
Barnaby, R. H. (M)
Beck, A. J. (M)
Beck, C., Jr. (M)
Behr, E. R. (SM)
Bellmer, W. A. (A)
Berglund, E. B. (SM)
Bernsley, J. T. (M)
Berrell, E. J. (A)
Blasbalg, S. (M)
Bolton, G. E. (A)
Cardon, J. (SM)
Chatterton, J. B. (M)
Cherry, E. P., Jr. (M)
Collard, C. A. (A)
Comes, R. W. (SM)
Cowgill, D. E. (SM)
Dalzell, C. W. (M)
Davy, S. J. (SM)
Dean, W. N. (M)
De France, J. J. (SM)
Dietz, H. G. (M)
Doig, H. L. H. (M)
Dunn, L. J. (SM)
Edwards, R. S. (M)
Eriksen, E. M., Jr. (M)
Fisher, D. L. (SM)
Fleisig, R. (A)
Fuller, E. J. (M)
Galante, S. P. (A)
Gavenman, E. H. (M)
Gedney, A. G. (M)
Gemmill, F. Q. (M)
Girodias, R. M. (M)
Gittens, E. D. (SM)
Giulianelli, R. M. (M)
Gregson, A. C. (M)
Hancock, J. R. (A)
Henny, K. (F)
Hesse, A. N. (M)
Hoffman, E. J. (SM)
Kelm, D. V. (M)
King, L. H. (SM)
King, W. E., Jr. (M)
Kirby, M. J. (M)
Kroeger, R. D. (M)
Learned, V. (F)
Lester, J. M. (SM)
Linn, S. S. (M)
Madigan, W. J. (M)
McHenry, J. J. (A)
Meaney, M. H., Jr. (M)
Mellor, W. N. (VA)
Menke, W. W. (M)
Mundo, C. J., Jr. (SM)
Murphy, R. B. (A)
Nason, D. B. (SM)
Niemela, R. J. (A)
Olson, O. F. (M)
Olthuis, R. W. (M)
Pellino, W. M. (M)
Raphael, M. S. (M)
Rau, D. S. (SM)
Ruth, E., III (SM)
Schreitmueller, R. F. (M)
Seay, P. A. (M)
Shaper, H. B. (M)
Shepherd, J. E. (F)
Shute, E. R. (SM)
Simmon, M. (M)
Smith, P. C. (SM)
Smith, W. G. (A)
Sussman, N. (M)
Terry, H. P. (A)
Trifiken, E. R. (SM)
Tschanen, W. (A)
Volpt, D. C. (M)
White, W. T. (SM)
Wies, G. (M)
Winchell, W. H. (VA)

Garden City Park (LI-2)
Braun, L., Jr. (M)
Fitzgerald, J. E. (A)
Frank, K. F. (M)
Leslie, R. E. (A)

Gardiner (NY-MH-2)
Thompson, T. N. (M)

Garnerville (NY-2)
Ten Eyck, R. A. (A)

Garrison (NY-2)
Elmore, W. B. (M)
Lewis, E. J. (M)
Schroeder, C. E. (A)

Geneseo (ROC-1)
Ganiard, R. W. (A)
Laidlaw, W. R. (M)

Geneva (ROC-1)
Benda, D. (M)
Fairbanks, D. I. (M)
Smith, C. L. (A)
Smith, S. S. (M)
Woodworth, D. J. (M)

Germantown (NY-MH-2)
Dougherty, J. W. (A)
Hinkein, D. J. (A)

Glen Cove (LI-2)
Andrews, D. H. (SM)
Aiello, V. S. (M)
Biscoe, G. W. (A)
Brown, L. E. (M)
Buchbinder, M. M. (SM)
Buchlenkirch, A. J. (M)
Cano, J. R. (A)
Cohen, M. (M)
Daly, W. P. (A)
Davis, W. M. (M)
Doncese, G. (A)
Duffy, D. P. (M)
Egnuss, E. M. (M)
Franzisco, G. (A)
Gebhardt, R. J. (A)
Getz, H. (A)
Glassman, S. (M)
Grabbe, D. (A)
Jackson, D. E. (M)
Jorge, A. (M)
Kingsbury, A. P. (M)
Kiser, W. L. (SM)
Klein, M. M. (M)
Lenihan, P. M. (M)
Magagnos, W. F. (M)
McDonough, J. A. (SM)
Papas, J. (A)
Parry, J. P. (M)
Peck, H. E. (M)
Proudfit, A. (M)
Robinson, D. L. (SM)
Scott, G. G. (A)
Shapiro, S. (M)
Shell, W. H. (M)
Smith, H. H. (M)
Souder, C. W. (SM)
Swiggett, R. L. (M)
Whealy, J. E. (SM)

Glendale (LI-2)
Belz, R. A. (A)
Capellupo, F. V. (M)
Dopman, W. G. (M)
Fleming, P. L. (M)
Gomes, C. N. (M)
Merkel, K. (A)
Muth, R. N. (M)
Veit, F. (M)
Vought, N. F. (SM)
Walsh, J. J. (A)

Glen Head (LI-2)
Cetrone, V. C. (M)
Cooke, W. T. (SM)
De Lallo, L. D. (M)
Dow, J. B. (F)
Gauger, R. H. (M)
Hanson, G. N. (SM)
Karels, L. E. (M)
Keeneth, J. A. (A)
Kilman, M. (A)
Martin, E. E. (A)
Mayer, F. N. (M)
McClure, R. E. (M)
O'Brien, T. H. (M)
Reed, F. C., Jr. (M)
Roessler, F. J., Jr. (M)
Simmons, J. C. (M)
Slaughter, G. K. (SM)
Swanson, E. H. (SM)
Timms, R. J. (M)
Todd, P. G. (M)
Tweeddale, J. E. (SM)
Wildenor, M. D. (M)
Zylla, H. R. (M)

Glen Oaks (LI-2)
Binder, D. I. (M)
Botta, A. J. (A)
Broder, A. (M)
Brown, W. K. (M)
Bruce, G. B. (SM)
Byrne, J. P. (A)
Da Reid, J. J. (M)
Dorchak, C. J. (M)
Elliott, R. G. (M)
Farkas, Z. D. (A)
Foley, J. H. (M)
Gallagher, M. L. (M)
Hansen, H. R. (A)
Lally, K. P. (M)
Middlebrook, V. S. (M)
Nelson, A. G. (A)
O'Leary, D. F. (M)
Prasinos, T. (M)
Ross, H. (M)
Sanderson, G. H. (M)
Sharrow, A. H. (M)
Shizume, P. K. (M)
Smith, G. E. (M)
Stewart, J. J. (M)
Storey, M., Jr. (M)

Glen Oaks Village (LI-2)
Breheney, R. F. (A)
Norman, R. H. (A)
Powell, T. (A)
Savadel, R. J. (M)

Glens Falls (SCH-1)
Humphrey, T. R. (A)
Nichols, D. H. (M)
Szydlowski, J. J. (A)
Wells, H. D., Jr. (M)

Gloversville (SCH-1)
Harpes, M. T. (M)

Goshen (NY-MH-2)
McClean, J. F. (SM)

Gowanda (BN-1)
Allen, M. B. (M)

Grand Island (BN-1)
Barnes, J. A. (M)
Knapp, W. H. (A)
Moreau, A. (M)
Prast, J. W. (A)

Gravesville (RU-1)
Bigelow, R. W. (A)

Great Neck (LI-2)
Abrams, H. N. (M)
Adams, J. (M)
Adise, H. H. (M)
Aichele, P. F. (SM)
Anderson, W. M. (M)
Appleman, L. (M)
Astrow, M. (M)
Bachman, H. L. (SM)
Beck, D. H. (SM)
Becker, J. E. (M)
Bender, A. (M)
Benjamin, J. N. (SM)
Bloom, C. H. (M)
Blumkin, R. (M)
Brian, J. (M)
Brown, D. A. (M)
Browning, J. H. (M)
Butt, R. J. (A)
Camplon, S. F. (A)
Chalkin, M. (A)
Chubb, C. F., Jr. (SM)
Coe, M. R. (SM)
Collstra, W. P. (M)
Cook, C. E. (SM)
Crawford, J. D. (SM)
Crimmins, J. W. (M)
Croly, J. W. (A)
Crosby, R. W. (M)
De Fries, H. A. (A)
Dell'Acqua, L. (M)
Dettinger, D. (SM)
Dostal, F. X. (A)
Drossos, J. (M)
Dryostep, J. J. (SM)
Dunlap, O. E., Jr. (SM)
Engelson, H. R. (A)
Erickson, R. L. (M)
Evans, R. A. (A)
Foley, T. P. (A)
Frank, R. L. (SM)
Frantz, W. P. (SM)
Frische, C. A. (F)
Garville, L. R. (M)
Gittelman, J. N. (M)
Goldstein, S. H. (A)
Goodstein, L. P. (SM)
Graham, V. M. (F)
Green, W. F. (M)
Greene, S. J. (M)
Grizzel, R. W., Jr. (M)
Guttman, M. D. (A)
Hanfling, J. D. (M)
Hannan, P. W. (SM)
Harris, H., Jr. (M)
Hamel, W. J. (M)
Hauser, A. A., Jr. (M)
Hershler, A. (M)
Hershyn, W. (M)
Hinden, A. (M)
Holcomb, P., Jr. (SM)
Holmboe, L. W. (SM)
Hrunek, R. L. (SM)
Huber, W. J. (M)
Isbister, E. J. (F)
Jaffe, D. L. (SM)
Jahn, D. M. (M)
Jarecky, J. L. (M)
Jasik, C. (SM)
Kahn, M. B. (SM)
Katzelnick, H. (A)
Ketay, M. F. (SM)
Kino, J. J. (M)
Knittel, G. H. (M)
Krencik, P. M. (A)
Kudo, Y. (M)
Landsman, D. I. (A)
Larick, S. H. (M)
Lazar, E. F. (SM)
Leeds, G. G. (A)
Lerz, O. M., Jr. (SM)
Levers, E. O. (A)
London, F. H. (A)
Mac Lean, W. D. (M)
Maloney, R. T. (M)
Marcuvitz, N. (F)
Martin, E. J. (M)
Mayerson, M. I. (M)
McBee, W. D. (SM)
McNamara, D. J. (M)
Miller, C. R. (M)
Milton, J. (A)
Milton, L. (M)
Mindell, M. I. (A)
Morgan, J. F. (M)
Morrison, M. (M)
Mulligan, J. R. A., Jr. (M)
Myles, H. E. (M)
Naldamast, D. (SM)
November, F. D. (A)
November, P. M. (M)
Orynskin, M. (M)
Padovano, R. J. (M)
Paley, W. D. (M)
Phillipos, L. E. (SM)
Plantenroth, J. A. (M)
Puttre, R. E. (M)
Redllen, H. W., Jr. (M)
Reid, W. (A)
Reils, J. D. (M)
Reuther, D. W. (M)
Riddell, R. B. (A)
Ripple, J. W. (M)
Roake, W. C. (M)
Robin, N. (A)
Rosanes, A. P. (M)
Rosenberg, S. L. (M)
Rostky, G. H. (M)
Roth, A. M. (M)
Rutman, S. M. (A)
Sadler, L. R. (M)
Saladna, J. C. (M)
Schimmel, H. (M)
Schmidt, E. R. (M)
Schneider, R. M. (SM)
Schwartz, J. M. (M)
Schwartz, L. S. (SM)
Segall, R. P. (M)
Shutterly, H. B. (A)
Sieven, R. L. (M)
Sperling, J. G. (M)
Spero, R. E. (A)
Stark, E. W. (M)
Sterns, R. B. (M)
Stone, S. M. (M)
Sturgeon, W. S. (SM)
Sussman, H. (SM)
Taffet, M. S. (M)
Tanenbaum, M. S. (SM)
Tenenbaum, F. (M)
Tindall, K. V. (M)
Toll, P. A. (A)
Tuminaro, R. D. (M)
Van Davelaar, F. S. (SM)
Vaupel, G. E. (A)
Vehslage, E. P. (M)
Ward, W. C., Jr. (M)
Wathen, R. L. (M)
Weill, A. E. (M)
Welch, T. J. (M)
Wheeler, H. A. (F)
Whitfield, E. W. (M)
Williams, F. H. (SM)
Winter, N. L. (M)
Wohl, R. J. (M)
Zbar, P. B. (M)
Zellers, J. E., Jr. (A)

Greenlawn (LI-2)
Graham, W. T. (M)
Horne, W. J., Jr. (M)
Johnston, H. (M)
Lisy, B. J. (M)
Morse, R. V. (M)
Nelson, R. T. (SM)
Parker, R. H. (M)
Schebleln, G. M., Jr. (A)
Schoenfeld, K. (M)
Shergalis, L. D. (M)

Greenport (LI-2)
Shipman, J. W., III (M)

Greenvale (LI-2)
Best, R. A. (M)
Di Paolo, E. M. (M)
Goldsmith, K. G. (M)
Hansel, P. G. (F)
Harrison, A. E. (SM)
Siegmund, E. L. (M)

Griffiss AFB (RU-1)
Dausin, L. R. (M)
Guffey, H. F. (M)
Kolhaas, R. L. (M)
Marlow, S. C. (A)
Pope, J. N., Jr. (M)
Shannon, P. D. (M)
Watkins, B. O. (M)
Winbigler, W. K. (M)

Guilderland (SCH-1)
Hannam, H. J. (M)

Kalesite (LI-2)
Donnelly, F. L. (A)
Lalvo, V. W. (M)
Larson, A. F. (SM)
Warner, W. V. (A)

Hamburg (BN-1)
Euler, J. R. (M)
Fiedler, L. (M)
McBride, N. G. (A)
Przybyl, R. P. (M)
Talbot, R. D. (M)

Hamilton Beach (LI-2)
Pihl, R. L. (A)

Hampton Bays (LI-2)
Turner, F. T. (M)

Harpursville (BINC-1)
Lawrence, N. S. (M)

Harrison (NY-W-2)
Carpiniello, F. (A)
De Pasquale, R. H. (SM)
Gallone, W. J. (A)
McIntyre, F. P. (M)
Modugno, V. D., Jr. (A)

Hartsdale (NY-W-2)
Belchis, S. (M)
Bonney, H. W. (M)
Byrne, R. M. (M)
Cloud, P. R. (M)
Engelhardt, G. B. (SM)
Gillette, D. (A)
Gordon, R. S. (M)
Guidi, W. R. (M)
Medoff, H. (M)
Robertson, H. E. (M)
Seelbach, W. C. (M)
Shorr, S. (SM)
Simon, M. L. (M)

Vogt, H. T., Jr. (M)

Hastings-On-Hudson (NY-W-2)
Archbald, R. W. (SM)
Batchelor, J. C. (SM)
Garman, R. L. (F)
Hohberger, H. P. (A)
Lodge, W. B. (F)
Ripp, H. (M)
Schaefer, L. E. (M)
Vavoudis, S. N. (M)

Hauppauge (LI-2)
Scheller, J. A. (A)

Hawthorne (NY-W-2)
Augustine, R. O. (M)
Hales, E. B. (M)

Hempstead (LI-2)
Allen, C. M. (M)
Bedingfield, S. G. (M)
Bellmar, C. L. (M)
Brosch, W. A. (M)
Cappadona, W. L. (M)
Comitz, P. (M)
Diorio, J. (A)
Eklund, K. E. (M)
Epstein, I. (M)
Evans, J. E., Jr. (M)
Feher, H. (M)
Gould, G. A. (A)
Gustus, D. A. (M)
Johnson, H. E. (A)
Keonjian, E. (SM)
Kilmer, T. W. (A)
Lesser, J. (SM)
Mandl, G. P. (SM)
Michaels, G. M. (M)
Morishita, N. (M)
Morris, R. C., Jr. (A)
Peters, J. L. (SM)
Philbin, M. J. (M)
Pilnick, C. (SM)
Rudnick, I. M. (A)
Selkirk, W. J. (M)
Skirrow, J. E. (A)
Stewart, J. W. (A)
Ury, G. A., Jr. (A)
Vaughan, J. A. (M)
Verton, M. P. (M)
Westover, T. A. (SM)
Williams, J. H. M. (M)
Zimbalatti, A. G. (M)

Henrietta (ROC-1)
Carey, J. J. (M)

Hewlitt (LI-2)
Kahgan, J. J. (M)

Hewlett Harbor (LI-2)
Cahan, L. C. (M)

Hicksville (LI-2)
Abjanich, G. S. (M)
Amodeo, C. F. (M)
Baggia, R. J., Jr. (M)
Bassett, W. H., Jr. (A)
Bernstein, H. (M)
Breck, L. R., Jr. (M)
Brooks, M. S. (A)
Brown, G. C. (M)
Cady, R. T. (M)
Chaber, R. K. (M)
Cines, S. M. (A)
Colgan, G. P. (M)
Cosonas, A. (A)
Daun, A. (SM)
Dolin, M. (M)
Emilio, G. A. (A)
Fein, A. (M)
Feinstein, J. (M)
Figlia, J. R. (M)
Fink, A. (SM)
Freier, M. (M)
Fry, W. H. (M)
Goodman, L. (M)
Goodwin, R. L. (M)
Gould, L. J., Jr. (M)
Hagedorn, H., Jr. (A)
Hall, J. D. (M)
Haller, K. A. (M)
Hartman, A. (A)
Hayes, W. A. (A)
Herman, S. (M)
Kawaller, J. (M)
Kennedy, J. B. (M)
Kieves, J. K. (A)
Kikta, M. S. (A)
Kowell, R. E. (A)
Kramer, S. (M)
Kretzing, J. C. (M)
Kuskowski, L. J. (A)
Lonschein, J. F. (A)
Loh, P. A. (SM)
Martin, R. W. (M)
Melrowitz, R. L. (M)
Meyer, F. (M)
Monahan, D. P. (M)
Muller, W. M. (M)
Murray, P. C. (A)
Naftulin, A. D. (M)
Niemiraki, W. V. (A)
Noland, J. A. (M)
Noneman, F. A. (M)
Oberlies, J. L. (M)
Pavalow, M. (SM)
Popik, M. J. (M)
Rabin, G. C. (M)
Rehbehn, J. E. (M)
Rennie, M. (A)
Rudich, I. (M)
St. John, K. M. (SM)
Schwartz, P. (A)
Seckel, J. P. (M)
Seldon, A. (M)
Sherry, L. I. (M)
Sicuranza, C. A. (M)
Sikalis, C. (M)
Simon, I. A. (M)
Slusarchyk, G. J. (M)
Smith, W. F. (M)
Spence, H. W. (M)
Sposato, F. J. (M)
Strong, J. J., Jr. (M)
Tilly, V. F. (M)
Variano, V. V. (M)
Waller, H. H. (M)
Wasson, I. (M)
Weiner, M. L. (A)
Weinrauch, A. (M)
Williams, G. W. (SM)
Wolk, B. (M)
Zampino, F. J. (A)
Zimmerman, H. (M)
Zinn, L. (M)

Highland (NY-MH-2)
Harrison, B. A. (M)
McCoy, W. B. (M)
Pinto, M. A. (A)
Royer, G. H. (M)

Hillburn (NY-2)
Teso, W. A. (M)

Hillsdale (NY-MH-2)
Saseff, S. S. (M)

Hilton (ROC-1)
Jeffers, R. K. (M)

Holcomb (ROC-1)
Hudson, D. M. (M)

Holland Patent (RU-1)
Bennison, G. K. (M)
Ladwig, H. A. (M)
McCann, G. R., Jr. (A)
Millet, J. F. (A)
Pulhamus, W. R. (M)
Ryerson, J. L. (M)
Stahlberger, W. C. (M)

Hollis (LI-2)
Auerbach, A. A. (M)
Brennan, A. T. (A)
Caputo, N. J. (VA)
Edell, J. J. (M)
Hultmark, R. S. (M)
Johanson, P. (A)
Larsen, G. R. (A)
Lurin, E. S. (M)
McDuffie, T. E. (M)
Prior, F. J. (A)
Richter, I. P. (A)
Schlafly, H. J. (SM)
Thomson, G. W. (M)
Walko, D. G. (M)

Holliswood (LI-2)
Marcus, P. (M)

Hoosick Falls (SCH-1)
Case, C. C., Jr. (M)
De Luca, A. P. (M)

Hopewell Junction (NY-MH-2)
Allen, C. A. (M)
Butler, R. A. (A)
Lear, E. F. (A)
Meyers, M. M. (A)
Slobodzinski, E. J. (M)
West, R. L. (SM)
With, E. D. (M)

Hornell (ELM-C-1)
Deegan, T. E. (M)

Horseheads (ELM-C-1)
Alexander, J. J. (A)
Bamford, A. J. (M)
Betts, B. J. (M)
Canty, B. R. (M)
Gerard, W. A. (M)
Gleason, C. H. (SM)
Groo, H. R., III (M)
Kylander, J. C. (M)
Larson, R. G. (SM)
Mansfield, W. O., Jr. (M)
Playfoot, K. C. (A)
Powell, K. D. (M)
Rial, W. S. (M)
Rice, L. (A)
Sadler, J. G. (SM)
Soule, W. J. (M)
Staples, R. L. (M)
Welton, D. A. (M)
White, R. A. (SM)

Hudson Falls (SCH-1)
Clark, N. R. (M)
Cohen, M. (A)
Scoville, M. E. (SM)

Howard Beach (LI-2)
Freedman, L. M. (A)
Green, M. (M)

Hughsonville (NY-MH-2)
Walter, G. (A)

Huntington (LI-2)
Alber, J. D. (M)
Andres, N. E., Jr. (M)
Ball, L. X. (M)
Beers, M. I. (SM)
Bennett, A. I. (M)
Billihimer, R. D. (A)
Bubbers, J. J. (A)
Burke, E. W., Jr. (SM)
Carroll, J. M. (M)
Caswell, J. N. (SM)
Comstock, G. E., III (M)
Copel, M. (SM)
Dannals, H. J. (M)
De Rocher, W. L. (SM)
Dosch, T. J. (M)
Duryea, J. C. (SM)
Elcher, H. G. (M)
Evans, J. M. (SM)
Evans, R. L. (A)
Evans, T. L. (M)
Feltham, C. F. (M)
Ferrier, D. T. (SM)
Fetrowitz, L. (M)
Forsberg, K. E. (M)
Gilbert, R. C. (SM)
Godfrey, E. R., Jr. (SM)
Gore, J. H. (M)
Gretz, R. W. (M)
Gunsaulus, L. A. (M)
Gutlove, N. M. (M)
Hanley, G. L. (M)
Hansen, C. A. (SM)
Hartman, L. A. (M)
Hinchey, R. L. (M)
Holcombe, P. G. (M)
Howell, S. N. (A)
Hoxie, I. R., Jr. (A)
Hutchison, T. C. (M)
Johnson, R. L., Jr. (M)
Joss, E. T. (M)
Juman, H. R. (A)
Kenyon, D. E. (SM)
Keogh, R. J. (M)
Klose, R. C. (M)
Kreschollek, F. W. (A)
Kulik, H. S. (M)
Lahm, G. P., Jr. (M)
Leibholz, S. W. (A)
Lipoke, J. A. (M)
Lockwood, R. C. (SM)
Loecher, G. S. (M)
Losee, W. B., Jr. (M)
Loughlin, B. D. (F)
Lyons, R. C. (M)
MacDonald, W. W. (SM)
Maher, T. F. (SM)
Matthews, L. M. (M)
Mc Coy, J. H. (SM)
Mclsaac, P. R. (A)
Merrill, G. (SM)
Michalski, E. H. (M)
Nehrbas, T. C. (M)
Packard, K. S., Jr. (SM)
Palter, N. H. (SM)
Perry, J. S. (M)
Poppe, C. W. (A)
Robertson, A. S. (M)
Rosar, M. T. (M)
Russell, J. A., III (M)
Sachs, B. K. (M)
Safran, M. (M)
Sard, E. W. (M)
Schaefer, A. E. (M)
Schroeder, K. R. (SM)
Search, R. W. (M)
Setaro, J. E. (M)
Sherman, C. M. (A)
Simons, R. F. (SM)
Singer, J. S. (M)
Soboleski, W. P. (M)
Spacie, R. W. (A)
Sperber, A. O. (SM)
Stengel, J. F., Jr. (A)
Suske, C. C. (A)
Swenson, W. J. (A)
Vogel, E. (SM)
Weaver, S. E. (M)
Weber, R. L. (M)
Wheeler, R. B. (M)
Winslow, R. G. (M)
Yamamoto, G. H. (M)

Huntington Station (LI-2)
Abourezk, W. (A)
Agree, I. (M)
Attura, G. M. (M)
Bernay, R. A. (M)
Buehrle, W. E., Jr. (A)
Connor, W. E., Jr. (A)
Danner, F. G. (M)
De Troy, B. A. (A)
Dickerson, N. I. (M)
Driscoll, F. X. (M)
Emerson, J. (SM)
Farkas, J. J. (M)
Fox, J. L. (A)
Fraser, R. (M)
Freundlich, M. M. (SM)
Gilmartin, J. J., Jr. (M)
Goldstein, A. (M)
Graven, C. J. (M)
Grib, B. F. (M)
Gross, S. H. (SM)
Hall, R. L. (SM)
Harder, J. F. (M)
Hein, R. W. (M)
Jaffe, H. (M)
Joline, E. S. (A)
Jolly, E. F. (M)
Kerzner, N. A. (M)
Kintner, P. M. (SM)
Kishi, H. J. (M)
Knecht, R. A. (SM)
Koppel, A. D. (SM)
Kronenpold, M. (M)
Krusos, D. A. (M)
Kuhn, K. H. (M)
Ladd, G. T. (M)
Lamb, H. M. (SM)
Lane, J. J. (A)
La Planta, R. A. (M)
Leeds, D. (M)
Lehr, P. (SM)
Lemberger, S. (M)
Levine, S. (M)
Liguori, A. (SM)
Marchesano, J. E. (M)
Marcus, J. A. (M)
McDermott, F. A. (M)
McMenamin, J. M. (M)
Melchner, F. T. (M)
Mesecher, M. G. (A)
Miller, M. P. (M)
Morrow, A. J. (A)
Nelson, E. P. (M)
Newdale, E. I. (M)
Noll, T. T. (SM)
Olson, C. W. (M)
Orford, R. J. (M)
Papamarcos, G. (M)
Popylisen, D. J. (M)
Richardson, C. M. (M)
Richter, F. G. (A)
Ritchey, N. B. (SM)
Roberts, F. G. (M)
Rosen, M. (SM)
Sammis, S. L., Jr. (M)
Schauerman, J. R. (M)
Schramm, C. T. (M)
Schroter, R. G. (M)
Schwaninger, J. W. (M)
Schwartz, B. (M)
Shergalis, D. J. (M)
Smith, E. F. (M)
Strazzulla, R. L. (M)
Uzzo, A., Jr. (M)
Vandenburgh, A. A. (A)
Vetter, W. F. (SM)
Walker, A. C. (M)
Wantz, B. G. (M)
Williams, H. R. (A)
Williams, R. J. (SM)
Wochinger, R. (SM)
Wright, M. L. (M)

Hurley (NY-MH-2)
Hofler, J. J. (A)
O'Reilly, J. P. (M)
Turner, J. M. (M)
Walston, C. E. (SM)

Hyde Park (NY-MH-2)
Bielawa, F. R. (A)
Burke, M. L. (M)
Cooper, R. A. (A)
Crowe, J. W. (M)
Dettling, A. K. (A)
Digan, T. E. (A)
Eckelman, P. F. (M)
Grubo, D. S. (M)
Hartwig, A. D. (M)
Henle, R. A. (M)
Hohmann, R. E. (M)
Kauffmann, J. A. (A)
McCarter, G. B. (M)
Muenzer, B. M. (M)
Patti, M. J. (M)
Rodriquez, L. H. (A)
Trimble, L. F. (M)
Whitenack, R. M. (A)

Ilion (RU-1)
Dally, B. A. (M)
D'Hoostelaere, A. C. (M)
Momberger, P. E. (M)
Pierce, D. C. (M)

Inwood (LI-2)
Geske, R. N. (A)

Irvington (NY-W-2)
Dickstein, S. R. (M)
Sommer, E. I. (M)

Irvington-On-Hudson (NY-W-2)
Arfin, B. (SM)
Auerbacher, W. F. (SM)
Espersen, G. (F)
Hipple, J. A. (SM)
Kelton, G. (SM)
Kohler, T. R. (SM)
Maps, C. E. (A)

Island Park (LI-2)
Horowitz, H. (M)
Marino, P. J. (M)
Preisler, M. (M)

Islip (LI-2)
Daubaras, E. J. (M)
Geyer, G. E. (M)
Maher, E. F. (A)
Oberbeck, J., Jr. (A)
Reeves, W. B. (M)

Islip Terrace (LI-2)
Monsees, F. G. (A)

Ithaca (ITH-1)
Antrum, P. D. (M)
Ares, M. (M)
Baker, H. D. (M)
Blair, W. W. (A)
Blatt, E. J. (M)
Bolgiano, R., Jr. (M)
Booker, H. G. (F)
Brierley, D. H. (M)
Bryant, N. H. (M)
Bullock, A. J., Jr. (A)
Cameron, B. (M)
Campbell, J. B. (M)
Charton, P. W. (SM)
Chernoff, D. P., (M)
Cohen, M. H. (M)
Colbert, S. M. (M)
Dalman, G. C. (SM)
De Claris, N. (M)
Eastman, L. F. (M)
Farrell, G. F., Jr. (M)
Ferris, E. E. (A)
Ford, L. H. (M)
Gordon, W. E. (SM)
Greer, D. L. (A)
Hackett, C. M., Jr. (M)
Hansell, P. D. (M)
Harris, D. C. (M)
Harris, J. E. (A)
Hautaniemi, B. W. (M)
Hazebrook, H. (M)
Hildreth, R. F. (M)
Holden, W. D. (M)
Hollar, M. E. (A)
Howland, I. R. (SM)
Ingalls, C. E. (SM)
Jackson, A. S. (M)
Jankowski, H. (M)
Johnson, E. M. (M)
Kantor, G. (M)
Kerns, G. P. (A)
Knoeller, R. W. (M)
Kran, W. P. (M)
Lawton, J. G. (M)
Levine, S. W. (M)
Lind, E. R. (M)
Lipp, J. P. (M)
Maresca, T. J. (A)
Matt, S. (M)
May, J. C. (M)
Mayer, H. F. (F)
McGaughan, H. S. (SM)
McLean, T. (SM)
Merrill, R. C. (M)
Meserve, W. E. (SM)
Mitchell, M. E. (M)
Nichols, B. (SM)
Nitzberg, R. (A)
Parker, R. R. (M)
Perry, A. D., Jr. (M)
Perry, F. M. (SM)
Pressly, W. H., Jr. (M)
Rayl, G. J. (M)
Rider, L. S. (M)
Roberts, C. R. (M)
Robins, R. S. (SM)
Rogers, R. G. (A)
Rooney, T. J. (M)
Ruck, H. C. (M)
Sample, G. A. (M)
Sanford, J. R. (M)
Seymour, M. E. (M)
Seymour, R. N. (M)
Shourer, F. (A)
Smith, H. G. (M)
Stanton, J. W. (M)
Struckman, K. A. (M)
Swana, J. J. (A)
Teegarden, W. M. (A)
Temple, K. A. (A)
Thornton, R. D. (M)
Warr, R. E. (M)
Webb, J. S. (SM)
Whyland, W. P. (M)
Wolf, D. A. (M)
Young, M. C. (M)
Zimmerman, S. W. (SM)

Jackson Heights (LI-2)
Alford, J. R. (M)
Anastos, E. G. J. (M)
Berlly, E. (M)
Bertan, L. L. (M)
Bila, P. (M)
Brenner, A. (A)
Buzzanca, V. J. (M)
Castrignano, R. A. (SM)
Codina, J. G. (A)
Cosachov, B. (A)
Demlit, G. (M)
Dorato, P. E. (M)
Dudek, J. J. (A)
Dupot, R. S. (A)
Eng, R. S. (M)
Facey, J. W. (VA)
Flum, E. (M)
Gaillard, R. L. (M)
Glick, H. (M)
Gommo, F. J. (M)
Graf, J. M. (M)
Green, S. (M)
Griebell, C. A. (M)
Grunwald, F. S. (A)
Hall, R. C. (M)
Hartt, C. J. (A)
Hart, E. T. (M)
Hollabaugh, M. G. (SM)
Hone, R. (M)
Karlsruher, G. W. (M)
Kelley, L. A. (M)
Kerner, T. (M)
Levine, S. (M)
Lipszyc, O. F. (SM)
Mahler, R. J. (M)
Marsocci, M. R. (M)

Martinez, E. P., Jr. (A)
Mazzzara, A. (A)
Michaelson, H. B. (M)
Mullin, J. F. (M)
Nemchok, W. J. (M)
Papke, F. E. (M)
Paterno, P. M. (M)
Pleasure, M. (SM)
Pribar, Z. (SM)
Rehberg, C. F. (M)
Rehfeld, M. J. (M)
Rudis, M. (M)
Samsky, B. S. (SM)
Scholer, R. M. (A)
Seligson, A. L. (M)
Shapiro, J. F. (A)
Terleckyi, J. (A)
Tomes, S. R. (SM)
Torian, J. T. (SM)
Tucci, C. J. (A)
Weil, K. (M)
Zirin, M. J. (A)
Zisselman, A. (A)

Jamaica (LI-2)
Baldwin, T. W. (M)
Barsanti, D. H. (A)
Berlin, E. P. (A)
Bernstein, G. (SM)
Bertuccio, D. J. (M)
Bodow, J. (M)
Bronstein, S. H. (M)
Bruch, R. (A)
Bukofzer, R. (M)
Cadek, J. (M)
Carter, B. S. (M)
Carvajal, J. A. (A)
Cataldi, J. T. (M)
Deloi, D. J. (M)
Dubinsky, A. C. (M)
Farren, R. W. (A)
Faux, W. H., Jr. (M)
Fritsche, A. J. (A)
Fuchs, H. B. (A)
Funck, E. V. (M)
Gilleran, F. M. (M)
Gloor, B. T. (A)
Gordon, J. J. (M)
Granet, A. J. (M)
Grigoraki, N. M. (M)
Hargrave, E., T. (A)
Havel, J. F. (A)
Holland, B. S. (A)
Homa, R. M. (M)
Hutter, R. G. E. (F)
Jacobs, B. (M)
Kamen, S. K. (M)
Karvel, C. T. (A)
Koffman, I. (M)
Kraus, J. (SM)
Lewinstein, M. (SM)
Martin, J. R. (A)
Melman, M. (M)
Menaker, D. S. (M)
Moos, A. M. (M)
Myles, M. D. (M)
Niczky, T. A. (M)
Olsen, R. T. (A)
Paledes, T. P. (M)
Pan, J. W. (M)
Resnick, S. (M)
Robbins, A. (M)
Roberts, A. (M)
Sachs, R. (SM)
Schachter, I. K. (A)
Schlachter, C. P. (A)
Schwarz, F. C. (M)
Seelig, K. V. (A)
Shottenfeld, R. (M)
Stark, H. M. (M)
Suisky, B. (M)
Theodoseau, T. (A)
Topper, L. (A)
Trachtenberg, J. M. (A)
Trochtenberg, H. J. (M)
Vaher, E. (M)
Weisman, L. S. (M)
Weiss, J. (M)
Wiesner, S. (SM)
Zacharlou, H. (M)
Zibiatt, R. (A)

Jamaica Estates (LI-2)
Bernstein, J. (SM)
Seidmann, R. W. (M)

Jamestown (ERI-1)
Crissey, D. L. (A)
Jazbutis, A. (M)

Jamesville (SYR-1)
Batz, J. C. (M)
Raper, J. A. A. (A)

Jericho (LI-2)
Barbells, A. M. (M)
Baumel, I. D. (M)
Bryerman, G. J. (M)
Hartel, R. (M)
Hasenfus, R. G. (A)
Houseworth, G. H. (SM)
Jacobson, N. (M)
Kurz, F. A. (M)
Leight, J. (M)
Levinson, E. (M)
Locker, M. H. (M)
Mehlman, S. J. (SM)
Miller, G. E. (A)
Novick, M. (M)
Pincus, M. (M)
Torgow, E. N. (SM)
Trevisin, R. F. (M)

Jewell (RU-1)
Markham, I. F. (M)

Johnson City (BING-1)
Arnold, O. E. (M)
Barbieri, G. (A)
Black, T. L. (M)
Bosman, E. H. (M)
Cantwell, R. J. (M)
Carros, J. R. (A)
Caulfield, J. T. (M)
Damron, D. H. (A)
Demer, F. M. (A)
Dervay, W. (A)
Duran, F. A., Jr. (SM)
Fournier, L. E. (M)
Fry, L. D. (M)
Fuchiek, R. J. (M)
Garr, D. E. (SM)
Herzig, D. F. (M)
Ingram, J. J. (M)
Johnson, M. R. (SM)
Jones, R. A. (M)
King, F. N. (M)
Miller, H. T., Jr. (A)
Moore, R. P. (M)
Nasoni, D. E. (A)
Neyhart, P. L. (M)
Pittsley, E. L. (M)
Pratt, R. L. (M)
Rangitsch, E. L. (M)
Rudwick, B. H (SM)
Rusnak, M. E (M)
Schultz, D. D. (M)
Sims, J. R. (M)
Sullivan, D. L. (M)
Tye, G. (A)
Wills, J. R. (M)

Johnstown (SCH-1)
Vunk, A. C. (M)

Katonah (NY-W-2)
Bender, R R. (A)
Cassidy, J. J. (M)
Davison, R. D. (A)
Hilliard, W. P. (M)
Stuckert, P. E. (M)
Weller, D. R. (SM)

Keeseville (SCH-1)
Bezlor, B. R. (A)

Kenmore (BN-1)
Anderson, E. W. (M)
Archibald, W. R. (M)
Arthur, R. J. (M)
Bechtel, M. E., Jr. (M)
Brown, R. M. (A)
Browne, J. F. (M)
Constantino, J. C. (M)
Cooke, D. E. (A)
Dietrich, R. W. (M)
Fleming, R. W. (A)
Francfemont, H. J., Jr. (A)
Iverson, R. W. (M)
Kaushagen, W. M. (SM)
Klingenmeier, P. L. (M)
Kohman, E. J. (M)
Koncsol, A. E. (A)
Lamy, R. H. (M)
Laufer, E. A. (M)
Leggiere, D. D. (M)
Le Van, W. I. (M)
Okun, A. M. (SM)
Oxley, V. C. (M)
Riggs, J. H. (SM)
Roess, T. L. (A)
Rupp, E. W., Jr. (SM)
Slomski, J. J. (M)
Spears, R. E. (A)
Stephenson, H. B. (M)
Swartzlander, D. E. (A)
Warren, F. H. (M)
Welmers, E. T. (SM)

Kerhonkson (NY-MH-2)
Greenberg, H. (M)

Kew Gardens (LI-2)
Arguello, R. J. (M)
Barber, D. (M)
Benscher, W. (A)
Berman, H. M. (SM)
Bidner, H. (A)
Blanco, M. G. (M)
Devito, M. F. (M)
Dircks, H. F. (M)
Espenschied, L. (F)
Friedman, I. (A)
Fu, C. (M)
Gordon, R. L. (A)
Hammwohner, J. (M)
Jacobs, M. (M)
Jensen, A. J. (M)
Klipperman, W. (A)
Kraker, D. I. (M)
Landauer, A. (A)
Lieberman, A. G. (M)
Lurye, J. R. (M)
Marantz, S. B. (A)
Polettl, G. (A)
Reuter, P. J. (SM)
Roberts, A. K. (SM)
Robertson, J. H. (M)
Robinson, H. L. (M)
Rosenberg, M. (M)
Schultz, M. L. (A)
Seliger, V. H. (SM)
Smith, C. I. (M)
Smith, C. R. (SM)
Spett, H. (M)
Spielman, S. (M)
Stern, F. G. (M)
Stiel, J. (M)
Stock, D. C. (M)
Taylor, J. M. (M)
Warren, D. M. (M)
White, G. R. (M)
Wiesner, L. (M)

Kings Park (LI-2)
Goodman, K. G. (M)
Liverios, D. T. (M)
Loprieco, M. G. (M)
Pretl, L. L. (SM)
Williamson, L. A. (A)

Kingston (NY-MH-2)
Ambrosini, F. (M)
Ameth, A. P., Jr. (SM)
Baxter, D. W. (A)
Bliss, B. E. (A)
Bloxsome, J. L. (M)
Breiding, E. J. (M)
Brown, M. E. (M)
Byman, E. C. (M)
Capasso, G. F. (M)
Carlson, J. W. (M)
Carroll, W. N. (A)
Clark, J. M. (M)
Conklin, R. N. (M)
Cooley, H. E. (M)
Counihan, R. G. (M)
Craft, B. C. (M)
D'Antonio, R. A. (M)
Dolan, P. A. (A)
Doman, D. B. (M)
Dougherty, R. L. (A)
Douglas, R. M. (A)
Dumas, A. M. (M)
Edgerton, J. F. (A)
Eisenstein, A. M. (M)
Ellsworth, J. L. (M)
Glass, D. H. (M)
Gordon, C. R. (A)
Groce, J. L. (M)
Hackenberg, F. U. (M)
Hairabedian, B. Z. (M)
Hamlin, J. E. (M)
Hayden, H. P. (M)
Heassler, R. A. (M)
Hollis, L. L. (M)
Hughes, M. W. (M)
Jenny, F. F. (M)
Johnson, E. L. (M)
Jones, R. L. (M)
Kaufman, H. B. (M)
Kenney, R. C. (M)
Kloepping, J. (A)
Krause, H. W. (M)
Laird, J. A., III (M)
Lampe, A. W. (M)
Linton, J. H. (M)
Malden, A. E. (M)
Mine, G. D. (A)
Mallin, E. J. (M)
Newton, J. D. (M)
Nienburg, R. E. (SM)
Ollive, J. F. (M)
Onysyk, J. (A)
Perimutter, T. W. (M)
Phillips, E. L. (M)
Pinsly, A. L. (SM)
Proudfoot, G. D. (M)
Reid, G. M., Jr. (M)
Rolfe, R. G. (M)
Roth, C. G. (M)
Ruffino, L. V. (M)
Schaaf, S. (A)
Schlam, D. (A)
Schoepf, D. B. (A)
Schrufer, H. J. (A)
Sebasky, G. M. (M)
Shortle, J. W. (M)
Siphers, J. W. (M)
Sirowatka, J. C. (A)
Skerritt, J. W. (A)
Smith, C. L. (M)
Trombly, R. L. (M)
Tuchman, W. L. (M)
Tubviler, K. E. (M)
Walker, D. L. (M)
Ware, N. E., Jr. (M)
Warren, D. J. (M)
Washburne, J. R., Jr. (M)
Watkins, D. L. (M)
Whalen, R. J. (M)
Williams, C. W. (M)
Yanoschak, V. (A)
Zetkov, J. R. (A)

Kirkville (SYR-1)
Byke, B. J. (A)
Hathcock, J. S., Jr. (M)
Smith, S. L. (M)
Stiver, J. W. (A)
Winfield, W. S. (M)

Lackawanna (BN-1)
Duma, E. D. (A)
Fetterolf, W. F. (A)

Lafayette (SYR-1)
Jutila, S. T. (M)

La Grangeville (NY-MH-2)
Christ, J. G. (A)
Mahar, T. F. (M)

Lake George (SCH-1)
Strampel, E. L. (M)

Lake Katrine (NY-MH-2)
Di Costanzo, J. A. (M)
Dowski, J. J. (M)
Georgallis, G. C. (M)
George, C. A. (A)
Metrick, J. (M)
Salzillo, E. M. (M)
White, J. J. (A)
Zuckerman, Y. N. (A)

Lake Mahopac (NY-2)
Millicker, D. J., Jr. (A)

Lake Success (LI-2)
Barnes, R. S. (M)
Barrow, W. L. (F)
Delany, F. J. (SM)
Wasserman, F. N. (A)
Zimbalist, A. (M)

Lancaster (BN-1)
Meller, G. L. (M)
Rimlinger, D. C. (M)
Sacha, R. J. (A)

Larchmont (NY-2)
Adler, B. (SM)
Adler, J. T. (A)
Basile, G. I. (M)
Brownell, H. R. (M)
Cammer, M. (M)
Downey, E. F. (A)
Kerby, G. A. (M)
King, S. (A)
Kline, A. (M)
Levy, M. L. (SM)
McVity, L. H. (A)
Mullenger, K. E. (M)
Rudd, W. C. (M)
Schneider, J. R. (A)
Stein, D. R. (M)
Viebranz, A. C. (M)

Latham (SCH-1)
Fitzgibbons, J. J. (M)
Pino, J. P. (M)

Laurelton (LI-2)
Antin, J. (M)
Barr, M. P. (M)
Cohen, D. (M)
Epstein, M. (M)
Gertler, E. (M)
Glaser, M. (SM)
Groner, P. S. (A)
Josepher, A. (A)
Kellner, A. S. (M)
Marin, F. L. (M)
Zelkowitz, L. J. (A)

Lee Center (RU-1)
Brunette, G. E. (M)
De Minco, A. P. (SM)
Kunze, A. A. (SM)

Le Roy (ROC-1)
Lapp, R. S. (M)
Lapp, S. P. (A)

Levittown (LI-2)
Bader, J. M. (M)
Bargeski, A. J. (M)
Beamer, F. E. (A)
Berger, C. D. (SM)
Bolnick, F. I. (M)
Brenner, W (SM)
Chernega, J. (M)
Clarke, G. M. (M)
Clune, W. T. (M)
Cooney, J. A. (A)
Corwin, J. J. (M)
Craig, A. F. (M)
Crane, R. L. (M)
Crush, J. F. (M)
D'Agostino, J. V. (M)
Di Matteo, P. L. (M)
Di Meglio, E. (A)
Duda, J. A. (A)
Dumas, E. G. (A)
Evans, A. P., Jr. (M)
Fishel, J. I. (A)
Flynn, W. J. (M)
Friedman, E. D. (SM)
Friedman, H. (A)
Gassler, J. H. (M)
Gottheim, E. (M)
Haussig, L. (M)
Heacock, W. J., Jr. (M)
Kuiba, N. S. (M)
Lavendol, L. G. (M)
Lee, G. C. (M)
Mehr, A. (A)
Miller, M. H. (A)
Mohr, M. T. (M)
Moreira, N. M. (A)
Morris, J., Jr. (M)
Nickel, W. S. (A)
Orlando, R. A. (M)
Paige, W. S. (M)
Piccione, S. C. (M)
Poulos, B. J. (A)
Prebster, M. T. (M)
Rice, W. F. (M)
Rich, A. L. (SM)
Sant Angelo, M. A. (M)
Schultz, R. D. (A)
Schweisberg, E. (M)
Shephard, L. P. (M)
Sinnott, J. (SM)
Sobol, J. (M)
Steinberg, W. A. (M)
Stolzman, B. R. (M)
Strickland, R. D. (M)
Sudinsky, L. (M)
Tatz, A. (SM)
Walker, C. M. (A)
Wellington, T. C. (M)
White, J. D., Jr. (VA)
Whiteman, J. R. (M)

Lewiston (BN-1)
Buranich, G. F. (SM)
Heston, W. S. (M)
Jachlewski, R. H. (M)

Liberty (NY-MH-2)
Mauer, W. V. (A)

Lincolndale (NY-W-2)
Bruns, W. H. (M)

Lindenhurst (LI-2)
Brown, L. E. (M)
Buda, P. V. (M)
Church, T. A. (A)
Collins, K. (M)
Morgenstern, O. A. (SM)
Rohner, C. J. (SM)
Royce, R. C. (M)
Siele, W. A. (A)
Suchanek, C. F. (A)

Little Neck (LI-2)
Allen, A. (M)
Bailey, W. F. (F)
Barry, J. C. (M)
Berendsen, C. G. (M)
Binns, J. R. (SM)
Boos, F. H., Jr. (M)
Clark, D. P. (M)
Cosby, J. C. (M)
Dean, C. E. (SM)
Eason, L. (M)
Egler, G. A. (M)
Erickson, T. (A)
Goldberg, H. (M)
Hana, T. C. (SM)
Hershkowitz, B. (A)
Hirsch, C. J. (F)
Kapp, C. E. (A)
King, W. F. (M)
Kunicky, B. F. (M)
Lamport, N. I. (A)
Levin, H. L. (A)
MacDonald, W. A. (F)
Nagel, K. H. (A)
Nelson, R. G. (M)
Page, C. E. (SM)
Pressman, R. (M)
Rosenblum, H. (SM)
Rybakoff, G. (M)
Spector, N. (A)
Spiegel, R. M. (M)
Taft, R. J. (A)
Tobin, M. W. (M)
Tucker, S. A. (SM)
Weinberg, S. (SM)
Wilson, W. H. (M)
Young, V. J. (SM)
Zimmer, E. W. (M)

Liverpool (SYR-1)
Allen, A. E. (A)
Andrews, J. V. (M)
Angus, A. C. (M)
Applebaum, S. P. (SM)
Bear, D. R. (A)
Beguin, F. P. (SM)
Benfer, R. L. (M)
Bowman, D. C. (A)
Boyce, H. K. (A)
Breckner, C. N. (M)
Brown, W. W. (SM)
Browne, D. E. (M)
Burns, D. L. (M)
Clanton, E. A. (M)
Clark, M. E. (SM)
Cover, N. W. (M)
Crine, C. W. (A)
Demaree, G. A. (M)
Demo, R. D. (M)
Doty, J. C. (M)
Eber, L. O., Jr. (A)
Eriksen, B. K. (A)
Fisk, R. E. (M)
Fitzpatrick, J. J. (A)
Flood, J. L. (A)
French, R. W. (M)
Gentry, F. E. (SM)
Gerlack, R. Z. (M)
Gillett, R. L., Jr. (M)
Hansen, R. J. (SM)
Hart, J. E. (M)
Hatfield, J. P. (M)
Henry, G. V., Jr. (M)
Hodgin, R. M., Jr. (A)
Hoefling, J. E. (M)
Hoverman, W. O. (M)
Hunting, R. A. (A)
Kelm, J. M. (M)
Klous, G. A. (M)
Klitros, D. E. (M)
Kluender, E. C. (SM)
Knight, W. W. (A)
Lane, J. R. (A)
Lee, A. E. (M)
Lewis, R. V. (SM)
Liggett, W. E. (M)
Malagisi, C. S. (M)
McCoy, D. R. (A)
Millham, R. L. (SM)
Miner, A. R., Jr. (A)
Miner, C. R. (SM)
Nease, J. (M)

Nester, W. H. (M)
Noyes, J. E. (M)
Paschetta, D. D. (M)
Pelfer, W. A. (A)
Perreault, D. A. (M)
Pfisterer, F. (A)
Platts, G. F. (SM)
Polito, L. J. (A)
Pollock, A. H. (M)
Radford, E. R. (M)
Sanderson, R. F. (M)
Schwager, R. A. (M)
Shrine, R. C. (M)
Smith, H. W. (M)
Smith, J. M. (M)
Smith, L. D. (M)
Sparks, J. E. (M)
Stern, E. (M)
Swing, M. (SM)
Tessler, H. J. R. (M)
Vanderlaan, H. J. (M)
Veley, H. N. (SM)
Walker, O. F. (SM)
Wall, J. A. (M)
Ward, D. D., Jr. (M)
Welch, R. F. (M)
Williamson, J. C. (M)

Lockport (BN-1)
Bulmore, H. R. (A)
Cress, R. B. (M)
French, P. M., Jr. (M)
Rupp, R. B. (M)
Shaler, P. M., Jr. (M)

Locust Valley (LI-2)
Barber, R. G. (M)
Boutellier, C. E. (A)
Geddy, G. B. (M)
Shaw, R. F. (SM)
Varnum, A. M. (M)
Whipple, G. D. (M)

Long Beach (LI-2)
Allen, E. H. (M)
Brown, R. M. (A)
Ellis, N. (A)
Klein, A. (M)
Leary, R. W. (M)
Mertz, P. (F)
Pace, R. A. (A)
Smook, I. R. (M)
Waldrop, J. E., Jr. (M)
Wurman, G. (M)

Long Island City (LI-2)
Albaum, M. H. (M)
Albicocco, S. P. (M)
Ashley, H. R. (A)
Astwood, E. J. (A)
Balamuth, L. (M)
Bersamo, M. V. (M)
Beman, D. C. (M)
Bodaky, A. J. (A)
Camilleri, C. M. (A)
Cheng, B. K. (A)
Cohen, H. (M)
Como, A. (A)
Degnan, B. T. (M)
De La Parra, A. F. (M)
Dolid, W. A. (A)
Douglas, D. A. (A)
Elsenbroek, M. C. (A)
Fleishman, G. (A)
Geen, W. E. (A)
Ginters, F. A. (A)
Goodman, H. (M)
Haring, L. L. (M)
Hartman, R. K. (M)
Jacobs, B. (A)
Jurison, J. (A)
Kelly, J. J. (A)
Kessler, F. (A)
Klein, W. L. (M)
Lesmez, J. J., Jr. (M)
Lewyt, A. M. (SM)
Liebert, F. R. (M)
Loui, J. S. (M)
Marzoli, A. (M)
McConnell, J. H. (SM)
Montuno, J. B. (M)
Morse, F. (M)
Narodny, L. H. (M)
Odessey, P. H. (M)
Osherowitz, J. M (A)
Pagano, C. N. (M)
Rabinowitz, M. H. (A)
Rich, L. C. (M)
Rubin, S. W. (M)
Ruggles, P. R. (A)
Salij, Z. B. (A)
Satz, R. G. (M)
Schroeder, G. F. (SM)
Shulman, I. (A)
Simmonds, J. (A)
Skwarek, F. J. (SM)
Snyder, S. J. (M)
Spera, R. L. (A)
Stahl, A. S. (SM)
Steams, R. (M)
Tepper, C. A. (A)
Valge, J. (A)
Vignali, J. J. (M)
Wald, D. (A)
Walker, W. (M)
Wood, S. (A)
Zeldner, S. (A)
Zilfoer, W. H. (A)
Zimet, M. M. (M)

Loudonville (SCH-1)
Gisser, D. (M)
Jermakoff, G. (M)
Rullson, J. P. (M)

Ludlowville (ITH-1)
Deutch, H. M. (SM)
Kascha, G. E. (M)
Livant, W. (M)
Prochazka, A. M. (M)
Sherman, R. G. (A)

Lynnbrook (LI-2)
Backus, C. H. (A)
Davidoff, F. (M)
Dixon, L. G. (M)
Doherty, T. F. (A)
Duttera, W. S. (SM)
Granville, R. W., Jr. (M)
Kirchner, C. W. (A)
Koch, R. F. (SM)
Lee, L. H. (M)
Magin, J. J. (M)
Monoscivein, M. (A)
Parkins, G. J. (M)
Richardson, K. (A)
Rosenfeld, R. I. (SM)
Rossoff, A. L. (SM)
Ruppel, A. E. (M)
Shmurak, B. (M)
Squassoni, G. F. (SM)
Surette, W. E., Jr. (M)
Traver, H. R. (M)

Lyons (ROC-1)
De Groat, P. H. (M)

Macedon (ROC-1)
Wesenberg, C. L. (M)

Mahopac (NY-2)
Black, G. R. (A)
Griffin, J. F., Jr. (M)
Moyer, J. J. (M)
Renke, A. (M)

Malden-On-Hudson (NY-MH-2)
Galto, K. W. (M)

Malverne (LI-2)
Beck, A. T. (M)
Brown, J. M. (M)
Deans, W. L. (A)
Gurevics, D. (A)
Hepburn, J. C. (SM)
Kelly, F. J. (M)
Pollack, I. (M)
Rojas, F. R. (SM)
Schneider, P. E. (M)
Shanney, W. J. (M)
Sharpe, L. E. (M)
Spencer, B. F. (SM)
Tanck, H. (M)
Van Rosenbergh, W. (M)
Vetter, R. F. (M)
Zettler, S. G. (M)

Mamaroneck (NY-W-2)
Carlisle, S. F., Jr. (M)
Cavallere, J. R. (M)
De-Vries, R. (A)
Johnson, R. K. (M)
Powell, A. E. (A)
Robbins, I. M. (A)
Romero, R. F. (M)
Scher, S. M. (A)
Steinberg, M. I. (A)
Stevens, A. M. (F)
Vollenwelder, A. D. (M)
Brounstein, A. (M)

Manhasset (LI-2)
Bass, J. G. (M)
Bell, W. W., III (M)
Bowie, R. M. (F)
Brown, H. A. (SM)
Brown, R. W. (M)
Davis, W. J. (M)
Della-Corte, J. P. (SM)
Dunn, B. B. (M)
Ebert, J. E. (SM)
Fitzpatrick, J. A. (M)
Gorrill, W. S. (SM)
Grosselfinger, W. H. (SM)
Hamlett, R. T. (SM)
Hathaway, J. L. (SM)
Jackson, B. A. (M)
Jones, M. E. (M)
Nickel, F., Jr. (VA)
Potter, R. E. (A)
Rimmler, F. F. (A)
Scott, R. (A)
Traenkle, J. W. (M)
Welbel, G. E. (SM)
Woods, W. C., Jr. (M)

Manlius (SYR-1)
Bessette, D. U. (M)
Budin, G. W. (M)
Chamberlin, J. C. (M)
Edwards, K. A. (SM)
Heartz, R. A. (M)
Jacobs, G. B. (SM)
Oleyar, M., Jr. (M)
White, P. K. (M)

Marathon (SYR-1)
Wilson, R. M. (A)

Marcellus (SYR-1)
Devine, G. F. (SM)

Marcy (RU-1)
Blaka, H. C. (M)
La Salle, R. H. (M)

Maspeth (LI-2)
Brecht, G. L. (A)
Gutroff, G. H. (M)
Howard, R. F. (M)
Jaworowski, B. R. (A)
Jaworowski, E. V. (A)
Kay, L. M. (SM)
Martin, R. E. (SM)
McAllister, J. P. (M)
Melnck, M. M. (M)
Michal, R. L. (M)
Muller, R. (A)
Pataki, E. (M)
Voots, W. R. (M)

Massapequa (LI-2)
Ashus, A. (A)
Bartsch, R. T. (M)
Baunsch, E. L. (VA)
Berler, R. (M)
Biegen, A. J. (M)
Bonner, W. A., Jr. (M)
Capasso, L. V. (M)
Chapman, P. W. (M)
Cherry, M. (M)
Crofford, M. (A)
Darden, R. R., Jr. (SM)
Di Toro, M. J., (F)
Enlow, P. M. (M)
Feldman, L. (M)
First, M. H. (M)
Gold, J. I. (M)
Goldstone, L. L. (A)
Hammond, R. J. (A)
Haneman, F. G. (A)
Harvey, W. M., Jr. (M)
Hill, C. E. (M)
Husmann, D. (M)
Katz, S. H. (SM)
Kaye, M. (M)
Krueger, A. C. (M)
Lalkowitz, E. (A)
Leibfried, T. F., Jr. (A)
Lombardi, M. W. (M)
Marcinkowski, E. R. (M)
Montren, W. (M)
Morris, P. E. (M)
Murphy, G. N. (M)
Rector, L. V. (M)
Ruvin, A. E. (M)
Sail, A. H. (M)
Salz, J. S. (M)
Schulkind, D. (A)
Shapiro, H. L. (SM)
Siroka, N. (SM)
Staros, B. (SM)
Whitefall, J. W. (M)
Wittner, R. D. (SM)

Massapequa Park (LI-2)
Arlin, A. D. (M)
Bailey, G. E. (M)
Cipolla, A. P. (A)
Cronauer, E. A. (M)
Feerst, I. (SM)
Finken, K. R., Jr. (A)
Gallagher, J. H. (A)
Glolelli, R. R. (A)
Goodman, J. (M)
Green, R. (M)
Halpin, A. T., Jr. (M)
Heins, J. L. (SM)
Hermelin, L. S. (SM)
Johnson, F. L. (A)
Karas, J. P. (A)
Lizzio, J. (A)
Mansfield, E. C. (A)
Ogden, D. R. (M)
Salamy, M. S. (M)
Scharf, E. (M)
Smith, H. D. (M)
Swearingen, T. J. (SM)
Virgadamo, F. (M)
Yutkowitz, C. K. (M)
Zuzolo, P. R. (M)

Massena (SYR-1)
Bond, N. T. (M)

Mastic (LI-2)
Parmely, E. H., Jr. (A)

Mastic Beach (LI-2)
Fuelling, P. W. (M)

Mattydale (SYR-1)
Abeyta, J. P., Jr. (M)
Fiederer, J. A. (M)
Gannett, G. L. (M)
Humphrey, J. G. (M)
Scholes, H. M. (M)

Mechanicville (SCH-1)
Belmonte, A. P. (M)

Medford (LI-2)
Ziegelmair, L. A. (M)

Medina (ROC-1)
Vosteen, R. E. (SM)

Melville (LI-2)
Cahill, F. C. (SM)
Comstock, G. C. (F)
Crist, P. W. (SM)
Gaus, A. (M)
Kearney, J. W. (SM)
Schrader, L. W., Jr. (M)
Speh, K. C. (SM)
White, W. D. (F)
Williams, A. L. (M)

Memphis (SYR-1)
Conlber, G. A. (A)

Merrick (LI-2)
Baird, J. E. (A)
Casale, D. R. (M)
Hirsch, R. B. (M)
Knight, P. (M)
Kowalski, A. (M)
Lindenfelser, W. A. (M)
Loehr, R. A. (A)
Paul, I. (M)
Randall, G. A. (SM)
Sahm, E. J. (M)
Squitieri, A. (M)
Tackel, H. W. (SM)
Wolff, H. (M)
Woodbury, C. P. (M)
Zeller, J. F. (M)

Middle Island (LI-2)
Adams, T. H. (A)

Middletown (NY-MH-2)
Daugherty, R. M. (SM)
Pajak, A. W. (M)

Middle Village (LI-2)
Blatz, R. E. (M)
Cohen, S. (M)
Donop, D. A. (M)
King, C. N. (M)
Lyons, J. W. (M)
Merkel, J. F. (A)
Muller, W. G. (A)
Parker, H. L. (A)
Shubel, E. J. (M)
Zamir, I. Z. (M)

Millbrook (NY-MH-2)
Florac, W. A., Jr. (M)
Wallace, J. F. (M)
Wroblewski, E. J. (A)

Miller Place (LI-2)
Watson, C. W. (M)

Milton (NY-MH-2)
Mueller, D. C. (M)

Mineola (LI-2)
Arams, F. R. (SM)
Avery, R. E. (SM)
Bauman, M. (M)
Bisby, J. F. (SM)
Blank, S. J. (M)
Blazek, G., Jr. (A)
Bostrom, R. C. (M)
Bradley, H. E. (M)
Brown, L. L. (A)
Caddell, R. (A)
Canning, J. H. (SM)
Close, R. N. (SM)
Cohen, A. M. (M)
Cramer, S. (M)
Crepeau, P. J. (M)
Epstein, J. N. (M)
Erwin, H. P., Jr. (M)
Fadem, R. J. (M)
Fagan, D. F. (M)
Fromm, W. E. (SM)
Fubini, E. G. (F)
Fyme, M. G. A. (A)
Gelfe, P. R. (M)
Gery, S. W. (M)
Goldberg, J. (M)
Goldberg, R. M. (M)
Graef, R. L. (M)
Haag, E. J. (A)
Halperin, A. (M)
Hayllick, R. M. (M)
Hechtman, H. (M)
Hendler, A. J. (M)
Hockenjos, R. M. (M)
Ihrig, L. C. (M)
Jordan, D. B. (M)
Julich, H. (M)
Kahan, J. G. (M)
Kanthack, I. H. (A)
Karpen, E. W. (M)
Kezer, C. F. (M)
Klein, H. M. (A)
Knocklein, H. P. (A)
Landauer, W. E. (SM)
Larson, R. A. (M)
Lebenbaum, M. T. (SM)
Lethin, J. E. (SM)
Lillie, D. F., Jr. (M)
Lombardo, P. P. (A)
Lo Presti, K. R. (A)
Loughren, A. V. (F)
Lowe, D. B., Jr. (M)
Lowman, R. V. (M)
Lynch, W. A. (SM)
Lyons, J. F., Jr. (M)
Mackeman, J. L. (M)
Matchett, M. W. (M)
McFarland, J. E. (SM)
McGregor, J. C. (SM)
Meyer, G. E. (A)
Mieher, W. W. (F)
Miller, D. M. (SM)
Morton, G. W. (M)
Mueller, F. J. (M)
Murphy, J. J. (M)
Oshiro, F. K. (M)
Owen, D. J. (M)
Paciantonio, A. (M)
Parsons, B. L. (M)
Pepper, H. H. (A)
Radway, T. D. (M)
Rearwin, R. H. (A)
Reymann, J., Jr. (M)
Richter, H. E. (M)
Ricker, N., Jr. (M)
Robertson, D. J. (M)
Rumrill, H. J. (M)
Saferstein, L. J. (M)
Satre, W. I., Jr. (M)
Sauer, H. E. (A)
Sawyer, H. S. (M)
Schaefer, G. H. (A)
Schwartz, R. H. (M)
Schweber, S. C. (A)
Schwenk, H. R. (M)
Shiltoff, M. (M)
Shively, R. P. (M)
Shulman, A. (A)
Siegel, J. R. (M)
Simonton, L. J. (M)
Skifter, H. R. (F)
Strobisch, A. (M)
Stephenson, J. G. (SM)
Tionaytis, C. J. (A)
Tolles, W. E. (SM)
Tom, L. J. (SM)
Wang, C. C. (F)
White, J. A. (M)
Witte, R. A. (A)
Wolkov, D. (SM)
Yale, W. H. (SM)

Minoa (SYR-1)
Ernst, E. C. (M)
Hagenauer, R. A. (M)
Wilson, R. D. (A)

Mitchell AFB (LI-2)
Venerella, J. A. (M)

Monroe (NY-MH-2)
Sperr, A. E. (M)
Vollkommer, W. A. (VA)

Monsey (NY-2)
Gradner, H. (A)
Sargent, A. F. (M)
Selender, H. (M)

Monticello (NY-MH-2)
Fleischer, A. P. (A)

Montrose (NY-W-2)
Koepcke, R. W. (A)

Mount Kisco (NY-W-2)
Burden, R. W. (A)
Daley, W. E. (M)
Doyle, R. J. (A)
Dubbels, D. A. (M)
Grace, F. (SM)
Harmon, H. F. (M)
Machanic, E. D. (A)
Orell, F. M. (M)
Short, W. P. (SM)
Stewart, J. A. (M)

Mount Marion (NY-MH-2)
Eickhorn, C. R., Jr. (M)
Foley, J. H. (A)
Hofler, E. V. (M)
Oldani, C. M. (M)
Pasquariello, C. J. (M)
Reilly, T. J. (M)
Schiff, A. (A)
Skatrud, R. O. (A)

Mount Marion Park (NY-MH-2)
Maryon, M. K. (A)

Mount Vernon (NY-W-2)
Achtellik, G. (M)
Bannon, D. W. (M)
Bloom, F. J. (SM)
Brenner, B. (M)
Callahan, J. P. (M)
Campbell, C. H. (M)
Charleston, S. M. (A)
Degenhardt, R. N. (M)
Desnoes, W. B. (A)
Douglas, R. H. (M)
Dowling, T. J. (A)
Duffy, J. J. (A)
Elkind, P. (A)
Geduldig, D. S. (M)
Gurdus, H. W. (A)
Hendlin, H. M. (M)
Herz, H. L. (M)
Hineline, H. D. (M)
Hoffmann, W. H. (M)
Krasnow, S. B. (M)
Kuhla, E. R. (M)
Lang, H. M. (A)
Mason, C. A. (M)
Matilla, P. E. (A)
Miller, D. C. (M)
Mitchell, D. C. (M)
Paribello, J. J. (A)
Pasternak, J. M. (A)
Pestone, A. A. (A)
Redstone, C. W. (M)
Rosenbaum, A. H. (VA)
Rosenberg, P. (SM)
Rolondi, G. L. D. (M)
Samuels, D. S. (A)
Senseney, G. T. (A)
Stabicki, W. (A)
Sonkin, D. (SM)
Spiteri, J., Jr. (A)
Stronoin, J. (M)
Sturm, N. (M)
Wallace, M. (SM)
Wines, A. J., Sr. (A)

Munsey Park (LJ-2)
Helndel, H. J. (SM)

Nanuet (NY-2)
Strauss, G. M. (M)
Went, J. J. (A)

Nassau (SCH-1)
Merchant, R. (M)

Neponsit (LI-2)
Goldfein, S. F. (M)
Sylvane, A. A. (SM)

Nesconset (LI-2)
Godwin, R. G. (M)

Newark Valley (BING-1)
Flanders, E. S. (M)
Sullivan, R. M. (M)

Newburgh (NY-MH-2)
Drake, H. (A)
Galage, D. J. (M)
Gorton, R. M. (M)
Hill, J. H. (A)
Konczal, F. D. (M)
Podell, S. (M)
Rhodes, J. F. (A)
Schoch, D. L. (A)
Vecchiarelli, N. (A)
Vlahos, P. G. (A)
Wall, J. J. (M)
Webb, J. C. (M)
Youngblood, H. R. (M)

New City (NY-2)
Doellner, L. J. (M)
Greenwald, M. H. (M)
Hastings, L. S., Jr. (A)
Webb, C. E. (M)

New Hartford (RU-1)
Baldridge, B. H. (SM)
Barrick, W. E. (M)
Benjamin, H. L. (A)
Brown, C. D. (M)
Bussey, H. C. (M)
Butler, G. T., Jr. (M)
Dennis, U. E. (M)
Dover, B. M. (M)
Estey, H. E. (M)
Flnison, G. W. (M)
Geiser, D. T. (M)
Griswold, J. H. (M)
Harris, L. D. (M)
Hogan, E. V., Jr. (SM)
Homak, P. M. (M)
Kuehl, W. J. (SM)
Larkin, R. M. (SM)
Markwalter, J. L., Jr. (SM)
McCabe, K. E. (M)
Olson, F. A. (M)
Pangburn, L. R. (M)
Pashby, C. A. (M)
Philpott, L. R. (SM)
Pincombe, A. L. (A)
Powers, R. (M)
Priest, F. R. (SM)
Ricci, B. E. (M)
Scanlan, R. E. (M)
Smith, S. B. (A)
Staudaher, F. M. (M)
Stubbles, J. E. (M)
Walker, R. K. (M)
Walthall, W. C., Jr. (M)
Warrick, A. C. (SM)
Watts, P. M. (M)
Yoder, D. F. (A)
Zachary, R. A., Jr. (SM)

New Hyde Park (LI-2)
Adler, L. L. (M)
Bell, V. J., Jr. (M)
Berger, M. (M)
Berkowitz, B. (M)
Berman, N. (M)
Blackstone, H. (SM)
Borghard, A. A. (A)
Bozlwick, G. E. (M)
Bruns, E. A. (M)
Callaghan, E. P. (A)
Camp, S. N. (M)
Collins, W. G. (M)
Comis, D. (M)
Contrastan, D. P. (A)
De Lorenzo, J. D. (M)
Detwiler, S. P. (M)
Dittenhoefer, H. F. (M)
Duffy, A. F. (A)
Eisenhauer, F. E. (M)
Ellis, F. W. (M)
Farber, R. J. (SM)
Fishbein, M. (SM)
Friedman, I. (M)
Giese, J. E. (A)
Goebeler, W. H., Jr. (M)
Hudelson, R. L. (M)
Huebscher, H. (SM)
Hyman, A. (M)
Isaacs, P. J. (M)
Jackson, F. S. (M)
Janiesch, H. R. (M)
Jung, C. W. (M)
Kahn, G. (A)
Kaplan, M. (A)
Kelley, R. J. (A)
Kelley, W. E. (M)
Lehtonen, E. W. (M)
Lenefsky, S. (M)
Liebman, H. S. (A)
Lonkemper, O. A. (A)
Loughlin, R. G. (SM)
Madrick, S. A. (A)
Marshall, J. C. (M)
Marsman, J. H. (SM)
McDonald, J. F. (SM)
McKenna, K. F. (M)
McMahon, J. R. (M)
Morettl, W. W. (M)
Mulholland, G. T. (A)
Odom, C. H. (A)
Orazio, A. F. (M)
Palmieri, C. A. (A)
Petrykanyn, J. (M)
Polak, H. L. (A)
Proscia, P. A. (M)
Richter, H. H. (A)
Ries, C. A. (SM)
Rowinski, S. J. (A)
Sherbin, L. E. (SM)
Sherry, R. S. (SM)
Sibilia, J. F. (M)
Simonelli, N. A. (M)
Stamps, G. M. (M)
Tarantino, T. C. (M)
Thomas, E. U. (SM)
Trunk, E. G. (SM)
Vanaman, F. P. (A)
Vinarub, M. E. (M)
Wittenberg, R. C. (M)
Wolf, E. G. (M)
Wozniak, L. M. (M)
Yorinks, A. (SM)
Zaikin, S. P. (M)

New Paltz (NY-MH-2)
Culver, R. S. (M)
Demers, M. E. (M)
Du Bois, G. E. (M)
Fritz, F. J. (M)
Stone, F. A. (M)
Wilson, P. J. (M)

New Rochelle (NY-W-2)
Alala, C. M. (M)
Andraud, R. J. (A)
Appelbaum, G. (A)
Auditore, C. J. (SM)
Baker, L. S. (A)
Benjamin, S. K. (M)
Berke, L. C. (M)
Botwinick, E. (M)
Bower, C. M. (M)
Burnett, L. J., Jr. (M)
Carter, W. F. (A)
Daly, R. T. (SM)
Dana, A. W. (M)
Dubiller, W. (F)
Feldman, E. F. (SM)
Fisher, S. G. (A)
Gage, L. S. (SM)
Goldberg, M. I. (A)
Goldfischer, L. I. (SM)
Grand, B. (M)
Greibach, E. H. (SM)
Hanchrow, J. J. (A)
Hamack, W. P. (M)
Harris, C. M. (SM)
Hirsch, J. D. (M)
Karp, J. R. (SM)
Landis, J. C. (M)
Lee, G. F. (M)
Lerner, N. C. (M)
Lurie, W. B. (SM)
Mathis, C. E. (M)
Murphy, M. J. (M)
Pels, E. (M)
Pentz, R. A. (M)
Pettal, R. (A)
Polansky, P. (A)
Reed, J. (SM)
St. Clair, B. W. (M)
Saltman, R. G. (M)
Schlessel, B. (M)
Schwartz, H. E., Jr. (M)
Shapiro, H. (A)
Taylor, E. R., Jr. (A)
Temple, D. I. (SM)
Wank, P. J. (M)
White, F. E. Jr. (VA)
Williams, J. E. (M)
Wood, C. R. (A)
Wu, W. I. L. (SM)

New York City (NY-2)
Abraham, I. (A)
Abrahamsen, A. (A)
Acheson, M. A. (F)
Adams, A. T. (M)
Adams, M. D. (SM)
Addamo, J. A. (A)
Adler, C. (A)
Adler, R. H. (M)
Afshar, G. H. (M)
Aghib, E. G. (A)
Albanese, J. P. (M)
Aldor, E. (M)
Alexander, L. (M)
Alexandro, F. J., Jr. (M)
Almquist, M. L. (F)
Alphonse, G. A. (M)
Altschuler, H. M. (SM)
Amatniek, E. (M)
Amy, E. V. (SM)
Andrasko, J. P. (VA)
Andres, R. K. (M)
Anis, J. (A)
Aposi, H. W. (SM)
Arm:, M. (M)
Arm, W. (M)
Armstrong, C. A. (SM)
Armstrong, G. S. (M)
Arnold, J. W. (SM)
Arons, E. L. (A)
Arthur, W. (M)
Asen, R. (A)
Ash, R. B. (M)
Aslund, N. R. D. (A)
Atwood, S. (SM)
Auriema, A. (A)
Austein, E. E. (M)
Aviv, D. G. (M)
Backer, C. M. (SM)
Backus, J. W. (M)
Baer, T. M. (M)
Baerst, L. R. (A)
Bailey, G. W. (F)
Balan, J. C. (M)
Barasch, H. P. (M)
Barash, L. F. (M)
Barash, S. A. (M)
Barghout, J. M. (M)
Barnabic, E. V. (M)
Barr, S. M. (SM)
Bart, G. P. (M)
Bartlett, S. C. (SM)
Baruch, S. N. (M)
Bashkow, T. R. (M)
Batty, W. E., Jr. (M)
Baulch, E. L. (M)
Baum, L. (M)
Baum, M. C. (M)
Baum, R. F. (SM)
Baumann, R. H. (M)
Baumgartner, J. G. (A)
Bealey, C. F. (A)
Bederman, S. (A)
Bednar, F. J. (A)
Beers, Y. (M)
Belfi, J. L. (M)
Beller, W. C. (M)
Benis, E. W. (SM)
Benedikt, J. (A)
Bennett, L. (A)
Berber, J. (A)
Bereza, A. (M)
Berger, L. (M)
Bergherr, W. (A)
Berk, J. (M)
Berkner, L. V. (F)
Bernstein, R. I. (SM)
Bertero, E. P. (A)
Bever, K. H. (A)
Bickel, H. J. (M)
Bigelow, S. C. (M)
Bitner, R. F. (A)
Black, D. G., Jr. (SM)
Blackman, R. B. (M)
Bland, G. F. (M)
Blomquist, E. A. (M)
Blume, R. J. (A)
Blumenthal, H. W. (M)
Bocharoff, G. M. (M)
Bock, M. (M)
Bodin, M. (M)
Boguslawski, H. A. (SM)
Bohn, W. C. (M)
Bolton, A. (M)
Bomberger, D. C. (M)
Bonne, A. W. (M)
Bonner, M. K. (M)
Borner, R. C. (M)
Borst, J. M. (VA)
Bose, J. H. (SM)
Bostwick, L. G. (M)
Boughtwood, J. E. (M)
Boyd, R. C. (M)
Boyd, W. L. (A)
Bradley, F. R., Jr. (M)
Bradt, G. (M)
Brady, T. D. (A)
Brainard, T. (A)
Braunfeld, M. T. (M)
Braverman, M. (A)
Bravman, P. J. (A)
Brender, D. M. (M)
Brenner, E. (SM)
Breuel, J. W. (A)
Bright, R., Jr. (SM)
Bristol, R. W. (M)
Brociner, V. (M)
Brodheim, E. (M)
Brodie, R. B. (M)
Bromberg, J. J. (A)
Bromley, D. L. (M)
Brookner, E. (M)
Brown, F. L. (M)
Brown, P. M. (A)
Brown, R. L. (M)
Bruckmann, F. E. (A)
Brudner, H. J. (M)
Brunet, M. (SM)
Buffo, B. (SM)
Bugnolo, D. S. (M)
Bulkley, D. D. (M)
Bullock, W. S. (A)
Burghard, G. E. (SM)
Burstein, I. (A)
Busch, A. (M)
Butterworth, J. S. (A)
Buttner, H. H. (F)
Byam, L. A., Jr. (M)
Cake, A. F. (A)
Cambridge, C. G. (SM)
Cameron, D. B. (M)
Campana, C. R. (A)
Campbell, E. A. (A)
Campbell, G. R. (A)
Campbell, R. D. (F)
Cannliff, C. J. (A)
Carlebach, W. M. (VA)
Carlson, E. C. (A)
Carreau, G. (M)
Caruthers, R. S. (SM)
Cassell, J. L. (VA)
Casselman, W. G. B. (A)
Castaner, A., Jr. (A)
Caweln, M. (F)
Cedarholm, J. P. (M)
Cepol, J. (M)
Chaffee, J. G. (F)
Chamberlain, A. B. (F)
Chandler, J. A. (A)
Chaney, W. G. (M)
Charas, S. (M)
Chen, T. (M)
Chemin, S. (A)
Chesnes, A. A. (SM)
Chin, M. (A)
Chinn, H. A. (F)
Chirlian, P. M. (M)
Chisholm, T. L., Jr. (A)
Chorafas, D. N. (M)
Christensen, J. W. (SM)
Chang, S. S. L. (SM)
Christiansen, H. C. (M)
Christian, H. K. (M)
Cinelli, H. L. (M)
Claassen, F. S. (M)
Clark, G. J., III (A)
Clarke, K. K. (M)
Clemens, G. J. (M)
Clewell, D. H. (F)
Clinton, P. J. (M)
Clotworthy, J. H. (M)
Coppeshall, I. S. (F)
Cohen, A. J. (M)
Cohen, C. B. (M)
Cohen, H. (M)
Cohen, J. (A)
Cohen, M. M. (M)
Cohn, I. H. (M)
Cole, L. N. (A)
Coleman, J. H. (M)
Coleman, S. F. (M)
Coleman, S. T. (A)
Coles, F. A. (SM)
Coles, W. T. (A)
Conegu, E. A. (A)
Cone, R. M. (A)
Connelly, J. H. (M)
Connelly, J. J. (M)
Connor, G. C. (VA)
Cooley, A. G. (F)
Cooper, F. S. (M)
Cooper, M. (A)
Copleln, G. D. (M)
Corderman, W. P. (SM)
Corey, H. E., Jr. (SM)
Correa, H. A. (A)
Corwith, H. P. (F)
Cosentino, A. A. (M)
Costello, A. W. (M)
Cothron, W. C. (SM)
Cotter, M. A. (M)
Cottin, R. S. (M)
Cowan, S. R. (A)
Crane, P. H. (A)
Cravis, H. (M)
Cravitz, S. (SM)
Crawford, W. J. (SM)
Crews, F. H. (M)
Cronin, D. (A)
Crowson, F. B. (SM)
Cumber, W. G. (A)
Cumming, L. G. (SM)
Cumming, M. J. (M)
Curtis, R. B. (M)
Cutling, F. (F)
Dahlbom, C. A. (SM)
Davidovits, M. (A)
Davies, R. H. (SM)
Davis, E. W. (M)
Davis, L. B. (SM)
Davis, R. F. (M)
Dean, N. J. (SM)
De Boer, J. J. (M)
De Bragga, J. W. (A)
Deely, R. M. (M)
Deland, T. (A)
De Laney, T. M. (A)
De Maios, J. (M)
Demaree, F. E. (A)
De Mello, W. (SM)
Demin, A. N. (A)
De Muro, T. M. (M)
De Neuf, D. K. (SM)
Denny, C. R. (M)
Desnoes, A. B. (M)
De Sobrino, R. (M)
Deutsch, E. M. (M)
Devine, P. J. (M)
Dewey, G. C. (M)
Diamond, S. (M)
Dibenedetto, G. J. (M)
Diesold, J. T. (A)
Dietrich, E. S. (A)
Dietrich, F. (VA)
Dillon, J. J. (A)
Dilson, J. (M)
Doherty, W. H. (F)
Donald, D. D. (SM)
Donovan, W. E. (SM)
Dorf, R. H. (M)
Doswell, M., III (A)
Dowds, H. M. (M)
Dressel, H. O. (M)
Driscoll, B. K. (M)
Dubs, E. E. (A)
Durocher, J. D., Jr. (A)
Duskis, E. F. (A)
Easton, R. L. (M)
Echtman, L. (M)
Edmonds, R. H. (M)
Edwards, H. M. (M)
Egert, S. S. (M)
Eggert, J. (SM)
Ehrlich, C. N. (A)
Eichwald, B. (SM)
Eisenberg, I. (M)
Eisenberg, L. (M)
Eisenberg, M. H. (M)
Eisenstein, N. I. (A)
Eisner, P. N. (M)
Elderkin, C. J. (M)
Ellem, F. (M)
Elliott, S. J. (M)
Ellis, A. E., Jr. (M)
Ellis, R. (M)
Ellwood, W. B. (SM)
Elsea, I. W. (M)
Emberson, R. M. (SM)
Engle, V. M. (M)
Engstrom, E. W. (F)
Enns, E. G. (A)
Eoyang, T. T. (SM)
Ettlinger, A. B. (M)
Evans, T. P. (SM)
Fagin, S. L. (M)
Falge, M. D. (SM)
Fairchild, S. M. (A)
Falknor, F. B., Jr. (A)
Farber, A. S. (M)
Farkas, F. S. (SM)
Farley, J. (A)
Farmer, O. J. (M)
Feiner, H. A. (A)
Feldman, S. (A)
Feldman, S. (M)
Feng, S. (M)
Ferrell, O. P. (A)
Fezer, H. (M)
Fifer, S. (SM)
Findlay, D. A. (A)
Finger, T. A. (M)
Finkel, J. (A)
Finkelstein, M. J. (M)
Fish, P. (SM)
Fishberg, S. (M)
Fisher, A. (A)
Fisher, G. J. (M)
Fisher, K. (M)
Fitch, W. A. (SM)
Fleischer, P. E. (M)
Flemming, F. L. (M)
Flick, R. A. (M)
Fordham, R. J. (M)
Forman, A. J. (M)
Forman, I. (M)
Foster, O. C. (M)
Fox, S. (M)
Frank, G. (M)
Franklin, K. L. (A)
Fraser, G. R. (M)
Freed, A. (A)
Freed, L. (A)
Freed, R. D. (M)
Freiberger, H. (M)
Freiman, C. V. (M)
Freseman, W. L. (SM)
Freudenberg, B. (SM)
Frezzolini, D. (VA)
Frishauf, S. H. (M)
Fritsch, W. W. (SM)
Fritz, C. B. (M)
Fruehauf, M. C. (M)
Fruhner, E. T. (SM)
Frum, A. (A)
Furedi, J. E. (A)
Furth, F. R. (SM)
Fury, A. E. (A)
Gabel, R. J. (M)
Gallupol, F. B. (M)
Galvin, J. P. (M)
Gancher, L. (A)
Gandolph, A. A. (A)
Gardner, R. S. (M)
Garson, E. L. (A)
Gast, R. W. (SM)
Gavenas, A. R. (M)
Gerard, D. R. (M)
Gerb, B. (M)
Gersch, W. M. (M)
Geyer, A. J. (A)
Ghirardi, A. A. (SM)
Gibbons, J. (A)
Gibson, O. B. (SM)
Gignoux, D. (M)
Gill, P. (A)
Gillette, E. H. (A)
Gilman, G. W. (F)
Girdwood, J. (M)
Gittelman, A. I. (M)
Gladston, H. (M)
Glasser, L. J. (M)
Glesnes, R. W. (A)
Glickstein, J. (A)
Gold, P. J. (A)
Goldfarb, A. T. (M)
Goldmark, P. C. (F)
Goldschmidt, K. (M)
Goldsmith, A. N. (F)
Gonda, T. (A)
Gonen, B. (A)
Goodman, L. D. (M)
Goodman, P. H. (A)
Goodman, S. J. (M)
Gordon, L. (A)
Gourgey, A. A. (A)
Goyder, C. W. (SM)
Grace, F. C. (M)
Graham, J. S. (A)
Graham, W. (M)
Grandizio, L. A. (M)
Gray, S. B. (A)
Green, J. D. (M)
Green, J. R. (M)

Greenbaum, M. (M)
Greenstein, P. (M)
Greenwald, C. (A)
Greig, J. H. (M)
Grey, R. (M)
Griffin, J. P. (M)
Grinza, E. (A)
Groginsky, H. L. (M)
Grosch, H. R. J. (SM)
Gross, R. D. (M)
Grossman, F. J. (A)
Grossner, N. R. (M)
Gruebel, A. H. (A)
Gruen, W. (M)
Grundfest, H. (SM)
Grundy, A. B., Jr. (A)
Guenther, R. (M)
Guild, B. (SM)
Gunderson, R. W. (M)
Gunn, D. W. (M)
Gustafson, W. G. (M)
Guterman, F. H. (M)
Guterman, H. C. (SM)
Haas, M. (A)
Haase-Dubosc, A. A. (M)
Hackenberg, J. H. (M)
Haddad, J. A. (M)
Haenschke, D. G. (M)
Hagerty, G. E. (M)
Hahn, S. (M)
Hallett, J. L. (A)
Halloran, V. P. (M)
Haney, F. (M)
Hara, B. (VA)
Hardwick, A. H. (SM)
Hare, V. C. M., Jr. (M)
Harkavy, H. A. (M)
Harmatz, H. J. (M)
Harmon, R. N. (F)
Harris, C. M. (SM)
Harris, H. E. (M)
Hartley, S. H. (M)
Hartmann, Z. (M)
Hartog, E. (M)
Harty, L. T. (A)
Harvey, C. C. (M)
Harvey, W. W. (A)
Hata, J. H. (A)
Haustschein, A. (SM)
Havens, B. L. (SM)
Haywood, O. G. (SM)
Hearn, R. B. (SM)
Heckt, G. (SM)
Heler, L. D. (M)
Heinrich, F. R. (A)
Heller, G. W. (A)
Heller, O. (M)
Hendrickson, J. F. (M)
Henry, J. L. (M)
Hermans, M. E. A. (M)
Hemstadt, W. H. (M)
Hertsch, G. (M)
Herz, H. (M)
Herzer, I. (M)
Hilton, P. N. (M)
Hinkley, J. W. (SM)
Hirsch, S. (M)
Hodges, A. R. (SM)
Hoefler, F. J. (A)
Hoelderich, W. A. (M)
Hoffart, H. M. (A)
Hogan, J. V. L. (F)
Holaday, D. A. (M)
Holahan, J. P. (M)
Hollander, L. J. (M)
Hollander, S. (SM)
Holzer, P. J. (M)
Honaman, R. K. (SM)
Horelick, D. (M)
Horn, V. M. (A)
Hornung, S. A. (A)
Hough, J. B. (A)
Hough, R. R. (SM)
Housman, H. (M)
Hovgaard, O. M. (SM)
Howells, F. W. (SM)
Hsieh, T. T. H. (A)
Huber, L. J. (M)
Hughes, H. K. (M)
Hultquist, J. A. (M)
Hunter, G. T. (M)
Huntley, H. R. (SM)
Hurd, C. C. (A)
Hyatt, W. R., Jr. (SM)
Hylton, A. W. (A)
Hyneman, J. R. (SM)
Inglis, R. S. (A)
Ingulli, C. N. (A)
Irvine, P. L. (A)
Isele, H. A. (A)
Itzkan, I. (M)
Jackson, H. H. (A)
Jacob, K. C. (A)
Jacobs, A. B. (M)
Jansky, C. M. (SM)
Jatlow, J. L. (SM)
Javid, M. (M)
Javitz, A. E. (M)
Joerg, E. A. (M)
Johnson, H. C. L. (A)
Johnson, H. W. (SM)
Johnson, R. L. (M)
Johnson, W. D. (M)
Jones, D. D. (A)
Jones, H. S. (SM)
Jones, H. W. (SM)
Jones, H. L., Jr. (M)
Jones, T. A. (M)
Jones, W. (A)
Joseph, D. A. (A)
Josephson, B., Jr. (M)
Julie, L. (M)
Jung, R. F. (A)
Jurgen, R. K. (SM)
Kabat, C. L. (A)
Kadanaoa, H. (A)
Kahn, I. (A)
Kallmann, H. E. (F)
Kamoschoer, J. F. (M)
Karachuk, S. T. (M)
Karda, W. O. (M)
Karmin, I. (M)
Kassler, R. (M)
Katell, E. (M)
Katz, S. (A)
Katz, S. (A)
Kaufman, G. L. (A)
Kells, A. J. (M)
Keller, A. C. (SM)
Kelley, N. D. (M)
Kelly, J. J. (M)
Kendall, J. A. (A)
Kenedy, J. M. (M)
Kent, G. J. (SM)
Kievit, B. (SM)
Killian, L. H. (A)
Kim, W. H. (M)
King, F. (SM)
Kinn, J. M., Jr. (SM)
Kirloff, A. (SM)
Kirvida, L. (M)
Klapoer, J. (M)
Klein, R. M. (SM)
Kline, D. C. (M)
Klinger, A. (M)
Klugman, A. I. (M)
Knox, J. L. (M)
Koehler, A. O. (M)
Koff, R. M. (A)
Kolker, N. (A)
Konig, W. F. (M)
Koonan, J. (M)
Kosinski, F. J. (M)
Kraemer, G. T. (M)
Kramer, B. H. (A)
Kranc, G. (M)
Krause, A. M. (M)
Kretschek, R. O. (A)
Kritz, A. (M)
Krzyzanowski, S. P. (A)
Kuhn, A. S. (SM)
Kunc, F. (M)
Kunik, I. (M)
Kurrelmeyer, B. (SM)
Kurzrok, R. M. (M)
Kwo, T. T. (M)
Laas, I. E. (A)
Lacey, J. C. (A)
La Flandra, J. (M)
La Hiff, W. J. (M)
Lainer, G. (SM)
Lala, J. J. (M)
Lambert, L. B. (M)
Lamneck, W. J. (M)
Landwerslek, J. E. (A)
Lapatine, S. (SM)
Lashinsky, H. (M)
Laufer, J. (M)
Lavi, Y. (M)
Lawson, R. H. (M)
Layton, H. M. (M)
Leake, A. (M)
Leary, M. T. (M)
Lebel, C. J. (SM)
Lebowitz, F. (M)
Lederman, A. (SM)
Lee, R. H. (M)
Lee, T. K. (M)
Lee, V. C. (A)
Le Fevre, K. G. (A)
Legedza, Z. (M)
Lemly, F. W. (A)
Lenehan, J. J. (M)
Leni, J. (M)
Lennon, T. J. (M)
Lentz, J. J. (M)
Leonard, W. L. (A)
Lesman, E. (A)
Lesnick, R. (A)
Lesser, D. A. (A)
Levens, L. M. (SM)
Levi, E. (M)
Levi, L. (M)
Levin, H. S. (M)
Levin, M. J. (M)
Levine, B. I. (A)
Levine, E. (M)
Levine, L. (M)
Levine, N. M. (A)
Levit, M. (A)
Levy, B. (M)
Levy, C. (M)
Levy, H. J. (M)
Levy, M. G. (M)
Lewis, G. (M)
Lewis, P. A. W. (M)
Liebell, E. (M)
Lieberman, D. (M)
Lieberman, M. S. (A)
Lilienfeld, H. J. (M)
Lindner, N. J. (M)
Lisoky, A. H. (M)
Lisoky, S. E. (M)
Littner, G. H. (M)
Llewellyn, F. B. (F)
Lockwood, L. W. (M)
Lokomowitz, L. I. (M)
Lomega, M. (M)
Lomis, A. L. (F)
Love, G. V. (M)
Low, C. L. (M)
Lowenstein, M. (A)
Lukashewitz, P. (A)
Lukianoff, L. (A)
Luntz, J. D. (SM)
Mabuchi, K. K. (M)
Mabuchi, O. (A)
Machover, C. (M)
Mac Kenzie, R. P. (M)
Maedel, G. F. (SM)
Magid, A. (M)
Mandell, M. (A)
Mandl, H. J. (M)
Manheimer, B. H. (M)
Manner, A. E. (A)
Mansky, L. (A)
Mapes, C. M. (SM)
Marcinkowski, H. L. (M)
Mariner, T. H. (A)
Markel, R. (A)
Marolda, J. (M)
Martin, A. E. (SM)
Martin, J. A. (M)
Marvin, P. R. (SM)
Marx, E. A. (SM)
Marx, F. L. (SM)
Maser, H. (SM)
Mason, L. (M)
Mason, W. (SM)
Massy, F. M. (M)
Mastrandrea, R. J. (M)
Match, I. (M)
Matilla, P. A. (A)
Mattison, G. H. (M)
Mattson, R. A. (M)
Mauro, A. (A)
Mausler, R. (M)
Mauzey, P. T. T. (M)
Mayer, R. O. (M)
Mazurek, F. (A)
McClelland, H. (A)
McCluskey, V. (M)
McConnell, K. R. (SM)
McCusker, R. F. (M)
McDermott, B. (M)
McDonald, J. R. (M)
McFarlane, R. (M)
McGiffert, S. Y. (SM)
McGrath, J. J. (M)
McKnight, R. W. (M)
McLaughlin, N. C. (M)
McManus, T. J. (M)
McMillin, R. R. (A)
McNally, W. P. (M)
McPherson, J. G. (SM)
McRae, J. W. (F)
Mehta, S. H. (A)
Meier, P. J. (M)
Merrigan, M. T. (A)
Meserole, W. E. (M)
Meslener, G. J. (A)
Meyerson, A. H. (M)
Michl, W. L. (A)
Migliore, S. P. (M)
Milenbach, H. (M)
Millais, W. G. (A)
Millar, J. Z. (F)
Miller, B. (M)
Miller, H. G. (SM)
Miller, K. S. (SM)
Miller, T. S. (A)
Minkow, M. (A)
Mitchell, C. W. (M)
Mitchell, D. (SM)
Mitchell, H. F., Jr. (M)
Mitchell, I. A. (VA)
Mitchell, L. B. (A)
Mitchell, T. H. (SM)
Molnar, R. J. (A)
Monahan, G. W. (A)
Monk, N. (SM)
Monshaw, J. H. (A)
Moore, J. H. (SM)
Moore, S. F. (M)
Morand, G. D. P. (A)
Morel, P. (A)
Morenoff, E. (M)
Morse, M. (A)
Moss, H. (M)
Mower, C. P. (A)
Muirhead, D. E. (A)
Muller, J. H. (SM)
Murbach, J. F. (M)
Murino, C. C. (M)
Murphy, O. J. (SM)
Myer, D. A. (SM)
Myers, M. C., Jr. (M)
Nalbantian, J. H. (SM)
Nancoz, A. P. (A)
Napoli, A. E. (M)
Narita, Y. (M)
Nashman, A. E. (SM)
Nathan, A. M. (M)
Nazerian, H. H. (A)
Neary, J. A. (M)
Nedell, E. (M)
Nelson, M. (M)
Nestor, R. P. (M)
Neuwirth, P. (M)
Nexon, V. J. (M)
Nicholides, E. C. (M)
Nidermayer, V. A., Jr. (A)
Nielsen, H. V. (M)
Nissen, J. H. (M)
Norman, N. C. (M)
Novik, W. (M)
O'Brien, R. S. (SM)
O'Bryan, H. M. (SM)
O'Hara, T. R. (M)
Okoronkwo, K. (A)
Olcott, E. W. (M)
Olsen, M. V. (M)
Onder, K. (SM)
O'Neill, L. H. (SM)
Onyshkevych, L. S. (M)
Orenstein, N. (M)
Osatake, T. (SM)
Oslatinsky, L. (SM)
Ostheimer, F. R. (A)
Ostrolenk, S. (M)
Owen, C. H. (M)
Oxer, H. (A)
Ozolins, L. (M)
Paley, W. S. (A)
Palmisano, G. A. (A)
Palocz, I. (SM)
Palocz, S. (M)
Paniaqua, R. (A)
Parisler, M. (A)
Parker, J. D. (SM)
Parodi, H. A. (M)
Paskin, M. (M)
Pasquler, C. J. (M)
Passavant, C. A. (M)
Paul, G. S. (M)
Pearson, H. (M)
Peborde, R. J. (A)
Pegler, H. M. (M)
Pegler, J. A. (A)
Pekarowitz, R. (M)
Pelleorinelli, C. L. (A)
Pelton, R. G. (M)
Perry, F. M. (M)
Peterson, E. (F)
Petranek, L. (A)
Petrides, T. (SM)
Pettit, O. F. (M)
Pezza, A. T. (A)
Pfeffer, P. (M)
Pfleger, K. W. (SM)
Phelps, C. H., Jr. (M)
Philbin, S. H. (A)
Phinney, E. D. (SM)
Pietrzyba, G. J. M. (M)
Pincus, R. M. (A)
Plore, E. R. (F)
Pitre, V. H. (A)
Pizzuti, F. D. (M)
Plesset, K. (A)
Plishner, P. J. (M)
Poosl, G. P. (M)
Polin, H. S. (A)
Pollak, J. P. (SM)
Pollak, R. H. (M)
Pomret, J. A. (M)
Ponemon, R. D. (M)
Popolow, R. H. (M)
Porter, R. W. (SM)
Poss, E. (A)
Post, R. D. (M)
Predmore, E. E. (M)
Price, A. S. (A)
Price, G. W. (M)
Privitera, P. S. (A)
Pucci, D. J. (A)
Pullman, I. (M)
Putterman, H. (M)
Quinones, D. (A)
Quirk, W. B. (M)
Rabinowitz, J. (M)
Racker, J. (M)
Radner, M. A. (M)
Raffone, J. J. (M)
Ragazzini, J. R. (F)
Rahmes, R. E. (SM)
Railwater, L. J. (SM)
Ralt, C. M. (M)
Randolph, G. C. (A)
Rankin, R. L. (SM)
Rapaport, H. (SM)
Rarity, J., Jr. (M)
Raymond, R. (A)
Read, O. (A)
Reaser, R. R. (M)
Reed, S. G. (M)
Rehm, W. P. (M)
Reichard, H. S. (M)
Reicher, M. D. (M)
Reiner, D. G. (M)
Reiner, M. (M)
Reinke, E. E. (M)
Reiss, L. (A)
Relson, M. (M)
Renne, H. S. (SM)
Revzin, S. A. (M)
Reynolds, G. (A)
Richardson, H. L. (SM)
Rider, J. F. (VA)
Ridings, G. H. (M)
Rigg, R. W. (M)
Rigogliosa, A. B. (M)
Rinder, R. M. (A)
Rios, E. Q. (A)
Rivera, J. J. (A)
Robbins, G. J. (A)
Robertson, C. B. (M)
Robinson, F. F. (A)
Rochwarger, M. M. (M)
Rocke, A. J. (A)
Roehrig, H. W. (A)
Rogan, J. J. (SM)
Rogers, D. W. (A)
Rogers, R. N. (M)
Rogoff, J. B. (A)
Romnes, H. I. (SM)
Rosaler, R. C. (SM)
Rose, T. T. (A)
Rosen, B. M. (M)
Rosen, B. (M)
Rosenbaum, P. L. (M)
Rosenberg, H. J. (M)
Rosenheim, D. E. (SM)
Rosenstark, S. (M)
Rosenthal, W. (M)
Rosner, I. S. (M)
Roth, J. E., Jr. (M)
Roth, S. A. (A)
Rothenstein, E. M. (A)
Rothschild, R. F. (M)
Rothschild, R. S. (M)
Rothschild, R. S. (M)
Rubenstein, A. L. (A)
Rubin, J. (M)
Rubin, J. S. (M)
Rubinstein, B. (M)
Ruddley, J. (M)
Rugge, R. A. (SM)
Runyon, C. R., Jr. (SM)
Rutzenberg, S. (A)
Sabto-Agami, J. C. (A)
Sadenwater, P. O. (M)
Safir, R. (SM)
Safran, P. (M)
Sage, I. M. (M)
Sager, N. (A)
Sahud, L. R. (A)
Salas, R. E. (M)
Salin, J. A. (M)
Samuels, M. (A)
Sanders, R. G. (A)
Saporta, L. J. (SM)
Sarachik, P. E. (M)
Sarasohn, H. M. (M)
Samoff, D. (F)
Saunders, H. M. (M)
Sautner, J. (M)
Sawka, R. J. (A)
Schaffer, E. (M)
Schaller, J. (A)
Schauffler, F. A. (A)
Schechter, G. (A)
Scher, N. (M)
Schetzen, M. (M)
Schiller, H. H. (SM)
Schilling, D. L. (M)
Schilling, W. A. (M)
Schlaikjer, J. E. (SM)
Schlenger, S. B. (M)
Schlesinger, S. P. (M)
Schlig, E. S. (M)
Schmertz, R. C., Jr. (M)
Schmidt, H. (A)
Schoenfeld, R. L. (M)
Schoenfuss, A. F. (SM)
Scholz, C. E. (F)
Schreiner, K. E. (M)
Schwalbe, M. I. (SM)
Schwartz, H. T. (M)
Schwartz, M. J. (A)
Schwartz, M. (SM)
Schwartz, M. I. (M)
Schwarz, R. J. (SM)
Schweitzer, M. P. (A)
Schwenzfeger, E. E. (A)
Seadler, S. E. (A)
Sear, E. F. (M)
Sedacca, J. M. (A)
Seklemian, R. S. (A)
Sellinger, S. (M)
Shain, M. D. (A)
Shamos, M. H. (M)
Shasiro, E. S. (A)
Shapiro, J. (M)
Shapiro, M. H. (M)
Shaw, B. (SM)
Shecter, E. S. (M)
Sheldon, E. E. (A)
Sheldon, M. (M)
Shelley, E. F. (SM)
Shepard, W. H. (A)
Sher, F. D. (M)
Sherman, J. B. (SM)
Sherman, M. (A)
Shiepe, E. M. (M)
Shloman, W. A. (SM)
Shokkos, C. (M)
Shonnard, J. R. (M)
Shulman, C. (SM)
Silber, A. (A)
Silbey, S. A. (M)
Silverberg, B. H. (M)
Silverman, R. A. (SM)
Silverschotz, S. B. (M)
Simms, J. P. (A)
Simon, E. J. (F)
Simon, P. F. (A)
Simpson, D. B. (M)
Sims, R. E. (A)
Sims, S. P. (A)
Singer, L. W. (A)
Sira, M. A., Jr. (A)
Skinner, L. V. (SM)
Slater, D. (M)
Smith, A. R. (M)
Smith, A. V. (M)
Smith, D. L. (SM)
Smith, G. M. (VA)
Smith, I. R. (M)
Smith, J. H., Jr. (M)
Smithline, H. (M)
Snyder, R. L. (M)
Solomon, A. H. (M)
Solomon, M. M. (M)
Soman, R. O. (M)
Sonsky, S. N. (M)
Sontz, C. (M)
Spampinato, P. (A)
Spampinato, R. (A)
Spangenberg, L. F. (SM)
Spears, W. K. (M)
Spector, M. S. (M)
Sperling, J. (A)
Spiegelman, D. (M)
Spira, J. S. (M)
Spitalny, M. (M)
Sponable, E. I. (SM)
Sprafkin, H. M. (M)
Spratt, E. L. (A)

Sprung, J. (M)
Stadnitski, R. K. (M)
Stalemark, F. R. V. (A)
Stanfield, F. L. (M)
Stanton, F. (SM)
Starace, N. L. (A)
Stavrinaki, A. G. (A)
Steenbeke, H. M. (M)
Stehn, J. W. (M)
Stein, H. S. (M)
Stein, P. (M)
Steinberger, N. (M)
Stelzer, I. (A)
Stenhammer, H. T. (M)
Stepic, W. W. (M)
Stern, E. (M)
Stern, J. L. (M)
Stern, K. (M)
Stern, R. M. (M)
Stern, T. E. (M)
Stewart, A. E. (A)
Stifel, R. C. (A)
Stiles, K. P. (SM)
Stobbe, J. A. (SM)
Stock, D. J. R. (A)
Stocklin, W. A. (SM)
Stone, E. W. (F)
Stone, W. G. (A)
Strack, R. R. (A)
Strack, W., Jr. (M)
Strandh, E. S. (A)
Streifer, W. (M)
Streifus, C. A. (M)
Strickland, H. A., Jr. (SM)
Striker, R. G. (M)
Strobel, H. M. (M)
Struyk, C. (M)
Stuff, A. O. (M)
Suarez, A. (A)
Sullivan, H. W. (A)
Sussman, A. B. (A)
Sussman, A. I. (M)
Sverdlik, S. S. (A)
Szucs, A. S. (A)
Tabor, J. H. (A)
Taishoff, J. (M)
Talley, T. J., III (M)
Tamiya, Y. (A)
Targ, R. (M)
Taub, H. (M)
Taylor, C. H. (F)
Taylor, K. A. (M)
Taylor, W. H., Jr. (SM)
Temes, C. L. (M)
Thieblemont, A. H. (VA)
Thomas, L. (A)
Thomas, S. W. (M)
Thompson, R. G. (SM)
Tietjen, H. (A)
Tilley, H. H. (SM)
Tillistrand, C. O. (M)
Tint, G. (M)
Tobolski, J. (M)
Tolopko, L. N. (A)
Tompos, A. (M)
Tower, W. S., Jr. (A)
Townes, C. H. (SM)
Trachtenberg, A. (M)
Traver, H. A. (M)
Trevor, J. B., Jr. (M)
Truckess, D. E. (SM)
Tuckerman, L. S. (M)
Tung, F. F. C. (M)
Turchiano, M. W. (A)
Tutoli, J. G. (A)
Tuttle, C. W. (A)
Tykulsky, A. (M)
Uretsky, C. L. (M)
Uttal, J. A. (M)
Uttendorfer, E. A. (SM)
Van Delft, R. N. (M)
Van Dyck, E. A. (M)
Van Gelder, H. (M)
Van Horn, R. H. (SM)
Van Valkenburgh, R. P. (A)
Van Wynen, K. G. (SM)
Vehling, R. H. (M)
Velitchko, W. A. (M)
Vetter, A. J. (M)
Vieira, J. F. (A)
Vigue, K. J. (SM)
Vinarub, E. I. (M)
Vincent, C. J. (M)
Vitorovich, N. (M)
Vogel, R. P. (M)
Vorhes, D. M. (M)
Wagner, E. G. (A)
Wales, N. B., Jr. (M)
Walker, R. M. (SM)
Wallace, A. (M)
Walsh, A. L. (A)
Walsh, J. B. (SM)
Walsh, M. A. (M)
Walton, J. S. V. (A)
Ward, J. S. (A)
Warshauer, W. J. (M)
Wartell, R. (M)
Watkins, J. E. (M)
Watts, W. W. (A)
Weaver, A. (M)
Weber, J. V. (M)
Weber, J. H. (M)
Weber, L. A. (M)
Weibien, R. E. (M)
Weigert, H. A. (M)
Weil, R. T., Jr. (SM)
Weinman, M. (M)
Weiss, G. D. (M)
Weiss, M. R. (M)
Weiss, S. I. (SM)
Weissman, E. (M)
Weltz, G. (A)
Wenglin, S. (M)
Werner, R. L. (SM)
Wernick, J. I. (A)
Wernlein, C. E., Jr. (M)
Werth, A. M. (M)
Westheimer, M. (M)
Wexler, P. S. (A)
Whalen, B. F. (A)
Wheaton, L. H. (A)
White, G. C. (M)
White, S. D. (SM)
Wiberg, H. J. (M)
Wichtendahl, W. J. (M)
Wiesendanger, M. U. (A)
Willett, E. (M)
Williams, H. D. (A)
Willner, P. (M)
Wilmotte, R. M. (F)
Wilson, I. G. (SM)
Wing, O. (M)
Winkler, A. (M)
Winner, B. A. (M)
Winner, L. (M)
Winters, A. (A)
Wise, R. J. (SM)
Withnell, R. (M)
Wojciechowski, B. M. (SM)
Wolder, S. (M)
Wolf, H. (SM)
Wolfthal, D. A. (M)
Wong, A. S. (A)
Wong, W. K. T. (A)
Wood, J., Jr. (M)
Wood, M. R. (SM)
Woran, J. M. (A)
Worthing, F. L. (A)
Wouk, V. (M)
Wright, S. E. (M)
Wuorinen, J. H., Jr. (M)
Wyatt, K. S. (A)
Yarmus, L. (A)
Yieh, T. (M)
Young, H. H. (A)
Young, R. O. (M)
Young, W. R., Jr. (SM)
Yu, E. K. C. (M)
Yusem, S. (M)
Zak, M. A. (A)
Zalkin, D. M. (M)
Zeamans, H. R. (VA)
Zeigler, K. L. (A)
Zelter, W. E. (M)
Zinsser, H. H. (A)
Zippler, W. N. (M)
Zydney, H. M. (M)
Zysman, B. (M)

Niagara Falls (BN-1)
Albin, J. F. (M)
Bowman, D. S. (M)
Emes, H. R. (M)
Gleason, M. H. (M)
Haney, C. A. (A)
Hardy, L. H. (M)
Hill, I. T. (A)
Howells, W. B., Jr. (M)
Juda, H. J. (M)
Krupper, J. A. (M)
Loming, J. G. (M)
Leonard, D. J. (M)
Libby, M. E. (A)
Potter, C. E. (M)
Rowe, R. G. (SM)
Sarkees, Y. T. (M)
Shulman, H. (A)
Teal, H. E. (A)
Tomel, J. B. (M)

Niskayuna (SCH-1)
Shea, R. F. (F)

North Baldwin (LI-2)
Baron, A. R. (M)
Burmeister, W. W. (M)
Casey, K. T. (M)
Hart, G. K., Jr. (M)
Laughlin, S. I. (M)
Millar, W. M. (M)
Olszewski, W. R. (A)
Revere, R. W. (A)
Rappelmann, G. E. (A)
Schaten, P. (M)
Witt, C. J. (M)

North Bellmore (LI-2)
Beckhardt, T. (M)
Bischoff, J. J. (A)
Brook, R. H. (M)
Carlstrom, R. A. (M)
Dolin, R. (SM)
Doundoulakis, G. J. (M)
Ducksteln, S. (A)
Elsenbach, J. (M)
Johl, M. J. (SM)
Lipkin, W. (M)
Mascetti, B. J. (M)
Shaw, D. (M)
Tenenbaum, E. (M)

North Chatham (NY-MH-2)
Ray, G. T. (M)

North Chili (ROC-1)
Previte, P. E. (A)

North Massapequa (LI-2)
Algeo, J. J. (A)
Johnson, J. H., Jr. (A)
Kaelin, B. A., Jr. (M)
Kant, M. (M)
Kornbluth, A. E. (SM)
Price, D. (M)
Prunty, P. F. (M)
Quinn, J. A. (M)
Sokol, A., Jr. (M)
Sonntag, L. (M)

North Merrick (LI-2)
Bissegger, C. A. (M)
Branker, H. E. (M)
Leggio, J. (SM)
Schneiderman, W. (M)
Takach, A. (M)
Thosersen, G. O. (A)

North Pelham (NY-W-2)
Wolfson, R. (M)

Northport (LI-2)
Chubb, E. (M)
Davis, F. S. (A)
Dickerman, J. J. (M)
Elsele, J. G., Jr. (M)
Guido, L. A. (A)
Huntington, A. (M)
Litchford, G. B. (SM)
Lockwood, M. D. (M)
Mansberg, H. (M)
Mason, R. P. (A)
Norton, S. G. (M)
Othmer, R. E. (SM)
Rudish, R. M. (M)
Stankiewicz, S. (SM)
Stodola, E. K. (SM)
Striegl, H. F. (M)
Woodard, G. F. (A)

North Rockville Centre (LI-2)
Melman, I. J. (SM)

North Syracuse (SYR-1)
Adamthwaite, F. V., Jr. (M)
Andrews, W. J. (SM)
Arnold, W. J. (M)
Ashley, R. B. (A)
Baker, D. W. (A)
Baker, V. L., Jr. (M)
Bartley, W. P. (M)
Beane, S. I. (A)
Becker, D. A. (M)
Besenfelder, E. R. (M)
Blackstock, R. S. (M)
Bochen, I. P. (M)
Bockstiegel, R. B. (M)
Bough, C. F. (M)
Boyd, C. R. (M)
Brown, S. R. (M)
Cadwell, E. B., Jr. (M)
Cady, W. R. (SM)
Carr, J. K. (M)
Carson, R. E. (SM)
Chynoweth, W. R. (SM)
Cleary, C. J., Jr. (M)
Cohen, E. (M)
Colley, L. E. (M)
Crandall, C. L. (M)
Crow, E. O. (M)
Cunningham, J. H. (M)
Curtiss, G. R. (M)
Dahl, F. J., Jr. (A)
Davidson, H. A. (M)
De Rose, J. F. (A)
Dickson, W. H. (A)
Donegan, J. H. (M)
Duncan, M. R. (SM)
Dunlap, I. J., Jr. (M)
Eschus, E. D. (M)
Elbeck, A. C. (M)
Etchel, J. H. (SM)
Elkins, R. A. (M)
Ellis, C. L. (SM)
Ellis, C. R. (M)
Ellis, S. S. (M)
Fehlau, C. E. (M)
Flaherty, T. J. (A)
Forney, J. F. (M)
Frederick, L. G. (M)
Freestone, H. T. (A)
Friant, R. J., Jr. (M)
Frieling, E. (M)
Garrett, D. E., Sr. (SM)
Gerling, H. B. (SM)
Gerwig, C. H., Jr. (A)
Geyer, B. H., Jr. (SM)
Gibson, V. R., Jr. (SM)
Ginder, M. E. (M)
Grauberger, W. E. (M)
Grimm, H. H. (SM)
Hamon, R. E. (A)
Horsch, J. R. (A)
Hundstad, C. E. (M)
Jacobs, T. E. (M)
Jenkins, W. M. (M)
Jensen, H. J. (M)
Johnson, F. P. (M)
Johnson, G. L. (M)
Johnson, W. G., Jr. (M)
Jones, M. E. (SM)
Jordan, J. F. (M)
Kennedy, J. A. (M)
Kenyon, R. W. (M)
Kirkpatrick, G. M. (SM)
Koprowski, E. M. (SM)
Krause, L. O. (SM)
Krauss, D. M. (M)
Kuhn, D. H. (M)
Larosche, J. R. (A)
Lasewicz, V. J. (M)
Letizia, A. (M)
Linnertz, R. C. (A)
Lowther, F. E. (M)
Maloney, W. J. (A)
Mareum, D. (A)
Markes, R. T. (A)
Mayo, B. R. (A)
McClure, R. C. (M)
McLean, R. C. (M)
Meehan, J. A. (A)
Merriam, R. H. (A)
Michalek, A. R. (M)
Muschamp, R. A. (SM)
Nelson, W. D. (M)
Ostrowski, R. E. (A)
Palladino, M. J. (SM)
Pell, W. (M)
Phillips, A. B. (M)
Phillips, K. G. (M)
Pickard, L. A. (M)
Plavcan, C. T. (A)
Popejoy, I. J. (M)
Rausch, R. H. (M)
Relyea, R. A. (M)
Robbins, J. H. (A)
Schulz, E. R. (M)
Schwartz, N. (SM)
Schwarz, E. G. (A)
Selin, B. A. (M)
Shumway, N. R. (M)
Skovholt, R. L. (M)
Smith, J. (M)
Spence, J. W. (M)
Staslor, R. A. (A)
Stewart, N. J. (M)
Stokes, C. L. (M)
Stone, R. F. (M)
Thielking, R. C. (M)
Thompson, D. F. (M)
Tidwell, B. B. (M)
Tillman, J. T., Jr. (A)
Vandeven, D. W. (M)
Vest, C. R. (M)
Voth, N. D. (A)
Warren, R. A. (M)
Wassilak, E. J. (M)
Webb, R. S. (M)
Whiteside, J. S., Jr. (M)
Wich, H. C. (M)
Wick, J. A. (M)
Wintle, H. C. (SM)
Wright, R. B. (A)
Zenon, Z. (M)
Zizza, L. R. (M)

North Tarrytown (NY-W-2)
Akin, R. M. (VA)
Palmquist, C. A. (M)
Vavra, J. M. (A)

North Tonawanda (BN-1)
Arrison, C. R., Jr. (M)
Arsem, A. D. (SM)
Dunn, J. L. (SM)
Janowsky, R. H. (A)
Johnston, G. D. (M)
Knorr, W. G., Jr. (M)
Mott, R. H. (M)
Purnell, R. F. (M)
Schmidt, F. M. (SM)
Taber, R. F. (A)

North Valley Stream (LI-2)
Melnick, H. (M)

North Wantagh (LI-2)
Hellering, H. L. (M)
Retzger, L. I. (A)

North Woodmere (LI-2)
Gross, S. B. (A)

North White Plains (NY-W-2)
Fogila, H. R. (M)
Koblick, S. N. (A)

Norwich (BING-1)
Bates, W. R. (M)
Hamilton, O. M. (A)
Knudson, L. I. (M)

Nyack (NY-2)
Efremov, O. (M)
Koulomzin, N. J. (A)
Miller, H. M. (SM)
Murphy, R. P. (SM)
Perry, A. C. (A)

Oceanside (LI-2)
Diamond, G. H. (M)
Elsenberg, A. J. (SM)
Gleimer, B. (M)
Levenstein, H. (M)
Schrader, W. A. (M)
Suttenberg, S. (M)
Urbanik, J. G. (M)

Olcutt (BN-1)
Ketcham, W. R. (A)

Old Bethpage (LI-2)
Bimbaum, W. N. (M)
Davidson, R. (SM)
Di Franco, J. V. (M)
Dombro, L. (A)
Herman, J. H. (A)
Kenny, M. (M)
Kushner, D. (M)

Old Westbury (LI-2)
Feldmann, H. (SM)

Olean (BN-1)
Jarboe, R. A. (M)
Jenner, W. C. (M)
Taylor, W. D. (M)
Zakrewski, J. E. (M)
Oneida (RU-1)
Simchik, R. J. (A)

Ontario Center (ROC-1)
Blake, B. F. (A)

Oran (SYR-1)
Johnson, T. T. (SM)

Orangeburg (NY-2)
Adelsberg, J. (A)

Orchard Park (BN-1)
Earl, H. D. (SM)

Ossining (NY-W-2)
Bertram, J. E. (M)
Boyce, J. (M)
Brown, R. D. (M)
Butler, S. A. (M)
Caputo, J. G. (M)
Dennard, R. H. (A)
Fraim, N. R. (M)
Garifo, M. A. (M)
Lescarboura, A. C. (SM)
Magnino, J. J., Jr. (M)
Nakagawa, N. (A)
Ruedisuell, R. W. (M)
Saron, R. B. (M)
Smith, L. A. (SM)
Tertel, R. H. (M)
Trifari, F. R. (SM)
Waxman, R. (M)
Yu, H. N. (M)

Oswego (SYR-1)
Gill, L. R. (A)
Shutts, B. C. (A)

Owego (BING-1)
Anderson, D. D. (A)
Armstrong, R. A. (A)
Barlow, J. P. (M)
Burcak, T. (M)
Dearden, Z. T. (M)
Doolittle, G. V. (A)
Giroux, P. H. (M)
Halpern, P. H. (M)
Hill, T. W. (M)
Huopana, R. O. (M)
Hyde, P. L. (A)
Jenkins, W. S. (A)
Johnson, C. I. (SM)
Johnson, G. W. (A)
Knox, L. A. (M)
Lyons, R. E. (M)
Martin, A. G., Jr. (M)
Masters, R. J. (M)
Rivera, E. R. (M)
Smith, J. S. Jr. (M)
Stalma, J. F. (M)
Stoops, E. H. (M)
Summers, W. P. (SM)
Urban, H. E. (M)
Vance, V. G. (M)
Vanderpool, R. F. (M)
Van Horn, J. F. (M)
Vinal, A. W. (M)
West, A. P. (M)

Oyster Bay (LI-2)
Bruhns, W. H. (A)
Bumstead, J. J. (A)
Dyer, J. N. (F)
George, B. A. (A)
George, H. A. (A)
Messner, W. S. (M)
Mills, J. J. (A)
Pogust, F. B. (M)

Oyster Bay Cove (LI-2)
Busby, J. W. (SM)

Ozone Park (LI-2)
Bazylevsky, G. (M)
Cava, F. C. Jr. (A)
Florietta, A. A. (M)
Hemandez, J. (A)
Kerr, R. G. (A)
Mellard, J. (M)
Nuscher, L. E. (A)
Schuster, D. (A)
Stone, K. A. (M)
Tleman, F. V. (M)
Watson, W. C. (A)

Painted Post (ELM-C-1)
Carpenter, N. R. (M)
Coolidge, J. C. (A)
Eveleth, J. H. (M)
Frazier, J. F. (M)

Palisades (NY-2)
Ward, B. R. (M)

Patchogue (LI-2)
Malkiewicz, J. F. (M)
Wise, A. P. E. (M)

Pattersonville (SCH-1)
Dodge, A. C. (SM)
Oakes, W. S. (M)

Pawling (NY-MH-2)
Kubacky, F. A., Jr. (A)

Pearl River (NY-2)
Cohn, D. A. (M)
Feinerman, B. (M)
George, R. E. (M)
Porter, H. A. (A)

Peconic (LI-2)
Oates, J. P., Jr. (A)

Peekskill (NY-W-2)
Arcate, J. A. (M)
Baron, R. G. (M)
Fontaine, A. B. (A)
Foxe, M. (M)
Guarino, R. J. (M)
Heitzman, C. L., Jr. (M)
Hyde, A. E. (M)
Juanillo, J. J. (M)
Kusnick, A. A. (SM)
Lee, H. T. (M)
Leitner, M. (A)
Mcdermid, W. L. (M)
Schreiner, R. J. (M)
Shapiro, E. (M)
Slawsky, S. M. (M)
Todd, S. E. (M)
Walder, B. (M)
Winkelstein, R. A. (M)

Pelham (NY-W-2)
Aaltonen, T. K. (A)
Cragg, R. P. (SM)
Kruse, L. C. (M)
Skinner, F. J. (SM)

Pelham Manor (NY-W-2)
Burnell, N. (A)
Caltan, J. M. (M)
Zadeh, L. A. (F)

Penfield (ROC-1)
Atwood, B. E. (SM)
Barker, J. R. (A)
Berch, W. H. (M)
Chipman, J. R. (A)
Cohen, G. H. (M)
Dulin, G. F. (M)
Helt, J. C. (M)
Hosking, M. B. (M)
Hule, J. A. (M)
Humphrey, L. C. (SM)
Pomroy, R. A. (A)
Potter, F. J. (A)
Schwittek, E. W. (M)
Shirman, J. (M)
Tubinis, M. P. (M)
Wyman, B. D. (M)

Penn Yan (ROC-1)
Emerson, L. E. (A)

Phoenix (SYR-1)
Pacia, E. (M)
Pavetto, J. C. (M)
Smith, D. L. (SM)
Stabler, E. P. (A)

Pine Bush (NY-MH-2)
Mattern, P. E. (M)

Pine City (ELM-C-1)
Andrews, R. W. (M)
Long, E. D. (M)

Pine Island (NY-MH-2)
Plossl, T. F. (A)

Pittsford (ROC-1)
Ashbaugh, R. R. (M)
Bond, H. A. (SM)
Brune, W. L. (SM)
Burkhardt, J. R. (A)
Busby, L. A. (M)
Carlson, D. V. (M)
Franco, G. A. (M)
Jorgensen, O. A. (M)
Nelson, J. A. (M)
Stephenson, E. D. (M)
Straehl, R. N. (M)
Taylor, R. B. (SM)
Walker, W. F. (M)
Whittall, M. D., Jr. (A)

Plainview (LI-2)
Abramson, J. (M)
Alper, R. (M)
Altschul, E. R. (M)
Amniratl, S. (M)
Bama, G., Jr. (M)
Bedolan, B. (A)
Berens, J. (SM)
Berge, P. J. (M)
Berton, J. F. (M)
Bloom, G. M. (M)
Bressler, S. (M)
Brown, A. R. (M)
Case, S. W. (A)
Chatterton, E. L. (SM)
Childs, C. W. (M)
Ciliuffo, J. S. (A)
Cohen, B. C. (A)
Cohen, J. B. (A)
Coleman, C. H. (A)
Courounis, S. P. (M)
Craib, J. F. (SM)
Crane, R. (M)
Cretella, S. A. (M)
Dalessandro, J. A. (M)
Davis, H. M. (SM)
Dickman, A. (SM)
Dinbart, M. (M)
Dorman, D. (M)
Elson, A. C. (A)
Fine, A. M. (M)
Fox, E. I. (M)
Frisch, I. J. (M)
Fucci, S. (SM)
Gertzis, S. (M)
Gewirtz, A. (M)
Gold, I. (M)
Gorelick, G. (M)
Greenwald, M. S. (M)
Gronlund, A. G. (A)
Gross, J. (M)
Hall, S. F. (M)
Halpern, M. (M)
Hastings, R. (M)
Hebel, E. Jr. (A)
Helchinger, C. L. (A)
Heiss, W. H. (SM)
Heller, Z. H. (M)
Helms, M. E. (M)
Ingram, R. H. (M)
Intraub, J. (A)
Jacobson, R. I. (SM)
Kahl, D. S. (SM)
Kanner, M. (M)
Kimball, L. R. (M)
Klein, R. C. (M)
Kogan, M. A. (A)
Lanning, W. C. (SM)
Lapidus, H. J. (A)
Leahy, R. E. (M)
Leichtman, J. A. (A)
Lesser, D. (M)
Levine, S. (M)
Marcus, M. A. (M)
Marsden, W. Y. (A)
Martin, M. B. (M)
McGuire, J. P. (M)
McInnis, T. F. (M)
Meri, K. C. (M)
Moerman, N. A. (M)
Nash, A. A. (M)
Nesenoff, N. (A)
Oken, S. (A)
Olwit, S. H. (M)
Perzley, W. (A)
Pignataro, F. P. (M)
Pizzicara, D. J. (A)
Potter, J. T. (A)
Prew, H. E. (M)
Radzka, B. (SM)
Richmond, C. H. (M)
Rose, S. I. (M)
Ross, C. J. (M)
Ross, G. F. (M)
Rudiger, T. F. (M)
Sadowski, H. (M)
Sayer, G. (M)
Schwint, K. F. (A)
Shaw, D. (A)
Simkins, R. S. (M)
Slocum, G. V. (M)
Smith, R. H. (M)
Stattler, J. J. (SM)
Stanler, L. (SM)
Steen, R. O. (M)
Stern, E. (M)
Szabo, J. A. (A)
Taboski, A. F. (M)
Taub, J. J. (M)
Tramposch, A. F. (M)
Turner, E. (M)
Van Derzeek, L. M. (M)
Vasilos, M. G. (M)
Well, W. M. (M)
Weinberg, M. (M)
Weiner, W. (M)
Wexler, H. (M)
Zaremba, C. J. (M)
Zinaman, H. J. (M)

Plandome (LI-2)
Blackwell, O. B. (F)
Di Blasi, J. (SM)
Dunning, O. M. (F)
Eaton, J. E. (M)
Spellman, F. C. (M)

Pleasant Valley (NY-MH-2)
Kingston, W. J. (A)
Layden, E. C. (M)
Spence, T. M. (M)
Swallow, D. S. (M)
Taylor, O. P. (SM)

Pleasantville (NY-W-2)
Armstrong, F. L. (M)
Berger, F. B. (SM)
Dewhirst, T. P. (VA)
Dieter, N. H. Jr. (M)
Elsele, W. A. (A)
Finkler, R. A. (M)
Flynn, W. J. (M)
Forrest, J. C. (M)
Fraser, J. T. (SM)
Freud, E. L. (M)
Fulmer, N. C. (M)
Gamertsfelder, C. R. (SM)
Gay, T. W. Jr. (M)
Glueckler, E. J. (M)
Grove, A. C. (SM)
Hannahs, W. H. (M)
Honig, A. R. (M)
Keenan, M. J. (A)
King, C. W. (M)
Kleckner, C. C. (M)
Kolb, D. J. (M)
Kowalsky, J. (M)
Kranz, F. W. (SM)
Lee, R. W. (SM)
Lehman, W. (M)
Lahr, S. (A)
Lepnis, A. (A)
Lohman, A. F. (M)
McGuire, E. C. (A)
McKendry, J. K. (M)
Michalec, G. W. (M)
Miller, A. G. (A)
Odell, T. W. (M)
Paine, G. R. (M)
Poureiau, L. L. (M)
Reed, H. J. Jr. (SM)
Rifkin, M. (M)
Rolfs, J. C. (M)
Rosenberg, H. J. (SM)
Sakson, P. J. (M)
Saltzman, H. (M)
Schick, F. T. (A)
Sherman, S. (M)
Sloles, G. W. (M)
Tull, W. J. (SM)
Ward, J. C. (M)
Wood, A. G. (M)
Zimbel, M. S. (M)
Zlolkowski, A. (SM)
Zola, M. J. (A)

Poland (RU-1)
Williams, E. E. (A)

Port Byron (SYR-1)
Breese, H. R. (M)
Webb, T. E. (M)

Port Chester (NY-W-2)
Anderson, A. E. (A)
Barker, D. R. (M)
Botwin, L. (SM)
Flannell, C. F. (M)
Goldberg, H. D. (A)
Houck, G. B. Jr. (M)
Jackman, W. L. (M)
Kalt, C. G. (M)
Luedtke, P. R. (A)
Rabinowitz, M. (M)
Toman, J. J. (A)
Watson, E. F. (SM)
Woloschak, K. (SM)

Port Ewen (NY-MH-2)
Sweet, A. J. Jr. (M)

Port Jefferson (LI-2)
Fields, W. H. (A)
Giordano, S. (A)
Kolancik, J. J. (M)
Munzer, L. F. (M)

Port Jervis (NY-MH-2)
MacCallum, W. F. (A)
Weill, R. L. (A)

Port Washington (LI-2)
Aitken, R. K. (M)
Asmundsson, E. (A)
Baston, W. M. (M)
Bempel, T. C. (M)
Bicknese, F. H. (M)
Burke, H. E., Jr. (M)
Burroughs, H. A. (SM)
Cahalan, I. W. (M)
Carduner, W. (VA)
Craig, D. R. Jr. (M)
Davidson, W. F. (SM)
Doersam, C. H., Jr. (SM)
Falco, E. E. (M)
Friedland, I. (M)
Gabor, A. (A)
Giba, J. J. (SM)
Herzog, A. W. (M)
Hickey, J. H. (SM)
Hoag, O. (SM)
Hylas, A. E. (M)
Jacquette, J. H. (M)
King, R. W. Jr. (M)
Knights, C. F. (M)
Larson, J. E. (A)
Lazich, B. (SM)
Leffingwell, W. B. (A)
Leonard, E. V. (M)
Link, W. J. (M)
Lluzie, D. S. (SM)
Lubkin, V. J. (M)
Mahoney, J. J. (A)
Marshall, J. H. (M)
Massengale, D. W. (M)
Murdoch, A. Jr. (SM)
Naybor, E. V. (M)
Nelson, E. L. Jr. (M)
Nixon, W. E. (A)
O'Connor, J. F. (M)
Okrent, J. J. (SM)
Pacent, H. G. (M)
Page, F. E. Jr. (SM)
Pasek, D. M. (SM)
Pasqua, L. (A)
Robberson, E. L. (A)
Roelofs, D. D. (M)
Spencer, N. A. (SM)
Staten, R. J. (M)
Stellwagen, F. W. (SM)
Strawbridge, R. B. (M)
Striffler, F. L. (M)
Tedford, W. E. (M)
Thayer, G. H. (M)
Trautman, D. L. (SM)
Watkays, D. E. (M)
Weston, S. (SM)
Williams, G. W. Jr. (M)
Witmer, F. S. (M)
Wolf, F. J. Jr. (SM)

Potsdam (SYR-1)
Martin, A. R. (A)
Reed, G. W. (A)
Sanford, R. S. (A)
Strong, W. J. (M)

Poughkeepsie (NY-MH-2)
Acton, F. G. (M)
Adem, R. (M)
Anderson, R. L. (M)
Ashar, K. G. (M)
Backman, F. F. (M)
Bahret, R. W. (M)
Baird, J. (SM)
Barber, A. E. (A)
Bardell, P. H. Jr. (M)
Barnes, D. E. (M)
Bartelt, J. E. (A)
Bashe, C. J. (M)
Bauer, E. W. (M)
Baumgarte, P. H. (M)
Beatty, H. J. Jr. (A)
Beesley, J. P. (M)
Benson, A. B. (M)
Berger, A. W. (M)
Beverly, N. E. (M)
Blauuw, G. A. (M)
Blessing, R. R. (SM)
Bloch, E. (M)
Blosk, R. T. (M)
Blust, C. D. (M)
Boden, R. C. (M)
Boland, L. J. (M)
Bonevac, S. (M)
Branin, F. H., Jr. (SM)
Brennemann, A. E., Jr. (M)
Brock, J. F. (A)
Brooks, F. P., Jr. (M)
Brosseau, E. F. (M)
Bruce, G. D. (M)
Brunschweiger, A. (A)
Bryson, B. L. (M)
Buchholz, W. (SM)
Buckley, W., Jr. (M)
Buley, T. L. (A)
Burke, E. J. (M)
Buton, E. C., Jr. (A)
Button, C. H. (M)
Cadden, W. J. (M)
Carlson, F. A. (M)
Carpenter, E. J., Jr. (M)
Carrothers, G. H. (M)
Case, P. W. (M)
Chapman, D. J. (M)
Chin, F. W. (M)
Christiansen, C. L., Jr. (M)
Chrysler, L. F. (M)
Cobb, R. W. (A)
Conroy, E. D. (M)
Constantine, G., Jr. (M)
Cooper, D. K. (A)
Coughlin, J. J. (M)
Courtois, J. R. (A)
Crane, A. E. (M)
Crawford, D. J. (M)
Crawford, J. K. (A)
Crawford, J. K. (A)
Crawford, W. A. (A)
Credle, A. B. (M)
Davis, C. M. (A)
Davis, C. M. (A)
Davis, E. M., Jr. (M)
Deabler, L. T. (M)
Dean, K. W. (M)
De Lano, R. B., Jr. (M)
Disney, J. V. (A)
Dix, D. S. (A)
Domenico, R. J. (M)
De Witt, D. (SM)
Doody, D. T. (M)
Dumin, D. J. (M)
Dundatscheck, E. P. (A)
Dunwell, S. W. (M)
Eggenberger, J. S. (M)
Elbsen, R. L. (M)
Elnolf, C. W. (M)
Evin, N. I. (M)
Eyre, C. (M)
Farrell, J. F. (M)
Flaherty, R. J. (M)
Fleisher, H. (M)
Fletcher, R. P. (A)
Floros, T. G. (M)
Folsom, R. M. (M)
Forsberg, H. A. (A)
Fox, A. (M)
Fox, P. E. (SM)
Frese, S. J., Jr. (A)
Fritz, E. L. (A)
Fuegel, E. F. (SM)
Gaffney, J. E. Jr. (M)
Gannon, P. M. (M)
Gayle, A. (M)
Genser, M. (A)
Gindl, A. M. (A)
Goble, A. S., III (M)
Golden, R. K. (M)
Goldman, E. H. (SM)
Goldstein, A. G. (M)
Gorman, D. F. (M)
Granito, G. D. (M)
Grecco, J. A. (M)
Greene, K. F. (M)
Greene, N. E. (M)
Greer, F. G. (M)
Griffith, J. E. (SM)
Grimm, D. S. (M)
Gulland, C. R. (SM)
Gutwin, O. A. (M)
Hahn, E. F. (M)
Hallock, D. G. (M)
Hanson, E. E. (M)
Hartman, F. B. (M)
Hasbrouck, L. J. (A)
Hawkins, G. V. (M)
Haynes, M. K. (M)
Heath, H. F., Jr. (M)
Heermans, J. W. (M)
Hellerman, L. (M)
Hennis, R. B. (A)
Hill, R. A. (M)
Hilliard, H. C., Jr. (M)
Hnat, S. (M)
Holtman, L. S. (A)
Holzman, G. R. (M)
Homrig, L. L. (M)
Hornick, J. C. (M)
Hoskinson, W. C. (M)
Hotchkiss, G. L. (M)
Hotchkiss, G. L. (M)
Houldin, R. J. (A)
Hung, J. W. (M)
Hunter, L. P. (SM)
Isole, J. J., Jr. (M)
Jackamonis, G. (A)
Jackson, P. W. (M)
Jensen, R. A. (SM)
Johnson, J. R. (M)
Jones, R. P. (M)
Jordan, E. I. (A)
Joyal, H. J. (M)
Jung, P. (M)
Kanter, L. E. (M)
Karan, C. (SM)
Kassan, J. D. (M)
Kehr, J. E. (M)
Kennard, A. G., Jr. (M)
Kennedy, G. F. (M)
Kilcrease, D. L. (A)
King, L. E. (M)
King, R. M. (M)
Klein, M. (M)
Knuepoel, R. G. (M)
Koelsch, A. C., Jr. (M)
Konyathy, D. L. (M)
Koskos, A. (M)
Kronick, H. E. (M)
Kurtz, J. A. (M)
Lamy, R. C. (M)
Lawrence, D. G. (M)
Lawrence, G. (A)
Lawrence, W. W., Jr. (M)
Lazarus, P. (M)
Lehtonen, R. (M)
Ligon, G. C. (M)
Ling, E. W. (M)
Lippel, B. (M)
Lockett, D. E. (M)
Logue, J. C. (SM)
Lorenz, E. J. (A)
Low, P. R. (M)
Lyon, J. R. (M)
Mackay, J. B. (A)
Mac Sorley, O. L. (SM)
Marcy, H. T. (M)
Marshall, J. G., Jr. (M)
Martin, J. B. (A)
Martin, R. R. (SM)
Masters, G. E. (M)
Matthews, E. G. (A)
McMillan, E. C. (A)
Merrill, R. E. (M)
Merrill, R. L. (A)
Merwin, R. E. (M)
Miano, S. V. (M)
Miller, E. W. (M)
Milta, L. A. (M)
Monroe, G. R. (A)
Moore, J. W. (M)
Morey, G. A. (A)
Murphy, J. J. (M)
Murtha, G. A. (A)
Mussell, H. A. (A)
Mutter, W. E. (SM)
Myers, A. S., Jr. (M)
Nanes, M. (M)
Necol, J. C. (M)
Nelson, V. A. (A)
Newman, C. A., Jr. (M)
Newman, E. G. (M)
Northrup, C. D. (A)
Nortman, J. J. (M)
Nutter, E. H. (M)
O'Farrell, J. J., Jr. (M)
Oliva, F. J. (M)
O'Neill, G. R. (M)
Ordemann, F. A., Jr. (A)
Ostapkovich, P. L. (M)
Ostrowski, E. A. (M)
Padees, A. (M)
Palmquist, E. B. (A)
Pearson, K. A. (A)
Pell, E. F. (M)
Penoyer, R. F. (M)
Perlini, R. (A)
Pfirman, W. S. (A)
Phelps, B. E. (M)
Phillips, F. G., Jr. (M)
Pietras, C. M. (M)
Pitkowsky, S. (M)
Plummer, R. W. (A)
Pomerene, J. H. (M)
Post, F. L. (M)
Potok, E. R. (M)
Preiss, R. J. (A)
Quick, A. E., Jr. (M)
Rainville, R. A. (A)
Reiner, W. D. (M)
Reynolds, D. J. (A)
Riley, W. B. (M)
Robins, R. D. (M)
Robinson, J. D. (A)
Rocket, F. A. (M)
Ross, H. D., Jr. (M)
Rubin, S. (M)
Russell, G. E. (M)
Russell, L. A. (A)
Rutz, R. F. (M)
Rymaszewski, E. J. (SM)
Sampere, R. D. (A)

Samuel, A. L. (F)
Santino, L. (A)
Schaal, W. C. (A)
Schiavone, R. N. (M)
Schoedel, R. A. (M)
Schulman, F. D. (M)
Scott, A. E. (M)
Seaman, P. H. (M)
Shelford, L. L. (M)
Shirk, R. W. (M)
Shively, R. R. (M)
Shultz, G. L. (M)
Siegall, B. (M)
Sinek, R. L. (A)
Sindelar, F. J. (A)
Singer, D. F. (A)
Skelly, D. J. (M)
Skov, R. A. (A)
Slade, B. N. (SM)
Slonaker, R. D. (M)
Smith, G. H. (M)
Smith, J. W. (A)
Smith, W. J. (M)
Smoyer, C. K. (M)
Soatz, P. (A)
Spencer, G. W., II (M)
Staciokas, L. J. (M)
Standeven, J. D. (M)
Stephens, C. E. (M)
Stern-Montagny, F. H. (A)
Stevens, W. Y. (M)
Stevenson, M. J. (M)
Stoughton, P. N. (A)
Strohm, W. G. (M)
Swenson, W. G. (M)
Taren, W. J. (M)
Tasini, B. (M)
Thomson, D. B. (M)
Thompson, D. M. (M)
Thompson, L. J. (A)
Title, R. S. (M)
Tomasulo, R. M. (M)
Trachy, R. A. (M)
Trapnell, F. M., Jr. (M)
Tsilibes, G. N. (M)
Turnbull, J. R., Jr. (M)
Twicken, S. (M)
Ulfsparre, L. O. (A)
Underhill, G. H. (M)
Vandewinckel, A. W. (M)
Van Winkle, H. E., Jr. (M)
Verdibello, A. A. (A)
Verven, S. J. (M)
Vitek, W. J. (M)
Vogl, N. G., Jr. (M)
Wadhwa, R. P. (M)
Wajda, E. S. (M)
Walsh, J. L. (A)
Warner, J. H., III (A)
Weiss, D. H. (M)
Wenner, J. W. (A)
Whalen, R. M. (M)
Wheeler, N. D. (A)
Whitmore, D. C. (M)
Wild, H. K. (M)
Wilser, W. C. (M)
Wilson, E. S. (SM)
Wilson, R. F. (M)
Windes, F. V. (A)
Winger, W. D. (A)
Winkler, V. D. (M)
Witt, V. R. (SM)
Wittenberg, W. M. (A)
Wolensky, W. (M)
Wolfersperger, D. B. (A)
Wolff, H. P. (SM)
Wood, E. C. (M)
Wood, J. R. (M)
Wright, R. G., Jr. (A)
York, J. J. (A)

Queens (LI-2)
Elsenhuth, A. J. (M)
Yourke, H. S. (A)

Poundridge (NY-W-2)
Tingley, G. R. (A)

Putnam Valley (NY-2)
Lupano, E. L. (A)

Queens Village (LI-2)
Abrahams, S. (M)
Alcott, E. H. (A)
Bracken, T. C. (A)
Bracken, W. B. (A)
Bulwin, E. B. (A)
Cegelski, R. M. (A)
Fredricks, R. J. (M)
Gerych, W. E. (M)
Glasheen, R. W. (M)
Goldstone, L. O. (SM)
Gould, N. (M)
Griemsmann, J. W. E. (F)
Hagen, A. A. (M)
Hansen, E. L. (SM)
Hill, E. B. (A)
Hoffer, L. H. (A)
Johnson, C. W. (M)
Kleinoder, J. (A)
Klumpen, R. D. (A)
Lapping, A. W. (M)
La Ware, H. D. (M)
Liebliedis, K. (M)
Mayer, H. A. (M)
McCabe, R. A. (A)
O'Connor, J. L. (M)
Peters, W. G. (A)
Runta, O. J. (A)
Schmidt, H. P. (A)
Scifo, P. A. (A)
Selvaggio, N. J. (M)
Tennis, J. E. (M)
Trelewicz, E. R. (M)
Tripp, J. R. (M)
Wassermann, C. L. (M)
Yeager, J. R. (M)
Zimmerman, L. (A)

Red Hook (NY-MH-2)
Gerbitz, C. G. (A)
Helneck, A. W. (M)
Holmes, F. L., Jr. (M)
Lalumandier, A. J. (M)
Lawrence, W. A. (A)
Moran, W. R., Jr. (M)
Neason, S. J. (A)
Rhodes, R. (M)
Sevigny, G. D. (M)
Vincent, R. M. (A)

Rego Park (LI-2)
Bogner, B. F. (M)
Finn, P. L. (M)
Fleig, W. J. (M)
Furia, N. J. (M)
Green, P. S. (M)
Herrmann, W. J. (SM)
Krygier, G. F. (SM)
Marantz, D. R. (A)
Martin, P. E. (M)
Metzner, J. J. (A)
Ottenberg, E. C. (M)
Ottenberg, L. A. (M)
Packer, B. S. (M)
Rabinovici, B. (SM)
Smith, W. J. (M)
Waly, A. (M)
Weissman, S. (A)
Wirfel, W. M. (M)
Wong, N. F. (M)

Rensselaer (SCH-1)
Stuarts, A., Jr. (M)

Rexford (SCH-1)
Coblne, J. D. (F)
De Witt, J. S. (M)
Stutt, C. A. (M)

Rhinebeck (NY-MH-2)
Beeby, P. A. (M)
Burawski, J. A. (M)
Cox, T. C. (M)
Cypser, R. J. (M)
Eilersick, F. W. (M)
Foster, B. D. (M)
Hart, D. M. (A)
Howe, C. K. (A)
Lynch, C. F. (SM)
Mazziotti, F. (M)
Palmer, E. F. (A)
Raser, E. J. (A)
Visiocky, J. (M)
Vize, J. F. (M)

Richfield Springs (SCH-1)
Kitts, D. E. (A)

Richmond Hill (LI-2)
Amell, E. B. (A)
Clark, A., Jr. (A)
D'Angelo, F. (A)
Della Salle, L. R. (M)
Egan, W. G. (M)
Fees, H. W. (A)
Godbrie, T. F. (A)
Iorio, J. (M)
Johannesen, W. (A)
Marek, J. R. (A)
Mazzei, A. L. (SM)
Milukas, V. V. (A)
Roche, M. J. (A)
Rousselet, C. A. (A)
Scaturro, M. R. (A)
Schenkerman, S. (A)
Selnick, L. L. (A)
Sleminski, P. J. (A)
Simmons, C. H. (A)
Vambutas, E. (M)
Winer, J. D. (M)
Yellen, A. F. (A)
Zanichkowsky, M. (M)

Ridgewood (LI-2)
Condy, J. (A)
La Presti, P. (A)

Riverdale (NY-2)
Baker, J. R. (M)
Bernstein, E. (M)
Froehlich, C. (SM)
Harder, D. (M)
Heller, J. L. (M)
Karlan, J. H. (A)
Kellner, R. (M)
Martinson, O. M. (A)
Rosenthal, S. W. (SM)
Stahl, C. (M)

Riverhead (LI-2)
Atwood, J. B. (SM)
Braaten, A. M. (SM)
Brandinger, J. J. (M)
Goddard, D. R. (SM)
Goldman, S. (M)
Herbig, A. J. (A)
King, E. E. (A)
Leis, W. S. (M)
Moore, H. A. (M)
Olsen, W. E. (A)
Peterson, H. O. (F)
Schock, R. E. (SM)
Schoenborn, F. J. W. (M)
Shipley, D. G. (A)
Taylor, H. A. (SM)
Wagner, R. J., Jr. (M)
Wicklzer, G. S. (SM)
Zimmerman, R. (A)

Rochester (ROC-1)
Ablon, L. J. (M)
Agalides, E. (M)
Agel, C. W. (A)
Alphenaar, A. W. (M)
Anderson, R. T. (M)
Andzer, A. (A)
Andzer, A. L. (M)
Antonio, J. (A)
Arao, R. S. (SM)
Amts, F. D., Jr. (M)
Auer, J. H., Jr. (M)
Babcock, T. R. (M)
Bailey, C. E. (A)
Baker, A. A., Jr. (M)
Baker, M. (M)
Baldwin, L. D. (A)
Balling, A. W. (VA)
Bangs, R. G. (A)
Baron, E. A. (M)
Barr, E. M. (M)
Bartlett, W. F. (A)
Bayer, W. L. (SM)
Beaman, L. W. (M)
Beardsley, R. R. (SM)
Bellor, W. F. (M)
Bendel, S., Jr. (SM)
Bender, J. W. (A)
Benedict, C. F. (M)
Biggar, R. A. (SM)
Billin, A. G. (SM)
Blow, A. W. (M)
Boehly, M. A. (A)
Bok, R. F. (A)
Bonaventura, J. J. (A)
Bouchard, G. O. (A)
Bouyoucos, J. V. (M)
Bowen, B. D. (A)
Boyd, R. K. (M)
Braggins, R. D. (A)
Brant, S. J. (A)
Brennan, A. T. (SM)
Brewer, W. L. (SM)
Brock, E. G. (SM)
Broutman, C. A. (M)
Brown, C. A. (M)
Brown, C. R. (M)
Brown, C. S. (M)
Brown, G. A. (M)
Brown, J. G. (M)
Browning, R. (M)
Brumley, C. H. (M)
Bryzinski, T. F. (M)
Bull, H. T. (M)
Burns, D. W. (A)
Burrows, H. R. (M)
Cello, T. (M)
Ceranowicz, H. N. (M)
Chesna, J. (A)
Clark, D. B. (M)
Clark, G. J. (A)
Clement, M. A. (M)
Clickner, G. M. (M)
Close, S. W. (M)
Coombs, W. F., Jr. (M)
Corsiglia, J. (M)
Cotter, W. F. (SM)
Cumley, R. L. (M)
Curry, R. C. (M)
Curtice, W. R. (M)
Curtis, S. R. (SM)
Czora, W. G. (A)
Dallor, F. E. (M)
Dale, A. W. (SM)
D'Andreano, L. D. (A)
Dasburg, A. V. (M)
Deming, R. L. (SM)
Dobson, H. R. (M)
Donovan, C. (A)
Douglas, J. L. (M)
Dowdell, V. L., Jr. (M)
Dubin, D. (M)
Du Bovy, J. L. (A)
Dudek, S. J. (A)
Dunklin, R. A. (M)
Dutcher, B. C. (M)
Elsaman, L. C. (M)
Elliott, G. (SM)
Ellis, F. H. (M)
Ellis, J. R. (M)
Ellis, T. E., Jr. (M)
Engard, W. J. (A)
England, W. B. (SM)
Engler, C. D. (M)
Enslein, K. (SM)
Erbelding, J. C. (A)
Ertman, R. J. (M)
Federici, J. T. (M)
Fine, L. (M)
Fink, E. J. (M)
Fischer, A. N. (M)
Fleisher, M. D. (M)
Fondrk, J. S. (M)
Forbes, E. J. (A)
Formicola, A. F. (A)
Foster, G. C. (M)
Fox, R. S. (A)
Freehafer, J. E. (M)
Frielinghaus, K. H. (A)
Gardner, K. J. (M)
Garland, J. E. (M)
Gaspar, A. F. (M)
Grammer, R. A., Jr. (M)
Gray, M. B. (M)
Gruner, H. W. (M)
Guenther, J. H. (SM)
Gutzmer R. F. (A)
Hahnel, A. (SM)
Halles, W. D. (SM)
Hadl, F. R. (M)
Hamar, R. K. (M)
Harris, L. R. (A)
Harris, T. J. (M)
Harrison, B. H. (M)
Haskell, J. W. (M)
Haupt, G. H. (SM)
Hausler, W. B. (M)
Healy, D. W., Jr. (SM)
Hecht, N. E. (M)
Heise, E. R. (M)
Herman, R. F. (SM)
Hewitt, C. G. (M)
Hicks, H. F., Jr. (SM)
Higgs, H. P. (A)
Hoeft, R. H. (M)
Holmes, L. C. (F)
Holstrom, A. (SM)
Houde, R. A. (A)
Hulse, R. W. (M)
Huntington, M. B. (VA)
Irish, R. N. (A)
James, C. L. (M)
Johnson, R. M. (M)
Johnstone, N. J. (M)
Kamp, F. S. (M)
Karas, W. P. (SM)
Karker, E. C. (M)
Kay, R. H. (M)
Keane, J. E. (A)
Kelman, F. J. (M)
Kelly, E. J. (M)
Kelly, R. A. (A)
Kendall, H. C. (SM)
Kende, G. (SM)
Kennedy, R. P., Jr. (M)
Klemmer, A. E. (M)
Klumb, H. J. (M)
Kraley, R. L. (M)
Krelm, W. J. (M)
Kushel, V. (M)
Ladd, J. H. (M)
Lake, A. E., Jr. (A)
Laniak, D. K. (A)
Lankes, L. R. (SM)
Laythe, R. F. (M)
Leavens, C. F. (M)
Le Brun, R. L. (M)
Lewis, R. E. (M)
Lindsay, C. D. (SM)
Lins, H., Jr. (M)
Lopez, G. J. (A)
Luhowy, G. J. (M)
Luke, L. M. (M)
Lusted, L. B. (F)
Lyke, E. F. (M)
Malorino, G. S. (A)
Malmsten, L. J. (M)
Manson, R. H. (F)
Mateyk, W. (M)
Mavis, G. W. (M)
Mazel, L. G. (M)
McArdle, B. L. (SM)
McGarvey, C. F. (M)
Messenger, P. R. (A)
Mitchell, F. A. (M)
Morken, D. A. (M)
Morris, A. E. (M)
Morris, G. F. (M)
Morrison, R. F., Jr. (M)
Morse, J. E. (M)
Mumma, H. A., Jr. (SM)
Murphy, W. L. (M)
Neff, W. H. (M)
Nelson, D. E. (M)
Nelson, R. L. (M)
Neugebauer, H. E. J. (SM)
Newitt, J. W. (A)
Nichols, N. B. (SM)
Norwood, W. R. (A)
Nugent, J. A. (M)
Orlowski, J. S. (M)
Orpin, L. H. (SM)
Ossmann, E. A. (M)
Oster, S. (M)
Ota, L. Y. (M)
Ozminkoski, J. R. (A)
Parkhill, D. F. (M)
Parks, W. J. (SM)
Partis, D. C. (A)
Patton, D. W. (A)
Paul, A. N. (M)
Payne, R. C. (M)
Payne, W. T., Jr. (A)
Pelham, K. F. (SM)
Phipps, A. R. (M)
Pichal, H. T. (SM)
Pitlik, H. (M)
Platnick, D. (M)
Polinsky, A. L. (M)
Porter, G. C. (A)
Powers, R. L. (M)
Prasil, A. (M)
Price, C. C. (M)
Qualich, A. (M)
Ramos, A. S. (A)
Randall, J. M. (M)
Raymond, R. S. (M)
Reynolds, C. H. (M)
Richards, G. L. (A)
Richards, J. B. (A)
Richards, W. H., Jr. (A)
Richter, W. (M)
Robbins, R. E., Jr. (A)
Rodatus, E. J. (A)
Rodgers, J. A. (SM)
Rogers, R. J. (M)
Roman, R. J. (SM)
Ronbeck, J. E. (M)
Ross, H. J. (M)
Ross, L. A. (A)
Rubega, R. (A)
Saeli, J. J. (A)
Sage, F. D. (A)
Sahba, D. R. (M)
Samuelson, J. R. (A)
Sass, L. J. (M)
Savchuk, V., Jr. (SM)
Schiff, S. (M)
Schifino, A. G. (M)
Schneider, G. O. K. (M)
Schwartz, L. S. (M)
Schwarz, A. H. (M)
Schwertz, F. A. (M)
Searcy, C. E. (M)
Shalloway, A. M. (SM)
Shannon, R. E. (SM)
Sheehan, J. F. (M)
Sheffer, O. N. (M)
Sheve, H. C. (VA)
Shook, C. G. (M)
Slaymaker, F. H. (SM)
Smart, R. L. (A)
Smith, D. S. J. (M)
Smith, M. D. (M)
Sowers, A. E. (M)
Staples, W. D. (SM)
Stern, M. A. (A)
Stevenson, H. (M)
Stewart, F. B. (M)
Stewart, L. C. (M)
Stolze, W. J. (SM)
Stone, D. J., Jr. (A)
Stoutz, C. O., Jr. (M)
Strack, H. O. (A)
Tapemoux, P. J. (SM)
Tartanian, C. N. (M)
Tersegno, H. W. (A)
Tholstrup, H. (SM)
Timm, O. C. A. (A)
Tolliver, P. M. (M)
Tomaszewski, C. A. (M)
Traino, C. (M)
Traub, R. A. (A)
Trost, H. K. (M)
Trott, M. (M)
Tryon, L. E. (M)
Turner, W. (M)
Tyrlick, W. V. (M)
Van Deloo, P. A. (M)
Vandervoort, Q. D. (M)
Vang, J. P. (A)
Van Sandwyk, J. (M)
Veal, T. G. (M)
Velle, J. L. (A)
Vincent, A. W. (SM)
Weller, R. (SM)
Wheeless, L. L., Jr. (M)
Whitman, R. N. (M)
Williams, A. S. (M)
Williams, R. C. (M)
Wilson, J. E. (A)
Wobig, W. H. (M)
Wolcott, J. R. (M)
Wolff, R. L. (M)
Wurtz, J. N. (A)
Yeaple, R. N. (M)
Yeaton, E. C. (A)
Young, E. A. (A)
Young, F. C. (SM)
Young, J. W. (A)
Zarcone, C. J. (A)
Zefting, A. H. (M)

Rock Stream (ROC-1)
Shepard, W. H. (M)

Rockville Centre (LI-2)
Bensen, H. (M)
De Weese, H. W. (SM)
Duke, V. J. (SM)
Fay, F. A. (A)
Gilman, B. S. (M)
Ginsberg, M. P. (SM)
Harnett, L. T. (M)
Hawkes, T. A. (A)
Hinners, F. A. (F)
Hopkins, J. J. (SM)
Lee, R. L. (M)
Leuteritz, H. C. (M)
Mason, J. D. (M)
McCartney, E. (A)
Meehan, J. D. (M)
Potter, N. (A)
Quatraro, W. (M)
Rich, E. M. (M)
Rutstein, I. (SM)
Schwartz, H. F. (M)
Shakun, M. F. (M)
Sinsheimer, W. J. (A)
Stotz, C. C. (M)
Tuck, C. A., Jr. (A)
Uzmann, J. G. (SM)
White, H. A. (A)
Wolff, F. (SM)
Wolff, G. (A)

Rocky Point (LI-2)
Beverage, H. H. (F)
Callahan, J. L. (F)
Carter, P. S. (F)
Kahn, A. (SM)
Martin, C. A. (SM)
Neuburger, A. (A)
Paramithas, C. P. (M)
Peterson, L. E. (M)
Sanford, V. M. (M)

Rome (RU-1)
Akerman, S. (A)

Allen, R. F (M)
Anderson, S. E. (M)
Bartley, L. S. (M)
Bayless, H. A. (M)
Beauchamp, A. J. (SM)
Beers, R. H. (M)
Benditzky, E. (M)
Benoit, R. C., Jr. (SM)
Bergeron, L. A. (M)
Berliner, J. (M)
Bethke, W. P. (SM)
Blymiller, A. L. (A)
Brendlar, D. E. (M)
Bromley, J. E. (M)
Brooks, R. M. (M)
Brown, D. E., Jr. (M)
Brownstein, H. S. (M)
Burrows, W. R. (M)
Byrne, R. D. (M)
Carlson, H. A. (SM)
Carney, P. G. (M)
Chapin, E. J., Jr. (M)
Chrestien, C. A. (A)
Colangelo, L. P. (M)
Cook, B. S. (M)
Coppola, A. (M)
Craiglow, L. H. (M)
Crane, R. B. (A)
Crowley, H. J. (M)
Cruickshank, J. E. (SM)
Dakan, D. L. (SM)
Darrow, F. M. (M)
Davis, H. (F)
Davis, H. (M)
Dayton, W. P. (M)
De Mesme, T. A. (A)
Diamond, F. I. (M)
Donovan, B. M. (A)
Eannarino, J. M. (SM)
Eidman, F. E., Jr. (M)
Etches, I. (SM)
Fallik, J. (M)
Fehr, D. L. (M)
Feiner, A. (A)
Ferlo, O. F. (A)
Fishner, S. (A)
Forte, M. P. (M)
French, E. O. (M)
Friedman, H. (SM)
Frohlich, A. J. (M)
Gabelman, I. J. (SM)
Giles, G. R. (A)
Gill, W. J. (M)
Glaviano, C. R. (M)
Gordon, C. W. (SM)
Graettinger, W. F. (A)
Graham, R. C. (M)
Griffiths, J. D. (A)
Grossel, R. L. (M)
Grzesik, J. (A)
Hadwick, R. E. (M)
Handelsman, M. (SM)
Harris, H. N., Jr. (M)
Hartofil, P. E. (A)
Harvey, D. M. (M)
Headle, H. W., Jr. (M)
Holberger, R. R. (M)
Holliday, R. H. (SM)
Howe, W. P. (M)
Jaeger, M. (M)
Kelly, W. S. (A)
Krajcovic, C. (A)
Larsen, P. N. (M)
Leinbach, H. J., Jr. (M)
Lemoine, J. S. (M)
Levy, G. (A)
Libby, R. L. (M)
Lillibridge, J. R., Jr. (M)
Lindeman, B. (SM)
Long, G. A. (A)
Loreto, D. R. (M)
Maggio, T. (M)
Malowicki, E. (M)
Marks, R. L. (SM)
Marschall, F. W. (M)
Martin, C. T., Jr. (M)
Mason, W. F. (SM)
McFee, J. E. (A)
McLaughlin, R. L. (M)
Meyer, C. H., III (M)
Miles, R. A. (M)
Miller, C. R. (M)
Mirman, I. (SM)
Modlin, C. J. (M)
Moore, F. F. (A)
Morelli, M. (M)
Moskowitz, F. (SM)
Moss, J. F. (M)
Munzer, E. N. (SM)
Naresky, J. J. (M)
Neeley, A. C. (A)
Nicholson, C. L. (M)
Niebuhr, K. E. (M)
Nilsson, N. J. (M)
Oglesby, R. G. (M)
O'Neel, W. E. (M)
Pendleton, E. E. (A)
Pesce, J. S. (M)
Petersen, J. A. (A)
Pope, W. T., Jr. (M)
Pranke, J. A. (A)
Pulido, G. G., Jr. (M)
Quanrud, O. G. (M)
Ratynski, M. V. (SM)
Redwine, C. H. (M)
Richards, M. V. (M)
Richter, H. (M)
Riesman, S. D. (M)
Roberts, C. L. (M)
Roberts, W. L. (M)
Root, R. A., Jr. (A)
Rudensey, M. B. (M)
Sacra, G. H. (M)
St. John, C. G. (M)
Schlegelmilch, R. O. (SM)
Schley, D. R. (M)
Schwartz, S. S. (A)
Scott, E. C. (M)
Selover, E. E. (M)
Shapiro, H. (M)
Sharki, P. (M)
Shiner, G. A. (A)
Simpson, P. D. (M)
Storrs, E. N. (SM)
Story, R. T. (SM)
Story, V. V. (SM)
Strom, C. A., Jr. (SM)
Sues, L. B. (A)
Swainston, D. W. (M)
Swientonlewski, E. J. (M)
Szalach, F. E. (M)
Taffel, B. F. (M)
Tallman, O. G. (SM)
Tenney, R. F. (M)
Tepper, S. J. (M)
Thompson, J. M. (SM)
Thompson, R. J. (SM)
Ticknor, J. M. (A)
Vaccaro, J. (A)
Vogelman, J. H. (F)
Warner, M. (M)
Waszklewicz, L. R. (M)
Webb, H. E., Jr. (M)
Werle, B. O. (M)
Wilkinson, R. J. (M)
Williams, T. G. (M)
Winkler, E. H. (SM)
Worthington, D. T. (M)
Worthington, J. W., Jr. (SM)
Wright, R. O. (M)

Ronkonkoma (LI-2)
De Muria, V. J. (M)
Gold, T. (M)

Roosevelt (LI-2)
Adachi, W. Y. (VA)
Brown, E. M. (SM)
Chartoff, P. (M)
Darch, N. S. (M)
Fragola, C. F. (SM)
Komuves, R. E. (M)
Kushner, J. (M)
Ladue, J. A. (M)
Popkin-Curman, J. R. (SM)
Randazzo, J. J. (A)

Rosedale (LI-2)
Bailey, J. W. (M)
Cavallari, J. D., Jr. (M)
Damm, G. W. (A)
Stio, W. V. (A)
Sweeney, J. N. (M)
Weiner, F. (A)
Zang, G. R. (A)

Roslyn (LI-2)
Doerschuck, J. (M)
Easton, A. (SM)
Hicks, W. M. (A)
Kahrilas, P. J. (SM)
Kamen, I. (SM)
Lessler, A. L. (A)
Margulies, F. (M)
Match, M. J. (M)
Nash, A. (M)
Platzman, P. M. (M)
Sontag, H. M. (M)
Susskind, S. E. M. (A)
Wild, J. J. (M)

Roslyn Estates (LI-2)
Skelsi, S. M. (M)

Roslyn Harbor (LI-2)
Aaron, B. D. (SM)
Minc, A. (M)

Roslyn Heights (LI-2)
Anstett, F. D. (SM)
Applebaum, S. J. (M)
Ashley, A. (M)
Barney, K. H. (SM)
Boltz, J. H. (SM)
Boop, W. E. (M)
Bordiga, B. (A)
Bourke, W. A. (SM)
Brack, W. (M)
Brower, J. D. (M)
Corwin, A. (SM)
Daelemans, G. L., Jr. (M)
Deutsch, S. (M)
Dmytrasz, J. N. (M)
Duffy, J. P., Jr. (M)
Dumey, A. I. (A)
Feldmann, F. (SM)
Fideiman, D. (M)
Gaines, B. (SM)
Gonzalez, V. M. (M)
Gray, J. E. (A)
Hauer, W. B. (M)
Hochman, R. J. (M)
Jackson, T. T. (SM)
Johnston, W. A., Jr. (SM)
Kohn, S. A. (M)
Loesing, J. B., Jr. (A)
Marshall, R. H. (M)
McLinden, J. E., Jr. (SM)
Morris, J. J. (M)
Pride, D. W. (M)
Rod, R. L. (SM)
Roth, H. H. (M)
Shanley, J. H. (M)
Skipper, L. C. (SM)
Spellberger, S. C. (SM)
Star, J. (SM)
Weinmann, R. H. (M)
Willenbecher, J. F. (SM)
Winship, L. T. (A)
Yelsey, B. (M)
Zetkov, G. A. (M)

Roxbury (BING-1)
Fryling, J. L. (M)

Rush (ROC-1)
Kohl, W. B. (A)

Rye (NY-W-2)
Bolton, W. D. (M)
Brilmayer, E. W. (M)
Davis, D. (M)
Deri, H. B. (A)
Eaves, A. J. (SM)
Haselton, M. L. (M)
Lamarque, J. W. (VA)

St. Albans (LI-2)
Behr, J. (A)
Brown, A. R. (M)
Ceccanti, L. P. (A)
Holder, V. D. (A)
Kelcher, A. (SM)
Kelcher, R. J. F. (M)
Kirsch, W. A. (SM)
Kuchlewski, E. C. (A)
Kuchlewski, T. R. (A)
Peyton, W. B. (A)
Rothenberg, S. M. (SM)
Smikle, K. R. (M)
Townsend, R. W. (A)
Washington, H. A. (M)

St. James (LI-2)
Jolas, G. C. (M)

St. Remy (NY-MH-2)
Brown, W. J. (A)

Salt Point (NY-MH-2)
Howson, J. C. (A)
Taylor, R. L. (A)

Sanborn (BN-1)
Bates, R. D. (A)

Sands Point (LI-2)
Callahan, E. C. (SM)
Deakin, G. (VA)
Hayward, G. H. (A)
Hollister, D. G. (SM)
Langerman, H. (A)
Moore, F. H. (SM)

Saratoga Springs (SCH-1)
Ant, E. B. (M)
Cavenaugh, D. E. (M)
Saslow, S. (M)

Saugerties (NY-MH-2)
Allen, G. W. (M)
Bading, C. E. (M)
Brennan, R. J. (M)
Bright, D. W. (M)
Buck, R. D. (SM)
Cart, R. E. (A)
Conard, L. J. (A)
Doolin, F. L. (M)
Gaglianello, J. W. (A)
Geller, H. (M)
Gledd, G. R. (M)
Goldberg, M. (A)
Lett, A. S. (A)
Lulgol, R. H. (A)
Martello, A. S. (M)
Moynihan, J. D. (SM)
Newcomb, C. E. (A)
Nitschke, N. E. (M)
Patterson, D. A. (A)
Peavy, W. R. (M)
Pocaliyko, P. N. (M)
Posklensky, D. (A)
Rooney, W. V. (M)
Schoenherr, H. W. (M)
Surman, G. R. (M)
Yonell, M. (A)
Young, F. G. (M)

Sauquoit (RU-1)
Belby, M. (A)
Krusemark, K. A. (M)
La Forte, J. T. (A)
Wilson, W. P. (M)

Sayville (LI-2)
Sprague, R. M. (M)

Scarsdale (NY-W-2)
Alpert, N. (SM)
Burnell, L. G. (SM)
Carlson, R. E. (SM)
Davidoff, S. (SM)
Dubbs, B. (M)
Fein, M. J. (SM)
Fox, W. C. O. (M)
Garretto, L. A., Jr. (M)
Heller, S. (M)
Keegan, R. R. (M)
Kimball, J. A. (M)
Lichtenstein, M. J. (SM)
McKirdy, R. W. (M)
Milsisco, E. J. (SM)
Monroe, R. B. (SM)
Oppenheimer, F. W. (M)
Seltz, F. A. (VA)
Skalski, C. A. (M)
Slaybaugh, C. W. (SM)
Snyder, R. F. (SM)
Stephens, M. C. (A)
Sutherland, W. R. (M)
Turner, A. (M)
Worthington, J. H. (A)

Schenectady (SCH-1)
Abraham, L. G., Jr. (A)
Acton, E. S. (M)
Adams, H. J. (M)
Alexander, N. W. (M)
Alexanderson, E. F. W. (F)
Allen, C. C. (SM)
Amoth, V. W. (SM)
Anderson, J. M. (A)
Anderson, R. E. (SM)
Barlow, D. P. (M)
Beggs, J. E. (F)
Bolster, M. F. (M)
Borner, E. F. (M)
Bourne, W. L. (M)
Boyd, M. R. (M)
Branch, G. M., Jr. (SM)
Brandes, P. D. (M)
Broughton, W. G. (M)
Buchhold, T. A. (SM)
Buddenhagen, D. A. (M)
Buscher, R. G. (M)
Chernoch, J. (M)
Chestnut, H. (SM)
Coates, C. C. L., Jr. (M)
Coghill, H. D. (M)
Cohen, A. (M)
Collins, R. N. (M)
Concordia, C. (SM)
Craig, E. J. (M)
Cruger, B. W. (A)
Curtis, T. P. (SM)
Dabul, A. (M)
Day, H. R. (SM)
Deblase, R. G. (M)
Dehn, R. A. (SM)
De Santis, V. J. (SM)
Dickey, F. E. (SM)
Dickinson, T. M. (M)
Dodson, G. C., Jr. (M)
Duckwald, C. S., Jr. (M)
Ender, R. C. (A)
Eshbach, J. R. (M)
Farrell, G. A. (M)
Felker, G. E., Jr. (M)
Fick, C. G. (F)
Fink, L. R. (F)
Fisher, J. C. (M)
Ford, W. A. (SM)
Frick, C. W. (SM)
Friedman, D. B. (M)
Gable, A. C. (SM)
Gittinger, N. C. (M)
Goldman, R. G. (SM)
Granat, W. G. (M)
Griffin, G. J., Jr. (M)
Grover, F. W. (F)
Hall, R. N. (F)
Hancock, W. L. (M)
Hawkins, D. W. (SM)
Helden, C. M. (SM)
Henyan, G. W. (M)
Herrmann, G. M. (SM)
Hershenov, B. (M)
Hess, P. N. (M)
Hickey, J. S., Jr. (SM)
Hilts, H. D. (A)
Hoffman, T. R. (SM)
Jackson, E. J. (SM)
Jakowatz, C. V. (M)
Jensen, A. O. (M)
Kamen, W. J. (A)
Kaufmann, R. H. (A)
Keenan, P. P. (M)
Kessler, G. W. (M)
King, F. E. (M)
Kirkmayer, L. K. (M)
Kohl, H. F. (A)
Kowalczyk, A. C. (A)
Krygsman, C. (A)
Lafferty, J. M. (F)
Lang, J. M. (M)
Larson, R. W. (SM)
Lawson, J. L. (SM)
Lee, E. S. (SM)
Lemmond, C. Q. (M)
Linville, T. M. (SM)
Lippitt, D. L. (A)
Lippitt, M. W., Jr. (M)
Maginniss, F. J. (M)
McAllister, J. F., Jr. (SM)
McArthur, E. D. (F)
McKeehan, W. F. (A)
Meahl, H. R. (SM)
Mihran, T. G. (SM)
Moles, F. J. (SM)
Morgan, R. E. (M)
Morrison, A. (SM)
Newhouse, V. L. (M)
Numrych, E. C. (M)
O'Donohue, J. P. (M)
Owen, J. K. (A)
Owens, D. G. (M)
Pashler, P. E. (SM)
Patterson, F. G. (VA)
Paxton, E. B. (A)
Pester, R. F. (SM)
Peters, P. H., Jr. (SM)
Pravda, M. F. (M)
Preschel, K. S. (M)
Prince, D. C. (SM)
Purcell, W. J. (M)
Quine, J. P. (M)
Rankin, A. E. (SM)
Raschke, R. R. (M)
Reed, R. I. (SM)
Relling, G. H. (M)
Rich, J. A. (SM)
Rocha, H. A. F. (A)
Rodbell, D. S. (M)
Rook, A. A. (M)
Rosner, C. H. (M)
Rothe, F. S. (M)
Russ, R. B. (SM)
Sampson, E. S. (SM)
Samuel, J., Jr. (M)
Shuey, R. L. (SM)
Speray, M. R. (A)
Stein, H. H. (M)
Stromer, P. R. (A)
Stupo, R. J., Jr. (SM)
Sults, C. C. (F)
Summerhayes, H. R., Jr. (SM)
Taylor, J. E. (M)
Taylor, L. A. (M)
Teare, W. H. (SM)
Thal, H. L., Jr. (M)
Thayer, R. W. (A)
Thorson, H. L. (SM)
Tiemann, J. J. (M)
Tomlinson, J. M. (M)
Troutman, P. H. (M)
Turrentine, R. E. (SM)
Verzulli, J. U. (A)
Volkers, W. K. (SM)
Waldron, W. K. (M)
Ward, R. H. (A)
Wargo, P. (M)
Watkins, K. E. (M)
Watson, R. P. (SM)
Watters, R. L. (M)
Webster, H. F. (SM)
Weinstein, M. (M)
White, G. M. (M)
White, W. C. (F)
Wilson, V. C. (A)
Wolfe, J. E. (SM)
Young, C. M. (SM)
Young, J. D. (M)
Younger, C. (A)
Yu, S. P. (M)

Sciplo Center (SYR-1)
Matuzich, J. D. (A)

Scotia (SCH-1)
Bailey, W. E., Jr. (M)
Bondley, R. J. (SM)
Brougham, R. W. (M)
Carleton, E. O. (A)
Chambers, D. E. (F)
Cook, E. D. (F)
Coolidge, A. W., Jr. (M)
Day, B. E. (M)
Eisenacher, P. L. (M)
Elder, T. A. (SM)
Fraenckel, V. H. (M)
Gardiner, P. C. (SM)
Gardner, G. F. (VA)
Gauper, H. A., Jr. (SM)
Hanrahan, L. R. (A)
Harris, L. A. (M)
Henry, R. J. (M)
Iler, G. W. (SM)
Jablonski, R. W. (A)
Knickerbocker, C. H. (M)
Mayer, C. B. (SM)
Migiore, C. (A)
Roberts, S. (M)
Sendzuk, G. T. (M)
Travis, E. F. (SM)
Vaughan, J. R. M. (SM)
Wade, E. J. (A)
Wagoner, C. A. (SM)
Wellinger, R. P. (M)
Wood, A. J. (M)

Scottsville (ROC-1)
Benin, Z. (SM)

Sea Cliff (LI-2)
Beer, A. E. (A)
Black, E., Jr. (SM)
Busching, H. L. (M)
Flackbert, C. (SM)
Hine, E. A. (M)
Hulland, B. L. (M)
Matuszek, F. A. (A)
Roherty, T. M. (M)
Shane, D. C. (M)
Singleton, C. M. (M)
Solt, H. B. (M)

Seaford (LI-2)
Battle, F. H., Jr. (M)
Beckham, C. L. (SM)
Catenaro, R. D. (A)
Cometz, W. (M)
Diehlmann, J. T. (M)
Flamholtz, P. (A)
Goodman, D. M. (SM)
Kaufman, I. (M)
Krutnan, J. M. (A)
Lurch, E. N. (M)
McEvoy, H. G. (M)
McPherson, D. L., III (M)
Meyer, W. C. (A)
Myers, E. N. (M)
Oliver, O., Jr. (M)
Perlmutter, A. M. (M)
Perzestty, T. S. (A)
Purdy, R. L. (A)
Selby, A. R. (M)
Walker, A. S. (M)
Wolin, S. (A)

Seaford Harbor (LI-2)
O'Maley, J. B. (M)

Searington (LI-2)
Hammer, R. M. (SM)

Seneca Falls (ROC-1)
Burroughs, F. L. (SM)
Cowden, D. G. (M)
Dangremond, J. L. (M)
Dickinson, W. A. (SM)
Dowse, E. C., Jr. (M)
Elsengrein, R. H. (A)
Faust, A. C. (A)
Fogg, G. E., Jr. (M)
Gessford, R. K. (SM)
Haas, P. (VA)
Holcomb, W. A. (A)
Jans, J. T. (M)
Kahl, M. I. (SM)
Keen, A. W. (SM)
Krawitz, M. (SM)
Loughlin, J. H. (SM)
Mackey, D. G. (A)
Ottemiller, W. H., Jr. (SM)
Peck, H. D., Jr. (M)
Shields, R. R. (M)
Stone, E. O. (M)
Stone, R. W. (SM)
Swan, R. A., Jr. (M)
Vogel, R. Q. (M)
Whitten, A. C. (A)

Sherburne (BING-1)
Brown, H. H. (M)
Drake, J. E. (M)
Fowler, A. K. (M)
Leitner, R. T. (M)
Lundahl, T. (SM)
Voorhaar, F. R. (M)

Shirley (LI-2)
Potter, D. W. (M)

Shokan (NY-MH-2)
Surdi, M. (M)

Shoreham (LI-2)
Sheridan, T. R. (SM)

Sidney (BING-1)
Knak, J. L. (M)
Sposili, M. C. (M)
Struble, R. C. (A)

Silver Creek (ERI-1)
Barris, H. A. (A)
Gull, R. A. (SM)

Skaneateles (SYR-1)
Biele, R. J. (SM)
Clark, P. B. (M)
Dean, W. W. (SM)
Ewing, L. M. (SM)
Hackley, C. L. (M)
Leeder, H. A., Jr. (M)
Lloyd, C. G. (SM)
Rist, D. H. (M)
Wiggin, J. F. (A)

Slingerlands (SCH-1)
Bowie, W. G. (SM)
Dillenback, G. V., Jr. (M)
Longley, J. F. (SM)
Rechnitzer, B. W. (A)
Roderick, R. A. (A)

Smithtown (LI-2)
Ciskanik, M. J. (A)
Elliott, W. A. (M)
Hanratty, R. J. (A)
Hastings, D. F. (A)
Kelly, J. H. (A)
Lemer, D. (A)
O'Neill, E. P. (M)
Pawelko, M. J. (M)
Wengenroth, R. D. (M)
Wethington, T. G. (M)

Smithville Flats (BING-1)
Rotherforth, D. E. (A)

Snyder (BN-1)
Ballit, A. T. (SM)
Blair, D. J. (M)
Breeden, F. C. (M)
Halsted, G. P. (M)
Hettich, R. D. (M)
Hultberg, C. A. (SM)
Malling, W. P. (SM)
Richmond, G. E., Jr. (M)
Robins, B. W. (SM)
Sanders, E. R. (SM)
Tittle, H. C. (M)
Whyman, E. W. (SM)

Solvay (SYR-1)
Fraonto, J. P. (M)
Shofstall, N. F. (SM)
Wagner, Z. G. (A)

Somers (NY-MH-2)
Funk, H. L. (M)

Southampton (LI-2)
Buckingham, W. D. (M)
Hildreth, A. E., Jr. (M)
Lamar, R. E. (M)

South Farmingdale (LI-2)
Saur, R. D. (M)
Serra, I. C. (A)

South Hempstead (LI-2)
La Rosa, R. (SM)

South Lansing (ITH-1)
Bray, D. W. (SM)
Swansen, H. W. (A)

South Ozone Park (LI-2)
Calabrese, A. (A)
Gilmore, J. F. (M)
Glickman, H. (M)
Helm, R. R. (M)
McDonald, F. J. (A)
Nelland, A. C. (A)
Rogers, W. (A)

South Salem (NY-W-2)
Becker, H. R. (A)

Spencerport (ROC-1)
Cieslak, A. B. (M)
Heath, R. R. (M)
Krueger, R. K. (M)
Reynolds, H. J. (A)
Sibley, H. C., Jr. (SM)

Springfield Gardens (LI-2)
Berthold, R. V. (M)
Davey, D. F. (A)
James, A. V. (A)
Martin, A. R. (A)
Phillips, L. E. (A)
Stiles, A. P. (M)

Spring Valley (NY-2)
Braunstein, L. J. (A)
Broussely, M. (A)
Cook, S. (M)
Faist, C. A. (A)
Handelman, R. B. (SM)
Rosenbaum, J. (M)
Semer, M. (M)
Staniloff, S. A. (A)
Welan, I. (M)

Staatsburg (NY-MH-2)
Norlan, R. (M)

Staten Island (NY-2)
Anderson, A. L. (A)
Arne, O. R. (M)
Aurlema, R. C. (M)
Bastow, J. G., Jr. (M)
Bellis, R. P. (M)
Bender, D. J. (M)
Bridge, J. A. (M)
Brown, A. L. (A)
Cerasoli, A. (M)
Codd, B. E. (M)
Culicetto, P. J. (M)
De Martinis, J. R., Jr. (A)
De Rosa, H. M. (M)
Donovan, T. F. (M)
Droste, G. T. (M)
Dusio, E. W. (M)
Embrechts, A. C. (SM)
Goretsky, L. M. (A)
Gunther, F. A. (SM)
Hamilton, C. W. (M)
Klein, W. T. (A)
Kopecky, G. F. (M)
Koushouris, J. L. (SM)
La Penna, F. W. (A)
Levine, M. E. (SM)
Lewis, L. C. (SM)
Lidell, D. (A)
Lilenfeld, J. (M)
Loesch, C. A. (M)
Martenson, R. B. (A)
Miller, S. S. (M)
Mollnelli, R. J. (M)
Panicello, T. B. (M)
Phillips, B., III (A)
Plant, R. E. (A)
Radgowski, S. P. (M)
Reeves, J. F. (M)
Reinhardt, N. J. (M)
Rietmeyer, H. W. F. (M)
Robinson, M. (A)
Rodwin, G. (SM)
Rose, A. F. (SM)
Rosenquist, J. H. (A)
Russell, L. H. (M)
Scian, H. (A)
Shanley, J. J. (A)
Smith, B. M. (M)
Streble, J. G. (M)
Taleporos, A. D. (M)
Turner, W. C. (A)
Weinberg, T. L. (A)
Weinmann, R. W. (A)
Zucker, S. M. (A)

Stewart AFB (NY-MH-2)
Ahern, W. C. (M)

Stewart Manor (LI-2)
Garrigan, T. E. (A)
Norton, R. S. (SM)
Quell, C. H. (M)
Ruddy, W. R. (M)

Stittville (RU-1)
Corey, S. A. (M)
Lege, A. C. (M)
Sullenger, J. E., Jr. (M)
Williams, R. L. (M)

Stone Ridge (NY-MH-2)
Darrell, R. D. (A)
Raymond, A. H., Jr. (M)

Stoney Brook (LI-2)
Holmes, D. D. (M)
Jacke, S. E. (A)
Medd, J. S. (SM)
Meranda, J. I. (M)
Rainey, E. A. (A)
Woodward, J. E. (M)

Suffern (NY-2)
Brendle, T. A. (A)
Frachtman, H. E. (M)

Sunnyside (LI-2)
Clemens, R. W. (A)
Fried, S. J. (M)
Mallinger, A. (M)
Stein, E. (M)
Young, J. M. (M)

Swan Lake (NY-MH-2)
Turetsky, N. (M)

Syosset (LI-2)
Abrams, C. F. (M)
Ashinsky, M. (M)
Barlam, T. (M)
Beardsworth, R. (A)
Berg, R. S. (A)
Bergman, S. I. (SM)
Bosse, W. F. (SM)
Campbell, T. A. (A)
Carothers, F. P. (SM)
Casper, S. D. (SM)
Charlton, J. (M)
Chow, W. T. (SM)
Clark, A. E., Jr. (A)
Coffman, B. C. (SM)
Cole, L. G. (M)
Connolly, T. W. (M)
Crosby, M. G. (F)
Dagavarian, H. O. (SM)
D'Avino, R. F. (A)
De Bolt, H. E. (A)
Erickson, J. S. (SM)
Espenlaub, W. C. (M)
Fisch, J. (A)
Freeman, S. M. (A)
Freiman, M. J. (M)
Funk, R. W. (SM)
Goldmuntz, L. A. (M)
Greenleaf, F. D. (SM)
Hershkowitz, P. (M)
Hess, J. C., III (A)
Hodgson, R. (SM)
Holst, P. F. G. (SM)
Irwin, R. P. (M)
Jagoe, R. W. (M)
Jarva, W. (A)
Kirschner, A., Jr. (M)
Knight, R. W. (M)
Koletsky, H. (M)
Kuhn, J. J. (M)
Leavitt, B. W. (SM)
Leslie, M. W. (SM)
Lovell, J. A. (M)
Lubiln, I. (M)
Marcus, D. H. (M)
Matava, S. J. (M)
McKeown, P. J. (M)
Nittoli, A. J. (M)
Pace, F. P. (M)
Perry, J. W. (M)
Raber, S. (SM)
Rein, C. A. (A)
Reisch, R. P. (M)
Sherman, E. H. (SM)
Smith, R. (A)
Somberger, E. A. (A)
Stalsinger, J. (SM)
Stella, R. (M)
Unruh, G. E. (M)
Vander Veer, J. H. (M)
Wachspress, M. H. (SM)
Weldmann, L. J. (M)
Werst, M. C. (M)
White, R. C. (M)
Wing, R. (A)
Wylie, T. F., Jr. (M)

Syracuse (SYR-1)
Abrahams, I. C. (SM)
Ackley, E. H. (M)
Adams, W. B. (A)
Allmansky, M. (M)
Allen, J. E. (SM)
Anderson, A. F. (A)
Anderson, C. T. (M)
Andrews, P. D. (SM)
Andrews, R. S. (A)
Andrews, W. A. (M)
Aoyagi, K. (SM)
Apple, L. S. (M)
Aronson, C. A. (SM)
Ashcroft, D. L. (M)
Astemborski, T. J. (M)
Bachman, C. H. (F)
Baker, L. T. (M)
Baker, W. R. G. (F)
Balabanian, N. (SM)
Barlow, L. C. (A)
Barnhart, H. D. (M)
Barton, L. M. (SM)
Bass, H. H. (M)
Beall, R. B. (A)
Beard, C. E. (SM)
Beldner, G. M. (M)
Benson, W. H., Jr. (M)
Bentivegna, M. J. (M)
Berlin, R. D. (A)
Bemkopf, W. C. (M)
Best, R. C. (M)
Blas, F. J. (SM)
Blenvenu, M. L. (M)
Bluhm, V. A. (M)
Bogosta, W. (M)
Borski, G. K. (M)
Bostick, G. (M)
Brackney, K. H. (M)
Brandli, A. (M)
Brearley, H. C., Jr. (M)
Brinkman, J. D. (M)
Brown, J. S. (SM)
Brule, J. D. (SM)
Buchta, J. C. (M)
Budell, L. A. (A)
Burkart, H. H. (SM)
Burke, T. H. (M)
Cabaniss, E. H. (SM)
Caffrey, T. P. (A)
Campbell, V. C. (SM)
Caputo, S. A. (A)
Card, W. H. (M)
Carrillo, E. B. (M)
Chafaris, G. J. (M)
Chapman, J. K. (SM)
Cheng, D. K. (SM)
Chrismark, A. H. (M)
Chivers, C. C. (M)
Chow, W. F. (SM)
Clark, M. M. (M)
Clement, R. R. (M)
Cochran, N. B. (M)
Cole, B. H. (M)
Colegrove, C. D. (M)
Colligan, J. A. (M)
Collins, N. E. (M)
Comstock, W. D. (M)
Conger, W. H. (M)
Connors, T. J., Jr. (M)
Cook, C. L. (M)
Countryman, D. J. (M)
Cox, T. M. E. (M)
Coykendall, J. C. (SM)
Crissey, K. L. (M)
Crosby, H. M. (SM)
Cross K. B. (M)
Cuccarese, E. A. (A)
Cuccio, A. B. J. (M)
Cummings, A. P. (M)
Curry, T. F. (M)
Damroth, J. F. (M)
Davis, M. M., Jr. (SM)
Davisson, R. R. (A)
De Dufour, W. F. (A)
Dee, P. L. (M)
Denny, J. H. (M)
Denslow, J. H., Jr. (M)
Derr, R. J. (M)
Dieter, M. R. (A)
Dome, R. B. (F)
Drum, J. J. (M)
Earls, H. G. (SM)
Eckert, T. A. (M)
Egtvedt, M. D. (M)
Eicholzer, A. J. (M)
Embree, C. R. (M)
Evans, H. J. (SM)
Fanning, J. J., Jr. (A)
Farrell, J. J. (F)
Fedorowycz, B. W. (M)
Fields, H., Jr. (M)
Fisch, E. A. (A)
Fishman, H. (SM)
Fitzmorris, S. R. (M)
Foland, A. J. (M)
Fong, M. (M)
Foster, R. F. (SM)
Friedman, H. J. (M)
Fritschel, P. G. (A)
Frohman, E. D. (M)
Frost R. R. (M)
Fulton, C. K. (A)
Gala, J. C. (M)
Galbraith, R. A. (SM)
Ganter, C. F. (M)
Garber, S. M., Jr. (M)
Garry, G. A. (M)
Geasey, R. E. (M)
Gernand, M. E. (M)
Ghandhi, S. K. (SM)
Gibbons, E. H., Jr. (M)
Gilchrist, B. (A)
Glasford, G. M. (SM)
Gleichauf, P. H. (SM)
Godwin, P. F., Jr. (M)
Goldman, S. (F)
Golubjatnikov, D. (M)
Good, F. R. (M)
Good, W. E. (F)
Gordon, F. D. (M)
Gottlieb E. (M)
Graeter, R. J. (M)
Graydon, A. (M)
Greenbaum, J. R. (M)
Greenberg, I. D. (M)
Greenhalgh, K. D. (M)
Greenwood, R. R. (M)
Gruenberg, H. (M)
Guckenheimer, E. (A)
Habermann, R., Jr. (SM)
Haedecke, A. D. (SM)
Hagen, D. L. (M)
Hall, W. H. (SM)
Hamlett, J. G. (M)
Hanousek, R. A. (M)
Harbourt, C. O. (M)
Harrington, R. F. (M)
Harris, P. E. (M)
Healy, R. G. (M)
Heaton, H. T. (M)
Heckelman, R. W. (M)
Hendrix, E. R. (M)
Herzog, E. E. (M)
Herzog, E. F. (F)
Hicks, R. B. (M)
Hjortzberg, A. B. (M)
Hoefer, W. G. (M)
Hoffman, J. (M)
Holland, J. T., Jr. (M)
Holmes, K. O. (SM)
Holonyak, N., Jr. (M)
Holtz, R. E. (M)
Holtzclaw, B. L. (M)
Honigman, R. L. (M)
Hornback, A. B. (M)
Howells, P. W. (SM)
Hu, M. (SM)
Hu, Y. S. (SM)
Humeniuk, P. (SM)
Hunter, N. E. (M)
Hurley, D. T. (M)
Hutchins, C. M. (M)
Hwang, V. C. (A)
Intrator, A. M. (M)
Jeffers, W. M. (A)
Johnson, C. W. (M)
Johnson, R. A. (A)
Johnson, R. M. (M)
Johnson, S. O. (M)
Jones, R. L. (SM)
Jost, J. W., Jr. (A)
Jueller, J. F. (M)
Kantor, S. D. (A)
Katz, H. W. (M)
Kelster, J. E. (F)
Kelly, P. E. (M)
Kenefake, E. W. (SM)
Kenison, R. G. (M)
Kennedy, A. (SM)
Kent, G. (M)
Kent, P. (M)
Kenyon, S. W. (A)
Kinzie, M. E. (M)
Klop, K. J. (A)
Kirk, R. L. (M)
Kirkendall, J. T. (M)
Kladke, W. F., Jr. (M)
Kleiner, S. (A)
Kletsky, E. J. (M)
Knights, J. E., Jr. (SM)
Knox R. L. (M)
Koch, A. R. (SM)
Korolenko, A. V. (A)
Krackhardt, E. M. (A)
Kreitzer, N. H. (M)
Krentel, W. D. (M)
Kurz, L. C., Jr. (M)
Latker, A. C. (M)
Lazar, H. (M)
Le Clair, J. E. (M)
Lederer, E. H. (SM)
Leeds, L. M. (F)
Leimweber, L. F. (M)
Lepage, W. R. (F)
Leppanen, K. E. (M)
Lesk, I. A. (SM)
Levitt, R. S. (M)
Lightstone, J. B. (M)
Ligomer, M. M. (M)
Lipnitz, J. W. (A)
Lipoert, H. B. (SM)
Lombard, W. A. (A)
Longacre, A. (SM)
Lucas, V. M. (M)
Lynch, I. E. (M)
Lyness, H. J. (M)
Lynn, L. H. (SM)
Mac Leod, W. R. (M)
Mader, G. E. (M)
Makris, J. (M)
Marquardt, R. A. (M)
Martin, H. R. (A)
Marvin, H. B. (F)
Masnik, M., Jr. (M)
Mather, D. L. (M)
Maxwell, D. E. (SM)
Mayer, R. C. (M)
McCarthy, J. J. (M)
McFee, R. (M)
McGeiver, S. F. (M)
McGillvra, G. E. (M)
McMurtrie, K. A. (SM)
Merrigan, C. F. (M)
Merrithew, R. F. (M)
Metzler, D. H. (A)
Meyer, B. H. (M)
Michaelson, W. (A)
Mikaelian, M. (M)
Miller, H. J., Jr. (M)
Millman, G. H. (SM)
Montella, D. T. (M)
Morlock, W. J. (F)
Muir, D. A. (SM)
Mullen, E. B. (M)
Mullin, L. A. (SM)
Neelands, E. J. (M)
Neely, L. (M)
Noble, M. L. (A)
Nonnekens, A. C. (SM)
Norton, C. T. (SM)
Novak, R. L. (M)
Oberrender, G. F., Jr. (M)
Ocko, R. (SM)
Ohms, D. V. (A)
Ovesia, M. V. (A)
Paganelli, T. I. (SM)
Page, E. R. (A)
Pardee, O. O'M. (M)
Parker, C. B. (A)
Passarelli, W. F. (M)
Payne, G. W. (A)
Penn, W. A. (M)
Perini, J. (A)
Perry, H. E. (M)
Perry, J. L. (M)
Peterson, E. O. (M)

Peterson, E. H., Jr. (M)
Peterson, G. R. (SM)
Polisse, L. F. (M)
Powell, F. E., Jr. (A)
Priest, C. A. (F)
Prosser, A. M. (A)
Putman, R. E. (M)
Quinn, H. H., Jr. (M)
Rabinowitz, A. A. (M)
Raillard, H. (M)
Ramp, H. O. (M)
Randall, D. P. (SM)
Reale, J. D. (A)
Rean, C. E. (M)
Redman, D. A. (M)
Reibert, F. A. (M)
Reilly, L. W. (M)
Reynolds, A. G. (M)
Reynolds, F. M. (M)
Reza, F. (M)
Richardson, R. L. (A)
Rives, T. C. (F)
Roberts E. G., Jr. (SM)
Robinson, E. L. (A)
Roesch, R. C. (A)
Romey, L. M. (M)
Rosenblatt, A. (A)
Rothenberg, H. C. (SM)
Roussin, A. G. (M)
Rubin, I. E. (M)
Rush, S. (SM)
Rutherman, E. R. (A)
Sadowsky, S. S. (M)
Salley, E. J. (A)
Sanders, A. E. (M)
San Soucie, W. R. (M)
Schick, N. E. (SM)
Schlecht, M. F. (M)
Schultz, R. E. (SM)
Schumacher, G. B. (A)
Schupp, G. A., Jr. (SM)
Scott, K. J. (M)
Scrivner, J. H. (SM)
Selig, T. R. (M)
Sensinger, W. A. (M)
Shaw, C. A. (M)
Shepp, R. E. (M)
Sheuer, R. L. (M)
Shuart, O. H. (M)
Silvaggio, J. A. (A)
Silverman, L. (A)
Slevin, R. F. (M)
Smith, B. J. (M)
Smith, L. D. (A)
Smith, R. L. (SM)
Smith, W. F., Jr. (A)
Somers, L. E. (M)
Spitzak, E. W. (M)
Stack, J. F. (A)
Starkey, G. M. (M)
Stauffer, J. W. (M)
Steams, C. F. (A)
Stephey, H. M. (M)
Stern, A. P. (SM)
Stone, E. W. (A)
Stone, W. R. (M)
Stonig, J. W. (A)
Straub, W. W. (M)
Sullivan, H. M. (SM)
Sullivan, P. E. (M)
Sullivan, R. M. (M)
Suran, J. J. (SM)
Swank, W. B. (M)
Swanson, R. W. (M)
Sylvan, T. P. (M)
Taylor, J. M. (M)
Teich, P. J. (M)
Thies, C. H. (SM)
Thomas, W. P., Jr. (M)
Thor, R. C. (M)
Todd, C. D. (M)
Towlson, H. G. (SM)
Tymann, T. J. (A)
Vandling, G. C. (M)
Villeneuve, A. T. (M)
Von Farge, C. A. (M)
Wakefield, W. F. (M)
Waldner, M. (M)
Wallman, E. J., Jr. (M)
Wayne, C. R. (SM)
Wechsler, L. D. (M)
Weir, I. R. (F)
Wellner, F. R. (SM)
Wessel, G. K. (SM)
Whistler, W. T. (M)
Widmann, L. C. (M)
Wild, A. F. (A)
Wilder, R. L. (A)
Winfield, K. C. (A)
Wingrove, E. R., Jr. (M)
Witkowski, R. J. (SM)
Witthun, H. D. (M)
Woodward, G. F. (SM)
Wright, T. C. (M)
Wurdinger, E. D. (M)
Wyrick, R. F. (M)
Yang, G. C. C. (M)
Yerian, C. S. (SM)
Zecher, R. O. (M)
Zierdt, C. H., Jr. (SM)
Zimmer, C. R. (M)

Tappan (NY-2)
Petrakos, N. (M)
Ulrich, E. C. W. (A)
Yamaoka, J. H. (M)

Tarrytown (NY-W-2)
Bernstein, S. (A)
Bevan, R. K. (A)
Cartoon, G. P. (M)
Feile, R. H. (A)
Kiseda, J. R. (M)
Minich, C. H. (A)
Motchok, E. P. (M)
Norton, J. M. (M)
Passman, A. J., Jr. (M)
Rae, J. R. (SM)
Sumoski, T. (M)
Williamson, C. R. (M)

Thornwood (NY-W-2)
Belcher, R. D. (M)
Burfeindt, K. L. (M)
Burns, G. D. (A)
Hall, H. D. (M)
Levine, R. J. (M)
MacDonald, J. N. (M)
Matsuoka, M. E. (M)
Orth, F. (M)
Washburn, C. A. (A)

Tillson (NY-MH-2)
Hampshire, J. R. (SM)
Mangan, B. A. (A)

Tioga Center (BING-1)
Hansen, R. R. (M)
Leightner, R. A. (M)

Tonawanda (BN-1)
Babcock, L. F. (M)
Banshak, W. G. (A)
Baumler, F. R. (M)
Bondy, M. F. (M)
Bossler, F. B. (M)
Calhoun, S. H. (A)
Carlson, R. E. (M)
Chipchak, J. S. (M)
Cole, E. S. (M)
Cooper, G. S. (M)
Crooks, R. G. (M)
Gordy, E. (A)
Green, V. H. (M)
Groth, L. H. (M)
Hampster, W. T. (SM)
Janushevich, A. (M)
Johnson, M. E. (A)
Koons, E. E. (M)
Koval, E. R. (M)
Krowl, G. W. (M)
Lepley, R. C. (SM)
Limburg, M. A., Jr. (M)
Mahany, T. D., Jr. (M)
Meldrum, M. A. (M)
Mennen, H. (M)
Morrison, H. V. (M)
Noye, P. R. (M)
Paterniti, A. R. (A)
Plicato, W. L. (A)
Popovich, B. (SM)
Powell, D. R. (M)
Price, E. L., Jr. (SM)
Reese, J. S. (M)
Schlichter, E. S. (M)
Shuart, J. F. (M)
Smolarek, E. J. (A)
Staples, Z. B. (M)
Timberlake, F. A. (SM)
Walbesser, W. J. (M)
Wasserman, B. (SM)
Wixson, E. S. (M)
Zehr, R. M. (M)

Troy (SCH-1)
Babits, V. A. (F)
Bashford, H. L. (M)
Beers, R. F. (SM)
Burger, R. W. (M)
Close, C. M. (M)
Harris, H. D. (M)
Holt, E. H. (M)
Jenkins, K. W. (M)
Kitsopoulos, S. C. (M)
Kunz, C. J., Jr. (M)
Love, A. L. (M)
MacGregor, W. (M)
Martin, T. A. (M)
Mortenson, K. E. (SM)
Norvik, F. J. (SM)
Servis, W. A. (A)

Trumansburg (ITH-1)
Beers, R. B. (M)
Clavier, P. A. (SM)

Tuckahoe (NY-W-2)
Austin, K. B. (M)
Bollari, L. (A)
Drew, C. E. (SM)
Dunn, C. J. (M)
Gallios, G. C. (M)
Jurafsky, A. J. (M)
King, K. L. (SM)
Nerenberg, R. I. (M)
Suppa, P. P. (SM)
Walsh, J. V. (M)

Ulster Park (NY-MH-2)
Lewis, A. G. (A)
Waldenmayer, D. W. (M)

Union (BING-1)
Bachman, D. F. (M)
Morgan, W. A. (M)

Uniondale (LI-2)
Aha, R. S. (M)
Brenner, M. (M)
Delligatti, S. F. (M)
England, J. W. (A)
Gould, R. V. (SM)
Keen, H. S. (M)
Kley, R. C., Jr. (M)
Kushner, G. (M)
Levinson, S. (M)
Mann, A. (M)
Norris, C. R. (M)
Schiff, R. M. (A)
Schmidt, J. G. (M)
Sumrell, F. N. (SM)

Upton (LI-2)
Adams, R. R. (A)
Bittner, J. W. (M)
Blewett, J. P. (SM)
Chase, R. L. (M)
Constant, T. N. (M)
Cowan, F. P. (M)
Gerrity, R. J. (M)
Halama, H. J. (M)
Higinbotham, W. A. (F)
Kiesling, J. D. (A)
Kuper, J. B. H. (F)
Plotkin, M. (SM)
Rankowitz, S. (M)
Rheaume, R. H. (M)
Spinrad, R. J. (M)
Tucker, S. M. (M)

Utica (RU-1)
Ahladas, J. P. (M)
Ainsworth, M. G. (A)
Antonucci, P. (M)
Augustine, J. A. (M)
Babicz, R. J. (F)
Baran, A. S. (M)
Baris, A. J. (M)
Barker, J. (SM)
Beams, C. E. (M)
Beaubien, W. H. (M)
Benvenga, F. T. (M)
Berg, N. E. (M)
Bernard, F. A. (M)
Bertram, R. H. (A)
Bickelhaupt, M. H., Jr. (M)
Bosworth, O. T. (A)
Brehm, W. R. (A)
Brown, R. J. (A)
Buckman, A. R. (M)
Buckman, S. L. (A)
Campbell, W. J. (M)
Capos, R. G. (M)
Carlson, W. A. (A)
Carne, E. B. (A)
Civin, C. J. (M)
Close, J. N. (A)
Colin, L. (M)
Comer, J. L. (M)
Conrad, G. A. (M)
Corning, J. J. (A)
Cotton, L. J. (M)
Cottrell, C. J. (M)
Demick, D. (A)
Doherty, D. T. (M)
Dondero, R. L. (M)
Dowdell, J. T. (A)
Doyle, C. M. (A)
Eakin, K. G. (SM)
Egan, G. E. (M)
Ellis, H. J., Jr. (M)
Everts, W. J. (M)
Feldman, I. (A)
Gardner, R. J. (SM)
Glaser, G. J. (M)
Godwin, C. J., Jr. (M)
Green, P. I. (M)
Gubbins, L. J. (A)
Habeck, G. L. (A)
Hann, J. D. (A)
Harris, R. L. (M)
Hart, G. W. (M)
Haushalter, C. H. (SM)
Hiatt, W. R. (M)
Holstead, A. J. (M)
Homan, R. E. (M)
Horner, R. E. (A)
Hudgens, J. E. D. (M)
Hurlburt, R. C. (A)
Husk, W. J. (M)
Hyatt, T. H. (M)
Hynes, W. J. (M)
Ignatz, R. R. (M)
Isaac, M. G. (M)
Jeanne, C. E. (A)
Johnson, J. D. (A)
Jones, D. W. (M)
Katz, H. (M)
Kelea, M. M. (M)
Kelley, G. J. (M)
Kinsley, R. B. (A)
Klein, J. A. (M)
Klion, J. (M)
Konig, H. F. (A)
Krajewski, S. J. (M)
Krassowsky, S. (M)
Kumik, J. G. (M)
Le Brun, D. E. (SM)
Lehman, M. L. (M)
Lemon, S. G. (M)
Lilly, H. H. (A)
Littlepage, C. R., Jr. (M)
Loudemilch, R. C. (M)
Lovecchio, J. A. (M)
Luthiger, R. (M)
Marcullis, N. J. (M)
Maynard, A. F. (SM)
McComb, D. S. (M)
Miles, R. J. (M)
Mills, G. M. (A)
Moldoff, S. (M)
Murray, W. H. (M)
Nishimura, H. G. (M)
North, F. J. (A)
Okamura, M. K. (A)
Oot, R. F. (A)
Pacini, H. P. (M)
Panaslewicz, J. J. (M)
Pearman, J. (M)
Peterossi, A. F. (M)
Pelowski, E. H. (M)
Peterpaul, C. A. (M)
Phillip, R. M. (M)
Phillips, J. N. (SM)
Pietrafesa, D. (A)
Plehn, J. G. (SM)
Potter, H. C. (M)
Puopolo, J. W. (M)
Quinn, W. M., Jr. (SM)
Radnor, R. R. (M)
Reiner, J. (M)
Roblchaud, R. H. (M)
Romanelli, P. A. (M)
Rosenberg, M. W. (A)
Ross, P. C. (SM)
Rubenstein, S. E. (M)
Rugarl, A. D. (M)
Rusho, F. W. (M)
Salerno, A. (SM)
Sallus, G. M. (M)
Samuels, F. A. (M)
Satinoff, D. (A)
Schiffman, M. (SM)
Seiderman, S. (M)
Siegel, G. H. (SM)
Small, L. (A)
Smith, M. J. (M)
Spear, A. C. (SM)
Spear, E. D. (SM)
Sperling, L. (M)
Still, E. W. (M)
Strauss, L. (M)
Stuart, H. D. (A)
Suntop, M. A. (M)
Thomas, K. W. (M)
Thornton, J. W. (M)
Tibbitts, J. R. (M)
Toblas, D. L. (M)
Tullis, B. C. (A)
Uren, D. E. (M)
Urynlak, A. J. (A)
Wagner, R. A. (SM)
Walls, G. R. (M)
Walters, J. E. (M)
Washington, R. W. (M)
Webb, J. K. (M)
Weigel, R. L. (M)
Weiss, D. H. (M)
Wendt, R. F. (A)
Werner, W. F. (M)
Willard, C. H. (M)
Williams, H. A., Jr. (M)
Wilson, D. E. (M)
Woodin, E. A. (A)
Worcester, K. P. (SM)
Young, D. B. (M)
Young, J. S. (M)
Zawada, J. D. (A)
Zielinski, C. A. (M)

Valhalla (NY-W-2)
Dworetzky, L. H. (SM)
Hodson, E. W., Jr. (A)
MacAdam, W. K. (SM)
Parr, A. F. W. (M)
Romanello, A. C. (M)

Valley Stream (LI-2)
Aoress, M. C. (M)
Albanese, V. J. (SM)
Bahnsen, R. J. (M)
Barnell, E. J. (A)
Borkum, D. B. (M)
Brandstetter, R. W. (A)
Cass, J. (A)
Cooney, F. A. (M)
Davis, S. (M)
Farkas, R. D. (M)
Ferrara, J. J. (M)
Freeman, P. S. (M)
Gamrat, S. (A)
Gangale, F. S. (A)
Goldman, G. (M)
Goodstein, J. (M)
Grossman, M. (M)
Gunther, H. H. (A)
Haase, W. E. (A)
Holmes, R. P. (M)
Jeffreys, F. R. (M)
Kappauf, E. F. (M)
Kern, J. R. (A)
King, L. H. (SM)
Lidz, S. (SM)
Lo Cascio, G. P. (M)
Maoenheim, B. (M)
Mancke, R. B. (M)
Manzolillo, D. C. (M)
Mauser, C. A. (A)
Meixner, V. G. (A)
Miller, G. (A)
Minneman, M. J. (SM)
Misail, G. (A)
Morgenstern, A. (A)
Peyser, W. P. (SM)
Pihell, L. J. (A)
Pitrelli, F. J. (A)
Platt, S. (M)
Quigley, M. F. (M)
Redding, J. D., Jr. (M)
Rokosz, A. J. (A)
Roth, H. A. (M)
Rothenberg, N. (M)
Sandler, P. L. (A)
Schaaf, W. K. (A)
Schlang, A. (M)
Schwarz, H. E. (A)
Shaw, W. J. (M)
Tillman, L. (M)
Wessbecher, F. W. (M)
Woemer, R. G. (A)
Wolf, C. F. (A)
Woodbury, W. F. (SM)
Ziegler, G. W. (A)

Verona (RU-1)
Boothyord, G. A. (M)
Butler, H. E. (SM)
Clark, D. R. (M)
Francis, H. G. (SM)

Vestal (BING-1)
Aldrich, D. H. (M)
Battilson, A. H. (M)
Beausoleil, W. F. (M)
Bertelsen, B. I. (A)
Blossom, E. L. (M)
Bowen, E. C. (M)
Boylan, R. P. (M)
Breedlove, R. H. (M)
Brockington, H. F. (M)
Busse, C. C. (M)
Bussey, R. L. (M)
Calkins, G. T. (M)
Carpenter, L. C. (M)
Carroll, A. B. (M)
Coleman, M. J. (M)
Cooper, A. E. (SM)
Cooper, J. V. B. (M)
Dzykin, D. R. (M)
Droege, F. J. (A)
Elsbree, W. F. (A)
Farr, L. E., Jr. (A)
Frank, R. A. (A)
Greene, J. E. (M)
Harasimowitz, S. (M)
Harford, H. D. (M)
Keough, K. J. (M)
Koranne, T. D. (M)
Lawson, E. R. (M)
Lewis, G. N. (M)
Lloyd, J. W., Jr. (A)
Lord, P. A. (M)
Lorschelder, E. B. (M)
Lozier, W. B., Jr. (A)
MacLeod, D. S. (A)
Markle, R. E. (M)
Martin, C. L. (M)
Mason, P. R., Jr. (A)
Minnick, A. W. (M)
Nuss, H. C. E. (M)
Oates, K. H. (A)
Okoniewski, J. S. (A)
Porterfield, F. B. (M)
Poupard, R. E. (M)
Pratt, W. H. (M)
Rogers, F. L., Jr. (M)
Rogers, M. D. (M)
Schaffert, R. M. (SM)
Schroeder, E. N. (SM)
Sweet, R. E. (A)
Sykas, A. J. (M)
Trest, L. S., Jr. (M)
Tutty, J. E. (M)
Vacca, L. N. (M)
Weisser, D. R. (A)
Wilson, G. D. (M)
Wright, W. F. (M)
Yantis, G. C. (M)

Victor (ROC-1)
Holmes, R. W. (SM)
Perkins, J. C., Jr. (M)

Wallkill (NY-MH-2)
Parker, R. G. (A)

Wantagh (LI-2)
Ahman, A. J. (A)
Alter, J. (SM)
Arndt, W. R. (SM)
Bauer, W. C. (M)
Bloom, L. (M)
Breese, M. E. (M)
Brown, C. J. (M)
Calliguri, J. F. (M)
De Cesare, J. F., Jr. (A)
Ely, R. C. (M)
Fauteck, W. S., Jr. (M)
Feingold, F. A. (M)
Gibbs, E. D. (M)
Glesecke, O. W. (SM)
Greeley, J. J. (M)
Greene, J. C. (M)
Gutman, J. H. (M)
Hagler, L. H. (A)
Herring, F. G. (M)
Hickman, W. C. (M)
Hodder, R. M. (M)
Hoffman, C. (M)
Horton, G. L. (M)
Hughes, J. G. (M)
Iddings, G. E. (SM)
Jauck, R. H. (SM)
Kesney, E. S. (A)
Leib, K. G. (M)
Lesher, R. H. (M)
McManus, J. T. (A)
Mills, N. B. (M)
Nelson, R. P. (M)
Orth, C. A. (M)
Osder, S. S. (M)
Ostemdorf, J. F. (A)
Pemick, H. L. (M)
Pollack, P. (M)
Posner, S. (M)
Price, C. R. (A)
Rawitz, H. (M)
Riker, W. E. (M)
Rosen, A. (M)
Salzberg, A. (A)

NEW YORK

Sarfaty, J. (A)
Schleber, T. (M)
Schlifres, P. (M)
Schleher, D.C. (A)
Schroeder, R.P. (M)
Seckler, P.J.A. (M)
Sferrazza, P.J. (M)
Shulman, A.R. (M)
Silverman, S. (M)
Stateman, M.J. (SM)
Steen, D.R. (M)
Strauss, A. (M)
Sunder, J.E. (M)
Vigliotta, A.P. (SM)
Vuono, R.A. (A)
Ward, W.P. (M)
Weinstein, M. (M)
Weiss, L.M. (M)

Wappingers Falls (NY-MH-2)
Acosta, B. (M)
Armstrong, R.M. (M)
Beetham, J.P. (M)
Brandt, W.E. (M)
Bredd, W.D. (A)
Buelow, F.K. (M)
Bullard, R.L. (M)
Caswell, A. (A)
Councill, E.D. (M)
Cramsie, G.J. (A)
Crumb, D.F. (M)
Cullen, J.W. (M)
Deininger, C.R. (M)
Desautels, P.M. (M)
Di Marco, A.F. (M)
Donohue, D.C. (A)
Ewing, J.E. (A)
Feitler, J. (M)
Fernekees, J.E. (M)
Finstuen, R.E. (M)
Flynn, M.J. (M)
Fredericks, C.F. (A)
Gaffney, J. (M)
Gedney, R.W. (M)
Geisler, H.J. (M)
Graff, W.S. (M)
Groce, D.C. (M)
Grossnickle, J.R. (M)
Headrick, L.L. (M)
Hipp, J.A. (M)
Howard, P.H. (A)
Johnson, J.D. (M)
Keller, R.E.L. (M)
Kerr, G.L. (M)
Maier, G.H. (A)
Marquis, J.F., Jr. (M)
Marshall, M.R. (M)
McDougall, J.C. (M)
Media, E. (M)
Moore, J.G. (A)
Morris, E.F. (M)
Nick, H.H. (A)
O'Brien, H.A. (M)
O'Connor, R.J. (A)
Ohlhorst, W.R. (M)
Patrick, R.M. (M)
Paul, A.J., Jr. (A)
Platz, E.F. (M)
Richards, R.K. (M)
Roberts, W. (M)
Rudy, G.J. (M)
Russell, R.A. (A)
Savary, D.L., Jr. (M)
Selmes, M.S. (A)
Skwiertz, R.J. (M)
Snyder, J.E. (M)
Stallard, L.B. (M)
Sumner, M. (M)
Thomas, E.M. (M)
Unger, G.G. (M)
Widmar, J.H. (M)
Williams, R.J. (M)
Zucker, M.S. (M)

Warners (SYR-1)
Walsh, L.F. (A)

Waterford (SCH-1)
Michon, G.J. (A)

Waterloo (ROC-1)
Allen, R.J. (A)

Water Mill (LI-2)
Delbert, C.R. (M)
Luke, R.O. (M)

Waterville (RU-1)
Seiler, R.T. (A)

Watervliet (SCH-1)
Lavoo, N. (M)
Merrill, H.B., Jr. (M)

Waverly (BING-1)
Cooney, J.O., Jr. (M)
Long, R.E. (M)
Owen, F.D. (M)

Webster (ROC-1)
Beetz, H.J. (M)
Clarke, W.B. (M)
Coleton, J.W. (M)
Daly, J.P. (M)
Evans, R.W. (A)
Fox, R.M. (M)
Hattersley, T.E., Jr. (SM)
Herbert, R.B. (M)
Hunderup, A.R. (M)
King, P.F. (A)
Matteson, R.G. (M)
Ozone, K. (SM)
Plotraschke, C.F. (M)
Proctor, T. (M)
Reinke, R.V. (M)
Sienkiewicz, A.H. (M)
Steck, A.F., Jr. (M)
Styner, T.L. (M)
Vosefski, J.R. (M)
Wheeler, J.L. (M)
Zogg, F.E. (SM)

Weedsport (SYR-1)
Jeffords, J.M. (M)

Wellsville (ELM-C-1)
La Dieu, F.A. (A)

West Babylon (LI-2)
D'Angelo H. (M)
McMullin, R.E. (M)

Westbury (LI-2)
Abajian, H.B. (M)
Adler, W. (M)
Aloisio, R.R. (M)
Arguin, R.G. (M)
Becker, N. (M)
Beley, E.G., Jr. (A)
Berkoff, S. (M)
Bittman, L.R. (A)
Borken, A. (A)
Chazman, P.L. (M)
Chin, J.H.S. (A)
Cohen, S.B. (M)
Collins, J.F. (M)
Dorne, A. (M)
Douglas, W.S. (A)
Ellis, P.H. (SM)
Esposito, J.R. (A)
Fialkov, H. (M)
Friedman, J. (A)
Gannon, J.A., Jr. (A)
Gitlin, S.A. (M)
Gittleman, R. (A)
Gledhill, A.P. (M)
Glixon, H.R. (A)
Graber, L.J. (SM)
Harjes, F.W. (A)
Heilmann, R.K. (SM)
Hoffman, H.L. (M)
Holfman, G. (SM)
Kelleher, R.L. (SM)
Kenny, J.A. (SM)
Kritz, J. (M)
Levine, S.W. (SM)
Liquori, M.A. (A)
Logan, R.W. (M)
Luce, P.P. (A)
Mahr, M., Jr. (M)
Mankin, A.H. (M)
Marston, R.S. (M)
Martines, L.T. (M)
Mesch, R.M. (M)
Martines, L.T. (M)
Mesch, R.M. (M)
Mordechian, R. (A)
Morganstern, K.H. (SM)
Moscarello, M.A. (SM)
Muligano, G.A. (SM)
Napolin, S. (A)
Oldmixon, R. (A)
O'Meara, T.J. (M)
Petrack, P. (M)
Pinkham, G.E. (M)
Piwinski, W. (M)
Price, R.C. (SM)
Proskauer, R. (M)
Richards, G.F. (M)
Rickert, H.H. (SM)
Rush, S. (M)
Rustad, A.C. (SM)
Savet, P.H. (A)
Schuhlein, C.M. (M)
Schumacker, A.L. (VA)
Schwiebert, H. (M)
Seoe, T.D. (M)
Shostak, R.B. (SM)
Simon, J.M. (SM)
Smith, H.W. (A)
Stein, D.B. (A)
Stitch, M. (SM)
Tichy, B.W. (M)
Troop, J. (A)
Truhlar, G. (M)
Volpe, C.D. (M)
Walcule, D. (M)
Waller, W.E. (M)
Whitford, J.R. (M)
Wilson, L.B. (M)
Winsen, J.H. (A)
Winson, P. (A)
Zaklad, S. (A)

Westernville (RU-1)
Mackey, C.L. (M)

West Forest Hills (LI-2)
Christian, J.L. (M)

Westhampton (LI-2)
Goodman, J.A. (M)

West Hempstead (LI-2)
Aveney, R.J. (M)
Bifano, V.J. (M)
Buck, J.D. (A)
Cohen, N.L. (M)
Dean, M.A. (M)
Erdhelm, W. (M)
Fairweather, R.W. (M)
Goldman, B. (A)
Karasz, J. (M)
Lammer, L.H. (M)
Lazarich, M.R. (A)
Levine, H.A. (SM)
Metzner, P. (M)
Multari, A.M. (M)
Saffitz, I.M. (M)
Seisler, M. (M)
Shnitkin, H. (M)
Thiede, F.C.W. (VA)
Trias, J.J. (M)
Voelpel, J. (A)
Weintraub, I.A. (M)
Westman, H.P. (SM)

West Hurley (NY-MH-2)
Mirick, H.L., Jr. (A)
Saxe, I.N. (M)

West Islip (LI-2)
Bell, R.W. (M)
Bushor, W.E. (M)
Collock, H. (A)
Damast, M.A. (M)
Eglit, W.F. (M)
Esper, C.H. (M)
Hermida, R.J. (M)
Leedham, R. (M)
Russo, A.J. (A)
Schecker, E.J. (A)
Stenecker, R.G. (M)

West Monroe (SYR-1)
Fiet, J.H., III (A)

Westmoreland (RU-1)
Van Etten, P. (A)

West Nyack (NY-2)
Burton, J.R. (M)
Stilwell, G.R., Jr. (M)
Wolff, J.H. (A)

West Point (NY-MH-2)
Friend, H.C. (A)
Gillette, E.C., Jr. (M)
Mitchell, J.D. (M)
Monahan, L.P., Jr. (M)
Schulke, H.A., Jr. (A)
Strohm, W.E. (M)

West Seneca (BN-1)
Nowicki, J.J. (A)

West Webster (ROC-1)
Bettin, R. (M)

White Plains (NY-W-2)
Asch, B. (A)
Bernardi, A.R. (A)
Blocker, T.B. (M)
Bloom, W.E. (A)
Bolsey, E.J. (A)
Borden, E.D. (A)
Brailey, M.L. (M)
Cohen, H.P. (A)
Coles, G.F. (A)
Cuccia, J.F. (M)
Deas, J.M. (M)
Eisenreich, W. (A)
Faup, J.J. (M)
Fearing, J.L. (VA)
Ferguson, H.F. (M)
Flower, R.A. (M)
Gano, A.S. (SM)
Gazzigli, J.J. (A)
Gilbert, J. (M)
Glancy, R.C., Jr. (SM)
Golec, E.J. (M)
Gottlieb, G.J. (M)
Gresko, J.J. (M)
Greunke, O.V. (SM)
Gronner, A. (SM)
Guttman, J. (M)
Haber, F. (M)
Hackett, A.J. (M)
Halpern, W. (M)
Hanft, H. (M)
Harris, E.R. (M)
Heizler, M.M. (A)
Horton, T.R. (M)
Houle, L.A. (M)
Ikeda, T. (A)
Jenkins, H.C. (M)
Kaye, H.W. (M)
Lake, J.R. (M)
Lebid, J. (M)
Lewis, J.R. (M)
Lida, S.L. (M)
Lisk, H.H. (M)
Macdonald, W.D. (SM)
Markham, G.W. (M)
Merritt, N.A. (M)
Metcalfe, D. (SM)
Meyer, B. (M)
Millman, J.H. (A)
Millman, J. (F)
Mountain, J.D. (M)
Pacifico, E.M. (M)
Pastoriza, H.G., Jr. (M)
Pendergrass, H.L. (A)
Pinz, B.M. (A)
Preston, F.S. (SM)
Reiner, S. (M)
Richmond, I.D. (A)
Sachs, H.L. (M)
Sandock, J. (M)
Sands, E.A. (A)
Sansevero, V.J. (A)
Scheiner, M.L. (M)
Schleicher, M. (A)
Schwartz, C.S. (M)
Shaw, D.B. (SM)
Spitalny, A. (M)
Strysko, W.J. (A)
Sulds, I.P. (A)
Tudbury, C.A. (M)
Wamick, G.H. (M)
Yakoff, O. (SM)
Zlserman, M. (SM)

Whitesboro (RU-1)
Berman, E.J. (SM)
Brady, C.E. (M)
Cole, F.G. (SM)
Davis, D.M. (M)
Diab, M.A. (M)
Edgell, R.S. (M)
Erwin, R.L., Jr. (M)
Fleming, J.A. (M)
Gaffney, R.E. (SM)
Gibson, J.A. (SM)
Grimm, R.S. (M)
Hartnett, G.C. (M)
Hauge, H.R. (M)
Kenyon, H.P., Jr. (M)
Ketchum, P.M. (SM)
Kulmus, R.J. (M)
Lanzara, E.M. (M)
Levesque, R.W. (M)
Lutze, R.J. (SM)
Miller, R.L. (A)
Mills, J.B. (M)
Orear, E.R. (SM)
Pfefer, B.L. (SM)
Piepho, J.B. (A)
Power, H.J. (A)
Riddle, P. (A)
Schatz, F.W. (SM)
Sill, D.B. (M)
Stark, J.A. (M)
Steel, J.W. (M)
Stitz, R.P. (M)
Wallenfels, W.B. (M)
Watson, D.E. (M)
Winn, O.H. (SM)
Withington, A. (M)

Whitestone (LI-2)
Abruzzi, P.W. (M)
Ballinger, R.F. (M)
Benisch, N.E. (M)
Chun, B. (M)
Dunefsky, M. (M)
Franchina, M.A. (SM)
Frann, S.I. (SM)
Greenberg, E. (M)
Greene, I. (A)
Hunter, E.M. (M)
Merten, D.J.S. (SM)
O'Connell, T.P. (A)
O'Toole, C.E. (SM)
Pedowicz, J.M. (M)
Pelner, N. (M)
Piller, S.E. (M)
Pokorny, J.S. (M)
Pollak, F. (M)
Pomerantz, M. (M)
Renkowitz, D. (M)
Rubin, W.L. (SM)
Sachs, M. (M)
Sandler, H. (M)
Schachter, J. (M)
Schadelbauer, B.F. (M)
Schaja, H.B. (M)
Shanahan, W.J. (M)
Smith, J.W. (SM)
Sobel, I.J. (A)
Steckler, I. (A)
Stone, G.F. (A)
Vogt, J.J. (M)
Wappler, A.C. (A)
Weida, R.L. (M)

Whitney Point (BING-1)
Read, L.P., Jr. (M)
Ticknor, S.L. (A)

Williamsville (BN-1)
Becker, H.D. (A)
Benperson, C.W. (A)
Billings, N. (M)
Black, P.B. (SM)
Carr, F.S. (M)
Cleary, R.E. (M)
Corp, D.E. (M)
Fryer, W.D. (M)
Gibbons, H.M. (A)
Giori, F.A. (M)
Hart, W.E. (M)
Himelar, S.L. (M)
Laurien, I.M. (M)
Lind, A.L. (M)
Lindsay, J.E. (M)
Mackechnie, H.K. (SM)
Mandale, W.R. (M)
Maylott, C.F. (SM)
Maynard, H.M. (M)
Merle, C.W. (SM)
Novo, R.B. (M)
Pelton, F.M. (M)
Pifer, M.J. (SM)
Sante, D.P. (SM)
Scheetz, H.A. (M)
Schlosser, G.A. (M)
Sears, R.A. (M)
Snyder, W.W. (SM)
Tona, C.J. (M)
Torode, S.W. (SM)
Wood, F.S. (M)

Williston Park (LI-2)
Flattau, T. (A)
Gillespie, C.H., Jr. (M)
Jennison, R.E. (A)
Kelly, M.J. (M)
Losow, H.C. (M)
Perkowski, T.F. (M)
Ploss, A.G. (M)
Rothstein, M. (M)
Schaetzl, R.J. (A)
Sullivan, L.D. (M)
Weldle, C.M., Jr. (A)
Zwick, G. (M)

Wilmington (SCH-1)
Preston, H.D. (A)

Windsor (BING-1)
Nielsen, R.S. (A)
Van Billiard, L.A. (A)

Woodbury (LI-2)
Fricker, J.N. (M)
Hanulec, J.D. (A)
Roel, E.L. (M)

Woodhaven (LI-2)
Bassett, A., Jr. (M)
De Size, L.K. (M)
Hess, D.T. (M)
Jacobs, F. (SM)
Jensen, H.S. (M)
Reitlinger, A. (M)
Sloan, R.R. (M)
Sweetland, J.G. (M)
White, C.F. (M)
Winter, D.W. (A)
Wolber, W.O. (M)

Woodmere (LI-2)
Cohen, A.L. (M)
Crystal, F.H. (A)
Ozarin, S.J. (A)
Zweiffler, I. (M)

Woodside (LI-2)
Altmayer, F.V. (M)
Berger, L.M. (M)
Bibbero, R.J. (SM)
Cabot, J.H. (A)
Callais, R.T. (M)
Culver, A.R. (A)
Deplerro, J.M. (M)
Digenova, F. (A)
Dore, N.J. (A)
Gautherin, G.A. (M)
Halko, J.W. (M)
Heathcote, B.G. (A)
Hlavna, R.S. (M)
Johnston, W.F. (A)
Keith, W.S. (M)
Kroessler, A.W. (M)
Malsto, M.S. (M)
Martin, A.L., II (A)
O'Sullivan, D.R. (A)
O'Sullivan, J.K. (M)
Parzen, B. (SM)
Peduto, R.J. (M)
Perle, R.C. (M)
Plutchok, H. (M)
Pozze, T. (M)
Rafferty, J.J. (M)
Reuman, W.H. (A)
Ricci, T.M. (A)
Rowney, E.A. (A)
Stapler, B. (A)
Tapiltz, J.H. (M)
Tucker, A.G. (A)
Varza, G. (A)
Wetzler, C.E. (M)
Zlachevsky, B. (A)

Woodstock (NY-MH-2)
Collins, M. (A)
Gray, R.G. (M)
Hickey, H.G. (M)
Jacob, W.P. (M)
Kutcher, M.M. (M)
Lindsay, R.L. (M)
Menard, E.A., Jr. (M)
Selfridge, J.J. (M)
Spencer, D.L. (M)
Van Rijn, J.C. (SM)

Wyandanch (LI-2)
Antman, H.S. (M)
Thompson, W.G. (A)
Totah, E.J. (M)

Yonkers (NY-W-2)
Altieri, J.R. (M)
Arbuthnott, J., Jr. (A)
Armani, L.J. (M)
Avrutik, R.F. (M)
Balletta, A.G. (M)
Bernardi, U.A. (M)
Blumberg, J. (M)
Bolz, R.A. (M)
Buchalter, M. (M)
Burger, E. (M)
Campbell, J.A. (A)
Caras, B. (A)
Castriota, L.J. (SM)
Cugliari, N. (M)
Defloria, R.N. (M)
Diamond, J.E. (M)
Fine, E.M. (M)
Fliderblum, D.D. (A)
French, C.C. (M)
Friedman, S.N. (A)
Gehrig, J.W. (A)
Genz, W.F. (M)
Goetzl, M. (M)
Goldman, A.L. (M)
Gomberg, L. (M)
Grabowski, J.L. (A)

Hesse, G.L. (SM)
Hillman, P.L. (SM)
Jones, D.H. (A)
Knauert, W.F. (M)
Korewick, J. (M)
Lamb, R.U. (M)
Letscher, E.J. (M)
Levy, P.M. (SM)
Lisewski, E.E. (A)
Loebl, W.W. (M)
Looney, L.A. (M)
Lynch, D.F., Jr. (A)
Mishkoff, S. (M)
Namerow, V.C. (A)
Ondroczky, O.A. (M)
Orefice, G.T. (M)
Oswald, H. (M)
Pelavin, M.H. (M)
Perelle, I.B. (A)
Regan, H.T. (M)
Reilley, A.G., Jr. (M)
Resnicow, L. (M)
Richardson, R.J. (A)
Richter, J.G. (A)
Robinson, R.J. (M)
Rodrigues, A.N. (A)
Roth, S.S. (A)
Sacks, E.I. (SM)
Schachat, T. (SM)
Schiller, G.J. (A)
Schreiber, W.B., JR. (M)
Schwartz, L. (M)
Shirley, G. (A)
Singer, R.E. (M)
Solins, R. (M)
Speranza, A.A., Jr. (A)
Staudt, W. (A)
Stein, R.S. (SM)
Sterk, A.A. (M)
Szymanski, L.A. (M)
Taffet, W. (A)
Troster, M. (M)
Ungvarsky, W.J. (M)
Valle, L.J. (A)
Webb, W.J. (A)
Woods, B.L. (M)
Yablonsky, D.M. (A)
Youla, D.C. (SM)
Zatorsky, E.F. (VA)

Yorktown Heights (NY-W-2)
Allen, R.G. (M)
Anderson, N.S. (M)
Arcand, A.T. (M)
Callinan, T.D. (SM)
Chang, H-W. (M)
Chien, N.L. (A)
Chien, R.T. (A)
Coombs, J.M. (M)
Deerhake, W.J. (SM)
Ellis, J.T., Jr. (M)
Furth, E. (A)
Gamo, H. (M)
Guros, F.S. (M)
Hodge, B. (M)
Kalenich, W.A. (A)
Krongelb, S. (M)
Lambert, J. (M)
Lohn, H.P. (M)
Mezei, J.E. (M)
Miller, R.E. (M)
Polenz, D.L. (M)
Rath, G.J. (A)
Saslovsky, S. (A)
Seville, A.R. (M)
Sholtz, P.N. (M)
Smith, M.G. (A)
Smyth, F.J. (M)
Sugal, I. (M)
Teschmacher, H.W. (SM)
Verma, Y.P. (A)
Ward, R.L. (M)
Wilser, R.E. (M)

Yorkville (RU-1)
Pankiewicz, C.L. (M)

NORTH CAROLINA

Albemarle (NC-W-3)
Almond, J.A. (M)

Asheboro (N-CAR-3)
Stephens, T.L. (M)

Asheville (NC-W-3)
Hayes, W.L. (M)
Kennedy, R.A. (M)
McConnel, W.G. (SM)
Morgan, Z.K., Jr. (A)
Schumer, H.A. (M)
Smith, I.A., Jr. (M)
Sprague, G.F. (SM)

Badin (NC-W-3)
McFadden, J.W. (M)

Banner Elk (N-CAR-3)
Kalbfleisch, A.M. (A)

Boone (N-CAR-3)
Isenhour, C.N. (M)
Littleton, W.W. (M)

Burlington (N-CAR-3)
Apple, H.L. (M)
Barlow, J.E. (SM)
Birdsey, G.J., Jr. (M)
Brown, C.J. (SM)
Casey, J.B. (M)
Chaffey, D.K. (M)
Cobb, H.E. (M)
Davis, D.A. (M)
Day, J.L. (M)
De Loach, H.H. (M)
Donaldson, E.E., Jr. (M)
Evans, G., Jr. (A)
Fox, M.L. (M)
Harris, R.H. (M)
Hastings, C.L. (SM)
Hoover, V.M. (M)
Hurst, E. (A)
Jones, W.G. (M)
Kelly, C.J. (A)
Kelly, I.E. (M)
Lockard, D.T. (M)
Mann, J.H. (A)
Massey, E.H. (M)
Mears, D.F. (M)
Miller, O.R. (M)
Mincey, J.H. (M)
Nance, R.L. (A)
Nimmcke, F.E. (SM)
Nino, J.A. (M)
North, T.G., Jr. (M)
Palmer, D.B. (M)
Peake, M.W. (M)
Perry, L.A. (M)
Ratchford, L.M. (M)
Riley, M.H., Jr. (M)
Rudisill, J.A., Jr. (M)
Savole, L.P. (A)
Sees, J.H. (M)
Sence, R.L. (A)
Shackley, E.R., Jr. (M)
Singletary, W.A. (M)
Smith, C.P. (M)
Smith, H.O. (M)
Stuart, J.C. (M)
Thomas, B.J. (M)
Thorne, J.C. (M)
Thrash, W.D. (M)
Troussoff, G.B. (SM)
Anderson, F.C. (A)
Barkley, H.B., Jr. (M)
Barron, J.I. (M)
Bateman, F.F. (M)
Brown, F.R. (A)
Bush, T.K. (M)
Caldwell, H.S. (A)
Carey, J.C. (SM)
Carr, L.D. (M)
Caudle, L.L., Jr. (M)
Chaney, A.L., Jr. (M)
Covington, N.J. (M)
Deyton, J.B., Jr. (M)
Dycus, R.W. (A)
Griffin, W.G., Jr. (A)
Hager, M.F. (A)
Hicklin, W.H., Jr. (M)
Howard, T.E. (M)
Kickler, E.M. (A)
Larson, F.P., Jr. (M)
Livingston, T.C. (M)
McCray, H.R., Jr. (M)
Minor, M.J. (SM)
Mullis, C.B. (M)
Murphy, B. (M)
Ramsey, R.W. (VA)
Winfield, O.M., Jr. (M)

Camp LeJeune (N-CAR-3)
Stapleton, G.F. (M)

Candler (NC-W-3)
Brown, J.R. (A)

Carrboro (NC-E-3)
Bell, W.C. (A)

Cary (NC-E-3)
Cormack, W.J. (M)
Dawkins, L.L. (SM)

Chapel Hill (NC-E-3)
Forrest, L.A., Jr. (A)
MacIntyre, A.B. (M)
Thurstone, F.L. (M)
Vilas, J.M. (M)

Charlotte (NC-W-3)
Scoggin, W.G., Jr. (A)

Cherry Point (NC-E-3)
Welch, C.H. (A)

Clemmons (N-CAR-3)
Woodford, M.J. (M)

Davidson (N-CAR-3)
McLane, S.B., Jr. (M)

Durham (NC-E-3)
Chenery, P.J. (SM)
Cronin, H.C. (M)
Edwards, F.D. (M)
Fullen, R.E. (A)
George, R.T., Jr. (M)
McKnight, D.R. (M)
Owen, H.A., Jr. (M)
Perry, W.T., Jr. (M)
Seeley, W.J. (SM)
Teasley, R.C. (M)
Vail, C.R. (SM)
Young, D.B. (M)

Elizabethtown (NC-E-3)
Baird, J.W. (A)

Elon College (N-CAR-3)
Baynard, J.S., Jr. (M)
Berryman, J.W. (M)

Farmville (N-CAR-3)
Thorne, M.G. (A)

Fort Bragg (N-CAR-3)
Megna, J.J. (M)
Robinson, J.H., Jr. (M)
Saunders, R.G. (M)
Walker, B. (M)

Gastonia (NC-W-3)
Huffstetler, J.P. (M)

Germanton (N-CAR-3)
Long, E.S. (A)

Goldsboro (NC-E-3)
Hansen, R.L. (M)
Hicks, J.M. (M)
Higgins, J.T. (A)
Page, D.W. (M)
Truebiood, D.B. (M)

Graham (N-CAR-3)
Abbott, J.D. (M)
James, H.C. (SM)
Jones, F.D. (M)
Miller, A.R. (A)
Pope, M.G. (M)
Rountree, R.H. (M)

Greensboro (N-CAR-3)
Adams, T.N. (M)
Aitkenhead, J. (M)
Allred, R.R. (M)
Annas, P.D. (M)
Atcheson, S.E. (M)
Bescherer, E.A. (SM)
Best, R.H. (M)
Bezera, G. (M)
Boettenreiter, W.K. (M)
Buntin, A.T. (A)
Coble, R.P., Jr. (M)
Coordsen, J.F., Jr. (M)
Fennell, T.C. (M)
Gardiner, J.G. (SM)
Hambright, W.A., Jr. (M)
Johnson, W.H. (M)
Joseph, F.T. (M)
Lowe, A.L. (A)
Lupton, C.C. (A)
Manning, G.B. (M)
Marteena, J.M. (M)
McLaughlin, N.R. (M)
Monroe, J.E. (A)
Morris, R.E. (M)
Porter, G.R. (M)
Schaffer, L.I. (M)
Smith, F.S. (M)
Stafford, O.C. (M)
Stanton, G.L. (SM)
Strandberg, C.F. (M)
Thayer, P.H., Jr. (M)
Wilder, G.R. (M)

Greenville (NC-E-3)
Behr, L.V.D.P. (A)

Guilford (N-CAR-3)
Hurt, C.V. (M)
Thompson, F.E. (M)

Hamlet (NC-W-3)
Drescher, H.W., Jr. (A)

Havelock (NC-E-3)
Lindeman, W.D. (A)

Hendersonville (NC-W-3)
Hawks, J.D. (M)
Hoots, L.C. (M)
Howell, E.K. (M)
Jones, H.Y. (A)
Kelley, H.P., Jr. (M)
Nuckolls, J.A. (M)

Hickory (NC-W-3)
Long, T.E. (A)
Roberts, W.L. (A)

High Point (N-CAR-3)
Elvins, J.F. (SM)
Cherry, W.H., Jr. (M)
Mingia, S.L. (M)
Portaro, S.A. (M)
Tolley, F.N. (M)

Jacksonville (NC-E-3)
McLendon, J.T., Jr. (A)

Jamestown (N-CAR-3)
Caldwell, D.J. (SM)
Moore, R.L. (M)

Kannapolis (NC-W-3)
Shaver, J.L., Jr. (A)

Kernersville (N-CAR-3)
Farrington, O.M. (M)

Kinston (NC-E-3)
Hurt, A.B., Jr. (M)

Laurinburg (NC-E-3)
Phillips, G.W. (A)

Lexington (NC-W-3)
York, R.E. (M)

Liberty (N-CAR-3)
Wolfgang, W.W. (M)

Lincolnton (NC-W-3)
Peeler, D.D. (M)
Manteo (VIR-3)
Shannon, B.F. (M)

Marion (N-CAR-3)
Dowdle, J.F. (M)

Mount Airy (N-CAR-3)
Epperson, R.H. (A)

New Bern (NC-E-3)
Haire, B.G. (M)

Pfafftown (N-CAR-3)
Garrison, W.H. (M)

Raleigh (NC-E-3)
Baldwin, C.M., Jr. (M)
Barclay, W.J. (SM)
Bell, N.R. (SM)
Buck, J.H. (M)
Burton, R.B. (A)
Caviness, L.L. (M)
Colvert, F.T. (A)
Combs, R.G. (M)
Coms, R.B. (M)
Duncan, V.D. (M)
Harrill, J.W. (M)
Higgins, J.F. (A)
Hill, J.S., II (M)
Hoadley, G.B. (SM)
Horne, W.H., III (M)
Hulick, H., Jr. (SM)
Idol, C.A. (M)
Jones, J.F. (A)
Kahn, S.H. (M)
Kern, W.J. (M)
Manning, E.G. (M)
McArthur, C.S. (SM)
Moore, C.H. (M)
Mott, H. (M)
Neuse, D.H. (A)
Paduchewit, P.I. (M)
Parkin, H.C. (A)
Rothstein, R.I. (A)
Seay, R.T. (A)
Sloop, W.B. (A)
Speed, W.J. (M)
Sugg, C.H. (A)
Sullivan, D. (A)
Thompson, H.W., Jr. (M)
Voss, C.H., Jr. (M)
Weinberg, D.I. (M)

Rural Hall (N-CAR-3)
Helms, C.M. (M)

Sanford (NC-E-3)
Buchanan, T.B. (A)

Statesville (NC-W-3)
Poole, Z.V. (M)

Thomasville (N-CAR-3)
Ward, D.L. (M)

Trinity (N-CAR-3)
Hill, K.R. (A)

Warsaw (NC-E-3)
Scott, C.S. (A)

Waynesville (N-CAR-3)
Reece, C.J., Jr. (M)

Weaverville (NC-W-3)
Kennedy, C.L., Jr. (A)

Wendell (NC-E-3)
Todd, M.C. (M)

Westfield (N-CAR-3)
Locke, R.V., Jr. (A)

Wilmington (NC-E-3)
Peebles, N.A. (M)

Winston-Salem (N-CAR-3)
Adams, J.E. (M)
Adams, J.G. (M)
Adkins, F.L., Jr. (M)
Amend, R.N. (M)
Anderson, F.B. (SM)
Applegate, I.D. (SM)
Arnold, H.H. (SM)
Baity, A.C., Jr. (M)
Balden, J.M. (M)
Barnett, H.A., Jr. (A)
Beach, O.R. (M)
Beard, C.E. (M)
Benton, A. (M)
Bernath, W.A. (M)
Bertie, C.E. (SM)
Bishop, C.R. (A)
Boatwright, J.H. (M)
Borlack, F.L. (A)
Bradie, M.E. (M)
Bright, J.Q. (SM)
Broadwell, B.L. (M)
Brunelle, A.A. (A)
Buckle, G.J., Jr. (A)
Bunney, E. (M)
Burnett, J.W. (M)
Cantrell, M.E. (M)
Carlisle, H.C., Jr. (A)
Carroll, W.D. (M)
Caskey, L.F. (M)
Cassidy, J.T. (A)
Clabough, E.M. (A)
Clayton, F.R. (M)
Climer, F.A. (M)
Coan, J.O., Jr. (A)
Cockrell, H.H., Jr. (M)
Coonen, J.J. (M)
Cordeman, R.C. (SM)
Corn, M. (A)
Cornett, L.A. (A)
Cottrell, B.P. (SM)
Cox, C.W. (M)
Craddock, G.L. (M)
Dague, G.I. (A)
Dahle, O.K. (A)
Dearing, M. (A)
Disher, R.S. (A)
Eberhart, E.K. (SM)
Edwards, G.W. (M)
Eidson, H.G., Jr. (A)
Epperson, J.P. (M)
Estes, F.B. (VA)
Evans, R.D. (A)
Evans, W.A., Jr. (M)
Ewing, C.E. (M)
Farrell, R.B. (SM)
Feeney, C.J. (A)
Fisher, R.W. (M)
Fowler, J.D. (M)
Fox, E.D. (M)
Fulp, W.M. (M)
Gegenheimer, W.C. (SM)
Genaille, R.A. (M)
Greer, L.H. (A)
Haase, W.D. (A)
Haines, A.B. (M)
Hamilton, R.D. (A)
Hanks, W.R. (M)
Heard, B.E. (M)
Hedrick, P.F. (SM)
Hege, A. (A)
Heineman, J.T. (M)
Herb, J.W. (M)
Highsmith, H.P. (M)
Hilker, A.H. (M)
Hill, G.V. (SM)
Himer, J.A. (M)
Hoffman, W.R.R. (VA)
Holton, E.F., Jr. (M)
Hoole, C.R. (M)
Hopper, F.L. (SM)
Huffman, J.C. (A)
Hunter, P.H. (M)
Ivester, H.E. (M)
Kennefick, A.R. (A)
King, L.C. (A)
Kirkland, F.E. (M)
Knowles, C.U. (M)
Kozanosky, C. (M)
Lanford, W.E. (M)
Laughter, F.H. (M)
Lee, R.E., Jr. (M)
Lehr, O.A. (A)
Leonard, A.B. (M)
Libby, V.A. (A)
Lumley, R.M. (A)
Lyle, D.A. (A)
Maddox, H.D. (SM)
Malone, W.H. (M)
March, R.C. (M)
McAvoy, W.G. (SM)
McClung, H.A. (M)
McFarland, R.T. (M)
McLane, A.R. (M)
McMillin, D.L. (A)
Moore, W.C. (M)
Morgan, G.T. (M)
Morrell, F.M., Jr. (M)
Mueller, H.W. (M)
Mulheron, A.R. (A)
Needham, D.P. (M)
Neilson, C.C. (M)
Newsome, A.T. (M)
Norwood, C.A. (SM)
O'Dea, O.B. (M)
Oliver, C.W. (M)
Owen, F.R. (M)
Palmer, C.W. (SM)
Parlee, G.N. (SM)
Payne, R.C. (A)
Pfohl, J.T. (A)
Powell, L.H. (VA)
Pratt, E.E. (M)
Pritchard, J.A. (A)
Pursley, R.E. (M)
Rappa, J. (A)
Reid, J.R. (A)
Reisenweaver, W.B. (M)
Remley, L.A., Jr. (M)
Reynolds, C.W. (SM)
Rice, J.C. (A)
Richards, H.E. (M)
Richardson, B.W. (M)
Ridgill, R. (M)
Robards, G.A. (M)
Robinson, J.L. (M)
Rudroff, M.G. (A)
Satterwhite, G.D. (M)
Shacklett, J.H. (A)
Sharpe, E.F. (M)
Shortt, H.L. (M)
Sidelinger, S.G. (A)
Slaydon, J.F., Jr. (M)
Smith, A.D., Sr. (M)
Smith, C.M., Jr. (SM)
Smith, F.C. (M)
Spikula, R.W. (M)
Stand, T.R. (A)
Starr, H.E. (M)
Stavrou, N.C. (A)
Stephenson, H.L. (A)
Stepka, A.J. (A)
Stepner, A.B. (A)
Stewart, D.L. (M)
Stockberger, J.M. (A)
Stouse, L.E., Jr. (M)
Swannack, C.H. (SM)

NORTH CAROLINA

Tanner, T. B. (M)
Therlot, E. J. (M)
Torres, F. B., Jr. (M)
Turrini, J. J. (M)
Tyack, L. C. (SM)
Vance, R. L. (SM)
Van Doeren, C. A. (M)
Voorhees, H. A. (M)
Wall, R. D. (A)
Ward, C. D., Sr. (A)
Watkins, D. C. (M)
Wells, H. W. (M)
Wescott, J. C. (A)
Wikstrom, D. E. (A)
Williams, R. B. (M)
Wilson, R. B. (M)
Zammit, J. F. (M)

NORTH DAKOTA

Bismarck (TC-5)
Nelson, I. (M)
Vavra, H. G. (M)

Dickinson (TC-5)
Linster, J. J., Jr. (A)

Edgeley (TC-5)
Meyer, L. L. (M)

Fargo (TC-5)
Anderson, E. M. (M)
Anderson, E. G. (SM)
Anderson, G. G. (M)
Foerster, A. C. (A)

Hetland, J. M. (VA)
Hoaby, E. A. (M)
Miller, V. D. (M)
Peterson, D. E. (M)

Grand Forks (TC-5)
Brown, G. M. (M)
Koontz, C. H. (A)
Price, J. E. (A)
Scheibe, P. O. (M)
Sciulli, J. E. (M)
Thomforde, C. (M)

Minot (TC-5)
Haeusler, H. (A)
Main, J. F. (A)

Pembina (TC-5)
Canann, R. F. (A)

Valley City (TC-5)
Amoo, L. R. (M)

OHIO

Ada (TOL-4)
Geyer, M. A. (M)
Klingenberger, J. L. (M)

Akron (AKR-4)
Arkwright, L. P. (A)
Baker, E. E., Jr. (M)
Barnett, C. B. (M)
Batcheldor, W. E. (A)
Batcher, K. E. (M)
Bentley, D. E. (A)
Berkey, R. H. (A)
Blumenthal, L. J. (M)
Bock, A. W. (A)
Bock, E. D. (A)
Bose, E. B. (M)
Bosomworth, G. P. (F)
Bowman, B. M. (M)
Bowyer, J. M. (M)
Brown, S. E. (A)
Buxton, A. C. (SM)
Caulkins, F. A. (M)
Chimera, V. J. (SM)
Chisman, J. A. (M)
Ciocca, F. J. (M)
Collett, L. N. (M)
Cook, E. E. (M)
Couture, C., Jr. (M)
Crano, C. A. (A)
Di Caudo, V. J. (M)
Eddey, E. E. (A)
Eishen, D. E. (A)
Emery, W. S. (A)
Foley, J. S. (M)
Forbes, D. F. (M)
Foreman, C. W. (SM)
Froman, H. L. (A)
Gibson, C. O. (A)
Grant, D. (M)
Gray, C. L. (M)
Hazlip, G. M. (M)
Hegbar, H. R. (F)
Heilmann, C. S. (SM)
Higgins, R. B. (M)
Hlatky, M. G. (M)
Hoffman, R. L. (M)
Holler, J. R. (SM)
Homa, G. D. (M)
Horowitz, M. (SM)
Huber, J. C., Jr. (M)
Iffland, H. L. (A)
Jonard, H. A. (M)
Jubin, T. A. (M)
Kanis, E. J. (A)
Kime, J. M. (M)
Knopp, L. L. (M)
Koelker, R. L. (M)
Kostolansky, V. A. (M)
Lambert, C. O. (SM)
Lee, W. C. (A)
Leibowitz, S. (M)
Le Way, W. E. (M)
Link, T. V. (M)
Lofgren, E. W. (M)
McCarty, J. R. (A)
McColn, K. H. (M)
McMahon, W. D. (SM)
Nank, W. A. (SM)
Nerhood, H. E. (A)
Opilinger, J. N. (A)
Paden, H. R. (M)
Pake, F. G. (M)
Papaloan, I. M. (M)
Paulsen, D. J. (M)
Phares, D. P. (M)
Potieny, J. (M)
Pressel, P. I. (M)
Rataski, C. P. (SM)
Redmond, J. F. (M)
Rice, W. D. (M)
Roberts, L. H. (M)
Rybum, P. W. (M)
Sager, J. R. (M)
Selb, W. D. (A)
Shively, H. G. (M)
Shoemaker, J. R. (SM)
Sicherl, C. R. (A)
Silkman, H. G. (SM)
Smith, P. C. (SM)
Steigerwalt, O. I. (M)
Steiner, W. L. (M)
Strang, J. R. (SM)
Sutherland, E. B. (M)
Tanenhaus, A. M. (SM)
Temple, T. W. (A)
Van Buskirk, W. J. (A)
Vaughan, R. L. (A)
Wagner, W. R. (M)
Watkins, W. H. (M)
Weinsheimer, W. E. (A)
Weyrick, R. C. (M)
Winkler, M. A. (SM)
Wittig, W. L. (SM)
Wold, J. E. (M)
Wright, D. M. (A)
Yanase, H. Y. (A)
Yarosh, N. P. (SM)
Zatezalo, G. E. (A)
Zelpler, K. O., Jr. (A)

Alliance (AKR-4)
Foulks, E. D. (M)
Smith, A. E. (A)

Amlin (COL-4)
Rife, W. E. (SM)

Arcanum (DAY-4)
Weber, S. E. (M)

Ashtabula (ERI-4)
Micksch, J. E. (A)

Athens (COL-4)
Bjerre, P. (M)
Carnes, R. C. (M)
Cartland, F. W. (M)

Atwater (AKR-4)
Mellander, W. C. (M)

Avon Lake (CLE-4)
Coffe, S. A. (M)
Dobosy, J. F. (SM)
Ramaley, C. W. (M)

Barberton (AKR-4)
Austin, A. O. (F)
Dorsey, J. T. (M)
Kane, C. G., Jr. (M)
Kelley, J. B. (M)
Klever, W. O. (A)
Miller, D. A. (M)
Whitchurch, N. E. (M)

Barnesville (PIT-4)
Graves, D. C. (A)

Bay Village (CLE-4)
Didinger, G. H., Jr. (M)
Friswold, F. A. (M)
Harmon, J. L. (M)
Smith, T. H. (SM)
Smith, C. W. (A)
Woznlak, A. J. (M)

Beachwood (CLE-4)
Ulmer, R. M. (M)

Bedford (CLE-4)
Jerome, W. R. (VA)
Kessler, J. C. (A)
Washko, F. H. (M)

Bellbrook (DAY-4)
Brown, W. C. (M)
Carpanzier, V. J. (SM)
Cunningham, R. F. (SM)
Ludwig, G. L. (M)

Bellefontaine (TOL-4)
Bridges, B. D. (A)
Conner, B. C. (M)
Wallace, H. L. (A)

Belpre (PIT-4)
Gottlieb, B. (A)

Berea (CLE-4)
Blackman, C. P. (SM)
Crozier, R. W. (A)
Epperson, J. B. (F)
Sanderson, R. B. (A)
Simmons, R. A. (A)

Bexley (COL-4)
Brooke, E. F. (M)
Wilcox, C. R. (M)

Blacklick (COL-4)
Edens, S. V. (M)

Bluffton (TOL-4)
Triplett, M. M. (M)
Triplett, W. R. (M)

Boardman (AKR-4)
Dustman, H. C. (M)

Bowling Green (TOL-4)
Symanon, J. H. (M)

Brecksville (CLE-4)
Butler, A. H. (M)
Csensich, J. E. (A)
Cull, R. R. (M)
Beunk, R. K. (A)
Dietzich, J. W. (A)
Hopwood, A. M., Jr. (VA)
La Moreaux, D. D. (A)
Lippert, G. R. (SM)
Nace, A. S. (SM)
Roeger, R. E. (M)
Smith, C. E. (F)
Stadig, S. V. (M)
Ulrich, J. F. (SM)
Weaver, J. H. (M)

Brewster (AKR-4)
Ward, L. D. (A)

Brooklyn (CLE-4)
Andrews, F. C. (A)
Lukke, T. A. (A)
Wood, R. M. (M)

Brookville (DAY-4)
King, H. B. (SM)

Burton (CLE-4)
Bogas, J. (A)

Campbell (AKR-4)
Klimko, C. A. (A)

Canton (AKR-4)
Arnold, E. N. (SM)
Beckerman, L. M. (M)
Burtner, R. L. (SM)
Duff, J. E. (M)
Fehn, F. P., Sr. (M)
Greene, F. L. (M)
Jameson, W. B. (A)
Koenig, J. (M)
Leist, L. G. (M)
Naylor, J. T. (A)
Sole, A. R. (A)
Walker, N. S. (VA)

Castalia (CLE-4)
Fabik, R. H. (A)

Centerville (DAY-4)
Gulden, E. V. (SM)
Meyer, G. B. (M)
Palmer, A. F. (M)
Rench, C. F. (M)
Rineer, I. (A)
Wehrman, R. B. (A)

Chagrin Falls (CLE-4)
Berlincourt, D. A. (M)
Bird, J. R. (SM)
Dombos, L. J. (M)
Fisher, H. F. (VA)
Gehman, J. B. (M)
Hartel, R. R. (M)
Kilroy, J. W. (M)
McConnell, H. M. (M)
Saint-Amour, J. D. (A)
Shields, E. T. (A)
Strealar, J. W. (M)

Chesterland (CLE-4)
Sallach, M. E. (SM)

Chevlot (CIN-4)
Spinner, L. N. (M)

Chillicothe (CIN-4)
Hanson, M. L. (SM)

Cincinnati (CIN-4)
Adams, M. M. (M)
Ahrends, S. W. (M)
Apgar, R. R., Jr. (M)
Ashman, A. B. (M)
Atwill, W. D. (M)
Ayers, N. E. (M)
Bain, S. J. (M)
Baird, C. W. (A)
Bass, H. (SM)
Bass, L. (SM)
Bates, F. E. (M)
Bauer, H. A. (M)
Baylor, A. D. (SM)
Beam, L. W. (A)
Berberich, R. J. (A)
Bereskin, A. B. (F)
Berg, D. F. (M)
Bernhard, C. J. (A)
Besco, F. E., Jr. (M)
Blair, D. (M)
Blum, S. (M)
Bopp, C. (SM)
Borgstrom, J. H. (M)
Bowling, J. C. (M)
Braun, E. C. (M)
Breunig, W. H. (M)
Briles, W. F. (M)
Brouse, H. L. (SM)
Brown, H. K. (M)
Brown, L. W. (SM)
Brown, N. E. (M)
Buden, D. (M)
Burnett, L. A. (M)
Burner, G. J. (M)
Bussard, E. J. H. (SM)
Calahan, D. A. (M)
Caldwell, J. F. (M)
Campbell, D. J. (A)
Campbell, R. D. (M)
Campisano, F. J. (M)
Carey, C. P. (SM)
Carlton, E. O. (A)
Carpenter, C. P. (SM)
Carson, R. E. (A)
Carver, J. G. (M)
Cavanaugh, H. D. (A)
Charlton, A. E. (A)
Cobb, R. B. (A)
Coble, R. B. (SM)
Collins, J. T. (A)
Congdon, K. P. (M)
Conklin, H. A., Jr. (M)
Cook, H. L., Jr. (M)
Crosby, R. H., Jr. (M)
Cunningham, G. W., Jr. (M)
Cunningham, T. W. (M)
Dale, W. L. (A)
Decker, R. H. (M)
Diehl, J. A. (A)
Ditz, A. E., Jr. (M)
Doctor, B. (M)
Doerr, W. H. (M)
Dolbeer, W. J. (A)
Dooley, E. B., Jr. (M)
Dumell, R. S. (A)
Dutton, C. E. (VA)
Ebbeler, J. R. (M)
Ecker, J. L. (M)
Ehlers, M. W. (A)
Eichenberger, N. F. (M)
Einbinder, L. W. (A)
Elms, J. C. (SM)
Emmerling, E. J. (M)
Engel, L. (M)
Engelmann, R. H. (SM)
Engels, R. O. (A)
Englert, R. W. (A)
Fenstermacher, A. L. (M)
Ficek, J. A. (M)
Finnigan, C. W. (SM)
Fisher, B. W. (M)
Fisher, L. R. (M)
Fleming, W. G. (M)
Forman, H. R. (A)
French, B. V. K. (SM)
Fromm, K. N. (M)
Frommer, J. C. (SM)
Gamble, E. H. (SM)
Garvin, C. W. (A)
Gehring, M. C. (SM)
Geick, G. H. (SM)
George, P. H. (A)
Georger, L. J. (M)
Gleitnoer, C. K. (SM)
Glover, D. (M)
Goode, J. P. (A)
Graves, J. A. (M)
Gray, C. E. (M)
Greschel, R. A. (A)
Griffin, W. H. (A)
Grosse, R. H. (M)
Grossoehme, F. (M)
Grove, H. M. (M)
Gruber, J. R. (SM)
Gulden, W. W. (M)
Haas, R. W. (M)
Haehnle, C. G. (SM)
Hamilton, F. A. (M)
Harris, H. H. (M)
Harter, W. R. (M)
Harvey, J. T. (M)
Headley, H. N. (M)
Heckman, H. T. (SM)
Heinzelman, G. J. (M)
Heising, C. R. (M)
Hellen, R. J. (M)
Helmheckel, T. A. (M)
Hentz, E. G. (A)
Herrin, C. B. (M)
High, R. A. (M)
Himes, H. D. (M)
Hirashima, H. K. (M)
Hogan, C. M. (SM)
Hosea, R. A. (M)
Hulstrand, B. E. (M)
Humphrey, W. R. (M)
Inderbeets, J. A. (M)
Jacobs, A. (M)
Johnson, W. C. (M)
Jones, E. M. (M)
Joyce, K. J. (M)
Kaesemeyer, W. W. (M)
Kammer, D. E. (M)
Keene, L. C. (SM)
Kelling, D. G. (M)
Kelly, J. W. (M)
Kennedy, D. D. (M)
Kerber, M. C. (M)
Kerhulas, A. T. (M)
Kibby, J. R. (A)
Kidwell, E. W., Jr. (A)
King, F. W., Jr. (SM)
Kiss, J. S. (M)
Kline, A. J. (M)
Knoblaugh, A. F. (F)
Kober, C. L. (SM)
Krody, J. L. (M)
Kuecken, J. A. (M)
Lambert, R. (SM)
Lambert, V. L. (M)
Lawall, R. W. (M)
Lehman, R. H. (M)
Lehnhoff, R. G. (M)
Lenk, H. H. (M)
Leppie, H. (M)
Linblad, T. N. (M)
Lorah, P. W. (M)
Loutzenhiser, C. F. (M)
Luhn, P. J. (M)
Lundgren, C. W., Jr. (M)
Lytel, A. (M)
Magrish, C. J. (M)
Maher, E. J. (M)
Maier, L. C., Jr. (M)
Marhauer, H. H. (M)
Marlowe, E. W. (M)
Marren, B. T. (M)
Martin, D. W. (F)
Mast, C. E. (M)
Maxim, R. A., Jr. (M)
McDermott, E. P. (M)
McDonald, J. M. (SM)
McGregor, M. A. (A)
McNair, R. J. (M)
Meehan, J. P. (SM)
Mentink, A. F. (M)
Meyer, A. (SM)
Meyer, B. W. (M)
Mezger, F. W. (M)
Mika, J. I. (M)
Miller, R. W. (M)
Miller, R. W. (M)
Mitchell, W. W., Jr. (A)
Moellering, E. E. (M)
Mohaupt, K. R. (M)
Montgomery, W. D. (SM)
Montross, R. A. (A)
Moulton, E. W. (SM)
Moxley, S. D., Jr. (M)
Murray, J. W. (M)
Nauman, J. G. (M)
Neal, N. D. (M)
Needles, W. F., Jr. (A)
Nistico, F. (M)
Nord, G. L. (M)
Novy, E. W. (M)
Nyberg, L. V. (A)
O'Connell, R. E. (A)
Oezer, J. J. (M)
Ohmart, P. E. (M)
Osterbrock, C. H. (M)
Overman, C. I. (A)
Parker, R. L. (A)
Perry, G. W. (A)
Pfeiffer, J. H., Jr. (A)
Pickett, T. A. (M)
Pienkowski, O. E. (M)
Pilkington, R. R. (M)
Plogstedt, A. E. (M)
Polanieckl, S. (M)
Quitter, J. P. (SM)
Ragen, J. R. (M)
Rakel, R. H. (M)
Ransom, G. B. (M)
Rea, R. C. (M)
Reardon, R. A. (A)
Rehrr, R. R. (A)
Richelieu, C. C. (M)
Richter, J. J. (M)
Rockowitz, M. (M)
Rockwell, R. J. (F)
Roskos, R. G. (A)
Rowe, S. (M)
Ruppel, D. (M)
Ruther, J. T. (M)
Sanders, H. E. (A)
Schafer, G. E. (M)
Schenck, R. L. (M)
Schlemmer, R. P. (M)
Schmidt, R. F. (M)
Schmittou, C. J. (M)
Schroeder, W. R. (VA)
Schroer, P. E. (A)
Schumacher, T. J. (A)
Scott, V. J., Jr. (M)
Seichter, K. R. (A)
Seward, G. J. (M)
Seyfried, J. E. (A)
Shadley, F. C. (M)
Shaw, C. B., Jr. (M)
Shekro, C. M. (M)
Sheridan, C. J. (M)
Shirk, W. B. (SM)
Silverman, S. (M)
Slaven, R. R. (M)
Smith, D. L. (M)
Staab, P. C. (A)
Stacy, R. A. (SM)
Stallings, R. E. (M)
Stegman, J. A. (M)
Stegman, T. E. (A)
Stephens, T. C. (SM)
Stewart, A. W. (M)
Strief, D. A. (M)
Stubbins, W. F. (SM)
Stuhlbarg, S. M. (M)
Sutphen, K. A. (M)
Taylor, G. O. (SM)
Thomas, D. E. (A)
Timperman, E. J. (M)
Toole, W. W. (M)
Topmiller, C. H. (VA)
Trutt, J. R. (M)
Tugman, L. M. (M)
Turrell, R. M. (M)
Tyberg, A. H. (M)

Van Den Berg, W. J. (A)
Vandoch, S. C. (A)
Van Valkenburg, H. M. (A)
Verkley, B. M. (M)
Weaver, C. W. (M)
Weber, C. E. (M)
Wedig, F. L., Jr. (SM)
Weller, C. E. (A)
Westerlund, K. I. K. (M)
Wetz, R. H. (SM)
Wexler, J. M. (M)
White, N. (A)
Williamson, G. F. (M)
Wills, T. C. (A)
Wilson, H. J. (A)
Wilson, J. W. (M)
Winder, C. F. (SM)
Wissel, F. A. (SM)
Woestman, J. W. (M)
Woodcock, C. A. (M)
Wrye, W. F., Jr. (M)
Wyzenbeek, A. (A)
Yancey, W. D. (M)
Yaney, P. P. (M)
Yarbrough, H. B. (M)
Yee, D. K. (M)
Young, J. D., Jr. (M)
Zimov, L. R. (SM)
Zoerner, J. R. (M)

Clayton (DAY-4)
Archer, R. F. (A)

Cleveland (CLE-4)
Ackerman, E. K. (SM)
Allen, D. P. (M)
Anderson, C. R. (M)
Anderson, F. D. (A)
Arndt, J. P. (SM)
Ashbrook, S. B., Jr. (A)
Begun, S. J. (F)
Bletcher, A. L. (M)
Blue, T. F., Jr. (M)
Bolz, R. W. (SM)
Briggs, R. F. (M)
Brincka, J. J. (M)
Buchspice, J. E. (A)
Burgener, D. R. (M)
Burhans, R. W. (A)
Busher, R. E. (M)
Cambell, J. H. (M)
Caskey, H. B. (M)
Cerveny, W. J. (SM)
Chakerian, R. (M)
Chapa, J. (A)
Chase, W. H. (SM)
Chemely, C. (A)
Christiansen, M. E. (A)
Chulick, C. M. (M)
Cleary, R. E. (A)
Collin, R. E. (M)
Crows, H. (M)
Cunningham, J. A. (A)
Curran, D. R. (SM)
Danbach, R. A. (SM)
Danbach, T. F. (M)
Dannemiller, J. R. (M)
Davison, B. (M)
De Lany, R. H. (SM)
De Parry, T. (M)
Dittenberger, R. J. (A)
Dittoe, R. E., Jr. (M)
Dombrady, S. E. (M)
Doyle, J. M. (A)
Elmendorf, D. E. (M)
Farr, H. J., Jr. (M)
Farrar, M. B. (M)
Fedorko, B. L. (M)
Frederico, B. D. (M)
Friedberg, M. R. (SM)
Gehake, E. P. (M)
Geiger, D. L. (M)
George, E. W. (A)
Gerhan, C. F. (M)
Gilbert, L. J. (M)
Glover, W. E. (A)
Goela, J. K. (A)
Goodman, A. M. (M)
Grace, H. (SM)
Granger, L. V. (M)
Gross, I. (M)
Grossman, H. (A)
Hamann, K. R. (M)
Hansen, R. E. (A)
Harrison, M. A. (M)
Heller, H. H. (SM)
Hickok, R. D. (SM)
Howard, R. M. (A)
Hulsr, R. A. (A)
Humphrey, A. J. (M)
Isear, J. A. (M)
Jackson, W., Jr. (M)
Jaffe, H. (SM)
Jeffery, E. L. (A)
Jira, J. W. (M)
Kazarian, R. (M)
Keck, L. J. (M)
Kinkald, J. C. (A)
Klever, W. H. (SM)
Klivans, N. R. (M)
Klock, H. F. (M)
Kotnik, J. T. (M)
Krasnican, M. J. (M)
Krausz, A. (SM)
Kres, A. J. (M)
Laden, H. N. (M)
Lake, W. H. (M)
Lalli, V. R. (M)
Lannan, P. E. (SM)
Lee, J. M. (M)
Leemon, W. (A)
Lesyk, L. (M)
Lewis, A. M. (M)
Little, H. (A)
Little, R. V., Jr. (M)
Lomaz, D. D. (M)
Louis, W. B. (M)
Ludwig, S. (M)
Luehring, E. L. (A)
Lungo, A. (M)
Lynch, T. F. (M)
Maclag, E. T. (M)
Malsel, J. E. (M)
Majercak, J. V. (M)
Martin, E. E. (M)
McCollister, D. R. (M)
McCormick, J. R. (M)
McNeel, E. L. (A)
Mentzer, P. K. (M)
Mergler, H. W. (M)
Middleton, A. E. (M)
Milford, F. J. (M)
Misek, A. E. (M)
Moravek, E. J. (A)
Morrow, L. A. (M)
Munshower, R. M. (A)
Murray, J. H. (A)
Myers, J. F. (M)
Nash, H. C. (M)
Naylor, A. F. (M)
Newborg, D. S. (M)
Nunan, J. K. (M)
Oestermeyer, C. F. (A)
O'Hearn, W. F., Jr. (A)
Pearson, D. M. (M)
Petrus, R. (A)
Phwonka, W. C. (M)
Plalsted, R. J. (M)
Pladis, A. P. (VA)
Plonsey, R. (M)
Potter, N. M. (VA)
Pragiln, J. (M)
Prechtel, C. J. (M)
Rea, J. K. (A)
Reash, C. W. (SM)
Reed, T. J. (M)
Relches, S. L. (SM)
Rienerth, G. R. (M)
Rittenhouse, J. W. (SM)
Rivers, N. (A)
Rodgers, R. C. (M)
Saby, J. S. (SM)
Saint-Amour, P. M. (A)
Saltzer, C. (M)
Sanderson, J. K. (M)
Schneider, P. (A)
Schuler, R. G. (SM)
Seaton, G. (A)
Seely, S. (F)
Sharp, F. R. (M)
Shearer, R. L. (M)
Sheetz, J. I. (M)
Shepherd, B. R. (M)
Sherman, K. S. (SM)
Snedeker, M. L. (SM)
Sollock, L. (A)
Spears, W. F. (SM)
Stafford, K. E., Jr. (M)
Taber, M. R. (M)
Thayer, G. N. (F)
Thayer, J. W. (M)
Thomas, G. E. (M)
Till, W. C. (M)
Todd, A. W. (A)
Tomanocy, J. A. (M)
Uguccini, O. W. (M)
Varady, D. J. (M)
Vuolle, C. E. (M)
West, S. S. (M)
Whalen, P. P. (A)
Whittaker, B. H. (M)
Wickenden, H. R. (A)
Wiemels, E. L. (M)
Wise, D. S. (SM)
Zelle, J. F. (SM)

Cleveland Heights (CLE-4)
David, B. W. (SM)
Germano, C. P. (SM)
Gibson, J. L. (M)
Hooper, J. R., Jr. (M)
Hudson, A. E. (M)
Livsey, R. A. (M)
Manring, J. M. (M)
Maloney, T. C. (M)
Martin, J. R. (M)
Newman, H. B. (M)
Palmer, P. D. (A)
Pierce, D. E. (A)
Scott, E. P. (M)
Tame, J. S. (M)

Clinton (COL-4)
Shaklee, F. S. (M)

Columbus (COL-4)
Adachi, S. (M)
Anthony, G. E. (M)
Antonevich, J. N. (M)
Austen, B. G. (M)
Autry, A. T. (A)
Bacon, J. (M)
Baeumler, H. W. (M)
Balley, R. J. (A)
Bain, T. D., Jr. (A)
Battocletti, F. E. (M)
Bauer, W. (M)
Beer, A. C. (M)
Bensema, W. D. (M)
Bishop, A. B., III (M)
Blake, R. E. (M)
Blessing, H. L. (M)
Boehnker, C. H. (A)
Bohannan, R. C. (M)
Boone, E. M. (F)
Bomhorst, K. F. (M)
Boyers, J. S. (SM)
Bulman, W. E. (SM)
Burrus, W. R. (M)
Butterworth, G. S. (M)
Campbell, R. M. (M)
Casto, A. E. (M)
Chapman, C. M. (M)
Chope, H. R. (SM)
Choos, W. E. (SM)
Clore, W. R. (SM)
Clymer, A. B. (M)
Cohen, D. (M)
Copeland, J. R. (M)
Cornetet, W. H., Jr. (M)
Cosgriff, R. L. (SM)
Crawford, R. W. (M)
Crone, W. R. (M)
Crooks, R. K. (SM)
Crow, W. F. (M)
Damon, E. K. (M)
Davis, B. D. (M)
Dawirs, H. N. (SM)
Deeter, C. R. (M)
Distelzweig, F. J. (M)
Dobson, D. A. (M)
Dukes, J. R. (A)
Easterday, J. L. (M)
Eastwood, W. J. (A)
Ebert, D. H. (M)
Elter, W. F. (A)
Ellis, R. E. (A)
England, S. J. M. (A)
Everett, W. G. (M)
Falkenbach, G. J. (SM)
Fell, C. F. (SM)
Filkins, L. D. (M)
Fragglotti, J. (M)
Francisco, G. E., Jr. (M)
Freundlich, J. J. (M)
Gayer, W. B. (M)
Gahm, W. L. (M)
Garbacz, R. R. (M)
Gagbacz, R. J. (M)
Gay, J. W. (M)
Guernsey, E. D. (M)
Gulcher, R. H. (M)
Haas, C. J. (M)
Habermann, C. L. (M)
Hald, H. R. (M)
Hane, T. C. (SM)
Handel, N. E. (M)
Hanks, C. L. (M)
Harcarufka, J. F. (M)
Harmer, J. D. (A)
Hayden, J. R. (M)
Hicks, E. P. (M)
Higgy, R. C. (SM)
Holley, H. G., Jr. (M)
Hood, W. L. (M)
Hover, P. B. (A)
Humphreys, R. F. (A)
Hunter, H. H. (A)
Iwanovsky, A. (M)
Jackson, A. J. (M)
Jackson, S. P. (A)
Jaeger, J. H. (SM)
James, R. B. (M)
Jastram, P. S. (M)
Jenkins, C. E. (M)
Jenkinson, G. H. (M)
Johnson, E. W., Jr. (M)
Jones, E. A. (SM)
Joost, A. E. (M)
Kalser, R. L. (M)
Kennaugh, E. M. (A)
Kirk, K. D. (M)
Kirschbaum, H. S. (A)
Klsha, A. (M)
Ko H. C. (M)
Kouyoumjian, R. G. (A)
Kraus, J. D. (F)
Kreager, C. R. (A)
Krzywonos, S. M. (M)
Kuba, R. E. (M)
Lackey, R. B. (A)
Larsen, W. L. (M)
Lawrence, G. M. (M)
Leonard, J. D. (SM)
Leonhard, C. P. (A)
Levadi, V. S. (M)
Levis, C. A. (SM)
Lewis, D. E. (M)
Lind, W. P. M. (M)
Lindgren, W. A. (A)
Linsk, L. (A)
Litterer, J. E. (A)
Lynn, F. M. (A)
Martin, P. T. (M)
Martino, J. P. (M)
Matyas, J. A. (A)
McFarland, R. H. (M)
McFarland, R. S. (M)
McNichols, H. B. (A)
Mendenhall, W. S., Jr. (A)
Merrill, R. L. (M)
Mochel, R. S. (A)
Moll, M. (A)
Moore, D. P. (M)
Muldowney, J. F. (A)
Myers, O. C. (M)
Nafzger, L. H. (M)
Nash, R. T. (A)
Norlega, J. R. (M)
Oppenheimer, S. L. (M)
Orr, W. (A)
Orris, E. G. (M)
Pang, T. C. (A)
Pattee, H. E. (A)
Peake, W. H. (M)
Perry, R. C. (M)
Peters, L., Jr. (A)
Pierzchala, L. C. (M)
Pifer, P. M. (M)
Porter, E. M. (A)
Querido, H. B. (M)
Ramey, D. E. (M)
Reed, T. W. (M)
Rice, D. R. (M)
Richmond, J. H. (SM)
Roehm, J. D. (M)
Rosol, G. L. (M)
Ryan, J. F. (M)
Ryan, P. A. (M)
Scheffler, H. S. (M)
Schulman, B. L. (M)
Serracchioli, F. (M)
Sessoico, F. M. (SM)
Shank, K. E. (M)
Sherwood, E. M. (M)
Sloan, C. B. (M)
Someroski, F. W. (M)
Spero, A. F. (M)
Stafford, J. H. (M)
Stapf, M. R., Jr. (A)
Stein, T. G. (M)
Stevens, R. H. (M)
Stoutenburg, D. V. (M)
Stuart, W. D. (M)
Studmann, G. H., Jr. (M)
Sullivan, R. P. (M)
Swanstrom, N. C. (A)
Tamolin, G. R. (M)
Taylor, J. K., Jr. (M)
Thomas, A. C. (M)
Thurston, M. D. (SM)
Tice, T. E. (SM)
Tischer, F. J. (SM)
Travis, E. W. (M)
Trost, V. E. (A)
Troyan, J. F. (A)
Truxall, F. W. (M)
Tucker, R. E. (M)
Tulloss, W. S. (M)
Walter, C. H. (SM)
Warren, C. E. (SM)
Webster, R. E. (M)
Weed, H. R. (SM)
Welmer, F. C. (SM)
Wendt, R. B. (M)
Whitney, W. (SM)
Wolf, F. A. (M)
Wright, E. T., Jr. (M)
Yaw, D. F. (SM)
Young, D. A. (VA)
Young, G. W. (A)

Conneaut (ERI-1)
Dvorsky, A. L. (M)
Feldner, G. E. (A)
Keskinen, A. R. (SM)
Morrell, G. A., Jr. (M)
Piller, S. (SM)
Ryan, W. J. (A)

Cuyahoga Falls (AKR-4)
Bachtell, R. S. (M)
Burke, J. T. (SM)
Buynak, G. R. (M)
Cacloppo, A. J. (M)
Chuma, N. (A)
Cobbs, E. R. (A)
Crosley, E. W., Jr. (M)
Davis, H. P. (M)
Diamantides, N. D. (M)
Dills, R. S. (M)
Evans, D. C. (M)
Flowers, H. L. (SM)
Fordham, C. E. (M)
Greene, H. R. (SM)
Guthrie, F. W. (M)
Hakes, T. H. (M)
Hellman, B. H. (A)
Hermann, P. J. (SM)
Heydorn, R. P. (M)
Horwitz, G. (A)
Ingalls, R. S. (M)
Jones, W. V., Jr. (SM)
Kelley, C. M. (SM)
Klerstead, F. H., Jr. (M)
Kult, M. L. (SM)
Lanier, H. F. (SM)
Machan, R. D. (M)
Mason, D. F. (M)
Maxwell, D. W. (A)
McCauley, C., Jr. (M)
Meneley, C. A. (SM)
Miller, R. F. (M)
Millier, W. W. (A)
Morrill, C. D. (SM)
Olsoen, E. E. (A)
Robinson, G. E. (M)
Shackelford, W. T., III (M)
Sibila, K. F. (SM)
Toman, W. J. V. (M)
Tracy, T. J. R. (M)
Trutko, J. M. (A)
Tuma, W. S. (M)
Welch, G. H. (M)
Yochelson, S. (M)

Dayton (DAY-4)
Adams, E. L. (SM)
Agins, B. R. (M)
Ahalt, C. A. (M)
Aleo, J. (M)
Allen, F. W. (A)
Allen, K. D. (A)
Althouse, J. M. (SM)
Amrhein, O. C. (M)
Anderson, J. R. (A)
Andrew, G. W. (SM)
Anglin, D. (M)
Apel, C. K. (M)
Arenstein, G. H. (SM)
Arment, Z. R. (A)
Ashby, G. L. (M)
Augustin, O. E. (SM)
Bahret, W. F. (M)
Ballard, J. W. (SM)
Bange, D. A. (M)
Barker, J. L. (M)
Barker, W. J. (M)
Barkley, M. M. (SM)
Bartman, H. M. (M)
Becker, R. H. (A)
Belitz, H. G. (A)
Bender, D. L. (A)
Blaier, M. (SM)
Blales, K. (A)
Biddle, W. G. (M)
Bissonette, A. G. (A)
Bloss, R. P. (M)
Boarlo, W. R. (SM)
Bockenstedt, P. J. (M)
Boedeker, H. F. (M)
Boettcher, B. K. (M)
Boone, G. R. (M)
Boone, J. V. (M)
Bordewisch, J. F. (M)
Borgelt, E. H. (M)
Botzong, W. B. (A)
Boyle, H. G. (A)
Braden, P. F. (A)
Brzanner, G. R. (M)
Braun, W. G. (M)
Breesman, R. N. (M)
Brobst, P. L. (M)
Brown, D. E. (M)
Brown, F. M. (M)
Brown, G. T., Jr. (SM)
Brumfield, W. T. (M)
Bruns, C. R. (M)
Bryan, C. R., Jr. (A)
Bryer, R. L., Jr. (A)
Bryson, V. E. (M)
Budde, E. V. (A)
Buhl, W. T. (VA)
Burneka, C. R. (A)
Butsch, L. M., Jr. (A)
Buxton, R. W. (A)
Byrd, E. W. (M)
Calhoun, R. P. (A)
Carbone, A. J. (M)
Carney, J. J. (A)
Carr, M. G. (M)
Caskey, O. G. (A)
Castanias, J. E. (SM)
Catanzarite, F. J. (A)
Cavender, J. T. (SM)
Chandler, J. A. (SM)
Charbonneaux, W. A. (SM)
Charnock, L. J. (SM)
Cherpeski, R. P. (M)
Choong, D. (A)
Christianson, L. L. (M)
Christie, J. B. (M)
Clark, A. D. (M)
Clark, A. H. (M)
Clark, P. H. (SM)
Clark, R. R. (M)
Clute, D. G. (M)
Coglianese, C. J. (A)
Combs, J. A. (M)
Conrad, C. G. (SM)
Coombs, C. C., Jr. (A)
Cooper, E. H. (SM)
Coop, R. S. (M)
Correll, E. G. (M)
Couch, L. J. (M)
Couch, P. W. (A)
Courtney, R. L. (M)
Coy, R. J. (A)
Croy, J. E. (M)
Cummins, S. E. (M)
Curp, W. C. (A)
Curtis, J. D. (M)
Curtis, L. L. (A)
Cushing, W. J. (A)
Daubendick, A. W. (M)
Davis, C. H. (A)
Day, J. G. (M)
Dayton, M. S. (M)
Decker, E. E. (M)
Deeken, J. W. (M)
De Fries, W. G. (A)
Dels, W. E. (SM)
De Luna, J. (M)
Demarest, D. (M)
Dennis, J. L. (F)
Deyerle, C. D. (A)
Dicke, A. H. (M)
Dietz, J. R. (M)
Director, H. (A)
Drouilhet, P. R., Jr. (M)
Drozd, C. J. (A)
Duckwitz, W. D. (SM)
Eckert, C. C. (SM)
Elcan, W. C. (M)
Eppers, W. C., Jr. (SM)
Falk, D. B. (A)
Falkowski, A. J. (SM)
Falvey, J. L. (M)
Fassett, J. O. (M)
Fawcett, C. D. (M)
Fedotin, L. S. (A)
Feist, W. E. (SM)
Ferguson, J. L. (M)
Finocharo, J. J. (M)
Fischer, R. W. (M)
Fisher, P. A. (A)
Foraker, C. M. (M)
Forster, A. G. (M)
Fouse, G. T. (SM)
Franme, R. J. (SM)

Franklin, C. S. (SM)
Frederick, D. E. (M)
Friedman, H. (M)
Fritz, A. D. (A)
Fulcher, J. A. (A)
Fulton, W. L., Jr. (M)
Gauvey, M. P. (M)
Gels, J. H. (M)
Georgi, J. P. (SM)
Georgia, A. (M)
Gerdes, C. V. (A)
Gemer, R. J. (M)
Gibbs, L. L. (M)
Gibson, J. D. S. (M)
Giffin, E. L., Jr. (A)
Gilbert, D. F. (SM)
Glan, G. (SM)
Gildewell, J. J. (M)
Golf, R. L. (SM)
Goldman, A. (SM)
Goldman, C. C. (M)
Gould, W. B. (M)
Graebner, M. S. J. (M)
Grant, J. M. (SM)
Granzow, D. B. (A)
Green, J. E. (M)
Griffing, B. L. (SM)
Grillmeier, E. J. (A)
Grimes, W. H. (M)
Gruber, C. W. (M)
Guest, T. W. (A)
Guzak, P. D. (A)
Hallman, L. B., Jr. (F)
Hanley, N. B. (M)
Hanneman, D. A. (M)
Harmon, W. L. (M)
Harnett, R. J. (A)
Harris, F. (SM)
Harter, R. H. (A)
Hausen, D. K. (M)
Hauser, P. D. (SM)
Hayes, T. J. (M)
Hazen, R. R. (A)
Heldenreich, J. (SM)
Helldoerfer, C. S. (M)
Henderson, A. B. (SM)
Herbert, M. B. (M)
Herzog, W. F. (A)
Heyd, J. W. (SM)
High, R. (M)
Hill, J. C. (SM)
Hill, M. A. (M)
Hilsabeck, D. M. (M)
Hilt, W. M. (SM)
Hobstetter, J. P. (A)
Hoefle, R. R. (SM)
Holley, J. S. (A)
Holloway, F. L. (SM)
Holmes, C. W. (A)
Hooke, J. M., Jr. (A)
Horrigan, J. S. (A)
Horton, W. L. (SM)
Hovey, W. J. (M)
Howe, J. C. (M)
Huckaby, J. H. (SM)
Hucke, H. M. (SM)
Hull, R. S. (SM)
Husmann, F. W. (M)
Hutchinson, K. R. (M)
Huster, L. W. (M)
Hutchinson, J. H. (M)
Ittelson, R. W. (SM)
Jacobs, M. (SM)
Jacobs, Y. (SM)
Jakus, L. A. (SM)
James, R. L. (SM)
Javorsky, J. J. (A)
Jent, J. H. (M)
Johnson, D. A. (M)
Johnston, E. B. (M)
Johnston, E. F., Jr. (M)
Johnson, R. A. (M)
Jones, C. L. (A)
Jones, O. D. (M)
Kaeding, D. A. (M)
Karabaich, F. (M)
Kearns, J. H., III (M)
Kellogg, R. E. (M)
Kerbs, W. A. (A)
Kern, J. L. (M)
Kessler, C. W. (M)
Kester, R. E. (SM)
Kester, W. C. (M)
Keto, J. E. (F)
Kidd, G. B. (M)
Klenker, J. E. (M)
Kltheffer, L. D. (SM)
Kimball, G. W. (M)
Kinnally, J. W. (M)
Klein, W. (M)
Klein, W. (A)
Kreitzburg, H. L., Jr. (M)
Krenzer, B. A. (M)
Kress, O. C. (A)
Kuppin, F. (M)
Ladd, E. L. (A)
Lamb, C. E. (M)
Landreman, G. R. (A)
Knight, A. R. (SM)
Kohls, G. F. (M)
Langston, G. A. (M)
Laureyns, G. A. (M)
Lawson, S. A. (SM)
Leland, H. E. (A)
Lemmen, R. M. (M)
Leonard, H. Q., Jr. (M)
Levine, H. M. (M)
Littell, C. C., Jr. (M)
Litwin, S. (M)
Lloyd, L. H. (SM)
Lockwood, G. C. (M)
Logus, P. J. (M)

Long, G. A., Jr. (M)
Long, R. E. (M)
Lord, A. S. (M)
Lumpkin, R. C. (M)
Madden, J. R. (M)
Magill, J. J. (M)
Mahlmeister, T. G. (M)
Maloporski, E. C. (M)
Marcus, G. H. (M)
Mawdsley, R. L. (SM)
McAdory, R. W. (M)
McClellan, K. C. (A)
McCormick, R. E. (SM)
McIlrath, R. J. (A)
McIntosh, V. C. (M)
McLaughlin, C. E. (M)
McLennan, M. A. (SM)
McMillan, W. R. (M)
McRae, A. H. (SM)
Mehron, M. E. (A)
Mendelson, D. A. (A)
Metzger, J. A. (A)
Meuche, C. H. (M)
Meulemans, J. I. (M)
Midgley, V. E. (A)
Miller, E. H. (A)
Miller, J. E. (M)
Mintz, B. (M)
Mirsky, M. M. (M)
Mitter, T. S. (M)
Moon, J. F. (A)
Moore, J. M. (M)
Moraff, H. (M)
Morris, J. T. (M)
Morrison, D. W. (SM)
Morse, B. K. (A)
Mountz, T. P., Jr. (M)
Moyer, D. F. (SM)
Mumma, R. E. (SM)
Myers, R. P. (M)
Netherwood, D. B. (M)
Nickels, J. L. (M)
Nisenoff, N. (M)
Noble, J. C. (M)
Norton, M. H. (M)
Notestine, D. D. (M)
Ogar, G. W. (M)
Overholser, W. E. (M)
Owen, H. W. (SM)
Pappas, M. J. (A)
Parker, A. P. (M)
Pasek, J. (A)
Peot, H. G. (A)
Perdzock, R. C. (M)
Peters, A. L., Jr. (SM)
Petit, A. H. (SM)
Piety, E. W. (SM)
Pippenger, C. R. (M)
Pirie, F. E. (M)
Pitinsky, L. (M)
Planchak, E. (M)
Pleshek, L. J. (SM)
Pokorny, J. J. (SM)
Porter, L. E. (M)
Pritchard, C. J. (M)
Quinn, R. E. (M)
Radke, C. E. (M)
Rahlf, J. P. (A)
Ramsey, J. T. (A)
Rawhouser, R. (SM)
Regnier, L. A. (M)
Reid, W. T. (M)
Retterer, B. L. (M)
Rhude, D. P. (M)
Rice, B. J. (A)
Richard, C. W. (SM)
Richard, P. R. (A)
Richardson, P. W. (M)
Richardson, T. L. (M)
Richmond, L. P. (SM)
Ricker, R. K. (M)
Ripoln, J. F., Jr. (SM)
Robinson, W. C. (M)
Roesler, L. (M)
Rogers, A. J. (SM)
Rohlinger, D. J. (M)
Rook, L. W. (M)
Roschi, J. W., Jr. (A)
Rose, L. H. (SM)
Rosener, G. M. (M)
Rothammer, W. H. (SM)
Rottenberg, M. J. (SM)
Rounds, J. M. (A)
Ruble, H. E. (M)
Ruddell, E. E. (A)
Russ, F. J. (SM)
Russell, H. J. (M)
Ryan, F. A. (A)
Rychlik, R. F. (SM)
Rynda, T. C. (SM)
Sansom, F. J. (M)
Sauer, R. J. (M)
Savoy, R. P. (M)
Scally, P. J. (A)
Schantz, G. W. (M)
Scheer, G. H. (SM)
Schram, S. M., Jr. (SM)
Schreiber, E. J. (M)
Schroeder, H. (M)
Schwartz, N. F. (M)
Schwenuesen, A. B. (M)
Schwitzgebel, W. C. (M)
Scott, J. E. (SM)
Segen, S. A. (A)
Semkow, J. W. (A)
Sen, W. J. (SM)
Senecal, T. L. (SM)
Seth, C. E. (A)
Shadburn, T. H. (M)
Sheffs, J. F. (A)
Sides, J. D. (A)
Siefker, R. G. (M)

Siek, J. R. (A)
Siff, R. G. (A)
Simons, R. A. (M)
Simopoulos, N. T. (M)
Singer, J. E. (M)
Skolnik, S. (SM)
Smith, D. A. (SM)
Smith, F. L. (M)
Smith, R. J. (A)
Smith, V. M. (A)
Snyder, A. R. (A)
Soerhoff, R. A. (A)
Sogn, L. T. (A)
Sonstegard, A. M. (A)
Soule, B. L. (M)
Speake, A. C. (M)
Spieler, R. J. (M)
Springer, P. W. (SM)
Sproule, J. H. (SM)
Stahler, Y. E. (M)
Stallone, M. J. (SM)
Stanford, R. W. (M)
Stanton, J. S. (M)
Stein, R. J. (A)
Stevens, R. D. (A)
Stewart, J. R. (A)
Stewart, J. (M)
Stewart, W. E. (SM)
Stolzenbach, R. W. (SM)
Stouch, D. H. (M)
Sutton, A. W., Jr. (M)
Sutton, W. K. (A)
Swift, R. E. (M)
Tarrants, Gene (SM)
Taylor, C. E. (M)
Teplitz, Harvey (M)
Theroux, Louis N. (SM)
Thinnes, R. L. (A)
Thom, A. R. (SM)
Thompson, J. P. (M)
Thompson, J. J. (M)
Thorne, E. D. (M)
Thresher, W. E. (M)
Tobias, J. J. (M)
Tomberg, Sidney (A)
Toomey, P. J. (M)
Trenkle, R. A. (SM)
Turner, E. M. (SM)
Turner, R. P. (A)
Valentine, E. O. (SM)
Velesky, J. J. (M)
Vendely, B. (A)
Versic, C. (M)
Vetter, C. R. (A)
Von Rohr, R. D. (A)
Wadsworth, N. L. (M)
Wall, J. R. (M)
Walling, G. P. (SM)
Wallis, M. A. (M)
Wamboldt, H. (M)
Warshawsky, L. M. (M)
Warwick, J. D. (M)
Watkins, G. F. (SM)
Watton, A., Jr. (SM)
Waugh, A. C. (SM)
Webb, W. C., Jr. (A)
Wehner, G. L. (M)
Weiser, R. V. (SM)
Westland, R. A. (M)
Whelan, R. E. (A)
Wiegert, P. G., Jr. (SM)
Wieland, E. S. (SM)
Wilde, A. J. (SM)
Wilkinson, J. E. (M)
Wilson, C. C. (M)
Winstead, D. D. (M)
Winters, W. D. (M)
Woodcock, S. J. (M)
Wooten, S. J. (A)
Worley, R. M. (M)
Wright, E. A. (M)
Writer, J. D. (M)
Wyse, D. S. (A)
Yolles, J. (SM)
Zalusky, C. W. (A)
Zleman, C. M. (M)
Zimmerle, D. F. (A)
Zimmerman, R. F. (M)
Zingg, J. F. (A)
Yoshida, H. (M)
Young, J. E. (M)
Young, L. McC. (SM)
Zabetakis, S. G. (M)
Zacharias, R. A. (A)
Zwissler, Howard R. (A)

Defiance (TOL-4)
Sherbo, J. C. (A)

Delaware (COL-4)
Krels, R. J. (M)
Poast, L. M. (M)

Dover (PIT-4)
Petrella, J. L. (A)

Doylestown (AKR-4)
Nuss, R. J. (A)

Dublin (COL-4)
Tracy, R. C. (M)

East Cleveland (CLE-4)
Corrigan, M. J. (M)
Gardner, R. A. (M)
Kennedy, E. D. (SM)
Serota, R. M. (SM)
Viton, E. J. (M)
Ward, D. C. (M)
White, J. E. (M)

Eastlake (CLE-4)
Sawyer, B. (A)

East Liverpool (PIT-4)
Ryckman, G. E. (A)

Elmore (TOL-4)
Bay, R. J. (A)

Elyria (CLE-4)
Finegold, I. (A)
Matil, E. J. (A)
Steele, E. M. (A)

Enon (DAY-4)
German, D. F. (M)
Hornseth, J. P. (M)

Euclid (CLE-4)
Beaver, A. R. (M)
Businger, K. A. (M)
Calderhead, H. J. (M)
Elze, R. P. (A)
Louis, J. R. (M)
Murray, J. E. (M)
Nurmi, L. O. (M)
Schanfarber, R. C. (A)
Schunemann, C. F. (SM)
Slavko, P. J., Jr. (M)
Tapp, N. P. (A)
Thompson, R. A. (M)
Wittlinger, H. A. (M)
Wurster, D. E. (M)

Fairborn (DAY-4)
Anderson, R. C. (M)
Archer, C. J. (SM)
Behane, D. (A)
Benson, M. C. (SM)
Bowker, I. H. (A)
Carnahan, K. R. (A)
Crosse, G. S. (A)
De Camp, P. W. (A)
Diavatis, N. D. (A)
Dickey, R. S. (M)
Emrick, B. S. (M)
Etheridge, L. R. (M)
Fahrney, R. L. (M)
Faust, R. L. (M)
Froehner, D. A. (A)
Green, W. M. (A)
Groszewski, D. J. (M)
Hayes, O. E. (M)
Hines, C. A. (SM)
Hybskmann, V. L. (A)
Ingram, D. B. (M)
Johnson, G. L. (M)
Kistner, R. L. (A)
Kohlmann, H. P. (M)
Lazur, E. (A)
Lynch, T. M. (M)
Matulka, D. D. (M)
Mayer, I. S. (SM)
McDowell, M. S. (A)
McElroy, G. A. (M)
McLaughlin, I. L. (M)
Milliron, J. R. (M)
Murrel, R. R. (M)
Peterson, L. S. (M)
Pflueger, W. W. (M)
Price, L. R. (M)
Pyle, J. L. (M)
Rizos, J. G. (SM)
Russell, C. C. (M)
Schivley, G. W. (M)
Shankland, D. G. (M)
Sinnott, D. J. (M)
Skinner, E. E. (SM)
Sparks, R. S. (A)
Spengler, J. R. (A)
Stimson, J. S. (M)
Taylor, P. B. (SM)
Thatcher, F. F., II (M)
Terrell, J. H., Jr. (M)
Vanderpool, H. D. (M)
Vargo, M. J., Jr. (A)
Whitlock, R. S. (A)
Wilson, J. W. (M)
Wolaver, L. E. (A)
Woodka, C. J. (M)

Fairview Park (CLE-4)
Atkisson, E. A. (M)
Hoff, H. B. (M)
Nagy, L., Jr. (M)
Westbrook, R. D. (M)

Findlay (TOL-4)
Creighton, G. W. (A)
Daymon, D. W. (M)
Hipskind, G. S. (M)
Lavender, J. S., Jr. (M)
Smith, E. C. (M)
Wells, D. H. (M)

Foster (DAY-4)
Porter, J. R. (M)

Franklin (DAY-4)
Bryant, V. D. (M)

Fremont (TOL-4)
Leite, R. C. (M)
Noffz, H. C. (M)
Swartzlander, G. W. (M)

Gahanna (COL-4)
De Myer, D. L. (M)
Mason, W. F. (M)
Stropki, G. T. (A)

Galion (AKR-4)
Blashfield, W. H. (M)

Brenton, G. P. (M)
Crissinger, W. W. (M)
Haferd, F. H. (M)
Kay, H. L. (M)
Moore, C. R. (A)
Murphy, C. E. (M)
Stetler, I. H. (A)
Van Voorhes, A. J. (M)

Garfield Heights (CLE-4)
Kurkul, W. (SM)

Gates Mills (CLE-4)
Gardiner, R. A. (SM)

Genoa (TOL-4)
Spencer, N. K. (M)

Girard (AKR-4)
Kramer, R. E. (SM)

Granville (COL-4)
Clark, J. V. (M)

Grove City (COL-4)
Birk, E. V. (A)

Hamilton (CIN-4)
Deveney, J. D. (A)
Marvin, I. E. (M)
Stein, J. L. (A)
Stump, A. M. (M)
Tushar, H. J. (M)
Wear, J. (M)
Whittington, R. C. (M)
Willsey, R. H. (M)
Winkeljohann, A. (M)

Hicksville (TOL-4)
Applegate, H. E. (SM)
Cutler, D. M. (SM)

Hilliards (COL-4)
Burgener, R. C. (A)
Thompson, H. E. (A)

Holland (TOL-4)
Holmes, H. R. (A)

Hubbard (AKR-4)
Bang, M. W. (SM)

Huron (CLE-4)
Wilber, B. E. (A)

Independence (CLE-4)
Jacques, G. E. (SM)

Ironton (CIN-4)
Loftis, H. J. (M)

Kent (AKR-4)
Dunbar, S. D. (M)
Iarussi, R. D. (A)
Lewis, D. C. (M)
Mathis, H. F. (SM)
Rymer, R. W. (M)
Wightman, E. E. (M)
Wills, R. H. (M)

Kettering (DAY-4)
Ashley, C. L. (M)
Banta, F. D. (A)
Brothers, A. L., Jr. (M)
Burns, J. H. (M)
Call, S. W. (M)
Desch, J. R. (M)
Gerhard, W. J. (M)
Getty, J. N. (M)
Grimm, F. W. (A)
Hannay, B. E. (A)
Hogan, J. R. (A)
Jacoby, G. R. (M)
Kinne, R. C. (SM)
Kyle, T. A. (M)
Marshall, C. J. (F)
Moran, J. F., Jr. (M)
Morrison, C. L. (M)
Murray, P. R. (SM)
Nelson, N. A. (SM)
Nordstrom, D. R. (M)
Sample, J. G. (M)
Shirley, J. R. (SM)
Slimmel, R. G. (SM)
Strasser, R. A. (M)
Thomas, E. R. (SM)
Walker, J. C. F., III (M)
Wallin, W. (M)

Kingston (CIN-4)
Leasure, R. B. (M)

Lakewood (CLE-4)
Benkelman, G. F. (SM)
Bremer, E., II (A)
Flack, S. G. (M)
Hamman, G. B. (M)
Haner, L. (M)
Hart, C. E. (A)
Keating, D. A. (M)
Mattern, R. M. (M)
Mealey, C. W., Jr. (M)
Mounce, C. O. (M)
Seleistad, H. D. (SM)
Tasch, A. (M)
Torsch, C. E. (SM)
Wagener, J. S. (SM)
Webner, R. D. (M)
Wells, M. (M)

Lancaster (COL-4)
Christian, H. S. (M)

Daubenmire, R. L. (A)
Hudson, R. S. (A)
Magestro, J. C. (M)
Markwood, W. R. (A)
Mitchell, J. P. (A)

Lemoyne (TOL-4)
Kohler, R. D. (M)

Lima (TOL-4)
Demecs, R. S. (A)
Gibbons, J. P. (M)
MacCallum, J. L. (A)
McIlvaine, D. K. (M)
Smith, J. A., Jr. (M)
Swiderski, E. F. (A)

Lisbon (PIT-4)
Catanzarite, V. O. (M)

Lockbourne AFB (COL-4)
Longino, D. R., Jr. (A)
Scherer, G. A. (M)
Thomas, O. D., Jr. (A)

Logan (COL-4)
Magle, R. (A)

Lorain (CLE-4)
Goodell, W. A. (M)
Heisner, D. A. (M)
Herrick, R. H. (SM)
Huge, H. M. (M)
Kauffman, H. C. (M)
Romoscr, P. E. (M)
Yarnack, J. E. (SM)

Louisville (AKR-4)
Boudler, A. G. (A)
Leslie, F. C., Jr. (A)

Loveland (CIN-4)
Hancock, H. E. (SM)
Kleinman, J. M. (M)
Rabe, W. A. (A)
Ryskamp, J. H. (M)
Thomas, J. P. (M)
Zwayer, B. E. (M)

Lyndhurst (CLE-4)
Borland, R. P. (M)
Comell, P. M. (A)
Dalasta, F. (M)
Grasson, W., Jr. (M)
Koeblitz, W. E. (M)
O'Gara, J. J. (A)
Semenhik, M. H. (A)
Spiller, H. A. (M)
Stevens, H. E. (M)

Madeira (CIN-4)
Meuleman, R. (SM)
Schneider, C. A. (M)

Mansfield (AKR-4)
Miller, K. W. (M)
Ryan, E. C. (M)
Stevens, W. C. (M)

Maple Heights (CLE-4)
Hall, W. S. (M)

Marietta (PIT-4)
Clark, C. E. (A)

Marion (AKR-4)
Davis, J. S., Jr. (M)
Jenkins, D. B. (M)

Martins Ferry (PIT-4)
Daubenmeyer, H. L., Jr. (A)

Mason (DAY-4)
Lantzer, F. N. (M)
Raso, F. A. (M)
Rehmann, W. H., Jr. (M)
Van Horn, J. E. (M)

Massillon (AKR-4)
Burriel, W. O. (A)
Kish, J., Jr. (A)

Maumee (TOL-4)
Chapman, L. B. (M)
Molloy, G. P. (SM)

Mayfield Heights (CLE-4)
Karbo, D. J. (M)
Reilly, E. J. (A)
Tonchch, S. V. (M)
Yeager, J. R. (M)

Medina (AKR-4)
Sharp, J. A. (M)

Medway (DAY-4)
Glancy, C. H. (M)
Gunning, M. E. (A)
Ridenour, P. W. (M)
Soorin, A. J. (M)
Waugh, R. E. (M)

Mentor (CLE-4)
Johnson, B. H. (M)
Miller, E. O. (M)
Wemelskirchen, L. M. (M)

Miamisburg (DAY-4)
Blerley, D. A. (M)

Middletown (CIN-4)
Crist, L. S. (A)

Millford (CIN-4)
Bissonette, A. J. (SM)
Davis, T. E. (M)
Marsh, J. H., Jr. (A)

Minerva (AKR-4)
Dieringer, W. K. (M)

Mingo Junction (PIT-4)
Horvath, S. (A)

Mogadore (AKR-4)
Brown, D. L. (M)
Hann, D. D. (M)
Zeigler, E. S. (A)

Monroeville (CLE-4)
Cramer, R. F. (A)

Mount Healthy (CIN-4)
Feldman, R. F. (A)

Mount Vernon (COL-4)
Woodward, R. O. (M)

Munroe Falls (AKR-4)
Nickson, R. W. (A)

Napoleon (TOL-4)
Roessing, E. F. (M)

Newark (COL-4)
Keith, R. S. (A)
Stevens, T. R. (A)

New Bremen (TOL-4)
Jung, D. H. (A)
Koeper, J. I. (M)

Newbury (CLE-4)
Kragle, R. J. (M)

New Carlisle (DAY-4)
Croner, A. J. (M)
Jeffers, G. N. (M)
Lewis, L. F. (A)
Lower, R. (SM)
Maxim, W. A. (A)

New Lebanon (DAY-4)
Mitchell, J. N., Jr. (A)

Newton Falls (AKR-4)
Force, E. (M)

North Canton (AKR-4)
Brown, D. L. (M)
Gray, D. W. (M)
Haas, D. L. (SM)
Iler, K. R. (M)
Miller, B. M. (M)
Miller, J. H. (M)
Stahl, M. D. (M)
Wagoner, J. W. (A)
Zumkehr, J. L. (A)
Zurcher, L. A. (SM)

North Olmsted (CLE-4)
Bieda, S. J. (A)
Bossard, G. L. (M)
Dalley, R. (A)
Mull, H. R. (SM)

North Royalton (CLE-4)
Bidlack, C. S. (SM)
Braschwitz, H. J. (M)
Hulme, W. P. (M)
Hutton, W. G. (SM)

Norwood (CIN-4)
Brandenburg, P. J. (A)
Haverkos, N. P. (M)
Sang, W. W. (M)

Oak Harbor (TOL-4)
Wott, H. W. (A)

Oakwood (DAY-4)
Colwell, R. E. (SM)

Oberlin (CLE-4)
Gilford, S. R. (M)
Howe, C. E. (M)
Young, M. L. (A)

Olmsted Falls (CLE-4)
Downer, E. W. (M)
Irwin, D. E. (M)
Klinect, R. R. (M)
Shirer, D. J. (M)
Wolfe, A. R. (M)

Oregon (TOL-4)
Brown, W. R. (A)
Reynolds, F. L. (A)

Ottawa (TOL-4)
Goodkin, S. S. (M)
Loman, J. A. (M)
Schoonover, D. J. (M)
Weideman, R. J. (M)

Oxford (CIN-4)
MacKinnon, A. J. (A)
Teetzel, F. M. (M)

Painesville (CLE-4)
Morrison, H. F. (A)

Parma (CLE-4)
George, W. C. (SM)
Guild, E. G. (A)
Hultzman, W. W. (M)
Kyles, V. (A)
Manning, B. M. (A)
Meder, R. (M)
Schindler, R. W. (M)
Schultz, R. J. (M)
Scott, R. J. (A)
Sommer, R. A. (M)
Wilson, P. H. (A)
Yambor, E. P. (M)

Parma Heights (CLE-4)
Brinkman, H. A. (M)
Ewart, J. M. (M)
Foster, F. A. (A)
Franks, C. V. (M)
Levisay, D. H. (M)

Perrysburg (TOL-4)
Griss, C. H. (M)

Phillipsburg (DAY-4)
Share, G. E. (SM)

Poland (AKR-4)
Everett, T. D. (A)
Walten, A. C. (A)

Portage (TOL-4)
Kloofenstein, L. R. (M)

Port Clinton (TOL-4)
Morgan, W. O. (A)

Portsmouth (CIN-4)
Davidson, A. P. (M)
Gilmer, R. L. (A)

Ravenna (AKR-4)
Braden, W. V. (A)
Cory, R. W. (A)
Montgomery, W. M. (M)

Reading (CIN-4)
Kamm, D. D. (A)
Westmark, J. E. (M)

Reynoldsburg (COL-4)
Cooper, L. K. (M)
Tinkham, H. J. (M)

Rocky River (CLE-4)
Byrd, H. F. (A)
Kelley, J. J. (M)
Stover, F. J. Jr. (M)

Rossford (TOL-4)
Perch, D. F. (M)

St. Bernard (CIN-4)
Wood, J. J. (M)

St. Clairsville (PIT-4)
Skoff, J., Jr. (A)
Sandusky (CLE-4)
Bertuccio, T. D. (M)
Conlin, H. T. (A)
Derrick, W. A. (M)
Fraser, R. J. (A)
Freyberg, J. A. (A)
Hummer, E. W. (A)
Kenyon, H. S. (SM)
Shumaker, R. (M)
Wild, J. H. (SM)

Shaker Heights (CLE-4)
Costanzo, P. (M)
Dennis, H. (SM)
Fields, I. L. (A)
Jones, A. F. (A)
Keithley, J. F. (SM)
Miller, H. J. (M)
Pfaff, R. W. (M)
Seidman, S. M. (M)
White, G. M. (M)

Sharonville (CIN-4)
Gorker, G. E. (A)

Shreve (AKR-4)
Mulligan, R. C. (A)

Sidney (TOL-4)
Ulman, W. H. (M)

Silverton (CIN-4)
Bertram, M. A. (A)

South Euclid (CLE-4)
Baskin, R. F. (M)
Di Julius, J. R., Jr. (A)
Glauberman, L. (M)
Louden, W. C. (M)
Monroe, R. T., Jr. (A)
Peterson, W. V. (M)

Springfield (DAY-4)
Baer, C. E. (SM)
Beedy, R. M. (M)
Bell, A. L. (SM)
Boyer, D. W. (A)
Breen, E. L. (M)
Carey, R. M. (M)
Cunningham, H. W. (A)
Davis, C. R. (M)
Dieterle, M. W. (M)
Jones, T. G., Jr. (M)
Parker, A. J. (SM)
Pingel, N. D. (M)
Rowe, N. L. (M)
Smith, L. A. (M)

Spring Valley (DAY-4)
Daugherty, D. J. (M)
Hearsum, D. R. (M)
Horst, W. R. (M)

Steubenville (PIT-4)
McFeely, H. H. (SM)

Stow (AKR-4)
Andresen, G. J. C. (A)
Blocki, W. G. (A)
Fauss, G. C. (A)
Leach, H. Jr. (M)
Strongsville (CLE-4)
Ward, W. L. (M)

Sylvania (TOL-4)
Myers, O. J. (A)
Williams, R. B., Jr. (M)

Talmadge (AKR-4)
Baogerman, G. L. (SM)
Farnsworth, N. B. (M)
Folk, V. O. (A)
Stonerook, T. D. (M)

Terrace Park (CIN-4)
Hudnall, J. U. (A)
Jordan, J. F. (F)

Tiffin (TOL-4)
Hartman, R. E. (A)

Tipp City (DAY-4)
Brode, R. L. (SM)
Gambill, C. C. (M)
Johns, M. W. (A)

Toledo (TOL-4)
Aufderheide, J. H. (M)
Beins, J. K. (M)
Bell, R. F. (M)
Bensman, R. W. (M)
Blomberg, P. E. (A)
Boudouris, A. (M)
Cameron, D. F. (M)
Childers, R. F. (M)
Chipman, R. A. (SM)
Comer, J. W. (M)
Cousino, R. E. (M)
Diehn, R. J. (A)
Dinning, J. R. (M)
Doubert, W. W. (M)
Drescher, L. L. (M)
Eash, G. H. (A)
Ewing, D. J., Jr. (M)
Frewalt, E. W. (A)
Fuller, L. E. (A)
Gage, J. F. (M)
Galambos, L. G. (M)
Gramlich, H. F. (A)
Hanna, R. N. (M)
Hawley, F. S. (A)
Hedler, R. C. (M)
Herrick, K. P. (M)
Hockenberger, F. R. (M)
Josenhant, J. G. (M)
Kaminski, G. L. (M)
Kearney, J. P. (SM)
Keck, M. W. (M)
Ketcham, A. R. (M)
Kirchenbauer, C. C. (SM)
Krieger, A. E. (A)
Laker, F. J., Jr. (M)
Larson, R. G. (M)
Leuck, D. D. (M)
Loehrke, H. F. (SM)
Loo, W. (M)
Marleau, R. S. (M)
Marsh, R. H. (A)
Martin, O. J. (M)
McCormick, J. M. (SM)
Meeker, J. G. (M)
Melcher, R. J. (A)
Morrison, E. (A)
Murley, E. M., Jr. (M)
Naborowski, J. C. (M)
Neuert, H. L. (M)
Nixon, W. A. (A)
Patay, J. J. (A)
Pierce, E. W. (M)
Rees, V. C. (A)
Richards, D. K. (M)
Rosencrantz, M. E. (M)
Rowe, H. N. (M)
Rynder, L. S. (M)
Schnell, W. S. (A)
Schoor, V. M. (M)
Seike, H. K. A. (M)
Sepoeler, W. C. (M)
Sheckler, L. D. (M)
Shodiss, H. F. (M)
Simonds, C. S. (M)
Stringfellow, W. M. (SM)
Szymkowiak, E. (A)
Volgt, E. H. (A)
Wallace, G. A. (A)
Weeber, R. E. (M)
Wooster, W. H. (A)

Trobwood (DAY-4)
Heibig, E. M. (A)
Sadow, R. M. (A)
Weissman, S. (SM)

Troy (DAY-4)
Benedict, D. E. (A)
Hook, G. E. (A)
Schmidt, H. J. (M)

Twinsburg (AKR-4)
Howard, W. R. (A)

Union (DAY-4)
Apple, R. C. (M)
Learish, H. B. (SM)

Uniontown (AKR-4)
Douglas, D. R. (A)
Lauby, J. W. (M)

University Heights (CLE-4)
Brown, L. H. (A)
Goldfarb, J. (M)
Roth, M. S. (M)
Seldner, K. (M)
Williams, H. C. (M)

Urbana (DAY-4)
Alty, R. L. (M)
Cammack, F. (M)

Vandalia (DAY-4)
Leffler, G. E. (A)
Mayer, J. M. (A)

Van Wert (FT-W-5)
Conley, W. H. (M)
Lindsay, J. T. (M)

Vincent (PIT-4)
Huck, L. A. (A)

Walbridge (TOL-4)
Corathers, C. N. (M)
Dehring, J. C. (M)

Warren (AKR-4)
Atwood, W. L. (SM)
Marshall, E. L. (VA)
Sprague, W. L. (M)

Warrensville Heights (CLE-4)
Davis, S. (M)

Waynesville (DAY-4)
Morin, R. W. (A)
Puterbaugh, W. H., Jr. (M)

West Carrollton (DAY-4)
Sonnanstein, E. H., Jr. (A)
Springer, L. D. (SM)

Westerville (COL-4)
Autery, R. M. (M)
Harris, E. L. (A)
Hodge, R. M. (A)
Huffman, D. L. (SM)
Plenkowski, E. C. (A)
Pontiollo, J. A. (M)

Westlake (CLE-4)
Albrecht, W. (M)
Corwin, G. (M)
Fletcher, E. S. (SM)
Hayes, K. V. (A)
Odell, M. P. (SM)
Seybold, J. F. (A)

West Richfield (AKR-4)
Bear, N. (A)
Brooks, R. C. (A)

West Union (CIN-4)
Malone, W. D. (M)

Wickliffe (CLE-4)
McNeill, T. J. (A)

Willoughby (CLE-4)
Hodina, E. C. (M)
Sommer, R. J. (A)

Willoughby Hills (CLE-4)
Blauvelt, R. C. (SM)

Willowick (CLE-4)
Mason, R. F. (A)

Wilmington (CIN-4)
Hart, W. J. (A)

Woodville (TOL-4)
Nitschke, N. C. (M)

Wooster (AKR-4)
Mullen, H. P., Jr. (A)

Worthington (COL-4)
Cary, H. (M)
Clutzer, E. C. (A)
Conlon, R. J. (M)
Crane, W. B., Jr. (M)
Davis, W. C. (SM)
De Vore, R. V. (M)
Kean, P. M., Sr. (A)
Orwig, E. O. (A)
Sisson, E. D. (M)
Taylor, R. C. (M)
Van Buskirk, R. C. (M)
Wyler, E. N. (M)

Wright-Patterson AFB (DAY-U-4)
Abbey, G. W., S. (M)
Amstutz, S. R. (M)
Bogrees, G. T. (M)
Bolick, H. H., Jr. (M)
Britain, J. F. (M)
Bryan, C. W. (M)
Cherian, E. J. (M)
Conover, J. C. (M)
Corbin, M. W. (A)
Donovan, P. R. (M)
Doty, A. (M)
Dukes, E. F., Jr. (A)
Fenton, R. E. (M)

OHIO

Francis, L. G. (M)
Garrett, E. T. (M)
Glushko, W. (A)
Gregory, J. W. (A)
Haneman, V. S., Jr. (M)
Hitzenhammer, A. D. (SM)
Houpis, C. H. (M)
Jones, E. D., Jr. (M)
Joppa, R. M. (SM)
Kennedy, J. V. (A)
King, J. D. (A)
Lanford, H. W., Jr. (SM)
Libelfeld, J. (M)
Lucas, G. R. (M)
Lundquist, G. J. P. (A)
McLean, M. H. (M)
Metscher, W. (M)
Mims, J. H. (A)
Morgan, B. S., Jr. (M)
North, R. L. (M)
Oliveros, C. G., Jr. (A)
Politzer, L. M. (M)
Prohaska, C. R. (M)
Pulling, B. S. (M)
Regulinski, T. L. (M)
Rippere, J. B. (SM)
Schelonka, E. P. (M)
Schwartz, D. M. (M)
Scott, J. W. (M)
Scott, S. D. (A)
Smith, C. V. (M)
Staas, P. C. (M)
Syberna, P. M. (M)
Thomas, C. P. (A)
Urbanski, L. J. (A)
Wisniewski, S. J. (M)
Young, R. W. (M)

Xenia (DAY-4)
Anderson, C. W. (VA)
Baker, W. W. (SM)
De Berry, D. R. (M)
Doran, R. J. (SM)
Doyle, C. E. (SM)
Holt, T. (M)
Horton, C. D. (M)
Kouri, F. G. (SM)
Lisowski, E. M. (M)
Magee, T. H. (M)
Marshall, C. H. (M)
Michaelson, B. L. (A)
Myszko, R. (M)
Noble, H. V. (F)
Noll, L. J. (M)
Nordlund, R. J. (SM)
O'Brien, W. R. (M)
Russell, B. W., Jr. (M)
Russell, J. W. (A)
Schoonover, W. C. (M)
Schuette, W. H. (M)
Steenbergen, H. H. (A)
Walker, R. V. (M)
Williams, G. S. (A)

Yellow Springs (DAY-4)
Aschbacher, S. J. (M)
Bletzinger, P. (M)
Carr, D. L. (A)
Colbert, C. (SM)
Fritz, W. (A)
Greene, C. K. (SM)
Kimball, D. E. (SM)
Nosker, P. W. (SM)
Obermayer, R. W. (M)
Otten, K. W. (M)

Youngstown (AKR-4)
Cherpack, J., Jr. (M)
Conroy, M. J. (A)
Dieringer, F. A. (VA)
Hansburg, M. (M)
Hirt, A. J. (A)
Housteau, C. M., Jr. (A)
McNicholas, J. V. (M)
Nyberg, W. C. (A)
Phillips, R. G. (A)
Resch, R. J. (M)
Small, J. P. (M)
Umbach, L., Jr. (M)
Williamson, W. P., III (A)

Zanesfield (TOL-4)
Hatfield, F. A. (A)
Hunt, W. A. (M)
Iverson, F. A. (M)
Schwerha, J. A. (M)
Snyder, H. D. (A)
Thompson, C. O. D., Jr. (M)

OKLAHOMA

Ardmore (OC-6)
Pryse, J. F. (A)
Rollins, C. W. (A)

Bartlesville (TUL-6)
Bondurant, J. E. (M)
Bratsher, R. T. (M)
Dale, H. C. (M)
Freeman, L. R. (M)
Greening, J. P. (A)
Hensley, W. A. (M)
Johnson, E. W. (M)
Kindred, R. L. (A)
Kline, M. E. (M)
Piety, R. G. (M)
Renfro, C. L. (A)
Walker, J. F. (M)

Bethany (OC-6)
Hill, W. M. (M)
Jackson, M. H. (M)

Broken Arrow (TUL-6)
Smith, D. (A)
Tompkins, H. S. (A)

Choctaw (OC-6)
Kovar, P. (SM)

Clinton (OC-6)
Staley, J. D. (M)

Coweta (TUL-6)
Higgins, H., Jr. (A)

Coyle (OC-6)
Shellhammer, O. K. (M)

Duncan (OC-6)
Copland, G. V. (M)
Gray, C. R. (M)
Hulme, J. R. (M)

Edmond (OC-6)
Daniel, D. B. (M)
Kearby, L. I. (M)

El Reno (OC-6)
Crawford, D. M. (A)

Enid (OC-6)
Stillman, G. E. (M)
Tennison, D. B. (A)

Fay (OC-6)
Conner, J. B. (M)

Fort Sill (OC-6)
Laorad, Q. C. (A)
Wood, P. W. (M)

Frederick (OC-6)
Jones, J. D., Jr. (SM)

Idabel (TUL-6)
Brown, S. F. (A)

Kinta (TUL-6)
Stowell, N. J. (M)

Lawton (OC-6)
Frei, J. (M)
Hudson, B. J. (A)
Jones, A. H. (M)
Mayberry, R. C. (M)
Shores, D. D. (A)
Theroux, G. L. (M)
Utterback, W. J. (M)
Wilson, H. D. (M)

Marland (TUL-6)
Gammon, C. (M)

McAlester (TUL-6)
Nichols, C. D. (M)

Medford (OC-6)
Scouten, D. C. (M)

Miami (TUL-6)
Wetherell, M. L. (M)

Midwest City (OC-6)
Agosta, H. A. (M)
Boyd, W. L. (M)
Crocker, J. A. (M)
Davis, A. C. (M)
Duff, J. B. (A)
Ferguson, J. W. (A)
Frey, W. A. (A)
Gilmore, E. H. (M)
Hedson, H. D. (A)
Hutton, J. E. (M)
Karstetter, W. H. (M)
Kimmell, H. W. (A)
Lewis, H. G. (M)
Lindley, R. A. (A)
McDonald, T. K. (SM)
Rauscher, A. I. (M)
Spence, R. E., Jr. (M)
Thompson, W. R. (M)
Villines, F. S. (M)
Weaver, T. H., Jr. (M)
Wedekind, D. E. (M)
Weisiger, J. M. (M)
Wood, R. L. (M)

Moore (OC-6)
Gordon, J. B. (A)

Muskogee (TUL-6)
Bishop, R. D. (M)
Hardesty, R. D. (M)
Miller, W. A. (A)

Norman (OC-6)
Brewster, A. H., Jr. (A)
Challenner, A. P. (SM)
Edwards, O. L. (A)
Farrar, C. L. (SM)
Green, B. B. (M)
Harp, C. E. (SM)
North, R. C., Jr. (M)
Palmer, J. D. (M)
Puckett, T. H. (M)
Tuma, G. (SM)
Vlay, C. J. (M)
Warren, J. D. (M)
Yarbrough, L. A. (M)

Oklahoma City (OC-6)
Adams, R. G. (M)
Allbright, B. D. (M)
Ashby, R. H. (M)
Ashworth, J. M. (M)
Bailey, J. E. (M)
Barker, M. W. (M)
Barnett, J. E. (A)
Bastian, L. R. (M)
Battenburg, N. (M)
Berry, G. P. (M)
Black, E. (M)
Bower, H. H., Jr. (M)
Brown, R. W., Jr. (M)
Buettner, N. G. (M)
Callihan, E. S. (M)
Cannon, W. P. (M)
Cherry, R. B. (A)
Clifton, J. L. (M)
Crippen, E. G. (M)
Cross, C. C. (M)
Daniels, C. L. (M)
Daugherty, L. C. (M)
Daugherty, W. M. (M)
Delbridge, J. D. (M)
Dick, C. W. (M)
Diggs, B. H. (M)
Dimick, C. V. (M)
Drumeller, C. C. (M)
Easum, C. M. (M)
Ebner, W. H. (M)
Ely, D. H. (M)
Farrow, C. L., Jr. (M)
Fish, R. L. (M)
Fisher, D. L. (A)
Foster, E. W. (M)
Hammer, F. E. (M)
Hannan, C. V., III (A)
Hamden, L. W. (M)
Hart, C. O. (M)
Haworth, R. E. (M)
Herriott, J. K. Jr. (A)
Hermann, F. (M)
Hilmes, E. F. (M)
Hines, J. W. (M)
Holaday, D. F. (M)
Holt, G. W. (SM)
Hurst, K. J. (M)
Jackson, F. L. (M)
Jackson, J. H., Jr. (M)
Jones, B. H. (M)
Jones, E. L. (M)
Kanen, G. M. (M)
Key, B. P. (M)
Kruger, K. W. (M)
Kuehne, A. (A)
Kuether, Q. W. (M)
Lagaly, G. B. (M)
Ledbetter, R. P. (M)
Le Fevre, F. W. (M)
Luciani, V. J. (M)
Lyons, E. F. (M)
Marrinan, H. J. (M)
Martin, M. M. (M)
Maupin, C. E. (M)
McGowan, C. W. (A)
McKinley, H. W. (SM)
Michaels, G. (A)
Miller, C. L. (M)
Miller, I. S. C. (M)
Monkres, J. P. (A)
Moore, R. E. (M)
Morris, R. K. (M)
Mueller, C. W. (SM)
Murar, E. J. (M)
Murta, E. J., Jr. (M)
Nangle, W. O. (A)
O'Brien, E. G. (M)
O'Neal, R. K. (A)
Owen, B. D. (SM)
Park, R. K. (M)
Penland, R. S., Jr. (M)
Persson, K. R. (M)
Phillips, H. E. (M)
Pickett, R. N. (M)
Pulliam, J. G. (M)
Ramsey, O. B., Jr. (M)
Rea, R. W. (M)
Redding, P. B. (M)
Reynolds, J. (M)
Ricciotti, S. (M)
Rogers, A. L. (M)
Sala, K. E. (M)
Scally, P. J. (M)
Schmitt, A. W. (M)
Shaw, J. E. (M)
Sheaffer, C. F. (VA)
Snethen, J. A. (A)
Sober, V. (M)
Spooner, A. J. (M)
Sroufe, J. S., Jr. (A)
Steed, G. H. (M)
Stevens, T. W. (A)
Swenson, H. T. (M)
Sypherd, R. S. (M)
Taylor, R. L. (SM)
Thomas, M. W. (SM)
Tyler, R. S. (M)
Waits, L. E. (A)
Walker, S. I. (M)
Watkins, P. E. (M)
Welch, P. G. (M)
Welling, W. J. (M)
Wells, F. D. (M)
Wichels, J., Jr. (M)
Wright, T. E. (M)
Zellmeer, F. F. (M)

Pauls Valley (OC-6)
Graham, W. L. (M)

Ponca City (TUL-6)
Brown, G. L. (M)
Conger, N. L. (A)
Doty, W. E. N. (M)
Fair, D. W. (M)
Hall, M. L. (M)
Karr, R. J. (A)
Lindsey, S. E. (M)
Rochelle, C. A. (A)
Sullivan, D. S. (M)
Marsh, C. L. (M)
Marsh, C. L. (M)

Sand Springs (TUL-6)
Goatcher, H. Z. (A)
Roop, L. H. (A)
Stulken, R. D. (A)

Sayre (OC-6)
Goostree, F. T., Jr. (M)

Seminole (OC-6)
Smith, G. L. (M)

Shawnee (OC-6)
Johnson, L. W. (M)
Jones, M. E. (M)
Wells, E. W. (M)
Wood, G. J. (A)

Stillwater (TUL-6)
Bowling, R. E. (M)
Buck, R. F. (M)
Cameron, C. F. (M)
Fristoe, H. T. (SM)
Hallett, P. C. (M)
Jones, H. L. (SM)
Labarthe, L. C. (M)
Lingelbach, D. D. (M)
Planinac, J. W. (M)

Tallihina (TUL-6)
Fox, D. N. (M)

Tinker AFB (OC-6)
Booth, J. E. (M)
Wilson, W. (A)

Tulsa (TUL-6)
Alexander, W. A. (M)
Atchison, R. L. (M)
Austin, R. A. (M)
Barnes, E. M., Jr. (M)
Be Luong, V. (M)
Blackman, B. A. (M)
Born, W. T. (F)
Bowman, D. C. (M)
Braidwood, D. W. (M)
Broding, R. (SM)
Brooks, L. C. (M)
Buffum, C. E. (SM)
Burns, K. N. (M)
Burton, R. G. (M)
Bushnell, J. M., Jr. (A)
Care, W. G. (A)
Casey, J. L. (M)
Childress, J. C., Jr. (A)
Cooley, J. A. (M)
Cooper, J. R. (SM)
Cordell, L. B. (M)
Cordell, R. L. (M)
Crom, C. L. (M)
David, W. O. (A)
Davis, D. R. (A)
Day, C. E. (M)
Deming, J. M. (A)
Dennis, J. R. (SM)
Dikmen, B. (M)
Donley, M. M. (A)
Draheim, L. H. (M)
Duerig, W. H. (A)
Dunn, C. S. (M)
Durham, E. R. (A)
Earthman, J. C. (M)
Elsler, J. D. (SM)
Ellis, R. M. (SM)
Favors, E. L. (A)
Ferguson, H. B. (M)
Ferguson, P. M. (M)
Field, H. S. (M)
Finn, R. S. (M)
Fisher, J. L. (A)
Fisher, R. B. (M)
Flury, H. E. (A)
Freeman, F. R. (M)
Giles, C. S. (A)
Gladson, G. G. (M)
Graf, V. V. (M)
Green, G. C. (A)
Hadley, C. F. (SM)
Harper, F. N. (M)
Hart, R. N. (M)
Hawkins, J. E. (SM)
Hearn, D. P. (M)
Hibbard, H. C. (M)
Hill, J. K. H. (A)
Holland, W. R. (M)
Holmes, E. J. (A)
Hooker, L. H. (A)
Hopkinson, E. C. (A)
Howell, W. R., Jr. (M)
Hunsicker, W. R. (M)
Hussey, C. V., Jr. (A)
Hutchinson, H. M., Jr. (A)
Irvin, R. G. (M)
Jacobs, G. G. (A)
James, D. B. (M)
Kartman, D. J. (M)
Keller, B. H. (A)
Kenton, J. K. (M)
Koeppel, B. W. (M)
Lamonte, R. J. (M)
Lash, C. C. (SM)
Lippman, L. (M)
Lopez, J. L. (M)
Lynn, R. D. (M)
Mahoney, E. H. (M)
Marshall, B. R. (A)
Martin, H. H., Jr. (A)
Matthews, C. G. (A)
McCoy, B. F. (A)
McFarland, R. L. (M)
Miller, J. W. (SM)
Mitchell, R. W., Jr. (M)
Moon, C. L. (A)
Murphy, W. J. (M)
Newton, G. R. (SM)
Nichols, R. L. (A)
Norris, W. F. (M)
O'Reilly, G. A. (SM)
Orsak, A. J. (A)
Peterson, G. (SM)
Phillips, H. W. (SM)
Pittenger, R. D. (M)
Reid, A. C. (M)
Roe, E. D. (A)
Schad, C. A. (M)
Shelton, H. C. (A)
Silverman, D. (F)
Smith, L. H. (A)
Sorge, W. A. (M)
Stinchcomb, B. G. (A)
Stover, E. B. Jr. (M)
Sweeny, A. C., Jr. (A)
Swift, G. (M)
Tenney, F. T. (A)
Vogt, C. O. (M)
Voorhels, T. E. (A)
Walker, J. V. (M)
Watson, G. E. (A)
Watson, R. E. (A)
Wattenbarger, W. W. (A)
Weinroth, S. A. (M)
Weldon, W. J. (A)
Westervelt, J. C. (A)
Whitlock, J. R. (M)
Wilcox, R. L. (M)
Willits, G. N. (A)
Wilson, B. F. (M)
Wood, G. A. (A)
Zongker, R. C. (M)

Village (OC-6)
Clinkenbeard, H. A. (M)

Wilson (OC-6)
Glenn, R. D. (M)

Woodward (OC-6)
Williams, F. G. (M)

Yukon (OC-6)
Rice, P. G. (M)

OREGON

Beaverton (POR-7)
Calnon, D. C., Jr. (M)
Christensen, H. E. (A)
Gasser, C. D. (A)
Goard, R. W. (A)
Jenkins, R. W. (M)
Kobbe, J. R. (M)
Macpherson, C. H. (M)
Passmore, F. X. (A)
Rice, R. G. (A)
Schiller, J. D. (A)
Tinker, F. B. (M)
Trump, W. E. (A)

Clackamas (POR-7)
Pickett, R. A. (A)

Corvallis (POR-7)
Albert, A. L. (F)
Amort, D. L. (A)
Ballard, B. J. (M)
Dunlap, C. R. (SM)
Feikert, G. S. (SM)
Huber, S. J. (M)
Hunnicutt, A. L. (M)
Jansen, L. C. (A)
Looney, J. C. (M)
Magnusson, P. C. (SM)
Michael, R. R. (M)
Moore, E. G., Jr. (M)
Oorthuys, H. J. (SM)
Stone, L. N. (M)
Stone, S. A. (M)
Strayer, R. W. (M)
Weber, L. J. (M)
Yunker, E. A. (SM)

Eugene (POR-7)
Balint, J. E. (SM)
Hoope, P. R. (A)
Surdam, E. L. (M)

Grants Pass (POR-7)
Walker, J. E. (M)

Gresham (POR-7)
Nichols, J. S. (M)

Hillsboro (POR-7)
Kelsey, G. M. (A)
Scott, H. D. (A)

Klamath Falls (POR-7)
Cramer, K. H. (A)
DuWane, W. H. (A)
Grikas, W. P. (M)
Orrell, D. B. (M)

La Grande (POR-7)
Cannon, T. W. (M)

McMinnville (POR-7)
Anderson, C. M. (M)
Bennett, S. D. (SM)
Charbonnier, F. M. (M)
Dyke, W. P. (M)
Hipperson, J. R. (M)
Wilson, P. B. (M)

Medford (POR-7)
Lamberg, R. (M)
Walker, V. G. (VA)

Oswego (POR-7)
Fillinger, R. V. (M)
Smith, D. E. (SM)

Philomath (POR-7)
Plunkett, D. T. (A)

Portland (POR-7)
Allen, W. M. (SM)
Austin, L. C. (A)
Bailey, R. L. (M)
Bartch, H. (A)
Bay, F. H. (M)
Beck, R. M. (M)
Be Lusko, J. V. (A)
Bishop, A. R. (M)
Bookwalter, L. S. (VA)
Brandt, T. (M)
Bronx, B. H. (A)
Brown, F. M. (M)
Brown, W. C. (A)
Carpenter, C. B. (SM)
Cassidy, J. J., Jr. (M)
Clark, R. N. (M)
Corbett, H. L., Jr. (M)
Corbett, T. (A)
Craycraft, H. T. (A)
Cutting, W. A. (M)
Dallas, W. K. (SM)
Davis, E. A. (A)
Davis, K. E. (A)
Davis, R. J. (SM)
Day, J. E. (A)
Deardorff, R. W. (F)
Delord, J. F. (SM)
Doel, D. (M)
Donoghue, J. J. (M)
Easterday, R. B. (A)
Ellis, P. V. (M)
Ellison, G. C., Jr. (M)
Elssner, E. H. (M)
Erwin, J. A. (M)
Flateau, S. L. (M)
Fox, R. A. (M)
Franzel, D. E. (M)
Gard, J. J., Jr. (M)
Gibson, C. B., Jr. (A)
Glover, M. H. (M)
Gordon, D. D. (A)
Gotcher, A. W. (A)
Griffith, J. W. (A)
Groeger, E. R. (M)
Grossenbacher, A. C. (A)
Hashizume, G. K. (M)
Hazony, D. (M)
Heath, H. W. (M)
Hedrick, L. C. (SM)
Henderson, J. E. (A)
Herren, R. A. (M)
Hollingsworth, K. M. (A)
Holtzman, M. (M)
Hood, F. D. (M)
Horseman, T. E. (M)
Howe, G. E. (A)
Jackson, F. E. (A)
James, T. W. (M)
Johnson, D. E. (SM)
Johnston, G. I. (M)
Keyser, K. E. (A)
Koroch, L. R. (M)
Krausse, J. B. (A)
Leech, E. R. (M)
Liedtke, J. A. (M)
Lund, C. W. (SM)
Lyon, W. C. (A)
Marthart, D. J. (M)
Marsh, W. E. (M)
McCann, F. H. (SM)
McEdward, F. A. (M)
McFarland, B. N. (M)
Melssner, E. R. (SM)
Mendoza, D. C. (M)
Miller, F. E. (SM)
Miller, V. F. (A)
Morey, A. M. (M)
Morgan, M. L. (A)
Morin, L. A. (M)
Moulton, C. H. (M)
Nelson, D. E. (A)
Newhouse, D. R. (M)
Nolan, C. A. (M)
Paul, B. R. (VA)
Peterson, R. M. (M)
Pittard, F. L. (M)
Poltis, W. J. (A)
Pooley, R. R. (M)
Poulin, R. A. (M)
Quinn, A. C. (M)
Raupach, R. C. (M)
Reilly, J. A. (A)
Rhiger, R. R. (M)
Richardson, W. E. (M)
Riley, J. C. (M)
Ritter, H. C. (A)
Roberts, M. L. (M)
Roolequet, R. L. (SM)
Rullman, R. G. (M)
Schmidt, R. W. (M)
Schmitt, G. W. (A)
Schmitt, W. L. (M)
Scott, E. D. (SM)
Shantz, C. J. (A)
Shelley, A. L. (M)
Single, E. P. (M)
Singleton, H. C. (SM)
Stoll, J. L. (M)
Strain, D. C. (M)
Svehaug, O. C. (A)
Tabshy, S. J. (M)
Terrill, F. Jr. (M)
Thompson, W. S. (M)
Thomson, A. (M)
Tunturi, A. R. (A)
Turnbull, J. L., Jr. (M)
Tyle, A. B. (SM)
Vassallo, W. H. (A)
Vollum, H. (F)
Weiss, L. S. (A)
White, L. C. (M)
Wilhoit, D. I. (M)
Winkler, L. R. (VA)
Winningstad, C. N. (M)
Worden, A. E. (M)

Salem (POR-7)
Hart, F. J. (A)
Hoskins, R. E. (A)
Purbrick, R. L. (M)
Stangland, D. E. (A)
Wane, W. M. (A)

Sherwood (POR-7)
Crawford, H. C. (A)
Long, L. A. (M)

The Dalles (POR-7)
Curtis, H. T. (M)
Stuart, C. J. (M)

Tigard (POR-7)
Eliander, H. F., Jr. (M)
Kidd, D. E. (M)
Webber, W. B. (M)

PENNSYLVANIA

Abington (PHI-3)
Adams, K. (M)
Batiuk, R. A. (M)
Beck, C. (A)
Booker, R. W. (M)
Chang, S. Y. (M)
Coullard, J. B. (SM)
Dittrich, W. A. (A)
Goff, K. W. (A)
Lounsberry, E. P. (M)
Remich, J. E. (A)
Schellenberg, P. J. (A)
Tarzian, V. (A)
Ventine, H., Jr. (SM)
Wheeler, E. B. (M)
Young, C. P. (SM)

Adah (PIT-4)
Bohar, J. (M)

Aldan (PHI-3)
Gahagan, J. R. (M)
Heacock, R. J. (A)

Aliquippa (PIT-4)
Haluga, M. G. (A)
Ugoletti, L. S. (M)

Allentown (P-LV-3)
Anand, R. P. (M)
Bartholomew, C. Y., Jr. (M)
Bolez, E. C. (A)
Bradford, C. E. (M)
Buehler, P. R. (M)
Chaplin, W. J. (A)
Chitsick, D. R. (M)
Cordaro, C. F. (A)
Hansen, E. (M)
Hanson, F. E. (SM)
Hanson, G. H. (M)
Herbert, N. J. (SM)
Hittinger, W. C. (A)
Kimura, F. S. (M)
Long, P. C., Jr. (M)
McGrath, J. W. (SM)
Morton, K. L. (M)
Newhard, C. E. (M)
Paulsen, J. F. (SM)
Purcell, R. H. (SM)
Ronci, V. L. (SM)
Rutter, V. E. (M)
Savadelis, I. C. (M)
Simpson, A. D. (SM)
Stubner, F. W. (M)
Sutter, D. M. (A)
Szabo, W. (M)
Tabor, C. J., Jr. (M)
Taylor, E. W. (M)
Taylor, R. R. (VA)
Tooker, H. A. (SM)
Von Chisen, L. H., Jr. (M)
Waltz, M. C. (SM)
Watson, H. A. (M)
Westberg, R. W. (A)
Whitner, R. A. (M)
Young, C. S. (SM)
Zuk, P. (M)

Allison Park (PIT-4)
Joller, C. R. (A)
Mink, R. E. (M)

Altoona (PIT-4)
Gamber, F. S. (M)
Schwartz, E. (M)
Fairey, T. E. (M)
Grace, J. N. (M)
Sander, H. F. (M)

Bethlehem (P-LV-3)
Birdsboro (PHI-R-3)
Dominicis, J. W. (A)
Harcar, A. R. (A)

Blawnox (PIT-4)
Belinsky, O. A. (A)

Blue Bell (PHI-3)
Kleslich, W. G. (M)
Parnell, J. (M)
Simon, W. (M)
Van Name, J. M. (M)

Boalsburg (CP-4)
Ayres, D. T. (A)
Bennett, P. E. (M)
Harris, D. E. (SM)
Kazrocki, F. E. (M)
Sechrist, C. F., Jr. (M)
Slear, L. S., Jr. (M)
Smilley, C. R. (A)

Brackenridge (PIT-4)
Monnier, H. E. (M)

Braddock (PIT-4)
Zygmunt, H. J. (M)

Bradford (EMP-4)
Bradford Woods (PIT-4)
Weaver, T. S. (M)
Dawson, A. W. (M)
Lucy, C. J. (M)
Marafioti, J. J. (M)
McIntosh, K. S. (A)
McKnight, G. P. (SM)
Schermerhorn, F. G. (A)
Shaw, M. R. (M)

Bridgeport (PHI-3)
Berkowitz, M. (SM)
Busch, E. G. (M)

Bridgeville (PIT-4)
Tury, S. F. (A)

Bristol (PHI-3)
Annett, M. E. (A)

Brookville (EMP-4)
Calvert, R. B. (M)
Emerick, L. C. (M)
Georgek, S. C., Jr. (M)
Porsch, A. W. (M)
Say, D. L. (M)

Broomall (PHI-3)
Benn, R. E. (M)
Boonin, N. B. (M)
Caplan, D. I. (M)
Disson, S. B. (SM)
Eells, W. A. (M)
Gray, R. L., Jr. (M)
Keesler, F. L. (M)
Marshall, D. E., Jr. (A)
Mason, E. A. (M)
Mercado, P. D. (A)
Muroff, J. M. (A)
Neely, E. H. (M)
Picus, F. (M)
Scalzetti, M. R. (M)
Sprouse, R. T. (A)
Streater, A. L. (M)
Thompson, G. H., Jr. (A)
Walkling, R. W. (M)
Wylen, J. (M)
Zechter, S. (SM)

Bryn Mawr (PHI-3)
Anderson, R. F. (M)
Bartlett, F. F. (M)
Chow, C. K. (M)
Crouse, R. T. (M)
Gardiner, F. J. (SM)
Gyllenhaal, P. R. (A)
Harman, C. F., Jr. (A)
Hertzberg, J. M. (M)
Hyde, H., Jr. (A)
Kimp, H. D. (SM)
Marshall, J. N. (M)
Rawle, J., III (A)
Reich, A. L. (SM)
Simons, K. A. (M)
Sohmer, R. G. (M)
Sumerlin, W. T. (SM)

Bethlehem (P-LV-3)
Brosious, D. R. (M)
Downing, H. L. (VA)
Elder, H. E. (A)
Fisher, R. E. (M)
Karakash, J. J. (SM)
Kircher, C. J. (M)
Larky, A. I. (M)
Lisle, J. (M)
Long, T. P., Jr. (M)
McCracken, L. G., Jr. (SM)
Posivak, J. S., Jr. (M)
Simpson, R. H. (M)
Slocum, L. V. (M)
Stauffer, R. E. (M)
Trotta, J. (M)
Wagner, R. E. (M)
Wahl, A. (M)

Bustleton (PHI-3)
Just, G. A. (A)

Butler (PIT-4)
Hitzel, J. M. (M)
Lewis, W. I. (M)
Olmsted, R. W. (M)
Wakeman, C. B. (M)

Campbelltown (PHI-L-3)
Egan, S. H. (A)

Camp Hill (PHI-L-3)
Austin, R. C. (A)
Berry, J. D. (M)
Eisenhard, S. E., Jr. (M)
Mac Donald, R. M. (A)
Morris, G. W. (M)
Peterson, R. K. (M)
Sponeybarger, J. O. (M)

Canonsburg (PIT-4)
Lybarger, S. F. (SM)
Sulkowski, E. L. (M)

Carbondale (PHI-3)
Gumpert, D. F. (M)
Watson, R. R. (M)

Carlisle (PHI-L-3)
Fourlas, N. J. (A)
Hoffman, P. R. (SM)
Mann, C. W. (A)
Meyers, K. D. (M)
Ryesky, S. D. (M)
Van Gavree, R. L. (A)

Carlisle Barracks (PHI-L-3)
Bernard, J. T. (M)
Goodrich, R. H. (M)

Carnegie (PIT-4)
Wintriss, G. V. (A)

Carversville (PHI-3)
La Sota, L. S. (A)
Maser, F. A. (A)

Center Valley (P-LV-3)
Bloom, R.D. (A)

Central City (PIT-4)
Hackman, H.R. (M)

Centre Hall (CP-4)
Campbell, H. L., III (M)
Dunn, L. R. (M)

Chalfont (P-LV-3)
Brenner, W.F. (A)
Curtis, C.T. (M)
Doelp, W. L., Jr. (A)
Koos, E.E. (M)

Cheltenham (PHI-3)
Alter, A.R. (SM)
Eckert, J.R., Jr. (A)
Himmer, F., Jr. (SM)
Hoagland, C.C. (SM)
Pinter, P.J. (M)
Sheldon, H.W. (SM)
Urban, S.J., Jr. (M)

Chester (PHI-3)
Desantis, Z.S. (M)
Ebert, H.K., Jr. (M)
Hyypolainen, E.K. (A)
Jasinski, A.J. (M)
Lind, E.N. (M)
McLaughlin, J.A. (M)
Root, W.E. (M)
Trumper, D.K. (A)

Cheswick (PIT-4)
Carter, E.L., Jr. (M)
Lee, C.H. (M)
Murray, D.W. (A)
Peters, J.E. (M)

Churchville (PHI-3)
Kirk, D., Jr. (M)
Sysko, S.J. (M)
Uphoff, F.B. (A)

Clarks Green (PHI-3)
Blackford, W. (SM)
Campbell, S.V. (M)
Moeller, K.F.W. (M)

Clarks Summit (PHI-3)
Cerva, C.H. (A)
Perkins, G.O. (M)
Thomas, J.E. (SM)
Winkler, R.H. (M)

Clarendon (EMP-4)
Haines, H.M. (M)

Clearfield (EMP-4)
Bolton, S.W. (M)
Boyd, J.C. (SM)
Diehl, W.F. (F)
Hosoda, J. (A)
Little, D.R. (M)
Wallace, R.P. (SM)

Clifton Heights (PHI-3)
Allen, G.P. (A)
Bradley, W.E. (M)
Kozikowski, J.L. (M)
Lobel, D.J. (M)
Lombardini, P.P. (SM)
Werbickas, J.P. (A)

Collegeville (PHI-3)
Burleigh, R P. (M)
Smith, R M. (A)

Collingdale (PHI-3)
Hart, J. W. (M)
Minahan, W. G. (M)

Columbia (PHI-L-3)
Horst, R. L. (M)

Conemaugh (PIT-4)
Yasko, R. N. (M)

Conestoga (PHI-L-3)
Landis, C. G. (M)

Connellsville (PIT-4)
Gillott, D. H. (M)

Conshohocken (PHI-3)
Anderson, E. A., Jr. (M)
Blumenthal, E. I. (M)
Milliken, E N. (A)
Ruf, F. C. (M)
Wells, G. H. (M)
Williams, D. E. (M)

Coopersburg (P-LV-3)
Miller, R. F. (M)

Coraopolis (PIT-4)
De Lutis, T. (M)

Cornwells Heights (P-LV-3)
Baskin, E. B. (A)
Douthwaite, W., Jr. (M)

Coudersport (EMP-4)
Du Bois, A. F. (M)

Crafton (PIT-4)
Slippach, F. W., Jr. (M)

Cumberland (PIT-4)
Duckworth J. J (M)

Curwensville (EMP-4)
Bowman, D. P (M)

Custer City (EMP-4)
Salter, E. (M)

Cynwyd (PHI-3)
Follenssee, W R. (A)
Prywes, N S. (M)

Darby (PHI-3)
Ross, W. F., Jr. (M)

Delmont (PIT-4)
Gwyn, C. B., Jr. (SM)

Delphi (PHI-3)
Richard, C D., Jr. (M)

Devon (PHI-3)
Bell, P. F. (M)
Denk, W. E (M)
Griffin, J. T. (M)
Hauptli, J. T. (A)
Zomber, G. L. (M)

Dickson City (PHI-3)
Dunn, J. E. (M)
Srebro, J. L. (A)

Dillsburg (PHI-L-3)
Zerby, A. B (M)

Downington (PHI-3)
Bittmann, E. E. (M)
Jensen, D. W. (M)

Doylestown (PHI-3)
Benecke, H. O. (SM)
Biggs, J. A. (M)
Cole, W. G. (M)
Davis, R. W., Jr. (SM)
Gerlach, G. G. (SM)
Mulherin, E. M. (M)
Schweitzer, R. W. (M)
Smith, A. W. (A)
West, H. (M)

Dresher (PHI-3)
Spleiman, H. (M)

Drexel Hill (PHI-3)
Boyajian, M. M. (A)
Chudleigh, W. H., Jr. (SM)
Dimmler, H. F., Jr. (M)
Dorsey, J. C. (M)
Free, A. L. (M)
Ley, G. S. (SM)
Marcovitz, M. W. (M)
Morris, C. R. (M)
Murel, F. (M)
Neel, J. M. (M)
Rosenberg, H. (M)
Schlenger, J. I. (M)
Shattuck, C. J. (M)
Stobbart, A. J. (M)
Webster, J. J. (M)

Drifton (PHI-3)
Kistan, C. A. (M)

Dry Run (PHI-3)
Worthington, F. M. (M)

Du Bois (EMP-4)
Bley, L. H. (M)
Kunst, A. F. (M)
McCarvey, H. J. (M)
Winters, W. J. (M)

Dunlo (PIT-4)
Cimba, J. (M)

Dunmore (PHI-3)
Reiner, C. (A)

Duquesne (PIT-4)
Laycak, J. F. (M)

Duryea (PHI-3)
Panick, R. J. (M)

East McKeesport (PIT-4)
Queer, P. R. (A)

Easton (P-LV-3)
Athar, R. M. (M)
Berk, D. M. (A)
Conover, L. J. (SM)
Duncan, J. R. (M)
Fellendorf, G. W. (M)
Gebhardt, F. L. (M)
Heller, L. J. (A)
Jackson, I. S. (A)
Kressman, J. H. (M)
Overton, D. A. (M)
Robertson, G. C. (M)
Slavics, J. W. (A)
Smith, F. W. (SM)
Volk, J. H. (M)
Waer, R. R. (M)

East Petersburg (PHI-L-3)
Hammersand, F. G. (M)
Morrell, A. M. (M)

East Pittsburgh (PIT-4)
Basista, J., Jr. (M)
Blewitt, D. D. (M)
Brown, B. K., Jr. (A)
Buckler, P. F. (A)
Crawford, R. G. (M)
Ferguson, R. W. (M)
Marusich, E. A. (M)
McDonald, J. (A)
Steinbruegge, H. A. (M)

Edwardsville (PHI-3)
Belensky, M. J., Jr. (A)
Korlishin, L. (A)

Elizabethtown (PHI-L-3)
Alger, P. B. (M)
Custer, H. M. (M)
Orr, R. W. (VA)

Elkins Park (PHI-3)
Anton, A. (M)
Blembaum, J. W. (A)
Boreen, H. I. (M)
Caldwell, W. H. (SM)
Dahlin, E. B. (M)
Feigenbaum, I. A. (M)
Focht, L. R. (M)
Francis, W. A. (M)
Gruen, H. (M)
Jacoby, N. (M)
Kaufmann, H. L. (M)
Kirsch, A. L. (SM)
Kraus, M. H. (M)
Krutter, H. (SM)
Levene, M. (M)
McGuire, T. J. (A)
New, R. (M)
Porter, H. F. (SM)
Rath, H. B. (M)
Rojas, R. R. (M)
Rothschild, L. I., Jr. (SM)
Schreyer, F. J. (M)
Sink, J. A. (A)
Suckle, B. W. (A)
Swartz, M. D. (A)
Valliere, E. G. (A)
Zaslav, B. (A)

Ellwood City (PIT-4)
Powell, K. F. (A)

Emmaus (PHI-3)
Gingrich, C. C., Jr. (M)

Emporium (EMP-4)
Ackman, C. W. (M)
Ackman, H. E. (SM)
Allgaier, W. A. (SM)
Baldwin, A. V. (SM)
Beeney, D. W. (M)
Bergdahl, R. F. (A)
Bisso, R. J. (SM)
Boden, E. H. (SM)
Boots, W. K. (SM)
Brunner, G. V. (SM)
Buescher, W. E. (SM)
Burwell, A. C., Jr. (SM)
Campbell, V. H. (SM)
Carlson, L. L. (M)
Carlstrom, T. H. (SM)
Clark, J. H. (M)
Clausen, R. P. (SM)
Conner, F. L. (A)
Cooley, R. M. (SM)
Curry, G. T. (SM)
Dander, D. A. (SM)
Detweiler, J. E. (A)
Dolnick, A. L. (SM)
Douglass, C. F. (SM)
Dresser, S. R., Jr. (M)
Erdle, P. J. (SM)
Fromell, H. J. (SM)
Gausman, T. E. (SM)
Goodman, H. L. (M)
Gorman, V. R. (A)
Grubbe, V. P. (M)
Heitner, A. J. (M)
Hench, H. S., Jr. (M)
Hendrickson, C. C. (SM)
Herbert, H. W. (SM)
Kackauskas, J. J. (M)
Kamler, H. V., Jr. (M)
Keenan, C. H. (A)
Klees, E. C. (M)
Klinestiver, G. H., Jr. (M)
Lambert, R. L. (SM)
Lantzy, W. E. (A)
Maguire, L. R. (SM)
McKain, J. L. (SM)
McNaughton, R. A. (M)
Melzer, H. (M)
Metzler, F. A., Jr. (A)
Mueller, W. P. (SM)
Murphy, W. A. (M)
Neuber, R. E. (SM)
Northrup, R. M. (A)
Overmier, E. E. (SM)
Palen, H. A. (M)
Palmateer, R. E. (SM)
Pawlikowski, S. L. (M)
Peterson, A. W. (SM)
Pope, L. A. (A)
Quint, G. L. (A)
Reitz, N. J. (SM)
Robbins, J. D. (SM)
Rolf, W. R. (SM)
Sassaman, P. H. (SM)
Schultz, A. J. (SM)
Schwender, L. D. (M)
Sember, W. J. (M)
Simon, P. R. (M)
Slinkman, R. W. (SM)
Snyder, V. D. (M)
Stengel, E. S. (SM)
Stumpff, H. G. (SM)
Summers, G. L. (M)
Veroason, D. L. (SM)
Walsh, R. J. (SM)

Erie (ERI-1)
Blais, P. D. (A)
Blakeley, F. J. (M)
Bova, A. S. (A)
Davidson, A. R. (SM)
Ehrman, P. B. (M)
Fisch, A. (M)
Flowers, R. B., Jr. (M)
Foster, J. H. (SM)
Gluck, F. (SM)
Gray, R. B. (SM)
Harding, G. D. (A)
Heibel, J. D. (M)
Herrick, H. S. (M)
Hestor, K. L. (M)
Klevans W. L. (M)
Lodge, A. (A)
Minnium B. B. (F)
Nedreski, R. J. (A)
Ozechoski, A. T. (A)
Page, R. S. (M)
Presutti, B. D. (A)
Rochin, D. W. (A)
School, P. D., Jr. (A)
Shafer, W. A. (A)
Smith, D. H. (M)
Sterner, P. E. (M)
Swanson, W. A. (M)
Taylor, G. P. (M)
Tuznik, R. H. (M)
Van Arsdell, J. C., Jr. (M)
Vieira, J. E. (A)
Werner, G. L. (M)
Windsor, R. T. (A)
Wolfskill, J. M. (M)
Young, F. R. (M)

Export (PIT-4)
Jones, G. E., Jr. (M)
Putkovich, R. P. (A)

Exton (PHI-3)
Reisener, W. C., Jr. (M)

Fairless Hills (PHI-3)
Gallagher, J. E. (A)

Fallsington (PHI-3)
Maddox, J. A. (M)

Flourtown (PHI-3)
Bartels, H. C., Jr. (A)
Bruno, A. (M)
Chase, B. G. (A)
Kishpaugh, A. W. (M)
Lynch, C. V., Jr. (M)
Marcus, H. M. (A)
O'Brien, J. F., Jr. (A)
Perkins, H. A., Jr. (M)
Spindler, C. W., Jr. (SM)

Folcroft (PHI-3)
Cunningham, W. G. (M)
Will, H. C. (M)

Ford City (PIT-4)
Tihanovich, W. P. (A)

Forest City (PHI-3)
Jergel, R. F. (A)

Fort Washington (PHI-3)
Jacoby, M. (M)
Price, R. (A)
Schantz, J. S. (VA)

Frackville (PHI-3)
Cooper, E. J. (M)
Troyanoski, W., Jr. (M)

Freedom (PIT-4)
Swartz, F. E. (A)

Fullerton (P-LV-3)
Moyer, R. H. (M)
Schelrer, R. D. (M)

Gettysburg (PHI-L-3)
Caln, M. F. (M)

Gibsonia (PIT-4)
Hause, J. C. (A)

Gladwyne (PHI-3)
Dever, J. A. (M)
Eckert, J. P., Jr. (F)
Owings, J. L. (M)

Glassport (PIT-4)
Leib, F. E. (M)
Pudlak, A. (A)

Glen Lyon (PHI-3)
Wright, J. E. (M)

Glen Mills (PHI-3)
De Prisco, C. F. (A)

Glenolden (PHI-3)
Stott, H. B. (SM)

Glenshaw (PIT-4)
Horlbeck, W. E. (M)
Komar, J. C. (M)
Springer, C. J. (A)
Suter, S. G. (M)
Van Nice, R. I. (M)

Glenside (PHI-3)
Beardwood, J. T., III (M)
Beaumont, W. H. (M)
Bobb, L. J. (M)
Brown, D. G. (A)
Chedaker, J. (A)
Irwin, R. R. (A)
Montgomery, A. P. (SM)
Plotkin, I. (M)
Stein, H. B. (SM)
Taylor, J. R. (M)
Wilson, H. R. (M)
Wood, H. O. (SM)

Gouldsboro (PHI-3)
Pellck, J., Jr. (A)

Green Lane (PHI-3)
Rabb, J. W. (M)

Greensburg (PIT-4)
Baldwin, C. H. (SM)
Bosted, N. P. (A)
County, C. H. (M)
Lamorte, M. F. (A)
Lynch, R. D. (M)
New, T. C. T. (M)
Weber, E. V. (M)

Greenville (PIT-4)
Greene, R. L. (M)
Schomburg, W. K. (M)

Gwynedd Valley (PHI-3)
Robinson, R. R. (A)

Hanover (PHI-L-3)
Rohrbaugh, P. A. (A)

Harborcreek (ERI-1)
Challstrom, K. I. (M)

Harrisburg (PHI-L-3)
Fuller, R. S. (M)
Harris, T. R. (A)
Heist, H. E., Jr. (A)
Holcombe, M. M. (SM)
Kelley, O. G. (A)
Middleton, W. W. (M)
Moretz, L. A. (M)
Peffer, R. M. (M)
Reisch, F. E. (M)
Shuey, D. R., Jr. (M)
Stock, K. A. (M)
Strickland, J. L. (M)
Wachtman, G. S. (SM)
Whitley, J. H. (A)

Hartsville (PHI-3)
Frekot, J. J. (M)
Herrmann, D. C. (M)
Snook, J. E. (M)
Wullert, J. R. (SM)

Hatboro (PHI-3)
Aurelius, K. P. (A)
Ayers, J. B. (M)
Baxter, K. W. (M)
Bearscove, K. O. (M)
Bicking, H. P. (M)
Brooks, C. E. (M)
Bryan, J. S. (M)
Buscher, D. G. (M)
Butterfoss, E. J. (A)
Cramton, F. N. (A)
Dietz, W. J. (A)
Doerfel, H. V. (M)
Ezoly, M. A. (A)
Fedde, G. A. (M)
Fitzpatrick, J. F. (M)
Foley, T. J. (M)
Fortini, M. M. (M)
Gleiter, W. C. (M)
Godley, W. P. (A)
Harrison, R. K. (M)
Hollander, M. (M)
Johnson, E. G. (SM)
Karew, J. J. (M)
Krouse, R. H. (A)
Krishnaswamy, P. B. (M)
Lichtenfels, J. L. (M)
Long, M. L., Jr. (SM)
Martin, H. B. (M)
Massey, T. J., Jr. (M)
McWilliams, C. R. (M)
Miles, T. J. (SM)
Miller, R. L. (M)
Patterson, T. A., Jr. (A)
Richter, H. K. (A)
Roschen, J. (M)
Saboe, J. (M)
Senulis, R. E. (M)
Steele, E. R. (M)
Suter, H. (SM)
Swanson, C. I. (A)
Tiley, J. W. (SM)
Trieb, M. (M)
Twist, G. A. (M)
Williams, G. C. (M)

Hatfield (PHI-3)
Barclay, F. T. (M)
Insinger, R. H., Jr. (M)
Smith, D. J. (A)

Haverford (PHI-3)
Benham, T. A. (SM)
Crawford, A. L., Jr. (SM)
Rauch, R. M. (A)
Schwennesen, D. (M)
Weiner, J. R. (SM)

Havertown (PHI-3)
Andes, J. H. (A)
Apolito, P. L. (M)
Beck, J. J. (SM)
Consalvi, A. L. (SM)
Crawford, C. S., Jr. (A)
Crockett, J. G. (M)
Currie, A. H. (M)
Deacon, N. E. (M)
Devenny, C. F., Jr. (M)
Dougherty, J. W. (M)
Dytrt, L. F. (M)
Eschner, A. H. (M)
Fulmer, J. W. (M)
Gilligan, T. E., Jr. (M)
Hastings, J. A. (M)
Henry, A. T. (A)
Kauders, R. M. (M)
Koch, J. F., Jr. (SM)
Ladenson, M. (A)
Liston, J. (A)
Lund, G. E. (M)
Meyer, S. (M)
Miehle, W. (M)
Mustico, J. (A)
Napolitano, P. (M)
Patchell, T. A. (M)
Reid, J. M. (M)
Robinson, C. W. (M)
Sachs, A. F. (M)
Satterthwaite, W. F. (M)
Sohon, H. (SM)
Titus, C. H. (M)
Wise, B. (A)
Woll, C. F. (SM)
Wynne, J. J. (M)
Zappacosta, A. D. (M)

Hazleton (PHI-3)
Butterwick, G. N. (A)
Gans, J. S. (A)
Lindermuth, G. (A)
Steckert, J. W. (M)
Walker, M. J. (M)

Hellam (PHI-L-3)
Megargel, L. R., Jr. (M)
Schmidt, E. W. (M)
Swengel, R. C. (A)

Hershey (PHI-L-3)
Smith, E. C. (M)

Highspire (PHI-L-3)
Miller, P. M. (M)

Hilliards (PIT-4)
Boyd, D. B. (A)

Holicong (PHI-3)
Dulberger, L. H. (M)

Holland (PHI-3)
Schwartzberg, H. L. (M)

Hollidaysburg (PIT-4)
Kilgore, W. (M)

Holmes (PHI-3)
Warner, H. (M)

Homestead Park (PIT-4)
Cauley, T. K. (M)

Horsham (PHI-3)
Bucks, R. M. (A)
Tremblay, H. G. (A)

Houston (PIT-4)
Wagner, F., Jr. (A)

Huntingdon Valley (PHI-3)
Angell, J. B. (SM)
Boothroyd, W. P. (F)
Borden, C. C. (A)
Brady, P. B. (SM)
Erle, S. D. (M)
Forell, H. K. (A)
Freeland, E. C. (SM)
Freeland, H. E. (M)
Gilman, H. (M)
Goetze, A. J. (M)
Gumas, G. (A)
Hayward, J. W. (M)
Hoffman, M. (M)
Jensen, R. D. (M)
Lee, C. F. (A)
Lorant, L. (SM)
Matthews, A. C. (SM)
Moore, R. C. (F)
Munster, A. C. (SM)
Oliver, W. G. (M)
Riebman, L. (M)
Riester, H. A. Jr. (M)
Ruehlemann, H. E. (SM)
Schulze, H. E. (M)
Spieler, A. (A)
Thompson, M. L. (SM)
Vallette, C. N. (M)
Vaughan, T. J. (M)
Weinberg, L. (M)
Welsh, W. J. (M)
Williams, M. A. (SM)

Indiana (PIT-4)
Hitchcock, R. C. (SM)

Irwin (PIT-4)
Brook, A. (A)
Heess, E. L. (M)
Jud, H. G. (M)
Kinder, H. R. (M)
Mucci, G. (M)
Place, W. P. (M)
Ratsch, H. J. (M)
Riemersma, H. (M)
Rowe, J. (M)
Wagner, H. A. (SM)
White, C. W. (A)
Wissman, A. J. (M)
Wright, E. B. (M)

Ivyland (PHI-3)
Erickson, M. L. (A)
Lee, W. S. (M)
Rogers, D. H. (M)

Jamison (PHI-3)
McClure, K. M. (M)

Jeannette (PIT-4)
Chick, R. F. (A)
Kitchel, O. D. (M)
Mulica, A. R. (M)

Jeddo (PHI-3)
Kallessar, J. J. (M)

Jenkintown (PHI-3)
Caplan, N. (SM)
Clark, W. R. (SM)
Frear, W. (SM)
Glasby, W. E. (M)
Hill, J. E. (M)
Husband, R. R. (M)
Koehler, J. F. (SM)
Lanagan, J. G. (A)
Laurent, G. J. (SM)
Liebscher, A. (SM)
McClarren, R. H. (SM)
Myers, A. S. Jr. (SM)
Namaroff, J. H. (SM)
Overdeer, R. H. (M)
Peltz, W. J. (SM)
Sepahban, A. H. (A)
Stewart, G. H., III (M)

Jersey Shore (WIL-4)
Johnson, C. E. (M)

Johnstown (PIT-4)
Campbell, T. E. (A)
Friedman, M. I. (A)
Kocsan, E. S. (M)
Shostek, R. E. (M)
Smith, R. F. (M)
Sodano, R. D. (A)
Straub, N. L. (A)
Treimer, J. A. (M)
Vrooman, A. L. (A)
Wood, J. E., Jr. (M)

Johnsville (PHI-3)
Kemp, J. C., Jr. (M)
Nupp, W. D. (A)
Pickett, H. D. (A)
Polhemus, G. C. (M)
Sander, R. E. (M)
Stobie, E. F. (M)
Vasaka, C. S. (SM)
Walker, H. R. (M)

Karthaus (EMP-4)
McMillan, R. E. (SM)

Kennerdell (PIT-4)
Smith, S. A. (A)

King Of Prussia (PHI-3)
Attarian, R. V. (M)
Dix, T. S., Jr. (SM)
Galbraith, J. R. (M)
Gregory, T. R. (M)
Hamill, R. V. (M)
Hand, G. C., Jr. (M)
Holeczy, A. A. (A)
Joos, J. W. (M)
Kutner, N. H. (M)
Lally, V. E. (M)
Levy, L. G. (M)
Longo, J. F. (M)
Millet, M. R. (M)
Osbahr, B. F. (SM)
Regan, J. V., Jr. (M)
Rosen, H. H. (SM)
Schneider, R. P. (M)
Seely, E. E. (M)
Selinsky, J. J. (M)
Sweigart, A. S. (A)
Weaver, R. L. (M)
Wright, J. A. (M)

Kingston (PHI-3)
Sakoski, C. (A)

Kittanning (PIT-4)
Golla, E. F. (SM)

Kutztown (PHI-R-3)
Tawney, G. L. (SM)

Lafayette Hill (PHI-3)
Bloomsburgh, R. A., Jr. (M)
Clark, W. A. (M)
McKee, G. R., Jr. (M)
Scott, C. H., Jr. (M)
Zuck, R. A. (A)

Lake Ariel (PHI-3)
Grimditch, W. H. (SM)
Harris, W. C. (M)

Lake Lynn (PIT-4)
Shibler, W. (A)

Lakeville (PHI-3)
Greenfield, J. C. (M)

Lampeter (PHI-L-3)
Damon, P. P. (A)

Lancaster (PHI-L-3)
Almond, W. R. (M)
Ayer, R. B. (SM)
Bedrosian, P. G. (A)
Beidler, R. T. (M)
Bennett, W. P. (SM)
Bixler, R. T. (SM)
Block, F. G. (M)
Brackbill, C. R. (SM)
Brown, B. B. (M)
Burnett, C. E. (SM)
Class, J. S. (A)
Comins, A. W. (SM)
Craig, M. E. (M)
De Laney, W. B. (M)
Des Rochers, R. D. (M)
Doner, C. E. (M)
Dreyer, K. (SM)
Duckworth, G. W. (M)
Dyall, W. T. (SM)
E'Del, R. R. (M)
Enck, F. D. (SM)
Epstein, D. W. (F)
Evans, J. (M)
Fendley, J. R., Jr. (A)
Forman, J. M. (M)
Free, J. J. (A)
Freund, W. H. (M)
Gadbois, G. S. (A)
Gaylord, J. W. (M)
Grimm, A. C. (SM)
Hagmann, R. W. (SM)
Handel, R. R. (SM)
Hansell, G. E. (A)
Harsh, M. D. (M)
Hatzikyriakos, P. P. (M)
Headrick, L. B. (F)
Herman, L. C. (SM)
Hershenson, L. H. (M)
Hillegass, H. N. (M)
Hoover, M. V. (M)
Johnson, J. K. (SM)
Kaseman, P. W. (M)
Kitchen, R. F. (M)
Kuwabara, T. (M)
Mandell, G. E. (A)
Mark, J. T. (A)
Mathiot, J. E. (M)
McLaughlin, K. M. (SM)
McNees, S. G. (M)
McNickle, R. E. (M)
Mengle, L. I. (M)
Metzger, P. A. (M)
Miller, L. D. (M)
Moodey, H. C. (SM)
Nekut, A. G. (SM)
Parker, W. N. (SM)
Pickard, J. B. (M)
Quinn, J. L., Jr. (M)
Ranson, D. J. (M)
Reed, R. E. (M)
Rogers, H. L. (M)
Rotow, A. A. (SM)
Schumacher, R. T. (M)
Scott, G. W., Jr. (SM)
Seelen, H. R. (SM)
Siegler, H. B. (A)
Sinclair, R. R. (A)
Smith, C. P. (SM)
Spangler, R. G. (A)
Spitzer, E. E. (F)
Stern, S. (A)
Stone, R. P. (SM)
Stoudenheimer, R. G. (SM)
Sweet, A. P., Jr. (M)
Trout, D. R. (M)
Trytko, E. F. (A)
Uyeda, Y. (M)
Van Asselt, R. L. (SM)
Van Orner, D. D. (M)
Veith, F. S. (SM)
Vine, B. H. (SM)
Warshaw, J. (M)
Weaver, J. L. (M)
Wenger, L. S. (SM)
Wenger, R. S. (SM)
Yingst, T. E. (M)
Zachariason, R. H. (SM)
Zorger, P. H. (M)

Langhorne (PHI-3)
Bayliss, B. F. (M)
Brown, J. N. (M)
Cooley, C. C., Jr. (A)
Ryan, T. J. (SM)

Lansdale (PHI-3)
Bonk, P. J. (M)
Carney, R. W. (M)
Clarke, C. E. (M)
Gable, N. P. (M)
Granger, B. W. (A)
Gray, C. R. (M)
Halmowitz, B. (M)
Ishler, H. K. (SM)
Levy, S. L. (SM)
Lyle, A. E. (SM)
Mandelkorn, R. S. (SM)
McCotter, J. D., Jr. (A)
Misra, R. P. (SM)
Moll, W. H. (M)
Mosenkis, R. (M)
Pratt, G. W. (M)
Schlegel, E. S. (M)
Schmitz, C. F., Jr. (A)
Schnable, G. L. (A)
Sluss, J. A., Jr. (SM)
Smith, W. E. (M)
Spencer, G. R. (F)
Tague, C. B., Jr. (M)
Thornton, C. G. (SM)
Waite, G. C. (M)
Wells, R. J. (M)

Lansdowne (PHI-3)
Ambrogi, J. N., Jr. (M)
Brumbaugh, J. M. (SM)
Candell, G. W. (M)
Ellis, D. J. (M)
Felton, W. W. (SM)
Foster, W. P. (M)
Holdsworth, R. M., Jr. (A)
Pappas, C. (M)

Latrobe (PIT-4)
Albert, D. E. (M)
Dom Thomas, J. E. (M)
Guidos, B. W. (A)
Monari, A. J. (A)

Lemoyne (PHI-L-3)
Smiley, W. A. (VA)

Laureldale (PHI-R-3)
Anron, I. (A)
Embree, M. L. (A)
Miller, L. E. (SM)

Lebanon (PHI-L-3)
Horst, E. P. (M)
Kiscadden, G. G. (M)

Levittown (PHI-3)
Abrams, J. J. (M)
Aires, R. H. (M)
Amodei, J. J. (M)
Azarem, D. (M)
Barnes, W. L. (M)
Barnette, W. E. (A)
Bell, C. V. (M)
Bensky, L. S. (M)
Bernbaum, L. M. (M)
Bernstein, F. (A)
Bloss, R. C. (M)
Boardman, H. B. (M)
Boys, H. N. (A)
Bradshaw, G. V., Jr. (M)
Brechling, G. E. (M)
Bressler, J. E.
Bushy, J. W. (M)
Charton, S. (M)
Cohen, I. (A)
Coleman, A. H. (M)
Colodny, S. H. (SM)
Darack, O. C. (A)
Darling, D. C. (M)
Dennen, W. B., Jr. (M)
Dixon, G. P. (M)
Dunn, T. E. (M)
Eby, J. A. (M)
Eckert, F. A. (M)
Elgner, H. (SM)
Elion, H. A. (M)
Elkin, H. A. (SM)
Ewald, W. J. (A)
Farrelly, R. J. (A)
Faust, E. J. (M)
Fink, E. A. (M)
Finn, H. M. (SM)
Foster, L. E. (M)
Fox, E. C. (M)
Furstein, R. A. (M)
Garber, H. N. (M)
Given, W. H., III (A)
Gleason, H. H. (SM)
Goldstone, J. R. (M)
Greenfield, J. D. (M)
Hacking, C. (SM)
Halprin, J. (A)
Haneman, W. J. (M)
Heinaman, H. B., Jr. (M)
House, H. J. (M)
Hsueh, C. Y. (M)
Insalaco, P. J. (A)
Jackson, W. K. (M)
Jessen, F. A., Jr. (M)
Johnston, J. B., Jr. (M)
Junker, E. S. (M)
Jurkevich, I. (A)
Kaden, G. (M)
Kaskey, G. (SM)
Krieg, S. (M)
Lamnin, M. (M)
Lathrop, P. A. (M)
Levine, S. A. (A)
Li, K. (A)
Lieberman, E. (M)
Ludwiczak, T. A. (M)
Miller, E. (M)
Miller, W. A. (M)
Mondress, M. (M)
Murr, R. H. (M)
Nachman, M. W. (M)
Nichols, R. R. (A)
Ogawa, H. F. (A)
Pitts, W. L. (SM)
Postman, M. H. (M)
Potosky, M. (M)
Powell, W. F., Jr. (M)
Raciti, S. A. (A)
Reust, R. H. (M)
Richards, R. E. (M)
Riley, P. J. (M)
Rosen, B. H. (M)
Shucker, S. (SM)
Silverman, M. (SM)
Slobins, M. (A)
Solomon, H. (A)
Sullivan, F. J. (M)
Susskind, I. N. (M)
Szumila, A. D. (A)
Terrell, R. L. (M)
Titelsky, E. J. (M)
Trilling, T. R. (M)
Turner, R. J. (M)
Turtil, J. F. (M)
Ustin, L. T. (M)
Walberg, A. G. (M)
Weinberg, A. D. (A)
Weinheimer, F. E. (A)
Weisman, S. M. (M)
Wilcox, J. E. (M)
Wood, R. F., Jr. (SM)
Wydro, W. S. (A)
Zeiger, K. K. (M)

Lewisburg (WIL-4)
Irland, G. A. (M)
Mathias, J. P. (A)
Walker, R. C. (M)
Webb, H. E. (M)

Lewistown (WIL-4)
Gardner, G. F. (M)

Liberty (ELM-C-1)
Frutiger, W. A. (M)

Line Lexington (PHI-3)
Schramm, J. A. (M)

Lititz (PHI-L-3)
Grosh, J. B., III (M)
Sheffy, H. J. (M)

Linglestown (PHI-L-3)
Fritz, W. B. (A)

Lionville (PHI-3)
Lynch, J. T. (M)

Lock Haven (WIL-4)
Cooney, T. D. (M)
Young, G. D. (A)

Lynnport (P-LV-3)
Klingaman, G. W. (M)

Macungie (P-LV-3)
Nelson, M. F. (A)

Malvern (PHI-3)
Balakian, C. (A)
Bedrosian, S. D. (SM)
Briggs, T. H. (SM)
Dowds, T. A. (M)
Durfee, G. H. (M)
Gralinger, A. B. (SM)
Greenblatt, R. C. (A)
Hood, C. E. (SM)
Ivins, W. A. (A)
Pedersen, J. H. (A)
Reiss, H. R. (M)
Skinner, N. W. (A)
Ten Broech, C. A. (M)
Wachter, W. J. (M)
Weisenberger, A. J. (M)

Manor (PIT-4)
Anderson, J. W. (A)

Maple Glen (PHI-3)
Wood, W. M. (A)

Marcus Hook (PHI-3)
Alexander, F. C., Jr. (SM)
Imboden, H. B. (SM)
Smith, O. J., III (M)

Marietta (PHI-L-3)
Oboryshko, H (M)

Mars (PIT-4)
Berninger, J. W. (A)

McAdoo (PHI-3)
Student, S. G. Jr. (M)

McKeesport (PIT-4)
Andrews, F. J. (M)
Levine, M. (M)
Morabito, R. A. (M)
Vogt, W. G. (M)

McKees Rocks (PIT-4)
Vargo, M. S. (M)
Zellner, F. L. Jr. (A)

Meadowbrook (PHI-3)
Bingley, F. J. (F)
Dolberg, C. E. (SM)
Fink, D. G. (F)
Forsyth, W. A. Jr. (M)
Greenwood, R. W. (M)
Lukens, R. Jr. (SM)
Reynolds, V. F. (M)
Sheppard, C. B. (M)
Walker, H. (VA)

Meadville (PIT-4)
Brown, R. L. (M)

Mechanicsburg (PHI-L-3)
Green, R. H. (A)
Lerch, D. P. (M)
Miller, H. E. (A)
Russell, J. D. (M)
Sechrist, W. S. (A)

Media (PHI-3)
Bargellini, P. L. (SM)
Bigelow, R. P. (A)
Celent, C. M. (M)
Gray, H. J., Jr. (M)
Kinkead, W. K. (M)
Miller, A. F. (M)
Rhea, H. E. (M)
Salati, O. M. (SM)
Schilpp, J. W. (M)
Ware, A. R. (M)

Mendenhall (PHI-3)
Stinger, H. J. (M)

Merion (PHI-3)
Adamson, R. G. (M)
Colehower, C. H. Jr. (M)
Emurian, A. D. (SM)

Merion Station (PHI-3)
Bonn, T. H. (SM)
Shapp, M. J. (SM)

Meshoppen (PHI-3)
Price, C. F. (M)

Meyersdale (PIT-4)
Baer, W. E. (A)

Middletown (PHI-L-3)
Fostar, M. (A)
Gobel, L. J. (A)
Jankowski, J. A. (M)
Pettersen, E. S. (M)
Steve, W. T. (M)

Millersville (PHI-L-3)
Smith, E. M. (M)
Weaver, J. E. (A)

Mill Hall (WIL-4)
Schnering, C. J. (M)

Mohnton (PHI-R-3)
Fister, T. J. (A)

Monessen (PIT-4)
Pansino, S. R. (M)

Monongahela (PIT-4)
Rockwell, R. R. (A)

Monroeville (PIT-4)
Cilyo, F. F., Jr. (M)
Coleman, W. E. (M)
Decker, R. W. (M)
Di Carlo, V. J. (A)
Hierholzer, F. J., Jr. (M)
Kardos, L. F. (M)
Kitka, E. J. (M)
Locante, J. (A)
Lyman, R. C. (M)
Murray, R., Jr. (A)
Utt, O. L. (M)
Wright, W. L. (A)

Mont Alto (PHI-3)
Clapsaddle, A. B. (M)

Mont Clare (PHI-3)
Kaufmann, H. W. (M)

Montoursville (WIL-4)
Bennett, A. J. (A)

Daley, C. J. (A)
Dowden, W. M. (M)

Montrose (PHI-3)
Flore, W. V. (M)

Moosic (PHI-3)
Kania, A. T. (M)

Morrisville (PHI-3)
Bootherstone, F. B. (A)
Misian, J.D. (M)
Riegel, R. B. (M)
Wieger, J. J. (A)

Morton (PHI-3)
Gaschnig, G. R. (M)

Mount Carmel (WIL-4)
Schneider, C. P. (A)

Mount Holly Springs (PHI-L-3)
Samuelson, W. H. E. (M)

Mount Joy (PHI-L-3)
Dock, S. J., Jr. (A)

Murrysville (PIT-4)
Baker, W. H. (M)
Caywood, W. P., Jr. (SM)
Decker, R. O. (M)
Jones, C. H. (SM)
Klotzbaugh, G. A. (SM)
Uphoff, R. L. (SM)

Myerstown (PHI-L-3)
Sando, G. G. (M)

Nanticoke (PHI-3)
Cancellari, N. J. (M)
Tullai, J. (M)

Narberth (PHI-3)
Auerbach, I. L. (F)
Brustman, J. A. (F)
Clapp, R. G. (SM)
Forstall, E. L. (SM)
Jeffries, S. A. (M)
Tabor, L. P. (SM)
Williamson, J. F. (VA)
Winsor, P., III (SM)

Nazareth (P-LV-3)
Kilpatrick, W. M. (M)

New Britian (PHI-3)
West, W. H. (M)

New Cumberland (PHI-L-3)
Brucklacher, J. E., Jr. (M)
Hanemann, H. A., Jr. (A)
Houck, G. R. (A)
Keat, J. E. (M)

Newfoundland (PHI-3)
Wohlfart, E. (A)

New Hope (PHI-3)
Ansley, A. C. (VA)
Chadwick, P. S. (A)
Goodwin, W. N., Jr. (F)
Karaczan, W. W. (M)
Stitz, K. W. (M)

New Kensington (PIT-4)
Brouwer, N. L. (M)
Hoch, F. R. (M)
Panian, F. C. (M)
Robl, R. F., Jr. (SM)
Signorella, J. E. (A)
Zubek, J. (M)

New Stanton (PIT-4)
Forbes, N. A. (M)

Newtown (PHI-3)
Adezio, L. S. (M)
Beck, K. H., Jr. (M)
Cushman, R. W. (M)
Ghebeles, G. C. (A)
Gould, D. F., II (M)
Lambert, C. R. (M)
Small, H. E. (M)
Yerkes, H. W. (A)

Newtown Square (PHI-3)
Bachofer, H. L. (A)
Dilkofsky, H. (M)
Fussell, R. L. (M)
Garlano, W. F. (SM)
Horwitz, J. D. (A)
Johnson, F. L. (M)
Livesay, R. (A)
Post, M. D. (SM)
Schneider, S. (M)
Shawhan, E. N. (M)
Snyder, C. M. (A)
Thomason, J. F. (M)

Newville (PHI-L-3)
McElwain, J. L. (M)

Nicholson (PHI-3)
Hricko, R. M. (A)

Noble (PHI-3)
Hilliard, D. M. (M)

Norristown (PHI-3)
Anderson, D. C. (M)
Boscia, S. J. (M)
Eisenmann, J. F. (M)
Eisenschmied, M. D. (M)
Flannery, W. E. (M)
Graham, E. C. (M)
Heltemes, R. B. (M)
Innes, F. T. (M)
Kilpatrick, D. G. (SM)
Kirkaldy, A. J., Jr. (A)
Lannutti, A. P. (M)
Lee, F. F. (SM)
Loeper, C. J. (M)
McCallister, J. P. (M)
Merrill, J. E. (A)
Middleton, R. J., Jr. (M)
Nurnberg, R. K. (A)
Oerter, G. W. (M)
Paxson, R. F. (M)
Peszka, S. F. (M)
Pezely, S. J. (M)
Place, S. W. (M)
Rauchwerk, A. (M)
Reardon, P. A. (M)
Roberts, F. R. (A)
Rogers, R. F. (M)
Sandoval, J. (A)
Smock, W. W. (M)
Starr, J. E. (M)
Stauffer, R. F. (M)
Thomas, J. K., II (M)
Webb, D. T. (SM)
Yeaton, R. B. (M)
Zern, R. T. (M)

North Hills (PHI-3)
Deemer, R. W. (M)
Moore, W., Jr. (M)
Stahl, R. W. (M)
Vick, A. J. (M)

North Wales (PHI-3)
Bergstrom, C. J. (A)
Burkart, D. P. (M)
Davis, H., III (M)
Ekiss, J. A. (M)
Fraunfelder, J. A. (M)
Guzewicz, J. F. (A)
Henderson, F. C. (M)
Oplinger, E. J. (M)
Stanwood, R. H. (A)

Norwood (PHI-3)
Biscardi, J. J. (M)

Oakford (PHI-3)
Hoffman, N. N. (M)

Oakmont (PIT-4)
Dimasi, L. A. (M)
Mattes, F. J. (M)
Muffly, G. (SM)

Oley (PHI-R-3)
Franke, R. B. (A)
Noll, E. M. (A)

Orefield (PHI-3)
Allerton, G. L. (SM)

Oreland (PHI-3)
Altemus, W. C. (M)
Clark, E. G. (M)
Comeau, C. P. (A)
Garden, M. (M)
Halsted, C. P. (A)
Hargens, C. W., III (SM)
Jacobs, E. (A)
Keener, C. E. (SM)
Keiper, F. P., Jr. (M)
Lawrence, J. D., Jr. (M)
Lockhart, J. C. (M)
Maher, W. F. (A)
Mehr, E. J. (M)
Nelson, F. H. (M)
Preston, G. W. (SM)
Zwart, C. (M)
Zebrowitz, S. (SM)

Oxford (PHI-3)
Mallalieu, F. R. (SM)

Palmerton (PHI-3)
Swanson, H. E. (M)

Paoli (PHI-3)
Bradley, R. E. (M)
Caldwell, R. P. (M)
Carlson, P. N. (M)
Collier, D. M. (SM)
Dahlberg, R. S., Jr. (SM)
Eble, B. B. (M)
Engelman, J. H. (M)
Engleman, R. (M)
Fasko, E. A. (M)
Faulis, D. R. (A)
Fegley, K. A. (M)
Fissell, C., Jr. (A)
Flanagan, F. M. (M)
Gluck, S. E. (M)
Gotischalk, J. M. (M)
Howard, J. H. (SM)
Hurst, S. R. (M)
Landrey, L. R. (SM)
Lauser, C. T. (M)
Lawson, A. C. (M)
Lerpold, B. A. (A)
Lohse, E. (SM)
McIlwain, K. (F)
Nordling, K. I. (A)
Overmiller, C. M. (M)
Pugh, A. L., Jr. (SM)
Reese, H. E., Jr. (M)
Remily, W. M. (M)
Sowell, J. B. (M)
Starr, D. A., Jr. (M)
Stevens, A. W. (A)
Taylor, H. W. (M)
Witherspoon, J. M. (SM)

Paxinos (WIL-4)
Farr, K. E. (SM)

Penndel (PHI-3)
Evtimenko, A. (A)

Perkasie (P-LV-3)
Soltau, R. H. (M)

Perkiomenville (PHI-3)
Okada, R. H. (M)

Philadelphia (PHI-3)
Abend, K. (M)
Aberth, O. (A)
Adamson, P. R. (M)
Adler, D. G. (M)
Affel, H. A., Jr. (SM)
Albright, R. B. (SM)
Alpert, D. (M)
Amatneek, K. V. (M)
Asseniero, W. L. (M)
Azoff, I. (M)
Bachman, B. E. (M)
Back, G. I. (F)
Ames, M. E., Jr. (M)
Anderson, J. C. (M)
Andress, P. M. (M)
Antharvedi, A. (A)
Bacon, J. R. (M)
Baconnet, J. (M)
Baker, B. A. (M)
Banks, J. (M)
Barney, L. W. (M)
Bartfeld, R. A. (M)
Barth, R. A. (M)
Bartik, W. J. (M)
Barton, R. (M)
Bash, I. F. (M)
Batey, R. W. (A)
Baumann, J. A. (A)
Bazan, S. J. (A)
Beane, T. E. (M)
Beatty, P. H. (M)
Beaver, M. W. (M)
Beckman, C. (M)
Beggs, G. E. Jr. (SM)
Bein, H. F. (M)
Bell, R. R. (M)
Bellramo, J. R. (A)
Belz, R. L. (M)
Benima, D. (A)
Benjamin, J. M., Jr. (SM)
Bennon, M. (M)
Bensinger, C. (A)
Benson, S. E. (M)
Berger, D. (M)
Berger, J. (M)
Berkowitz, R. S. (M)
Beter, R. H. (SM)
Biberman, L. S. (M)
Bieging, G. P. (M)
Bigelow, J. F. (SM)
Birx, D. L. (M)
Bixler, D. A. (M)
Block, I. E. (M)
Blumberg, D. F. (M)
Boghosian, W. H. (M)
Bogusz, J. F. (M)
Bohn, J. L. (SM)
Bonanni, D. A. (A)
Bossi, E. W. (M)
Bowe, C. E., Jr. (M)
Boyle, J. M. (M)
Brachman, R. J. (M)
Bradley, W. E. (F)
Bradshaw, J. L. (M)
Breslow, A. J. (M)
Brawley, H. E., Jr. (M)
Brainerd, J. G. (F)
Brett, G. F. (M)
Brisk, H. L. (A)
Brothers, J. T. (F)
Brown, D. W. (M)
Bruchlos, H. O. (A)
Brunner, D. H. (M)
Buggy, R. V. (SM)
Burger, A. F. (M)
Burgett, M. I., Jr. (SM)
Buzby, J. A. (M)
Bycer, B. B. (SM)
Byers, A. C. (SM)
Byrne, J. J., Jr. (A)
Campbell, J. K. (A)
Campbell, E. R., Jr. (A)
Carapellotti, L. T. (SM)
Carlson, E. G. (M)
Carnuccio, J. N. (M)
Castillo, P. S., Jr. (A)
Cathers, H. W. (A)
Cattafesta, W. M. (M)
Cavileer, F. E. (A)
Chamberlin, N. K. (M)
Chambers, C. C. (F)
Chance, B. (F)
Chang, J. J. (M)
Chapline, J. D. Jr. (M)
Chase, C. T. (SM)
Chatten, J. B. (M)
Cheney, E. A. (M)
Chong, C. F. (A)
Chressanthis, A. G. (M)
Chu, J. C. (M)
Ciamala, D. J. (M)
Ciletti, V. J. (M)
Clark, F. R. (A)
Closson, L. E. (SM)
Coburn, J. M. (M)
Cockrell, J. L. (SM)
Cohen, B. H. (M)
Cola, T. F. (M)
Cole, P. J. (M)
Coles, R. V. (SM)
Colocousis, J. (SM)
Comer, A. J. (A)
Conrad, M. (SM)
Cooperstein, B. D. (M)
Copestakes, J. E. (A)
Cottingham, J. H. (M)
Cotton, R. V. (M)
Cramer, B. G. (M)
Creamer, E. M., Jr. (M)
Cressman, R. N. (M)
Crew, B. L. (M)
Cummings, E. J. (M)
Cummins, R. G. (M)
Daigle, E. J., Jr. (M)
D'Ambrisi, A. S. (M)
D'Amico, J. R. (M)
Daniels, J. H. (M)
Davis, R. P. (M)
Davis, T. F. (M)
De Coatsworth, C. G. (M)
Dectrow, T. X. (M)
De Florio, R. A. (M)
Deshakta, P. N. (A)
Deysher, J. B. (A)
Dibrell, J. W. (M)
Diem, G. W. (M)
Di Giacomo, J. J. (M)
Di Sabato, C. A. (M)
Divor, C. (M)
Dobren, S. (A)
Doherty, W. E., Jr. (M)
Domboski, R. F. (M)
Dorfman, J. C. (M)
Dorsay, T. A. (A)
Doto, N. J. (M)
Dove, J. B. (A)
Dovlak, R. J. (M)
Dunbar, R. C. (M)
Dunn, E. B. (M)
Durgin, T. R. (A)
Eamshaw, D. P. (SM)
Edelman, R. D. (M)
Edelman, S. Z. (M)
Edwards, R. Q. (A)
Eichert, E. S. (SM)
Eisenberg, M. (M)
Elliott, L. D. (M)
Ellis, J. A. (A)
Emerson, K. H. (SM)
Emery, E. J. (A)
Endres, R. D. (SM)
Engle, J. L. (M)
Epstein, H. (M)
Epstein, H. (SM)
Estersohn, H. (A)
Ett, A. H. (SM)
Evalds, E. H. (A)
Evans, W. R., Jr. (M)
Even-Tov, D. (M)
Everett, F. C. (M)
Eynon, J. U. (M)
Fang, J-C (A)
Fante, R. L. (M)
Fazlello, N. A. (M)
Famar, F. E. (M)
Faunce, N. P. (M)
Feller, M. S. (A)
Fenster, S. C. (M)
Fenton, F. H., Jr. (M)
Fernbach, M. (M)
Fey, C. (A)
Fidler, R. D. (A)
Flen, J. L. (A)
Fierstein, J. H. (M)
Fink, L., III (M)
Fisher, E. J. (M)
Fisher, F. (M)
Fitch, J. A. (M)
Fleming, R. E. (M)
Flomenhoft, M. (M)
Flood, F. T. (A)
Flood, J. J., Jr. (M)
Fogarty, J. D. (M)
Foley, G. M. (SM)
Foley, J. J. (M)
Follmer, W. C. (M)
Ford, H. P., Jr. (M)
Ford, R. (M)
Forster, W. H. (SM)
Fow, B. F. (M)
Fowler, C. J. (SM)
Francisco, R. L. (M)
Frank, A. I. (M)
Friedman, M. (M)
Fuchs, A. M. (M)
Fujimoto, A. (M)
Gaither, L. E. (SM)
Gardner, W. H. (A)
Gelb, H. A. (A)
Gelfand, R. (A)
Gelles, A. J. (A)
Gellhaus, K. M. (M)
Gerber, E. L. (M)
Geselowitz, D. B. (A)
Gilbert, W. E. (SM)
Gillies, J. H. (SM)
Gilman, H. D. (M)
Gilman, W. L. (M)
Gittens, V. S. (A)
Giordano, M. J. (M)
Glace, K. (M)
Glassman, I. (M)
Goldich, N. (A)
Goldman, A. (M)
Goldman, R. L. (M)
Goldstein, I. E. (SM)
Goldstein, P. (A)
Goodman, J. H. (M)
Goodman, R. M. (SM)
Goodwin, D. P. (M)
Gollub, R. (M)
Grande, F. M. (M)
Gravel, A. J. (A)
Grieco, L. (M)
Griffin, E. H. (M)
Griffin, G. G. (A)
Griffith, C. H. (A)
Groon, J. G. (A)
Gross, A. M. (A)
Gross, M. A. (M)
Grossman, S. (A)
Gudis, R. S. (A)
Haas, N. V. (M)
Hadley, A. M. (SM)
Haffer, D. (A)
Haines, B. P. (SM)
Halushmsky, G. D. (M)
Hamilton, B. S. (M)
Hamilton, S. (SM)
Hardiman, E. R. (M)
Harold, P. H. (M)
Harris, H. H. (SM)
Hart, D. J. (SM)
Hartnett, J. D. (A)
Hatton, R. W. (M)
Hazeltine, A. V. (M)
Hebert, E. J., Jr. (M)
Heck, J. C. (M)
Hechelman, T. J. (M)
Heiss, S. K. (A)
Helfen, E. (M)
Hendrie, G. C. (M)
Hendrixson, L. H. (M)
Henninger, J. H. (M)
Hermann, J. E. (M)
Herscher, M. B. (A)
Hershfield, L. L. (M)
Heskett, H. (M)
Hewitt, E. C. (M)
Hill, W. C. (A)
Hiller, G. (M)
Himmelstein, F. (M)
Hirsch, M. (A)
Hitt, J. J. (M)
Hock, R. E. (M)
Hoffman, A. (M)
Hoffman, E. (A)
Hoffman, P. (M)
Hollander, G. L. (SM)
Hollinger, R. A. (M)
Holm, R. M. (A)
Holtzman, I. D. (M)
Hopper, G. M. (M)
Horn, C. H. (M)
Howard, W. A. (SM)
Hule, D. L. (M)
Hunter, R. D. (M)
Hurst, J. F. (M)
Hyams, I. (M)
Inacker, H. F. (M)
Isaacson, J. J. (A)
Isken, J. R. (M)
Jacobowitz, H. (M)
Jacobson, L. J. (M)
Jakacki, W. B. (M)
Jednacz, J. E. (M)
Jha, A. R. (M)
Johnson, N. (SM)
Jones, A. G. (M)
Jones, E. D. (M)
Jones, J. T., Jr. (A)
Joshi, A. K. (A)
Joyce, S. B. (M)
Jung, J. P. (M)
Jurskis, A. (M)
Kaferle, J. G. (M)
Kati, A. R. (M)
Kalos, S. (A)
Kanal, L. N. (A)
Kansas, R. (SM)
Kaplan, R. M. (M)
Kappeler, W. H. (A)
Karniol, E. D. (M)
Karr, C. H. (M)
Kashkan, S. (A)
Kass, S. (M)
Katz, A. S. (M)
Katz, S. (SM)
Kaufman, E. J. (A)
Kauffmann, R. A. (M)
Kell, D. C., Jr. (M)
Kenny, H. W. (A)
Kemus, A. (M)
Keroes, H. I. (A)
Kimel, H. (M)
King, W. C. (SM)
Kirk, D. B. (M)
Kline, S. (M)
Knaff, P. R. (A)
Knipe, W. T. (M)
Koblenz, A. M. (M)
Kocher, W. H. H. (M)
Kolodner, M. (M)
Komfield, N. R. (M)
Korsen, M. (M)
Kosich, R. J. (M)
Kotliar, A. (M)
Kovach, J. F. (A)
Koval, J. F. (M)
Kozak, M. J. (M)
Krah, M. A. (M)
Kraus, C. R. (SM)
Kraus, F. A. (M)
Krendel, E. S. (SM)
Kritikos, H. N. (A)
Kropp, C. W. (M)
Ku, Y. H. (SM)
Kuberry, R. W. (M)

Kugler, F. (M)
Kusner, D. B. (M)
Kyne, T. (M)
Lancaster, W. W. (A)
Landauer, W. I. (M)
Lane, A. L. (M)
La Vergnetta, F. E. (M)
Lawrence, D. H. (A)
Lazinski, R. H. (M)
Leader, R. (A)
Leitch, J. G. (SM)
Leonard, T. V. (A)
Levin, R. (M)
Lewis, E. M., III (M)
Lewis, G. (M)
Lieb, A. B. (A)
Lieberman, I. J. (M)
Lindinger, J. L. (SM)
Ling, D. A. (M)
Linsky, E. F. (M)
Lisanti, A. G. (A)
Liss, D. M. (M)
Livezey, F. M. (M)
Lock, F. J., Jr. (M)
Locker, R. J. (M)
Loftus, E. V. (SM)
Loftus, J. A. (M)
Loginow, S. (SM)
Lorber, H. (M)
Lovejoy, E. W. (SM)
Lubow, B. P. (M)
Luce, R. C. (A)
Lueders, L., Jr. (A)
Lukoff, H. (SM)
Luoto, U. A. (M)
Lynch, T. J. (M)
MacDonald, R. D. (A)
Mac Fadden, W. C. (M)
Machler, R. C. (SM)
Mac Williams, J. E. (M)
Maddox, J. L., Jr. (M)
Maddox, J. L., Jr. (M)
Magasiny, I. P. (SM)
Maguire, H. T. (A)
Mah, L. (M)
Malczynski, J. R. (M)
Malkin, T. A. (M)
Malta, S. V. (M)
Manser, J. E. (A)
Mapp, H. S. (M)
Markowitz, H. (A)
Markowitz, R. S. (M)
Marks, E. I. (M)
Marsele, I. (A)
Marsten, J. (F)
Martin, M. A. (A)
Martire, J. A. (A)
Masurat, G. (M)
Mauger, R. S. (A)
May, K. S. (M)
Mayer, H. C. (M)
Mayher, R. J. (M)
McBride, J. M. (M)
McCarron, F. J. (A)
Mc Carthy, Ex. R. (M)
McCarthy, C. S., Jr. (M)
McCarty, F. H. (A)
McDade, J. J. (M)
McDermody, R. A. (M)
McDevitt, B. J. (M)
McDowell, A. P., Jr. (M)
McEnroe, J. M., Jr. (A)
McFall, T. J. (M)
McGrath, J. N. (M)
McKnight, C. F. (A)
McNally, F. C., Jr. (A)
Meehan, F. J. (A)
Meinken, K. C., Sr. (A)
Meiris, J. T. (M)
Merklinger, J. J. (M)
Meyer, W. T. (M)
Michel, C. (M)
Mikolajczyk, W. J. (M)
Miller, B. L. (A)
Miller, L. K. (A)
Miller, W. G., Jr. (M)
Milowitz, P. (M)
Mina, V. A. (M)
Mode, D. E. (SM)
Mogavero, C. (M)
Mooney, J., Jr. (M)
Mooney, W. J., Jr. (A)
Moore, T. W. (M)
Morris, L. C. (M)
Moskowitz, N. (M)
Mozenter, M. J. (M)
Muckel, F. H. (M)
Murphy, E. G. (M)
Murphy, J. S. (M)
Murray, R. E. (M)
Naiman, M. L. (SM)
Nambiar, K. K. (A)
Nankin, H. B. (M)
Nelson, C. R. (SM)
Neuber, H. K. (M)
Neumann, L. R. (A)
Newman, E. L. (M)
Newmeyer, D. R. (M)
Nichol, A. V. (SM)
Nicholson, V. (A)
Nishimura, J. Y. (A)
Nolan, J. J. (A)
Noyer, R. O. (SM)
Nussbaum, M. (A)
Nye, D. D., Jr. (M)
O'Hara, J. J. (SM)
Olevsky, B. (A)
O'Malley, M. (A)
Ottinger, R. W. (M)
Packer, W. H. (A)
Paffas, E. D. (A)
Parrott, N. E. (A)
Partin, M. E. (M)
Paskman, M. (M)
Patterson, G. W. (F)
Paz, H. J. (A)
Pearce, C. T. (SM)
Pearson, E. E. (M)
Perkins, C. C. (M)
Perles, A. H. (M)
Peters, A. E. (M)
Peterson, E. F., Jr. (M)
Petrilla, A. D. (M)
Pierce, O. B. (A)
Piontkowski, J. S. (M)
Platt, B. E. (A)
Plizak, B. T. (M)
Podell, E. J. (M)
Polin, B. H. (M)
Porath, N. (M)
Porter, T. J. (M)
Powers, E. N. (M)
Pressman, A. (M)
Procopio, L. W., Jr. (M)
Rabum, L. E. (SM)
Rachlin, M. (A)
Raffa, P. E. (M)
Rambo, L. W. (M)
Randall, N. C. (M)
Ranisier, R. (M)
Ratner, A. (A)
Ree, J. (M)
Revesz, G. (M)
Reyers, R. R. (M)
Richman, R. R. (M)
Richter, F. (M)
Riethof, T. R. (M)
Robinson, G. W. (A)
Rogers, D. A. (M)
Rogers, R. S. (M)
Rohr, J. G. (M)
Rollins, M. M. (M)
Rolnick, M. A. (M)
Roman, A. F. (M)
Romanofsky, N. K. (M)
Rooney, J. D. (M)
Roseman, H. M. (M)
Rosenstein, G. M. (A)
Rosenthal, D. (M)
Ross, I. L. (M)
Roth, H. H. (M)
Roth, T. J. (A)
Rothwarf, F. (M)
Rovins, J. J. (M)
Ruben, H. (SM)
Rudin, B. (M)
Rudnick, J. J. (A)
Rudofsky, S. (A)
Rudy, P. (M)
Ruff, J. A. (A)
Ruger, J. F. (M)
Rutledge, J. E., Jr. (M)
Salzar, D. E. (A)
Sapinosa, R. J. (M)
Sarkisian, J. (A)
Saunders, J. (M)
Scarpello, M. J. (M)
Schaefer, H. W. (A)
Schaffer, H. H. (M)
Schifreen, C. S. (A)
Schmechel, D. M. (M)
Schock, H. E., Jr. (A)
Scholes, W. R. (A)
Scholtes, P. W. (M)
Schrader, R. H. (M)
Schuder, J. C. (M)
Schumacher, F. A. (M)
Schumann, G. H. (M)
Schwan, H. P. (F)
Schwartz, I. (M)
Schwartz, P. (M)
Scott, P. R., Jr. (M)
Seawell, W. N. (M)
Segal, B. (M)
Segal, R. J. (SM)
Seif, E. (M)
Serafin, J. F. (M)
Shappel, J. J. (A)
Sheffler, W. J. (M)
Shelton, R. M. (M)
Sherman, A. (A)
Shern, S. I. (A)
Shienbloom, H. M. (A)
Shih, W. (M)
Showers, R. M. (SM)
Shulman, M. B. (A)
Shwon, J. E. (M)
Sichel, A. T. (M)
Siegel, P. (M)
Sigler, S. H. (A)
Silverstein, E. R. (M)
Simendinger, R. A. (M)
Siomko, G. (A)
Sipler, H. (M)
Slavin, H. (M)
Slawek, J. E. (M)
Smith, B. J. (A)
Smith, D. B. (F)
Smith, R. C. (M)
Soltoff, B. M. (M)
Songster, G. F. (M)
Soorenko, T. (M)
Sorius, A. (M)
Sos, J. (M)
Spady, R. J. (M)
Spandorfer, L. M. (M)
Spector, E. N. (A)
Spiegel, P. (M)
Spielman, S. C. (SM)
Sorunk, W., Jr. (M)
Stachelko, V. (M)
Stambaugh, J. C. (M)
Stanton, L. (M)
Starks, W. H. (SM)
Steele, R. W. (M)
Steelman, A. T., Jr. (M)
Stein, M. (A)
Stein, S. J. (SM)
Steinberg, M. (M)
Steinruck, C. F., Jr. (A)
Stella, A. J. (M)
Stern, F. (M)
Stevens, A. J. (A)
Stiles, C. J. (M)
Stone, J. (A)
Stovall, J. R., Jr. (M)
Strahl, G. E. (M)
Stranix, R. G. (M)
Stratton, C. H. (A)
Strauss, H. E. (M)
Stubbs, G. S. (M)
Stufflebeam, C. E. (A)
Sugalski, A. C. (A)
Sullivan, H. B. (A)
Sun, H. (A)
Swider, M. F. (M)
Szukalski, E. A. (M)
Talbot, G. S. (M)
Tarpley, R. E. (SM)
Taylor, P. (A)
Teacher, C. F. (M)
Ten-Cate, W. L. (A)
Throckmorton, C. L. (M)
Tillman, A. F. (M)
Tobe, S. S. (SM)
Todd, C. R. (M)
Tom, J. (M)
Tomar, R. M. (A)
Tonooka, S. (M)
Torres, A. A. (SM)
Torrey, R. D. (M)
Trachtenberg, B. M. (M)
Trachman, J. (M)
Trocky, E. V. (A)
Turchi, D. J. (A)
Turczyn, A. (A)
Unoerfelder, B. R. (A)
Urkowitz, H. (SM)
Ussler, W., Jr. (M)
Valeskr, C. S. (M)
Van Aller, W. H. (M)
Van Basselaere, L. J. (M)
Van Horn, J. C. (SM)
Varallo, F. A. (M)
Varricchio, A. L. (M)
Vasilevskis, H. S. (M)
Veit, Q. F. (M)
Vetach, J. E. (M)
Volpe, J. M. (M)
Waggoner, G. F. (SM)
Wagner, M. (A)
Walunas, J. S. (M)
Walylko, J. J. (M)
Warchaizer, S. E. (M)
Warner, E. H. (M)
Warren, S. R., Jr. (SM)
Warwick, R. E. (A)
Watson, B. (A)
Weber, H. C. (M)
Webster, G. R. (M)
Weldknecht, C. J., Jr. (M)
Weilerstein, I. M. (M)
Weiner, M. (M)
Weinger, R. (A)
Weinstock, W. W. (SM)
Weir, K. (M)
Weiss, S. (A)
Wentworth, H. B. (A)
Wenzinger, E. C. (M)
West, W. P. (SM)
Whitby, L. S. (M)
White, F. J. (M)
White, J. P. (M)
Wightman, R. R. (M)
Willenborg, E. J. (A)
Williams, A. J., Jr. (F)
Williams, J. B. (SM)
Williams, W. H. (M)
Wilson, L. D. (SM)
Wilsker, O. (M)
Witkin, E. (SM)
Woessner, W. J., Jr. (M)
Wolciehowski, E. T. (M)
Wojcik, J. J. (SM)
Wolf, A. A. (M)
Wolfson, H. S. (M)
Wolin, L. (SM)
Wood, R. F. (M)
Wood, R. F. (A)
Woodcock, V. E. (M)
Woods, L. J. (SM)
Wos, J. (A)
Wyeth, F. H. (M)
Yacyk, J. (M)
Yamada, H. (A)
Yang, T. (M)
Yanishevsky, G. (M)
Zapacosta, J. A. (M)
Zimmerman, B. L. (A)
Zimmerman, M. S. (SM)
Zwirn, H. L. (A)

Philipsburg (CP-4)
Crain, H. M. (SM)
Dickey, C. W. (M)

Phoenixville (PHI-3)
Carter, W. S., Jr. (M)
Menges, W. R. (M)

Pine Grove Mills (CP-4)
Griffin, W. D. (M)
Miller, N. B. (M)
Pharo, L. C., Jr. (M)

Pineville (PHI-3)
Schreiner, W. A. (M)
Pitcairn (PIT-4)
Gannon, G. F., Jr. (A)
Jones, C. I. (M)
Kaufman, W. M. (A)
Keener, E. L. (SM)
Kroko, L. J. (A)
McGinley, G. W. (M)
Raney, R. A. (F)
Raymond, C. G. (A)
Taylor, M. E. (M)

Pittock (PIT-4)
Shyhalla, N. (M)

Pittsburgh (PIT-4)
Allen, S. D. (M)
Anderson, A. E. (M)
Angello, S. J. (F)
Aronson, M. H. (M)
Bairbach, R. J. (M)
Barron, F. E. (SM)
Bauer, B. F. (M)
Baughman, G. W. (SM)
Bear, W. C. (M)
Benjamin, C. E. (M)
Bennett, A. I., Jr. (A)
Betzler, C. J. (M)
Bhavnani, K. H. (M)
Biel, D. T. (M)
Billetdeaux, A. C. (M)
Binstock, M. H. (M)
Bizon, A. M. (M)
Blackmon, H. (SM)
Blair, H. A., Jr. (M)
Boardman, E. (A)
Booker, C. A., Jr. (M)
Bossart, P. N. (F)
Boyer, J. L. (M)
Bright, H. S. (SM)
Brinda, J., Jr. (M)
Browder, F. E. (M)
Bush, N. E. (M)
Butterfield, S. E. (M)
Calvert, J. F. (SM)
Caplan, H. M. (A)
Carlan, A. J. (M)
Castner, R. J. (A)
Chackan, H. G. (M)
Chandler, A. M. (A)
Chang, H. K. H. (M)
Chang, H. (SM)
Chen, K. (A)
Chesavage, A. J. (M)
Chin, T. (A)
Church, C. H. (M)
Clark, R. C. (A)
Coates, R. S. (M)
Colker, J. (M)
Coltman, J. W. (F)
Conry, W. T. (M)
Cox, H. L., Jr. (A)
Crawford, E. M. (A)
Cunningham, R. C. (SM)
Davis, R. E. (SM)
Dean, W. C. (M)
Delgado, R. H. (M)
Diamond, H. (M)
Dicker, D. F. (M)
Dodd, A. E. (M)
Duckett, E. J. (SM)
Dugan, J. F. (M)
Eash, J. J. (M)
Engel, F. A., Jr. (SM)
England, T. R. (M)
Evans, R. (A)
Fairman, J. F., Jr. (M)
Feber, R. R. (M)
Feucht, D. L. (M)
Flaherty, J. M. (M)
Florino, J. A. (M)
Fooks, J. H. (SM)
Ford, D. J. (M)
Franz, J. P., Jr. (M)
Friedman, A. B. (A)
Frylins, C. V. (M)
Garrett, S. J. (M)
Gates, A. F. (M)
Germann, J. D. (A)
Gibson, F. C. (M)
Gilbert, C. W. (M)
Gill, H. A. (SM)
Gogniat, T. (M)
Golden, W. H. (M)
Goldstein, R. P. (A)
Graul, T. A. (M)
Greenwood, J. H. (SM)
Hager, R. E. (A)
Hall, J. C. (M)
Hamilton, W. H. (SM)
Hanna, C. R. (SM)
Hansen, J. R. (SM)
Hartley, R. R. (SM)
Haun, R. D., Jr. (M)
Haves, J. A. (A)
Herwald, S. W. (SM)
Hollandbeck, R. F. (M)
Hovey, B. K. (SM)
Huggler, L. R. (M)
Hughes, T. R. (M)
Humes, R. M. (A)
Hutcheson, J. A. (F)
Jackson, A. H. (A)
Jarvis, P. H. (A)
Jones, D. H. (M)
Kadak, E. (M)
Kaiser, H. R. (SM)
Keay, F. W. (M)
Kenney, T. C. (SM)
Ketterer, R. L. (M)
Kleshauer, F. W. (M)
Klingler, E. H. (M)
Knox, W. G. (A)
Konnerth, K. L., Jr. (M)
Krasik, S. (SM)
Lavi, A. (M)
Lawson, T. R., Jr. (M)
Leahy, E. F. (M)
Leeds, J. V., Jr. (M)
Le May, C. Z. (SM)
Lempert, J. (SM)
Leonard, F. J. (M)
Leone, H. A. (A)
Libenschek, R. S. (A)
Lipchak, J. B. (M)
Loesdon, G. R. (A)
Lubich, J. W. (M)
Luther, J. M. (M)
Mack, M. C. (SM)
Mackiewicz, T. J. (A)
Madsen, C. J. (SM)
Magee, C. H. (A)
Malmberg, P. R. (M)
Marcus, T. J. (M)
Margolis, S. G. (M)
Marsh, J. M. (A)
Marshall, S. C. (M)
Martin, A. V. J. (SM)
Martin, W. A. (M)
Mathias, R. A. (SM)
McConaghy, D. L. (M)
McConnell, R. A. (SM)
McCreanor, R. A. (A)
McCreary, H. S., Jr. (A)
McIntosh, R. O. (SM)
McNamara, J. E. (A)
Melngailis, I. (M)
Menear, W. R. (M)
Menes, M. (M)
Merritts, T. D. (M)
Miller, W. M. (VA)
Milnes, A. G. (SM)
Mitchell, J. B. (M)
Mocharko, G. L., Jr. (M)
Moore, G. E. (M)
Moses, A. J. (M)
Moss, A. I. (M)
Moulds, H. S. (A)
Naoel, G. W. (SM)
Newell, W. E. (A)
Noodle, L. H. (M)
O'Donnell, J. J. (M)
O'Donnell, T. J. (SM)
Ong, C. J. (M)
O'Shea, J. P. (A)
Osbon, W. O. (M)
Osial, T. A. (SM)
Pack, J. L. (M)
Painter, W. C. (M)
Pakala, W. E. (SM)
Pawlowski, R. (M)
Peters, H. D. F. (M)
Peters, L. J. (SM)
Philios, J. (M)
Pickholtz, L. (M)
Pitman, P. F. (M)
Plutt, J. A., Jr. (M)
Porterfield, C. P. (M)
Potter, W. S. (A)
Pryor, E. R. (M)
Rathbone, D. E. (M)
Rau, F. J. (M)
Reihing, J. V., Jr. (M)
Relf, K. E. (M)
Reynolds, M. T. (M)
Rhoads, D. O. (A)
Roberts, R. W. (M)
Ross, E. J. (M)
Rude, P. A. (M)
Ruth, D. K. (A)
Rydin, R. A. (M)
Sack, E. A., Jr. (M)
Saucedo, R. (M)
Schatz, E. R. (SM)
Schindler, D. G. (M)
Schmid, O., Jr. (A)
Schneeberger, R. J. (SM)
Schneider, H. L. (SM)
Schultz, J. H. (M)
Schultz, M. A. (SM)
Schwinck, A. J. (M)
Scott, T. G. (M)
Seidel, R. A. (M)
Shafer, W. L. (A)
Shaw, J. B. (M)
Shaw, V. G. (SM)
Sheker, E. B. (M)
Sherman, A. G. (M)
Sherwin, G. W. (A)
Shoupp, W. E., (F)
Sines, W. U., Jr. (M)
Sleplan, J. (F)
Smith, L. E. (M)
Smith, P. W. (M)
Snefsky, E. A. (M)
Sparrow, R. F. (M)
Stapelfeldt, R. (M)
Stapp, I. P. (M)
Staublitz, E. J. (M)
Steinback, R. T. (M)
Stott, W. R. (A)
Strasser, A. (M)
Stuart, R. A. (A)
Sze, T. W. (A)
Sziklai, G. C. (F)
Taylor, W. (A)
Teare, B. R., Jr. (F)
Thompson, J. H. (SM)
Tunell, R. H. (A)
Twaska, V. M. (A)
Uleman, T. (SM)
Umbel, F. K. (A)
Unger, E. J. (M)
Vogeley, C. E., Jr. (SM)

PENNSYLVANIA

Voshall, R. E. (M)
Wade, R. A. (M)
Walchli, H. E. (SM)
Wei, Y. (M)
Wexler, C. H. (M)
Wieczorkowski, E. A. (M)
Williams, E. M. (F)
Wolfe, P. N. (M)
Wood, J. E. (M)
Wood, M. G. (SM)
Woodford, J. B., Jr. (SM)
Wyckoff, R. D. (F)
Yarussi, F. P. (A)
Young, F. J. (M)
Zionts, S. (A)
Zoffel, G. I. (M)

Pittston (PHI-3)
Loughney, T. M. (M)
Miller, A. N. (M)
Moceyunas, A. J. (M)

Plymouth Meeting (PHI-3)
Applegarth, A. R., Jr. (SM)
Best, D. T. (M)
Broomall, J. M. (SM)
Charnow, M. F. (A)
Ginsberg, A. (M)
Ginsberg, E. M. (M)
Hauer, C. A. (M)
Koller, W. B. (M)
Krantz, F. H. (M)
Loev, D. (A)
Luscombe, C. F. (M)
Ryesky, A. (M)
Smith, R. C. (M)
Warshaw, C. H. (M)

Port Matilda (CP-4)
Seeley, R. M., Jr. (M)

Pottstown (PHI-3)
Binelli, W. D. (M)
Boyer, N. W. (A)
Mellon, R. E. P. (VA)
Trout, H. J., Jr. (A)

Prospect Park (PHI-3)
Babiak, J. (M)
Sagan, E. R. (A)

Quakertown (P-LV-3)
Anderson, A. E. (F)
Cole, W. P. (SM)
Hendricks, P. S. (VA)
Moose, L. F. (M)
Porter, V. J. (M)

Radnor (PHI-3)
Lentz, W. K. (A)
Roberts, R. E. (SM)

Reading (PHI-R-3)
Ake, N. E. (M)
Baloga, J. J. (M)
Bang, R. L. (M)
Bennett, W. F. (A)
Blakely, R. E. (M)
Brader, G. F. (A)
Coldren, S. D. (A)
Emery, L. D., Jr. (M)
Feicht, R. B. (M)
Gable, J. R. (A)
Greely, D. K. (A)
Harlin, W. R. (M)
Hauck, H. S. (M)
Helm, K. P. (M)
Henrich, G. R. (A)
Hill, A. R. (A)
Hill, K. J. (M)
Holzinger, C. S. (M)
Lipscomb, R. F. (M)
Lundberg, R. H. (M)
McRoden, W. L. (M)
Mill, A. F. (A)
Mystinski, S. A. (M)
Noll, W. S. (M)
Pomeroy, R. C. (SM)
Radomski, J. J. (M)
Rose, F. L. (M)
Rothermel, R. S. (M)
Saloom, J. A. (M)
Schilling, R. G. (A)
Scull, E. W. (A)
Shaffer, R. E. (A)
Shockley, D. B. (A)
Wentzel, L. S. (A)
Zechman, R. W. (A)

Richboro (PHI-3)
Del Mar, D. (M)

Ridgway (EMP-4)
Cowles, R. J. (M)
Gausman, G. G. (M)
Kirkpatrick, D. N. (SM)

Ridley Park (PHI-3)
Blumberg, M. (A)
Dietze, H. O. (A)
Fritz, C. H. (M)
Jamison, J. S. (M)
McWilliams, G. R. (A)
Parris, S. R. (M)
Rowe, L. R. (A)

Rochester (PIT-4)
Dolby, L. W., III (A)

Rockwood (PIT-4)
Henkels, H. W. (SM)

Ronks (PHI-L-3)
Perry, H. E. (M)

Rosemont (PHI-3)
Abernethy, H., III (M)
Garrison, P. A. (M)
Speakman, E. A. (F)

Roslyn (PHI-3)
Barnett, G. F. (M)
Beaver, J. A., Jr. (M)
Butt, S. P., Jr. (A)
Callahan, A. H. (M)
Douglass, F. W. (M)
Grove, L. R. (M)
Hochman, S. (M)
Kuter, J. J. (M)
Sayer, T. C. (M)
Silverman, J. B. (M)
Stahl, R. A. (M)
Yutz, R. W. (M)

Royersford (PHI-3)
Grime, R. (M)

Rydal (PHI-3)
Clarke, I. A. (M)
Ferrill, T. M., Jr. (SM)
Herr, R. F. (SM)
Lagore, J. A. (SM)

St. Davids (PHI-3)
Gabriel, E. Z. (M)
Karcher, R. W. (M)

St. Mary's (EMP-3)
Bickmire, R. L. (SM)
Breindel, L. A. (A)
Butler, E. W. (SM)
Dressel, H. (A)
Fritz, C. F. (A)
Fritz, H. U. (M)
Gamer, W. J. (A)
Hoffman, R. R. (SM)
Inge, E. F. (M)
Kerstetter, B. E. (M)
Neff, A. K. (A)
Pierson, I. S. (M)
Simbeck, R. H. (M)
Snowdon, T. L. (SM)
Sorg, F. X. (M)
Speer, J. S., II (M)
Young, R. W. (M)

Salfordville (PHI-3)
Archer, G. R. (A)

Saxonburg (PIT-4)
Cooper, R. W. (A)
Stuebgen, W. F. (A)

Saylorsburg (PHI-3)
Smith, H. A. (A)

Sayre (ELM-C-1)
Ball, M. (A)
Franklin, B. A. (A)

Schwenksville (PHI-3)
De Berardis, A. J. (M)

Scranton (PHI-3)
Cooke, K. R. (A)
Corwin, N. J. (M)
Drazdauskas, C. J. (M)
Kaplan, M. (SM)
Kelly, J. F. (M)
Kinback, R. W. (M)
Marsinkavage, D. M. (A)
Miller, W. A. (A)
Naplak, L. A. (M)
Oschmann, R. G. (M)
Quinn, J. M. (M)
Ringland, R. S. (SM)
Risse, J. A. (M)
Schiller, J. (M)
Schmick, H. L. (M)
Smith, G. (SM)
Thomas, W. F. (M)

Secane (PHI-3)
Kranzley, A. S. (M)

Sewickley (PIT-4)
Bukoskey, R. M. (A)

Sharon (PIT-4)
Barley, C. D. (M)
Bowers, P. R. (M)
Dalton, K. J. (M)
Zahniser, R. M. (A)

Sharon Hill (PHI-3)
Ardys, J. (M)
Eckert, E. R. (M)
Rubinoff, M. (M)

Shenandoah (PHI-3)
Kulak, A. J. (M)

Shillington (PHI-R-3)
Lundberg, W. R. (M)
Swavely, R. S. (A)

Sinking Spring (PHI-L-3)
Nester, A. L. (M)

Smethport (EMP-4)
Francisco, S. G. (M)

Solebury (PHI-3)
Algeo, B. C., Jr. (SM)

Somerton (PHI-3)
Pharo, E. W., Jr. (M)

Souderton (PHI-3)
Lawson, T. C. (M)
Smith, H. B. (M)

Southampton (PHI-3)
Barsky, H. S. (SM)
Dempster, B. W. (M)
Grzywacz, W. (M)
Lex, R. G., Jr. (M)
O'Connor, W. B. (M)
Schroeder, A. C. (F)
Thompson, R. L. (A)

South Williamsport (WIL-4)
Feehrer, M. R. (M)
Lavo, H. J. (M)

Spring City (PHI-3)
Clevenstine, W. M. (A)
Molotte, D. W. (M)

Springdale (PIT-4)
Duris, M. W. (M)

Springfield (PHI-3)
Brinton, J. H., Jr. (M)
Chalupa, J. F. (M)
Di Campli, B. A. (M)
Ebling, W. F., Jr. (M)
Hoepfner, K. B. (M)
Hudgins, W. D. (SM)
King, G. W. K. (M)
Laiming, H. J. (SM)
Marcott, C. M. (M)
Metzger, A. C. (M)
Miller, M. N. (M)
Mitchell, W. J., Jr. (A)
O'Neill, J. F. (M)
Schwartz, R. F. (SM)
Sylvester, R. A. (M)
Wagenseller, J. E. (A)
Ware, W. E. (M)
Weiss, E. (M)
Welsh, J. J. (SM)

State College (CP-4)
Ammerman, C. R. (SM)
Bacchialoni, F. L. (M)
Baker, W. L. (SM)
Barber, K. F. (A)
Bastuscheck, C. P. (SM)
Baxter, F. C., Jr. (M)
Bender, R. M. (M)
Binstock, L. (M)
Bloomquist, W. B. (M)
Bogar, J. E. (M)
Bringman, J. M. (M)
Brownfield, L. B. (M)
Brownlee, R. R. (M)
Caldine, H. G. (M)
Callaghan, J. W. (M)
Campanella, A. J. (M)
Cannon, J. B., Jr. (M)
Carey, D. E. (M)
Chubb, W. R., Jr. (M)
Clark, D. G. (M)
Crossley, G. L. (SM)
Dale, J. A. (A)
Davis, M. G. (M)
Dean, J. C. (M)
Diamant, H. B. (M)
Doerr, C. W. (M)
Eck, R. C. (M)
Eliot, W. A. (SM)
Erdley, R. F. (M)
Erhard, J. L. (M)
Fieni, D. O. (M)
Figart, E. C. (M)
Files, W. D. (SM)
Finlon, F. P. (M)
Freed, P. J. (SM)
Geronimo, M. B. (A)
Hall, F. T., Jr. (M)
Harbolis, S. S. (M)
Harris, V. E. (M)
Hastert, D. D. (M)
Henman, R. J. E. (M)
Herlt, B. G., Jr. (M)
Herman, E. B. (SM)
Hofecker, W. J. (M)
Houser, W. G. (M)
Hunter, R. P. (SM)
Kenly, T. F. (M)
Key, G. L., Jr. (SM)
Key, J. T., Jr. (M)
Knausenberger, G. E. (M)
Krueger, D. (M)
Kulp, K. H. (M)
Kush, L. J. (M)
Lawther, J. M. (A)
Lee, H. S. (M)
Leiss, W. J. (SM)
Lemley, L. W. (M)
Lopez, A. F. (SM)
Marcus, R. B. (M)
McCallum, R. G. (M)
McGinley, J. H. (M)
McKinney, D. W. (M)
McLucas, J. L. (SM)
Mentzer, J. R. (SM)
Milliken, M. P. (M)
Minor, L. C. (A)
Moore, F. B. (SM)
Moore, R. G. (M)
Musser, G. L. (SM)
Nearhoof, H. J. (SM)
Norris, R. S. (M)
Oblinger, J. T. (M)

O'Connor, H. C., Jr. (M)
Oelbermann, E. J. (SM)
Palmer, J. R. (SM)
°Passow, R. L. (SM)
Pellick, T. J. (A)
Perks, N. W. (M)
Quinn, T. P. (M)
Rentschler, M. B. (M)
Rexroat, L. D. (M)
Richardson, E. (M)
Ripple, J. R. (A)
Ritzer, V. H. (A)
Rix, H. D. (SM)
Rowlands, R. O. (SM)
Rutelli, J. P. (SM)
Santalucia, A. J. (M)
Scheihing, F. A. (M)
Shaffer, J. D. (M)
Sharp, A. C. (SM)
Siewers, D. C. (M)
Skioper, R. E. (SM)
Skudrzyk, E. J. (M)
Smith, J. P. (M)
Spackman, R. M. (M)
Stavely, E. B. (M)
Taylor, J. G. (M)
Thompson, F. C. (A)
Traugott, R. D. (M)
Vetter, A. R. (M)
Walker, J. P., Jr. (M)
Wolfe, R. E. (M)
Wurst, J. W. (M)

Stratford (PHI-3)
Mathes, R. E. (F)
Upham, S. W. (M)

Sunbury (WIL-4)
Roush, J. E. (M)
Weber, J. O. (A)
Young, R. H. (M)

Swarthmore (PHI-3)
Barus, C. (SM)
Bowler, D. L. (M)
Burtis, S. F., Jr. (M)
Jablonski, E. R. (M)
Johnson, F. M. (M)
Malcomson, J. A. (A)
Roberts, G. A. (M)
Tompkins, H. E. (SM)

Tamaqua (PHI-3)
Dignazio, L. A. (M)

Tarentum (PIT-4)
Chantler, G. D. (M)

Telford (P-LV-3)
Hinds, J. L., Jr. (M)
Robinson, S. A. (SM)

Throop (PHI-3)
Goodman, J. (M)
Yatsko, F. P. (A)

Tobyhanna (PHI-3)
Fuqua, H. G. (SM)
Jarecki, S. J. (A)
Piscatello, D. J. (A)

Towanda (ELM-C-1)
Englsch, R. A. (A)

Trafford (PIT-4)
Breakey, G. A. (M)

Trevose (PHI-3)
Bess, T. J., Jr. (M)
Edwards, A. H. (A)
Fath, J. P. (A)
Gorny, D. S. (M)
Hanson, L. B. (A)
Reed, F. F. (M)
Rice, R. A. (M)

Tunkhannock (PHI-3)
Inman, A. D. (A)

Turtle Creek (PIT-4)
Christensen, B. (M)
Skinner, D. D. (A)

Tyrone (PIT-4)
Gwin, J. D. (M)
Kearney, H. B., Jr. (M)

University Park (CP-4)
Bowhill, S. A. (SM)
Brown, J. L., Jr. (M)
Bulman, G. R. P. (M)
Ebaugh, P. (M)
Ross, W. J. (SM)
Schmerling, E. R. (SM)
Smith, R. M. (M)
Walker, E. A. (M)
Waynick, A. H. (F)
Wilson, G. L. (SM)

Upper Darby (PHI-3)
Beane, J. M. (SM)
Bush, B. A., Jr. (A)
Charp, S. (SM)
Chernish, G. (SM)
De Carlo, A. P. (M)
Dinackus, H. G. (M)
Dzwonczyk, J. G. (M)
Garkav, E. (M)
Gerry, M. E. (SM)
Gumacos, C. (M)
Hopkins, V. A. (SM)
McCoy, C. T. (SM)

Mehan, A. J. (M)
Pope, R. A. (M)
Santaguida, C. (A)
Weinberg, H. M. (A)
Wykstra, E. A. (M)

Valencia (PIT-4)
Findley, R. W. (M)

Valley Forge (PHI-3)
Register, C. L. (SM)

Verona (PIT-4)
Bartholomew, R. R. (M)
Smith, R. E. (M)
Thompson, F. T. (A)
Viener, A. H. (M)

Villanova (PHI-3)
Chen, T. C. (SM)
Dilks, U. C. S. (SM)
Klekotka, J. A. (M)
Lockwood, F. P., Jr. (A)
Stineman, J. W., Jr. (A)

Wallingford (PHI-3)
Jayne, F. B. (A)
Martin, J. L. (M)
Robinson, I. E. (M)
Shallcross, D. H. (A)

Warren (EMP-4)
Barre, W. E. (M)
Loranger, J. A. (SM)
Loucks, W. J. (A)
Myers, S. J. (A)
Thein, D. H. (A)
Wanner, L. R. (M)
Wright, J. B. (A)

Warrington (PHI-3)
Clarance, A. L. (M)

Washington (PIT-4)
Loffredi, A. J. (A)
Paul, D. R. (M)
Spriggs, L. A., Jr. (M)

Waverly (PHI-3)
Mundell, K. C. (M)

Wayne (PHI-3)
Anderson, F. W. (SM)
Blakely, R. T. (SM)
Bowman, D. F. (SM)
Cecal, J. A. (A)
Collins, H. B., Jr. (SM)
D'Andrea, L. L. (SM)
Davis, H. U. (M)
De Wolf, J. B. (M)
Dodge, H. S. (M)
Leisenring, J. C. (A)
Lenfest, G. C. (M)
Libby, E. C. (M)
McSorley, S. L. (A)
Lolli, L. M. (A)
Medkeff, R. J. (M)
Niemann, E., Jr. (A)
Palmer, G., Jr. (SM)
Raphelson, M. (M)
Reagan, W. E. (M)
Schneider, W. M., Jr. (M)
Stern, D. M. (M)
Wellard, C. L. (A)

Waynesboro (PHI-3)
Marlow, W. C., Jr. (VA)

Weatherly (PHI-3)
Kiser, N. L. (SM)

Wellsboro (ELM-C-1)
Weaver, C. H. (A)

Wesleyville (ERI-1)
Brown, P. A. (M)
Larson, K. E. (M)

West Chester (PHI-3)
Bloch, M. W. (M)
Craig, R. C. (M)
Fuller, J. B., Jr. (M)
Green, R. E., Jr. (M)
Haner, L. P. (SM)
Hayes, H. J. (M)
Hickey, J. E., Jr. (M)
Kieselbach, R. (M)
Loring, R. A. (M)
Tracy, R. A. (M)

West Lawn (PHI-R-3)
Hornberger, R. F. (M)
Rexon, L. (M)

West Middlesex (PIT-4)
Herr, C. E. (A)

West Pittston (PHI-3)
Bruno, A. R. (M)

West Reading (PHI-R-3)
Pietruszynski, L. J. (M)

Wexford (PIT-4)
Wagner, R. J. (A)

Wilkes-Barre (PHI-3)
Graytock, R. A. (M)
Groff, H. A. (M)
Parise, J. D. (A)
Reid, J. F. (A)

Williamsport (WIL-4)
Amey, G. B. (A)
Anderson, L. F. (M)
Andrews, R. C. (A)
Bresee, W. H. (M)
Deming, G. W. (M)
Gehrke, F. E. (SM)
Gregor, T. P. (A)
Horrigan, J. B. (M)
Jewart, D. M. (SM)
King, J. W. (A)
McCarthy, F. J. (M)
Pennington, E. T. (M)
Peterson, N. C. (M)
Petts, R. G. (M)
Posy, P. H. (M)
Richart, D. H. (M)
Sibley, R. C. (M)
Simmons, W. J., Jr. (A)
Teno, E. (A)
Watson, W. H. (M)

Willow Grove (PHI-3)
Dry, D. N. (M)
Fisher, M. K. (M)
Florence, V. H. (M)
Franke, A. E. (M)
Fraser, R. S. (M)
Hirschman, H. (M)
Hockeimer, H. E. (M)
Koop, W. S., Jr. (A)
Kornfeld, M. (M)
Lewis, J. R. (M)
Rude, R. T. (M)
Saltzman, A. R. (A)
Shulman, L. (M)
Sikina, T. V. (M)
Spelghts, M. T. (M)
Thomson, D. M. (M)
Tillman, R. M. (M)
Zohn, R. L. (M)

Wilmerding (PIT-4)
Brath, P. W. (M)

Woodlyn (PHI-3)
Kashmar, E. J. (M)
Russo, L. J. (M)

Wrightsville (PHI-L-3)
Gleeson, E. J. (M)
Young, C. R. (A)

Wyncote (PHI-3)
Alexy, M. R. (SM)
Bernbaum, B. (M)
Cooper, D. T. (VA)
Craig, P. M. (F)
Dorris, R. C. (M)
Fox, B. (M)
Gonzalez-Correa, E. (M)
Hardy, N. (M)
Kinnier, D. (M)
Kusma, D. (SM)
Lilly, C. H. (A)
Sher, N. (M)
Smith, R. V. (SM)

Wyndmoor (PHI-3)
Leibovitz, P. T. (M)
Lieberman, F. (M)

Wynnewood (PHI-3)
Appel, W. N. (A)
Blum, C. M. (A)
Dohan, W. R. (M)
Fisher, J. F. (SM)
Fulton, L. H. (A)
Leas, J. W. (SM)
Meyerhoff, A. J. (SM)

Wyoming (PHI-3)
Casterlin, A. N. (A)

Wyomissing (PHI-R-3)
Boynton, W. D. (M)
Davis, W. J. (M)
Gelvis, J. P. (M)
Huyett, W. I. (M)
Le Lacheur, R. M. (M)
McLaughlin, J. F. (A)
Prudhon, G. L. (SM)

Yardley (PHI-3)
Cook, E. G. (M)
Emslie, N. M. (A)
Grau, W. C. (A)
Mac Donald, H. E. (M)
Schwartz, N. J. (M)

Yeadon (PHI-3)
Dillon, T. P. (A)
Grieser, T. F. (SM)
Haber, F. (M)
McBlain, W. L. (M)
Merrill, J. H. (M)
Molieri, J. T. (A)
Myers, E. F. (M)

York (PHI-L-3)
Beck, M. R. (M)
Boyer, R. M. (A)
Boyer, W. H. (A)
Byerly, H. W. (M)
Chronister, W. M. (M)
Dangi, J. R. (M)
De Frees, H. F. (M)
Feder, J. H., Jr. (A)
Frost, E. L. (M)
Goodling, G. G., Jr. (M)
Haas, W. I. (M)
Kiger, L. L. (A)

Kudlich, K. H. (M)
Lease, D. A. (A)
Lease, J. R. (A)
Lewis, D. O. (M)
Lowe, F. B. (A)
Parker, J. C., Jr. (M)
Pueschner, H. (M)
Schutt, R. O., Jr. (M)
Sims, W. H., Jr. (M)
Staub, J. R. (A)
Sterner, F. L. (M)
Stover, N. K. (A)
Todd, R. H. (M)
Walker, H. (SM)
Wanbaugh, W. C. (M)
Weiner, E. G. (A)
White, D. L. (M)
Wildermuth, J. R. (M)
Zeisler, M. D. (M)

Youngwood (PIT-4)
Nowalk, T. P. (M)
Pridmore, T. C. (SM)
Stein, F. S. (SM)
Stelmak, J. P. (SM)

RHODE ISLAND

Ashaway (BOS-1)
Young, R. W. (M)

Barrington (BOS-1)
Carmody, T. P. (M)
Prior, T. K. (A)

Bristol (BOS-1)
Tingley, F. M. (M)

Central Falls (BOS-1)
Onoyan, G. G. (A)

Cranston (BOS-1)
Abbenante, N. (M)
Amoroso, F. (M)
Bailey, L. E. (M)
Cardillo, A. (M)
Landesberg, M. M. (M)
Monopoli, R. V. (A)
Salk, D. (A)
Sherman, A. (M)
Soscia, B. L. (M)

Cumberland (BOS-1)
Woodward, J. E. (A)

East Greenwich (BOS-1)
Bingham, R. C. (A)
Gillin, G. F. (A)
Tyler, E. M. (M)
Wong, G. J. (M)

East Providence (BOS-1)
Bishop, B. F. (M)
Henry, F. J. (M)
Williams, J. N. (A)

Hoxsie (BOS-1)
Kunz, G. A. (M)

Kingston (BOS-1)
Bliamptis, E. E. (M)
Dawson, C. H. (SM)
Prince, M. J. (M)

Manville (BOS-1)
Lavallee, M. L. (A)

Middletown (BOS-1)
Wilson, R. E., Jr. (M)

Newport (BOS-1)
Alexander, C. S., Jr. (M)
Baer, E. W., III (M)
Barber, C. (M)
Barry, D. T. (M)
Bash, J. P. (M)
Bowerman, R. H. (M)
Delgado, R. (M)
Greichen, J. J. (A)
Hale, H. D., Jr. (M)
Mainland, R. (M)
Murphy, E. J. (M)
Phillips, L. D. (M)
Ripple, E. G. (M)
Soliozy, C. S. (M)
Swallow, C. E. (A)
Vallandigham, W. W. (M)
Vincent, G. D. (A)
Mathison, W. W. (M)

North Kingstown (BOS-1)
Smith, P. W. (A)

North Tiverton (BOS-1)
Patenaude, N. H. (A)

Pawtucket (BOS-1)
Beckett, H. F. (M)
Farrell, C. L., Jr. (A)
Nichols, A. J. (A)

Peace Dale (BOS-1)
Birch, W. B. (A)

Point Judith (BOS-1)
Merriam, R. W. (M)

Providence (BOS-1)
Anderson, G. P. (M)
Angulo, C. M. (SM)
Barlow, H. B., Jr. (M)
Blanchard, W. E. (M)
Bliss, Z. R. (A)
Chen, C. (M)
Dandrea, W. (VA)
de Klerk, J. (SM)
Farnsworth, H. E. (SM)
Farrell, F. X. (M)
Fine, S. (M)
Halton, E. B. (M)
Kodis, R. D. (SM)
Kornhauser, E. T. (SM)
Mann, H. L. (A)
Markey, J. T. (A)
Murtaugh, W. A., Rev. (M)
Rizzi, P. A. (M)
Testa, E. (M)
Trementozzi, F. J. (M)
Truell, R. (SM)
Verrecchia, T. A. (M)

Quonset Point (BOS-1)
Huff, M. S. (M)

Riverside (BOS-1)
Bushnell, R. R. (A)

Rumford (BOS-1)
Chick, B. B. (M)

Tiverton (BOS-1)
Lizotte, O. A. (M)
Swinburn, A. H. (M)

Wakefield (BOS-1)
Mowbray, W. H. (A)

Warren (BOS-1)
Bowen, H. C. (M)

Warwick (BOS-1)
Fiddes, G. B. (M)
Klemer, B. H. (M)
Nans, E. A., Jr. (M)
Thoresen, J. C. (A)
Tully, P. P. (A)

West Barrington (BOS-1)
Coppolino, L. S. (M)
Prior, T. C. J. (M)

Westerly (BOS-1)
Finocchiaro, E. C. (M)

Woonsocket (BOS-1)
Dube, J. J. A. (A)
Rison, D. M. (A)
Urrico, F. X. (M)

SOUTH CAROLINA

Aiken (S-CAR-3)
Barnes, B. B. (M)
Hoover, R. E. (A)
Ramsey, R. W. Jr. (M)
Ross, J. D. (A)
Studley, R. V. (M)
Yingling, G. B. (M)

Anderson (S-CAR-3)
Glaser, H. I. (M)

Beaufort (S-CAR-3)
Manke, J. A. (M)

Cayce (S-CAR-3)
Hafely, C. H. (A)

Charleston (S-CAR-3)
Alderman, E. L. (M)
Bailey, J. H. (M)
Birchfield, W. P. (A)
Boehm, W. R. (SM)
Brooks, M. J. (M)
Brust, N. T. (M)
Bull, W. I. (SM)
Cook, J. E. (M)
Countryman, G. L. (SM)
Dawson, O. D. (A)
Fechter, G. B. (M)
Goldberg, H. S. (M)
Hart, R. N. III (M)
Herring, O. L., Jr. (M)
Jefferies, D. W. (M)
Knickel, E. R. (M)
Lackey, H. B. (M)
Morrissey, J. N. (M)
Risher, R. G. (M)
Sarco, J. (A)
Schachte, W. L. (SM)
Schleppegrell, J. R. (A)
Smith, F. A. (M)

Charleston Heights (S-CAR-3)
Flynn, L. A. (A)
Hare, M. D. (M)
Peterson, F. H. (M)
Shimandle, J. G. (M)

Cheraw (S-Car-3)
Akerman, B. (SM)

Chester (S-CAR-3)
Craig, M. J. (M)

Clemson (S-CAR-3)
Haischer, D. H. (A)
Hind, A. T., Jr. (M)
Thurston, J. N. (SM)

Columbia (S-CAR-3)
Fallers, R. G. (SM)
Ferris, W. R. (F)
Foster, L. W. (SM)
Hanan, J. E. (M)
Lambert, R. D., Jr. (SM)
Lowman, B. L. (M)
Moore, S. F. Jr. (M)
Moseley, S. T. (SM)
Noland, J. H., Jr. (SM)
Parsons, J. H., Jr. (A)
Reese, M. T. (M)
Roberts, W. H. (M)
Romanyszyn, M. T. (A)
Scott, A. L. (A)
Smith, E. H., Jr. (M)
Snyder, R. J. (A)
Taylor, J. (SM)
Warr, G. H. (M)

Florence (S-CAR-3)
Herring, M. J. (A)
Moore, B. E. (M)
Sellars, E. A. (SM)
Townsend, A. P. (A)
Zeigler, A. L. (A)

Folly Beach (S-CAR-3)
Howell, J. E. (M)

Greenville (S-CAR-3)
Garrison, W. E. (M)
Greer, P. A. (M)
Mills, C. W. (M)
Pace, M. W. (A)
Wearn, W. C. (M)
White, J. H. (M)

Greenwood (S-CAR-3)
Duffie, J. E. (M)
Hawthorne, D. (A)
McCombs, J. W. (M)

Irmo (S-CAR-3)
Goodson, B. M. (A)
Warner, D. F. (M)

Lancaster (S-CAR-3)
Elliott, R. J. (M)

Moncks Corner (S-CAR-3)
Volf, L. F. (A)

Mount Pleasant (S-CAR-3)
Gay, R. E. (M)
Porcher, F. P. (M)
Schneider, A. P. (M)

North Augusta (S-CAR-3)
Felder, A. A. (M)
Gill, J. P., Jr. (M)

North Charleston (S-CAR-3)
Gatch, C. E. (A)
Germann, F. G., Sr. (A)
Hunter, H. L. (M)
Martin, J. A. (A)
Pelley, A. D. (M)
Rogers, C. L. (M)
Thomason, J. G. (M)

Orangeburg (S-CAR-3)
O'Cain, W. L. (A)

Rock Hill (S-CAR-3)
Henson, J. A. (A)

Shaw AFB (S-CAR-3)
Benedict, D. F. (M)
Chandler, R. M. (M)

Spartanburg (S-CAR-3)
Pippin, R. F., Jr. (M)

West Columbia (S-CAR-3)
Bowers, C. W. (M)

SOUTH DAKOTA

Arlington (TC-5)
Dill, E. C. (M)

Brookings (TC-5)
Cheadle, J. N. (SM)
Falk, H. C. (M)
Liepa, A. (M)

Canning (TC-5)
Graf, E. A. (M)

College Station (TC-5)
Essler, W. O. (M)

Ellsworth AFB (TC-5)
Bell, W. D. (M)
Burke, J. F. (M)
Gunther, W. J. (A)
Reyna, R. C. (M)
Swisher, L. W. (A)

Freeman (TC-5)
Deissler, K. L. (A)

Mount Vernon (TC-5)
Croson, H. L. (M)

Piermont (TC-5)
Nygaard, G. M. (M)

Pierre (TC-5)
Brancel, O. R. (M)
Jones, M. G. (A)

Rapid City (TC-5)
Fisher, G. M. (M)
Mayer, F. N. (M)
Nelson, E. A. (M)

Roslyn (TC-5)
Storley, C. L. (M)

Sioux Falls (TC-5)
Bunday, G. F. (A)
Froke, L. C. (A)
McKenna, W. E. (M)
Nelson, V. R. (A)
Pierce, M. E. (M)
Sikorski, J. W. (A)
Warren, L. C. (A)

Vermillion (TC-5)
Bedwell, T. H. (M)
Graf, S. J. (M)

Wagner (TC-5)
Kucera, A. T. (M)

TENNESSEE

Alcoa (ATL-3)
Warren, M., Jr. (M)

Altamont (HUN-3)
Morgan, C. C., Jr. (M)

Bristol (ATL-3)
Bastin, Q. S. (M)
Bernot, T. (M)
Bradfute, G. A., Jr. (A)
Gover, W. M. (M)
King, L. A. (SM)
Lyons, M. A. (M)
Mayer, G. J. (M)
Robinson, M. P., Jr. (M)
Scalf, P. L. (M)
Schell, J. H. (M)
Shackelford, H. L. (M)
Slenker, S. (M)
Smith, B., Jr. (SM)

Chattanooga (ATL-3)
Barnes, B. B. (A)
Bohr, E. T. (M)
Briscoe, H. R., Jr. (A)
Crozier, H. W. (M)
Hochdorf, M. (M)
Holfstetter, G. E. (M)
Jones, H. B. (A)
King, T. R. (A)
Meagher, A. W. (A)
Smith, R. T. (A)
Terrell, J. M., Jr. (M)
Young, B. A. (M)

Clarksville (HUN-N-3)
Wilson, C. L. (M)

Concord (ATL-3)
Devine, J. M. (A)

Cordova (HUN-M-3)
Downs, H. I. (M)

Dayton (ATL-3)
Warner, C. J. (A)

Donelson (HUN-N-3)
Green, N. (M)
Pearsall, S. H. (M)

Erwin (ATL-3)
Reeves, H. L., Jr. (A)

Fayetteville (HUN-3)
Thompson, A. W. (M)
Young, J. B., Jr. (M)

Fountain (ATL-3)
Oakes, L. C. (M)

Franklin (HUN-N-3)
Montogmery, W. C. (M)
Ragsdale, S. P. (A)

Gatlinburg (ATL-3)
Stanbery, J. F. (SM)

Greeneville (ATL-3)
Brown, J. H. (A)
Furman, O. G. (M)
Jimenez, G. L. (M)
Turski, S. (M)

Jackson (HUN-M-3)
Altenpohl, D. (M)

Johnson City (ATL-3)
Hunter, W. C. (A)

Kingsport (ATL-3)
Devaney, R. G. (M)
Henry, J. W. (SM)
Lingar, W. E. (M)

Kingston (ATL-3)
Hanauer, S. H. (M)

Knoxville (ATL-3)
Affel, R. G. (M)
Bradshaw, R. L. (M)
Brittain, J. E. (A)
Craig, L. W. (M)
Eckel, J. R., Jr. (M)
Evans, R. C. (A)
Horton, J. R. (M)
Neff, H. P., Jr. (M)
Pierce, J. F. (SM)
Schede, R. W. (M)
Simpson, T. L. (M)

TENNESSEE

Sundeen, O. H. (M)
Tillman, J. D., Jr. (M)

Lake City (ATL-3)
Byerly, J. W. (A)

Lawrenceburg (HUN-3)
Beckham, R. H. (M)

Lebanon (HUN-M-3)
Rucks, A. J. (M)

Manchester (HUN-3)
Davis, B. M. (M)
Eddings, R. A. (M)
Kingery, M. K. (M)
Norman, C. F. (M)

Maryville (ATL-3)
Artis, P. T. (M)
McClelland, F. M. (M)

McKenzie (HUN-M-3)
Heathcot, J. H. (A)

Memphis (HUN-M-3)
Babb, E. L. (A)
Bovaird, C. F. (A)
Boyd, I. H. (M)
Branyan, C. A. (A)
Browning, J. W. (M)
Busler, L. F., Jr. (A)
Dunning, R. A. (A)
Ecoff, F. A., Jr. (A)
Fitzgerald, G. M., Jr. (A)
Freymuth, J. J., Jr. (M)
Greene, M. A. (M)
Haas, B. I. J. (M)
Harbison, R. T. (A)
Holbrook, T. C., Jr. (A)
Horton, H. C. (M)
King, R. E. (A)
Logan, E. W., Jr. (A)
Maice, L., Jr. (M)
McLing, J. T. (A)
Ray, C. D. (M)
Stewart, E. B. (A)
Walker, J. A. (M)

Nashville (HUN-N-3)
Allen, R. B. (M)
Arnold, T. G., Jr. (M)
Binns, F. D. (M)
Branch, B. S. (M)
Bright, F. W. (M)
Burch, C. E. (A)
Campbell, J. S. (M)
Creel, J. D. (M)
Daddario, A. S. (M)
Dewitt, J. H., Jr. (F)
Dicker, P. E. (SM)
Dorris, C. G. (M)
Duke, C. R. (M)
Edling, E. A. (A)
Esslinger, G. H. (M)
Ewing, A., Jr. (M)
Fowler, W. L. (M)
Gentry, R. O. (A)
Genung, N. W. (M)
Greenhouse, H. M. (M)
Hobbs, R. V. (M)
Holladay, A. M. (M)
Hucaby, R. L. (M)
Johnson, L. E., Jr. (M)
Kincaid, W. B., JR. (M)
King, J. L. (A)
Madden, K. W. (M)
Mason, F. H., III (M)
McAdams, E. E. (M)
McAllister, G. P. (M)
Montgomery, L. H., Jr. (SM)
Rawls, L. E. (M)
Reynolds, G. A. (M)
Satterfield, R., Jr. (A)
Schumann, F. (SM)
Shelton, A. C. (SM)
Stiller, W. W., Jr. (SM)
Sutton, A. T. (M)
Wolfson, R. P. (M)
Zeigler, R. H. (M)

Norris (ATL-3)
Dale, J. A. (SM)

Oak Ridge (ATL-3)
Anderson, J. L. (M)
Banta, H. E. (SM)
Dahl, A. H. (M)
De Hart, S. B. (M)
Edwards, R. S. (M)
Fairstein, E. (SM)
Fort, W. G. S. (M)
Green, F. P. (M)
Groothuis, S. E. (M)
Henry, K. M., Jr. (A)
Henson, F. W. (M)
Hirsch, C. B., Jr. (M)
Holt, G. A. (M)
Judish, J. P. (M)
Knowles, D. J. (SM)
Manning, F. W. (M)
Marks, J. E. (M)
Miller, J. W. (M)
Miller, P. D. (M)
Mosko, S. W. (M)
Pigg, J. C. (M)
Porter, F. M. (M)
Redford, J. L. (A)
Reed, E. A., Jr. (M)
Ritter, R. C. (M)
Shipley, E. D. (M)
Smith, H. F., Jr. (A)
Southern, A. L. (M)
Stone, R. S. (A)
Van Sickle, G., Jr. (A)
Walker, C. S. (M)
Worsham, R. E. (A)
Zachry, D. S., Jr. (M)
Ziegler, N. F. (A)

Shelbyville (HUN-3)
Thompson, R. D. (A)

Sparta (ATL-3)
Haston, C. W. (M)

Tullahoma (HUN-3)
Cortner, A. H. (M)
Giltinan, T. L. (A)
Henderson, R. P. (M)
Johnson, M. D. (M)
Kalsner, R. W. (SM)
Pope, R. H. (M)

TEXAS

Abilene (FW-6)
Alford, A. R. (A)
Bottom, V. E. (M)
Henley, R. D. (A)
Kumm, A. L. (M)

Amerillo (LUB-6)
Bowden, A. J. (A)
Boatwright, F. V. (M)
Dearness, J. L. (A)
Farmer, P. E. (M)
Greene, C. E. (M)
Harris, H. W. (M)
Krasin, E. (M)
Martin, J. L. (M)
Patterson, J. M. (M)
Torrey, W. H. (A)
Williams, A. M. (M)

Arlington (FW-6)
Askew, W. J., Jr. (M)
Baker, M. F. (M)
Bentley, R. L., Jr. (M)
Billingsley, J. D. (M)
Belesenick, C. R. (A)
Buelerle, C. D. (M)
Bushart, G. J., Jr. (M)
Calvin, C. C., Jr. (M)
Cashat, S. D. (M)
Clanton, J. D., Jr. (M)
Coble, H. F. (M)
Connell, J. W. (M)
Davis, D. A. (M)
Davis, J. A., Jr. (M)
Ditto, J. C. (M)
Drennan, J. B. (A)
Fischer, J. N. (M)
Forester, J. R. (A)
Gegon, P. H. (M)
Gibbs, T. E. (SM)
Hale, R. A. (M)
Hegi, J. G. (M)
Hodge, R. B., Jr. (M)
Hoelke, W. D. (M)
Howard, J. E. (M)
Huggins, L. L. (M)
Hutcheson, G. C. (SM)
Jordan, C. F., Jr. (M)
Lanier, R. E. (SM)
Linehan, R. J. (M)
Lowry, L. W. (M)
Lundberg, C. F. (M)
Martin, R. E. (M)
Matthews, J. L. (M)
Muery, R. W. (M)
Price, R. R. (M)
Raymond, W. D (M)
Reynolds, G. N. (M)
Tardiff, R. J. (M)
Thayer, E. A. (M)
Zombolas, G. P. (A)

Austin (SA-A-6)
Adams, R. M. (M)
Anderson, C. D. (M)
Armstrong, J. E. (M)
Baltzer, O. J. (SM)
Barclay, J. N. (SM)
Block, E. H. (M)
Bostick, F. X. (M)
Britt, C. O. (M)
Broman, W. N. (A)
Clardy, D. E. (M)
Darmento, J. (M)
Davis, A. (SM)
Davis, D. K. (M)
Deam, A. P. (M)
Douglas, J. H. (M)
Duesterhoeft, W. C., Jr. (SM)
Duff, B. M. (M)
Fannin, B. M. (SM)
Garner, W., Jr. (M)
Gribble, R. F. (M)
Hackett, R. E. (M)
Hartwig, W. H. (SM)
Hixson, E. L. (SM)
Hopkins, G. H., Jr. (M)
Jackson, A. E. (A)
Kreuz, L. B. (SM)
La Coste, L. J. B. (M)
Lagrone, A. H. (SM)
Lane, R. N. (SM)
Lauderdale, D. M. (M)
Law, P. F. (M)
Martin, P. E. (M)
McKinney, C. M. (SM)
McQueen, A. N., Jr. (M)
Morrow, R. E. (M)
Oplela, A. D., Jr. (M)
Owen, T. E. (M)
Phillips, J. P. (M)
Reinhard, E. A. (M)
Reynolds, B. C. (M)
Ripperger, E. A. (A)
Robertson, W. (A)
Sandlin, B. J. (M)
Simpson, J. D. (M)
Smith, H. W. (SM)
Stone, C. S. (M)
Smith, R. T. (M)
Smith, S. E. (M)
Stratton, A. W. (F)
Tolbert, C. W. (SM)
Tucker, E. A. (SM)
Wallace, R. H. (M)
Wallis, W. R. (A)
Werner, C. T. (M)
White, G. E. (SM)
Whitener, A. S. (M)
Willett, N. W. (SM)
Wright, J. R. (M)
Wukasch, E. O. (M)

Ballinger (FW-6)
Kelley, W. C. (M)

Baytown (HOU-6)
Jordan, R. W. (A)
Suttle, A. D., Jr. (SM)

Beaumont (B-PA-6)
Andrews, F. E. (A)
Ballard, B. J. (M)
Burgess, C. H. (M)
Bush, C. R. (M)
Crum, F. M. (SM)
Cryer, J. E. (M)
Cunningham, R. E. (M)
Davis, A. Q., Jr. (M)
Davis, V. E. (A)
Eckles, W. W., Jr. (M)
Ferguson, J. D. (M)
Haack, W., Jr. (A)
Hughes, B. F. (M)
Keenon, D. L. (M)
Laughlin, C. E. (M)
Lawrence, T. B. (M)
Montague, L. E. (A)
Morgan, J. G. (M)
Musick, A. L., Jr. (M)
Normand, A. J. (A)
Otto, G. (A)
Pearson, E. A. (A)
Petkovsek, J., Jr. (SM)
Powell, J. W. (A)
Shane, Z. G. (A)
Smith, H. K. (M)
Stockard, L. C. (M)
Straughn, W. L., Sr. (M)
Turk, G. L., Jr. (A)
Walker, C. B. (A)
Welch, H. E. (A)
Whitmeyer, L. J., Jr. (A)
Wilder, E. H. (M)

Beeville (SA-A-6)
Godfrey, B. L., Jr. (A)
Parker, C. F. (M)

Bellaire (HOU-6)
Ball, D. F. (SM)
Barnette, L. A. M. (SM)
Borden, R. R. (A)
Brook, A. H. (M)
Cowles, L. G. (SM)
Crawford, D. (M)
Cunningham, A. B. (M)
Fleming, L. (SM)
Granberry, H. W. (M)
Herzog, G. (F)
Hicks, F. M. (A)
Keyes, R. (M)
Lee, B. D. (M)
Loofbourrow, R. J. (SM)
Mann, R. W. (SM)
Mazzagatti, R. P. (SM)
Owen, W. W. (M)
Peelz, G. E., Jr. (M)
Reeves, D. S. (M)
Schafer, E. L. (A)
Stafford, J. A. (M)
Stelzer, R. B. (SM)
Waldie, A. D. (M)
Walter, R. T. (M)

Benbrook (FW-6)
Maes, W. J. (M)
Shafer, L. (M)

Big Lake (SA-A-6)
Segars, L. K. (M)

Big Spring (LUB-6)
Light, J. E., Jr. (M)
Trantham, J. F. (A)

Breckenridge (FW-6)
McBeath, H. M., Jr. (A)

Brownfield (LUB-6)
Spear, R. B. (M)

Brownsville (SA-A-6)
Maring, K. T. (M)
Martin, G., Jr. (A)

Bryan (HOU-6)
Druce, A. J. (M)
Fridel, G. E. (M)
Moore, L. C. (A)
Sosolik, F. J. (A)

Caddo Mills (DAL-6)
Shuler, J. L. (M)

Canyon (LUB-6)
Thompson, C. E. (M)

Carswell AFB (FW-6)
Reierson, V. L. (M)

Castroville (SA-A-6)
Burges, E. G. (M)

Center (B-PA-6)
Riley, H. E. (A)

China (B-PA-6)
Seaberg, I. (A)

Cibolo (SA-A-6)
Seibel, H. (M)

Cleburne (FW-6)
Gardner, A. H. (SM)
Graham, H. L. (A)
Ryter, R. L. (SM)

College Station (HOU-6)
Dillingham, H. C. (SM)
German, J. P. (SM)
Hallmark, G. D. (SM)
Hebert, J. O., Jr. (M)
Jonas, L. K. (M)
Kilmer, R. E. (M)
Navarro, S. O. (M)
Roots, E. N., Jr. (M)

Commerce (DAL-6)
Sparkman, W. A., Jr. (M)

Corpus Christi (SA-A-6)
Kettlewell, J. (M)
Lockhart, H. B. (A)
McHugh, E. L. (M)
Roberts, J. D. (A)
Segrest, B. C. (M)
Taylor, P. (M)
Trevilliam, R. A. (A)
Zazvorka, J., Jr. (SM)

Corsicana (DAL-6)
Jackson, M. L. (M)

Cuero (SA-A-6)
Murray, J. W. (M)

Dallas (DAL-6)
Abraham, R. P. (M)
Adams, L. P. (SM)
Adcock, W. A. (SM)
Adkins, A. W., Jr. (SM)
Albano, J. (SM)
Allan, R. E. (M)
Allison, G. D. (M)
Alley, P. D. (M)
Anderson, J. (SM)
Ankele, E. T., Jr. (M)
Armistead, H. G., Jr. (M)
Arnold, D. C. (SM)
Ashley, C. E. (M)
Aymond, E. F., Jr. (A)
Bailey, R. W. (M)
Bailey, W. R. (M)
Baker, G. T. (M)
Baker, H. C. (M)
Barnett, M. L. (M)
Barney, G. M. (M)
Barr, W. W. (A)
Barton, J. R. (A)
Bechtel, B. (A)
Beckhoff, G. (A)
Becklund, O. A. (SM)
Bennett, G. T. (SM)
Bentley, E. M. (A)
Berglund, J. F. (M)
Blard, J. R. (M)
Bloger, W. H. (SM)
Blackwell, L. A. (M)
Boller, R., Jr. (M)
Bonin, E. L. (M)
Bonner, J. H. (M)
Bowling, W. P. (M)
Bowman, W. W. (M)
Boyles, A. E. (M)
Brachman, M. K. (SM)
Bradford, J. R., Jr. (M)
Branham, D. W. (M)
Branum, M. C. (A)
Brawner, C. A., Jr. (SM)
Brewer, H. D. (A)
Brock, F. A. (M)
Broodo, A. (M)
Brower, W. C. (M)
Brown, K. C. (M)
Brown, L. E. (M)
Brown, M. H. (SM)
Brown, P. L. (A)
Brown, R. L., Jr. (SM)
Brown, R. A. (A)
Brown, V. L. (M)
Bruland, R. V. (M)
Buchanan, D. L. (M)
Buchanan, R. A. (M)
Buchmeyer, H. W. (SM)
Buckner, R. P. (M)
Bullock, M. W. (SM)
Burdine, B. R. (M)
Burg, K. E. (M)
Burnett, D. (M)
Buzzard, R. S. (M)
Call, P. D. (M)
Camp, H. E. (M)
Campbell, J. R. (M)
Campion, R. M., Jr. (A)
Chang, C. M. (A)
Chapin, R. C. (M)
Chapman, A. B. (M)
Chenault, H. P. (A)
Chick, D. R. (M)
Childress, C. B. (M)
Chun, M. E. (SM)
Clabaugh, G. E. (M)
Clark, W. E. (M)
Carey, D. R. (A)
Carland, J. F. (SM)
Carleton, G. W. (M)
Carlton, L. A., Jr. (M)
Carman, J. N. (A)
Carpenter, J. R. (A)
Carr, W. B. (A)
Carter, T. F. (M)
Chandler, J. D., Jr. (M)
Chandler, N. M. (M)
Coats, R. P. (A)
Collins, F. (SM)
Congdon, R. L. (SM)
Cooper, J. W. (SM)
Cornelison, B. (SM)
Corwin, T. L. (A)
Corwin, T. L. (A)
Couch, V. Y. (M)
Coulon, N., Jr. (M)
Coursey, J. R. (M)
Couvillion, A. J., Jr. (M)
Cox, K. J. (M)
Cox, R. H. (M)
Crabtree, W. A. (M)
Crandell, C. F. (M)
Crank, J. B. (M)
Cullum, A. E., Jr. (F)
Cunningham, R. W. (M)
Daniell, C. M. (SM)
Davis, C. F., Jr. (M)
Day, W. J. (M)
Deaderick, G. E. (M)
Dean, J. T. (M)
Dew, W. M., Jr. (M)
De Weese, C. R. (M)
Dill, C. T. (A)
Dobbins, T. K. (M)
Dodd, C. L. (SM)
Doherty, J. E. (M)
Dowell, K. P. (M)
Dunaway, R. M. (M)
Dunlap, R. H. (M)
Dyer, F. C. (M)
Earhart, C. E. (SM)
Ebensberger, A. C. (SM)
Edwards, T. S. (M)
Elkenburg, R. B. (M)
Elkins, C. C. B., Jr. (M)
Elmore, C. M., Jr. (M)
Erlinger, O. W., Jr. (M)
Evans, A. D. (SM)
Evres, W. G. (SM)
Faln, W. W. (M)
Farmer, C. R., Jr. (A)
Farrell, T. A., Jr. (M)
Fewer, D. R. (SM)
Finley, C. G. (M)
Fischer, D. G. (M)
Fisher, L. M. (A)
Geisel, F. J. (SM)
Geissinger, E. L. (M)
George, R. A. (M)
Germain, J. N. (M)
Gerrard, J. A. F. (SM)
Gilder, E. E. (A)
Gill, R. M. (M)
Gilliam, J. R. (A)
Gluck, L. D. (M)
Flath, E. H., Jr. (M)
Flynn, J. G., Jr. (SM)
Fontenote, W. J. (M)
Forsyth, P. G. (SM)
Fox, C. H. (M)
Fox, K. R. (M)
Francis, T. L. (M)
Frauman, C. I. (M)
Gela, A. J. (M)
Godbey, J. K. (SM)
Goldstein, M. (M)
Goodman, W. D. (A)
Gragert, W. J. (M)
Granberry, D. S. (SM)
Graves, W. W. (M)
Green, G. F., Jr. (M)
Green, J. A. (SM)
Greenberg, L. H. (M)
Griffin, E. H. (M)
Griffin, R. C. (M)
Grover, L. L. (M)
Gudzin, M. G. (M)
Haefele, D. M. (M)
Haggerty, P. E. (F)
Hall, D. B. (M)
Hall, J. R. (SM)
Hallford, B. R. (M)
Hammack, G. W. (M)
Harmon, F. I. (M)
Harmon, R. E. (M)
Harrison, F. (SM)
Hasty, J. D. E. (SM)
Hatcher, J. L. (A)
Head, C. D., III (M)
Headington, N. L. (M)
Hedeman, W. R., Jr. (SM)
Heimer, A. R. (M)
Helzer, K. W. (M)
Henrici, C. R. (SM)
Herbst, A. O. (M)
Hewlett, T. N. (M)
Hiatt, E. V. (M)

Hinel, C. B. (M)
Hinkle, V. O., Jr. (M)
Hirschberg, J. K. (A)
Hisamoto, R. M. (M)
Hodges, A. J. (M)
Hoehn, G. L., Jr. (SM)
Holt, I. D. (M)
Hooker, B. C. (A)
Horak, F. A. (SM)
Horne, K. M., Jr. (A)
Howard, G. M. (SM)
Howes, R. B., Jr. (M)
Hunke, F. O., Jr. (M)
Hunt, J. T. (A)
Hutchinson, N. D. (M)
Hutson, R. N. (M)
Hyatt, J. L. (M)
Hyltin, T. M. (A)
Ince, N. S. (M)
Inzman, J. H. (M)
Irwin, C. B., Jr. (M)
Jackson, R. W. (SM)
Jenkins, E. A. (M)
Joel, H. C. (M)
Johns, J. H. (M)
Johnson, D. L. (M)
Johnson, G. D. (M)
Johnson, W. S. (A)
Johnson, W. M. (M)
Jones, R. W. (M)
Jostrand, B. D. (A)
Joyce, W. F. (SM)
Jurek, W. M. (SM)
Kamena, J. G. (M)
Kantenberger, R. F. (A)
Kearley, R. L., Jr. (M)
Kearse, G. P. (SM)
Keener, R. F. (M)
Kelser, L. E. (M)
Kelly, J. J. (A)
Kelsay, W. D. (M)
Kemp, C. J. (M)
Kennedy, F. H., Jr. (SM)
Kettler, C. L. (M)
Kettler, E. W., Jr. (M)
Keyser, A. R., Jr. (M)
Kilby, J. S. (M)
Kitchens, L. G. (M)
Knight, J. H. (M)
Koeijmans, G. D. (A)
Koepsel, W. W. (M)
Kost, C. R. (M)
Kuehen, W. (SM)
Kuhn, T. G. (M)
Lambert, C. C. (M)
Land, D. W. (M)
Laue, L. C. (A)
Laverone, A. J., Jr. (M)
Lawrence, L. J. (A)
Lawson, B. B. (A)
Ledford, R. E., Jr. (A)
Lee, C. C. (M)
Leedom, J. N. (M)
Leinfelder, E. J. (A)
Lewis, M. T. (M)
Lincoln, C. F., Jr. (A)
Lineback, J. T. (A)
Linker, C. L. (M)
Lipscomb, E. W. (SM)
List, B. H. (M)
Little, W. A. (M)
Londenberg, E. F., Jr. (A)
Looer, G. B. (M)
Loooser, T. L. (SM)
Loras, J. (SM)
Lowe, H. N. (A)
Lowry, J. H., Jr. (SM)
Lucas, C. H. (M)
Lupfer, W. C. (A)
Lynne, S. (M)
MacDonald, J. R. (F)
Mace, J. W. (M)
Mann, R. M. (M)
Marcus, S. B. (M)
Marshall, C. H. (M)
Martin, D. O. (SM)
Martin, J. W. (A)
Martin-Veque, C. A. (M)
Mason, A. E., Jr. (M)
Mathis, J. D. (SM)
Matlack, N. C. (SM)
Matzen, W. T. (M)
Maxwell, J. W. (A)
Maxwell, K. D. (M)
McAnally, D. G. (M)
McClanahan, M. E. (M)
McClellan, J. C., Jr. (M)
McClure, R. M. (M)
McConoughey, S. R. (M)
McCord, A. R. (M)
McDermott, E. (M)
McDonald, E. D., Jr. (A)
McDonald, J. E. (M)
McDonald, M. (A)
McKenna, R. G. (M)
McKinney, R. C. (M)
McMillin, J. M., Jr. (M)
McMullin, T. J. (M)
McMurray, R. F. (M)
McNeely, J. S. (SM)
Meador, M. E. (M)
Meadows, R. A. (M)
Meads, P. H. (M)
Meinholdt, D. W. (A)
Meinstein, A. (M)
Melancon, N. J. (A)
Meredith, M. K. (M)
Meyer, R. B. (A)
Michaelis, L. P. (M)
Miller, H. M. (M)
Miller, N. D. (SM)
Mills, R. L. (M)
Mitchell, H. L. (M)
Mitchell, W. R. (M)
Moffitt, J. F. (M)
Mollenhauer, H. H. (A)
Monroe, T. C., Jr. (M)
Moore, J. E., Jr. (M)
Morris, K. L. (M)
Morrison, E. J. (M)
Morrison, J. A., Jr. (M)
Morton, H. W. (M)
Moselev, J. S., Jr. (A)
Moseley, T. B. (SM)
Moss, H. (SM)
Moxley, W. C., Jr. (A)
Mundell, D. P. (A)
Mureen, R. W. (A)
Mut, S. C. (M)
Naab, P. J. (M)
Nastasiak, J. J. (M)
Neal, C. M. (M)
Neathery, J. L., Jr. (M)
Neitzel, E. B. (M)
Nelson, G. G. (A)
Nelson, J. E. (M)
Newell, B. J. (A)
Newell, B. J. (A)
Nilson, O. J. (A)
Nipper, J. T. (M)
North, M. E. (M)
Norvell, E. W. (A)
Norvell, K. A. (M)
Nunley, W. (M)
Oakley, J. H. (M)
O'Bryant, R. (M)
Ohlen, G. M. (M)
Olson, R. W. (F)
Oster, R. E. (M)
Owen, J. G. (M)
Owens, H. L. (SM)
Packard, D. C. (A)
Palmer, W. D. (M)
Papoulias, V. P. (M)
Parsons, R. L. (A)
Patrick, L. B. (M)
Pelt, T. E. (M)
Penisten, G. E. (M)
Penn, W. D. (SM)
Peterson, D. A. (SM)
Petlitz, R. L. (A)
Phillips, J. L., Jr. (M)
Pipoin, T. M., Jr. (M)
Pittman, P. D., Jr. (M)
Potter, W. D. (M)
Pray, G. E. (SM)
Pritchard, R. L. (SM)
Pruvenok, A. J., Jr. (M)
Puckett, R. D. (A)
Puett, J. W. F. (M)
Quimby, K. S., Jr. (A)
Radcliffe, J. C. (SM)
Ratti, J. N. (M)
Reed, B. S. (M)
Reese, J. R. (M)
Reese, J. R. (M)
Renner, D. S. (M)
Retzlaff, D. (M)
Reynolds, P. R. (M)
Rice, J. A. (M)
Rice, L. W., Jr. (M)
Riley, J. H. (A)
Riley, E. C. (A)
Riser, H. N. (M)
Ritchie, C. A. (M)
Roberts, E. L. (M)
Roberts, J. O. (A)
Robinson, D. A. (A)
Robinson, G. C. (M)
Robinson, R. C. (M)
Rodden, W. H. (M)
Rogers, T. E. (M)
Romans, W. E. (M)
Rosenbreter, E. W. (SM)
Rountree, J. D. (SM)
Ruhberg, D. L. (A)
Runyan, W. R. (M)
Rutherford, C. R. (M)
Ryssum, P. E. (M)
Sarrafian, G. P. (M)
Sartor, J. O., Jr. (M)
Scammel, B. C. (M)
Scanlon, P. J. (M)
Schultz, R. H. (A)
Schwalm, C. M. (A)
Seay, C. F., Jr. (SM)
Service, C. W. (M)
Sessel, R. (M)
Severin, J. A. (M)
Sharp, F. B., Jr. (M)
Sharpe, T. W. (M)
Sheffield, R. D. (M)
Shepherd, M., Jr. (SM)
Sherman, M. R. (M)
Shook, E. M. (M)
Shuffler, R. M. (SM)
Sick, W. N., Jr. (M)
Simmons, A. C., Jr. (M)
Simonds, F. W. (M)
Simpson, W. D. (M)
Smallwood, J. L. (M)
Smith, G. A., Jr. (M)
Smith, H. (M)
Smith, H. J. (SM)
Smith, J. E. (A)
Smith, D. L. (M)
Smith, F. G. (A)
Smith, F. G., Jr. (SM)
Smith, T. D. (M)
Smoot, R. L., Jr. (A)
Smylie, J. W. (M)
Snipes, R. W. (A)
Sonnaville, A., Jr. (M)
Sorkin, S. A. (M)
Spaulding, G. B. (SM)
Spencer, L. P. (A)
Soleker, L. J. (M)
Stanford, J. A. (M)
Stein, A. J., Jr. (M)
Stevens, B. A. (M)
Stewart, W. E. (M)
Stinson, L. W. (A)
Storey, B. (M)
Stover, J. S. (M)
Strom, L. D. (M)
Stroup, R. M., Jr. (M)
Sullivan, O. J. (A)
Sullivent, E. E., Jr. (M)
Summers, G. C. (M)
Swain, D. L. (M)
Tatom, J. R. (M)
Tatum, F. W. (SM)
Taylor, J. H. (M)
Teal, G. K. (F)
Teasdale, A. R., Jr. (SM)
Teddlie, E. A. (A)
Thomas, C. T. (SM)
Thomas, O. E. (M)
Thomas, T. C. (M)
Thompson, J. H., Jr. (SM)
Thompson, W. J. (M)
Thomson, W. L. (M)
Thomson, J. R. (M)
Thomson, J. T., Jr. (M)
Thornhill, J. W. (SM)
Thurmond, F. S., Jr. (M)
Tipole, K. R. (M)
Tittle, C. W. (SM)
Titus, G. W. (M)
Travis, J. B., Jr. (M)
Trent, R. L. (SM)
Trewitt, M. B. (M)
Tubb, G. E. (M)
Tucker, C. W. (M)
Tucker, D. J. (SM)
Tullius, A. B. (M)
Tullius, R. F. (M)
Vanderpool, C. L. (A)
Vandigriff, J. E. (M)
Varga, J. E. (M)
Vilbig, J. L., Jr. (SM)
Vincent, B. T., Jr. (M)
Wadel, L. B. (SM)
Waite, H. M. (A)
Wallace, P. P. (M)
Wallace, R. M. (M)
Wallis, T. F., Jr. (A)
Walston, J. A. (A)
Walters, C. C. (M)
Waters, W. F. (M)
Watson, C. D., Jr. (M)
Watson, J. M. (A)
Watson, L. C. (M)
Waugh, J. H., Jr. (M)
Weaver, S. M. (M)
Weaver, T. H. (M)
Weber, R. L. (M)
Webster, R. R. (SM)
Wedel, E. L. (A)
Weedfall, R. W. (M)
Weeks, R. M. (M)
Weinreich, G. F., Jr. (A)
Welch, A. B. (M)
Welch, C. (M)
Weldon, J. O. (F)
Weldon, J. F. (M)
Weldon, J. M. (M)
Wells, E. R. (M)
West, H. B., Jr. (M)
Wetterau, L. C., Jr. (M)
White, C. A., Jr. (M)
White, G. W., Jr. (SM)
Whitehurst, J. D. (M)
Whitson, D. R. (M)
Wilhelm, E. S. (SM)
Wilkinson, J. D. (M)
Wilkinson, M. M. (M)
Willard, R. S., Jr. (M)
Williams, C. S. (SM)
Williams, E. R., Jr. (M)
Willis, G. D. (M)
Wilson, R. B. (M)
Wiman, L. (M)
Wissemann, H. J. (SM)
Witty, W. M. (SM)
Wolfe, I. F. (A)
Wollny, W. T. (M)
Wood, H. A. (M)
Woods, R. B. (SM)
Woolfolk, R. L. (SM)
Worth, W. G., Jr. (SM)
Wright, T. A. (M)
Wulfe, R. F. (M)
Wyatt, A. E. (M)
Yancey, J. D., Jr. (M)
Yarbrough, A. D. (M)
Yarbrough, K. A. (A)
Yeasley, F. W. (SM)
Zapp, K. A. (A)
Zlemer, D. R. (M)
Zimmerman, C. W. (M)
Zimmerman, M. (M)
Zuefeldt, R. D. (M)

De Kalb (SHR-6)
Harkey, T. J. (A)

Del Rio (SA-A-6)
Cheesack, S. (A)
Williams, R. D. (M)

Denison (DAL-6)
Knight, J. D. (A)
Patti, V. C. (A)
Slagle, D. F. (A)
Denton (FW-6)
Haisler, J. B., Jr. (M)

Devine (SA-A-6)
Burkholder, C. C. (M)

Dickinson (HOU-6)
Thomason, E. M. (A)

El Campo (HOU-6)
Copeland, T. J. (M)

El Paso (EP-6)
Alexander, W. R. (A)
Anderson, K. E. (A)
Armstrong, J. H. (M)
Averre, C. W. (A)
Badt, M. B., Jr. (M)
Baird, J. K. (M)
Barnes, T. G. (SM)
Barto, R. C. (M)
Bastian, W. M. (M)
Bayer, J. A. (A)
Beck, C. L. (A)
Beymer, E. H. (M)
Bigelow, G. F. (M)
Bringelson, A. L. (M)
Brown, C. W., Jr. (A)
Brown, J. S. (M)
Bryant, A. D. (M)
Buloer, T. J. (A)
Clatfelter, A. C. (SM)
Clelland, L. M. (M)
Crosson, J. W. (M)
Davis, W. B. (M)
De Busk, W. H. (A)
De Long, G. E. (M)
Dryden, E. R., Jr. (A)
Fischer, D. W., Jr. (A)
Franks, E. A. (A)
French, C. E. (M)
Fulkerson, T. E. (M)
Gavaldon, A. L. (A)
Geller, M. (A)
Giorgi, D. A. (A)
Hardison, J. M. (M)
Hart, B. G. (A)
Harrison, C. E. (M)
Holt, W. L. (A)
Holcombe, W. H., Jr. (M)
Hurd, C. D. (M)
Ingerson, W. E. (M)
Ingram, B. A. (M)
Isines, N. J. (A)
Jabor, T. (M)
Jensen, H., Jr. (M)
Johnson, D. L. (M)
Jones, R. T. (A)
Jones, T. R., Jr. (M)
Keith, R. E. (M)
Kelch, J. E. (A)
Kerker, R. (M)
Kevorkian, G. (M)
Kitchen, F. J. (M)
Kotovsky, S. K. (M)
Krivanich, M. A. (M)
Krutilek, G. A. (A)
Kuberski, C. C. (M)
Kuntz, H. A., Jr. (M)
Lentz, W. H. (M)
Licon, C. G. (A)
Lovitt, S. A. (A)
Lutener, C. C. (M)
Mager, R. F. (M)
Manglapane, R. (M)
Marquilles, J. (M)
Marshall, S. V. (M)
Maury, J. H. (M)
McCalla, T. M., Jr. (M)
McCollum, A. J. (A)
McCreary, J. T. (A)
McGill, W. T. (M)
McGraw, J. E. (SM)
McKennon, L. W. (A)
McKenzie, J. (A)
Meredith, G. L. (M)
Messina, J. (M)
Miller, W. E., Jr. (SM)
Mitchell, R. D. (A)
Morgan, W. R. (A)
Morris, C. P. (M)
Napper, H. B. (M)
Nelson, D. R. (M)
Nielsen, L. M. (M)
Osborn, H. H. (A)
Reeves, T. M. (M)
Rihaczek, A. W. (M)
Robinson, G. G. (M)
Rodenroth, R. D. (M)
Rojas, A. M., (M)
Rusche, C. L. H. (A)
Santa Ana, L. T. (A)
Sarge, A. E. (A)
Schroeder, K. G. (M)
Sharp, R. L. (M)
Shiplett, K. E. (M)
Short, D. S. (A)
Slater, B. M. (M)
Smith, K. W. (M)
Stewart, J. C. (M)
Stuart, J. F. (SM)
Talbott, E. P. (SM)
Thompson, C. A. (A)
Thorne, H. W. (A)
Tisdale, W. G. (A)
Toland, W. A. (M)
Trullinger, L. L. (A)
Van Gorder, M. (M)
Walker, P. G., III (M)
Walter, B. F. (SM)
Walton, K. J. (SM)
Wasser, N. (M)
Watkins, R. I. (M)
Webb, L. G. (M)
White, W. L. (A)
Wilder, G. E. (M)
Wilson, D. J. (A)
Winant, A. T. (M)
Youngberg, W. A. (M)

Fort Bliss (EP-6)
Andrews, L. A. (M)
Chin, Q. (M)
Hercessian, Y. T. (M)
Rieger, R. W. (M)
Rush, R. I. (M)
Tomlin, E. W., III (A)
Vass, J. L., Jr. (A)
Waite, A. C., Jr. (M)

Fort Davis (LP-6)
Thompson, A. R. (M)

Fort Hood (FW-6)
Montoya, J. R. (A)

Fort Worth (FW-6)
Abshier, D. G. (M)
Absolom, R. H. (A)
Adams, W. A. (M)
Allen, C. A., Jr. (M)
Allen, R., Jr. (M)
Athans, M. (A)
Babb, D. D. (M)
Baglione, D. F. (A)
Baker, B. R. (M)
Baker, R. O. (M)
Ball, J. H. (M)
Barr, E. W. (A)
Baswell, A. C., Jr. (M)
Bateman, J. W. (M)
Baxley, W. E. (A)
Bean, R. C. (M)
Beasley, B. (M)
Beckman, W. R. (M)
Berkley, R. D. (M)
Blum, S. (SM)
Boatright, A. W. (M)
Bohannan, B. J. (M)
Bordelon, C. J. (A)
Bosquez, R. D., Jr. (M)
Bourland, H. M. (M)
Brandt, L. C. (M)
Bridges, D. K. (A)
Bronson, R. D. (M)
Brooker, E. C., Jr. (M)
Brooks, J. L. (M)
Brothers, J. E. (A)
Brown, M. A. (M)
Brust, M. F. (M)
Bryan, K. W. (M)
Bunch, B. D. (A)
Burkhalter, W. R. M. (M)
Cantrell, W. E. (M)
Carlson, R. L. (A)
Carmouche, C. L. (M)
Carr, P. G. (M)
Caudle, R. L. (A)
Chandler, S. B. (A)
Charvoz, P. L. (M)
Christenson, N. B. (M)
Christian, H. C. (M)
Clark, J. E., Jr. (M)
Clark, L. T. (A)
Clements, C. W. (SM)
Cleveland, A. J. (M)
Collup, D. E. (SM)
Condron, W. F. (A)
Conrad, R., Jr. (M)
Cook, A. B. (M)
Cotnam, J. L. (M)
Cox, E. R. (M)
Crittenden, L., Jr. (M)
Crotty, J. V. (SM)
Crumb, S. F. (SM)
Cyr, R. P. (M)
Daggett, D. H. (M)
Danner, O. G. (M)
Deering, C. S. (M)
Delaney, J. S. (M)
Dickinson, R. M. (M)
Dilworth, J. H. (A)
Dinsmore, J. T. (A)
Dodd, J. M. (M)
Drewett, J. D. (M)
Dunlap, K. H. (A)
Du Toit, J. P. (M)
Eberhard, R. C. (A)
Ecklund, T. W. (M)
Egan, D. G. (SM)
Elliott, J. E. (M)
Ellis, H. G. (M)
Engler, A. R. (M)
Errante, J. J. (M)
Falk, B. (M)
Faulkner, H. E. (M)
Felice, J. J. (M)
Fink, W. L. (M)
Finkboner, W. E. (M)
Fisher, M. C. (A)
Fleming, D. R. (M)
Fleischer, C. H. (M)
Ford, B. H., Jr. (M)
Frank, A. (A)
Franks, W. R. (M)
Frazier, J. B. (A)
Fuhr, W. H. (A)
Funderburk, H. E. (SM)
Gandy, W. W. (SM)
Gaston, C. W. (M)
Gault, R. M. (M)
Gerlach, P. D. (M)
Gilmartin, T. (SM)
Godbey, W. C. (A)

TEXAS

Goggin, J. C. (M)
Gordon, M.J. (M)
Green, G.M. (M)
Green, P. C. (SM)
Greenlee, D. R. (M)
Grider, K. V. (M)
Grohowski, J. A. (A)
Hair, U. R. (A)
Hall, G. D. (M)
Hann, G. W. (M)
Hardin, B.A. (M)
Hargrove, J. L. (M)
Harman, D. G. (SM)
Harmon, J.M. (M)
Hartel, B. (M)
Haury, F. W., Jr. (M)
Hawkins, W. K. (A)
Hawthorne, M. M. (M)
Hay, G. W. (SM)
Hayes, R. R. (M)
Hearne, S. M. (M)
Heizer, L. E. (A)
Hicks, R. D. (M)
Hines, R. L. (A)
Hites, W. H. (M)
Hodges, T. R. (A)
Hogue, W. T. (M)
Holliday, C. E. (A)
Holt, J. M. (M)
Holtkamp, L. A. (A)
Horn, C.E. (M)
Jackson, G.L. (A)
Jiles, C. W. (M)
Johns, S. E., Jr. (M)
Johnson, W.M. (A)
Jones, D. M. (M)
Jones, L. R. (A)
Keck, J. F. (A)
Kelly, B. A. (SM)
Kent, A.H., Jr. (M)
Keplinger, M. (M)
Keppler, C., III (M)
Kidd, L. H. (SM)
Kinyon, W. E. (M)
Knight, D. G. (M)
Koski, J. I. (SM)
Kunselman, J. S. (A)
Laimore, W. J. (M)
Lane, M. E. (A)
Langston, J.W. (M)
Lanham, S. T., Sr. (M)
Lanier, J. (M)
Lattier, E. E., Jr. (M)
Logsdon, H. E. (M)
Looney, G. R. (M)
Lowrie, G. M. (A)
Macune, C.W. (M)
Mallory, V. L. (SM)
Maren, F.A. (A)
Martin, W.E. (M)
Mayfield, S. A. (M)
McConnell, D. K. (M)
McCully, W. L. (M)
McCutcheon, T.L. (M)
McDonnell, J.E. (M)
McDuff, B. G. (A)
McKenzie, J. R., Jr. (M)
McNary, R. C. (A)
McWhorter, L. C. (M)
Meredith, K. M., Jr. (M)
Migliccio, P. S. (M)
Miller, E. W. (M)
Miller, R. D. (A)
Mitchell, D. B. (M)
Moniz, J. J. (M)
Moore, H. E. (M)
Moore, S. D. (SM)
Moore, W. F. (A)
Morgan, R.L. (M)
Morgan-Voyce, A.M. (SM)
Morgenthaler, H. L. (A)
Morton, L.W. (M)
Mowery, D. K. (M)
Murdock, J. B., Jr. (M)
Musil, V. P. (M)
Neher, H. T. (SM)
Neshyba, S. J. (M)
Nicely, B. R. (M)
Norman, T. J., Jr. (SM)
Nunley, L. J. (M)
Pace, R. L. (M)
Palmer, E. B. (M)
Palmer, J. E. (VA)
Peck, R. D. (M)
Perry, E. R. (M)
Peterson, W. E. (M)
Pickens, F.T., III (M)
Polimeroi, L. G. (M)
Porter, F. K. (M)
Powell, S. C. (M)
Pryor, L. C. (A)
Quirino, F. (SM)
Randal, J. M. (A)
Rankin, L.T. (A)
Rasmussen, J.M. (M)
Ray, R.E. (M)
Redman, P.J. (A)
Riggs, H. K. (M)
Roberts, P. L. (A)
Robertson, D.R. (M)
Rcbertson, G.H. (M)
Robinson, D.A. (M)
Roderick, R. (SM)
Romaker, P. F. (A)
Ross, C. C. (VA)
Roy, F. J. (M)
Rushing, G. F. M)
Salls, A. E. (SM)
Sanchez, C. M. (A)
Sayre, G. L. (M)
Schappert, P. J. (M)
Seale, I. A. (M)
Serfass, B. R. (A)
Sewell, C. R. (M)
Seymour, D. E. (M)
Shaver, J. W. (M)
Shepherd, M. F. (M)
Shipman, H. F. (A)
Shoptaugh, J. R., Jr. (A)
Sigler, G. A., Jr. (M)
Sissom, A. W. (SM)
Sivernell, R. B. (A)
Slack, J. R. (M)
Slagle, G. M., Jr. (A)
Smith, J. R. (M)
Smith, L. B. (M)
Smith, R. O. (A)
Snead, J.L., Jr. (M)
Sneed, C. O. (M)
Soniat, E. (M)
Spears, M. F. (M)
Spradlin, J.D. (M)
Stanford, E.G. (M)
Stanley, J.D. (A)
Stewart, G. W. (M)
Stoker, C. J. (M)
Stuck, L. W., Jr. (M)
Stratton, J. W. (SM)
Stribling, J.L., Jr. (M)
Strother, J. J. (M)
Sumner, G.C. (SM)
Theriot, I. J. (SM)
Thomasson, W. D. (M)
Tighe, M.J. (A)
Tinkler, D.M. (M)
Travis, C. M. (SM)
Trimm, J. H. (M)
Tucker, B. J. (M)
Van Hoozer, C. H. (M)
Volder, J. E. (SM)
Wallis, C. L. (A)
Ward, E. B. (M)
Watkins, O. E. (M)
Watson, R.D. (M)
Webb, E. E. (SM)
Webb, V. C. (M)
Weidler, C. R. (M)
Welter, N. E. (M)
Wentworth, G.E. (M)
Whipple, A. J. (M)
Willman, J.F. (M)
Williams, C. E. (A)
Wilson, C. T. (M)
Wolanski, H. S. (A)
Wood, G. K. (A)
Woodrun, H.C. (A)
Worley, E. B , Jr. (M)
Young, F. W. (M)

Freeport (HOU-6)
Coker, S. G. (M)

Friendswood (HOU-6)
Havard, W. L. (A)

Galveston (HOU-6)
Allen, L. G. (A)
Lee, J. L. (M)
Matthews, J. A. (A)

Ganado (HOU-6)
Patton, A. D. (M)

Garland (DAL-6)
Albertine, H., Jr. (SM)
Andreassen, H. N. (M)
Bickel, R. L. (M)
Bondy, M. A. (M)
Buie, J. G. (A)
Carroll, J. M. (M)
Cawood, J. L. (A)
Coleman, H. R. (A)
Davis, P. D., Jr. (SM)
Dubose, G. P. (M)
Evans, L. L. (M)
Faith, W. O. (SM)
Funnell, W. W., Jr. (SM)
Granger, F. P., Jr. (M)
Griffith, B. W., Jr. (SM)
Grubbs, C. E. (M)
Grubbs, W. C., Jr. (SM)
Hager, C. K. (M)
Harton, P. L. (M)
Kattawar, A. (M)
Keeth, J.K. (M)
Logan, F. (M)
Lynn, J. C. (M)
MacKenzie, D. G. (M)
Marcucci, R. L. (M)
McCrum, K. W. (M)
McMurtrey, A. W., Jr. (SM)
Mitchell, W.D. (SM)
Parish, H. G. (M)
Parrish, O. C. (M)
Sandefer, S. R. (A)
Sanford, A. L. (A)
Sims, J.C. (M)
Sneed, J. D. (M)
Spilman, J. C (M)
Stanton, A. N. (SM)
Tackett, H. A. (SM)
Taylor, D. R. (M)
Tipton, C. D. (SM)
Underbrink, G. P. (M)
Whiteside, D. L. (M)
Williams, B. M. (SM)
Williams, C. E. (M)
Yeager, D. L. (A)

Genoa (HOU-6)
Davis, G. A. (A)
Johnson, O. F. (M)
Teague, J. W. (M)

Georgetown (FW-6)
Brown, B. M. (M)

Grand Prairie (DAL-6)
Albertson, H. D. (M)
Anderson, R. P. (M)
Blanning, R. B. (M)
Chadbourne, J. D. (M)
Davis, J. T., Jr. (M)
Howell, J. S., Jr. (A)
Morris, B. V. (M)
Romary, D. L. (M)
Tharp, C. U. (A)
Young, D. C. (M)

Grapevine (FW-6)
Blackshear, J. W. (A)
Donovan, J. J. (M)
Koogle, J. F. (A)

Greenville (DAL-6)
Cain, R. E. (M)
Johnson, D. M. (M)

Harlingen (SA-A-6)
Belken, V. J. (M)

Hempstead (HOU-6)
Sherron, R. J., Jr. (M)

Henderson (SHR-6)
Daniels, T. E. (SM)

Hitchcock (HOU-6)
Hullett, V. T. (A)

Houston (HOU-6)
Adkins, E. E., III (A)
Albertson, J. N. (A)
Anderson, W. L. (SM)
Anthony, J. P. (SM)
Armand, H. A. (SM)
Arnett, R. A. (SM)
Arthur, M. A. (SM)
Asbury, R. T. (M)
Atkinson, C. J., Jr. (M)
Attail, G. (M)
Austin, F. M. (SM)
Badger, A. S. (SM)
Baker, B. M. (SM)
Baker, J. H. (M)
Baker, L. E. (M)
Baker, R. L. (A)
Ball, J. D. (M)
Beeman, K. R. (M)
Belk, J. H. (A)
Bender, J. C. (SM)
Benner, R. G. (A)
Beyer, A. R. (A)
Beyer, F. (A)
Beyer, J. A. (M)
Biggs, M. A. (A)
Blanchard, A. (SM)
Bobbitt, J. T. (M)
Bodden, A. L., Jr. (A)
Bogs, C. W. (A)
Booker, J. L. (A)
Bowen, L. C., Jr. (A)
Bowers, W. E. (A)
Boyd, C. S. (A)
Bravenec, F. R. (M)
Brougher, R. M. (M)
Brown, C. R. (A)
Browne, N. R. (M)
Bryan, R. G. (M)
Buck, H. M. (SM)
Buckner, G. O., Jr. (SM)
Bucy, J. F., Jr. (M)
Buechner, R. H. (SM)
Bulhon, J. J. M. (M)
Burrows, R. C., Jr. (A)
Busacker, J. W. (A)
Butemeyer, D. K. (M)
Butts, T. M. (A)
Byers, E. G. (SM)
Cammack, A. R. (A)
Campbell, J. R. (M)
Canup, R. E. (SM)
Capers, J. L. (A)
Caplan, R. S. (SM)
Capote, L. C. (A)
Carter, J. H. (A)
Carter, W. H., Jr. (SM)
Cash, F. L. (SM)
Chapman, C. W. (M)
Childers, H. E. (SM)
Chinski, G. R. (SM)
Chung, W. J. Y. (M)
Cisneros, I. (M)
Clerc, M. C (M)
Cohn, D. (A)
Colbern, F. W. (A)
Cook, G. R. (SM)
Cormier, R. E. (M)
Cornett, J. R. (M)
Coulter, T. W. (M)
Craig, G. H. (M)
Crews, I. B. (M)
Crook, T. N. (M)
Crossland, O. C. (A)
Cummings, L. C., Jr. (M)
Curry, C. P. (A)
Curry, W. L. (M)
Dady, W. E. (M)
Dahlstrom, D. D. (M)
Davison, B. D. (A)
Dewan, J. T. (M)
Dixon, T. K., Jr. (M)
Donohoe, L. J. (A)
Dosher, R. T., Jr. (SM)
Douglas, J. E. (A)
Dowling, D J. (M)
Drennan, H. J. (M)
Drisdale, T. B. (A)
Dupree, E. M. (SM)
Du Rapau, J. J. (A)
Eaton, F. M. (M)
Edwards, W. H. (A)
Ehrlich, B. F. (M)
Ekerodt, S. (A)
England, L. T. (A)
Erath, L. W. (M)
Feagin, F. J. (SM)
Flatow, T. (SM)
Fossler, K. L. (M)
Francis, C. A. (M)
Franklin, P. E. (M)
Frazier, L. J. (A)
Frobese, C. W. (M)
Frosch, A. (M)
Gardner, D. H. (VA)
Gass, F. G. (A)
Geddes, L. A. (SM)
Geery, P. W. (A)
Gillespie, T. F. (A)
Girala, A. S. (M)
Gollwitzer, L. H. (A)
Graham, M. (SM)
Green, J. W. (M)
Greenwood, H. M. (M)
Greer, W. J. (SM)
Gundlach, E. E. (M)
Hagen, H. B. (M)
Haill, H. K. (M)
Halbert, J.L. (M)
Hale, E M. (SM)
Hallenburg, J. K. (SM)
Halliday, O. T. (SM)
Hanlon, E. G. (A)
Hanus, F. J. (A)
Hargett, J. T. (M)
Harris, R. A (M)
Hawkins, D. W. (M)
Hegar, D. T. (M)
Heins, A. E. (M)
Heintz, K. O. (SM)
Helken, E. W. (M)
Herrod, R. A., Jr. (M)
Hickman, D. M. (M)
Hill, H. B. (A)
Hilton, R. C. (M)
Hinds, M. H. (A)
Hiner, T. L. (A)
Holloway, M. R. (A)
Hougen, H. C. (M)
Houston, J. T., Jr. (A)
Hubbard, C. L. (M)
Hudgins, W. T., Jr. (M)
Huffman, C. H. (M)
Huhndorff, E. P. (M)
Hunt, C. J. (A)
Hurlbert, L. L. (M)
Huston, O. H. (M)
Irwin, H. R. (M)
Jameson, J. P. (M)
Jasper, L. L. (A)
Johnstone, C. W. (SM)
Jones, H. J. (SM)
Joss, J. (A)
Kannensteine, F. M. (M)
Kaufman, S. (SM)
Keating, L. M. (A)
Keeling, R. W. (M)
Keep, H. A. (A)
Kelly, R. W. (SM)
King, G. L. (A)
Klicpera, M. F. (A)
Kokesh, F. P. (M)
Kolb, R. H. (M)
Kriegel, H. C. (SM)
La Munyon, R., II (A)
Langley, L. W. (M)
Lathrop, W. A. (A)
Limb, L. K. (M)
Lord, A. H. (A)
Lorenz, L. H. (A)
Loveland, H. D. (A)
Luce, E. S. (M)
MacDonald, C. O. (M)
Madeley, P. E. (M)
Manesz, J. H. (M)
Marquess, R. L. (A)
Marsh, G. E. (M)
Martin, S. A., Jr. (M)
Masterson, H. T. (M)
Matteson, L. W., Jr. (A)
Matthews, C. R. (A)
Matthews, T. S. (M)
McArthur, H. K. (M)
McCabe, L. L. (SM)
McConnell, H. E. (SM)
McKay, G. C., Jr. (M)
McLendon, C. R. (M)
McLin, W. R. (A)
McManis, L. B. (SM)
McNatt, W. E. (M)
Melton, D. P. (M)
Menelaides, K. L. (M)
Menger, W. M. (M)
Millar, H. D. (M)
Miller, K. E. (M)
Millis, E. G. (M)
Milton, D. F. (A)
Minton, W. C. (A)
Mitchell, J. L. (M)
Mitchell, J. L. (M)
Monkhouse, J. R. (M)
Moore, A. M. (M)
Moore, R. D., Jr. (A)
Mullan, L. A. (M)
Nelsen, H. H. (M)
Neuenschwander, E. F. (M)
Nicolau, N. G. (M)
O'Brien, D. D. (A)
Ordino, J. R. (A)
Orsinger, A. R. (M)
Otis, D. C. (M)
Packard, J. C. (M)
Palmer, C. C. (M)
Palmer, O. M., Jr. (M)
Parker, R. H. (M)
Parsons, R. W. (A)
Patterson, H. B., Jr. (M)
Pearson, J. B. (M)
Pennington, M. S. (A)
Phillips, F. S. (M)
Pierson, A. L., III (M)
Pittman, R. R. (M)
Plumb, F. E. (A)
Rank, W. B. (M)
Ransome, R. L. (M)
Reid, A. C. (M)
Reynolds, R. C. (A)
Rhodes, H. A. (M)
Richardson, J. G. (A)
Robinson, J. C. (A)
Roby, J. W., Jr. (M)
Rodd, F. R. (M)
Rogers, H. H., Jr. (M)
Rojko, R. M. (M)
Rust, W. M., Jr. (F)
Ryon, R. M. (SM)
Salter, R. E. (M)
Santee, B. D. (M)
Sasseen, J. H. (SM)
Savage, K. D. (A)
Sawyer, W. G. (M)
Saxer, N. K. (M)
Schmidt, F. P. (A)
Schmidt, H. (A)
Schmuck, R. H. (M)
Schneider, W. P. (M)
Schuster, N. A. (SM)
Schutz, T. C. (M)
Scroggins, E. B. (M)
Sears, H. A. (M)
Seitas, A. D. (A)
Sembera, F. J. (M)
Sharpe, M. O. (SM)
Shawver, E. F. (M)
Sherrill, B. (M)
Slems, L. E. (M)
Silvus, H. S., Jr. (M)
Skellie, A. C. (M)
Sloughter, W. J. (SM)
Smith, F. C., Jr. (SM)
Smith, O. R. (SM)
Spann, M. M. (M)
Sparks, D. J. (A)
Spence, D. W. (SM)
Stanley, R. S. (M)
Stapleton, J. W. (M)
Steward, W. B. (SM)
Stickley, D. F. (A)
Stone, O. L. (M)
Stotler, D. E. (A)
Stroman, L. J. (M)
Tanguy, D. R. (M)
Tate, J. B. (M)
Taylor, A. D. (A)
Teal, E. E. (M)
Thomas, C. W., Jr. (A)
Thompson, R.R. (SM)
Thornton, L. C. (A)
Thurmond, J. G. (A)
Trimmier, W.W. (M)
Tullos, F. N. (M)
Turner, C. G. (SM)
Ulmer, J. G. (A)
Unger, J. H. (SM)
Van Wambeck, S.H. (SM)
Vincent, L. P., Jr. (M)
Vogel, C. B. (M)
Walker, H. O., Jr. (A)
Walters, W. T. (M)
Washburn, W. M. (A)
Waters, J. S. (M)
Watson, J. K. (M)
Watson, J. S. (A)
Watt, J. S. (SM)
Weidner, C. P. (A)
Welz, W. C. (M)
Wenzel, G. E. (A)
Wheeler, H. T. (M)
Whitaker, T. N. (SM)
White, G. (SM)
Widerstrom, F. W. (A)
Wilkinson, S. L. (M)
Will, J. H. (M)
Williams, A. P. (M)
Williamson, W. W. (A)
Wischmeyer, C. R. (SM)
Witt, W. W. (M)
Woehst, K. H. (A)
Wofford, J. H. (M)
Wofford, W. D., Jr. (A)
Wright, F. E. (A)
Wright, J. L. (A)
Wrye, W. C., Jr. (M)
Zill, F. W. (M)

Irving (DAL-6)
Atchley, B. K. (M)
Baker, T. J. (M)
Breithaupt, J. J. (M)
Butler, D. M. (M)
Buzbee, J. M. (M)
Cleveland, A. R. (M)
Curling, R. L. (M)
Dillon, P. (M)
Flowers, B. R. (M)
Hampton, J.W. (SM)
Harris, H. F. (M)
Haskins, D.E. (M)
Heithecker, L. F. (M)
Holly, L. C. (M)

Le Gette, J. L. (M)
Jones, J. F. (SM)
Jones, W.B. (M)
Kramer, C. V. (SM)
Lewis, R. E. (M)
Logan, J.J. (SM)
MacDonald, F.H. (M)
Mayberry, K. L. (M)
Merlington, R. N. (A)
Nelson, S. R. (A)
Nichols, L. A. (A)
Parker, F. D. (M)
Penn, T. C. (SM)
Petrasek, A. C. (SM)
Roberts, B. W. (M)
Seals, R. B. (M)
Sheppard, D. E. (A)
Skelton, C.W. (SM)
Smith, C. H. (M)
Stone, R.M. (SM)
Sullivan, W. A., Jr. (M)
Telew, W. (M)
Thomas, C. R. (M)
Walker, R. K. (M)
Wisdom, A. H. (M)

Kelly AFB (SA-A-6)
Cooper, J. H. (M)
Hirsch, C. O. (A)
Robertson, J.T. (M)

Kermit (LP-6)
Hopper, W. L. (M)

Kerrville, (SA-A-6)
Mason, A.F., Jr. (M)

Kingsville (SA-A-6)
Balkanli, H. (M)
Guinn, J. R., Jr. (M)
Korges, E. (M)
Rawls, H. F. (A)

Lackland AFB (SA-A-6)
Wier, E. J., Jr. (M)

Lackland City (SA-A-6)
Stenshoel, C.R. (M)

Lake Jackson (HOU-6)
Williams, W. E. (M)

La Porte (HOU-6)
Harrison, R. H. (A)

Laredo (SA-A-6)
Hill, G. C. (M)
Thomas, G. W. (A)

Longview (SHR-6)
Bean, R. N. (M)

Lubbock (LUB-6)
Bland, E. W. (A)
Bryant, R. S. (A)
Cardwell, H. A. (M)
Carver, D. H. (M)
Charlesworth, L.M. (A)
Craig, J. P. (A)
Criswell, J. J. (M)
Delashaw, J. W. (M)
Donaldson, C.A. (M)
Easter, B. H. (A)
Edwards, D. J. (A)
Fagan, J.R. (M)
Grigsby, L. L. (M)
Hollingsworth, R.B. (A)
Houston, C.E. (SM)
Hutton, C.D. (A)
Joiner, J.B. (M)
Jones, L.B., Jr. (A)
Kilcrease, E. F. (M)
Lankford, I.C., Jr. (A)
Lebanoff, L. (A)
Lee, R. F. (SM)
Paul, C. A. (A)
Smith, G. H. (A)

Luflin (B-PA-6)
Hill, F. C. (M)
Saxon, M. (SM)

Marble Falls (FW-6)
McDonald, C. J. (M)

Mesquite (DAL-6)
Gray, T., Jr. (A)
Nieswiadomy, B. L. (M)

Midland (LUB-6)
Coleman, M.V., Jr. (M)
Floyd, C. W., Jr. (M)
King, V. G. (M)
Lowery, R. O. (M)
Maunder, E.R. (M)
Murphy, M. L. (A)
Nance, B. J. (M)
Yates, T. (A)

Mineral Wells (FW-6)
Dunlavy, J. H., Jr. (A)
Mitchell, D. H. (SM)

Nederland (B-PA-6)
Leins, F.R. (M)

Odessa (LUB-6)
Blake, R. C. (A)
Schock, W. R. (A)
Orange (B-PA-6)
Coale, C. R., Jr. (M)
Jones, R.L. (M)
Stivers, R. B. (M)

Overton (SHR-6)
Sutton, J.P. (M)

Palacios (HOU-6)
Arnold, H. N. (A)

Pampa (LUB-6)
McQuigg, H. E. (M)

Pasadena (HOU-6)
Clarke, C. V., Jr. (M)
Gulihur, D. L. (M)

Perrin AFB (DAL-6)
Kreger, K. W. (M)

Point Comfort (SA-A-6)
Conant, R. D. (M)

Ponder (FW-6)
Swafford, T. W., Jr. (M)

Port Arthur (B-PA-6)
Dolson, R.M. (A)
Hamilton, C.J., Jr. (M)
Hurst, E. H. (M)
Kelly, W. T. (M)
Krutz, E. H. (A)
Monroe, W. M. (A)
Swanson, E.C. (M)

Port Isabel (SA-A-6)
Brand, J. (M)

Port O'Connor (SA-A-6)
Caldwell, J. L., Jr. (M)

Prairie View (HOU-6)
Kelly, G. E., Jr. (M)

Richardson (DAL-6)
Adams, J. E. (M)
Allen, M.B. (M)
Ariail, H. E., Jr. (M)
Athans, M. (A)
Bark, D. A. (M)
Bates, L. D. (M)
Biggs, J. A. (SM)
Blount, J.F. (M)
Bohan, J.L. (M)
Braginton, P.R. (SM)
Braun, C. (A)
Brooks, F. E., Jr. (F)
Brown, J.M. (M)
Bryan, W.D. (M)
Carter, R. C. (M)
Cate, G. M. (M)
Chancey, W. L. (M)
Church, G. C. (M)
Cook, L. (M)
Cooke, H. F. (M)
Corbin, C. D. (M)
Crandell, E. L. (M)
Davidson, K.W. (M)
Donnell, W. F. (A)
Eddleston, J.H. (M)
Eichenseer, R.J. (M)
Fenner, R.G. (M)
Foos, R. (A)
Forney, F. E. (A)
Gage, R. G. (M)
Garon, A.J. (SM)
Gilbreath, B. F. (M)
Godbey, J. J. (M)
Halvorson, R. L. (M)
Hancock, R. I. (A)
Hern, H. D. (M)
Herndon, R.A. (M)
Hertel, P., Jr. (M)
Higginbotham, H. L. (M)
Hill, J. D., III (M)
Hughes, L. E. (A)
Hull, J. E. (M)
Ivy, A. W. (M)
Jasper, J. D. (M)
Jones, J. W. (M)
Kaff, L. E. (M)
Lee, R. E. (SM)
Leming, T. L. (M)
Love, K. A. (A)
Luecke, G. N. (M)
Luthans, R.L. (A)
Lynch, P. D. (M)
Manning, V. R. (M)
Mason, J.S. (M)
Mathis, J. B. (SM)
Mitchell, A. T. (A)
Muhm, R. E. (M)
Murdock, B. J. (SM)
Nail, A. E., Jr. (M)
Nichols, R. A. (M)
Nickol, W. L. (M)
Obenhaus, R. E. (M)
Ocraschek, F. J. (SM)
Pippenger, D.E. (A)
Powers, J. D. (M)
Prickett, T., Jr. (SM)
Prier, H. W. (A)
Randolph, C. E. (M)
Reece, J. O. (M)
Sawyer, F. L. (M)
Sebesta, J. R. (M)
Smith, C.E. (A)
Spieker, M. (M)
Stambaugh, E. D. (A)
Stewart, R. F. (M)
Stillwell, H. F. (SM)
Veerman, W. H. (M)
Warriner, B. (SM)
Wendlandt, C.W. (M)
Wolff, E. A., Jr. (M)
Yaple, T. L. (M)

Saginaw (FW-6)
Krotz, W. E. (A)

San Angelo (SA-A-6)
Vancil, B. I. (M)

San Antonio (SA-A-6)
Adams, R. M. (A)
Anderson, W. L. (M)
Arnold, J. B. (SM)
Balusek, A. J. (M)
Beckwith, J. E. (M)
Behrendt, H.B. (M)
Berns, P.J. (A)
Bergquist, A. O. (A)
Blake, G. A. (SM)
Brann, W. (M)
Bristow, G. P., Jr. (M)
Brogan, F. A. (SM)
Buchanan, H. (M)
Cadena, D.G. (M)
Carmack, W. J. (A)
Case, B. (A)
Chamberlain, P.E. (M)
Cleo, L. W. (A)
Crites, C. R. (M)
Crockett, A. E. (M)
Cuccia, J. W. (A)
Cunningham, J. B. (A)
Daniels, D. G. (A)
Dean, J. L. (A)
Donaldson, W.L. (SM)
Dubois, V. G., Jr. (A)
Duepner, F. (M)
Edmonson, J.W.E. (M)
Egerton, W. G. (SM)
Egger, S. L. (M)
Enderle, T. L. (SM)
Fitz Simon, D.E.J. (A)
Ford, M. J. (A)
Fountain, L.S. (M)
Fretz, O. G. (SM)
Gallagher, J. D. (M)
Gardiner, B.E. (A)
Gosch, V. E. (A)
Gower, S. G. (A)
Graf, C. R. (M)
Gunkel, W.A. (M)
Hallum, J. T. (M)
Hamm, W. J. (SM)
Harrell, R. D. (A)
Harris, W. C. (A)
Hasbrook, A. F. (SM)
Hixon, S.M. (A)
Hornbrook, F.W. (M)
Ing, G. W. (SM)
Jackson, T.R. (A)
Jackson, W.J. (SM)
Jeffers, C. L. (SM)
Jones, R. L., Jr. (A)
Kelly, R. W. (M)
King, J. D. (M)
Lamb, H. O. (M)
Laster, C. C., Jr. (M)
Lincoln, J.P. (M)
Lusk, E. C. (A)
Matthews, K. B. (M)
Mayne, W.H. (SM)
McConnell, J.W. (M)
Medina, G.R. (A)
Meiners, W.H. (A)
Milam, R. W. (A)
Miller, C. M. (M)
Miller, W. J. (A)
Minton, J.P. (F)
Moore, J. D. (M)
Morris, C. R. (M)
Morrison, G., Jr. (A)
Parr, J. O., Jr. (SM)
Pomy, H. J. (M)
Pool, E. B. (M)
Porter, J. B. (M)
Prucha, M. J. (M)
Rhodes, M. H. (A)
Richey, E. O. (SM)
Rives, J. B. (SM)
Samford, H. L. (A)
Savino, L. J. (A)
Sears, D. (M)
Semmes, D. R. (A)
Siegel, H. A. (A)
Sikes, R. E. (SM)
Simpson, S. H., Jr. (SM)
Smith, M. T. (M)
Smith, R. J., Jr. (M)
Stokes, P. B. (M)
Sullivan, M. C. (M)
Tollerson, J. C. (M)
Taucer, C. W. (M)
Travers, D. N. (M)
Turner, H. C. (M)
Wangler, R. B. (M)
Wardwell, H. W. (M)
Watson, J. T. (A)
Watson, R. J. (M)
White, D. C. (A)
White, D. D. (A)
Wiggins, E. D. (M)
Wilkes, C. P. (M)
Wines, C. B., Jr. (A)
Wornser, J. J. (M)
Zimmerman, L. O. (M)
Zumwalt, B. C. (M)

San Benito (SA-A-6)
Hill, R. T. (M)

San Marcos (SA-A-6)
Whan, D. F. (A)

Seguin (SA-A-6)
Vahrenkamp, R. H., Jr. (M)

Sour Lake (B-PA-6)
Collins, J.P. (M)
Cross, O. (A)

Sunray (LUB-6)
Perkins, C. S. (M)

Tarleton Station (FW-6)
Baker, L. T. (M)

Temple (FW-6)
Fowler, A. F. (A)
Martin, B. A. (M)

Texarkana (SHR-6)
Dickinson, M. A. (A)

Texas City (HOU-6)
Meyer, J. L. (M)

Tyler (DAL-6)
Godfrey, R. M. (M)
Grice, C. F. (M)
Hays, J. W. (M)

Vernon (FW-6)
Watts, J. D. (M)

Victoria (SA-A-6)
Joss, J. W. (A)
Scroggins, C. M. (M)

Waco (DAL-6)
Fulwiler, R. J. (A)
Schweitman, H. D. (SM)

Waxahachie (DAL-6)
Pitts, W. C., Jr. (M)

West Columbia (HOU-6)
Blair, R. S. (M)

Wichita Falls (FW-6)
Adams, J. (A)
Dickensheets, L. (A)
Wiley, H. T. (M)

Ysleta (LP-6)
Lane, J. F. (A)

UTAH

Bountiful (SLC-7)
Anderton, C. W. (M)
Barneck, C. A (A)
Bowen, M. J. (M)
Glover, K. H. (M)
Hansen, C. F. (M)
Moss, S. D. (M)
Prisbrey, D. (A)
Reidel, R. L. (A)
Richardson, F. L. (M)
Stephenson, L. D. (M)
Washburne, J. W. (A)
Wilson, D. E. (M)
Yancey, L. D. (M)

Brigham City (SLC-7)
Black, F. B. (M)
Chiaretta, F. L. (M)
Gardner, T. W. (A)
Jensen, S. D. (M)

Centerville (SLC-7)
Folsom, J. B. (M)

Clearfield (SLC-7)
Billings, R. G. (M)
Kartchner, K. A. (M)
Taylor, J. M. (M)

Dutch John (SLC-7)
Eggers, J. W. (M)

Heber (SLC-7)
Fisher, B. (M)

Hill AFB (SLC-7)
Brewer, L. R. (M)
Dickman, F. R. (A)

Hyde Park (SLC-7)
Hancey, H. L. (M)

Hyrum (SLC-7)
Atkinson, A. L. (M)

Kaysville (SLC-7)
Kishimoto, T. H. (M)

Layton (SLC-7)
Loomis, F. E. (A)

Lehi (SLC-7)
Wing, G. J. (M)

Logan (SLC-7)
Chadwick, D. G. (M)
Clark, C. (SM)
Cole, L. S. (SM)
Jones, W. L. (SM)

Magna (SLC-7)
Sedlor, R. J. (M)

Moab (SLC-7)
Widows, C. H. (A)

Murray (SLC-7)
Burgess, E. W. (M)
Judkins, C. D. (M)
Patterson, C. L., III (M)
Reid, D. W. (M)
Rinn, B. R. (A)
Tew, D. E. (M)

Ogden (SLC-7)
Barrett, M. J. (M)
Lee, G. F. (M)
Lone, R. S. (M)
Mitchell, J. W. (M)
Rudd, F. S. (M)
Urie, H. G. (A)
Wardleigh, G. R. (M)

Provo (SLC-7)
Bartholomew, D. (M)
Hurlbut, P. R. (M)
Jonsson, J. J. (SM)
Monson, D. J. (M)

Roy (SLC-7)
Arrington, A. C. (M)

Salt Lake City (SLC-7)
Adams, B. L. (M)
Ahearn, J. M. (M)
Alley, C. L. (SM)
Anderson, J. E. (A)
Arbaney, V. A. (M)
Ballard, F. (A)
Brown, D. E. (M)
Brown, D. E. (M)
Brown, J. E. (M)
Carman, F. C. (M)
Carver, V. D. (SM)
Christiansen, R. J. (M)
Clayton, V. E. (SM)
Cochran, G. R. (M)
Conway, J. F., Jr. (M)
Cozzens, W. D. (M)
Dalley, J. E. (M)
Davis, T. D (M)
Diehl, C. E. (M)
Dixon, D. R. (M)
Evans, C. R. (M)
Feintuch, H. (M)
Gates, F. Y. (M)
Gehmlich, D. K. (M)
Geller, W. (M)
Glantz, R. H. (A)
Gray, C. S. (SM)
Green, D. J. (M)
Grover, R. C (M)
Grow, R. W. (SM)
Gunderson, A. L. (M)
Haegele, R. W. (SM)
Hall, J. E. (A)
Hammond, S. B. (SM)
Harper, R. B. (M)
Harris, L. D. (SM)
Harvey, T. (A)
Haycock, D. C. (SM)
Heine, W. (M)
Hemsley, A. L. (M)
Higgins, R. N. (M)
Hing, K. M. L. (A)
Hoggan, M. J. (A)
Hooper, J. S. (M)
Hubbard, J. J. (A)
Hunt, M. J. (A)
Johnson, W. L. (M)
Klitz, R. W. (M)
Lambert, T. M. (M)
Larsen, R. R. (A)
Longson, F. W. (M)
McLaughlin, J. W. (M)
Meyer, H. E., Jr. (M)
Meyer, K. G. (M)
Miller, D. (M)
Murphy, L. C. (M)
Nicholes, G. H. (M)
Nielsen, R. D. (M)
Noffsinger, D. T. (A)
Piele, G. H. (M)
Pound, E. F. (A)
Powers, J. T. (M)
Quayle, R. J. (M)
Rathke, J. E (A)
Redd, H. J. (M)
Robinson, W. H. (A)
Shaffer, M. R., Jr. (M)
Stimpson, E. C., Jr. (M)
Thorpe, J. N. (M)
Trinnaman, R. R. (A)
Vodak, A. W. (M)
Wagner, L. W. (M)
Warner, H. R. (A)
Watson, D. R. (M)
Weimer, J. W. (A)
Wells, K. R. (M)
Wright, J. W. (F)

Sandy (SLC-7)
Atwood, K. W. (M)
Nelson, K. F. (M)
Skinner, R. L. (M)

Smithfield (SLC-7)
Finchum, W. A. (M)

Spanish Fork (SLC-7)
Hone, S. J. (M)

Tremonton (SLC-7)
Bjorn, D. E. (A)

UTAH

Woods Cross (SLC-7)
Smith, K. D. (M)
Urry, L. W. (M)

VERMONT

Bennington (BOS-1)
Osgood, D. W (M)

Burlington (B-NV-1)
Bender, D. R. (M)
Borah, D. F., III (A)
Cloutier, M. P. (A)
Eckels, A. R. (SM)
Frisby, W. L. (M)
Irwin, R. W., Jr. (A)
Landry, A. E. (M)
Laroche, R. A. (M)
Leonard, C. E. (M)
Martin, S. T. (SM)
Mooney, R. M. (M)
Sichel, F. J. M. (SM)
Tierney, J. W. (M)

Charlotte (B-NV-1)
Parlas, J. L. (SM)

Chester (BOS-1)
Rowe, A. H. (A)

Essex Junction (B-NV-1)
Beauregard, L. P. (A)
Faunce, N. J. (M)
La Porte, G. L. (M)
Marcotte, R. A. (M)

Jericho (B-NV-1)
Snowman, L. R. (M)

Newport (B-NV-1)
Jones, A. H. (M)

Northfield (B-NV-1)
Marsh, R. F. (SM)
Seal, P. M. (SM)
Webb, M. L. (M)

Richmond (B-NV-1)
Quinn, P. A. (A)

Rutland (BOS-1)
Church, H. V. (M)
Lyman, R. P. (SM)
O'Brien, J. A. (M)

St. Albans (B-NV-1)
Wright, H. E. (M)

Shelburne (B-NV-1)
Bundy, L. M. (M)

South Burlington (B-NV-1)
Dudevoir, W. G. (M)
Horvath, C. (M)
Wheatley, D. M. (M)

South Woodstock (BOS-1)
Garceau, L. (M)

Springfield (BOS-1)
Churchill, D. W. (A)
Lohan, F. J. (M)
Power, D. W. (M)
Ranney, A. F. (A)

Stowe (B-NV-1)
Prouty, G. S., Jr. (M)

Waterbury (B-NV-1)
Chase, W. C. (M)

Waterbury Center (BOS-1)
Havens, A. C. B. (A)

Weston (BOS-1)
Boothby, L. W. (M)

VIRGINIA

Abingdon (VIR-3)
Krusberg, R. J. (M)

Alexandria (W-DC-3)
Akerberg, E. D. (A)
Anderson, L. M. (A)
Andrus, A. M. (M)
Ashenden, G. K., Jr. (M)
Ashley, D. S. (M)
Balwanz, W. W. (SM)
Bates, J. F. (A)
Bauer, R. E. (M)
Bawer, R. (A)
Beresford, H. E. (M)
Besancon, M. (SM)
Beasancon, M. (SM)
Bickford, F. H., Jr. (A)
Boswell, R. A. (A)
Bowman, W. B. (A)
Bradley, J. C. (M)
Briskman, R. D. (A)
Brooks, F. C. (M)
Busby, E. S., Jr. (M)
Callahan, A. L. (M)
Carroll, L. O. (A)
Carson, J. O., Jr. (M)
Carterette, A. A., Jr. (M)
Chadwick, G. G. (M)
Chatfield, N. V. (A)
Childers, A. A. (SM)
Cole, R. I. (F)
Collins, W. H. (M)
Colton, R. B. (F)
Compton, M. E., Jr. (M)
Coven, A. W. (SM)
Cryer, J. M., Jr. (M)
Danos, L. A., Jr. (M)
D'Antonio, R. G. (M)
Darcey, R. J. (M)
Dawson, H. E. (A)
Decof, D. N. (M)
Disenhaus, N. (SM)
Dittman, P. E. (M)
Dudley, D. D. (M)
Dupree, J. E. (SM)
Durig, R. F. (M)
Ellsworth, R. T., Jr. (A)
Evans, J. P. (M)
Everhard, F. U., Jr. (A)
Favret, A. G. (SM)
Firth, E. E. (SM)
Fleming, J. H. (M)
Foyer, D. R. (A)
Fraedrich, D. K. (M)
Fry, L. T. (A)
Garafola, J. R. (M)
Garrigus, N. F. (M)
Gills, L. C. (M)
Glass, R. (A)
Goeser, J. N. (SM)
Goldberg, A. S. (M)
Gonzalez, W. (A)
Graves, C. J. (M)
Greear, D. W. (M)
Guinard, N. W. (SM)
Hall, C. C. (M)
Harmon, W. R. (SM)
Harris, J. E., Jr. (M)
Harvey, D. T., Jr. (M)
Heffernan, H. J. (A)
Heister, C. F. (SM)
Hendershot, L. R. (A)
Hight, S. C. (F)
Hill, M. E. (A)
Hopkins, A. F., Jr. (SM)
Humphrey, J. S. (A)
Hurlburt, R. W., Jr. (A)
Husted, J. M. (M)
Iddings, H. G., Jr. (SM)
James, J. E. (M)
Jewell, H. H., Jr. (M)
Johannes, J. M. (SM)
Johnson, S. F. (M)
Kelleher, K. S. (SM)
Kiebach, C. D. (A)
King, W. M. (M)
Klenk, J. L. (M)
Knoer, H. (SM)
Knopf, A. J. (A)
Kochendarfer, D. C. (A)
Koll, A. J., Jr. (M)
Konkel, A. J., Jr. (M)
Kozak, A. S. (A)
Kubilius, A. A. (M)
Leftwich, L. L. (M)
LittleJohn, H. S. (M)
Littlepage, C. M. (A)
Longfellow, B. S. (M)
Lorenz, R. J. (M)
Love, F. B. (M)
Lucke, W. N. (M)
Mallinson, F. C. (SM)
Malone, D. M. (M)
Mancebo, T. W. (M)
Marsolan, V. C. (SM)
Mazur, D. G. (SM)
McCall, C. P. (M)
McElroy, E. J. (M)
McEwan, A. J. (M)
McGinnis, L. F., Jr. (A)
McLeod, J. A. (M)
Melton, B. S. (SM)
Melville, J. E. (A)
Messer, A. M. (M)
Miller, A. T. (A)
Miller, E. R. (A)
Miller, J. W. (M)
Mittelman, L., Jr. (M)
Montague, H., III (M)
Moore, H. S. (M)
Moore, R. T. (SM)
Moreland, H. H. (M)
Morrow, C. M. (M)
Mullin, J. H. (A)
Myers, J. C. (SM)
Myers, O. H. (A)
Nabell, E. G. (A)
Noble, H. L. (A)
Park, K. L. (A)
Parker, C. V. (SM)
Peake, H. J. (SM)
Peavey, B. (M)
Percy, R. W. (M)
Perrino, S. R. (A)
Phillips, R. M. (M)
Pichetto, P. B. (M)
Price, H. W., Jr. (M)
Raudenbush, J. E. (M)
Rayborn, H. C. (M)
Raybuck, C. B. (SM)
Rector, C. (M)
Reid, J. G., Jr. (SM)
Reiser, D. (M)
Rochelle, R. W. (M)
Romer, W. J. (M)
Rowe, H. E. (SM)
Royce, R. K. (M)
Sabel, A. J. (SM)
Salmond, D. S. (SM)
Sargent, R. S. (SM)
Schneider, F. H. (M)
Schneider, R. J. (SM)
Scholl, G. S. (A)
Schumann, A. W. (M)
Seddon, J. C. (F)
Shepard, D. H. (SM)
Skewis, W. H. (A)
Smith, C. (A)
Spayth, F. J. (M)
Spencer, C. L. (M)
Stern, H. I. (M)
Stewart, C. (SM)
Stinson, J. F. (SM)
Stroble, R. R. (M)
Strother, J. F. (M)
Stuckert, E. M. (SM)
Tasaka, T. (M)
Taylor, W. B. (M)
Thompson, L., Jr. (SM)
Tidball, F. E. (SM)
Tucker, J. W. (M)
Tucker, W. K., Jr. (A)
Underwood, R. W. (M)
Varela, A. A. (SM)
Vaughn, J. E. (M)
Von Alven, W. H. (M)
Von Dohlen, H. W. (M)
Watt, E. J. (M)
Watts, C. R., Jr. (M)
Welhe, W. K. (SM)
Weinstein, A. (M)
West, J. S. (M)
White, D. R. J. (SM)
Williamson, H. G. (M)
Wise, J. P. (M)
Wunderley, R. H. (M)
Young, M. P. (SM)

Annandale (W-DC-3)
Beecher, G. L. (A)
Black, L. (M)
Bouvy, J. W. (M)
Bradley, E. H. (SM)
Cervenka, F. J. (SM)
Curtis, C. V. (M)
Dixon, J. T. (SM)
Evans, A. L. (A)
Garlan, H. (M)
Germain, E. G., Jr. (A)
Hershberger, W. C., Jr. (M)
Jackson, D. A. (A)
James, F. B. (M)
Johnson, F. (SM)
Marshall, A. R. (M)
Olds, M. L. (M)
Pyle, S. H. (M)
Richman, H. R. (M)
Stralton, J. C. (M)
Teachman, A. E. (SM)
Turner, J. S. (SM)
Williams, R. T. (M)

Arlington (W-DC-3)
Adams, T. M. (M)
Albee, C. (M)
Anderson, R. L. (M)
Atkinson, E. E. (M)
Backus, W. A. (M)
Baker, H. L. (A)
Banks, C. R. (SM)
Bankson, H. D. (M)
Barr, L. V. (M)
Batch, W. J. (M)
Batista, W. C. (A)
Becker, O. E. (M)
Beecher, W. C. (M)
Bennett, R. (F)
Bernstein, H. E. (SM)
Bettis, W. E. (M)
Beyer, C. M. (SM)
Boggs, G. E. (M)
Boros, G. (A)
Bowen, C. H. (A)
Bradley, M. R. (M)
Breen, M. T. (A)
Bridges, J. M. (F)
Brown, R. F., Jr. (M)
Brunk, H. L., Jr. (M)
Buchanan, O. R. (A)
Burleson, M. M. (A)
Burris-Meyer, H. (SM)
Busch, C. R. (M)
Butts, R. S. (M)
Cahan, P. J. (M)
Calohan, W. C. (M)
Campbell, J. S. (A)
Campbell, W. H. (SM)
Chasnov, B. (SM)
Clark, G. E., Jr. (A)
Clark, R. L. (F)
Cobb, C. A. (SM)
Cobb, M. W. (A)
Cochran, J. L. (SM)
Coe, G. J. (M)
Cohen, J. (SM)
Connaway, J. E. (A)
Cook, D. C. (A)
Cook, E. F. (SM)
Crigler, T. B. (A)
Cummings, C. I. (SM)
Davidson, W. P. (M)
Davis, C. H. (A)
Davis, T. R. (A)
De Hart, R. N. (M)
De Maar, J. D. (M)
Dennison, B. H., Jr. (SM)
Dettra, J. E., Jr. (A)
De Vore, C. (SM)
Dixon, G. C. (SM)
Dodge, J. E. (A)
Donald, B. L. (M)
Dreyfus, J. (SM)
Dutton, W. P. (M)
Elwen, C. J. (SM)
Enos, R. M. (M)
Eskinzes, J. G. (A)
Etter, W. A. (M)
Fagan, B. B. (M)
Ferris, R. C. (M)
Fiedelman, C. (SM)
Fletcher, R. (M)
Flint, R. B. (M)
Freeman, J. T. (M)
Gall, R. G. (M)
Garcia, O. M. (M)
Garrett, L. F. (A)
Garrett, W. O. (SM)
Gauss, H. (M)
Gibson, G. B. (SM)
Giles, R. C. (M)
Gillenwater, T. M. (M)
Girard, E. J. (SM)
Gleason, D. H. (A)
Good, C. A., Jr. (M)
Gorman, T. A., Jr. (M)
Gregory, C. A. (SM)
Griffin, L. L. (M)
Groves, W. E. (SM)
Gumina, L. V. (A)
Hahn, W. R., Jr. (M)
Hale, R. J. (A)
Hall, O. E. (M)
Harding, G. C. (M)
Harkins, P. B. (SM)
Harsh, J. L. (A)
Hedrick, C. E. (M)
Hens, R. J. (A)
Heyden, J. F. (A)
Hice, L. C. (A)
Higgins, D. P. (A)
Hilgedick, W. C. (SM)
Hinman, W. S., Jr. (F)
Hoggarth, K. G. (A)
Huck, W. J., Jr. (M)
Hutton, D. B. (A)
Israel, F. (M)
Jacks, S. T. (M)
Johannessohn, N. A. (M)
Johnson, P., Jr. (A)
Jolkovski, J. (M)
Jones, E. L. (M)
Jones, G. H., Jr. (A)
Kahwajy, F. T., Jr. (M)
Karp, A. L. (M)
Kefalas, G. P. (M)
Keller, A. J. (M)
Kerr, J. M., Jr. (M)
Kersey, J. A. (SM)
King, L. H. (M)
Koditek, G. W. (A)
Kosar, W. S., Jr. (M)
Krason, H. C. (M)
Krcek, J. A. (SM)
Lancioni, P. (M)
Lawson, A. A. (SM)
Lay, L. L. (M)
Lee, J. M. (SM)
Levin, A. (A)
Loda, C. J. (SM)
Logan, B. A., Jr. (M)
Louer, P. E. (M)
Low, W. C. (M)
Luck, D. G. C. (F)
Lynch, J. A. M. (SM)
Manning, J. R. (M)
Martin, D. L. K. (SM)
Martin, E. T. (SM)
Martin, O. L. (M)
Martin, R. D. (SM)
Martin, T. J. (M)
Maryeski, W. P. (M)
Mayer, D. S. (M)
McCachren, W. S. (SM)
McClure, G. H. (SM)
McConnell, I. R. (M)
Meader, G. S., Jr. (A)
Mendus, W. M. (A)
Messick, V. D. (A)
Metzger, E. E. (M)
Metzger, W. (M)
Milbrodt, P. E. (A)
Miller, J. L. (M)
Miller, J. L., Jr. (M)
Millies, F. G. (M)
Mills, R. L. (A)
Moffet, J. A. (M)
Montoomery, J. N., III (M)
Morrisey, J. A. (A)
Morscher, L. N., Jr. (SM)
Murray, C. B., Jr. (A)
Nelson, C. W., Jr. (M)
Neumann, A. J. (M)
Noble, J. S. (A)
Nyhen, E. M. (M)
Parker, M. L., Jr. (M)
Parris, D. S. (A)
Pennington, I. B. (M)
Perrott, T. A. (M)
Petit, A. F. (M)
Peyton, P. B., Jr. (M)
Podrasky, R. W. (M)
Poling, A. C. (M)
Pressly, C. P., III (M)
Pressnall, J. R., (A)
Price, M. A. (SM)
Prins, D. W. S. (A)
Puro, W. O. (SM)
Quinn, F. S., Jr. (M)
Quinn, R. B. (M)
Rawicz, L. (A)
Riodon, C. A. (M)
Roder, C. C. (VA)
Rosenthal, S. (A)
Sargent, C. J. (M)
Schaaf, R. H. (SM)
Scholetzky, J., Jr. (A)
Scofield, H. L. (SM)
Scull, R. C. (A)
Seifert, F. F. (M)
Selby, H. A. (A)
Sellosohn, I. (A)
Sergeant, R. C. (SM)
Sherer, L. M. (SM)
Sherwood, R. M. (SM)
Sisco, H. W. (SM)
Smith, E. L., Jr. (M)
Smith, R. O. (SM)
Smith, T. F. (M)
Spies, M. C. (M)
Stec, C. L. (SM)
Stephan, H. W. (VA)
Stewart, J. M. (SM)
Stilman, J. P. (M)
Stormuste, C. G. (M)
Strothers, H. (M)
Suminski, H. (A)
Sutton, B. L. (M)
Swanson, M. W. (SM)
Swierczek, W. L. (A)
Taack, G. B., Jr. (M)
Tate, J. P., Jr. (A)
Teschner, D. (M)
Thames, W. M. (SM)
Thomas, F. J. (M)
Thomasson, H. B. (M)
Thompson, R. A. (A)
Tranham, W. E. (M)
Trepub, B. G. (M)
Trotter, B. E. (SM)
Vance, R. T. (M)
Van Valkenburgh, R. A. (M)
Veatch, J. P. (SM)
Vossen, B. (SM)
Ware, M. (M)
Welant, M. A., Jr. (M)
Welhe, V. I. (F)
Weiss, R. A. (SM)
White, C. E. (SM)
Whitney, R. J. (A)
Wiener, G. (A)
Williams, E. A. (M)
Williams, L. L., III (M)
Wilson, J. B. (A)
Wilson, L. M. (A)
Wilson, W. F. (M)
Winick, A. B. (M)
Wiltins, E. G. (SM)
Wulff, J. G. (A)
Yoon, P. (M)

Ashland (VIR-3)
Ryscuck, J. (M)

Atlee (VIR-3)
Ferri J. A. (A)

Bayside (VIR-3)
Bradbury, J. T. (M)
Enright, R. E. (M)

Estabrook, R. K. (A)

Bedford (VIR-3)
Shawl, W. C. (M)

Blacksburg (VIR-3)
Baker, V. H. (M)
Hogge, E. C. (A)
Holt, C. A. (M)
Kuun, A. (A)
Lee, C. (SM)
Miller, R. H. (M)
Stewart, A. W. (M)

Bristol (VIR-3)
Boggs, W. G. (M)
Chambers, W. M. (A)

Cape Charles (VIR-3)
Brehm, C. M. (M)

Charlottesville (VIR-3)
Albee, R. B. (M)
Anderson, R. V. (M)
Ankney, S. M. (M)
Ballard, L. L. (M)
Bossleux, E. V., Jr. (M)
Brown, B. T., Jr. (M)
Burford, A. J. (M)
Butcher, R. B. (M)
Butler, A. A., Jr. (M)
Carpentier, R. A. (M)
Clevenger, J. E. (M)
Colby, K. G. (M)
Fleming, R. F., Jr. (M)
Fosque, H. S. (M)
Fuller, H. P., Jr. (M)
Gehrke, W. C. (M)
Grymes, J. R., Jr. (M)
Harris, O. R. (SM)
Harvey, G. L. (SM)
Hedrick, R. L. (M)
Hermansdorfer, J. E. (M)
Humphris, R. R. (M)
Jones, G. D., Jr. (M)
Landes, H. S. (M)
Lee, K. O. (M)
Maine, R. E. (M)
Moss, F. E. (M)
Overstreet, R. L., Jr. (M)
Purnell, L. S. (SM)
Quarles, L. R. (F)
Ramey, R. L. (M)
Redfield, D. D. (A)
Roberts, J. M. (SM)
Roberts, W. W. (A)
Rockett, F. H., Jr. (SM)
Siegel, C. M. (SM)
Smith, A. G. (M)
Stavitski, L. X. (M)
Swygert, W. E., Jr. (M)
Teague, D. L. (M)
Tolsch, I. H. (SM)
Towler, W. R. (M)
Turf, L. (A)
Updike, O. L., Jr. (M)
Van Benthem, J. (M)
Van Sickler, E. P. (A)
Walker, W. P. (M)
Ward, J. W. (SM)
Welch, A. A. (M)
Westbury, T. J., Jr. (M)
Wright, P. W. (A)

Accotebaque (VIR-3)
Bracheen, T. W. (M)
Selby, S. L. (A)

Alton (W-DC-3)
Bowie, D. M. (M)
Clark, V. C. (SM)
Duncan, R. L. (SM)

Colonial Beach (VIR-3)
Brooks, F. E. (M)

Craddock (VIR-3)
Shepherd, J. F. (M)

Culpeper (VIR-3)
Barnes, W. C. (M)
Gros, J. R. (M)
Manchee, R. W. (M)
Marwell, M. S. (M)
Middlebrook, C. G. (M)
Potter, R. R. (M)
Ryland, R. T., Jr. (M)
Sawyer, R. S. (M)
Shultz, L. R. (A)
Tharp, T. H. (M)

Danville (VIR-3)
Johnson, R. (A)
Lea, H. D. (M)
Motley, L. C. (M)

Dumfries (VIR-3)
Gustafson, A. J., Jr. (A)
Morton, R. W. (M)
Stubblefield, R. L. (A)

Fort Loring (W-DC-3)
Griffin, P. W. (M)

Fredericson (VIR-3)
Spratley, J. B. (M)

Fairfax (W-DC-3)
Aasen, C. L. (M)
Ambrose, T. J. (M)
Andrews, M. B. (M)
Barbeau, A. R. (M)
Barnhill, J. H. (M)
Bergen, S. (SM)
Bohl, L. H., Jr. (M)
Bonham, L. L. (M)
Bradford, H. K. (M)
Cave, E. L. (M)
Christie, C. B. (M)
Dittberner, D. L. (M)
Dresser, P. L. (M)
Edwards, B. E. (M)
Emery, R. H. (M)
Finneran, R. J. (A)
Fischer, R. L. (SM)
Gartzke, F. J. (M)
Goldwag, H. (M)
Holland, F. S. (A)
Hyams, H. C. (SM)
Jacobellis, B. R. (M)
Kings, L. (M)
Lenert, R. W. (M)
Levine, S. (M)
Martin, W. C. (M)
Pettingill, S. A. (M)
Phillips, C. C. (M)
Pratt, D. E. (M)
Purple, W. C., Jr. (M)
Revilla, A. G. (M)
Scanga, J. A. (M)
Scott, W. G. (M)
Sharp, D. W. (SM)
Snyder, O. C. (SM)
Thornwall, J. C. (M)
Volk, C. M. (M)
Ward, H. T., Jr. (M)
Wetzel, L. D. (M)
White, G. T. (M)
Williams, R. E. (SM)

Falls Church (W-DC-3)
Alexander, H. R. (M)
Allen, D. A. (A)
Allen, E. W., Jr. (F)
Aller, J. C. (A)
Anderson, R. J. (A)
Anderson, W. L. (M)
Andrew, R. T. (M)
Atwell, R. G. (M)
Ballard, A. H. (SM)
Barnett, J. S. (M)
Bartlett, G. W. (SM)
Bartlett, O. H., Jr. (M)
Baylor, W. R. (A)
Bell, W. S. (A)
Bergman, C. E. (M)
Beverly, P. L. (M)
Bierach, K. F., Jr. (M)
Billhelmer, C. R. (M)
Bodenhamer, R. B. (M)
Boland, C. E. (A)
Bolser, F. C. (SM)
Boring, W. D. (M)
Bowers, A. W. (M)
Bowers, D. M. (M)
Brady, R. F. (SM)
Broden, B. W. (M)
Brown, H. B. (M)
Brown, L. (M)
Burch, R. R. (M)
Caballero, J., Jr. (M)
Carter, C. S., Jr. (M)
Carter, D. W. (A)
Casey, G. J. (M)
Casteel, M. R. (M)
Cleckner, D. C. (SM)
Colby, P. R. (SM)
Combes, E. T. (M)
Combs, D. D. (A)
Conlon, J. R. (M)
Crain, T. H. (A)
Craven, E. S. (M)
Crawley, A. O. (M)
Crenshaw, A. N., Jr. (M)
Croy, J. R. (M)
Davis, C. B. (SM)
Davis, F. E. (A)
Davis, J. N. (M)
Dent, J. R. (M)
Dickinson, W. T. (M)
Diehl, E. J. (SM)
Driese, E. C. (M)
Dula, A. M. (A)
Edmonds, A. H., Jr. (A)
Ellis, R. E. (SM)
Erdle, F. E. (M)
Ernst, A. A. (M)
Fama, C. S. (M)
Farago, J., Jr. (A)
Fawcett, K. J., Jr. (M)
Feild, S. C., Jr. (M)
Field, F. M. (A)
Fiel, M. J. (M)
Fowlkes, J. C. (M)
Frederick, E. W. (M)
Friedlander, A. T. (M)
Fullilove, M. N. (M)
Gallo, W. A., Jr. (A)
Gleseler, L. P. (A)
Glass, B. W., Jr. (M)
Gordon, H. L. (M)
Green, C. E. (M)
Greer, J. W. (SM)
Guhne, R. D. (M)
Haas, D. L. (M)
Hagaman, B. G. (SM)
Harmon, W. R., Jr. (M)
Haskins, R. L. (SM)
Hawkins, H. D. (M)
Hedger, R., Jr. (A)
Henry, R. L., Jr. (M)
Hensell, R. L. (M)
Hewitt, G. J. (M)
Hixson, J. D. (M)
Hoffmann, G. E. (M)
Hohos, J. A. (A)
Hoopes, R. D. (A)
Horne, C. P. (M)
Houseman, E. O., Jr. (M)
Irby, R. F. (M)
Jacobson, R. S. (SM)
Jahoda, J. R. (SM)
Jahr, E. F. (M)
James, W. G. (SM)
Johnson, C. D. (M)
Johnson, W. R. (M)
Johnston, E. L. (M)
Johnston, W. H. (M)
Jones, S. R. (M)
Katz, E. H. (A)
Kern, T. W. (M)
Kidd, E. W. (A)
King, E. E. (M)
Knight, C. R. (SM)
Knutson, H. C. (M)
Kovski, J. J. (SM)
Krejci, D. W. (M)
Landfried, H. H. (M)
Lawrence, M. M. (M)
Lebel, A. L. (A)
Leopold, J. M. (A)
Lerner, L. (M)
Little, S. (M)
Livingston, J. L. (M)
Mahood, W. L. (M)
Marcev, J. M., Jr. (M)
Marihugh, W. (M)
Masterson, J. T. (M)
Maton, G. L. (M)
Maxwell, W. P. (A)
May, C. D., Jr. (M)
McBride, G. H. (M)
McDowell, D. E. (A)
McDowell, R. B. (SM)
McKenney, M. S. (M)
McLean, J. W. (SM)
McMahon, J. H. (M)
Mead, O. J., Jr. (SM)
Meara, V. T. (M)
Meenahan, W. J. (M)
Meloy, T. (SM)
Merchant, R. C. (M)
Merchant, R. S. (M)
Mileson, D. F. (M)
Miller, R. E. (M)
Montaque, N. C. (A)
Moore, J. L. (M)
Morrow, C. W. (SM)
Munkasey, P. F. (M)
Myers, E. G. (M)
Myers, W. D. (A)
Nickell, R. S. (M)
Ocel, R. P. (M)
Parker, C. F., Jr. (SM)
Pate, J. D. (M)
Patton, T. N., Jr. (M)
Plank, P. E. (A)
Proferes, N. J. (A)
Quin, K. H. (A)
Randall, H. (SM)
Ratliff, T. D. (M)
Renton, R. J. (M)
Ricciardelli, A. M. (SM)
Roche, A. O., III (M)
Rogers, C. J. (A)
Rogers, W. H., Jr. (M)
Rowland, E. T. (M)
Rumble, A. R. (SM)
Salford, L. F. (SM)
Sanders, N. D. (A)
Saunders, C. H., Jr. (M)
Savarese, R. T. (A)
Scott, R. M. (M)
Scott, S. R. (SM)
Seccombe, W. T. (SM)
Shaffer, L. R., Jr. (M)
Shearer, H. W. (M)
Sherman, W. R. (SM)
Sjoholm, E. M. (A)
Skrivseth, A. G. (SM)
Smith, B. D., Jr. (M)
Smith, L. G. (M)
Smith, T. H. (A)
Smith, W. M. (SM)
Sobol, E. J. (A)
Sotak, J. W. (A)
Stansell, T. A., Jr. (M)
Stevens, C. L. (A)
Stevens, R. L. (A)
Stiles, R. G. (SM)
Stillwell, D., Jr. (M)
Stone, R. E. (M)
Svedlow, J. D. (M)
Swanson, R. W. (A)
Taira, W. C. (M)
Taylor, L. L. (SM)
Taylor, P. E. (M)
Taylor, P. E. (M)
Taylor, P. G. (M)
Teare, E. H., Jr. (M)
Thompson, H. H. (A)
Thrasher, P. M., Jr. (M)
Tuttle, L. P., Jr. (M)
Uffelman, M. R. (M)
Vandivere, E. F., Jr. (A)
Vernon, A. W. (A)
Vignali, J. A. (M)
Villines, W. M. (M)
Walker, C. T. (M)
Walsh, J. P. (M)
Webb, B. S. (M)
Weld, A. C. (M)
Whiting, W. K. (M)
Wickenkamp, F. W. (M)
Wilbur, J. W. (M)
Wilcox, H. E. (M)
Williams, J. H., Jr. (A)
Witherow, J. A. (M)
Young, A. H. (M)

Fort Myer (W-DC-3)
Hollander, H. C. (M)

Gainesville (W-DC-3)
Sedman, T. M. (A)

Hampton (VIR-3)
Alchelmann, F. J. (M)
Babcock, R. A., III (M)
Boyer, W. J. (M)
Burton, W. G., Jr. (M)
Carley, R. R. (M)
Chicoine, E. L. (M)
Croswell, W. F. (M)
Dial, E. W. (M)
Duncan, L. E. (M)
Frankenberg, A. J. (M)
Franklin, L. F. (M)
Hastings, C. E. (SM)
Helun, A. C. (M)
Jones, R. F. (M)
Kessler, L. (M)
King, W. C., Jr. (A)
Lee, C. Q. (A)
Mead, W. L. (M)
Passera, A. L. (M)
Russell, J. A., Jr. (M)
Sams, T. G. (M)
Stoller, M. J. (M)
Vavra, P. H. (M)
Wells, W. B. (M)
Youngblute, O., Jr. (M)

Harrisonburg (VIR-3)
Braun, W. L. (SM)
Foley, J. M. (M)
Jackson, R. C. (M)
Jones, T. B., Jr. (M)

Herndon (W-DC-3)
Bugg, J. E. (SM)
Groff, E. M. (A)
Martin, W. L. (M)

Hillsboro (W-DC-3)
Dove, P. S. (M)

Index (VIR-3)
Dennison, W. A. (M)

King George (VIR-3)
Payne, J. N. (M)

Langley AFB (VIR-3)
Andrae, P. H., II (M)
Burrill, G. P. (M)
Fernandez, M. (SM)
Klucarich, S. (A)
Lee, T. C. (M)
Satterfield, J. M. (M)
Wood, H. L. (M)

Leesburg (W-DC-3)
Alberts, W. S. (SM)
Carr, L. H. (M)
Compton, R. T., Jr. (M)
Martin, W. H. (M)
Sturgill, L. G. (M)
Whitmore, W. C., Jr. (A)

Lexington (VIR-3)
Kwei, M. W. (M)

London Bridge (VIR-3)
Dawson, T. F. (M)
Soper, R. T (A)

Lorton (W-DC-3)
Korb A. (SM)

Lynchburg (VIR-3)
Andrus, O. F. N. (M)
Ball, R. M. (M)
Brauner, E. J. (M)
Breazeale, W. M. (SM)
Bunday, D. L. (SM)
Bunger, J. W. (M)
Cardwell, B. B., Jr. (M)
Casselberry, R. L. (M)
Cisler, M. C. (SM)
Corbell, I. T., Jr. (SM)
Dalton, W. D. (A)
Dewire, G. M. (M)
Downes, C. L. (A)
Erlandsen, C. F. (M)
Gifford, R. P. (M)
Hannell, F. D. (M)
Hassel, E. W. (M)
Hoelle, H. J. (A)
Kail, W. F. (M)
Kinney, R. V. (A)
Lezan, G. R. E. (M)
Linker, J. B., Jr. (SM)
McGee, A. A., Jr. (M)
McKee, T. A. (M)
McNeill, H. N. (A)
Murphy, W. T., Jr. (A)
Myers, R. T. (M)
Orth, J. T. (M)
Penpiatt, H. J. (M)
Phillips, J. M., Jr. (M)
Pickett, R. T., III (M)
Pinkerton, D. C. (SM)
Pitman, J. E. (M)
Poppe, J. R. (M)
Portz, H. G. (M)
Ray, K. P. (M)
Roberts, D. M. (M)
Rose, G. D., Jr. (M)
Shepherd, N. H. (SM)
Sherman, J. H., Jr. (M)
Sherman, P. (A)
Smee, P. G. (SM)
Smith, J. S. (SM)
Sutton, R. B. (A)
Svitek, G. A. (M)
Thomas, H. P. (F)
Van Aken, H., Jr. (A)
Williams, J. A., Jr. (A)
Williamson, R. H. (F)
Willson, K. R. (SM)
Worthen, K. J. (M)

Lynnhaven (VIR-3)
Kane, H. P. (M)
Stoddert, T. M. (M)

Madison (VIR-3)
Newsom, B. B. (M)

Manassas (W-DC-3)
Becker, W. J. (A)
Goatley, C. (A)

Marion (VIR-3)
Crispin, H. L. (M)
Muller, E. S., Jr. (M)

Martinsville (VIR-3)
Vaughn, J. R., Jr. (A)

McLean (W-DC-3)
Ankers, R. E., Jr. (M)
Bateman, R. (F)
Behme, A. E. (M)
Bouchey, S. H. (M)
Brown, D. H. (M)
Butler, J. E. (M)
Child, A. A. (A)
Creutz, J. (M)
Darling, R. S. (A)
Davis, E. D. (A)
Dee, H. E. (A)
Dyke, E. (SM)
Ferry, R. N. (M)
Gumb, D. F. (A)
Hall, R. W. (A)
Harding, K. C. (SM)
Heckel, R. D. (M)
Hopkins, C. (SM)
Rogers, G. J. (M)
Seewald, E. C. (M)
Shoemaker, R. F. (A)
Smith, A. E. (SM)
Smith, J. M. (M)
Stokes, H. S. (SM)
Stonesifer, R. A. (M)
Stotler, H. J. (M)
Sunde, D. H. (A)
Swafford, J. H. (A)
Trenaman, J. I. (SM)
Tucker, G. L. (M)
Van Wagoner, R. C. (M)

Mount Vernon (W-DC-3)
Phillips, M. L. (SM)

Newport News (VIR-3)
Andrews, R. E. (M)
Bierke, J. O. (M)
Cootes, J. G. (M)
Davies, R. A. (M)
Harkavy, V. M. (SM)
Hunter, W. W., Jr. (M)
Wolfe, L. I., Jr. (M)

Norfolk (VIR-3)
Alderman, J. M. (M)
Anda, R. O. (A)
Bailey, A. B. (M)
Beck, F. E., Jr. (M)
Beck, F. F. (M)
Blagg, R. L. (M)
Chapman, P. W. (M)
Christian, O. R. (M)
Coffland, A. E. (A)
Colnar, P. V. (SM)
Council, J. W. (A)
Cowie, D. C. (M)
Crowley, H. R. (M)
Davis, E. E. (M)
De Jarnette, H. M. (M)
De Witt, D. D. (M)
Dryer, H. M. (A)
Eiler, J. E., Jr. (SM)
Estes, D. R., Jr. (M)
Fabianic, W. S. (M)
Fox, D. A. (M)
Gartiner, R. S. (M)
Geary, J. T. (M)
Gibson, R. D. (M)
Gladding, E. B. (SM)
Graham, D. A. (M)
Hamilton, G. H. (A)
Herrmann, W. E. (A)
Hurley, J. H., Jr. (A)
Jennings, J. L. (A)
Judson, J. F. (M)
Justice, R. J. (M)
Kaseman, F. S. (M)
Keast, P. M. (M)
King, S. O. (A)
Koontz, C. E. (M)
Lawless, J. H. (M)
Lindell, R. L. (M)
Lounderback, H. W., Jr. (M)
Martin, W. P. (M)
McCaslin, L. B., Jr. (M)
Medley, R. C. (A)
Noble, L. V. (M)
Ochseltree, S. L. (M)
Orr, J. F. (M)
Ostroski, A. B. (M)
Paterson, R. C. (A)
Peffer, J. C. (SM)
Pyle, H. D. (M)
Reiher, E. J. (M)
Roman, R. (A)
Slaughter, W. R. (A)
Smith, A. J. (A)
Sutherland, C. E. (M)
Swab, C. S. (M)
Tache, W. N. (M)
Talmage, G. E. (A)
Thompson, L. H. (A)
Thumn, H. L., Jr. (A)
Trahadias, P. N. (A)
Vann, I. M., Jr. (M)
Vam, S. P., Jr. (A)
Wagner, W. Q. (A)
Wilder, D. B., Jr. (M)
Williams, B. D., Jr. (M)

North Arlington (W-DC-3)
Moss, D. G. (M)

North Springfield (W-DC-3)
Fine, F. (M)
Hirt, R. B. (A)
Shelton, J. P., Jr. (M)
Stell, J. P. (A)

Oakton (W-DC-3)
Wood, W. H. (M)

Oceana (VIR-3)
Williams, B. A. (A)

Petersburg (VIR-3)
Clemente, J. R. (A)

Phoebus (VIR-3)
Cooper, W. N. (A)

Poquoson (VIR-3)
Burlock, J. (M)

Portsmouth (VIR-3)
Bell, J. S., Jr. (SM)
Butler, W. J. (M)
Corkran, R. L., Jr. (M)
Cox, J. C. (M)
Hoffman, G. R. (M)
Howell, J. E., Jr. (M)
Howerton, D. J. (M)
Jenkins, D. C. (M)
Moore, J. B., Jr. (A)
Nelson, M. (A)
Norcom, G. J. (M)
Sperry, G. T. (SM)

VIRGINIA

Williamson, D. E. (M)

Quinton (VIR-3)
Black, J. H. (A)

Richmond (VIR-3)
Arnold, N. R. (A)
Bailey, R. C. (SM)
Batte, R. B. (M)
Conte, T. M. (SM)
Dickinson, J. O. (M)
Fortna, J. D. E. (M)
Golding, R. M. (A)
Gregory, C. A., Jr. (M)
Hobbs, W. E. (M)
Kyle, J. W. (M)
Lee, W. M. (M)
Martin, E. L. (A)
Miller, A. G. (A)
Pettus, W. W., IV, (M)
Richter, A. R. (M)
Szczebak, E. J. (M)
Thorpe, R. A. (M)
Toms, E. C. (M)
Vellines, W. E., Jr. (M)
Wilson, R. C., Jr. (M)
Wolfe, I. P. (A)
Woods, D. C. (M)
Wrisley, J. C. (A)

Roanoke (VIR-3)
Bailey, F. M. (SM)
Branscom, G. A. (M)
Briggs, J. P. (A)
Clower, W. D. (M)
Guill, G. M., Jr. (A)
Legendre, V. (M)
Malloy, J. J. (M)
McCants, D. G. (M)
Newman, J. E. (A)

Salem (VIR-3)
Hill, J. T. (A)

Sandston (VIR-3)
Rowand, G. E. (A)

South Arlington (W-DC-3)
Thompson, F. J. (M)

South Norfolk (VIR-3)
Yates, Z. (A)

Springfield (W-DC-3)
Alderson, W. S. (SM)
Ayers, J. G., Jr. (M)
Baird, L. I. (M)
Bargh, P. F. (M)
Barreto, J. M. (SM)
Behrens, F. A. (M)
Bell, W. E. (M)
Burkhardt, R. H. (M)
Bush, J. E. (M)
Campanella, S. J. (M)
Castle, R. A (M)
Chatfield, G. F. (A)
Coffee, J. M. (M)
Conant, W. W. (A)
Connelly, E. M. (A)
Coulter, D. C. (M)
Devereaux, W. J. (M)
Diedrich, W. A. (M)
Gale, M. (M)
Grairn, R. J. (A)
Guy, L. S. (M)
Hamilton, E. E. (M)
Hocking, L. J. (A)
Jaynes, F. H. (A)
Jennette, J. E., Jr. (M)
Johnson, W. C. (M)
Johnston, E. C. (A)
Johnston, E. C. (A)
Jones, R. C. (SM)
Keigher, J. P. (M)
Kennedy, W. J. (M)
Keys, C. A. (A)
Klotz, J. W. (M)
Lindsay, J. C (M)
Lipsey, E. M. (M)
Loynd, H. T., Jr. (M)
McAndrews, F. C. (SM)
McCown, J. R. (M)
Nolen, J. F. (A)
Peake, F. E., Jr. (M)
Peratino, G. S. (M)
Phillips, J. T. (A)
Probert, L. J. (A)
Ransone, J. T., Jr. (M)
Rock, P. (A)
Rose, J. (M)
Shinn, L. A. (M)
Smith, A. W. (M)
Smith, S. T. (SM)
Spitz, D. C. (M)
Sponner, W. A. (M)
Stelter, L. R. (M)
Stewart, J. P. (A)
Thompson, K. B. (A)
Tucker, W. J., Jr. (M)
Walter, W. P. (A)
Wardrip, S. C. (M)
Wigington, R. L. (M)
Winter, R. E. (M)
Wright, C. S. (SM)

Stanardsville (VIR-3)
Whitehurst, C. H., Jr. (A)

Staunton (VIR-3)
Trainum, D. A. (M)

Sterling (W-DC-3)
Burtingame, C. W. (M)
Richardson, R. M. (A)

Suffolk (VIR-3)
Bangley, J. H., Jr. (A)
O'Connell, J. V. (A)

Triangle (W-DC-3)
Calfee, R. W. (M)

Vienna (W-DC-3)
Acelo, L. J. (A)
Bird, G. T. (SM)
Brantly, R. S., Jr. (M)
Carrick, R. L. (M)
Cooke, N. M. (SM)
Csiszer, A. (M)
Cuthbertson, R. D. (M)
Dausend, J. P. (M)
Dupree, W. F. (A)
Fairchild, I. J., Jr. (M)
Falcone, J. (M)
Feineman, G. (M)
Gibbs, D. R. (M)
Gray, W. A. (SM)
Hall, J. R. (M)
Hall, J. N. (SM)
Kaneski, V. J. (M)
Karalow, G. T. (A)
Mauldin, H. W., Jr. (M)
McDonald, K. D. (M)
McKnight, C. J. (M)
Meisinger, H. P. (SM)
Minor, R. E. (A)
Nye, J. W. (M)
O'Connor, M. A., Jr. (M)
Poulter, H. M. (M)
Ravinsky, J. (A)
Ritt, P. E. (M)
Schmid, P. E., Jr. (A)
Shumaker, J. L. (SM)
Toler, B. L. (A)
Turnage, H. C. (M)
Webb, P. L. (A)
Wimmer, P. L. (M)
Wolfe, J. J. (A)

Virginia Beach (VIR-3)
Conway, B. B. (M)
Du Val, C. N. (A)
Freeman, S., III (M)
Hickey, H. V. (M)
Humphries, J. H. (A)

Ware Neck, (VIR-3)
Lawrence, H. M. (SM)

Warrenton (W-DC-3)
Gundy, G. L. (A)
Kowalewski, H. S. (A)
White, E. J. (M)
Williams, J. S. (M)
Woodside, C. S. (SM)
York, J. A. (M)
Zura, F. A. (M)

Warwick (VIR-3)
Comstock, A. L. (M)
Fuhrmeister, P. F. (M)
McFall, C. H., Jr. (M)
Premo, D. A. (M)
Siverson, W. E., Jr. (M)
Webb, D. D., Jr. (M)

Waynesboro (VIR-3)
Butler, J. W. (A)
Cockrell, W. D. (SM)
Cooper, B. (M)
Curtis, D. D. (A)
Duncan, W. L. (A)
East, W. L., Jr. (A)
Hansen, W. O. (M)
Klann, P. A. (A)
Palmer, H. L. (M)
Swann, C. H. (M)
Thuresson, R. G. (A)
Wilson, T. M. (M)
Zaluski, J. P. (M)

Williamsburg (VIR-3)
Dutton, A. A. (A)
Harrell, E. E. (A)
Kyle, H. C. (M)

Winchester (VIR-3)
Baughman, D. L. (M)
Shawe, M. E. (A)
Whitney, P. B. (SM)

Wise (VIR-3)
Gardner, C. B. (M)

Woodbridge (VIR-3)
De Rosa, G. D. (A)
Heasly, C. C., Jr. (M)
Kiblinger, W. H. (M)
Snelling, H. F. (M)

Yorktown (VIR-3)
Duran, A. E. (M)

WASHINGTON

Auburn (SEA-7)
Babcock, D. W. (A)
Huber, W. (SM)
Lidovitch, S. B. (M)

Bainbridge Island (SEA-7)
McCarty, E. W. (M)

Belfair (SEA-7)
Osborn, N., III (M)

Bellevue (SEA-7)
Asplund, L. R. (M)
Ausec, R. C. (A)
Banks, R. B. (M)
Beckenstein, M. (M)
Bethel, H. W. (M)
Birch, J. S. (M)
Black, J. C. (M)
Boys, J. A. (SM)
Boytz, J. R. (M)
Burge, D. L. (M)
Burgh, A. J. (A)
Burnett, W. A. (M)
Bush, B. E., Jr. (A)
Charters, R. L. (M)
Cockrill, M. S. (M)
Crane, W. K. (SM)
Crawford, W. N. (M)
Downing, G. (M)
Durney, C. H. (M)
Dye, D. L. (M)
Fairfield, H. R. (M)
Ferguson, R. C. (A)
Folsy, V. E. (M)
Fonda, K. A. (M)
Furst, U. R. (SM)
Gellert, M. E. (M)
Gibson, G. A. (M)
Gill, C. C. (M)
Goss, W. (M)
Hamilton, W. R. (M)
Harms, R. G. (M)
Hule, W. (M)
Johnson, K. L. (M)
Johnson, R. E. (M)
Jones, L. R. E. (SM)
Kearl, J. A. (A)
Kendall, E. L. (M)
King, B. G. (M)
Lane, R. G. (M)
Lerchenmueller, W. (M)
Letwin, A. (M)
Lewis, R. D., Jr. (M)
Lundberg, R. M. (M)
Maleau, H. L. (A)
McElhoe, B. A. (M)
Metter, R. E. (M)
Montgomery, R. A. (M)
Moose, W. A. (A)
Olsson, E. A. (M)
Orr, M. W. (M)
Plootl, W. H. (M)
Robinson, R. B. (M)
Shomer, J. E. (A)
Short, L. E. (M)
Shupe, R. H. (M)
Smith, C. R. (SM)
Stapleton, E. R. (M)
Sullivan, J. K. (M)
Thiel, P. A. (M)
Thompson, A. G. (M)
Trivelas, A. C. (M)
Turko, D. A. (M)
Walsh, G. J. (M)
Westburg, V. B. (M)
Wilson, P. F. (A)
Wright, W. E. (M)

Bellingham (SEA-7)
Christensen, D. M. (M)
Harper, E. E. (M)
Price, J. W. (M)

Blaine AFB (SEA-7)
Robbins, R. A. (M)

Bothell (SEA-7)
Curtis, W. L. (M)
Vermillion, E. E. (M)

Bremerton (SEA-7)
Bean, D. A. (M)
Carlsten, E. E. (M)
Cornwell, F. N. (M)
Helmark, H. A. (A)
Levin, R. J. (A)
Linkletter, R. L. (M)
Lynostad, E. O. (M)
Mason, J. E. (M)
Milden, C. W. (M)
Pitts, H. L. (SM)
Thorne, C. M. (M)
Tufts, W. F. (M)

Centralia (SEA-7)
Lippincott, E. W. (M)

College Place (SEA-R-7)
Brown, R. H. (M)

Colville (SEA-7)
Parkinson, B. N. (M)

Dash Point (SEA-7)
Boze, J. L. (A)

Deer Harbor (SEA-7)
Tippery, M. W. (M)

Des Moines (SEA-7)
Berntsen, D. G. (M)
Perkins, L. C. (M)

East Wenatchee (SEA-7)
Frese, G. M. (SM)

Edmonds (SEA-7)
Grinnell, C. W. (M)
Jones, W. L. (M)
Ohlen, C. E. (M)

Electric City (SEA-7)
Alps, R. B. (M)

Ellensburg (SEA-7)
Purnell, M. V. (M)

Eltopia (SEA-R-7)
Seilstad, N. D. (M)

Enumclaw (SEA-7)
Stedman, C. K. (SM)

Everett (SEA-7)
Hauoen, E. L. (M)
Powers, C. R. (M)

Fairchild AFB (SEA-R-7)
Wehlander, E. O. (M)

Federal Way (SEA-7)
Hartwell, S. A. (M)

Friday Harbor (SEA-7)
Taylor, C. C. (M)

Gig Harbor (SEA-7)
Berkheimer, R. H. (M)
Bice, M. H. (M)

Hoquiam (SEA-7)
Smading, R. E. (A)

Ilwaco (SEA-7)
Ganifas, G. (A)

Issaquah (SEA-7)
Paschal, S. L. (M)

Kennewick (SEA-R-7)
Hinshaw, R. M. (A)
Lambert, T. G. (M)
Rastovich, M. (A)
Ratcliffe, C. A. (M)
Schilling, R. D. (M)
Taylor, G. R. (A)
Vik, L. M. (A)

Kent (SEA-7)
Baker, R. G. (M)
Evans, R. E. (M)
Froeschle, E. J., Jr. (M)
Half, D. H. (M)
Hill, F. E. (SM)
Kirkpatrick, R. L. (M)
Miller, S. E. (M)
Nunner, R. J. (M)
Swain, G. W. (M)
Tyras, G. (M)
Zevenbergen, J. W. (M)

Keyport (SEA-7)
Anderson, R. J. (M)

Kirkland (SEA-7)
Bohn, A. L. (M)
Flint, D. C. (M)
Gaines, J. E. (M)
Glaser, R. A. (M)
Hufford, M. R. (M)
Layman, R. S. (M)
Sheldon, J. K. (A)
Smith, M. R. (M)
Wall, R. E., Jr. (M)
Whipple, M. M. (M)

Larson AFB (SEA-7)
Head, G. M. (M)

Longview (POR-7)
Collins, E. H. (M)

Lynnwood (SEA-7)
Swinney, S. I. (A)

McChord AFB (SEA-7)
Hill, A. P. (M)

Medina (SEA-7)
Hunt, D. E. (M)

Mercer Island (SEA-7)
Caldwell, R. R. (M)
Carman, D. M. (M)
Delk, E. T. (M)
Fitch, J. L. (A)
Foster, J. H. (M)
Franzel, R. T. (M)
Harris, R. E. (A)
Kleburtz, R. B. (M)
Lahn, F. C. (M)
May, E. L. (M)
Maynard, J. E. (SM)
Moore, W. H. (M)
Nelson, R. H. (M)
Perdue, R. E. (M)
Porad, B. L. (M)
Pyle, H. S. (SM)
Rosenberry, W. J. (M)
Winder, D. E. (M)
Woodward, R. M. (M)

Mineral (SEA-7)
Rowe, V. G. (M)

Moses Lake (SEA-7)
Harrison, J. C. (A)
Kowalchik, J. J. (A)

Mountlake Terrace (SEA-7)
Engstrom, W. C. (M)
Gallwey, K. L. (M)
Rundquist, C. F. (A)

Neah Bay (SEA-7)
Huxhold, H. P. (A)

Oak Harbor (SEA-7)
Baker, N. C. (M)
Haeckler, W. K. (M)
Paston, R. G. (M)
Reiff, G. A. (A)

Olympia (SEA-7)
Christensen, A. B. (VA)
Guiberson, M. D. (M)

Onalaska (SEA-7)
Thomas, E. J. (M)

Pacific Beach (SEA-7)
Van Cott, J. M. (M)

Pasco (SEA-R-7)
Driver, G. E. (M)

Port Angeles (SEA-7)
Niemi, R. I. (A)
Oakes, G. K. (A)

Port Orchard (SEA-7)
Drew, D. H., Jr. (M)
Finke, W. H. (M)

Pullman (SEA-R-7)
Betts, A. L. (SM)
Craine, L. B. (M)
Dayot, V. D. (M)
Harbour, R. D. (M)

Ravensdale (SEA-7)
Cockrill, W. C. (A)

Renton (SEA-7)
Anderson, F. C. (M)
Ashland, R. F. (M)
Bealrsto, R. J. (M)
Elfers, P. L. (M)
Harley, T. P. (M)
Hood, L. I. (A)
Hulse, B. T., Jr. (M)
Melkonian, H. A. (M)
Nelson, J. K. (M)
Sippach, H. G. (M)

Richland (SEA-R-7)
Althoff, P. C. (M)
Barcroft, J. R. (M)
Brown, D. P. (M)
Cartmell, T. R. (M)
Clark, R. G. (M)
Cone, R. R. (M)
Connally, R. E. (M)
Crosetti, P. A. (M)
Forsberg, J. I. (A)
Frederick, C. L. (M)
Glass, C. E. (A)
Harvey, R. A. (SM)
Hunter, D. O. (M)
Iverson, N. A. (M)
Kelly, P. R. (M)
Libby, H. L. (M)
McClung, W. E. (A)
Pleasance, C. L. (M)
Rising, F. L. (M)
Ruiz, A. L. (SM)
Simsen, C. A. (M)
Spear, W. G. (SM)
Stiede, W. L. (M)
Upson, U. L. (M)
Waldkoetter, G. L. (A)
Wood, E. C. (M)
Wood, M. R., Jr. (M)
Worlton, D. C. (M)
Zeitler, G. A. (M)

Seattle (SEA-7)
Aburano, P. F. (M)
Afker, M. J. (M)
Alexander, W. L. (M)
Allen, R. W. (M)
Andermann, A. (M)
Anderson, E. R. (M)
Aoyama, H. T. (M)
Appleford, L. R. (M)
Appleman, C. B. (SM)
Arlowe, H. H. (SM)
Armstrong, C. W. (M)
Arnold, W. R. (M)
Ashbaugh, F. E. (M)
Ashe, J. E. (M)
Austin, J. D. (M)
Bach, R. O. (SM)
Baker, J. C. (M)
Ballata, R. J. (M)
Barger, S. D. (A)
Bark, R. S. (M)
Barnes, L. S. (M)
Bateman, C. D. (M)
Battles, M. T., Jr. (M)
Baumgartner, D. L. (M)
Beals, E. L. (A)
Beauchamp, F. A. (A)
Behrens, R. G. (M)
Belch, F. R. (M)
Belenski, J. D. (M)
Bergseth, F. R. (M)
Berzin, J. G. (M)
Betts, D. C. (M)
Bielka, R. P. (SM)
Bloss, J. D., Jr. (SM)

Bird, F. W. (A)
Bishop, D. J. (M)
Bjorkman, F. D. (M)
Bjorkstam, J. L. (A)
Blanchard, D. I. (A)
Bloomfield, J. A. (M)
Boileau, O. C., Jr. (M)
Bowers, J. C. (M)
Boynton, H. W. (A)
Bradburn, W. C. (M)
Brady, T. L. (A)
Brock, R. L. (M)
Brown, T. S. (M)
Brudwig, A. H. (M)
Brune, F. A. (M)
Buldhaupt, L. F. (A)
Bull, W. A. (SM)
Bushman, F. W. (M)
Bystrom, A., Jr. (A)
Campbell, S. S. (M)
Carlson, B. L., Jr. (M)
Caron, J. Y. (M)
Cavanaugh, J. T. (A)
Chamberlin, W. C. (M)
Chang, C. Y. (M)
Chase, L. I. (M)
Chase, R. F. (M)
Chen, H. C. (M)
Chopp, J. A. (A)
Christoff, N. A. (M)
Clark, L. G. (A)
Clark, R. N. (M)
Connell, J. L. (M)
Consego, B. J. (M)
Cooley, W. W. (A)
Corpus, A. R. (M)
Coughlan, G. B. (M)
Craig, D. I. (A)
Currie, W. E. (M)
Dalby, T. G. (M)
Damghalian, H. R. (M)
Davies, W. R. (A)
Decker, D. A. (M)
De Groot, E. B. (M)
De Groot, F. M. (M)
Dempsey, J. P. (M)
Dennis, D. L. (A)
Dettmann, J. R. (A)
Dhar, R. L. (A)
Dorband, A. E. (M)
Dorracaque, P. E. (M)
Dorwart, R. J. (M)
Douglas, I. M. (M)
Drake, R. S. (M)
Duncan, J. A. (M)
Duryee, P. A. (A)
Duvall, L. L. (M)
Early, E. W. (M)
Easson, G. S. (A)
Eastman, A. V. (F)
Ebken, A. F., Jr. (M)
Eckton, W. H., Jr. (M)
Edwards, E. H. (M)
Edwards, J. T. (M)
Eisenbach, M. E. (M)
Ellerbeck, K. H. (M)
Elliott, H. R. (A)
Embree, R. R. (A)
Engstrom, D. E. (A)
Ercolini, J. E. (M)
Erdmann, P. R. (M)
Erwin, E. V. (M)
Erwin, R. L. (M)
Erwood, R. G. (M)
Esh, R. W. (M)
Esson, R. C. (A)
Evenson, H. J. (M)
Fancher, V. M. (M)
Fantin, P. J. (M)
Fargo, R. J. (M)
Farrens, D. G. (M)
Ferguson, R. E. (M)
Ferrell, P. J. (M)
Fisher, R. C. (SM)
Fluke, J. M. (M)
Foss, R. N. (M)
Foster, J. H. (M)
Foster, N. H. (SM)
Friedland, R. J. (M)
Frost, R. D. (M)
Fu, K. (M)
Galloway, W. C. (SM)
Geam, G. R. (A)
Gedaugas, J. (M)
Gee, H. P. S. (M)
Geiger, R. G. (M)
Gelbach, H. R. (M)
Giarola, A. J. (M)
Gilbert, D. M. (A)
Gilbert, R. E. (M)
Gilbertson, S. R. (M)
Goldberg, P. A. (M)
Goldhaber, J. C. (M)
Gould, E. E. (M)
Gray, C. T. (M)
Graybeal, J. (A)
Griggs, W. M. (M)
Gunby, G. C. (M)
Guy, A. W. (M)
Gurette, R. J. (M)
Halstead, F. H., Jr. (M)
Hammer, E. D. (M)
Hansen, W. P., Jr. (A)
Harrison, A. E. (F)
Harrold, W. T. (SM)
Hassendian, G. K. (M)
Hatfield, J. B. (M)
Havens, J. D. (M)
Hayashi, M. (A)
Heindsmann, T. E. (SM)
Held, G. (A)
Herbert, E. C. (M)
Hermanson, K. P. (A)
Hill, W. R., Jr. (SM)
Hoard, G. L. (SM)
Hoard, R. F. (M)
Hoglund, R. H. (SM)
Hokenson, H. S. (M)
Holman, F. S. (A)
Horn, H. T. (M)
Hove, R. G. (M)
Hsu, C. (M)
Hu, A. Y. (M)
Hu, W. (A)
Hufford, G. (M)
Hughes, V. C. (M)
Ikstrums, I. (M)
Illman, R. W. (M)
Ingman, J. F. (M)
Isbera, C. A. (M)
Ishimaru, A. (M)
Jacks, H. G. (M)
Janes, H. P., Jr. (M)
Jensen, W. R. (A)
Jessup, D. G. (M)
Johnson, J. F. (SM)
Johnson, L. F., Jr. (M)
Johnson, O. E. (M)
Jones, E. A. (M)
Jorgensen, H. E. (A)
Judson, H. H., Jr. (M)
Kalviste, A. (A)
Kaminoff, M. (M)
Katayama, T. T. (A)
Kellar, J. B. (A)
Kilbrith, D. W. (A)
Kimbark, E. W. (M)
Kindall, E. W. (M)
Kirkaddon, W. V. (M)
Kleitsch, J. C. (M)
Kohl, P. H. (M)
Kostrey, M. J. (M)
Kramer, L. V. (M)
Kubik, P. (A)
Kudish, H. (M)
Kuzeja, C. (M)
Lal, M. C. (M)
Lantor, I. (M)
Larson, D. C. (M)
Larson, L. A. (A)
Laxdall, D. W. (M)
Ledray, W. (M)
Lehtone, L. L. (A)
Lennstrom, C. O. (M)
Leonard, P. W. (A)
Le Von, M., Jr. (M)
Libby, T. M. (F)
Lillie, W. A. (A)
Lind, P. C. (A)
Lind, R. P. (A)
Linder, W. J. (M)
Lindsey, R. J., Jr. (M)
Lins, E. G. (A)
Litot, P. A. (A)
Louie, C. H. (M)
Low, F. J. (A)
Lucey, W. E. (M)
Ludwig, R. I. (A)
Luna, A. H. (M)
Lund, W. W., Jr. (SM)
Lytle, D. W. (M)
Madle, E. J. (M)
Major, McC., D. (M)
Manetsch, T. J. (A)
Martin, J. L. (M)
Masters, R. W. (SM)
Maxwell, R. L. (M)
McGuire, C. B. (A)
McIlroy, F. W. (A)
McInelly, R. M. (M)
McIvor, B. H. (M)
McKay, W. M. (M)
McKenna, B. D. (A)
McKinley, W. R., Jr. (M)
McKittrick, W. (M)
McPherson, E. L. (M)
McRae, J. C. (M)
Mears, R. J. (M)
Meerdink, K. J. (M)
Merriam, D. P. (M)
Metz, P. R. (M)
Michelsen, P. W. (A)
Miller, C. E. (A)
Miller, D. J. (A)
Miller, J. J., Jr. (M)
Mitchell, G. W. (A)
Moelter, A. (M)
Molten, G. J. (A)
Momenthy, A. M. (M)
Morris, C. R. (M)
Mossman, F. B. (SM)
Murray, W. A. (A)
Nagle, J. L. (M)
Nakamachi, P. Y. E. (M)
Nation, A. W. C. (M)
Neal, E. T. (A)
Neal, T. (M)
Nelson, N. P. (M)
Nesbitt, W. E. (SM)
Newell, J. A. (M)
Newman, S. M. (M)
Nichols, W. R. (SM)
Niemi, L. T. (M)
Noges, E. (M)
Nolan, J. L. (M)
Noland, L. J. (M)
Nordmann, F. M. (M)
Nuttall, W. D. (M)
Nutting, D. C. (M)
Ogasawara, T. B. (M)
Olson, B. V. (M)
Olson, D. S. (A)
Omoth, M. J. (M)
Oncley, P. B. (M)
Oopelt, J. W. (M)
Ordonia, J. M. (A)
Orth, J. W. (A)
Ostrom, C. W. (M)
Page, R. (M)
Paisley, M. R. (M)
Panich, M. G. (M)
Parks, H. F. (SM)
Parr, E. D. (M)
Parris, J. A. (M)
Parrott, J. E. (M)
Parsons, L. W. (M)
Pascual, R. A. (M)
Paterson, J. M. (M)
Payne, R. S. (M)
Pearson, R. E. (A)
Pedersen, R. E. (M)
Peedo, E. (M)
Perry, F. E. (M)
Petrich, R. D. (M)
Peyton, E. E. (M)
Pilling, L. H. (M)
Piltz, F. (A)
Pitre, J. A. (M)
Polcuch, A. F. G. (M)
Poppe, R. F., Jr. (M)
Porter, B. C. (A)
Porterfield, H. D. (M)
Post, D. F. (M)
Post, M. O. (A)
Pournelle, J. E. (A)
Prau, L. M. (M)
Prentiss, G. K., Jr. (M)
Prindle, R. H. (M)
Pscheidt, K. (A)
Pyper, T. L. (A)
Quantz, R. G. (A)
Randall, H. L. (M)
Rao, N. N. (A)
Rasmussen, F. A. (M)
Renfro, H. E. (VA)
Reynolds, D. K. (SM)
Rice, R. W. (M)
Ritchey, O. W. (M)
Robbins, F. D. (M)
Roberts, B. J. (M)
Rogers, W. E. (SM)
Rotta, E. A. (M)
Ruck, D. T. (A)
Rudzitis, A. (A)
Rummens, W. S. (A)
Rupp, A. (M)
St. John, I. S. (M)
Salzer, R. E. (A)
Sander, C. M. R. (A)
Saran, G. S. (M)
Sauber, P. T. (M)
Schaper, E. (M)
Sclomore, D. L. (M)
Scott, C. V. (M)
Scovill, J. M. (M)
Shallbetter, C. E. (M)
Sharp, B. M. (M)
Shaw, D. G. (A)
Shaw, M. E. (SM)
Shaw, W. C. (A)
Sheppard, J. J., Jr. (M)
Shimada, K. (M)
Shipek, R. H. (M)
Shirrod, R. L. (A)
Shook, W. A. (A)
Siddons, W. J. (M)
Sigelmann, R. A. (A)
Simons, D. D. (M)
Simons, R. I. (M)
Sivers, R. D. (A)
Skahill, B. J., Jr. (A)
Sleeper, W. H. (SM)
Sleeth, J. D. (M)
Small, R. E. (M)
Smeester, R. J. (M)
Smith, K. C. (M)
Smith, L. B. (M)
Snyder, P. O. (A)
Sowa, C. P. (M)
Stampalia, J. J., Jr. (M)
Starks, J. C. (SM)
Stebbins, J. A. (M)
Stefanowicz, M. R. (A)
Stockman, R. R. (M)
Strauss, B. (M)
Strohecker, J. P. (M)
Stucki, A. B. (M)
Sutherland, L. C. (M)
Swarm, H. M. (SM)
Swisher, B. F. (A)
Talcott, M. S. (M)
Tashiro, S. (M)
Tate, J. A. (SM)
Tateishi, G. (M)
Tenning, C. B. (M)
Ten Zeldam, H. J. (A)
Thomasson, L. T. (M)
Thompson, K. J. (M)
Thompson, M. E. (M)
Thurston, P. H. (A)
Tighe, R. F. (A)
Timm, W. E. (M)
Todaro, C. N. (M)
Todd, H. C. (A)
Tolmie, J. R. (F)
Traub, L. A. (M)
Tung, J. K. (M)
Turner, R. L., Jr. (A)
Urban, R. A. (M)
Van Deventer, A. J. (M)
Van Over, W. E. (M)
Vanskyock, J. A. (M)
Van Valtenburg, W. P. (A)
Vassilatos, D. A. (M)
Voss, J. M. (A)
Wagner, W. J. (SM)
Walker, R. T. (M)
Ware, D. R. (M)
Warshawsky, J. (M)
Wei, L. Y. (M)
Weiland, W. A. (M)
Weinstein, G. (M)
West, E. A., Jr. (M)
Wetli, R. T. (M)
Willard, H. R. (M)
Williams, A. (M)
Williams, C. E. (F)
Williams, G. M. (A)
Wilson, A. R. (SM)
Wilson, R. L. (M)
Winward, K. B. (A)
Wisner, R. M. (SM)
Wood, S. P. (M)
Woodbury, J. W. (M)
Woodhouse, G. H. (M)
Wright, C. P. (M)
Wright, J. M. (M)
Yamauchi, T. T. (M)
Yee, J. S. (M)
Yeslin, A. R. (M)
Young, R. C. (SM)
Zareh, M. (M)
Zumba, C. F. (M)

Snohomish (SEA-7)
Sterley, R. R. (M)

Spokane (SEA-R-7)
Barrows, J. H. (A)
Brockman, C. F., Jr. (A)
Burnette, W. D. C. (A)
Caruana, P. A. (A)
Coates, F. M. (M)
Dains, H. O. (M)
Gorman, D. P. (M)
Green, D. J. (M)
Green, W. L. (M)
Mac Lean, T. W. (M)
Mead, H. W. (M)
Ruskin, D. A. (M)
Storms, H. H. (VA)
Switzer, W. H. (A)
Trebby, F. J. (M)
Van Gelder, R. B. (M)

Sumner (SEA-7)
Breakey, E. P. (M)
Mendel, F. S. (M)

Tacoma (SEA-7)
Backman, J. A. (A)
Brostrom, K. E. (M)
Hamlin, D. R. (M)
Hansen, Q. P. (M)
Johnson, B. F. (M)
Leader, R. E. (M)
Mann, J. W. (A)
McClarrock, J. M. (M)
McDonough, D. M. (SM)
McElroy, C. M. (M)
Morrill, D. W. (A)
Olson, D. L. (A)
Perkins, M. G. (M)
Sell, G. L. (M)

Tumwater (SEA-7)
Nielsen, R. G. (M)

Vancouver (POR-7)
Bauer, W. D. (A)
Curtis, A. F. (M)
Murdock, M. J. (M)
Peterson, A. C. (M)
Roesler, R. W. (M)
Rogers, E. J. (M)
Wohlgemuth, D. G. (A)

Vashon (SEA-7)
Patience, D. L. (M)
Williams, K., Jr. (M)

Vashon Island (SEA-7)
Caproni, G. A. (A)

Walla Walla (SEA-R-7)
Parmelee, W. G. (M)
Tyrrell, R. L. (A)
Wilken, B. W. (A)

Wenatchee (SEA-7)
Wallace, J. (SM)

Whidbey Island (SEA-7)
Crandall, W. R. (M)

Winslow (SEA-7)
Waterman, H. B. (M)

Yakima (SEA-7)
Forgey, J. A. (A)
Munger, R. E. (A)
Root, M. W. (M)

Zenith (SEA-7)
Friddell, H. G. (M)

WEST VIRGINIA

Bluefield (PIT-4)
Hammer, A. C. (A)

Charleston (PIT-4)
Brick, G. R. (A)
Brown, T. M. (A)
Dixon, W. E. (SM)
Drury, G. R. (A)
Helgeson, G. T. (A)
Johnson, E. M. (SM)
Kish, F. (M)
Sinsel, P. W. (M)
Wolford, J. E. (A)
York, D. E. (A)

Clarksburg (PIT-4)
Hough, R. D. (M)

Dunbar (PIT-4)
Mitchell, S. E. (A)

Green Bank (PIT-4)
Drake, F. D. (M)
Findlay, J. W. (SM)
Hvatum, H. (M)

Huntington (PIT-4)
Bromley, R. A. (A)
Clay, J. P. (M)
Hawes, J. G. (M)
Kilpatrick, L. E. (SM)
Miller, R. M. (A)
Roberts, V. B. (A)
Tanner, J. E. (M)

Martinsburg (W-DC-3)
Boland, E. J. (SM)
Reynolds, T. G., Jr. (A)
Ricketts, J. C. (M)

Middlebourne (PIT-4)
Nichols, G. C. (A)

Montgomery (PIT-4)
Propps, J. M. (A)

Morgantown (PIT-4)
Barbe, E. C. (M)
Colwell, R. C. (SM)
Seibert, C. B. (M)
Smith, N. S., Jr. (M)

Moundsville (PIT-4)
Jones, J. W. (M)
Rulong, C. P. (M)

New Martinsville (PIT-4)
Shepherd, W. P. (M)

Nitro (PIT-4)
Rogers, L. J. (M)

Oak Hill (PIT-4)
Phillips, T. (M)
Thomas, R. R., Jr. (M)

Ona (PIT-4)
Pitts, M. J. (A)

Parkersburg (PIT-4)
Spence, R. C. (A)

Ravenswood (PIT-4)
Ellison, B. P. (M)

St. Albans (PIT-4)
Aliff, J. R. (M)
Counts, D. C. (M)
Fertig, R. B. (M)
Jones, W. E. (M)

South Charleston (PIT-4)
Johnson, H. L. (A)
Thompson, W. R. (M)

Weirton (PIT-4)
Mellis, J. G. (A)
Mellis, J. G. (A)

West Union (PIT-4)
Ellefritz, J. F. (M)

Wheeling (PIT-4)
Ackermann, M. E. (A)
Levenson, D. W. (M)
Rollins, E. A. (M)
Snead, W. K. (A)
Winslow, R. B. (A)

White Sulpher Springs (PIT-4)
Ballard, R. L. (A)

WISCONSIN

Antigo (TC-5)
Lovelace, D. G. (M)
Parfitt, R. J. (M)

Appleton (MIL-5)
Hansen, J. C. (M)
Schlafke, D. A. (A)

Bristol (CHI-5)
Scheefer, K. E. (M)

Brookfield (MIL-5)
Bischoff, A. F. H. (SM)
Elsele, E. J. (A)
Kandorf, G. R. (M)
Kirschner, J. G. (M)
Lindemann, A. W. (M)
Ribbens, W. F. (M)
Stumpf, H. W. (M)
Woods, H. C. (A)

Burlington (MIL-5)
Holmbeck, J. D. (A)
Klein, F. N. (M)

Butler (MIL-5)
Body, J. J. (A)

WISCONSIN

Hemday, R. H. (M)
Kaetel, H. C. (M)
Kuchuck, C. L. (A)

Chippewa Falls (TC-5)
Peloquin, P. T. (A)

Cudahy (MIL-5)
Pavlick, P. J. (A)

Delafield (MIL-5)
Farber, E. R. (M)

Eau Claire (TC-5)
Baker, E. W. (M)
Jorgenson, T. O. (M)
Larkins, A. H. (M)

Egg Harbor (MIL-5)
Lemere, J. P. (M)

Elm Grove (MIL-5)
Bailey, T. J. (A)
Evans, J. A. (M)
Horgan, J. D. (M)

Elrick (TC-5)
Rogne, R. J. (M)

Fond Du Lac (MIL-5)
Jensen, K. S. (SM)
Kroes, D. P. (M)

Fort Atkinson (MIL-5)
Anthes, J. (A)
La Motte, L. D. (A)

Fox Point (MIL-5)
Howard, J. R. (M)

Grafton (MIL-5)
Konig, V. A. Y. (A)
Rubinstein, H. W. (M)

Greendale (MIL-5)
Bovich, E. J. (A)
Jomeruck, J. H. (M)
Raucher, W. L. (M)
Talt, R. B. (M)

Hales Corners (MIL-5)
Allen, J. K. (M)
Jacobs, J. E. (M)
McGillem, C. D. (M)
Podlewski, R. S. (A)

Hartland (MIL-5)
Harry, W. R. (VA)
Kalling, A. F. (M)
Keast, D. E. (A)

Highland (MIL-5)
Rosenkranz, C. A. (A)

Janesville (MIL-5)
Brandt, R. W. (SM)
Glander, H. H. (M)
Weckwerth, H. A. (M)
Williams, C. R. (M)
Ziehlke, R. J. (A)

Kenosha (CHI-5)
Bart, S. (M)
Helde, S. M. (A)
Krause, R. E. (M)
Osterlund, S. G. S. (M)
Reich, E. A. (M)
Thiel, W. (A)

La Crosse (TC-5)
Leeman, A. (M)

Lake Nebagamon (TC-5)
Caspers, G. E., Jr. (M)

Loyal (TC-5)
Matanic, M. D. (A)

Madison (MIL-5)
Asmuth, J. L. (M)
Bell, R. D. (M)
Bergman, R. E. (A)
Boehme, A. W. (M)
Bushnell, R. H. (M)
Davidson, C. H. (M)
Dietmeyer, D. L. (M)
Dora, G. I. (A)
Duffendack, O. S. (F)
Emerson, R. E. (M)
Gilson, W. E. (SM)
Greenbaum, L. A. (M)
Greer, W. M. (A)
Greiner, R. A. (M)
Gritzmacher, D. E. (M)
Hasker, L. (M)
Hahn, N. G. (M)
Harlu, W. R. (M)
Hasby, R. O. (SM)
Hill, R. F. (M)
Ishii, K. (M)
Kelley, W. V. (VA)
Koehler, G. (F)
Kutrumanes, C. P. (A)
Mack, H. A. (A)
Maldonado, C. D. (M)
Morin, C. J., Jr. (M)
Moschinske, J. E. (M)
Noble, D. S. (SM)
Olive, D. W. (M)
Ottum, R. W. (A)
Parent, R. J. (M)
Peterson, H. A. (SM)
Reitan, D. K. (SM)
Rekoff, M. G., Jr. (M)
Retherford, R. C. (M)
Revenaugh, J. J. (M)
Ridgout, V. C. (SM)
Rusch, P. H. (M)
Sabroff, R. R. (M)
Sadler, L. S. (M)
Scheibe, E. H. (SM)
Sciamore, A. K. (M)
Scott, T. M. (A)
Stiles, J. J. (M)
Stafford, T. S. (M)
Stephan, R. R. (A)
Swift, W. B. (M)
Tiedemann, A. T. (M)
Uhrig, A. F. (A)
Van Bladel, J. G. (SM)
Vanko, J. A. (A)
Wickhem, R. J. (A)
Young, C. E. (A)

Manitowoc (MIL-5)
Heinzen, R. A. (M)

Marathon (MIL-5)
Straub, L. J. (A)

McFarland (MIL-5)
Pierce, R. L. (M)

Menasha (MIL-5)
Pawlowski, E. W. (A)

Menomonee Falls (MIL-5)
Gudenschwager, P. F. (M)
Luecke, M. W. (A)
Ruff, H. M. (A)
Van Alstyne, A. (M)

Merrill (TC-5)
Bartelt, C. H. (M)

Middleton (MIL-5)
Miller, J. B. (M)
Mount, R. C. (M)

Milton (MIL-5)
Harris, R. J. T. (M)
Haugen, M. G. (M)

Milwaukee (MIL-5)
Aasterud, J. P. (M)
Abhasi, A. (A)
Alderson, A. E. (M)
Alpert, W. I. (M)
Ammon, G. M. (A)
Appleman, C. G. (M)
Armstrong, J. F. (A)
Bahe, A. C. (M)
Baird, J. T. (M)
Bakeman, O. R. (M)
Barnum, T. G. (A)
Barrett, R. O. (M)
Bartol, T. J. (A)
Baumeister, E. A. (M)
Bernstein, S. (SM)
Biwer, M. M. (M)
Bores, J. W. (M)
Bourbeau, F. J. (A)
Boutelle, J. O. (A)
Boyd, B. (M)
Braniner, H. C. (M)
Bodny, D. R. (M)
Burkhalter, B. L. (A)
Burner, L. C. (A)
Burton, J. T. (A)
Butler, L. W. (M)
Calhoun, M. C. (M)
Camell, D. M. (A)
Camos, T. F. (M)
Carlson, A. W. (M)
Cather, J. R. (M)
Clare, E. W. (A)
Connerton, B. J. (A)
Cook, K. T. (M)
Cooke, E. R. (A)
Cordes, E. L. (M)
Cork, H. A. (M)
Croteau, E. M. (M)
Das Gupta, A. K. (A)
De Block, E. T. (M)
Delsinger, J. J. (M)
De Witt, C. M., III (M)
Dobnick, O. X. (A)
Doyen, R. G. (A)
Doylen, D. H. (M)
Drozniaklewicz, D. L. (M)
Dunn, J. V. (M)
Durand, E. L. (M)
Eckert, F. A., Jr. (VA)
Eckl, J. J. (M)
Edwards, M. A. (F)
Ehlers, G. M. (SM)
Elliot, W. H. (M)
Erb, J. J. (A)
Erickson, H. L. (M)
Evans, R. E. (M)
Fitzgerald, R. R. (M)
Flanagan, L. A. (M)
Flood, F. F. (A)
Frankos, D. T. (M)
Fritz, E. W. (A)
Gabriele, T. C. (M)
Gainer, W. P. (M)
Ganiere, H. C. (M)
Garstang, W. W. (SM)
Geiger, L. C. (M)
Glass, T. J. (M)
Gneiner, G. T. (M)
Goggio, E. C. (SM)
Gollhardt, R. W. (M)
Goossens, H. R. (M)
Graham, J. D. (A)
Guenther, H. J. (M)
Haertel, D. G. (M)
Hamren, G. C. (A)
Hebal, W. H. (M)
Helderman, T. E. (A)
Helgeson, V. L. (M)
Hemker, J. B. (M)
Hetchler, L. F. (M)
Hogan, H. A. (M)
Horvath, A. E. (M)
Howell, J. F. (M)
Jacobi, T. (M)
James, R. A. (A)
Jensen, M. W. (A)
Johnson, G. A. (M)
Johnson, R. R. (A)
Jordal, V. M. (M)
Kaiser, E. H. (A)
Kaszorzak, T. L. (M)
Kelly, D. S. W. (SM)
Kelly, D. V. (M)
Kenoert, G. D. (M)
Khouri, A. S. (M)
Kile, F. O., Jr. (M)
Killmann, D. R. (M)
Kinney, T. W. (M)
Knooow, H. S. (M)
Kokalj, F. P. (M)
Kopania, A. A. (M)
Kossen, D. J. (A)
Kroman, E. J. (M)
Krug, R. E. (A)
Kunde, P. J. G. (A)
Laeser, P. B. (M)
Laubenstein, A. E. (M)
Leavitt, R. F. (A)
Lecus, C. M. (A)
Lehman, D. R. (A)
Limpel, E. J. (M)
Lyon, T. I. (M)
Macherey, R. E. (M)
Maklary, J. R. (A)
Makowski, J. J. (M)
Matthews, R. B. (M)
Matthias, L. H. (M)
McCarter, O. T. (A)
McCarthy, R. R. (A)
McMillin, G. L., Jr. (A)
Mederer, S. J. (M)
Meier, R. D. (M)
Mereen, D. E. (M)
Merrill, H. S., Jr. (M)
Metzger, J. P. (A)
Michaels, E. J. (M)
Michalak, E. M. (A)
Michel, A. N. (M)
Miotke, J. A. (M)
Miotke, T. F. (M)
Mohler, D. S. (A)
Monty, B. E. (M)
Morot, V. G. (A)
Mundschau, M. J. (M)
Murphy, A. W. (A)
Myszewski, G. L. (M)
Nance, D. K. (A)
Naughton, G. J. (VA)
Nelzke, G. G. (A)
Norman, O. A. (M)
North, R. L. (M)
O'Keefe, W. D. (M)
Ollenburg, M. A. (A)
Olson, R. C. (M)
Onsager, R. W. (M)
Onstad, P. R. (M)
Oppenheim, R. H. (M)
Or, D. W. (M)
Pare, T. J. (A)
Petzold, D. W. (M)
Phillips, R. A. (M)
Plontek, T. A. (A)
Pozorski, J. J. (M)
Quam, D.L. (M)
Queever, L. (M)
Ragatz, E. C. (M)
Rand, K. A. (A)
Rapp, R. L. (M)
Rebman, W. H. (M)
Regis, R. J. (M)
Richter, W. (F)
Rodewald, M. V. (M)
Rosin, R. J. (A)
Rynning, A. (M)
Saari, L. V. (M)
Sackett, R. W. (A)
St. John, J. D. (M)
Sauerland, F. (M)
Schaack, R. J. (A)
Schaffer, J. E. (A)
Schimmel, K. J. (A)
Schlaefer, B. J. (M)
Schlageter, G. A. (M)
Schlehlein, G. J. (A)
Schleicher, F. (M)
Schlicke, H. M. (SM)
Schumacher, P. J., Jr. (M)
Schutten, H. P. (M)
Semple, C. E. C. (M)
Sherley, M. O. (M)
Sherwood, E. T. (SM)
Sill, F. J. (A)
Sitzwohl, J. F., Jr. (M)
Smith, C. C. (M)
Smith, O. H. (M)
Snowdon, A. C. (M)
Spaeth, C. A. (A)
Sparacino, B. J. (A)
Sperber, D. J. (A)
Stefancic, K. (M)
Steffen, R. V. (A)
Striegel, M. E. (A)
Sutinen, C. P. (SM)
Tackes, G. G. (A)
Talbot, V. R. (M)
Taus, H. G. (M)
Taylor, F. H. (M)
Trout, E. D. (A)
Tschantz, L. G. (A)
Turri, R. N. (M)
Uradnicek, R. K. (M)
Van Zeeland, F. J. (SM)
Vebber, W. O. (M)
Veerkamp, N. B. (M)
Visser, A., Jr. (A)
Wagner, W. O. (M)
Weigel, E. (M)
Weltermann, B. R. (A)
Weller, D. A. (SM)
West, B. M. (M)
Wetter, R. J. (M)
Wiesen, D. W. (M)
Wille, E. A. (M)
Williams, S. B. (M)
Wislalowski, J. S. (M)
Wittke, R. F. (A)
Woelffer, R. M. (A)
Wolff, R. L. (M)
Wolnlakowski, L. R. L. (A)
Wullman, J. C. (A)
Young, R. E. (A)
Yug, A. G. (M)
Zacher, G. E. (A)
Zoesch, A. C. (A)
Zolin, F. H. (A)
Zwarra, H. J. (M)

Minocqua (TC-5)
Martin, H. T. (A)

Mosinee (TC-5)
Grambsch, R. J. (M)

Mukwonago (MIL-5)
Brown, H. W. (A)

Muskego (MIL-5)
Stevenson, D. L. (M)

New Berlin (MIL-5)
Beaudoin, L. W. (M)

Oconomowoc (MIL-5)
Randall, A. E. (M)

Oconto (TC-5)
Ackerman, M. J. (M)
De Witt, C. P. (M)

Oshkosh (MIL-5)
Williams, N. (M)

Pardeeville (MIL-5)
Boss, W. O. (M)

Peshtigo (TC-5)
MacLaughlin, D. C. (A)

Racine (MIL-5)
Arcand, R. T. (M)
Auterman, J. L. (M)
Berkovec, J. W. (M)
Briedis, G. (A)
Due, R. C. (A)
Hill, R. G. (A)
Johnson, W. H. (M)
Kohner, M. (SM)
MacDowell, G. E. (A)
Rogers, N. A. (A)
Salvat, R. F. (M)
Slater, O. C. (A)
Van Horn, J. H. (SM)
Wilkerson, A. W. (A)
Zelazo, N. K. (SM)

Saukville (MIL-5)
Nunn, E. D. (M)

Schofield (TC-5)
Richwalski, D. J. (A)

Sheboygan (MIL-5)
Mayer, H. J. (M)

Shorewood (MIL-5)
Munson, R. R. (M)

South Milwaukee (MIL-5)
Abrahamson, G. D. (M)
Bridgen, G. A. (M)
Burg, G. M. (M)
Gabriel, R. C. (M)
Jacobs, M. (M)
Kerske, J. F. (M)
Popp, R. J. (A)
Zahn, P. E. (M)

Spooner (TC-5)
Edwards, P. E. (A)

Sturgeon Bay (MIL-5)
Bacon, F. W., Jr. (M)

Sun Prairie (MIL-5)
Wable, G. E. (A)

Thiensville (MIL-5)
Runft, A. J. (M)
Sielicki, A. J. (M)
Silverman, D. M. (M)

Tomahawk (TC-5)
McGinnis, H. J. (M)

Union Grove (MIL-5)
Harris, J. H. (M)

Walworth (MIL-5)
Richter, R. E., Jr. (A)

Watertown (MIL-5)
West, G. A. (A)

Waukesha (MIL-5)
Beutler, A. J. (M)
Cummings, H. R. (M)
Koenig, E. C. (M)
Pepper, J. R. (M)

Wausau (MIL-5)
Burns, S. S. (M)
Ladwig, T. H. (A)
Zielesch, B. E. (M)

Wauwatosa (MIL-5)
Bailey, J. E. (M)
Hawley, D. E. (M)
Kelley, J. P. (M)
Lucas, A. C. (M)
Pinnow, R. L. (M)
Schlager, K. J. (A)
Schuppner, H. W. (M)
Torkildsen, R. A. (M)
Wollaeger, L. A. (M)

West Allis (MIL-5)
Houle, T. H. (M)
Lofy, F. J. (M)
Nass, E. H. (A)
Paalu, A. (M)
Reback, R. R. (M)
Reinke, H. J. (M)
Taylor, E. D. (M)

West Bend (MIL-5)
Gonring, D. L. (A)
Gonring, J. F. (A)

West Depere (MIL-5)
Stangel, W. (M)

Westfield (MIL-5)
Rank, D. F. (M)

Whitewater (MIL-5)
Bumbalek, J. E. (A)
Weinberg, B. L. (A)

WYOMING

Casper (DEN-6)
Bruce, J. L. (M)
Fagerstone, D. V. (A)
Hathaway, D. L. (SM)
Young, W. R. (M)

Cheyenne (DEN-6)
Bril, D. H. (M)
Brougham, H. S. (M)
Dobberstein, R. H. (A)
Ellerbruch, D. A. (M)
Grove, W. C. (M)
Kjellburg, R. L. (M)
Maness, D. H. (M)
Nakano, O. (M)
Shelton, J. T. (M)

Crowheart (DEN-6)
Hagen, G. D. (M)

Laramie (DEN-6)
Carty, E. H. (M)
Fermella, L. R. (M)
Lonsdale, E. M. (SM)
Strock, R. E. (A)

New Castle (DEN-6)
Jones, M. J. (A)
Rinehart, B. H. (VA)

Sheridan (DEN-6)
Stanton, J. M. (M)

Worland (DEN-6)
Levisay, L. O. (A)

OVERSEAS MILITARY

APO New York
Aguilar, A. (A)
Allen, P. S. (M)
Alley, J. W. (M)
Altman, S. S. (M)
Arnold, R. D. (M)
Arrington, J. L., II (SM)
Audain, R. B. (A)
Aulbach, C. E. (A)
Batson, J. A. (A)
Baumgartner, J. H. (SM)
Beabout, E. G. (M)
Bean, H. C., Jr. (M)
Beckwith, P. B. (M)
Bell, J. W. (A)
Benson, B. C. (M)
Berger, E. G. (M)
Berghoefer, F. G. (M)
Biggs, J. P. (M)
Bills, A. E. (M)
Billodeau, R. L. (M)
Bishop, D. D. (M)
Blachman, N. M. (SM)
Black, K. C. (F)
Blakley, D. H. (M)
Blinn, W. J. (M)
Blow, T. C. (M)
Boatright, B. C. (M)
Bodin, B. H. (A)
Bolstridge, L. J. (M)
Borsody, B. F. (SM)
Bowler, J. A. (M)
Braun, M. E., Jr. (M)
Brayshaw, R. A. (M)
Britto, J. D. (M)
Brooks, N. S. (M)
Brumbaugh, G. M., Jr. (M)
Bruton, H. C. (SM)
Bryan, W. L. (M)
Burritt, E. J. (A)
Busch, S. D. O. (M)
Cadieux, J. P. (M)
Carnes, F. W. (M)
Carter, S. P. (M)
Cassidy, J. J. (M)
Cattermole, G. B. (M)
Chandler, D. P. (M)
Chapman, A. K. (M)
Chapman, G. H. (M)
Childs, A. W. (A)
Christie, R. L. (M)
Clark, M. F. (A)
Clarke, W. E. (M)
Claunch, E. E. (M)
Clothier, E. L. (A)
Cook, D. E. (M)
Coons, R. J. (M)
Cooper, J. R. (M)
Corles, R. L. (M)
Coss, W. L. (M)
Cranshaw, R. J., Jr. (A)
Criner, J. E. (M)
Curtis, R. W. (SM)
Dambrauskas, V. (M)
Davitt, J. H. (SM)
Decker, B. J. (A)
De Valve, R. H. (M)
Dickson, J. F. (M)
Dillon, D. C. (M)
Dillow, J. C. (M)
Dixon, T. O. (SM)
Doby, W. C. (M)
Drollinger, R. H. (M)
Drzewicki, D. D. (A)
Dudley, A. L. (M)
Duggan, R. W., II (M)
Dye, F. R. (M)
Dziuk, J. R. (A)
Easley, W. A., Jr. (A)
Eaton, R. C. (SM)
Edson, M. C., Jr. (A)
Eller, G. H. (A)
Erdman, A. L. (A)
Evernham, J. L. (M)
Fabijan, F. M. (A)
Favre, R. M., Jr. (M)
Fetzer, M. J. (M)
Ficklin, B. P. (M)
Finh, J. H. (M)
Fisher, J. E. (A)
Fliss, A. D. (M)
Flottman, E. R. (M)
Flynn, R. J. (M)
Fowler, L. D. (M)
Fuchs, M. J. (M)
Fund, J. L. (A)
Gallup, G. B. (A)
Garee, J. A., Jr. (M)
Gates, V. (M)
Gentry, K. M. (SM)
Giles, J. N. (M)
Gipple, H. W. (M)
Glenn, A. J. (M)
Goen, Q. F. (SM)
Gorelick, A. P. (M)
Graham, H. U. (SM)
Greene, A. N. (M)
Greenfield, W. D. (M)
Gundersen, J. R. (A)
Haas, H. P. (A)
Hager, D. N. (A)
Hall, C. M. (A)
Hall, W. W., Jr. (M)
Hancsak, R. P. (M)
Hanrahan, J. A. (M)
Hart, W. M., Jr. (A)
Helple, R. B. (M)
Hessel, J. (F)
Hilbun, J. M. (M)
Holmes, H. B., III (M)
Horvath, M. J., Jr. (M)
Houghton, E. C. (SM)
Houser, C. R. (A)
Howard, D. F. (M)
Hudson, G. W. (M)
Hunsuck, J. D. (M)
Inafuku, R. H. (M)
Isaac, V. L. (A)
Jansen, E. K. (A)
Johnson, A. W. (A)
Johnson, C. W. (M)
Jones, C. M. (M)
Joska, J. S. (M)
Joyce, R. E. (A)
Kane, L. P. (M)
Kanner, R. H. (M)
Kaplan, M. L. (M)
Kelly, P. J. (M)
Ketcik, J. M. (A)
King, F. N. (M)
Kirkland, F. B. (A)
Kroeckel, C. H. (M)
Krupinski, J. A. (A)
Kush, J. J. (M)
Lairmore, G. E. (A)
Larkin, W. D. (M)
Le Gullou, J. L. (M)
Lord, W. P. (M)
Luchi, R. D. (M)
Lucid, J. R. (M)
Luecker, G. (M)
Madsen, J. F. (M)
Mahoney, T. R. (M)
Mangold, J. F. (M)
Manley, T. M. (M)
Martin, A. J. (A)
Mayo, J. J., Jr. (M)
McCarron, D. J. (M)
McCluskey, P. M. (M)
McCoy, H. H. (A)
McCreight, I., III (M)
McKim, W. J. G. (M)
McLeod, M. G. (M)
McNeill, J. F., Jr. (M)
McPadden, G. E. (M)
Mellion, H. I. (M)
Michels, R. E. (A)
Miller, D. H. (M)
Mills, B. E. (SM)
Miranda, R. T. (A)
Mitchell, W. E. (M)
Moore, J. E. (A)
Moreno, M. R. (M)
Morgan, C. L. (M)
Mull, C. L. (M)
Needham, H. A. (M)
Newell, L. T. (SM)
Nichols, T. O., Jr. (A)
Nicholson, G. O. (M)
Nicholson, J. E. (M)
Niemann, D. A. (A)
O'Keefe, W. C. (A)
Ostlund, G. L. (A)
Palmer, L. N. (SM)
Pansch, H. J. (A)
Paradis, K. A. (A)
Park, R. L. (M)
Pasciuti, R. A. (M)
Peacock, W. M., Jr. (M)
Petersen, R. R. (M)
Phillips, S. C. (M)
Phillips, W. F. (M)
Pixton, J. R. (M)
Plame, S., Jr. (SM)
Poopele, R. E. (M)
Porter, F. A. (M)
Poynter, L. H., Jr. (A)
Pranitch, J. (A)
Prohofsky, L. A. (M)
Provost, C., Jr. (A)
Quintal, R. J. (A)
Rearick, H. F. (M)
Reiter, W. J. (A)
Retzbach, W. J. (A)
Richardson, H. W. (M)
Ritter, F. (M)
Roach, J. H. (M)
Rodin, H. C. (SM)
Rowe, H. A. (M)
Roy, L. B. (M)
Royer, W. C. (SM)
Rubendall, K. W. (M)
Salamy, A. E. (M)
Saxton, A. W., Jr. (A)
Schauers, C. J. (M)
Scheres, W. J. (M)
Scott, G. C. (M)
Selvaggio, V. F. (A)
Semmelhack, H. P. (M)
Sengel, P. A. (VA)
Seybold, L. C., Jr. (M)
Shaskey, E. N. (M)
Sheridan, W. R. (M)
Shey, P. F. (M)
Shine, E. F., Jr. (M)
Shuda, D. G. (M)
Sidon, A. P. (M)
Sgathy, R. (M)
Siler, M., Jr. (M)
Simonds, F. M., Jr. (A)
Sloman, F. A. (A)
Smaker, T. P., Jr. (A)
Smally, E. D. (A)
Smith, C. E. (M)
Smith, D. M. (M)
Smith, M. O. (M)
Smith, R. A. (M)
Smullin, R. (M)
Snyder, N. (SM)
Sommer, J. G., Jr. (M)
Soules, C. W. (M)
Stangl, F. P. (SM)
Stoker, R. R., Jr. (M)
Strate, K. E. (M)
Strohmeyer, G. R. (M)
Stroman, C. F. (M)
Studebaker, M. E. (M)
Sugimoto, J. Y. (M)
Swatek, P. W. (A)
Teague, G. E. (M)
Timmerman, F. (SM)
Travis, L. J., Jr. (M)
Trogdon, F. H. (M)
Turner, L. D. (A)
Turner, T. B. (M)
Tylka, J., Jr. (A)
Underwood, B. P. (A)
Wahle, J. J. (M)
Walt, B. W., III (M)
Ward, B. L., Jr. (M)
Ward, H. H., III (SM)
Warner, A. H. (SM)
Watlington, F. W. (M)
Watts, G. J. (A)
Webber, P. A. (M)
Welch, G. L. (M)
Westman, H. E. (M)
Whiteman, S. E. (A)
Williams, A. C. (A)
Williams, L. D. (A)
Willis, H. W. (SM)
Wilson, F. C. (A)
Wilson, W. W. (M)
Winner, D. R. (M)
Wright, R. K. (A)
Young, R. W. (A)
Zunich, M. (A)
Zwart, R. (A)

APO San Francisco
Aleksa, J. J. (M)
Antosy, S. J. (M)
Armstrong, J. E. (M)
Austin, F. A. (M)
Ballard, J. L. (A)
Barkman, R. N. (A)
Barrle, T. H. (M)
Barry, G. D. (M)
Bartlett, J. E. (A)
Bates, W. J. (M)
Beahr, A. W. (A)
Behrends, P. O. (A)
Betts, R. W. (A)
Binns, F. W. (M)
Black, J. G. (A)
Blain, E. J. (M)
Blough, A. K., Jr. (A)
Boakes, W. H. (M)
Booth, G. H. (A)
Bowne, J. C. (M)
Bradley, J. J. (SM)
Branch, G. E. (SM)
Bravin, C. (A)
Brown, B. L. (A)
Bundy, C. W. (SM)
Bunko, M. (M)
Burke, R. M. (M)
Carlson, D. N. (M)
Carpenter, A. B., Jr. (M)
Carr, B. A. (M)
Chabot, R. C. (A)
Chambers, D. A. (M)
Chambers, G. S. (M)
Cheney, F. H. (M)
Clair, F. F. (M)
Colburn, L. J. (A)
Cole, P. P. (M)
Collins, H. E. (M)
Cook, J. D. (M)
Coughlin, J. T. (M)
Coward, R. W. (M)
Curtis, R. E. (M)
Dean, M. H. (A)
Delort, R. (M)
Dick, H. J. (M)
Diers, C. E. (M)
Dolan, B. A. (M)
Doran, J. W. (F)
Duncan, H. H. (M)
Dunn, J. E. (M)
Eckart, J. H. (M)
Edlund, R. W. (M)
Emanuel, D. A. (M)
Farrar, J. H. (M)
Feucht, R. W. (M)
Fisher, R. L. (M)
Flynn, F. A. (M)
Fouch, J. W. (A)
Fordar, J. K. (M)
Fraser, E. J. (A)
Furukawa, M. (M)
Giara, E. J., Jr. (M)
Gillis, J. W. (A)
Goss, J. (A)
Gregal, J. (M)
Gremer, C. E. (M)
Haettenschwiller, D. L. (A)
Hale, G. R. (M)
Hanna, D. L. (M)
Harding, N. D., Jr. (M)
Harding, P. (M)
Hart, J. E. (M)
Haverstock, J. W., Jr. (M)
Hayes, C. R. (A)
Helde, W. H. (M)
Helnen, J. (M)
Henning, J. C., III (M)
Hildebrand, D. B. (M)
Hoffman, L. E. (M)
Humphreys, J. D. (M)
Hunt, J. R. (A)
Hurt, F. W. (M)
Jesse, H. W. (M)
Johnson, E. L. (M)
Johnson, J. A. (M)
Jones, W. G. (A)
Jouvenat, J. M. (M)
Kawal, W. T. (M)
Keasler, E. S., Jr. (M)
Keene, E. F. (A)
Kindell, F. E. (M)
King, J. W., Jr. (M)
Kirin, M. J. (A)
Kirschenbaum, J. (SM)
Kilmel, E. W. (M)
Koster, W. J. (M)
Lackowski, D. H. (M)
Laine, L. C. (M)
Laine, R. U. (M)
Lane, J. P. (A)
La Porte, B. E. (M)
Leach, E. R. (M)
Lenz, W. K. (A)
Little, P. R. (M)
Lotz, W. E., Jr. (SM)
Magrane, J. H. (M)
Mangels, R. H. (M)
Martin, A. L. (M)
McCain, G. (M)
McCauley, D. D. (M)
Menash, F. H. (SM)
Moskowitz, S. (M)
Murray, J. D., Jr. (M)
Neal, M. E. (M)
Nemirow, D. M. (A)
Neuman, R. H. (A)
Obenchain, I. R., Jr. (SM)
Olsen, J. C. (M)
Olszewski, L. V. (A)
Oman, L. M. (SM)
Osborne, R. B. (M)
Paschot, H. W. (SM)
Pankowski, B. J. (M)
Parkkinen, M. (A)
Patch, H. W., Jr. (M)
Paul, B. W. (M)
Pennilwell, A. F. (M)
Peolin, G. R. (M)
Pette, D. C. (M)
Powell, R. L. (M)
Pratt, J. D. (A)
Quenstedt, R. E. (A)
Ray, R. L. (M)
Reid, J. F. (M)
Rende, A. A. (M)
Rice, H. A. (M)
Rogers, D. E. (M)
Royce, E. R. (M)
Rundlett, L. M. (M)
Samson, S. L. (M)
Sencenbaugh, D. W. (M)
Scheidler, W. E. (M)
Schibi, H. R. (M)
Schreiber, E. L. (M)
Schwenter, G. E. (A)
Seaver, G. E. (M)
Shaffer, R. E. (A)
Shank, R. B. (M)
Shea, E. T. (A)
Singer, H. (M)
Skorhelm, R. D. (M)
Smithey, L. D. (M)
Stirling, H. J. (M)
Stover, R. F. (M)
Stuart, R. R. (M)
Stute, R. A. (M)
Swanson, K. T. (A)
Tedesco, J. R. (M)
Thomas, J. E. (A)
Tom, H. (M)
Tyler, W. L. (A)
Upham, W. C. (M)
Vaughan, D. D. (M)
Weiner, J. H. (M)
Wenger, D. B. (M)
Wheeler, F. K. B. (SM)
Wheeler, R. D. (A)
White, J. A. (A)
Wicks, D. S. (SM)
Wilkins, D. E. B. (A)
Williams, D. G. (M)
Williams, M. M. (M)
Wilson, G. F. (M)
Wine, J. R. (M)
Winier, H. (M)
Wittstone, R. E. (M)
Wolfe, D. C. (M)
Yanagihara, F. T. (A)

APO Seattle (ANC-7)
Arnold, W. L. (M)
Barrett, T. B. (M)
Beatrice, R. R. W. (A)
Bindner, J. T. (SM)
Borgeman, C. E. (M)
Davle, L. J. (M)
Hedberg, R. W. (M)
King, T. H. (M)
Lamaster, F. S. (A)
Prager, S. (M)
Rupcich, J. N. (A)
Thomson, G. C. (M)
Thomton, R. R. (A)
Voight, R. O. (M)
Wyatt, C. L. (M)

ADEN COLONY

Aden
Bruce, J. R. (VA)

ARGENTINA

Buenos Aires (BA)
Andrews, G. J. (SM)
Arbo, O. (A)
Barbieri, M. (M)
Barcala, J. M. (SM)
Baumann, C. (SM)
Bilotti, A. (A)
Blon, J. L. (SM)
Brandt, L. (M)
Brest, U. R. (M)
Grant, J. C. (SM)
Kirkcetiler, E. J. (SM)
Cambre, C. A. (A)
Carballal, J. L. (A)
Cassiet, A. H. (M)
Castro, A. A. (M)
Cole, T. J. (A)
Collazo, J. A. (M)
Conde, H. O. (A)
Coriat, J. L. (SM)
Dallocchio, H. S. (M)
Diamand, M. (M)
Dickson, A. R. K. (M)
Di Marco, A. (SM)
Diaz, J. O. (M)
Diez, F. L. (A)
Falcone, J. A. (M)
Fernandez, O. C. (SM)
Flint-Halpern, M. (A)
Gamba, D. W. (A)
Gayoso, R. A. (M)
Giron, D. G. (A)
Glaubach, N. (A)
Glucksmann, A. (A)
Koblitsky, M. J. (M)
Leunis, J. (M)

AUSTRALIA

Machain, L. R. (M)
Maget, R. V. X. (SM)
Manifesto, H. D. (A)
Marelli, R. V. (A)
Margulius, M. (SM)
Martinez, J. (A)
Mattiussi, O. A. (M)
Neistadt, R. B. (M)
Nolzeux, P. J. (F)
Novits, B. (M)
Novillo, H. L. (A)
Osorio, A. E. (M)
Perfillo, L. M. (A)
Picard, A. (M)
Pinasco, S. F. (M)
Pluss, C. P. (SM)
Pulver, U. (M)
Rawson, G. (A)
Ricci, A. J. (M)
Rocha, L. F. (M)
Rossi, R. (A)
Rostrom, R. W. (A)
Rueda, J. V. (M)
Schiavi, E. H. (A)
Schwartz, O. (M)
Schweimer, K. P. (M)
Scott, R. H. (SM)
Silberman, F. J. (A)
Steiner, J. I. (SM)
Stzube, F. R. (A)
Thomae, M. A. (A)
Ulzurrun, E. T. (A)
Valentinuzzi, M. E. (M)
Van Der Lee, A. C. (M)
Van Soankeren, G. H. (SM)
Zollfrel, C. D. (A)

Caseros (BA)
Boquete, C. B. (M)

Hurlingham (BA)
Cosentino, A. T. (F)

Martinez (BA)
Candido, J. V. (SM)

San Martin (BA)
De Los Santos, A. N. (A)
Garrido, R. A. P. (A)

San Miguel De Tucuman (BA)
Frias, D. E. (SM)
Lopez De Zavalia, R. J. (A)

Rio Negro (BA)
De Haro, F. O. (A)

Vincente Lopez (BA)
Pereyra, L. A. (SM)

Zarate (BA)
Berenyi, S. (M)

AUSTRALIA

New South Wales

Alexandria
McFadden, D. R. (A)

Ashfield
Honnor, W. W. (SM)

Beecroft
Hope, R. S. (M)

Bexley
Wardale, A. H. (M)

Canberra
Brown, S. E. (A)
Carden, P. O. (A)
Finney, K. L. (A)
Graf, G. R. (M)
Hibbard, L. U. (M)
Robertson, D. S. (A)
Wadsworth, B. F. P. (M)

Chipperdale
Dobble, L. G. (SM)
Chandler, G. A. (A)
Krishnan, T. (M)
Ryan, R. D. (M)

East Lindfield
Thom, F. W. P. (SM)

Five Dock
Cansick, N. V. C. (A)

Kensington
Laisk, E. (M)

Kogarah
Chinn, H. R. (A)

Longueville
Beard, M. (M)
Swire, B. E. (M)

Mosman
Wylet, D. G. (SM)

Neutral Bay
Stevenson, M. H. (SM)

Orange
Crouch, E. C. (A)

Penshurst
Hansen, I. C. (M)
Moon, C. D. (A)

AUSTRALIA

Roseville
Fisk, E. (F)

Sydney
Aitchison, R. E. (M)
Bean, L. P. R. (SM)
Bushby, T. R. W. (SM)
Fowler, A. (M)
Gutmann, F. (SM)
Hall, L. S. (SM)
Hooke, L. A. (SM)
Kirkham, P. (M)
Lampard, D. G. (M)
MacDonald, J. A. (M)
Mingay, D. F. (SM)
Munro, G. H. (SM)
Parish, H. C. (VA)
Shaw, R. H. (M)
Warner, J. (M)

Villawood
Hall, G. G. (M)

West Ryde
Benson, J. E. (SM)

Queensland

Adelaide
Ellesworth, G. (SM)
Mudgway, D. J. (A)
Pybus, A. W. L. (SM)
Treharne, R. F. (A)
Willoughby, E. O. (M)

Brisbane
Ham, G. (VA)
Oliver, E. (M)
Wade, C. F. N. (SM)
Webster, H. C. (M)

South Australia

Beaumont
Davies, R. J. C. (M)

Clarence Park
D'Assumpcao, H. A. (M)

Colonel Light Gardens
Beck, H. M. (A)

Woomera
Pickering, L. A. (M)

Victoria

Ballarat
McCulloch, G. R. (A)

Blackburn
Hooper, E. M. (VA)

Brighton
Rubenstein, S. J. (VA)
Warner, G. A. (M)

Canterbury
Coate, E. F. (SM)

Chadstone
Vaux, L. J. (M)

East Malvern
Cox, L. V. (M)

Frankston
Kennewell, E. M. (A)

Heidelberg
Brodribb, M. I. (M)

Ivanhoe
Chakanovskis, E. (A)

Melbourne
Brownless, S. F. (M)
Caro, D. E. (A)
Faudell, C. L. (SM)
Glover, A. J. G. (M)
Jacoby, A. (A)
Mair, R. B. (SM)
Skelton, T. H. (SM)

Richmond
Webb, A. L. C. (VA)

South Melbourne
McInnes, I. G. (SM)

Sunshine
Blakeley, W. C. (M)

West Australia

Applecross
Baldock, A. R. (A)

Bellevue
Simrod, R. (A)

Perth
Hatton, G. H. T. (A)
Hayman, W. G. (M)

AUSTRIA

Vienna
Barrett, A. E. (SM)
Buehler, J. H. (A)
Zemanek, H. (M)

BELGIUM

Antwerp
Fettweis, A. L. M. (M)
Hanotte, P. E. (M)

Balen Wezel
Carpentier, W. J. O. (M)

Brussels
Belevitch, V. (SM)
Bernaert, A. L. J. (A)
Bouchier, P. (A)
Bourguignon-Famaey, G. (A)
Gewillig, M. R. (M)
Hecq, Y. V. (M)
Heibig, W. L. (M)
Hoffmann, J. A. J. L. (A)
Janssen, T. A. M. (M)

Brussels
Lunn, H. J. (M)
Murphy, B. (M)
Sawitzki, N. (M)
Van Roy, J. (M)
Voltaggio, F., Jr. (SM)
Vorobeitchik, J. (M)

Charleroi
Destrant, M. C. (A)

Ghent
Buys, W. L. (M)
Vanden Meersche, A. J. (VA

Kortrijk
Vanwormhoudt, M. C. (M)

Mons
Harmegnies, P. A. (M)

Putte
Liekens, A. F. (A)

Uccle-Brussels
Marlique, J. (M)

Wezembeck
Tavernier, G. C. (M)

Wilrijk
Deschuytere, L. C. (M)

BERMUDA

Hamilton
Hillier, R. J. (M)
Spershott, J. H. (M)
Thorogood, R. R. (A)

Pembroke
Amos, A. F. (A)

Warwick
Harries, J. H. O. (SM)

BOLIVIA

La Paz
Weil, R. B. (M)

BRAZIL

Alagoas
Lisboa, M. H. D. A. (M)

Belo Horizonte
De Castro, E. M. (M)

Pernambuca
Brandt, W. L. (M)

Porto Alegre
Ely, R. S. (M)
Muller, F. R. (A)
Petrzoto, E. S. (SM)
Ritter, G. (A)
Stucken, H. (A)

Rio De Janeiro
Amarante, A. J. D. (A)
Aragao, S. P. (A)
Bonapace, H. (SM)
Calcoya, J. I. (M)
Calenda, V. (M)
Cimbleris, B. (M)
Coelho, C. A. B. (A)
Correa, A. D. C. (M)
Costa, H. (F)
Costa, P. S. (A)
Coutinho, E. O. (M)
De Castro E. Silva, R. (A)
De Mattos, H. C. (M)
De Mediros, L. A. (M)
De Oliveira, A. M. (SM)
De Sa, M. A. M. (A)
Do Carmo, A. C., Jr. (A)
Farmer, F. H. (M)
Ferreira, D. S. (M)
Fuzesi, Z. (M)
Girard, P. A. (M)
Guedes, H. O. P. (M)
Guimaraes, G. S. C. (M)
Heinlinger, W. W. L. (SM)
Hertz, J. A. (M)
Herz, G. (M)
Lacombe, C. G. (A)
Leal, J. M. (A)
Lienhard, J. W. (M)
Mala, G. N. S. (M)
Maranhao, S. M. (A)
Mestano, C. (A)
Miranda, E. D. S. (A)
Neto, J. V. P. (M)
Nevitt, H. J. B. (SM)
Nina, J. P. (M)
Pereira, M. P. D. B. (M)
Pinheiro, U. B. (A)
Portella, A., III (A)
Pradal, H. A. (A)
Quadra, F. F. (A)
Ribeiro, H. S. G. (A)
Santos, J. C. P. (A)
Schreyer, H. T. (M)
Valverde, J. F. (M)
Waeny, J. C. C. (M)

Sao Paulo
Altschul, E. O. (A)
Barradas, O. C. M. (M)
De Barros Barreto, L. A. (M)
Beaman, W. G. (A)
Belck, H. B. (M)
Benchimol, A. (M)
Boffi, L. V. (M)
Borda, J. A. (M)
Chow, Y. (M)
Christian, W. (A)
Dantine, W. A. (M)
Da Rosa, A. V. (M)
De Arruda, P. R. (A)
De Castro, C. E. R. (A)
De Macedo, A., Jr. (M)
De Mello, G. H. (A)
De Miranda, S. M. (A)
De Sa E Silva, C. (M)
Fanta, P. (M)
Funari, B. (M)
Girardelli, L. R. L. (A)
Goldberger, N. (A)
Goldmann, R. D. (A)
Greis, W. F. (A)
Guimaraes, B. Q. (M)
Hirschfeld, B. (SM)
Kubelka, W. (M)
Leirner, A. A. (M)
Levy, G. I. (M)
Lignon, J. R. (A)
Lopes, C. D. P. (M)
Meyer, L. V. (A)
Moreira, J. S. (A)
Muzzio, J. L. R. (A)
Nepomuceno, L. X. (A)
Perisse, G. L. C. (M)
Ribeiro, S. T. (M)
Rittmeister, H. (M)
Rubin, L. (SM)
Senise, J. T. (M)
Sherman, F. L. (M)
Smit, J. (M)
Stamopoulos, C. D. (SM)
Tal, C. T. (SM)
Tissi, P. (A)
Woelz, A. L. (M)

BRITISH EAST AFRICA

KENYA

Nairobi
Pegrume, S. A. (M)
Talbot-Jones, R. V. (M)
Tully, A. (M)

BRITISH GUIANA

East Coast Demerara
Tibbits, A. E. (A)

Georgetown
De Freitas, J. F. (A)

Rio Demerara
Greaves, H. A. (M)

BRITISH OCEANIA

FIJI Islands

Suva
Peck, D. G. (M)

BRITISH WEST AFRICA

Nigeria

Lagos
Fenton, W. A. (M)
Rowe, J. M. (M)

BRITISH WEST INDIES

BAHAMAS

Nassau
Ingraham, K. R. (M)
Sherman, A. B. L. (M)

GRENADA

Windward Island
Smith, R. A. (M)

JAMAICA

Cross Roads
Gauntlett, G. A. R. (M)

Kingston
Dixon, A. E. (A)
Samuels, R. P. (M)
Thomson, A. G. (M)

Pallsadoes
Hoyes, V. V. (M)
Shaw, H. L. (A)

TRINIDAD

Port-of-Spain
Borde, E. H. (A)
Fung, J. H. (A)
Kerr, J. L. (M)
Vendenhoek, E. F. (A)

San Fernando
Bell, R. J. (M)

BURMA

Chauk
Porter, A. H. (M)

Rangoon
Ba'hil, F. (M)
Khin, M. A. (A)
Kyi, M. A. (M)
Lwin, M. M. (A)
Maung, U. A. (A)
Myint, A. (M)
San, P. T. (M)
Su, B. (A)
Than, M. M. (M)
Than, M. P. (A)
Win, U. S. (A)

CANADA

ALBERTA

Ardrossan
Ewell, A. T. (A)

Bowness
Carlson, C. V. (A)
McDougall, S. B. (A)

Calgary (SA-B)
Allan, W. K. (M)
Allinson, M. V. (A)
Ball, E. T. (M)
Barhan, R. N. (A)
Biemackl, H. R. A. (A)
Blank, J. A. (M)
Brownlee, E. P. (M)
Caldwell, L. W., Jr. (M)
Cole, A. M. (A)
Connor, E. C. (A)
Cook, R. E. (M)
Curtis, R. H. (M)
Davis, A. P. (SM)
Dickson, F. J. (A)
Dubber, W. G. (A)
Evans, P. R. N. (A)
Freek, W. L. (M)
Gill, A. L. (A)
Gordon, L. (A)
Gordon, R. E. (M)
Griswold, A. L. (A)
Guthoff, G. H. (A)
Handford, G. B. (M)
Hansen, C. H. (A)
Hemming, G. (A)
Hill, R. F. (A)
Hollingshead, G. W. (A)
Johnson, C. M. (M)
Johnston, C. W. (M)
Kelcey, M. F. (M)
Kerr, W. G. (A)
Kitaliiz, R. S. (M)
Lamb, R. W. H. (M)
Larson, V. C. (M)
Lauber, D. H. (A)
Litchinsky, S. (M)
Lundrigan, E. G. (A)
Maberley, G. A. (A)
MacDonald, A. G. (M)
Macisaac, G. M. (A)
Marion, G. E. (A)
Marshall, D. R. T. (M)
McBride, B. J. (A)
McLean, R. A. (M)
Meleshko, O. M. (A)
Merry, H. C. (A)
Miller, E. C. (A)
Moore, A. M. (A)
Moore, J. D. (M)
Nawata, T. T. (A)
Parkinson, G. E. (M)
Partin, W. (M)
Peters, R. R. (A)
Petrik, J. (A)
Sadler, G. L. (M)
Sandrelli, R. D. (A)
Schafer, E. D. W. (M)
Sisko, J. R. (M)
Smith, M. F. (A)
Smith, R. E. (M)
Stuart, A. J. (M)
Swanson, R. W. (A)
Szojka, F. C. (M)
Umbach, E. A. (A)
Upton, D. K. (A)
Watt, K. M. (M)
Webster, D. J. (A)
Werbisky, C. E. (A)
White, G. H. (A)

Cold Lake (NA-B)
Andree, A. D. M. (A)
Gaulin, R. J. (A)
Krijnen, T. M. G. (A)
Overett, T. H. R. (M)
Stromsmoe, K. A. (M)
Yates, J. W. (A)

Edmonton (NA-B)
Adler, J. G. (A)
Arksey, G. W. (M)
Banks, K. M. (M)
Bassendowski, E. A. (A)
Bastock, D. W. (A)
Berwick, C. D. (A)
Bilduleak, G. (M)
Boyko, L. L. (A)
Bradbury, W. C. (M)
Burtch, N. (A)
Cable, R. P. (A)
Caldwell, A. (M)
Campbell, T. G. (A)
Cary, S. L. (A)
Cunningham, W. E. (M)
Davidson, O. J. (A)
Ducey, R. J. (M)
Earnshaw, A. (M)
Few, E. I. (A)
Goodman, C. J. (M)
Hall, T. W. (M)
Harwood, E. L. (M)
Henderson, I. W. (A)
Hollingworth, F. (A)
Ingram, G. R. (A)
Inkman, W. M. (A)
Johnson, R. A. (A)
Kantautas, A. (A)
Kiss, F. V. (M)
Knights, G. F. (M)
Leitch, J. G. (M)
Lines, E. G. (A)
MacDonald, D. L. (SM)
Makepeace, F. G. (A)
McMahon, V. J. (M)
Nichol, A. C. (A)
Peterson, D. A. (M)
Porteous, J. W. (SM)
Powley, R. K. (A)
Rice, G. R. A. (A)
Richard, G. B. (A)
Rodgers, J. P. (M)
Royer, D. P. (A)
Sacker, J. E. (M)
Scotten, E. C. (A)
Skutle, G. O. (A)
Smith, A. O. (A)
Smith, O. A. (M)
Storms, W. L. (A)
Sutcliffe, R. F. (M)
Wadson, T. E. (A)
Whitley, W. M. (A)
Wylie, A. (A)
Zaharichuk, S. (M)
Zowlak, J. (M)

Granum (SA-B)
Johnson, N. P. (A)

Islay (NA-B)
Waterfield, J. W. (M)

Leduc (NA-B)
Stein, R. A. (M)

Ralston (SA-B)
Clink, W. L. (M)

Red Deer (NA-B)
Bartley, G. A. (SM)

Rimbey (NA-B)
Gardner, R. J. (A)

Ponoka (NA-B)
Taylor, E. L. (M)

St. Albert (NA-B)
Donovan, L. N. (M)
Usher, R. (M)

Sherwood Park (NA-B)
Henderson, R. G. (M)

South Edmonton (NA-B)
Cole, D. R. (A)

Sylvan Lake (NA-B)
Jonkman, J. Y. (A)

Whitecourt (NA-B)
Gay, J. L. (M)

BRITISH COLUMBIA

Aldergrove (VAN-B)
Kearney, J. E. (M)

Burnaby (VAN-B)
Cushing, T. D. (M)
Kay, D. H. J. (M)
Reagh, D. M. (A)

Castlegar (VAN-B)
Thorp, W. W. (M)

Dawson Creek (VAN-B)
Benner, F. D. (M)

Edgewater (VAN-B)
Boker, D. D. (A)

Esquimalt (VAN-B)
Evans, D. J. (M)
Hutcheson, J. G. R. (M)
Milne, A. R. (M)

Fort Nelson (VAN-B)
Jones, L. M. (M)

Kelowna (VAN-B)
Wyatt, T. E. (A)

Lytton (VAN-B)
Manders, D. F. (SM)

Mission City (VAN-B)
Kyashko, W. (A)

Nanaimo (VAN-B)
Carswell, J. D. (A)
Heaslip, D. E. (A)
Mac Intyre, E. R. (M)
Pirart, M. A. (M)

New Westminster (VAN-B)
Ahrens, R. H. (M)
Aitken, R. (M)
Shiu, S. D. W. (M)

North Burnaby (VAN-B)
Butler, R. H. (A)
Dill, H. J. (M)
Newton, W. K. (M)
Smith, J. M. (A)

North Surrey (VAN-B)
Ott, E. K. (A)
Turner, J. H. (A)

North Vancouver (VAN-B)
Alfreds, L. J. (SM)
Alltree, R. C. (A)
Crawford, A. M. (M)
Elliot, D. T. (A)
Goldie, H. J. (M)
Lynch, T. G. (M)
Mariati, C. D. (A)
McDonald, R. C. (A)
Neveroski, F. (A)
Niblock, P. A. (M)
Racey, T. W. (A)
Reyda, D. C. (A)
Willoner, G. (SM)
Wilson, C. M. (A)

Penticton (VAN-B)
Paton, I. W. (A)

Port Moody (VAN-B)
Chisholm, E. (A)

Read Island (VAN-B)
Taylor, A. H. (SM)

Richmond (VAN-B)
Hepburn, J. T. (M)
Matheson, C. D. (A)
Vroom, D. R. (A)

Royal Oak (VAN-B)
Chorlton, D. J. (M)

Savona (VAN-B)
Payne, T. E. G. (A)

South Burnaby (VAN-B)
Knight, G. M. (A)
Trainor, W. J. (M)
Tripp, H. H. (A)

Trail (VAN-B)
Baron, H. D. (A)
Gowans, W. K. (M)

Vancouver (VAN-B)
Allison, R. W. (M)
Beallie, D. F. (A)
Beaton, R. J. (A)
Black, D. T. (M)
Bohn, E. V. (A)
Branham, K. (A)
Breeze, J. E. (SM)
Carpenter, D. D. (SM)
Chandler, A. H. (M)
Chandler, G. C. (SM)
Clisch, D. F. (A)
Cole, R. A. (SM)
Crinqan, F. J. (M)
Crowson, D. B. (M)
Cuddeford, R. A. (M)
Cummings, W. M. (A)
Delaney, D. K. (A)
Diamond, M. (M)
Dietiker, W. (M)
Eno, T. S. (M)
Fall, S. T. (M)
Fraser, F. S. (M)
Frazer, E. J. (M)
Garrison, G. J. (M)
Gibbon, N. T. (M)
Gray, J. S. (M)
Green, M. E. (SM)
Hale, D. R. (A)
Hale, S. T. (A)
Harrow, A. E. (A)
Hilton, B. C. (A)
Hings, D. L. (VA)
Hird, E. V. (M)
Holmes, A. T. (M)
Hopkins, J. A. (M)
Howes, H. A. (M)
Humble, R. S. (A)
Kersey, L. R. (M)
Klaus, E. F. (A)
Klok, B. (A)
Knight, A. G. (A)
Kohler, P. H. (A)
Kolbeins, E. N. (M)
Liddicoat, W. L. (A)
Marsh, R. A. (M)
McCarter, W. L. (M)
McConnell, B. (A)
McGrath, E. F. (A)
McLennan, D. E. (A)
Mohammed, A. (M)
Moore, A. D. (SM)
Noakes, F. (M)
Norman, E. R. (A)
Norman, R. O. (M)
Phillips, G. E. (A)
Potvin, L. H. (A)
Praeg, W. F. (M)
Price, E. M. (A)
Pye, R. M. (A)
Reader, W. R. (M)
Robinson, R. A. (M)
Robson, E. E. (M)
Saito, Y. (M)
Seabrook, H. B. (M)
Shelding, J. A. (M)
Smith, C. R. (A)
Spencer, R. E. (A)
Spilsbury, A. J. (M)
Thomoson, H. C. (A)
Thompson, W. H. (M)
Tracey, W. R. (A)
Tupper, B. R. (F)
Varah, L. A. (A)
Warren, G. D. R. (A)
Weeks, R. L. (M)
Whiteside, R. L. (A)

Vernon (VAN-B)
Hanslip, G. (M)

Victoria (VAN-B)
Blyth, G. S. (A)
Davidson, M. H. (A)
Duston, R. F. (M)
Johns, J. G. (A)
Madill, C. L. (M)
Weir, R. C. (M)

West Vancouver (VAN-B)
Bennett, W. F. (M)
Bonnett, J. D. W. (A)
Whittey, T. (M)

MANITOBA

Argyle (WIN-B)
Baranovsky, C. (M)

Beausejour (WIN-B)
Webber, B. O. (A)

Brandon (WIN-B)
Gomez, A. M. (M)

Brooklands (WIN-B)
Bigar, E. (A)

Cranberry Portage (WIN-B)
Moore, D. G. (A)

East Kildonan (WIN-B)
Thrasher, P. J. (A)

Fort Garry (WIN-B)
Coish, H. O. (M)
Haakonsen, H. M. (M)

Gretna (WIN-B)
Roddick, J. H. (M)

Lac du Bonnet (WIN-B)
Uhlman, J. C. (A)

Norwood (WIN-B)
Barschel, E. (A)

Rivers (WIN-B)
Strain, E. M. (M)

St. Boniface (WIN-B)
Philpott, G. W. (M)

St. James (WIN-B)
Cuthbert, P. (A)

Transconia (WIN-B)
Halchuk, R. A. (M)

West Kildonan (WIN-B)
Yankewicz, W. W. (M)

Winnipeg (WIN-B)
Ardellan, T. E. (M)
Barnstable, F. H. (M)
Blair, R. G. (M)
Blicq, R. S. (A)
Body, H. T. (SM)
Bridges, E. (M)
Brown, J. R. B. (A)
Buchmeier, H. P. G. (M)
Cahoon, R. D. (F)
Campbell, D. C. (M)
Campbell, J. F. (A)
Charron, J. H. A. (A)
Clayton, H. C. V. (A)
Crolly, J. A. (M)
Cross, I. F. (SM)
Dunn, H. (A)
Dusang, E. B. (M)
Galpin, W. H. (M)
Grant, F. D. (A)
Grausdin, P. (A)
Hackett, F. J. (M)
Hamilton, W. (A)
Harvey, V. H. (A)
Hooper, A. W. (M)
Hopper, C. J. (M)
Horner, S. G. L. (F)
Jex, J. F. (A)
Johnson, R. A. (M)
Johnston, W. A. R. (M)
Kirk, G. R. (M)
Konrad, J. E. (M)
Laurila, W. E. (A)
Leite, A. N. (A)
Love, G. (M)
Lumley, J. N. C. (M)
MacDonald, P. A. (SM)
Maguire, R. T. (M)
McLaren, G. A. (A)
McQuaid, A. C. (A)
Mestery, S. J. (A)
Murphy, B. F. (M)
Naqvi, S. I. H. (A)
Nattress, I. A. (M)
Newey, D. K. (M)
Noakes, J. F. (A)
Oakes, D. A. (M)
Paterson, D. J. (M)
Punshon, R. L. (M)
Raber, M. B. (M)
Roulston, K. I. (SM)
Royko, W. (M)
Saunders, M. G. (M)
Sawka, M. H. (M)
Shaver, H. B. (A)
Simister, R. M. (M)
Sloker, G. H. (A)
Sutton, W. D. (A)
Taylor, D. F. (M)
Tinkler, E. B. (A)
Tinkler, R. F. (M)
Trencher, J. W. (M)
Wallace, G. R. (M)
White, T. J. (M)
Whitford, B. G. (M)
Williamson, K. H. (M)
Windrick, P. F. (M)
Wormell, H. T. (SM)
Zold, T. (M)

NEW BRUNSWICK

Bathurst (MON-B)
Cote, J. A. (A)

Campbellton (MON-B)
Lyon, W. D. (M)

Chatham (MON-B)
Boose, W. H. (A)

Fredericton (MON-B)
Bailey, C. O. C. (M)
Collier, R. J. (M)
Scott, R. N. (M)
Smolinski, W. J. (M)
Wasson, W. D. (M)

Moncton (MON-B)
Grant, D. J. (M)
Kemp, J. R. (A)
Richaur, F. F. (M)

Oromocto (TOR-B)
Nightingale, A. J. (M)

Sackville (MON-B)
Hart, E. S. (A)
Smith, H. M. (SM)

St. John (MON-B)
Bishop, J. G. (M)
Fanjoy, E. M. (M)
Isaacs, H. A. J. (A)

NEWFOUNDLAND

Labrador (NEW-B)
Tanton, J. E. (A)

Gander (NEW-B)
Alway, V. J. (M)

St. John's (NEW-B)
Ainsworth, V. A. (A)
Au, C. D. (A)
Bailey, F. C. (M)
Bedinafield, J. F. (A)
Bishop, H. A. (M)
Bunt, R. H. (M)
Coe, M. C. J. (M)
Filyer, J. (A)
Fisher, L. (A)
Gaskell, W. M. (A)
Gladden, M. (M)
Gould, T. C. (A)
Halfyard, R. (M)
Hierlihy, O. G. (M)
Inkson, I. A. (M)
Jerrett, A. C. (M)
Kaltenbach, R. F. (M)
Lawton, B. (M)
Lesperance, B. J. (A)
Lewis, R. (M)
Lloyd, D. (M)
Lounder, J. F. (A)
Mac Gray, M. D. (M)
Marshall, D. R. J. (M)
Morford, R. V. (A)
Moseley, S. V. (A)
Mulloy, F. A. (A)
Noah, D. J. (A)
Oliver, J. V. (A)
Prowse, B. J. (A)
Quarmby, A. (A)
Ross, G. M. (M)
Ryde, C. H. (M)
Sparrowe, J. A. V. (A)
Stevens, T. J. (M)
Taagepera, A. (A)
Tibbett, J. E. (A)
Wells, R. J. (M)
Williams, V. (A)
Witherstone, E. D. (M)

NOVA SCOTIA

Armdale (MON-B)
Currie, V. J. (A)
Thibodeau, D. L. (M)

Cornwallis (MON-B)
Pimenoff, V. J. (M)

Dartmouth (MON-B)
Cox, G. C. (M)

Greenwood (MON-B)
Brown, H. C. (A)
Hermiston, J. A. (A)
Storm, A. C. (A)

Halifax (MON-B)
Arvisais, G. J. (M)
Burchill, G. H. (M)
Fowlie, W. D. (M)
Grant, A. S. G. (M)
Greig, A. W. (M)
Heenan, N. I. (A)
Mac Williams, A. R. (A)
Murray, C. W. (A)
Robertson, J. J. C. (VA)
Tuszynski, A. A. (M)
Wilson, R. W. (M)
Wood, W. (A)

Middleton (MON-B)
Mac Leod, R. A. (A)

Shelburne (MON-B)
Kent, M. P. (A)

Sydney (MON-B)
Janega, J. J. (M)
Oulton, G. R. (M)

West Berwick (MON-B)
Kelly, T. W. (A)

Wolfville (MON-B)
Tillotson, J. G. (M)

Woodlawn (MON-B)
White, W. R. (A)

ONTARIO

Acton (H-KW-B)
Coats, W. D. (M)

Agincourt (TOR-B)
Barringer, A. (A)
Butler, C. A. (M)
Collins, G. S. (M)
Cummings, V. J. (M)
Davis, L. S. (A)
Liggans, C. E. (A)
Maine, A. E. (M)
Rethoret, R. H. (M)
Shack, A. G. (M)

Ajax (TOR-B)
Bayly, B. D. F. (F)
Mulholland, G. C. (A)
Philp, H. F. (A)

Almonte (OTT-B)
Maynard, L. A. (M)

Alvinston (L-SWO-B)
Jackson, R. B. (A)

Ancaster (HAM-B)
Fines, W. W. (A)
Fromanger, A. L. (M)
Gomard, P. (M)
Jewell, G. S. (M)
Jeynes, W. E. (M)
Olson, E. (SM)
Ruse, E. (M)
Smith, C. J. (M)
Stapleton, A. A. (A)
Thomas, E. A. (M)
Wiffin, R. F. (A)
Wilder, J. C. (M)

Arnprior (OTT-B)
Boire, P. C. (M)
Montagnon, N. B. (M)
Wassink, B. J. (A)
Zuidhof, A. (M)

Ashburn (TOR-B)
Anderson, W. H. (M)

Aurora (TOR-B)
Morris, D. V. (A)

Bancroft (BAY-B)
Shaw, P. D. W. (A)

Barrie (TOR-B)
Paulin, W. P. (M)

Belleville (BAY-B)
Attridge, D. M. (A)
Baxter, G. I. (A)
Bell, G. L. (M)
Benger, W. C. (SM)
Blacker, H. L. (M)
Burkett, K. V. (M)
Carey, P. M. (M)
Clarke, W. E. (M)
Coombs, C. W. (M)
Cowan, D. J. (M)
De Paul, V. A. (M)
Desmond, N. T. (A)
Dryden, T. W. R. (A)
Duke, A. M. (M)
Field, G. C. (M)
Fort, D. E. (M)
Frederick, H. V. (M)
Goodwin, R. N. (M)
Hanna, J. L. (A)
Heaven, W. H. (SM)
Hunt, C. A. (A)
Ives, W. J. (A)
Jarros, A. (M)
Jarvis, J. A. (SM)
Johns, D. M. (A)
Johnson, M. E. (M)
Jones, A. F. H. (A)
Kostashuk, S. S. (M)
Lind, E. P. (M)
Lund, D. M. (M)
Martin, N. (M)
Mitchell, T. E. (M)
Moore, N. A. (M)
Punchard, J. C. R. (F)
Revill, A. D. (SM)
Rickards, C. E. (M)
Robb, A. S. (SM)
Rywak, J. (SM)
Scarlett, A. E. (A)
Sillitoe, S. (M)
Smith, R. L. (SM)
Stewart, P. P. (A)
Stinson, A. W. (M)
Stroud, E. L. (M)
Tanner, R. H. (F)
Vice, D. G. (M)
Weller, M. J. (SM)
Wamboldt, G. L. (M)
Wesbrook, L. E. (A)
Williamson, J. A. (M)
Williamson, R. (SM)

Bells Corners (OTT-B)
Itenson, V. A. (M)

Bloomfield (BAY-B)
Woods, W. T. (A)

Brampton (TOR-B)
Akenhead, B. A. (M)
Cooper, J. E. (M)
Milsom, D. E. G. (A)

Branchton (H-KW-B)
Riley, D. (A)

Brantford (HAM-B)
Hochner, S. V. (A)
McConnachie, W. A. (A)
Williams, J. K. (M)

Brittania Bay (OTT-B)
Scott, J. C. W. (F)

Brockville (OTT-B)
Leeder, W. F. (A)
Uszkay, E. S. (M)

Bronte-Oakville (H-KW-B)
Ticknor, A. E. (M)

Burlington (H-KW-B)
Beaumont, G. F. (SM)
Cockle, E. S. (M)
Davis, C. C. (M)
Duff, D. L. A. (M)
Heys, D. M. (M)
Lower, W. M. (M)
McFarlane, R. A. (M)
Merritt, H. J. (M)
Moes, C. (M)
Musselman, J. A. (M)
Stonelake, D. A. (M)
Webb, H. H. (M)
Wilkinson, S. (M)

Byron (LON-B)
Golden, P. (M)
Warr, R. J. (M)

Cardinal Heights (OTT-B)
Ayukawa, K. (M)
Couzens, D. T. (M)
Miedzinski, J. (SM)

Carleton Place (OTT-B)
Britney, O. L. (M)
Kerr, G. O. (A)

Chalk River (OTT-B)
Cowper, G. (SM)
Jones, A. R. (M)

City View (OTT-B)
Smith, W. B. (SM)

Clarkson (TOR-B)
Beattie, D. (M)
Boersma, J. (A)
Heidebrecht, L. E. (M)
Sharf, W. A. (A)

Clinton (LON-B)
Bogstad, F. O. (M)
Brightwell, S. A. (M)
Firlotte, J. L. (M)
Higgins, G. S. (A)
Hondsolth, R. R. B. (SM)
Lowe, A. W. (M)
Mawdsley, J. S. (M)

Senior, R. N. (M)
Shutt, S. (A)

Cobourg (BAY-8)
Williamson, D. B. (SM)

Coldwater (TOR-B)
Parker, D. L. (M)

Cooksville (TOR-8)
Came, L. C. (A)
Hastie, F. S. (A)
Hayward, J. R. (M)

Copper Cliff (TOR-B)
Shaw, J. L. (SM)

Cornwall (OTT-8)
Hamilton, W. D. (M)

Deep River (OTT-8)
Allen, V. H. (M)
Brown, J. C. (M)
Drew, T. D. (A)
Dunloo, D. P. (M)
Goulding, F. S. (SM)
Hayter, D. M. (M)
Waugh, J. B. S. (M)

Don Mills (TOR-B)
Adams, R. L. (SM)
Anto, H. (A)
Breckenridge, A. G. (M)
Brown, R. W. (SM)
Eastwood, G. C. (M)
Flynn, M. W. (M)
Gillies, G. A. (A)
Greenwood, R. E. (M)
Lee, C. (A)
Low, A. R. (M)
McCloskey, K. P. (A)
Millen, T. I. (SM)
Pipe, G. E. (M)
Robinson, J. D. (A)
Semmelink, A. (SM)
Simoni, A. (M)
Stevens, A. (A)

Dorchester (LON-B)
Moore, D. (M)

Downsview (TOR-B)
Armstrong, H. D. (M)
Brudsky, S. (A)
Casciato, L. (M)
Cohen, H. A. (M)
Day, C. A. (M)
Gattoni, L. I. (A)
Geary, B. H. (A)
Hyde, G. (M)
Lewis, D. H. (A)
Stephenson, W. R. (M)
Wall, E. (M)
Williams, N. A. (SM)
Yablo, S. (M)

Dryden (TOR-B)
Ellenwood, D. S. (M)

Dundas (HAM-B)
Anthes, R. G. (SM)
Kozak, W. S. (M)

Dunnville (HAM-B)
Duffin, M. V. (A)
Hayles, O. J. (M)

Eastview (OTT-B)
Brahan, J. W. (A)
Filiopino, J. F. (A)
Storr, J. W. (M)

Elliott Lake (TOR-B)
Popovich, C. D. (A)

Etobicoke (TOR-B)
Knott, J. C. (M)
Rocholl, H. C. (A)
Thompson, R. S. (M)

Falconbridge (TOR-B)
Demers, R. J. H. (M)

Forest Hill (TOR-B)
Van Dyk, T. (M)

Fort Erie (HAM-B)
Moratz, W. P. (A)
Waud, E. C. (VA)

Fort Frances (TOR-B)
Shine, G. L. (A)

Fort William (TOR-B)
Andrews, G. R. (M)

Foymount (OTT-B)
Baxter, E. G. (M)
Lemke, M. F. (M)

Galt (H-KW-B)
Sweet, J. L. (A)

Gananoque (OTT-B)
Olive, G. W. (F)

Georgetown (H-KW-B)
Matthies, J. G. (M)
Prust, P. (A)

Goderich (LON-B)
Carlson, D. E. (A)
Hurst, R. V. (M)

Guelph (H-KW-B)
Armstrong, A. S. (M)
Brown, R. M. (A)
Clegg, G. M. (A)
Irwin, G. J. (SM)
Mackay, F. S. (SM)
Robinson, C. A. (VA)
Valerlote, P. T. (A)

Hamilton (HAM-B)
Aldwinckle, J. G. V. (M)
Anderson, J. W. (M)
Bohay, J. A. (M)
Cannon, E. T. (A)
Cantion, C. F. (SM)
Ceelen, P. A. J. (M)
Challis, R. (M)
Cheek, W. A. (A)
Connor, J. J. (A)
Coolsma, S. F. (M)
Dean, W. W. H. (SM)
Edwards, F. H. (M)
Felix, M. O. (SM)
Geldart, W. J. (M)
Gladwin, A. S. (M)
Godfrey, G. F. (A)
Harris, L. R. (M)
Harris, O. E. (A)
Hazan, P. L. (M)
Heal, G. L. (A)
Hloo, T. M. (M)
Hore, H. B. (A)
Howes, C. N. (M)
Humbert, V. J. (A)
Jackson, C. M. (M)
Kassner, J. (A)
Kelterborn, W. H. (SM)
Leskiw, H. (M)
Litwin, J. D. (A)
Lucyk, J. (M)
Lyons, K. C. (M)
Martin, R. H. (A)
Mason, V. V. (SM)
McGee, H. R. (M)
Minchel, C. C. (M)
Prinsen, H. W. (M)
Rapo, E. (A)
Ross, R. G. (M)
Sandler, A. A. (M)
Shenton, W. E. (M)
Stevert, A. H. (SM)
Silke, A. G. (A)
Slater, H. (A)
Smith, W. D. (M)
Sparrow, J. (M)
Staryk, M. (M)
Stauffer, R. L. (M)
Todd, H. F. E. (A)
Walker, M. L. (A)
Watts, T. O. (M)
Wilk, J. (A)
Wynn, W. W. (M)
Yakymyshyn, M. M. (M)

Highland Creek (TOR-B)
Gladys, S. J. (M)

Hornby (H-KW-B)
Pefhany, J. (A)

Iondale Heights (TOR-B)
Johnston, K. S. (A)

Islington (TOR-B)
Brammanis, A. (M)
Gent, L. F. T. (M)
Mathers, F. F. (A)
Westcott, D. B. (M)
Wood, A. E. (M)

Jordan Station (HAM-B)
Pond, J. F. (M)

Kapuskasing (TOR-B)
Campbell, J. H. (M)

Keewatin (TOR-B)
Jones, A. W. (M)

Kettleby (TOR-B)
Borth, L. A. (M)

King (TOR-B)
Stubbs, R. A. (A)

Kingston (BAY-B)
Armstrong, H. L. (M)
Bowen, B. A. (M)
Bradley, D. J. (M)
Camoling, C. H. R. (M)
Chambers, R. G. (A)
Chisholm, R. M. (A)
Harrower, G. A. (M)
Hay, J. D. (M)
Hetherington, F. E. (M)
Hyman, W. R. (M)
McPherson, J. A. (M)
Murray, R. G. (M)
Ryan, W. D. (M)
Stewart, H. H. (SM)

Kirkland Lake (TOR-B)
Chaoman, K. G. (M)

Kitchener (H-KW-B)
Albrecht, J. (A)
Barsony, C. L. (M)
Clark, W. B. (SM)
Cox, G. M. (SM)
Dankwardt, R. W. (M)
De Haas, T. (M)
Durrall, J. M. (M)
Feilchenfeld, M. M. (M)
Goetz, H. E. J. (M)
Guzik, S. W. (M)
Hass, Z. K. (SM)
Kennedy, T. E. (M)
Love, S. F. (M)
Marsland, J. W. (A)
McHugh, D. E. (A)
Moshier, L. S., Jr. (A)
Ritz, E. A. (A)
Smallwood, S. G. (A)
Turchan, P. J. (A)
Washburn, J. C. (M)

Lancaster (OTT-B)
McLeod, J. W. (M)

Lansing (TOR-B)
Fisher, G. W. (A)

Leaside (TOR-B)
Brereton, R. L. (M)
Crossan, G. W. (M)
Fitzallen, J. H., Jr. (M)
Hogan, J. F. (A)
Webster, C. G. (M)

Lively (TOR-B)
Leask, R. D. (M)

London (LON-B)
Bach, J. R. (SM)
Beninger, G. J. (A)
Blackwell, J. H. (SM)
Brouwer, J. J. (A)
Brule, R. J. (A)
Dearle, R. C. (SM)
Fallona, J. P. (M)
Ferguson, A. F. (M)
Foster, G. L. (M)
Fulford, J. A. (M)
Graham, B. (SM)
Hay, D. R. (SM)
Hinz, E. J. (A)
Hosker, G. R. (M)
Jackson, N. B. (M)
Jamain, E. R. (M)
Jeffery, J. (M)
Johnston, S. N. A. (A)
Lopatauskas, J. V. (A)
Luke, R. W. (M)
Moeys, G. L. (A)
Nunn, W. A. (A)
Oliver, W. L. (M)
Pepino, L. F. (A)
Prodger, A. (A)
Prothero, J. W. (M)
Rumbold, D. G. (A)
Ruth, C. G. (M)
Stewart, T. W. W. (A)
Stokes, S. J. (A)
Strik, W. L. (M)
Suchard, D. G. (M)
Tull, E. H. (SM)
Warder, J. C. (M)
Wilton, R. (SM)
Zelonka, F. A. (M)

Longlac (TOR-B)
Koshman, R. (A)

Lorne Park (TOR-B)
Grossman, J. S. (M)
Teng, T. (A)

Lowbanks (HAM-B)
Moore, B. W. L. (A)

Malton (TOR-B)
Frusher, R. J. (M)
Galvin, P. (M)

Mattice (TOR-B)
Denyer, J. H. N. (M)

Mitchener (H-KW-B)
Banks, F. A. O. (M)

Newmarket (TOR-B)
Blackwood, G. W. (M)
Posnikoff, P. W. (M)

Niagara Falls (HAM-B)
Roberts, W. F. (A)

Nobel (TOR-B)
Anthony, F. (A)

North Bay (TOR-B)
Scott, C. R. (A)
Sullivan, T. (M)
Trenouth, H. W. (A)

Oakville (H-KW-B)
Alsop, J. W. (A)
Amis, T. E. (A)
Fekyt, D. P. (A)
Maskell, R. F. (A)
McLennan, E. A. (M)
Paddon, J. W. (SM)

Orangeville (TOR-B)
Wray, D. G. (A)

Orillia (TOR-B)
MacQuarrie, R. C. (A)

Oshawa (TOR-B)
Hunt, J. W. (M)
Kerr, R. L. (M)
Marchand, W. C. (M)
McLean, D. J. (M)
Starker, H. H. (A)

Ottawa (OTT-B)
Adey, A. W. (A)
Aksim (V. E. (SM)
Andrews, A. G. (M)
Anglin, F. M. (A)
Argyle, J. V. (A)
Baar, J. G. (A)
Ballard, B. G. (F)
Barrett, W. A. C. (M)
Barton, F. S. (F)
Beauchesne, L. A. (M)
Begley, R. G. (M)
Bell, A. C. (M)
Bennett, J. R. G. (SM)
Bennett, L. F. (M)
Bhattacharyya, B. K. (A)
Blevis, B. C. (M)
Blore, W. E. (M)
Boelman, P. M. (A)
Boyd, G. M. (M)
Bradley, J. H. (A)
Bredahl, A. (M)
Bresee, C. W. (M)
Broten, N. W. (M)
Brown, R. K. (M)
Brown, W. C. (A)
Brunton, H. W. (M)
Bulger, G. E. (A)
Burridge, M. V. (A)
Burtnyk, N. (A)
Byers, V. J. (SM)
Card, M. L. (SM)
Cairns, F. V. (M)
Cardis, R. M. (M)
Carriere, J. M. (M)
Carroll, D. V. (SM)
Castleman, D. H. (M)
Caton, W. A. (M)
Chapman, J. H. (SM)
Chapman, R. (A)
Chown, B. F. (M)
Chrome, J. T. (M)
Chrzanowski, J. T. (M)
Clemence, C. R. (A)
Coburn, G. S. (M)
Coffey, L. E. (M)
Cole, W. A. (SM)
Collins, W. C. (A)
Conway, W. R. (M)
Cooper, R. J. G. (A)
Cope, L. G. (A)
Corbett, H. L. (M)
Cormack, G. D. (M)
Covington, A. E. (SM)
Cox, L. G. (M)
Craven, J. H. (A)
Cumming, W. A. (SM)
Dacey, M. J. (A)
Dashney, D. R. (A)
Davies, N. G. (M)
Day, J. W. B. (M)
Des Brisay, A. W. Y. (M)
De Vinney, J. S. (A)
Doherty, L. H. (SM)
Doucet, D. W. (M)
Duff, G. C. (A)
Edelson, E. P. (S)
Elliott, R. E. (A)
Ennis, D. E. (A)
Evans, C. R. (A)
Evans, G. (M)
Farkas, J. (M)
Fedorak, W. N. (A)
Field, G. S. (F)
Field, P. A. (SM)
Ford, J. G. (M)
Franklin, C. A. (M)
Freeman, R. E. (SM)
Gagne, R. R. J. (M)
Galbraith, R. A. H. (SM)
Gilbert, M. (M)
Glinski, G. (SM)
Gooderham, D. (M)
Gouin, W. P. (M)
Grainger, G. E. (M)
Grant, D. A. (M)
Green, E. W. (M)
Grundy, D. P. (M)
Hamilton, A. C. (M)
Haney, W. L. (SM)
Hanna, G. F. (M)
Hatton, W. L. (M)
Heal, J. A. (M)
Henderson, D. J. (A)
Henderson, D. P. (M)
Henderson, J. P. (SM)
Henderson, J. T. (F)
Hendry, A. (M)
Henshaw, C. H. (A)
Hildebrandt, A. E. (M)
Holcomb, W. L. (M)
Hood, R. T. (A)
Hopps, J. A. (M)
Horwood, J. L. (M)
Hudson, A. C. (M)
Huget, W. J. (A)
Hughes, B. (M)
Hunt, F. R. (M)
Hurd, R. A. (M)
Irvine, G. W. (M)
Jenkins, E. E. (SM)
Jewell, L. (M)
Johnson, E. F. (M)
Johnston, H. S. (A)
Jones, R. H. (A)
Jones, S. G. (M)
Joslin, J. D. (M)
Kalra, S. N. (M)
Kasvand, T. (A)
Kendall, W. S. (M)
Kenney, J. R. (M)
Kenniger, A. (M)
Kivistik, O. (M)
Klein, E. J. (M)
Knights, S. F. (SM)
Korczynski, W. F. (M)
Kydd, J. G. (A)
Lacey, W. K. (A)
Lake, G. T. (M)
Lamb, H. A. (A)
Langille, R. C. (SM)
Lavrench, W. (M)
Lazecki, S. (M)
Le Grand, A. J. (A)
Lemay, R. B. (M)
Lemke, R. L. (A)
Locke, J. L. (M)
Loh, S. C. (M)
Lomas, E. G. (SM)
Loutit, J. A. (M)
MacKay, J. G. (M)
McIntosh, J. A. (A)
McKinley, D. W. R. (F)
Mac Kinnon, K. A. (F)
MacLullich, D. A. (SM)
MacNair, E. A. (A)
Magee, A. I. (A)
Mah, H. W. (M)
Mahmud, M. A. (M)
Makow, D. M. (M)
Marchand, J. R. (M)
Mason, L. J. (M)
Matte, G. (M)
McCormick, G. C. (A)
McCuaig, N. E. (M)
McGrail, J. J. (M)
McIntosh, B. A. (A)
McIntyre, B. J. (A)
McKendry, B. A. (M)
McLeish, C. W. (SM)
McNamara, A. G. (M)
Medd, W. J. (M)
Meek, J. H. (M)
Melton, R. E. (M)
Mervyn, G. (M)
Mes, J. J. A. F. (M)
Miller, B. G. (M)
Miller, C. A. (SM)
Modley-Jones, H. S. (A)
Molozzi, A. R. (M)
Moore, D. A. (A)
Moore, L. R. (M)
Myhill, D. A. (M)
Nasmyth, P. W. (M)
Neal, G. (M)
Neale, M. J. L. (M)
Nelson, L. E. (M)
Nikkel, R. F. (M)
Nixon, F. G. (A)
Norton, J. A. (M)
Olivero, M. A. (M)
Oltheten, J. B. (M)
Oulmet, J. A. (F)
Park, F. R. (SM)
Paterson, H. R. M. (A)
Patterson, C. F. (SM)
Pedersen, B. O. (M)
Penstone, S. R. (M)
Perry, E. G. (M)
Petersons, O. (M)
Petrie, L. E. (M)
Phillips, L. W. (A)
Poole, E. C. (SM)
Presentey, S. M. (SM)
Price, M. (M)
Primich, R. I. (M)
Puffer, J. K. (M)
Puttock, K. L. (A)
Raine, H. R. (M)
Rantz, R. D. (M)
Rastogi, R. G. (SM)
Real, R. R. (M)
Redhead, P. A. (SM)
Reiche, H. (SM)
Rempel, C. (M)
Richards, R. S. (M)
Richardson, W. G. (F)
Riordon, J. S. (M)
Riorden, R. C. (A)
Robinson, H. (M)
Robinson, T. J. B. (M)
Rogers, T. F. (M)
Rosebrugh, R. K. (A)
Rowe, W. A. (M)
Rowlatt, J. H. (M)
Roy, O. Z. (M)
Ruedy, R. (A)
Sandoz, D. A. (SM)
Schroeder, K. A. (A)
Schwartz, H. H. (M)
Seaman, E. A. (A)
Searle, W. R. (A)
Sheffield, A. G. (SM)
Shepertycki, T. H. (A)
Sheppard, R. (M)
Sheppard, R. D. B. (SM)
Simpson, B. H. (M)
Simpson, F. W. (M)
Skanes, D. M. (M)
Smith, F. E. (A)
Smyth, H. R. (SM)
Soucy, C. I. (SM)
Stanlforth, A. (SM)
Steele, K. A. (M)
Stock, E. H. (A)
Stone, D. G. (M)
Stone, S. A. (A)
Sturrock, J. K. (M)
Sturrock, R. F. (M)
Tamowski, H. J. (A)
Tant, V. E. (SM)
Taylor, A. L. (A)
Tennucl, J. E. (A)
Thain, R. S. (SM)

Timmers, A. G. W. (M)
Trohon, B. L. (A)
Vandervelden, C. G. (M)
Von Baeyer, H. J. (F)
Wahl, H. E. (M)
Watson, G. D. (SM)
Weaver, W. A. L. (A)
Webb, E. L. R. (SM)
Webb, P. R. W. (A)
Welsh, W. (M)
White, P. W. (M)
White, R. A. S. (M)
White, W. E. (SM)
Wilcox, D. A. (A)
Wilmot, R. D. (M)
Wilson, W. R. (SM)
Wittke, P. H. (M)
Wong, J. Y. (SM)
Wright, R. (SM)
Yurko, M. (M)

Painswick (TOR-B)
Wamica, I. H. (A)

Parry Sound (TOR-B)
Signore, S. S. (M)

Pembroke (OTT-B)
Srinivasan, S. (M)

Peterborough (BAY-B)
Flemons, R. S. (SM)
Grosso, J. E. (M)
Klingbell, H. N. (M)
Klodt, R. A. (M)
Mallory, P. G. (M)
MacKelvie, J. S. (SM)
Young, J. A. I. (M)

Petrolia (TOR-B)
Jackson, F. J. (M)

Pickering (TOR-B)
Brimbecom, R. J. (M)

Picton Mill Camp (BAY-B)
Clerke, B. C. (A)

Port Arthur (TOR-B)
Hunter, W. C. (M)

Port Colborne (HAM-B)
Sinko, J. P. (A)

Port Credit (TOR-B)
Eaton, G. F. (M)
Etches, E. D. (M)
Hummel, W. M. (A)
Macumber, M. G. (A)
Sparks, B. B. (A)

Port Hope (TOR-B)
Mac Gregor, A. R. (A)
Seldler, H. G. (A)
Taylor, W. (M)

Port Rowan (LON-B)
Martin, J. O. (M)

Preston (HAM-B)
Buchanan, C. E. (A)

Prince Edward Island (MON-B)
Doucette, J. T. K. (A)

Ramsayville (OTT-B)
Harris, L. H. (M)

Ravenna (HAM-B)
Fiegehen, G. D. A. (A)

Renfew (OTT-B)
Belanger, J. P. (M)
Muller, W. J. (M)

Rexdale (TOR-B)
Freen, P. (M)
George, J. N. S. (A)
Gronstrand, T. L. (A)
Loughrin, W. R. (M)
Murphy, W. L. (A)
Pelzer, F. W. G. (A)

Richmond (OTT-B)
Ling, T. G. (M)

Richmond Hill (TOR-B)
Bull, T. R. (A)
Ford, F. A. (SM)
Matheson, A. I. (A)

Riverside (L-SWO-B)
Barnes, E. M. (A)
Butler, B. H. (A)
Le Blanc, R. J. (A)

Rockcliffe (OTT-B)
Suolmoto, M. (M)
Fawcett, G. M. (SM)

Roslin (BAY-B)
Hutson, G. E. (A)

Russell (OTT-B)
Snyder, J. S. (A)

Sarnia (L-SWO-B)
Cook, R. H. (M)
Thomas, A. (M)

Sault Ste. Marie (TOR-B)
Levasseur, J. R. A. (M)
McRae, D. W. (A)

ScarBorough (TOR-B)
Andrews, D. S. (A)
Davidson, J. W. (M)
Ellerston-Jones, E. K. (A)
Flood, F. M. (A)
Graham, H. E. (M)
Halsall, D. L. (SM)
Hayes, T. D. (M)
Hull, S. E. (A)
Kenridge, E. L. (M)
Koster, J. A. (M)
Kufluk, A. (M)
Lazenby, T. W. (A)
McGovern, J. R. (M)
Morfitt, D. C. (M)
Morrison, D. C. (A)
Noble, D. E. (M)
Poldre, O. (M)
Prezlosl, F. W. (M)
Pugh, W. H. (M)
Rawley, J. W. (A)
Ripplin, D. W. (M)
Sands, J. S. (M)
Shurben, W. E. (A)
Snowdon, G. R. (M)
Turner, R. J. A. (SM)
Keen, W. (A)

Sittsville (OTT-B)
Knowles, J. E. (A)
Rowe, G. C. (SM)

South Mountain (OTT-B)
Graham, G. L. (A)

St. Catherines (HAM-B)
Bastings, R. L. (A)
Goertzen, J. (A)
Harris, J. E. (A)
Kennedy, H. G. (A)

St. Thomas (LON-B)
Mac Donald, R. D. (M)
Onn, W. R. (M)

Stirling (BAY-B)
Glendinning, B. W. (A)

Stoney Creek (HAM-B)
Gillard, W. H. (M)
Parker, H. J. (A)

Stouffville (TOR-B)
Dulmage, H. B. (SM)

Streetsville (TOR-B)
Meredith, C. C. (M)
Meredith, C. J. (A)
Meredith, M. (M)

Sudbury (TOR-B)
LeClaire, R. C. A. (M)
Maki, A. E. (A)

Swansea (TOR-B)
Bow, A. (A)

Tecumseh (L-SWO-B)
Gignac, N. J. (A)

Thistletown (TOR-B)
Buckles, F. G. (M)
Harben, J. F. C. (M)
Lockyer, J. E. (A)
Sangster, R. (M)
Smith, K. C. (A)
Thomson, J. M. (SM)

Thornhill (TOR-B)
Giles, G. H. (A)
Poulter, R. C. (SM)
Stoddart, T. W. H. (M)
Watson-Watt, R. (F)

Timmins (TOR-B)
Amendola, B. (A)
Mott, E. D. (A)
Sulckles, D. (A)
Stocco, S. L. (M)

Toronto (TOR-B)
Arnold, C. P. C. (A)
Aufleger, A. R. (A)
Aylesworth, A. B. (M)
Bacon, W. H. (M)
Bain, J. D. (SM)
Bain, J. R. (SM)
Baker, L. R. (M)
Baldwin, C. D. (M)
Baldwin, J. H. (SM)
Balmer, P. D. (SM)
Banner, W. G. (M)
Barclay, A. P. H. (SM)
Barker, N. G. F. (M)
Barratt, N. T. (M)
Beaudoin, D. P. (M)
Beechey, D. F. (M)
Bell, A. R. (M)
Bennett, L. J. (M)
Berman, S. (A)
Berrevoets, J. (M)
Berry, F. G. (M)
Billedeau, V. A. (A)
Black, R. C. (A)
Boerner, W. K. (A)
Boll, K. E. (A)
Bond, S. (M)
Bozoki, B. (A)
Bradley, R. T. (A)
Bratsberg, W. P. (M)
Bridgland, C. J. (SM)
Bridgman, J. M. (M)
Brooby, R. M. (SM)
Brunn, G. F. (M)
Bullock, R. G. (M)
Bura, P. (SM)
Burke, A. C. (M)
Byers, H. G. (SM)
Carew, S. J. H. (M)
Cary, F. C. (M)
Cass, R. S. (A)
Chambers, J. D. (M)
Chaudhari, A. L. (A)
Chisholm, D. J. (A)
Choat, W. F. (M)
Clarke, J. W. (A)
Conway, J. C. (M)
Cox, H. G. (A)
Cox, R. E. (A)
Coxall, N. (SM)
Dallyn, H. E. (A)
Dalzell, T. D. (M)
Davis, G. W. L. (M)
Davis, K. J. (A)
Davis, W. B. (M)
Davy, A. S. (A)
Dawson, H. S. (SM)
Deacon, F. W. (A)
Dixon, A. R. (A)
Dmitrevsky, S. L. (M)
Dmytrasz, W. (A)
Duffey, W. B. (M)
Dunki, F. S. (A)
Dutton, I. R. (M)
Dworkin, A. E. (M)
Dyjack, L. C. (A)
Eisen, D. M. (M)
Eldring, M. P. (M)
Erler, K. A. (A)
Evis, F. A. (M)
Feldman, B. (M)
Fincher, B. H. W. (A)
Fisher, A. M. (A)
Fisken, J. L. (A)
Forde, D. (M)
Fredericks, M. J. (A)
Galbraith, G. E. (A)
Gandy, L. D. (M)
Geiger, D. G. (SM)
Giacoletto, J. P. (SM)
Goldberger, R. (M)
Gracey, T. G. (M)
Grant, H. S. (A)
Gregson, J. H. (M)
Grzebien, B. (M)
Hallam, P. A. (A)
Hames, A. L. (M)
Hamilton, H. E. S. (M)
Hansen, B. C. (A)
Hanson, J. V. (M)
Haraldsen, K. (M)
Harris, D. L. (M)
Hase, A. M. (M)
Hawkins, P. J. (M)
Heath, F. J. (SM)
Heenan, P. J. (A)
Henderson, V. L. (SM)
Herring, J. (A)
Hobbs, F. B. (VA)
Hobson, R. E. (A)
Holm, H. R. (A)
Hooper, J. F. (M)
Hugenholtz, E. H. (SM)
Hunter, J. B. (M)
Hyndman, W. H. (M)
Hynes, K. W. (M)
Isserstedt, S. G. (M)
Itiniant, L. (A)
Jackson, H. W. (SM)
Jackson, P. F. B. (M)
Jagger, C. E. (M)
James, W. E. (M)
Jones, R. (M)
Juzyczz, M. S. (M)
Karwin, P. R. (M)
Kasner, I. I. (A)
Katchky, M. (M)
Kates, J. (M)
Kemp, R. H. (A)
Kendall, R. V. (M)
Kerfoot, J. H. (M)
Keyser, G. M. (A)
Kingsmorth, A. (SM)
Knowlton, K. R. (M)
Koun, A. (A)
Korchinski, J. (M)
Koski, L. N. (A)
Kowalik, H. (M)
Kravetz, A. J. (M)
Kupinsky, H. G. (A)
Kwan, B. (A)
Lane, H. R. (M)
Lang, G. R. (M)
Leary, A. R. J. (M)
Liss, I. M. (M)
Llewellyn-Thomas, E. (M)
Lochanko, A. A. (M)
Long, R. G. (M)
Longstaffe, J. R. (VA)
Lovas, A. (SM)
Lowry, C. A. L. (M)
Mac Gregor, H. D. (M)
Mac Kenzie, K. (M)
Mackie, A. S. (M)
Mac Lachlan, D. T. (M)
Marek, E. (A)
Marshall, O. H. (M)
Martens, G. O. (M)
Martin, F. J. (M)
Martinsons, G. V. (M)
Matthews, J. N. (A)
Maxwell, J. (A)
McAteer, J. (A)
McCord, J. T. (A)
McCurdy, G. E. (M)
McFaddon, H. W. (M)
McIntyre, R. G. (A)
McLaughlin, R. H. (M)
McVity, J. R. G. (A)
Mitchener, H. G. (M)
Moher, R. B. (M)
Mosher, F. M. (A)
Muller, S. N. (A)
Murray, R. L. A. (A)
Myirea, K. C. (A)
Nawrocky, R. J. (M)
Naylor, R. W. (SM)
Neal, J. T. (M)
Nelson, P. A. (A)
Norris, C. A. (SM)
Nylin, M. E. (M)
Oakes, C. R. (M)
Oakson, G. (A)
O'Beirne, H. (M)
Obukuro, A. D. (A)
Ormiston, J. W. (A)
Otsuki, J. S. (M)
Paisley, P. P. (M)
Paisley, S. R. (M)
Parker, T. A. (A)
Patterson, S. G. (M)
Patterson, W. C. (M)
Pattison, S. B. (M)
Paul, W. (M)
Pearce, R. G. (A)
Penner, R. J. (M)
Peprnik, H. O. (M)
Pickering, J. N. (M)
Pointon, C. G. (A)
Pollock, H. L. (M)
Ponzo, L. S. (M)
Pounsett, F. H. R. (F)
Price, E. G. (M)
Price, H. (SM)
Price, L. M. (F)
Provan, R. J. (M)
Pryzdial, E. F. (A)
Purvis, W. J. (M)
Putz, H. R. (M)
Qua, E. W. (M)
Quigley, G. T. (SM)
Raymer, R. J. (M)
Reale, E. P. (M)
Rennie, J. C. (SM)
Richardson, J. R. (M)
Richter, E. (M)
Ridout, J. R. (A)
Robinson, W. A. (M)
Rogers, H. Z. (M)
Rose, A. B., Jr. (A)
Rosenthal, A. L. (SM)
Rowland, H. L. (A)
Roy, D. R. (M)
Ruest, E. A. J. (A)
Rye, E. F. (A)
Ryll, E. (M)
Salkus, S. (M)
Samuels, K. V. (M)
Sandison, T. A. (SM)
Saunders, L. E. (A)
Saville, H. G. (M)
Scholfield, W. D. (M)
Schultz, R. M. (M)
Scott, J. V. (M)
Secord, A. H. (M)
Seljak, A. A. (A)
Seshu, S. (M)
Sharp, V. S. (A)
Shintani, R. S. (A)
Shoemaker, H. F. (SM)
Slemon, G. R. (M)
Smedmor, G. (A)
Smith, E. D. (A)
Smith, W. R. (M)
Smokorowski, L. F. (M)
Snitke, J. A. (A)
Soanes, S. V. (M)
Speedlove, D. S. (M)
Stein, H. H. (M)
Steinberg, L. M. (A)
Stewart, A. C. (A)
Stewart, G. L. (SM)
Stillwater, J. (A)
Story, R. (M)
Straka, M. K. H. (M)
Swan, C. B. (M)
Swan, E. O. (SM)
Sweeny, T. V. (M)
Tang, D. D. (A)
Taraleshkov, B. M. (M)
Tavner, B. H. (A)
Taylor, A. K. (M)
Taylor, M. K. (SM)
Taylor, R. B. (A)
Tennent, B. (SM)
Thompson, R. W. (M)
Tipple, H. L. (M)
Tomcio, N. (A)
Tooping, F. V. (SM)
Toye, J. M. (M)
Tuchak, W. C. (A)
Tucker, D. C. (M)
Turner, K. A. (M)
Tustin, F. C. (A)
Vallillee, B. D. (A)
Van Steinburg, C. E. (M)
Vejins, M. (A)
Vilcans, J. (M)
Vriesen, K. S. (M)
Vural, B. (SM)
Ward, R. F. (A)
Warhurst, R. P. (A)
Wedgewood, R. S. (M)
Weedon, G. F. C. (A)
Wheelans, R. B. (A)
Whyte, J. R. (M)
Williams, A. R. (A)
Williams, R. (M)
Wilson, A. E. (A)
Wilson, R. W. (M)
Wong, R. D. C. (A)
Woolf, G. F. B. (M)
Wywiorski, M. (A)
Yen, J. L. (A)

Trenton (BAY-B)
Holmes, W. H. (M)
Mann, W. R. (SM)
Tiller, R. W. (A)
Turney, G. N. (A)
Walsh, J. J. (M)

Wallaceburg (L-SOW-B)
Lawson, R. (A)

Waterdown (HAM-B)
Pynn, R. D. (SM)
Van Marle, J. C. (M)

Waterloo (H-KW-B)
Day, A. G. (M)
Dufault, G. J. (M)
East, T. W. R. (SM)
Flumerfelt, L. R. (M)
Kadish, J. E. (SM)
Keeler, J. S. (M)
McCarron, J. J. (M)
McConachie, B. S. (SM)
Reesor, G. E. (M)
Samson, J. F. (A)

Welland (HAM-B)
Blair, F. D. (A)

Wellandport (HAM-B)
Matys, S. J. (M)

Weston (TOR-B)
Atlee, R. Y. (M)
Beasley, B. C. (M)
Dobbin, G. K. (M)
Healey, T. J. (A)
Mackett, L. J. (M)
Smith, J. E. (A)
Williams, H. S. (A)

Whitby (TOR-B)
Matthews, R. P. (SM)
Vogt, G. A. (M)

Willowdale (TOR-B)
Ainlay, A. (SM)
Armitage, G. G. (SM)
Baldwin, J. O. (M)
Bedingham, G. M. (M)
Crouch, M. B. (A)
Davies, G. E. (M)
Eakins, J. R. (A)
Elliott, A. W. D. (M)
Gilfin, P. A. (A)
Goldman, S. J. (A)
Hackbusch, R. A. (F)
Hanna, F. M. (SM)
Jordan, J. L. (M)
Kelk, G. F. (M)
Leaver, E. W. (M)
Le Page, R. W. (A)
McDowell, G. E. (M)
McLaughlin, G. H. (A)
Mounce, G. R. (M)
Palin, E. L. (SM)
Penrose, R. M. (M)
Piechota, A. (M)
Purdy, T. W. (M)
Richards, G. A. (M)
Simmonds, L. C. (VA)
Simpson, J. R. (M)
Watt, C. M. (A)
Yachimec, P. (M)

Wilton Grove (LON-B)
Smith, J. N. (A)

Windsor (L-SWO-B)
Campbell, L. L. (M)
Clark, R. A. (M)
Clark, S. M. (M)
Elvidge, R. E. (A)
Fletcher, H. R. (A)
Halas, E. (A)
Hitzeroth, E. J. (M)
Kiss, J. A. (A)
Marzotto, E. J. (A)
McWhirter, D. A. (M)
Perrault, O. S. (A)
Rinn, E. J. (A)
Ruse, W. A. (M)
Tuba, W. C. (A)
Turik, M. (A)
Walker, G. B. (A)
Wood, R. D. (A)

Unionville (TOR-B)
Fischer, E. J. (M)

PROVINCE OF QUEBEC

Aylmer, East (OTT-B)
Belrose, J. S. (M)
France, J. R. (M)
Terrell, D. S. (M)
Wells, G. (A)

CANADA

Bale D'Urfe (MON-B)
Booker, C. C. (A)
Rankin, T. G. (SM)
Whitmore, E. J. (SM)
Wighton, J. J. (M)

Beaconsfield (MON-B)
Bell, J. W. (F)
Dobridge, R. W. (M)
Klop, C. F. (A)
Mitchell, W. (M)
Therlault, E. E. (M)
Turnbull, J. A. (A)
Willows, D. J. (M)

Beaurepaire (MON-B)
Lisle, J. R. D. (M)
Morrison, W. B. (M)
Penton, R. E. (SM)

Bigras Island (MON-B)
Altenbach, R. K. (M)
Clarkson, L. (M)

Candiac (QUE-B)
Barcelo, P. O. (A)

Cartierville (MON-B)
Lurion, E. (M)

Charny (MON-B)
Lacroix, D. R. (M)

Cote St. Luc (MON-B)
Pascal, J. (A)
Pullan, E. (M)
Walsh, D. (A)

Cte Of Laval (MON-B)
Smoller, R. G. (A)

Dorval (MON-B)
Arena, G. (A)
Bartnikas, R. (M)
Coughlin, F. J. (A)
Cox, J. R. G. (SM)
Floyd, F. J. (M)
Gelhar, W. O. (M)
Hodgson, A. (M)
Inglis, J. B. (A)
Maclennan, N. D. (M)
Scott, R. (SM)

Drummondville (MON-B)
Marceau, J. P. (M)
Mechas, M. G. (A)
McWilliam, E. A. (VA)
Millar, R. B. (A)
Payette, R. (M)

Duvernay (MON-B)
Julien, G. J. C. (M)

Fabreville (MON-B)
Van Manen, S. (M)

Granby (MON-B)
Henry, R. A. (M)
Jedrychowski, J. L. (SM)
Lambert, N. E. (M)
Steeves, D. M. (A)
Sterling, J. A. (A)
Ursano, A. (M)

Halet (OTT-B)
Bellavance, F. (A)

Hampstead (MON-B)
Kingan, J.J. (SM)

Hudson Heights (MON-B)
Summers, L. I. (M)

Hull (MON-B)
Frechette, L. P. (M)
McDowell, W. J. (M)

Ile Perrot (MON-B)
Baldock, R (M)
Martin, R. E. (A)

L'Abord A Plouffe (MON-B)
Aston, J. P. (SM)
Chadwick, S. (M)
Kennedy, A. E. (A)
Neville, A. H. (M)
Smith, G. C. (A)
Tober, H. (M)
Weytze, D. W. (A)

Lac Bouchette (MON-B)
Ohnuma, H. (A)

Lachine
Clarke, J. L. (M)
Dinnin, A. J. (M)
Isaac, V. E. (M)
Kelsey, E. S. (SM)
Milne, A. F. (A)
Mulrhead, C. R. (SM)
Pinnell, J. E. (M)
Purse, K. G. (M)
Walker, A. S. (M)
Wright, D. F. (M)

Lac St. Denis (MON-B)
Lee, E. (M)

Lakeside (MON-B)
Livis, M. J. (A)

Lauzon (MON-B)
Pelletier, R. M. (A)

Laval West (MON-B)
Baumans, H. W. (M)

Levis (MON-B)
Bernier, J. (M)

Longueuil (MON-B)
Paquette, A. (A)
Robilliard, P. A. (M)

MacDonald College (MON-B)
Blevis, E. H. (M)

Marleville (MON-B)
Bilocq, R. E. (A)

Mascouche (MON-B)
Dixon, G. L. (M)

McMasterville (MON-B)
Stirling, P. H. (M)
Wood, H. H. (M)

Montreal (MON-B)
Adams, C. B. (A)
Adkar, C. K. (M)
Adler, E. (M)
Adler, E. L. (M)
Agnew, J. A. (A)
Allen, D. E. M. (M)
Allen, R. E. (A)
Amey, G. X. (M)
Andrews, A. H. (M)
Archambault, G. (M)
Argue, T. A. (M)
Arsenault, L. (M)
Ashfield, J. C. (M)
Baby, J. (M)
Bachynski, M. P. (SM)
Baily, F. A. A. (M)
Bailey, G. J. (M)
Banlin, W. F. (M)
Barath, F. T. (M)
Barrow, F. A. (VA)
Barry, A. (A)
Bar-Lelan, M. (M)
Baudot, J. A. (M)
Baumgartner, H. E. (M)
Baylis, G. F. (M)
Beaulieu, W. R. (M)
Beer, W. J. (A)
Bellringer, C. C. E. (M)
Beresford, A. C. (M)
Bernier, J. C. (SM)
Berridge, B. M. (M)
Berube, J. P. G. (A)
Berube, R. (M)
Best, D. R. (A)
Bird, L. T. (M)
Blair, B. D. (M)
Bonneville, S. (SM)
Bosisio, R. G. (A)
Bourbonnais, P. J. (M)
Bradley, M. V. (A)
Breton, A. Y. (M)
Bryden, J. E. (M)
Buck, L. G. (SM)
Buizert, H. (M)
Campbell, A. F. (M)
Campbell, C. J. (M)
Campbell, J. A. (SM)
Cardella, O. (M)
Carr, E. (A)
Carruthers, W. E. (M)
Carty, D. G. (A)
Caslin, R. G. (M)
Challis, W. L. (A)
Chapman, C. N. (SM)
Chapman, S. J. (M)
Chipos, G. E. (M)
Chisholm, K. G. (M)
Christensen, P. S. (A)
Clarke, H. W. (M)
Claydon, E. C. (A)
Clement, L. J. (A)
Conroy, J. J. M. (SM)
Cook, W. S. (A)
Cunha, S. H. (M)
Dasko, G. J. (A)
David, E. (M)
Davidson, G. K. (SM)
De Beer, B. C. (M)
De Kat, B. C. (A)
Delbridge, W. A. (M)
Demers, P. (A)
Derzal, M. (A)
Desjardins, A. A. (A)
Desser, M. S. (A)
Dewey, D. L. (M)
Dolron, J. A. B. (A)
Douglas, J. C. (M)
Dube, J. J. (M)
Dubreuil, E. J. (M)
Ducker, P. G. (M)
East, L. A. W. (SM)
Engeri, K. G. (A)
Erlick, P. S. (M)
Evan-Jones, W. (A)
Fabiszewski, H. (M)
Farnell, G. W. (SM)
Ferenczy, M. (M)
Fisher, C. B. (M)
Fisher, F. S. (M)
Fisher, G. T. (M)
Fisher, S. T. (SM)
Flom, M. (M)
Fodor, N. J. (A)
Foldes, P. (M)
Fong, T. T. (A)

Forster, B. D. (M)
Fortin, C. (A)
Frenette, C. (M)
Frenette, R. H. (M)
Gagnon, P. (A)
Gaherty, W. D. (M)
Ganapathy, N. (M)
Gaon, D. (M)
Gauthier, G. M. (M)
Gavsle, F. J. (M)
Germain, C. (M)
Gilmer, D. R. (M)
Ginsberg, G. (A)
Ginsburg, I. (A)
Gordon, K. I. (M)
Gorfinkel, G. G. (A)
Gould, S. (A)
Gravel, J. J. O. (A)
Groome, G. L. (A)
Groome, G. R. (M)
Gultian, J. E. (A)
Haeberlin, R. O. W. (M)
Hall, J. S. (M)
Halliday, R. E. (A)
Hamilton, H. A. (M)
Hands, R. K. (A)
Hansard, H. H. (M)
Hansen, A. K. (SM)
Harris, K. B. (SM)
Harrison, B. M. (A)
Hatzidakis, K. (M)
Hauck, H. G. (M)
Haworth, I. F. (A)
Hayes, J. E. (F)
Heckman, G. R. (M)
Heines, J. M. H. (M)
Henry, C. (A)
Heybroek, C. J. (A)
Hings, H. J. (M)
Hobbs, N. M. (M)
Hodge, N. H. (M)
Holburn, R. I. (M)
Homa, D. M. (M)
Horrigan, E. W. (SM)
Howes, F. S. (F)
Hryhorijiw, W. (M)
Humble, C. W., Jr. (A)
Hunt, A. B. (SM)
Ingram, D. E. (M)
Inkster, W. J. (M)
Jackson, J. E. (SM)
Jackson, R. W. (M)
Jamieson, F. C. (M)
Jamshedji, J. S. (M)
Janssens, E. L. (SM)
Jensen, T. (A)
Johnston, T. W. (M)
Junas, W. M. (M)
Jutting, W. C. V. B. (M)
Kager, G. H. (M)
Kahn, I. (M)
Katz, J. (A)
Katz, L. (M)
Kaufman, H. (M)
Keyes, L. A. (A)
King, C. M. (A)
Kingan, A. J. (M)
Kinnear, D. R. (M)
Klibhuis, J. (M)
Knitel, E. J. M. (SM)
Knott, R. S. (M)
Knox, D. E. (M)
Knox, J. B. (F)
Koblin, S. (A)
Kruusement, J. (A)
Kubina, S. J. (M)
Kurlents, H. (M)
La Ferriere, P. J. (M)
Lank, G. W. (M)
Laporte, J. M. (M)
Lavallee, P. (M)
Lavery, D. J. (A)
Lavole, J. L. (M)
L'Ecuyer, P. A. (M)
Lee, P. J. L. (M)
Lees, K. C. (A)
Leeson, F. D. (M)
Leftheris, J. P. (M)
Legault, E. G. (M)
Leinwand, J. J. (M)
Levasseur, G. Y. (M)
Litchfield, J. F. (M)
Litwin, M. M. (M)
Loose, G. A. (M)
Louizos, D. G. (M)
Lukacs, P. (M)
MacDonald, F. X. (M)
Mackay, C. J. E. (M)
Mac Kimmie, G. B. (M)
Macpherson, M. F. (M)
Mahoney, J. A. (M)
Mairs, L. A. (M)
Maloiepszy, V. (M)
Marcotte, J. (M)
Margolick, F. H. (SM)
Marshall, J. L. (M)
Martin, D. M. (M)
Martin, J. H. (M)
McCook, J. M. (M)
McDonald, D. J. (SM)
McGuire, C. H. (SM)
McGuire, J. (M)
McLean, M. D. (M)
McNeil, B. T. (M)
Meller, I. V. (M)
Mertke, S. H. (M)
Meunier, J. L. (M)
Middleton, L. (M)
Milborne, H. S. (M)
Minklewicz, M. D. K. (M)
Miroshnichenko, A. (A)
Mockler, T. P. (A)

Moen, H. P. (M)
Moore, E. J. (M)
Mowbray, D. R. (A)
Murphy, P. E. (M)
Nachfolger, N. (M)
Nadon, L. (A)
Nagami, T. T. (A)
Nichol, D. W. (M)
Nichols, W. A. (F)
Nienaltowski, W. (M)
Norton, R. J. (M)
Noyes, J. F. (M)
Olding, N. R. (SM)
O'Neill, G. A. (M)
Onno, P. (M)
Ornstein, W. (A)
Oxley, A. B. (F)
Pasoff, S. (M)
Patterson, R. M. (M)
Patton, R. J. (M)
Pauch, J. E. (M)
Paul, K. R. (M)
Pavlasek, T. J. F. (M)
Pearce, G. E. (A)
Pedrosa, J. B. (M)
Pilbe, R. (M)
Polly, J. (A)
Poznanski, Z. (M)
Prichodko, A. (M)
Provost, P. (A)
Provost, Y. (A)
Pugsley, J. D. (A)
Quinn, S. F. (M)
Rasmussen, F. H. (M)
Reeves, R. (M)
Reid, K. G. (M)
Reidy, M. G. (A)
Reilly, W. B. (A)
Rodd, D. G. (M)
Rolland, S. F. (M)
Rondeau, J. P. (M)
Roth, S. (A)
Ruden, J. (A)
Rumin, N. C. (M)
Rumstein, A. (A)
Russell, D. F. (M)
Salmon, R. L. (A)
Salvin, S. (A)
Sauchuk, J. M. (M)
Schneider, R. S. (A)
Schon, F. K. K. (M)
Schoner, B. (M)
Schwartz, H. H. (SM)
Segal, B. M. (M)
Sekelj, P. (SM)
Sequera, T. C. (M)
Serbyn, R. (M)
Shearer, C. W. (SM)
Sherman, B. N. (M)
Shkarofsky, I. P. (M)
Short, A. J. (A)
Shoub, B. (M)
Sibley, G. B. (M)
Silberberg, N. (M)
Smith, F. A. (SM)
Smith, W. J. (M)
Sophianopoulos, A. A. (A)
Spencer, K. J. (M)
Steel, W. A. (F)
Steinmetz, N. (A)
Steohens, C. H. (A)
Stewart, J. M. (M)
Stovman, J. A. (M)
Sumner, H. C. (M)
Swarup, P. (M)
Tahirali, G. W. (M)
Tamagi, T. T. (M)
Tatlock, J. F. (A)
Teany, A. R. (M)
Tiberghien, C. M. J., Jr. (M)
Toczylowski, H. S. (SM)
Tsao, F. A. (M)
Turton, E. P. (A)
Van Messel, J. (M)
Venn, B. A. (M)
Verwoerdt, W. C. (M)
Vincent, J. J. (M)
Vogel, N. I. (M)
Wachholz, E. (M)
Wagner, S. (SM)
Wallace, R. J. (SM)
Warren, F. G. R. (SM)
Watson, J. (M)
Weaver, J. H. (M)
Webb, P. P. (M)
Weintraub, G. (M)
White, R. A. (A)
Whitehead, J. R. (SM)
Wilkinson, H. E. (A)
Willmott, R. C. (M)
Wilson, D. S. (A)
Wisenden, G. A. (M)
Wlochowicz, R. (M)
Wolff, W. A. (A)
Woodman, B. H. (A)
Woonton, G. A. (F)
Woosey, S. (M)
Zakalb, L. J. (M)
Zelinger, G. (M)
Ziemelis, V. (M)
Zimmerman, H. (M)
Zomners, O. (M)

Outremont (MON-B)
Blostein, M. L. (M)
Gentner, R. F. (A)
Malina, B. (M)
Pinsky, C. (A)
Slaven, L. (M)

Parent (MON-B)
Forbes, J. M. (M)

Pointe Claire (MON-B)
Anderson, D. A. (SM)
Bond, D. W. (M)
Cameron, B. G. (M)
Collins, J. A. (M)

Curtis, R. W. (M)
Gissing, H. R. (SM)
Gregory, A. H. (M)
Holm, F. H. (M)
Lee, F. B. (SM)
Mackenzie, D. G. (M)
McIntyre, R. J. (M)
Miller, E. W. (M)
Muller, R. A. (SM)
Papouschek, F. (M)
Sutherland, J. G. (M)
Wells, A. F. (M)
Williamson, R. B. (M)

Port Alfred (MON-B)
Gagnon, L. A. (M)

Quebec (QUE-B)
Boulet, L. (SM)
Chabot, M. A. (M)
Chinnick, R. F. (M)
Cobb, W. B. (A)
Corbeil, M. J. (M)
Corbeil, L. V. (M)
Cote, L. J. A. (A)
Courtenay, T. H. (M)
Cummins, J. A. (M)
Dion, A. (M)
Evans, J. C. (A)
Featherstone, J. W. (A)
Giguere, R. (M)
Grein, A. E. (A)
Guerbilsky, A. (M)
Guevremont, J. U. (M)
Lafiamme, A. K. (M)
Lefebvre, R. A. (A)
Legare, G. (A)
L'Heureux, L. J. (M)
Lortie, A. L. (M)
Massicotte, L. D. (M)
McKinnon, D. J. G. (M)
Moir, L. E. (M)
Morewood, H. W. (M)
Nadeau, A. G. (M)
Paris, A. P. (M)
Park, K. R. (A)
Paul, R. A. (A)
Poulot, J. A. (M)
Robichaud, L. P. A. (M)
St. Onge, J. L. (M)
Somers, H. (A)
Spindler, G. B. (M)
Stobo, J. D. (A)
Surtees, W. J. (M)
Thistle, W. G. (M)
Turner, D. G. (M)
Wildi, T. (M)

Richelieu (MON-B)
Davies, K. P. (M)

Rimouski (QUE-B)
Quellet, A. (M)

Riviere Du Loup (QUE-B)
Lavole, L. (M)

Rosemere (MON-B)
Dingwall, R. A. (M)
Walsh, B. R. (M)

Rosemount (MON-B)
Robinson, M. R. (A)

Roxboro (MON-B)
Haddon, A. G. (M)
Newton, K. G. D. (M)
Roloff, W. T. (M)

Saguenay (QUE-B)
Friedmann, E. (A)

St. Anne De Bellevue (MON-B)
Birman, G. (M)

St. Antoine De Tilly (MON-B)
Methot, F. R. (A)

St. Bruno (MON-B)
Davis, J. F. (M)
Desplns, L. J. (A)

St. Eustache (MON-B)
Gorman, H. (A)
Hendrick, G. B. (M)
Ramsay, J. F. (A)
Reid, J. N. (A)

Ste. Foy (QUE-B)
Baril, J. C. (A)
Beaulieu, J. A. (M)
Belak, M. J. (M)
Bobyn, E. J. (M)
Broughton, M. B. (M)
Dumas, J. E. (M)
Fortin, G. J. E. (A)
Gosselin, L. (A)
Larsen, R. S. (M)
Letarte, M. (M)
Park, W. J. (M)
Regniere, J. P. (A)
Vaillancourt, R. M. (A)

Ste. Genevieve (QUE-B)
Haberl, J. F. (M)
Kassner, M. H. (M)
Leeuwen, A. V. (M)

Ste. Genevieve De Pierrefonds (MON-B)
Bailey, P. H. G. (M)
Radford, R. C. (M)
Whittaker, J. A. (M)

St. Hubert (MON-B)
Lindsey, G. R. (M)

St. Hyacinthe (MON-B)
Leclerc, J. G. (A)

St. Jean (MON-B)
Boulin, A. J. J. (M)

St. Jerome (MON-B)
Rinfret, C. J. (M)

St. Lambert (MON-B)
Barrie, W. H. (M)
Ferris, H. A. (SM)
Hammond, R. E. (SM)
Matthews, H. W. (M)
Parsons, G. W. (M)
Roach, C. L. (M)
Rousseau, M. (M)
Solar, L. (M)
Watson, D. J. (M)

St. Laurent (MON-B)
Aasgaard, P. U. (M)
Bousfield, J. A. T. (SM)
Cahn, P. R. G. (M)
Dutkowski, W. (A)
Hanna, D. C. (M)
Leitch, D. H. (A)
Lumsden, R. B. (SM)
Papoas, N. J. (SM)
Rawlins, W. A. (M)
Semple, E. R. (M)
Wilson, S. S. (M)

St. Raymond (QUE-B)
Cook, G. J. (M)
French, R. (A)

Ste. Rose De Laval (MON-B)
Prins, J. W. (M)
Robinson, H. A. (SM)

St. Sauveur Des Montaignes (MON-B)
Jaderholm, H. W. (VA)

Ste. Therese De Blainville (MON-B)
Farmer, E. W. (SM)

Senneterre (MON-B)
Carroll, F. W. (M)

Seven Islands (MON-B)
Van Egmond, J. (A)

Shawinigan (QUE-B)
Fournier, G. (A)

Sherbrooke (MON-B)
Beliveau, J. H. (A)

Sillery (QUE-B)
Boisvert, M. (M)
Du Berger, P. (M)
Dure, J. D. (M)
Gagnon, R. (M)
Galbraith, D. S. (M)
Randoin, R. A. (A)

Sylvestre (MON-B)
Warun, P. (M)

Terrebonne (MON-B)
McKeon, R. M. (M)

Town Of Laval Islands (QUE-B)
Rhodes, A. J. (M)

Town of Mt. Royal (MON-B)
Cooney, T. A. (M)
Desaulniers, R. R. (M)
Foster, J. H. (A)
Jackson, K. A. (SM)
Pollock, B. N. (M)

Town of Pointe Claire (MON-B)
Williams, F. F. (M)

Trois Rivieres (QUE-B)
Audet, H. A. (M)
Hamel, Y. R. (A)
Lapemiere, J. J. (M)
Savard, J. F. (M)

Valois (MON-B)
Rugg, H. H. (SM)
Russell, W. D. (M)
Whittaker, J. F. (M)

Vercheres (MON-B)
Dandois, G. P. F. (M)
Julien, M. J. R. (A)

Verdun (MON-B)
Belanger, J. P. (A)
Bowie, P. G. (M)
Dumas, L. (M)
Parent, G. J. C. (A)
Redmond, G. W. (A)

Victoriaville (QUE-B)
Langlois, C. M. (M)

Villa St. Martin (QUE-B)
Walker, E. A. (A)

Ville La Salle (MON-B)
Pinnell, S. E. A. (M)

Ville St. Laurent (MON-B)
Cooke, R. W. (SM)
Doucet, M. (A)
Doutre, B. G. (M)
Gobeil, C. E. (M)
Goulet, P. E. (M)
Mairet, G. F. (A)
Oakes, H. S. (A)
Robbins, M. A. (M)
Sankey, C. (A)
Sennik, J. J. (M)

Ville St. Michel (MON-B)
McIlroy, C. J. (M)

Westmount (MON-B)
Caswell, C. F. (M)
Christmas, W. I. (M)
Dorey, J. D. (A)
Martin, G. H. (M)
Raynsford, R. P., Jr. (M)
Smith, P. D. P. (M)

Westmounts (QUE-B)
Kossatkine, I. (A)

Yamachiche (MON-B)
Bird, C. H. R. (VA)

SASKATCHEWAN

Gull Lake (REG-B)
Bartole, G. C. (A)

Limerick (REG-B)
Hanson, O. W. (M)

Moose Jaw (REG-B)
Gartner, B. L. (M)

North Battleford (REG-B)
Sebulsky, E. (A)

Prince Albert (REG-B)
Hansen, D. R. (A)

Regina (REG-B)
Brock, G. A. (A)
Chesters, B. H. (A)
Cozine, L. V. (A)
Dean, H. C. (A)
Ferguson, G. E. (A)
Funk, J. A. (M)
Gibson, E. M. (A)
Glremes, E. M. (A)
Hawley, K. T. (M)
Hockin, W. J. (M)
Kaldor, H. (M)
Lee, S. F. (M)
Lewis, A. W. (A)
McBride, L. E. (M)
McKay, W. (M)
McNeil, J. M. (M)
Moyer, L. S. (M)
Odling, E. C. (A)
Savage, M. C. (A)
Smith, S. K. (M)
Sundeen, P. G. (M)
Un K. K. (M)

Rowatt (REG-B)
O'Byrne, L. A. (A)

Saskatoon (REG-B)
Gordon, D. A. (A)
Green, F. D. (M)
Hoskins, L. C. (M)
Kavadas, A. D. (M)
Michalenko, A. (M)
Moorcroft, D. R. (M)
Ratz, H. C. (M)
Wacker, A. G. (M)

Semans (REG-B)
MacGregor, R. J. (A)

Weyburn (REG-B)
Baker, K. D. (M)

YUKON

Watson Lake (NA-B)
Svrcek, L. (A)

Whitehorse (NA-B)
Parent, L. E. (M)

CANAL ZONE

Balboa
Overby, H. A. (SM)

Cristobal
Brannan, F. T. (A)

Curundu
Adams, C. W. (A)

Fort Amador
Earl, E. O. (A)

Rodman
Garos, S. J. (A)

CEYLON

Colombo
Ambrose, D. C. (M)
Gnanalingam, S. (M)

Panadura
Adikaram, K. B. (A)

CHILE

El Salvador
Ribbeck, C. S. (A)

Punta Arenas
Femenias, J. L. (A)

Santiago
Cerda, H. E. (A)
Collyer, J. H. (M)
Del Rio, J. (A)
Horluvla, F. A. (A)
Isely, F. C. (SM)
Vallarino, A. D. (M)

Vina Del Mar
Brito Infante, J. M. (A)

COLOMBIA

Bogota
Alzate, B. (M)
Amore, I. (M)
Arce, H. H. (M)
Beeny, L. S. (SM)
Clavijo-j, L. G. (M)
Errante, E. P. (M)
Estevez, C. L. (M)
Florez, J. P. (M)
Fric, M. (A)
Gabrilunas, K. B. (A)
Garbrecht, F. S. (M)
Lopez-Aparicio, J. (M)
Neira-M, T. (A)
Ospina, A. (M)
Owen, H. (A)
Pick, L. M. (M)
Reyes, J. H. (A)
Scott, C. B. (M)
Smith, D. L. (A)
Torres-Galvez, C. A. (M)
Villegas-a, A. (SM)
Williams, J. H. (M)

Cartagena
Camacho, L. H. (A)

Medellin
Nassar, J. E. (M)
Orozco-c, G. (M)
Vieco-b, G. (M)

Valle
Ramirez-Saenz, A. (M)

COSTA RICA

San Jose
Carazo-g, L. E. (A)
Vargas-v, A. (A)

CUBA

Havana
Arnaud, J. P. (F)
Barranco, A. A. (M)
Bode-c, M. (A)
Borden, F. W. (M)
Condom, A. S. (SM)
De Cubas, J. D. (M)
Estrada-Castro, C. J. (M)
Forest, O. J. (A)
Harris, F. (SM)
Leonard, R. B. (A)
Madariaga, J. F. (A)
Magno, H. T. (SM)
Misner, P. E. (A)
Montes, J. V. (A)
Pages, E. V. (A)
Pella, A. (M)
Rojas, H. D. (M)
Roth, M. C. (M)
Siddall, W. D. (A)
Torres-Ruiz, J. G. (A)
Valladares, J. A. (M)

Marianao
Guiral, R. L. (M)

Oriente
Reguera, J. J. (A)

Santiago de Cuba
Meneau, A. (A)

CYPRUS

Nicosia
Bloom, R. A. (A)

CZECHOSLOVAKIA

Prague
Bena, J. J. (M)
Blecha, J. (A)
Cetkovsky, J. (A)
Horna, O. A. (M)
Savel, J. (A)
Sedmidubsky, Z (M)
Snejdar, V. (M)
Ulrych, M. (A)
Vackar, J. F. (M)

DENMARK

Bagsvaerd
Elnegaard, E. (A)
Copenhagen
Carstens, L. (M)
Christiansen, J. V. (M)
Faqt, B. (M)
Findal, P. (M)
Funch, O. (A)
Gronlund, M. P. S. (A)
Harmar, W. W. (SM)
Ingerslev, F. H. B. (SM)
Jacobsen, H. V. (M)
Jorgensen, N. (M)
Kjaer, A. N. (M)
Koehler, R. L. (M)
Larsen, B. F. (M)
Larsen, S. E. (M)
Linnet, C. (A)
Lund, C. O. (M)
Morch, V. H. (A)
Nielsen, B. A. (A)
Nielsen, J. O. (SM)
Overlie, P. T. (M)
Pedersen, S. A. C. (SM)
Petersen, B. S. (A)
Rindbo-Petersen, E. (M)
Sauerberg, J. (M)
Sorensen, E. V. (A)
Toft, S. C. (M)

Gentofte
Pederson, N. T. (A)
Svensson, R. (M)

Glostrop
Jensen, K. B. (M)
Langgaard, E. (M)
Norgaard, A. K. (A)

Hellerup
Pedersen, G. (SM)
Ring, O. (M)
Rybner, J. (F)

Hillerod
Christensen, O. (A)
Ungstrup, E. E. (A)

Hojbjerg
Ranfelt, V. E. B. (M)

Hvidovre
Poulsen, S. W. I. (M)

Kolding
Rasmussen, K. (M)

Naerum
Kjaer, V. (A)

Roskilde
Christiansen, E. M. (A)
Hansen, G. K. F. (M)

Saby
Bagger, P. V. (M)

Struer
Christensen, K. H. (A)
Jensen, S. E. (M)

Taastrup
Fabrin, K. W. (A)

Valby
Nag, D. S. (M)

Virum
Bruun, G. (SM)
Jorgensen, B. (M)

DOMINICAN REPUBLIC

Ciudad Trujillo
Obinger, G. H., Jr. (A)
Valde, G. E. (M)

EAST CAROLINE ISLANDS

Truk Island
Hammons, E. G. (A)

ECUADOR

Quito
Barton, C. H. (M)
Hussein, N. A. (A)
Jacobson, H. P., Jr. (SM)
Larson, A. G. (M)
Lintz, H. E. (M)
Rota, L. (M)

EGYPT

Alexandria
Ahmed, A-L. I. (M)
El-Sabbagh, H. H. (SM)
Salem, I. A. (M)

Cairo
Abd-El-Aziz, M. E. (M)
Abu-Kandeel, A. A. (M)
Abu-Zeid, M. M. (M)
Amer, S. (A)
Cassimatis, D. J. (A)
Constantinidis, G. (A)
El-Demerdache, A. R. M. (M)
El-Hadidy, S. A-W. (M)
El-Harty, A. K. (M)
El-Kashlan, E. I. (A)
El-Kotoury, A. S. (M)
El-Said, M. A. H. (SM)
Ez-Eldin-Fouad, M. (SM)

ENGLAND

Fahmy, A. I. (A)
Fahmy, M. N. I. (M)
Fahy, A. E-H. (A)
Grdseloff, I. (M)
Hassan, B. (M)
Ismail, M. A. W. (A)
Kamal, A. A. (M)
Mahmoud, A. A. (M)
Mahmoud, H. M. (M)
Makar, R. T. (M)
Reda, M. S. (M)
Riad, M. A. (M)

Giza
Elssa, H. A. (M)
Sourial, R. S. (M)

EL SALVADOR

San Salvador
Richardson, A. S. (M)

ENGLAND

BEDFORDSHIRE

Bedford
Kendall, J. T. (SM)

Luton
Butler, J. S. (M)
Youle, E. (M)

BERKSHIRE

Abingdon
Cooke-Yarborough, E. H. (M)
Fry, D. W. (M)
Wells, F. H. (F)
Westwood, D. (M)

Aldermaston Wharf
Parry, R. Y. (SM)

Bracknell
Stalmthorpe, R. L. (M)
Wood, J. (M)

Maidenhead
Den Brinker, C. S. (M)

Newbury
Brooke, H. A. (SM)

Reading
Cresswell, J. V. (M)
Simons, A. H. (SM)

Sunningdale
Taylor, R. H. (M)

Wantage
Cox, R. J. (M)

Windsor
Sowerbutts, D. (M)

BUCKINGHAMSHIRE

Bletchley
Deards, S. R. (M)

Gerrards Cross
Diver, F. G. (SM)
Morton, H. B. (M)
Pearce, A. F. (SM)

Great Missenden
Reyner, J. H. (SM)

High Wycombe
Ludgate, F. E. (SM)
Simmonds, J. C. (A)

Iver
Rhys-Jones, J. E. (SM)

Newport Pagnell
Boswell, I. I. (A)

Slough
Wilkins, A. F. (F)

Stoke Poges
Ireland, G. R. (M)
McLean, F. C. (SM)

Wolverton
Bentley, J. W. C. (SM)

CAMBRIDGESHIRE

Cambridge
Beck, A. H. W. (F)
Bonem, Z. (M)
Cope, J. E. (SM)
Dalgleish, J. W. (SM)
Edwards, B. J. (SM)
Fuller, D. Q. (M)
Germany, L. W. (M)
Havranek, W. C. R. (M)
Jones, J. D. (SM)
Karp, A. (SM)
Loncarevic, B. D. (M)
Mouillin, E. B. (SM)
Nelms, G. L. (M)
Petok, M. H. N. (M)
Pound, J. P. (M)
Rao, J. (M)
Ratcliffe, J. A. (F)

ENGLAND

CHESHIRE

Cheadle
Roberts, W. G. F. (SM)

Cheadle Hulme
Fielding, E. A. (M)

Chester
Coppack, K. N. (M)

Mellor
White, G. J. (M)

Wallasey
Brisbar, P. J. (A)

CORNWALL

Fowey
Sutherland, J. G. A. (SM)

CUMBERLAND

Carlisle
Topping, J. (M)

Maryport
Elliott, I. (A)

DERBYSHIRE

Derby
Buckland, V. (A)

DEVONSHIRE

Brixham
Preece, K. E. (M)

Devonport
Fairfax, O. M. (SM)

Paignton
Macnee, D. H. (SM)

DORSETSHIRE

Ferndown
Hooper, J. L. (A)

ESSEX

Barking
Bulgin, A. F. (SM)

Brentwood
Goodey, R. A. H. (SM)

Chelmsford
Amey, S. H. (A)
Anderson, E. W. (SM)
Cafferata, H. (M)
Chandra, A. N. (M)
Churchman, A. (M)
Cooper, V. J. (M)
Deeley, A. R. (M)
Flocco, G. D. (M)
Forte, S. S. (M)
Heisdon, P. B. (M)
Latham, C. (M)
Markenscoff, A. C. (M)
Parker, J. W. (M)
Rao, N. V. (M)
Smith, F. L. (SM)
Warren, K. A. J. (A)

Chigwell
Bulgin, R. A. (M)

Colchester
Howe, F. R. (M)

Danbury
Young, A. J. (M)

Gidea Park
Godbold, B. C. (M)
Pitts, W. J. (M)

Harlow
Brown, A. C. (M)
Cade, C. M. (SM)
Harris, K. E. (SM)

Hornchurch
Ringrose, J. W. (M)

Ilford
Evans, V. O. (A)
O'Brien, D. (M)
Watts, T. B. (A)

Romford
Stott, H. T. (SM)

Southend-on-Sea
Clark, J. E. (SM)

Theydon Bois
Roberts, R. S. (SM)

Thorpe Bay
Roberts, C. A. (A)
Rotwell, W. E. (A)

Westcliffe-on-Sea
Dastidar, P. R. (A)

GLOUCESTERSHIRE

Bristol
Ackroyd, J. (M)
Connerton, C. D. (SM)
Griffin, R. E. (M)
McCarthy, A. A. (A)
McLauchlan, D. J. A. (M)
Summers, L. E. A. (M)
Leeson-Magry, A. J. (A)

Cheltenham
Fisher, E. C. (M)

Kingswood
Evans, R. I. (M)

HAMPSHIRE

Andover
Cook, K. L. W. (A)

Bournemouth
Sleger, J. (SM)

Crookham
Kuypers, M. W. (M)

Farnborough
Dale, T. G. M. (M)
Hobday, S. W. (M)
Jackson, W. R. (SM)

Havant
Rzymowski, E. (A)

Headley Down
Coursey, P. R. (A)

Portchester
Rouse, F. W. D. (A)

Portsmouth
Bettinson, S. F. (M)
Silvester, D. D. (M)

Southampton
Keel, R. (A)
Nowicki, J. R. (A)

Tadley
Abercrombie, S. D. (SM)

HERTFORDSHIRE

Aldenham
Johnston, D. L. (M)

Barnet
Capelli, M. P. (M)
Wrede, D. F. (M)

Boreham Wood
Laverick, E. (SM)

By Tring Station
Silson, R. G. (A)

Hatfield
Millward, M. A. (M)

Hemel Hempstead
Hornby, F. R. (A)

Hertford
Parker, A. H. (M)

Hitchin
Hume, C. R. (A)
Sowerby, J. M. (M)

Hoddesdon
Lyons, C. L. (SM)

Letchworth
Cartwright, J. R. (M)
Lewis, F. J. (M)

New Barnet
Starr, A. T. (SM)

Radlett
Hedges, T. C. (M)
Howse, H. A. G. (SM)
Luskow, A. A. (A)

Redbourn
Knight, D. J. (M)

Rickmansworth
Davidson, I. A. (M)
Montgomery, A. W. (F)

St. Albans
Chaffey, R. (M)

Stevenage
Schotten, H. G. (M)

Ware
Hicks, B. W. (M)

Welwyn Garden City
Grenly, M. (A)
Smith, A. A. (M)
Weston, P. E. (M)

KENT

Beckenham
Crawley, H. J. (A)

Bexleyheath
Brown, D. C. (M)
Bugeja, A. A. (M)
Herdman, T. L. (M)

Broadstairs
Saunter, H. D. (A)

Bromley
Kiryluk, W. (M)
Stoner, C. R. (M)

Chislehurst
Fischbacher, R. E. (SM)
Francis, C. J. (SM)
Simmons, B. D. (M)

Dover
Smye-Rumsby, B. A. A. (M)

Erith
Giovanni, G. (A)

Farnborough
Vedy, L. G. (A)

Gillingham
Hammond, E. R. (M)

Hayes
Binyon, B. (SM)

Orpington
Harrison, K. W. (SM)
Lawrence, E. (SM)
Saraga, W. (SM)
Thomas, W. D. (A)

Sevenoaks
Van Hasselt, M. (SM)

Sidcup
Ashbridge, N. (F)
Spagnoletti, P. H. (M)

St. Mary Cray
Eckersley, P. P. (F)

Walmer
Knight, S. G. (M)

LANCASHIRE

Accrington
Bleasdale, J. (A)

Chadderton
Brooks, G. R. (M)

Liverpool
Brown, A. G. (M)
Chalmers, D. (A)
Falcon, G. L. (M)
Morris, I. G. (M)
Watkinson, F. (A)

Manchester
Bowden, B. V. (SM)
Brown, R. H. (M)
Carlisle, D. M. (M)
Cobb, J. W. (M)
Cutteridge, O. P. D. (SM)
Jackson, W. (F)
Searby, N. H. (SM)
Williams, F. C. (F)

Ormskirk
Panagakis, H. (M)

Prescot
Muir, L. M. (A)

Roby
Kirk, J. G. (M)

Ulverston
Oxley, R. F. (SM)

LEICESTERSHIRE

Oadby
Ball, L. F. (M)

MIDDLESEX

Ashford
Hawkes, R. C. (A)

Enfield
Ash, E. A. (M)
Lee, E. M. (SM)
Fleming-Williams, B. C. (SM)
Oldham, C. A. (A)
Rantzen, H. B. (SM)
Sly, R. J. (A)

Greenford
Mac Lachlan, V. D. (M)

Harrow
Dawe, F. W. (M)

Hayes
Addle, R. W. (M)

Hounslow
Hughes, R. (A)
O'Hanlon, D. M. V. (M)
Sullivan, R. W. J. (SM)

Kenton
Espley, D. C. (F)

London
Abel-Harry, C. B. (M)
Adorian, P. (SM)
Barber, P. F. (M)
Barlow, D. (M)
Barlow, H. M. (F)
Battison, J. H. (SM)
Beanup, T. W. (SM)
Bedford, L. H. (F)
Bevan, P. A. T. (SM)
Birch, D. A. (M)
Bishop, H. (F)
Black, C. P. (A)
Boyle, H. (M)
Brown, J. (SM)
Brown, R. C. (M)
Bryant, G. H. (M)
Bunzl, T. F. (M)
Bury, G. J. (M)
Chrees, S. T. (M)
Cotton, A. F. R. (SM)
Cotty, W. F. (A)
Cowley, R. I. (SM)
Crosfield, J. F. (M)
Dawes, E. J. (SM)
Deal, A. W. (M)
Dent, F. D. (A)
Dumert, V. (M)
Earp, C. W. (SM)
Ellis, J. B. (M)
Ellis, L. W., Jr. (M)
Farrell, R. L. (M)
Faulkner, H. (F)
Finney, R. (M)
Flack, W. I. (SM)
Fleming, P. A. (SM)
Foster, H. G. (SM)
Gagne, R. E. (M)
Gann, G. D. (M)
Gibbon, C. P. H. (M)
Godfrey, S. S. (A)
Goldup, T. E. (F)
Greig, J. (SM)
Griffiths, W. H. F. (SM)
Gruner, L. (M)
Halsey, J. E. (A)
Hamilton, D. (M)
Hassan, A. M. (M)
Heaton-Armstrong, L. J. (SM)
Hirshman, C. L. (SM)
Ho, C. F. (A)
Hogg, F. L. (SM)
Holland-Martin, C. G. (M)
Honiatt, R. R. W. (M)
James, I. J. P. (SM)
Jasper, F. H. C. (M)
Jesty, L. C. (F)
Jezierski, E. C. J. (A)
Jull, E. V. (M)
Lamont, K. (M)
Lawson, C. J. V. (M)
Layzell, L. M. (M)
Lindsay, P. A. (M)
Mayer, C. G. (SM)
Mazur, S. S. (M)
Meyer, L. W. (SM)
Minnett, H. C. (M)
Minton, M. (SM)
Mirk, D. B. (SM)
Monleone, J. (M)
Morant, A. J. (M)
Morgan, G. (M)
Page, D. F. (A)
Parker, J. D. (SM)
Parr, G. (SM)
Payne, C. E. (M)
Paynter, A. E. (M)
Pocock, H. S. (SM)
Rastorgouelf, V. (M)
Robertson, A. A. (M)
Rose, A. (M)
Rose, S. P. (A)
St. Clair, A. M. (M)
Schwarz, H. F. (M)
Shefer, J. O. (M)
Shelley, B. J. (M)
Sivagnanasunderam, T. (A)
Smith, C. W. (M)
Sodomsky, K. F. (M)
Spence, R. (M)
Spooner, F. E. (M)
Starr, C. H. (SM)
Straughan, T. A. (M)
Strong, C. E. (F)
Szentirmai, G. (M)
Taylor, R. W. (M)
Thomas, H. A. (SM)
Trim, R. M. (M)
Troutbeck, W. H. (VA)
Ullrich, E. H. (F)
Valder, F. L. (M)
Voelcker, H. B., Jr. (A)
Williams, G. M. E. (M)
Wilson, A. G. (M)
Wynn, R. T. B. (SM)
Zacharov, B. (M)

Northolt
Meakin, A. D. (M)

Northwood
Dempsey, M. W. (A)

Pinner
Thurnell, D. P. (SM)

Potters Bar
Neill, S. F. M. (SM)

Southall
Burns, J. A. N. (M)

Staines
Hollister, R. H. (A)
Warr, H. J. J. (M)

Stanmore
Harvey, J. R. (SM)
Russell, C. R. (A)

Stanwell
Parnell, H. R. (M)

Sunbury-on-Thames
Irvin, J. L. (A)

Twickenham
Gill, A. J. (F)

Wembley
Mace, D. G. W. (SM)
Rubenstein, G. (M)

Wembley Park
Bray, W. J. (A)

NORFOLK

Gorleston-on-Sea
Rayment, K. I. (A)

Great Yarmouth
Dyson, A. A. (M)

NORTHAMPTONSHIRE

Kingsthorpe
Benham, C. M. (M)
Kaye, J. B. (M)

Kislingbury
Gardner, F. (M)

NORTHUMBERLAND

Newcastle-Upton-Tyne
Hare, J. (M)
Hodgson, C. C. V. (M)

NOTTINGHAMSHIRE

Beeston
Morris, D. J. (M)
Pollard, J. R. (M)

Radcliffe-on-Trent
Douglas, A. (M)

SOMERSETSHIRE

Weston-Super-Mare
McCall, D. R. (M)

STAFFORDSHIRE

Cannock Wood
Barrett, J. (M)

Rugeley
Kannan, S. (M)

Stoke-on-Trent
Gautby, H. R. B. (A)

Walsall
Hardcastle, C. (M)
Whitehead, E. A. N. (M)

Wolverhampton
Taylor, D. H. J. (M)

SURREY

Banstead
Smith-Rose, R. L. (F)

Cheam
Bond, W. (SM)

Chessington
Briggs, R. H. (M)

Coulsdon
Clemett, C. J. (M)

Croydon
Booth, P. C. (M)
Ringham, G. B. (SM)

Dorking
Jones, E. E. (M)

Esher
Reeves, R. (SM)

Farnham
Clarke, G. F. (A)
Dawes, T. J. (A)
Parsons, A. N. (M)

Guildford
Rouse, J. A. (A)
Williams, R. C. G. (SM)

Hindhead
Rowe, J. H. (M)

Kingston-on-Thames
Kinross, R. I. (M)

New Malden
Hills, W. J. (M)

Richmond
Head, J. E. (VA)

South Croydon
Carpenter, R. E. H. (SM)

Sutton
Higham, E. H. (M)
Wood, H. R. A. (M)

Tadworth
Somerville, T. (SM)

Thames-Ditton
Hersch, W. (M)

Tolworth
Kerr-Waller, R. D. (M)
Roberts, D. A. E. (M)

Virginia Water
Hutcheson, P. (M)
Webster, A. (M)

Walton-on-Thames
Budge, R. K. (A)

Weybridge
Hansford, I. V. (M)
Kelliher, M. G. (M)
Pitman, D. A. (M)

Woking
Gabriel, R. P. (VA)

Worcester Park
Walker, T. H. (M)

SUSSEX

Crawley
Elvy, M. T. (SM)

Goring-by-Sea
Smale, J. A. (F)

Hastings
Mortlock, A. (M)

Horsham
Roberts, A. R. V. (M)

Polegate
Collins, R. G. (M)

Portslade-by-Sea
Evans, S. B. (SM)

West Worthing
Havranek, W. A. (M)

WARWICKSHIRE

Birmingham
Allen, W. S. (SM)
Jones, H. H. (A)
Morrow, R. E. (SM)
Truscott, D. N. (M)

Coventry
Boden, T. W. (M)
Booth, A. E. (M)
Crocker, C. H. (A)
Wilson, R. (A)

Kenilworth
Keen, A. W. (SM)

Leamington Spa
Montgomerie, G. A. (A)

Rugby
Hibberd, R. G. (SM)
Hulme, F. H. (M)

Solihull
Maskell, W. A. C. (SM)

WEST SUSSEX

Worthing
Payne, L. S. (F)

WILTSHIRE

Devizes
Savage, W. B. (M)

WORCESTERSHIRE

Evesham
Smith, C. (A)
Sturley, K. R. (SM)

Malvern
Carter, R. H. A. (SM)
Dummer, G. W. A. (SM)

YORKSHIRE

Bradford
Greenwood, S. W. (M)
Patchett, G. N. (M)

Bridlington
Sniedza, O. A. (A)

Leeds
Brayshaw, G. S. (SM)

Rotherham
Smith, E. G. (M)

Sheffield
Bagshaw, G. W. (SM)
Benson, F. A. (M)
Cullen, A. L. (M)
Holroyd, W. H. (M)
Jurkus, A. P. (A)
Weislitzer, J. (M)

Shipley
Vilipsons, J. (M)

Walshford
Simms, T. C. (A)

Yarm-on-Tees
Bloom, M. S. (M)

ETHIOPIA

Addis Ababa
Desta, B. (M)
Gouin, P. L. (M)
Macfarlane, J. T. (M)
Mehta, B. B. (M)

FEDERATION OF RHODESIA AND NYASALAND

Salisbury
Paterson-Jones, E. A. (SM)
Reeves, J. M. (M)
Stevenson, K. (M)

Zomba
Davies, K. J. (M)

FINLAND

Helsinki
Kanerva, O. (A)

Hyvinkaa
Ivars, R. E. (M)

FORMOSA

Taichung
Bourret, P. L. (M)

TAIWAN

Pan-Geo
Wang, C. (A)

Taipei
Chou, T. (M)
Ong, H. (M)

Taipei
Kao, C. (M)

FRANCE

ALPS MARITIMES

Annecy
Friedrichs, G. (M)

ARDENNE

Tarze
Oudard, A. (A)

CORREZE

Brive
Roncier, R. (M)

JEAMONT

Dufossez
Ducastel, G. (M)

LOIRET

Orleans
Delvigne, A. F. (A)

LOT-ET-GARONDE

Bordeaux
Duhamel, J. P. (A)

MEURTHE ET MOSELLE

Pont-A-Mousson
Lemettre, R. J. (M)

RHONE

Lyon
Blolley, E. J. M. (M)
Dejardin, G. L. (SM)

SEINE

Antony
Fromageot, A. P. A. (SM)
Musson-Genon, R. P. A. (SM)

Bobigny
Calen, A. E. (A)

Boulogne
Altman, F. J. (SM)
Brown, E. W., Jr. (M)
Derveaux, R. (M)
Ellassen, K. E. (A)
Sourlau, P. J. (M)
Teeuw, J. W. (A)
Williams, R. E. (M)

Bourg-La-Reine
Brodin, J. (A)
Gauvenet, A. J. (A)

Chatenay Malaby
Robleux, J. H. (M)

Clamart
Blassel, P. P. (M)

Clichy
Warin, M. (A)

Colombes
Cosnard, F. F. (A)
Duprez, J. L. (M)

Courbevoie
Masson, C. M. (A)
Namian, P. (A)

Fontenay-Aux-Roses
Grivet, P. A. (A)
Surdin, M. M. (SM)

Gentilly
Beurel, J. (A)

Issy-Les-Moulineaux
Goudet, G. (SM)
Voge, J. P. (SM)

Levallois
Gandin, P. (A)

Malakoff
Besson, P. (M)

Montrouge
Zwobada, R. L. (SM)

Neuilly
Lebail, P. E. (M)
Lochard, J. C. (M)

Nogent-Sur-Marne
Clavier, P. J. (M)

Pantin
Churg, E. (A)

Paris
Algrain, P. R. (M)
Alsberg, ... (M)
Angot, A. M. (SM)
Berterottiere, R. L. (M)
Berthaud, M. C. (M)
Bloch, R. M. (A)
Bodez, P. M. (M)
Boudouris, G. (SM)
Boutry, G. A. (SM)
Bricaud, J. M. (SM)
Busquet, P. R. (M)
Camus, P. A. (M)
Chauchat, J. N. (M)
Chauvierre, M. (SM)
Christensen, P. E. (A)
Cohen, R. (A)
Courtillot, E. P. (SM)
David, P. B. (SM)
De Bozas, G. D. (M)
Deloraine, E. M. (F)
De Thomasson, M. M. L. (M)
Dreyfus, P. L. (A)
Esculier, G. G. (M)
Fabricant, P. (VA)
Feissel, H. G. (SM)
Floquet, J. (A)
Fuks, A. (A)
Gaschi, J. F. (M)
Gaston, S. (A)
Gazale, M. J. (M)
Gerten, N. (M)
Ghertman, J. (A)
Gibolin, E. (SM)
Girerd, J. L. M. (M)
Guyot, L. F. (A)
Hammer, A. P. (A)
Hoffman, R. B. (SM)
Horwinski, E. R. (M)
Huong, S. (A)
Israel, R. (A)
James, R. M. (M)
Kyrambaris, G. (M)
Kelton, M. R. (M)
Labin, E. (SM)
Labin, E. (SM)
Lacarriere, C. (A)
Larquier, R. (SM)
Lehmann, G. J. (SM)
Lermoyez, M. J. (A)
Lestel, J. H. (M)
Levy, L. (M)
Loeb, J. M. (SM)
Luppe, R. (M)
Mandel, P. (SM)
Mercier, J. M. (SM)
Moisson, A. A. (SM)
Mourier, G. (SM)
Nozieres, H. (A)
Ortusi, J. A. (SM)
Palluel, P. C. (SM)
Pernice, J. R. (SM)
Ponte, M. J. H. (F)
Robin, G. (M)
Samuel, S. (M)
Sillani, S. R. (M)
Sirel, M. (M)
Sokoloff, B. A. (A)
Sold, U. (M)
Sperring, F. E. (M)
Stevenson, L. A., Jr. (M)
Sulzer, H. G. (M)
Sundt, P. C. (M)
Touraton, E. R. (SM)
Vassy, E. J. (A)
Weill, H. (M)

Plessis-Robinson
Weissfloch, A. J. (SM)

Puteaux
Mimoun, G. L. (A)

Rosny Sous Bois
Ferrier, P. A. (A)

Suresnes
Gutton, M. H. (A)

SEINE ET OISE

Brunoy
Thun, R. J. (M)

Chatou
Gillotaux, P. (M)

Chaville
Saintesprit, G. L. (SM)

Corbeil-Essonnes
Behm, L. F. (A)

Garches
Muller, J. J. (A)

Le Vesinet
Bussat, R. M. A. (A)
Piel, G. J. (M)

Mareil-Marly
Berline, S. D. (SM)

Mames La Coquette
Nill, A. A. (M)

Orsay
Guenard, P. R. G. (F)
Leblond, A. F. (M)
Warnecke, R. R. (F)

Rueil-Malmaison
Barret, J. P. (M)
Sauvanet, M. M. (SM)

St. Cloud
Champeix, R. P. (SM)
Deschamps, J. D. (M)
Goublin, R. D. (A)

St. Germain-en-Laye
Beurtheret, C. A. (SM)
Raymond, F. H. (SM)

Sartrouville
Baron, J. (M)

Taverny
Comte, G. N. (M)

Versailles
De Colligny, G. (M)
Durand, P. A. (M)
Prache, P. M. (M)

Villiers Sur Marne
Halbquerax, M. E. (M)

GERMANY

Backnang
Koch, E. L. (SM)

Bayern
Schuh, C. F. (A)

Beimerstetten
Frundt, H-J. H. W. (SM)

Berlin
Fock, H. W. (A)
Gundlach, F. W. (SM)
Heyne, H. H. (SM)
Hore, K. (M)
Nestel, W. (SM)
Ruhmann, A. A. (SM)
Zickermann, C. A. (SM)

Bremen
Busch, C. W. (M)

Darmstadt
Moller, R. (F)
Walther, A. (SM)
Zinke, O. (SM)

Duesseldorf
Buetow, M. (A)

Freiburg-Breisgau
Beuche, G. R. (A)

Gottingen
Meyer, E. W. (SM)
Schnupp, P. (A)

Hamburg
Borgnis, F. E. (SM)
Joetten, K. K. F. (M)
Kroemer, H. (M)
Mathieu, G. A. (F)
Paehr, H. W. (SM)
Severin, H. K. F. (SM)

Hannover
Klotz, E. W. K. (SM)
Schonfeld, W. H. (M)

Hessen
Symons, W. E. (M)

Hildesheim
Funck, H. E. (A)

Karlsruhe
Rothe, H. (F)

Koln-Mulheim
Horn, H. (F)

Konstanz
Kleinsteuber, W. G. (SM)

Krefeld
Effertz, F. H. (M)

Mannheim
Weiland, F. A. (A)

Munich
Fischer, K. (A)
Gross, F. F. (A)
Handleman, M. (M)
Henrici, J. (SM)
Klanka, N. (M)
Kleen, W. J. (F)
Knoll, M. (SM)
Lusser, R. (M)
Moustafa, K. (A)
Mueller, R. A. (A)
Peters, J. F. (SM)
Piltoy, H. T. (SM)
Rohde, L. (F)
Saal, R. S. (SM)
Schultz, J. J. (M)
Trentini, G. V. (SM)
Tsui, F. F. (M)

Numberg
Hecker, W. (M)
Mazare, H. F. (SM)
Pleplow, H. (SM)
Unger, E. (M)

Oberpfaffenhofen
Ulbricht, G. (M)

Porz-Rhein
Riepka, H. C. (SM)

Ruesselsheim-Main
Pfeifer, E. (A)
Stuttgart-Zuffenhausen
Piltoy, R. (M)

Ulm-Donau
Bruck, L. (SM)
Bruckmann, H. P. (SM)
Fraenz, K. O. (SM)
Grasselt, K-H. (A)
Hess, H. A. (M)
Kotowski, P. (A)
Runge, W. T. (SM)

Wetzlar
Uebermuth, H. W. (M)

Wiesbaden
Brod, F. W. (A)
Helmann, W. (M)

Wildbahn
Phillips, R. H. (M)

GREECE

Athens
Antonacakis, G. I. (A)
Aristogenis, G. S. (A)
Basbas, L. T. (M)
Cassapoglou, C. B. (M)
Chairetakis, E. P. (A)
Gogos, A. C. (M)
Economides, A. (M)
Karlambas, N. (A)
Katsaounis, P. C. (A)
Katzells, N. G. (M)
Lascaris, C. A. (M)
Mazarakis, A. (A)
Myroyannis, A. J. (M)
Papadopoulos, D. A. (SM)
Perpinias, A. EM. (M)
Tsinteas, G. S. (A)
Vergis, M. (A)

Attica
Soldatos, G. (M)

Canea
Ichhakis, M. A. (M)

Corinthos
Sazakis, N. G. (A)

Egion
Charalampous, T. D. (M)

Piraeus
Dourvanas, S. A. (A)

Salonika
Klaftas, G. Z. (A)

Thessaloniki
Papadopoulos, N. D. (A)
Stathopoulos, A. E. (A)

GUAM

GUAM

Agana
Belford, K. R. (A)
Goodwin, C. E. (A)

GUATEMALA

Guatemala City
Guaragna, L. F. (M)

HONG KONG

Hong Kong
Braude, A. N. (M)
Chen, Y. C. (A)
Cheung, W. S. H. (M)
Loutlit, L. W. (A)
Luk, Y. K. (M)
Monfon, L. (M)
More, H. Y. H. (M)
Sham, Y. S. (A)
Zinky, W. R. (M)

Kowloon
Cheng, C. C. (A)
Chui, T. Y. (M)
Hooe, W. J. (A)
Hsu, H. (M)
Lee, T. Y. (M)
Shih, S. L. (M)
Wu, R. S. (A)

HUNGARY

Budapest
Egri, E. (A)
Lajos, P. (A)

ICELAND

Akureyri
Bjargmundsson, I. (A)

Hafnarfirdi
Halldorsson, T. J. (A)

Keflavik
Jonsson, S. G. (A)

Reykjavik
Halldorsson, S. (M)
Sonnenfeld, S. (A)
Thorkelsson, S. (A)

INDIA

ANDHRA

Bihar
Joshi, M. G. (M)
Neogy, S. C. (A)
Roy, K. M. (M)
Sen, K. K. (M)
Sinha, N. K. (M)

Kakinada
Murty, G. N. (M)
Rao, V. V. L. (SM)
Satyanarayana, M. (M)
Subrahmanyam, G. (M)

Rajahmundry
Chauhan, M. V. (M)
Murthi, J. K. (SM)

Visakhapatnam
Kurma, V. R. (A)
Murty, D. S. (M)
Rao, B. R. (SM)
Rao, M. S. (SM)

BANGALORE

Bangalore
Chatterjee, R. (M)
Chidambaram, R. (A)
Gupta, P. P. (A)
Nagaraja, N. S. (M)
Prakash, K. S. S. (A)
Rajamani, V. S. (M)
Ramachandran, P. (M)
Ravi, S. (M)
Sharma, I. S. (A)
Sreenivasan, K. (SM)
Suryan, G. (M)

Basavanqudi
Rao, P. L. S. (M)

Jalahalli
Baliga, B. V. (SM)
Subramaniam, C. R. (M)

Malleswaram
Chatterjee, S. K. (M)
Naidu, M. K. R. (M)

BOMBAY

Ahmedabad
Kotadia, K. M. (M)

Allahabad
Ji, G. (A)
Krishnaji (SM)
Mukerjee, T. (A)

Baroda
Contractor, S. N. (M)

Sen, S. M. (M)

Bombay
Agarwal, S. P. (A)
Bengalli, N. K. (M)
Bhatnagar, H. M. (M)
Billimoria, R. P. (A)
Conesa, R. (M)
Daruvala, D. J. (M)
Dastur, J. B. (A)
Gandhi, C. D. (M)
Gillon, K. E. C. (A)
Huano, G. T. C. (A)
Husein, A. E. (M)
Kamat, V. Y. (M)
Kantebet, S. R. (F)
Katre, V. S. (A)
Lakhanpal, D. D. (SM)
Marathe, D. H. (SM)
Merchant, V. V. (A)
Mirchandani, I. I. T. (A)
Motwane, H. V. (A)
Padmanabhan, S. V. (A)
Pai, M. V. (A)
Phatak, R. K. (SM)
Shroff, T. R. (A)
Sukhadia, P. U. (M)
Vaishampayan, R. K. (M)

Fort Bombay
Gokarn, G. D. (SM)
Kohli, F. C. (M)
Toshniwal, G. R. (SM)

Jogeshwara
Telang, V. S. (M)

Nasik City
Rajendra, Y. L. (M)

Poona
Alva, S. V. C. (SM)
Mishra, S. (A)
Prabhakar, A. (M)
Row, D. P. (SM)
Swaminathan, K. (A)
Virkar, D. V. (SM)

Sanoli
Kanitkar, G. C. (A)
Raju, T. A. (M)

Secunderabad
Rao, H. J. (M)
Venkatraman, M. P. (M)

Worli
Langoah, P. O. (SM)

Coimbatore District

Pollachi
Iyer, S. K. (A)

Coorg

Mercara
Ponnappa, B. M. (M)

Delhi

Delhi
Ramabhadran, S. (A)
Tandan, S. P. (M)

Faridabad
Balasundaram, N. (SM)

Dharwar

Karnatak
Paramasivayya, G. S. (M)

Godavary District

Pyna
Raju, D. V. S. (M)

Kerala

Palghat
Peter, J. P. (M)

Madras

Annamalainagar
Vijayaraghavan, K. (M)

Chromepet
Sitaram, R. (M)
Sitharaman, M. R. (A)

Kombai
Mohamed, M. K. (M)

Madras
Patel, S. N. (M)
Pattabiraman, J. (SM)
Ramachandra, M. (M)
Ramachandran, D. N. (A)
Saifuddin, (M)
Thangavelu, K. S. (M)

Nungambakam
Belgamvala, M. K. (A)

Tiruchy
Eugene, A. F. (SM)

Triplicane
Rao, K. R. (M)

Madhya Pradesh

Bhilai
Sardesai, S. N. (M)

Indore
Jain, P. L. (M)

Jabalpur
Garud, G. N. (M)
Ghose, A. (M)
Mishra, N. K. (A)
Mithal, G. K. (M)
Pal, P. C. (M)
Sarwate, V. V. (M)

Phillai
Mukerji, H. M. (SM)

Raipur
Shukla, R. S. (M)

Seoni
Agrawal, J. P. (M)

Mysore

Belgaum
Rao, K. V. (A)

Nepal

Kathmandu
Baldya, N. R. (M)
Kanskar, K. R. (A)
Singh, R. P. (M)

New Delhi

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Bhatt, N. B. (SM)
Burmanray, P. N. (A)
Gadadhar, N. V. (M)
Ganguly, S. K. (M)
Ghose, A. K. (M)
Joshi, M. V. (SM)
Kumar, V. (M)
Matange, N. D. (SM)
Peterson, P. R. (M)
Ramamurthy, T. V. (A)
Rao, K. L. (M)
Sachdev, D. K. (A)
Sant, M. D. (M)
Sivaswami, R. S. (M)
Subrahmanyan, T. R. (M)
Subramanian, C. S. (M)
Tandan, R. K. (M)
Thacker, M. S. (A)
Vij, K. K. (A)
Wadhwa, L. K. (M)

Punjab

Ambala Punjab Circle
Bhashyam, S. R. (SM)

Patiala
Anand, V. B. (SM)

Rajasthan

Kotah Jn.
Vasantharajan, M. N. (M)

Pilani
Chatterjee, A. K. (SM)
Jain, J. D. (M)
Singh, A. (SM)
Wadia, B. H. (A)

Saharanpur

Roorkee
Bhattacharjee, D. K. (A)

Saurashtra

Rajkot
Taneja, S. P. (M)

Travancore

Trivandrum
Nair, P. R. (A)

Udyogamandal
Ramani, R. V. (A)

Uttar Pradesh

Dehra-Dun
Singh, R. V. (M)

Lonavla
Nair, B. K. S. (M)

Lucknow
Chakravarti, S. P. (SM)
Joshi, C. P. (SM)
Madan, M. P. (SM)
Saxena, A. P. (M)

West Bengal

Calcutta
Banerjee, A. (M)
Chatterjee, S. D. (SM)
Correa, W. R. (M)
Kamat, D. S. (M)
Krishnaswami, M. S. (M)
Nadler, M. (M)
Nag, B. (A)
Pandit, J. D. (A)
Pipial, A. (A)
Raha, H. N. (M)
Seshadri, G. (A)
Sweet, C. M. (M)
Verma, J. K. D. (M)

Kharagpur
Mullick, S. K. (A)
Rajagopalan, P. K. (A)

Parganas
Ghosh, S. R. (A)

Serampore
Das, P. N. (M)

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Liong, L. K. (M)
Samoen, M.SC.E.E. (M)

Djakarta
Clapp, R. O. (M)

IRAN

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Clement, P. F. (M)
Evans, W. C. A. (M)
Farman-Farmaian, C. (M)

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Baghdad
Al-Rubayi, N. A. (M)
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Strabane
Smyth, W. (A)

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Zaks, Z. W. (A)

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Ziv, J. (A)

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Amariglio, I. (A)

Ramath Hasharon
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Gilman, K. (M)

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D'Auria, G. (A)

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Zanini, A. (A)

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Comoglio, G. (A)
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Devalle, M. (A)
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Goffi, G. (SM)
Pinciroli, A. (SM)
Pinolini, F. (M)

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Owaki, K. (M)

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Saito, S. (SM)

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Kumagai, T. (SM)

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Okabe, T. (M)

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Hoshika, Y. (A)

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Oono, Y. (SM)

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Kida, Y. (A)
Misugi, T. (M)

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Nomura, K. (M)

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Mains, M. C. (M)

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Makino, Y. (A)
Okazaki, B. (A)

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Kawahashi, T. (SM)
Kunaoai, M. (A)
Morita, M. (A)
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Takeuchi, Y. (A)
Yamazaki, T. (SM)

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Nakagami, M. (SM)

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Mizutani, M. (A)

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Kitamura, Z. (SM)
Osawa, T. (M)
Okura, T. (M)
Saburi, O. (M)
Takiyama, K. (M)
Tanaka, T. (SM)
Tateisi, K. I. (M)

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Hata, S. (SM)
Havashi, T. (M)
Honda, T. (A)
Kimura, R. (M)
Kojima, Y. (SM)
Makimoto, T. (M)
Mikami, T. (M)
Minamoto, S. (M)
Miyakoshi, K. (SM)
Naoami, K. (SM)
Okuno, Y. (A)
Ozaki, H. (SM)
Sueata, E. (SM)
Susi, M. (A)
Suita, T. (M)
Tanaka, Y. (A)
Taniouchi, F. (M)
Terada, M. (M)
Ura, K. (M)
Yoshimura, T. (A)

Saitama-Ken
Yamazaki, M. (A)

Sapporo
Suzuki, M. (SM)

Sendia
Honda, N. (M)
Koike, Y. (SM)
Matsudaira, M. (SM)
Matsuo, T. (M)
Mushiake, Y. (A)
Naoia, K. (SM)
Naoai, K. (M)
Nishizawa, J. (M)
Oizumi, J. (SM)
Saito, N. (M)
Shibata, Y. (M)
Uchida, H. (SM)
Uda, S. (SM)
Watanabe, Y. (F)

Tobata City
Konomi, M. (A)

Tokushim-Shi
Harada, N. (M)

Tokyo
Abe, R. (A)
Adachi, H. (A)
Akira, A. (A)
Aoi, S. (A)
Birkenhead, W. (M)
Cohen, C. L. (M)
Endo, K. (A)
Ezoe, H. (SM)
Fuiii, T. (SM)
Fulii, T. (A)
Fuiiki, S. (M)
Fukata, M. (M)
Fukushi, A. (A)
Harashima, O. (SM)
Hayashi, R. (A)
Hirai, M. (M)
Hirayama, H. (A)
Hosono, T. (M)
Ibuka, M. (A)
Ida, K. (A)
Ieiri, S. (M)
Ilmura, N. (A)
Ikeda, K. (SM)
Ikegami, F. (M)
Ikezawa, T. (A)
Imahata, K. (M)
Imayoshi, B. (A)
Inatsu, M. (A)
Inose, H. (M)
Ishikawa, D. (M)
Ishikawa, T. (SM)
Ishiwata, S. (A)
Ishizaki, Y. (A)
Iwakata, H. (SM)
Iwama, K. (A)
Kadokura, T. (A)
Kawasaki, Y. (M)
Kobayashi, K. (SM)
Kodaira, N. (M)
Koga, I. (F)
Koichibara, T. (A)
Komabayashi, E. (A)
Komai, M. (A)
Kondo, T. (A)
Kono, T. (A)
Koomura, S. (A)
Kudo, Y. (A)
Kumagai, K. (A)
Kumagai, Y. (M)
Kurihara, Y. (A)
Kurita, M. (A)
Kurodo, H. (A)
Kuroiwa, Y. (A)
Kurokawa, H. (M)
Kusunoki, J. (M)
Matsumaru, K. (A)
Matsumura, S. (A)
Matsuyama, K. (A)
Matuo, T. (A)
Mii, N. (A)
Miki, S. (A)
Mikuma, F. (SM)
Minozuma, F. (M)
Mita, S. (A)
Miyaji, K. (M)
Miyakawa, H. (M)
Mizukoshi, S. (A)
Mizuma, M. (SM)
Morimiya, T. (A)
Morimoto, S. (A)
Morimura, T. (M)
Morita, K. (M)
Morita, K. (SM)
Morita, T. (A)
Murakami, I. (A)
Murata, K. (A)
Namba, S. (SM)
Nemoto, T. (A)
Niguchi, K. (M)
Nishi, E. (A)
Nishino, O. (A)
Nishizaki, T. (M)
Niwa, Y. (F)
Nojima, S. (A)
Nomura, T. (M)
Oeihara, Y. (A)
Ohashi, K. (SM)
Okabe, T. (A)
Okada, M. (SM)
Okada, T. (A)
Okada, T. (M)
Okamura, S. (M)
Okamura, S. (SM)
Okochi, J. A. M. (M)
Omi, H. (SM)
Omori, S. (M)
Onoe, M. (M)
Osafune, H. (SM)
Otsuki, Y. (M)
Owaku, S. (A)
Oyama, S. (A)
Richards, P. A. (SM)
Sakai, Y. (M)
Sakamoto, T. (SM)
Sassa, K. (A)
Sawada, R. (SM)
Sawamura, I. (A)
Sawamura, E. (A)
Seki, H. (SM)
Seki, T. (SM)
Sekiguchi, T. (SM)
Shibata, K. (M)
Shimbori, M. (SM)
Shimizu, R. (SM)
Shinkawa, H. (SM)
Shiozaki, Y. (A)
Someya, I. (M)
Soto, K. (A)
Sugawara, S. (A)
Sunaoshi, T. (A)
Suzuki, K. (SM)
Tadokoro, Y. (M)
Taguchi, T. (A)
Takada, S. (SM)
Takahashi, M. (A)
Takahashi, R. (A)
Takahashi, S. (M)
Takama, S. (A)
Takeda, Y. (SM)
Takeuchi, H. (SM)
Taki, Y. (M)
Tanimura, I. (A)
Tanabe, Y. (SM)
Tanaka, O. (A)
Terao, M. (M)
Togino, K. (M)
Tomono, M. (A)
Tomota, M. (SM)
Tsubol, K. (A)
Tsuzawa, M. (M)
Tufts, R. M. (SM)
Tukizi, O. (M)
Uchida, H. (A)
Uchimaru, K. (M)
Uesugi, Y. (A)
Ugai, S. (M)
Unotoro, T. (M)
Yagi, H. (F)
Yamashita, A. (A)
Yamashita, K. (A)
Yanai, H. (M)
Yasuda, I. (A)
Yokoyama, H. (M)
Yoshida, J. (A)
Yoshida, S. (A)
Yuhara, H. (M)

Yokohama
Hayasi, S. (A)
Iijima, K. (M)
Kohno, S. (SM)
Matsuyuki, T. (SM)
Nishio, H. (SM)
Sawazaki, N. (A)
Suzuki, Z. (A)

JORDAN

Amman
Shaweesh, H. M. (M)

KOREA

Seoul
Dale, P. R. (M)
Hwang, I. Y. (A)
Kim, K. R. (M)
Kim, M. K. (A)
Lee, C. H. (M)
Suh, D. U. (A)

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Hoffman, J. D. (A)
Kano, K. (M)
Koenreich, J. L. (M)
Lewis, R. H. (M)
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Peterson, R. A. (M)
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Tueni, J. A. (M)

Beyrouth
Shoucair, S. F. (M)

Tripoli
Skerrey, C. E. (M)

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Swift, R. R. (A)
Wildermuth, J. L. (M)

MALAYA FEDERATION

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Singh, K. (M)
Stubbs, W. (SM)

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Hin, T. K. (M)
Snowden, J. (M)

Singapore
Tan, Y. S. (M)

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BAJA CALIFORNIA

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Marquez, J. (M)

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Diego, J. M. (M)
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HIDALGO

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MOROCCO

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Sabbah, J. (M)

Tangier
Mellard, D. (A)
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The Haque
Bijl, P. C. J. (SM)
Barrow, B. B. (M)
Bartholome, P. J. (A)
Bekkering, D. H. (A)
Bloemsma, J. (M)
Blum, H. (A)
Bonghi, G. (A)
Clark, R. G. (SM)
Den Orth, J. M. O. (SM)
De Vooqt, A. H. (M)
Goldmann, A. S. (A)
Heerema, H. H. (M)
Houtsmuller, J. (SM)
Janssen, J. M. L. (SM)
Staples, E. B. (SM)

Veldhoven
Gradus, H. H. J. M. (M)

Voorburg
Moran, J. F. (M)
Van Berkel, P. L. M. (M)
Van Nauta Lemke, H. R. (M)

Wageningen
Samwel, J. A. (M)

Wassenaar
Van Der Pol, B. (F)
Vandkuren, H. C. A. (SM)

NETHERLANDS ANTILLES

Curacao
Van Haaren, R. H. C. (SM)

NEW ZEALAND

Auckland
Crawford, W. C. (A)
Lawrence, L. J. (A)
Mayo, L. E. (A)

Dunedin
Martin, L. H. (SM)

Gisborne
Paulson, E. J. (VA)

Wellington
Henderson, B. G. (A)

NICARAGUA

Managua
Guerrero, M. A. (M)
Robinson, H. E. (M)

NORWAY

Bergen
Bakken, O. (M)
Hiis, P. T. (SM)
Dahl, H. (SM)
Mack, E. (M)
Wessel-Berg, T. (A)

Blindern
Nickelsen, J. C. (VA)

NORWAY

Konsberg
Staensen, S. A. (M)

Lillestrom
Eggestad, M. (M)
Jaeger, T. C. (A)
Lied, F. (A)

Oslo
Bostad, J. (M)
Fremming, H. O. (A)
Gaudernack, L. F. (SM)
Haraldsen, H. P. (M)
Hisdal, B. J. (M)
Hvinden-Haug, L. H. (M)
Kulvik, E. (SM)
Overby, H. (M)
Rorholt, B. A. (M)
Scheel, C. F. (M)
Sem-Sandberg, S. (M)
Snedkerud, O. T. (A)

Trondheim
Engvik, S. B. (M)
Tangvik, S. (M)

OKINAWA

RYUKYUS

Naha
Sakumoto, I. (M)

PAKISTAN

EAST PAKISTAN

Dacca
Ahmed, W. (SM)
Nurullah, A. S. M. (A)

Rajshahi
Chowdhury, M. R. (M)

Hazara
Sathar, S. A. (SM)

WEST PAKISTAN

Karachi
Ayoob, A. S. (SM)
Chagla, H. R. (M)
Farooq, M. O. (M)
Hasan, S. (M)
Khan, A. R. (M)
Khan, F. A. (M)
Rafi, M. A. (M)
Rauf, A. (M)
Ullah, I. (M)
Yousafi, K. N. (M)

Rawalpindi
Haq, S. (M)
Karimi, A. A. (M)

PERU

Ilo
Berrevoets, G. J. (A)

Lima
Canese, O. R. (A)
Gonzalez, A. M. (M)
King, D. W. G. (M)
La Pierre, V. M. (SM)
Woodman, R. F. (M)

Talara
Sekimotto-Pinillos, R. A. (M)

Trujillo
Baisley, B. B. (M)

PHILIPPINE ISLANDS

Baguio
Aquinaldo, P. A., Jr. (M)
Glover, F. N. (M)

Cagayan de Oro City
Lim, M. (M)

Davao City
Obra, R. S. (A)

Dumaguete City
Bercovitz, N., Jr. (M)

Manila
Aquinaldo, J. A. (A)
Bentley, A. D., Jr. (M)
Bethel, C. D., Jr. (SM)
Gamboa, A. C., Jr. (A)
Hidalgo, M. T. (M)
Piconnell, J. J. (M)
Reynolds, R. A. (A)

Quezon City
Albarracin, M. B., Jr. (M)
Yogore, M. G. (M)

San Juan
Ozaeta, E. H. (A)

POLAND

Warsaw
Auerbach, J. E. (A)
Barwicz, W. (A)
Czechowski, A. (A)
Groszkowski, J. (M)
Hennel, J. (SM)
Klemozychi, L. (A)
Ryzko, S. (A)
Smolinski, A. K. (SM)
Wojnar, A. (A)

PORTUGAL

Lisbon
Chapin, C. J. (M)
Chubbuck, E. L. (M)
Da Cunha, A. M. C. (M)
De Bivar, A. M. B. (SM)
De Figueiredo, R. J. P. (M)
Esten, P. W. (SM)
Fernandes, A. A. D. (M)
Victorino, J. M. C. (A)

Portuguese East Africa
Davis, D. A. (M)

PUERTO RICO

Arecibo
Mercado, T. (M)

Bayamon
Boyd, L. K. (SM)
Moreno, M. (A)

Guayama
Blondet-Bloise, L. (A)

Hato Rey
Hester, F. A. (SM)
Serra, M. A. (A)
Weed, A. C., Jr. (M)

Mayaguez
Dueno, B. (M)
Fiol, L. E. (M)
Fischbach-Nazario, H. (M)
Garcia de Quevedo, J. L. (SM)

Playa Ponce
Castillo, E. A. (A)

Rio Piedras
Arce-Blanco, R. (M)
Castanera, J. R. (M)
Mercado, C. R. (A)

San Juan
Acosta, R. J. (M)
Firpi, A. (M)
Gedney, G. C. (M)
Jones, T. L. (M)
Mayo, G. A. (A)
Negroni, J. A. (M)
Perry, R. P. (A)
Ryssy, J. W. (M)

Santurce
Arzuaga, J. (M)
Cortes-Vazquez, R. (A)
Petersen, R. L. (M)
Rivera, C. R. (A)

Vieques
Flanagan, J. R (M)

REPUBLIC OF PANAMA

Panama City
Chu, M. (A)
Rivera-Cardona, B. A. (M)

RUMANIA

Bucharest
Tanasescu, T. A. (SM)

Bucuresti-Marqurele
Toma, V. I. (M)

SAUDI ARABIA

Dhahran
Barnes, L. (M)
Mueller, E. H. (SM)
Rieg, R. V. (M)
Stilley, J. C. (M)

Kuwait
Khalil, A. Y. (A)
Mahmoud, M. A. (A)

SCOTLAND

Aberdeen
Stocker, G. A. (M)

AYRSHIRE

Carclule
Rodger, J. B. (A)

EAST LOTHIAN

North Berwick
Oliphant, A. J. (M)
Oliphant, W. D. (SM)

FIFE

Rosyth
Welling, A. J. (A)

St Andrews
Campbell, C. K. (M)

LANARKSHIRE

Glasgow
Chamberlain, E. (A)
Eaton, J. C. (M)
Howe, G. W. O. (F)
Maclean, D. J. H. (M)
Weaver, C. (M)

MIDLOTHIAN

Edinburgh
Bruce, D. C. (M)
Charleson, W. A. (A)
Conner, C. I. (M)
Mascall, A. L. (M)
Pringle, R. W. (SM)
Small, J. E. (M)

RENFREWSHIRE

Greenock
Tait, J. S. R. (A)

SPAIN

Barcelona
Lopez, F. C. G. (A)
Owen, K. (M)
Pascucci, A. (SM)
Zobel, E. V. (M)

Madrid
Collino, A. (SM)
De Onis, A. (M)
Escolano, M. (M)
Espinosa, M. (SM)
Gavilan, E. E. (A)
Herrero, M. C. (SM)
Izquierdo, L. E. (M)
Lara, A. (M)
Marin, H. (A)
Millan, A. (M)
Santesmases, M. I. (A)
Sowell, P. W. (M)
Williams, J. R. L. (M)

Murcia
Sauras, P. P. (M)

STRAITS SETTLEMENTS

Singapore
Boyer, F. A. (SM)
Dyson, G. N. (M)
Hock, T. C. (M)
Thompson, J. G. (M)
Trafford, W. (M)

SUDAN

Khartoum
Bunyan, S. A. (A)

SWEDEN

Alvsbyn
Joste, S. V. (M)

Arboga
Olsson-Seffer, R. (A)

Bjornstorp
Gyllenkrok, T. G. (A)

Bofors
Gertzell, S. G. (A)

Bromma
Femer, E. J. U. (A)

Danderyd
Schleimann-Jensen, A. (F)

Enskede
Axeling, G. S. (M)
Edsman, K. S. (M)

Erstavikvagen
Lundgren, E. H. (A)

Farsta
Magnusson, B. G. (M)

Goteborg
Ekelof, S. (SM)
Heynan, B. (M)
Lundwall, B. H. (A)
Roll, A. (M)

Gothenburg
Aurell, C. G. P. (M)
Hellstroem, P. G. (A)
Olving, S. (M)
Orhaug, T. A. (M)
Ots, A. (M)
Stomberg, A. V. (M)

Haegersten
Person, L. B. (M)

Johanneshov
Sparrendahl, G. E. W. (A)

Kryssarvagen
Brundin, B. H. E. (A)

Lidingo
Dalen, G. S. (M)
Friden, S. G. (A)
Granqvist, C. E. (F)
Hakansson, P. O. E. (A)

Jiewertz, B. (M)
Lofgran, L. E. (M)
Norrelgen, G. A. (A)
Scholdstrom, R. K. O. (A)
Solders, P. G. (A)
Stannow, J. C. (A)
Westerhult, B. C. O. (A)

Linkoping
Hellgren, G. P. (M)
Perers, O. F. (M)

Malmo
Ljungman, N. H. (M)
Romell, G. D. R. (M)

Molndal
Hoglund, J. B. (M)
Yngvesson, Y. K. O. (M)

Norrkoping
Braune, E. H. J. (M)
Werthen, H. L. O. (M)

Orebro
Hartman, D. A. B. (M)

Roslahs-Nasby
Markeslo, G. A. (A)
Nyberg, S. L. (A)
Vigoh, M. E. (A)

Solna
Haard, B. (M)

Stockholm
Ahlgren, S. I. (A)
Alfven, H. O. G. (SM)
Algotsson, L. (A)
Andersson, K. N. (A)
Anjou, L. A. (M)
Arosenius, L. T. H. (A)
Backmark, N. (M)
Behr, K. E. (A)
Bjork, N. A. N. (M)
Blomberg, K. H. (F)
Ehnborg, A. V. (A)
Elfving, A. L. (M)
Enander, B. N. (A)
Fagerlind, S. G. (A)
Granier, S. G. (SM)
Gustafsson, L. (M)
Hansson, H. W. (M)
Houbaer, A. J. (A)
Jacobson, B. (A)
Josephson, B. A. S. (M)
Karlstedt, L. (A)
Katzeff, K. (M)
Kruse, O. S. N. (M)
Laurent, T. (SM)
Lindstrom, G. (M)
Lofgren, E. O. (SM)
Martensson, I. (M)
Nelson, R. H. (M)
Nerhag, O. (A)
Nilsson, B. N. A. (A)
Norrby, H. J. (A)
Ohrvik, S. O. (A)
Olszanski, H. (M)
Overby, S. L. (SM)
Palmblad, B. (A)
Persson, I. (M)
Persson, N. I. E. (A)
Persson, T. P. (A)
Ramskold, O. S. H. (A)
Ridderstrand, L-G. I. (A)
Scheltelowitz, H. (A)
Sivers, C. H. V. (SM)
Stenmo, E. (A)
Styren, K. (M)
Sundquist, A. (M)
Svala, C. G. (M)
Tommer, S. J. A. (M)
Von Utfall, J. C. J. (M)
Vos, M. (SM)
Wahlstrom, G. (A)
Warring, S. E. (M)
Weidstam, E. (SM)
Westerberg, K. S. R. (A)
Wikland, T. E. (A)

Stocksund
Feichtinger, A. F. (M)

Vallingby
Mollfors, H. G. (M)

Vigbyholm
Bergstrom, R. G. (A)

SWITZERLAND

Baden
Haffter, T. F. (M)

Basel
Fenyves, F. L. (SM)
Hagger, H. J. (M)
Huber, P. K. (A)
Thalmann, V. (A)

Berne
Anselmi, S. C. (M)
Bachmann, A. E. (A)
Digoelmann, H. (M)
Gerber, W. (M)
Rathe, E. J. (M)

Burgdorf
Menzi, H. U. (M)
Chateau-d'Oex
Roch, A. A. (M)

Ennetbaden
Mueller, A. V. A. (M)

Frauenfeld
Baumer, H. S. (M)

Geneva
Cheretakis, A. P. (A)
Fischer, J. (M)
Gayer, J. H. (SM)
Goldberg, R. (A)
Gracie, J. A. (SM)
Gross, C. C. (F)
Kirstein, P. T. (M)
Lapostolle, P. M. (SM)
Mussard, M. E. (A)
Petermann, L. A. (SM)
Sundaram, V. (M)
Svoboda, J. J. (M)

Hegnau
Gloor, B. (M)

Kanton Zug
Mathias, J. M. (M)

Kilchberg-ZH
Kaufmann, P. (M)

Kloten
Holtz, R. F. (SM)

Lutry-Lausanne
Demleville, H. (M)

Lurem
Margna, C. R. (M)

Mannedorf
Brumm, G. (M)

Muri-Bern
Eprecht, G. W. (M)

Neuchatel
Bonanomi, J. A. (M)
Christeler, A. (M)
Gsteiger, K. E. (M)

Nussbaumen
Weiss, H. (A)

Olten
Lang, G. J. (M)

Urdorf-ZH
Braun, A. F. (M)

Uster
Gibas, H. A. S. (SM)

Wabern
Kilchermann, K. (M)

Wettingen
Neck, H. (M)

Wettswil
Mollnari, H. A. (M)

Winterthur
Druey, W. (SM)

Zollikerberg
Keller, J. (A)
Schiess, G. (M)
Stutz, T. O. J. (A)
Sulzer, R. F. (M)

Zug
Kistler, R. J. (A)
Van Der Lans, J. H. M. (M)

Zurich
Baumann, E. (SM)
Baumgartner, R. H. (A)
De Quervain, A. P. (M)
Furrer, F. E. (M)
Gaumann, T. (M)
Guanella, G. (SM)
Gurewitsch, A. M. (SM)
Hayes, L. W. (F)
Hirt, K. (A)
Hohermuth, H. U. (M)
Kinberg, C. (A)
Klein, A. L. (M)
Koller, R. (M)
Langenegger, P. B. (A)
Mueller, H. E. (M)
Nordby, K. S. (A)
Oertli, E. H. (A)
Proebster, W. E. (A)
Ruth, L. C. (M)
Schlaeppi, H. P. (A)
Schneider, M. V. (M)
Shah, R. R. (M)
Speiser, A. P. (SM)
Staub, F. (A)
Strohschneider, W. (SM)
Strutt, M. (F)
Stuber, R. (M)
Sun, S-F. R. K. (SM)
Tank, F. (F)
Walder, E. (M)
Weber, G. C. (A)
Weinberger, I. (A)
Wohler, G. O. (M)

TAHITI

Papeete
Baker, G. R. (M)

TANGANYIKA

Dar Es Salaam
Greig, C. (M)

TASMANIA

Kingston Beach
Roberts, R. E. (M)

THAILAND

Bangkok
Bintasan, L. (A)
Chitinanda, P. (M)
Makino, Y. (M)
Muangphant, C. (M)
Tantraporn, V. (M)

TURKEY

Ankara
Arpon, B. R. S. (M)
Esmer, M. (M)
Parlar, M. N. (A)

Istanbul
Apaydin, P. (A)
Ataman, A. (M)
Ozker, T. (SM)
Sertekin, T. (A)
Turhan, M. (M)
Urgoren, F. (A)

UNION OF SOUTH AFRICA

BELGIAN CONGO

Leopoldville
Rouche, N. (M)

Sona Bata
Franke, G. S. (M)

CAPE OF GOOD HOPE

Capetown
Dunbar, J. (A)
Gilmour, R. R. (SM)
Lennox, C. N. (M)
Miles, V. G. (M)

Grahamstown
Stack-Forsyth, E. F. (SM)

Stellenbosch
Olen, C. L. (A)

Worcester
Smuts, M. N. (A)

NATAL

Durban
Chapson, E. (A)
Phillips, W. E. (SM)

Stanger
Karodia, A. M. (A)

ORANGE FREE STATE

Kimberley
Morris, H. R. (M)

TRANSVAAL

Johannesburg
Bichara, M. R. E. (A)
Brickhill, G. A. (A)
Jacobs, A. J. (M)
Jamieson, R. T. (M)
Kucera, F. L. (M)
Lichtenstein, A. H. (A)
Silbermann, H. (SM)
Sive, F. (A)
Suttner, R. (M)
Van Gogh, W. D. (M)

Pretoria
Macnamara, M. R. H. (A)
Malan, D. G. (M)
Zawels, J. (SM)

URUGUAY

Montevideo
Elices, F. J. (M)
Guimaraes, A. (A)
Moran, W. F. (M)
Sapelli, W. J. (A)

U.S.S.R.

Leningrad
Shmakov, P. V. (A)

Moscow
Denisenko, I. N. (A)
Efimov, E. A. (A)
El Meshad, Y. A. (A)
Kostanjanz, B. A. (A)
Martjushov, K. I. (A)
Novakovsky, S. V. (SM)
Shokin, A. I. (A)
Sobolev, M. A. (A)
Sorokin, A. A. (A)
Zahvatoshin, K. V. (A)

VENEZUELA

Cabimas
Kirk, W. (M)

Caracas
Alamo-Segovia, J. A. (M)
Applewhite, V. C. (M)
Arreaza, R. G. (M)
Barias, J. P. (M)
Bartelme, R. R. (M)
Carter, J. (M)
Charlole, R. O. (A)
Cohen, L. D. (A)
De La Roca, G. R. M. (M)
Elquezabal, I. I. (M)
Eriksson, J. I. (SM)
Fonseca, N. J. (M)
Fuerst, L. L. (SM)
Gall, F. (M)
Giovacchini, O. (A)
Graham, F. A. (M)
Groshaus, M. L. (M)
Gula-Monasterio, A. E. (M)
Hackett, A. H. (M)
Hodgson, A. D. (SM)
Jaclr. S. E. B. (A)
Jimenez-Michelena, L. G. (SM)
Key-Telera, E. G. (A)
Lopez, L. A. (SM)
Nikken, P. H. G. (SM)
Pachano, P. I. (A)
Rios, E. E. (A)
Salz, H. (A)
Suarez-Flamerich, O. (M)
Vicens, A. (A)
Vurgalt, M. (A)
Warnek, R. G. (M)

YUGOSLAVIA

Wartes, L. M., Jr. (A)
Wehrman, R. J. H. (A)
Wenzel, G. E. (A)
Woodworth, F. B. (SM)

Chacao
Siblesz, G. M. (A)

Laguaira
Nouel, C. C. (A)

Maracaibo
Christie, G. A. (A)
Grove, R. E. (M)
Hinds, W. C., Jr. (M)
McBain, H. F. (M)

Maturin
Persons, C. O. (M)
Vehrs, D. F. (M)

Merida
Huerta, A. F. (M)

Petare
Mireles, A. (M)

Zulia
Tedodri, D. C. (A)

WALES

Colwyn Bay
Whale, G. S. (M)

YUGOSLAVIA

Ljubljana
Bremsak, F. (M)

Zagreb
Albert, V. R. (M)

HELPFUL HINTS
for using the IRE DIRECTORY

A few minutes' study of the basic layout of the IRE DIRECTORY will help you to find the information for which you are looking more quickly and more accurately. At first glance, the IRE DIRECTORY may seem to be confusing, but by using the various portions of the book as listed below, you will find your way around easily, and will discover that it is actually a very simple arrangement, and a much more logical one than a purely alphabetical terminology listing.

PINK SECTION at the front of the products and firms section contains a terminology index listing every product, major and minor, for which a list of manufacturers is given. Page numbers refer you to the page on which the listings for that product begin. Following this alphabetical index is a copy of the questionnaire which is sent to the firms who have furnished us with product information. A quick look through this questionnaire will help greatly in understanding the product arrangement. At the top of the first page of the pink section is a small index referring you to the opening page of the complete-data spread section, the alphabetical directory, and each of the three product directories.

THE COMPLETE DATA SPREAD SECTION (pages 1-160) contains product advertisements of great usefulness to the reader. Most of these advertisements are two pages or more, and all of them contain complete information on the products manufactured by the advertising firms—specifications, prices, illustrations, and suggested applications.

ALPHABETICAL DIRECTORY OF MANUFACTURERS (pages 161-264) contains a list of 4,304 firms representing the majority of buying and selling power in the radio-electronic industry. Each firm listing contains the complete mailing address and telephone number for the firm. Following the state name in the firm address, a list of code numbers is given. These numbers refer to the 102 major products listed in the book (for quick reference to the meaning of the codes, use the questionnaire form in the pink section).

THE THREE DIRECTORIES OF PRODUCTS ARE:

1. Complete Equipment
2. Components
3. Materials and Services

This breakdown into three directories saves you from traveling through many products in which you are not interested at the moment, and helps you to turn immediately to the listings for the type of product you want, following a straight line to your destination. Use the Machol edge index at the top of the first page of the pink section to locate immediately the first page of the appropriate directory, then use the Machol edge index at the beginning of each directory to find the specific product you want. You don't even have to know the page number—the index will find it for you automatically!

102 MAJOR PRODUCTS are listed within these three Directories. Each product listing contains a number of sub-headings so that you may know specifically what each firm makes. To interpret the code numbers shown after each firm's listing, consult the first page of that product class, where the sub-headings are defined. You will note that advertisements are positioned throughout the book in the most appropriate listing section, so that the advertisement for a relay manufacturer will appear in the relay section, to help you with further information on his product. Every advertiser's listing shows you the page number on which his advertisement may be found, and you will derive more value from this book if you consult these advertisements for facts you cannot find in the listings.

COMPLETE ADDRESS LISTINGS are given only for advertisers in this section. If you wish to locate the address and telephone number for any other firm, it will be necessary to use the alphabetical directory.

THE DISTRIBUTION SECTION is class 102, the last class in the book. This section contains a list of 1389 manufacturers representatives, distributors and jobbers, grouped geographically. See page 702 for a more complete explanation of the use of this section.

ADVERTISER'S INDEX appears on pages 154-160 and on pages 726-728.

How to Use the Machol Edge Index

High speed reference is a major objective of the IRE DIRECTORY. To this end we have adopted the Machol Edge Index system, and these indexes:

Advertisers Index, pages 154-160 and 726-728.

Key to Products, Pink Section.

Index to Spreads, 1.

1	COMPLETE DATA SPREADS
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HOW TO USE

1. Bend the Directory almost double with the back cover page on the inside.
2. Hold in your right hand with your four fingers near to the bound edge and your right thumb near the middle of the open side of this page.
3. From the heavy or light line symbol adjacent to the subject you seek, run your eyes across the page edges until you reach the horizontally corresponding symbol.
4. OPEN THERE!

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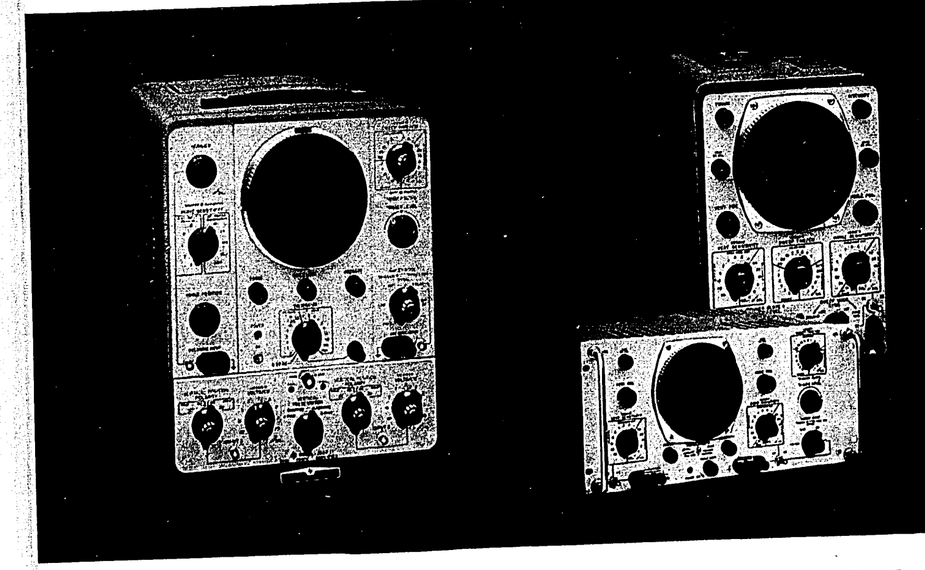
For details, circle #2 on Reader Service Card

hp

SHORT FORM 1959 CATALOG

hp offers complete coverage in quality oscilloscopes – DC to 10 MC!



hp 150A/AR – DC to 10 MC

Models 150A/AR are intended as the most broadly useful, convenient high quality 10 MC scopes offered. A variety of plug-ins (see below) provide dual trace or differential input, or high amplification eliminating pre-amplifiers on input from most transducers.

Automatic Trigger

Sweep Range 0.02 μsec/cm to 15 sec/cm; 24 sweeps 0.1 μsec/cm to 5 sec/cm, 3% accuracy. Internal, line voltage or external triggering, pos. or neg. slopes, sensitivity 0.5 v (external). Has sweep amplifier, vernier; sensitivity 200 mv/cm to 15 v/cm. Vertical amplifier dc to 10 MC, optimum transient response and rise time less than 0.035 μsec. Calibrating voltages, 0.2 mv to 100 v peak, accuracy 3%. Approx. 1 KC square wave rise and decay time 1.0 μsec. $1,100.00 (cabinet), $1,200.00 (rack mount).

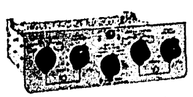
hp 130B/BR – DC to 300 KC

Termed the finest low frequency oscilloscope ever offered, *-hp-* 130B/BR combine big 'scope performance and positive dependability with 1 mv sensitivity and the convenience of direct reading, "universal" automatic trigger, no preamplification from most transducers and simple controls.

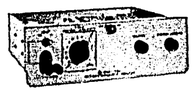
Similar X and Y amplifiers

Models 130B/BR have similar horizontal and vertical amplifiers with sensitivity 1 mv/cm to 125 v/cm. Input circuits are balanced on the 6 most sensitive ranges; single ended input dc or ac coupled. 21 sweep times may be directly set, instrument sweeps 1 μsec/cm to 12.5 sec/cm, triggering is internally, by line power, or externally by 0.5 v or greater. Includes x 5 magnifier for all internal sweeps increasing fastest sweep time to 0.2 μsec/cm. *-hp-* 130B (cabinet) or 130BR (rack) $650.00.

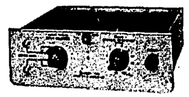
New amplifiers and accessories



-hp- 152B Dual Trace Differential Amplifier. New plug-in amplifier providing differential input and dual traces electronically switched between A and B channels at either 100 KC or on alternate sweeps. Sensitivity range 0.05 v/cm to 50 v/cm, input attenuator with 9 calibrated ranges in 1-2-5-10 sequence and vernier. $250.00.



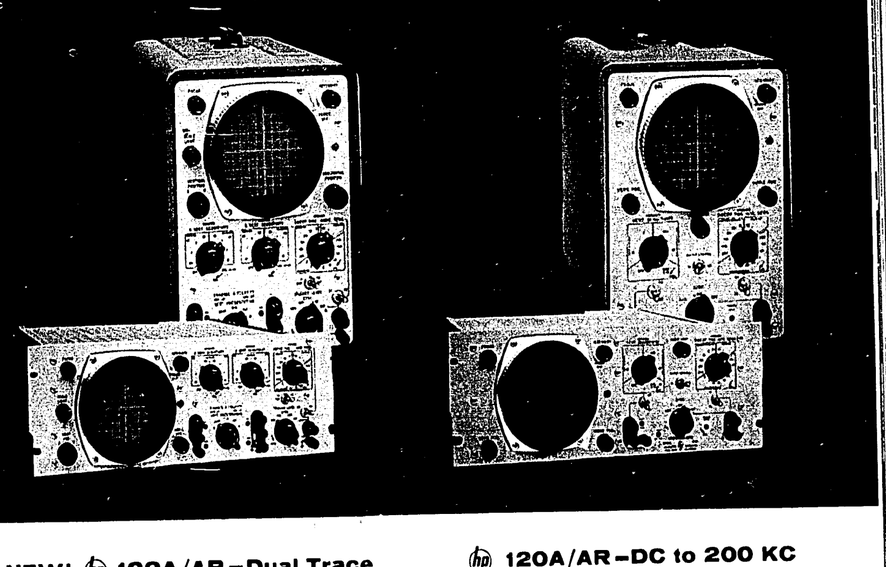
-hp- 153A Very High Gain Amplifier. New plug-in permitting *-hp-* 150A to be used for many direct measurements from transducer without *preamplification*. Pass band dc to 500 KC, sensitivity 1 mv/cm to 125 v/cm, balanced input on all ranges. 15 calibrated ranges in 1-2-5-10 sequence, 1 mv/cm to 50 v/cm; plus vernier. $125.00.



-hp- 151B High Gain Amplifier. For 150A high gain unit with 5.0 mv/cm sensitivity, frequency response dc to 10 MC.. 12 calibrated ranges on 1-2-5-10 sequence, 5 mv/cm to 20 v/cm; accuracy ±5%. Vernier adjustment. 1 megohm input impedance with 31 μμf shunt. Pass band rise time 0.035 μsec. Has 2 BNC terminals. $200.00.

Data subject to change without notice. Prices f. o. b. factory.

For details, circle #4 on Reader Service Card



NEW! hp 122A/AR – Dual Trace

Model 122A/AR is a dual trace, 200 KC oscilloscope providing two separate traces for simultaneous study; single trace available when desired. Twin vertical amplifiers, alternate and chopped presentation, differential input, automatic syncing and x 5 sweep expansion. Ideal for direct comparison of filter, amplifier, output/input or with vibration testing apparatus.

Sweeps 5 μsec/cm to 200 msec/cm

15 calibrated sweeps; vernier extends slow sweep to 0.5 sec/cm, expander extends fast sweep to 1 μsec/cm. Automatic trigger; manual override sets trigger between +10 and −10 v. Vertical amplifiers dc to 200 KC (dc coupled) or 2 cps to 200 KC (ac coupled). Sensitivity 10 mv/cm to 100 v/cm. Horizontal amplifier same bandwidth as vertical, sensitivity 0.1 v/cm to 100 v/cm. *-hp-* 122A (cabinet) or 122AR (rack mount), $625.00.

hp 120A/AR – DC to 200 KC

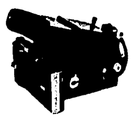
Ideal for industrial or production line work as well as daily lab jobs, Models 120A/AR are outstanding in both value and "big 'scope" performance features. This all-new instrument covers DC to 200 KC, has the *-hp-* universal trigger circuit which optimizes signals automatically; also offers automatic synchronization on any internal or external voltage including line power.

Sweeps 1 μsec/cm to 0.5 sec/cm

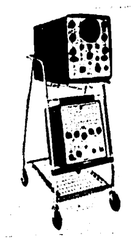
Features include 15 calibrated sweeps in 1-2-5 sequence, sweep speeds range 5 μsec/cm to 0.5 sec/cm, "times-5" sweep expansion on all ranges, high sensitivity calibrated vertical amplifiers. All power supplies are regulated for steady, drift-free traces. Automatic trigger and base line can be cut out for bright, clear photography trace. Extra compact Model 120AR is only 7" high. Utmost dependability, rugged construction. *-hp-* 120A (cabinet) or 120AR (rack) $435.00.

Increase convenience of your 150A/AR

-hp- 154A Voltage/Current Dual Channel Amplifier. New plug-in for 150A permits simultaneous measurement and observation of ac voltage and current. Electronic channel switching by alternate sweeps or by 100 KC chopper. Unique current probe clamps *around* wire under test, does not load circuit. $430.00.



-hp- 196A Oscilloscope Camera. Most convenient recording camera available. Object-to-image size ratio 1 to 0.9 views full 10 cm graticule width. One-hand mounting and multiple picture setting. Easy access to *f*-stop and shutter while camera mounted. Permits viewing image with both eyes while photographing, even if wearing glasses. Employs Polaroid® Land Camera Back, Wollensak 3" f/1:9 lens. 7 shutter speeds 1/100 to 1 sec. Weight only 9 lbs. $425.00.



-hp- AC-115A Oscilloscope Testmobile. For 150 series oscilloscopes but fits others. 4" rubber tired wheels, heavy chrome tube construction, tilts 'scope to 30° in 7½° increments, folds for storage, shipping. $80.00. *-hp-* AC-116A Storage Unit fastens to *-hp-* AC-115A, holds 150A plug-ins or *-hp-* AC-117A Accessory Drawers. *-hp-* AC-116A, $22.50. *-hp-* AC-117A, $10.00.

For details, circle #5 on Reader Service Card

Oscillators – 0.008 to 10,000,000 cps

Hewlett-Packard now offers 12 high quality, fast and accurate oscillators, each an exceptional value and each engineered to do a specific job best. Each incorporates the famous RC resistance capacity circuit pioneered by *-hp-*. This circuit makes possible instruments that are highly stable, wide range, compact and portable; instruments that are extremely simple to operate and require no tedious re-setting or adjustment during operation.

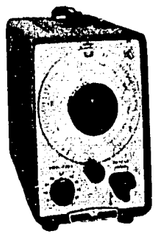
Instrument	Primary Uses	Frequency Range	Output	Price
-hp- 200AB	Audio tests	20 cps to 40 KC	1 watt/24.5 v	$150.00
-hp- 200CD	Subsonic through supersonic audio and ultrasonic tests	5 cps to 600 KC	160 mw or 10 v/600 ohms; 20 v open circuit	170.00
-hp- 200J	Interpolation, frequency measurements	6 cps to 6 KC	160 mw/10 v	300.00
-hp- 200T	Telemetry, carrier current tests	250 cps to 100 KC	160 mw or 10 v/600 ohms; 20 v open circuit	450.00
-hp- 201C	High quality audio tests	20 cps to 20 KC	3 w or 42.5 v/600 ohms	225.00
-hp- 202A	Low frequency measurements	0.008 to 1200 cps	28 mw or 30 v p-p/4000 ohms	525.00△
-hp- 202C	Servo equipment tests, measurements	1 cps to 100 KC	160 mw or 10 v/600 ohms	300.00
-hp- 205AG	High power audio tests, gain measurements	20 cps to 20 KC	5 watts	500.00△
-hp- 206A	High quality, high accuracy audio tests	20 cps to 20 KC	+ 15 dbm	750.00△
-hp- 207A	Audio sweep generation	20 cps to 20 KC	160 mw or 10 v/600 ohms	275.00
-hp- 233A	Carrier oscillator—current tests	50 cps to 500 KC	3 w/600 ohms	500.00
-hp- 650A	Wide range video tests	10 cps to 10 MC	15 mw/3 v	490.10△

△ Rack mounted instruments $15.00 less.

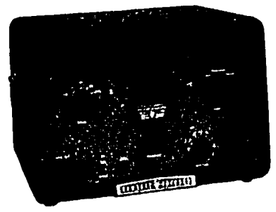
200 Series Audio Oscillators

For audio and ultrasonic measurements, *-hp-* offers popular Models 200AB and 200CD. Both have highest stability and accurate tuning circuits. Low impedance operating levels plus superior insulation guarantee long years of trouble-free dependability. Operation is simple; just three controls; no zero setting necessary. *-hp-* 200AB, 20 cps to 40 KC, $150.00. *-hp-* 200CD, 5 cps to 600 KC, $170.00.

207A Sweep Oscillator

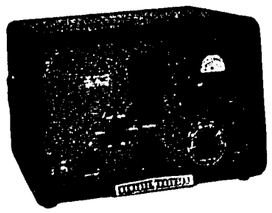


This new audio oscillator provides continuous single-sweep frequency coverage from 20 cps to 20 KC. No band switching is needed; dial accuracy is 4%, and the instrument also provides a flexible 10 v/600 ohm output usable balanced or with one side grounded. Frequency response is ±1.0 db full range, distortion and hum are less than 1%. *-hp- 207A may be swept by hand, motor driven, tuned remotely or coupled to a recorder.* -hp- 207A, $275.00.



202A Function Generator

Compact, multi-purpose source of transient-free test voltages from 0.008 cps to 1,200 cps. Continuously variable through 5 bands; offers exceptional stability (within 1%) and distortion less than 1% to 100 cps. Sine, square or triangular waves may be selected by a front panel switch; the 30 volt output peak-to-peak is constant for all wave forms and over full frequency range. *-hp-* 202A, $525.00△.

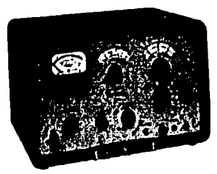


650A Test Oscillator

Covering 10 cps to 10 MC, *-hp-* 650A is a highly stable, wide band instrument for audio, supersonic, video and rf measurements. Output is flat within 1 db full range; voltage range is 0.00003 to 3 v. In addition to 600 ohm impedance, voltage divider provides a 6 ohm impedance. Distortion less than 1% to 100 KC; stability ±2% to 100 KC. $490.00△.

Distortion, Wave Form Analyzers – 20 cps to 50 KC

NEW! 302A Wave Analyzer



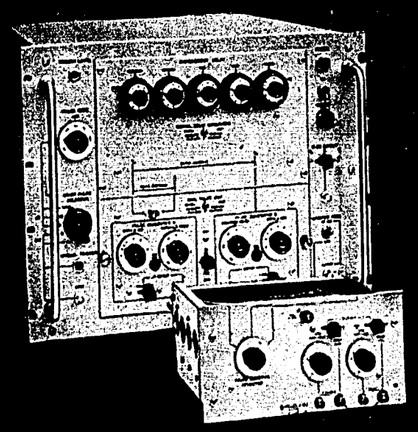
New, completely transistorized, this advanced instrument provides direct, accurate wave component measurement without troublesome calibration or stabilization. Measurement range 20 cps to 50 KC. The instrument is hum free, requires little power, needs no warm-up, has very sharp acceptance circuits plus an AFC. May be battery operated (18 to 28 volts). Simple operation, rugged, trouble-free. $1,475.00.△

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 302A	Wave form analysis	20 cps to 50 KC	Direct reading, no calibration needed	$1,475.00△
-hp- 330B	Measures total audio distortion	20 cps to 20 KC	Includes input amplifier, VTVM	410.00△
-hp- 330C	For FM broadcast measurements	20 cps to 20 KC	Special VU meter to meet F.C.C. requirements	440.00△
-hp- 330D	For AM, FM broadcast measurements	20 cps to 20 KC	AM detector and VU meter to meet F.C.C. requirements	500.00△

△ Rack mounted instruments $15.00 less.

NEW!

218AR Digital Delay Generator



Independently adjustable time intervals or pulse delays

±0.1 μsec time interval accuracy

Crystal oscillator time base

Regulated power supplies

Model 218AR Digital Delay Generator is a totally new instrument applicable to many types of timing measurements including calibrating the range determining circuits of radar receivers, etc. The generator is built to rigid standards and is suitable for military use. It provides two precision time intervals or pulse delays, either of which are independently adjustable from 1 to 10,000 microseconds in 1 microsecond steps. These time intervals are accurate to within 0.1 microsecond ±0.001% of the selected value, and may be initiated from an internal multivibrator, 10 cps to 10 KC, or from an external rate generator, 0 cps to 10 KC. Total jitter does not exceed 0.02 microseconds in either case. The instrument also provides a 50 volt synchronizing output pulse at the beginning or end of a time interval, and a 1 microsecond timing comb output at the front panel.

No count ambiguity

A unique feature of the new *-hp-* 218AR is its time base, a pulsed crystal controlled oscillator. The oscillator starts at T_0 and stops at the last output pulse. This eliminates the "plus-or-minus-1-count" ambiguity of many counter circuits in such application.

Model 218AR is a completely self-contained instrument, requiring only one or more *-hp-* 219 series plug-ins to perform a broad variety of time and delay generation measurements. Simplicity and flexibility are increased by the large variety of output signals provided by the plug-in units. The instrument is particularly compact and well-designed; etched circuits and the use of plug-ins materially increase circuit accessibility.

The instrument's power supplies are fully regulated to avoid effects of line voltage variations. It is available as *-hp-* 218AR, rack mount. $2,000.00.

219A Dual Trigger Unit

This plug-in drawer for *-hp-* 218AR supplies trigger pulses of positive polarity, 50 volts, 0.1 μsec rise time from a 50 ohm source. Pulse A occurs at T_0 or T_1 as selected by a switch; Pulse B is triggered at T_2. *-hp-* 219A, $100.00.

219B Dual Pulse Unit

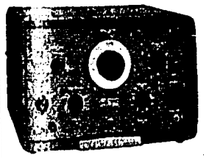
This plug-in drawer for *-hp-* 218AR produces two high-power pulses which are continuously adjustable in width, 0.2 to 5 μsec and in amplitude from 0 to 50 volts, positive or negative polarity. The leading edge of these pulses can be set to occur at the beginning or end of the selected time interval. Both pulses are brought out to separate front panel jacks but may be switched to a common jack with no change in level or output impedance. *-hp-* 219B, $450.00.

219C Digital Pulse Duration Unit

This plug-in drawer for *-hp-* 218AR produces a high power output pulse whose delay and duration are digitally controlled. The pulse is available in both polarities simultaneously, and is continually adjustable in amplitude up to at least 15 volts from a 90 ohm source. It may also be obtained from a directly coupled 500 ohm source with an amplitude of at least 90 volts. *-hp-* 219C, $350.00.

Square Wave and Pulse Generators

212A Pulse Generator



Provides continuously variable, high power "fast pulses" of superior wave form. Combines broad general usefulness with 0.02 μsec rise and decay time to meet requirements of radar, TV and nuclear work. Pulse length variable 0.07 to 10 μsec; minimum overshoot; 50 watt peak power (50 v to 50 ohms load). Low impedance means accurate pulses can be delivered at a distance from the instrument. Repetition rate variable 50 to 5,000 pps; controlled internally or externally. Synchronizing pulse available in advance of, or following output pulse. $585.00 (cabinet), $570.00 (rack mount).

211A Square Wave Generator

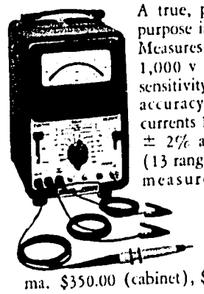
Versatile, wide range instrument for testing oscilloscopes, networks, video and audio amplifier performance, modulating signal generators and measuring time constants. Offers simple control of electronic switches; is also convenient for indicating phase shift, frequency response, transient effects. Two separate outputs (a) 7 volt 75 ohm circuit for TV work; (b) 55 volt 600 ohm output for high level work. Both have full amplitude variation. Instrument operates free-running or externally synchronized with positive going pulse or sine wave of 5 volts minimum amplitude. $300.00 (cabinet), $305.00 (rack mount).

DC and AC Voltmeters; DC Milliammeter

NEW! -hp- 425A Microvolt-Ammeter

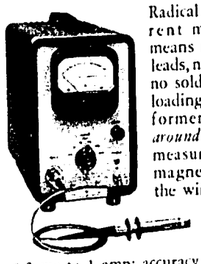
New, high sensitivity, high stability microvolt meter reading end scale voltages of 10 μv to 1 v in 11 ranges. Also reads currents of 10 μμa to 3 ma in 18 step, 1-3-10 sequence. Accuracy ± 3% on all ranges. Drift less than 2 μv referred to input terminals under all conditions; much less under lab conditions. Input impedance 1 megohm ± 3% on all ranges. Instrument can also be used as a 100 db amplifier providing up to 1 v output from signals as small as 10 μv. Amplifier ac rejection is at least 3 db at 0.2 cps and 60 db at 60 cps and above. $500.00 (cabinet), $505.00 (rack).

NEW! -hp- 412A Precision Volt-Ohm-Ammeter



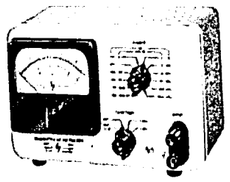
A true, precision, multipurpose instrument at last! Measures dc voltage 1 μv to 1,000 v (max. full scale sensitivity 1 mv, full scale accuracy 1%). Measures currents 1 μa to 1 amp with ± 2% accuracy, full scale (13 ranges). As ohmmeter, measures 0.02 ohms to 5,000 megohms. Low noise, drift. Recorder output provides 1 v or 1 ma. $350.00 (cabinet), $355.00 (rack).

NEW! -hp- 428A Clip-On DC Milliammeter



Radical approach to current measurements means no breaking of leads, no dc connections, no soldering, no circuit loading. "Current transformer" probe clamps *around* wire under test, measures by sampling magnetic field around the wire. Readily measures dc current in presence of strong ac. Covers 0.3 ma to 1 amp; accuracy ± 3%. $475.00 (cabinet), $480.00 (rack).

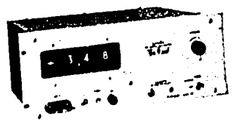
NEW! -hp- 403A Transistorized AC Voltmeter



Battery-operated, portable, weighs less than 5 lbs., transistorized, covers 1 cps to 1 MC and 100 μv to 300 v rms (max. full scale sensitivity 1 mv). Also reads db direct from −12 to 2 db. 400 hours battery life (6 mos. average use) hum less than 30 μv on all but lowest range. Average reading meter; accuracy ± 3% to 500 KC, ± 5% to 1 MC. Input impedance 2 megohms; high overload capacity. $250.00.

Instrument	Primary Uses	Frequency Range	Voltage or Current Range	Input Impedance	Price
-hp- 400D	Wide range ac measurements High sensitivity	10 cps to 4 MC	0.001 to 300 v 12 ranges	10 megohms 15 μμf shunt	$225.00
-hp- 400H	High accuracy wide range ac measurements	10 cps to 4 MC	0.001 to 300 v 12 ranges	10 megohms 15 μμf shunt	325.00
-hp- 400L	Log voltages, linear db measurements	10 cps to 4 MC	0.001 to 300 v 12 ranges	10 megohms 15 μμf shunt	325.00
-hp- 403A	Battery-operated portable; fast, accurate, hum-free ac measurements	1 cps to 1 MC	0.001 to 300 v 12 ranges	2 megohms 40, 20 μμf shunt	250.00
-hp- 405AR	Direct, automatic voltage measurement. Recorder output, automatic polarity	Dc	0.001 v to 1,000 v (accuracy ±0.2% of reading ±1 count)	11 megohms to dc	825.00
-hp- 410B	Audio, rf, VHF measurements; dc voltages; resistances	dc; ac—20 cps to 700 MC	1.0 to 300 v 7 ranges	dc—122 megohms; ac—10 megohms/ 1.5 μμf	245.00
-hp- 412A	Precision voltage, current resistance measurements	Dc	1 mv to 1,000 v 1 μa to 1 amp	10 to 200 megohms, depending on range	350.00
-hp- 425A	Read μv, μμa; 100 db amplifier; medical, biological, physical, chemical	dc voltages as 100 db amplifier	10 μv to 1 v 11 ranges	1 megohm ± 3%	500.00
-hp- 428A	Clip-on milliammeter eliminates direct connection, circuit loading	Dc	0.3 ma to 1 amp, 6 steps, ±3% accuracy	——	475.00

NEW! -hp- 405AR Automatic DC Digital Voltmeter



Literally "touch-and-read" measuring speed. Automatic range, polarity selection, covers 0.001 v to 1,000 v (accuracy ± 0.2% of reading ±1 count). New novel circuitry provides a stability of readings virtually eliminating jitter in the last digit. Floating input, analog-to-digital conversion, digital recorder output and front panel switch to hold ranges. *Just 7" high!* $825.00.

-hp- 400D Vacuum Tube Voltmeter

Best -hp- ac VTVM ever built! Covers all frequencies 10 cps to 4 MC. Extremely sensitive, wide range, accurate within 2% to 1 MC, measures 0.1 mv to 300 v. Direct reading in db or volts; 10 megohm input impedance with 15 μμf shunt insures negligible loading on circuits under test. $225.00 (cabinet), $230.00 (rack).

-hp- 410B Vacuum Tube Voltmeter

All-purpose test instrument, range, 20 cps to 700 MC. Also serves as dc VTVM with 122 megohms impedance, or ohmmeter for measurements 0.2 ohms to 500 megohms. Input capacity 1.5 μμf, 10 megohms input resistance. $245.00 (cabinet), $265.00 (rack).

-hp- 400L Logarithmic Voltmeter

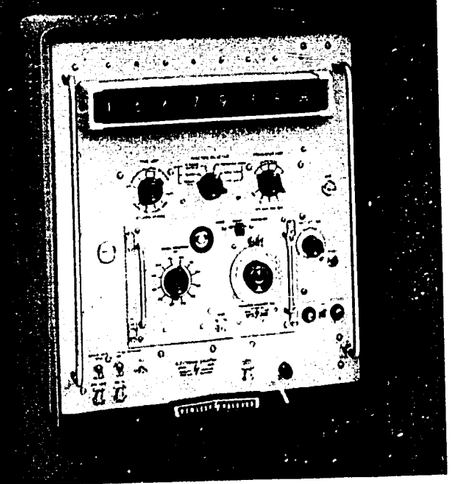
New -hp- 400L, 10 cps to 4 MC, features a 5" true log voltage scale plus a 12 db linear decibel scale. Accuracy is a *constant percentage of the reading*, ± 2% of reading or ± 1% of full scale, whichever is more accurate, to 500 KC; ± 5% full frequency range. Voltage range 0.3 mv to 300 v. $325.00 (cabinet), $330.00 (rack).

-hp- 400H Vacuum Tube Voltmeter

Need extreme accuracy of 1%? -hp- 400H covers 10 cps to 4 MC, has 5" meter with mirror scale, measures voltages 0.1 mv to 300 v (max. full scale sensitivity 1 mv), 10 megohm resistance minimizes circuit loading. 56 db feedback amplifier insures stability. Rugged, trouble-free precision instrument. $525.00 (cabinet), $530.00 (rack).

For details, circle #8 on Reader Service Card

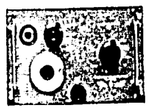
NEW! -hp- 524C Precision Electronic Counter



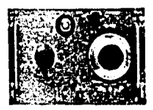
- Bright, big-number readout
- New stability—3 parts in 10^9 short-term
- Direct, instantaneous, automatic readings
- Covers frequencies 10 cps to 220 MC*
- Measures time interval 1 μsec to 100 days
- Measures period 0 cps to 10 KC
- Resolution 0.1 microseconds
- No calculation or complex setup
- Easily used by non-technical personnel
- High sensitivity, impedance, reliability

* With proper plug-ins.

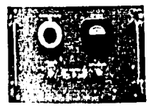
5 PLUG-IN UNITS INCREASE FLEXIBILITY, USEFULNESS FOR MANY MEASUREMENTS



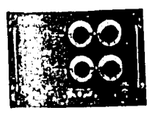
-hp- 525A Frequency Converter. Extends 524's direct reading range to cover 10 cps to 100 MC with no loss in accuracy. Provides additional amplification to increase video sensitivity to 0.1 v through 524's basic 10 cps to 10.1 MC range. $250.00.



-hp- 525B Frequency Converter. Converts -hp- 524 for direct readings 100 to 220 MC in decade steps. Maintains same high accuracy throughout range; provides high sensitivity for low level work. $250.00.



-hp- 526A Video Amplifier. Increases 524 sensitivity to 10 mv for low power frequency measurement 10 cps to 10.1 MC. Accuracy same as counter; minimum input 10 millivolts rms. $175.00.



-hp- 526B Time Interval Unit. Permits 524 to measure interval 1.0 μsec to 100 days with accuracy of 0.1 μsec ± 0.0001%. Reads in sec, msec or μsec. Triggering from separate "stop" or "start" on pos. or neg. going waves. Trigger adjustable −192 to + 192 volts. $175.00.

-hp- 526C Period Multiplier. Permits 524 to measure period over 100, 1,000 or 10,000 cycles of unknown, thus providing the greater accuracy of mid-range frequency readings. Front panel switch selects desired period. $225.00.

New big-number readout, and new crystal oscillator stability of 5 parts in 10^9 per week—these are significant advances incorporated into new -hp- 524C Electronic Counter.

The new 524C permits you to buy only the basic counting facilities you need now—later on add inexpensive plug-ins to triple and quadruple the usefulness of your counter.

The basic -hp- 524C reads frequency 10 cps to 10.1 MC over 5 selected periods. Display time is variable, counts are automatically reset, action is repetitive, readings are direct without calculation or interpolation; an automatic illuminated decimal point is included.

The instrument is of highest quality throughout and employs a military design approach. -hp- 524C, less plug-ins, $2,300.00 (cabinet); $2,275.00 (rack mount). -hp- also offers Model 524D, similar but with 8 vertical readout units, at lower price.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 524B Frequency Counter	Frequency, period measurements	10 cps to 10.1 MC (Freq.) 0 cps to 10 KC (Period)	Direct reading, no interpolation; stability about 2/1,000,000/week	$2,150.00■
-hp- 524C Frequency Counter	Frequency, period measurements	10 cps to 10.1 MC (Freq.) 0 cps to 10 KC (Period)	Direct reading, no interpolation; stability about $5/10^9$ per wk	2,300.00■
-hp- 524D Frequency Counter	Frequency, period measurements	10 cps to 10.1 MC (Freq.) 0 cps to 10 KC (Period)	Direct reading, no interpolation; stability $5/10^9$ per wk	2,150.00■
-hp- 525A Frequency Converter	Extends 524 range to 100 MC; increases basic sensitivity	10 cps to 100 MC	Accuracy ±1 cps ± stability; 0.1 v rms min. input	250.00
-hp- 525B Frequency Converter	Extends 524 range from 100 to 220 MC; high sensitivity	100 MC to 220 MC	Accuracy ±1 cps ± stability; 0.2 v rms min. input	250.00
-hp- 526A Video Amplifier	Increases 524 sensitivity to 10 millivolts	10 cps to 10.1 MC	Accuracy same as basic counter; 10 mv rms min. input.	175.00
-hp- 526B Time Interval Unit	Measures interval 1 μsec to 100 days	1 μsec to 10^7 sec	Accurate 0.1 μsec ±0.0001%	175.00
-hp- 526C Period Multiplier	Period measurement	Extends range of 524 to measure 10,000 periods	Greater accuracy in period measurement	225.00

■ Rack mounted instrument $25.00 less.

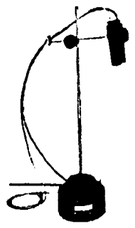
For details, circle #9 on Reader Service Card

Other hp Frequency Measuring and Monitoring Equipment

hp 500B/C Frequency Meters

Directly measures frequency of voltages 3 cps to 100 KC; expanded scale allows any 10% or 30% of range to be measured full scale. Sensitivity 0.2 v rms (sine waves), 1 v peak for pulses. Input impedance 1 megohm with 40 $\mu\mu$f shunt; accuracy independent of line voltage changes. Also available as *-hp-* 500C, calibrated for direct reading in rpm. *-hp-* 500B/C, $285.00 (cabinet), $290.00 (rack mount).

hp 506A Optical Tachometer Pickup



Versatile, flexible light source and pickup for use as a transducer with *-hp-* 521A/C, 500B/C, etc. Measures 300 to 300,000 rpm (beyond with amplified output); normal output at least 1 v rms into 1 megohm or greater impedance. Light source 21 cp 6 v bulb; Type 1P41 phototube, phototube bias 70 to 90 v dc (supplied from *-hp-* 500B/C, 521 A/C). *-hp-* 506A, $125.00.

hp 508A–D Tachometer Generators

Rotating speed transducers used with electronic counters or frequency meters for simple, accurate measurements from 15 to 40,000 rpm (or beyond with amplifier) *-hp-* 508A provides 60 output pulses per shaft revolution; *-hp-* 508B, C, D provide 100, 120 and 360 pulses/rev respectively. Output voltage increases linearly with shaft speed to 5,000 pps. Running torque approx. 0.15 in. oz.; peak starting torque approx. 4 in. oz. *-hp-* 508A, B, C or D, $100.00.

hp 521 Industrial Counters

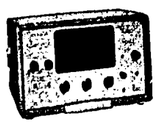
-hp- 521D

Low cost, simple operation, almost limitless uses characterize *-hp-* 521 Industrial Counters. *-hp-* 521A measures frequency, random events per unit of time; with transducers also measures rps, speed, rpm, weight, pressure, temperature, acceleration, etc. *-hp-* 521A reads direct in cps, rpm, and rps; display is variable 0.1 to 15 seconds or "hold." Frequency range 1 cps to 120 KC, accuracy ± 1 count ± accuracy of power line frequency (usually ± 0.1%); input min. 0.2 v rms; input attenuator adjusts sensitivity 0.2 to 100 v rms, input impedance 1 megohm with 50 $\mu\mu$f shunt, gate time 0.1 and 1 sec. also Manual Gate. *-hp-* 521C same as 521A except has greater accuracy, crystal controlled time base and 5-place (instead of 4-place) registration with count capacity of 99,999. *-hp-* 521D same as 521A except has in-line readout in bright, large numerals. *-hp-* 521E similar to 521D but has 5-place, in-line readout. *-hp-* 521G similar to 521A but measures to 1.2 MC (5 places). *-hp-* 521A, $475.00. *-hp-* 521C, $650.00. *-hp-* 521D, $675.00. *-hp-* 521E, $875.00. *-hp-* 521G, price on request.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 100D Secondary Standard	Frequency, time measurements	100 KC, 10 KC, 1 KC, 100 cps, 10 cps	Stability 1/1,000,000 (short-time). Sine or rectangular output. Marker pips	$ 750.00△
-hp- 500B Electronic Frequency Meter	Rapid frequency measurements	3 cps to 100 KC	9 ranges ±2% accuracy. Input 0.2 to 250 volts	285.00
-hp- 500C Electronic Tachometer Indicator	Rpm measurements	180 to 6,000,000 rpm	Similar to 500B but calibrated in rpm	285.00
-hp- 506A Optical Tachometer Pickup	Rps and rpm measurement	300 to 300,000 rpm	Phototube and light source; output 1 v rms	125.00
-hp- 508A Tachometer Generator	Shaft speed measurement	15 to 40,000 rpm	Output 60 cycles per revolution	100.00
-hp- 508B Tachometer Generator	Shaft speed measurement	15 to 30,000 rpm	Output 100 cycles per revolution	100.00
-hp- 508C Tachometer Generator	Shaft speed measurement	15 to 25,000 rpm	Output 120 cycles per revolution	100.00
-hp- 508D Tachometer Generator	Shaft speed measurement	15 to 5,000 rpm	Output 360 cycles per revolution	100.00
-hp- 520A Nuclear Scaler	For counting high-rate pulses	Capacity 100 counts in 2 decades. 10,000,000 pps counting rate	100:1 divider for operation of low speed scalers	615.00△
-hp- 521A Industrial Electronic Counter	Measure frequency, speed	1 cps to 120 KC	Direct reading, accurate within ±1 count ±0.1%, 4 place registration	475.00
-hp- 521C Industrial Electronic Counter	Measure frequency, speed	1 cps to 120 KC	Direct reading, accuracy within ±1 count ±0.01%, 5 place registration	650.00
-hp- 521D Industrial Electronic Counter	Measure frequency, speed	1 cps to 120 KC	Direct in-line readout accuracy within ±1 count ±0.01%	675.00
-hp- 521E	Measure frequency, speed	1 cps to 120 KC	Same as 521C except has in-line digital readout	875.00
-hp- 521G	Measure frequency, speed, elapsed time	1 cps to 1.2 MC	Direct reading, accuracy ±1 count ±0.1% 5 place registration	on request
-hp- 522B Electronic Counter	Frequency, period, time interval measurements	10 cps to 120 KC	Direct reading, accuracy ±1 count ±0.001%	915.00△
-hp- 523B Electronic Counter	Frequency, period, time interval	10 cps to 1.1 MC	Direct reading, accuracy ±1 count ±2/1,000,000	1,245.00
-hp- 523CR	Frequency, period, time interval	10 cps to 1.2 MC	Direct reading, accuracy ±1 count ±2/1,000,000, in-line digital readout, 10-line code arrangement	1,485.000
-hp- 523DR Electronic Counter	Frequency, period, time interval	10 cps to 1.2 MC	Direct reading, accuracy ±1 count ±2/1,000,000	1,285.00

△ Rack mounted instruments $15.00 less.

hp 522B Electronic Counter



Compact, low cost, versatile instrument for frequency, period or time measurements. Measures frequency 10 cps to 120 KC, time interval 10 μsec to 10^5 sec. Reads direct in cps, KC, seconds or milliseconds. Count automatically reset, action repetitive. Stability of time base 1/100,000 per week. Easily used by untrained personnel. High quality, completely self-contained, bright, clear numerals; ideal industrial as well as lab instrument. $915.00△.

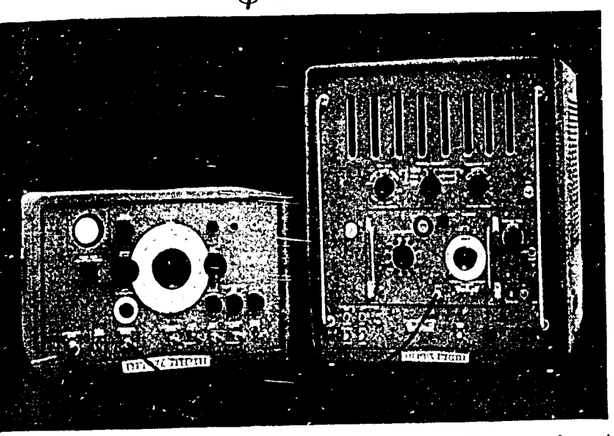
hp 523CR/DR Electronic Counters

-hp- 523CR

Model 523CR is a revolutionary all-purpose counter measuring frequency 10 cps to 1.2 MC, time interval 1 μsec to 27.8 hours, period 0.00001 cps to 100 KC. Stability 2/1,000,000 per week. Results displayed in sec, msec, μsec or KC; automatic decimal. Display time variable 0.1 sec to 10 sec or indefinitely. Accuracy ± 1 count plus crystal stability, 5 gate times. Usable with 100 KC primary standard. High quality; completely self-contained. Pulse output for Z-axis oscilloscope modulation. *-hp-* 523DR similar but has neon numeral column readout. *-hp-* 523CR, $1,485.00; *-hp-* 523DR, $1,285.00.

For details, circle #10 on Reader Service Card

hp 540A/540B Transfer Oscillator



Measure frequency to 12.4 KMC quickly, easily, with electronic counter accuracy. Avoid guesswork, end "trial and error," eliminate expensive setups. Measure on pulsed, AM, FM, CW and noisy circuits.

Just two -hp- instruments—Model 540B Transfer Oscillator and a 524 series electronic counter, (with plug-ins) are all the equipment you need to measure unknown frequencies up to 12.4 KMC swiftly and accurately.

This simple, two instrument setup is particularly useful for quick CW and AM frequency measurement, FM center frequency and deviation checks, and frequency of high-noise signals. Frequencies of pulsed signals can be measured using an external oscilloscope. Overall accuracy is better than 10 times that of the best microwave wavemeters; and on clean CW signals, is about 1/1,000,000.

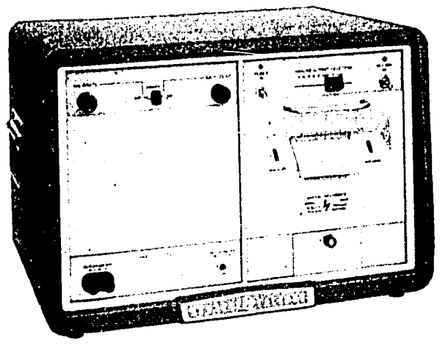
Simple operation

When approximate frequency is known, the 540B is tuned until a harmonic beats with the unknown. The multiplying factor is noted, and the 540B frequency measured on the 524. The 524 reading, times the multiplying factor, is the unknown.

Brief Specifications, hp 540B

Oscillator Freq. Range: 100 to 220 MC
Harmonic Freq. Range: Up to 12.4 KMC
Stability: Better than 0.002%/minute
Output: 2 volts into 50 ohms
Amplifier Gain: 40 db max, 1 v output
Oscilloscope: 100 cps to 200 KC; vert. sens. 5 mv rms/inch
Price: $750.00△.
Model 540A, similar to 540B, but requires an external mixer above 5 KMC. $615.00△.

hp 560A/561A/B Digital Recorder



Continuous digital record for counters
Direct reading, simple hookup
Five 11-digit lines/second
Analog output for pen recorder
Accuracy identical to counter used

No intermediate equipment is needed between *-hp-* 560A and an *-hp-* counter equipped with 560A digital recorder kit. In direct hookup, completely self-contained *-hp-* 560A provides a printed record of all types of test data, plus, through an analog output, a convenient graphic record of very small data variations.

The analog output is a voltage or current proportional to the number represented by any 3 consecutive digits of recorded data. The 560A permits expanded strip chart recording and the chart cannot be driven off scale since range variation for the 3-digit scale is 0 to 999. Wider variation merely causes a repetition of the 0 to 999 sequence. Print capacity is five, 11-digit lines/second; secondary or coding data may be entered simultaneously with primary data.

-hp- 561A Digital Recorder offers 10-line coded decimal entry with separate connection for each position of each wheel so that the instrument may be operated from relays, stepping switches and beam switching tubes.

-hp- 561B Digital Recorder similar to *-hp-* 561A, for use with *-hp-* 405AR Digital Voltmeter and *-hp-* frequency counters with in-line presentation.

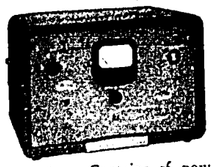
△ Rack mount instrument $15.00 less.

Brief Specifications

Accuracy: Identical to counter used
Printing Rate: 5 lines/sec maximum
Digit Capacity: Up to 11 per line
Driving Source: 560A—Parallel entry staircase voltages
561A/B—Ten-line decimal code
Analog Output: (560A) Proportional to any 3 consecutive digits; max. amplitude 1 ma or 100 mv
Print Command Signal: 10 μsec minimum, pos. or neg., 15 v pulse
Price: *-hp-* 560A $1,265.00△ (with six comparators).
-hp- 561A $975.00△.
-hp- 561B price on request.

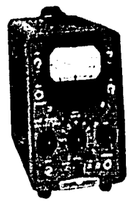
For details, circle #11 on Reader Service Card

Microwave Impedance Measuring Equipment



hp 416A Ratio Meter

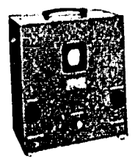
Automatically combines forward and reverse signals and displays their ratio directly, irrespective of amplitude variations. Contains rf power monitor indicating proper power level. Rear terminal signal available to operate oscilloscope or recorder. Suitable for single and swept frequency operation. $475.00△.



hp 415B Standing Wave Indicator

For all waveguide and coaxial slotted sections. Gives readings in SWR or db. Single frequency operation; 315 to 2020 cps. Low noise level, 0.1 μv (full scale) sensitivity, 60 db. calib. attenuator. $200.00.

hp 803A vhf Bridge



Provides direct impedance measurements in vhf range, 2 to 2,000 ohms, −90° to +90° phase angle. Wide frequency range 52 to 500 MC; makes measurements down to 5 MC and up to 1,000 MC. Fast, simple to use. $800.00.

hp 417A vhf Detector

Super-regenerative (AM) receiver covering all frequencies from 10 to 500 MC in 5 bands. Designed for use with -*hp*- 803A Bridge. 5 μv sensitivity full range. Single frequency control, reads direct in MC. $350.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-*hp*- 360A-D Low Pass Filters	Eliminates harmonic voltages from uhf systems	Cut-off frequencies A- 700 MC C-2,200 MC B-1,200 MC D-4,100 MC	50 db rejection at 1.25 cutoff freq.	$ 40.00
-*hp*- 415B Standing Wave Indicator	SWR indicator or null indicator	With external detectors, 10 to 18,000 MC	0 to 70 db attn. Max. sensitivity 0.1 μv	200.00
-*hp*- 416A Ratio Meter	Reflection coefficient measurements	With external detectors, 10 to 18,000 MC	Continuous swept frequency presentation; accuracy ±3%	475.00△
-*hp*- 417A vhf Detector	vhf bridge detector (for -*hp*- 803A)	10 to 500 MC	Approx. 5 μv sensitivity	350.00
-*hp*- 803A vhf Bridge	Measurement of vhf impedance, SWR	52 to 500 MC	2 to 2,000 ohms impedance —90° to +90° phase angle	800.00
-*hp*- 805A Coaxial Slotted Section	Measurement of SWR	500 to 4,000 MC	For Type N Connectors flexible cables	450.00
-*hp*- 805B Coaxial Slotted Section	Same as above	Same as above	For rigid 7/8" RG44/U line	450.00
-*hp*- 806B Coaxial Slotted Section	Same as above (mounts in 809B)	3,000 to 12,000 MC	For Type N Connectors flexible cables	200.00
-*hp*- 809B Universal Probe Carriage	G, J, H, X and P 810 Waveguide Sections Supports 806B section, also		Accepts 442B, 444A probes	160.00
-*hp*- 814B Universal Probe Carriage	Supports K and R 815B Waveguide Slotted Sections		Accepts Untuned Probe 446B	200.00

△ Rack mounted instruments $15.00 less.

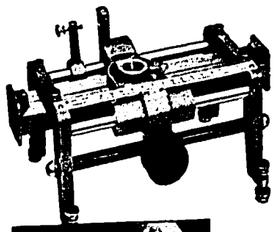
hp 360 Low Pass Filters

Isolating filters which speed microwave measurements by eliminating harmonics, permitting transmission at single, known frequency only. Particularly necessary in slotted line, filter characteristic, receiver response, similar measurements. Table above gives cut-off frequency; insertion loss not over 3 db; nominal impedance 50 ohms. -*hp*- 360A, B, C or D, $40.00.

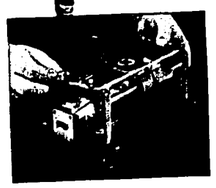
hp 805A/B Slotted Lines

Exclusive -*hp*- "parallel-plane" design insures utmost mechanical rigidity, less leakage, greater accuracy, low SWR of 1.02 or 1.04 (depending on model). Range 500 MC to 4 KMC, reads in cm and mm to 0.1 mm. -*hp*- 805A, for 50 ohm Type N use, -*hp*- 805B, for 46.3 ohm RG 44/U stub supported 7/8" O.D. coax. -*hp*- 805A/B, $450.00.

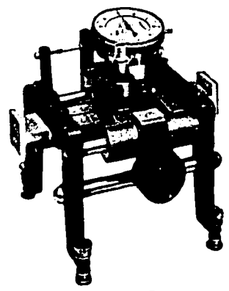
hp 809B/814B Universal Probe Carriages



-*hp*- 809B and 810B



Quick, easy waveguide interchange



-*hp*- 814B, 815B, 446B

Models 809B and 814B are precision built mechanical assemblies operating, respectively, with -*hp*- 810B and 815B series slotted sections.

Combination of the 809B carriage and 810 slotted sections covers 2.6 to 18.0 KMC. Combination of 814B carriage and 815B series sections covers 18.0 to 40.0 KMC.

On either carriage, waveguides can be interchanged in seconds for real savings on engineering time. Only one probe is required for each carriage to cover full frequency range. Manufacture is of highest quality to assure positive mechanical positioning of interchangeable waveguides and precise installation of mating -*hp*- probes (see table, "Waveguide Test Equipment"). -*hp*- 809B has a vernier scale reading to 0.1 mm and is equipped for dial gauge mounting. -*hp*- 814B has a dial read directly to 0.1 mm and interpolated to 0.01 mm.

-*hp*- 810B Slotted Sections. -*hp*- 810B, for mounting in 809B carriage, is a flanged, waveguide section with accurately machined slot. Slot is tapered at ends to minimize reflection. Available in 5 waveguide bands, 3.95 through 18.0 KMC.*

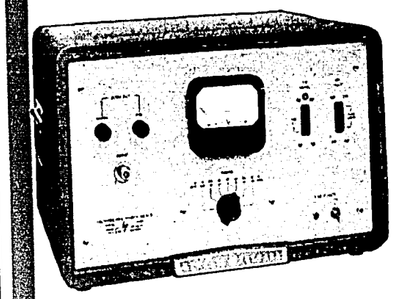
-*hp*- S810A. Complete slotted section assembly including probe carriage. In 2.6 to 3.95 KMC (S-band) size only.*

-*hp*- 815B Slotted Sections. For mounting in 814B carriage. Available K and R bands, 18.0 to 40.0 KMC. These sections are accurately machined so that they are quickly and easily interchanged, and precisely positioned.*

*For prices, see Waveguide Test Equipment table.

For details, circle #12 on Reader Service Card

Microwave Power Measuring Equipment



hp 434A Calorimetric Power Meter

Just connect and read powers 10 mw to 10 watts! Covers dc to 12.4 KMC. No barretter or thermistor needed. No external terminations or plumbing. Measures CW or pulsed power. Two simple controls; no technical skill required.

New -*hp*- 434A Calorimetric Power Meter is, factually, the fastest, easiest way yet devised to measure powers accurately from 10 milliwatts to 10 watts, dc to 12.4 kilomegacycles.

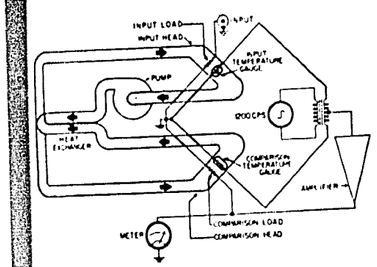
With the 434A, measurement is literally as simple as connecting to the 50 ohm, type N front panel terminal and reading power directly. Thus the instrument is particularly suited for use by non-technical people.

Compact, self-contained

-*hp*- 434A fills the range between bolometer microwave power meters (such as the popular -*hp*- 430C, below) and conventional calorimeters for powers above 10 watts. But unlike previous cumbersome equipment suggested for its range, the new -*hp*- 434A is compact, moderate in cost, completely self-contained, and needs no detectors or external plumbing whatsoever.

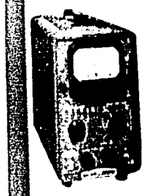
Brief Specifications

Input Power Range: 7 ranges; full scale readings 0.01 to 10 watts
Frequency Range: dc to 12.4 KMC
dc Input Impedance: 50 ohms ± 5 ohms at input jack
Input SWR: Less than 1.7 full range, less than 1.3 to 7 KMC
Meter Response (full scale): Less than 5 seconds
Controls: Zero Set, Meter Range
Accuracy: Within 5% of full scale
Price: $1,115.00 (cabinet); $1,100.00 (rack mount)



Circuitry, -*hp*- 434A

hp 430C Microwave Power Meter



No computations! Provides instantaneous, automatic power readings *direct* in dbm or mw at all frequencies for which there are suitable bolometer mounts. For CW measurements, uses either 1/100 amp. fuse or Sperry 821 barretter. Also measures CW or pulsed power with negative coefficient thermistor. Provides up to 16 ma bias current. Operates with all mounts in adjacent table. Range 0.02 to 10 mw. $250.00.

hp 477B Coaxial Thermistor Mount

For frequency range 10 MC to 10 KMC. SWR less than 1.5. Thermistor element is 200 ohm negative. No tuning required; not susceptible to burnout. $75.00 (including thermistor).

hp 764D-767D Dual Directional Couplers

New high directivity dual coaxial couplers make reflectometer measurements practical in vhf and uhf coax systems. Flat response, high power capacity, low insertion loss. Four models, covering 216 to 4,000 MC collectively. 764D/765D $160.00. 766D/767D $150.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-*hp*- 430C Microwave Power Meter	Measurement of rf power	Depends on Bolometer Mount	0.02 to 10 mw ±5% accuracy	$ 250.00
-*hp*- 434A Calorimetric Power Meter	Measurement of rf power	dc to 12.4 KMC	Direct reading, no barretters, thermistors or terminations; CW, pulsed	1,115.00△
-*hp*- 475B Tunable Bolometer Mount	Measurement of rf power (with 430B/C)	1,000 to 4,000 MC	Matches 50 ohm line to 100 or 200 ohms	225.00
-*hp*- 476A Universal Bolometer Mount	Measurement of rf power (with 430B/C)	10 to 1,000 MC	No tuning required SWR less than 1.25	85.00
-*hp*- 477B Coaxial Thermistor Mount	Measurement of rf power (with 430C)	10 MC to 10 KMC	No tuning required SWR less than 1.5	75.00
-*hp*- 485 Waveguide Detector Mount	Measurement of rf power	2,600 to 12,400 MC	Full coverage of waveguide band	See Table Waveguide Equipment
-*hp*- 487B Waveguide Thermistor Mount	Measurement of rf power	3,950 to 40,000 MC	Full coverage, no tuning, 1.5 SWR except K/R487B 2.0	See Table Waveguide Equipment
-*hp*- 764D Dual Directional Coupler	Reflectometer and rf power measurements	216 to 450 MC	Coupling attenuation* 20 db, directivity 30 db	160.00
-*hp*- 765D Dual Directional Coupler	Reflectometer and rf power measurements	450 to 945 MC	Coupling attenuation* 20 db, directivity 30 db	160.00
-*hp*- 766D Dual Directional Coupler	Reflectometer and rf power measurements	940 to 1,975 MC	Coupling attenuation* 20 db, directivity 26 db	150.00
-*hp*- 767D Dual Directional Coupler	Reflectometer and rf power measurements	1,900 to 4,000 MC	Coupling attenuation* 20 db, directivity 26 db	150.00

*Power handling capacity all 764/767 series couplers 50 watts CW, 10 Kw peak.

For details, circle #13 on Reader Service Card

Waveguide Test Equipment – 2.6 to 40.0 KMC

Basic, low-cost elements offer utmost flexibility for assembly of exact instrumentation required. Each unit covers entire range of its waveguide size. Careful engineering, simple, sturdy mechanical design, highest quality manufacture insures accurate, multi-purpose operation.

Instrument	Coaxial Type N Conn.	"S" 3" x 1½" 2.6 - 3.95 KMC	"G" 2" x 1" 3.95 - 5.85 KMC	"J" 1½" x ¾" 5.2 - 8.2 KMC	"H" 1¼" x ⅝" 7.05 - 10.0 KMC	"X" 1" x ½" 8.2 - 12.4 KMC	"P" .702"x.391" 12.4 - 18.0 KMC	"K" .500"x.250" 18.0 - 26.5 KMC	"R" .360"x.220" 26.5 - 40.0 KMC
Adapter, Waveguide to Coax		S281A $50	G281A $40	J281A $35	H281A $30	X281A $25			
Cover to Choke Flange		S290A $65	G290A $50	J290A $35	H290A $30	X290A $15	P290A $25		
Attenuators Waveguide to Waveguide	-hp- 292 Series: HX292B $25, MX292A $25, MP292A $25, NP292A $22.50, NK292A $20								
Fixed 3, 6, 10, 20 db		S370A $75	G370A $75	J370A $65	H370A $60	X370A $55	P370A $60	K370A $85	R370A $95
Precision Fixed		S372 $375	G372 $250	J372 $140	H372 $120	X372 $100	P372 $115		
Flap, 25 db max.		S375A $120	G375A $110	J375A $100	H375A $90	X375A $90	P375A $100	K375A†† $140	R375A†† $180
Calibrated, precision		S380A $260	G382A $500	J382A $350	H382A $350	X382A $275	P382A $275	K382A $425	R382A $450
Detector Mounts	420A $50				H421A $95	X421A $75	P421A $95		
	420B $75								
	440A† $85								
		S485D* $170	G485D* $170	J485D* $170					
		S485A† $140	G485B† $95	J485B† $90	H485B† $85	X485B† $75			
Thermistor Mounts (Fixed tuned) ■	477B $75		G487B $95	J487B $90	H487B $80	X487B $75	P487B $110	K487B†† $150	R487B†† $225
Frequency Meters, Reaction				J530A/B**	H530A $120	X530A $120	P530A $150		
Waveguide						X532A $150	P532A $210	K532A $230	R532A $250
Directional Coupler, Cross Guide: 20, 30 db6		S750 $150	G750 $120	J750 $80	H750 $70	X750 $50			
Directional Couplers, Multi Hole: 3, 10, 20 db		S752 $375	G752 $250	J752 $140	H752 $120	X752 $100	P752 $115	K752 $175	R752 $200
Slotted Sections, Waveguide		S810A* $450	G810B§ $110	J810B§ $110	H810B§ $110	X810B§ $90	P810B§ $110		
Slotted Sections, Waveguide								K815B $265	R815B $265
Tuners, Slide Screw		S870A $225	G870A $185	J870A $150	H870A $130	X870A $125	P870A $130	K870A†† $140	R870A†† $140
E-H						X880A $130	P880A $150		
Waveguide Phase Shifter				J885A $450		X885A $350	P885A $400		
Terminations, Low Power		S910A $60	G910A $50	J910A $35	H910A $30	X910B $25	P910A $30		
Terminations, High Power		S912A $160				X912A $50			
Moving Load		S914A $100	G914A $75	J914A $70	H914A $60	X914B $50	P914A $55	K914B $250	R914B $250
Standard Reflections						X916 $100			
Adjustable Shorts		S920A $100	G920A $70	J920A $60	H920A $50	X920A $40	P920A $55	K920A†† $140	R920A†† $150
Waveguide Shorting Switch						X930 $100			
Broad Band Probe	442B§ $40	All frequencies 446B $145 18.0 to 40 KMC							
Broad Band Probe, Untuned		444A $40 2.4 to 18.0 KMC							
Waveguide Clamps, Stands		Model 24 stand, $3.00				Model 25 clamps, $2.50 each, all bands			

†For use with barretter or crystal. ‡For use with barretter only. *Complete assembly including carriage. §Mounts in 809B Carriage.

■ Includes Thermistor, installed. **J530A, 5.85 to 8.2 KMC, $120; J530B, 5.20 to 7.05 KMC, $150. * Includes barretter; checked for square law characteristics.

††Available with circular flanges equivalent to UG-425/u for K bands and UG-381/u for R bands. Specify by adding suffix "C" to model number: i.e., K487BC.

NEW! hp 382A Precision Attenuators

Previously offered for frequencies 3.95 through 18.0 KMC, popular -hp- 382A series precision attenuators are now available in "K" and "R" bands, 18.0 to 40.0 KMC. "K," "R" band attenuators are of new, space-saving design (see photo). Direct reading, one-control tuning, high power handling capacity. Attenuation 0 to 50 db full range, independent of frequency. Phase shift constant with attenuation. For prices G, J, H, X and P382A, see table above. -hp- K382A, $425.00. -hp- R382A, $450.00

hp 281A Waveguide - Coax Adapters

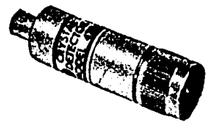
For convenient transition between waveguide and coax systems. Each unit covers a full waveguide range with SWR less than 1.25. Type N coax plug, AN waveguide flange. For S, G, J, H and X bands, 2.6 to 12.4 KMC. $25.00 to $50.00.

hp 487B Thermistor Mounts

For fast, accurate waveguide power measurements. Each unit covers full range of its waveguide frequency. No tuning needed, SWR 1.5 max., except K and R bands, SWR 2.0 max. Max. power 10 mw. Rugged construction, high temperature coefficient thermistors virtually eliminate burnout. For G, J, H, X, P, K and R bands. 3.95 to 40.0 KMC. $75.00 to $225.00.

hp 870A Slide Screw Tuners

For flattening waveguide systems, matching, etc. Probe position and penetration adjusts to set up reflection canceling existing reflection. Precision lead screw or micrometer varies probe insertion; vernier adjusts probe position. Corrects SWRs of 20 with accuracy of 1.02 SWR. For S, G, J, H, X, P, K, R bands, 2.6 to 40.0 KMC. $125.00 to $225.00.



hp 420A/B Crystal Detectors

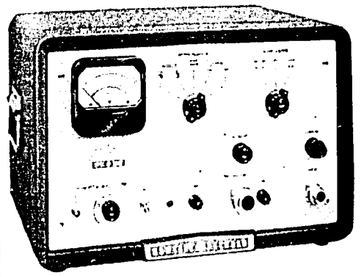
Employs a silicon crystal to detect rf signals in Type N coaxial lines. Covers frequencies 10 MC to 12.5 KMC, sensitivity approx. 0.6 v/0.1 mw, frequency response ±3 db full range. Uses modified 1N26 crystal, max SWR 3. $50.00 each. Also available as matched pairs as -hp- 420B, $150.00 pair.

hp 444A/446B Untuned Probes

-hp- 444A is modified crystal (1N76 or 1N26) plus small antenna in convenient housing. Probe penetration easily variable; may be locked in position. No tuning needed; sensitivity superior to most elaborate single or double tuned probes. Range 2.0 to 18 KMC; fits ¾" bore. *New -hp- 446B*, for -hp- 814 Probe Carriage, similar but covers K and R bands, 18.0 to 40.0 KMC. -hp- 444A, $40.00. -hp- 446B, $145.00.

NEW! hp Noise Measuring Equipment

hp 340B/342A Noise Figure Meters



Receiver and component alignment jobs that once took skilled engineers a full hour are now done in 5 minutes by a semi-skilled worker. Receiver performance can often be improved over the best adjustment previously possible. Improvement in receiver performance often equals doubling transmitter output. Since accurate alignment is easy, equipment is better maintained and peak performance enjoyed regularly.

Above are some of the time-saving, cost-cutting advantages of new -hp- noise figure measuring equipment including new Models 340B and 342A Noise Figure Meters and a variety of coaxial and waveguide noise sources.

Model 340B Noise Figure Meter automatically measures and continuously displays IF or rf amplifier noise figure at either 30 or 60 MC. Other frequencies from 10 to 60 MC on special order.

Model 342A Noise Figure Meter is similar to Model 340B except that it operates on five frequencies, 30, 60, 70, 105, and 200 MC. 30 MC and four other frequencies between 38 and 200 MC on special order.

Brief Specifications

Frequency Range: Depends on noise source

Noise Figure Range: 3 to 30 db, indication to ∞ with waveguide noise source
0 to 15 db, indication to ∞ with IF noise source

Accuracy: ± 0.5 db, 10 to 25 db; ± 1 db, 3 to 10 db, and 25 to 30 db, waveguide noise source
± 0.5 db, 0 to 15 db, IF noise source

Required Rcvr or rf Amplifier Gain: Approx. 40 db minimum (Waveguide Noise Source)
Approx. 50 db minimum (IF Noise Source)

Input Frequency: 30 or 60 MC, selected by switch

Bandwidth: 1 MC minimum

Input Impedance: 50 ohms

Price: -hp- 340B, $715.00△; -hp- 342A, $815.00△.

(Note: This instrument available only in U. S. and Canada.)

hp 343A vhf Noise Source

For IF and rf amplifier measurement. Temperature-limited diode broadband source operating at frequencies 10 to 600 MC. Excess noise 5.2 db, 50 ohms impedance. $75.00.

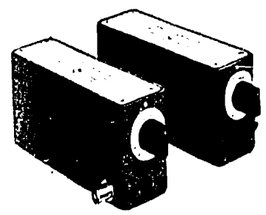
hp 345B IF Noise Source

Operates at either 30 or 60 MC. Frequency selector switch; other frequencies between 10 and 60 MC on special order. Separate switch matching 50, 100, 200 and 400 ohm lines. Excess noise 5.2 db. Temperature limited diode instrument. $75.00.

hp 347A Waveguide Noise Source

Argon gas discharge tubes mounted in waveguide section. Models cover all waveguide frequencies 2.6 through 18.0 KMC; S, G, J, H, X and P bands. Excess noise level approximately 15.2 db; noise level uniform even when instrument is cold. $180.00 to $190.00.

hp 355A/B Attenuators – 0 to 132 db



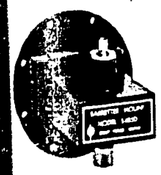
Here are two completely new design 50 ohm attenuators providing, together, 0 to 132 db attenuation in 1 db steps from dc to 500 MC! -hp- 355A provides 0 to 12 db attenuation in 1 db steps; -hp- 355B provides 0 to 120 db attenuation in 10 db steps. One simple control for each attenuator; overall full range accuracy is ± 0.25 db for -hp- 355A. For -hp- 355B, accuracy is ±1 db to 250 MC; ± 2 db to 500 MC. -hp- 355A or 355B, $125.00.

hp 350 Attenuators

Basic bridged-T high accuracy attenuators (not pictured). -hp- 350A matches 500 ohm lines, -hp- 350B matches 600 ohms. Maximum 110 db attenuation in 1 db steps. 5 watts capacity, high accuracy, compact, low cost. -hp- 350A or 350B, $85.00.

More hp equipment, available for most waveguide frequencies

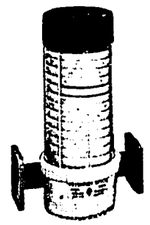
hp 485 Detector Mounts



Three basic series offered; *S485A* for S band (no tuning, 1.35 SWR, 821 element); *485B*, for G, J, H, X bands (tunable, 1.25 SWR (with barretter) full range, 1N23, 1N21 or 821 element); *485D* for S, G, J bands (factory-installed 821 barretter). $75.00 to $170.00.

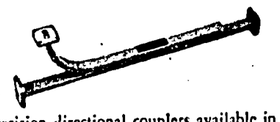
△ Rack mount instrument $15.00 less.

hp 532A Waveguide Frequency Meters



New design for P, K, R bands. Wide band, direct reading, no interpolation or charts. Comprises a high Q resonant cavity tuned by choke plunger; no sliding contacts. Transmits almost full power at resonance; resonance indicated by 1.5 db dip in output. Precision tuning mechanism; no back-lash. Also similar model for X-band. $150 to $250.

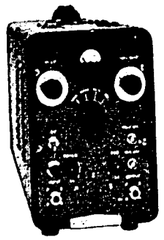
hp 752 Multi-Hole Couplers



Precision directional couplers available in 3 models with coupling factors of 3, 10 and 20 db. Coupling accuracy ± 0.4 db except K, R bands which are ± 0.7 db. Directivity better than 40 db full range, coupling variation not over ± 0.5 db full range. Primary guide SWR less than 1.05. S, G, J, H, X, P, K, R bands, 2.6 to 40.0 KMC. $100.00 to $375.00.

Wide Band Amplifiers for Fast Circuit Work

Traveling-Wave Tube Amplifiers



-hp- offers Traveling-Wave Tube Amplifiers for all frequencies 2 to 12.4 KMC. *-hp-* 490B, 492A and 494A are low level, high gain amplifiers with 30 and 25 db gain; they offer amplitude, pulse, phase or FM modulation. *-hp-* 491A is a high power traveling-wave tube amplifier having a rated output of 1 watt, 2 to 4 KMC. All amplifiers have exclusive *-hp-* helical coupling system, and employ encapsulated traveling-wave tubes that can be readily replaced. *-hp-* 490B/491A, $1,400.00. *-hp-* 492A/494A, $1,500.00.

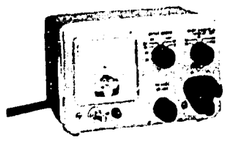
Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 450A Amplifier, Stabilized	General purpose lab amplifier	10 cps to 1,000,000 cps	20 and 40 db gain, frequency response ±½ db	$ 140.00
-hp- 460AR Amplifier, Wide Band	Wide band, pulse amplification	100 KC to 120 MC	20 db gain, rise time 0.003 μsec	185.00
-hp- 460BR Amplifier, Fast Pulse	Pulse amplification high output	100 KC to 120 MC	15 db gain, 125 peak volts	225.00
-hp- 490B Traveling-Wave Tube Amplifier	Amplification throughout "S" band	2 to 4 KMC	30 db gain; Millimicrosec rise time; 10 mw output	1,400.00
-hp- 491A Traveling-Wave Tube Amplifier	High power "S" band amplification	2 to 4 KMC	30 db gain; millimicrosec rise time; 1 watt output	1,400.00
-hp- 492A Traveling-Wave Tube Amplifier	Amplification through most of "G" and "J" bands	4 to 8 KMC	30 db gain; millimicrosec rise time; 10 mw output	1,500.00
-hp- 494A Traveling-Wave Tube Amplifier	Amplification throughout "X" band	7 to 12.4 KMC	25 db gain; millimicrosec rise time; 5 mw output	1,500.00

460AR/BR Fast Pulse Amplifiers

-hp- 460AR Wide Band Amplifiers, in cascade with *-hp-* 460BR Fast Pulse Amplifiers, provide up to 90 db gain, 125 v open circuit. This permits direct connection to oscilloscope deflection plates. Rise time 0.003 μsec. Will amplify millimicrosecond pulses. Over 100 MC band width for 'scopes. *-hp-* 460AR, $185.00. *-hp-* 460BR, $225.00.

Regulated and Klystron Power Supplies

NEW! 721A Transistor Power Supply



New, completely transistorized, compact, regulated supply. Output 0 to 30 v, continuously variable. 150 ma maximum output, output impedance less than 0.2 ohms. Regulation, no load to full load, 0.3% or 30 mv whichever is greater. Line voltage change of ± 10% causes output change of less than 0.3% or ± 15 mv, whichever is greater. Front panel switch limits maximum output current preventing damage to transistors, etc., from accidental overload. Reads ma, v direct. $145.00.

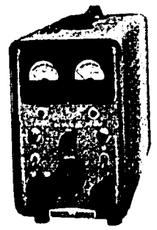
Instrument	Primary Use	Characteristics	Price
-hp- 711A Laboratory Power Supply	General purpose regulated dc supply for lab and field use	0 to 500 volts @ 100 ma	$250.00
-hp- 712B Power Supply	Same as 711A	0 to 500 volts @ 200 ma	365.00△
-hp- 715A Klystron Power Supply	Regulated beam, reflector source for low power klystrons	250 to 400 volts @ 50 ma	300.00
-hp- 721A Transistor Power Supply	Powering transistors, similar applications	0 to 30 v, 150 ma	145.00

△ Rack mounted instruments $15.00 less.

712B Power Supply

This *-hp-* instrument features high regulation of 50 mv no load to full load, 0.1 millisecond transient response, internal impedance 0.1 ohms in series with 25 μh; full-load maximum hum less than 500 μv, sealed transformers, chokes and condensers. 0 to 500 v, 200 ma supply and fixed −300 v tap providing a 50 ma, 300 to 800 v variable supply for klystron operation. $365.00△.

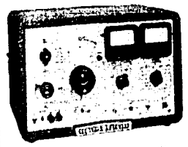
711A Power Supply



High regulation, 0 to 500 volt supply with separate meters. Ideal for powering experimental setups, other basic applications, including driving low level amplifiers, constant frequency oscillators and other setups requiring highly stable voltages. Regulation 0.5% or 1.0 volt, whichever is greater, no load to full load or on line voltages 110/230 v ± 10%. Less than 1.0 mv ripple, overload relay protection. Includes two 6.3 v ac 3 amp supplies. $250.00 (rack mount, $255.00).

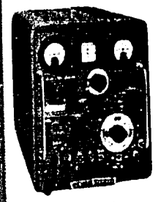
Signal Generators – 50 KC to 21 KMC

NEW! 606A Standard Signal Generator



New, ultra-modern; 50 KC to 65 MC. Output 3 v full range, continuous attenuation to 0.1 μv. MO-PA circuit with full feedback loop insures constant output full range. Low distortion, broad modulating capabilities. Typical *-hp-* speed, ease of operation; occupies ¼ bench space normally needed for generators of this frequency. $1200.00△.

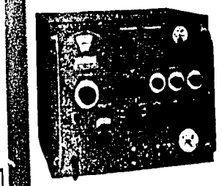
608D vhf Signal Generator



10 to 420 MC. Highest stability. No incidental FM or frequency drift. Calibrated output 0.1 μv to 0.5 v throughout range. Built-in crystal calibrator provides frequency check accurate within 0.01% each 1 and 5 MC. Master-oscillator, intermediate and output amplifier circuit design. Premium quality performance, direct calibration, ideal for aircraft communications equipment testing. $1,100.00.

-hp- 608C vhf Signal Generator. High power (1 v max.) stable, accurate generator for lab or field use. 19 to 480 MC. Ideal for testing receivers, amplifiers, driving bridges, slotted lines, antennas, etc. $1000.00.

626A/628A shf Signal Generators

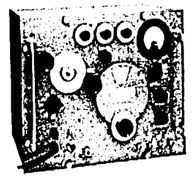


New instruments, bringing high power, wide range, convenience and accuracy to 10 to 21 KMC range. Frequencies, output voltage directly set and read. Output 10 to 20 db better than previous spot-frequency sets SWR better than 1.2 at 0 dbm and lower. Internal pulse FM or square wave modulation; also external pulsing or FM'ing. *-hp-* 626A, 10 to 15.5 KMC, $3,250.00. *-hp-* 628A, 15 to 21 KMC, $3,250.00.

Instrument	Frequency Range	Characteristics	Price
-hp- 606A	50 KC to 65 MC	Output 0.1 μv to 3 v. Full feedback loop, low distortion	$1,200.00△
-hp- 608C	10 to 480 MC	Output 0.1 μv to 1 v into 50 ohm load. AM, pulse, or CW modulation. Direct calibration	1,000.00
-hp- 608D	10 to 420 MC	Output 0.1 μv to 0.5 v. Incidental FM less than 0.001%	1,100.00
-hp- 612A	450 to 1,230 MC	Output 0.1 μv to 0.5 v into 50 ohm load. AM, pulse, CW or square wave modulation. Direct calibration	1,200.00
-hp- 614A	800 to 2,100 MC	Output 0.1 μv to 0.223 v into 50 ohm load. Pulse, CW or FM modulation. Direct calibration	1,950.00
-hp- 616A	1,800 to 4,000 MC	Output 0.1 μv to 0.223 v into 50 ohm load. Pulse, CW or FM modulation. Direct calibration	1,950.00
-hp- 618B	3,800 to 7,600 MC	Output 0.1 μv to 0.223 v into 50 ohm load. Pulse, CW FM or square wave modulation. Direct calibration	2,250.00
-hp- 620A	7,000 to 11,000 MC	Output 0.1 μv to 0.223 v into 50 ohm load. Pulse, FM or square wave modulation. Direct calibration	2,250.00
-hp- 623B	5925 - 6575 MC 6575 - 7175 MC 7175 - 7725 MC (specify)	Output 70 μv to 0.223 v into 50 ohm load. FM or square wave modulation. Separate power meter and wave meter section	1,900.00
-hp- 624C	8,500 to 10,000 MC	Output 2.23 μv to 0.223 v into 50 ohm load. Pulse, FM or square wave modulation. Separate power meter and wave meter section	2,265.00△
-hp- 626A	10 to 15.5 KMC	Output 10 dbm to −90 dbm. Pulse, FM, or square wave modulation. Direct calibration	3,250.00
-hp- 628A	15 to 21 KMC	Output 10 dbm to −90 dbm. Pulse, FM, or square wave modulation. Direct calibration	3,250.00

△ Rack mounted instruments $15.00 less.

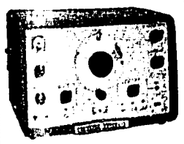
614A/616A uhf Signal Generators



Among most widely used signal generators. *-hp-* 614A, 800 MC to 2.1 KMC, *-hp-* 616A, 1.8 to 4.0 KMC. Direct reading, direct frequency set, no calibration charts, wide range. *-hp-* 614A SWR 1.6, output accuracy ± 1 db − 10 dbm to −127 dbm. *-hp-* 616A, SWR 1.8, output accuracy ± 1.5 db, −7 dbm to −127 dbm. Both have constant internal impedance 50 ohms. Modulation is internal or external pulse, or FM. *-hp-* 614A or *-hp-* 616A, $1,950.00.

Swept Frequency Oscillators

686A Electronic Sweep Oscillator



Totally new kind of backward-wave device eliminating sweep motors, tuning plungers, range limitations, etc. Covers all or part of X-band with flexible, *quiet* electronic sweep. Simple to operate, direct reading, continuously adjustable sweep width and rate, 10 mw output minimum, frequency sweep linear with time. Has slow sweep for recorders; fast for oscilloscope; single sweep manually started or externally triggered, external FM, AM modulation. Ultimate in X-band sweep oscillators, $2900.00△.

Instrument	Frequency Range	Characteristics	Price
-hp- 683A	2.0 to 4.0 KMC	Electronically swept; variable sweep rate, width. Output 10 mw, SWR 2.1 or less. Pulse, square wave, FM, AM modulation	$3,000.00△
-hp- 684A	3.7 to 5.9 KMC		2,900.00△
-hp- 685A	5.2 to 8.3 KMC		2,900.00△
-hp- 686A	8.2 to 12.4 KMC		2,900.00△
-hp- 687A	12.4 to 18.0 KMC		3,400.00△

△ Rack mounted instruments $15.00 less.

Data subject to change without notice. *Prices f. o. b. factory.*

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Bendix SUPERMARKET

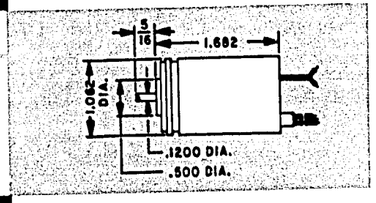
PRECISION COMPONENTS for SERVOMECHANISM & COMPUTING EQUIPMENT

AUTOSYN® SYNCHROS

AY-190 SERIES SIZE 11 FRAME

FUNCTION	CORROSION RESISTANT
Transmitter	AY-190-A1
Control Transformer	AY-191-A1
Resolver	AY-192-A1
Differential	AY-193-A1
Receiver	AY-194-A1*

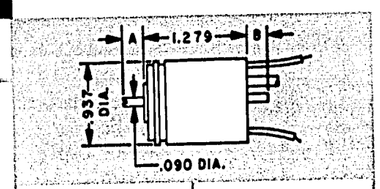
* Receiver not normally furnished in corrosion resistant construction.



AY-500 SERIES SIZE 10 FRAME

FUNCTION	STANDARD CONSTRUCTION	CORROSION RESISTANT	HIGH TEMPERATURE
Receiver	AY-50☐-2-A1	AY-50☐-F-20-A1	AY-50☐-8-A1
Receiver		AY-50☐-25-A1	
Control Transformer	AY-50☐-3-A1	AY-50☐-26-A1	
Transmitter	AY-50☐-4-A1	AY-50☐-F-19-A1	
Transmitter		AY-50☐-38-A1	
Control Transformer (HI-Z)	AY-50☐-5-A1		
Linear	AY-51☐-10-A1		
Resolver	AY-52☐-3-A1	AY-52☐-25-A1	
Differential	AY-53☐-3-A1	AY-53☐-25-A1	
Resolver (HI-Z)	AY-54☐-5-A1	AY-54☐-38-A1	
Resolver (HI-Frequency)	AY-55☐-24-A1	AY-55☐-39-A1	

Units listed can be furnished with terminal lugs.

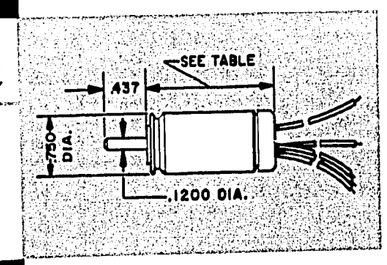


TYPICAL NO.	DIMENSION A	DIMENSION B
AY-500-2	1/4	0
AY-502-2	1/4	1/4
AY-503-2	3/8	0

AY-300 SERIES SIZE 8 FRAME

FUNCTION	CORROSION RESISTANT STANDARD HOUSING Length — 1.692"	CORROSION RESISTANT SHORT HOUSING Length — 1.241"
Receiver	AY-300-2-A1*	AY-300S-12-A1
Control Transformer	AY-300-25-A1	AY-300S-15-A1
Transmitter	AY-300-26-A1	AY-300S-16-A1
Control Transformer (HI-Z)	AY-300-38-A1	AY-300S-18-A1
Resolver	AY-320-25-A1	AY-320S-17-A1
Differential	AY-330-25-A1	AY-330S-15-A1

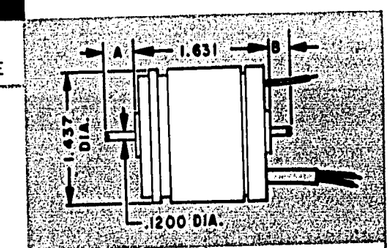
* Receiver not normally furnished in corrosion resistant construction.



AY-200 SERIES SIZE 15 FRAME

FUNCTION	STANDARD CONSTRUCTION	CORROSION RESISTANT	HIGH TEMPERATURE
Multi-Power Transmitter	AY-20☐S-1-B	AY-20☐S-44-B	
Receiver	AY-20☐S-2-B	AY-20☐S-52-B	
Control Transformer	AY-20☐S-3-B	AY-20☐S-25-B	AY-20☐S-31-B
Single-Power Transmitter	AY-20☐S-4-B	AY-20☐S-26-B	
Control Transformer (HI-Z)	AY-20☐S-5-B	AY-20☐S-38-B	AY-21☐S-48-B
Linear		AY-21☐S-42-B	
Resolver (HI-Z)	AY-22☐S-5-B	AY-22☐S-38-B	
Resolver	AY-22☐S-27-B	AY-22☐S-25-B	
Resolver (HI-Accuracy)		AY-22☐S-51-B	
Differential (Servo Application)	AY-23☐S-3-B	AY-23☐S-25-B	
Differential (Synchronous Application)	AY-23☐S-4-B		
Resolver (Omni Application)	AY-24☐S-5-B		
Resolver (HI-Frequency)	AY-25☐S-24-B	AY-25☐S-39-B	
Resolver, Control Transformer	AY-26☐S-3-B		
Variable Transformer	AY-27☐S-43-B	AY-27☐S-46-B	AY-27☐S-46-B
Resolver (Feedback)		AY-910-A-1	
Control Transformer (HI-Z)		AY-920-A1	

Units listed have loose leads. Can also be furnished with terminal boards.
AY-910 is furnished with terminal board.



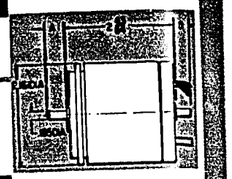
TYPICAL NO.	DIMENSION A	DIMENSION B
AY-200-1	1/4	0
AY-201-1	1/2	0
AY-202-1	7/16	3/8
AY-910	19/32	0
AY-920	1/2	0

For details, circle #19 on Reader Service Card

AY-400 SERIES SIZE 22 FRAME

FUNCTION	STANDARD CONSTRUCTION	CORROSION RESISTANT	TYPE NO.	DIMENSION A	DIMENSION B
Transmitter	AY-40□-1-A	AY-40□-2-A	AY-401-1	½	0
Differential	AY-43□-1-A	AY-43□-2-A	AY-402-1	½	½

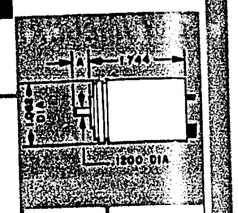
Units listed have loose leads.
Can also be furnished with terminal boards.



AY-600 SERIES SIZE 11 FRAME

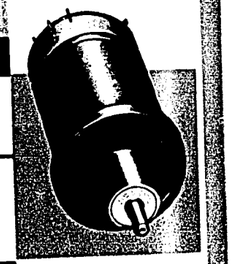
FUNCTION	STANDARD CONSTRUCTION	CORROSION RESISTANT	HIGH TEMP. AND CORROSION RESISTANT
Multi-Power Transmitter	AY-60□- 1-A1	AY-60□- 6-A1	AY-60□-12-A1
Control Transformer	AY-60□- 3-A1	AY-60□- 5-A1	AY-60□- 9-A1
Control Transformer (Med. Z)		AY-60□-11-A1	
Single-Power Transmitter	AY-60□- 8-A1		
Receiver	AY-60□-10-A1	AY-62□- 5-A1	
Resolver	AY-62□- 3-A1	AY-62□-18-A1	
Resolver (HI-Z)		AY-63□- 5-A1	AY-63□-12-A1
Differential		AY-935-A1	
Control Transformer (HI-Z)			

Units listed have loose leads. Can also be furnished with terminal boards.



TYPICAL NO.	DIMENSION A
AY-600-1	5/16
AY-601-1	½
AY-935-A1	½

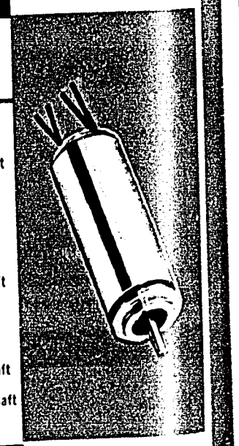
MOTORS AND GENERATORS



TACHOMETER GENERATORS — DAMPING

TYPE NUMBER	FRAME SIZE	GENERATOR EXCITATION (VOLTS)	GENERATOR OUTPUT (VOLTS)	LINEARITY	POWER INPUT (WATTS)	PHASE SHIFT	INERTIA	TEMPERATURE RANGE	REMARKS
FT-102-4-A1	10	26	0.5/1000	0.5% to 4000 rpm	1.75	Less than 10°	0.5 gm-cm²	−55°C to +125°C	Damping
FT-102-5-A1	10	18	0.34/1000	0.5% to 4000 rpm	3.5	Less than 10°	0.4 gm-cm²	−55°C to +95°C	Damping
FT-104-6-A1	11	115	0.55/1000	0.5% to 4000 rpm	2.4	20°	0.6 gm-cm²	−55°C to +95°C	Damping

LOW INERTIA SERVO MOTORS



TYPE NO.	RATED VOLTAGE PHASE 1	RATED VOLTAGE PHASE 2	MAX. POWER INPUT TOTAL (WATTS)	NO LOAD SPEED (RPM)	STALL TORQUE (OZ. IN.)	TORQUE TO INERTIA RATIO (RADIANS-SEC.²)	FRAME SIZE	REMARKS
CK-1066-40-A1	26	26	3.2	9,500	0.11	35,000	5	Tapered Shaft
CK-1018-7-A1	18	18	5.0	10,000	0.13	18,400	10	Tapered Shaft
CK-1018-16-A1	26	26	6.0	10,000	0.3	40,000	10	125°C Ambient Temp. Corrosion Resistant, Tapered Shaft
CK-1025-13-A1	115	115/57.5	12.0	4,800	1.45	31,000	15	MK 7 Mod. 1
CK-1031-18-A1	26	55	9.0	6,175	0.35	10,000	10	Corrosion Resistant
CK-1038-17-A1	26	50	4.75	5,500	0.39	14,500	15	Pinion on Tapered Shaft
CK-1041-19-A1	26	65	6.6	3,600	0.7	3,500	15	Drag Cup
CK-1043-17-A1	26	50	4.75	5,500	0.39	14,500	15	Tapered Shaft
CK-1045-16-A1	26	26	6.0	10,000	0.3	40,000	10	125°C Ambient Temp. Corrosion Resistant, Splined Shaft
CK-1048-24-A1	18	18	3.0	6,300	0.15	21,300	8	Splined Shaft
CK-1048-31-A1	26	26	4.5	6,300	0.20	28,300	8	Splined Shaft
CK-1049-25-A1	26	26	6.5	5,800	0.35	19,000	8	Splined Shaft
CK-2006-5-A1	115	115	30.0	6,600	3.0	5,700	20	
CK-2006-13-A1	115	115	26.0	6,000	2.5	41,500	20	Corrosion Resistant, Tapered Shaft with Threaded End
CK-2011-13-A1	115	115	26.0	6,000	2.5	41,500	20	Corrosion Resistant, Pinioned Shaft
CK-3004-4-A1	115	230	70.0	3,700	14.5	5,800	28	

MOTORS — CENTER TAPPED CONTROL WINDINGS

TYPE NUMBER	FRAME SIZE	CONT. PHASE VOLT.	CENTER TAPPED CONTROL PHASE TOTAL Z	R	X	POWER CONT. PHASE	FIXED PHASE VOLT.	FIXED PHASE Z	R	X	POWER FIXED PHASE	EFFECTIVE RESISTANT CONTROL PHASE	TORQUE	NO LOAD SPEED (RPM)
1265271	8	55	750	597	450	3.19	26	170	142	93	3.25	960	0.3	6000
1265272	10	52	584	419	405	3.3	26	146	105	101	3.3	830	0.3	10000
1265273	11	40	263	151	215	3.5	115	2175	1250	1780	3.5	460	0.63	6000
1269605	8	26	268	200	178	2.0	26	268	200	178	2.0	360	0.2	6000
1269702	8	52	680	568	372	3.25	26	170	142	93	3.25	830	0.3	6000

For details, circle #20 on Reader Service Card

MOTOR TACHOMETERS — TEMPERATURE COMPENSATED AND INTEGRATING TACHOMETERS

TYPE NUMBER	FRAME SIZE	RATED MOTOR VOLTAGES PHASE 1	PHASE 2	MAX POWER (MOTOR) WATTS	NO LOAD SPEED (GEN EXCITED)	STALL TORQUE	GENERATOR EXCITATION VOLTAGE	GENERATOR OUTPUT VOLTS PER 1000 RPM	LINEARITY OVER TEMP RANGE	POWER INPUT WATTS	PHASE SHIFT OVER TEMP RANGE	INERTIA gm-cm²	REMARKS
FV-124-17-A1	10	26	62*	7.0	9500	0.28	26	0.25	±1%	3.5	10±5°	1.0	Temp. Compensated from −40°C to +140°C, Damping
FV-125-16-A1	10	26	26	7.0	9500	0.28	26	0.25	±1%	3.5	10±5°	1.0	Temp. Compensated from −50°C to 95°C includes permanent magnet pickup, Damping.
FV-1000-1-A1	15	115	115	8.5/3.5	6000 Min	0.5 Min	115	1.50		6.5		21	−55° to +85° 4 poles motor, Integrating
X1265278-1	15	115	26	4/3	4000 Min	0.8	115	1.00		6.5		21	+15° to +85° 8 poles motor, Integrating
X1269710-1	15	115	40	6/6	7000 Min	0.75 Min	115	1.00		6.5		21	+15° to +85° 4 poles motor, Integrating
X1287158-1	15	52	26	2.2/3.75	6000 Min	0.35 Min	24	1.00		3		21	+15° to +70° 4 poles motor, Integrating
X1302932-1	11	30	30	3.5/3.5	5900	0.6	115	2.00		6.5		10	−55° to +105° 6 poles motor, Pulse generator, Integrating
X1302965-1	11	115	35	3.5/3.5	5900	0.6	115	1.00		1.5		9	+15° to +55° 6 poles motor, 2000 cps generator Integrating

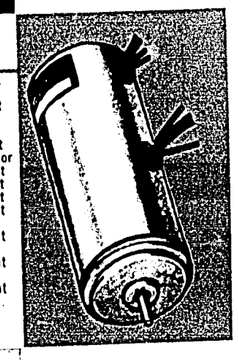
All corrosion resistant.

*Center tapped phase

TACHOMETER GENERATORS — TEMPERATURE COMPENSATED AND INTEGRATING

TYPE NUMBER	FRAME SIZE	GENERATOR EXCITATION (VOLTAGE)	GENERATOR OUTPUT VOLTS PER 1000 RPM	LINEARITY OVER TEMP. RANGE	POWER INPUT WATTS	PHASE SHIFT OVER TEMP. RAISE	INERTIA gm-cm²	TEMP RANGE	REMARKS
FT-107-7-A1	11	115	2.00	0.10% to 4000 RPM	6.2		7.5	−55°C to +85°C	Integrating
FT-1003-3-A1	15	115	4.00	0.12% to 4000 RPM	12		7	−55°C to +70°C	Integrating
FT-1003-4-A1	15	115	1.50	0.12% to 4000 RPM	6.5		20	−55°C to +85°C	Integrating
FT-1004-5-A1	15	115	2.75	0.12% to 1000 RPM	6.5		20	−55°C to +125°C	Integrating
FT-2000	20	115	2.00	0.15% to 3600 RPM	8	0±0.1°	100	15°C to 75°C	Integrating
X1261412-1	20	115	2.00	0.15% to 3600 RPM	8		100	−55°C to +85°C	Integrating
X1269711-1				1% to		12°±10°		−50°C to	Damping
X1290426	10	26	0.30	4000 RPM	3.5		0.4	+45°C	Compensated

MOTOR DAMPING TACHOMETERS



TYPE NO.	RATED VOLTAGE PHASE 1	PHASE 2	MAX. POWER INPUT TOTAL (WATTS)	NO LOAD SPEED (RPM)	STALL TORQUE (OZ. IN.)	TORQUE TO INERTIA RATIO (RADIANS-SEC.²)	GEN. EXCIT. (VOLTS)	GENERATOR OUTPUT (VOLTS)	FRAME SIZE	REMARKS
FV-10□-5-A1	26	26	7.0	10,000	0.28	20,000	18	0.37/1000	10	Corrosion Resistant
FV-10□-7-A1	26	26	9.7	6,000	0.50	22,000	26	0.5/1000	11	High Temperature Corrosion Resistant
FV-103-6-A1	115	115/57.5	7.0	6,200	0.60	25,500	115	0.5/1000	11	
FV-105-15-A2	26	26	7.0	10,000	0.28	6,000	18	0.34/1000	10	High Inertia Rotor Includes Permanent
FV-109-10-A1	26	26	7.0	10,000	0.28	14,000	18	0.3/1000	10	Magnet Generator for Speed Measurement
FV-110-12-A1	33*	52/26	7.0	10,000	0.28	20,000	26	0.5/1000	10	Corrosion Resistant
FV-110-9-A1	26	52/26	7.0	10,000	0.28	20,000	26	0.5/1000	10	Corrosion Resistant
FV-112-11-A1	18	18	3.0	6,000	0.15	13,000	18	0.25/1000	8	Corrosion Resistant
FV-120-14-A1	26	26	6.0	20,000	0.16	11,400	26	0.25/1000	10	Two Pole Motor
FV-2005-5-A1	115	115/57	26.0	6,000	2.5	39,000	115	0.5/1000	20	Corrosion Resistant
FV-3005-5-A1	115	230/115	70.0	3,700	14.5	4,200	115	0.5/1000	28	
X1269606	26	26	4.0	6,000	0.20	17,000	18	0.25/1000	8	Corrosion Resistant
X1290423	115	40*	7.0	6,200	0.60	25,500	115	0.5/1000	11	High Temperature
X1295664	26	26	4.0	6,000	0.20	17,000	26	0.3/1000	8	Corrosion Resistant High Temperature

*Center tapped phase

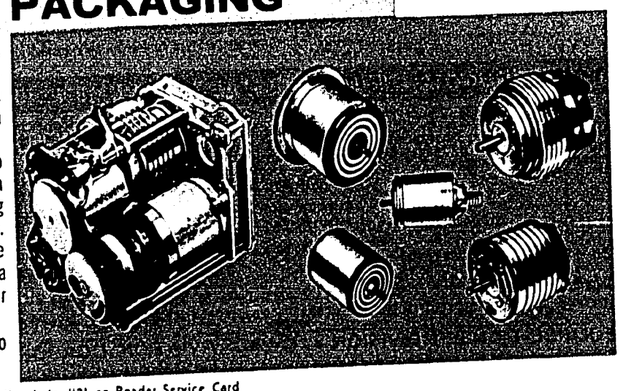
COMPONENT PACKAGING

In addition to supplying catalog component items such as — synchros, motors, gyros, etc. — Eclipse-Pioneer is in an excellent position to offer a premium in the way of customer service and accommodation on component packaging.

We may have already solved a problem similar to yours — for somebody else, thus enabling our system specialists to adapt from our extensive line, existing production packages to meet your systems requirements.

Should your problem turn out to be entirely new, we can — and will — design, develop, and produce a component or complete system to solve your specific problem.

No package too intricate or too simple, no quantity too large or too small — for Eclipse-Pioneer.

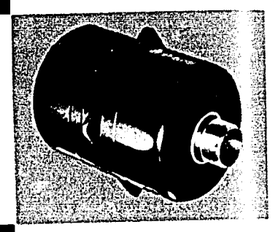


For details, circle #21 on Reader Service Card

PRECISION GYROS FOR ALL APPLICATIONS

Eclipse-Pioneer . . . the nation's foremost supplier of panel indicator gyros . . . offers a complete line of gyros to meet all applications. This group includes all the basic vertical, rate, free, and directional types used as reference components in complete navigation, radar, compass, automatic flight control, and guidance systems.

CAGEABLE FREE GYRO TYPE NUMBER 17224-1-A



FEATURES: Designed specifically for missile application where maximum operating temperature of 350°F. allows location near missile skin. Caging time of 8 secs. achieved through solenoid-link mechanism, thus replacing standard motor-gear train caging mechanisms.

MOTOR: 115 volts, 400 cps, 3 phase with rated speed of 22,000 rpm and a rotor moment of inertia of 1260 gram-cm².

DRIFT RATE: Will not exceed 4° per hour when subjected to Scorsby test at amplitude of ±15° and rate of approximately 6 cpm (corrected for earth's rotation).

PICKOFF: Potentiometer pickoff available on inner and outer gimbal axes. May be excited by either dc or ac source potential. 360° freedom on outer axis and ±85° on inner axis.

CAGING AND UNCAGING: Can be caged and uncaged remotely by applying 28 volts dc. Positive mechanical locking in cage position. Dynamic caging up to roll rates of 30°/sec. Will cage consistently from any position within 8 secs. with gyro rotor at full speed. Application of 28 volts dc will uncage within 0.1 seconds.

WARM-UP TIME: 90% of rated speed in one minute.

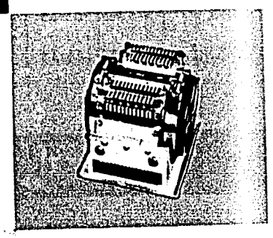
ENVIRONMENTAL CHARACTERISTICS: Maximum operating temperature of 350°F. and a minimum of −55°F. Maximum allowable shock is 60 g. with maximum operating vibration of 7 g. (from 10 to 550 cps). Maximum excursion not to exceed 0.5 in. Positive hermetic seal.

OPERATING LIFE: Minimum of 1000 hours.

OVERALL SIZE: 4 inches x 5 inches (less connector).

WEIGHT: Approximately 4.2 lbs.

MINIATURE VERTICAL GYRO TRANSMITTER TYPE NUMBER 14128-1-A



FEATURES: Electrolytic switch detectors, hysteresis synchronous motor, completely self-contained, requires no erection amplifier, and hermetically sealed.

MOTOR: 115 volts, 400 cps, 3 phase, hysteresis synchronous with rated speed of 24,000 rpm and a rotor moment of inertia of 1200 gram-cm².

DATA TRANSMITTERS:
- Type — Autosyn synchro
- Output voltage — 11.8 volts (maximum)
- Null — 30 mv (maximum)
- Maximum error — 7 minutes
- Sensitivity — 200 mv/degree

ERECTION RATE:
- Normal — 2 degree per minute, nominal
- Fast — 20 degree per minute

DEGREES OF FREEDOM:
- Bank — 360 degrees
- Pitch — Controlled tumbling at 85 degrees (approximately)

FREE DRIFT: ¼ degree per minute

OPERATING LIFE: 1000 hours

TEMPERATURE RANGE: −55°C to +71°C

DIMENSIONS:
- With shockmount — 5-1/2" wide x 4-15/16 high x 5-1/4 long
- Gyro only — 3-1/2" diameter x 5" long

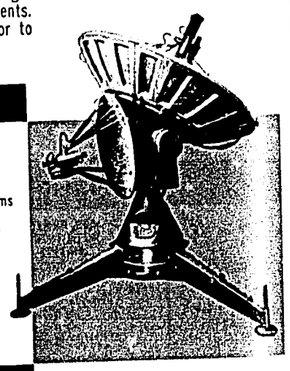
WEIGHT:
- With shockmount — 5 lbs. 12 oz.
- Gyro only — 3 lbs. 12 oz.

RADAR ANTENNA DEVICES

Vast experience in servo-mechanisms and in latest packaging techniques plus the use of lightweight castings throughout, enables Eclipse-Pioneer to manufacture radar antenna devices to meet a wide variety of exacting requirements. Airborne or ground radar antenna devices can be supplied to include the electro-mechanical drive unit only or to include the complete reflector assemblies and feed systems.

TYPICAL EXAMPLES OF ECLIPSE-PIONEER RADAR ANTENNA DEVICES

HIGH GAIN SEARCH ANTENNA

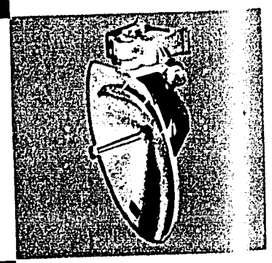


Lightweight, ground-based, air-transportable, dual reflector, multi-band, high gain search antenna and control system.

Specifications	
Weight	1000 lbs.
Data accuracy	0.5 mil.
Slewing rates (in azimuth and elevation)	2 rpm
Operating temperature range	−54°C to +66°C
Elevation and Azimuth	Two-speed 60 cps synchro data systems 1:1 and 36:1
Servo drives	Induction motor coupled bidirectional hysteresis clutch
Wind loading	50 mph (full operating performance). 100 mph (no structural damage).
Frequency range	10 to 1
Bands	Four, remotely selected
Polarization	Four planes remotely selected
Beam width	Broad and narrow remotely selected

Available with shock-proof, water-proof transit cases.

AIRBORNE WEATHER RADAR ANTENNA TYPE NUMBER 40027-□-A

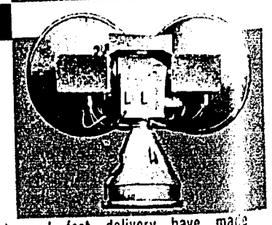


Airborne weather radar antenna with line of sight stabilization for x- or c-band, switchable wide fan (cosecant squared) beam pattern for mapping or pencil beam for storm detection.

Specifications	
Standard frequency range	9345 to 9405 mc/s. This permits beacon operation at 9310 mc/s.
Optional frequency range	9215 to 9275 mc/s.
Operation	Up to 60 kw peak with a 0.001 duty cycle.
Reflector size	30 in. dia. (truncated)
Beam width	3.2° maximum in E and H planes
Side lobes	At least 18 db below main lobe peak.
Polarization	Horizontal for pencil beam, vertical for mapping.
Weight	27 lbs. (approximate)
Operating temperature range*	−40°C to +55°C
Storage temperature range*	−65°C to +55°C
Humidity	10% to 95%

*These temperature ranges can be extended for specific application

GROUND ANTENNA PEDESTAL TYPE NUMBER 40107-1-A



Lightweight, ground-based, air or all-purpose vehicle transportable tracking antenna pedestal for mounting dual reflector.

Specifications	
Weight	700 lbs. approx.
Data accuracy*	0.7 mil.
Slewing rates (in azimuth and elevation)	4 rpm.
Operating temperature range	−54°C to +66°C
Elevation and Azimuth	Two-speed synchro data systems 1:1 and 16:1
Elevation load	Counterbalanced
Servo drives	¾ hp motors (dc) for use with an amplidyne servo system.
Wind loading	50 mph (full operating performance) 100 mph (no structural damage)

*Higher accuracies available

Supermarket volume makes Eclipse-Pioneer the ideal place to shop for synchros, motors, gyros, radar antenna devices, and component packages.

Premium precision, minimum cost, and fast delivery have made Eclipse-Pioneer the "buy word" for precision components.

ECLIPSE-PIONEER DIVISION • Bendix AVIATION CORPORATION • TETERBORO • NEW JERSEY

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SYLVANIA INDUSTRIAL & MILITARY

Special-Purpose Cathode Ray Tubes

Type	Faceplate	Focus	Deflection	Deflection Angle	Anode Volts Kv.Abs.Max.	Nominal Length (Inches)
RADAR INDICATORS						
3ACP12A	C	ES	ES	....	6.6*	10
3FP7A	C	ES	ES	....	4.4*	10
3JP7	C	ES	ES	....	4.4*	10
3JP12	C	ES	ES	....	2.75	11⅓
3KP7	C	ES	ES	....	6.6*	16¾
5ABP7	C	ES	ES	....	6.6*	16¾
5ADP7	C	ES	ES	....	11.0	11⅓
5AHP7	C	ES	MAG.	53	11.0	11⅓
5AHP7A	CA	ES	MAG.	53	11.0	11⅓
5AHP14	C	ES	MAG.	53	11.0	11⅓
5AHP14A	CA	ES	MAG.	53	11.0	11⅓
5AHP19	C	ES	MAG.	53	11.0	11⅓
5AHP19A	CA	ES	MAG.	53	11.0	11⅓
5AQP7	C	ES	ES	....	4.4	16¾
5CP7A	C	ES	ES	....	4.4*	16¾
5CP12	C	ES	ES	....	4.4*	16¾
5FP7A	C	MAG.	MAG.	53	8.8	11⅓
5FP14	C	MAG.	MAG.	53	8.8	11⅓
5FP14A	C	MAG.	MAG.	53	8.8	11⅓
5RP7A	C	ES	ES	....	28.0*	16¾
5UP7	C	ES	ES	....	2.75	14¾
6DP7	CA	ES	ES	....	15.0*	20⅛
6DP14	CA	ES	ES	....	15.0*	20⅛
6DP19	CA	ES	ES	....	15.0*	20⅛
6DP25	CA	ES	ES	....	15.0*	20⅛
7ABP7	C	ES	MAG.	50	11.0	13¼
7ABP7A	CA	ES	MAG.	50	11.0	13¼
7ABP14	C	ES	MAG.	50	11.0	13¼
7ABP14A	CA	ES	MAG.	50	11.0	13¼
7ABP19	C	ES	MAG.	50	11.0	13¼
7ABP19A	CA	ES	MAG.	50	11.0	13¼
7BP2A	C	MAG.	MAG.	53	8.8	13¼
7BP7A	C	MAG.	MAG.	53	8.8	13¼
7JP7	C	ES	ES	....	6.6	14½
7MP7	C	MAG.	MAG.	50	8.8	12½
7MP14	C	MAG.	MAG.	50	8.8	12¾
8CP7	C	ES	ES	....	6.6*	16½
10KP7	T	MAG.	MAG.	50	11.0	17⅝
10KP7A	T	MAG.	MAG.	50	11.0	17⅝
10VP7	CA	MAG.	MAG.	50	13.2	17⅝
10WP7	T	ES	MAG.	50	13.2	16¹³⁄₁₆
10WP7A	TA	ES	MAG.	50	13.2	16¹³⁄₁₆
10WP14	T	ES	MAG.	50	13.2	16¹³⁄₁₆
10WP14A	TA	ES	MAG.	50	13.2	16¹³⁄₁₆
10WP19	T	ES	MAG.	50	13.2	16¹³⁄₁₆
10WP19A	TA	ES	MAG.	50	13.2	18
12ABP7	T	ES	MAG.	55	13.2	18
12ABP7A	TA	ES	MAG.	55	13.2	18
12ABP14	T	ES	MAG.	55	13.2	18
12ABP14A	TA	ES	MAG.	55	13.2	18
12ABP19	T	ES	MAG.	55	13.2	18
12ABP19A	TA	ES	MAG.	55	13.2	18
12CP7A	T	MAG.	MAG.	50	11.0	19⅝
12CP7C	TA	MAG.	MAG.	50	13.2	19⅝
12SP7	C	MAG.	MAG.	55	11.0	18¾
12SP7D	TA	MAG.	MAG.	55	13.0	18¾
OSCILLOSCOPES						
2AP1A	C	ES	ES	....	1.1	7⅞
3AC1A	C	ES	ES	....	6.6*	10
3AC2A	C	ES	ES	....	6.6*	10
3AD1	C	ES	ES	....	6.6*	10
3AD2	C	ES	ES	....	6.6*	10
3BP1A	C	ES	ES	....	2.2	10
3JP1	C	ES	ES	....	4.4*	10
3JP2	C	ES	ES	....	4.4*	10
3KP1	C	ES	ES	....	2.75	11½

Type	Faceplate	Focus	Deflection	Deflection Angle	Anode Volts Kv.Abs.Max.	Nominal Length (Inches)
OSCILLOSCOPES (Continued)						
3MP1	C	ES	ES	....	2.75	8
3RP1	C	ES	ES	....	2.75	9⅛
3RP1A	C	ES	ES	....	2.75	9⅛
3SP1	C	ES	ES	....	3.0	9⅛
3SP2	C	ES	ES	....	3.0	9⅛
5ABP1	C	ES	ES	....	6.6*	16¾
5ADP1	C	ES	ES	....	6.6*	16¾
5ADP2	C	ES	ES	....	6.6*	16¾
5AQP1	C	ES	ES	....	4.4	16¾
5AQP2	C	ES	ES	....	4.4	16¾
5BP1A	C	ES	ES	....	2.2	16¾
5CP1A	C	ES	ES	....	4.4*	16¾
5RP1A	C	ES	ES	....	28.0*	16¾
5RP2A	C	ES	ES	....	28.0*	16¾
5UP1	C	ES	ES	....	2.75	14¾
6DP1	CA	ES	ES	....	15.0*	20⅛
6DP2	CA	ES	ES	....	15.0*	20⅛
7JP1 7VP1	C	ES	ES	....	6.6	14½
8CP1	C	ES	ES	....	6.6	16½
8CP2	C	ES	ES	....	6.6*	16½
VIDEO RECORDERS						
3ACP11A	C	ES	ES	....	6.6*	10
3ADP11	C	ES	ES	....	6.6*	10
3KP11	C	ES	ES	....	2.75	11½
3SP5	C	ES	ES	....	3.0	9⅛
3SP11	C	ES	ES	....	3.0	9⅛
5ABP11	C	ES	ES	....	6.6*	16¾
5ADP11	C	ES	ES	....	6.6*	16¾
5AQP11	C	ES	ES	....	4.4	16¾
5CP11A	C	ES	ES	....	4.4*	16¾
5FP11A	C	MAG.	MAG.	53	8.8	11⅓
5RP5A	C	ES	ES	....	28.0*	16¾
5RP11A	C	ES	ES	....	28.0*	16¾
5UP11	C	ES	ES	....	2.75	14¾
5WP11	C	ES	MAG.	50	30.	11⅞
6DP11	CA	ES	ES	....	15.0*	20⅛
8CP5	C	ES	ES	....	6.6*	16½
8CP11	C	ES	ES	....	6.6*	16½
10NP11	A	MAG.	MAG.	52	27.5	17¾
INDUSTRIAL MONITORS						
3KP4	C	ES	ES	....	2.75	11⅓
3RP4	C	ES	ES	....	2.75	9⅛
3SP4	C	ES	ES	....	3.0	9⅛
5ABP4	C	ES	ES	....	6.6*	10¾
5ABP4A	CA	ES	MAG.	53	11.0	11⅓
5FP4A	C	MAG.	MAG.	53	8.8	11⅓
5RP4A	C	ES	ES	....	28.0*	16¾
8CP4	C	ES	ES	....	6.6*	16½
8FP4	TA	MAG.	MAG.	90	10.8	11⅞
10SP4	TA	ES	MAG.	50	22.0	16¾
RECEIVER CHECK TUBES						
5AXP4	C	AUTO	MAG.	53	19.8	10⅝
8XP4	T	AUTO	MAG.	90	22.0	11⅞
8YP4	T	AUTO	MAG.	110	22.0	8¹¹⁄₁₆
FLYING SPOT SCANNERS						
3KP16	C	ES	ES	....	2.75	11⅓
5BNP16	CA	ES	MAG.	53	19.8	10⅝
5WP15	C	ES	MAG.	50	30.	11⅞
5ZP15	CA	ES	MAG.	40	30.0	14⅝
5ZP16	CA	ES	MAG.	40	30.0	14⅝
5ZP24	CA	ES	MAG.	40	30.0	14⅝
10VP15	CA	MAG.	MAG.	50	13.2	17⅝

A Aluminized C Clear T Tinted * Post accelerator voltage

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SYLVANIA GERMANIUM TRANSISTORS

Transistor Type	Application	Max. Diss. At 25°C Type	Ambient	Max. VCB	Max. VCE(1)	Max. IC (ma)	Max. Junction Temp. (°C)	Typical Values Current Gain hFE	Cutoff Current (ua at rated VCB) ICBO	Cutoff Frequency fab (mc)	fae (mc)	Circuit Power Gain db
RF-IF AMPLIFIER												
2N94	RF-IF Amplifier	NPN	50 mw	—	20	—	75	7.5	35	—	3	—	26
2N94A	RF-IF Amplifier	NPN	50 mw	20	20	50	75	7.5	—	25	3	—	26
2N216	IF Amplifier	NPN	50 mw	—	18	—	75	5	—	25	3	—	24
2N233A	IF Amplifier	NPN	50 mw	—	18	—	75	5	—	25	3	—	27
2N247	RF/IF Amplifier	PNP	35 mw	-35	VEB = -0.5	10	85	60	—	25	—	—	13.5
2N370	20 Mc Amplifier	PNP	80 mw	-20	VEB = -1.5	10	85	105	—	25	—	—	38
2N373	IF Amplifier	PNP	80 mw	-12	VEB = -0.5	10	85	90	—	3	—	—	25
2N515	IF Amplifier	NPN	50 mw	—	18	10	75	7.5	—	25	3	—	27
2N516	IF Amplifier	NPN	50 mw	—	18	10	75	7.5	—	25	3	—	28.5
2N517	IF Amplifier	NPN	50 mw	-18	VEB = -1.0	10	85	100	—	25	(1.5 mc operation)		34
2N544	RF/IF Amplifier	PNP	80 mw	-18	VEB = -0.5	10	85	100	—	25	(1.5 mc operation)		20
2N624	12.5 mc Amplifier	PNP	100 mw	-30	-20	—	100	30	—	15	(12.5 mc operation)		
OSCILLATOR												
2N193	Oscillator	NPN	50 mw	—	18	50	75	7.5	—	25	3	—	—
2N211	Oscillator	NPN	50 mw	—	10	50	75	10	—	25	3	—	14.5
2N371	20 Mc Oscillator	PNP	80 mw	-20	VEB = -0.5	10	85	90	—	25	—	—	
MIXER												
2N194	Mixer	NPN	50 mw	—	18	50	75	8	—	25	3	—	15
2N372	20 Mc Mixer	PNP	80 mw	-20	VEB = -0.5	10	85	90	—	27	—	—	14.5
2N409	Mixer	PNP	80 mw	—	-20	15	85	48	—	—	3	—	20
CONVERTER												
2N140	Converter	PNP	35 mw	-16	—	15	85	—	—	5	5	—	30
2N194A	Converter	NPN	50 mw	—	18	5	75	—	—	—	2	—	23
2N212	Converter	NPN	50 mw	—	12	50	75	20	—	25	6	—	40
2N374	Converter	PNP	80 mw	-12	VEB = -0.5	10	85	105	—	3	—	—	32
2N411	Converter	PNP	80 mw	-13	—	15	85	—	—	5	—	—	32
2N1058	Converter	NPN	50 mw	—	18	—	75	—	—	—	4	—	24
AUDIO, DRIVER, AND MEDIUM POWER												
2N34	Audio	PNP	50 mw	-40	—	25	100	75	75	—	50	—	.010	37
2N35	Audio-Driver	NPN	50 mw	40	25	1.5A	75	—	—	40	5 ma	.400	—	23
2N68	Audio-Power	PNP	1.5 w	-30	-15	1.5A	75	—	—	40	5 ma	.400	—	23
2N95	Audio-Power	NPN	1.5 w	30	15	1.5A	75	—	—	40	5 ma	.400	—	23
2N101	Audio-Power	PNP	1 w	-30	-15	800	75	—	—	40	5 ma	.400	—	23
2N102	Audio-Power	NPN	1 w	30	15	800	75	—	—	40	5 ma	.400	—	—
2N109	Audio	PNP	50 mw	-25	—	70	85	—	—	70	5	—	—	23
2N141	Audio-Power	PNP	1.5 w	-60	-30	800	75	—	—	40	5 ma	.400	—	23
2N142	Audio-Power	NPN	1.5 w	60	30	800	75	—	—	40	5 ma	.400	—	23
2N143	Audio-Power	PNP	1 w	-60	-30	800	75	—	—	40	5 ma	.400	—	23
2N144	Audio-Power	NPN	1 w	60	30	800	75	—	—	30	5 ma	.400	—	23
2N213	Audio-Driver	NPN	50 mw	40	25	100	75	300	—	50	—	.010	10kc	40
2N213A	Audio-Driver	NPN	50 mw	—	25	100	85	—	—	—	—	.110	—	—
2N214	Audio-Matched Pair	NPN	180 mw	40	25	100	75	—	75	25	—	—	—	28
2N228	Audio-Output	NPN	50 mw	—	25	100	75	60	70	50	600	—	10kc	26
2N270	Audio-Power	PNP	150 mw	-25	—	75	85	—	75	—	—	.600	—	37
2N306	Audio-Driver	NPN	50 mw	-20	15	—	75	75	—	25	—	—	10kc	30
2N381	Audio-Power	PNP	400 mw	—	-30	200	85	—	—	35	10	—	10	30
2N382	Audio-Power	PNP	200 mw	—	-30	200	85	—	—	60	10	—	10	34
2N383	Audio-Power	PNP	200 mw	—	-30	200	85	—	—	80	10	—	10	38
2N405	Audio-Driver	PNP	150 mw	-20	-18	35	85					.250	—	—
2N591	Audio-Driver	PNP	150 mw	-40	-25	100	85					—	10kc	40
2N1059	Audio-Output	NPN	180 mw	40	15	100	75					—	10kc	28
2N1101	Audio-Output	NPN	180 mw	20	15	100	75					—	10kc	—
2N1102	Audio-Output	NPN	180 mw	40	25	100	75					—	10kc	—
HIGH POWER AUDIO												
2N176	Audio-Power	PNP	10 w at 80°C	—	-30	3A	90	—	—	—	—	.006	—	—
2N242	Audio-Power	PNP	25 w	-45	-45	2A	100	—	—	—	1.0	—	.007	35
2N268	Audio-Power	PNP	25 w	-80	—	—	85	—	—	—	2.0 ma	—	.006	30
2N296	Audio-Power	PNP	25 w	—	-60	2A	85	—	—	30	1.0 ma	—	.004	—
2N301	Audio-Power	PNP	12 w at 55°C	-40	—	1A	85	—	—	—	0.5 ma	—	—	35
2N301A	Audio-Power	PNP	12 w at 55°C	-60	—	1A	85	—	—	—	0.5 ma	—	—	—
2N307A	Audio-Power	PNP	17 w	-35	-35	2A	75	—	—	30	3.5 ma	—	.0035	25
2N326	Audio-Power	NPN	7 w	35	35	2A	85	—	—	35	250	.150	—	—
2N350	Audio-Power	PNP	10 w at 80°C	-40	—	3A	90	30	40	60	1.5 ma	—	.005	31.5
2N351	Audio-Power	PNP	10 w at 80°C	-40	—	3A	90	45	55	—	1.5 ma	—	.005	33.5
2N419	Power Supply	PNP	32 w (17)	—	-45	3A	95					—	—	—
2N420	Power Supply	PNP	34 w (17)	—	-40	5A	100					—	—	—
COMPUTER												
2N123	Switching	PNP	100 mw	-20	-15	125	85					5	—	—
2N312	Switching	NPN	100 mw	15	15	200	85	—	50	7	(tr + td = 1.5 us max.)			—
2N356	Switching	NPN	100 mw	20	18	500	85	—	30	20	3	—	—	—
2N357	Switching	NPN	100 mw	20	15	500	85	—	30	20	6	—	—	—
2N358	Switching	NPN	100 mw	20	12	500	85	—	30	20	9	—	—	—
2N377	Switching	NPN	150 mw	25	20	200	100	—	40	6	6	—	—	—
2N385	Switching	NPN	150 mw	25	25	200	100	—	70	17	4	—	—	—
2N388	Switching	NPN	150 mw	25	20	200	100	—	110	10	8	—	—	—
2N404	Switching	PNP	120 mw	-25	-24	100	85	—	—	10	4	—	—	—
2N425	Switching	PNP	150 mw	-30	-20	400	85	—	15	10	6	—	—	—
2N426	Switching	PNP	150 mw	-30	-18	400	85	—	18	10	11	—	—	—
2N427	Switching	PNP	150 mw	-30	-15	400	85	—	20	10	17	—	—	—
2N428	Switching	PNP	150 mw	-30	-12	400	85	—	30	10	17	—	—	—
2N439	Switching	NPN	100 mw	30	20	—	85					3	—	—
2N556	Switching	NPN	100 mw	25	20	200	85	—	50	10	{tr + td = 3.5 us max. to = 2.0 us max.}			—
2N557	Switching	NPN	100 mw	20	20	200	85	—	30	10	{tr = 6.5 us max. to = 2.5 us max.}			—
2N558	Switching	NPN	100 mw	15	10	200	75	—	75	10	{tr + td = 3.5 us max. to = 2.0 us max.}			—
2N585	Switching	NPN	120 mw	25	20	200	85	—	30	25	{tr = 2.0 us max. to = 2.0 usmax.}			—
2N587	Switching	NPN	150 mw	40	20	200	85					5	—	—
2N679	Switching	NPN	150 mw	25	20	200	85					2	—	—
2N1114	Switching	NPN	150 mw	25	15	200	100					7	—	—

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SYLVANIA CRYSTAL DIODES

*ABSOLUTE MAXIMUM RATINGS — CHARACTERISTICS AT 25°C

Type	Description	Reverse Working Voltage (volts)	Avg. Anode Current (ma)	Forward Current at +1 Volt (ma min.)	Reverse Current (ua max.)
1N34A	60 volt	60	50	5	30 at —10v, 500 at —50
1N35	Matched Pair	50	22.5	7	10 at —10v
1N38B***	100 volt	100	30	4 (25 max.)	6 at —3v, 500 at 100v
1N398	200 volt	200	50	4	100 at —100v, 600 at 200v
1N40	Plug-in Varistor	25	22.5	12.7 at 1.5v	40 at 10v
1N41**	Packaged Varistor	25	22.5	12.7 at 1.5v	40 at 10v
1N42**	100 volt Varistor	100	22.5	12.7 at 1.5v	750 at —100v
1N48**	70 volt	70	50	4	800 ua at —50v
1N52A	50 volt	50	50	5 (25 max.)	100 at —50v
1N54A	High Back Resistance	50	50	5	7 at —10v, 100 at —50v
1N55A***	150 volt	150	50	4	500 at —150v
1N56A***	High Conduction	40	60	15	300 at —30v
1N58A	100 volt	100	50	4	600 at —100v
1N60	Video Detector	25	50	—	—
1N63	High Back Resistance	100	50	4	50 at —50v
1N64**	Video Detector	20		(45 mc) = 100 ua	
1N65	70 volt	70	50	2.5	200 at —50v
1N67A***	Miniature—High Back	80	30	4	5 at —5v, 50 at —50v
1N68A	100 volt General Purpose Miniature	100	40	3.0	625 at —100v
1N69A***	60 volt	60	40	.5 (25 max.)	30 at 10v, 500 at —50v
1N70A***	100 volt	100	30	.3 (25 max.)	25 at 10v, 300 at 50v
1N71	Low Impedance Varistor	40	60	15	300 at —30v
1N72	UHF Mixer	5	25	(N.F. = 14 — 19db)	—
1N77A	Photodiode .093" dia. per	—	10	—	8 at —10v, 30 at —50v (dark)
1N77B	Photodiode .077" dia. per	—	10	—	8 at —10v, 30 at —50v (dark)
1N81	Low Voltage	40	30	3	10 at —10v
1N81A***	Low Voltage	40	30	3 (25 max.)	10 at —10v
1N82	UHF Mixer	—	—	—	—
1N82A	UHF Mixer	—	—	—	—
1N90	Miniature—General Purpose	60	30	5	750 at —50v
1N91	100 volt 150 ma Germanium Rectifier	30	150	—	2.7 ma at 100v
1N92	200 volt 100 ma	65	100	—	1.9 ma at 200v
1N93	300 volt 75 ma	100	75	—	1.2 ma at 300v
1N98	Miniature—High Back	80	30	20	.8 at —5v, 100 at —50v
1N100	Miniature—High Back	80	30	20	.5 at —5v, 50 at —50v
1N115	60 volt Computer	60	25	2.5	—
1N117	60 volt General Purpose Miniature	60	30	10	100 at —50v
1N118	Miniature—High Conduction	60	60	20	100 at —50v
1N119	60 volt—Computer	60	25	5	—
1N120	60 volt—Computer	60	25	5	—
1N126A***	Miniature—60 volt	60	30	5 (25 max.)	50 at —10v, 850 at —50v
1N127	Miniature—100 volt	100	30	3	25 at —10v, 300 at —50v
1N127A***	Miniature—100 volt	100	30	3 (25 max.)	25 at —10v, 300 at —50v
1N128***	Miniature—High Back	40	30	3	10 at —10v
1N140	70 volt	70	85	40	300 at —50v
1N191	Miniature—Computer	90	30	5	—
1N192	70 volt—Computer	60	25	25	—
1N193	High Temperature	50	30	1.0 at +2v	20 at —10v, 40 at —40v
1N194	High Temperature	40	30	1.5 at +2v	10 at —40v
1N195	High Temperature	40	30	2.0 at +2v	10 at —40v
1N196	High Temperature	50	30	1.0 at +2v	10 at —40v
1N198	Miniature—75°C	80	30	4	10 at —10v, 50 at —50v
1N198A***	Miniature—75°C	80	30	4 (25 max.)	10 at —10v, 50 at —50v
1N253	.65 volt 1 amp. Silicon Rectifier	—	1000	—	10 at —75v
1N254	135 volt 400 ma Silicon Rectifier	—	400	—	10 at —150v
1N255	270 volt 400 ma Silicon Rectifier	—	400	—	10 at —350v
1N256	400 volt 200 ma Silicon Rectifier	—	200	—	—
1N270	70 volt Miniature	80	60	200	75 at —10v, 100 at —50v
1N276***	50 volt	50	40	40	20 at —10v, 100 at —50v
1N279***	30 volt	30	80	100	200 at —20v
1N281	.60 volt High Conductance	60	75	100	30 at —10v
1N283	Miniature—High Conductance	20	100	200	80 at —10v
1N294	60 volt	60	50	.5 (25 max.)	10 at —10v, 800 at —50v
1N295**	Video Detector	40	35	(50 mc lo = 375 ua)	—
1N297	80 volt DC Restorer	80	35	3.5	10 at —50v
1N298	OV Miniature Computer	70	50	2.0	250 at —40v
1N417	Computer	60	60	—	—
1N418	Computer	60	16	7	—
1N419	Computer	80	60	125	—
1N435	Varistor	40	60	—	300 at —30v
1N448	VLI	100	60	25	30 at —30v, 100 at —100v
1N449**	VLI	30	60	50	30 ua at —30v
1N450	VLI	100	60	50	30 at —30v, 100 at —100v
1N451**	VLI	150	60	50	150 ua at —150v
1N452**	VLI	30	80	100	30 ua at —30v
1N453**	VLI	100	80	100	100 ua at —100v
1N454**	VLI	50	100	200	50 ua at —50v
1N455**	VLI	30	100	300	30 ua at —30v
1N456	25 volt Silicon Miniature	25	90	40	.025 at —25v
1N457	70 volt Silicon Miniature	60	75	20	.025 at —60v
1N458	150 volt Silicon Miniature	125	55	7	.025 at —125v
1N459	200 volt Silicon Miniature	175	40	3	.025 at —175v
1N461	25 volt Silicon Miniature	25	60	15	0.5 at —25v
1N462	70 volt Silicon Miniature	60	50	5	0.5 at —60v
1N463	200 volt Silicon Miniature	175	30	1	0.5 at —175v
1N464	125 volt Silicon Miniature	125	40	3	1.0 at —125v
1N482	30 volt HI Conduction Silicon Miniature	36	200	100	.25 at —30v
1N482A	30 volt HI Conduction Silicon Miniature	36	200	100	.025 at —30v
1N483B	50 volt HI Conduction Silicon Miniature	70	200	100	.025 at —60v
1N486A	160 volt HI Conduction Silicon Miniature	225	200	100	.05 at —225v
1N571	High Conductance	15	—	200	100 at —10v at 55°C
1N584	400 volt 200 ma Germanium Rectifier	—	400	—	—
1N634	Miniature—VLI	60	100	50	.35 at —30v, 115 at —100v
1N636	60 volt	60	30	2.5 (25 max.)	.10 at —10v, 20 at —20v
1N805	10 volt P. C. Detector	40	35	3.0	100 at —10v
1N1093	Computer	15	50	—	.25 at —5v and 75 at —14v at 55°C
D-660	5 volt VHF TV Mixer	—	—	—	—
SR-200	200 ma 300 volt (PIV) Silicon Rectifier	—	200	—	1.0 at —300v
SR-500	500 ma 400 volt (PIV) Silicon Rectifier	—	500	—	1.0 at —300v

*Ratings are limiting values assigned by the manufacturer to operating or storage conditions (electrical, mechanical, or environmental) under the control of the user. If values are exceeded, permanent impairment of the device and/or performance may result.

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***Available to Military Performance Specifications

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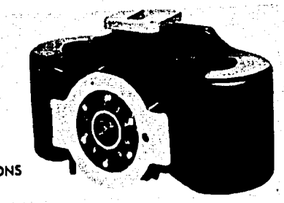


MAGNETRONS

FERRITE DEVICES

SYLVANIA MICROWAVE COMPONENTS & TUBES

"Rocket" Planar Triodes

Sylvania Rocket Tubes are planar-electrode disc-seal triodes for use as oscillators and amplifiers at frequencies up to 3300 mc. Design permits broadband operation. Tuning is simpler and covers a greater continuous range than that of many other types of UHF tubes.

2C36—is a pulse-modulated oscillator for frequencies up to 3000 mc.
2C37—is designed for use as a c.w. oscillator up to 3300 mc. Plate disc is flat, grid disc folded.
5764—is a CW or pulse-modulated oscillator for use up to 3300 mc.
5765—is for use as a c.w. oscillator without external feedback in the range from 900 to 2900 mc.
5767—is a c.w. oscillator for use up to 3300 mc. Both discs are folded.
5768—is intended for use as a c.w. amplifier-multiplier up to 3000 mc.
6018—is a pulse-modulated oscillator for use up to 1750 mc.
6BA4—High gain, low noise, UHF television amplifier.
6481 (RT434)—c.w. oscillator for use up to 3300 mc.
6503—c.w. amplifier for use up to 3000 mc.

Microwave Crystal Diodes

Sylvania manufactures microwave crystals for radar, countermeasure and test applications.

Type	Purpose	Frequency
1N21B*	Mixer	3000 mc
1N21C*	Mixer	3000 mc
1N21D*	Mixer	3000 mc
1N21E*	Mixer	3000 mc
1N21WE	Double ended mixer	9375 mc
1N23B**	Mixer	1000 mc
1N23C**	Mixer	9375 mc
1N23D**	Mixer	9375 mc
1N23E**	Mixer	9375 mc
1N23WE	Double ended mixer	9375 mc
1N149	Mixer	1000 mc
1N25	Mixer	1000 mc
1N25A	Mixer	24000 mc
1N26	Mixer	24000 mc
1N26A	Mixer	35000 mc
1N53	Mixer	35000 mc
1N53B	Mixer	35000 mc
D938	Mixer	16000 mc
1N78	Mixer	16000 mc
1N78A	Mixer	16000 mc
1N78B	Mixer	10000-22000 mc
1N286	Mixer	3000-12000 mc
1N1132	Tripolar Mixer	9375 mc
1N31	Video Detector	3000 mc
1N32	Video Detector	10000 mc
1N76	Video Detector	10000 mc
1N76A	Video Detector	26500-40000 mc
1N446	Video Detector	9000 mc
1N1611	Video Detector	1000-12000 mc
1N358	Tripolar Video Detector	1000-12000 mc
1N358A	Tripolar Video Detector	3000-12000 mc
1N369	Tripolar Video Detector	1000-12000 mc
1N369A	Tripolar Video Detector	1000-12000 mc
1N630	Tripolar Video Detector	3000-12000 mc
1N1610	Tripolar Video Detector	1000-12000 mc
1N2127	Tripolar Video Detector	100 mc
1N830 (D-4050)	"Micro-min" detector	9375 mc
1N833 (D-4063)	"Micro-min" detector	3060 mc
1N831 (D-4064)	"Micro-min" mixer	9375 mc
1N832 (D-4065)	"Micro-min" mixer	9375 mc

NOTE: Reverse polarity and matched pairs are available for all mixer crystal types except 1N286 and 1N1132.
*Double ended version: 1N416 series **Double ended version: 1N415 series

Magnetrons

Sylvania magnetrons are designed for military and commercial radar applications.

Type		
2J42	9375 Mc-Fixed	8 KW
2542H	9375 Mc-Fixed; High Alt.	7 KW
2J42B	9375 Mc-Fixed; Ruggedized	7 KW
6027	9375 Mc-Fixed	18 KW
6027H	9375 Mc-Fixed; Ruggedized	18 KW
7098	9300-9500 Mc Beacon Tunable; Ruggedized	60 W
7503	Type 7098 with TNC output	60 W
6874	9000-9600 Mc-Tunable	180 KW
7006	9000-9600 Mc-Tunable; Rugged.; High RRV	190 KW
M4163	8500-9600 Mc-Tunable	180 KW
M4164	8500-9600 Mc-Tunable; Rugged.; High RRV	200 KW
M4193	8500-9600 Mc-Tunable; Rugged.; High RRV	200 KW
M4154	24000 Mc-Fixed; Ruggedized	55 KW
5789	34800 Mc-Fixed	40 KW
M4155A	34800 Mc-Fixed; Ruggedized	40 KW
6799	34800 Mc-Fixed	100 KW

TR and ATR Tubes

Sylvania's TR/ATR line emphasizes new developments in high power and coaxial types.

Type	Description	Frequency, mc
6164	Broadband TR	8490-9578
6163	ATR	9050
TR860	Coaxial TR	(classified)
6899	Broadband TR	8700-8900

Counter Tubes

Sylvania decade counter tubes provide visual and electrical read-out for a broad field of counting and programming applications.

Type	Rated Speed	Outputs
6476	4 KC	10
6476A	4 KC	10
6802	4 KC	4
6879	5 KC	3
6909	100 KC	4
6910	100 KC	10
7155	100 KC	3

Trigger Tubes

OA5—Cold cathode trigger tube capable of dissipating one watt of energy. Designed in T 5½ bulb size.

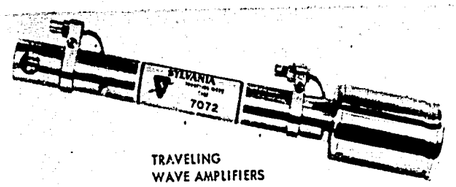
6483—Cold cathode trigger tube capable of dissipating one watt of energy. Designed in T-3 bulb size.

6873—Ruggedized cold cathode trigger tube with increased trigger sensitivity and higher operating voltage capabilities. T 5½ bulb.

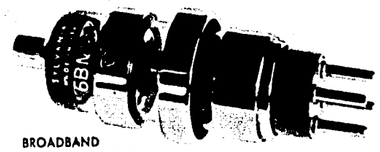
SYLVANIA
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

SYLVANIA ELECTRIC PRODUCTS INC.
Special Tube Operations
500 Evelyn Ave., Mountain View, Calif.

For details, circle #26 on Reader Service Card



TRAVELING WAVE AMPLIFIERS



BROADBAND REFLEX KLYSTRONS

SYLVANIA MICROWAVE COMPONENTS

Rugged, Reliable Traveling-Wave Amplifiers

Broadband amplifiers for airborne, shipboard, and ground based equipment. Fully tested to complete military-type specifications. Ideal for countermeasures, radar, communications and test equipment.

Lightweight Permanent Magnet Types

Type	Frequency (KMC)	Power Output
TW-4006	1-2	15 mw
TW-4007	1-2	1 watt
TW-4002	2-4	10 mw
7072	2-4	1 watt

Compact Solenoid Types*

Type	Frequency (KMC)	Power Output
6753	1-2	15 mw
6752	1-2	2 watts
TW-620A	1-2	2 watts
TW-538	1-2	1 KW, pulse
6493	2-4	10 mw
6559	2-4	2 watts
TW-534	2-4	2 watts, pulse
6698	2-4	1 KW, pulse
TW-613	8-11	5 mw
TW-622	8-11	2 watts
TW-591	8-10.5	1.0 KW, pulse

Rugged, Reliable Backward Wave Oscillators

Compact voltage-tuned broadband oscillators for wide-range search receivers and test equipment.

Type	Frequency (KMC)	Power Output
6699*	1-2	20-700 mw
6496*	2-4	20-700 mw
7096	2-4	100 mw
BW-623*	4-8	20-700 mw
PIA-1757	26.5-41	5 mw

*Mating Solenoid available for all types.

Long-Life Reflex Klystrons for Microwave Relays

These reliable klystrons are widely proven in microwave relay service. Fully tested to the equipment specification. Maximum frequency stability results from special tuner design.

Type	Frequency (KMC)	Power Output
6974*	4.6-5.0	2 watts
K-4008	5.3-6.3	0.02-1 watt
K-4009	5.3-6.6	0.02-1 watt
K-4010	5.8-7.125	0.02-1 watt
K-4011	6.3-7.5	
6468	6.125-6.425	1 watt
6469	6.575-6.875	1 watt
6470	7.125-7.425	1 watt
K-8418	6.125-6.425	1 watt
K-8408	6.575-6.875	1 watt
K-8398	7.125-7.425	1 watt
K-4162	6.125-6.425	1 watt
K-4161	6.575-6.875	1 watt
K-4160	7.125-7.425	1 watt

*Special Linear Tuner.

Broadband Reflex Klystrons

These versatile klystrons are ideal for search receivers, signal generators, and microwave relays.

Type	Frequency (KMC)	Power Output
6BM6	0.55-3.8	50-175 mw
6BM6A*	0.55-3.8	50-175 mw
6BL6	1.6-6.5	60-250 mw
5836	1.6-6.5	60-250 mw
5837	0.55-3.8	50-175 mw

*Pulse type.

Waveguide Windows

Type	Freq. Range, mc	Waveguide
BW342	8730-9270	UG-52A/U
BW369	9205-9285	UG-40A/U
BW382	9300-9320	RG-52/U
BW416	9365-9385	UG-40A/U
BW386	8490-9578	UG-40A/U

Ferrite Devices

Sylvania Ferrite Devices are available in a wide range of frequency and power levels. The new Tee Circulators perform the same electrical function as standard phase-shift circulators, and occupy one-fourth the space.

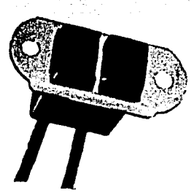
	Type	Frequency (KMC)	Isolation (db)	Insertion Loss (db)
BROADBAND Type N Coaxial Isolators	FD-154	1.3-2.1	10	1
	FD-151P	2-4	15	1
	FD-153P	2.0-2.7	20	1
	FD-155	2.6-3.2	80	5
	FD-1517	4.5-5.0	35	1
	FD-154	1.3-2.1	10	1
	FD-1519	4-8	10	1
	FD-1522	8-11	20	1
BROADBAND Waveguide Isolators	FD-492	3.95-5.85	18	1
	FD-502	5.85-8.2	20	1
	FD-512	7.05-10	24	1
	FD-522	8.2-12.4	30	1
	FD-911	12.4-18	24	1
	FD-531	18-26.5	24	1

	Type	Frequency (KMC)	Power	Isolation (db)	Insertion Loss (db)
High Power Waveguide Isolators	FD-483	2.8-3.6	3 KW, avg	15	0.8
	FD-963	4.6-5	20 W, CW	25	1
	FD-977	5.37-5.43	120 KW, pk	15	1
	FD-503	5.925-6.425	20 W, CW	40	0.8
	FD-503A	5.925-6.425	20 W, CW	60	1
	FD-504	6.575-7.125	20 W, CW	60	1
	FD-962	7.1-8	20 W, CW	35	1
	FD-513	7.1-8.4	20 W, CW	40	1
	FD-505	7.125-7.75	20 W, CW	60	1
	FD-525	8.2-10.2	100 KW, pk	30	1
	FD-524	8.5-9.6	100 KW, pk	20	1
	FD-1013	8.5-9.6	125 KW, pk	15	0.8
	FD-1037	8.5-9.6	125 KW, pk	25	1
	FD-527	9.275-9.475	150 KW, pk	15	0.35
	FD-523	9.5-10.5	100 KW, pk	15	0.5

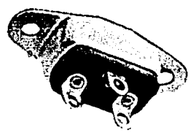
	Type	Frequency (KMC)	Power	Isolation (db)	Insertion Loss (db)
Ferrite Circulator Duplexers	FD-C501	5.925-6.425	150 W, avg	25	0.5
	FD-C502	6.425-6.875	100 W, avg	25	0.5
	FD-C503	7.125-7.75	100 W, avg	25	0.5
	FD-C521	8.4-10	100 KW, pk	15	0.5

	Type	Frequency (KMC)	Power	Isolation (db)	Insertion Loss (db)
Tee Circulators	FD-TC501	5.925–6.425	10 W, avg	20	0.3
	FD-TC522	8.8±.05	10 W, avg	20	0.2
	FD-TC911	13.5±.01	10 W, avg	28	0.2
	FD-TC531	23.8±.05	10 W, avg	20	0.2

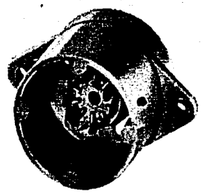
For details, circle #27 on Reader Service Card



A. C. Receptacle—Designed for economical installation

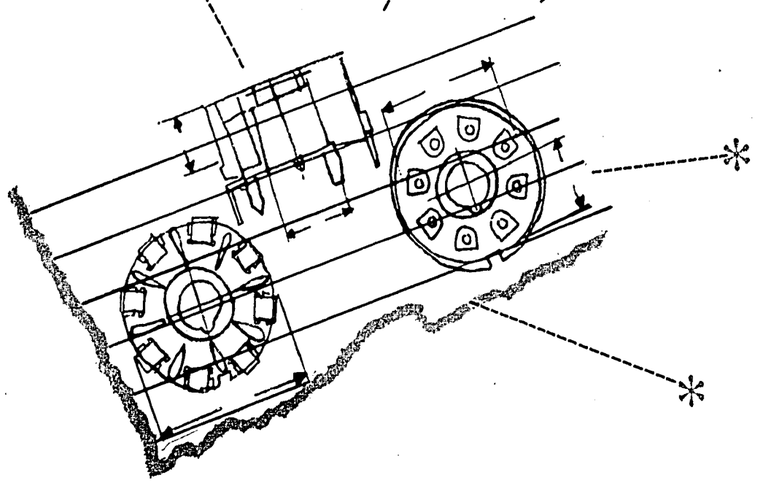


Interlock Plug—3-pin —positive grounding

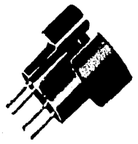


Anti-corona Sockets —Octal, 9-pin

Printed Circuit Sockets —Octal, 9-pin, 7-pin



Counter Tube Socket —with built-in zero-adjust



"Class 30" Transistor Socket—for standard 100-mil grid

"In-line" Transistor Socket—with snap-in printed circuit contacts

Any one of these sockets could have been designed for you

If you're building circuits . . . chances are you've come across at least one socketing problem. Maybe it was an entirely new problem like socketing the "class 30" transistor or perhaps a recurring bugaboo like high voltage arcing.

Either way, if you brought your problem to Sylvania it didn't take long to find an efficient, economical solution.

If you haven't been checking Sylvania for your socket requirements, why not do it next time? Sylvania has produced millions of sockets in over 150 varieties to fit every need. Many are now standard items and may offer an immediate solution to your problem. Write for specification sheets on the above sockets or let us suggest the best socket for the application you have in mind.

Sylvania Electric Products Inc., Parts Division, Warren, Pennsylvania

SYLVANIA
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

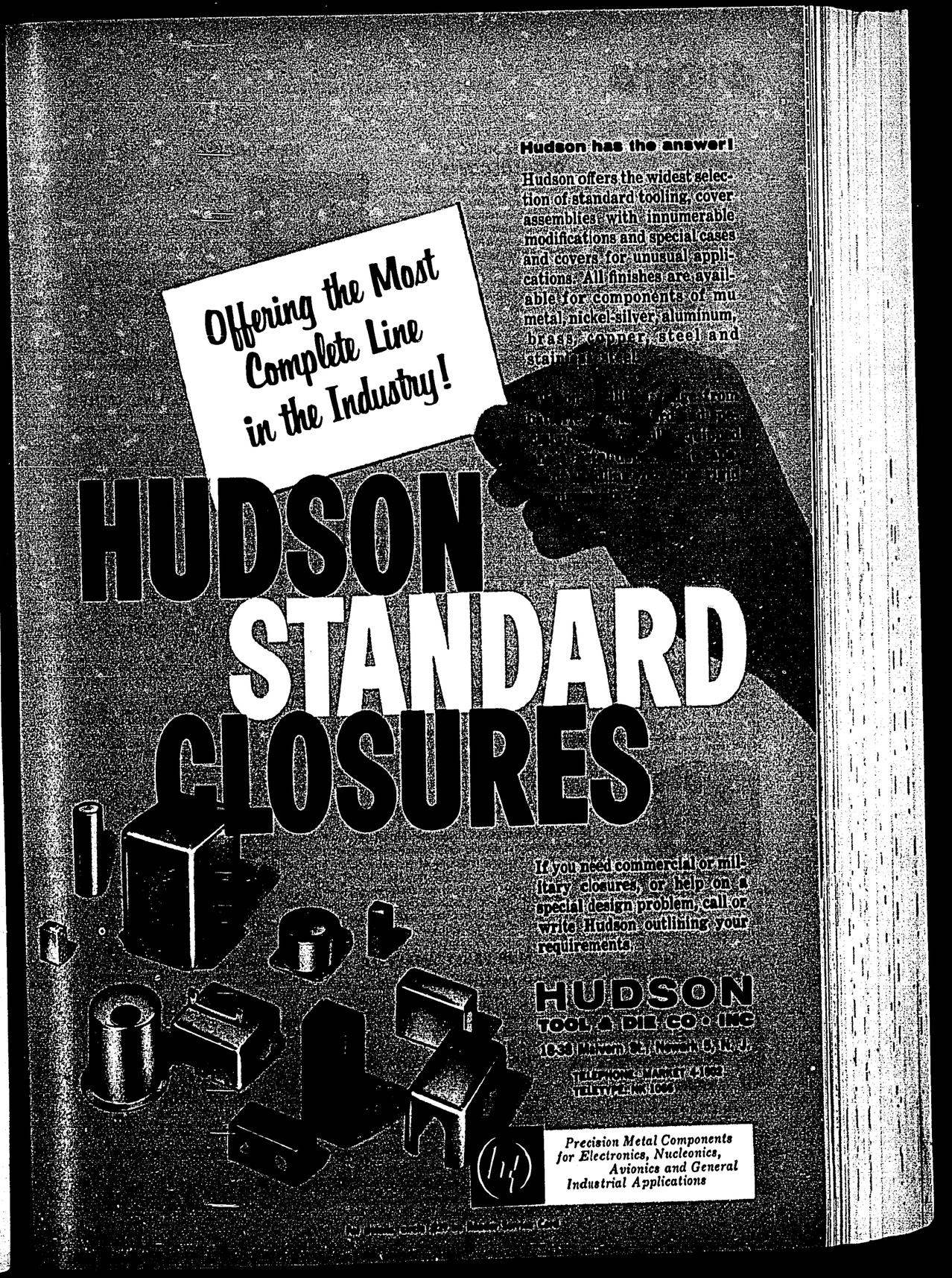
GENERAL SYSTEM

DIVISION

Custom Molded Plastics
Custom Metal Stampings
Custom Welded Parts
Custom Assemblies
Alloy, Clad, Plated Wire
Plated Metal Strip
Electronic Components
Fluorescent Components

For details, circle #28 on Reader Service Card

1960 IRE Directory



sierra

TRADE MARK

NEW MONITOR OSCILLOSCOPES

Sierra 218
Monitor Oscilloscope

The new Sierra Oscilloscopes, Model 218 Series are especially designed for continuous function monitoring of as many as seven channels simultaneously in one rack unit. Rugged and compact, the Scopes provide, in the smallest possible package, a convenient means for viewing and evaluating complex voltages. Designed primarily for tape recording and data handling systems, the Scopes are particularly ideal for measuring and analyzing mechanical quantities through a transducer, such as stress, strain and vibration, pressure, displacement and acceleration.

NEW IN-CIRCUIT TRANSISTOR TESTER

Sierra 219A
Transistor Tester

The new Sierra Model 219A Transistor Tester provides a technical breakthrough—a means for in-circuit transistor testing, saving hours of trouble shooting and service time. Designed with a unique combination of transistor circuits, using low impedance methods, the Tester will measure the Beta parameter of a transistor while it is connected in a circuit. Beta and Collector Current parameters may be measured with the transistor removed from the circuit. Request Bulletin.

WAVE ANALYZERS

Model	Frequency Range—kc	Selectivity		Accuracy		Direct Reading in dbm	
		Down 3 db	Down 45 db	Frequency	Measuring	Balanced	Unbalanced
121A	15 KC-500 KC	± 100 cps	± 1000 cps	± 3 KC	± 2 db	Note D	600 ohms
158A	500 KC- 10 MC	± 2000 cps	± 5000 cps	± 0.06 MC	± 2 db	—	600 ohms

CARRIER FREQUENCY VOLTMETERS

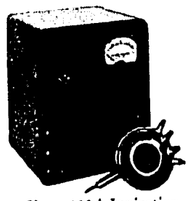
101C	20-500	± 550 cps	± 2900 cps	Note A	± 3 db	Note D	600 ohms
103B†	3- 40	± 400 cps	± 3000 cps	± 0.5 KC	± 3 db	Note D	600 ohms
104A	5-150	± 300 cps	± 1500 cps	± 1 KC	± 3 db	Note D	600 ohms
108B	15-500	± 550 cps	± 2900 cps	± 3 KC Note B	± 2 db Note C	135 ohms Note D	600 ohms
114A	100-800	± 550 cps	± 2900 cps	Note A	± 3 db	Note D	600 ohms
121Y	15-500	± 100 cps	± 1000 cps	± 3 KC	± 2 db	135,600Ω	—

All Sierra Carrier Frequency Voltmeters feature built-in calibration oscillators and circuits for level calibration, have aural monitoring jacks, and (except 103B) are furnished with Sierra Model 149A Precision Spiral Scale Dials. New Sierra 121Y CFVM, similar to Model 121A Analyzer but has special 20-pin connectors and selector switch for rapid patching to carrier racks.
†Contains carrier re-insertion oscillator for monitoring suppressed carrier systems. Furnished with planetary drive dial. Note A. Ranges from ± 2 KC at low end of dial to ± 3 KC at upper end. Note B. ± 1 KC in the 48 KC to 256 KC region. Note C. ± 1 db for + 30 db to —40 db attenuator steps on 135 ohm balanced measurements. Note D. All models may be converted for 135 and 600 ohm balanced line measurements by convenient plug-in bridging transformer, Model 130D.

WIDEBAND DIRECTIONAL COUPLERS

Model	10 KC	3 MC	10 MC	30 MC	100 MC	300 MC	1000 MC	2000 MC	Primary Line Connectors
137, 137A				73	63	53	43	37	Type N
138, 138A				59	49	39	29		Type N
145		52	42	32	22	12			Type N
150				53	43	33	23		Type N
212A				50	40				Type LC Female
213A				68	58	48			Type LC Female
214A					81	71			Type LC Female
139B	50	50							None

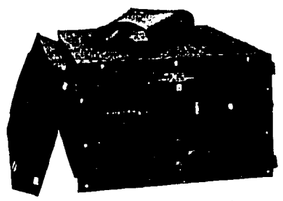
Directivity: 12 db ± 3 db greater than coupling factor at each frequency. e.g.: Model 145 at 100 MC has directivity of 34 db (22 + 12).
Impedance: Models 137 and 138 are 51.5 ohms. Models 137A, 138A, 145, 150, 212A, 213A and 214A are 50.0 ohms. Model 139B may be matched to most impedances encountered on open wire lines.
Power: Models 137, 137A, 138, 138A, 145, and 150 usable to 1000 watts. Models 212A, 213A and 214A usable to 150 KW peak. Model 139B usable to 50 KW or higher under certain conditions. See Bulletin 101.
Connectors: See table for primary line. Secondary line, type N, male, except 139B. Model 139B for open wire transmission lines.



Sierra 193A Ionization Gauge and 192A Amplifier

IONIZATION GAUGE & AMPLIFIER

Model 193A Ionization Gauge and Model 192A Ionization Gauge Amplifier provide convenient, dependable and accurate monitoring of pressures during processing from 10^{-4} to 10^{-1} mm Hg. Monel encased Phillips type ion gauges operate for months without attention; amplifier includes high voltage rf power supply, VTVM, heater transformer and low voltage supply. Request Bulletin 118.



Sierra 124A Line Fault Analyzer

LINE FAULT ANALYZER

Designed for rapid location of faults on cables, transmission lines. Instantly pin-points shorts, opens, grounds; indicates nature of fault as well as exact location. Easy to use, high resolution.

Model 124A Line Fault Analyzer operates on most OPEN WIRE power, communications lines. Direct reading, range ½ to 200 miles. Sweep marker continuously adjustable from 5 to 100 miles, locates faults with accuracy of ¼ mile. Request Bulletin 102.

IMPEDANCE METER

For high noise carrier measurements 30 KC to 300 KC. Measures on "hot" lines. Request Bulletin 112.

COAXIAL READOUT DEVICES

Increase Directional Coupler sensitivity, low VSWR, operates to 1,200 MC. 50 ohm impedance, filtered output. Request Bulletin

DOUBLE STUB TUNERS

Match 50 ohm line to loads having 2:1 VSWR. To 3.5 Kw peak; three models covering, collectively, 155 MC to 1,700 MC. Request Bulletin 110.

LINE BRIDGING TRANSFORMER

Converts voltmeter and wave analyzer inputs from single-ended to balanced operation. Model 130D bridges both 135 and 600 ohm balanced lines. Frequency range 3 KC to 500 KC. Write for details.

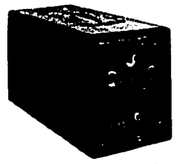
THERMOPILE

Converts differential temperatures in flowing liquids to electrical energy. Output approx. 1 mv/°C. Request Bulletin 119.

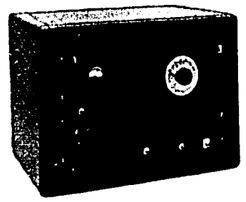
LOW PASS FILTERS

Model 184 Series Low Pass Filters have an insertion loss of not more than 0.4 db in pass band, sharp cut-off, 1.5 VSWR or less, and rejection greater than 60 db from 1.25 to 10 times cut-off frequency. Five models: for cut-off frequencies of 44, 75, 131, 230, 400 MC. Power range 250 watts in pass band, 25 watts in rejection band. Request Bulletin 115. *(Also higher frequency models. Request Bulletin M-23.)*

Sierra 290A Calorimeter



Sierra X287A Water Load



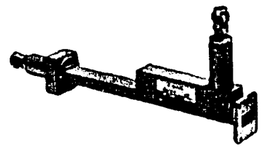
Sierra 215A Power Source

CALORIMETERS, WATER LOADS

Now Sierra offers two groups of Calorimeters and mating Water Loads for both waveguide and coaxial service.

Model 190 Calorimeter and Sierra XB187A/B Water Loads constitute a complete system for calorimetric power measurements in the SL, S, XB and X bands. Model 187 Water Loads are available with power measuring ranges of, respectively, 20 Kw, 10 Kw, 1 Kw and 2 Kw average. Request Bulletin M24. Model 190 Calorimeter has ranges of 300, 600, 1,500 and 3,000 watts max. A Coaxial Liquid Cooled Load, Sierra 186A-Z (not shown) can be used with 190 Calorimeters to measure dc to 4 MC. Request Bulletins.

New Model 290A Calorimeter includes liquid flow controls, calibration sources and metering circuits. The calorimeter is self-calibrating and permits accuracies up to 1%. A closed loop circulating system with fluid pump and heat exchanger is available as an accessory. Request Bulletin.



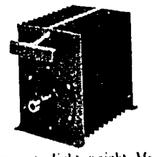
Sierra X187B Water Load

New Model 287 series Dual Water Loads provide balanced measurements when used with Model 290A. 287 series loads are offered in SL, S, XB and X bands and, in conjunction with Model 290A, comprise a complete power measuring system. An unusual feature of the 287 series is that the thermopile is a part of the load, resulting in materially improved accuracy. Request Bulletin.

NEW POWER SOURCES— 25 MC TO 1,000 MC

New Model 215 Power Sources permit fast, accurate calibration of Bi-Directional Power Monitors and Termination Wattmeters. Output power is adjustable from 20% to 100% of rated power, and tuning is continuous over frequency ranges. Units are self-contained including power supply, and are supplied in sturdy bench cabinets or can be rack mounted. Four models cover, respectively, 25 MC to 50 MC, 50 MC to 150 MC, 150 MC to 470 MC and 470 MC to 1,000 MC. All models have an output of 50 watts ± 1.5 db; use Type N connectors and operate from a 115 v, 60 cps input. Request Bulletin M19.

50 OHM COAXIAL TERMINATIONS



New compact, light weight Model 160 series coaxial terminations feature stable operation over a wide frequency range and up to high ambient temperatures. High surface to volume ratio provide a very low VSWR from dc to 4,000 MC. Model 160—1: 1 watt; Model 160—5: 5 watts; Model 160—20: 20 watts; Model 160—100: 100 watts; Model 160—500: 500 watts. Request Bulletin 114.

FIELD, LAB POWER MEASURING INSTRUMENTS

TERMINATION WATTMETERS

Sierra 185A-15FN
Termination
Wattmeter

Sierra 185A Series Average-Reading Termination Wattmeters are broadly useful, dependable instruments for terminating rf coaxial transmission systems and measuring rf powers. They are ruggedly built, conservatively rated, and ideal as dummy loads for testing and adjusting transmitters and oscillators. Three models offer, respectively, power ranges of 0 to 5/15, 0 to 30/100 and 0 to 150/500 watts. Other specifications (all models): frequency range 20 to 1,000 MC, accuracy ±5%, maximum VSWR 1.2, female N connectors. Request Bulletin 120. (Sierra also offers Model 195A Peak Reading Wattmeters; request Bulletin 121.)

BI-DIRECTIONAL POWER MONITORS

Sierra 164
Power Monitor

Sierra offers Power Monitors whose collective frequency ranges provide coverage from 2 MC to 1,000 MC.

Model 164 Series (shown). Two plug-in elements cover 25 MC to 1,000 MC, measure incident and reflected power of 10, 50, 100 and 500 watts full scale. Another plug-in is similar but covers 2 MC to 30 MC. Also available are four lower power elements covering same range at 1, 5, 10 and 50 watts full scale. Power is read direct on linear scale accurate within ±5%. Insertion VSWR less than 1.08 (Type N connectors) except on 1 watt ranges where VSWR is 1.15. 50 ohm impedance. Model 164 with Type N or UHF connectors, male or female. Request Bulletin 111.

Model 194A-A Peak-Reading Power Monitor (not shown) measures incident and reflected peak power directly, 200 MC to 1,215 MC. 1, 3, 10 and 30 Kw peak, ±5% full scale. From 1μsec, 400 pps up. Request Bulletin 122.

PLUG-IN ELEMENTS FOR MODEL 164

(Note: Model 164 does not include plug-ins. Order separately as needed.)

180 Series—1, 5, 10, 50 watts full scale
180–52: 25 MC to 52 MC
180–148: 50 MC to 148 MC
180–470: 144 MC to 470 MC
180–1000: 460 MC to 1,000 MC

270 Series—50, 100, 500, 1,000 Watts full scale
270–75: 10 MC to 75 MC
270–30: 2 MC to 30 MC

181 Series—10, 50, 100, 500 watts full scale
181–250: 25 MC to 250 MC
181–1000: 200 MC to 1000 MC

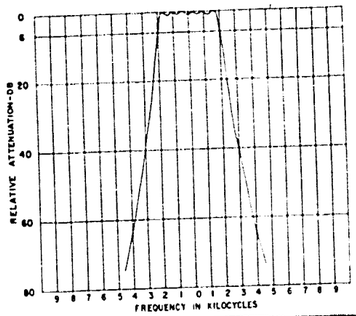
Accessories Available: Model 164-LS Equivalent Transmission Line Section; Model 164-CC Carrying Case.

Model 194A-A Peak-Reading Power Monitor. Model 194A-A quickly measures incident and reflected powers on radar and other pulsed systems. Measures peak power directly, independently of duty cycle. 200 MC to 1,215 MC. 1, 3, 10 and 30 Kw peak. ±5% full scale. From 1 μsec pulses, 400 pps up. HN connectors. Request Bulletin 122.

Data subject to change without notice.

5442D BOHANNON DRIVE, MENLO PARK, CALIFORNIA, U. S. A.
Engineering Sales Representatives in all principal areas
Canada: Atlas Instrument Corp., Ltd., Toronto, Montreal, Vancouver, Winnipeg • Export: Frazar & Hansen, Ltd., San Francisco

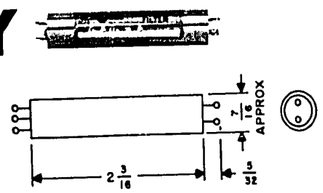
Selectivity characteristics of a standard production F455-40 Filter. The curve indicates the actual performance expected from this filter. All Collins Filters feature these steep-skirted, flat-topped selectivity characteristics.



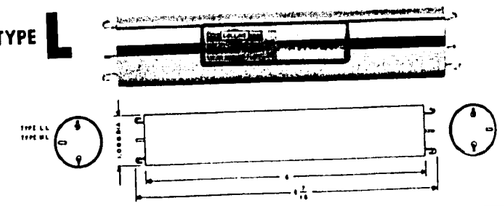
COLLINS MECHANICAL FILTERS

RELIABLE, ECONOMICAL SERVICE • COMPACT

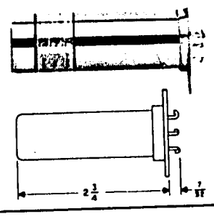
TYPE **Y**



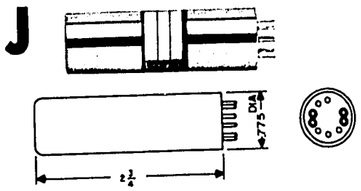
TYPE **L**



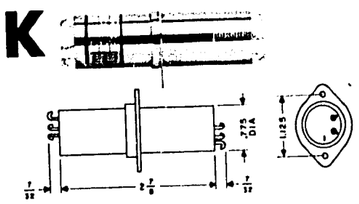
TYPE **H**



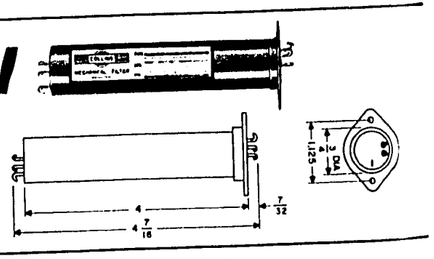
TYPE **J**



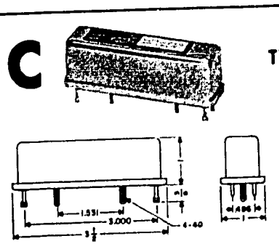
TYPE **K**



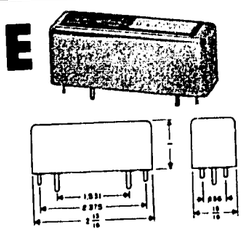
TYPE **W**



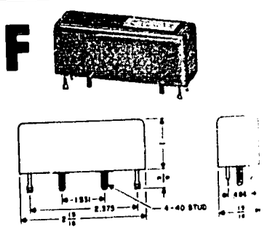
TYPE **C**



TYPE **E**



TYPE **F**



For details, circle #32 on Reader Service Card

Mechanical Filter Summary Table
This table lists the standard Mechanical Filters available. Detailed specifications are available on request.

Center Freq.	Type No.	Part No.	6 db Bandwidth	Max. 60 db Bandwidth	Case Style
250 kc	F250A-20	526-9012-00	2.0 kc	4.3 kc	C
250 kc	F250Z-3	526-9080-00	2.7 kc	5.5 kc	W
250 kc	F250A-67	526-9039-00	6.7 kc	14.0 kc	C
250 kc	F250A-85	526-9049-00	8.5 kc	18.0 kc	C
300 kc	F300X-68	526-9307-00	6.8 kc	13.2 kc	(1" dia. x 3)" long)
455 kc	F455E-05	526-9321-00	0.5 kc	2.5 kc	E
455 kc	F455F-05	526-9318-00	0.5 kc	2.5 kc	F
455 kc	F455H-05	526-9229-00	0.5 kc	2.5 kc	H
455 kc	F455J-05	526-9154-00	0.5 kc	2.5 kc	J
455 kc	F455K-05	526-9228-00	0.5 kc	2.5 kc	K
455 kc	F455E-15	526-9370-00	1.5 kc	3.5 kc	E
455 kc	F455F-15	526-9227-00	1.5 kc	3.5 kc	F
455 kc	F455H-15	526-9170-00	1.5 kc	3.5 kc	H
455 kc	F455J-15	526-9155-00	1.5 kc	3.5 kc	J
455 kc	F455K-15	526-9168-00	1.5 kc	3.5 kc	K
455 kc	F455E-21	526-9322-00	2.1 kc	5.3 kc	E
455 kc	F455F-21	526-9323-00	2.1 kc	5.3 kc	F
455 kc	F455H-21	526-9313-00	2.1 kc	5.3 kc	H
455 kc	F455J-21	526-9156-00	2.1 kc	5.3 kc	J
455 kc	F455K-21	526-9317-00	2.1 kc	5.3 kc	K
455 kc	F455Y-21	526-9337-00	2.1 kc	5.3 kc	Y
455 kc	F455E-31	526-9074-00	3.1 kc	6.5 kc	E
455 kc	F455F-31	526-9075-00	3.1 kc	6.5 kc	F
455 kc	F455H-31	526-9093-00	3.1 kc	6.5 kc	H
455 kc	F455J-31	526-9089-00	3.1 kc	6.5 kc	J
455 kc	F455K-31	526-9169-00	3.1 kc	6.5 kc	K
455 kc	F455Y-31	526-9338-00	3.1 kc	6.5 kc	Y
455 kc	F455E-40	526-9324-00	4.0 kc	8.5 kc	E
455 kc	F455F-40	526-9325-00	4.0 kc	8.5 kc	F
455 kc	F455H-40	526-9326-00	4.0 kc	8.5 kc	H
455 kc	F455J-40	526-9327-00	4.0 kc	8.5 kc	J
455 kc	F455K-40	526-9303-00	4.0 kc	8.5 kc	K
455 kc	F455Y-40	526-9339-00	4.0 kc	8.5 kc	Y
455 kc	F455E-60	526-9084-00	6.0 kc	12.6 kc	E
455 kc	F455F-60	526-9087-00	6.0 kc	12.6 kc	F
455 kc	F455H-60	526-9094-00	6.0 kc	12.6 kc	H
455 kc	F455J-60	526-9091-00	6.0 kc	12.6 kc	J
455 kc	F455K-60	526 9159-00	6.0 kc	12.6 kc	K
455 kc	F455Y-60	526-9340-00	6.0 kc	12.6 kc	Y
455 kc	F455E-80	526-9332-00	8.0 kc	18.5 kc	E
455 kc	F455F-80	526-9331-00	8.0 kc	18.5 kc	F
455 kc	F455H-80	526-9330-00	8.0 kc	18.5 kc	H
455 kc	F455J-80	526-9329-00	8.0 kc	18.5 kc	J
455 kc	F455K-80	526-9328-00	8.0 kc	18.5 kc	K
455 kc	F455Y-80	526-9311-00	8.0 kc	18.5 kc	Y
455 kc	F455E-120	526-9336-00	12.0 kc	23.0 kc	E
455 kc	F455F-120	526-9173-00	12.0 kc	23.0 kc	F
455 kc	F455H-120	526-9171-00	12.0 kc	23.0 kc	H
455 kc	F455J-120	526-9333-00	12.0 kc	23.0 kc	J
455 kc	F455K-120	526-9316-00	12.0 kc	23.0 kc	K
455 kc	F455Y-120	526-9342-00	12.0 kc	23.0 kc	Y
455 kc	F455E-160	526-9320-00	16.0 kc	27.5 kc	E
455 kc	F455F-160	526-9335-00	16.0 kc	27.5 kc	F
455 kc	F455H-160	526-9314-00	16.0 kc	27.5 kc	H
455 kc	F455J-160	526-9334-00	16.0 kc	27.5 kc	J
455 kc	F455K-160	526-9315-00	16.0 kc	27.5 kc	K
455 kc	F455Y-160	526-9343-00	35.0 kc	62.0 kc	Y
455 kc	F455E-350	526-9371-00	35.0 kc	62.0 kc	E
455 kc	F455F-350	526-9180-00	35.0 kc	62.0 kc	F
455 kc	F455H-350	526-9302-00	35.0 kc	62.0 kc	H
455 kc	F455J-350	526-9300-00	35.0 kc	62.0 kc	J
455 kc	F455K-350	526-9186-00	35.0 kc	62.0 kc	K
455 kc	F455Y-350	526-9344-00	35.0 kc	62.0 kc	Y
500 kc	F500B-08	526-9007-00	0.8 kc	3.5 kc	E
500 kc	F500B-14	526-9030-00	1.4 kc	3.8 kc	E
500 kc	F500F-14	526-9215-00	1.4 kc	3.5 kc	F
500 kc	F500B-31	526-9008-00	3.1 kc	7.5 kc	E
500 kc	F500B-60	526-9009-00	6.0 kc	14.0 kc	E
500 kc	F500F-60	526-9319-00	6.0 kc	19.0 kc	F
500 kc	F500F-94	526-9216-00	9.4 kc	19.0 kc	F

MECHANICAL FILTERS FOR SINGLE SIDEBAND

Carrier Freq.					
60 kc	F60Z-4	526-9190-00	Upper Sideband	"	L
64 kc	F64Z-4	526-9191-00	"	"	L
68 kc	F68Z-4	526-9192-00	"	"	L
72 kc	F72Z-4	526-9193-00	"	"	L
76 kc	F76Z-4	526-9194-00	"	"	L
80 kc	F80Z-4	526-9195-00	"	"	L
84 kc	F84Z-4	526-9196-00	"	"	L
88 kc	F88Z-4	526-9197-00	"	"	L
92 kc	F92Z-4	526-9198-00	"	"	L
96 kc	F96Z-4	526-9199-00	"	"	L
100 kc	F100Z-4	526-9139-00	"	"	L
104 kc	F104Z-4	526-9140-00	"	"	C
250 kc	F250Z-4	526-9130-00	"	"	C
250 kc	F250Z-5	526-9131-00	Lower Sideband		C
300 kc	F300Z-4	526-9312-00	Upper Sideband	(1" dia. x 3)" long)	
300 kc	F300Z-5	526-9311-00	Lower Sideband	(1" dia. x 3)" long)	
455 kc	F455Z-1	526-9095-00	Upper Sideband	H	
455 kc	F455Z-2	526-9096-00	Lower Sideband		H
455 kc	F455Z-4	526-9364-00	Upper Sideband	Y (1/2" dia. x 2)" long)	
455 kc	F455Z-5	526-9365-00	Lower Sideband	Y (1/2" dia. x 2)" long)	

FILTERS

CUSTOM DESIGN

Small size and high performance characteristics of Collins Mechanical Filters make them a natural choice of equipment designers. Collins Filters are now employed and may be designed into high performance transmitting and receiving equipment, multiplexing equipment, missile guidance systems, frequency synthesisers, doppler radar, data transmission systems, precision navigation equipment, spectrum analyzers, and other specialized equipment where reliability, compactness and economy are required.

CUSTOM DESIGN

The filters shown are standard production types. It is possible to obtain special types with a wide variety of characteristics. We are interested in discussing your requirements. For prices and delivery information call or write: Collins Radio Company, Product Line Manager, Western Division, 2700 West Olive Ave., Burbank, California.

COLLINS

COLLINS RADIO COMPANY
BURBANK • CEDAR RAPIDS • DALLAS

For details, circle #33 on Reader Service Card

SPECIFY DALOHM® COMPONENTS FOR INHERENT DEPENDABILITY!

DALOHM gives you quality resistance products made by the most advanced techniques. DALOHM quality is constantly monitored by our environmental laboratories to assure stability and high standards of *uniformity and reliability.* DALOHM resistors and potentiometers meet applicable Military Specifications. We invite your requests for qualification samples or test reports.

Examine this resume of the DALOHM line. You'll find a wide variety of resistors, trimmer potentiometers and other electronic products from which you can select a component to meet your needs.

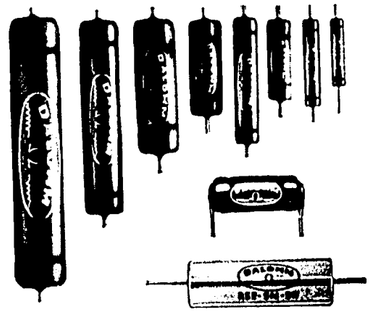
And, remember, DALOHM engineers stand ready to help in design, development and production of special resistance products, resistor networks and electronic equipment.

DALOHM Wire Wound Miniature Power Resistors

Carefully designed, precision made to meet all space problems and for all applications where equipment must meet the most severe environmental, shock, vibration and humidity conditions. Smallest in size, completely welded from terminal to terminal, coated with special silicone material, impervious to moisture, salt spray, vapor gases. Temperature coefficient all types 0.00002/Deg. C.

TYPES RS—RLS—RSE

Resistance range from .05 ohm to 175K ohms, depending on type: tolerance range from .05% to 3%. Type RS with axial leads in six wattages—1, 2, 3, 5, 7, 10; nine sizes. Type RLS with radial leads in six wattages—1, 2, 3, 5, 7, 10; eight sizes. Type RSE ruggedized in metal housing for tremendous shock resistance; five wattages—2, 3, 5, 7, 10; seven sizes.



Ask for Bulletins R-23, R-30, R-25

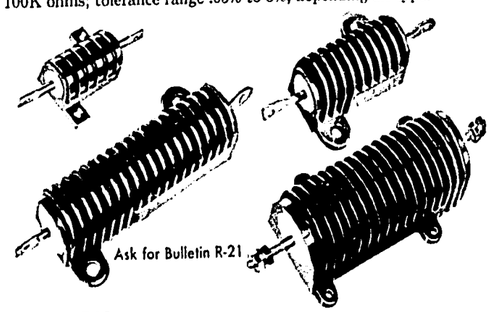
TYPES NS—NLS

Non-inductive characteristics. Five wattages—2, 3, 5, 7, 10; six sizes. Resistance range from 1 ohm to 37K ohms; tolerance range .05% to 3%. Type NS with axial leads. Type NLS with radial leads.

Ask for Bulletin R-34

TYPE RH

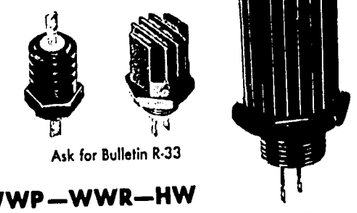
Silicone sealed in die-cast, black anodized, radiator finned housing. Lugs provided for mounting to heat sink. Four wattage ranges—10, 25, 50, 250; resistance range 0.1 ohm to 100K ohms; tolerance range .05% to 3%, depending on type.



Ask for Bulletin R-21

TYPE PH

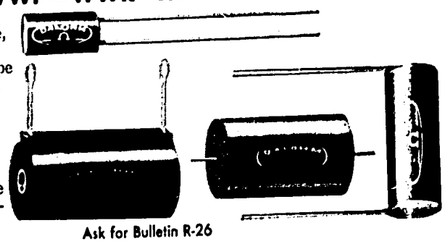
New ruggedized Powerhouse resistor designed for mounting through hole in chassis or heat sink; sealed in black anodized, finned aluminum housing. Three wattages—10, 25, 100; resistance values from 0.1 ohm to 60K ohms; tolerances from .05% to 3%.



Ask for Bulletin R-33

TYPES WWA—WWL—WWP—WWR—HW

Precision encapsulated, non-inductive, pi-wound. Resistance range from 1 ohm to 6 Megohms, depending on type and size; tolerances from .05% to 1%. Type WWA (axial leads) in sub-miniature and standard sizes; Type WWL (lugs) in sub-miniature and standard sizes; Type WWP (parallel leads) in sub-miniature sizes; Type WWR (radial leads) in sub-miniature sizes: HW (high temperature) in sub-miniature sizes.



Ask for Bulletin R-26

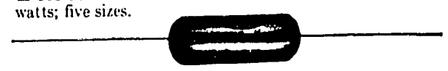
DALE PRODUCTS, INC.
1318 28th Ave.
COLUMBUS, NEBRASKA

DALOHM Metal Film Resistors

New molded metal film resistors combine advantages of DALOHM molding techniques with advanced high vacuum evaporated metal film procedures to provide the best characteristics of wire wound resistors, yet retain miniature size. Metal film resistors have inherently good H.F. characteristics and low noise levels. DALOHM MF resistors have other outstanding features: high stability, fully insulated, low and controllable temperature coefficients and ability to withstand rigorous environmental conditions.

TYPE MF

Resistance range from 100 ohms to 4 Megohms, depending on size; tolerance 1%; temperature coefficient is ± 50 P.P.M. or ± 100 P.P.M. Available in five wattages—2, 1, ½, ¼ and ⅛ watts; five sizes.



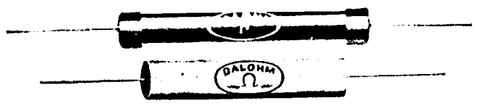
Ask for Bulletin R-43

DALOHM Deposited Carbon Resistors

Assure stable, accurate, dependable performance. Pure crystalline carbon bonded on ceramic rods of special material. Provide precision resistance values, low voltage coefficient, low capacitive and inductive characteristics in high frequency applications, extremely high stability and economy.

TYPES DC—DCH

Resistance range from 10 ohms to 200 Megohms; tolerance 1% or higher as specified. Type DC in six wattages—⅛, ¼, ½, 1, 2, and 5; nine sizes. DCH hermetically sealed in non-hygroscopic ceramic envelope; seven wattages—1/10, ⅛, ¼, ½, 1, 2 and 5; ten sizes.



Ask for Bulletins R-24, R-27

TYPES MC—DCF

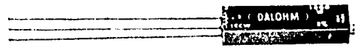
Type MC is a deposited carbon resistor completely insulated and protected from environmental and mechanical damage by molded housing; resistance range from 1 ohm to 50 Megohms. Available in five wattages—⅛, ¼, ½, 1 and 2; five sizes in standard tolerance of 1%. The DCF type has a new coating material which provides a completely insulated resistor, yet maintains sub-miniature size. Available in five wattages—⅛, ¼, ½, 1 and 2; eight sizes in standard tolerance of 1%.

Ask for Bulletins R-37, R-42

DALOHM Trimmer Potentiometers

TYPE 1000 Trimmer

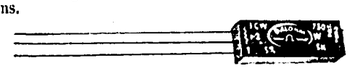
Miniature precision trimmer potentiometer with completely sealed case and welded construction throughout; is resistant to stringent environmental conditions. Rated at 2.5 watts; resistance range from 100 ohms to 50K ohms; tolerance 5%.



Ask for Bulletin R-44

TYPE 750 Miniature

Identical to the Type 1000 trimmer except is smaller with 2 watts rating and resistance range from 100 ohms to 30K ohms.



Ask for Bulletin R-41

TYPE A10-W Trimmer

Rated at 1 watt; resistance range from 10 ohms to 30K ohms; tolerance 5% standard. Ask for Bulletin R-32

TYPE B11-W Trimmer

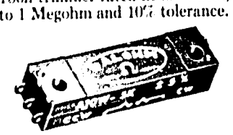
Identical to A10-W but with 10% tolerance and resistance range to 100K ohms. Ask for Bulletin R-37

TYPE C12-W Trimmer

Similar to B11-W but with 15% standard tolerance and resistance range to 20K ohms. Ask for Bulletin R-38

TYPE A10-C Trimmer

Superior performing deposited carbon trimmer rated at .25 watts; resistance range from 20K ohms to 1 Megohm and 10% tolerance.

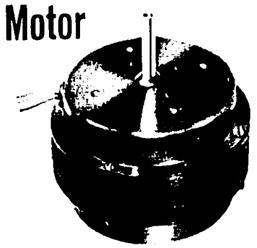


DALOHM Hysteresis Motor

The DALOHM hysteresis motor is a split-capacitor type, sub-fractional horsepower from 1/20th to 1/300th. Totally enclosed, it has a new space-saving pancake design giving great rigidity. It is ideally suited for such applications as facsimile machines, Hi-Fi turntables, tape recorders, tele-metering and many other types of equipment where constant synchronous speed is essential.

An outstanding feature is the exceptionally low heat rise. This removes the basic objection common in most hysteresis motors. It also has extremely low noise and no vibration or magnetic strays.

Ask for Bulletin R-80



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DALE PRODUCTS, INC.
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COLUMBUS, NEBRASKA

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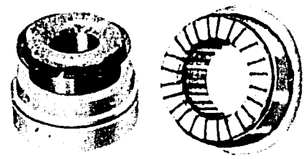
For...Military and Commercial Avionics

Leading system manufacturers now depend on CELCO for their difficult and critical applications on many of these components.

Our design development, production and quality control experience – combined with CELCO's highly skilled operators, production foremen and engineers – comprises a team that has proven their outstanding performance for quality components.

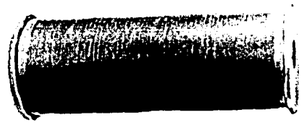
Apply the CELCO "know-how" to your production requirements!

Celco We specialize in the design and manufacture of **PRECISION DEFLECTION YOKES** for military and commercial applications. CELCO can give you immediate engineering evaluation on your critical display problems.

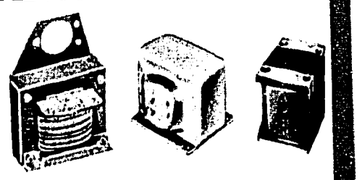


Celco **COILS FOR TRAVELING WAVE TUBES** – precision wound for minimum transverse magnetic fields. High temperature windings are a CELCO engineering development –

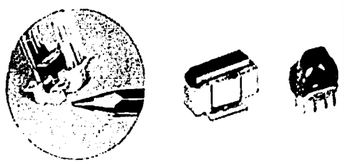
Unit illustrated is 12" long.



Celco **HIGH TEMPERATURE TRANSFORMERS** – high temperature windings and impregnations on CELCO TRANSFORMERS permit high operating temperature with reduced size and weight.

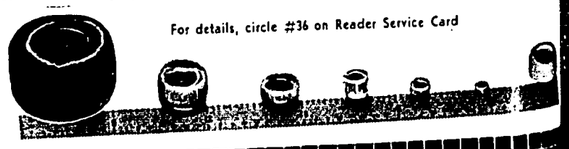


Celco **MINIATURE TRANSFORMERS & SATURABLE REACTORS** – specially produced for the Transistor and Plug-in type amplifier assembly. CELCO designs these units wherever reduction in size and weight must be made.



Celco **TOROIDAL COILS** – CELCO is equipped to cover an extremely wide range of toroidal windings.

No. 50 wire on a .062" ID Toroid
No. 15 wire on 9" OD Toroid



For details, circle #36 on Reader Service Card

Celco *Constantine Engineering Laboratories Co.*
ISLAND AVE PHONE: DAvis 7-1123 MAHWAH, N. J.

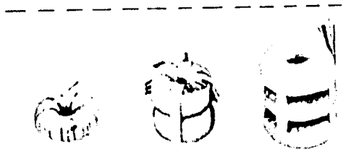
and Production of:

MAGNETIC AMPLIFIERS AIRCRAFT MOTOR COMPONENTS

...Nuclear and Computer Industries

Celco **MAGNETIC AMPLIFIERS**–encapsulated with epoxy resins or silicone rubber. CELCO experience with proper treatment of Toroidal Coils assures designed performance.

Celco **TOROIDAL COMPONENTS** – for use in system assemblies. Sub-assemblies of chokes, Transformers and Saturable Reactors are manufactured at CELCO for packaging into a single unit.

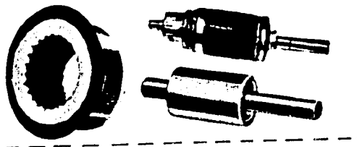


Celco **PRECISION TRANSFORMERS** – CELCO develops Precision Transformers for such applications as Computer Components with high accuracy of turns ratio and output voltages.

Celco **HERMETICALLY SEALED MAGNETIC AMPLIFIERS & TRANSFORMERS** – with various types of terminations, evacution and inert gas pressurization give CELCO components minimum weight with high-breakdown voltage resistance.

Celco **R.F. CHOKES, TRANSFORMERS** – specialized universal winding types of coils and assemblies. These CELCO windings are used when minimum distributed capacitance is required and space does not permit use of mechanical supports.

Celco **MOTOR COMPONENTS**–Centrifugally cast squirrel cage rotors for low inertia motors, armatures, stators, field coils and special type rotor coils – are a CELCO production specialty.



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Call DAvis 7-1123 in Mahwah, N.J.—*for immediate engineering evaluation price and delivery quotations.*

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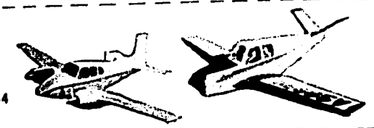

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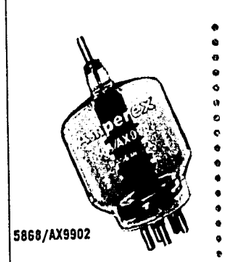
5868/AX9902

DX151

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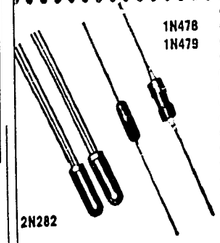
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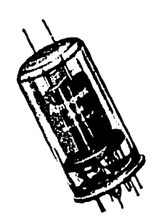
1N479
2N282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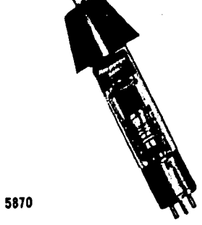
0G3/85A2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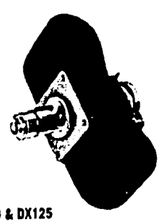
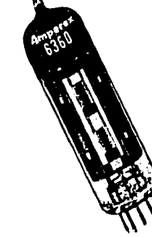

5780 & DX125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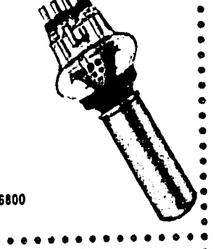
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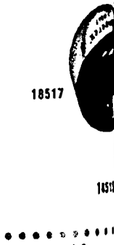
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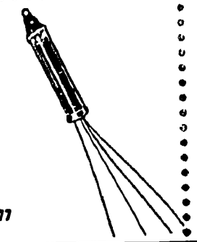
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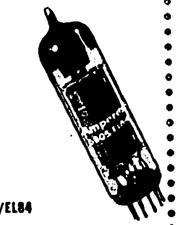
6BQ5/EL84

6693

7459

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Excise Tax.

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	75.00
	20.00
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	30.00
	75.00
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PE06/40N	5.95
DIODE, CLIPPER	
6339	$44.50
COUNTERS, GEIGER	
75N	$16.50
75NB3	16.50
80N	45.00
85NB3	22.70
90CB	27.00
90NB	27.00
90NB4	27.00
100C	54.00
100CB	58.00
100HB	54.00
100N	43.50
100NB	45.50
120C	90.00
120CB	95.00
120N	90.00
120NB	95.00
150N	61.00
150NB	66.00
153C	91.00
160G	66.00
170G	110.00
180G	50.00
200C	67.00
200CB	71.00
200HB	67.00
200N	56.00
200NB	58.50
230C	43.00
230N	41.00
240C	43.00
240N	41.00
912NB	53.00
18503	28.00
18508	127.00
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18510	127.00
18515	186.50
18516	206.25
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VC25/20	$22.00
VC25/32	25.25
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COUNTER, DECADE	
6370/EIT	$16.50
DIODE, DAMPER	
#6R3/EY81	$2.80
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#5726/E91AA	$2.10
DIODE, VTVM	
6923/EA52	$13.00
IGNITRONS	
‡5551A/652	$65.00
‡5552A/651	99.00
‡5553B/655	245.00
5555/653B	316.00
‡5822A	116.00
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#6BR5/EM80	2.45
#6CD7/EM34	3.65
#6DA5/EM81	2.45
#6FG6/EM84	2.95
#DM71	2.00
KLYSTRONS	
DX122	**
DX123	**
DX124	**
DX151	**

Type No.	Price
KLYSTRON, REFLEX	
2K25	$39.50
MAGNETRONS	
2J42	$160.00
2J48	250.00
4J47	500.00
4J57	270.00
4J58	270.00
4J59	270.00
5586	417.00
5657	417.00
5780A	**
6589	**
6972	325.00
PENTODES	
#6AU6	$ 2.10
828	27.50
6083/AX9909	14.25
EFP60	8.75
PENTODE, DUO-DIODE	
#6DC8/EBF89	$3.25
PENTODE, FRAME GRID	
5847	$18.21
PENTODES, HI-FI	
#6BQ5/EL84	$2.35
#6CA7/EL34	6.20
#6CW5/EL86	3.50
#8BQ5/XL84	2.60
#6267/EF86	2.75
#7189	3.60
TRIODE-PENTODES, HI-FI	
#6BM8/ECL82	$3.00
#50BM8/UCL82	3.00
PENTODES, "PREMIUM QUALITY"	
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6084/E80F	3.75
6227/E80L	3.75
6686/E81L	5.00
6688/E180F	8.00
6689/E83F	4.50
E90F	**
E99F	**
TRIODE-PENTODES	
#6U8	$3.30
#6BL8/ECF80	3.80
TRIODE-PENTODE "PREMIUM QUALITY"	
E80CF	**
PENTODES, SUBMINIATURE	
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6008/5911	1.50
RECTIFIERS	
#1S2A/DY87	$2.75
#5AR4/GZ34	4.20
#5R4G-Y	1.90
#6CA4/EZ81	2.10
#6V4/EZ80	1.50
575A	22.15
673	22.15
8020AX	15.00
RECTIFIERS, MERCURY	
857B	$235.00
866AX	2.65
869B	150.00
869BL	150.00
872AX	9.90
6508	80.00
6693	25.00
7136	25.00
8008AX	9.90
RECTIFIERS, XENON	
3B28	$ 7.60
4B32	13.50
VOLTAGE REFERENCE TUBES	
OE3/85A1	$2.50
OG3/85A2	2.50

Type No.	Price
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5651	$2.50
VOLTAGE REGULATORS	
OA2	$1.75
OB2	1.90
90C1	2.50
6354/150B2	3.00
TETRODES	
4-125A	$ 36.00
4-250A	46.50
4-400A	55.00
4CX250B	45.00
4X150A	38.95
4X150D	38.95
4X250B	42.50
4X250F	42.50
4X500A	121.00
6075/AX9907	250.00
6076/AX9907R	305.00
6079/AX9908	60.00
6155	36.00
6156	46.50
6979	42.50
7527	55.00
TETRODES, BEAM	
813	$22.65
7378	**
TWIN TETRODES	
829B	$18.90
832A	15.85
5894/AX9903	25.00
6252/AX9910	25.00
6907	25.00
6939	14.00
7377	**
THYRATRONS	
2D21	$ 2.05
3C23	11.98
5560/FG95	33.00
5632/C3J	15.50
5684/C3JA	19.80
5685/C6JA	29.30
5727/E91N	2.70
5949/1907	**
AX260	150.00
THYRATRONS, HYDROGEN	
§6268/AX9911	$32.50
§6279/AX9912	45.00
THYRATRONS, MERCURY	
5557/FG17/967/1701	$ 9.50
5559	22.00
5869/AGR9950	25.00
5870/AGR9951	100.00
6786	200.00
AX105/FG105	53.33
THYRATRONS, XENON	
2050	$ 1.85
5544	38.41
5545	29.30
TRIODES	
#6Q4/EC80	$ 6.00
#6R4/EC81	2.50
450TH	77.00
450TL	77.00
501R/5759	225.00
502/5760	210.00
502R/5761	235.00
504R	245.00
805	20.00
810	25.35
811A	6.50
812A	6.50
833A	47.90
834	19.30
838	20.00
845	20.85
849	185.00
849A	185.00
880	565.00

Type No.	Price
TRIODES (Con't)	
889A	221.00
889RA	347.00
891	275.00
891R	430.00
892	270.00
892R	425.00
5604	570.00
5619	423.00
5658	565.00
5666	280.00
5667	370.00
5771/356	600.00
5866/AX9900	20.00
5867/AX9901	30.00
5868/AX9902	55.00
5923/AX9904	165.00
5924/AX9904R	231.00
5924A	275.00
6077/AX9906	1675.00
6078/AX9906R	1900.00
6333	**
6445	420.00
6446	305.00
6447	465.00
6756	388.00
6757	535.00
6758	173.00
6759	206.00
6800	350.00
6801	505.00
6960	150.00
6961	210.00
7092	125.00
7459	230.00
DX144/EC56	**
DX145/EC57	**
HF200	49.50
HF201A/468	34.50
HF300	40.50
ZB3200	390.00
TRIODES, FRAME GRID	
#2ER5	$ 2.90
#3ER5	2.90
#4ER5	2.90
#6ER5/EC95	2.90
5842	18.21
TRIODE, INDICATOR "PREMIUM QUALITY"	
6977/DM160	$3.50
TWIN TRIODES	
#4ES8/XCC189	$4.55
#6AQ8/ECC85	2.60
#6DJ8/ECC88	4.55
#6ES8/ECC189	4.55
#6J6/ECC91	2.80
#9AQ8/PCC85	3.10
#12AT7/ECC81	3.05
#12AU7/ECC82	2.45
#12AX7/ECC83	2.50
#17EW8/HCC85	2.60
5920/E90CC PQ	2.40
6085/E80CC PQ	3.75
6201 PQ	3.25
6211 PQ	2.40
6360	**
6463 PQ	2.95
6922/E88CC PQ	4.75
7062/E180CC PQ	2.40
7119/E182CC PQ	4.15
7316	2.00
E92CC	2.40
TRIODE, GLOW DISCHARGE	
5823/Z900T	$2.50
TRIGGER TUBES, COLD CATHODE	
Z50T	$2.20
Z70U	1.95
Z300T	4.95
Z804U	4.30
HEPTODE, DUAL CONTROL, "PREMIUM QUALITY"	
6687/E91H	$1.45
BEAM DEFLECTION TUBE "PREMIUM QUALITY"	
6218/E80T	$15.00

If it's "MICROWAVE"

Partial list of standard items

EQUIPMENT	MODEL	L 1.12 - 1.70 KMC	M 1.7 - 2.31 KMC	S 2.6 - 3.95 KMC	C 3.95 - 5.85 KMC	A 5.85 - 8.20 KMC	B 7.05 - 10 KMC	X 8.2 - 12.4 KMC	G 12.4 - 18 KMC	K 18 - 26.5 KMC	T 26.5 - 40 KMC	V 33 - 50 KMC	W 50 - 75 KMC	Z 60 - 90 KMC
ADAPTER—COAX. TO W.G.	101	L	M	S	C	A	B	X						
Choke to Choke	102	L	M	S	C	A	B	X	G	K	T			
Cover to Cover	103	L	M	S	C	A	B	X	G	K	T	V	W	Z
7/8" to RG 48/U	104			S										
ANTENNA—Horn	110	L	M	S	C	A	B	X	G	K	T	V	W	Z
ATTENUATOR—WAVEGUIDE Fixed High Power	119	L	M	S	C	A	B	X	G	K	T	V	W	Z
Fixed - Low Power	120	L	M	S	C	A	B	X	G	K	T	V	W	Z
Flap	121	L	M	S	C	A	B	X	G	K	T	V	W	Z
Precision	123	L	M	S	C	A	B	X	G	K	T			
Fixed - Coaxial	125	(2,000 - 10,000 mcs.) Low & Hi-Power												
Fixed - Coaxial	126	(0 - 4,000 mcs.) Low & Hi-Power												
Variable Coaxial	127	(Continuous) (500 - 10,000 mcs.)												
Fixed Coaxial—Very High Power	128	(1,000 - 3,000 mcs.)												
BEND— E Plane	130	L	M	S	C	A	B	X	G	K	T	V	W	Z
H Plane	131	L	M	S	C	A	B	X	G	K	T	V	W	Z
Coaxial (7/8") Right Angle	135			S										
CAVITY— Filter	140	L	M	S	C									
LHT Transmitter	141	L		S										
Reference	142	L	M	S	C									
COUPLER— Signal Sampler Coaxial	148	(100 - 6,000 mcs.)												
Waveguide	149	L	M	S	C	A	B	X						
CRYSTAL DETECTOR MOUNTS COAXIAL Broadband	150	(900 - 12,400 mcs.)												
Tunable	151	(900 - 12,400 mcs.)												
Matched	152	(500 - 3,000 mcs.)												
CRYSTAL DETECTOR MOUNTS WAVEGUIDE Broadband	160			S	C	A	B	X	G	K				
Tunable	161			S	C	A	B	X	G	K	T	V	W	Z
DIRECTIONAL COUPLERS Coax 3/8"	165	(100 - 3,500 mcs.) HIGH DIRECTIVITY												
Coax - 7/8"	167	(100 - 3,000 mcs.) HIGH DIRECTIVITY												
Coax - 1 5/8"	168	(100 - 1,500 mcs.) HIGH DIRECTIVITY												
Coax - 3 1/8"	169	(100 - 1,000 mcs.) HIGH DIRECTIVITY												
Waveguide Uni-Directional	170	L	M	S	C	A	B	X	G	K	T	V	W	Z
Bi-Directional	171	L	M	S	C	A	B	X	G	K	T	V	W	Z
Uni- Reflectometer	172			S	C	A	B	X	G	K	T	V	W	Z
Bi- Reflectometer	173			S	C	A	B	X	G	K	T	V	W	Z
Broadband	174			S	C	A	B	X	G	K	T	V	W	Z
FILTER—LOW PASS Coaxial	175	Cut off frequency 100 to 3,000 mcs.												
LINE STRETCHER— Coaxial - 3/8"	180	(900 - 12,400 mcs.)												
LOAD—COAXIAL Low Power	190	(0 - 4,000 mcs.)												
Medium Power 7/8" Line	191	L		S										
Medium Power 1 5/8" Line	192	L												
High Power 3 1/8" Line	193	L		S										
High Power 1 5/8" Line	194	L												
LOADS—WAVEGUIDE Low Power	200	L	M	S	C	A	B	X	G	K	T	V	W	Z
Medium Power	201	L	M	S	C	A	B	X	G	K	T	V	W	Z
High Power	202	L	M	S	C	A	B	X	G	K	T	V	W	Z
Tunable	203			S	C	A	B	X	G	K	T	V	W	Z
Movable	204			S	C	A	B	X	G	K	T	V	W	Z
Water	210	L		S	C		B	X						
Monitor— Power	219													
MIXER—CRYSTAL Coaxial	220	L		S	C									
Waveguide	230			S	C	A	B	X	G	K	T			
Balanced Waveguide	235			S				X		K				
NUT & BOLT	240	L		S	C	A	B	X	G	K	T			
POWER DIVIDER- Coaxial - Fixed	245	L		S										
Adjustable	246	L		S										
MULTIPLIER—(FREQUENCY) Waveguide - Coaxial Input	248	any input or output freq. 1 - 90 kmc												
Waveguide Input	249	any input or output freq. from 1 - 90 kmc												
PROBE— Tunable	0	(900 - 12,400 mcs.)												
REFLECTION— Standard W.G.	256				S	C	A	B	X	G	K	T		
ROTARY JOINT—COAXIAL Med. Speed 7/8"	260	(2,700 - 2,900 mcs.)												

EQUIPMENT—	MODEL	L 1.12 - 1.70 KMC	M 1.7 - 2.31 KMC	S 2.6 - 3.95 KMC	C 3.95 - 5.85 KMC	A 5.85 - 8.20 KMC	B 7.05 - 10 KMC	X 8.2 - 12.4 KMC	G 12.4 - 18 KMC	K 18 - 26.5 KMC	T 26.5 - 40 KMC	V 33 - 50 KMC	W 50 - 75 KMC	Z 60 - 90 KMC
High Speed 7/8"	261	(2,700 - 2,900 mcs.)												
Inline L.T.	262	(10-3,000 mcs.)												
ROTARY JOINT WAVEGUIDE Doorknob Transition	270			S				X						
Circular Transition	271						B	X		K				
Crossover Transition	272						B	X						
SHIFTER—PHASE Waveguide	275	L	M	S	C	A	B	X	G	K	T			
SHORT—MOVABLE Waveguide - (Unhoused)	283	L		S	C	A	B	X	G	K	T	V	W	
SHORTS—MOVABLE (HOUSED) 3/8" Coaxial	290	L		S	C	A	B	X						
3/8" Coaxial	291	L		S	C									
7/8" Coaxial	292	L		S										
Waveguide	293	L	M	S	C	A	B	X	G	K	T	V	W	
Waveguide Precision	294	L	M	S	C	A	B	X	G	K	T	V	W	Z
SLOTTED LINE—COAXIAL 3/8" Line	300	(4,000 - 10,000 mcs.)												
7/8" Line	301	(1,000 - 4,000 mcs.)												
Waveguide	310	L	M	S	C	A	B	X	G	K	T			
STAND	330	L		S	C	A	B	X	G	K	T			
SWITCH—Coax	334	L												
W.G. Rotary Type	335	L	M	S	C	A	B	X	G	K	T	V	W	Z
W.G. Multiple Type	336			S				X		K				
TEE—Coaxial 7/8" Line	340	L		S										
W.G. Series TEE	350	L	M	S	C	A	B	X	G	K	T	V	W	Z
W.G. Shunt	351	L	M	S	C	A	B	X	G	K	T	V	W	Z
W.G. E/H (Hybrid)	352	L	M	S*	C	A	B	X*	G	K*	T	V	W	Z
TRANSITIONS—COAXIAL 3/8" - 7/8" Line	370	(0 - 4,000 mcs.)												
7/8" to 1 5/8"	371	(0 - 4,000 mcs.)												
W.G. Taper	380	Any Combination of waveguide, sizes L to T inclusive.												
W.G. Step	381									BX				
W.G. Elbow	382									BX				
TUBE MOUNT—KLYS.	390					C	A	B	X					
TUNER—Coaxial 3/8" Single Stub	400	L		S	C	A	B	X						
7/8" Single Stub	401	L		S										
3/8" Double Stub	402	L		S	(2,000 - 10,000 mcs.)									
7/8" Double Stub	403	L		S										
3/8" Triple Stub	404	L		S	(2,000 - 10,000 mcs.)									
7/8" Triple Stub	405	L		S										
7/8" Slug	407	L		S										
TUNER—WAVEGUIDE Single Stub	409	L	M	S	C	A	B	X	G	K	T	V	W	Z
Double Stub	410	L	M	S	C	A	B	X	G	K	T	V	W	Z
Triple Stub	411	L	M	S	C	A	B	X	G	K	T	V	W	Z
E/H	412	L	M	S	C	A	B	X	G	K	T	V	W	Z
Glide Screw	413			S	C	A	B	X	G	K	T	V	W	Z
Double Slug	414			S	C	A	B	X	G	K	T			
TWISTS	420			S	C	A	B	X	G	K	T			
WAVEMETER—COAXIAL Micrometer	430	L		S	C									
In Case	440	L	M	S	C									
Waveguide MICROMETER Absorbtion	450						A	B	X	G	K	T		
Transmission	451						A	B	X	G	K	T		
Direct Reading	460							B	X					

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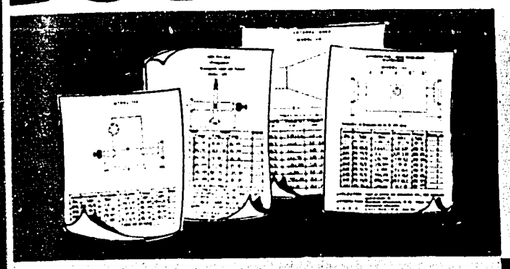

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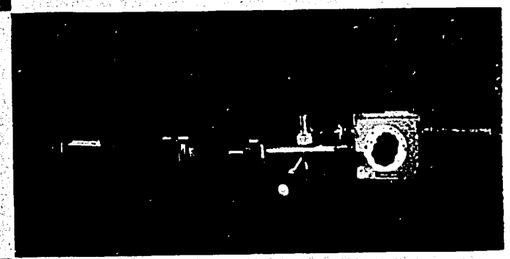

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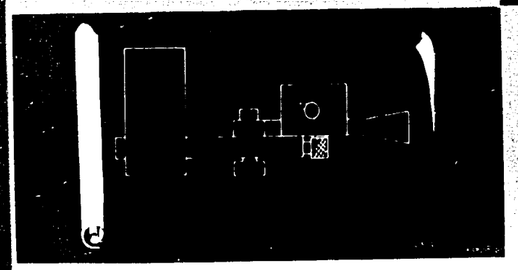

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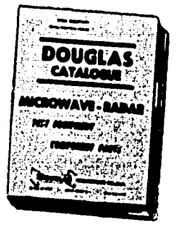

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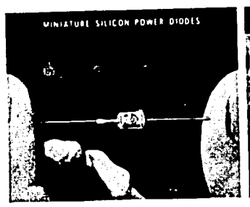
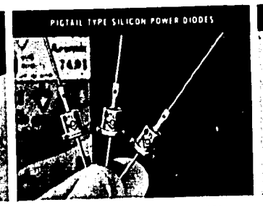
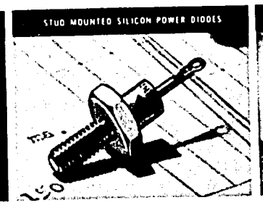
Special configurations and high reliability rectifiers for military applications may be obtained under our "Prescribed Reliability" Program. Address your inquiry to: Military Products Dept.



Ratings: 100 to 600 PIV, Up to 500 ma.
Specifically designed for missile and airborne equipment applications where miniaturization and reliability are prime factors. Hermetically sealed, all-welded, pigtail lead construction. Manufactured to meet the most rigid military requirements. Request **Bulletin SR-203**



Ratings: 50 to 600 volts PIV • 250 to 750 ma.
An extensive line of silicon power diodes for military and industrial applications featuring all-welded, hermetically sealed construction. All designed and manufactured to meet the most rigid military requirements. For complete technical data, write for **Bulletin SR-202.**



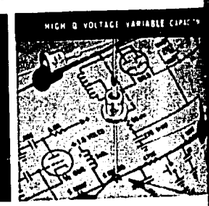
Ratings: 50 to 600 volts PIV • 400 ma. to 1 amp.
Industrial and military types including the 1N253, 1N254 and 1N255. Stud mounted, hermetically sealed, all-welded construction. Operating temperature range: –55°C to +150°C. Designed and manufactured to meet most rigid military specifications. **Bulletin SR-135C**

Ratings: 20 to 160 volts • 100μa to
Ideal components for bias supplies, sens
lays, computers etc. High resistance, (fi
ohms and higher at —10 volts). Excelle
forward characteristics. Extremely sma
cost. Encapsulated to resist adverse
mental extremes. **Bulletin SR-163.**

Ratings: From 100 ma. to 50 Amps.
Low forward voltage drop and low leakage characteristics make this series ideal for a wide variety of power applications. For details request **Bulletin C-349,** (26 volt cells); **Bulletin SR-160,** (45 to 52 volts per cell) and **Bulletin SR-152,** on high current density cells.

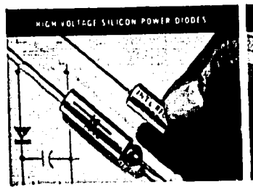
Ratings: 25 to 156 volts AC, 50 to 1,200 ma. DC
The widest range in the industry! Designed for Radio, Television, TV booster, UHF converter and experimental applications. Input ratings from 25 to 156 volts AC and up. DC output current 50 to 1,200 MA. Write for application information. **Bulletin ER-178-A**

Ratings: 400 PIV, up to 750 ma.
SD-500. A hermetically sealed, all-welded silicon junction rectifier offering maximum reliability in the high temperatures encountered in TV applications. Pigtail leads eliminate the need for brackets, blocks, etc., simplify installation. For complete data: **Bulletin SR-201**

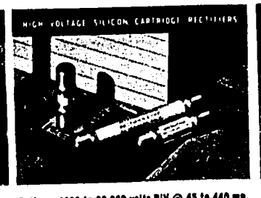


Ratings: 6 of 1000, 200 PIV DC
Semicap's small size, light weight, high
bility and low power requirements ma
ideal for automatic frequency control,
quency modulation oscillators and
networks. All-welded hermetically se
shock-proof housing. Request **Bulletin**

SILICON AND SELENIUM HIGH VOLTAGE TYPES



Rating: 600 to 2400 volts PIV • 100 to 125 ma.
Three types available. Hermetically sealed, pigtail construction. Style J rated at 600 to 1000 volts PIV at 125 ma. **Bulletin SR-138E** Styles K and L with PIV ratings from 600 to 2400 volts at 100 ma. dc output current are described in technical detail—**Bulletin SR-157.**



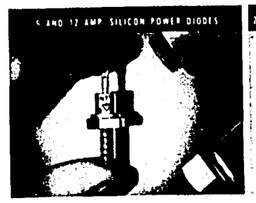
Ratings: 1000 to 20,000 volts PIV @ 45 to 440 ma.
Especially suited for miniaturized military equipment where optimum reliability is a prime factor. Standard types for, normal convection cooling and high current types for forced air or oil cooling. Hermetically sealed, metallized ceramic housing. Request **Bulletin SR-225.**

Ratings: 20 to 20,000 volts • 0.2 to 195 ma.
Designed for long life and reliability in half-wave, voltage doubler, bridge, center-tap circuits, and 3-phase circuit types. Phenolic cartridges and hermetically sealed types available. Operating temperature range: –65°C to +100°C. For details specify **Bulletin H-2.**

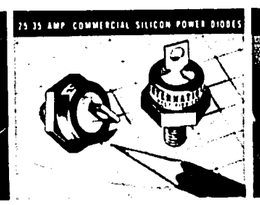
Ratings: 85 to 600 ma • 1500 to 6000 PI
Highly reliable series of tube replacement
rated from 1500 to 6400 PIV, 85 to 600 ma (
the ST-7 replacement for the 6X4 Tube) offer
rior characteristics of silicon
voltage applications.
For complete data:

POWER TYPES FOR INDUSTRIAL AND MILITARY APPLICATIONS

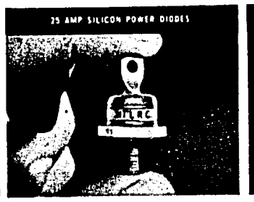
SILICON AND SELENIUM MEDIUM CURRENT TYPES 1 TO 150 AMPS.



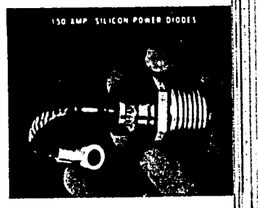
Ratings: 8 and 12 Amps • 50 to 500 PIV.
Precision-controlled diffusion process insures optimum operation and high uniformity of characteristics over the entire operating temperature range. Full 8 or 12 ampere output current over a PIV range from 50 to 500 volts. Rugged, all-welded construction.
Bulletin XSR-308.



Ratings: 25 to 35 Amps • 50 to 500 PIV.
50 to 500 PIV Rated "Quad-Sealed" power diodes are low in cost yet provide extremely stable operation on a wide range of commercial applications. 4 layer "Quad-Seal" process assures high resistance to humidity, shock, vibration and temperature extremes.
Bulletin SR-310.

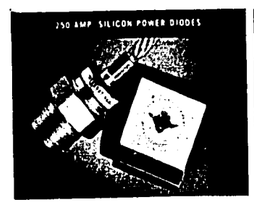


Rating: 50 to 500 volts PIV • 25 to 45 Amps.
Advanced ceramic techniques assuring excellent thermal characteristics and mechanical stability are used in the production of these highly reliable, hermetically sealed rectifiers for military or industrial applications. For complete technical data, request **Bulletin SR-304**

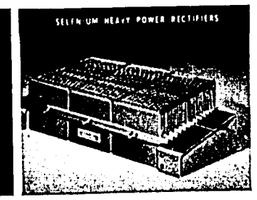


Ratings: 50 to 800 volts PIV • 45 to 150 Amps.
An extensive series of standard and revers
polarity types. Optional mounting bases i
cluding machine thread and pipe thread type
Machine thread base types: **Bulletin SR-30**
Pipe thread base types. **Bulletin SR-30**
Complete stack assemblies: **Bulletin SR-30**

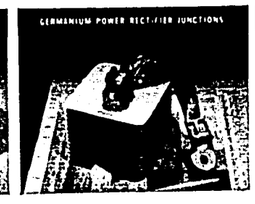
SILICON, SELENIUM AND GERMANIUM HIGH CURRENT TYPES 50 TO 670 AMPS. SPECIAL JUNCTION



Ratings: 50 to 500 volts PIV • 75 to 250 Amps.
Standard and reverse polarity types offered in a series of machine thread and pipe thread mounting styles. Complete assemblies in all circuit configurations also available. Rugged construction and hermetic sealing assure long life and reliability. Ask for **Bulletin SR-305**



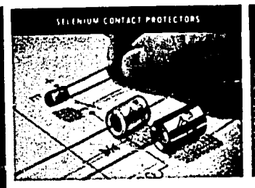
Ratings: 6 to 30,000 volts • 50 to 2,300 Amps.
Specifically designed for industrial DC power needs. Patented construction features assure long life. Descriptive bulletins available are: **Bulletin C-349,** (26 volt cells); **Bulletin SR-160,** (45 to 52 volts per cell) and **Bulletin SR-152,** on high current density cells.



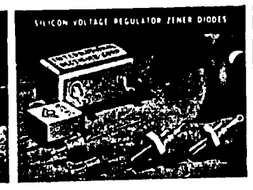
Ratings: 500 amperes • 26 to 66 volts rms
High capacity functions especially designed for high-current, low-voltage electrochemical installations. Air cooled, these hermetically sealed junctions provide efficiency to 98.5%. Cast aluminum airfoil housing effects maximum heat transfer. Request **Bulletin GPR-25A.**

Ratings: 10 Amps • 20 to 200 PIV.
A completely new miniature control device capabl
of replacing the thyratron and similar units that pr
portionately control power to a load from an ac source
Units currently available with output currents up t
10 amps, PIV ratings from 20 to 200 volts.
Bulletin SR-35

SPECIAL SEMI-CONDUCTOR DEVICES



Complete series of AC and DC types.
Designed to eliminate arcing and erosion across the contacts of relays, switches, etc. A complete series in each of three basic types: diode type, cartridge type and hermetically sealed types for industrial application. For complete data: **Bulletin SR-130-A**



Ratings: From 600 milliwatts to 10 watts
A complete series in 6 types. Miniature single junction types, multiple junction types and double anode units. 750 milliwatt and 1 watt types: **Bulletin SR-251,** 3.5 and 10 watt types: **Bulletin SR-252,** Multiple junction 5 watt types: SR-253, Double anode types: SR-254

Voltage Regulation: ±0.01%
Built to withstand environmental extremes, and operable up to 125°C, these miniature, highly stable reference packs provide output voltages of either 8.4 or 16.8 volts dc—are available in 6 distinct types allowing operation from varied power sources.
Request **Bulletin SR-401.**

(Wide range of silicon and selenium types.)
Self-generating cells available in standard an
custom sizes, mounted or unmounted. Fo
details on wide selection of selenium type
request **Bulletin PC-649A.** Silicon solar cells wit
efficiencies as high as 10%. Designed to ruggedi
military specifications. **Bulletin SR-275A.**

International Rectifier Corp.

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The World's Largest Supplier of Industrial Metallic Rectifiers • Selenium • Germanium • Silicon

A WORLD OF DIFFERENCE THROUGH RESEARCH

REPRESENTATIVES THROUGHOUT THE WORLD

For details, circle #42 on Reader Service Card

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AMPLIFIER KLYSTRONS

	U.S.A. Price	Typical Operation: Output Power, Watts CW	Typical Operation: Output Power, Watts Pulse	Typical Operation: Power Gain db	Frequency Range Mc	Maximum Ratings: Beam Voltage Volts	Maximum Ratings: Beam Current Amps
3K2500LX	$ 2,360.00	1320	.....	25	980-1200	7000	0.6
3K2500SG	2,950.00	1300	.....	25	1700-2400	7000	0.6
3K3000LQ	2,360.00	2790	.....	30	720- 985	9000	0.75
3K50,000LA	4,200.00	10,000	12,000[7]	25	400- 600	20,000	2.5
3K50,000LF	4,200.00	10,000	12,000[7]	25	570- 720	20,000	2.5
3K50,000LQ	4,200.00	10,000	12,000[7]	25	720- 985	20,000	2.5
3KM3000LA	2,470.00	2300	.....	30	385- 580	9000	0.75
3KM4000LT	1,880.00	.....	38,200	30	960-1215	28,000	6.0
3KM50,000PA	11,000.00	20,000	50,000	30	225- 400	30,000	2.5
4K50,000LQ	4,560.00	11,200	.....	50	720- 985	20,000	2.5
4KM3000LQ	3,750.00	2000	.....	40	720- 985	20,000	0.75
4KM3000LR	2,585.00	2000	.....	40	610- 985	10,000	0.75
4KM50,000LA	4,230.00	10,000	.....	50	400- 610	20,000	2.5
4KM50,000LQ	3,760.00	10,000	.....	50	610- 985	20,000	2.5
4KM50,000SG	10,000.00	11,400	.....	50	1700-2400	18,000	2.0
4KM170,000LA	23,500.00	75,000	.....	50	300- 500	35,000	5.5
6K50,000LQ	8,250.00	.....	200,000	50	300- 500	55,000	11.0
		9,000	.....	30	720- 980	20,000	2.5

REFLEX KLYSTRONS

	U.S.A. Price	Maximum Ratings: Resonator Voltage Volts	Maximum Ratings: Resonator Dissipation Watts	Maximum Ratings: Cathode Current ma	Maximum Ratings: Reflector Voltage Volts (Typical)	Electrical Characteristics: Heater Voltage Volts	Electrical Characteristics: Heater Current Amps	Electrical Characteristics: Frequency Range Mc
1K015CA[2]	$295.00	350	15	50	—250	6.3	0.8	5400-6000
1K015CG[1]	295.00	350	15	50	—250	6.3	0.8	5400-6000
1K125CA[1]	235.00	1000	125	110	—285	6.3	1.2	3700-4400
1K125CB[1]	235.00	1000	125	110	—335	6.3	1.2	4400-5000
1K20KA[1]	475.00	350	20	50	—190	6.3	0.8	10,700-11,500
1K20XD[1]	475.00	350	20	50	—175	6.3	0.8	10,000-10,700
1K20XK[1]	475.00	350	20	50	—160	6.3	0.8	9200-10,000
1K20XS[1]	475.00	350	20	50	—140	6.3	0.8	8500-9200

TETRODES

	U.S.A. Price	Maximum Ratings: Plate Dissipation Watts	Maximum Ratings: Plate Voltage Volts	Maximum Ratings: Plate Current ma	Maximum Ratings: Grid Dissipation Watts	Maximum Ratings: Screen Voltage Volts	Maximum Ratings: Screen Dissipation Watts	Electrical Characteristics: Filament Voltage Volts	Electrical Characteristics: Filament Current Amps	Electrical Characteristics: Amplification Factor
4-65A	$ 25.00	65	3000	150	5	600	10	6.0	3.5	.....
4-125A	36.00	125	3000	225	5	600	20	5.0	6.5	.....
4-250A	46.50	250	4000	350	10	600	35	5.0	14.5	.....
4-400A	55.00	400	4000	350	10	600	35	5.0	14.5	.....
4-1000A	132.00	1000	6000	700	25	1000	75	7.5	21.0	.....
4CN15A	57.65	15	2500	.....	2	400	12	6.0	3.0	.....
4CW10,000A	625.00	10,000	7500	3000	75	1500	250	7.5	75.0	.....
4CX125C	55.00	125	2500	250	2	400	12	6.0	3.0	.....
4CX250B	45.00	250	2000	250	2	400	12	6.0	2.6	.....
4CX250F	45.00	250	2000	250	2	400	12	26.5	0.57	.....
4CX250K	54.00	250	2000	250	2	400	12	6.0	2.6	.....
4CX250M	54.00	250	2000	250	2	400	12	26.5	0.57	.....
4CX300A	48.00	300	2500	250	2	400	12	6.0	3.0	.....
4CX1000A	156.00	1000	3000	1000	0	400	12	6.0	10.5	.....
4CX5000A	450.00	5000	7500	3000	75	1500	250	7.5	75.0	.....
4W300B	42.50	300	2000	250	2	400	12	6.0	2.6	.....
4W20,000A	1,850.00	20,000	8000	15,000	60	1500	200	10.0	30.0[9]	.....
4X150A	38.95	150	1250	250	2	400	12	6.0	2.6	.....
4X150D	38.95	150	1250	250	2	400	12	26.5	0.57	.....
4X150G	54.00	150	1250	250	2	400	15	2.5	6.8	.....
4X250B	42.50	250	2000	250	2	400	12	6.0	2.6	.....
4X250F	42.50	250	2000	250	2	400	12	26.5	0.57	.....
4X500A	121.00	500	4000	350	10	500	30	5.0	13.5	.....

PENTODE

4E27A/5-125B	$ 40.00	125	4000	200	5	750	20	5.0	7.50	.....

TRIODES

2C39A	$ 22.50	100	1000	125[5]	2	.....	.....	6.3	1.0	100
2C39WA	30.00	100	1000	125[5]	2	.....	.....	6.3	1.0	100
3C24	15.00	25	2000	75	7	.....	.....	6.3	3.0	24
3CPN10A5	32.15	10	.....	.....	2	.....	.....	6.0	1.0	100
3CX100A5	32.15	100	1000	125[5]	2	.....	.....	6.0	1.0	100
3W5000A1	210.00	5000	6000	2500	50	.....	.....	7.5	51.0	5
3W5000A3	198.00	5000	6000	2500	150	.....	.....	7.5	51.0	20
3W5000F1	210.00	5000	6000	2500	50	.....	.....	7.5	51.0	5
3W5000F3	198.00	5000	6000	2500	150	.....	.....	7.5	51.0	20
3X100A5	25.00	100	1000	125[5]	2	.....	.....	6.3	1.0	100
3X2500A3	198.00	2500	6000	2500	150	.....	.....	7.5	51.0	20
3X2500F3	198.00	2500	6000	2500	150	.....	.....	7.5	51.0	20
3X3000A1	198.00	3000	6000	2500	50	.....	.....	7.5	51.0	5
3X3000F1	198.00	3000	6000	2500	50	.....	.....	7.5	51.0	5
25T	15.00	25	2000	75	7	.....	.....	6.3	3.0	24
35T	20.00	50	2000	150	15	.....	.....	5.0	4.0	39
75TH	28.00	75	3000	225	16	.....	.....	5.0	6.25	20
75TL	28.00	75	3000	225	13	.....	.....	5.0	6.25	12
100TH	22.00	100	3000	225	20	.....	.....	5.0	6.3	38
100TL	22.00	100	3000	225	15	.....	.....	5.0	6.3	14
250TH	33.00	250	4000	350	40	.....	.....	5.0	10.5	37
250TL	33.00	250	4000	350	35	.....	.....	5.0	10.5	14
304TH	60.50	300	3000	900	60	.....	.....	5 or 10	25 or 12.5	20
304TL	60.50	300	3000	900	50	.....	.....	5 or 10	25 or 12.5	12
450TH	77.00	450	6000	600	80	.....	.....	7.5	12.0	38
450TL	77.00	450	6000	600	65	.....	.....	7.5	12.0	18
592/3-200A3	37.50	200	3500	250	25	.....	.....	10.0	5.0	25
750TL	137.50	750	10,000	1000	100	.....	.....	7.5	21.0	15
1000T	137.50	1000	7500	750	80	.....	.....	7.5	15.5	35
1500T	245.00	1500	8000	1250	125	.....	.....	7.5	24.0	24
2000T	340.00	2000	8000	1750	150	.....	.....	10.0	23.5	23

For details, circle #44 on Reader Service Card

Eimac First for Reliability in Power Electron Tubes

HIGH VACUUM RECTIFIERS

MERCURY-VAPOR RECTIFIERS

	U.S.A. Price	Filament Voltage Volts	Filament Current Amps	Peak Inverse Voltage Volts	Peak Plate Current Amps	Average Plate Current ma	Plate Dissipation Watts
2-01C	$ 17.25	5.0	0.35	1,000	0.010	1	0.1
2-25A	14.00	6.3	3.0	25,000	1.0	50	15
2-50A	16.50	5.0	4.0	30,000	1.0	75	30
2-150D	36.00	5.0	13.0	30,000	3.0	250	90
2-240A	40.00	7.5	12.0	25,000	4.0	500	150
2-450A	94.00	7.5	26.5	25,000	8.0	1000	450
2-2000A	214.50	10.0	25.0	75,000	12.0	750	1200
250R	30.50	5.0	10.5	60,000	2.5	250	150
253	30.00	5.0	10.0	15,000	2.5	350	100
8020(100R)	15.00	5.0	6.5	40,000	1.5	100	60
2CL40A	32.00	6.0	3.0	16,000	10.0[4]	120[4]	40[4]
2X1000A	120.00	26.5	2.25	25,000	25.0[4]	1250[4]	1000
2X3000F	140.00	7.5	51.0	25,000	20.0	3000	3000
KY21A	25.00	2.5	10.0	11,000	3.0	750	.....
RX21A	24.00	2.5	10.0	11,000	3.0	750	.....

PREFORMED CONTACT FINGER STOCK

A prepared strip of silver-plated spring material, slotted and formed into a series of fingers designed to make sliding contact.

Single Edge	Width	U.S.A. Price per Ft.
CF-100	1/32"	$1.65
CF-300	3/32"	1.80
CF-500	1/8"	2.00
CF-900	3/4"	1.65

Double Edge	Width	U.S.A. Price per Ft.
CF-200	1/16"	2.10
CF-400	1 1/32"	2.55
CF-600	2 1/4"	2.95

Klystron Types	Width	U.S.A. Price per Ft.
CF-700	1/32"	1.90
CF-800	1/32" x 3/16"	1.85

Used as contact between klystrons and externally-tuned cavities. Available in 3-foot lengths only.

PULSE MODULATORS

	U.S.A. Price	Plate Dissipation Watts	Plate Voltage Volts	Plate Current ma	Grid Dissipation Watts	Screen Voltage Volts	Screen Dissipation Watts	Filament Voltage Volts	Filament Current Amps	Amplification Factor
4PR60A	$90.00	60	20,000	18,000[3]	...	1500	8	26.0	2.25	...
6C21	77.00	300	30,000	15,000[3]	50	.....	...	8.2	17.00	30

HEAT-DISSIPATING CONNECTORS

Type	Hole Diameter	U.S.A. Price
HR-1	.052	$ .60
HR-2	.062	.60
HR-3	.072	.60
HR-4	.102	.80
HR-5	.127	.80
HR-6	.367	.80
HR-7	.127	1.60
HR-8	.575	1.60
HR-9	.569	3.00
HR-10	.510	1.60

SK-604 TUBE EXTRACTOR

A spring-steel extractor for use with the 4X150 series, 4X250 series and 2C39 series tubes. U.S.A. Price $ .55

VACUUM SWITCHES

Single-pole double-throw switch within a high vacuum adaptable for high-voltage switching. Contact spacing .015". Switch will handle R-F potentials as high as 20 Kv. In D-C switching will handle approximately 1.5 Amps. at 5 Kv.

Type	U.S.A. Price	Coils	U.S.A. Price
VS-2	$18.00	12V	$7.50
VS-6	32.00	24V	8.50

1001G IONIZATION GAUGE

For measuring pressures from 10^{-3} to less than 10^{-8} mm of mercury. U.S.A. Price $32.00

HV-1 DIFFUSION PUMP

Triple-jet, air-cooled vacuum pump of the oil-diffusion type. Capable of reaching an ultimate vacuum of 4×10^{-7} mm of mercury when used with suitable forepump. U.S.A. Price $156.00

AIR SYSTEM SOCKETS

CHIMNEYS

	U.S.A. Price	Tube	Screen By-Pass Capacitor uuf	Special Characteristics
SK-100	$123.00	4KM3000LQ; 3KM3000LA; 3K3000LQ	.....	Cathode socket.
SK-110	123.00	3K50,000LA,F,Q; 3KM50,000PA; 4K50,000LQ; 4KM50,000SG; 6K50,000LQ, 4KM50,000LA; 4KM50,000LF; 4KM50,000LQ	.....	Cathode socket.
SK-200	60.00	3K2500SG; 3K2500LX; 3KM4000LT	.....	Cathode socket.
SK-300	60.00	4CX5000A; 4CW10,000A	none	
SK-400	16.50	4-400A; 4-250A; 4-125A	none	
SK-500	17.00	4-1000A	none	
SK-600	12.50	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	2700	No terminals grounded.
SK-602	12.50	4X150A; 4X150D; 4X250B 4X250F; 4CX250B; 4W300B	2700	No terminals grounded. (Special SK-600)
SK-610	13.00	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	2700	Cathode terminals grounded.
SK-620	15.75	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	1100	No terminals grounded. Screen by-pass capacitor plastic sealed.
SK-630	17.60	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	1100	Cathode terminals grounded. Screen by-pass capacitor plastic sealed.
SK-640	5.00	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	none	No terminals grounded.
SK-650	8.00	4X150A; 4X150D; 4X250B; 4X250F; 4CX250B; 4W300B	none	Cathode terminals grounded.
SK-655	4.00	(Screen by-pass capacitor for use with SK-650)	1100	Plastic sealed.
SK-700	20.00	4CX300A; 4CN15A; 4CX125C	1100	No terminals grounded.
SK-710	20.00	4CX300A; 4CN15A; 4CX125C	1100	Cathode terminals grounded.
SK-740	9.10	4CX300A; 4CN15A; 4CX125C	none	No terminals grounded.
SK-760	9.10	4CX300A; 4CN15A; 4CX125C	none	Integral chimney. No terminals grounded.
SK-770	9.10	4CX300A	none	Integral chimney, screen terminals grounded.
SK-800A	40.00	4CX1000A	1500	No terminals grounded.
SK-810	40.00	4CX1000A	1500	Cathode terminals grounded.
SK-900	48.00	4X500A	650	
SK-1000	On Request	4KM170,000LA	.....	Cathode socket.

CHIMNEYS

	U.S.A. Price
SK-306	$ 6.00
SK-406	8.00
SK-506	12.00
SK-606	.60
SK-626	.75
SK-636	6.00
SK-806	8.00
SK-906	10.00

[1] Waveguide Output Fitting
[2] Coaxial Output Fitting
[3] Pulse
[4] Convection liquid cooled
[5] Cathode Current
[6] Clipper diode service only
[7] TV Peak-Synchronizing Level
[8] Plus 2250 watts bombarder power
[10] 15 Mc Bandwidth, 3 db points.

All prices subject to change without notice

EITEL-McCULLOUGH, INC.
SAN CARLOS • CALIFORNIA
SAN BRUNO, CALIFORNIA • SALT LAKE CITY, UTAH

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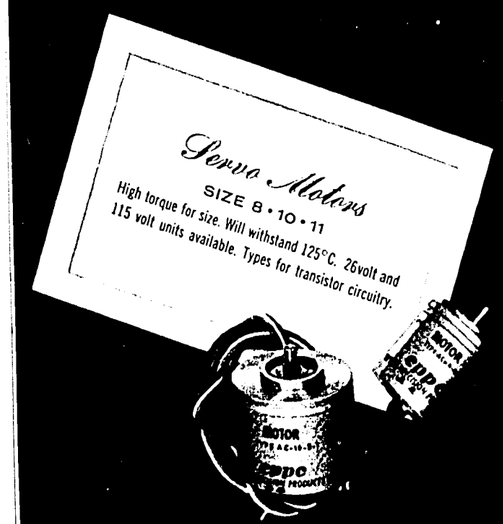
CPPC for ANY ROTARY COMPONENT



Servo Motors

SIZE 8 • 10 • 11

High torque for size. Will withstand 125°C. 26volt and 115 volt units available. Types for transistor circuitry.

Linear Transformers

(Induction Potentiometers)

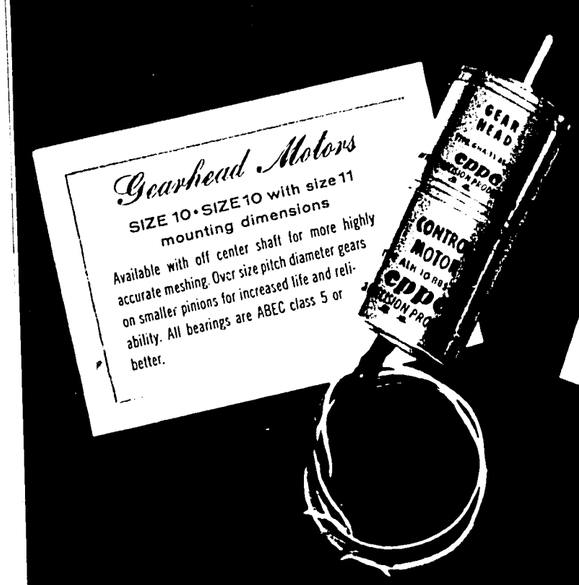
SIZE 8 • 10 • 11

These units feature low secondary impedances. Can be designed to work with wide range of load impedances. Infinite resolution. Linearity .5%. Wide variety. Can be temperature compensated.

Synchros

SIZE 8 • 10 • 11 • 15 • Pancake
BuOrd • High Temp. (450°F)

Highest accuracy in production quantities (7' max. error is typical); lowest nulls, lowest phase shifts; corrosion resistant construction, stainless steel or aluminum housings. Double ended shafts available. An extremely wide variety of synchros available as Transmitters, Receivers, Control Transformers, Differentials, Resolvers.



Gearhead Motors

SIZE 10 • SIZE 10 with size 11 mounting dimensions

Available with off center shaft for more highly accurate meshing. Over size pitch diameter gears on smaller pinions for increased life and reliability. All bearings are ABEC class 5 or better.

D. C. Motors

SIZE 8

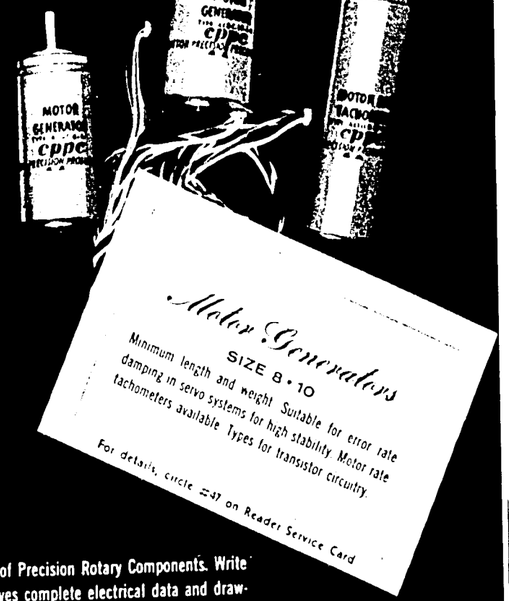
Smooth rotation at low speeds. Reversible. Speed linearly proportional to voltage. 28 or 14 volt input. Leads or terminals. Available with governor which maintains constant speed within ±1%.

For details, circle #46 on Reader Service Card

Precision Computing Resolvers

SIZE 8 • 10 • 15 • Pancake

Highest accuracy (functional error 03% to 1%) Excellent nulls, low phase shift. Units to resist 450° F. Resistive, feedback winding or thermistor compensation. Types for transistor circuitry BuOrd shafts and Mk 4 Mod 0 brush block obtainable.



Motor Generators

SIZE 8 • 10

Minimum length and weight. Suitable for error rate damping in servo systems for high stability. Motor rate tachometers available. Types for transistor circuitry.

For details, circle #47 on Reader Service Card

CLIFTON PRECISION PRODUCTS CO., INC.

CLIFTON HEIGHTS, PA.

These pages describe only partially our wide line of Precision Rotary Components. Write or telephone for CPPC's latest catalogue which gives complete electrical data and drawings. Special units are available to withstand severe vibration and shock, extremely high temperature, and radio-active environments.

Most units available for immediate delivery. Two plants (Clifton Heights, Pa. and Colorado Springs, Colo.) to serve you.

Home Sales Office: 9014 West Chester Pike, Upper Darby, Pa., Hilltop 9-1200 (Suburban Philadelphia).

CINCH SOCKETS

PRINTED CIRCUIT SOCKETS

No. 22920

These sockets for the three types of receiving tubes. Miniature, Flat Press and Button.

The contacts are so spaced that they can be mounted in an incremental drill pattern. This fact together with the exact precision and uniformity of Cinch sockets make them ideal for automatic assembly.

No. 22920—7 contact miniature molded vertically mounted socket with JAN type shield base. Mica insulation. Silver plated phosphor bronze contacts drop through .062" dia. clearance holes arranged on a .1" X and Y axis.

No. 24255

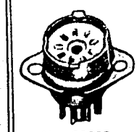
No. 24255 — 8 contact button base subminiature molded, vertically mounted socket. Mica insulation. Silver plated beryllium copper contacts drop through .070" dia. clearance holes arranged on a .1" X and Y axis.

No. 24255A–Same as above except insulation to withstand temperatures above 200° Centigrade.

No. 22024

No. 22024—7 contact flat press subminiature molded, vertically mounted socket for conventional wiring. Assembled with a special shield base to accept a subminiature shield with the "J" lock. Flat sided retaining nuts and screws are provided for mounting. Mica insulation. Silver plated beryllium copper contacts.

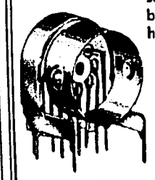
No. 22023—Same as above except insulation to withstand temperatures above 200° Centigrade.



No. 22022

No. 22022 — 8 contact button base subminiature molded vertically mounted socket for conventional wiring. Assembled with special shield base to accept a subminiature shield with the "J" lock. Mica insulation. Silver plated beryllium copper contacts.

No. 22021—Same as above except insulation to withstand temperatures above 200° Centigrade.



No. 24202

No. 24202- 7 contact miniature molded right angle mounted socket with JAN shield base. Mica insulation. Silver plated beryllium copper contacts drop through .062" dia. clearance holes arranged on a .1" X and Y axis.

No. 24257— 7 contact flat press subminiature molded right angle socket. Mica insulation. Silver plated beryllium copper contacts drop through .046" dia. clearance holes arranged on a .1" X and Y axis.

No. 24257

No. 24439—Similar to above except 9 contacts. Both meet Mil. Specs.

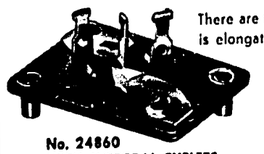
No. 24308 — 8 contact button base subminiature molded, right angle mounted socket. Mica insulation. Silver plated beryllium copper contacts drop through .046" dia. clearance holes arranged on .1" X and Y axis.

No. 24308

No. 24308A—Same as above except insulation to withstand temperatures above 200° Centigrade.

For details, circle #48 on Reader Service Card

POWER TRANSISTOR SOCKETS



No. 24860
WITH INTEGRAL EYELETS

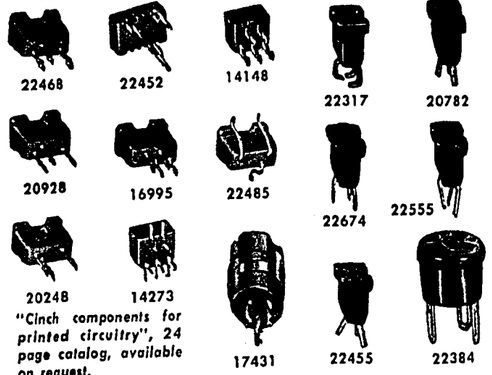
There are three laminated type sockets; No. 22831 is elongated in shape, top and bottom plates are of chocolate colored XP Bakelite, 1/64" and 3/64" respectively; both vacuum wax impregnated. No. 24324 is rectangular in shape. Top and bottom plates are of natural XP Bakelite, vacuum wax impregnated. Formed thread for 6 — 20 screw, .104/.110 dia. hole in C R steel plate. Provides easy attachment to a heat sink. No. 24860 is identical with 24324 except it is equipped with integral eyelets for easy assembly to chassis. All contacts are of brass, cadmium plated.

No. 22831

No. 24246

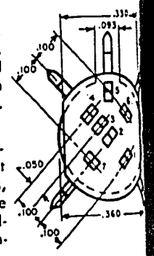
No. 24246 is a molded socket with General Purpose Bakelite casting. Contacts are of phosphor bronze, cadmium plated.

QUICK, EASY ASSEMBLY WITH CINCH TRANSISTOR SOCKETS:



"Cinch components for printed circuitry", 24 page catalog, available on request.

UNIVERSAL TRANSISTOR SOCKETS



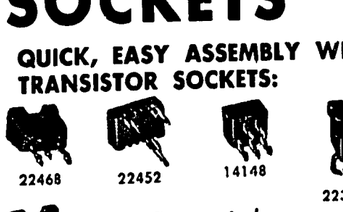
Standoff type Universal Transistor Socket for use with ten transistor bases and five base types. Casting is mica-filled phenolic (MFE). Contacts are beryllium copper, gold plated. Contacts may be used with either one or two sided 1/16" p.w. boards.

STANDOFF TYPE

No. 24872

No. 24872 for use with transistors designed to the triangular base layout .2" x .1" (JETEC-30) contact centers, as well as the three contact in-line (.048 x .192 contact centers). Available in G. P. Black and low loss Mica-filled Phenolic.

CINCH MIL SOCKETS MEET AND SURPASS RIGID MILITARY REQUIREMENTS



MINIATURE NOVAL

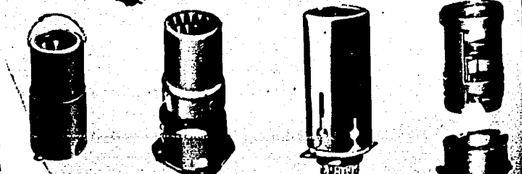
Saddles and shield base are brass, nickel plated. All contacts are silver plated; tails are hot tin dipped. Molded castings are type MFE material, ceramic castings are grade L4 material or better.

MIL shields are made of brass, nickel plated. Springs are non-magnetic stainless steel. Heat-reducing inserts are available.

Descriptive circular on sockets, shields and shield inserts available on request.

CINCH HEAT DISSIPATING TUBE SHIELDS

For Miniature, Sub-miniature, Octal and Power Tubes. The 7 and 9 pin Miniature Series, T, TR and NW Series are variously covered by Military Specifications: MIL-S-9372B (USAF), MIL-S-242A (Ships), MIL-S-19786A (Navy), SCL-6307/2 (Signal Corps). In Octal and Power Series, the shields are covered by Redstone Arsenal and Signal Corps approval.



OCTAL and POWER SHIELDS TR5 and TR6 T5 and T6

Under license arrangement with International Electronic Research Corporation.

CINCH MANUFACTURING COMPANY
1026 South Homan Ave., Chicago 24, Illinois
Division of United-Carr Fastener Corporation, Boston, Mass.

JONES PLUGS . . . SOCKETS

S-312-AB

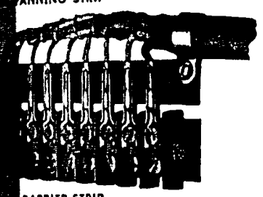
"300" SERIES Plugs and Sockets are designed for light duty service. Two to thirty-three contacts. Plugs and sockets polarized. Phosphor bronze "knife switch" socket contacts engage both sides of heavy brass plug contacts for positive connections. Molded bakelite insulation. Also can be supplied with contact tails that will take standard solderless terminals. UL approved.

ES BARRIER TERMINAL STRIP

500 SERIES . . . wider and higher barriers for increased creepage distances. Closed bottoms for complete insulation. Material between s at the base adds to the strength and maintains same creepage dis- between contact to contact and contact to ground. Can be imprinted No insulating or marker strip required.

ES FANNING STRIP

ANNING STRIP



BARRIER STRIP

Big help in terminal wiring. Connections are made through Fanning Strip, on bench or anywhere apart from barrier strip, and quickly slipped into assembly. Simplifies and facilitates soldering. Insures positive, correct connections. Saves time. Ideal for harness or cable assembly. Strong construction; brass terminals, cadmium plated. Heavy Bakelite mounting.

P-2406-CCT

S-2406-SB

P-506-CE PLUG WITH CAP

S-506-DS SOCKET WITH DEEP BRACKETS

2400 SERIES plugs and sockets . . . improved socket contacts. For highest electrical and mechanical efficiency. 4 individual flexing surfaces. Positive contact over practically their entire length. Cadmium plated plug and socket. Contacts mounted in recessed pockets, greatly increasing leakage distance, increasing voltage rating.

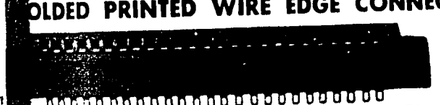
500 SERIES for heavy duty work, severest electrical services. For 5,000 Volts 25 Amperes per Contact alterable by circuit characteristics. Socket contacts phosphor bronze knife-switch type, cadmium plated. Plug contacts hard brass cadmium plated 2, 4, 6, 8, 10, and 12 contacts. Plugs and sockets polarized. Long leakage path from terminal, and terminal to ground. Caps and brackets, steel parkerized (rust-proofed). Plug and socket blocks interchangeable in caps and brackets. Terminal connections most accessible. Cap insulated with canvas bakelite.

Jones catalog; plugs and sockets, barrier strips, fanning strips, terminal panels, fuse mounts. Available on request.

HOWARD B. JONES DIVISION
CINCH MANUFACTURING COMPANY

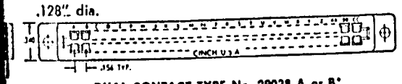
CINCH CONNECTORS

OLDED PRINTED WIRE EDGE CONNECTOR



SINGLE CONTACT TYPE NO. 29029 A OR B*

Made in 6 through 25 contacts inclusive. Designed for nominal 1/16" printed wire board, either single or two sided copper. A polarizing contact made of brass, Sel-Rex gold plated, can be placed in any contact position. Insulation material is of glass filled Diallyl Phthalate (Type GDI-30 per Mil. M-19833). Contacts are of Beryllium Copper or Phosphor Bronze with Sel-Rex gold plate .00003 minimum. Terminals are mounted on .156" centers. Mounting holes are .128" dia.



DUAL CONTACT TYPE No. 29028 A or B*

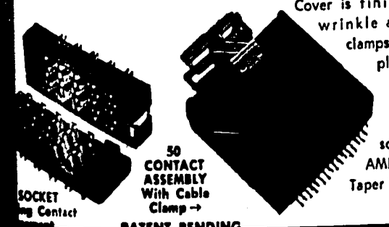
Made in 12 through 50 contacts in multiples of two. Designed for nominal 1/16" printed wire board, copper clad on both sides. Contacts, polarizing contact, insulation and mounting holes are the same as described for No. 29029.

*A—Phosphor Bronze Contact *B—Beryllium Copper Contact

CH HINGE CONNECTORS

positive contact, have simple locking device, easy release. Maximum er of contacts in minimum space.

g contact action keeps contacts clean at all times. Either the plug or body fit into the cap. Cable entrance hole can be placed at the one end, or in the top or both. Cover is finished in black wrinkle and the cable clamps are cadmium plated. Contact tails will take either conventional solder wiring or AMP "78" series Taper Tab receptacles.



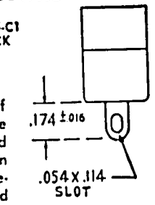
SOCKET
ng Contact

50 CONTACT ASSEMBLY With Cable Clamp →

PATENT PENDING

CINCH UNIVERSAL EDGE CONNECTORS

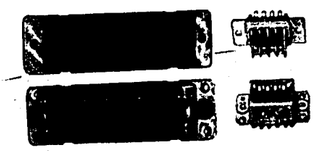
No. 24585-15-C1
G. P. BLACK



Available in four basic materials, and in any number of contacts 6 through 25. All contacts are phosphor bronze with P-92-3-03 finish (.0003 silver followed by .00003 gold flash). Pre-assembled polarizing key in any connector in any contact position when desired. Type one contact, reproduced here, which takes a standard No. 20 stranded copper wire for conventional soldering is ready for delivery.

For details, circle #49 on Reader Service Ca

BLUE RIBBON CONNECTORS



24 CONTACT P & C ELIMINATES BREAKAGE IMPROVED TYPE

8-CONTACT PLUG & SOCKET

Visual alignment unnecessary—ribbon spring contacts—floating bushings. Tha protective barriers between ribbon contacts insure uniform spacing. The entire length of the contacts are supported by quality dielectric. Multiple mounting makes it possible to make or break any number of circuits simultaneously. Molded in mounting plates are of corrosion resistant passivated stainless steel.

Manufactured by agreement with Amphenol Electronics Corp.

PRINTED CIRCUIT SUB-MINIATURE CONNECTOR

DC-37P (TOP) DC-37S-1

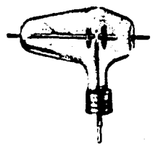
Manufactured by agreement with Cannon Electric Company

D-Sub-Miniature; Printed circuit pin and socket inserts are available in 9, 15, 25, 37 and 50 contacts. Steel with cadmium plate finish shell; contacts of copper alloy with gold over silver plate; Nylon or Diallyl-phthalate insulation. Keystone shell shape polarization.

CINCH MANUFACTURING COMPANY
1026 South Homan Ave., Chicago 24, Illinois
Division of United-Carr Fastener Corporation, Boston, Mass.

TUNG-SOL

TUNG-SOL/CHATHAM SPECIAL-PURPOSE TUBES



VACUUM SWITCH
Used in high-voltage test equipment and airborne radar units.
Types available: 1S22

RECTIFIERS
Used throughout industrial electronic equipment and broadcasting operations—AM, FM and TV.
Types available: 1Z2, 3B25, 3B28, 4B32, 5AT4, 5R4GY, 5R4WGA, 5R4WGB, 6H6WGT, 6X4W, 25Z6WGT, 26Z5W, 83, 583, 5517, 5726/6AL5W, 5726/6AL5W/6097, 5829WA, 3B29, 576A.

VOLTAGE REFERENCE TUBES
Used in radios and other electronic gear with regulated power supplies. Especially in high-accuracy units.
Types available: 5651, 5651WA. 5783, 5783WA, 5783WB.

TELEPHONE TUBES
Used in hand sets and carrier equipment.
Types available: 313C, 338A, 407A, 426A, 5842/417A, 5847/404A, 6028/408A.

TWIN TRIODES
Used widely in equipment handling frequencies from the audio level through the frequency band.
Types available: 5670, 5670WA, 6SU7GTY, 12AT7WA, 12AY7, 53, 6SC7GTY, 5687, 5687WA, 2C51, 6188/6SU7WGT, 5814, 5814WA, 5751, 5751WA, 6SN7WGTA, 6021.

HYDROGEN THYRATRONS
Used in radar modulators and missile tracking beacons. Miniatures in airborne units.
Types available: 1258, 5948, 5949, 7190, 7191, VC1257, 7192, 7240, 7454, 5948A, 5949A.

VOLTAGE REGULATORS
Used in Radio and other electronic equipment with regulated power supplies.
Types available: OB2WA, OB2, OC3W, OD3W, 6542, 6627/OB2WA, 6074, 7099.

POWER PENTODES
Used in public address systems, hi-fi amplifiers, radio transmitters and receivers.
Types available: 2E22, 3A4, 5A6, 6AR6, 6L6WGB, 5881, 26E6WGB, 6098/6AR6WA, 6146, 6550, 6883.

THYRATRONS
Used in power supplies, radio transmitters, motor controllers and spot welders.
Types available: 2A4G, 2D21W, 3C23, 6D4, 323B, 393A, 394A, 395A, 885, 2050W, 5594, 5696, 2D21, 2050, 5727/2D21W, 5643, 6012, 6901.

SEMICONDUCTORS

GERMANIUM TRANSISTORS

TO-5 Inverted Header Design Brings you these Benefits . . .

- improved thermal properties for longer life.
- superior mechanical characteristics for increased reliability.

MEDIUM POWER, MEDIUM FREQUENCY

TYPE	Pc mw	V_{CE} volts	V_{CB} volts	I_C ma	T_J °C	Max. I_{CBO} μa	h_{FE}	fab mc
2N381	200	−25	−25	200	85	10	36	1.2
2N382	200	−25	−25	200	85	10	54	1.5
2N383	200	−25	−25	200	85	10	72	1.8
INDUSTRIAL TYPES								
2N460	200	—	−45	400	100	15	25	1.2
2N461*	200	—	−45	400	100	15	50	1.2

*Designed to meet MIL-T-19500/45

MEDIUM POWER, HIGH FREQUENCY

TYPE	Pc mw	V_{CE} volts	V_{CB} volts	I_C ma	T_J °C	Max. I_{CBO} μa	h_{FE}	fab mc
COMPUTER TYPES								
2N404*	120	−24	−25	100	85	5	30	12
2N425	120	−20	−30	400	85	5	30	4
2N426	120	−18	−30	400	85	5	40	6
2N427	120	−15	−30	400	85	5	55	11
2N428†	120	−12	−30	400	85	5	80	17
2N578	120	−14	−20	400	85	5	15	5
2N579	120	−14	−20	400	85	5	30	8
2N580	120	−14	−20	400	85	5	45	15
2N581	120	−14	−18	100	85	5	30	8
2N582	120	−14	−25	100	85	5	60	18
GENERAL PURPOSE TYPES								
2N413	120	−18	−30	200	85	5	30▲	2.5
2N414	120	−15	−30	200	85	5	60▲	5
2N416	120	−12	−30	200	85	5	80▲	10
2N417	120	−10	−30	200	85	5	140▲	20
						▲h_{fe}		

*Designed to meet MIL-T-19500/20
†Designed to meet MIL-T-19500/44

TO-3 and High Power Outlines Feature Exclusive Tung-Sol Cold Weld Seal . . .

- True hermetic, copper-to-copper seal improves thermal characteristics.
- Elimination of heat-damage, heat-caused moisture and "splash" increase reliability.
- Vacuum-tight, moisture-proof cold-weld seal lasts even through "breathing" over long-life.

For further information

For details, circle #50 on Reader Service Card

* SPECIAL-PURPOSE TUBES
* SEMICONDUCTORS
* ENTERTAINMENT TUBES
* LAMPS

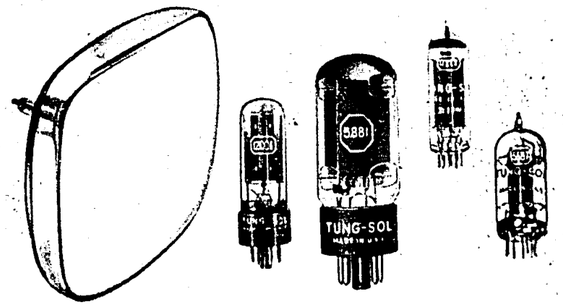
PENTODES
Used in military and other communications equipment.
Types available: 1AD4, 6AJ5, 6AK5WB, 6AS6, 6AU6WA, 5636, 5636A, 5639, 5654/6AK5W, 5654/6AK5W/6096, 5672, 5678, 5725/6AS6W, 5725/6AS6W/6187, 5749/6BA6W, 5875.

VHF TRIODES
Used in military VHF radio and test equipment.
Types available: 5676

POWER TRIODES
Used in high current regulated power supplies and radio and industrial gear with built-in power supplies.
Types available: 6AS7G, 5998, 6080, 6080WA, 6082, 6336, 6336A, 6394A, 6520, 7105, 6528, 7241, 7242.

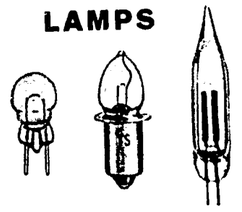
INDICATOR THYRATRONS
Used in relay service wherever a small, lightweight, self-indicating tube is needed.
Types available: 7400, 7401, 7323.

ENTERTAINMENT TUBES



Tung-Sol Blue Chip quality tubes are available for virtually every entertainment need — cathode ray, series-string, hybrid auto radio, TV, radio and hi-fi.

LAMPS



Neon glow and miniature incandescent lamps represent two areas of Tung-Sol lamp leadership, dating from 1907 and development of the first successful electric automotive headlamp.

POWER, MEDIUM FREQUENCY

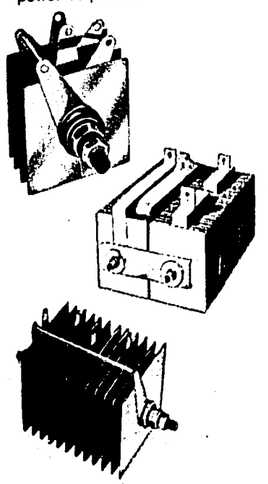
TYPE	Pc W	V_{CE} volts	V_{CB} volts	I_C A	T_J °C	Max. I_{CBO} ma	h_{FE}	fab mc
AUDIO TYPES								
2N242	15	−45	—	2	85	1.0	50	0.4
POWER SWITCH TYPES								
2N378	50	−20	−40	5	100	0.5	30	0.3
2N379	50	−40	−80	5	100	0.5	30	0.3
2N380	50	−30	−60	5	100	0.5	50	0.4
2N459	50	−60	−105	5	100	0.5	30	0.3

HIGH POWER, MEDIUM FREQUENCY

TYPE	V_{CE} volts	V_{CB} volts	I_C A	T_J °C	Max. I_{CBO} ma	h_{FE}	$f_{\alpha e}$ Kc
MILITARY TYPE							
TS748	Designed to meet MIL-T-19500/13A dated 8 January 1958						
INDUSTRIAL TYPES							
2N173	−50	−60	15	95	8	52	10
2N174	−70	−80	15	95	8	37	10
2N174A	−70	−80	15	95	8	37	10
2N277	−40	−40	15	95	8	52	10
2N278	−45	−50	15	95	8	52	10
2N441	−40	−40	15	95	8	30	10
2N442	−45	−50	15	95	8	30	10
2N443	−50	−60	15	95	8	30	10

SELENIUM RECTIFIERS

Specializing in high power units. All plate sizes . . . all power requirements.



SILICON RECTIFIERS

Wide power range for radio, television and heavy-duty industrial applications.

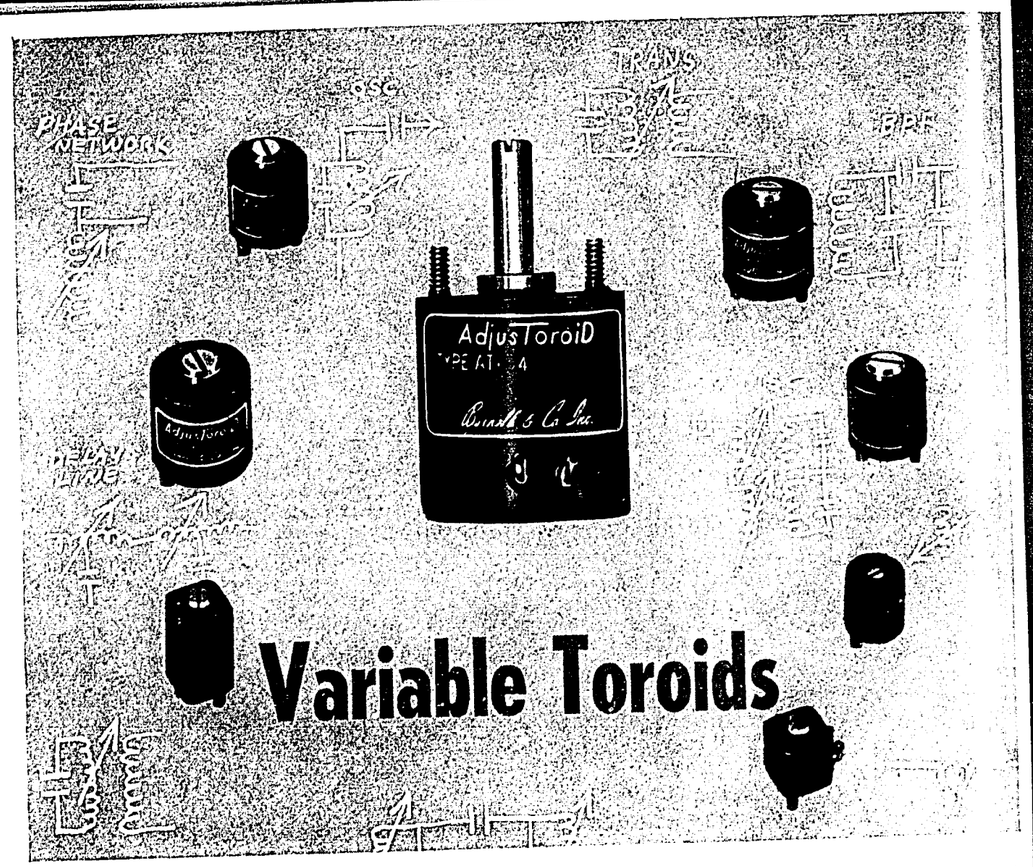
Small, flexible lead units for TV, radio, power supplies, blockers, DC to DC converters. Series 1N2072 to 1N2079 with Peak Inverse Voltages from 50 to 500.

Top hat, axial lead units with ratings up to 750 ma and up to 600 Peak Inverse Voltage.

High current, stud-mounted units with ratings up to 70 amperes and up to 600 Peak Inverse Voltage.

TUNG-SOL®

For details, circle #51 on Reader Service Card



Variable Toroids

Burnell Adjustoroids® are always new because they are always being designed for newer and broader electronic and mechanical applications.

NEW Burnell's complete line of encapsulated Adjustoroids are particularly adaptable to printed circuit use.

NEW A screw mount PC type Adjustoroid for greater durability in high acceleration, shock and vibration environments.

NEW 'Pot' mounting Adjustoroids for panel mounting and knob adjustment wherever slotted controls are difficult to reach.

NEW Continuous internal improvements including adjustment range, Q, size, etc. Burnell Adjustoroid engineers are constantly seeking solutions to space, accessibility and performance problems.

Burnell Adjustoroids and sub-miniature Adjustoroids are supplied hermetically sealed to meet government specifications MIL E 15305A or encapsulated in many sizes and shapes to meet the application. If your Adjustoroid needs can't be met from our stock catalogue, we'll be glad to manufacture to your specifications. For additional information, write for Adjustoroid bulletin.

	Length/ Dia.	Width	Hgt.	Wt.	Useful Freq. Range	Max Q	Max L in hys
AT-0	1 1/16		1"	2 oz	1 kc to 20 kc	10 kc	3 hys
AT-1	1 3/4	1 3/4	1 1/4"	7.25 oz	2 kc to 10 kc	4 kc	15 hys
AT-2	2 3/4	2 3/4	2 1/4"	24 oz	Below 2.5 kc	2.5 kc	125 hys
AT-4	1 15/64		1 1/4"	4 oz	1 kc to 16 kc	6 kc	15 hys
AT-6	1 1/16		1"	2 oz	10 kc to 100 kc	30 kc	75 hys
AT-10	1 15/64		1 1/4"	4 oz	3 kc to 50 kc	20 kc	75 hys
*AT-11	45/64	45/64	3/4"	.83 oz	2 kc to 25 kc	15 kc	5 hys
*AT-12	45/64	45/64	3/4"	.83 oz	15 kc to 150 kc	60 kc	.5 hys
AT-15	1 31/32		1 7/8"	14 oz	Below 5 kc	4 kc	125 hys
AF-51	1 15/64		2"	5 oz	30 cps to 500 cps	120 cps	1000 hys
AF-52	1 15/64		2"	5 oz	50 cps to 1 kc	250 cps	1000 hys
*AF-87	45/64	45/64	1 1/4"	1.7 oz	90 cps to 2 kc	400 cps	80 hys
*AF-88	45/64	45/64	1 1/4"	1.7 oz	.16 kc to 4 kc	800 cps	42 hys
†ATE-11	3/4		3/4"	.83 oz	2 kc to 25 kc	15 kc	5 hys
†ATE-12	3/4		3/4"	.83 oz	15 kc to 150 kc	60 kc	.5 hys

Special "pot" type sub-miniature Adjustoroids are not available with AT-11, AT-12, AF-87, AF-88.

†*Special screw mountings are available with the ATE-11 and ATE-12 in printed circuit applications for "plug in" types. Where vibration and shock are significant considerations, mounting screws serve as terminal connections.*

®*Trade Name Pat. #2,762,020*

Burnell & Co., Inc.

PIONEERS IN TOROIDS, FILTERS AND RELATED NETWORKS

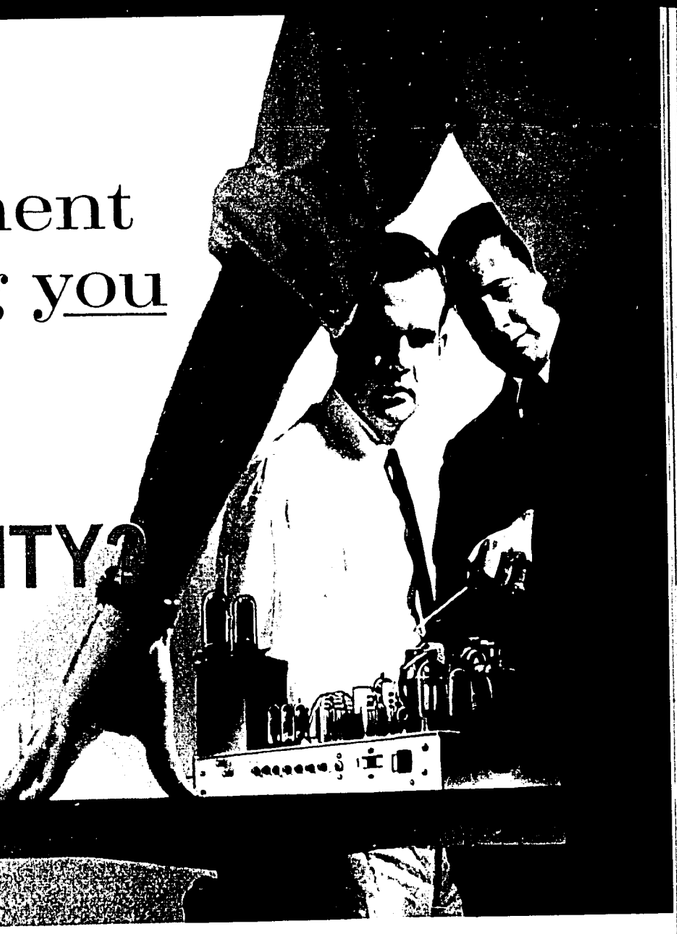
EASTERN DIVISION
DEPT. P-9
10 PELHAM PARKWAY
PELHAM, N. Y.
PELHAM 8-5000
TELETYPE PELHAM 3633

PACIFIC DIVISION
DEPT. P-9
720 MISSION ST.
SOUTH PASADENA, CALIF.
RYAN 1-2841
TELETYPE PASACAL 7578

For details, circle #52 on Reader Service Card

1960 IRE Directory

Is management asking you about TUBE RELIABILITY?



...asking you to predict the future performance of the tubes you specified for that new radio, phonograph, or TV-set design? Asking you to specify high-quality tubes at the lowest possible costs? There's a simple way to answer these questions. That's to design around RCA PREFERRED TUBE TYPES.

These are the types *most* designers specify *most* often, because Preferred Types have proven themselves *the most reliable, the most useful.* And because they're specified so frequently, they're in virtually continuous production. This means ready availability, no production hold-ups because of shortages. Means better-performing tubes, too (the more you work with a tube, the better you can make it). Preferred Types minimize field problems, as well. Service technicians are more familiar with them...know they're in demand, so keep them in stock.

There's no question of tube reliability if you specify PREFERRED designer-preferred TUBE TYPES. Ask your RCA Field Representative for the up-to-date list.

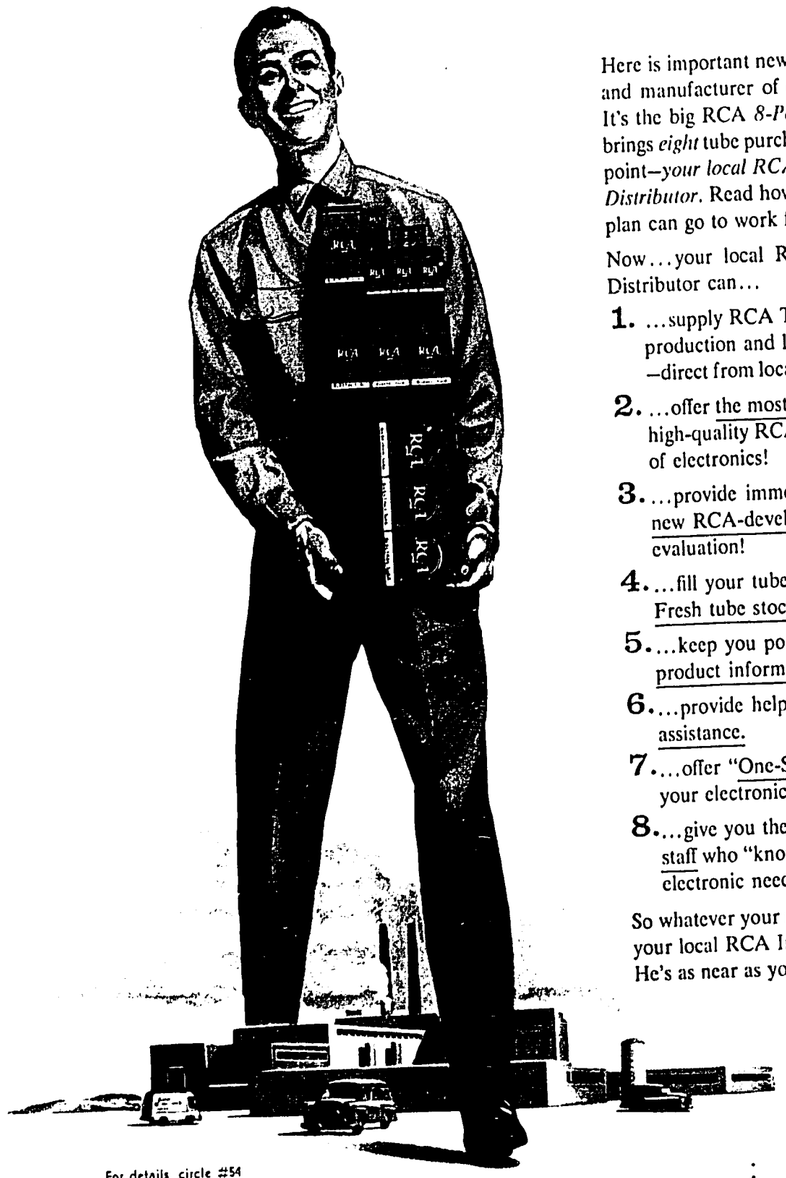
RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N.J.

RCA FIELD OFFICES

EAST: 744 Broad St., Newark 2, N. J. HUmboldt 5-3900
MIDWEST: Suite 1154, Merchandise Mart Plaza Chicago 54, Ill., WHitehall 4-2900
WEST: 6355 E. Washington Blvd. Los Angeles 22, Calif. RAymond 3-8361

For details, circle #53 on Reader Service Card

NOW...look how much your RCA Industrial Tube Distributor can do for you...



Here is important news for every designer and manufacturer of electronic equipment. It's the big RCA *8-Point-One* plan that brings *eight* tube purchasing benefits from *one* point—*your local RCA Industrial Tube Distributor*. Read how the big 8-Point-One plan can go to work for you—right now.

Now...your local RCA Industrial Tube Distributor can...

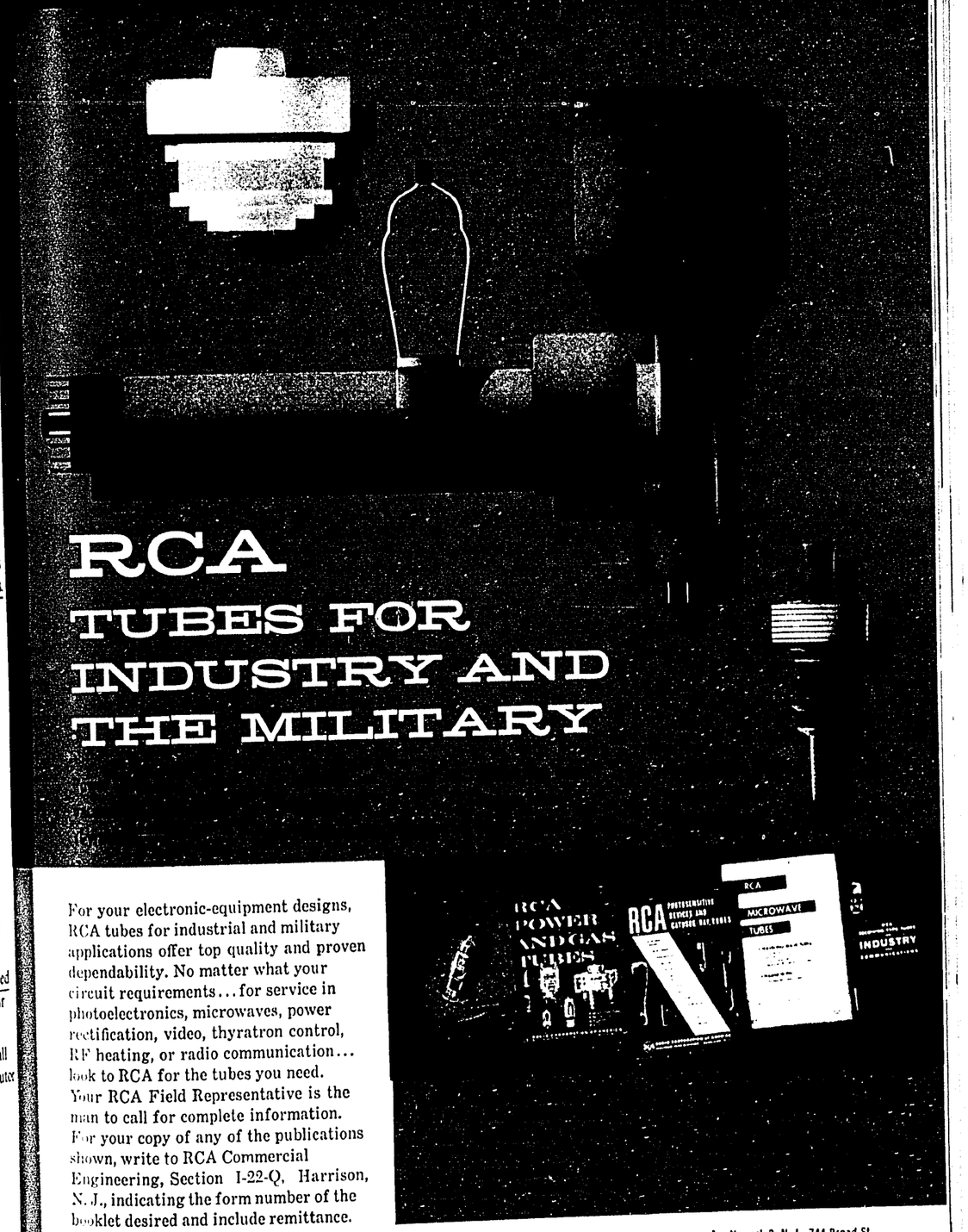
1. ...supply RCA Tubes for your pre-production and laboratory requirements—direct from local stock at factory prices.
2. ...offer the most comprehensive line of high-quality RCA Tubes in the history of electronics!
3. ...provide immediate delivery of new RCA-developed types for your evaluation!
4. ...fill your tube orders from Factory-Fresh tube stocks!
5. ....keep you posted with practical product information—regularly!
6. ....provide helpful RCA technical assistance.
7. ....offer "One-Stop" order service on your electronic requirements.
8. ....give you the benefits of a specialized staff who "know" electronics and your electronic needs.

So whatever your needs in electronics, call your local RCA Industrial Tube Distributor. He's as near as your telephone.

For details, circle #54 on Reader Service Card

For the name of your nearest RCA Industrial Tube Distributor, call Western Union by 'phone number and ask for Operator 25.

RADIO CORPORATION OF AMERICA
Electron Tube Division — *Harrison, N. J.*



For your electronic-equipment designs, RCA tubes for industrial and military applications offer top quality and proven dependability. No matter what your circuit requirements...for service in photoelectronics, microwaves, power rectification, video, thyratron control, RF heating, or radio communication... look to RCA for the tubes you need. Your RCA Field Representative is the man to call for complete information. For your copy of any of the publications shown, write to RCA Commercial Engineering, Section I-22-Q, Harrison, N. J., indicating the form number of the booklet desired and include remittance.

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- Dayton 2, Ohio 244 N. Wilkinson St BAldwin 6-2366
- Washington 6, D.C. 1625 "K" St., N.W., District 7-1760

RADIO CORPORATION OF AMERICA
Electron Tube Division — *Harrison, N. J.*

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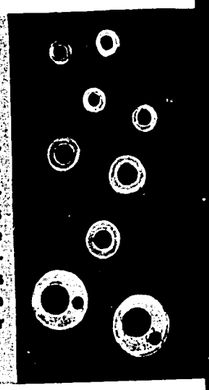
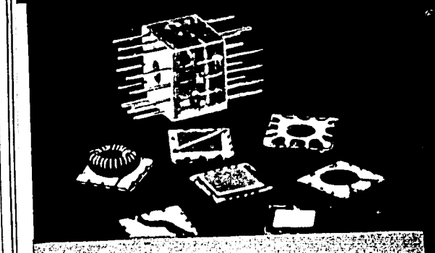
Whatever your design needs

...INDUSTRIAL ...ENTERTAINMENT
...MILITARY ...COMPUTER

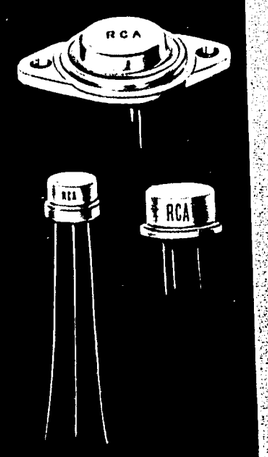
specify RCA semiconductor products



RCA FERRITES
...a comprehensive line of memory cores, switching cores, transfluxors, memory planes, and aperture plates for computer and data processing equipment. RCA's wide experience in the manufacture and application of ferrite materials can be of valuable help to you in your computer designs.



RCA MICROMODULES
...an important, new concept in electronic parts packaging makes possible electronic equipment having a parts density of 600,000 parts per cubic foot —resulting in a size reduction to 1/10 that of existing miniature equipment.



RCA TRANSISTORS
...RCA Transistors cover a wide range of applications from DC to VHF, for RF, IF, AF and switching functions in entertainment, industrial, military and computer applications. They are produced and controlled to meet the most critical performance requirements and have built an enviable record of electrical uniformity and long life.

RCA DIFFUSED-JUNCTION SILICON RECTIFIERS
...a wide range of types for entertainment, industrial and magnetic-amplifier service featuring rugged design, high-efficiency performance and electrical uniformity. Precision-controlled diffused junction process provides high reliability. New types are constantly being added to this line.

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- Los Angeles 22, Calif., 6355 E. Washington Blvd., RA 3-8361
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- Needham Heights 94, Mass., 64 "A" St., HI 4-7200

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- Dayton 2, Ohio, 224 N. Wilkinson St., BA 6-2366
- Washington 6, D.C., 1625 "K" St., N.W., DI 7-1260

TECHNICAL DATA AND APPLICATION ASSISTANCE

For technical data on developmental Micromodules, or if you would like to have a specific circuit reduced to Micromodule design, please contact your Field Representative at the RCA Field Office nearest you. He will be glad to pass your design requirements on to our Application Engineers for their recommendations.

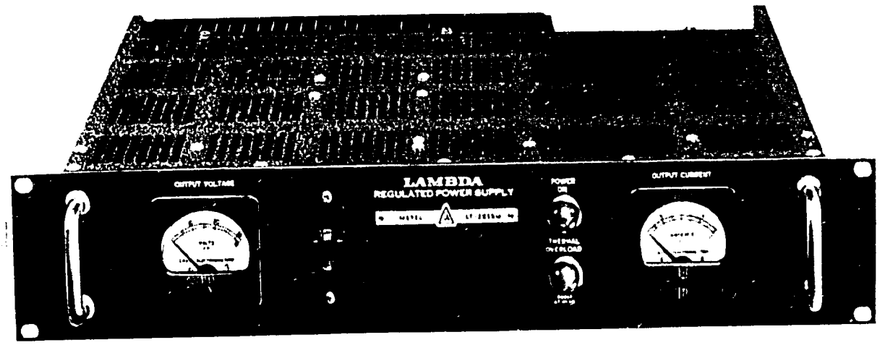
For technical data on RCA Semiconductor Products and Ferrite Cores, contact the RCA Field Office nearest you, or write for technical data to Commercial Engineering, Section I-22-NN, Somerville, N. J.

For details, circle #56 on Reader Service Card

RADIO CORPORATION OF AMERICA
Semiconductor and Materials Division
Somerville, N. J.

LAMBDA'S ALL-TRANSISTOR LINE

Delivered now • Guaranteed for five years



1-AMP AND 2-AMP—CONVECTION COOLED

No internal blowers
No moving parts

0-32 VDC

0-1 AMP 0-2 AMP

CONDENSED DATA

Voltage Bands	0-8, 8-16, 16-24, 24-32 VDC
Line Regulation	Better than 0.15 per cent or 20 millivolts (whichever is greater). For input variations from 105-125 VAC.
Load Regulation	Better than 0.15 per cent or 20 millivolts (whichever is greater). For load variations from 0 to full load.
AC Input	105-125 VAC, 50-400 CPS
Electrical Overload Protection	Magnetic circuit breaker, front panel mounted. Unit cannot be injured by short circuit or overload.
Thermal Overload Protection	Thermostat, manual reset, rear of chassis. Thermal overload indicator light, front panel.
Size	3½" H x 19" W x 14⅜" D.

- Ambient 50° C at full rating.
- High efficiency radiator heat sinks.
- Silicon rectifier.
- 50-400 cycles input.
- Special, high-purity foil, long-life electrolytics.

- Compact. Only 3½" panel height.
- Short-circuit proof.
- Protected by magnetic circuit breakers.
- Hermetically sealed transformer. Designed to MIL T27A.

- All transistor. No tubes.
- Fast transient response.
- Excess ambient thermal protection.
- Excellent regulation. Low output impedance. Low ripple.
- Remote sensing and DC vernier.

Model LT 1095	$285
Model LT 1095M (metered)	$315
Model LT 2095	$365
Model LT 2095M (metered)	$395

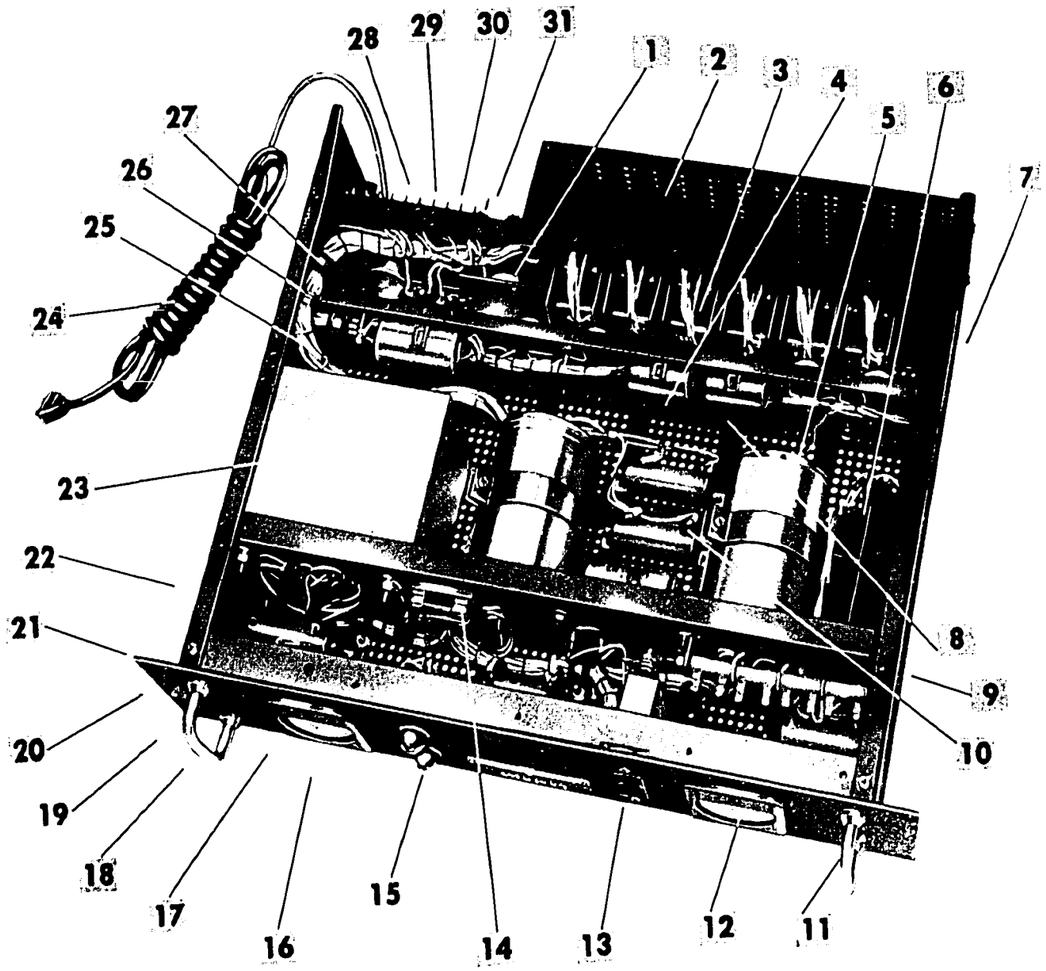
LAMBDA ELECTRONICS CORP.
11-11 131 STREET • COLLEGE POINT 56, NEW YORK

GUARANTEED BY LAMBDA FOR FIVE FULL YEARS

INDEPENDENCE 1-8500 CABLE ADDRESS: LAMBDATRON, NEW YORK

For details, circle #57 on Reader Service Card

LAMBDA L-T TRANSISTORIZED POWER SUPPLIES



DESIGN AND PERFORMANCE FEATURES

1. Thermal overload breaker for excess ambient temperature protection
2. High efficiency, convection heat sinks
3. Industrial type power transistors inherently protected against overload
4. Highly stable Zener voltage reference diode
5. Special, high-purity foil, hermetically sealed, long-life electrolytic capacitors
6. Silicon rectifier
7. Excellent regulation, low output, impedance, low ripple
8. Stable, low-noise wire-wound reference networks and multipliers
9. Unit welded chassis and frame
10. Every connection and solder joint individually inspected and checked
11. Sturdy gripping handles
12. Meters on "M" models
13. Magnetic circuit breaker
14. Fuses, internal failure protection
15. Thermal overload indicator light
16. Fast transient response
17. Every specification lab-checked before shipment
18. Rated for full load over entire voltage range
19. Advanced packaging for optimum thermal and mechanical design
20. Rated for 24-hour continuous duty
21. Compact—only 3½" panel height
22. Rated for operation from 50-400 cycle source
23. Hermetically-sealed transformer—designed to Mil-T 27A
24. Heavy-duty extra-length industrial cord
25. Harness wiring
26. Nylon jacketed vinyl wire
27. Sturdy cable clamp anchors
28. Remote DC vernier adjustment terminals
29. Remote sensing terminals
30. All controls clearly identified and marked
31. Heavy-duty barrier-type terminal block located for convenient rack cabling

GUARANTEED BY LAMBDA FOR FIVE FULL YEARS

LAMBDA ELECTRONICS CORP.

For details, circle #58 on Reader Service Card

FOR ALL POWER SUPPLY NEEDS THROUGH 1.5 AMPERES

NEED ONLY 8¾" OF PANEL HEIGHT!

Three voltage ranges:
0-200, 125-325, 325-525 VDC

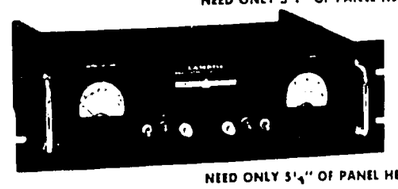
(metered)
MODEL C-1580M: 0-200 VDC, 0-1500 MA **580.00**
MODEL C-1581M: 125-325 VDC, 0-1500 MA **605.00**
MODEL C-1582M: 325-525 VDC, 0-1500 MA **680.00**
(unmetered)
MODEL C-1580: 0-200 VDC, 0-1500 MA **550.00**
MODEL C-1581: 125-325 VDC, 0-1500 MA **575.00**
MODEL C-1582: 325-525 VDC, 0-1500 MA **650.00**

NEED ONLY 7" OF PANEL HEIGHT!

(metered)
MODEL C-880M: 0-200 VDC, 0-800 MA **370.00**
MODEL C-881M: 125-325 VDC, 0-800 MA **345.00**
MODEL C-882M: 325-525 VDC, 0-800 MA **390.00**
(unmetered)
MODEL C-880: 0-200 VDC, 0-800 MA **340.00**
MODEL C-881: 125-325 VDC, 0-800 MA **315.00**
MODEL C-882: 325-525 VDC, 0-800 MA **360.00**

NEED ONLY 5¼" OF PANEL HEIGHT!

(metered)
MODEL C-480M: 0-200 VDC, 0-400 MA **289.50**
MODEL C-481M: 125-325 VDC, 0-400 MA **274.50**
MODEL C-482M: 325-525 VDC, 0-400 MA **289.50**
(unmetered)
MODEL C-480: 0-200 VDC, 0-400 MA **259.50**
MODEL C-481: 125-325 VDC, 0-400 MA **244.50**
MODEL C-482: 325-525 VDC, 0-400 MA **259.50**



NEED ONLY 5¼" OF PANEL HEIGHT!

(metered)
MODEL C-280M: 0-200 VDC, 0-200 MA **214.50**
MODEL C-281M: 125-325 VDC, 0-200 MA **189.50**
MODEL C-282M: 325-525 VDC, 0-200 MA **199.50**
(unmetered)
MODEL C-280: 0-200 VDC, 0-200 MA **184.50**
MODEL C-281: 125-325 VDC, 0-200 MA **159.50**
MODEL C-282: 325-525 VDC, 0-200 MA **169.50**

LAMBDA®

POWER SUPPLIES

Less space! Improved performance!
Long, trouble-free service!
Transient free output!

Fill the need for compact, regulated DC power supplies. Economy of panel space, functional simplicity, new quick-service features.

Wiring, tubes and other components readily accessible. You can reach them easily, service them fast

400 MA, 800 MA, and 1.5 ampere models include new, high-efficiency, long-life, hermetically-sealed semi-conductor rectifiers. All Com-Pak models are constructed with hermetically-sealed magnetic components and capacitors for long trouble-free service.

Condensed Data

LINE REGULATION	Better than 0.15% or 0.3 Volt, whichever is greater.
LOAD REGULATION	Better than 0.25% or 0.5 Volt, whichever is greater
INTERNAL IMPEDANCE	
C- 200 Series	Less than 6 ohms
C- 400 Series	Less than 3 ohms
C- 800 Series	Less than 1.5 ohms
C-1500 Series	Less than 0.75 ohms
RIPPLE AND NOISE	Less than 3 millivolts rms
POLARITY	Either positive or negative may be grounded.
AMBIENT TEMPERATURE	Continuous duty at full load up to 50°C (122°F) ambient.
AC OUTPUT (unregulated)	6.5 VAC (at 115 VAC Input)
C- 200 Series	10 AMP
C- 400 Series	15 AMP
C- 800 Series	20 AMP
C-1500 Series	30 AMP
AC INPUT	105-125 VAC, 50-400 CPS
OVERLOAD PROTECTION	AC and DC fuses, built-in blown-fuse indicators

GUARANTEED BY LAMBDA FOR FIVE FULL YEARS

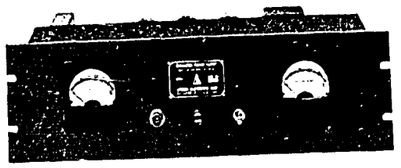
LAMBDA ELECTRONICS CORP.

For details, circle #59 on Reader Service Card

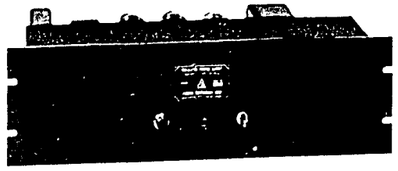
OTHER LAMBDA POWER SUPPLIES—RACK MODELS.....

100 MA SERIES

Complete power supply dependability



Model 28M: 200-325 VDC, 0-100 MA, with meters, $89.50
Model 29M: 100-200 VDC, 0-100 MA, with meters, 99.50



Model 28: 200-325 VDC, 0-100 MA, without meters, $59.50
Model 29: 100-200 VDC, 0-100 MA, without meters, $69.50

These long-lasting, dependable sources of power deliver "work horse" service...yet cost as little as $59.50.

Intended primarily for fixed voltage use, they provide a convenient, low-cost power source for auxiliary equipment; also suited to production line applications.

Lambda gives you the strongest proof of consistent, trouble-free power supply performance ever offered: a guarantee covering workmanship and materials (except for tubes and fuses) for *five full years.*

The guarantee, by far the most liberal one given by any power supplies manufacturer, has been made possible by an outstanding record of field performance.

This performance record proves the excellent experience which owners of Lambda power supplies have had with their equipment even under the most grueling, heavy-duty service.

Factual evidence of this kind is backed up by the results of many independent preference studies which show that of the engineers who specify power supplies, more than 50% prefer Lambda equipment.

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LAMBDA ELECTRONICS CORP.

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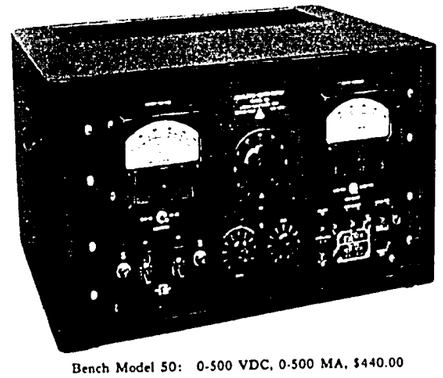
.....HEAVY DUTY AND PORTABLE MODELS

500 MA

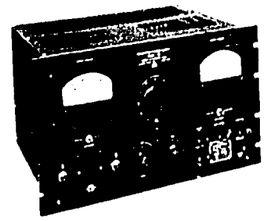
Wide range power supplies in bench and rack models



Bench Model 50: 0-500 VDC, 0-500 MA, $440.00

Lambda Model 50 is a general purpose, heavy duty power supply for bench use. It is housed in a compact cabinet provided with a rear access door and two sturdy carrying handles.

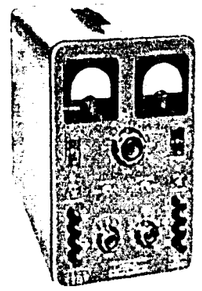
Rack Model 50R, intended for mounting in a standard 19" rack, is identical to Model 50 except that a ventilated dust cover is supplied in place of the cabinet.



Rack Model 50R: 0-500 VDC, 0-500 MA, $420.00

200 MA PORTABLE

Wide range de luxe portable power supply for broad field and laboratory applications

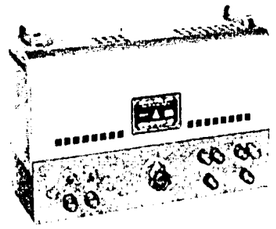


Model 71:
0-500 VDC,
0-200 MA,
$310.00

Built for heavy-duty service, this versatile precision unit features maximum compactness and portability. Weight: 49 lbs. Only 13" high, 8¾" wide, 14½" deep.

Model 71 is mounted on rubber bumper feet and is equipped with a sturdy fold-down leather handle.

100 MA PORTABLE



Model 25: 200-325 VDC, 0-100 MA, $69.50

Model 26: 100-200 VDC, 0-100 MA, $79.50

COMPACT...PORTABLE...LOW COST

Supplies both regulated voltages and unregulated AC voltage for a variety of uses. Popularly used as a power source for electronic equipment and for many other applications requiring a source of stabilized DC voltage. Weight: only 19 lbs. Size: 8"H x 14"W x 6"D.

NEW 36-PAGE CATALOG

Send for your free copy

New 36-page edition contains information and specifications on Lambda's full line of transistor-regulated and tube-regulated power supplies.

GUARANTEED BY LAMBDA FOR FIVE FULL YEARS

LAMBDA ELECTRONICS CORP.

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CHECK LIST: LAMBDA REGULATED DC POWER SUPPLIES

Model	Style	Voltage Range (VDC)	Current Range (MA DC)	Regulation Impedance Ripple (Table I)	6.3 VAC Output (Amps)	Meters	Output Voltage Control	Output Terminals	Size Weight (Table II)	Price (U.S. and Canada) F.O.B. Factory College Pt., N.Y.
REGULATED POWER SUPPLIES—RACK MOUNTING										
TRANSISTORIZED										
LT-1095	Rack	0-32	0-1000	A	—	None	Rear	Rear	S-1	285.00
LT-1095M	Rack	0-32	0-1000	A	—	2½" rect	Rear	Rear	S-1	315.00
LT-2095	Rack	0-32	0-2000	B	—	None	Rear	Rear	S-1	365.00
LT-2095M	Rack	0-32	0-2000	B	—	2½" rect	Rear	Rear	S-1	395.00
TUBE REGULATED										
C-280	Rack	0-200	0-200	C	10A	None	Rear	Rear	S-2	184.50
C-280M	Rack	0-200	0-200	C	10A	3½" rect	Rear	Rear	S-2	214.50
C-281	Rack	125-325	0-200	C	10A	None	Rear	Rear	S-2	153.50
C-281M	Rack	125-325	0-200	C	10A	3½" rect	Rear	Rear	S-2	189.50
C-282	Rack	325-525	0-200	C	10A	None	Rear	Rear	S-2	169.50
C-282M	Rack	325-525	0-200	C	10A	3½" rect	Rear	Rear	S-2	199.50
C-480	Rack	0-200	0-400	D	15A	None	Rear	Rear	S-2	259.50
C-480M	Rack	0-200	0-400	D	15A	3½" rect	Rear	Rear	S-2	289.50
C-481	Rack	125-325	0-400	D	15A	None	Rear	Rear	S-2	244.50
C-481M	Rack	125-325	0-400	D	15A	3½" rect	Rear	Rear	S-2	274.50
C-482	Rack	325-525	0-400	D	15A	None	Rear	Rear	S-2	259.50
C-482M	Rack	325-525	0-400	D	15A	3½" rect	Rear	Rear	S-2	289.50
C-880	Rack	0-200	0-800	E	20A	None	Rear	Rear	S-3	340.00
C-880M	Rack	0-200	0-800	E	20A	3½" rect	Rear	Rear	S-3	370.00
C-881	Rack	125-325	0-800	E	20A	None	Rear	Rear	S-3	315.00
C-881M	Rack	125-325	0-800	E	20A	3½" rect	Rear	Rear	S-3	345.00
C-882	Rack	325-525	0-800	E	20A	None	Rear	Rear	S-3	360.00
C-882M	Rack	325-525	0-800	E	20A	3½" rect	Rear	Rear	S-3	390.00
C-1580	Rack	0-200	0-1500	F	30A	None	Rear	Rear	S-4	550.00
C-1580M	Rack	0-200	0-1500	F	30A	3½" rect	Rear	Rear	S-4	580.00
C-1581	Rack	125-325	0-1500	F	30A	None	Rear	Rear	S-4	575.00
C-1581M	Rack	125-325	0-1500	F	30A	3½" rect	Rear	Rear	S-4	605.00
C-1582	Rack	325-525	0-1500	F	30A	None	Rear	Rear	S-4	650.00
C-1582M	Rack	325-525	0-1500	F	30A	3½" rect	Rear	Rear	S-4	680.00
28	Rack	200-325	0-100	G	3A	None	Rear	Rear	S-5	59.50
28M	Rack	200-325	0-100	G	3A	3½" rect	Rear	Rear	S-5	89.50
29	Rack	100-200	0-100	H	3A	None	Rear	Rear	S-5	69.50
29M	Rack	100-200	0-100	H	3A	3½" rect	Rear	Rear	S-5	99.50
32	Rack	200-325	0-300	J	2 @ 5A	None	Rear	Rear	S-6	139.50
32M	Rack	200-325	0-300	J	2 @ 5A	3½" rect	Rear	Rear	S-6	169.50
33	Rack	100-200	0-300	J	2 @ 5A	None	Rear	Rear	S-6	154.50
33M	Rack	100-200	0-300	J	2 @ 5A	3½" rect	Rear	Rear	S-6	184.50
50R	Rack	0-500 0-50 0-200	0-500 Bias High Imped.	K L M	2 @ 5A	4½" rect	Front	Fr & rear	S-7	420.00
REGULATED POWER SUPPLIES—PORTABLE AND BENCH										
25	Bench	200-325	0-100	G	3A	None	Front	Front	S-8	69.50
26	Bench	100-200	0-100	H	3A	None	Front	Front	S-8	79.50
50	Bench					See Model 50R above			S-9	440.00
71	Portable	0-500 0-50 0-200	0-200 Bias High Imped.	N P Q	2 @ 5A	3½" rect	Front	Front	S-10	310.00

TABLE I
DC OUTPUT VOLTAGE REGULATION, IMPEDANCE, RIPPLE

	Regulation: Line (105-125 VAC)	Regulation: Load (min to max)	Internal Impedance (ohms)	Ripple, rms (millivolts or %)
	Less than	Less than	Less than	Less than
A	0.15% or 20MV	0.15% or 20MV	0.50	1 mv
B	0.15% or 20MV	0.15% or 20MV	0.025	1 mv
C	0.15% or 0.3V	0.25% or 0.5V	6	3 mv
D	0.15% or 0.3V	0.25% or 0.5V	3	3 mv
E	0.15% or 0.3V	0.25% or 0.5V	1.5	3 mv
F	0.15% or 0.3V	0.25% or 0.5V	0.75	3 mv
G	1%	1%	10	10 mv
H	1%	1%	10	5 mv
J	1%	1%	4	10 mv
K	0.15% or 0.1V	0.5% or 0.3V	2	8 mv
L	0.1%	unregulated	3,300	2 mv
M	0.1%	unregulated	17,500	5 mv
N	0.15% or 0.3V	0.15% or 0.3V	4	5 mv
P	0.1%	unregulated	5,500	2 mv
Q	0.1%	unregulated	25,000	5 mv

TABLE II
SIZES AND WEIGHTS

	Size H x W x D (inches)	Net (lbs)	Shipping (lbs)
S-1	3½ x 19 x 14⅜	35	65
S-2	5¼ x 19 x 14⅜	53	80
S-3	7 x 19 x 14⅜	84	100
S-4	8¾ x 19 x 14⅜	120	140
S-5	5¼ x 19 x 8	19	23
S-6	10½ x 19 x 9¼	42	52
S-7	10½ x 19 x 14¼	89	140
S-8	8 x 14 x 6	19	23
S-9	12½ x 22 x 15	110	158
S-10	13 x 8¾ x 14½	49	85

GENERAL SPECIFICATIONS

Sufficient tolerance is incorporated in the specifications to allow for normal commercial component and tube deviations. Tube replacements may be made with any equivalent tubes meeting E.I.A. specifications.

INPUT
105-125 VAC, 50-400 CPS, single phase. Exceptions: Models 50, 50R and 71 – 105-125 VAC, 50-60 CPS.

DC OUTPUT
Voltage Range: Continuously variable over ranges specified, except where otherwise noted.

Current Range. The current ranges given apply to the entire DC output voltage range, and for input voltages from 105 to 125 VAC. No "de-rating" is necessary.

Polarity: Either positive or negative terminal may be grounded.

AC OUTPUT
The AC output is unregulated, isolated and ungrounded. It has a value of slightly higher than 6.3 V (when fully loaded) at an input of 115 VAC. This value allows for voltage drop in connecting leads. Dual outputs may be connected in series or parallel.

DUTY CYCLE
Continuous duty at full load.

METERS
Where meters are indicated, a separate voltmeter and milliammeter are provided.

OVERLOAD PROTECTION
Ample protection is provided against external overload and internal failure conditions by means of fuses.

Circuit breakers of the magnetic, "trip-free" type are employed in Models 50, 50R, 71 and LT series as protection against external overloads. And in the LT series, the transistor complement is independently protected by special transistor circuitry.

STYLE
Rack Models are designed for mounting on standard 19" relay racks.

Bench Models are provided with compact, special-purpose designed, ventilated cabinets equipped with carrying handles. The power supply units may be removed from their cabinets for mounting in standard relay racks (except Models 25, 26 and 71).

RATINGS AND COMPONENTS
All components used are of the highest quality and are operated well within manufacturers ratings. Hermetically sealed, oil-filled capacitors are used exclusively, except in LT series, where special high purity foil, long life electrolytics are used. Ample safety factors are provided in the design to insure the long life, and the dependable, trouble free operation so desirable in industrial and laboratory applications.

All specifications and prices subject to change without notice

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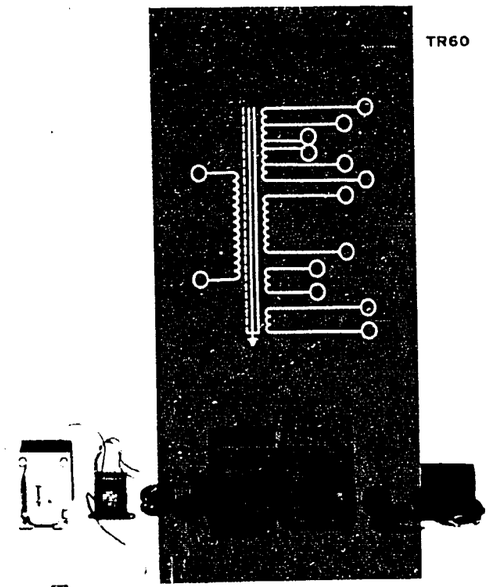

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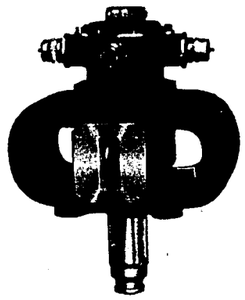
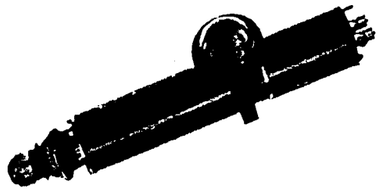
MAGNETRONS



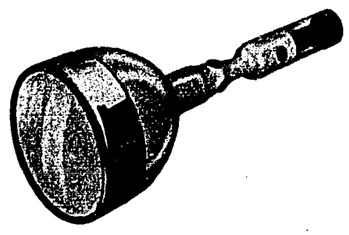
TYPE NUMBER	FREQUENCY RANGE MEGACYCLES	PEAK POWER (MINIMUM) KILOWATTS	DUTY RATIO	REMARKS
L-3204	8800 ±25	0.04	0.25	Extremely high duty.
L-3105	9300 ±40	0.10	0.01	Extreme ruggedization.
L-3186	9300 ±40	0.10	0.027	Ruggedized.
L-3028B	9280 to 9320	0.12	0.027	Frequency stable.
L-3058	9330 to 9350	1.0	0.003	High power beacon.
L-3268	9300 ±30	4.0	0.001	Recommended for new systems.
LT-6233	9280 to 9345	7.0	0.003	High duty beacon.
L-3103	8500 to 9600	30.0	0.002	High duty version of LT-6543.
L-3168	9375 ±30	30.0	0.002	High duty version of LT-4J52A.
LT-6543A	8500 to 9600	65.0	0.001	Tested for pulse jitter.
L-3211	8600 to 9500	65.0	0.001	Hydraulically tuned.
LT-6510	9375 ±30	65.0	0.001	Tested for pulse jitter.
LT-4J52A	9375 ±25	70.0	0.001	Recommended for new systems.
LT-4J50A	9375 ±30	225.0	0.001	Recommended for new systems.

KLYSTRONS



TYPE NUMBER	FREQUENCY RANGE MEGACYCLES	PEAK POWER (MINIMUM) MEGAWATTS	CATHODE PULSE LENGTH MICRO-SECONDS	CATHODE DUTY RATIO	REMARKS
L-3283	1250 to 1350	2	8	0.003	Broadband—(50 megacycles between 2 megawatt points).
L-3035	1240 to 1360	2.2	8	0.003	Long range search radar.
L-3235	1240 to 1360	4	8	0.003	For linear accelerator.
L-3257	1280 to 1330	4	30	0.0003	For linear accelerator.
L-3227	1280 to 1330	5	8	0.002	For linear accelerator.
L-3231	1240 to 1360	5	8	0.0015	Long range search radar.
L-3250	1250 to 1350	10	7.2	0.0015	

DISPLAY TUBES



5CHP11
Dual Deflection Character Writing CRT. High speed electrostatic deflection character writing, with equal sensitivity for X and Y axis. Magnetic deflection character positioning. High definition gun (3000 TV lines). Bright, photographic screen.

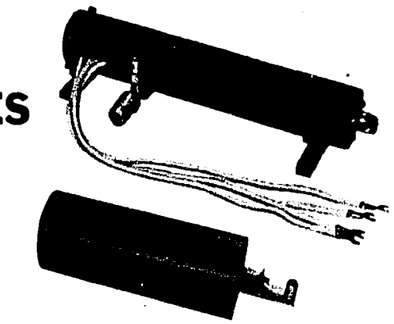
5CJP11
High Definition CRT. 3000 line TV resolution. Highly actinic photographic screen. Up to 30 KV operation.

5CGP29
Single Gun Lawrence Type Color Tube. Multi-color long persistence phosphors. 80 color elements per inch. Simple retrofit for monochrome tube, using standard deflection and focus components. Magnetic deflection and focus.

For details, circle #64 on Reader Service Card

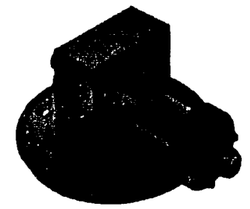
TRAVELING WAVE TUBES

BACKWARD WAVE OSCILLATORS



TYPE NUMBER	FREQUENCY RANGE MEGACYCLES	POWER OUTPUT	FOCUSING	DUTY FACTOR	REMARKS
TWT					
L-3266	8000 to 12000	10 milliwatts	Periodic Permanent Magnet.	CW	Designed for military airborne environments.
L-3272	Classified	Classified	Periodic Permanent Magnet.	Classified	
L-3235	8000 to 12000	2 watts	Periodic Permanent Magnet.	CW	
L-3190	Classified	Classified	Permanent Magnet.	Classified	
L-3264	100 to 300	100 watts	Solenoid	CW	
BWO					
L-3265	7000 to 11000	10 milliwatts	Solenoid	CW	
L-3274	8200 to 12400	10 milliwatts	Solenoid	CW	
L-3279	15000 to 21000	5 milliwatts	Solenoid	CW	

MINIATURE NOISE SOURCES



TYPE NUMBER	FREQUENCY RANGE MEGACYCLES	EXCESS NOISE RATIO	NOMINAL OPERATING CURRENT	NOMINAL OPERATING VOLTAGE	REMARKS
L-2000	2700 to 2900	18.5 ±0.2db	75 ma	30 volts	Waveguide
L-2001	5400 to 5900	13.0 ±0.5db	100 ma	70 volts	Waveguide
L-2002	7500 to 8600	14.5 ±0.5db	100 ma	40 volts	Waveguide
L-2003	8500 to 9600	14.5 ±0.5db	100 ma	50 volts	Waveguide
L-2004	8500 to 9600	18.5 ±0.5db	100 ma	50 volts	Waveguide
L-2005	16000 to 17000	18.4 ±0.5db	50 ma	60 volts	Waveguide
L-2006	1000 to 2000	18.5 ±0.5db	50 ma	175 volts	Coaxial
L-2007	2000 to 4000	18.5 ±0.5db	85 ma	135 volts	Coaxial
L-2008	200 to 450*	18.5 ±0.5db	25 ma	200 volts	Coaxial

*Any 50 mc band in the stated range.

The noise sources listed are miniaturized and rugged units specifically designed for pulsed operation in conjunction with automatic noise measuring equipments. They are equally suitable for CW operation. Inquiries are requested for radar systems requirements as the above is only a representative list of various units now in production.

DUPLEXERS AND TR TUBES

Litton Industries is actively engaged in production and development of high and low power duplexers and TR tubes for the UHF frequency range. Information on these devices can be supplied on request.

Information on Litton Industries classified tubes is available on your evidence of "need to know."

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Litton Industries has been built on a program of establishing strong proprietary product values based on advanced technologies. We have twenty-two manufacturing plants in the United States and two overseas. Engineers and scientists on our staff have the pleasure of seeing the fruition of their research and development work in the form of economically useful products. Here are our areas of exploration and manufacturing:

Military Equipments & Systems · Commercial Flight Equipment · Communications Equipment · Components · Electron Tubes · Business Machines ·

Here are some of the products we make:

Accounting Machines
Adding Machines
Antennas
Automatic Control Devices
Carcinotrons
Cathode Ray Tubes
Communications Equipments
Computers
Countermeasures Equipments
Cross Field Devices
Data Processing Equipments
Digital Computers
Directional Couplers
Display Tubes
Duplexers
Echo Boxes
Etched Circuits
Ferrite Load Isolators
Fire Control Systems
Gas Tubes
Guidance Systems
Klystrons
Magnetrons
Microwave Components
Missile Control Systems
Multiplexers
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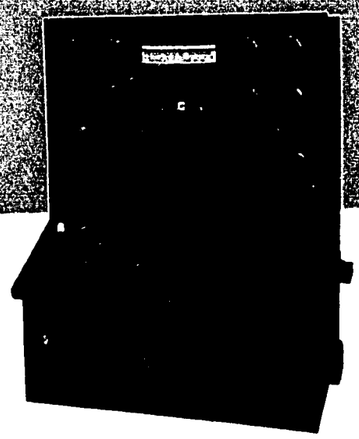
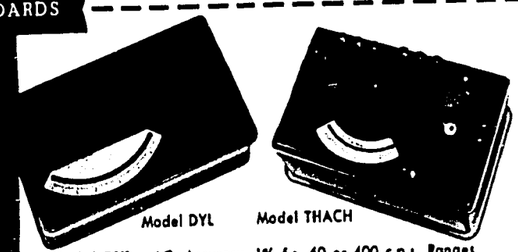


Model LTC—AC-DC/DC calibration console. *Accuracy*—.05% *of actual reading.* Ranges—.5 v. to 1111.5 v.; 1 ma. (2 ma. on AC) to 11.115 amps. Resolution—.01%. Frequency—DC to 25 kc. Other consoles are:

Model	% Accuracy	Ranges
LTD	.05 of reading	.1 v. to 1111.1 v.; 1 ma. to 11.111 amps. DC
LTCA	.05 of reading	.5 v. to 1111.5 v.; 2 ma. to 11.115 amps. AC-DC
LTA	.05 of full scale	.3 v. to 1500 v.; 2 ma. to 30 amps. AC-DC.
LTHD	.05 of reading	0-1.6 amps.; 0-1.6 v. DC.



Model DYL Model THACH

Model DYL—AC. Accuracy—1% f.s. 60 or 400 c.p.s. Ranges 10/20/50/100/200/500 ma.; 1/2/5/10 amps.; 20/50/100/200/500 v. f.s. 12" venier scale. **Model THACH**—AC/DC *Self Checking* Volt-Amp-Milliammeter. Accuracy—.2% f.s. to 4 kc. Ranges—10/20/50/100/200/500 ma.; 1/2/5 amps.; 1/2/5/10/20/50/100/200/500/1000v. f.s. Checks its own accuracy against an internal standard cell. Special regulated **THACH Power Supply** (optional) automatically shuts off power to the THACH when switching ranges, reducing possibility of accidental overloads. Output is DC or 60 c.p.s. (400 c.p.s. can be plugged in).

ranges, .3 v. to 1.5 kv.; 1.5 ma. to 15 amps. f.s.
Accuracy .1% f.s. Multirange I or E combinations
Accuracy .1% f.s. Multirange I or E combinations
00 c.p.s.
Pivots and shock-mounted jewels.

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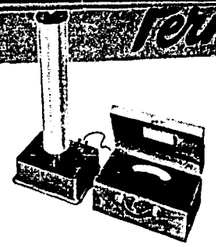
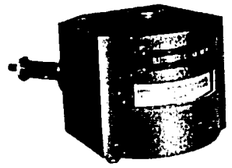
AC-DC ELECTROSTATIC VOLTMETERS



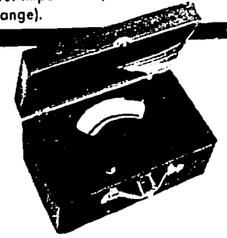
Model CRV — Crest or peak voltmeter for reading true RMS, negative peaks and positive peaks. Accuracy—1% f.s. for basic 0-1 kv. instrument. 1% multipliers available up to 100 kv. for AC or pulsed DC measurements. 5.2" scale. For pulses of 20/sec. or more. High input impedance (varies according to range).



Model ESH - Accuracy-1% f.s. (.5% on special order). Single or multirange combs. from 5 kv. to 100 kv. f.s. 6" scale. Input impedance up to 5 x 10^{15} ohms. Reads true RMS. Switch controlled from rear. Transit lock and brackets for panel mounting available. Adaptor for peak voltage reading. All electrostatics have a modified square law scale.

Model ESD — Accuracy-1% (.5% on special order). Sing multirange from 120 v. to 5 5.2" scale. Reads true RMS impedance 10^{15} ohms. Univ **Model**—Accuracy—1%; range 300 v. to 5 kv. f.s. 4" scale **VPA**—Peak voltage adapto 30 kv. maximum invers rating.

AC-DC POLYRANGERS



Model U88 — Accuracy — .5% DC; .75% AC/DC f.s. (thermocouple side). 88 ranges f.s. from 200 μa. to 1.5 amps.; 20 mv. to 750 v. DC, and 10 ma. to 3 amps.; .5 v. to 750 v. AC/DC. Frequency 5 kc. on E and 15 kc. on I. 5.2" scale. Automatic Temperature Compensation. **Model USP**—similar to above but 28 ranges.

Model C — Rugged DC, .25% f.s. accurate reference standard. 14 ranges f.s. from 1.5 ma. to 3 amps.; 1 v. to 1 kv. (2 combs.) 1 sec. period. 6.3" scale. **Model WVA** — same, but 27 f.s. ranges from 1 ma. to 15 amps.; 100 mv. to 1 kv. **Model S**—Accuracy-.5%. Sensitivity to 10,000 ohms/v.; 5 mv.; 100 μa. 13 ranges. 5.2" scale.

Model DYP — Transformer dynamometer for 60 c.p.s. A ing. Accuracy — .3% f.s. ranges from 5 ma. to 10 v. to 2 kv. 6.3" scale. Polyra are portable, general pur and E measuring instru Other models and range co tions available. Write for c plete listing.

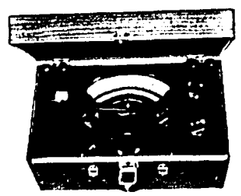
AC-DC THERMOCOUPLE INSTRUMENTS

Model XT—R.F. ammeter. Accuracy —1% f.s. DC to 70 Mc. Single range from 1 amp. to 100 amps. (higher on special order). Automatic Temperature Compensation. 6.3" scale. **Model RF**—same, but ranges 1 ma. to 1 amp. f.s. Frequency — 1 Mc. (4 range unit 250 kc.). **Model AU** — Accuracy-.5% (on special order) up to 20 kc.

Model A—Accuracy—.75% f.s. (.5% on special order). Single or multirange switch controlled f.s. ranges from 1 ma. to 1.5 amps.; .2 v. to 1.5 kv. Frequency — up to 7 kc. on E; 15 kc. on I. Automatic Temperature Compensation. 6.3" scale. Thermocouple instruments are available with a thermocouple replacement feature and overload protective shunt.

Model RFV—Radio frequen meter. Accuracy — .5% f.s. max. frequency influence o controlled multirange units v. (5 Mc.) to 300v. f.s. (15 Single range instruments of v. f.s. have an upper frequen of 10 Mc. Automatic Temp Compensation. 6.3" scale C certified on DC. Frequency ence constant.

DC CORROSION AND ELECTROLYSIS INSTRUMENTS

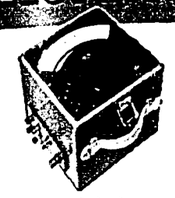


Model PV — Potentiometer voltmeter — measures *true potentials* with zero current drain. Accuracy — .5% f.s. Multirange combs. from 2 mv. to 20 v. f.s. 5.2" scale. **Model ZR**—Zero resistance micro-milliammeter having a zero volt loss. Accuracy—.5% f.s. Multirange combs. from 10 μa. to 300 ma.

Model HS-COR — Designed for rugged field use for A. T. & T. and Bell Tel. Labs. Accuracy — .5% f.s. Multirange combs. from 5 mv. to 100 v. Sensitivities to 1 megohm/v. 6.3" scale. Features the *formica case, Diamond Pivots,* and *special non-slip binding posts for alligator clips.*

Diamond Pivots and shock mounted jewels are included in all Laboratory Standards and ultra high sensitivity instruments (thermocouple meters, low resistance meters, etc.) They are many more shock resistant than conventional pivots and jewels their installation assures a tion free moving element the severest operating con

ELECTRICAL INDICATING INSTRUMENTS

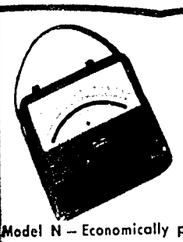


del PDLW — Polyphase watter for use down to 20% p.f. racy—.75% f.s. up to 500 c.p.s. irange combs. from 1.5 w. to kw. f.s. at 75/150/300 v. f.s. quency limits of 2.5 kc. on spe- order) 5.2" scale. **Model PDW** me, but accuracy — .25% f.s. n to 50% p.f. and up to 800 . Ranges from 15 w. f.s. at 00/200 v. f.s. 6.3" scale.

Model DW — Single phase reference standard wattmeter. Accuracy —.25% f.s. to 50% p.f. and up to 800 c.p.s. Multirange combs. from 5 w. to 2 kw. f.s. at 50/100/200 v. f.s. 6.3" scale. **Model DLW**—same, but accuracy .5% f.s. down to 20% p.f. and up to 500 c.p.s. Ranges from .2 w. f.s. at 75/150/300 v. **University Model**—same, but 4" scale and reduced accuracy.

Model VAW—Volt-Amp-Watt-meter. AC. Accuracy—.5% f.s. for E. and I.; .75% f.s. for w. Ranges for "50-800 c.p.s." model—50/100/200/250/500 w.; 1/2/2.5/5 kw. f.s. at 100/200/500 v. f.s. down to 50% p.f.; "50-125 c.p.s." model has additional ranges of 12.5/25 w. f.s. and 25/50 v. f.s.

AC-DC WATTMETERS



A *NEW* portable Field instrument

Model N — Economically priced, rugged DC and AC voltmeters and ammeters. Accuracy — .5% f.s. Switch controlled. Range combs. — 50 mv. to 1.5 kv. (up to 5 k.-ohms/v.); 50 μa. to 50 amps. DC; 5 v. to 750 v.; 10 ma. to 10 amps. AC. Long 6" scale. Moulded bakelite case with carrying strap. *Can be supplied for panel mounting.*

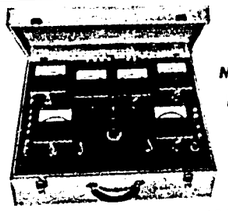
UNIVERSITY MODEL

Portable double pivoted D'Arsonval,[1] dynamometer,[2] and moving iron[3] instruments. Single and multirange. Switch controlled to 5 amps. and 1 kv. Self-contained to approximately 20 amps. and 1.5 kv. (DCHI to 30 kv.)

Model	*Accuracy*	*Scale*	*F.S. Ranges Start At*
1C	.25% f.s.	6.3"	DC 30 μa; 50 mv.
1S	.5% f.s.	6.3"	DC 1 μa; 1 mv.
1UNIV.	.5% f.s.	4"	DC 2 μa; 1 mv.
1DCHI	1% f.s.	4"	DC 1.5 kv. 50k Ω/v.
2D	.25% f.s.	6.3"	AC/DC 5 ma; 1.5 v.
2UNIV.	.5% f.s.	4"	AC/DC 10 ma; 7.5 v.
2MI	.5% f.s.	6.3"	AC 10 ma; 7.5 v.

AC-DC VOLTMETERS AND AMMETERS

EPSTEIN FRAME



Model MAT

set, designed in accordance with ASTM specifications (sec. A341-49 A343-49), for core loss measurements, determination of hysteresis and magnetization curves, magnetic field and AC permeability Inductors above and below 1 amp. available. Includes automatic nal power compensation circuit. Contains a DC ammeter, AC am- r, RMS voltmeter, flux voltmeter, low p.f. wattmeter, and fluxmeter convenient overlapping ranges. **Model COL** — core loss test set special .25% f.s. accurate flux voltmeter (6.3" scale), RMS voltmeter, eter and wattmeter.

Model FM — a zero torque multirange fluxmeter calibrated in maxwells. Reads changes in flux linkage of a search coil as it moves in a magnetic field. Accuracy-.5% f.s. Sensitivity 1000 lines/div. using standard 10 turn search coil (1000 turn coil = 10 lines/div.). 5.2" scale. **Calibrated search coil and magnet** available for certification purposes.

MAGNETIC TESTING INSTRUMENTS

IC instruments have hand- n mirrored scales, electro- c and magnetic shielding temperature compensation. bles in general conform to specs C39.1-1951 for either or .5% class instruments. *All products are calibrated st primary standards that National Bureau of Stand- Certificates of Accuracy and unconditionally guaranteed materials and workmanship period of one year.*

Model JWSP

TYPE EW CASE

All of the models described in this brochure, and in our complete catalog, are available as edgewise panel instruments with *no loss in accuracy or sensitivity.* Scale lengths — 5" (type EW-5) and 7" (type EW-7). Switch controlled. Single or multirange. In some cases, such as polyrangers, they are supplied mounted in standard 19" rack panels. **Model JW** — Accuracy — .5% f.s. Max. of 3 DC ranges (B.P.'s only) from 2 μa, and 1.5 mv. f.s. Scale 4". **New Model JWSP** — same, but can contain up to 10 switch controlled ranges. **Rectangular DC and AC models** available at accuracies from .5% to 1% f.s.

AC-DC PANEL INSTRUMENTS

For details, circle #68 on Reader Service Card

Symbol of Quality

SENSITIVE RESEARCH INSTRUMENT CORPORATION

310 MAIN STREET · NEW ROCHELLE N. Y

ELECTRICAL INSTRUMENTS OF PRECISION SINCE 1927

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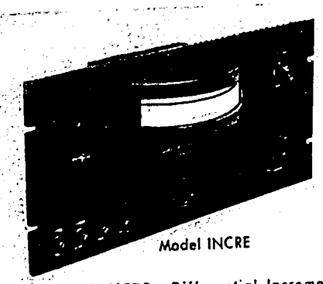
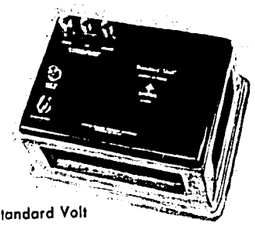
SPECIAL INSTRUMENTS

by SENSITIVE RESEARCH

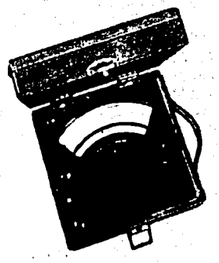


Model INCRE



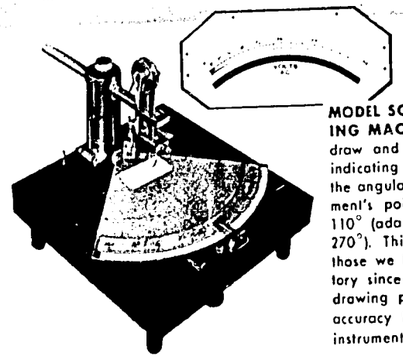
Standard Volt

Model INCRE – Differential Incremeter. ***A NEW .05% f.s. accurate expanded scale DC standard*** for rack panel mounting or portable use. Combines the high comparison accuracy of the differential instrument with a .005% stable source. Scale has an effective length of 63" or 70", and a resolution of 1000 divisions. Each 10% of any range is expanded over the instrument's *actual* 6.3" or 7" scale length. Direct reading! No balancing or nulling! Single or multirange combinations from 200 μa. to 10 amps. and 200 m.v. to 1 kv. **The Standard Volt** is the internal source used, and is available separately. Input 115 v. 60c.p.s. 25 va. Output 1.0 v. and 1.0185 v. to within .01%. (Exact E. can be certified to .001%).



Model RA measures the ratio of 2 DC currents or voltages. Accuracy – .25% max. Minimum current per coil 50 μa. Scale reads 0 to ∞. Special scales as required.

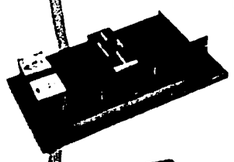
Model FRE – Frequency meter. Accuracy – .25% of center frequency. (expanded scale), or of f.s. value (zero left). Ranges e.g.; 54 – 66 c.p.s.; 350-450 c.p.s.; or 0-100 c.p.s. f.s. Nominal input 115 v. and/or 230 v. ±15%. 6.3" scale.



MODEL SCAMA — SCALE DRAWING MACHINE used to manually draw and print any flat electrical indicating instrument scale where the angular deflection of the instrument's pointer is no greater than 110° (adapter available for arcs of 270°). This unit is a duplicate of those we have used in our laboratory since 1927 and is capable of drawing precision scales to all the accuracy that the resolution of an instrument will permit.

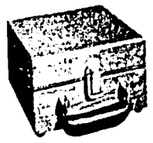
INSTRUMENT ACCESSORIES

VACUUM THERMOCOUPLES (Instrument type)–Sensitivities from 1 ma. to 1 amp. Output approximately 8-10 mv. open circuit. UHF types. Isolated or contact heaters. Special long-time constants. AIR COUPLES to 100 amps. (higher on special order).



LABORATORY STANDARD SHUNTS–Accuracy–.1% or .05%. Potential drop 50 mv., 100 mv., or 300 mv. Values from 1 amp. to 1000 amps. Rated for continuous duty.

MULTIPLIERS–Available to extend voltage ranges of all instruments. Accuracy – .1% or .05%.



FORMICA CASES are available for all portable instruments normally supplied in a wood case. They are structurally strong, a good dust and humidity barrier, and will look like new for the life of the instrument.

MODEL STC – Miniature Standard Cell. Accuracy – .025%. Nominal output 1.0185 v.

Specifications subject to change without notice.

Printed in U. S. A.

SENSITIVE RESEARCH

NEW ROCHELLE, N. Y.

For details, circle #70

FIELD ENGINEERS ALL OVER THE WORLD

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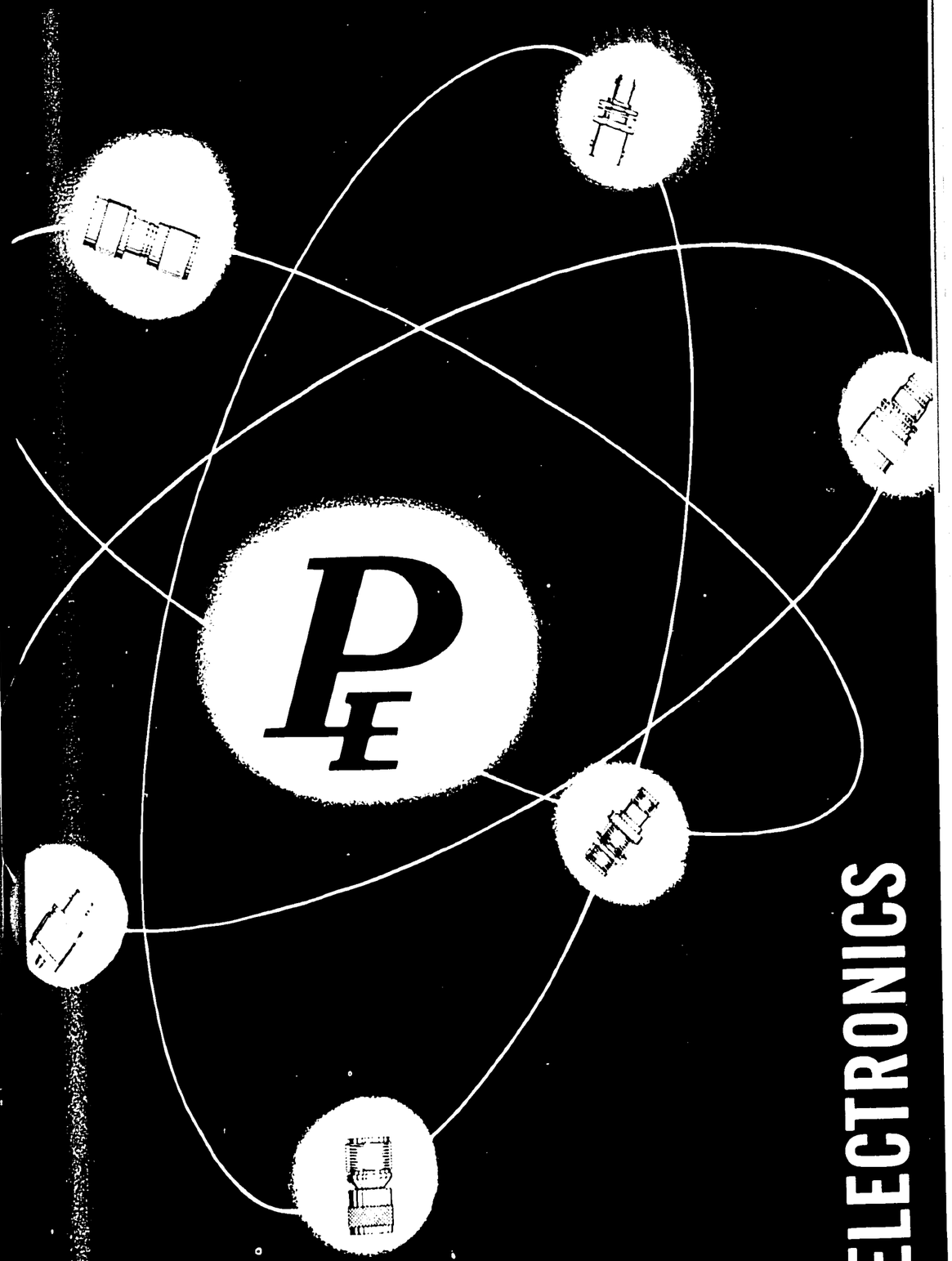
No. Illinois & Lake County, Indiana, So. Wisconsin

Michigan, Ohio, W. Pennsylvania, West Virginia

Central New York State

New England & Hudson River Co.'s, N. Y.

INSTRUMENT CORPORATION



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Phone: GArden 4-2076

WEST COAST REPRESENTATIVE
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Phone: GRanite 9-8884

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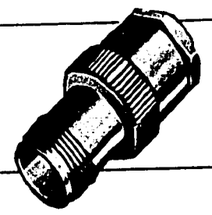
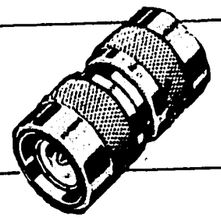
For faster service call our Enterprise number.

INDUSTRIAL PRODUCTS COMPANY

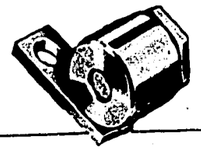
Danbury, Connecticut
A DIVISION OF AMPHENOL-BORG ELECTRONICS CORPORATION

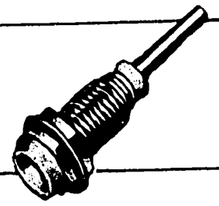
For details, circle #72 on Reader Service Ca

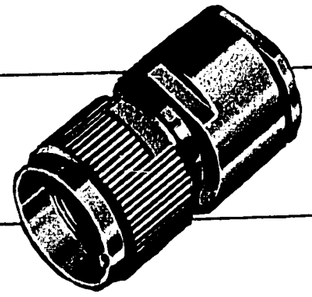

TNC Connectors

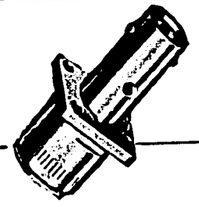

C Connectors

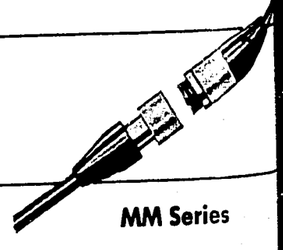
MB Connectors


Terminations


Tip Jacks


LC Connectors

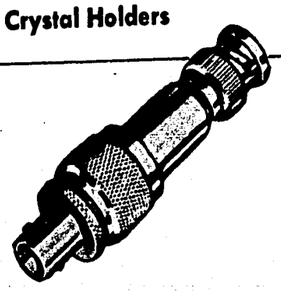

MHV Connectors

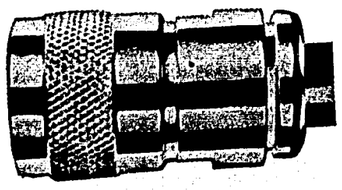

MM Series

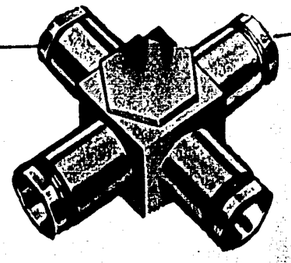
Crystal Holders

Triaxial Cable Connector

All other standard s
and special connec







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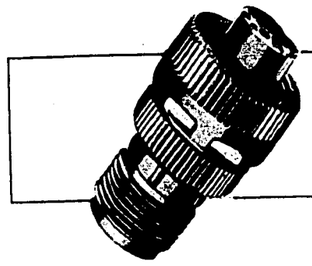
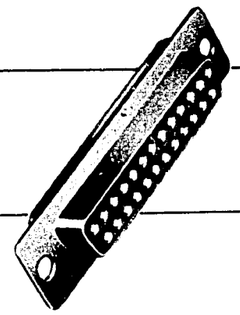
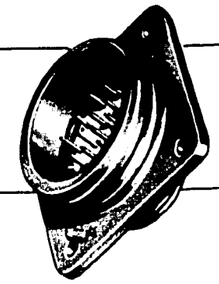
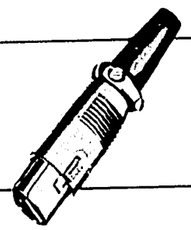
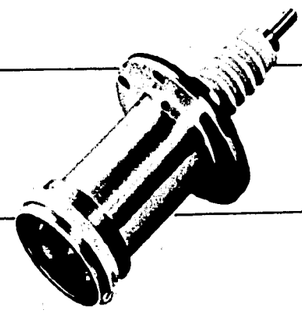

MS Connector

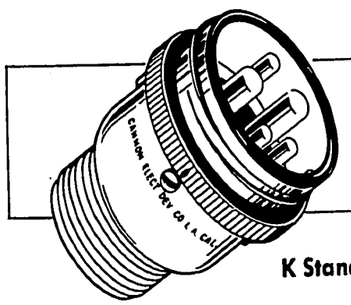

D Sub-Miniature


K Miniature

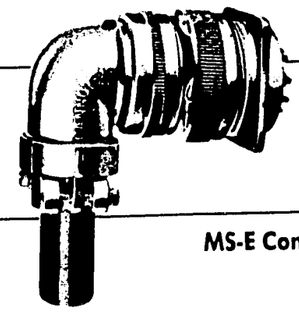

XLR Connector


RF Connector

RF Aluminum Connector

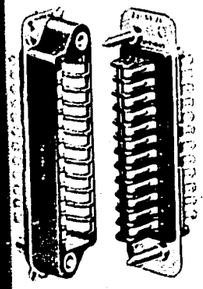


K Standard Connector


MS-E Connector

For details, cricle #73 on Reader Service Card

AMPHENOL


e Ribbon Rack & Panel
Connectors (26 Series)

Subminax (27 Series)

Miniature Blue Ribbon
Connectors (Series 57)

Miniature MS (165 Series)

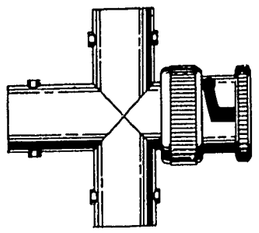
RF Connectors
(82 & 31 Series)

UHF Connectors (83 Series)

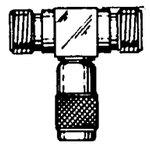
Rack & Panel Connectors
(Series 126)

Authorized distributor for

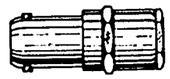
DAGE



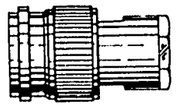
Coaxial Connectors



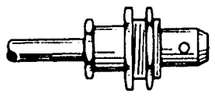
CUB Connectors



Triax Connectors



TNC Connectors



DM Connectors

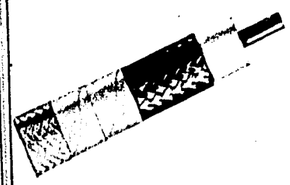
Authorized Distributor for

TIMES

COAXIAL CABLES

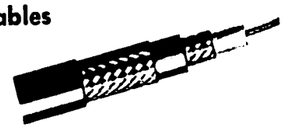
Standard Coaxial Cables (RG Type)

Armored Coaxial Cables (RG Type)



Teflon Coaxial Cables

Teflon Miniature Cables



Teflon Extruded Cables

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Hoffman Electronics CORPORATION

- general purpose diodes
- glass diodes
- zener diodes
- rectifiers
- zener reference units
- zener power regulators
- solar cells

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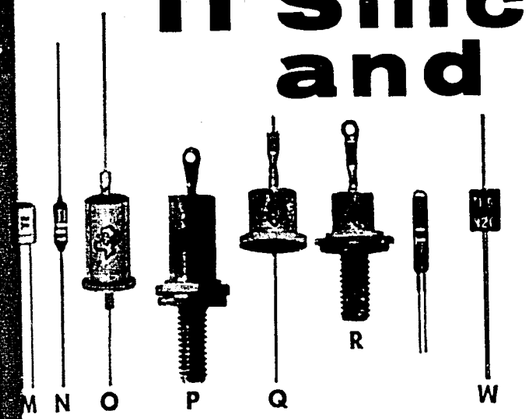

GENERAL PURPOSE SILICON DIODES

Type	Case Type	PIV	V_f	Min DC Fwd I @25°C ma at 1v	Max I_{rb} @25°C µa	P @25°C mw	Ambient Temp °C	Max at Elevated Temps (150°C) I_{rb} @ PIV µa	P mw
1N645	N	225	275	400	0.2	600	100	15	
A1N645	N	225	275	400	0.2	600	100	15	
1N646	N	300	360	400	0.2	600	100	15	
1N647	N	400	480	400	0.2	600	100	20	
A1N647	N	400	480	400	0.2	600	100	20	
1N648	N	500	600	400	0.2	600	100	20	
A1N648	N	500	600	400	0.2	600	100	20	
1N649	N	600	720	400	0.2	600	100	25	
A1N649	N	600	720	400	0.2	600	100	25	
600C	M	27	30	3	1 @ −10v	150	100	200 @ −10v	40
601C	M	45	50	10	0.025 @ −10v	150	150	400 @ −10v	40
604C	M	4.7	5.5	60	0.1	150	150	40	40
606C	M	6.8	7.5	35	0.1	150	150	40	40
608C	M	10	11	25	0.1	150	150	40	40
610C	M	15	17	20	0.1	150	150	40	40
612C	M	22	25	20	0.1	150	150	40	40
614C	M	33	37	25	0.1	150	150	40	40
616C	M	47	52	10	0.2	150	150	40	40
618C	M	68	75	10	0.2	150	150	40	40
620C	M	100	110	10	0.2	150	150	40	40
622C	M	150	170	7	0.2	150	100	20	40
624C	M	220	250	3	0.2	150	100	20	40

1 At PIV except for types 600C and 601C

HIGH CONDUCTANCE SILICON DIODES

Type	Case Type	Min Saturation Volts @ 100µa PIV	@ 25°C v	Av Rect Fwd I @ 25°C ma	Recurrent Peak Fwd I @ 25°C ma	P @ 25°C mw
1N482	N	30	40	125	400	500
1N482A	N	30	40	200	650	500
1N483	N	60	80	125	400	500
1N483A	N	60	80	200	650	500
1N484	N	125	150	125	400	500
1N484A	N	125	150	200	650	500
1N485	N	175	200	125	400	500
1N485A	N	175	200	200	650	500
1N486	N	225	250	125	400	500
1N486A	N	225	250	200	650	500
1N487	N	300	330	125	400	500
1N487A	N	300	330	200	650	500
1N488	N	380	420	125	400	500
1N488A	N	380	420	200	650	500

SILICON COMPUTER DIODES

Type	Case Type	PIV	V_f	Max T_R @25°C µsec	Max I_{rb} @ 25°C µa	I_o @ 25°C ma	Min I_o @ 1v ma	Typ Cap @ 25°C f = 1mc VR = −12v µµf	Max I_{rb} @ PIV @ 100°C µa
1N698	N	50	60	0.3	5	100	6	2.7	25
1N699	N	100	120	0.3	5	100	6	2.7	50
1N699L	N	200	240	0.3	10	100	6	2.7	100

PHOTO DEVICE

Type	Bias Voltage @ 25°C v max	Dark Current @ 25°C ±50v max µa	Dark Current @ 100°C ±50v max µa	*Typ Light Current @ 25°C @ ±10v µa	*Typ Sensitivity @ 10v µa/mw/cm²
1N175	50	0.5	100	200	22.3

* Light current measured in terms of radiation. Radiation = 3 mw/cm² in a frequency bandwidth of .7 to 1 micron.

SILICON RECTIFIERS — ECONOMY PACKAGE

Type	Case Type	PIV	I_o ma @ 25°C — 100°C	Recurrent Peak Current @ 25°C a	Dynamic Forward Voltage Drop @ 100°C v @ ma	Dynamic Reverse Current @ 100°C ma @ v
1N1084	W	200	750 — 300	6	0.6 @ 500	0.2 @ 200
1N1085	W	400	750 — 300	6	0.6 @ 500	0.2 @ 400
1N1086	W	600	750 — 300	6	0.6 @ 500	0.2 @ 600

POWER REGULATORS AND DOUBLE ANODE CLIPPERS

Available with either anode or cathode to stud

Type	Case Type	Zener Voltage @25°C	I_z ma	Power Diss @60°C w	Reverse Current I_{rb} 25°C µa @−5v	@−10v	max Z_z @25°C @I_z ohms	Typ Temp Coef %/°C
1N1816	R	13	500	10	25	—	2	0.07
1N1817	R	15	500	10	15	—	2	0.07
1N1818	R	16	500	10	10	—	3	0.07
1N1819	R	18	500	10	10	—	3	0.07
1N1820	R	20	250	10	—	10	3	0.08
1N1821	R	22	250	10	—	10	3	0.08
1N1822	R	24	250	10	—	10	3	0.08
1N1823	R	27	250	10	—	10	3	0.08
1N1824	R	30	150	10	—	10	4	0.08
1N1825	R	33	150	10	—	10	4	0.08
1N1826	N	36	150	10	—	10	5	0.09
1N1827	R	39	150	10	—	10	5	0.09
1N1828	R	43	150	10	—	10	6	0.09
1N1829	R	47	150	10	—	10	7	0.09
1N1830	R	51	150	10	—	10	8	0.10
1N1831	R	56	150	10	—	10	9	0.10
1N1832	R	62	50	10	—	10	12	0.10
1N1833	R	68	50	10	—	10	14	0.10
1N1834	R	75	50	10	—	10	20	0.11
1N1835	R	82	50	10	—	10	22	0.11
1N1836	R	91	50	10	—	10	35	0.11

Suffix A (±5% Tolerance) Suffix C (Double Anode Clipper)

VOLTAGE REGULATOR DIODES

Type	Case Type	Zener Voltage @25°C*	Max Total Power 25°C mw	Max Total Power 150°C mw	Z_z max ohms
1N746†	N	3.3	400	100	28
1N747†	N	3.6	400	100	24
1N748†	N	3.9	400	100	23
1N749†	N	4.3	400	100	22
1N750†	N	4.7	400	100	19
1N751†	N	5.1	400	100	17
1N752†	N	5.6	400	100	11
1N753†	N	6.2	400	100	7
1N754†	N	6.8	400	100	5
1N755†	N	7.5	400	100	6
1N756†	N	8.2	400	100	8
1N757†	N	9.1	400	100	10
1N758†	N	10	400	100	17
1N759†	N	12	400	100	30
650C	M	3.7–4.5	150	40	
651C	M	4.3–5.4	150	40	
652C	M	5.2–6.4	150	40	
653C	M	6.2–8.0	150	40	
654C	M	8.5–9.5	150	40	
655C	M	9.5–10.5	150	40	

†Suffix A (±5% Tolerance)

SILICON RECTIFIERS

Type	Case Type	Mounting	PIV 25°C v	PIV 150°C v	I_o 25°C ma	I_o 150°C ma	Recurrent Peak Current −65°C to +150°C ma	E_b @25°C volts	I_{rb} @ PIV @25°C µa
1N586	O	Axial	1500	1000	25	10	150	10@10ma	50
1N589	O	Axial	1500	1000	50	25	250	8@50ma	50
1N1130	P	Cathode Stud	1500	1000	300	150	1 a	15@1.3	50
1N1131	P	Anode Stud	1500	1000	300	150	1 a	15@1.3	50
1N538	Q	Axial	200	200	750	250	2.5 a @25°C	1@.5	10
1N539	Q	Axial	300	300	750	250	2.5 a @25°C	1@.5	10
1N540	Q	Axial	400	400	750	250	2.5 a @25°C	1@.5	10
1N1095	Q	Axial	500	500	750	250	2.5 a @25°C	1@.5	10
1N1096	Q	Axial	600	600	750	250	2.5 a @25°C	1@.5	10
1N1124	R	Cathode Stud	200	200	3 a	1 a	10 a @50°C	1.1@1	10
1N1125	R	Cathode Stud	300	300	3 a	1 a	10 a @50°C	1.1@1	10
1N1126	R	Cathode Stud	400	400	3 a	1 a	10 a @50°C	1.1@1	10
1N1127	R	Cathode Stud	500	500	3 a	1 a	10 a @50°C	1.1@1	10
1N1128	R	Cathode Stud	600	600	3 a	1 a	10 a @50°C	1.1@1	10
1N1124R	R	Anode Stud	200	200	3 a	1 a	10 a @50°C	1.1@1	10
1N1125R	R	Anode Stud	300	300	3 a	1 a	10 a @50°C	1.1@1	10
1N1126R	R	Anode Stud	400	400	3 a	1 a	10 a @50°C	1.1@1	10
1N1127R	R	Anode Stud	500	500	3 a	1 a	10 a @50°C	1.1@1	10
1N1128R	R	Anode Stud	600	600	3 a	1 a	10 a @50°C	1.1@1	10

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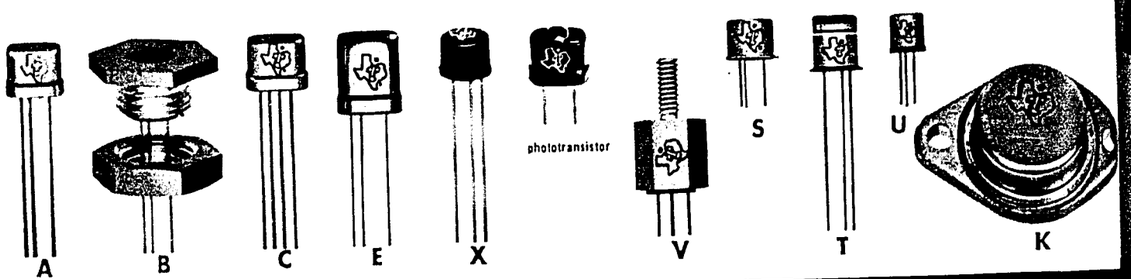

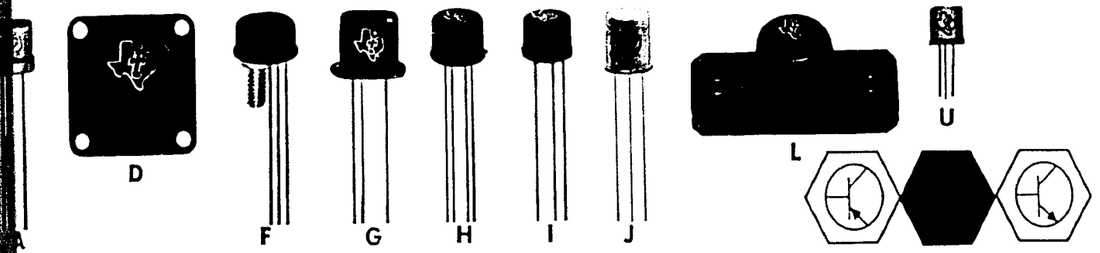

GERMANIUM TRANSISTORS

	Type	Case Type*	Former Designation	Dissipation at 25°C mw	Collector Voltage-v max	Collector Current ma max	Beta min	Beta max	Collector Reverse Current I_{CO} max µa	Collector Reverse Current I_{CO} max v	Gain db and R_{CB} typ	Audio Gain db typ min	Audio Gain db typ max	RF Gain db min	Alpha Cutoff Frequency mc typ
computer pnp	2N395	X		150	−30	−250	20		150	−6	−15				4.5
	2N396	X		150	−30	−250	30		150	−6	−20				6
	2N397	X		150	−30	−250	40		150	−6	−15				11.5
	2N705	U		150	−15	− 50	25			−50	−4.5 at 65°C				250
	2N708	U		300	−15	− 50									
	2N710	U		150	−30	−250	50		200	−6	−20				6.5
	2N1093	X	320	150	−30	−250									750
	2N1195	S		225	30	− 40									1.5
	2N1303	Y		150	30	300	50		6	25					8
	2N1305	Y		150	30	300	70		6	25					11
	2N1307	Y		150	30	300	100		6	25					20
	2N1309	Y		150	30	300	150		6	25					45
npn	2N1302	Y		150	25	300	50		6	25					8
	2N1304	Y		150	25	300	70		6	25					11
	2N1306	Y		150	25	300	100		6	25					20
	2N1308	Y		150	25	300	150		6	25					32
computer power pnp	2N1046	K	X282	15W	−80	−3a	40	70 (Avg)	−1ma	−40				10 at 100mc	250
VHF tetrode pnp	2N25	C	501	25	−15	−2	65 (Avg)		−20	−12				10 at 18mc	50
high frequency pnp	2N248	A		30	−25	−5	20 (Avg)		−10	−12					750
	2N1141	S		750	−35	−100	12db at 10ma, 100mc		−5	−6					600
	2N1142	S		750	−30	−100	10db at 10ma, 100mc		−10	−15					480
	2N1143	S		750	−25	−100	8db at 10ma, 100mc		−10	−12					
radio RF, converter, osc and IF pnp	2N1107	A	RF	30	−16	−5			−10	−12	h_{fe} 34 at 455kc				
	2N1108	A	Conv	30	−16	−5			−10	−12	h_{fe} 33 at 455kc				
	2N1109	A	OSC	30	−16	−5			−10	−12	h_{fe} 29 at 455kc				
	2N1110	A	1st IF	30	−16	−5			−10	−12	h_{fe} 25 at 455kc				
	2N1111	A	2nd IF	30	−20	−5			−10	−12	h_{fe} 25 at 455kc	h_{fe} 29 at 1kc			
	2N1111A	A	Reflex	30	−20	−5			−10	−12	h_{fe} 25 at 455kc	h_{fe} 29 at 1kc			
	2N1111B	A	Reflex	30	−27	−5						39/26†			
audio output pnp	2N185	A	352	150	−20	−150	35 (70 Avg)		−15	−20		37	42		
	2N238	A	310	50	−20	−150	50 (Avg)		−20	−20		31/22†			
	2N291	E	357	300	−25	−200	30 (45 Avg)		−25	−25					
	2N580	A		150	−20	−150	(35 Avg)		−14	−12					
	2N250	K	356	25w	−30	−3a	30 at 0.5a		−1ma	−30		30			2.5
	2N251	K	356A	25w	−60	−3a	30 at 0.5a		−2ma	−60		30			3
general purpose npn	2N364	A	200A	150	30	50	9	19	10	30					3.5
	2N365	A	201A	150	30	50	19	49	10	30					7.5
	2N366	A	202A	150	30	50	49	142	10	30					15
	204A	A		150	60	50	9	49	−20	−30					11
pnp	2N364	A	301	150	−30	−50	19	49	−20	−30					
	2N369	A	302	150	−30	−50	49	142	−20	−30					
medium power pnp	2N1038	T		800	−40	−1a	20	60	−125	−20	0.2 ohm Rcs				
	2N1039	T		800	−60	−1a	20	60	−125	−30	0.2 ohm Rcs				
	2N1040	T		800	−80	−1a	20	60	−125	−40	0.2 ohm Rcs				
	2N1041	T		800	−100	−1a	20	60	−125	−50	0.2 ohm Rcs				
power pnp	2N456	K		50w	−40	−5a	30 at 5a avg.		−2ma	−40	0.048 ohm Rcs				
	2N457	K		50w	−60	−5a	30 at 5a avg.		−2ma	−60	0.048 ohm Rcs				
	2N458	K		50w	−80	−5a	30 at 5a avg.		−2ma	−80	0.048 ohm Rcs				
	2N511	K‡		80w	40	10a	10 at 10a		20−2ma		0.025 ohm Rcs				
	2N511A	K‡		80w	60	10a	10 at 10a		30−2ma		0.025 ohm Rcs				
	2N511B	K‡		80w	80	10a	10 at 10a		40−2ma		0.025 ohm Rcs				
	2N512	K‡		80w	40	15a	10 at 15a		20−2ma		0.025 ohm Rcs				
	2N512A	K‡		80w	60	15a	10 at 15a		30−2ma		0.025 ohm Rcs				
	2N512B	K‡		80w	80	15a	10 at 15a		40−2ma		0.025 ohm Rcs				
	2N513	K‡		80w	40	20a	10 at 20a		20−2ma		0.025 ohm Rcs				
	2N513A	K‡		80w	60	20a	10 at 20a		30−2ma		0.025 ohm Rcs				
	2N513B	K‡		80w	80	20a	10 at 20a		40−2ma		0.025 ohm Rcs				
	2N514	K‡		80w	40	25a	10 at 25a		20−2ma		0.025 ohm Rcs				
	2N514A	K‡		80w	60	25a	10 at 25a		30−2ma		0.025 ohm Rcs				
	2N514B	K‡		80w	80	25a	10 at 25a		40−2ma		0.025 ohm Rcs				
	2N1021	K		50w	−100	−5a	23 at 5a avg.		−2ma	−100	0.06 ohm Rcs				
	2N1022	K		50w	−120	−5a	23 at 5a avg.		−2ma	−120	0.06 ohm Rcs				
	2N1042	K§		20w	−60	−3a	20	60	−125	−30	0.16 ohm Rcs				
	2N1043	K§		20w	−80	−3a	20	60	−125	−40	0.16 ohm Rcs				
	2N1044	K§		20w	−80	−3a	20	60	−125	−50	0.16 ohm Rcs				
	2N1045	K§		20w	−100	−3a	20	60	−125	−60	0.16 ohm Rcs				
photoconductive npn	800			85	20	5									

‡ Except for 0.090" Emitter lead † Min. audio power gain—Class A/Class B § To specify case type T add suffix (—2) to type number § To specify case type V add suffix (—1) to type number

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SILICON TRANSISTORS

	Type	Case Type	Dissipation at 25°C w	Small Signal Current Transfer Ratio h_{fe} min	Small Signal Current Transfer Ratio h_{fe} max	Collector Current I_C ma max	DC Current Transfer Ratio h_{FE} min	DC Current Transfer Ratio h_{FE} max	Collector Breakdown Voltage-v BV_{CBO} min	Saturation Resistance R_{CS} Ohms max	Alpha Cutoff Frequency f_{ab} mc typ
small signal	2N1149/903	A	0.150	9	20	25		10 (typ)	45	200	4
	2N1150/904	A	0.150	18	40	25		20 (typ)	45	200	5
	2N1151/904A	A	0.150	18	90	25		25 (typ)	45	200	8 (min)
	2N1152/905	A	0.150	36	90	25		40 (typ)	45	200	6
	2N1153/910	A	0.150	76	333	25		80 (typ)	45	200	7
	2N117	G	0.150	9	20	25		10 (typ)	45	200	6
	USN2N117	G	0.150	9	20	25		10 (typ)	45	200	1 (min)
	2N118	G	0.150	18	40	25		20 (typ)	45	200	5
	USN2N118	G	0.150	18	40	25		20 (typ)	45	200	2 (min)
	2N118A	G	0.150	18	90	25		25 (typ)	45	200	8 (min)
	2N119	G	0.150	36	90	25		40 (typ)	45	200	6
	USN2N119	G	0.150	36	90	25		40 (typ)	45	200	2 (min)
	2N120	G	0.150	76	333	25		80 (typ)	45	200	7
	2N332	H	0.150	9	20	25		10 (typ)	45	200	6
	2N333	H	0.150	18	40	25		20 (typ)	45	200	5
	2N334	H	0.150	18	90	25		25 (typ)	45	200	8 (min)
	2N335	H	0.150	36	90	25		40 (typ)	45	200	6
	2N336	H	0.150	76	333	25		80 (typ)	45	200	7
switching	2N337	H	0.125	19		20	20	55	45	150	10 (min)
	2N338	H	0.125	39		20	45	150	45	150	20 (min)
	2N702	U	0.500	1 at 50mc		20	15	45	20	60	100
	3N34	H	0.125	1 at 30mc		10 Power Gain: 22db typ at 30 mc			30	300	
frequency	3N35	H	0.125	1 at 70mc		10 Power Gain: 20db typ at 70 mc			30	300	150
	2N1154/851	A	0.750	9		60		18 (typ)	50	300	8
	2N1155/952	A	0.750	9		50		18 (typ)	80	350	8
	2N1156/953	A	0.750	9		40		18 (typ)	120	400	8
	2N243	A	0.750	9	32	60		14 (typ)	60	350	7
	2N244	A	0.750	28	90	60		30 (typ)	60	350	8
	2N339	J	1	9	90	60		15 (typ)	55	300	6
	2N340	J	1	9	90	60		15 (typ)	85	350	6
	2N341	J	1	9	90	60		20 (typ)	125	400	6
	2N342	J	1	9	32	60		14 (typ)	60	350	6
	2N342A	J	1	9	32	60		14 (typ)	85	350	6
	2N343	J	1	28	90	60		30 (typ)	60	350	8
	2N497	I§	4		30 (typ)		12	36	60	25	9
	2N498	I§	4		30 (typ)		12	36	100	25	9
	2N656	I§	4		60 (typ)		30	90	60	25	8
	2N657	I§	4		60 (typ)		30	90	100	25	8
amplifier	2N122	L	8.75			140	3		120	200	1
	2N1047	F	40		20 (typ)		12	36	80	15	8
	2N1048	F	40		20 (typ)		12	36	120	15	8
	2N1049	F	40		40 (typ)		30	90	80	15	7
	2N1050	F	40		40 (typ)		30	90	120	15	7
	2N389	D	85 at 25°C 45 at 100°C		30 (typ)		12	60	60	5	7
	2N424	D	85 at 25°C 45 at 100°C		30 (typ)		12	60	80	10	6

† All connections insulated from case § Collector in electrical contact with case

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Your most advanced, dependable semiconductor and component products available anywhere are made by Texas Instruments—pioneer leader with the greatest semiconductor experience.

Ready to give you fast, time-saving local service on TI products is TI's nationwide network of top distributors—quality local sources where you get the newest TI products—off-the-shelf within hours—at factory prices.

If you have an electronic component requirement, contact your Texas Instruments distributor nearest you for fastest possible delivery from his complete line of stock. Check the list above for your nearest authorized TI distributor.

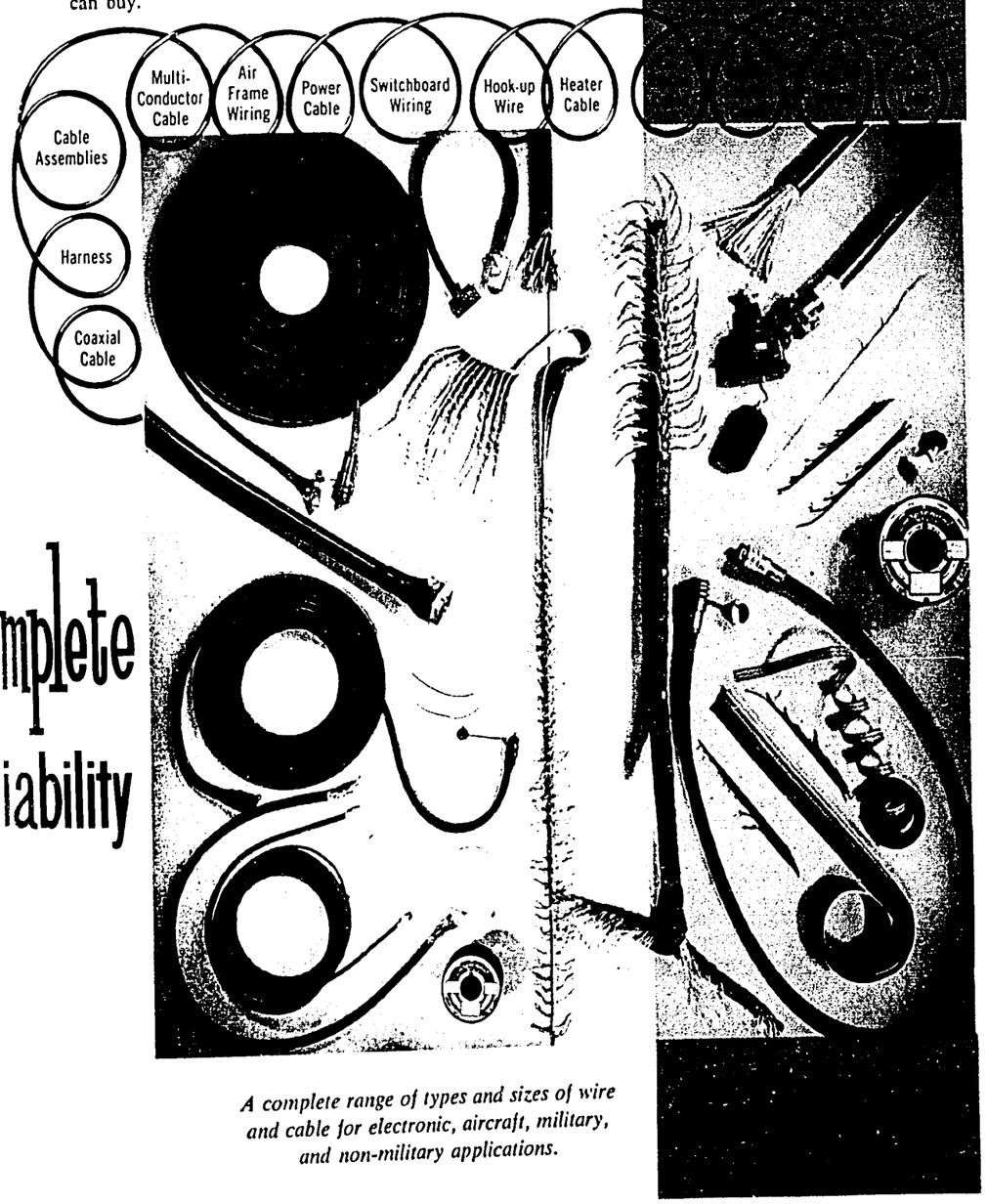
TEXAS INSTRUMENTS
INCORPORATED
SEMICONDUCTOR-COMPONENTS DIVISION
POST OFFICE BOX 312
13500 N. CENTRAL EXPRESSWAY
DALLAS, TEXAS

For details, circle #78 on Reader Service Card

Surprenant

Surprenant's reputation for quality products is a direct outgrowth of its unique versatility. *All manufacturing processes from testing the incoming copper rod and insulation ingredients to terminating the finished wire and cable are done at the Surprenant plant.* This permits Surprenant quality certification at every step of manufacture.
Combine these controls with the most advanced manufacturing techniques and quality materials like TEFLON — and you know why Surprenant manufactures the most reliable wire and cable that money can buy.

true VERSATILITY



Complete reliability

A complete range of types and sizes of wire and cable for electronic, aircraft, military, and non-military applications.

For details, circle #79 on Reader Service Card

New! NARDA Two-Stage, Low-Cost
ULTRASONIC VAPOR DEGREASER

Aircraft engine oil strainer, one of many aircraft, automotive and electronics parts cleaned and decarbonized by the new Narda Ultrasonic Vapor Degreaser—in less time and with less chemicals!

• BETTER CLEANING • UP TO 40 TIMES FASTER!

• INCREASES ENGINE and INSTRUMENT RELIABILITY!

This new production model SonBlaster Vapor Degreaser, originally designed by Narda for the U. S. Air Force, is now commercially available to operators of aircraft and automotive fleet service centers–at low cost! Pushbutton operated, this advanced design equipment thoroughly and quickly degreases and decarbonizes: oil and fuel strainers, pistons and rings, valves, spark plugs, carburetors, fuel pumps, ball bearings and hydraulic system parts, etc.

Especially recommended where manual cleaning with abrasives, strong corrosive chemicals or inflammable solvents is harmful or dangerous. Unexcelled where superior work *plus* volume production is desired. Volatile solvents for degreasing and aqueous solutions for decarbonizing can be used alternately.

The SonBlaster Vapor Degreaser is simple and economical to use. To degrease: place parts in (1) boiling sump and (2) ultrasonic sump (3) flush with power spray, using filtered and distilled pure solvent (4) condensing solvent vapor removes any residue traces–finished job is the ultimate in degreasing!

SPECIFICATIONS:

Electrical Input: 208/230 volts, 50/60 cycles, 25/20 amps.

Generator: Delivers 300 watts average; 600 watts peak, 40 kc

Transducer: Barium Titanate, 40 kc. Diaphragm, 112 sq. inches.

Recirculation System: ½ h.p. pump, stainless steel filter; 4500-watt heater, thermostatically controlled.

Valves: Pushbutton, solenoid operated on all drains.

Cabinet: Cold rolled steel, baked enamel finish; 16 gauge, 302 stainless steel top. (All stainless steel cabinet optional at extra cost.) Overall dimensions, 56" long x 32" wide x 23½" wide.

Sumps: Overall working area, 28" x 16", 14 gauge, 302 stainless steel, heliarc welded.
Boiling sump capacity, 7 gals.
Ultrasonic sump capacity, 6 gals.
Distillate reservoir capacity, 2 gals.

Price: $2990 for above model. Other Narda Ultrasonic Vapor Degreasers from $1500 up.

For additional information, please write to:

the narda ultrasonics corporation Dept. IRED-4

625 MAIN ST. • WESTBURY, L. I., NEW YORK • EDgewood 3-5400

America's Volume Producer of Dependable Low Cost Ultrasonic Systems

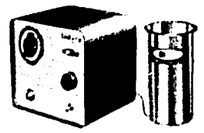
For details, circle #80 on Reader Service Card

Narda SonBlasters offer the most complete line of lowest-cost mass-produced ultrasonic cleaners!

Narda's mass-production techniques assure you the most complete line of ultrasonic cleaners at the lowest prices in the industry! From the smallest 35-watt to the amazing 2500-watt unit with a tank capacity of 75 gallons, Narda's SonBlasters are available **now**—off-the-shelf—for immediate delivery. And with a full 2-year warranty besides!

What do **you** want to clean? Transistors, semi-conductors, other electronic, automotive, missile and avionic components, instruments, timing mechanisms—Narda's SonBlasters clean 'most any mechanical, electrical or horological part or assembly you can think of—and clean faster, better and cheaper.

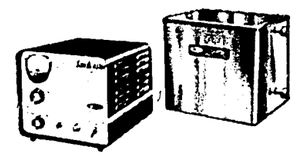
No matter what you need in ultrasonic cleaning equipment, you'll find Narda's complete line of production-size units have the quality, power, performance, capacity and appearance of cleaners selling up to three times their price! Write for more details **now** and we'll include a free questionnaire to help determine the precise model you need. Address: Dept. IRED-19.



Generator G-202 35 watts
Transducerized Tank NT-202 Capacity: ⅜ gallon

An amazingly efficient, yet inexpensive, ultrasonic cleaner. Duty cycle timer permits operator to turn the unit on, set it, and leave; the SonBlaster will turn off automatically at the end of the cycle. Four choices of timers—from 0-15 min. to 0-120 min. Also available without timer at slightly lower cost (G-201).

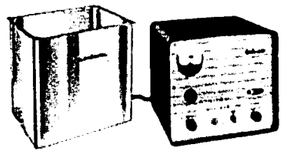
$220



Generator G-601 60 watts
Transducerized Tank NT-602 Capacity: 1 gallon

A more powerful production-type unit, with a special circuit and selector switch permitting operator to alternate between two tanks, when items being cleaned require different solutions or a two-step process.

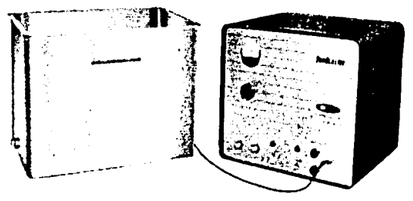
$350



Transducerized Tank NT-1505 Capacity: 5 gallons
Generator G-1501 200 watts

The lowest price in the industry for a tank of this capacity and activity. Generator also will operate 2, 3 or 4 submersible transducers at one time, with just a turn of the load selector switch on the front panel.

$695



Transducerized Tank NT-5001 Capacity: 10 gallons
Generator G-5001 500 watts

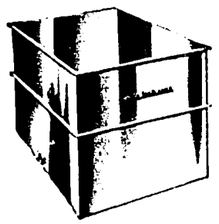
Generator features standby switch for longer life and load selector switch on the front panel to operate up to 8 submersible transducers or 8 NT-602 or 2 NT-1505 transducerized tanks at one time. Larger tanks available on special order.

$1325

Submersible Transducer NT-605

Heli arc welded stainless case, hermetically sealed for safe, leak-proof immersion. Radiating face: 27 sq. in. Effective plane of radiation: 40-50 sq. in. (approximately 10" x 5"). Effective cavitation of volumes up to 1200 cu. in. at 24 in. tank height (5 gal.) and 2400 cu. in. at 48 in. tank height (10 gal.). Bulkhead electrical fitting on back allows all wiring connections to be made on outside of tank. For use in any arrangement or location in any shape tank you desire to use. Also available—model NT-604, identical with NT-605, except for pipe thread instead of bulkhead fitting, permitting electrical connections inside of tank.

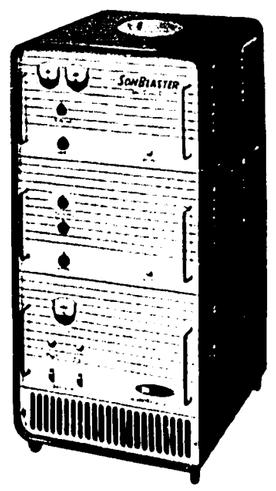
$130



Transducerized Tank NT-25001
Capacity: 75 gallons

Powerful unit drives the largest mass-produced industrial-size transducerized ultrasonic cleaning tank made! Also energizes up to 40 Narda 60-watt submersible transducers (NT-604 or -605). Capable of energizing tanks measuring up to 15 square feet of area by 2' or 3' high.

$4360



Generator G-25001
2500 watts

Consult with Narda for all your ultrasonic requirements. The SonBlaster catalog line of ultrasonic cleaning equipment ranges from 35 watts to 2.5 KW, and includes transducerized tanks as well as immersible transducers which can be adapted to any size or shape tank you may now be using. If ultrasonics can be applied to help improve your process, Narda will recommend the finest, most dependable equipment available—and at the lowest price in the industry!

For custom-designed cleaning systems, write to our Industrial Process Division; for information on Chemical processing applications, write to our Chemical and Physical Process Division; both at the address below.

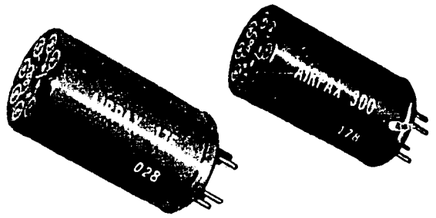
the narda ultrasonics corporation

625 MAIN STREET, WESTBURY, L. I., N. Y.

Subsidiary of The Narda Microwave Corporation

For details, circle #81 on Reader Service Card

AIRPAX ELECTRONICS INCORPORATED



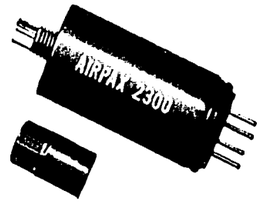
Types 175 and 300. The sub-miniature choppers which set the standards for the chopper industry. Type 175 uses a 6.3 volt, 60 CPS drive; Type 300 requires a 6.3 volt, 400 CPS drive. Both are hermetically sealed, stable, long-life choppers.

Types 6010 and 6015. Transistor choppers. Type 6015 includes the drive transformer. It is encased in a sub-miniature can with a 7 pin header. Drive for the 6010 may be as high as 100 KC; the type 6015 drive is 6.3 volts at 50 to 2000 CPS.

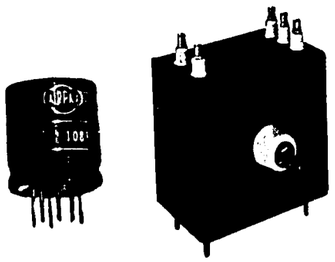
Airpax produces CHOPPERS for every purpose

Type 371. For reliability under extreme conditions of shock and vibration Airpax provides a center pivoted type which functions during vibrations of 15 G amplitude, over a frequency range of 10 to 2500 CPS.

Type 5600. Designed for transistor drive. Drive coil is tapped at its electrical center and requires only 8.5 milliamperes of drive current from a 9 volt, 400 CPS source. Eliminates drive transformer.



Type 2300. This low noise chopper is ideal for use in null seeking servo systems, instrument amplifiers and applications where noise must be kept at 1 microvolt or less, RMS. Drive is 6.3 volts, RMS at 400 CPS.



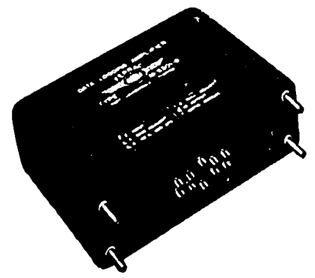
CUSTOM TRANSFORMERS. Airpax designs and manufactures custom transformers. The Fosterite facility at Cambridge is the largest in the country. Small size or large, bring your transformer requirements to Airpax.

Magnetic inverse time delay CIRCUIT BREAKER. Only slightly larger than an "ON-OFF" switch, this circuit breaker provides power control and positive circuit protection. Available in ratings from 50 ma. to 10 amps.

AIRPAX ELECTRONICS INCORPORATED

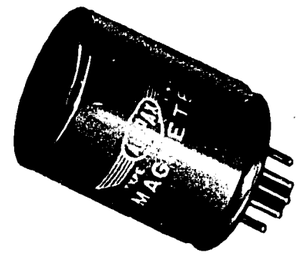
CAMBRIDGE, MARYLAND — FORT LAUDERDALE, FLA.

For details, circle #82 on Reader Service Card

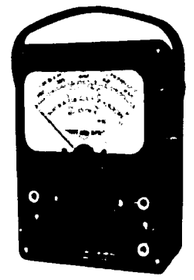


DATA LOGGING AMPLIFIER. A three-stage high accuracy, molded magnetic amplifier designed to deliver ± 5 volts at a linearity better than 0.1%. Voltage gains from 100 to 10,000 are obtainable in this differential type magnetic amplifier.

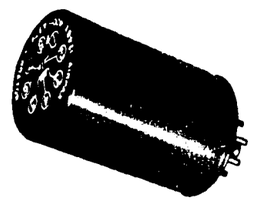
TACH-PAK. The all new Airpax TACH-PAK is a completely self-contained, highly sensitive unit which makes possible the accurate measurement (0.25%) of the speed of any rotating, reciprocating or oscillating shaft. Also available with AN connector.



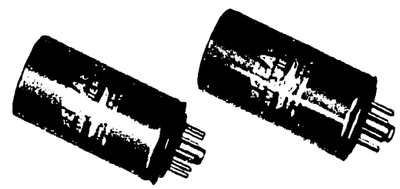
MAGMETER. Frequency to voltage converter. Output current is linear with input frequency. The MAGMETER is substantially insensitive to fluctuations in signal amplitude or waveform. Operates servo type recorders.



AIRCRAFT TEST SET. Inexpensive, portable all purpose test set measures frequency, DC and AC voltages commonly found in aircraft ground maintenance checks. Standard phase checker is a built-in feature.



VIBRATORS. Airpax pioneered high-frequency power vibrators. Type 500 is a 400 CPS interrupter for moderate continuous or heavy intermittent loads. This vibrator and variations are used in airborne transceivers, guidance equipments, and portable sets.



FERRAC Magnetic Amplifiers. Available in plug-in or molded types. Faster response—wider dynamic range—higher gains.

PREAC. Airpax PREAC amplifiers, for 60 or 400 CPS operation, have power gains of over 50 db. Unit is hermetically sealed.

AIRPAX ELECTRONICS INCORPORATED

AM21

For details, circle #83 on Reader Service Card

ALLIED'S HERMETICALLY SEALED RELAYS

MECHANICAL SPECIFICATIONS

ALLIED TYPE	TYPE OF TERMINAL	MAXIMUM OUTLINE DIMENSIONS AA	A	B	C	WT. (OZ.)	MOUNTING DIMENSIONS D	E	TYPE MOUNTING
ASH	SOLDER	2 5/16	2 5/16	1 5/8	1 7/16	3.5	.938	1.187	(3)#6-32 Studs
ASHO	PLUG-IN	3	2 37/64	1 5/8	1 7/16	4			Octal Plug-in
BJHR	SOLDER	3 11/32	2 45/64	1 41/64	1 3/4	7.5	.875	1.625	(3)#6-32 Studs
BJHRO	PLUG-IN	3 11/16	2 3/4	1 41/64	1 3/8	7.5			Octal Plug-in
BOH	SOLDER	3 11/32	2 53/64	2 1/32	2 1/32	7.5	1.856	1.856	(4).206 Dia. Holes
BOHO	PLUG-IN	3 11/32	2 11/32	2 13/64	DIA.	8			Octal Plug-in
BOHR	SOLDER	3 5/16	2 13/16	1 53/64	1 45/64	8.5	1.250	1.250	(3)#8-32 Studs
BOHRO	PLUG-IN	3 13/64	2 45/64	1 53/64	1 45/64	8.5			Octal Plug-in
BOYH	SOLDER	3 9/32	2 53/64	2 1/32	2 1/32	8.5	1.856	1.856	(4).206 Dia. Holes
BOYHR	SOLDER	3 5/16	2 11/16	1 37/64	1 45/64	8.5	1.250	1.250	(3)#8-32 Studs
BOYHRO	PLUG-IN	3 13/64	2 45/64	1 53/64	1 45/64	8.5			Octal Plug-in
CNAH	SCREW	4 31/64	3 15/64	2 21/32	2 17/32	22	1.875	2.000	(3)#10-32 Studs
CH	SOLDER	2 7/64	1 3/4	1 1/2	1 7/16	5	1.187	1.268	(3)#6-32 Studs
JH-6D	SOLDER	1.187	.906	1.320	.400	0.8	CTR CTR	1.078	(2).120 dia. holes
JH-12D	SOLDER	1.187	.906	1 7/16	.840	1.5	1.200	.400	(2).125 dia. holes
JH-18D	SOLDER	1.387	1.106	1 1/2	1.240	2.5	1.200	.600	(2).152 dia. holes
KH-6D	PLUG-IN	1 7/64	57/64	.396	.800	0.33			8 Pin Plug-in
KHJ-6D	SOLDER	1.062	.781	1.320	.400	0.5	CTR CTR	1.078	(2).120 dia. holes
KHY-6D	SOLDER	1.096	.759	1 13/64	13/32	0.5	1.000	.125	(4).096 dia. holes
LKH-6C	SOLDER	3 15/32	3 13/64	1 29/32	1 29/32	8.5	1.375	1.500	(3)#6-32 Studs
LKH-4C	SOLDER	3 1/32	2 21/32	1 5/8	1 7/16	6	.938	1.187	(3)#6-32 Studs
LKHO	PLUG-IN	3 37/64	3	1 5/8	1 7/16	5.5			Octal Plug-in
MEH-6	SOLDER	2 5/64	1 23/32	1 3/8	1	3	.672	1.047	(3)#6-32 Studs
MEHG	PLUG-IN	2 7/32	1 37/32	1 3/8	1	3.5	.762	1.165	Note 1 (3)#4-40 Studs
MH-6D	SOLDER	1 33/64	1 33/64	1 5/64	.722	1	CTR CTR	.875	(2) Holes .125 Dia.
MH-12	SOLDER	1 25/32	1 33/64	1 53/64	1 3/64	2.5	CTR CTR	1.406	Note 3 (2)#6-32 Studs
MH-18	SOLDER	1 25/32	1 33/64	1 53/64	1 9/32	4	CTR CTR	1.562	Note 3 (2)#6-32 Studs
MHT-12	SOLDER	2 1/8	1 13/16	1 5/16	DIA.	3	CTR CTR	.625	Note 3 (2)#6-32 Studs
MHT-18	SOLDER	2 9/64	1 33/64	1 13/64	DIA.	4.5	CTR CTR	.625	(3)#6-32 Studs
MHK-12	SOLDER	1 53/64	1 1/2	1 37/64	1 13/64	3.5	.938	1.187	Note 4 (2) .144 Dia. Holes
MHUO-12	PLUG-IN	1 3/4	1 33/64	1 41/64	1 9/64	2.5	CTR CTR	1.406	Note 4 (2) .125 Dia. Holes
MHLO-12	PLUG-IN	1 3/4	1 33/64	1 53/64	1 9/64	2.5	CTR CTR	1.531	Note 4 (2) .144 Dia. Holes
MHUO-18	PLUG-IN	1 3/4	1 33/64	1 53/64	1 9/32	4.0	CTR CTR	1.562	Note 4 (2) .125 Dia. Holes
MHLO-18	PLUG-IN	1 3/4	1 33/64	2 5/64	1 9/32	4.0	CTR CTR	1.687	(2)#6-32 Studs
*MHJ-12	SOLDER	1 25/32	1 33/64	1 41/64	1 9/64		CTR CTR	1.406	(2)#6-32 Studs
*MHJ-18	SOLDER	1 25/32	1 33/64	1 53/64	1 5/16		CTR CTR	1.562	(2)#6-32 Studs
MHY-12	SOLDER	1 43/64	1 33/64	1 53/64	1 9/32		CTR CTR	1.562	Note 3 (2)#6-32 Studs
PBHW-6	SOLDER	2 37/64	2 13/64	1 53/64	1 43/64	6	CTR CTR	1.468	{4}#6-32 Studs
PBH-6	SOLDER	2 37/64	2 13/64	1 53/64	1 43/64	6	1.218	1.218	(4)#6-32 Studs
PBH-9	SOLDER	2 45/64	2 13/64	1 53/64	1 43/64	6	1.218	1.218	(4)#6-32 Studs
PBH-12	SOLDER	2 45/64	2 13/64	1 53/64	1 43/64	6.5	1.218	1.218	"AN" CONNECTOR
PBHN-9	PLUG-IN	3 1/8	2 1/8	1 53/64	1 43/64	9	Note 3		"AN" CONNECTOR
PBHN-12	PLUG-IN	3 1/8	2 1/8	1 53/64	1 43/64	9.5	Note 3		(3)#6-32 Studs
PDH-9	SOLDER	2 1/2	2 3/64	1 5/8	1 7/16	6	.938	1.187	(3)#6-32 Studs
PDH-12	SOLDER	2 1/2	2 3/64	1 5/8	1 7/16	6.5	.938	1.187	14 Pin Plug (3)#6-32 Studs
PDHG	PLUG-IN	2 53/64	2 5/16	1 5/8	1 7/16	6.5	Note 1		(3)#8-32 Studs
POHR-9	SOLDER	3 5/8	3 13/64	1 29/32	1 29/32	12	1.375	1.437	(3)#8-32 Studs
POHR-12	SOLDER	3 29/32	3 33/64	2 5/32	2 5/32	13.5	1.625	1.812	14 Pin Plug-in
POHRO-12	PLUG-IN	4 5/16	3 1/2	2 5/32	2 5/32	13.5			(2) .161 Dia. holes
PRH	SOLDER	3 13/64	2 39/32	3 5/32	1 7/16	9.5	CTR CTR	2.687	(2).125 dia. clearance holes
RSH-3D	SOLDER	2 7/64	1 41/64	1.233	.853	2.0	CTR CTR	.973	(2).125 dia. clearance holes
RSH-6D	SOLDER	2 7/64	1 41/64	1.233	.853	2.0	CTR CTR	.973	8 pin plug-in + keyway + (2).125 dia. clearance holes
RSHO-6D	8 PIN PLUG-IN	2 5/16	1 41/64	1.233	.853	2.0	CTR CTR	.973	
RSH-3D	7 PIN PLUG-IN	2 7/64	1 7/8	3/4	DIA.	2.0			7 Pin Plug-in
SKH	SOLDER	2 17/32	2 1/16	1 5/8	1 7/16	4.5	.938	1.187	(3)#6-32 Studs
SKHO	PLUG-IN	3	2 27/64	1 5/8	1 7/16	5			Octal Plug-in
SKHW	SOLDER	2 17/32	2 1/16	1 5/8	1 7/16	4.5	.938	1.187	Note 3 (3)-6-32 Studs
SKHG	PLUG-IN	2 37/64	2 5/16	1 5/8	1 7/16	5	Note 1		14 Pin Plug-in(3)#6-32 Studs
SKHN	PLUG-IN	3 5/16	2 1/64	1 5/8	1 7/16	6.8	Note 3		"AN" CONNECTOR
SWHO	PLUG-IN	2 41/64	2 5/64	1 5/8	1 7/16	5.5			Octal Plug-in
SWH	SOLDER	2 7/16	2 5/64	1 5/8	1 7/16	5.5	.938	1.187	(3)#6-32 Studs
T-154H-CC-CC	SOLDE.	1 49/64	1 41/64	1 5/16	5/64	1.0	1.000	.500	(3)#4-40 NC-2A Studs

ELECTRICAL SPECIFICATIONS

CONTACT RATING (AMPS.)	CONTACT FORM MAX.	COIL DATA MAX D.C. OHMS	OPER.
5	SPDT	3500	AC
		3485	DC
5	SPDT	3500	AC
		3485	DC
5	DPDT	3700	AC
		5000	DC
5	DPDT	3700	AC
		5000	DC
10	DPDT	2675	AC
		5000	DC
5	DPDT	2675	AC
		5000	DC
10	DPDT	2675	AC
		5000	DC
10	DPDT	2675	AC
		5000	DC
10	DPDT	10,000	DC
10	DPDT	10,000	DC
10	DPDT	10,000	DC
50	SPST	600	AC
10	4PDT	4460	AC
		525	DC
5	2PDT	12,000	DC
2	4PDT	12,000	DC
2	6PDT	12,000	DC
½	DPDT	5,000	DC
3	2PDT	27,800	DC
3	2PDT	8,120	DC
2	6PDT	11,000	DC
2	4PDT	11,000	DC
2	DPDT	11,000	DC
5	DPDT	1330	AC
		2930	DC
5	DPDT	1330	AC
		2930	DC
5	DPDT	15,900	DC
5	4PDT	16,000	DC
5	6PDT	22,100	DC
5	4PDT	16,000	DC
5	6PDT	22,100	DC
5	4PDT	16,000	DC
5	4PDT	16,000	DC
5	6PDT	22,100	DC
5	6PDT	22,100	DC
5	4PDT	16,000	DC
5	6PDT	22,100	DC
10	4PDT	22,100	DC
10	DPDT	380	AC
		4800	DC
10	DPDT	380	AC
		4800	DC
10	3PDT	380	AC
		4800	DC
10	4PDT	380	AC
		4800	DC
10	3PDT	380	AC
		4800	DC
10	4PDT	380	AC
		4800	DC
2	3PDT	415	AC
		4800	DC
2	4PDT	415	AC
		4800	DC
2	4PDT	415	AC
		4800	DC
10	3PDT	800	AC
		5200	DC
10	4PDT	800	AC
		5200	DC
10	4PDT	800	AC
		5200	DC
10	4PDT	700	AC
		5200	DC
2	SPDT	1400	AC
2	DPDT	1400	AC
2	DPDT	1400	AC
2	SPDT	1400	AC
2	4PDT	1500	AC
2	DPDT	1500	AC
3	4PDT	1500	AC
2	4PDT	1500	AC
2	4PDT	1500	AC
2	DPDT	1800	AC
2	DPDT	1800	AC
2	4PDT	11,000	DC

*NOTE: MHJ type relays are available in all MH type mountings.

For details, circle #84 on Reader Service Card

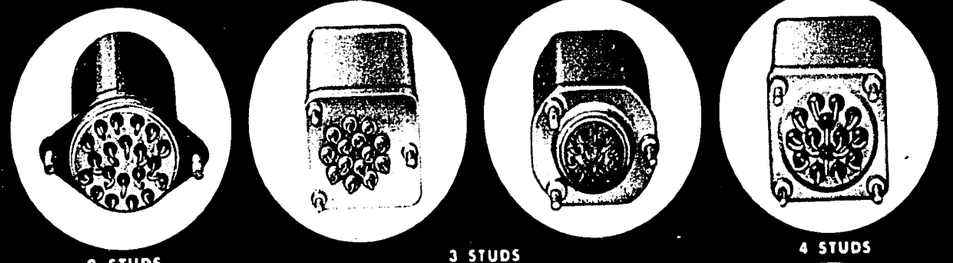
NOTE 1: Use 14 pin miniature socket

NOTE 2: Two Relays in one enclosure

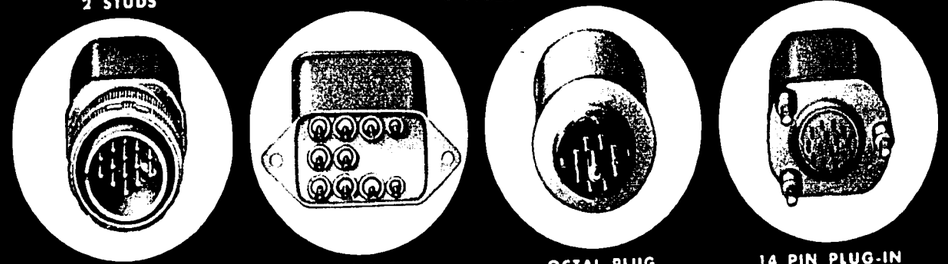
NOTE 3: Air Force approved

NOTE 4: Sockets available from Allied Control

TYPES OF MOUNTINGS AND TERMINALS

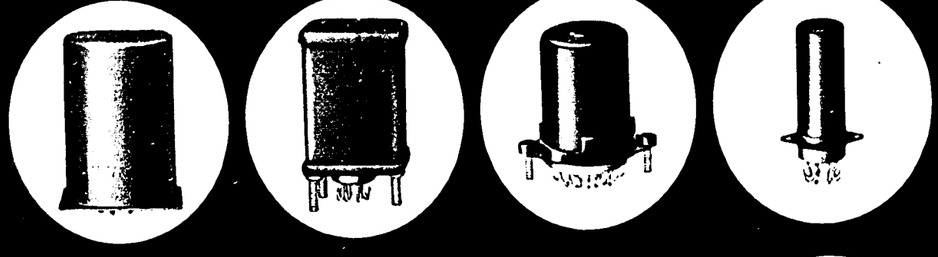


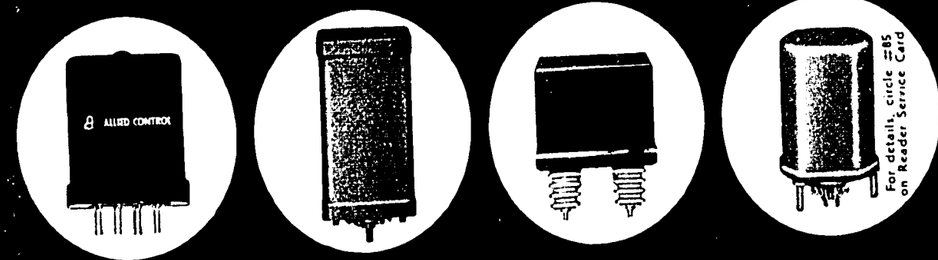
2 STUDS — 3 STUDS — 4 STUDS



"AN" PLUG-IN — 2 HOLE — OCTAL PLUG — 14 PIN PLUG-IN

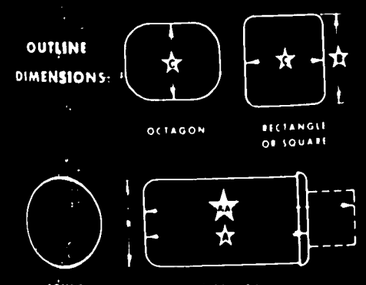
TYPES OF HOUSINGS



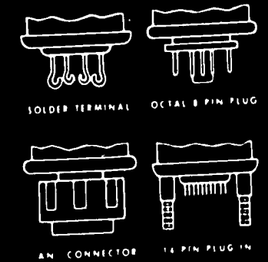


For details, circle #85 on Reader Service Card

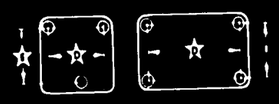
OUTLINE DIMENSIONS:



TYPE TERMINALS:



MOUNTING DIMENSIONS:



ALLIED CONTROL

ALLIED CONTROL COMPANY, INC., 2 EAST END AVENUE, NEW YORK 21, N. Y.

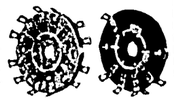
before you freeze your design...call on OAK engineers!

OAK "EARLY-BIRD" ENGINEERING HELPS YOU GET BETTER COMPONENTS . . . FASTER!

By calling on Oak engineers early, you take full advantage of their 25 years of specialization in electro-mechanical devices. This intensive background enables them to save you costly re-engineering time. Even on seemingly simple components, Oak engineers have been able to make valuable suggestions that resulted in better performance and lower costs. Combine this thorough engineering with Oak's manufacturing skills and facilities, and you can feel assured of getting the *exact* component you need . . . and in a lot less time.

NEW! 150°C SWITCH SECTIONS

These high-temperature, low-power wafers have demonstrated high reliability in actual operation during 800-hour tests at a continuous, ambient 150°C. Special alloy clips; ceramic or Mycalex insulation.



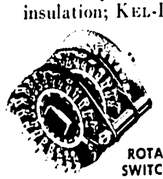
ELECTRO-MECHANICAL COMPONENTS ENGINEERED AND MANUFACTURED TO YOUR EXACT REQUIREMENTS!

low-current switches

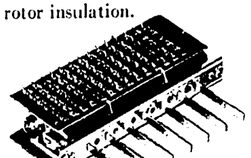
Mounts in a 1" diameter circle

Type A Miniature Rotary Switch

Available in three models: 45°, 36°, and 30° throw. Up to 18 contacts. Silicone glass stator insulation; KEL-F® rotor insulation.

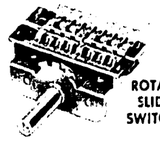


ROTARY SWITCHES



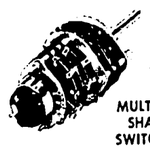
PUSHBUTTON SWITCHES

PRINTED CIRCUIT SWITCHES



ROTARY SLIDER SWITCHES

LEVER OPERATED SWITCHES



MULTIPLE SHAFT SWITCHES

The above switches represent but seven of the hundreds of basic Oak designs—already tooled for fast production. Custom variation of these designs provides a source of special switches in almost *infinite variety*. Excellence of design plus highest quality materials make Oak switches the best you can buy. Standard insulation is phenolic, steatite, and Mycalex; contacts, silver-plated spring brass or spring silver alloy.

choppers

smallest...lightest in its class

Series M

DC-AC

Low Level Inverter

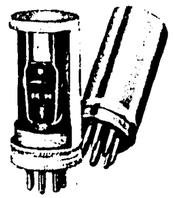
Withstands 30 G vibrations from 0-500 cps and −55° to +100°C temperatures. Custom-built in an unusual variety of packages.

Type 605 Chopper Eliminates Phase-Shift Circuit

Has 0° (or 180°) phase-lag "designed-in." Available with side or vertical flange mounts, flattened pierced pins, solder loops, or standard socket pins.

NC 600 Series of Oak Choppers

Available for frequencies from 15 to 600 cycles. Operates up to 125°C. High contact rating. Exceptional stability. Low voltage starting.

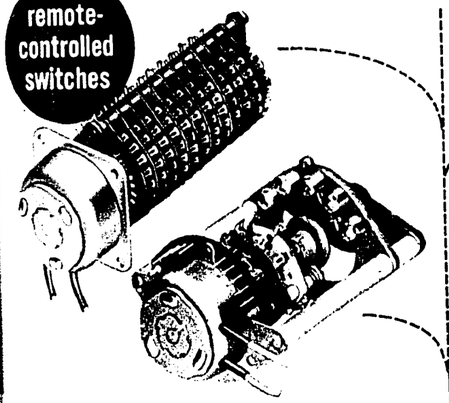


VIBRATORS

Custom-Designed and Custom-Built

Basic Oak designs cover practically any application. The V6000 Series is a versatile, general purpose vibrator. Type 94 is designed primarily for auto radios. Type 95 is a small, medium power shunt drive interrupter. The MV Series is designed for portable radios and similar applications. All can be supplied for military needs.

remote-controlled switches

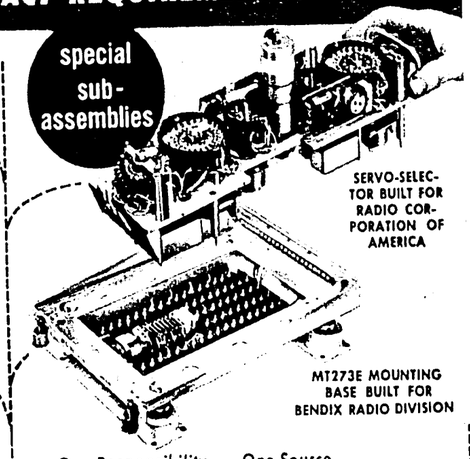


Thousands of Combinations

Oak remote-controlled switches are custom combinations of Oak rotary solenoids* and the many types of Oak rotary switches. They are unusually reliable, giving a positive stepping action even under conditions of shock and vibration. Ideal for mobile and military equipment.

*Mfd. under license from G. H. LELAND, INC.

special sub-assemblies



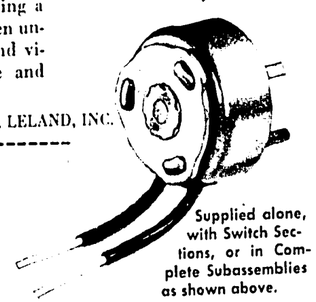
SERVO-SELECTOR BUILT FOR RADIO CORPORATION OF AMERICA

MT273E MOUNTING BASE BUILT FOR BENDIX RADIO DIVISION

One Responsibility . . . One Source

Turn your prototype over to Oak engineers. They will analyze it, test it, redesign for optimum performance, and convert it into a manufacturable device. Oak's modern production facilities then build your subassembly, and run any life and environment tests which may be required.

rotary solenoids*



Supplied alone, with Switch Sections, or in Complete Subassemblies as shown above.

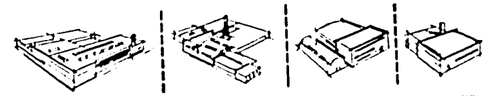
Oak rotary solenoids are ideal actuators for remote control of complex circuits under the severe conditions of MIL-S-4040A and similar specifications. They are compact, rugged and extremely adaptable.

*Mfd. under license from G. H. LELAND, INC.

OAK MFG. CO.

1260 Clybourn Ave., Dept. R, Chicago 10, Illinois
Phone: MOhawk 4-2222

Four plants . . . 3200 employees . . . 400,000 sq. ft. equipped for economical production



Chicago, Ill. | Crystal Lake, Ill. | Chicago, Ill. | Elkhorn, Wis.

For details, circle #86 on Reader Service Card

1960 I. E. Prod.

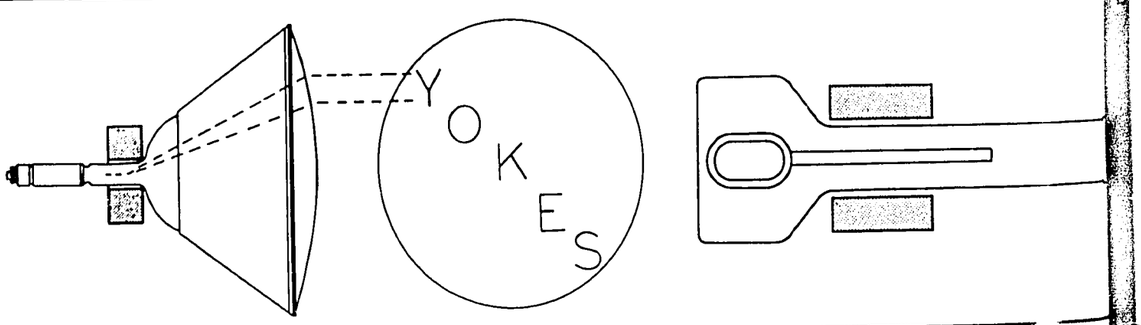
For details, circle #87 on Reader Service Card

. . . LEADING SPECIALISTS IN PRECISION DISPLAYS

Celco YOKES

YEARS AHEAD IN DESIGN PERFORMANCE!

Celco YOKES FOR CHARACTER DISPLAYS & HIGH RESOLUTION APPLICATIONS



Deflection yokes for difficult character display and high Resolution problems are another achievement in advanced design and engineering at Celco.

Celco Deflection Yokes permit the rapid presentation of random character and alpha numeric displays. Low hystersis, high accuracy and fast recovery time with emphasis on the degradation of current near zero make possible magnetic deflection in character displays.

Celco High Sensitivity Yokes minimize the deflecting currents required from the deflection drivers, resulting in high efficiency for your system.

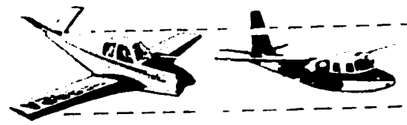
For best utilization of the New High Resolution CRT's CELCO YOKES assure minimum defocusing at large deflection.

The construction of our yokes makes it possible to obtain **sensitivities, linearities, responses and distortion-free deflection fields** not possible with the usual types of yoke.

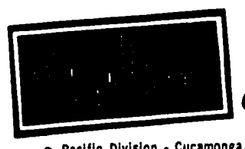
For critical applications, many of our customers have saved years of trial and error in YOKE selection by specifying CELCO YOKES.

Write for CELCO DEFLECTION YOKE Catalogue & Design Sheets or for assistance Call your nearest CELCO Plant listed below

For details, circle #88 on Reader Service Card



Your plant is only hours away by the Celco Air Fleet



Constantine Engineering Laboratories Company

Main Plant: MAHWAH, N. J. DAvis 7-1123

● Pacific Division - Cucamonga, Calif. - YUkon 2-2688 ● Central Division, Susquehanna, Pa. - ULysses 3-3500 ● Southern Division, Miami, Fla. - Wilson 5-2164

Celco FOR STANDARD, COMMERCIAL & MILITARY APPLICATIONS

For details, circle #89 on Reader Service Card

Single units or production quantities immediately available in wide range of inductance-resistance-Recovery time-pin cushion corrected or optimum focus as required. Also available 2-1/8" and 2-1/2" neck CRT yokes.

TYPE BY

Transistorized encapsulated yoke for 70 7/8" neck and 1" neck image storage tubes.

TYPE AY

Push-pull or single ended yokes for 52°, 70° and 90° deflections for 1 7/16" neck CRT.

TYPE RY

Rotating deflection yokes for PPI displays. Gears, bearings, slip rings and contact assembly included.

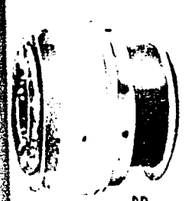
TYPE CF

Electromagnetic focusing coil for 7/8", 1" and 1 7/16" neck CRT

TYPE MY

Miniature light weight deflection yoke coils or assemblies for incorporation into customer housings.

Celco ENGINEERED YOKES FOR PRECISION DISPLAYS



DP

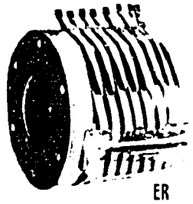
Dual ... yoke custom ... deflection system ... off-center-ing co...

HS

Special high sensitivity deflection yoke with critical damping provisions.

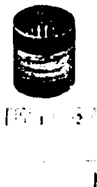
PI

Plug-in type encapsulated deflection yoke for rapid insertion.



ER

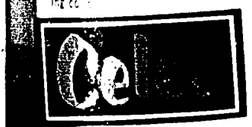
Encapsulated rotating, 4 axis slip ring precision deflection yoke.



MS

Miniature deflection yoke for rotating or fixed coil radar system.

For engineering information on your special display problems call your nearest Celco Plant.



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THE SHRINKING MAN'S FILTER

Although worlds apart in purpose, practitioners of the art of head shrinking and Burnell & Co. miniaturization engineers are both expert in reducing to size. For example, Burnell's new microminiature *MICROID* filters are particularly valuable in transistorized circuitry and only a step away from micromodule use. Range of the new Type *MIT* band pass filter is 7.35 kc to 100 kc, band width 15% at 3 db and +60% —40% at 40 db. Size is 1/2"x19/32"x15/16", weight .3 oz. Types *MLP* and *MHP* cover 5 kc to 100 kc with a standard impedance of 10K ohms. These are microminiature counterparts of the popular Burnell TCL and TCH low pass and band pass filters. The band pass filter results when cascading a TCL with TCH filter. Size is 3/4" x 1/2" x 1".

Type *MIF* microminiature interstage filters are designed for a wide variety of applications. Input impedance is 10K ohms, output to grid with a voltage gain of approximately 2:1. The 3 db band width is nominally 8%. Ranging from 7.5 kc to 100 kc, these interstage filters are provided in the same case as Type *MLP*.

Fully encapsulated, the new *MICROID* filters provide less weight, more reliability and exceed MIL specifications. We'll be glad to design and manufacture to your specifications in any quantity. Write for special filter bulletin to help solve your circuit problems.

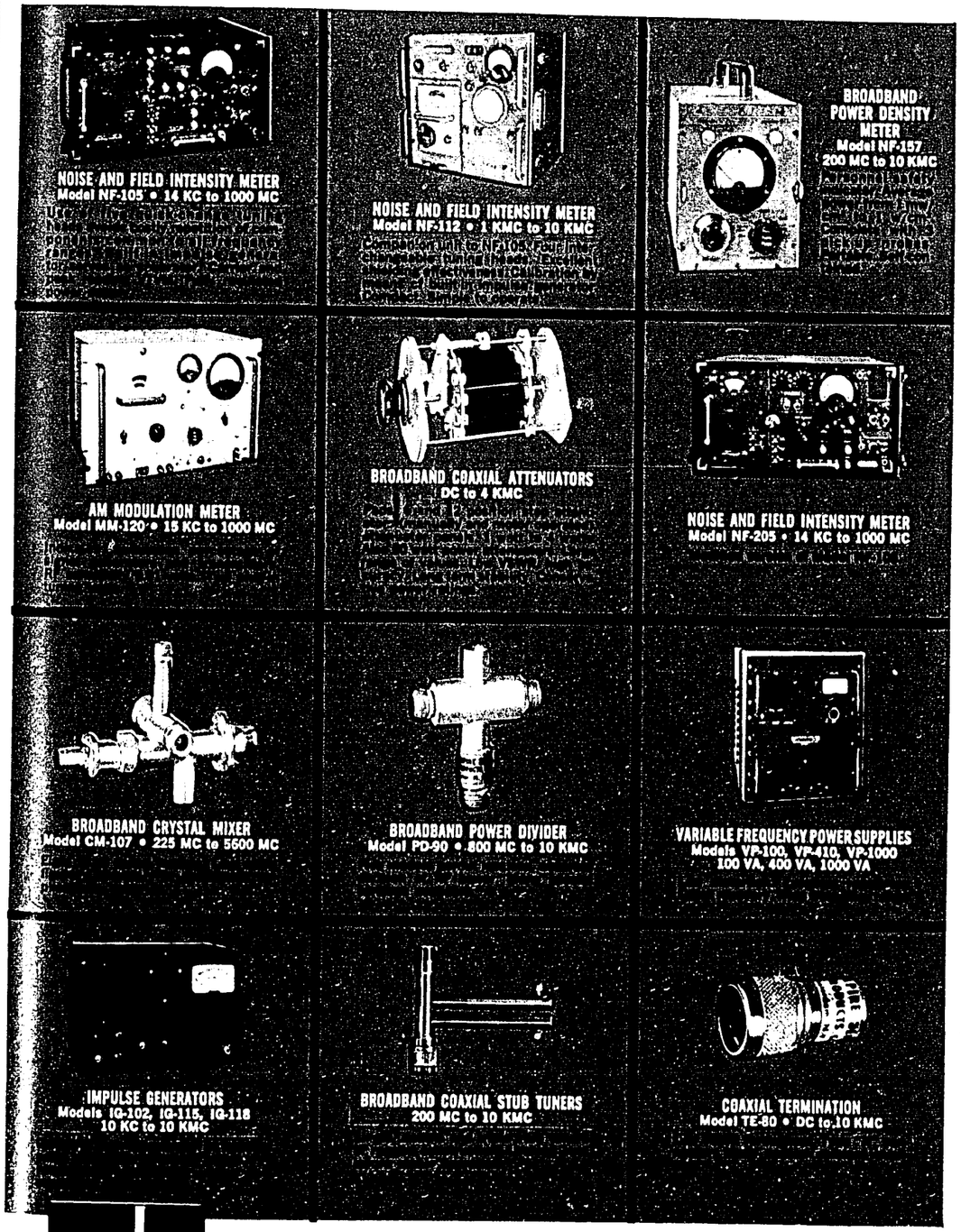
Burnell & Co., Inc.

PIONEERS IN microminiaturization OF
TOROIDS, FILTERS AND RELATED NETWORKS

EASTERN DIVISION
DEPT. P-10
10 PELHAM PARKWAY
PELHAM, N. Y.
PELHAM 8-5000
TELETYPE PELHAM 3633

PACIFIC DIVISION
DEPT. P-10
720 MISSION ST.
SOUTH PASADENA, CAL.
RYAN 1-2841
TELETYPE: PASACAL 7578

When Reliability is a must...
specify EMPIRE



edp

EMPIRE DEVICES PRODUCTS CORP.

AMSTERDAM, NEW YORK — VICTOR 2-8400

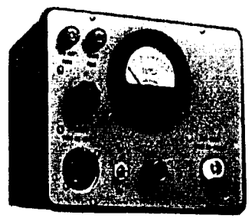
MANUFACTURERS OF:

FIELD INTENSITY METERS • DISTORTION ANALYZERS • IMPULSE GENERATORS • COAXIAL ATTENUATORS • CRYSTAL MIXERS

Average Reading R.F. POWER METERS

These broad band R.F. Power Meters are of the absorption-type consisting of an oil filled, air cooled, coaxial load resistor and a voltmeter calibrated to read watts. The power meter is suitable for use as a field or laboratory test instrument, is completely shielded and non-radiating, permitting transmitter testing and adjustment without interference. The meter box is easily detachable, permitting location of the load resistor at a remote point. In cases where power measurements are not required the load resistor may be used as a dummy load. No correction curve is necessary to cover the frequency range. The spurious response usually associated with directional couplers and capacitative voltage dividers is absent in this purely resistive voltage divider. Since this is a resistive voltage divider which has the same voltage division at DC, 60 cycle AC, and at high radio frequencies, this instrument can be calibrated and its calibration can be checked frequently on 60 cycle supply voltages.

Model	Power Ranges In Watts	Max. Power Dissipation	Price
PM-3	60, 150	150 watts	$220.00
PM-5	1.5, 6	10 watts	95.00
PM-7	150, 600	600 watts	285.00
PM-8	1.5, 6, 15, 60	100 watts	225.00
PM-9	2.5, 10	10 watts	105.00
PM-10	15, 60	90 watts	145.00
PM-16	150, 600, 1500	1500 watts	375.00
PM-18	1.5, 6, 15, 60, 150, 600	600 watts	485.00
PM-19	1.5, 6, 15, 60, 120	100 watts	250.00



PEAK READING
R.F. POWER METERS

The peak reading power meters listed are designed to accurately measure the peak power of pulsed R.F. signals in the range of .2 to 700 MC with PRF of 800 to 10,000 pps and pulse duration of .5 microseconds or more, and less than specified maximum average power dissipation.

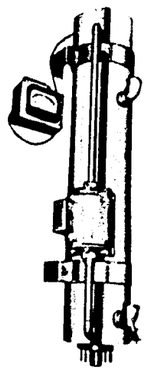
Model	Peak Range	VSWR	Max. Average Power Dissipation	Connector	Impedance	Supply Voltage	Accuracy	Freq. Range	Price
PM-12	0-50kw	1.15	60 watts	Type HN	51.5	115V,60-1600cps	±10%	.2-700Mc	$350.00
TS-305	0-50kw	1.15	50 watts	Type HN	51.5	115V,60-1600cps	±10%	220-330Mc	$350.00
PM-13	0-100kw	1.15	100 watts	Type HN	51.5	115V,60-1600cps	±10%	.2-700Mc	$125.00

NEW! HI-POWER COAXIAL

CALORIMETRIC POWER METER

DIRECT READING—5 to 50 KW

DC—1000 MC • VSWR less than 1.3



These power meters are greatly simplified Calorimeters which use water to carry the heat away, for economy of space and cost.

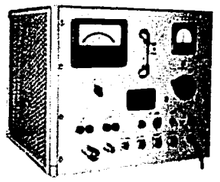
The instrument is fully self-contained, portable, water cooled and requires only connection to the power line and water supply. It does not use any flow meters, thermometers or any other controls. There is only the "ON" and "OFF" switch for the operator to use on the front panel, when a measurement is to be made. A sensitive thermopile and microammeter measure the power dissipated in the R.F. load. The microammeter is calibrated in watts, is direct reading and can be remotely located.

The radio frequency load has a low VSWR between DC to 1000 MC. This feature makes it possible to calibrate this instrument at 60 cps against an accurate laboratory type wattmeter, and then use it at any frequency up to 1000 MC. Thus an accuracy of 2% can be easily accomplished. This recalibration is necessary only when measurements are made at extreme temperatures or when wear is suspected.

This calorimeter is particularly recommended for field service where a rugged and yet accurate Power Meter is required for use by unskilled personnel.

Model	Power Rating	Connector	Max. VSWR	Water Supply	Price
CX-5	5 KW	1-5/8"	1.3	1.5 G.P.M.	$1050.00
CX-10	10 KW	3-1/8"	1.3	3 G.P.M.	1450.00
CX-20	23 KW	3-1/8"	1.3	6 G.P.M.	2250.00
CX-50	50 KW	6-1/8"	1.3	15 G.P.M.	4500.00

DIRECT READING
CALORIMETER BRIDGE

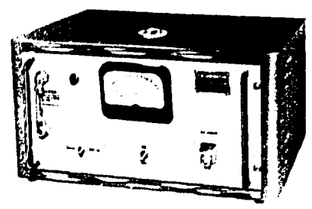


with Self-Contained Calorimeter Loads, Cooling System & Circulating System.

This Calorimeter is completely self-contained with its own circulating system, cooling system and the radio frequency dummy load and requires only connection to the regular power line. The R.F. power is read directly on a 4½" meter in watts. A single coaxial dummy load is available to cover the frequency range from DC to 10,000 Mc and for the power range from 1 to 1000 watts. The overall accuracy of this Calorimeter is 3%. However, this accuracy can be improved greatly by calibrating the Calorimeter by means of an external laboratory-type wattmeter.

Model	Range	Frequency	Price
CB-11	1 watt	DC-4 KMC	$900.00
CB-12	5 watts	"	900.00
CB-13	25 watts	"	1250.00
CB-14	150 watts	"	1250.00
CB-15	300 watts	"	1250.00
CB-16	750 watts	"	1450.00
CBW-1	1 watt	7-12 KMC	1450.00
CBW-2	5 watts	"	1450.00
CBW-3	25 watts	"	1250.00
CBW-4	150 watts	2.4-12 KMC	1100.00
CBW-5	750 watts	1-12 KMC	1500.00
CBW-6	3000 watts	"	2400.00
CBW-7	6000 watts	"	3000.00

DIRECT READING
Calorimetric Power Meter



These power meters are greatly simplified Calorimeters, which use an accurate metering pump of the gear type driven by an over-powered synchronous motor to keep the fluid flow constant. The instrument is fully self-contained, portable, self-cooled and requires only connection to the power line. It does not use any flow meters, thermometers or any other controls. There is only the "ON" & "OFF" switch for the operator to use on the front panel, when a measurement is to be made. A sensitive thermopile and microammeter measures the power dissipated in the R.F. load. The microammeter is calibrated in watts and is direct reading. These Calorimeters are available with either a coaxial or a waveguide load.

COAXIAL CALORIMETERS

Type	Full Scale Power	Freq. Range KMC	Price
CPM-20	20	DC-10	$880.00
CPM-50	50	DC-10	880.00
CPM-100	100	DC-10	880.00
CPM-500	500	DC-10	880.00
CPM-5000	5000	DC-1	1400.00
CPM-10000	10000	DC-1	2000.00
CPM-20000	20000	DC-1	3250.00

WAVEGUIDE CALORIMETERS

Type	Full Scale Power	Price
CPW-20	20	$850.00
CPW-50	50	850.00
CPW-100	100	850.00
CPW-500	500	850.00
CPW-5000	5000	1200.00
CPW-10000	10000	1750.00
CPW-20000	20000	2950.00

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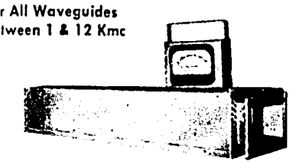
HI-POWER DIRECT READING
CALORIMETER

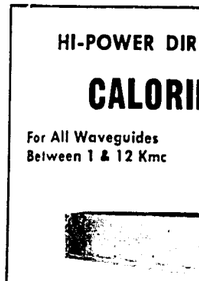
For All Waveguides Between 1 & 12 Kmc



This Calorimetric Power Meter consists of a Waveguide Thermopile Mount, a Microammeter and a blower to remove heat. The instrument is compact and is not much bigger than a Waveguide Waterload. It is extremely simple to operate. There are no controls, thermometers, flowmeters, heat exchanger or liquids. Reading time is approximately 1 minute and 1 minute between readings of different power levels. Accuracy is better than plus or minus 5%. The effect of ambient temperature changes between 60°F to 80°F is negligible.

Model	Frequency Range KMC	Average Power Rating	Price
DCXS	8.2-12.4	10 watts	$550.00
DCXS (B)	8.2-12.4	300 watts	750.00
DCXL	7-10	10 watts	550.00
DCXL (B)	7-10	500 watts	750.00
DCM	5.85-8.20	50 watts	750.00
DCM (B)	5.85-8.20	500 watts	850.00
DCN	3.95-5.85	100 watts	850.00
DCN (B)	3.95-5.85	600 watts	950.00
DCS	2.4-3.7	100 watts	850.00
DCS (B)	2.4-3.7	1000 watts	950.00
DCH	1.7-2.6	100 watts	900.00
DCH (B)	1.7-2.6	2000 watts	1050.00
DCL	1.12-1.70	100 watts	900.00
DCL (B)	1.12-1.70	2000 watts	1050.00

SEMICONDUCTOR LIFETIME MEASURING EQUIPMENT



Here is a reliable instrument for measuring lifetimes as short as one microsecond It is so designed as to accommodate large or small samples including cylindrical ingots. The light source consists of a non-inductive capacitor charged through a resistor by the variable high voltage supply to the firing voltage of the air gap between two electrodes. The resulting light flash is focused by a lens onto the sample holder. The lens is adjustable so that the light image can be brought to focus at any point. The sample holder will accommodate ingots from ¾ to 10-inches in length. Its adjustable fingers make pressure contact with the ends of the specimen. A trap lite and stray light shield is mounted on the bed of the sample holder. The adjustable bed has a full traveling range of 12-inches.

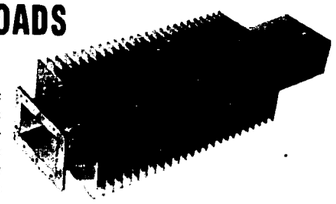
Semiconductor Lifetime Measuring Equipment, Model LM-1 .....$1250.00

Light Source with Variable Power Supply 15,000V .04 Mfd. 15,000V, Model LS-2 .....$1250.00

Light Source with Variable Power Supply 10,000V, Cabinet & Stand, .02 Mfd., Model LS-1 .....$850.00

HI-POWER DUMMY LOADS

A. WAVEGUIDE:



These Waveguide Dummy Loads are of the lossy wall type. They are designed to change microwave energy into heat which is removed by means of cooling fins into the adjoining air. A full line of such dummy loads is listed below. Lossy wall loads are superior to inguide loads because of the more efficient removal of the heat generated, and the highly reduced tendency toward pulse power breakdown. New construction shortens the path between the inner surface of the lossy guide and the cooling fins. The lossy material used in these loads absorbs only a minimum of moisture, is extremely durable, provides a strong adhesive bond to the metal walls and handles the thermal shock efficiently.

Type	Frequency Range KMC	Nominal Average Power Dissipation	Peak Power Rating	Flange	*	Price
TERMINATIONS FOR ½-in. x 1-in. WAVEGUIDE						
LPTX 1	8.2-12.4	1		UG39/U		$25.00
HPTXS75	" "	75		UG135/U	P	55.00
HPTXS250	" "	250	.29	UG135/U	P	100.00
DA22/U	" "	175	.29	UG39/U		85.00
TERMINATIONS FOR 1¼-in. x ⅝-in. WAVEGUIDE						
HPTXL100	7-10	100	.46	UG138/U	P	75.00
HPTXL250	" "	250	.46	UG138/U		100.00
DA21/U	" "	280	.46	UG51/U		105.00
HPTXL500	" "	500	.46	UG51/U	P	135.00
TERMINATIONS FOR 1½-in. x ¾-in. WAVEGUIDE						
HPTX600	5.85-8.20	600	.71	UG344/U	P	210.00
TERMINATIONS FOR 1-in. x 2-in. WAVEGUIDE						
HPTX800	3.95-5.85	800	2.0	UG149A/U		220.00
TERMINATIONS FOR 1½-in. x 3-in. WAVEGUIDE						
DA18/U	2.4-3.7	700	1.5	UG53/U		175.00
TS338	" "	700	1.5	UG438/U		175.00
HPTS2500	2.60-3.95	2500	3.2	UG53/U	P	225.00
TERMINATIONS FOR 3.41-in. x 6.66-in. WAVEGUIDE						
HPTL1000	1.12-1.70	1000	7.0	UG417/U		370.00
HPTL2500	" "	2500	10.0	UG417/U		435.00
HPTL4000	" "	4500	17.0	UG417/U		485.00

* P Indicates Pressurization

B. COAXIAL:

These R.F. Terminations are oil filled resistors, in which the oil is used as a dielectric and to carry the heat generated to cooling fins. At the rated power the heat dissipating housing is designed to keep the temperature of the oil below 250°F. No additional forced cooling is necessary up to 1500 watts. Above 1500 watts, additional cooling, such as water or forced air is necessary. These loads are housed in an expandable all metal housing. Neoprene diaphragms are not used.

Type	Frequency Range KMC	Watts Average Power	VSWR Maximum	Price
OIL FILLED, AIR COOLED (CONVECTION)				
CPTN 50	DC—.9	50	1.1	$ 40.00
CPTN 100	DC—.9	100	1.1	50.00
CPTN 500	DC—.9	500	1.1	185.00
CPTNS 500	DC—1	500	1.25	245.00
CPTNS 100	DC—1	100	1.2	65.00
CPTN 1500	DC—.6	1500	1.15	300.00
OIL FILLED, WATER COOLED				
CPTU6K	DC—.6	6000	1.15	665.00
CPTL10K	DC—.6	10000	1.2	950.00
CPTP10K				
CPTP20	DC—.6	20000	1.25	900.00
AIR COOLED (CONVECTION or BLOWER) LOW FREQUENCY DUMMY LOAD				
DA-64	DC—5Mc	1200		450.00
14ACN	DC—5Mc	3000		450.00

NEW LOW POWER R.F. CALORIMETER

From 5 milliwatts full scale (50 microwatts per mm) to 10 watts full scale. DC to 26 KMC in 4 plug in units. These Thermopile Mounts are Thermally insulated Dummy Loads with an intimately installed Thermopile which results in higher sensitivity, fast response (30 seconds or less), simplicity of construction and higher reliability. Does not use flowmeters, thermometers, vacuum tubes or transistors.

Model	Frequency Range	Max. VSWR	Power Ranges	Reading Time	Power Indicator	Price of Complete Calorimeter
CX-5	DC-10 KMC	1.5	5, 25, 100 & 1000 mw		Galvanometer	
CX-10	DC-10 KMC	1.5	10, 100, 1000 mw		Galvanometer	
CX-10K	DC-10 KMC	1.5	10 watts	40 sec.	Microameter	$550.00
CWX-10	7-12 KMC	1.2	10, 100, 1000 mw	30 sec.	Galvanometer	
CWX-10K	7-12 KMC	1.2	2, 10 watts	30 sec.	Microameter	$550.00
CWKU-10	12-18 KMC	1.3	10, 100, 1000 mw	30 sec.	Galvanometer	
CWKU-10K	12-18 KMC	1.3	2, 10 watts	30 sec.	Microameter	$550.00
CWK-10	18-26 KMC	1.3	10, 100, 1000 mw	30 sec.	Galvanometer	
CWK-10K	18-26 KMC	1.3	2, 10 watts	30 sec.	Microameter	$550.00

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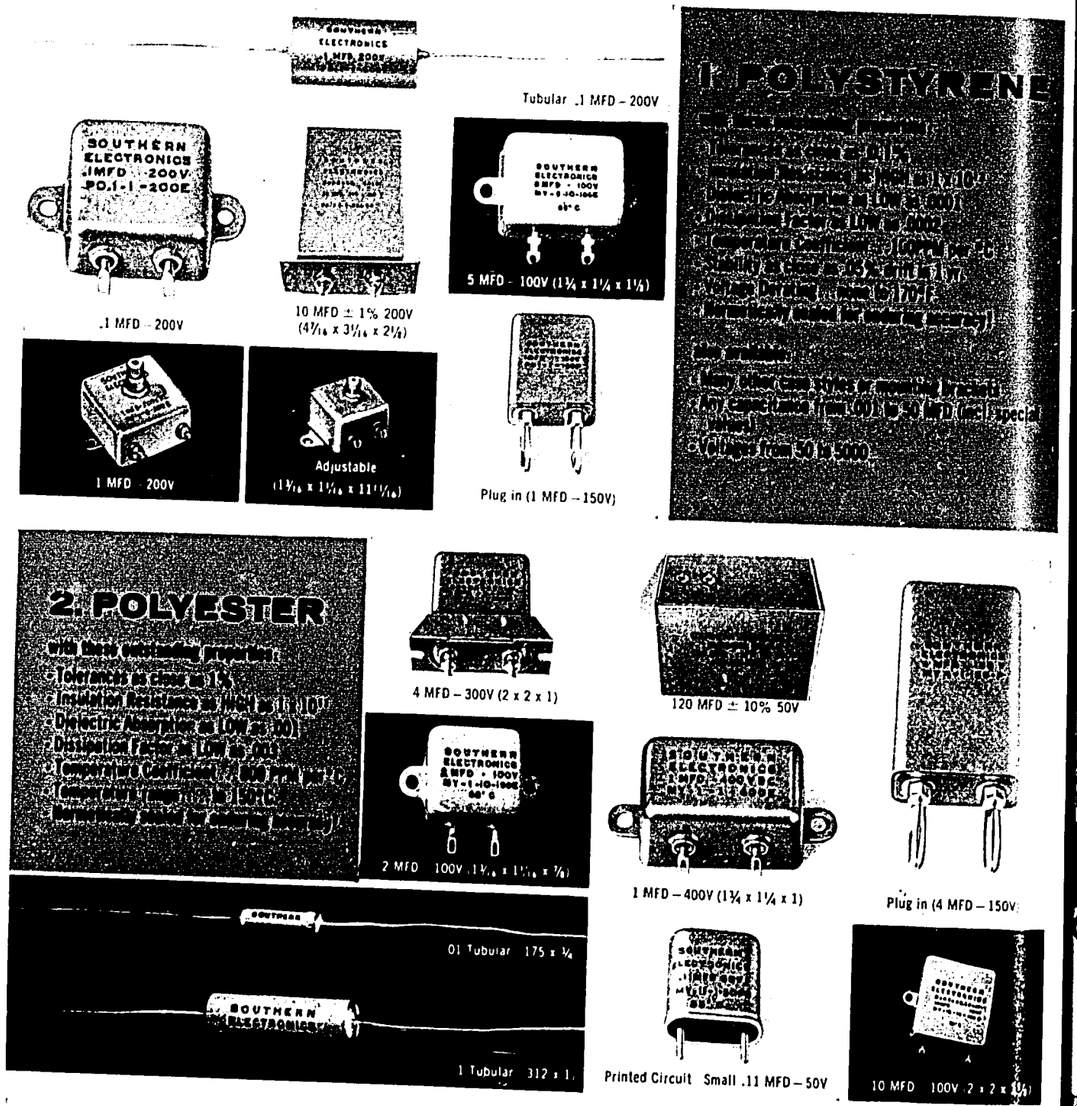

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— operates with extreme linearity and low hysteresis

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Special magnetic design, coupled with the low temperature coefficient of InAs, provide extreme linearity for either input quantity.

The magnetic circuit is optimized for DC and audio frequencies, while the Halltron input can be used from DC into the megacycle range. The MC-1 is 1⅝" wide (square base) and 2 5/16" high. Mumetal shielding minimizes interference.

Other MC units are available for higher outputs, greater efficiency or optimized parameters for specific applications.

MS-40 Series MAGNETORESISTOR

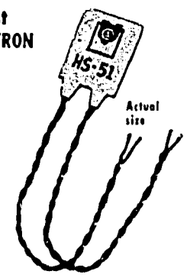
The FIRST magnetic field sensitive RESISTOR

Utilizes high-electron mobility indium antimonide.

A new SEMICONDUCTOR DEVICE in which the electrical resistance is a function of an applied MAGNETIC FIELD. Utilizes non-inductive design and "thinner-than-a-dime" construction. For use as: contactless potentiometers, amplifiers, E & I regulators, squaring devices, modulators, transducers, etc.

HS-50 Series *Halltron*

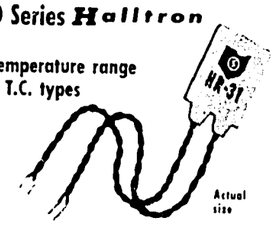
The FIRST and most widely used HALLTRON



Utilizes high efficiency indium antimonide for applications which require high levels of output power, high sensitivity and economical Hall-effect components and which do not need extreme linearities or elevated temperature operation.

HR-30 Series *Halltron*

Wide temperature range —low T.C. types



The HR-30 Series Halltron utilizes indium arsenide for low T.C. characteristics. For applications which require moderate output power levels, high sensitivities, good linearities with both current and magnetic field, wide temperature operating ranges and low T.C. of Hall-output voltages.

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GaSb	PbTe	Ag_2Te	(In,Ga)Sb	Te	

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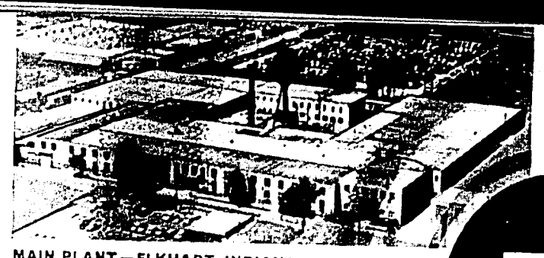

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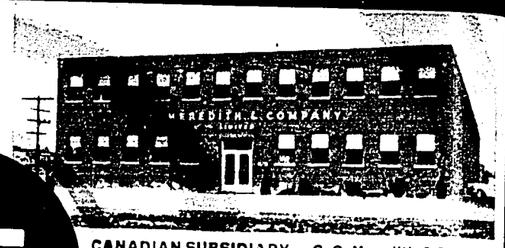

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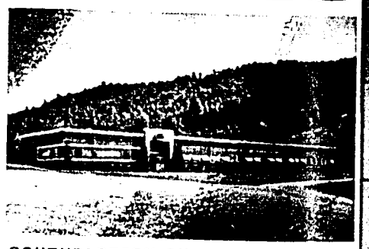

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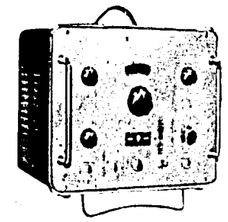
[illegible] STRATHMORE ROAD
[illegible] NEEDHAM 46, MASSACHUSETTS
PHONE: BEACON 2-7996

771-772

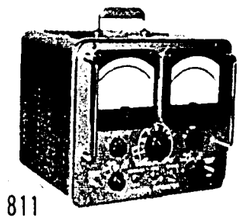
- Model L771B 950 to 2000 MC SEC
- Model S771B 1950 to 4000 MC SEC
- Model C772A 3950 to 8200 MC SEC
- Model X772A 7050 to 11,000 MC SEC
- Power Output 10-100 MW CW MAX into matched load. Variable through level set attenuator
- Modulation pulse, square wave both internal and external



811

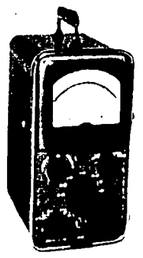
RATIO METER AND STANDING WAVE AMPLIFIER IN ONE COMPACT PACKAGE

- Two cycle Precision Laboratory VSWR reflectometer readings of 1.02 to [illegible] on only two scales
- VSWR DB and reflection coefficient scales eliminate conversion tables
- Full 70 DB standing wave amplification on expanded VSWR scales
- Crystal and bolometer operation



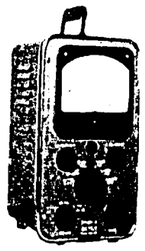
812

- A 3-inch removable meter with 1% linearity provides high resolution and accuracy
- A filter tunable between 950 and 1050 CPS aligns instrument with output frequency of signal source
- Range 70 DB in six decade steps. Normal and expanded scales for VSWR and DB
- Gain automatically maintained when switching from normal to expanded scales
- Detectors crystal or bolometer
- Full scale sensitivity 0.1 [illegible] V signal-to-noise ratio 3:1



831

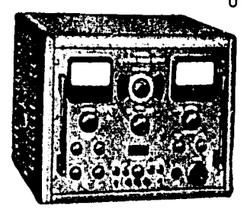
- Power Range Full Scale
  - 20 DBM or 0.010 MW
  - 15 DBM or 0.030 MW
  - 10 DBM or 0.10 MW
  - 5 DBM or 0.30 MW
  - 0 DBM or 1.00 MW
  - 5 DBM or 3.00 MW
- Maximum possible accumulative error 5%
- FXR Series 218 Temperature Compensated Thermistor Head a required accessory



For details, circle #97 on Reader Service Card

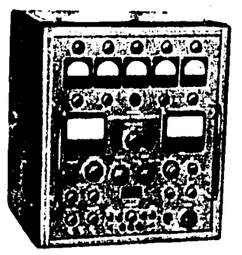
815

- Beam 200 to 2000 V at 0 to 125 MA 1800 to 3600 V 250 W to 3600 V
- Control Grid Pos 0 to 150 V Neg 0 to 300 V
- Reflector 0 to 1000 V
- Regulation 0.03%
- Ripple 3 MV RMS MAX
- Internal Modulation pulse sawtooth square wave



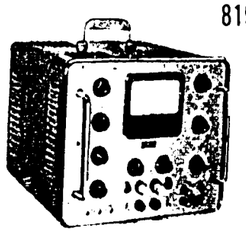
- Helix Beam 0 to 1800 V at 0 to 100 MA 1700 to 2500 V at 0 to 100 MA 2500 to 3500 V at 250 W MAX
- Grid 1 0-300 V DC at 0 to 5 MA
- Grid 2 reflector 0-1200 V DC at 0 to 1 MA
- Grid 3 focusing electrode 0 to 750 V DC at 0.1 MA
- Grid 4 focusing electrode [illegible] to 500 V DC at 0.1 MA
- Collector 0-300 V DC at 0-100 MA
- Anode 0-600 V DC at 0-60 MA
- Filament 0-15 V DC 0-3 AMP at 20 W MAX

817



- Beam 300-1000 V at 85 MA Grid 300 to 150 V at 0 to 5 MA Built-in limiting resistor
- Reflector 0-900 V at 10-20 A
- Regulation 1%
- Internal Modulation pulse sawtooth square wave

819



FXR, Inc.

formerly F.R MACHINE WORKS, Inc.

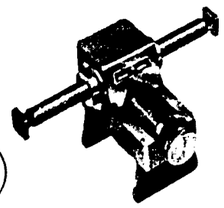
26-12 BOROUGH PLACE, WOODSIDE 77, N. Y.

FXR

DESIGNED FOR OPERATION
OVER THE FULL WAVEGUIDE BANDWIDTH,
FROM 350 TO 530 MC.

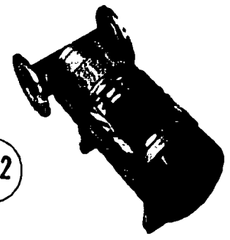
WR 975 components also available. Frequency range 750 to 1120 MC.

WAVEGUIDE TEST EQUIPMENT



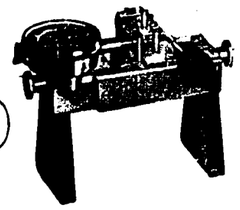
164

DIRECT READING PRECISION VARIABLE ATTENUATORS



402

PRECISION DIRECT READING FREQUENCY METERS



03

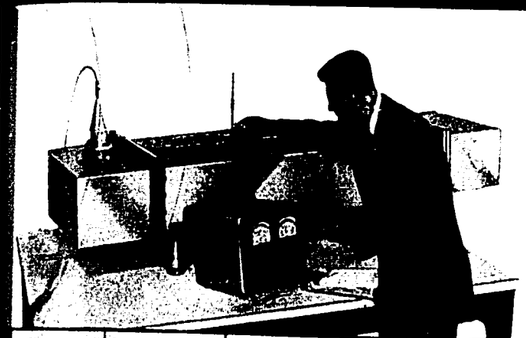
PRECISION SLOTTED SECTIONS

FXR SERIES PREFIX / WAVEGUIDE SIZE IN INCHES	J 21.00x 10.50 ID	L 6½x3¼	R 4.460x2.310	S 3x1½	H 2x1	C 1½x¾
FREQUENCY RANGE IN KMC/SEC	0.35-0.53	1.12-1.70	1.70-2.60	2.60-3.95	3.95-5.85	5.85-8.20
SLOTTED SECTIONS	J104A †	L101A $950	R101A $1340	S101A $445	H101A $385	C101A $325
ATTENUATORS Flap		L150B $170	R150B $225	S151A $100	H151A $ 95	C151A $ 90
Semiprecision				S155A $120	H155A $105	C155A $ 95
Precision Calibrated		L160B $575	R160B $500	S161A $375	H161A $320	C161A $300
Precision Direct Reading				S164A $595	H164A $500	C164A $350
Fixed		L168A-E $215		S168A-E $ 73	H168A-E $ 63	C168A-E $ 55
CRYSTAL DETECTOR MOUNTS Tunable						
Fixed-tuned						
MATCHED BOLOMETER MOUNTS				S207A $145	H207A $140	C207A $135
THERMISTOR MOUNTS		L216A $225	R216A $250	S216A $120	H216A $ 94	C216A $ 88
THERMISTOR HEADS		L218A $350	R218A $350	S218A $225	H218A $180	C218A $170
TUNERS Slide screw		L310A $250	R310A $325	S311A $150	H311A $140	C311A $135
E/H				S312A $225	H312A $175	C312A $150
PRECISION PHASE SHIFTERS						
DIRECT READING FREQUENCY METERS Precision						C402A $1275
Reaction					H410A $250	C410A $180
Reaction, micrometer						
Transmission						
TERMINATIONS Fixed	J501A †	L501A $210	R501A $180	S501B $ 44	H501B $ 34	C501B $ 30
Sliding		L502A $350		S502A $ 95	H502A $ 70	C502A $ 65
STANDARD MISMATCHES				S510A $500	H510A $420	C510A $390
				S510B $350	H510B $310	C510B $295
				S510C $290	H510C $250	C510C $235
				S510D $250	H510D $210	C510D $195
				S510E $350	H510E $310	C510E $295
WAVEGUIDE-TO-COAX ADAPTERS	J600B †	L600B $170	R601B $225	S601B $ 50	H601B $ 40	C601B $ 35
DIRECTIONAL COUPLERS Crossguide		L612E $300	R612E $250	S612D $130	H612D $120	C612D $ 65
Multihole				S610A-D $350	H610A-D $200	C610A-D $135
WAVEGUIDE TEES Series		L620A $175	R620A $175	S620A $ 90	H620A $ 80	C620A $ 60
Shunt		L621A $175	R621A $175	S621A $ 90	H621A $ 80	C621A $ 60
Hybrid		L622A $220	R622A $220	S622A $110	H622A $ 95	C622A $ 75
WAVEGUIDE BENDS 90° E-plane	J623B †	L623B $125	R623B $150	S623B $ 90	H623B $ 65	C623B $ 45
90° H-plane	J624B †	L624B $125		S624B $ 90	H624B $ 65	C624B $ 45
PRECISION SLIDING SHORTS		L630A $275		S630A $175	H630A $165	C630A $155
STANDARD GAIN HORNS		LG38A $350	R638A $500	S638A $175	H638A $150	C638A $125
SHIELDED TUBE MOUNTS					H760A $150	
HARMONIC GENERATORS						
WAVEGUIDE STANDS		Z911A $ 15		Z910A $ 7	Z910A $ 7	Z910A $ 7

For details, circle #98 on Reader Service Card

EXCLUSIVE — FXR MICROWAVE TRAINING KIT
provides the foundational knowledge and practical experience necessary to train a student or technician for work in the microwave field.

845



2MM and 3MM COMPONENTS

The same FXR high standards are inherent in all 2MM and 3MM components, now available.

W 1¼x⅝	X 1x½	Y 0.622x 0.311 ID	*K 0.420x 0.170 ID	*U 0.280x 0.140 ID	Q 0.224x 0.112 ID	M 0.148x 0.074 ID	E 0.122x 0.061 ID	F 0.080 x 0.041 ID	G 0.051 x 0.025
7.05-10.00	8.20-12.40	12.40-18.00	18.00-26.50	26.50-40.00	33.00-50.00	50.00-75.00	60.00-90.00	90.00 - 140.00	140.00 - 220.0
W101A $300	X101A $245	Y102A $545	K102A $545	U102A $545	Q103A $1100	M103A $995	E103A $1650	F105A $1400	G105A $140
W151A $ 80	X151A $ 60	Y151A $ 75	K151A $ 59	U151A $ 69	Q151A $110	M151A $100	E151A $190		
W155A $ 85	X155A $ 75	Y155A $ 90	K155A $135	U155A $170					
W161A $270	X161A $210	Y161A $270	K162A $320	U162A $340	Q162A $525	M162A $500	E152A $975	F163A $975	G163A $97
W164A $350	X164A $250	Y164A $275	K164A $425	U164A $450	Q164A $825	M164A $800	E164A $1200		
W168A-E $ 55 (Models A-30B, B-60B, C-100B, D-200B, E-300B)	X168A-E $ 50	Y168A-E $55							
		Y205B $175	K205B $175	U206B $200 U205B $200	Q206B $210	M206B $210	E206B $350		
	X211A $ 54	Y212A $ 80	K212A $ 80	U212A $ 80		M208A $325	E208A $400	F208A $400	G208A $40
W207A $120	X207A $ 80								
W216A $ 79	X216A $ 74	Y216A $110	K216A $150	U2.6S $270					
W218A $150	X218A $145	Y218A $210	K218A $250	U218S $400					
W311A $130	X311A $125	Y311A $130							
W312A $135	X312A $130	Y312B $135	K312B $155	U312B $170	Q312B $195	M311A $195 M312B $205	E312B $350	F313A $775	G313A $77
								F314A $950	G314A $95
	X402A $1275								
W410A $165	X410A $150	Y410A $210	K410A $230	U410A $250					
					Q410X $325	M410X $300	E410X $500	F412A $750	G412A $75 G413A $80
	X411A $175								
W501B $ 25	X501B $ 24	Y501A $ 24	K501A $ 30	U501A $ 35	Q501A $ 95	M501A $90	E501A $150	F501A $150	G501A $15
W502A $ 55	X502A $ 45	Y502A $ 50	K502A $ 70	U502A $ 75					
W510A $370	X510A $360	Y510A $450	K510A $480	U510A $625					
W510B $285	X510B $275	Y510B $325	K510B $340	U510B $525					
W510C $229	X510C $215	Y510C $275	K510C $280	U510C $450					
W510D $185	X510D $175	Y510D $225	K510D $240	U510D $280					
W510E $285 (Models A-100, B-105, C-110, D-120, E-150 VSWH available for entire 510 Series)	X510E $275	Y510E $325	K510E $340	U510E $350					
W601B $ 30	X601B $ 25								
W612D $ 75	X612D $60		K612D †		Q612D †	M612D †	E612D †	(Models D-200B, E-250B)	
W610A-D $115 (Models A-30B, B-60B, C-100B, D-200B)	X610A-D $ 75	Y610A-D $100	K610A-D $155	U610A-D $175		M610A-D $500			
W620A $ 45	X620A $ 35	Y620A $ 40	K620A $ 45	U620A $ 55	Q620A $ 65	M620A $ 60	E620A $110	F620A $275	G620A $27
W621A $ 45	X621A $ 35	Y621A $ 40	K621A $ 45	U621A $ 55	Q621A $ 65	M621A $ 60	E621A $110	F621A $275	G621A $27
W622A $ 60	X622A $ 49	Y622A $ 54	K622A $ 65	U622A $ 80	Q622A $ 80	M622A $ 80	E622A $150	F622A $325	G622A $32
W623B $ 35	X623B $ 24	Y623B $ 32	K623B $ 38	U623B $ 42	Q623B $ 55	M623B $ 50	E623B $ 90	F623A $275	G623A $27
W624B $ 35	X624B $ 24	Y624B $ 32	K624B $ 38	U624B $ 42	Q624B $ 55	M624B $ 50	E624B $ 90	F624A $275	G624A $27
W630A $145	X630A $130	Y630B $145	K630B $155	U630B $150	Q630B $155	M630B $160	E630B $250	F631A $275	G631A $27
W638A $120	X638A $100	Y638A $125	K638A $150	U638A $175	Q638A $120	M638A $125	E638A $250	F638A $200	G638A $20
W760A $130	X760A $130	Z762B(unshielded) $145							
					Q780A $165	M780A $160	E780A $250	F781A $475	G781A $47
Z910A $ 7	Z910A $ 7	Z910B $ 7	Z910B $ 7	Z910B $ 7	Z910C $ 7	Z910C $ 7	Z910C $ 7		

The technical data and prices are subject to change without notice.

Prices indicated are domestic

For details, circle #99 on Reader Service Card

NOTE : †Price will be furnished on request.
*Specify required flanges when ordering.
BIDIRECTIONAL COUPLERS available on special order.
WAVEGUIDE FLANGES and FLANGE SCREWS available

Precision Microwave Equipment

FXR

GENERAL OFFICES:
212 BOROUGH PLACE
WOODSIDE 77, N. Y.
ONE: AStoria 8-2800

COAXIAL ATTENUATORS

INSTRUMENT	MODEL NO.	FREQ KMC/SEC	PRICE	COMMENT
SLOTTED SECTIONS	N101A N101B *V101A *V101B	1.00- 4.00 4.00-10.00 1.00- 4.00 1.00- 4.00	$470.00 $440.00 $470.00 $470.00	Type N or C adapter connector supplied for N101A, B
CUTOFF ATTENUATOR	N170A	1.00- 4.00	$200.00	
TUNABLE PROBES	B200A B202A	1.00-12.40 0.35- 1.40	$145.00 $225.00	1N23B supplied 1N21B supplied
DETECTOR MOUNTS Tunable Untuned	N200A N210A **N210B	1.00-12.40 0.10-10.00 0.10-10.00	$145.00 $ 50.00 $ 55.00	1N23B crystal supplied
THERMISTOR HEAD	N218A	0.01-10.00	$145.00	Used with Model B831A
FREQUENCY METER DIRECT READING	N410A	1.00- 4.00	$495.00	Accuracy 0.08%
DOUBLE STUB TUNER	N300A	1.00-10.00	$ 90.00	
THERMISTOR MOUNTS Broadband Temp Compensated	N215A N217A	0.50-10.50 0.50-10.50	$ 75.00 $140.00	Z215L element supplied
COAX-TO-COAX ADAPTERS	N605A, B, C, D		$ 52.00	
TEE	N626A		$ 60.00	
KLYSTRON OSCILLATOR CAVITY	N750A		$280.00	
KLYSTRON TUBE MOUNT	N761A		$ 95.00	Z761P cable not supplied
KLYSTRON TUBE MOUNT	Z762B		$145.00	Z762P cable supplied

*Mating coax dim. ⅞" all others ⅜" **Model N210B has built in DC return.

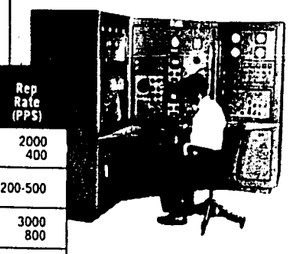
HIGH POWER PULSE MODULATORS

THE FXR standard or custom designed high-power pulse modulators will meet your most exacting requirements . . . advanced engineering and expert craftsmanship assure this.

IMPORTANT — Send for our PRELIMINARY QUESTIONNAIRE.

*High Power Modulator Model No.	Power (peak mega-watts)	Voltage (peak kilovolts)	Current (peak amps)	Duty Cycle	Pulse Width (μ sec)	Rep Rate (PPS)
Z820A	1.0	33	33	0.001	0.5 2.5	2000 400
Z821A	14.0	90	160	0.001	2.0	200-500
Z860A	0.260	20	13	0.008	0.25 1.0	3000 800
Z861A	5.5	55	100	0.0024	6	400
Z862A	13	10	1.3	0.375	1.13-1.53	1-25KC
Z863A	40	300	132	0.0017	8.5	244

*Partial listing of standard units. Custom units developed to specific requirements. Prices and deliveries of all modulators will be furnished upon request.



STANDARD and CUSTOM DESIGN

For details, circle #100 on Reader Service Card

HIGH VOLTAGE REGULATED POWER SUPPLIES

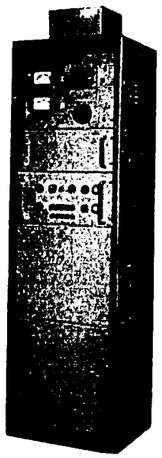
- EXCEPTIONAL REGULATION—BETTER THAN 0.1% WITH A 10% FLUCTUATION OF PRIMARY POWER.
- LOW RIPPLE.
- BUILT-IN FOCUS, FILAMENT AND MAGNET SUPPLIES.
- RF INSULATION TECHNIQUES INCORPORATED TO MINIMIZE PICK-UP AND CARONA NOISE.

FXR Model Z850A
- 0 to 12 KV
- 150 MA
- Ripple, 4 MV

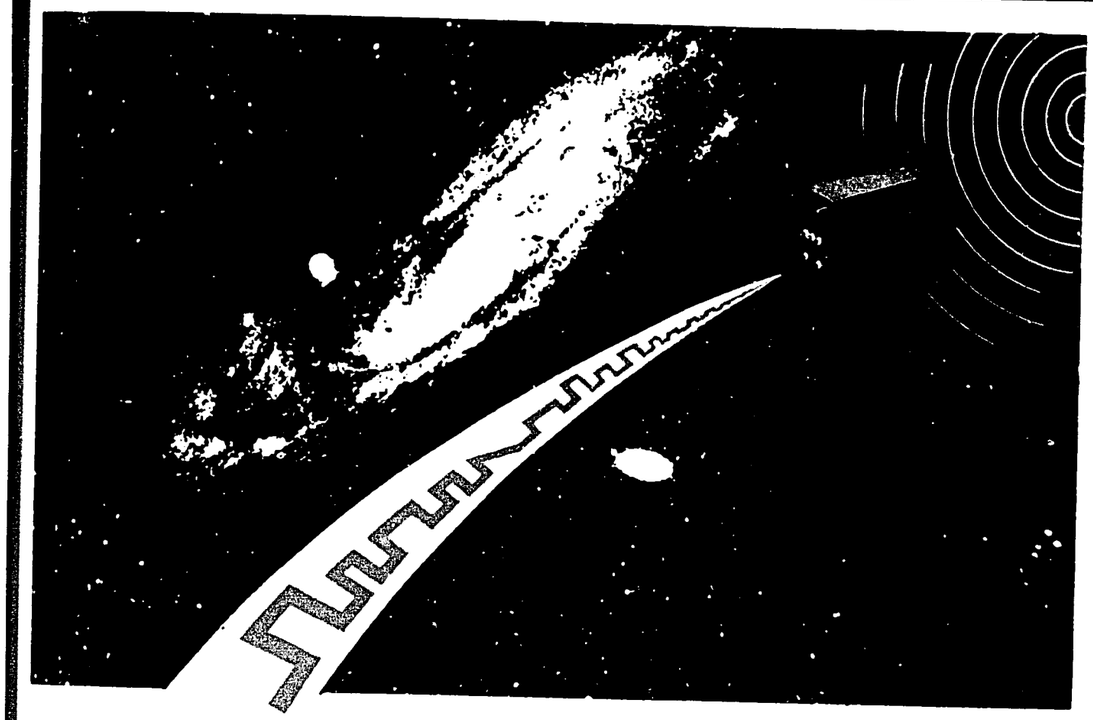
FXR Model Z851A
- 0 to 10 KV
- 250 MA
- Ripple, 5 MV

FXR Model Z852A
- 0 to 18 KV
- 1 AMP
- Ripple, 5 MV

Representatives of the commercial line of high-voltage power supplies developed and manufactured by FXR.



shown here, FXR Model 2850A



MAXIMUM TELEMETERED RESPONSE THROUGH FLAT AMPLITUDE AND CONSTANT DELAY

In keeping with its reputation as a pioneer in the field of toroids, filters and related networks, Burnell & Co. now offers a complete line of low pass and band pass constant delay filters for standard RDB telemetering channels. These Burnell constant delay filters combine accurate amplitude and phase to effectively limit intelligence distortion and false transients to a minimum. Telemetered signals from off course missiles or those in distant or terminal flight are no longer blocked by attenuation and noise.

Amplitude and Phase Necessary

For maximum performance of telemetering systems, it is recognized that filtering of sampled data requires *both* linear phase and flat amplitude in the pass band. However, until recently a combination of the two in one unit had not been available.

Combination Achieved

Existing sub carrier discriminators afford no better than a choice of flat amplitude pass band with *non-linear* phase in one filter or a constant time delay filter with *distorted amplitude*. In contrast, Burnell constant delay filters combine both—are flat within 3 db over the pass band—1½ db for the low pass filters—and possess a time delay constant within 5%.

Write for Bulletin CD 051

TECHNICAL DATA

FOR ± 7½% PASS BAND
1 Flat within 3 db over pass band
2 21 db at ± 15% of center freq.
3 40 db at ± 22% of center freq.
4 Time delay over the pass band, constant to ± 5%

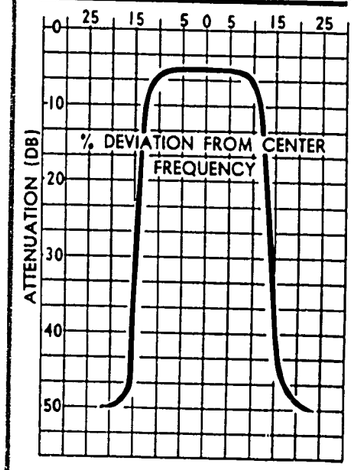
FOR ± 15% PASS BAND
1 Flat to 3 db over pass band
2 23 db at ± 30% of center freq.
3 40 db at ± 44% of center freq.
4 Time delay over pass band constant to ± 7%

Input impedance — 500 ohms
*Output impedance — 500 ohms and high impedance for operation to a grid
*optional impedance available on special order.

CONSTANT DELAY BAND PASS

Channel	Frequency	Part #	Delay in ms.	B/W
1	.4 KC	S-60051	34.00	15%
2	.56 KC	S-60052	24.30	15%
3	.73 KC	S-60053	18.60	15%
4	.96 KC	S-60054	14.20	15%
5	1.3 KC	S-60055	10.50	15%
6	1.7 KC	S-60056	8.00	15%
7	2.3 KC	S-60057	5.93	15%
8	3.0 KC	S-60058	4.40	15%
9	3.9 KC	S-60059	3.38	15%
10	5.4 KC	S-60060	2.44	15%
11	7.35 KC	S-60061	1.80	15%
12	10.5 KC	S-60062	1.26	15%
13	14.5 KC	S-60063	0.91	15%
14	22. KC	S-60064	0.60	15%
15	30. KC	S-60065	0.44	15%
16	40. KC	S-60066	0.33	15%
17	52.5 KC	S-60067	0.252	15%
18	70. KC	S-60068	0.189	15%
A	22. KC	S-60069	.305	30%
B	30. KC	S-60070	.224	30%
C	40. KC	S-60071	.168	30%
D	52.5 KC	S-60072	.128	30%
E	70. KC	S-60073	.096	30%

CASE SIZE—2" x 3½" x 4 1/16"
• INPUT IMPEDANCE = 500 ohms
• OUTPUT IMPEDANCE = 500 ohms and to grid



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Where other materials fail our work begins...

The world's most NEARLY PERFECT electronic insulation materials.....

Whatever your high temperature needs—to 1550°F—there is a Mycalex insulation to meet them . . . each offering a *unique combination* of special advantages for electronic design: the *plus* factors of the inorganics *and* the design latitudes of the organics!

MYCALEX® glass-bonded mica—formulations of high quality natural mica and electrical grade glasses, with high dielectric strength, total dimensional stability, high arc resistance, high temperature resistance. Depending on their formulation, they can be machined or molded to exacting tolerances, inserts can be permanently molded in or cemented in—the thermal expansion of MYCALEX being close to that of stainless steel.

SUPRAMICA® ceramoplastics—advanced formulations of synthetic mica and high temperature glasses, created for insulation applications at operating temperatures up to 1550°F. They have a thermal expansion coefficient close to that of stainless steel. They are available in moldable or machinable types . . . both offering *total* dimensional stability.

SUPRAMICA 555—Precision-molded insulation, for operating temperatures to 700°F.

SUPRAMICA 560—Precision-molded insulation, for operating temperatures to 932°F. (500°C.)

MYCALEX 410—Precision-molded insulation, for operating temperatures to 600°F.

MYCALEX 410X—Lightweight precision-molded insulation material.

SUPRAMICA 500—Machinable insulation, for operating temperatures to 850°F.

SUPRAMICA 620—Machinable insulation, for operating temperatures to 1550°F.

MYCALEX 385—Machinable insulation, for operating temperatures to 700°F.

MYCALEX 400—Machinable insulation, for operating temperatures to 800°F.

General Offices and Plant: 125-B Clifton Blvd., Clifton, N. J.
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WORLD'S LARGEST MANUFACTURER OF GLASS-BONDED MICA AND CERAMOPLASTIC PRODUCTS

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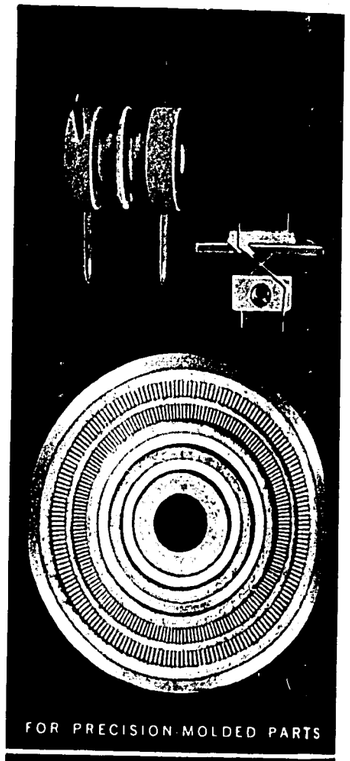
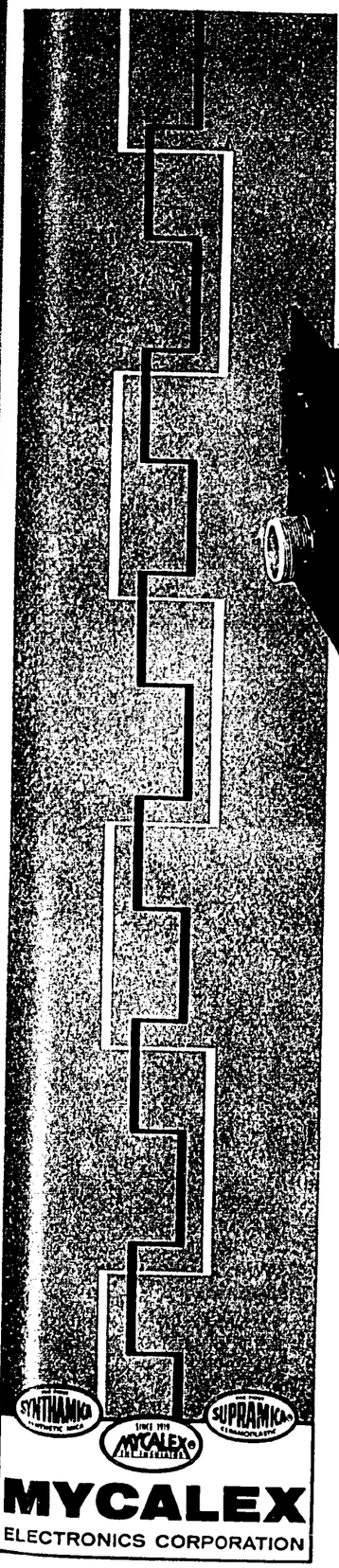


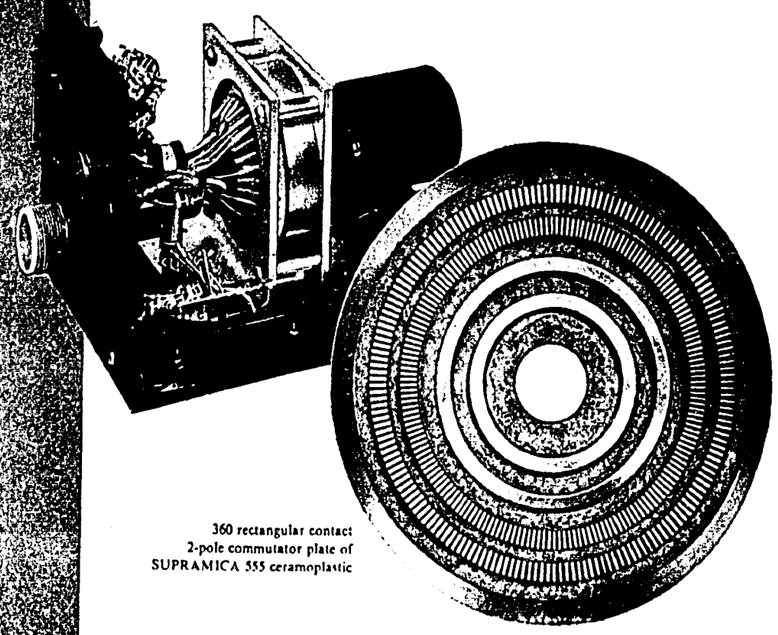
MYCALEX
CORPORATION OF AMERICA



MYCALEX
ELECTRONICS CORPORATION

major advance in miniaturization:

SUPRAMICA® 555 commutator plates



360 rectangular contact 2-pole commutator plate of SUPRAMICA 555 ceramoplastic

on a 3 inch precision-molded plate ...up to 540 rectangular contacts!

Since 1948 . . . when Mycalex Electronics Corporation pioneered the first *precision-molded* MYCALEX® 410 glass-bonded mica, 180-contact commutator plate . . . MYCALEX switches have introduced a degree of accuracy and dependability never before approached in mechanical switching.

And now, Mycalex offers a *new* ceramoplastic commutator plate design destined to set *even higher* standards for long-life, low-noise-level multiplexing.

Typical of these new plates is the CP 427. Its specifications call for *precision-molded* SUPRAMICA 555 ceramoplastic which delivers total dimensional stability as well as superb thermal endurance (700°F.). The individual contacts of this plate have an exclusive *rectangular* form and embody tolerances within the .0005" range. They are permanently fixed in place.

An exclusive brush-holder design permits *lower pressures* on the wipers . . . gives *lower contact resistance* with a noise level of *less than 10 microvolts*. Brush bounce is eliminated and life greatly extended. MYCALEX switches using this type of design have been tested satisfactorily for over 1000 hours at 600 RPM without maintenance.

Information on complete MYCALEX switches or matched brush assemblies and plates is available.

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EXCLUSIVE LICENSEE OF MYCALEX CORPORATION OF AMERICA

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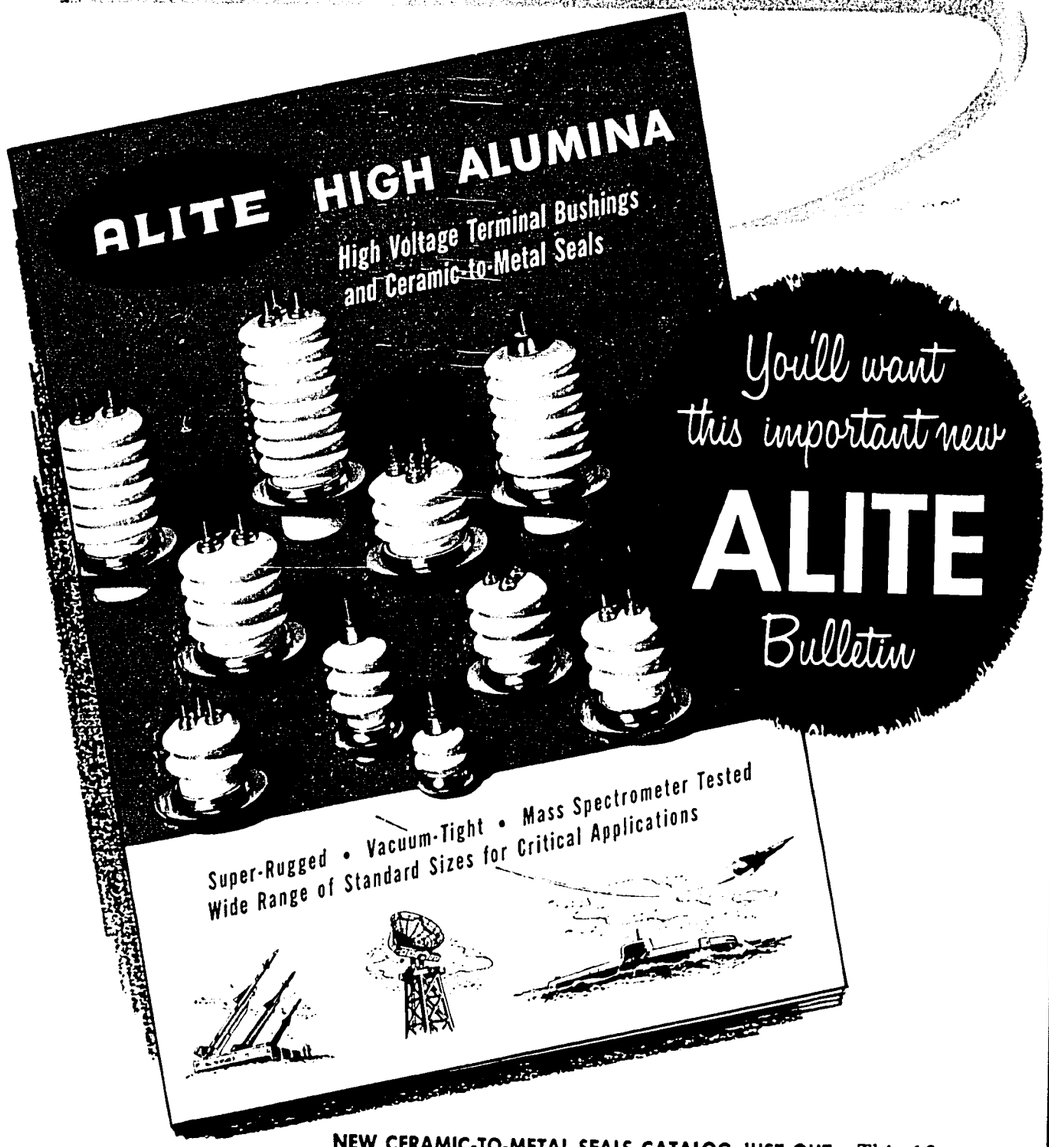
ENGINEERS . . . PRODUCT DESIGNERS:



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Bulletin

NEW CERAMIC-TO-METAL SEALS CATALOG JUST OUT—This 16-page bulletin contains complete information and detailed specifications on the industry's broadest standard line of hermetic bushings. Gives important performance data on ALITE High Alumina Ceramic —complete details on Alite's electrical properties, mechanical strength, temperature resistance, etc. Facts on over 100 standard sizes of high voltage terminals, feed-throughs, cable end seals, plus helpful information on special applications.

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TUNING FORK RESONATORS

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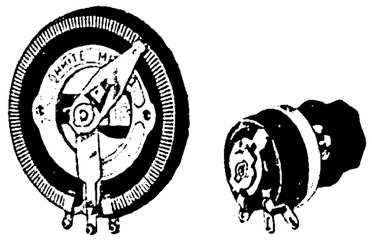
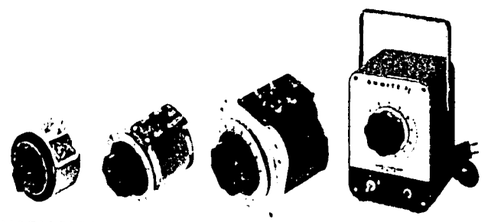
INDUSTRY-PREFERRED COMPONENTS

catalog and engineering manual 58

Long life and dependability are synonymous with the name Ohmite. When you specify Ohmite components . . . you build reliability into your product. This reliability is backed by Ohmite's continuing research programs which explore new product ideas, improve present products, and develop more efficient manufacturing processes. All this plus the fact that Ohmite is the world's leading specialist in the manufacture of power-type resistance components—high quality rheostats and wire-wound resistors in the most complete range of sizes and types available to industry. Reliability is also characteristic of Ohmite tap switches, precision wire-wound resistors, metal film resistors, general-purpose relays, variable transformers, subminiature tantalum capacitors, and R. F. chokes.



RHEOSTATS Complete range of vitreous-enameled, close control, power rheostats from 12½ to 1000 watts. Single or tandem. Many additional features. Also available to meet MIL-R-22A requirements. All sizes from stock in a wide range of resistance values.



VARIABLE TRANSFORMERS Newly expanded line of six basic models with current ratings that meet a large percentage of industrial applications. Includes *enclosed units and tandem assemblies*. Two models, VT2 and VT4, offer capacity greater than competitive units of comparable size and price. A sizeable "bonus", in current is given in all sizes when the overvoltage feature is not required ("N" suffix, see below).

Advanced Features—Positive current transfer achieved with direct brush to slip-ring, pigtail connection; table or panel mounting on Models VT4 and VT8 (adjustable shaft moves to brush or base side); interchangeable with other popular types both electrically and "mounting-wise"; rhodium plating on brush track for longer life.

Specials—Shafts for nonstandard panel thicknesses, auxiliary switches, taps on transformer winding for fixed intermediate voltages, and motor drives for remote control or servo-operation.

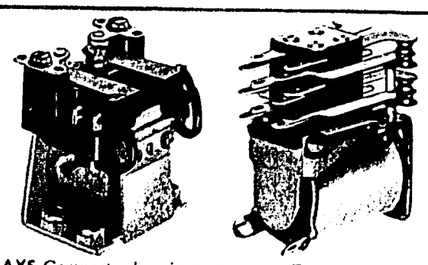
Basic Models (with overvoltage) All inputs 120 v ac*

MODEL VT2	MODEL VT4	MODEL VT8
Volts output: 0-120/132	Volts output: 0-120/140	Volts output: 0-120/140
Amps output: 1.5	Amps output: 3.5	Amps output: 7.5

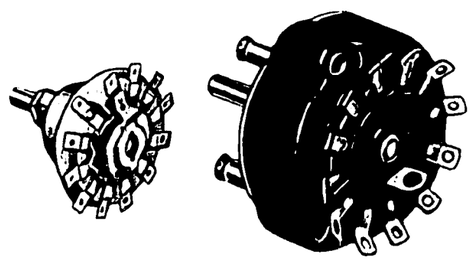
Basic Models (without overvoltage) All inputs 120 v ac*

MODEL VT2N	MODEL VT4N	MODEL VT8N
Volts output: 0-120	Volts output: 0-120	Volts output: 0-120
Amps output: 1.8	Amps output: 4.75	Amps output: 10.0

*Units available for 240-volt input also

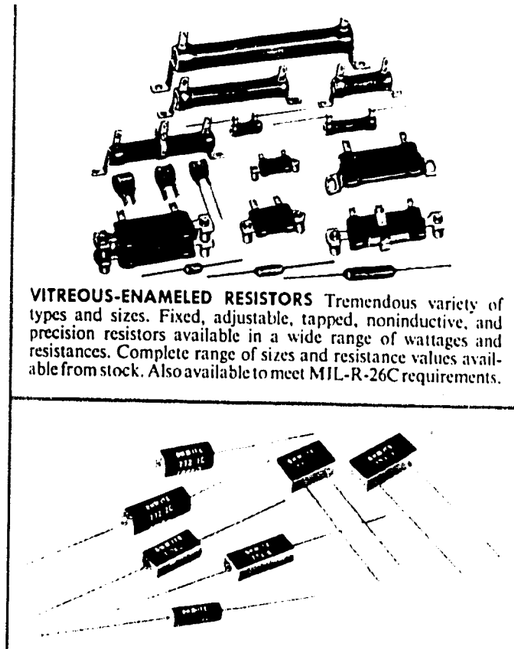


RELAYS Compact relays in many types. For a.c. or d.c., in a wide range of contact combinations and coil voltages. Four stock models in 65 types. Also nine standard types promptly made to order. Available in hermetically sealed or dust-protective enclosures. Models TT and TS relays, with "molded module" contact springs, are designed to meet MIL-R-5757C and MIL-R-6106C respectively.

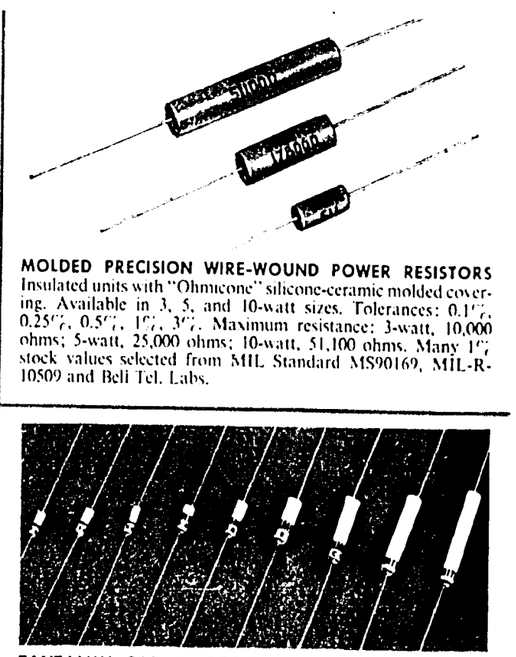


TAP SWITCHES Ceramic insulated, rotary selector switches for a-c use. High-current, silver-to-silver contacts. Single or tandem. Five sizes: 100, 50, 25, 15, and 10 amperes available from stock.

For details, circle #106 on Reader Service Card

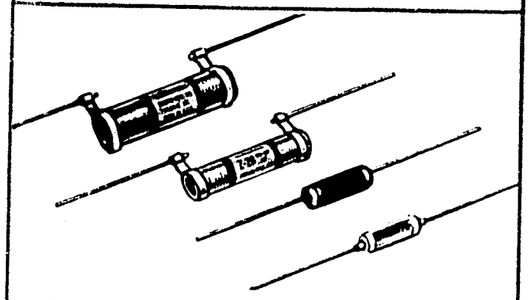


VITREOUS-ENAMELED RESISTORS Tremendous variety of types and sizes. Fixed, adjustable, tapped, noninductive, and precision resistors available in a wide range of wattages and resistances. Complete range of sizes and resistance values available from stock. Also available to meet MIL-R-26C requirements.



MOLDED PRECISION WIRE-WOUND POWER RESISTORS Insulated units with "Ohmicone" silicone-ceramic molded covering. Available in 3, 5, and 10-watt sizes. Tolerances: 0.1%, 0.25%, 0.5%, 1%, 3%. Maximum resistance: 3-watt, 10,000 ohms; 5-watt, 25,000 ohms; 10-watt, 51,100 ohms. Many 1% stock values selected from MIL Standard MS90169, MIL-R-10509 and Bell Tel. Labs.

METAL FILM PRECISION RESISTORS Wattage ratings at 125°C and 150°C ambient; excellent high frequency characteristics; low temperature coefficient of resistance. Long-term load and shelf stability. Styles to meet MIL-R-10509C and MIL-R-19074B (Ships). Many 1% stock values selected from MIL Standard MS90169, MIL-R-10509 and Bell Tel. Labs.



R. F. CHOKES Radio-frequency chokes in seven stock sizes for 3 to 520 megacycle applications. Single-layer wound. Other single-layer chokes and vitreous-enameled chokes can be made to order.

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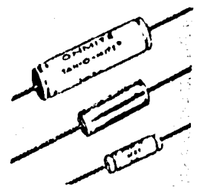
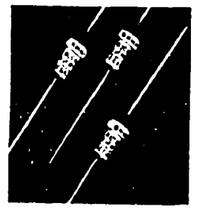
TANTALUM CAPACITORS Series TW (tantalum wire capacitors) available in eleven subminiature sizes; .01 to 80 mfd. over-all capacitance range. Smallest size .062 x .20 inch; largest .134 x .812 inch. Insulated units standard. Working voltages to 150 volts. Wide range of stock sizes, capacitance values, and voltage ratings.



Series TF (tantalum foil capacitors) available in three sizes; .25 to 140 mfd. over-all capacitance range. Working voltage to 150 volts. For −55°C to +85°C operation. Available in polar and nonpolar units. Available for vibration ranges 0-55 and 0-2000 cps. Meets MIL-C-3965B. Styles CL-34 and CL-35. Wide range of stock units in polar type.



Series TS (tantalum, porous, slug-type capacitors) size "U" offers a range of 1.75 to 30 mfd. Working voltages to 125 are available. Design and construction meet MIL-C-3965B Grade 3. Two operating temperature ranges, −55°C to +85°C (Style UB) and −55°C to +125°C (Style UC). New Style SUB, *straight side type*, available in temperature range −55°C to + 85°C. All styles carried in stock.

RHEOSTATS • RESISTORS • RELAYS
TAP SWITCHES • R. F. CHOKES
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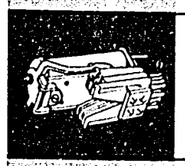
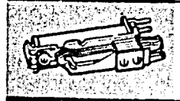
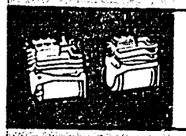
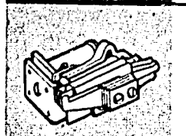
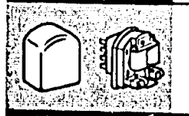
RELAYS SWITCHES

AUTOMATIC ELECTRIC

AE RELAYS

	SERIES	OPERATING TIME, SECONDS	RELEASE TIME, SECONDS
CLASS B When extremely long service and reliable operation are demanded, this relay meets the requirements. Life often exceeds 400 million operations. Ideal for computers, fire control, pulsing or switching functions.	BQA	0.002-0.030	0.005-0.050
	BSO	0.040-0.120	0.025-0.350
	BSR	0.004-0.035	0.035-0.600
	BSA	0.020-0.055	0.035-0.600
	BFA	0.010-0.025	0.008-0.020
	BMS	0.010-0.030	0.015-0.050
CLASS E A new telephone-type relay, designed for long-life industrial service. Based on the rugged Class B design, this is a universal relay, engineered for a variety of uses demanding compact size coupled with our usual high standard of reliability.	EQA	0.002-0.030	0.005-0.025
	ESO	0.015-0.050	0.025-0.125
	ESR	0.005-0.030	0.025-0.125
	ESA	0.015-0.030	0.050-0.125
	EFA	0.005-0.025	0.005-0.025
	EMS	0.010-0.030	0.015-0.030
 **CLASS A** This original telephone-type relay will hold down costs, yet provide dependable operation and long life. A wide variety of coils, contacts, contact spring arrangements and mounting facilities makes this truly the "all-purpose" relay.	AQA	0.002-0.025	0.005-0.025
	ASO	0.040-0.120	0.020-0.250
	ASR	0.004-0.025	0.020-0.350
	ASA	0.010-0.050	0.020-0.350
	AWS	††Up to 2	0.005-0.025
	AVR	0.002-0.025	††1 to 15
	AMC	0.210-0.280	0.300-0.345
 **CLASS C** This compact relay combines unusual dependability and surprisingly long service life in a space about half of the size of the average relay of equal rating. Can be used for high-speed or delayed operation.	CQA	0.005-0.035	0.005-0.025
	CSA	0.010-0.040	0.015-0.200
	CMS	0.010-0.035	0.010-0.050
 **CLASS S** Specify this relay for aircraft use, where a small, light relay is required, resistant to shock and vibration. It features fast pulse response because of its small mass and slight self-inductance. Series SQPC available for printed circuits.	SQA	0.002-0.016	0.005-0.085
	SQD	0.002-0.030	0.005-0.085
	SQPC	0.002-0.030	0.005-0.085
	S-Power	0.005-0.016	0.005-0.010
 **CLASS Z** Choose Class Z relays where a small, light relay is needed but long life or time delay is of greater importance than extremely small size. Similar to Class A relay, but smaller and less sensitive.	ZQA	0.002-0.025	0.005-0.025
	ZSO	0.010-0.050	0.050-0.150
	ZSR	0.003-0.010	0.050-0.200
	ZSA	0.010-0.040	0.050-0.200
	ZMS	0.010-0.040	0.005-0.200
	ZFA	0.010-0.025	0.008-0.020
	Type 18	0.002-0.025	0.005-0.025
CLASS F An a.c. relay, for use when the number of relays doesn't justify a rectifier, and when operate and release time delays are not a factor. When operate and release timing is required, an inexpensive rectifier can be used with any of the above d.c. relays.	FQA	0.002-0.025	0.005-0.040
	BFA	0.010-0.025	0.008-0.020
	EFA	0.005-0.025	0.005-0.025
	FMS	0.002-0.020	0.002-0.020
	FMC	0.298-0.333	0.290-0.350
	ZFA	0.010-0.025	0.008-0.020
 **POLARIZED** Series PHD and PLD offer "2-position" or "3-position" operation; Series PTW provides "2-position" only. "2-position" relays "stick" operated until current is reversed; "3-position" have neutral position in absence of current.	PLD	0.003-0.010	0.022-0.047
	PHD	0.006-0.027	0.065-0.075
	PTW****	0.007 Minimum	0.0002 Approx. Travel Time
SPECIAL PURPOSE—We can usually make assemblies of Automatic Electric relays with modifications to suit your special applications. The Class E Video relay, illustrated here, is an example. Others are designed for power applications, electro-mechanical interlocking, marginal operation, mechanical locking, micrometer adjusting, and the simultaneous closing of up to 35 circuits (BAR relay).			

AE STEPPING SWITCHES

FAST STEPPING, SMOOTH RUNNING, POSITIVE STEPPING

TYPE 44

The Type 44 is a small switch with a large, flexible capacity. Use this switch in almost any d.c. application—for impulse controlled response or self-interrupted operation. Though it's only slightly larger than a pack of king-size cigarettes, the Type 44 rotary stepping switch accommodates up to six 10-point bank levels.

TYPE 45

In every feature of its design, the Type 45 rotary stepping switch provides for adaptation to varied requirements, including a.c. operation. The one-piece, open-type flat frame occupies only one side of this switch, so the 25-point contact banks can be built up level by level as needed, up to twelve.

SERIES OCS RELAY

Here's a shock-resistant relay which can be used for cam-switching...for alternate on-off operations...or as a "stepper." When you order Automatic Electric's OCS relay, you specify the programming. This compact unit simplifies engineering and wiring—cuts space, weight and maintenance costs.

For details, circle #108 on Reader Service Card

RELAYS SWITCHES

AUTOMATIC ELECTRIC

SERIES	MAXIMUM COIL VOLTAGE	MAX. NO. OF STANDARD CONTACTS	TYPE OF CONTACTS†††	WEIGHT	DIMENSIONS (MAX.) IN.
BQA	250 dc	24 Spgs.	Code 0—18 ga. Twin	8-12 oz.	4-3/32x2-5/16x1
BSO	135 dc	**24 Spgs.		8-14 oz.	4-3/32x2-5/16x1
BSR	135 dc	*6 Spgs.		8-14 oz.	4-3/32x1-7/8x1
BSA	250 dc	*6 Spgs.		8-14 oz.	4-3/32x1-7/8x1
BFA	230 ac	24 Spgs.		8-14 oz.	4-3/32x2-5/16x1
BMS	250 dc	***2 Form C	Snap-action	7-11 oz.	4-3/32x2-17/32x1-23/32
EQA	150 dc	26 Spgs.	Code 0—18 ga. Twin	2-3 oz.	2-1/4x1-23/32x1-1/8
ESO	110 dc	26 Spgs.			
ESR	110 dc	*6 Spgs.			
ESA	110 dc	*6 Spgs.			
EFA	220 ac	12 Spgs.			
EMS	150 dc	2 Form C	Snap-action		2-1/4x1-23/32x2-3/16
AQA	250 dc	26 Spgs.	Code 4—18 ga. Mercury	8-12 oz.	4-3/32x2-3/16x1-7/16
ASO	135 dc	26 Spgs.		8-14 oz.	4-3/32x2-3/16x1-7/16
ASR	135 dc	*6 Spgs.		8-12 oz.	4-3/32x2x1-7/16
ASA	250 dc	*6 Spgs.		8-12 oz.	4-3/32x2x1-7/16
AWS	250 dc	1 Form A		7-11 oz.	4-3/32x2-3/4x1-7/16
AVR	250 dc	Special		8-12 oz.	4-1/4x2x1
AMC	250 dc	2		12-16 oz.	4-3/4x3-1/16x3
CQA	150 dc	12 Spgs.	Code 0—18 ga. Twin	4-oz.	4-1/32x2-3/16x21/32
CSA	150 dc	12 Spgs.	Code 0—18 ga. Twin	4-oz.	4-1/32x2-3/16x21/32
CMS	150 dc	1 Form C	Snap-action	6-oz.	3-13/16x2-7/16x1
SQA	†115 dc	9 Spgs.	Code 0—20 ga. Twin	2-oz.	1-17/32x2x11/16
SQD	†115 dc	18 Spgs.		2- 3 oz.	1-17/32x2x1
SQPC	†115 dc	18 Spgs.		2- 3 oz.	1-17/32x2x1
S-Power	115 dc	1 Make	Silver-Tungsten	12 oz.	1-1/2x1-1/2x1-1/4
ZQA	135 dc	13 Spgs.	Code 4—18 ga.	4- 6 oz.	2-1/2x2-3/4x1-1/2
ZSO	115 dc	13 Spgs.		4- 6 oz.	2-1/2x2-3/4x1-1/2
ZSR	115 dc	*6 Spgs.		4- 6 oz.	2-1/2x2-3/4x1-1/2
ZSA	135 dc	*6 Spgs.		4- 6 oz.	2-1/2x2-3/4x1-1/2
ZMS	135 dc	***2 Form C	Snap-action	8-10 oz.	2-1/2x2-5/8x2-1/4
ZFA	115 ac	13 Spgs.	Code 4—18 ga.	4- 6 oz.	2-1/2x2-3/4x1-5/16
Type 18	12 or 24 dc	10 Spgs.	Code 9—18 ga.	4- 6 oz.	2-1/2x2-1/4x1-1/4
FQA	To 230 (16-66 cycles)	12 Spgs.	Code 4—18 ga.	9-13 oz.	4x1-15/16x1-1/4
BFA	To 230 (20-60 cycles)	24 Spgs.	Code 0—18 ga.	8-14 oz.	4-3/32x2-5/16x1
EFA	To 220 ac	12 Spgs.	Code 0—18 ga.	2- 3 oz.	2-1/4x1-23/32x1-1/8
FMS	To 240 (16-66 cycles)	2 Form C	Snap-action	10-14 oz.	3-1/2x2-3/8x2-3/8
FMC	To 240 (16-66 cycles)	2	Merc.-Glass	14-18 oz.	4-5/8x2-3/4x2-3/4
ZFA	To 115 (20-60 cycles)	13 Spgs.	Code 4—18 ga.	4- 6 oz.	2-1/2x2-7/8x1-11/32
PLD	350 dc	6 each side	Code 4—18 ga.	28 oz.	4x3-1/4x2
PHD	350 dc	6 each side	Code 4—14 ga.	27-37 oz.	4-13/16x2-3/4x3
PTW****		1 Form C	TungstenCarbide or Palladium	14 oz.	2-7/8x2-1/4x3-5/16

*More contacts can be used at a sacrifice of speed.
**Up to 0.600 sec. release time on BSO relay with 6 springs max.
***With 1 snap-action switch and 1 contact assembly (8 springs max.)
****Octal or pin-type plug (to fit WE Co. 255 applications) available.
†Higher wattage obtainable with oversize coils.
††Timing value in conjunction with a Series ASO relay.
†††Most relays can be furnished with special heavy-duty contacts.

We will be happy to send additional literature on request. You may be interested in some of the following:

Rotary Stepping Switches.....#1698-H
Relays for Industry.....#1702-E
Relay Terms.....#1884
Basic Circuits.....#1927
Hermetically Sealed Components.....#4083
Key Switches and Other Electrical Control Components.....#4018-E

Address requests to:
Director, Industrial Control and Equipment Sales, Northlake, Illinois

For details, circle #109 on Reader Service Card

Automatic Electric, pioneer in the use of telephone-type relays for industry, has the experience, reputation, manufacturing facilities, research staff, and down-to-earth, practical "know how" to solve your knottiest control problem. We specialize in the hermetic sealing of relays and switches, as well as in the design, circuitry and assembly of industrial control "packages" and systems. Our representative and facilities are at your command.

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UPPER DARBY, PA. (Philadelphia suburb)

*District Office

Check the Yellow Pages of your telephone directory to get in touch with our representative in your area. Address all Home Office inquiries to: Director, Industrial Control and Equipment Sales.

RELAYS SWITCHES

AUTOMATIC ELECTRIC

Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

Distributors in U.S. and Possessions:

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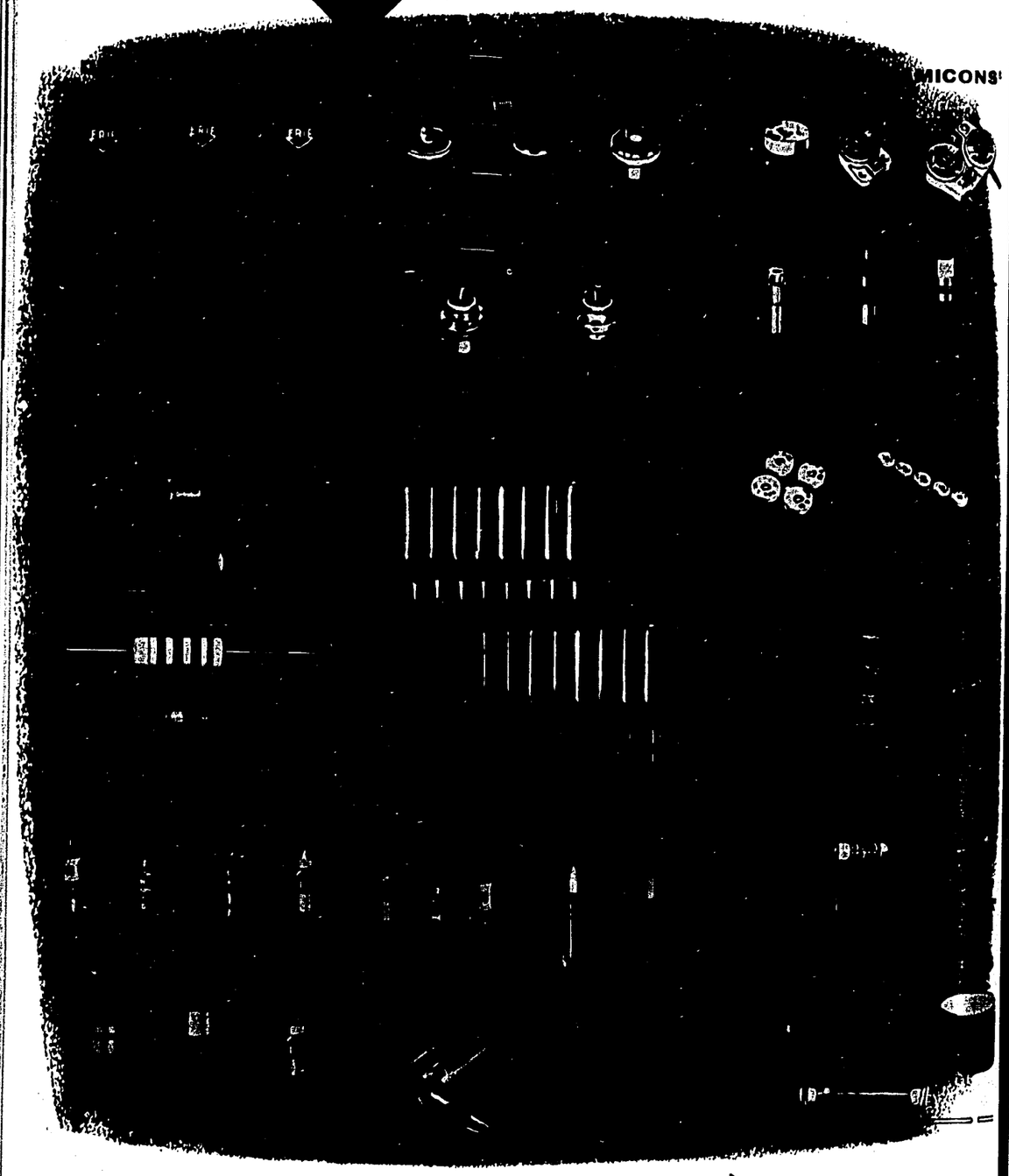
Export Distributor: Automatic Electric International, Incorporated, Northlake, Illinois.

ERIE

ELECTRONIC COMPONENTS



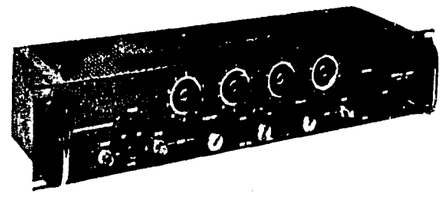
For details, circle #110 on Reader Service Card

ELECTRONICS DIVISION

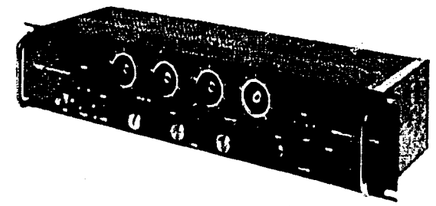
ERIE INSTRUMENTATION • DIGITAL ELECTRONIC EQUIPMENT

featuring...Glow Transfer Tube Decade Counters

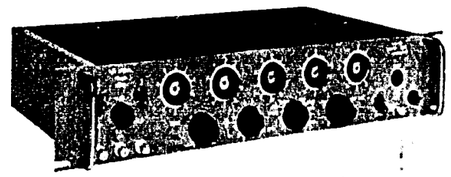
MODEL 210: TIME INTERVAL METER



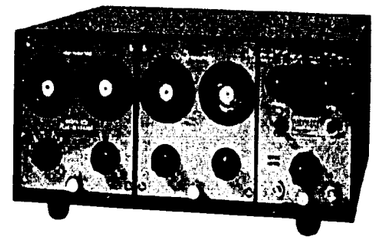
MODEL 130: EVENTS PER UNIT TIME METER



MODEL 400: UNIVERSAL COUNTER TIMER

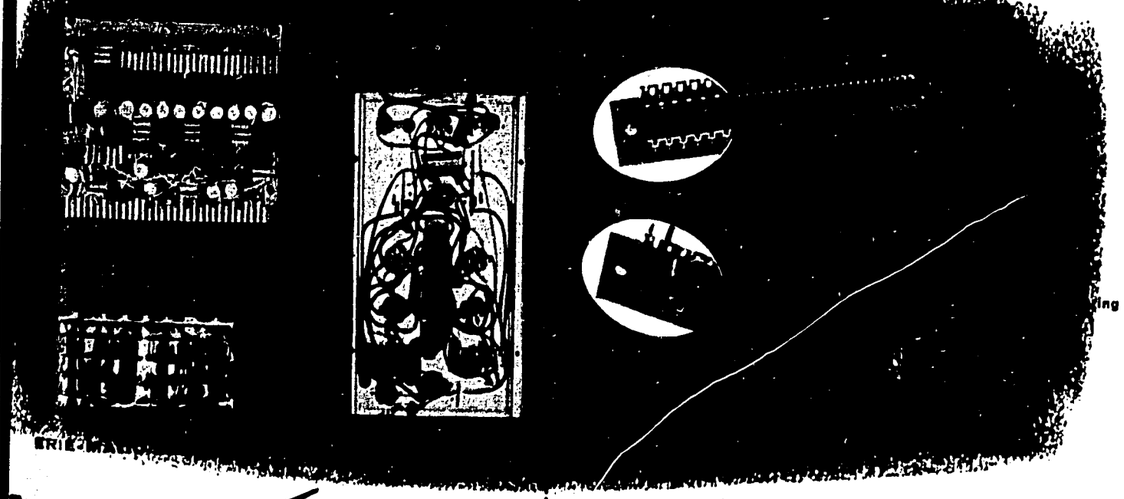


MODEL 320: PRE-SET COUNTER



CUSTOM BUILT ELECTRO MECHANICAL **ASSEMBLIES**

ANY TYPE OF ELECTRONIC OR ELECTRICAL ASSEMBLY



For details, circle #111 on Reader Service Card

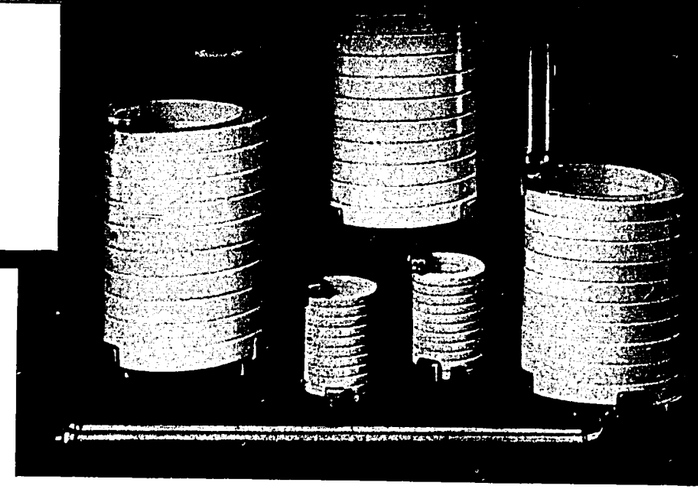
ELECTRO-MECHANICAL DIVISION

Lapp

TUBE SUPPORTS
for air-cooled tubes

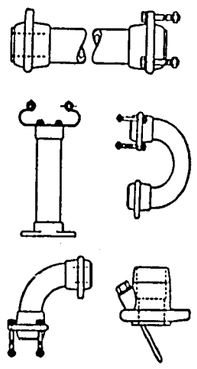
No longer is it necessary for equipment manufacturers to design supports for forced-air-cooled tubes. After producing many such special designs, Lapp has engineered and built a complete series of insulating supports for air-cooled tubes. Use of these supports facilitates design of transmitter and other high-power circuits. Simple, compact, efficient and attractive in appearance, in porcelain or steatite, they make for economical production, easy interchangeability, and availability of replacement units. Write for Bulletin 301, with complete description and specification data.

For details, circle #112 on Reader Service Card



INSULATION FOR WATER-COOLED SYSTEMS

For carrying cooling water which must undergo a change in potential, use of Lapp porcelain eliminates troubles arising from water contamination and conductivity, sludging and electrolytic attack of fittings. Permanent cleanness and high resistance of cooling water is assured—for positive cooling and long tube life.



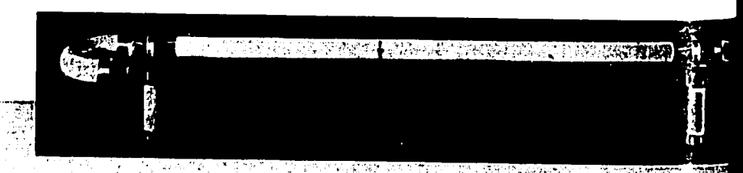
LAPP PORCELAIN WATER COILS

Twin-hole and single-hole models in sizes to provide flow of cooling water from 2 to 90 gallons per minute. Cast aluminum mounting bases, lead pipe or flexible metal hose for attachment.

LAPP PORCELAIN PIPE

Inside diameters ¾″ to 3″, in straight, 90° and 180° elbows, fittings. Swivel-type connections. Standoff insulators attach directly to fitting bolts.

Write for Bulletin 301 with specifications for Lapp Porcelain Water Coils and Porcelain Pipe.



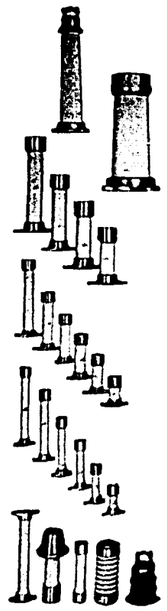
ENTRANCE INSULATORS

To eliminate losses which occur in ordinary types of bushings at radio frequency, Lapp units use air as major insulation, porcelain path being lengthened by its "bowl" shape. In wide variety of types for most electrical and mechanical requirements.

STAND-OFF INSULATORS

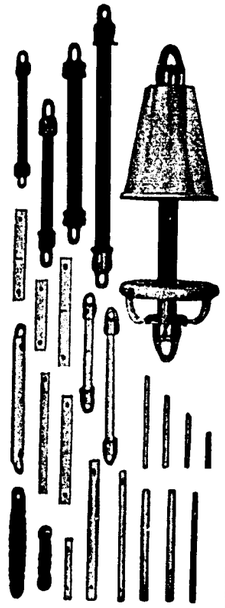
Dependable mechanical and electrical performance—and trim good looks. Hundreds of standard and special types available.

Write for Bulletin 301, listing entrance and stand-off insulators.

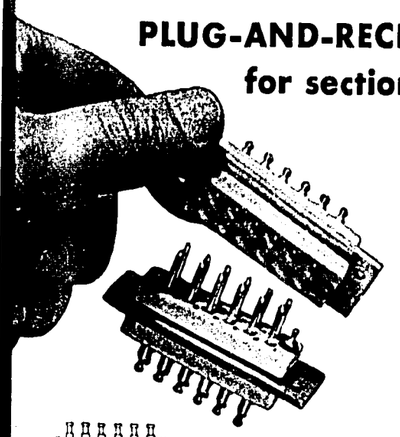


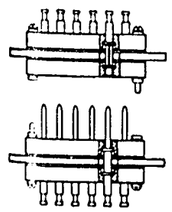
ANTENNA STRAIN INSULATORS

The largest of the porcelain rod insulators shown develops 12,000 lb. strength. Available, as specified, with rain shield and/or corona rings. Smaller units, in porcelain or steatite, for all strain or spreader use. Engineering and production facilities also available for special performance units See catalog 301.



PLUG-AND-RECEPTACLE UNITS
for sectionalizing circuits



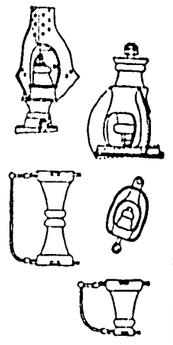


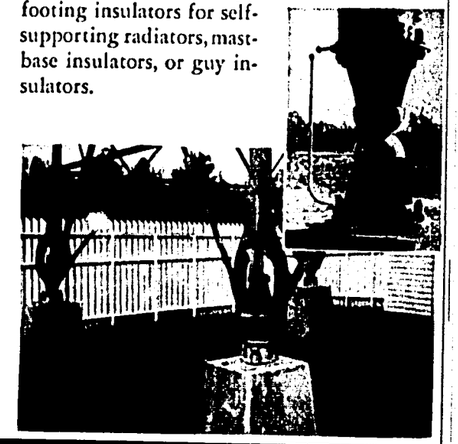
For panel-rack or other sectionalized circuits, Lapp offers a variety of plug-and-receptacle units. Any number of contacts can be provided (in multiples of twelve). Male and female contacts are full floating, for easy alignment and positive contact. Contacts silver plated, terminals tinned for soldering. Insulation is steatite, the low-loss ceramic . . . non-carbonizing even under leakage flashover resulting from contamination, moisture or humidity. Write for complete electrical and mechanical specifications and recommendations.

For details, circle #113 on Reader Service Card

ANTENNA TOWER INSULATORS

Most of the world's radio towers are supported by Lapp insulators, including the tallest guyed mast ever built. Through the Lapp "compression cone," immense loads can be carried by electrical porcelain. Write for data on Lapp footing insulators for self-supporting radiators, mast-base insulators, or guy insulators.





LAPP GAS-FILLED CONDENSERS
Capacitance for high-voltage, high-current duty

The record of more than 18 years' service, in thousands of installations, proves the reliability of the Lapp Gas-Filled Condenser. For duty at high voltages and high currents, this unit offers the advantages of extreme compactness . . . low loss . . . high safety factor . . . constant capacitance under temperature variation . . . grounded tuning shaft . . . and rugged sturdiness. Units available in four tank diameters, 7″ to 18″ . . . in fixed or variable capacitance . . . capacitances to 30,000 mmf; current ratings to 390 amps at 1 mc; voltages to 85 Kv peak. Write for Bulletin 302.

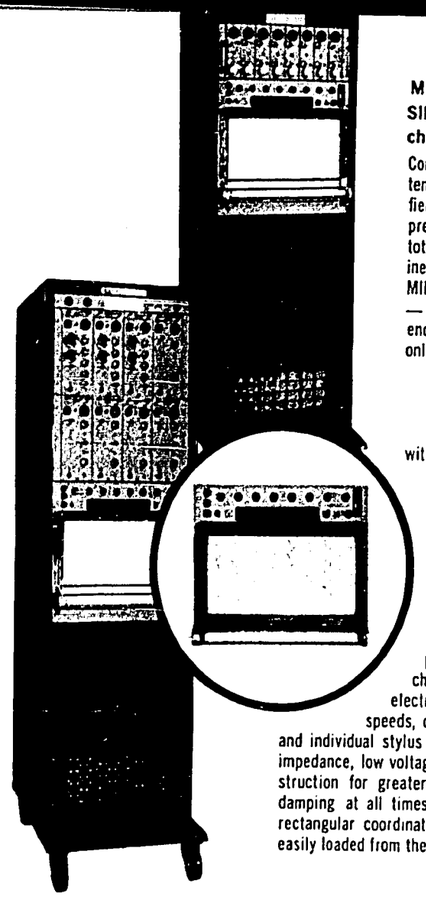
SPECIAL ASSEMBLIES

Lapp business is electrical porcelain, its application, design, manufacture, and assembly. Our skill is in our knowledge of the capabilities, and limitations, of ceramic insulation . . . in engineering ingenuity to meet specified requirements . . . and in efficient production. If you have need for insulating parts and associated sub-assemblies, we may be able to show you how they can be made most economically, to perform most efficiently.

Lapp

LAPP INSULATOR CO., INC.
RADIO SPECIALTIES DIVISION
150 SUMNER ST., LEROY, N. Y.

VERSATILE, RELIABLE RECORDING INSTRUMENTATION FROM SANBORN



MAXIMUM PERFORMANCE VERSATILITY — 6 or 8 channels, DC to 150 cps

Linearity 0.5%, 3 db down at 150 cps (10 div peak-to-peak amplitude). Improved current feedback power amplifiers, negligible drift. Total panel space only 38½". Efficient ducted air system assures constant, adequate cooling of all circuits for reliable operation.

VERSATILE "350" SERIES PREAMPS — compact (10½" high) interchangeable units with highly developed circuitry; for use in "350" systems, or individually (see "450" unit Amplifiers) with its own power supply to drive optical recorders, tape recorders, 'scopes, meters, etc. Available types include

- Carrier
- DC Coupling
- Phase Sensitive Demodulator
- True Differential Wide Band DC (4 models)
- Basic Chopper

with others in development

MINIMUM PANEL SPACE, SIMPLER PREAMPS — 6 or 8 channels, DC to 150 cps

Comparable performance to "350" System; uses same Recorder-Power Amplifier unit. Modules of up to 8 plug-in preamps occupy 7" of panel space; total panel space only 28" (max.); cabinet 60" high.

MINIATURIZED "850" SERIES PREAMPS — simplified, economical plug-in front ends for "850" systems; panel area only 2 1/16" x 7". Types include

- Carrier (separate MOPA required)
- Phase Sensitive Demodulator
- DC Coupling
- Basic Chopper (MOPA required)

with others in development

BASIC "350"/"850" 6- and 8-CHANNEL RECORDER-AMPLIFIER UNITS

6- or 8-channel recorder with transistorized, current feedback Power Amplifiers and voltage regulated power supply. Sensitivity 0.1 volt/chart div; panel space 17½"; nine electrically controlled pushbutton chart speeds, or remote control; automatic over-all and individual stylus heat control; time-code marker; low impedance, low voltage galvanometers with enclosed construction for greater reliability; true velocity feedback damping at all times, limiting ahead of output. Inkless, rectangular coordinate recording on Permapaper charts, easily loaded from the front.

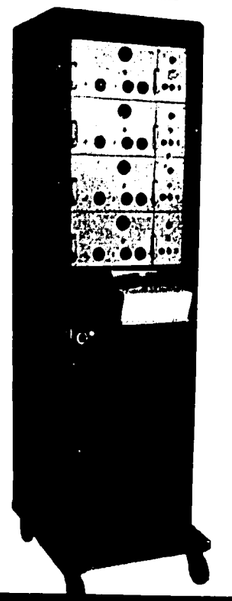
VERSATILE, ECONOMICAL — 1 to 8 channels DC to 100 cps

Twelve front ends cover the widest variety of applications. Frequency response 2 db down at 100 cps; over-all linearity better than 1%; basic sensitivity from 10 μv/div to 0.1 volt/div, depending on preamplifier. Current feedback driver amplifier and regulated power supply for each channel; amplifiers, recorder available in individual portable cases.

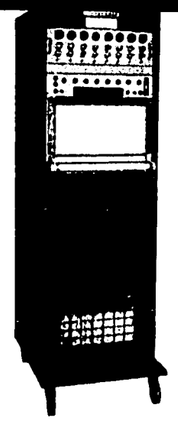
1- to 8-CHANNEL "150" SERIES RECORDERS Nine chart speeds (multi-channel types), shifted mechanically; automatic over-all and individual stylus heat control; recorder assembly slides out for easy paper loading, better view of recording and marking notations on record; time-code marker; paper take-up; inkless, rectangular coordinate recording on Permapaper charts.

FAMILIAR "150" SYSTEM FRONT ENDS — feature wide choice of types, plug-in design; all have attenuator ratios of 1, 2, 5, 10 . . . to 1000, many have calibrated zero suppression.

- AC-DC
- Carrier
- Servo Monitor (phase-sensitive demodulator)
- DC Coupling
- Log-Audio
- Low Level
- Stabilized DC
- AC Wattmeter
- RMS Volt/Ammeter
- 400 Cycle Frequency Deviation
- Frequency Meter
- Triplexer 3-channel electronic switch



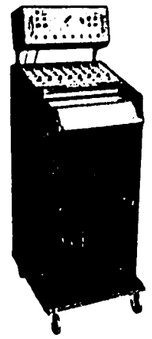
For details, circle #114 on Reader Service Card



when preamplification is not needed —

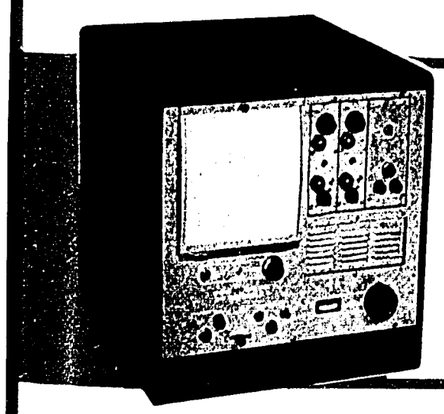
SIMPLIFIED 6- or 8-CHANNEL SYSTEM — 5 volts full-scale

Model 358-5480 system for computer readout, telemetry recording, DC voltage monitoring and similar applications requiring no preamplification. Control panel provides position, smooth gain and attenuation controls, and internal calibration signal. Sensitivity 0.1 volt/div; linearity 0.5% of full scale, gain stability better than 1%; current feedback amplifiers, velocity feedback damping; 9 electrically controlled chart speeds and all other "350" Recorder features.



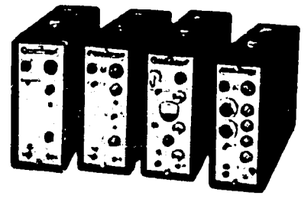
"150" SYSTEM AND PROGRAMMER FOR COMPUTER READOUT

6- or 8-channel consoles in 46½" high mobile cabinet. Dual-Channel DC Amplifiers have sensitivities from 0.01 to 10 volts/div; internal calibration 2 volts ± 1%; frequency response flat to 20 cps down 3 db at 50 cycles. Optional Programmer sequences system operation in 20 steps including recorder turn-on, calibration, computer DC level reading, recording for pre-set time, turn-off and reset.



HIGH SPEED OPTICAL X-Y RECORDER — flat response to 100 cps, writing speeds to 2500"/sec.

Can record such rapidly changing variables as acceleration and vibration of mechanical elements, transistor characteristics, etc. Mirror-galvanometers and a light beam produce recording traces on ultraviolet-sensitive 8" x 8" direct-print paper that develops immediately by exposure to normal room light. Interchangeable "850" system preamplifiers are used for each axis; new preamps and time base generator now in development allow a wide variety of applications.



SELF-CONTAINED "450" UNIT AMPLIFIERS with power supply

Versatile "350" Series preamplifiers with individual power supplies in portable cases; for driving 'scopes, optical oscillographs, tape recorders, etc. Available in "450" cases or four-unit modules in 19" frame for rack mounting. One "450" case and power supply can serve any "350" preamp.

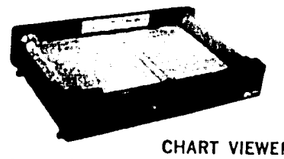


CHART VIEWER for easier editing and study

Permits convenient viewing and interpretation of Sanborn and other strip charts up to 200 ft. long and 16" wide, at continuously variable speeds from ¼" to 7½" per second. Single control for direction and paper speed. Viewing table 18½" x 24".

LINEAR MOTION TRANSDUCERS

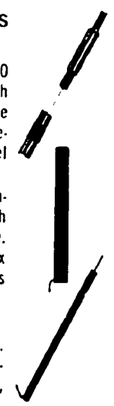
. . . to measure displacement

PROBE STYLE — complete, ready to connect to 150, 350 or 850 Series Carrier Amplifiers; uses differential transformer. High sensitivity, unlimited resolution, linearity 0.5%; stroke range 0.050", sensitivity 50 chart div deflection/0.001" displacement. Model 580 for flange mounting has plug-in cable, Model 581 for screw mounting has integral cable.

LINEARSYN — differential transformer; error due to nonlinearity less than 1% of full scale; unlimited resolution. High shock, vibration resistance; hermetically sealed, immersible. Strokes from ±0.005" to ±10.000"; high sensitivities. Six standard series (three shielded, three unshielded), five models in each series.

. . . to measure velocity

LVsyn — accurate, stable calibration; unlimited resolution. Single-ended or push-pull output. Strokes to 9"; output sensitivities from 35 to 650 mv/inch/sec. Twelve standard Models, with regular or unbreakable cores.



For details, circle #115 on Reader Service Card

Other Sanborn precision instruments include . . .

Individual Recording Galvanometers, Power Amplifiers, Recording Assemblies . . . Servo Monitor Phase Shifters . . . Event Recorders, 4 to 32 channels . . . Monitor Meter . . . Wide Band Driver Amplifier . . . Master Slave Control . . . Pressure Transducers.

For complete descriptive information and specifications, write to the Industrial Division in Waltham or contact your local Sanborn Sales-Engineering representative.

SANBORN COMPANY

INDUSTRIAL DIVISION
175 Wyman Street, Waltham 54, Mass.

400 CYCLE TINYMAX TRANSFORMERS

for greater space and weight savings

TORWICO'S UNIQUE DESIGN TECHNIQUE TAKES FULL ADVANTAGE OF CORE PERFORMANCE AND PACKAGING EFFICIENCY.

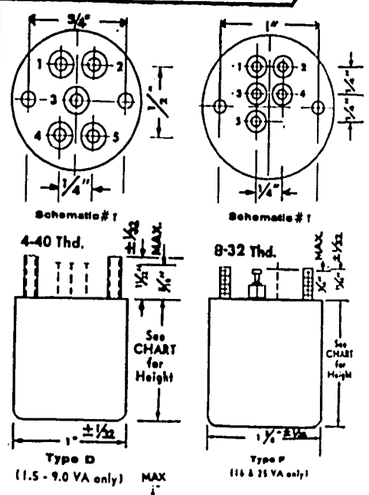
V. A.	O D ±1/32	Height ±1/32	Case Style	Nominal Weight	% Regulation
1.5	1	15/32	D & E	¼ oz.	20
3.0	1	19/32	D & E	1 oz.	15
6.0	1	13/16	D & E	1½ oz.	10
9.0	1	1-1/16	D & E	2 oz.	8
16.0	1-3/8	1-1/8	F	4 oz.	7
25.0	1-3/8	1-3/8	F	5 oz.	6

STANDARD CATALOG NUMBERS

Standard Voltage Ratings PRI/SEC	Available From Stock: 1.5-9.0 V.A. Size Terminal End Mounting Secondary Centertapped	Available From Stock: 16 and 25 V.A. Size Terminal End Mounting Secondary Centertapped	1.5-9.0 V.A. Size Reverse Mounting Secondary Centertapped
115/6.0	TW (VA) D6.0T	TW (VA) F6.0T	TW (VA) E6.0T
115/6.3	TW (VA) D6.3T	TW (VA) F6.3T	TW (VA) E6.3T
115/10	TW (VA) D10T	TW (VA) F10T	TW (VA) E10T
115/26	TW (VA) D26T	TW (VA) F26T	TW (VA) E26T
115/115	TW (VA) D115T	TW (VA) F115T	TW (VA) E115T
115/200	TW (VA) D200T	TW (VA) F200T	TW (VA) E200T
115/250	TW (VA) D250T	TW (VA) F250T	TW (VA) E250T
115/300	TW (VA) D300T	TW (VA) F300T	TW (VA) E300T

★ Electrostatic shields can be provided between pri and sec. Use next larger case height for a given rating. Simply add "S" to the end of the code number as shown in the example.

Other V.A. ratings, secondary voltages and constructions engineered to your specifications.



tol. ±1/64 unless otherwise specified

All Terminals Color Coded For Permanent Identification
1—Brown 2—Red 3—Orange 4—Yellow 5- Green
In Addition To Terminal Marking As Shown

SPECIFICATIONS:

Conform with MIL-T-27A.
Grade 4, Class S.
Ambient Temperature —55 to +85°C.
Maximum Total Operating 130°C.
Life Expectancy 10,000 Hours Minimum.
Hermetically Sealed.
Maximum Altitude 70,000 ft.
Pri Voltage 115V ±10%.
Pri. Frequency 400 cps ±5%.
Sec. Voltage Tolerance ±3% (at 115V. in & Rated Load).

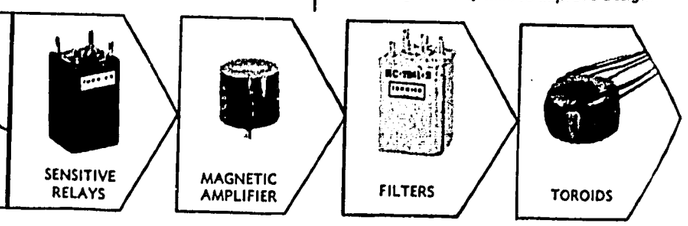
Torwico Electronics reserves the right to make changes at any time to improve design.

HOW TO ORDER:

Non standard ratings may be ordered by code number per the following example:

TW	25	F	6.3	T	S
TINYMAX INDENT.	V.A. Rating	Case Style	Sec. Voltage	Schematic	Electrostatic Shield

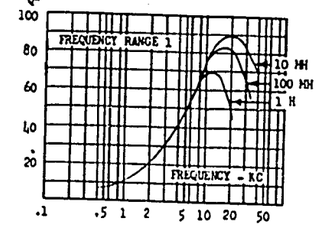
TORWICO ELECTRONICS, INC.
1090 Morris Ave., Union, N. J.



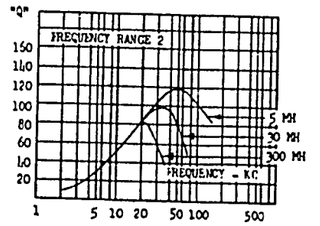
TOROIDAL INDUCTORS

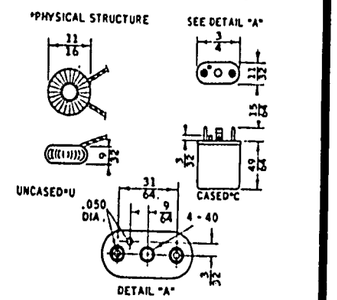
TWC SERIES

Standard Inductance values from 1.0 MH to 4.0 H



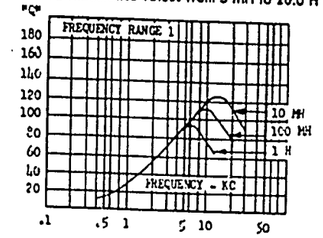
Standard Inductance values from 1.0 MH to 500 MH



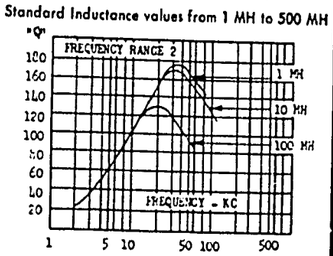


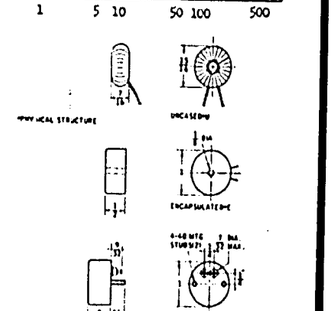
TWS SERIES

Standard Inductance values from 5 MH to 20.0 H



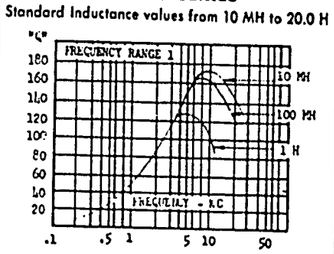
Standard Inductance values from 1 MH to 500 MH



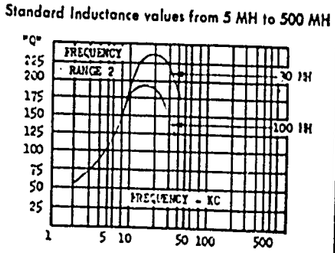


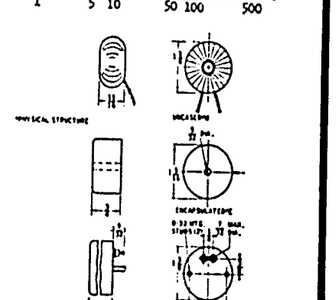
TWM SERIES

Standard Inductance values from 10 MH to 20.0 H



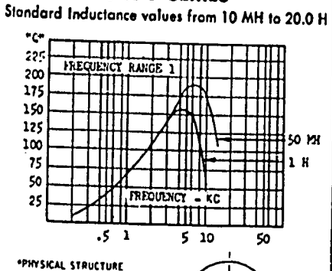
Standard Inductance values from 5 MH to 500 MH

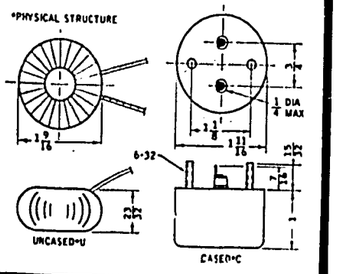




TWI SERIES

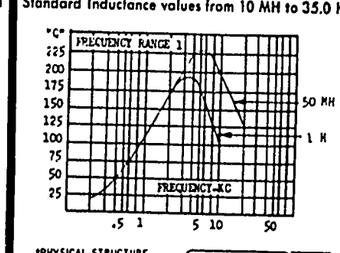
Standard Inductance values from 10 MH to 20.0 H

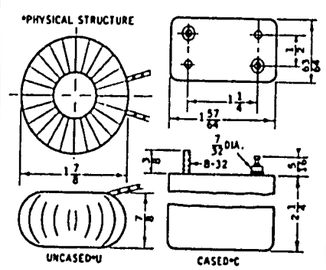




TWD SERIES

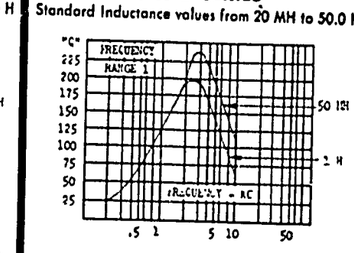
Standard Inductance values from 10 MH to 35.0 H

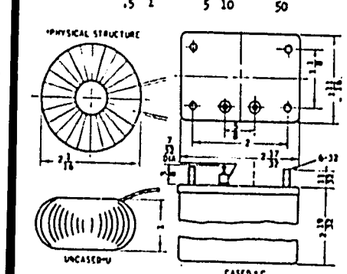




TWL SERIES

Standard Inductance values from 20 MH to 50.0 H





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On ordering:
Please designate coil size, inductance value, frequency range and physical structure.
Example: TWS 75 MH 1 c

unsurpassed performance in every application *world-wide sales and technical representation*

VA-842
Pulse Amp. Klystron with 75 Kilowatts average power output

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For details, circle #118 on Reader Service Card

NUMBER	TYPE	FREQUENCY RANGE/kMc	TYPICAL OUTPUT
X-12	Reflex Osc.	12.4 – 18.0	100 mW
X-13	Reflex Osc.	8.2 – 12.4	250 mW
X-13B	Reflex Osc.	7.5 – 11.0	250 mW
V-23	Oscillator	9.1 – 11.0	5 watts CW
V-24B	Pulse Amp.	9.2 – 9.5	60 kW
X-26 Series	Reflex Osc.	5.3 – 7.5	1 watt
V-27	Amplifier	9.1 – 11.0	6 watts CW
V-27B	Amplifier	8.5 – 10.0	6 watts CW
VA-28	Oscillator	13.35 – 13.65	14 watts CW
V-39B	Reflex Osc.	10.0 – 15.5	50 mW
V-40B	Reflex Osc.	15.0 – 21.0	50 mW
V-42B	Amplifier	0.375 – 0.425	15 kW CW
V-45	Multiplier	9.0 – 10.0	Up to 1 watt
V-53B	Reflex Osc.	10.7 – 11.7	50 mW
V-54	Reflex Osc.	10.5 – 12.2	200 mW
V-55	Reflex Osc.	8.2 – 11.5	500 mW
V-55B	Reflex Osc.	8.2 – 11.5	500 mW
V-58	Reflex Osc.	8.5 – 10.0	700 mW
V-63	Oscillator	8.5 – 10.0	5 watts CW

NUMBER	TYPE	FREQUENCY RANGE/kMc	TYPICAL OUTPUT
VA-64F	Oscillator	13.5	18 watts CW
VA-64G	Oscillator	13.3	18 watts CW
VA-67B	Oscillator	13.35 – 13.65	1 watt CW
V-82	Pulse Amp.	9.3	7 kW
VA-87 Series	Pulse Amp.	2.7 – 2.9	1.3 MW
VA-92	Reflex Osc.	14.0 – 17.5	200 mW
VA-92B	Reflex Osc.	12.4 – 14.5	380 mW
VA-92C	Reflex Osc.	12.4 – 14.5	250 mW
VA-94	Reflex Osc.	16.0 – 17.0	20 mW
VA-94B	Reflex Osc.	15.8 – 16.2	20 mW
VA-96	Reflex Osc.	22.0 – 25.0	40 mW
VA-97	Reflex Osc.	34.0 – 35.6	15 mW
VA-98	Reflex Osc.	23.6 – 24.4	20 mW
VA-113-14-15	Reflex Osc.	5.925 – 7.725	50 to 300 mW
VA-121B	TWT Pulse Amp.	2.0 – 3.4	40 watts
VA-121C	TWT Pulse Amp.	2.0 – 3.4	40 watts
VA-125 Series	TWT Pulse Amp.	2.65 – 3.25	1.5 MW
VA-128	TWT Pulse Amp.	2.6 – 3.3	10 kW
V-151/6316	Reflex Osc.	8.5 – 10.0	25 mW

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VA-97

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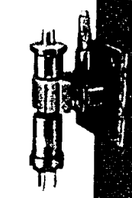
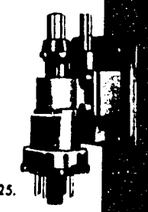


VA-203B

VA-221H



VA-225.

For details, circle #119 on Reader Service Card

NUMBER	TYPE	FREQUENCY RANGE/kMc	TYPICAL OUTPUT
V-153/6315	Reflex Osc.	8.5 – 10.0	100 mW
V-154	Reflex Osc.	10.5 – 12.2	200 mW
V-157	Reflex Osc.	8.5 – 10.0	180 mW
VA-161	BWO	8.2 – 12.4	80 mW
VA-161B	BWO	7.5 – 11.0	80 mW
VA-162	BWO	12.4 – 18.0	30 mW
VA-168	BWO	8.0 – 10.0	200 mW
VA-201B	Reflex Osc.	8.5 – 9.6	60 mW
VA-203B/6975	Reflex Osc.	8.5 – 9.6	30 mW
VA-210B	Reflex Osc.	9.6 – 10.8	30 mW
VA-217	Reflex Osc.	8.5 – 9.6	20 mW
VA-218	Reflex Osc.	10.5 – 10.55	70 mW
VA-220 A-G,Z	Reflex Osc.	5.925 – 8.1	1 watt
VA-220J	Reflex Osc.	4.9 – 5.2	1 watt
VA-221 Series	Reflex Osc.	5.985 – 7.555	40 mW
VA-221H	Reflex Osc.	5.25 – 5.56	40 mW
VA-222 A-G,Z	Reflex Osc.	5.925 – 8.1	1 watt
VA-222R	Reflex Osc.	5.8 – 6.0	2 watts
VA-225 Series	Reflex Osc.	7.0 – 8.5	1 watt

NUMBER	TYPE	FREQUENCY RANGE/kMc	TYPICAL OUTPUT
V-260/6310	Reflex Osc.	8.5 – 10.0	70 mW
V-262	Reflex Osc.	8.5 – 10.0	70 mW
V-270/6312	Reflex Osc.	8.5 – 10.0	70 mW
V-290/6314	Reflex Osc.	8.5 – 10.5	120 mW
VA-800	CW Amp.	1.7 – 2.4	10 kW
VA-800C	CW Amp.	2.16 – 2.4	10 kW
VA-802	CW Amp.	1.7 – 2.4	1 kW
VA-804 Series	CW Amp.	4.4 – 5.875	2 kW
VA-805 Series	CW Amp.	5.875 – 6.425	2 kW
VA-806 Series	CW Amp.	7.125 – 8.5	2 kW
VA-808	Pulse Amp.	5.3 – 5.9	20 kW
VA-816J	Pulse Amp.	3.43 – 3.57	2.5 MW
VA-820 Series	Pulse Amp.	2.7 – 2.9	5 MW
VA-821	Pulse Amp.	2.7 – 3.0	1.5 MW
VA-822	CW Amp.	9.9 – 10.8	1 kW
VA-833A	CW Amp.	0.680 – 0.985	10 kW
VA-833B	CW Amp.	0.470 – 0.680	10 kW
VA-839	Pulse Amp.	2.73 – 2.87	5 MW
VA-845	Pulse Amp.	9.3 – 9.6	5 kW

The complete standard line of DE MORNAY-BONARDI microwave test equipment — *now adding...*

Size Designation Frequency Band in KMC Waveguide Nomenclature	DBA 60-90 RG-99/U Cat No	DBB 50-75 RG-98/U Cat No	DBC 33-50 RG-97/U Cat No	DBD 26.5-40 RG-96/U Cat No	DBE 18-26.5 RG-53/U Cat No	DBF 12.4-18 RG-91/U Cat. No	DBG 8.2-12.4 RG-52/U Cat. No	DBH 7.05-10.0 RG-51/U Cat. No.	DBJ 5.85-8.2 RG-50/U Cat. No.	DBK 3.95-5.85 RG-49/U Cat. No.	DBL 2.6-3.95 RG-48/U Cat. No
Tube Mounts											
Klystron Tube Mount							DBG-111-1	DBH-111-1	DBJ-111-1	DBK-111-1	DBL-111-1
Noise Tube Mount with Tube			ABC-140-T	DBD-140T	DBE-140-T	DBF-140-T	DBG-140-T	DBH -140T	DBJ-140-T	DBK-140-T	DBL-140-T
Transmission Line Components											
Adaptors, Choke to Cover	DBAL-018	DBBL-018	DBCE-018	DBD-010 DBDL-018	DBE-010 DBEG-018	DBF-010 DBFG-018	DBG-010 DBGH-018	DBH-010 DBHJ-018	DBJ-010 DBJR-018	DBK-010 DBKL-018	DBL-010 DBCL-018
Tapered Transitions						DBF-057	DBG-057	DBH-057	DBJ-057	DBK-057	DBL 057
N to Waveguide Transformers	DBA-210	DBB 210	DBC-210	DBD-210	DBE-210	DBF-210	DBG-210	DBH-210	DBJ-210	DBK-210	DBL-210
*Straight Sections	DBA-224	DBB 224	DBC-224	DBD-224	DBE-224	DBF-224	DBG-224	DBH-224	DBJ-224	DBK-224	DBL-224
90° E Plane Elbows	DBA-234	DBB 234	DBC-234	DBD-234	DBE-234	DBF-234	DBG-234	DBH-234	DBJ-234	DBK-234	DBL-234
90° H Plane Elbows				DBD-266-1	DBE-266 1	DBF-266 1	DBG-266-1	DBH-266-1	DBJ-266-1	DBK-266-1	DBL-266-1
Rotating Joints 90-90				DBD-266-2	DBE-266 2	DBF-266-2	DBG-266-2	DBH-266-2	DBJ-266-2	DBK-266-2	DBL-266-2
Rotating Joints 90 Col				DBD 266-3	DBE-266-3	DBF 266 3	DBG-266-3	DBH 266-3	DBJ-266 3	DBK-266-3	DBL-266-3
Rotating Joints Col 90				DBD 266-4	DBE-266-4	DBF-266 4	DBG-266-4	DBH 266-4	DBJ 266 4	DBK-266-4	DBL-266-4
Rotating Joints Col Col				DBD-274	DBE-274	DBF-274	DBG-274	DBH-274	DBJ-274	DBK-274	DBL-274
90° Twisted Sections				DBD 275	DBE 275	DBF-275	DBG-275	DBH 275	DBJ-275	DBK 275	DBL-275
Bulkhead Flanges	DBA-274	DBB 274	DBC-274	DBD-275-1	DBE-275 1	DBF-275 1	DBG-275-1				
Bulkhead Flanges with Seals	DBA-275	DBB 275	DBC-275	DBD 276	DBE 276	DBF-276	DBG-276	DBH-276	DBJ-276	DBK-276	DBL-276
Pressurizing Units	DBA-275 1	DBB-275-1	DBC-275 1								
	DBA-276	DBB-276	DBC-276								
Crystal Mounts & Multipliers											
Crystal Mounts	DBA-310	DBB-310	DBC-310	DBD-310	DBE-310	DBF-310	DBG-310	DBH 310	DBJ-310	DBK-310	DBL-310
Crystal Mounts, Movable Short	DBA 313	DBB-313	DBC 313	DBD-313	DBE 313	DBF-313	DBG 313	DBH 313	DBJ-313		
Tunable Crystal Mounts	DBA-319	DBB-319	DBC 319	DBD-319	DBE-319	DBF 319	DBG 319	DBH 319	DBJ-319	DBK-319	DBL-319
Crystal Multipliers		DBBW-350	DBCA-350	DBDB 350	DBEC-350	DBFC-350	DBGE-350	DBHF-350	DBJF 350	DBKG-350	DBLJ-350
Power Absorbing Units											
Precision Attenuators	DBA 410	DBB-410	DBC-410	DBD-410	DBE-410	DBF-410	DBG 410	DBH 410	DBJ-410	DBK-410	DBL-410
Variable Attenuators, Calibrated	DBA 430-1	DBB 430-1	DBC-430-1	DBD-430-1	DBE 430 1						
Variable Attenuators	DBA-430	DBB-430	DBC-430	DBD-430	DBE-430	DBF-430	DBG 430	DBH 430	DBJ-430	DBK-430	DBL-430
Fixed Attenuators	DBA-440A	DBB-440A	DBC-440A	DBD 440A	DBE-440A	DBF-440A	DBG 440A	DBH 440A	DBJ-440A	DBK 440A	DBL-440A
Low Power Terminations	DBA 450	DBB-450	DBC-450	DBD 450	DBE 450	DBF-450	DBG 450	DBH 450	DBJ 450	DBK 450	DBL-450
Movable Low Power Terminations	DBA-456A	DBB 456A	DBC-456A	DBD-456A	DBE-456A	DBF-456A	DBG 456A	DBH 456A	DBJ 456A	DBK-456A	DBL 456A
Movable Term with Extension	DBA-456	DBB-456	DBC-456	DBD 456	DBE-456	DBF 456	DBG 456	DBH 456	DBJ 456	DBK 456	DBL 456
Movable Term with Ext & Vernier	DBA-456-1	DBB 456 1	DBC 456 1	DBD 456-1	DBE-456-1	DBF-456-1	DBG 456 1	DBH-456-1	DBJ-456-1	DBK 456-1	DBL-456-1
Tunable Low Power Terminations	DBA-459	DBB 459	DBC-459	DBD 459	DBE 459	DBF 458	DBG 459	DBH-459	DBJ 459	DBK 459	DBL-459
High Power Terminations	DBA 460	DBB 460	DBC-460	DBD 460	DBE-460	DBF-460	DBG 460	DBH-460	DBJ-460	DBK 460	DBL-460
Horns											
Pickup Horns	DBA-510	DBB 510	DBC-510	DBD-510	DBE-510	DBF-510	DBG-510	DBH-510	DBJ-510	DBK-510	DBL-510
Standard Gain Horns, 15 DB	DBA-520	DBB 520	DBC-520	DBD 520	DBE-520	DBF-520	DBG-520	DBH-520	DBJ-520	DBK-520	DBL 520
Standard Gain Horns, 20 DB	DBA 520	DBB 520	DBC-520	DBD 520	DBE-520	DBF-520	DBG-520	DBH-520	DBJ-520	DBK-520	DBL 520
Tees, Junctions and Mixers											
E-Plane Tees	DBA 610	DBB 610	DBC-610	DBD 610	DBE-610	DBF-610	DBG-610	DBH-610	DBJ 610	DBK-610	DBL-610
Waveguide Switches, 2 Way	DBA 616	DBB 616	DBC-616	DBD 616	DBE-616	DBF-616	DBG-616	DBH-616	DBJ 616	DBK-616	DBL-616
Waveguide Switches, 4 Way	DBA-617	DBB 617	DBC 617	DBD 617	DBE-617	DBF-617	DBG-617	DBH-617	DBJ 617	DBK-617	DBL 617
H Plane Tees	DBA 620	DBB 620	DBC 620	DBD 620	DBE-620	DBF 620	DBG-620	DBH-620	DBJ 62G	DBK-620	DBL 620
Basic Directional Couplers	DBA 630	DBB 630	DBC 630	DBD 630	DBE 630	DBF-630	DBG-630	DBH-630	DBJ-630	DBK-630	DBL-630
Directional Couplers, Flg to Term	DBA 631	DBB 631	DBC-631	DBD 631	DBE-631	DBF 631	DBG-631	DBH-631	DBJ-631	DBK-631	DBL-631
Directional Couplers, Core to Term						DBF 632	DBG-632	DBH-632	DBJ-632	DBK-632	DBL-632
Directional Couplers, Xtal to Flg	DBA 633	DBB 633	DBC 633	DBD 633	DBE-633	DBF 633	DBG-633	DBH-633	DBJ-633	DBK 633	DBL-633
Directional Couplers, Xtal to Term	DBA 634	DBB 634	DBC-634	DBD 634	DBE-634	DBF-634	DBG-634	DBH 634	DBJ-634	DBK 634	DBL 634
Magic Tees	DBA 650	DBB 650	DBC 650	DBD 650	DBE-650	DBF-650	DBG-650	DBH 650	DBJ 650	DBK-650	DBL-650
Balanced Crystal Mixers	DBA 665	DBB 665	DBC-665	DBD 665	DBE-665	DBF-665	DBG-665	DBH-665	DBJ-665	DBK-665	DBL 665
Frequency Meters											
Precision Cavity Wavemeters,											
Reaction Type	DBA-715-1	DBB-715-1	DBC-715 1	DBD-715-1	CBE-715-1	DBF-715-1	DBG-715-1	DBH-715-1	DBJ-715-1	DBK-715-1	DBL-715-1
Absorption Type	DBA-715-2	DBB-715-2	DBC-715-2	DBD-715-2	DBE-715-2	DBF-715-2	DBG-715-2	DBH-715-2	DBJ-715-2	DBK-715-2	DBL-715-2
Transmission Type	DBA-715 3	DBB-715-3	DBC-715 3	DBD-715-3	DBE-715-3	DBF-715-3	DBG-715-3	DBH-715-3	DBJ-715-3	DBK 715-3	DBL-715-3
Reference Cavity, Reaction Type	DBA-715-1A	DBB-715-1A	DBC-715-1A	DBD-715-1A	DBE-715-1A	DBF-715-1A	DBG-715-1A	DBH-715-1A	DBJ-715-1A	DBK-715-1A	DBL-715-1A
Reference Cavity, Absorption	DBA-715 2A	DBB-715-2A	DBC-715-2A	DBD-715-2A	DBE-715-2A	DBF-715-2A	DBG-715-2A	DBH-715-2A	DBJ-715-2A	DBK-715-2A	DBL-715-2A
Reference Cavity, Transmission	DBA-715 3A	DBB-715-3A	DBC-715-3A	DBD-715-3A	DBE-715-3A	DBF-715-3A	DBG-715-3A	DBH-715-3A	DBJ-715-3A	DBK-715-3A	DBL-715-3A
Impedance Meters											
Precision Standing Wave											
Detectors, Complete	DBA 825	DBB 825	DBC-825	DBD 825	DBE-825	DBF-825	DBG-825	DBH 825	DBJ-825		
Carriage Units Only	DB 820	DB 820	DB 820	DB 820	DB 820	DB 820	DB-820-1	DB-820-1	DB-820-1		
Waveguide Sections	DBA 821	DBB 821	DBC-821	DBD-821	DBE 821	DBF-821	DBG-821	DBH-821	DBJ-821		
Broadband Probes	DBA 822	DBB 822	DBC-822	DBD 822	DBE 822	DBF-822	DBG 822	DBH-822	DBJ-822		
Phase Shifters, Tuners & Shorts											
Phase Shifters	DBA 915	DBB-915	DBC-915	DBD-915	DBE-915	DBF-915	DBG-915	DBH 915	DBJ-915	DBK-915	DBL-915
Calibrated Phase Shifters	DBA-915-1	DBB 915-1	DBC-915-1	DBD-915 1	DBE-915-1	DBF-915-1	DBG-915-1	DBH-915-1	DBJ-915-1	DBK-915-1	DBL-915-1
Variable Stub Tuners	DBA-919	DBB 919	DBC 919	DBD-919	DBE-919	DBF 919	DBG 919	DBH-919	DBJ-919	DBK-919	DBL-919
Fixed Shorts	DBA 960	DBB 960	DBC-960	DBD 960	DBE-960	DBF-960	DBG 960	DBH-960	DBJ 960	DBK-960	DBL 960
Movable Shorts	DBA-969A	DBB 969A	DBC-969A	DBD-969A	DBE-969A	DBF-969A	DBG 969A	DBH-969A	DBJ-969A	DBK-969A	DBL-969A
Movable Shorts with Extension	DBA 969	DBB 969	DBC-969	DBD-969	DBE-969	DBF-969	DBG-969	DBH-969	DBJ-969	DBK 969	DBL 969
Movable Shorts with Ext & Vernier	DBA-969-1	DBB 969-1	DBC-969-1	DBD-969-1	DBE-969-1	DBF-969-1	DBG-969-1	DBH-969-1	DBJ-969-1	DBK-969-1	DBL-969-1
E-H Plane Tuners	DBA-979	DBB 979	DBC-979	DBD 979	DBE-979	DBF-979	DBG-979	DBH-979	DBJ-979	DBK-979	DBL-979
E-H Plane Tuners with Vernier	DBA-979-1	DBB 979-1	DBC-979-1	DBD-979-1	DBE 979 1	DBF-979-1	DBG 979-1	DBH-979-1	DBJ-979-1	DBK-979-1	DBL-979-1
Accessories											
Standard Plain Flange	DBA-1000	DBB-1000	DBC-1000	DBD-1000	DBE-1000	DBF-1000	DBG-1000	DBH-1000	DBJ-1000	DBK-1000	DBL-1000
Standard Choke Flange				DBD-1001	DBE-1001	DBF-1001	DBG-1001	DBH-1001	DBJ-1001	DBK-1001	DBL-1001
Aluminum Plain Flange							DBG-1002				DBL-1002
Aluminum Choke Flange							DBG-1003				DBL-1003
Special Round Flange				DBD-1004	DBE-1004						
Screw Plain Flange					DBE-1005						
Screw Choke Flange					DBE-1006						
Adjustable Waveguide Supports, Ultramicrowave	DB-1010	DB-1010	DB-1010	DB-1010	DB-1010						
Adjustable Waveguide Supports, Microwave						DB-1010-1	DB-1010-1	DB-1010-1	DB-1010-1	DB-1010-2	DB-1010-2
Waveguide Chassis Mounting Stands	DBA-1012	DBB-1012	DBC-1012	DBD-1012	DBE-1012	DBF-1012	DBG-1012	DBH-1012	DBJ-1012	DBK-1012	DBL-1012
Waveguide Fastening Screws, Pr.	DBA-1020	DBB-1020	DBC-1020	DBD-1020	DBE-1020	DBF-1020	DBG-1020	DBH-1020	DBJ-1020	DBK-1020	DBL-1020
Waveguide Window Seals	DBA-1100	DBB-1100	DBC-1100	DBD-1100	DBE-1100	DBF-1100	DBG-1100	DBH-1100			

New 1959-60 catalog on request. Deliveries: 2 weeks to 30 days on most items.

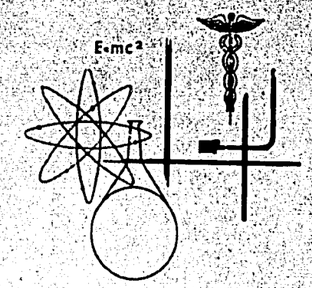
DE MORNAY-BONARDI®

DE MORNAY-BONARDI
780 SOUTH ARROYO PARKWAY • PASADENA, CALIF.

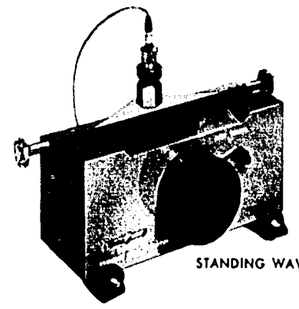
For details, circle #120 on Reader Service Card

140 KMC

ULTRAMICROWAVE® EQUIPMENT BY

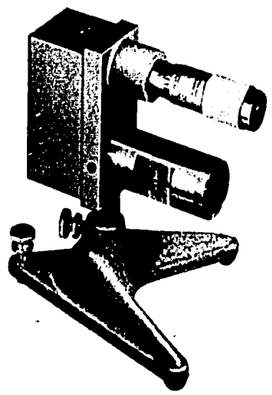


—it works—it's accurate—it's available

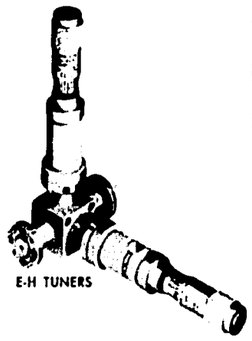


STANDING WAVE DETECTORS

CRYSTAL MOUNTS



CAVITY WAVEMETERS



E-H TUNERS

Recent advances in physical research have created an interest in the highest attainable microwave frequencies—an interest which requires the use of millimeter wave components and instruments beyond the scope of those currently available. Just as in 1954, when De Mornay-Bonardi was the first to offer commercially available instruments and components of A and B sizes (50-90 KMC), now for first time D-B offers instruments and components for the W size—90 to 140 KMC. These units truly represent a major breakthru in the microwave art, and can greatly enlarge your scope of microwave activity.

DE MORNAY-BONARDI
780 SOUTH ARROYO PARKWAY • PASADENA, CALIF.

DE MORNAY-BONARDI®

For details, circle #121 on Reader Service Card

C-A-C®

A Subsidiary of Collins Radio

As designers and manufacturers of inductor components and related inductor assemblies, Communication Accessories Company works constantly toward three major objectives which are prime requisites to sound business and sturdy growth:

1. To produce the best products
2. To provide the best service
3. To keep a realistic price structure

To accomplish these objectives, C-A-C has built an ultra modern and functional 56,000 square foot production and office building where provisions for employee comfort and efficiency are a part of the architecture.

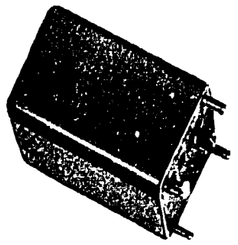
C-A-C's staff of engineers and sales representatives has been so selected as to make these goals actualities. In fact, C-A-C's entire personnel functions as a tool to provide you with the utmost in good service.

C-A-C's products, constructed from the best available components, assure maintenance-free operation at peak performance. Your operational costs are reduced when you make use of C-A-C components. We welcome your requests for information, products or assistance. For further product detail, send for our latest catalog.

COMMUNICATION ACCESSORIES COMPANY
Highways 50 and 71 Bypass, Lee's Summit, Mo.

LAMINATED TRANSFORMERS and REACTORS

Transformers For Transistor and Tube Circuits



POWER TRANSFORMERS
Std. to MIL-T-27A, Class S
Also Class T to 200° C Amb.

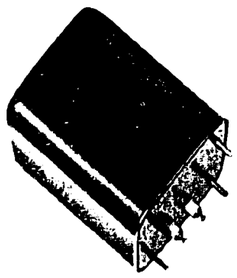
Inquire about our new series of transformers specifically designed for modern aircraft equipments. They employ outputs of medium range plate voltage at high currents and special outputs to supply transistor circuits.

Hermetically Sealed, Built per MIL-T-27A, Grade 4, Class S (85°C Ambient, 45°C Rise). Life expectancy X (10,000 hours minimum). Maximum operating altitude, 70,000 feet

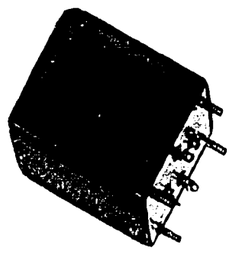
DC to DC Converter Saturable Transformers and Separate Switching Transformers with non-saturable power transformers also available.

Many standard units carried in stock.

Transformers and Chokes available from 50 CPS to 15 KC.



FILTER REACTORS



FILAMENT TRANSFORMERS
380-1000 Cycles
105/115/125 Volt Primaries

TOROIDS (REGULAR)

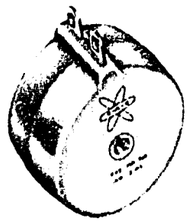
OPEN COIL
(TYPE QL)

CORE TYPE 206. Excellent Q characteristics especially for portable and airborne equipments. Best from 1 KC to 20 KC. Q to 140. Inductance from 5 MH to 3 HY.

CORE TYPE 848. Same physical size as the 206. Lower permeability for use from 2 KC to 100 KC. Q to 190. Inductance from 2 MH to 500 MH.

CORE TYPE 930. High Q for high power level and stability with slight increase in weight and volume. Frequency .5 KC to 10 KC. Q to 160. Inductance from 5 MH to 17.5 HY.

CORE TYPE 395. Same physical size as 930. Lower permeability for use from 1 KC to 50 KC. Exceptional high Q to 225. Inductance from 5 MH to 500 MH.



MOLDED PLASTIC
(TYPE MP)

CORE TYPE 254. Exceptional Q below 5 KC. For critical filters, oscillators and tuned transformers. Sharp characteristics and highest power capabilities Q to 205. Inductance from 20 MH to 36 HY.

CORE TYPE 715. Used below 2.5 KC where higher Q is important. Best in high level networks where stability versus voltage is a factor. Q to 250. Inductance from 20 MH to 60 HY.

HERMETICALLY SEALED
(TYPE HS)

Special core types in a variety of permeabilities and sizes, including temperature stabilized, are available on request. Many in stock.

For details, circle #122 on Reader Service Card

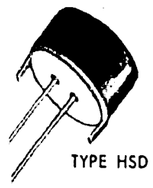
SUB-MINIATURE TOROIDS

TYPE QLS

Basic Inductor Component with flex leads. Wax impregnated units standard. Plain or plastic dipped on special order. Q valves from 12 to 190 over a frequency range of 1 KC to 5 MC. Maximum 4 HY inductance.

TYPE MPF

Hi-temp polyester resin molding compound. Tinned brass terminals. 3-48 tapped center bushing easily stacked. Special versions available for 350° F. application.



TYPE HSD

Optimum case size for printed circuit applications with mounting tabs. Hermetically sealed compression glass header. Available with four leads for tapped coils.

CORE TYPE 050 from 5.0 MH to 3.0 HY
For Freq. up to 15 KC.

CORE TYPE 051 from 1.0 MH to 500 MH
For Freq. up to 100 KC.

CORE TYPE 054 from .05 MH to 10 MH
For Freq. up to 5 MC.

THIS SERIES NOT AVAILABLE WITH TEMPERATURE STABILIZATION

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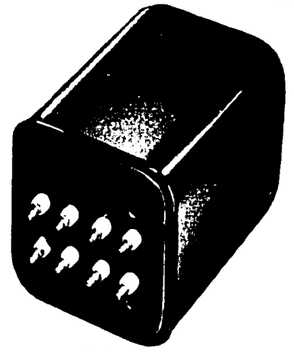
MAGNETIC AMPLIFIERS SATURABLE REACTORS PRECISION TRANSFORMERS

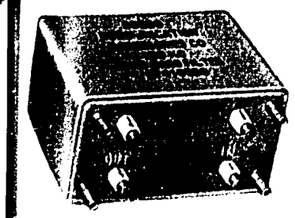


We build saturable transformers for 2-phase servo motors, missile control and other automatic control devices in a wide variety of types. Frequency, 60 CPS to 15 KC. Also complete magnetic amplifiers and Special Mag Amp devices.

Built to MIL-T-27A
Grade 4, Class R, Life X
Altitude to 50,000 Feet (or you name it!)

Communication Accessories Company

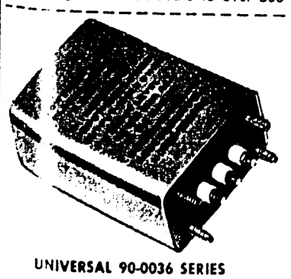
FILTERS



100 KC BAND PASS FILTER

BAND PASS

LC filters utilizing high Q toroidal inductors, high quality capacitors, impedence transformations, near unity coupling and other applications of advanced network theory resulting in high performance units in small volume packages. C-A-C filters range from sub-audio to over 500 KC.



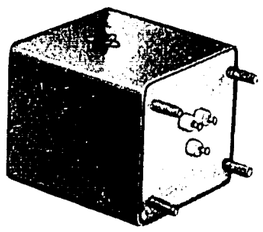
UNIVERSAL 90-0036 SERIES
40 CPS to 50 KC

LOW PASS

All the wide variety of C-A-C Low Pass Filters are built to military specifications. Temperature: —40°C to +85°C for a pass band tolerance of ± 1 db.

BAND REJECTION AND HIGH PASS FILTERS ALSO AVAILABLE

TELEGRAPH TONE FILTERS and NETWORKS



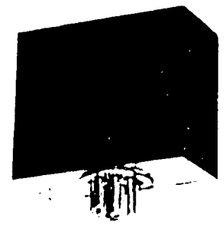
HERMETICALLY SEALED
170 Cycle Spacing

Transmit Filters, 90-057- Series
Receive Filters, 90-0573 Series
Center Frequency from 425 CPS to 3315 CPS.

C-A-C produces many types of telegraph filters with a variety of channel spacing—120 Cycle, 150 Cycle, 85 Cycle and others. Also Oscillators, Discriminators and Translation Filters.

C-A-C®

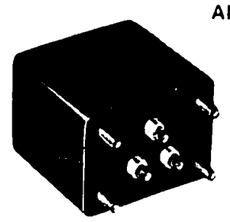
SPECIAL FILTERS



TELEMETERING FILTERS

TELEMETERING CHANNEL FILTERS
Miniaturized Version of
Standard RDB Series
90-0734 Series
90-0735 Series
90-0003 Series
400 CPS to 960 CPS
1,300 CPS to 2,300 CPS
3,000 CPS to 70,000 CPS

AIRCRAFT NAVIGATION FILTERS



AIRCRAFT NAVIGATION FILTERS

C-A-C has developed numerous custom designs for equipment manufacturers. Send your specifications for a prompt engineering proposal

INSTRUMENT LANDING SYSTEM
90 and 150 Cycle Filters

VHF OMNI RANGE
30 Cycle Filters
9960 Cycle Discriminators
30 Cycle Transformers

TACTICAL AIR NAVIGATION
15 Cycle Band Pass Filters
135 Cycle Band Pass Filters
4046 Cycle Band Pass Filters
1350 Cycle Tuned Circuits
Pulse Differentiating Transformers
Rate Coupling Transformers
Special Toroidal Coils
Pulse Delay Networks

MARKER BEACON
400 CPS Tuned Circuits
1300 CPS Tuned Circuits
3000 CPS Tuned Circuits
Audio Transformers

THESE ARE TYPICAL OF MANY SPECIAL FILTERS C-A-C SUPPLIES

Bliley

THE STANDARD OF QUALITY

BG7 SERIES

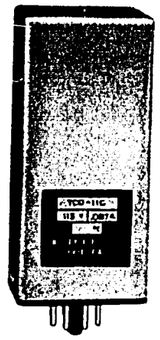
BH9 SERIES

BX SERIES

BG9 SERIES

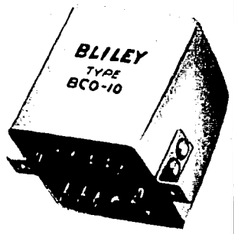
QUARTZ CRYSTALS

BTC-2 SERIES



TCO-11 SERIES

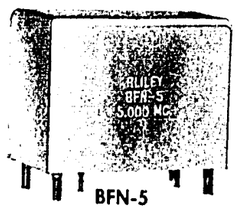
TCO-141 SERIES



BCO-10 SERIES

OVENS

BFN-28A



BFN-5

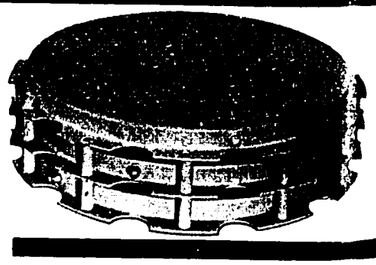
CRYSTAL FILTERS

CCO-7 SERIES

PACKAGED OSCILLATORS

DOUBLE ENDED RINGING LINE

SET OF THREE MATCHED DELAY LINES



ULTRASONIC DELAY LINES

For details, circle #124 on Reader Service Card

For details, circle #125 on Reader Service Card

BLILEY ELECTRIC CO. UNION STATION BUILDING **ERIE, PENNSYLVANIA**

CRYSTALS

SERIES	FREQUENCY RANGE	DESCRIPTION	BULLETIN
BH6	200 kc to 125 mc	Holder is equivalent to MIL Type HC-6 U, can be supplied with all MIL Type crystal units, and for commercial requirements. Special models for high shock, temperature and vibration applications. Also available with wire leads.	No. 493
BX	10 mc to 125 mc	Holder is equivalent to MIL Type HC-18 U. Can be supplied with all MIL Type crystal units and for commercial requirements. Also available with plug-in pins.	No. 502
BH9	4 kc to 200 kc	Holder is equivalent to MIL Type HC-13 U. Can be supplied with all MIL Type crystal units. Also available with wire leads. Special models for high shock, vibration and temperature applications.	No. 501
BG6	3 mc to 100 mc	Glass mounted crystal unit has minimum ageing and high reliability. Also supplied with wire leads when part of BTC-2 crystal oven assembly. Special model BG61A-5 at 5 mc has maximum stability for time standards.	No. 496
BG7	4 kc to 3 mc	Advanced design in all glass mounting for plug-in or with wire leads in Bliley TCO-11C oven assembly. Exceptional stability with low ageing and low resistance.	No. 503
BG9	100 kc or 1000 kc	Glass mounted crystal unit developed for secondary standards. Has minimum ageing and high Q for stability.	100kc-No.492 1000kc-No.491
BG12	100 kc	Glass mounting for GT-cut crystals at 100 KC. Supplied with wire leads in TC97 oven assembly for primary standards.	No. 498

OVENS

SERIES	HEATER VOLTAGE	DESCRIPTION	BULLETIN
TCO-14	6.3, 12.0 or 26.5	High stability (·1°C.) oven for use with Bliley crystal series BH6 or BH9 (MIL-Holders HC-6 U or HC-13 U)	No. 514
TCO-141	6.3, 12.0 or 26.5	Crystal and component oven with stability ·1.5°C. features snap-action thermostat for reliable performance and low circuit interference. For use with Bliley crystal series BH6 or BH9 (MIL-Holders HC-6 U or HC-13 U)	No. 515
TC90	6.3, 18 or 115	Precision crystal ovens for frequency standards. Single stage models hold ·1°C; Dual stage models hold ·.25°C.	No. 500
BTC-1	6.3	An hermetically sealed crystal and oven subminiature plug-in package which maintains frequency ·3 ppm with ambient temperature variation from -55°C. to +70°C. Freq. range: 5 mc to 125 mc.	No. 494
BTC-2	6.3 or 26.5	An hermetically sealed plug-in package consisting of oven and glass mounted crystal for high reliability, high stability and low ageing. Freq. range: 4 kc to 125 mc.	No. 497
BCO-10	12.6, 26.5 or 115	A compact component oven providing temperature control for up to 10 diodes. Stability ·1°C. with ambient temperature -10° to +50°C	No. 517
BPCO-1	26.5	High stability transistorized proportional controlled plug-in oven for crystals and components. Stability ·.01°C. from +10°C. to +50°C. For use with Bliley crystal series BG6, BG7 and BG9.	No. 518
TCO-11	115	Precision oven designed for use with Bliley BG6 and BG7 series glass mounted crystals. Temperature stability ·1°C.	No. 508

CRYSTAL FILTERS

Bliley filter networks are available in three standard designs with characteristics selected for general application as shown in the following tabulation:

MODEL	FREQ	BW-6db	BW-60db	FORM FACTOR	IMPEDANCE
BFN-5	5.0 mc	3.5 kc	12 kc	3.5	1600 ohms
BFN-11	10.7 mc	30.0 kc	55 kc	1.8	2700 ohms
BFN-13	13.0 mc	30.0 kc	55 kc	1.8	1500 ohms

CUSTOM ENGINEERED FILTERS

Bliley facilities are available for analysis, design and production of crystal filter networks for specialized applications over the range from 100 kc to 10 mc. Depending upon functional requirements, bandwidths from 50 cycles to 100 kc are attainable. With an unsurpassed background in the development and manufacture of quartz crystal resonators, Bliley is in a unique position to utilize modern crystal filter synthesis techniques in combination with special quartz resonators having low spurious response characteristics. Request Bulletin No. 509.

PACKAGED OSCILLATORS

Bliley Model CCO-7 is an ultra-stable packaged oscillator that combines transistorized circuitry, temperature control and a precision quartz crystal at 1 mc, mounted in glass, for stability of 1 parts in 10 million. For applications that require stabilities in excess of 1 ppm, oscillator design should be closely integrated with crystal parameters to obtain desired performance. Bliley has extensive experience in design and development of packaged oscillators for high stability performance. Request Bulletin No. 516.

ULTRASONIC DELAY LINES

Bliley ultrasonic delay lines for the range 2 to 1500 microseconds are custom engineered for each application. Exceptional performance characteristics such as low loss and attenuation of spurious responses result from a complete appreciation of the critical factors involved.

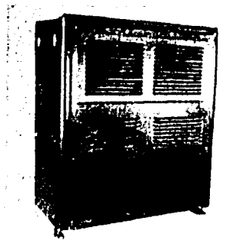
A new series of low loss short delay lines (2 to 50 microseconds) for carrier frequencies up to 30 mc utilizes barium titanate transducers. Loss levels of these lines, into terminations of 100 ohms, range from 6 db to 10 db compared to 35 db for quartz transducers. Bliley is completely equipped to design, produce and test ultrasonic delay lines for your application. Request Bulletins No. 18 and No. 513.

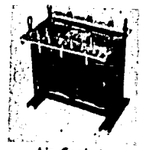
BLILEY ELECTRIC CO. UNION STATION BUILDING **ERIE, PENNSYLVANIA**

PLATE TRANSFORMERS

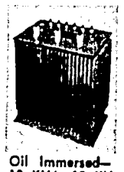
25 cycles to 2000 cycles
Single and polyphase for all rectifier circuits
Indoor or outdoor—submerged—airborne operation

Liquid Immersed—OIL, ASKAREL
3 KVA through 10000 KVA
Voltages through 230 KV
Air Cooled—Class A, B, H
1 KVA through 4000 KVA
Voltages through 15 KV
Compound Filled
1 KVA through 25 KVA
Voltages through 15 KV

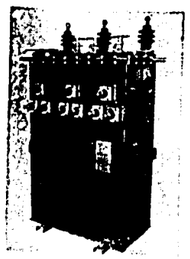




Air Cooled—
7 KVA—8 KV



Oil Immersed—
10 KVA—12 KV



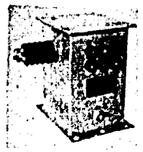
Air Cooled 75 KVA—5 KV Regulated

Askarel Immersed—35 KVA—15 KV

FILAMENT TRANSFORMERS

DRY TYPE AND COMPOUND FILLED
Output 0.5 KVA through 25 KVA High Potential Test 4 KV through 31 KV
LIQUID IMMERSED—OIL OR ASKAREL
Output 0.15 KVA through 25 KVA High Potential Test 10 KV through 140 KV

Air Cooled—
7 volts—1000 amps

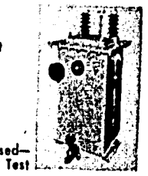


Askarel Immersed—
300 VA—35 KV Test

FILTER REACTORS

Liquid Immersed—OIL or ASKAREL
LI^2 from 10 through 50000
Hi Potential Test 10 KV through 140 KV
Air Cooled or Compound Filled
LI^2 from 1 through 5000
Hi Potential Test 4 KV through 31 KV

Air Cooled—
LI^2 25—19 KV Test

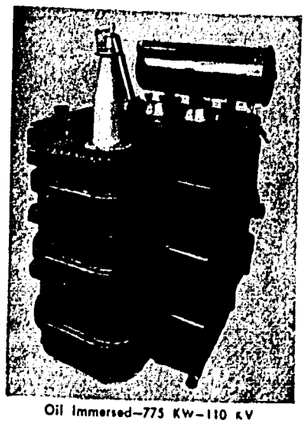


Oil Immersed—
LI^2 40—34 KV Test

UNIT RECTIFIERS

A complete assembly consisting of:
Plate Transformer • Filament Transformer (if required)
Filter Reactor and/or Capacitor
Tube or Semiconductor Rectifiers

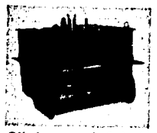
Liquid Immersed—Oil or Askarel
Output Power—2 KW through 10000 KW
Output Voltage—1 KV through 120 KV
Air Cooled
Output Power—1 KW through 4000 KW
Output Voltage—600 volts through 15 KV



Oil Immersed—775 KW—110 KV

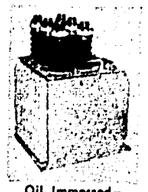
Askarel Immersed—
5 KW—10 KV

Oil Immersed—Silicon
Rectifiers—2 KW—15 KV

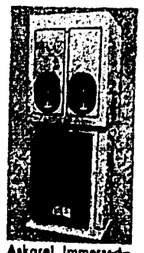


Oil Immersed—Selenium
Rectifiers—10 KW—12 KV

Oil Immersed—
17 KW—16 KV



Oil Immersed—
12 KW—13 KV



Askarel Immersed—
37 KW—17 KV

MOLONEY ELECTRIC COMPANY
ST. LOUIS, 20, MISSOURI

For details, circle #126 on Reader Service Card

PULSE TRANSFORMERS

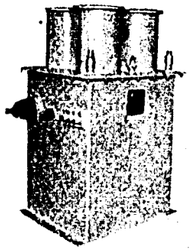
LIQUID IMMERSED

Average Power 0.5 KW through 2500 KW
Pulse Voltage Output 15 KV and above

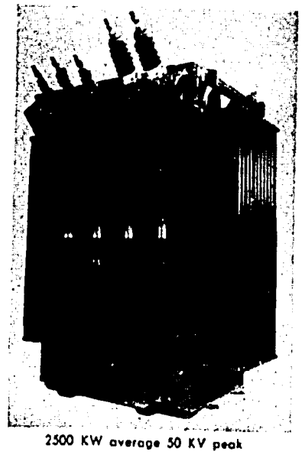
25 KW average 100 KV peak

2 KW average
30 KV peak

20 KW average
60 KV peak



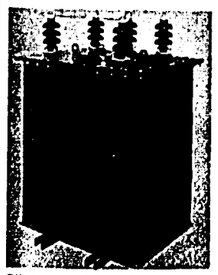
45 KW average 90 KV peak



2500 KW average 50 KV peak

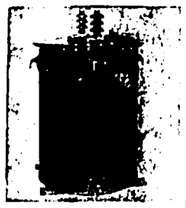
MODULATION TRANSFORMERS and REACTORS

For Amplitude Modulated Transmitters with Radio Frequency Outputs of 1 Kilowatt and Above.



Oil Immersed Transformer—25 KW

Compound Filled
Reactor—1 KW

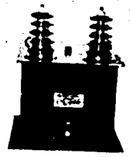


Askarel Immersed
Reactor—10 KW

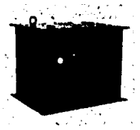
CHARGING REACTORS

LIQUID IMMERSED
Peak LI^2 from 1 to 100,000—4 KV to 140 KV

2.0 hy.—3.5 amp—50 KV Test



1.0 hy.—1.0 amp—
50 KV Test



1.5 hy.—4 amp—
34 KV Test

HYPERCORES

For smaller, lighter weight magnetic components, use Moloney HyperCores.

12 Mil

1 Mil

2 Mil

4 Mil

When you specify **Moloney** . . . for transformers and other magnetic components for electronics . . . you're tapping one of the richest reservoirs of experience and technical know-how available today to the electrical industry. Since 1896 **Moloney** has designed and fabricated transformers and related products. Now **Moloney's** vast store of knowledge and engineering ability is available to the electronics industry.

Write for Magnetic Component Bulletin #3815 and HyperCore Bulletin #SR-208.

MOLONEY ELECTRIC COMPANY
ST. LOUIS, 20, MISSOURI

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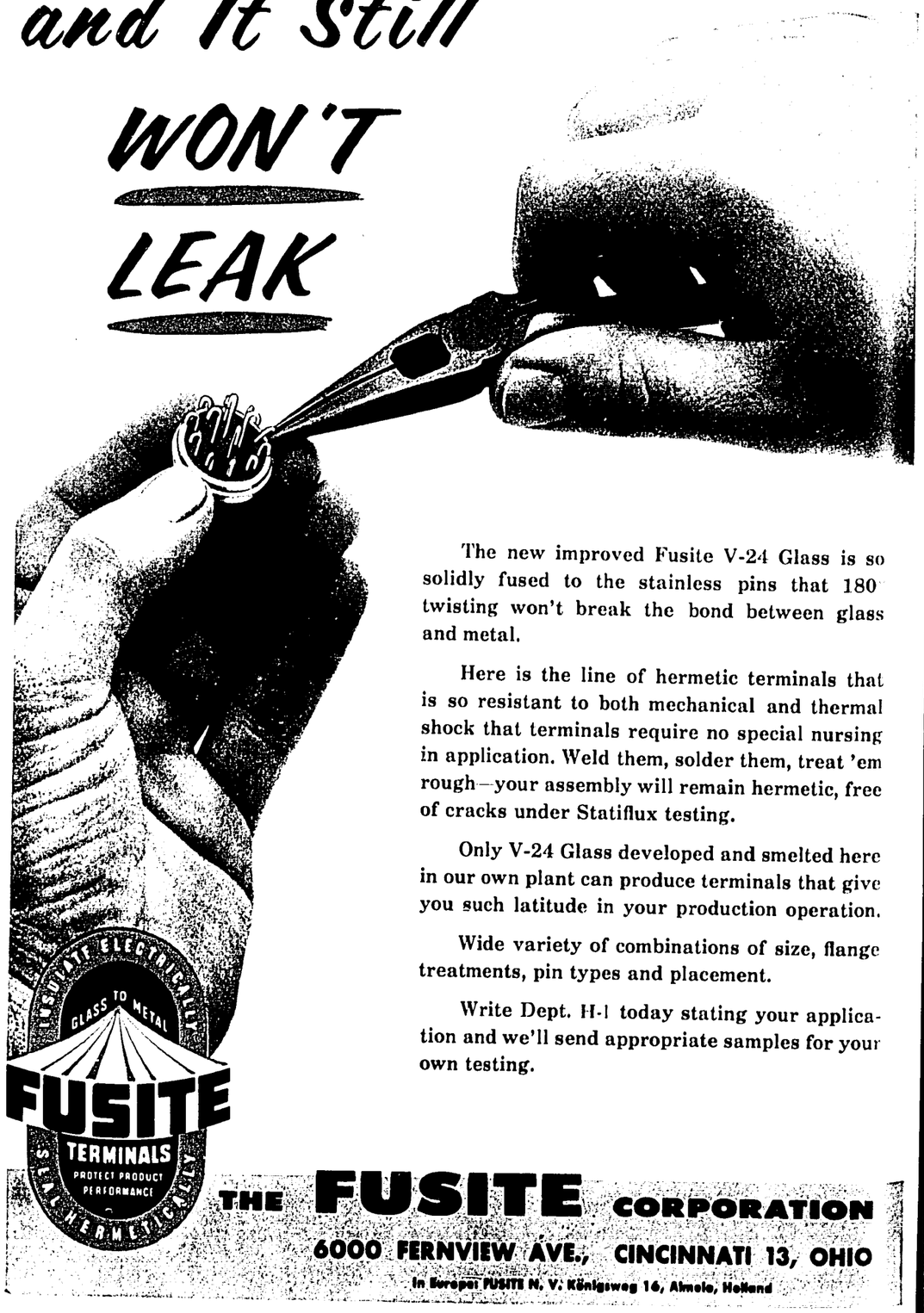
Twist It 'til It Snaps and It Still WON'T LEAK



The new improved Fusite V-24 Glass is so solidly fused to the stainless pins that 180° twisting won't break the bond between glass and metal.

Here is the line of hermetic terminals that is so resistant to both mechanical and thermal shock that terminals require no special nursing in application. Weld them, solder them, treat 'em rough—your assembly will remain hermetic, free of cracks under Statiflux testing.

Only V-24 Glass developed and smelted here in our own plant can produce terminals that give you such latitude in your production operation.

Wide variety of combinations of size, flange treatments, pin types and placement.

Write Dept. H-1 today stating your application and we'll send appropriate samples for your own testing.

THE FUSITE CORPORATION
6000 FERNVIEW AVE., CINCINNATI 13, OHIO
In Europe: FUSITE N. V. Königsweg 16, Almelo, Holland

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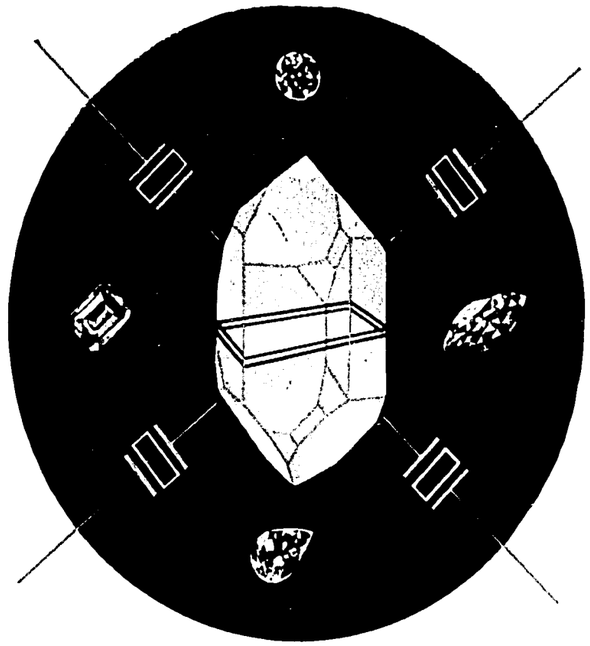
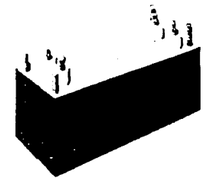




HOW TO SIMPLIFY CIRCUIT DESIGN WITH BURNELL CRYSTAL FILTERS

Through advanced crystal filter production techniques and circuitry by Burnell & Co., it is now possible to overcome numerous design problems formerly believed insoluble with even the best individual toroidal components.

FREQUENCY RANGE EXTENDED

Depending on band width and frequency, filters may be composed entirely of crystals or in complex networks, combine quartz crystal elements with stabilized toroidal coils to produce the desired band width and shape factor. Frequency has been extended from low range up to 20 megacycles.

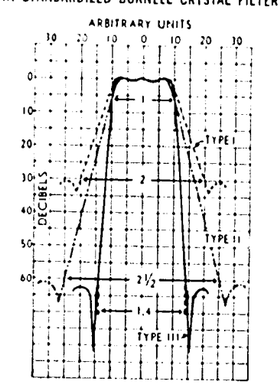
TRANSISTOR TO PENTODE OPERATION

Economy is achieved with standardized complex designs of lattice networks and their three terminal network derivatives. Packaging encompasses a wide range in standard, miniature and sub-miniature sizes with considerable latitude in permissive impedance range from transistor usage to pentode operation.

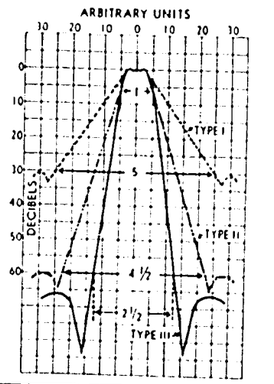
STANDARD DESIGN OR CUSTOM ENGINEERED

Whether you need crystal filters of standard design or custom units engineered to specifications of center frequency, band width, selectivity and impedance level, the facilities of Burnell & Co. are at your disposal. Write for new Burnell Crystal Filter Bulletin XT-455.

TYPICAL RESPONSE CURVES INDICATING THE VARIOUS SHAPE FACTORS AVAILABLE IN STANDARDIZED BURNELL CRYSTAL FILTERS



WIDE BAND CRYSTAL FILTER



NARROW BAND CRYSTAL FILTER

Burnell & Co., Inc.
PIONEERS IN TOROIDS, FILTERS AND RELATED NETWORKS

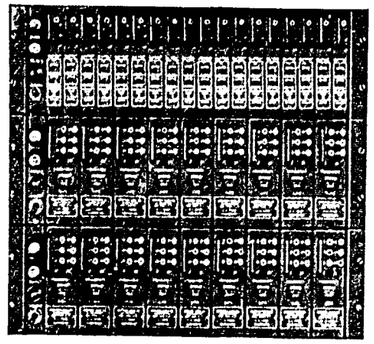
DEPT. P-12

EASTERN DIVISION
10 PELHAM PARKWAY
PELHAM, N. Y.
PELHAM 8-5000
TWX PELHAM 3633

PACIFIC DIVISION
720 MISSION STREET
SOUTH PASADENA, CALIFORNIA
RYAN 1-2841
TWX PASACAL 7578

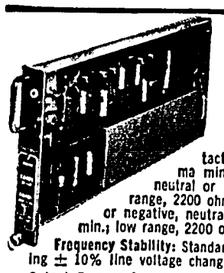
For details, circle #129 on Reader Service Card

Northern Radio TRANSISTORIZED Voice Frequency Carrier Telegraph Systems



18 CHANNELS IN ONLY 15¾" PANEL SPACE

Top shelf shows 18 FS Tone Keyers, Type 211, Model 1; Next 2 shelves contain 9 each FS Tone Converters, Type 212, Model 2.



FREQUENCY SHIFT TONE KEYER

Type 211, Model 1

Keying Inputs, levels and impedances: 1: Contact keying (internal battery to "dry" contacts) 1 ma min.; 2. DC current pulses, positive or negative, neutral or polar; high range, 220 ohms, 30 ma. min; low range, 2200 ohms, 0.5 ma. min.; 3. DC voltage pulses, positive or negative, neutral or polar; high range, 100,000 ohms, 10 volts min.; low range, 2200 ohms, 1 volt min.

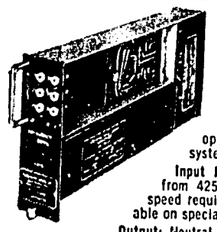
Frequency Stability: Standard Networks ± 2 cps total for all causes including ± 10% line voltage change and ± 25°C. from 25°C. temperature change.

Output Frequencies: All standard VF carrier channels from 425 to 3315 cps. Bandwidth dependent on keying speed requirements. Other frequencies and bandwidths available on special order.

Output Level and Impedance: 5 dbm maximum, into 600 ohms, unbalanced. May be paralleled with any number of other Keyers operating on different frequencies in the same audio system.

Power Requirements: 14 V DC, 15 MA. Two transistorized power supplies and one automatic change-over relay are mounted on the rear of each mounting shelf.

Dimension: 7/8" wide x 5¼" high x 10½" deep.



FREQUENCY SHIFT TONE CONVERTER

Type 212, Model 2

Input Level and Impedance: —48 dbm to +8 dbm into 600 ohms, unbalanced. May be paralleled with any number of other converters operating on different frequencies in the same audio system.

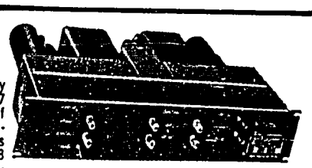
Input Frequencies: All standard telegraph VF channels from 425 to 3315 cps.. Bandwidth dependent on keying speed requirements. Other frequencies and bandwidths available on special order.

Output: Neutral DC voltage pulses of 5 volts maximum across a 2000 ohm external load. Polar pulses ± 10 volts across a 2000 ohm external load. Output drives appropriate voltage-to-current converters, such as Northern Radio Type NRC 691 Transistor Relay which provides "Dry Contact" Keying to external battery supply.

Power Requirements: 14 V DC at 30 MA. Two transistorized power supplies and one automatic change-over relay are mounted on the rear of each mounting shelf.

Dimensions: 17/8" x 5¼" x 113¼" deep. For rack mounting a number of these units, a shelf assembly is available accommodating nine (9) units in a panel height of 5¼".

LINE BATTERY P.S. PANEL



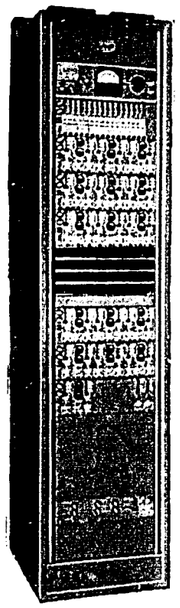
The Northern Radio Line Battery Power Supply Panel, Type 227 Model 1, is used as a source of DC power for teleprinter, telegraph and similar circuits. It is equipped with two (2) Type 228 Model 1 Power Supplies, to provide DC requirements for a group of eighteen (18) or less teleprinter channels. The two Power Supplies are normally mounted on the Line Battery Power Supply Panel, Type 227 Model 1, with one Supply operating and the second "standing-by." An automatic transfer circuit is provided on the panel to place the "stand-by" unit in operation should the first supply fail. The Line Battery Power Supply Panel, Type 227 Model 1, is 3½" high x 19" long. The AC input and DC output circuits are isolated from each other and also from chassis so that either side of the circuit may be grounded, or left ungrounded as may be determined.

Technical Data:

AC Input: 115/230 volt, 50/60 cycles AC ± 10%. Output Voltage: 120 volts DC nominal. Maximum Output Current: 1.2 amperes. Maximum Output Ripple Voltage: 2%.

16-CHANNEL DIVERSITY SYSTEM

- **Diversity switching sensitivity from —60 dbm to 0dbm**



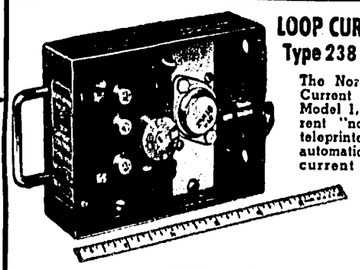
The Northern Radio Voice Frequency Telegraph Terminal, Type 235 Model 1, is a multi-channel frequency shift communications terminal used for transmission and reception of telegraph, teleprinter or telemetering signals over channels subject to fading or attenuation changes, such as long distance point-to-point radio circuits. It provides the necessary equipment for transmission of 16 intelligence channels over one (1) voice frequency circuit, and diversity reception of 16 similar channels, received through two (2) voice frequency circuits. The two (2) voice frequency receiving circuits are normally obtained from radio receivers arranged for space diversity reception. Means are provided to allow reception on a frequency diversity basis rather than space diversity. A combination of space and frequency diversity may be utilized for maximum reliability, when conditions are such as to require same. All the necessary equipment may be mounted in approximately ⅔ of one standard 7-foot telegraph rack.

PRINTER RELAY

Type 237, Model 1

The Northern Radio Printer Relay, Type 237 Model 1, is used as a coupling device between a DC teleprinter signal loop and the printer selector magnet. It replaces electro - mechanical signal relays and their associated local DC power supplies normally used with printers, providing the advantages of relays and improving printer performance but eliminating the maintenance problems which electro - mechanical relays introduce.

This device effectively isolates the reactance of the printer selector magnet, presenting a resistive termination to the signal loop. Several printers equipped with this device can, therefore, be connected in series with the same signal loop without harmful interaction between them. The Printer Relay may be used with either polar or neutral keyed signals. When neutral signals are supplied, the device automatically selects the proper operating level for the loop current supply, and can therefore tolerate large changes in absolute values of loop current without introducing appreciable distortion into the printer selector magnet. It normally mounts within the housing of the teleprinter.



LOOP CURRENT CONTROL

Type 238 Models 1 and 2

The Northern Radio Loop Current Control, Type 238 Model 1, is used as a current "normalizer" in DC teleprinter signal loops, to automatically maintain loop current at the optimum value despite changes in loop resistance or loop supply voltage.

The Loop Current Control, Type 238 Model 1, is designed for use in loops requiring a nominal 60 milliamperes operating current, while the Model 2 is designed for a nominal 20 milliampere circuit. Both models incorporate a calibration control to allow reasonable variations from these design values.

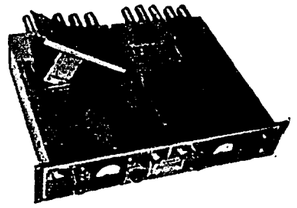
Input Impedance: Variable. Automatically changes as necessary to maintain "constant current" in the circuit to which connected. Maximum and minimum limit of operation are specified by allowable voltage drops across the terminals of the device.

Voltage Limits: Maximum—80 volts; Minimum—5 volts.

Operating Currents: Model 1: 60 milliamperes (adjustable 55-75 milliamperes). Model 2: 20 milliamperes (adjustable 10-30 milliamperes).

MULTI-CHANNEL FREQUENCY SHIFT TONE TELEGRAPH SYSTEMS

These Multi-Channel Telegraph Systems are audio carrier systems capable of multiplexing such circuits as telephone lines, VHF, UHF, or radio frequency links—or practically any type circuit from which a two-wire audio circuit can be derived. Designed to meet any speed requirements, these systems are fully electronic, without relays or moving parts to wear. They can be used for high-speed printer, Morse or time division Multiplex circuits, as well as such application as Telemetering, Control Circuits and Servo-Mechanisms. Instantaneous and complete sending and channel control permits any binary code groups, either "Clear Text" or "Cryptographic," to be channelized without need for additional phasing or synchronizing equipment, while paralleling of channels will allow for transmission of other type codes, such as 3 element cable code. The completely independent operation of each channel, including its own power supply, localizes faults to one channel only, leaving other channels unaffected. Individual channel separation filters are used at both transmitting and receiving ends. This arrangement allows for sending telegraph or control signals over a circuit carrying, simultaneously, other forms of intelligence: or for two-way communications on the same line. The audio frequency shift principle of transmission provides for high fidelity of signal reproduction over a wide range of signal levels as well as under severe noise or interference conditions. Circuit requirements of any speed, shift and center frequency can readily be met. The systems illustrated are for use on printer circuits up to 100 WPM channel capacity. The system arrangement is very flexible, permitting grouping of the basic units into various arrangements of Multiplex Systems. These systems can be made to accommodate a large variety of channel numbers and speeds to meet any individual requirements. The flexibility is further improved by the fact that the racks, power control units, and terminal connection panels are the same for both transmitting and receiving terminals.

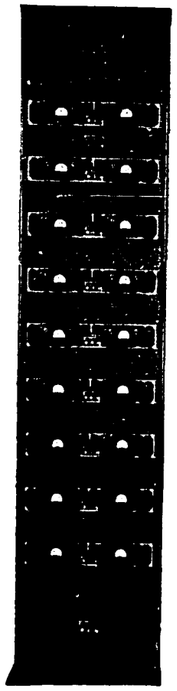


DUAL FS TONE KEYER; TYPE 153 MODEL 3:

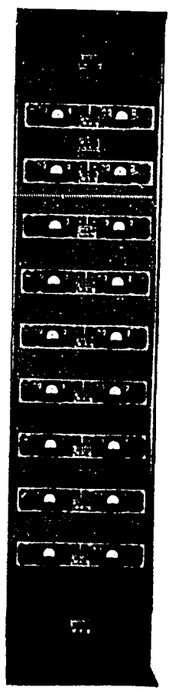
Keying Input.... Relay contacts, ± DC current or voltage pulses, neutral or polar.

Input Level.... DC voltage: ± 10 volts min. DC current: 45 ma min., ± or polar. Relay: contact rating 5 ma min.

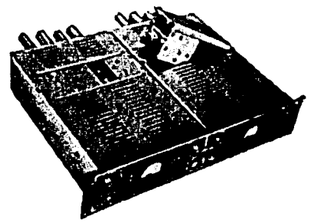
Keying Input Z... DC voltage: 100K ohms. DC current: 220 ohms.



TRANSMITTER



RECEIVER



DUAL FS TONE CONVERTER: TYPE 152 MODEL 3:

Input Z: 600 ohms, unbalanced.

Input Level:—40 dbm to 0 dbm.

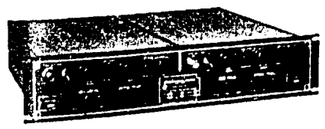
Input Frequencies: 18 channels, 425-3315 cps, 170 cycle spacing.

Keying Speed: 45 dot cycles.

DUPLEX TELEGRAPH SYSTEM FOR MULTI-CHANNEL TONE EQUIPMENT

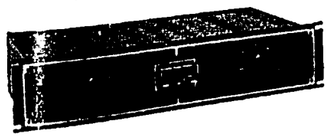
SEVEN NEW FEATURES in this system—simple 4-position switch selects from 12 possible duplex combinations: duplex operation between stations connected via carrier telegraph channels: *all-electronic*, without relays or moving parts: polar or neutral for either half duplex or full duplex: break-in now also possible for all *half*-duplex circuits: provided with positive feature to prevent space signal lock-out: includes individual line battery for each channel.

The Northern Radio Duplex Telegraph System consists of one each Dual Frequency Shift Tone Keyer, Type 153 Model 3; Dual Duplex Selector Panel, Type 200 Model 1; Dual Loop switch Panel, Type 200A Model 1; and Dual Frequency Shift Tone Converter, Type 152 Model 3.



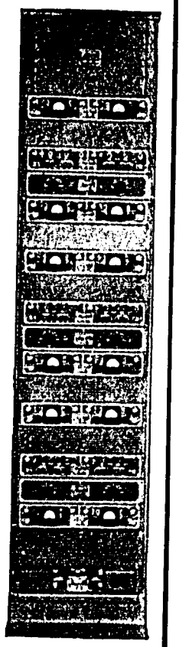
DUAL DUPLEX SELECTOR PANEL Type 200 Model 1

The Dual Selector Panel provides 12 loop options, patching facilities for monitoring purposes and channel routing, including the possibility of patching-in another tele-printer loop circuit (T-junction). Any of the 12 loop options are available and may be selected for the Dual Loop Switch Panel by simple strapping arrangements. It has an individual line battery for each channel for greatest circuit flexibility. Battery and line fuses are also provided for maximum protection.



DUAL LOOP SWITCH PANEL Type 200A Model 1

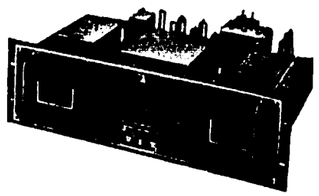
The Dual Loop Switch Panel rapidly selects half-duplex and/or full duplex mode of operation for any of the 4 standard loop options by front panel switching available from the 12 loop options in the Dual Duplex Selector Panel.



REGENERATIVE REPEATER

TYPE 207

MODEL 1



This new Regenerative Repeater—the most advanced in the industry—is designed for use in telecommunication circuits to re-shape and re-time distorted signals for local use or retransmission. Special provision has also been made for its use on half-duplex where it will not only regenerate the ordinary teleprinter signals but also faithfully reproduce such special signals "break" signals and "mark restoration" information. *Outstanding features include:* ... maximum acceptable signal distortion: new circuitry accepts up to 47% mark or space distortion: "floating" input & output circuits: completely electronic output, no relays: greater timing circuit stability: time base derived from highly stabilized L-C oscillator: adaptable to any speed: low-pass filter & frequency-determining elements are plug-in units: completely self-contained: includes power supply & line battery.

TECHNICAL DATA:

Input Keying Signal Requirements: (1) Neutral keying, positive or negative sense, (a) on-off 60 ma pulses, (b) on-off voltage pulses 10-100V into 100K ohms, (2) Polar keying, (3) Dry contact keying.

Frequency Stability of Time Base Generator: Less than 1 point range loss for ± 10% line voltage variation or ± 20° C ambient change from 25° C.

Sampling Time: Approximately 50 microseconds.

Output: Electronic tube outputs: (a) neutral 65 ma. max. into 2K ohms, (b) polar 33 ma (max.) into 2K ohms.

Power Requirement: 125 watts approx. 110/220V, 50/60 cps.

Mounting: Standard 19" rack mounting, 5¼" panel.

Pace Setters in Quality Communication Equipment
NORTHERN RADIO CO. inc.
147 W 22nd ST., NEW YORK 11, N Y
In Canada Northern Radio Mfg Co Ltd
1950 Bank St Billings Bridge Ottawa Ontario

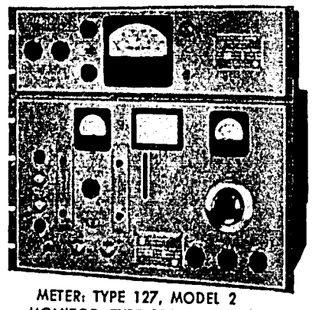
Northern Radio FREQUENCY SHIFT TERMINAL EQUIPMENT

FREQUENCY and SHIFT MONITOR SYSTEM

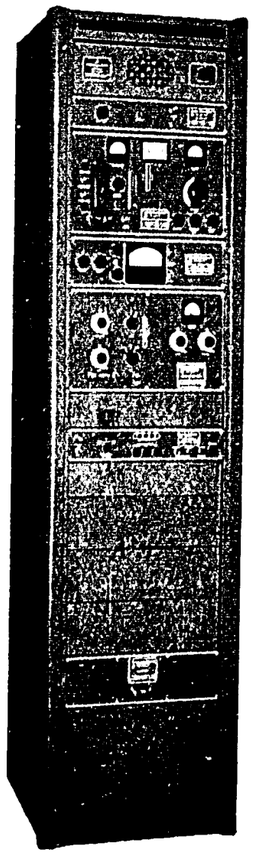
This system consists of a Type 106 Frequency and Shift Monitor and a Type 127 Frequency Meter. It is designed as a secondary standard to monitor the frequency and amount of shift of transmitter carrier output. It is particularly intended to measure the frequency shift of a mark and space (FS) signal either when setting up for traffic or under normal keying conditions.

The Monitor's stability is better than 2 cycles per megacycle over an ambient temperature range of 0-50° C—using crystals having a temperature coefficient of only 3 parts/million/degrees C. Range is 2.5-30 mc with 10 crystal-controlled frequencies (separate panel trimmers for each); use of external oscillator also provided for. Frequency Shift range is 10-10,000 cps. Less than 100 millivolts RF input needed for 2 volts audio output.

The Frequency Meter is specially designed with selectable normal and fast-acting damping factors, permitting frequency measurements of signals while keying. Its accuracy is 2% of full scale for the ranges 0-200, 500, 2000, 5000, 20,000 cps.



METER: TYPE 127, MODEL 2
MONITOR: TYPE 106, MODEL 4



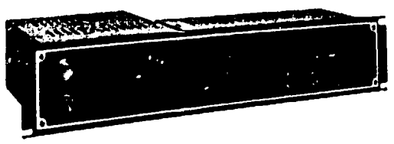
TYPICAL TRANSMITTER TERMINAL for TWINPLEX OPERATION

TYPE 105, MODEL 6

FREQUENCY SHIFT KEYER

Supersedes and replaces its leader predecessor, Type 105, Model 4.

- Highest stability achieved by any FS Keyer.
- Increased frequency range 1.0 to 7.0 mc.
- Pre-selection of proper FS for any particular transmitter frequency multiplication.
- Permits use with external oscillator without need of adapters.
- Improved accessibility for even easier maintenance.
- Direct-reading frequency calibration of shift from 0 to 1000 cps.
- FS dial adjusts "Mark" and "Space" frequencies equally above and below the carrier position.
- Direct-reading frequency calibration of mixer and output tuning dials from 1.0 to 7.0 mc.
- Direct reading calibration of output frequency vernier ± 600 cps.
- Pulse-shaping circuit permits operation within assigned band-width with no adjacent channel radiation.
- Linear carrier shift up to 1400 cps for Fax operations.



TWINPLEX COMBINER TYPE 177 MODEL 1

For twinplex operation, the transmitting terminal includes a Twinplex Combiner Type 177 Model 1.

The Twinplex communication system makes possible a 2-channel radio circuit whereby 2 non-synchronous or synchronous telegraph transmissions modulate a single radio carrier wave causing the carrier to assume one of four specific frequencies with 400 cps separations.

The Combiner converts the four possible conditions of two telegraph signals (M1-M2, M1-S2, S1-M2, S1-S2) respectively into one of four voltages related in a 0-1-2-3 manner. The Combiner output voltage modulates the Frequency Shift Keyer.

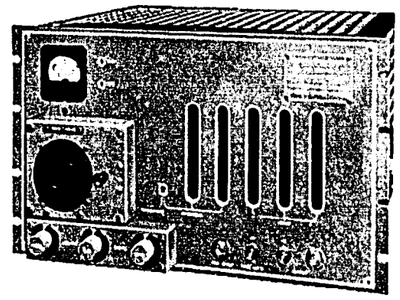
The two telegraph channels provide the same operational flexibility as that of two separate single channel FS systems. One can, for example, simultaneously use channel #1 on 60 wpm teletype and channel #2 on high-speed Morse or Time-Division Multiplex.

TECHNICAL DATA:

Keying Inputs: 1. Contacts; 2. DC current pulses, positive, negative, or polar; 3. DC voltage pulses, positive, negative, or polar.
Input Level: 1. DC Voltages: ± 10 volts minimum; 2. DC Current: ma. minimum.
Keying Speed: 240 Words per minute maximum.
Output Impedance: 10,000 ohms.
Keying Input Impedance: 1. DC Voltage: 100,000 ohms. 2. DC Current: 220 ohms.
Output Level: Neutral: 0 to 25 volts; Polar: +6 to −6 volts.
Output Voltage Conditions: Four output voltages are to be proportioned as follows assuming linear F.S. Keyer characteristic.
Input: M1 M2, M1 S2, S1 M2, S1 S2; Output 0, 1, 2, 3.
Individual level adjustments provided.
Power Requirements: 100/220 volts, 50/60 cycles. Approximately 50 watts. Connections at rear of chassis.
Dimensions: 3½" High x 19" Wide x 10" Deep.

For details, circle #132 on Reader Service Card

VARIABLE MASTER OSCILLATOR TYPE 173 MODEL 1



The Northern Radio Company Variable Master Oscillator provides a continuously variable source of radio frequency energy with a stability of approximately 1 cycle per megacycle in the range of 2 to 4 megacycles. It may be used as the basic control oscillator for diversity receivers, high frequency transmitters and other communications devices, or as a laboratory standard for test and measurement functions.

Its ease of operation and direct reading of frequency make it an outstandingly useful device where precise frequency control must be maintained by completely unskilled personnel. No curves, interpolations or calculations of any kind are required in its use. Frequency is set approximately to the desired value by rotating the oscillator dial. The last three digits of the frequency automatically pulls in to the valve pre-set on the switches and holds with an accuracy that exceeds that of most temperature-controlled crystal oscillators.

HIGH FREQUENCY OSCILLATOR

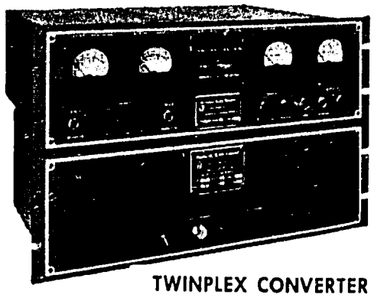
Output Frequency: 2-4 MC continuously variable.
Stability for any combination of temperature range from 0 to 50° C, and line voltage of 115 to 230 ± 10%: Approximately 1 cycle per megacycle.
Output level: ½ watt into 75 ohm load. Lever control on rear of chassis.
Readability: ± 2.5 cycles per second. Direct digital readout on mechanical and electronic counters.
Resettability: Absolute.

BEAT FREQUENCY OSCILLATOR

Output Frequency: 400-800 KC crystal controlled.
Output Level: 3.5 volts into 1000 ohm load. Level control on rear of chassis.

TIME BASE CRYSTAL OSCILLATOR

Output frequency 100 KC
Stability for 0 to 50° C and ± 10% Line Voltage change: 0.2 part per million for any 12 hour period; 1.0 par million for thirty days.
Output Level: Approximately 2 volts.
Output Impedance: Approximately 100,000 ohms.

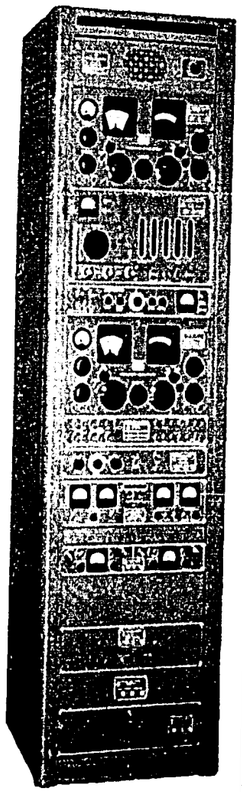


TWINPLEX CONVERTER TYPE 178 MODEL 1

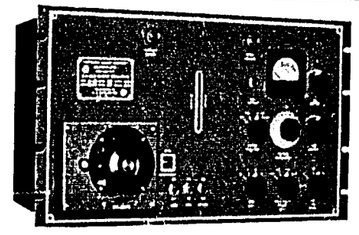
This Twinplex communication system makes possible a 2-channel radio circuit whereby 2 non-synchronous or synchronous telegraph transmissions modulate a single radio carrier wave by causing the carrier to assume one of four specific frequencies with 400 cps separations.

The receiving equipment consists of the Twinplex Converter Type 178 Model 1 and a single or diversity receiver such as the Northern Radio Type 110 Dual Diversity Receiving System. The Converter demodulates and separates the four audio tones from the radio receiver(s) into two channels each carrying the originally transmitted intelligence. The Twinplex Converter replaces the standard FS Converter for this purpose.

The two telegraph channels provide the same operational flexibility as that of two separate single channel FS systems. One can, for example, simultaneously use channel #1 or 60 wpm teletype and channel #2 on high-speed Morse or Time-Division Multiplex. It further permits the reception of channel #1 signals on all standard FS converters (tunable to 400 cps shift) without need for a Twinplex Converter: this is valuable for "Forked Circuit Operation" where the intelligence of channel #1 is intended for pick-up by other receiving stations which are not equipped for Twinplex Reception in addition to the main receiving stations which are so equipped. Reception of channel #2 (or of both channels) requires the receiving end to be equipped with a Twinplex Converter.

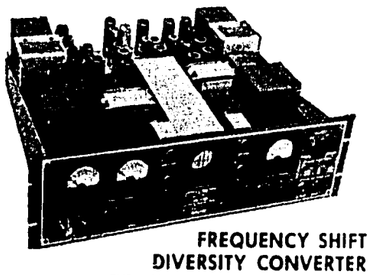


TYPICAL RECEIVER TERMINAL for TWINPLEX OPERATION



VARIABLE MASTER OSCILLATOR TYPE 115, MODEL 1

The Variable Master Oscillator Type 173 (above) may be replaced by this Variable Master Oscillator Type 115 Model 1 which is designed principally for use in diversity reception to supply variable or crystal HFO voltage to the receivers. Its variable frequency has a stability equivalent to that obtained by non-temperature-controlled crystal oscillators. It also provides 3 HFO crystals for operation of diversity receivers where fixed frequencies are required, and 2 BFO crystals.

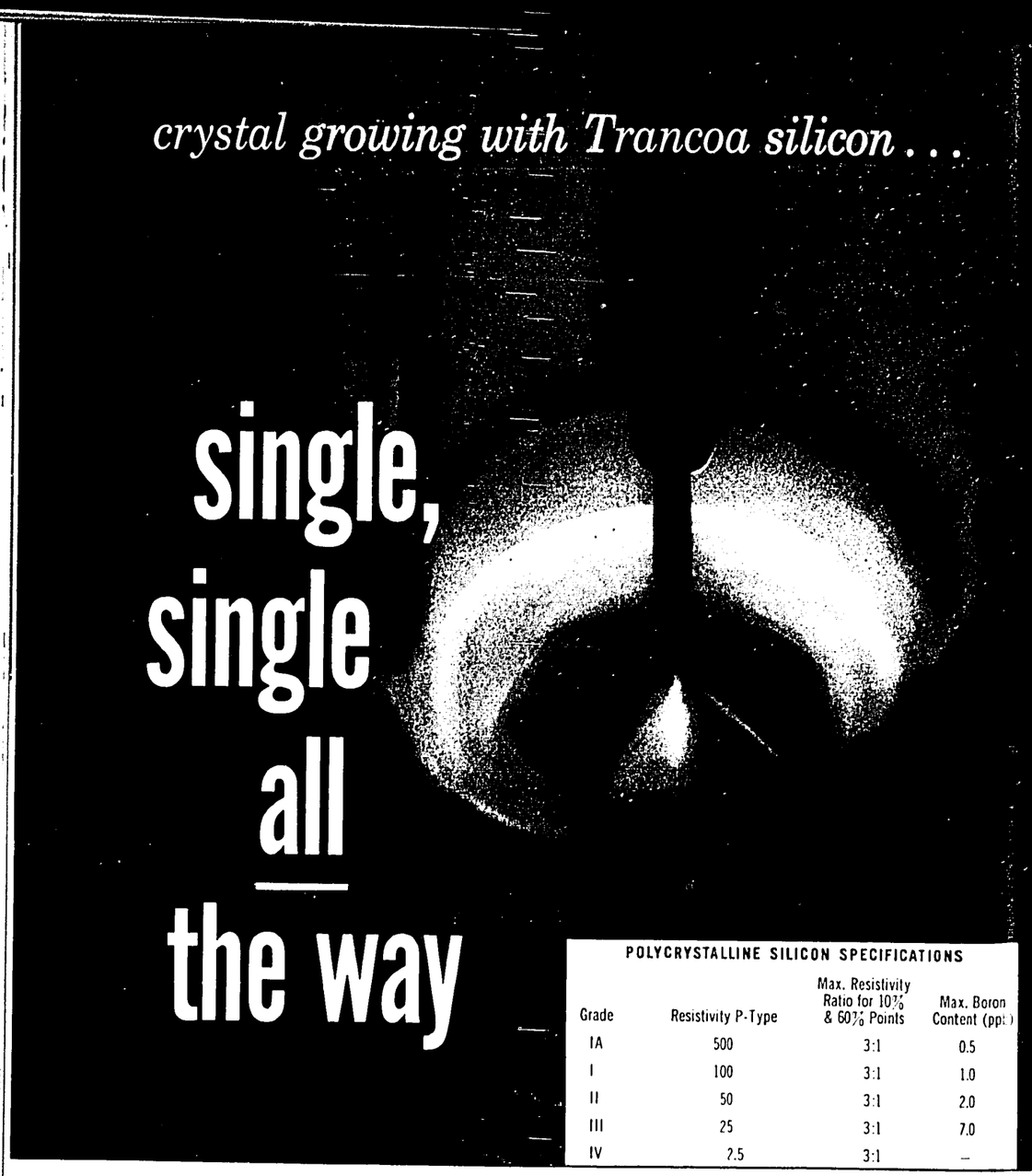


FREQUENCY SHIFT DIVERSITY CONVERTER TYPE 174, MODEL 1

For use with either single-receiver frequency diversity systems or 2-receiver space diversity systems. By means of plug-in units, any reasonable number of channels is available between the frequencies of 425 and 3315 cps for either frequency or space diversity operation. For standard FS operation, the plug-in networks provide shift adjustments from 100 to 1000 cps shift.
Normal Input Level: −40 to +10 VU (Zero VU = 1MW into 600 ohms). (Satisfactory operation on fades to −60 VU.)
Limiter Recovery Time: Negligible for a 40 VU differential between Mark and Space frequencies.
Output: 65 ma into 2000 ohms floating (self-contained line battery).
Keying Speed: Maximum of 40 dot cycles with narrow band frequencies diversity. Up to 400 dot cycles with the wide band networks.
Monitor: 2-inch Cathode Ray tube
Input phone jack
2 input volume level indicators
1 output current indicator

Pace Setters in Quality Communication Equipment
NORTHERN RADIO COMPANY, inc.
147 WEST 22nd ST NEW YORK 11, NEW YORK
In Canada Northern Radio Mfg. Co., Ltd. 1950 Bank St. Billings Bridge Ottawa Ontario

For details, circle #133 on Reader Service Card



crystal growing with Trancoa silicon . . .

single, single all the way

POLYCRYSTALLINE SILICON SPECIFICATIONS			
Grade	Resistivity P-Type	Max. Resistivity Ratio for 10% & 60% Points	Max. Boron Content (ppt)
IA	500	3:1	0.5
I	100	3:1	1.0
II	50	3:1	2.0
III	25	3:1	7.0
IV	2.5	3:1	–

Consistently clean Trancoa Silicon eliminates the twins, polys, and dropped charges that can result from dirty material. This will give you a larger yield of single crystal per pound of silicon . . . saving material, saving machine time, saving labor.

We prove the cleanliness of our Silicon at Trancoa by growing test crystals with only 3/16th of an inch between crucible and crystal . . . and they are single, single all the way! You can be confident of achieving uniform results within a lot and from one lot to another by growing crystals with Trancoa Silicon.

See table for the five grades available. Complete information is contained in "Trancoa Methods for Evaluating Silicon". Write today for a copy.

Trancoa®
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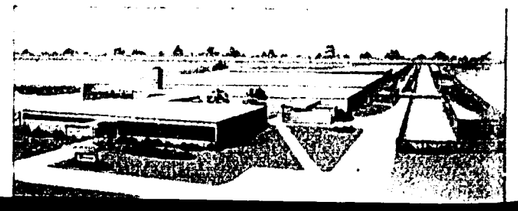
Tel. REading 2-3900

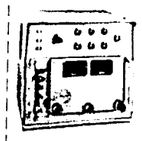


MICROWAVE · ELECTRONICS

All Polarad microwave signal generators and sources feature single-dial tuning control, direct reading frequency dial accurate to 1%, continuous tuning in each range, high stability, low harmonic content, and non-contacting short-type klystron cavity chokes for noiseless tuning and accurate calibration.

MICROWAVE SIGNAL GENERATORS
Model MSG-1
950 to 2,400 mc
Model MSG-2
2,150 to 4,600 mc
Power Output:
0 dbm to –127 dbm

Model MSG-1



MICROWAVE SIGNAL GENERATOR
Model PMX
4,450 to 11,000 mc
Basic Unit Model GB-2
(Modulator, Keyer, Power Supplies)
Tuning Unit G-48
4,450 to 8,000 mc
Tuning Unit G-711
6,950 to 11,000 mc

Model PMX

MICROWAVE SIGNAL GENERATOR
Model MSG-34
4,200 to 11,000 mc all in one unit
Power Output:
0 dbm to –127 dbm

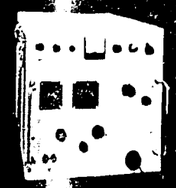
Model MSG-34

MICROWAVE SIGNAL GENERATOR
Model PMK
10,000 to 21,000 mc
Basic Unit Model GB-3
(Modulator, Keyer, Power Supplies)
Tuning Unit G-1015
10,000 to 15,500 mc
Tuning Unit G-1521
15,000 to 21,000 mc

Model PMK

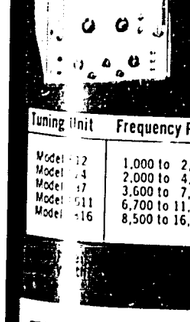
Model SG-121R Signal Generator and Model SS-1218 Source are available to cover the frequency range 12,400 to 17,500 mc

MICROWAVE SIGNAL SOURCE Model KSS—1,050 to 11,000 mc		
Tuning Unit	Frequency Range	Power Output Range
S-12	1,050 to 2,250 mc	80 to 400 mw
S-24	2,140 to 4,600 mc	40 to 250 mw
S-48	4,450 to 8,000 mc	15 to 50 mw
S-711	7,850 to 11,000 mc	14 to 40 mw

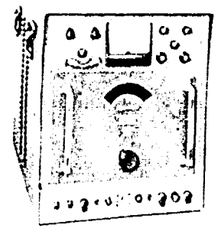


EHF MICROWAVE GENERATORS AND SOURCES
9 plug-in units cover 18,000 to 50,000 mc

SIGNAL GENERATORS Basic Unit Model HU-2	FREQUENCY RANGE	SIGNAL SOURCES Basic Unit Model HU-1
Plug-In Tuning Unit Model No.		Plug-In Tuning Unit Model No.
G1822-1	18,000 – 22,000 mc	S1822-1
G2225-1	22,000 – 25,000 mc	S2225-1
G2427-1	24,700 – 27,500 mc	S2427-1
G2730-1	27,270 – 30,000 mc	S2730-1
G2933-1	29,270 – 33,520 mc	S2933-1
G3336-1	33,520 – 36,250 mc	S3336-1
G3540-1	35,100 – 39,700 mc	S3540-1
	37,100 – 42,600 mc	S3742-1
	41,700 – 50,000 mc	S4150-1



Tuning Unit	Frequency Range	Power Output
Model [illegible]12	1,000 to 2,000 mc	70 – 800 mw
Model [illegible]24	2,000 to 4,000 mc	70 – 750 mw
Model [illegible]37	3,600 to 7,200 mc	15 – 500 mw
Model [illegible]511	6,700 to 11,400 mc	15 – 200 mw
Model [illegible]516	8,500 to 16,000 mc	3 – 75 mw



EXTENDED RANGE MICROWAVE RECEIVER
Model R
400 to 46,700 mc

Four instruments in one:
- AM-FM receiver
- Field intensity receiver
- Pulse, pulse-time or pulse-position demodulator
- Sensitive power meter

Basic Unit Model R-B

8 Interchangeable Plug-in Tuning Units*

Model RR-T	400- 1,000 mc	Model RX-T	7,300-11,260 mc
Model RL-T	950- 2,040 mc	Model RKS-T	9,500-15,600 mc
Model RS-T	1,900- 4,340 mc	Model RKU-T	14,700-22,000 mc
Model RM-T	4,200- 7,740 mc	Model RQ-T	20,260-46,700 mc

*U. S. Patent 2,774,243

CALIBRATED FIELD INTENSITY METER

Power Supply — Monitor Unit

Model FIM 1,000-10,000 mc

A highly sensitive instrument for field intensity and r-f interference measurements, antenna pattern analysis. Used as null detector and r-f voltmeter. Highly accurate frequency and power calibration.

Four Interchangeable Tuning Units*

FIM-L	1,000 to 2,240 mc
FIM-S	2,140 to 4,340 mc
FIM-M	4,190 to 7,740 mc
FIM-X	7,360 to 10,000 mc

*U. S. Patent 2,774,243

Calibrated Antennas Supplied with Model FIM

Test Antennas (not calibrated): 1,000 to 39,700 mc

MICROWAVE ATTENUATOR
Model SIJ
Covering
4,000 to 12,400 mc
Continuously variable, stub-tuned.

SUB-MINIATURE S-BAND CAVITIES
Plate and Grid Pulsed Models
Each Covering
2,750 to 3,000 mc

ALL CERAMIC KLYSTRON TUBES
Maximum Heat & Shock Resistance
ZV 1012 600 to 2,000 mc
ZV 1010 900 to 3,800 mc
ZV 1009 1,600 to 6,500 mc

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MICROWAVE · ELECTRONICS

FOR MICROWAVE SPECTRUM ANALYSIS

DIRECT-READING SPECTRUM ANALYZER
Model TSA 10 to 44,000 mc

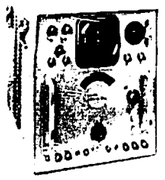
FEATURES
- Direct-reading UNI-DIAL control
- High accuracy, resolution and sensitivity
- Stable, accurate frequency marker

To test missile radars, microwave components, telemetering, multi-pulse transmissions

Model DU
Spectrum Display and Power Unit

Five interchangeable Tuning Units

STU-1	10 — 1,000 mc
STU-2A	910 — 4,560 mc
STU-3A	4,370 — 22,000 mc
STU-4	21,000 — 33,000 mc
STU-5	33,000 — 44,000 mc



COMBINATION SYNCHROSCOPE SPECTRUM ANALYZER
Model TSA-S 10 to 44,000 mc

Time Display: Pulsed signal as seen in synchroscope operation.

Frequency Display: Same signal as seen in spectrum analyzer operation.

Selector switch determines function instantly. Tuning Units: Same as Model TSA above.

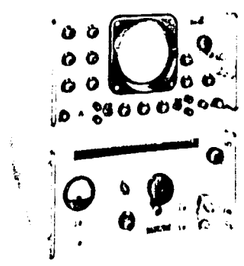
VERY WIDE DISPERSION SPECTRUM ANALYZER
Model TSA-W 10 to 44,000 mc

Narrow and Wide Pulse Analysis

70 mc frequency dispersion displays pulses as narrow as 0.1 μsec. For wide pulse analysis, dispersion may be adjusted to as narrow as 100 kc.

Wide dispersion permits simultaneous observation of two or more signals separated by relatively large frequency difference.

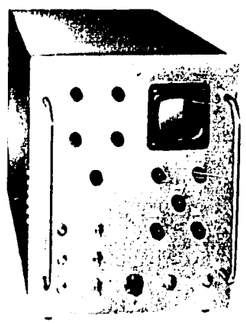
Resolution: 7 kc narrow bandwidth, 50 kc wide bandwidth. Tuning Unit Frequency Ranges: Same as Model TSA above.



MULTI-BAND, SINGLE UNIT SPECTRUM ANALYZER
Model SA-84

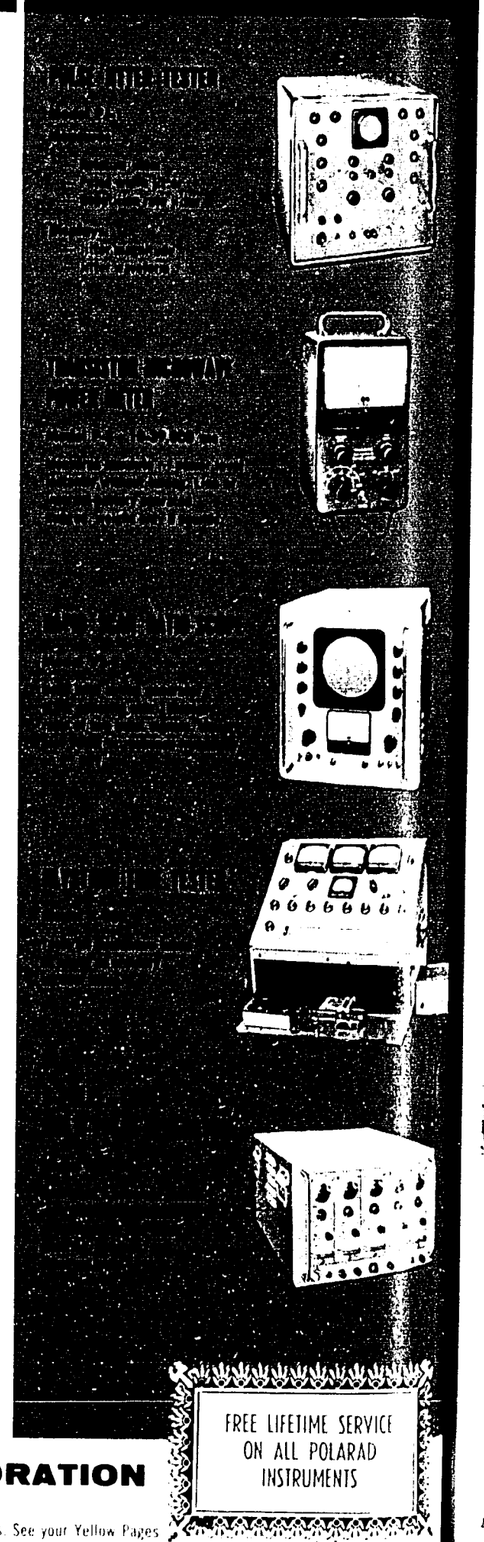
Complete frequency coverage, 10 to 40,880 mc, all in one self-contained unit. No additional tuning units required

Also available: Model SA-84W 10-40880 mc in one unit, and same choice of dispersion bandwidths as Model TSA-W above.



MULTI-PULSE SPECTRUM SELECTOR
Model SD-1

Permits spectrum analysis of individual microwave pulses in a pulse group. Any pulse in a complex coded signal may be isolated and intensified for examination.



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For details, circle #136 on Reader Service Card

Here's how to pick the best DIODES for your money

Price is no clue when diodes sell for about the same, and just **looking** at them tells nothing. But if you ask the right questions about the three key factors in the production of quality germanium gold bonded diodes, you have your clues to more long-term reliability for your money. Here they are:

BAKING TIME AND TEMPERATURE
bear a direct relationship to long-term stability. You get a measure of the quality of diodes by asking: "How long do you bake, and at what temperature?" (All GT diodes are baked at 140°C for at least 96 hours—the highest and longest in the industry!)

STRICT, STATISTICAL, HISTORY LOGGING
traces the progress of every single wafer made from each ingot of germanium. At GT, if a few wafers fail to pass the stringent GT quality tests along the way, then all from the ingot are suspect and can be identified and pulled out. There are no "stowaways" in a shipment of GT quality diodes.

LEVEL OF TESTING STANDARDS
reveals the level of quality. Ask about "everyday" test standards. (In the GT Seal Test, diodes are submerged in a penetrant-dye solution for 24 hours under 75 psi. This test is so sensitive that it will reveal a leak so small it would take over 300 years for 1 cc of gas to diffuse through the case.) All GT quality tests—100% electrical, 100% shock and vibration, and 100% temperature cycling—are at the highest industry level... and as a final mark of quality, the color bands on GT Germanium Gold Bonded Diodes are baked on to stay.

GT is equipped to supply diodes tested to individual customer requirements, such as JAN Qualification Inspection Tests and many others.

To get the full measure of quality in Germanium Gold Bonded Diodes, see your GT representative; or write directly to the company with know-how **NOW.**

GENERAL TRANSISTOR CORPORATION
91-27 138th Place, Jamaica 35, New York

FOR IMMEDIATE DELIVERY FROM STOCK, CONTACT YOUR NEAREST AUTHORIZED GENERAL TRANSISTOR DISTRIBUTOR OR GENERAL TRANSISTOR DISTRIBUTING CORP., 91-27 138TH PLACE, JAMAICA 35, NEW YORK. FOR EXPORT, GENERAL TRANSISTOR INTERNATIONAL CORP., 91-27 138TH PLACE, JAMAICA 35, NEW YORK. PRECISION MAGNETIC RECORDING HEADS AVAILABLE FROM GENERAL TRANSISTOR WESTERN CORP., 6110 VENICE BLVD., LOS ANGELES, CALIF.

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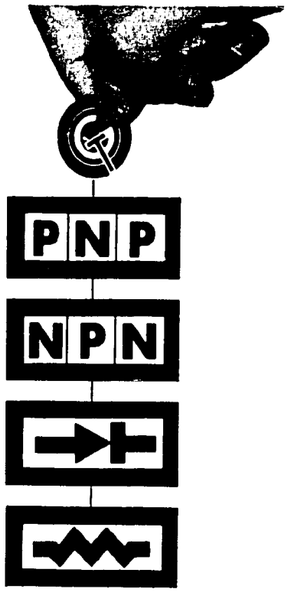

Here's General Transistor does it

GT know-how NOW gives you high-quality semiconductor devices in production quantities for prompt delivery

"If it's a high-quality device and you need it—regardless of quantity—General Transistor will produce and deliver it as promised."

That's the GT policy...and here's how it was made to work:

PROCESS ENGINEERING—From the very beginning of the company, a process engineering program was devoted to the continuous improvement of high-quality, high-speed, mass-production techniques. The results were increasingly rewarding to our growing list of customers; GT became their most dependable supplier, meeting every emergency.

QUALITY CONTROL—Intensive efforts were also applied to innovating techniques for quality control during production. OUR AIM: To supply only high-quality semiconductor devices.

LARGE PRODUCTION FACILITIES—Today GT is a major producer; GT production facilities are larger than those of many suppliers in the semiconductor field. Meeting high-quality specifications, in quantity, is never a problem.

LOGISTIC RELIABILITY—GT's earned reputation for high-quality devices in production quantities is a precious one. It's worth protecting. Therefore, "wild" claims are avoided. This leads to logistic reliability. When GT says: "We will deliver"—that is a fact on which other plans may be based.

GT never announced a major research breakthrough until the result was available in production quantities. When GT publishes specifications, tolerances, etc., it is done with the full knowledge that they can be substantiated to every decimal point in production quantities . . . not merely in sample lots.

GT's place in the industry is that of a primary supplier of high-quality devices in production quantities for prompt delivery. This is know-how NOW.

That's why you can depend on General Transistor. It's the company with NOW-HOW.

GENERAL TRANSISTOR CORPORATION
91-27 138th Place, Jamaica 35, New York

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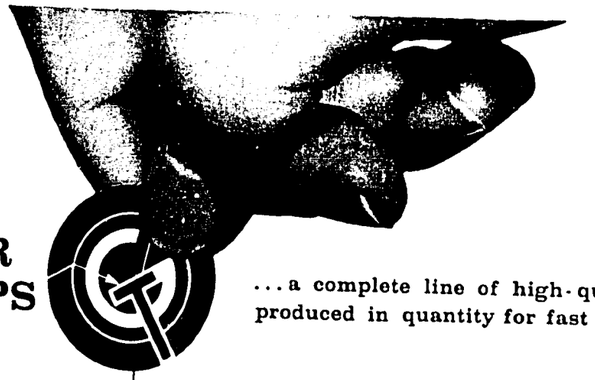
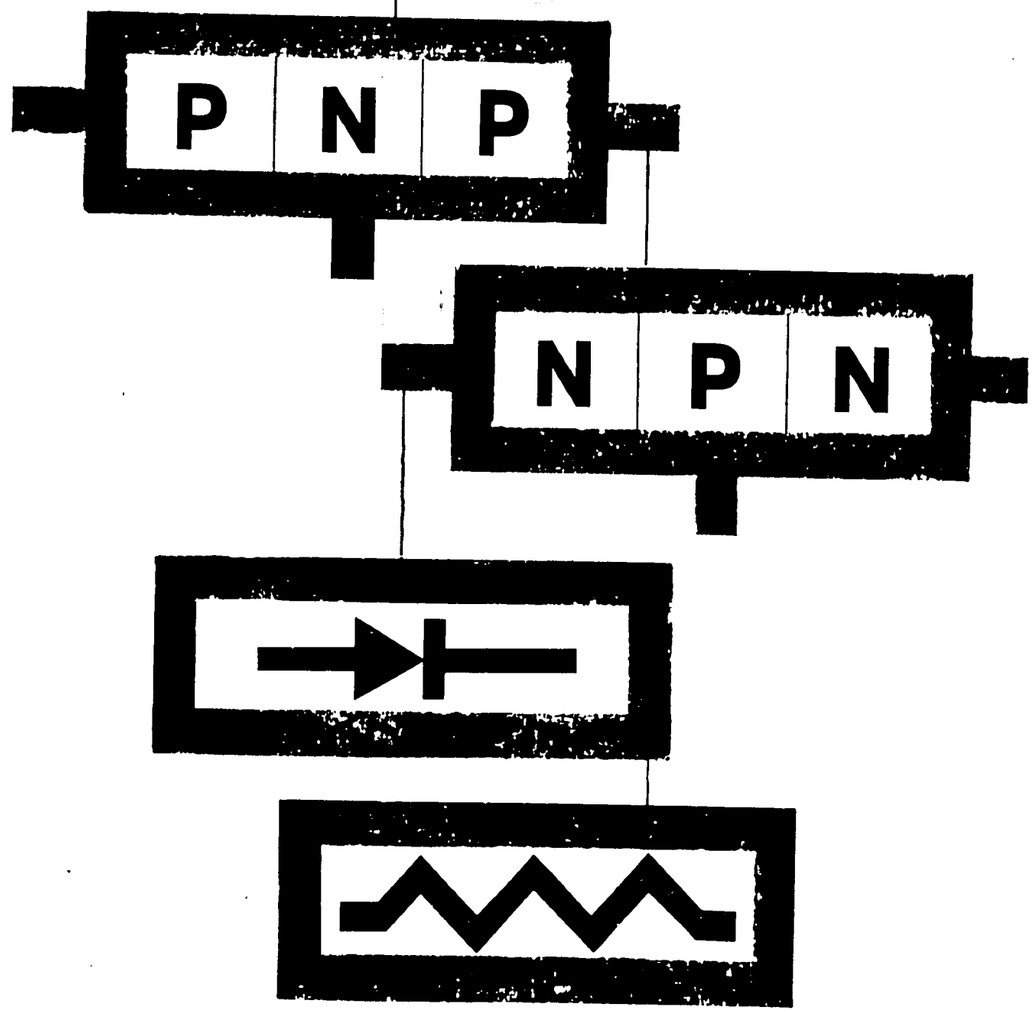


AT YOUR FINGER TIPS

...a complete line of high-quality devices, produced in quantity for fast delivery.



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are you silicon wait-bait?

avoid unnecessary delays

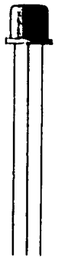
GT DELIVERS SILICON TRANSISTORS IN 24 TO 48 HOURS!

No need to get hung up with delays or hooked by unkept promises! GENERAL TRANSISTOR delivers sample quantities of GT Silicon Transistors in 24 to 48 hours... production quantities in 2 to 4 weeks!

These are not mere claims, but firm promises on which you can base your design and production schedules.

Quality? Yes—plenty of weight here without waiting. General Transistor is today one of the largest suppliers of highly dependable devices, delivering **quality** in **quantity.**

For full information—**and fast delivery**—call your local General Transistor representative, or contact us directly. Write for Silicon Brochure S-100.



GENERAL TRANSISTOR CORPORATION

91-27 138th Place, Jamaica 35, New York
Phone: Hickory 1-1000

A Few of the GT Alloyed Junction Silicon Transistors Now Available

- HIGH SPEED SWITCHING
- MEDIUM SPEED SWITCHING
- HIGH VOLTAGE
- HIGH SPEED LINEAR AMPLIFIER
- MEDIUM SPEED LINEAR AMPLIFIER

PNP:	2N1219	2N1220	2N1221	2N1222	2N1
V_{cbo}	30 v	30 v	30 v	30 v	40
V_{ceo}	25 v	25 v	25 v	25 v	40
V_{ebo}	20 v	20 v	10 v	10 v	10
I_{cbo}	.1 μa max.	.1 μa max.	.1 μa max.	.1 μa max.	.1 μa
h_{fe}	18 min.	9 min.	—	—	—
f_{ab}(mc)	5 min.	2 min.	5 min.	2 min.	2 f
h_{ie}	—	—	18 min.	9 min.	6 m

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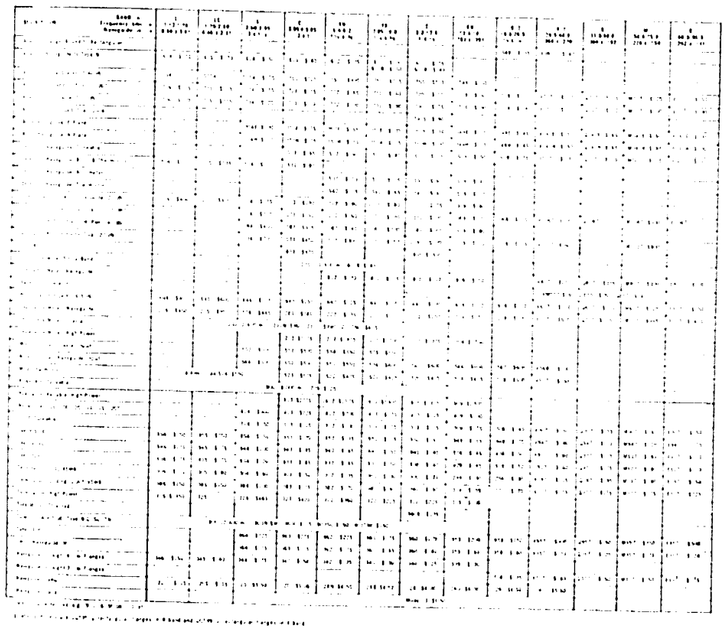
Narda—UHF and Microwave products from 200 to 90,000 Mc

Narda's full catalog includes a complete line of UHF and Microwave instruments, as well as bolometers and thermistors, all of the highest quality. Most of our products are available for immediate delivery; flexible production schedules permit prompt shipment of even those items not regularly on the shelf.

Narda's list of repeat customers reads like a "Who's Who" of American industry and universities. You'll experience the same satisfaction, when you choose among the instruments listed on this page and the next three. For additional information on any item, and a free copy of our latest catalog, write to the address shown below.

Waveguide Instruments L to E Band



Microwave Test Instruments

Frequency Power Meter
Model 107
500-1500 mc
$1150.

•

Radar Performance Checker
Model 116
All Frequencies
$485.

•

VSWR Amplifier
Model 441
All Frequencies
$200.

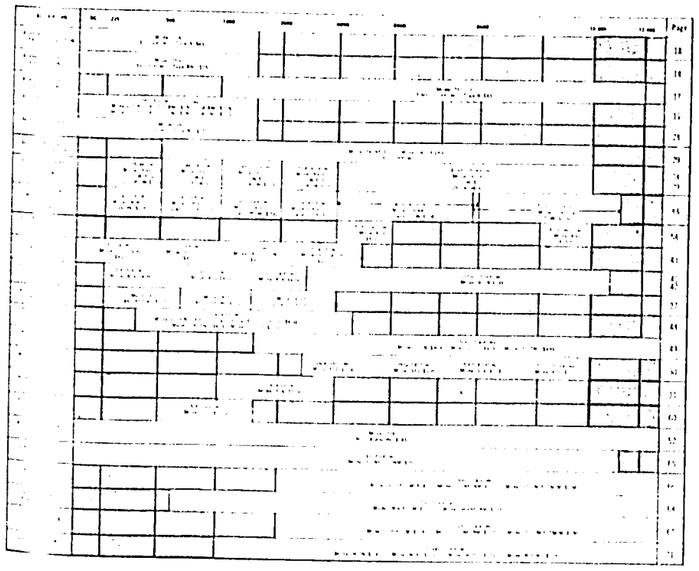
•

Tuned Pre-amp
Model 442
All Frequencies
$200.

•

Laboratory Training Set
Model 117
X Band
$1900.

Coaxial and UHF Equipment



Bolometers & Thermistors

The complete line of Bolometers (barretters) and Thermistors for all frequency ranges, including cylindrical (821), crystal (610), disc (603), and miniature (604), configurations.

For more information, consult the Narda sales representatives in these cities:

Albuquerque · Atlanta · Cedar Rapids · Chicago · Dallas · Dayton · Denver · Detroit · Kansas City · Mount Vernon · No. Hollywood · Orlando · Palo Alto · Pittsburgh · Seattle · St. Louis · Syracuse · Upper Darby · Waltham · Washington, D.C. · Westlake · Wichita · Arnprior · Montreal · Toronto
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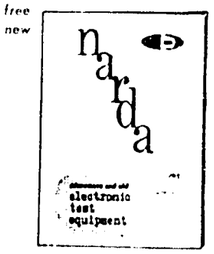

the narda microwave corporation

118-160 HERRICKS ROAD, MINEOLA, L. I., N. Y.

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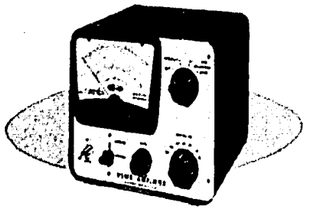
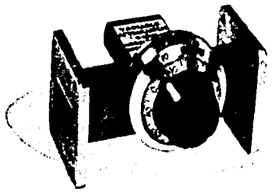
Narda-UHF and Microwave products from 200 to 90,000 Mc



BATTERY-OPERATED VSWR AMPLIFIER

Transistorized and battery-operated for complete independence from line voltage deviations. 0.1 microvolt sensitivity at 200 ohms over both "normal" and "extended" scales. Protective circuit permits any switching operation or cable connection to be made or broken without danger to bolometer; blowouts can not occur. Covers frequency of 1,000 cps ± 1%; plug-in frequency networks available for 315-3,000 cps. Bandwidth: 25-30 cps. Range: 70 db (60 db in 10 db steps, 10 db continuous).

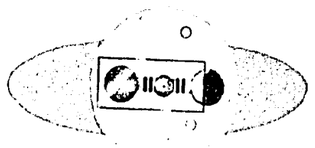
Model 441 . . . $200



VARIABLE ATTENUATORS FIXED CALIBRATED PADS

Variable attenuators — 0 to 20 db range; VSWR under 1.15; all waveguide sizes.
Fixed calibrated pads available in all waveguide sizes with 3, 6, or 10 db calibration.

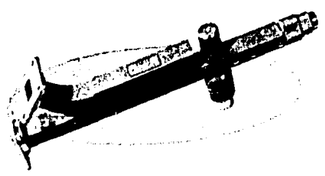
13 models, from $55 to $200.



DISC BOLOMETERS AND THERMISTORS

Coaxial bolometer elements available for 200-ohm operation at 4.5 or 8.75 ma bias. Thermistors with 200 ohms resistance at 13 ma. For power measurement and detection to 10 mw.

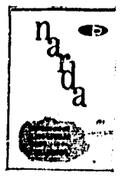
$25.00 each.



HARMONIC AND CRYSTAL MIXERS

Mixers serve as converters in coaxial lines and waveguides with microwave receivers and spectrum analyzers. NARDA Harmonic Mixers hold a silicon crystal element with provision for the injection of a standard frequency.

Priced from $425.



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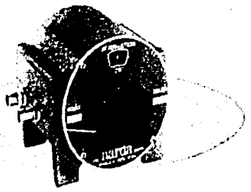


TURRET ATTENUATORS

A UHF-only attenuator, representing considerable savings in costs for this application. Each model offers a Designer or Development Engineer twelve steps of attenuation from d.c. to 1,500 mc, with a VSWR of 1.25. Model 705 provides 0 to 30 db attenuations; model 705 — 0 to 20 db; model 707 — 0 to INF db.

All models . . . $275 each.

COAXIAL ATTENUATORS

Double pi-section attenuators for high power rating and broad frequency characteristic. Available in 6 or 10 db values, dc to 1500 mc. VSWR equals 1.2. Frequency variation is ±1 db; calibration frequency equals 1000 mc; calibration accuracy equals ±0.2 db.

6, or 10 db Models . . . $40 each.

WAVEGUIDE DETECTORS

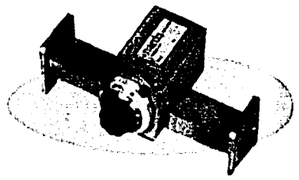
Designed for broad band operation with low VSWR and maximum versatility. May be used with a variety of crystal, bolometer (barretter) or thermistor elements, for absolute power measurement when used with appropriate bolometers and thermistors, as well as for detection of relative power levels. Also fixed tuned models.

13 models available from $75 to $125.

TRANSISTORIZED, BATTERY-OPERATED MICROWAVE POWER METER

Fully transistorized and self-balancing to provide accurate, automatic direct-reading measurements of cw or pulsed power. Provides the widest power measuring range available, with 0.001 to 0.01 mw and 0.003 to 0.03 mw scales, in addition to the five standard scales up to 10 mw. Powered by a nickel-cadmium battery, which is rechargeable overnight or during operation with built-in battery charger, it provides complete independence of filament heating errors and line voltage variations. Accuracy: 3% of full scale reading.

Model 440 . . . $250



CALIBRATED VARIABLE ATTENUATORS

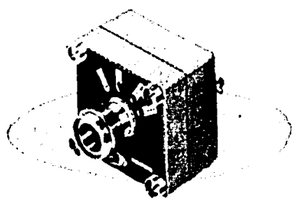
Precision attenuators of the parallel vane type, providing a maximum VSWR of 1.15; maximum insertion of 0.5 db; calibration accuracy — 0.3 db; calibration chart supplied. Calibration is precise and permanent, and not affected by humidity or temperature variations.

Seven models from $200 to $375.

BOLOMETERS AND THERMISTORS

Ruggedized construction; coin silver contacts. Barretter types available for 4.5 and 8.75 ma bias; 50, 100, 200, 400 ohm values. Thermistor types 100 or 200 ohm operation.

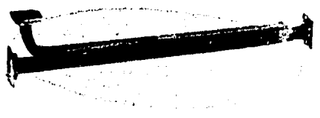
N821B & N610B, $10.00 each.



COAXIAL DETECTORS

Mounts for both bolometers and thermistors of the mica disc type, from 500 to 10,000 mc. Usable with any of the four types of bolometers and thermistors; a unique arrangement permits rapid change of elements and shows at a glance which type is in the detector, as well as its bias current requirements.

Model 561 (not including element) $50.



HIGH DIRECTIVITY COUPLERS

3, 6, 10, 20 and 40 db couplers, all with directivity exceeding 40 db. 40 db (high power) coupler may be used at full rated power of the waveguide size. Standard cover flanges terminate both ends of primary line; low VSWR termination and standard cover flange on secondary arm.

$95 to $400.

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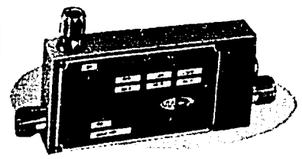
118-160 HERRICKS ROAD, MINEOLA, L. I., N. Y.

For details, circle #142 on Reader Service Card

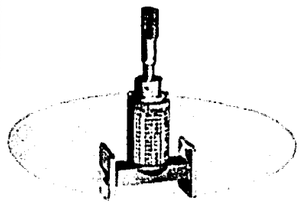
Narda-UHF and Microwave products from 200 to 90,000 Mc



COAXIAL DIRECTIONAL COUPLERS

Only Narda offers coaxial directional couplers in 10 and 30 db values, as well as 20 db. Flat coupling — values within 1 db of nominal over full octave frequency range. Calibration provided to ±0.2 db accuracy. Directivity exceeding 20 db. May also be used at lower frequencies than specified. 225 to 10,000 mc.

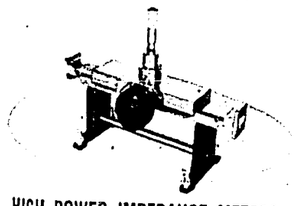
Five models, from $100.



WAVEGUIDE FREQUENCY METERS

Each consists of a section of waveguide with a resonant cavity attached symmetrically to the broad wall. Coupling is through an inductive iris, designed so unit is electrically equivalent to a straight section of waveguide. Power dip is at least 10% over the frequency range; accuracy equals 0.08%.

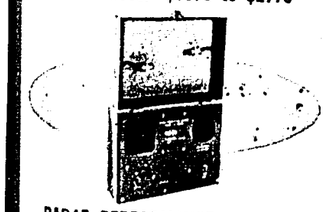
Five models from $110 to $150.



HIGH POWER IMPEDANCE METERS and VARIABLE REACTANCES

Meters have fixed value output coupling of 45 db, nominal. Reactances can vary magnitude of standing wave ratio from 1.02 to 2.0. Phase of standing wave is separately variable. Maximum residual VSWR: 1.02. (1.03 for 12.4-18.0 kmc Meter)

Meters: $1375 to $2175
Reactances: $1975 to $2775



RADAR PERFORMANCE CHECKER (Transistorized)

Used with an echo box, for rapid pre-flight or production line measurement of over-all radar performance. Completely portable; no power source needed. Accuracy: 2 db. Resolution: 2 db. Range: 0 db to —12 db on panel dial.

Model 116T . . . $485.

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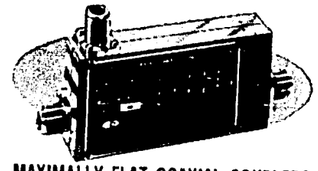
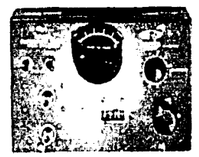


MAXIMALLY FLAT COAXIAL COUPLERS

A new series of coaxial directional couplers, pioneered by Narda, presenting the flattest frequency response of any coupler manufactured today. Coupling variation is only ± 0.2 db over a full octave; deviation of mean value from nominal is only ± 0.3 db. Calibration accuracy is ± 0.1 db and 5 calibration points are engraved on the nameplate of each unit. Intermediate points may be determined at a glance. Connectors are Series N Female; others available on special order. Models are available covering frequencies from 240 to 11,000 mc, most in both 10 and 20 db versions.

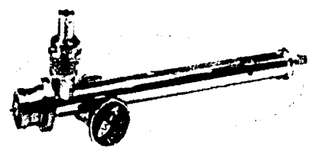
10 models . . . $200



S to X BAND FREQUENCY METER

The only single instrument covering 2,350 to 10,500 mc., and less expensive than any combination covering same frequencies. Completely self-contained; built-in detector and indicating meter; nomograph type calibration chart converts digital counter readings to frequency in mc., to rated accuracy of 0.2%.

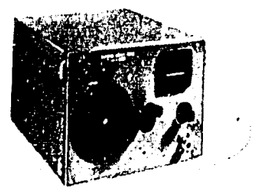
Model 802B . . . $785.



RF PROBE

A precision tuneable RF Probe with optional detector (included). Fine wire probe is adjustable in depth over a wide range by a fine-pitch threaded knob. Probe pickup may be tuned over the range of 900 to 18,000 mc. Insertion loss: 25 db or less in most slotted lines.

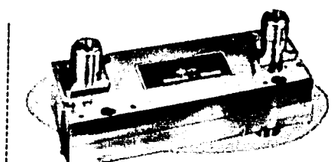
Model 229 . . . $125.



ECHO BOXES

C Band and X Band Echo Boxes with high Q resonant cavities used for rapid testing and evaluation of radars. Frequency indication is direct reading in megacycles; resonance indicator is panel microammeter. Complete with carrying case.

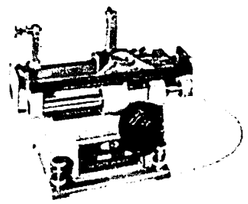
C Band (Loaded Q: 50,000) . . . $ 970
X Band (Loaded Q: 90,000) . . . $1500



COAXIAL HYBRID JUNCTIONS

For use in duplexers, mixers and other circuits requiring power division into two lines. Signal into one terminal appears at two opposite terminals, equal in amplitude, but shifted 90 degrees. Features in-line terminals for operation of TR tubes between a pair of hybrids; ruggedized construction; equal power split, ± 0.25; VSWR: 1.2; isolation: 20 db. Three models cover frequencies of 46-950, 950-2000, 2000-4000 mc.

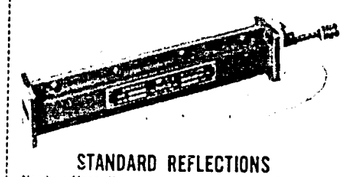
All models . . . $225 each



IMPEDANCE METERS

Carriage mounting and drive mechanism are integral with the transmission line casting, for permanent accuracy and freedom from slope errors. Angle-mounted, scale and vernier. Removable supporting stand. Coverage from 2600 to 90,000 mc; coaxial models, from 1500 to 90,000 mc—all accurate for VSWR's of 1.01.

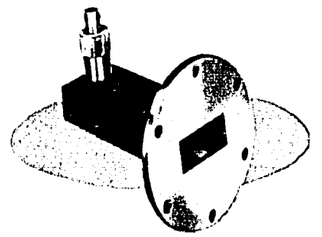
13 models from $250 to $425.



STANDARD REFLECTIONS

Narda offers five values of reflections for each of six different waveguide sizes. Provides calibrated reflections or VSWRs for use in standardizing reflectometers or calibrating slotted line impedance meters. Five values of reflection coefficient in each waveguide size.

Six models from $125 to $300.



BOLOMETER AND THERMISTOR BROADBAND MOUNTS

A new series of Narda matched mounts, offering the optimum in accuracy and flexibility, with instant replacement of element. Bolometers and thermistors, available from stock, plug in without tools and without need for adjustments. VSWR is extremely low over the full waveguide band. No tuning required.

$60 to $210

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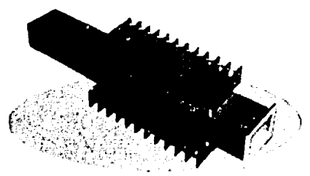
Narda-UHF and Microwave products from 200 to 90,000 Mc

WAVEGUIDE TERMINATIONS

Narda Waveguide Terminations provide an exceptionally low VSWR (less than 1.02) over the entire frequency range of the waveguide. Power is in excess of 1 kw peak, 1 watt average. Standard cover flange input.

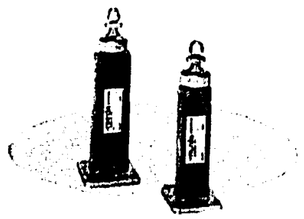
13 models from $20 to $45.



HI POWER TERMINATIONS

An improved type capable of handling extremely high power without deteriorating under high temperatures. Designed for operation over the entire waveguide band with average VSWR approx. 1.05. Heat dissipating fins at regions where most power is absorbed.

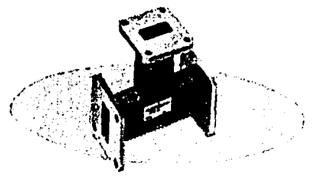
Seven models . . . $125 to $700.



ADJUSTABLE WAVEGUIDE SHORTS

Tuneable shorts of the trap or non-contacting type for minimum r-f loss for use in many tuning and measurement applications. Tuned by a knurled lead screw with locking nut, except for model covering 12.4 to 18.0 kmc, which uses micrometer drive. Models to cover bands from 2.60 to 90.0 kmc.

13 models from $40 to $90.



TEE SECTIONS

Waveguide tee sections for making connections in microwave circuits corresponding to series and shunt connections at lower frequencies. Very tight tolerances permit use as a power divider. Branches are terminated with standard cover flanges.

Thirty models from $35 to $275.

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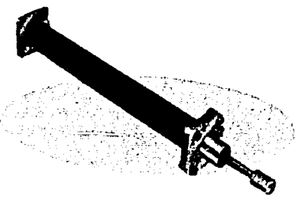
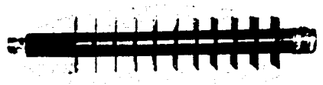


SLIDING TERMINATIONS

The most convenient means for evaluating the residual VSWR of slotted lines. VSWR of the element is 1.01 or less, from 1100 to 90,000 mc. The sliding feature makes these terminations particularly suitable for evaluating residual VSWR of impedance meters.

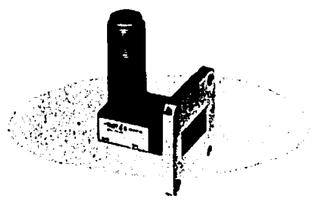
13 models from $60 to $90.



COAXIAL HI POWER TERMINATIONS

Useful over the complete frequency range from 700 to 12,400 mc, with a VSWR of 1.20 or less and under 1.1 from 1000 to 9000 mc. Designed for power levels up to 200 watts average and 50,000 watts peak. Efficient heat-dissipating fins permit withstanding temperatures in excess of 500° F.

Model 369, NF & NM . . . $250
Model 369, CF & CM . . . $270



ADAPTERS

These adapters provide a low VSWR, lossless transition from rectangular waveguide to type N coaxial line. Broadband design provides bilateral VSWR below 1.25 over the complete waveguide frequency range. Small but rugged, for both laboratory and field use.

Seven models from $25 to $175.

TWISTS

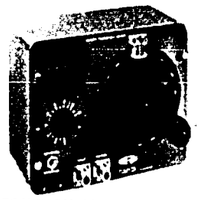
Narda waveguide twists provide a smooth 90 degree twist in waveguide orientation. Standard models use brass waveguide and two flanges equivalent to standard cover flanges. Other flange combinations, waveguides and lengths, available on special order.

13 models from $40 to $175.

COAXIAL TERMINATIONS

Narda Coaxial fixed and sliding Terminations are the first and only to cover the entire frequency range S to X band; provide accurate reference for coaxial component VSWR measurements. VSWR of the terminations is 1.05 or less. Travel of sliding termination is in excess of half wavelength at lowest frequency.

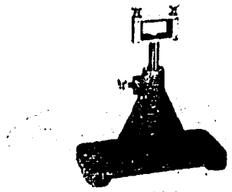
Fixed: $55 to $58 Sliding: $110 to $116



UHF FREQUENCY METER DETECTORS

The only direct reading frequency meter detectors available for the UHF range. Absorption type meters, with 0.2 db insertion loss, each includes resonant cavity, coaxial switch, crystal detector, current meter, sensitivity control, and type N input and output terminals. 200-500 mc, 500-1500 mc., 1500-2400 mc.

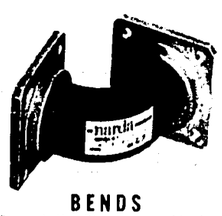
Three models . . . $375 each.



STANDS AND CLAMPS

Heavy cast iron Model 3 stands for use with Model 2 Series Clamps. Rectangular base for stability and closer spacing when required. Knurled screw provided for height adjustment. Clamps are felt lined to provide secure clamping action without marring surfaces or finishes.

$3.50 to $5.50.



BENDS

Narda E – and H – Plane waveguide bends for use where a 90 degree angle is required with negligible reflection of the microwave signal. VSWR equals 1.05 maximum. Standard cover type flanges. Special flanges, materials and dimensions available on special order.

13 models from $25 to $100.

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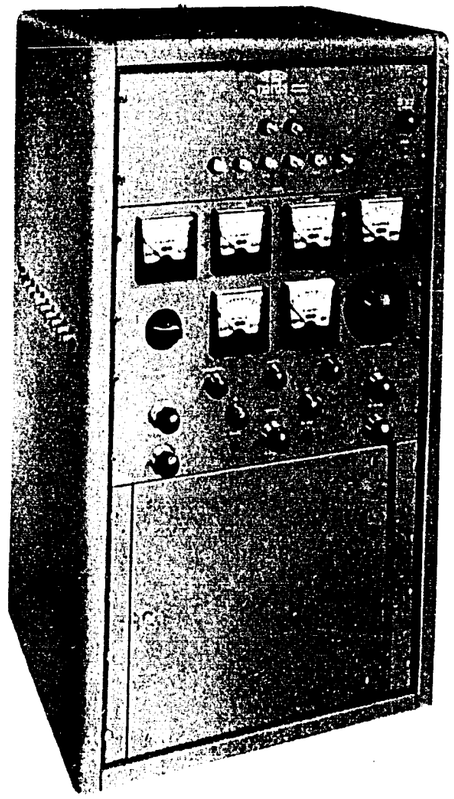
NEW FROM NARDA

Model 10001 $4700.



High Power MICROWAVE MODULATOR *accepts over 40 magnetrons!*

Here's the first of a series of new products from Narda's recently-established High Power Electronics Division! A high power Microwave Modulator that permits installation **inside the unit** of any of more than 40 magnetrons! Complete, compact and self-contained, it accepts magnetrons covering 3,200 mc to 35,000 mc, with peak outputs from 6 KW to 120 KW. Model 10001 features a completely interlocked circuit, with all high voltage leads and connections **internal,** for maximum safety; solid state high voltage bridge rectifiers for longer life and reduced heat output (prolonging life of other components, too); and built-in meters and viewing connectors for all principal parameters.

Other features are shown below. For complete specs and a list of at least 40 magnetrons suitable for use with the 10001, write Narda's High Power Electronics Division (HPED) at Dept. IRED-9.

SPECIFICATIONS

High voltage supply: Continuously variable from 0 to 4 KV at 100 ma; **Magnetron filament supply:** Cont. variable from 0 to 13 volts at 3 A; **Rep. rate generator range:** Cont. variable from 180 to 3000 pps; **Pulse width:** 1 microsecond at 70% points, rise time 0.15 microseconds, max. slope 5% (other pulse widths available); **Size:** 38" h, 22" w, 18" d. **Weight:** 150 lbs.

Complete 1959 catalog available on request.

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HIGH POWER ELECTRONICS DIVISION
118-160 HERRICKS ROAD, MINEOLA, L. I., N. Y. · PIONEER 6-4650

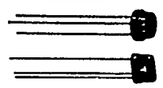
For details, circle #145 on Reader Service Card

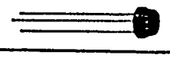
Transitron offers...

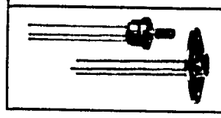
INDUSTRY'S MOST COMPLETE LINE

SILICON TRANSISTORS

JAN TRANSISTOR		Minimum Current Gain (B)	Maximum Collector Voltage (Volts)	Typical Cut-off Frequency (MC)	Maximum I_{co} @ 25°C and V_c Max. (μa)	FEATURES
	JAN-2N118	10	30	10	1	• Only Jan Silicon Transistor

SMALL SIGNAL		Minimum Current Gain (B)	Maximum Collector Voltage (Volts)	Typical Cut-off Frequency (MC)	Maximum I_{co} @ 25°C and V_c Max. (μa)	FEATURES
	2N333	18	45	7	50	• Low I_{co} • Operation to 175°C • 200 mw Power Dissipation
	2N335	37	45	10	50	
	2N480	40	45	11	.5	
	2N543	80	45	15	.5	
	ST905	36	30	10	10	

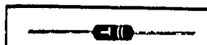
HIGH SPEED SWITCHING		Typical Cut-off Freq. (MC)	Maximum Collector Voltage (Volts)	Maximum Collection Saturation Resistance (ohms)	Max. Power Dissipation @ 100°C ambient (MW)	FEATURES
	2N1139	150	15	60	500	• High Frequency Operation • Low Saturation Resistance • Low I_{co}
	2N337	20	45	150	50	
	2N338	30	45	150	50	

MEDIUM POWER		Max. Power Dissipation @ 25°C Case (Watts)	Maximum Collector Voltage (Volts)	Minimum DC Current Gain (B)	Typical Rise Time (μsec)	Typical Fall Time (μsec)	FEATURES
	2N545	5	60	15	.3	.5	• Fast Switching • High V_c • Rugged Construction
	2N547	5	60	20			
	2N498	4	100	12			
	2N551	5	60	20			
	2N1140	3	40	20	.2	.1	

HIGH POWER		Maximum Power Dissipation . . 25°C Case (Watts)	Minimum DC Current Gain (B)	Typical Collector Saturation Resistance (Ohms)	Maximum Collector Voltage (Volts)	FEATURES
	ST400	85	15 @ 2 Amps	1.5	60	• High Current Handling Ability • Low Saturation Resistance • Rugged Construction
	2N389	85	12 @ 1 Amp	3.5	60	
	2N424	85	12 @ 1 Amp	6.0	80	

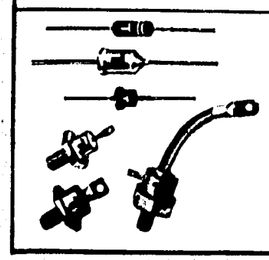
Write for Bulletins: TE-1353 and TE-1355

SILICON DIODES

 FEATURES	Fast Switching and High Frequency Types Ratings @ 25°C				Military and High Conductance Types Ratings @ 150°C			
		Max. Inverse Voltage (Volts)	Max. Average Fwd. Current, (ma)	Inverse Recovery Time (μsec)		Max. Inverse Voltage (Volts)	Max. Average Fwd. Current (ma)	Max. Inverse Current (μa) @ V
• Recovery Times Under 15 μsec • High Conductance Combined With Fast Switching • Subminiature Size • High Inverse Resistance	1N808	100	100	.3	JAN 1N457	60	25	5 @ 60
	1N809	200	100	.3	JAN 1N458	125	25	5 @ 125
	1N658	120	200	.3	JAN 1N459	175	25	5 @ 175
	1N659	55	100	.3	1N485B	180	50	5 @ 175
	1N643	110	100	.3	1N488A	380	50	25 @ 330
	JAN 1N251	30	75	.15	1N464	175	40	30 @ 125

Write for Bulletin TE-1350

SILICON RECTIFIERS

Ratings @ 150°C Case Temperature			Peak Recurrent Inverse Voltage (Volts)	Maximum Average Forward Current (ma)	Maximum Inverse Current (ma)	FEATURES
	Subminiature Glass	1N689 1N649	600 600	150 150	0.2 0.2 (@ 25°C)	• Reliability at High Temperatures • High Efficiency • Rugged Construction • Hermetic Sealing • Low Thermal Resistance
	Miniature	TJ60A TJ30A	600 300	200 200	0.5 0.5	
	Axial Leads	SL715 1N547	1500 600	100 250	0.2 0.3	
	Military	JAN 1N256	570	200	0.25 (@ 135°C)	
	Stud Mounted	TM155 TM67	1500 600	400 3000	0.5 0.5	
	Medium Power	TR402 TR601	400 600	Amps 20 10	5 5	
	High Power	TH402B	400	50	15	

For details, circle #146 on Reader Service Card

Write for Bulletin TE-1351

SILICON REGULATORS AND REFERENCES

	Voltage Range (Volts)	Maximum Dynamic Resistance (ohms)	Maximum Current @ 25°C (ma)	Maximum Current @ 125°C (ma)	FEATURES
Subminiature — SV-5	4.3-5.4	55	50	10	• Long-term stability • Operation up to 150°C • Small size, easy mounting • Hermetically sealed
Miniature — SV-815	13.5-18	120	40	8	
Power — SV-924	20-27	8	55°C (amps)* .4	(ma)* 100	
Stabistor — SG-22	.64	40	150	25	
Reference — SV-3176	8-8.8	15	Temp. Coefficient ±.001%/°C		
Ref-Amp — 3N44	8.3-9.8		±.002%/°C		

*Case temperature ratings

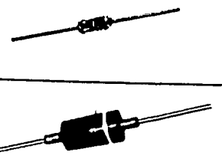
Write for Bulletin TE-1352

SILICON CAPACITORS

	Ultra High Frequency Types — Ratings @ 25°C						FEATURES
	Cut-off Freq. (mc)	Capacity (μμf) @ V Max.	Capacity (μμf) @ −0.1V	Q @ −4V @ 50Mc	Q @ −4V @ 100Mc	Maximum Working Voltage	
SCH-51	5000	.35	2	100	50	10	• Subminiature Size • High Q • High Temperature Operation
SCH-52	5000	.8	4	100	50	7	
	High Frequency Types						
				Q @ −4V At 5mc	Q @ −4V At 50mc		
SC-1		4.4	24	350	35	22	
SC-5		25	120	350	35	11	
SC-15		120	360	350	35	6	

Write for Bulletin PB-45

GERMANIUM DIODES

Specifications and Ratings at 25°C		Forward Current @ +1V (ma)	Inverse Current at Specified Voltage (μa @ V)	Max. Oper. Voltage (volts)	Description
	JAN-1N270	200	100 @ −50	80	JAN TYPES
	JAN-1N277	100	250 @ −50 @ 75°C 75 @ −10	100	
	JAN-1N281	40	500 @ −50 30 @ −50	60	
	JAN-1N126	5	500 @ −50 30 @ −10	60	
	JAN-1N198	5	250 @ −50 @ 75°C 75 @ −10	50	
	1N283	200	20 @ −10	20	COMPUTER TYPES
	T16G	40	100 @ −50	60	
FEATURES • Milli Microsecond Switching • Superior Forward Conductance • High Inverse Resistance • Uniformity and Stability • Gold Bonded Construction	1N278	20	125 @ −50 @ 75°C	50	HI-TEMPERATURE TYPES
	T22G	40	20 @ −10 @ 75°C	15	
	T9G	100	20 @ −50 2 @ −10	60	HI-RESISTANCE TYPES
	1N67A	5	50 @ −50 5 @ −5	80	
	T8G	100	20 @ −100 5 @ −10	100	
	S570G	10	30 @ 6	Recovery Time .002 (μsec)	MILLI-MICROSECOND SWITCHING

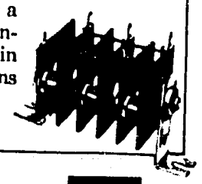
GERMANIUM COMPUTER TRANSISTORS

	Minimum Current Gain (B)	Maximum Collector Voltage (volts)	Typical Cutoff Freq. (MC)	FEATURES
2N427	40	15	8	• High FrequencySwitching • Low Saturation Resistance • Uniform Input Characteristics
2N428	60	12	13	

Write for Bulletin TE-1300 & TE-1319

Your local authorized TRANSITRON DISTRIBUTOR now carries in-stock inventories for immediate delivery.

Transitron's TD series of rectifier stacks offer a wide range of ratings in seven standard circuit configurations. High voltage cartridges, quads, plug-in assemblies, and many other special encapsulations are also available. Your inquiries are invited.
Write for Bulletin TE-1342.



Transitron

For details, circle #147 on Reader Service Card

electronic corporation • wakefield, massachusetts

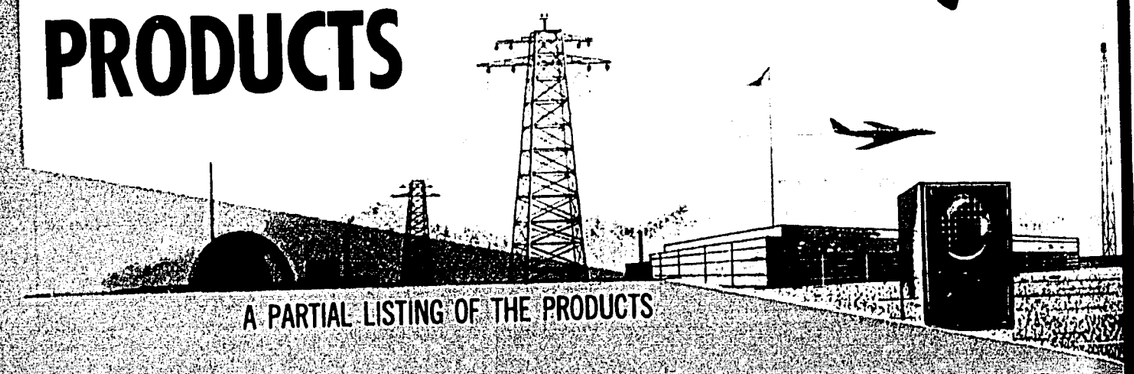
BUYERS GUIDE FOR ITT PRODUCTS

Components Division

Components & Tubes

HIGH RELIABILITY FOR ELECTRONICS

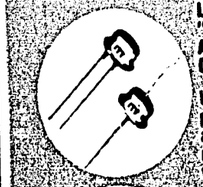
ITT Components Division, a unit of the world-wide International Telephone and Telegraph Corporation, offers high reliability electronic components for industrial and military applications.



A PARTIAL LISTING OF THE PRODUCTS OF ITT COMPONENTS DIVISION

diffused junction silicon devices standard JEDEC packages

Dual positive hermetic sealing — maximum heat transfer — withstand high current surges — designed for highest electrical efficiency, and maximum operating reliability to meet military specifications.

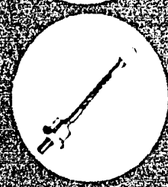


LOW POWER TYPES "TOP-HAT" (SERIES R) AND "DERBY" (SERIES C) CONFIGURATIONS

Up to 1.5 amps for printed circuit or wire-in applications with voltage ratings up to 800 volts PIV.

MEDIUM POWER TYPES SERIES "D", "K" AND "U"

Rated up to 30 amps at 150° C. case temperature. Voltage ratings up to 800 volts PIV.



HIGH POWER TYPES SERIES "T"

Ratings up to 70 amperes at 150° C. case temperature. Voltage ratings up to 600 volts PIV.

ZENER VOLTAGE REGULATOR DIODES

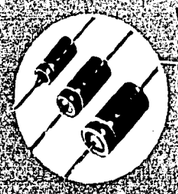
3.9 to 100 volts ±5% and ±10% tolerances. 750 milliwatt, 1 watt, 3.5 watt and 10 watt ratings. Axial lead or stud mountings.

HIGH CURRENT SILICON RECTIFIERS

Silicon rectifier assemblies to provide desired current and voltage output. Both single and three phase assemblies are available.

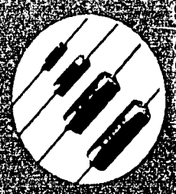
tantalum capacitors

ITT miniature tantalum capacitors fill the ever growing need for lightweight, miniaturized high reliability components to meet military specifications. These capacitors offer greater electrical stability with rugged construction and larger capacity per unit volume.



WET ANODE TYPES

3 Case Sizes, with a non-corrosive electrolyte. Operate without derating from 55° C. to 125° C. Designed to MIL specifications. Large capacity per unit volume.



SOLID ANODE TYPES

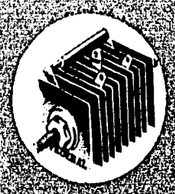
4 Case Sizes . . . with excellent frequency stability over wide operating temperature ranges . . . hermetically sealed. All types designed to MIL specifications.

GLASS SEALS

Compression seals, solder seals, pressure, standoff and spadenut terminals, condenser end seals and transistor closures, designed for uniform seal integrity and high electrical insulation under the most severe conditions. Standard types and custom designs are made to your specifications.

hi-density selenium rectifiers

ITT Hi-Density Selenium Rectifiers utilize maximum cell area, providing high electrical output in relation to weight, good voltage regulation within rated capacity — superior quality and performance characteristics for industrial and military applications.



NEW! 45 VOLT INDUSTRIAL RECTIFIER

Smaller, lighter, more efficient selenium rectifiers can be designed with ITT's new 45 volt cells. Other features include: smaller mounting dimension, long life, low temperature rise, conservative ratings and reliability at higher temperatures — plus cost reductions.

NEW! DOUBLE DENSITY INDUSTRIAL RECTIFIER

Carefully controlled evaporation techniques permit ITT's Hi-Density selenium rectifier cells to carry double the current of conventional cells — 180 milliamperes per square inch. This process features rectifiers of small size, high operating efficiency at a lower cost.

CONTACT PROTECTORS

Suppresses voltage surges in inductive circuits. Extends contact life by reducing erosion due to sparking and preventing component failure. Reduces electrical noise. Available for DC or AC applications.

New! Ultra-fast to protect transistors against over voltage.

power tubes

ITT power triodes and rectifier tubes for communications, dielectric and induction heating, random noise generators and pulse operation applications are outstanding. An exceptionally wide range of tubes are available in air cooled, water cooled and vapor cooled types.

POWER TRIODES

ITT Power Triodes, for CW and pulse operation are used as modulators, amplifiers and oscillators in communications and industrial service. Water cooled and air cooled types.

EVAPORATIVE COOLED POWER TRIODES

Evaporative Cooled Power Triodes feature high anode dissipation, high loading capacity and exceptional overload capability.

SUPER-POWERED TRIODES

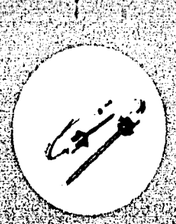
Super-powered Triodes, developed by ITT Components Division, for use as modulators, amplifiers and oscillators in communication and industrial services.

CERAMIC POWER TRIODES

Ceramic Power Triodes with rugged, coaxial design for modern requirements in high temperature, high frequency, high power applications.

special purpose tubes

Special Purpose Tubes made by ITT are available in many standard types and sizes, and custom designed types are also made for specific applications.



TRAVELING WAVE TUBES

A rugged line of traveling wave tubes with metal envelopes and ceramic seals. They are of the helix type, self-aligning in the external solenoid, and are provided with either coaxial or waveguide fittings.

IATRON TUBES**

Iatron storage tubes are used in radar and electronic display systems. They feature extreme brightness for day light viewing and controlled storage time. Information can be written, stored and erased with ease. Direct view and projection types.

HYDROGEN THYRATRONS

ITT - Kuthe hydrogen thyratrons, made by Kuthe Laboratories, Inc.*, the world's largest manufacturer of gas-filled thyratrons and diodes, feature an extensive line of glass or ceramic types.

*A unit of ITT Components Division

GLASS HYDROGEN THYRATRONS

ITT - Kuthe hydrogen thyratrons used in pulse forming circuits and other applications deliver peak powers up to 33 megawatts. High altitude designs are available. Hydrogen reservoirs are used for long life.

CERAMIC HYDROGEN THYRATRONS

Ceramic hydrogen thyratrons feature peak performance with size reduced by one-third over equivalent glass types. They can withstand greater shock and vibration and high ambient temperatures up to 125° C.

RESEARCH AND DEVELOPMENT TYPES

In addition to the standard products of the ITT Components Division, the ITT Laboratories are making a variety of other types, in limited quantities, for development purposes. These include:

- Image Converter Tubes
- Multiplier Photo Tubes
- Lead Telluride Infrared Detectors
- Barrier Grid Storage Tubes
- Electro Static Focusing TWT
- Permanent Magnet Type TWT
- Super Powered Pulse Triodes

**A trademark of International Telephone and Telegraph Corporation

ITT *Components Division*

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

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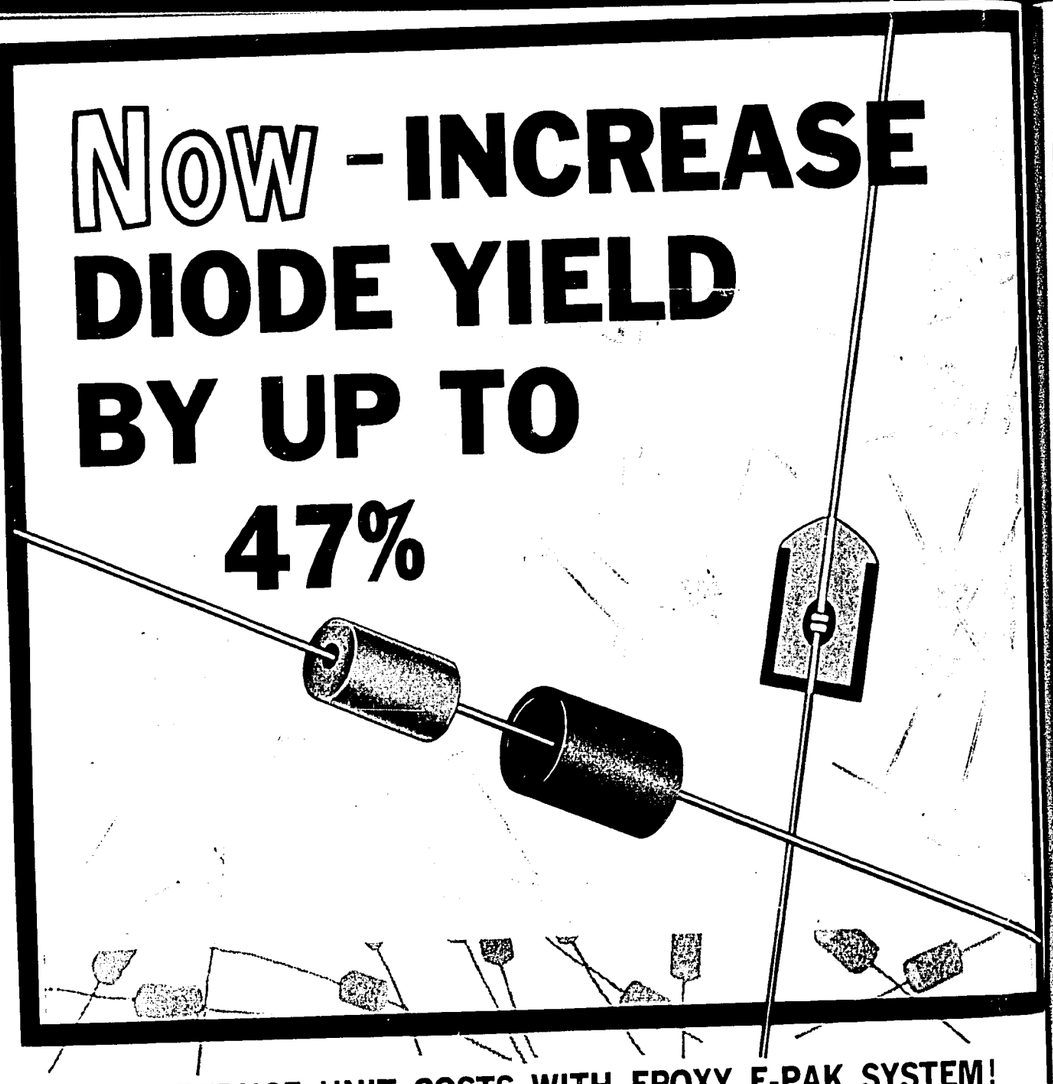
For details, Circle 4 on the Reader Service Card.

NOW - INCREASE DIODE YIELD BY UP TO 47%



AND REDUCE UNIT COSTS WITH EPOXY E-PAK SYSTEM!

Now, Epoxy Products brings the mass production economy of the famous E-Pak system* to diode encapsulation! It works like this: the diode is inserted into a preformed yellow epoxy E-Form pellet . . . both pellet and diode are then placed in a molded epoxy case . . . heat is applied, the pellet melts, cures, seals the unit completely. It's a quick, efficient operation that requires no expensive fixturing, yet meets all applicable Mil-Specs (including MIL Std. 202-A).

This system eliminates glass to metal seals and the accompanying disadvantages of glass cracking, and weld contamination. Heat dissipation is exceptional.

These rugged epoxy packages are homogeneous and resistant to 95% relative humidity for 1,000 hours. They can be cycled from —55° C to +200° C. The yellow pellet provides immediate cathode identification and quick visibility.

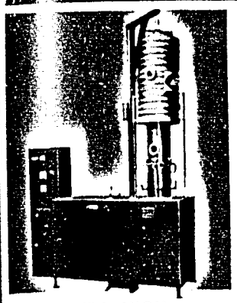
If you encapsulate diodes, **every other method is now obsolete!** Write today for complete information and samples. Inquire, too, about the applications of E-Pak system to other semiconductor devices.

*Patents applied for.

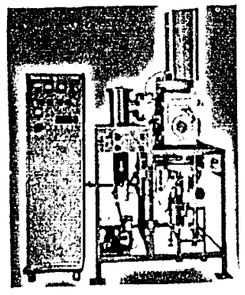
EPOXY A DIVISION OF JOSEPH WALDMAN & SONS
PRODUCTS, INC.
137 Coit Street, Irvington, New Jersey
ESsex 5-6000

For details, circle #150 on Reader Service Card

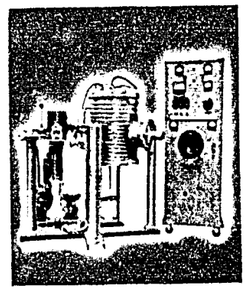
Kinney® HIGH VACUUM EQUIPMENT



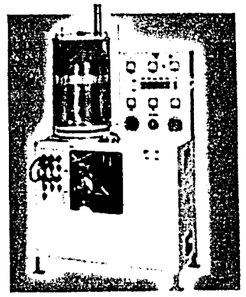
ULTRA HIGH VACUUM SYSTEM
The KINNEY Model UH-9 Ultra High Vacuum System is the first standard working equipment producing pressures in the order of 1×10^{-9} mm Hg. with realistic time cycles. The UH-9 is equipped with fittings customarily found in High Vacuum Evaporators but operates at much lower pressures. Ask for Bulletin 4150.1.



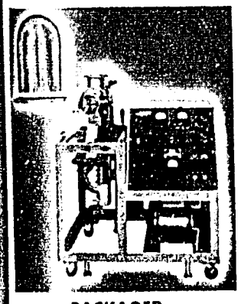
FLOATING ZONE REFINER
An important advance in the purification of semi-conductor materials and refractory metals, this KINNEY development will process loads 6" to 10" long and up to 1½" in diameter with purification heretofore unattainable. Chamber suitable for use with vacuum or inert gas atmosphere. Ask for Bulletin 4501.1.



F-9 UNIVERSAL LABORATORY FURNACE
Laboratory furnace of improved design with a capacity of 5 lbs. of steel or similar volume of other metals if crucible is tilt poured; or 25 lbs. if bottom plug pouring is employed. Can be provided with resistance or induction heaters to attain temperatures in excess of 2000° C. Ask for Bulletin 4560.1A.

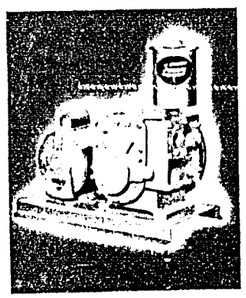


HIGH VACUUM EVAPORATORS
The KINNEY Line of High Vacuum Evaporators embraces sizes from small laboratory units to high production equipment with chambers 6 ft. in diameter. Model R-2 illustrated has a high capacity pumping system which will produce pressures in the order of 1×10^{-6} mm Hg. in seven minutes. Ask for Bulletin 4100.1D.

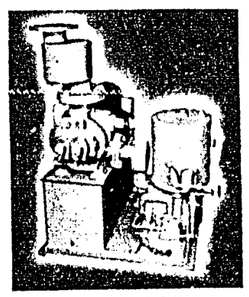


PACKAGED PUMPING SYSTEMS
KINNEY Packaged Pumping Systems afford speedy evacuation of chambers, tanks, bell jars, tubes, etc., with ultimate pressures to 1×10^{-7} mm Hg. Systems consist of KINNEY Cold Trap, Fractionating Oil Diffusion Pump, two-stage Mechanical Pump, Operating and Control Panel. Ask for Bulletin 3000.1.

SINGLE-STAGE VACUUM PUMPS
The KINNEY Line of single-stage Pumps includes 3 Simplex and 11 Duplex models embracing a range from 13.0 to 780 cfm free air displacement. These oil-sealed Rotary Piston Pumps feature gas-ballasting and develop ultimate pressures to .010 mm Hg. or better. Ask for Bulletin 3120.1.

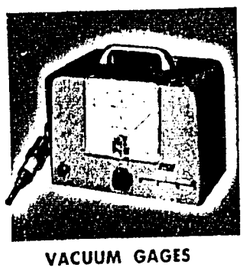


TWO-STAGE VACUUM PUMPS
Designed for work in the low micron area, KINNEY two-stage, gas-ballasted, oil-sealed mechanical Pumps range in capacities from 2.0 to 46.0 cfm free air displacement. They attain ultimate pressures in the order of .0002 mm Hg. or lower. Ask for Bulletin 3150.1.



MECHANICAL BOOSTER VACUUM PUMPS
A major advance in vacuum technology . . . developed to produce clean, dry vacuum with maximum speed and at lowest cost. These Kinney two-stage and four-stage Pumps, covering a range from 30 to 5100 cfm free air displacement, attain ultimate pressures of .0002 mm Hg. or lower. Ask for Bulletin 3180.1.

OIL DIFFUSION PUMPS
KINNEY High Speed and Fractionating Oil Diffusion Pumps offer high pumping speed in the low micron region. High Speed models 1" to 10" . . . Fractionating models 2" to 16" and higher. KINNEY straight-through and right-angle Poppet Valve Baffles also available. Ask for Bulletins 3270.1 and 3290.1.



VACUUM GAGES
The KINNEY family of integrated Vacuum Gage Systems covers a broad range of pressures. The new KINNEY Compensated Thermocouple Gage accurately spans the range from 3000 to 1 micron. The KINNEY TIG-5 Thermocouple/Ionization Gage gives accurate readings from 3000μ to 1×10^{-3} mm Hg. Ask for Bulletin 3800.1.

HIGH VACUUM ACCESSORIES
High Vacuum Valves, Packaged Power Units, Low Voltage and Rectified Power Supplies, Hermetic Sealing Units, Liquid Nitrogen Cold Traps, Complete Gage Systems, Ionization Gage Tubes, Feed-throughs of all sizes, Rotary Motion Devices, Headers, Filament Holders, Pyrex and Stainless Steel Bell Jars, Bell Jar Guards, Japanese Fan Shutters, Work-Holding Fixtures, Tripods, Gaskets, Highest Purity Coating Materials.

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3631 WASHINGTON STREET • BOSTON 30 • MASS.

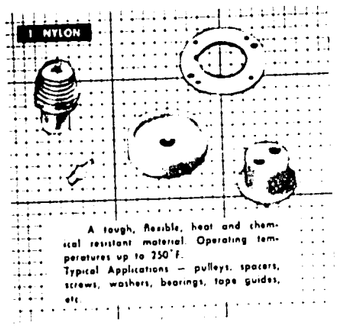
Please send literature on the following KINNEY products —

- ☐ High Vacuum Pumps
- ☐ Mechanical Booster Pumps
- ☐ Oil Diffusion Pumps
- ☐ Packaged Pumping Systems
- ☐ High Vacuum Gages
- ☐ Ultra High Vacuum Systems
- ☐ Floating Zone Refiner
- ☐ Laboratory Furnaces
- ☐ Evaporators
- ☐ High Vacuum Accessories

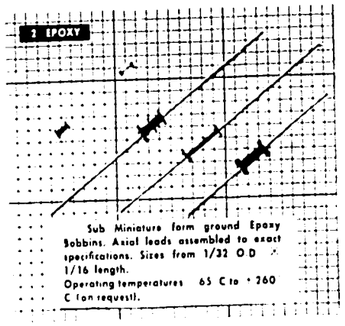
Name_____
Company_____
Address_____
City_____ Zone_____ State_____

CLIP AND MAIL THIS COUPON TODAY

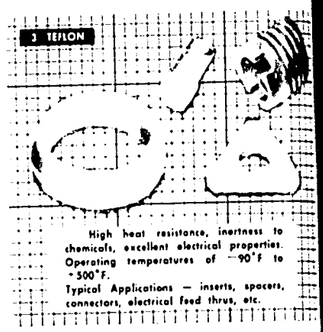
For details, circle #151 on Reader Service Card



A tough, flexible, heat and chemical resistant material. Operating temperatures up to 250°F.
Typical Applications — pulleys, spacers, screws, washers, bearings, tape guides, etc.



Sub Miniature form ground Epoxy Bobbins. Axial leads assembled to exact specifications. Sizes from 1/32 O.D. x 1/16 length.
Operating temperatures 65 C to +260 C (on request).



High heat resistance, inertness to chemicals, excellent electrical properties. Operating temperatures of −90°F to +500°F.
Typical Applications — inserts, spacers, connectors, electrical feed thrus, etc.

NORRICH
PRECISION ELECTRONIC COMPONENTS

Here are some of the quality parts being manufactured at Norrich for more reliable electronic products.

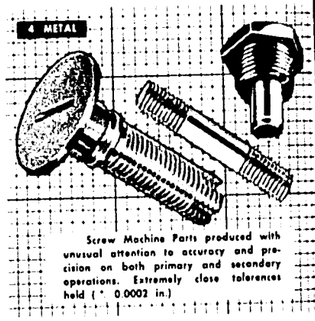
Norrich specializes in the machining of precision plastic and metal components for Electrical, Chemical and Mechanical applications. This specialization is based on a wealth of experience and skill acquired in working with all types of plastic and metal materials.

Advanced production methods, ultra modern production and inspection equipment, continuous quality control, and engineering skill enables N.P.C. to meet critical delivery schedules at economical costs.

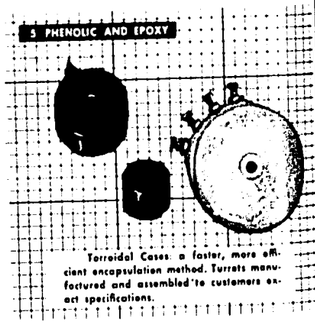
Norrich is actively engaged in producing custom parts for aircraft, missile, instrument, radar, radio, etc; for the foremost electronic manufacturers.

No matter what your problem, Norrich Plastics feels confident in its ability to aid in its resolution; drawing fully on extensive facilities, engineering and experience to produce precision parts in any quantity.

Send us your prints; analysis, evaluation and recommendations given. Call or write for technical specifications, descriptive brochures and quotations.



Screw Machine Parts produced with unusual attention to accuracy and precision on both primary and secondary operations. Extremely close tolerances held (± 0.0002 in.)



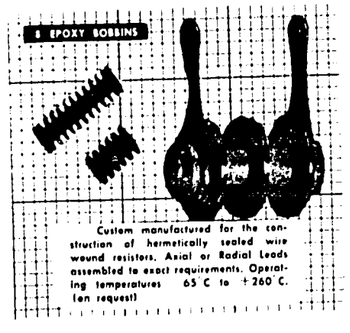
Toroidal Cases: a faster, more efficient encapsulation method. Turrets manufactured and assembled to customers exact specifications.

Screw Machine Parts. Extremely good tensile and impact strength.

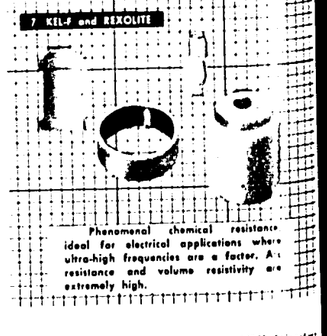
NORRICH PLASTICS CORP.

107-109 WEST 18th STREET, NEW YORK 11, N. Y. WAtkins 4-8360-1

For reliable encapsulating and encasing of Resistors, Capacitors, Coils, Transformers and other applications where hermetic sealing is required. Wall thickness's to .005.



Custom manufactured for the construction of hermetically sealed wire wound resistors. Axial or Radial Leads assembled to exact requirements. Operating temperatures 65°C to +260°C. (on request)



Phenomenal chemical resistance ideal for electrical applications where ultra-high frequencies are a factor. Arc resistance and volume resistivity are extremely high.

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The CARE that produces QUALITY in THERMISTORS

Besides the technology and manufacturing resources you'd expect of Keystone, there's a great deal of individual patience and care bound up in each thermistor we make. Our Thermistor Division is staffed by people who appreciate the importance of precision workmanship—and many of them have been with us since we made our first negative temperature coefficient resistance unit over 20 years ago. ● Along with our complete laboratory, engineering and manufacturing facilities, our "people who care" have made Keystone *the key name* in thermistors today.

How do you benefit by all this? It's simple. Whether the thermistor you need is as large as your thumb or as small as a gnat's eye, it will perform as specified . . . on earth, in space, or below the seas . . . if made by the people at Keystone. ● We'd be more than pleased to hear from you about your possible application for thermistors. Chances are we can help. Write us.

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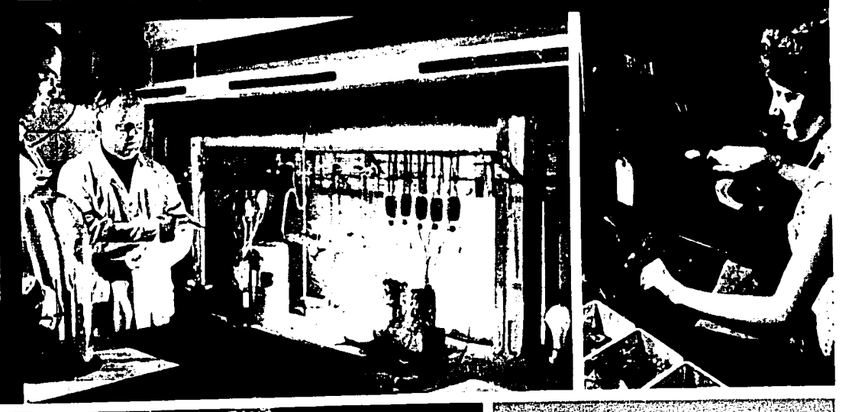

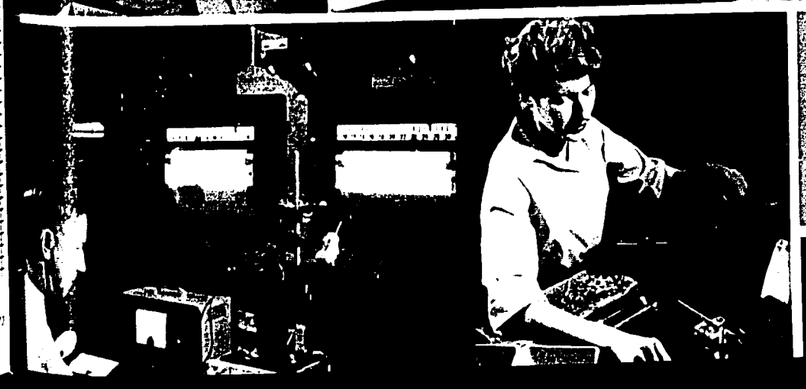

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CARBON COMPANY
Thermistor Division
ST. MARYS, PA.

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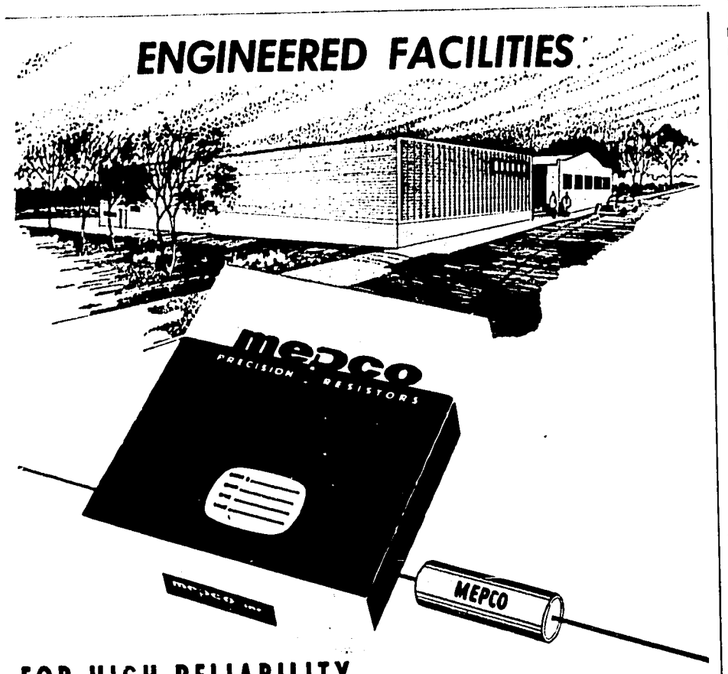

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- Hermetically Sealed Deposited Carbon Resistors
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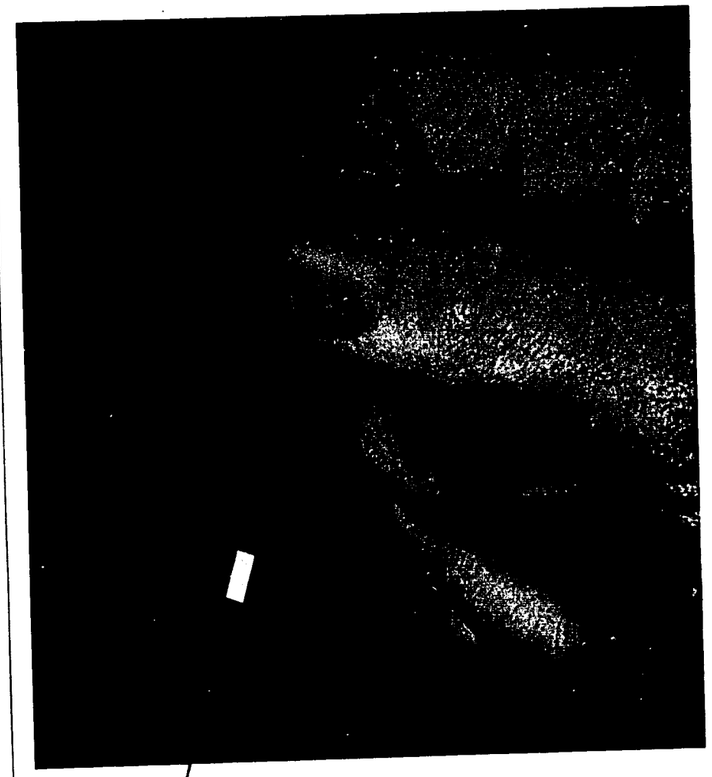

Amazing New **WEE-DUCTOR**

The R. F. Choke that's so small you can pack 200,000 to a cubic foot

Tiny, new WEE-DUCTOR covers a full range of inductances from 0.10 μH to 1,000 μH, yet it measures only 0.150" x 0.375" and occupies a volume of less than 0.0066 cubic inch!

Unique, new, ferrite sleeve and core construction provides 10,000 to 1 inductance range in a tiny package . . . yet it still allows for a high current rating at 125°C operating temperature.

WEE-DUCTOR is the latest addition to the Essex Electronics line of standard R.F. Choke Coils . . . write today for detailed data sheet describing this amazing new miniature choke with the expanded range of inductances!

Essex Electronics Standard Line of R.F. Chokes

Essex Part Number	L μH	Max. Res. Ω	I Max. ma	Dia.	Length
WEE-DUCTOR	0.10 - 1,000	0.035 - 14.9	3000 - 150	0.157	0.375
RFC-S	0.10 - 100	.02 - 6.0	4000 - 220	0.188	0.44
RFC-M	1.0 - 1,000	.04 - 21.0	2700 - 125	0.25	0.60
RFC-L	1.0 - 10,000	.03 - 80.0	4000 - 80	0.31	0.90

CHOKES • DELAY LINES • COILS • PULSE TRANSFORMERS

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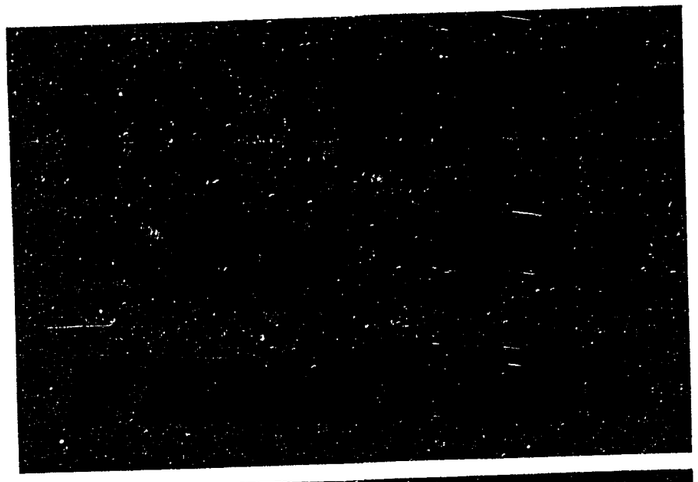

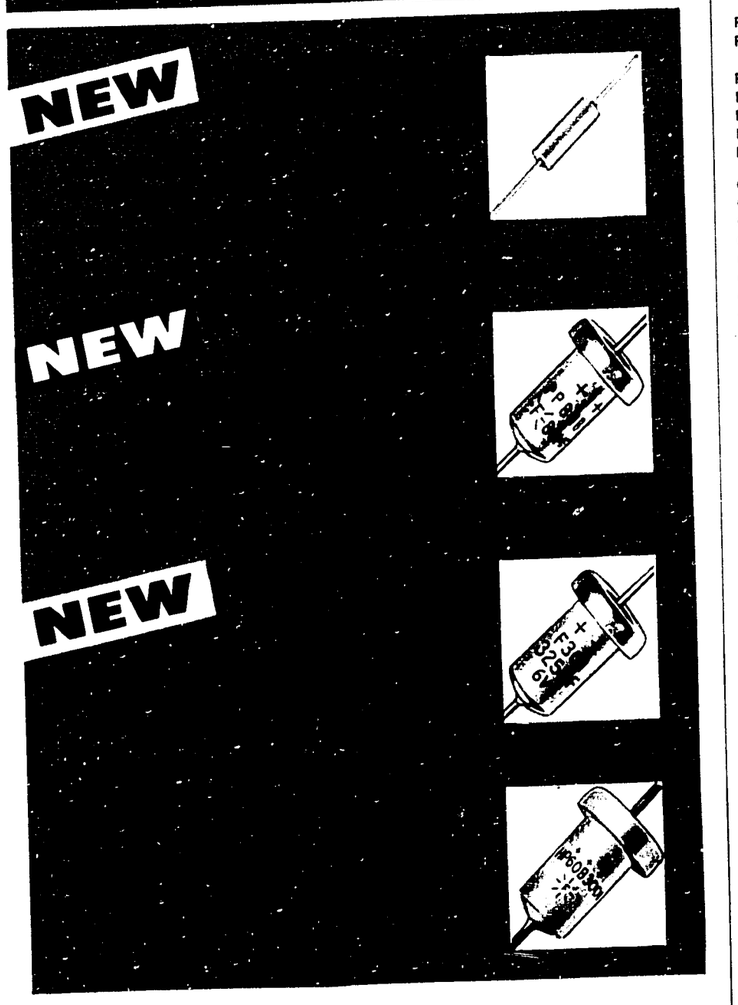

FANSTEEL RELIABILITY

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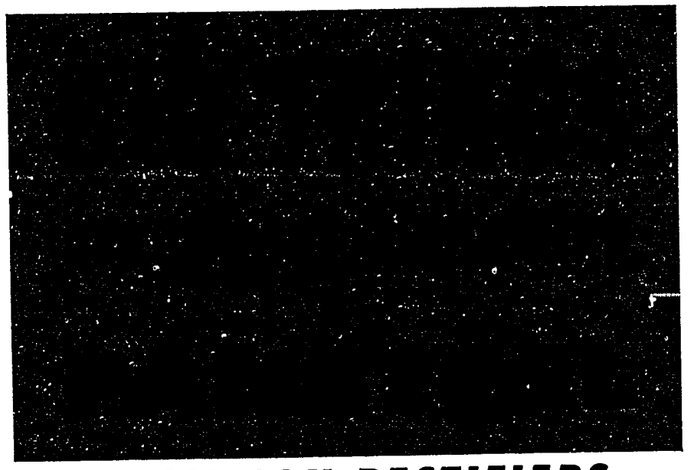

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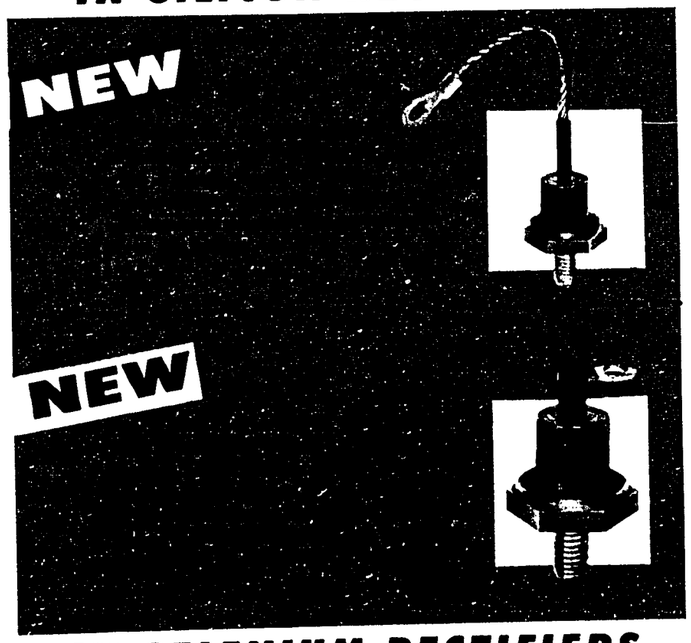

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FANSTEEL METALLURGICAL CORPORATION North Chicago, Ill., U.S.A.

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Compact! Easy to Read! Union Data Display Indicators

Union Switch & Signal makes two types of electro-mechanical, DC-operated data display indicators: digital types, displaying 10, 12, or 16 characters on a wheel; and alpha-numerical types, displaying up to 64 characters on a MYLAR* belt. Character assignments can be furnished as required.

TRANSLATION Both Digital and Alpha-Numerical Indicators operate directly on binary codes on a null-seeking basis. This eliminates the need for external equipment for translation from binary to decimal code, as required with other display devices.

VISUAL READ-OUT Indicator packages are designed for quick, easy readability, even when indicators are mounted in rows.

INFINITE RETENTIVITY The indicators require power only during the response time, because they are of the null-seeking type. Once positioned, the indicators *retain* the data visually and electrically until a new code is transmitted.

ELECTRICAL READ-OUT The design of the decoding and control portions of the indicators provides electrical read-out of data in the same form as the input. The data can be read continuously or periodically without erasing the stored information.

USES These indicators can be used in the output of digital computers, in teletype receiving equipment, in telemetering systems, or wherever data needs to be displayed. Bulletin No. 1015 gives you complete information.

**Dupont's synthetic fiber*

Bulletin No. 1015 gives you complete information.

"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
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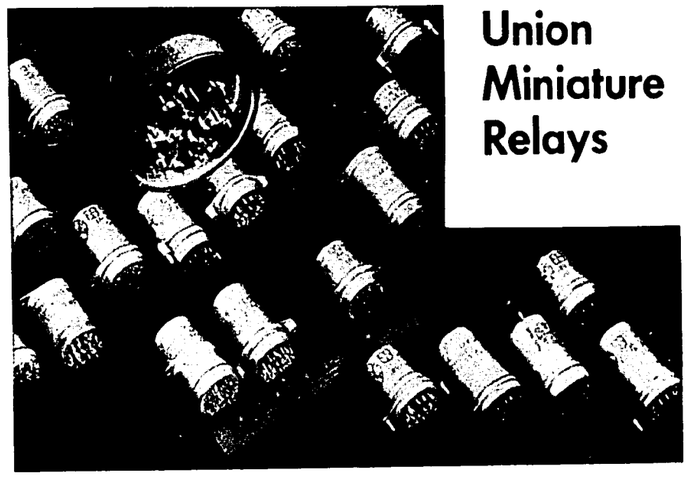
Tops in reliability!



Union Miniature Relays

Used in seven successful missiles. Union Miniature Relays originally were developed for air-borne and guided missile electronic equipment; they meet or exceed the requirements of MIL-R-25018, MIL-R-6106C, and MIL-R-5757C. They are now being utilized in the following missiles: The Matador, Thor, Talos, Vanguard, Atlas, Titan, and the Jupiter C.

The excellent reliability and small size of the Union Miniature Relays have led to their use in traffic control systems, computers, resistance welders, and other equipment.

OUTSTANDING FEATURES

HI-LO CONTACTS—Permit high and low load handling in same relay. Dry-circuit contacts available for extremely low-level loads.

COIL RESISTANCE—In standard case, from 0.9 to 8750 ohms; in long case, from 1.6 to 13,000 ohms.

TEMPERATURE RATING—Class A −55 to +85°C; Class B −65 to +125°C.

AC OR DC—Nominal operating voltages from 1.5 to 160 volts, DC; 115 volts, 60 to 400 cps, AC. Built-in rectifiers in AC relays.

TYPES AND MOUNTINGS—6PDT or 4PDT; plug-in or solder-lug connections. All usual mountings.

SPECIALS—Slow-acting relays if you need a differential between operating time of various relays. Plate-circuit relays—operate on less than 8 milliamperes; double-coil relays—either coil operates relay. Write for complete information.

"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
PITTSBURGH 18, PENNSYLVANIA

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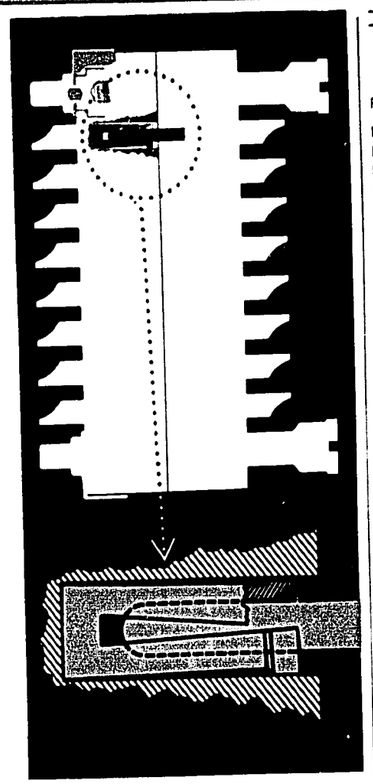
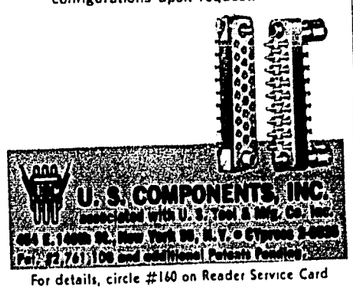


"better than we expected!"

SMI-C Subminiature Series* Precision Connectors

When our connectors meet your specifications perfectly . . . well that's all part of our job. But when they exceed requirements, we drop all modesty and do a little shouting. This was the case with our new SMI-C Connector Series, causing one of our leading customers to exclaim "Better than we expected!" These are the newest members of the family of over 150 reliable types of U. S. COMPONENT connectors, products of a close liaison between application engineers and our design team.

- STAINLESS STEEL REINFORCING RETAINER provided under each screwlocking element removes all torque stresses from molded bodies, avoiding breakage.
- POSITIVE RE-ENTRANCY OF MALE PINS assured each time by flanged guide female contact.
- SELF-ALIGNMENT ACTION assisted by provision of wider countersink on upper end of contact.
- IDEAL FOR CRITICAL ENVIRONMENTAL CONDITIONS and extremes of military applications.
- 7-11-14-20-26-34 contacts. Other configurations upon request.



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HELPFUL HINTS
for using the IRE DIRECTORY

A few minutes' study of the basic layout of the IRE DIRECTORY will help you to find the information for which you are looking more quickly and more accurately. At first glance, the IRE DIRECTORY may seem to be confusing, but by using the various portions of the book as listed below, you will find your way around easily, and will discover that it is actually a very simple arrangement, and a much more logical one than a purely alphabetical terminology listing.

PINK SECTION at the front of the products and firms section contains a terminology index listing every product, major and minor, for which a list of manufacturers is given. Page numbers refer you to the page on which the listings for that product begin. Following this alphabetical index is a copy of the questionnaire which is sent to the firms who have furnished us with product information. A quick look through this questionnaire will help greatly in understanding the product arrangement. At the top of the first page of the pink section is a small index referring you to the opening page of the complete-data spread section, the alphabetical directory, and each of the three product directories.

THE COMPLETE DATA SPREAD SECTION (pages 1-160) contains product advertisements of great usefulness to the reader. Most of these advertisements are two pages or more, and all of them contain complete information on the products manufactured by the advertising firms—specifications, prices, illustrations, and suggested applications.

ALPHABETICAL DIRECTORY OF MANUFACTURERS (pages 161-264) contains a list of 4,304 firms representing the majority of buying and selling power in the radio-electronic industry. Each firm listing contains the complete mailing address and telephone number for the firm. Following the state name in the firm address, a list of code numbers is given. These numbers refer to the 102 major products listed in the book (for quick reference to the meaning of the codes, use the questionnaire form in the pink section).

THE THREE DIRECTORIES OF PRODUCTS ARE:

1. Complete Equipment
2. Components
3. Materials and Services

This breakdown into three directories saves you from traveling through many products in which you are not interested at the moment, and helps you to turn immediately to the listings for the type of product you want, following a straight line to your destination. Use the Machol edge index at the top of the first page of the pink section to locate immediately the first page of the appropriate directory, then use the Machol edge index at the beginning of each directory to find the specific product you want. You don't even have to know the page number—the index will find it for you automatically!

102 MAJOR PRODUCTS are listed within these three Directories. Each product listing contains a number of sub-headings so that you may know specifically what each firm makes. To interpret the code numbers shown after each firm's listing, consult the first page of that product class, where the sub-headings are defined. You will note that advertisements are positioned throughout the book in the most appropriate listing section, so that the advertisement for a relay manufacturer will appear in the relay section, to help you with further information on his product. Every advertiser's listing shows you the page number on which his advertisement may be found, and you will derive more value from this book if you consult these advertisements for facts you cannot find in the listings.

COMPLETE ADDRESS LISTINGS are given only for advertisers in this section. If you wish to locate the address and telephone number for any other firm, it will be necessary to use the alphabetical directory.

THE DISTRIBUTION SECTION is class 102, the last class in the book. This section contains a list of 1399 manufacturers representatives, distributors and jobbers, grouped geographically. See page 702 for a more complete explanation of the use of this section.

ADVERTISER'S INDEX appears on pages 154-160 and on pages 726-728.

How to Use the Machol Edge Index

High speed reference is a major objective of the IRE DIRECTORY. To this end we have adopted the Machol Edge Index system, and these indexes:

Advertisers Index, pages 154-160 and 726-728.

Key to Products, Pink Section.

Index to Spreads, 1.

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HOW TO USE

1. Bend the Directory almost double with the front cover page on the inside.
2. Hold in your right hand with your four fingers near to the bound edge and your right thumb near the middle of the open side of this page.
3. From the heavy or light line symbol adjacent to the subject you seek, run your eyes across the page edges until you reach the horizontally corresponding symbol.
4. OPEN THERE!

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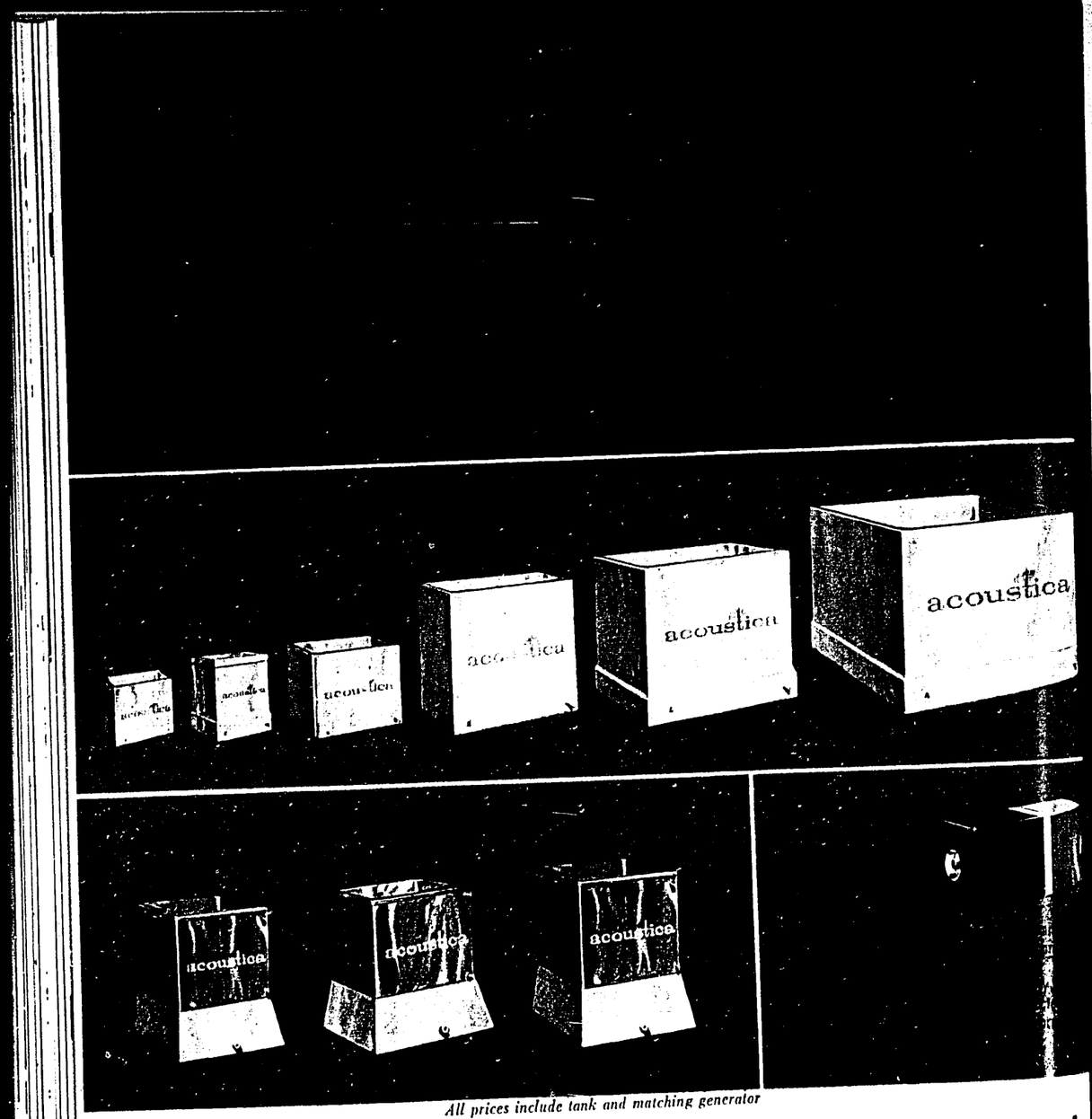
1960 Edition prepared by The Advertising Department of the Institute of Radio Engineers, 72 W. 45th St., New York 36, N.Y.
William C. Copp, Mgr.; Lillian Petranek, Asst.; Carl Maier, Production; Frank G. MacAloon, Research.



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acoustica

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Acoustica Associates, Inc., Fairchild Court, Plainview, N.Y., OVerbrook 1-2100
10400 Aviation Blvd., Los Angeles, Calif., ORchard 0-3393, SPring 6-0511

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Acoustica Associates, Inc.
Fairchild Court, Plainview, N.Y., Dept. IRE

Send information to help us determine the correct ultrasonic cleaner for our purpose.

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TITLE & COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

A

A A Metal Products, Inc., 154 Elliot St., Brattleboro, Vt., 81, 84, 86, 87, 95
Tel: ALpine 4-4333

ABC Sound Engrg. Co., 145 W. 47 St., New York 36, N.Y., 27, 30, 57, 81
Tel: JUdson 2-1111

A. C. Transformer Corp., 89 Madison St., Newark 5, N.J., 73
Tel: MI 2-7574

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Tel: VIctoria 9-2414

ACF Electronics, 1321 Leslie Ave., Alexandria, Va., 41, 62, 83, 90, 99
Tel: KIng 8-4400

ACF Industries, Inc., Avion Div., 11 Park Pl., Paramus, N.J., 9, 15, 19, 25, 28, 30, 45, 50, 61, 79, 80
Tel: COlfax 1-4100

ACF Industries, Inc., Nuclear Products Erco Div., P.O. Box 5, Riverdale, Md., 9, 16, 90
Tel: WArfield 7-4444

A & D Electronics, Inc., Mt. Rascal Rd., Hackettstown, N.J., 4
Tel: GArden 5-5716

A K Mfg. Co., Inc., 115 S. Northwest Hwy., Barrington, Ill., 82
Tel: DUnkirk 2-5432

A.L.A. Industries, Inc., 151 Crotona Ave., Harrison, N.Y., 37, 54, 81, 89
Tel: TEnnyson 5-0400

AMP, Inc., Capitron Div., 155 Park St., Elizabethtown, Pa., 9, 15, 41, 48, 61, 73, 86
Tel: EMpire 7-1105

A & P Metal Products Mfg. Co., 111 Bloomingdale Ave., Hicksville, L.I., N.Y., 81, 84, 86
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A.P.M. Corp., 252 Hawthorne Ave., Yonkers, N.Y., 44, 52, 53, 86, 87
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Tel: YOnkers 8-2010

A.P.W. Company, 72 W. Main St., Rockaway, N.J., 43, 59
Tel: OAkwood 7-0643

A.R.F. Products, Inc., 7627 Lake St., River Forest, Ill., 1, 4, 6, 16, 18, 20, 21, 26, 34, 36, 37, 42, 61
Tel: FO 9-6000

A.R. & T. Electronics, Inc., 1101 McAlmont St., Little Rock, Ark., 34, 36, 61
Tel: FR 5-6441

A-1 Precision Products, 3622 W. Jefferson Blvd., Los Angeles 16, Calif., 44, 70, 82, 86, 87, 94, 98
Tel: RE 1-8268

Abalon Precision Mfg. Corp., 540 Casanova St., New York 59, N.Y., 81, 84, 86, 87
Tel: LUdlow 9-5082

Abbot, Edward A., P.O. Box 274, Forest Hill, 75, N.Y., 85
Tel: ALgonquin 4-5810

Abrams Instruments Corp., 606 E. Shiawassee St., Lansing 1, Mich., 4, 9, 13, 28, 31, 85, 86, 90
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Academic Press, Inc., 111 Fifth Ave., New York 3, N.Y., 101
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Accuracy, Inc., 4 Gordon St., Waltham, Mass., 67
Tel: TWinbrook 4-1126

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Tel: ENdicott 5-1211

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Tel: CHesapeake 3-2166

Accurate Specialties Co., 37-11 57th St., Woodside 77, N.Y., 46, 86, 93, 97
Tel: TWining 9-5757

Code Numbers TELL YOU

what each company does or makes. The numbers after each address refer you to the 102 product and service classes, in which detailed information on the firm will be found.

o o o

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PINK SECTION
gives a guide to the products and services listed in the Product Directories.

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For complete listings of over 900 major and minor products listed in the "Products and Services" sections of this Directory, see the pink section preceding page 1.

Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago 24, Ill., 70, 87
Tel: VAn Buren 6-5900

Ace Coil & Electronics, 916 Lincoln Hwy., Metuchen, N.J., 43, 73

Ace Electronics Associates, Inc., Dept. A3, 99 Dover St., Somerville 44, Mass., 67
See ad on page 528
Tel: SOmerset 6-5130

Ace Engineering & Machine Co., Inc., Tomlinson Road, Huntington Valley, Pa., 12
Tel: CHapel Hill 1900

Ace Fabricators, 1647 N. Milwaukee Ave., Chicago 47, Ill., 86, 89, 95
Tel: HUmboldt 6-1149

Ace Plastic Co., 91-30 Van Wyck Expwy., Jamaica 35, N.Y., 86, 95
Tel: Jamaica 3-5500

Ackerman Engravers, Inc., 458 Broadway, New York 13, N.Y., 86, 87
Tel: BArclay 7-1479

Ackerman-Gould Co., 10 Neil Ct., P.O. Box 188, Oceanside, L.I., N.Y., 86, 92
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Tel: ORiole 8-4110

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Acme Electric Heating Co., 1217 Washington St., Boston, Mass., 88

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Tel: CLearwater 3-5121

Acme Telectronix, Div. of NEA Service, Inc., 1200 W. Third St., Cleveland 13, Ohio, 11, 31
Tel: MAin 1-7300

Acme Wire Co., 1255 Dixwell Ave., New Haven 14, Conn., 82, 86, 89, 91
Tel: LO 2-2171

Acoustica Associates, Inc., Dept. IRE, Fairchild Ct., Plainview, N.Y., 4, 12, 16, 71, 83, 86, 92
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Acoustical Mfg. Co., Ltd., St. Peters Rd., Huntingdon, England, 36, 54, 77
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Acro Products Co., 309 Shurs Lane, Philadelphia 28, Pa., 36, 73
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Acro Tool & Die Works, 4554 Broadway, Chicago 40, Ill., 84, 86, 92
Tel: LO 1-1807

Acromag, Inc., Dept. G, 22519 Telegraph Rd., Detroit 41, Mich., 36, 73
See ad on page 366
Tel: ELgin 6-7211

Acromark Co., 538 Morrell St., Elizabeth 4, N.J., 86, 87, 92
Tel: ELizabeth 2-6500

Actioncraft Products, 2 Yennicock Ave., Port Washington, L.I., N.Y., 87, 89
See ad on page 635
Tel: POrt Washington 7-4500

Acton Laboratories, Inc., 536 Main St., Acton, Mass., 5, 12, 14, 26, 36, 90
See ad on page 292
Tel: COlonial 3-7756

Wherever you fly... More Channels nearby!

WITH ARC's NEW TYPE T-25A 360 CHANNEL TRANSMITTER

As air traffic becomes heavier, pilots are busier with more frequent ground communications. To meet this growing need in traffic control, ARC designed the Type T-25A 360 Channel Transmitter with the widest range of frequencies — more than adequate for today or years to come. Weighing only 7.7 pounds including shock mounting, the T-25A provides complete coverage of 360 channels at 50 kc spacing between 118.00-135.95 megacycles. It is a 6-10 watt unit (nominal 8 watts), providing ample range for planning approaches in congested air traffic areas. Power consumption of only 2.0 amperes during transmission on the 28 volt model, plus the 2.0 amps input to the receiver dynamotor that supplies high voltage. This means little added power drain on the electrical system.

This transmitter is recommended for use with ARC's line of tunable receivers, (R-13B and R-19) for a primary communication system on small aircraft or as a "back-up" to ARC Type 210 Transmitter-Receiver on larger aircraft.

Certified to CAA TSO C-37 Category A and FCC Requirements

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Actuator Products Corp., 14 Nashua St., P.O. 247, Woburn, Mass., 28, 87
Tel: WElls 3-1400

Adage, Inc., 292 Main St., Cambridge 42, Mass., 9, 45, 56
Tel: UNiversity 4-7410

Adair Engrg. Co., George P., 1610 Eye St. N.W., Washington, D.C., 85, 90
Tel: EXecutive 3-1230

Adams-Russell Co., Inc., 200 Sixth St., Cambridge 42, Mass., 37, 50, 73, 80
Tel: UNiversity 8-8040

Adams & Westlake Co., Relay Div., 1025 N. Michigan St., Elkhart, Ind., 66
Tel: 2-0550

Adcon, Inc., 1117 Commonwealth Ave., Boston 15, Mass., 4, 9, 36
Tel: STadium 2-1117

Addis Translations, R., P.O. Box 2887 Woodside Rd., Woodside, Calif., 101
Tel: ULmar 1-1492

Addison-Wesley Publishing Co., Reading, Mass., 101
Tel: REading 2-3700

Adelman Co., Leon L., 25 Chittenden Ave., New York 33, N.Y., 102
See ad on page 715
Tel: SWinburne 5-1145

Adler Electronics, Inc., 1 Le Fevre Lane, New Rochelle, N.Y., 1, 6, 7, 12, 21, 24, 26, 32, 34, 36, 37, 61, 73, 77, 81, 90
Tel: NEw Rochelle 6-1620

Admiral Corp., 3800 Cortland St., Chicago 47, Ill., 1, 4, 6, 7, 9, 10, 20, 21, 22, 23, 25, 29, 33, 45, 48, 50, 59, 61, 70
Tel: SP 2-0100

Advance Electronics Co., 8510 North End Ave., Oak Park 37, Mich., 37, 50, 63
Tel: LI 6-0248

Advance Electronics Corp., 2 Commercial St., Hicksville, L.I., N.Y., 34, 36, 50
Tel: OVerbrook 1-6400

Advanced Electronics, Inc., 94 Silas Deane Highway, Rocky Hill 9, Conn., 4, 12, 36, 43, 66, 82, 86, 90
Tel: JAckson 9-6881

Advanced Elecns. Mfg. Corp., 2116 S. Sepulveda Blvd., Los Angeles 25, Calif., 23
Tel: GRanite 8-9220

Advanced Vacuum Products, 430 Fairfield Ave., Stamford, Conn., 52
Tel: DAvis 4-2148

Advertising Engrg. Assoc., 1342 Bel Aire Rd., San Mateo, Calif., 101
Tel: FIreside 5-4931

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See ad on page 337
Tel: GRegory 2-5622

Aemco, Inc., 12 State St., Mankato, Minn., 66, 70
Tel: 5153

Aeromotive Equipment Corp., 1632 Central St., Kansas City 8, Mo., 1, 18, 20, 33, 37
Tel: VIctor 2-5870

Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill., 4, 5, 9, 12, 14, 36, 56, 81, 85, 90
Tel: WHitehall 3-0401

Aero Guidance Corp., 873 Linden Ave., Carpinteria, Calif., 1, 16, 19, 24, 26, 29, 34, 36, 37, 45, 50, 61, 80, 85, 90
Tel: CArpinteria 8-1721

Aero Instrument Co., 11423 Vanowen St., North Hollywood, Calif., 19, 31, 56, 70
Tel: POplar 5-7330

Aero Research Instrument Co., 315 N. Aberdeen St., Chicago 7, Ill., 12, 72, 82
Tel: TAylor 9-6400

Aerocoil, Inc., 2207 Summit Ave., Union City, N.J., 36, 43, 62, 66
Tel: UNion 3-2955

Aeroconomy Agency, P.O. Box 1001, Schenectady 1, N.Y., 101
Tel: FRanklin 2-8426

Aeroflex Corp., 34-06 Skillman Ave., Long Island City, N.Y., 9, 12, 28, 34, 36
Tel: STillwell 6-3325

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Tel: SYcamore 5-8771

Aerolite Electronics Co., 2207 Summit Ave., Union City, N.J., 36, 37, 38, 44, 51, 53, 60, 62, 66, 69, 82
Tel: UNion 3-2955

Aerolux Lights Corp., 653 11 Ave., New York 36, N.Y., 12, 15, 32, 56, 60, 65, 75, 79, 90
Tel: CIrcle 6-5324

Aeronautical Communications Equipment, 3000 S.W. 37 Ave., Miami 33, Fla., 1, 24, 33
Tel: HIghland 8-6503

Aeronautical Electric Co., 5656 Northwest Highway, Chicago 46, Ill., 60, 98
See ad on page 483
Tel: SPring 4-5200

Aeronautical Electric Inc., Raleigh-Durham Airport, P.O. Box 6527, Raleigh, N.C., 1, 7, 10, 20, 24, 36, 37
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Aeronutronic Systems, Inc., 13729 Victory Blvd., Van Nuys, Calif., 9
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Aerotron Supply Co., 8504 S. Normandie Ave., Los Angeles 44, Calif., 87
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Aerotronic Associates, Inc., P.O. Box 419, Concord, N.H., 4, 9, 12, 19
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Aerovox Corp., Crowley Div., 1 Central Ave., West Orange, N.J., 37, 38, 43, 46, 55, 83, 87
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Tel: 1-2141

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Tel: RAndolph 5-1000

Aid Associates, 972 Elsinore Ct., Palo Alto, Calif., 85, 90, 100, 101
Tel: DAvenport 4-0360

Ainslie Corp., 312 Quincy Ave., Quincy 69, Mass., 37, 80, 86
See ad on page 379
Tel: GRanite 2-8747

Air Control Instl. Ltd., Victoria Rd., Ruislip, England, 40, 58
Tel: RUislip 4000

Airborne Accessories Corp., 1414 Chestnut Ave., Hillside 5, N.J., 36, 41, 45, 50, 58
Tel: MUrryhill 8-0250

Airborne Instrument Lab., 1345 New York Ave., Huntington, L.I., N.Y., 4, 9, 12, 19, 26, 36, 38
Tel: MYrtle 2-6100

Aircom, Inc., 48 Cummington St., Boston, Mass., 1, 18, 19, 34, 36, 37, 38, 50, 61, 77, 80, 90
See ad on page 590
Tel: COpley 7-9115

Aircom, Inc., 139 E. First Ave., Roselle, N.J., 19, 36, 37, 38, 47, 61, 73, 77, 80, 85
Tel: CHestnut 5-2900

Aircraft Armaments, Inc., P.O. Box 126, Cockeysville, Md., 9, 19, 81, 85, 90
Tel: VAlley 5-8400

Aircraft Electronics, 6219 South Sears Blvd., Tucson, Ariz., 12, 15, 30, 36, 55, 61, 85, 86, 90, 92
Tel: MAin 4-6348

Aircraft Radio Corp., Boonton, N.J., 1, 20, 37
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Tel: DEerfield 4-1800

Airdesign Corp., 241 Fairfield Ave., Upper Darby, Pa., 36, 61, 73
Tel: GRanite 4-8000

Airecо, Inc., 2323 Second Ave. Carman, Schenectady 3, N.Y., 12
Tel: EX 3-3673

Airflyte Electronics Co., 540 Ave. A, Bayonne, N.J., 9, 44, 45, 62, 70, 80, 86, 94
See ad on page 550
Tel: HEmlock 6-2230

Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, N.Y., 40, 58
See ad on page 394
Tel: AMityville 4-3700

Air-Maze Corp., 25000 Miles Rd., Cleveland 28, Ohio, 50, 90
Tel: MOntrose 2-8000

Airmec Limited, High Wycombe, Bucks, England, 3, 4, 9, 12, 21, 22, 23, 26, 31

Air-O-Tronics Engrg. Co., P.O. Box 31, Lancaster, Calif., 53
Tel: WHitehall 3-4654

Airpax Electronics Inc., Seminole Div., P.O. Box 8488, Fort Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 3, 4, 9, 21, 28, 36, 45, 46, 56, 61, 70, 72, 73
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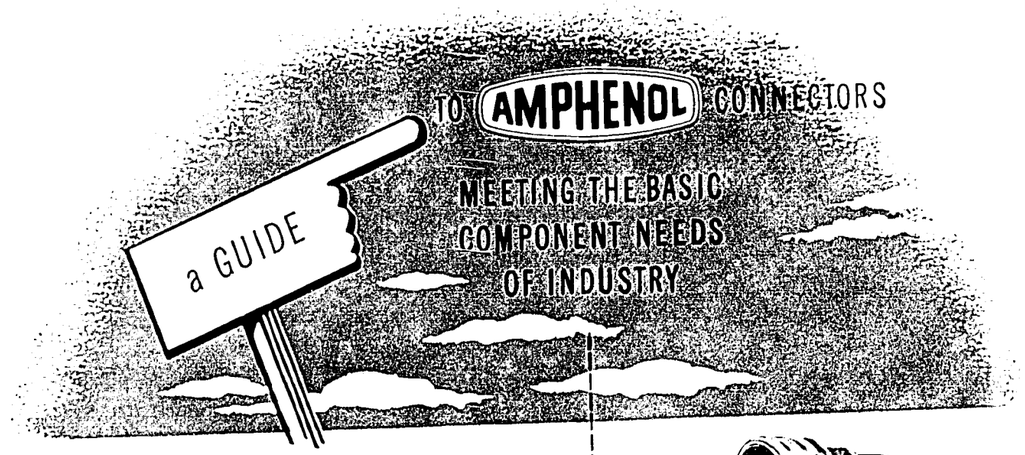
Tel: LUdlow 3-6160



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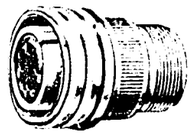

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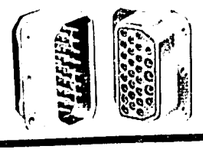

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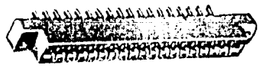

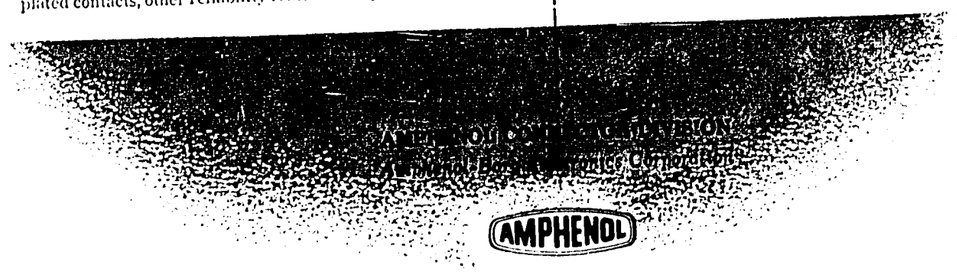

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Air-Shields, Inc., Hatboro, Pa., 81
Tel: OSborne 5-5200

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Tel: OLive 4-1676

Airtronics International Corp., 6900 West Rd. 84, P.O. 8576, Ft. Lauderdale, Fla., 9, 12, 26, 36, 48, 49, 61, 62
Tel: LUdlow 3-4541

Airtronix Development Corp., 4902 Church Ave., Brooklyn 3, N.Y., 6, 30, 36, 59, 77, 86

Ajax Condenser Co., Inc., 932 West Wrightwood, Chicago 14, Ill., 41
Tel: GRaceland 7-0000

Akeley Camera, Inc., Div. Flecker, J. W., 6502 Hamilton Ave., Pittsburgh 6, Pa., 15, 31
Tel: EM 1-7617

Alac, Inc., 365 W. Arden, Glendale, Calif., 87, 98
Tel: CHapman 5-7383

Aladdin Electronics, Div.-Aladdin Industries, Inc., 719 Murfreesboro Rd., Nashville 10, Tenn., 43, 73
Tel: CHapel 2-3411

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Tel: RYan 1-3318

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Tel: HUbbard 9-3040

Alco Electronics Mfg. Co., 3 Wolcott Ave., Lawrence, Mass., 12, 56
Tel: MUrdock 6-3889

Alden Electronic & Impulse Recording Equipment Co., Inc., P.O. Box 125, Westboro 1, Mass., 4, 9, 10, 11, 14, 34, 36, 61
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Tel: FOrest 6-4467

Alden Products Co., 121D N. Main St., Brockton 64, Mass., 44, 46, 51, 53, 60, 69, 79, 82, 84, 86, 87, 98
See ads on page 419, 691
Tel: JUniper 3-0160

Alden Systems Co., 1 Washington St., Westboro, Mass., 11, 14, 51, 53, 87
Tel: FOrest 6-4467

Aldshire Mfg. Co., Inc., 111 Lake Ave., Tuckahoe, N.Y., 59
Tel: SPencer 9-1297

Alectron Mfg. Co., 7842-39th Ave., Kenosha, Wis., 75
Tel: OL 7-3248

Alert Products, Inc., 728 Market St., Camden 2, N.J., 16, 40, 43, 50, 54, 86, 90
Tel: WOodlawn 6-1150

Alfax Paper & Engr. Co., Washington St., Westboro, Mass., 11
Tel: FOrest 6-4467

Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 1, 19, 26, 37, 38, 50, 70, 77, 80
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Tel: HAncock 6-2150

Alfred Electronics, 897 Commercial St., Palo Alto, Calif., 19, 26, 36, 61
Tel: DAvenport 6-6496

All American Tool Mfg. Co., 8027 Lawndale Ave., Skokie, Ill., 12, 73, 92
Tel: ORchard 3-7084

All Channel Products Corp., 47-39 49th St., Woodside 77, N.Y., 37
Tel: EXeter 2-1536

All Products Co., Communication Products Div., Mineral Wells, Texas, 37, 90
Tel: FA 5-3301

All Star Products, Inc., Squire Ave., Defiance, Ohio, 42
Tel: 2-1065

Allard Instrument Corp., 146 E. 2 St., Mineola, L.I., N.Y., 58, 60
Tel: PIoneer 6-5895

Allegany Instrument Co., 1091 Wills Mountain, Cumberland, Md., 5, 9, 12, 23, 31
Tel: PArkview 4-1200

Allegheny Electronic Chemicals Co., 207 Hooker-Fulton Bldg., Bradford, Pa., 47
See ad on page 438
Tel: BRadford 2-3588

Allegheny Ludlum Steel, Oliver Bldg., Pittsburgh 22, Pa., 46, 52, 93, 99
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Allen-Bradley Co., 114 W. Greenfield Ave., Milwaukee 4, Wis., 4, 38, 41, 46, 50, 55, 66, 67, 70, 83, 98
Tel: OR 1-2000

Allen Co., Inc., L. B., 9329 W. Bernice, Schiller Park, Ill., 87, 88, 91, 97
Tel: GL 5-3097

Allied Allegri Co., 141 River Rd., Nutley, N.J., 36, 82, 98
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Allied Chemical Corp., General Chemical Div., 40 Rector St., New York 6, N.Y., 91
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Allied Chemical Corp., Plastics & Coal Chemical Div., 40 Rector St., New York 6, N.Y., 89, 91, 95
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Tel: BUtterfield 8-7403

Allied International Corp., 230 Park Ave., New York 17, N.Y., 1, 10, 16, 20, 24, 39
Tel: MUrray Hill 9-6126

Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 30, 36, 77, 102
See ad on page 178
Tel: HAymarket 1-6800

Allied Research & Engineering Div., Allied Record, 6916 Santa Monica Blvd., Hollywood 38, Calif., 37, 80, 86
Tel: HOllywood 2-1251

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Allis-Chalmers Mfg. Co., 935 S. 70th St., Milwaukee 1, Wis., 64, 88
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Tel: WAtkins 4-2815

Alloyd Research Corp., 202 Arsenal St., Watertown 72, Mass., 88, 90, 93
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Alloys Unlimited, Inc., 21-01 43rd Ave., Long Island City 1, N.Y., 82, 86, 93, 97, 99
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Tel: EDgewood 3-3090

Alpar Mfg. Corp., 220 Demeter St., Palo Alto, Calif., 37
Tel: DAvenport 6-8105

Alpha Metals, Inc., 56 Water St., Jersey City 4, N.J., 86, 93, 97
Tel: HEnderson 4-6778

Alpha Wire Corp., 200 Varick St., New York 14, N.Y., 82, 87, 89, 95
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Alpine Electronic Components, Inc., Wolcott Rd., Waterbury, Conn., 44, 53, 87, 98
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Altec Lansing Corp., Peerless Elect. Prods. Div., 1515 S. Manchester Ave., Anaheim, Calif., 73
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Althor Products, 2301 Benson Ave., Brooklyn 14, N.Y., 81
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Alto Scientific Co., Inc., 855 Commercial St., Palo Alto, Calif., 34, 36, 45, 50, 56, 61, 66, 77
Tel: DAvenport 1-3434

Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa., 82, 86, 87, 93, 97
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Amatom Elect. Hardware Co., 88 Drake Ave., New Rochelle, N.Y., 51, 53, 60, 69, 86, 87, 94, 98, 99

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Amco Engineering Co., 7333 W. Ainslie St., Chicago 31, Ill., 40, 81, 84
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Tel: UNderhill 7-8500

Amelco, Inc., 2040 Colorado, Santa Monica, Calif., 1, 4, 14, 16, 20, 21, 24, 28, 29, 34, 36, 45, 56, 61, 62, 73, 77, 79, 81, 82
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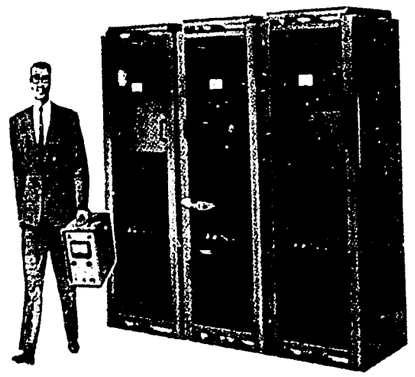

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American Bosch Arma Corp., Arma Div., Garden City, N.Y., 4, 9, 28
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American Brass Co., 414 Meadow St., Waterbury 20, Conn., 81, 82, 87, 93, 98, 99
Tel: PLaza 4-1121

American Can Co., Bradley Sun Div., 181 Long Ave., Hillside, N.J., 87
Tel: WAverly 3-0400

American Commun. Corp., 280 Broadway, New York 7, N.Y., 6, 30, 36, 44, 61, 77, 81
Tel: REctor 2-0319

American Cyanamid, Formica Corp. Subsid., 4614 Spring Grove Ave., Cincinnati 32, Ohio, 46, 86, 89, 95
Tel: KIrby 1-3670

American Electric Cable, 181 Appleton St., Holyoke, Mass., 82
Tel: JE 9-9893

American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich., 92
Tel: TRinity 5-2505

American Electronic Lab., 121 N. 7th St., Philadelphia 6, Pa., 12, 17, 19, 25, 36, 37, 47, 50, 80, 90
Tel: WAlnut 5-8780

American Electronics Co., 1203 Bryant Ave., New York 59, N.Y., 2, 26, 33, 37, 44, 50, 69, 77, 85, 101
Tel: DAyton 9-4815

American Electronics, Inc., 1025 W. 7th St., Los Angeles 17, Calif., 4, 22, 25, 28, 40, 45, 58, 61, 90
Tel: MAdison 4-9241

American Electronics, Inc., American Data Div., 75 Front St., Brooklyn 1, N.Y., 4, 9, 12, 21, 24, 34, 81
Tel: ULster 8-0500

American Elite Inc., 48-50 34th St., Long Island City 1, N.Y., 6, 7, 19, 25, 27, 30, 59, 65, 68, 74, 76, 77
Tel: STillwell 6-8913

American Feldmuehle Corp., 11 W. 42nd St., New York 36, N.Y., 46, 83
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Tel: PEnnsylvania 6-9751

American Gas Furnace Co., 141 Spring St., Elizabeth, N.J., 86, 88
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American Hydromath Corp., 42-17 Hunter St., Long Island City 1, N.Y., 1, 9
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Tel: GLen Rock 4211

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Tel: AMherst 5-3411

American Latex Fibre Corp., 500 Broadway, Lawrence, Mass., 86
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American Latex Products Corp., 3341 W. El Segundo Blvd., Hawthorne, Calif., 78, 86, 87, 89, 90
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American Laubscher Corp., 250 W. 57th St., New York 19, N.Y., 87
Tel: JUdson 6-7474

American Leonic Mfg. Co., 3001 Walnut St., Philadelphia 25, Pa., 82

American Machine & Foundry Co., 11 Bruce Pl., Greenwich, Conn., 4, 9, 16, 25, 28, 37, 80, 85
Tel: NOrmandy 1-7400

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Tel: TW 8-5881

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Tel: EDgewood 3-4840

American Measurements & Control, Inc., 240 Calvary St., Waltham 54, Mass., 4, 28, 36, 58, 72
Tel: TWinbrook 4-6212

American Metal Climax, 61 Broadway, New York 6, N.Y., 93
Tel: BO 9-1800

American Metrix Corp., N. Haddan Ave., Camden 3, N.J., 12, 56
Tel: WO 3-4025

American Microphone Mfg. Co., 412 S. Wyman St., Rockford, Ill., 53, 57, 59
See ad on page 474
Tel: WOodland 8-9661

American Missile Products, 15233 Grevillea, Lawndale, Calif., 1, 9, 15, 34, 36, 45, 50, 61, 62, 72, 85, 90
Tel: OS 9-1401

American Molded Products Co., 2727 W. Chicago Ave., Chicago 22, Ill., 86, 87, 89, 94
Tel: ARmitage 6-3235

American Optical Co., Instrument Div., Box A, Buffalo 15, N.Y., 12, 15
Tel: FI-4000

American Phono Needle Co., 1 Continental Ave., Forest Hills 75, N.Y., 59
Tel: LIggett 4-5058

American Platinum & Silver Div., Engelhard Industries, 231 N.J.R.R. Ave., Newark 5, N.J., 93, 97
See ad on page 198
Tel: MArket 2-8035

American Plastics Corp., 342 Madison Ave., New York 17, N.Y., 86
Tel: MU 2-5880

American Printed Circuits Co., 104 Forest St., Metuchen, N.J., 62, 86, 95, 98
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American Products Mfg. Co., 8127-33 Oleander St., New Orleans 18, La., 91, 95
Tel: UN 6-6782

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Tel: GA 4-3338

American Quartz Labs. Inc., Plastics Div., Garrison, N.Y., 86, 89, 95
Tel: GA 4-3338

American Radar Components, 415 E. Main St., Denville, N.J., 44, 80
Tel: OAkwood 7-5530

American Radio Co., Inc., 445 Park Ave., New York 22, N.Y., 74, 76
Tel: PL 3-5046

American Research Corp., Route 6, Farmington, Conn., 12
Tel: ORchard 7-2603

American Research & Mfg. Corp., 920 Halpine Ave., Rockville, Md., 4, 12, 28, 36, 43, 45, 61, 73, 85, 89
Tel: HA 7-7117

American Screw Co., W. Main St., Willimantic, Conn., 87
Tel: HArrison 3-2521

American Sealants Co., 517 Woodbine St., Hartford 6, Conn., 91
See ad on page 658
Tel: JAckson 2-1188

American Silver Co. Inc., 36-07 Prince St., Flushing 54, N.Y., 46, 70, 82, 87, 93, 97
Tel: FLushing 3-8012

American Smelting & Refining, 120 Broadway, New York 5, N.Y., 91, 97
Tel: RE 2-9500

American SpeedLight Corp., 5301 Metropolitan Ave., Middle Village 79, N.Y., 4
Tel: [illegible]

American Standard Labs., 1 Newark St., Hoboken, N.J., 12, 72

American Super-Temperature Wires, Inc., 10 W. Canal St., Winooski, Vt., 82
See ad on page 605
Tel: UNiversity 2-9636

American Television & Radio Co., 300 E. Fourth St., St. Paul 1, Minn., 4, 6, 20, 45, 61
See ad on page 426
Tel: CApital 2-3791

American Thermo Electric, 1023 N. Fuller Ave., Los Angeles 46, Calif., 45
Tel: HOllywood 4-1632

American Time Products, Inc., 580 Fifth Ave., New York 36, N.Y., 31, 92
See ad on page 354
Tel: PLaza 7-1430

American Tradair Corp., 34-01 30th St., Long Island City 6, N.Y., 12, 22, 25
Tel: EMpire 1-1414

Amersil Quartz Div., Engelhard Industries, Inc., 685 Ramsey Ave., Hillside, N.J., 47
See ad on page 198
Tel: MUrdock 8-4500

Amglo Corp., 4333 N. Ravenswood Ave., Chicago 13, Ill., 4, 58, 61, 75
See ads on pages 477, 577
Tel: BUckingham 1-2727

Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 68, 74, 75, 76
See ad on pages 38-39
Tel: WElls 1-6200

Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 66, 75
See ad on page 577
Tel: CAnal 6-1446

Ampex Audio, Inc., 1020 Kifer Rd., Sunnyside, Calif., 6, 27, 54, 63, 77
Tel: REgent 6-2110

Ampex Corp., Professional Products Div., 934 Charter, Redwood City, Calif., 27
Tel: EMerson 9-1481

Amphenol-Borg Electronics Corp., Amphenol Cable & Wire Div., S. Harlem Ave. & 63rd St., Chicago 38, Ill., 82
Tel: BIshop 2-1000

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 37, 44, 47, 50, 52, 53, 69, 82, 98
See ad on page 166
Tel: BIshop 2-1000

Amphenol-Borg Electronics Corp., Amphenol Western Div., 9201 Independence Ave., Chatsworth, Calif., 44
Tel: DIamond 8-0000

Amphenol-Borg Electronics Corp., Industrial Products-Danbury Knudsen, 33 E. Franklin St., Danbury, Conn., 37, 38, 44, 70, 80
Tel: PIoneer 3-9272

Amplifier Corp. of America, 398 Broadway, New York 13, N.Y., 36, 61, 73, 79, 90
Tel: WOrth 6-2929

Ampower Corp., 50 Broad St., New York 4, N.Y., 87
Tel: WHitehall 4-6975

Amtron Corp., 17 Felton St., Waltham, Mass., 1, 34, 90
Tel: TW 4-5020

Amy, Aceves & King, Inc., 11 W. 42nd St., New York 36, N.Y., 37, 85, 90
Tel: LOngacre 5-4622

Anaconda Wire & Cable Co., 25 Broadway, New York 4, N.Y., 82
Tel: HAnover 2-0300

Anaconda Wire & Cable Co., Sequoia Wire & Cable Co., Subsid., 2261 Bay Rd., Redwood, Calif., 82, 89
Tel: EMerson 9-0331

Analab Instrument Corp., 30 Canfield Rd., Cedar Grove, N.J., 25
Tel: CEnter 9-0500

Analogue Controls, Inc., 200 Frank Rd., Hicksville, L.I., N.Y., 1, 4, 9, 28, 67
Tel: OVerbrook 1-7300

Anchor Metal Co., Inc., 922 Meeker Ave., Brooklyn 22, N.Y., 95, 97
Tel: STillwell 2-7090

Anchor Plastics Co., Inc., 35-36 36th St., Long Island City 6, N.Y., 86, 89, 95
Tel: RAvenswood 9-1494

Anchor Plating & Finning, 9536 Rush St., El Monte, Calif., 86
Tel: Cumberland 3-8281

Anchor Specialty Mfg. Co., 300 Hollister Rd., Teterboro, N.J., 53, 62, 81, 84, 86, 90
Tel: ATlas 8-1939

Andersen Labs., Inc., 501 New Park Ave., West Hartford 10, Conn., 1, 4, 9, 12, 16, 28, 36, 38, 48, 85
Tel: ADams 3-4491

Anderson Electric Corp., P.O. Box 2151, Birmingham, 1, Ala., 44, 98
Tel: TRemont 9-0441

Andrea Radio Corp., 27-01 Bridge Plaza No., Long Island City 1, N.Y., 6, 59
Tel: STillwell 4-5411

Andrew Antenna Corp., Ltd., 606 Beech St., Whitby, Ont., Canada, 26, 37, 70, 80, 82
Tel: MOhawk 8-3348

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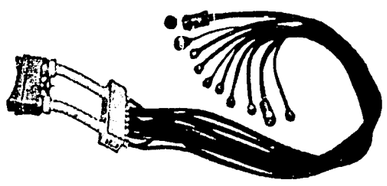
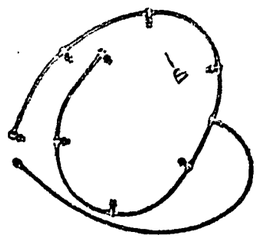
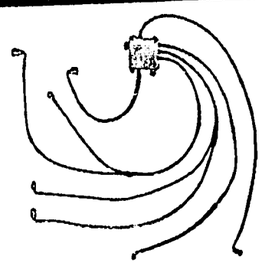


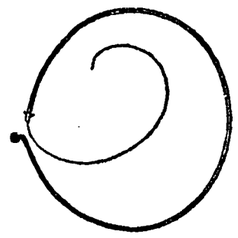
MISSILE CONTROL CABLE: This cable is fabricated using both Benseal® (a plastic molded covering) and Bendix electrical connectors. Protects vital circuitry controlling the firing of missiles.



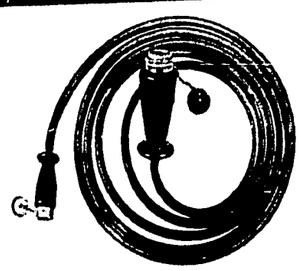
THERMOCOUPLE HARNESS: Flexible, completely sealed and suitable for continuous operation in ambient temperatures of —65°F to 1500°F. Thermocouples are singly detachable and the sealed harness eliminates any chance of trouble from altitude, moisture or other contaminants.



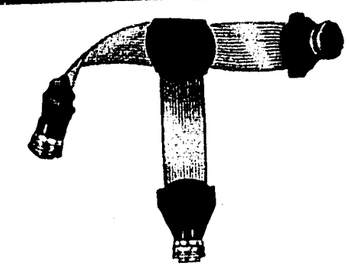
CONTROL HARNESS: This configuration, encased and sealed in metal braid and complete with junction box, can safely withstand the adverse effects of engine environment such as heat, vibration, and oils.



FUEL CELL CABLE: Safely conducts electricity to fuel control valves, pumps, switches and gaging devices immersed within fuel cells. Features: unbroken stainless steel bellows type conduit, double layer protection between current carrying conductors, stainless steel integral connector shells.



HEAVY DUTY CABLE: Ground support cable assembly built and designed for hard usage at missile launching sites. Heavy duty moldings and a tough neoprene tubing combine to resist wear.



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Tel: TRiangle 4-4400

Anelex Corp., 150 Causeway St., Boston 14, Mass., 9
Tel: RIchmond 2-1720

Annis Co., R. B., 1101 N. Delaware, Indianapolis 2, Ind., 63, 92
Tel: MElrose 5-2838

Ansley Mfg. Co., Arthur, New Hope, Pa., 9, 36, 62, 85, 86, 90
See ad on page 503
Tel: AXtel 7-2711

Ansonia Wire-Cable Co., 111 Martin St., Ashton, R.I., 82
Tel: PA-6-6300

Antenna & Radome Research Associates. See Arra Corp.

Antenna Specialists Co., 12435 Euclid Ave., Cleveland 28, Ohio, 37
Tel: SWeetbriar 1-7878

Anthony & Co., J. L., 115 Baker St., Providence 5, R.I., 82, 93, 97
Tel: HOpkins 7-9700

Anti-Corrosive Metal Products Co., Inc., Box 1894, Albany, N.Y., 86, 87, 94
Tel: JUdson 2-7711

Antlab, Inc., 6330 Proprietors Rd., Worthington, Ohio, 37
Tel: TUxedo 5-5396

Anton Electronic Laboratories, Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 22, 44, 52, 56, 75
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715

Antrex Corp., 2001 Willow St., Chicago 47, Ill., 20, 24, 27, 30, 36
Tel: HUmboldt 6-2727

Apex Machine Co., 14-13 118 St., College Pt. 56, L.I., N.Y., 92
Tel: FLushing 8-2010

Apex Wire & Cable Corp., 237 37th St., Brooklyn 32, N.Y., 82
Tel: SOuth 8-4004

Applegate & Co., C. J., 1840 24th St., Boulder, Colo., 17, 61, 62, 79, 90
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Tel: HIllcrest 2-8750

Appliance Manufacturer, 201 N. Wells St., Chicago 6, Ill., 101
Tel: STate 2-4121

Applied Dynamics Corp., 32 North Main St., Natick, Mass., 92
Tel: OLympic 3-5271

Applied Physics Corp., 2724 S. Peck Rd., Monrovia, Calif., 12, 22
Tel: HIllcrest 6-7181

Applied Radiation Corp., 2404 North Main St., Walnut Creek, Calif., 12, 55, 61, 73, 76, 80
Tel: YE 5-2250

Applied Research, Inc., 76 S. Bayles Ave., Port Washington, N.Y., 36, 38, 50, 80
See ad on page 448
Tel: POrt Washington 7-8707

Applied Science Corp. of Princeton, Box 44, Princeton, N.J., 4, 23, 34, 70
Tel: SWinburne 9-1000

Applied Technology, Inc., 930 Industrial Ave., Palo Alto, Calif., 18, 24, 25, 36, 90
Tel: DA 5135

Arch Gear Works, Inc., 97 Holmes St., N. Quincy 71, Mass., 28, 70
Tel: PR 3-8801

Archer Label Co., 783 Kohler St., Los Angeles 21, Cal., 87
Tel: MAdison 4-7824

Arco Electronics, Inc., 64 White St., New York 13, N.Y., 5, 41, 42, 64
See ad on page 399
Tel: WOrth 6-0530

Arco Transformer-Electronic Corp., 1602 S. Hanna St., Fort Wayne, Ind., 43, 73
Tel: HArrison 4113

Arde Assoc., Engrg. Div., 75 Austin St., Newark 2, N.J., 85, 101
Tel: BIgelow 8-8500

Ardente Acoustic Labs. Ltd., 8-12 Minerva Rd., N. Acton, London, N.W. 10, England, 36, 42, 43, 44, 70, 73
Tel: ELgar 3-923

Aremac Associates, 50 S. San Gabriel Blvd., Pasadena, Calif., 86
Tel: SY 5-5938

Arenberg Ultrasonic Lab., Inc., 94 Green St., Jamaica Plain 30, Mass., 9, 12, 26, 36, 38, 48
See ad on page 388
Tel: JAmaica 2-8640

Argonne Electronic Mfg. Corp., 165-11 South Rd., Jamaica 33, N.Y., 12, 36, 37, 38, 41, 42, 54, 57, 59, 66, 67, 73, 87
Tel: OLympia 7-7528

Argos Products Co., 301 Main St., Genoa, Ill., 54, 81
Tel: 4-5118

Aries Laboratories, Inc., 225 Greenwich Ave., Stamford, Conn., 86, 89, 90, 91, 94, 95
Tel: DAvis 5-4124

Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 50, 85, 90
Tel: LI 8-4100

Arkay, Inc., 88-06 Van Wyck Expressway, Richmond Hill 18, N.Y., 12, 20, 23, 26, 36, 45, 77, 81, 100
Tel: AX 7-6666

Ark-Les Switch Corp., 51 Water St., Watertown 72, Mass., 44, 70
Tel: WA 4-2330

Arlin Mfg. Co., 12 Perkins St., Lowell, Mass., 89, 95
Tel: GLenview 4-6751

Armco Steel Corp., 703 Curtis St., Middletown, Ohio, 93
Tel: GA 2-2711

Armel Electronics, Inc., 840 Fifth Ave., Brooklyn 32, N.Y., 44, 94, 98
Tel: STerling 8-0422

Armour Alliance Industries, 16123 Armour St. N.E., Alliance, Ohio, 50
Tel: TAlbot 1-3510

Armour Electronics, 4201 Redwood Ave., Los Angeles 66, Calif., 12, 61, 79, 90
Tel: TE 0-6731

Armstrong Cork Co., Liberty & Charlotte St., Lancaster, Pa., 86, 87, 89
Tel: EXpress 7-5151

Armstrong Whitworth Aircraft Ltd., Sir W. G., A.W.E. Electronics Div., Hucclecote, Gloucester, England, 4, 9, 12, 23, 26, 34, 36
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Tel: TOll Bar 2261

Arnhold Ceramics, Inc., One East 57th St., New York 22, N.Y., 54, 67, 92
Tel: PLaza 5-8213

Arnold Engineering, P.O. Box G, Marengo, Ill., 46, 55, 83
See ads on pages 432, 468
Tel: (Chicago) ANdover 3-6300

Arnold Magnetics Corp., 4613 W. Jefferson Blvd., Los Angeles 16, Calif., 36, 45, 61, 73
Tel: REpublic 1-6344

Arnoux Corp., 11924 W. Washington Blvd., Los Angeles 66, Calif., 4, 9, 34, 36, 45, 61, 70, 72, 85
Tel: TExas 0-5371

Arra Corp. (Antenna & Radome Research Associates), 1 Bond St., Westbury, L.I., N.Y., 19, 37, 38, 77, 80
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Tel: EDgewood 4-8770

Arrow Fastener Co., Inc., 1 Junius St., Brooklyn 12, N.Y., 87, 92
Tel: DIckens 6-1608

Arrow, Hart & Hegeman Electronics Co., 103 Hawthorn St., Hartford 6, Conn., 61, 66, 70
Tel: CHapel 9-8471

Arrow Machinists & Fabricators, 154 E. Third St., Mt. Vernon, N.Y., 84, 86
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Tel: OWens 9-4000

Art Wire & Stamping Co., 21 Boyden Pl., Newark 2, N.J., 86, 97, 99
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Tel: HUmboldt 4-2100

Artisan Electr. Corp., 171 Ridgedale Ave., Morristown, N.J., 69
Tel: JEfferson 8-8500

Artisan Metal Works Co., 11400 Madison Ave., Cleveland 2, Ohio, 81, 84, 87
Tel: LAkewood 1-6173

Artos Engineering Co., 2735 S. 28th St., Milwaukee 46, Wis., 92
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Tel: MItchell 5-6010

Artronic Instrument Co., 11232 Triangle Lane, Silver Spring, Md., 4, 9, 12, 23, 31, 48, 50, 62, 73, 85, 90
Tel: LOckwood 5-4447

Arvin Industries, Inc., 13th & Big Four RR, Columbus, Ind., 6
Tel: 5521

Asco Wire & Cable Co., 2 Burroughs St., Bridgeport 8, Conn., 82
Tel: EDison 6-1864

Asheville-Schoonmaker Mica Co., 900 Jefferson Ave., Newport News, Va., 99
Tel: CHestnut 4-7311

Ashland Electronic Products, Inc., 32-02 Queens Blvd., Long Island City, N.Y., 40, 58
Tel: EXeter 2-4010

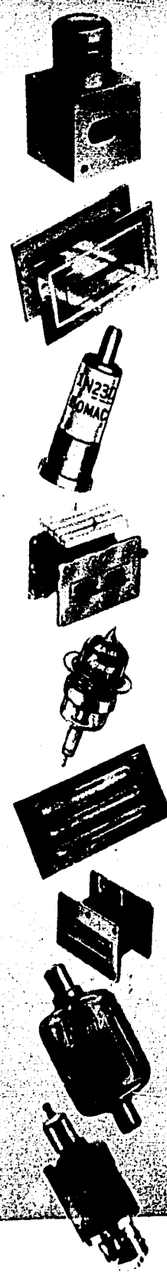
Assembly Products, Inc., Wilson Mills Rd., Chesterland, Ohio, 4, 12, 18, 66
Tel: HAmilton 3-4436

Associated American Winding Machinery Lab., Inc., 750 St. Anns Ave., New York 56, N.Y., 82, 92
Tel: CYpress 2-5050

Associated Commodity Corp., Woolworth Bldg., New York 7, N.Y. 41
Tel: WOrth 4-4192

Associated Elects. Co., 1820 Ave. S., Brooklyn 29, N.Y., 101
Tel: NIghtingale 8-6900

Associated Engrg. Corp., 65 Kent St., Brookline 46, Mass., 53, 82, 86
Tel: ASpinwall 7-4664



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Tel: PI 3-8899

Associated Research, Inc., 3792 W. Belmont Ave., Chicago 18, Ill., 12, 13, 85
See ad on page 290
Tel: COrnelia 7-4040

Associated Specialties Co., 1751 Main St., Orefield, Pa., 61
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Tel: EXpress 5-1275

Associated Spring Corp., Barnes Gibson Raymond Div., 40300 Plymouth Rd., Plymouth, Mich., 86, 87
Tel: GLenview 3-6100

Associated Testing Labs., Inc., 115 Clinton Rd., Caldwell, N.J., 12, 88, 90
See ad on page 294
Tel: CApital 6-7407

Astatic Corp., Harbor & Jackson St., Conneaut, Ohio, 57, 59, 63
Tel: 2-2656

Astra, Inc., P.O. Box 226, Raleigh, N.C., 85
Tel: VAnce 8-4386

Astron Corp., 255 Grant Ave., East Newark, N.J., 41, 50
See ad on page 398
Tel: HUmboldt 2-7800

Astronetics, Inc., Box 450, Red Bank, N.J., 4, 12, 45, 61
Tel: ATlantic Highlands 1-2700

Atkins and Merrill, Inc., Post Road, Sudbury, Mass., 37, 81, 86, 90, 94, 95
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Tel: HIlltop 3-8822

Atlantex Corp., 625 McGrath Hwy., Somerville, Mass., 52, 66, 73
Tel: MOnument 6-5100

Atlantic Design Co., 796 Broad St., Newark 2, N.J., 85, 90
Tel: MArket 3-5864

Atlantic & Pacific Wire & Cable Co., Inc., 137 Grand St., New York 13, N.Y., 82

Atlantic Research Corp., Shirley Hwy. at Edsall Rd., Alexandria, Va., 12, 13, 15, 16, 36, 61, 72, 85, 86, 90
Tel: FL 4-3400

Atlantic Transformer Corp., 30 Hynes Ave., Groton, Conn., 73
Tel: HIlltop 5-9768

Atlantis Engrg. Corp., 1807 Stratford Dr., Garland, Tex., 4, 9, 12, 61, 85, 86, 90
Tel: BRoadway 8-2465

Atlas E-E Corp., 47 Prospect St., Woburn, Mass., 42, 51, 87
Tel: WEIls 3-5390

Atlas Engrg. Co., 176 Blue Hill Ave., Roxbury, Mass., 61, 73
Tel: HIghlands 5-7100

Atlas Screw & Specialty Co., 450 Broome St., New York 13, N.Y., 87
Tel: WOrth 6-0600

Atlas Sound Corp., 1449 39 St., Brooklyn 18, N.Y., 54, 57
Tel: GEdney 8-5500

Atmo Seal Co., 3475 Cardiff Ave., Cincinnati 9, Ohio, 52
Tel: TRinity 1-5512

Atohm Electronics, 7648 San Fernando Rd., Sun Valley, Calif., 67
Tel: STanley 7-9873

Atomic Lab., Inc., 3086 Claremont Ave., Berkeley 5, Calif., 9, 12, 22, 61
Tel: 5-5001

Atomics International, P.O. Box 309, Canoga Park, Calif., 90
Tel: DIamond 7-0200

Atomitron, Inc., 168-25 Hillside Ave., Jamaica, L.I., N.Y., 36, 38, 50, 80
Tel: OL 7-6300

Atronic Products, Inc., One Bala Ave., Bala-Cynwyd, Pa., 4, 12, 17
Tel: GR. 7-1860

Attleboro Refining Co., 400 Union St., Attleboro, Mass., 93
Tel: ATtleboro 1-3705

Atwood-Consulting & Mfg. Engineer, Wilfrid L., 528 Adelaide Ave., S.E., Warren, Ohio, 4, 85, 88
Tel: EX 4-3868

Auburn Mfg. Co., Stack St., Middletown, Conn., 86, 87, 89, 95, 96
Tel: DIamond 6-6631

Audel & Co., Theodore, 49 W. 23rd St., New York, 10, N.Y., 101
Tel: ORegon 5-4890

Audicon Electronics, Inc., 216 Lyon St., Paterson 4, N.J., 1, 6, 36, 61, 86, 90
Tel: LAmbert 5-1339

Audio Design Service, 216-18 40 St., Bayside 61, N.Y., 85
Tel: BAyside 4-4400

Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn., 50, 53, 73
Tel: PArkway 9-7386

Audio Devices, Inc., 444 Madison Ave., New York 22, N.Y., 63, 64
Tel: PLaza 1-6640

Audio Devices, Inc., Rectifier Division, 620 E. Dyer Rd., Santa Ana, Calif., 64, 68
Tel: KImberly 5-8241

Audio-Master Corp., 17 East 45 St., New York 17, N.Y., 27, 30, 32
Tel: OXford 7-0725

Audiomation Labs., 7230 Clinton Rd., Upper Darby, Pa., 59
Tel: MAdison 6-6041

Audiotex Mfg. Co., Div. of G-C Textron, Inc., 412 S. Wyman St., Rockford, Ill., 63
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Tel: WOodland 8-9661

Audio-Video Corp., 324 Central Ave., Albany 6, N.Y., 4, 6, 9, 10, 20, 21, 26, 27, 30, 32, 36, 37, 45, 54, 57, 59, 63, 77, 81, 82, 85
Tel: 6-1129

Auerbach Electronics Co., 109 N. Essex Ave., Narberth, Pa., 4, 9, 12, 85, 90
Tel: MO 4-7633

Augat Brothers, Inc., 33 Perry Ave., Attleboro, Mass., 47, 51, 99
See ad on page 696
Tel: ATtleboro 1-2202

Austenal Co., Div. of Howe Sound Co., 224 East 39 St., New York 16, N.Y., 93
Tel: OXford 7-5656

Austin Co., 76 Ninth Ave., New York 11, N.Y., 4, 9, 13, 25, 34, 72, 85, 90
Tel: WAtkins 4-3630

Austin, O., 250 Dover St., Brooklyn 35, N.Y., 86
Tel: NI 6-7733

Autocrat Electronics Co., 5024 Elm St., Skokie, Ill., 59
Tel: ORchard 3-8033

Automatic Coil Co., Inc., 195 Sackett St., Brooklyn 31, N.Y., 43, 73, 86
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Tel: ULster 2-5454

Automatic Control Co., 995 University Ave., St. Paul 4, Minn., 4, 81
Tel: MI 6-1801

Automatic Electric Co., Northlake, Ill., 53, 66, 70, 86, 90
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Tel: FIllmore 5-7111

Automatic Electric Sales, 21 E. 40th St., New York 16, N.Y., 66
Tel: LExington 2-6226

Automatic Management, Inc., 25 Brigham St., Westboro 80, Mass., 4, 9, 85, 86, 92, 101
Tel: FOrest 6-5377

Automatic Metal Products Corp., 323 Berry St., Brooklyn 11, N.Y., 44, 66, 70
See ad on page 421
Tel: EVergreen 8-6057

Automatic Precision & Mfg. Corp., see A.P.M. Corp.

Automatic Prod. Research, 19 Beechwood Ave., Mount Vernon, N.Y., 4, 67
Tel: MO 4-7011

Automatic Radio Mfg. Co., 122 Brookline Ave., Boston 15, Mass., 6
Tel: CO 6-1420

Automatic Switch Co., 50-56 Hanover Rd., Florham Park, N.J., 66, 70, 92
Tel: FRontier 7-4600

Automatic Timing & Controls, Inc., King of Prussia, Pa., 4, 9, 24, 28, 36, 56, 73
Tel: BRoadway 9-1100

Automation Electncs., Inc., 1500 W. Verdugo Ave., Burbank, Calif., 6, 29, 44, 70
Tel: VIctoria 9-2431

Automation Engrg. Lab. Inc., 24 Bridge St., Greenwich, Conn., 85, 86, 90
Tel: NOrmandy 1-6000

Autometric Corp., 1501 Broadway, New York 36, N.Y., 4, 6, 9, 25, 74
Tel: BRyant 9-8700

Autoscrew Co., 216-222 W. 18th St., New York 11, N.Y., 87, 99
Tel: WAtkins 9-3137

Autotron Inc., Box 2278, Santa Monica, Calif., 12
Tel: GL 4-2963

Autotron, Inc., 3629 N. Vermilion St., Danville, Ill., 4
Tel: HI 6-0650

Autotronics, Inc., Box 812, Route 1, Florissant, Mo., 4, 28, 61
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Tel: TEmple 7-3565

Autron Engrg., Inc., 1254 W. 6th St., Los Angeles 17, Calif., 4, 9
Tel: MU 3237

Avco Corp., Crosley Div., 1329 Arlington St., Cincinnati 25, Ohio, 1, 4, 6, 7, 15, 16, 18, 20, 24, 25, 29, 34, 36, 37, 90, 100
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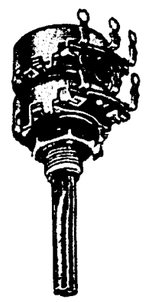

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1/10W. Micro-miniature—For transistor circuits, hearing aids. 0.286" diam. 500 ohms to 10 megs.

1/10W. Ultra-miniature—For computers, hearing aids, transistor circuits. 0.502" diam. 500 ohms to 10 megs.

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2-5W. Wirewound—For instruments and TV. Single or dual-concentric. 1-5/32" diam. 1 ohm thru 15K ohms.

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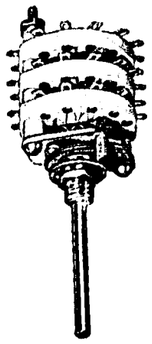

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Sub-miniature rotary—15/16" diam. for military and high reliability applications. Rating 0.5 amp. at 6VDC, 100 ma. at 110VAC, Laminated phenolic, steatite, single or multiple sections.

Standard rotary—1-5/16" diam. laminated phenolic or steatite insulation, single or multiple sections. Rating 2 amps. at 15VDC 150 ma. at 110VAC (Resistive load.)

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Spring return—1-5/16" diam., coil or C-type springs, phenolic, steatite, single or multiple sections.

Specialized—Lever, slide, tone, tuner sections, others.

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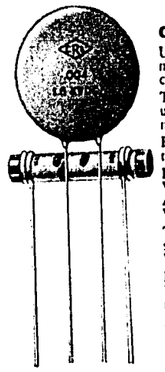

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Ultra-miniature—3 to 12 VDC, 0.22—2.2 mfd.—for low power factor transistor applications.

Temperature compensating—Discs, tubulars, 150 v to 6,000 VDCW, 1 mmf.—0.1 mf. Capacitance +100 to —5250 ppm.

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High Voltage—High Accuracy—High Voltage types, up to 30,000 VDCW. High Accuracy types, ± 1% tolerance, 500 VDCW, up to 2,500 mmf.

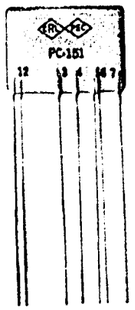
Trimmer—Tubular or flat. Meet JAN-C-81 specifications. 1 mmf. to 400 mmf. 500 VDCW.

Feed-thru—10—5000 mmf., 500—1,500 VDCW, bushing, shoulder, ring, eyelet, resistor-capacitor combinations.

Specialties—Stand-off, button-shape, potted, other capacitors.

Write for Group D bulletins.

IN ELECTRONICS



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Signal Winding DC Resistance	1000 ohms ±15% each signal winding	1000 ohms ±15% each signal winding	10 ohms ±15%
AC Excitation Volts	5.5 V. @ 400 cps	2.5 V. @ 400 cps	6 V. RMS
Input DC Signal Range	0 to ±100 μa.	0 to ±80 μa.	0 to ±10 mv.
AC Output Range	0 to 2.2V. @ 400 cps (sine wave)	0 to 1.5V. @ 400 cps (sine wave)	0 to 2.7V. @ 400 cps (sine wave)
Overall Dimensions (Inches)	27/32x27/32x1 5/16	27/32x27/32x1 3/16	1 1/4x7/8x5/8
Null Amplitude (Noise Level)	20 mv. RMS	15 mv. RMS max.	25 mv. RMS max.
Output Impedance	7000 ohms	7000 ohms	10,000 ohms
Null Drift (In terms of input signal) −65°C to +100°C	±0.5 μa. max.	±0.5 μa. max.	±0.1 mv. max.
Hysteresis — % of maximum input signal	0.5% maximum	0.5% maximum	0.5% maximum
Type of Mounting	Male Stud	Female Insert	Male Stud
Maximum % Distortion in Output	25%	15 %	20%
Weight Ounces	1.3 oz.	1.2 oz.	1.5 oz.

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Behlman Engineering Co., 2911 Winona Ave., Burbank, Calif., 61
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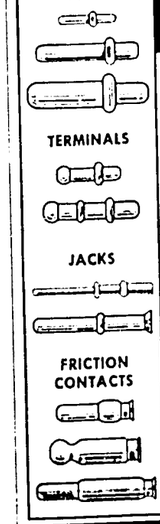

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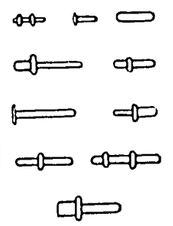

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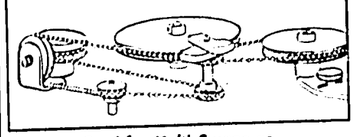

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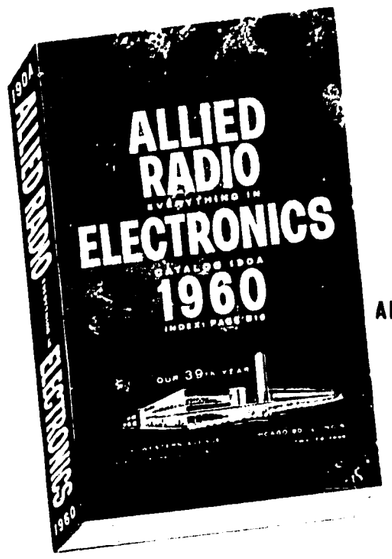

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See ad on page 510
Tel: CApital 2-6220

Bendix Aviation Corp., Research Lab. Div., Fisher Bldg., Detroit 2, Mich., 4, 6, 7, 9, 10, 15, 16, 20, 22, 25, 28, 3 37, 41, 44, 45, 58, 68, 74, 76, 90, 92
Tel: TR 5-5000

Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 19, 2 26, 37, 38, 41, 44, 77, 82
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Bendix Aviation Corp., Sheffield Cor. Sub., Box 893, Dayton 1, Ohio, 4, 7, 90, 92
Tel: CLearwater 4-5377

Bendix Aviation Corp., York Div., York, Pa., 1, 9, 25
Tel: 4-71951

Benson-Lehner Corp., 11930 W. Olympic Blvd., Los Angeles 64, Calif., 9, 3
Tel: BRadshaw 2-3484

Bentley-Harris Mfg. Co., Hector & Lime Sts., Conshohocken, Pa., 89
Tel: TAylor 8-0634

Berg Mfg. Corp., 142 Reno Ave., Ne Cumberland, Pa., 44, 92, 98
Tel: CEdar 8-9394

Bergen Laboratories, Inc., 247 Crook Ave., Clifton, N.J., 9, 12, 26, 31, 36, 4 56, 61, 66, 79, 85, 90
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Tel: GRegory 3-7800

Berkeley Enterprises, Inc., 815 Was ington St., Newtonville 60, Mass., 100, 101
Tel: DEcatur 2-5453

Berkshire Elec. Cable Co., Leeds, Mas 82
Tel: JUstice 4-3853

Berkshire Labs., 584 Bank Village Greenville, N.H., 12, 73
Tel: GReenville 111

Berkshire Transformer, Kent, Conn., 4 73
Tel: WAlker 7-3541

Berman Laboratories, 112-03 Rockaway Blvd., Ozone Park 20, N.Y., 17
Tel: VIrginia 3-1045

Bernard-Franklin Co., Inc., Hedley & Bath Sts., Philadelphia 37, Pa., 81, 8
Tel: JE 3-4500

Bernco Engrn. Corp., 2320 S. Tibbs Ave., Indianapolis 41, Ind., 4, 70, 8 84
Tel: CH 1-2871

Bernds-Bach, Inc., 6932 Romaine St., Hollywood 38, Calif., 9, 27, 36
Tel: HOllywood 2-0931

Beryllium Corp., P.O. Box 1462, Reading, Pa., 93
Tel: WAlker 9-0781

Bestran Corp., Dilectron Div., 2069 S. Myrtle Ave., Monrovia, Calif., 41
Tel: RYan 1-4541

Bethlehem Apparatus Co., Front & Depot Sts., Hellertown, Pa., 92, 93
Tel: TErrace 8-3691

Beva Laboratory, Inc., P.O. Box 478, Trenton, N.J., 23, 36, 61
Tel: EXport 4-4074

Bickel, Richard L., P.O. Box 451, Garland, Tex., 85
Tel: BR 6-6859

Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa., 12, 19, 21, 66, 67
Tel: LOcust 4-1620

Bigelow Mfg. Corp., 225 W. Bigelow St., Newark 8, N.J., 97
Tel: BIgelow 3-6850

Biggs Co., Carl H., 2255 Barry Ave., Los Angeles 64, Calif., 86, 91
Tel: ER 8-0462

Bill Jack Scientific Instrument Co., 143 S. Cedros Ave., Solana Beach, Calif., 4, 9, 58, 70, 86
Tel: SKyline 5-1551

Bingham Mfg. Co., J. F., 69 Bay State Rd., Lawrence, Mass., 81, 84, 86
Tel: MUrdock 5-5188

Binghamton Magnetic Ind., 40 Wall St., Binghamton, N.Y., 63
Tel: 2-0880

Biophysical Electrn. Inc., 400 Northern Blvd., Great Neck, N.Y., 4, 72, 85, 90
Tel: HU 7-2305

Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, 19, 26, 37, 38, 50, 67, 70
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Tel: CHurchill 8-1200

Bird & Co., Inc., Richard H., 1 Spruce St., Waltham 54, Mass., 60
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Birtcher Corp., Industrial Div., 4371 Valley Blvd., Los Angeles 32, Calif., 99
Tel: CApitol 2-9101

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Tel: NIagara 4-3100

Bishop Mfg. Corp., 10 Canfield Rd., Cedar Grove, N.J., 89
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Bitterman Electric Co., Box 1877, Canaan, Conn., 43, 73
Tel: TAylor 4-7345

Biwax Corp., 3441 Howard St., Skokie, Ill., 91
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Tel: ORchard 3-1050

Bixby Assoc., H. O., 100 Memorial Dr., Cambridge 42, Mass., 85
Tel: EL 4-0404

Bjorksten Research Lab., P.O. Box 265, Madison 1, Wis., 90
Tel: ALpine 6-5581

Black Light Eastern Corp., 201-04 Northern Blvd., Bayside 61, N.Y., 13
Tel: FA 1-0909

Black & Webster, Inc., 570 Pleasant St., Watertown 72, Mass., 70, 92
Tel: WAlnut 6-0100

Blackhawk Engrg. Co., P.O. Box 146, Janesville, Wis., 41, 50
Tel: PLeasant 2-6826

Blackstone Corp., Murdock Labs., Div., 921 Port Wash. Blvd., Port Washington, L.I., N.Y., 36, 92
Tel: POrt Washington 7-7747

Blaine Electronetics, Inc., 14757 Keswick St., Van Nuys, Calif., 13, 15, 16, 19, 26, 37
Tel: STate 2-6303

Blair Sales Co., Inc., 45 S. Broadway, Yonkers, N.Y., 102
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Tel: YOnkers 3-0150

Blehart Co., L. D., 10 Fiske Pl., Mt. Vernon, N.Y., 14
Tel: MOunt Vernon 8-7046

Bliley Electric Co., 200 Union Station Bldg., Erie, Pa., 47, 48, 50
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Tel: GLendale 6-7561

Blinn Co., Delbert, P.O. Box 757, Pomona, Calif., 69, 94, 95
Tel: NAtional 9-3000

Bliss Electronic Corp., P.O. Box 309, Sussex, N.J., 10, 12, 30, 36, 82, 85, 86, 90
Tel: SUssex 2-3000

Blonder-Tongue Labs. Inc., 9 Alling St., Newark 2, N.J., 6, 7, 21, 26, 32, 36, 37, 38, 44, 49, 50, 73, 77, 92
Tel: MA 2-8151

Blue M Electric Co., 138 & Chatham St., Blue Island, Ill., 12, 88
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Tel: FUlton 5-9000

Bodine Electric Co., 2254 W. Ohio St., Chicago 12, Ill., 58
Tel: SEeley 3-6410

Bodnar Industries, Inc., 238 Huguenot St., New Rochelle, N.Y., 87, 94
Tel: NEw Rochelle 6-4664

Boehm Co., R. A., 58 Brooklyn Ave., Merrick, L.I., N.Y., 58
Tel: FReeport 8-6040

Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y., 33, 86, 90
Tel: SP 7-2208

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Tel: JU 6-2121

Boesch Mfg. Co., Inc., 45 River St., Danbury, Conn., 9, 12, 86, 92
Tel: PI 3-5571

Bogart Mfg. Co., 315 Seigel St., Brooklyn 6, N.Y., 37, 38, 50, 70, 80, 90
Tel: HYacinth 7-4972

Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 36, 61
Tel: LAmbert 5-2200

Boland & Boyce, 356 W. 40th St., New York 18, N.Y., 101
Tel: BR 9-3256

Bolling Industries, Inc., 330 E. Locust St., Scranton 2, Pa., 81, 86
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Bomac Laboratories, Inc., Salem Rd., Beverly, Mass., 38, 50, 68, 76, 80
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Tel: WAlker 2-6000

Bomyte Co., Green St., Silverdale, Pa., 86, 89, 95
Tel: ALpine 7-0511

Bon-De Electronic Labs., 135 Cabot St., Beverly, Mass., 12, 22, 52, 86, 92, 99
Tel: WAlker 7-1499

Bond Electronics Corp., 60 Springfield Ave., Springfield, N.J., 67

Bone Engrg. Corp., 701 W. Broadway, Glendale 4, Calif., 61
Tel: CH 5-2638

Bonny Mfg. Corp., 339 Auburn St., Auburndale, Mass., 86, 89, 94, 95
Tel: DEcatur 2-5796

Boonton Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J., 5, 12, 26
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Tel: JEfferson 9-4210

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Tel: DEerfield 4-4400

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Tel: DEerfield 4-3200

Booth Co., Arthur E., 265 S. Alexandria Ave., Los Angeles 4, Calif., 12, 61, 85, 90
Tel: DUnkirk 1-2161

Boots Aircraft Nut Corp., Newtown Turnpike, Norwalk, Conn., 86, 87
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Borden Chemical Co., P.O. Box 1589, Santa Barbara, Calif., 89, 95
Tel: WOodland 3134

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Borg Equipment Div., Amphenol-Borg Electronics Corp., 120 S. Main St., Janesville, Wis., 9, 31, 58, 67
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Tel: PLeasant 4-6616

Borg-Warner Corp., Pesco Prods. Div., 24700 N. Miles Rd., Bedford, Ohio, 4, 40, 45, 58, 61
Tel: MOntrose 2-2100

Borolite Corp., 3113 Forbes St., Pittsburgh 30, Pa., 93, 94
Tel: MUseum 2-4600

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Tel: WE 9-9260

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Tel: LIberty 2-8897

Boston Insulated Wire & Cable Co., 65 Bay St., Boston Mass., 82
Tel: COlumbia 5-2104

Bourns, Inc., P.O. Box 2112, Riverside, Calif., 67, 72
Tel: OVerland 4-2700

Bow Solder Products Co., 251 Freeman St., Brooklyn 22, N.Y., 97
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Tel: SHerwood 3121

Bracke-Seib X-Ray Co., Inc., 16 Pelham Bay Park West, Pelham Manor, N.Y., 12, 17, 61, 90
Tel: PElham 8-4346

Bradford Components, Inc., 65 South Ave., Salamanca, N.Y., 41, 43, 67
Tel: 2340

Bradley Industries, 1654 N. Damen Ave., Chicago 47, Ill., 81
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Tel: ARmitage 6-8197

Bradley Semiconductor Co., 275 Welton St., New Haven 11, Conn., 64, 68
Tel: STate 7-7181

Brady Co., W. H., 704 W. Glendale Ave., Milwaukee 9, Wis., 87, 92
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Tel: EDgewood 2-8100

Brainin Co., C. S., 318 Washington St., Mt. Vernon, N.Y., 70, 93
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Branson Instruments, Inc., 37 Brown House Rd., Stamford, Conn., 12
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Branson Ultrasonic Corp., 37 Brown House Rd., Stamford, Conn., 81, 92
Tel: FIreside 8-7781

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Tel: HAwthorne 7-1773

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Brew & Co., Inc., Richard D., 90 Airport Rd., Concord, N.H., 48
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Tel: EDison 4-1182

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Brillhart Plastics Sales Corp., Old Country Rd., Mineola, L.I., N.Y., 52, 86
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Brilmayer Labs., Inc., E. W., 86 Fulton St., New York 38, N.Y., 12
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Bristol Co., P.O. Box 1790 IRD, Waterbury 20, Conn., 4, 5, 9, 12, 14, 15, 24, 28, 34, 36, 45, 56, 66, 70, 72, 87
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British Industries Corp., 80 Shore Rd., Port Washington, N.Y., 54
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British Thomson-Houston Co., Ltd., Rugby, Eng., 4, 9, 12, 15, 19, 25, 26, 28, 30, 36, 38, 47, 52, 61, 64, 65, 68, 70, 72, 73, 75, 76, 77, 79, 80, 88, 90, 92
Tel: RUgby 2121

Brocker Labs., 935 Commercial St., Palo Alto, Calif., 3, 85, 90
Tel: DAvenport 1-3113

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Tel: COrtlandt 7-2312

Brooks Research, Inc., P.O. Box 67, Brighton Sta., Rochester 10, N.Y., 4, 9, 12, 19, 22, 23, 28, 36, 48, 55, 61, 70, 85, 90, 91
Tel: LUdlow 6-2720

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Tel: HYacinth 3-1379

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Brown University, Div. of Engineering, Providence 12, R.I., 100

Browning Labs., Inc., 100 Union Ave., Laconia, N.H., 6, 19, 24, 36, 77
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Tel: TExas 0-6441

Brubaker, Paul M., 100 Essex Ave., Glen Ridge, N.J., 85
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Bruel & Kjaer, Naerum, Denmark, 3, 5, 12, 14, 36, 56, 57
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Bruno-New York Industries Corp., 460 W. 34th St., New York 1, N.Y., 1, 9, 12, 19, 26, 30, 90
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Brunswick Instruments, P.O. Box 813, New Brunswick, N.J., 5, 12, 26, 45, 60, 85
Tel: CHarter 7-5919

Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio, 89, 93

Brush Instruments, Div. of Clevite Corp., 37th & Perkins, Cleveland 14, Ohio, 14, 23, 28, 34, 36, 61
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Brush Nail Expansion Bolt Co., Greenwich, Conn., 87
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Bryant Computer Div., P.O. Box 620, Springfield, Vt., 9, 27, 63
Tel: TUrner 5-2141

Brys Instrument Co., 7026 Sixth Ave., Brooklyn 9, N.Y., 43, 67
Tel: BEachview 8-0305

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Tel: WAverly 3-7474

Buck Engineering Co., Inc., 37-41 Marcy St., Freehold, N.J., 61, 81, 84, 86
Tel: FRechold 8-1111

Buck Instrument Co., P.O. Box 357, Boulder, Colo., 4, 12, 85
Tel: HIllcrest 2-3741

Buckbee Mears Co., Fourth & Rosabel St., St. Paul 1, Minn., 62
Tel: CA 7-6371

Buckeye Bobbin Co., 12200 Sprecher Ave., Cleveland 11, Ohio, 87

Bucknell Engrg. Co., Inc., P.O. Box 3426, S. El Monte, Calif., 55, 66, 73

Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio, 84, 86, 87
Tel: HEnderson 1-7100

Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 37, 38, 50, 73, 77, 80
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Tel: STillwell 6-1706

Budelman Electronics Corp., 375 Fairfield Ave., Stamford, Conn., 8, 18, 19, 21, 24, 37
Tel: FIreside 8-9231

Building Blocks Electronic Co., 2172 East 36th St., Brooklyn 34, N.Y., 12, 23, 36, 56, 61
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Tel: CLoverdale 3-8931

Bulova Research & Devel. Labs. Inc., 62-10 Woodside Ave., Woodside 77, N.Y., 4, 9, 15, 25, 28, 31, 36, 47
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Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62 St., Woodside 77, N.Y., 19, 26, 31, 36, 47, 50, 62, 88
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Tel: NEwtown 9-5700

Bunnell & Co., J. H., 81 Prospect St., Brooklyn 1, N.Y., 86, 92
Tel: ULster 8-0100

Bureau of Engravings, Inc., Industrial Div., 500 S. 4th St., Minneapolis 15, Minn., 62
Tel: FEderal 9-8721

Burgess Battery Co., Dept. IRE, Foot of Exchange St., Freeport, Ill., 39
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Tel: ADams 2-2161

Burgoyne Testing Labs., 542 Main St., Westbury, N.Y., 90
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Burke & James, Inc., 321 S. Wabash Ave., Chicago 4, Ill., 14, 32
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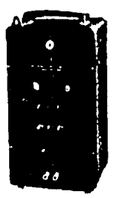
*Shunt capacitance, 25 μμf on two most sensitive ranges



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For Measuring DC Voltages when combined with any AC Voltmeter

Voltage Range ..... 1 μv — 100 v DC
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Down to 40 μv at reduced accuracy
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5% elsewhere
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Frequency Range ..... 15 cps — 6 mc
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Tel: OX 1-2461

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Tel: TEmple 8-4711

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Burnett Radio Lab., W.W.L., 4818 Idaho St., San Diego 16, Calif., 47, 85, 90
Tel: ATwater 2-2740

Burr-Brown Research Corp., Box 6444, Tucson, Ariz., 3, 12, 36, 90
Tel: AXtel 8-0722

Burroughs Corp., 6071 Second Ave., Detroit 32, Mich., 9, 46
Tel: TR 5-2260

Burroughs Corp., Electrodata Div., 460 Sierra Madre Villa, Pasadena, Calif., 9, 63
Tel: RYan 1-0471

Burroughs Corp., Electronic Tube Div., Box 1226, Plainfield, N.J., 9, 19, 46, 61
Tel: PLainfield 6-0876

Burroughs Corp., Research Center, Paoli, Pa., 9, 34, 46
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Tel: GArfield 1-1740

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CBS Electronics Co., 2601 N. Howard St., Philadelphia 33, Pa., 53, 73, 79, 82, 85, 86
Tel: GArfield 3-2797

CBS Electronics, Div. of Columbia Broadcasting System, Inc., 100 Endicott St., Danvers, Mass., 68, 74, 75, 76
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Tel: SPring 4-2360

C. G. Electronics Corp., 15000 Central East, Albuquerque, N.M., 4, 9, 12, 34, 37, 43, 50, 60, 62, 73, 86
Tel: ALpine 6-9858

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C.M. Mfg. & Machine Co., 103 Dewey St., Bloomfield, N.J., 84, 88, 90, 93, 99
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C-W Mfg. Co., Box 2065, El Monte, Calif., 47

CWS Waveguide Corp., 136 Norman Ave., Amityville, L.I., N.Y., 80
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Cable Designs, Inc., 66 Rushmore St., Westbury, N.Y., 82, 86
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Caig Labs., 46 Stanwood Rd., New Hyde Park, L.I., N.Y., 91
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California Institute of Technology, 4800 Oak Grove Dr., Pasadena 3, Calif., 90

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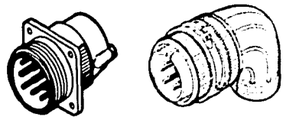

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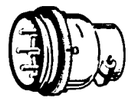

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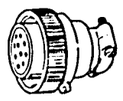

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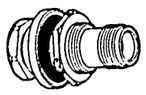

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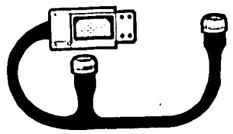

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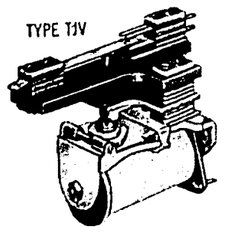

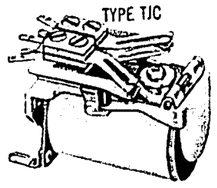

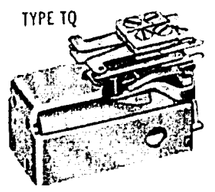

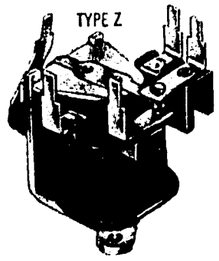

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Cohu Electronics, Inc., Millivac Instruments Div., 2315 Second Ave., Carman, Schenectady, N.Y., 3, 5, 12, 36, 45, 56
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Coil Co. of America, Inc., 218 Washington St., Northvale, N.J., 30, 43, 73
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Coil Winders, Inc., 100 New York Ave., Westbury, L.I., N.Y., 43, 48, 50, 73
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Coleman Instruments, Inc., 318 Madison St., Maywood, Ill., 12
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Collins Elect. Mfg. Corp., Stevensville, Md., 45
Tel: MIssion 3-4661

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Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 1, 2, 7, 18, 20, 21, 24, 25, 26, 29, 32, 33, 37, 50
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Colorado Research Corp., Broomfield, Colo., 1, 4, 9, 28, 32, 35, 36, 40, 61, 72, 85
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Columbia Prods. Co., 6625 Shakespeare Rd., Columbia, S.C., 37, 87
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Columbia Technical Corp., 61-02 31st Ave., Woodside 77, N.Y., 48, 89, 91
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Comet Ltd., Waldeggstrasse 72, Liebfeld-Berne, Switzerland, 75
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Communication Accessories Co., U.S. Hwy. 50 & 71 Bypass, Lee's Summit, Mo., 36, 43, 48, 50, 73
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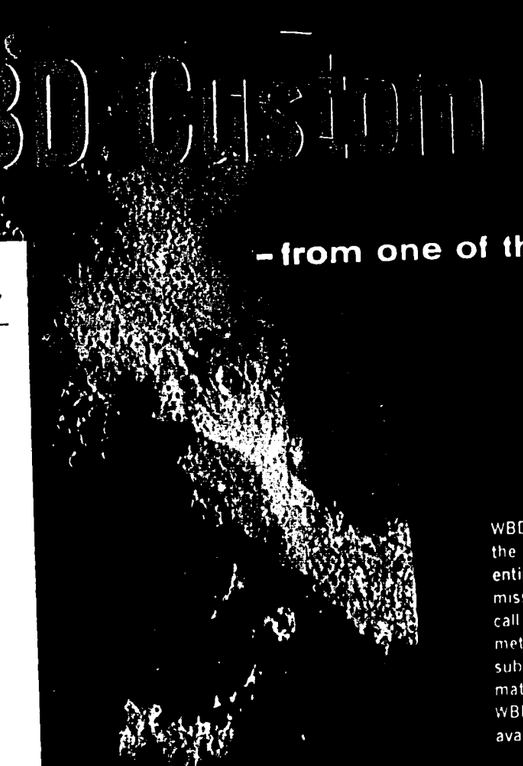

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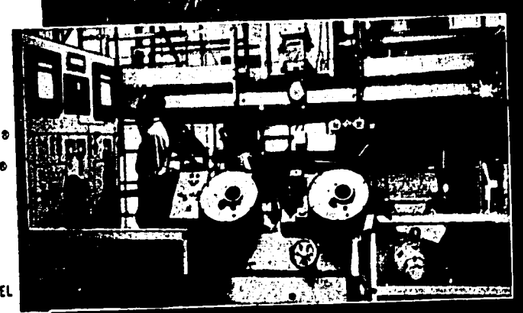

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Communications Eng. Co., 28059 Groveland Ave., Roseville, Mich., 90
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Compact Controls Co., 1633 N. Halsted St., Chicago 14, Ill., 4
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Compagnie Generale de Metrologie, P.O. Box 30, Annecy, France, 3, 5, 12, 19, 23, 26, 35, 56, 61
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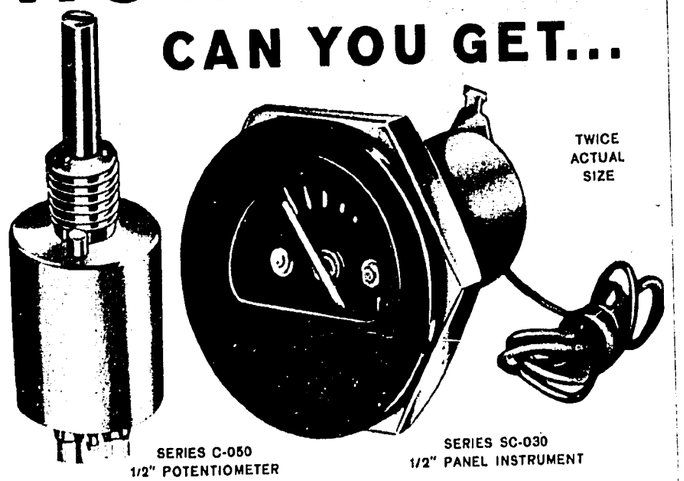

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Cutler Metal Prods. Co., 1025 Line St., Camden 3, N.J., 81, 84, 86
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Tel: STate 6-0458

Dage TV, Div. Thompson Products, West 10th St., Michigan City, Ind., 32, 36
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Dahlstrom Metallic Door, 419 Buffalo St., Jamestown, N.Y., 81, 84
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Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 37, 58, 62, 67, 86, 94
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Tel: ELkridge 90

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Tel: LO 4-1978

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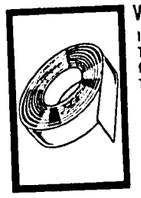

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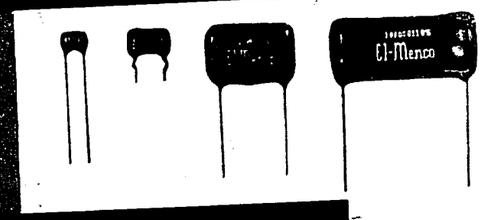

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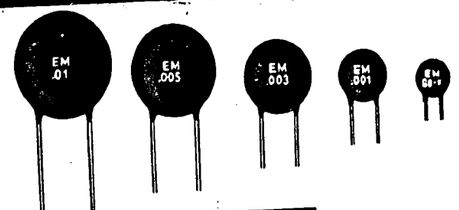

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Only 1 Failure in 7,168,000 Unit-Hours!

- Life tests at 100°C with rated voltage applied have yielding only 1 FAILURE PER 716,800 UNIT-HOURS for 1 MFD. Since the number of unit-hours of these capacitors is inversely proportional to the capacitance, 0.1 MFD Mylar-Paper Dipped capacitors will yield only 1 FAILURE PER 7,168,000 UNIT-HOURS!
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- Exceed all electrical requirements of E.I.A. specification RS-164 and military specifications MIL-C-91A and MIL-C-25A.

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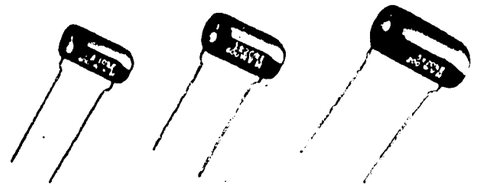

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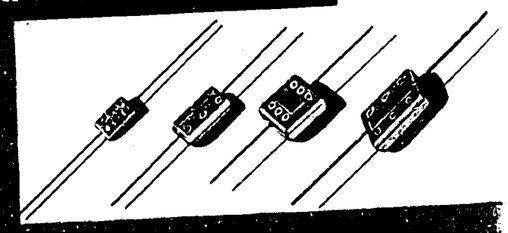

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E-T-A Products Co. of America, 6284 N. Cicero Ave., Chicago 46, Ill., 66, 70
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Eastern Industries, Inc., 100 Skiff St., Hamden 14, Conn., 4, 28
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Tel: CH 8-3841

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Tel: YUcca 2-1881

Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N.Y., 60
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Eldorado Electronics, 2821 10th St., Berkeley 10, Calif., 9, 22, 31, 36
Tel: TH 1-4613

Electra Mfg. Co., 4051 Broadway, Kansas City, Mo., 41, 67
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Electric Storage Battery, Exide Industrial Div., Rising Sun-Adams Ave., Philadelphia 20, Pa., 39, 64
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Electric Storage Battery Co., Ray-O-Vac Co., Div., 212 E. Washington Ave., Madison 10, Wis., 39
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Electric Terminal Corp., P.O. Box 2217, Providence 5, R.I., 98
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Electro Instruments, 3540 Aero Ct., San Diego 11, Calif., 3, 5, 9, 12, 14, 23, 28, 31, 34, 36, 45, 56, 62, 67
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Electro Seal Corp., 946 North Ave., Des Plaines, Ill., 4
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Electron Enterprises, 6917-19-21 Stanley, Berwyn, Ill., 6, 36, 59
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Tel: HIghlands 2-1600
Electronic Assistance Co., 20 Bridge Ave., Red Bank, N.J., 1, 3, 4, 8, 12, 16, 17, 30, 32, 36, 45, 48, 49, 61, 62, 65, 72, 73, 90, 92, 100
Tel: SHadyside 7-5100
Electronic Associates, Inc., Long Branch & Naberal Aves., Long Branch, N.J., 9
Tel: CApital 9-1100
Electronic Batteries, Inc., 34 35th St., Brooklyn 32, N.Y., 39
Tel: STerling 8-3641
Electronic Cable Corp., 126 Jackson St., Cambridge 40, Mass., 43, 62, 82
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Tel: TRowbridge 6-7250
Electronic Chem. Corp., 813 Communipaw Ave., Jersey City 4, N.J., 91
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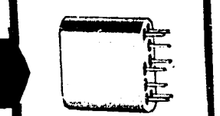
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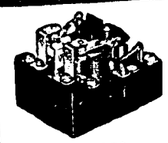
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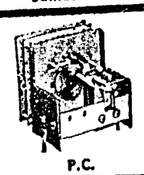
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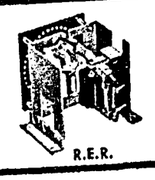
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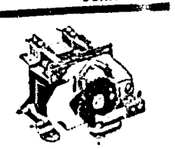
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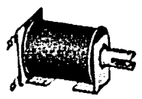
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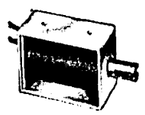
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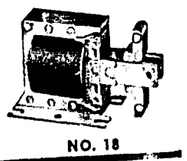
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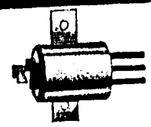

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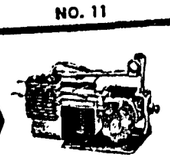
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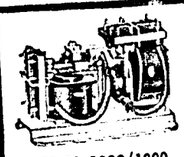
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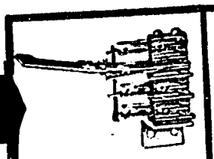
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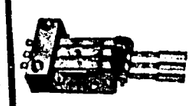
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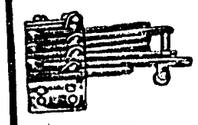
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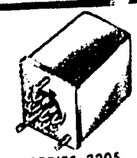
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See ad on page 542
Tel: YOrkshire 8-8161

Fairfield Engrn. Corp., 934 Hope St., Springdale, Conn., 28, 36, 61
Tel: DA 5-1561

Fairmount Chemical Co., 136 Liberty St., New York 6, N.Y., 97
Tel: BArclay 7-6375

Falcon Machine & Tool Co., Inc., 208 Concord Turnpike, Cambridge 40, Mass., 12, 28, 44, 87
See ad on page 349
Tel: TRowbridge 6-3269

Falls Metal Works, Inc., 409 Main St., Little Falls, N.J., 81, 88
Tel: CLifford 6-1300

Falstrom Co., 46 Falstrom Ct., Passaic, N.J., 81, 84, 86
Tel: PR 7-0013

Fansteel Metallurgical Corp., North Chicago, Ill., 41, 61, 64, 70, 93, 99
See ad on pages 156-157
Tel: DExter 6-4900

Farinon Electric Co., 416 D St., Redwood City, Calif., 24
Tel: EMerson 9-2102

Farley & Loetscher Mfg., Plastics Div., 7th & White Sts., Dubuque, Iowa, 84, 95
Tel: 2-5451

Farmer Elect. Prods. Co., 2300 Washington St., Newton Lower Falls, Mass., 4, 72
Tel: DEcatur 2-8383

Farnsworth Electronics, Div. of I.T. & T., 3702 Pontiac St., Ft. Wayne, Ind., 75, 80, 90
Tel: HArrison 7571

Farrall Instrument Co., P.O. Box 658, Grand Island, Neb., 17, 85, 86, 90
Tel: DUpont 4-1530

Farrand Controls, Inc., 4401 Bronx Blvd., New York 70, N.Y., 4, 9, 28, 72, 90
Tel: FA 4-2200

Farwell Metal Fabricating, 73 W. Fairfield Ave., St. Paul 7, Minn., 81, 84, 86
See ad on page 601
Tel: CApital 4-5318

Farwest Mfg. Div., 209 First Ave., Seattle 4, Wash., 3, 12, 30, 61
Tel: 4-5656

Fasco Industries, 255 Union St., Rochester, N.Y., 4, 40, 58, 70, 71
Tel: HAmilton 6-1800

Fasteners, Inc., 198 Columbus Ave., Pittsfield, Mass., 87
Tel: HIllcrest 3-9105
Fawn Plastics Co., Inc., 2301 York Rd., Timonium, Md., 94
Tel: VA 3-7260
Federal A-C Switch Corp., P.O. Box 25, Lancaster, N.Y., 70
Tel: MU 1600
Federal Electric Corp., Rt. 17 & Garden State Pkwy., Paramus, N.J., 100, 101
Tel: COlfax 1-7200
Federal Mfg. & Eng. Corp., 1055 Stewart Ave., Garden City, N.Y., 12, 19, 26, 80, 86
Tel: PIoneer 2-7400

Federal Pacific Elec. Co., 50 Avenue L, Newark 1, N.J., 4, 12, 31, 56
Tel: MA 3-6500
Federal Scientific Corp., 615 West 131 St., New York 27, N.Y., 25, 36, 50, 85, 90
Tel: AUdubon 6-4400
Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 60, 87, 98
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Tel: IRving 8-5744
Federal Shock Mount Corp., Div. Korfund Co., Inc., 48-15 32nd Pl., Long Island City 1, N.Y., 78
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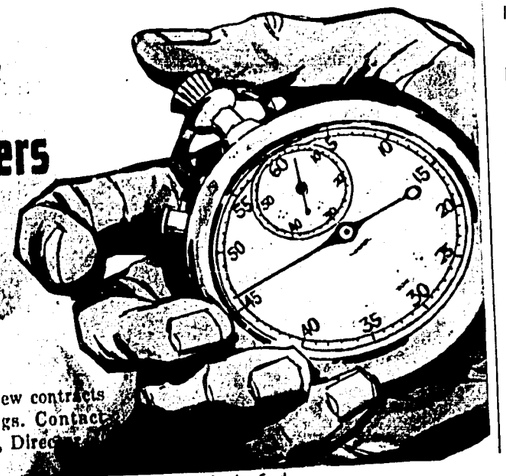

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Federal Tool & Mfg. Co., 3600 Alabama Ave., Minneapolis 16, Minn., 86
Tel: WEst 9-7843
Feedback Controls, Inc., 899 Main St., Waltham 54, Mass., 1, 4, 8, 28, 30
Tel: TW 4-1020
Feiler Eng. & Mfg. Co., 8026 N. Monticello, Skokie, Ill., 10, 16, 30
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Felker Mfg. Co., 1128 Border Ave., Torrance, Calif., 92
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Felsenthal & Sons, Inc., 3500 N. Kedzie Ave., Chicago 18, Ill., 86
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Felt Products Mfg. Co., 7450 N. McCormick Blvd., Skokie, Ill., 87, 89
Tel: ROgers Park 1-4500
Felters Co., 210 South St., Boston 11, Mass., 87
Tel: LIberty 2-7021
Fenn College, Dept. of Electrical Eng., 1983 E. 24 St., Cleveland 25, Ohio, 100
Tel: PR 1-0250
Fentiman & Sons, Ltd., F., 335 Roosevelt Ave., Ottawa 3, Ont., Canada, 37
Tel: PArkway 2-6581
Fen-Tone Corp., 106 Fifth Ave., New York 11, N.Y., 57, 59
Tel: OREgon 5-1707
Fenwal Electronics, Inc., 51 Mellan St., Framingham, Mass., 4, 67
Tel: TRinity 3-7455
Fenwal, Inc., Pleasant St., Ashland, Mass., 4, 56, 70, 71
Tel: TRinity 5-6111
Ferranti Electric, Inc., Electronics Div., 95 Madison Ave., Hempstead, N.Y., 1, 3, 4, 9, 48, 68, 74, 75, 76
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Ferranti-Packard Elect., Industry St., Toronto 15, Ont., Canada, 1, 4, 6, 9, 22, 24, 34, 36, 52, 61, 62, 74, 85, 90
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Ferrara, Inc., 8106 W. 9 Mile Rd., Oak Park, Mich., 4, 9, 90
Tel: JOrdan 6-2327
Ferricore, Inc., 250 South St., Newark 5, N.J., 37, 46, 87, 93, 94
Tel: MItchell 2-6860
Ferris Instrument Co., 110 Cornelia St., Boonton, N.J., 12, 26, 31, 37, 38
Tel: DEerfield 4-0781
Ferrotran Electronics Co., 693 Broadway, New York 12, N.Y., 12, 28, 30, 43, 45, 50, 61, 62, 73, 77, 79, 90
Tel: ALgonquin 4-5810
Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 9, 34, 37, 46, 55, 67, 83
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Tel: CHerry 6-2811
Fiber Glass Industries, Inc., Homestead Pl., Amsterdam, N.Y., 89, 95
Tel: VIctor 2-4000
Fiber Fabricators Co., 4540 W. Addison St., Chicago 41, Ill., 73, 86, 87, 95, 98
Tel: AV 2-4545
Fidelitone, Inc., 6415 N. Ravenswood, Chicago 26, Ill., 59, 63
Tel: BRiargate 4-0075

Fidelity Amplifier Co., 1633 N. Halstead St., Chicago 14, Ill., 3, 4, 5, 36, 56, 60, 61, 86, 90, 98
Tel: MO 4-3515
Fidelity Chemical Products, 470 Frelinghuysen Ave., Newark 12, N.J., 91
Tel: BIgelow 2-4110
Fidelity Instrument Corp., 1000 E. Boundary Ave., York, Pa., 4, 36, 61, 73, 79
Tel: YOrk 7675
Film Capacitors, Inc., 3400 Park Ave., New York 56, N.Y., 41, 61
Tel: CYpress 2-5181
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Tel: WAtkins 4-3245
Filtors, Inc., 30 Sagamore Hill Dr., Port Washington, N.Y., 66
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Filtron Co., Inc., 131-15 Fowler Ave., Flushing 55, L.I., N.Y., 41, 48, 50, 61, 62, 73, 90
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Finn & Co., Inc., T. R., 200 Central Ave., Hawthorne, N.J., 78
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Finney Co., 34 W. Interstate, Bedford, Ohio, 37, 68
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Fire Control Co., Inc., 703 Thornton St., Wilmington 1, Del., 4
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First Electronics Corp., 117 Blue Hill Ave., Boston 19, Mass., 53, 61, 62, 67, 82, 86, 94
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Tel: NEw Rochelle 6-1300
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Tel: ULster 7-4176
Fisher & Crome, 109 N. Camac St., Philadelphia 7, Pa., 81, 86, 87, 89, 92, 95, 98
Tel: LOcust 4-5054
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Tel: HUntington 315
Fisher Radio Corp., 21-21 44th Dr., Long Island City 1, N.Y., 6, 36, 77
Tel: EX 2-2500
Fisher Research Lab., Inc., 1975 University Ave., Palo Alto, Calif., 3, 4, 10, 13, 16, 20, 22, 26, 37, 56, 61
Tel: DA 2-4646
Fisher Scientific Co., 711 Forbes St., Pittsburgh 19, Pa., 4, 5, 12, 14, 39, 56, 66, 72, 78, 79, 91
Tel: EXpress 1-1330
Fleetwood Labs., Inc., 300 Victory Blvd., New Rochelle, N.Y., 12
Tel: BEverly 5-0831
Flexaust Co., 100 Park Ave., New York 17, N.Y., 40
Tel: OREgon 9-1300
Flexonics Corp., 1315 South 3 Ave., Maywood, Ill., 71
Tel: FIllmore 3-8000

Flexrock Co., 3609 Filbert St., Philadelphia 1, Pa., 86, 87, 95
Tel: BA 2-5500
Flight Research, Inc., P.O. Box 1-F, Richmond 1, Va., 27
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Flock Process Co., Inc., 373 Main Ave., Norwalk, Conn., 86, 87
Flow Corp., 85 Mystic St., Arlington 74, Mass., 3, 12, 26, 50, 56, 72
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Flite-Tronics, Inc., 3312 Burton Ave., Burbank, Calif., 1, 61, 90
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Fluke Mfg. Co., Inc., John, 1111 W. Nickerson, Seattle 99, Wash., 12, 61, 101
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Fluornlon Labs., Inc., Box 305D, Caldwell, N.J., 86, 87, 89, 90, 94, 95
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Flush Wall Radio Co., 1012 Cleveland St., Clearwater, Fla., 6, 30
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Foampak Corp., 400 N. 12th St., Philadelphia 23, Pa., 86
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Fonda Corp., P.O. Box 244, Narberth, Pa., 27, 36, 59
Tel: MOhawk 4-2735
Food Mach. & Chem. Corp., 1105 Coleman Ave., San Jose, Calif., 81, 90
Tel: CYpress 4-8124
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa., 46, 47, 82, 83, 89, 91, 93, 99
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Forbes & Wagner, Inc., 350 Central Ave., Silver Creek, N.Y., 28, 36, 43, 48, 50, 73
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Ford Radio & Mica Corp., 536-63 St., Brooklyn, N.Y., 99
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Forest Electric Co., 7216 Circle Ave., Forest Park, Ill., 43, 73
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Fort Hill Engraving Co., 40 Hanover St., Boston 8, Mass., 86, 87, 95
Tel: RIchmond 2-2570
Fort Wayne Metals, Inc., 3211 MacArthur Dr., Fort Wayne, Ind., 63, 82, 85
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Foss, Inc., William L., 927 15 St., Washington 5, D.C., 85
Tel: RE 7-3883
Foster Transformer Co., 3820 Colerain Ave., Cincinnati 23, Ohio, 43, 50, 73
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Fostoria Pressed Steel, N. Main St., Fostoria, Ohio, 88
Tel: HEmlock 5-7721

Foto-Video Labs., Inc., 36 Commerce Rd., Cedar Grove, N.J., 6, 7, 21, 23, 26, 32, 35, 36, 61, 64, 70, 85, 90
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Fox Co., C. J., 236 Aborn St., Providence 1, R.I., 87
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Foxboro Co., Foxboro, Mass., 4, 34, 56
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Franke Gear Works, Inc., 4401 Ravenswood Ave., Chicago 40, Ill., 28
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Franklin-Dales Co., 180-184 E. Mill St., Akron 8, Ohio, 66, 70, 71
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Franklin Electronics, Inc., E. 4 St., Bridgeport, Pa., 12, 22, 36
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Freeland Products Co., 700 Dryades St., New Orleans 12, La., 74, 76
Tel: TUlane 6381
Freedlander Res. & Dev. Lab., 3341 W. El Segundo Blvd., Hawthorne, Calif., 89, 90, 91
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Frequency Standards, Inc., P.O. Box 504 Shafta Rd., Asbury Park, N.J., 19, 25, 37, 38, 44, 50, 56, 70, 80
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Friden, Inc., 2350 Washington Ave., San Leandro, Calif., 9
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Fried, Licensed Prof. Engineer, Crescent Beach Dr., Huntington, N.Y., 4, 85, 86, 90
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Friend, A., P.O. Drawer 29, Bala-Cynwyd, Pa., 85
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Fuchs Impulse Motor Servomechanisms, 114 E. 28 St., New York 16, N.Y., 4, 11, 14, 28, 56, 58, 66, 85, 90
Fugle-Miller Laboratories, Inc., 301 Central Ave., Clark, N.J., 36, 37, 43, 48, 50, 67, 73
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Tel: FUlton 1-2727
Fuji Communication Apparatus Mfg. Co., Ltd., c/o The Nissho American Corp., 74 Trinity Pl., New York 6, N.Y., 44, 67, 68
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Furane Plastics, Inc., 4516 Brazil St., Los Angeles 39, Calif., 46, 81, 89, 91, 95
Tel: CH 5-1151
Furnas Electric Co., 1000 McKee St., Batavia, Ill., 70
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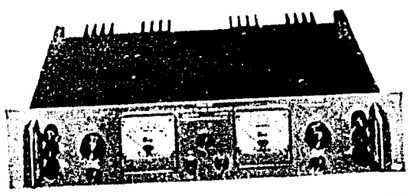


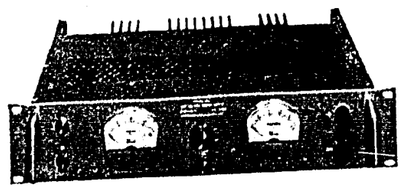
802A

TWIN SUPPLY—.01% REGULATION
2 0-30 VOLT, @ 0-1.0 AMPERE OUTPUTS

LINE REGULATION: less than 3.0 millivolts
LOAD REGULATION: less than 3.0 millivolts
RIPPLE AND NOISE: less than 250 microvolts rms.

SPECIAL FEATURES: By connecting the outputs in series, 0-60 volts @ 1.0 ampere can be obtained. Automatic short circuit protection. Fast recovery time. Output terminals front and rear. Remote sensing. Continuously variable.

$580.00



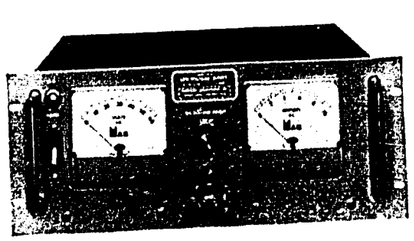
806A

PROGRAMMABLE—.01% REGULATION
0-20 VOLTS @ 0-2.0 AMPERES

LINE REGULATION: less than 2.0 millivolts
LOAD REGULATION: less than 2.0 millivolts
RIPPLE AND NOISE: less than 200 microvolts rms.

SPECIAL FEATURES: Remote programming at 100 ohms per volt. Fast recovery time. Output terminals provided on front and rear. Remote sensing. Continuously variable. Automatic overload protection.

$320.00. With meters, $350.00



810A

RACK MOUNTED SUPPLY
0-50 VOLTS @ 0-7.5 AMPERES

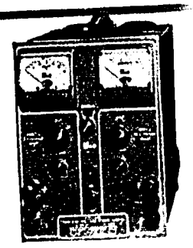
LINE REGULATION: less than 10 millivolts
LOAD REGULATION: less than 10 millivolts
RIPPLE AND NOISE: less than 1.0 millivolts

SPECIAL FEATURES: Excellent transient response. Output terminals both front and rear. Designed to work with sudden load changes. External sensing provided. Automatic overload protection.

$895.00

TWIN SUPPLY BENCH TYPE
2-36 VOLTS @ 0-1.0 AMPERE

LINE REG: less than 10 mv.
LOAD REG: less than 10 mv.
RIPPLE & NOISE: less than 500 μv. rms.
SPEC. FEATURES: A twin power supply—may be connected in series to provide 4 to 72 volts at 1.0 ampere. Has automatic overload protection.



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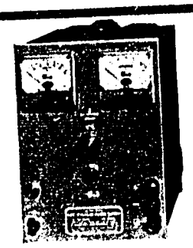
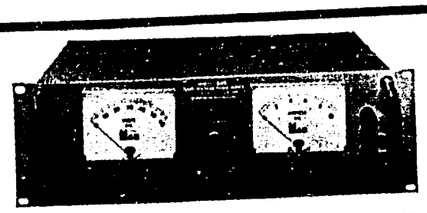


800B

LABORATORY BENCH TYPE
2-30 VOLTS @ 0-2.5 AMPERES

LINE REG: less than 10 mv.
LOAD REG: less than 10 mv.
RIPPLE & NOISE: less than 500 μv. rms.
SPEC. FEATURES: An inexpensive laboratory type power supply with automatic overload protection.

$339.00



812B

FIXED VOLTAGE—ECONOMICAL
(SELECTABLE 0-32 VOLTS) @ 10 AMPERES

LINE REGULATION: less than 15.0 millivolts
LOAD REGULATION: less than 15.0 millivolts
RIPPLE AND NOISE: less than 1.0 millivolts rms.

SPECIAL FEATURES: For fixed voltage applications and not continuously variable. An economical high current supply with excellent transient response. Automatic overload protection.

$550.00. With meters, $590.00

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Tel: REdwood 1-2020

G

G-C Electronics Mfg. Co., 400 S. Wyman St., Rockford, Ill., 67, 70, 94
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G-L Electronics Co., Inc., 2921 Admiral Wilson Blvd., Camden 5, N.J., 46
Tel: WOodlawn 6-2780

G-M Labs., Inc., 4300 N. Knox Ave., Chicago 41, Ill., 12, 28, 58
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GNY, 85 Shields Ave., Williston Park, N.Y., 24
Tel: PIoneer 2-6218

GOE Engineering Co., 219 S. Mednik Ave., Los Angeles 22, Calif., 83, 87, 98
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GPE Controls, Inc., 240 E. Ontario St., Chicago 11, Ill., 4, 9, 28
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GPS Instrument Co., 180 Needham St., Newton 64, Mass., 9
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G-V Controls, Inc., Okner Pkwy., Livingston, N.J., 66, 70, 71
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Gables Engineering, Inc., 247 Greco Ave., Coral Gables 34, Fla., 81
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Gabriel Co., Gabriel Electronics Div., 135 Crescent Rd., Needham Heights 94, Mass., 37, 50, 73, 80, 85, 86, 90
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Gamewell Co., 1238 Chestnut St., Newton Upper Fall, Mass., 67
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Gap Instrument Corp., 116 E. Merrick Rd., Freeport, N.Y., 4, 28, 58
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Gar Precision Parts, Inc., 190 Henry St., Stamford, Conn., 80
Tel: FI 8-2671

Garde Mfg. Co., 53 John St., Cumberland, R.I., 30, 44, 51, 52, 53, 87, 94, 98
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Gardener Electronics, Co., 2545 E. Indian School, Phoenix, Ariz., 4
Tel. CR 4-9681

Gardner, Ben R., P.O. Box 872, State College, Pa., 85, 90
Tel: AD 8-8917

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Gardner-Denver Co., Wire-Wrap. Div., 1333 Fulton St., Grand Haven, Mich., 92
Tel: 551

Gardner Lab., Inc., P.O. Box 5728, Bethesda 14, Md., 12
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Garfield Associates, E., 1122 Spring Garden St., Philadelphia 23, Pa., 11, 14, 23, 101
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Garlock Packing Co., Garlock Electronic Products, Camden 1, N.J., 42, 44, 69, 86, 87, 89, 94, 95, 98
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Tel: WOodlawn 4-0370

Garrard Sales Corp., 80 Shore Rd., Port Washington, N.Y., 32, 59
Tel: PO 7-7700

Garrett Corp., Air Research Mfg. Div., 9851 Sepulveda Blvd., Los Angeles 45, Calif., 4, 9, 28, 40, 44, 50, 58, 72
Tel: SP 6-1010

Garron Aircraft Supply, 5 Union Square, New York 3, N.Y., 82, 87
Tel: OREgon 5-8700

Gates Electronic Co., 1705 Taylor Ave., New York 60, N.Y., 12, 45, 56, 61, 64, 73
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Tel: TYrone 2-6490

Gates Radio Co., 123 Hampshire, Quincy, Ill., 1, 4, 7, 16, 18, 20, 21, 24, 27, 29, 32, 33, 34, 36, 37, 49, 50, 61, 62, 73, 79, 88, 90
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Gavitt Wire & Cable Co., Central St., Brookfield, Mass., 37, 62, 82
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Tel: GR 1-1600

General Aniline & Film Corp., Ansco Div., Charles St., Binghamton, N.Y., 15, 63
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General Aniline & Film Corp., Antara Chemicals Div., 435 Hudson St., New York 14, N.Y., 93
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General Aniline & Film Corp., Ozalid Div., Ansco Rd., Johnson City, N.Y., 92
Tel: BInghamton 7-2301

General Applied Science Labs., 60 Hempstead Ave., Hempstead, N.Y., 1, 3, 9, 19, 25, 36, 62, 85, 90
Tel: IVanhoe 6-4000

General Automatic Corp., 12 Carlton Ave., Wayne, N.J., 66
Tel: CLifford 6-2756

General Automatics, Inc., 972 Elsinore Ct., Palo Alto, Calif., 3, 4, 9, 12, 13, 21, 43, 48, 50, 56, 62, 85, 86, 90
Tel: DA 4-0360

General Aviation Elect. Mfg., 179 Berger St., Woodridge, N.J., 81, 84, 86, 87, 98, 99
Tel: WEbster 9-8198

General Bronze Corp., GB Electronics Corp., Subsid., Hook Creek Blvd., Valley Stream, N.Y., 4, 15, 19, 50, 80
Tel: LOcust 1-8300

General Cable Corp., 730 Third Ave., New York, N.Y., 82
Tel: LExington 2-2920

General Cable Corp., Metal Textile Corp. Div., 647 E. First Ave., Roselle, N.J., 70, 78, 82, 87, 96, 99
Tel: CHestnut 5-3000

General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 12, 37, 44, 51, 53, 60, 69, 70, 87, 89, 91, 92, 98
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Tel: ROckford 8-9661

General Ceramics Corp., Dept. ID, Crows Mill Rd., Keasbey, N.J., 9, 37, 46, 52, 55, 83, 89
See ad on page 618
Tel: VAlley 6-5100

General Ceramics Corp., Arnhold Ceramics, Inc., Sub., 1 E. 57 St., New York 22, N.Y., 54
Tel: PLaza 5-8213

General Coil Products, Inc., 147-12 Liberty Ave., Jamaica 35, L.I., N.Y., 37, 43, 73
Tel: AXtel 2-8390

General Communication Co., 677 Beacon St., Boston 15, Mass., 1, 18, 19, 25, 26, 37, 38, 50, 60, 70, 80
Tel: COpley 7-0030

General Communications, Janesville Rd., Box 169, Ft. Atkinson, Wis., 21, 30, 32, 35, 36, 61
Tel: JO 3-5547

General Components, Inc., 225-229 E. 144th St., New York 51, N.Y., 98
Tel: MOtt Haven 5-0740

General Controls Co., 801 Allen Ave., Glendale, Calif., 1, 4, 9, 15, 28, 36, 56, 58, 66, 67, 70, 71, 73
Tel: VIctoria 9-2181

General Controls Co., 1200 Soldiers Field Rd., Boston 34, Mass., 4, 70
Tel: STadium 2-7440

General Controls Co., Pic Automation Control Div., 8080 McCormick Blvd., Skokie, Ill., 4, 7, 66
Tel: IR 8-2323

General Crystal Co., Inc., 372 Wilmot Ave., Burlington, Wis., 47
Tel: ROckwell 3-2425

General Devices, Inc., P.O. Box 253, Princeton, N.J., 4, 13, 19, 26, 34, 36, 44, 45, 61, 70, 85
See ad on page 360
Tel: DAvis 9-2323

General Dynamics Corp., Convair Div., 1675 W. Fifth St., Pomona, Calif., 90
Tel: NAtional 9-5111

General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N.Y., 4, 7, 8, 9, 12, 14, 15, 19, 23, 36, 41, 43, 45, 56, 58, 61, 66, 67, 70, 73, 79, 88, 92
Tel: FRanklin 4-2211

General Electric Co., Capacitor Dept., John St., Hudson Falls, N.Y., 41
Tel: HUdson Falls 4-3341

General Electric Co., Capacitor Div., Irmo, S.C., 41
Tel: AL 2-6332

General Electric Co., Cathode-Ray Tube Dept., Electronics Park, Syracuse, N.Y., 74
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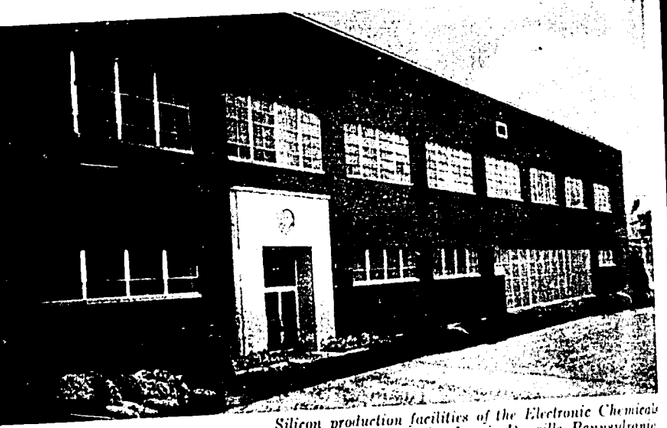

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Tel: TRinity 3-4331

General Electric Co., Communication Products Dept., Lynchburg, Va., 6, 8, 10, 16, 18, 20, 24
Tel: VI 6-7311

General Electric Co., Computer Dept., 1103 N. Central Ave., Phoenix, Ariz., 9, 21
Tel: AL 4-3171

General Electric Co., Defense Systems Dept., 735 State St., Santa Barbara, Calif., 90
Tel: WOodland 5-0551

General Electric Co., Defense Systems Dept., Syracuse, N.Y., 90
Tel: GRanite 6-4411

General Electric Co., Distrib. Assemblies Dept., 42 Woodford Ave., Plainville, Conn., 70, 81
Tel: SHerwood 7-1671

General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court St. Plant, Bldg. 3-50, Syracuse, N.Y., 9, 16, 25, 37, 46, 48, 62, 72, 83
See ads on pages 283, 288, 445, 447, 505, 617
Tel: GRanite 6-4411

General Electric Co., Industry Control Dept., P.O. Box 2488, Roanoke, Va., 67
Tel: DUpont 9-7011

General Electric Co., Instrument Dept., 40 Federal St., Lynn, Mass., 4, 12, 14, 22, 23, 34, 56, 70
Tel: LY 3-3400

General Electric Co., Insulator Dept., S. Charles & Cromwell, Baltimore 30, Md., 83, 89
Tel: PLaza 2-8020

General Electric Co., Laminated Prods. Dept., 1 Plastics Ave., Coshocton, Ohio, 95
Tel: MAin 2-5310

General Electric Co., Lamp Wire-Phosphors Dept., 21800 Tungsten Rd., Cleveland 17, Ohio., 93, 99
Tel: KE 1-5050

General Electric Co., Large Lamp Div., Nela Park, Cleveland 12, Ohio, 60, 99
Tel: GL 1-6600

General Electric Co., Light Military Electronics Dept., French Rd., Utica, N.Y., 1, 4, 9, 15, 25
Tel: SW 7-1000

General Electric Co., Magnetic Materials Section, 7800 N. Neff Rd., Edmore, Mich., 55, 67, 79
Tel: HAmilton 7-5151

General Electric Co., Miniature Lamp Dept., Nela Park-Noble Rd., East Cleveland 12, Ohio, 60
Tel: GL 1-6600

General Electric Co., Missile-Space Vehicle Dept., 3198 Chestnut St., Philadelphia 4, Pa., 90
Tel: EVergreen 2-7800

General Electric Co., Power Tube Dept., 1 River Rd., Bldg. 267, Schenectady 5, N.Y., 36, 65, 75, 76
See ad on page 584
Tel: FRanklin 4-2211

General Electric Co., Radio Receiver Dept., 1285 Boston Ave., Bridgeport, Conn., 6, 36, 54, 59, 77
Tel: EDison 4-1012

General Electric Co., Receiving Tube Dept., 316 E. Ninth St., Owensboro, Ky., 74
Tel: MU 3-2401

General Electric Co., Semiconductor Products Dept., Charles Bldg., Liverpool, N.Y., 64, 68
Tel: GRanite 6-4411

General Electric Co., Semiconductor Products Dept., Electronics Park, Syracuse, N.Y., 64, 68
Tel: GRanite 6-4411

General Electric Co., Specialty Control Dept., P.O. Box 812, Waynesboro, Va., 4, 66
Tel: WHitehall 2-8161

General Electric Co., Specialty Electronic Components, W. Genesee St., Auburn, N.Y., 9, 36, 46, 48, 50, 54, 59, 72, 81, 83, 86, 90
Tel: AUburn 3-7321

General Electric Co., Technical Products Operations, Electronics Park, Syracuse, N.Y., 6, 7, 11, 18, 21, 29, 32, 35, 36, 37, 61
Tel: GRanite 6-4411

General Electric Co., Wiring Device Dept., 95 Hathaway St., Providence, R.I., 51, 60, 70, 71, 88, 98
Tel: STuart 1-1800

General Electric Co., X-ray Department, 4855 Electric Ave., Milwaukee 1, Wis., 4, 12, 17, 22, 75
Tel: EVergreen 3-3211

General Electric Co., 1635 Broadway, Ft. Wayne, Ind., 36, 61, 73, 79
Tel: EAstbrook 7431

General Electric Co., 6901 Elmwood Ave., Philadelphia 42, Pa., 45, 61, 66, 92
Tel: SA 9-4200

General Electric Co., Ltd., of England, Telephone Works, Coventry, Eng., 3, 4, 6, 8, 9, 10, 12, 18, 20, 22, 24, 25, 30, 33, 36, 37, 40, 41, 45, 46, 47, 48, 49, 50, 53, 56, 58, 61, 62, 66, 68, 72, 73, 86
Tel: COventry 5-2152

General Electro Mechanical Corp., 785 Hertel Ave., Buffalo 7, N.Y., 4, 12, 28, 84
Tel: BE 9685

General Electrodynamics Corp., 4430 Forest Lane, Garland, Texas, 15, 74, 75, 76, 88
Tel: BRoadway 6-1161

General Electronic Lab., Inc., 195 Massachusetts Ave., Cambridge 39, Mass., 1, 3, 7, 18, 19, 26, 28, 34, 36, 37, 77, 80
Tel: UNiversity 4-8500

General Electronics Co., 4200 Mobile Rd., Montgomery 8, Ala., 2, 4, 8, 43, 45, 56, 61, 62, 70, 72, 85, 86, 90
Tel: AM 5-7076

General Electronics, Inc., 101 Hazel St., Paterson, N.J., 65, 74, 75, 76
Tel: MUlberry 4-5271

General Findings & Supply Co., Industrial Div., Pearl St., Attleboro, Mass., 70, 86, 87, 88, 97, 99
Tel: 1-1155

General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, N.Y., 4, 12, 52, 66, 70, 86, 87, 90
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Tel: VAlley Stream 5-6363

General Industries Co., Olive & Taylor Sts., Elyria, Ohio, 27, 58
Tel: FAirfax 3-3136

General Instrument Corp., Automatic Division, 65 Gouverneur St., Newark 4, N.J., 42, 43, 68, 73
Tel: HUmboldt 5-2100

General Instrument Corp., Semiconductor Division, 65 Gouverneur St., Newark 4, N.J., 64, 68
Tel: HUmboldt 5-2100

General Instrument Corp., F. W. Sickles Div., 165 Front St., Chicopee, Mass., 28, 36, 37, 42, 43, 48, 50, 61, 70, 73, 77
Tel: RE 3-6621

General Insulated Wire Works, 69 Gordon Ave., Providence 5, R.I., 82
Tel: HOpkins 1-2100

General Kinetics, Inc., 555 23 St., South, Arlington 2, Va., 9, 12, 27, 34, 85, 90, 92
Tel: OTis 4-7555

General Lab. Assoc., Inc., 17 E. Railroad St., Norwich, N.Y., 82
Tel: 4-3264

General Magnetic Corp., 10001 Erwin Ave., Detroit 34, Mich., 55
Tel: WAlnut 1-7558

General Magnetics, Inc., 135 Bloomfield Ave., Bloomfield, N.J., 36, 45, 61
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Tel: PIlgrim 8-2400

General Metal Products Co., 1010-14 Centre St., Easton, Pa., 86
Tel: EAston 9122

General Metals Corp., Adel Precision Products Div., 10777 Vanowen St., Burbank, Calif., 92
Tel: STanley 7-2611

General Mills, Inc., Mechanical Div., 1620 Central Ave., Minneapolis 13, Minn., 1, 9, 15, 19, 25
Tel: STerling 9-8811

General Motors Corp., AC Spark Plug Div., Box 746, S. Milwaukee, Wis., 1, 4
Tel: SO 2-7000

General Motors Corp., Delco Radio Div., 700 E. Firmin St., Kokomo, Ind., 64, 68
Tel: GLadstone 2-8211

General Nuclear Corp., 550 Fifth Ave., New York 28, N.Y., 61, 92
Tel: PLaza 7-3638

General Plastics Corp., 165 Third Ave., Paterson 4, N.J., 86, 87, 89, 91
Tel: ARmory 4-4710

General Precision Lab., 63 Bedford Rd., Pleasantville, N.Y., 1, 6, 7, 21, 27, 32, 33, 36, 61
Tel: ROgers 9-5000

General Products Corp., Salem St., Union Springs, N.Y., 41, 86, 94, 98
Tel: UNion Springs 7-7367

General RF Fittings, Inc., 702 Beacon St., Boston 15, Mass., 44
Tel: KEnmore 6-2200

General Radio Co., West Concord, Mass., 3, 4, 5, 12, 14, 19, 21, 26, 31, 35, 36, 38, 41, 42, 44, 48, 50, 53, 57, 61, 67, 73, 79, 94
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Tel: EMerson 9-4400

General Research & Supply Co., 572 S. Division, Grand Rapids, Mich., 92
Tel: GLendale 9-3341

General Resistance, Inc., 577 E. 156 St., New York 55, N.Y., 5, 12, 67
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Tel: CYpress 2-1500

General Testing Labs., Inc., 61 Washington Ave., Carlstadt, N.J., 90
Tel: WE 9-6933

General Time Corp., 355 Lexington Ave., New York 17, N.Y., 9, 56, 90
See ad on page 470
Tel: MUrray Hill 7-9292

General Tire & Rubber Co., Industrial Products Div., Garfield St., Wabash, Ind., 87
Tel: WAbash 1440

General Transformer Co., 18240 Harwood Ave., Homewood, Ill., 73
Tel: SYcamore 8-6124

General Transistor Corp., 91-27 138 Pl., Jamaica 35, N.Y., 67, 68
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Tel: HIckory 1-1000

General Transistor Western Corp., 6220 Venice Blvd., Los Angeles 34, Calif., 63
Tel: WEbster 3-5867

General Ultrasonics Co., 67 Mulberry St., Hartford 3, Conn., 12, 92
Tel: JAckson 7-2161

Genesys Corp., 10131 National Blvd., Los Angeles 34, Calif., 4, 9, 34, 46, 62, 63
Tel: TExas 0-2777

Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif., 12, 36, 58, 72, 92
Tel: BRadshaw 2-2706

Genistron, Inc., 2301 Federal Ave., Los Angeles 64, Calif., 43, 50, 85
Tel: BR 2-0189

Geodimeter Co., Berg, Hedstrom & Co., Div., 1170 Broadway, New York 1, N.Y., 12
Tel: MUrray Hill 5-3730

Georator Corp., 314 Tudor Lane, Manassas, Va., 13, 45, 58, 61
Tel: EMpire 8-2101

George Products Co., Inc., 759 Ramsey Ave., Hillside, N.J., 99
Tel: MUrdock 8-8150

Geotechnical Corp., 3401 Shiloh Rd., Garland, Texas., 9, 12, 13, 14, 23, 31, 34, 36, 45, 56, 72, 78, 85, 86, 90
Tel: BRoadway 8-8102

Geotronic Labs., Inc., 1314 Cedar Hill Ave., Dallas 8, Tex., 13, 36, 41, 43, 45, 48, 61, 72, 73, 90
Tel: WH 6-9123

Gerber Scientific Instrument Co., Rt. 5, South Windsor, Conn., 9
Tel: JA 8-2124

Gering Products, Inc., N. 7 St. & Monroe Ave., Kenilworth, N.J., 86, 87, 89, 91, 95
Tel: BRidge 6-2900

Gernsback Library, Inc., 154 W. 14 St., New York 11, N.Y., 101
Tel: ALgonquin 5-7755

Gerst & Co., Paul E., 4868 N. Clark St., Chicago 40, Ill., 12, 58, 85
Tel: LOngbeach 1-5897

Gertsch Products, Inc., 3211 S. La Cienega, Los Angeles 16, Calif., 3, 5, 9, 12, 19, 31, 36, 38, 50, 70, 73
Tel: VErmont 9-2201

Getters Electronics, Inc., 1920 Buffalo Ave., Niagara Falls, N.Y., 99
Tel: BUtler 2-2363

Giannini Controls Corp., 918 E. Green St., Pasadena, Calif., 1, 4, 9, 34, 67, 72
Tel: MUrry 1-7152

Giannini Controls Corp., New Jersey Div., Box 32, Caldwell, N.J., 67, 72
Tel: CApital 6-7777

Gibbs Mfg. & Research Co., 450 N. Main St., Janesville, Wis., 36, 47, 70, 86, 90
Tel: PLeasant 4-4467

Gibson Electric Co., P.O. Box 541, Delmont, Pa., 44, 55, 70, 86, 93
Tel: HOward 8-7701

Gilfillan Brothers, Inc., 1815 Venice Blvd., Los Angeles 6, Calif., 1, 25, 37, 80, 90, 101
Tel: DUnkirk 1-3441

Gillies Co., Inc., Duncan M., 66 Central St., West Boylston, Mass., 86, 92
Tel: TEmple 5-4445

Gilmore Industries, Inc., 13015 Woodland Ave., Cleveland 20, Ohio, 4, 12, 14, 56
Tel: RA 1-6400

Girard-Hopkins, 1000-40 Ave., Oakland 1, Calif., 41
Tel: KEllogg 2-8477

Girdler Corp., Process Equip. Div., P.O. Box 43, Louisville 1, Ky., 88
Tel: JU 7-7553

Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn 37, N.Y., 97
Tel: EV 6-5100

Glaser-Steers Corp., 155 Oraton St., Newark 4, N.J., 59
Tel: HUmboldt 4-6400

Glasply Corp., 70 Lyons Pl., Mount Vernon, N.Y., 86, 89, 95
Tel: MOunt Vernon 7-6666

Glass Products Co., see Scientific Components, Inc.

Glasseal Products Co., Inc., 1111 E. Elizabeth Ave., Linden, N.J., 44, 52, 86, 88
Tel: HU 6-2067

Glass-Tite Industries, 88 Spectacle St., Cranston 10, R.I., 44, 47, 52, 85, 87, 98
Tel: STuart 1-3200

Glastic Corp., 4321 Glenridge Rd., Cleveland 21, Ohio, 86, 89, 94, 98
Tel: IVanhoe 6-0100

Gleason-Avery Inc., Auburn, N.Y., 58
Tel: 3-6021

Glentronics, Inc., 859 E. Alosta Ave., Glendora, Calif., 45, 61
Tel: EDgewood 5-4514

Globe Electrical Mfg. Co., 1729-45 W. 134 St., Gardena, Calif., 9, 62, 66, 86, 98
Tel: FA 1-3311

Globe Industries, Inc., 1784 Stanley Ave., Dayton 4, Ohio, 28, 40, 58
Tel: BAldwin 2-3741

Godfrey Mfg., Co., 1633 N. Halsted St., Chicago 14, Ill., 30, 36, 59, 60, 86, 98
Tel: MOhawk 4-3515

Godley Co., Paul, P.O. Box J, Upper Montclair, N.J., 85
Tel: PIlgrim 6-3000

Goldak Co., Inc., 1544 W. Glenoaks Blvd., Glendale 1, Calif., 13
Tel: CH 5-6571

Goldsman Co., 1328-34 N. 4 St., Philadelphia 22, Pa., 81, 90
Tel: PO 5-4468

Goldsmith Bros. Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill., 70, 82, 93, 97
Tel: RA 6-0232

Gombos Co., Inc., John, Webro Rd., Clifton, N.J., 19, 37, 42, 77, 80, 86
Tel: PR 3-6633

Good Electronics Corp., P.O. Box 20[illegible] W. Palm Beach, Fla., 4, 9, 17, 36, 4[illegible] 56, 62, 70, 86, 90
Tel: VI 8-3241

Good-All Electric Mfg. Co., 121 W. First St., Ogallala, Neb., 41
Tel: OGallala 900

Goodmans Industries Ltd., Axiom Works, Wembly, Middlesex, England 12, 36, 38, 54, 72, 92
Tel: WEmbly 1200

Goodrich Aviation Products, 500 S. Main St., Akron 18, Ohio, 71, 87
Tel: BLackstone 3-1171

Goodrich Co., B. F., Sponge Product Div., 64 Derby Pl., Shelton, Conn., 2[illegible] 96
Tel: REgent 5-4661

Goodyear Aircraft Corp., Litchfield Park, Ariz., 25, 37

Gordon Associates, Inc., 62 White St., Red Bank, N.J., 85, 101
Tel: SHadyside 1-2743

Gordon Co., Herbert W., Woodchuck Hill Rd., Harvard, Mass., 19, 26
Tel: GL 6-3548

Gordon, Herman L., Munsey Bldg., Washington 4, D.C., 85
Tel: NAtional 8-2497

Gordos Corp., 250 Glenwood Ave., Bloomfield, N.J., 65, 66, 70
Tel: PIlgrim 3-6800

Gore & Assoc., W. L., 487 Paper[illegible] Rd., Newark, Del., 82, 89, 95, 96
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Tel: ENdicott 8-8325

Gorham Mfg. Co., Electronics Div., [illegible] Adelaide Ave., Providence 7, R.I., [illegible] 37, 44, 50, 77, 80, 86, 90
See ad on page 593
Tel: WIlliams 1-1000

Gorman Machine Co., Dept. D, 480 [illegible] Main St., Randolph, Mass., 43, 92
See ads on pages 665, 667
Tel: WOodlawn 3-4440

Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif., 36, 43, [illegible] 61, 73
Tel: THornwall 8-0776

Gotham Audio Dev. Corp., 2 W. 46 St., New York 36, N.Y., 27, 32, 36, 57, [illegible]
Tel: COlumbus 5-4111

Gould-National Batteries, Inc., Nicad Div., 172 Pleasant St., Easthampton 6, Mass., 39
Tel: EAsthampton 1200

Gould Publications, 80-46 222 St., Jamaica 27, N.Y., 101
Tel: HOllis 8-7723

Gow-Mac Instrument Co., 100 Kings Rd., Madison, N.J., 12
Tel: FRontier 7-3450

Grace Electronic Chemicals, Inc., 101 [illegible] Charles St., Baltimore 1, Md., 47, [illegible]
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Tel: PLaza 2-7699

Grafo Colloids Corp., 310 Wilkes Pl., Sharon, Pa., 91
Tel: DIamond 6-5023

Graf-Tek, Inc., P.O. Box 74, Ridgewood, N.J., 101
Tel: OLiver 2-3664

Gramer-Halldorson Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 43, 73
Tel: EVerglade 4-4400

Gramm Trailer Corp., 425 E. O'Conner Ave., Lima, Ohio, 81
Tel: CApital 9-7015

Granco Products, Inc., 36-07 20 Ave., Long Island City 5, N.Y., 6, 77
Tel: RAvenswood 1-0400

Grand Sliding Mechanisms, 2401 W. Ohio St., Chicago 12, Ill., 84
Tel: CHesapeake 3-0400

Grand Transformers, Inc., Paw Paw Ave., Benton Harbor, Mich., 43, 73
Tel: WA 5-0380

Granger Associates, 966 Commercial St., Palo Alto, Calif., 25, 36, 37, 85, 90
Tel: DAvenport 1-4175

Granite State Mach. Co., 124 Joliette St., Manchester, N.H., 25, 28, 36, 37, 73, 81, 101
Tel: NAtional 7-7804

Grant Gear Works, Inc., 174 W. 2 St., Boston 27, Mass., 28
Tel: ANdrew 8-4403

Grant Pulley & Hardware Corp., 43 High St., West Nyack, N.Y., 84
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Tel: NYack 7-4400

Graphite Metallizing Corp., 1057 Nepperhan Ave., Yonkers, N.Y., 44, 70, 80, 87
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Tel: YOnkers 8-8400

Grass Instrument Co., 101 Old Colony Ave., Quincy 70, Mass., 17, 23, 36, 72
Tel: PResident 3-0002

Gray Instrument Co., 448 Mill Rd., Andalusia, Pa., 5, 12, 67
Tel: HObart 4-2100

Gray Mfg. Co., 16 Arbor St., Hartford 1, Conn., 25, 27, 30, 36, 72
Tel: ADams 3-1271

Gray Radio Co., Inc., 501 Forest Hill Blvd., West Palm Beach, Fla., 11, 16
Tel: JUstice 2-2201

Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 53, 69, 70
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Tel: FLeetwood 4-1040

Great American Elect. Co., 43 Washington Ave., Nutley 10, N.J., 65
Tel: NOrth 1-1001

Great American Industries, Rubatex Div., Railroad Ave., Bedford, Va., 89
Tel: JUstice 6-2611

Great Eastern Metal Products, Div. Gemp Mfg. Corp., 22 Woodworth Ave., Yonkers, N.Y., 81, 87
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Tel: GReenleaf 6-7300

Great Lakes Electric Mfg., 17 S. Des Plaines St., Chicago 6, Ill., 45
Tel: ANdover 3-3565

Green Instrument Co., Inc., 385 Putnam Ave., Cambridge 39, Mass., 92
Tel: ELiot 4-2989

Green Rectifier Co., 1-10 30 St., Fair Lawn, N.J., 4, 12, 15, 43, 45, 61, 62, 64, 68, 73, 79, 81, 84, 86, 90, 92
Tel: SWarthmore 7-8100

Greene Organization, Inc., Dan, P.O. Box 124, Cambridge 38, Mass., 102
See ad on page 710
Tel: UNiversity 4-2220

Greer Stop Nut Co., 2620 W. Flournoy St., Chicago 12, Ill., 87, 99

Gregg Elec. Mfg. Co., Inc., 2 S. Broadway, Lawrence, Mass., 62, 92
Tel: MUrdock 3-8974

Greibach Instruments Corp., 315 North Ave., New Rochelle, N.Y., 12, 56
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Tel: NEw Rochelle 3-7900

Greibach Research & Development, 80 Pryer Ter., New Rochelle, N.Y., 56, 57, 66, 85
Tel: NEw Rochelle 6-6246

Gremar Mfg. Co., Inc., 7 North Ave., Wakefield, Mass., 44
Tel: CRystal 9-4580

Gries Reproducer Corp., 168 Beechwood Ave., New Rochelle, N.Y., 28, 44, 83, 87, 94
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Tel: NEw Rochelle 3-8600

Grigsby Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill., 70, 86
Tel: CLearbrook 3-2180

Grimson Color, Inc., 381 4 Ave., New York 16, N.Y., 6, 7, 21, 32, 36, 61, 76
Tel: OR 9-9088

Groov-Pin Corp., 1125 Hendricks Causeway, Ridgefield, N.J., 87
Tel: WIl 5-6780

Guardian Elec. Mfg. Co., 1601R W. Walnut St., Chicago 12, Ill., 4, 12, 43, 66, 70, 86
See ad on page 202
Tel: CHesapeake 3-1100

Gudebrod Bros. Silk Co., Inc., 225 W. 34 St., New York 1, N.Y., 87
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Tel: LAckawanna 4-5858

Gudeman Co., 340 W. Huron St., Chicago 10, Ill., 41, 73
See ad on page 402
Tel: DE 7-7400

Guenther, Willy, 1138 Massachusetts Ave., Arlington 74, Mass., 70
Tel: MI 3-9286

Guidance Controls Corp., 110 Duffy Ave., Hicksville, N.Y., 28, 67
See ad on page 349
Tel: WElls 8-9500

Gulton Industries, Inc., 212 Durham Ave., Metuchen, N.J., 1, 2, 5, 9, 12, 27, 28, 36, 37, 39, 41, 44, 50, 61, 62, 67, 72, 92
Tel: LIberty 8-2800

Gulton Industries, Inc., Nuclear Instrumentation, 15000 E. Central Ave., Albuquerque, N.M., 1, 6, 7, 9, 18, 22, 34, 37, 38, 50, 62, 73, 80, 83, 96
Tel: AL 6-9858

Gunn, Ross, 4437 Lowell St., N.W., Washington 16, D.C., 85
Tel: WO 6-6467

Gurley Co., W. & L. E., 514 Fulton St., Troy, N.Y., 4, 9, 12, 72
Tel: AS 2-6300

Gyrex Corp., 3003 Pennsylvania Ave., Santa Monica, Calif., 4, 9, 13, 31, 50, 72, 90
Tel: EXbrook 3-0462

Gyro Electronics Co., 325 Canal St., New York 13, N.Y., 2, 10, 12, 20, 45, 62, 90
Tel: WO 6-1290

H

H&H Machine Co., Inc., Noble & Jackson St., Norristown, Pa., 87, 92
Tel: BRoadway 2-6453

H. J. Transitions, Inc., 237 Woodlawn Ter., Collingswood 7, N.J., 66, 85
Tel: COllingswood 5-7658

HPL Manufacturing Co., 15210 Miles Ave., Cleveland, Ohio, 86
Tel: WYoming 1-5000

HRB-Singer, Inc., Science Park, State College, Pa., 1, 9, 11, 15, 36, 37, 90
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Tel: ADams 7-7611

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Hallamore Electronics Co., 714 N. Brookhurst St., Anaheim, Calif., 6, 21, 28, 32, 34, 36
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Industrial Condenser Corp., 3243-65 [illegible] California, Chicago 18, Ill., 41
Tel: IN 3-2200

Industrial Controls Co., 805 Albin Ave., Lindenhurst, N.Y., 1, 4, 5, 9, 12, [illegible] 17, 28, 36, 45, 56, 85
Tel: MOhawk 1-6060

Industrial Development Labs., 982 Riv[illegible] Rd., Edgewater 5, N.J., 5, 17
Tel: WHitney 3-4084

Industrial Devices, Inc., 982 River Rd[illegible] Edgewater 5, N.J., 60, 70, 86, 87, 9[illegible]
Tel: WHitney 3-4084

Industrial Elec. Controls, 2271 E. 14th St., Brooklyn 29, N.Y., 4, 9
Tel: ESplanade 5-5259

Industrial Electronic Engineers, Inc., 3973 Lankershim Blvd., N. Hollywood, Calif., 9, 60, 85, 90
See ads on pages 285, 484
Tel: TRiangle 7-0328

Industrial Elect. Rubber, 31945 Aurora Rd., Solon, Ohio, 85, 86, 87, 89, 90, 91, 94
Tel: CHurchill 8-1388

Industrial Electronics, 8060 Wheeler, Detroit 10, Mich., 4, 36, 56
Tel: TY 8-7600

Industrial Elect. Co., Monitor Controller Div., 99 Grove St., Rockland, Mass., 4, 61, 66, 70, 88
Tel: TRiangle 7-3308

Industrial Electronics of Canada, 80 Thomas St., Streetsville, Ont., 4, 45, 58, 61, 64
Tel: ATwater 9-9001

Industrial Engravers, Inc., 2212 McDonald Ave., Brooklyn 23, N.Y., 86, 87
Tel: HIckory 9-3200

Industrial Hardware Mfg., 109 Prince St., New York 12, N.Y., 70
Tel: OREgon 7-1881

Industrial Instruments, Inc., 89 Commerce Rd., Cedar Grove, N.J., 4, 12, 67, 70
Tel: CEnter 9-6200

Industrial Nucleonics Co., 650 Ackerman Rd., Columbus 14, Ohio, 72
Tel: AMherst 7-6351

Industrial Research Prod., 9400 Belmont Ave., Franklin Park, Ill., 90
Tel: GL 1-1320

Industrial Retaining Ring Co., 57 Cordier St., Irvington 11, N.J., 87
Tel: WAverly 6-5000

Industrial Science & Eng., 201 N. Wells St., Chicago 6, Ill., 101

Industrial Systems Co., 28 Main St., Matawan, N.J., 88, 92
Tel: MAtawan 1-4470

Industrial Tectonics, Inc., 3686 Jackson Rd., Ann Arbor, Mich., 22, 87
Tel: NOrmandy 3-2451

Industrial Tele., Inc., 369 Lexington Ave., Clifton, N.J., 4, 6, 12, 21, 23, 26, 34, 57, 82
Tel: GRegory 3-0900

Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 3, 5, 12, 26, 31, 45, 61
See ad on page 339
Tel: GRamercy 3-4684

Industrial Timer Corp., 1407 McCarter Hwy., Newark 4, N.J., 4, 9, 31, 56, 66, 70
Tel: HU 4-5600

Industrial Transformer, Gouldsboro, Pa., 5, 12, 15, 61, 73
Tel: VIctor 2-2111

Industrial Tubes, Inc., 321 Stevens St., Geneva, Ill., 65, 75, 76, 85
Tel: GEneva 806-807

Industrial Winding Machinery Corp., P.O. Box 62, New York 5, N.Y., 9, 43, 92
See ad on page 667
Tel: WHitehall 3-1754

Industro Transistor Corp., 35-10 36th Ave., Long Island City 6, N.Y., 68
See ad on page 545
Tel: EXeter 2-8000

Industron Corp., 55 Needham St., Newton 61, Mass., 41, 42, 73, 88, 90
Tel: DE 2-1477

Inertia Switch, Inc., 311 W. 43 St., New York 36, N.Y., 70
See ad on page 554
Tel: JUdson 6-5880

Information for Industry, 1000 Connecticut Ave., Washington 15, D.C., 101
Tel: STerling 3-4938

Ingraham Co., North Main St., Bristol, Conn., 56, 58, 86, 87
Tel: LUdlow 2-6321

Inland Electronics Corp., 500 Rathbone Ave., Aurora, Ill., 12, 86, 90
Tel: 6-7744

Inland Motor Corp., 18 Walter St., Pearl River, N.Y., 58
See ad on page 478
Tel: PEarl River 5-4015

Insl-X Co., Inc., Water St. & Broadway, Ossining, N.Y., 89, 91
Tel: WIlson 1-1397

Inso Electronic Products, Inc., 1200 Commerce Ave., Union, N.J., 82
See ad on page 609
Tel: MUrdock 6-4258

Instant Circuits, Div. Alfred W. Barber Labs., 32-44 Francis Lewis Blvd., Flushing, N.Y., 9, 62
Tel: INdependence 3-3306

Institute of Radio Engineers, Inc., 1 E. 79th St., New York 21, N.Y., 101
Tel: LEhigh 5-5100

Instron Engrg. Corp., 2500 Washington St., Canton, Mass., 4, 9, 12, 14, 36, 72, 88
Tel: CAnton 6-2500

Instru-Lec Corp., 520 Homestead Ave., Mount Vernon, N.Y., 28
Tel: MOunt Vernon 8-3754

Instrument-Apparatus News, 845 Ridge Ave., Pittsburgh 12, Pa., 101
Tel: FAirfax 1-0161

Instrument Components of N.J., Inc., 312 M. Pleasant Ave., Newark 4, N.J., 58
Tel: HUmboldt 3-6300

Instrument Development Labs., Inc., 67 Mechanic St., Attleboro, Mass., 9, 15, 44, 70
See ad on page 422
Tel: ATtleboro 1-3880

Instrument Electronics Corp., P.O. Box 830, Port Washington, N.Y., 3, 12
Tel: PO 7-4242

Instrument Laboratories, 315 W. Walton Pl., Chicago 10, Ill., 3, 12, 36, 56, 85, 90
Tel: MIchigan 2-0123

Instrument Masters, Inc., 11 Hamburg Turnpike, Riverdale, N.J., 12, 56, 90
Tel: TEmple 5-7500

Instrument Resistors Co., 1306 Commerce Ave., Union, N.J., 67
Tel: MUrdock 6-4363

Instrument Specialties Co., Inc., 284-A Bergen Blvd., Little Falls, N.J., 87, 96
See ad on page 640
Tel: CLifford 6-3500

Instruments for Industry, Inc., 101 New South Rd., Hicksville, N.Y., 36, 90
See ad on page 368
Tel: OVerbrook 1-7100.

Instruments of N.E., 108 Greenwood Lane, Waltham 54, Mass., 12, 85
Tel: TWinbrook 3-4047

Instruments Publishing Co., 845 Ridge Ave., Pittsburgh 12, Pa., 101
Tel: Fairfax 1-0161

Insul-8 Corp., 1369 Industrial Rd., San Carlos, Calif., 6, 7, 21, 32, 36, 85
Tel: LY 3-8003

Insulated Circuits, Inc., 100 8th St., Passaic, N.J., 9, 62
Tel: GRegory 2-5300

Insulating Fabricators, 150 Union Ave., East Rutherford, N.J., 86, 89, 95
Tel: WEbster 9-7392

Insulation Mfg. Corp., 565 W. Washington Blvd., Chicago 6, Ill., 86, 87, 89, 91, 94, 95
Tel: CE 6-7320

Insulation Products Co., P.O. Box 5679, Pittsburgh 8, Pa., 86
Tel: PEnhurst 1-2090

Intelex Systems, Inc., 22 Thames St., New York 6, N.Y., 1, 15, 24, 29, 40, 46, 47, 54, 58, 74, 76
Tel: BOwling Green 9-3800

Intelligent Mach. Res. Co., 7019 Edsall Rd., Alexandria, Va., 9, 90
Tel. FL 4-5000

Interchemical Corp., 120 Potter St., Cambridge 42, Mass., 91
Tel: UNiversity 4-0375

Intercontinental Dynamics Corp., 170 Coolidge Ave., Englewood, N.J., 4
Tel: LOwell 7-3600

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 3, 4, 12, 15, 30, 34, 36, 41, 45, 61, 73, 92
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200

Interference Measurements Lab., 907 E. 51st St., Brooklyn 3, N.Y., 90
Tel: INgersoll 9-1765

Interference Testing & Research Lab., Inc., 150 Causeway St., Boston 14, Mass., 26, 85, 90
Tel: LAfayette 3-7826

International Business Machines Corp., 590 Madison Ave., New York, N.Y., 4, 9
Tel: PLaza 3-1900

International Business Machines Corp., 112 E. Post Rd., White Plains, N.Y., 9
Tel: WHite Plains 9-1900

International Crystal Mfg. Co., 18 N. Lee, Oklahoma City 2, Okla., 2, 26, 47, 62, 69
Tel: CE 6-3741

International Eastern Co., 801 Sixth Ave., New York 1, N.Y., 86, 92
See ad on page 666
Tel: ALgonquin 5-3296

International Elect. Ind., 468 Grand Ave., Brooklyn 38, N.Y., 53, 69, 82
Tel: NE 8-0211

International Electronics Corp., 1551 Franklin Ave., Mineola, N.Y., 1, 4, 6, 7, 16, 18, 23, 24, 25, 29, 32, 34, 37, 85, 88
Tel: Pioneer 6-5010

International Elecn. Industries, Inc., P.O. Box 1368, Nashville, Tenn., 41
Tel: CYpress 8-4411

International Electronic Research Corp., 145 W. Magnolia Blvd., Burbank, Calif., 99
See ad on page 694
Tel: VIctoria 9-2481

International Instruments, Inc., P.O. Box 2954, New Haven 15, Conn., 12, 56, 66, 70
See ad on page 471
Tel: FUlton 7-2515

International Nickel Co., 67 Wall St., New York 5, N.Y., 93
Tel: WHitehall 4-1000

Internatl. Optical Co., Inc., 45 Urban Ave., Westbury, L.I., N.Y., 32, 86
Tel: EDgewood 3-2232

Internatl. Physical Index, 1909 Park Ave., New York 35, N.Y., 101
Tel: LEhigh 4-8412

Internatl. Pump & Machine Works, 81 Dorsa Ave., Livingston, N.J., 92
Tel: WYman 2-5900

Internatl. Radiant Corp., 111 New York Ave., Westbury, N.Y., 12
Tel: EDgewood 4-8820

International Radio-Electronics, P.O. Box 261, Elkhart, Ind., 27
Tel: JAckson 2-8583

International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 39, 42, 64, 68, 79
See ad on pages 42-43
Tel: ORegon 8-6281

International Register Co., 2620 W. Washington Blvd., Chicago 12, Ill., 12, 70
Tel: VAn Buren 6-4242

International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa., 64, 67, 72, 95
Tel: WA 2-2166

International Telemeter Corp., Amplivision Div., 2000 Stoner Ave., Los Angeles 25, Calif., 48, 82
Tel: GR 8-7751

International Telephone & Telegraph Corp., Federal Div., 100 Kingsland Rd., Clifton, N.J., 1, 9, 11, 15, 16, 18, 24, 25, 36, 37, 38, 50, 61
Tel: NUtley 2-3600

International Telephone & Telegraph Corp., Federal Telecommunication Labs. Div., 500 Washington Ave., Nutley, N.J., 90
Tel: NOrth 1-1100

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 15, 41, 52, 64, 65, 68, 70, 72, 75, 76, 79
See ad on pages 148-149
Tel: NUtley 2-3600

International Telephone & Telegraph Corp. Industrial Products Div., 250 Garibaldi Ave., Lodi, N.J., 3, 5, 12, 19, 23, 26, 31, 36, 38, 56
Tel: PRescott 3-1550

International Telephone & Telegraph Corp., Industrial Products Div., 15191 Bledsoe St., San Fernando, Calif., 6, 7, 9, 10, 20, 21, 24, 32, 35, 45, 61, 77
Tel: EMpire 7-6161

International Telephone & Telegraph Corp., Kuthe Laboratories, Inc., 730 S. 13th St., Newark 3, N.J., 75
Tel: BIgelow 2-6000

International Telephone & Telegraph Corp., Royal Electric Corp. Div., 95 Grand Ave., Pawtucket, R.I., 44, 51, 53, 69, 70, 82
Tel: PAwtucket 2-8600

International Telephone & Telegraph Labs., 937 Commercial St., Palo Alto, Calif., 8, 24, 29, 34, 36, 49, 50, 61, 73
Tel: DA 1-0211

International Wax Refining, 99 E. Hawthorne Ave., Valley Stream, N.Y., 89, 91
Tel: LOcust 1-2500

Interscience Publishers, 250 Fifth Ave., New York 11, N.Y., 101
Tel: LExington 2-1727

Interstate Electronics Corp., 707 E. Vermont Ave., Anaheim, Calif., 1, 4, 6, 7, 9, 11, 15, 22, 31, 32
Tel: PRospect 4-6540

Interstate Electronics, Inc., 227 Fulton St., New York 7, N.Y., 41, 102
See ad on page 403
Tel: BEekman 3-8780

Invar Electronics Co., 323 W. Washington Blvd., Pasadena, Calif., 31, 61
Tel: SY 4-0454

Invengineering Inc., P.O. Box 360, Belmar, N.J., 85, 90
Tel: PRospect 5-6800

Investment Casting Co., 60 Brown Ave., Springfield, N.J., 86, 93
Tel: DRexel 6-6260

Iron Fireman Mfg. Co., Electronics Div., 2838 S.E. 9 Ave., Portland 2, Ore., 4, 44, 66
Tel: BElmont 4-6551

Isochem Resins Corp., 221 Oak St., Providence 9, R.I., 89, 91, 95
Tel: JAckson 1-5769

Isocyanate Products, Inc., Box 1681, Wilmington 99, Del., 87, 89
Tel: EAst 8-5661

Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 46, 52, 83, 89, 92, 99
See ad on page 619
Tel: MIllington 7-0385

Isomet Corp., P.O. Box 34, Palisades Park, N.J., 15, 22, 47

Isotope Develop. Ltd., Beenham Grange, Aldermaston Wharf, Nr. Reading, Berks, Eng., 4, 22, 36, 61
Tel: WOolhampton 4514

Itek Corp., 1605 Trapelo Rd., Waltham 54, Mass., 1, 3, 4, 9, 19, 28, 61, 85, 90, 92
Tel: TW 3-8700

Itemco, Inc., 18 Beechwood Ave., Port Washington, L.I., N.Y., 12
See ad on page 299
Tel: POrt Washington 7-8330

J

J-B-L Instrument Co., Sycamore & Mill Rd., Clifton Heights, Pa., 70
Tel: MA 3-4377

J-B-T Instrument, Inc., 133 Hamilton St., New Haven 8, Conn., 3, 12, 15, 31, 36, 56, 66, 70
Tel: STate 7-5825

JFD Electronics Corp., 1462 62 St., Brooklyn 4, N.Y., 37, 42, 48, 77
See ad on page 406
Tel: DEwey 1-1000

J.S.H. Electronics Co., 1108 Venice Blvd., Los Angeles 15, Calif., 74, 75, 76
Tel: RIchmond 9-7644

J-V-M Microwave Co., 9300 W. 47th St., Brookfield, Ill., 19, 26, 36, 37, 38, 50, 77, 80
Tel: HUnter 5-2000

Jack & Heintz, Inc., 17600 Broadway Ave., Cleveland 1, Ohio, 4, 28, 58, 60, 62, 66, 70, 73, 79, 85, 86, 90, 91
Tel: MOntrose 2-1000

Jackson Electrical Instrument Co., 18 S. Paterson Blvd., Dayton 2, Ohio, 3, 12, 23, 26, 35
Tel: BAldwin 4-0367

Jacksonville Metal-Plast, 575 Dora St., Jacksonville 4, Fla., 81, 84, 86, 90
Tel: ELgin 6-4884

Jaidinger Mfg. Co., Inc., 1921 W. Hubbard St., Chicago 22, Ill., 66, 70
Tel: HA 1-1090

James Vibrapowr Co., 4050 N. Rockwell St., Chicago 18, Ill., 43, 45, 66, 73
See ad on page 428
Tel: COrnelia 7-6333

Jamison Plastic Corp., 1255 Newbridge Rd., N. Bellmore, L.I., N.Y., 81, 86, 87, 94, 98
Tel: SUnset 5-3400

Jan Hardware Mfg. Co., Inc., 75 N. 11th St., Brooklyn, N.Y., 12, 28, 44, 74, 81, 86, 87, 90, 94, 96, 99
Tel: EVergreen 7-3300

Janco Corp., 3111 Winona Ave., Burbank, Calif., 12, 51, 70, 94
Tel: VIctoria 9-2107

Jansen Electronics Mfg., 2285 University Ave., St. Paul 14, Minn., 4, 86
Tel: MI 6-7458

Jansky & Bailey, Inc., 1339 Wisconsin Ave., Washington 7, D.C., 85, 86, 90
Tel: FEderal 3-4800

Jarrell-Ash Co., 26 Farwell St., Newtonville, Mass., 12
Tel: DEcatur 2-2130

Javex Electronics, P.O. Box 646, Redlands, Calif., 12, 37, 38, 44, 47, 53, 69, 70, 81
Tel: PYramid 3-5752

Jelliff Mfg. Corp., C. O., Pequot Rd. Southport, Conn., 82
Tel: CL 9-1615

Jem Electronics Corp., 743 Circle Ave. Forest Park, Ill., 4, 72
Tel: PResident 1-8242

Jennings Machine Corp., 3452 Ludlow St., Philadelphia 4, Pa., 92
Tel: EVergreen 6-2420

Jennings Radio Mfg. Corp., 970 McLaughlin Ave., P.O. Box 1278, San Jose 8, Calif., 12, 41, 42, 66, 70
See ad on page 408
Tel: CYpress 2-4025

Jensen Industries, Inc., 7333 W. Harrison St., Forest Park, Ill., 59, 63
Tel: FOrest 6-0180

Jensen Mfg. Co., 6601 S. Laramie Ave. Chicago 38, Ill., 54
Tel: PArtsmouth 7-7600

Jerrold Electronics (Canada), Ltd., 50 Wingold Ave., Toronto 19, Ont., Canada, 6, 7, 21, 26, 35, 36, 37, 38, 44, 50, 70, 73, 82
Tel: RUssell 1-6174

Jerrold Electronics Corp., Dept. TED 33, Jerrold Bldg., Philadelphia 32, Pa., 6, 7, 26, 35, 36, 37, 38, 44, 50, 61, 70
See ad on page 338
Tel: BAldwin 6-3456

Jersey Specialty Co., Inc., Burgess Pl., Mountainview, N.J., 82
Tel: Oxbow 4-6200

Jetronic Industries, Inc., Main & Cotton St., Philadelphia 27, Pa., 12, 16, 19, 23
Tel: IVyridge 2-7660

Jettron Products, Inc., 56 Route 10, Hanover, N.J., 44, 69
See ad on page 549
Tel: TUcker 7-0571

Jobbins Electronics, 771 Hamilton Ave., Menlo Park, Calif., 43, 48, 55, 61, 73
See ad on page 413
Tel: DAvenport 6-7110

Jodee Plastics Co., 131-29 Springfield Blvd., Jamaica 13, N.Y., 81, 83, 86, 87, 89, 95
Tel: FIeldstone 1-3644

Jodon, Inc., F. R., 8510 Beech Tree Rd., Washington 14, D.C., 3, 4, 5, 7, 9, 12, 13, 15, 23, 26, 27, 34, 36, 45, 50, 56, 61, 62, 63
Tel: EM 5-1515

Johanson Mfg. Corp., P.O. Box 329, Boonton, N.J., 42
Tel: DEerfield 4-2676

Johns Hopkins University, Operations Research Off., 6935 Arlington Rd., Bethesda, Md., 90
Tel: OL 4-4200

Johns-Manville, 22 East 40th St., New York 16, N.Y., 52, 78, 81, 87, 89, 91, 95
Tel: LExington 2-7600

Johns-Manville, Dutch Brand Div., 7800 Woodlawn Ave., Chicago 19, Ill., 63
Tel: SAginaw 1-1000

Johnson Assoc., Walter A., 18 Norton Ave., Endicott, N.Y., 90, 92
Tel: STillwell 8-3652

Johnson Co., E. F., 206 2nd Ave., S.W., Waseca, Minn., 2, 20, 29, 36, 37, 42, 50, 53, 60, 69, 94
Tel: 990

Johnson & Hoffman Mfg. Co., 31 E. 2nd St., Mineola, N.Y., 86, 87, 99
Tel: PIoneer 2-3333

Johnson Mfg. Co., Inc., 616 1st Ave. N., Mt. Vernon, Iowa, 97
Tel: 3651

Johnson Research Corp., Route 107, Bethpage, N.Y., 92
Tel: WElls 8-4600

Johnson-Williams, Inc., 2625 Park Blvd., Palo Alto 30, Calif., 12
Tel: DAvenport 3-4131

Jonathan Mfg. Co., 720 E. Walnut St., Fullerton, Calif., 84
Tel: LAmbert 6-4651

Jones Div., Howard B., Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 44, 53, 62, 69, 98
See ad on pages 48-49
Tel: NEvada 2-2000

Jones Elecns. Co., M. C., 185 N. Main St., Bristol, Conn., 19, 36, 37, 80
Tel: LUdlow 2-6388

Jones & Lamson Machine, Springfield, Vt., 92
Tel: TUrner 5-2121

Jones-Porter Instrument, Box 302, Millburn, N.J., 3, 4, 9
Tel: DR 6-3550

Jonesville Paper Tube Co., 474 Beck Rd., Jonesville, Mich., 89
Tel: VIctor 9-7141

Jordan Co., Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis., 4, 28
Tel: UPtown 1-3200

Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa., 40, 44
Tel: GRant 1-2170

Joy Mfg. Co., Electrical Products Div., 1201 Macklind Ave., St. Louis 10, Mo., 44, 70
Tel: MIssion 5-6670

Juall Gear Co., Inc., 1108 Goffle Rd., Hawthorne, N.J., 28
Tel: HAwthorne 7-4220

Julie Research Labs., Inc., 556 W. 168th St., New York 32, N.Y., 5, 9, 12, 38, 61, 67, 90
Tel: LOrraine 8-8700

K

K-C-K Corp., Texas Capacitor Co. Div., 922 S. 75th St., Houston 23, Tex., 41
Tel: WAlnut 6-5727

K-F Development Co., 2606 Spring St., Redwood City 1, Calif., 67
See ad on page 535
Tel: EMerson 8-5670

K-V Transformer Corp., 20 E. Franklin St., Danbury, Conn., 36, 50, 73
Tel: PIoneer 3-5531

K-W Engineering Works, 15920 Pin Oak Ct., Butler, Wis., 37, 87
Tel: (Milwaukee) SUnset 1-8616

Kaar Engineering Corp., 2995 Middlefield Rd., Palo Alto, Calif., 20, 24, 37, 61
Tel: DAvenport 6-5050

Kahle Engineering Co., 3322 Hudson Ave., Union City, N.J., 85, 86, 88, 90, 92
See ad on page 668
Tel: UNion 7-6500

Kahn, Leonard R., 22 Pine St., Freeport, L.I., N.Y., 85
See ad on page 626
Tel: FReeport 9-8800

Kahn Research Labs., Inc., 22 Pine St., Freeport, N.Y., 7, 16, 24, 29
Tel: FReeport 9-8800

Kaiser Aircraft-Electronics, Kaiser Industries Corp., P.O. Box 437, Toledo 1, Ohio, 1, 2, 4, 9, 20, 24, 29, 45, 61, 86, 90
Tel: RAndolph 6-1591

Kaiser Electronics, Inc., 23 Monroe St., Union, N.J., 15, 36, 45, 61, 79
Tel: MUrdock 7-2525

Kaiser Industries Corp., West Coast Elect. Lab., 850 San Antonio Rd., Palo Alto, Calif., 90
Tel: DA 1-3320

Kalite Technical Co., Inc., 715 Mattison Ave., Asbury Park, N.J., 101
Tel: PRospect 4-2100

Kall, Albert R., 431 W. Tabor Rd., Philadelphia 20, Pa., 85, 90
Tel: LIvingstone 8-4100

Kaman Aircraft Corp., Nuclear Div., 1 West Las Vegas, Colorado Springs, Colo., 12, 15, 22, 37, 90, 96
Tel: ME 4-2826

Kanthal Corp., Amelia Place, Stamford, Conn., 82, 88, 92
Tel: DAvis 5-2206

Kapitol Magnetic Corp., 2241 N. Knox Ave., Chicago 39, Ill., 36, 43, 45, 50, 73
Tel: DI 2-8500

Karg Labs., Inc., 30 Meadow St., S. Norwalk, Conn., 6, 34, 77
Tel: VOlunteer 6-3200

Karlson Associates, Inc., 433 Hempstead Ave., W. Hempstead, L.I., N.Y., 54, 81, 90

Karp, A. Lawrence, P.O. Box 266, Ridgeway Sta., Stamford, Conn., 14
Tel: TO 9-8144

Kato Engineering Co., 1415 First Ave., Mankato, Minn., 45, 58, 61
Tel: 8-2941

Katolight Corp., First Ave. at Chestnut, Mankato, Minn., 45, 48
Tel: MAnkato 7966

Kauke & Co., Inc., 1632 Euclid St., Santa Monica, Calif., 34
Tel: EXbrook 5-5246

Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 3, 7, 12, 19, 26, 35, 36, 38
See ad on page 268
Tel: CApital 6-4000

Kaynar Mfg. Co., Inc., Box 2001, Terminal Annex, Los Angeles 54, Calif., 87
Tel: SPruce 3-3070

Kearfott Co., Inc., 1500 Main Ave., Clinton, N.J., 1, 4, 5, 9, 12, 15, 16, 18, 19, 25, 28, 36, 37, 38, 45, 46, 50, 55, 56, 58, 73, 80, 83, 93
See ad on page 348
Tel: GRegory 2-1000

Kearfott Co., Inc., Microwave Div., 14844 Oxnard St., 18, 25, 36, 37, 38, 46, 50, 70, 80, 83
Tel: STate 6-1760

Keil Engrg. Prods., Inc., 4356 Duncan Ave., St. Louis 10, Mo., 62
Tel: OLive 2-7005

Keim, Llewellyn Bates, 5324 W. 57th St., Los Angeles 56, Calif., 85
Tel: ORegon 8-9768

Keisers Industries, Inc., Lauman St., P.O. 42, Mt. Holly Springs, Pa., 82
Tel: HUnter 6-3611

Keithley Instruments, Inc., 12415 Euclid Ave., Cleveland 6, Ohio, 12, 36, 56, 61
Tel: SW 5-2666

Keller, Jr., Hugo P., 50 E. 42nd St., New York 17, N.Y., 15, 47, 59, 87
Tel: MUrray Hill 2-8450

Keller Products, Inc., 41 Union St., Manchester, N.H., 86
Tel: NAtional 7-7887

Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill., 4, 8, 9, 18, 24, 29, 30, 33, 36, 41, 43, 44, 50, 56, 57, 61, 62, 64, 66, 70, 73, 85, 100
Tel: PArtsmouth 7-6900

Kelsey-Hayes Co., Utica Drop Forge-Tool, 2415 Whitesboro St., Utica 4, N.Y., 92
Tel: RE 5-6411

Kelvin Electric Co., 5907 Noble Ave., Van Nuys, Calif., 36, 38, 43, 49, 50, 67, 73
See ad on page 414
Tel: STate 2-6662

Kelvin & Hughes, Ltd., 80 Shore Rd., Port Washington, N.Y., 58

Kemlite Labs., Inc., 1819 W. Grand Ave., Chicago 22, Ill., 37
Tel: TA 9-6050

Kemode Mfg. Co., Inc., 151 W. 18th St., New York 11, N.Y., 92
Tel: WAtkins 4-1869

Kemtron Electron Products, Inc., 14 Prince Pl., Newburyport, Mass., 47, 68
Tel: HO 2-4464

Kendall Co-Polyken Sales, 309 W. Jackson Blvd., Chicago, Ill., 89
Tel: WE 9-7100

Kenilworth Coupling Co., P.O. Box 75, Asheville, N.C., 28
Tel: ALpine 3-8993

Kennecott Copper Corp., Okonite Co., Subsidiary, 220 Passaic St., Passaic, N.J., 82
Tel: PRescott 7-0400

Kennedy & Co., D. S., 155 King St., Cohasset, Mass., 37, 50, 80, 90
See ad on page 376
Tel: EVergreen 3-1200

Kennedy Industries, 1581 E. Charles St., Banning, Calif., 44
Tel: VIctor 9-4721

Kenru Company, P.O. Box 121, Parsippany, N.J., 67, 69
Tel: TU 7-2378

Kenwood Engineering Co., 265 Colfax Ave., Kenilworth, N.J., 37
Tel: CHestnut 5-0100

Kenyon Transformer Co., 1057 Summit Ave., Jersey City 7, N.J., 36, 45, 73, 79

Kepco, Inc., 131-38 Sanford Ave., Flushing 55, N.Y., 45, 61, 73, 79
See ad on page 495
Tel: INdependence 1-7000

Kerrco Products, Box 228, Havelock Sta., Lincoln 7, Neb., 81, 94
Tel: LIncoln 6-5105

Kessler Co., F., 41-45 47th St., Long Island City 4, N.Y., 73

Kester Solder Co., 4219 Wrightwood Ave., Chicago 39, Ill., 97
See ad on page 688
Tel: BElmont 5-1601

Key Resistor Corp., 321 W. Redondo Beach Blvd., Gardena, Calif., 61, 62, 67, 86
Tel: DA 3-5000

Keystone Carbon Co., 1935 State St., St. Marys, Pa., 67
See ad on page 153
Tel: TE 4-1591

Keystone Electronics Co., 65-67 7th Ave., Newark, N.J., 47, 50
Tel: HUmboldt 2-0630

Keystone Electronics Corp., 49 Bleecker St., New York 12, N.Y., 39
Tel: GRamercy 5-4600

Keystone Products Co., 904-23rd St., Union 2, N.J., 4, 28, 36, 50, 73
Tel: UN 6-5400

Kidde & Co., Inc., Walter, 577 Main St., Belleville 9, N.J., 1, 4, 9, 12, 15, 28, 36, 45, 61, 66, 79, 90
Tel: PLymouth 9-5000

Kidde Ultrasonic & Detection Alarms, Inc., 577 Brighton Rd., Allwood Sta., Clifton, N.J., 4
Tel: GRegory 2-5000

Kierulff Electronics, Inc., 820 W. Olympic, Los Angeles 15, Calif., 30
Tel: RIchmond 7-0271

Kimble Glass Co., P.O. Box 1035, Toledo 1, Ohio, 99
Tel: CHerry 2-6543

King Laboratories, Inc., 127 Solar St., Syracuse 4, N.Y., 93, 99
Tel: GRanite 4-3359

King Radio Corp., 9700 W. 75th St., Merriam, Kan., 1, 6, 10, 16, 20, 24, 50, 61
Tel: HEdrick 2-8520

Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 37, 38, 44, 53, 80
See ad on page 425
Tel: SW 3-5000

Kingsley Machine Co., 850 Cahuenga Blvd., Hollywood 38, Calif., 86, 92
See ad on page 669
Tel: HOllywood 9-7243

Kingston Industries, Inc., Kingston Electronics Div., North St., Medfield, Mass., 4, 12, 23
Tel: FLeetwood 9-4347

Kinn Electronics Corp., 4104 Pinkney Rd., Baltimore 7, Md., 1, 45, 85, 86, 88, 90, 94
Tel: ROgers 4-7910

Kinn, T. P., Consultant, 7007 Lancaster Rd., Baltimore 7, Md., 85
Tel: HUnter 6-8988

Kinney Co., Inc., Joseph, 11 Sycamore St. Carnegie, Pa., 82, 86, 93, 96
Tel: BRowning 9-6600

Kinney Mfg. Div., New York Air Brake Company, 3631 Washington St., Boston 30, Mass., 12, 88, 92
See ad on page 151
Tel: JAmaica 4-3220

Kip Electronics Corp., 29 Holly Pl., P.O. Box 562, Stamford, Conn., 74, 75, 90
See ad on page 579
Tel: DAvis 5-1551

Kirchberger & Co., Inc., M., 250 Humphrey St., Englewood, N.J., 83, 89, 99

Kirkland Co., H. R., 10 King St., Morristown, N.J., 60, 69, 70
Tel: JE 8-2777

Kistler Instrument Corp., 15 Webster St., S. Tonawanda, N.Y., 12, 72
Tel: JAckson 2099

Klein Electronics Co., Leo, 2404 S. La Brea Ave., Los Angeles 16, Calif., 59
Tel: WE 5-3119

Klein & Sons, Inc., M., 7200 McCormick Rd., Chicago 45, Ill., 92
Tel: JUniper 8-6820

Kling Metal Spinning & Stamping Co., 245-247 Centre St., New York 13, N.Y., 81, 86
Tel: CAnal 6-5580

Klipsch & Associates, P.O. Box 96, Hope, Ark., 54
Tel: PR 7-3395

Knapic Electro-Physics, 936-38 Industrial Ave., Palto Alto, Calif., 47
Tel: DA 1-5544

Knickerbocker Annunciator Co., 75 Murray St., New York 7, N.Y., 82
Tel: BArclay 7-5306

Knight Electronics, 210 S. DesPlaines, Chicago 6, Ill., 2, 3, 4, 6, 12, 20, 21, 26, 29, 30, 35, 36, 54, 70, 77
Tel: FI 6-7474

Knight Corp., Ewen, 206 A St., Needham Heights 94, Mass., 18, 24, 25, 34, 36, 37, 46, 70, 80, 83, 85, 90
Tel: HIllcrest 4-6400

Knights Co., James, 101 E. Church St., Sandwich, Ill., 21, 26, 31, 47, 48, 50
See ad on page 439
Tel: 2141

Knopow, Howard S., 7377 N. 76th St., Milwaukee 18, Wis., 85
Tel: FLagstone 3-8017

Knopp, Inc., 1307-66th St., Oakland 8, Calif., 12, 73, 80
Tel: OLympic 3-1661

Knowles Electronics, Inc., 10545 Anderson Pl., Franklin Park, Ill., 57
Tel: GLadstone 5-3600

Koch & Sons, H., Box 127, Corte Madera, Calif., 81, 86
Tel: WAbash 4-3510

Koehring Co., Hydraulic Press Mfg. Co., Marion Rd., Mount Gilead, Ohio, 92
Tel: 9351

Kollman Case Corp., P.O. Box 180, Fort Wayne 1, Ind., 81
Tel: HArrison 0919

Kollmorgen Optical Corp., 347 King St., Northampton, Mass., 4, 16
Tel: JU 4-0280

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst 73, L.I., N.Y., 1, 4, 9, 12, 15, 28, 36, 72
See ad on page 370
Tel: TWining 9-5600

Kolton Electric Mfg. Co., 123 New Jersey R.R. Ave., Newark 5, N.J., 73, 98
Tel: MItchell 2-4622

Koppers Co., Inc., Plastics Div., Koppers Bldg., Pittsburgh 19, Pa., 89, 95
Tel: EXpress 1-3300

Kreckman Co., Herb, Cresco, Pa., 37
Tel: LYndhurst 5-2212

Krengel Mfg. Co., Inc., 227 Fulton St., New York 7, N.Y., 87, 92
Tel: CO 7-5712

Krohn-Hite Corp., 580 Massachusetts Ave., Cambridge 39, Mass., 3, 36, 58, 61
Tel: UNiversity 4-4272

Kruger Instruments, H., Box 164, San Gabriel, Calif., 4

Krystinel Corp., Fox Island Rd., Port Chester, N.Y., 37, 46, 55, 70, 83
See ad on page 619
Tel: WEstmore 9-2261

Kulite Tungsten Co., 1040 Hoyt Ave., Ridgefield, N.J., 46, 86, 93
Tel: WHitney 5-3000

Kulka Electric Corp., 633 S. Fulton Ave., Mount Vernon, N.Y., 44, 51, 52, 60, 65, 70, 80, 98
See ad on page 690
Tel: MOunt Vernon 4-4024

Kuprian Mfg. Co., 157 Prospect Ave., Binghamton, N.Y., 45, 61, 82, 87
See ad on page 492
Tel: RAymond 3-6426

Kurman Electric Co., Inc., 191 Newel St., Brooklyn 22, N.Y., 4, 45, 66
See ad on page 520
Tel: EVergreen 3-8000

Kurtz, John, 702 Bay St., Staten Island 4, N.Y., 5, 36, 53
Tel: GIbraltar 8-6414

Kurz-Kasch, Inc., 1421 S. Broadway, Dayton 1, Ohio, 81, 86, 94
Tel: BAldwin 3-8161

Kuss Industries, Inc., Tacony & Lewis St., Philadelphia 24, Pa., 24, 81, 84, 86
Tel: CUmberland 9-3115

Kwikheat Mfg. Co., 3732 San Fernando Rd., Glendale 4, Calif., 88, 92
Tel: CHapman 5-2376

L

L.A.B. Corp., 990 Onondaga St., Skaneateles, N.Y., 12, 92
Tel: OVerbrook 5-5781

L.E.E., Inc., 625 New York Ave., Washington 1, D.C., 27, 54, 58, 61, 63
Tel: NAtional 8-3225

LEL, Inc., 384 Oak St., Copiague, L.I., N.Y., 1, 10, 18, 20, 25, 34, 36, 77
See ad on page 372
Tel: Amityville 4-2200

L M B-Heeger, Inc., 2528 W. 9th St., Los Angeles 6, Calif., 52, 81, 84, 91, 97
Tel: DUnkirk 7-6995

L & O Research & Dev. Co., 1952 E. Allegheny Ave., Philadelphia 34, Pa., 3, 11, 12, 14, 17, 36, 48, 73
Tel: NEbraska 4-7174

L & R Mfg. Co., 577 Elm St., Kearny, N.J., 92
Tel: WYman 1-5330

Labelon Tape Co., Inc., 450 Atlantic Ave., Rochester 9, N.Y., 87
Tel: HUbbard 2-3460

Labko Scientific, Inc., 111 W. Elm, Box 831, Stillwater, Okla., 36, 85, 86, 90
Tel: FRontier 2-7167

Laboratories Lambda, Aranguren St., Buenos Aires, Argentina, 12
Tel: Buenos Aires 43-3760

Laboratory Equip. Corp., Hilltop Rd., St. Joseph 2, Mich., 41, 43, 55, 61, 83

Laboratory for Electronics, 1079 Commonwealth Ave., Boston 15, Mass., 1, 4, 9, 19, 25, 26, 31, 48, 62, 73, 80, 90
Tel: AL 4-4235

Laboratory Furniture Co., Old Country Rd., Mineola, N.Y., 81
Tel: PIoneer 2-3600

Lab-Tronics, Inc., 3656 N. Lincoln Ave., Chicago 13, Ill., 17, 36, 44, 53, 82, 98
Tel: GRaceland 7-7900

Lake Mfg. Co., 2323 Chestnut St., Oakland 7, Calif., 30, 36
Tel: TEmplebar 2-2498

Lambda Electronics Corp., 11-11 131st St., College Point 56, N.Y., 61
See ad on pages 57-62
Tel: INdependence 1-8500

Lambda-Pacific Eng., Inc., 14725 Arminta St., Van Nuys, Calif., 7, 18, 19, 26, 35, 37, 50, 62, 77, 80
Tel: TRiangle 3-2400

Laminated Sheet Products, 449 Neponset St., Norwood, Mass., 62, 81, 86, 89, 95, 98
Tel: NOrwood 7-3500

Lamkin Labs, Inc., Monitor Div., Bradenton, Fla., 21 26
Tel: 6-1906

Lamson & Sessions Co., 5000 Tiedman Rd., Cleveland 9, Ohio, 87
Tel: CL 2-3700

Lamtex Ind., Inc., 51 State St., Westbury, N.Y., 86, 87, 89, 94, 95
Tel: EDgewood 3-2680

Lancaster Glass Corp., Lancaster, Ohio, 99
Tel: OLive 3-0311

Land-Air, Inc., 7444 W. Wilson Ave., Chicago 31, Ill., 1, 4, 10, 12, 22, 31, 34, 36, 37, 58, 61, 66, 70, 72, 85, 86
Tel: UN 7-7550

Land-Air Inc., Instruments & Electronics Div., 2133 Adams Ave., San Leandro, Calif., 1, 9, 12, 22, 31, 34, 61, 73, 84
Tel: LOckhaven 9-5841

Landes Electn. Fasteners, 510 W. Broadway, New York 12, N.Y., 87, 89, 98
Tel: AL 4-4593

Landis & Gyr, Inc., 45 W. 45 St., New York 36, N.Y., 9, 56
Tel: JUdson 6-4644

Landsverk Electrometer, 641 Sonora Ave., Glendale 1, Calif., 12, 22, 62, 75, 87, 89, 90, 94
Tel: CHapman 5-6687

Lansky Die Cutting Corp., 473 President St., Brooklyn 15, N.Y., 54, 86
Tel: ULster 2-5346

Lansing Sound, Inc., J. B., 3249 Casitas Ave., Los Angeles 39, Calif., 72, 81
Tel: NO 5-4101

La Pointe Industries, Inc., 155 W. Main St., Rockville, Conn., 19, 36, 37, 50, 62, 86, 87
Tel: TR 5-3351

Lapp Insulator Co., Inc., Radio Specialties Div., 150 Sumner St., LeRoy, N.Y., 41, 42, 44, 69, 83, 89
See ad on pages 112-113
Tel: LE Roy 385

Larson Instrument Co., 24 Orchard St., Tarrytown, N.Y., 4, 14, 66
Tel: MEdford 1-3419

Lavelle Aircraft Corp., Sterling St., Newton, Bucks County, Pa., 37, 81, 86
Tel: WOrth 8-3838

Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J., 3, 12, 19, 23, 25, 26, 31, 47, 90
See ad on page 300
Tel: LOwell 6-2600

Lawn Electronics Co., Inc., Woodward Rd., Englishtown, N.J., 36, 45, 61
Tel: ENglishtown 7-9000

Leach Corp., Relay & Inet Div., 18435 Susana Rd., Compton, Calif., 4, 27, 34, 45, 61, 66, 81
See ad on page 521
Tel: NEvada 6-1061

Leach & Garner Co., Ind. Division, Pearl St., Attleboro, Mass., 82, 93, 97
Tel: 1-1155

Lear, Inc., 110 Ionia Ave. N.W., Grand Rapids 2, Mich., 1, 4, 16, 28, 36, 50, 61, 87, 90
Tel: GL 1-1555

Lear, Inc., Lear Cal Div., 3171 S. Bundy Dr., Santa Monica, Calif., 1, 4, 16, 28, 37, 57, 61, 86
Tel: EXmont 8-6211

Lear, Inc., Lear-Romec Div., Abbe Rd., Elyria, Ohio, 4, 28, 36, 58, 92
Tel: FAirfax 3-3211

Leclanche, S. A., 48 Ave. De Grandson, Yverdon, Switzerland, 39, 41
Tel: 024 2 47 21

Lectrocon Co., 410 W. Chelten Ave., Philadelphia, Pa., 44
Tel: TEnnessee 9-8711

Lectrohm, Inc., 5560 Northwest Highway, Chicago 30, Ill., 67
Tel: ROdney 3-1700

Lee Chemical Corp., Walter, 1383 Seabury Ave., Bronx 61, N.Y., 86, 87, 89, 94, 95, 98
Tel: SY 2-4400

Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif., 36, 61, 66
Tel: NOrmandy 3-1295

Leecraft Mfg. Co., Inc., 60 Greene St., New York 12, N.Y., 60, 69
Tel: WOrth 6-2855

Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa., 4, 5, 9, 12, 22, 28, 36, 41, 42, 56, 61, 70
Tel: DAvenport 9-4900

Lehigh Engr. Associates, 62 Mulberry St., Newark, N.J., 85, 90
Tel: MItchell 2-3155

Lehigh Structural Steel, 17 Battery Pl., New York 4, N.Y., 37
Tel: WHitehall 4-1424

Lektra Laboratories, Inc., 154 11 Ave., New York 11, N.Y., 4, 56
Tel: ALgonquin 5-2013

Leland, Inc., G. H., 123 Webster St., Dayton 2, Ohio, 66, 70
Tel: BAldwin 4-9891

Lelanite Corp., Box 152, Webster, Mass., 94
Tel: WEbster 1969

Lemert Engineering Co., 1313 Western Ave., Plymouth, Ind., 88, 92
Tel: WEbster 6-3430

Lenkurt Electric Co., Inc., 1105 County Rd., San Carlos, Calif., 4, 8, 18, 20, 24, 33, 34
Tel: LYtell 1-8461

Lenz Electric Mfg. Co., 1759 North Western Ave., Chicago 47, Ill., 82
See ad on page 608
Tel: ARmitage 6-4454

Lepel High Frequency Labs., Inc., 55th St. and 37th Ave., Woodside 77, N.Y., 88
See ad on page 650
Tel: HAvemeyer 6-4580

Lerco Electronics, Inc., 501 S. Varney St., Burbank, Calif., 53, 87, 94, 98
Tel: VI 9-5556

Le Roi Engineering, P.O. Box 251, Elmhurst, Ill., 85, 90

Lesa, S. P. A., Via Bergamo 21, Milano, Italy, 8, 30, 36, 38, 40, 43, 45, 49, 50, 54, 57, 58, 59, 67, 70
Tel: Milano 554341

Lessells & Assoc., Inc., 916 Commonwealth Ave., Boston, Mass., 4, 36, 44, 85, 90, 101
Tel: BEacon 2-2380

Lettine Radio Mfg. Co., 62 Berkley St., Valley Stream, N.Y., 2, 7, 24
Tel: PYramid 1-9397

Leupold & Stevens Instr., 4445 N.E. Glisan St., Portland 13, Ore., 4, 9
Tel: BE 4-7423

Levin & Son, Inc., 3610 S. Broadway, Los Angeles 7, Calif., 92
Tel: ADams 3-7169

Levine, Daniel, 3826 North 55 Dr., Glendale, Ariz., 85
Tel: APplegate 8-5421

Levine, Prof. Engineer, Sam, 6 Sunnybrook Rd., Bernardsville, N.J., 85
Tel: BErnardsville 8-0699

Levinthal Electronic Products, Stanford Industrial Park, Palo Alto, Calif., 7, 17, 18, 19, 22, 24, 25, 36, 61, 73
Tel: DAvenport 6-1640

Leviton Mfg. Co., 236 Greenpoint Ave., Brooklyn 22, N.Y., 44, 51, 53, 60, 69, 70, 82
Tel: EVergreen 3-4500

Lewis Co., Inc., E. B., 11 Bragg St., E. Hartford 8, Conn., 47, 50
Tel: JA 8-0830

Lewis Engineering Co., 339 Church St., Naugatuck, Conn., 12, 56, 67, 72, 82
See ad on page 610
Tel: PArk 9-5253

Lewis & Saunders, Lakeport, N.H., 80
Tel: LAconia 2488

Lewyt Mfg. Corp., 43-22 Queens Blvd., Long Island City, N.Y., 1, 9, 26, 36, 80, 92
Tel: EXeter 2-5050

Leyse Aluminum Co., Kewaunee, Wis., 86, 87
Tel: KEwaunee 335

Librascope, Inc., 808 Western Ave., Glendale 1, Calif., 1, 4, 9, 14, 15, 28, 36, 48, 58
Tel: CItrus 4-6541

Licon Division, Illinois Tool Works, 6606 W. Dakin St., Chicago 34, Ill., 70
See ad on page 554
Tel: AVenue 2-4040

Lieco, Inc., 112 E. Sunrise Hway., Freeport, N.Y., 19, 37, 38, 50, 73, 80
Tel: MAyfair 3-4848

Life Instrument Co., Inc., 120 Brook St., Franklin, Mass., 4, 43, 62, 66, 81
Tel: FRanklin 332W

Light Electric Corp., 214 Lackawanna Ave., Newark 3, N.J., 73
Tel: HU 5-4110

Lignacraft, 66 Main St., Binghamton, N.Y., 85, 92
Tel: RAymond 3-7563

Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill., 47, 73, 79, 86, 88
Tel: MOnroe 6-3443

Lindgren & Assoc., Inc., Erik A., 4515 N. Ravenswood Ave., Chicago 40, Ill., 12
Tel: LO 1-0408

Line Electric Co., 271 S. 6 St., Newark 3, N.J., 66, 70
Tel: HU 4-9400

Linemaster Switch Co., Woodstock, Conn., 70
Tel: WAlnut 8-3051

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 3, 12, 28, 30, 32, 36, 41, 54, 57, 61, 65, 72, 73, 75, 76, 86, 92
See ads on pages 270, 301
Tel: TExas 0-7711

Ling Systems, Inc., 11949 Vose St., N. Hollywood, Calif., 7, 18, 19, 24, 36, 37, 38, 49, 50, 73, 77, 80, 82, 86
Tel: POplar 5-9041

Lingo & Son, Inc., John E., 2814 Buren Ave., Camden 5, N.J., 37
Tel: WO 4-0487

Link Aviation, Inc., Binghamton, N.Y., 4, 9, 12, 28, 36, 62, 86, 87
Tel: RAymond 3-9311

Lion Fastener Co., Inc., c/o Southco, Lester, Pa., 87
Tel: LEhigh 4-8600

Lippincott Co., J. B., E. Washington Sq., Philadelphia 5, Pa., 101

Lipps Engrg. Edwin A., 1511 Colorado Ave., Santa Monica, Calif., 63
Tel: EXbrook 3-0449

Liquidometer Corp., 41-03 36 St., Long Island City 1, N.Y., 4, 12, 28, 44, 56
Tel: STillwell 4-1440

Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill., 51
Tel: VAnderbilt 4-1188

Little, Inc., Arthur D., 30 Memorial Dr., Cambridge 42, Mass., 15, 85, 90
Tel: UNiversity 4-5770

Little Falls Alloys, Inc., 199 Caldwell Ave., Paterson 1, N.J., 82
See ad on page 611
Tel: LAmbert 5-1014

Litton Engineering Labs., P.O. Box 949, Grass Valley, Calif., 83, 88, 92
See ad on page 669
Tel: GRass Valley 1730

Litton Industries, Inc., Airtron Div., 200 E. Hanover Ave., Morris Plains, N.J., 18, 19, 29, 37, 38, 44, 47, 50, 61, 70, 73, 77, 80, 87, 101
Tel: JEfferson 9-5500

Litton Industries, Inc., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 9, 50, 74, 75, 76, 80
See ad on pages 64-65
Tel: LYtell 1-8411

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 9, 11, 16, 18, 24, 25, 27, 29, 31, 32, 34, 37, 43, 44, 50, 52, 62, 73, 74, 75, 76, 77, 80, 90
See ad on page 66
Tel: CRestview 4-7411

Litton Industries, Inc., Md. Div., 4900 Calvert Rd., College Park, Md., 1, 4, 14, 16, 18, 20, 21, 24, 25, 28, 34, 37, 50, 58, 61, 78
Tel: UNion 4-5678

Litton Industries, Inc., U.S. Engineering Co. Div., 13536 Saticoy St., Van Nuys, Calif., 48, 53, 62, 83, 87, 94, 98
Tel: STanley 3-3520

Livingston Electronics Corp., P.O. Box 33, Livingston, N.J., 44, 66, 69, 99
Tel: CApital 6-3333

Lockheed Aircraft Corp., California Div., Dept. 2710, 2400 N. Hollywood Way, Burbank, Calif., 15, 90
See ad on page 314
Tel: TRiangle 7-2711

Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 7, 9, 15, 25, 34, 37, 46, 50, 72, 90
See ad on page 380
Tel: REgent 9-4321

Loewy, Associates, Raymond, 425 Park Ave., New York 22, N.Y., 86
Tel: MUrray Hill 8-2500

Loge Sound Engineers, J. M., 2171 W. Washington Blvd., Los Angeles 18, Calif., 29, 30, 36

London Chemical Co., Inc., 1535 N. 5 Ave., Melrose Park, Ill., 91, 97
Tel: AU 7-9495

Long, Inc., Thomas J., 215 Stonehinge Lane, Carle Place, N.Y., 86
Tel: EDgewood 4-2300

Lord Manufacturing Co., 1635 W. 12 St., Erie 6, Pa., 78, 87
Tel: GLendale 6-8511

Los Alamos Scientific Lab., Box 163, Los Alamos, N.M., 90
Tel: LOs Alamos 2-5561

Louthan Mfg. Co., P.O. Box 781, E. Liverpool, Ohio, 46, 83, 89
Tel: FU 5-1538

Lowell Mfg. Co., 3030 Laclede Station Rd., St. Louis 17, Mo., 81
Tel: STerling 1-9058

Loyola Laboratories, P.O. 90074 Airport Sta., Los Angeles 45, Calif., 85, 90
Tel: ORegon 8-1686

Lubcke, Harry R., Consulting Engineer, 2443 Creston Way, Hollywood 28, Calif., 85
Tel: HOllywood 9-3266

Ludlow Papers, Inc., P.O. Box 135, Needham Heights 94, Mass., 17
Tel: HIllcrest 4-4900

Luhrs & Co., C. H., 297 Hudson St., Hackensack, N.J., 70, 80
Tel: DIamond 2-4749

Luma Electric Equip. Co., P.O. Box 132, Toledo 1, Ohio, 92
Tel: GReenwood 5-4168

Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 9, 12, 19, 23, 38, 44, 48, 90
See ad on page 331
Tel: EDgewood 4-3100

Lundey Assoc., Inc., 694 Main St., Waltham 54, Mass., 52
Tel: TWinbrook 3-6064

Luther Electronic Mfg. Co., 5728 W. Washington Blvd., Los Angeles 16, Calif., 41, 73, 83, 86
Tel: WEbster 9-5826

Luther Manufacturing Co., 7312 Varna Ave., N. Hollywood, Calif., 28, 58, 66
Tel: PO 5-4265

Luxo Lamp Corp., 102 Columbus Ave., Tuckahoe, N.Y., 57, 92
Tel: WOodbine 1-2678

Luzerne Rubber Co., Muirhead Ave., Trenton, N.J., 86, 94, 95
Tel: EXport 2-4131

Lyman Electronic Corp., 12 Cass St., Springfield, Mass., 12, 81, 86, 90
Tel: RE 7-5361

Lynch Carrier Systems, 695 Bryant St., San Francisco 7, Calif., 4, 8, 49, 50
Tel: EXbrook 7-1471

Lynch Mfg. Co., R. H., 7835 E. Arroyo Dr., S. San Gabriel, Calif., 81, 84
Tel: AT 0-3810

Lynmar Engrs., Inc., 1432 N. Carlisle St., Philadelphia 21, Pa., 36, 37, 38
Tel: STevenson 7-4450

Lyons, Ltd., Claude, 80 Shore Rd., Port Washington, N.Y., 61

Lyons, Leonard J., Consulting Engineer, 3710 Crestway Dr., Los Angeles 43, Calif., 85
Tel: AXminster 1-5446

Lytle Corp., 1404 San Mateo Blvd. S.E., Albuquerque, N.M., 31, 39, 56, 58, 81, 90, 101
Tel: AMherst 8-3311

M

MB Mfg. Co., P.O. Box 1825, New Haven 8, Conn., 12, 78
Tel: FUlton 9-1511

M E Labs., 943 Industrial Ave., Palo Alto, Calif., 1, 18, 19, 23, 24, 26, 29, 34, 36, 37, 38, 48, 50, 61, 80
Tel: DAvenport 6-9500

M.E.C., Inc., 796 Berry Rd., Nashville 4, Tenn., 41
Tel: CYpress 8-3376

M F Electronics Co., 122 E. 25th St., New York 10, N.Y., 9, 36, 62, 86, 90
See ad on page 372
Tel: GRamercy 3-5899

M-G Metal Products Co., 1217 Webster Ave., Chicago 14, Ill., 86
Tel: LIncoln 9-2100

MM Enclosures, Inc., 111 Bloomingdale Rd., Hicksville, L.I., N.Y., 81, 84, 86

M P Engineering Co., Fairfield 3, Conn., 30, 36, 59, 77
Tel: AMherst 8-2385

MSI Telecommunications, Consulting Engrs., 1475 Broadway, New York 36, N.Y., 85, 90
See ad on page 626
Tel: BRyant 9-8517

M V M, Inc., 48-50 34 St., Long Island City 1, N.Y., 86
Tel: STillwell 6-8913

Maas & Waldstein Co., 2121 McCarter Hwy., Newark 4, N.J., 86, 91
Tel: HUmboldt 4-1600

Macarr, Inc., 4360 Bullard Ave., New York 66, N.Y., 61
Tel: OL 3-3306

MacDonald & Co., 1324 Ethel St., Glendale 7, Calif., 92
Tel: SYlvan 0-1615

MacDonald-Wadman Co., Inc., 459 Stuart St., Boston 16, Mass., 66
Tel: COmmonwealth 6-2336

Machinery Electrification, Inc., 56 Hudson St., Northborough, Mass., 4, 9, 66, 81, 84, 86, 90
Tel: EXeter 3-2461

Machlett Labs., Inc., 1063 Hope St., Springdale, Conn., 75, 76
Tel: (Stamford) FIreside 8-7511

Mack Elec. Devices, Inc., 43 Glenside Ave., Wyncote, Pa., 66, 70
Tel: TUrner 4-8123

Mackay, Inc., A. D., 198 Broadway, New York 38, N.Y., 82, 83, 91, 93, 99
Tel: BArclay 7-8532

Mackay Research Labs., P.O. Box 738, Benson, Ariz., 74, 75, 76

MacLaren & Co., Inc., F. B., 6 W. 18 St., Huntington Station, L.I., N.Y., 4, 9, 14, 28, 36, 61, 62, 72, 90
Tel: HAmilton 3-4433

Macleod & Hanopol, Inc., 10 Roland St., Charlestown 29, Mass., 9, 12, 82, 86
Tel: MO 6-2171

Macmillan Co., Dept. IRE-8, 60 Fifth Ave., New York 11, N.Y., 101
See ad on page 701
Tel: ORegon 5-4000

Madigan Corp., 200 Stonehinge Lane, Carle Place, N.Y., 1, 7, 10, 20, 32, 36, 37, 61, 85, 90
Tel: EDgewood 4-2500

Magnadyne Corp., 84 S. Water St., Port Chester, N.Y., 66
Tel: (Byram, Conn.) JEfferson 1-8064

Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill., 4, 12
Tel: UNderhill 7-8090

Magnasync Mfg. Co., Ltd., 5546 Satsuma Ave., N. Hollywood, Calif., 9, 27, 28, 32, 36, 49, 62, 63
Tel: STanley 7-5493

Magnatran, Inc., P.O. Box 211, Kearny, N.J., 61, 73
Tel: WY 1-6633

Code Numbers TELL YOU

what each company does or makes. The numbers after each address refer you to the 102 product and service classes, in which detailed information on the firm will be found.

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Magnavox Research Labs., 2255 S. Carmelina Ave., Los Angeles 64, Calif., 1, 9, 27, 44, 62, 70
Tel: BRadshaw 2-0347

Magnecraft Electric Co., 3354C West Grand Ave., Chicago 51, Ill., 66
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Tel: EVerglade 4-6868

Magnet Wire, Inc., 25 Walker St., New York 13, N.Y., 82
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Tel: CAnal 6-0900

Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 4, 9, 12, 28, 32, 36, 45, 61, 73, 79
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Tel: CYpress 2-6610

Magnetic Controls Co., 6405 Cambridge St., Minneapolis 16, Minn., 4, 36, 45, 61, 79
Tel: WEst 9-4691

Magnetic Core Corp., John & Lawrence Sts., P.O. Box 368, Newburgh, N.Y., 46
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Tel: JOhn 1-5116

Magnetic Devices, Inc., 712 East St., Frederick, Md., 66
Tel: MOnument 2-2144

Magnetic Instruments Co., 546 Commerce St., Thornwood, N.Y., 4, 22, 28, 36, 56, 70
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Tel: ROgers 9-5312

Magnetic Metals Co., Hayes Ave. at 21st St., Camden 1, N.J., 46, 99
See ad on page 436
Tel: WOodlawn 4-7842

Magnetic Powders, Inc., Fairview Ave., Johnsonburg, Pa., 93
Tel: WO 5-2015

Magnetic Recording Industries, 126 Fifth Ave., New York 11, N.Y., 27
Tel: AL 5-7250

Magnetic Research Corp., 3160 W. El Segundo Blvd., Hawthorne, Calif., 21, 34, 36, 45, 61
Tel: OSborne 5-1171

Magnetico, Inc., 6 Richter Ct., E. Northport, L.I., N.Y., 28, 36, 43, 45, 61, 73
Tel: ANdrew 1-4502

Magnetics, Inc., Dept. P-69, P.O. Box 391, Butler, Pa., 46, 99
See ad on page 434
Tel: BUtler 7-3787

Magnetics, Inc., Control Div., P.O. Box 391, Butler, Pa., 36, 61, 73
Tel: BUtler 7-3787

Magnetics Research Co., 255 Grove St., White Plains, N.Y., 9, 35, 36, 43, 62, 73
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Tel: WHite Plains 9-9588

Magne-Tronics, Inc., 49 West 45th St., New York 36, N.Y., 32
Tel: CIrcle 7-0210

Magtrol, Inc., 240 Seneca St., Buffalo 4, N.Y., 12, 28
Tel: MOhawk 7451

Maico Electronics, Inc., 21 N. Third St., Minneapolis 1, Minn., 3, 4, 9, 21, 22, 27, 28, 34, 49, 63, 85, 86, 90
Tel: FE 9-7041

Maida Development Co., 214 Academy St., Hampton, Va., 41, 42
Tel: HAmpton 3-0785

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Tel: WOrth 2-1165

Maine Dept. of Economic Development, State Capitol, Augusta, Me., real estate opportunities
See ad on this page
Tel: MAyfair 3-4511

Makepeace Div., D.E., Engelhard Industries, Inc., Attleboro, Mass., 44, 80, 87
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Tel: ATtleboro 1-0089

Malco Tool & Mfg. Co., 4025 West Lake St., Chicago 24, Ill., 44, 98
Tel: VAnburen 6-9300

Malkin-Illion Co., 400 Coit St., Irvington 11, N.J., 81, 84, 86
Tel: ESsex 2-3405

Mallinckrodt Chemical Works, 2nd & Mallinckrodt Sts., St. Louis 7, Mo., 91
Tel: CE 1-8980

Mallory Battery Co., 13000 Athens Ave., Cleveland 7, Ohio, 39
Tel: AC 6-0030

Mallory & Co., Inc., P. R., 28 S. Gray St., Indianapolis 6, Ind., 39, 41, 45, 53, 61, 62, 64, 66, 67, 70, 77, 93
Tel: MElrose 6-5353

Mamco Corp., 532-542 Fourth St., Racine, Wis., 58
Tel: MElrose 4-1923

Mandex Mfg. Co., Inc., 2614 W. 48th St., Chicago 32, Ill., 2, 6, 7, 8, 36, 44, 53, 62, 69, 82, 86, 87, 94, 98, 99
Tel: CLiffside 4-4200

Mandrel Industries, Inc., 800 Welch Rd., Palo Alto, Calif., 4, 13, 14, 23, 27, 28, 56, 61, 72, 82, 84, 86, 90

Mandrel Ind., Inc., Greenleaf Mfg. Div., 935 Poplar Dr., St. Louis 23, Mo., 4, 28
Tel: TWinbrook 2-4180

Manger Electric Co., Miller St., Stamford, Conn., 62, 82, 86, 98, 99
Tel: FIreside 8-7761

Manhattan Physical Research Group, Inc., 556 W. 191 St., New York 40, N.Y., 1, 85, 90, 100
Tel: SW 5-3351

Manning, Maxwell & Moore, Inc., Stratford, Conn., 4, 14, 24, 34, 56, 72
Tel: DRexel 8-8281

Mansfield Fabricators, 541 Grant St., Mansfield, Ohio, 86, 87
Tel: LA 5-3302

Mansol Ceramics, Co., 140 Little St., Belleville, N.J., 83, 89, 91, 99
Tel: PL 9-8600

Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 12, 16, 18, 19, 25, 26, 31, 33, 47, 61, 90
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Tel: DAvis 5-1391

Mantec, Inc., 126 Maryland St., El Segundo, Calif., 12
Tel: EAstgate 2-0659

Manuels Incorporated, 3033 Excelsior Blvd., Minneapolis 16, Minn., 101
Tel: WAlnut 2-8373

Manufacturers Engrg. & Equipment Corporation, York Rd. & Sunset Lane, Hatboro, Pa., 12
Tel: OS 5-3300

Mara Electronics, Inc., 44 Court St., Brooklyn 1, N.Y., 66, 73
Tel: ULster 5-0488

Marantz Co., 25-14 Broadway, Long Island City 6, N.Y., 32, 36, 85, 90
Tel: RA 1-6500

Marblette Corp., 37-31 30th St., Long Island City 1, N.Y., 89, 91, 95
Tel: STillwell 4-8100

Marco Industries Co., 207 S. Helena St., Anaheim, Calif., 60
Tel: KEystone 5-6037

Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 3, 5, 6, 19, 21, 26, 31, 34, 35, 38, 56, 76
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Tel: LOwell 7-0607

Marconi's Wireless Telegraph Co., Ltd., 750 Third Ave., New York 17, N.Y., 1, 3, 6, 7, 8, 10, 16, 18, 19, 20, 21, 24, 25, 26, 29, 30, 32, 33, 35, 36, 37, 44, 47, 48, 49, 50, 54, 59, 61, 73, 74, 75, 76, 84, 85, 100, 101
Tel: YUkon 6-9855

Marine Electric Corp., Galbraith-Pike Marine Div., 600 4th Ave., Brooklyn 15, N.Y., 30, 36, 54, 61, 73, 88, 90

Marine View Electronics, 28 Main St., White Plains, N.Y., 1, 2, 3, 8, 12, 20, 21, 30, 33, 36, 43, 50, 53, 61, 73, 81, 84, 86, 98
Tel: WH 6-1818

Mark Products Co., 5439 Fargo Ave., Skokie, Ill., 37, 80, 82
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Tel: ORchard 5-1500

Markel & Sons, L. Frank, School Lane, Norristown, Pa., 82, 89, 95
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Tel: BRoadway 2-8960

Markem Machine Co., 150 Congress St., Keene 5, N.H., 92
Tel: ELmwood 2-1130

Markite Corp., 155 Waverly Pl., New York 14, N.Y., 67
Tel: ORegon 5-1384

Marlin-Rockwell Corp., 402 Chandler St., Jamestown, N.Y., 87
Tel: 61-541

Marma Electronic Co., 1635 N. Halsted St., Chicago 14, Ill., 5
Tel: MOhawk 4-3516

Marquardt Aircraft Co., Pomona Div., 2709 Garey Ave., Pomona, Calif., 9, 28, 62, 74, 90, 101
Tel: LYcoming 3-1311

Marshall Associates, Inc., John, P.O. Box 2463, Bridgeport 8, Conn., 87
Tel: ED 5-9401

Marsland Engrg., Ltd., 154 Victoria St. S. Kitchener, Ont., Canada, 28, 36, 42, 54, 66, 67, 77
Tel: SHerwood 5-9486

Marstan Electronics Corp., 621 Ave. of the Americas, New York 11, N.Y., 1, 4, 12, 15, 16, 19, 24, 28, 34, 36, 58, 61, 66, 70, 79, 85, 90
Tel: WAtkins 4-7551

Martin Co., Baltimore Div., Middle River, Baltimore 3, Md., 1, 4, 9, 15, 18, 25, 28, 34, 36, 37, 38, 45, 48, 61, 62, 72, 73, 80, 84, 94
Tel: MUrdock 7-3800

Martin Company, Denver Div., Box 179, Denver 1, Colo., 90
Tel: PYramid 4-5211

Martin Products, Inc., 139 E. Central Blvd., Palisades Park, N.J., 86, 87
Tel: WIndsor 4-2590

Martindale Electric Co., Box 617, Edgewater Branch, Cleveland 7, Ohio, 12, 92
Tel: LAkewood 1-8567

Maryland Etching Co., Inc., Eudowood Lane, Towson 4, Md., 86, 87
Tel: VAlley 5-0700

Masonite Corp., 111 W. Washington St., Chicago 2, Ill., 81, 86
Tel: FR 2-5644

Massa Labs., Inc., 5 Fottler Rd., Hingham, Mass., 3, 12, 13, 14, 34
Tel: RIverview 9-4800

Massachusetts Gear & Tool Co., 40 Nashua St., Woburn, Mass., 28
Tel: WOburn 2-1400

Massachusetts Institute of Technology, Lexington 73, Mass., 90
Tel: VO 2-3370

Master Appliance Mfg. Co., Fourth & Ontario Sts., Racine, Wis., 40, 58
Tel: MElrose 3-7791

Master Etching Corp., 50 Honeck St., Englewood, N.J., 87
Tel: LOwell 9-0100

Master Mobile Mounts, Inc., 1306 Bond St., Los Angeles 15, Calif., 37, 47
Tel: RIchmond 7-0638

Master Specialties, 956 E. 108th St., Los Angeles 59, Calif., 61, 66
Tel: LOrain 4-4481

Mastertone Recording Studios, Inc., 130 W. 42nd St., New York 36, N.Y., 32
Tel: WIsconsin 7-2940

Materials for Electronics, Inc., 152-25 138th Ave., Jamaica 34, N.Y., 46, 47, 59, 83, 87, 88, 89, 91, 93, 99
Tel: FIeldstone 1-1611

Mathes Mfg. Co., 2220 Young St., Dallas 1, Tex., 6, 36
Tel: RIverside 8-8311

Matthew Laboratories, 3344 Ft. Independence St., New York 63, N.Y., 15, 61, 79, 90
Tel: KI 8-1011

Matthews & Co., Jas., 3827 Forbes Ave., Pittsburgh 13, Pa., 86, 92
Tel: MUseum 1-8500

Matthews, J. A., & J. B. Minter, 106 Main St., Denville, N.J., 85
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Tel: OAkwood 7-0290

Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y., 12, 13, 36, 70
Tel: STillwell 4-4600

Maurey Instrument Corp., 7924 S. Exchange Ave., Chicago 17, Ill., 67
Tel: RE 1-1717

Maxson Corp., W. L., Instruments Div., 575 10th Ave., New York 18, N.Y., 19, 20, 36, 70
Tel: LO 5-1900

Maxson Corp., W. L., Langevin Div., 47-37 Austell Pl., Long Island 1, N.Y., 21, 30, 32, 36, 43, 50, 61, 73
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Maxson Corp., W. L., Unimax Switch Div., Ives Rd., Wallingford, Conn., 70
Tel: COlony 9-8701

Maxson Corp., W. L., United Mfg. Co. Div., 41 Haig St., Hamden 14, Conn., 81
Tel: CHestnut 8-4491

Mayberry Electronics Co., 111 South Oak St., Inglewood 1, Calif., 1, 3, 4, 9, 12, 27, 28, 36, 45, 61, 62, 66, 85, 86
Tel: ORegon 8-4847

Mayberry, Len, 111 S. Oak St., Inglewood, Calif., 85
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Tel: ORegon 8-4847

McAlister, Inc., J. G., 1117 N. McCadden Pl., Hollywood 38, Calif., 32
Tel: HOllywood 3-3253

McCoy Electronics Co., Watts & Chestnut Sts., Mount Holly Springs, Pa., 42, 47, 50
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Tel: HUnter 6-3411

McCurdy Radio Ind., Ltd., 22 Front St. W., Toronto 1, Ont., Canada, 32, 36, 49, 50, 61
Tel: EMpire 6-6531

McDermott Corp., 1639 Stephen St., Ridgewood 27, L.I., N.Y., 60
Tel: GLenmore 6-3606

McDonnell Aircraft, Robertson, Mo., 15, 90

McDowell Electronics, Inc., 105 Forrest St., Metuchen, N.J., 88
Tel: LIberty 8-9109

McGill University, Engineering Bldg., Montreal, Quebec, Canada, 100

McGraw-Edison Co., National Electric Coil, 800 King Ave., Columbus 16, Ohio, 43, 89
Tel HUdson 8-1151

McGraw-Edison Co., Pittsburgh Lectrodryer, P.O. Box 1766, Pittsburgh 30, Pa., 92
Tel: GRant 1-8782

McGraw-Hill Book Co., Dept. IRE (D), 327 W. 41st St., New York 36, N.Y., 101
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Tel: LOngacre 4-3000

McGregor Electronic Industries, Inc., 132 First St., McGregor, Iowa, 73
Tel: 682

McIntosh Laboratory, Inc., 2 Chambers St., Binghampton, N.Y., 6, 36, 77
Tel: RAymond 3-5491

McKay Electric Co., 19790 Stahelin Ave., Detroit 19, Mich., 4, 36, 43, 61, 73

McKenna Laboratories, 2503 Main St., Santa Monica, Calif., 12, 36, 92
Tel: EXbrook 9-8846

McLaughlin Research Corp., 311 W. 43rd St., New York 36, N.Y., 90, 101
Tel: CIrcle 3-3535

McLean Engineering Labs., 70 Washington Rd., P.O. Box 228, Princeton, N.J., 40
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Tel: WAlnut 4-4440

McMillan Industrial Corp., Brownville Ave., Ipswich, Mass., 37, 38, 50, 81, 86, 96
Tel: ELmwood 6-2926

Measurement Engrg. Ltd., John St., Arnprior, Ontario, Canada, 4, 9, 12, 16, 17, 22, 24, 36, 56, 81, 84
Tel: ARnprior 543J

Measurements, A McGraw-Edison Div., Box 180, Boonton, N.J., 3, 12, 26
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Tel: DEerfield 4-2131

Medal Mfg. Co., Inc., P.O. Box 45, Sharon, Pa., 37
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Medical-Elecnes. Develop., 400 Northern Blvd., Great Neck, N.Y., 9, 17, 57, 72, 85, 90
Tel: HUnter 7-2305

Melco Products, Inc., 301 Fifth Ave. S., Minneapolis 15, Minn., 73
Tel: FEderal 9-2791

Meller Co., Adolf, P.O. Box 702, Providence 1, R.I., 15, 80
Tel: DExter 1-3717

Melody Master Mfg. Co., 2842 N. Cicero Ave., Chicago 41, Ill., 36, 54
Tel: KIldare 5-5559

Melpar, Inc., 3000 Arlington Blvd., Falls Church, Va., 15, 25, 85, 90
Tel: JE 4-6000

Menlo Park Engineering, 711 Hamilton Ave., Menlo Park, Calif., 18, 19, 25, 26, 36, 55, 61
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Tel: DAvenport 6-9080

Menlo Research Lab., P.O. Box 522, Menlo Park, Calif., 12, 22, 61, 85, 90
Tel: DAvenport 2-4456

Mepco, Inc., 37 Abbett Ave., Morristown, N.J., 67
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Tel: JEfferson 9-2000

Merck & Co., Inc., Electronic Chemicals Div., Dept. IR-109, Lincoln Ave., Rahway, N.J., 47
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Tel: FUlton 1-5000

Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill., 4, 70, 71
Tel: PEnsacola 6-2100

Mercury Contacts, Inc., Box 615, Far Hills Sta., Dayton 19, Ohio, 66, 70
Tel: ULrick 9-4201

Mercury Electronic Co., Red Bank, N.J., 12, 45, 61
Tel: ATlantic Highlands 1-2700

Mercury Transformer Corp., 12964 Panama St., Los Angeles 66, Calif., 73
Tel: EX 7-2143

Meridian Metalcraft, Inc., 8739 S. Miller Grove Dr., Whittier, Calif., 37, 38, 47, 48, 50, 73, 77, 80, 81, 84
Tel: OXford 2-3761

Merit Coil & Transformer Corp., Merit Plaza, Hollywood, Fla., 43, 73
Tel: WAbash 3-1536

Merit Plating Co., 218 E. 141 St., New York 51, N.Y., 86
Tel: CYpress 2-6380

Merit Short Wave Diathermy Co., 2758 Whittier Blvd., Los Angeles 23, Calif., 17, 88, 92
Tel: ANgelus 1-7521

Mesa Plastics Co., 11751 Mississippi Ave., Los Angeles 25, Calif., 89, 91, 95
Tel: BR 2-0259

Metal Fabricators Corp., 63 Pond St., Waltham 54, Mass., 80, 81, 84, 85, 86
Tel: TWinbrook 3-6800

Metal Finishers, Inc., 78 S. Franklintown Rd., Baltimore 18, Md., 86, 91
Tel: GIlmor 5-0594

Metal Hydrides, Inc., Congress St., Beverly, Mass., 46, 93
Tel: WA 2-1875

Metal Textile Corp., 647 E. 1st Ave., Roselle, N.J., 82, 87, 96

Metal & Thermit Corp., Rahway, N.J., 91, 92
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Metal & Wood Fastening Devices Co., 60 Lakeshore Rd., Valois Mont. 33, P.Q., Canada, 87
Tel: OXford 5-4582

Metalcraft, Inc., 65-33 Austin, Rego Park, Queens, N.Y., 81
Tel: TW 6-3600

Metallic Arts of New England, Inc., 150 Broadway, Cambridge 42, Mass., 81, 84, 86, 99
Tel: KIrkland 7-5790

Metalphoto Corp., 6811 Superior Ave., Cleveland 3, Ohio, 81, 87
Tel: UTah 1-7575

Metals & Controls Div. of Texas Instruments, Incorporated, 51 Forest St., Attleboro, Mass., 4, 46, 52, 66, 70, 71, 80, 82, 93, 97, 99
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Tel: ATtleboro 1-2800

Metaplast Co., Inc., 34-51 56th St., Woodside 77, N.Y., 52, 83, 91
Tel: HA 6-9843

Metaplast Corp., Davisville Rd., Hatboro, Pa., 37, 86
Tel: OSborne 5-2416

Metavac, Inc., 45-68 162nd St., Flushing 58, N.Y., 15, 38, 41, 67, 80, 96
Tel: HIckory 5-0400

Metco, Inc., 76 Lafayette St., Salem, Mass., 19, 25, 36, 38, 76, 77, 80
Tel: PI 4-8400

Meter-Mix Corp., 626 Dorchester Ave., South Boston 27, Mass., 4, 86, 92, 95
Tel: ANdrew 8-8380

Meters, Inc., 5353 N. Keystone Ave., Indianapolis 20, Ind., 3, 12, 15, 56
Tel: CLifford 5-3570

Methode Mfg. Corp., 7447 W. Wilson Ave., Chicago 31, Ill., 44, 62, 69, 92, 94, 99
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Metox, 86 Rue Villiers, de l'Isle Adam, Paris, France, 11, 20, 24, 44, 45, 47, 58, 60, 69, 70, 84, 94
Tel: MEn 31-10

Metpro, Inc., R. I., 230 Toronto Ave., Providence 5, R.I., 86, 87, 99
Tel: STuart 1-3050

Metro Engrg. Associates, Glendale Village, Easthampton, Mass., 34
Tel: EAsthampton 1100

Metron Instrument Co., 432 Lincoln St., Denver 3, Colo., 28
Tel: PEarl 3-3764

Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N.Y., 3, 12, 13, 19, 26, 56, 57, 59
Tel: OREgon 5-1707

Metz Refining Co., 369 Mulberry St., Newark 2, N.J., 91, 93, 97
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Meyercord Co., 5323 W. Lake St., Chicago 44, Ill., 87

Mica Condensers Corp., 71 Murray St., New York 7, N.Y., 41
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Mica Corp., 4031 Elenda St., Culver City, Calif., 89, 95
Tel: TExas 0-6861

Mica Insulator Co., Div., of Minnesota Mining, 797 Broadway, Schenectady 1, N.Y., 86, 87, 89, 95, 98
Tel: FRanklin 4-4191

Mica Fabricating Co., Rochelle Park, N.J., 83, 86, 88, 89

Micacraft Products, Inc., 703 McCarter Highway, Newark 5, N.J., 89, 99
Tel: MArket 3-4074

Micamold Electronics Mfg. Corp., 65 Gouverneur St., Newark 4, N.J., 41, 48, 50
Tel: HUmboldt 5-2100

Micarta Fabricators, Inc., 5324 N. Ravenswood Ave., Chicago 40, Ill., 44, 47, 51, 60, 62, 69, 81, 86, 87, 89, 95, 98
Tel: LOngbeach 1-9700

Michigan Magnetics, Inc., 203 W. 3rd St., Vermontville, Mich., 63
Tel: CLifford 9-8911

Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass., 19, 73, 92, 97
Tel: KIrkland 7-8660

Micro Balancing, Inc., 191 Herricks Rd., Garden City Park, N.Y., 4, 92
Tel: PIoneer 6-0851

Micro-Circuits Co., Maudlin Rd., New Buffalo, Mich., 37, 91
Tel: 272 W 1

Micro-Die Inc., 92 S. 6th St., Newark 7, N.J., 52, 86
Tel: MArket 2-0471

Micro Gee Products, Inc., 6319 W. Slauson Ave., Culver City, Calif., 4, 28, 36, 85
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Microdot, Inc., 220 Pasadena Ave., S. Pasadena, Calif., 44, 70, 82, 98
Tel: MUrray 2-3351

Microflect Co., Inc., 3450 25th S.E., Salem, Ore., 18, 37
Tel: EMpire 3-1128

Microlab, 71 Okner Pkwy., Livingston, N.J., 38, 50, 73
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Tel: WYman 2-5700

Micro-Lectric Div., Micro Machine Works, 19 Debevoise Ave., Roosevelt, L.I., N.Y., 28, 44, 47, 67, 70, 86, 90
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Tel: FReeport 8-3222

Micromech Mfg. Corp., 1020 Commerce Ave., Union, N.J., 47, 86, 92
Tel: MU 8-6323

Microphase Corp., P.O. Box 1166R, Greenwich, Conn., 50, 90
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Tel: NOrmandy 1-6200

Microsonics, Inc., Hingham Industrial Center, Hingham, Mass., 48
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Microtran Co., Inc., 145 E. Mineola Ave., Valley Stream, N.Y., 73, 79
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Microtronics, Inc., 9 Porete Ave., North Arlington, N.J., 19, 77, 84, 86, 92, 99
Tel: WYman 1-0242

Microwave Associates, Inc., South Ave., Burlington, Mass., 19, 36, 38, 47, 50, 56, 64, 68, 76, 77, 80
Tel: BRowning 2-3000

Microwave Chemicals Lab., Inc., Dept. 12, 282 Seventh Ave., New York 1, N.Y., 15, 37, 46, 47, 80, 83, 90
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Tel: WAtkins 4-6725

Microwave Development Laboratories, Inc., 92 Broad St., Wellesley, Mass, 19, 29, 38, 50, 80
Tel: CEdar 5-6252

Microwave Electronics Co., 4061 Transport St., Palo Alto, Calif., 76
Tel: DA 1-1770

Mid-Century Instrumatic Corp., 611 Broadway, New York 12, N.Y., 9, 14
Tel: SPring 7-4016

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 5, 12, 15, 31, 45, 56, 61, 67, 73, 79, 90
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Tel: DRexel 6-7130

Middlesex Paper Tube Co., 345 Chelmsford St., Lowell, Mass., 87, 89
Tel: GLenview 7-7687

Middletown Mfg. Co., Stack St., Middletown, Conn., 81, 84, 99
Tel: DIamond 6-8659

Midget Louver Co., 6-8 Wall St., Norwalk, Conn., 81
Tel: VOlunteer 6-2342

Midland Mfg. Co., Inc., 3155 Fiberglas Rd., Kansas City, Kan., 47, 50
Tel: FInley 2-7950

Midland Paint & Varnish, 9115 Reno Ave., Cleveland 5, Ohio, 91

Midwest Business Service, 8526 11th Ave., S., Minneapolis 20, Minn., 101
Tel: TU 1-5110

Mid-West Metal Products, Inc., 450 E. Donovan Rd., Kansas City 15, Kan, 81, 84, 86
Tel: MAyfair 1-1980

Midwest Molding & Mfg. Co., Gurnee, Ill., 44, 86, 87
Tel: Ontario 2-1320

Midwest Plastic Products Co., 1801 Chicago Rd., Chicago Heights, Ill., 95
Tel: SKyline 4-3476

Midwest Research Institute, 425 Volker Blvd., Kansas City 10, Mo., 90
Tel: LOgan 1-0202

Midwestern Instrum., Inc., P.O. Box 7186, Tulsa, Okla., 4, 9, 12, 13, 14, 23, 27, 28, 34, 36, 56, 58, 59, 63, 66, 85, 86
Tel: RI 7-1331

Milford Rivet & Mach. Co., 875 Bridgeport Ave., Milford, Conn., 87, 92
Tel: TRinity 8-1761

Milford Rivet & Machine, Penn. Div., Hatboro, Pa., 87

Milgo Electronic Corp., 7601 N.W. 37th Ave., Miami 47, Fla., 4, 9, 14, 28, 31, 34, 36, 61, 62
Tel: OX 1-1220

Miljan, Inc., Box 396, 15506 Vermont St., Paramount, Calif., 9, 72, 82
Tel: MEtcalf 3-1023

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 2, 9, 23, 26, 36, 42, 43, 44, 48, 53, 61, 69, 73, 84, 87, 89, 90, 91, 94, 98, 99
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Tel: DAvenport 4-4108

Miller Associates, P.O. Box 369, Lakeville, Conn., 19, 25

Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif., 37, 43, 50, 73, 77, 98
Tel: ADams 3-4294

Miller Co., Sanford, 11 Lynch St., Brooklyn 11, N.Y., 43, 61, 64, 68, 73
Tel: ULster 8-2817

Miller Dial & Name Plate Co., 4400 N. Temple City Blvd., El Monte, Calif., 87
Tel: CU 3-5111

Miller Electric Mfg. Co., 718 S. Bounds St., Appleton, Wis., 92
Tel: RE 4-9821

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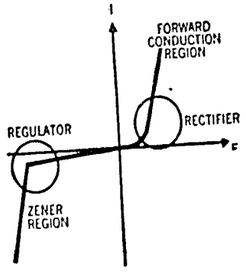

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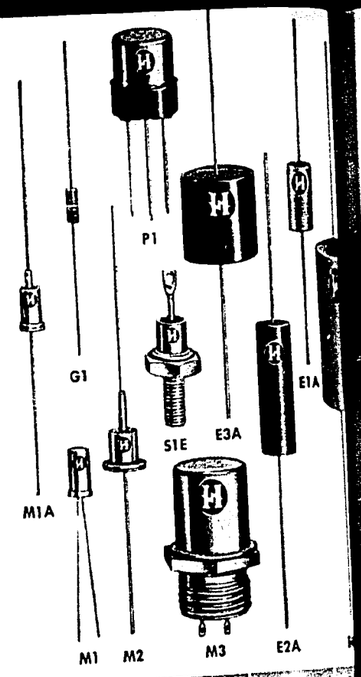

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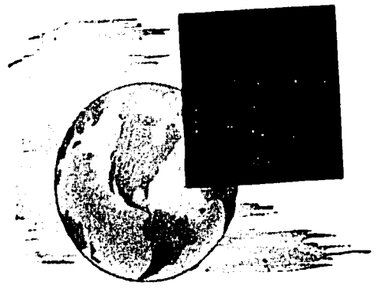

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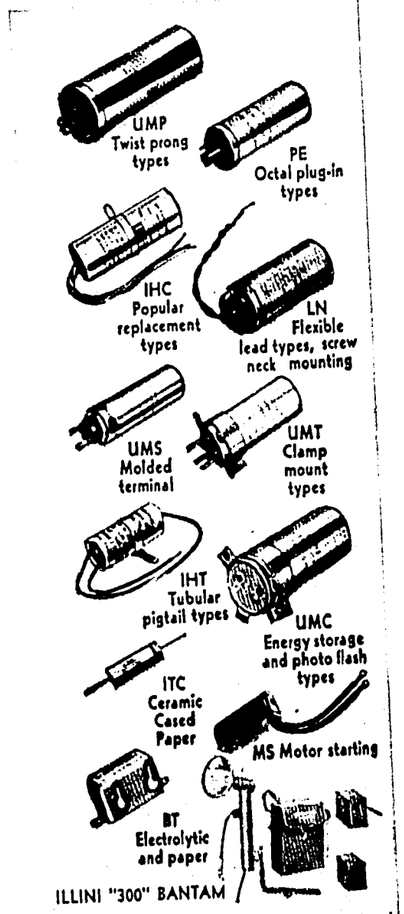

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National Electronics, Inc., 628 North St., Geneva, Ill., 75, 76
See ad on page 586
Tel: GEneva 7000
National Electronics Labs., Inc., 1713 Kalorama Rd., Washington 9, D.C., 1, 4, 6, 7, 34
Tel: HU 3-5000
National Engineering Products, Inc., 435 Washington Building, Washington 5, D.C., 89, 91
Tel: REpublic 7-4473
National Lead Co., 111 Broadway, New York 6, N.Y., 86, 87, 93, 97
Tel: REctor 2-9400
National Moldite Co., 250 South St., Newark 5, N.J., 37, 46, 55, 83, 93, 95, 96
Tel: MItchell 2-6860
National Pneumatic Co., Inc., Holtzer-Cabot Motor Div., 125 Armory St., Boston 19, Mass., 12, 28, 45
Tel: JAmaica 4-7000
National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 1, 2, 6, 16, 29, 31, 42, 43, 46, 69, 83, 87, 94
See ad on page 642
Tel: NO 5-4800
National Radio Institute, 3939 Wisconsin Ave., N.W., Washington 16, D.C., 100
Tel: EM 2-9700
National Scientific Labs., Inc., 2010 Massachussets Ave., N.W., Washington 6, D.C., 4, 12, 23, 36, 50, 61, 85, 90, 101
Tel: HUdson 3-4030
National Semiconductors, Ltd., 146 Bates Rd., Montreal 26, P.Q., Canada, 68, 72
Tel: RE 7-4031
National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 15, 44, 53, 69, 86, 89, 95, 98
See ad on page 462
Tel: YOnkers 8-6400
National Ultrasonic Corp., 111 Montgomery Ave., Irvington 11, N.J., 12, 72, 92
Tel: ESsex 1-0550
National Union Electric Corp., 1100 E. Bell St., Bloomington, Ill., 74, 75
Tel: BLoomington 7-6041
National U. S. Radiator Corp., Plastic Metals Div., 342 Madison Ave., New York 17, N.Y., 93
Tel: MUrray Hill 2-2974
National Video Corp., 4300 W. 47th St., Chicago 32, Ill., 74, 99
Tel: CL 4-5600
National Vulcanized Fibre Co., Maryland Ave. & Beech St., Wilmington 99, Del., 86, 89, 95
Tel: OLympia 5-6371
National Wire & Cable Corp., 130 San Fernando Rd., Los Angeles 31, Calif., 37, 82, 89, 96, 97
Tel: CApital 5-5611
Natvar Corporation, 211 Randolph Ave., Woodbridge, N.J., 89
Tel: FUlton 8-8800
Navigation Computer Corp., 1621 Snyder Ave., Philadelphia 45, Pa., 9, 19
See ad on page 506
Tel: HOward 5-7700
Naybor Laboratories, Inc., E. V., 26 Manorhaven Blvd., Port Washington, L.I., N.Y., 55, 66, 70
Tel: POrt Washington 7-4300
Naz-Dar Co., 461 Milwaukee Ave., Chicago 10, Ill., 36, 41, 44, 67
Tel: CHesapeake 3-1630
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Tel: NIghtingale 5-7427
Neff Instrument Corp., 2211 E. Foothill Blvd., Pasadena, Calif., 36, 61
Tel: RY 1-5121
Nelson Technical Enterprises, Inc., 116 W. Main St., St. Charles, Ill., 85, 101
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Tel: THornwall 8-2277
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Tel: JUniper 5-1000
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Tel: CO 9-7701
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Tel: MItchell 2-1682-3-4
Network Industries, Inc., 213 W. 5th St., Bayonne, N.J., 52, 70
Tel: HEmlock 6-9191
Networks Electronic Corp., 14806 Oxnard St., Van Nuys, Calif., 28, 36, 45, 52, 61, 70, 73
Tel: STanley 3-2191
Neutronic Associates, 93-14 101 Ave., Ozone Park 16, L.I., N.Y., 61
Tel: VIrginia 7-7703
Nevada Air Products Co., P.O. Box 1090, Reno, Nevada, 7, 26, 40
Tel: FAirview 2-9421
Nevada Antenna Co., P.O. Box 1126, Tonopah, Nev., 37
Tel: TOnopah 1826
New England Area Representatives, 99 Highland Ave., Somerville 43, Mass., 102
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Tel: PRospect 6-2262
New England Electrical Works, Inc., 365 Main St., Lisbon, N.H., 82
Tel: 8-6620
New England Etching & Plating Co., 25 Spring St., Holyoke, Mass., 87
New England Laminates Co., Inc., P.O. Box 43, Stamford, Conn., 86, 89, 94, 95
Tel: DAvis 4-4181
New England Oven & Furnace Co., 385 Boston Post Rd., Orange, Conn., 88
Tel: SYcamore 9-2005
New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 5, 12, 14, 23, 41, 56, 73
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Tel: KIrkland 7-1997
New England Tape Co., 30 Sand St., Hudson, Mass., 82, 86, 89, 95
Tel: HUdson 965
New England Transformer Co., Inc., 47 McGrath Hwy., Somerville 43, Mass., 73
Tel: SOmerset 6-6100
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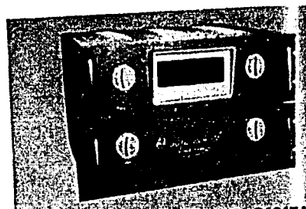
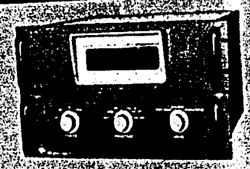
Technological advance requires automatic high-accuracy measurements that only digital voltmeters can make. Customers in advanced fields find that NLS digital voltmeters last up to 5 and 10 times longer, a benefit from the producer who originated the digital voltmeter and who has the greatest research and development experience. Some applications are: missile checkout, computers, reliability testing, process monitoring, quality control, and general laboratory use. NLS features are unique because they were designed for application and not just for competition. Features of NLS meters include: complete transistorization, mercury relay digitizers rated at 3 billion readings, plug-in oil-immersed stepping switches, "no needless nines" digital logic for high speed and long life. Write today for complete data on AC-DC digital meters and accessories.

Prices and specifications subject to change without notice; prices (quoted f.o.b. Del Mar) slightly higher in Alaska, Hawaii, and outside U.S.A.



V-44 ALL-ELECTRONIC DIGITAL VOLTMETER—500 readings per second . . . measures DC voltages from ±0.001 to ±999.9 volts . . . input impedance 10 megohms . . . completely automatic . . . output for data logging accessories.



M-24 VOLT-OHM-RATIOMETER—Measures DC voltages of ±.0001 to ±999.9 volts; resistances of .1 ohm to 1 megohm; DC voltage ratios to ±.9999 . . . transistorized . . . completely automatic . . . connectors for data logging accessories . . . complete—$4950.

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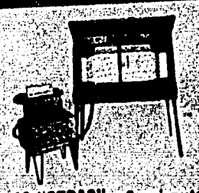
NLS 481 LOW-COST INDUSTRIAL VOLTMETER—Measures and displays DC voltages of ±0.001 to ±999.9 volts . . . automatically selects and indicates range and polarity . . . 4-digit illuminated readout . . . one compact unit, 5¼-in. high . . . complete—$1285.



NLS 12 "OTRAC"—Semi-automatic oscillogram trace reader and computer . . . permits tabular recording in sequence of digital values of 10 or more traces . . . new optigraphic reading head . . . centralized controls . . . quick-change data handling system.

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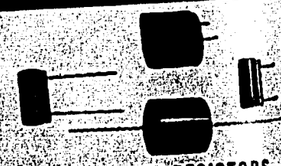

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Tel: GI 3-8451

New Process Metals, Inc., 45-65 Manufacturers Pl., Newark 5, N.J., 93, 99
Tel: MArket 4-1380

New Rochelle Tool Corp., 320 Main St., New Rochelle, N.Y., 88, 92
Tel: NE 2-5555

New York Air Brake Co., Kinney Manufacturing Div., 3631 Washington St., Boston 30, Mass., 12, 88, 92
See ad on page 151
Tel: JAmaica 4-3220

New York Air Brake Co., Vacuum Equipment Div., 1325 Admiral Wilson Blvd., Camden, N.J., 12, 22, 88, 92
Tel: WOodlawn 6-0782

New York Coil Co., Inc., 144-48 Second Ave., Phoenixville, Pa., 41, 43, 73
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Tel: CYpress 2-3740

New York Testing Labs., 47 West St., New York 6, N.Y., 12, 85, 86, 90, 91
Tel: BOwling Green 9-6220

New York Transformer Co., Third Ave., Alpha, N.J., 43, 50, 61, 73
Tel: GLencourt 4-1143

Newark Controls Co., 15 Ward St., Bloomfield, N.J., 4, 70, 72
Tel: PIlgrim 8-2971

Newark Spinning & Stamping Co., 472 Bloy St., Hillside 5, N.J., 86
Tel: BIgelow 3-5353

Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif., 6, 27, 30, 36, 59, 77, 84
Tel: HOllywood 9-5381

Newman Corp., M. M., 79 Clifton Ave., Marblehead, Mass., 87, 89, 92
Tel: NEptune 1-0637

Newth Rubber Co., County Rd., Barrington, R.I., 86, 89
Tel: CHerry 5-8050

Newton Co., 55 Elm St., Manchester, Conn., 4, 25, 50, 70
Tel: MItchell 3-1543

Nexon, Wolf, Westheimer, 1475 Broadway, New York 36, N.Y., 85, 90
Tel: BRyant 9-8517

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See ad on page 678
Tel: (Hartford) CHapel 2-2281

Nicad Div., Gould-National Batteries, Inc., 172 Pleasant St., Easthampton, Mass., 39
Tel: EAsthampton 1200

Nichols & Clark, Inc., P.O. Box 321, Newburyport Turnpike, Hathorne, Mass., 36
Tel: SPring 4-3300

Nichols Ltd., R. H., 4544 Dufferin St., Toronto, Ont., Canada, 4, 5, 12, 14, 17, 22, 26, 34, 36, 56, 58, 61, 64, 79, 88, 90, 92
Tel: ME 3-8191

Nielsen Hardware Corp., 770 Wethersfield Ave., Hartford 1, Conn., 87
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Tel: JAckson 2-8145

Nilsen Mfg. Co., 21 N. Church St., Addison, Ill., 12, 26, 42, 56
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Tel: CAnal 6-1648

Nixon Gear & Machine Co., Inc., 201 Oxford St., Syracuse 4, N.Y., 28
Tel: GRanite 5-9925

Noble & Westbrook Mfg. Co., 20 Westbrook St., E. Hartford 8, Conn., 92
Tel: BU 9-2717

Non-Linear Systems, Inc., Del Mar Airport, Del Mar, Calif., 9, 12, 14, 45, 56, 67
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Tel: SKyline 5-1134

Nonotuck Mfg. Co., Water St., Holyoke, Mass., 82
Tel: JE 4-4509

Nopco Chemical Co., Plastics Div., 175 Schuyler Ave., N. Arlington, N.J., 89, 95
Tel: WYman 8-3555

Norbute Corp., Metalab Equip. Co., 270 Duffy Ave., Hicksville, L.I., N.Y., 22, 81, 90
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Norden-Ketay Corp., Precision Components Div., Jericho Tpke., Commack, N.Y., 28, 36, 58, 67
Tel: FOrest 8-5500

Norrich Plastics Corp., 107-109 W. 18th St., New York 11, N.Y., 28, 44, 46, 83, 86, 87, 89, 91, 94, 95, 98, 99
See ad on page 152
Tel: WAtkins 4-8360

Norrman Labs., Ernst, Williams Bay, Wis., 3, 12, 13, 23, 31, 56, 90
Tel: CIrcle 5-5516

North American Aviation, Inc., Autonetics Div., 9150 E. Imperial Hwy., Downey, Calif., 1, 4, 9, 25
Tel: SPruce 3-2233

North American Electronics, Inc., 212 Broad St., Lynn, Mass., 64, 68
Tel: LYnn 8-2835

North American Philips Co., Philips Labs. Div., Irvington-on-Hudson, N.Y., 46, 75, 76, 99
Tel: LYric 1-8400

North Atlantic Industries, Inc., 603 Main St., Westbury, L.I., N.Y., 4, 9, 12, 26, 28, 45
See ad on page 305
Tel: EDgewood 4-1122

North Electric Co., 55 W. 42nd St., New York 36, N.Y., 4, 8, 20, 30, 34, 44, 50, 51, 53, 61, 66, 70, 79, 81, 84, 98
Tel: CH 4-1416

North Electric Co., 553 South Market St., Galion, Ohio, 4, 8, 9, 12, 20, 30, 32, 33, 34, 36, 43, 44, 45, 46, 53, 66, 70, 84, 85, 86, 87, 98
Tel: HOward 8-2420

North Hills Electric Co., 402 Sagamore Ave., Mineola, L.I., N.Y., 12, 17, 26, 43, 48, 50, 61, 73, 79, 83
See ads on pages 415, 455, 591
Tel: PIoneer 7-0555

North Shore Nameplate, Inc., 214-27 Northern Blvd., Bayside 61, L.I., N.Y., 81, 86, 87
See ad on page 645
Tel: BAyside 4-4000

Northam Electronics, Inc., 2420 N. Lake Ave., Altadena, Calif., 9, 27, 61, 72
Tel: RYan 1-9378

Northeast Electronics Co., P.O. Box 425, Airport Rd., Concord, N.H., 3, 4, 19, 26, 34, 38, 56, 85
Tel: CApitol 5-6641

Northeast Scientific Corp., 30 Wetherbee St., R.F.D. #1, South Acton, Mass., 19, 61
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Tel: COlonial 3-7706

Northeastern Engineering, Inc., 25 S. Bedford St., P.O. Box 150, Manchester, N.H., 4, 9, 31, 34
See ad on page 356
Tel: NAtional 2-6485

Northern Electric Co., Ltd., 1600 Dorchester St. W., Montreal, P.Q., Canada, 30, 32, 36, 53, 57, 82
Tel: WEllington 7-8541

Northern Electronic & Vacuum Industries, P.O. Box 105, St. Sauveur des Monts., P.Q., Canada, 9, 85
Tel: CA 7-2629

Northern Engineering Labs., Inc., 372 Wilmot Ave., Burlington, Wis., 31, 47, 72
Tel: ROckwell 3-7155

Northern Plastics Corp., 2nd & Market St., La Crosse, Wis., 36, 41, 44, 46, 62, 67, 86, 89, 95, 98, 99
Tel: LA Crosse 4-6070

Northern Radio Co., Inc., 147 W. 22nd St., New York 11, N.Y., 3, 21, 24, 33, 34
See ad on pages 130-133
Tel: WAtkins 9-9117

Northwest Industries Ltd., P.O. Box 517, Municipal Airport, Edmonton, Alta., Canada, 62, 81, 82, 85, 86, 90, 101
Tel: GLendale 5-3161

Northwest Plastics, Inc., 65 E. Plato Ave., St. Paul 7, Minn., 86, 94
Tel: CA 7-6686

Norton Assoc., Inc., P.O. Box 96, Garden City, L.I., N.Y., 63
Tel: IVanhoe 3-2968

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Tel: SWift 8-2511

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Tel: FE 9-7417

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Tel: ORegon 8-9111

Norwood Controls Unit, Detroit Control Div., 934 Washington St., Norwood, Mass., 4, 9, 12, 24, 34, 36, 56, 71, 72
Tel: NO 7-4010

Nothelfer Winding Labs., Inc., Ewingville Rd., P.O. Box IRE, Trenton, N.J., 43, 73
See ad on page 242
Tel: EX 2-7117

Nuclear-Chicago Corp., 223 W. Erie St., Chicago 10, Ill., 4, 9, 14, 17, 22, 31, 47, 50, 56, 86, 90, 91, 93, 96
Tel: DElaware 7-3060

Nuclear Corporation of America, 2 Richwood Pl., Denville, N.J., 22
Tel: OAkwood 7-4200

Nuclear Corporation of America, Central Electronic Mfrs. Div., 2 Richwood Pl., Denville, N.J., 12, 65, 76
Tel: OAkwood 7-4200

Nuclear Corporation of America, Inc., 9842 Manchester Rd., St. Louis 19, Mo., 22, 75
Tel: WOodland 2-2162

Nuclear Development Lab., P.O. Box 7034, Kansas City, Mo., 22
Tel: DElmar 3-7692

Nuclear-Electronics Corp., 2925 N. Broad St., Philadelphia 32, Pa., 22, 26, 61
Tel: BAldwin 6-2300

Nuclear Environment Assoc., Box 3021, University Station, Columbus 10, Ohio, 22
Tel: AX 9-5335

Nuclear Measurements Corp., 2460 N. Arlington Ave., Indianapolis 18, Ind., 22
Tel: LIberty 6-2415

Nuclear Research Corp., Southampton, Pa., 4, 22
Tel: EL 7-5015

Nucleonic Corp of America, 196 Degraw St., Brooklyn 31, N.Y., 13, 22, 100
Tel: MAin 4-7370

Nucleonic Products Co., 1601 Grande Vista Ave., Los Angeles 23, Calif., 67, 68
Tel. AN 2-1187

Nugent Elect. Co., Inc., 802 E. Eighth St., New Albany, Ind., 44
Tel: WHitehall 5-0211

Numberall Stamp-Tool Co., 379 Huguenot Ave., Huguenot Pk., S.I. 12, N.Y., 92
Tel: YUkon 4-0822

Nutron Mfg. Co., Inc., 67 Monroe Ave., Staten Island 1, N.Y., 61, 85
Tel: GIbraltar 7-3229

Nutt-Shel Co., 2701 S. Harbor Blvd., Santa Ana, Calif., 87
Tel: KI 5-9311

Ny-Glass, Inc., 2501 E. 68th St., Long Beach 5, Calif., 87, 89, 94, 95
Tel: NEvada 6-8440

Nylogrip Products, 570 Pleasant St., Watertown 72, Mass., 87
Tel: WAlnut 6-0100

Nylok Corp., 611 Industrial Ave., Paramus, N.J., 87
Tel: CO 1-9400

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O K Electronics Corp., 7 Hunt Pl., Nutley 10, N.J., 51, 66, 70
Tel: NOrth 1-1001

O & S Research Corp., 1811 Bannard St., Riverton, N.J., 60, 70, 86, 87, 90
Tel: WA 5-4331

Oak Manufacturing Co., Dept. R, 1260 N. Clybourn Ave., Chicago 10, Ill., 42, 45, 66, 70, 77
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Tel: MOhawk 4-2222

O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif., 4, 30, 32, 81, 84
Tel: HOllywood 4-1117

Oerlikon Tool & Arms Corporation of America, P.O. Box 3049, Asheville, N.C., 81, 84, 86
Tel: ALpine 3-6464

Offner Electronics, Inc., 3900 N. River Rd., Schiller Park, Ill., 12, 13, 14, 17, 36
Tel: GLadstone 1-0050

Ogden Coil & Transformer Co., 3323 W. Cermak Rd., Chicago 23, Ill., 43, 61, 72
Tel: VI 7-5356

Ohio Crankshaft Co., Tocco Div., 3800 Harvard Ave., Cleveland 5, Ohio, 58, 88
Tel: DIamond 1-2300

Ohio Semiconductors, Inc., 1035 W. Third Ave., Columbus 8, Ohio, 45, 68, 72
See ad on page 95
Tel: AX 4-4938

Ohmart Corp., Box 67, Sta. B., Cincinnati 22, Ohio, 4, 22, 56
Tel: PArkway 1-2302

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 5, 37, 38, 41, 43, 66, 67, 68, 70, 73, 79
See ad on pages 106-107
Tel: ORchard 5-2600

Olsen Corp., Gunnar A., 215-11 42nd Ave., Bayside 61, L.I., N.Y., 37
Tel: BAyside 9-8092

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Tel: BL 5-2576

Omega Instrument Co., 103 E. Altadena Dr., Altadena, Calif., 4, 9, 12, 13, 34, 36, 57, 72, 85
Tel: SY 4-8814

Omega Labs., Inc., Haverhill St., Rowley, Mass., 19, 38, 80
Tel: WHitney 8-7757

Onan & Sons, Inc., D. W., 2945 University Ave. S.E., Minneapolis 14, Minn., 61, 92
See ad on page 496
Tel: FEderal 2-1155

O'Neil-Irwin Mfg. Co., 316 8th Ave., Lake City, Minn., 92
Tel: 6301

Onondaga Pottery Co., Electronics Div., 1858 W. Fayette St., Syracuse 1, N.Y., 41, 62, 67
See ad on page 507
Tel: HO 8-1681

Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 4, 12, 15, 43, 45, 61, 62, 64, 66, 79, 90, 92
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Tel: WOrth 6-0380

Oppenheimer Plastics, Inc., Wyandotte Rd., Willow Grove, Pa., 44, 53, 62, 69, 81, 86, 87, 89, 90, 94, 95, 98
Tel: OLdfield 9-6000

Optical Coating Lab., Inc., 977 Sebastopol Rd., Santa Rosa, Calif., 15, 32, 86
Tel: LIberty 5-6440

Optimized Devices, Inc., 864 Franklin Ave., Thornwood, N.Y., 4, 5, 12
See ad on page 301
Tel: ROgers 9-6110

Optomechanisms, Inc., 216 E. Second St., Mineola, L.I., N.Y., 4, 12, 23, 56, 72, 86, 90
Tel: Pioneer 6-5576

Optron Corp., 335 S. Salinas St., Santa Barbara, Calif., 12, 56, 72
Tel: WOodland 5-6140

Orbitran Co., Inc., 11487 Woodside Ave, Lakeside, Calif., 9, 19, 32, 48, 50, 61
Tel: HIckory 3-6832

Ordnance Research Lab., Pennsylvania State University, University Park, Pa., 90

Oregon Electronic Mfg. Co., 2105 S.E. 6th Ave., Portland 14, Ore., 61
Tel: BElmont 6-9292

Orradio Industries, Inc., Shamrock Circle, Opelika, Ala., 63
Tel: SHerwood 5-5771

Ortho Filter Corp., 7 Paterson Ave, Paterson 1, N.J., 36, 38, 43, 50, 73
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Tel: MUlberry 4-5858

Oryx Sales Co., 9015 Wilshire Blvd, Beverly Hills, Calif., 92
Tel: BRadshaw 2-6635

Osborne Electronic Sales, 712 S.E. Hawthorne, Portland 14, Ore., 36, 43, 67, 73
Tel: BE 2-0161

Osborne Transformer Corp., 948 E. Lafayette Ave., Detroit 7, Mich., 41, 64, 73
Tel: WOodward 1-4290

Oster Mfg. Co., John, Avionic Div., 1 Main St., Racine, Wis., 28, 36, 40, 45, 58
See ad on page 480
Tel: MElrose 7-4445

Ostlund, Evert M., P.O. Box 458, Andover, N.J., 24, 36, 85, 90
See ad on page 626
Tel: PArkway 9-6635

Otis Elevator Co., Electronics Div., 35 Ryerson St., Brooklyn 5, N.Y., 4, 9, 12, 90
Tel: ULster 5-6800

Owen Labs., Inc., 55 Beacon Pl., Pasadena, Calif., 12, 61, 90
Tel: RYan 1-6901

Owens-Corning Fiberglas Corp., 598 Madison Ave., New York 22, N.Y., 82, 89, 95
Tel: MU 8-8380

Owens-Illinois, Kimble Glass Co., P.O. Box 1035, Toledo 1, Ohio, 94, 99
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Oxford Components, Inc., 556 W. Monroe St., Chicago 6, Ill., 54, 60, 73, 81

Oxford Electric Corp., 3911 S. Michigan Blvd., Chicago 15, Ill., 43, 54, 60, 73
Tel: ATlantic 5-6161

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PAM Associates, Inc., 7315 Harford Rd, Baltimore 14, Md., 12, 90
Tel: HI 4-6195

P.B.R. Mfg. Co., H. & Luzerne St., Philadelphia 24, Pa., 12, 81, 84, 86
Tel: GArfield 6-0932

P C A Electronics, 16799 Schoenborn, Sepulveda, Calif., 19, 43, 48, 73
Tel: EMpire 2-0761

PIC Design Corp., 477 Atlantic Ave, East Rockaway, N.Y., 28, 36, 87, 98
Tel: LY 3-6470

PSP Engineering Co., 6058 Walker Ave., Maywood, Calif., 14, 28, 37, 43, 58, 70, 72
Tel: LUdlow 3-4785

Pace Electrical Instrument Co., Inc., 70-31 84 St., Glendale 27, L.I., N.Y., 56
Tel: DAvenport 6-3982

Pace Engineering Co., 13035 Saticoy St., N. Hollywood, Calif., 72
Tel: POplar 5-0453

Pacific Automation Products, Inc., 1000 Airway, Glendale 1, Calif., 4, 82, 86
Tel: CItrus 6-2411

Pacific Electro Nuclear Corp., 9520 Jefferson Blvd., Culver City, Calif., 22
Tel: VErmont 7-4411

Pacific Relays, Inc., 13915 Saticoy St., Van Nuys, Calif., 66
Tel: ST 2-2360

Pacific Resistor Co., 2186 Colorado Ave., Santa Monica, Calif., 67, 82
Tel: EX 3-0531

Pacific Scientific Co., P.O. Box 22019, Los Angeles 22, Calif., 4, 44, 45, 52, 66, 67, 70, 72, 85, 86, 87, 88, 90, 93, 97
Tel: SPruce 3-2020

Pacific Semi-Conductors, Inc., 10451 W. Jefferson Blvd., Culver City, Calif., 68
Tel: OSborne 9-4561

Pacific Technical Co., 2047 Sawtelle Blvd., Los Angeles 25, Calif., 17, 61
Tel: GR 7-0455

Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif., 15, 22, 26, 59, 87, 94
Tel: GR 8-1134

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 1, 9, 12, 19, 25, 27, 31, 36, 43, 48, 49, 50, 61, 62, 73, 74
See ad on page 246
Tel: BRadshaw 2-6141

Page Communications Engrs., Inc., 710 Fourteenth St. N.W., Washington 5, D.C., 85, 90
Tel: EXecutive 3-1523

Page-Madden Co., 76-96 E. Second St., Mineola, L.I., N.Y., 46, 83, 87, 89, 99
Tel: Pioneer 6-2660

Painton & Co., Ltd., Bembridge Dr., Kinsthorpe, Northampton, England, 37, 38, 43, 44, 53, 67, 69, 70, 87, 94
Tel: NOrthampton 3-2354

Palmer Instruments, 1028 Mission St., South Pasadena, Calif., 85, 90
Tel: MU 2-1337

Palnut Co., 94A Glen Rd., Mountainside, N.J., 87
Tel: ADams 3-3000

Palo Alto Engrg. Co., 620 Page Mill Rd., Palo Alto, Calif., 36, 45, 73
Tel: DAvenport 6-5360

Pan American Trade and Development Corp., 2 Park Ave., New York 16, N.Y., 47
Tel: MU 6-7960

Pan-Air Electronics Corp., 1120 W. Magnolia Blvd., Burbank, Calif., 1, 9, 21, 36, 38, 43, 50, 53, 62, 81, 86, 87
Tel: VIctory 9-5411

Panduit Corp., 14461 Waverly Ave., Midlothian, Ill., 87
Tel: HIlltop 5-3134

Panellit, Inc., 7401 N. Hamlin Ave., Skokie, Ill., 4, 9, 34, 56, 70
Tel: ORchard 5-2500

Panob Corp., 49 Beech St., Port Chester, N.Y., 81, 86, 87, 94
See ad on page 683
Tel: WEstmore 9-3066

Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mt. Vernon, N.Y., 2, 3, 12, 14, 19, 29, 31, 80
See ad on page 320
Tel: OWens 9-4600

Panseal, Inc., 10 Main St., Little Ferry, N.J., 1, 4, 12, 15, 17, 28, 36, 52, 66, 70, 71, 72, 82, 85, 101
Tel: DIamond 3-2483

Pantek Co., Box 17121, Los Angeles 17, Calif., 85

Paragon Electric Co., 1600 12th St., Two Rivers, Wis., 57, 70
Tel: 303

Paragon-Revolute Corp., 77 South Ave., Rochester 4, N.Y., 92
Tel: BAker 5-2480

Parameters, Inc., 195 Herricks Rd., New Hyde Park, L.I., N.Y., 36, 85, 90
Tel: Pioneer 7-8484

Paramount Paper Tube Corp., 618 S. Lafayette St., Fort Wayne 2, Ind., 87
See ad on page 646
Tel: ANthony 4197

Paramount Products Co., 759 Ramsey Ave., Hillside, N.J., 99
Tel: MUrdock 8-8150

Paraplegics Mfg. Co., Inc., 10068 Franklin Ave., Franklin Park., Ill., 62, 81, 82, 86
Tel: GLadstone 5-1697

Park Nameplate Co., Inc., 34-10 Linden Pl., Flushing 54, L.I., N.Y., 87
Tel: FLushing 9-7000

Parke Mathematical Laboratories, Inc., Bedford Rd., Carlisle, Mass., 85, 90
Tel: EMerson 9-3818

Parke, Nathan Grier, Bedford Rd., Carlisle, Mass., 85
See ad on page 627
Tel: EMerson 9-3818

Parker-Kalon Div., General American Transportation Corp., Clifton, N.J., 87
Tel: GRegory 1-1000

Parker Seal Co., Div. of Parker-Hannifin Corp., 10567 Jefferson Blvd., Culver City, Calif., 80, 87
See ad on page 244
Tel: TExas 0-4618

Parks Labs., Henry Francis, P.O. Box 1665, Lake City Sta., Seattle 55, Wash., 56, 61, 90, 101
Tel: LAkeview 3-4832

Parkside Wire Co., 2535 W. Armitage Ave., Chicago 47, Ill., 82
Tel: SPaulding 2-1331

Par-Metal Products Corp., 32-42 49th St., Long Island City 3, N.Y., 81, 84
See ad on page 621
Tel: Astoria 8-8905

Parsons Co., Ralph M., 151 S. De Lacey Ave., Pasadena, Calif., 31, 34, 48, 50, 61, 86, 90
Tel: RYan 1-0461

Partlow Corp., 216 Campion Rd., New Hartford, N.Y., 4, 14, 56, 71
Tel: UTica 2-5105

Partridge Transformers Ltd., Roebuck Rd.-Chessington, Surry, England, 43, 73
Tel: ELmbridge 6737

Parzen Associates, 402 Sagamore Ave., Mineola, L.I., N.Y., 85
Tel: PI 7-0497

Parzen, Benjamin, 34-01 38 Ave., Long Island City 1, N.Y., 85, 90
Tel: EX 2-5200

Pass & Seymour, Inc., 50 Boyd Ave., Syracuse 9, N.Y., 60, 69, 70, 83
Tel: HOward 8-6211

Patent Button Co. of Tennessee, Inc., 2000 Centry St., Knoxville 1, Tenn., 86, 94
Tel: 2-9621

Patterson, Moos Div., Universal Winding Co., 90-28 Van Wyck Expwy., Jamaica 18, N.Y., 9, 15, 22, 36, 39, 61, 62, 85, 86
Tel: AXtel 7-4400

Patton-Mac Guyer Co., 17 Virginia Ave., Providence 5, R.I., 98, 99
Tel: HOpkins 1-1550

Paul & Stein Bros., Inc., 235 5th Ave., New York 16, N.Y., 82, 89, 93
Tel: MU 4-6370

Pearce-Simpson, Inc., 2295 N.W. 14 St., Miami 35, Fla., 16, 20
Tel: NEwton 4-7695

Pearson Electronics, Inc., 707 Urban St., Palo Alto, Calif., 73
Tel: DAvenport 5-3147

Pease & Curren, Inc., 780 Allens Ave., Providence 5, R.I., 93
Tel: HOpkins 1-6340

Peck & Harvey Mfg. Corp., 5650 N. Western, Chicago 45, Ill., 92
Tel: ED 4-2200

Peck Spring Co., 313 John St., Plainville, Conn., 28, 86, 87, 98
Tel: SH 7-2767

Peeco Corporation, 2760 Whittier Blvd., Los Angeles 23, Calif., 17, 85, 88, 95
Tel: ANgelus 9-4164

Peer, Inc., 1200 Milton St., Benton Harbor, Mich., 1, 24, 92

Peerless Electric Co., 1401 W. Market St., Warren, Ohio, 40
Tel: EXpress 3-1551

Peerless Electronics, Inc., 5338 Alhambra Ave., Los Angeles 32, Calif., 99
Tel: CApital 1-5196

Peerless Products Industries, 812 N. Pulaski Rd., Chicago 51, Ill., 37, 86, 87
Tel: BElmont 5-9883

Pee-Wee Molding Corp., 1720 Atlantic Ave., Brooklyn 13, N.Y., 86, 87, 89
Tel: PR 4-3441

Pegasus Labs., Inc., 3692 Eleven Mile Rd., Berkley, Mich., 4, 12, 28, 36
Tel: LIncoln 6-3636

Peirce Dictation Systems, 5900 N. Northwest Hwy., Chicago 31, Ill., 27, 63
Tel: RO 3-3220

Pek Labs., Inc., 4024 Transport St., Palo Alto, Calif., 65, 75, 76, 85, 90
Tel: DA 1-2787

Pendar, Inc., 14744 Arminta St., Van Nuys, Calif., 60, 66, 67, 70
Tel: STanley 3-3136

Penn Engineering & Manufacturing Corp., P.O. Box 311, Doylestown, Pa., 87
Tel: ROger 6-8853

Penn Fibre & Specialty Co., Inc., 2030 E. Westmoreland St., Philadelphia 34, Pa., 86, 87, 89, 95, 98
Tel: REgent 9-4862

Penn Keystone Corp., P.O. Box 350, Hawkins St., Derby, Conn., 56, 60, 66
Tel: REgent 4-3301

Penn Resistor Corp., 526 N. Broad St., Lansdale, Pa., 41, 50, 67
Tel: ULysses 5-9516

Penn Transformer Corp., E. Bishop St. Ext., Bellefonte, Pa., 43, 73
Tel: ELgin 5-4747

Penn-East Engineering Corp., Industrial Ave., Kutztown, Pa., 36, 50, 73
Tel: OV 3-7307

Pennsylvania Testing Lab., Doylestown, Pa., 5, 9, 12, 61, 90
Tel: FIllmore 8-5818

Penta Labs., Inc., 312 N. Nopal St., Santa Barbara, Calif., 65, 66, 75, 76
Tel: WOodland 5-4581

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 41, 46, 81, 82, 87, 89, 93, 96, 99
See ad on page 687
Tel: EVerglade 4-2122

Performance Measurements, 15301 W. Mc Nichols Rd., Detroit 35, Mich., 4, 56
Tel: VErmont 8-7879

Perkin-Elmer Corp., Vernistat Div., 777 Main Ave., Norwalk, Conn., 15, 67, 73
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Tel: VIctor 7-2441

Perkin Engineering Corp., 345 Kansas St., El Segundo, Calif., 15, 36, 45, 61, 73, 79
Tel: EAstgate 2-1375

Perkins Machinery & Gear Co., Circuit Ave., W. Springfield, Mass., 86, 87, 92
Tel: REpublic 7-4751

Permacel, U. S. Hwy. 1, New Brunswick, N.J., 87, 89, 91, 95
Tel: CHarter 7-7900

Permag Corp., 88-06 Van Wyck Expwy., Jamaica 18, L.I., N.Y., 12, 55, 102
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Tel: OLympia 7-1818

Perma-Power, 3100 N. Elston, Chicago 18, Ill., 4, 79
Tel: KEystone 9-7171

Permonite Mfg. Co., 444 Lake Shore Dr., Chicago 11, Ill., 44, 51, 53, 69, 82, 86, 98
Tel: MIchigan 2-1915

Perron & Co., Inc., Ray, 1870 Centre St., Boston 32, Mass., 102
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Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 4, 12, 15, 19, 45, 61, 73, 90
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Tel: TRinity 8-3251

Peter Partition Corp., 124 Boerum Pl., Brooklyn 1, N.Y., 86, 87
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Tel: TRiangle 5-4033

Petersen Radio Co., Inc., 2800 W. Broadway, Council Bluffs, Iowa, 47
Tel: 2-2760

Pettinos, Inc., Charles, 1 E. 42nd St., New York, N.Y., 91
Tel: MU 7-7337

Pfanstiehl Chemical Corp., 104 Lake View Ave., Waukegan, Ill., 59
Tel: MAjestic 3-1360

Phalo Plastics Corp., 530 Boston Turnpike, Shrewsbury, Mass., 82
Tel: VI 4-4021

Phaostron Instrument Electronics Corp., 151 Pasadena Ave., South Pasadena, Calif., 12, 56, 66, 67
Tel: CI 5-1471

Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N.Y., 44, 80, 82, 87, 93
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Tel: PLaza 1-3200

Phelps Dodge Copper Products Corp., Inca Mfg. Div., Fort Wayne, Ind., 82
Tel: EAstbrook 0511

Pheoll Manufacturing Co., Inc., 5700 Roosevelt Rd., Chicago, Ill., 87, 93
Tel: CO 1-0300

Philadelphia Insulated Wire Co., 200 N. 3rd St., Philadelphia 6, Pa., 82
Tel: MArket 7-0456

Philadelphia Quartz Co., 1146L Public Ledger Bldg., Philadelphia 6, Pa., 91
Tel: MArket 7-7200

Philadelphia Scientific Glass, Paletown Rd., 1, Quakertown, Pa., 4, 13, 52, 66, 70, 71, 72, 74, 88, 99
Tel: KEystone 6-4203

Philadelphia Wireless Tech. Institute, 1533 Pine St., Philadelphia 2, Pa., 100
Tel: KI 6-0745

Philamon Labs., Inc., 90 Hopper St., Westbury, L.I., N.Y., 3, 31
See ad on page 105
Tel: EDgewood 3-1700

Philbrick Researches, George A., 230 Congress St., Boston 10, Mass., 9, 36, 61, 62, 101
Tel: HU 2-3225

Philco Corp., Govt. & Industrial Div., 4700 Wissahickon Ave., Philadelphia 44, Pa., 1, 4, 9, 10, 11, 12, 15, 16, 18, 20, 21, 23, 24, 25, 26, 28, 29, 30, 32, 33, 34, 36, 38, 73, 76, 80, 85
Tel: VIctor 3-4000

Philco Corp., Lansdale Tube Co. Div., Church Rd., Lansdale, Pa., 15, 68, 74
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Tel: ULysses 5-4681

Philco Corp., Tech. Rep. Div., 22nd & Lehigh Ave., Philadelphia 32, Pa., 85, 100, 101
Tel: Baldwin 3-1800

Philco Corp., Western Development Labs., 3875 Fabian Way, Palo Alto, Calif., 1, 7, 9, 18, 21, 25, 31, 34, 90
Tel: DAvenport 6-4350

Philips Electronics, Inc., Instrument Div., 750 S. Fulton Ave., Mt. Vernon, N.Y., 4, 22, 75, 79
Tel: MO 4-4500

Philips Electronics, Inc., 100 E. 42 St., New York 17, N.Y., 12, 17

Phillips Control Corp., 59 W. Washington St., Joliet, Ill., 43, 55, 66, 70
Tel: JOliet 3-3431

Phillips Process Co., Inc., 192 Mill St., Rochester 14, N.Y., 92
Tel: BAker 5-8201

Philson Manufacturing Co., Inc., 47 Bergen St., Brooklyn 1, N.Y., 37
Tel: ULster 5-0136

Photo Bell Co., 43 Vesey St., New York 7, N.Y., 4, 66, 72, 90
Tel: WOrth 2-6739

Photo Chemical Products, 999 A. Stewart Ave., Garden City, L.I., N.Y., 14, 86, 98
Tel: PI 1-6500

Photo Research Corp., 837 N. Cahuenga Blvd., Hollywood 38, Calif., 12, 32
Tel: HO 2-6674

Photocircuits Corp., 31 Sea Cliff Ave., Glen Cove, L.I., N.Y., 62, 83
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Tel: ORiole 6-8000

Photocon Research Products, 421 N. Altadena Dr., Pasadena, Calif., 9, 12, 36, 57, 72
Tel: SYcamore 2-4131

Photo-Crystals, Inc., 15 S. 1st St., Geneva, Ill., 4, 36, 37, 38, 66, 70, 72
Tel: GEneva 7150

Photron Instrument Co., 6516 Detroit Ave., Cleveland 2, Ohio, 12, 13, 14, 23, 34, 36, 56
Tel: ATlantic 1-7020

Physics Research Labs., Inc., P.O. Box 555, Hempstead, L.I., N.Y., 5, 12, 56, 64, 67, 73, 90
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Tel: IVanhoe 3-8229

Pickard & Burns, Inc., 240 Highland Ave., Needham, Mass., 90
Tel: HIllcrest 4-3345

Pickering & Co., Inc., Sunnyside Blvd, Plainview, L.I., N.Y., 36, 43, 50, 54, 59, 72
Tel: OVerbrook 1-0200

Pickett & Eckel, Inc., 1109 S. Fremont Ave., Alhambra, Calif., 62, 85, 86, 87, 90, 94, 95
Tel: ATlantic 2-5151

Pierce, George C., Supvr., Product Services, 901 N. Columbus St., Alexandria, Va., 3, 12, 13, 36, 61, 72, 85
Tel: KIng 9-7500

Piezo Crystal Co., 265 E. Pomfret St, Carlisle, Pa., 47, 50
Tel: CArlisle 1495

Piezo Products Co., Whitney St., Sherborn, Mass., 4, 36, 85, 90
Tel: TR 9-9497

Pilgrim Products, Inc., 277 Central St. West Acton, Mass., 86, 87, 89, 95, 98
Tel: COlonial 3-7368

Pilot Chemicals, Inc., 36 Pleasant St. Watertown 72, Mass., 22, 91
Tel: WAtertown 4-7775

Pilot Radio Corp., 37-06 36th St., Long Island City 1, N.Y., 36, 77
Tel: ST 4-5455

Pimex, Inc., 18 E. 60th St., New York 22, N.Y., 5, 12, 37, 41, 54, 56, 88
Tel: PLaza 3-3041

Pioneer Electroponents, 141 Albertson Ave., Albertson, L.I., N.Y., 87, 94, 98, 99

Pioneer Gen-E-Motor Corp., 5841 W. Dickens, Chicago 39, Ill., 58, 92

Pioneer Machine Works, Inc., 618 Adam St., W. New York, N.J., 92
Tel: UNion 3-3838

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 4, 12, 19, 21, 26, 28, 31, 36, 45, 50, 56, 61, 62, 72, 77, 80, 90
See ad on page 323
Tel: CAnal 6-7250

Pittman Electrical Developments Co., P.O. Box 150, Sellersville, Pa., 58
Tel: ALpine 7-2433

Plamondon, Jr., A. D., 32 E. Scott St., Chicago 10, Ill., 85
Tel: SUperior 7-4339

Planet Manufacturing Corp., 225 Belleville Ave., Bloomfield, N.J., 41
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Tel: PIlgrim 3-2874

Plasteck, Inc., P.O. Box 551, Poteau, Okla., 60, 69, 81, 86, 87
Tel: 705

Plastic Capacitors, Inc., 2620 N. Clybourn Ave., Chicago 14, Ill., 41, 42, 61
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Tel: DIversey 8-3735

Plastic Mold & Engineering Co., 157 Clifford St., Providence 3, R.I., 44, 53, 54, 57, 60, 69, 72, 94, 95
Tel: GAspee 1-9260

Plastic Wire & Cable Corp., E. Main St., Jewett City, Conn., 82
Tel: DRake 6-4411

Plastics & Electronics, P.O. Box 38, Sta. J., Buffalo 8, N.Y., 9, 36, 62, 90
Tel: SUmmer 1630

Plastics Engineering Co., 1607 Geele Ave., Sheboygan, Wis., 89, 95
Tel: GLencourt 8-2121

Plastoid Corp., 42-61 24th St., Long Island City 1, N.Y., 82
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Tel: STillwell 6-6200

Pneumafil Corp., 2516 Wilkinson Blvd., Charlotte 8, N.C., 81, 84, 86
Tel: EX 9-7441

Podgor Co., Inc., Joseph E., 16-18 S. Marshall St., Philadelphia 6, Pa., 92
Tel: WAlnut 5-7878

Poinsettia Co., Inc., 112 Cedar Ave., Pitman 6, N.J., 86, 90
Tel: LUther 9-7666

Point Consulting Co., Box 8656, Pittsburg 21, Pa., 85
Tel: FA 7-5338

Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 18, 19, 26, 37, 38, 50, 61, 76, 77
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Tel: EXeter 2-4500

Polaroid Corp., 730 Main St., Cambridge 39, Mass., 23
Tel: UN 4-6000

Pollak Corp., Joseph, Dept. B, 75-95 Freeport St., Boston 22, Mass., 66, 70
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Tel: AVenue 2-9550

Polydoroff, W. J., 927 15th St., N.W., Washington, D.C., 1, 16, 37, 46, 77
Tel: NAtional 8-6724

Polymer Corp. of Pennsylvania, Dept. RB, 2140 Fairmont Ave., Reading, Pa., 46, 55, 80, 86, 87, 89, 91, 95
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Tel: FRanklin 6-5791

Polyphase Instrument Co., E. Fourth St., Bridgeport, Pa., 12, 43, 48, 50, 56, 62, 72, 73
Tel: BRoadway 9-4660

Poly-Scientific Corp., College Ave., P.O. Box 191, Blacksburg, Va., 44, 45, 70, 98
Tel: PRescott 2-8212

Polytechnic Research & Development Co., 202 Tillary St., Brooklyn 1, N.Y., 19, 31, 36, 38, 50, 56, 61, 69, 77, 80
Tel: UL 2-6800

Polytron Engineering, Inc., P.O. Box 5024, Middle River 20, Md., 45, 61
Tel: SAratoga 7-6116

Pomona Electronics Co., Inc., 1126 W. 5 Ave., Pomona, Calif., 53, 69
Tel: NAtional 9-9549

Popper & Sons, Inc., 300 4th Ave., New York 10, N.Y., 92
Tel: ORegon 4-5500

Porcelain Products Co., 225 N. Patterson St., Carey, Ohio, 83
Tel: 6-2211

Portchester Instrument Corp., 114 Wilkins Ave., Port Chester, N.Y., 18, 19, 50, 80
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Tel: WEstmore 9-4092

Porter Co., H. K., Inc., Riverside-Alloy Metal Div., Riverside, N.J., 93
Tel: HOhart 1-3000

Porter Co., H. K., Delta Star Elec. Div., Thomas Works, Lisbon, Ohio, 83, 89
Tel: HA 4-7231

Porter Co., Inc., H. K., National Electric Div., Porter Bldg., Pittsburgh 19, Pa., 8
Tel: EXpress 1-1800

Port-O-Vox Corp., 521 W. 43rd St., New York 36, N.Y., 6, 7, 10, 20, 30, 54, 57
Tel: LO 3-4073

Potter Aeronautical Corp., Route 22, Union, N.J., 4, 9, 43, 72
Tel: MUrdock 6-3010

Potter & Brumfield, Div. of American Machine & Foundry Co., Princeton, Ind., 66
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Tel: FUlton 5-5251

Potter Co., 1950 Sheridan Rd., N. Chicago, Ill., 41, 50, 61
Tel: DExter 6-4350

Potter Instrument Co., Inc., Sunnyside Blvd., Plainview, L.I., N.Y., 9, 27
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Tel: OVerbrook 1-3200

Powell Co., Harold H., 2102 Market St., Philadelphia 3, Pa., 44
Tel: LOcust 4-1440

Power Designs, Inc., 1700 Shames Dr., Westbury, L.I., N.Y., 15, 45, 61, 79
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Tel: EDgewood 3-6200

Power Industries, Inc., 2611 S. Indiana Ave., Chicago 16, Ill., 43, 45, 48, 50, 67, 73, 85, 86, 90
Tel: CAlumet 5-1125

Power Sources, Inc., Northwest Industrial Pk., South Ave., Burlington, Mass., 45, 61, 79
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Tel: BRowning 2-3610

Powers Co., J. J., 818 N. 22nd, Melrose Park, Ill., 54, 81
Tel: FIllmore 5-3500

Precise Development Corp., 2 Neil Ct., Oceanside, L.I., N.Y. 3, 5, 12, 23, 26, 35
Tel: ROckville Centre 6-0171

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 12, 15, 45, 61, 73, 90
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Tel: FLemington 900

Precision Apparatus Co. Inc., 70-31 84th St., Glendale 27, L.I., N.Y., 3, 12, 23, 26, 35
Tel: DAvenport 6-3982

Precision Circuits, Inc., 705 S. Fulton Ave., Mount Vernon, N.Y., 62
Tel: MOunt Vernon 4-3737

Precision Crystal Lab., 2223 Warwick Ave., Santa Monica, Calif., 47
Tel: EXbrook 4-7004

Precision Electronic Components Ltd., 50 Wingold Ave., Toronto, Ont., Canada, 67
Tel: RU 1-6174

Precision Electronics, Inc., 48 Merrick Rd., Rockville Centre, L.I., N.Y., 37, 43, 73
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Tel: ORiole 8-4182

Precision Electroplating, 519 S. Oakley Blvd., Chicago 12, Ill., 86
Tel: SFeley 3-5855

Precision, Inc., 4748 France Ave. N., Minneapolis 22, Minn., 43, 67, 73, 81, 86
Tel: JUniper 8-9441

Precision Instrument Co., 1011 Commercial St., San Carlos, Calif., 9, 27, 34
Tel: LYtell 1-4441

Precision Line, Inc., 63 Main St., Maynard, Mass., 67, 72
Tel: TWin Oaks 7-2451

Precision Mechanisms Corp., 577 Newbridge Ave., East Meadow, L.I., N.Y., 4, 28
Tel: IVanhoe 3-8955

Precision Metal Products, 41 Elm St., Stoneham 80, Mass., 86, 87, 89, 95, 98
Tel: SToneham 6-1999

Precision Metalsmiths, Inc., 1081 E. 200 St., Cleveland 17, Ohio, 86, 93

Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 87, 89, 95
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Tel: ARmitage 6-5200

Precision Piezo Service, 427 Mayflower St., Baton Rouge 2, La., 47
Tel: DIckens 2-5359

Precision Radiation Instruments, Inc., 5810 S. Normandie, Los Angeles, Calif., 6, 36, 59, 77
Tel: PL 3-3501

Precision Recording Chart Co., 2430 E. Linden Ave., Linden, N.J., 14
Tel: HUnter 6-2102

Precision Resistor Co., 109 U. S. Highway 22, Hillside, N.J., 67
Tel: BIgelow 3-3809

Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill., 12, 88, 92
Tel: CApitol 7-2660

Precision Styli Corp., 900 Nepperhan Ave., Yonkers, N.Y., 59
Tel: YO 8-3433

Precision Tube Co., Inc., Church Rd., Wissahickon Ave., North Wales, Pa., 82, 93
Tel: OXbow 9-4806

Preis Engraving Machine Co., 651 U. S. Hwy. 22, Hillside, N.J., 92
Tel: MU 6-7736

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Tel: WEstmore 9-8900

Premier Metal Products Co., 337 Manida St., New York 59, N.Y., 81, 84
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Tel: WYandotte 1-6600

Premier Research Labs., 83-89 Seventh Ave., New York 11, N.Y., 47
Tel: AL 5-0700

Prentice-Hall, Inc., Englewood Cliffs, N.J., 101
Tel: WIndsor 7-1000

Prescott Television Co., 7706 Melrose Ave., Los Angeles 46, Calif., 27
Tel: WEbster 3-7193

Preservation Packaging, 1407 Chestnut Ave., Hillside, N.J., 86
Tel: WA 6-0916

Presin Co., 2014 Broadway, Santa Monica, Calif., 9, 31, 56
Tel: EXbrook 3-9738

Press Wireless Labs., Inc., 25 Prospect Pl., West Newton 65, Mass., 12, 19, 24, 27, 33, 61, 80
Tel: LAsell 7-5600

Pressman Associates, 7803 Farnsworth St., Philadelphia 15, Pa., 61, 85
Tel: DE 3-8064

Prestole Corp., 1345 Miami St., Toledo, Ohio, 86, 87
Tel: OXford 1-2465

Price Electric Corp., E. Church & 2nd Sts., Frederick 1, Md., 66
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Tel: MOnument 3-5141

Prince Rubber Co., Inc., 1675 Niagara St., Buffalo 7, N.Y., 86, 87, 89, 95
Tel: VIctoria 7400

Princeton University Press, Princeton, N.J., 101
Tel: WAlnut 4-5500

Printed Electrn. Corp., 7 North Ave., Natick, Mass., 62
Tel: OLympic 5-0070

Printloid, Inc., 44-05 10th St., Long Island City 1, N.Y., 9, 81, 86
Tel: EMpire 1-1770

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 3, 12, 19, 23, 26, 31
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Tel: POrt Washington 7-8150

Process & Instruments, 15 Stone Ave., Brooklyn 33, N.Y., 12, 17, 55, 85, 90
Tel: GL 2-8380

Prodelin, Inc., Dept. I-8, 307 Bergen Ave., Kearny, N.J., 37, 44, 80, 82
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Tel: WYman 1-8600

Product Development Corp., 61 Batterymarch St., Boston 10, Mass., 47, 90
Tel: HUbbard 2-0407

Production Metals, Inc., 129 Pierrepont St., Brooklyn 1, N.Y., 93
Tel: ULster 8-0750

Production Research Corp., Thornwood, N.Y., 10, 15, 19, 24, 34, 37, 50, 56
Tel: ROgers 9-2766

Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, L.I., N.Y., 92
See ad on page 671
Tel: OYster Bay 6-0009

Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif., 52, 89, 91
Tel: NO 5-5951

Profile Electronics, Inc., 6 Bridge St., Concord, N.H., 43, 48, 50
See ad on page 415
Tel: CApital 4-1232

Progress Electronics Co., 107 Franklin St., New York 13, N.Y., 44, 70, 82, 102
See ad on pages 71-74
Tel: CAnal 6-5611

Progressive Tool & Die, 530 Boston Turnpike, Shrewsbury, Mass., 92
Tel: VIking 2-9551

Publishers Authorized Binding Service, 5811 W. Division St., Chicago 51, Ill., 101
Tel: EStebrook 9-4055

Pulse Engineering, Inc., 560 Robert Ave., Santa Clara, Calif., 36, 43, 50, 73
Tel: CHerry 8-6040

Pulse Techniques, Inc., 1411 Palisade Ave., W. Englewood, N.J., 36, 49, 50
Tel: TEaneck 7-2575

Pure Carbon Co., Inc., 441 Hall Ave., St. Marys, Pa., 87
Tel: TErminal 4-1573

Pye Corp. of America, 1149 Raritan Ave., Highland Park, N.J., 16, 20, 24, 36
Tel: COrtlandt 7-4930

Pye Telecommunications, Newmarket Rd., Cambridge, England, 1, 10, 16, 18, 20, 23, 24, 30
Tel: TEversham 3131

Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill., 44
Tel: DIckens 2-6300

Pylon Electronics Development, Ltd., 161 Clement St., LaSalle, Montreal 32, P.Q., Canada, 36, 38, 45
Tel: DOminic 6-1510

Pyramid Electric Co., 507 26th St., Union City, N.J., 5, 12, 41, 64
See ad on page 404
Tel: UNion 5-1776

Pyroferric Co., Inc., 621 E. 216th St., New York 67, N.Y., 46, 61
Tel: OLinville 4-3930

Pyrofilm Resistor Co., Inc., U. S. Hwy. 46, Parsippany, N.J., 67
Tel: DEerfield 4-8282

Q

Q. O. S. Corp., Bronx Blvd. & 216th St., New York 67, N.Y., 15, 61
Tel: OLinville 4-3930

QVS Inc., 20 N. 15 St., East Orange, N.J., 56
Tel: ORange 3-3996

Q-Line Manufacturing Corp., 1562 61st St., Brooklyn 19, N.Y., 37, 42, 50, 81, 84
Tel: BE 6-9320

Quality Components, Inc., St. Marys, Pa., 41, 46, 86, 87
Tel: TE 4-2817

Quality Name Plate, Inc., Box 344, Ridgewood, N.J., 62, 81, 87
Tel: GIlbert 4-5392

Quam-Nichols Co., 234 E. Marquette Rd., Chicago 37, Ill., 43, 54, 73
Tel: HU 8-5800

Quan-Tech Laboratories, 236 Mt. Kemble Ave., Morristown, N.J., 3, 36, 56, 61
See ad on page 374
Tel: JEfferson 8-6350

Quarie Controllers, P.O. Box 95, Canton, Mass., 4, 73
Tel: SUnset 4-2842

Quartzite Processing, Inc., 197 Chelsea St., Everett 49, Mass., 46, 47, 70, 83, 86, 89
Tel: DUnkirk 9-8793

Qutronic Transformer, 525 Broadway, New York 12, N.Y., 36, 43, 73
Tel: WOrth 2-3639

R

RCA Institutes, Inc., 350 W. 4th St., New York, N.Y., 100
Tel: WAtkins 4-7845

RCA Service Co., MU-114, Patrick Air Force Base, Cocoa, Fla., 90
Tel: UL 7-2233

R E F Manufacturing Corp., 393 Jericho Tpke., Mineola, L.I., N.Y., 81, 84, 86
Tel: PIoneer 2-8400

R-J Audio Products, Inc., 80 Shore Rd., Port Washington, L.I., N.Y., 81
Tel: PO 7-7700

R K Manufacturing Co., P.O. Box 98, Carterville, Ill., 73
Tel: YUkon 5-2311

R M S Assoc., Inc., 112 W. Boston Post Rd., Mamaroneck, N.Y., 82, 86, 90
Tel: OWens 8-5802

R N R Metal Products, 986 Linwood St., Brooklyn 8, N.Y., 81, 84
Tel: NI 9-8200

R-S Electronics Corp., 435 Portage Ave, Palo Alto, Calif., 1, 25, 36, 43, 45, 61, 73, 90
See ad on page 267
Tel: DAvenport 1-1130

Racal Engrg., Ltd., Western Rd., Bracknell, Berks, England, 1, 4, 9, 12, 16, 24, 29, 31, 33, 36, 37, 50, 57, 61, 62, 70, 72, 73, 84, 86, 90
Tel: BRacknell 941

Racon Electric Co., 1261 Broadway, New York 1, N.Y., 54, 57, 72
Tel: MUrray Hill 4-6258

Radar Design Corp., P.O. Box 38, Pickard Dr., Syracuse 11, N.Y., 19, 37, 38, 50, 80, 96
Tel: GL 4-4418

Radar Engineers, 4719 Brooklyn, Seattle 5, Wash., 12, 17
Tel: LAkeview 5-5335

Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 12, 19, 21, 26, 37, 38, 50, 70, 73, 77, 80
See ad on page 322
Tel: OVerbrook 1-5600

Radar Relay, Inc., 2322 Michigan Ave., Santa Monica, Calif., 60, 62, 66, 69, 78, 81
Tel: TExas 0-1526

Radex Corp., 2076 Elston Ave., Chicago 14, Ill., 5, 56, 92
Tel: ARmitage 6-6900

Radial Cutter Mfg. Corp., 831 Bond St., Elizabeth 4, N.J., 92
Tel: ELizabeth 5-9000

Radian Labs., Inc., P.O. Box 454, Mineola, L.I., N.Y., 52
Tel: MA 1-7455

Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio, 37, 45, 61
Tel: MElrose 1-6660

Radiation Counter Labs., 5121 Grove St., Skokie, Ill., 4, 22
Tel: ORchard 3-8700

Radiation Dynamics, Inc., Westbury Industrial Park, Westbury, L.I., N.Y., 22
Tel: EDgewood 4-3990

Radiation Electronics Co., 8241 N. Kimball, Skokie, Ill., 12, 15, 36, 72, 73, 90
Tel: ORchard 4-4900

Radiation, Inc., Melbourne, Fla., 1, 3, 9, 25, 34, 36, 37, 80
Tel: PArkway 3-1511

Radiation Instr. Dev. Lab., 5737 S. Halsted St., Chicago 21, Ill., 9, 12, 22, 36
Tel: TRiangle 3-2345

Radiation Research Corp., 1114 First Ave., New York 21, N.Y., 39, 41, 75, 90
Tel: TEmpleton 8-2513

Radiatronics, Inc., 5956 Kester Ave., Van Nuys, Calif., 18, 28, 37, 50, 61, 70, 80, 81, 84, 86
Tel: STate 2-1461

Radio City Prods. Co., Inc., Centre & Glendale Sts., Easton, Pa., 1, 3, 12, 19, 26, 36, 61, 86, 90
Tel BLackburn 8-9122

Radio Components, Ltd., 50 Wingold Ave., Toronto, Ont., Canada, 41, 43, 70, 73, 77
Tel: RUssell 1-6174

Radio Cores, Inc., 9540 S. Tulley Ave., Oak Lawn, Ill., 46
See ad on page 435
Tel: GArden 2-3353

Radio Corp. of America, Astro-Electronic Prods. Div., Princeton, N.J., 15
Tel: WAlnut 4-2700

Radio Corp. of America, Defense Electronic Products, Front & Cooper Sts., Camden, N.J., 1, 6, 7, 10, 14, 15, 16, 18, 20, 21, 27, 29, 30, 32, 34, 37, 39, 54, 68, 76, 100
Tel: WOodlawn 3-8000

Radio Corp. of America, Electron Tube Div., Section I-22-Q, 415 S. 5th St., Harrison, N.J., 3, 12, 23, 26, 35, 39, 56, 63, 65, 68, 72, 74, 75, 76, 92, 99
See ad on pages 53-55
Tel: HUmboldt 5-3900

Radio Corp of America, RCA Labs., David Sarnoff Research Center, Princeton, N.J., 90
Tel: WAlnut 4-2700

Radio Corp. of America, Semiconductor & Materials Div., Section I-22-NN, Rt. 202, Somerville, N.J., 9, 46, 62, 64, 68, 72
See ad on page 56
Tel: RAndolph 5-4500

Radio Craftsmen, Inc., 4223 W. Jefferson Blvd., Los Angeles 16, Calif., 22, 36, 59
Tel: RE 1-7321

Radio Development & Research, Inc., 100 Pennsylvania Ave., Paterson 3, N.J., 4, 28, 36, 40, 43, 45, 58, 61, 64, 68, 72, 73, 79
Tel: LAmbert 5-2200

Radio Engineering Co., 8 State St., New York 4, N.Y., 36, 62, 85, 86
Tel: WH 4-5266

Radio Engineering Labs., 29-01 Borden Ave., Long Island City 1, N.Y., 2, 7, 18, 24, 29, 36, 61
Tel: STillwell 6-2100

Radio Engrg. Labs., Inc., Standard Electronics Div., 29-01 Borden Ave., Long Island City 1, N.Y., 2, 7, 8, 29, 32, 36, 50, 53, 61, 73, 79
Tel: STillwell 6-2100

Radio Eng. Prod., Ltd., 1080 University St., Montreal 3, Que., Canada, 3, 8, 33, 36, 49, 50, 53, 66
Tel: UNiversity 6-6887

Radio Frequency Laboratories, Inc., Powerville Rd., Boonton, N.J., 12, 33, 34, 36, 52, 61, 63, 84, 87
See ad on page 304
Tel: DEerfield 4-3100

Radio Industries, Inc., 666 Garland Pl., Des Plaines, Ill., 41, 43, 73
Tel: VAnderbilt 7-4402

Radio Magazines, Inc., P.O. Box 629, Mineola, L.I., N.Y., 101
Tel: PI 2-1950

Radio Mfg. Co., Inc., 65 Eucalyptus Lane, Santa Barbara, Calif., 99
Tel: WOodland 9-0419

Radio Mfg. Engineers, Div., Electro Voice, Inc., Buchanan, Mich., 2
Tel: OX 5-6831

Radio Materials Co., 3325 N. California Ave., Chicago 18, Ill., 41
Tel: IRving 8-3600

Radio Music Corp., 84 S. Water St., Port Chester, N.Y., 32, 36, 50, 59
Tel: JEfferson 1-8620

Radio Receptor Co., Inc., Eng. Products Div., 81 N. 4th St., Brooklyn 11, N.Y., 1, 6, 16, 18, 20, 21, 24, 25, 29, 34, 61
Tel: EV 8-6000

Radio Receptor Co., Inc., Selenium Div., 240 Wythe Ave., Brooklyn 11, N.Y., 64
Tel: EVergreen 8-6000

Radiometer Co., 72 Emdrupvej, Copenhagen, N.V., Denmark, 3, 5, 12, 13, 23, 26, 35, 36, 56, 61
Tel: SO 5000

Radion Corp., 345 E. Terra Cotta Ave., Crystal Lake, Ill., 37
Tel: 3700

Radionic Labs., Inc., 1111 State Rd. 67 East, Anderson, Ind., 90

Rae Motor Corp., 2009 Kewaunee, Racine, Wis., 58
Tel: ME 3-1196

Railroad Electronic Labs. of Omaha, Inc., 6614 Blondo St., Omaha 4, Neb., 30, 43, 50, 54, 61, 73
Tel: REgent 1513

Railway Communications, 9351 E. 59 St., Raytown 33, Mo., 3, 8, 12, 23, 43, 49, 50, 73, 85, 90
Tel: FLeming 3-2100

Ram Chemicals, Inc., 210 E. Olive St., Gardena, Calif., 90, 91
Tel: FAculty 1-0710

Ram Electronics, Inc., 600 Industrial Ave., Paramus, N.J., 36, 43, 50, 61, 73
Tel: COlfax 1-6930

Ram Meter, Inc., 1100 Hilton Rd. Ferndale, Detroit 20, Mich., 86, 90
Tel: LIncoln 7-1000

Ramage & Miller Enterprises, 3221 Florida Ave., Richmond, Calif., 25, 26, 36, 61, 73
Tel: BEacon 4-7061

Ramo-Wooldridge Corp., P.O. Box 45215 Airport Sta., Los Angeles 45, Calif., 1, 9, 12, 19, 34, 45, 61, 90
Tel: OBborne 5-4651

Rand Corp., 1700 Main St., Santa Monica, Calif., 90

Randall, Inc., Douglas, 6 Pawcatuck Ave., Westerly, R.I., 43, 73
Tel: LY 5-5757

Rangertone, Inc., 73 Winthrop St., Newark, N.J., 32, 63, 85
Tel: HUmboldt 5-2550

Rank Cintel, Ltd., Worsley Bridge Rd., London, S.E. 26, England, 3, 4, 5, 7, 9, 12, 21, 22, 23, 27, 31, 32, 36, 43, 61, 62, 73, 74, 75, 79
Tel: HIther Green 4600

Ransom Research, Box 269, San Pedro, Calif., 9
Tel: TE 2-6848

Rantec Corp., 23999 Ventura Blvd., Calabasas, Calif., 19, 37, 38, 50, 70, 80
See ad on page 385
Tel: DIamond 7-5446

Rapid Electric Co., 2881 Middletown Rd., New York 61, N.Y., 61, 64
See ad on page 501
Tel: TAlmadge 8-2200

Rapid Specialties Co., 325 W. Huron St., Chicago 10, Ill., 87
Tel: DElaware 7-1440

Rattray & Co., Inc., George, 116-08 Myrtle Ave., Richmond Hill 18, N.Y., 67
See ad on page 535
VIrginia 6-8250

Rauland Corp., 4245 N. Knox Ave., Chicago 41, Ill., 74, 75, 76, 99
Tel: MUlberry 5-5000

Raway Bearing Co., 8 Forsythe St., New York 2, N.Y., 87
Tel: WA 5-8150

Rawson Electrical Instrument Co., 118 Potter St., Cambridge 42, Mass., 3, 12, 26, 43, 56
See ad on page 473
Tel: KIrkland 7-4041

Raybestos Manhattan, Inc., Manheim, Pa., 86, 87, 89, 91, 95
Tel: MOhawk 5-2211

Raymond Engineering Lab., Smith St., Middletown, Conn., 4, 9, 28, 90
Tel: DI 6-7745

Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis., 39
Tel: ALpine 5-7201

Raypar, Inc., 7800 W. Addison St., Chicago 34, Ill., 43, 45, 69, 73, 99
Tel: TUxedo 9-3700

Raytheon Co., Waltham 54, Mass., 1, 3, 8, 9, 10, 12, 15, 16, 17, 18, 23, 24, 25, 36, 38, 43, 45, 46, 47, 50, 51, 53, 61, 62, 64, 67, 68, 70, 73, 74, 75, 76, 79, 80, 83, 86, 90, 92, 94
Tel: TWinbrook 9-8400

Raytheon Co., Microwave & Power Tube Div., Waltham 54, Mass. 76
See ad on page 582
Tel: TWinbrook 9-8400

Raytheon Co., Semiconductor Div., 215 First Ave., Needham Heights 94, Mass., 9, 62, 64, 68
Tel: HIllcrest 4-6700

Raytherm Corp., Oakside at Northside, Redwood City, Calif., 82
Tel: EMerson 9-3376

Rea Magnet Wire Co., Inc., 3610 E. Pontiac St., Fort Wayne 4, Ind., 82
Tel: ANthony 5201

Recora Co., Inc., Powis Rd., Box 68, St. Charles, Ill., 4, 70
Tel: SAint Charles 9000

Recordise Corp., P.O. Box 478, Edgemere, L.I., 91, N.Y., 63

Recoton Corp., 52-35 Barnett Ave., Long Island City 4, N.Y., 36, 59, 63
Tel: DEfender 5-3344

Rectico, Inc., 963 Frelinghuysen Ave., Newark, N.J., 64
Tel: BIgelow 3-8738

Red Devil Mfg. Co., 1402 N. Ogden Ave., Chicago 10, Ill., 87
Tel: MIchigan 2-5161

Red Point Corp., 1907 Riverside Dr., Glendale 1, Calif., 86, 92
Tel: TH 2-4895

Redford Corp., The, Lake Luzerne, N.Y., 4, 9, 15, 28, 31
Tel: LUzerne 3064

Redman Electronics Corp., P.O. Box 72, Thompsonville, Conn., 43, 48, 73
Tel: RIverview 5-8024

Redmond Co., Inc., Owosso, Mich., 45, 58

Reed & Prince Mfg. Co., 1 Duncan Ave., Worcester 1, Mass., 87
Tel: PL 3-2934

Reed Research, Inc., 1048 Potomac St. N.W., Washington 7, D.C., 14, 27, 70
Tel: FE 3-7000

Reese, Inc., J. Ramsey, 71 Murray St., New York 7, N.Y., 86, 87, 98
Tel: WOrth 2-4059

Reeve Electronics, Inc., 609 W. Lake St., Chicago 6, Ill., 88, 92
Tel: RAndolph 6-9755

Reeves Equipment Corp., 10 E. 52nd St., New York 22, N.Y., 27, 30, 54, 63
Tel: PLaza 9-7189

Reeves-Hoffman Div., 145 Cherry St., Carlisle, Pa., 31, 47, 50
Tel: 2480

Reeves Instruments Corp., Roosevelt Field, Garden City, L.I., N.Y., 1, 4, 9, 12, 14, 25, 28, 36, 37, 61, 62, 72, 80, 86, 87, 90, 98
Tel: PIoneer 6-8100

Reeves Soundcraft Corp., Great Pasture Rd., Danbury, Conn., 27, 63, 85, 91
Tel: PI 3-7601

Reflectone Corp., Post Rd., Stamford, Conn., 1, 9, 12, 36, 61
Tel: DA 5-2251

Regent Controls, Inc., Harvard Ave., Stamford, Conn., 4, 62
Tel: FI 8-7734

Rego Insulated Wire Co., 830 Monroe St., Hoboken, N.J., 37, 82
Tel: OL 6-2020

Regulator Equipment Corp., 100 Pennsylvania, Paterson 3, N.J., 36, 66, 79
Tel: LA 5-2200

Reichhold Chemicals, Inc., 525 N. Broadway, White Plains, N.Y., 91
Tel: WHite Plains 8-6200

Reilly Tar & Chemical, 1615 Merchant Bank, Indianapolis 4, Ind., 91
Tel: ME 8-7531

Reiner Electronics Co., Centre & Glendale Sts., Easton, Pa., 81, 84, 86, 90
Tel: BLackburn 8-9122

Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y., 101
Tel: MU 8-8600

Rek-O-Kut Co., Inc., 38-19 108th St., Corona 68, N.Y., 27, 32, 59, 63
Tel: DEfender 5-3500

Relay Sales, Inc., P.O. Box 186-IR, West Chicago, Ill., 66, 102
See ad on page 524
Tel: WEst Chicago 1100

Relays, Inc., 162 W. 83rd St., New York 24, N.Y., 66
Tel: TR 3-4500

Reliance Automatic Lighting Co., 1919 Mead St., Racine, Wis., 4, 70
Tel: MElrose 2-6171

Remanco, Inc., 1630 Euclid, Santa Monica, Calif., 1, 15, 18, 25, 26, 29, 36, 38, 90
Tel: EX 3-7184

Remler Co., 2101 Bryant, San Francisco 10, Calif., 1, 16, 30, 44, 57, 69, 78, 84, 86, 87, 94, 99
Tel: VAlencia 4-3435

Renbrandt, Inc., 6 Parmelee St., Boston 18, Mass., 28
Tel: HI 5-8910

Reon Resistor Corp., 117 Stanley Ave., Yonkers, N.Y., 67
See ad on page 537
Tel: YOnkers 5-9850

Republic Aviation Corp., Special Prods. & Services, Conklin St., Farmingdale, N.Y., 3, 12, 15, 25, 37, 61, 86, 92, 95
Tel: CH 9-1100

Republic Electronic Industries Corp., 111 Gazza Blvd., Farmingdale, L.I., N.Y., 1, 3, 10, 12, 16, 23, 26, 30, 32, 33, 36, 61, 62, 72
Tel: CHapel 9-1414

Republic Foil, Inc., 55 Triangle St., Danbury, Conn., 93
Tel: PIoneer 3-2731

Republic Lens Co., Inc., 31 E. 169 St., New York 52, N.Y., 32, 47
Tel: CYpress 3-2790

Resdel Engrg. Corp., 330 S. Fair Oaks Ave., Pasadena, Calif., 1, 4, 18, 19, 25, 26, 31, 36, 61, 85, 86, 88, 90
Tel: SYcamore 5-5197

Rese Engineering, Inc., 731 Arch St., Philadelphia, Pa., 9, 12, 36, 62
Tel: WAlnut 2-5841

Research Chemicals, Inc., 170 W. Providencia, Box 431, Burbank, Calif., 93
Tel: VI 9-1648

Research Development Mfg. 429 E. Collom St., Philadelphia 44, Pa., 28, 46, 87
Tel: GLadstone 5-9700

Research, Inc., 115 N. Buchanan Ave., Hopkins, Minn., 12, 88
Tel: WEst 5-2156

Research Industrial Labs., Roslyn, Pa. 4, 12, 36, 56, 90
Tel: TU 4-8098

Resin Consultants & Mfg. Co., Inc. 132 Nassau St., New York 38, N.Y. 86, 89, 91
Tel: BEekman 3-5587

Resistance Products Co., 914 S. 13th St. Harrisburg, Pa., 67
Tel: CEdar 6-9006

Resistors, Inc., 5226 W. 26 St., Cicero 50, Ill., 67
Tel: OLympic 2-7555

Resistron Labs., Inc., 2908 Nebraska Ave., Santa Monica, Calif., 12, 22, 41, 61, 65, 70, 73, 74, 75, 76, 99
Tel: EXbrook 3-5217

Revere Copper & Brass, 230 Park Ave. New York, N.Y., 93
Tel: MUrray Hill 9-6800

Revere Corp. of America, N. Colony Rd., Wallingford, Conn., 4, 66, 70, 72, 82
Tel: COlony 9-7701

Rex Corporation, Hayward Rd., West Acton, Mass., 82, 89, 95
Tel: COlonial 3-7721

Rex Rheostat Co., 149 Babylon Tpke. Roosevelt, L.I., N.Y., 67
Tel: FReeport 9-1030

Reynolds Electric Co., 3000 River Rd. River Grove, Ill., 58
Tel: TUx 9-2232

Rheem Mfg. Co., see: United Electrodynamics, Inc.

Rheem Semiconductor Corp., Dept. P12, 327 Moffett Blvd., P.O. Box 816, Mountain View, Calif., 64, 68
See ad on page 512
Tel: YOrkshire 8-8391

Rhein Sound System, Inc., 133 Hamilton St., New Haven, Conn., 1, 6, 30, 32, 36, 77
Tel: SPruce 7-4175

Rho Engineering Co., 2242 Sepulveda Blvd., Los Angeles, Calif., 36, 38, 41, 61, 62, 67, 86, 90
Tel: GR 7-4741

Rhode Island Insulated Wire Co., Inc. 50 Burnham Ave., Cranston, R.I., 82
Tel: EL 1-2500

Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn., 4, 66, 70
Tel: JAckson 2-4265

Ribet & Desjardins, 13-17 Rue Perier, Montrouge, Seine, France, 26, 35, 70
Tel: ALesia 24-40

Rich Electronics, Inc., 212 N.W. 8th Ave., Miami 36, Fla., 4, 16, 36, 37, 85, 86, 90
Tel: Miami FR 4-1304

Richards Co., Inc., Arklay S., 38 Winchester St., Newton Highlands, Mass. 12
Tel: LA 7-4385

Richards Electrocraft, 4432 N. Kedzie Ave., Chicago 25, Ill., 44, 53, 70
Tel: CO 7-4011

Richardson-Allen Corp., 116-15 15 Ave., College Point 56, N.Y., 61
Tel: FLushing 3-2828

Richardson Co., 2749 Lake St., Melrose Park, Ill., 81, 86, 89, 94, 95
Tel: MA 6-8900

Richmont, Inc., 922 S. Myrtle Ave., Monrovia, Calif., 92
Tel: ELliott 9-2555

Rider Publisher, Inc., J. F., 116 West 14th St., New York 11, N.Y., 101
Tel: ORegon 5-5020

Riester & Thesmacher Co., 1526 W. 25 St., Cleveland 13, Ohio, 81, 84
Tel: CHerry 1-0154

Rimak, Inc., 10929 Vanowen St., N. Hollywood, Calif., 12, 32, 81, 84, 86, 87, 88, 98
Tel: TRiangle 7-5526

Rinco, Inc., 7962 S.E. Powell Blvd., Portland 6, Ore., 5, 67
Tel: PRospect 4-3259

Ripley Co., Inc., 1 Factory St., Box 31, Middletown, Conn., 40, 58
See ad on page 396
Tel: DIamond 6-6679

Riverbank Labs., Engrg. Dept., P.O. Box 65, Geneva, Ill., 61
Tel: GEneva 2207

Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 9, 36, 37, 38, 45, 50, 61, 62, 66, 73, 80
See ad on page 525
Tel: LOckwood 5-4578

Robbins & Myers, Inc., Motor Div., 1345 Lagonda Ave., Springfield, Ohio, 58
Tel: FAirfax 3-6461

Roberts Electronics, Inc., 1045 N. Sycamore, Hollywood 38, Calif., 27
Tel: HO 2-6331

Robertshaw-Fulton Controls, Acro Div., 2040 E. Main St., Columbus 16, Ohio, 58, 66, 70
See ad on page 555
Tel: CLearbrook 3-8531

Robertshaw-Fulton Controls, Aeronautical & Instrument Div., Santa Ana Freeway, Anaheim, Calif., 36, 47, 56, 80, 82
Tel: KEystone 5-8151

Robertshaw-Fulton Controls, Fulton Sylphon Div., P.O. Box 400, Knoxville 1, Tenn., 4, 71
Tel: 4-1641

Robertson Electric Co., Inc., 124 S. Elmwood Ave., Buffalo 2, N.Y., 44, 82, 89, 94
See ads on pages 425, 615
Tel: MAdison 6658

Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif., 4, 28, 36, 85
Tel: RYan 1-1594

Robins Industries Corp., 36-27 Prince St., Flushing 54, N.Y., 63, 86, 87
Tel: HIckory 5-7200

Robinson Machine Co., Inc., 286 Preakness Ave., Paterson 2, N.J., 92
Tel: ARmory 4-8405

Robinson Recording Labs., #35 S. 9th St., Philadelphia 7, Pa., 32
Tel: WA 2-6800

Robinson Technical Products, Inc., Teterboro Air Terminal, Teterboro, N.J., 78
Tel.: ATlas 8-2500

Robotron Corp., 21300 West 8 Mile Rd., Detroit 41, Mich., 4, 88
Tel: KEnwood 4-7400

Rockbar Corp., 650 Halstead Ave., Mamaroneck, N.Y., 54, 59
Tel: OWen 8-7300

Rockbestos Product Corp., Nicoll & Canner Sts., New Haven 4, Conn., 82
Tel: STate 7-1141

Rockefeller Institute, York Ave. & 66th St., New York 21, N.Y., 90
Tel: LE 5-9000

Rockland Insulated Wire & Cable Co., Inc., 36 Main St., Haverstraw, N.Y., 82
Tel: HAverstraw 9-3103

Rockwell Engineering, 2125 E. 45th St., Indianapolis 5, Ind., 28, 90
Tel: CLifford 1-9453

Rodale Mfg. Co., Inc., 6th & Minor Sts., Emmaus, Pa., 44, 51, 69, 70, 87
Tel: WOodring 5-9071

Rode, Inc., 5 Green St., Woburn, Mass., 80
Tel: WEIls 3-3580

Rodney Associates, Inc., 855 Sixth Ave., New York 1, N.Y., 100, 101
Tel: WIsconsin 7-5716

Roeblings Sons Corp., J. A., 640 S. Broad St., Trenton 2, N.J., 82
Tel: EXport 6-6511

Roflan Co., Route 17, Topsfield, Mass., 24, 37, 44, 53, 54, 57, 70

Rogan Brothers, 8009 N. Monticello Ave., Skokie, Ill., 94
See ad on page 683
Tel: ORchard 5-1233

Rogers Corp., Rogers, Conn., 62, 86, 87, 89, 90, 95
Tel: PRescott 4-9605

Rogers Electronic Tubes & Components, 116 Vanderhoof Ave., Toronto 17, Ont., Canada, 41, 42, 46, 50, 54, 67, 68, 69, 73, 74, 75, 76, 83
Tel: HU 5-8621

Rohde & Schwarz Sales Co. (USA), Inc., 111 Lexington Ave., P.O. Box 275, Passaic, N.J., 3, 5, 12, 19, 21, 26, 29, 31, 33, 36, 37, 38, 41
Tel: PRescott 3-8010

Rohn Mfg. Co., 116 Limestone, Bellevue, Peoria, Ill., 37
Tel: 7-8416

Rola Co., Div. Muter Co., 2530 Superior Ave., Cleveland, Ohio, 43, 54, 73
Tel: PR 1-4242

Rollan Electric Co., 8233 Princeton Ave., Chicago 20, Ill., 37, 43, 73, 92
Tel: RAdcliff 3-4000

Roller Mike, Inc., 110 Wall St., New York 5, N.Y., 4, 47, 85
Tel: WH 3-5792

Roller-Smith Instruments, Inc., 50 Ave. "L," Newark, N.J., 56, 70
Tel: MArket 3-8520

Romac Products Co., 48-01 25th Ave., Long Island City 3, N.Y., 86, 99
Tel: RA 8-2631

Romar Plastics, Inc., 1313 E. Main St., St. Charles, Ill., 86
Tel: JUno 6-6571

Rome Cable Corp., 421 Ridge St., Rome, N.Y., 82
Tel: ROme 3000

Ronette Acoustical Corp., 190 Earle Ave., Lynbrook, N.Y., 57, 59
Tel: LYnbrook 3-5500

Rosan, Inc., 2901 W. Coast Hwy., Newport Beach, Calif., 87, 98
Tel: LIberty 8-5533

Rosemont Engrg. Co., 4900 W. 78th St., Minneapolis 24, Minn., 72
Tel: WA 7-7711

Rosenberg Associates, 100 Stevens Ave., Mt. Vernon, N.Y., 85, 90
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Rosenberg, Paul, 100 Stevens Ave., Mt. Vernon, N.Y., 85
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Tel: MOunt Vernon 7-8040

Rosenthal, Myron M., 19 Brookline Dr., North Massapequa, N.Y., 85
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Tel: PErshing 5-2501

Ross & Associates, Donald, 7908 Bonhomme St., St. Louis 5, Mo., 85
Tel: PArkview 5-2242

Ross Mfg. Co., 2538 Peterson, Chicago 40, Ill., 43, 73
Tel: BRiargate 4-6330

Ross Metal Co., Milton, 235 Jacksonville Rd., Hatboro, Pa., 9, 43, 44, 46, 52, 53, 62, 69, 73, 81, 82, 83, 86, 87, 89, 91, 94, 95, 98, 99
Tel: OSborne 2-0550

Rostan Corp., 5660 59th St., Maspeth 78, L.I., N.Y., 37
Tel: TW 4-7558

Rotary Devices Corp., 40 Jay St., Englewood, N.J., 4, 9, 28, 34, 37, 44, 45, 56, 70, 80, 94
Tel: LO 9-0433

Rotating Components, Inc., 267 Green St., Brooklyn 22, N.Y., 40, 58
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Tel: EVergreen 9-3490

Rotor Clip Co., 114 Allen Blvd., Farmingdale, N.Y., 87

Rototest Labs., Inc., 2803 Los Flores Blvd., Lynwood, Calif., 85, 90
Tel: NEvada 6-9238

Rotron Mfg. Co., 7-9 Schoonmaker Lane, Woodstock, N.Y., 40, 70
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Tel: ORiole 9-2401

Rountree, J. G., Consulting Engineer, 4906 Westfield Dr., Austin 3, Tex., 85

Rowan Controller, 2315 Homewood Ave., Baltimore 18, Md., 50, 66, 70
Tel: BE 5-7113

Rowe Engravers, 262 E. 16th St., Paterson 4, N.Y., 62, 86
Tel: MUlberry 4-1426

Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 16, 21, 37
Tel: EVergreen 2-5666

Royal Electric Corp., 95 Grand Ave., Pawtucket, R.I., 44, 51 53, 82
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Royal-McBee Corp., Westchester Ave., Port Chester, N.Y., 9
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Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N.J., 91, 93
Tel: PIlgrim 8-1300

Ruby Chemical Co., 68-70 McDowell St., Columbus 16, Ohio, 97
Tel: CApital 1-3055

Ruckelshaus Lab., John G., 110 Pomeroy Rd., Madison, N.J., 67, 85, 90
Tel: FRontier 7-1879

Rucker Co., 4700 San Pablo Ave., Oakland 8, Calif., 12, 37
Tel: OLympic 3-5221

Ruge Associates, Inc., Arthur C., Elm Ave., Hudson, N.H., 4, 5, 56, 67, 72
Tel: TUxedo 2-5195

Rumple, Inc., 15026 Oxnard St., Van Nuys, Calif., 81
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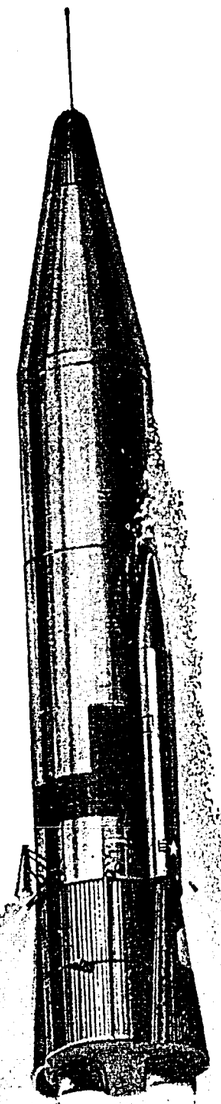

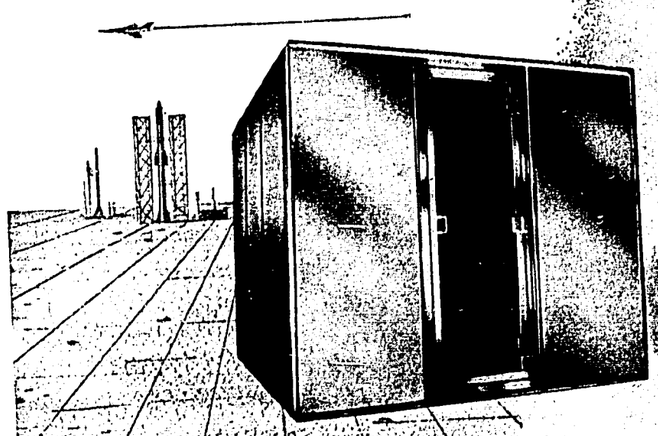

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Russell Gasket Co., & Cleveland Fabricating Co., 7424 Bessemer Ave., Cleveland 27, Ohio, 86, 87
Tel: DIamond 1-5508

Russell & Stoll Co., Inc., 125 Barclay St., New York 7, N.Y., 44

Rust Industrial Co., Inc., 130 Silver St., Manchester, N.H., 13, 14
Tel: NAtional 3-3596

Rutherford Electronics, 8944 Lindblade St., Culver City, Calif., 19
Tel: TExas 0-7393

Ryan Aeronautical Co., Ryan Electronics Div., P.O. Box 2308, San Diego 12, Calif., 1, 4, 9, 15, 25, 28, 37, 61, 90
Tel: BRowning 7-6450

Rycom Instruments, 9351 E. 59 St., Raytown, Mo., 3, 8, 12, 20, 23, 43, 56
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Rye Sound Corp., 145 Elm St., Mamaroneck, N.Y., 27, 36, 44, 53, 54, 69, 74
Tel: OWens 8-0080

Rytron Co., Inc., 7303 Lankershim Blvd., N. Hollywood, Calif., 36, 43, 50, 73
Tel: TRiangle 7-0863

S

S & B Machine & Tool Co., 52 Edison Pl., Newark 2, N.J., 36, 84, 86, 92, 99
Tel: MArket 3-2795

Safeway Heat Element, Inc., 680 Newfield St., Middletown, Conn., 88
Tel: DIamond 6-6601

Salt Corp. of America, 2 Gregg St., Lodi, N.J., 39
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Sag Harbor Industries, Inc., Bay Sq., Sag Harbor, N.Y., 43, 48, 55, 82, 87
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Sage Electronics Corp., 2 Country Club Rd., East Rochester, N.Y., 67
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Tel: LU 6-8010

Sage Laboratories, Inc., 159 Linden St., Wellesley 81, Mass., 19, 37, 38, 47, 50, 70, 80
Tel: CEdar 5-4760

St. Eloi Corporation, P.O. Box 507, Newton Sta., Cincinnati 44, Ohio, 64, 85, 93
Tel: LO 1-6463

St. John X-Ray Laboratory, Califon, N.J., 22, 90
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St. Regis Paper Co., Panelyte Div., 150 E. 42nd St., New York 17, N.Y., 89, 95
Tel: OX 7-4400

Sams & Co., Inc., H. W., 2201 E. 46th St., Indianapolis 6, Ind., 101
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San Fernando Electric Mfg. Co., 1509 First St., San Fernando, Calif., 41, 50, 67
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San Jose Scientific Co., 605 Sunol St., San Jose, Calif., 14, 35
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Sanborn Co., 175 Wyman St., Waltham 54, Mass., 3, 13, 14, 17, 23, 36, 56, 72
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Tel: TWinbrook 4-6300

Sanders Assoc., Inc., 95 Canal St., Nashua, N.H., 4, 15, 25, 28, 37, 38, 40, 47, 50, 62, 80, 82
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Sandia Corporation, Sandia Base, Albuquerque, N.M., 90
Tel: ALpine 6-4411

Sands Associates, Inc., P.O. Box 896, Palo Alto, Calif., 85, 101
Tel: DAvenport 5-3716

Sangamo Electric Co., 11th & Converse Sts., Springfield, Ill., 4, 14, 16, 28, 34, 36, 41, 43, 45, 46, 50, 56, 58, 61, 70, 73, 98
Tel: 4-6411

Sanial Laboratories, 168-14 32 Ave., Flushing 58, L.I., N.Y., 85

Saratoga Industries, Ballston & Congress Aves., Saratoga Springs, N.Y., 19, 22, 26, 36, 38, 43, 45, 50, 61, 73, 77, 79, 80, 90
Tel: SAratoga 4100

Sargeant & Wilbur Heat Treating Corp., 170 York Ave., Pawtucket, R.I., 86, 97
Tel: PA 3-5800

Sargent Electric Corp., 630 Merrick Rd., Lynbrook, L.I., N.Y., 70
Tel: LY 3-5600

Sargent & Greenleaf, Inc., Security Devices Laboratory Div., 24 Seneca Ave., Rochester 21, N.Y., 20, 36, 39, 66
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Sargent-Rayment Co., 4926 East 12th St., Oakland 1, Calif., 36, 77
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Sartron, Inc., 114 N. Main St., Newberg, Ore., 36, 43, 55, 73
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Satellite-Kennedy, Inc. of Calif., P. O. Box 1711, Monterey, Calif., 90
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Sauereisen Cements Co., 1045 N. Canal St., Pittsburgh 15, Pa., 91
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Saxonburg Ceramics, Inc., P.O. Box 157, Saxonburg, Pa., 41, 74, 83, 89
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Saxton Products, Inc., 4320 Park Ave., New York 60, N.Y., 80, 81, 82, 94, 95
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Scaico Controls, Inc., P.O. Box 41, Cooper St., Delanco, N.J., 4, 56, 70, 71
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Scala Radio Co., 2814 Nineteenth St., San Francisco, Calif., 37, 73, 80
Tel: VAlencia 6-2898

Scantlin Electronics, Inc., 2215 Colby Ave., Los Angeles 64, Calif., 9, 20
Tel: GRanite 8-8251

Scatter Comm., Inc., 4923 St. Elmo Ave., Bethesda 14, Md., 24, 37, 85, 90
Tel: OLiver 6-1500

Schaevitz Engineering, Rt. 130, Schaevitz Blvd., Pennsauken, N.J., 4, 12, 26, 28, 44, 61, 72
Tel: NOrmandy 2-8000

Schafer Custom Engineering, 235 S. 3rd St., Burbank, Calif., 4, 32
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Schaffer Air Industries, 290 N. Henry St., Brooklyn 22, N.Y., 12, 86, 90
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Schauer Mfg. Corp., 4500 Alpine Ave., Cincinnati 42, Ohio, 45, 61, 64, 92
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Schindlers, 2429 Beverly Ave., Santa Monica, Calif., 36, 57
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Schirmer-National Alarm, 20 West Side Ave., Bergenfield, N.J., 4, 15, 36
Tel: DUmont 5-1200

Schloer, Inc., Modern Design Div., Vestal Pkwy., Vestal, N.Y., 27, 90, 92, 101
Tel: ST 5-9901

Schlumberger Well Surveying Corp., P.O. Box 307, Ridgefield, Conn., 22
Tel: ID 8-2631

Schmit Engineering Co., 802 Fabian Way, Palo Alto, Calif., 4, 90, 92
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Schoene Electronics Lab., 1410 S. Grand Ave., Evansville 13, Ind., 4, 12, 61, 86, 90
Tel: HA 3-9038

Schrocter, A. R., Route 10, Dover, N.J., 2, 4, 12, 27, 86, 90
Tel: FO 6-3905

Schutter Microwave Corp., Carl W., 80 E. Montauk Hway, Lindenhurst, L.I., N.Y., 30
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Schweber Electronics, 60 Herricks Rd., Mineola, L.I., N.Y., 41, 102
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Schweitzer Inc., Peter J., Lee, Mass., 89, 93
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Sciaky Bros., Inc., 4915 W. 67th St., Chicago 38, Ill., 4, 9, 73, 88, 92

Scientific-Atlanta, Inc., 2162 Piedmont Rd., N.E., Atlanta 9, Ga., 4, 14, 19, 21, 26, 80
Tel: TRinity 5-7291

Scientific Components, Inc., 30 S. Salsipuedes St., Santa Barbara, Calif., 44, 62
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Scientific Electric, Inc., 105-119 Moroe St., Garfield, N.J., 12, 61, 88, 92
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Scientific Electronic Labs., Inc., 866 Bergen St., Newark 8, N.J., 52, 70, 83, 99
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Scientific Engineering Labs., 1510 Sixth St., Berkeley 10, Calif., 4, 12, 22, 61, 88, 92
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Tel: LAndscape 6-2772

Scientific Radio Products, 215 S. 11th St., Omaha 2, Neb., 47, 50
Tel: ATlantic 9787

Scientific Radio Service, 4301 Sheridan St., University Park, Hyattsville, Md., 47
Tel: WA 7-0535

Scientific Service Labs., 7725 Pinson St., Dallas, Tex., 1, 4, 13
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Numbers after address show the product and service classes in which firm appears. These classified listings follow the Alphabetical Directory. For complete instructions on use of this Directory, see pink sheets preceding catalog section.

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Known for over thirty years for transformer custom-design and manufacture.

The illustrations shown here are only a few of the many types manufactured.

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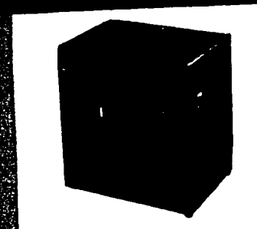
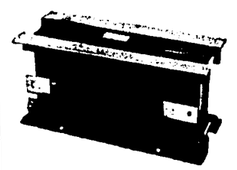
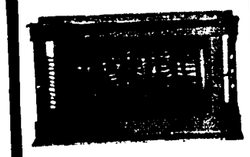
SIGNALING
HIGH AND LOW
VOLTAGE



High Voltage Test up to 50 KV Often equipped with circuit breakers, indicating meter and variable auto transformer input to 20 KVA

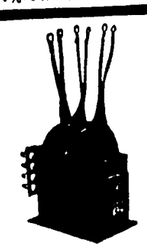


Current Transformer Phase Angle error corrected 2.4 minutes. Accuracy ½ of 1% 1 to 10,000 Amperes.

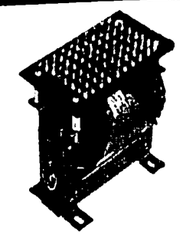


Audio Transformer, from 2 Cycles to 3 KC in sizes from 1 to 100 KVA

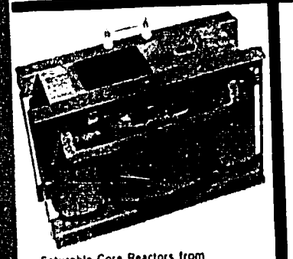
Air Core Reactors 0 1 to 50 KVA



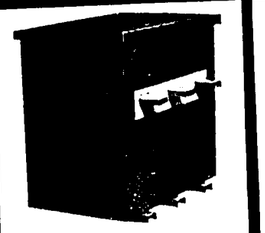
Multi-filament transformer up to 10 KVA and up to 60 KV insulation



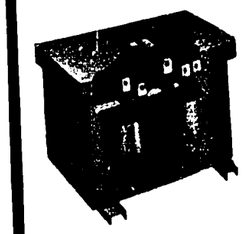
Multi-Voltage Transformer for test or experimental use 0 1 to 50 KVA



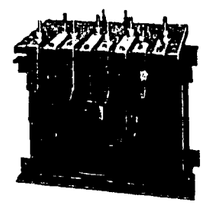
Saturable Core Reactors from sizes 1 to 200 KVA



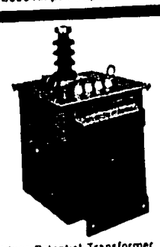
Rectifying Transformer 1, 2 or 3 Phase, 1 to 3000 Amperes up to 300 KVA



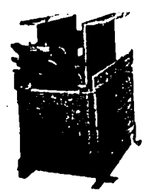
Phase Changing Transformer 2 to 300 KV



Filament Transformer, 400 cycles with 4 secondaries, 10 volts, 100 Amperes. Each secondary can be mounted in parallel series or series parallel.



Outdoor Potential Transformer, output: 35 KV, 25 KVA continuous duty, Vacuum-oil filled. With brackets for pole mounting.



Heating Transformer for Molybdenum Furnaces: Has a 10,000 Ampere secondary with a maximum of 5 volts Primary taps extended to reduce secondary to 0.75 volts.

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Tel: ELmwood 6-6339

Scott, Inc., Hermon Hosmer, 111 Powder Mill Rd., Maynard, Mass., 3, 6, 30, 36, 59
Tel: TWin Oaks 7-8801

Scranton Corp., Elcor Div., 4059 W. North, Chicago 39, Ill., 40, 45, 58, 61
Tel: HU 6-2060

Scripps Institute of Oceanography, Marine Physical Lab., University of Calif., San Diego 52, Calif., 90
Tel: ACademy 3-3218

Scully, Inc., 62 Walter St., Bridgeport 8, Conn., 27
Tel ED 4-5300

Sealectro Corp., 610 Fayette Ave., Mamaroneck, N.Y., 44, 53, 98
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Sealol Corp., Providence 5, R.I., 52, 90
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Sealtron Corp., Reading Rd. at Amity, Cincinnati 15, Ohio, 44, 52
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Secode Corp., 555 Minnesota St., San Francisco 7, Calif., 4, 20, 33, 61
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Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 82
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Seeburg Corp., 1500 N. Dayton St., Chicago 22, Ill., 30, 36, 59
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Seeley Electronics, 1060 S. La Brea Ave., Los Angeles 19, Calif., 20
Tel: WEbster 3-1183

Segal Machinery, Edward, 132 Lafayette St., New York 13, N.Y., 92
Tel: WOrth 6-3935

Seismograph Service Corp., Seiscor Mfg Co. Div., P.O. Box 1590, Tulsa 1, Okla., 13, 14, 81, 85, 86, 90
Tel: RIverside 3-1381

Sel-Rex Corp., 75 River Rd., Nutley 10, N.J., 12, 45, 61, 64, 79, 85, 86, 90, 92, 93
Tel: NUtley 2-5200

Semicon, Inc., 258 East St., Lexington 73, Mass., 12, 15, 47, 54, 68, 72, 85
Tel: VOlunteer 2-0496

Semiconductor Information Service, Publ. of Semiconductor Electronics, 238 Main St., Cambridge 42, Mass., 101
Tel: KIrkland 7-1997

Semi-Elements, Inc., Saxonburgh Blvd., Saxonburg, Pa., 47, 64, 68, 83
Tel: FLanders 2-2548

Seminetals, Inc., 133-20 91st Ave., Richmond Hill 18, L.I., N.Y., 47
Tel: AXtel 7-0200

Semrow Products Co., Inc., 4317 N. Ravenswood Ave., Chicago 13, Ill., 87, 93
Tel: BIttersweet 8-4400

Sensitive Research Instrument Corp., 310 Main St., New Rochelle, N.Y., 3, 12, 56
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Tel: BEverly 5-2300

Sensory, Inc., 10 New St., Morristown, N.J., 4, 9, 90
Tel: JE 8-7661

Sequoia Wire & Cable Co., see: Anaconda Wire & Cable Co.

Ser Company, 543 Lexington St., Waltham, Mass., 85, 90, 100, 101
Tel: TW 3-7572

Service Instruments Corp., 426 S. Westgate Dr., Addison, Ill., 3, 12
Tel: KIngswood 3-7740-1

Servo Corp. of America, 111 New South Rd., Hicksville, L.I., N.Y., 1, 4, 9, 12, 15, 16, 19, 21, 28, 34, 36, 58
Tel: WEIls 8-9700

Servo Dynamics Corp., Main St., Somersworth, N.H., 28, 58
Tel: 1126

Servomechanisms, Inc., 12500 Aviation Blvd., Hawthorne, Calif., 1, 4, 9, 15, 28, 36, 58, 72, 73
Tel: ORegon 8-7841

Servomechanisms, Inc., Mechatrol Div., 1200 Prospect Ave., Westbury, N.Y., 4, 28, 36, 58
Tel: ED 3-6000

Servonic Instruments, Inc., 640 Terminal Way, Costa Mesa, Calif., 4, 12, 44, 67, 70, 72
Tel: MIdway 6-2427

Servonics, Inc., 822 N. Henry St., Alexandria, Va., 4, 9, 12, 28, 36, 50, 56
Tel: TEmple 6-4800

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Servotrol Co., 114 W. Illinois St., Chicago 10, Ill., 67
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Sessions & Son, J. H., Riverside Ave., Bristol, Conn., 81, 86, 87
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Set Screw & Manufacturing Co., 470 Main St., Bartlett, Ill., 87
Tel: TEmpson 7-2831

Setchell-Carlson, Inc., New Brighton, St. Paul 12, Minn., 6, 21, 36
Tel: MElrose 3-3131

Seymour Manufacturing Co., Franklin St., Seymour, Conn., 93
Tel: TUxedo 8-2541

Shallcross Manufacturing Co., 20 Preston St., Selma, N.C., 5, 12, 38, 48, 56, 61, 62, 67, 70, 80
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Tel: WOodlawn 5-2341

Shallite, Inc., 128 W. 1st Ave., Roselle, N.J., 67
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Shamban & Co., W. S., 11617 W. Jefferson Blvd., Culver City, Calif., 9, 36, 41, 81, 86, 87, 89, 94, 95
Tel: EXmont 7-2195

Shamp Scientific Supply, Sponge Products Div., 1500 Massachusetts Ave., N.W., Washington 5, D.C., 38, 85, 90, 96
Tel: HU 3-4167

Shand & Jurs Co., 2600 8th St., Berkeley 10, Calif., 4, 34
Tel: AShberry 3-2345

Shanda Lab., Inc., 96 Harrison Ave., Jersey City 4, N.J., 97
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Shaw Insulator Co., 160 Coit St., Irvington 11, N.J., 86
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Sheffield Corp., P.O. Box 893, Dayton 1, Ohio, 4, 12, 92
Tel: CLearwater 4-5577

Shell Chemical Corp., 50 W. 50th St., New York 20, N.Y., 87, 89, 95
Tel: JUdson 6-5000

Sheltered Workshops, Inc., 2521 5th St., Santa Monica, Calif., 81, 86
Tel: EXbrook 9-2741

Shepard Labs., Inc., Broad St. at Park Ave., Summit, N.J., 9, 63
Tel: CRestview 3-5255

Sheppard Co., Inc., R. H., 101 Philadelphia St., Hanover, Pa., 61
Tel: ME 7-3751

Sherman Industrial Electronics, Box 813, 601 W. College Ave., State College, Pa., 88

Sherman Mfg. Co. H. B., 22 Barney St., Battle Creek, Mich., 44, 92, 98
Tel WO 4-7104

Sherold Crystals, Inc., Truman Rd. & McGee Trafficway, Kansas City 8, Mo., 47
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Shielding, Inc., 66 N. Read Ave., Riverton, N.J., 12, 81, 87, 96
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Shipley Co., Inc., 71 Vista Ave., Newton 66, Mass., 86, 91
Tel: DEcatur 2-8222

Shockley Transistor Corp., 1117 California Ave., Palo Alto, Calif., 68
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Shores Labs., P.O. Box 112, East Patchogue, L.I., N.Y., 90
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Shurite Meters, 130 Wallace St., New Haven 8, Conn., 56
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Sibley Co., Bridge St., Haddam 3, Conn., 62, 93
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Siegler Corp., P.O. Box 500, Paramus, N.J., 6, 27, 30, 31, 32, 36, 49, 59, 63, 77
Tel: DIamond 3-5700

Sieman Manufacturing Corp., P.O. Box 275, Wayne, Ill., 4, 58, 67
Tel: MAnsfield 6-3539

Siemens & Halske, A. G., Munich & West Berlin, Germany, 3, 4, 5, 7, 8, 10, 11, 12, 16, 19, 26, 29, 35, 37, 41, 43, 44, 46, 50, 56, 67, 82

Sierra Electronic Corp., 5442D Bohannon Dr., Menlo Park, Calif., 7, 8, 12, 18, 19, 23, 24, 25, 26, 34, 36, 38, 50, 56, 61, 80
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Tel: DAvenport 6-2060

Sierra Research Corp., P.O. Box 22, Buffalo 25, N.Y., 1, 9, 28, 34, 36
Tel: PL 8823

Sightmaster Corp., 50 Aleppo St., Providence 9, R.I., 51
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Sigma Instruments, Inc., 31 Pearl St., South Braintree 85, Mass., 12, 36, 66
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Tel: ESplanade 6-0615

Signalite, Inc., 37-41 Neptune Hwy., Neptune, N.J., 60, 75
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Sikorsky Aircraft, N. Main St., Stratford, Conn., 15, 90
Tel: DR 8-6351

Silicon Transistor Corp., 150 Glen Cove Rd., Carle Place, L.I., N.Y., 68
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Tel: Pioneer 2-4100

Silicone Insulation, Inc., 1383 Seabury Ave., Bronx 61, N.Y., 86, 87, 89, 94, 95, 98
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Silicone Seals, Inc., 3604 Milwaukee Ave., Chicago 41, Ill., 44, 52
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Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 12, 19, 23, 26, 35, 56, 66
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Tel: EStebrook 9-1121

Simpson Manufacturing Co., Inc., M., 32-25 49th St., Long Island City 3, N.Y., 6, 19, 27, 30, 36, 45
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Sims Casting Corporation, 2174 E. Erie Blvd., Syracuse 3, N.Y., 80

Sinclair Radio Associates, Laboratories, Ltd., Box 179, Downsview, P.O., 70 Sheffield St., Toronto 15, Canada, 12, 15, 19, 26, 37, 38, 50, 73, 80, 85, 90
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Tel: CHerry 4-5519

Sinnet Mfg. Co., 945 Pembroke St., Bridgeport 8, Conn., 4, 13, 36, 70
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Single Crystal Corp. of America, Saxonburg Blvd., Saxonburg, Pa., 22
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Sioux Radio Products, 300 Douglas Ave., Yankton, S.D., 37, 43, 73
Tel: North 5-3507

Sivers Lab, Box 42018, Stockholm 42, Sweden, 19, 23, 38, 61, 66, 70, 73, 77, 80
Tel: 19 80 53

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Skottie Electronics, Inc., 304 Bridge St., Phoenixville, Pa., 41
Tel: HUnter 9-4726

Skydyne, Inc., River Rd., P.O. Box 1106, Port Jervis, N.Y., 81, 86
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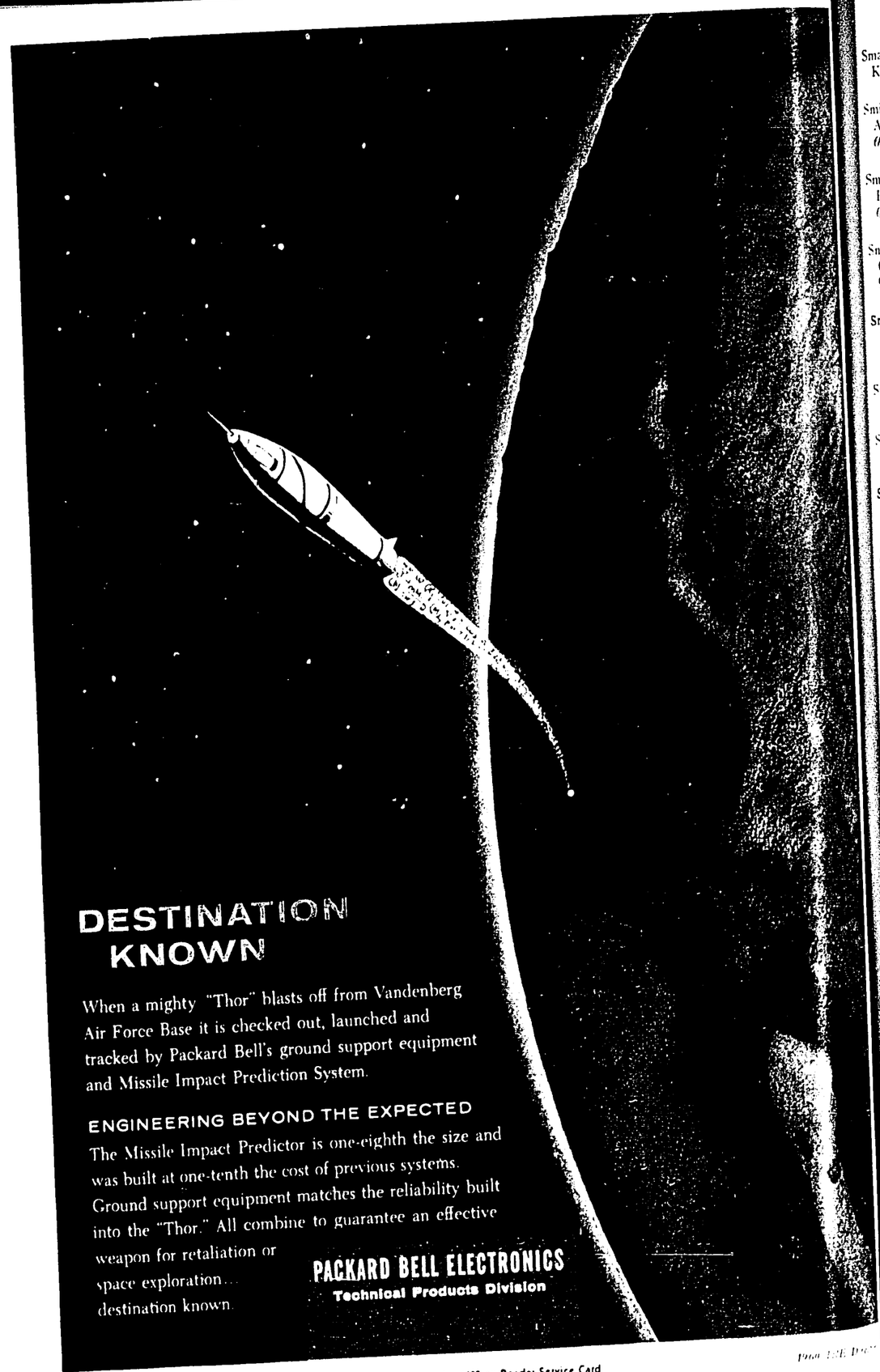

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Tel: CL 3-7900

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Tel: NEwburgh 8800

Smith-Meeker Engineering Co., 157 Chambers St., New York 7, N.Y., 85, 90
Tel: WOrth 4-5510

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Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., 61, 73, 79
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Tel: BIshop 2-1414

Solartron Electronic Group, Ltd., Queens Rd., Thames Ditton, Surrey, England, 3, 9, 12, 19, 23, 25, 34, 36, 38, 61, 72
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Soundscriber Corp., 6 Middletown Ave., North Haven, Conn., 27
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Tel: CLifford 4-5252

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Tel: VIctoria 9-3193

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 3, 4, 5, 9, 12, 13, 14, 15, 23, 27, 34, 36, 45, 56, 63
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Tel: HO 5-3471

Space Electronics Corp., 930 Air Way, Glendale 1, Calif., 19, 24, 25, 85, 89, 90
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Tel: SUperior 7-0580

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Tel: WAlnut 1-2345

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Tel: BRowning 2-0800

Specialty Electronics Development Corp., Eileen Way, Syosset, L.I., N.Y., 12, 15, 19, 22, 23, 24, 34, 36, 38, 46, 47, 52, 56, 61, 80
Tel: WAlnut 1-5200

Specialty Engineering Electronics Co., 79 Clifton Pl., Brooklyn 38, N.Y., 3, 4, 9, 10, 12, 14, 16, 19, 20, 22, 23, 25, 26, 29, 30, 34, 36, 37, 44, 45, 61, 77, 79, 81, 84, 85, 86, 90
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Spectralab Instruments, 608 Fig Ave., Monrovia, Calif., 12, 19, 26, 34, 36, 50
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Speer Carbon Co., Speer Resistor Div., Bradford, Pa., 57, 87
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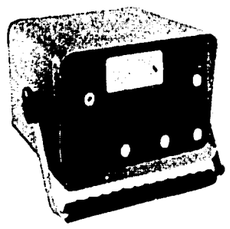

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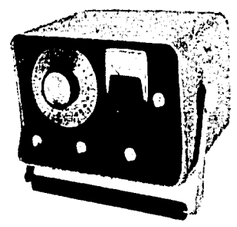

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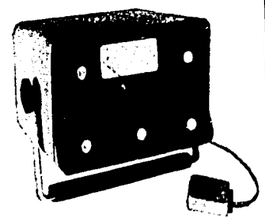
Continuously variable over a frequency range from 2 to 200,000 cps. Transistorized, battery operated, providing 1 v. rms output at less than 1% distortion. Five band, extended frequency range makes this instrument particularly useful in the design, test and repair of audio, geophysical, medical, and control equipment. Special features include calibrated attenuator and adjustable combination handle-support. **FREQUENCY RANGE:** 2 cps to 200 kcps in 5 bands (10:1) • **CALIBRATION ACCURACY:** Frequency 2%, 20 cps to 200 kcps • **LEVEL** 5% • **OUTPUT:** Volts (Rated) 1.0 v. rms at less than 1% distortion • **SOURCE IMPEDANCE:** 1500 ohms in attenuator positions; less than 50 ohms in low impedance position • **DIMENSIONS:** 7½" H (with feet) x 11¾" W (with handle) x 10⅜" D • **PRICE:** $310.00 f.o.b. Houston, Texas.



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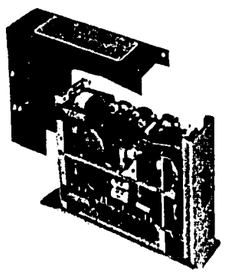
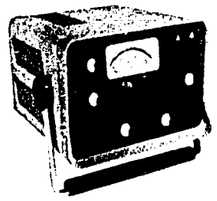
The SIE Model T-1 Vibration Meter enables the user to measure displacement amplitude, acceleration and velocity of vibration—from which frequency can be easily calculated. Battery-powered transistor circuitry makes the T-1 completely portable, and eliminates the effects of power-line transients. It is necessary only to connect the transducer (either seismic-velocity or crystal accelerometer type) for reading to be taken, making the T1 invaluable for field vibration analysis on aircraft, equipment, components or installations with no auxiliary power source. Output jacks are provided to permit waveform monitoring and recording of measured parameters.





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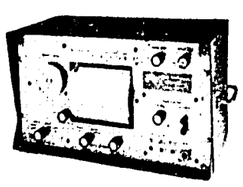

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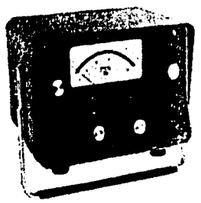

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Sprague Electric Co., 235 Marshall St., North Adams, Mass., 5, 9, 12, 26, 41, 43, 48, 49, 50, 62, 67, 68, 73, 82
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Springer Aircraft Radio, Route 11, Box 330, Indianapolis 19, Ind., 1
Tel: FLeetwood 6-2690

Spruce Pine Mica Co., Inc., P.O. Box 456, Spruce Pine, N.C., 86, 89, 98
Tel: POplar 5-4241

Square D Co., 4041 N. Richards St., Milwaukee 12, Wis., 4, 66, 67, 70, 73
Tel: EDgewood 2-2000

Stackpole Carbon Co., Stackpole St., St. Mary's, Pa., 41, 46, 55, 67, 70
Tel: TErminal 4-1521

Stainless, Inc., North Wales, Pa., 37
See ad on page 384
Tel: OXbow 9-4871

Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif., 9, 27, 58, 61, 63
Tel: HO 4-7461

Standard Cabinet Co., 53 Washington Ave., Carlstadt, N.J., 12, 90
See ad on page 307
Tel: GEneva 8-1500

Standard Coil Products Co., 2100 N. Soto St., Los Angeles 32, Calif., 77, 90
Tel: CApitol 2-8161

Standard Coil Products Co., 2085 N. Hawthorne Ave., Melrose Park, Ill., 77
Tel: AUstin 7-3800

Standard Coil Products Ltd., 37 Drummond St., Toronto 18, Ont., Canada, 77
Tel: CL 9-7651

Standard Condenser Co., 3749 N. Clark St., Chicago 13, Ill., 41
Tel: EAstgate 7-5440

Standard Electric Time Co., 89 Logan St., Springfield 2, Mass., 9, 12, 31, 45, 53, 56, 81, 90
Tel: RE 2-1142

Standard Electrical Products Co., 2240 E. 3rd St., Dayton 3, Ohio, 43, 70, 73
Tel: CLearwater 3-1191

Standard Electromagnetics, Inc., 4 Frederick St., Walkersville, Md., 66
Tel: VInewood 5-2921

Standard Electronics Research Corp., 2 East End Ave., New York 21, N.Y., 4, 12, 17, 72, 85, 90
Tel: RH 4-4100

Standard Gage Co., Inc., Poughkeepsie, N.Y., 92
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Standard Metals Corp., 262 Broad St., North Attleboro, Mass., 44, 80, 82, 86, 87, 93, 97
Tel: MY 5-9395

Standard Plastics Co., Inc., 62 Water St., Attleboro, Mass., 86
Tel: ATtleboro 1-1940

Standard Pressed Steel Co., P.O. Box 693, Jenkintown, Pa., 87
Tel: TUrner 4-7300

Standard Screw Co., 2701 Washington Blvd., Bellwood, Ill., 87
Tel: LInden 4-3500

Standard Telephones & Cables Ltd., Connaught House, 63 Aldwych, London, W.C., 2, England, 1, 3, 5, 7, 8, 9, 13, 18, 19, 24, 25, 29, 32, 34, 36, 37, 38, 41, 46, 47, 52, 53, 54, 57, 61, 64, 65, 66, 67, 68, 73, 74, 75, 76, 82, 88

Standard Tool & Manufacturing Co., 237 Laurel Ave., Kearny, N.J., 86, 92
Tel: WY 1-5500

Stanley Tools, 111 Elm St., New Britain, Conn., 92

Stanley Transformer Co., 31-23 Vernon Blvd., Long Island City 6, N.Y., 73
Tel: YEllowstone 2-4400

Stanpat Co., 150-42 12th Rd., Whitestone 57, N.Y., 86, 95
Tel: FL 9-1693

Stanwyck Coil Co., E., 75 Carson Ave., Newburgh, N.Y., 37, 43, 44, 50, 73, 86
See ad on page 417
Tel: JOhn 1-3030

Stanwyck Winding Co., Inc., 137-151 Walsh Ave., Newburgh, N.Y., 37, 43, 73
Tel: NEwburgh 3360

Star Expansion Industries Corp., Mountainville, N.Y., 53, 87, 92
Tel: COrnwall 3-3755

Star Porcelain Co., 49 Muirhead Ave., Trenton 9, N.J., 46, 83, 89
Tel: EXport 2-3154

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State Laboratories, Inc., 649 Broadway, New York 12, N.Y., 68, 74, 75, 76
See ad on page 581
Tel: ORegon 7-8400

State Testing Lab., Inc., 226 Knowlton St., Bridgeport 8, Conn., 12, 56, 85, 86, 90
Tel: ED 4-4079

States Company, 19 New Park Ave., Hartford 6, Conn., 12, 37, 90, 94, 98
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Tel: PLainfield 7-1600

Sta-Warm Electric Co., 553 N. Chestnut St., Ravenna, Ohio, 88, 92
Tel: AXminister 6-6462

Steel Co., Herman D., Lafayette Bldg., Philadelphia 6, Pa., 87
Tel: WA 5-1900

Steel Protection & Chemical Co., Inc., Bridge St., Mooresville, Ind., 86
Tel: MOoresville 0102

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Tel: MA 4-5911

Steiner-Ives Co., Springfield Rd., Union, N.J., 88
Tel: MUrdock 8-7474

Stelma, Inc., 200 Henry St., Stamford, Conn., 3, 8, 33, 61, 62
Tel: DAvis 4-7561

Stencilgraph Designs, 61 Beekman St., New York 38, N.Y., 86

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Tel: AXminister 5-5421

Stereatronics, Inc., 66 Westland R. E., Weston 93, Mass., 9, 12, 36, 62, 90
Tel: TWinbrook 4-6071

Sterling Manufacturing Co., 7201 Wentworth Ave., Cleveland 2, Ohio, 56
Tel: OLympic 1-5800

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, L.I., N.Y., 1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 23, 25, 26, 28, 32, 34, 36, 37, 38, 43, 45, 50, 56, 58, 61, 70, 72, 77, 79, 80, 81, 84, 85, 86, 87, 90, 96
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Sterling Transformer Co., 297 N. 7th St., Brooklyn 11, N.Y., 73
See ad on page 571
Tel: STagg 2-4200

Stevens-Arnold, Inc., 7 Elkins St., South Boston 27, Mass., 45, 66
See ad on page 430
Tel: ANdrew 8-1170

Stevens Manufacturing Co., Inc., P.O. Box 1007, Mansfield, Ohio, 70, 71
See ad on page 250
Tel: TUxedo 4-1311

Stevens Manufacturing Co., Inc., George, Pulaski Rd. at Peterson, Chicago 30, Ill., 9, 92
See ad on page 673
Tel: JUniper 8-1300

Stevens Products, Inc., 86-88 Main St., E. Orange, N.J., 54, 86, 87, 89, 94, 95
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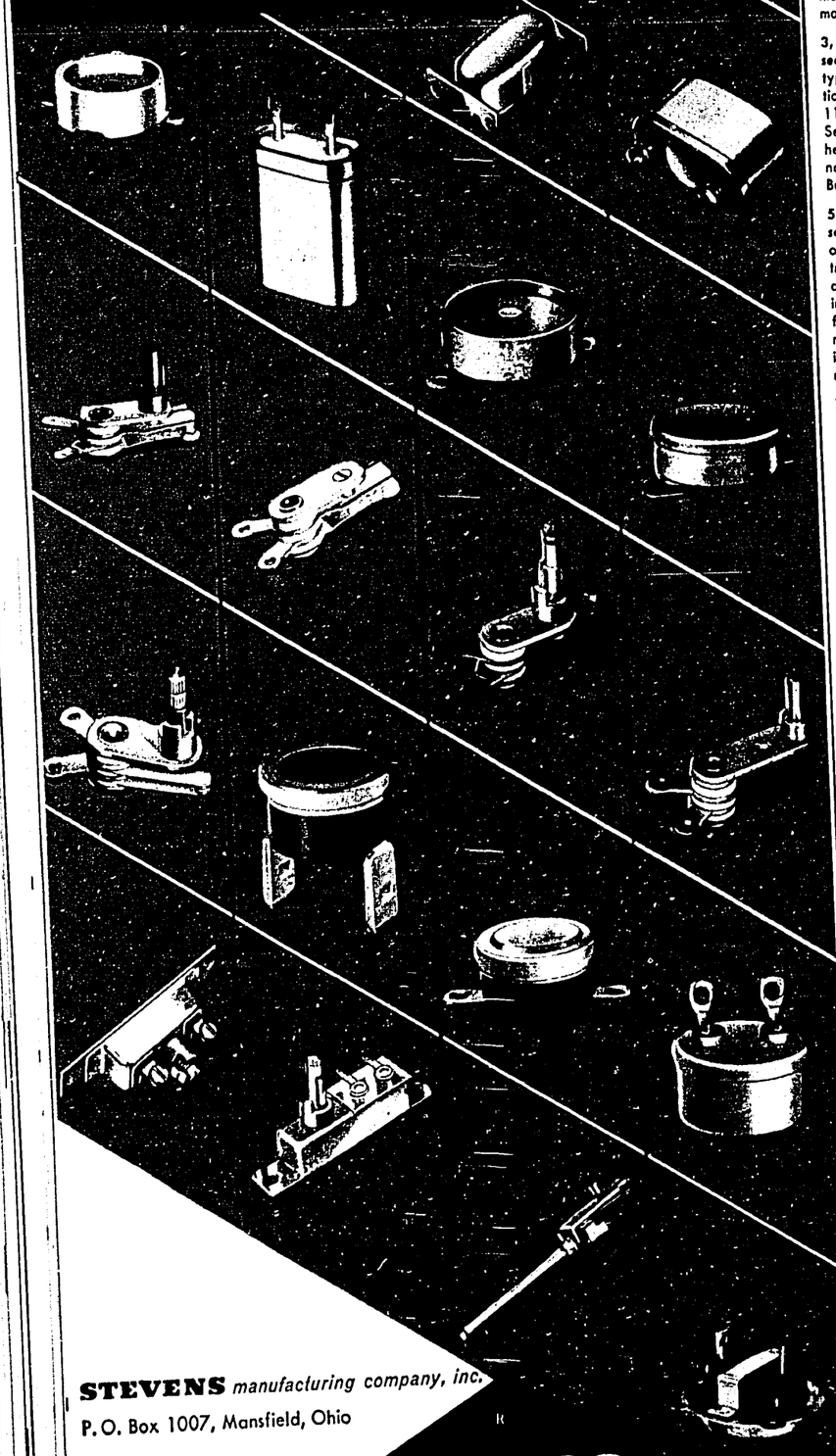

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16, TYPE W* *adjustable* **(16),** *or non-adjustable* Snap action bimetal strip type for operatio to 300°F. Rated at 5 amps at 115 VAC, amps at 230 VAC. Screw or nozzle mounting spade, solder or screw terminals. Bulletin 4000

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Tel: GRaceland 2-6600

Stewart Engineering Co., P.O. Box 727, Soquel, Calif., 19, 88, 92
Tel: GReenwood 5-4790

Stewart Stamping Co., 630 Central Park Ave., Yonkers 4, N.Y., 86, 87, 98
Tel: YO 5-0816

Stewart & Stevenson Services, Inc., 4516 Harrisburg Blvd., Houston, Texas, 58, 61
Tel: CApitol 5-5341

Stewart-Warner Electronics, 1300 N. Kostner Ave., Chicago 51, Ill., 1, 4, 9, 11, 48, 101
Tel: ALbany 2-1000

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Tel: REctor 2-8163

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Tel: WO 4-4265

Stimpson Co., Inc., Edwin B., 77 Franklin Ave., Brooklyn 5, N.Y., 87, 98
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Tel: ULster 5-3131

Stoddart Aircraft Radio Co., Inc., 6644 Santa Monica Blvd., Hollywood 38, Calif., 26, 38
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Tel: HOllywood 4-9292

Stokes Corp., F. J., 5500 Tabor Rd., Philadelphia 20, Pa., 12, 88, 92
Tel: CUmberland 9-0100

Stone City Products Co., 1206 7th St., Bedford, Ind., 86, 87
Tel: BR 5-3373

Stone Labs., 1312 Tremont St., Boston 20, Mass., 90
Tel: GA 7-3600

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Tel: NOrmandy 2-3127

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Tel: WOodward 9-8890

Strandberg Engineering Lab., Inc., 225 Summit Ave., Greensboro, N.C., 86, 90
Tel: BR 4-1651

Strat-O-Seal Manufacturing Co., 3039 Fullerton Ave., Chicago 47, Ill., 98
Tel: HU 9-1282

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Tel: GLens Falls 2-8098

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Stromberg-Carlson Co., Electronic Control Systems, 2231 S. Barrington Ave., Los Angeles 64, Calif., 4
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Struthers-Dunn, Inc., Lambs Rd., Pitman, N.J., 66
Tel: LUther 9-7500

Stueck, Inc., W. Whitney, Old Saybrook, Conn., 92
Tel: EV 8-9309

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Sturrup, Inc., 50 Silver St., Middletown, Conn., 9, 36, 43, 48, 86, 90
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Sturtevant Co., P. A., 120 E. Lake St., Addison, Ill., 92, 101
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Styroformics, 17 Hawkins St., Somerville 43, Mass., 86, 87, 89
Tel: MOnument 6-5151

Suffolk Products Corp., Woodbine & Scudder Aves., Northport, N.Y., 28, 86, 99
Tel: NO 3-1700

Suflex Corp., 33-40 57th St., Woodside 77, Queens, N.Y., 89, 95
Tel: NE 9-5530

Sullivan, Ltd., H. W., 80 Shore Rd., Port Washington, L.I., N.Y., 3, 5, 12, 26, 31, 38, 41, 42, 56, 70
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Sun Chemical Corp., Electro-Technical Products, 113 E. Centre St., Nutley 10, N.J., 89
Tel: NUtley 2-7070

Sun Dial Corp., P.O. Box 326, Caldwell, N.J., 81, 86, 87
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Tel: CApital 6-4334

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Tel: NEwcastle 1-6000

Sunshine Scientific Instrument Co., 1810 Grant Ave., Philadelphia 15, Pa., 4, 9, 11, 12, 14, 23, 31, 35, 36, 56, 61, 82, 86, 90
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Supa Insulations, Inc., 123 E. Bassett St., Rocky Mount, N.C., 82
Tel: ROcky Mount 6-8155

Superex Electronics Corp., 4-6 Radford Pl., Yonkers, N.Y., 6, 37, 43, 44, 46, 53, 69, 73, 83, 91
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Superior Carbon Products, Inc., 9115 George Ave., Cleveland 5, Ohio, 44, 46, 70, 87, 93, 94, 98
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Tel: TUlip 2-6880

Superior Marine Radio Co., 136 St. George St., St. Augustine, Fla., 16, 24

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Tel: EDgewood 3-1555

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Sutton Publishing Co., Inc., 172 S. Broadway, White Plains, N.Y., 101
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Swan Electronics, 5010 N. Austin Ave., Chicago 30, Ill., 37, 43
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Synthetic Mica Corp., 20 Passaic Ave., Caldwell Twp., N.J., 90
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Tel: GR 9-8011

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System Development Corp., 2500 Colorado Ave., Santa Monica, Calif., 9
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Systems Development, Inc., 307 Water St., Binghamton, N.Y., 61, 85, 86, 90
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Taylor-Winfield Corp., 1052 Mahoning Ave., Warren, Ohio, 92
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Teca Corp., 80 Main St., White Plains, N.Y., 17
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Tel: JE 5-8100

Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 4, 5, 9, 38, 46, 50, 66, 67, 70, 80
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Tel: WIndsor 4-2221

Tech Master Corp., 75 Front St., Brooklyn 1, N.Y., 6, 36, 77
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Techalloy Co., Inc., Box 34, Rahns, Pa., 82, 93
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Technic, Inc., 7001 N. Clark, Chicago 26, Ill., 86, 91, 93
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Technic, Inc., 39 Snow St., Providence, R.I., 86, 91, 93
Tel: JAckson 1-4200

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Tel: REctor 2-6249

Technical Appliance Corp., N. Main St., Sherburne, N.Y., 4, 37, 44, 73, 80
See ad on page 382
Tel: SHerburne 7-2211

Technical Associates, 140 W. Providencia Ave., Burbank, Calif., 22
Tel: VIctoria 9-5838

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 41, 42, 46, 52, 74, 83, 87, 89, 94, 99
See ad on page 621
Tel: ARmory 1-0163

Technical Communications, Inc., 130 S. La Brea Ave., Los Angeles 36, Calif., 101
Tel: WEbster 8-2878

Technical Design-Dev. Co., 2300 Washington St., Newton Lower Falls 62, Mass., 85, 90
Tel: BIgelow 4-5700

Technical Devices Co., 2340 Centinela Ave., Los Angeles 64, Calif., 92
Tel: GRanite 7-0708

Technical Electronics Co., 4040 Inez Blvd., Culver City, Calif., 5, 12, 58
Tel: FEnas 0-5461

Technical Information Corp., 41 Union Sq., New York 3, N.Y., 85, 101
Tel: WAtkins 4-2111

Technical Manuals, Inc., 210 Main St., Hackensack, N.J., 101
Tel: DIamond 3-8730

Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 1, 2, 16, 24, 26, 29, 33, 37, 61, 73
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Tel: OWens 8-4800

Technical Measurement Co., 441 Washington Ave., North Haven, Conn., 9, 22
Tel: CEdar 9-2501

Technical Products Co., Instruments Div., 6670 Lexington Ave., Los Angeles 38, Calif., 12, 50
Tel: HO 4-8121

Technical Publishing House, 4 Tyler Rd., Lexington 73, Mass., 101
Tel: VOlunteer 2-8998

Technical Research Group, 2 Aerial Way, Locust Grove Industrial Pk., Syosset, L.I., N.Y., 31, 85
Tel: OVerbrook 1-6900

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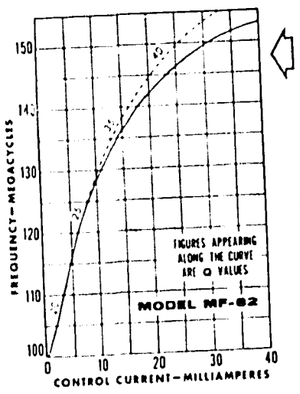
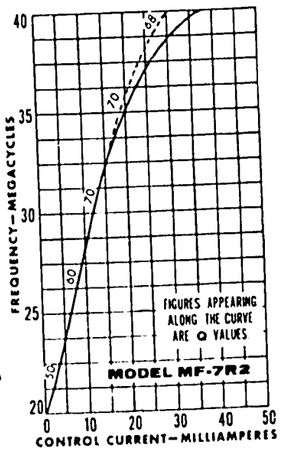
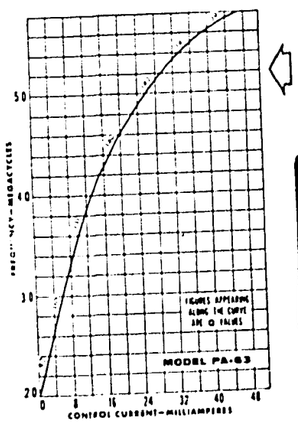


MF-82 Typical Freq. Range, 0-40 ma: 100 to 150 mc. Starting Inductance 0.2 μh, ±10%. PM Bias, sealed in steel can (dotted curve shows performance of MF-82C, same as above but in copper can).

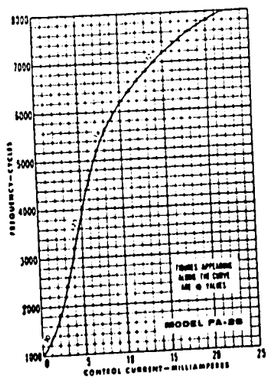


Typical Freq. Range, 0-40 ma: 20 to 40 mc. Starting Inductance 1.5 uh, ±10%. PM Bias, sealed in steel can (dotted curve shows performance of MF-7R2C, same as above but in copper can).

MF-7R2



PA-63 Typical Freq. Range, 0-50 ma: 2.0 to 5.8 mc. Starting Inductance 45 μh, ±10%. PM Bias, epoxy-embedded.



Typical Freq. Range, 0-50 ma: 1000 to 8000 cps. Starting Inductance 4.0 henries, ±10%. PM Bias, epoxy-embedded.

PA-28

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Tel: BEverly 5-1000

Technical Wire Products, Inc., 45 Ba Ave., Springfield, N.J., 70, 78, 82, 96, 99
Tel: DRexel 6-3010

Technicraft Co., 1156 Commonwe Ave., Boston 34, Mass., 86, 87, 89, 91, 92

Technicraft Labs., Inc., Thomas Conn., 19, 80
Tel: ATlas 3-4315

Techniflex Mfg. Co., Inc., 55 Jer Ave., Port Jervis, N.Y., 8, 9, 20, 2 34, 36
Tel: POrt Jervis 3-2207

Techniques, Inc., 40 Jay St., Englew N.J., 9, 62, 70, 92, 99
Tel: LOwell 9-5333

Technisonic Studios, Inc., 1201 Br wood Blvd., St. Louis 17, Mo., 2 Tel: PA 1-2400

Technitrol Engineering, 1952 E. V gheny Ave., Philadelphia 34, Pa. 12, 26, 34, 36, 48, 62, 73
Tel: GA 6-9105

Technograph Printed Electronics, I 920 Northwest Blvd., Winston-Sal N.C., 90
Tel: PArk 3-0767

Technology Instrument, 7229 Moll North Hollywood, Calif., 28, 57, Tel: PO 5-8620

Technology Instrument Corp., 535 Ma St., Acton, Mass., 4, 28, 62, 67, 72
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Tel: COlonial 3-7711

Technology Press, Mass. Inst. of Te nology, Cambridge 39, Mass., 101
Tel: UN 4-6900

Tech-Ohm Resistor Corp., 36-11 35 St., Long Island City 6, N.Y., 67, 8 Tel: ST 6-2274

Techron Corp., 81 Washington St., B ton 8, Mass., 62, 69
Tel: CApitol 7-7484

Teiner Co., Inc., Roland, 134 Trem St., Everett 49, Mass., 81, 84, 86

Tektronix, Inc., P.O. Box 831, Portla 7, Ore., 21, 23, 26, 36
Tel: CYpress 2-2611

Tel Electro Consulting Service, P Box 451, San Carlos, Calif., 85, 86 Tel: UL 1-0100

Telcon, Inc., Dept. E61, P.O. Box 2 Pacific Palisades, Calif., 44, 82
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Tel: GL 4-4043

Tele Coil Co., 2733 Saunders St., Ca den 5, N.J., 73, 90
Tel: EMerson 5-7528

Telechrome Mfg. Corp., 28 Ranick D Amityville, L.I., N.Y., 1, 2, 3, 4, 7, 21, 24, 29, 33, 34, 35, 36, 45, 82, 85
Tel: LIncoln 1-3600

Telecomputing Corp., 1289 Sate St., North Hollywood, Calif., 41, 70, 73
Tel: POplar 5-8160-Ext. 24

Telecomputing Corp., Cook Batter Div., 3850 Olive St., Denver, Colo. Tel: FLorida 5-3531

Telecomputing Corp., Data Instruments Div., 12838 Saticoy St., N. Hollywood, Calif., 4, 9, 85
Tel: STanley 7-8181

Telecomputing Corp., Whittaker Gyro Div., 10217 Lindbergh St., Van Nuys, Calif., 1, 4
Tel: STanley 3-1951

Telecomtrol Corp., 20 Diller Ave., Newton, N.J., 90
Tel: NEwton 632

Telectro Industries Corp., 35-16 37th St., Long Island City 1, N.Y., 1, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 18, 19, 21, 23, 25, 26, 27, 28, 30, 32, 33, 34, 36, 37, 38, 39, 43, 45, 50, 55, 56, 61, 62, 63, 70, 73, 77, 79, 80, 81, 83, 85, 86, 95, 96
Tel: YE 2-8600

Telectron Co., 3991 S.W. 12th Ter., Ft. Lauderdale, Fla., 24, 43
Tel: Jackson 4-8361

Telectrosonic Corp., 35-18 37th St., Long Island City 1, N.Y., 9
Tel: RA 1-2200

Telegraph Condenser Co., Oakcroft Rd., Chessington, Surrey, England, 46, 51, 52, 83, 89, 98
Tel: ELmbridge 5241

Telegraph Condenser Co., Wales Farm Rd., Acton, London, W3, England, 41, 42, 46, 48, 50, 52, 62, 72, 83, 89
Tel: ACorn 0061

Telemeter Magnetics, Inc., 2245 Pontius Ave., Los Angeles 64, Calif., 9, 34, 46, 70, 83
Tel: BRadshaw 2-0991

Telephonics Corp., Park Ave., Huntington, L.I., N.Y., 10, 15, 16, 18, 20, 24, 25, 29, 30, 36, 53, 54, 57, 61
Tel: HA 3-6200

Telerad Mfg. Corp., 1440 Broadway, New York, N.Y., 1, 19, 25, 26, 34, 36, 37, 38, 50, 77, 80, 90
Tel: BRyant 9-0893

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Tel: WH 4-4161

Tele-Signal Corp., 63 Sea Cliff Ave., Glen Cove, L.I., N.Y., 8, 16, 24, 33, 34
Tel: ORiole 1-3020

Teletest Instrument Corp., 120-20 Roosevelt Ave., Flushing 68, N.Y., 12
Tel: HI 6-4000

Teletronic Labs., Inc., 1835 W. Rosecrans Ave., Gardena, Calif., 86
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Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 12, 19, 24, 26, 29, 56, 70, 81, 90
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Tel: EDgewood 3-1027

Teletype Corp., 4100 Fullerton Ave., Chicago 39, Ill., 9, 33
Tel: SP 2-1040

Television Digest, Wyatt Bldg., Washington 5, D.C., 101
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Television Utilities Co., 112-33 Colonial Ave., Corona 68, N.Y., 6, 7, 21, 24, 36, 61
Tel: TWining 8-1000

Television Zoomar Corp., 500 Fifth Ave., New York 36, N.Y., 32
Tel: BRyant 9-5835

Televiso Corp., 1415 Golf Rd., Des Plaines, Ill., 50
Tel: ROdney 3-8100

Telewave Labs., Inc., 43-20 34th St., Long Island City 1, N.Y., 67
Tel: EXeter 2-4500

Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 5, 9, 36, 43, 45, 49, 50, 53, 54, 57, 61, 62, 72, 73, 86
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Tel: MIdway 6-7211

Tel-Instrument Electronics Corp., 728 Garden St., Carlstadt, N.J., 7, 12, 21, 23, 26, 35, 36, 61, 79
Tel: WE 3-1600

Telonic Engrg. Corp., 773 Broadway, Laguna Beach, Calif., 90
Tel: HYatt 4-7581

Telonic Industries, Inc., 75 N. Second Ave., Beech Grove, Ind., 19, 26, 35, 38, 50
Tel: STate 6-9239

Telrex Laboratories, Dept. SC, Rt. 35, Asbury Park, N.J., 37
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Tel: PRospect 5-7252

Telvision Laboratories, Inc., 333 Mill St., Wauconda, Ill., 43
Tel: JAckson 6-2511

Temco Aircraft Corp., Electronics Div., P.O. Box 6191, Dallas 22, Texas, 1, 4, 9, 24, 25, 28, 34, 36, 37, 45, 61, 62, 72, 73, 86, 90, 93
Tel: BR 6-7111

Temperature Engrg. Corp., 1800 Union Landing Rd., Riverton, N.J., 4, 12, 71, 81, 88, 92
Tel: TAlmadge 9-3880

Tempil Corp., 132 W. 22 St., New York 11, N.Y., 51, 56, 70, 91
Tel: ORegon 5-6040

Tempo Instrument, Inc., Commercial St., P.O. Box 338, Hicksville, L.I., N.Y., 4, 56, 66, 70, 90
Tel: OVerbrook 1-2280

Ten Bosch, Inc., M.-80 Wheeler Ave., Pleasantville, N.Y., 9, 36
Tel: ROgers 9-3000

Tenna Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio, 2, 20, 37, 44, 82, 101
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Tennalab, Quincy, Ill., 37
Tel: BAldwin 2-0237

Tenney Engineering, Inc., 1090 Springfield Rd., Union, N.J., 12, 88
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Tensitron, Inc., 162-164 Harvard Depot Rd., Harvard, Mass., 12, 72
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Tensolite Insulated Wire Co., Inc., W. Main St., Tarrytown, N.Y., 82
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Tel: MEdford 1-2300

Tensolite Insulated Wire, Pacific Div., 1516 N. Gardner St., Los Angeles, Calif., 82

Tensor Electric Dev. Co., 1873 Eastern Pkwy., Brooklyn, N.Y., 36, 43, 50, 55, 73, 85
Tel: HY 5-9200

Terado Co., 1065 Raymond Ave., St. Paul 8, Minn., 45, 61, 66
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Tesla Electric Co., 2005-7 Armitage Ave., Chicago, Ill., 3, 4, 12, 30, 32, 36, 61, 85
Tel: AR 9-6100

Tetrad Co., Inc., 62 St. Mary's St., Yonkers, N.Y., 59
Tel: YOnkers 3-1474

Tetrafluor, Inc., 343 Hindry Ave., Inglewood 1, Calif., 86, 89, 95
Tel: ORegon 8-4056

Teveo Insulated Wire, 108 E. Prospect, Burbank, Calif., 53, 89, 95
Tel: VIctoria 9-5574

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expway, Dallas, Tex., 4, 9, 12, 13, 14, 15, 16, 25, 30, 31, 34, 36, 41, 56, 61, 64, 66, 67, 68, 70, 71, 80, 82, 87, 93, 99
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Tel: FLeetwood 7-5411

Texas Instruments, Incorporated, P.O. Box 6027, Houston 6, Tex., 4, 9, 12, 13, 14, 18, 21, 34, 36, 45, 61, 63, 72, 90
Tel: JAckson 6-1411

Textile Thread Co., 47 Bacon St., Watertown, Mass., 87
Tel: WA 4-5432

Thermador Electrical Mfg. Co., 715 S. Raymond Ave., Alhambra, Calif., 61, 73
Tel: CUmberland 3-8851

Thermal American Fused Quartz Co., 18-20 Salem St., Dover, N.J., 47
Tel: FOxcroft 6-2807

Thermal Control Corp., 43 Washington Ave., Nutley 10, N.J., 70
Tel: NOrth 1-1601

Thermax Wire Corp., 304 E. 45 St., New York, N.Y., 82
Tel: MUrray Hill 9-7120

Thermo Materials, Inc., 4040 Campbell Ave., Menlo Park, Calif., 46, 52, 83, 86, 89
Tel: DAvenport 6-2780

Thermosen, Inc., 375 Fairfield Ave., Stamford, Conn., 64, 68, 75
Tel: DAvis 5-1324

Theta Instrument Corp., 48 Pine St., East Paterson, N.J., 4, 12
Tel: SWarthmore 7-7700

Thomas & Betts Co., Inc., 36 Butler St., Elizabeth 1, N.J., 44, 98
Tel: EL 4-4321

Thomas Electronics, Inc., 118 Ninth St., Passaic, N.J., 4, 12, 23, 26, 74, 86, 90, 92, 99
Tel: GRegory 3-4040

Thomas Instrument Co., Silver Rock, Phoenix, N.Y., 92
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Thomas Mold & Die Co., 249 W. Henry St., Wooster, Ohio, 37
Tel: HOward 2-5911

Thomas & Skinner, Inc., 1125 E. 23 St., Indianapolis 7, Ind., 46, 55
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Tel: WAbash 3-2448

Thomas & Sons, Inc., Wm., 1063 Slocum Ave., Ridgefield, N.J., 86
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Thompson-Bremer & Co., 228 N. La Salle St., Chicago 1, Ill., 87, 98
Tel: FRanklin 2-6858

Thompson & Co., John L., 1118-22 St., N.W., Washington 7, D.C., 90, 101
Tel: FEderal 7-4200

Thompson Fiber Glass Co., 1733 Cordova St., Los Angeles 7, Calif., 86, 89, 95
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Brushless alternator for emergency AC aircraft power or missile power supply systems.

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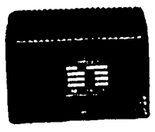

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Design capitalizes on the inherent advantage of transistorized equipment . . . stresses retrofit, which means they can be used to replace vibrators and dynamotors in existing aircraft if so desired.

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3 sizes—25, 50 and 100 watts with overload capacities up to 100% for short periods.
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Temperature Range—Minus 40° C to plus 45° C.
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As higher-altitude jet aircraft were developed, dynamotors were required that would operate at 80,000 feet. The result—this Winco dynamotor to operate at higher altitudes.

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And Repeat.
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Literally thousands of each of the Winco Inverters from 20 VA to 6½ KVA have been manufactured on a mass-production basis at low-cost without sacrifice of high quality standards.

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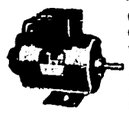

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Tel: OSborne 5-4651

Thompson-Ramo-Wooldridge, Tapco Group, 23555 Euclid Ave., Cleveland 17, Ohio, 4, 28, 36, 37, 38, 44, 45, 58, 61, 66, 70, 80
Tel: IV 1-7500

Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 46, 52, 83, 87, 89, 91, 95
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Tel: PIlgrim 3-7797

Thordarson-Meissner, 7th & Bellmont Sts., Mt. Carmel, Ill., 45, 50, 61, 73, 79, 90
Tel: MOunt Carmel 1200

Three Point One Four Corp., 24 Woodworth Ave., Yonkers, N.Y., 39, 70
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Tel: GReenleaf 6-4440

Thwing-Albert Instrument Co., Penn St. & Pulaski Ave., Philadelphia 44, Pa., 12, 56
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Tibbetts Industries, Inc., Colcord Ave, Camden, Me., 57
Tel: CEdar 6-3366

Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y., 11, 14, 31, 33, 58, 99
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Times Wire & Cable Co., 358 Hall Ave, Wallingford, Conn., 82
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Tingstol Co., 1461 W. Grand Ave., Chicago 22, Ill., 60, 62, 69
Tel: CAnal 6-1520

Tinnerman Products, Inc., P.O. Box 6688, Brookpark Rd., Cleveland 1, Ohio, 87
Tel: SHadyside 1-9300

Tippett & Co., 1492 Highland Ave, Needham, Mass., 101
Tel: HIllcrest 4-6005

Titan Metal Mfg. Co., Bellefonte, Pa., 82, 93, 94
Tel: EL 5-4712

Toeco Metal Products, Inc., 70 Marbledale Rd., Tuckahoe 7, N.Y., 81, 84, 86
Tel: FAirbanks 4-5882

Tomberg, Dr. Victor T., 84-25 Elmhurst Ave., Elmhurst 73, N.Y., 85, 90
Tel: HA 9-6577

Topatron, Inc., 942 E. Ojai Ave., Ojai, Calif., 12, 84
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Topflight Corp., 160 E. Ninth Ave, York, Pa., 87
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Topic, Inc., Natick Industrial Centre, Natick, Mass., 11, 12, 41, 42, 50, 80, 85, 86
Tel: OLympic 3-6113

Topper Mfg. Co., Inc., 147-12 Liberty Ave., Jamaica, N.Y., 9, 12, 15, 28, 36, 43, 62, 73, 82, 83, 86, 87, 89, 90, 91, 94
Tel: AX 7-5742

Topping Electronics, Ltd., 94 Laird Dr., Toronto 17, Ont., Canada, 1, 12, 16, 24, 26, 31, 36, 45, 61, 73, 79, 85, 90
Tel: HU 9-4325

Tork Time Controls, Inc., 38 Grove St., Mt. Vernon, N.Y., 70
Tel: MO 4-3542

Torngren Co., Inc., C. W., 236 Pearl St., Somerville 45, Mass., 37, 86
Tel: MOnument 6-3250

Torocoil Co., 2615 Bristol Rd., Columbus 21, Ohio, 5, 43, 73
Tel: HUdson 6-4067

Torotel, Inc., 5512 E. 110th St., Kansas City 34, Mo., 36, 43, 48, 50, 61, 73
Tel: SOuth 1-6314

Torrington Mfg. Co., 100 Franklin Dr., Torrington, Conn., 40
Tel: HUnter 2-4422

Torrington Mfg. Co., Progressive Co. Div., 50 Norwood St., Torrington, Conn., 87
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Torsion Balance Co., 35 Monhegan St., Clifton, N.J., 70
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Towaco Electronics, Pine Brook Rd., Towaco, N.J., 3, 21, 33
Tel: DE 4-4443

Tower Construction Co., 2733 Hawkeye Dr., Sioux City 2, Iowa, 37
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Tel: 5-7653

Tracerlab, Inc., 1601 Trapelo Rd., Waltham 54, Mass., 4, 22, 36, 75
Tel: TW 4-6600

Trad Electronics Corp., 1001 First Ave., Asbury Park, N.J., 23, 26, 38, 70
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Trancoa Chemical Corp., 312-326 Ash St., Reading, Mass., 47, 93
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Trans Electronics, Inc., 7349 Canoga Ave., Canoga Park, Calif., 12, 45, 61
Tel: DIamond 0-3334

Trans-Aire Electronics, Inc., 195-02 Jamaica Ave., Jamaica 23, N.Y., 6, 12
Tel: HOllis 4-0600-1

Transco Products, Inc., 12210 Nebraska Ave., Los Angeles 25, Calif., 18, 37, 44, 50, 66, 70, 80
Tel: BRadshaw 2-5687

Transdata, 1844 Brigden Rd., Pasadena 7, Calif., 9, 34
Tel: SY 8-3086

Transducers, Inc., 2957 Honolulu Ave., La Crescenta, Calif., 12
Tel: CH 5-3123

Transdyne Corp., 5815 57th Dr., Maspeth 78, N.Y., 25
Tel: TWining 4-6681

Transformer Design, Inc., 7377 N. 76th St., Milwaukee 18, Wis., 73
Tel: FLagstone 3-8017

Transformer Engineers, 285 N. Halstead St., Pasadena, Calif., 43, 50, 73
Tel: RY 1-6906

Transformer Metal Products, 35 York St., Brooklyn 1, N.Y., 81, 84, 86
Tel: MA 4-6550

Transformer Specialty Co., 221 Rock Hill Rd., Bala-Cynwyd, Pa., 73
Tel: MOhawk 4-5770

Transformer Technicians, Inc., 2608 N. Cicero Ave., Chicago 39, Ill., 43, 50, 61, 73
Tel: NAtional 2-8140

Transformers, Inc., 200 Stage Rd., Vestal, N.Y., 5, 36, 43, 50, 61, 67, 73
Tel: Pioneer 8-3311

Transistor Applications, 103 Broad St., Boston 10, Mass., 36, 45, 101
Tel: HA 6-1794

Transistor Devices, Inc., Instrument Masters Div., 11 Hamburg Turnpike, Riverdale, N.J., 3, 4, 12, 36, 45, 61, 86, 90
Tel: TEmple 5-7575

Transistor Electronics, 3357 Republic Ave., Minneapolis 26, Minn., 9, 12, 36, 60
Tel: WEst 9-6754

Transitron Electronic Co., 168-182 Albion St., Wakefield, Mass., 42, 64, 68, 79
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Tel: CRystal 9-4500

Transline Associates, 95 Summit St., Newark 3, N.J., 11, 24, 36, 38, 44, 52, 80
Tel: MItchell 2-4323

Translite Electronics Corp., 5720 W. Armitage Ave., Chicago 39, Ill., 6, 30, 59, 73
Tel: BE 7-4756

Trans-Lux Corp., 625 Madison Ave., New York 22, N.Y., 32
Tel: Plaza 1-3110

Transonic, Inc., 808 16th St., Bakersfield, Calif., 36, 50, 61, 73
Tel: FA 7-5701

Transradio, Ltd., 138A Cromwell Rd., London S.W. 7, England, 82

Trans-Sil Corp., 55 Honeck St., Englewood, N.J., 64, 68
Tel: LOwell 7-1720

Trans-Sonics, Inc., Burlington, Mass., 72
Tel: BRowning 2-1000

Transvision, Inc., 460 North Ave., New Rochelle, N.Y., 6, 36, 54
Tel: NE 6-6000

Travco Associates, 148-03 Hillside Ave., Jamaica 35, N.Y., 102
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Tel: OLympia 7-8630

Trent Tube Co., 498 S. Church St., East Troy, Wis., 87
Tel: MIdway 2-7321

Trenton Transformer Corp., P.O. Box 568-R, Trenton, N.J., 36, 61, 73
Tel: OWen 5-3451

Trepac Corp. of America, 30 W. Hamilton Ave., Englewood, N.J., 4, 8, 26, 33, 36, 62, 66, 70, 85, 90
Tel: LOwell 7-3810

Tresco, Inc., 3824-28 Terrace St., Philadelphia 28, Pa., 73
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Tel: IVyridge 3-1383

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 50, 52, 73
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Tel: EXmont 7-2145

Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis., 51, 53, 92
Tel: COncord 4-3410

Tricon Mfg. Co., 8012 S. Wallace St., Chicago 20, Ill., 70, 82, 86, 87, 88, 93, 97, 99
Tel: ABerdeen 4-0600

Tricraft Products Corp., 1124 W. Newport Ave., Chicago 13, Ill., 12, 37, 86, 88
Tel: WEllington 5-5383

Tri-Dex Company, P.O. Box 1207, Lindsey, Calif., 86, 90, 98
Tel: LIndsey 2-4051

Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 44, 53, 54, 70, 81, 82, 86, 90, 98
See ad on page 465
Tel: LIbertyville 2-3700

Trimount Instrument Co., 3119 W. Lake St., Chicago 12, Ill., 4, 12, 56, 66
Tel: NEvada 2-3747

Trimount Plastic Co., Inc., 71 Dudley St., Arlington 74, Mass., 86, 89, 95
Tel: MIssion 3-3600

Trio Laboratories, Inc., Dept. IRE-60, Expressway Industrial Pk., Plainview, L.I., N.Y., 12
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Trio Mfg. Co., Griggsville, Ill., 37
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Trion, Inc., 1000 Island Ave., McKees Rocks, Pa., 92
Tel: FEderal 1-3300

Triplett & Barton, Inc., 831 N. Lake St., Burbank, Calif., 85
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Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio, 3, 12, 19, 23, 26, 35, 56, 66
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Tel: 323-W

Tripl-T Co., Box 5352, Pasadena, Calif., 9, 36
Tel: SY 2-7687

Tri-Point Plastics, Inc., 175-177 I. U. Willets Rd., Albertson, L.I., N.Y., 36, 62, 89, 95, 98
Tel: MA 1-5800

Tri-State Plastic Molding, 505 Fourth Ave., Henderson, Ky., 86, 93, 94
Tel: VAlley 6-9061

Triwec Transformer Co., 3261 Milwaukee Ave., Chicago 18, Ill., 73
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Tronic Coil Winding Co., 58 Wesley St., Waterbury, Conn., 43, 73
Tel: PL 6-4668

Trop-Artic, Inc., 3000 S. Hackley St., Muncie, Ind., 12
Tel: ATlas 2-4582

Tru-Connector Corp., 416 Union St., Lynn, Mass., 44
Tel: LY 8-9379

Trump, Walter N., 516 S. Vermont Ave., Columbus, Kan., 81, 87
Tel: 429R

Tru-Ohm Products, Div. of. Model Engineering & Mfg. Co., Inc., 2800 N. Milwaukee Ave., Chicago 18, Ill., 67
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Tel: EVerglade 4-2646

Trutone Electronics, Inc., 6912 Santa Monica Blvd., Los Angeles 38, Calif., 30, 36, 54, 77
Tel: HO 4-8118

Tubular Rivet & Stud Co., Weston Ave., Quincy 70, Mass., 70, 87, 92, 98
Tel: PRes 3-1776

Tuck Manufacturing Co., 19 Ellis Ave., W. Bridgewater, Mass., 92
Tel: JU 3-1188

Tullamore Electronics Co., 6726 S. Ashland Ave., Chicago 36, Ill., 9, 12, 22, 36, 56, 61
Tel: PR 8-4700

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 22, 45, 60, 64, 65, 66, 68, 74, 75, 76
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Tel: HUmboldt 2-4200

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Tel: EMpire 3-8144

Turner & Co., W. R., 4831 W. Jefferson Blvd., Los Angeles 16, Calif., 58, 61
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Twenty-First Century Electronics, Inc., P.O. Box 2326, Riverside, Calif., 1, 12, 13, 15, 17, 25, 26, 73, 90
Tel: OVerland 8-0780

Twin City Metalseal Corp., 801 S.E. 8th St., Minneapolis 14, Minn., 4, 62, 86, 87
Tel: FEderal 9-7701

Twin Lock, Inc., 1024 W. Hillcrest Blvd., Inglewood 1, Calif., 8, 16, 44, 62, 82, 85, 86
Tel: OR 8-4773

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Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 44, 53, 60, 62, 70, 78
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Tel: LAsall 7-8400

Ulanet Co., George, 416 Market St., Newark 5, N.J., 70, 71
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Ultradyne, Inc., 2624 San Mateo, N.E., Albuquerque, N.M., 4, 34, 59, 62, 72
Tel: AMherst 8-2431

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Tel: CUmberland 3-3193

Ultronix, Inc., 111 E. 20th Ave., San Mateo, Calif., 67

Underwood Corp., Canoga Div., 15330 Oxnard St., Van Nuys, Calif., 4, 18, 23, 25, 34, 37, 38, 50, 61, 80, 85, 90
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Ungar Electric Tools, Inc., 4101 Redwood Ave., Los Angeles 66, Calif., 92
Tel: EXmont 8-5718

Uniform Tubes, Inc., Collegeville, Pa., 87, 99
Tel: HU 9-7276

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Union Carbide Corp., Haynes Stellite Co. Div., 1020 W. Park Ave., Kokomo, Ind., 93
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Union Carbide Corp., Kemet Co. Div., P.O. Box 6087, Cleveland 1, Ohio, 41, 99
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Union Carbide Corp., National Carbon Co. Div., 30 E. 42nd St., New York 17, N.Y., 39, 87, 99
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Union Carbide Corp., Silicones Div., 30 E. 42nd St., New York 17, N.Y., 89, 91
Tel: MU 7-8000

Union Carbide Corp., Union Carbide Metals Div., 30 E. 42nd St., New York 17, N.Y., 93
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Union Elect-Sonics Corp., 111 Penn St., Quincy 69, Mass., 61, 72, 97
Tel: MAyflower 9-6800

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Tel: CHurchill 2-5000

Unistrut Products Co., 933 W. Washington Blvd., Chicago 7, Ill., 84, 86, 87
Tel: MUnroe 6-2665

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United Aircraft Corp., Ketay Dept. Norden Div., Jericho Turnpike, Commack, N.Y., 4, 28, 36, 58, 67
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United Aircraft Corp., Norden Div. Norden Labs., 121 Westmoreland Ave., White Plains, N.Y., 1, 4, 9, 25, 28
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United Carbon Products Co., 1300-R N. Madison St., Bay City, Mich., 86
Tel: TW 3-4575

United Catalog Publishing, Inc., 60 Madison Ave., Hempstead, L.I., N.Y., 101
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United Components, Inc., 360 Henry St., Orange, N.J., 52, 68
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United Control Corp., 4540 Union Bay Pl., Seattle, Wash., 1, 4, 28, 34, 36, 50, 70, 71, 72
Tel: LA 5-9200

United Electric Controls Corp., 85 School St., Watertown 72, Mass., 4, 13, 28, 56, 70, 71
Tel: WAlnut 6-1000

United Electrodynamics, Inc., 200 Allendale Rd., Pasadena, Calif., 36, 45, 61, 70
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United Electronic Manufacturing Corp., 542 39th St., Union City, N.J., 41
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United Electronics Co., 42 Spring St., Newark 4, N.J., 41, 42, 75, 76
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Tel: TWinbrook 4-7271

United Microwave Co., 8 Columbus Ave., Valhalla, N.Y., 19, 26, 37, 38, 70, 73, 77, 80
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United Packaging Co., Inc., 4511 Wayne Ave., Philadelphia 44, Pa., 86
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U. S. Components, Inc., 454 E. 148th St., New York 55, N.Y., 44
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U. S. Dynamics Corp., 1258 Columbus Ave., Boston 20, Mass., 4, 12, 45, 47, 61, 64, 68, 85, 88, 92
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U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif., 28, 58
Tel: ADams 3-3131

U. S. Electrical Tool Co., 3640 Llewellyn St., Cincinnati 23, Ohio, 92
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U. S. Electronics Corp., 280 Warren St., Lyndhurst, N.J., 43, 50, 55, 73, 94
Tel: GEneva 8-2400

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U. S. Instrument Corp., P.O. Box 1191, Charlottesville, Va., 16, 43, 44, 53, 57, 66, 70, 84, 98
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U. S. Motors Corp., 102 W. 5th Ave., Oshkosh, Wis., 61
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U. S. Radium Corp., P.O. Box 246, Morristown, N.J., 22, 81, 86, 87, 99
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U. S. Relay Co., 717 N. Coney Ave., Azusa, Calif., 43, 66
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U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N.Y., 87, 91, 95
Tel: CIrcle 7-5000

U. S. Science Corp., Sub. Topp Industries, 5221 W. 102nd St., Los Angeles 45, Calif., 1, 3, 4, 9, 12, 18, 21, 22, 24, 26, 28, 34, 36, 37, 45, 48, 56, 61, 67, 72, 73, 80, 90
Tel: SPring 6-0450

U. S. Semiconductor Products, Inc., 3540 W. Osborn Rd., Phoenix, Ariz., 15, 41, 47, 64, 68
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Tel: APplegate 8-5591

U. S. Sonics Corp., 625 McGrath H'way, Somerville, Mass., 72
Tel: MOnument 6-5100

U. S. Steel Corporation, 525 William Penn Pl., Pittsburgh 30, Pa., 82, 87, 93
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U. S. Steel Corp., American Steel & Wire Div., Rockefeller Bldg., Cleveland 13, Ohio, 82
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U. S. Testing Co., Inc., 1415 Park Ave., Hoboken, N.J., 90
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U. S. Time Corp., Waterbury 20, Conn., 4, 72
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U. S. Time Corporation, Gyroscope Div., 375 Park Ave., New York 22, N.Y., 4, 72
Tel: PLaza 9-5665

U. S. Tool Co., Inc., 255 N. 18 St., East Orange, N.J., 92
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United Transformer Corp., 150 Varick St., New York 13, N.Y., 43, 48, 49, 50, 73
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Unitek Corporation, Weldmatic Div., 380 N. Halstead Ave., Pasadena, Calif., 92
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Universal Can & Condenser Co., 3435 N. Kimball Ave., Chicago 18, Ill., 41
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Universal Circuit Controls Corp., 3610 Oakton St., Skokie, Ill., 70
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Universal Drafting Machine Co., 7960 Lorain Ave., Cleveland 2, Ohio, 92
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Universal Electric Co., 300 E. Main St., Owosso, Mich., 58
Tel: SAratoga 5-7174

Universal Electronics Company, 1720 22nd St., Santa Monica, Calif., 61
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Universal Manufacturing Co., Inc., 1168 Grove St., Irvington, N.J., 5, 92
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Universal Match Corp., Armament Division, 472 Paul Ave., St. Louis 21, Mo., 36
Tel: JAckson 2-1620

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Universal Transistor Products Corporation, 17 Brooklyn Ave., Westbury, N.Y., 15, 22, 36, 41, 45, 61, 73, 75, 79
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Universal Winding Co., Dept. 165, P.O. Box 1605, Providence 1, R.I., 92
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University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N. Y., 38, 50, 54, 81, 85
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University of California, 405 Hilgard Ave., W. Los Angeles 24, Calif., 9, 27, 34
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University of California Press, Berkeley 4, Calif., 101
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University of Southern California, Psychology Dept., Los Angeles 7, Calif., 85
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Univox Corp., 102 Warren St., New York 7, N.Y., 4, 82, 86
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Uniwave, Inc., 109 Marine St., Farmingdale, L.I., N.Y., 4, 19, 30, 38, 45, 50, 77, 80
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Uptegraff Manufacturing Co., R. E., P.O. Box 182, Scottdale, Pa., 73
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Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill., 92, 98
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Vacuum Specialties Co., 34 Linden St., Somerville 43, Mass., 4, 88, 92
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Valpey Crystal Corp., 1244 Highland St., Holliston, Mass., 15, 47, 72, 90
Tel: GArden 9-4851

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Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif., 43, 48, 50, 73
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Vector Associates, 139-30 34th Rd., Flushing 54, L.I., N.Y., 12, 36, 50, 61, 62, 82, 84, 86, 90
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Vickers, Inc., Electronic Products Div., 1815 Locust St., St. Louis 3, Mo., 1, 4, 28, 36, 61, 64, 79
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Vicon Corp., 1369 Industrial Rd., San Carlos, Calif., 6, 7, 32, 36
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Victor Adding Machine Co., 3900 N. Rockwell St., Chicago 39, Ill., 9, 34,
Tel: KE 9-8210

Victor Electric Wire & Cable Corp., 618 Main St., West Warick, R. I., 44, 82, 95
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Victor R. F. & Microwave Co., 36 W. Water St., Wakefield, Mass., 19, 25, 26, 37, 38, 44, 47, 50, 77, 80, 86
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Victoreen Instrument Co., 3025 W. Mission Rd., Alhambra, Calif., 4, 22, 36, 61, 66, 70

Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 9, 12, 22, 36, 61, 67, 75
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Videocraft Manufacturing Co., 5720 Armitage Ave., Chicago 39, Ill., 43
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Tel: MElrose 6-1590

Viking Industries, Inc., 21343 Roscoe Blvd., Canoga Park., Calif., 44, 70, 94
Tel: Diamond 7-8500

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Vitro Laboratories, Silver Spring Lab., 14000 Georgia Ave., Silver Spring, Md., 3, 9, 16, 28, 61, 70, 85, 90, 100
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Wah Chang Corporation, 233 Broadway, New York 7, N.Y., 82, 93
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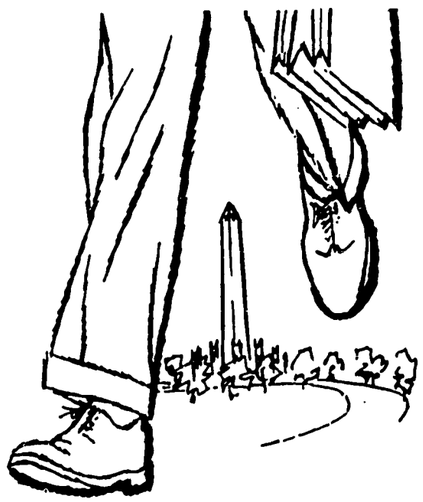
Tel: COrtlandt 7-0887



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Waldom Electronics, Inc., 4625 West 53rd St., Chicago 32, Ill., 44, 47, 54, 69, 81, 87, 91, 94, 98
Tel: LUdlow 5-1212

Waldorf Instrument Co., Huntington Station, L.I., N.Y., 4, 9, 14, 19, 21, 25, 26, 28, 34, 36, 45, 56, 58, 61, 72, 90
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Tel: AKron 9441

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Warwick Manufacturing Corp., 7300 N. Lehigh Ave., Niles, Ill., 59, 77
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Washington Aluminum Co., Knecht Ave. & Penna. R.R., Baltimore 29, Md., 37, 80, 81, 84, 85, 86, 87
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Washington Machine & Tool Works., 13111 Wayzata Blvd., Minneapolis 26, Minn., 9, 28, 70, 80
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Waterbury Co. Inc., 835 S. Main, Waterbury 90, Conn., 81, 87, 89, 98
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Waterbury Rolling Mills, East Aurora St., Waterbury 20, Conn., 93
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Waugh Engineering Co., 7842 Burnett Ave., Van Nuys, Calif., 1, 4, 9, 21, 28, 34, 36, 43, 45, 66, 72
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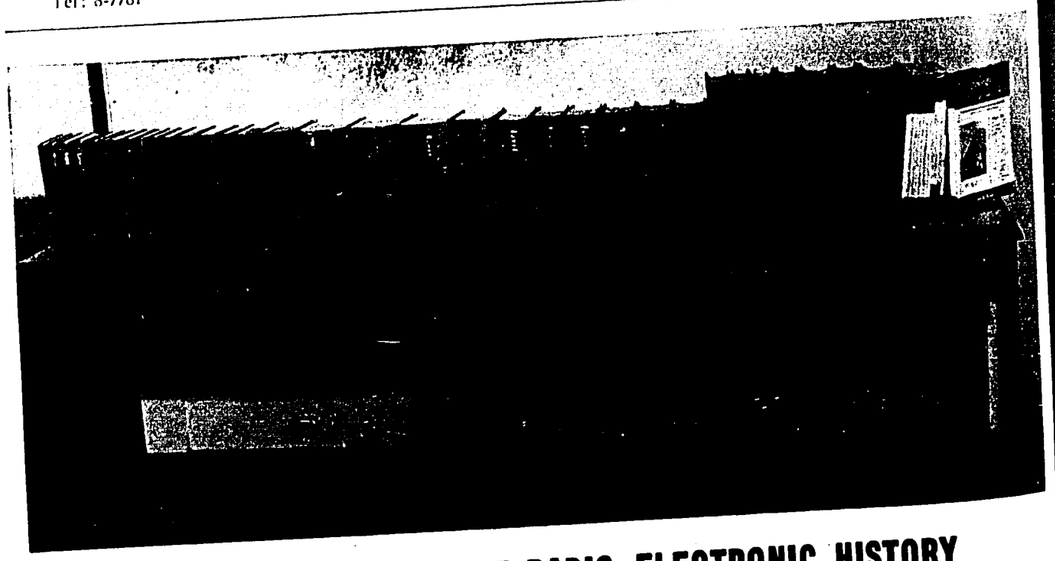

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Code Numbers TELL YOU

what each company does or makes. The numbers after each address refer you to the 102 product and service classes, in which detailed information on the firm will be found.

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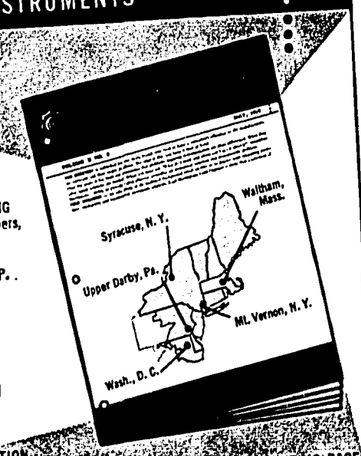

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Directory I
Complete Equipment

Communication—
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35 major groups
242 products

The products and services of the radio-electronics industry have been organized into three basic directories:

I. Complete Equipment
II. Components
III. Materials & Services

Within these three basic directories, 102 major product and service groups are numbered consecutively throughout. Under each of these 102 classes a further breakdown is given, showing in detail by a system of code numbers after each firm listed what specific products within the class are manufactured by that firm.

For a terminology cross-index listing the 857 sub-products in alphabetical order, consult the pink section preceding page 1.

The first few times you use this EDGE INDEX

follow the "How to use" instructions slowly—one step at a time. After that you will be able to open easily and almost instantly to the section that you seek.

Machol edge indexes covering the alphabetical section and each of the three major directory groups will be found on pages 161, 265, 365, and 597.

HOW TO USE

1. Bend the Directory almost double with the back cover page on the inside.
2. Hold in your right hand with your four fingers near to the bound edge and your right thumb near the middle of the open side of this page.
3. From the heavy or light line symbol adjacent to the subject you seek, run your eyes across the page edges until you reach the horizontally corresponding symbol.
4. OPEN THERE!

LICENSE NO. 25
MACHOL EDGE INDEX PATENT #2680630

For complete list of products and services, arranged alphabetically for fast reference, see the pink section preceding page 1.

1 COMPLETE DATA SPREADS
161 ALPHABETICAL DIRECTORY
265 DIRECTORY I COMPLETE EQUIPMENT
365 DIRECTORY II COMPONENTS
597 DIRECTORY III MATERIALS & SERVICES

INDEX TO COMPLETE EQUIPMENT

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Directory I. Complete Equipment

1. Aircraft & Airport Equipment.

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M E Labs., Calif., 5
Madigan Corp., N.Y., 5, 10
Magnavox Research Labs., Calif., 5, 10
Manhattan Physical Research Group, Inc., N.Y., Non-Gyro Guidance Research
Marconi's Wireless Telegraph Co., Ltd., N.Y., 5, 10, 15, 20, 25, 30, 35
Marine View Electronics, Inc., N.Y., 25
Marstan Electronics Corp., N.Y., 5, 10
Martin Co., Baltimore Div., Md., 5, 10
Mayberry Electronics Co., Calif., 25
Minneapolis-Honeywell Reg. Co., Minn., 25
Missouri Research Labs., Inc., Mo., 25
Mitchell Industries, Inc., Texas, 5, 10, Automatic Pilots
Motorola Inc., Ariz., 5, 10, 15, 20, 25
National Aeronautical Corp., Pa., 5, 10, 15, 20, 30, Airborne Connectors
National Electronics Labs., Inc., D.C., 15, 20

National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 15
See ad on page 642
Tel: NO 5-4800

Nems-Clarke Co., Md., 5, 15
North American Aviation, Inc., Autonetics Div., Calif., 25
Northrop Corp., Nortronics Div., Calif., 25, Inertial Navigation

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 5, 10, 25
See ad on page 246
Tel: BRadshaw 2-6141

Pan-Air Electronics Corp., Calif., 5
Panseal, Inc., N.J., 25
Peer, Inc., Mich., 20, Airport Tower Consoles
Philco Corp., Govt. & Indl. Div., Pa., 5, 10, 15, 20, 25, Missile Controls
Philco Corp., Western Development Labs., Calif., 5, 10
Polydoroff & Assoc., D.C., 5
Pye Telecommunications Ltd., Eng., 15, 20, Landing Systems

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 5
See ad on this page
Tel: DAvenport 1-1130

Racal Engrg. Ltd., England, 15, 20
Radiation, Inc., Fla., 10
Radio City Products Co., Inc., Pa., 5
Radio Corp. of America, Defense Elec. Prod., N.J., 5, 10
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10, 15, 20
Ramo-Wooldridge Corp., Calif., 5, 10
Raytheon Co., Mass., 5, 10, 25
Reeves Instrument Corp., N.Y., Guidance Systems
Reflectone Corp., Conn., 25
Remanco, Inc., Calif., 5
Remler Co., Calif., 20
Republic Electronic Indust. Corp., N.Y., 5, 10
Resdel Engrg. Corp., Calif., 5, 10
Rhein Sound System, Inc., Conn., 15, 20
Ryan Aeronautical Co., Ryan Electronics Div., Calif., 25
Scientific Service Labs., Texas, 5
Servo Corp. of America, N.Y., 25, 35, Doppler
Servomechanisms, Inc., Calif., 25
Sierra Research Corp., N.Y., 5, 10
Simmonds Aerocessories, Inc., N.Y., 5
Skiatron Elect.-Television Corp., N.Y., 25
Solid State Electronics Co., Calif., 5, 10
Sperry Gyroscope Co. of Canada, Ltd., Canada, 25
Sperry Rand Corp., Ford Instrument Co., Div., N.Y., 25
Sperry Rand Corp., Sperry Gyroscope Co. Div., N.Y., 5, 10
Sperry Rand Corp., Sperry Phoenix Co. Div., Ariz., Controls & Instr.
Spivey Inc., James S., D.C., 5, 10, 15, 20
Springer Aircraft Radio Corp., Ind., 5, 10, 35
Standard Telephones & Cables Ltd., England, 5, 10, 15, 20, 30, 35

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 25, 35
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Stewart-Warner Electronics, Ill., 15, 20
Stromberg-Carlson Div., General Dynamics Corp., N.Y., 5, 10, 35
Stromberg-Carlson-San Diego, Calif., 5, 10
Summers Gyroscope Co., Calif., 25

Sylvania Electric Products, Inc., Special Tube Operations, 500 Evelyn Ave., Mountain View, Calif., 5, 10
See ad on pages 26-27
Tel: YOrkshire 8-6211

Sylvania Electric Products, Inc., Sylvania Electronic Systems Div., Mass., 5, 10
Systems, Inc., Fla., 25, 35

Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 15, 20
See ad on page 352
Tel: OWens 8-4800

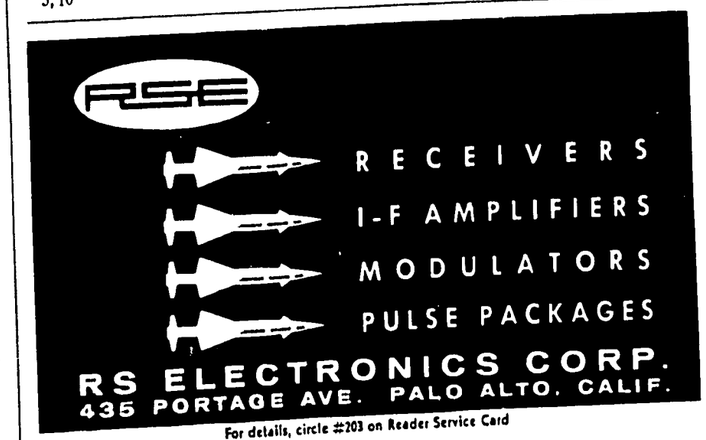
Telechrome Mfg. Corp., N.Y., 10
Telecomputing Corp., Whittaker Gyro Div., Calif., Auto Pilot Systems
Telectro Industries Corp., N.Y., 5, 10, 15, 20, 35
Telerad Mfg. Corp., N.Y., 10
Temco Aircraft Corp., Electronics Div., Texas, 25
Topping Electronics Ltd., Canada, 20
Twenty First Century Electronics, Inc., Calif., 5, 15
United Aircraft Corp., Norden Div., Norden Labs., N.Y., 25
United Control Corp., Wash., 25
U. S. Science Corp., Sub. Topp Industries, Inc., Calif., 5, 10, 15, 20, 25, 35
Varo Mfg. Co., Inc., Texas, 15, 20
Vickers, Inc., Electric Products Div., Mo., Auto Pilots
Virginia Electronics Co., Inc., D.C., 15, 20
Waugh Engrg. Co., Calif., 10
Westinghouse Electric Corp., Pa., 25
Westrex Corp., N.Y., 15, 20
Wilcox Electric Co., Inc., Mo., 5, 10, 15, 20, 25, 35
Young Spring & Wire Corp., Gonset Div., Calif., 5, 10, 15, 20

2. Amateur Equipment.

5. Receiving equipment **10. Transmitters**

American Electronics Co., N.Y., 5, 10
Barker & Williamson, Inc., Pa., 5, 10
Bassett Inc., Rex, Fla., 5, 10
Central Electronics, Inc., Ill., 10

Collins Radio Co., 855 35th St. N. E., Cedar Rapids, Iowa, 5, 10
See ad on pages 32-33
Tel: EMpire 3-0281



For details, circle #203 on Reader Service Card

Admittance Meters: See class 26

1. Aircraft & Airport Equipment.

Communication & Navigation

5. Airborne receivers
10. Airborne transmitters
15. Airport receivers
20. Airport transmitters
25. Computers, Air Navigation
30. GCA types
35. VOR types

A. F. R. Products, Inc., Ill., 5, 10
Adler Electronics, Inc., N.Y., 5, 10
Admiral Corp., Ill., 5, 10
Aermotive Equipment Corp., Mo., 5, 10
Aero Guidance Corp., Calif., 5, 10, 20, 35
Aeronautical Comm. Equip., Inc., Fla., 5, 10, 15, 20
Aeronautical Electronics, Inc., N.C., 15, 20

Aircom, Inc., 48 Cummington St., Boston, Mass., 5, 10
See ad on page 590
Tel: COpley 7-9115

Aircraft Radio Corp., Boonton, N.J., 5, 10, 25, 35
See ad on page 164
Tel: DEerfield 4-1800

Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 35
See ad on page 590
Tel: HAncock 6-2150

Allied International Corp., N.Y., 5, 10, 15, 20
Amelco, Inc., Calif., 5, 10, 15, 20
American Hydromath Corp., N.Y., 25
American Missile Products, Calif., 5
Amtron Corp., Mass., 5, 10, 15, 20
Analogue Controls, Inc., N.Y., 25
Andersen Labs., Inc., Conn., 5, 10
Audicon Electronics, Inc., N.J., 5, 15
Avco Corp., Crosley Div., Ohio, 30

Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Mass., 25
See ad on page 296
Tel: UNiversity 4-7420

Barber Labs., A. W., N.Y., 15
Beam Instruments Corp., N.Y., 25
Bell Aircraft Corp., Niagara Frontier Div., N.Y., 5, 10
Belock Instrument Corp., N.Y., 25
Bendix Aviation Corp., Ind., 5, 10, 25, 30, 35
Bendix Aviation Corp., Mich., 5, 10, 15, 20, 25, 30, 35
Bendix Aviation Corp., Bendix Radio Div., Md., 5, 10, 15, 20

Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 25
See ad on pages 19-22
Tel: ATlas 8-2000

Bendix Aviation Corp., York Div., Pa., Missile Beacons

Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., VOR Signal; ILS Signal Generators
See ad on page 336
Tel: DEerfield 4-3200

Bowmar Instrument Corp., 8000 Bluffton Rd., P.O. Box 2835, Fort Wayne, Ind., 25
See ad on page 347
Tel: SHerwood 3121

Bruno-New York Industries Corp., N.Y., 5
CGS Labs., Inc., Conn., 5, 10
California Computer Products, Inc., Calif., 25
Canadian Aviation Electronics Ltd., Canada, 25
Canadian G.E. Co., Ltd., Elecrn. Equip.-Tube Dept., Canada, 5, 10, 15, 20, 25
Canadian Marconi Co., Canada, 5, 10, 25
Canadian Westinghouse Co., Ltd., Electronics Div., Canada, 35
Central Electronics, Inc., Ill., 5, 20
Centronix, Inc., Fla., 5, 10, 15, 20, 25
Chisholm Industries Ltd., Canada, 1, 6, 7, 16, 20, 24, 36, 84

Clifton Precision Products Co., Inc., Marple & Broadway, Clifton Hts., Pa., 25
See ad on pages 46-47
Tel: MAdison 6-2101

Collins Radio Co., 855 35th St. N.E., Cedar Rapids, Iowa, 5, 10, 15, 20, 25, 35
See ad on pages 32-33
Tel: EMpire 3-0281

Colorado Research Corp., Colo., 25
Communications Co., Fla., 15, 20
Computing Devices of Canada, Ltd., Ont., 25
Continental Electronics Mfg. Co., Texas, 10
Corbin Corporation, Md., 5, 10
Creative Electronics Corp., Conn., 5, 10
Daystrom Inc., Weston Instruments Div., N.J., 25
Daystrom-Weston Industrial; Div. of Daystrom, Inc., N.Y., 15, 20
Designers for Industry, Inc., Ohio, 5, 25, 30
Di/An Controls, Inc., Mass., 25
Dynamic Electronics-New York, Inc., N.Y., 5, 10, 15, 20, 30, 35
Dynamics Corp. of America, Reeves Instrument Corp., N.Y., 25
Dynavia Corp., Va., 25
EPR Special Products Corp., N.Y., 5, 10, 15, 20, 30, 35
Edcliff Instruments, Calif., 25
Ekco Electronics Ltd., England, 5, 15, 20
Electro-Mechanical Research, Inc., Fla., 5, 10
Electronic Assistance Corp., N.J., 5, 10, 15, 20
Electronic Communications, Inc., Fla., 5, 10, 15, 20, 25
Electronic Development Co., Inc., Calif., 5, 10
Electronic Specialty Co., Calif., 5
Emerson Radio & Phonograph Corp., Md., 5, 10, 25
Engineering Associates, Ohio, 5
Erco Radio Labs., Inc., N.Y., 15, 20
Fae Instrument Corp., N.Y., 25
Feedback Controls, Inc., Mass., 25
Ferranti Electric, Inc., Electronics Div., N.Y., 25
Ferranti-Packard Electric Ltd., Canada, 25
Flite-Tronics, Inc., Calif., 5, 10, Compass Comparators
Ford Motor Co., Sub.-Aeronutronic Systems Inc., Calif., 25
Forney Industries, Aviation Div., Colo., 5, 10
Gates Radio Co., Ill., 20
General Applied Science Labs., Inc., N.Y., 25
General Communication Co., Mass., 5, 10
General Controls Co., Calif., 25
General Electric Co., Light Military Elect. Dept., N.Y., 5, 10, 25
General Electronic Labs., Inc., Mass., 5, 10
General Mills, Inc., Mechanical Div., Minn., 25
General Motors Corp., AC Spark Plug Div., Wisc., 25, Inertial Guidance Systems
General Precision Lab., Inc., N.Y., 25, Doppler Systems
Giannini Controls Corp., Calif., 5, 10, 25
Gilfillan Bros., Inc., Calif., 30
Gulton Industries, Inc., N.J., 5, 10, 15
Gulton Industries, Inc., New Mexico, 5, 10

HRB—Singer, Inc., Science Park, State College, Pa., 5
See ad on page 366
Tel: ADams 7-7611

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 5, 10
See ad on page 204
Tel: VAn Buren 6-6300

Hastings-Raydist, Inc., Va., 25
Haydon Instrument Co., Conn., 25
Hazeltine Corp., N.Y., 5, 10, 35
Hoffman Electronics Corp., Calif., 5, 10, 25
Huyck Sons, F. C., Waldorf Electronics Div., N.Y., 25
Industrial Control Co., N.Y., 25
Intelex Systems, Inc., N.Y., 5, 10
International Electronics Corp., N.Y., 20, 30
International Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 10, 15, 20, 25, 30, DMET & Tacan Beacon Simulators
Interstate Electronics Corp., Calif., 5, 10
Itek Corp., Mass., 25
Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 5, 10, 15, 20

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 25, Inertial Guidance
See ad on page 348
Tel: GRegory 2-1000

Kidde & Co., Inc., Walter, N.J., 25
King Radio Corp., Kansas, 5, 10, 15, 20, 35
Kinn Electronics Corp., Md., 15, 20, 35

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst 73, N.Y., 25
See ad on page 370
Tel: TWining 9-5600

LEL, Inc., 384 Oak St., Copiague, N.Y., 5, 10
See ad on page 372
Tel: AMityville 4-2200

Laboratory for Electronics, Inc., Mass., 25, 30
Land-Air, Inc., Ill., 5
Land-Air, Inc., Instrument & Electronic Div., Calif., 5
Lear, Inc., Mich., 5, 10, 15, 20, 25, 30, 35
Lear, Inc., Lear Cal Div., Calif., 5, 10, 15, 20, 30, 35
Lewyt Mfg. Corporation, N.Y., 5, 10
Librascope, Inc., Calif., 25

KAY Electronic Test & Measuring Instruments

• Sweeping Oscillators • Noise Figure Measurement • TV Picture & Sound Signal Sources • Marker Generators • Pulsed Carrier Generators • TV Transmitters • Color Generators • Signal Generators • Attenuators • Sound Spectrographs • Gain and Loss Test Sets • Spectrum Analyzers • Vibration Analyzers • Vacuum Tube Voltmeters • Transistorized Test Instruments • Power Supply • Voltmeters • Probe • Video Amplifier • Crystal Oscillator • Audio-Oscillator • Fluttermeter • Rota-Graph

SWEEPING OSCILLATORS

Vari-Sweep

INST.	RANGE	TUNING	WIDTH	OUTPUT	PRICE
MEGA-SWEEP	50kc-1000mc	continuous	0-40	100mv	$495
CALIB. MEGA-SWEEP	50kc-950mc	single dial	0-40	50mv	545
MEGA-SWEEP 111A	10mc-500mc	zero level	0-40	.15V rms 70 ohms	595
	400mc-950mc	base line		.3V rms 300 ohms	
MEGA-SWEEP 112A	800mc-1200mc	single dial	0-40	.3V rms 70 ohms	595
VARI-SWEEP	2-220mc Fund	continuous	Up to 30 mc plus	1.0V rms 70 ohms	745
VARI-SWEEP 400	15-470 mc	continuous	30mc plus	1.0V rms 70 ohms	795
ULTRA-SWEEP	450-900 Fund	continuous	0-50 mc	3.0V rms 70 ohms	975
MAGNA-SWEEP	5-1000mc	continuous	25-1000 mc	0.1V rms 1.5V rms	4950
	2200-3800mc	variable over range		50 ohms	

SWEEPING OSCILLATORS WITH MARKS

Rada-Sweep Sr.

Marka-Sweep
Model Video 50

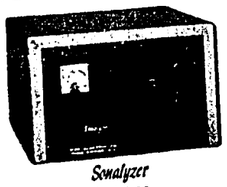
INST.	RANGE	TUNING	WIDTH	MARKERS	OUTPUT	PRICE
MARKA-SWEEP	50kc-20mc	3 ranges	complete	6 crystals	0.2V rms	$$$$
MODEL VIDEO		50kc-20mc	range		70 ohms	
MARKA-SWEEP	50kc-8mc	.....	0-8mc	5 crystals	1.5V rms	745
MODEL VIDEO TTV				1 variable	70 ohms	
MARKA-SWEEP	50kc-50mc	contin.	4-50mc	8 crystals	1.0V P.-P.	745
MODEL VIDEO 50			contin. variable			
VARI-SWEEP	10-145mc	contin.	30mc+	11 crystals	1.0V rms	995
MODEL RADAR	Fund			1 variable	70 ohms	
VARI-SWEEP	4-120mc	contin.	30mc+	11 crystals	1.0V rms	995
MODEL IF	Fund			1 variable	70 ohms	
RADA-SWEEP SR	1-260mc	6 switched	60-70mc	24 crystals	0.5V rms	595
	Fund	bands			70 ohms	plus crystals
KILO-SWEEP	50kc-2mc	contin.	contin. to 100kc	6 crystals	0.25V rms	575-895
	.5mc				70 ohms	
	-10mc					575
SONA-SWEEP	5kc-200kc	contin.	0-20kc	6 crystals	0.25V rms	
					70 ohms	425
RADA-SWEEP	20-40mc	.....	20mc or 2mc	9 crystals	.25V rms	
	50-70mc				70 ohms	675
LIGNA-SWEEP CP	100kc-220mc	6 switched	10-60mc	18 crystals	1.0V rms	plus crystals
		bands	contin. variable		70 ohms	600 ohms
LIGNA-SWEEP SKV	200cps-11mc	4 switched	2kc-10mc	uses variable	1.0V rms	895
		bands		marker	and 70 ohms	

NOISE FIGURE MEASUREMENT . . . NOISE GENERATORS

Mega-Node Sr.

INST.	RANGE	NOISE FIG. RANGE	PRICE
MEGA-NODE	5-220mc	0-16db @ 50 ohms	$345
		0-23.8db @ 300 ohms	295
MEGA-NODE SR.	10-3000mc	0-20db @ 50 ohms	270-495
MICROWAVE	1120-26,500mc	Fluorescent Tubes 15.8 ± .25db	(with power supply
MEGA-NODES		Inert Gas Tubes 15.28 ± .1db	$1495, covering range
RADA-NODE	5-26,500mc	0-23.8 ± .25 db	5mc to 40
		IF strips @ 30 and 60mc	345
MEGA-NODE 175-A	50-500mc	0-19db, 300 ohms	345
MEGA-NODE 403-A	3-500mc	0-19db, 50 ohms	

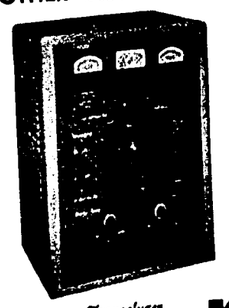
SPECTRUM ANALYSIS



Sonalyzer
Model 30

INST.	DESCRIPTION	FREQ. RANGE	FEATURES	PRICE
VIBRALYZER	Vibration Frequency Analyzer	5-4400cps	Displays amplitude vs frequency vs time. Provides permanent record.	$2495
SONA-GRAPH	Sound spectrograph for frequency analysis of audio energy	85-8000cps	Records frequency and intensity to time	2195
ECHO-VOX SR.	Provides variable periods of time delay at audio frequencies	40-12,000cps	20 to 1600 millisecond delay range	1695
SONA-STRETCHER	Speech stretcher for slowing speech to ⅓ normal tempo	100-4000cps	Has phono & tape recorder inputs	950
SONALYZER MODEL 30	A 30-Channel all-electronic spectrum analyzer providing immediate visible display of complex waveforms up to 20,000 cps			1995
SONAGRAM DISPLAY UNIT	Accessory for use with Sonalyzer to provide a 3-dimensional-frequency vs intensity vs time-display on long persistence 'scope			495
VARI-VOX	A compressor and expander for audio signals; slows to ⅓ or doubles normal tempo with no loss of intelligibility			1495

OTHER INSTRUMENTS



Transalyzer

INST.	RANGE	RANGE OF MEASUREMENT	FEATURES	PRICE
DRD METERS	1.1-18Kmc	Direct reading digital frequency meters with coupling elements for waveguide or coaxial line. Accuracy ±0.1%		$325-550
	9 Models			595
MICROLTER 50 VTVM	100cps-50mc	Full Scale: 1mv-1V in 7 ranges. May be used as 50mc video amp.		1495
TRANSALYZER	50kc-50mc	Measures Alpha and Alpha Cutoff—Collector and Emitter Current. 3 Voltages—Emitter to Base, Emitter to Collector, and Base to Collector		995
MEGA-MATCH	10mc-1000mc	Confin. tuned sweeping oscillator	Displays reflected energy. Checks matching impedance	325
UTILATOR	4.5-220mc	Fundamental Freq. Utility Oscillator	0.7V rms into 70 ohms metered AGC'd	2195
GAIN SET		Complete Equipment for Making Precision Measurements of Gain or Loss in Components and Systems		975
MEGA-PIX	TV Sound-Picture	Color or Black and White Transmitter	.25 output into 70 ohms	795 135
RADA-PULSER SR.	Pulsed-Carrier	Generator, 12-80mc. Continuously variable carrier frequency and pulse width		
AUDIOLATOR	15cps-15kc	Transistorized audio oscillator, battery operated. Flat to ±0.5 db over range. Output 1.0V rms at 600 ohms.		95
TRANSIFIER	15cps-15mc	Transistorized battery operated amplifier giving 10db and 20db gain		

WRITE FOR 1959-A CATALOG

KAY ELECTRIC COMPANY

DESIGNERS & MANUFACTURERS OF PRECISION ELECTRONIC TEST AND MEASURING EQUIPMENT

MAPLE AVE., PINE BROOK, NEW JERSEY

CApital 6-4000

Dept. ID-9

For details, circle #204 on Reader Service Card

Directory I. Complete Equipment

2. Amateur Equipment.

Corbin Corporation, Md., 5, 10
Creative Electronics Corp., Conn., 5, 10
Dynamic Electronics-New York, Inc., N.Y., 5, 10
Eldico Electronics, Radio Eng. Labs., Inc. Div., N.Y., 10
Electro-Voice, Inc., E. V. Instrument Div., Mich., 5
Electro-Voice, Inc., Radio Mfg. Engrg. Div., Ill., 5
Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y., 10
See ad on page 295
Tel: STillwater 6-8700
Electronic Patent Applications, Conn., 5, 10
General Electronics Co., Inc., Ala., 10
Gulton Industries, Inc., N.J., 5, 10
Gyro Electronics Co., N.Y., 5, 10
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 5, 10
See ad on page 204
Tel: VAn Buren 6-6300
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10
See ad on page 328
Tel: YUkon 3-3961
I. D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind., 5
See ad on page 485
Tel: LIberty 7-3581
International Crystal Mfg. Co., Inc., Okla., 5, 10
Johnson Co., E. F., Minn., 10
Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 10
Knight Electronics, Ill., 5, 10
Lettine Radio Mfg. Co., N.Y., 10
Mandex Mfg. Co., Inc., Ill., 5
Marine View Electronics, Inc., N.Y., 5
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 10
See ad on page 416
Tel: DAvenport 4-4108
Morrow Radio Mfg. Co., Oregon, 5, 10
Multi-Products Co., Mich., 5, 10
National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5
See ad on page 642
Tel: NO 5-4800
Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mt. Vernon, N.Y., 2
See ad on page 320
Tel: OWens 9-4600
Radio Engrg. Labs., Inc., N.Y., 5, 10
Radio Mfg. Engrg., Electro Voice Inc., Div., Mich., 5
Schroeter, A. R., N.J., 10
Tapetone, Inc., Mass., 5
Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 5, 10
See ad on page 352
Tel: OWens 8-4800
Telechrome Mfg. Corp., N.Y., 5, 10
Tenna Mfg. Co., Ohio, 5
Vocaline Co. of America, Inc., Conn., Transceiver
Young Spring & Wire Corp., Gonset Div., Calif., 5, 10

Ammeters: See class 56

Amplifiers: See class 36

Attenuators: See class 38

Atmospheric test chambers: See class 12

3. Audio Frequency Test Equipment.

3. AF signal
5. Beat frequency oscillators
10. Distortion & noise analyzers
15. Intermodulation meters
17. Harmonic frequency
20. Output power meters
25. Sound level
30. Spectrum analyzers
35. Square wave generators
40. Telegraph test
45. Voltmeters-audio frequency

Airmec Limited, Eng., 3
Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 45
See ad on pages 82-83
Tel: LUdlow 3-6160
Avtron Mfg. Co., Ohio, 10, 15
B. J. Electronics, Borg-Warner Corp., Calif., 30
B & K Instruments, Inc., Ohio, 5, 10, 17, 25, 30, 45
Bailey Electronics Lab., P.A., Conn., Noise Meter
Ballantine Labs., Inc., Boonton, N.J., 45
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Tel: DEerfield 4-1432
Barker & Williamson, Inc., Pa., 3, 10, 15
Bassett Inc., Rex, Fla., 3
Brocker Labs., Calif., 35
Bruel & Kjaer, Denmark, 5, 10, 25, 30, 45
Burr-Brown Research Corp., Ariz., 35, 45
Canadian Marconi Co., Canada, 3, 5, 10, 17, 20, 35, 45
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Use the Reader Service Card just inside the back cover for more information on advertised products.

3. Audio Frequency Test Equipment.

Centronix, Inc., Fla., 3, 5, 10, 17, 30, 35
Chesapeake Instrument Corp., Md., 10, 30
Cohu Electronics, Inc., Millivac Instruments Div., N.Y., 45
Compagnie Generale de Metrologie, France, 3
Consolidated Avionics Corp., N.Y., 20
Cresent Communications Corp., Conn., 3, 45
D & R Ltd., Calif., Wow & Flutter Meters
Daven Co., N.J., 10, 20, 45
Dawe Instruments Ltd., England, 3, 10, 20, 25
Daystrom Systems, Div. of Daystrom, Inc., Cal., 30
Decade Instrument Co., N.J., 5, 17
Decker Corp., Pa., 30
Donner Scientific Co., Cal., 3, 10, 30
Douglas Radio Labs., Mass., 10
Dymec, Inc., Calif., 3
Dynamic Electronics-New York, Inc., N.Y., 3, 10, 30
EPR Special Products Corp., N.Y., 5, 10, 35
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Elcor, Inc., Va., 35
Electric Eye Equipment Co., Ill., 10
Electro Instruments, Inc., Calif., 45
Electronic Assistance Corp., N.J., 3, 10, 17
Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y., 3, 35
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Tel: STillwell 6-8700
Electronics International Co., Calif., 3
Elgenco, Inc., Calif., Noise Generators, Low Frequency
Elsin Electronics Corp., N.Y., 45
Engineering Associates, Ohio, 3, 5, 10
Epsco-Worcester, Mass., 30
Erwood, Inc., Illinois, 25
Farwest Mfg. Div., Wash., Phase Sequence Indicators
Ferranti Electric, Inc., Electronics Div., N.Y., 30
Fidelity Amplifier Co., Ill., 3
Fisher Research Lab., Inc., Calif., 3, 45
Flow Corp., Mass., 20, 45
General Applied Science Labs., Inc., N.Y., 30, 35
General Automatics, Inc., Calif., 3
General Electric Co. of England, Ltd., England, 40
General Electronic Labs., Inc., Mass., 10, 45
General Radio Co., West Concord, Mass., 3, 5, 10, 17, 20, 25, 35, 45
See ad on Cover 4
Tel: EMerson 9-4400

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3. Audio Frequency Test Equipment.

Triplett Electrical Instrument Co., Harmon Road, Bluffton, Ohio, 25
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Tel: 323-W

U.S. Science Corp., Sub. Topp Indust., Inc., Calif., 3

Vitro Labs., Silver Spring Lab., Md., 25, 30

Wallson Assoc., Inc., 35 E. Runyon St., Newark 8, N.J., 10
See ad on page 311
Tel: TAlbot 4-2600

Waveforms, Inc., N.Y., 3, 45

Wayne Kerr Corp., 1633 Race St., Philadelphia 3, Pa., 10
See ad on page 277
Tel: GArfield 5-2844

Westinghouse Electric Corp., Pa., 20, 45

Winston Electronics, Inc., Pa., 10, 15, 17, 20, 25, 45

Wintronics, Calif., 45

Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 45
See ad on page 310
Tel: BEekman 3-6720

4. Automatic Control Equipment.

5. Burglar-alarm & protective systems
10. Combustion & smoke-nuisance controls
15. Electronic remote controls
16. Fluid flow
17. Gyroscopes
18. Liquid level
20. Photo electric
25. Positioning equipment
27. Pressure
30. Production controls, counting & sorting equipment
35. Servo type
40. Temperature, electronic
45. Timing
50. Vacuum controls
55. Variable speed controls

A & D Electronics, Inc., N.J., 55, DC Motor

A.R.F. Products, Inc., Ill., 25

Abrams Instruments Corp., Mich., 15, 45

Acoustica Associates, Inc., Dept. IRE, Fairchild Court, Plainfield, N.Y., 18
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Tel: OVerbrook 1-2100

Adcon Inc., Mass., 20

Admiral Corp., Ill., 5

Advanced Electronics, Inc., Conn., 15, 30

Aero Electronics Co., Ill., 15, 25, 35

Aeroflex Corp., N.Y., 17, 25

Aerolab Devel. Co., Semiconductor Systems Div., Calif., 15, 35, 40, 45

Aerotronic Associates, Inc., N.H., 15, 30, 45

Airborne Instrument Lab., N.Y., 25, 30

Airmec Limited., Eng., 18, 20, 25, 30, 40, 45

Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla. Cambridge Div., Jacktown Rd., Cambridge, Md., 15, 25, 35, 45, 55
See ad on pages 82-83
Tel: LUdlow 3-6160

Airtronics, Inc., D.C., 45

Alden Electronic & Impulse Recording Equipment Co., Inc., Alden Research Center, P.O. Box 125, Westboro 1, Mass., 45
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Tel: FOrest 6-4467

Allen-Bradley Co., Wisc., 27, 45

Amelco, Inc., Calif., 35

American Bosch Corp., Arma Div., N.Y., 15, 17, 35

American Electronics, Inc., Calif., 35

American Electronics, Inc., American Data Div., N.Y., 15, 30

American Instrument Co., Inc., Maryland, 27, 40

American Mach. & Foundry Co., Conn., 15, 16, 17, 25, 35, 55

American Mach. & Foundry Co., D.C., 15, 25, 30, 35, 55

American Mach. & Metals, Rahm Instruments, N.Y., Motion Sensing

American Measurements & Control, Inc., Mass., 15, 16, 35

American Research & Mfg. Corp., Md., 15

American Speedlight Corp., N.Y., Electronic Flash Equipment

American Television & Radio Co., 300 E. Fourth St., St. Paul 1, Minn., 5
See ad on page 426
Tel: CApital 2-3791

Amglo Corp., 4333 N. Ravenswood Ave., Chicago 13, Ill., 45
See ads on pages 477, 577
Tel: BUckingham 1-2727

Analogue Controls, Inc., N.Y., 20, 25, 35, 50

Andersen Labs., Inc., Conn., 35, 40

Applied Science Corp. of Princeton, N.J., 15

Armstrong Whitworth Aircraft, Ltd., Sir W. G., A.W.E. Electronics Div., Huccleeote, Gloucester, England, 15
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Tel: TOll Bar 2261

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Astronetics, Inc., N.J., 55

Atlantis Engrg. Corp., Texas., 30

Atronic Products., Inc., Pa., 30

Atwood, Consulting & Mfg. Eng., W.L., Ohio, 15, 16, 18, 20, 27, 35, 40, 45, 50

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Automatic Products Research, N.Y., 25

Automatic Timing & Controls, Inc., Pa., 15, 16, 18, 25, 27, 35, 45, 55

Autometric Corp., N.Y., 25, 35

Autotron, Inc., Ill., 5, 20, 30, 45

Autotronics, Inc., Box 812, Route 1, Florissant, Mo., 35
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Tel: TEmple 7-3565

Autron Engrg., Inc., Calif., 15, 20, 27, 30, 40

Avco Corp., Crosley Div., Ohio, 15

Avien, Inc., N.Y., 18, 40

Avtron Mfg. Co., Ohio, 30

Babcock Radio Engrg., Inc., Cal., 15

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Bailey Meter Co., Ohio, 10, 16, 18, 27, 40, 45, 50

Baldwin-Lima-Hamilton Corp., Mass., 27

Barber-Colman Co., Dept. 60 D, 1211-9 Rock St., Rockford, Ill., 25, 35, 40
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Tel: WOodland 8-6833

Barnes Development Co., Pa., 30

Barnes Engrg. Co., Conn., 40

Bar-Ray Products, Inc., N.Y., 40

Barry Controls, Inc., Mass., 50

Barry Controls, Inc., Insco Co. Div., Mass., 55

Barton Electronics, Inc., Conn., 15, 20, 30, 45

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Beattie-Coleman, Inc., Calif., 5, 45

Beckman Instruments, Inc., Berkeley Div., Calif., 15, 20, 30, 45

Beckman Instruments, Inc., Systems Div., Calif., 45

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Belock Instrument Corp., N.Y., 17, 25, 35, 45

Bendix Aviation Corp., Ind., 10, 15, 18, 25, 35, 45

Bendix Aviation Corp., Mich., 17, 18, 25, 35

Bendix Aviation Corp., Bendix Pacific Div., Calif., 15, 16, 25, 27, 35

Bendix Aviation Corp., Cincinnati Div., Ohio, 18, Viscosity, Specific Gravity

Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 15, 17, 35
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Tel: ATlas 8-2000

Bendix Aviation Corp., Pioneer Central Div., Iowa, 10, 17, 18

Bendix Aviation Corp., Sheffield Corp., Sub., Ohio, 30, 45

Bernco Engrg. Corp., Ind., 10, 45

Bill Jack Scientific Instrument Co., Calif., 30

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Borg-Warner Corp., Pesco Prods. Div., Ohio, 35

Bowmar Instrument Corp., 8000 Bluffton Rd., P.O. Box 2835, Fort Wayne, Ind., 15, 18, 25, 35, 55
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Tel: SHerwood 3121

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Gertsch Products, Inc., Calif., 45

Harrison Labs., Inc., B.M., Mass., 45

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 3, 10, 15, 17, 20, 25, 35, 45
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Tel: YUkon 3-3961

Hermes Electronics Co., Dept. BD, 75 Cambridge P'kway, Cambridge 42, Mass., 30
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Tel: UNiversity 4-7200

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 3, 10, 20, 35, 45, noise figure meters and sources
See ad on pages 3-18
Tel: DAvenport 5-4451

Hickok Electrical Instrument Co., Ohio, 3, 5, 10, 20

Hycon Eastern, Inc., see Hermes Electronics Co.

Hycon Electronics, Inc., Calif., 45

Industrial Test Equipment Co., 55 East 11th St., New York 3, N.Y., 3, phase meters and shifters
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Itek Corp., Mass., 30

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Jackson Elec. Instrument Co., Ohio, 3

Jodon, Inc., F. R., D.C., 30

Jones-Porter Instrument Co., Inc., N.J., 3, 17

Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 5, 30
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Tel: CApital 6-4000

Knight Electronics, Ill., 3

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L & O Research & Development Corp., Pa., 5, 25

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 30
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Tel: LOwell 6-2600

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 30, High Intensity Sound Generators
See ads on pages 270, 301
Tel: TExas 0-7711

Maico Electronics, Inc., Minn., 25

Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 3, 5, 10, 15, 17, 20, 30, 35, 40, 45
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Massa Labs., Inc., Mass., 25

Mayberry Electronics Co., Calif., 45

Measurements, a McGraw Edison Div., Box 180, Boonton, N.J., 15, 35
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Tel: DEerfield 4-2131

Meters, Inc., Ind., 20, 45

Metropolitan Electronics & Instruments Co., N.Y., 45

Minneapolis Honeywell Regulator Co., Md., 10, 30

Mohawk Business Machines Corp., N.Y., 3, 5

Muirhead & Co., Ltd., England, 3, 10, Phase Meters

Muirhead Instruments, Inc., N.Y., 3, 10, 30, 35, Phase Meters

Nems-Clarke Co., Md., 30

New London Instrument Co., Conn., 35

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Northeast Electronics Corp., N.H., 3, 20, 45

Northern Radio Co., Inc., 147 West 22nd St., New York 11, N.Y., 35
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Tel: WAtkins 9-9117

Panoramic Radio Products, Inc., 528 South Fulton Ave., Mt. Vernon, N.Y., 10, 15, 17, 30
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Tel: OWens 9-4600

Philamon Laboratories, Inc., 90 Hopper St., Westbury, L.I., N.Y., 3
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Tel: EDgewood 3-1700

Pierce, George C., Supvr. Products Services, Va., 25, 40

Precise Development Corp., N.Y., 3, 25, 35, 45

Precision Apparatus Co., Inc., N.Y., 3, 35, 45

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 10, 17, 30
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Tel: POrt Washington 7-8150

Quan-Tech Labs., 236 Mt. Kemble Ave. Morristown, N.J., 10, 17, 30
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Tel: JEfferson 8-6350

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Radio City Products Co., Inc., Pa., 25

Radio Corp. of America, Electron Tube Division, Section I-22-Q, 415 South Fifth St., Harrison, N.J., 3, 45
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Radio Engrg. Products Ltd., Canada, 45

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Railway Communications, Inc., Mo., 3

Rank Cintel Ltd., England, 3, 35

Rawson Electrical Instrument Co., 111 Potter St., Cambridge 42, Mass., 45
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Tel: KIrkland 7-4041

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Sanborn Co., 175 Wyman St., Waltham 54, Mass., 25
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Sensitive Research Instrument Corp. 310 Main St., New Rochelle, N.Y., 45
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Southwestern Industrial Electronics Co. 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Texas, 25
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Tel: HO 5-3471

Specialty Engrng. & Electrn. Co., N.Y. 10, 40

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Standard Telephones & Cables Ltd., England, 3, 10, 25, 30, 40

Stark Electronic Instruments Ltd., Canada, 20, 35, 45

Statistical Instrument Co., N.Y., 10, 30

Stelma, Inc., Conn., 10, 40

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 3, 5
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Tel: POrt Washington 7-7200

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Systems, Inc., Fla., 3, 30

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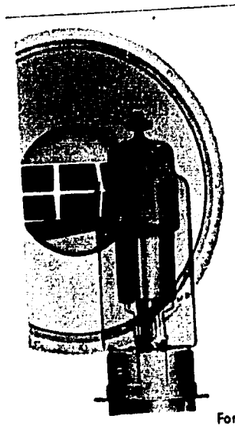
Telechrome Mfg. Corp., N.Y., 3, 40

Tesla Electric Co., Ill., 3, 5

Towaco Electronics, N.J., 40

Transistor Devices, Inc., N.J., 45



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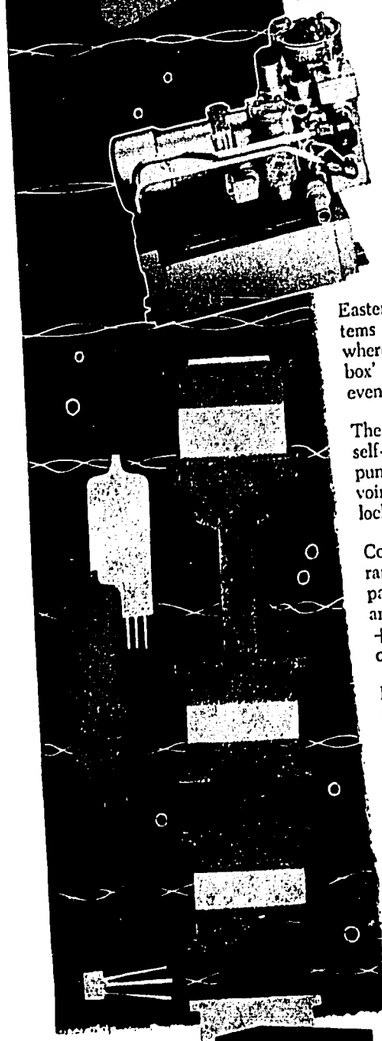

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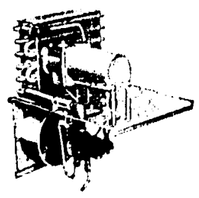

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Brown Brockmeyer Co., Ohio, 15, Garage Door Type
Buck Instrument Co., Colo., 27
Bulova Research & Development Lab., Inc., N.Y., 15, 27, 35, 45
CG Electronics Corp., New Mex., 5, 15
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Calbest Electronics Co., Calif., 15
Camden Electronics, Inc., N.J., 5, 20, 55
Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y. 25
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Concord Control, Inc., 1282 Soldiers Field Rd., Boston 35, Mass., 15, 25, 30, 35, 45
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Electronic Specialty Co., Calif., 15, 25, 35, 40, 45
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Electronics Corp. of Amer., Mass., 5, 10, 15, 18, 20, 30, 40, 45
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El-Tronics, Inc., Alwac Computer Div., Calif., 30
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Endeveo Corp., Digitran Co. Div., Calif., 25, 30
Engineering Associates, Ohio, 18
Engineering Specialties, Ohio, 55
Epic, Inc., N.Y., 40
Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 30, 45
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Tel: GLendale 6-8592
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Ess Specialty Corp., N.J., 10, 20, 30
Etelco, Ltd., England, 5, 10, 15, 20, 30, 40, 45
Evershed & Vignoles, Ltd., England, 10, 15, 16, 18, 25, 27, 35, 40, 50
Ewald Instruments, Rt. 7, Kent, Conn., 45
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Tel: WAlker 7-3278
Exactel Instrument Co., Calif., 15, 16, 18, 25, 27, 35
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Fairchild Controls Corp., Dept. 31P, Components Div., 225 Park Ave., Hicksville, L.I., N.Y., 17, 25, 27
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Tel: WElls 8-5600
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Fidelity Instrument Corp., Pa., 55
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Fisher Scientific Co., Pa., 40
Foxboro Co., Mass., 15, 16, 18, 27, 40
Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 30
See ad on page 410
Tel: EVergreen 6-1300
Fried, Licensed Prof. Eng., Walter, N.Y., 20, 25, 40
Fuchs Impulse Motor Servomechanisms, N.Y., 15, 25, 35
GPE Controls, Inc., Ill., 16, 18, 25, 27, 35, 50
Gap Instrument Corp., N.Y., 25
Gardener Electronics Co., Ariz., Metal Detectors
Garrett Corp., Air Research Mfg. Div., Calif., 27, 35, 40
Gates Radio Co., Ill., 15
General Automatics, Inc., Calif., 5, 15, 18, 20, 25, 30, 35
General Bronze Corp., GB Elec. Corp., Subsid., N.Y., 35
General Controls Co., Calif., 10, 15, 16, 18, 20, 25, 27, 30, 35, 40, 45, 50
General Controls Co., Mass., 45
General Controls Co., Pic Automation Controls Div., Ill., 20, 30
General Devices, Inc., P.O. Box 253, Princeton, N.J., 15, 45, 55
See ad on page 360
Tel: DAvis 9-2323
General Electric Co., Apparatus Sales Div., N.Y., 10, 15, 18, 20, 27, 30, 45, 50, 55
General Electric Co., Instrument Dept., Mass., 20, 27, 35, 40, 45
General Electric Co., Light Military Elec. Dept., N.Y., 15
General Electric Co., Specialty Control Dept., Va., 5, 15, 18, 20, 25, 30, 45
General Electric Co., X-Ray Department, Wis., 18
General Electric Co., Ltd. of England, Eng., 15, 16, 18, 25, 40, 45
General Electro Mechanical Corp., N.Y., 25, 35, 55
General Electronics Co., Inc., Ala., 20, 45
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., 40
See ad on page 461
Tel: VAlley Stream 5-6363
General Motors Corp., AC Spark Plug Div., Wis., 17
General Radio Co., West Concord, Mass., 55
See ad on Cover 4
Tel: EMerson 9-4400
Genesys Corporation, Calif., 15, 30, 35
Giannini Controls Corp., Calif., 17, 27, 35, 40, 55
Gilmore Industries, Inc., Ohio, 15, 16, 27, 35, 40
Good Electronic Corp., Fla., 5, 15, 20, 27, 30, 40
Green Rectifier Co., N.J., 55
Guardian Electric Mfg. Co., 1601R W. Walnut St., Chicago 12, Ill., 18, 35
See ad on page 202
Tel: CHesapeake 3-1100
Gurley Co., N.Y., 25
Gyrex Corp., Calif., 17, 45
Haledy Electronics Co., N.Y., 16, 18, 20, 50
Hamilton Watch Co., Hathaway Instrument Div., Colo., 40, 55
Hanson-Gorrill-Brian, Inc., N.Y., 15, 25, 35, 40, 55
Harmon Electronics Co., Mo., 5, 15
Harrel, Inc., N.Y., 40, 45
Hastings-Raydist, Inc., Va., 15, 25, 27, 50
Haydon Co., A.W., 240 N. Elm St., Waterbury 20, Conn., 45
See ad on page 518
Tel: PLaza 6-4481
Haydon Instrument Co., Conn., 30, 45
Hays Corp., Ind., 10
Hays Mfg. Co., Pa., 16
Hehn-Engrg., Lester C., N.Y., 20
Hewson Co., Inc., N.J., 5
High Vacuum Equipment Corp., Mass., 50
Hill Assoc., Inc., James J., Fla., 5, 30, 45
Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 20
See ad on page 226
Tel: UNiversity 9-9850
Hoover Electric Co., Calif., 35
Hoover Electronics Co., Md., 15
Hosmer & Co., E. A., Calif., 15, 18, 30, 45
Hubbard Electronics, Inc., Calif., 30, 40, 45
Hughes Aircraft Co., Hughes Prod. Div., Calif., 25, 30
Hughey & Phillips, Inc., 3200 N. San Fernando Blvd., Burbank, Calif., 20
See ad on page 381
Tel: VIctoria 9-1104
Hull Corp., Hatboro, Pa., 50
See ad on page 667
Tel: OSborne 5-5000
Humphrey, Inc., Calif., 17
Huyck Sons, F. C., Waldorf Electronics Div., N.Y., 15, 35
I-T-E Circuit Breaker Co., Special Prods. Div., Pa., 35
Industrial Control Co., N.Y., 15, 25, 35, 55
Industrial Electronic Controls Co., N.Y., 30
Industrial Electronics Co., Monitor Controller Div., Mass., 5, 10, 15, 18, 20, 45
Industrial Electronics, Inc., Mich., 20, 27, 30
Industrial Electronics of Canada, Canada, 20
Industrial Instruments, Inc., N.J., 18, 30
Industrial Television, Inc., N.J., 15
Industrial Timer Corp., N.J., 45
Instron Engrg. Corp., Mass., 15, 25, 35, 55
Intercontinental Dynamics Corp., N.J., 20
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 15, 40, 45
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
International Business Machines Corp., N.Y., 15
Interstate Electronics Corp., Calif., 5
International Electronics Corp., N.Y., 5
Iron Fireman Mfg. Co., Electronics Div., Ore., 17, Aircraft Overheat
Isotope Develop. Ltd., England, 18
Itek Corp., Mass., 17
Jack & Heintz, Inc., Ohio, 15, 35, 45
Jansen Electronics Mfg., Inc., Minn.
Jem Electronics Corp., Ill., 15, 20
Jodon, Inc., F. R., D. C., 25, 35
Jones-Porter Instrument Co., Inc., N
25
Jordan Co., Inc., Wis., 15, 16, 25, 35
Kaiser Industries, Kaiser Aircraft Elect. Div., Ohio, 5, 15, 20, 30, 35, 45
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 15, 17, 18, 25, 30, 35,
See ad on page 348
Tel: GRegory 2-1000
Kellogg Switchboard & Supply Co.,
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Keystone Products Co., N.J., Fire Control
Kidde & Co., Inc., Walter, N.J., 10,
20, 25, 35, 45, 55
Kidde Ultrasonic Detection Alarm Inc., N.J., 5, 20, 40
Kingston Industries, Inc., Kingston Electronics Div., Mass., 55
Knight Electronics, Ill., 20
Kollmorgen Optical Corp., Mass.,
25, 35
Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst 73, N.Y., 27
See ad on page 370
Tel: TWining 9-5600
Kruger Instruments, Harold, Calif.,
Kurman Electric Co., Inc., 191 Nevins St., Brooklyn 22, N.Y., 5
See ad on page 520
Tel: EVergreen 3-8000
Laboratory For Electronics, Inc., Mass.
25
Land-Air, Inc., Ill., 25
Larson Instrument Co., N.Y., 40
Leach Corp., Relay & Inet Div., 1942 Susana Rd., Compton, Calif., 15, 45
See ad on page 521
Tel: NEvada 6-1061
Lear, Inc., Mich., 15, 17, 25, 35
Lear, Inc., Lear Cal Div., Calif.,
Lear, Inc., Lear-Romec Div., Ohio.,
40
Leeds & Northrup Co., Pa., 10, 15,
25, 30, 35, 40
Lektra Laboratories, Inc., N.Y., 45
Lenkurt Electric Co., Inc., Calif., 15
Lessells & Associates, Inc., Mass.,
35
Leupold & Stevens Instruments, Inc., Ore., 18, 35
Librascope, Inc., Calif., 10, 35
Life Instrument Co., Inc., Mass., 20,
Link Aviation, Inc., N.Y., 15, 25, 30,
40, 55
Liquidometer Corp., N.Y., 18
Litton Industries, Md. Div., Md., 25,
Lynch Carrier Systems, Inc., Calif.,
Machinery Electrification, Inc., Mass.
15, 18, 20, 30, 45, 55
MacLaren & Co., F. B., N.Y., 15, 20,
35, 55
Magnaflux Corp., Ill., 30
Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 15, 20,
55
See ad on page 496
Tel: CYpress 2-6610

Directory I. Complete Equipment

4. Automatic Control Equipment.

Magnetic Controls Co., Minn., 40
Magnetic Instruments Co., Inc., 546 Commerce St., Thornwood, N.Y., 18
See ad on page 373
Tel: ROgers 9-5312
Maico Electronics, Inc., Minn., 15, 25, 30, 35, 55
Mandrel Industries, Inc., Calif., 17, 20, 27, 30, 35, 45
Mandrel Industries, Inc., Greenleaf Mfg. Div., Mo., 17, 40
Manning, Maxwell & Moore, Inc., Conn., 15, 16, 18, 27, 40, 50
Marstan Electronics Corp., N.Y., 20, 45
Martin Co., Baltimore Div., Md., 17, 25, 27, 45, 55
Mayberry Electronics Co., Calif., 15, 35, 45
McKay Electric Co., Mich., 55
Measurement Engrg. Ltd., Canada, 5, 10, 15, 17, 18, 20, 25, 30, 40, 45, 55
Mercoid Corp., Ill., 18, 27, 50
Metals & Controls Div., Texas Instruments, Inc., 51 Forest St., Attleboro, Mass., 40
See ad on page 676
Tel: ATtleboro 1-2800
Meter-Mix Corp., Mass., 16
Micro Balancing, Inc., N.Y., 20
Micro Gee Products, Inc., Calif., 15, 35, Gyro Rate Table
Midwestern Instruments, Inc., Okla., 35
Milgo Electronic Corp., Fla., 25, 35
Minneapolis-Honeywell Regulator Co., Minn., 5, 10, 15, 25, 27, 35, 40, 55
Minneapolis-Honeywell Regulator Co., Aeronautical Div., Minn., 15, 17, 18, 27, 35, 40
Minneapolis-Honeywell Regulator Co., Boston Div., Mass., 17, 30, 40
Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 5, 15, 16, 18, 25, 27, 30, 35, 40, 50, 55
Model Rectifier Corp., 1675 Utica Ave., Brooklyn 34, N.Y., 55
See ad on page 492
Tel: CLoverdale 8-6800
Modelectric Products Co., Inc., N.J., 15, 20, 27, 30
Molex Products Co., Ill., 40
Monitor Controller, Mass., 5, 10, 15, 20, 45
Montek Associates, Inc., Utah, 15, 25, 35, 40
Montgomery Mfg. Co., Ind., 45
Moog Servo Controls, N.Y., 25, 27, 35
Moore Associates, Inc., Calif., 5, 15, 30
Moran Instrument Corp., Calif., 35
Mosler Research Prods., Inc., Conn., 5
Motorola, Inc., Ariz., 15
Muirhead & Co., Ltd., England, 17
Muirhead Instruments, Inc., N.Y., 17, 25
Multi-Products Co., Mich., 15
Multi-Tron Lab., Inc., Ill., 20, 50
N R C Equipment Corp., Dept. 12, 160 Charlemont St., Newton 61, Mass., 50
See ad on page 670
Tel: DEcatur 2-5800
Nageldinger & Son, Inc., N.Y., 27
Naniloa Corp., Ohio, 15, 20, 25, 30, 35
National Electronics Labs., Inc., D.C., 5, 16, 27
National Scientific Labs., Inc., D.C., 30, 35, 40
Neptune Meter Co., Revere Corp. of Amer., Sub., Conn., 16, 18, 40
Newark Controls Co., N.J., 18, 27, 50
Newton Co., Conn., 15, 25
Nichols Ltd., R.H., Toronto, Ontario, Canada, 15, 27
North American Aviation, Inc., Autonetics Div., Calif., 25
North Atlantic Industries, Inc., 603 Main St., Westbury, L.I., N.Y., 35
See ad on page 305
Tel: EDgewood 4-1122
North Electric Co., N.Y., 5, 15, 30
North Electric Co., Ohio, 5, 15, 25, 30, 40, 45
Northeast Electronics Corp., N.H., 15
Northeastern Engineering, Inc., 25 S. Bedford St., P.O. Box 150, Manchester, N.H., 45
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Tel: NAtional 2-6485
Northrop Corp., Nortronics Div., Calif., 15, 35
Norwood Controls Unit, Detroit Controls Div., Mass., 16, 18, 27, 35, 40
Nuclear-Chicago Corp., Ill., 45
Nuclear Research Corp., Pa., 16
O'Brien Electric Corporation, Calif., 15
Ohmart Corp., Ohio, 18
Omega Instrument Co., Calif., 27
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 15, 20, 30, 55
See ad on page 499
Tel: WOrth 6-0380
Optimized Devices, Inc., 864 Franklin Ave., Thornwood, N.Y., 30
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Tel: ROgers 9-6110
Optomechanisms, Inc., N.Y., 20
Otis Elevator Co., Electronic Div., N.Y., 25, 35
Pacific Automation Products, Inc., Calif., 15, 30, 45
Pacific Scientific Co., Calif., 25, 45
Panellite, Inc., Ill., 5
Panseal, Inc., N.J., 5, 10, 16, 20, 27, 40, 45
Partlow Corp., N.Y., 40, 45
Pegasus Laboratories, Inc., Mich., 25, 35, 55
Performance Measurements Co., Mich., 16
Perma-Power, Ill., 15
Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 15
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Tel: TRinity 8-3251
Philadelphia Scientific Glass Co., Pa., 40
Philco Corp., Govt. & Industrial Div., Pa., 15, 17
Philips Electronics, Inc., N.Y., 45
Photobell Co., Inc., N.Y., 5, 10, 15, 18, 20, 25, 30, 35, 45, 55
Photo-Crystals, Inc., Ill., 5, 10, 15, 20
Piezo Products Co., Mass., 40
Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 15, 35, 55
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Tel: CAnal 6-7250
Potter Aeronautical Corp., N.J., 16
Precision Mechanisms Corp., N.Y., 25, 35
Quarie Controllers, Mass., 15
Racal Engrg. Ltd., England, 30, 45
Radiation Counter Labs., Inc., Ill., 18
Radio Development & Research Corp., N.J., 55
Railway Communications, Inc., Mo., Teleprinter Motor Controller
Rank Cintel, Ltd., England, 5, 30
Raymond Engrg. Lab., Inc., Conn., 45
Recora Co., Inc., Ill., 5, 30
Redford Corp., N.Y., 15, 20, 25, 30, 40, 45, 55
Reeves Instrument Corp., N.Y., 15, 17, 25, 35
Regent Controls, Inc., Conn., 15, 18, 30, 40
Reliance Automatic Lighting Co., Wis., 45, Interval
Resdel Engrg. Corp., Calif., 40, 45
Research Industrial Labs., Pa., 40, 45
Revere Corp. of America, Conn., 16, 18, 20
Rhodes, Inc., M. H., Conn., 45
Rich Electronics, Inc., Fla., 15, 20, 45
Robertshaw-Fulton Controls Co., Tenn., 27, 40, 50
Robinette Co., W. C., Calif., 25, 35, 55
Robotron Corp., Mich., 20, 45
Roller Mike, Inc., N.Y., 30
Rotary Devices Corp., N.J., 45
Ruge Assoc., Inc., Arthur C., N.H., 40
Ryan Aeronautical Co., Ryan Electronics Div., Calif., 15, 35
Sanders Assoc., Inc., N.H., 17, 25, 35
Sangamo Electric Co., Ill., 45
Scaico Controls, Inc., N.J., 15, 27, 40, 50
Schaevitz Engrg., N.J., 15, 55
Schafer Custom Engrg., Div. of Textron Inc., Calif., 15, Studio
Schirmer National Alarm Co., N.J., 5, 15, 20, 40, 45
Schmit Engrg. Co., Calif., 25, 30
Schoene Electronics Lab., Ind., 45
Schroeter, A. R., N.J., 17
Sciaky Bros., Inc., Ill., 25, 45
Scientific-Atlanta, Inc., Ga., 15, 25, 55
Scientific Engineering Labs., 1510 Sixth St., Berkeley 10, Calif., 50
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Tel: LAndscape 6-2772
Scientific Service Labs., Tex., 15, 25, 27, 35
Secode Corp., Calif., 5, 15
Sensory, Inc., N.J., 20, 30
Servo Corp. of America, N.Y., 35
Servomechanisms, Inc., Calif., 35
Servomechanisms, Inc., N.Y., 35
Servonic Instruments, Inc., Calif., 25, 27
Servonics, Inc., Va., 35
Shand & Jurs Co., Calif., 15, 18, 27, 40

Fisher Research Lab., Inc., Calif., 18
Fisher Scientific Co., Pa., 40
Foxboro Co., Mass., 15, 16, 18, 27, 40
Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 30
See ad on page 410
Tel: EVergreen 6-1300
Fried, Licensed Prof. Eng., Walter, N.Y., 20, 25, 40
Fuchs Impulse Motor Servomechanisms, N.Y., 15, 25, 35
GPE Controls, Inc., Ill., 16, 18, 25, 27, 35, 50
Gap Instrument Corp., N.Y., 25
Gardener Electronics Co., Ariz., Metal Detectors
Garrett Corp., Air Research Mfg. Div., Calif., 27, 35, 40
Gates Radio Co., Ill., 15
General Automatics, Inc., Calif., 5, 15, 18, 20, 25, 30, 35
General Bronze Corp., GB Elec. Corp., Subsid., N.Y., 35
General Controls Co., Calif., 10, 15, 16, 18, 20, 25, 27, 30, 35, 40, 45, 50
General Controls Co., Mass., 45
General Controls Co., Pic Automation Controls Div., Ill., 20, 30
General Devices, Inc., P.O. Box 253, Princeton, N.J., 15, 45, 55
See ad on page 360
Tel: DAvis 9-2323
General Electric Co., Apparatus Sales Div., N.Y., 10, 15, 18, 20, 27, 30, 45, 50, 55
General Electric Co., Instrument Dept., Mass., 20, 27, 35, 40, 45
General Electric Co., Light Military Elec. Dept., N.Y., 15
General Electric Co., Specialty Control Dept., Va., 5, 15, 18, 20, 25, 30, 45
General Electric Co., X-Ray Department, Wis., 18
General Electric Co., Ltd. of England, Eng., 15, 16, 18, 25, 40, 45
General Electro Mechanical Corp., N.Y., 25, 35, 55
General Electronics Co., Inc., Ala., 20, 45
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., 40
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Tel: VAlley Stream 5-6363
General Motors Corp., AC Spark Plug Div., Wis., 17
General Radio Co., West Concord, Mass., 55
See ad on Cover 4
Tel: EMerson 9-4400
Genesys Corporation, Calif., 15, 30, 35
Giannini Controls Corp., Calif., 17, 27, 35, 40, 55
Gilmore Industries, Inc., Ohio, 15, 16, 27, 35, 40
Good Electronic Corp., Fla., 5, 15, 20, 27, 30, 40
Green Rectifier Co., N.J., 55
Guardian Electric Mfg. Co., 1601R W. Walnut St., Chicago 12, Ill., 18, 35
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Tel: CHesapeake 3-1100
Gurley Co., N.Y., 25
Gyrex Corp., Calif., 17, 45
Haledy Electronics Co., N.Y., 16, 18, 20, 50
Hamilton Watch Co., Hathaway Instrument Div., Colo., 40, 55
Hanson-Gorrill-Brian, Inc., N.Y., 15, 25, 35, 40, 55
Harmon Electronics Co., Mo., 5, 15
Harrel, Inc., N.Y., 40, 45
Hastings-Raydist, Inc., Va., 15, 25, 27, 50
Haydon Co., A.W., 240 N. Elm St., Waterbury 20, Conn., 45
See ad on page 518
Tel: PLaza 6-4481
Haydon Instrument Co., Conn., 30, 45
Hays Corp., Ind., 10
Hays Mfg. Co., Pa., 16
Hehn-Engrg., Lester C., N.Y., 20
Hewson Co., Inc., N.J., 5
High Vacuum Equipment Corp., Mass., 50
Hill Assoc., Inc., James J., Fla., 5, 30, 45
Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 20
See ad on page 226
Tel: UNiversity 9-9850
Hoover Electric Co., Calif., 35
Hoover Electronics Co., Md., 15
Hosmer & Co., E. A., Calif., 15, 18, 30, 45
Hubbard Electronics, Inc., Calif., 30, 40, 45
Hughes Aircraft Co., Hughes Prod. Div., Calif., 25, 30
Hughey & Phillips, Inc., 3200 N. San Fernando Blvd., Burbank, Calif., 20
See ad on page 381
Tel: VIctoria 9-1104
Hull Corp., Hatboro, Pa., 50
See ad on page 667
Tel: OSborne 5-5000
Humphrey, Inc., Calif., 17
Huyck Sons, F. C., Waldorf Electronics Div., N.Y., 15, 35
I-T-E Circuit Breaker Co., Special Prods. Div., Pa., 35
Industrial Control Co., N.Y., 15, 25, 35, 55
Industrial Electronic Controls Co., N.Y., 30
Industrial Electronics Co., Monitor Controller Div., Mass., 5, 10, 15, 18, 20, 45
Industrial Electronics, Inc., Mich., 20, 27, 30
Industrial Electronics of Canada, Canada, 20
Industrial Instruments, Inc., N.J., 18, 30
Industrial Television, Inc., N.J., 15
Industrial Timer Corp., N.J., 45
Instron Engrg. Corp., Mass., 15, 25, 35, 55
Intercontinental Dynamics Corp., N.J., 20
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 15, 40, 45
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
International Business Machines Corp., N.Y., 15
Interstate Electronics Corp., Calif., 5
International Electronics Corp., N.Y., 5
Iron Fireman Mfg. Co., Electronics Div., Ore., 17, Aircraft Overheat
Isotope Develop. Ltd., England, 18
Itek Corp., Mass., 17
Jack & Heintz, Inc., Ohio, 15, 35, 45, 5
Jansen Electronics Mfg., Inc., Minn., 5
Jem Electronics Corp., Ill., 15, 20
Jodon, Inc., F. R., D. C., 25, 35
Jones-Porter Instrument Co., Inc., N
25
Jordan Co., Inc., Wis., 15, 16, 25, 35, 5
Kaiser Industries, Kaiser Aircraft Elect. Div., Ohio, 5, 15, 20, 30, 35, 4
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Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 15, 17, 18, 25, 30, 35, 4
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Tel: GRegory 2-1000
Kellogg Switchboard & Supply Co., I
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Keystone Products Co., N.J., Fire Co
trol
Kidde & Co., Inc., Walter, N.J., 10,
20, 25, 35, 45, 55
Kidde Ultrasonic Detection Alar
Inc., N.J., 5, 20, 40
Kingston Industries, Inc., Kingst
Electronics Div., Mass., 55
Knight Electronics, Ill., 20
Kollmorgen Optical Corp., Mass.,
25, 35
Kollsman Instrument Corp., 80-08 45
Ave., Elmhurst 73, N.Y., 27
See ad on page 370
Tel: TWining 9-5600
Kruger Instruments, Harold, Calif.,
Kurman Electric Co., Inc., 191 Nev
St., Brooklyn 22, N.Y., 5
See ad on page 520
Tel: EVergreen 3-8000
Laboratory For Electronics, Inc., Mass.
25
Land-Air, Inc., Ill., 25
Larson Instrument Co., N.Y., 40
Leach Corp., Relay & Inet Div., 1942
Susana Rd., Compton, Calif., 15, 45
See ad on page 521
Tel: NEvada 6-1061
Lear, Inc., Mich., 15, 17, 25, 35
Lear, Inc., Lear Cal Div., Calif., 1
Lear, Inc., Lear-Romec Div., Ohio,
40
Leeds & Northrup Co., Pa., 10, 15,
25, 30, 35, 40
Lektra Laboratories, Inc., N.Y., 45
Lenkurt Electric Co., Inc., Calif., 15
Lessells & Associates, Inc., Mass.,
35
Leupold & Stevens Instruments, Inc.
Ore., 18, 35
Librascope, Inc., Calif., 16, 35
Life Instrument Co., Inc., Mass., 20,
Link Aviation, Inc., N.Y., 15, 25, 30,
40, 55
Liquidometer Corp., N.Y., 18
Litton Industries, Md. Div., Md., 25,
Lynch Carrier Systems, Inc., Calif.,
Machinery Electrification, Inc., Mass.
15, 18, 20, 30, 45, 55
MacLaren & Co., F. B., N.Y., 15, 30,
35, 55
Magnaflux Corp., Ill., 30
Magnetic Amplifiers, Inc., 632 Tinto
Ave., New York 55, N.Y., 15, 20,
55
See ad on page 496
Tel: CYpress 2-6610

Directory I. Complete Equipment

4. Automatic Control Equipment.

Magnetic Controls Co., Minn., 40
Magnetic Instruments Co., Inc., 546 Commerce St., Thornwood, N.Y., 18
See ad on page 373
Tel: ROgers 9-5312
Maico Electronics, Inc., Minn., 15, 25, 30, 35, 55
Mandrel Industries, Inc., Calif., 17, 20, 27, 30, 35, 45
Mandrel Industries, Inc., Greenleaf Mfg. Div., Mo., 17, 40
Manning, Maxwell & Moore, Inc., Conn., 15, 16, 18, 27, 40, 50
Marstan Electronics Corp., N.Y., 20, 45
Martin Co., Baltimore Div., Md., 17, 25, 27, 45, 55
Mayberry Electronics Co., Calif., 15, 35, 45
McKay Electric Co., Mich., 55
Measurement Engrg. Ltd., Canada, 5, 10, 15, 17, 18, 20, 25, 30, 40, 45, 55
Mercoid Corp., Ill., 18, 27, 50
Metals & Controls Div., Texas Instruments, Inc., 51 Forest St., Attleboro, Mass., 40
See ad on page 676
Tel: ATtleboro 1-2800
Meter-Mix Corp., Mass., 16
Micro Balancing, Inc., N.Y., 20
Micro Gee Products, Inc., Calif., 15, 35, Gyro Rate Table
Midwestern Instruments, Inc., Okla., 35
Milgo Electronic Corp., Fla., 25, 35
Minneapolis-Honeywell Regulator Co., Minn., 5, 10, 15, 25, 27, 35, 40, 55
Minneapolis-Honeywell Regulator Co., Aeronautical Div., Minn., 15, 17, 18, 27, 35, 40
Minneapolis-Honeywell Regulator Co., Boston Div., Mass., 17, 30, 40
Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 5, 15, 16, 18, 25, 27, 30, 35, 40, 50, 55
Model Rectifier Corp., 1675 Utica Ave., Brooklyn 34, N.Y., 55
See ad on page 492
Tel: CLoverdale 8-6800
Modelectric Products Co., Inc., N.J., 15, 20, 27, 30
Molex Products Co., Ill., 40
Monitor Controller, Mass., 5, 10, 15, 20, 45
Montek Associates, Inc., Utah, 15, 25, 35, 40
Montgomery Mfg. Co., Ind., 45
Moog Servo Controls, N.Y., 25, 27, 35
Moore Associates, Inc., Calif., 5, 15, 30
Moran Instrument Corp., Calif., 35
Mosler Research Prods., Inc., Conn., 5
Motorola, Inc., Ariz., 15
Muirhead & Co., Ltd., England, 17
Muirhead Instruments, Inc., N.Y., 17, 25
Multi-Products Co., Mich., 15
Multi-Tron Lab., Inc., Ill., 20, 50
N R C Equipment Corp., Dept. 12, 160 Charlemont St., Newton 61, Mass., 50
See ad on page 670
Tel: DEcatur 2-5800
Nageldinger & Son, Inc., N.Y., 27
Naniloa Corp., Ohio, 15, 20, 25, 30, 35
National Electronics Labs., Inc., D.C., 5, 16, 27
National Scientific Labs., Inc., D.C., 30, 35, 40
Neptune Meter Co., Revere Corp. of Amer., Sub., Conn., 16, 18, 40
Newark Controls Co., N.J., 18, 27, 50
Newton Co., Conn., 15, 25
Nichols Ltd., R.H., Toronto, Ontario, Canada, 15, 27
North American Aviation, Inc., Autonetics Div., Calif., 25
North Atlantic Industries, Inc., 603 Main St., Westbury, L.I., N.Y., 35
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Tel: EDgewood 4-1122
North Electric Co., N.Y., 5, 15, 30
North Electric Co., Ohio, 5, 15, 25, 30, 40, 45
Northeast Electronics Corp., N.H., 15
Northeastern Engineering, Inc., 25 S. Bedford St., P.O. Box 150, Manchester, N.H., 45
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Tel: NAtional 2-6485
Northrop Corp., Nortronics Div., Calif., 15, 35
Norwood Controls Unit, Detroit Controls Div., Mass., 16, 18, 27, 35, 40
Nuclear-Chicago Corp., Ill., 45
Nuclear Research Corp., Pa., 16
O'Brien Electric Corporation, Calif., 15
Ohmart Corp., Ohio, 18
Omega Instrument Co., Calif., 27
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 15, 20, 30, 55
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Tel: WOrth 6-0380
Optimized Devices, Inc., 864 Franklin Ave., Thornwood, N.Y., 30
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Tel: ROgers 9-6110
Optomechanisms, Inc., N.Y., 20
Otis Elevator Co., Electronic Div., N.Y., 25, 35
Pacific Automation Products, Inc., Calif., 15, 30, 45
Pacific Scientific Co., Calif., 25, 45
Panellite, Inc., Ill., 5
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Photobell Co., Inc., N.Y., 5, 10, 15, 18, 20, 25, 30, 35, 45, 55
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Solatron, Inc., Mass., 5
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 15
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Tel: POrt Washington 7-7200
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Z & W Mfg. Corp., Ohio, 15
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Bolometers: See class 19

5. Bridges & Decades.

5. Bridges, capacitance
10. Bridges, impedance
15. Bridges, inductance
20. Bridges, resistance
25. Decades, capacitance
30. Decades, impedance
35. Decades, inductance
40. Decades, resistance

Acton Laboratories, Inc., 536 Main St., Acton, Mass., 10
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Tel: WOrth 6-0530

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5. Bridges & Decades.

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Tel: PLainfield 4-5502
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Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., South Plainfield, N.J., 5, 15, 20, 25, 40
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Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 20
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Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 5, 15, 25, 35
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Tel: EVergreen 6-1300
General Radio Co., West Concord, Mass., 5, 10, 15, 20, 25, 30, 35, 40
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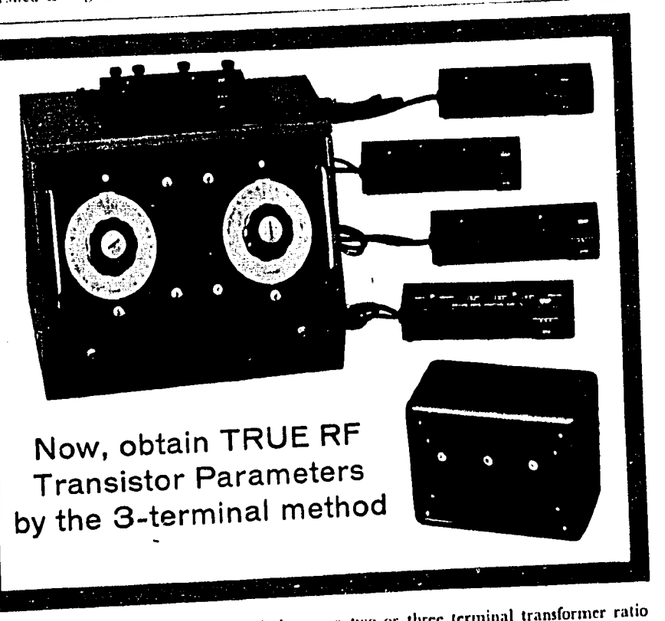
Tel: EMerson 9-4400



Now, obtain TRUE RF Transistor Parameters by the 3-terminal method

You can now measure alpha and admittance parameters of transistors accurately (within 2%) and easily under small signal conditions.

The addition of 5 special transistor adapters to the revolutionary Wayne Kerr RF Bridge, a two or three terminal transformer ratio arm bridge, makes these measurements possible. The direct currents and voltages required are furnished by a separate Wayne Kerr Control Unit which also provides for monitoring. Write for technical information.

FOR TRANSISTOR MEASUREMENTS Measure input, output admittance and current gain in grounded base configuration, and input and transfer admittance in grounded emitter configuration.
FOR GENERAL MEASUREMENTS Measure complex impedance, balanced and unbalanced, or balanced with the center point grounded and the impedance between any pair of terminals in a 3-terminal network.
Measure resistance, capacitance and inductance over 15 kc to 5 mc.
Capacitance range: 0.01 $\mu\mu$f to 20,000 $\mu\mu$f in 6 ranges
Resistance range: 10 ohms to 10 megohms in 6 ranges
Inductance range: 0.5μH to 50 mH in 6 ranges
Extreme stability due to fact that impedance looking back into the terminals and impedance to ground at balance are both exceedingly low.
Accuracy of bridge: 1% over most of range; with adapters—within 2%.
RF Bridge B-601 $640.00
Transistor Adapters Q-601 A to E $300.00
OTHER INSTRUMENTS: AF, VHF Bridges; AF, UHF Oscillators; Microwave Equipment; Attenuators; Wave Analyzer; Distance and Vibration Meters.
Send for complete W-K catalog showing other instruments

WAYNE KERR CORPORATION 1633 Race Street Philadelphia 3, Pa.
Electronics for Measurement and Control
Sales, Stock and Service Facilities

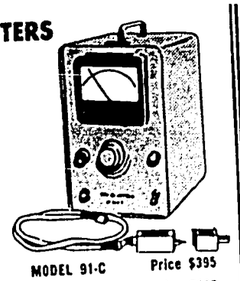
For details, circle #208 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

VOLTMETERS

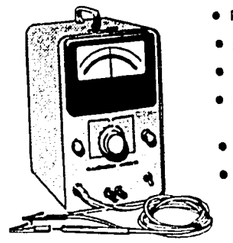
SENSITIVE RF VOLTMETERS

- RANGE:
  Model 91-C: 1 mv to 3 v.
  Model 91-CA: 0.3 mv to 3 v.
- FREQ. RANGE: 10 kc to 600 mc.
- ACCURACY: 5% to 200 mc.
  10% to 600 mc.
- High impedance probe and 52 ohm adapter.
- Special adapters and voltage divider available.



MODEL 91-C Price $395
MODEL 91-CA Price $495

DIFFERENTIAL DC VOLTMETER-AMPLIFIER



- RANGE: 10 μv to 1000 v.
- ACCURACY: 3% full scale.
- COMMON MODE REJECTION: 80 db
- INPUT RESISTANCE: 10 megohms to 100 megohms.
- Zero center meter.
- OUTPUT CAPABILITY: 0.5 ma into 1500 Ω.

MODEL 98-A Price $395

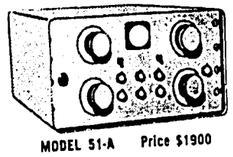
NULL DETECTORS

NEW DC NULL DETECTOR

- For use with bridges. Provides compression for hunting or linearity for close tolerance work.
- HUNTING RANGE: 60 db.
- FULL SCALE SENSITIVITY:
  VOLTAGE: 10 μv to 100 v.
  CURRENT: 1 μμa to 10 μa.
  POWER: 10^{-17} watts to 10^{-3} watts.
- INPUT RESISTANCE: 10 meg.
- OUTPUT RATING: 1.0 v across 500 Ω.
- MAX. AMPLIFIER GAIN: 100 db.

MODEL 56-A
Price $450

NEW AC NULL DETECTOR

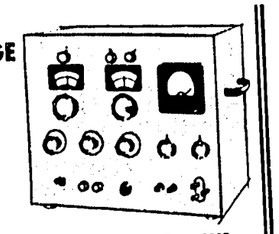


MODEL 51-A Price $1900

- TUNING RANGE: 20 cycles to 200 kc.
- SENSITIVITY: 10μv for ¼ inch CRT deflection or 100 μ dc output.
- PHASE SENSITIVE.
- HUNTING RANGE: 75 db with AVC on; 25 db with AVC off.
- INPUT IMPEDANCE: 1 megohm shunted by 100 μμf.
- Discrimination of 2nd harmonic of tuned freq. is 35 to 40 db.
- Useful as a low frequency impedance bridge detector, tuned voltmeter, or in wave analysis.

BRIDGES

THREE TERMINAL
CAPACITANCE BRIDGE



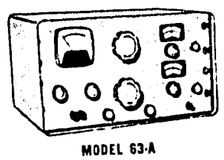
- CAP. RANGE: .0002 μμf to 11,000 μμf.
- APPROX. ACCURACY: ±0.25% + range factor.
- Measures direct or grounded capacitance and conductance.

MODEL 74-C Price $935

- Self-contained 100 kc oscillator and detector.
- Special models available at 1000 ~, 465 kc and with built-in dc bias for diode testing.

NEW INDUCTANCE BRIDGE

(Tentative Specifications)

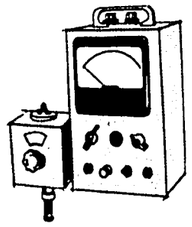


MODEL 63-A

- INDUCTANCE RANGE: .002μh to 1.1 henry.
- INDUCTANCE ACCURACY: ±0.25% + range factor.
- RESOLUTION: .01%.
- TEST FREQUENCIES: Continuously variable from 1 kc to 100 kc with internal oscillator and detector.
- EFFECTIVE SERIES RESISTANCE RANGE: .01 to 110,000 ohms.
- Non-interacting inductance and resistance balance controls.

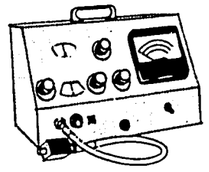
UHF GRID DIP METER

- FREQ. RANGE: 300 to 1000 mc.
- Small, lightweight probe.
- High sensitivity for both capacitive and inductive coupling.
- Internal 120 ~ modulation or external modulation.
- May be operated as a diode detector.



MODEL 101-B Price $275

RF DISTORTION METERS



MODEL 85 Price $740

- FREQ. RANGE:
  Model 85-B: 1 to 100 mc.
  Model 85-C: 0.1 to 6 mc.
- SENSITIVITY: 60 db below 1 v.
- INPUT IMPEDANCE: Approximately 50 ohms.
- Rapid measurement of total distortion.
- Same voltmeter features as model 91-C above.

HERE ARE OUR REPRESENTATIVES

NEW ENGLAND: George Gregory Assoc., West Newton, Mass. • NEW YORK: S. B. M. Assoc., Rochester, N. Y. • N. J., N. Y. C., L. I., WESTCHESTER: N. J. Lorain Assoc., W. Orange, N. J. • E. PENNA., MD., WASH., D. C.: C. F. Paddock, Silver Springs, Md. • SOUTH EAST: J. L. Highsmith & Co., Charlotte, N. C. • FLORIDA: A. H. Lynch & Assoc., Inc., Ft. Myers, Fla. • MICHIGAN: Anderson Electronics Co., Roseville, Mich. • W. PENNA., OHIO: Dayton Assoc., Dayton, O. • IOWA, WIS., MINN.: Arthur Engineering Sales Co., Milwaukee, Wisc. • COL., UTAH, N. M.: Parrish Electronics, Denver, Col. • CALIF., ARIZ., NEV.: J. F. Lorain & Assoc., N. Hollywood, Calif. • CANADA: Mel Sales Ltd., Arnprior, Ontario • EXPORT: A. V. Marano & Co., N. Y. C.

Boonton *ELECTRONICS* Corp. Morris Plains, N. J. Phone: JEfferson 9-4210

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For details, circle #209 on Reader Service Card

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General Resistance, Inc., 577 E. 156th St., New York 55, N.Y., 20, 40
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Tel: CYpress 2-1500

Gertsch Products, Inc., Calif., 10, 40

Gray Instrument Co., Pa., 20

Gulton Industries, Inc., N.J., 5

Harris Transducer Corp., Conn., 10

Harrison Labs., Inc., B. M., Mass., 20

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10, 15, 20, 25, 40
See ad on page 328
Tel: YUkon 3-3961

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 10
See ad on pages 3-18
Tel: DAvenport 5-4451

Hickok Electrical Instrument Co., Ohio, 5, 10

Howell Instrument Co., Tex., 20

Indikon Co., Inc., Mass., 5

Industrial Control Co., N.Y., 5

Industrial Development Labs., Inc., N.J., 5, 20

Industrial Instruments, Inc., N.J., 5, 10, 20, 25, 40

Industrial Test Equipment, Co., 55 E. 11th St., New York 3, N.Y., 5, 10, 15, 20
See ad on page 339
Tel: GRamercy 3-4684

Industrial Transformer Corp., Pa., 10, 15

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Jodon, Inc., F. R., D.C., 20

Julie Research Labs., Inc., N.Y., 20

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 20, 25, 30, 35, 40
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Tel: GRegory 2-1000

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Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 5, 15, 20, 25
See ad on page 318
Tel: LOwell 7-0607

Marma Electronic Co., Ill., 40

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 20
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Muirhead Instruments, Inc., N.Y., 5, 10, 15, 20, 25, 35, 40

Narda Microwave Corp., Dept. IRED-3, 118-160 Herricks Rd., Mineola, N.Y., 10
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Tel: PIoneer 6-4650

New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 5, 10, 15, 20, 25, 30, 35, 40
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Tel: KIrkland 7-1997

Nichols Ltd., R. H., Canada, 5, 10, 20, 25, 40

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 40
See ad on pages 106-107
Tel: ORchard 5-2600

Optimized Devices, Inc., 864 Franklin Ave., Thornwood, N.Y., 20
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Tel: ROgers 9-6110

Pennsylvania Testing Lab., Inc., Pa., 5, 10, 15, 25, 35

Physics Research Labs., Inc., P.O. Box 555, Hempstead, N.Y., 20, 40
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Tel: IVanhoe 3-8299

Pimex, Inc., N.Y., 20, 40

Precise Development Corp., N.Y., 5, 15, 20, 25, 35

Pyramid Electric Co., 507 26th St., Union City, N.J., 5, 20
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Tel: UNion 5-1776

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Rank Cintel, Ltd., England, 5, 10, 15, 20

Rinco, Inc., Ore., 5, 10, 15, 20, 25, 40

Rohde & Schwarz Sales Co., Inc., N.J., 5, 10, 15, 20, 25, 35, 40

Ruge Assoc., Inc., Arthur C., N.H., 20

Shallcross Mfg. Co., 20 Preston St., Selma, N.C., 20
See ad on page 538
Tel: WOodlawn 5-2341

Siemens & Halske, A. G., Germany, 5, 10, 15, 20, 25, 30, 35, 40

Southern Electronics Corp., 150 W. Cypress Ave., Burbank, Calif., 25
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Tel: VIctoria 9-3193

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 5
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Tel: HO 5-3471

Spivey, Inc., James S., D.C., 5, 10, 15, 20, 25

Sprague Electric Co., Mass., 5, 35

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Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5
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Tel: POrt Washington 7-7200

Sticht Co., Inc., Herman H., 27 Park Pl., New York 7, N.Y., 20
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Tel: REctor 2-8163

Sullivan, Ltd., H. W., N.Y., 5, 10, 15, 20, 25, 30, 35, 40

Taffet Radio & Television Co., N.Y., 5, 10, 15, 20

Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 5, 10, 15, 20, 40
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Tel: WIndsor 4-2221

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Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 40
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Tel: ESsex 4-9800

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Tel: GArfield 5-2844

Whitney Blake Co., Conn., 5, 20

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Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 20
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Tel: BEekman 3-6720

6. Broadcast Receivers.

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15. FM broadcast
20. TV broadcast—B & W
25. TV broadcast—Color
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35. UHF-VHF

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American Elite, Inc., N.Y., 5, 10

American Television & Radio Co., 300 E. 4th St., St. Paul 1, Minn., 5, 20, 35
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Tel: CApital 2-3791

Ampex Audio, Inc., Calif., 5, 15

Andrea Radio Corp., N.Y., 5, 10, 20, 35

Arvin Industries, Inc., Ind., 5, 15

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Audio-Video Corp., N.Y., 15, 30

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Avco Corp., Crosley Div., Ohio, 35

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Belock Instrument Corp., N.Y., 5, Transistor

Bendix Aviation Corp., Mich., 30

Bendix Aviation Corp., Freiz Instrument Div., Md., 30

Blonder-Tongue Labs., Inc., N.J., 5, 15, 30, 35

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Model WWVT RECEIVER
transistorized and rugged

A portable receiver for utilizing transmissions of WWV and WWVH. It is battery operated, small (9"x12"x5"), light weight (6 lbs.), rugged-sealed metal case and encapsulated components, and designed especially for remote operations under extreme environmental conditions; meets MIL-8189B Specifications. It features instantaneous crystal controlled frequency selectivity, self-contained antenna and 2 microvolt sensitivity.

Model WWVC STANDARD FREQUENCY COMPARATOR

A highly sensitive (better than 1 uv on all frequencies) crystal controlled receiver for utilizing transmissions of the National Bureau of Standards stations WWV and WWVH. Used for precise audio and radio frequency standards work as well as accurate time interval measurements. Available in cabinet or for rack mounting using a 5¼" panel.

Model SR-7 WWV RECEIVER

This receiver is the dual conversion type. Dimensions: 3-15/16" x 11" x 8½" deep. Available in upright or vertical models, or as rack mounted model. Noise limiter, antenna trimmer and provision for an oscilloscope or head phone are incorporated.

Model AK-8 ANTENNA KIT

This special antenna is designed to provide optimum response to signals from WWV and WWVH on 2.5, 5, 10, 15 and 20 mc. Includes modification kit for receiver with all wire, 50' of coaxial cable and suitable fittings to provide outstanding performance. Antenna is completely assembled; needs only one support for satisfactory operation.

Benchpak Model BP 200A Adjustable POWER SUPPLY

Hi range 150V to 300V: Lo range 0 to 150V. 150 MA available throughout (200 MA at high end of each range) plus a fixed 150V 50 MA at all times. 4" wide x 8" deep x 7½" high; weight 14 lbs.

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SPEED-CHASSIS

The Speed-Chassis is a flexible breadboard assembly with interchangeable socket arrangements which can be mounted on a relay rack if desired. Shield cover and panel are available to make successful breadboard assemblies both permanent and neat.

Send for specifications, prices and delivery

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6. Broadcast Receivers.

Brooks Radio & TV Corp., N.Y., 20, Kits
Browning Labs., Inc., N.H., 15
Calbest Electronics Co., Calif., 5, 15
Califone Corporation, Calif., 5, 15
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Centronix, Inc., Fla., 5, 15, 35
Chisholm Industries, Ltd., Canada, 5, 15, 20
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Delco Radio Div., Gen. Motors Corp., Ind., 5, Auto Radio
Designers For Industry, Inc., Ohio, 5, 15, 20, 25, 30, 35
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Electron Enterprises, Ill., 5
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Engineering Associates, Ohio, 35
Ferranti-Packard Electric Ltd., Canada, 35
Fisher Radio Corp., N.Y., 5, 15
Flush Wall Radio Co., Fla., 5
Foto-Video Labs., Inc., 36 Commerce Rd., Cedar Grove, N.J., 30
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General Electric Co., Technical Prods. Operation, N.Y., 5, 10, 20
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10. FM broadcast
12. Fixed frequency
15. Relay broadcast & STL equipment
20. TV broadcast
25. TV closed circuit
35. UHF-VHF

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American Elite, Inc., N.Y., 5, 10, 12, 20, 35
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Blonder-Tongue Labs., Inc., N.J., 25
Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., Signal Generator Calibrators
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Erco Radio Labs., Inc., N.Y., 5, 10, 12, 20
Foto-Video Labs., Inc., 36 Commerce Rd., Cedar Grove, N.J., 25
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Cabinets & Consoles: See class 81

Calibrators, TV: See class 35

Cameras: Oscilloscope: See class 23

Cameras: Television: See class 32

Cathode-Ray Tubes: See class 74

Cardiographs: See class 17

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

SUBMINIATURE 13-DIGIT ENCODER *for airborne or other limited space applications. Detailed specifications in Bulletin 0858.* **SIZE:** *2⅜" dia. x 3¾" long; ¼" dia. shaft, ⅞" long.* **WEIGHT:** *1¼ lbs.* **OVERALL ACCURACY:** *± 1¼ quanta in 8192.* **READOUT RATE:** *Model A, nominally 10KC (50 microsecond pulse), max. of 100KC (5 microsecond pulse). Model B, max. of 200KC for element, 10KC for sequence.* **MAXIMUM ANGULAR SPEED OF ROTATION AT FULL ACCURACY:** *2 rpm (6 rpm at 12-digit accuracy). 10 rpm with temperature control.*

4" DIA. 13-DIGIT ENCODER *for general purpose applications. Detailed specifications in Bulletin 0958.* **SIZE:** *4" OD with protrusions on one side x 7" long; ¼" dia. shaft, 0.67" long.* **WEIGHT:** *9¼ lbs.* **OVERALL ACCURACY:** *± 1 quanta in 8192.* **READOUT RATE:** *100 cps, max.* **MAXIMUM ANGULAR SPEED OF ROTATION AT FULL ACCURACY:** *720 rpm; maximum rotation rate, 600 rpm.*

6" DIA. 13-DIGIT ENCODER *for general purpose applications. Specifications in Bulletin 1058.* **SIZE:** *6⅜" dia. with protrusions x 7¾" long; ½" dia. shaft, 1" long.* **WEIGHT:** *14 lbs.* **OVERALL ACCURACY:** *± 1 quanta in 8192.* **READOUT RATE:** *100 cps, max.* **MAXIMUM ANGULAR SPEED OF ROTATION AT FULL ACCURACY:** *720 rpm (10 microsecond pulse).*

Model A2.6SS13 (Parallel readout)
Model B2.6SS13 (Sequential readout)

Model A4DP13

Model A6DP13

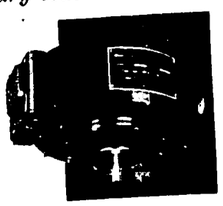
Now from

Baldwin®

precision shaft angle analog-to-digital encoders in 5 standard models:

13, 16 and 18 digit / photoelectric readout / reflected binary code.*

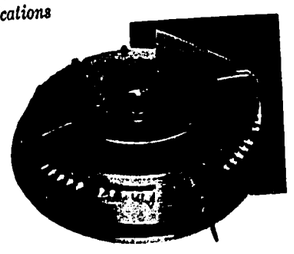
9" DIA. 16-DIGIT ENCODER *precision unit for radar applications. Detailed specifications in Bulletin 1158.* **SIZE:** *9⅛" dia. with protrusions x 4⅜" high; ½" dia. shaft, 1¼" long.* **WEIGHT:** *17½ lbs.* **OVERALL ACCURACY:** *± 1 quanta in 65,536.* **READOUT RATE:** *100 cps, max.* **MAXIMUM ANGULAR SPEED OF ROTATION AT FULL ACCURACY:** *90 rpm (10 microsecond pulse)*



Model A9SP16

HIGH PRECISION 18-DIGIT ENCODER *for radar or theodolite applications. Detailed specifications in Bulletin 1258.* **SIZE:** *21" max. dia. x 8⅛" high.* **WEIGHT:** *169 lbs.* **OVERALL ACCURACY:** *± 1 quanta in 262,144.* **READOUT RATE:** *100 cps, max.* **MAXIMUM ANGULAR SPEED OF ROTATION AT FULL ACCURACY:** *25 rpm (10 microsecond pulse).*

*Encoders with decimal, trigonometric functions and other nonlinear codes are also available. All disks are made on a special divided circle machine designed and built by Baldwin. *Write for descriptive bulletins.*



Model A21SP18

Industrial Products Division
THE BALDWIN PIANO COMPANY
1807 Gilbert Avenue, Cincinnati 2, Ohio
For details, circle #211 on Reader Service Card

8. Carrier Current Equipment.

5. Complete terminal equipment
10. Repeat & relay equipment

Avtron Mfg. Co., Ohio, 10

Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., Comparators, Q Comparators
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Tel: DEerfield 4-3200

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Tel: VAn Buren 6-6300

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Lenkurt Electric Co., Inc., Calif., 5, 10
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Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 10
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5. Analog to digital converters
7. Card to tape converters
10. Computers, analog
15. Computers, digital
20. Counters, continuous
22. Counters, mechanical
25. Counters, pre-set
30. Data reduction equipment
32. Digital to analog converters
35. Electronic calculators
40. Memory & storage devices
45. Packaged circuits
50. Printers
55. Tape to card converter
60. Tape recording & play back equipment

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Tel: HEmlock 6-2230

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Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 5, 10
See ad on pages 82-83
Tel: LUdlow 3-6160

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See ad on page 290
Tel: FOrest 6-4467

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to help you find your way around in the IRE DIRECTORY:
Pink section contains a complete description of each of the various parts of the DIRECTORY, plus a terminology index to all products listed, and a copy of the complete questionnaire form.
Machol Edge Indexes on pages 265, 365, and 587 guide you directly to the major product headings.

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Ansley Mfg. Co., Arthur, New Hope, Pa., 45
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Tel: AXtel 7-2711

Arenberg Ultrasonic Lab., Inc., 94 Green St., Jamaica Plain (Boston) 30, Mass., 40
See ad on page 388
Tel: JAmaica 2-8640

Armstrong Whitworth Aircraft, Ltd., Sir W. G., A.W.E. Electronics Div., Hucclecote, Gloucester, England, 5, 32, 50
See ad on page 359
Tel: TOll Bar 2261

Arnoux Corp., Calif., 5, Systems
Artronic Instrument Co., Md., 40, 45
Atlantis Engrg. Corp., Tex., 45
Atomic Labs., Inc., Calif., 10
Audio-Video Corp., N.Y., 60
Auerbach Electronics Corp., Pa., 5, 10, 15, 20, 30, 32, 40, 45
Austin Co., N.Y., 5, 7, 10, 15, 30, 55
Automatic Management, Inc., Mass., 5, 10, 15, 20, 22, 30, 40
Automatic Timing & Controls, Inc., Pa., 22, 25
Autometric Corp., N.Y., 10, 15
Autron Engineering, Inc., Calif., 22, 25, Counters, Electro-Mech.
Avtron Mfg. Co., Ohio, 35
B. J. Electronics, Borg-Warner Corp., Calif., 40, 60
Bailey Meter Co., Ohio, 5, 30

Baldwin Piano Co., Industrial Products Div., 1807 Gilbert Ave., Cincinnati 2, Ohio, 5
See ad on page 282
Tel: MAin 1-4300

Beckman Instruments, Inc., Berkeley Div., Calif., 10
Beckman Instruments, Inc., Systems Div., Calif., 5, 10, 25, 30, 32, 55
Belock Instrument Corp., N.Y., 10
Bendix Aviation Corp., Bendix Computer Div., Calif., 7
Bendix Aviation Corp., Bendix Products Div., Ind., 15, 20, 25, 45
Bendix Aviation Corp., Bendix Radio Div., Md., 30
Bendix Aviation Corp., Cincinnati Div., Ohio, 25

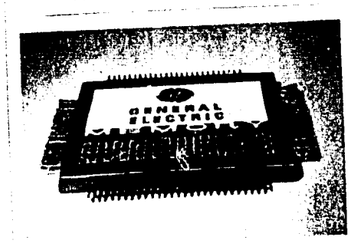
Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 5
See ad on pages 19-22
Tel: ATlas 8-2000

Bendix Aviation Corp., Research Lab. Div., Mich., 5, 15, 32, 40
Bendix Aviation Corp., York Div., Pa., Digital Loggers & Comparators
Benson-Lehner Corp., Calif., 5, 20, 25, 30

Bergen Labs., Inc., 247 Crooks Ave., Clifton, N.J., 45
See ad on page 471
Tel: GRegory 3-7800

Berkeley Enterprises, Inc., Mass., Small Robots
Berndt-Bach, Inc., Calif., 30, 40, 60
Bill Jack Scientific Instrument Co., Calif., 20, 22, 25
Boesch Mfg. Co., Inc., Conn., 20, 22, 25

Borg Equipment Div., Amphenol-Borg Electronics Corp., 120 South Main St., Janesville, Wis., 22
See ad on page 530
Tel: PLeasant 4-6616



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HEAVY MILITARY ELECTRONICS DEPARTMENT
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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Bowmar Instrument Corp., 8000 Bluffton Rd., P.O. Box 2835, Fort Wayne, Ind., 15, 20, 22, 25
See ad on page 347
Tel: SHerwood 3121

Briggs Assoc., Inc., Pa., 5, 7, 15, 30, 32, 35, 40, 50, 55, 60
Bristol Co., Conn., 5, 10, 20, 32
British Thomson-Houston Co., Ltd., England, 15
Brooks Research, Inc., N.Y., 5, 7, 30, 32, 45, 55
Bruno-New York Industries Corp., N.Y., 10
Bryant Computer Products Div., Vt., 40
Bulova Research & Development Labs., Inc., N.Y., 10, 15, 25, 45
Burroughs Corp., Mich., 5, 7, 10
Burroughs Corp., N.J., 20, 25
Burroughs Corp., Pa., 5, 10, 15, 20, 25, 30, 32, 35, 40, 50, 55
Burroughs Corp., Electrodata Div., Calif., 5, 7, 15, 40, 50
CG Electronics Corp., N.M., 5, 15, 30, 32, 45
C&K Components, Inc., Mass., 25, 40, 45
Cal-Tronics Corporation, Calif., 5, 7, 10, 15, 32
California Computer Products, Inc., Calif., 5, 15, 30, 32, 35, 40, 45
Calif. Tech. Industr. Div. of Textron Inc., Cal., Tape Reader, Punch-Duplicator
Canadian Aviation Electronics, Ltd., Quebec, 5, 10, 32

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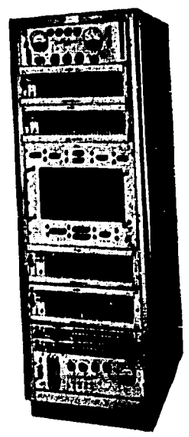

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Canadian G.E. Co., Ltd., Electr. Equip. Tube Dept., Canada, 5, 7, 10, 15, 20, 22, 25, 30, 32, 35, 40, 45, 50, 55, 60
Canadian Research Institute, Canada, 10, 15, 35, 40
Canadian Westinghouse Co., Ltd., Elect. Div., Canada, 10, 15, 40
Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 45
See ad on page 174
Tel: WOodruff 2-9200
Centronix, Inc., Fla., 5, 7, 10, 15, 30, 32, 40, 45, 55
Chadwick-Helmuth Co., Calif., 10
Chesapeake Instrument Corp., Md., 30
Chicago Aerial Industries, Inc., Ill., 10
Clary Corporation, Calif., 15, 50
Cleveland Metal Spec. Co., Ohio, 40, 45
Clifton Precision Products Co., Inc., Marple & Broadway, Clifton Heights, Pa., 5
See ad on pages 46-47
Tel: MAdison 6-2101
Coleman Engineering Co., Inc., Calif., 5, 30, 32
Colorado Research Corp., Colo., 10, 30, 45
Components Corp., Ill., 40
Comptron Corporation, Mass., 45
Computer Control Co., Inc., 983 Concord St., Framingham, Mass., 15, 30, 40, 45
See ad on this page
Tel: CEdar 5-6220
Computer Engineering Associates, Inc., Calif., 10
Computer Equipment Corp., Calif., 5, 30, 40
Computer Systems, Inc., N.Y., 10, 32
Computer-Measurements Co., Calif., 5, 25, 32, 50
Computing Devices of Canada, Ltd., Ont., 40
Concord Control, Inc., 1282 Soldiers Field Rd., Boston 35, Mass., 5, 10, 15, 30, 45, 60
See ad on page 273
Tel: ALgonquin 4-5106
Consolidated Avionics Corp., N.Y., 7, 30, 45
Consolidated Controls Corp., Conn., 5
Consolidated Electrodynamics Corp., Calif., 5, 30, 40, 60
Control Corp., Minn., 5, 30, 32
Control Data Corp., Minn., 15, 30
Control Devices, Inc., Mich., 22
Cook Electric Co., Ill., 60
Counting Instruments Ltd., England, 20, 22, 25, 50
Cubic Corp., Calif., 5, 10, 15, 30, 32
Cyclotron Specialties Co., Calif., 22
Datex, California, 5, 30, 32
Daystrom, Inc., Daystrom Systems Div., Calif., 5, 15, 30, 40
Daystrom, Inc., Weston Instruments Div., N.J., 15, 32
Delaware Products Co., N.J., 5
Deltime, Inc., N.Y., 35, 40
Denominator Co., N.Y., 22
Designers for Industry, Inc., Ohio, 5, 7, 30, 32, 40, 55
Devol Research Co., Conn., 5, 32, 40
Di/An Controls, Inc., Mass., 7, 15, 20, 25, 30, 35, 40, 45, 55, Shift Registers
Dian Labs., Inc., N.Y., 10
Digitac, Inc., Calif., 20, 22, 25
Digital Equip. Corp., Mass., 15, 25, 45
Digitronics Corp., N.Y., 7, 15, 30, 45
Donner Scientific Co., Calif., 10, 35
Dorsett Labs., Inc., Okla., 10
Dumont Airplane Marine Instrument Inc., Pa., 40
DuMont Labs., Inc., Allen B., N.J., 40
Durant Mfg. Co., Wis., 5, 20, 22, 25
Dwyer Engineering Co., Inc., Airport Rd., Nashua, N.H., 45
See ad on page 504
Tel: TUxedo 3-3206
Dychro Corp., Mass., 5
Dymec, Inc., Calif., 20, 25, 30
Dynamics Corp. of Am., Reeve Instrument Corp., N.Y., 10
Dynapar Corp., Ill., 20, 25, 40, 45
E H Research Labs., Inc., 1922 Park Blvd., Oakland 6, Calif., 20
See ad on page 298
Tel: GLencourt 2-1314
E.M.I. Electronics Ltd., England, 10, 15, 30, 32, 40, 60
Eagle Signal Co., Ill., 25
Edison Industries, Thomas A., Instrument Div., 61 Lakeside Ave., West Orange, N.J., 40, 45
See ad on page 345
Tel: ORange 3-6800
Ehrenpreis, Consulting Engrg., Dana N.Y., 5, 7, 10, 15, 30, 40
Eldorado Electronics, Calif., 10, 20, 25
Electrical & Physical Instrument Corp., N.Y., 20
Electro Instruments, Inc., Calif., 5, 32
Electro-Measurements, Inc., Oregon, 32
Electro-Mec Lab., Inc., 47-51 33rd St., Long Island City 1, N.Y., 5
See ad on page 529
Tel: STillwell 6-3402
Electro-Mechanical Research, Inc., Fla., 5
Electro-Pulse, Inc., 11861 Teale St., Culver City, Calif., 25
See ad on page 321
Tel: TExas 0-9193
Electrol, Inc., Calif., 10, 30, 32, 35, 45, 45, Diode Function Generator
Electromation Co., Calif., 60
Electronic Applications, Inc., Conn., 5
Electronic Associates, Inc., N.J., 10, 32
Electronic Communications, Inc., Fla., 5, 10
Electronic Computer Co., Pa., 5, 30
Electronic Engrg. Co. of Calif., Calif., 5, 7
Electronic Specialty Co., Calif., 5, 32
El-Tronics, Inc., Alwac Computer Div., Calif., 5, 7, 15, 30, 40, 60
Emerson Electric Mfg. Co., Mo., 5, 15, 32
Emerson Radio & Phonograph Corp., Md., 10, 30, 60
Endevco Corp., Digitran Co. Div., Calif., 5, 20, 22
Engineered Electronics Co., Calif., 45
Engineering Associates, Ohio, 20
Ensco, Inc., Utah, 10
Epsco, Inc., Mass., 15, 25, 30, 40, Shift Register

Directory I. Complete Equipment

9. Computers & Counters.

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 20, 25, 45
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Tel: GLendale 6-8592
Etelco, Ltd., England, 7, 10, 20, 30, 35, 40
Evans, James, Conn., 30
Eversheds & Vignoles Ltd., England, 10
Fairchild Camera & Instrument Corp., Defence Prods. Div., N.Y., 30, 40, 55
Farrand Controls, Inc., N.Y., 5, 10, 32
Ferranti Electric, Inc., Electronics Div., N.Y., 15, 40
Ferranti-Packard Electric Ltd., Canada, 10, 15, 40, 45, Tape Reader
Ferrara, Inc., Mich., 25
Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 40
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Tel: CHerry 6-2811
Fischer & Porter Co., Pa., 5, 7, 20, 22, 30, 55
Ford Motor Co., Sub.-Aeronutronic Systems, Inc., Calif., 15, 40, 45
Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 20, 25
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Tel: EVergreen 6-1300
Friden, Inc., Calif., 7, 22, 30, 45
GPE Controls, Inc., Ill., 10, 15
G P S Instrument Co., Mass., 10, Specialized Data Types
Garrett Corp., Air Research Mfg. Div., Calif., 10
General Applied Science Labs., Inc., N.Y., 5, 30, 32, 45
General Automatics, Inc., Calif., 5
General Ceramics Corp., Dept. ID, Crows Mill Rd., Keasbey, N.J., 40
See ad on page 618
Tel: VAlley 6-5100
General Controls Co., Calif., 15, 20, 22, 25
General Electric Co., Apparatus Sales Div., N.Y., 5, 7, 10, 15
General Electric Co., Computer Dept., Ariz., 5, 10, 15, 30, 45
General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 10, 15, 20, 30, 40, 45
See ads on pages 283, 288, 445, 447, 505, 617
Tel: GRanite 6-4411
General Electric Co., Light Military Elect. Dept., N.Y., 10, 15, 40
General Electric Co., Specialty Electronic Components Dept., N.Y., 20, 45, Shift Registers
General Electric Co., Ltd., of England, England, 5, 10, 15
General Kinetics, Inc., Va., 60
General Mills, Inc., Mechanical Div., Minn., 10, 15
General Time Corp., 355 Lexington Ave., New York 17, N.Y., 20, 22, 25
See ad on page 470
Tel: MUrray Hill 7-9292
Genesys Corporation, Calif., 5, 7, 15, 30, 32, 35, 40, 45, 50
Geotechnical Corp., Tex., 30
Gerber Scientific Instrument Co., Conn., 5, 10, 30
Gertsch Products, Inc., Calif., 32
Giannini Controls Corp., Calif., 5
Globe Electrical Mfg. Co., Calif., 45
Good Electronic Corp., Fla., 45
Gulton Industries, Inc., N.J., 5, 45
Gulton Industries, Inc., N.M., 45
Gurley Co., N.Y., 20
Gyrex Corp., Calif., 30, High Speed Units
HRB—Singer, Inc., Science Park, State College, Pa., 15, 30, 32
See ad on page 366
Tel: ADams 7-7611
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 5, 7, 10, 15, 30, 32
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Tel: VAn Buren 6-6300
Haloid Xerox, Inc., N.Y., 50
Hampshire Engrg. Co., Mass., 15, 32, 60
Hanson-Gorrill-Brian, Inc., N.Y., 5, 30
Harvey-Wells Elect., Mass., 15, 20, 30
Haydon Co., A. W., 240 N. Elm St., Waterbury 20, Conn., 20, 40
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Tel: PLaza 6-4481
Haydon Instrument Co., Conn., 15, 20, 22, 25
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 10
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Tel: YUkon 3-3961
Hermes Electronics Co., Dept. BD, 75 Cambridge Pkwy., Cambridge 42, Mass., 30, 40
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Tel: UNiversity 4-7200
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 20, 30, 32, 50
See ad on pages 3-18
Tel: DAvenport 5-4451
Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 45
See ad on page 226
Tel: UNiversity 9-9850
Hogan Labs., Inc., N.Y., 50
Hoover Electronics Co., Md., 5, 32, 45
Hosmer & Co., E. A., Calif., 50
Huyck & Sons, F. C., Waldorf Electronics Div., N.Y., 5, 10, 15, 32
Hycon Eastern, Inc., See Hermes Electronics Co.
Hymac Corp., Calif., 22
I-L-S Instrument Corp., Ohio, 20, 25, Counters, Frequency
Imra Corporation, Mass., 40
Industrial Cont. Co., N.Y., 5, 10, 40, 45

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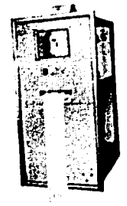
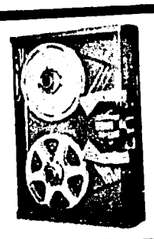
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

M908 Magnetic Tape Transport With Complete Program Freedom



M3260 High Speed Alphanumeric Printer

ALL SOLID STATE DESIGNS



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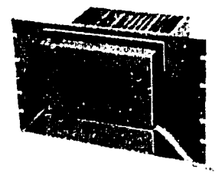
M906 General Purpose Magnetic Tape Transport



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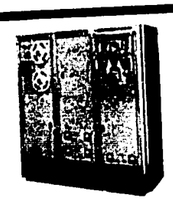

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Industrial Electronic Engineers, In
3973 Lankershim Blvd., North Ho
wood, Calif., 5
See ads on pages 285, 484
Tel: TRiangle 7-0328
Industrial Timer Corp., N.J., Progra
mers
Industrial Winding Machinery Co
P.O. Box 62, New York 5, N.Y.
25
See ad on page 667
Tel: WHitehall 3-1754
Instant Circuits Div. of Alfred W. E
ber Labs., N.Y., 45
Instron Engrg. Corp., Mass., 10
Instrument Development Laborato
Inc., 67 Mechanic St., Attleboro, Ma
5
See ad on page 422
Tel: ATtleboro 1-3880
Insulated Circuits, Inc., N.J., 45
Intelligent Machines Research Co
Va., 30
International Business Machines Co
N.Y., 15
International Business Machines Co
N.Y., 7, 15, 35, 40, 50, 55
I. T. & T. Corp., ITT Federal D
N.J., 5, 10, 15
I.T. & T. Corp., Industrial Prods. D
Calif., 5
Interstate Electronics Corp., Calif.,
Itek Corp., Mass., 10, 15, 30, 40
Jodon, Inc., F. R., D.C., 32, 35, 40,
Jones-Porter Instrument Co., Inc., N
5
Julie Research Labs., Inc., N.Y., 5,
Kaiser Industries, Kaiser Aircra
Elect. Div., Ohio, 10
Kearfott Co., Inc., 1500 Main Ave.,
ton, N.J., 5, 7, 10, 15, 20, 22, 30,
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Tel: GRegory 2-1000
Kellogg Switchboard & Supply Co.,
5, 10
Kidde & Co., Inc., Walter, N.J., 10,
Kollsman Instrument Corp., 80-08
Ave., Elmhurst 73, N.Y., 10, 15, 2
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Laboratory for Electronics, Inc., Ma
15, 40
Land-Air, Inc., Instrument & Electr
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Landis & Gyr, Inc., N.Y., 15, 20, 25
Leeds & Northrup Co., Pa., 10
Leupold & Stevens Instruments, In
Ore., 5
Lewyt Mfg. Corporation, N.Y., 30
Librascope, Inc., Calif., 5, 7, 10, 15,
22, 30, 32, 35, 40, 55
Link Aviation, Inc., N.Y., 5, 10, 15,
30, 32
Litton Industries, Inc., Electron Tu
Div., 960 Industrial Rd., San Carlos
Calif., 15
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Tel: LYtell 1-8411
Litton Industries, Inc., Electronic Equi
ments Div., 336 N. Foothill Rd., Be
erly Hills, Calif., 5, 15, 35
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Tel: CRestview 4-7411
Lockheed Aircraft Corp., Missiles &
Space Div., Dept. J-93, P.O. Box 504,
962 W. El Camino Real, Sunnyvale,
Calif., 5, 10, 15, 30, 32, 40, 50, 60
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Tel: REgent 9-4321
Lumatron Electronics, Inc., Dept. IR-60,
68 Urban Ave., Westbury, L.I., N.Y.,
5
See ad on page 331
Tel: EDgewood 4-3100
M F Electronics Co., 122 E. 25th St.,
New York 10, N.Y., 20
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Tel: GRamercy 3-5899
Machinery Electrification, Inc., Mass.,
25, 40
MacLaren & Co., F. B., N.Y., 10, 30, 32
MacLeod & Hanopol, Inc., Mass., 5
Magnasync Mfg. Co., Ltd., Calif., 60
Magnavox Research Labs., Calif., 5, 15,
30, 40
Magnetic Amplifiers, Inc., 632 Tinton
Ave., New York 55, N.Y., 10
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Tel: CYpress 2-6610
Magnetics Research Co., 255 Grove St.,
White Plains, N.Y., 20, 30, 40, 45
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Tel: WHite Plains 9-9588
Maico Electronics, Inc., Minn., 5, 10, 15,
32, 40
Marquardt Aircraft Co., Pomona Div.,
Calif., 5, 10, 30, 32, 45
Martin Co., Baltimore Div., Md., 5, 7,
10, 15, 20, 30, 32, 40, 45, 55
Mayberry Electronics Co., Calif., 10,
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Measurement Engrg., Ltd., Canada, 25
Medical-Electronics Development Co.,
N.Y., 30
Mid-Century Instrumatic Corp., N.Y.,
10
Midwestern Instruments, Inc., Okla.,
40, 60
Milgo Electronic Corp., Fla., 5, 10, 30,
32, 45
Miljan, Inc., Omohundro Co., P., Calif.,
Rate of Change Computer
Millen Mfg. Co., Inc., James, 150 Ex
change St., Malden 48, Mass., 22
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Tel: DAvenport 4-4108
Milman Engineering Co., Calif., Digital
Readout
Minneapolis Honeywell Regulator Co.,
Md., 7, 30, 60
Minneapolis Honeywell Regulator Co.,
Aeronautical Div., Minn., 5, 10, 15, 32
Minneapolis Honeywell Regulator Co.,
Boston Div., Mass., 30
Minneapolis Honeywell Regulator Co.,
Brown Instrument Div., Pa., 5, 15, 20,
22, 30, 35, 40, 45, 60
Minneapolis Honeywell Regulator Co.,
Datamatic Div., Mass., 15
Minnesota Mining & Mfg. Co., Minn., 60
Missouri Research Labs., Inc., Mo., 30
Monroe Calcul. Mach. Co., Inc., Electrn.
Components Div., Calif., 7, 22, 50, 55
Montek Associates, Inc., Utah, 20, 30
Moseley Co., F. L., Calif., 5, 7, 30, 55
Motorola, Inc., Ariz., 10
Naniloa Corp., Ohio, 5, 30, 32
National Cash Register Co., Electronics
Div., Calif., 15, 30, 40, 50, 55
Navigation Computer Corp., 1621 Sny
der Ave., Philadelphia 45, Pa., 15, 25,
30, 32, 40, 45
See ad on page 506
Tel: HOward 5-7700
New London Instrument Co., Conn., 10,
15
Non-Linear Systems, Inc., Del Mar Air
port, Del Mar, San Diego, Calif., 5, 30
See ad on page 230
Tel: SKyline 5-1134
North American Aviation, Inc., Auto
netics Div., Calif., 10, 15
North Atlantic Industries, Inc., 603
Main St., Westbury, L.I., N.Y., 5,
Servo
See ad on page 305
Tel: EDgewood 4-1122
North Electric Co., Ohio, 5, 15, 20, 22,
25, 30, 40, 45
Northam Electronics Inc., Calif., 30
Northeastern Engineering, Inc., 25 S.
Bedford St., P.O. Box 150, Manches
ter, N.H., 5, 20, 25, 32, 50, Frequency
Counters
See ad on page 356
Tel: NAtional 2-6485
Northern Electronic Vacuum Indust.,
P.Q., Canada, 10, 35
Northrop Corp., Nortronics Div., Calif.,
5, 10, 15, 20, 30, 32, 35, 40
Nortronics Co., Inc., Minn., 60
Norwood Controls Unit, Detroit Con
trols Div., Mass., 5
Nuclear-Chicago Corp., Ill., 50
Oltronix Inc., Ga., 30
Omega Instrument Co., Calif., 10
Orbitran Co., Inc., Calif., 5
Otis Elevator Co., Electronics Div.,
N.Y., 10
Packard Bell Electronics Corp., 12333
W. Olympic Blvd., Los Angeles 64,
Calif., 5, 15, 32, 40, 45, 50
See ad on page 246
Tel: BRadshaw 2-6141
Pan-Air Electronics Corp., Calif., 45
Panellite, Inc., Ill., 5, 30
Patterson Moos, Div. of Universal
Winding Co., N.Y., 5, 10, 15, 20, 22,
25, 30
Pennsylvania Testing Lab., Inc., Pa., 10
Philbrick Researches, Inc., George A.,
Mass., 10
Philco Corp., Govt. & Indl. Div., Pa., 5,
7, 10, 15, 20, 25, 30, 32, 40, 50, 55

Directory I. Complete Equipment

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These small, rugged, low cost units are assembled magnetic shift registers with associated transistor circuitry mounted on a printed circuit board. Units may be cascaded to form registers of any length with input and output to every bit available on the socket.

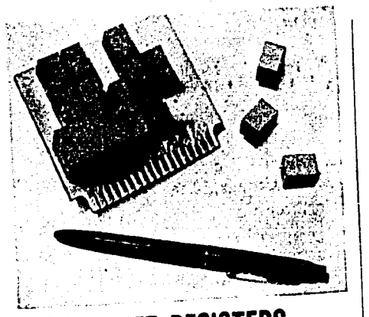
Only Magnetics Research's unique "wide width" design gives you:

- **Output voltages of controlled width**
- **Operation independent of advance current width**
- **Positive protection against transistor over-dissipation**

For complete details on standard stock designs write for MRC technical bulletin I-259

MAGNETICS RESEARCH COMPANY, Inc.
255 Grove Street • White Plains, N.Y. • White Plains 9-9588

For details, circle #217 on Reader Service Card



SHIFT REGISTERS
. . . custom designed

General Electric custom designs shift registers between 0 and 700 kc/s. With shift pulse power as low as .001 watts per kc, *voltage controlled* registers can deliver shift rates from 70 to 700 kc, to customers' specifications. Up to 100 kc, core-diode registers can be tailored to your exact needs. Most important, G. E.'s short cycle design service delivers first prototypes within a matter of days after specifications are received. 227-25

GENERAL ELECTRIC

DEFENSE ELECTRONICS DIVISION
HEAVY MILITARY ELECTRONICS DEPARTMENT
DEFENSE INDUSTRIES SALES
COURT STREET, SYRACUSE, NEW YORK

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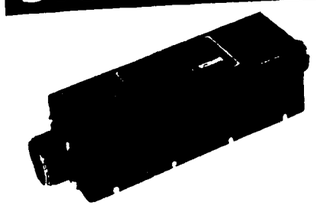
DIGIOMETER



"Digiometer" is a fast rugged component which accepts binary digits at its input and provides the equivalent of a precision potentiometer setting at its output. The operation is accomplished by hermetically-sealed micro-miniature relays switching fixed, encapsulated, precision resistance elements. The unit shown will accept up to ten digits in straight binary code. Other codes can be supplied on order.

APPLICATIONS

Digital control systems
Automatic checkout systems
Airborne command links
Industrial automaton systems
Digital-analog function generation
Tie-in of digital and analog systems

SYSTEMS LABORATORIES CORPORATION
14844 Ventura Blvd., Sherman Oaks, California, U.S.A.

For details, circle #219 on Reader Service Card

Philco Corp., Western Development Labs., Calif., 15, 20
Photocon Research Products, Calif., 22
Plastics & Electronics Corp., N.Y., 45
Potter Aeronautical Corp., N.J., 5, 20, 25, 32
Potter Instrument Co., Inc., Sunnyside Blvd., Plainview, L.I., N.Y., 15, 25, 30, 40, 50, 60
See ad on page 286
Tel: OVerbrook 1-3200
Precision Instrument Co., Calif., 60
Presin Co., Calif., 20, 22, 25, 50
Printloid, Inc., N.Y., 50
Racal Engrg., Ltd., England, 5, 25, 50
Radiation, Inc., Fla., 5, 30, 32, 50
Radiation Instrument Dev. Lab., Inc., Ill., 5
Radio Corp. of America, Semiconductor & Materials Div., Section 1-22-NN, Route 202, Somerville, N.J., 40
See ad on page 56
Tel: RAndolph 5-4500
Rank Cintel Ltd., England, 20, 25, 45
Ranson Research, Calif., 5, 15, 20, 25 30, 32, 40, 45
Raymond Engrg. Lab., Inc., Conn., 60
Raytheon Co., Mass., 5, 10, 40
Raytheon Co., Semiconductor Div., Mass., 45
Redford Corp., N.Y., 20, 25
Reeves Instrument Corp., N.Y., 5, 10, 32
Reflectone Corp., Conn., 10
Remington Rand, Univac, Sperry Rand Div., N.Y., 7, 15, 50, 55
Rese Engrg., Inc., Pa., 7, 40, 45
Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 40
See ad on page 525
Tel: LOckwood 5-4578
Ross Metals Co., Milton, Pa., 45
Rotary Devices Corp., N.J., 5, 40
Royal McBee Corp., N.Y., 15
Ryan Aeronautical Co., Ryan Electronics Div., Calif., 5, 10
Scantlin Electronics, Inc., Calif., 15, 45
Sciaky Bros., Inc., Ill., 25
Sensory, Inc., N.J., 20, 25
Servo Corp. of America, N.Y., 35
Servomechanisms, Inc., Calif., 10, 15, 40
Servonics, Inc., Va., 5, 10
Shamban & Co., W. S., Calif., 45
Shepard Labs., Inc., N.J., 50, 60, Variable Speed-Servo Controlled
Sierra Research Corp., N.Y., 5, 32
Skiatron Elect.-Television Corp., N.Y., 5, 10, 15, 30, 32
Solartron Electronic Group, Ltd., England, 5, 10, 30, 60
Solartron, Inc., Calif., 5, 10, 40
Soroban Engineering, Inc., Fla., 15, 30, 40, 50, Perforators
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Texas, 5, 10, 30, 60
See ad on page 248
Tel: HO 5-3471
Specialties, Inc., N.Y., 30
Specialty Engrn. & Electrn. Co., N.Y., 5, 20, 32, 45
Speer Carbon Co., Jeffers Electronics Div., Pa., 45
Spellman High Voltage Co., 3029 Webster Ave., New York 67, N.Y., 5, 15, 20, 25, 30, 32
See ad on page 501
Tel: KIngsbridge 7-0306
Spencer Mfg. Co., Ill., 20, 25
Sperry Gyroscope Co., Calif., 10
Sperry Gyroscope Co. of Canada, Ltd., Canada, 5, 10, 15, 30, 32, 35, 45
Sperry Rand Corp., Ford Instrument Co. Div., N.Y., 5, 10, 15, 32
Sperry Rand Corp., Remington Rand Univac Div., N.Y., 7, 15, 30, 35, 40, 55
Sperry Rand Corp., Sperry Gyroscope Co. Div., N.Y., 10, 15, 20, 30
Sperry Rand Corp., Sperry Gyroscope Co., Div., N.Y., 10, 15, 30
Sperry Rand Corp., Sperry Gyros. Dept. Countermeasures Div., N.Y., 15, 30
Sperry Rand Corp., Sperry Gyros. Dept. Surface Armament Div., N.Y., 30
Sprague Electric Co., Mass., 45
Stancil-Hoffman Corp., Calif., 40, 60
Standard Electric Time Co., Mass., 10
Standard Telephones & Cables, Ltd., England, 15, 30, 35, 40
Statistical Instrument Co., N.Y., 5
Stereatronics, Inc., Mass., 20, 45, Shift Registers
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 10, 22, 35, 45
See ads on pages 306, 351
Tel: POrt Washington 7-7200
Stevens Mfg. Co., Inc., George, Pulaski Rd. at Peterson, Chicago 30, Ill., 22
See ad on page 673
Tel: JUniper 8-1300
Stewart-Warner Electronics, Ill., 15
Strand Engineering Co., Mich., 15, 32
Stromberg-Carlson-San Diego, Calif., 32, 45, 50, Printers
Sturrup, Inc., Conn., 40
Summers Gyroscope Co., Calif., 10
Summers and Mills, Inc., Tex., 10
Sunshine Scientific Instrument, Pa., 45
Sunvic Controls, Ltd., England, 10
Sylvania Electric Products, Inc., Sylvania Electronic Systems Div., Mass., 10
System Development Corp., Calif., 15
Systems, Inc., Fla., 32
Systems Laboratories Corp., 14852 Ventura Blvd., Sherman Oaks, Calif., 25
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Tel: STate 9-0501
Systron Corp., Calif., 5, 15, 20, 25, 30, 50
Taller & Cooper, Inc., Div. of American Electronics, N.Y., 5, 7, 20, 22, 25, 30, 40, 50, 55, 60
Tally Register Corp., Wash., 30, Digital X-Y Plotter
Tech Laboratories, Inc., Bergen & Elsall Blvds., Palisades Park, N.J., 40
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Tel: WIndsor 4-2221
Technical Measurement Corp., Conn., 5, 15, 20, 25, 32, 40, 45
Techniflex Mfg. Co., Inc., N.Y., 5, 10, 15, 20, 25, 30
Techniques, Inc., N.J., 5
Telechrome Mfg. Corp., N.Y., 5, 10, 15, 32, 50
Telecomputing Corp., Data Instruments Div., Calif., 5, 20, 22, 25, 30, 55, 60

Directory I. Complete Equipment

9. Computers & Counters.

Telectro Industries Corp., N.Y., 5, 10, 35, 40, 60
Telectrosonic Corp., N.Y., 60
Telemeter Magnetics, Inc., Calif., 7, 30, 40, 55
Teletype Corp., Ill., 50
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 5, 10
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MIdway 6-7211
Temco Aircraft Corp., Electronics Div., Texas, 5, 10, 15
Temperature Engineering Corp., N.J., 40, 50
Ten Bosch, Inc., M., N.Y., Electronic Rotor Balancer, Mechanical & Electro Mechanical Computer Components, Computer, Air Data
Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 10, 15
See ad on pages 75-78
Tel: FLeetwood 7-5411
Texas Instruments, Incorporated, Houston, Tex., 5, 10, 15, 30, 40
Thompson-Ramo-Wooldridge, Inc., Calif., 5, 10, 15, 30, 32
Topper Mfg. Co., Inc., N.Y., 5
Transdata, Calif., 30
Transistor Electronics Corp., Minn., 45
Tripl-T Co., Calif., 45
Tullamore Electronics Co., Ill., 5
United Aircraft Corp., Norden Div., Conn., 5, 10, 15
United Aircraft Corp., Norden Div., Norden Labs., N.Y., 10
U.S. Science Corp., Sub., Topp Indust., Inc., Calif., 10
University of California, Calif., 30
Valor Electronics, Inc., Calif., 40
Van Norman Industries, Inc., Electronic Div., N.H., 20
Veeder-Root, Inc., Conn., 15, 20, 22
Victor Adding Machine Co., Ill., 50, Counter, Electronic Decimal
Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 25
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Tel: ENdicott 1-6200
Virginia Electronics Co., Inc., D.C., 45
Vitro Laboratories, N.J., 5, 7, 15, 20, 30, 32, 35, 40, 45, 55
Vitro Labs., Silver Spring Lab., Md., 5, 10, 32
Waldorf Instrument Co., Huyck & Sons Div., N.Y., 5, 10, 15, 30, 32
Walkirt Co., Calif., 15, 20, 25, 45
Wang Labs., Inc., Mass., 5, 15, 30, 32, 40, 45, 50
Washington Machine & Tool Works, Minn., 22
Waugh Engrg. Co., Calif., 32
Wayne-George Corp., Mass., 5, 15, 30, Shaft Encoders
Webster Electric Co., Wis., 60
Westgate Lab., Inc., Ohio, 30
Westport Electric, Calif., 20, 25
Whiteford Laboratory, Calif., Tape Handling Equipment
Wiancko Engineering Co., 255 N. Halstead Ave., Pasadena, Calif., 5
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Tel: ELgin 5-7186
Wright Machinery Co., N.C., 5

Consoles, cabinets & enclosures: See class 81

Consoles, studio: See class 32

Counting & Sorting Equipment: See class 4

Couplings: See class 80

Crystal testers: See class 12

Cutting heads & styli: See class 63

Data recorders: See class 34

Data storage mechanisms: See class 34

Decades: See class 5

Delay lines: See class 48

Detectors, radiation: See class 22

Diode testers: See class 12

Disk recorders: See class 27

Disks, blank: See class 63

Distortion analyzers: See class 3

Dosimeters: See class 22

Embossing recorders: See class 27

10. Emergency Communications Equipment.

5. Despatching equipment **10. Walkie-talkies**

Admiral Corp., Ill., 10
Aeronautical Electronics, Inc., N.C., 5
Alden Electronic & Impulse Recording Equipment Co., Inc., P.O. Box 125, Alden Research Center, Westboro 1, Mass., 5
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Tel: FOrest 6-4467
Allied International Corp., N.Y., 10
Audio-Video Corp., N.Y., 5, 10
Bendix Aviation Corp., Ind., 5, 10
Bendix Aviation Corp., Bendix Radio Div., Md., 10
Bendix Aviation Corp., Mich., 10
Bendix Radio, Indust. Commun. & Electronic Prods., Md., 5, 10
Bliss Electronic Corp., N.J., 5
Centronix, Inc., Fla., 10
Cleveland Electrn., Inc., Ohio, 10
Communications, Co., Fla., 5
Creative Electronics Corp., Conn., 10
Dictograph Products, Inc., N.Y., 5
Dynamic Electronics-New York, Inc., N.Y., 5
EMI—Cossor Electronics Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 10
See ad on page 412
Tel: HAlifax 6-7491
Electro-Voice, Inc., Radio Mfg. Engrg. Div., Ill., 10
Electronic Communications, Inc., Fla., 10
Electronic Engrg. Co., Md., 5, 10
Emerson Radio & Phonograph Corp., Md., 10
Feiler Engineering & Mfg. Co., Ill., 5
Fisher Research Lab., Inc., Calif., 5
General Electric Co., Communication Prods. Dept., Va., 5, 10
General Electric Co., Ltd. of England, England, 5, 10
Gyro Electronics Co., N.Y., 10
Hosmer & Co., E. A., Calif., 5
ITI Electronics, Inc., N.J., 5
I.T. & T. Corp., Industrial Prods. Div., Calif., 10
King Radio Corp., Kan., 5
LEL Inc., 384 Oak St., Copiague, L.I., N.Y., 10
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Tel: AMityville 4-2200
Land-Air, Inc., Ill., 10
Madigan Corp., N.Y., 5, 10
Marconi's Wireless Telegraph Co., Ltd., N.Y., 10
Morrow Radio Mfg. Co., Ore., 10
Motorola, Communications & Electronics, Inc., Ill., 5, 10
Muirhead Instruments, Inc., N.Y., 5, 10
Philco Corp., Govt. & Indl. Div., Pa., 5, 10
Port-O-Vox Corp., N.Y., 10
Production Research Corp., N.Y., 10
Pye Telecommunications, Ltd., England, 10

alfax "ELECTRICITY IS THE INK" **is revolutionizing graphic recording!**

ALFAX PAPER AND ALDEN ADJUSTERLESS RECORDING TECHNIQUES MAKE POSSIBLE—

• ***New Accuracies and Resolution in Direct Graphic Recording!***

Record full range of your electronic signal outputs—monitor processes and operations directly and instantaneously on Alfax Paper —no pens or ink—up to 17 step permanent tone shades.

Magazine Fact Finder—2 Channels Plus Timing

Here is a compact Magazine Recorder which will permanently record two separate operations and automatically print a recurring time signal on the Alfax Tape. Simple to install—they will operate unattended — remotely or on the spot.

Multi-Channel Fact Finder—30 Channels Plus Timing

Record thirty channels of on-off data by merely supplying current to writing stylI—no pens or inks—simple motion switches are easily installed to make or break writing current to Alfax Paper. Ideal for monitoring production operations and processes, this compact, rugged recorder is portable for lab, factory and field use.

Alden "Flying Spot" Component Recorders

Get hi-resolution tone shade recordings on Alfax Paper of detecting instruments using scanning or sweep methods to collect data. Synchronize Alden "Flying Spot" with sweep or rep rate of your equipment—use direct signal outputs to mark Alfax with tone shades proportional to signal variations. Ideal for sonar, radar, facsimile, ultrasonic and magnetic flaw detection etc.

Alden Curve Plotters

The Basic Helix Recorder with special electronics can provide continuous, automatic curve plotting of phenomena converted to voltage. Any number of channels can be recorded simultaneously along with standard or reference signals so that the information is instantly and permanently self-calibrated.

• ***Fastest, Most Accurate Means of Communication!***

New high and low speed Alden facsimile recording systems using Alfax Paper are the most accurate means of communication today —are simple to install and operate virtually unattended.

High Speed Selective Dispatch Facsimile System

Specially designed to permit selection of pertinent data from any copy — letters, dispatches, reports, etc. — for instant transmission to wherever needed—yet complete reproductions can also be sent. 12 square inches of copy, 1800 words of newspaper type, or 900 words of typewriter text can be transmitted and received per minute.

Continuous Reproduction Facsimile System

Extremely high quality reproduction of large copy: such as newspapers, weather maps, blueprints, finished advertising layout, drawings, photographs, etc., can be transmitted easily with this equipment. Copy is scanned flat and reproduction automatically on remote continuous recorder.

Alden Giant Bulletin System

Fastest, accurate means of disseminating information to large groups of people. Automatically provides changing "up to the minute" bulletins 4 feet wide and up to 10 feet high and as much as 12 square feet of copy per minute, enlarged 10 times from remote flat-copy scanner as sent either by wire or a microwave system.

WRITE FOR LITERATURE on Alfax or Alden Recorders to:

ALDEN ELECTRONIC AND IMPULSE RECORDING EQUIPMENT CO.

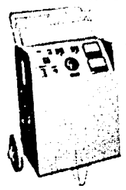
Alden Research Center, Westboro, Mass.

For details, circle #220 on Reader Service Card

Headquarters for **HIGH POTENTIAL** Testing

INSULATION BREAKDOWN DIELECTRIC STRENGTH

Every over-potential test need from the generator to the appliance motor . . . is met by a HYPOT®



150 KV Testing Mobile HYPOT®

Non-destructive testing of power cables, generators, and insulators with AC or DC test potentials to 150 KV. New DC Mobile HYPOT® is easier to handle, cuts costs. Write for bulletin "Mobile HYPOT®"

Model 5500

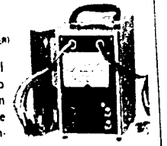
Typical Mobile HYPOT® provides 0 to 120 kv d-c at 5 ma. More compact and easier to use than equivalent a-c test sets. Lower in cost, too.

30 KV Testing Bench HYPOT®

Models available with AC or DC test potentials from 5 to 30 KV. Widely used for insulation testing of cables, distribution equipment and heavy duty motors.

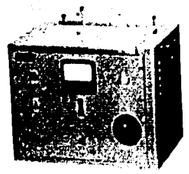
10 KV Testing Portable HYPOT Jr.®

The advanced over-potential tester that enables anyone to make high potential breakdown tests. Separate lights indicate excess leakage current and insulation breakdown. Available with test voltages from 1500 v a-c to 10000 v a-c.



Model 412

INSULATION Materials Tester



Model 4501 Materials Tester

New materials testing AC HYPOT® meets ASTM dielectric strength test requirements. Features automatic rate of test voltage rise, transparent test cage that is safety interlocked and complete line of plug-in materials testing fixtures. Write for new bulletin . . . "HYPOT® Insulation Tester"

VIBROTEST® measures FIVE MILLION Megs

Direct reading a-c operated megohmmeter for resistance measurement to five million megohms. Drift free, stable and accurate on all ranges.

VIBROTEST® Model 2570 has six megohm ranges: 1-50, 10-500, 100-5000, 1,000-50,000, 10,000-500,000 and 100,000-5,000,000 megohms. Write for bulletin.

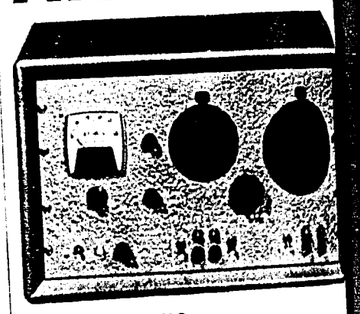
Write for Bulletins · 10-35.16

ASSOCIATED RESEARCH, Incorporated

3792 W. Belmont Avenue • Chicago 18, Illinois

For details, circle #221 on Reeder Service Card

THE AETNA SERVO ANALYZER



APPLICATIONS

Aetna's LOW COST Servo Analyzer be used to measure amplitude sponse, phase response, open or cl loop transfer functions, transient sponse, computer response etc. particularly useful in evaluating and DC servo systems.

TECHNICAL DATA

FREQUENCY RANGE

Model 100-A
0.25 to 100 cycles per second

Model 100-B
0.0008 to 100 cycles per second

Frequency stability 1.0%

OUTPUT WAVE FORMS

Sine wave 20 volts peak to peak
Modulated sine wave 30 volts
Square wave 20 volts peak to p
Synchronized sweep over the entire f quency range
Cathode follower output system a 100 to 1 attenuator

PHASE MEASUREMENT

Zero to ± 180 degrees

INPUT CARRIER

50 to 5000 cycles per second, 115 v

POWER REQUIRED

150 watts, 117 volts, 60 cycles

RACK MOUNTING

19" wide x 10½" high x 14" d

CABINET MOUNTING

21½" wide x 13" high x 14½" d

NET WEIGHT

65 pounds

AETNA ELECTRONIC CORPORATION

Readington Road, North Branch, New Jersey

RANDOLPH 5-1000

For details, circle #222 on Reader Service Card

Directory I. Complete Equipment

10. Emergency Communications Equipment.

Radio Corp. of America, Defense Elec. Prod., N.J., 10
Raytheon Co., Mass., 10
Republic Electronic Indust. Corp., N.Y., 10
Siemens & Halske, A. G., Germany, 10
Simmonds Aerocessories, Inc., N.Y., 10, Beacons & Receivers
Simpson Mfg. Co., Inc., Mark, N.Y., 5
Space Electronics Corp., Calif., 5
Specialty Engrn. & Electrn. Co., N.Y., 10
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 10
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Tel: POrt Washington 7-7200
Systems, Inc., Fla., 10
Telephonics Corp., N.Y., 10
Vocaline Co. of America, Inc., Conn., 10
Wheeler Elect. Corp., Div.-Sperry Corp., Conn., 5
Young Spring & Wire Corp., Gonset Div., Calif., 5

Environmental test chambers: See class 12

Equalizers: See class 49

FM/FM modulators: See class 34

11. Facsimile Equipment.

5. Receiving equipment
10. Sensitized paper
15. Transmitting equipment

Acme Electronix Div. of NEA Service, Inc., Ohio, 5, 15
Alden Electronic & Impulse Recording Equipment Co., Inc., P.O. Box 125, Alden Research Center, Westboro 1, Mass., 5, 10, 15
See ad on page 290
Tel: FOrest 6-4467
Alden Systems Co., Mass., 5, 10, 15
Alfax Paper & Engr. Co., Mass., 10
Barker & Williamson, Inc., Pa., 5, 15
Brick Electronic Equipment Co., N.J., 5, 10, 15
Designers for Industry, Inc., Ohio, 5, 15
Eastman Kodak Co., 343 State St., Rochester 4, N.Y., 10
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Tel: LOcust 2-6000
Electronic Communications, Inc., Fla., 5, 15
Engineering Associates, Ohio, 5, 15
Fairchild Camera & Instrument Corp., Defence Prods. Div., N.Y., 5, 15
Fairchild Camera & Instrument Corp., Industrial Prods. Div., N.Y., 10
Fuchs Impulse Motor Servomechanisms, N.Y., 5, 10, 15, Pocket Portable
Garfield Associates, E., Pa., 5, 10, 15
General Electric Co., Technical Prods. Operation, N.Y., 15
Gray Radio Co., Inc., Fla., 15
H R B—Singer, Inc., Science Park, State College, Pa., 15
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Tel: ADams 7-7611
Haloid Xerox, Inc., N.Y., 10
Hogan Labs., Inc., N.Y., 5, 10, 15
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 15
Interstate Electronics Corp., Calif., 5, 15
L & O Research & Development Corp., Pa., 5, 15
Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10, 15
See ad on page 66
Tel: CRestview 4-7411
Metox, France, 5, 15
Muirhead & Co., Ltd., England, 5, 10, 15
Philco Corp., Govt. & Indl. Div., Pa., 5, 15
Siemens & Halske, A. G., Germany, 15
Skiatron Elect. & Television Corp., N.Y., 15
Stewart-Warner Electronics, Ill., 5, 10, 15
Stromberg-Carlson-San Diego, Calif., 5
Sunshine Scientific Instrument, Pa., 10
Technitrol Engineering Co., Pa., 5, 15
Telectro Industries Corp., N.Y., 5, 15
Times Facsimile Corp., 540 West 58th St., New York 19, N.Y., 5, 10, 15
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Tel: JUdson 2-3030
Topic, Incorporated, Mass., 10
Transline Associates, N.J., 5, 15
U.S. Recording Co., D.C., 5, 10, 15
Westrex Corp., N.Y., 5, 15

Field strength meters: See class 26

Film projectors, television: See class 32

Filters: See class 50

Frequency meters: See class 56

Frequency meters, microwave: See class 19

Frequency shift converters & keyers: See class 33

Frequency standards: See class 31

GCA equipment: See class 1

Galvanometers: See class 56

Galvanometers, recording: See class 13

Gears: See class 28

12. General Test Equipment.

5. Calibrators, instrument
10. Capacitor testers
12. Circuit testers
15. Crystal testers
20. Detectors—flaw
22. Digital voltmeters
25. Diode testers
30. Dynamometers
35. Electrometers
37. Environmental test chambers
40. Galvanometers
45. Insulation testers
50. Mass spectrometer
55. Multi-testers
60. Null indicators
65. Ohm & megohm meters
67. Pressure gages
70. Pyrometers
72. Racks—aging
73. Resistor testers
74. Shielded enclosures
76. Spectrometers
78. Stroboscopes
80. Transistor testers
82. Ultrasonic generators
84. Ultrasonic testers
85. Vacuum gages
86. Vacuum tube testers
88. Vacuum tube voltmeters
90. Vibration analyzers

Ace Engineering & Machine Co., Inc., Pa., 74
Acme Electric Corp., 44 Water St., Cuba, N.Y., 45
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Tel: CUba 4
Acoustica Associates, Inc., Dept. IRE, Fairchild Court, Plainview, N.Y., 82
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Tel: OVerbrook 1-2100
Acton Laboratories, Inc., 536 Main Street, Acton, Mass., 88
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Tel: COlonial 3-7756
Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 60
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Tel: GRegory 2-5622
Adler Electronics, Inc., N.Y., 5
Advanced Electronics, Inc., Conn., 90
Aero Electronics Co., Ill., 12, 20, 40
Aero Research Instrument Co., Inc., Ill., 70
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Aerolux Light Corp., N.Y., 78
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Aerotronic Associates, Inc., N.H., 25, 80
Aerovox Corp., Mass., 10
Aetna Electronics Corp., Readington Rd., North Branch, N.J., 82
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Aireco, Inc., N.Y., 37
Airmec Limited, Eng., 45, 65, 80, 88
Airtronics International Corp., Fla., 55
Alberhill Corp., Dynamics Instrumentation Div., Calif., 88
Alcar Instruments, Inc., N.J., 82, 84
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All American Tool & Mfg. Co., Ill., 86
Allegany Instrument Co., Inc., Md., 5, 12
American Electronic Labs., Inc., Pa., 80
American Electronics, Inc., American Data Div., N.Y., 30
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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Acton Laboratories, Inc.
LABORATORY INSTRUMENTS OF EXCEPTIONAL PRECISION

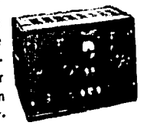
VOLTAGE MEASUREMENT

TYPE 810-A VTVM — Balanced circuits and liberal inverse feedback to insure long-time stability and accuracy. 7 full scale DC ranges: 1-1000 volts; 6 AC ranges; 1-300 V (rms); 7 resistance ranges 0.2 to 500 with multipliers of x1-x1 meg. DC accuracy ±2%; AC accuracy ±3%. Frequency response ±1 db, 10 cps to 700 mc. 100 meg input impedance for DC measurement. High input impedance to 700 mc maintained by 1.2 mmf input capacitance of AC probe.

TYPE 815-A VTVM — Has wide ranges. 9 full scale DC ranges; 0.1-1,000 volts; 8 AC ranges: 0.1-300 volts (rms); 9 DC current ranges: 0.001 ua to 100 ma; 9 resistance ranges: 0.2 to 500 with multipliers x0.1 to x10 meg. DC accuracy ±2%, AC ±3%, both 1 V range and higher. Frequency response 15 cps to 100 MC. DC input impedance 100 meg; AC 5 mmf and 10 meg. Also available as 815-AR (rack mount — gray panel).

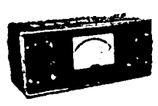
IMPEDANCE MEASUREMENT

TYPE 310-B Z-ANGLE® METER — Measures in polar form the impedance, phase angle, dissipation factor, and storage coefficient of any RLC combination. One balancing control permits accurate analyses to be made more quickly and easily than with conventional AC bridges Measures impedances from 0.5 to 100 k. Frequency range: 30 cps to 40 kc. Accuracy of impedance magnitude is ±1% to 20 kc and ±2 degrees for phase angle. Unit has internal 400 cps and 60 cps signals.



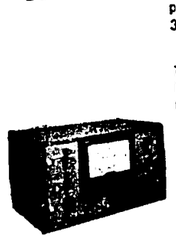
TYPE 314-A LOW-IMPEDANCE Z-ANGLE® METER — Measures low values of complex impedances in polar form. Direct readings of impedance in ohms, phase angle in degrees, and dissipation factor. Freq. range of 30-1000 cps, impedance-magnitude range of 0.005-1000 ohms accurate to ±1%, and dissipation-factor range of 0 to infinity. Phase angles measured from −90° to 0° to +90°, with accuracy of ±1°. 4-terminal arrangement nullifies effect of lead impedance and insures accurate measurements. Also available as 314-AR (rack mount).

PHASE MEASUREMENT AND GENERATION

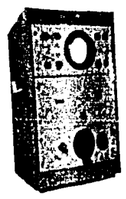


TYPE 320-AB PHASE METER — Measures phase difference between 2 signals (1 cps to 100 kc) of any wave shape and indicates phase angle on large meter with separate ranges of 360°, 180°, 90°, and 36°. Accuracy is ±(1% of full scale + 3 degrees). Requires no adjustments, corrections, or balancing operations. Amplitude range is .7 to 120 volts rms. Input impedance of 10 meg and 13 mmf. Also available as 320-ABR (rack mount).

TYPE 709-A BROADBAND SECONDARY PHASE STANDARD — Calibrates phase measuring instruments and measures phase when used with oscilloscope. Develops 2 sinusoidal signals variable from 0° to 360° with respect to each other. Range is 20 cps to 20 kc. Accuracy of ±1° from 20 cps to 10 kc. High input impedance, low output impedance. Inherent distortion less than 1%. 0.5 to 5-volt output varies less than ±2% with phase shift. Also available as 709-AR (rack mount).



TYPE 328-A TRANSISTORIZED PHASE METER — Frequency range 10 cps to 50 kc. Direct reading from 0 to 360° in 6 ranges of 60° each on large 5" meter scale. Absolute accuracy of 1° from 10 cps to 10 kc. Amplitude range .25 to 170 volts peak except at low frequencies. Input impedance: one megohm shunted by 20 mmf. Internal output impedance is approx. 100,000 ohms. Recorder connector provided. Power: 105-125 volts, 60 cycle AC, 20 watts. Terminals provided for operating from an external 45 volt battery, 50 mil drain. Also available as 328-AR (rack mount).



TYPE 7000-B AUDIO PRIMARY PHASE STANDARD — Calibrates phase detectors and phase shifting devices but can also be used to measure phase shift. Supplies 2 sinusoidal signals of same frequency whose phase relationship is continuously variable from 0° to 360° with ±0.05° accuracy, set by Lissajous pattern. Any single frequency available from 30 cps to 20 kc. Output of 1 to 10 volts rms from impedance of approximately 200 ohms.

TYPE 706-A ULTRA-SONIC PRIMARY PHASE STANDARD — Calibrates high frequency phase meters, phase detectors, and phase-shifting devices. Generates 2 sine-wave signals having variable phase difference 0° to 360° at any specified single frequency 20 to 200 kc. Phase angle accuracy of ±0.1 degree set by observation of multiple frequency Lissajous pattern on built-in scope. Also available as 706-AR.

TYPE 511-A POWER AMPLIFIER — Low distortion, low noise and phase shift compensated amplifier for 50 cps to 50 kc range. Output load characteristics: 5 ohms 12.8 watts, 25 ohms 13 watts, 200 ohms 15 watts, 1200 ohms 12 watts, down 1 db at 50 kc. Phase compensation permits application as drive source for Type 7000-B. Also available as 511-AR (rack mount).

TRANSMISSION AND DELAY MEASURING SETS

Measures the absolute amplitude and relative delay characteristics of 600 ohm transmission circuits in the frequency range from 200 cycles to 24 kc. The instrument consists of two basic units: the 451-A Transmitter and the 452-A Receiver.

The instruments will operate 32°F to 130°F and with normal 60 cycle line voltages ranging from 105 to 125 volts. It has an overall precision and accuracy of ±50 microseconds and a drift rate not exceeding ±50 microseconds per 30 minutes.

POTENTIOMETER TESTING EQUIPMENT

TYPE 394-A PONOGOMETER® STANDARD — Measures equivalent noise resistance (ENR) of single or multiturn precision potentiometers. Provides for establishing threshold level of ENR from 10-2000 ohms. ENR's above threshold level established produce both visual and audio indication. 100 kc frequency response flat to 50 kc. Accuracy is ±(3% of threshold value + 3 ohms). Recovery time is 1.5 seconds maximum. Also available as 394-AR (rack mount). Ideal for incoming inspection or laboratory analysis.

TYPE 395-C PONOGOMETER® STANDARD — Calibrates Ponogometer®. Accuracy 1%. Also available as 395-CR (rack mount).

TYPE 396-B PONOGOMETER® ATTENUATOR — Extends range of threshold resistance of Ponogometer®. Permits direct measurement of ENR's from 10 ohms to 100 k. Frequency response is ±3 db from 12 cps to 1.5 mc. Available as 396-BR (rack mount).

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Acton Laboratories, Inc., also has complete facilities and experienced engineering staff to provide specialized research in and development of electronic components and instruments.

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Testing to military and commercial specifications in a fully equipped Environmental Testing Laboratory is another important service provided by Acton Laboratories, Inc.

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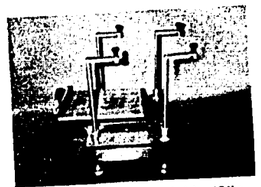

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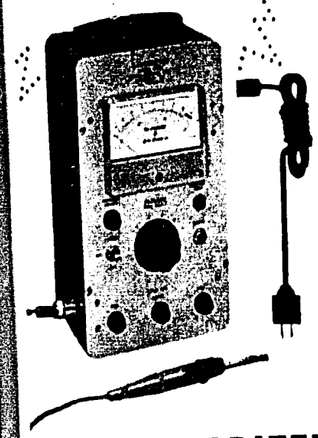

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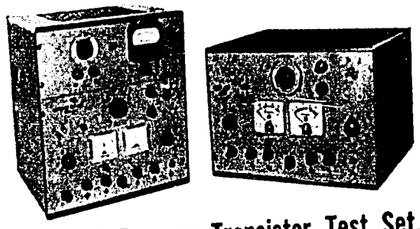

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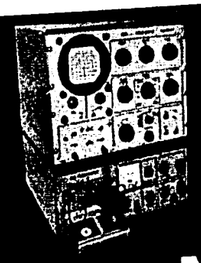

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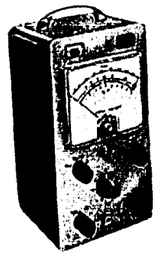
• Standard of the Industry for low power transistors Measures h parameters and equivalent T coefficients NPN and PNP junction and surface barrier transistors common base or emitter circuits α and β cutoff and I and C Measurement frequency from 100 cps to 1 mc



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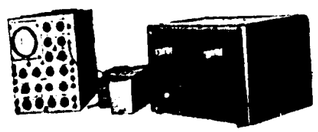

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130	Pulse Generator	Fast general purpose pulse circuitry. Pulse widths 100 millimicroseconds to 1 second. Rise time < 10 millimicroseconds. Pulse amplitude: 50 volts.
140	Transistor Rise, Storage, and Fall Time Meter	Semi-automatic measurement of rise, storage and fall time of NPN and PNP transistors. 10 millimicroseconds to 10 microseconds full scale, each channel. Readout time: less than 50 milliseconds. Linearity: ± 7%, ± 5 millimicroseconds.
161	Binary	50 Mc scale of 2 unit. Element for fast pulse systems. Extends ranges of present cycle counters.
201C	Electrometer Amplifier	Measures currents between 10^{-6} and 10^{-15} ampere. Ultra-high sensitivity with ultra-low noise. Response time: 250 microseconds for 10^{-9} ampere full scale.
202	Electrometer for Automatic Control	Measures current with specifications identical to EH model 201C, but has presettable high limit control for actuation of external devices. Extremely stable; zero drift less than 3% per week.
203 series	Constant Impedance Micromicroammeter	Constant impedance instrument for automatically measuring very low currents. Measures transistor I_{co}, diode back current, capacitor leakage current. Fast response time even with large overloads. Provisions for remote control.
213	Microvoltmeter	Measures potentials below 1 microvolt. Response time < 50 milliseconds. Chopper stabilized; ultra-low drift. Accuracy: 3% of full scale.
215 series	Multimeter • Millivoltmeter • Micromicroammeter • Megmegohmmeter • Current Integrator	Basically a very stable millivoltmeter, the EH 215 series offers easy conversion to micromicroammeter, megmegohmmeter, and current integrator. As millivoltmeter, range is 10 millivolts to 10 volts f. scale with fast response. Measures current to < 10^{-11} ampere. Measures resistance to > 10^{16} ohms Measures integrated current <10^{-13} coulomb.
301B	Analytical Balance	Automatic analytical balance. Measurement time: 1 second. Accuracy: 0.2%. Range: 1 milligram to 200 grams.
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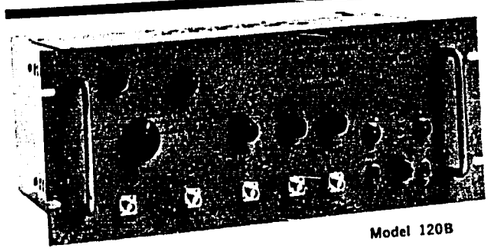

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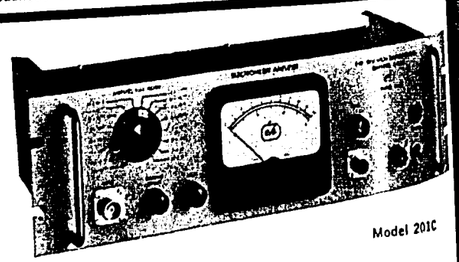

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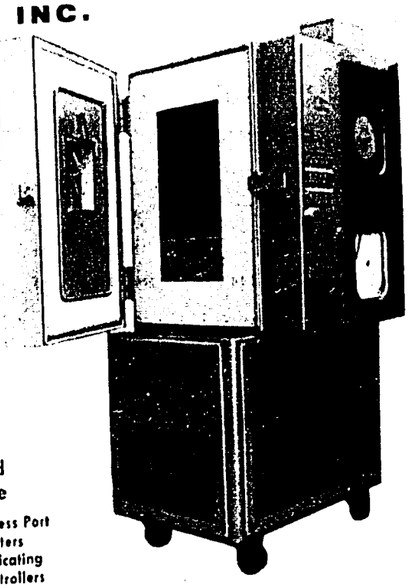

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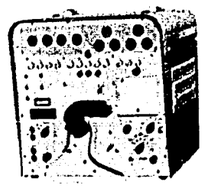

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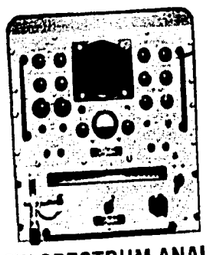

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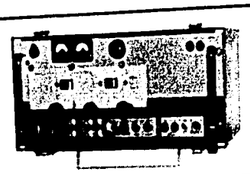

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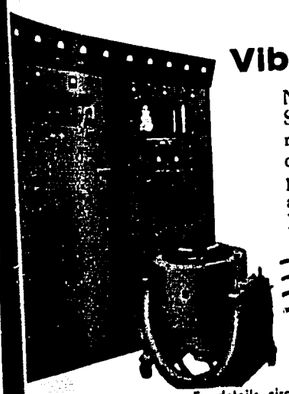

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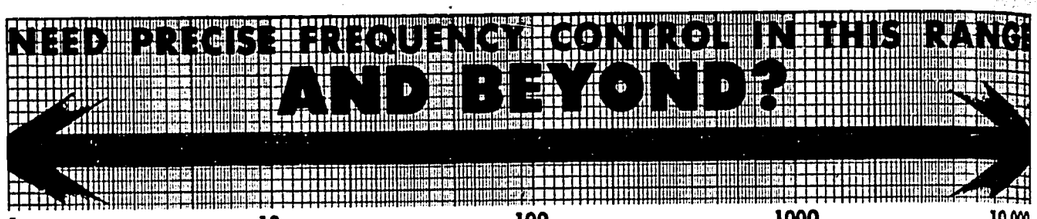

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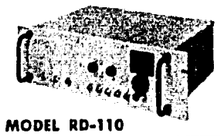
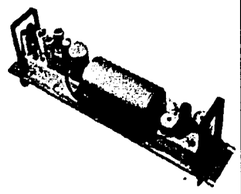
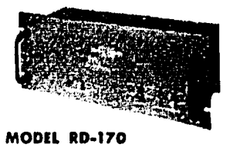
Ultra-stable frequency generators for use as reference sources or master oscillators. Unmatched for precision, compactness and low cost, Manson Oscillators and Harmonic Generators meet the highest stability specifications per dollar.

		SPECIFICATIONS
1 Megacycle HARMONIC REFERENCE OSCILLATOR Price $1095.  MODEL RD-110	Complete, self-contained system incorporates ultra-stable crystal oscillator, jitter-free pulse generator, mixer and regulated power . . . . . Generates, measures, monitors frequencies at harmonic points to over 1000 Mc . . . . . Crystal frequency tunable ±25 cycles *without degradation of stability characteristics* . . . . . counter-type, ultra-linear tuning dial for exceptionally accurate settability and readability.	FREQ. STABILITY: Meets above listed specifications. FREQUENCY: 1 megacycle, tunable ±25 cycles. OUTPUTS: a) Sine Wave, 3 volts rms across 50 ohms; b) *Pulse*, jitter-free, balanced, ±40 volts peak across 250 ohms. TUNING ACCURACY: 0.1 cps with direct-reading, linear dial; substantially zero-error readability and resettability. HARMONICS: Usable to kilomegacycle region. INPUT: 105/125 V., 60 cps, 100 watts. SIZE: 5¼" H x 19" W x 11¾" D, for rack or bench.
1 Megacycle HIGH STABILITY OSCILLATOR Price $395.  MODEL RD-140	Compact crystal oscillator suitable as a reference source or master oscillator in frequency control systems . . . . . non-microphonic design and proportional oven control assure high insensitivity to both vibration and temperature . . . . . *new packaged* version (RD-145) for direct, sub-assembly incorporation in portable or airborne instruments . . . . . 2 x 4 x 6 inches, 12 ounces . . . . . employs ultra-precise Manson thermostatic oven, substantially meeting RD-140 specs. FREQUENCY DIVIDERS AND MULTIPLIERS available to extend range from 100 kc to 10 mc and above . . . . . stability characteristics equal to crystal oscillator. AVAILABLE SOON! Model RD-147, ultra-low-drift oscillator . . . incorporates continuous aging compensation to reduce drift rate to 5 parts in 10^8 per 6 months.	FREQ. STABILITY: Meets above listed specifications. FREQUENCY: 1 megacycle. (Frequencies from 0.8 mc to 1.2 mc available on special modification.) Frequency adjustable more than 6 cycles, allowing ample compensation for crystal aging. Alternate version, Model RD-146, incorporates calibrated trimmer dial on front panel. OUTPUT: Sine wave, 1 volt rms across 1000 ohms. POWER REQUIRED: 250 VDC @ 60 ma; 6.3 VAC @ 1.8A. MOUNTING: For 19" relay rack or bench use. Front panel height, 3½".
1000 Megacycle REFERENCE GENERATOR Price $850.  MODEL RD-170	This precision-built, low cost standard employs crystal synthesizer techniques for high stability, low noise and low spurious signals . . . . . Basic unit furnishes outputs of 0.1 kmc and 1 kmc . . . . . Optional feature includes harmonic generator utilizing base frequencies to furnish highly stable, usable outputs over a major portion of microwave spectrum . . . . . All outputs tunable when used with RD-110. • Model RD-175, L-band generator, output tunable 1.095kmc-1.405kmc in 10-mc steps, meets above listed stability specifications when used with RD-140.	OUTPUT FREQUENCIES: 100 mc and 1000 mc sinusoidal. Tunable ±2.5kc and ±25kc respectively, if used with RD-110. STABILITY: Meets above stability specifications when used with RD-110 or RD-140. OUTPUT POWER: 100 milliwatts at either output. HARMONICS (Model RD-170H): Usable to above 20,000 Mc. INPUT POWER: 250 VDC @ 150 ma reg.; 6.3 VAC @ 4A. SIZE & MOUNTING: 5¼" H x 6¾" D, for 19" rack or bench use.

For Military Applications. . . . . CRYSTAL FREQUENCY SYNTHESIZERS

Manson manufactures the 0-406/UR synthesizer and a full line of disciplined incremental and continuous-coverage oscillators, approaching the "black-box" equivalent of a crystal with thousands of selectable frequencies. Ideal for SSB systems, as transmitter exciters or receiver VFO's, ultra-stable frequency generators, FSK exciters and similar applications where exactness, operating convenience and equipment dependability are mandatory.

Standard and developmental models cover the range from 15 kc to 410 mc. Features include stabilities and setting accuracies to $1/10^8$ and better; zero-error readability and resettability; ultra-low spurious signals; MIL construction.

Letterhead inquiries invited.

MANSON LABORATORIES
375 FAIRFIELD AVENUE
STAMFORD, CONNECTICUT
DAvis 5-1391

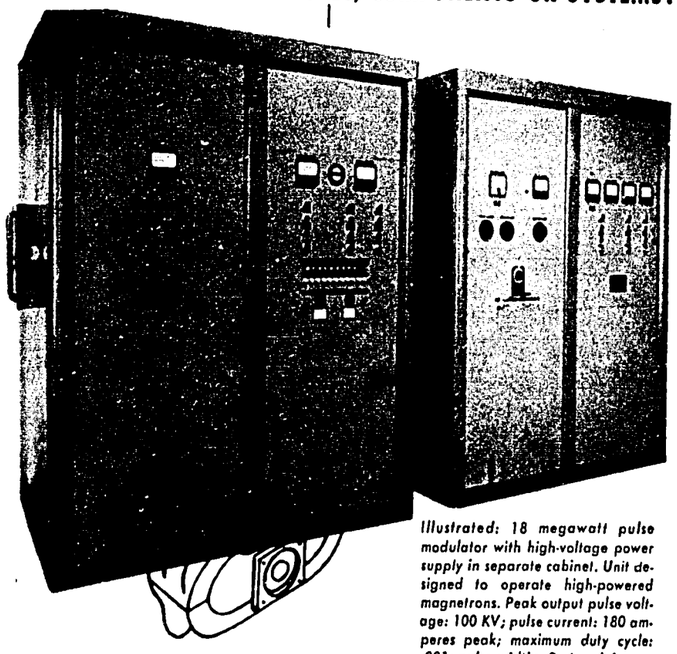
manson

Pulse Modulators, High Voltage Power Supplies, Communications Instruments and Components, Complete Microwave Systems.

For details, circle #234 on Reader Service Card

Testing MAGNETRONS KLYSTRONS CARCINOTRONS

● OTHER MICROWAVE TUBES, COMPONENTS OR SYSTEMS?



Illustrated: 18 megawatt pulse modulator with high-voltage power supply in separate cabinet. Unit designed to operate high-powered magnetrons. Peak output pulse voltage: 100 KV; pulse current: 180 amperes peak; maximum duty cycle: .001; pulse widths: 2, 4 and 6 μsec.

Come to Manson for the widest selection of standard *Pulse Modulators* and *High-Voltage Power Supplies* covering all useful power levels. From kilowatts to tens of megawatts, Manson has precision-engineered designs for operation and test of magnetrons, klystrons, traveling wave tubes, backward wave oscillators, lighthouse tubes, pulse transformers, waveguide components and related devices. The wide range of standard models is readily adaptable to meet individual specifications.

HIGH POWER PULSE MODULATORS:

Hard- and soft-tube types from 16 kw. to 30 megawatts peak power output, and higher. Average output powers as high as 60 kilowatts. Typical operating features include: continuously adjustable voltage control; discrete or variable pulse widths; internally- and externally-controllable repetition frequencies; auxiliary synchronized outputs; pulse-shape monitoring circuits; and interlocking and overload protection.

HIGH VOLTAGE POWER SUPPLIES:

High-voltage DC and AC types, single- or multiple-output, regulations and stabilities to 0.01%. Standard and custom designs to satisfy your specific tube testing or production problems: highly-regulated supplies uniquely suited for TWT test and operation; unregulated high-power supplies for systems testing; and complete power sources for controlling all aspects of tube production.

Available from stock! **BASIC 1 AND 2 MEGAWATT MODULATORS**

375 FAIRFIELD AVE. manson **STAMFORD, CONN.**

Manson offers to engineers and technicians a rewarding present and attractive future in Connecticut.

For details, circle #235 on Reader Service Card

Directory I. Complete Equipment

12. General Test Equipment.

Panseal, Inc., N.J., 60, 67, 70

Pegasus Laboratories, Inc., Mich., 30

Pennsylvania Testing Lab., Inc., Pa., 60, 72

Permag Corp., 88-06 Van Wyck Expressway, Jamaica 18, N.Y., Gaussmeter
See ad on page 469
Tel: OLympia 7-1818

Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 10, 12, 20, 45
See ad on page 306
Tel: TRinity 8-3251

Phaostron Instrument & Electronic Co., Calif., 55, 60, 86, 88

Philco Corp., Govt. & Ind'l Div., Pa., 5, 12, 80

Philips Electronics, Inc., N.Y., 50, Electron Microscope

Photo Research Corp., Calif., Light Meters

Photocon Research Products, Calif., 67, 84

Photron Instrument Co., Ohio, 40

Physics Research Labs., Inc., P.O. Box 555, Hempstead, N.Y., 5, 12, 40, 55, 65, 73
See ad on page 306
Tel: IVanhoe 3-8299

Pierce, George C., Supvr. Products Services, Va., 67

Pimex, Inc., N.Y., 40

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 5, 30
See ad on page 323
Tel: CAnal 6-7250

Polyphase Instrument Co., Pa., Strain Meas. Insts.

Precise Development Corp., N.Y., 5, 25, 55, 65, 73, 80, 86, 88

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 45
See ads on pages 500, 583
Tel: Flemington 900

Precision Apparatus Co., Inc., N.Y., 12, 55, 65, 80, 86, 88

Precision Scientific Co., Ill., 37

Press Wireless Labs., Inc., Mass., Capacitance Voltage Dividers

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 5, 90
See ad on page 340
Tel: POrt Washington 7-8150

Process & Instruments, N.Y., 50

Pyramid Electric Co., 507 26th St., Union City, N.J., 10
See ad on page 404
Tel: UNion 5-1776

Pyramid Electric Co., S.C., 10

Racal Engrg. Ltd., England, 22

Radar Engineers, Wash., 12, 20

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Test and Service Products

For MAGNET CHARGING, TREATING and CALIBRATION

MODEL 1221 is used for small magnets. Its 10,000 ampere-turn output will saturate about 2" of Alnico V. Operates by condenser discharge method thru plug-in fixtures. Uses only 30 watts at 115 v. For continuous duty; charging cycle averages 3 sec. Price $180.

MODEL 107A is a versatile, condenser discharge magnetizer for most medium size magnets of either simple or complex pole configuration. It provides ranges of 12,000 and 24,000 ampere-turns and is capable of saturating most instrument magnets, including the core type mechanisms, using the standard flat bar, adapters or wire-wound fixtures. Can be used for continuous duty production magnetizing; average charging cycle is under 5 sec. Weight is 75 lbs. Size 12 x 7 x 17. Operates from 115-volt, 60-cycle line. Price $530.

MODEL 1500 is designed for production, research and instrument repair work. It will magnetize the new cobalt platinum and barium ferrite materials as well as all the Alnicos. It will saturate large switchboard meter assemblies and all panel type instruments and uses most existing adapters designed for the Model 107A. Wire-wound fixtures are plugged into the front panel through a safety interlock system providing maximum operator protection. Operates from 115-volt, 60-cycle line. Size 11 x 20 x 15; weight 125 lbs. Price $945.

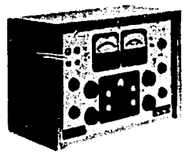
MODEL 942 will saturate Alnico magnets weighing up to 34 lbs. and high flux ceramic magnets of any shape or pole configuration. Operates on condenser discharge principle from regular 115-volt, 60-cycle line. Produces charging outputs (depending on number of 100 μf condensers employed) from 100,000 to 200,000 ampere-turns through plug-in transformers, up to 3600 watt-seconds using wire-wound fixtures. Adapters for multi-pole rotors, rod, bar, ring and various other shapes available. Equipped with extensive system of safety interlocks for complete operator protection. Designed for continuous production use with low power consumption. Price of basic unit is less than $2100.

MODEL 889A de-magnetizes saturated magnets to any desired level of flux. Provides a precision method for rapidly treating permanent magnets, including the new core type instrument mechanisms. Used with Model 206A Booster or Model 107A Charger. Price $247.

MODEL 1295A is a stable, all transistorized Gaussmeter which measures magnetic fields to ±3% accuracy over 9 full-scale ranges: 0-100, 200, 500, 1K, 2K, 5K, 10K, 20K, and 20K+ gausses, using a single probe. A 1000-gauss, ±¾% reference magnet is also supplied. Operates from 115-volt, 50-400 cps line, or 5 mercury cells (not supplied). Price complete $420.

For ELECTRICAL INSTRUMENT CALIBRATION

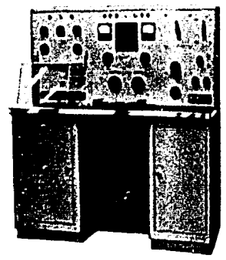
A Model for Every Purpose and Price Range



MODEL 829 checks AC and DC meters of all types and ranges. Compact cabinet contains power supply, special Weston standard meters, Wheatstone Bridge and all circuits for quick, convenient instrument calibration to 0.5% accuracy by non-technical personnel. Automatic protection for both operator and instrument under test is provided by interlocks and high voltage discharge circuits. Net price $2650.

DUAL POTENTIOMETER DC STANDARD

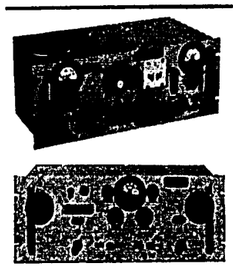
MODEL 262B



MODEL 262B Dual Potentiometer Standards for calibrating meters to 0.1% through a range of 1 millivolt to 1500 volts and 1 microampere to 150 amperes. Uses L & N Brooks Mod. 7 pot. and Weston Mod. 5 standard cells. Voltage and current ranges are separate for the calibration of wattmeters. Operates on 105/125 volts, 50/1600 cycles, 350 watts, with internal voltage regulator. Operator is protected by interlocks. Price $15,600.

Also available are MODELS 261B and 454 Standards for calibrating AC meters to 0.5% through ranges of 10 millivolts to 1500 volts and 1 microampere to 200 amperes; MODEL 260C Standards for DC meters to 0.5% over ranges of 1 millivolt to 1500 volts and 1 microampere to 150 amperes. Accuracy of 0.25% using charts. These standards have been used for 8 years by the government services and leading industrial organizations.

For CRYSTAL TESTING



FOUR MODELS developed for Signal Corps under national crystal testing standardization program to measure resonance and anti-resonance resistance of quartz crystals including those covered by MIL-C-3098B. Capacitance, inductance and PI of crystal can be determined.

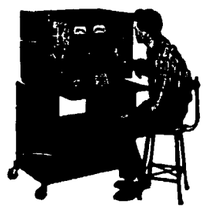
MODEL 459A (Improved TS-330/TSM) covers 800 kc to 15 mc, for 0.002% crystals, 0-9900 ohms. Operates from 115/230 v, 50-1000 cps. Price $1125.

MODEL 531 (TS-683/TSM) Crystal Impedance Meter covers range of 10-140 mc for 10-150 ohm crystals. Twelve fixed calibrating resistors of 10, 22, 30, 40, 51, 60, 68, 82, 91, 100, 120 and 150 ohms, plus a 100-ohm var. resistor for determining crystal resistance. Anti-resonance adapter also provided. Operates from 115/230 v, 50-1000 cps source. Price $590.

MODEL 541A (TS-710/TSM) for 10-1100 kc range crystals with resistances from 200 ohms to 0.5 megohms. An internal load capacitance is calibrated from 15 to 105 mmf with accuracy better than ±0.5 mmf. Power dissipated in crystal measured by built-in VTVM and ohmmeter. For 115/230 v, 50-1000 cps operation. Price $860.

MODEL 1207 (AN/TSM-15) covers range of 75-200 mc for 10-125 ohm crystals. Crystal voltage at series resonance is measured within 10%, effective resistance within ±5 ohms and the power calculated. 18 Co cancellation inductances and 1 uncompensated var. resistor supplied; 5 compensated var. resistors available. 115/230 v, 50-1000 cps. Price $1245.

VARIABLE FREQUENCY POWER SUPPLY



PORTABLE CALIBRATION SYSTEM

MODEL 150

MODEL 150 is a stable, single phase, 150 VA power source of laboratory quality. Output frequency is continuously adjustable between 380 and 2400 cps with stability of 0.1% ±2 cycles. Price $575.

Portable Cart provides Versatile Use and Storage Facility for Owners of Models 150 and 829.

Heavy gauge steel cart is mounted on free rolling, swivel casters. Interior shelf adjustable full height. Inside measures 33" wide x 16½" deep x 26" high. Opening one side accommodates standard 19" wide panels; other side 24" wide for equipment in cabinets. Drop leaf work shelf attaches either side.

Prices are FOB Boonton, N.J. & subject to change without notice. ***Send for product literature.***

Radio Frequency Laboratories, Inc. BOONTON N.J., U.S.A.

Designers and Manufacturers of Electronic Equipment since 1922

For details, circle #236 on Reader Service Card

READ PHASE NULL VOLTS DIRECTLY

MODEL 301 Broadband Phase Angle Voltmeter is designed for laboratory use, features 10 cps to 100 kc operation, 12 voltage ranges covering 1 mv to 300 volts.

NORTH ATLANTIC PHASE ANGLE VOLTMETERS

For Production Line, Laboratory, Ground Checkout

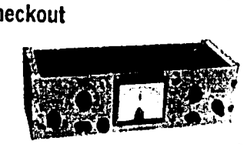
Now, combined in one compact package, all the functions required for precise measurement of voltage, phase angle, quadrature, impedance and power factor. Measurement of AC signals which previously required extensive equipment—or which could not be made at all—can be accomplished simply and accurately in the laboratory, on the production line or in the field. For broadband or single frequency operation.

READ DIRECTLY

- Total Voltage
- Phase Angle
- In-phase Voltage
- Quadrature Voltage
- Null

Specifications: Abridged specifications of the Model 301 Broadband Phase Angle Voltmeter are shown below. Specifications of other models on request.

- Frequency range 10 cps to 100 kc
- 1 mv to 300 volts full scale
- Accuracy 1/2° absolute; special technique .01°
- 0–360° phase angle without ambiguity
- Nulling sensitivity 5 microvolts
- Signal and/or reference isolation
- Optional filters plug in from front
- Bench or rack mounting



Model 202. For production line or checkout applications. Characteristics similar to Model 301 but designed for single frequency operation.

Model 401 AC To DC Phase Sensitive Converter permits conventional DC instrumentation to be used for AC measurements. Single- or double-ended DC output proportional to rms, fundamental, in-phase or quadrature component of AC signal.

Plug-In Accessories for Phase Angle Voltmeters include reference isolation, resistance summing, and bridging transformer modules for eliminating ground loops and adapting voltmeter to ratiometer applications.

TECHNICAL DATA

Write for detailed specifications and application information

NORTH ATLANTIC *industries, inc.*

603 Main Street, Westbury, New York

EDgewood 4-1122

For details, circle #237 on Reader Service Card

Directory I. Complete Equipment

12. General Test Equipment.

Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 5
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Tel: OVerbrook 1-5600

Radiation Electronics Co., Ill., 70

Radiation Instrument Dev. Lab., Inc., Ill., 76

Radio City Products Co., Inc., Pa., 55, 72, 73

Radio Corp. of America, Electron Tube Division, Section 1-22-Q, 415 South Fifth St., Harrison, N.J., 86, 88
See ads on pages 53-55
Tel: HUmboldt 5-3900

Radio Frequency Labs., Inc., Powerville Rd., Boonton, N.J., 5, 15, 45, gauss and flux meters
See ad on page 304
Tel: DErfield 4-3100

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Railway Communications, Inc., Mo., 88

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Rawson Electrical Instrument Co., 118 Potter St., Cambridge 42, Mass., 55, Gauss & Flux Meters
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Richards Co., Inc., Arklay S., Mass., 70

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Scientific Electric, Inc., N.J., 82

Scientific Engineering Labs., Inc., 1510 Sixth St., Berkeley 10, Calif., 37, 85
See ad on page 673
Tel: LAndscape 6-2772

Scientific Wood Cabinet Co., N.J., 72

Sel-Rex Corp., N.J., Relay Testers

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

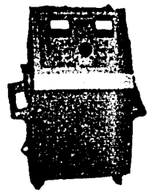
PE HIGH VOLTAGE TEST EQUIPMENT

DC OVERPOTENTIAL TESTERS

MODEL S50 DC 0-50 KV, 5 ma.
MODEL S100 DC 0-100 KV, 5 ma.
MODEL S120 DC 0-120 KV, 5 ma.
MODEL S150 DC 0-150 KV, 5 ma.
MODEL S200 DC 0-200 KV, 5 ma.

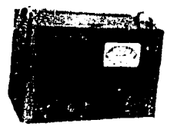
Features:
- Non-destructive testing
- Small, light weight units
- Rugged design for industrial use
- Use of selinium rectifiers
- Plug-in type HV output shielded cable
- Control cabinet stacks on top of HV tank (May be separated for remote control)

— Also available in heavier current models —



SENSITIVE HIPOT TESTERS, DELUXE SERIES "H"

H2 AC/DC 0-2 KV Peak AC/DC, 1 ma.
H5 AC/DC 0-5 KV Peak AC/DC, 1 ma.



Features:
- 5 microamp circuit breaker (adjustable to 1000) deenergizes HV
- Non-destructive testing
- Dual output, AC and DC
- Dual scale KV meter, directly at output
- Portable, safe
- Guarded or straight ground return

Also available in larger cabinets with 19" panel in 10 KV, 20 KV, and 30 KV models, with two meters, plus other extra features. (See general catalog.)

HIGH VOLTAGE TEST SETS, SERIES "K" HIGH CAPACITY AC, or DC

Many sizes: 2 KV to 200 KV and 1 to 100 KVA or KW

For dielectric tests on: Insulating materials, motors and generators, transformers, wire and cable, HV bushings and other apparatus.

FEATURES:
- High current capacity to meet ASTM, IPCEA Standards
- Metering at output for greatest accuracy
- Complete safety and convenience controls, including external interlock
- 4" meters with dual scales
- Motorized output control optionally available
- Separate control section for remote control

Send for catalog of complete line, including: low-cost S & D hipot testers, high power HV test sets, cable fault locaters, and wire sparkers.

PE PESCHEL ELECTRONICS, INC.

Towners, R.F.D. 1, Patterson, New York, TRinity 8-3251

For details, circle #238 on Reader Service Card

GOERZ FOR INSTRUMENT CALIBRATION TO... ±0.05%

PHYSICS RESEARCH LABORATORIES, Inc. proudly announces the availability of the famed C. P. Goerz AC/DC Comparator. The Goerz Comparator is a basic standardizing instrument offering accuracies in the ±0.05% class. The accuracy of ±0.05% is referred to *true value, not* full scale. It holds for *current, voltage* and *power* in the following ranges up to and including 1000 c. p. s.:

CURRENT: 0-50 ma; 0.2/0.5/1/2/5/10/20/50/100/125 amperes;

VOLTAGE: 0-15; up to 600 volts in 5-volt steps;

POWER: Up to 600 volts; up to 100 amperes.

All quoted accuracies are based on the accessories supplied with the instrument. Higher current and voltage available with special accessories.

For Optical Equipment: Write To Goerz American Optical Co. Inwood, L.I., N.Y.

Further details are available upon request in PRL technical note 319 ADC.

Physics Research LABORATORIES
House of Fine Instruments
P.O. Box #555 Hempstead, L. I., N.Y.

For details, circle #239 on Reader Service Card

STERLING GYRO TEST COMPONENTS

Rate Tables
Precision Test Tables
Multi Mode Test Tables
2 & 3 Axis Tables
Roll Tables

Special Test Equipment
Microsyns
Electronic Test Components

STERLING PRECISION CORPORATION
1 MAYNECK AVE
PORT WASHINGTON, N.Y.

For details, circle #240 on Reader Service Card

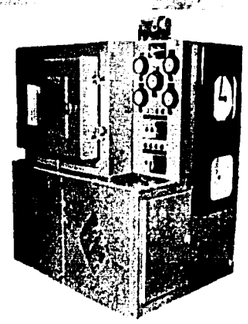
You can DEPEND on --

Standard TEST CABINETS

FOR ACCURATE DEPENDABLE ENVIRONMENTAL TESTS

self-contained units to meet every condition

HIGH and LOW TEMPERATURES, ALTITUDE, HUMIDITY, FUNGUS, SAND and DUST, SALT SPRAY, RAIN and SUNSHINE, EXPLOSION and SPECIAL APPLICATIONS.



Every Standard test cabinet is designed for reliable and accurate testing, along with years of care-free durable operation. Whatever the simulated condition is desired to test your product accurately . . . correctly, there is a Standard cabinet to do the job. All guaranteed to give high level performance — the result of a decade of engineering skill and experience in designing and fabricating test equipment. Why not look into the many outstanding features offered by Standard today . . . send for our illustrated Catalog No. 59.

COMPLETE ENVIRONMENTAL TESTING LABORATORY SERVICES FOR QUALIFICATION AND PRODUCT CERTIFICATION.

WALK-IN EQUIPMENT DESIGNED AND FABRICATED TO ORDER

MEMBER OF ENVIRONMENTAL EQUIPMENT INSTITUTE

Standard CABINET COMPANY
53 WASHINGTON AVENUE
CARLSTADT, NEW JERSEY
DESIGNERS-MANUFACTURERS OF TEST EQUIPMENT

For details, circle #241 on Reader Service Card

Directory I. Complete Equipment

12. General Test Equipment.

Semicon, Inc., Mass., 25
Sensitive Research Instrument Corp., 310 Main St., New Rochelle, N.Y., 5, 40
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Tel: BEverly 5-2300
Service Instruments Corp., Ill., 5, 10, 12, 15, 25, 73, 80
Servo Corp. of America, N.Y., 22, 70
Servonic Instruments, Inc., Calif., 67
Servonics, Inc., Va., 22
Servo-Tek Products Co., Inc., 1086 Goffle Rd., Hawthorne, N.J., 5
See ad on page 350
Tel: HAwthorne 7-3100
Shallcross Mfg. Co., 20 Preston St., Selma, N.C., 40, 45, 60, 73
See ad on page 538
Tel: WOodlawn 5-2341
Sheffield Corp., Ohio, Dimensional & X-Ray Thickness
Shielding, Inc., 66 N. Read Ave., Riverton, N.J., 74
See ad on page 240
Tel: TAlmadge 9-1433
Siemens & Halske, A. G., Germany, 5, 45, 70
Sierra Electronic Corp., 5442D Bohannon Drive, Menlo Park, Calif., 80, 85, 88
See ad on pages 30-31
Tel: DAvenport 6-2060
Sigma Instruments, Inc., 31 Pearl St., So. Braintree 85, Mass., Relay Testers
See ad on page 524
Tel: VIctor 3-5000
Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 5, 10, 12, 30, 40, 55, 60, 65, 70, 80, 86, 88
See ad on page 475
Tel: EStebrook 9-1121
Sinclair Radio Laboratories, Ltd., Box 179, Downview P.O., 70 Sheffield St., Toronto 15, Canada
See ad on page 595
Tel: CHerry 4-5519
Slaughter Co., Ohio, 10, 12, 45, 65, 73, 78
Solartron Electronic Group, Ltd., England, 5, 22, 76, 88, 90
Solartron, Inc., Calif., 5, 22, 60
Sonex, Inc., Pa., 80
Sorensen & Co., Inc., Conn., 10
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Texas, 10, 40, 65, 73, 70
See ad on page 248
Tel: HO 5-3471
Specialty Electronics Development Corp., N.Y., 80, 88
Specialty Engrg. & Electrn. Co., N.Y., 12, 55, 88
Spectralab Instruments, Calif., 45
Spectrum Instruments, Inc., N.Y., 90
Spellman High Voltage Co., 3029 Webster Ave., New York 67, N.Y., 45
See ad on page 501
Tel: KIngsbridge 7-0306
Sperry Products, Inc., Conn., 84
Sprague Electric Co., Mass., 10
Standard Cabinet Co., 53 Washington Ave., Carlstadt, N.J., 37
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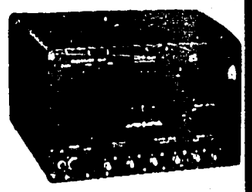
Tel: GEneva 8-1500
Standard Electric Time Co., Mass., 30
Standard Electronics Research Corp., N.Y., 20
Stark Electronics Instruments, Ltd., Canada, 10, 12, 55, 65, 74, 80, 86, 88
State Testing Laboratory, Inc., Conn., 37
States Co., Conn., Relay Testers
Statham Instruments, Inc., Calif., 67
Statistical Instrument Co., N.Y., 90
Stereatronics, Inc., Mass., 80
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 12, 74
See ads on pages 306, 351
Tel: POrt Washington 7-7200
Sticht Co., Inc., Herman H., 27 Park Pl., New York 7, N.Y., 12, 35, 45, 65, 70, 78
See ad on page 475
Tel: REctor 2-8163
Stokes Corp., F. J., Pa., 37, 85
Strand Engineering Co., Mich., 80
Strempel Instrument Corp., N.Y., 10, 25, 73
Sullivan, Ltd., H. W., N.Y., 40
Sun Electric Corp., Ill., 90
Sunshine Scientific Instrument, Pa., 5, 10, 12, 20, 40, 45, 55, 60, 65, 67, 84, 85, 86
Superior Instruments Co., 2435 White Plains Rd., New York 67, N.Y., 65, 88
See ad on page 309
Tel: TUlip 2-6880
Sylvania Electric Products, Inc., Special Tube Operations, 500 Evelyn Ave., Mountain View, Calif., 85
See ad on pages 26-27
Tel: YOrkshire 8-6211
Systron Corp., Calif., 22
Taffet Radio & Television Co., N.Y., 12, 15
Takk Corp., Ohio, 45
Taller & Cooper, Inc., Div. of American Electronics, N.Y., 30
Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 25, 45, 72, 78, 80, 86
See ad on page 502
Tel: REctor 2-6249
Technical Electronics Corp., Calif., 12
Technical Products Co., Calif., 90
Technitrol Engineering Co., Pa., 25
Telectro Industries Corp., N.Y., 5, 10, 12, 15, 22, 25, 30, 35, 45, 55, 67, 72
Teletest Instrument Corp., N.Y., 10, 86, Flyback Checker
Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 25
See ad on page 308
Tel: EDgewood 3-1027
Tel-Instrument Electronics Corp., N.J., 5, 90

Precision Electronic Test Equipment

LABORATORY INSTRUMENTS

PULSE TIMER — MODEL PT 244



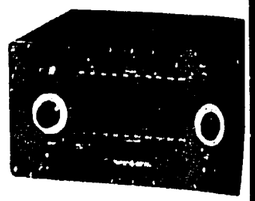
The TLI Model PT-244 is a paired trigger generator which provides a fixed and a delayed pulse. Delays up to 10,000 microseconds are provided with an accuracy of ±0.01 microseconds read directly from a combination of decade counters and a digital dial. Mechanically, the instrument is a full size module of the TLI Modular Instrumentation System and therefore may be used with modular system Stack Pedestal for bench mounting or may be rack-mounted with the Modular Rack Adapter.

SPECIFICATIONS

Accuracy	±0.01 microseconds
Delay Range	0-10,000 microseconds
Marker Output	10, 1 and 0.1 microseconds
Jitter	Less than .001 microseconds
PRF	30-2500 PPS
Fixed Pulse Amplitude	±25 volts open circuit
Delayed Pulse Amplitude	±55 volts open circuit
Output Impedance	1500 ohms minus 700 ohms plus

PRICE Model PT-244 Pulse Timer—$1,895.00

TEST OSCILLATOR — MODEL TO 258

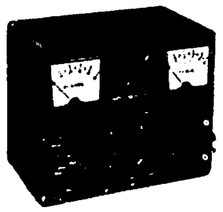


Model TO-258 Test Oscillator furnishes twenty pre-determined frequencies selected by means of push-buttons. A calibrated control permits any selected frequency to be varied ±15% of its nominal value in the telemetering model. It features low distortion and excellent frequency stability over wide ranges of temperature and power input. Features a full sized modular cabinet.

SPECIFICATIONS

Telemetering model furnishes standard FM/FM frequencies from 400 ~ to 70 KC. Special Models for any 20 frequencies from 20 to 100,000 cycles per second.

Model TO-258 Test Oscillator (FM/FM) $425.00



DIODE TESTER — MODEL DT 257

Model DT-257 Diode Tester measures the static characteristics of germanium, silicon and low-power selenium diodes. Separate forward and reverse power supplies, having continuously variable outputs or pre-set regulated reverse potentials permit either complete measurements or checks at selected operating points. Features a 2/3 modular cabinet.

SPECIFICATIONS

Pre-set regulated reverse voltages.
-10, -50, -100, 0-150 volts at 5 ma.
Forward current to 500 ma. at 1.0 volt.
Reversed or shorted diode indications.
Internal meter overload protection.
Test fixture allows quick connections.
Provisions for accessory diode heater.

Model DT-257 Diode Tester $295.00
Model OV-120 Diode Oven $150.00

MILLIMICROAMMETER — MODEL MA 259

As an accessory to the Model DT-257 Diode Tester, this instrument will measure the low reverse currents of silicon diodes. The minimum full scale range of 50 microamperes for the Diode Tester is extended to 0.01 microamperes by use of the millimicroammeter.

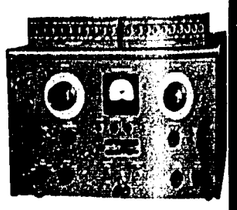
As a millimicroammeter, this instrument covers the range from 0.01 microamperes to 1,000 microamperes and is completely self contained and battery powered.

SPECIFICATIONS

6 Ranges	0.01; 0.1; 1.0; 100; 1,000μa full scale
Input Impedance	0.01μa Range—50 megohms 0.1μa Range—5 megohms 1.0μa Range—0.5 megohms 10μa Range—50,000 ohms 100μa Range—5,000 ohms 1,000μa Range—500 ohms
Accuracy	5% of full scale
Voltage Drop	All ranges 0.5 volts

Model DT-257 less batteries $125.00

PULSE GENERATOR — MODEL PG 200AA

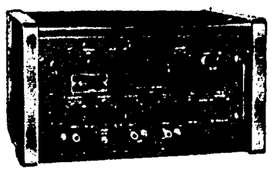


Model PG-200AA Pulse Generator features wide ranges of pulse duration, amplitude, and positioning. It may be operated self-synchronous or driven by an external signal of almost any wave-form. In both cases, it furnishes a fast trigger for synchronizing auxiliary equipment.

SPECIFICATIONS

Duration and position .05 to 50 us, 1000 us with range extenders.
Rise and decay times constant .03 us.
Single pulses to 20,000 per second.
100 volts, 50 ohms driving impedance.
Trigger or sine wave synchronization.
Calibrated width, position and rate.
May be cascaded for dual pulse output.

Model PG-200AA Pulse Generator $850.00
Model PGA-210 Range Extender $80.00



ELECTRONIC SWITCH — MODEL ES 180A

Model ES-180A Wide-Band Electronic Switch provides presentation of two waveforms on almost any conventional oscilloscope. It also furnishes a movable horizontal index trace for making rapid and accurate amplitude and time measurements without parallax error. The control dial is calibrated both in volts and percentage amplitude and a connector is provided for introducing external time markers.

SPECIFICATIONS

Unity DC gain down 3 db at 15 MC. 6 db at 22 MC; Rise-time .023 microseconds.
Identical stable feedback amplifiers, both DC and heater supplies regulated.
93 ohms output impedance minimizes effect of cable length and load on bandwidth.
Input impedances 1 megohm and 10 mmfd; attenuator divisions 1, 3, 10, 30, 100.
Alternate-sweep or alternate-sample displays, switching rates to 400 KC.

Model ES-180A Electronic Switch $995.00

TELETRONICS LABORATORY, INC. 54 KINKEL STREET WESTBURY, L. I., N. Y.

A wholly owned subsidiary of Crosby Teletronics Corporation

For details, circle #242 on Reader Service Card

the industry's pioneer & complete line of

MINIATURIZED ELECTRONIC INSTRUMENTS

By *building-in* trio labs' panel-mounting instruments you . . . customize test systems, set-ups and instruments; save space, (average model is 4" x 4" x 4"); save time with at-a-glance monitoring; save money; make monitoring foolproof (go-no go"); improve system reliability; increase overall design freedom. Choose from many "standard" or "special" models—or consult us for new designs for your needs. Write for free "how to" Engineering Guide to Dept. IRE-60.

CUSTOMIZE EFFICIENCY & ACCURACY WITH TRIO LABS' BUILD-IN INSTRUMENTS

BEFORE . . . 3 external instruments were used to measure AC and DC voltages . . . cluttered, tedious, wasteful, subject to error.

AFTER . . . 3 trio labs' miniature VTVMs integrally built-in now are always on hand to measure just the parameters you designate.

trio

Laboratories, Inc. Plainview, L. I., N. Y.

For details, circle #243 on Reader Service Card

Directory I. Complete Equipment

12. General Test Equipment.

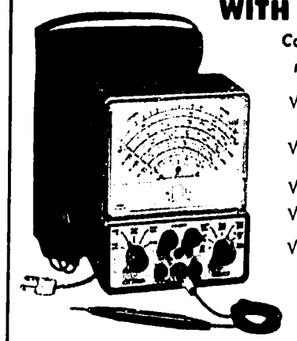
Temperature Engineering Corp., N.J., 37, 70, 72, 85
Tenney Engineering, Inc., N.J., 37
Tensitron, Inc., Mass., Tension Meters
Tesla Electric Co., Ill., 5, 12, 20, 45, 72, 82
Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 80
See ad on pages 75-78
Tel: FLeetwood 7-5411
Texas Instruments, Incorporated, Houston, Tex., 25, 72, 80
Theta Instrument Corp., N.J., 5
Thomas Electronics, Inc., N.J., 72, 86
Thwing-Albert Instrument Co., Pa., 30, 40, 70
Topatron, Inc., Calif., 37, 74, 90
Topic, Incorporated, Mass., 10
Topper Mfg. Co., Inc., N.Y., 12
Topping Electronics, Ltd., Canada, 80
Trans Electronics, Inc., Calif., 25, 80
Trans-Aire Electronics, Inc., N.Y., 80
Transducers, Inc., Calif., 5
Transistor Devices, Inc., N.J., 60, 65, 88
Transistor Electronics Corp., Minn., 25, 80
Tricraft Products Corp., Ill., 86
Trimount Instrument Co., Ill., 67
Trio Laboratories, Inc., Dept. IRE-60, Expressway Industrial Park, Plainview, L.I., N.Y., 55, 60, 65, 88
See ad on this page
Tel: OVerbrook 1-0400
Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio, 25, 65, 80, 86, 88
See ad on page 472
Tel: 323-W
Trop-Arctic, Inc., Ind., 37
Tullamore Electronics Co., Ill., 35
Twenty-First Century Electronics, Inc., Calif., 82
Ultra-Violet Products, Inc., Calif., 5, 20
Unit Process Assemblies, Inc., N.Y., Non-Destructive Thickness Tester
United States Dynamics Corp., Mass., 25
U. S. Science Corp., Sub. Topp Indust., Inc., Calif., 5, 12
Vacuum Tube Products Co., Inc., Calif., 85
Valor Electronics, Inc., Calif., 80
Van Norman Industries, Inc., Electronic Div., N.H., 40, 45

The New Model 77

VACUUM TUBE VOLTMETER

WITH NEW 6" FULL-VIEW METER

Compare it to any peak-to-peak V. T. V. M. made by any other manufacturer at any price!



- V Model 77 completely wired and calibrated with accessories (including probe, test leads and portable carrying case) sells for only $42.50.
- V Model 77 employs a sensitive six inch meter. Extra large meter scale enables us to print all calibrations in large easy-to-read type.
- V Model 77 uses new improved SICO printed circuitry.
- V Model 77 employs a 12AU7 as D.C. amplifier and two 9006's as peak-to-peak voltage rectifiers to assure maximum stability.
- V Model 77 uses a selenium-rectified power supply resulting in less heat and thus reducing possibility of damage or value changes of delicate components.
- V Model 77 meter is virtually burn-out proof. The sensitive 400 microampere meter is isolated from the measuring circuit by a balanced push-pull amplifier.
- V Model 77 uses selected 1% zero temperature coefficient resistors as multipliers. This assures unchanging accurate readings on all ranges.

AS A DC VOLTMETER

The Model 77 is indispensable in Hi-Fi Amplifier servicing and a must for Black and White and color TV Receiver servicing where circuit loading cannot be tolerated.

AS AN ELECTRONIC OHMMETER

Because of its wide range of measurement leaky capacitors show up glaringly. Because of its sensitivity and low loading, intermittents are easily found, isolated and repaired.

AS AN AC VOLTMETER

Measures RMS values if sine wave, and peak-to-peak value if complex wave. Pedestal voltages that determine the "black" level in TV receivers are easily read.

Model 77 comes complete with operating instructions, probe and test leads. Use it on the bench—use it on calls. A streamlined carrying case, included at no extra charge, accommodates the tester, instruction book, probe and leads. Operates on 110-120 volt 60 cycle. Only.....

$42.50 NET

Specifications

• **DC VOLTS**—0 to 3/15/75/150/300/750/1,500 volts at 11 megohms input resistance • **AC VOLTS (RMS)**—0 to 3/15/75/150/300/750/1,500 volts • **AC VOLTS** (Peak to Peak)—0 to 8/40/200/400/800/2,000 volts • **ELECTRONIC OHMMETER**—0 to 1,000 ohms/10,000 ohms/100,000 ohms/1 megohm/10 megohms/100 megohms/1,000 megohms • **DECIBELS** —10 db to + 18 db, + 10 db to + 38 db, + 30 db to + 58 db. All based on 0 db = .006 watts (6 mw) into a 500 ohm line (1.73v). • **ZERO CENTER METER**—For discriminator alignment with full scale range of 0 to 1.5/7.5/37.5/75/150/375/750 volts at 11 megohms input resistance.

Now at your local radio parts jobber.

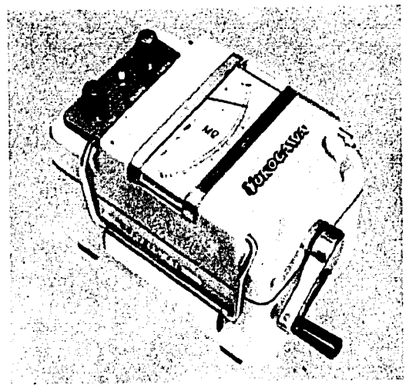
SICO **SUPERIOR INSTRUMENTS CO.**

2435 White Plains Road — New York 67 N Y

For details, circle #244 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

GREATER RELIABILITY for reading of insulation resistance



INSULATION TESTER

Model I-5

- *Expanded Scale*
- *Quick response*
- *Silent Generator*
- *CORE MAGNETIC SYSTEM indicator*
- *Housed in light metal case*

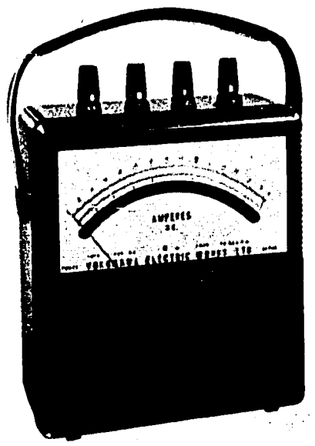
- *Optional accessory of leather carrying case and leads, pictured at right*

THOROUGHLY PROVEN for measuring AC-DC current and voltage

PORTABLE PRECISION AC-DC INSTRUMENTS

Models SPF and MPF

Rated accuracy 0.5 of 1% of full scale



- *Highly legible, clear scale*
- *Convenient terminals*
- *SPF,AC instruments: PURE IRON CUP SHIELD mechanism*
- *MPF,DC instruments: CORE-MAGNET SELF-SHIELD mechanism*
- *Shoulder-bag, leather carrying case; optional accessory*

YEW *Write for complete catalog and specifications:*
YOKOGAWA ELECTRIC WORKS, Inc.
40 Worth Street · New York 13, N. Y.

For details, circle #245 on Reader Service Card

12. General Test Equipment.

Varian Associates, Inc., Instrument Div., Calif., 76
Vector Associates, Inc., N.Y., 80, 86
Vectron, Inc., Mass., Capacitance Voltage Dividers
Veeco Vacuum Corp., 86-E Denton Ave., New Hyde Park, L.I., N.Y., 85
See ad on page 674
Tel: PIoneer 6-1161
Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 35
See ad on page 578
Tel: ENdicott 1-6200
Wac Line, Inc., Ohio, 35
Wallace & Tiernan, Inc., N.J., 67, 8
Wallson Associates, Inc., 35 E. Runyon St., Newark 8, N.J., 25
See ad on page 311
Tel: TAlbot 4-2600
Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 78
See ad on page 474
Tel: ROckford 8-9661
Waltham Precision Inst. Co., Therma Dynamic Prods. Div., N.Y., 37
Ward Leonard Electric Co., 83 South St., Mount Vernon, N.Y., Load Banks
See ad on page 526
Tel: MOunt Vernon 4-1000
Waters Mfg., Inc., Mass., 25, 86
Waveforms, Inc., N.Y., 82, 88
Wayne Kerr Corp., 1633 Race St., Philadelphia 3, Pa., 80
See ad on page 277
Tel: GArfield 5-2844
Webber Mfg. Co., Inc., Ind., 37
Weinschel Engrg. & Mfg. Corp., 1055 Metropolitan Ave., Kensington, Md., 5, 60
See ads on pages 324, 390
Tel: LOckwood 4-0121
Welch Scientific Co., W. M., Ill., 40, 76, 85
Wells-Gardner & Co., Ill., 82
Western Instruments, Calif., 80
Westgate Lab., Inc., Ohio, 84
Westinghouse Electric Corp., Pa., 4, 60, 65
Westport Electric, Calif., 78
Wiancko Engineering Co., 255 N. Halstead Ave., Pasadena, Calif., 5
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Tel: ELgin 5-7186
Winslow Co., Inc., N.J., 5, 10, 12, 40, 5, 60, 65, 70, 73, 85
Wintronics, Calif., 5, 88
Wright Equipment Corp., N.J., 72, 8, 86
Wyle Mfg. Corp., Calif., 37, 90
Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 12, 44, 45, 55, Network analyzer
See ad on this page
Tel: BEekman 3-6720

Generators, marker (microwave): See class 19

Generators, marker (radio frequency): See class 26

Directory I. Complete Equipment

Generators, marker (television): See class 35

Generators, pulse: See class 19

Generators, signal (AM & FM): See class 26

Generators, signal (TV): See class 35

Generators, sweep (radio frequency): See class 26

Generators, sweep (TV): See class 35

Generators, synchronizing: See class 35

Generators, time delay: See class 19

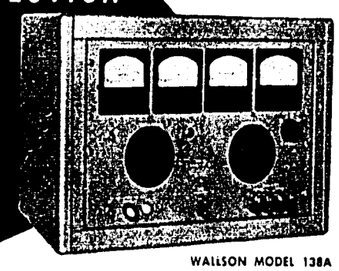
Generators, ultrasonic: See class 12

13. Geophysical Apparatus.

5. Complete exploration equipment
10. Control equipment
15. Microphones
20. Recording galvanometers

Abrams Instruments Corp., Mich., 10
Associated Research, Inc., 3792 W. Belmont Ave., Chicago 18, Ill., 5
See ad on page 290
Tel: COrnelia 7-4040
Atlantic Research Corp., Va., 15
Austin Co., N.Y., 10
Becks, Inc., Minn., 10
Black Light Eastern Corp., N.Y., 5
Blaine Electronetics, Inc., Calif., Antenna Pattern Measure. Equip.
Borden Engrg. Co., N.J., 5
Canadian Research Institute, Canada, 5, 20
Century Electonics & Instruments, Inc., Okla., 5, 20
Chesapeake Instrument Corp., Md., 15
Cohu Electronics, Inc., Massa Div., Mass., 15, 20

FOR INCOMING INSPECTION
*Dynamic Semiconductor Rectifier Analyzer by WALLSON



WALLSON MODEL 138A

A completely self-contained Dynamic Rectifier Test Set with *Forward Current* adjustable from 0 to 5 amperes independently of *Reverse Voltage*, which is adjustable between 0 and 1,000 volts. This analyzer measures *Forward Voltage Drop* and *Reverse Current* of any type of semiconductor rectifier in accordance with the proposed JEDEC specifications.

*Dynamic tests performed under simulated 60 cycle operating conditions!

Other WALLSON Products
–Automated High Vacuum Exhaust Equipment
–TWT Power Supplies
–Dynamic and Life Test Equipment for Semiconductor Rectifiers with ratings up to 500 amp. and 2,500 volts

Write for Technical Bulletin 104 today!

WALLSON ASSOCIATES, INC.
35 East Runyon Street · Newark 8, N. J. — TAlbot 4-2600

For details, circle #246 on Reader Service Card

13. Geophysical Apparatus.

Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 20
See ad on page 514
Tel: GEneva 8-4000
Designers for Industry, Inc., Ohio, 10
Dictograph Products, Inc., N.Y., 15
Edin Co., Inc., Mass., 20
Electric Regulator Corp., Conn., 10
Electro-Technical Labs., Tex., 5, 10, 20, Geophones
Epsco Worcester, Mass., 20
Etelco, Ltd., England, 10
Evershed & Vignoles, Ltd., England, 5
Fisher Research Lab., Inc., Calif., 5
General Automatics, Inc., Calif., 10
General Devices, Inc., P.O. Box 253, Princeton, N.J., 10
See ad on page 360
Tel: DAvis 9-2323
Georator Corp., Va., 5
Geotechnical Corp., Tex., 5, 10, 15, 20
Geotronic Labs., Inc., Tex., 5
Goldak Co., Inc., Calif., 5
Gyrex Corp., Calif., 10
Hamilton Watch Co., Hathaway Instrument Div., Colo., 20
Hamilton Watch Co., Industrial Div., Pa., 20
Harris Transducer Corp., Conn., 15
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 15
See ad on page 328
Tel: YUkon 3-3961
Industrial Control Co., N.Y., 10
Jodon, Inc., F. R., D.C., 20
Mandrel Industries, Inc., Calif., 5
Massa Labs., Inc., Mass., 20
Maurer, Inc., J. A., N.Y., 20
Metropolitan Electronics & Instruments Co., N.Y., 15
Midwestern Instruments, Inc., Okla., 20
Moran Instrument Corp., Calif., 5
Norrman Labs., Ernst, Wis., 10
Nucleonic Corp. of America, N.Y., 5
Offner Electronics, Inc., Ill., 20
Omega Instrument Co., Calif., 15
Philadelphia Scientific Glass Co., Pa., 10
Photron Instrument Co., Ohio, 20
Pierce, George C., Supvr. Products Services, Va., 15
Radiometer, Denmark, 15
Rust Industrial Co., Inc., N.H., 20
Sanborn Co., 175 Wyman St., Waltham 54, Mass., 20
See ad on pages 114-115
Tel: TWinbrook 4-6300
Scientific Service Labs., Tex., 5
Seismograph Service Corp., Seiscor Mfg. Co., Div., Okla., 5, 10, 15, 20
Servo-Tek Products Co., Inc., 1085 Goffle Rd., Hawthorne, N.J., 10
See ad on page 350
Tel: HAwthorne 7-3100

13. Geophysical Apparatus.

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 5, 10, 15, 20
See ad on page 248
Tel: HO 5-3471

Standard Telephones & Cables, Ltd., England, 15

Summers and Mills, Inc., Tex., 5

Taller & Cooper, Inc., Div. of American Electronics, N.Y., 10

Telectro Industries Corp., N.Y., 10

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 5, 10, 15, 20
See ad on pages 75-78
Tel: FLeetwood 7-5411

Texas Instruments, Incorporated, Houston, Tex., 5, 20

Twenty-First Century Electronics, Inc., Calif., 5

Ultra-Violet Products, Inc., Calif., 5

United Electric Controls Co., Mass., 10

Varian Associates, Instrument Div., Calif., 5

Virginia Electronics Co., Inc., D.C., 10

Wang Labs., Inc., Mass., 10

Consult the advertisements in this issue for complete data on prices, specifications, product availability, and other information. Every advertiser's listing shows the page number of the advertisement.

14. Graphic Recorders.

3. Boards—plotting
5. Charts & papers
10. Ink writing
15. Inkless types
20. Fixed speed types
25. Variable speed types

Acton Laboratories, Inc., 536 Main St., Acton, Mass., 15
See ad on page 292
Tel: COlonial 3-7756

Aero Electronics Co., Ill., 3

Alden Electronic & Impulse Recording Equipment Co., Inc., P.O. Box 125, Alden Research Center, Westboro 1, Mass., 5, 15, 20, 25
See ad on page 290
Tel: FOrest 6-4467

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Amelco, Inc., Calif., 15, 20

B & K Instruments, Inc., Ohio, 15, 25

Beckman & Whitley, Inc., Calif., 5, 20, 25

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Benson-Lehner Corp., Calif., 3

Blehart Co., N.Y., 3

Bristol Co., Conn., 5, 10, 15, 20, 25

Bruel & Kjaer, Denmark, 10, 15, 25

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California Computer Products, Inc., Calif., 20, 25

Canadian Aviation Electronics, Ltd., P.Q., Canada, 3, 15

Canadian Research Institute, Canada, 15

Centronix, Fla., 15, 20, 25

Chart-Pak, Inc., 250 River Rd., Leeds, Mass., 3, 5
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Computer Systems, Inc., N.Y., 3, 10, 15, 25

Corbett Science Labs., Calif., 3, 5, 10, 15, 20, 25

Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 10, 15, 25
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Dawe Instruments, Ltd., England, 5

Designers for Industry, Inc., Ohio, 3

Edin Co., Inc., Mass., 5, 10, 15, 20, 25

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Electro Instruments, Inc., Calif., 3, 10

Electro-Medical Lab., Inc., Vt., 10, 15

Engineering Associates, Ohio, 10, 20, 25

Epic, Inc., N.Y., 5, 15

Epsco Worcester, Mass., 5, 10, 15, 25

Evershed & Vignoles, Ltd., England, 15, 20, 25

Fisher Scientific Co., Pa., 10

Fuchs Impulse Motor Servomechanisms, N.Y., 15, 25

Garfield Associates, E., Pa., 15, 20, 25

General Electric Co., Apparatus Sales Div., N.Y., 10, 15, 20, 25

General Electric Co., Instrument Dept., Mass., 5, 10, 15

General Radio Co., West Concord, Mass., 10, 25
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Tel: EMerson 9-4400

Geotechnical Corp., Tex., 15, 20, 25

Gilmore Industries, Ohio, 25

Hamilton Watch Co., Hathaway Instrument Div., Colo., 15

Hogan Labs., Inc., N.Y., 5, 15, 20, 25

Huyck & Sons, F. C., Waldorf Electronics Div., N.Y., 3

Impact-O-Graph Corp., Ohio, Impact Acceleration, & Gravity Recorders

Instron Engrg. Corp., Mass., 5, 10, 20, 25

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L & O Research & Development Corp., Pa., 10

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Litton Industries, Md. Div., Md., 3

MacLaren & Co., F. B., N.Y., 3

Mandrel Industries, Inc., Calif., 20

Manning, Maxwell & Moore, Inc., Conn., 10, 20

Massa Labs., Inc., Mass., 5, 10, 15, 25

Mid-Century Instrumatic Corp., N.Y., 10, 15, 20, 25

Midwestern Instruments, Inc., Okla., 15, 20, 25

Milgo Electronic Corp., Fla., 3

Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 5, 10

Moseley Co., F. L., Calif., 3, 10, 20, 25

Mullard Overseas, Ltd., England, 5, 15, 25

New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 10, 15, 20, 25
See ad on page 331
Tel: KIrkland 7-1997

Nichols, Ltd., R. H., Toronto, Ontario, Canada, 10, 15, 25

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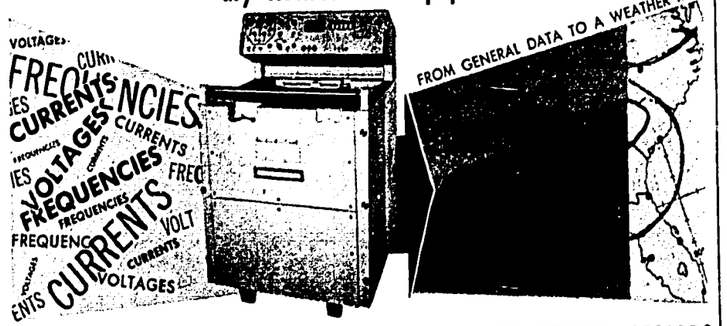

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14. Graphic Recorders.

Non-Linear Systems, Inc., Del Mar Airport, Del Mar, San Diego, Calif., Trace Readers
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Tel: SKyline 5-1134

Nuclear-Chicago Corp., Ill., 20, 25

Offner Electronics, Inc., Ill., 5, 10, 15, 20, 25

P.S.P. Engineering Co., Calif., 25

Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mt. Vernon, N.Y., 10
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Tel: OWens 9-4600

Partlow Corp., N.Y., 5

Photo-Chemical Products, N.Y., 3

Photron Instrument Co., Ohio, 5, 10, 15, 20, 25

Precision Recording Chart Co., N.J., 5

Radio Corp. of America, Defense Elec. Prod., N.J., 10

Reed Research, Inc., D.C., Chart Reader

Reeves Instrument Corp., N.Y., 3, 10, 25

Rust Industrial Co., Inc., N.H., 10

San Jose Scientific Co., Calif., 10

Sanborn Co., 175 Wyman St., Waltham 54, Mass., 5, 15, 25
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Tel: TWinbrook 4-6300

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Scientific-Atlanta, Inc., Ga., 5, 10

Seismograph Service Corp., Seiscor Mfg. Co., Div., Okla., 15, 25

Sound Apparatus Co., N.J., 10, 15, 25

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 10
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Tel: HO 5-3471

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Sperry Rand Corp., Sperry Piedmont Co. Div., Va., 5

Sunshine Scientific Instrument, Pa., 3

Sunvic Controls, Ltd., England, 10, 25

Telectro Industries Corp., N.Y., 20, 25

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 10, 15, 20, 25
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Tel: FLeetwood 7-5411

Texas Instruments, Inc., Houston, Tex., 5, 10, 25

Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 15
See ad on page 312
Tel: JUdson 2-3030

Varian Associates, Instrument Div., Calif., 5, 10, 15, 20

Waldorf Instrument Co., Div. of Huyck & Sons, N.Y., 3

Westinghouse Electric Corp., Pa., 5, 10, 20, 25

Headphones: See class 54

Impedance meters: See class 26

15. Infrared Equipment.

5. Amplifiers
10. Black body sources
15. Detectors
20. Optical transmitting materials
25. Optical filters
30. Power supplies
35. Pyrometers
40. Radiometers
45. Systems

ACF Industries, Inc., Avion Div., N.J., 5, 15, 30

AMP, Inc., Capitron Div., Pa., 30

Aerojet-General Corp., Azusa, Calif., 45

Aerolux Light Corp., N.Y., 20, 40

Aircraft Electronics, Ariz., 5, 30

Airtronics, Inc., D.C., 30

Akeley Camera, Inc., Div., Flecker, J. W., Pa., 20, 25

American Bosch Arma Corp., Hempstead, L.I., N.Y., 45

American Cystoscope Makers, Pelham, N.Y., 45

American Instrument Co., Inc., Md., 15

American Missile Products, Calif., 5

American Optical, N.Y., 45

Atlantic Research Corp. See: U.S. Flare Div.

Avco Corporation, Crosley Div., Ohio, 45

Avco Research & Dev., Wilmington, Mass., 45

Avco Research, Cincinnati, Ohio, 45

Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Mass., 15, 20, 25
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Tel: UNiversity 4-7420

Barnes Engrg. Co., Conn., 5, 10, 15, 20, 25, 30, 35, 40

Bausch & Lomb Optical Co., N.Y., 20, 25

Beckman Industries, Anaheim, Calif., 45

Beckman Industries, Fullerton, Calif., 45

Beckman Industries, Newport Beach, Calif., 45

Beckman & Whitley, Inc., Calif., 40

Bell Aircraft-Avionics Div., N.Y., 45

Bendix Aviation Corp., Mich., 15

Blaine Electronetics, Inc., Calif., Antenna Lab. Equipment

Boeing Airplane, Seattle, Wash., 45

Bristol Co., Conn., 5, 35, 40

British Thomson-Houston Co., Ltd., England, 15, 35

Bulova Research & Development Labs., Inc., N.Y., 5, 15, 30

California Technical Industries, Calif., 45

Chicago Miniature Lamp Works, 1508 N. Ogden Ave., Chicago 10, Ill., 25
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Tel: MOhawk 4-1741

Chrysler Corp., Mich., 45

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15. Infrared Equipment.

Dell Optics Co., Ltd., N.J., 20, 25

Deltron, Inc., Pa., 30

Designers for Industry, Inc., Ohio, 15

DuMont Laboratories, Inc., Allen B., N.J., 45

E A K Research Lab., N.Y., 15

Eastman Kodak Co., 343 State St., Rochester 4, N.Y., 5, 15, 20, 25
See ad on page 545
Tel: LOcust 2-6000

Edison Industries, Thomas A., Instrument Div., 61 Lakeside Ave., W. Orange, N.J., 15
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Tel: ORange 3-6800

Edmund Scientific Co., N.J., 25

Ednalite Optical Co., Peekskill, N.Y., 45

Electronic Communications, Inc., Fla., 10

Electronics Corp. of America, Cambridge, Mass., 15, 45

Electrosnap Corp., Ill., 25

Emerson Electric Manufacturing Co., Mo., 45

Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 35
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Tel: BIgelow 3-0030

Eppley Lab., Inc., R.I., 10, 15, 40

Erwood, Inc., Ill., 5

Fairchild Camera and Inst. Corp., Syosset, L.I., N.Y., 45

Farrand Optical Co., Inc., New York, N.Y., 15, lenses and windows

Filmohm Corp., N.Y., 15

Fish-Schurman Corp., N.Y., 20, 25

Ford Motor Co., Dearborn, Mich., 45

General Aniline and Film Co., Ansco Div., N.Y., 45

General Bronze Corp., GB Elec. Corp., Subsid., N.Y., 15

General Controls Co., Calif., 35

General Electric Co., Light Military Elect. Dept., N.Y., 15

General Electrodynamics Corp., Tex., 15

General Mills, Mechanical Div., Minn., 45

Green Rectifier Co., N.J., 30

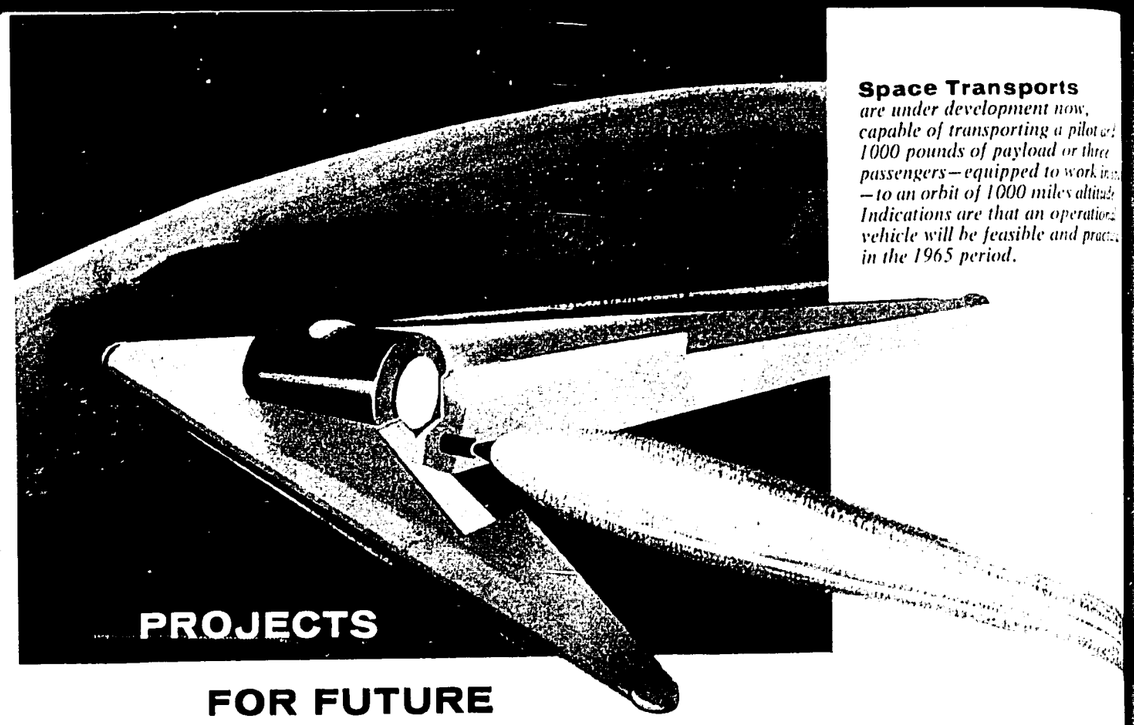
Grumman Aviation, Bethpage, L.I., N.Y., 45

H R B—Singer, Inc., Science Pk., State College, Pa., 5, 10, 40, Mirrors
See ad on page 366
Tel: ADams 7-7611

Hanson-Gorrill-Brian, Inc., N.Y., Viewers

Hoffman Electronics Corp., Hoffman Labs. Div., Calif., 45

Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 15
See ad on page 226
Tel: UNiversity 9-9850



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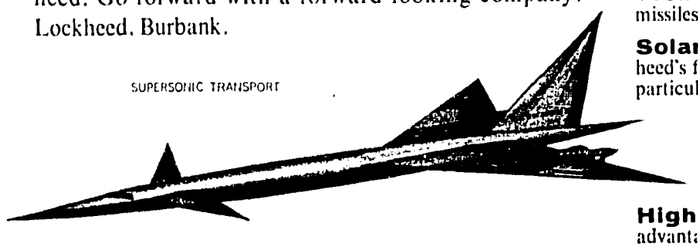

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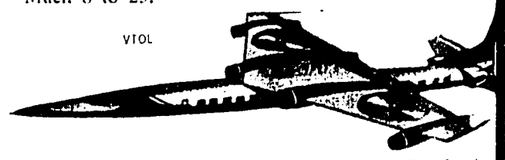

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15. Infrared Equipment.

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Hughes Aircraft Co., Newport Beach, Calif., lenses

Industrial Transformer Corp., Pa., 30

Instrument Development Labs., Inc., 67 Mechanic St., Attleboro, Mass., 45
See ad on page 422
Tel: ATtleboro 1-3880

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 5
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., Clifton, N.J., 15
See ad on pages 148-149
Tel: NUtley 2-3600

Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 15

Interstate Electronics Corp., Calif., 5, 15

Isomet Corporation, N.J., 20

J-B-T Instrument, Inc., Conn., 35

Jolon, Inc., F. R., D.C., 10

Kaiser Electronics, Inc., N.J., 30

Kaman Aircraft Corp., Nuclear Div., Colo., 40

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 15
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Tel: GRegory 2-1000

Keller Jr., Hugo P., N.Y., 20, Sapphire

Kidde & Co., Inc., Walter, N.J., 5, Cooling

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst 73, N.Y., 25
See ad on page 370
Tel: TWining 9-5600

Librascope, Inc., Calif., 15, 25

Little, Inc., Arthur D., Mass., 45

Lockheed Aircraft Corp., California Div., Dept. 2710, 2400 North Hollywood Way, Burbank, Calif., 5, 10, 15, 35, 40
See ad on page 314
Tel: TRiangle 7-2711

Lockheed Aircraft Corp., Missiles and Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 5, 15, 20
See ad on page 380
Tel: REgent 9-4321

Lockheed Aircraft, Marietta, Ohio, 45

Marstan Electronics Corp., N.Y., 5, 15

Martin Co., Baltimore Div., Md., 5, 10, 15, 35, 40

Matthew Labs., N.Y., 30

McDonnell Aircraft, Mo., 45

Meller Co., Adolf, R.I., 20

Melpar, Inc., Va., 45

Mergenthaler Linotype Co., Systems Engineering Dept., Brooklyn, N.Y., 45

Metavac, Inc., N.Y., 25

Meters, Inc., Ind., 35

Microwave Chemicals Lab., Inc., Dept. 12, 282 7th Ave., New York 1, N.Y., 20
See ad on page 441
Tel: WAtkins 4-6725

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 30
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Tel: DRexel 6-7130

Minneapolis-Honeywell Regulator Co., Aeronautical Div., Minn., 5, 15, 25, 30

Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 35

N. J. E. Corp., N.J., 30

National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 45
See ad on page 462
Tel: YOnkers 8-6400

North American Aviation, Columbus, Ohio, 45

Northrop Corp., Nortronics Div., Calif., 5, 15, 20, 25, 30

Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 30
See ad on page 499
Tel: WOrth 6-0380

Optical Coating Lab., Inc., Calif., 25

Otis Elevator Co., Defense & Industrial Div., N.Y., 45

Pacific Transducer Corp., Calif., 35

Panseal, Inc., N.J., 15

Patterson Moos, Div. of Universal Winding Co., N.Y., 5, 15, 30

Perkin-Elmer Corp. Vernistat Div., 777 Main Ave., Norwalk, Conn., 15, 45, Lenses
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Tel: VIctor 7-2441

Perkin Engineering Corp., Calif., 30

Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 30
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Tel: TRinity 8-3251

Philco Corp., Govt. & Indl. Div., Pa., 5, 15

Philco Corp., Lansdale Tube Co. Div., Church Rd., Lansdale, Pa., 15
See ad on page 546
Tel: ULysses 5-4681

Power Designs, Inc., 1700 Shames Dr., Westbury, N.Y., 30
See ad on page 498
Tel: EDgewood 3-6200

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 30
See ads on pages 500, 583
Tel: FLemington 900

Production Research Corp., N.Y., Calibrators

Q.O.S. Corp., N.Y., 15, 30

Radiation Electronics Co., Ill., 5, 10, 15, 30, 35, 40

Radiation, Inc., Orlando, Fla., 15

Radio Corp. of America, Astro Electronics Prods. Div., Princeton, N.J., 45

Radio Corp. of America, Defense Electronic Products, N.J., 45

Radio Corp. of America, Electronics Systems Div., N.J., 45

Raytheon Co., Mass., 5, 15, 25, 30

Redford Corp., N.Y., 5, 15

Remanco, Inc., Calif., 10

Republic Aviation, New York, 45

Ryan Aeronautical Co., Calif., 45

Sanders Associates, Inc., N.H., 45

Schirmer National Alarm Co., N.J., 5

Semicon, Inc., Mass., 15

Servo Corp. of America, N.Y., 15, 20, 25, 35

Servomechanisms, Inc., Calif., 45

Sikorsky Aircraft, Conn., 45

Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada
See ad on page 595
Tel: CHerry 4-5519

Singer Mfg. Co., Conn., 20

Skiatron Electronics & Television Corp., N.Y., 15

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 30
See ad on page 248
Tel: HO 5-3471

Space Tech. Lab., Los Angeles, Calif., 45

Specialty Electr. Dev. Corp., N.Y., 30

Spectra Electronics Corp., Mt. Vernon, N.Y., 45

Spellman High Voltage Co., 3029 Webster Ave., New York 67, N.Y., 30
See ad on page 501
Tel: KIngsbridge 7-0306

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 30, 40
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 45
See ad on pages 23-25
Tel: JUdson 6-2424

Systems, Inc., Fla., 5, 30

Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 15, 30
See ad on page 502
Tel: REctor 2-6249

Technical Operations, Inc., Burlington, Mass., 45

Telectro Industries Corp., N.Y., 5, 15

Telephonics Corp., N.Y., 5

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 20, 25
See ad on pages 75-78
Tel: FLeetwood 7-5411

Thompson-Ramo-Wooldridge, Inc., Calif., 15

Topper Mfg. Co., Inc., N.Y., 5, 10, 15

Twenty-First Century Electronics, Inc., Calif., 5, 35, 40

Union Carbide Corp., Linde Co. Div., New York, N.Y., Lenses & Windows

U.S. Flare Div., Atlantic Research Corps., Calif., flares

U.S. Semiconductor Products, 3540 West Osborn Rd., Phoenix, Ariz., 15, Lenses & Windows
See ad on page 252
Tel: APplegate 8-5591

Universal Transistor Prods., N.Y., 30

Valpey Crystal Corp., Mass., Lenses & Windows

Varo Mfg. Co., Inc., Tex., 30

Westinghouse Electric Corp., Pa., 15

Zenith Optical Lab., N.Y., 25

Zoomar, Inc., N.Y., 20

Insulating materials: See class 89

Insulation testers: See class 12

Integrators, pulse count: See class 22

Intermodulation meters: See class 3

Ionization chambers: See class 22

Jacks: See class 53

Klystrons: See class 76

Lighting equipment, television studio: See class 32

Lighting equipment, tower: See class 37

Loudspeakers: See class 54

Magnetic tape & wire: See class 63

Magnetic tape & wire recorders: See class 27

Magnetrons: See class 76

16. Marine Equipment.

5. Direction finders
10. Radiotelephones
15. Shipborne communications equip.
20. Sonar

ACF Industries Inc., Nuclear Prods. Erco Div., Md., 20
A.R.F. Products, Inc., Ill., 15
Acoustica Associates, Inc., Dept. IRE, Fairchild Ct., Plainview, N.Y., 20
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Alert Products, Inc., N.J., 10
Allied International Corp., N.Y., 10
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American Mach. & Foundry Co., Conn., 20
American Mach. & Foundry Co., D.C., 20
Andersen Labs., Inc., Conn., 5
Atlantic Research Corp., Va., 20
Avco Corp., Crosley Div., Ohio, 5, 20
Avionics Corp. of America, Pa., 5
Barker & Williamson, Inc., Pa., 10
Bassett Inc., Rex, Fla., 10
Belock Instrument Corp., N.Y., Navigation
Bendix Aviation Corp., Bendix Pacific Div., Calif., 5, 10, 15, 20
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Bendix Aviation Corp., Mich., 5, 10, 15, 20
Blaine Electronetics, Inc., Calif., Antenna Lab. Equip.
Canadian G.E. Co. Ltd., Electr. Equip.-Tube Dept., Canada, 20
Canadian Marconi Co., Canada, 5, 10, 15, 20
Cavitron Electron Oscillator Co., Calif., 5
Centronix, Inc., Fla., 10, 15, 20
Chesapeake Instrument Corp., Md., 20
Chisholm Industries Ltd., Canada, 10, 15
Continental Elecns., Mfg., Co., Tex., 20
Dalmo Victor Co., Div. of Textron Inc., Calif., 15, 20
Designers for Industry, Inc., Ohio, 5, 15, 20
Dumont Airplane-Marine Instrument, Inc., Pa., 5
Dynamic Electronics-New York, Inc., N.Y., 5, 10
EMI—Cossor Electronics Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 20
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Tel: HAlifax 6-7491
Edo Corp., N.Y., 20
Eldico Electronics, Radio Eng. Labs., Inc. Div., N.Y., 15
Electronic Assistance Corp., N.J., 5, 10, 15, 20
Electronic Communications, Inc., Fla., 15
Electronic Research Associates, Inc., N.J., 20
Erco Radio Labs., Inc., N.Y., 10, 15
Executone, Inc., N.Y., 15
Feiler Engineering & Mfg. Co., Ill., 15
Fisher Research Lab., Inc., Calif., 5, 10
Gates Radio Co., Ill., 15
General Electric Co., Communication Prods. Dept., Va., 15
General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 15, 20
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Tel: GRanite 6-4411
Gray Radio Co., Inc., Fla., 10
Harris Transducer Corp., Conn., 15, 20
Harrison Labs., Inc., B. M., Mass., 20
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5
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Tel: Yukon 3-3961
Hoffman Electronics Corp., Calif., 15
Hudson American, Radio Eng. Labs., Inc., Div., N.Y., 10, 15
Huyck & Sons, F. C., Waldorf Electronics Div., N.Y., 5
International Electronics Corp., N.Y., 5, 10, 15
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 15
Jetronic Industries, Inc., Pa., 20
Kahn Research Labs., Inc., N.Y., 15
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 20
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King Radio Corp., Kansas, 10
Kollmorgen Optical Corp., Mass., Optics
Lear, Inc., Mich., 5
Lear, Inc., Lear Cal Div., Calif., 5
Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd. Beverly Hills, Calif., 20
See ad on page 66
Tel: CRestview 4-7411
Litton Industries, Md. Div., Md., 5, 15
Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 15
See ad on pages 302-303
Tel: DAvis 5-1391
Marconi's Wireless Telegraph Co., Inc., N.Y., 5, 10, 15
Marstan Electronics Corp., N.Y., 15
Measurement Engrg., Ltd., Canada, 15
Motorola Communications & Electronics Inc., Ill., 10, 15
Mullard Overseas, Ltd., England, 15
Multi-Products Co., Mich., 10
Munston Mfg. & Service, Inc., N.Y., 10, 15
National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5
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Tel: NO 5-4800
Pearce-Simpson, Inc., Fla., 10, Dc Indicators
Philco Corp., Govt. & Indl. Div., Pa., 10, 15, 20
Polydoroff & Assoc., D.C., 5
Pye Corporation of America, N.J., 5
Pye Telecommunications Ltd., England, 5, 10
Racal Engrg. Ltd., England, 10
Radio Corp. of America, Defense Elec. Prod., N.J., 10, 15
Radio Receptor Co., Eng. Prods Div., N.Y., 15
Raytheon Co., Mass., 5, 10, 15, 20
Remler Co., Calif., 15
Republic Electronic Indust. Corp., N.Y., 10, 15
Rich Electronics, Inc., Fla., 5, 15
Rowe Industries, Ohio, 10
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Servo Corp. of America, N.Y., 5
Siemens & Halske, A. G., Germany, 15
Skiatron Elect.-Television Corp., N.Y., 20
Sonar Radio Corp., N.Y., Inc., 15
Specialty Engrg. & Electric Co., N.Y., 20
Sperry Gyroscope Co. of Canada, Ltd., Canada, 5, 10
Sperry Rand Corp., Sperry Piedmont Co. Div., Va., 5, 10, 15
Spilsbury & Tindall Ltd., Canada, Inc.
Superior Marine Radio Co., Fla., 5, 15
Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 15
See ad on page 352
Tel: OWens 8-4800
Telectro Industries Corp., N.Y., 5, 20
Telephonics Corp., N.Y., 20
Tele-Signal Corp., N.Y., 15
Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 20
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Tel: FLeetwood 7-5411

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16. Marine Equipment.

Topping Electronics, Ltd., Canada, 10
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United States Instrument Corp., Va., 15
Vitro Labs., Silver Spring Lab. Md., 20
Westinghouse Electric Corp., Md., 15
Westrex Corp., N.Y., 15
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Young Spring & Wire Corp., Gonset Div., Calif., 10

Marker generators, microwave: See class 19

Marker generators-RF: See class 26

Marker generators, TV: See class 35

17. Medical Equipment.

5. Electrocardiographs
10. Diathermy
15. Electronic cauterizing
20. Electro-encephalographs
25. Stimulators

American Electronic Labs., Inc., Pa., 25
Applegate & Co., C. J., 1840 24th St., Boulder, Colo., 25
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Tel: HIllcrest 2-8750
Atronics Products, Inc., Pa., 25
Aviation Electronic Service, Ill., 25
B & K Instruments, Inc., Ohio, Acoustical Meas. Equip.
Berman Laboratories, N.Y., Metal Detector
Bracke-Seib X-Ray Co., Inc., N.Y., X-Ray Equip.
Cambridge Instrument Co., Inc., N.Y., 5, 20
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Canadian Research Institute, Canada, 5, 25
Crescent Eng. & Research Co., Calif., 5, 20
Dallons Lab., Inc., Calif., 5, 10, 15, 20, 25
E A K Research Lab., N.Y., 10
Electro-Medical Lab., Inc., Vt., 20, 25
Electronic Assistance Corp., N.J., 10, 15, 25
Emsco, Inc., Utah, 5, 20, 25
Epsco Worcester, Mass., 5, 20
Essential Electronics Corp., Ohio, 5, 20, Oscilloscope Presentation
Exact Electronics, Inc., Oreg., 25
Farrall Instrument Co., Neb., 25
General Electric Co., X-Ray Depart., Wisc., 5
Hood Electronic Corp., Fla., 25
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Horwitron Electro-Medical Co., Pa., 25
Hughes Aircraft Co., Hughes Prod. Div. Calif., 5, 20
Industrial Control Co., N.Y., 25
Industrial Development Labs., Inc., N.J., 5
L & O Research & Development Corp., Pa., 5
Lab-Tronics, Inc., Ill., 25
Levinthal Electronics Prods., Inc., Calif., 25
Ludlow Papers Inc., Mass., 5, Paper
Measurement Engrg., Ltd., Canada, 25
Medical-Electronics Development Co., N.Y., Blood Pressure Apparatus
Merit Short Wave Diathermy Co., Calif., 10
Mooradian High Freqcy. Labs., N.J., 10, 15, 25
Nichols Ltd., R. H., Canada, 5
North Hills Electric Co., Inc., 402 Saga-more Ave., Mineola, L.I., N.Y., 25
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Tel: PIoneer 7-0555
Nuclear-Chicago Corp., Ill., Nuclear Electronic
Offner Electronics, Inc., Ill., 5, 20
Pacific Technical Co., Calif., 5, 20
Panseal, Inc., N.J., 5
Peeco Corporation, Calif., 10
Process & Instruments, N.Y., 25
Radar Engineers, Wash., 25
Raytheon Co., Mass., 10
Sanborn Co., 175 Wyman St., Waltham 54, Mass., 5
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Tel: TWinbrook 4-6300
Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., Audiometers
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Tel: LYric 2-6400
Standard Electronics Research Corp., N.Y., 25
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Teca Corp., N.Y., 5, 10, 15, 20, 25
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Meters: See class 56

Micro-ammeters: See class 56

Microphones: See class 57

Microphones, geophysical: See class 13

Microwave amplifiers: See class 36

Microwave antennas: See class 37

Microwave attenuators: See class 38

18. Microwave Communications.

5. Receivers
10. Relay equipment
15. Transmitters

A.R.F. Products, Inc., Ill., 5
Aermotive Equipment Corp., Mo., 15
Aircom, Inc., 48 Cummington St., Boston, Mass., 5, 15
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Tel: COpley 7-9115
Airtronics, Inc., D.C., 5, 15
American Elite Inc., N.Y., 5, 10, 15
Applied Technology, Inc., Calif., 5
Assembly Products, Inc., Ohio, 10
Avco Corp., Crosley Div., Ohio, 5, 15
Bell Aircraft Corp., Avionics Div., N.Y., 5, 15
Bell Aircraft Corp., Niagara Frontier Div., N.Y., 5, 15
Bendix Aviation Corp., Ind., 5, 15
Budelman Electronics Corp., Conn., 5, 10, 15
Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y., 10
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Tel: JUdson 6-1420
Canadian G.E. Co. Ltd., Electr. Equip.-Tube Dept., Canada, 5, 10, 15
Canadian Westinghouse Co. Ltd., Elect. Div., Canada, 5, 10, 15
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Centronix, Inc., Fla., 5, 15
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10, 15
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Defiance Engrg. & Microwave Corp., Mass., 10
Designers for Industry, Inc., Ohio, 5, 10, 15
E.M.I. Electronics Ltd., England, 5, 10, 15
Electro Development Corp., Wash., 10
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Electronic Development Co., Inc., Calif., 5, 10, 15
Emerson Electric Mfg. Co., Mo., 5
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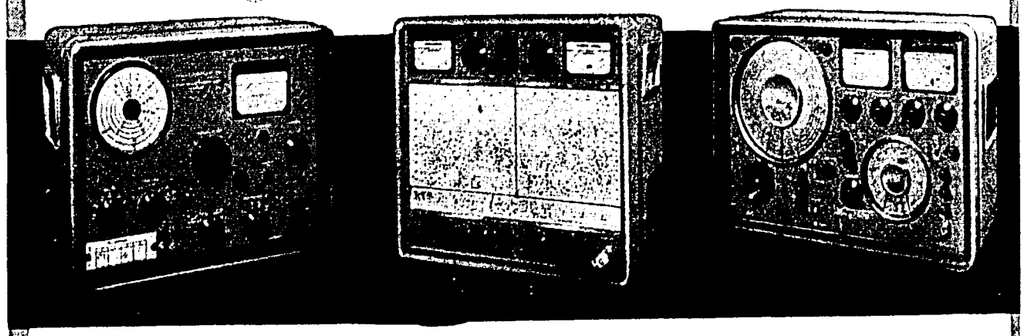
Engineering Associates, Ohio, 5, 15
Gates Radio Co., Ill., 15
General Communication Co., Mass., 10
General Electric Co., Communication Prods. Dept., Va., 5, 10, 15

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

117 DIFFERENT EQUIPMENTS

Marconi for Electronic Measurement



CARRIER DEVIATION METER Model 791D

Measures Deviation: 200 cps to 125 kc in four ranges; extended down to 10 cps using external readout.

Carrier Frequency Range: **4 to 1,024 mc,** directly calibrated.

Modulation Frequency Range: **50 cps to** 35 kc.

Crystal Locking: ensures freedom from microphony, allows measurement of FM hum and noise in VHF and UHF communication and broadcast transmitters.

STANDARD SIGNAL GENERATOR Model 867

Frequency Range: 15 kc to 30 mc on 15-ft high-discrimination full-vision scale.

Crystal Accuracy: 0.01% with in-built 1-mc harmonic source.

Output Range: 4 μv to 4 volts at 75 ohms. 0.4 μv to 0.4 volt at 13 ohms. Automatic level control for good stability.

Amplitude Modulation: Monitored and variable up to 100%; high quality assured by envelope negative feedback. Modulation frequencies, 400 and 1,000 cps. Less than 200 cps spurious FM.

FM SIGNAL GENERATOR Model 1066A

Frequency Range: 10 to 470 mc, on fundamentals throughout. 0.0025% short-term stability.

Direct-Reading Incremental Tuning: Stepped control up to ±15 kc; continuously variable from 0 to ±20 and 0 to ±100 kc.

Output Range: 0.2 μv to 200 mv at 50 ohms.

Modulation: FM deviation continuously variable and monitored from 0 to 20 and 0 to 100 kc. Also AM up to 40%. Modulation frequencies, 1 and 5 kc.

Marconi Instruments market 117 different equipments of importance to electronic engineers, from voltmeters to test equipment for guided missile projects and multi-channel links. Representative of the types of equipment that American industry has relied on for many years, the three Marconi instruments above are outstanding for quality and the advanced nature of their designs. Altogether, the range of equipments provided is an impressive guide to the achievements of Marconi Instruments in every essential branch of instrumentation.

If you would like us to mail you details of Marconi instruments made for any particular job, please let us know your requirements, and ask for leaflets B147R.

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Directory I. Complete Equipment

18. Microwave Communications.

General Electric Co., Technical Prods. Operation, N.Y., 5, 10, 15
General Electric Co., Ltd. of England, England, 5, 10, 15
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Gulton Industries, Inc., New Mexico, 5, 15
Hallicrafters Co., Ill., 4401 W. 5th Ave., Chicago 24, Ill., 5, 15
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Tel: VAn Buren 6-6300
International Electronics Corp., N.Y., 5, 10, 15
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 10, 15
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 10
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Tel: AMityville 4-2200
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Lenkurt Electric Co. Inc., Calif., 5, 10, 15
Levinthal Electronics Prods., Inc., Calif., 15
Ling Systems Inc., Calif., 10
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Litton Industries Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10, 15
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Tel: Crestview 4-7411
Litton Industries, Md. Div., Md., 5, 10, 15
M E Labs., Calif., 5, 10, 15
Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 15
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Tel: DAvis 5-1391
Marconi's Wireless Telegraph Co. Ltd., N.Y., 5, 10, 15
Martin Co., Baltimore Div., Md., 5, 15
Menlo Park Engineering, 711 Hamilton Ave., Menlo Park, Calif., 10
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Tel: DAvenport 6-9080
Microflect Co., Inc., Oregon, Passive Repeaters
Motorola Communications & Electronics, Inc., Ill., 5, 10, 15
N.R.K. Mfg. & Eng. Co., Ill., 5, 15
Narda Microwave Corp., High Power Electronics Div., Dept. IRED-9, 118-160 Herricks Rd., Mineola, N.Y., 15
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Philco Corp., Govt. & Indl. Div., Pa., 5, 10, 15
Philco Corp. Western Development Labs., Calif., 10
Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 5
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Portchester Instrument Corp., 114 Wilkins Ave., Port Chester, N.Y., 10
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Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 5, 10, 15
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Tel: WEstmore 9-8900
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Radiatronics, Inc., Calif., 15
Radio Corp. of America, Defense Elec. Prod., N.J., 10
Radio Engrg. Labs., Inc., N.Y., 5, 10, 15
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10, 15
Raytheon Co., Mass., 5, 10, 15
Remanco, Inc., Calif., 5
Resdel Engrg. Corp., Calif., 15
Sierra Electronic Corp., 5442D Bohannon Drive, Menl Park, Calif., 15
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Tel: DAvenport 6-2060
Sperry Rand Corp., Sperry Gyroscope Co. Div., N.Y., 5
Standard Telephones & Cables, Ltd., England, 5, 10, 15
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 10, 15
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Tel: POrt Washington 7-7200
Summers Gyroscope Co., Calif., 5
Systems Inc., Fla., 5, 15
Telectro Industries Corp., N.Y., 5, 15
Telephonics Corp., N.Y., 5, 15
Texas Instruments, Incorporated, Houston, Texas, 5, 15
Thompson - Ramo - Wooldridge, Inc., Calif., 5, 10, 15
Transco Products, Inc., Calif., 10
Underwood Corp., Canoga Div., Calif., 5
U.S. Science Corp., Sub. Topp Indust., Inc., Calif., 15
Visual Electronics Corp., N.Y., 5, 10, 15
Westinghouse Electric Corp., Md., 5, 10
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Wunderlich Radio Co., Ill., 5, 10, 15

Microwave filters: See class 50

Microwave power supplies: See class 61

Microwave receivers: See class 18

19. Microwave Test Equipment.

5. Bolometers
7. Calorimeters
10. Frequency meters
15. Marker generators
17. Mixers
20. Oscillators
25. Pulse generators
30. Slotted lines & measuring accessories
35. SWR meters
40. Time delay generators
45. Wavemeters

ACF Industries, Inc., Avion Div., N.J., 17, 20, 25, 30
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Aerotronic Associates, Inc., N.H., 35
Airborne Instrument Lab., N.Y., 20
Aircom, Inc., 48 Cummington St., Boston, Mass., 5, 7, 10, 15, 17, 20, 25, 30, 35, 45
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Alfred Electronics, Calif., 20
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Arra Corp., Antenna & Radome Research Assoc., 1 Bond St., Westbury, N.Y., 17, 30
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Tel: EDgewood 4-8770
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B.I. Electronics, Borg-Warner Corp., Calif., 30
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Bendix Aviation Corp., Jones Elect. Co., M. C., Conn., 35
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Blaine Electronetics, Inc., Calif., Microwave Antenna Test Equip.
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Tel: NEwtown 9-5700
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Calif. Tech. Indust. Div.-Textron Inc., Calif., 20, 30, 35, Radome Test. Equip.

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

for spectrum analyzers...
for frequency response tracers...
for telemetering test instruments...

dependable CERTIFIED SPECIFICATIONS for accurate data

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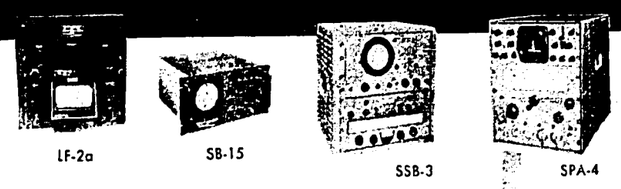

Panoramic
RADIO PRODUCTS, INC.

PANORAMIC **BROADBAND SPECTRUM ANALYZERS**—0.5 cps to 25 mc.

A matchless series of 5 easy-to-operate direct reading instruments plot amplitude vs frequency of inputs with display on 5" CRT or chart. Features include: "quick look" broadband plus highly selective narrow band analysis with adjustable center frequency, sweep width, and selectivity (resolution). Linear and 40-db log calibrated amplitude scales.

Applications: vibration-noise analysis, distortion measurements and Fourier analysis.

Model LF-2a. 0.5 cps to 2,250 cps. Exceptional stability, to 0.05 cps/hr, for narrow-band analysis with 0.1 cps resolution. Built-in recorder gives 12" x 4½" chart.

Model LP-1a. 20 cps to 22,500 cps. "Quick look", 1 sec, 40 cps-20 kc log sweep plus linear sweeps. Resolution range 10 cps to 1 kc. Famous for noise and vibration analysis.

Model SB-7bz. 1 kc-300 kc. Features discriminator linearized sweep for accurate analysis. Resolution capability to 100 cps. Noted for ease of use and reliability.

Model SB-15. 100 cps-525 kc. Complete yet only 8¾" high. Many advanced features. 100 cps resolution capability.

Models SPA-3. 200 cps-15 mc; and SPA-3/25, 200 cps-25 mc. Resolution capability is 200 cps. For applications where broad frequency coverage is a must.

PANALYZORS—for wide range RF Spectrum Analysis. **Three models: SB-3, SB-8b, and SB-12a** (in various types) cover the frequency range to 1000 mc, supplying broad choice of sweep widths up to 10 mc, sensitivity, resolution capabilities up to 10 cps, and other factors. Widely used for analysis of locally generated AM, Single Sideband, FM, and pulsed transmissions, for general RF spectrum study, and spotting spurious frequency components.

SPECIAL for Single Sideband Spectrum Analysis, the new **Model SSB-3a** incorporates a highly selective Panalyzor with a 2-40 mc tuning head, two-tone audio source, and unique self-checking features to cover a 60-db dynamic range.

PANADAPTORS—Basic Models SA-8b and SA-3 (in over 20 types). For operation with Communications and Special Purpose Receivers. Main use is in monitoring jammed communication channels for detection of interference, spurious, off-frequency transmitters, etc. Also adaptable to receivers with non-standard IF. Specify companion receiver when inquiring.

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Direct-reading instruments for pulsed AM, FM and CW signal analysis, with ±1% frequency accuracy. Features: continuously adjustable IF filter bandwidths and sweep speeds; linear, log, and power amplitude scales, calibrated frequency markers, and others.

Model SPA-4, 10 mc to 44 kmc. Single tuning head. Highly stable, with 0-70 mc and 0-5 mc dispersion ranges. Sensitivity to —100 dbm. Calibrated on 8 individual sliderule scales. IF bandwidth range 1 kc to 80 kc.

Model SPA-1, 50 mc-4 kmc. Two plug-in tuning heads. 0-10 mc dispersion. Sensitivity to —100 dbm. IF bandwidth range is 9 kc to 100 kc.

ACCESSORIES for PANORAMIC Broadband Analyzers: Increase Applications Areas

Spectral Density Analyzer, Model PDA-1 for random waveform analysis.

Synchronous Frequency Analyzer, Model SF-2, for dynamic balance analysis.

Time-Frequency Analyzer, Model TFA-1, for transient studies.

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also Signal Alternator, Model SW-1; Triangular Wave Generator TW-1 IF filters, CF-1. Oscilloscope Camera F-296, and many others.

PANORAMIC **TELEMETERING TEST INSTRUMENTS** (for IRIG FM/FM Systems)

Model TMI-1a, Telemetering Indicator, analyzes 350 cps-85 kc band. Used for subcarrier spectrum analysis, pre-emphasis, distortion measurement.

Model TMC-1, Telemetering Subcarrier Deviation and 3-Point Calibrator. Used with TMI-1a for precise analysis of individual channel deviation, and provides 3 frequencies per channel for accuracy in discriminator calibration to 0.02%, (0.002% optional).

Model TMC-307a, Seven-Point Calibrator. Provides 7 frequencies for each ±7½% and 15% IRIG channel. Accuracy to 0.02% (0.002% optional). Calibration of 18-channel discriminator completed in 42 seconds when an automatic operation.

Automatic FREQUENCY RESPONSE TRACING SYSTEMS 0.5 cps to 15 mc

Automatically plot amplitude response vs. frequency. Consist of Panoramic Spectrum Analyzer and a companion sweep frequency generator. Unique advantages: single-line display, unlimited dynamic range, responds to *fundamental* frequency only, discriminates against spurious and noise. Use **Model G-5** with LF-2a, **G-2** with Lp-1a, **G-3a** with SB-7bz, **G-15** with SB-15, **G-6** with SPA-3. Invaluable for plotting response of amplifiers, transducers, filters, etc.

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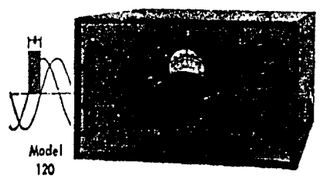
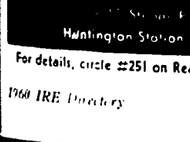
CEC Precision Instruments



Phase Angle Meter and Monitor

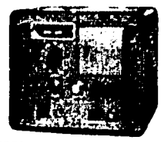
- ***Direct Reading Without Ambiguity:*** Phase angle is read directly on a large 6½" meter. The Coarse Meter Scale is graduated from 0° to 360° in 5° divisions. A selector switch cancels out all but the last 30° of any measured phase angle, providing a vernier reading on a 0° to 30° scale which is graduated in 0.5° divisions.
- ***High Accuracy Over a Wide Frequency And Amplitude Range:*** An accuracy of ± 1 degree is obtained over the frequency range of 20 cps to 20,000 cps and from 2 to 20 volt peak input. At frequencies of 20,000 to 100,000 cps phase measurements can be made at slightly reduced accuracy.
- ***Accepts Sinusoidal or Complex Wave Forms:*** Since the method of phase detection is based on the point of zero cross over, any type of wave form is acceptable which does not cross the zero axis more than once in a given direction per cycle.
- ***Recorder Output:*** An output is available which is suitable for use with recording equipment. It provides 0 to 10 volts DC corresponding to a phase angle of 0 to 360°.
- ***Rugged:*** Originally designed for Military use, as Monitor, Phase AN/URM-67



Precision Pulse Delay Generator Model 131

- Ranges: 100 to 999,900 yards in 100 yard steps.
- Accuracy: ± 5 yards or 0.01%.
- Input Trigger: 50 to 5,000 P.P.S. random source accepts up to 10% jitter.
- Pulse Widths: 0.1, 0.6, and 4.0 μsecs.
- Rise Time: 0.05 μsecs.
- Amplitude: Up to ± 50 volts into 75.Ω
- Output: Strobe and Trains—Train spacing 1,000, 10,000 or 100,000 yds.
- Internal Trigger Generator: 50 to 500 and 500 to 5,000 P.P.S.
- Power Requirements: 115 volts ± 10%; 50 to 450 cycles, 300 watts.
- Also available: Model 130 with range of 1 to 10,000 μsecs. in 0.1 μsec. step.

VHF-UHF Frequency Calibrator Model 121



- Wide Frequency Range: Covers entire spectrum from 50 mc to 11,000 mc without the use of tuning controls.
- Ease of Operation: A flick of the switch delivers the full spectrum. A switch provides a choice of 50 mc or 100 mc spacing. The amplitudes of the marker signals are adjusted by an output level control.
- Accurate: (±) 0.005% at any frequency, unaffected by temperature or input power variations.
- Compact; Rugged; Light Weight: Built to the same specifications as its Military equivalent of Test Set AN/USM-45.

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PULSE GENERATORS

2120A Pulse Generator—fully calibrated pulse width & delay, 10 cps—100 kc, 80 v from 93 ohms, .02 μs rise time.

2125B Pulse Generator—general purpose unit, 10 cps—100 kc, 50 v into 50 ohms.

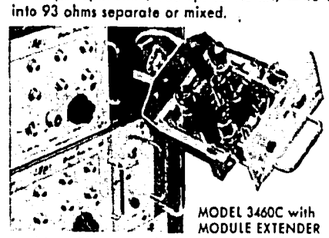
3450B Megacycle Pulse Generator—200 cps to 2 mc, ±50 v output.

4120A Variable Pulse Generator—economical compact unit, 33 cps to 330 kc, ±50 v output.

4550A 10 MC Pulse Generator—fully transistorized unit providing ±10 v into 180 ohms at 20 mμsec rise time. 100 cps to 10 mc rep. rate.

2140A Double Pulse Generator—high power independently controlled outputs, separate or mixed. 10 cps—100 kc.

3460C Megacycle Double Pulse Generator—0-100 μs separation, 130 cps to 1.3 mc, ±40 v into 93 ohms separate or mixed.



MODEL 3460C with MODULE EXTENDER

New Electro-Pulse instruments feature plug-in modular printed board construction for ease of use and maintenance.

2150A Pulse Burst Generator—5 pulse output, on-off coding, independant delay, width, and provision for delay modulation.

5621A Digital Code Group Generator—provides 2 digitally positioned triggers, with 1 μsec resolution, either or both of which may be connected to initiate a 3-pulse group. Also available digitally controlled variable width Single and Double Pulse Generators.

2200 Series Time Delay Generators—1 to 4 channels of 1-10,000 μs delay from external triggers. Trigger outputs.

5720A Time Mark Generator—Separate or mixed markers 10 sec to 1 μsec in decades. Each output 12 v at 10% duty cycle.

5100A Series Pulse Code Generators—for core testing and word generation, clock rates to 1 mc, multichannel 10 bit code with interval repeat, current output 50 ma to 5 amp per channel.

6020B Voltage and Current Calibrator—.5% accuracy measurements of DC, sine wave, or pulse voltages.

ELECTRONIC COUNTERS

7100 Series Totalizers—1 to 6 glow transfer counter decades.

7200 Series Preset Counters—2 to 5 preset decades, optional batch counter.

7300 Series Frequency Indicators—Read 0.1 to 10,000 events per second.

7440B Time Interval Meter—measures time intervals or periods from 10 μs to 99 sec.

7550B Time Interval & Frequency Meter—measures frequency, period, interval, etc. Counting rate to 100 kc.

7600 Series Dual Preset Counters—2-4 decade presets with warning preset selection.

Write for Complete Data
All data subject to change without notice

Representatives in Major Cities
Electro-Pulse, Inc.
11861 TEALE ST CULVER CITY CALIF
Phone EXmont 8 6764 or TExas 0-9193

For details, circle #252 on Reader Service Card

Directory I. Complete Equipment

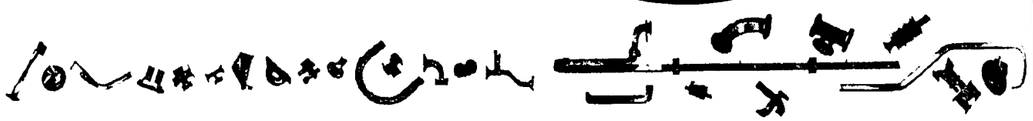
19. Microwave Test Equipment.

Canadian Marconi Co., Canada, 5, 7, 10, 25, 30, 35, 45
Canoga Corp. of California, Calif., 17, 20
Carad Corp., Calif., 25
Caswell Electronic Corp., Calif., 10, 17, 30, 45
Centronix, Inc., Fla., 20, 25, 40
Chemalloy Electronics Corp., Calif., 7, RF Water Load
Coaxial Connector Co., N.Y., 17
Columbus Electronics Corp., 1010 Saw Mill River Rd., Yonkers, N.Y., 20
See ads on page 511, 543
Tel: YOnkers 8-1221
Compagnie Generale de Metrologie, France, 15, 25
Control Electronics Co., 10 Stepar Pl., Huntington Station, L.I., N.Y., 15, 40
See ads on pages 321, 451
Tel: HAmilton 7-7961
Crosby Laboratories, Inc., N.Y., 25, 40
Cubic Corp., Calif., 7, 35
Daystrom Inc., Weston Instruments Div., N.J., 5, 10
Decade Instrument Co., N.J., 20
Defiance Engrg. & Microwave Corp., Mass., 10, 17, 30
DeMornay-Bonardi, 780 So. Arroyo P'kway, Pasadena, Calif., 10, 17, 30, 45
See ad on pages 120-121
Tel: SYcamore 2-4142
Diamond Antenna & Microwave Corp., Mass., 10, 17, 30
Dixco Wayne Electronics, Ohio, 10, 25
Douglas Microwave Co., Inc., Dept. R-9, 252 E. 3rd St., Mt. Vernon, N.Y., 10, 30, 45
See ad on pages 40-41
Tel: MOunt Vernon 8-6900
DuMont Labs., Inc., Allen B., Scientific Instrument Div., N.J., 25
Dymec, Inc., Calif., 20
E.M.I. Electronics Ltd., England, 20, 30
EPR Special Products Corp., N.Y., 17, 20, 25
Electrical & Physical Instrument Corp., N.Y., 25
Electro Impulse Laboratory, 208 River St., Red Bank, N.J., 5, 7, 10
See ad on pages 92-93
Tel: SHadyside 1-0404
Electro-Pulse, Inc., 11861 Teale St., Culver City, Calif., 20, 25, 40
See ad on this page
Tel: TExas 0-9193
Electronic Applications, Inc., Conn., 10
Electronic Tube Corp., Pa., 25
Elsin Electronics Corp., N.Y., 10, 17, 20, 30, 45
Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 17, 25
See ad on page 91
Tel: VIctor 2-8400

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

RAMCOR

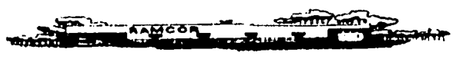
Creating
Advanced Concepts
In Microwave
And Electronic
Instrumentation



Ramcor makes available to government and industry a specialized combination of creative engineering, proven development techniques and precision production abilities.

Ramcor is a dynamic merger of a mature manufacturing organization with a first rank engineering team—both rigorously schooled in design, development and production of electronic instruments, systems and system support equipment.

Organized, staffed and equipped to meet the most critical requirements of government and industrial programs, Ramcor offers the scientific knowledge, engineering experience and production capabilities needed to produce next generation concepts—today.



RADAR MEASUREMENTS CORPORATION

•

190 DUFFY AVENUE, HICKSVILLE, N. Y.

Microwave Equipment

Adapters
Attenuators, Calibrated 20 db
Attenuators, precision rotary calibrated
Attenuators, variable
Attenuators, fixed
Bends "E"
Bends "H"
Detectors–shorts, adjustable
Detectors, fixed
Directional Couplers, bi-directional, 10 db
Directional Couplers, cross guide, 20, 30 db
Directional Couplers multi-hole, 10 db
Horns
Mixers
Switches
Slotted lines
Tees, series
Tees, shunt
Tees, hybrid
Terminations, high-power
Terminations, low-power
Terminations, sliding
Tuners, E-H
Tuners, slide screw
Universal probe carriages

Coaxial Equipment

Attenuators, variable
Directional couplers, type N
Adapters, type N to
Detectors, type N
Tuners, double stub type N
Slotted lines
Terminations, type N
Thermistor mounts
Terminations, sliding, type N

Complete data on equipment, available on request

For details, circle #253 on Reader Service Card

Directory I. Complete Equipment

19. Microwave Test Equipment.

Engineering Associates, Ohio, 5, 10, 20, 25, 30, 35, 45
Exact Electronics, Inc., Ore., 25, 40
FXR, Inc., 26-12 Borough Place, Woodside 77, N.Y., 5, 10, 17, 20, 25, 30, 35, 45
See ad on pages 97-100
Tel: AStoria 8-2800
Federal Mfg. & Eng. Corp., N.Y., 15, 25
Filmohm Corp., N.Y., 5
Frequency Standards, Inc., P.O. Box 504, Shafto Rd., Asbury Park, N.J., 10, 20, 45
See ad on page 453
Tel: PRospect 4-0500
General Applied Science Labs., Inc., N.Y., 25
General Bronze Corp., GB Elec. Corp. Subsid., N.Y., 30
General Communication Co., Mass., 10, 25, 45
General Devices, Inc., P.O. Box 253, Princeton, N.J., 17, 20
See ad on page 360
Tel: DAvis 9-2323
General Electric Co. Apparatus Sales Div., N.Y., 10
General Electronic Labs., Inc., Mass., 10, 35
General Mills, Inc., Mechanical Div., Minn., Radar Test Sets
General Radio Co., West Concord, Mass., 20, 25, 30, 40
See ad on Cover 4
Tel: EMerson 9-4400
Gertsch Products, Inc., Calif., 10
Gombos Co., Inc., John., N.J., 10, 30, 45
Gordon Co., Herbert W., Mass., 10, 20, 25, 30, 35, 45
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 7, 15, 20, 25
See ad on page 204
Tel: VAn Buren 6-6300
Hamner Electronics Co., Inc., N.J., 25, Pulse Analyzer
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 7, 10, 20, 25, 30, 35, 40, 45
See ad on pages 3-18
Tel: DAvenport 5-4451
Hickok Electrical Instrument Co., Ohio, 10, 15, 20, 25
I-T-E Circuit Breaker Co., Special Prods., Div., Pa., 30
I.T.&T. Corp., Indust. Prods. Div., N.J., 10, 20, 30, 35
Itek Corp., Mass., Microwave Spectrum Analyzers
J-V-M Microwave Co., Ill., 5, 10, 15, 17, 20, 25, 30, 45
Jetronic Industries, Inc., Pa., 15, 25
Jones Electronics Co., Inc., M.C., Conn., 35
Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 45, Random Noise Generator
See ad on page 268
Tel: CApital 6-4000
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 17, 20, 25, 30, 35, 40, 45
See ad on page 348
Tel: GRegory 2-1000
Laboratory for Electronics, Inc., Mass., 10, 20
Lambda-Pacific Engr. Inc., Calif., 10, 45
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 25
See ad on page 300
Tel: LOwell 6-2600
Levinthal Electronic Products, Inc., Calif., 25
Lieco Inc., N.Y., 17, 30
Ling Systems Inc., Calif., 45
Litton Industries, Airtron Inc., Div., N.J., 17
Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 25
See ad on page 331
Tel: EDgewood 4-3100
M E Labs., Calif., 7, 10, 17, 20
Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 20, 25
See ad on pages 302-303
Tel: DAvis 5-1391
Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 10, 30, 45
See ad on page 318
Tel: LOwell 7-0607
Marconi's Wireless Telegraph Co. Ltd., N.Y., 10, 17
Marstan Electronics Corp., N.Y., 40
Maxson Corp., W. L., Instruments Div., N.Y., 20
Menlo Park Engineering, 711 Hamilton, Menlo Park, Calif., 20
See ad on page 373
Tel: DAvenport 6-9080
Meteo, Inc., Mass., 17, 20, 35, 45
Metropolitan Electronics & Instruments Co., N.Y., 20
Mico Instrument Co., Mass., 45
Microtech, Inc., Conn., 30
Microtronics, Inc., N.J., 10, 45
Microwave Assoc., Inc., Mass., 5, 7, 10, 17, 20, 30, 45
Microwave Development Labs., Inc., Mass., 17
Miller Associates, Conn., Radar Monitor
Missouri Research Labs., Inc., Mo., Radar Analyzer
Monitor Products Co., Calif., 20
Mu Beta Products., Calif., 20
Narda Microwave Corp., Dept. IRED-3, 118-160 Herricks Rd., Mineola, L.I., N.Y., 5, 10, 17, 30, 35, 45
See ad on pages 141-144
Tel: PIoneer 6-4650
Narda Microwave Corp., High Power Electronics Div., Dept. IRED-9, 118-160 Herricks Rd., Mineola, L.I., N.Y., 25
See ad on page 145
Tel: PIoneer 6-4650

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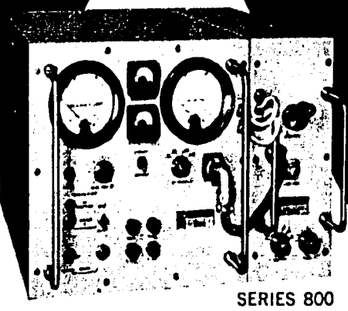
STALO STABILITY TESTER

Accurate to 1 part in 10^9

Measures short term deviation and long term drift from UHF to 10,000 mc. Checks stability of radar systems components, stalos, robos, K's, klystrons and other stable signal sources, either on production line or in the field. Particularly useful in design, test and maintenance of MTI radars.

A VERSATILE MICROWAVE STABILITY TESTER... DESIGNED FOR ANY APPLICATION REQUIRING PRECISE MEASUREMENT OF FREQUENCY STABILITY



SERIES 800

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Other PITLOG [illegible]
Tunable Stalos [illegible]
UHF [illegible]

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237 Lafayette Street New York 12, N. Y. CAnal 6-7250

Advanced Instrumentation Since 1927

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for
PRECISION MEASUREMENTS
from 50 to 10,500 MCS

WEINSCHEL

100% Square Wave MODULATED RF SOURCES
Offer High Amplitude and Frequency Stability

Model MS-6

Output Amplitude Independent of Load
Feedback circuit maintains constant incident power, allowing use of full generator output without power consuming impedance masking.

Amplitude Stability
After one hour warm-up and without feedback circuit: ± 0.1 db/hr. With regulator and external directional coupler, the incident power will change less than 0.2 db for a change in load of from 25 to 150 ohms. With a voltage probe, the voltage variation is reduced by 10:1 by feedback.

Model No.	Frequency MCS	Minimum Peak Power Output (100% Sq. Wave Modulated)
MS-1	50-250	80MW
MS-2	250-920	200MW
MS-3	900-2000	100MW
MS-4	2000-4200	60MW
MS-5	4000-7300	40MW
MS-6	7200-10,500	30MW

Write for complete specifications.

Weinschel Fixed Coaxial Attenuators cover the frequency range of DC to 12 KMC
Write for complete catalog, specifying frequency range of interest

WEINSCHEL ENGINEERING CO

Weinschel Engineering
KENSINGTON MARYLAND

For details, circle #255 on Reader Service Card

19. Microwave Test Equipment.

Navigation Computer Corp., 1621 Snyder Ave., Philadelphia 45, Pa., 25, 40
See ad on page 506
Tel: HOward 5-7700

Northeast Electronics Corp., N.H., 35

Northeast Scientific Corp., 30 Wetherbee St., RFD 1, South Acton, Mass., 20, 25
See ad on page 497
Tel: COlonial 3-7706

Omega Laboratories, Inc., Mass., 17, 30, 45

Orbitran Co., Inc., Calif., 40

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 25
See ad on page 246
Tel: BRadshaw 2-6141

Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mount Vernon, N.Y., 10, 15, 25, Spectrum Analyzer
See ad on page 320
Tel: OWens 9-4600

Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 25
See ad on page 306
Tel: TRinity 8-3251

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 17, 20
See ad on page 323
Tel: CAnal 6-7250

Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 20, 25, 35
See ad on pages 135-136
Tel: EXeter 2-4500

Polytechnic Research & Dev. Co., Inc., N.Y., 5, 7, 10, 20, 30, 35

Portchester Instrument Corp., 114 Wilkins Ave., Port Chester, N.Y., 17, 45
See ad on page 594
Tel: WEstmore 9-4092

Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 10, 17, 20, 45
See ad on page 390
Tel: WEstmore 9-8900

Press Wireless Labs., Inc., Mass., 30

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 15
See ad on page 340
Tel: POrt Washington 7-8150

Production Research Corp., N.Y., 10

Radar Design Corp., N.Y., 30, 45

Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 10, 25, 30, 35, 45
See ad on page 322
Tel: OVerbrook 1-5600

Radio City Products Co., Inc., Pa., 25

Ramo-Wooldridge Corp., Calif., 35

Rantec Corp., 23999 Ventura Blvd., Calabasas, Calif., Modulators
See ad on page 385
Tel: DIamond 7-5446

Resdel Engrg. Corp., Calif., 20, 25

Rohde & Schwarz Sales Co., Inc., N.J., 20, 30

Rutherford Electronics Co., Calif., 25, 40, Pulse Systems

Sage Labs., Inc., Mass., 10, 17, 30, 45

Saratoga Industries, N.Y., 10, 17, 20, 25, 45

Scientific-Atlanta, Inc., Ga., 17, 20

Servo Corp. of America, N.Y., 5

Siemens & Halske, A. G., Germany, 10, 20, 30, 45

Sierra Electronic Corp., 5442D Bohannon Drive, Menlo Park, Calif., 7, 20, 25, 35, wave analyzers
See ad on pages 30-31
Tel: DAvenport 6-2060

Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 25
See ad on page 475
Tel: EStebrook 9-1121

Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada, 5, 7, 10, 17, 20, 30, 35, 45
See ad on page 595
Tel: CHerry 4-5519

Sivers Lab., Sweden, 10, 17, 20, 30, 35, 45

Solartron Electronic Group, Ltd., England, 35

Specialty Electronics Development Corp., N.Y., 10, 17, 20, 25, 45

Specialty Engrn. & Electrn. Co., N.Y., 25

Spectralab Instruments, Calif., 20

Spencer-Kennedy Labs., Inc., Mass., 25

Sperry Rand Corp., Sperry Microwave Elect. Co. Div., Fla., 5, 10, 17, 25, 30, 35, 45

Standard Telephones & Cables, Ltd. England, 25, 45

Stewart Engineering Co., Calif., 20

Strand Labs., Inc., Mass., Signal Generators & Spectrometers

Sun Electric Corp., Ill., 10

Sunvic Controls, Ltd., England, 25

Systron Corp., Calif., 40

Ta-Mar, Inc., Calif., 30

Technicraft Labs., Inc., Conn., 30

Telectro Industries Corp., N.Y., 10, 15, 25, 35, 40

Telerad Mfg. Corp., N.Y., 10, 17, 20, 45

Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 25, 40, Telemeter Test Oscillator
See ad on page 308
Tel: EDgewood 3-1027

Telonic Industries, Inc., Ind., 20

Triplett Electrical Instrument Co., Harmon Road, Bluffton, Ohio, 15
See ad on page 472
Tel: 323-W

United Microwave Co., N.Y., 5, 10, 17, 20, 30, 45

United Shoe Machinery Corp., Research Div., Mass., 10, 17, 30, 45

Uniwave, Inc., N.Y., 5, 7, 17, 30, 35, 45

Van Norman Industries, Inc., N.H., 10

Varian Associates, Instrument Div. Calif., 20

Vectron, Inc., Mass., 15, Microwave Spectr. Analy. Multip. Gating Unit

Victor R. F. & Microwave Co., Mass., 5, 20, 30, 35, 45

Visual Electronics Corp., N.Y., 10

Waldorf Instrument Co., Huyck Scott Div., N.Y., 15, 35

Wave Particle Corp., Calif., 20

Waveline, Inc., N.J., 10, 20, 30, 35, 40

Wayne-Kerr Corp., 1633 Race St., Philadelphia 3, Pa., 45
See ad on page 277
Tel: GArfield 5-2844

Weinschel Engrg. & Mfg. Corp., 10503 Metropolitan Ave., Kensington, Md. 20
See ads on pages 324, 390
Tel: LOckwood 4-0121

Directory I. Complete Equipment

Microwave transmitters:
See class 18

Microwave tuners: See class 77

Microwave, waveguides:
See class 80

Milli-ammeters: See class 56

20. Mobile Equipment.

5. Central station receivers
10. Central station transmitters
15. Citizen radio
20. Mobile receivers
25. Mobile transmitters
30. Selective calling equipment

A.R.F. Products, Inc., Ill., 20, 25

Admiral Corp., Ill., 20, 25

Aermotive Equipment Corp., Mo., 20, 25

Aeronautical Electronics, Inc., N.C., 5, 10, 20, 25, 30

Aircraft Radio Corp., Boonton, N.J., 20, 25
See ad on page 164
Tel: DEerfield 4-1800

Allied International Corp., N.Y., 5, 10, 20, 25

Amelco, Inc., Calif., 5, 10, 20, 25

American Television & Radio Co., 300 E. Fourth St., St. Paul 1, Minn., 20
See ad on page 426
Tel: CApital 2-3791

Antrex Corp., Ill., 25, 30

Arkay, Inc., New York, 15, 20, 25

Audio-Video Corp., N.Y., 20, 25

Avco Corp., Crosley Div., Ohio, 20, 25, 30

Barker & Williamson, Inc., Pa., 15, 20, 25

Beam Instruments Corp., N.Y., 20, 25

Bendix Aviation Corp., Ind., 5, 10, 20, 25

Bendix Aviation Corp., Mich., 15, 20, 25, 30

Bendix Aviation Corp., Bendix Radio Div., Md., 5, 10, 15, 20, 25, 30

Bendix Radio Indust. Commun.-Electronic Prods., Md., 5, 10, 15, 20, 25, 30

Canadian G.E. Co. Ltd., Electr. Equip.-Tube Dept., Canada, 5, 10, 15, 20, 25, 30

Canadian Marconi Co., Canada, 5, 10, 20, 25, 30

Centronix, Inc., Fla., 20, 25, 30

Chisholm Industries Ltd., Canada, 20, 25

Use the Reader Service Card at the back of this issue for further information on advertised products.

20. Mobile Equipment.

Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10
See ad on pages 32-33
Tel: EMpire 3-0281

Communications Co., Fla., 5, 10, 20, 25

Cook Electric Co., Ill., 5, 10, 20, 25

Corbin Corporation, Md., 5, 15

Craig Systems, Inc., Dept. H-1, 361 Merrimack St., Lawrence, Mass., 20, 25
See ad on page 598
Tel: MUrdock 8-6961

Creative Electronics Corp., Conn., 5, 10, 15, 20, 25

Designers for Industry, Inc., Ohio, 20, 25

DuMont Labs., Inc., Allen B., N.J. 5, 10, 15, 20, 25, 30

DuMont Labs. Inc., Allen B., Scientific Instrument Div., N.J., 5, 20, 25

Dynamic Electronics-New York, Inc., N.Y., 15, 20, 25

EPR Special Products Corp., N.Y., 20, 25

Electrical Communications, Calif., 30

Electronic Engrg. Co., Md., 5, 10, 15, 20, 25

Fisher Research Lab., Inc., Calif., 15

Gates Radio Co., Ill., 10

General Electric Co., Communication Prods. Dept., Va., 5, 10, 15, 20, 25, 30

General Electric Co., Ltd. of England, England, 5, 10, 15, 20, 25, 30

Gyro Electronics Co., N.Y., 15

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 15, 20, 25
See ad on page 204
Tel: VAn Buren 6-6300

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10, 15, 20, 25
See ad on page 328
Tel: YUkon 3-3961

Hosmer & Co., E. A., Calif., 30

I.D.E.A. Inc., 7900 Pendleton Pike, Indianapolis 26, Ind., 20
See ad on page 485
Tel: LIberty 7-3581

I.T.&T. Corp., Industrial Prods. Div., Calif., 5, 10, 15, 20, 25, 30

Johnson Co., E. F., Minn., 15, 25

Kaar Engrg. Corp., 5, 10, 15, 20, 25

Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 5, 10, 20, 25

King Radio Corp., Kansas, 5, 10, 15, 20, 25

Knight Electronics, Ill., 15

LEL, Inc., 384 Oak St., Copiague, L.I., N.Y., 15
See ad on page 372
Tel: AMityville 4-2200

Lenkurt Electric Co., Inc., Calif., 5, 10, 20, 25, 30

Litton Industries, Md. Div., Md., 20, 25

Madigan Corp., N.Y., 5, 10, 15, 20, 25, 30

Marconi's Wireless Telegraph Co. Ltd., N.Y., 5, 10, 20, 25, 30

Marine View Electronics Inc., N.Y., 30

Metox, France, 20, 25

Morrow Radio Mfg. Co., Oregon, 20, 25

Motorola Communications & Electronics, Inc., Ill., 5, 10, 15, 20, 25

Mullard Overseas, Ltd., England, 5, 10, 20, 25

Multi-Products Co., Mich., 15

North Electric Co., N.Y., 30

North Electric Co., Ohio, 30

Pearce-Simpson, Inc., Fla., 20, 25

Philco Corp., Govt. & Indl. Div., Pa., 5, 10, 20, 25, 30

Port-O-Vox Corp., N.Y., 20, 25

Pye Corporation of America, N.J., 5, 10, 20, 25

Pye Telecommunications Ltd., England, 5, 10, 15, 20, 25, 30

Radio Corp. of America, Defense Elec. Prod., N.J., 10, 20, 25

Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10, 20

Rycom Instruments, Mo., 20, 25

Sargent & Greenleaf, Inc., Security Devices Laboratory Div., 24 Seneca Ave., Rochester 21, N.Y., 30
See ad on page 393
Tel: HOpkins 7-3200

Scantlin Electronics, Inc., Calif., 30

Secode Corp., Calif., 30

Seeley Electronics, Calif., 5, 20

Specialty Engrn. & Electrn. Co., N.Y., 20, 25, 30

Sperry Products, Inc., Conn., 20, 25, 30

Spilsbury & Tindall Ltd., Canada, 5, 10, 20, 25, 30

Stromberg-Carlson Div., General Dynamics Corp., N.Y., 20, 25, 30

Techniflex Mfg. Co., Inc., N.Y., 30

Telephonics Corp., N.Y., 20, 25

Tenna Mfg. Co., Ohio, 20

Visual Electronics Corp., N.Y., 5, 10, 20, 25

Vocaline Co. of America, Inc., Conn., 15

Westrex Corp., N.Y., 5, 10, 20, 25

Wunderlich Radio Co., Ill., 5, 10, 20, 25

Young Spring & Wire Corp., Gonset Div., Calif., 15, 20, 25

Z & W Mfg. Corp., Ohio, 15

21. Monitor Equipment.

5. Frequency
10. Modulation
15. Remote control monitors
20. Video monitors

A.R.F. Products, Inc., Ill., 10

Adler Electronics, Inc., N.Y., 20

Admiral Corp., Ill., 15, 20

Airmec Limited, England, 5, 10

Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 5
See ad on pages 82-83
Tel: LUdlow 3-6160

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Directory I. Complete Equipment

21. Monitor Equipment.

Amelco, Inc., Calif., 5
American Electronics, Inc., American Data Div., N.Y., 15
American Mach. & Foundry Co., D.C., 5, 10, 15
Audio-Video Corp., N.Y., 20
Avtron Mfg. Co., Ohio, 5, 10
Babcock Radio Engrg., Inc., Calif., 15
Beckman, Berkeley Div., Calif., 5
Beckman Instruments, Inc., Helipot Div., Calif., 5
Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 10, 15, 20
See ad on page 170
Tel: LOwell 3-9511
Biddle Co., James G., Pa., 5
Blonder-Tongue Labs., Inc., N.J., 20
Budelman Electronics Corp., Conn., 5, 10
CGS Labs., Inc., Conn., 5
Canadian Marconi Co., Canada, 5, 10
Canoga Corp. of California, Calif., 20
Cohu Electronics, Inc., Kin. Tel., Div., Calif., 20
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10
See ad on pages 32-33
Tel: EMpire 3-0281
Computer-Measurements, Co., Calif., 5
Conrac, Inc., Calif., 20
Control Corp., Minn., 15
Cunningham, Son & Co., Inc., James, N.Y., 15, 20
Decade Instrument Co., N.J., 5
DuMont Labs., Inc., Allen B., N.J., 20
DuMont Labs., Inc., Allen B., Scientific Instrument Div., N.J., 20
Dynapar Corp., Ill., 5
E.M.I. Electronics Ltd., England, 20
Eidson Electronic Co., Texas, 10
Electric Regulator Corp., Conn., 5, 15
Electronic Applications, Inc., Conn., 5
Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 10
See ad on page 91
Tel: VIctor 2-8400
Erco Radio Labs., Inc., N.Y., 10, FM
Erie Resistor Corp., 644 West 12th St., Erie 6, Pa., 5
See ad on pages 110-111
Tel: GLendale 6-8592
Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 15, 20
See ad on page 490
Tel: CEnter 9-6100
Gates Radio Co., Ill., 5, 10
General Automatics, Inc., Calif., 15
General Communications, Inc., Wisc., 20
General Electric Co., Computer Dept., Ariz., 15
General Electric Co., Technical Prods., Operation, N.Y., 20
General Precision Lab., Inc., N.Y., 20
General Radio Co., West Concord Mass., 5, 10
See ad on Cover 4
Tel: EMerson 9-4400
Grimson Color Inc., N.Y., 20
Hallamore Electronics Co., Calif., 20

See the pink section preceding page 1 for a complete explanation of how to get the most out of this Directory.

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 5
See ad on pages 3-18
Tel: DAvenport 5-4451
Huyck Sons, F. C., Waldorf Electronics Div., N.Y., 15, 20
Industrial Television Inc., N.J., 20
Insul-8-Corp., Calif., 20
I.T.&T. Corp., Industrial Prods. Div., Calif., 20
Jerrold Electronics (Canada) Ltd., Canada, 20
Knights Co., James, 101 E. Church St., Sandwich, Ill., 5
See ad on page 439
Tel: 2141
Lampkin Labs., Inc., Fla., 5, 10
Litton Industries, Md. Div., Md., 10
Magnetic Research Corp., Calif., 5
Maico Electronics, Inc., Minn., 20
Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 10
See ad on page 318
Tel: LOwell 7-0607
Marconi's Wireless Telegraph Co. Ltd., N.Y., 20
Marine View Electronics Inc., N.Y., 15
Maxson Corp., Langevin Div., N.Y., 20
Minneapolis Honeywell Regulator Co., Md., 10, Voice Communications
Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 15
Motorola Communications & Electronics, Inc., Ill., 10
Multi-Products Co., Mich., 15
New London Instrument Co., Conn., 5, 10
Northern Radio Co., Inc., 147 West 22nd St., New York 11, N.Y., 5
See ad on pages 130-133
Tel: WAtkins 9-9117
Northrop Corp., Nortronics Div., Calif., 5, 10, 15
Pan-Air Electronics Corp., Calif., 15
Philco Corp., Govt. & Indl. Div., Pa., 15, 20
Philco Corp., Western Development Labs., Calif., 5
Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 10
See ad on page 323
Tel: CAnal 6-7250
Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 5
See ad on page 390
Tel: WEstmore 9-8900
Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 5
See ad on page 322
Tel: OVerbrook 1-5600
Radio Corp. of America, Defense Elec. Prod., N.J., 15, 20
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10, 15, 20
Rank Cintel Ltd., England, 5, 15, 20
Rohde & Schwarz Sales Co., Inc., N.J., 5
Rowe Industries, Ohio, 5
Scientific-Atlanta, Inc., Ga., 5, 10
Servo Corp. of America, N.Y., 5
Setchell-Carlson, Inc., Minn., 20
Skiatron Elect.-Television Corp., N.Y., 20
Systron Corp., Calif., 5
Taller & Cooper, Inc., Div. of American Electronics, N.Y., 15
Tektronix, Inc., Ore., 20
Tel-Instrument Electronics Corp., N.J., 20
Telechrome Mfg. Corp., N.Y., 20
Telectro Industries Corp., N.Y., 10, 2
Television Utilities Corp., N.Y., 15, 2
Texas Instruments Incorporated, Houston, Texas, 5
Thompson Ramo Wooldridge, Inc., Calif., 20
Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5
See ad on pages 116-117
Tel: ELizabeth 4-5650
Towaco Electronics, N.J., 5
U.S. Science Corp., Sub. Topp Indst. Inc., Calif., 5, 10
Visual Electronics Corp., N.Y., 5, 1, 15, 20
Waldorf Instrument Co., Huyck Sci. Div., N.Y., 20
Waterman Products Co., Inc., 2445 Emerald St., Philadelphia 25, Pa., 10, 20
See ad on page 330
Tel: GArfield 6-8600
Waugh Engrg. Co., Calif., 5

Multimeters: See class 12

Multi-vibrators: See class 26

Noise analyzers: See class 3

22. Nuclear Equipment.

5. Beta gauges
10. Crystals
15. Dosimeters
20. Ionization chambers
25. Ionization gauges
30. Particle accelerators
35. Pulse count integrators
40. Radiation detectors
45. Scalers
50. Survey meters

Admiral Corp., Ill., 15, 40
Airmec Limited, England, 40, 45
American Electronics, Inc., Calif., 40
American Mach. & Foundry Co., D.C., 15
American Tradair Corp., N.Y., 5, 10, 2, 35, 40, 45, 50
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 20, 45, 50, air particle monitor
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715
Applied Physics Corp., Calif., 20
Applied Radiation Corp., Calif., 30, 3
Atomic Labs., Inc., Calif., 30, 40
Avo, Ltd., N.Y., 15
B.J. Electronics, Borg-Warner Corp., Calif., 15, 40, 45
Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Mass., 5, 10, 15, 20, 25, 35, 40, 45, 50
See ad on page 296
Tel: UNiversity 4-7520
Bausch & Lomb Optical Co., N.Y., 15
Bendix Aviation Corp., Ind., 15
Bendix Aviation Corp., Mich., 15, 40
Bendix Aviation Corp., Cincinnati Div., Ohio, 15, 20, 40, 50, Pulse Hgt. Analyz.
Bon-De Electronic Labs., Inc., Mass., 25
Bram Metallurgical-Chemical Co., Pa., 10
Brooks Research, Inc., N.Y., 30, 35, 40, 45, 50
Cambridge Instrument Co., Inc., N.Y., 15
Canadair Ltd., Missile & Systems Div., Canada, Res.-Type Nuclear Reactors
Canadian G.E. Co., Ltd., Electr. Equip.-Tube Dept., Canada, 40
Canadian Research Institute, Canada, 40
Central Electronic Mfg. Inc., N.J., 25
Components Corp., N.J., 50
Computing Devices of Canada, Ltd., Canada, 15, 35
Cook Electric Co., Inland Test. Labs. Div., Ill., 20
Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 5
See ad on page 514
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Daystrom Inc., Weston Instruments Div., N.J., 40
Designers for Industry, Inc., Ohio, 5
Douglas Radio Labs., Mass., 45
E A K Research Lab., N.Y., 20, 40, 45, 50
E H Research Labs., 1922 Park Blvd., Oakland 6, Calif., 45
See ad on page 298
Tel: GLencourt 2-1314
E.M.I. Electronics Ltd., England, 15, 40
Eastman Kodak Co., 343 State Street, Rochester 4, N.Y., 15, 40
See ad on page 545
Tel: LOcust 2-6000
Eberline Instrument Corp., New Mexico, 40, 50
Edgerton, Germeshausen & Grier, Inc., Mass., 15
Edwards High Vacuum Ltd., Canada, 25
Ekco Electronics Ltd., England, 5, 10, 20, 35, 40, 45, 50
Eldorado Electronics, Calif., 35, 45
Electric Regulator Corp., Conn., 50
Electrical & Physical Instrument Corp., N.Y., 45
Electronic Products Co., N.Y., 25, 40, 50
Electronic Research Labs., Mass., 25
Emerson Radio & Phonograph Corp., Md., 35, 40
Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 5
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Tel: BIgelow 3-0030
Engineered Electronics Co., Calif., 45
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Engineering Specialties, Ohio, 20
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Fairchild Camera & Instrument Corp., Defence Prods. Div., N.Y., 40
Ferranti-Packard Electric Ltd., Canada, 5, 15
Fisher Research Lab., Inc., Calif., 15, 40, 45, 50
Franklin Electronics, Inc., Pa., 45
General Electric Co., Instrument Dept., Mass., 20, 40
General Electric Co., X-Ray Dept., Wisc., 5, 20, 30, 40
General Electric Co., Ltd. of England, England, 15, 40
Gulton Industries, Inc., N.M., 30, 35
Hamner Electronics Co., Inc., N.J., 35, 45, Scintillation Counters
Harvey-Wells Elect., Mass., 45
Heath Co., 305 Territorial Rd., Benton Harbor 4, Mich., 40
See ad on page 328
Tel: YUkon 3-3961
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 45
See ad on pages 3-18
Tel: DAvenport 5-4451
High Voltage Engineering Corp., Mass., 30, Neutron Sources
Hoffman Electronics Corp., Calif., 40
Industrial Tecnics, Inc., Mich., Nuclear Shielding
Interstate Electronics Corp., Calif., 10, 15, 20, 35, 45
Isomet Corporation, N.J., 10, 40, Isotopes
Isotope Develop., Ltd., England, 5, 15, 35, 40, 45, 50
Kaman Aircraft Corp., Nuclear Div., Colo., 30, 40
Land-Air, Inc., Ill., 20, 35, 50
Land-Air, Inc., Instrument & Electronic Div., Calif., 20, 40, 50
Landsverk Electrometer Co., Calif., 15, 20, 40, 50
Leeds & Northrup Co., Pa., 35
Levinthal Electronics Prods., Inc., Calif., 10, 40
Magnetic Instruments Co., Inc., 546 Commerce St., Thornwood, N.Y., 40
See ad on page 373
Tel: ROgers 9-5312
Maico Electronics, Inc., Minn., 40, 50
Measurement Engrg., Ltd., Canada, 40
Menlo Research Lab., Calif., 40, 50
Montek Associates, Inc., Utah, Scram Amplifiers
Moran Instrument Corp., Calif., 40
Multi-Tron Lab., Inc., Ill., 30
N R C Equipment Corp., Dept. 12, 160 Charlemont St., Newton 61, Mass., 25
See ad on page 670
Tel: DEcatur 2-5800

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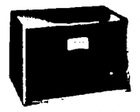
More than 100 types of detectors covering the entire range of nuclear radiation . . . unique configuration and "special application" devices. The Anton Neutron Detector Catalog and the Anton a, b, γ Detector Catalog belongs in your radiation facility reference file.



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Newest version of the first commercially available log-linear ratemeter. The 229 Series sets the standard for precision count rate measurements in the research, medical and industrial fields. Six linear scales—one log scale—integral highly regulated power supply—other unique features. Favorably priced—can be used with scintillation, halogen or organic counters. Recorder jack included. Ideal for chromatogram analysis.

AIR PARTICLE MONITORS

Portable and rack mounted a, b, γ air particle monitoring units. Moving paper and fixed paper instruments available. Produced to latest AEC and military specifications.

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Convenient, complete uninterrupted "head-to-toe" b, γ monitored exiting. Effective rapid portal monitor offers eight individual alarm channels. Complete with long-lived, thin-walled Anton halogen quenched stainless steel detectors.

HAND AND FOOT MONITORS

For a, b, γ detection and measurement. Equipped with scaler or ratemeter read-out. Auxiliary probes available. Incorporate long-lived, Anton halogen quenched stainless steel counters.

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Directory I. Complete Equipment

21. Monitor Equipment.

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American Electronics, Inc., American Data Div., N.Y., 15
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Beckman Instruments, Inc., Helipot Div., Calif., 5
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See ad on page 170
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Canadian Marconi Co., Canada, 5, 10
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DuMont Labs., Inc., Allen B., Scientific Instrument Div., N.J., 20
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E.M.I. Electronics Ltd., England, 20
Eidson Electronic Co., Texas, 10
Electric Regulator Corp., Conn., 5, 15
Electronic Applications, Inc., Conn., 5
Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 10
See ad on page 91
Tel: VIctor 2-8400
Erco Radio Labs., Inc., N.Y., 10, FM
Erie Resistor Corp., 644 West 12th St., Erie 6, Pa., 5
See ad on pages 110-111
Tel: GLendale 6-8592
Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 15, 20
See ad on page 490
Tel: CEnter 9-6100
Gates Radio Co., Ill., 5, 10
General Automatics, Inc., Calif., 15
General Communications, Inc., Wisc., 20
General Electric Co., Computer Dept., Ariz., 15
General Electric Co., Technical Prods., Operation, N.Y., 20
General Precision Lab., Inc., N.Y., 20
General Radio Co., West Concord Mass., 5, 10
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I.T.&T. Corp., Industrial Prods. Div., Calif., 20
Jerrold Electronics (Canada) Ltd., Canada, 20
Knights Co., James, 101 E. Church St., Sandwich, Ill., 5
See ad on page 439
Tel: 2141
Lampkin Labs., Inc., Fla., 5, 10
Litton Industries, Md. Div., Md., 10
Magnetic Research Corp., Calif., 5
Maico Electronics, Inc., Minn., 20
Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 10
See ad on page 318
Tel: LOwell 7-0607
Marconi's Wireless Telegraph Co. Ltd., N.Y., 20
Marine View Electronics Inc., N.Y., 15
Maxson Corp., Langevin Div., N.Y., 20
Minneapolis Honeywell Regulator Co., Md., 10, Voice Communications
Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Pa., 15
Motorola Communications & Electronics, Inc., Ill., 10
Multi-Products Co., Mich., 15
New London Instrument Co., Conn., 5, 10
Northern Radio Co., Inc., 147 West 22nd St., New York 11, N.Y., 5
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Northrop Corp., Nortronics Div., Calif., 5, 10, 15
Pan-Air Electronics Corp., Calif., 15
Philco Corp., Govt. & Indl. Div., Pa., 15, 20
Philco Corp., Western Development Labs., Calif., 5
Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 10
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Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 5
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Tel: WEstmore 9-8900
Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 5
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Radio Corp. of America, Defense Elec. Prod., N.J., 15, 20
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10, 15, 20
Rank Cintel Ltd., England, 5, 15, 20
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Scientific-Atlanta, Inc., Ga., 5, 10
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Skiatron Elect.-Television Corp., N.Y., 20
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Tel-Instrument Electronics Corp., N.J., 20
Telechrome Mfg. Corp., N.Y., 20
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Television Utilities Corp., N.Y., 15, 3
Texas Instruments Incorporated, Houston, Texas, 5
Thompson Ramo Wooldridge, Inc., Calif., 20
Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5
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Tel: ELizabeth 4-5650
Towaco Electronics, N.J., 5
U.S. Science Corp., Sub. Topp Indust. Inc., Calif., 5, 10
Visual Electronics Corp., N.Y., 5, 10, 15, 20
Waldorf Instrument Co., Huyck Sci. Div., N.Y., 20
Waterman Products Co., Inc., 2445 Emerald St., Philadelphia 25, Pa., 10, 20
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Tel: GArfield 6-8600
Waugh Engrg. Co., Calif., 5

Multimeters: See class 12

Multi-vibrators: See class 26

Noise analyzers: See class 3

22. Nuclear Equipment.

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40. Radiation detectors
45. Scalers
50. Survey meters

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Airmec Limited, England, 40, 45
American Electronics, Inc., Calif., 40
American Mach. & Foundry Co., D.C., 15
American Tradair Corp., N.Y., 5, 10, 30, 35, 40, 45, 50
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 20, 40, 50, air particle monitor
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715
Applied Physics Corp., Calif., 20
Applied Radiation Corp., Calif., 30, 35
Atomic Labs., Inc., Calif., 30, 40
Avo, Ltd., N.Y., 15
B.J. Electronics, Borg-Warner Corp., Calif., 15, 40, 45
Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Mass., 5, 10, 15, 20, 25, 35, 40, 45, 50
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Tel: UNiversity 4-7520
Bausch & Lomb Optical Co., N.Y., 15
Bendix Aviation Corp., Ind., 15
Bendix Aviation Corp., Mich., 15, 40
Bendix Aviation Corp., Cincinnati Div., Ohio, 15, 20, 40, 50, Pulse Hgt. Analyz.
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Bram Metallurgical-Chemical Co., Pa., 10
Brooks Research, Inc., N.Y., 30, 35, 40, 45, 50
Cambridge Instrument Co., Inc., N.Y., 15
Canadair Ltd., Missile & Systems Div., Canada, Res.-Type Nuclear Reactors
Canadian G.E. Co., Ltd., Electr. Equip.-Tube Dept., Canada, 40
Canadian Research Institute, Canada, 40
Central Electronic Mfg. Inc., N.J., 25
Components Corp., N.J., 50
Computing Devices of Canada, Ltd., Canada, 15, 35
Cook Electric Co., Inland Test. Labs. Div., Ill., 20
Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 5
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Tel: GEneva 8-4000
Daystrom Inc., Weston Instruments Div., N.J., 40
Designers for Industry, Inc., Ohio, 5
Douglas Radio Labs., Mass., 45
E A K Research Lab., N.Y., 20, 40, 45, 50
E H Research Labs., 1922 Park Blvd., Oakland 6, Calif., 45
See ad on page 298
Tel: GLencourt 2-1314
E.M.I. Electronics Ltd., England, 15, 40
Eastman Kodak Co., 343 State Street, Rochester 4, N.Y., 15, 40
See ad on page 545
Tel: LOcust 2-6000
Eberline Instrument Corp., New Mexico, 40, 50
Edgerton, Germeshausen & Grier, Inc., Mass., 15
Edwards High Vacuum Ltd., Canada, 25
Ekco Electronics Ltd., England, 5, 10, 20, 35, 40, 45, 50
Eldorado Electronics, Calif., 35, 45
Electric Regulator Corp., Conn., 50
Electrical & Physical Instrument Corp., N.Y., 45
Electronic Products Co., N.Y., 25, 40, 50
Electronic Research Labs., Mass., 25
Emerson Radio & Phonograph Corp., Md., 35, 40
Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 5
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Tel: BIgelow 3-0030
Engineered Electronics Co., Calif., 45
Engineering Associates, Ohio, 20, 45
Engineering Specialties, Ohio, 20
Etelco, Ltd., England, 35, 40, 45
Fairchild Camera & Instrument Corp., Defence Prods. Div., N.Y., 40
Ferranti-Packard Electric Ltd., Canada, 5, 15
Fisher Research Lab., Inc., Calif., 15, 40, 45, 50
Franklin Electronics, Inc., Pa., 45
General Electric Co., Instrument Dept., Mass., 20, 40
General Electric Co., X-Ray Dept., Wisc., 5, 20, 30, 40
General Electric Co., Ltd. of England, England, 15, 40
Gulton Industries, Inc., N.M., 30, 35
Hamner Electronics Co., Inc., N.J., 35, 45, Scintillation Counters
Harvey-Wells Elect., Mass., 45
Heath Co., 305 Territorial Rd., Benton Harbor 4, Mich., 40
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High Voltage Engineering Corp., Mass., 30, Neutron Sources
Hoffman Electronics Corp., Calif., 40
Industrial Teconics, Inc., Mich., Nuclear Shielding
Interstate Electronics Corp., Calif., 10, 15, 20, 35, 45
Isomet Corporation, N.J., 10, 40, Isotopes
Isotope Develop., Ltd., England, 5, 15, 35, 40, 45, 50
Kaman Aircraft Corp., Nuclear Div., Colo., 30, 40
Land-Air, Inc., Ill., 20, 35, 50
Land-Air, Inc., Instrument & Electronic Div., Calif., 20, 40, 50
Landsverk Electrometer Co., Calif., 15, 20, 40, 50
Leeds & Northrup Co., Pa., 35
Levinthal Electronics Prods., Inc., Calif., 10, 40
Magnetic Instruments Co., Inc., 546 Commerce St., Thornwood, N.Y., 40
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Maico Electronics, Inc., Minn., 40, 50
Measurement Engrg., Ltd., Canada, 40
Menlo Research Lab., Calif., 40, 50
Montek Associates, Inc., Utah, Scram Amplifiers
Moran Instrument Corp., Calif., 40
Multi-Tron Lab., Inc., Ill., 30
N R C Equipment Corp., Dept. 12, 160 Charlemont St., Newton 61, Mass., 25
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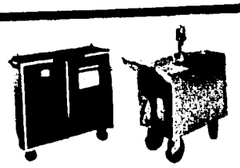

AIR PARTICLE MONITORS

Portable and rack mounted a, b, γ air particle monitoring units. Moving paper and fixed paper instruments available. Produced to latest AEC and military specifications.

PRECISION LABORATORY RATEMETER

Newest version of the first commercially available log-linear ratemeter. The 229 Series sets the standard for precision count rate measurements in the research, medical and industrial fields. Six linear scales—one log scale—integral highly regulated power supply—other unique features. Favorably priced—can be used with scintillation, halogen or organic counters. Recorder jack included. Ideal for chromatogram analysis.

PORTAL "CHECK-OUT" MONITORS

Convenient, complete uninterrupted "head-to-toe" b, γ monitored exiting. Effective rapid portal monitor offers eight individual alarm channels. Complete with long-lived, thin-walled Anton halogen quenched stainless steel detectors.

HAND AND FOOT MONITORS

For a, b, γ detection and measurement. Equipped with scaler or ratemeter read-out. Auxiliary probes available. Incorporate long-lived, Anton halogen quenched stainless steel counters.

ANTON ELECTRONIC LABORATORIES, INC.

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

CUT LAB EQUIPMENT COSTS IN HALF

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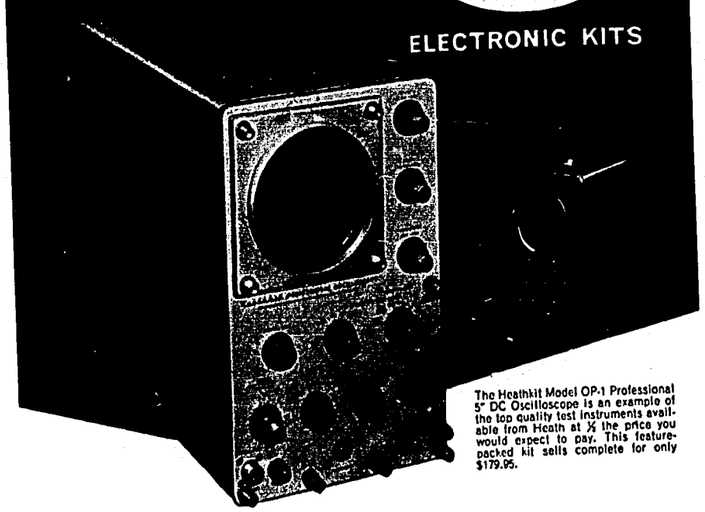

The Heathkit Model OP-1 Professional 5" DC Oscilloscope is an example of the top quality test instruments available from Heath at ½ the price you would expect to pay. This feature-packed kit sells complete for only $179.95.

Heathkits give you twice as much equipment for every dollar invested.

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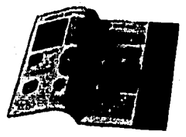

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22. Nuclear Equipment.

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Nichols, Ltd., R. H., Canada, 50
Norbute Corp., Metalab Equipment Co. Div., N.Y., Fume Hoods for Radioactive Materials
Nuclear-Chicago Corp., Ill., 5, 10, 15, 20, 25, 35, 40, 45, 50
Nuclear Corp. of America, N.J., 10, 15, 20, 25, 35, 40, 45, 50
Nuclear Corp., of America, Inc., Mo., 5, 10, 15, 20, 25, 40, 45, 50
Nuclear Development Lab., Mo., 40
Nuclear-Electronics Corp., Pa., 20, 35, 40, 45, 50
Nuclear Environments Assoc., Ohio, 40
Nuclear Measurements Corp., Ind., 40, 45, 50, Gamma Alarm System
Nuclear Research Corp., Pa., 40
Nucleonic Corp. of America, N.Y., 15, 20, 35, 40, 45, 50
Ohmart Corp., Ohio, 5, 20, 40, Gamma Gages
Pacific Electro-Nuclear Corp., Calif., Pulse Height Analyzer
Pacific Transducer Corp., Calif., 15, 40
Patterson Moos Div., Universal Winding Co., N.Y., 5, 10, 15, 40
Philips Electronics, Inc., N.Y., 40, 45, 50
Pilot Chemicals, Inc., Mass., 10, 40
Radiation Counter Labs., Inc., Ill., 5, 10, 15, 20, 35, 40, 45, 50
Radiation Dynamics, Inc., N.Y., 30
Radiation Instrument Dev. Lab., Inc., Ill., 10, 15, 40, 45
Radio Craftsmen, Calif., 40
Rank Cintel, Ltd., England, 15
Resitron Labs., Inc., Calif., 20, 25
St. John X-Ray Lab., N.J., 15, 40
Saratoga Industries, N.Y., 20, 40, 50
Schlumberger Well Surveying Corp., Conn., Neutron Generators & Moisture Analyzers
Scientific Engrg. Labs., Inc., 1510 Sixth St., Berkeley 10, Calif., 25, 30, 45
See ad on page 673
Tel: LAndscape 6-2772
Single Crystal Corp.-Amer., Pa., 10
Specialty Electronics Development Corp., N.Y., 15, 40, 50
Specialty Engrn. & Electrn. Co., N.Y., 15, 40, 50
Sperry Gyroscope Co. of Canada, Ltd., Canada,, 15
Strand Engineering Co., Mich., 40, 50
Summers and Mills, Inc., Tex., 40
Systems, Inc., Fla., 35, 40, 50
Systron Corp., Calif., 45
Technical Associates, Calif., 20, 40, 45, 50
Technical Measurement Corp., Conn., 40, 45
Tracerlab, Inc., Mass., 5, 10, 15, 20, 25, 35, 40, 45, 50
Tullamore Electronics Co., Ill., 35, 45
Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 15, 40, 50
See ad on pages 50-51
Tel: HUmboldt 2-4200
U. S. Radium Corp., N.J., Radiation Sources
U. S. Science Corp., Sub. Topp Indust., Inc., Calif., 15
Universal Transistor Prods., N.Y., 5, 10, 15, 20, 35, 40, 45, 50

Directory I. Complete Equipment

22. Nuclear Equipment.

Vacuum Tube Products Co., Inc., Calif., 25
Varian Associates, Instrument Div., Calif., 30
Victoreen Instrument Co., Calif., 15, 20, 40, 50
Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 15, 20, 35, 40, 45, 50
See ad on page 578
Tel: ENdicott 1-6200
Wave Particle Corp., Calif., 30
Welch Scientific Co., W. M., Ill., 25
Western Radiation Lab., Calif., 5, 40, Radioisotopes
Westinghouse Electric Corp., Pa., 40
Wood Counter Lab., N., Ill., 40, Neutron Counters

Null indicators: See class 12

Ohm meters: See class 12

Oscillators, beat frequency: See class 3

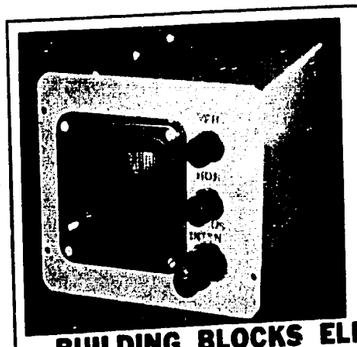
Oscillators, microwave: See class 19

Oscillators, radio frequency: See class 26

23. Oscilloscopes—Cathode-Ray.

5. General purpose
10. Oscilloscope cameras
15. Oscillosynchroscopes
20. Recording oscillographs
25. Special UHF & pulse analysis equipment
30. Time & voltage-calibrators

Admiral Corp., Ill., 5
Advanced Electronics Mfg. Corp., Calif., 5
Airmec Limited, England, 5
Airtronics, Inc., D.C., 25
Allegany Instrument Co., Inc., Md., 20, 30
American Electronic Labs., Inc., Pa., 5
Analab Instrument Corp., N.J., 5, 15
Applied Science Corp. of Princeton, N.J., 20
Arkay, Inc., N.Y., 5
Armstrong Whitworth Aircraft, Ltd., Sir W. G., A.W.E. Electronics Div., Hucclecote, Gloucester, England, 10, 20
See ad on page 359
Tel: TOll Bar 2261
Artronic Instrument Co., Md., 30
Avionics Corp. of America, Pa., 5
Beam Instruments Corp., N.Y., 5, 10
Beattie-Coleman, Inc., Calif., 10
Beva Lab., Inc., N.J., 25
Brooks Research, Inc., N.Y., 25
Brush Instruments, Div. of Clevite Corp., Ohio, 20
Building Blocks Electronic Co., 2172 E. 36th St., Brooklyn 34, N.Y., 5
See ad on this page
Tel: CLoverdale 3-8931
Canadian Research Institute, Canada, 20
Central Research Labs., Inc., Minn., 20
Centronix, Inc., Fla., 20
Century Electronics & Instruments, Inc., Okla., 20
Chadwick-Helmuth Co., Calif., Pulse Camera & Synchrometer
Cohu Electronics, Inc., Massa Div., Mass., 20
Compagnie Generale de Metrologie, France, 5
Computer Equipment Corp., Calif., 30
Consolidated Electrodynamics Corp., Calif., 20
Dallons Labs., Inc., Calif., Cardioscopes
Designers for Industry, Inc., Ohio, 5, 20, 25, 30
DuMont Labs., Inc., Allen B., N.J., 5, 10
DuMont Labs., Inc., Allen B., N.J., Scientific Instrument Div., 5, 10
Dynamic Electronics-New York, Inc., N.Y., 5, 15, 30
EMI—Cossor Electronics, Ltd., 301 Windsor St., Woodside, Halifax, N. S., Canada, 5, 10
See ad on page 412
Tel: HAlifax 6-7491
E.M.I. Electronics, Ltd., England, 5, 10
EPR Special Products Corp., N.Y., 5, 25
Edgerton, Germeshausen & Grier, Inc., Mass., High Speed
Edin Co., Inc., Mass., 20
Electro Instruments, Inc., Calif., 5
Electro-Medical Lab., Inc., Vt., 10
Electro Precision Corp., Ark., 15, 25
Electronic Tube Corp., Pa., 5, 10, 15, 20, 25
Engineering Associates, Ohio, 5
Epic, Inc., N.Y., 20
Epsco Worcester, Mass., 20
Fairchild Camera & Instrument Corp., Defense Prods. Div., N.Y., 10
Fairchild Camera & Instrument Corp., Indust. Prods. Div., N.Y., 5, 15
Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 5
See ad on page 490
Tel: CEnter 9-6100
Garfield Associates, E., Pa., 5, 10, 20
General Electric Co., Apparatus Sales Div., N.Y., 20
General Electric Co., Instrument Dept., Mass., 20
Geotechnical Corp., Tex., 20
Grass Instrument Co., Mass., 10
Hamilton Watch Co., Hathaway Instrument Div., Colo., 10, 20
Hamilton Watch Co., Industrial Div., Pa., 20
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 30
See ad on page 328
Tel: YUkon 3-3961
Heitz, Inc., Karl, N.Y., 10
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 5, 10, 15
See ad on pages 3-18
Tel: DAvenport 5-4451
Hickok Electrical Instrument Co., Ohio, 5, 15
Hughes Aircraft Co., Hughes Prod. Div., Calif., 5, 20
Hycon Electronics, Inc., Calif., 5
Hymac Corp., Calif., 5
ITI Electronics, Inc., N.J., 5
Industrial Television, Inc., N.J., 5
International Electronics Corp., N.Y., 5, 20
I. T. & T. Corp., Indust. Prods. Div., N.J., 5
Jackson Elec. Instrument Co., Ohio, 5
Jetronic Industries, Inc., Pa., 5
Jodon, Inc., F. R., D.C., 5, 20
Kingston Industries, Inc., Kingston Electronics Div., Mass., 5



This PANEL MOUNTED OSCILLOSCOPE mounts in a hole 5⅛" wide by 4⅝" high and extends 10½" beyond the front panel. The front panel dimensions are 6" wide by 5⅛" high. The input impedance is 1 megohm and the frequency response is linear from 10 cycles to 40,000 cycles. The unit employs identical vertical and horizontal amplifiers, push-pull. The gain is approximately .1-.25 volts RMS per inch. This oscilloscope is complete with low and high voltage power supplies. Weight is 6 lbs.

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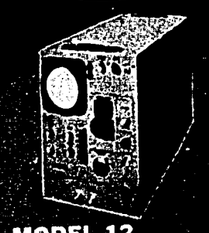

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Directory I. Complete Equipment

23. Oscilloscopes—Cathode-Ray.

Knight Electronics, Ill., 5
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 5, 25
See ad on page 300
Tel: LOwell 6-2600
Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 5, 10, 15, 25, 30
See ad on this page
Tel: EDgewood 4-3100
M E Labs., Calif., 25
Mandrel Industries, Inc., Calif., 20
Midwestern Instruments, Inc., Okla., 20
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 15
See ad on page 416
Tel: DAvenport 4-4108
Minneapolis-Honeywell Reg. Co., Brown Instrument Div., Pa., 20
Minneapolis-Honeywell Reg. Co., Heiland Div., Colo., 20
National Scientific Labs., Inc., D.C., 20, 25
New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 20, 25
See ad on this page
Tel: KIrkland 7-1997
Norrman Labs., Ernst, Wisc., 30
Optomechanisms, Inc., N.Y., 10
Phileo Corp., Govt. & Indl. Div., Pa., 5
Photron Instrument Co., Ohio, 5
Polaroid Corporation, Mass., 10
Precise Development Corp., N.Y., 5, 15
Precision Apparatus Co., Inc., N.Y., 5
Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 5
See ad on page 340
Tel: PArt Washington 7-8150
Radio Corp. of America, Electron Tube Div., Sect. I-22-Q, 415 S. Fifth St., Harrison, N.J., 5
See ad on pages 53-55
Tel: HUmboldt 5-3900
Radiometer, Denmark, 5
Railway Communications, Inc., Mo., 5, Multi-Channel
Rank Cintel, Ltd., England, 5
Raytheon Co., Mass., 25
Republic Electronic Indust. Corp., N.Y., 5, 15
Rycom Instruments, Mo., 5
Sanborn Co., 175 Wyman St., Waltham 54, Mass., 20
See ad on pages 114-115
Tel: TWinbrook 4-6300
Scopes Co., Inc., N.Y., 5, 15, 25
Sierra Electronic Corp., 5442D Bohannon Dr., Menlo Park, Calif., 5
See ad on pages 30-31
Tel: DAvenport 6-2060
Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 5
See ad on page 475
Tel: EStebrook 9-1121
Sivers Lab., Sweden, 25
Solartron Electronic Group, Ltd., England, 5, 20
Solartron, Inc., Calif., 5
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 5, 20
See ad on page 248
Tel: HO 5-3471
Specialty Electronics Development Corp., N.Y., 5
Specialty Engrn. & Electrn. Co., N.Y., 5
Spivey, Inc., James S., D.C., 5
Stark Electronic Instruments, Ltd., Canada, 5
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 30
See ads on pages 306, 351
Tel: PArt Washington 7-7200
Strand Engineering Co., Mich., 20
Sunshine Scientific Instrument, Pa., 30
Tektronix, Inc., Ore., 5
Tel-Instrument Electronics Corp., N.J., 5
Telectro Industries Corp., N.Y., 5
Thomas Electronics, Inc., N.J., 5
Trad Electronics Corp., 1001 First Ave., Asbury Park, N.J., 15
See ad on page 341
Tel: PRospect 6-7445

(Continued on page 332)

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23. Oscilloscopes—Cathode-Ray.

Triplett Electrical Inst. Co., Harmon Rd., Bluffton, Ohio, 5
See ad on page 472
Tel: 323-W

Underwood Corp., Canoga Div., Calif., 25

Waterman Products Co., 2445 Emerald St., Philadelphia 25, Pa., 5, 15, 25, 30
See ad on page 330
Tel: GArfield 6-8600

Waters Mfg., Inc., Mass., 5

Phase meters: See class 26

Phonographs: See class 59

Photo electric controls: See class 4

Pick-ups: See class 59

Picture tubes: See class 74

Plugs: See class 53

24. Point to Point Equipment.

5. Receivers 10. Transmitters

Adler Electronics, Inc., N.Y., 5, 10
Aero Guidance Corp., Calif., 5, 10
Aeronautical Comm. Equip., Inc., Fla., 5, 10
Aeronautical Electronics, Inc., N.C., 5, 10
Allied International Corp., N.Y., 5, 10
Amelco, Inc., Calif., 5, 10
American Electronics, Inc., American Data Div., N.Y., 5, 10
American Mach. & Foundry Co., D.C., 5, 10
Antrex Corp., Ill., 5, 10
Applied Technology, Inc., Calif., 5
Automatic Timing & Controls, Inc., Pa., 5, 10
Avco Corp., Crosley Div., Ohio, 5, 10
Babcock Radio Engrg., Inc., Calif., 5, 10
Bailey Meter Co., Ohio, 5, 10
Barker & Williamson, Inc., Pa., 5, 10
Bassett Inc., Rex, Fla., 5, 10
Bendix Aviation Corp., Ind., 5, 10
Bendix Aviation Corp., Bendix Radio Div., Md., 5, 10
Bristol Co., Conn., 5, 10
Browning Labs., Inc., N.H., 5
Budelman Electronics Corp., Conn., 5, 10
Canadian G.E. Co. Ltd., Electronic Equip.-Tube Dept., Canada, 5, 10
Canadian Marconi Co., Canada, 5, 10
Central Electronics, Inc., Ill., 10
Centronix, Inc., Fla., 5, 10
Chisholm Industries Ltd., Canada, 5, 10

24. Point to Point Equipment.

Collins Radio Co., 855 35th St. N.E., Cedar Rapids, Iowa, 5, 10
See ad on pages 32-33
Tel: EMpire 3-0281

Communications Co., Fla., 5, 10
Continental Elecns., Mfg., Co., Texas, 10
Control Corp., Minn., 5, 10
Corbin Corporation, Md., 5, 10
Creative Electronics Corp., Conn., 5, 10
Crosby Laboratories Inc., N.Y., 5, 10
Designers for Industry, Inc., Ohio, 5, 10
Dollar Co., Robert, Comm. Equip. Div., Calif., 5, 10
DuMont Labs., Inc., Allen B., Scientific Instrument Div., N.J., 5, 10
E.M.I. Electronics Ltd., England, 5, 10
EPR Special Products Corp., N.Y., 5, 10
Ekco Electronics Ltd., England, 5, 10
Eldico Electronics, Radio Eng. Labs. Inc., Div., N.Y., 10
Electronic Communications, Inc., Fla., 5, 10
Elliott-Evans, Inc., Telectron Co., Div., Fla., 5, 10
Emerson Radio & Phonograph Corp., Md., 5, 10
Erco Radio Labs., Inc., N.Y., 5, 10
Farinon Electric Co., Calif., 5, 10
Ferranti-Packard Electric Ltd., Canada, 5, 10
GNY, N.Y., 5
Gates Radio Co., Ill., 10
General Electric Co., Communication Prods. Dept., Va. 5, 10
General Electric Co., Ltd. of England, England, 5, 10

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 5, 10
See ad on page 204
Tel: VAn Buren 6-6300

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10
See ad on page 328
Tel: YUkon 3-3961

Intelex Systems Inc., N.Y., 5, 10
International Electronics Corp., N.Y., 5, 10
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 10
I.T.&T. Corp., Industrial Prods. Div., Calif., 5, 10
Internatl. Telephone & Telegraph Labs., Calif., 5, 10
Kaar Engrg. Corp., Calif., 5, 10
Kahn Research Labs. Inc., N.Y., 5, 10
Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 10
Kellogg Switchboard & Supply Co., Ill., 5, 10
King Radio Corp., Kansas, 5, 10
Knight Corp., Ewen, Mass., 5, 10
Kuss Industries, Inc., Pa., 5, 10
Lenkurt Electric Co. Inc., Calif., 5, 10
Lettine Radio Mfg., Co., N.Y., 10
Levinthal Electronics Prods., Inc., Calif., 10
Ling Systems Inc., Calif., 5, 10

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10
See ad on page 66
Tel: CRestview 4-7411

Litton Industries, Md. Div., Md., 5, 10
M E Labs., Calif., 5, 10
Manning, Maxwell & Moore, Inc., Conn., 5, 10
Marconi's Wireless Telegraph Co. Ltd., N.Y., 5, 10
Marstan Electronics Corp., N.Y., 5, 10
Measurement Engrg., Ltd., Canada, 5, 10
Metox, France, 5, 10
Motorola Communications & Electronics, Inc., Ill., 5, 10

Northern Radio Co., Inc., 147 West 22nd St., New York 11, N.Y., 5
See ad on pages 130-133
Tel: WAtkins 9-9117

Norwood Controls, Unit Detroit Controls Div., Mass., 5, 10

Ostlund, Evert M., P.O. Box 458, Andover, N.J., 5
See ad on page 626
Tel: PArkway 9-6635

Peer, Inc., Mich., 10
Philco Corp., Govt. & Indl. Div., Pa., 5, 10

Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 5, 10
See ad on page 390
Tel: WEstmore 9-8900

Press Wireless Labs., Inc., Mass., 5, 10
Production Research Corp., N.Y., 10
Pye Corporation of America, N.J., 5, 10
Pye Telecommunications Ltd., England, 5, 10
Racal Engrg. Ltd., England, 5, 10
Radio Engrg. Labs., Inc., N.Y., 5, 10
Tropo Scatter FM
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10
Raytheon Co., Mass., 5, 10
Rollan Co., Mass., 5, 10
Scatter Communications, Inc., Md., System Design, Installation

Sierra Electronic Corp., 5442D Bohannon Drive, Menlo Park, Calif., 1
See ad on pages 30-31
Tel: DAvenport 6-2060

Space Electronics Corp., Calif., 5, 10
Specialty Electronics Development Corp., N.Y., 5, 10
Spilsbury & Tindall Ltd., Canada, 5, 10
Standard Telephones & Cables, Ltd. England, 5, 10
Stromberg-Carlson—San Diego, Calif. 5
Summers Gyroscope Co., Calif., 5
Superior Marine Radio Co., Fla., 5, 10
Tabet Mfg. Co., Inc., Va., 5, 10
Taller & Cooper, Inc., Div. of America Electronics, N.Y., 5, 10
Ta-Mar, Inc., Calif., 5, 10

Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 5, 10
See ad on page 352
Tel: OWens 8-4800

Telechrome Mfg. Corp., N.Y., 5, 10
Telectron Company, Fla., 5, 10
Telephonics Corp., N.Y., 5, 10
Tele-Signal Corp., N.Y., 5, 10

Teletronics Laboratory, Inc., 54 Kirke St., Westbury, L.I., N.Y., 5, 10
See ad on page 308
Tel: EDgewood 3-1027

Television Utilities Corp., N.Y., 5

Directory I. Complete Equipment

24. Point to Point Equipment.

Temco Aircraft Corp., Electronics Div., Texas, 5, 10
Topping Electronics, Ltd., Canada, 5, 10
Transline Associates, N.J., 5, 10
U.S. Science Corp., Sub. Topp Indust. Inc., Calif., 5, 10
Virginia Electronics Co., Inc., D.C., 5, 10
Visual Electronics Corp., N.Y., 5, 10
Westinghouse Electric Corp., Md., 10
Westrex Corp., N.Y., 5, 10
Wilcox Electric Co., Inc., Mo., 5, 10
Wunderlich Radio Co., Ill., 5, 10
Young Spring & Wire Corp., Gonset Div., Calif, 5, 10

Power supplies: See class 61

Pre-amplifiers: See class 36

Production control equipment: See class 4

Projectors, television film: See class 32

Pulse count integrators: See class 22

Pyrometers: See class 12

"Q" meters: See class 26

25. Radar Equipment.

1. Airborne 15. Marine
10. Ground Based

ACF Industries Inc., Avion Div., N.J., 5
Admiral Corp., Ill., 5, 10, 15
American Mach. & Foundry Co., Conn., 5, 10, 15
American Mach. & Foundry Co., D.C., 5, 10, 15
American Tradair Corp., N.Y., 5
Applied Technology, Inc., Calif., 5, 10
Austin Co., N.Y., 10
Autometric Corp., N.Y., 10
Avco Corp., Crosley Div., Ohio, 5, 10, 15
B. J. Electronics, Borg-Warner Corp., Calif., 10
Bell Aircraft Corp., Avionics Div., N.Y., 5, 10

25. Radar Equipment.

Bell Aircraft Corp., Niagara Frontier Div., N.Y., 5, 10
Bendix Aviation Corp., Bendix Pacific Div., Calif., 5, 10
Bendix Aviation Corp., Bendix Products Div., Ind., 5, 10, 15
Bendix Aviation Corp., Bendix Radio Div., Md., 5

Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 5, 10
See ad on pages 19-22
Tel: ATlas 8-2000

Bendix Aviation Corp., Research Lab Div., Mich., 5, 10, 15
Bendix Aviation Corp., York Div., Pa., Simulators
British Thomson-Houston Co., Ltd., England, 15
Bulova Research & Development Labs. Inc., N.Y., 5, 10
Canadian Aviation Electronics, Ltd., P.Q., Canada, 5, 10
Canadian G.E. Co. Ltd. Electronic Equip.-Tube Dept., Canada, 5, 10, 15
Canadian Westinghouse Co. Ltd., Elect. Div., Canada, 5, 10, 15
Canoga Corp. of California, Calif., 10
Centronix, Inc., Fla., 10, 15

Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5
See ad on pages 32-33
Tel: EMpire 3-0281

Continental Elecns., Mfg., Co., Texas, 10

Craig Systems, Inc., Dept. H-1, 361 Merrimack St., Lawrence, Mass., 10
See ad on page 598
Tel: MUrdock 8-6961

Cubic Corp., Calif., 10
Dalmo Victor Co., Div. of Textron Inc., Calif., 5, 10, 15
Daystrom Instrument, Div. of Daystrom, Inc., Pa., 5, 10, 15
Dayton Aircraft Products, Inc., Fla., 10, 15
Designers for Industry, Inc., Ohio, 5, 10, 15
DuMont Labs., Inc., Allen B., N.J., 5, 10
Dynamic Electronics-N.Y. Inc., N.Y., 5, 10
Dynamics Corp. of Am., Reeves Instrument Corp., N.Y., 10, 15
E.M.I. Electronics Ltd., England, 5, 10, 15
Edo Corp., N.Y., 15
Ehrenpreis, Consulting Engrg., David, N.Y., 5, 10, 15
Ekco Electronics Ltd., England, 5, 10
Electro Development Corp., Wash., 10
Electronic Communications, Inc., Fla., 5, 10, 15
Emerson Radio & Phonograph Corp., Md., 5

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 10
See ad on page 91
Tel: VIctor 2-8400

Engineering Associates, Ohio, 5

FXR, Inc., 26-12 Borough Place, Woodside 77, N.Y., 10
See ad on pages 97-100
Tel: AStoria 8-2800

Fairchild Eng. & Airplane Corp., Astrionics, Div., N.Y., 5, 10, 15
Federal Scientific Corp., N.Y., Simulator Equipment

Frequency Standards, Inc., P.O. Box 504, Shafto Rd., Asbury Park, N.J., Beacons
See ad on page 453
Tel: PRospect 4-0500

General Applied Science Labs. Inc., N.Y., Simulators
General Communication Co., Mass., 5, 10, 15

General Electric Co., Heavy Military Electronics Dept., Defense Electronics Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 10, 15
See ads on pages 283, 288, 445, 447, 505, 617
Tel: GRanite 6-4411

General Electric Co., Light Military Elect. Dept., N.Y., 5
General Electric Co., Ltd. of England, England, 10
General Mills, Inc., Mechanical Div., Minn., 5
Gilfillan Bros. Inc., Calif., 10
Goodyear Aircraft Corp., Ariz., 5

Gorham Mfg. Co., Electronics Div., 333 Adelaide Ave., Providence 7, R.I., 5, 10, 15
See ad on page 593
Tel: WIlliams 1-1000

Granger Associates, Calif., 5, 10, 15
Granite State Mach. Co., Inc., N.H., 10
Gray Mfg. Co., Conn., 5
Hazeltine Corp., N.Y., 5, 10
Hoffman Electronics Corp., Calif., 5
I-T-E Circuit Breaker Co., Special Prods., Pa., 5, 10, 15
International Electronics Corp., N.Y., 5, 10, 15
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 10, 15

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 15
See ad on page 348
Tel: GRegory 2-1000

Kearfott Co., Inc., Microwave Div., Calif., 5, 10, 15
Knight Corp., Ewen, Mass., 10, 15

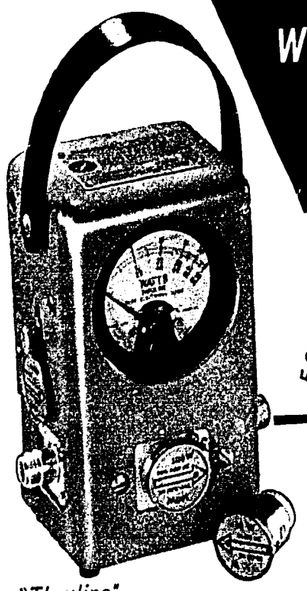
LEL, Inc., 384 Oak St., Copiague, N.Y., 5, 10
See ad on page 372
Tel: AMityville 4-2000

Laboratory for Electronics, Inc., Mass., 5, 10

Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J., 5, 15
See ad on page 300
Tel: LOwell 6-2600

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

when rf power must be absorbed or accurately measured...



"Thruline"

50 OHM NOMINAL

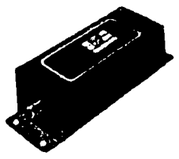
You will find dependable coaxial line instruments and accessories at Bird Electronic. Specialization in this field, backed by a constantly growing engineering staff and enlarged physical facilities, has resulted in the continuous development of new designs to meet specific requirements. If you are searching for more than a standard product for field or laboratory use, turn to Bird Electronic. Our years of experience in this field may assist you in the solution of your problem.

DIRECTIONAL RF WATTMETERS

Direct reading . . . "thru" type . . . for measuring forward or reflected power in complete systems under operating conditions . . . inserted between transmitter and antenna or load . . . full scale power and frequency range determined by plug-in elements.

Model	Line	Impedance	Frequency ELEMENTS Power		Connector
43	RG-8/U etc.	50 ohms	25-60; 50-125 100-250; 250-500; 400-1000 mc	10; 25; 50; 100; 250; 500 W	N; C; HN; UHF
4712	1⅝	50 ohms	200-500 400-1000 mc	.5; 1.0; 1.5; 2.5; 5.0 KW	Rtma Std.
460	3⅛	50 ohms	200-500 mc	1; 2.5; 5; 10	Flange
480	3⅛	51.5 ohms	400-1000 mc	25; 50 KW	Sleeve Bullet
490	6⅛	51.5 ohms	200-500 mc	25; 50 and 100 KW	

COAXIAL RF FILTERS



Designs utilize both distributed and lumped constant . . . insertion loss and VSWR are very low in pass band . . . high attenuation in stop band . . . new miniature filters as light as 5 ounces. Will produce in quantity to your specs.

	Low Pass	Low Pass	Low Pass	Low Pass	High Pass	Band Pass
Models	5310	5311	522	819-1200	530	5131
Cut Off	90 mc	160 mc	400 mc	1200 mc	420 mc	45 mc & 105 mc
Stop Band	100-180 mc	180-320 mc	500-1200 mc	1900-4000 mc	100-375 mc	33.7-39.7 mc 120-1000 mc
Max. Power	100W	100W	150W	3.5KW	50W	25W
Min. Stop Band Atten.	55db	55db	55db	40db	60db	25db 40db
VSWR in p.b.	1.5	1.5	1.35	2 to 1	2.5	1.6
Connectors	Female N		Male-Female N			Female BNC

Chart shows characteristics of typical Filters

"Termaline" RF ABSORPTION WATTMETERS

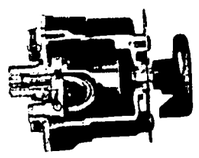
Portable . . . direct reading . . . non-radiating "load" type wattmeter . . . used in field or laboratory to measure and absorb power . . . accuracy ±5% of full scale . . . VSWR 1.1 to 1 maximum over operating range.

Model	Freq. Range	Max. Power	Power Range Scales	Input Connector
611	30-500 mc	60W	0-15; 0-60	Female N
612	30-500 mc	80W	0-20; 0-80	
67	30-500 mc	500W	0-25; 0-100; 0-500	Coplanar with Adapter to UG-21/U (optional) RG-17 & RG-19 cable assemblies: adapters to rigid lines
67C*	30-500 mc	2500W	0-100; 0-500; 0-2500	
824*	30-220 mc	5000W	0-5000	

*Water cooled (other available models described in specification sheets)

COAXIAL SWITCHES

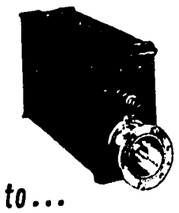
Small compact design permits the "Coaxwitch" selector to be incorporated into many electronic units where repeated channel switching is required. Finger-tip operation: pull knob, rotate and push in to make contact.



Model	74	71B	72R	65J
Positions	Six	Eight	Reversing Switch	Two
Coaxial Circuits	One	One	Two	Two
Connector	Type N female connectors are standard on all models to receive UG-21/U series plug. Use adapters with other cables and connectors.			

"Termaline" RF LOAD RESISTORS

Reflection-free terminations for 50 ohm coaxial lines . . . low VSWR . . . non-radiating . . . water cooled ratings 2500 W to 50 KW . . . air cooled rating to 1500 W.



Model	Max. Power	Freq. Range	Max.* VSWR	Connector
80	5W	0-1KMC	1.1	"N", "C", "HC"
80A	20W	0-500MC	1.1	
81	50W	0-1KMC	1.1	N Female
81B	80W	0-1KMC	1.1	
82A	500W	0-1KMC	1.1	Coplanar with Adapter to UG-21/U
883	1.2KW	0-1KMC	1.1	LC
888	1.5KW	0-1KMC	1.1	3⅛ Flanged

*Other VSWR requirements can usually be met by special selection

turn to...

BIRD ELECTRONIC CORP.

CHurchill 8-1200

30303 Aurora Road • Solon, Ohio

Western Representative:
VAN GROOS COMPANY, Woodland Hills, Calif.

For details, circle #262 on Reader Service Card

Directory I. Complete Equipment

25. Radar Equipment.

Levinthal Electronic Products, Inc., Calif., 5, 10

Litton Industries Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10
See ad on page 66
Tel: CRestview 4-7411

Litton Industries, Md. Div., Md., 5, 10, 15

Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 5
See ad on page 380
Tel: REgent 9-4321

Manson Laboratories Inc., 375 Fairfield Ave., Stamford, Conn., 10
See ad on pages 302-303
Tel: DAvis 5-1391

Marconi's Wireless Telegraph Co. Ltd., N.Y., 5, 10, 15

Martin Co., Baltimore Div., Md., 5, 10

Melpar, Inc., Va., 5, 10

Menlo Park Engineering, 711 Hamilton Ave., Menlo Park, Calif., 5, 10
See ad on page 373
Tel: DAvenport 6-9080

Metco, Inc., Mass., 5, 10, 15

Miller Associates, Conn., Raytector

Mytron, Inc., Mass., 10

Newton Co., Conn., Simulators

North American, Autonetics Div., Calif., 5

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 5, 10
See ad on page 246
Tel: BRadshaw 2-6141

Philco Corp., Govt. & Indl. Div., Pa., 5, 10, 15

Philco Corp., Western Development Labs., Calif., 10

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 5
See ad on page 267
Tel: DAvenport 1-1130

Radiation, Inc., Fla., 5, 10

Radio Receptor Co., Eng. Prods. Div., N.Y., 5

Ramage & Miller Enterprises, Calif., 5, 10, 15

Raytheon Co., Mass., 5, 10, 15

Reeves Instrument Corp., N.Y., 10

Remanco, Inc., Calif., 5, 10, Simulators

Republic Aviation Corp., N.Y., 5, 10, 15

Resdel Engrg. Corp., Calif., 10

Ryan Aeronautical Co., Ryan Electronics Div., Calif., Doppler

Sanders Assoc., Inc., N.H., 5, 10

Sierra Electronic Corp., 5442D Bohannon Drive, Menlo Park, Calif., 10
See ad on pages 30-31
Tel: DAvenport 6-2060

Skiatron Elect.-Television Corp., N.Y., 5, 10, 15

Solartron Electronic Group, Ltd., England, Simulators

Space Electronics Corp., Calif., 5, 10

Specialty Engrn. & Electrn. Co., N.Y., 5

Sperry Gyroscope Co., Calif., 5

Sperry Gyroscope Co. of Canada, Ltd., Canada, 5, 15

Sperry Rand Corp., Ford Instrument Co., Div., N.Y., 10

Sperry Rand Corp., Sperry Gyroscope Co. Div., N.Y., 10

Sperry Rand Corp., Sperry Gyroscope Co. Div., N.Y., 10

Sperry Rand Corp., Sperry Gyros. Div., Surface Armament Div., N.Y., 10

Sperry Rand Corp., Sperry Piedmont Co. Div., Va., 10, 15

Spilsbury & Tindall Ltd., Canada, 15

Standard Telephones & Cables, Ltd., England, 5, 10

Stavid Engineering, Inc., N.J., 5, 10, 15

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 10
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Strand Engineering Co., Mich., 5, 10

Sylvania Electric Products Inc., Special Tube Operations, 500 Evelyn Ave., Mountain View, Calif., 5, 10, 15
See ad on pages 26-27
Tel: YOrkshire 8-6211

Sylvania Electric Products Inc., Sylvania Electronic Systems Div., Mass., 5

Systems Inc., Fla., 5, 10

Telectro Industries Corp., N.Y., 5, 10, 15

Telephonics Corp., N.Y., 5

Telerad Mfg. Corp., N.Y., 5

Temco Aircraft Corp., Electronics Div., Texas, 5, 10, 15

Texas Instruments Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 5, 10, 15
See ad on pages 75-78
Tel: FLeetwood 7-5411

Transdyne Corp., N.Y., 10

Twenty First Century Electronics, Inc., Calif., 5, 10

Underwood Corp., Canoga Div., Calif., 5, 10, 15

United Aircraft Corp., Norden Div., Conn., 5

United Aircraft Corp., Norden Div. Norden Labs., N.Y., 5

Victor R. F. & Microwave Co., Mass., 5

Waldorf Instrument Co., Huyck & Sons Div., N.Y., 10

Westinghouse Electric Corp., Md., 10

Westinghouse Electric Corp., Pa., 5

Wilcox Electric Co., Inc., Mo., 5

Wunderlich Radio Co., Ill., 10

Radar reflectors: See class 37

Radiation detectors: See class 22

26. Radio Frequency Test Equipment.

5. Field strength meters	42. RF signal generators
10. Impedance & admittance meters	45. Signal generators, AM
15. Marker generators	50. Signal generators, FM
20. Multi-vibrators	52. Signal generators, SSB
25. Oscillators	55. Sweep generators
30. Phase meters	
35. "Q" meters	
40. RF power output meters	

A.R.F. Products, Inc., Ill., 42, 50

Acton Laboratories, Inc., 536 Main St., Acton, Mass., 30
See ad on page 292
Tel: COlonial 3-7756

Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 30
See ad on page 337
Tel: GRegory 2-5622

Adler Electronics, Inc., N.Y., 42, 45, 50

Aero Guidance Corp., Calif., 45, 50, 55

Airborne Instrument Lab., N.Y., 40

Airmec Limited, England, 25, 30, 42, 45, 50

Airtronics, Inc., D.C., 25, 42, 55

Airtronics International Corp., Fla., 40

Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 10
See ad on page 590
Tel: HAncock 6-2150

Alfred Electronics, Calif., 25, 55

American Electronics Co., N.Y., 25

American Mach & Foundry Co., D.C., 45, 50

American Quartz Labs., N.Y., 25

Andrew Antenna Corp., Ltd., Canada, 30

Arenberg Ultrasonic Laboratory, Inc., 94 Green St., Jamaica Plain (Boston) 30, Mass., 25
See ad on page 388
Tel: JAmaica 2-8640

Arkay, Inc., New York, 42, 45

Armstrong Whitworth Aircraft Ltd., Sir W. G., A.W.E. Electronics, Hucclecote, Gloucester, England, 25, 40
See ad on page 359
Tel: TOll Bar 2261

Audio-Video Corp., N.Y., 5

Avionics Corp. of America, Pa., 40, 50

Avo, Ltd., N.Y., 45, 50

Avtron Mfg. Co., Ohio, 5, 30, 40

B. J. Electronics, Borg-Warner Corp., Calif., 42

Babcock Radio Engrg., Inc., Calif., 42

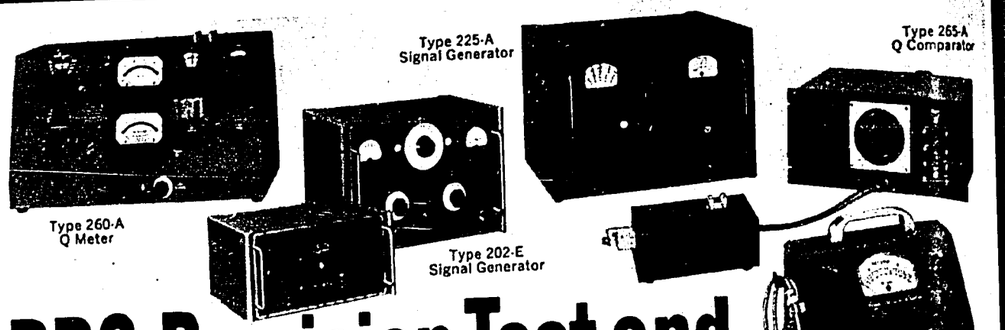
Barker & Williamson, Inc., Pa., 10, 40

Bassett, Inc., Rex, Fla., 5, 25

Bendix Aviation Corp., Jones Elect Co., M. C., Conn., 40

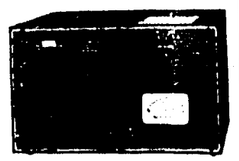
Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 40
See ad on page 170
Tel: LOwell 3-9511

Bergen Laboratories, Inc., 247 Crooks Ave., Clifton, N.J., 30
See ad on page 471
Tel: GRegory 3-7800



BRC Precision Test and Measuring Instruments

–Specified World-wide for Quality and Dependability



Type 250-A RX Meter

	TYPE	FREQ. RANGE	Q RANGE	TUNING CAP. RANGE	Q ACCURACY	PRICE
Q Meters	260-A	50KC to 50MC	10 to 625	30 to 460$\mu\mu$f	5% to 30MC	$850.00
	190-A	20 to 260MC	5 to 1200	7.5 to 100$\mu\mu$f	7% to 100MC	$875.00

	TYPE	FREQ. RANGE	Q RANGE	L RANGE	C RANGE	R RANGE	PRICE
Q Comparators	265-A	200KC to 70MC	30 to 500	.15μh to 15mh	5$\mu\mu$f to .01μf	500Ω to 20MΩ	$795.00

	TYPE	FREQ. RANGE	OUTPUT RANGE	FM MOD.	AM MOD.	PRICE
FM-AM Signal Generators	202-E	54 to 216MC	0.1μv to 0.2 v.	0 to 240KC	0 to 50%	$1125.00
	202-G	195 to 270MC	0.1μv to 0.2 v.	0 to 240KC	0 to 100%	$1100.00
	225-A	10 to 500MC	0.1μv to 0.1 v.	0 to 60KC	0 to 30%	$ 945.00

	TYPE	FREQ. RANGE	OUTPUT RANGE	FM MOD.	AM MOD.	MARKERS	PRICE
Sweep Signal Generators	240-A	4.5 to 120MC	1μv to 0.3v. Sweep 1μv to 0.1v. CW & AM	±1% to ±30% of center freq.	30%	crystal and pip.	$1820.00

	TYPE	FREQ. RANGE	OUTPUT RANGE	MODULATION	MODULATING FREQ.	PRICE
Aircraft VOR/ILS Signal Generators	211-A	88 to 140MC	0.1μv to 0.2v.	0-100% AM	400 & 1000 cps	$1890.00
	232-A	329.3 to 335MC	1μv to 0.2v.	0-100% AM	90/150 & 1000 cps	$1990.00

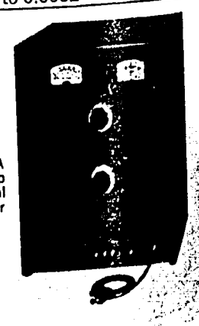
	TYPE	FREQ. RANGE	R RANGE	C RANGE	L RANGE	PRICE
RX Meters	250-A	500KC to 250MC	15Ω to 100.000Ω	0 to 20$\mu\mu$f	0.001μh to 100mh	$1525.00

	TYPE	FREQ. RANGE	CALIBRATED INPUT	CALIBRATED OUTPUT	% AM RANGE	PRICE
Signal Generator Calibrators	245-C	500KC to 1000MC	0.025, 0.05, 0.1v	5, 10 or 20μv	10-100%	$390.00
	245-D	500KC to 1000MC	0.025, 0.05, 0.1v	0.5, 1.0, or 2.0μv	10-100%	$385.00

	TYPE	FREQ. RANGE	OUTPUT RANGE	FM MOD.	AM MOD.	ACCESSORY TO:	PRICE
Univerters	207-E	100KC to 55MC	1μv to 0.1v.	0-240KC	0 to 50%	202-E	$430.00
	203-B	100KC to 25MC	1μv to 0.1v.	1.5 to 30MC	30%	240-A	$420.00

	TYPE	MEASURES	THICKNESSES	PRICE
Film Gauge	255-A	Non-magnetic Metals	0.000004" to 0.0002"	$575.00

BRC Precision Test Equipment is engineered and manufactured to the highest standards of the industry–standards that have made the BRC trademark a recognized symbol of precision and dependability throughout the world. Highly qualified field representatives–specialists in electronic test equipment–stand ready to solve customer problems in every major foreign and domestic area. For the complete facts write today for the new BRC catalog.



Type 240-A Sweep Signal Generator

25th ANNIVERSARY *Precision Electronic Instruments since 1934*

Boonton Radio Corporation

BOONTON, NEW JERSEY, U.S.A.

For details, circle #263 on Reader Service Card

Magnetic Amplifier Relays RL – 101, RL – 102 and RL – 103. Sensitivity 40 microwatts.

Variable Delay Lines: Rise time 55ns; impedance 75 to 1500 ohms; resolution time less than 8 x 10⁻¹¹ sec.; total delay up to 1200 μs.

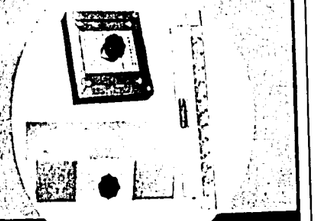
Step Variable Delay 602-603 Series: Equal input and output impedance; 11 different steps; total delay 0.2 μs to 27.5 μs; impedance 75 to 500 ohms.

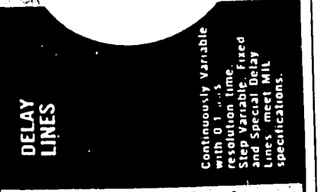
Tapped Delay Lines ST, 6T, 7T, 8T and 9T Series: Total delay 0.1 μs to 500 μs; impedance 50 ohms to 2500 ohms.

AD-YU ELECTRONICS LAB., INC. formerly ADVANCE 249 Terhune Ave., Passaic, N. J.

DELAY LINES

Continuously Variable with 0.1 μs resolution time. Step Variable, Fixed and Special Delay Lines meet MIL specifications.





Type 405 Series Direct reading in degrees

Type 405H — 8 cps to 500 kc. Type 405 — 8 cps to 100 kc. Type 405L — 1 cps to 20 kc. No amplitude adjustment 0.25° relative accuracy

Type 205A1 — A2 — 100 kc to 15 mc, 0.05° accuracy

Type 205B — 10 mc to 500 mc, 0.05° accuracy

Type 202 — 20 cps to 150 kc, 1° full scale sensitivity, accuracy 0.02° or 2%

PHASE METERS

0.0001 CPS TO 500 MEGACYCLES Accuracy 0.05 Microvolt Sensitivity

For details, circle #264 on Reader Service Card

Directory I. Complete Equipment

26. Radio Frequency Test Equipment.

Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, 40, RF Wattmeters
See ad on page 334
Tel: CHurchill 8-1200

Blaine Electronetics, Inc., Calif., R. F. Antenna Pattern Test Equipment

Blonder-Tongue Labs., Inc., N.J., 5

Boonton Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J., 25
See ad on page 278
Tel: JEfferson 9-4210

Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., 10, 35, 42, 45, 50, 55
See ad on page 336
Tel: DEerfield 4-3200

British Thomson-Houston Co., Ltd., England, 5, 10

Bruno-New York Industries Corp., N.Y., 40, 42

Brunswick Instruments, N.J., 40

Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62nd St., Woodside 77, N.Y., 25
See ad on page 440
Tel: NEwtown 9-5700

Canadian Marconi Co., Canada, 5, 10, 25, 35, 40, 42, 45, 50, 55

Canadian Research Institute, Canada, 42, 45

Canoga Corp. of California, Calif., 55

Centronix, Inc., Fla., 45, 50

Chapin Electronics, Inc., Mass., 5

Clough-Brengle Co., Ill., 42, 45, 55

Collins Radio Co., 855 35th St. N.E., Cedar Rapids, Iowa, 52
See ad on pages 32-33
Tel: EMpire 3-0281

Community Engineering Corp., Pa., 55

Compagnie Generale de Metrologie, France, 45, 50

Creative Electronics Corp., Conn., 5, 20, 25, 40, 52

Crosby Laboratories, Inc., N.Y., 52

Cubic Corp., Calif., 30

Dawe Instruments Ltd., England, 25

Daystrom Inc., Weston Instruments Div., N.J., 10, 30, 40

Decade Instrument Co., N.J., 25, 55

Defiance Engrg. & Microwave Corp., Mass., Noise Generators

Dynamic Electronics-New York, Inc., N.Y., 5, 15, 25, 40, 42, 45, 50, 55

Dynamic Instrument Co., Inc., Mass., 30, Angle

Dytronics Co., Ohio, 30

E H Research Labs., Inc., 1922 Park Blvd., Oakland 6, Calif., 42
See ad on page 298
Tel: GLencourt 2-1314

E.M.I. Electronics Ltd., England, 25, 40

EPR Special Products Corp., N.Y., 25, 30, 42, 45, 50, 52, 55

Ehrenpreis, Consulting Engrg., David, N.Y., 20

Electro Impulse Laboratory, 208 River St., Red Bank, N.J., 40
See ad on pages 92-93
Tel: SHadyside 1-0404

Electronic Applications, Inc., Conn., 42

Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y., 15, 42, 55
See ad on page 295
Tel: STillwell 6-8700

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 5, 40
See ad on page 91
Tel: VIctor 2-8400

Engineering Associates, Ohio, 5, 20, 35, 42, 45, 50, 55

Ensco, Inc., Utah, 25

Erwood, Inc., Ill., 5

Federal Mfg. & Enc., Corp., N.Y., 15, 42, 50

Ferris Instrument Co., N.J., 5, 42, 50, 52

Fisher Research Lab., Inc., Calif., 25

Flow Corp., Mass., 40

Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 25, 42
See ad on page 400
Tel: CEnter 9-6100

General Communication Co., Mass., 30, 42

General Devices, Inc., P.O. Box 254, Princeton, N.J., 25
See ad on page 360
Tel: DAvis 9-2323

General Electronic Labs., Inc., Mass., 5

General Radio Co., West Concord, Mass., 10, 25, 42, 45, 55
See ad on Cover 4
Tel: EMerson 9-4400

Gordon Co., Herbert W., Mass., 5, 30, 42

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 42
See ad on page 204
Tel: VAn Buren 6-6300

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 15, 25, 35, 42, 45, 55
See ad on page 328
Tel: YUkon 3-3961

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 10, 25, 40, 42, 45
See ad on pages 3-18
Tel: DAvenport 5-4451

Hickok Electrical Instrument Co., Ohio, 5, 15, 20, 25, 40, 42, 45, 50, 55

Hupp Electronics Co., Pa., 15, 20

Industrial Television, Inc., N.J., 5

Industrial Test Equipment Co., 55 East 11th St., New York 3, N.Y., 30
See ad on page 339
Tel: GRamercy 3-4684

Interference Testing & Research Lab., Inc., Mass., 5

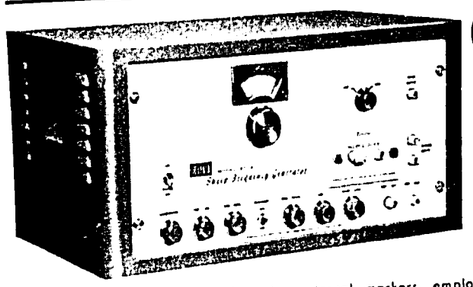
International Crystal Mfg. Co., Inc., Okla., 25, 42

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

PRECISION TEST EQUIPMENT

JERROLD

FOR ACCURATE QUANTITATIVE MEASUREMENTS... USING SWEEP FREQUENCY GENERATOR TECHNIQUES...



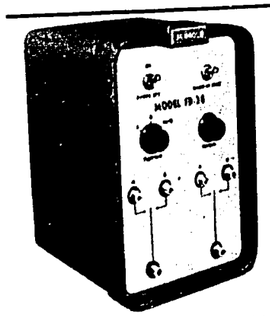
NEW

WIDE BAND SWEEP FREQUENCY GENERATOR — MODEL 900-A

SWEEP WIDTHS—AS WIDE AS 400 MC . . . FROM 0.5 MC to 400 MC. The JERROLD Model 900-A, Wide Band Sweep Frequency Generator is an instrument of unusual versatility. In two ranges—0.5 to 400 MC and 275 MC to 1200 MC—the instrument supplies sweeps with center at any frequency from 500 KC to 1000 MC and sweep widths as broad as 400 MC and as narrow as 100 KC. RF output—carefully monitored by matched, crystal diodes feeding two stage, push-pull AGC amplifier—is flat within ±0.5 db over sweep width up to 800 mcs. and ±1.5 db from 800 mcs. to 1200 mcs. When using sweep widths as narrow as 20 mcs. flatness at any frequency is approximately ±0.15 db. The output voltage is 0.5 RMS across a 50 ohm load at the upper range and 0.25 volts lower range.

The instrument features provisions for external markers, employing "birdie bypass" circuitry, and a plug-in R.F. detector that can be used in remote applications.

$1260.00



A HIGH SPEED COAXIAL SWITCH — MODEL FD-30

For the simultaneous display of two channels or voltages on an oscilloscope.

Frequency range of coaxial circuit is from DC to 250 MC with a VSWR of less than 1.1 at 50 or 75 ohms impedance. Switch contacts "Mercury-Wetted" with an adjustable switch rate of 30, 15 or 10 cps.

$250.00

Wide Band Sweep Generators—Models 601 and 602

Portable, wide band instruments designed for the test and alignment of LF, IF, and RF circuitry. The Generators feature an electronic, saturable reactor sweep circuit with a maximum sweep deviation of approximately 5 to 1. RF output on all ranges is fundamental.

MODEL 601

12 MC to 225 MC in eleven overlapping ranges. RF output of 1.0 volt RMS. Output flat ±½ db over widest sweep width and as flat as 1/5 db at sweep widths of 40 mc or lower.

MODEL 602

4 MC to 112 MC in eleven overlapping ranges. RF output of 2.5 volts RMS. Output flat within ±½ db.

Other Generators available on special order to cover any portion of the frequency range from 15 KC to 225 MC.

$395

VARIABLE, LABORATORY ATTENUATORS — MODELS AV-50 and AV-75

$150.00

Variable, switch-type attenuators from DC to 500 MC. The attenuators feature: 0 to 62.5 db attenuation, in 0.5 db steps; insertion loss of ¼ db at 250 MC, and ½ db at 500 MC; VSWR of less than 1.15 at 250 MC, and less than 1.4 at 500 MC. Jerrold developed rotary, coaxial switches that utilize a floating rotor with dual wiping, self aligning contacts mounted in a "Tel-F" dielectric, completely shielded switch sections; and rugged, compact construction. Model AV-50 is 50 ohms with BNC connectors, and Model AV-75 is 75 ohms with Jerrold "F" Series connectors

ALSO AVAILABLE FOR ACCURATE QUANTITATIVE MEASUREMENTS

MODEL 707 — PRECISION SWEEP GENERATOR

Available with plug-in oscillator heads for any frequency range from 4 MC to 250 MC. Flatness ±5/100 db, power output +20 dbm.

MODEL CM-6 & CM-10 — CRYSTAL MARKERS

Available with 6 or 10 crystal frequencies of your choice. Harmonics, side band or "birdie bypass" markers.

MODEL VC-12 — VOLTAGE COMPARATOR

For use with any sweep generator for accurate quantitative measurements of Voltage, Power, dbm, and relative db differential.

MODEL SPR-100 — OSCILLOSCOPE PREAMPLIFIER

A complete sweep generator accessory featuring a built-in amp that is flat to 250 MC, a preamp. gain of 40 db, and provision for marker insertion employing "birdie bypass" circuitry.

JERROLD **ELECTRONICS CORPORATION**

Industrial Products Division
Dept. TED 33, The Jerrold Building
Philadelphia 32, Pa.

Jerrold Electronics Corp., Ltd., Toronto, Canada — Export Representative, Rocke International, New York 16, New York

Prices and Data Subject to Change Without Notice

For details, circle #265 on Reader Service Card

Directory I. Complete Equipment

26. Radio Frequency Test Equipment.

A.T.&T. Corp., Indust. Prods. Div., N.J., 5, 10, 25, 30, 40, 42, 45, 50, 55

A-V-M Microwave Co., Ill., 25, 42

Jackson Elec. Instrument Co., Ohio, 50

Jerrold Electronics (Canada) Ltd., Canada, 5, 55

Jerrold Electronics Corp., Dept. TED 33, The Jerrold Bldg., Philadelphia 32, Pa., 5, 15, 42, 55
See ad on page 338
Tel: BAldwin 6-3456

Jones, Inc., F. R., D.C., 25, 30, 42

Jones Electronics Co., Inc., M. C., Conn., 40

Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 15, 35, 42, 50, 55, Random Noise Generator
See ad on page 268
Tel: CApital 6-4000

Knight Electronics, Ill., 42, 45, 55

Knights Co., James, 101 E. Church St., Sandwich, Ill., 25, 42
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Tel: 2141

Laboratory for Electronics, Inc., Mass., 25

Lambda-Pacific Engr., Inc., Calif., 40

Lampkin Labs., Inc., Fla., 42

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 45
See ad on page 300
Tel: LOwell 6-2600

Lewyt Mfg. Corp., N.Y., 55

M E Labs., Calif., 25, 42, 45, 50, 55

Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 25, 42
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Tel: DAvis 5-1391

Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 25, 35, 40, 42, 45, 50, 55, FM Deviation
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Tel: LOwell 7-0607

Marconi's Wireless Telegraph Co., Ltd., N.Y., 25

Maxson Corp., W. L., Instruments Div., N.Y., 25, 35

Measurements, a McGraw Edison Div., Box 180, Boonton, N.J., 5, 42, 45, 50
See ad on page 340
Tel: DEerfield 4-2131

Menlo Park Engineering, 711 Hamilton Ave., Menlo Park, Calif., 55
See ad on page 373
Tel: DAvenport 6-9080

Metropolitan Electronics & Instruments Co., N.Y., 45, 50, 55

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., Grid Dip Meter
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Tel: Davenport 4-4108

Monitor Products Co., Calif., 25

Morrow Radio Mfg. Co., Oregon, 5

Motorola Communications & Electronics, Ill., 55

Mu Beta Products, Calif., 42, 45, 50

Nems-Clarke Co., Md., 5, 30

Nevada Ag. Products Co., Nevada, Antenna Tuning Equip.

New London Instrument Co., Conn., 42, 45, 50

Nichols Ltd., R. H., Toronto, Ont., Canada, 45, 50

Nilsen Mfg. Co., Ill., 50

North Atlantic Industries, Inc., 603 Main St., Westbury, L.I., N.Y., 30
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Tel: EDgewood 4-1122

North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 35
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Tel: PIoneer 7-0555

Northeast Electronics Corp., N.H., 30, Transmission Test

Nuclear-Electronics Corp., Pa., 42, 45

Pacific Transducer Corp., Calif., 55

Philco Corp., Govt. & Ind'l Div., Pa., 42, 45, 50, 52, 55

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 25, 30
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Tel: CAnal 6-7250

Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 5, 25, 42, 45, 50, 55
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Tel: EXeter 2-4500

Precise Development Corp., N.Y., 35, 20, 25, 42, 45, 50, 55

Precision Apparatus Co., Inc., N.Y., 35, 25, 42, 45, 50, 55

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 35
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Tel: POrt Washington 7-8150

Radar Measurements Corp., 100 Dutty Ave., Hicksville, L.I., N.Y., 5, 30, 42
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Radio City Products Co., Inc., Pa., 42, 45, 50

Radio Corp. of America, Electron Tube Division, Section 1-22-Q, 415 South Fifth St., Harrison, N.J., 15, 25, 42, 45, 50, 55
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Tel: HUmboldt 5-3900

Radiometer, Denmark, 25, 35, 42, 45, 50, 55

Ramsey & Miller Enterprises, Calif., 42, 45

Rawson Electrical Instrument Co., 118 Potter St., Cambridge 42, Mass., 40
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Remotron, Inc., Calif., 50

Reynolds Electronics Indust. Corp., N.Y., 5, 35, 42, 45, 50

Riedel Electric Corp., Calif., 20, 25, 42

Riker Dissectaphone, Europe, 45, 50, 55

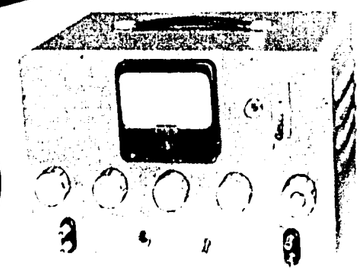
Manufacturers of:

PHAZOR PAT. PEND

PHASE METER

MODEL 200AB

PRICE $419.00



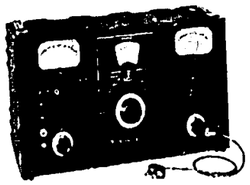
PHASE METERS
•
NULL DETECTORS
•
IMPEDANCE COMPARATORS
•
POWER OSCILLATORS
•
FREQUENCY STANDARDS
•
AUTOMATIC HI-POT
•
Other Electronic Test Equipment

2° absolute accuracy
Readings not affected by noise and harmonics
Frequency range 15 CPS – 30KC
Accuracy to .01 degree with simple circuit techniques
High sensitivity on input & reference channels
Can measure in-phase & quadrature voltage component

For further information contact your nearest representative or write for brochure

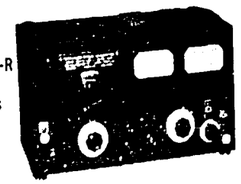
ITECO **INDUSTRIAL TEST EQUIPMENT CO.**
55 E. 11th ST · NEW YORK 3 · GR. 3-4684

For details, circle #266 on Reader Service Card



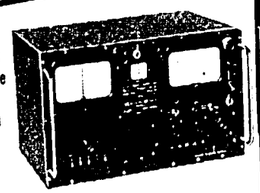
MODEL 65-B
Standard
Signal Generator

MEASUREMENTS'
Electronic Instruments for Research, Development and Design



MODELS 80 and 80-R
Standard
Signal Generators

MODEL 210 Series
FM Standard
Signal Generators

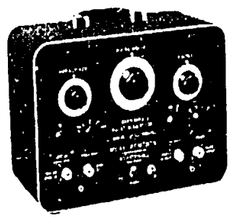


MODEL 58-AS
VHF Radio Noise
and
Field Strength
Meter

MODEL 72
Square Wave
Generator

MODEL 202-C
Standard Barretter
Bridge

MODEL 59
Megacycle
Meter



MODEL 179
Standard
Pulse
Generator

MODEL 162
Vacuum
Tube
Voltmeter

STANDARD SIGNAL GENERATORS

MODEL	FREQUENCY RANGE	PRICE
65-B	75 Kc to 30 Mc	$875.00
80	2 Mc to 400 Mc	590.00
80-R	5 Mc to 475 Mc	625.00
82	20 cps to 200 Kc 80 Kc to 50 Mc	660.00
84-TVR	400 Mc to 1000 Mc	785.00
95	50 Mc to 400 Mc	1800.00
210 Series	25 Mc to 480 Mc	450.00 to 475.00

VHF RADIO NOISE AND FIELD STRENGTH METER

MODEL	FREQUENCY RANGE	PRICE
58-AS	15 Mc to 150 Mc	$925.00

SQUARE WAVE GENERATORS

MODEL	FREQUENCY RANGE	PRICE
71	6 cps to 100,000 cps	$195.00
72	5 cps to 5 Mc	248.00

MEGACYCLE "GRID-DIP" METERS

MODEL	FREQUENCY RANGE	PRICE
59-LF	100 Kc to 4.5 Mc	$168.00
59	2.2 Mc to 420 Mc	168.00
59-UHF	420 Mc to 940 Mc	198.00

VACUUM TUBE VOLTMETERS

MODEL	FREQUENCY RANGE	PRICE
67	5 to 100,000 sine-wave cps	$235.00
162	27 cps to over 150 Mc	210.00

CRYSTAL CALIBRATORS

MODEL	FREQUENCY RANGE	PRICE
111	250 Kc to 1000 Mc	$ 97.50
111-B	100 Kc to 1000 Mc	110.00

STANDARD BARRETTER BRIDGE

MODEL	FREQUENCY RANGE	PRICE
202-C	2 Mc to 1000 Mc	$375.00

STANDARD PULSE GENERATOR

MODEL	FREQUENCY RANGE	PRICE
179	60 cps to 100,000 cps	$365.00

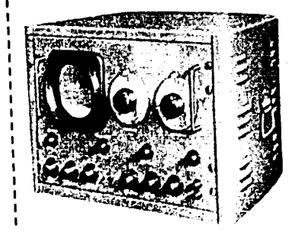
This is only a partial listing of Measurements' products. Write for our complete Catalog.

Laboratory Standards

MEASUREMENTS
A McGraw-Edison Division
BOONTON, NEW JERSEY

For details, circle #267 on Reader Service Card

SPECTRUM ANALYZERS
TELEMETERING CALIBRATORS



Model SS-100

SPECTRUM ANALYZERS

MODEL SS-5 — 1 cycle to 5 KC Resolution to 2 cycles

MODEL SS-100 — 13.5 cycles to 110 KC Resolution to 27 cycles.

MODEL SS-500 — 75 cycles to 500 KC Resolution to 150 cycles.

MODEL UR-10 — 100 KC to 10 MC Resolution to 500 cycles.

Synchronous Sweep Generators and Variable Rate Attachments available for all Spectrum Analyzers.

SINGLE SIDEBAND SPECTRUM MONITOR MODEL MD-500

500 kc center frequency
0-100 kc sweep width
Resolution to 10 cycles.

The MD-500 has a built-in frequency converter for operation to over 500 mc

TELEMETERING CALIBRATORS

Telemetering calibrators designed to give separate crystal controlled calibrated frequencies for the 23 telemetering sub carrier channels.

Calibrators available with 11, 9, 7, 5 or 3 points with crystal oscillators accurate to ± .005%, ± .001%, or ± .00025%.

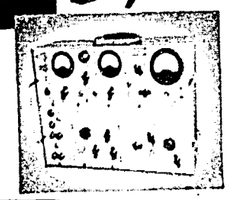
PROBESCOPE calibrators exceed all Inter-range Instrument Group Specifications.

PROBESCOPE CO., Inc.
8 Sagamore Hill Drive
Port Washington, N.Y.
Phone: Port Washington 7-8150

For details, circle #268 on Reader Service Card

Tomorrow's Circuitry

RT-500 RECEIVER-TRANSMITTER TESTER

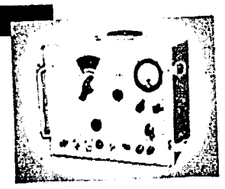


Equivalent to AN/TRM-1. Laboratory-quality portable instrument, designed to measure performance on transmitting and receiving equipment.
- Frequency Range: 190 KC to 400 MC
- Signal Generator Output: 2.5 to 100,000 microvolts into 50 ohms
- Transmitter Tester Power Range: 3 to 100 watts
- Volt/Milliwatt Meter: multi-range meter measures AC, DC volts and milliwatts

SG-25 STANDARD SIGNAL GENERATOR

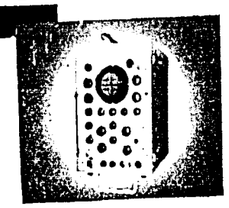
Equivalent to AN/URM-25D. For alignment of radio receivers, measurements of receiver sensitivity and selectivity, and in all radio frequency voltage measurement work.
- Frequency Range: 10 KC to 50 MC in 8 bands
- Calibrated Output: 0.1 to 100,000 microvolts into 50 ohms
- High Output: 2.0 volts, 500 ohms impedance

SG-26 STANDARD SIGNAL GENERATOR



Equivalent to AN/URM-26B. For alignment of radio receivers, measurements of receiver sensitivity and selectivity, and in all radio frequency voltage measurement work.
- Frequency Range: 4 to 405 MC in 6 bands
- Calibrated Output: 0.1 to 100,000 microvolts into 50 ohms
- Output Impedance: 50 ohms nominal

PO-400 PULSE OSCILLOSCOPE



Equivalent to AN/USM-38. Precision portable oscilloscope for analyzing amplitude and time characteristics of complex electrical waveforms.
- Transient Response: 0.06 microseconds (rise time)
- Square Wave Response: less than 5% drop at 50 cycles
- Deflection Sensitivity: 0.1V RMS per inch
- Sweep: 1 to 100,000 microseconds per inch, triggered or recurrent

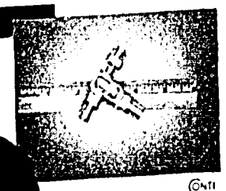
AT-120-R. F. STEP ATTENUATOR

Designed for use in output systems of signal generators, precision microvolters, IF strips of microwave receivers, etc.
- Frequency Range: 0 to 1000 MC
- Attenuation Range: up to 120 db in ten steps
- Output Impedance: 50 ohms standard, 75 ohms optional
- VSWR: 1.1 up to 500 MC, 1.2 up to 1000 MC

CS-200 SERIES COAXIAL SWITCHES

For all types of coaxial switching.
- Positions: up to 12
- Nominal Impedance: 5 ohms
- VSWR: 1.2 up to 500 MC, 1.3 up to 1000 MC
- Cross-talk for 12 Position: greater than 75 db down at 1000 MC

CM-300 CRYSTAL DETECTOR MOUNT



For general purpose in RF monitoring 50 or 75 ohm coaxial systems. Can be used with Trad Attenuator AT-120.
- Frequency Range: 10 to 1000 MC
- Accuracy: ½ db
- Impedance: available in 50, 75, 100, 150 and 225 ohms
- Maximum Signal Output: 2.5 V RMS

Trad has a complete, diversified line of electronic products, some of which are listed here. All products are available for speedy delivery. Trad's national representative organization is now being expanded. Interested reps may write or call George Trad at Prospect 6-7445 for appointment.

TRAD ELECTRONICS CORPORATION
1001 First Ave.
Asbury Park, N. J.

©NTI

For details, circle #269 on Reader Service Card

Directory I. Complete Equipment

26. Radio Frequency Test Equipment.

Radio & Schwarz Sales Corp., Boro, N.J., 5, 10, 25, 30, 35, 40, 42, 45, 50, 55

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Schwartz Electro, N.Y., 5, 45

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Siemens & Halske, A.G., Germany, 25, 30, 35, 4, 25, 30, 32, 55

Sierra Electronic Corp., 5442D Bohannon Drive, Menlo Park, Calif., 25, 40, 42

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Tel: DAvenport 6-3699

Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 5, 15, 42, 45, 50, 55

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Tel: EStebrook 9-1121

Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada, 25, 40, 42

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Tel: CHerry 4-5519

Specialty Engrg. & Electric Co., N.Y., 45, 50

Spectralab Instruments, Calif., 42, 45, 50

Sperry Electron Co., Mass., Interference Locator

Stark Electronic Instruments Ltd., Canada, 25, 4, 42, 45, 50, 55

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 42, 45, 50

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Tel: POrt Washington 7-7200

Stoddart Aircraft Radio Co., Inc., 6644 Santa Monica Blvd., Hollywood 38, Calif., 5

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Tel: HOllywood 4-9292

Superior Tool & Die Co., Inc., Bridgeport 1, Conn., 25

Systron-Donner Corp., Elec., 45, 50, 52

Tower Radio & Television Co., N.Y., 25, 42, 45

Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 42

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Tel: OWens 8-4800

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Telecto Industries Corp., N.Y., 5, 15, 45, 50, 52

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Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 52

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Tel: EDgewood 3-1027

Tel Instrument Electronics Corp., N.J., 25, 42, 45, 50, 55

Telonic Industries, Inc., Ind., 15, 25, 42, 55

Thomas Electronics, Inc., N.J., 55

STODDART RADIO INTERFERENCE
AND FIELD INTENSITY MEASURING EQUIPMENT

covering a frequency range of 30 cps to 1000 mc

NM-40A (AN/URM-41)
30 cps to 15 kc

SELECTIVE OPERATION/Specifications

Sensitivity: For a one-to-one signal-to-noise ratio, the sensitivity of the NM-40A is better than 0.15 microvolt from 1000 to 15,000 cps, 0.25 microvolt from 300 to 1000 cps and 1.0 microvolt from 30 to 300 cps, when used as a selective two-terminal voltmeter with its narrowest bandwidth and an input impedance of 100,000 ohms.

Spurious Responses:

$2\ F_0' > 60$db down from F_0
$3\ F_0' > 55$db down from F_0
All others > 75 db down
} where F_0 is any input signal using selective operation

WIDEBAND OPERATION/Specifications

Frequency Response: 30 cps to 15 kcs, ±0.5 db.

Sensitivity: 15 microvolts sensitivity at input impedance of 100,000 ohms.
Input Impedance: 50, 600, 10,000 and 100,000 ohms.
The NM-40A may also be used as an ultra-sensitive AUDIO frequency WAVE ANALYZER.

NM-10A (AN/URM-6B)
14 kc to 250 kc

GENERAL SPECIFICATIONS:

Sensitivity: Electrostatic pickup using rod antennas, one microvolt-per-meter to 2 volts-per-meter. Electro-magnetic pickup using shielded loop antennas, 10 microvolts-per-meter to 100 volts-per-meter. As a two-terminal voltmeter, either balanced or unbalanced, one microvolt to one volt.

Effective Random Noise Bandwidth: Varies from approximately 55 cps to 400 cps over the frequency range. Calibration charts give exact figures for each frequency.

Image Rejection: Better than 50 db.

I.F. Rejection: Greater than 60 db.

The equipment is of sturdy drip-proof construction and may be operated for prolonged periods in driving rain or snow with no deleterious effects.

NM-20B (AN/PRM-1A)
150 kc to 25 mc

GENERAL SPECIFICATIONS:

Sensitivity: As a two-terminal voltmeter, either balanced or unbalanced, one μv to one volt. Electrostatic pick-up using rod antenna, 2 μv/meter to 2 volts-per-meter. Electromagnetic pick-up using shielded loop antenna: SMALL LOOP, 10 to 30 μv/meter min. to 10,000 to 30,000 μv/meter max.; LARGE LOOP, 2 to 6 μv/meter min. to 20,000 to 60,000 μv/meter max.

Image Rejection: Better than 50 db.

I.F. Rejection: >45 db.

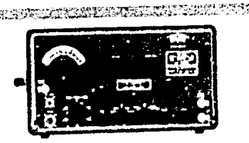
BFO is provided for C.W. reception.

NM-30A (AN-URM-47)
20 mc to 400 mc

Sensitivity: Radiated pick-up using a calibrated, tuned dipole (without reflector), 0.6 to 60 μv/meter, depending on frequency. Conducted pick-up via 50-ohm matched coaxial line, 0.5 to 1 μv from 20 to 240 mc, less than 6 μv from 240 to 400 mc.

Spurious Response Rejection: Better than 40 db.

I.F. Rejection: >60 db.



NM-50A (AN/URM-17)
375 mc to 1000 mc

Sensitivity: Radiated pick-up using a calibrated, tuned dipole (without reflector) 35 to 160 μv/meter, depending on frequency. Conducted pick-up via 50-ohm matched coaxial line, 2 to 5 μv.

Impulse Bandwidth: Approximately 600 kc over frequency range.

Image Rejection: Better than 40 db.

Spurious Response Rejection: Better than 40 db.

I.F. Rejection: >80 db.

APPROVAL DATA CHART

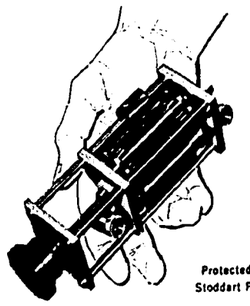
STODDART & MILITARY TYPE	FREQUENCY	MIL-I-16910A (Ships) Amend. #2	MIL-I-26600* (U.S.A.F.) & MIL-I-6181B	MIL-I-11748B (Sig. C)	S.A.E.	A.S.A.	C.I.S.P.R.
NM-40A (AN/URM-41)	30cps-15Kc	CLASS "I"	Not Req'd	Not Req'd	Not Req'd	Not Req'd	Not Incl.
NM-10A (AN/URM-6B)	14Kc-250Kc	CLASS "I"	Not Req'd	APPROVED	Not Req'd	CISPR 2 Proposed	Not Incl.
NM-20B (AN/PRM-1A)	150Kc-25Mc	CLASS "I"	CLASS "I" *CATEGORY "A"		Not Req'd	CISPR 2 Proposed	--
NM-30A (AN/URM-47)	20Mc-400Mc	CLASS "I"	CLASS "I" *CATEGORY "A"	APPROVED	APPROVED	CISPR 3 Proposed	APPROVED
NM-50A (AN/URM-17)	375Mc-1000Mc	CLASS "I"	CLASS "I" *CATEGORY "A"	APPROVED	Not Req'd	CISPR 3 Proposed	Not Incl.

** Can be supplied with C.I.S.P.R. Recommended detector time constants.
S.A.E. (Society of Automotive Engineers)
A.S.A. (American Standards Association)
C.I.S.P.R (Comite International Special des Perturbations Radioelectriques (International Special Committee on Radio Interference)

All items immediately available from stock

STODDART COAXIAL ATTENUATORS AND TERMINATIONS

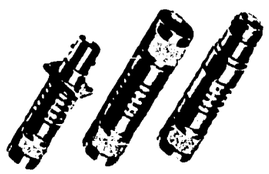
made with exclusive Stoddart Filmistors for highly accurate and stable resistive values from dc to 3000 mc.



Protected under Stoddart Patents

2, 6 AND 10-POSITION TURRET ATTENUATORS
WITH SIMPLE "PULL-TURN-PUSH" OPERATION, SMALL AND RUGGED

ATTENUATOR PADS



Available in any conceivable combination of male and female Type C and Type N connectors. Maximum length of 3" for any attenuation value.

GENERAL SPECIFICATIONS:
VSWR: <1.2 to 3000 mc for values from 10 to 60 db; as value decreases below 10 db, VSWR increases to not over 1.5.
Characteristic Impedance: 50 ohms.
Attenuation Value: Any value from 0 db to 60 db including fractional values.
Accuracy: ±0.5 db; values above 50 db have rated accuracy of attenuation through 1000 mc only.
Power Rating: 1.0 watt sine wave.

COAXIAL TERMINATIONS
Small-stable-50 or 70 ohms

½-Watt: 50 ohms impedance, TNC or BNC connectors, dc to 1000 mc, VSWR less than 1.2.

1-Watt: 50 ohms impedance, dc to 3000 mc or dc to 7000 mc, Type N or Type C connectors, male or female; VSWR less than 1.2, 70 ohm, Type N, male or female terminations available.

Fast delivery on all items/Send for complete literature

STODDART
AIRCRAFT RADIO CO., INC.
6644 Santa Monica Blvd., Hollywood 38, Calif. HO 4-8351

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SUB-MINIATURE CLUTCH-BRAKE ELECTRO-MAGNETIC

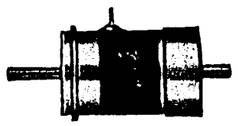
RELIABILITY • HIGH PERFORMANCE • VERSATILITY

• 9 Models • 5 Sizes • 3 Shaft Alternates • Equals 135 Standard Configuration Selection • Available on Prompt Delivery

Model B

Model B-Brake
Normally free — Energized to brake
- .500 thru 1.562 servo mounting dia.
- 4 thru 120 oz. in. min. brake torque.
- .8 to 16 oz. weight

Model BF



Model BF-Brake
Normally braked — Energized to free.
- .500 thru 1.562 servo mounting dia.
- 2 thru 60 oz. in. min. brake torque.
- .8 to 16 oz. weight.

Model MBC

Model MBC-Duplex Clutch
Output shaft normally clutched to one input flange — Energized same output shaft clutched to other input flange
- .500 thru 1.562 servo mounting dia.
- 2 thru 60 oz. in. min. clutch torque
- 1 to 20 oz. weight

Model CF

Model CF-Clutch
Normally clutched — Energized to free
- .500 thru 1.562 servo mounting dia.
- 2 thru 60 oz. in. min. clutch torque
- .9 to 18 oz. weight.

Model C

Model C-Clutch
Normally free — Energized to clutch.
- .500 thru 1.562 servo mounting dia.
- 4 thru 120 oz. in. min. clutch torque
- .8 to 16 oz. weight.

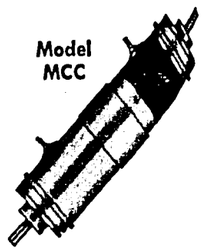
Model MC

Model MC-Brake Clutch
Normally braked — Energized to clutch
- .500 thru 1.562 servo mounting dia.
- 2 thru 60 oz. in. min. clutch or brake torque
- 1 to 16 oz. weight

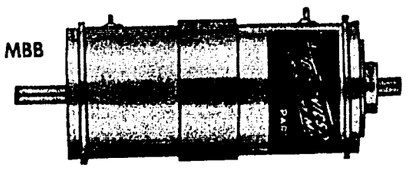
Model MB-Clutch Brake
Normally clutched — Energized to brake.
- .500 thru 1.562 servo mounting dia.
- 2 thru 60 oz. in. min. clutch or brake torque
- 1 to 16 oz. weight

Model MB

Model MCC

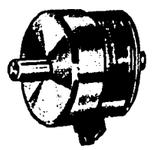


Model MBB



Model MBB-Clutch Brake
Normally input flange and output shaft free — Energize one coil to clutch input flange to output shaft or Engage other coil to brake output allowing input flange to free.
- .500 thru 1.562 servo mounting dia.
- 3.5 thru 120 oz. in. min. clutch or brake torque
- 1.6 to 30 oz. weight.

Autotronics Industrial Miniatures are available in 4 models with a pilot mounting dia. of 1.125 — torque rating 20 thru 40 oz. in. min.

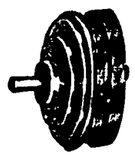


C-125-Clutch. Normally free — Energize to clutch.
B-125-Brake. Normally free — Energized to brake.
BF-125-Brake. Normally braked — Energize to free.
MC-125-Brake Clutch. Normally braked — Energize to clutch.

PANCAKE CLUTCH-BRAKE

The Newest addition to the precision line is the Pancake unit — in 4 models featuring a 1.000 in. servo mounting dia. — length .500 in. from servo flange to end of cap — torque rated 6 thru 12 oz. in. min.

Available Models:



PC-8-Clutch. Normally free — Energized to clutch.
PMC-8-Brake Clutch. Normally braked — Energized to clutch.
PB-8-Brake. Normally free — Energized to brake.
PBF-8-Brake. Normally braked — Energized to free.

All standard units operate at 28 v.d.c. Other voltages can be supplied.

AUTOTRONICS, INC., Box 812, Route 1, Florissant, Mo.

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Rotators: See class 37

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SWR meters: See class 19

Scalers: See class 22

Selective calling equipment:
See class 20

28. Servo-Mechanisms.

3. Brakes
5. Controls
7. Couplings
10. Gears, gear-trains, etc.
11. Magnetic clutches
12. Repeaters
13. Resolvers
15. Servo amplifiers
17. Servo multipliers
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Consolidated Airborne Systems, Inc., N.Y., 15

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SERVO COMPONENTS TO COMPLETE ASSEMBLIES

DAYSTROM TRANSICOIL designs and manufactures a wide variety of precision servo components and complete assemblies for both industry and the military. The precision that goes into these products is the result of many years of specialized experience in the servo field. You're getting a head-start on quality when you specify Daystrom Transicoil . . .

SERVO MOTORS & MOTOR GENERATORS
- Frame Size: 5, 6, 8, 9, 11, 15, and 18 for 60 and 400* cycle operation
- Standard Operation:—55 C to +120 C
- *400 cycle units may be wound for operation with transistor drive

GEAR TRAINS
- Mounted on the motor or generator
- Maximum backlash will not exceed 30 minutes as measured with a 1 in-oz. load on the output shaft
- Ratios from 7:1 to 2187:1. Other ratios available to suit customer specifications

SYNCHROS—Transmitters, Control Transformers, Differentials
- Frame Sizes: 8 and 11 for 400 cycle operation
- Also Inductive Potentiometer, Infinite Resolution
- Output: linear

AMPLIFIERS—Tube or Transistor Types
- Miniaturized amplifiers to drive a combination of Daystrom Transicoil rotating components and assemblies
- Designed to meet industrial and military requirements

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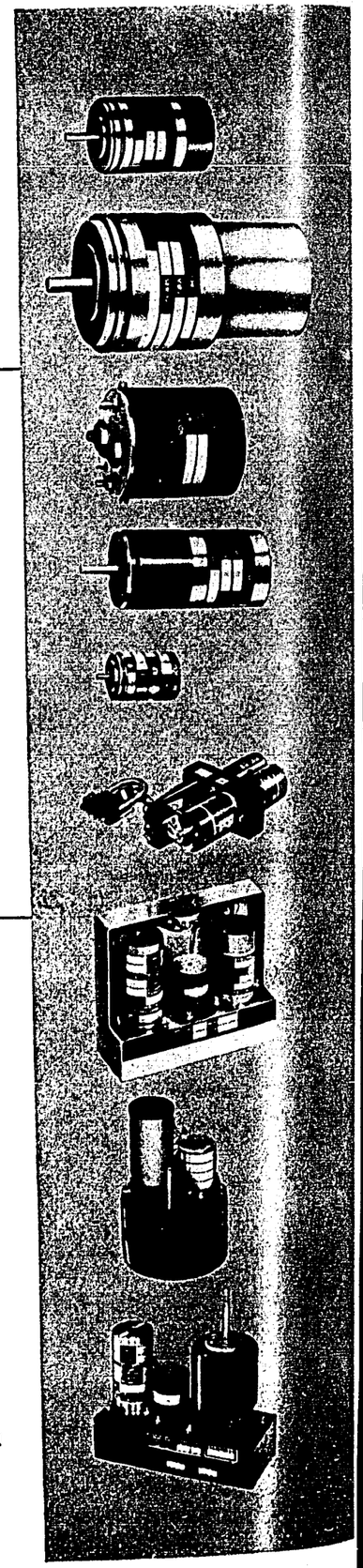
- Design and manufacture of complete servo assemblies to customer specifications



Complete specifications, mechanical data, dimensions, etc., are included in the Daystrom Transicoil Catalog. This is available at no cost through Daystrom Sales Representatives in principal cities throughout the United States, or by letterhead request to the plant.

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A Division of Daystrom, Inc.

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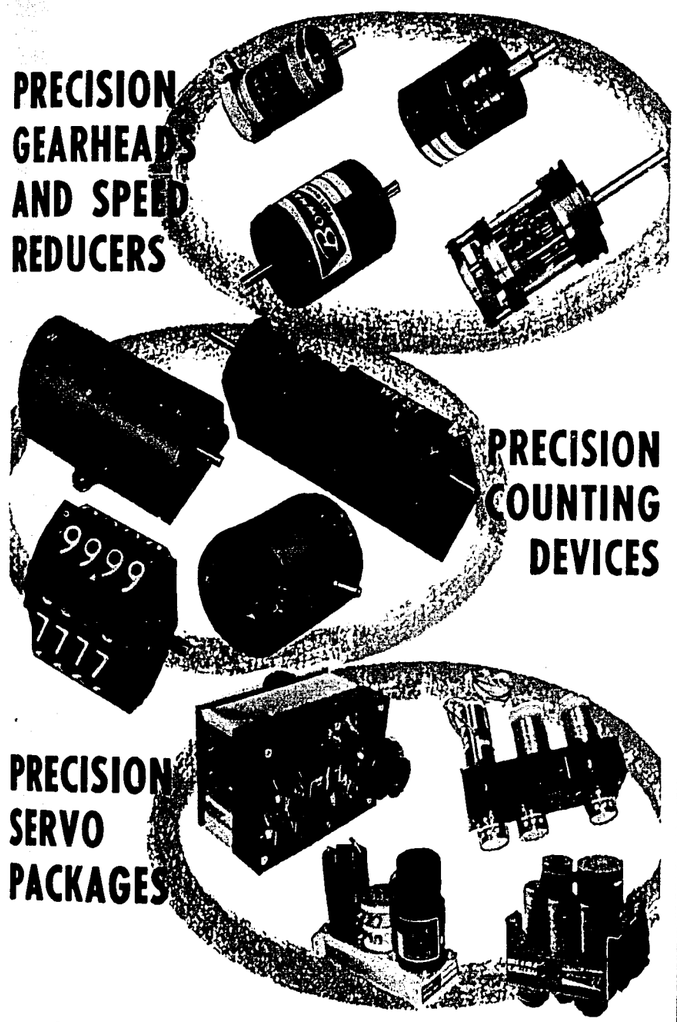

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Optimum performance and reliability of precision electronic control systems are dependent upon the components and servo packages of which they are comprised.

Bowmar's sound, imaginative approaches to components and package design have led many projects to new high levels of reliability and accuracy, while often reducing critical weight and size. This experience and pioneering have improved the state of the art in many types of precision systems including **weapons control, inertial guidance, navigation, autopilot** and **tracking.** Bowmar experience is displayed by its successful history of performance in the most advanced missile and aircraft programs.

Why not let Bowmar skills contribute to your project? Bowmar's engineering and production capabilities are equal to any task, regardless of complexity.

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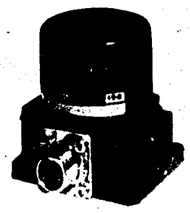
Synchros—Size 2—20 sec max. error

HYDRAULICS



6100 Series Servo Valve

Servo Valves

- Two moving parts
- Anti-clogging — over size orifices, high pressure clearing
- Flow rates—0-5, 0-10 gpm

Systems

For hi-performance hydraulic or pneumatic missile control.

COMPUTERS

Navigational Computer

- Great Circle Course and Navigational
- Inertial Position
- Guidance
- Analog and Digital for Missile Applications

INERTIAL GUIDANCE

23 lb. Inertial Platform

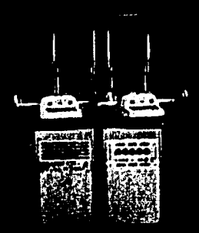
Components include floated gyros, single and two-axis accelerometers, first and second integrators, computers. Complete systems in production for major missile applications feature high accuracy, long-term reliability, light-weight construction.

GYROS

Miniature Floated Gyro

- Rate-floated Integrating; Spring Restrained
- Vertical—Miniature, Self-Contained
- Two Axis Free For Missile Control
- Directional, Conventional and Roll Stabilized
- 3 Gyro, 3 and 4 Gimbal Platforms
- North Seeking Theodolites

GROUND SUPPORT



Digital Logging System

Completely integrated ground support equipment based on unique [illegible] test equipment modules for analog or digital, manual, semi-automatic or fully automatic testing of complete sub-systems or systems.

MICROWAVE

Antenna Array

- Waveguides, Strip—Transmission Lines, Ferrite Components
- Radar rf and Antenna Assemblies
- Transponder Systems, Target Simulators, Test Sets
- Traveling Wave Assemblies

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Kearfott offers challenging opportunities in advanced component and system development

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Midwest Office: 23 W. Calendar Avenue, La Grange, Illinois
South Central Office: 6211 Denton Drive, Dallas, Texas
West Coast Office: 253 N. Vinedo Avenue, Pasadena, California

For details, circle #275 on Reader Service Card

Directory I. Complete Equipment

28. Servo-Mechanisms.

Falcon Machine & Tool Co., Inc., 208 Concord Tnpk., Cambridge 40, Mass., 7
See ad on this page
Tel: TRowbridge 6-3269
Farrand Controls, Inc., N.Y., 5, 15
Feedback Controls, Inc., Mass., 5, 10, 12, 15, 17
Ferrotran Electronics Co., N.Y., 15
Forbes and Wagner, Inc., 350 Central Ave., Silver Creek, N.Y., 3
See ads on pages 349, 369, 413, 444, 453, 565
Tel: YE 4-2691
Franke Gear Works, Inc., Ill., 10
Fuchs Impulse Motor Servomechanisms, N.Y., 5, 20
G-M Labs., Inc., Ill., 20
GPE Controls, Inc., Ill., 5
Gap Instrument Corp., N.Y., 7, 10
Garrett Corp, Air Research Mfg. Div., Calif., 15
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Gries Reproducer Corp., 168 Beechwood Ave., New Rochelle, N.Y., 10
See ad on page 639
Tel: NEw Rochelle 3-8600
Guidance Controls Corp., 110 Duffy Ave., Hicksville, L.I., N.Y., 3, 5, 11
See ad on this page
Tel: WEIls 8-9500
Gulton Industries, Inc., N.J., 15
Hall-Barkan Instruments, Inc., N.Y., 10
Hallamore Electronics Co., Calif., 15
Hamilton Watch Co., Hathaway Instrument Div., Colo., 10
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Harrel, Inc., N.Y., 15
Helipot Corp., Calif., 7, 10, 12, 13, 20
Hoffman Electronics Corp., Calif., 10
Hoover Electric Co., Calif., 20, Drives
Hunter Spring Co., Pa., Mechanical Servos
Huyck & Sons, F. C., Waldorf Electronics Div., N.Y., 5, 12, 15, Test Boards
I.M.C. Magnetics Corp., 570 Main St., Westbury, L.I. N.Y., 13, 20
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Tel: EDgewood 4-7070
Hex Optical Co., N.Y., 10
Illinois Tool Works, Fastex Div., Ill., 10
Induction Motors Corp., N.Y., 13, 20
Induction Motors of Calif., Calif., 13, 20
Industrial Control Co., N.Y., 5, 10, 12, 15, 17
Instru-Lee Corp., N.Y., 10
Itek Corp., Mass., 10
Jack & Heintz, Inc., Ohio, 3, 5, 10, 12, 20
Jan Hardware Mfg. Co., Inc., N.Y., Drives, Angle Gear & Ball Bearing Ratio
Jordan Co., Inc., Wis., 5, 15
Juall Gear Co., Inc., N.J., 10
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 3, 5, 7, 10, 11, 12, 13, 15, 17, 20
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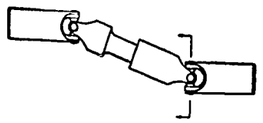
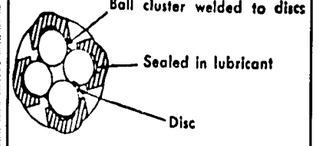
Tel: GRegory 2-1000
Kenilworth Coupling Co., N.C., 7
Keystone Products Co., N.J., 15
Kidde & Co., Inc., Walter, N.J., 5, 15
Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst 73, N.Y., 3, 5, 7, 15
See ad on page 370
Tel: TWining 9-5600
Lear, Inc., Mich., 5, 7, 11, 15, 20

ZERO BACKLASH GUARANTEED with MINI-JOINTS

Now available with preloaded ball spline as telescoping double universal joint





Features
• Zero backlash • Maximum operating angle of 30° • Lightweight • Sealed-In Lubrication

SINGLE JOINT DIMENSIONS

Pt. No.	Bore	Body	Length	Torque In. Oz.	Price 1-9
SBS	Solid	3/16	1-1/32	4	$4.35
1BS	.0938	3/16	"	"	4.65
2BS	.125	"	"	"	"
3BS	.156	9/32	1-3/8	16	4.55
4BS	.1875	"	"	"	"
5BS	.2188	3/8	1-3/4	64	4.50
6BS	.250	"	"	"	"

Further information available promptly on request

FALCON MACHINE & TOOL CO., INC.
208 Concord Turnpike, Cambridge 40, Mass.

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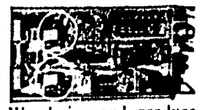
ELECTRO-MECHANICAL DEVICES

Forbes and Wagner Electro-Mechanical Clutch and Brake Assembly

The Aerocom Transmitter built by Aeronautical Communications Equipment Inc. uses two F&W drives as circled. The Aerocom Tuner uses one F&W Drive.



Aerocom Transmitter

We design and produce components and assemblies for Commercial and Military Applications. Let us help you with your Electronic Problems.

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350 Central Avenue
Silver Creek, N. Y. • Phone YE 4-2691

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PRECISION POTENTIOMETERS
A complete line of linear and non-linear potentiometers.
LINEARITY . . .
Standard .08%
Best .03%
MAXIMUM RESOLUTION .015%
Low torque, low noise, excellent stability.
Exceeds MIL 5272 and NAS 710.

MAGNETIC CLUTCHES

Unique electro-magnetic design provides for extreme torque to inertia ratio . . . over 1,000,000 rad./sec.²
SPECIFICATIONS
- Zero backlash and .0005" max. end play
- Friction face
- ABEC-5 ball bearings
- .0015" TIR input/output shaft concentricity with servo mount pilot
- Exceeds MIL-5272, 4158, and 8189 specs.

Send For Free Data Sheets

MICRO & SUB-MINIATURE CLUTCH BRAKES
- Most advantageous for critical size/critical weight applications
- Offered in sizes 6 and 8
- Exceeds MIL-E-5272, 4158, and 8189 specs

GC GUIDANCE CONTROLS CORP.
110 Duffy Ave.
Hicksville, N. Y.
a subsidiary of Dyna-Magnetic Devices Inc.

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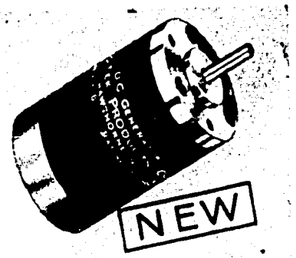
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.



direct-current

TACHOMETER GENERATOR

permanent-magnet

APPLICATIONS

- **VELOCITY SERVOS** Ideal for use as a rate generator in servo or integrating devices where a highly linear speed/voltage relationship is required with minimum ripple.
- **DIRECT READING TACHOMETER** Makes an excellent tachometer when combined with a d-c voltmeter having proper voltage range.
- **SPEED TRANSDUCER** Ideal for use as a speed transducer in connection with fast response direct writing oscillographs.

FEATURES

- **SIZE** Miniature. Approx. dia. 1¼".
- **LINEARITY** Output voltage is proportional to speed to better than ½ of 1%.
- **SPEED** Excellent service life at 12,000 rpm. Higher speeds possible.
- **OUTPUT** Various models up to 20 volts per 1,000 rpm.
- **RIPPLE** The rms value will not exceed 3% of the d-c value at any speed in excess of 100 rpm.
- **BRUSH LIFE** Better than 20,000 hours at 1800 rpm.
- **BIDIRECTIONAL OPERATION** Output in either direction is held to a ¼ of 1% tolerance.
- **CONSTRUCTION** Aluminum housings with protective treatment; stainless steel shafts; fully shielded ball bearings; Mylar insulation.

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SINGLE UNITS from $22.50 priced lower in quantity

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PRODUCTS CO

1086 Goffle Rd., Hawthorne, N.J.

Phone HAwthorne 7-3100

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Lear, Inc., Lear Cal Div., Calif., 11, 15, 20

Lear, Inc., Lear-Romec Div., Ohio, 17, 20

Leeds & Northrup Co., Pa., 15, 20

Librascope, Inc., Calif., 10, 15, 20, Differentials

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 15
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Tel: TExas 0-7711

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Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 5, 15
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Tel: CYpress 2-6610

Magnetic Instruments Co., Inc., 546 Commerce St., Thornwood, N.Y., 15, 17
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Tel: ROgers 9-5312

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Micro-Lectric Div., Micro Machine Works, 19 Debevoise Ave., Roosevelt, N.Y., 10
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Midwestern Instruments, Inc., Okla., 5, 12, 15

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Norrich Plastics Corp., 107-109 W. 19th St., New York 11, N.Y., 7
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Tel: WAtkins 4-8360

North Atlantic Industries, Inc., 6[illegible] Main St., Westbury, L.I., N.Y., 12, 13, 15, 17
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Tel: EDgewood 4-1122

Oster Mfg. Co., Avionic Div., 1 Main St., Racine, Wis., 13, 15, 20, Indicators
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Tel: MElrose 7-4445

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Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 5, 15
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Servo-Tek Products Co., Inc., 1086 Goffle Rd., Hawthorne, N.J., 5, 10, 15, 20
See ad on this page
Tel: HAwthorne 7-3100

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Sperry Rand Corp., Sperry Gyroscope Div., Aeronautical Equip. Div., N.Y., 15

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Tel: POrt Washington 7-7200

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Technology Instrument Corp., Calif., 11

Technology Instrument Corp., 535 Main St., Acton, Mass, 3, 11
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Tel: COlonial 3-7711

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Temco Aircraft Corp., Electronics Div., Texas, 15, 17

Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 5, 15, 20

Topper Mfg. Co., Inc., N.Y., 15

Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 15
See ad on pages 116-117
Tel: ELizabeth 4-5650

United Aircraft Corp., Ketay Dept., Norden Div., N.Y., 13, 15, 20

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BRAKES
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GEAR HEADS, DIFFERENTIALS
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United Aircraft Corp., Norden Div., Conn., 13, 20

United Aircraft Corp., Norden Div., Norden Labs., N.Y., 15, 17

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U. S. Electrical Motors, Inc., Calif., 5, 10, Variable Speed Drives, AC Drives

U. S. Gear Corp., Mass., 10

U. S. Science Corp., Sub. Topp Indust., Inc., Calif., 5, 11, 15

Varo Mfg. Co., Inc., Tex., 5

Vickers, Inc., Electric Products Div., Mo., 5, 11, 15

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Waugh Engrg. Co., Calif., 15

Western Gear Corp., Electro Parts Div., Calif., 20

Winzeler Mfg. & Tool Co., Ill., 10

Wright Machinery Co., N.C., 10, 20

Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 20
See ad on page 310
Tel: BEekman 3-6720

Shielding material, RF:
See class 96

Shipborne communications equipment: See class 16

Signal generators, AM&FM:
See class 26

Signal generators, TV: See class 35

29. Single Sideband.

5. Receivers **10. Transmitters**

Admiral Corp., Ill., 5, 10

Aero Guidance Corp., Calif., 5, 10

Amelco, Inc., Calif., 5, 10

Automation Electncs., Inc., Calif., 5

Avco Corp., Crosley Div., Ohio, 5

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Canadian G. E. Co., Ltd., Electronic Equip.-Tube Dept., Canada, 5, 10

Canadian Marconi Co., Canada, 5, 10

Canadian Westinghouse Co., Ltd., Elect. Div., Canada, 5, 10

Central Electronics, Inc., Ill., 10

29. Single Sideband.

Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10
See ad on pages 32-33
Tel: EMpire 3-9281

Communications Co., Fla., 5, 10

Continental Electronics Mfg. Co., Tex., 10

Corbin Corporation, Md., 5, 10

Creative Electronics Corp., Conn., 5, 10

Crosby Laboratories, Inc., N.Y., 5, 10

Dynamic Electronics-New York, Inc., N.Y., 5

Eldico Electronics, Radio Eng. Labs., Inc., Div., N.Y., 10

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Erco Radio Labs., Inc., N.Y., 5, 10

Gates Radio Co., Ill., 5, 10

General Electric Co., Technical Prods. Operation, N.Y., 5, 10

Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill., 5, 10
See ad on page 204
Tel: VAn Buren 6-6300

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10
See ad on page 328
Tel: YUkon 3-3961

Intelex Systems, Inc., N.Y., 5, 10, Airborne

Internatl. Electronics Corp., N.Y., 5, 10

Internatl. Telephone & Telegraph Labs., Calif., 5, 10

Johnson Co., E. F., Minn., 10

Kahn Research Labs., Inc., N.Y., 5, 10

Kaiser Industries, Kaiser Aircraft & Elect. Div., Ohio, 5, 10

Kellogg Switchboard & Supply Co., Ill., 5, 10

Knight Electronics, Ill., 10

Litton Industries, Airtron, Inc., Div., N.J., 5

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10
See ad on page 66
Tel: CRestview 4-7411

Loge Sound Engineers, Calif., 5, 10

M E Labs., Calif., 5, 10

Marconi's Wireless Telegraph Co., Ltd., N.Y., 5, 10

Microwave Development Labs., Inc., Mass., Generators

National Radio Co., Inc., 37 Washington St., Melrose 76, Mass., 5
See ad on page 642
Tel: NO 5-4800

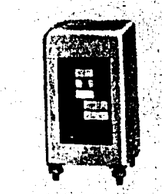
Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mt. Vernon, N.Y., Analyzers
See ad on page 320
Tel: OWens 9-4600

Philco Corp., Govt. & Indl. Div., Pa., 5, 10

Racal Engrg., Ltd., England, 5, 10

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Accurate



These tolerances are from absolute frequency under any combination of the conditions within operating specifications. For specific operating conditions much closer frequency tolerances may be maintained.

TRANSISTORIZED
TUNING FORK

FREQUENCY STANDARDS

TYPE MAFC — Frequency Standard

- Frequency Range Available: 360 cps to 4 kc
- Tolerances % ±: 0.2, 0.05, 0.02, 0.01, 0.005*
- Temperature Ranges: —20 to +71°C, —55 to +100°C, —55 to +125°C
- Power Supply Voltage: 12 or 28 vdc ± 15%
- Size: 1⅞"x1⅞"x2¼" • Weight: 8 oz.

TYPE AFC — Frequency Standard

- Frequency Range Available: 360 cps to 4 kc
- Tolerances % ±: 0.2, 0.05, 0.02, 0.01, 0.005*
- Temperature Ranges: —20 to +71°C, —55 to +100°C, —55 to +125°C
- Power Supply Voltage: 12 or 28 vdc ± 15%
- Size: 2⅛"x2⅛"x3¼" • Weight: 13 oz.

TYPE MAFCD — Frequency Standard

- Frequency: 60 cps
- Tolerances % ±: 0.2, 0.05, 0.02, 0.01, 0.005*
- Temperature Range: —55 to +71°C
- Wave Shape: Sine w/less than 1% harmonic distortion
- Power Supply Voltage: 10 to 14 vdc
- Size: 4⅛"x4⅛"x4⅛" • Weight: 4 lbs.

TYPE MFB — Frequency Divider

- Ratios Available: 2:1, 4:1, 5:1, 8:1, 10:1, 16:1
- Temperature Ranges: —20 to +71°C, —55 to +100°C
- Power Supply Voltage: 12 or 28 vdc ± 15%
- Size: 1⅝"x1⅝"x2¼" • Weight: 6 oz.

TYPE MFS — Frequency Standard for Laboratory or Field

Type MFS is a small, lightweight frequency standard that can replace units many times its size without sacrificing frequency stability. Internal batteries and provisions for external power supply make the unit ideal for either laboratory or field applications.

- Frequency Ranges Available: 50 cps to 4 kc
- Frequency Stability: 2 parts in 10⁹/per month
- Temperature Range: —20 to +71°C
- Size: 3⅜"x5⅝"x5⅝" • Weight: 2 lbs.

TYPE MLS — Laboratory — Frequency Standard

Type MLS is an extremely high stability laboratory frequency standard. The clock on the panel facilitates easy checking of stability.

- Frequency Ranges Available: 50 cps to 4 kc (Multiple Taps Optional)
- Frequency Stability Available: 5 parts in 10⁹
- Output: 10 watts at specified frequency
- Input: 115 v, 50 cycles to 400 cycles
- Size: 9"x10"x7" • Weight: 15 lbs.

A wide variety of units are designed to comply with the most severe military specifications.

Manufactured by

ACCURATE INSTRUMENT CO.

2418 W. ALABAMA
HOUSTON 6, TEXAS
JA 3-2712

For details, circle #281 on Reader Service Card

29. Single Sideband.

Radio Corp. of America, Defense Elec. Prod., N.J., 5, 10
Radio Engrg. Labs., Inc., N.Y., 5, 10
Radio Engrg. Labs., Inc., Standard Electronics Div., N.Y., 5, 10
Radio Receptor Co., Eng. Prods. Div., N.Y., 5, 10
Remanco, Inc., Calif., 5
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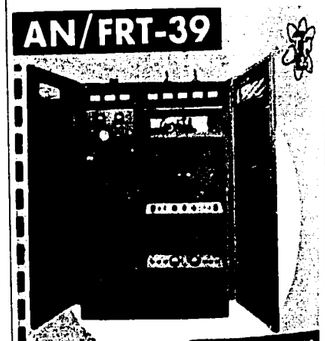
Standard Telephones & Cables, Ltd., England, 5, 10
Stromberg-Carlson Div., General Dynamics Corp., N.Y., 10
Systems, Inc., Fla., 5
Tapetone, Inc., Mass., 5
Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 5, 10
See ad on this page
Tel: OWens 8-4800
Telechrome Mfg. Corp., N.Y., 5, 10
Telephonics Corp., N.Y., 5, 10
Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 5, 10
See ad on page 308
Tel: EDgewood 3-1027
Westinghouse Electric Corp., Md., 5, 10
Westrex Corp., N.Y., 5, 10
Wilcox Electric Co., Inc., Mo., 5, 10
Wunderlich Radio Co., Ill., 5, 10
Young Spring & Wire Corp., Guise Div., Calif., 5, 10

AN/FRT-39



BULLETIN 2078

GPT-10K

SINGLE SIDEBAND HI-POWER TRANSMITTER

The TMC Model GPT-10K, Basic Transmitter, is a conservatively rated, general purpose unit capable of providing 10 kw PEP output throughout the range of 4 to 32 megacycles. Conservatively designed, all components within a large safety factor, attractive styling, GPT-10K includes built-in spectrum analyzer, P.S. Exciter, complete with all necessary tuning and loading controls.

The TECHNICAL MATERIEL CORP.
MAMARONECK, N.Y.

For details, circle #282 on Reader Service Card

Directory I. Complete Equipment

Slotted lines: See class 19

Smoke nuisance controls: See class 4

Sorting equipment: See class 4

30. Sound Systems.

5. Inter-com's 10. Public Address

ABC Sound Engrg. Co., N.Y., 5, 10
Aircraft Electronics, Ariz., 5, 10
Airtronix Dev. Corp., N.Y., 5, 10
Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 10
See ad on page 178
Tel: HAymarket 1-6800
American Communications Corp., N.Y., 5, 10
American Elite, Inc., N.Y., 10
Antrex Corp., Ill., 5, 10
Audio-Master Corp., N.Y., 10
Audio-Video Corp., N.Y., 5, 10
Beam-Echo, Ltd., England, 10
Bliss Electronic Corp., N.J., 5, 10
British Thomson-Houston Co., Ltd., England, 5, 10
Bruno-New York Industries Corp., N.Y., 5
Calbest Electronics Co., Calif., 5
Califone Corporation, Calif., 10, Portable
Communication Equip. & Engineering Co., Ill., 5, 10
Dalmotron Co., Calif., 5
Dictograph Products, Inc., N.Y., 5, 10
Du Kane Corp., Ill., 5, 10
Dynamic Electronics-New York, Inc., N.Y., 5, 10
Electro-Voice, Inc., E. V. Instrument Div., Mich., 10
Electronic Assistance Corp., N.J., 5, 10
Electronic Engrg. Co., Md., 5, 10
Electronic Systems Engrg. Co., Okla., 10
Engineered Sound Systems, Ltd., Canada, 5, 10
Etelco, Ltd., England, 5, 10
Executone, Inc., N.Y., 5, 10
Feiler Engineering & Mfg. Co., Ill., 10
Flush Wall Radio Co., Fla., 5, Radio
General Communications, Inc., Wis., 5, 10
General Electric Co., Ltd of England, England, 5, 10
Godfrey Mfg. Co., Ill., 5
Gray Mfg. Co., Conn., 5, Airborne
Hosmer & Co., E. A., Calif., 5
Interelectronics Corp, 2432 Grand Concourse, New York 58, N.Y., 10
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
Kellogg Switchboard & Supply Co., Ill., 5
Kierulff Electronics, Inc., Calif., 5, 10
Knight Electronics, Ill., 5
Lake Mfg. Co., Calif., 5
Lesa, S. P. A., Italy, 5, 10
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 5, 10
See ads on pages 270, 301
Tel: TExas 0-7711
Loge Sound Engineers, Calif., 5, 10
M P Engineering Co., Conn., 5, 10
Marconi's Wireless Telegraph Co., Ltd., N.Y., 5, 10
Marine Electric Corp., Galbraith-Pilot Marine Div., N.Y., 5, 10
Marine View Electronics, Inc., N.Y., 5
Maxson Corp., Langevin Div., N.Y., 5, 10
Newcomb Audio Products Co., Calif., 10
North Electric Co., N.Y., 5
North Electric Co., Ohio, 5
Northern Electric Co., Ltd., Canada, 5, 10
O'Brien Electric Corp., Calif., 10
Philco Corp., Govt. & Industrial Div., Pa., 5
Port-O-Vox Corp., N.Y., 5, 10
Pye Telecommunications, Ltd., England, 5, 10
Radio Corp. of America, Defense Elec. Products, N.J., 5
Railroad Electronic Labs. of Omaha, Inc., Neb., 5, 10
Reeves Equipment Corp., N.Y., 5
Remler Co., Calif., 5, 10, Marine, Airborne
Republic Electronic Industries Corp., N.Y., 5, 10
Rhein Sound System, Inc., Conn., 5
Scott, Inc., H. H., Mass., 10
Seeburg Corp., Ill., 10
Siegler Corp., Bogen-Presto Co. Div., N.J., 5, 10
Simpson Mfg. Co., Inc., Mark, N.Y., 5, 10
Specialty Engrn. & Electron. Co., N.Y., 10
Spivey, Inc., James S., D.C., 5
Taffet Radio & Television Co., N.Y., 10
Talk-A-Phone Co., Ill., 5
Tandberg of America, Inc., N.Y., 5
Telectro Industries Corp., N.Y., 5
Telephonics Corp., N.Y., 5, 10
Tesla Electric Co., Ill., 5
Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 5
See ad on pages 75-78
Tel: FLeetwood 7-5411
Thompson-Ramo-Wooldridge, Inc., Calif., 5, 10
Translite Electronics Corp., Ill., 5
Trutone Electronics, Inc., Calif., 10
U. S. Recording Co., D.C., 5, 10
Vinco Electronics Corp., Conn., 5, 10
Vocaline Co. of America, Inc., Conn., 5, 10
Webster Electric Co., Wis., 5, 10
Westlab Electronics, Inc., N.Y., 5, 10

See the pink section preceding page 1 for complete instructions on how to get the most out of this Directory.

Spectrometers: See class 12

Spectrum analyzers: See class 3

Speed controls: See class 4

Square wave generators: See class 3

31. Standards of Frequency & Time.

5. Elapsed time measuring equip.
10. Primary standards of frequency
15. Primary standards of time
20. Secondary standards of frequency
25. Secondary standards of time
30. Tuning forks

Abrams Instruments Corp., Mich., 25
Accurate Instrument Co., 2418 W. Alabama St., Houston 6, Tex., 10, 15, 20, 25, 30
See ad on page 352
Tel: JAckson 3-2712
Acme Electronix, Div. of NEA Service, Inc., Ohio, 20, 25, 30
Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 5
See ad on page 337
Tel: GRegory 2-5622
Aero Instrument Co., Calif., 5, 20
Aerolab Devel. Co., Semiconductor Systems Div., Calif., 5
Airmec, Limited, England, 10, 15, 20, 25
Akeley Camera, Inc., Div. Flecker, J. W., Pa., 20, 25
Allegany Instrument Co., Inc., Md., 5
American Time Products, Inc., 580 5th Ave., New York 36, N.Y., 20, 25, 30
See ad on page 354
Tel: PLaza 7-1430
Artronic Instrument Co., Md., 20, 25
Bassett, Inc., Rex, Fla., 20
Beckman/Berkeley Div., Calif., 5, 20, 25
Bergen Labs Inc., 247 Crooks Ave., Clifton, N.J., 5
See ad on page 471
Tel: GRegory 3-7800

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

FREQUENCY STANDARDS

PRECISION FORK UNIT
TYPE 50

Size 1" dia. x 3¾" H. Wght., 4 oz.*

Frequencies: 240 to 1000 cycles
Accuracies:—
Type 50 (±.02% at —65° to 85°C)
Type R50 (±.002% at 15° to 35°C)
Double triode and 5 pigtail parts required
Input, Tube heater voltage and B voltage
Output, approx. 5V into 200,000 ohms

*3¼" high
400 - 1000 cy.

FREQUENCY STANDARD
TYPE 50L

Size 3¾" x 4½" x 5½" High
Weight, 2 lbs.

Frequencies: 50, 60, 75 or 100 cycles
Accuracies:—
Type 50L (±.02% at —65° to 85°C)
Type R50L (±.002% at 15° to 35°C)
Output, 3V into 200,000 ohms
Input, 150 to 300V, B (6V at .6 amps.)

PRECISION FORK UNIT
TYPE 2003

Size 1½" dia. x 4½" H. Wght. 8 oz.*

Frequencies: 200 to 4000 cycles
Accuracies:—
Type 2003 (±.02% at —65° to 85°C)
Type R2003 (±.002% at 15° to 35°C)
Type W2003 (±.005% at —65° to 85°C)
Double triode and 5 pigtail parts required
Input and output same as Type 50, above

*3½" high
400 to 500 cy.
optional

FREQUENCY STANDARD
TYPE 2005

Size, 8" x 8" x 7¼" High
Weight, 14 lbs.

Frequencies: 50 to 400 cycles
(Specify)
Accuracy: ±.001% from 20° to 30°C
Output, 10 Watts at 115 Volts
Input, 115V. (50 to 400 cycles)

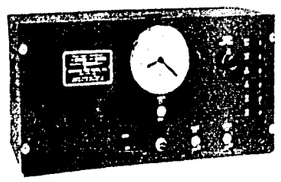
FREQUENCY STANDARD *NEW*
TYPE 2007-6
TRANSISTORIZED, Silicon Type

Size 1½" dia. x 3½" H. Wght. 7 ozs.

Frequencies: 400 — 500 or 1000 cycles
Accuracies:
2007-6 (± .02% at —50° to +85°C)
R2007-6 (±.002% at +15° to +35°C)
W2007-6 (±.005% at —65° to +125°C)
Input: 10 to 30 Volts, D. C., at 6 ma.
Output: Multitap, 75 to 100,000 ohms

FREQUENCY STANDARD
TYPE 2121A

Size
8¾" x 19" panel
Weight, 25 lbs.



Output: 115V
60 cycles, 10 Watt
Accuracy:
±.001% from 20° to 30°C
Input, 115V (50 to 400 cycles)

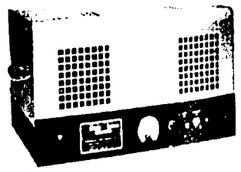
FREQUENCY STANDARD
TYPE 2001-2

Size 3¾" x 4½" x 6" H., Wght. 26 oz.

Frequencies: 200 to 3000 cycles
Accuracy: ±.001% at 20° to 30°C
Output: 5V. at 250,000 ohms
Input: Heater voltage, 6.3 - 12 - 28
B voltage, 100 to 300 V., at 5 to 10 ma.

FREQUENCY STANDARD
TYPE 2111C

Size, with cover
10" x 17" x 9" H.
Panel model
10" x 19" x 8¾" H.
Weight, 25 lbs.



Frequencies: 50 to 1000 cycles
Accuracy: (±.002% at 15° to 35°C)
Output: 115V, 75W. Input: 115V, 50 to 75 cycles.

ACCESSORY UNITS
for TYPE 2001-2

L—For low frequencies
multi-vibrator type, 40-200 cy.
D—For low frequencies
counter type, 40-200 cy.
H—For high freqs, up to 20 KC.
M—Power Amplifier, 2W output.
P—Power supply.

This organization makes frequency standards within a range of 30 to 30,000 cycles. They are used extensively by aviation, industry, government departments, armed forces—where maximum accuracy and durability are required.

WHEN REQUESTING INFORMATION
PLEASE SPECIFY TYPE NUMBER

American Time Products, Inc.

Watch Master
Timing Systems

Telephone: PLaza 7-1430

580 Fifth Ave., New York 36, N.Y.

For details, circle #283 on Reader Service Card

Directory I. Complete Equipment

31. Standards of Frequency & Time.

Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., Standards of Q
See ad on page 336
Tel: DEerfield 4-3200

Borg Equipment Div., Amphenol-Borg Electronics Corp., 120 S. Main St., Janesville, Wis., 10, 15, 20, 25
See ad on page 530
Tel: PLeasant 4-6616

Bulova Research & Development Labs., Inc., N.Y., 5, 20, 25, 30

Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62nd St., Woodside 77, N.Y., 10, 15, 20, 25
See ad on page 440
Tel: NEwtown 9-5700

Canadian Marconi Co., Canada, 10

Colortone Electronics, Inc., N.Y., 20

Computer Equipment Corp., Calif., 5

Computer-Measurements Co., Calif., 5

Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 20, 25
See ads on pages 321, 451
Tel: HAmilton 7-7961

Crystal Research Labs., Inc., Conn., 25

Decade Instrument Co., N.J., 20

Delta-F, Inc., Ill., 10, 15, 20, 25, 30

Deltime, Inc., N.Y., 5

De Mornay-Bonardi, 780 S. Arroyo Pkwy., Pasadena, Calif., 15, 20
See ad on pages 120-121
Tel: SYcamore 2-4142

Designers for Industry, Inc., Ohio, 5, 10, 15, 20, 25

Dimco-Gray Co., 212 E. Sixth St., Dayton 2, Ohio, 5
See ad on page 639
Tel: BAldwin 2-6703

Dymec, Inc., Calif., 5

Dynapar Corp., Ill., 20, 25

E H Research Laboratories, Inc., 1922 Park Blvd., Oakland 6, Calif., 20
See ad on page 298
Tel: GLencourt 2-1314

Eldorado Electronics, Calif., 5

Electric Regulator Corp., Conn., 5

Electro Instruments, Inc., Calif., 25

Electro-Pulse, Inc., 11861 Teale St., Culver City, Calif., 5
See ad on page 321
Tel: TExas 0-9193

Electronic Applications, Inc., Conn., 20

Electronic Engrg. Co. of Calif., Calif., 15, 20, 25

Electronics International Co., Calif., 20

Engineering Associates, Ohio, 10, 20

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 5, 20, 25
See ad on pages 110-111
Tel: GLendale 6-8592

Erwood, Inc., Ill., 30

Esterline-Angus Co., Inc., Ind., 5, 10, 20, 25

Federal Pacific Elec. Co. Inc., N.J., 5

Ferris Instrument Co., N.J., 20

General Radio Co., West Concord, Mass., 5, 10, 15, 20, 30
See ad on Cover 4
Tel: EMerson 9-4400

Geotechnical Corp., Tex., 10, 20, 25

Gertsch Products, Inc., Calif., 20

Gyrex Corp., Calif., 20, 25, 30

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 15
See ad on page 204
Tel: VAn Buren 6-6300

Hamilton Watch Co., Hathaway Instrument Div., Colo., 10, 30

Hamilton Watch Co., Industrial Div., Pa., 5, 10, 15, 30

Haydon Co., A. W., 240 N. Elm St., Waterbury 20, Conn., 5
See ad on page 518
Tel: PLaza 6-4481

Hermes Electronics Co., Dept. BD, 75 Cambridge Pkwy., Cambridge 42, Mass., 10, 15, 20, 25
See ad on page 452
Tel: UNiversity 4-7200

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 15, 20
See ad on pages 3-18
Tel: DAvenport 5-4451

Hill Electronics, Inc., Pa., 10, 20

Hycon Eastern, Inc., See: Hermes Electronics Co.

Industrial Test Equipment Co., 55 E. 11th St., New York 3, N.Y., 20
See ad on page 339
Tel: GRamercy 3-4684

Industrial Timer Corp., N.J., 5

I. T. & T. Corp., Industrial Products Div., N.J., 10, 15, 20, 25

Interstate Electronics Corp., Calif., 25

Invar Electronics Co., Calif., 20

J-B-T Instruments, Inc., Conn., 5

Knights Co., James, 101 E. Church St., Sandwich, Ill., 20
See ad on page 439
Tel: 2141

Laboratory for Electronics, Inc., Mass., 20

Land-Air, Inc., Ill., 15

Land-Air, Inc., Instrument & Electronic Div., Calif., 25, Alpha Counter

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 20
See ad on page 300
Tel: LOwell 6-2600

Litton Industries, Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5
See ad on page 66
Tel: CRestview 4-7411

Lytle Corporation, N.M., 5

Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 20
See ad on pages 302-303
Tel: DAvis 5-1391

Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 10, 20
See ad on page 318
Tel: LOwell 7-0607

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., Resistance Standards
See ad on page 494
Tel: DRexel 6-7130

Milgo Electronic Corp., Fla., 5

Monitor Products Co., Calif., 20

Muirhead & Co., Ltd., England, 30

Muirhead Instruments, Inc., N.Y., 20, 30

Murata Mfg. Co., Ltd., Japan, 30

National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 10
See ad on page 642
Tel: NO 5-4800

New London Instrument Co., Conn., 20

Norrman Labs., Ernst, Wis., 5, 10, 15, 20, 25

Northeastern Engineering, Inc., 25 S. Bedford St., P.O. Box 150, Manchester, N.H., 20
See ad on page 356
Tel: NAtional 2-6485

Northern Engrg. Labs., Inc., Wis., 20

Nuclear-Chicago Corp., Ill., Radioactivity

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 25
See ad on page 246
Tel: BRadshaw 2-6141

Panoramic Radio Products, Inc., 528 S. Fulton Ave., Mt. Vernon, N.Y., 20
See ad on page 320
Tel: OWens 9-4600

Parsons Co., Ralph M., Electronics Div., Calif., 5, 25

Philamon Laboratories, Inc., 90 Hopper St., Westbury, L.I., N.Y., 20, 30
See ad on page 105
Tel: EDgewood 3-1700

Philco Corp., Western Development Labs., Calif., 25

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 20, 25
See ad on page 323
Tel: CAnal 6-7250

Polytechnic Research & Dev. Co., Inc., N.Y., 20

Presin Co., Calif., 5

Probescope Co., Inc., 8 Sagamore Hill Dr., Port Washington, L.I., N.Y., 20
See ad on page 340
Tel: POrt Washington 7-8150

Racal Engrg., Ltd., England, 5

Rank Cintel, Ltd., England, 20, 25

Redford Corp., N.Y., 5

Reeves-Hoffman Div., Pa., 10, 20

Resdel Engrg. Corp., Calif., 5

Rohde & Schwarz Sales Co., Inc., N.J., 10, 15, 20, 25

Siegler Corp., Bogen-Presto Co. Div., N.J., 20

Solid State Electronics Co., Calif., 20

Specific Products, 21051 Costanso, P.O. Box 425, Woodland Hills, Calif., 10, 15
See ad on page 280
Tel: DI 0-3131

Standard Electric Time Co., Mass., 5

Sticht Co., Inc., Herman H., 27 Park Pl., New York 7, N.Y., 5
See ad on page 475
Tel: REctor 2-8163

Sullivan, Ltd., H. W., N.Y., 10, 20, 30

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244.

SPECIAL

TIMING and COUNTING INSTRUMENTS

THE Series 70 System measures CONTINUOUS time intervals by means of an electronic memory or storage. Time increments as well as continuous time intervals are measured by the Series 70 System, and recorded on tape punch and printer readout.

ELECTRONIC time averaging of two inputs to this system averages out errors due to eccentricities.

THIS System was developed for testing inertial gyros — but the general approach may be the solution to your problems! Write today to the SPECIALIST IN FREQUENCY COUNTERS.

NORTHEASTERN ENGINEERING, INC.

MANCHESTER, N. H. • 25 So. Bedford St.

P. O. Box 150 • NAtional 2-6485

For details, circle #284 on Reader Service Card

31. Standards of Frequency & Time.

Sunshine Scientific Instrument, Pa., 5, 15, 25, 30

Systron Corp., Calif., 5, 20, 25

Technical Research Group, N.Y., 10

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 10, 15
See ad on pages 75-78
Tel: FLeetwood 7-5411

Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 10, 15, 30
See ad on page 312
Tel: JUdson 2-3030

Topping Electronics, Ltd., Canada, 20, 25

Van Norman Industries, Inc., Electronic Div., N.H., 20

Varo Mfg. Co., Inc., Tex., 20, 30

Walkirt Co., Calif., 20, 25

Westinghouse Electric Corp., Pa., 5

Westport Electric, Calif., 5

Strain gages: See class 12

Stroboscopes: See class 12

Styli: See class 59

32. Studio Equipment.

5. Consoles & speech input equip.	17. TV camera lenses
10. TV cameras	20. TV film projectors
15. TV camera control equipment	25. TV studio lighting equipment
	30. Turntables

Adler Electronics, Inc., N.Y., 5

Aerolux Lights Corp., N.Y., 25

Aerovox Corp., Mass., 5

Audio-Master Corp., N.Y., 30

Audio-Video Corp., N.Y., 5, 10, 15, 30

Bache & Co., Semon, N.Y., Copper Back & Front Surface Mirrors

Baughman Co., E. J., Calif., Camera Pedestals, Pan & Tilts

Bausch & Lomb Optical Co., N.Y., 17

Blonder-Tongue Labs., Inc., N.J., 10, 15

Burke & James, Inc., Ill., 17

Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y. 17
See ad on page 357
Tel: JUdson 6-1420

Canadian G. E. Co., Ltd., Electrical Equip.—Tube Dept., Canada, 5, 10, 15, 17, 20, 25, 30

Canadian Marconi Co., Canada, 5, 10, 15, 17, 30

Cohu Electronics, Inc., KinTel Div., Calif., 10, 15

Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5
See ad on pages 32-33
Tel: EMpire 3-0281

Colorado Research Corp., Colo., 15

Dage TV Div., Thompson Products Inc., Ind., 5, 10, 15, 20

Directory I. Complete Equipment

32. Studio Equipment.

Daven Co., N.J., 5

DuMont Labs., Inc., Allen B., N.J., 10

E.M.I. Electronics, Ltd., England, 5, 10, 15, 20

Eastman Kodak Co., 343 State St., Rochester 4, N.Y., 17, 20
See ad on page 545
Tel: LOcust 2-6000

Electromation Co., Calif., 15

Electronic Applications, Inc., Conn., 5, 30

Electronic Assistance Corp., N.J., 5

Engineered Sound Systems, Ltd., Canada, 5

Fairchild Recording Equip. Corp., N.Y., 30

Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 10, 15
See ad on page 490
Tel: CEnter 9-6100

Garrard Sales Corp., N.Y., 30

Gates Radio Co., Ill., 5, 10

General Communications, Inc., Wis., 5, 15

General Electric Co., Technical Products Operation, N.Y., 5, 10

General Precision Lab., Inc., N.Y., 10, 15, 20

Gotham Audio Dev. Corp., N.Y., 30

Grimson Color, Inc., N.Y., 15, 17, Anamorphic

Hallamore Electronics Co., Calif., 10, 15

Heitz, Inc., Karl, N.Y., 17

Houston Fearless Corp., Calif., 15

Insul-8-Corp., Calif., 10, 15, 17, 20

International Electronics Corp., N.Y., 10

International Optical Co., Inc., N.Y., 17

I. T. & T. Corp., Industrial Products Div., Calif., 10, 15

Interstate Electronics Corp., Calif., 10, 15

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 5, 10
See ads on pages 270, 301
Tel: TExas 0-7711

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5
See ad on page 66
Tel: CRestview 4-7411

Madigan Corp., N.Y., 10, 15, 17

Magnasync Mfg. Co., Ltd., Calif., 5

Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 25
See ad on page 496
Tel: CYpress 2-6610

Magne-Tronics, Inc., N.Y., Wired music

Marantz Co., N.Y., 5

Marconi's Wireless Telegraph Co., Ltd., N.Y., 5, 10, 15, 17, 20

Masterton Recording Studios, Inc., N.Y., 5

Maxson Corp., Langevin Div., N.Y., 5

McAlister, Inc., J. G., Calif., 25, Camera Dollies

McCurdy Radio Industries, Ltd., Canada, 5, 30

Mole-Richardson Co., Calif., 25

National Cine Equipment, Inc., N.Y., 17, 25

North Electric Co., Ohio, 15, 25

Northern Electric Co., Ltd., Canada, 5

O'Brien Electric Corporation, Calif., 5

Optical Coating Laboratory, Inc., Calif., Dichroic-Mirrors

Orbitran Co., Inc., Calif., 10

Philco Corp., Government & Indl. Div., Pa., 5, 10, 15

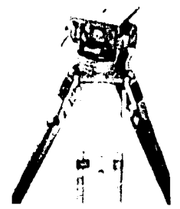
Photo Research Corp., Calif., 10

Radio Corp. of America, Defense Electronics Products, N.J., 5, 10, 15, 30

CECO offers you a variety of dependable equipment for

IMAGE ORTHICON
VIDICON
MICRO RELAY

IMAGE ORTHICON

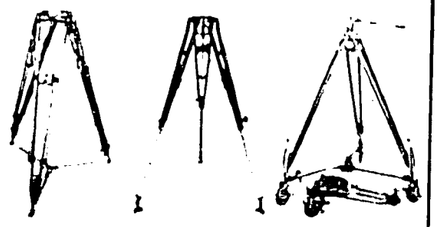


TH-2 BALANCED TV HEAD MODEL C with adjustable center of gravity for Image Orth Cameras weighing up to 135 lbs. **$425.00**

MICRO RELAY

TH-3 MICRO RELAY TILT HEAD for mounting Parabola Beam Reflectors **$285.00**

TRIPODS



TR-1B PROFESSIONAL TYPE TRIPOD with wooden tripod legs for BALANCED TV Head and LARGE VIDICON HEAD **$150.00**

TR-3 METAL TRIPOD for mounting MICRO RELAY TILT HEAD, LARGE VIDICON and BALANCED TV HEAD. **$260.00**

D-3 PROFESSIONAL SENIOR DOLLY for PRO JR., METAL and Professional Type Tripods **$180.00**

CAMERA EQUIPMENT CO., INC.

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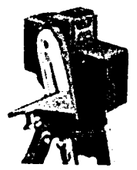
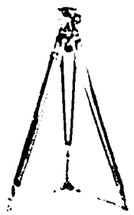
VIDICON



X-140 REMOTE CONTROL PAN & TILT HEAD with "Dialastop" for remotely panning and tilting Vidicon Cameras weighing up to 20 lbs **$400.00**

X-141 CONTROL BOX for REMOTE HEAD **$40.00**



TR-6 PRO JR SPRING BALANCED PAN & TILT HEAD for Vidicon Cameras weighing up to 35 lbs (With Tripod) **$200.00**

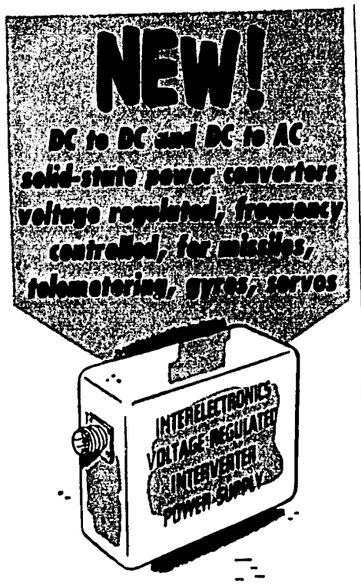
TH-3-V LARGE VIDICON SPRING BALANCED PAN & TILT HEAD for Vidicon Cameras weighing up to 100 lbs **$310.00**

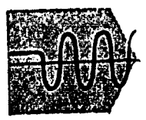
**Dealer and quantity price inquiries invited.*

Write today for information on the equipment you need

For details, circle #285 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.





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INTERELECTRONICS CORPORATION

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32. Studio Equipment.

Radio Engrg. Labs., Inc., N.Y., 5
Radio Music Corp., N.Y., 30
Rangertone, Inc., N.J., Tape to Film, Synchronizing
Rank Cintel, Ltd., England, 5, 10, 20
Rek-O-Kut Co., Inc., N.Y., 30
Republic Electronic Indust. Corp., N.Y., 5
Republic Lens Co., Inc., N.Y., 17
Rhein Sound System, Inc., Conn., 5
Rimak, Inc., Calif., 5
Robinson Recording Labs., Pa., 30
Schafer Custom Engrg. Div., Textron, Inc., Calif., Control Equip.
Siegler Corp., Bogen-Presto Co., Div., N.J., 5, 30
Standard Telephones & Cables, Ltd., England, 5
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 30
See ads on pages 306, 351
Tel: POrt Washington 7-7200
Stromberg-Carlson Div., General Dynamics Corp., N.Y., 5
Telectro Industries Corp., N.Y., 5
Television Zoomar Corp., N.Y., 17
Tesla Electric Co., Ill., 5
Thompson-Ramo-Wooldridge, Inc., Calif., 10, 15
Trans-Lux Corp., N.Y., Rear Projection Screen
U. S. Recording Co., D.C., 5, 10, 30
Vicon Corporation, Calif., 10, 15
Victorlite Industries, Inc., Calif., Daylight Overhead Projectors
Visual Electronics Corp., N.Y., 5, 10, 15, 17, 20, 25, 30
Westlab Electronics, Inc., N.Y., 5
Zoomar, Inc., N.Y., 17

Survey meters: See class 22

Sweep generators, radio frequency: See class 26

Sweep generators, TV: See class 35

Tape, magnetic recording: See class 63

Tape phonographs: See class 59

Tape recorders: See class 27

Telegraph test equipment: See class 3

33. Telegraph & Teleprinter Equipment.

5. Frequency shift converters
10. Frequency shift keyers
15. Receivers
20. Transmitters

Admiral Corp., Ill., 15, 20
Aermotive Equipment Corp., Mo., 15, 2
Aeronautical Comm. Equip., Inc., Fla., 10, 15, 20
American Electronics Co., N.Y., 15, 2
Barker & Williamson, Inc., Pa., 5, 1 15, 20
Boehme, Inc., H. O., N.Y., 5, 10
Canadian Marconi Co., Canada, 5, 1 15, 20
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10, 15
See ad on pages 32-33
Tel: EMpire 3-0281
Communication Equip. & Engineering Co., Ill., 10, 15, 20
Continental Elecns. Mfg. Co., Tex., 2
Dollar Co., Robert, Comm. Equip. Div., Calif., 5, 10, 15, 20
Electrical Communications, Calif., Tone Decoders & Senders
Erco Radio Labs., Inc., N.Y., 5, 10, 1 20
Gates Radio Co., Ill., 20
General Electric Co., Ltd., of England, England, 5, 10, 15, 20
General Precision Lab., Inc., N.Y., 5, 1 15, 20
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 15, 20
See ad on page 204
Tel: VAn Buren 6-6300
Haloid Xerox, Inc., N.Y., 15
Harmon Electronics Co., Mo., 5, 10, 1 20
Hazeltine Corp., N.Y., 15, 20
Hosmer & Co., E. A., Calif., 15, 20
Kellogg Switchboard & Supply Co., I 5, 10, 15, 20
Lenkurt Electric Co., Inc., Calif., 5, 1 15, 20
Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 10
See ad on pages 302-303
Tel: DAvis 5-1391
Marconi's Wireless Telegraph Co., Ltd., N.Y., 10, 15, 20
Marine View Electronics, Inc., N.Y.
Monroe Calcul. Mach. Co., Inc., Electronic Components Div., Calif., 15, 20
Moore Associates, Inc., Calif., 5, 10
Motorola, Inc., Ariz., 15, 20
North Electric Co., Ohio, 5
Northern Radio Co., Inc., 147 W. 22 St., New York 11, N.Y., 5, 10, 15
See ad on pages 130-133
Tel: WAtkins 9-9117
Philco Corp., Govt. & Indl. Div., Pa., 20
Press Wireless Labs., Inc., Mass., 5, 15, 20
Racal Engrg., Ltd., England, 15
Radio Engrg. Products, Ltd., Canada, 5, 10, 15, 20
Radio Frequency Laboratories, Inc., Powerville Rd., Boonton, N.J., 5
See ad on page 304
Tel: DEerfield 4-3100
Republic Electronic Indust. Corp., N.Y., 5, 10

Directory I. Complete Equipment

33. Telegraph & Teleprinter Equipment.

Rohde & Schwarz Sales Co., Inc., N.J., 15, 20
Secode Corp., Calif., Tone Decoders
Stelma, Inc., Conn., 5, 10
Stromberg-Carlson—San Diego, Calif., 15
Taffet Radio & Television Co., N.Y., 10
Taller & Cooper, Inc., Div. of American Electronics, N.Y., 5
Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 5, 10, 15, 20
See ad on page 352
Tel: OWens 8-4800
Techniflex Mfg. Co., Inc., N.Y., 5, 10, 15, 20
Telechrome Mfg. Corp., N.Y., 5, 10, 15, 20
Telectro Industries Corp., N.Y., 10, 15, 20
Tele-Signal Corp., N.Y., 5, 10
Teletype Corp., Ill., 15, 20, Readers & Punchers
Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y.
See ad on page 312
Tel: JUdson 2-3030
Towaco Electronics, N.J., 20
Trepac Corp. of America, N.J., Repeaters & Relays
Warren Mfg. Co., Inc., Mass., 15, 20
Western Union Telegraph Co., N.Y., 15, 20
Westinghouse Electric Corp., Md., 10, 20
Westrex Corp., N.Y., 5, 10, 15, 20
Wilcox Electric Co., Inc., Mo., 15, 20

34. Telemetering Equipment.

1. Data recorders
2. Data storage mechanisms
15. FM/FM modulators
20. Receivers
25. Transmitters

A.R.F. Products, Inc., Ill., 20, 25
A.R&T. Electronics, Inc., Ark., 15, 25
Adler Electronics, Inc., N.Y., 20, 25
Advance Electronics Corp., N.Y., 25
Aero Guidance Corp., Calif., 20, 25
Arcom, Inc., 48 Cummington St., Boston, Mass., 20, 25
See ad on page 590
Tel: COpley 7-9115
Alden Electronic & Impulse Recording Equip. Co., Inc., P.O. Box 125, Alden Research Center, Westboro 1, Mass., 5
See ad on page 290
Tel: FOrest 6-4467
Allo Scientific Co., Inc., Calif., 20
Alpelco, Inc., Calif., 15, 20, 25
American Electronics, Inc., American Data Div., N.Y., 5, 10, 20, 25
American Missile Products, Calif., 5, 15, 25
Amitron Corp., Mass., 20, 25
Applied Science Corp. of Princeton, N.J., 5, 10, 20, 25
Armstrong Whitworth Aircraft, Ltd., Sir W. G., A. W. E. Electronics Div., Hucclecote, Gloucester, England, 5, 20, 25
See ad on this page
Tel: TOll Bar 2261
Arnoux Corp., Calif., Decommutation Systems
Austin Co., N.Y., 5, 10
Avco Corp., Crosley Div., Ohio, 20, 25
Avien, Inc., N.Y., 25
B. J. Electronics, Borg-Warner Corp., Calif., 5
Bailey Meter Co., Ohio, 5, 20, 25
Barker & Williamson, Inc., Pa., 15, 20, 25
Beckman Instruments, Inc., Systems Div., Calif., 5
Beckman & Whitley, Inc., Calif., 5
Bendix Aviation Corp., Bendix Pacific Div., Calif., 5, 15, 25
Bendix Aviation Corp., Friez Instrument Div., Md., 5, 25
Boonton Radio Corp., 50 Intervale Rd., Boonton, N.J., Telemetering Sig. Gen.
See ad on page 336
Tel: DEerfield 4-3200
Borden Engrg. Co., N.J., 25
Bristol Co., Conn., 20, 25
Brush Instruments, Div. of Clevite Corp., Ohio, 5
Burroughs Corp., Pa., 10, 15
CG Electronics Corp., N.M., 10
Cal-Tronics Corporation, Calif., 5
Canadair, Ltd., Missile & Systems Div., Canada, 15, 25
Canadian G. E. Co., Ltd., Electronic Equip. & Tube Dept., Canada, 5, 10, 15, 20, 25
Canadian Westinghouse Co., Ltd., Elect. Div., Canada, 20, 25
Centronix, Inc., Fla., 5, 10, 15, 20, 25
Century Electronics & Instruments, Inc., Okla., 5
Consolidated Avionics Corp., N.Y., 5, 20, 25
Consolidated Electrodynamics Corp., Calif., 5, 10
Continental Electronics Mfg. Co., Tex., 25
Control Corp., Minn., 5, 20, 25
Cook Electric Co., Ill., 5
Corbin Corporation, Md., 20, 25
Crosby Laboratories, Inc., N.Y., Test Oscillator
Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 20, 25
See ad on page 514
Tel: GEneva 8-4000
Data-Control Systems, Inc., Conn., 5, 10, 15, 20, 25
Deltime, Inc., N.Y., 10
Di/An Controls, Inc., Mass., 10
Dorsett Labs., Inc., Okla., 15
Dynamics Corp. of Am. Reeves Instrument Corp., N.Y., 20, 25
E.M.I. Electronics, Ltd., England, 5, 10, 15, 20, 25
Electro Instruments, Inc., Calif., 5, 10
Electro-Mechanical Research, Inc., Fla., 5, 10, 15
Electromation Co., Calif., 5
Electronic Development Co., Inc., Calif., 20, 25
Engineering Associates, Ohio, 20, 25
Epic, Inc., N.Y., 25
Erco Radio Labs., Inc., N.Y., 20, 25
Etelco, Ltd., England, 5, 10, 15, 20, 25
Ferranti-Packard Electric, Ltd., Canada, 10
Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 10
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Tel: CHerry 6-2811
Fischer & Porter Co., Pa., 5, 25
Ford Motor Co., Sub.—Aeronutronic Systems, Inc., Calif., 10, 20, 25
Foxboro Co., Mass., 5, 20, 25
Gates Radio Co., Ill., 15, 25
General Devices, Inc., P.O. Box 253, Princeton, N.J., 5, 10, 15, 20, 25
See ad on page 360
Tel: DAvis 9-2323

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FIRST IN QUALIFIED ALL ELECTRONIC SOLID STATE MULTICODER PRODUCTION.
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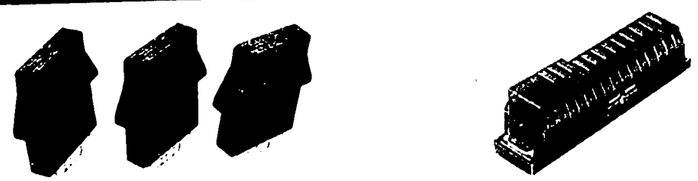

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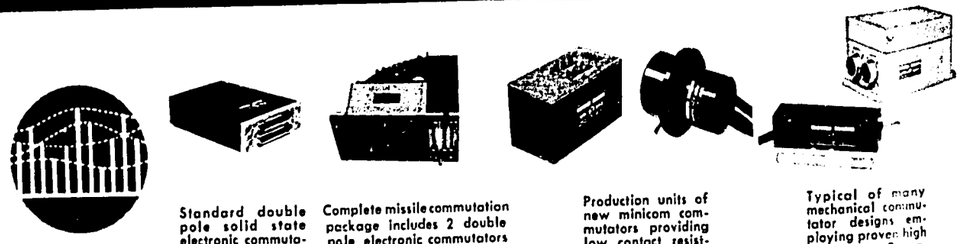

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Directory I. Complete Equipment

34. Telemetering Equipment.

General Electric Co., Instrument Dept., Mass., Telemetering Equipment
General Electronic Labs., Inc., Mass., 20, 25
General Kinetics, Inc., Va., 5
Genesys Corporation, Calif., 10
Geotechnical Corp., Tex., 5, 10, 15, 20, 25
Giannini Controls Corp., Calif., 5
Gulton Industries, Inc., N.M., 20, 25
Hallamore Electronics Co., Calif., 5, 10, 15
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 20, 25
See ad on page 204
Tel: VAn Buren 6-6300
Hanson-Gorrill-Brian, Inc., N.Y., 5, 10
Harmon Electronics Co., Mo., 15, 20, 25
Heitz, Inc., Karl, N.Y., 5
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 5
See ad on pages 3-18
Tel: DAvenport 5-4451
Hogan Labs., Inc., N.Y., 5
Hoover Co., Ltd., Canada, 15
Hycon Electronics, Inc., Calif., 5, 10, 20, 25
ITI Electronics, Inc., N.J., 20, 25
Industrial Television, Inc., N.J., 20
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., Telemetering Power Supplies
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
International Electronics Corp., N.Y., 5, 10, 15, 20, 25
International Telephone & Telegraph Labs., Calif., 15, 20, 25
Jodon, Inc., D.C., 5, 10, 15
Karg Labs., Inc., Conn., 20
Kauke & Co., Inc., Calif., 15
Knight Corp., Ewen, Mass., 20
LEL, Inc., 384 Oak St., Copiague, L.I., N.Y., 20, 25
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Tel: AMityville 4-2200
Land-Air, Inc., Ill., 15, 20
Land-Air, Inc., Instrument & Electronic Div., Calif., 20
Leach Corp., Relay & Inet Div., 18435 Susana Rd., Compton, Calif., 5, 10
See ad on page 521
Tel: NEvada 6-1061
Lenkurt Electric Co., Inc., Calif., 20, 25
Litton Industries, Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5
See ad on page 66
Tel: CRestview 4-7411
Litton Industries, Md. Div., Md., 5, 10, 15, 20, 25
Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 5, 10, 15, 20, 25
See ad on page 380
Tel: REgent 9-4321
M E Labs., Calif., 20, 25
Magnetic Research Corp., Calif., 25
Maico Electronics, Inc., Minn., 10
Manning, Maxwell & Moore, Inc., Conn., 25
Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 20
See ad on page 318
Tel: LOwell 7-0607
Marstan Electronics Corp., N.Y., 20, 25
Martin Co., Baltimore Div., Md., 15
Midwestern Instruments, Inc., Okla., 5, 10, 15
Milgo Electronic Corp., Fla., 5, 10
Minneapolis-Honeywell Regulator Co., Md., 5
Minneapolis-Honeywell Reg. Co., Brown Instrument Div., Pa., 5, 10, 20, 25
Monroe Calcul. Mach. Co., Inc., Electrn. Components Div., Calif., 5
Moore Associates, Inc., Calif., 20, 25
Motorola, Inc., Ariz., 5, 10, 15, 20, 25
Mu Beta Products, Calif., 25
Mycalex Electronics Corp., 125-B Clifton Blvd., Clifton, N.J., 15, 20
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Tel: PRescott 9-8866
Naniloa Corp., Ohio, 10
National Electronics Labs., Inc., D.C., 20, 25
Nems-Clarke Co., Md., 20
Nichols Ltd., R.H., Canada, 5, 10, 20, 25
North Electric Co., N.Y., 20, 25
North Electric Co., Ohio, 10
Northeast Electronics Corp., N.H., 20, 25
Northeastern Engineering, Inc., 25 S. Bedford St., P.O. Box 150, Manchester, N.H., 5
See ad on page 356
Tel: NAtional 2-6485
Northern Radio Co., Inc., 147 W. 22nd St., New York 11, N.Y., 20, 25
See ad on pages 130-133
Tel: WAtkins 9-9117
Norwood Controls Unit, Detroit Controls Div., Mass., 20, 25
Omega Instrument Co., Calif., 15, 25
Panellite, Inc., Ill., 5
Parsons Co., Ralph M., Electronics Div., Calif., 25
Philco Corp., Govt. & Indl. Div., Pa., 10, 15, 20, 25
Philco Corp., Western Development Labs., Calif., 15, 20, 25
Photron Instrument Co., Ohio, 5
Precision Instrument Co., Calif., 5
Production Research Corp., N.Y., 20, 25
Radiation, Inc., Fla., 5, 10, 15, 20, 25
Radio Corp. of America, Defense Elec. Prod., N.J., 5, 10
Radio Frequency Laboratories, Inc., Powerville Rd., Boonton, N.J., 20, 25
See ad on page 304
Tel: DEerfield 4-3100
Radio Receptor Co., Eng. Prods. Div., N.Y., 20, 25
Ramo-Wooldridge Corp., Calif., 15, 20, 25
Rotary Devices Corp., N.J., 15
Sangamo Electric Co., Ill., 5
Servo Corp. of America, N.Y., 20
Shand & Jurs Co., Calif., 5
Sierra Electronic Corp., 5442D Bohannon Dr., Menlo Park, Calif., 20, 25
See ad on pages 30-31
Tel: DAvenport 6-2060
Sierra Research Corp., N.Y., 5, 10, 15, 20, 25
Solartron Electronic Group, Ltd., England, 5
Solid State Electronics Co., Calif., 15
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 5, 20, 25
See ad on page 248
Tel: HO 5-3471
Specialty Electronics Development Corp., N.Y., 5, 20
Specialty Engrn. & Electrn. Co., N.Y., 20, 25
Spectralab Instruments, Calif., 25
Spivey, Inc., James S., D.C., 25
Standard Telephones & Cables, Ltd., England, 20, 25
Stavid Engineering, Inc., N.J., 20, 25
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5
See ads on pages 306, 351
Tel: POrt Washington 7-7200
Summers Gyroscope Co., Calif., 15, 20
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Directory I. Complete Equipment

34. Telemetering Equipment.

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Tapetone, Inc., Mass., 20
Techniflex Mfg. Co., Inc., N.Y., 20, 25
Technitrol Engineering Co., Pa., 5
Telechrome Mfg. Corp., N.Y., 25
Telectro Industries Corp., N.Y., 5, 10, 15, 20, 25
Telemeter Magnetics, Inc., Calif., 10
Telerad Mfg. Corp., N.Y., 20, 25
Tele-Signal Corp., N.Y., 10
Temco Aircraft Corp., Electronics Div., Texas, 5, 10, 15, 20, 25

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 15, 25
See ad on pages 75-78
Tel: FLeetwood 7-5411

Texas Instruments, Incorporated, Houston, Tex., 5, 10, 20, 25
Transdata, Calif., 5, Waveform Translator
Ultradyne, Inc., N.M., Sub-Carrier Oscillator
Underwood Corp., Canoga Div., Calif., 20, 25
United Control Corp., Wash., 25
U.S. Science Corp., Sub. Topp Industries, Inc., Calif., 20, 25
University of California, Calif., 5, 10, 15, 20, 25
Victor Adding Machine Co., Ill., 5
Waldorf Instrument Co., Huyck & Sons Div., N.Y., 5
Wang Labs., Inc., Mass., 5, 10
Waugh Engrg. Co., Calif., 20, 25
Westgate Lab., Inc., Ohio, 5, 10
Westinghouse Electric Corp., Pa., 20, 25

Television boosters: See class 36

Television monitors: See class 21

Television receivers: See class 6

35. Television Test Equipment.

1. Synchronizing generators
10. TV calibrators
15. TV marker generators
20. TV signal generators
25. TV sweep generators
30. UHF-VHF generators

B & K Mfg. Co., Ill., 20, Closed Circuit, Circuit Analyzer
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Tel: DEerfield 4-3200

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Tel: STillwell 6-8700

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Tel: CEnter 9-6100

General Communications, Inc., Wisc., Color Switching System
General Electric Co., Technical Prods., Operation, N.Y., 5

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Tel: EMerson 9-4400

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Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 20, 25
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Tel: YUkon 3-3961

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 30
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Tel: DAvenport 5-4451

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Tel: BAldwin 6-3456

Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 15, 20, 25, 30
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Tel: CApital 6-4000

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Magnetics Research Co., Inc., 255 Grove St., White Plains, N.Y., 5
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Tel: WHite Plains 9-9588

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Tel: LOwell 7-0607

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Test chambers: See class 12

Test equipment, audio frequency: See class 3

Test equipment, general: See class 12

Test equipment, microwave & radar: See class 19

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

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Test equipment, television: See class 35

Time delay generators: See class 19

Timing motors: See class 58

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Towers: See class 37

Transformers: See class 73

Transmitters, airborne & airport: See class 1

Transmitters, amateur: See class 2

Transmitters, broadcast: See class 7

Transmitters, facsimile: See class 11

Transmitters, microwave: See class 18

Transmitters, mobile: See class 20

Transmitters, point-to-point: See class 24

Transmitters, radar: See class 25

Transmitters, single sideband: See class 29

Transmitters, telegraph & teleprinter: See class 33

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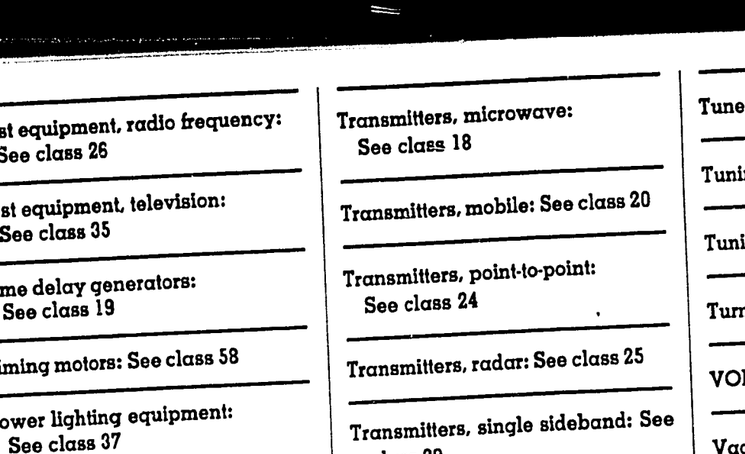

For details, circle #290 on Reader Service Card

1960 IRE DIRECTORY

Directory II Components

45 major groups 428 products

The products and services of the radio-electronics industry have been organized into three basic directories:

I. Complete Equipment

II. Components

III. Materials & Services

Within these three basic directories, 102 major product and service groups are numbered consecutively throughout. Under each of these 102 classes a further breakdown is given, showing in detail by a system of code numbers after each firm listed what specific products within the class are manufactured by that firm.

For a terminology cross-index listing the 857 subproducts in alphabetical order, consult the pink section preceding page 1.

The first few times you use this EDGE INDEX

follow the "How to use" instructions slowly—one step at a time. After that you will be able to open easily and almost instantly to the section that you seek.

Machol edge indexes covering the alphabetical section and each of the three major directory groups will be found on pages 161, 265, 365, and 597.

HOW TO USE

1. Bend the Directory almost double with the back cover page on the inside.
2. Hold in your right hand with your four fingers near to the bound edge and your right thumb near the middle of the open side of this page.
3. From the heavy or light line symbol adjacent to the subject you seek, run your eyes across the page edges until you reach the horizontally corresponding symbol.
4. OPEN THERE!

LICENSE NO. 25
MACHOL EDGE INDEX PATENT #2680430

For complete list of products and services, arranged alphabetically for fast reference, see the pink section preceding page 1.

1 COMPLETE DATA SPREADS

161 ALPHABETICAL DIRECTORY

265 DIRECTORY I COMPLETE EQUIPMENT

365 DIRECTORY II COMPONENTS

597 DIRECTORY III MATERIALS & SERVICES

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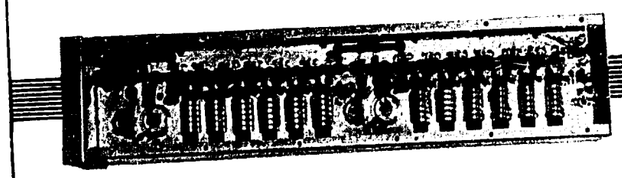
BROADBAND RF AMPLIFIERS



HRB-SINGER Presents

A New Line of Amplifiers With Improved Performance Capabilities

LOW NOISE: input network utilizes a grounded grid triode which offers optimum low noise characteristics for broad-band amplifiers operating in the VHF region

EXTREME BANDWIDTH CAPABILITY: bandwidths not achievable using conventional techniques

OPTIMUM NOISE FIGURE FOR BROAD-BAND: uses conventional low-noise input network

LESS SUBJECT TO OVERLOADING: basically a distributed type amplifier

DYNAMIC RANGE: significant advantage of paralleling is the increased dynamic range

HIGH RELIABILITY: several of the distributed lines may fail without total loss of operation

MODEL NO.	BANDWIDTH	GAIN	NOISE FIGURE	POWER INPUT
530 NK	50 mc—300 mc	>30 db	5-7 db	180 ma. at 150 v. 4 amps at 6.3 v.
3060 NK	300 mc—600 mc	>22 db	<10 db	180 ma. at 150 v. 4 amps at 6.3 v.
2550 NK	250 mc—500 mc	>27 db	<8 db average	180 ma. at 150 v. 4 amps at 6.3 v.

Impedence: 50 Ohms Nominal

The basic distributed band-pass amplifier has been modified by employing a cascade pair of grounded grid triodes in an active input network to obtain higher order results. Reliability in operation is insured by employing pentodes essentially in parallel which will allow operation of the amplifier with reduced gain even if several pentode tubes should fail.

These compact units, weighing approximately two pounds, employ miniature components and high grade etched wiring chassis for lightweight ruggedness and high reliability. Amplifiers are available in bench, rack, or weather-proof enclosures for antenna mounting. For increased versatility power supplies are packaged separately from amplifiers and are available for operation from 50 to 400 cycles AC, and from 28 VDC.

In addition to the amplifier models now available, **HRB-SINGER, INC.,** engineers will meet your own special performance requirements for specific UHF and VHF applications. Direct your inquiries to **Dept. G-10.**

HRB HRB-SINGER, INC.

A SUBSIDIARY OF THE SINGER MANUFACTURING COMPANY

Science Park, State College, Pa.

For details, circle #291 on Reader Service Card

MAGNETIC AMPLIFIERS

MILITARY & INDUSTRIAL

PRECISION TYPES, for analog computing, telemetering, industrial and nuclear controls, data logging; 60 and 400 CPS.
Input, 100 microamperes, DC
Output, 15 volts, DC
Gain, to 1,000,000 per stage
Linearity, to 1%
Balance, to 0.2%
Temperature, to 100° C.

RELAY AND MONITOR TYPES, for relay preamplification missile checkout systems, data logic and switching controls . . . in linear and snap-action types; 60 and 400 CPS.
Input, one microwatt, DC
Output, one watt, AC or DC

SEND FOR LITERATURE . . .

DETAILED ENGINEERING BULLETINS are available from the factory or from our many field representatives . . .

HI-PERFORMANCE TYPES, for electro-hydraulic valves, tape and machine controls, and other fast response requirements; 400 CPS.
Input, 300 microamperes, DC
Output, 15 volts, DC
Response, to 100 CPS.

CYCLEMAG FREQUENCY DETECTORS, for tachometers, speed measurement, frequency control systems . . .
Input, one watt, AC
Output, to 1 milliampere, DC
Frequencies, to 2000 CPS.

CUSTOM DESIGNS often solve tough design problems. Acromag's experience working with wire drawing machines, missile systems, nuclear reactors, auto-pilots, and industrial instrumentation . . . is yours for the asking . . .

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Write to DEPT. G
22519 Telegraph Road
Detroit 41, Mich.
Phone: ELgin 6-7211

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Directory II. Components

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7. Audio
10. Decade
12. Differential
15. Dynamic noise suppressors
25. Hearing aid
30. High fidelity
35. IF amplifiers
42. Linear
45. Magnetic
50. Microwave
52. Null
54. Peak limiting
55. Phono pre-amplifiers
57. Photocell
60. Power
62. Printed circuit
67. Pulse
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Consult the advertisement in this issue for full product information.

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

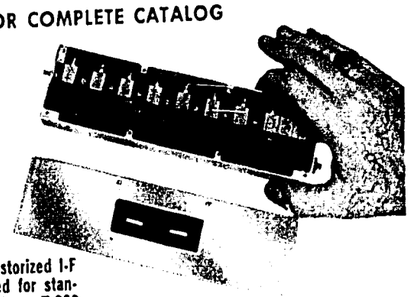
INSTRUMENTS FOR INDUSTRY Inc.

101 NEW SOUTH ROAD • HICKSVILLE, LONG ISLAND, NEW YORK
PHONE – OV 1-7100 • WIRE – IFICO NY

WIDE BAND AMPLIFIERS ● **I-F AMPLIFIERS PRE-AMPLIFIERS**

WRITE FOR COMPLETE CATALOG

TRANSISTORIZED AMPLIFIER SERIES T-330



A new series of completely transistorized I-F amplifiers offered to fill the need for standardized, high quality units. These T-330 series amplifiers by I.F.I. are available in a variety of center frequencies and bandwidths. They also can be equipped with emitter follower, cathode detector or low noise tube input.

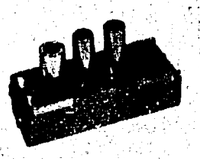
The quality of construction is high. The use of printed circuitry and quality control procedures provide rigid standards. Individual inspection and testing of each unit prior to delivery assure the superior quality of IFI transistorized I-F amplifiers. These transistorized amplifiers meet all applicable military environmental specifications.

Quantity	Unit Price
1-10	$800
11-25	700

SPECIFICATIONS

Center Freq.	T-330A	30 mc
	T-330B	30 mc
Bandwidth	T-330A	10 mc
	T-330B	3 mc
Gain	T-330A	80 db min.
	T-330B	100 db min.
Output (max)	T-330A	+ 5 DBM
	T-330B	+10 DBM
Input Impedance	T-330A	50 ohm
	T-330B	50 ohm
Noise Figure	T-330A	10 db
	T-330B	9 db
Mean Stage Gain	T-330A	11.5 DB
	T-330B	14.0 DB

A complete range of wide band amplifiers are offered by IFI. Every unit is built to the highest specifications insuring optimum performance and reliability.



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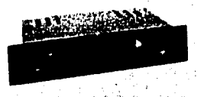

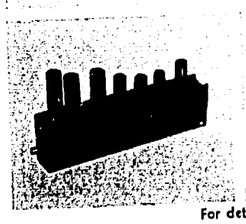

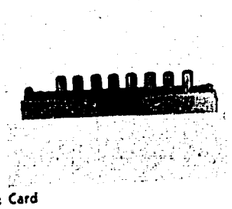

For details, circle #293 on Reader Service Card

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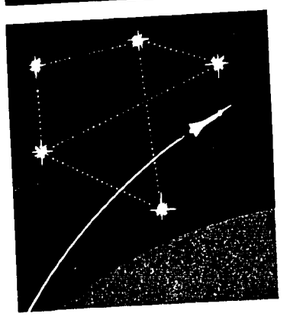

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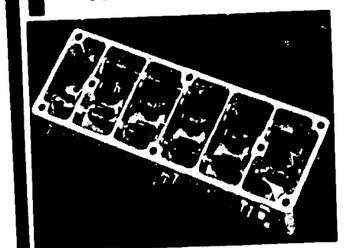

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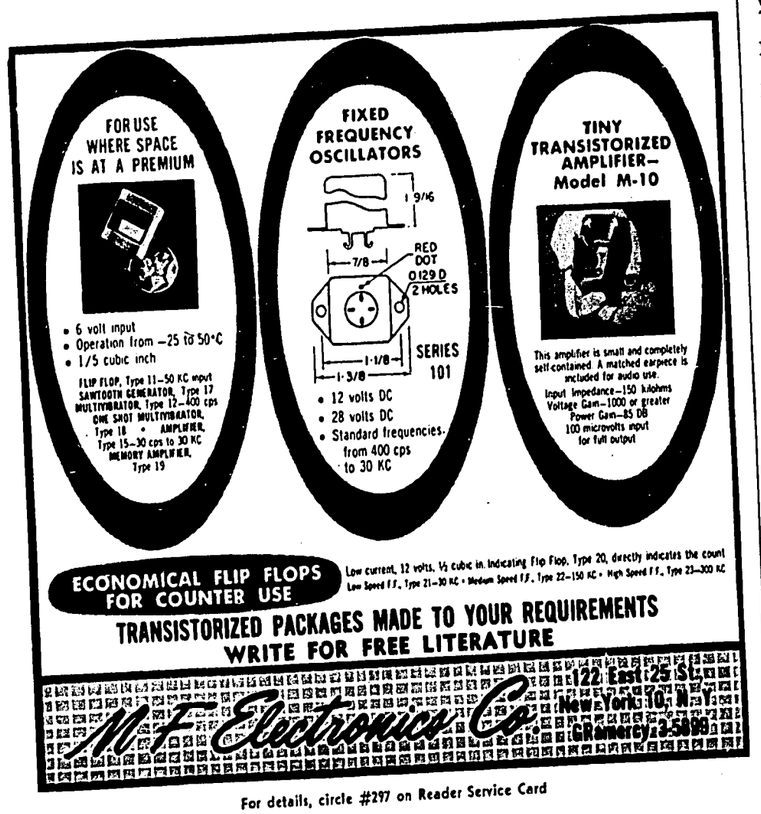

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Thornwood, N. Y. ROgers 9-5312

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MP
TRAVELING WAVE TUBE AMPLIFIERS
SWEEP OSCILLATORS
POWER LEVELING AMPLIFIERS
FREQ. MULTIPLIERS
MICROWAVE TEST CONSOLE
SOLENOIDS FOR TWT'S AND BWO'S

MENLO PARK ENGINEERING
711 HAMILTON AVENUE, DAVENPORT 6-9080
MENLO PARK, CALIFORNIA
TWX PALO ALTO 110

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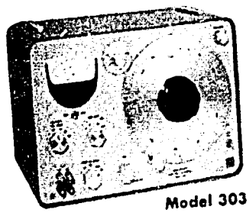
QUAN-TECH ELECTRONIC INSTRUMENTS



Model 303

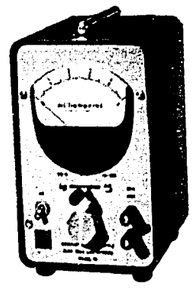
Designed especially for applications in the fields of ultrasonics and noise spectrum analysis. Switch enables you to select any of four constant bandwidths. Two broadest positions are flat topped, vastly increasing the simplicity of tuning at high frequencies

New! — Wave and Noise Spectrum Analyzer

Frequency Range: 30 cycles to 100 kc, ±300 cycle vernier
Voltage Range: 100 microvolts to 300 volts full scale
Bandwidth: —3 db at 10 and 30 cycles round top; 100 cycles and 1 kc, flat top
Monitor Output: Meter output and a voltage proportional to dial setting provide graphic display on oscilloscopes and X-Y recorders

Price: $1200.00

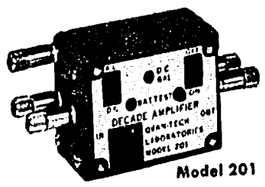
Provides constant output current, variable over a wide range, and independent of the voltage drop across the load. Extremely useful for transistor applications, potentiometer noise measurements, strain gage applications, etc.



Model 151

New! Constant Current Supply

Output: 0.5 to 500 ma. DC in three ranges: 0.5 to 5 ma; 5 to 50 ma; and 50 to 500 ma. 20 volts maximum output voltage.
Power Input: 105-125 volts, 50-60 cycles, 25 watts.
Price: $225.00



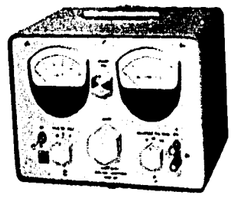
Model 201

Extremely compact and stable, a completely self-contained miniature amplifier Its DC response, low noise, and freedom from microphonics make it exceptionally useful with DC oscilloscopes and in sub-sonic as well as conventional applications.

DC-Coupled Decade Amplifier

Gain: 10 ±2%, flat within ±2% DC to 100 KC.
Input: 400k ohms and 30 mmf, 20 uv input noise.
Output: 100 ohms, 1 volt P-P max, ½% distortion.
Batteries: Three ZM 9 mercury cells, life 600 hrs.
Price: $85.00

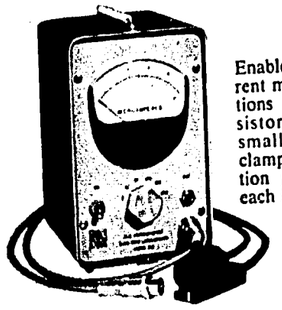
Models 104 and 121 Power Supplies feature 0.1% regulation and metered ranges of voltage and current. Models 101, 102, 103, and 105 (not shown) are compact, lightweight supplies providing voltage metering and 0.25% regulation. Continuous adjustment and overload protection on all models.



Model 104

Transistorized Power Supplies

Model 101:	0- 8 volts DC, 0- 2 amps.	Price $195.00
Model 102:	0-14 volts DC, 0- 1 amp.	Price $175.00
Model 103:	0-30 volts DC, 0-½ amp.	Price $175.00
Model 104:	0-50 volts DC, 0- 1 amp.	Price $375.00
Model 105:	0-50 volts DC, 0-¼ amp.	Price $205.00
Model 121:	0-15 volts DC, 0- 5 amps.	Price $425.00



Model 301

Enables rapid, accurate AC current measurements and observations of wave forms in transistors, magnetic amplifiers, small servo systems, etc. A clamp-on probe and an insertion probe are provided with each instrument.

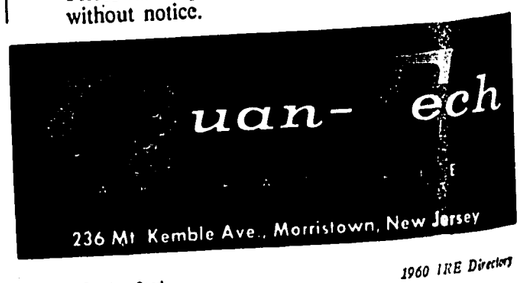
AC Microammeter

Sensitivity: 3 ua to 100 ma full scale (300 ua to 100 ma—clamp on probe).
Frequency: ±2% 50 ~ to 100 KC (±5% 100 ~ to 100 KC—clamp on probe).
Input Impedance: 2 ohms—3 ua to 1 ma; negligible 300 ua to 100 ma.
Price: $290.00

Also available is Model 202 Isolation Amplifier, custom-built power supplies, and amplifiers to your specifications.

We welcome any requests for information regarding specific applications of Quan-Tech instruments.

Prices and specifications subject to change without notice.



For details, circle #300 on Reader Service Card

Directory II. Components

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Quan-Tech Labs., 236 Mt. Kemble Ave., Morristown, N.J., 5, 10, 12, 85, 92, Isolation
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Tel: JEfferson 8-6350

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R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 35, 42, 50, 62, 67, 70
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Tel: LOckwood 5-4578

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Sanborn Co., 175 Wyman St., Waltham 54, Mass., 5, 12, 85
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Tel: TWinbrook 4-6300

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Sargent & Greenleaf, Inc., Security Devices Laboratory Div., 24 Seneca Ave., Rochester 21, N.Y., 7
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Tel: HOpkins 7-3200

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Tel: DAvenport 6-2060

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Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 7, 25, 92
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Tel: LYric 2-6400

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Texas, 12, 85, 92
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Tel: HO 5-3471

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Sperry Rand Corp. Sperry Gyros. Div. Electr. Tube Div., N.Y., 50
Spivey Inc., James S., D.C., 5
Standard Telephones & Cables, Ltd., England, 7, 60
Statham Instruments, Inc., Calif., 5, 85
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Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 7, 35, 50, 57, 60, 67, 70, 80, 90
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Tel: POrt Washington 7-7200

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Tel: YOrkshire 8-6211

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Taffet Radio & Television Co., N.Y., 5, 7, 80
Taft-Pierce Mfg. Co., R.I., Versachek Electronic Gage
Tapetone, Inc., Mass., 70, Parametric
Tech-Master Corp., N.Y., 7, 30, 55, 92

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 45, 60, 92
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Tel: REctor 2-6249

Techniflex Mfg. Co., Inc., N.Y., 5, 10, 12, 52, 67, 80
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Tel: MIdway 6-7211

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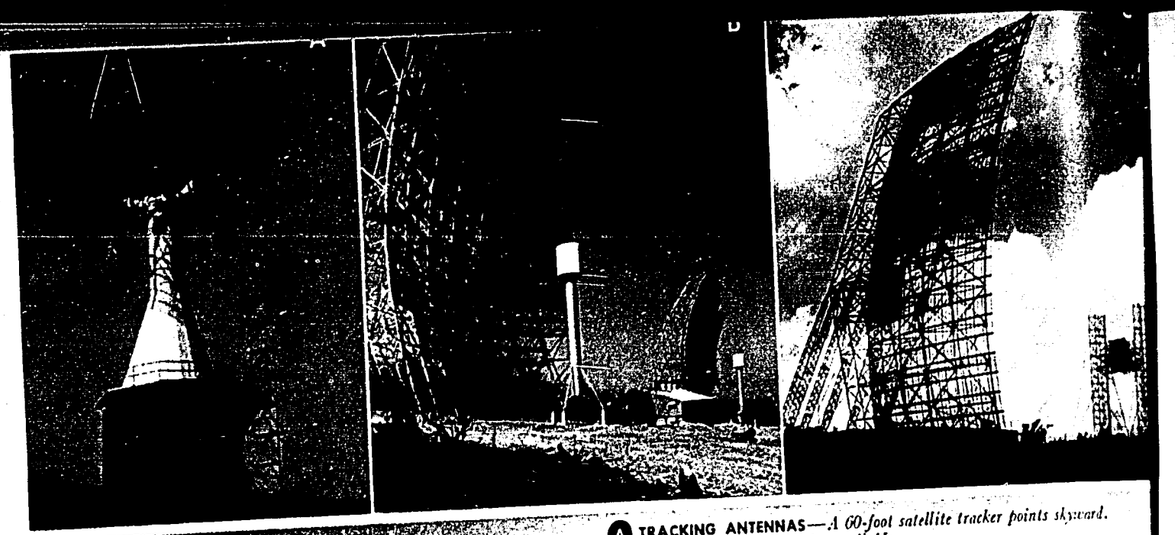


A **TRACKING ANTENNAS** — *A 60-foot satellite tracker points skyward. 28- and 84-foot models also available.*

B **SCATTER ANTENNAS** — *One end of a scatter link showing two 120-foot antennas. 28- and 60-foot models are also available.*

C **RADAR ANTENNAS** — *A giant radar antenna forerunner to the BMEWS Program. Dozens of conventional types are also available.*

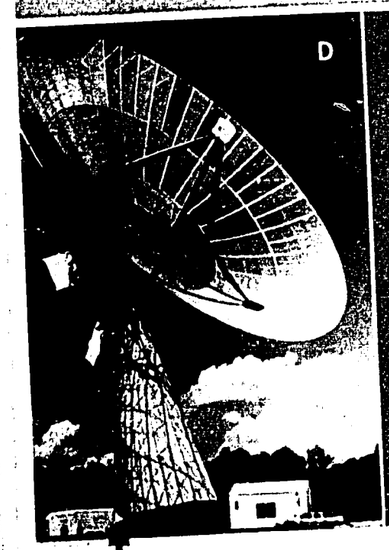
D **RADIO TELESCOPES** — *An 84-foot radio telescope listens to the heavens whisper. 28- and 60-foot models are also available.*

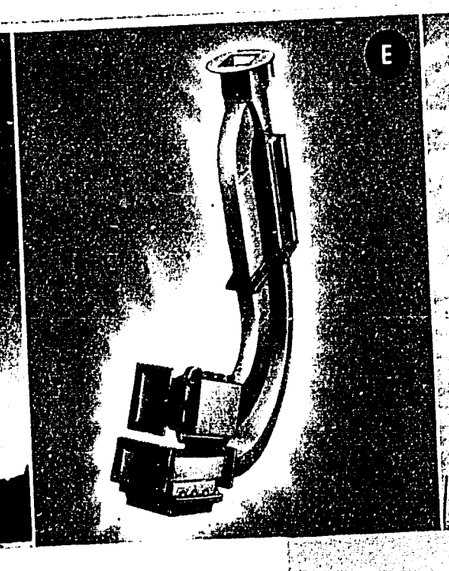
E **WAVEGUIDE COMPONENTS** — *A dual polarized feed with two waveguide inputs. Other large size components include many types of horns, duplexers, transitions, straight sections and bends.*

F **FIELD SERVICE** — *Kennedy Field Service engineers erect an 84-foot radio telescope. Other services include site selection, construction, personnel training and servicing.*

G **RESEARCH AND DEVELOPMENT** — *Kennedy's antenna service includes basic R & D in microwave propagation.*

ASK KENNEDY!





THE solution to antenna problems begins when someone says: "Let's ask Kennedy!"

A few of the many reasons why are shown on this page. These Kennedy antennas are setting new standards for all-weather reliability and versatility wherever they serve throughout the free world.

Kennedy antennas come in many shapes and many sizes. But whatever the type, and whatever the conditions under which it must serve, Kennedy can offer a design that fully measures up to specifications.

Kennedy Field Service engineers are available to install antennas anywhere in the world. It's a part of the complete, integrated service that is still another reason why more and more people in electronics are "asking Kennedy" about antenna problems.

For details, circle #301 on Reader Service Card

ANTENNA EQUIPMENT

D. S. KENNEDY & CO.

COHASSET, MASSACHUSETTS EVergreen 3-1200

West Coast Affiliate

SATELLITE-KENNEDY, INC. of CALIFORNIA

P.O. Box 1711, Monterey, California — FRontier 3-2461

Down-to-earth SOLUTIONS *to out-of-this-world* PROBLEMS

Tracking Antennas-Radio Telescopes-Radar Antennas

"Trans-Horizon" Antennas-Tropospheric Scatter

Ionospheric Scatter

Directory II. Components

36. Amplifiers.

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 5
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Tel: FLeetwood 7-5411

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Tel: ELizabeth 4-5650

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Varian Associates, Tube Div., 611 Hansen Way, Palo Alto 2-BG-59, Calif., 50
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Tel: ENdicott 1-6200

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Walkirt Co., Calif., 7, 12, 60, 67, 92

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Tel: TAlbot 4-2600

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Warren Transformer Co., Inc., Pa., 45

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Tel: GArfield 6-8600

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37. Antennas & Accessories.

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7. Aircraft
10. All-wave receiving
15. Amateur antennas, accessories & rotators
17. Automobile
20. Dummy
22. FM broadcast transmitting
23. Ferrite Rod
24. Fixed station antenna system
25. Ground plane
26. Marine
30. Microwave
35. Mobile
40. Radar reflectors
45. Rotators
50. Supporting towers
55. TV broadcast transmitting
60. TV multiple systems
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65. Tower erection & maintenance service
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Aircraft Radio Corp., Boonton, N.J., 7
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Tel: DEerfield 4-1800

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Tel: HAncock 6-2150

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Argonne Electronics Mfg. Corp., N.Y., 23

Arra Corp. (Antenna & Radome Research Assoc.), 1 Bond St., Westbury, L.I., N.Y., 30, 40
See ad on page 389
Tel: EDgewood 4-8770

Atkins & Merrill, Post Road, Sudbury, Mass., 40, Radomes
See ad on page 628
Tel: HIlltop 3-8822

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Babcock Relays, Inc., Calif., 7, 10, 15, 24, 25, 26, 30, 35, 40, 63, 65, 75

Gabriel electronics division

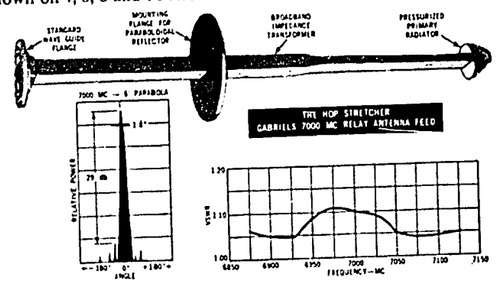
THE GABRIEL COMPANY

INTEGRATED ANTENNA PROGRAMS — RESEARCH DEVELOPMENT PRODUCTION

New Products

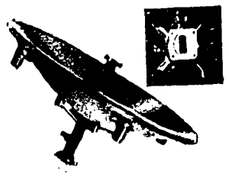
The HOP-STRETCHER feeds offer higher gain, lower sidelobe levels and more desirable beam-widths for center-fed parabolic antennas. This feed was developed for S, X, K_u and K_a bands.

Technical features of X-band antenna • Sidelobes at least 24 db down on 4, 6, 8 and 10 ft. reflectors • High gain efficiency, 65-70%

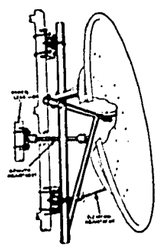


The new hi gain 3 kmc Cylindrical Coaxial Feed provides similar E and H-plane patterns, minimum side and backlobes, and negligible squint. Rear-mounted, with easy polarization adjustment to any angle.

7000 mc Offset Antenna. Ideal for installations where passive reflectors are utilized — VSWR less than 1.10:1 over 5900-8500 mc — Sidelobes at least 24 db down — gain is 41 db at 7000 mc. Elliptically shaped reinforced fiberglas reflector.

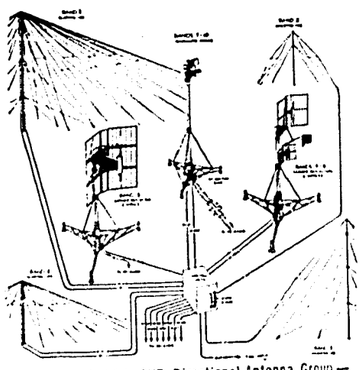


The new X-band parabolic antenna with standard feed. Features variable polarizing adjustment, 0 to 90°. Manually locked in position.



The new universal 3-point suspension mounting bracket for 2, 4, 6, 8 and 10 ft. parabolic reflectors.

Features • Independent azimuth adjustment. • Independent elevation adjustment. • Adaptable for mounting in all locations.

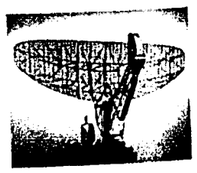


Broadband, HF-to-SHF, Directional Antenna Group — Remotely controlled.

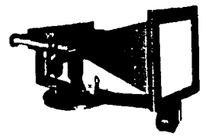
Low-drag Airborne Flush-mount Antenna. Beacon — Countermeasures — Homing — Navigation

Missile Antennas — Telemetering, Destruct, Guidance ICBM, Surface-to-Air, Air-to-Air, and Surface-to-Surface.

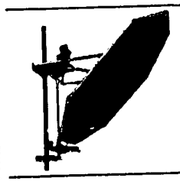
Radar Antennas
- Shipborne Search
- Harbor Control
- Airborne Height Finding
- Land Base Search



Designed, developed, and constructed to military specifications with improved strength-to-weight ratio and component reliability.



Aleutian Line—Dew Line Low loss, heavy duty duplex feed horns for Tropospheric Scatter Radio Communication Systems.



Motorized Passive Reflector For maximum point-to-point transmission in microwave relay links. Fast, accurate, easy adjustment from remote location. Manually adjusted reflectors also available.

The Gabriel Electronics Division is one of the world leaders in microwave relay link antennas, and the more complex antennas. They are dedicated to improve and extend the state-of-the-art in antennas and antenna components.

Call or write to GABRIEL ELECTRONICS DIVISION for counsel on your antenna needs.

GABRIEL'S STANDARD MICROWAVE PARABOLIC ANTENNAS

...Contributing millions of trouble-free operational hours for industry and the military.

- 7000 mc — Broadband (5925-7425 mc) high gain > 40 db low sidelobes — low VSWR < 1.13:1 over band.
- 4000 mc — Narrow-beam broadband (3700-4200 mc) — low VSWR < 1.2:1 — gain > 37 db.
- 2000 mc — Available in offset and center-fed feeds. Narrow-beam broadband (1750-2110 mc) — high gain > 28 db low VSWR < 1.3:1 over band
- 940 mc — All weather radome covered feed — gain > 22 db low VSWR < 1.25:1.

135 CRESCENT RD., NEEDHAM HEIGHTS 94, MASSACHUSETTS—phone Hillcrest 4-0005

For details, circle #302 on Reader Service Card

Directory II. Components

37. Antennas & Accessories.

Barker & Williamson, Inc., Pa., 15, 20, 23, 70
Bassett Inc., Rex, Fla., 15, 17, 24, 26, 35
Belling & Lee Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 10, 50, 60, 63
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Tel: ENfield 3322
Bendix Aviation Corp., Bendix Pacific Div., Calif., 26
Bendix Aviation Corp., Bendix Products Div., Ind., 7
Bendix Aviation Corp., Bendix Radio Div., Md., 7, 23, 24, 25, 35, 75
Bendix Aviation Corp., Jones Electronics Co., M.C., Conn., 20
Bendix Aviation Corp., Research Labs. Div., Mich., 7, 45
Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 20
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Tel: LOwell 3-9511
Bendix Radio, Industrial Communications & Electronic Prods., Md., 24, 25, 35
Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, 20
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Tel: CHurchill 8-1200
Birdair Structures, Inc., N.Y., Air-Supported Radomes, Towers, Air Inflated Parabolic Antennas
Blaine Electronetics, Inc., Calif., 7, 50, Horn Antennas, Radiation Pattern Measurements
Blaw-Knox Co., Blaw Knox Equip. Div., Pa., 24, 40, 50, 65
Blonder-Tongue Labs., Inc., N.J., 60, 63, 75
Bogart Mfg. Co., N.Y., 7, 20, 30, 75
Brooks & Perkins, Inc., Mich., 40
Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 20, 30
See ad on page 592
Tel: STillwell 6-1706
Buddman Electronics Corp., Conn., 24
Buggie Corp., Buggie Div., H. H., Ohio, 35, 75
CG Electronics Corp., N.M., 5, 25
California Tech. Indust. Div.-Textron Inc., Calif., Antenna Test-Range Equipment
Canadian Marconi Co., Canada, 26, 40
Cannon Corp. of California, Calif., 7, 30, 40, 45, 50, 75
Carborundum Co., Refractories Div., N.Y., 20
Channel Master Corp., N.Y., 45, 50, 63, 70
Chisholm-Ryder Co., Premax Prods. Div., N.Y., 7, 15, 17, 24, 25, 26, 35, 75
Chu Associates, Mass., 24, 25, 30, 75
Clear Beam Antenna Co., Calif., 17, 50, 60, 63, Antennas, FM Receiving
Coaxial Connector Co., Inc., N.Y., 10, 20, 24, 30, 75
Coilcraft, Inc., Ill., 23
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 7, 22, 24, 30, 75
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Tel: EMpire 3-0281
Columbia Products Co., S.C., 17, 25, 26, 35
Communication Equip. & Engineering Co., Ill., 7
Communication Prods. Co., N.J., 17, 24, 25, 26, 35, 45, 75
Communications Co., Fla., 24, 25
Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 20
See ads on pages 321, 451
Tel: HAmilton 7-7961
Copperweld Steel Co., Pa., 5, 22
Corbin Corporation, Md., 25, 75
Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., So. Plainfield, N.J., 10, 15, 17, 45, 63, 75
See ad on Cover 3
Tel: PLainfield 6-9000
Craig Systems, Inc., Dept. H-1, 361 Merrimack St., Lawrence, Mass., 50
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Tel: MUrdock 8-6961
Dale Products, Inc., 1318 28th Ave., Columbus, Nebr., 7
See ad on pages 34-35
Tel: LOcust 4-3131
Dalmo Victor Co., Div. of Textron, Inc., Calif., 7, 30, 40
Dayton Aircraft Products, Inc., Fla., 7
Defiance Engrg. & Microwave Corp., Mass., 7, 25, 26, 30, 35, 40
Diamond Antenna & Microwave Corp., Mass., 7, 20, 24, 25, 26, 30, 40
Dorne & Margolin, Inc., N.Y., 7
Douglas Microwave Co., Inc., Dept R-9, 252 E. 3rd St., Mt. Vernon, N.Y., 30
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Dresser-Ideco Co., Ohio, 24, 30, 40, 50, 65, 70
Dynamic Electronics-New York, Inc., N.Y., 7, 10, 20, 23, 24, 25, 35, 40, 65, 75
Dynamics Corp. of America, Reeves Instrument Corp., N.Y., 45
E.M.I. Electronics Ltd., England, 5, 7, 22, 24, 30, 55, 60, 75
Ecco Electronic Components Corp., N.Y., 30
El-Rad Mfg. Co., Ill., 23
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Electro Impulse Laboratory, 208 River Street, Red Bank, N.J., 20
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Electronic Specialty Co., Calif., 7, 30, 40, 75
Elsin Electronics Corp., N.Y., 30
Emerson & Cuming, Inc., Mass., 30, 40
Emerson Electric Mfg. Co., Mo., 30, 40

ANTENNAS REFLECTORS & ASSOCIATED EQUIPMENT

FROM DESIGN TO PRODUCTION

Stock Reflectors — solid spun, 4 in. to 10 ft. in diameter • mesh, 4 ft. to 18 ft. in diameter • larger sizes or special shapes on request.

Antennas — up to 10,000 mc

Large Waveguide Components

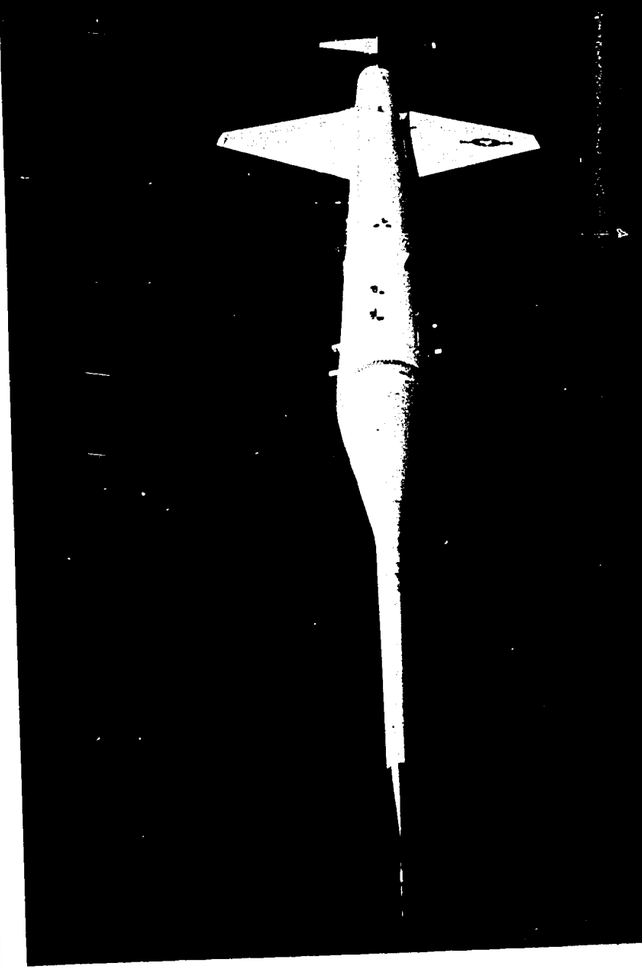
Prompt Delivery of any type antenna or reflector — precision built to your specifications. Write for technical data.

Ainslie CORPORATION

312 Quincy Ave., Quincy, Massachusetts

For details, circle #303 on Reader Service Card

(right) Lockheed Q-5 target missile features telemetry that registers miss-distance and theoretical hits in testing accuracy of other missiles.



ANTENNA—TELEMETRY

Studying results of antenna pattern measurements — part of the activity of the Space Communications laboratory.

Lockheed
MISSILES AND SPACE DIVISION

Systems Manager for Navy POLARIS FBM; DISCOVERER SATELLITE; Army KINGFISHER; Air Force Q-5 and X-7

SUNNYVALE, PALO ALTO, VAN NUYS, SANTA CRUZ, SANTA MARIA, CALIFORNIA
CAPE CANAVERAL, FLORIDA
ALAMOGORDO, NEW MEXICO • HAWAII

For details, circle #304 on Reader Service Card

Expanding the Frontiers of Space Technology

Lockheed maintains extensive research capabilities for the development of antennas and telemetering systems and spacecraft applications.

Laboratory studies in antennas and electromagnetic propagation include the application of solid state materials to microwave transmission line components; the design of antennas to survive the rigors of space flight; the effects of space on radio signals and radar detection; and the scattering from missile shapes and space vehicles. Research is also being conducted in the application of ferrites and MASERS; on problems of radio transmission between space vehicles and Earth, re-entry scattering and diffraction by man-made objects and ionized gases; and development of antennas for data link systems between satellites and ground stations.

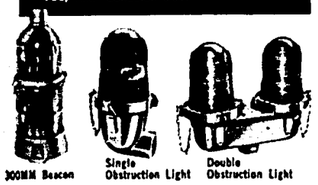
Telemetering has been brought to a high degree of successful application in the integration of circuits and components into high-performance systems. A completely sub-miniaturized FM-FM system has been developed, along with a complete PAM-FM system characterized by highly efficient band-width utilization, low power consumption and economy of size and weight. This represents a significant achievement in the field of high capacity telemetry.

Engineers and Scientists—Lockheed Missiles and Space Division programs reach far into the future and deal with unknown and challenging environments. If you are experienced in one or more of the above areas, or have background in related work, we invite you to share in the future of a company that has an outstanding record of achievement and make an important individual contribution to your nation's progress in space technology. Write: Research and Development Staff, Dept. J-93, 962 W. El Camino Real, Sunnyvale, California. U.S. citizenship required.

HUGHEY and PHILLIPS, INC.

Specialists in Obstruction Lighting Equipment and Controls

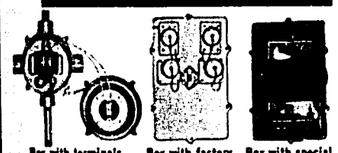
BEACON and OBSTRUCTION LIGHTS, designed to meet specifications of CAA, FCC, and Canadian DOT.



300MM Beacon — Single Obstruction Light — Double Obstruction Light

You'll find Hughey & Phillips have obstruction lights for every job. The engineering of each light offers maximum efficiency and simplified installation and maintenance. Whether you need bottom or side entrance conduit fitting types, there is a model to meet your requirements.

SPECIAL CAST ALUMINUM WATERTIGHT JUNCTION BOXES, offering a wide choice in types of terminals, cable support, and factory installed screw cap receptacles.



Box with tarminals, cable support, and receptacle in cover. — Box with factory installed screw cap receptacles. — Box with special terminals and cable support.

Hughey & Phillips have pioneered in the use of adequate junction boxes with proper terminals, and built-in cable support to meet NEC requirements.

SPECIAL CONTROL UNITS, designed for both indoor and outdoor installation.

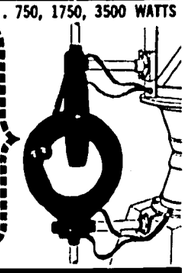
- Photo-Electric Control Units
- Beacon Flashers
- Combination Photo Control & Beacon Flashers
- Lamp Failure Indicator System
- Controls with Autotransformer system . . . pioneered by Hughey and Phillips for tall towers increases lamp life.

Photo control, flasher and Lamp Failure Alarm

TOWER LIGHTING ISOLATION TRANSFORMER

THREE SIZES . . . 750, 1750, 3500 WATTS

FEATURING:
- HIGHER EFFICIENCY
- IMPROVED REGULATION
- ADDITIONAL TAPS
- FIBER GLASS INSULATION
- EPOXY ENCASED
- VERSATILE MOUNTING



HUGHEY & PHILLIPS, INC.
MANUFACTURERS OF
300MM Beacons Obstruction Lights Photo Electric Controls Beacon Flashers Special Junction Boxes Microwave Tower Light Control and Alarm Systems Tower Isolation Transformers, and Complete Kits for Tower Lighting, Sleetmelter Power and Control

3200 N. San Fernando Blvd Burbank, Calif

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Directory II. Components

37. Antennas & Accessories.

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 30, 75
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Tel: VIctor 2-8400
Engineering Associates, Ohio, 25, 30
Entron, Inc., Md., 60
Erco Radio Labs., Inc., N.Y., 24, 25, 75
Essex Electronics, 569 Springfield Ave., Berkeley Heights, N.J., 23
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Tel: CRestview 3-9300
Fentiman & Sons, Ltd., Canada, 40
Ferricore Inc., N.J., 23
Ferris Instrument Co., N.J., 20
Ferroxcube Corp. of America, 50 East Bridge St., Saugerties, N.Y., 23
See ads on pages 285, 361, 433, 467, 531, 617
Tel: CHerry 6-2811
Finney Co., Ohio, 15, 63, 75, F.M. Receiving
Fisher Research Lab., Inc., Calif., 26
Frequency Standards, Inc., P.O. Box 504, Shafto Rd., Asbury Park, N.J., 7, 30, feed systems
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Tel: PRospect 4-0500
Fugle-Miller Laboratories, Inc., 301 Central Ave., Clark, N.J., 23
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Tel: FUlton 1-2727
Gabriel Co., Gabriel Electronics Division, 135 Crescent Rd., Needham Heights 94, Mass., 7, 24, 25, 26, 30, 35, 40, 45
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Tel: HIllcrest 4-0005
Gates Radio Co., Ill., 5, 22, 50, 55, 70
Gavitt Wire & Cable Co., Mass., 23
General Cement Mfg. Co., 400 S. Wyman St., Rockford, Ill., 63
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General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 23
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General Instrument Corp., Mass., 23
Gilfillan Bros. Inc., Calif., 40
Gombos Co. Inc., John, N.J., 30
Goodyear Aircraft Corp., Ariz., 7, 20, 30, 40
Gorham Mfg. Co., Electronics Div., 333 Adelaide Ave., Providence 7, R.I., 7, 20
See ad on page 593
Tel: WIlliams 1-1000
Granger Associates, Calif., 7, 10, 24, 26, 30, 35, 75
Granite State Mach. Co., Inc., N.H., 30, 40, 75
Gulton Industries, Inc., N.J., 7, 24, 25, 30, 35, 40
Gulton Industries, Inc., N. M., 15, 17, 20, 23, 24, 26, 30, 35, 40, 45, 75
H R B-Singer, Inc., Science Park, State College, Pa., 7, 10, 24, 30, 40, 75
See ad on page 366
Tel: ADams 7-7611
Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 7, 30, 75
See ad on page 204
Tel: VAn Buren 6-6300
Hermes Electronics Co., Dept. BD, 75 Cambridge Parkway, Cambridge 42, Mass., 30
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Tel: UNiversity 4-7200
Hoover Electronics Co., Md., 20
Houston Fearless Corp., Calif., 45
Hudson American, Radio Eng. Labs. Inc., Div., N.Y., 26
Hughey & Phillips, Inc., 3200 N. San Fernando Blvd., Burbank, Calif., 70
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Tel: VIctoria 9-1104
Hycon Eastern, Inc., See: Hermes Electronics Co.
I-T-E Circuit Breaker Co., Special Products, Pa., 7, 10, 15, 24, 25, 26, 30, 40, 45, 50, 75
Illumitronic Engineering Co., 680 E. Taylor Ave., Sunnyvale, Calif., 24
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Tel: REgent 9-2395
International Electronics Corp., N.Y., 5, 7
International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 30
See ad on pages 42-43
Tel: ORegon 8-6281
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 7, 25, 26, 30, 40, 45
JFD Electronics Corp., 1462 62nd St., Brooklyn 4, N.Y., 7, 17, 35, 63, 75
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Tel: DEwey 1-1000
J-V-M Microwave Co., Ill., 30, 40
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Kaar Engrg. Corp., Calif., 17, 26, 35
Kaman Aircraft Corp., Nuclear Div., Colo., Telemeter
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 23, 30
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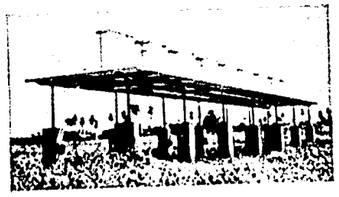
Kearfott Co., Inc., Microwave Div., Calif., 30, 75

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

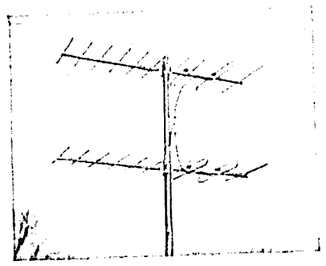
Antennas



MINITRACK ANTENNAS

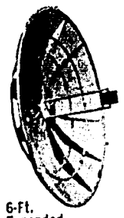
Horizontally or vertically mounted arrays similar to this MINITRACK antenna can be designed for individual beam requirements or you can select from a number of existing designs.

TACO offers unsurpassed facilities for the design, development and manufacture of military and commercial antenna systems. Mechanically, Taco is currently handling antenna arrays in the area of 2000' dimensions. Electrically, Taco is equipped and experienced in the design and manufacture of antennas from 30 MC to X-band. Modern laboratory and manufacturing facilities include long-range test sites, complete measuring and testing equipment, automatic constant potential welding equipment, and provision for competent field service and installation service anywhere.



RUGGEDIZED YAGI

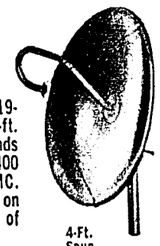
From 30 MC to 500 MC. Available as individual units or stacked systems.



6-Ft. Expanded Aluminum Mesh

PARABOLIC ANTENNAS

Mesh sizes from 4-ft. to 19-ft. and spun sizes from 4-ft. to 6-ft. Frequency bands from 806-960 MC, 1700-2400 MC and 5925-7450 MC. Other bands available on special order. Variety of mountings.



4-Ft. Spun Aluminum

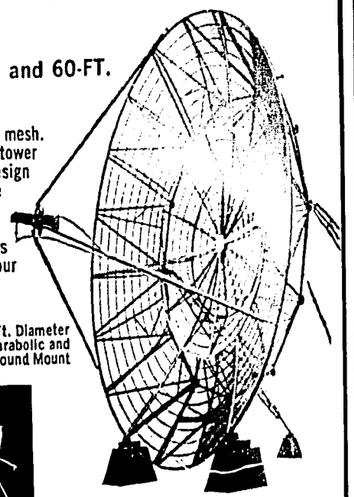
WAVE GUIDE COMPONENTS

Large Wave Guide Components for 10½" and 21" in the form of wave guide bends, feed horns, are available. Certified welders assure quality units fully tested to meet the most stringent electrical and mechanical requirements.

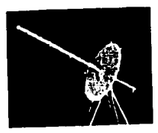
28-FT., 32-FT. and 60-FT. PARABOLICS

Expanded aluminum mesh. Ground mounted or tower mounted. Unique design allows rapid, simple erection.

Dual polarized horns supplied to meet your requirements at reasonable cost.



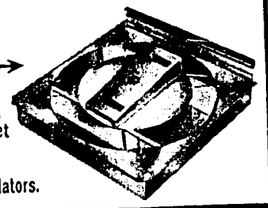
28-Ft. Diameter Parabolic and Ground Mount



AIRBORNE ANTENNAS

←Antenna AT-256-A/ARC Type and Construction: Streamlined blade type antenna. Heat treated permanent mold aluminum castings with Teflon insulators.

Antenna G-833→



Type and Construction: Flush mounted annular slot antenna for communication band. Sheet aluminum, spot welded construction per Air Force specifications. Fibreglas insulators.

HELICAL ANTENNAS and MOUNTS

Mechanical mount for azimuth and elevation. Electromechanical remote mounts also available. Helicals available in 4, 6, or 8 turns from 215-265 MC. Other frequencies on special order. Mount illustrated is H-M-1.

and the best TV antennas in the world...

TACO ANTENNAS

TACO

TECHNICAL APPLIANCE CORP.
SHERBURNE, N. Y.

In Canada: Horkbusch Electronics Ltd. Toronto 4, Ont.

Directory II. Components

37. Antennas & Accessories.

Kemlite Labs., Inc., Ill., 70
Kennedy & Co., D. S., 155 King St., Cohasset, Mass., 30, 35, 40, tropo scatter
See ad on page 376
Tel: EVergreen 3-1200
Kenwood Engineering Co., Inc., N.J., 63
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 7, 30
See ad on page 425
Tel: Swiftwater 3-5000
Knight Corp., Ewen, Mass., 20
Kreckman Co., Herb, Pa., 15, 24, 25, 75
Krystinel Corp., Fox Island Rd., Port Chester, N.Y., 23
See ad on page 619
Tel: WEstmore 9-2261
Lambda-Pacific Engr., Inc., Calif., 30, 75
Land Air, Inc., Ill., 7
La Pointe Industries, Inc., Conn., 10, 15, 40, 75
Lavelle Aircraft Corp., Pa., 40
Lear, Inc., Lear Cal Div., Calif., 7
Lehigh Structural Steel Co., N.Y., 50, 65
Lieco, Inc., N.Y., 20, 30
Ling Systems Inc., Calif., 30, 40
Lingo & Son, Inc., John E., N.J., 55
Litton Industries, Airtron, Inc. Div., N.J., 20, 23, 25, 30, 45
Litton Industries, Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 30, 40
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Tel: CRestview 4-7411
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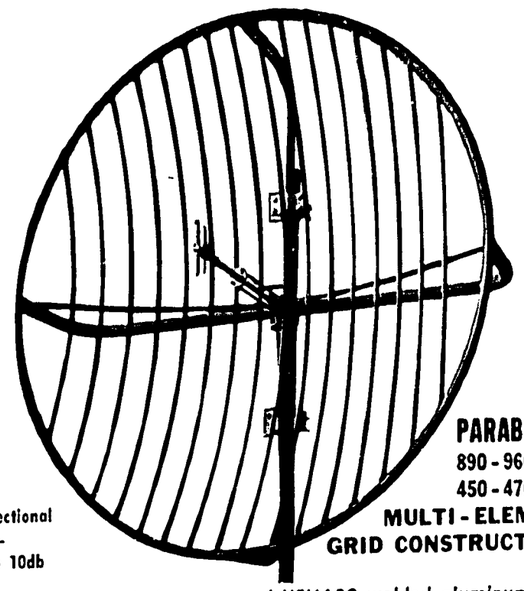

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890 - 960 MC
450 - 470 MC
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light weight, low windage, rugged HELIARC welded aluminum open construction permits lighter, lower cost towers
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* patent applied for

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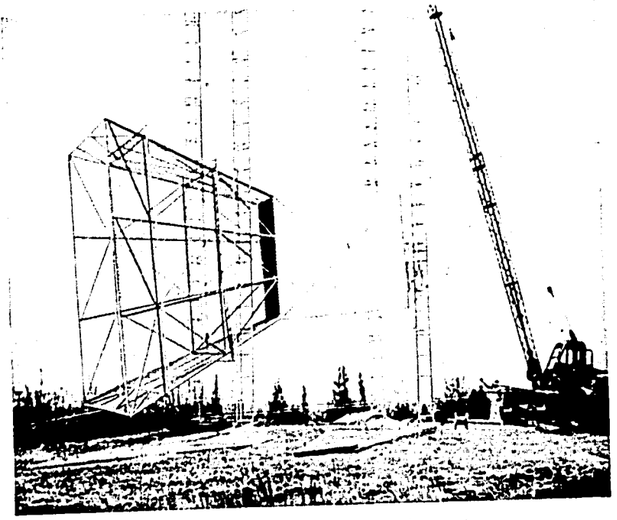
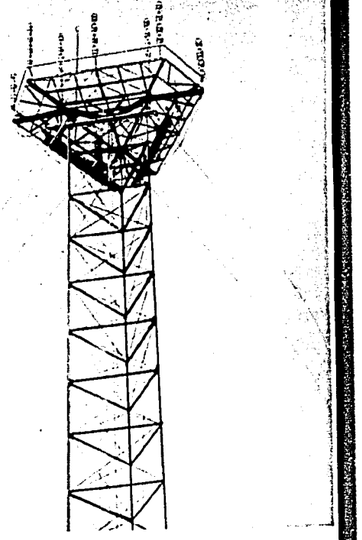
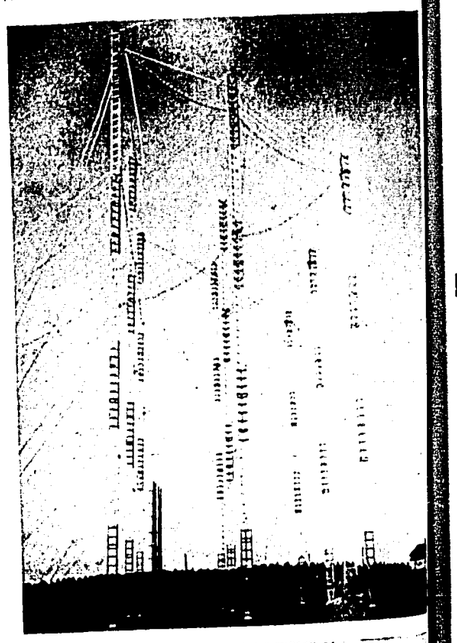
Special-design tower supporting Air Force antennas for test purposes.



Horn-type receiving antenna and support towers for signal amplification.





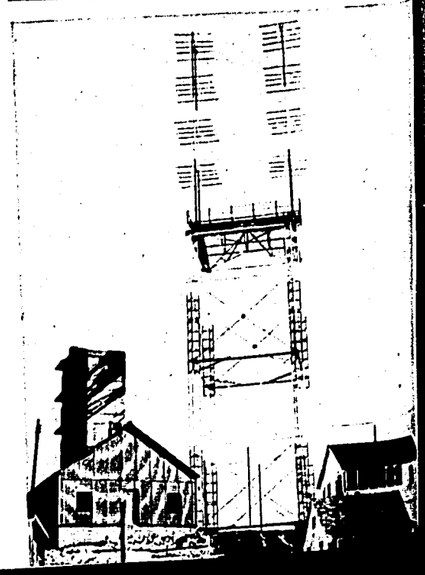
Towers supporting large curtain type antenna for scatter communication.

STAINLESS TOWER DESIGNS OFFER UNUSUAL VERSATILITY FOR SPECIAL APPLICATIONS

"Custom" design utilizing Stainless stock tower sections is the answer to many special tower requirements. Standard stock tower sections may be modified and adapted to special specifications at minimum cost.

A wide variety of self-supporting or guyed structures are available to support all types of top or antenna loads and withstand all types of wind, ice and rigidity conditions.

Let Stainless' Design Staff advise and assist you with your structural problems.



Special design self-supporting test structure having very rigid deflection and ice load specification.

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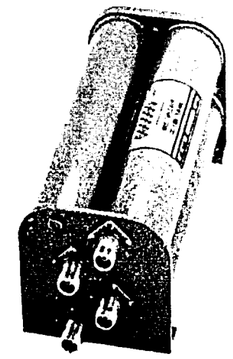
Rantec's long line of proprietary products, results of many original research and development projects, are now in use in major missile and satellite programs, tracking range installations and instrumentation laboratories throughout the world. These are "flight proven," "range proven" products with a history of *tested* reliability.

RF & MICROWAVE

ANTENNAS

Rantec antennas — helical arrays, antenna feeds, slot arrays and other special designs — are widely known for their efficient, dependable operation in telemetry systems, radar tracking and augmentation, command guidance and ECM systems. Rantec helix installations have been used in many major missile and satellite projects including the long-range Pioneer series.

TELEMETRY MULTIPLEXERS



When quantity of information, weight, space and optimum antenna location are problems, Rantec telemetering multiplexers provide an easy, efficient solution. With Rantec multiplexers, two, three, four (illustrated) or six telemetry signals can be coupled to a single antenna system. Isolation between r-f inputs is extremely high while transmission loss of signals to the antenna is extremely low. Rantec multiplexers (high Q coaxial band pass filters) cover the telemetry band and are optimized for indicated frequency ranges. They are now in production for use in nine major missile programs.

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To meet the pressing needs of systems engineers, Rantec has designed, developed and manufactured a number of widely-used microwave ferrite components.

Amplitude Modulators
Single Side-Band Modulators
Phase Shifters
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Circulators (illustrated)
Load Isolators

In addition to the above products, Rantec also designs and manufactures VHF remote attenuators, non-contacting antenna lobing switches, high-speed logarithmic pattern recorders and automatic radome boresight measurement equipment.

Complete information on Rantec products and a brochure describing Rantec research and development capabilities are available free of charge on request.

rantec corporation

calabasas, california

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Specialty Engrn. & Electrn. Co., N.Y., Radomes
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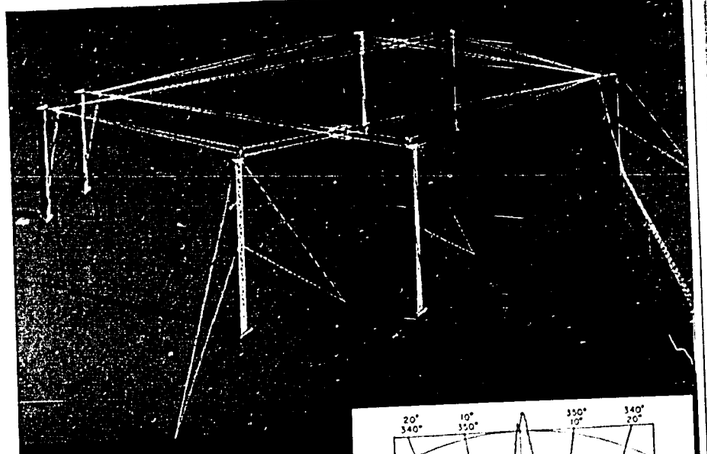
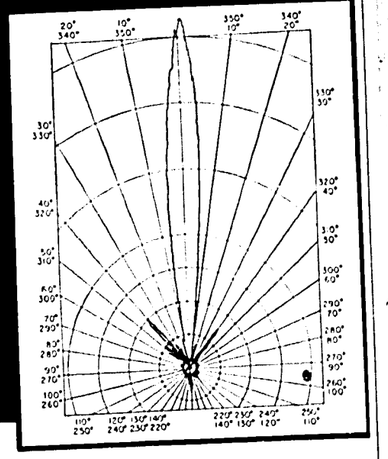


THE NEW

Trylon / Laport Rhombic

a low-interference antenna for long distance communications



The history making concept by E. A. Laport of the unique Rhomboid Antenna illustrated above, has been developed, engineered, installed and tested by the facilities of The Wind Turbine Company. An 8.5 mc installation realizes such significant improvement, as: Sidelobes at least 14 db below the main beam over a two to one frequency range. Gain at least 10 db more than comparable conventional Rhombics, twice the power handling capacity — and with lower transmission line loss, too!

The meticulous model testing and careful attention to electrical and structural details inherent in this installation, are typical of Trylon engineering. The Wind Turbine Company welcomes the opportunity to apply this sound approach to the planning, design, fabrication, and installation of your next antenna system — whether for AM, FM, TV, Microwave, Mobile, or Long-distance communications.

TRYLON

ANTENNA DESIGN, FABRICATION, INSTALLATION

GALVANIZED STEEL TOWERS

TRANSMISSION LINES, SWITCHES & RELATED EQUIPMENT

WIND TURBINE COMPANY, West Chester, Pa.

In Canada: The Wind Turbine Company of Canada, Ltd., Waterloo, Ontario

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- FIXED
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Complete installations for all communications purposes

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Tower Erectors and Fabricators the World Over!

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Tel: OWen 6-3110

Winegard Co., Iowa, 75, FM Broadcast Receiving, TV Receiving

Wunderlich Radio Co., Ill., 5, 24, 30, 50, 65, 70, 75

Z & W Mfg. Corp., Ohio, 7, 25

38. Attenuators.

2. IF
4. RF
5. Decade
10. Impedance Matching
15. Microwave
18. Fixed microwave step
20. Volume controlling

ACDC Electronics, Inc., Calif., 2, 4

Aerolite Electronics Co., N.J., 10

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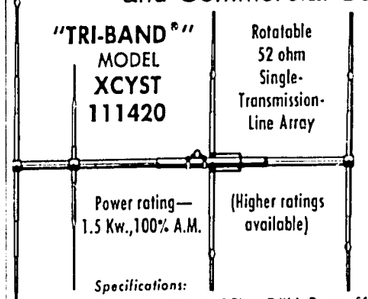
Andersen Labs., Inc., Conn., 2

Applied Research, Inc., 76 S. Bayles Ave., Port Washington, N.Y., 4, 10
See ad on page 448
Tel: POrt Washington 7-8707

TELREX LABORATORIES

Designers and Manufacturers of

COMMUNICATION ARRAYS FOR THE ARMED FORCES
and Commercial Service



Specifications:
Gain 11Mc.-8.0 db, F/B 24 db, E-Plane B-W ½Power—66°
Gain 14MC.-8.4 db, F/B 24 db, E-Plane B-W ½Power- 60°
Gain 20Mc.-8.6 db, F/B 24 db, E-Plane B-W ½Power—56°
Wind surface—13.36 sq. ft. Load at 100 mph.—423 lbs.
Turning radius—23 ft. Container size—12"x12"x14'
Antenna weight—160 lbs. Shipping weight 200 lbs.
Antenna rated design with ½" radial ice—110 mph.

Calibrated for easy assembly to specifications and center frequency of your choice. Custom Quality construction throughout. Suggested rotator for above — Telrex Model 500-RI5.

Also available: Over 172 off-the-shelf fixed or rotatable high-performance arrays: 7Mc. to 600Mc. Mono, Duo, Tri and Multi-band individually fed or single line feed, and medium to extra heavy duty rotator-indicator control systems, rotated masts, and towers.

- Telrex is equipped to design and supply to our specifications or yours, Broadband or single frequency, fixed or rotary arrays for communications, FM, TV, scatter-propagation, etc.
- Consultants and suppliers to communication firms, universities, propagation laboratories and the Armed Forces.

For information or to order, phone PRospect 5-7252 or write Department SC.

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Communication and TV Antennas

ASBURY PARK 25, NEW JERSEY, U.S.A.

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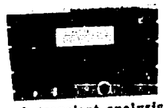
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

New High Power Pulsed Oscillator PG-650-C



The successful introduction of the PG-650 pulsed oscillator to many test applications has led to an improved model of interest to workers in ultrasonics, r.f. transient analysis, nuclear magnetic resonance, etc. The following characteristics and features are available only with the PG-650-C.

Frequency Coverage 5-90 MC in 7 ranges*

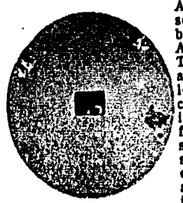
R.F. output Voltage (Min.) into 93 ohms .....0—300 p to p
Pulse length continuously variable .....1½—15 μsec
Rise and Fall times (Max.) .....0.3 μsec
Pulse Droop .....5% Max.
Noise Output between Pulses .....Thermal Noise from Termination
Harmonic Content (Max.) mostly 3rd 10%
R.F. Leakage .....Negligible
Trigger to Pulse Jitter .....005 μsec

SPECIAL FEATURES

Internal Delay Ranges available from calibrated Helipot .....200, 1100, 11,000 μsec
Gate Pulse output available for intensifying and blanking purposes.
External modulation of r.f. oscillator using varying pulse lengths and p.r.f.'s for Carr-Purcell Method.
Fine controls of P.R.F., Pulse length, and delay times.

** Use of special coils will extend the coverage from 0.5 to 150 MC*

ULTRASONIC DELAY LINES

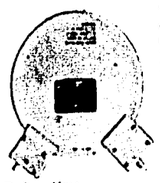


Advanced designs in solid delay lines has been the feature of ARULAB products. This organization has always been the leader in a highly competitive field in improving the performance in all respects. The model shown has the lowest secondary level and widest bandwidth in history and was designed especially for integration applications.

SPECIFICATIONS:

Delay time .....900 μsec
Average Max. Secondary level .....70 db
Triple Travel level .....60 db
Bandwidth for Operation .....10 MC
Center Frequency .....40 MC
3 db Bandwidth .....20 MC
Size .....1½" diam. x 1"

Model "C" Miniturized Line



The Model "C" series delay lines were developed to reduce the weight and cost of the longer delays needed for radar applications. These units represent a 20% reduction in diameter and 40% in weight over older models. Typical Specifications:

Delay time .....1500 μsec
Center Frequency .....32 MC
Bandwidth 3 db .....20 MC
Insertion Loss (50 ohms) .....60 db
Capacity .....100 μμfd
Max. Secondary level—5 MC-BW .....43 db
Max. Secondary level—20 MC-BW .....40 db
Aluminum Case .....8¾" diam. x ⅞"
Weight .....2 lbs.-14 oz.

Please write for our bulletins on other test equipment: Wide Band Amplifiers, Preamplifiers, and Precision Attenuators.

ARENBERG ULTRASONIC LABORATORY, INC.

94 Green Street, Jamaica Plain 30, Mass.
Phone—JAmaica 2-8640

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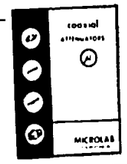
MICROLAB

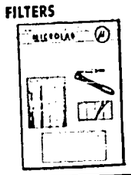
coaxial components FROM STOCK

ATTENUATORS



Fixed and variable
D.C. to 13,000 mc.
0 to 80 db.
2, 20, 200 watts
Write for catalog #9B

FILTERS



High pass & low pass
100 to 13,000 mc.
10 and 500 watts
1.2 Max. VSWR
Write for catalog #7A

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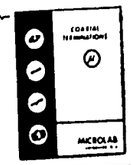

Fixed and sliding
D.C. to 13,000 mc.
2, 10 and 150 watts
1.1 Max. VSWR
Write for catalog #9A

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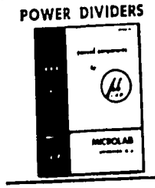

Resistive—wide band
Reactive—min. loss
D.C. to 13,000 mc.
2 to 6 outputs
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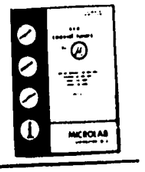

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Line stretchers
250 to 10,000 mc.
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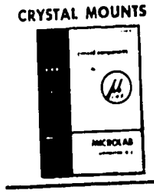

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38. Attenuators.

Arenberg Ultrasonic Laboratory, Inc., 94 Green St., Jamaica Plain (Boston) 30, Mass., 2
See ad on this page
Tel: JAmaica 8-8640

Argonne Electronics Mfg. Corp., N.Y., 20

Arra Corp. (Antenna & Radome Research Assoc.), 1 Bond St., Westbury, L.I., N.Y., 15, 18, Continuously Variable
See ad on page 389
Tel: EDgewood 4-8770

Atomitron, Inc., N.Y., 15, 18

Babcock Relays, Inc., Calif., TV Receivers

Bellaire Electronics, Inc., N.J., 15

Belling & Lee, Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 4
See ad on page 418
Tel: Enfield 3322

Bendix Aviation Corp., Jones Electronics Co., M. C., Div., Conn., 4

Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 4
See ad on page 170
Tel: LOwell 3-9511

Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, Directional & Coax RF
See ad on page 334
Tel: CHurchill 8-1200

Blonder-Tongue Labs., Inc, N.J., 4, 10

Bogart Mfg. Co., N.Y., 4, 15

Bomac Laboratories, Inc., Salem Rd., Beverly, Mass., 15
See ad on page 172
Tel: WAlker 2-6000

British Thomson-Houston Co., Ltd. England, 15

Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 15, 18
See ad on page 592
Tel: STillwell 6-1706

Canadian Marconi Co., Canada, 2, 4, 5

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See ads on pages 400, 527
Tel: 2-4571

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Daven Co., N.J., 2, 4, 5, 10, 20

Defiance Engrg. & Microwave Corp., Mass., 4, 15, 18

DeMornay-Bonardi, 780 S. Arroyo Parkway, Pasadena, Calif., 15
See ad on pages 120-121
Tel: SYcamore 2-4142

Diamond Antenna & Microwave Corp., Mass., 4, 15

Douglas Microwave Co., Inc., Dept. R-4, 252 E. 3rd St., Mt. Vernon, N.Y., 15
See ad on pages 40-41
Tel: MOunt Vernon 8-6900

Dymec, Inc., Calif., 15

Dynamic Electronics-New York, Inc., 4

E.M.I. Electronics, Ltd., England, 15

Ecco Electronic Components Corp., N.Y., 4, 15

Electrical & Physical Instrument Corp., N.Y., 4, 5, 10

Electro Impulse Laboratory, 208 River St., Red Bank, N.J., 15
See ad on pages 92-93
Tel: SHadyside 1-0404

Electronic Applications, Inc., Conn., 20

Elsin Electronics Corp., N.Y., 15, 18

Emerson & Cuming, Inc., Mass., 15

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 2, 4, 5, 10, 15, 18
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Tel: VIctor 2-8400

Entron, Inc., Md., 4

FXR, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 4, 15
See ads on pages 97-100
Tel: AStoria 8-2800

Ferris Instrument Co., N.J., 4

Filmohm Corp., N.Y., 15, 18

Frequency Standards, Inc., P.O. Box 504, Shafto Rd., Asbury Park, N.J., 4, 15
See ad on page 453
Tel: PRospect 4-0500

General Communication Co., Mass., 15

General Radio Co., West Concord, Mass., 4, 5
See ad on Cover 4
Tel: EMerson 9-4400

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Goodrich Co., B. F., Sponge Products Div., Conn., 15

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Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 15
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Tel: VAn Buren 6-6300

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 2, 4, 5, 15, 18
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Tel: DAvenport 5-4451

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See ad on page 338
Tel: BAldwin 6-3456

Julie Research Labs., Inc., N.Y., 5

Kay Electric Co., Dept. ID-9, 14 Maple Ave., Pine Brook, N.J., 2, 4, 5
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Tel: CApital 6-4000

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 15
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Tel: GRegory 2-1000

Kearfott Co., Inc., Microwave Div., Calif., 15

Kelvin Electric Co., 5907 Noble Ave., Van Nuys, Calif., 10
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Tel: STate 2-6662

Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 4, 15
See ad on page 425
Tel: SWiftwater 3-5000

Lesa, S.P.A., Italy, 20

Lieco, Inc., N.Y., 15

Ling Systems, Inc., Calif., 15, 18

Litton Industries, Airtron, Inc., Div., N.J., 15, 18

Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 15
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Tel: EDgewood 4-3100

Lynmar Engineers, Inc., Pa., 10

M E Labs., Calif., 4, 10, 15, 18

Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 4
See ad on page 318
Tel: LOwell 7-0607

Martin Co., Baltimore Div., Md., 2, 4, 10, 15

McMillan Industrial Corp., Mass., 15

Meridian Metalcraft, Inc., Calf., 10, 15, 18

Metavac, Inc., N.Y., 10, 15, 18

Metco, Inc., Mass., 15

Microlab, 71 Okner Parkway, Livingston, N.J., 4, 10, 15, 18
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Tel: WYman 2-5700

Microtech, Inc., Conn., 15, 18

Microwave Assoc., Inc., Mass., 15

Microwave Development Labs., Inc., Mass., 15

Monogram Industries, Inc., Cascade Research Div., Calif., 10, 15

Motorola, Inc., Ariz., 15, 18

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Muirhead Instruments, Inc., N.Y., 4, 5

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N.R.K. Mfg. & Eng. Co., Ill., 15

N Y T Electronics, Inc., Calif., 2, 4

Narda Microwave Corp., Dept. IRED-3, 118-160 Herricks Rd., Mineola, L.I., N.Y., 15
See ads on pages 141-144
Tel: PIoneer 6-4650

New London Instrument Co., Conn., 4

Northeast Electronics Corp., N.H., 2, 20

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 20
See ad on pages 106-107
Tel: ORchard 5-2600

Omega Laboratories, Inc., Mass., 15

Ortho Filter Corp., 7 Paterson Ave., Paterson 1, N.J., 4, 5
See ad on page 456
Tel: MUlberry 4-5858

Painton & Co., Ltd., England, 2, 4, 5, 10, 20

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- Min. VSWR for all values of attenuation over band
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4414-30	2.0-4.0	30	1.3	$250.
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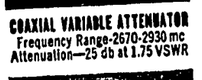

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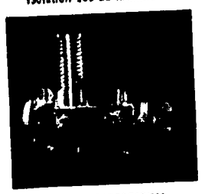
Isolation-100 db minimum



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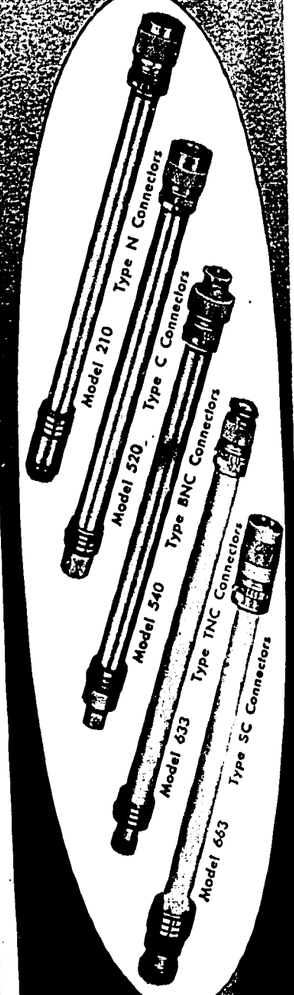

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Polytechnic Resch. & Dev. Co., N.Y., 15
Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 15
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Pylon Electronic Development Co., Ltd., Canada, 4, 15
Radar Design Corp., N.Y., 4, 10, 15, 18
Radar Measurements Corp., 190 Duffy Ave., Hicksville, L.I., N.Y., 15, 18
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Tel: OVerbrook 1-5600
Rantec Corp., 23999 Ventura Blvd., Calabasas, Calif., 15
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Tel: DIamond 7-5446
Raytheon Co., Mass., 15
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Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 4, 10
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Tel: LOckwood 5-4578
Rohde & Schwarz Sales Co., N.J., 4, 10
Sage Labs., Inc., Mass., 4, 15, 18
Sanders Associates, Inc., N.H., 15
Saratoga Industries, N.Y., 15, 18
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Tel: WOodlawn 5-2341
Shamp Scientific Supply Co., D.C., 15
Sierra Electronic Corp., 5442D Bohannon Dr., Menlo Park, Calif., 15
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Tel: DAvenport 6-2060
Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada, 10, 15, 18
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Sivers Lab., Sweden, 15
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Specialty Electr. Dev. Corp., N.Y., 15
Spencer-Kennedy Labs., Inc., Mass., 4
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Standard Telephones & Cables, Ltd., England, 4, 5
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 15
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Tel: POrt Washington 7-7200
Stoddart Aircraft Radio Co., Inc., 6644 Santa Monica Blvd., Hollywood 38, Calif., 4, 15, 18
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Tel: HOllywood 4-9292
Sullivan, Ltd., H. W., N.Y., 5, 10
Sylvania Electric Products, Inc., Special Tube Operations, 500 Evelyn Ave., Mountain View, Calif., 15
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Systems, Inc., Fla., 2, 4, 5, 15
Taffet Radio & Television Co., N.Y., 4, 10
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 2, 4, 5, 10, 15, 18, 20
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Telectro Industries Corp., N.Y., 2, 4
Telerad Mfg. Corp., N.Y., 15, 18
Telonic Industries, Inc., 2, 4, 5, 10
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Trad Electronics Corp., 1001 First Ave., Asbury Park, N.J., 18
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Underwood Corp., Canoga Div., Calif., 15
United Microwave Co., N.Y., 15
United Shoe Machinery Corp., Research Div., Mass., 15, 18
University Loudspeakers, Inc., N.Y., 10, 20
Uniwave, Inc., N.Y., 15, 18
Victor RF & Microwave Co., Mass., 4, 15
Vidaire Electronics Mfg. Corp., N.Y., 4
Visual Electronics Corp., N.Y., 15
Wac Line, Inc., Ohio, 15
Waveline, Inc., N.J., Ohio, 15
Weinschel Engrg. & Mfg. Corp., 10503 Metropolitan Ave., Kensington, Md., 2, 4, 15, 18
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Tel: LOckwood 4-0121
Welwyn Electrical Labs., Ltd., England, 2, 4, 10
Westbury Electronics, Inc., N.Y., 4
Whiting & Davis Co., Inc., Mass, 15, 18
Wunderlich Radio Co., Ill., 2, 4, 15
Zenith Optical Lab., N.Y., 15

Ballasts and voltage regulators:
See class 75

39. Batteries.

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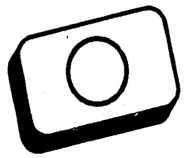

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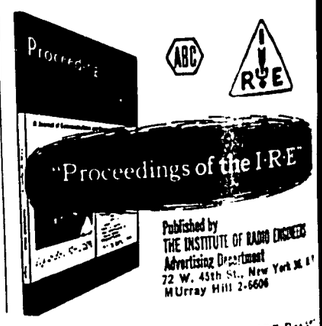

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39. Batteries.

Burgess Battery Co., Dept. IRE, Foot of Exchange St., Freeport, Ill., 5, 10, 18
See ad on page 392
Tel: ADams 2-2161

Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y., 18
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Tel: JUdson 6-1420

Channel Master Corp., N.Y., 5
Cook Co., Frank R., Colo., 5, 25
DeWitt Development Co., Ill., 15
DonMar Products, Inc., Colo., 5, 20
Electric Auto-Lite Co., Ohio, 15
Electric Storage Battery Co., Exide Automotive Div., Ohio, 15
Electric Storage Battery Co., Exide Industrial Div., Pa., 15
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Electronic Batteries, Inc., N.Y., 15
Fisher Scientific Co., Pa., 5
Gould-National Batteries, Inc., Nicad Div., Mass., 18
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Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 30
See ad on page 226
Tel: UNiversity 9-9850

International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 30
See ad on pages 42-43
Tel: ORegon 8-6281

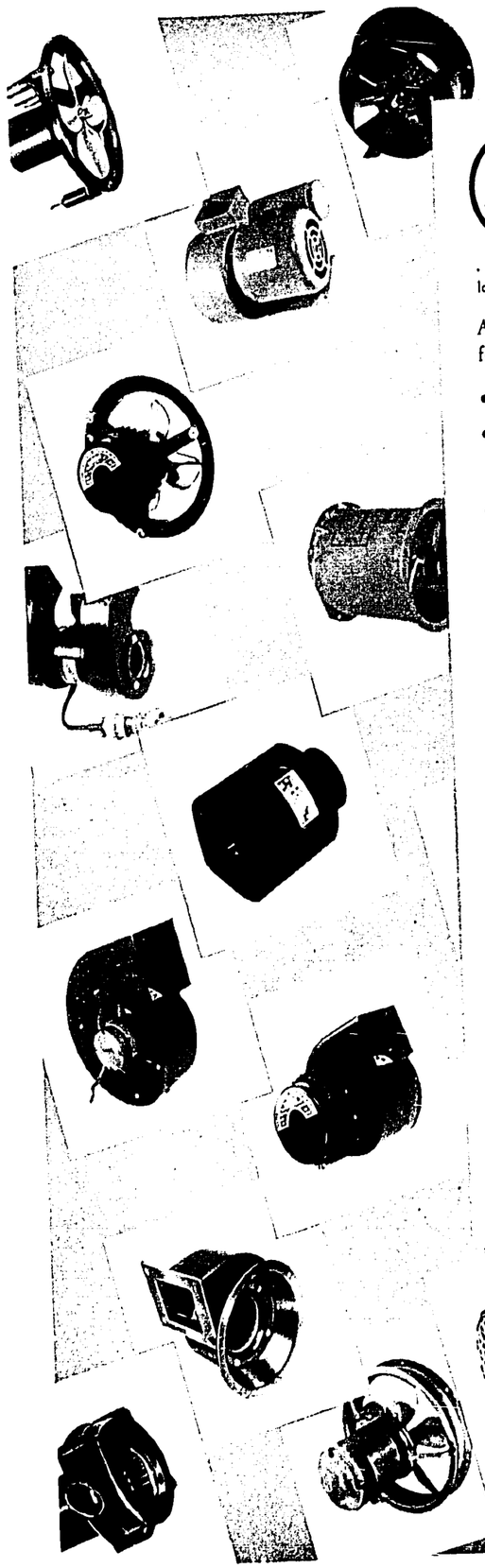
Keystone Electronics Corp., N.Y., Battery Holders
Leclanche, S. A., Switzerland, 5, 15
Lytle Corporation, N.M., 25
Mallory Battery Co., Ohio, 5, 10
Mallory & Co., Inc., P. R., Ind., 5, 10
Nicad Div., Gould-National Batteries, Inc., Mass., 18, 20
Patterson-Moos Div., Universal Winding Co., N.Y., 5, Solid State
Radiation Research Corp., N.Y., Krypton Nuclear
Radio Corp. of America, Defense Elec. Prod., N.J., 5

Radio Corp. of America, Electron Tube Division, Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 5, 10
See ad on pages 53-55
Tel: HUmboldt 5-3900

Ray-O-Vac Co., Wis., 5
Saft Corp. of America, N.J., 18

Sargent & Greenleaf, Inc., Security Devices Laboratory Div., 24 Seneca Ave., Rochester 21, N.Y., Battery Holders
See ad on this page
Tel: HOpkins 7-3200

Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 18
See ad on page 482
Tel: LYric 2-6400



AIR-MARINE MOTORS, INC.

air · marine motors, inc.

Designers and manufacturers of sub-fractional h.p. motors, blowers and fans . . .

. . . application engineered and proven by environmental laboratory testing, to customer or MIL specifications.

Air-Marine manufactures electric motors for the following general performance ranges:

- **HORSEPOWER** . . . . . 1/500th to 1/2 h.p.
- **SPEEDS** . . . . . 3600 rpm max. at 60 cps
  24,000 rpm max. at 400 cps
  Dual and Variable Speed Units
- **FREQUENCY** . . . . . Fixed . . . 50, 60 or 400 cps
  Variable . . . 50 to 450 cps, and 320 to 1,000 cps
  Special . . . as required
- **VOLTAGE** . . . . . Standard 115V and 230V
  Special . . . as required
- **PHASE** . . . . . 1, 2 or 3 phase
- **SIZE** . . . . . 1" O.D. to 4 3/4" O.D.
- **BLOWER CAPACITY** . . . . . To 1,000 CFM air delivery for blowers and fans depending on Static Pressure encountered.

TYPES OF SUB-FRACTIONAL MOTORS MANUFACTURED:

Induction, Hysteresis Synchronous, Reluctance, Synchronous, Servo, Gear, and High Slip Induction.

BLOWER AND FAN TYPES OFFERED

Centrifugal and Vane Axial Blowers, Blower Housings, Axial Flow Fans.

SERVICES OFFERED

Complete design and development
Air delivery measurement
Environmental testing.

air · marine motors, inc.

369 Bayview Ave., Amityville, New York

2221 Barry Ave., Los Angeles, Calif.

For details, circle #320 on Reader Service Card

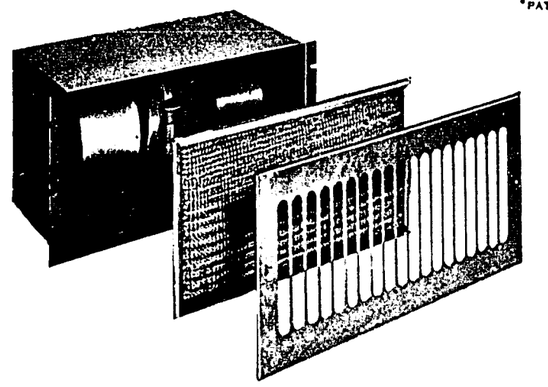
McLEAN

Your Best Source For...

RACK MOUNTED

FANS and BLOWERS*

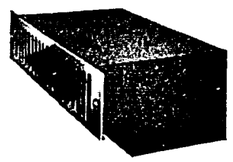
*PATENTED



STANDARD RACK MOUNTED FANS & BLOWERS

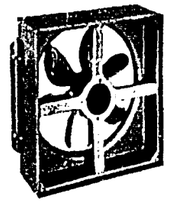
Over 15 models available in panel heights of 3½" to 12¼" in increments of 1¾". Range, 80 to 1200 cfm. All units feature quiet operation, no electrical noise and maximum air delivery. Blower units provide better air delivery against pressure and higher velocity for faster cooling. Highly reliable, rubber mounted, 115 volts, 60 cycle motors. Also Mil. Spec. and DC motors available. Permanent filters. Smart, heavy gauge, stainless steel grilles.

RECESSED MODELS



Provide higher performance with minimum panel height. Filter and blower are recessed into the unused portion of the open base commercial type rack. Fit 3½", 5¼", 7", 8¾" and 10½" panel heights and deliver 150 cfm to 1200 cfm. Highly reliable, rubber mounted, 115 volts, 60 cycle motors. Mil. Spec. and DC motors available. Permanent filters.

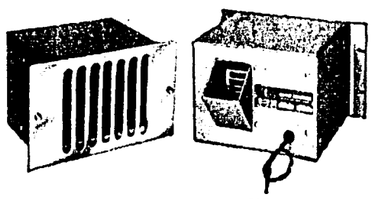
REVERSIBLE FAN



Easy-to-install Filter Box Propeller Fan gives wide choice of cfm's and great mounting flexibility. Operates as blow or suck—without rework. Compact, low-cost. Long, service-free life. Operates from various power sources.

HALF PANEL WIDTHS

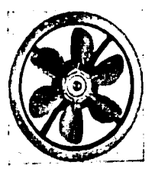
For narrow racks or where space is a problem. Fit half the width of standard 19" racks leaving balance of space for other components. Blower model (5¼" high) delivers 100 cfm. Fan model (7" high) delivers 225 cfm. Powered by highly reliable, rubber mounted, 115 volts, 60 cycle motors. Mil. Spec. and DC motors available. Permanent type filter.



HALF PANEL WIDTH FILTER-GRILLE ASSEMBLIES ALSO AVAILABLE

MIL. SPEC. BLOWERS

Meet most rigid specifications. Mount in any position. Deliver 10 cfm. Fit 3¼" cube. Continuous duty, totally enclosed motor, 1/300 hp. 115 volts, 60 cycle, 3400 rpm.



RING TYPE FANS

175 to 395 cfm. Fan diameters 6½" and 8". Motors totally enclosed, highly reliable, 115 volts, 60 cycle, 3000 rpm. Mil. Spec. and DC motors available. Other sizes available.

FREE! Engineering Booklet on Forced Air Cooling. Describes air convection methods. Includes design data, tables, charts, etc.

FREE! 36 page catalog loaded with helpful data. Shows complete line of fans, blowers.

McLean Engineering Laboratories

Princeton, New Jersey • Walnut 4-4440

TWX Princeton, New Jersey 636

mclean

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Directory II. Components

39. Batteries.

Telecomputing Corp., Cook Batteries Div., Colo., 18, 20, 25

Telectro Industries Corp., N.Y., 15, 18, 20, 25

Three Point One Four Corp., 24 Woodworth Ave., Yonkers, N.Y., 18, 20, 25, 30

See ad on page 557
Tel: GReenleaf 6-4440

Union Carbide Corp., National Carbon Co., Div., N.Y., 5, 10, 15, 18, 20

Yardney Electric Corp., 40-50 Leonard St., New York 13, N.Y., 25, Silver Cadmium

See ad on page 393
Tel: WOrth 6-3100

Bearings: See class 87

40. Blowers & Cooling Fans.

5. Air wheels & housings
10. Complete blower assemblies
15. Fan blades

Air Control Installations, Ltd., England, 5, 10, 15

Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, N.Y., 5, 10

See ad on page 394
Tel: AMityville 4-3700

Alert Products, Inc., N.J., 10

Amco Engineering Co., 7333 W. Ainslie St., Chicago 31, Ill., 10

See ad on page 599
Tel: UNderhill 7-8500

American Electronics, Inc., Calif., 10

Ashland Electric Products, Inc., N.Y., 10

Borg-Warner Corp., Pesco Prods. Div., Ohio, 10

Colorado Research Corp., Colo., 10

Controls Co. of America, Ill., 5, 10, 15

Craig Corp., Mass., 5, 10, 15

Dominion Electrohome Industries, Ltd., Canada, 10

Dumont Airplane & Marine Instruments, Inc., Pa., 10, 15

Dynamic Air Engrg., Inc., Calif., 10

Eicor Div., Ill., 10

Electronic Techniques, Inc., Calif., 10

Fasco Industries, Inc., N.Y., 5, 10, 15

Flexaust Co., N.Y., Flexible Air-Ducts

Garrett Corp., Air Research Mfg. Div., Calif., 10, Heat Exchangers

General Electric Co., Ltd., England, 10

Globe Industries, Inc., Ohio, 10

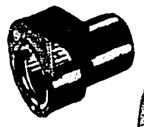
Handee Household Products, Inc., N.Y., 15

Heinze Electric Co., Mass., 10

Hertner Electric Co., Ohio, 10

Hoover Co., Ltd., Canada, 10

ILG Electric Ventilating Co., Ill., 5, 10, 15



IMMEDIATE DELIVERY!

Motor Blower Assemblies!

Compact, rugged construction. In stock from 4 to 150 CFM. Designed for applications where space and weight are prime factors. Blowers available without motors.

Write for literature.

Ripley's wide-range line of small motor-blowers offers a selection with a variety of models . . . one ideally suited for your specific job. Designed to meet your most exacting requirements and stocked for immediate delivery!

Why not let our engineers advise you?

Complete facilities for fabricating blower wheels, blowers, motor-blower assemblies for all industries. Estimates submitted promptly on receipt of blueprints or specifications.

Write for complete information today.

Superior . . . through Research

RIPLEY ESTABLISHED 1939

RIPLEY COMPANY INC.

MIDDLETOWN, CONNECTICUT

For details, circle #322 on Reader Service Card

RCi

Sub-fractional AC MOTORS and ROTATING DEVICES

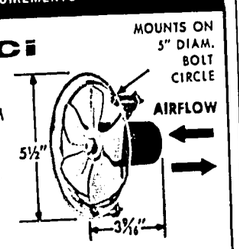
ADAPTABLE TO THE WIDEST VARIETY OF APPLICATIONS TO FIT YOUR REQUIREMENTS

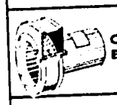
STANDARD AND CUSTOM DESIGNS

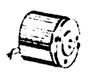
- 1/2000 to 1 HP
- Military Specs
- 60-400 CPS and variable frequency
- Size 1" to 3⅞" O.D.
- High ambient temperature
- Totally enclosed or open frame

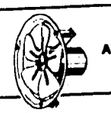
A TYPICAL RCi AXIAL FAN

- Air delivery to 300 CFM
- Readily mounted
- Available for 50 thru 1000 CPS operation — no switching
- Quick delivery

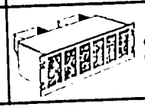


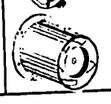

CENTRIFUGAL BLOWERS


SERVO MOTORS


AXIAL FANS

GEAR MOTORS


COOLING CABINETS


VANE-AXIAL BLOWERS

INDUCTION MOTORS • SYNCHRONOUS MOTORS • TORQUE MOTORS
P. M. ALTERNATORS MOTOR GENERATORS

SEND FOR CATALOG R

ROTATING COMPONENTS, inc.

267 Green Street • Brooklyn 22, N. Y. • EVergreen 9-3490

For details, circle #323 on Reader Service Card

HI VOLTAGE LOW INDUCTANCE CAPACITORS

Designed as high temperature gas discharge sources for Thermonuclear and similar type power research. Suitable for high peak energy within a short time constant and for blocking, bi pass service, power supply filters and similar applications.

FEATURES

- Voltage Ratings up to 150KV.
- High energy content up to 4000 joules.
- Ringing frequency as high as 1.25 mcs.
- Hermetically sealed. Low cost per joule.

Write for complete information and data sheets on Tub Type AE3002 and Tubular Type AE301.

Axel

Manufacturers of
High Voltage Capacitors
Low Inductance Capacitors
Pulse Forming Networks
Radio Noise Filters
Wire Wound Resistors

AXEL ELECTRONICS

Div. of Axel Bros. Inc.

134-20 Jamaica Ave., Jamaica, N.Y.

For details, circle #324 on Reader Service Card

Directory II. Components

40. Blowers & Cooling Fans.

Intelex Systems, Inc., N.Y., 10

Joy Mfg. Co., Pa., 10

Lesa, S.P.A., Italy, 5

Master Appliance Mfg. Co., Wis., 5, 10, 15

McLean Engineering Laboratories, 70 Washington Rd., P.O. Box 228, Princeton, N.J., 5, 10, 15
See ad on page 395
Tel: WAlnut 4-4440

Nevada Air Products Co., Nevada, 10

Oster Mfg. Co., Avionic Div., 1 Main St., Racine, Wis., 10
See ad on page 480
Tel: MElrose 7-4445

Peerless Electric Co., Ohio, 5, 10, 15

Radio Development & Research Corp., N.J., 10

Ripley Co., Inc., 1 Factory St., Middletown, Conn., 5, 10
See ad on page 396
Tel: DIamond 6-6679

Rotating Components, Inc., 267 Green St., Brooklyn 22, N.Y., 5, 10
See ad on page 396
Tel: EVergreen 9-3490

Rotron Mfg. Co., 7-9 Schoonmaker Lane, Woodstock, N.Y., 10
See ad on this page
Tel: ORiole 9-2401

Sanders Associates, Inc., N.H., 10

Scranton Corp., Elcor Div., Ill., 10

Small Motors, Inc., Ill., 5, 10

Stepper Motors Corp., Calif., Incremental

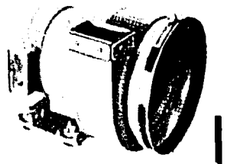
Sun Electric Corp., Ill., 10

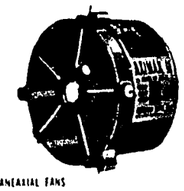
Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 5, 10, 15
See ad on page 502
Tel: REctor 2-6249

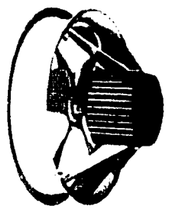
Torrington Mfg. Co., Conn., 5, 10, 15

United Aircraft Products, Inc., Ohio, 5, 10

Western Gear Corp., Electro Parts Div., Calif., 10


CENTRIFUGAL BLOWERS – LOOSE SCROLL
N_s = 30 000 – 70 000

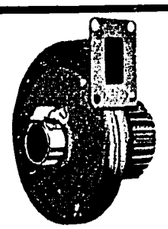

VANEAXIAL FANS
N_s = 50 000 – 125 000

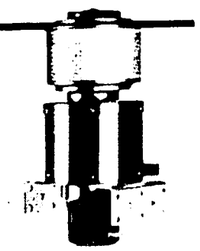

PROPELLER FANS
N_s = 100 000 – 400 000

Engineered to $\frac{NVQ}{\Delta P^{0.75}} = L_s$

OUR FANS AND YOUR EQUIPMENT BECOME SMALLER, QUIETER AND LESS EXPENSIVE

CENTRIFUGAL BLOWERS – TIGHT SCROLL
N_s = 1 000 – 40 000


RADIAL WHEEL BLOWERS
N_s = 4 000 – 20 000


MULTISTAGE BLOWERS
N_s = 900 – 9 000

ROTRON

The wide range of ROTRON FAN types enables our Application Engineers to match accurately the SPECIFIC SPEED (N_s) of our air movers with the LOAD SPEED (L_s) characteristics of your equipment for ultimate cooling efficiency. Send for CATALOG SHEET 20201 S

ROTRON MANUFACTURING CO., INC.

For details, circle #325 on Reader Service Card

Broadcast equipment: See Dir. I

Brushes, Motor: See class 87

Bushings: See class 87

Bridges: See class 5

Cabinets: See class 81

Cable clips: See class 87

Cable & wire: See class 82

Cans: See class 87

41. Capacitors: Fixed.

5. Ceramic
10. Decade
15. Electrolytic
17. Energy storage
20. Feed through
25. Fixed composition
30. Gas filled
35. Glass dielectric
40. High voltage
45. Metallized paper
50. Mica
55. Oil filled
60. Paper
65. Plastic insulated
70. Power factor
75. Precision air
80. Printed circuit
85. Pulse forming networks
90. Silvered mica
95. Tantalum
98. Vacuum

ACF Electronics, Va., 65, 80

AMP, Inc., Capitron Div., Pa., 40, 45, 50, 55, 60, 65, 85

Aerovox Corp., Mass., 5, 10, 15, 17, 20, 25, 40, 45, 50, 55, 60, 65, 70, 80, 85, 90, 95

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244.

ASTRON capacitors

ACCEPTED AND APPROVED

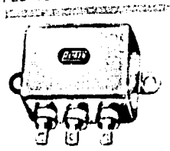
INDUSTRIAL —
MILITARY —
COMMERCIAL —

TYPE TES (ACTUAL SIZE)

TYPE RLR

TYPE XPR

TYPES AQ-TQ — CP04 THRU CP11



TYPE MDL

TYPES EX-EZ

SOLID TANTALUM

Subminiature, (⅛" x ¼") hermetically sealed metal case . . .
Temperature range —80° to +85° C
Maximum capacity variation averages less than ±5%
Indefinite shelf life, meets environmental requirements MIL-C-3965

METALLIZED MYLAR*

Type RQL in a hermetically sealed case is designed to meet electrical and environmental requirements of MIL-C-18312 (U.S.N.)
Type RLR is an uncased unit . . . tough protective mylar* wrap and epoxy end seal
Both have a temperature range of —55° C to +125° C without derating

MYLAR* DIELECTRIC

Round (XPR) and flat (XPF) miniature capacitors
Temperature range of —55° to +125° C
Units employ an outer mylar* polyester tape wrap and ends sealed with a plastic thermosetting resin to afford excellent protection against moisture.

MIL-C-25A PAPER — CP04 through CP70

Temperature range to +125° C . . . Hermetically sealed miniature tubulars and bathtub cans with ratings up to and including 1000 volts . . . Variety of types and mounting styles available.

METALLIZED PAPER

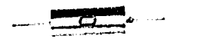
With self healing characteristics
Miniature glass-to-metal sealed tubulars
Metal cased and uncased units
Conform to MIL tests for moisture resistance, thermocycle immersion and vibration . . .
To +125° C operation.

SAFETY MARGIN ELECTROLYTIC**

Astron Electrolytics with high purity foil, special stable electrolytes and precision assembly provide long life, exceptionally low leakage and resistance to corrosive elements. Designed for use in transistorized and printed circuits in all military, industrial and commercial applications.

RF NOISE SUPPRESSION FILTERS

A standard line of typical filters covering a wide range of electrical and mechanical requirements or custom engineered and produced filters specifically for your equipment.
SOLVING YOUR FILTER REQUIREMENTS FROM THE PROBLEM TO THE PRODUCT.



TYPE TES (ACTUAL SIZE)

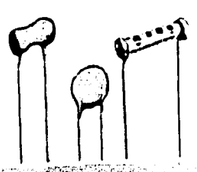
TYPE RQL

TYPE XPF

TYPE ADM — CP53 THRU CP55

TYPE MQL

TYPE EK



CERAMIC CAPACITORS

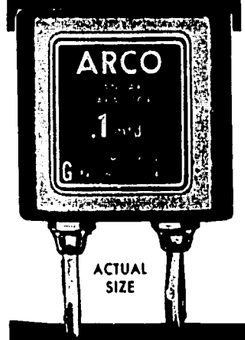
Skottie Electronics, Inc., wholly owned subsidiary of Astron Corporation, offers a complete and reliable selection of disc and tubular types — temperature compensating, all purpose high dielectric constant, and high voltage ceramic capacitors.

℠ TRADEMARK
®, REGISTERED DUPONT TRADEMARK

SPECIALISTS IN CAPACITOR MINIATURIZATION
ASTRON CORPORATION
255 GRANT AVENUE, E. NEWARK, N. J.
EXPORT DIVISION: ROCKE INTERNATIONAL CORP., 13 EAST 40TH ST., NEW YORK, N. Y.
IN CANADA: CHARLES W. POINTON, 6 ALCINA AVE., TORONTO, ONTARIO
WRITE TODAY FOR COMPLETE INFORMATION

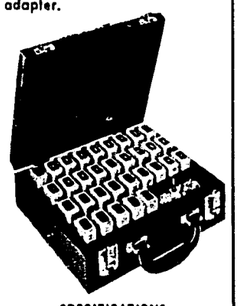
For details, circle #326 on Reader Service Card

now...
A PRECISION LABORATORY
STANDARD CAPACITOR KIT
FOR ALL PHASES OF PRODUCTION TESTING . . . YET LOW IN COST!



ACTUAL SIZE

Complete set of 32 precision standards ranging from .0001 to .5 mfd. Includes handsome durable carrying case (11⅜w x 9⅜h x 3⅝d) plus a 4-position adapter.



SPECIFICATIONS:
INSULATION RESISTANCE
5000 megohm - microfarads or 50,000 megohms, whichever is the lesser.
TEMPERATURE COEFFICIENT
.0001 to .1 mfd.
+40 ±15 ppm/°C.
0.2 to 0.5 mfd.
−130 ±10 ppm/°C.
MAXIMUM VOLTAGE
.0001 to 0.04 mfd.
500 volts peak.
.05 to 0.5 mfd.
300 volts peak.
DISSIPATION FACTOR
.0001 to .0004 mfd. — 0.15%
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ARCO STANDARD CAPACITORS MAY BE PURCHASED IN INDIVIDUAL UNIT VALUES OF ANY QUANTITY.
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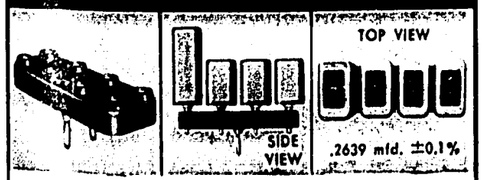
±0.1% TOLERANCE MINIATURIZED
OVER 50 SMALLER AND LIGHTER THAN OTHER STANDARDS OF COMPARABLE ACCURACY



By quick and easy insertion of ARCO standard capacitors into the adapter jig, a capacitance value of four significant figures with an accuracy of ±0.1% is obtained.

ARCO electronics inc.
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BURLINGAME ASSOC., 510 S. Fulton Ave., Mt. Vernon, N.Y. MOunt Vernon 4-7530
514 University Bldg., Syracuse, N.Y. GRanite 4-7409
974 Main St., Waltham, Mass. TWinbrook 4-1955
222 Long Lane Upper Darby, Pa. SHerwood 7-9080
8218 Wisconsin Ave., Washington 14, D.C. OLiver 4-6400
J. NEAL & CO., 3931 S.W. 5th Ter., Miami, Fla. HIghland 4-1118

CENTRAL STATES
HUGHMARSLAND&CO., 6699 Lincoln Ave., Chicago 45, Ill. ORchard 6-1100
JOSEPH D. GRAY, 6730 E. 19th St., Indianapolis 19, Ind. FLeetwood 6-4249
JACK BLONIGAN, 231 N. Edgewood Ave., Minneapolis 27, Minn. LIberty 5-4481
THE FREDR. SHARPCO., 2138 Lee Rd., Cleveland 18, Ohio FAirmount 1-4200
BILL JAEGER, 321 N. Monroe St., Xenia, Ohio DRake 2-5496
LEE MARK ASSOC., P.O. Box 8447, Kansas City 14, Mo. NI 2-3313
1500 Big Bend Blvd., St. Louis 17, Mo. MIssion 7-1470
ENGINEERING ASSOC., 2912 Stanley, Fort Worth, Tex. WAlnut 3-7386

ROCKY MOUNTAIN STATES
LANDES, ZACHARY & PETERSON CO., 601 S. Jason, Denver 23, Colo. SHerman 4-1311
2501 S. State St., Salt Lake City, Utah. HUnter 7-7873
1900 Mills St., El Paso, Tex. KEystone 3-9060
1609 2nd St., N.W., Albuquerque, N.M. CHapel 2-7761

PACIFIC COAST
W. K. GEIST CO., 3177 Glendale Blvd., Los Angeles 39, Calif. NOrmandy 5-5219
ELLENJE CO., 345 California Ave., Palo Alto, Calif. DAvenport 6-1455
M. K. WIDDEKIND CO., 221 1st Ave., N., Seattle 9, Wash. ATwater 4-4849

EXPORT
LINDOR INTERNATIONAL, 9 E. 45th St., New York 17, N.Y. MU 2-3760

Directory II. Components

41. Capacitors: Fixed.

(Continued from page 397)

Aerovox Corp., Hi-Q Div., N.Y., 5, 20, 40, 80
Airborne Accessories Corp., N.J., 20, 45
Ajax Condenser Co., Inc., Ill., 15, 17, 40, 60, 65, 80
Allen-Bradley Co., Wis., 5, 20
American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 5, 20
See ad on page 180
Tel: AMherst 5-3411
Arco Electronics, Inc., 64 White St., New York 13, N.Y., 5, 10, 15, 40, 50, 60, 65, 80, 90
See ad on this page
Tel: WOrth 6-0530
Argonne Electronics Mfg. Corp., N.Y., 5, 15
Associated Commodity Corp., N.Y., 50
Astron Corp., 255 Grant Ave., East Newark, N.J., 5, 15, 20, 40, 45, 55, 60, 65, 80, 95
See ad on page 398
Tel: HUmboldt 2-7800
Avnet Corp., Calif., 5, 15
Axel Bros., Inc., 134-20 Jamaica Ave., Jamaica 18, N.Y., 17, 20, 55, 60, 70, 85
See ad on pages 396
Tel: REpublic 9-1700
Balco Research Lab., Inc., Capacitor Div., 49 Edison Pl., Newark 2, N.J., 17, 20, 25, 40, 65, 80, 98, Vernier
See ad on page 401
Tel: MItchell 3-5200
Barco, Inc., Wis., 15, 90, 95
Bendix Aviation Corp., Mich., 5
Bendix Aviation Corp., Cincinnati Div., Ohio, Radiation Resistant
Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 17, 40, 50, 70, 85
See ad on page 170
Tel: LOwell 3-9511
Bestran Corp., Dilectron Div., Calif., 5, 40, 70, 80
Blackhawk Engrg. Co., Wis., 17, 20, 25, 40, 65, 80, 98
Bradford Components, Inc., N.Y., 5
Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 5
See ad on page 693
Tel: TRowbridge 6-2800
Canadian Research Institute, Canada, 10
Carborundum Co., Refractories Div., N.J., 5
Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 5, 20, 40, 80
See ad on page 174
Tel: WOodruff 2-9200
Chicago Condenser Corp., Dept. A, 3255 W. Armitage Ave., Chicago 47, Ill., 17, 20, 25, 40, 45, 55, 60, 65, 70, 75, 80, 85
See ad on page 489
Tel: CApitol 7-7070
Condenser Products Co., Conn., 85

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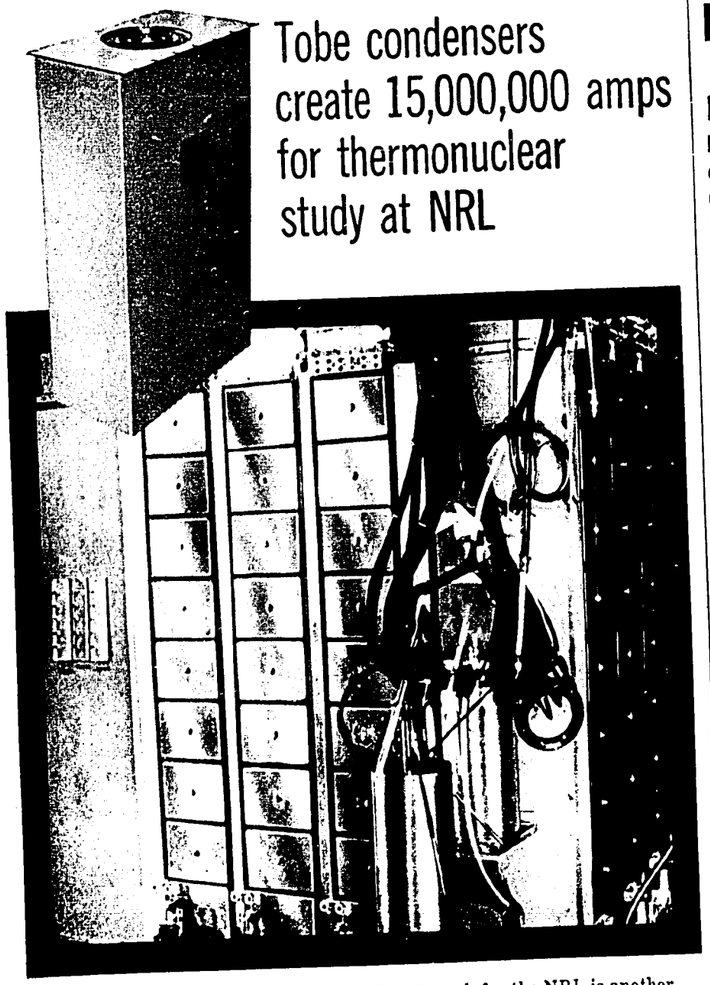

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Directory II. Components

41. Capacitors: Fixed.

Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., South Plainfield, N.J., 5, 10, 15, 17, 20, 25, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95
See ad on Cover 3
Tel: PLainfield 6-9000

Corning Glass Works, 550 High St., Bradford, Pa., 35, 80
See ads on pages 400, 527
Tel: 2-4571

Corson Electric Mfg. Corp., N.J., 17, 40, 55, 60, 65, 85

Cosmic Condenser Corp., 853 Whittier St., New York 59, N.Y., 15, 60, 80
See ad on this page
Tel: LUdlow 9-3360

Crystal-X Corp., Pa., 65

Daly Condenser Co., c/o British Radio, D.C., 15

Dearborn Electronics Labs., Ill., 17, 40, 55, 60, 65, 70

Derf Radio Co., N.Y., 5, 10, 15, 17, 20, 25, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 95, 98

Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass., 17, 20, 25, 40, 45, 55, 60, 65, 70, 80, 85
See ad on page 400
Tel: NOrwood 7-2620

Diamond Electronics Corp., N.Y., 5, 15, 17, 20, 25, 40, 50, 65, 90

Dolinko & Wilkins, Inc., N.J., 98

Double E Prod. Co., Calif., 20, 40, 60, 85, Teflon Dielectric 500°F Hi-Temp.

Dumont Airplane & Marine Instruments, Inc., Pa., 15, 55, 60, 65

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 85
See ad on page 446
Tel: WIndsor 7-0400

Eclipse Electronics Co., Canada, 55, 60, 65

Electra Mfg. Co., 4051 Broadway, Kansas City, Mo., 5, 80
See ad on page 534
Tel: WEstport 1-6864

Electric Machinery Mfg. Co., Mullenbach Div., Calif., 5

Electrical Utilities Co., Ill., 17, 20, 40, 45, 55, 60, 65, 70, 80, 85

Electro-Capacitors Co., Calif., 15

Electro-Measurements, Inc., Ore., 10

Electro Motive Mfg. Co., Inc., S. Park & John Sts., Willimantic, Conn., 5, 20, 50, 55, 60, 90
See ad on page 196
Tel: HArrison 3-4551

Electron Products Co., Calif., 10, 20, 40, 45, 55, 60, 65, 70, 80

Electronic Fabricators, Inc., N.Y., 40, 65, 95

Electronic Plastics Co., Calif., 65

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 5, 17 20, 25, 40, 50, 65, 80, 90, 95
See ad on pages 110-111
Tel: GLendale 6-8592

Etching Co. of Calif., Calif., 80

Fansteel Metallurgical Corp., North Chicago, Ill., 15, 95
See ad on pages 156-157
Tel: DExter 6-4900

Film Capacitors, Inc., N.Y., 10, 40, 45, 55, 65

Filtron Co., Inc., N.Y., 17, 20, 40, 45, 55, 60, 65, 85

Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 10
See ad on page 410
Tel: EVergreen 6-1300

General Electric Co., Apparatus Sales Div., N.Y., 15, 17, 20, 40, 55, 60, 65, 70, 85, 95

Gen. Electric Co., Capacitor Dept., N.Y., 15, 17, 25, 40, 55, 60, 65, 70, 80, 85, 95

General Electric Co., Capacitor Div., S.C., 15, 95

General Electric Co., Ltd. of England, England, 60, 65

General Products Corp., N.Y., 60, 65

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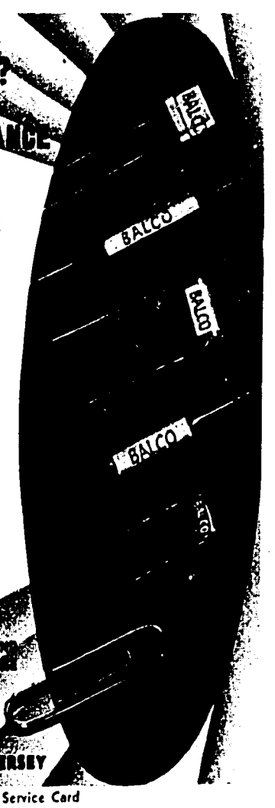

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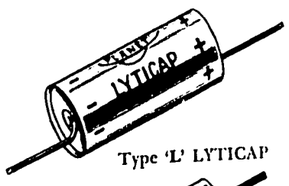
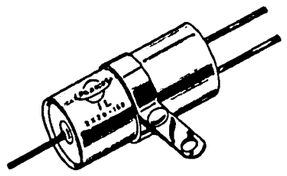
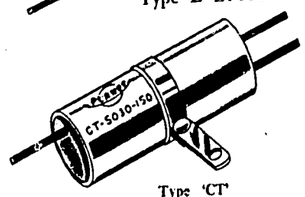


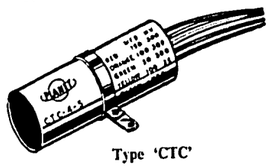
Type 'L' LYTICAP



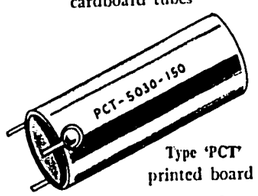
Type 'IL' dual LYTICAP



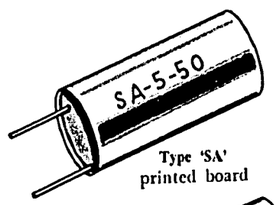
Type 'CT'
cardboard tubes



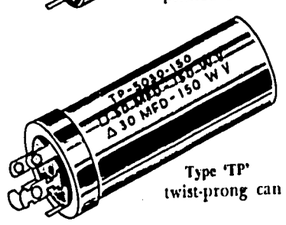
Type 'CTC'



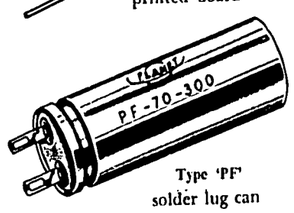
Type 'PCT'
printed board



Type 'SA'
printed board



Type 'TP'
twist-prong can



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solder lug can

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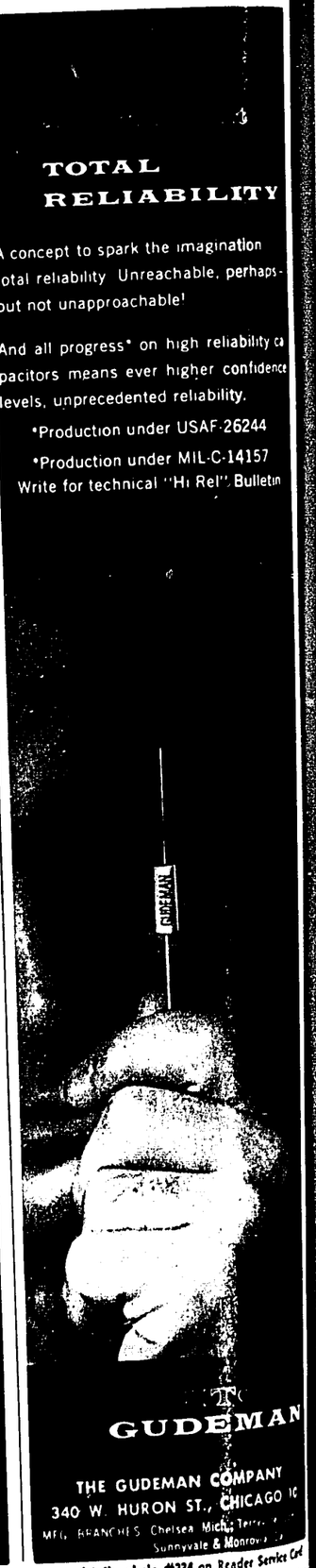

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41. Capacitors: Fixed.

General Radio Co., West Concord, Mass., 10, 50, 65, 75, 90
See ad on Cover 4
Tel: EMerson 9-4400

Geotronic Labs., Inc., Tex., 45, 55, 65

Girard-Hopkins, Calif., 55, 60, 70

Good-All Electric Mfg. Co., Neb., 5, 15, 40, 60, 65, 80

Gudeman Co., 340 W. Huron St., Chicago 10, Ill., 15, 17, 20, 40, 45, 55, 60, 65, 70, 80
See ad on page 402
Tel: DE 7-7400

Gulton Industries, Inc., N.J., 5

Hallett Mfg. Co., Calif., 20

Hilger & Watts, Ltd., N.Y., 5, 20, 50, 90

Hughes Aircraft Co., Hughes Prod. Div., Calif., 75, 80, 98

Hydrawerk Aktiengesellschaft, Germany, 15, 17, 20, 35, 40, 45, 55, 60, 65, 70, 80, 85, 95

Illinois Condenser Co., 1616 N. Throop St., Chicago 22, Ill., 5, 15, 17
See ad on page 228
Tel: EVerglade 4-1300

Industrial Condenser Corp., Ill., 15, 40, 45, 55, 60, 65, 70, 80

Industron Corp., Mass., 40

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 17, 25, 40, 65, 70
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200

International Electronic Industries, Inc., Tenn., 15, 80, 95

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 15, 80, 95
See ad on pages 148-149
Tel: NUtley 2-3600

Interstate Electronics, Inc., 227 Fulton St., New York 7, N.Y., distributor
See ad on this page
Tel: BEekman 3-8780

Jennings Radio Mfg. Corp., 970 McLaughlin Ave., P.O. Box 1278, San Jose 8, Calif., 40, 98
See ad on page 408
Tel: CYpress 2-4025

K-C-K Corp, Texas Capacitor Co. Div., Tex., 65, 80

Kellogg Switchboard & Supply Co., Ill., 45, 55

Laboratory Equipment Corp., Mich., 40

Lapp Insulator Co., Radio Specialties Div., 159 Sumner St., Le Roy, N.Y., 30, 40
See ad on pages 112-113
Tel: LE Roy 385

Leclanche, S. A., Switzerland, 5, 10, 15, 25, 40, 45, 55, 60, 65, 70, 95

Leeds & Northrup Co., Pa., 75, 90

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 98
See ads on pages 270, 301
Tel: TExas 0-7711

Luther Electronic Mfg. Co., Calif., 85

M.E.C., Inc., Tenn., 15

Maida Development Co., Va., 5, 20, 40, 80

Mallory & Co., Inc., P. R., Ind., 5, 15, 17, 20, 55, 60, 65, 80, 95

Metavac, Inc., N.Y., 50, 90

Mica Condensers Corp., N.Y., 50

Micamold Electronics Mfg. Corp., N.J., 15, 17, 20, 40, 45, 50, 55, 60, 65, 70, 80, 85, 90, 95

Minitronics Corp., N.Y., 15, 80, 95

Mucon Corp., 9 St. Francis St., Newark 5, N.J., 5
See ad on page 405
Tel: MItchell 2-1476

Muirhead & Co., Ltd., England, 10, 50, 60

Muirhead Instruments, Inc., N.Y., 10, 50, 60

Murata Mfg. Co., Ltd., Japan, 5, 20, 40, 80

Muter Co., Ill., 5, 20

Naz-Dar Co., Ill., 80

New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 30
See ad on page 331
Tel: KIrkland 7-1997

New York Coil Co., Inc., Pa., 45, 60, 65

Northern Plastics Corp., Wis., 80

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 15, 95
See ad on pages 106-107
Tel: ORchard 5-2600

Onondaga Pottery Co., Electronics Div., 1858 W. Fayette St., Syracuse 1, N.Y., 5, 80
See ad on page 507
Tel: HO 8-1681

Penn Resistor Corp., Pa., Noise Reduction

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 50
See ad on page 687
Tel: EVerglade 4-2122

Pimex, Inc., N.Y., 65

Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J., 15, 80
See ad on page 402
Tel: PIlgrim 3-2874

Plastic Capacitors, Inc., 2620 N. Clybourn Ave., Chicago 14, Ill., 17, 40, 45, 55, 60, 65, 70, 80, 85
See ad on page 405
Tel: DIversey 8-3735

Potter Co., Ill., 20, 25, 35, 40, 45, Metallized Mylar, Metallized Teflon, 55, 60, 65, 70, 80

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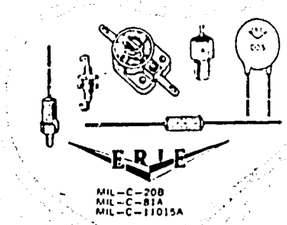
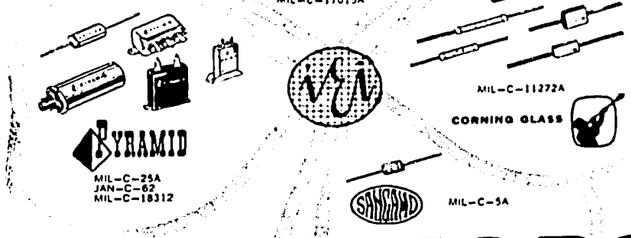


Authorized "NAVY STOCK" Government Source Inspection on Premises



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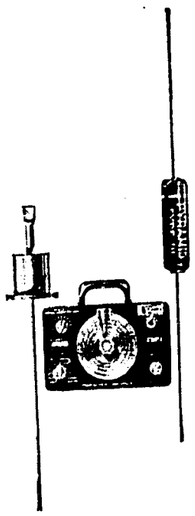

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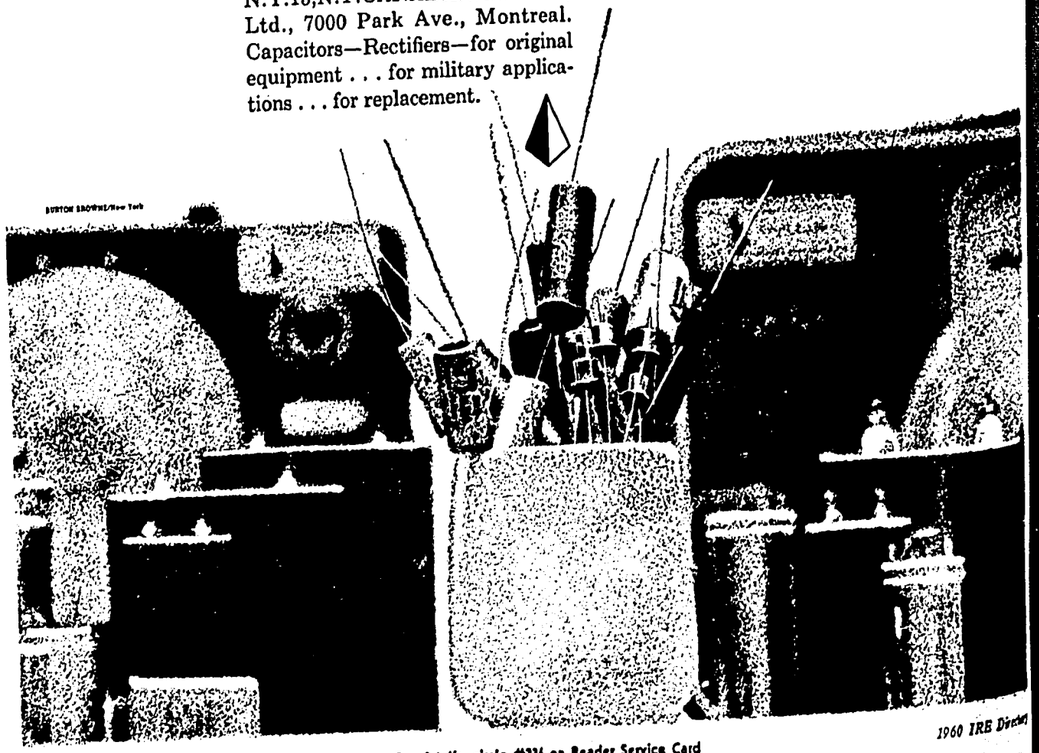

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The latest additions to the growing line of "Vitramon" Capacitors feature smaller mounting area, lower inductance, and more versatility of application — *plus* all the phenomenal electrical characteristics for which "Vitramon" Capacitors are noted — fine silver electrodes fused to pure porcelain enamel, perfectly bonded to provide *stability, wide temperature range, humidity immunity, low loss, low noise.*

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- Thin design — 5/64" to 7/64"
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- Tiny mounting area — 11/64" x 9/32"
- Designed for automatic insertion
- Packed for cartridge feeding
- Capacitance through 1000 mmf. at 100 vdc

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- Compatible with MIL-C-10950B
- Very low inductance
- Flexible leads
- Maximum height from mounting surface 1/4"
- To 1000 mmf at 300 vdc

AXIAL SERIES

- Extremely rugged
- 4 case sizes from 3/8" to 29/32"
- 0.5 to 6800 mmf; 500 to 300 vdc

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- Mounted axially or radially
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- 0.5 to 5600 mmf; 500 to 300 vdc

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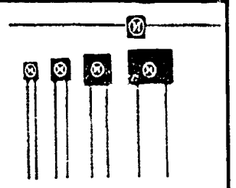
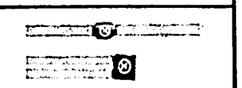
MUCON SUBminiature CERAMIC CAPACITORS

micro-size leads shapes



"thinline"



ribbon leads

OVERALL VERSATILITY

The unlimited variety of MICRO-SMALL shapes and lead arrangements available in custom-made MUCON SUBminiature Ceramic Capacitors immediately result in space-saving assemblies. Almost any capacitance value, obtainable in any one of 12 different ceramic dielectric materials gives you the specific capacitor needed for your ideal REDUCED package.

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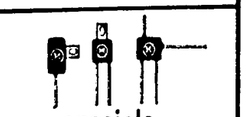

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Directory II. Components

41. Capacitors: Fixed.

Pyramid Electric Co., 507 26th St., Union City, N.J., 15, 40, 45, 60, 65, 80, 95
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Tel: UNion 5-1776
Quality Components, Inc., Pa., 25
Radiation Research Corp., N.Y., 17, 40, 65
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Rohde & Schwarz Sales Co., Inc., N.J., 10, Frequency Synthesizers, Standard Attenuators
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Sangamo Electric Co., Ill., 15, 17, 20, 25, 40, 45, 50, 55, 60, 65, 70, 90, 95
Saxonburg Ceramics, Inc., Pa., 5
Schweber Electronics, 60 Herricks Rd., Mineola, L.I., N.Y., distributor
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for subminiaturazation of printed and conventional circuitry

Are obsolescent oversized capacitors cramping your style? Let JFD Precision Trimmers help you save time and space . . . upgrade performance reliability in critical network design.

Miniature and subminiature JFD Piston Capacitors give you maximum tuning range in absolute minimum physical size . . . precise tuning resolution and stability . . . ultra low loss operation . . . rugged shock, vibration and corrosion resistance . . . approximately zero temperature coefficient. These are some of the reasons why they are specified in almost all of today's critical systems.

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for Space-Challenging Demands!

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New JFD air-tight, water-tight Miniature Quartz Sealcaps seal out moisture, seal in reliability and accuracy, regardless of atmosphere. Combine characteristics of new Sealcap construction and miniature quartz capacitor design. Eliminates corona and voltage breakdown at high altitude. Sealcap design prevents formation of moisture inside unit. Quartz design provides high Q, ultra-low loss high frequency operation, greater stability and approximately zero temperature coefficient. Available unpotted or encapsulated for higher dielectric strength. For complete data write for Bulletin No. 215A. Also available in glass dielectric (bulletin 207B)

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Combine variable inductor and capacitor in one compact unit. Affords more circuit in less space, better reliability, greater economy, faster assembly, smaller size and weight. Use of glass or quartz dielectric assures a low temperature coefficient. Flexibility in design to suit circuit requirements. The number of turns, types of windings, size and type of capacitor plates, Q and other parameters can be designed to suit individual circuit requirements.

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Designed for applications calling for short delay intervals, the new lines offer a high ratio of delay to pulse rise time, in minimum space. Available for printed circuit assembly or for conventional mounting, JFD distributed-constant Delay Lines meet all military requirements. They can also be modified or custom-designed to meet your most rigid specifications. JFD lumped constant Delay Lines can also be designed to suit your requirements.

Characteristics: Precise pulse fidelity; operating temperature range of —55° C to +125° C; excellent temperature stability; rugged encapsulated construction resists environmental moisture, humidity, shock and vibration; linear phase shift; 0.1 inch grid spacing for printed board types; attenuation of approximately 1 db per μ sec.

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Telegraph Condenser Co., England, 5, 15, 17, 20, 40, 50, 55, 60, 65, 70, 80, 90, 95
Texas Instruments Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 15, 80, 95
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Tel: AMherst 8-1656
Westinghouse Electric Corp., Pa., 70

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42. Capacitors: Variable.

5. Neutralizing
10. Precision variable
15. Temperature compensating
20. Trimmers, air
25. Trimmers, ceramic
30. Trimmers, glass
35. Trimmers, vacuum
40. Tuning

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Illinois Tool Works, Fastex Div., Ill., 25
Industron Corp., Mass., 40
International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 10, Silicon
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Jennings Radio Mfg. Corp., 970 McLaughlin Ave., P.O. Box 1278, San Jose 8, Calif., 35
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Johnson Co., E. F., Minn., 5, 20, 40
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National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 10, 20
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Oak Mfg. Co., Dept. R, 1260 N. Clybourn Ave., Chicago 10, Ill., 10, 40
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Tel: MOhawk 4-2222
Plastic Capacitors, Inc., 2620 N. Clybourn Ave., Chicago 14, Ill., 10
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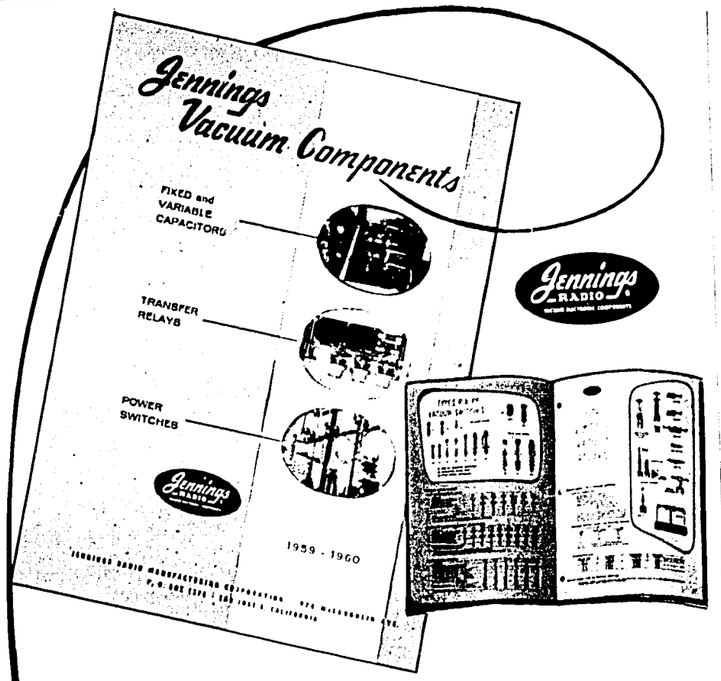
Q-Line Mfg. Corp., N.Y., 10, 30
Rogers Electronic Tubes Components, Canada, 20, 25

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264



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Max. interrupting current (10 times)	1500 amps rms @ 9 kv
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RB3 Vacuum Transfer Relay

Overall length	3 in.
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Test voltage between terminals	21 kv
Continuous current	28 amps rms

Type USLS Vacuum Variable Capacitor

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Overall length	5⅝"
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Peak voltage (min. capacity)	10 kv
Continuous current	40 amps rms

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Technical Ceramics & Lava Corp., 55 Fifth Ave., Paterson 4, N.J., 25
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Clips, test: See class 53

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Coil forms, ceramic: See class 83

Coil forms, paper & plastic: See class 87

Coil winding machines: See class 92

43. Coils.

5. Audio frequency chokes
10. Deflection yokes
15. Filter
20. Flyback
25. Focusing coils
26. IF chokes
28. Magnet
30. Power chokes
35. RF chokes
36. Relay
38. Solenoid
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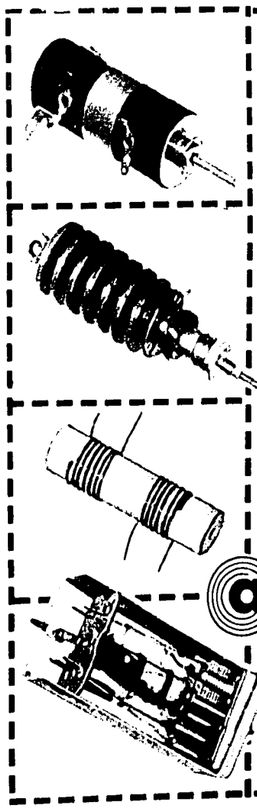

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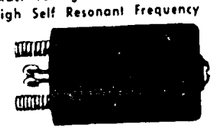
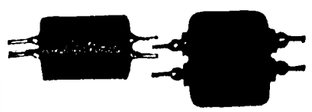
Exact Tuning Without Trimmers
High Self Resonant Frequency



Cat. #	NOMINAL IND. MHY MIN.	MAX.	AVERAGE Q	SELF RES. FREQ MC
VHI- 1	1.1	1.75	95	2.2
VHI- 2	1.7	2.5	95	1.9
VHI- 3	2.3	3.7	95	1.6
VHI- 4	3.	4.5	100	1.4
VHI- 5	4.	5.7	100	1.3
VHI- 6	5.5	7.5	100	1.
VHI- 7	7.	10.5	100	.9
VHI- 8	10.	15.	100	.85
VHI- 9	14.5	20.5	100	.6
VHI-10	20.	30.	100	.55

MINIATURE PULSE TRANSFORMERS



- Meets all requirements of MIL-T-27A
- Small size and weight
- Ideal for computer applications

CATALOG #	APPLICATION	TURNS RATIO
EPT- 1	Impedance Matching and Interstage Coupling	1:1
EPT- 2		2:1
EPT- 3		3:1
EPT- 4		4:1
EPT- 5		4:1
EPT- 6		5:1
EPT- 7		7:1
EPT- 8		5:1
EPT- 9		3:1
EPT-11	Blocking Oscillator	1:1
EPT-12		1:1
EPT-13		2:1
EPT-14		1:1.4
EPT-15	Memory core & Current driver	3:3 1PP
EPT-16		3:3:3 1PP
EPT-17	Current driver	4:1
EPT-18	Current Transformer	11:1
EPT-19	Pulse Inversion	6:1:1

*Supplied both molded and cased

Send for NEW TRANSFORMER AND INSTRUMENT CATALOGS

FREED TRANSFORMER CO., INC.
1713 Weirfield Street, Brooklyn (Ridgewood) 27, N.Y.
For details, circle #343 on Reader Service Card

COIL WINDERS, INC.

"TODAY'S COMPONENTS for TOMORROW'S ELECTRONIC PROGRESS!"

TOROIDAL INDUCTORS

Subminiature to maximum sizes — open construction, hermetically sealed or custom-design epoxy molded — readily available.

POWER TRANSFORMERS

To meet specific and exacting requirements — from subminiature to 5 K.V.A. output — up to 200° C. temp., 50 K.C freq. in accordance with MIL-T-27A, Grades 4 and 5.

FILTERS

Low pass, high pass, band pass and band eliminator — custom engineered to exacting requirements and specifications.

POWER SUPPLIES

Custom engineered A.C., D.C., high voltage . . . with tolerances to ½% — regulated transistorized with tolerances is low as 0.1%.

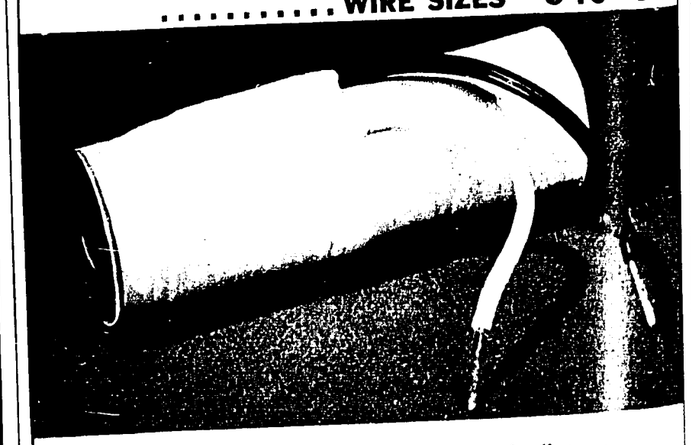
MAGNETIC AMPLIFIERS

And saturable reactors for two-phase servo motors and electronic controls from microwatts to 3 K.V.A.

New York Ave., Westbury, L. I., N. Y.

For details, circle #344 on Reader Service Card

Electrical Coil Windings
.....WIRE SIZES #6 TO #56



For 42 years . . . specializing in all types of coils to customers' specifications. Design or engineering assistance available on request.

COTO-COIL CO., INC.
SINCE 1917
74 Pavilion Avenue Providence 5, Rhode Island

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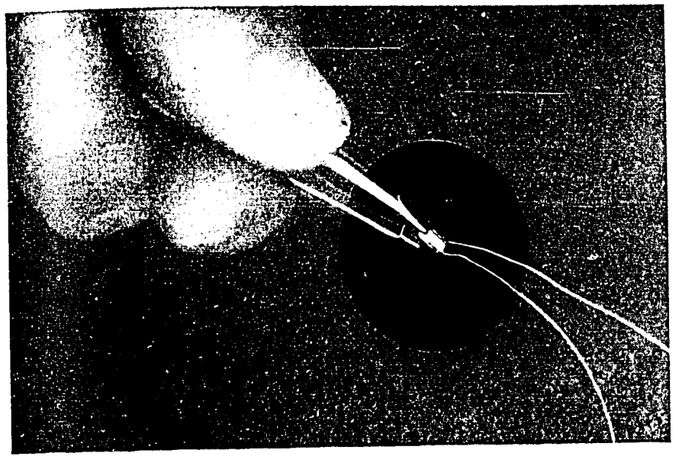

NOW--48-56 Gauge Wire Coils built to YOUR specifications

Whatever your application—from hearing aids to missile systems—Deluxe Coils' new fine wire plant can supply the miniature coils you need . . . built to your specifications for precision and accuracy.

Deluxe Coils' engineers work with you to make each coil fit the exact size and performance requirements of your design. In the newest of air and sound conditioned facilities these coils are then produced in quantities and speeds that will meet even mass production schedules.

ENCAPSULATED

in Epoxy resin, Deluxe ultra-fine wire miniature coils are easily inserted in otherwise difficult assemblies. Simplify change or replacement.

All types of miniature fine wire coils, 40-47 gauge, ultra fine wire coils, 48-56 gauge, and components can be produced.

A few current applications include:

- *Electric Watches*
- *Hearing Aids*
- *Hi-fidelity Cartridges*
- *Guided Missiles*
- *Servo-Mechanisms*
- *Miniature and Micro-Miniature Relays*

Write for information on Deluxe Coils' fine wire production capabilities—and how they can be put to work for you, right away.

DELUXE COILS, INC.
POST OFFICE BOX 318 • WABASH, INDIANA

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Directory II. Components

43. Coils.

Del Electronics Corp., Dept. IR, 521 Homestead Ave., Mt. Vernon, N.Y., 28, 30
See ad on page 491
Tel: OWens 9-2000

Delevan Electronics Corp., N.Y., 35, 38, 45

Delta Radio Co., N.Y., 26, 35, 45

Deluxe Coils, Inc., First & Webster Sts., P.O. Box 318, Wabash, Ind., 28, 36, 38
See ad on this page
Tel: WAbash 1720

Deri Radio Co., N.Y., 5, 10, 15, 20, 25, 26, 28, 30, 35, 36, 38, 45

Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass., 40
See ad on page 409
Tel: NOrwood 7-2620

Dewitt Development Co., Ill., 5, 15, 26, 35, 36, 38

Dietz Design & Mfg. Co., Mo., 5, 15, 26, 28, 30, 35, 38, 40, 45

Direct TV Replacement, England, 5, 10, 15, 20, 25, 26, 30, 35

Dormeyer Industries, Ill., 5, 28, 30, 35, 36, 38

Double E Products Co., Calif., 15, 35, 40

Dresser Industries, Hermetic Seal Transformer Co. Div., Tex., 5, 15, 30, 40

DuMont Labs., Allen B., Special Yoke Dept., N.J., 5, 10, 15, 20, 25, 28, 30, 35, 40, 45

EMI—Cossor Electronics Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 10, 25
See ad on page 412
Tel: HAlifax 6-7491

Eagle Electronics Corp., Conn., 40

Electran Mfg. Co., 1901 N. Clybourn Ave., Chicago 14, Ill., 28, 30
See ad on page 564
Tel: BIshop 8-4596

Electrical Windings, Inc., Ill., 5, 15, 28, 30, 36, 38

Electro Development Corp., Wash., 5, 15, 30, 35, 38, 40

Electro Engrg. Works, Calif., 30

Electromation Co., Calif., 40

Electronic Cable Corp., 126 Jackson St., Cambridge 40, Mass., 26, 35
See ad on page 609
Tel: TRowbridge 6-7250

Electronic Coils, Inc., Mass., 5, 15, 26, 28, 30, 35, 36, 38, 40

Electronic Transformer Co., Inc., N.Y., 5, 15, 30, 40

Elliott Evans, Inc., Telectron Co., Div., Fla., 10, 25

El-Rad Mfg. Co., Ill., 20, 26, 28, 35, 36, 40, 45

El-Tronics, Inc., Alwac Computer Div., Calif., 40

Ensign Coil Co., Ill., 5, 15, 28, 36

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

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TOROIDS
MAG-AMPS
RF COILS

FUGLE-MILLER LABORATORIES • INC

CLARK NEW JERSEY

Tel. FUlton 1-2727

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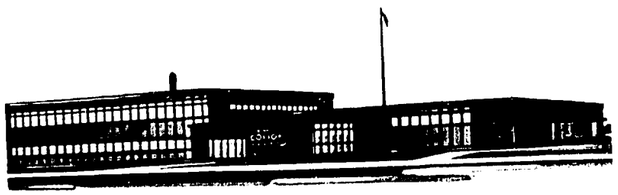
Canada's Most Modern ELECTRONICS PLANT . . .



DEFLECTION YOKES—DEFLECTION SYSTEMS

ANALOGUE & DIGITAL COMPUTERS
VERTICAL & OBLIQUE IONOSPHERIC SOUNDERS
RADAR—SONAR—COMMUNICATIONS
INDUSTRIAL TELEVISION & SOUND SYSTEMS

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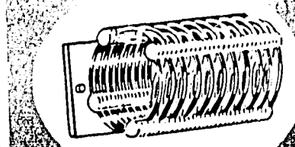
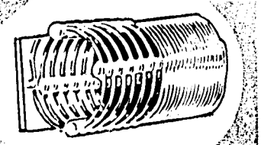
air dux

AIR WOUND COILS

Special Designs?
That's our business! We now supply a majority of the air wound coils used by leading equipment manufacturers.



High Q!
Q's of over 500 are possible with the unique air-core construction. Send for free Catalog.



Standard Air Dux!
A wide selection is available from Jobbers nationally.

illumitronic
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Directory II. Components

43. Coils.

Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y., 5, 15
See ad on page 565
Tel: DIckens 5-7531

Espey Mfg. Co., Inc., N.Y., 5, 15, 30, 36

Espey Mfg. Co., Saratoga Industries Div., N.Y., 5, 15, 30, 40, 45

Essex Electronics, 569 Springfield Ave., Berkeley Heights, N.J., 26, 35, 38, 40, 45
See ad on page 155
Tel: CRestview 3-9300

Ferrotran Electronics Co., N.Y., 28, 38, 45

Fisher Engineering, Inc., Ind., 28, 30, 38

Forbes & Wagner, Inc., 350 Central Ave., Silver Creek, N.Y., 28, 36, 38, 40, 45
See ads on pages 349, 369, 413, 444, 453, 565
Tel: YE 4-2691

Forest Electric Co., Ill., 5, 30

Foster Transformer Co., Ohio 5, 15, 30

Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 5, 15, 30, 40
See ad on page 410
Tel: EVergreen 6-1300

Fugle-Miller Laboratories, Inc., 301 Central Ave., Clark, N.J., 15, 26, 28, 30, 35, 36, 38, 40, 45
See ad on page 412
Tel: FUlton 1-2727

TRAVELING WAVE TUBE SOLENOIDS*

Anodized aluminum for lightest weight. Choice of foil or wire, aluminum or copper, air or liquid cooled for optimum design.

Close liaison with tube manufacturers and system designers results in best possible designs in minimum developmental time.

CURRENT REGULATED POWER SUPPLIES*

Laboratory, military and commercial, models from 500 watts to 10 kilowatts with five to one current adjustment with one small potentiometer.

ELECTROMAGNETS, SPECIAL FOCUS COILS, and HIGH ENERGY MAGNET COILS*

We are equipped to design and build sources of magnetic energy for any application.

IF and RF CHOKES, COILS AND TRANSFORMERS*

Designed and built to your requirements by our Western Coil Products Division. One of our 100 stock designs may meet your requirements.

* All products are designed and built to customer requirements in accordance with applicable military or customer specifications.

JOBBINS ELECTRONICS
771 HAMILTON AVENUE
MENLO PARK, CALIFORNIA
TELEPHONE: DAVENPORT 6-7110
TWX: PALO ALTO, CALIFORNIA 131

For details, circle #350 on Reader Service Card

General Automatics, Inc., Calif., 5, 15, 40

General Coil Prods., Inc., N.Y., 5, 15, 26, 28, 35, 36, 38, 45

General Electric Co., Apparatus Sales Div., N.Y., 30, 38

General Electronics Co., Inc., Ala., 40

General Instrument Corp., Automatic Div., N.J., 35

Gen. Instrument Corp., F. W. Sickles Div., Mass., 5, 10, 15, 20, 26, 35, 36, 38, 40, 45

Genistron, Inc., Calif., 5, 15, 35, 40

Geotronic Labs., Inc., Tex., 5, 15, 30, 40

Gorman Machine Co., Dept. D, 480 S. Main St., Randolph, Mass., 40
See ads on pages 665, 667
Tel: WOodlawn 3-4440

Goslin Electric & Mfg. Co., Calif., 5, 15, 26, 30, 40

Gramer-Halldorson Transformer Corp., Ill., 38, 40

Grand Transformers, Inc., Mich., 5, 15, 28, 30, 38

Green Rectifier Co., N.J., 30

Guardian Electric Mfg. Co., 1601R W. Walnut St., Chicago 12, Ill., 36, 38
See ad on page 202
Tel: CHesapeake 3-1100

Hadley Co., Robert M., Calif., 5, 30, 40

Hammond Mfg. Co., Ltd., Canada, 5, 15, 28, 30, 35, 38, 40

Harder Co., Donald C., Calif., 5, 10, 25, 28, 30, 38, 40

Highland Engineering Co., N.Y., 5, 15, 28, 30, 36, 38, 45

Hillburn Electronics Products Co., 55 Nassau Ave., Brooklyn 22, N.Y., 36, 38
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Tel: STagg 2-3875

Hindle Transformer Co., Inc., N.J., 15, 28, 30

Hisonic, Inc., Kan., 40

Hoover Electric Co., Calif., 38

I. M. C. Magnetics Corp., Gray & Kuhn, Inc., Div., N.Y., 15, 40

Illumitronic Engineering, 680 E. Taylor Ave., Sunnyvale, Calif., 35, Balun Coils
See ads on pages 412, 686
Tel: REgent 9-2395

Induction Motors Corp., Div. of P.S.P. Engr., Calif., 38

Inductor Engrg., Inc., Del., 15, 40

Industrial Winding Machinery Corp., P.O. Box 62, New York 5, N.Y., 28, 36, 38, 40
See ad on page 667
Tel: WHitehall 3-1754

James Vibrapowr Co., 4050 N. Rockwell St., Chicago 18, Ill., 5, 36, 38
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Tel: COrnelia 7-6333

Jobbins Electronics, 771 Hamilton Ave., Menlo Park, Calif., 15, 25, 26, 28, 30, 35, 36, 38
See ad on this page
Tel: DAvenport 6-7110

Kapitol Magnetic Corp., Ill., 15, 28, 30, 35, 36, 38, 40

Kellogg Switchboard & Supply Co., Ill., 5, 36, 38, 40

Kelvin Electric Co., 5907 Noble Ave., Van Nuys, Calif., 5, 15, 28, 30, 36, 38, 40
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Tel: STate 2-6662

Laboratory Equipment Corp., Mich., 40

Lesa, S.P.A., Italy, 15

Life Instrument Co., Inc., Mass., 28, 36, 38

Litton Industries, Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 10, 15, 20, 30, 35, 40
See ad on page 66
Tel: CRestview 4-7411

Magnetico, Inc., N.Y., 5, 40

Magnetics Research Co., Inc., 255 Grove St., White Plains, N.Y., 40
See ad on page 387
Tel: WHite Plains 9-9588

Marine View Electronics, Inc., N.Y., 5, 15, 26, 35, 38, 40

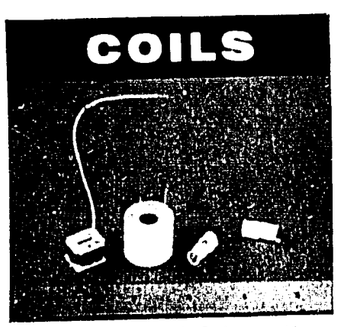
Maxson Corp., Langevin Div., N.Y., 5, 40

McGraw-Edison Co., National Electrical Coil, Ohio, 28

McKay Electric Co., Mich., 38, 40

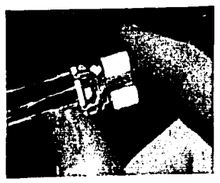
Merit Coil & Transformer Corp., Fla., 10, 25, 26, 35

COILS



Designed and Produced by Forbes and Wagner
The F&W specially designed coils shown above have solved specific problems. We will be glad to put our coil experience to work for you.

Typical F & W Coils: Relay IF RF Saturable Reactor Antenna Choke Solenoid Color Purity Toroidal Magnet Inductor TV—All Types Variable



The F&W subminiature coils in this subminiature relay were designed and built in cooperation with a large electrical manufacturer. Write for illustrated brochure

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350 Central Avenue
Silver Creek, N. Y. • Phone YE 4-2691

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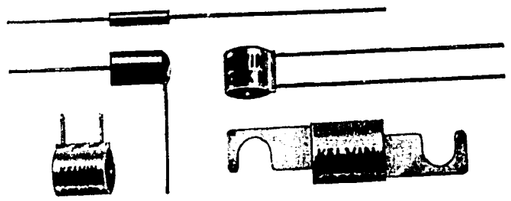
KELVIN

Precision Electrical Components

RESISTORS



WIRE WOUND precision, encapsulated

Newly developed Kelvin winding techniques produce tension-free ("RELAXED") resistor windings, practically eliminating resistance drift with age and "shorts" or "opens" due to thermal shock.

Specifications: Shock, moisture and temperature proof; exceeds military specifications.

Size Range: from micro-miniature, .080 dia. x .375 length to 1.0 dia. x 2.125 length.

Wattage, Resistance and Voltage Range: from .05 watt, 100K max. resistance, 100 volts max.,to 2.5 watts, 25.0 Meg max. resistance, 1200 volts max.

Temperature Range: —65°C to +125°C.

Standard resistance tolerances are 1%, 0.5%, 0.25% and 0.1%. Special tolerances upon request.

Temperature coefficient: ±.002% per degree C within operating temperature ranges.

Microscopic techniques are used for precision welding of all terminations.

WIRE WOUND power, precision

Available from 20 watts, ⅝" dia. x 2" length to 200 watts, 1¼" dia. x 10½" length.

Specifications:

Maximum Resistance Ranges: up to 15K

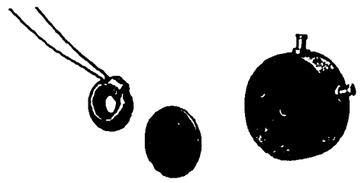
Tolerances: up to .01%

Temperature Coefficient: ±.002%/°C, closer upon request.

Temperature Range: —55°C to +100°C.

Coating: Silicone varnish

TOROIDS



INDUCTORS

Uncased: impregnated with a special plastic compound for high Q factors and maximum temperature stability. Coils are coated with an inert wax having a melting point of approximately 125°C. to provide moisture resistance and mechanical protection. Insulated flexible lead wires with Hi-temp insulation are provided.

Cased: hermetically sealed in conformance with MIL-T-27A specifications. A variety of standard sizes and shapes are available. Special case configurations available to customer's specifications.

Encapsulated: easily mounted or stacked on a single screw through the center holes. The sturdy turret lugs may be used as tie points to mount other components. Will withstand temperatures of —55°C to +125°C under conditions of high humidity and severe mechanical shock.

Specifications: Kelvin now offers higher Q factors and inductances at lower frequencies in miniature coils than heretofore available due to the application of advanced winding techniques. Excellent stability vs. temperature and current, and self-shielding effects are also main features of Kelvin toroids wound on molybdenum permalloy dust cores.

Size Range: Encapsulated; ¾" O.D. x ⅜" height, to 2⅜" O.D. x 1⅛" height. Uncased; ⅝" O.D. x 1/32" height, to 2¼" O.D. x 1" height.

Inductance Range: from .00002 HY. to 200 HY.

Temperature Coefficient: 100 PPM/degree F.

Tolerance: within 1% of nominal inductance values. Stabilized coils available upon request. These units will remain within 0.1% tolerance from +30°F to +130°F.

TRANSFORMERS power, miniature

400 cycle, in the power range under 15 V. A.

Specifications:

Frequency Range: 375 cps to 525 cps.

Ambient Temperature (for full rating): —55°C to +90°C.

Encapsulation: Epoxy; moisture, temperature, shock-proof.

Windings: Toroidal, no external fields.

Specials up to 100 V. A., 400 cycle.

RATIO precision

For precise voltage division or multiplication over wide range of load fluctuations, frequency and ambient temperature... with low insertion loss.

Specifications:

Ratio: Two secondary windings, choice of any ratio from 1:1 to 1000:1 on both windings; choice of 115, 28, 12 or 6.3 volt primary windings.

Tolerance: 0.1% standard; accuracies to .005% available.

Case: Hermetically sealed.

MAGNETIC AMPLIFIERS

Toroidal construction, maintenance free, rugged and highly reliable. Designed to fulfill the most exacting requirements. When inquiring, specify power supply frequency, voltage, output, input and output impedance, signal power for full output, response time, temperature requirements, maximum case size and weight.

POWER TRANSFORMERS AND FILTER CHOKES

Available in all standard case sizes and hermetically sealed in conformance with MIL-T-27A.

FILTERS

WAVE precision, electric

Cases hermetically sealed to MIL-T-27A. Low-pass, band-pass, high-pass and band supression types available in the audio and low RF ranges.

TELEMETERING Sub-miniature

Available in standard RDB frequencies.

Send for complete literature

KELVIN ELECTRIC COMPANY

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Directory II. Components

43. Coils.

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 26, 35
See ad on page 416
Tel: DAvenport 4-4108

Miller Co., Sanford, N.Y., 30

Miller Co., J. W., Calif., 15, 26, 35, 45

Molded Insulation Co., Pa., 26, 28, 35

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Muirhead Instruments, Inc., N.Y., 10

Muter Co., Rola Co. Div., Ohio, 10, 20

Mystic Transformers, Inc., Mass., 5, 15, 30

N Y T Electronics, Inc., Calif., 5, 15, 26, 30, 35, 40, 45

National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5, 15, 26, 35, 40
See ad on page 642
Tel: NO 5-4800

New York Coil Co., Inc., Pa., 5, 26, 28, 30, 35, 36, 38

New York Transformer Co., Inc., N.J., 5, 15, 30, 40

North Electric Co., Ohio, 15, 26, 36

North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 26, 35, 40, 45
See ads on pages 415, 455, 591
Tel: PIoneer 7-0555

Nothelfer Winding Labs., Inc., P.O. Box IRE, Ewingville Rd., Trenton, N.J., 5
See ad on page 242
Tel: EX 2-7117

Ogden Coil & Transformer Co., Ill., 5, 15, 28, 30, 38

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 35
See ad on pages 106-107
Tel: ORchard 5-2600

Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 15, 28, 30, 38
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Tel: WOrth 6-0380

Ortho Filter Corp., 7 Paterson Ave., Paterson 1, N.J., 5, 15, 30, 40
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Tel: MUlbury 4-5858

Osborne Electronic Sales Corp., Ore., 40

Osborne Transformer Corp., Mich., 5, 15, 30, 40

Oxford Electric Corporation, Ill., 5

PCA Electronics, Calif., 40

P.S.P. Engineering Co., Calif., 38

Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 26, 35
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Tel: BRadshaw 2-6141

Painton & Co., Ltd., England, 35

Pan-Air Electronics Corp., Calif., 45

Partridge Transformers Ltd., England, 5, 15, 30, 35

Penn-Tran Corp., Pa., 10, 20, 28, 36, Neutralizing

Phillips Control Corp., Ill., 36, 38

Pickering & Co., Inc., N.Y., 28, 38

Polyphase Instrument Co., Pa., 15, 40

Potter Aeronautical Corp., N.J., 28

Power Industries Co., Inc., Ill., 5, 10, 15, 25, 26, 28, 30, 35, 36, 38, 40, 45

Precision Electronics, Inc., 48 Merrick Rd., Rockville Centre, L.I., N.Y., 5, 10, 15, 20, 25, 26, 28, 30, 35, 36, 38, 40, 45
See ad on this page
Tel: ORiole 8-4182

Precision, Inc., Minn., 28, 36, 38, 40

Profile Electronics, Inc., 6 Bridge St., Concord, N.H., 5, 15, 26, 28, 35, 36, 38, 45
See ad on this page
Tel: CApital 4-1232

Pulse Engineering, Inc., Calif., 40

Quam Nichols Co., Ill., 25

Qutronic Transformer Corp., N.Y., 40

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 26, 35
See ad on page 267
Tel: DAvenport 1-1130

Radio Components Ltd., Canada, 10, 20, 26, 35, 38, 45

OVER 100,000,000

Coils and Transformers

produced since 1947 by . . .

M. Friedlieb, M.E.

Now expanding facilities to better handle your coil and transformer requirements—

- High Quality—Low Cost. Prompt and reliable delivery.
- Short runs or quantity production.

PRECISION ELECTRONICS, INC.

48 Merrick Road, Rockville Centre, N.Y., ORiole 8-4182

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Profile Electronics

Incorporated

CONCORD, NEW HAMPSHIRE

custom coil winding

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COILS

WOUND TO YOUR SPECIFICATIONS

Whether for quality commercial or military—when you want the finest in precision and the most dependable in delivery—specify coils by North Hills Electric ...specialists in custom production of universal, solenoid and bobbin coils.

ENGINEERING AND DESIGN CONSULTATION

Where specifications are not supplied, take advantage of North Hills' efficient and courteous design service.

FREE BULLETIN

Standard coils and coil forms available from stock

Write or call for free Bulletin C 12

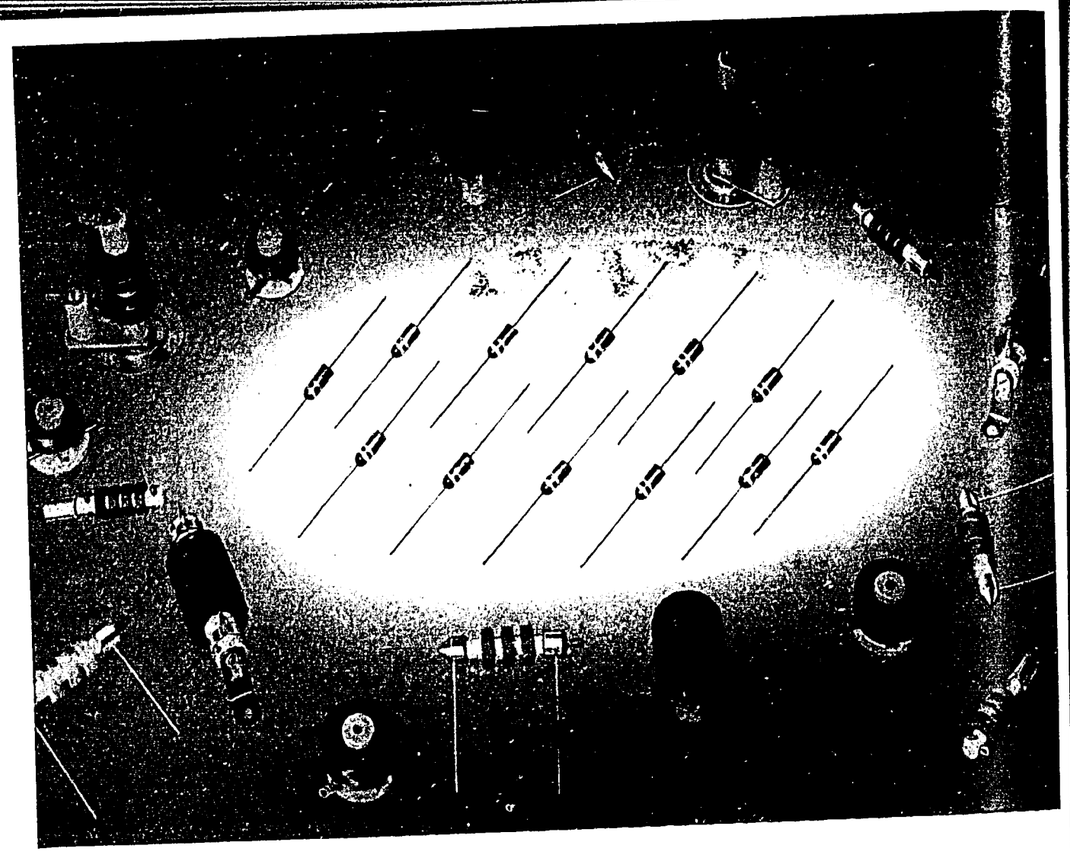
nh

NORTH HILLS ELECTRIC CO., INC.

402 Sagamore Avenue Mineola, New York

Tel. PI 7-0555

For details, circle #355 on Reader Service Card



Encapsulated Inductances

Millen DESIGNED for APPLICATION encapsulated coils provide another advance in the r-f inductor field. Modern application requires miniature, heat and cold resistant, hermetically sealed, and abrasion-resistant r-f inductor assemblies. The James Millen Manufacturing Company has pioneered many advances in the r-f inductor field, including the now-standard 4 pi r-f choke, the axial lead r-f choke, and the miniature r-f choke. Developments have now made possible another advance, the No. 3430I and No. J301 encapsulated inductors—hermetically sealed miniature size. Ambient temperature minus 55 degrees to plus 100 degrees C.

NO. J301 MINIATURE ENCAPSULATED INDUCTANCES

DESIGNED for APPLICATION miniature inductances are: extremely small (see table at right) hermetically sealed wound on axial lead Carbonyl cores color coded. Coils are available in RETMA standard values plus 25, 50, 150, 250, 350, 500, and 2500 microhenries. Coils are three layer solenoids up to 350 microhenries. From 360 to 2500 microhenries coils are pi-wound. Current rating 50 to 600 milliamperes depending on coil size. Inductance ± 5%. Special coils on order.

NO. 3430I STANDARD ENCAPSULATED INDUCTANCES

Encapsulated DESIGNED for APPLICATION axial lead phenolic form r-f inductances. Hermetically sealed heat resistant abrasion proof color coded. 1 to 350 microhenries available in RETMA standard values plus 25, 50, 150, 250, and 350 microhenries. Inductance ± 5%. Values available in same progression as J301 coil listed in the table at the right. Solenoid winding for 1 to 15 microhenries. Universal pi winding from 20 microhenries to 350 microhenries. Current rating 250 to 1500 milliamperes, depending on coil size. Ambient temperature range minus 55 degrees to plus 100 degrees Centigrade. Size: ¼ inches diameter × ⅞ inches long. Special coils on order.

COIL NUMBER	INDUCTANCE MICROHENRIES	DIAMETER INCHES	LENGTH INCHES
J301-25	25	¼	⅞
J301-33	33	¼	⅞
J301-47	47	¼	⅞
J301-50	50	¼	⅞
J301-82	82	¼	⅞
J301-100	100	¼	⅞
J301-120	120	¼	⅞
J301-150	150	¼	⅞
J301-200	200	¼	⅞
J301-220	220	¼	⅞
J301-250	250	¼	⅞
J301-300	300	¼	⅞
J301-330	330	¼	⅞
J301-350	350	¼	⅞
J301-360	360	¼	⅞
J301-390	390	¼	⅞
J301-430	430	¼	⅞
J301-470	470	¼	⅞
J301-500	500	¼	⅞
J301-510	510	¼	⅞
J301-560	560	¼	⅞
J301-620	620	¼	⅞
J301-680	680	¼	⅞
J301-750	750	¼	⅞
J301-820	820	¼	⅞
J301-910	910	¼	⅞
J301-1000	1000	¼	⅞
J301-1200	1200	¼	⅞
J301-1300	1300	¼	⅞
J301-1500	1500	¼	⅞
J301-1800	1800	¼	⅞
J301-2000	2000	⅜	⅞
J301-2200	2200	⅜	⅞
J301-2400	2400	⅜	⅞
J301-2500	2500	⅜	⅞

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN, MASSACHUSETTS, U.S.A.

For details, circle #356 on Reader Service Card

Directory II. Components

43. Coils.

Radio Development & Research Corp., N.J., 28, 30, 40
Radio Industries, Inc., Ill., 20, 35
Railroad Electronic Labs. of Omaha, Inc., Neb., 40
Railway Communications, Inc., Mo., 40
Ram Electronics, Inc., N.J., 5, 10, 20, 25, 30
Randall, Inc., Douglas, R.I., 28, 30, 36, 38, 40
Rank Cintel, Ltd., England, 10, 25
Rawson Electrical Instrument Co., 118 Potter St., Cambridge 42, Mass., 35
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Tel: KIrkland 7-4041
Raypat, Inc., Ill., 5, 15, 20, 26, 35
Raytheon Co., Mass., 5
Redman Electronics Corp., Conn., 35, 40
Rola Co., Div., Muter Co., Ohio, 5, 10, 20
Roller Electric Co., Ill., 26, 38
Ross Mfg. Co., Ill., 10, 20, 26, 35
Ross Metals Co., Pa., 40
Rytron Co., Inc., Calif., 5, 15, 30, 40
Ryvon Instruments, Mo., 40
Sag Harbor Industries, Inc., N.Y., 28, 30, 36, 38
Sangamo Electric Co., Ill., 5, 15, 30, 38, 40
Saratoga Industries, N.Y., 5, 10, 15, 20, 25, 26, 28, 30, 35, 36, 38, 40, 45
Sarkes, Inc., Ore., 15, 28, 36, 40
Siemens & Halske, A. G., Germany, 36
Signal Transformer Co., 1661 McDonald Ave., Brooklyn 30, N.Y., 5, 15, 30, 40
See ad on page 566
Tel: ESplanade 6-0615
Sonic Radio Products, S.D., 15, 26, 35, 38, 40, 45
Sorensen, Inc., Ill., 26, 28, 30, 35, 38
Spar[illegible] Ltd., S.G., Canada, 20, 26, 38
Speer Carbon Co., Jeffers Electronics Div., 35, 38
Sperry Gyroscope Co. of Canada, Ltd., Que., 40
Sprague Products Co., Cooper Hewitt Electric Div., N.J., 36
Square D Co., Electric Co., Mass., 40
Standard Electrical Products Co., Ohio, 5, 26, 30, 35
Stanwyck Coil Co., E., 75 Carson Ave., Newburgh, N.Y., 15, 26, 35, 40, 45
See ad on this page
Tel: JOhn 1-3030
Stanwyck Winding Co., Inc., N.Y., 26, 35, 38, 40, 45
Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 38
See ads on pages 306, 351
Tel: POrt Washington 7-7200
Stupakoff, Inc., Conn., 38
Sumner Coil Co., N.J., 26, 35, 45
Superior Electronics Corp., N.Y., 5, 15, 26, 45
Swan Electronics Co., Ill., 26, 28, 35, 38, 45
Sylvania Electric Products, Inc., Mass., 5, 15, 30, 40
Sylvania Electric Products, Inc., Sylvania Electronic Systems Div., Mass., 26, 28, 35
Syntronic Instruments, Inc., 100 Industrial Rd., Addison, Ill., 10, 25
See ad on this page
Tel: KIngswood 3-6444
Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 15, 28, 30, 40
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Tel: REctor 2-6240
Telechron Inc., N.Y., 5, 26, 30
Telechron Company, Pa., 20
Telecube Engineering Corp., N.Y., Pa., 15, 20, 25, 26, 28, 35, 38, 45
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 5, 15, 28, 36, 38, 40
See ads on pages 466, 569
Tel: MIdway 6-7211
Television Laboratories, Inc., Pa., 5, 25, 35, 40
Tensor Electric Dev. Co., Inc., N.Y., 5, 26, 28, 30, 35, 38

Deflection YOKE specialists

COMPLETE LINE for every Military and Special purpose . . . in PRODUCTION QUANTITIES . . . or CUSTOM DESIGNED to your specific requirement.

syntronic

INSTRUMENTS, INC.

100 Industrial Road, Addison, Ill., Phone Klngswood 3-6444

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⅛ Inch High—On Stanwyck Printed Circuit Coils!

- These shorter terminals available only on STANWYCK COILS—save needed space and Q.
- STANWYCK COILS are designed by experts in the field—manufactured to your exact specifications!
- All STANWYCK COILS are self-supporting and adaptable to Automation design! (Unless otherwise specified)
- STANWYCK COIL service save you money, time and effort by providing complete coil design, manufacture and production!

E. STANWYCK COIL COMPANY

75 Carson Ave., Newburgh, N.Y.—John 1-3030

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Transistorized Converter Transformer

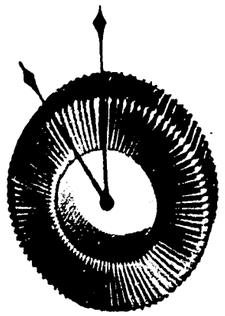
Open Construction Filter Choke

Epoxy, Encapsulated Toroidal Inductor

Magnetic Amplifier

Variable Inductor

Beat the Clock



RAPID SOLUTION TO YOUR **TOROIDAL COMPONENT** PROBLEMS

Write for complete information

Differential Transformer

If you require speedy delivery, try us first.—We offer custom design and/or production of toroidal components such as inductors, transformers, magnetic amplifiers, oscillator coils, filters and potentiometer windings. Each component leaving our plant is thoroughly tested and we guarantee quality whether it be open, encased, encapsulated, MIL-T-27A or commercial construction.

Wire Size—AWG	
MAX.	5
MIN.	44

Fastest Production and Prototype Delivery

UNIVERSAL

TOROID COIL WINDING, INC.

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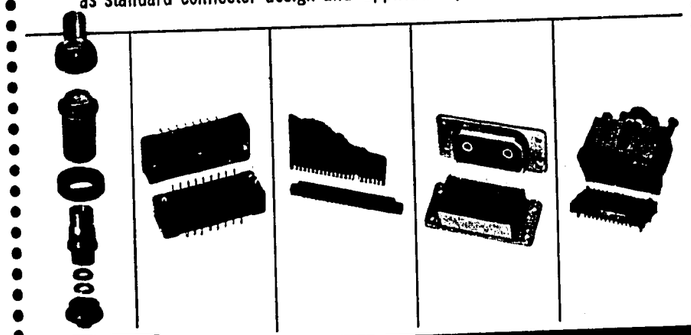
RELIABLE COMPONENTS

ANTON PRECISION-BUILT CONNECTORS

incorporate new techniques in hermetic sealing, high-altitude operation, molding and waterproofing. Our facilities include complete design and model making shops as well as the full range of shock, vibration and environmental test equipment. We welcome your "difficult" as well as standard connector design and application problems.



ANTON ELECTRONIC LABORATORIES INC

A subsidiary of United States Hoffman Machinery Corporation

1226 FLUSHING AVE., BROOKLYN 37, N. Y.

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BELLING & LEE

ENGLAND'S FINEST COMPONENTS

"The Line That Keeps in Step with Electronic Progress"

Leading Electrical & Electronic Design Engineers prefer the high standard BELLING & LEE products for CONTROL & POWER SUPPLY CIRCUITS. . . .

Miniature Unitors, Printed Circuit Connectors, Terminals, Flexible Terminal Blocks, Fuse Links, Miniature & Microminiature Plugs & Sockets, Thermal Delay switches, etc.

Consult us for your specific requirements. Complete catalogue, specifications, applications & diagrams for qualified respondents

ERCONA

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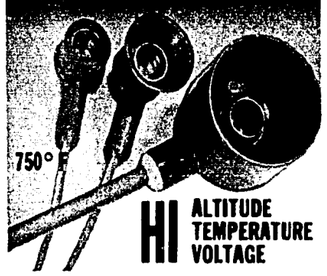
SILICONE

TUBE CAP CONNECTORS



HI ALTITUDE TEMPERATURE VOLTAGE

This is a new series of Tube Cap Connectors using special silicone components for high reliability applications. They provide the highest degree of resistance to temperature extremes and are virtually unaffected by ozone and corona. The excellent dielectric characteristics make them ideal for high voltage. Skirts and sealed-in leads guard against flashover at high altitudes. Additional features include anti-corona cup and long-life spring contacts.

Clip this out—keep handy for part numbers and specs on connectors below for either ¼" or ⅜" top caps. Prefix 90 for ¼"; 91 for ⅜". Lead wire 18" long from center of cap or length to your specs.

#90 or 91SCCSL beryllium copper contact, cadmium plated nests in anti-corona cup. Silicone rubber insulation throughout.

#90 or 91SCCRSL beryllium copper contact, cadmium plated nests in anti-corona cup. Silicone rubber insulation throughout. Takes up to one watt resistor — specify value and tolerance.

#90 or 91SCCDSL beryllium copper contact, cadmium plated nests in anti-corona cup. Skirt clings to tube — guards against flash-over Silicone rubber insulation throughout.

#90 or 91SCCDRSL beryllium copper contact, cadmium plated enclosed in anti-corona cup. Skirt clings to tube — helps suppress corona—guards against arc-over. Takes up to one watt resistor. Specify value and tolerance.

#90 or 91CCSTLRL beryllium copper contact, cadmium plated nests in anti-corona cup. Glass-filled silicone insulation on cap; silicone rubber on lead. Long skirt for arc-over. Takes up to 2 watt resistor. Specify value and tolerance.

Besides new silicone types — Alden provides a complete series of connectors for ¼", ⅜" and ½" cap in your choice of phenolic, mica, polyethylene, nylon and Kel-F. Complete hi-voltage cable assemblies are available using Alden hi-voltage disconnects and tube cap connectors.

TELL US ABOUT YOUR CONNECTING PROBLEM. FOR PROMPT RECOMMENDATIONS — WRITE OR PHONE JACK POLLARD NOW.

ALDEN PRODUCTS CO.

1210 NORTH MAIN STREET
BROCKTON 64, MASS.

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Directory II. Components

43. Coils.

Topper Mfg. Co., Inc., N.Y., 28, 36, 40
Torocoil Co., Ohio, 40
Torotel, Inc., Mo., 5, 15, 40
Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5, 15, 30, 40
See ad on pages 116-117
Tel: ELizabeth 4-5650
Transformer Engineers, Calif., 5, 15, 30, 40
Transformer Technicians, Inc., Ill., 5, 15, 30, 40
Transformers, Inc., N.Y., 5, 15, 30, 40
Tronic Coil Winding Co., Inc., Conn., 15, 30, 36, 40
Turbo Jet Products Co., Calif., 28, 36, 38
United States Electronics Corp., N.J., 5, 15, 25, 26, 28, 30, 35, 36, 38
United States Instrument Corp., Va., 36
U.S. Relay Co., Calif., 5, 15, 36, 38, 45
United Transformer Corp., 150 Varick St., New York 13, N.Y., 5, 15, 30, 35, 40
See ad on Cover 2
Tel: ALgonquin 5-3500
Universal Toroid Coil Winding, Inc., 171 Coit St., Irvington 11, N.J., 5, 15, 26, 35, 40
See ad on page 418
Tel: ESsex 4-9800
Valor Electronics, Inc., Calif., 26, 35, 40
Vanguard Electronics Co., Calif., 15, 26, 35, 45
Vari-L Co., Inc., 432 Fairfield Ave., Stamford, Conn., 40
See ad on page 254
Tel: FIreside 8-0091
Varo Mfg. Co., Inc., Tex., 5, 35, 40
Videocraft Mfg. Co., Ill., 10
Virginia Electronics Co., Inc., D.C., 5, 26, 35
Warren Mfg. Co., Inc., Mass., 40
Warren Transformer Co., Inc., Pa., 28, 30, 35, 38, 40
Warsaw Coil Co., Ind., 5, 10, 15, 20, 26, 35, 36, 38, 45
Waters Mfg., Inc., Mass., 35, 38, 40, 45
Waugh Engrg. Co., Calif., 28
West Coast Electrical Mfg. Corp., Calif., 38
Western Coil Products Co., Calif., 26, 28, 35, 36, 38, 45
Westinghouse Electric Corp., Pa., 40
Wheeler Elect. Corp. Div.-Sperry Corp., Conn., 5, 15, 28, 30, 35, 36, 38, 40
Whitewater Electronics, Inc., Wis., 15, 26, 28, 30, 35, 38, 45
Winatic Corp., N.Y., 28, 36, 38
Wirco Electronics Inc., Calif., 15, 26, 28, 30, 35, 36, 38, 45
Wright-Zimmerman, Inc., Minn., 20, 26, 35, 45

Commutators: See class 44

Computers: See class 9

Condensers: See class 41

44. Connectors.

5. AN & MIL standard types
7. Anode
10. Co-axial
15. Hermetically sealed
17. Interlock
20. Microphone
25. Multiple circuit connectors
29. Phono
30. Power
32. Printed circuit
34. RF type
35. Slip rings
37. Commutating connectors
40. Sub-miniature
45. Waterproof

A.P.M. Corporation, 252 Hawthorne Ave., Yonkers, N.Y., 5, 30
See ads on pages 462, 634
Tel: YOnkers 8-2010
A-1 Precision Products, Calif., 32, 35, 40
Accurate Electronics Corp., Ohio 7, 17, 25, 28, 30, 32
Aerolite Electronics Co., N.J., 7, 10, 17, 28
Aerovox Corp., Mass., 25
Airflyte Electronics Co., 540 Ave. A, Bayonne, N.J., 35, 37, 40
See ad on page 550
Tel: HEmlock 6-2230
Alden Products Co., 121D N. Main St., Brockton 64, Mass., 7, 25, 28, 30, 40
See ads on pages 419, 691
Tel: JUniper 3-0160
Alpine Electronic Comp., Inc., Conn., 32, 40
American Communications Corp., N.Y., 10, 34
American Electronics Co., N.Y., 10, 28, 34
American Radar Components, Inc., N.J., 5
Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 5, 10, 15, 20, 25, 30, 32, 34, 40, 45
See ad on page 166
Tel: BIshop 2-1000
Amphenol-Borg Electronics Corp., Amphenol Western Div., Calif., 5, 10, 15, 25, 30, 32, 34, 40, 45
Amphenol-Borg Electronics Corp., Industrial Prods.-Danbury Knudsen Div., Conn., 10, 15, 25, 34, 40, 45
Anderson Electric Co., Ala., 15, 45
Andrew Corp., Ill., 10, 34
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 7, 10, 15, 17, 25, 30, 32, 34, 40, 45
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715
Ardente Acoustic Labs. Ltd., England, 40
Ark-Les Switch Corp., Mass., 40
Armel Electronics, Inc., N.Y., 5, 25, 30, 32
Automatic Metal Products Corp., 323 Berry St., Brooklyn 11, N.Y., 5, 10, 32, 34, 40
See ad on page 421
Tel: EVergreen 8-6057
Automation Electronics, Inc., Calif., 32, 40
Avnet Corp., Calif., 5, 10, 17, 34
Avnet Electronics Corp., N.Y., 5, 10, 17, 25, 30, 34, 40, 45

DAGE

COAXIAL CABLE CONNECTORS

67 NORTH SECOND STREET · BEECH GROVE, INDIANA

BNC SERIES

CABLE PLUG

DAGE NO.	AN NO.	CABLE RG ( )/U
056-1	UG-88/U	55,58
073-1	UG-260/U	59,62,71
359-1	UG-88B/U	55,58
416-1	UG-260A/U	59,62,71
813-1	UG-88C/U	55,58
815-1	UG-260B/U	59,62,71
2030-1	UG-88A/U	55,58
3421-1	UG-260C/U	59,62,71

CABLE JACK

124-1	UG-261/U	59,62,71
130-1	UG-89/U	55, 58
415-1	UG-89B/U	55, 58
417-1	UG-261A/U	59,62,71
814-1	UG-89A/U	55, 58
816-1	UG-261B/U	59,62,71
3420-1	UG-89C/U	55, 58
3422-1	UG-261C/U	59,62,71

SINGLE HOLE MOUNT CABLE JACK

2225-1	UG-910/U	59,62,71
2230-1	UG-909/U	55,58
2461-1	UG-624/U	59,62,71
3441-1	UG-909A/U	55,58
3442-1	UG-910A/U	59,62,71

FLANGE MOUNT CABLE JACK

121-1	UG-262/U	59,62,71
122-1	UG-291/U	55,58
371-1	UG-262A/U	59,62,71
413-1	UG-291A/U	55,58
817-1	UG-291B/U	55,58
1-110-1	UG262B/U	59,62,71
3423-1	UG-262C/U	59,62,71
3425-1	UG-291C/U	55,58

SINGLE HOLE MOUNT JACK RECEPTACLE

DAGE NO.	AN NO.
081-1	UG-625/U
667-1	UG-625A/U
667-2	UG-1094/U
1-400-1	UG-911/U
1-408-1	UG-625B/U

FLANGE MOUNT JACK RECEPTACLE

055-1	UG-290/U
671-1	UG-290A/U

ADAPTER STRAIGHT SINGLE HOLE BULKHEAD FEED THRU (JACK-JACK)

547-1	UG-492/U
1-190-1	UG-492A/U
2201-1	UG-492B/U

PLUG RECEPTACLE RIGHT ANGLE SINGLE HOLE MOUNT

618-1	UG-535A/U
818-2	UG-1098/U
2556-1	UG-1174/U

ADAPTER TEE (2 JACK, 1 PLUG ENDS)

134-1	UG-274/U
1-040-1	UG-274A/U
3424-1	UG-274B/U

BINDING POST

501-1	UG-924/U

C SERIES

CABLE PLUG

DAGE NO.	AN NO.	CABLE RG ( )/U
288-1	UG-573A/U	8,9
1-121-1	UG-709A/U	58
1-200-1	UG-943A/U	10,12
1-262-1	UG-626A/U	5,6
3433-1	UG-573B/U	8,9
3434-1	UG-626B/U	5,6

CABLE JACK

DAGE NO.	AN NO.	CABLE
310-1	UG-572/U	8,9
1-604-1	UG-633/U	5,6
3432-1	UG-572A/U	8,9
3439-1	UG-633A/U	5,6

SINGLE HOLE MOUNT CABLE JACK

308-1	UG-570/U	8,9
585-1	UG-939/U	8,9
1-605-1	UG-704/U	55,58
3430-1	UG-570A/U	8,9

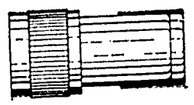
FLANGE MOUNT CABLE JACK

804-1	UG-629/U	5,6
3431-1	UG-571A/U	8,9

SINGLE HOLE MOUNT JACK RECEPTACLE

DAGE NO.	AN NO.
2377-1	UG-634/U
3429-1	UG-569A/U

N SERIES



PLUG

DAGE NO.	AN NO.	CABLE RG ( )/U
037-1	UG-21B/U	8,9
131-1	UG-18B/U	5,6,21
400-1	UG-21C/U	8,9
1-111-1	UG-21D/U	8,9
1-243-1	UG-18A/U	5,6,21
1-244-1	UG-21A/U	8,9
1-624-1	UG-18C/U	5,6,21
2799-1	UG-204C/U	14

JACK

062-1	UG-23B/U	8,9
140-1	UG-20B/U	5,6,21
1-242-1	UG-20A/U	5,6,21
1-246-1	UG-23A/U	8,9
1-247-1	UG-23D/U	8,9
1-490-1	UG-23C/U	8,9
1-527-1	UG-20C/U	5,6,21

FLANGE MOUNT CABLE JACK

047-1	UG-22B/U	8,9
132-1	UG-19B/U	5,6,21
245-1	UG-1052/U	58
1-258-1	UG-22D/U	8,9
1-480-1	UG-22C/U	8,9
1-526-1	UG-19C/U	5,6,21
2328-1	UG-1187/U	8,9
3195-1	UG-1187A/U	8,9
3456-1	UG-1095A/U	55,58
3457-1	UG-1095B/U	55,58

SINGLE HOLE MOUNT CABLE JACK

DAGE NO.	AN NO.	CABLE RG ( )/U
2146-1	UG-160C/U	8,9
2413-1	UG-936A/U	10,12
3039-1	UG-160B/U	8,9

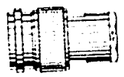
RIGHT ANGLE FLANGE MOUNT JACK RECEPTACLE

DAGE NO.	AN NO.
2466-1	UG-997A/U

FLANGE MOUNT JACK RECEPTACLE

019-1	UG-58A/U

TNC SERIES



CABLE PLUG

DAGE NO.	CABLE RG ( )/U
8000-1	55,58
8004-1	59,62,71

CABLE JACK

8005-1	55,58
8006-1	59,62,71

SINGLE HOLE MOUNT CABLE JACK

8009-1	55,58
8010-1	59,62,71

FLANGE MOUNT CABLE JACK

8007-1	55,58
8008-1	59,62,71

SINGLE HOLE MOUNT JACK RECEPTACLE

DAGE NO.	DATA
8001-1	Herm. Seal
8012-1	

FLANGE MOUNT JACK RECEPTACLE

8011-1	

RIGHT ANGLE SINGLE HOLE MOUNT JACK RECEPTACLE

8016-1	Solder pot

RIGHT ANGLE FLANGE MOUNT JACK RECEPTACLE

8015-1	Solder pot

TRIAXIAL SERIES

CABLE PLUG

DAGE NO.	DATA
2675-1	Polarized
2743-1	Standard

CABLE JACK

2741-1	Standard
2742-1	Polarized

SINGLE HOLE MOUNT CABLE JACK

3107-1	Standard
3197-1	Polarized

FLANGE MOUNT JACK RECEPTACLE

2676-1	Not pressurized

SINGLE HOLE MOUNT JACK RECEPTACLE

2677	Polarized

CABLE JACK (MIN.)

5922-1	P	Coax cable

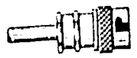
SINGLE HOLE MOUNT JACK RECEPTACLE (MIN.)

5923-1	P	Herm. seal

ADAPTER STRAIGHT SINGLE HOLE BULKHEAD FEED THRU (JACK to JACK) (MIN.)

5924-1	P	Herm. seal

DM SERIES



CABLE PLUG

DAGE NO.	POLARITY	DAGE JACKET DIA. MAX., MIN.
1-300-1	A	.135 .115
1-317-1	B	.135 .115
1-818-1	E	.135 .115
1-940-1	J	.135 .115
1-941-1	L	.135 .115
5149-1	F	.135 .115
5152-1	M	.135 .115
5312-1	K	.135 .115

CABLE JACK

DAGE NO.	POLARITY	OUTER JACKET DIA. MAX., MIN.
1-350-1	A	.135 .115
1-352-1	B	.135 .115
5165-1	E	.135 .115
5166-1	J	.135 .115
5167-1	K	.135 .115
5168-1	L	.135 .115
5169-1	M	.135 .115
5170-1	F	.135 .115

SINGLE HOLE MOUNT JACK RECEPTACLE

DAGE NO.	POLARITY	MT. DIM. Hole DIM.	MT. DIM. Panel THK.
1-310-1	A	1	1/8
1-311-1	B	1	1/8
1-707-1	E	2	1/8
1-875-1	J	1	1/8
1-945-1	K	1	1/8
1-946-1	L	1	1/8
5231-1	M	1	1/8
5232-1	F	1	1/8

SOLDER MOUNTED JACK RECEPTACLE

DAGE NO.	POLARITY	HERM. SEAL
1-771-1	B	Yes
1-772-1	F	Yes
1-774-1	A	Yes
1-778-1	E	Yes
1-954-1	J	Yes
1-955-1	L	Yes
5061-1	K	Yes
5062-1	M	Yes

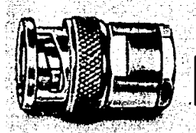
JACK BULK HEAD FEED THRU'S

1-699-1	K	Yes
1-957-1	L	Yes
5059-1	M	Yes
5060-1	F	Yes
5208-1	A	Yes
5209-1	B	Yes
5210-1	E	Yes
5211-1	J	Yes

OTHER FITTINGS AVAILABLE. WRITE FOR FREE CATALOG.

Today's requirements call for miniaturization,

but...



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Unit engineered to fit all available sub-miniature cables, AUTOMATIC'S Sub-Miniature Connectors are available in three types; BAYONET, PUSH-ON AND THREADED COUPLING.

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No special tools required for assembly. Foolproof clamping insures accurate alignment . . . positive contact . . . extra strong grip. Exclusive internal-parts design allows outside dimensions of connectors to remain constant regardless of cable dimensions.

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Tel: ENfield 3322

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Tel: LOwell 3-9511

Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 7, 17, 20, 28, 32, 40
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Tel: TEmple 8-4711

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Elco Corp., Pa., 5, 10, 15, 17, 20, 25, 28, 30, 32, 40, 45

crimp-type, snap-locked contacts

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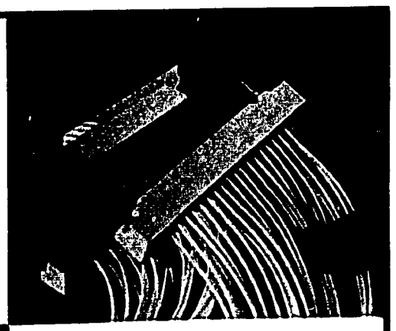
HYFEN® connector

feed-thru, multiple insert

Makes possible the design of lighter and more compact equipment. Each insert holds 35 contacts. Frames available for 5 or 8 inserts.



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For complete information, write: OMATON DIVISION, BURNDY—Norwalk, Connect.

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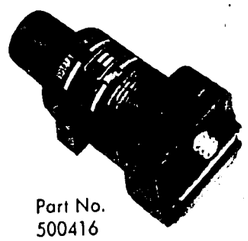
COMMUTATORS AND INERTIAL VELOCITY METERS

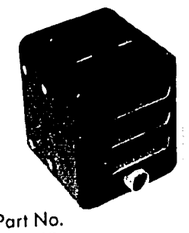


Part No. 500416

PAM or FM/FM Commutator
3 Pole 30x10 — AC or DC Motor

This unit continued operating from pre-flight through recovery in the nose cone of a Jupiter missile.

Part No. 500416 (DC Motor)
500417 (AC Motor)
MIL-E-5272A, MIL-I-6181B, IRIG



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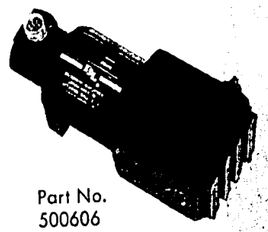
PDM Miniature Commutator
3 11/64" x 3 13/32" x 3¼"
for 3 (45x20) Poles with pulser

Motor is completely contained within the commutator rings and reduces volume to provide an ideal unit for missile and other airborne applications..

MIL-E-5272A, MIL-I-6181B, IRIG (MOD.)



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Combination FM/FM Commutator
2 Poles 30x5 plus 2 poles 60x5

A flexible PAM commutator with 28V DC motor and all switch contacts available at connectors for interwiring per flight requirements. Useful for systems checkout due to long life capabilities.

Missile and aircraft environments.

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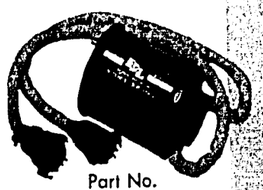
1½" dia. x 3½" — weight 15 oz.

This unit reacts to acceleration forces and yields an output signal which is the time integral of that acceleration to an accuracy of 50 feet at 100 miles.

MIL-E-5400



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These converters, with a multi-turn input, provide bi-directional read-out of 20,000 bits per minute for 500 hours or more. Standard models have 1000, 3600 and 216,000 bits capacity.

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Write for Technical Bulletins on these units by part number or send your specifications.

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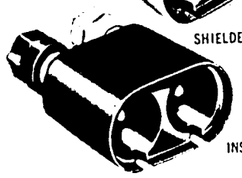
DUB-L-PLUG
DUAL ELECTRICAL CONNECTORS



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INSULATED TYPE

SHIELDED/INSULATED AND INSULATED TYPES AVAILABLE

ALL CONDUCTING METAL PARTS GOLD-PLATED

NYLON BODIES ON INSULATED TYPES AVAILABLE IN 6 COLORS

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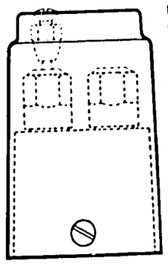

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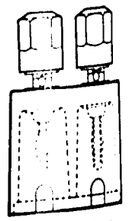

WRITE FOR DUB-L-PLUG DATA SHEET

THE SUPERIOR ELECTRIC COMPANY
590 Tripp Avenue Bristol, Connecticut

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44. Connectors.

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Graphite Metallizing Corp., 1057 Nepperhan Ave., Yonkers, N.Y., 35, 37, Telemeter
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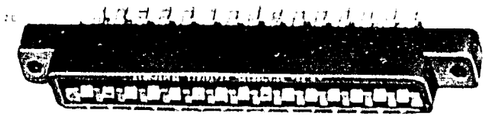

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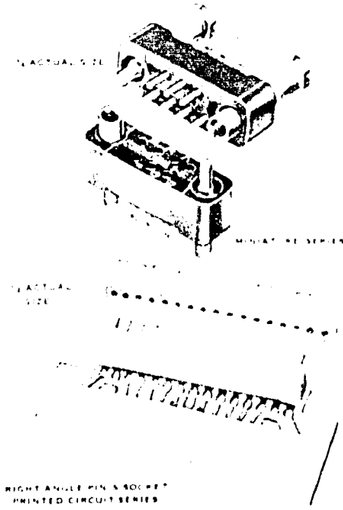

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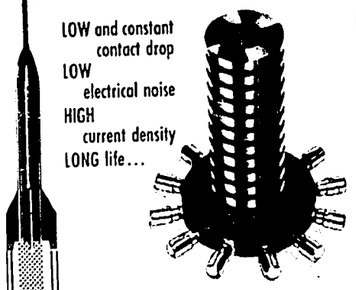

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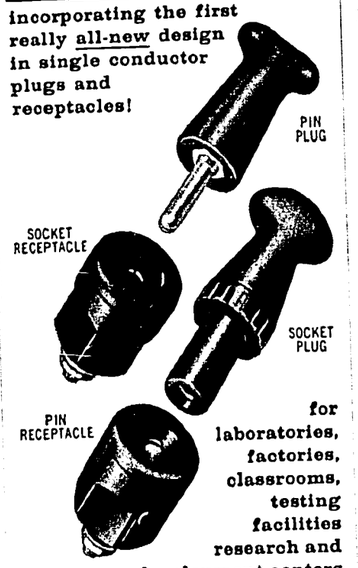
ELECTRICAL CONNECTORS

incorporating the first really all-new design in single conductor plugs and receptacles!



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CORROSION-RESISTANT NYLON PARTS IN RED, WHITE, BLUE, YELLOW, GREEN, BLACK
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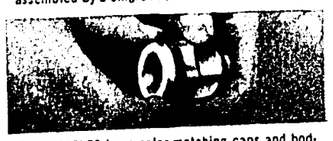

RECEPTACLES have color-matching caps and bodies to permit more rapid circuit identification on both front and back of panel.

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540 Trapp Avenue Bristol Connecticut

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Mandex Mfg. Co., Inc., Ill., 7
Marconi's Wireless Telegraph Co., Ltd., N.Y., 10
Methode Mfg. Corp., 7447 W. Wilson Ave., Chicago 31, Ill., 5, 25, 30, 32, 34, 37, 40
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Tel: UNderhill 7-9600
Metox, France, 5, 10, 25, 40
Micarta Fabricators, Inc., Ill., 7, 17, 28, 32
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Micro-Lectric Div., Micro Machine Works, 19 Debevoise Ave., Roosevelt, L.I., N.Y., 40
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Tel: FReeport 8-3222
Midwest Molding & Mfg. Co., Ill., 35, 37
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 30
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Tel: DAvenport 4-4108
Molded Insulation Co., Pa., 5, 10, 15, 25, 32, 40, 45
Molding Corp. of America, R.I., 15, 40
Molex Products Co., Ill., 25, 30, 32
Morse Co., Frank W., Mass., Pin Type Cord
Mutual Electronic Industries Corp., N.Y., 5, 10, 15, 17, 34, 35
Mycalex Electronics Corp., 125-B Clifton Blvd., Clifton, N.J., 37
See ad on page 103
Tel: PRescott 9-8866
National Tel-Tronics Corp., 52 St. Casimer Ave., Yonkers, N.Y., 20, 28
See ad on page 462
Tel: YOnkers 8-6400
Naz-Dar Co., Ill., 32
Norrich Plastics Corp., 107-109 W. 18th St., New York 11, N.Y., 35, 40
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Tel: WAtkins 4-8360
North Electric Co., N.Y., 25
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Pacific Scientific Co., Calif., 35
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Permonite Mfg. Co., Ill., 7, 17, 28
Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N.Y., 10, 34
See ad on page 612
Tel: PLaza 1-3200
Plastics Mold & Engineering Co., R.I., 28, 40
Poly-Scientific Corp., Va., 35, 37
Powell Co., Pa., 5, 15, 25, 40, 45
Prodelin, Inc., Dept. I-8, 307 Bergen Ave., Kearny, N.J., 10, 15, 34, 45
See ad on page 613
Tel: WYman 1-8600
Progress Electronics Co., 107 Franklin St., New York 13, N.Y., 5, 10, 15, 17, 20, 25, 28, 30, 34, 35, 40, 45
See ad on pages 71-74
Tel: CAnal 6-5611
Pyle-National Co., Ill., 5, 10, 25, 30, 45
Remler Co., Calif., 45
Richards Electrocraft, Inc., Ill., 20, 28, 40
Robertson Electric Co., Inc., 124 S. Elmwood Ave., Buffalo 2, N.Y., Connector Splice Cases
See ads on pages 425, 615
Tel: MAdison 6658
Rodale Mfg. Co., Inc., Pa., 45
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Ross Metals Co., Milton, Pa., 5, 10, 15, 20, 25, 28, 32, 35, 40
Rotary Devices Corp., N.J., 35, 37
Royal Electric Corp., R.I., 17
Russell & Stoll Co., Inc., N.Y., 17, 30
Rye Sound Corp., N.Y., 40
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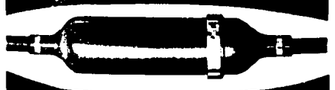

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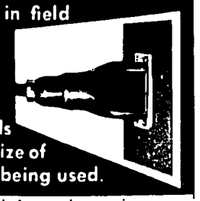

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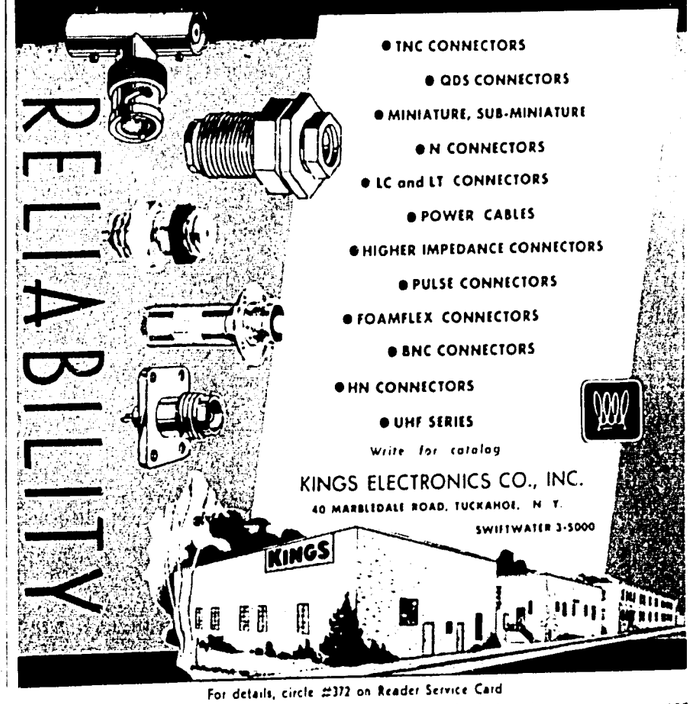

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SUPERIOR

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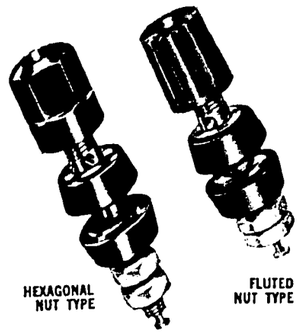

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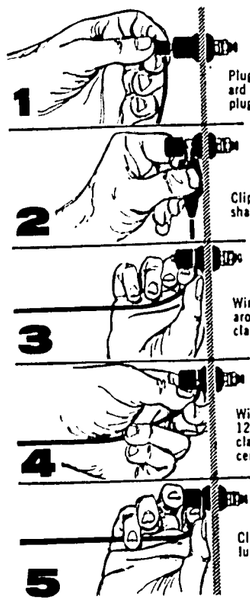

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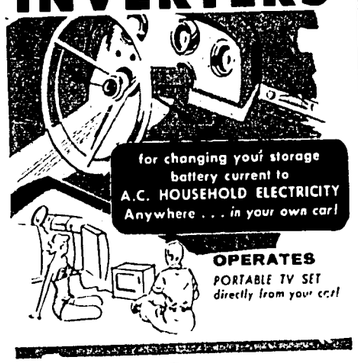

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Tel: WOodland 6-1585

Sealectro Corp., 610 Fayette Ave., Mamaroneck, N.Y., 10, 32, 40
See ad on page 692
Tel: OWens 8-5600

Sealtron Corp., Ohio, 5, 15, 40

Servonic Instruments, Inc., Calif., 35

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Siemens & Halske, A.G., Germany, 1

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Slip Ring Co. of America, Calif., 35

Smith, Inc., H. H., N.Y., 10, 20, 28

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Specialty Engrn. & Electrn. Co., N.Y., 5, 25, 32, 45

Standard Metals Corp., Mass., 35

Stanwyck Coil Co., E., 75 Carson Ave. Newburgh, N.Y., 32, 40
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Tel: JOhn 1-3030

Superex Electronics Corp., N.Y., 20, 28, 40

Superior Carbon Products, Inc., Ohio, 35, 37

Superior Electric Co., 590 Tripp Ave. Bristol, Conn., 30
See ads on pages 422, 424, 426, 481, 502, 562, 570, 588
Tel: LUdlow 2-9561

Switchcraft, Inc., 5561 N. Elston Ave. Chicago 30, Ill., 20, 28
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Tel: SPring 4-1515

Taffet Radio & Television Co., N.Y., 3

Ta-Mar, Inc., Calif., 10, 34

Tap-A-Line Mfg. Co., P.O. Box 563, Pompano Beach, Fla., 25
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Tel: WEbster 3-3262

Technical Appliance Corp., N. Main St., Sherburne, N.Y., 10, 34
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Tel: SHerburne 7-2211

Telcon, Inc., Dept. E61, P.O. Box 216, Pacific Palisades, Calif., 10, 34
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Tel: GL 4-4043

Tenna Mfg. Co., Ohio, 10, 37

Thomas & Betts Co., Inc., N.J., 17

Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 10

Transco Products, Inc., Calif., 10, 15, 34

Transline Associates, N.J., 15

Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 10
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Tel: LIbertyville 2-9700

Tru-Connector Corp., Mass., 10, 15, 17, 34, 40, 45

Twin Lock, Inc., Calif., 17, 25

Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 7, 10, 32
See ad on page 464
Tel: LAsall 7-8400

Union Electronics & Machine Corp., 71 Broadway, Wakefield, Mass., 10, 34, 4
See ad on page 427
Tel: CRystal 6-5000

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United States Chemical Milling Corp., Calif., 32

U.S. Components, Inc., 454 E. 148th St., New York 55, N.Y., 5, 15, 17, 25, 30, 32, 40
See ad on page 160
Tel: CYpress 2-6525

United States Instrument Corp., Va., 45

Victor Electric Wire & Cable Corp., R.I., 17, 28

Victor R.F. & Microwave Co., Mass., 10, 34

Viking Industries, Inc., Calif., 15, 25, 30, 32, 40, 45

Waldom Electronics, Inc., Ill., 7, 17, 28

Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 28, 40
See ad on page 474
Tel: ROckford 8-9661

Waltham Horological Corp., Mass., 10, 15, 20, 34, 40

Walworth Co., Electronics Div., N.Y., 5, 10

Westbury Electronics, Inc., N.Y., 10, 34

Whitney Blake Co., Conn., 5, 30

Wilgreen Industries, N.Y., 5, 10, 15, 20, 25, 30, 34, 40, 45

Winchester Electronics, Inc., Conn., 5, 10, 15, 17, 20, 25, 30, 32, 34, 37, 40, 45

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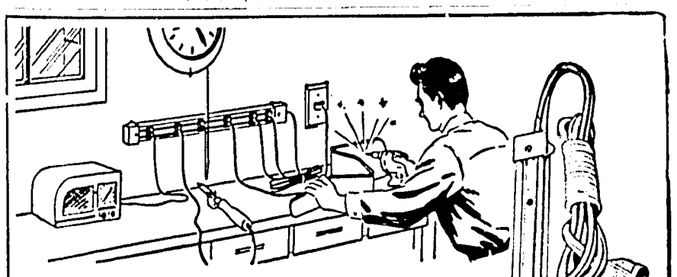

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AC DC Electronics, Inc., Calif., 5, 10, 30

ACF Industries, Inc., Avion Div., N.J., 15

Accurate Instrument Co., 2418 W. Alabama St., Houston 6, Tex., 15
See ad on page 352
Tel: JAckson 3-2712

Acme Electric Corp., 44 Water St., Cuba, N.Y., 5, 10, 15
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Tel: CUba 4

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Admiral Corp., Ill., 5, 10

Aero Guidance Corp., Calif., 10, 15

Aerolab Devel. Co., Semiconductor Systems Div., Calif., 5, 10, 12, 15, 28, 30

Airborne Accessories Corp., N.J., 5, 15

Airflyte Electronics Co., 540 Ave. A, Bayonne, N.J., 12
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Tel: HEmlock 6-2230

Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 5, 10, 12, 15, 25
See ad on pages 82-83
Tel: LUdlow 3-6160

Alto Scientific Co., Inc., Calif., 5, 30

Ameleo, Inc., Calif., 5, 10

American Electronics, Inc., Calif., 5, 15, 20

American Machine and Foundry Co., Leland Airborne Products Div., Ohio, 10, 15, 20

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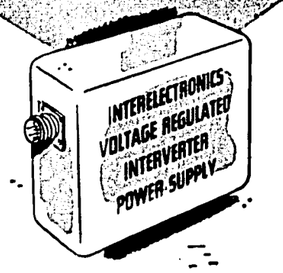

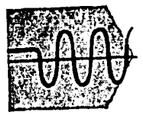

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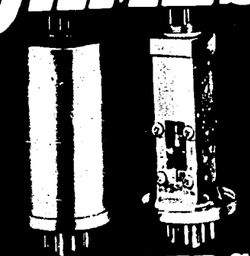

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Arkay, Inc., N.Y., 10, 15

Arnold Magnetics Corp., Calif., 10, 15

Arnoux Corp., Calif., 5, 10, 30

Astronetics, Inc., N.J., 5

Audio-Video Corp., N.Y., 10

Avionics, Ltd., Canada, 5, 10

Ballantine Laboratories, Inc., Boonton, N.J., 5, 30
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Tel: DEerfield 4-1432

Barker & Williamson, Inc., Pa., 10, 15, 28

Beckman Instruments, Inc., Systems Div., Calif., 5

Bendix Aviation Corp., Bendix Pacific Div., Calif., 10

Bendix Aviation Corp., Ind., 5, 10, 20

Bendix Aviation Corp., Mich., 5, 10, 15

Bergen Labs., Inc., 247 Crooks Ave., Clifton, N.J., 10
See ad on page 471
Tel: GRegory 3-7800

Borg-Warner Corp., Pesco Products Div., Ohio, 5, 10, 15, 20

Bristol Co., Conn., 5, 10, 12, 15

Brunswick Instruments, N.J., 10

Cal-Tronics Corporation, Calif., 5, 10, 12, 15, 28, 30

Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y., 5, 10, 30
See ad on page 357
Tel: JUdson 6-1420

Canada Research Institute, Canada, 5

Carter Motor Co., Ill., 10, 15, 20

Celco-Constantine Eng. Labs. Co., 70 Island Ave., Mahwah, N.J., 10
See ads on pages 36-37, 88-89
Tel: DAvis 7-1123

Chicago Standard Transformer Corp., 3501 W. Addison St., Chicago 18, Ill., 5, 10
See ad on page 563
Tel: INdependence 3-7400

Christie Electric Corp., Calif., 5

Co-Engineering Co., N.J., 10, 15, 25

Cohu Electronics, Inc., Millivac Instr. Div., N.Y., 10, 12

Collins Electronics Mfg. Co., Md., 12, 25

Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 10, 15
See ad on page 491
Tel: PLainfield 4-5502

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Computer Engineering Associates, Inc., Calif., 5, 10

Consolidated Avionics Corp., N.Y., 5, 10, 15

Continental Electric Co., N.J., 5, 10, 15, 20

Control Corp., Minn., 5

Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 5, 10, 15
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Tel: HAmilton 7-7961

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Cook Electric Co., Ill., 15

Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., South Plainfield, N.J., 5, 10, 15, 25
See ad on Cover 3
Tel: PLainfield 6-9000

Craig Corp., Mass., 5, 10, 15, 20, 30

Crescent Eng. & Research Co., Calif., 5

Cubic Corp., Calif., 5, 15

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Daven Co., N.J., 5, 10, 15, 30

Daystrom, Inc., Weston Instruments Div., N.J., 5

Device Development Corp., Mass., 12

Dormitzer Electric & Mfg. Co., Inc., Mass., 5, 10, 12, 15, 20, 25

Dresser Electric Co., Mich., 5

Dresser Inds., Hermetic Seal Transformer Co. Div., Tex., 5, 10, 15

EPR Special Products Corp., N.Y., 5, 10, 15

Ercor Div., Ill., 5, 10, 15, 20

Electric Regulator Corp., Conn., 5, 10, 12

Electric Specialty Co., Conn., 5, 10

Electro Development Corp., Wash., 5, 10, 15, 28, 30

Electro Instruments, Inc., Calif., 5, 30

Electronic Assembly Co., Inc., Mass., 5, 10, 28, 30

Electronic Assistance Corp., N.J., 5, 10, 15

Electronic Plastics Co., Calif., 10

Electronic Research Associates, Inc., N.J., 5, 10, 15, 28, 30

Electronics International Co., Calif., 30

Engineering Associates, Ohio, 20

Era Electric Corp., N.J., 5, 10

Ferrotran Electronics Co., N.Y., 5, 10, 15, 30

Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 5, 10, 15
See ad on page 410
Tel: EVergreen 6-1300

Gates Electronic Co., 1705 Taylor Ave., New York 60, N.Y., 5
See ad on page 493
Tel: TYrone 2-6490

General Devices, Inc., P.O. Box 253, Princeton, N.J., 5, 10, 12, 15, 20
See ad on page 360
Tel: DAvis 9-2323

General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15

General Electric Co., Pa., 5, 10, 15

General Electric Co., Ltd., England, 10, 15

General Electronics Co., Inc., Ala., 5, 10, 15

General Magnetics, Inc., 135 Bloomfield Ave., Bloomfield, N.J., 10
See ad on page 176
Tel: PIlgrim 8-2400

Georator Corp., Va., 10, 15, 20

Geotechnical Corp., Tex., 10, 15

Geotronics Labs., Inc., Tex., 5, 10

Glentronics, Inc., Calif., 5, 10, 28, 30

Great Lakes Electric Mfg. Co., Ill., 10, 20

Green Rectifier Co., N.J., 5

Gyro Electronics Co., N.Y., 28, 30

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See ad on page 204
Tel: VAn Buren 6-6300

Hammond Mfg. Co., Ltd., Canada, 28, 30

Harrel, Inc., N.Y., 10, 15

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10, 15, 25
See ad on page 328
Tel: YUkon 3-3961

Hertner Electric Co., Ohio, 5, 10, 15, 20

Hesco Energ., Calif., 5, 10, 28

Hoover Co., Ltd., Canada, 5, 10, 15, 20

Hoover Electric Co., Calif., 5, 10, 15

Imperial Electric Co., N.Y., 5, 10, 20

Industrial Control Co., N.Y., 10

Industrial Electronics of Canada, Canada, 5, 10

Industrial Test Equipment Co., 55 E. 11th St., New York 3, N.Y., 15
See ad on page 339
Tel: GRamercy 3-4684

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 5, 10, 15, 28, 30
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200

I. T. & T. Corp., Industrial Prods. Div., Calif., 5, 10, 15

James Vibrapowr Co., 4050 N. Rockwell St., Chicago 18, Ill., 10, 12, 25, 28
See ad on page 428
Tel: COrnelia 7-6333

Jodin, Inc., F. R., D.C., 15

Kaiser Electronics, Inc., N.J., 5, 10, 15

Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 10, 15

Kapitol Magnetic Corp., Ill., 5, 10, 15

Kato Engineering Co., Minn., 5, 10, 15, 20, 30

Katolight Corp., Minn., 5, 20, 30, Phase

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 12, 20
See ad on page 348
Tel: GRegory 2-1000

Kenyon Transformer Co., Inc., N.J., 5, 10, 15, 28

Kepco, Inc., 131-38 Sanford Ave., Flushing 55, N.Y., 5
See ad on page 495
Tel: INdependence 1-7000

Kidde & Co., Inc., Walter, N.J., 5, 10, 15

Kinn Electronics Corp., Md., 10, 15

Kupfrian Mfg. Corp., 157 Prospect Ave., Binghamton, N.Y., 5, 10, 15
See ad on page 492
Tel: RA 3-6426

Kurman Electric Co., Inc., 191 Newel St., Brooklyn 22, N.Y., 25
See ad on page 520
Tel: EVergreen 3-8000

Lawn Electronics Co., Inc., N.J., 5, 10, 15

Be sure to consult the advertisements in this issue for complete product information—specifications, prices, availability, etc.

Leach Corp., Relay & Inet Div., 18435 Susana Rd., Compton, Calif., 5, 10, 15, 20
See ad on page 521
Tel: NEvada 6-1061

Lesa, S.P.A., Italy, 10, 15

Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 5, 10, 15
See ad on page 496
Tel: CYpress 2-6610

Magnetic Controls Co., Minn., 5, 10, 15, 30

Magnetic Research Corp., Calif., 15

Magnetico, Inc., N.Y., 5, 10

Mallory & Co., Inc., P. R., Ind., 12, 25

Martin Co., Baltimore Div., Md., 10, 12

Mayberry Electronics Co., Calif., 5, 10, 12, 15, 30

Mercury Electronic Co., N.J., 5, 10, 15, 30, Static Type

Metox, France, 30

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 5
See ad on page 494
Tel: DRexel 6-7130

Minneapolis-Honeywell Reg. Co., Boston Div., Mass., 10

Minneapolis-Honeywell Reg. Co., Brown Instrument Div., Pa., 12

Model Rectifier Corp., 1675 Utica Ave., Brooklyn 34, N.Y., 5, 30
See ad on page 492
Tel: CLoverdale 8-6800

Modern Industries, Inc., Calif., 5, 10, 15, 30

Motorola, Inc., Ariz., 5, 10, 12, 15, 20, 25, 27, 28, 30

N Y T Electronics, Inc., Calif., 5, 10, 30

National Pneumatic Co., Inc., Mass., 20

Networks Electronic Corp., Calif., 5, 10, 30

Non-Linear Systems, Inc., Del Mar Airport, Del Mar, San Diego, Calif., 5
See ad on page 230
Tel: SKyline 5-1134

North Atlantic Industries, Inc., 603 Main St., Westbury, L.I., N.Y., 5
See ad on page 305
Tel: EDgewood 4-1122

North Electric Co., Ohio, 10

Oak Mfg. Co., Dept. R, 1260 N. Clybourn Ave., Chicago 10, Ill., 12, 25
See ad on pages 86-87
Tel: MOhawk 4-2222

Ohio Semiconductors, Inc., 1035 W. Third Ave., Columbus 8, Ohio, 5, 10, 12, 15, 28
See ad on page 95
Tel: AX 4-4938

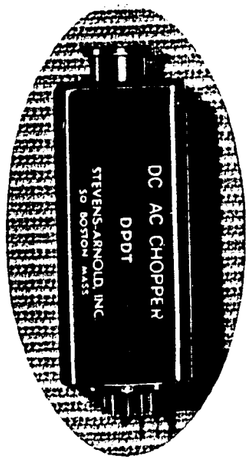
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 5, 10, 15, 28
See ad on page 499
Tel: WOrth 6-0380

Oster Mfg. Co., Avionic Div., 1 Main St., Racine, Wis., 15
See ad on page 480
Tel: MElrose 7-4445

Pacific Scientific Co., Calif., 12, 20

Palo Alto Engineering Co., Calif., 5, 10

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244



DC-AC CHOPPERS

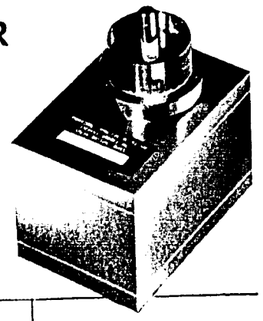
For 50/60/94/120 Cycle Use

There are twenty-two miniature types, both single and double pole, built to rigid commercial specifications with the emphasis on long life, low noise level, and extreme reliability. Please write for Catalog 515.

MICROVOLT MODULATORS

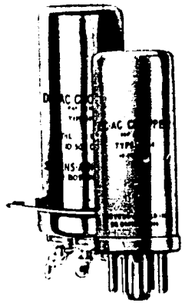
VIBRATING CAPACITOR

A vibrating-reed type capacitance modulator used to measure currents as low as 10^{-16} amperes. Drift never exceeds ±0.2 millivolts per day, noncumulative. Thus it is ideal where stable performance without recalibration is required for periods of a month or more. Write for Catalog 523.



ULTRA HIGH SPEED RELAYS

Operating time 200 microseconds. Mount in any position. Will cover the range of —65°C to +85°C factory sealed. Please write for Catalog 337.



0-500 CYCLE DC-AC CHOPPERS

Liberal factors of safety. Before any Chopper is shipped, it is tested twice over the range of —65°C to +85°C to give double proof of stamina. Please write for Catalog 280.

RESONANT RELAYS

Permit remote control by radio or carrier through frequency discrimination. Relays operate only when energized at rated frequencies and reject all others. Please write for Catalog 335.

STEVENS-ARNOLD

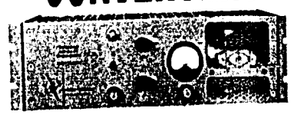
INCORPORATED

7 ELKINS STREET, SOUTH BOSTON 27, MASS. S/A-13-2/3

For details, circle #379 on Reader Service Card

Military reliability in

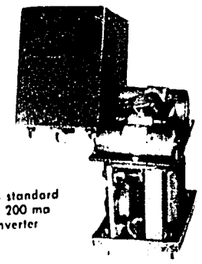
SEMI-CONDUCTOR POWER CONVERTERS



PS-4000B 115 volt AC input; 300 volt 1.5 ampere regulated DC output supply

PS-8001
300 watt miniature all-silicon rectifier regulator

PS-3001
26 volt DC input, 115 volt, 150 VA Square wave output



PS-1004B standard 325 volt, 200 ma dc-dc converter

Power Sources units are now in production missiles

Complete range of sizes, types and capacities for military and commercial requirements:

- DC to AC available in any power up to 1500 watts . . . square or sine wave output.
- AC to DC available with voltages up to 500V, and currents to 3 amps . . . DC Regulation to 0.1 . . . Impedances to .05 ohms . . . Over-all efficiencies 70-75%.
- DC to DC available in combinations of the DC to AC and AC to DC ratings shown above.
- Military Reliability is assured by extremely conservative designs and the use of the best, pretested military grade components and advanced semiconductor techniques. Meet MIL E-5400 and MIL-E-8189.

POWER SOURCES, inc.

Burlington Massachusetts

For details, circle #380 on Reader Service Card

Directory II. Components

45. Converters.

Perkin Engineering Corp., Calif., 5, 10, 15, 30

Peschel Electronics, Inc., Towners, R.F.D. 1, Patterson, N.Y., 5
See ad on page 306
Tel: TRinity 8-3251

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 10
See ad on page 323
Tel: CAnal 6-7250

Poly-Scientific Corp., Va., 12

Polytron Engineering, Inc., Md., 10

Power Designs, Inc., 1700 Shames Dr., Westbury, L.I., N.Y., 5, 10
See ad on page 498
Tel: EDgewood 3-6200

Power Industries Co., Inc., Ill., 5, 10, 25

Power Sources, Inc., Northwest Industrial Park, South Ave., Burlington, Mass., 5, 10, 15, 30
See ad on page 430
Tel: BRowning 2-3610

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 30
See ads on pages 500, 583
Tel: FLemington 900

Pylen Electronic Development Co., Ltd., Canada, 10, 15, 30

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 5
See ad on page 267
Tel: DAvenport 1-1130

Radiart Corp., Ohio, 5, 10, 15, 25

Radio Development & Research Corp., N.J., 5, 10, 12, 15, 20, 30

Ramo-Wooldridge Corp., Calif., 5, 10, 15

Raypar, Inc., Ill., 10

Raytheon Co., Mass., 5

Redmond Co., Inc., Mich., 10, 15

Rho Engrg. Co., Calif., 5, 10

Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 5, 10
See ad on page 525
Tel: LOckwood 5-4578

Rotary Devices Corp., N.J., 20

Sangamo Electric Co., Ill., 5, 10, 20

Saratoga Industries, N.Y., 5, 10

Schauer Mfg. Corp., Ohio 5

Scranton Corp., Elcor Div., Ill., 5, 10, 15, 20, 30

Sel-Rex Corp., N.J., 5

Servo-Tek Products Co., Inc., 1086 Goffle Rd., Hawthorne, N.J., 5
See ad on page 350
Tel HAwthorne 7-3100

Simpson Mfg. Co., Inc., Mark, N.Y., 5, 10

Solid State Electronics Co., Calif., 12

Sorensen & Co., Inc., Conn., 5, 10, 15, 30

Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 5, 10, 15
See ad on page 248
Tel: HO 5-3471

Specialty Electronics Development Corp., N.Y., 5, 10, 15

Specialty Engrn. & Electrn. Co., N.Y., 5, 30

Spectrol Electronics Corp., Calif., 5, 10, 15, 30

Standard Electric Time Co., Mass., 5

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 12
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Stevens-Arnold, Inc., 7 Elkins St., South Boston 27, Mass., 12
See ad on page 430
Tel: ANdrew 8-1170

Syntron Co., 83 Lexington Ave., Homer City, Pa., 5
See ad on page 513
Tel: GR 9-8011

Systron Corp., Calif., 5

Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 5, 10, 12, 15, 25, 28, 30
See ad on page 502
Tel: REctor 2-6249

Telechrome Mfg. Corp., N.Y., 10

Telectro Industries Corp., N.Y., 5, 10, 20, 30

Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 5, 10
See ads on pages 466, 569
Tel: MIdway 6-7211

Temco Aircraft Corp., Electronics Div. Texas, 5, 10, 12, 15

Terado Company, 1065 Raymond Ave., St. Paul 8, Minn., 10, 15
See ad on page 525
Tel: MIdway 6-2514

Texas Instruments Incorporated, Houston, Tex., 15

Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 15

Thordarson-Meissner, Ill., 10

Topping Electronics, Ltd., Canada, 5, 10, 15, DC-DC

Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5, 10, 15, 30
See ad on pages 116-117
Tel: ELizabeth 4-5650

Trans Electronics, Inc., Calif., 5, 10, 15

Transistor Applications, Inc., Mass., 10

Transistor Devices, Inc., N.J., 5, 30

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 5, 10, 15
See ad on pages 50-51
Tel: HUmboldt 2-4200

United Electrodynamics, Inc., Calif., 5, 10, 30

United States Dynamic Corp., Mass., 5

U.S. Science Corp., Sub. Topp Indust., Inc., Calif., 10, 15

Universal Transistor Prods., N.Y., 5, 10, 28, 30

Uniwave, Inc., N.Y., 10

Valor Electronics, Inc., Calif., 10, 15

Varo Mfg. Co., Inc., Tex., 5, 10, 15, 20

Victory Engineering Corp., 114 Springfield Rd., Union, N.J., 12
See ad on page 541
Tel: MUrdock 8-7150

Vokar Products, Inc., Mich., 25, 27

Waldorf Instrument Co., Huyck & Sons Div., N.Y., 5, 10, 30

Warren Mfg. Co., Inc., Mass., 15

Wasatch Engrg. Co., Calif., 5

Webster Electric Co., Wis., 30

Westinghouse Electric Corp., Pa., 5

Wincharger Corp., E. Seventh & Division St., Sioux City 2, Iowa 5, 10, 15, 20
See ad on page 256
Tel: 2-1844

Cord, lacing: See class 87

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46. Cores & Core Materials.

5. Ceramic
10. Ferrite
15. Laminations
17. Magnetic
20. Metallic powders
25. Powdered metal
30. Tape wound
35. Toroid

Accurate Specialties Co., Inc., N.Y., 20

Actovox Corp., Mass., 10, 17, 35

Actovox Corp., Crowley Div., N.J., 10, 17, 25, 35

Airpax Electronics, Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla., Cambridge Div., Jacktown Rd., Cambridge, Md., 35
See ad on pages 82-83
Tel: LUdlow 3-6160

Airtronics, Inc., D.C., 10, 17, 35

Alden Products Co., 1210 N. Main St., Brockton 64, Mass., 35
See ads on pages 419, 691
Tel: JUniper 3-0160

Allen-Bradley Co., Wis., 10

Allegheny Ludlum Steel Corp., Pa., 15

American Cyanamid, Formica Corp., Subsid., Ohio, 15

American Feldmuehle Corp., 11 W. 42nd St., New York 36, N.Y., 5
See ad on page 617
Tel: PEnnsylvania 6-9751

American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 5
See ad on page 180
Tel: AMherst 5-3411

American Silver Co., Inc., N.Y., 15

Arnold Engineering Co., P.O. Box G, Marengo, Ill., 17, 25, 30, 35
See ads on pages 432, 468
Tel: (Chicago) ANdover 3-6360

Barium & Chemicals, Inc., Ohio, 5, 10

Beemer Engrg. Co., Pa., 25

Bram Metallurgical & Chemical Co., Pa., 20, 25

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Burroughs Corp., Pa., 30

Burroughs Corp., Pa., 10, 17, 30, 35

Canadian Westinghouse Co., Ltd., Elect. Div., Canada, 5, 20, 17, 20, 30, 35

Carborundum Co., Refractories Div., N.Y., 5

Carpenter Steel Co., Pa., 17

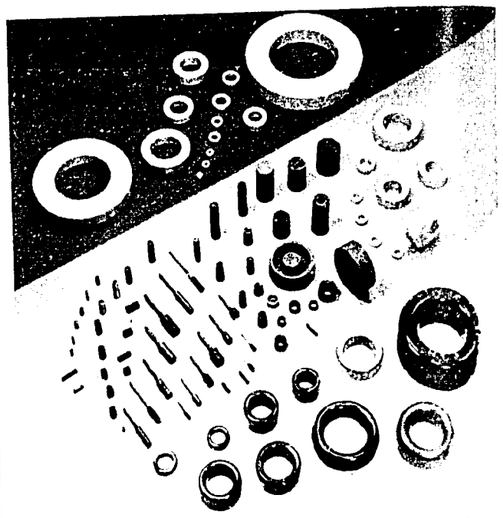
Carstedt Research, Inc., Calif., 30, 35

Centralab, Div. Globe-Union, Inc., 929 E. Keefe Ave., Milwaukee 1, Wis., 5
See ad on page 174
Tel: WOodruff 2-9200

Specify "ARNOLD"

for your MAGNETIC CORE requirements

Top to bottom: Tape wound cores, Silectron C, E and O cores, and bobbin cores.



Top to bottom: Mo-Permalloy powder cores, iron powder cores, and sendustron

SILECTRON C-CORES, E-CORES and TOROIDS Arnold C and E cores are made from precision-rolled Silectron strip in 1, 2, 4 and 12 mil thicknesses.

They are supplied in a wide variety of shapes, and in sizes from a fraction of an ounce to several hundred pounds. In addition to standard transformer applications, they may also be supplied for special applications such as saturable reactors, instrument transformers and pulse transformers.

Over 1,000 stock cores are listed in the Arnold Silectron catalog. A wide selection of preferred sizes are carried in stock for immediate shipment. For complete data on C and E cores and Silectron toroids, *write for Bulletin SC-107A.*

TAPE WOUND CORES of High Permeability Materials Arnold tape wound cores are available made of Deltamax, 4-79 Mo-Permalloy, Supermalloy, Mumetal, 4750 Electrical Metal, Silectron, or the new rectangular-loop material, Supermendur. All except Supermendur cores are available in standard tape thicknesses of 1, 2 and 4 mils; also in special tape thicknesses of ½ mil, 12 mil or other, as required or feasible. Supermendur is presently available in 4 mil cores.

Toroidal cores are made in 30 standard sizes with protective nylon or aluminum cases. Special sizes of toroidal cores are produced to individual requirements. *Write for Bulletin TC-101A. (TC-113A for Supermendur Cores.)*

BOBBIN CORES Arnold bobbin cores are available in a wide range of sizes, tape thicknesses, widths and number of wraps to suit the ultimate use of the core in electronic computer assemblies. Magnetic materials usually employed are Deltamax and Square Permalloy in standard thicknesses of 1, ½, ¼ and ⅛ mil. Bobbins are supplied in ceramic or stainless steel. *Write for Bulletin TC-108A.*

MO-PERMALLOY POWDER CORES Available in a wide range of sizes, from .260" OD to 5.218" OD. They are coated various types of enamel and varnish finishes, some of which permit winding with heavy Formex insulated wire without supplementary insulation over the core.

These powder cores are supplied in four standard permeabilities: 125, 60, 26 and 14 Mu. They provide constant permeability over a wide range of flux density, and in most cases may be furnished stabilized to provide essentially constant permeability over a specific temperature range. Large warehouse stocks of preferred sizes are carried for immediate shipment. *Write for Bulletin PC-104C.*

IRON POWDER CORES A wide selection of cores is available from simple cylinders to special cores of complicated design. The line includes all standard types of threaded cores, slug, sleeve, slug and cylindrical insert cores: for use in antenna and RF coils, oscillator coils, IF coils, permeability tuning, FM and television coils, noise filter coils, induction heating and hardener coils, and other low frequency applications. Preferred sizes are carried in warehouse stock for quick shipment. A standard series of iron powder toroids is also manufactured conforming to the standard sizes proposed by the Metal Powder Industries. *Write for Bulletin PC-109.*

SENDUST POWDER CORES Available in a wide selection of sizes, ranging from .800" OD to 3.346" OD, and in permeabilities of 10, 13, 25, 30, 50 and 80, although not all sizes available in all permeabilities. They possess magnetic properties generally superior to iron powder cores, but inferior to Mo-Permalloy powder cores in the audio and carrier frequency range. *Write for Bulletin SDC-110.*

SPECIAL MATERIALS

2V PERMENDUR . . . a ferromagnetic alloy of cobalt, vanadium and iron that possesses high flux density saturation properties. Its magnetostrictive properties are useful in many transducer applications. *Write for Bulletin EM-23.*

VIBRALLOY . . . a ferromagnetic alloy of nickel, molybdenum and iron whose temperature coefficient of elastic modulus is controllable over a wide range. It has high ferromagnetic permeability, and a rather high coefficient of magnetostriction. Used in applications where a zero or controlled thermo-elastic coefficient is desired.

BARIUM TITANATE . . . A piezoelectric ceramic widely used in accelerometers, phono pickups, microphones, ultrasonic grinding and cleaning devices and underwater signaling devices. For more information, *write for Bulletin CM-116.*

ARNOLD

SPECIALISTS in MAGNETIC MATERIALS

THE ARNOLD ENGINEERING COMPANY, Main Office: MARENGO, ILL.
BRANCH OFFICES and REPRESENTATIVES in PRINCIPAL CITIES

For details, circle #381 on Reader Service Card

Directory II. Components

46. Cores & Core Materials.

Connolly Co., Wallace E., Calif., 10, 17, 25, 35
Continental Can Co., Inc., N.Y., 15
Custom Components, Inc., N.J., 10, 25, 35
Division Lead Co., Ill., 20, 25
Double E Products Co., Calif., 10, 20, 35
Dynacor, Inc., Md., 17, 30, 35
Electric Machinery Mfg. Co., Mullenbach Div., Calif., 5
Electrical Refractories Co., Ohio, 5
Electronic Mechanics, Inc., N.J., 5
Elna Ferrite Lab., Inc., N.Y., 10
Emerson & Cuming, Inc., Mass., 5, 10, 17
Fair-Rite Products Corp., N.Y., 10
Ferricote, Inc., N.J., 10, 25, 35
Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 10, 17, 35
See ads on pages 285, 361, 433, 467, 531, 617
Tel: CHerry 6-2811
Foote Mineral Co., Pa., 5, 10, 20, 25
Furane Plastics, Calif., 15
G-L Electronics Co., Inc., N.J., 15, 30, 35
General Ceramics Corp., Dept. ID, Crows Mill Rd., Keasbey, N.J., 5, 10, 17
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Tel: VAlley 6-5100
General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 5, 10
See ads on pages 283, 288, 445, 447, 505, 617
Tel: GRanite 6-4411
General Electric Co., Specialty Electronic Components Dept., N.Y., 10, 35
General Electric Co., Ltd., of England, 10, 17
Genesy Corp., Calif., 17
Goslin Elec. & Mfg. Co., Calif., 17, 30, 35
Hamilton Watch Co., Pa., 17, 30, 35
Intelex Systems, Inc., N.Y., 10, 17, 20, 25, 30, 35
Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 5
See ad on page 619
Tel: MIllington 7-0385
Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 5, 10, 17
See ad on page 348
Tel: GRegory 2-1000
Kearfott Co., Inc., Microwave Div., Calif., 10
Knight Corp., Essex, Mass., 5, 10, 20
Krystinel Corp., Fox Island Rd., Port Chester, N.Y., 5, 10, 17, 35
See ad on page 619
Tel: WEstmore 9-2261
Kulite Tungsten Co., N.J., 5, 25
Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 10
See ad on page 350
Tel: REgent 9-4321
Lundun Mfg. Co., Ohio, 5
Magnetic Core Corp., John & Lawrence Sts., P.O. Box 368, Newburgh, N.Y., 10, 17, 25, 35
See ad on this page
Tel: JOhn 1-5116
Magnetic Metals Co., Hayes Ave. at 21st St., Camden 1, N.J., 15, 17, 25, 35
See ad on page 439
Tel: WOodlawn 4-7842
Magnetics, Inc., Dept. P-60, P.O. Box 391, Butler, Pa., 15, 17, 25, 30, 35
See ad on page 434
Tel: BUtler 7-4787
Materials for Electronics, Inc., N.Y., 5, 20, 25
Metal Hydrides, Inc., Mass., 20, 25
Metals & Controls Div. of Texas Instruments, Inc., 34 Forest St., Attleboro, Mass., 15
See ad on page 576
Tel: ATtleboro 1-3131

Look to FXC *for a complete line of ferrite cores*

Complete details, including sample kit information, furnished on request

Say ferroxcube when you need ferrite.

FERROXCUBE
CORPORATION OF AMERICA
50 East Bridge Street, Saugerties, N. Y.

For details, circle #382 on Reader Service Card

ELECTRONIC
Powder Metal Parts

TOROIDAL CORES
HI TEMPERATURE
HI STABILITY
RAD-A-COR
TEL-A-COR
FILT-A-COR

MAGNETIC CORES TO MATCH ANY Electrical and Mechanical Specifications

Contact us for samples and engineering information.

MAGNETIC CORE CORP.

Manufacturers of Electronic Powder Metallurgy

John & Lawrence Streets, New Windsor,
Newburgh, New York
Telephone: JOhn 1-5116

For details, circle #383 on Reader Service Card

Performance-Guaranteed Products by MAGNETICS, inc.

TAPE WOUND CORES

Magnetics, Inc. offers guaranteed maximum and minimum performance limits for high permeability tape wound cores. Available immediately from stock made from Hy Mu-80 (square *and* round), or Orthonol®. Cores are dry hydrogen annealed to meet performance specifications.

Inside Diameters	0.375-in. to 4.000-in.
Outside Diameters	0.500-in. to 6.000-in.
Tape thickness	.001, .002, .004, .006
Heights	0.125-in. to 2.000-in.

Note: All AIEE standard sizes are included. Special sizes on request.

TAPE WOUND SILICON (Magnesil) CORES are available in 2, 4 or 12 mil gauges for use typically in current transformer, magnetic amplifier and saturable reactor applications. Core sizes meet all standard size criteria. Cores are available cased or uncased.

TAPE WOUND BOBBIN CORES are made of 4-79 Mo Permalloy or Orthonol® tapes. Stainless steel and ceramic bobbin cores with exclusive "Poly-Cap" do not distort with temperature—allow normal potting techniques. Ultra-small stainless steel bobbin cores are available for miniaturization (0.047' diameter). A broad range of diameters and tape widths are also available.

For Complete Details: **Write for Bobbin Core Catalog BC-203**

Magnetics, Inc. offers tape wound cores in both phenolic and aluminum core boxes, in standard paint finish or with GVB (Guaranteed Voltage Breakdown limits) finish. GVB cores can be vacuum impregnated and will withstand 1,000 volts at 60 cycles before breakdown. The aluminum boxed cores will withstand temperatures to at least 450°F. All core tests are in accordance with accepted standards of the AIEE Working Group on Core Matching and Grading.

For Complete Details: **Write for Tape Wound Core Catalog TWC-200**

MOLYBDENUM PERMALLOY POWDER CORES

Only Magnetics, Inc. guarantees realistic inductance limits for both temperature stabilized and non-stabilized molybdenum permalloy powder cores. Linear inductance cores are also available. Performance-Guaranteed, all cores may be ordered in a variety of standard sizes, and can be numerically coded within the guaranteed inductance limits at slight extra cost.

Inside Diameters . . . 0.225 to 0.950-in. Heights . . . . . 0.140 to 0.570-in.
Outside Diameters . 0.375 to 1.570-in. Permeabilities . . . . Minimum to

Standard baked enamel and wax-tight varnish finishes, or no finish. Cores with finishes which will sustain 500 or more volts may be wound directly with heavy Formex-coated wire.

For Complete Details: **Write for Powder Core Bulletin PC-203**

MAGNETIC LAMINATIONS

"Performance-Guaranteed" laminations are available in Hy Mu-80, 48 Alloy and Orthonol®. Standard shapes include DU-1, DU-37, DU-50, EE-24-25, EE-26-27, EE-28-29, EE-186-187, EI-11, EI-12, EI-21, EI-75, EI-187, EI-375, EI-625, F-12, F-12 (Modified), F-13, F-20, F-21, F-187, Ring, UBE, UI-312 and UI-375. Standard gauges are 0.014-in. and 0.006-in. Laminations are dry-hydrogen annealed to meet specifications. Special shapes produced to fit your specifications. These include rotor, stator, and recording head laminations using customer-owned dies.

For Complete Details: **Write for Magnetics, Inc. Applications Engr. Dept.**

MAGNETIC SHIELDS

"Performance-Guaranteed" shields are used in the protection of electronic measuring devices from moderate or high flux external fields. Shields are usually made from Mu Metal or 48 Alloy, respectively, but they can be made from a number of other commercially available magnetic and non-magnetic materials when your specifications require it. Shields are normally .025-in. thick, but other thicknesses such as .014, .020, .031 and .062 can be readily supplied. Shields are fabricated and can be painted, lacquered or unfinished to meet your requirements. They are dry-hydrogen annealed for highest field attenuations.

For Complete Details: **Write Magnetics, Inc. Applications Engr. Dept.**

These MAGNETICS Representatives are at your service:

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369 N. Craftsman's Ct.

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3841 E. Colorado Blvd.

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Magnetics, Inc.
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1743 Maryland Ave.

COLO.—Lakewood
W. Keith Kidder
1480 Hoyt Street

CONN.—New Canaan
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Magnetics, Inc.
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15 Elm Place

FLA.—Orlando
C. B. Small
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4 North Cicero Ave.

IND.—Ft. Wayne
James W. Green
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2511 W. Drexel

MICHIGAN
R. C. Warner
P.O. Box 338
South Whitley, Ind.

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C. L. Omer
6047 Howe Drive

MASS.—Marshfield
Magnetics, Inc.
R. C. Woodward
Tupelo Rd.,
Holly Ridges

MINN.—Minneapolis
Fred Peterson
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N.C.—Winston-Salem
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N.J.—North Plainfield
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W. J. Irvine
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N.Y.—Rochester 18
Fowler-Beach Corp.
3700 East Ave., Room 3

OHIO—Cleveland 7
R. G. Sinnell
1229 Westlake Ave.

TEXAS—Dallas 20
J. H. Lawrence
P.O. Box 13026

CANADA—Toronto 7
George M. Fraser
George M. Fraser, Ltd.
1554 Yonge St.

EXPORT
B. Freudenberg, Inc.
240 West 98th St.
New York 25, N. Y.

MAGNETICS inc.

DEPT. P-69, BUTLER, PENNSYLVANIA

Directory II. Components

46. Cores & Core Materials.

Microwave Chemicals Laboratory, Inc., Dept. 12, 282 Seventh Ave., New York 1, N.Y., 10
See ad on page 441
Tel: WAtkins 4-6725

Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo., 30
See ad on pages 126-127
Tel: EVergreen 3-3300

Motorola, Inc., Ariz., 5, 10, 17, 35

Mullard Overseas, Ltd., England, 10

National Cash Register Co., Ohio, 10

National Ceramic Co., N.J., 5

National Moldite Co., N.J., 10, 20, 25, 35

National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5, 35
See ad on page 642
Tel: NO 5-4800

Norrich Plastics Corp., 107-109 W. 18th St., New York 11, N.Y., 5, 15, 17
See ad on page 152
Tel: WAtkins 4-8360

North American Philips Co., Inc., Philips Labs. Div., N.Y., 10

North Electric Co., Ohio, 17

Northern Plastics Corp., Wis., 15

Norton Co., Mass., 5

Page-Madden Co., N.Y., 5

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 15, 20, 25
See ad on page 687
Tel: EVerglade 4-2122

Polydoroff & Assoc., D.C., 10, 20, 25, 35

Polymer Corp. of Pa., Dept. RB, 2140 Fairmont Ave., Reading, Pa., 25, 35
See ad on page 684
Tel: FRanklin 6-5791

Pyroferric Co., Inc., N.Y., 25

Quality Components, Inc., Pa., 25

Quartzite Processing, Inc., Mass., 10

Radio Cores, Inc., 9540 S. Tulley Ave., Oak Lawn, Ill., 17, 20, 25, 35
See ad on this page
Tel: GArden 2-3353

Radio Corp. of America, Semiconductor & Materials Div., Section I-22-NN, Route 202, Somerville, N.J., 10, Memory Planes, Aperture Plates
See ad on page 56
Tel: RAndolph 5-4500

Raytheon Co., Mass., 10

Research Development Mfg., Inc., Pa., 17

Rogers Electronic Tubes & Components, Canada, 10, 15

Ross Metals Co., Milton, Pa., 30, 35

Sangamo Electric Co., Ill., 35

Siemens & Halske, A.G., Germany, 10

Stackpole Carbon Co., Pa., 10

Standard Telephones & Cables, Ltd., England, 10, 15, 20, 30, 35

Star Porcelain Co., N.J., 5

Steward Mfg. Co., D. M., Tenn., 5, 10

Superex Electronics Corp., N.Y., 10

Superior Carbon Products, Inc., Ohio, 20, 25

Superior Steatite & Ceramic Corp., 89 W. Forest Ave., Englewood, N.J., 5
See ad on page 620
Tel: LOwell 8-4555

Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 17
See ad on page 556
Tel: WIndsor 4-2221

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 5
See ad on page 621
Tel: ARmory 1-0163

Telegraph Condenser Co., England, 5

Telegraph Condenser Co., Ltd., United Insulator Div., England, 5

Telemeter Magnetics, Inc., Calif., 5, 10, 17

Thermo Materials, Inc., Calif., 5, 10

Thomas & Skinner, Inc., 1125 E. 23rd St., Indianapolis 7, Ind., 15, 30, 35
See ads on pages 435, 469
Tel: WAbash 3-2448

Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 5
See ad on page 620
Tel: PIlgrim 3-7797

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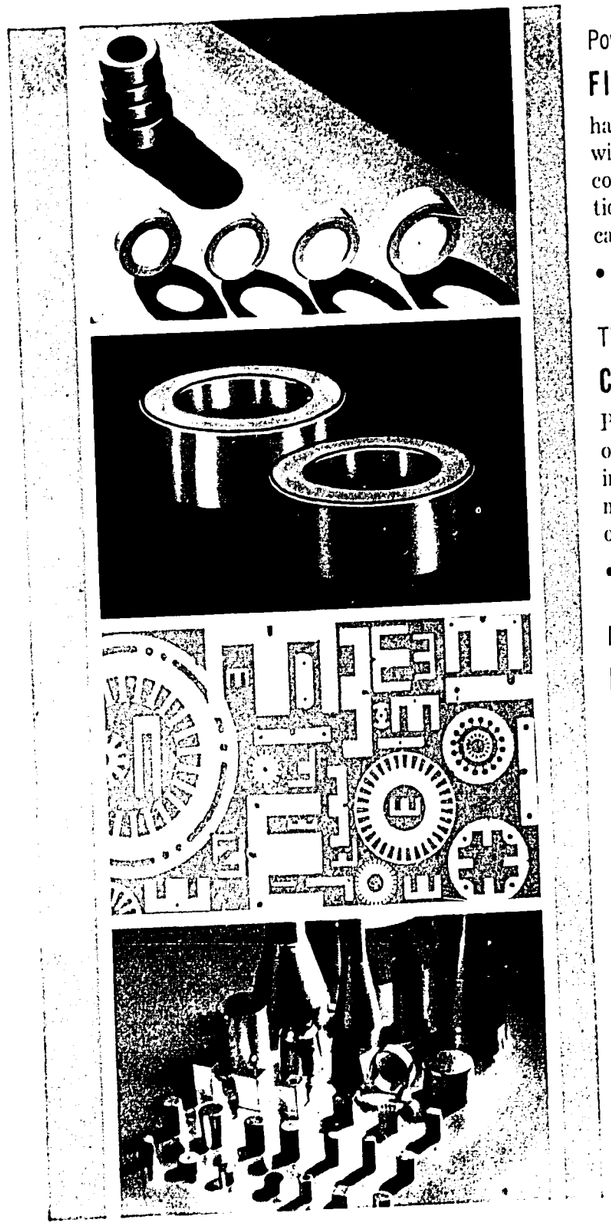
DESIGNews

Magnetic Metals Company designs and produces stamped and tape wound cores and shields for the electrical and electronic industries.



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motor laminations
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electromagnetic shields

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Directory II. Components

46. Cores & Core Materials.

United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 5
See ads on pages 541, 681
Tel: BEekman 3-8870

Vitro Laboratories, N.J., 5, 10, 17, 20, 25

Waters Mfg. Inc., Mass., 5, 10, 35

Western Gold & Platinum Co., Calif., 5, 20

Westinghouse Electric Corp., Pa., 15, 17, 20, 25, 30, 35

Williams Gold Refining Co., 2978 Main St., Buffalo 14, N.Y., 20
See ad on page 681
Tel: UNiversity 7204

Counters: See class 9

Couplings: See class 80

Crystal testers: See class 12

47. Crystals & Accessories.

15. Crystal holders
19. Crystal ovens
25. Germanium
20. Quartz
30. Raw quartz
35. Silicon

...room, Inc., N.J., 5

Allegheny Electronic Chemicals Co., 207 Hooker-Fulton Bldg., Bradford, Pa., 35, Single Crystal Slices, Crystal Seeds, Custom Dopes, Special Cast Shapes
See ad on page 438
Tel: BRadford 2-3588

American Electronic Labs., Inc., Pa., 5

American Quartz Labs., N.Y., 20

Amersil Quartz Div., Engelhard Industries, Inc., 685 Ramsey Ave., Hillside, N.J., 30, fused quartz and silica
See ad on page 198
Tel: MUrdock 8-4500

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 5
See ad on page 166
Tel: BIshop 2-1000

Augat Brothers, Inc., 33 Perry Ave., Attleboro, Mass., 5
See ad on page 696
Tel: ATtleboro 1-2202

Bassett, ... Rex, Fla., 5, 10, 20

Bliley Electric Co., 200 Union Station Bldg., Erie, Pa., 10, 20
See ad on pages 124-125
Tel: GLendale 6-7561

Bram Metallurgical-Chemical Co., Pa., 15, 20, 30

Braun Tool & Instrument Co., Inc., 141 Fifth Ave., Hawthorne, N.J., 5
See ad on pages 459, 543, 551
Tel: HAwthorne 7-1773

Breon Labs., Pa., 5, 10, 20, 30

British Thomson-Houston Co., Ltd., England, 15, 35

Bulova Research & Development Labs., Inc., N.Y., 5, 10, 20

Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62nd St., Woodside 77, N.Y., 5, 10, 20
See ad on page 440
Tel: NEwtown 9-5700

Burnett Radio Lab., Calif., 5, 20

C-W Mfg. Co., Calif., 20

Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 20
See ad on page 693
Tel: TRowbridge 6-2800

Clark Crystal Co., Inc., Mass., 10, 20

Coaxial Connector Co., Inc., N.Y., 5

Component Mfg. Service, Inc., Mass., 5

Constantin & Co., L. L., N.J., 5

Cox & Co., N.Y., 10

Dallons Labs., Inc., Calif., 20, 30

Delta-F, Inc., Ill., 5, 10

Diamond Antenna & Microwave Corp., Mass., 5

Diamond Drill Carbon Co., N.Y., 30

Dearborn Crystal Co., Md., 10, 20

Edwards High Vacuum, Ltd., Canada, 20

Erbon Electronic Co., Tex., 5, 15, 20

Electronics, Inc., Warren Components Div., Pa., 5

Erie Co., N.J., 5, Teflon

Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 20, 35
See ad on page 198
Tel: BIgelow 3-6030

Ferro Mineral Co., Pa., 35

General Crystal Co., Inc., Wis., 20

General Electric Co., Ltd., of England, England, 15, 20, 35

Gibbs Mfg. & Research Corp., Wis., 10

Glass Tite Industries, Inc., R.I., 5

Grace Electronic Chemicals, Inc., 101 North Charles St., Baltimore 1, Md., 35
See ad on page 442
Tel: PLaza 2-7699

Harmon Electronics & Co., N.Y., 15, 35

Hermetic Parts Corp., Calif., 5

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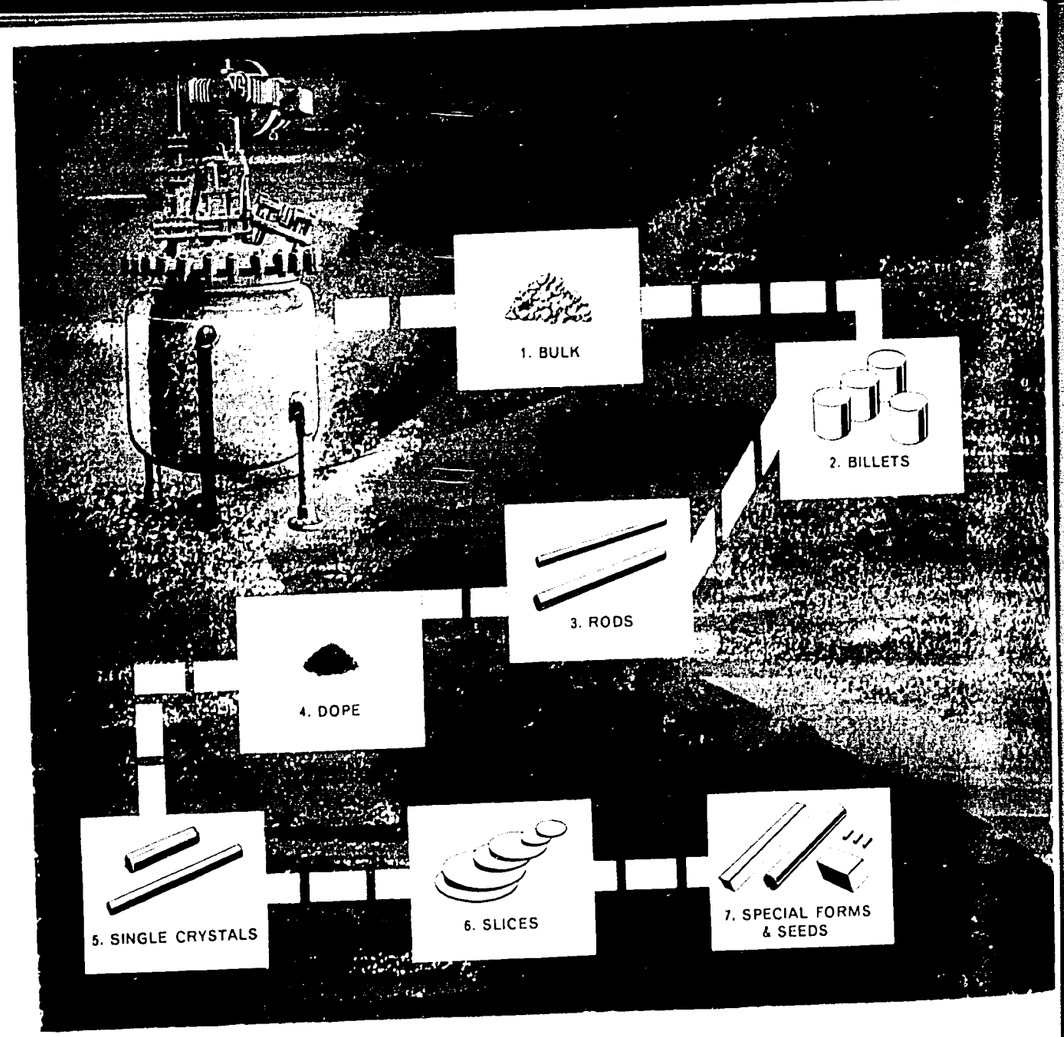

SILICON...any way you want it!

Is there any good reason why you shouldn't obtain all forms of silicon you want from a *single* source?

Up to now the answer to that question was simple: No one firm offered a complete silicon supply facility.

But that is no longer true because from Allegheny you can now obtain silicon in every form. Here are the facts:

1. BULK — The bulk polycrystalline silicon you get from Allegheny comes in four grades, three semiconductor, one solar. Each requires a minimum of doping, exhibits a high degree of uniformity and shows a significantly low boron level.

2. CAST BILLETS — Cut to charge size for Czochralski furnaces and in standard sizes up to 2" in diameter.

3. CAST RODS. — For float zoning, you get uniformly dense cast rods in standard sizes up to 1", with lengths entirely dependent on your requirements.

4. MASTER DOPING ALLOYS — These are made from extremely pure silicon, using 99.999% or better elemental dope. They are alloyed in different ranges, and in homogeneous lots of sufficient size to allow for long term standardization in your production doping procedures.

5. SINGLE CRYSTALS — Custom processing of single crystals is a basic service from Allegheny. We will depend on your specifications and grow in Czochralski or float zone furnaces, again depending on application.

6. SLICES — You can get slices to meet any surface requirement since Allegheny has both the know-how and facilities for slicing, lapping, and finishing. And 100% testing is your assurance that the slices completely meet your specifications.

7. SEEDS & SPECIAL FORMS — You tell us your machining and other physical requirements and we will provide the shapes and forms, cut ultrasonically. All seeds are oriented optically to ½° (or better) to the (111), (110) or (100) plane.

Analyze your current silicon supply arrangements. Consider that *only* Allegheny provides every form of silicon you need. Doesn't it look like now is a good time for you to get the facts from the people at Allegheny? Write, wire, or phone

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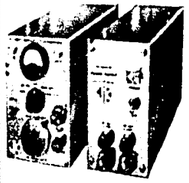
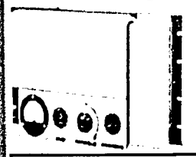
JK PRODUCTS

PACKAGED FREQUENCY MANAGEMENT

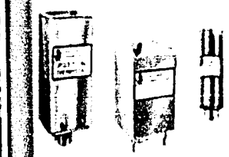


New JKFS-1100T Precision Frequency Standard: Most advanced-design frequency standard available today, is transistorized, with double proportional control oven. ***Stability:*** 5 x 10^{-10}/Day. ***Input:*** 24 to 32 v DC. ***Output:*** 1 v rms into 50 ohms at 1 MC and 100 KC. ***Dimensions:*** 6.0" H x 4.9" W x 12" D.

New JKFS-1100TP Companion Power Supply: Completely transistorized power supply available to operate from 115 v AC or 24 v DC. Has built-in standby batteries good for up to 20 hours operation. Has automatic switchover. Weight of combined units is 25 lbs. ***Dimensions:*** 6.0" H x 3 19/16" W x 12" D. Units are designed to mount with 7" x 19" panel for rack mounting.

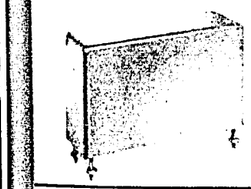


Time-Proven JKFS-1000 Frequency Standard: ***Stability:*** 1 x 10^{-9}/Day. ***Output:*** 5V into 5000 ohms at 1 MC, 50 mV into 50 ohms at 100 KC. Pulse output for measurements up to 20 MC. 115 v 60 cps A.C. 15 1/4" high, 19" wide, for standard rack mounting.

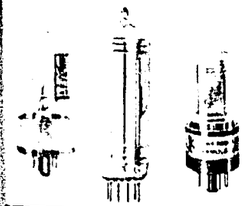


JK Thermystals: Advanced-design frequency control unit combining plug-in simplicity with extreme precision. ***Frequency stability:*** 30 to 900 kc, ±.0001 to 1000 cps, ±.00002% to ±.00005%. Higher frequencies available.

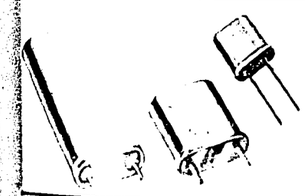
JK Transistor Oscillators: Complete, compact, precise precision signal sources providing fixed temperature and humidity environment for transistor and circuitry elements. ***Frequency Range:*** 100 Cycles to 75 m.c. ***Frequency Stabilities:*** 12 hr. period 1 x 10^{-8} to 1 x 10^{-9}. Fully transistorized and temperature controlled.



JK Crystal Filters: Compact, rugged, hermetically sealed and stable, JK CRYSTAL FILTERS (band pass filters) have a ***Frequency Range:*** 1 kc to 40 mc, and are available for special filtering purposes to 150 mc. ***Band Width*** at 6 db: 0.01% to 4% of nominal on most frequencies, and up to 10% for certain frequencies.



JK Glasline Crystals: For ultra stable frequency control, JK GLASLINE CRYSTALS provide unprecedented stability and reliability. Compact, evacuated and hermetically-sealed against moisture, contamination, shock and barometric pressure. Over a complete range of 1000 cycles to 5 mc. and up. High shock and vibration performance.



JK Military Types: Hermetically-sealed, JK MILITARY TYPE CRYSTALS are metal-cased and in ***Frequency Ranges:*** 8 kc to 100 mc. High shock and vibration performance.

JK Ovens: Capable of maintaining set temperatures around components or circuitry with less than ±1° C. variation over the range of −55° to +100° C. JK OVENS are light, compact, inexpensive, uniform and reliable.

THE JAMES KNIGHTS COMPANY—SANDWICH, ILLINOIS

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47. Crystals & Accessories.

Hermetic Seal Corp., 31 S. Sixth St., Newark 7, N.J., 5
See ad on page 460
Tel: MArket 3-9400

Hermetic Corp., Mass., 5

Hoffman Co., P. R., 421 Cherry St., Carlisle, Pa., 20, 30
See ad on page 437
Tel: CArlisle 1900

Hunt Corp., 453 Lincoln St., Carlisle, Pa., 5, 10, 20
See ad on page 437
Tel: CArlisle 1450

Hugg Electronics Co., Pa., 10, 20

Infolex Systems, Inc., N.Y., 5, 20

International Crystal Mfg. Co., Inc., Okla., 5, 20, 25

Isomet Corporation, N.J., 15, 35

James Electronics, Calif., 5

Keller, H. Hugo P., N.Y., Sapphire & Ruby

Kempton Electron Products, Inc., Mass., 35, 38

Kevistone Electronics Co., N.Y., 10, 20

Knapp Electro-Physics, Inc., Calif., 15, 35, Silicon Ingots

Knights Co., James, 101 E. Church St., Sandwich, Ill., 5, 10, 20, 30
See ad on this page
Tel: 2141

Lavoie Laboratories, Inc., Matawan Freehold Rd., Morganville, N.J., 10
See ad on page 300
Tel: LOwell 6-2000

Lewis Co., Inc., J. B., Conn., 20

Lindsay Laboratories Co., Ill., 10

Litton Industries, Systems Inc., Div., N.J., 5

Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 10
See ad on pages 302-303
Tel: DAvis 5-1391

Marconi Wireless Telegraph Co., Ltd., N.Y., 5

Master Mobile Mounts, Inc., Calif., 20

Materials Research Corp., N.Y., 15

McCoy Electronics Co., Watts & Chestnut Sts., Mount Holly Springs, Pa., 10, 20
See ad on page 441
Tel: HUnter 6-3411

Merck & Co., Inc., Electronic Chemicals Div., Dept. IRE-60, Lincoln Ave., Rahway, N.J., 35
See ad on page 435
Tel: FUlton 7-5500

Merriam Manufacturing, Inc., Calif., 5

Metox, Inc., 5

Micro-Electric Corp., 111 5

Micro-Electric Div., Micro Machine Works, 13 Debevoise Ave., Roosevelt, L.I., N.Y., Crystal Holder Assemblies
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SYNONYM FOR QUALITY, RELIABILITY AND STABILITY!

Frequency control SYSTEMS AND OSCILLATORS .3 cps to 100 mc

Bulova frequency control systems and oscillators are custom-engineered for the most exacting military and industrial applications.

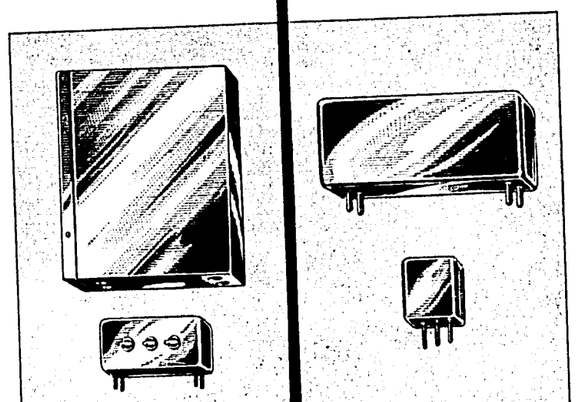
Bulova systems and oscillators span the frequency range from .3 cps to 100 mc and in stability ± 15 pp million without oven to ± 1 pp 10^9 with proportional oven control ...are available in either tube type or transistor construction.

They graduate in size from the MB-100 (1" x 1" x 2") to complete systems. The MB-100 compensated crystal oscillator assures single frequency output with a stability of ± 15 pp million from −50° C. to +90° C. without oven control. Complete systems may include power supply, oscillator, gated and resetting circuitry, binary stage, voltage regulator and pulse or power amplifiers

Crystal FILTERS 7 kc to 20 mc

Bulova crystal filters are designed to solve filtering problems at center frequencies with bandwidths of 0.01% to 8% and slope factors of 60/6 db as steep as 1.4 to 1.

Bulova filters shave the frequency range from 7 kc to 20 mc, inclusive ...are available as bandpass, reject and single side band. They graduate in size from the 2E2 SB (1 7/16" x 1 13/16" x 1¼") for frequencies of 175 kc through 20 mc to the OE6 (5½" x 3 1/16" x 3 3/4") a single side band for frequencies of 7 kc through 500 kc.

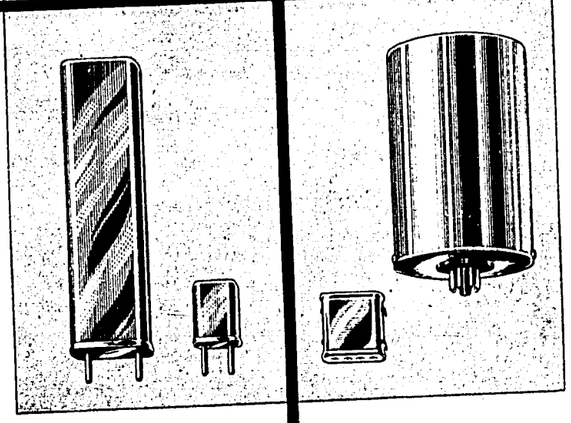


CRYSTALS 2 kc to 100 mc

Bulova crystals are designed and produced for use wherever reliable, close-frequency control is essential.

Bulova crystals assure exacting control from 2 kc through 100 mc with 100 g shock resistance and 30 g to 2000 cps vibration resistance in most frequencies. They graduate in size from the HC-13/U (1½" x 2 3/32" x 3") for 2 kc to the HC-18/U (.50" x .400" x .510") for 100 mc. The HC-18/U is now available to cover 450 kc through 1100 kc and 2 mc through 100 mc.

The majority of Bulova MIL Type crystals may be obtained in miniature holders.



OVENS

Bulova ovens are engineered to maintain ±.1° C. of operating temperatures so as to assure superior results in electrical stability of crystals, components and circuitry.

Bulova ovens graduate from the AM-100ED (external measurements: 3" diameter with a 7" maximum height; internal: 1.8" diameter with a 6" height) to the BHC-18-1 (external: 1 1/32" x 1 1/32" x 1¼"; internal 1 1/32" x 1 1/32" x 7/32"). The AM-100 maintains a temperature stability of ± .1° C. and is used for Bulova Type 74 glass crystal holders (Military Type HC-15/U), or complete systems. The BHC-18-1 holds temperature to ± 2° C. (−55° to +90° C. ambient) and has a capacity for a single HC-18/U plug-in type crystal holder or two crystal diodes, such as the IN658.

Complete information on all Bulova components and systems is available from your nearest Sales Representative, or by writing—*Department A-1376, Electronics Division, Bulova, 40-06 62nd Street, Woodside 77, New York.*

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YTTRIUM-IRON GARNET

Actual Size

SINGLE CRYSTALS

for MICROWAVE APPLICATIONS

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LOW-LOSS YIG NOW ALLOWS GREATER FLEXIBILITY IN THE DESIGN OF

Pass or rejection band tunable filters

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Magneto-optical devices

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MICROWAVE CHEMICALS LABORATORY, INC.

[illegible] SEVENTH AVE [illegible] NEW YORK 1, N.Y.

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Directory II. Components

47. Crystals & Accessories.

Micromech Mfg. Corp., N.J., 5
Microwave Associates, Inc., Mass., 5, 35
Microwave Chemicals Laboratory, Inc., Dept. 12, 282 Seventh Ave., New York 1, N.Y., Yttrium Iron Garnet
See ad on this page
Tel: WAtkins 4-6725
Midland Mfg. Co., Inc., Kan., 10, 20
Miller Labs., August E., N.J., 10, 20
Monitor Products Co., Calif., 5 ,10, 20, 30
Motorola, Inc., Ariz., 5, 10, 15, 20, 30, 35
Nebel Lab., R. E., N.Y., 5, 20
Northern Engrg. Labs., Inc., Wis., 5, 10, 20
Nuclear-Chicago Corp., Ill., 5
Pan American Trade Development Corp., N.Y., 30
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Precision Crystal Laboratory, Calif., 10, 20
Precision Piezo Service, La., 20
Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 5
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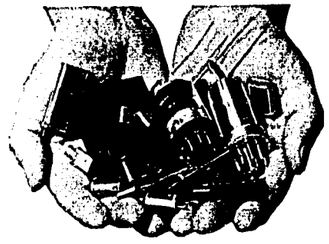
Tel: WEstmore 9-8900
Premier Research Labs., Inc., N.Y., 5, 10, 20, Tourmaline
Product Development Corp., Mass., 35
Quartzite Processing, Inc., Mass., 20
Raytheon Co., Mass., 15, 35
Reeves-Hoffman Div., Pa., 10, 20
Republic Lens Co., Inc., N.Y., 15, 20
Robertshaw-Fulton Controls Co., Aeronautical-Instrument Div., Calif., 10
Roller Mike, Inc., N.Y., 20
Sage Labs., Inc., Mass., 5
Sanders Assoc., Inc., N.H., 5
Scientific Radio Products, Inc., Neb., 10, 20
Scientific Radio Service, Md., 20
Semi-Elements, Inc., Pa., 15, 20, 35
Semicon, Inc., Mass., 35
Semimetals, Inc., N.Y., 15
Sherold Crystals, Inc., Truman Road & McGee Trafficway, Kansas City 8, Mo., 5, 10, 20, 30
See ad on this page
Tel: VIctor 2-9792
Standard Telephones & Cables, Ltd., England, 15, 20, 35
Staver Co., Inc., N.Y., 5
Thermal American Fused Quartz Co., N.J., 20
Trancoa Chemical Corp., 312-326 Ash St., Reading, Mass., 35, Silicon—Semiconductor and Solar Grades
See ad on page 134
Tel: REading 2-3900
United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 15
See ads on pages 541, 681
Tel: BEekman 3-8870



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Quality CRYSTAL FILTERS

from 1 m.c. to 30 m.c., with band width of 0.1% to 0.8% of center frequency.

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McCOY ELECTRONICS COMPANY
Mt. Holly Springs, Pa.
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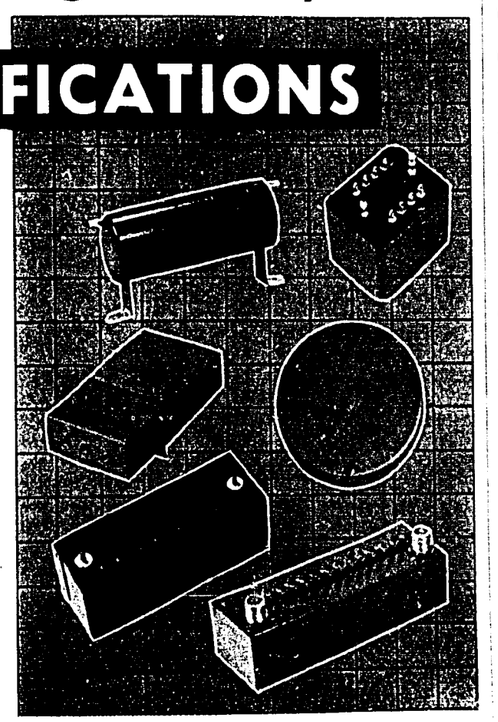
BREW DELAY LINES

... designed to your

SPECIFICATIONS



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BREW'S experienced personnel can solve your Delay Line Problems.

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Founded in 1946 for design, development and manufacture of delay lines.

Brew offers you the "one source" for Distributed Constant, Lumped Constant, and Ultrasonic Delay Lines. You and your product will benefit from Brew's modern and complete production facilities, pioneer experience, and complete cooperation from our personnel.

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design · development · manufacture

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Directory II. Components

47. Crystals & Accessories.

United States Dynamic Corp., Mass., 15, 35

U.S. Semiconductor Products, Inc., 3540 W. Osborn Rd., Phoenix, Ariz., 35
See ad on page 252
Tel: APplegate 8-5591

Valpey Crystal Corp., Mass., 10, 20
Victor R. F. & Microwave Co., Mass., 5
Waldom Electronics, Inc., Ill., 5
Westronix Corp., Texas Crystals Div., Fla., 5, 10, 20
Wright Electronics, Inc., Mo., 10, 20

Cutting Heads & styli: See class 63

Decades: See class 5

Deflection yokes: See class 43

48. Delay Lines.

5. Decade
10. Distributed constant fixed
15. Distributed constant variable
20. Lumped constant fixed
22. Lumped constant variable
25. Ultrasonic

ACDC Electronics Inc., Calif., 10, 20
AMP, Inc., Capitron Div., Pa., 10, 20
Admiral Corp., Ill., 10, 15

Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 5, 10, 15, 20, 22
See ad on page 337
Tel: GRegory 2-5622

Airtronics International Corp., Fla., 10, 20
Andersen Labs., Inc., Conn., 25

Arenberg Ultrasonic Laboratory, Inc., 94 Green St., Jamaica Plain (Boston), 30, Mass., 25
See ad on page 388
Tel: JAmaica 2-8640

Artronic Instrument Co., Md., 5, 20, 22
Barker & Williamson, Inc., Pa., 20
Beckman Berkeley Div., Calif., 22
Beckman Instruments, Inc., Helipot Div., Calif., 15

Bel Fuse, Inc., 197 Van Vorst St., Jersey City, N.J., 10
See ad on page 445
Tel: HEnderson 2-0463

Bell Aircraft Corp., Avionics Div., N.Y., 20

Bliley Electric Co., 260 Union Station Bldg., Erie, Pa., 25
See ad on pages 124-125
Tel: GLendale 6-7561

Brew & Co., Inc., Richard D., 90 Airport Rd., Concord, N.H., 5, 10, 15, 20, 22, 25
See ad on this page
Tel: CApitol 5-6606

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DELAY LINES
Excellent transmission fidelity

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DELAY LINES
Custom built to your requirements.

Our Delay Lines are being used by leading manufacturers of high-precision test equipment, electronic computers, Color TV transmitters and receivers and in many other military and commercial applications. Write for Data!

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FLATS
New elliptical core design offers high delay per unit length

MiniLines
The new miniaturized encapsulated delay lines

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Brubaker Electronics, Inc., Calif., 20

Burnell & Co., Inc., Dept. P-11, 10 Pelham Parkway, Pelham, N.Y., 20
See ads on pages 52, 90, 101, 129
Tel: PElham 8-5000

Caddell-Burns Mfg. Co., N.Y., 20

Carad Corp., Calif., 20

Celco—Constantine Engineering Laboratories Co., 70 Island Ave., Mahwah, N.J., 10, 15, 20
See ads on pages 36-37, 88-89
Tel: DAvis 7-1123

Circo Ultrasonic Corp., 51 Terminal Ave., Clark, N.J., 25
See ad on page 663
Tel: FUlton 8-8600

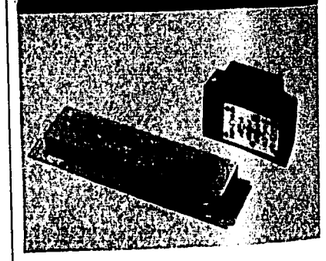
Coil Winders, Inc., 100 New York Ave., Westbury, L.I., N.Y., 10, 20, 22
See ad on page 410
Tel: EDgewood 4-3170

Columbia Technical Corp., 61-02 31st Ave., Woodside 77, L.I., N.Y., 10, 20
See ads on pages 444, 659
Tel: AStoria 8-7401

Communication Accessories Co., U.S. Highway 50 & 71 Bypass, Lee's Summit, Mo., 20
See ad on pages 122-123
Tel: BRoadway 1-1700

Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 5, 10, 15, 20, 22, 25
See ads on pages 321, 451
Tel: HAmilton 7-7961

DELAY LINES



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Silver Creek, N. Y. • Phone VE 4-2691

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Directory II. Components

48. Delay Lines.

Corning Glass Works, 550 High St., Bradford, Pa., 25
See ads on pages 400, 527
Tel: 2-4571

Dallons Lab., Inc., Calif., 25

Deltime, Inc., N.Y., 10, 15

Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass., 20
See ad on page 400
Tel: NOrwood 7-2620

Developmental Electronics Corp., Calif., 10, 15, 20, 22

Dietz Design & Mfg. Co., Mo., 5, 10, 15, 20, 22, 25

Double E Prod. Co., Calif., 20

Dynamic Electronics-New York, Inc., N.Y., 10, 15, 20, 22

E.M.I. Electronics Ltd., England, 10, 20

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 5, 10, 15, 20, 22
See ad on page 446
Tel: WIndsor 7-0400

Electronic Assistance Corp., N.J., 25

El-Rad Mfg. Co., Ill., 5, 10, 15, 20, 22

El-Tronics, Inc., Alwac Computer Div., Calif., 5

Essex Electronics, 569 Springfield Ave., Berkeley Heights, N.J., 10, 15, 20, 22
See ad on page 155
Tel: CRestview 3-9300

Ferranti Electric, Inc., Electronics Div., N.Y., 25

Filtron Co. Inc., N.Y., 5, 10, 15, 20, 22

Forbes & Wagner, Inc., 350 Central Ave., Silver Creek, N.Y., 10, 20
See ads on pages 349, 369, 413, 444, 453, 565
Tel: YE 4-2691

Fugle-Miller Labs., Inc., 301 Central Ave., Clark, N.J., 20
See ad on page 412
Tel: FUlton 1-2727

General Automatics, Inc., Calif., 20

General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 10, 15, 25
See ads on pages 283, 288, 445, 447, 505, 617
Tel: GRanite 6-4411

General Electric Co., Specialty Electronic Components Dept., N.Y., 10, 15, 20, 22, Wire Sonic

ELECTRICALLY VARIABLE
DELAY LINES

A unique General Electric product, *Electrically Variable Delay Lines* are suitable for general signal processing applications and as modulating devices for FM communications equipment. Highly adaptable to transistorized circuitry, EVDL's can be produced within a wide range of operating characteristics to give delays up to 12 microseconds. Tailored to defense electronics equipment, the EVDL will withstand extreme humidity, shock and vibration. 227-24

GENERAL ELECTRIC
DEFENSE ELECTRONICS DIVISION
HEAVY MILITARY ELECTRONICS DEPARTMENT
DEFENSE INDUSTRIES SALES
COURT STREET, SYRACUSE, NEW YORK

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- DELAY LINES
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- DELIMITERS AND TEMPFUSES
- HERMETICALLY SEALED FUSES
- PRECIOUS METAL PAINTS
- PRECISION METALIZING FOR ELECTRONICS

BEL FUSE INC.
131 VAN VORST ST.
JERSEY CITY, N. J.
PHONE: HEnderson 2-0463

Part #	Delay ± 5%	Impedance ± 10%	Rise Time (Maximum)	Length Inch.	O.D. Inch.
2-05	.05 usec	200 ohms	.05 usec for delay of .3 usec	1½"	.375"
2-1	.1			2½"	
2-15	.15			3½"	
2-2	.2			4½"	
2-25	.25			5¾"	
2-3	.3			6"	
3-1	.1 usec	300 ohms	.055 usec for delay of .45 usec	1¾"	.325"
3-2	.2			3¼"	
3-3	.3			4"	
3-4	.4			5⅜"	
3-45	.45			6"	
5-1	.1 usec	500 ohms	.09 usec for delay of 1.0 usec	1⅛"	.325"
5-2	.2			1¾"	
5-3	.3			2¼"	
5-4	.4			3"	
5-5	.5			3¼"	
5-6	.6			3¾"	
5-7	.7			4¼"	
5-8	.8			5"	
5-9	.9			5¾"	
5-10	1.0			5⅞"	
10-1	.1 usec	1000 ohms	.09 usec for delay of 1.0 usec	1⅛"	.325"
10-2	.2			1¾"	
10-3	.3			2¼"	
10-4	.4			3"	
10-5	.5			3¼"	
10-6	.6			3¾"	
10-7	.7			4¼"	
10-8	.8			5"	
10-9	.9			5¾"	
10-10	1.0			5⅞"	
10-11	1.1			6"	
12-1	.1 usec	1200 ohms	.09 usec for delay of 1.0 usec	1¼"	.325"
12-2	.2			1¾"	
12-3	.3			2½"	
12-4	.4			3"	
12-5	.5			3¼"	
12-6	.6			4¼"	
12-7	.7			4¾"	
12-8	.8			5½"	
12-9	.9			6"	
12-10	1.0			6¼"	
18-1	.1 usec	1800 ohms	.09 usec for delay of 1.0 usec	1¼"	.325"
18-2	.2			1¾"	
18-3	.3			2½"	
18-4	.4			3"	
18-5	.5			3¼"	
18-6	.6			4¼"	
18-7	.7			4¾"	
18-8	.8			5½"	
18-9	.9			6¼"	
18-95	.95			6¼"	
25-1	.1 usec	2500 ohms	.07 usec for delay of .7 usec	1¼"	.325"
25-2	.2			2¼"	
25-3	.3			3¼"	
25-4	.4			4"	
25-5	.5			4¾"	
25-6	.6			5½"	
25-7	.7			6¼"	
25-75	.75			6¼"	

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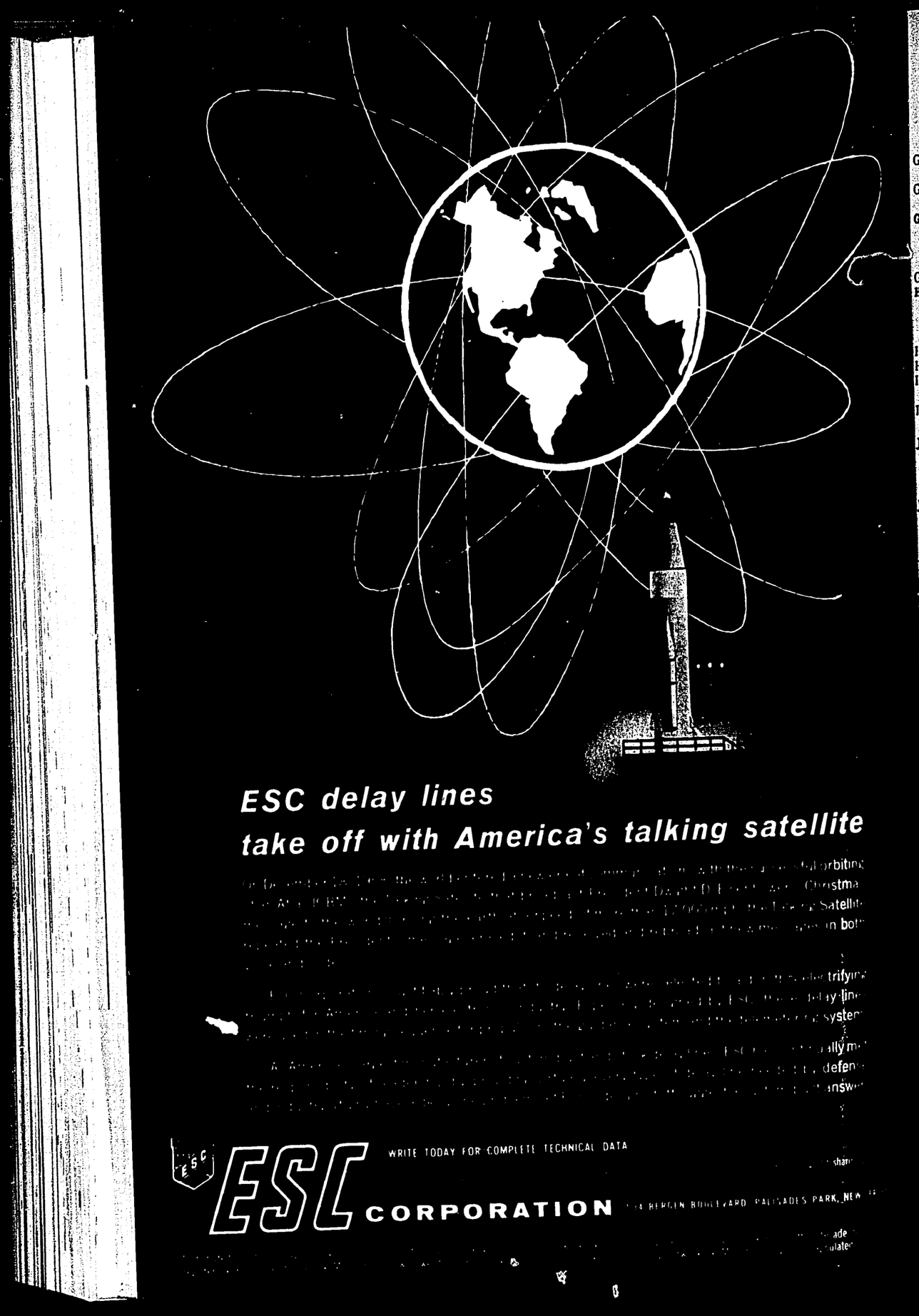
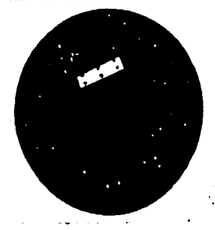
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.



Directory II. Components

48. Delay Lines.

General Electric Co., Ltd., of England, England, 10, 20
General Instrument Corp., F. W. Sickles Div., Mass., 5, 10, 20, 22
General Radio Co., West Concord, Mass., 15
See ad on Cover 4
Tel: EMerson 9-4400
Geotronic Labs., Inc., Texas, 5, 20
Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill., 10
See ad on page 204
Tel: VAn Buren 6-6300
Hazeltine Corp., N.Y., 10, 20
Helipot Corp., Calif., 15
I. M. C. Magnetics Corp., Gray & Kuhn Div., N.Y., 10, 15, 20, 22
International Telemeter Corp., Amplivision Div., Calif., 10
JFD Electronics Corp., 1462 62nd St., Brooklyn 4, N.Y., 10, 20
See ad on page 406
Tel: DEwey 1-1000
Jobbins Electronics, 771 Hamilton Ave., Menlo Park, Calif., 5, 10, 15, 20, 22
See ad on page 413
Tel: DAvenport 6-7110
Katolight Corp., Minn., 15, 20
Knights Co., James, 101 E. Church St., Sandwich, Ill., 25
See ad on page 439
Tel: 2141
L & O Research & Development Corp., Pa., 10, 20, 22
Laboratory for Electronics, Inc., Mass., 25
Librascope, Inc., Calif., 5
Litton Industries, U.S. Engineering Co., Div., Calif., 20
Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 10
See ad on page 331
Tel: EDgewood 4-3100
M E Labs., Calif., 10
Marconi's Wireless Telegraph Co. Ltd., N.Y., 25
Martin Co., Baltimore Div., Md., 22
Meridian Metalcraft, Inc., Calif., Microwave
Micamold Electronics Mfg. Corp., N.J., 20
Microsonics, Inc., Mass., 25
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 10, 20
See ad on page 416
Tel: DAvenport 4-4108
Nitronics, Inc., 1291 Central Ave., Hillside, N.J., cores
See ad on page 619
Tel: WAverly 6-2250
N Y T Electronics, Inc., Calif., 10, 20
North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 20
See ads on pages 415, 455, 591
Tel: PIoneer 7-0555
Orbitran Co. Inc., Calif., 5, 20
PCA Electronics, Calif., 10, 15, 20, 22
Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 10, 15, 20, 22
See ad on page 246
Tel: BRadshaw 2-6141
Parsons Co., Ralph M., Calif., 20, 22
Polyphase Instrument Co., Pa., 20
Power Industries Co., Inc., Ill., 5, 10, 15, 20, 22, 25
Profile Electronics, Inc., 6 Bridge St., Concord, N.H., 20
See ad on page 415
Tel: CApital 4-1232
Redman Electronics Corp., Conn., 20
Sag Harbor Indust., Inc., N.Y., 5, 10, 20
Shallcross Mfg. Co., 20 Preston St., Selma, N.C., 5, 10, 15, 20, 22
See ad on page 538
Tel: WOodlawn 5-2341
Sprague Electric Co., Mass., 10, 20
Stewart-Warner Electronics, Ill., 20, 22
Sturrup, Inc., Conn., 25
Technitrol Engineering Co., Pa., 10, 20
Telegraph Condenser Co., England, 20
Torotel, Inc., Mo., 10, 20
U.S. Science Corp., Sub Topp Indust., Inc., Calif., 22
United Transformer Corp., 150 Varick St., New York 13, N.Y., 20
See ad on Cover 2
Tel: ALgonquin 5-3500



GE WIRE SONIC DELAY LINES

New in the field of delay devices, *Wire Sonic Delay Lines* employ a special alloy wire as the delay medium. WSDL provides long delay per unit volume (up to 10,000 μsec) and adjustable or fixed delay. *Plus* values such as shock and vibration resistance, stability over wide temperature ranges and the availabilty of output taps give this advanced type of delay device unlimited applications at relatively low cost. 227-23

GENERAL ELECTRIC
DEFENSE ELECTRONICS DIVISION
HEAVY MILITARY ELECTRONICS DEPARTMENT
DEFENSE INDUSTRIES SALES
COURT STREET, SYRACUSE, NEW YORK

For details, circle #403 on Reader Service Card

Valor Electronics, Inc., Calif., 20, 22, Delay Line Box
Vanguard Electronics Co., Calif., 10, 20, 22
Western Coil Products Co., Calif., 10, 20
Wheeler Elect. Corp., Div., Sperry Corp., Conn., 20
Whitewater Electronics Inc., Wis., 5, 10, 15, 20, 22

Dials: See class 87

Diodes, germanium & silicon: See class 68

Diodes, selenium: See class 64

Disks, blank recording: See class 63

Dosimeters: See class 22

Electro-magnets: See class 55

Electrometer tubes: See class 75

Envelopes, vacuum tube: See class 99

49. Equalizers.

5. Dialogue
10. Line
15. Magnetic recording
20. Recording diameter
25. Sound effect

Aerovox Corp., Mass., 25
Aerovox Corp., Cinema Engrn. Div., Calif., 5, 10, 15, 20, 25
Airtronics International Corp., Fla., 10
Blonder-Tongue Labs. Inc., N.J., 10
Daven Co., N.J., 5, 25
Dietz Design & Mfg. Co., Mo., 5, 10, 15, 25
Dresser Industries, Hermetic Seal Transformer Co. Div., Texas, 10
E.M.I. Electronics Ltd., England, 15
Electronic Applications, Inc., Conn., 5, 25
Electronic Assistance Corp., N.J., 10
Fairchild Recording Equip. Corp., N.Y., 10
Gates Radio Co., Ill., 10, 25
General Electric Co., Ltd., England, 10
Hisonic, Inc., Kansas, Phase & Amplitude
International Tele.-Teleg. Labs., Calif., 10
Kelvin Electric Co., 5907 Noble Ave., Van Nuys, Calif., 5, 10, 15
See ad on page 414
Tel: STate 2-6662

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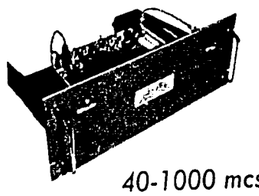
For details, circle #402 on Reader Service Card

advances in **RF** *techniques*

In recent years, Applied Research Inc. has contributed notably to the state of the art with unique originations in RF components and equipments. Much must remain undiscussed; the production items below are representative.

BROADBAND RF AMPLIFIERS



40-1000 mcs

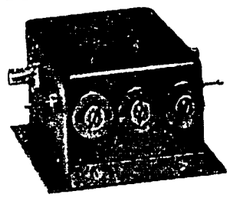
Model HFW Amplifiers cover an octave of frequency. Their truly exceptional performance features low noise, high gain with low power drain. Units are available in weather-proof cases for antenna mounting or other outdoor installation.

SPECIFICATIONS (condensed)

Model HFW-302

Input freq.	300 to 600 mcs
Input, output VSWR	Less than 1.5 in passband
Noise figure, average	7 db
Gain	20 db

BANDPASS FILTERS



30-2000 mcs

Model HFF and HFF-T Bandpass Filters are rugged, reversible in operation, remarkable in performance (which approximates theoretical expectations). Advanced filter designs are also available for antenna couplers and diplexers.

SPECIFICATIONS (Condensed)

Model HFF-T3

Center freq.	425 mcs
Bandwidth	50 mcs
Insertion loss	0.15 db
VSWR	1.03 in passband

UHF CONVERTERS

300-900 mcs

Model UHC-R Converters provide the ultimate in sensitivity and performance, featuring low noise, high image and spurious rejection, minimum adjacent channel interference.

TYPICAL SPECIFICATIONS (condensed)

(Model UHC-R-4.5)

Input freq.	400-525 mcs
RF bandwidth	10 mcs
Noise figure	5.5 db
Output bandwidth	5 mcs
Converter gain	50 db (min.) overall

FIXED PAD Attenuators & Terminations

(Patents Pending)

For Type

BNC Connectors

DC to 1000 mcs

HFA-50 and HFA-75 Attenuators; HFT-50 and HFT-75 Terminations have impedances of 52.5 and 75 ohms; VSWR is 1.2 maximum up to 1000 mcs; attenuation values 1 to 20 db.

For Type

TNC Connectors

DC to 2000 mcs

HFA/T-50 and HFA/T-75 Attenuators; HFT/T-50 and HFT/T-75 Terminations have impedances of 52.5 and 75 ohms; VSWR is 1.2 maximum up to 2000 mcs; attenuations values 1 to 20 db.

For Type

N Connectors

DC to 2500 mcs

HFA/N-50 Attenuators and HFT/N-50 Terminations have impedances of 52.5 ohms; VSWR is 1.2 maximum up to 2500 mcs; attenuation values 1 to 20 db.

Impedance Transformers

For Type

BNC Connectors

DC to 1000 mcs

Type HFAM Impedance Matching Transformers match any pair of 50, 75, 93 ohms with minimum loss over a broad band of frequencies; VSWR is 1.2 maximum at 1000 mcs

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Applied Research inc.

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49. Equalizers.

Lesa, S.P.A., Italy, 25
Ling Systems, Inc., Calif., 10
Lynch Carrier Systems, Inc., Calif., 1
Magnasync Mfg. Co., Ltd., Calif., 5, 2
Maico Electronics, Inc., Minn., 15
Marconi's Wireless Telegraph Co. Ltd., N.Y., 10
McCurdy Radio Industries Ltd., Canada, 10, 25
Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 15
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Tel: BRadshaw 2-6141
Pulse Techniques, Inc., N.J., 5
Radio Engrg. Products Ltd., Canada, 10
Railway Communications, Inc., Mo., 7
Siegler Corp., Bogen-Presto Co. Div., N.J., 20
Sprague Electric Co., Mass., 15, 25
Technisonic Studios, Inc., Mo., 5, 25
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 10, 25
See ads on pages 466, 569
Tel: MIdway 6-7211
United Transformer Corp., 150 Varick St., New York 13, N.Y., 5, 10, 15, 25
See ad on Cover 2
Tel: ALgonquin 5-3500

Fans: See class 40

Fasteners: See class 87

50. Filters.

5. Antenna
10. Band pass & band rejection
12. Crystal
14. Equalizer
15. High pass
20. Loudspeaker dividing networks
22. Low pass
25. Mechanical
30. Microwave
35. Noise reduction
37. SSB
45. UHF & VHF

ACDC Electronics Inc., Calif., 10, 22
ACF Industries, Inc., Avion Div., NY, 30
Adams-Russell Co., Inc., Mass., 5, 22, 30, 45
Admiral Corp., Ill., 37
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Advance Electronics Co., N.Y., 22, 3
Aero Guidance Corp., Calif., 5, 10, 30, 37, 45
Aerovox Corp., Mass., 22, 35
Aerovox Corp., Cinem Engrg. Div., Calif., 14, 15, 22
Airborne Accessories Corp., N.J., 3
Aircom, Inc., 48 Cummington St., Boston, Mass., 5, 30
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Tel: COpley 7-9115
Air-Maze Corp., Ohio, 35
Alberhill Corp., Dynamic Instrument Co., Div., Calif., 15, 22
Alert Products, Inc., N.Y., 10, 15, 22, 3
Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 22
See ad on page 590
Tel: HAncock 6-2150

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Directory II. Components

50. Filters.

Allen-Bradley Co., Wis., 22, 45
All-Tronics, Inc., 45 Bond St., Westbury, L.I., N.Y., 22, 35, radio interference
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Tel: EDgewood 3-3090
Alto Scientific Co., Inc., Calif., 10, 45
American Electronic Labs., Inc., Pa., 10, 15, 22, 30
American Electronics Co., N.Y., 5, 10, 15, 22
American Missile Products, Calif., 10, 15, 22
Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 5
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Tel: BIshop 2-1000
Andrew Corp., Ill., 5
Applied Research, Inc., 76 So. Bayles Ave., Port Washington, N.Y., 10, 45
See ad on page 448
Tel: POrt Washington 7-8707
Ark Engineering Co., Pa., 5, 10, 22, 30
Armour Alliance Industries, Ohio, 35
Arttronic Instrument Co., Md., 22
Astron Corp., 255 Grant Ave., East Newark, N.J., 15, 22
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Tel: HUmboldt 2-7800
Atomitron, Inc., N.Y., 5, 30
Audio Development Co., Minn., 10, 15, 22
B & K Instruments, Inc., Ohio, 10
Barker & Williamson, Inc., Pa., 5, 10, 15, 20, 22, 35, 37, 45
Bassett, Inc., Rex, Fla., 35
Belling & Lee, Ltd., Great Cambridge, Rd., Enfield Middlesex, England, 35
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Tel: ENfield 3322
Bendix Aviation Corp., Bendix Pacific Div., Calif., 10
Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, 5, 10, 15, 22, 45
See ad on page 334
Tel: CHurchill 8-1200
Blackhawk Engrg. Co., Wis., 5, 10, 12, 14, 15, 22, 25, 30, 35, 37, 45
Bliley Electric Co., 200 Union Station Bldg., Erie, Pa., 12
See ad on pages 124-125
Tel: GLendale 6-7561
Blonder Tongue Labs., N.J., 5, 10, 45
Bogart Mfg. Co., N.Y., 10, 15, 22, 30
Bomac Laboratories, Inc., Salem Rd., Beverly, Mass., 30
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Tel: WAlker 2-6000
Boston Gear Co., Mass., 35
British Industries Corp., Wharfedale Div., N.Y., 20
Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 30
See ad on page 592
Tel: STillwell 6-1706
Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62nd St., Woodside 77, N.Y., 10, 12, 15, 22, 37
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Tel: NEwtown 9-5700
Burnell & Co., Inc., Depts. P-10 and P-12, 10 Pelham Parkway, Pelham, N.Y., 5, 10, 12, 14, 15, 22, 37
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Tel: PElham 8-5000
CG Electronics Corp., N.M., 5, 25
Caledonia Electronics & Trans. Corp., N.Y., 10, 15, 22
California Magnetics Control Corp., Calif., 5, 10, 14, 15, 22, 35, 37, 45
Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 10
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Carad Corp., Calif., 10, 15, 22
Celco—Constantine Engineering Laboratories Co., 70 Island Ave., Mahwah, N.J., 10, 15, 22
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Tel: DAvis 7-1123
Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 20
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Tel: WOodruff 2-9200
Chicago Condenser Corp., Dept. A, 3255 W. Armitage Ave., Chicago 47, Ill., 20, 35
See ad on page 489
Tel: CApitol 7-7070
Chicago Electronic Engineering Co., 3223 W. Armitage Ave., Chicago 47, Ill., 10, 15, 22
See ad on page 561
Tel: CApitol 7-3130
Chicago Magnetic Control, 1616 N. Damen Ave., Chicago 47, Ill., 10, 15, 22
See ad on page 563
Tel: ARmitage 6-7400
Chicago Standard Transformer Corp., 3501 W. Addison St., Chicago 18, Ill., 10, 15, 22, 35
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Tel: INdependence 3-7400
Clevite Electronic Components, Ohio, 25
Clippard Instrument Lab., Inc., Ohio, 5, 15
Coaxial Connector Co., Inc., N.Y., 5, 15, 35, 45
Coil Winders, Inc., 100 New York Ave., Westbury, L.I., N.Y., 5, 10, 14, 15, 20, 22, 35
See ad on page 410
Tel: EDgewood 4-3170
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 25, 37, 45
See ad on pages 32-33
Tel: EMpire 3-0281
Communication Accessories Co., U. S. Highway 50 & 71 Bypass, Lee's Summit, Mo., 10, 14, 15, 22, 30
See ad on pages 122-123
Tel: BRoadway 1-1700
Communication Equip. & Engineering Co., Ill., 10, 14, 15, 22
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Control Electronics Co., Inc., 10 Stepar Place, Huntington Station, N.Y., 10, 14, 15, 22, 30, 37, 45
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Tel: HAmilton 7-7961
Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., South Plainfield, N.J., 10, 15, 22, 35, 45
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Tel: PLainfield 6-9000
Cycle Transformer Corp., N.Y., 10, 15, 22
D & R, Ltd., Calif., 10, 15, 22
Daven Co., N.J., 10, 14, 15, 20, 22
De Cursey Fire Lab., Calif., 10, 15, 20, 22
Delmance Electric & Microwave Corp., Mass., 5, 10, 12, 15, 22, 30, 37
DeMornay-Bonardi, 780 S. Arroyo Parkway, Pasadena, Calif., 30
See ad on pages 120-121
Tel: SYcamore 2-4142
Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass., 5, 10, 14, 15, 22, 35, 37, 45
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ALL-TRONICS, Inc.
45 Bond St., Westbury, N.Y., ED 3-3090

For details, circle #405 on Reader Service Card

WHERE SHARING PAYS OFF

SOME YEARS AGO we pointed out in "Proceedings of the IRE" that an amazing and unique characteristic of scientific men is their sense of responsibility to the past and to the future, expressed in their sharing with one another the new findings and discoveries of their science. The fact that engineers share information is a major contribution to the amazing growth of industrial progress and to our high standard of living.

Design Engineers seem to have an impelling need to publish. It is important and fortunate that they have had magazines *in which to publish*. Of course, their articles make these magazines possible, just as the publishing organization's faith and courage gives them the vehicle for communication. A magazine is a three-way team of author, medium, and reader—mutually dependent.

Such a contribution of one to the other is the vital service of the periodical. The thundering pace of radio-electronics and its expression in communications; glorious hi-fi music; the brilliant, full-color picture; and that same radio principle bringing in a new era in industrial controls which makes automation practical; the amazing time-and-effort-saving electronic computer; and new fabulous developments already being discovered in research which will be made practical by the radio engineer—all these *could not have been possible* without the publication as a means of collating and organizing information, and distributing it to those who needed it and *knew how to work with it*.

These are generalities! But "Proceedings of the IRE" *is specific*. The Superheterodyne circuit, FM, TV, radar, the computer, color TV, the transistor, scatter propagation, solid state electronics (stereatronics) all were presented and developed *article by article* in the history-making issues of "Proceedings of the IRE." The impact on industry of this broad exchange of information among engineers has been enormous, creating new markets and even new ways of life.

FM is an excellent illustration of this "sharing." Consider particularly the "lead out time" needed in FM. In December 1935, an article by Armstrong (an IRE Member) in "Proceedings of the IRE" proved conclusively to the engineering world that frequency modulation was an improvement *and practical*. (Today, FM is the audio side of every TV receiver.) This was the fourteenth article on frequency modulation *that had appeared in "Proceedings of the IRE,"* eight of them by Armstrong. It is now known that some of these articles which defined the weakness that had to be corrected, as well as some that amplified the discovery by further independent research, all helped make the final perfection possible.

At that time, in all the world, only four other articles on the subject had appeared. These were condensations of the "discussion" in "Proceedings of the IRE." Yet the final "Proceedings" article was published six years before the first FM broadcasting station went on the air. Engineers needed every bit of this "lead-out time" to do their work. The early publication in "Proceedings of the IRE" gave them just that; and thousands of engineers, who had followed this series, knew in December, 1935 that a great change had come and that they must design and tool up for it. Armstrong shared, "Proceedings" published, and an industry profited!

This is the traditional service of the "old-line" magazine. The author "shared"—the magazine "published"—the reader "studied" and industry progressed mightily through the three-way contribution. Truly, the reader contributes attention! This kind of publishing wins such attention, more than any other kind! It does the ground-work and sales-conviction building that comes years ahead of the final product news.

Advertising shares! The informative "ad" follows exactly the same pattern with exactly the same results. Again and again, display copy in "Proceedings of the IRE" has announced new developments or highlighted the engineering usage of a staple item. Year-after-year, we have seen-time businesses start sharing their helpful information with readers in "Proceedings of the IRE" and as a result reap orders, prosper and grow. Today in aggregate, they are the giant industry identified as "Electronics."

It is said that the fundamental result of a magazine is to define a market. Since 1913, "Proceedings of the IRE" has defined an unfolding technical radio and electronic market by articles that stimulated the use of new products and by presenting the manufacturers' stories of these new components, instruments and systems to engineers eager for as many new devices as would serve them well.

Proceedings of the IRE

Editorial Department:
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AUDIO AND HIGH FREQ. MINIATURIZED

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BUILT TO MIL. SPECS. FAST PROTOTYPE SERVICE
1 to 3 WEEKS DELIVERY

Distributed Constant Delay Lines

CEC DISTRIBUTED CONSTANT DELAY LINE FEATURES
- Lowest cost — reliable performance
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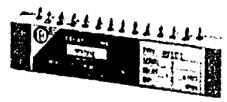
Long and Short Delays from 5 μ secs to 5,000 μ secs. Choice of impedances.

Lumped Constant Delay Lines



Multi-tapped Lumped Constants available in many configurations

DELAYS TO 20,000 MICROSECONDS
BANDWIDTHS to 500 MCS
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Complete delay and pulse systems designed to your needs.

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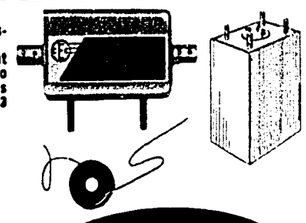
Standard and Special Designs - to meet customer's unusual requirements.
HIGH, LOW & BANDPASS FILTERS with input and output impedances from 500 ohms to 10,000 ohms, and with cut-off frequencies from 200 cps to 70 kcs, including the 23 standard RDB Telemetering channels.



STANDARD	SPECIALS
High Pass	90° Phase Shift
Low Pass	Null "T"
Band Pass	Ultra Stable
Inter-Stage	Band Suppression
	Constant Delay

SPECIAL FILTERS AND TOROIDS TO YOUR SPECS. QUICK DELIVERY

CEC CONTROL ELECTRONICS CO., INC.
Ten Stepar Place Huntington Station New York

NOTE Data Sheets on request

Directory II. Components

50. Filters.

Devol Research Co., Conn., 10
Diamond Antenna & Microwave Corp., Mass., 5, 10, 12, 15, 22, 30
Dietz Design & Mfg. Co., Mo., 5, 10, 12, 14, 15, 20, 22, 35, 37, 45
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Double E Products Co., Calif., 10, 15, 22, 35

Douglas Microwave Co., Inc., Dept. R-9, 252 E. 3rd St., Mt. Vernon, N.Y., 22, 30
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Tel: MOunt Vernon 8-6900

Downing Crystal Co., Md., 12
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Dynamic Electronics-New York, Inc., N.Y., 5, 10, 15, 20, 22, 37, 45
Dytronics Co., Ohio, 10

EMI—Cossor Electronics, Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 10, 45
See ad on page 412
Tel: HAlifax 6-7491

E.M.I. Electronics Ltd., England, 5

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 10, 15, 20
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Tel: WIndsor 7-0400

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El-Rad Mfg. Co., Ill., 5, 10, 14, 15, 20, 22

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 10, 22, 30, 45
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Tel: VIctor 2-8400

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Espey Mfg. Co., Inc., N.Y., 10, 15, 22

FXR, Inc., 26-12 Borough Place, Woodside 77, N.Y., 30
See ad on pages 97-100
Tel: AStoria 8-2800

Federal Scientific Corp., N.Y., High Resolution
Ferrotran Electronics Co., N.Y., 10, 15, 22
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Flow Corp., Mass., 22

Forbes & Wagner, Inc., 350 Central Ave., Silver Creek, N.Y., 10, 15, 22
See ads on pages 349, 369, 413, 444, 453, 565
Tel: YE 4-2691

Foster Transformer Co., Ohio, 10, 15, 22, 35

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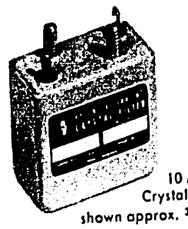
CRYSTAL FILTERS in the 10 Kc to 30 Mc range



10 Mc Crystal Filter shown approx. ¾ size

The accompanying table shows a partial list of standard Hermes Filters. Custom units may be engineered to your particular specifications of center frequency, bandwidth, selectivity, and impedance level. *Write for Crystal Filter Technical Bulletin.*

SYMMETRICAL BANDPASS

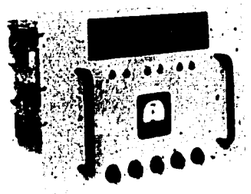
Model No.	Center Freq.	Bandwidth (6-db)	Bandwidth (60-db)	Maximum Insertion Loss	Maximum Passband Variation	Impedance Ohms (Nominal)	Case Size L	W	H
100 KPA	100 Kc	50 cps	200 cps	3 db	±1/2 db	8200	3 15/16"	2 13/16"	2"
2215 KA	2215 Kc	2.8 Kc	12 Kc	3 db	±1/2 db	4000	2 9/16"	1 5/16"	1 47/64"
2215 KB	2215 Kc	250 cps	1000 cps	3 db	±1/2 db	4000	2 9/16"	1 5/16"	1 47/64"
9 MA	9 Mc	3 Kc	12 Kc	3 db	±1/2 db	1000	1 61/64"	19/32"	15/16"
10 MA	10.7 Mc	30 Kc	60 Kc	3 db	±1/2 db	2000	2 3/8 "	1"	1 1/32"
10 MB	10.7 Mc	15 Kc	30 Kc	3 db	±1/2 db	1000	2 3/8 "	1"	1 1/32"
10 ME	10.7 Mc	6 Kc	15 Kc	3 db	±1/2 db	500	2 3/8 "	1"	1 1/32"
10 MF	10.7 Mc	3.5 Kc	10 Kc	3 db	±1/2 db	300	2 3/8 "	1"	1 1/32"
13 MA	13 Mc	30 Kc	54 Kc	6 db	± 1 db	1500	3 9/16"	1"	1 1/2"
13 MB	13 Mc	15 Kc	27 Kc	6 db	± 1 db	750	3 9/16"	1"	1 1/2"
30 MK	30 Mc	25 Kc	62 Kc	3 db	±1/2 db	820	2 3/8 "	1"	1 1/32"
30 MP	30 Mc	5 Kc	15 Kc	3 db	±1/2 db	750	2 3/8 "	1"	1 1/32"

SINGLE SIDEBAND

Model No.	Center Freq.	Sideband	Passband (2 db except as noted)	Minimum Attentuation (Unwanted)	Maximum Insertion Loss	Maximum Passband Variation	Impedance Ohms (Nominal)	Case Size L	W	H
100 KUC	100 Kc	upper	300 to 6000 cps	60 db	10 db	±1/2 db	8200	5 3/8 "	3"	2 3/8 "
100 KLC	100 Kc	lower	300 to 6000 cps	60 db	10 db	±1/2 db	8200	5 3/8 "	3"	2 3/8 "
3 MUA	3.2 Mc	upper	300 to 3000 cps (3 db)	40 db	3 db	± 1 db	1600	2 9/16"	1 5/16"	1 47/64"
2 MUA	2 Mc	upper	300 to 6000 cps	60 db	3 db	±1/2 db	3900	4 3/8 "	2 3/8 "	1 7/8 "
2 MLA	2 Mc	lower	300 to 6000 cps	60 db	3 db	±1/2 db	3900	4 3/8 "	2 3/8 "	1 7/8 "

RAPID ACCESS in Analog Data Reduction Systems

DIGITAL TIMING GENERATOR

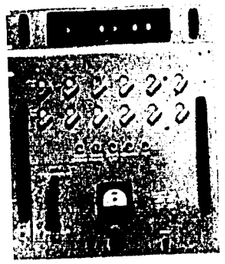


MODEL 201 for Tape Indexing generates numerically coded timing signals which are recorded on the magnetic tape throughout the data recording periods, providing a precise digital index in terms of elapsed time.

Write for Technical Bulletin TSG

MODEL 206A IS A MILITARIZED AIRBORNE VERSION OF MODEL 201.

MAGNETIC TAPE SEARCH UNIT

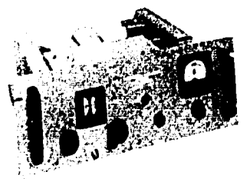


MODEL 202 for Tape Searching operates during data reduction periods. This instrument automatically locates and selects for controlled playback the tape data included between a "sequence start time" and a "sequence end time" specified by panel dial settings. Model 202 may be modified to search for timing formats other than those originated by Model 201.

ULTRA STABLE OSCILLATOR

One Megacycle Signal Source

STABILITY: 1 PART IN 10^9 PER DAY



For precise time measurements or frequency control, Model 101C features include: A crystal oven without moving parts that is stabilized to better than 0.01°C. by temperature-sensitive resistance bridge, and dissipation in oscillator crystal which is stabilized at a power level of less than one microwatt. MULTIPLIERS and DIVIDERS are available for other frequency values with corresponding stability. *Write for Bulletin USO.*

MAGNETIC CORE LOGIC EQUIPMENTS

1. **DIGITAL FORMAT CONVERTERS FOR**
   Gray Code to Binary Coded Decimal
   Straight Binary to Binary Coded Decimal
2. **TIME PROGRAMMERS FOR**
   precise elapsed time interval pulses
3. **MAGNETIC CORE STORAGE REGISTERS**

Write for Technical Information

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See ad on page 410
Tel: EVergreen 6-1300

Frequency Standards, Inc., P.O. Box 504, Shafto Rd., Asbury Park, N.J., 10, 15, 20, 30
See ad on this page
Tel: PRospect 4-0500

Fugle-Miller Laboratories, Inc., 301 Central Ave., Clark, N.J., 5, 10, 15, 22
See ad on page 412
Tel: FUlton 1-2727

Gabriel Co., Gabriel Electronics Div., 135 Crescent Rd., Needham Heights 94, Mass., 5, 10, 15, 22, 30
See ad on page 378
Tel: HIllcrest 4-0005

Garrett Corp., Air Research Mfg. Div., Calif., 35

Gates Radio Co., Ill., 5, 10, 15, 22

General Automatics, Inc., Calif., 10, 15, 20

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General Instrument Corp., F. W. Sickles Div., Mass., 10, 15, 22, 45

General Radio Co., West Concord, Mass., 10, 15, 22, 45
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Tel: EMerson 9-4400

Genistron, Inc., Calif., 15, 22, 35

Gertsch Products, Inc., Calif., 10

Gorham Mfg. Co., Electronics Div., 333 Adelaide Ave., Providence 7, R.I., 30
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Tel: WIlliams 1-1000

Gulton Industries, Inc., N.J., 22

Gulton Industries, Inc., N.M., 5, 10, 30, 45

Gyrex Corp., Calif., 10, 25

Hallett Mfg. Co., Calif., 35

Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill., 12, 30, 37, 45
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Tel: VAn Buren 6-6300

Hammond Mfg. Co., Ltd., Canada, 10, 22

Harmon Electronics Co., Mo., 10

Hermes Electronics Co., Dept. BD, 75 Cambridge Parkway, Cambridge 42, Mass., 12
See ad on page 452
Tel: UNiversity 4-7200

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 22, 30
See ad on pages 3-18
Tel: DAvenport 5-4451

Highland Engineering Co., N.Y., 10, 14, 15, 22, 35

Hisonic, Inc., Kan., 10, 15, 20, 22

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Tel: LI 8-0671

Hupp Electronics Co., Pa., 12, 37

Hycon Eastern, Inc., See: Hermes Electronics Co.

I. D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind., 15
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Tel: LIberty 7-3581

I.M.C. Magnetics Corp., Gray & Kuhn Div., N.Y., 10

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See ads on pages 412, 686-
Tel: REgent 9-2395

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International Tel. & Tel. Corp., ITT Federal Div., N.J., 5, 30

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J-V-M Microwave Co., Ill., 5, 10, 30, 45

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Jerrold Electronics Corp., Dept. TED 33, The Jerrold Bldg., Philadelphia 32, Pa., 10
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Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 25, 30
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Tel: STate 2-6662

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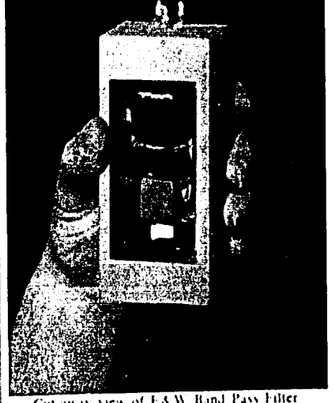

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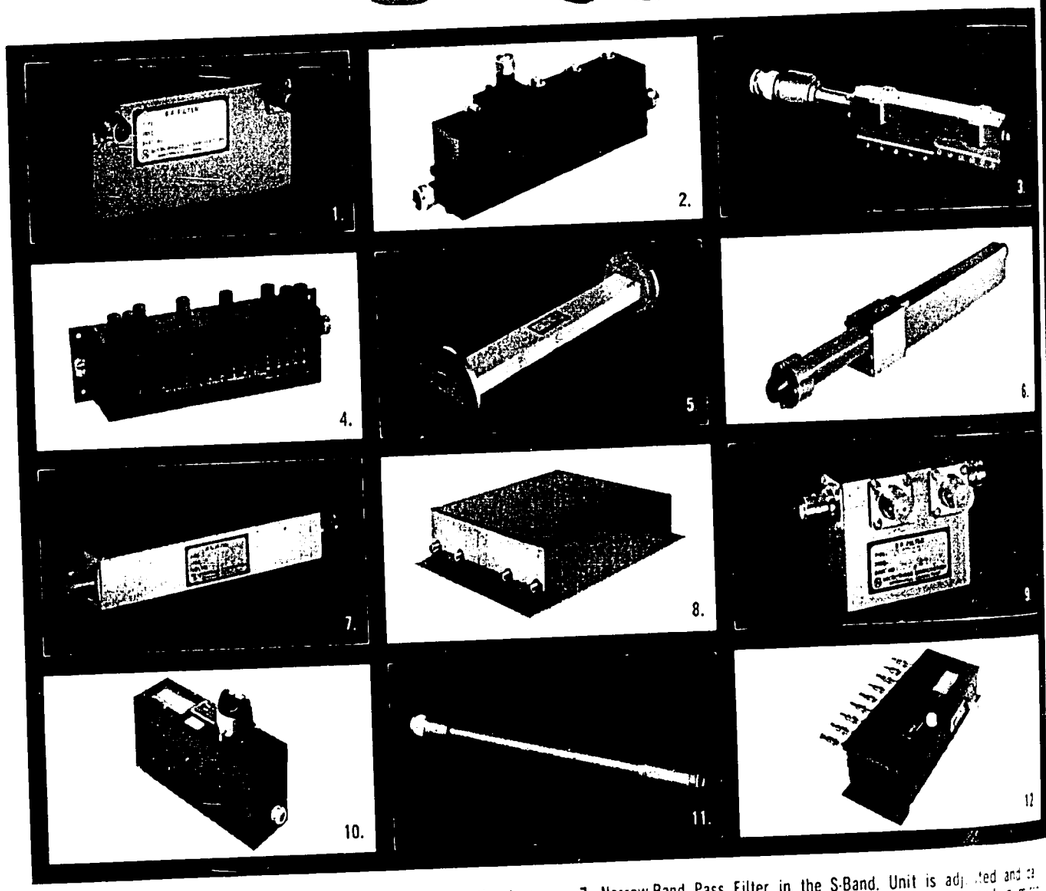

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Litton Industries, Inc., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 5, 10, 30, 35
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Tel: LYtell 1-8411

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 10, 15, 22
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Tel: CRestview 4-7411

Litton Industries, Inc., Md. Div., Md., 5, 10

Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 30
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Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 5, 10, 14, 15, 20, 22, 30, 35, 37, 45
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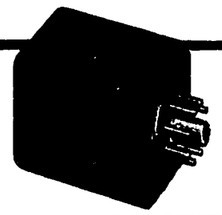

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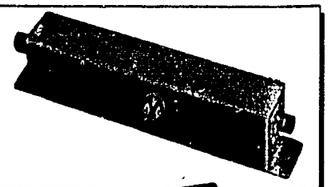

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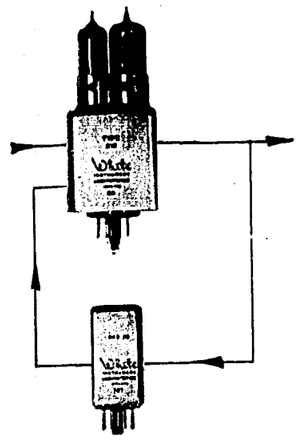

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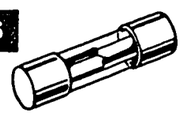

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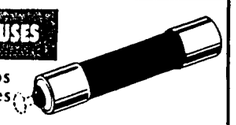

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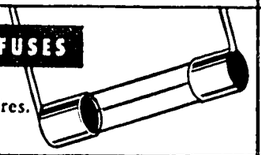

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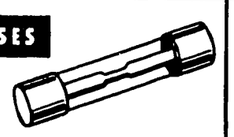

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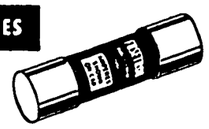

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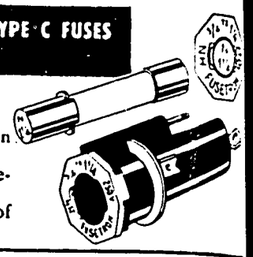

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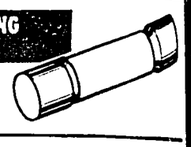

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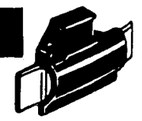

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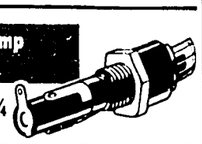
Panel mounted for ¼ x 1 inch and ¼ x 1¼ inch fuses.

BUSS Series HJ and HK Lamp Indicating FUSEHOLDERS

Panel mounted for ¼ x 1 inch and ¼ x 1¼ in. fuses.

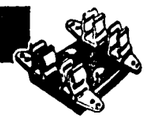


BUSS No. 4051 ONE-PIECE CLIP and TERMINAL

Solder type terminal for ¼ inch fuses.

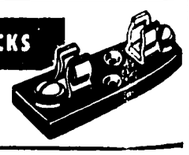
BUSS No. 4409 FUSE BLOCKS

Small Base, solder type Side Terminals.



BUSS No. 4512 FUSE BLOCKS

Full Base, Screw type Terminals.



For more detailed information to help you select fuses and fuseholders to meet your electrical protection needs . . . Write for BUSS bulletin SFB.

Or tell us your problem and let our Fuse Engineers assist you in getting the protection you require.

Bussmann Mfg. Division, *McGraw-Edison Co.* University at Jefferson, St. Louis 7, Mo.

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Makers of a complete line of fuses for home, farm, commercial, electronic and industrial use.

Directory II. Components

51. Fuses & Fuse Holders.

51. Fuses and Fuse Holders.

1. Fuses **10. Fuse holders**

Accurate Electronics Corp., Ohio, 10
Aerolite Electronics Co., N.J., 10
Alden Products Co., 121D N. Main St., Brockton 64, Mass., 10
See ads on pages 419, 691
Tel: JUniper 3-0160
Alden Systems Co., Mass., 10
Amatom Electronic Hardware Co., Inc., N.Y., 10
Atlas E-E Corp., Mass., 10
Augat Brothers, Inc., 33 Perry Ave., Attleboro, Mass., 10
See ad on page 696
Tel: ATtleboro 1-2202
Avnet Corp., Calif., 5, 10
Bel Fuse, Inc., 197 Van Vorst St., Jersey City, N.J., 5, 10
See ad on page 445
Tel: HEnderson 2-0463
Belling & Lee Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 5, 10
See ad on page 418
Tel: ENfield 3322
Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 10
See ad on page 603
Tel: WAlker 5-6980
Braun Tool & Instrument Co., Inc., 141 Fifth Ave., Hawthorne, N.J., 10
See ads on pages 459, 543, 551
Tel: HAwthorne 7-1773
Burndy Corp. Omaton Div., Richards Ave., Norwalk, Conn., 5, 10
See ad on page 421
Tel: TEmple 8-4711
Bussmann Mfg. Div., McGraw Edison Co., University at Jefferson, St. Louis 7, Mo., 5, 10
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Tel: GArfield 1-1740
Derf Radio Co., N.Y., 10
Eagle Electric Mfg. Co., Inc., N.Y., 5, 10
Eastern Insulated Wire Corp. & Circle F Mfg. Co., N.J., 10
Eby, Inc., Hugh H., Pa., 10
Electronic Mechanics, Inc., N.J., 10
Garde Mfg. Co., R.I., 10
General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 10
See ad on page 474
Tel: ROckford 8-9661
General Electric Co., Wiring Device Dept., R.I., 5, 10
I. T. & T. Royal Elect. Corp. Div., R.I., 5
Janco Corp., Calif., 10
Kulka Electric Corp., 633 S. Fulton Ave., Mt. Vernon, N.Y., 10
See ad on page 690
Tel: MOunt Vernon 4-4024
Leviton Mfg. Co., Inc., N.Y., 5, 10
Littelfuse, Inc., Ill., 5, 10
Micarta Fabricators, Inc., Ill., 10
Mutual Electronics Industries Corp., N.Y., 5
North Electric Co., N.Y., 5, 10
OK Electronics Corp., N.J., 5
Permonite Mfg. Co., Ill., 10
Raytheon Co., Mass., 10
Rodale Mfg. Co., Inc., Pa., 5
Royal Electric Corp., R.I., 5
Sightmaster Corp., R.I., 5
Smith Inc., H. H., N.Y., 10
Staver Co., Inc., N.Y., 10
Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 5
See ad on page 502
Tel: REctor 2-6249
Telegraph Condenser Co., Ltd., United Insulator Div., England, 5
Tempil Corp., N.Y., 5
Trico Fuse Mfg. Co., Wis., 5
Zeirick Mfg. Corp., N.Y., 10

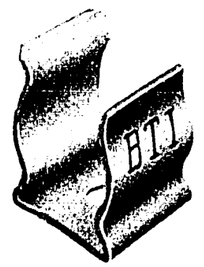
Galvanometers: See classes 12 & 56

Galvanometers, recording: See class 13

Gaskets: See class 87

BTI

FUSE CLIPS



BTI Fuse Clips are available from stock in a wide range of sizes and designs to accommodate the NEC and SAE standard fuses. Integral lug type or specially designed fuse clips and non-standard parts made to meet your custom requirements.

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Gears: See class 28

Geiger-Mueller tubes: See class 75

Generators, marker (microwave): See class 19

Generators, marker (TV): See class 35

Generators, motor: See class 58

Generators, pulse: See class 19

Generators, signal (AM & FM): See class 26

Generators, signal (TV): See class 35

Generators, square wave: See class 3

Generators, sweep (radio frequency): See class 26

Generators, synchronizing: See class 35

Generators, time delay: See class 19

Generators, ultrasonic: See class 12

Germanium crystals: See class 47

Germanium diodes: See class 68

Getters: See class 99

Graphic recorders: See class 14

Grids & Grid wire: See class 99

Grilles: See class 87

Grommets: See class 87

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Rio Piedras 6-3615

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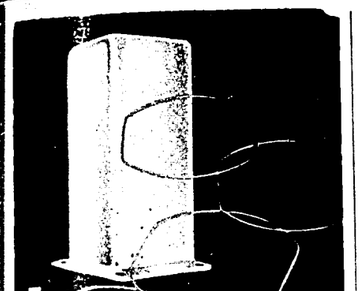

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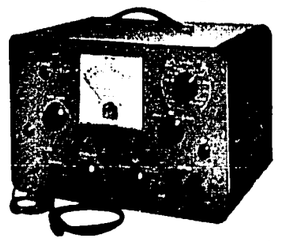

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Directory II. Components

Guns & gun parts, CRT:
See class 99

Harnesses, pre-formed wire:
See class 82

Headphones: See class 54

52. Hermetic Seals.

5. Ceramic to metal
10. Complete headers
15. Glass to metal
20. Switch & shaft

A.P.M. Corporation, 252 Hawthorne Ave., Yonkers, N.Y., 20
See ads on pages 462, 634
Tel: YOnkers 8-2010

Advanced Vacuum Prods., Inc., Conn., 5

Allegheny Ludlum Steel Corp., Pa., 15

American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 5, 20
See ad on page 180
Tel: AMherst 5-3411

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 10
See ad on page 166
Tel: BIshop 2-1000

Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 10, 15
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715

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Atmo Seal Co., Ohio, 10, 15

Avnet Corp., Calif., 15

B G Corp., N.J., 5

Belling & Lee Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 10, 15
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Tel: ENfield 3322

Bon-De Electronic Labs., Inc., Mass., 15

Brilhart Plastics Sales Corp., N.Y., 10

British Thomson-Houston Co., Ltd., England, 15

Carborundum Co., Refractories Div., N.J., 5, 15

Cathodeon Ltd., Meadowcroft Labs., England, 10, 15

Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 5
See ad on page 174
Tel: WOodruff 2-9200

Ceramaseal, Inc., P.O. Box 25, New Lebanon Center, N.Y., 5, 10, Sapphire-to-Metal
See ad on page 463
Tel: WEst Lebanon 3-5851

Cooper Hewitt Elec. Co., N.J., 10, 15

Corning Glass Works, 550 High St., Bradford, Pa., 15
See ads on pages 400, 527
Tel: 2-4571

Dage Electric Co., Inc., 67 N. Second St., Beech Grove, Ind., 10, 15
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Dallons Labs., Inc., Calif., Quartz-to-Glass

Deutsch Co., Calif., 15

Electrical Industries, Div., Philips Electronics Inc., 691 Central Ave., Murray Hill, N.J., 10, 15
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Tel: CRestview 7-4300

Elsin Electronics Corp., N.Y., 10, 15

El-Tronics, Inc., Warren Components Div., Pa., 10, 15

Elzee Metal Products Co., Inc., N.Y., 10

Ferranti-Packard Electric Ltd., Canada, 15

Frenchtown Porcelain Co., N.J., 5, 10

Fusite Corp., Dept. H-1, 6000 Fernview Ave., Cincinnati 13, Ohio, 15
See ad on page 128
Tel: REdwood 1-2020

Garde Mfg. Co., R.I., 10

General Ceramics Corp., Dept. ID, Crows Mill Rd., Keasbey, N.J., 5
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Tel: VAlley 6-5100

General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, N.Y., 5, 10, 15, 20
See ad on this page
Tel: VAlley Stream 5-6363

Glasseal Prods. Co., Inc., N.J., 5, 10, 15

Glass-Tite Industries, Inc., R.I., 5, 10, 15, 20

Heldor Mfg. Corp., N.J., 5, 10

Hermaseal Co., Inc., Ind., 5, 10, 15

Hermetic Pacific Corp., Calif., 10, 15

Hermetic Seal Corp., 31 S. Sixth St., Newark 7, N.J., 5, 10, 15
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Tel: MArket 3-9400

Hermetite Corp., Mass., 10, 15

Houghton Labs., Inc., N.Y., 5, 15

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 10, 15
See ad on pages 148-149
Tel: NUtley 2-3600

Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 5
See ad on page 619
Tel: MIllington 7-0385

Johns-Manville, N.Y., 5, 15, 20

Kulka Electric Corp., 633 S. Fulton Ave., Mt. Vernon, N.Y., 20
See ad on page 690
Tel: MOunt Vernon 4-4024

LMB-Heeger, Inc., Calif., 5, 15

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 10
See ad on page 66
Tel: CRestview 4-7411

Lundey Assoc., Inc., Mass., Ceramic Confined Gasket

Metals & Controls Div. of Texas Instruments, Inc., 51 Forest St., Attleboro, Mass., 5, 15
See ad on page 676
Tel: ATtleboro 1-2800

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Directory II. Components

52. Hermetic Seals.

Vacuum Tube Products Co., Inc., Calif., 15
Vitroseal Corp., Pa., 15
Zell Products Corp., Conn., 10, 15

Hybrid Junctions: See class 80

Iconoscopes: See class 76

Image orthicons: See class 76

Inductors: See class 43

Insulating materials: See class 89

Insulators, ceramic: See class 83

Insulators, plastic: See class 94

Insulators & spacers, vacuum tube: See class 99

Inverters: See class 45

53. Jacks, Jack Fields & Plugs.

5. Jacks
10. Jack fields
15. Patch cords
20. Plugs
25. Test clips
30. Test jacks
35. Test leads

A.P.M. Corporation, 252 Hawthorne Ave., Yonkers, N.Y., 20
See ads on pages 462, 634
Tel: YOnkers 8-2010

Accurate Electronics Corp., Ohio, 5, 10, 20

Aerolite Electronics Co., N.J., 5, 15, 20

Aerovox Corp., Mass., 5, 15, 20

Air-O-Tronics Engrg. Co., Calif., 5, 15, 20, 25, 30, 35

Alden Products Co., 121D N. Main St., Brockton 64, Mass., 30
See ads on pages 419, 691
Tel: JUniper 3-0160

Alden Systems Co., Mass., 5, 10, 15, 20, 30

Alpine Electronic Comp., Inc., Conn., 5, 20, 30

Amatom Electronic Hardware Co., Inc., N.Y., 5, 15, 20, 25, 30, 55

American Microphone Mfg. Co., 412 S. Wyman St., Rockford, Ill., 15
See ad on page 474
Tel: WOodland 8-9661

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 5, 20
See ad on page 166
Tel: BIshop 2-1000

Anchor Specialty Mfg. Co., Inc., N.J., 25

Associated Engrg. Corp., Mass., 15, 20, 25, 35

Audio Development Co., Minn., 5, 10, 15, 20

Automatic Electric, Sub. of Gen. Telephone & Electronics, Northlake, Ill., 5, 15, 20
See ad on pages 108-109
Tel: FIllmore 5-7111

Avnet Corp., Calif., 5, 20

Bayly Engrg. Ltd., Canada, 5

Belling & Lee Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 30
See ad on page 418
Tel: ENfield 3322

Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 5, 15, 20, 25, 30, 35
See ad on page 603
Tel: WAlker 5-6980

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Metaplast Co., Inc., N.Y., 5, 15
Micro Die, Inc., N.J., 10

Mitronics, Inc., 1291 Central Ave., Hillside, N.J., 5, 10, 15
See ad on page 619
Tel: WAverly 6-2250

Molding Corp. of America, R.I., 10
Multi-Tron Lab., Inc., Ill., 15

Mycalex Corp. of America, 125-B Clifton Blvd., Clifton, N.J., 5
See ad on page 102
Tel: PRescott 9-8866

Network Industries, Inc., N.J., 20
Networks Electronic Corp., Calif., 10, 15
Pacific Scientific Co., Calif., 15
Panseal, Inc., N.J., 20
Philadelphia Scientific Glass Co., Pa., 15, 20
Products Research Co., Calif., 5, 15, 20
Radian Labs., Inc., N.Y., 5, 10

Radio Frequency Laboratories, Inc., Powerville Rd., Boonton, N.J., 20
See ad on page 304
Tel: DEerfield 4-3100

Ross Metals Co., Milton, Pa., 10, 15

Scientific Electronic Laboratories, 866 Bergen St., Newark 8, N.J., 5, 10, 15
See ad on page 697
Tel: BIgelow 3-8675

Sealol Corp., R.I., 20
Sealtron Corp., Ohio, 10, 15
Silicone Seals, Inc., Ill., Silicone Rubber
Specialty Electronics Development Corp., N.Y., 5, 10, 15
Sperti Faraday Inc., Cooper Hewitt Elec. Co. Div., N.J., 5, 10, 15
Sphere Co., Inc., N.J., 5, 10, Silicone Rubber
Standard Telephones & Cables, Ltd., England, 15

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 15
See ad on pages 23-25
Tel: JUdson 6-2424

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 5
See ad on page 621
Tel: ARmory 1-0163

Telegraph Condenser Co., England, 5
Telegraph Condenser Co., Ltd., United Insulator Div., England, 5
Thermo Materials, Inc., Calif., 5, 10

Thor Ceramics, Inc., 225 Belleville Ave. Bloomfield, N.J., 5
See ad on page 620
Tel: PIlgrim 3-7797

Torwico Electronics, 1090 Morris Ave. Union, N.J., 5, 10
See ad on pages 116-117
Tel: ELizabeth 4-5650

Transline Associates, N.J., 15

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 10
See ad on page 63
Tel: EXmont 7-2145

United Components, Inc., N.J., 10, 15

U.S. Stoneware Co., Alite Div., P.O. Box 119, Orrville, Ohio, 5
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Tel: (Smithville, Ohio) MOnica 9-2271

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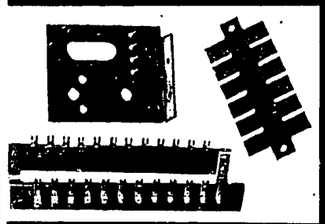

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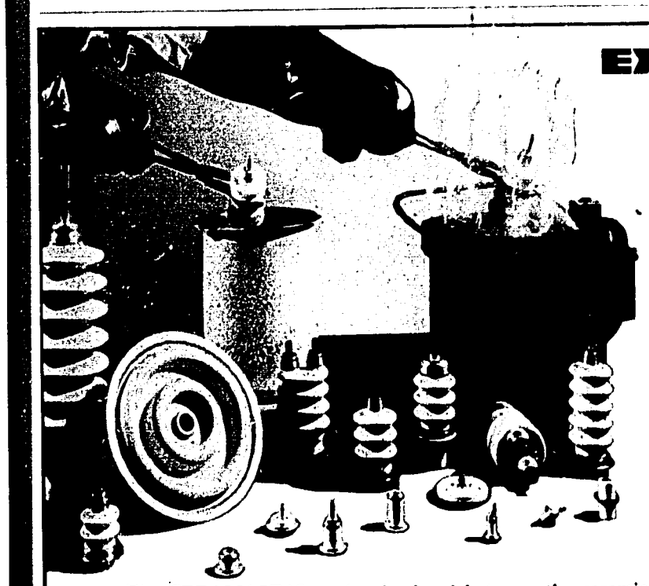

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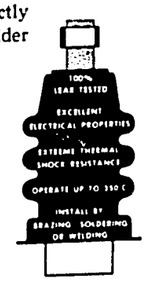

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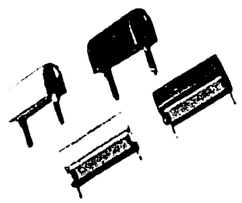

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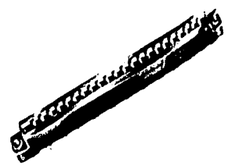
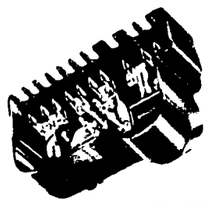
Unique torsion-bar contacts, provide consistent performance unaffected by repeated insertions of maximum and minimum tolerance boards. Available in various multiples of contacts.





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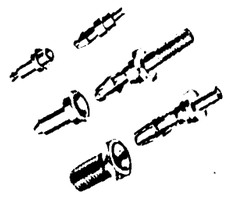
Stamped circuits, molded housings, special contacts custom-designed in a complete package to fit the application.



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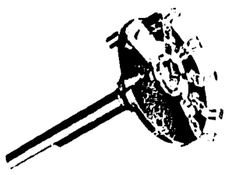

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ELECTRICAL DOT ASSEMBLIES

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For details, circle #421 on Reader Service Card

Directory II. Components

53. Jacks, Jack Fields & Plugs.

Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 5, 15, 30
See ad on page 693
Tel: TRowbridge 6-2800

Cannon Electric Co., Dept. 425, 3208 Humboldt St., Los Angeles 31, Calif., 5, 15, 20, 30, 35
See ad on page 184
Tel: CApital 5-1251

Carter Parts Co., Ill., 5, 20

Chester-Marton Electronics Corp., Pa., 15, 25, 35

Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 5, 20
See ad on pages 48-49
Tel: NEvada 2-2000

Circon Component Corp., Santa Barbara Municipal Airport, Goleta, Calif., 5, 20
See ad on page 484
Tel: WOodland 7-1113

Clover Industries, Inc., N.Y., 20

Coaxial Connector Co., Inc., N.Y., 5, 10, 15, 20

Component Mfg. Service, Inc., Mass., 15, 20

Derf Radio Co., N.Y., 5, 20, 25, 30, 35

Donmar Products, Inc., Colo., 25, 30

E-Z-Hook Test Products, Ky., 25

Eastern Specialty Co., Pa., 25, 30, 35

Eby, Inc., Hugh H., Pa., 5, 20

Ecco Electronic Components Corp., N.Y., 5, 10, 15, 20

Electrocraft, Inc., Ill., 5, 20

Electronic Techniques, Inc., Calif., 20

Electronics, Inc. of Pa., Pa., 35

Empire Electronics Co., Inc., N.J., 15, 35

Entlo Corp., N.J., 30

Engineered Electronics Co., Calif., 10

First Electronics Corp., Mass., 15, 35

Garde Mfg. Co., R.I., 20

General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 25, 35
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Tel: ROckford 8-9661

General Electric Co., Ltd. of England, England, 15, 20, 30, 35

General Radio Co., West Concord, Mass., 5, 15, 20
See ad on Cover 4
Tel: EMerson 9-4400

Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 25, 30
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Tel: FLeetwood 4-1040

Hallett Mfg. Co., Calif., 35

International Electric Ind., Inc., N.Y., 15, 35

I. T. & T. Royal Elect. Corp. Div., R.I., 20

Jaxex Electronics, Calif., 5, 15, 20, 25, 30, 35

Johnson Co., E. F., Minn., 5, 20

Jones Div., Howard B., Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 5, 20
See ad on pages 48-49
Tel: NEvada 2-2000

Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 5, 10, 15, 20
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Tel: SWiftwater 3-5000

Kurtz, John, N.Y., 25, 35, Jumper Leads

Lab-Tronics, Inc., Ill., 5, 15, 20, 25, 30, 35

Lerco Electronics, Inc., Calif., 5, 20

Leviton Mfg. Co., Inc., N.Y., 20

Litton Industries, U.S. Engineering Co., Div., Calif., 5, 20, 30

Mallory & Co., Inc., P.R., Ind., 20

Mandex Mfg. Co., Inc., Ill., 5, 30

Marine View Electronics, Inc., N.Y., 25

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 20
See ad on page 416
Tel: DAvenport 4-4108

Morse Co., Frank W., Mass., 20

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Full-size 'gator... great new insulator!

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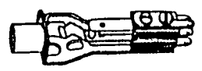
JACK — PLUGS — KEYS



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Thirty-five years of continuous production has produced fourteen basic types ranging from substantially all military types to specialized low cost units suitable for incorporating in toys as a sound generating device. All basic types produced in a wide assortment of variations.

Write for bulletins on these and the many additional standard stock items as well as an almost unlimited variety of manufactured-to-order products falling within the product classifications shown above.

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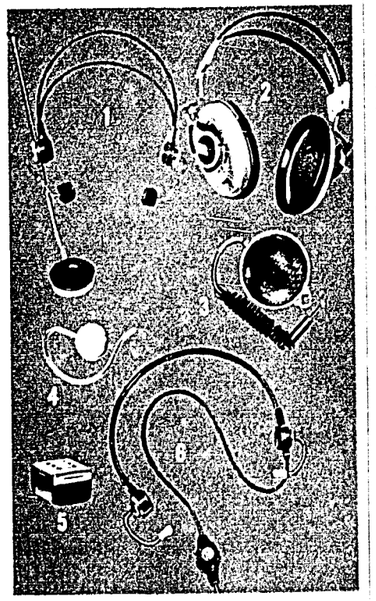

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For complete information on these and other Telex listening devices and accessories, write

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Telex Park, St. Paul 1, Minn., Dept. 102

See Telex ad in Class, "Transformers"
For details, circle #424 on Reader Service Card

Mueller Electric Co., 1558Y E. 31st St., Cleveland 14, Ohio, 25
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Tel: PRospect 1-5225

Murdock Corp., Mass., 20

National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 5, 20
See ad on page 462
Tel: YOnkers 8-6400

Nems-Clarke Co., Md., 5, 10, 15, 20

North Electric Co., N.Y., 5, 10, 15, 20, 25, 30, 35

North Electric Co., Ohio, 5, 10, 15, 20

Northern Electric Co., Ltd., Canada, 5, 10, 15, 20

Oppenheimer Plastics Inc., Pa., 20

Painton & Co., Ltd., England, 20

Pan-Air Electronics Corp., Calif., 5, 15, 30

Permonite Mfg. Co., Ill., 5, 20

Plastic Mold & Engineering Co., R.I., 20

Pomona Electronics Co., Inc., Calif., 15, 35

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Radio Engrg. Products Ltd., Canada, 10

Raytheon Co., Mass., 30

Richards Electrocraft, Inc., Ill., 5, 15, 20

Roflan Co., Mass., 5, 10, 15, 20

Ross Metals Co., Milton, Pa., 5, 15, 20, 25, 30

Royal Electric Corp., R.I., 20

Rye Sound Corp., N.Y., 5, 15, 20

Sealectro Corp., N.Y., 610 Lafayette Ave., Mamaroneck, N.Y., 5, 20, 30
See ad on page 692
Tel: OWens 8-5600

Smith, Inc., H. H., N.Y., 5, 15, 20, 25, 30, 35

Standard Electric Time Co., Mass., 5, 15, 20, 25, 30, 35

Standard Telephones & Cables, Ltd., England, 5, 20

Star Expansion Industries Corp., N.Y., 20

Stromberg-Carlson Div., General Dynamics Corp., N.Y., 5, 15, 20

Superex Electronics Corp., N.Y., 5, 20, 25

Switchcraft, Inc., 5561 N. Elston Ave., Chicago 30, Ill., 5, 10, 15, 20
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Tel: SPring 4-1515

Symphony Electronics Corp., Calif., 5, 20, 25, 30, 35

Taurus Corporation, 8 Coryell St., Lambertville, N.J., 30
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Tel: EXport 7-1570

Telephonics Corp., N.Y., 5, 20

Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 5, 15, 20
See ads on pages 466, 569
Tel: MIdway 6-7211

Tevco Insulated Wire, Calif., 5, 20

Trico Fuse Mfg. Co., Wisc., 25

Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 5, 10, 15, 20
See ad on page 465
Tel: LIbertyville 2-3700

Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 5, 20, 30
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Tel: LAsall 7-8400

United States Instrument Corp., Va., 5, 10, 15, 20, 30

Vector Electronic Co., 1100 Flower St., Glendale 1, Calif., Patch boards
See ad on page 549
CHapman 5-1076

W & M Mfg. Corp., N.Y., 5, 20

Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 5, 15, 20
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Tel: ROckford 8-9661

Waltham Horological Corp., Mass., 5, 15, 20

Whitso, Inc., Ill., 5, 30

Junctions, Hybrid: See class 80

Klystrons: See class 76

Knobs: See class 94

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Lacing cord & tape: See class 87

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54. Loudspeakers.

5. Commercial grade loudspeakers
7. Cones
10. Headphones
15. High-frequency
20. Low-frequency
25. Wide-range, 2 & 3 way systems

A.L.A. Industries, Inc., N.Y., Baffles

Acoustical Mfg. Co., Ltd., England, 25

Alert Products, Inc., N.J., 25

Ampex Audio, Inc., Calif., 5, 10

Argonne Electronics Mfg. Corp., N.Y., 5, 10

Argos Products Co., Ill., Speaker Baffles

Arnhold Ceramics, Inc., N.Y., 5, 15, 20, 25

Atlas Sound Corp., N.Y., 5, 15, 25

Audio-Video Corp., N.Y., 5, 25

Beam-Echo Ltd., England, 15, 20

Becker Electronics Mfg. Corp., N.Y., 5

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British Industries Corp., Wharfedale Div., N.Y., 15, 20, 25

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Cleveland Electrn., Inc., Ohio, 5, 15, 20, 25

Dictograph Products, Inc., N.Y., 5, 7, 10, 15, 20, 25

Du Kane Corp., Ill., 15

Duotone Co., Inc., N.J., 15, 20, 25

Electro-Voice, Inc., E. V. Instrument Div., Mich., 10, 15, 20, 25

Electronic Applications, Inc., Conn., 25

General Ceramics Corp., Arnhold Ceramics, Inc., Sub., N.Y., 5, 15, 20, 25

General Electric Co., Radio Receiver Dept., Conn., 15, 20, 25

General Electric Co., Specialty Electronic Components Dept., N.Y., 15, 20, 25

Goodmans Industries, Ltd., England, 5, 7, 15, 20, 25

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Hawley Products Co., 333 N. 6th St., St. Charles, Ill., 7
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Tel: SAint Charles 3130

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 25
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Tel: YUkon 3-3961

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Intelex Systems, Inc., N.Y., 15, 20, 25

Jensen Mfg. Co., Ill., 5, 15, 20, 25

Karlson Assoc., Inc., N.Y., Enclosure

Klipsch & Associates, Ark., 15, 20, 25

Knight Electronics, Ill., 25

I.E.E., Inc., D.C., 25

Lansky Die Cutting Corp., N.Y., Baffles

Lesa, S.P.A., Italy, 10, 25

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 5, 7, 15, 20, 25
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Tel: TExas 0-7711

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Marine Electric Corp., Galbraith-Pilot Marine Corp. Div., N.Y., 5

Marsland Engrg., Ltd., Canada, 5

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Murata Mfg. Co., Ltd., Japan, 10, 15

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Muter Co., Rola Co., Div., Ohio, 5

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Oxford Components, Inc., Ill., 5, 15, 20, 25

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Pimex, Inc., N.Y., 15

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Railroad Electronic Labs. of Omaha, Inc., Neb., 5, 25

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Roflan Co., Mass., 10

Rogers Electronic Tubes & Components, Canada, 5, 15, 20

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Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 10, 25
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Telephonics Corp., N.Y., 10

Telex, Inc., Dept. 102, 1633 Eustis St., St. Paul 1, Minn., 5, 10
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Tel: MIdway 6-7211

Thompson-Ramo-Wooldridge, Inc., Calif., 5

Transvision, Inc., N.Y., 25

Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 10
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Trutone Electronics, Inc., Calif., 25

United Audio Prods., Inc., N.Y., 5, 7, 15, 20, 25

University Loudspeakers, Inc., N.Y., 5, 15, 20, 25

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55. Magnets.

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10. Permanent

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Allen-Bradley Co., Wis., 10

Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y., 5
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Tel: BUtterfield 8-7403

Applied Radiation Corp., Calif., 5

Arnold Engineering Co., P.O. Box G Marengo, Ill., 10
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Tel: (Chicago) ANdover 3-6800

Aircraft Electronics, Ariz., 5

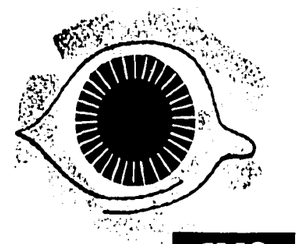
Crucible Steel Co. of America, Pa., 10

Device Development Corp., Mass., 5

Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 10
See ads on pages 285, 361, 433, 467, 531, 617
Tel: CHerry 6-2811

General Ceramics Corp., Dept. ID, Crows Mill Rd., Keasbey, N.J., 10
See ad on page 618
Tel: VAlley 6-5100

General Electric Co., Magnetic Material Section, Mich., 10



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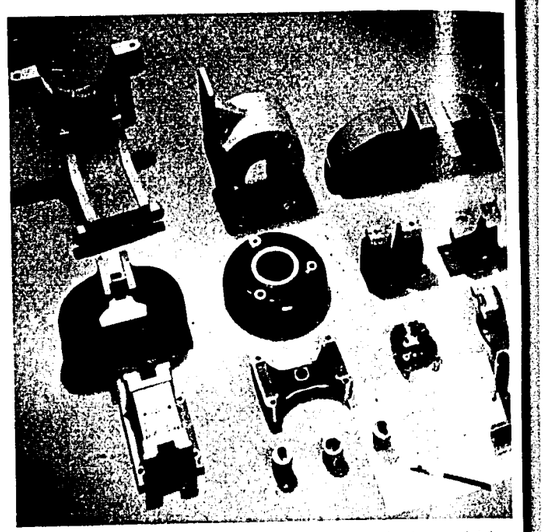
for your PERMANENT MAGNET requirements

Typical group of Arnold permanent magnets, both cast and sintered types.



Typical group of permanent magnet assemblies, aluminum jacketed.

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Arnold permanent magnets are available in all types of Alnico material, in sizes ranging from large castings weighing over 80 pounds to very small sintered parts weighing less than one gram.

Alnico V can usually be depended upon to deliver the greatest energy product to the magnetic circuit per unit weight of magnet material. It is therefore generally the first choice for a magnetic material except where special physical considerations are paramount.

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Arnox III is a molded-type magnet having high coercive force and moderately low residual induction and energy product. Principal uses are for magnetic requirements which are not stringent, and for a relatively short magnet of reasonable cross section. Accurate dimensions and close tolerances can be economically obtained. These magnets can be premagnetized before assembly, and have very high resistance to demagnetization. Slightly better magnetic properties are obtained in the pressing direction than in other directions.

ARNOX V

Arnox V is a ceramic permanent magnet material composed of highly oriented barium ferrite. It has many times the energy product of Arnox III and is comparable in many applications to Alnico V. Because of its high coercive force, its use is recommended in applications where a short magnetic length is desirable or where extremely high demagnetizing forces may be encountered. In many applications, it may be magnetized prior to assembly.

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Vicalloy is a carbon-free permanent magnet alloy containing about 10% vanadium, 50% cobalt and the balance iron.

Vicalloy may be fabricated in the form of castings, hot rolled bars and forgings, or cold rolled strip, wire and tubing. After suitable heat treatment, the material is quite readily machinable. Vicalloy is available on special order in bar, strip and thin tape for recording purposes. *For more information, write for "The Magneteer," Vol. 2, No. 1.*

CUNIFE

Cunife is a permanent magnet alloy of copper, nickel and iron which is malleable, ductile and machinable after final heat treatment. The magnetic properties of Cunife are developed by cold working and are directional with the best magnetic properties found only in the smaller sizes of rods or wires.

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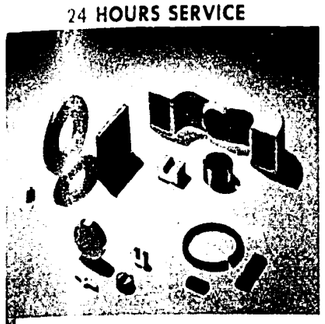

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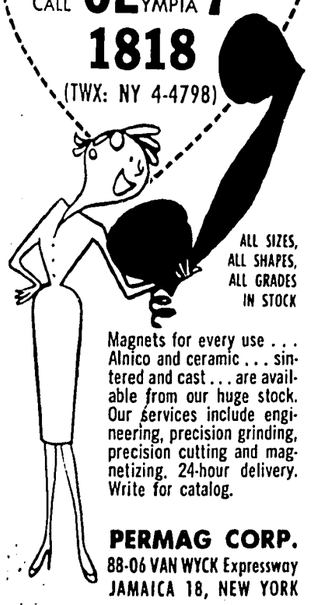

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JAMAICA 18, NEW YORK

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Directory II. Components

55. Magnets.

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Simonds Saw & Steel Co., N.Y., 10
Stackpole Carbon Co., Pa., 10
Steward Mfg. Co., D.M., Tenn., 10
Sylvania Electric Products, Inc., Mass., 5
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Magnetic Recording Tape and Wire: See class 63

Magnetrons: See class 76

Markers and Tags: See class 87

Mesh, wire: See class 82

Metals: See class 93

For further information about any of the products or services advertised in this book, circle the appropriate number on the Readers Service Card at the back of the book.

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• Alnico Cast • Barium Ferrite

• Alnico Sintered • Sincomax

Thomas & Skinner, Inc.

INDIANAPOLIS 7, INDIANA

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5. Ammeters
10. Clock Radio
15. Frequency indicating
20. Galvanometers
23. Liquid level indicators
25. Micro-ammeters
30. Milli-ammeters
32. Positioning indicators
33. Strain indicators
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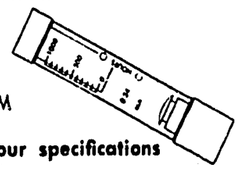

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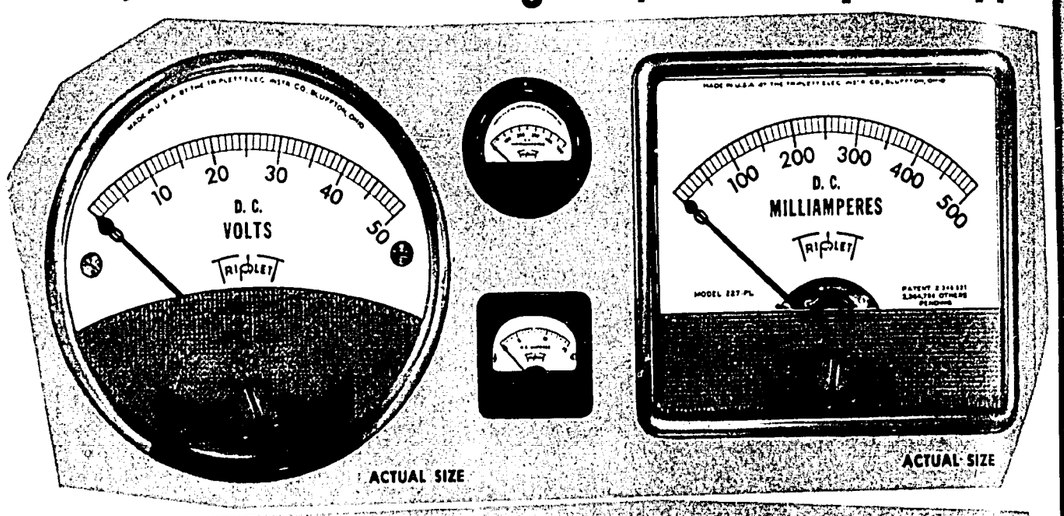

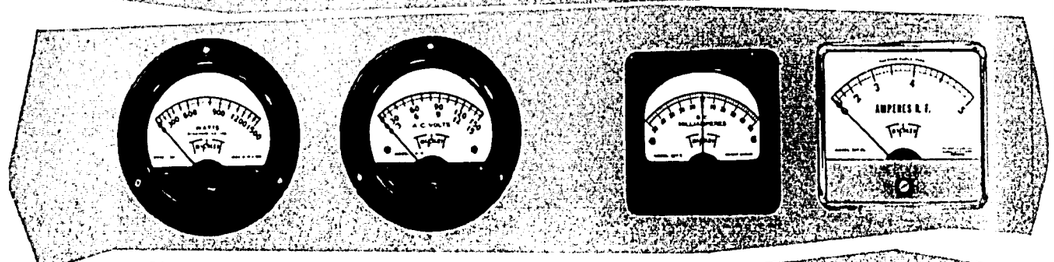

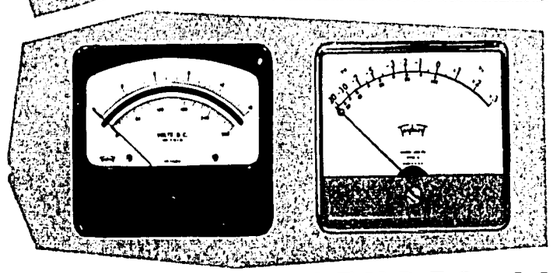

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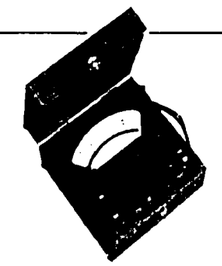

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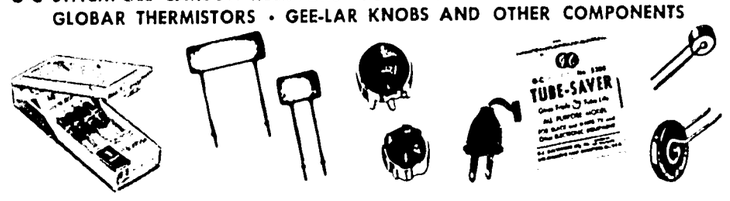

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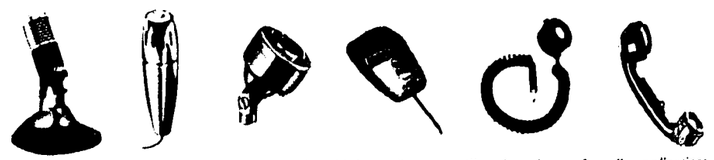

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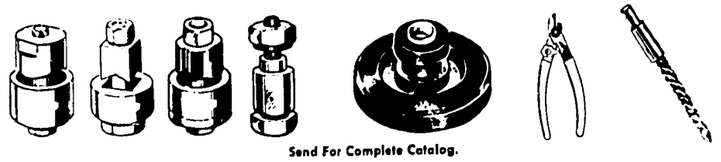

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Texas Instruments Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 23
See ad on pages 75-78
Tel: FLeetwood 7-5411

Thwing-Albert Instrument Co., Pa., 23, 33, 34

Trimount Instrument Co., Ill., 23

Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio, 5, 25, 30, 50, 55, 60
See ad on page 472
Tel: 323-W

Tullamore Electronics Corp., Ill., 35, 40

United Electric Controls Co., Mass., 34

U. S. Science Corp., Sub. Topp Indust., Inc., Calif., 32

Vacuum Tube Products Co., Inc., Calif., 35

Varo Mfg. Co., Inc., Tex., 15

Victory Engineering Corp., 114 Springfield Rd., Union, N.J., 23, 34
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Tel: MUrdock 8-7150

Wac Line, Inc., Ohio, 5, 15, 25, 30, 50, 55

Waldorf Instrument Co., Hayes & Sons Div., N.Y., 32, 33, 34, 50

Waveforms, Inc., N.Y., 55

Wayne Kerr Corp., 1633 Race St., Philadelphia 3, Pa., 50, 60
See ad on page 277
Tel: GArfield 5-2844

Welch Scientific Co., W. M., Ill., 5, 20, 25, 30, 50, 60

Westinghouse Electric Corp., Pa., 5, 15, 20, 25, 30, 32, 34, 45, 50, 55, 60

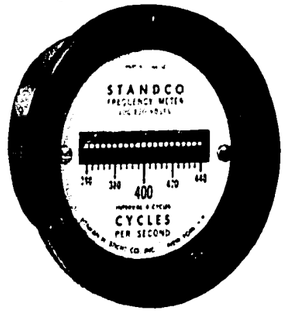
Westport Electric, Calif., 15

Winslow Co., Inc., N.J., 15, 20, 50, 60

Yellow Springs Instrument Co., Ohio, 34

Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 5, 15, 20, 25, 30, 50, 55
See ad on page 310
Tel: BEekman 3-6720

"STANDCO" VIBRATING REED FREQUENCY METERS



HERMETICALLY SEALED and Ruggedized 3½" and 2½" Sizes Meeting all MIL Specs

Normal Frequencies
25, 50, 60 or 400 Cycles
Special Ranges
from 15-1500 cycles

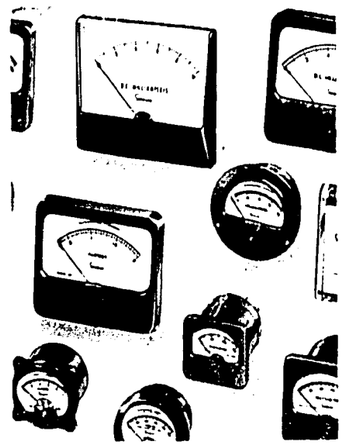
ALSO IN OTHER TYPES

PANEL MOUNTING: 3½" Flush Bakelite.
SWITCHBOARD MOUNTING: 7¼" round surface, or 4½" square semi-flush cases.
PORTABLES: In large or small cases.

Write for Bulletin 805

HERMAN H. STICHT CO., INC.
27 PARK PLACE NEW YORK 7, N. Y.

For details, circle #437 on Reader Service Card



These are Simpson panel instruments . . . engineered and built to stay accurate . . . available from stock or custom-built

Simpson
INSTRUMENTS THAT STAY ACCURATE

SIMPSON ELECTRIC CO.
5218 W. KINZIE ST., CHICAGO 44, ILLINOIS
Phone: ESTebrook 9-1121
In Canada: BACH-SIMPSON, LTD., LONDON, ONT.
For details, circle #438 on Reader Service Card

Microphones, geophysical:
See class 13

57. Microphones & Stands.

3. Aircraft
5. Carbon
10. Ceramic
15. Condenser
20. Crystal
25. Dynamic
30. Velocity
32. Magnetic
35. Microphone stands

ABC Sound Engrg. Co., N.Y., 10, 20, 25, 32

American Microphone Mfg. Co., Div. of GC-Textron, Inc., 412 S. Wyman St., Rockford, Ill., 3, 5, 10, 20, 25, 30, 32, 35
See ad on page 474
Tel: WOodland 8-9661

Argonne Electronics Mfg. Corp., N.Y., 20, 25, 32, 35

Astatic Corp., Ohio, 5, 10, 20

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Atomic Labs., Inc., Calif., 5

Audio-Video Corp., N.Y., 5, 10, 15, 20, 25, 30, 32, 35

B & K Instruments, Inc., Ohio, 15, 35

Brown Co., Irv, N.Y., 35

Bruel & Kjaer, Denmark, 15

Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y., 35
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Tel: JUdson 6-1420

Capps & Co., Inc., N.Y., 15, 20

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Electro-Voice, Inc., E. V. Instrument Div., Mich., 3, 10, 20, 25, 35

Electronic Applications, Inc., Conn., 15, 25, 35

Fen-Tone Corp., N.Y., 10, 20, 25, 30, 32, 35

General Radio Co., West Concord, Mass., 15, 20, 25
See ad on Cover 4
Tel: EMerson 9-4400

Gotham Audio Dev. Corp., N.Y., 15

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264

INDUCTION MOTORS CORP. ACQUIRES NEW DIVISION, ANNOUNCES LARGE EXPANSION PROGRAM

Company Changes Name to IMC Magnetics Corp.

WESTBURY, NEW YORK, AUGUST 3, 1959—Induction Motors Corporation, one of America's leading manufacturers of electro-mechanical components for the electronics, aircraft and missile industries, is launching a large-scale expansion program, it was announced by Charles Wohlstetter, Board Chairman, and Simon Saretsky, President.

It was also announced that the company has acquired an important new division and is changing its name to one more indicative of the expanding line of products it is offering in the electronic components field.

As of May 1, Induction Motors became IMC Magnetics Corporation, a name designed to make it clear that the company has moved beyond the area of manufacturing motors alone, Mr. Wohlstetter said. Shortly thereafter, construction will begin to double the size of IMC's plant in Westbury, Long Island, from 30,000 to 60,000 sq. ft.

The new IMC division is Gray & Kuhn, Inc., of Roslyn Heights, Long Island. Established by John E. Gray and John J. Kuhn in 1956, it designs and manufactures delay lines, pulse and blocking oscillator transformers, and filters—all of which have constantly widening applications in modern electronic equipment. Its delay lines—of the phase corrected, lumped constant and mamgnetostriction types—are being used in radar systems, color television, electronic computers, pulse generators, telemetering equipment, and broadband oscilloscopes.

Its blocking oscillator transformers—of the low current miniature variety, encapsulated in epoxy resin—are being used for the generation of rectangular pulses in electronic computers, pulse generators, television transmitters and telemetering equipment.

Its filters—of the band-pass and low-pass types—are being used in communication receivers, telemetering devices, and multi-plexing systems,

The Gray & Kuhn line, Mr. Wohlstetter said, fits logically into the IMC family of products and expands the number of components IMC produces for the data processing field. To date, the major percentage of Gray & Kuhn's volume has been for commercial use. Mr. Gray, formerly President of the Harnett Electric Division of Hazeltine Electronics Corp., will continue as President of the new IMC division. Mr. Kuhn, former Executive Vice President of Electro-Mechanical Products, Inc., will remain as Vice President.

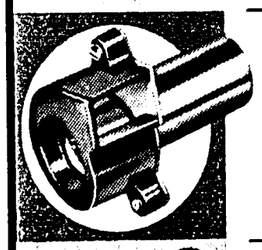
The new division represents IMC's second acquisition. The first, in 1956, was PSP Engineering Company of Maywood, California, the nation's largest designer and manufacturer of aircraft quality solenoids, and also a large producer of high precision synchros, resolvers, and stepping motors. PSP products are in use in speed control systems, launching devices, and general control systems on many of the major missile projects currently in work in the U.S.

Mr. Wohlstetter said the new addition in Westbury will house dust-controlled and air-conditioned manufacturing space and laboratories for the production of servo motors and servo tachometers. He added that the expansion stems from the company's continuous program of broadening its product lines.

IMC PRECISIONEERED MOTORS

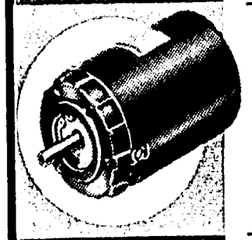
700 FRAME SERVO MOTOR

INPUT: 6-57 volts; 2 phase at 400 cps
FREQUENCY RANGE: 400-1000 cps
NUMBER OF POLES: 2, 4 and 6 poles
TYPICAL PERFORMANCE: 26/26 at 400 cps; No load Speed: 6,200 rpm; Stall Torque: 0.30 oz. in.; Power 3 watts/ø; Inertia: 0.65 gm cn²; Acceleration: 33,000 rad/sec²; Impedance: 133 + j117 ohms
WEIGHT: 1.6 ounces
DIMENSIONS: 0.750 Dia. x 1.062 Length
Bulletin 7F3



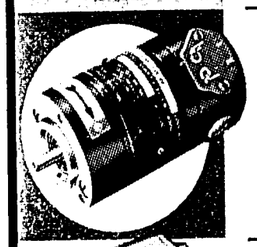
900 FRAME AC MOTOR

FREQUENCY: 320-1000 cps
AIR DELIVERY: (1½" Blower)*; 10 cfm @ 0"sp; 8 cfm @ 0.2"sp
RPM: 7000 @ 400 cps
WEIGHT OZ.: 7
WEIGHT OF MOTOR OZ.: 4½
*Also available in 1" blower size
Bulletin 9F4



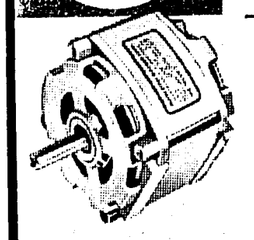
1600 FRAME MOTOR

HORSEPOWER: 1/300-1/10
FREQUENCY: 25-1000 cycles—var. 50-1000 cycles
VOLTAGE: 26-208
POLES: 2, 4, and 6 poles
PHASES: 1, 2, or 3
TYPES: Induction or Synchronous
BEARINGS: Ball or Sleeve
Available non-cooled or self-cooled
APPLICATIONS: Blower, Fan, Gear, Recording and Control



2000 FRAME DC MOTOR

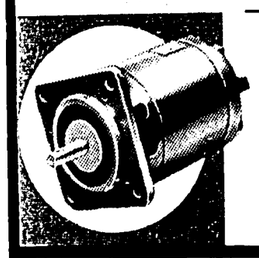
INPUT: 6-115 volts DC
OUTPUT POWER: 1/75 to 1/10 hp depending on speed, duty cycle and cooling
LIFE: 1000 hr brush life; 250 hrs at high altitude. Available with gear speed reducer and/or speed governor, shunt, series, or compound wound.
Bulletin 20F2



2900 FRAME HYSTERESIS MOTOR

VOLTS:	115	T.P.I. (oz.in.):	4.5
CPS:	60	T.P.O. (oz.in.):	5.0
WATTS INPUT:	24	T.St. (oz.in.):	4.0
AMPERES:	.22	CAPACITOR (mfd):	2.5
NUMBER OF POLES:	4	220 VOLTS A.C.:	∫
RPM:	1800	WEIGHT:	1 lb
H.P.:	1/125		

Hysteresis Catalog



3800 FRAME AC MOTOR

INPUT: 26-230 volts AC; 1, 2 and 3 phase
INPUT FREQUENCY: 25-400 cycles
NUMBER OF POLES: 2, 4, 6, 8 and 12 poles
OUTPUT POWER: Induction motors—to 1 hp. Torque motors—10 to 200 oz. in. stall torque; Hysteresis synchronous motors—1/200 to 3/4 hp (can be wound for single, dual or three speed.)
BEARINGS: Ball or Sleeve
WEIGHT: 8-11 lbs.
MOUNTING: Round or square flange and ¾" base
Bulletin 38F6

IMC's versatile engineering staff is available to meet your specific design requirements

imc Magnetics Corp.
Formerly Induction Motors Corp.
570 MAIN STREET/WESTBURY, L.I., N.Y./EDGEWOOD 4-7070 • 6058 WALKER AVE./MAYWOOD CALIF.

Directory II. Components

57. Microphones & Stands.

Greibach Research & Development Labs., N.Y., 3, Magnetic Throat
Hal-Hen Co., N.Y., Earphones
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 20
See ad on page 328
Tel: YUkon 3-3961
Industrial Television, Inc., N.J., Megaphones
Kellogg Switchboard & Supply Co., Ill., 15
Knowles Electronics, Inc., Ill., 32
Lear, Inc., Lear Cal Div., Calif., 3
Lesa, S.P.A., Italy, 20, 25, 30, 35
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 3, 15, 25, 30, 35
See ads on pages 270, 301
Tel: TExas 0-7711
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Medical-Electronics Development Co., N.Y., 15
Metropolitan Electronics & Instruments Co., N.Y., 25, 30, 32, 35
Motorola Communications & Electronics, Inc., Ill., 3, 25
Murata Mfg. Co., Ltd., Japan, 10
National Cine Equipment, Inc., N.Y., 35
Northern Electric Co., Ltd., Canada, 25
Omega Instrument Co., Calif., 15
Paragon Electric Co., Wis., 35, 40
Photocon Research Products, Calif., 15
Plastic Mold & Engineering Co., R.I., 25
Port-O-Vox Corp., N.Y., Wireless RF Microphone
Racal Engrg., Ltd., England, 32
Racon Electric Co., Inc., N.Y., 35
Remler Co., Calif., 32
Roffan Co., Mass., 3, 5, 25, 30, 32, 35
Ronette Acoustical Corp., N.Y., 20
Schindlers, Calif., 15
Shure Brothers, Inc., Ill., 5, 10, 20, 25, 30, 32, 35
Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 10, 32
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Tel: LYric 2-6400
Standard Telephones & Cables, Ltd., England, 15, 25, 30, 35
Symphony Electronics Corp., Calif., 20
Tandberg of America, Inc., N.Y., 15, 20, 25
Telephonics Corp., N.Y., 3, 5, 25, 32
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 3, 25, 32
See ads on pages 466, 569
Tel: MIdway 6-7211
Tibbetts Industries, Inc., Me., 20, 32
Turner Co., Iowa, 5, 20, 25, 35
United States Instrument Corp., Va., 32
Universal Microphone Co., Calif., 3, 5, 10, 15, 20, 25, 30, 32, 35
Vitavox Limited, England, 25, 35

Microwave amplifiers: See class 36

Microwave antennas: See class 37

Microwave attenuators: See class 38

Microwave filters: See class 50

Microwave power supplies: See class 61

Microwave receivers: See class 18

Microwave transmitters: See class 18

Microwave tuners: See class 77

Microwave, waveguides: See class 80

Monoscope tubes: See class 76

58. Motors & Synchros.

5. Blower & fan
7. Clock radio
10. Dynamotors
12. Fractional HP
15. Frequency changers
20. Motor-generators
25. Phonograph
30. Servo
32. Speed regulating
34. Synchros
35. Synchronous motors
40. Timing

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Airborne Accessories Corp., N.J., 12
Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, N.Y., 5, 12, 25, 35
See ad on page 394
Tel: AMityville 4-3700
Allard Instrument Corp., N.Y., 5, 12, 30
American Electronics, Inc., Calif., 5, 12, 15, 20, 30, 34
American Machine & Foundry Co., Leland Airborne Prods. Div., Ohio, 20, 35
American Measurements & Control, Inc., Mass., 30
Amglo Corp., 4333 N. Ravenswood Ave., Chicago 13, Ill., 12, 35, 40
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Tel: BUckingham 1-2727
Ashland Electric Products, Inc., N.Y., 5, 12, 35
Barber-Colman Co., Dept. 60D, 1211-9 Rock St., Rockford, Ill., 12, 20, 30, 35
See ad on page 478
Tel: WOodland 8-6833
Basler Electric Co., Ill., 30
Beckman Instruments, Inc., Helipot Div., Calif., 30, 34
Bekey Electric Co., Inc., Calif., 20, 30, 35
Bendix Aviation Corp., Ind., 10, 20, 30, 34, 35
Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 20, 30, 32, 34
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Tel: ATlas 8-2000
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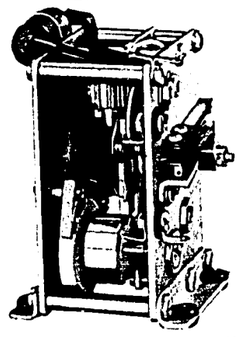
Bodine Electric Co., Ill., 12, 35
Boehm Co., R. A., N.Y., 5, 12, 20, 32
Borg Equipment Div., Amphenol-Borg Electronics Corp., 120 S. Main St., Janesville, Wis., 12, 30, 35
See ad on page 530
Tel: PLeasant 4-6616
Borg-Warner Corp., Pesco Prods. Div., Ohio, 5, 12, 20
Brevel Prods. Corp., N.Y., 12
Bucknell Engrg. Co., Inc., Calif., 15, 20
Carter Motor Co., Ill., 10, 12, 15, 20
Celco—Constantine Engineering Laboratories Co., 70 Island Ave., Mahwah, N.J., 5, 12, 20, 30, 34, 35
See ads on pages 36-37, 88-89
Tel: DAvis 7-1123
Christian-Dunker Co. of Germany, Conn., 12, 25, 35

AMGLO Constant Speed DC Motors



Reed controlled, DC Motors offer constant speed from 900 RPM to 1 Rev. Per Day.

- 3 to 110 V. DC operating voltage.
- 0.1 to 2 Watt Input.
- Built to specifications for use in timing, signalling and missile control.

Write for Quotation and Recommendations

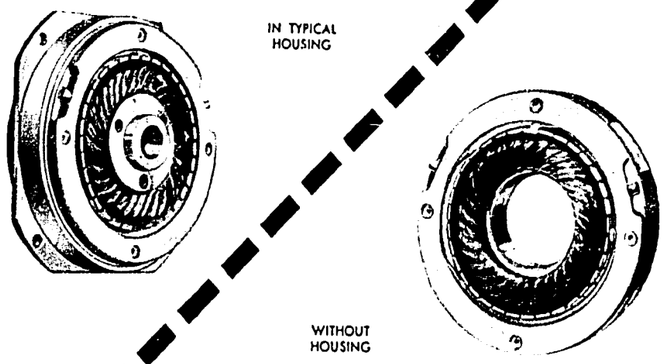
AMGLO CORPORATION
4333 No. Ravenswood Ave.
Chicago 13, Ill.

For details, circle #440 on Reader Service Card

a Complete line of

D.C. TORQUE MOTORS

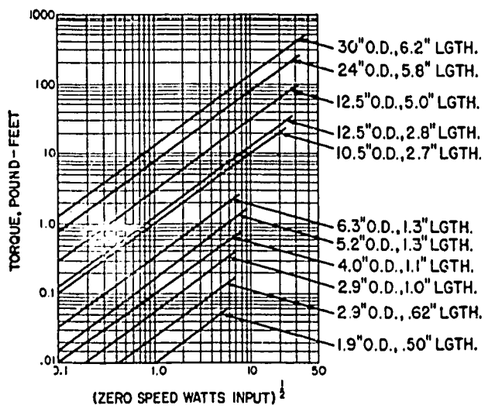
FOR DIRECT DRIVE SERVO APPLICATIONS



- High angular acceleration by utilizing direct drive (4,000 rad. sec.^{2})
- High peak torque per unit volume
- Minimum control and total power input
- Rapid electrical response
- Optimum shape for compact systems

THIS DESIGN TAKES MAXIMUM ADVANTAGE OF THE PROPERTIES OF DC CONTROL POWER AND PERMANENT MAGNET FIELDS.

TYPICAL RATINGS



Matching Rotary Amplifiers Also Available

For further information and Catalog write to:

INLAND MOTOR CORPORATION

MANUFACTURERS OF ELECTRICAL MACHINERY

18 WALTER STREET

PEARL RIVER • NEW YORK

For details, circle #441 on Reader Service Card

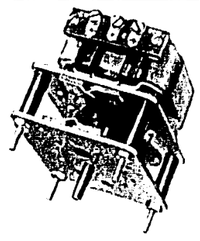
THE MARK OF QUALITY

BARBER COLMAN

quick solutions to various electronic problems

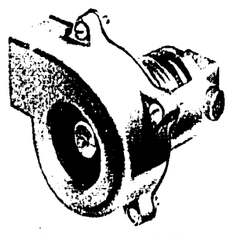
Ultra-Sensitive Relays

Operating on input powers of 40 to more than 1,000 microwatts, the Barber-Colman Micropositioner polarized relay is ideal as a differential relay in electronic plate circuits, as a null detector in resistance bridge circuits, or as an amplifier in photoelectric circuits. Resonant relays also available from Barber-Colman.



Reversible Small Motors

Shaded pole a-c type, up to 1/25 hp . . . adaptable to a variety of control circuits, including transistor and vacuum tube types. Ideal for use with servo mechanisms and other follow-up and positioning units. Available with or without gearheads. A wide range of gear ratios for gear motors . . . open or enclosed.



Small Motors with Blowers

In both a-c and d-c types with cooling fans or blowers for quick, dependable dissipation of heat from tubes, circuit components and other equipment mounted in confined enclosures.

BARBER-COLMAN COMPANY

Dept. 60D, 1211-9 Rock Street, Rockford, Illinois

For details, circle #442 on Reader Service Card

Directory II. Components

58. Motors & Synchros.

Clifton Precision Products Co., Inc., Marple & Broadway, Clifton Heights, Pa., 20, 30, 34
See ad on pages 46-47
Tel: MAdison 6-2101

Continental Electric Co., N.J., 5, 15, 20
Control Data Corp., Minn., 12
Controls Co. of America, Ill., 5, 12, 25, 30, 34, 35, 40
Cramer Controls Corp., Conn., 35, 40
D & R, Ltd., Calif., 20, High Frequency
Daco Instrument Co., N.Y., 30, 34, 35, 40

Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 12, 25, 35
See ad on pages 34-35
Tel: LOcust 4-3131

Daystrom Transcoil Corp., Div. of Daystrom, Inc., Worcester, Montgomery County, Pa., 30
See ad on page 346
Tel: JUno 4-2421

Diehl Mfg. Co., N.J., 20, 30
Dominion Electrohome Industries, Ltd., Canada, 5, 12
Duotone Co., Inc., N.J., 5, 40, 45, 50
Dynamic Instrument Co., Inc., Mass., 30
Eastern Air Devices, Inc., N.H., 5, 12, 20, 30, 35

Edison Industries, Thomas A., Instrument Div., 61 Lakeside Ave., West Orange, N.J., 20, 30
See ad on page 345
Tel: ORange 3-6800

Edwards Eng. Co., N.Y., 10, 12, 20
Eicor Div., Ill., 5, 10, 12, 15, 20, 35
Electric Auto Lite Co., Ohio, 5, 12, D.C. Motors & Generators
Electric Indicator, Inc., Conn., 5, 12, 20, 30, 32, 34, 35
Electric Machinery Mfg. Co., Minn., 20, 35
Electric Motors & Specialties, Ind., 12, 15, 20
Electric Regulator Corp., Conn., 32
Electric Specialty Co., Conn., 10, 12, 15, 20, 35
Electronic Communications, Inc., Fla., 12, 30
Electronic Specialty Co., Calif., 12, 30
Engineering Associates, Ohio, 15, 34
Evershed & Vignoles, Ltd., England, 12, 30, 32, 34, 35
Fasco Industries, Inc., N.Y., 5, 12, 25
Forney Industries, Aviation Div., Colo., 20
Fuchs Impulse Motor Servomechanisms, N.Y., 30, Impulse Synchronous
G-M Labs., Inc., Ill., 30
Gap Instrument Corp., N.Y., Step Motors
Garrett Corp., Air Research Mfg. Div., Calif., 5, 12
General Controls Co., Calif., 12, 30
General Electric Co., Apparatus Sales Div., N.Y., 10, 12, 15, 20, 25, 30, 32, 35
General Electric Co., Clock & Timer Dept., Mass., 7, 40
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Gerator Corp., Va., 15, 20
Gerst & Co., Paul E., Ill., 12, 15, 20
Gleason-Avery, Inc., N.Y., 25, 35, 40
Globe Industries, Inc., Ohio, 5, 12, 20, 30, 32, 34, 35, 40
Hamilton Watch Co., Industrial Div., Pa., 7, 40
Hansen Mfg. Co., Inc., Ind., 35, 40

Haydon Co., A. W., 240 North Elm St., Waterbury 20, Conn., 40
See ad on page 518
Tel: PLaza 6-4481

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Hertner Electric Co., Ohio, 5, 12, 15, 20, 30, 35
Hoover Co., Ltd., Canada, 5, 10, 12
Hoover Electric Co., Calif., 5, 10, 12, 20, 30, 35
Horlick Co., Inc., William J., Mass., 20
Howard Industries, Inc., Wis., 5, 12, 20, 30, 35, 40
H.G Electric Ventilating Co., Ill., 5

I.M.C. Magnetics Corp., 570 Main St., Westbury, N.Y., 5, 10, 12, 15, 20, 30, 32, 34, 35
See ad on page 476
Tel: EDgewood 4-7070

Imperial Electric Co., N.Y., 20
Induction Motors of Calif., Calif., 30, 34
Industrial Electronics of Canada, Canada, 15
Ingraham Co., Conn., 7, 35, 40

Inland Motor Corp., 18 Walter St., Pearl River, N.Y., 12, 20, 30, 35
See ad on page 478
Tel: PEarl River 5-4015

Instrument Components of N.J., Inc., N.J., 12, 20, 30, 40
Inteles Systems, Inc., N.Y., 5
Jack & Heintz, Inc., Ohio, 5, 10, 12, 20
Kato Engineering Co., Minn., 15, 20, 35

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 12, 20, 30, 34, 35
See ad on page 348
Tel: GRegory 2-1000

Kelvin & Hughes, Ltd., N.Y., 30, 35
L.E.E., Inc., D.C., 35
Land Air, Inc., Ill., 12
Lear, Inc., Lear-Romec Div., Ohio, 5, 12, Torque
Lesa, S.P.A., Italy, 5, 12, 25
Librascope, Inc., Calif., 30
Litton Industries, Md. Div., Md., 30, 34
Luther Manufacturing Co., Calif., 5, 30, 34, 35
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Mamco Corp., Wis., 5, 12
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Ohio Crankshaft Co., Tocco Div., Ohio, 20

Oster Mfg. Co., Avionic Div., 1 Main St., Racine, Wis., 5, 12, 20, 30, 32, 34
See ad on page 480
Tel: MElrose 7-4445

P.S.P. Engineering Co., Calif., 30
Pioneer Gen-E-Motor Corp., Ill., 20
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Radio Development & Research Corp., N.J., 5, 10, 20
Rae Motor Corp., Wis., 5, 12
Redmond Co., Inc., Mich., 5, 10, 12, 20, 25
Reynolds Electric Co., Ill., 12, 35, 40

Ripley Co., Inc., 1 Factory St., Box 31, Middletown, Conn., 5
See ad on page 396
Tel: DIamond 6-6679

Robbins & Myers, Inc., Motor Div., Ohio, 5, 12, 15, 20, 35

Robertshaw-Fulton Controls Co., Acro Div., 2040 E. Main St., Columbus 16, Ohio, 12
See ad on page 555
Tel: CLearbrook 3-8531

Rotating Components, Inc., 267 Green St., Brooklyn 22, N.Y., 5, 12, 15, 20, 30, 35
See ad on page 396
Tel: EVergreen 9-3490

Sangamo Electric Co., Ill., 10, 12, 20, 30, 34, 35, 40
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Servomechanisms, Inc., Calif., 20, 30, 32, 34, 35, 40
Servomechanisms, Inc., N.Y., 12, 20, 30, 35

Servo-Tek Products Co., Inc., 1086 Gottle Rd., Hawthorne, N.J., 5, 12, 20, 30, 32
See ad on page 350
Tel: HAwthorne 7-3100

Siemon Mfg. Co., Ill., 5, 10, 12, 15, 20, 30, 34, 35, 40
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Societe Industrielle de Sonceboz, Switzerland, 7, 12, 25, 30, 35, 40
Stancil-Hoffman Corp., Calif., 32

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 32, 40
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

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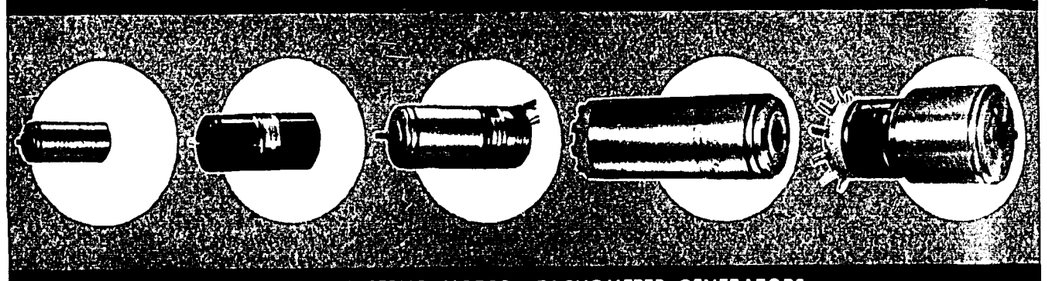
SERVO MOTOR TACH GENERATORS

to your precise specification

Oster®

- Both Damping and Integrating types available with parameters to your requirement.
- Complete size range. 8, 10, 11, 15, 18. Can be designed with gear train.
- 54 C to 125 C ambient temperature range.
- Designed to MIL-E 5272.
- Assembled under closely controlled environmental conditions.



400 CPS SERVO MOTOR – TACHOMETER GENERATORS

Oster Type	Size	Length Inches	Wt. Oz.	Rotor Inertia gm cm²	MOTOR					GENERATOR				
					Rated Voltage Ø 1	Ø 2	No load speed RPM	Watts per phase @ Stall	Stall Torque OZ. IN.	Excit. Volt.	Output Volts per 1000 RPM	Lin.% to 3600 RPM	Null MV	Phase Shift @ 25
8MTG-6201-01	8	1.850	2.3	0.77	26	40/20	6,500	2.2	0.16	26	0.25	0.5	15	± 5°
*10MTG-6228-02	10	2.157	4.2	0.72	115	115/57.5	9,500	2.8	0.26	115	0.45	1.5	19	±15°
10MTG-6229-12	10	2.100	2.9	1.09	33/16.5	52/26	9,500	3.0	0.28	26	0.45	1.5	13	±15°
*10MTG-6229-03	10	2.100	2.9	1.09	26	26	10,500	3.0	0.26	18	0.3	1.5	12	±15°
10MTG-6229-15	10	2.100	2.9	1.09	26	26	10,500	3.0	0.26	26	0.3	1.5	12	±15°
*10MTG-6232-05	10	2.104	4.2	1.1	115	36/18	6,500	3.5	0.26	115	0.30	1.5	15	±15°
11MTG-6251-13	11	2.531	7.0	1.3	115	115/57.5	6,500	3.5	0.63	115	0.55	0.5	19	±15°
11MTG-6251-00	11	2.531	7.0	1.1	115	40/20	6,500	3.5	0.63	115	0.55	1.5	19	±15°
11MTG-6254-01	11	2.200	6.0	1.1	115	115/57.5	6,500	3.5	0.63	115	0.55	1.5	19	±15°
15MTG-6280-01	15	3.281	14.0	5.3	115	115/57.5	5,000	6.2	1.5	115	3.0	0.2	13	± 5°
†*15MTG-6276-03	15	3.875	15.0	4.4	115	57.5	8,500	5.8	0.70	115	2.75	0.2	13	± 05°
18MTG-6302-02	18	3.680	20.0	5.7	115	115/57.5	9,000	16.0	2.7	115	3.0	0.2	13	± 5°
18MTG-6302-04	18	3.680	20.0	5.7	115	115/57.5	4,800	9.2	2.4	115	3.0	0.2	13	± 5°

*These units designed for 85°C ambient but same characteristics can be designed for 125°C. †Additional 21.4 watts for heater, the values given are independent of ambient temperature.

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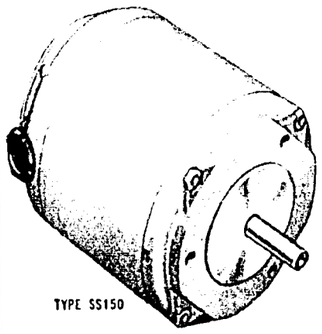
- CAN BE USED AS A D-C STEPPING MOTOR
- 72 RPM SHAFT SPEED WITHOUT GEARS
- STARTS AT FULL 150 OUNCE-INCHES TORQUE



TYPE SS150

A SLO-SYN Synchronous Motor is an enclosed, permanent magnet type synchronous a-c motor adaptable for a wide variety of control applications. At 60 cycles the speed accurately remains at a constant 72 RPM without gear reduction. A single-pole, three-position switch can give instant starting, stopping and reversing control because the motor has three leads only. When used as a stepping or "inching" motor, d-c impulses are converted into either 200 or 400 precise increments of one revolution of the motor shaft.

RATINGS AND SPECIFICATIONS

INPUT	120 volts, 40/70 cycles, 1 phase
OUTPUT SPEED	72 RPM at 60 cycles
CURRENT	0.3 ampere maximum at 60 cycles
TORQUE	150 ounce-inches
WEIGHT	6.5 pounds
SHAFT DIAMETER	3/8"
SHAFT LENGTH	1-3/16"
DIMENSIONS	4-1/4" dia., 4-3/4" depth

SLO-SYN Synchronous Motor types are available with a resistor and a capacitor integrally mounted in an enclosure on the end of the motor if desired. Planetary gear types are also available which have specially-designed speed reduction assemblies to provide speeds of 3.323, 0.665, 0.133 or 0.027 RPM.

WRITE FOR SLO-SYN SYNCHRONOUS MOTOR BULLETIN

THE SUPERIOR ELECTRIC COMPANY
590 Tripp Avenue, Bristol, Connecticut

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Directory II. Components

58. Motors, Synchros.

Stewart & Stevenson Services, Inc., Tex., 20
Summers Gyroscope Co., Calif., 12, 30, 32, 34, 40
Superior Electric Co., 590 Tripp Ave., Bristol, Conn., 35
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Tel: LUdlow 2-9561
Syntorque, Inc., N.Y., 12, 15, 20, 30, 35
Technical Electronics Corp., Calif., 25, 35
Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 30
Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 35
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Tel: JUdson 2-3030
Turner & Co., Calif., 15, 20, 32, 35, Precision Freq. Controlled Alternators
United Aircraft Corp., Ketay Dept., Norden Div., N.Y., 30, 34
United Aircraft Corp., Norden Div., Conn., 34
United Pressed Products Co., Ill., 12, 25
U. S. Electrical Motors, Inc., Calif., 5, 12, 32, Gear Motors
Universal Electric Co., Mich., 5, 12
Wac Line, Inc., Ohio, 32
Waldorf Instrument Co., Huyck & Sons Div., N.Y., 30
Warren Mfg. Co., Inc., Mass., 20
Western Devices, Inc., 600 W. Florence Ave., Inglewood, Calif., 5
See ad on page 624
Tel: ORegon 8-7827
Western Gear Corp., Electro Parts Div., Calif., 5, 12, 20, 30, 35, 40
Westinghouse Electric Corp., Pa., 5, 12
Wincharger Corp., E. Seventh & Division Sts., Sioux City 2, Iowa, 10, 12, 20
See ad on page 256
Tel: 2-1844
Wright Machinery Co., N.C., 5, 12, 30, 34, 35
Yokogawa Electric Works, Inc., 40 Worth St., New York 13, N.Y., 30, 35
See ad on page 310
Tel: BEekman 3-6720

Multitesters: See class 12

Nameplates: See class 87

Neon lights: See class 60

Nuts: See class 87

Orthicons, image: See class 76

Oscilloscopes: See class 23

Permanent magnets: See class 55

59. Phonographs, Pick-ups, Record Changers, etc.

5. Pick-ups—crystal
10. Pick-ups—dynamic
15. Pick-ups—magnetic
20. Pick-ups—reluctance
25. Playback arms
30. Record changers
35. Record players
40. StylI—diamond
45. StylI—metallic
50. StylI—sapphire
55. Tape phonographs & playback equipment

A.P.W. Company, N.J., 15
Admiral Corp., Ill., 30, 35
Airtronix Dev. Corp., N.Y., 35
Aldshir Mfg. Co., Inc., N.Y., 40, 45, 50
American Elite, Inc., N.Y., 30
American Microphone Mfg. Co., Div. of GC-Textron, Inc., 412 S. Wyman St., Rockford, Ill., 5, 25
See ad on page 474
Tel: WOodland 8-9661
American Phono Needle Co., N.Y., 5, 40, 45, 50
Andrea Radio Corp., N.Y., 35
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Audio-Video Corp., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55
Autocrat Electronics Co., Ill., 35
Beam-Echo, Ltd., England, 55
Birmingham Sound Reproducers, Ltd., England, 5, 30
Califone Corp., Calif., 35
Capps & Co., Inc., N.Y., 50
Channel Master Corp., N.Y., 35
Components Corp., N.J., 25, 35
Cook Laboratories, Inc., Conn., Hi Fi Record
Diamond Tool Engrg. Co., Mass., 40, 50
Dictograph Products, Inc., N.Y., 55
Dyna-Empire, Inc., 1075 Stewart Ave., Garden City, L.I., N.Y., 15, 25, 35
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Tel: PIoneer 1-2700
Electro-Sonic Labs., Inc., N.Y., 10, 25
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Electrovox Co., Inc., N.J., 40, 45, 50
Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 5
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Fidelitone, Inc., Ill., 40, 45, 50
Fonda Corp., Pa., 55
Garrard Sales Corp., N.Y., 30, 35
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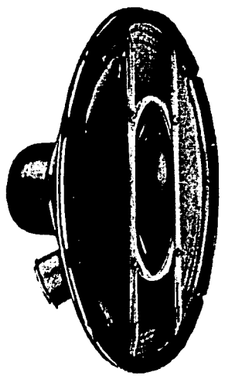
General Electric Co., Specialty Electronic Components Dept., N.Y., 15, 20, 25, 40, 50
Glaser-Steers Corp., N.J., 30
Godfrey Mfg. Co., Ill., 35
Gotham Audio Dev. Corp., N.Y., 10, 25



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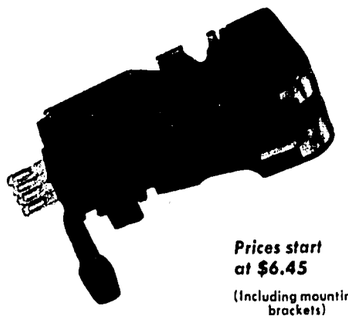

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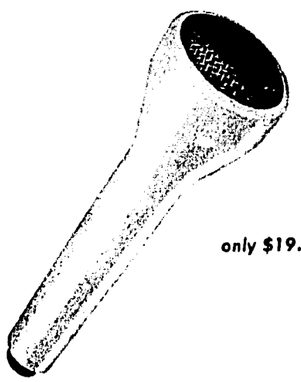

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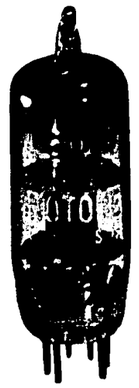

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Directory II. Components

59. Phonographs, Pick-ups, Record Changers, etc.

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 30, 55
See ad on page 328
Tel: YUkon 3-3961
Herold Radio & Electr. Corp., N.Y., 35
Jensen Industries, Inc., Ill., 5, 40, 45, 50
Keller, Jr., Hugo P., N.Y., 50
Klein Electr. Co., Calif., Demagnetizer
Lesa, S.P.A., Italy, 5, 25, 30, 35, 55
M P Engineering Co., Conn., 35
Marconi's Wireless Telegraph Co., Ltd., N.Y., 35
Materials for Electronics, N.Y., 40, 50
Metropolitan Electronics & Instruments Co., N.Y., 15, 30, 40, 45, 50, 55
Midwestern Instruments, Inc., Okla., 55
Muter Co., Ill., Pick-ups, Ceramic
Newcomb Audio Products Co., Calif., 35
Pacific Transducer Corp., Calif., 15, 20 25, 40, 50
Pfanstiehl Chemical Corp., Ill., 40, 45, 50
Pickering & Co., Inc., N.Y., 15, 20, 25, 40, 45
Precision Radiation Instruments, Inc., Calif., 35
Precision Styli Corp., Superior Abrasives Lab., N.Y., 40
Radio Craftsmen, Calif., 35
Radio Music Corp., N.Y., 15, 20, 25, 40
Recoton Corp., N.Y., 15, 20, 25, 40, 45, 50
Rek-O-Kut Co., Inc., N.Y., 25, 35
Rockbar Corp., N.Y., 30, 35
Ronette Acoustical Corp., N.Y., 5, 25
Scott, Inc., H. H., Mass., 15, 25, 35
Seeburg Corp., Ill., 30, 35, 55
Shure Brothers, Ill., 5, 15, 25, 40, 50
Siegler Corp., Bogen-Presto Co. Div., N.J., 25, 35, 55
Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., Pickups—Ceramic
See ad on page 482
Tel: LYric 2-6400
Swiss Jewel Co., Pa., 40, 50
Symphony Electronics Corp., Calif., 5
Tetrad Co., Inc., N.Y., 40, 50
Translite Electronics Corp., Ill., 55
Ultradyne, Inc., N.M., 20
United Audio Prods., N.Y., 5, 30, 35
V-M Corporation, Mich., 30, 35, 55
Warwick Mfg. Corp., Ill., 30, 35, 55
Waters Conley Co., Inc., Minn., 35
Weathers Industries, N.J., 5, 20, 35, 40
Webster Electric Co., Wis., 5, 25, 55
Aerolite Electronics Co., N.J., 5
Aerolux Light Corp., N.Y., 10, 15

Phosphors: See class 99

Photoconductors: See class 68

Photo multiplier: See class 75

Picture tubes: See class 74

60. Pilot Lights & Assemblies.

5. Brackets, jewels, mounts
10. Incandescent lights
15. Neon lights

Aeronautical Electric Co., 5656 Northwest Hwy., Chicago 46, Ill., 5, sockets
See ad on this page
Tel: SPring 4-5200
Alden Products Co., 121D N. Main St., Brockton 64, Mass., 10
See ads on pages 419, 691
Tel: JUniper 3-0160
Amatom Electronic Hardware Co., Inc., N.Y., 5
Bird & Co., Inc., Richard, Mass., 5
Brunswick Instruments, N.J., 15
Carling Electric, Inc., Conn., 5
Chicago Miniature Lamp Works, 1508 N. Ogden Ave., Chicago 10, Ill., 10, 15
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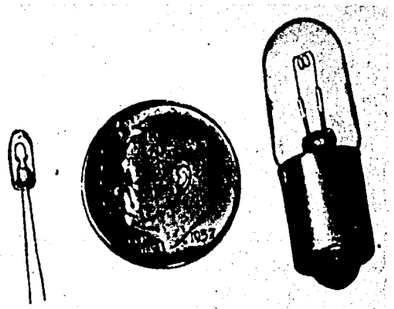

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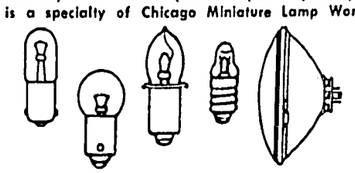

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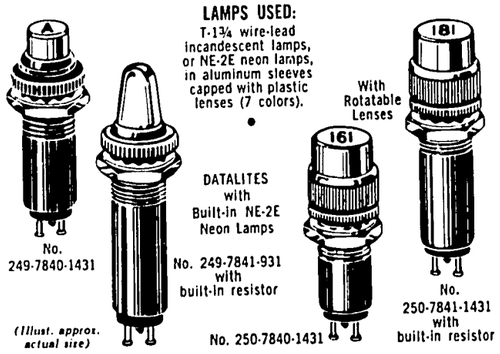

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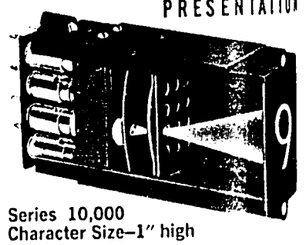

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Directory II. Components

60. Pilot Lights & Assemblies.

Circon Component Corp., Santa Barbara Municipal Airport, Goleta, Calif., 5, 10, 15
See ad on page 484
Tel: WOodland 7-1113
Derf Radio Co., N.Y., 5, 10, 15
Dialight Corp., 60 Stewart Ave., Brooklyn 37, N.Y., 5, 10, 15
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Tel: HYacinth 7-7600
Drake Mfg. Co., 4622 N. Olcott Ave., Chicago 31, Ill., 5, 10, 15
See ad on this page
Tel: CHesapeake 3-4462
Eagle Elec. Mfg. Co., N.Y., 5, 10, 15
Eastern Ins. Wire Corp., N.J., 10, 15
Eldema Corp., Calif., 10, 15
Electrosnap Corp., Ill., 10
Electro-Snap Switch Co., Ill., Lighted Pushbuttons
Engineered Electronics Co., Calif., 15, High Sensitivity
Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 5
See ad on page 637
Tel: IRving 8-5744
Fidelity Amplifier Co., Ill., 10
General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 5, 10, 15
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Tel: ROckford 8-9661
General Electric Co., Large Lamp Div., Ohio, 10
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Godfrey Mfg. Co., Ill., 10
Herzog Miniature Lamp Works, Inc., N.Y., 10, Lamps
Hetherington, Inc., Pa., 5, 10, 15
Hoffman Engrg. Corp., Conn., 10, 15
I.D.E.A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind., Digital Readouts
See ad on this page
Tel: LIberty 7-3581
Industrial Devices, Inc., N.J., 15
Industrial Electronic Engineers, Inc., 3973 Lankershim Blvd., No. Hollywood, Calif., In-Line Display
See ads on pages 285, 484
Tel: TRiangle 7-0328
Johnson Co., E. F., Minn., 5

The **BEST** *way to fill your* **MINIATURE LIGHTING NEEDS**

This quick-reference, illustrated catalog is packed with information about pilot—dial—signal—indicator—illuminating lighting units and lampholders of all types. In the big DRAKE line you'll find practical answers to virtually any Miniature Lighting requirement. And of course, our decades of specialized experience are at your service to help with unusual problems—our engineers will gladly discuss them with you!

SEND FOR YOUR COPY TODAY!

DRAKE MANUFACTURING COMPANY
4622 N. OLCOTT AVE. • CHICAGO 31, ILL.

MINIATURE LIGHTING SPECIALISTS

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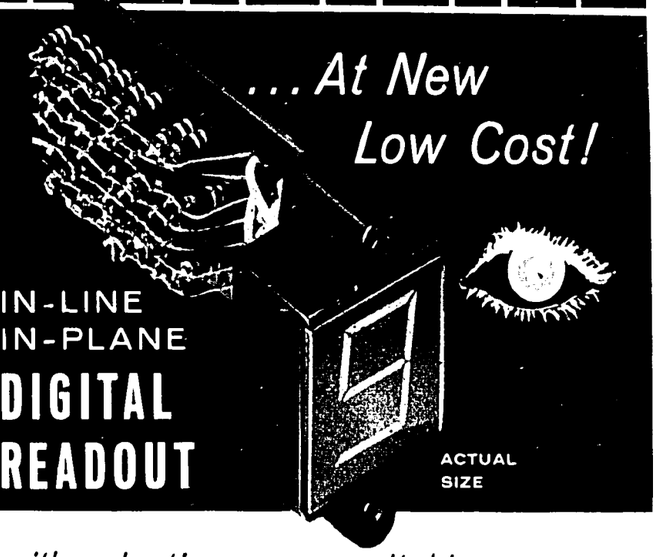
LEGIBILITY

Burton Browne Advertising



with selective group switching

features: Clearly defined characters ½" x ⅞" easy to read even with high ambient light & viewing angles up to 150°. In-plane construction eliminates confusing depth to figures.

Multiple units may be arranged in-line occupying only 1⅛"x1½" panel area per digit. For limited space applications matrix and indicator may be separated.

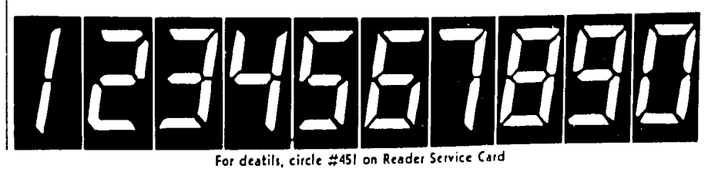
Selective group switching eliminates complicated relay trees commonly employed for segmented displays.

Input range 150 to 300 volts. Power Consumption only 1 watt max. per digit at 150V.

Cost as low as $5.00 per digit in production quantities.

ELECTRONIC EQUIPMENT DIVISION | ***I.D.E.A., Inc.***
7900 Pendleton Pike—Indianapolis 26, Indiana

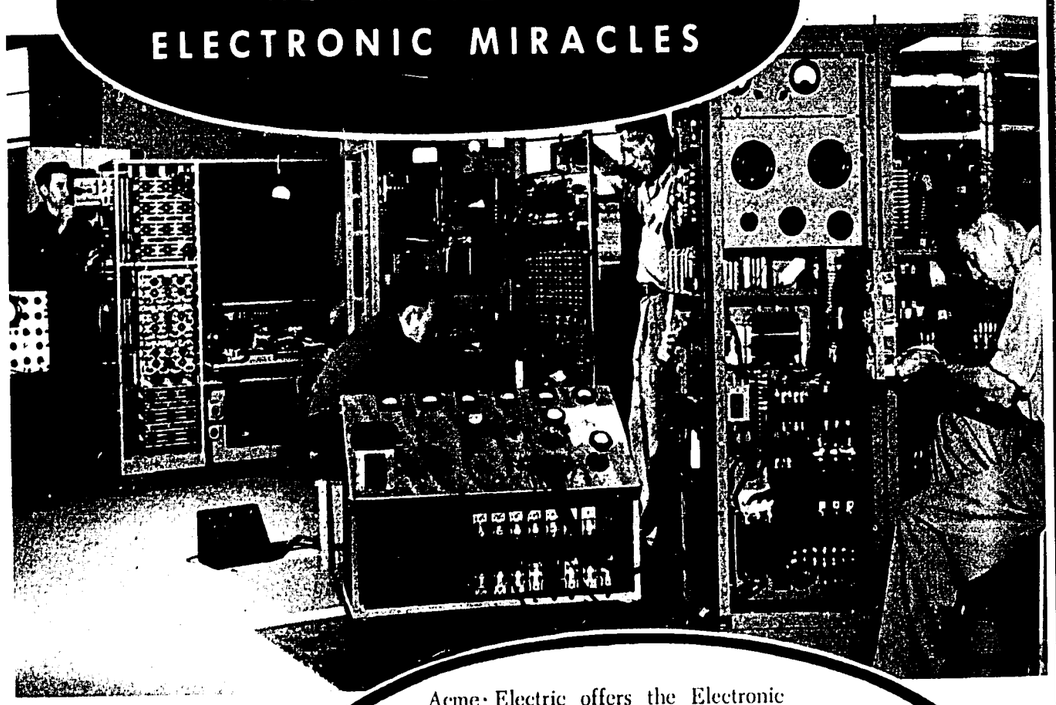
Applications include use in digital voltmeters, counters, status boards, missile check-out and countdown equipment, timers, target range units, air route and terminal area traffic control systems, aircraft and control instrumentation.



For details, circle #451 on Reader Service Card

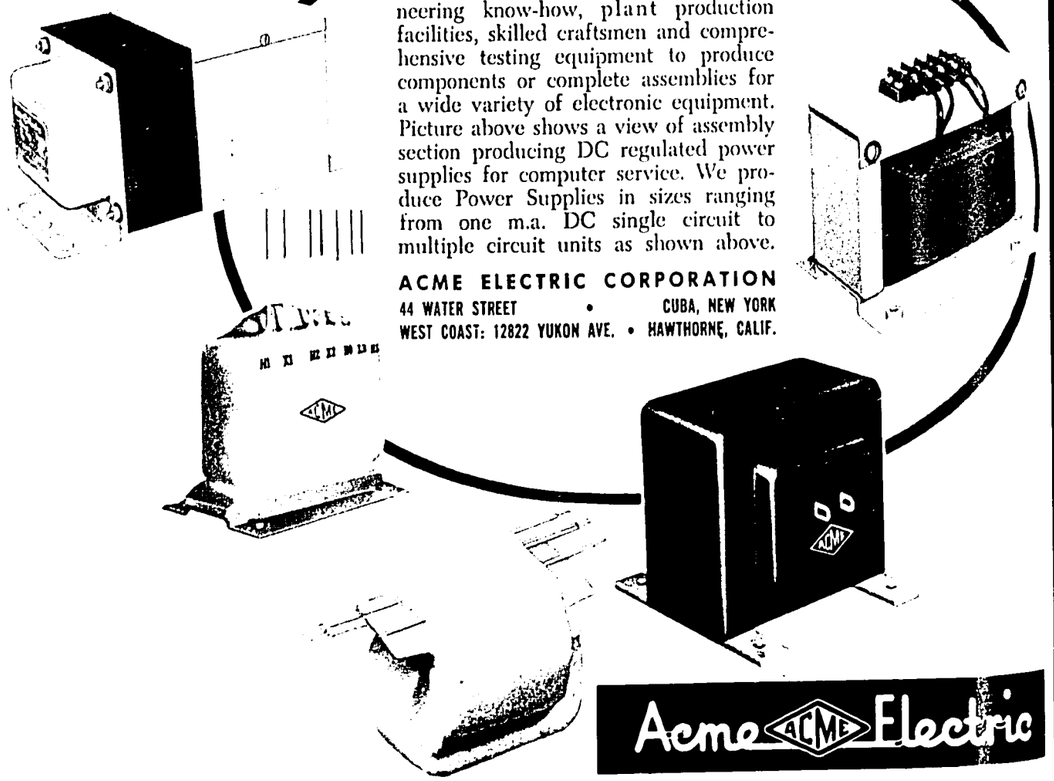
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264

ACME ELECTRIC HELPS CREATE ELECTRONIC MIRACLES



Acme-Electric offers the Electronic Industry the invaluable asset of engineering know-how, plant production facilities, skilled craftsmen and comprehensive testing equipment to produce components or complete assemblies for a wide variety of electronic equipment. Picture above shows a view of assembly section producing DC regulated power supplies for computer service. We produce Power Supplies in sizes ranging from one m.a. DC single circuit to multiple circuit units as shown above.

ACME ELECTRIC CORPORATION
44 WATER STREET • CUBA, NEW YORK
WEST COAST: 12822 YUKON AVE. • HAWTHORNE, CALIF.



Acme Electric

For details, circle #452 on Reader Service Card

Directory II. Components

60. Pilot Lights & Assemblies.

Kirkland Co., H. R., N.J., 5, 10, 15
Kulka Electric Corp., 633 S. Fulton Ave., Mt. Vernon, N.Y., 10
See ad on page 690
Tel: MOunt Vernon 4-4024
Leecraft Mfg. Co., Inc., N.Y., 5, 10, 15
Leviton Mfg. Co., Inc., N.Y., 5, 10, 15
Marco Industries Co., Calif., 5, 10, 15
McDermott Corp., Julian A., N.Y., 10, 15
Metox, France, 5
Micarta Fabricators, Inc., Ill., 5
O & S Research Inc., N.J., 5
Oxford Components, Inc., Ill., 10, 15
Oxford Electric Corp., Ill., 10
Pass & Seymour, Inc., N.Y., 5, 15
Pendar, Inc., Calif., 10
Penn Keystone Corp., Conn., 10
Plasteck, Inc., Okla., 10
Plastic Mold & Engineering Co., R.I., 5, 15
Radar Relay, Inc., Calif., 5
Signalite, Inc., N.J., 15
Sloan Co., Calif., 5, 10, 15
Smith, Inc., H. H., N.Y., 5
Smith Mfg. Co., J & H, N.Y., 5
Symphony Electronics Corp., Calif., 5, 10, 15
Tingstol Co., Ill., 5
Transistor Electronics Corp., Minn., 15, Indicators
Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 10, 15
See ad on pages 50-51
Tel: HUmboldt 2-4200
Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 15
See ad on page 464
Tel: LAsall 7-8400
Westgate Lab., Inc., Ohio, 10
Westinghouse Electric Corp., Lamp Div., N.J., 10

Pins & Prongs: See class 99

Potentiometers: See class 67

61. Power Supplies

2. AC type
4. DC type
5. High voltage (kilovolts)
15. Low voltage
17. Magnetic
20. Medium voltage
25. Microwave
30. Primary power sources, fuel engine driven
35. Transistor
37. Variable
40. Voltage regulated power sources

ACDC Electronics, Inc., Calif., 2, 4, 5, 15, 20, 25, 40
ACF Industries, Inc., Avion Div., N.J., 17, 35
AMP Inc., Capitron Div., Pa., 5, 20
ARF Products, Inc., Ill., 4, 35
ARA&T Electronics, Inc., Ark., 4
Acme Electric Corp., 44 Water St., Cuba, N.Y., 2, 4, 15, 17, 30, 35, 37, 40
See ad on page 486
Tel: CUba 4

61. Power Supplies.

Adler Electronics, Inc., N.Y., 4, 17
Admiral Corp., Ill., 35
Aero Guidance Corp., Calif., 35
Aerolab Devel. Co. Semiconductor Systems Div., Calif., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
Aerovox Corp., Mass., 2, 15, 40
Aircom, Inc., 48 Cummington St., Boston, Mass., 25
See ad on page 590
Tel: COpley 7-9115
Aircom, Inc., N.J., 25
Aircraft Electronics, Ariz., 2, 4, 5, 15, 20, 35, 37, 40
Airdesign Corp., Pa., 2, 4, 5, 15, 40
Airpax Electronics Inc., Seminole Div., P.O. Box 8488, Ft. Lauderdale, Fla.; Cambridge Div., Jacktown Rd., Cambridge, Md., 2, 4
See ad on pages 82-83
Tel: LUdlow 3-6160
Airtronics, Inc., D.C., 40
Airtronics International Corp., Fla., 20, 40
Alden Electronic & Impulse Recording Equipment Co., Inc., Alden Research Center, P.O. Box 125, Westboro 1, Mass., 4
See ad on page 290
Tel: FOrest 6-4467
Alfred Electronics, Calif., 4, 5, 25, 37
Alto Scientific Co., Inc., Calif., 4, 35
Ameleo, Inc., Calif., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
American Communications Corp., N.Y., 2, 4, 15
American Electronics, Inc., Calif., 2, 4, 17, 35, 37, 40
American Machine & Foundry Co., Leland Airborne Product Div., Ohio, 2, 4, 5, 15, 20, 30, 35, 40
American Missile Products, Calif., 2, 4, 15, 20, 35, 40
American Research & Mfg. Corp., Md., 2, 4, 5, 15, 17, 20, 35, 37, 40
American Television and Radio Co., 300 E. 4th St., St. Paul 1, Minn., 2, 4, 15
See ad on page 426
Tel: CApital 2-3791
Amglo Corp., 4333 N. Ravenswood Ave., Chicago 13, Ill., 4, 15, 35
See ads on pages 477, 577
Tel: BUckingham 1-2727
Amplifier Corp. of America, N.Y., 2, 4, 15, 20, 35, 40
Applegate & Co., C. J., 1840 24th St., Boulder, Colo., 2, 4, 5, 15, 20, 25, 35, 37
See ad on this page
Tel: HIllcrest 2-8750

UNIPLUGS

Model 119—12.6 VDC @ 0.9 amps DC Filament Supply $43.50

Model 125B—6.3 VDC @ 1.5 amps DC Filament Supply $47.00

Model 227—28.0 VDC @ 1.2 amps DC Filament Supply $59.00

Model 123A—800 VDC @ 1.5 ma. Reg. Photomult. Supply $98.00

Model 123A—1000 VDC @ 1.5 ma. Reg. Photomult. Supply $98.00

Model 223—1500 VDC @ 1.5 ma. Reg. Photomult. Supply $159.00

Model 224—2650 VDC @ 1.5 ma. Reg. Photomult. Supply $495.00

Model 212—200 to 300 VDC 150 ma. max. Voltage Regulator $46.50

Model 214—200 to 300 VDC 250 ma. max. Voltage Regulator $58.00

Model 215—150 VDC @ 12 ma., 6.3 VAC @ 0.9 amps Power Supply $44.00

These "Uniplugs" are the most popular for general lab-stock. Delivery is usually from stock. Quantity prices on 10 or more of a kind.

C. J. APPLEGATE & COMPANY
1840 24th Street Phone: HIllcrest 2-8750 Boulder, Colorado

For details, circle #453 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

ELECTRONIC POWER SUPPLIES

For Transistors • Strain Gauges • Bridges
For Research • Production • O.E.M.

DESIGNED FOR APPLICATION

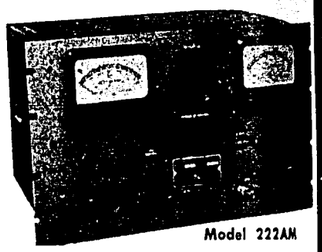
Every Electronic Measurements Power Supply gives the user a carefully selected combination of features . . . the features most sought after in each particular voltage and current range. When desired, these features can be modified to meet unusual applications. For example, the ®Regatron Programmable models can be converted to constant current operation by means of a few simple external connections. A plug-in chopper stabilization unit is also available.

To aid the purchaser in his selection, Electronic Measurements has various specification sheets and bulletins which will be furnished on request. A partial list includes:

Bulletin 765AM . . . the use of programmable power supplies in automatic test and process equipment.

Bulletin 422AM . . . the use and selection of power supplies for laboratory application.

Bulletin 350AM . . . a brief summary of E/M power supplies.



Model 222AM

ENGINEERING SPECIFICATION CHART

TYPE	MODEL NUMBER	OUTPUT Voltage	OUTPUT Current	REGULATION LINE 105—125 V AC 50—60 CPS %	REGULATION LINE V	REGULATION NO LOAD TO FULL LOAD %	REGULATION NO LOAD TO FULL LOAD V	MAX. RIPPLE IN MV	MOUNTING	DIMENSIONS H	DIMENSIONS W	DIMENSIONS D	WGT. IN LBS.	PRICE
REGATRON PROGRAMMABLE TRANSISTOR POWER PACKS	212A[1]	0—100 V DC	0—100 MA	0.15	0.05	0.1	0.05	½	MAY BE USED IN RACK OR ON TABLE.	3½	19	9¼	14	$[illegible]
	212A'[1]	Equivalent to two model 212A's. Outputs may be used in series, parallel, or independently.								5¼	19	9¼	27	[illegible]
	213A	0—50 V DC	0—1 AMP	0.1	0.05	0.1	0.05	1		7	19	11	35	[illegible]
	214A	0—100 V DC	0—1 AMP	0.1	0.05	0.1	0.05	1		10½	19	16	75	[illegible]
	215A	0—50 V DC	0—3 AMP	0.1	0.05	0.1	0.05	1		10½	19	16	75	[illegible]
	218A	0—100 V DC	0—3 AMP	0.1	0.05	0.1	0.05	1		5¼	19	12½	30	[illegible]
	220A	0—50 V DC	0—500 MA	0.1	0.05	0.1	0.05	1		5¼	19	12½	30	[illegible]
	221A	0—100 V DC	0—500 MA	0.1	0.05	0.1	0.05	1		3½	19	9¼	16	[illegible]
	221A'[1]	0—100 V DC	0—200 MA	0.15	0.05	0.1	0.05	1						
REGATRON PROGRAMMABLE GENERAL PURPOSE POWER PACKS	229A	0—150 V DC	0—300 MA	0.1	0.1	0.1	0.1	1	RACK OR TABLE.	5¼	19	12½	30	$[illegible]
	231A	0—300 V DC	0—100 MA	0.1	0.1	0.1	0.1	1	RACK OR TABLE	7	19	11½	30	[illegible]
		0—150 V DC	0—5 MA	0.5	—— 0.5% AT MAX. SET.			3	AS REQUESTED.[6]					
		6.3 V AC	6 AMP[7]											[illegible]
	232A	SAME AS MODEL 231A EXCEPT 0—300 V DC OUTPUT IS 200 MA												[illegible]
	233A	SAME AS MODEL 231A EXCEPT 0—300 V DC OUTPUT IS 300 MA												[illegible]
	234A	0—300 V DC	0—500 MA	0.1	0.1	0.05	0.05	1	MAY BE USED IN RACK OR ON TABLE.	7	19	11½	30	[illegible]
	235A	0—600 V DC	0—500 MA	0.05	0.05	0.025	0.03	1		10½	19	16	75	[illegible]
	236A	0—600 V DC	0—200 MA	0.05	0.05	0.02	0.03	1		8¾	19	14½	58	[illegible]
		0—150 V DC	0—5 MA	0.5	—— 0.5% AT MAX. SET.			3						
		6.3 V DC	10 AMP											
REGATRON NON-PROGRAMMABLE GENERAL PURPOSE POWER PACKS	209B[1,2]	0—600 V DC	0—600 MA	0.02	0.05	0.01	0.02	½	MAY BE USED IN RACK OR ON TABLE.	10¾	19	15	75	$[illegible]
		0—150 V DC	0—5 MA	0.5	—— 0.5% AT MAX. SET.			½						
		6.3 V DC	10 AMP											
	210B[1,2]	SAME AS MODEL 209B EXCEPT 0—600 V DC OUTPUT IS 1006 MA AND 0.05 LOAD Reg.								10½	19	15	60	[illegible]
	222A[3]	0—1000 V DC	0—500 MA	0.02	0.05	0.01	0.02	1		10½	19	15	60	[illegible]
		6.3 VAC	10 AMP	0.02	0.05	0.015	0.02	1		10⅝	19	15	60	[illegible]
	2300[4]	0—300 V DC	0—1.5 AMP											
		6.3 V AC	10 AMP											
REGATRON CALIBRATORS	2601[5]	0—300 V DC	0—100 MA	0.03	0.03	0.02	0.02	1	CABINET MODEL IS STANDARD. ALSO AVAILABLE FOR STANDARD 19-INCH RACK MOUNTING.	7	11	15	33	$[illegible]
	2602[5]	SAME AS MODEL 2601 EXCEPT OUTPUT CURRENT IS 200 MA												[illegible]
	2603[5]	SAME AS MODEL 2601 EXCEPT OUTPUT IS 300 MA												[illegible]
EM GENERAL UTILITY POWER PACKS	205A	100—325 V DC	0—150 MA	1	——	1	——	10	MAY BE USED IN RACK OR ON TABLE.	7	10	11	40	$[illegible]
		0—150 V DC	0—5 MA	1	—— 0.5% AT MAX.SET			10						
		6.3 V AC	6 AMP											
	206B	0—325 V DC	0—125 MA	1	——	1	0.2	5		7	19	11	40	[illegible]
		6.3 V DC	6 AMP											
	204AB	0—500 V DC	0—200 MA	½	0.2	1	0.2	5		10½	19	15	71	[illegible]
		0—150 V DC	0—5 MA	——	—— 0.5% AT MAX.SET.			5						
		6.3 V AC	10 AMP											
	204A	SAME AS MODEL 204AB EXCEPT WITHOUT 0—150 V DC SUPPLY												[illegible]

NOTES:
[1] HAS MODULATION INPUT.
[2] DIAL CALIBRATION GUARANTEED ACCURATE TO 0.25% OR 0.3 V.
[3] DIGITAL-TYPE PRESENTATION WITH A GUARANTEED CALIBRATION ACCURACY OF 0.25% OR 0.5V.
[4] DIAL CALIBRATION GUARANTEED ACCURATE TO 0.3% OR 0.4 V.
[5] DIAL SETTINGS ARE ACCURATE WITHIN 0.1% AND/OR 0.025 V, WHICHEVER IS GREATER. TOLERANCE OF 1-VOLT CONTROL IS ±5% CORRESPONDING TO 0.05 V.
[6] ADD SUFFIX R FOR RACK MOUNTING.
ADD SUFFIX T FOR ENCLOSED TABLE MOUNTING.

GENERAL NOTES: FOR PANEL VOLTMETER AND AMMETER ADD LETTER "M" TO MODEL NUMBER. FOR CHOPPER STABILIZATION ADD LETTER "K" TO MODEL NUMBER.

(R) Registered U. S. Patent Office. Patents Issued and Pending.

ELECTRONIC MEASUREMENTS COMPANY, INCORPORATED
EATONTOWN • NEW JERSEY

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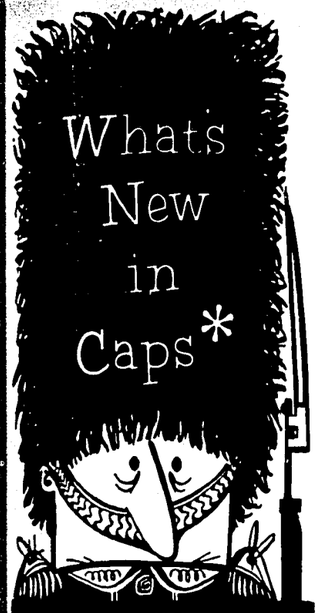
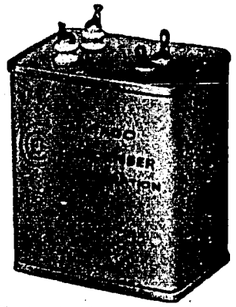


***POWER SUPPLY FOR DC MINIATURIZED!**



The 5 KVDC/5ma unit occupies only 2½ x 3¾ x 3¾ inches, weighs 3¾ LBS. Hermetically sealed, highest quality selenium rectifiers. Long-life, quality capacitors . . . LOW RIPPLE OF 1%! Lightweight, compact. Positive or negative terminal can be grounded to case. Stand-off high voltage terminals for safety.

Also complete line of quality film capacitors. POLYETHYLENE, ACETATE, TEFLON®, POLYSTYRENE, and MYLAR®.

® DU PONT TRADE MARK

Write Dept. A
CHICAGO CONDENSER CORPORATION
3255 WEST ARMITAGE AVENUE, CHICAGO 47, ILL.

For details, circle #455 on Reader Service Card

Directory II. Components

61. Power Supplies.

Applied Radiation Corp., Calif., 4, 5, 25, 40
Armour Electronics, Calif., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
Arnold Magnetics Corp., Calif., 2, 4
Arnoux Corp., Calif., 2, 4, 15, 17, 20, 35, 40
Arrow-Hart & Hegeman Elect. Co., Conn., 17
Associated Specialties Co., 1751 Main St., Orefield, Pa., 40
See ad on this page
Tel: EXpress 5-1275
Astronetics, Inc., N.J., 37, 40
Atlantic Research Corp., Va., 4
Atlantis Engrg. Corp., Texas, 4, 35, 40
Atlas Engrg., Co., Mass., 2, 4, 5, 15, 17, 20, 25, 30, 35, 37, 40
Atomic Labs., Inc., Calif., 5
Audicon Electronics, Inc., N.J., 2, 4, 15, 17, 20, 35, 40
Autotronics, Inc., Box 812, Route 1, Florissant, Mo., 4
See ad on page 344
Tel: TEmple 7-3565
Avionics, Ltd., Canada, 35
Bailey Electronics Lab., P.A., Conn., 2, 4, 15, 20, 35, 37, 40
Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Mass., 5, 15, 20
See ad on page 296
Tel: UNiversity 4-7420
Barker & Williamson, Inc., Pa., 35
Barwood Electronics, Inc., Cal., 2, 40
Basler Electric Co., Ill., 2, 4, 5, 15, 17, 20, 35, 37, 40
Bassett Inc., Rex, Fla., 2, 5
Behlman Engineering Co., 2911 Winona Ave., Burbank, Calif., 2, 37
See ad on page 168
Tel: VIctoria 9-5733
Bellaire Electronics, Inc., N.J., 40
Bendix Aviation Corp., Bendix Pacific Div., Calif., 35
Bendix Aviation Corp., Ind., 2, 4, 30, 35, 40

Use the Reader Service Card at the back of this issue for further information on advertised products.

Bergen Laboratories, Inc., 247 Crooks Ave., Clifton, N.J., 2, 4, 35, 40
See ad on page 471
Tel: GRegory 3-7800
Beva Lab., Inc., N.J., 4, 5, 40
Bogue Electric Mfg. Co., N.J., 5, 15, 17, 20
Bone Engrg. Co., Calif., 2, 4, 5, 15, 37
Booth Co., Arthur E., Calif., 2, 4, 20, 37
Borg-Warner Corp., Pesco Prods. Div., Ohio, 2
Bracke-Seib X-Ray Co., Inc., N.Y., 5
British Thomson-Houston Co., Ltd., England, 25
Brush Instruments, Div. of Clevite Corp., Ohio, 40
Buck Engrg. Co., Inc., N.J., 2, 15
Building Blocks Electronic Co., 2172 E. 36th St., Brooklyn 34, N.Y., 4, 15, 20, 25, 35, 37, 40
See ad on page 329
Tel: CLoverdale 3-8931
Burroughs Corp., N.J., 4
California Computer Products, Inc., Calif., 4, 15, 35, 37, 40
California Magnetic Control Corp., Calif., 2, 4, 5, 15, 17, 20, 35, 37, 40
Cal-Tronics Corp., Calif., 2, 4, 15, 35, 37, 40
Camden Electronics, Inc., N.J., 2, 4
Canadair Ltd., Missile & Systems Div., Canada, 35
Canadian Aviation Electronics, Ltd., Quebec, 2, 4, 15, 20, 35, 40
Canadian Marconi Co., Canada, 2, 40
Canadian Research Institute, Canada, 2, 4, 5, 15, 20, 37, 40
Carad Corp., Calif., 5
Celco-Constantine Engineering Laboratories Co., 70 Island Ave., Mahwah, N.J., 2, 4, 5, 15, 17, 20, 35, 37, 40
See ads on pages 36-37, 88-89
Tel: DAvis 7-1123
Central Transformer Co., Ill., 5, 40
Centronix, Inc., Fla., 35, 37
Chicago Condenser Corp., Dept. A, 3255 W. Armitage Ave., Chicago 47, Ill., 4
See ad on this page
Tel: CApitol 7-7070

ELECTRONICALLY REGULATED D. C. CONSTANT VOLTAGE POWER SUPPLIES

The output voltage is continuously variable from 200 to 325 volts D.C. for load currents of 0 to 100 M.A. with an input voltage of 105 to 125 volts 60 cycle. Regulation is better than 1%. An isolated A.C. voltage of 6.3 volts at 3 amperes is available at the output terminal connections.

MODEL 3 ILLUSTRATED

MODEL 3 CAB. MTG., VOLTMETER	$69.50
MODEL 1 RELAY RACK MTG.	$52.50
MODEL 2 SUB-CHASSIS MTG.	$49.50
DUAL RACK MOUNT FOR MODEL 2 Mounts Two Model 2 Units in 8¾"	$9.00

ASSOCIATED SPECIALTIES CO.
1751 MAIN STREET
OREFIELD, PENNSYLVANIA

For details, circle #456 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

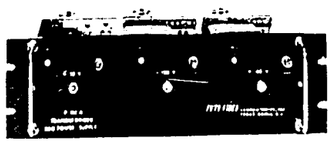
FOTO-VIDEO
LABORATORIES, INC.
ELECTRONICS • ENGINEERING AND MANUFACTURING

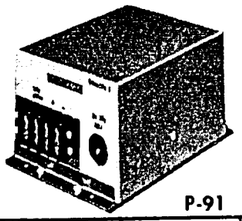
P-37

ALL TRANSISTOR POWER SUPPLIES

Silicon Rectifiers
Large Power Handling Ability
Compactness
Completely Transistorized
High Efficiency
Regulation Against Both Line and Load
Zero Warmup Time
Short Recovery Time
Short-Circuit Protected
Conservative Design
Continuous Rating
Stable Over Long Periods

P-172


P-158


P-91

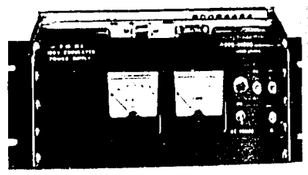
P-41

Model	Input	Current in Amps		Voltage	Regulation in %	Ripple in mv.	Max. Source Imped. in Ohms	Price
P-37A	22-30 VDC	2.0		21	0.5	3	0.5	$ 95.00
P-37B	22-30 VDC	2.0		16-21	2.0	10	2.0	59.00
P-41A	22-30 VDC	2.0		28	0.5	3	0.5	125.00
P-58A	115V-125V 50 to 400 Cycle	0.250 0.005	and	150 −150	0.5	3	0.5	343.00
P-60A	115V-125V 50 to 400 Cycle	3		28	1.0	10	0.5	250.00
P-91A	115V-125V 50 to 400 Cycle	1		24-32	1.0	1	0.5	295.00
P-291A	115V-125V 50 to 400 Cycle	0.250		50-60	0.5	1	0.5	350 00
P-158A		Two P-58's + one P-41			0.5	3	0.5	595 00

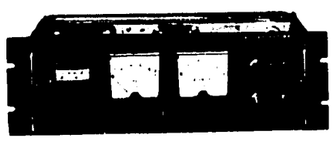
Note 1: All the above except P-158 are compact modules.
Note 2: P-158 has 3 modules in 19" rack mount frame 5¼" high.
Note 3: Many other models available, write for catalogue information.

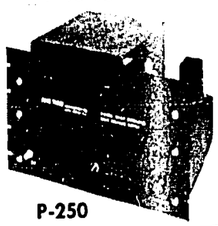
HIGH POWER, HIGH VOLTAGE AND SUPER REGULATED POWER SUPPLIES

Silicon Rectifiers
Excellent Regulation
Extremely Low Ripple
Regulation Against Both Line and Load Variation
Economical In Rack Height
Conservative Design
Continuous Duty
50 to 400 Cycle Operation
Excellent Mechanical Design
Out-Swinging Chassis
All Parts Readily Accessible
6.3 V and 5 V. AC Outputs Provided on Most Models


P-15-15

P-20-05


P-62


P-250

INPUT FOR ALL MODELS: 115-125V 50-400 CYCLE

Model	Current in ma	Voltage See Note #2	Regulation in %	Ripple in mv	Max. Source Imped. in Ohms	Rack Height in Inches	Price See Note #1
P-68A	100	150	0.1	1	0.5	3½	$185.00
P-46A	200	150	0.1	1	0.5	5¼	270.00
P 8-15A	800	150	0.1	1	0.5	7	395.00
P 15-15A	1500	150	0.1	1	0.5	7	595.00
P 73A	200	300	0.1	1	0.5	5¼	225.00
P-65A	800	300	0.1	1	0.5	5¼	395.00
P 15-30	1500	300	0.1	1	0.5	7	595.00
P-250	1	15-30 kv	0.5	10	2	10½	325.00
P-20-05	10	300 to 1610	0.005	1	0.1	5¼	425.00

Note 1: All models furnished with meters for current and voltage at $30.00 additional charge.
Note 2: Voltage adjustable ±10% unless otherwise indicated.
Note 3: Many other models available, write for catalog information.

Complete line of Television Terminal and Test Equipment. Write for Catalog

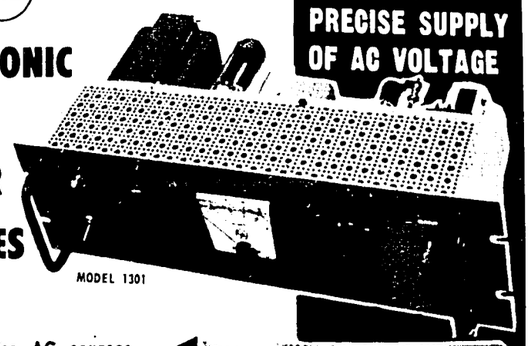
FOTO-VIDEO® LABORATORIES, INC.
36 Commerce Rd. • Dept. I-1 • Cedar Grove, N. J. • CEnter 9-6100

For details, circle #457 on Reader Service Card

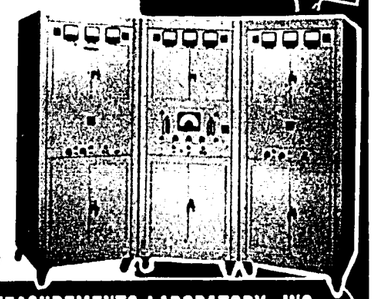
CML

ULTRA STABLE and PRECISE SUPPLY OF AC VOLTAGE

ELECTRONIC AC POWER SOURCES


MODEL 1301

From precise AC sources featuring 0.1% regulation, 0.1% frequency stability and 0.1% distortion — to general purpose wide frequency range units of up to 80 KVA in three phase capacity — Make CML your source of supply for dependable AC power sources.


MODEL 1447

COMMUNICATION MEASUREMENTS LABORATORY, INC.
350 LELAND AVENUE, PLAINFIELD, NEW JERSEY
Tel. PL 4-5502

For details, circle #458 on Reader Service Card

DEL

HIGH VOLTAGE QUALITY RELIABILITY

Power Supplies and Transformers

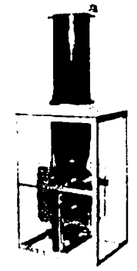
Design—Development—Manufacture

POWER SUPPLIES
Compact epoxied units to 40 kv
Fully instrumented units to 200 kv
Regulated special purpose supplies
Air, oil, solid dielectric insulated units

TRANSFORMERS
High voltage filament
High voltage plate
Low capacity high voltage
Current limiting
Reactors

METER MULTIPLIERS
5 kv to 150 kv

HIGH VOLTAGE GROUNDING SWITCHES


200 PV Transformer

For further information—write today to Dept. IR

DEL ELECTRONICS CORPORATION
521 HOMESTEAD AVENUE • MOUNT VERNON, N. Y. • OWENS 9-2000

For details, circle #459 on Reader Service Card

Directory II. Components

61. Power Supplies.

Chicago Standard Transformer Corp., 3501 W. Addison St., Chicago 18, Ill., 2, 4, 35, 40
See ad on page 563
Tel: INdependence 3-7400

Christie Electric Corp., Calif., 4, 15, 17, 20, 37, 40

Cohu Electronics, Inc., KinTel Div., Calif., 4, 40

Colorado Research Corp., Colo., 4, 15, 37, 40

Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 2, 40
See ad on this page
Tel: PLainfield 4-5502

Compagnie Generale de Metrologie, France, 40

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Consolidated Electrodynamics Corp., Calif., 2, 4

Consolidated Resistance Co. of America, N.Y., 2, 4, 15, 20, 37, 40

Constanta Co. of Canada, Ltd., Canada, 5, 15, 25

Control Corp., Minn., 2, 4, 15, 35

Control Devices, Inc., Mich., 2, 4

Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 2, 4, 25, 35, 40
See ads on pages 321, 451
Tel: HAmilton 7-7961

Cook Co., Frank R., Colo., 4

Cornell-Dubilier Electric Corp., Dept. IRE, 333 Hamilton Blvd., So. Plainfield, N.J., 2, 40
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Tel: PLainfield 6-9000

Creative Electronics Corp., Conn., 2, 4, 5, 15, 20, 35, 40

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D & R Ltd., Calif., 4, 17, 35, 40

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Daven Co., N.J., 2, 4, 5, 15, 20, 35

Daystrom Systems, Div. of Daystrom, Inc., Calif., 35, 40

Dayton Aircraft Products, Inc., Fla., 4, 5

De Coursey Eng. Lab., Calif., 35

Del Electronics Corp., Dept. IR, 521 Homestead Ave., Mount Vernon, N.Y., 2, 4, 5, 20, 37, 40
See ad on this page
Tel: OWens 9-2000

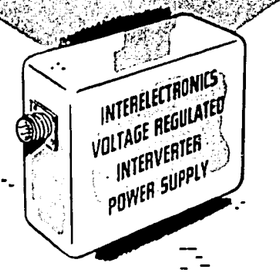
Deltron, Inc., Pa., 2, 4, 5, 17, 20, 25, 35, 37, 40

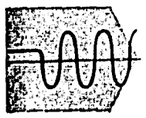
Deluxe Coils, Inc., First and Webster Sts., P.O. Box 318, Wabash, Ind., 4, 5, 40
See ad on page 411
Tel: WAbash 1720

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 141-764

NEW!

DC to DC and DC to AC solid-state power converters voltage regulated, frequency controlled, for missiles, telemetering, gyros, servos





Interelectronics Inverter solid-state thyratron-like elements and magnetic components convert DC to any number of voltage regulated or controlled frequency AC or filtered DC outputs from 1 to 1800 watts. Light weight, compact, 90% or better conversion efficiency.

Ultra-reliable in operation, no moving parts, unharmed by shorting output or reversing input polarity. Complies with MIL specs for shock, acceleration, vibration, temperature, RF noise.

Now in use in major missiles, powering telemetering transmitters, radar beacons, electronic equipment. Single and polyphase AC output units now power airborne and marine missile gyros, synchros, servos, magnetic amplifiers.

Interelectronics — first and most experienced in the DC input solid-state power supply field, produces its own solid-state gating elements, all magnetic components, has the most complete facilities and know-how—has designed and delivered more working KVA than any other firm!

For complete engineering data write Interelectronics today, or call LUdlow 4-6200 in N. Y.

INTERELECTRONICS CORPORATION

2432 GR. CONCOURSE, N. Y. 58, N. Y.

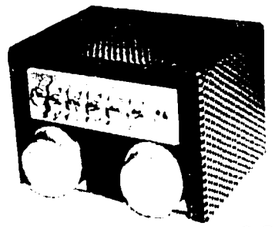
For details, circle #460 on Reader Service Card

CUSTOM BUILT Power Supplies

- D.C. to D.C.
- A.C. to D.C.
- D.C. to A.C.
- Regulated or Unregulated

SEND DETAILS FOR OUR QUOTATION

ALSO STOCK MODELS FOR 5V., 12.6., 28V. BATTERIES



CA-1252-10 TRANSISTORIZED MOBILE SUPPLY

$54.00 NET

INPUT = 12.6V. D.C., DELIVERS 100 WATTS at 250/500V. D.C.

WRITE FOR BULLETIN 5974

KUPFRIAN MFG. CORP.

157 PROSPECT AVE.
BINGHAMTON, N.Y.

For details, circle #461 on Reader Service Card

HIGH POWER at Transistor Voltages!

NEW MRC DV-III TRANSISTOR POWER SUPPLY

The DV-III offers unparalleled performance at an unbelievably low price! **SAVES MONEY**—Replaces several high-priced power sources! One versatile DV-III features all these outputs: either 0-60 V., D.C. or 0-30V., D.C. or 0-115 V., A.C. **SAVES TIME**—Ends annoying battery and meter hook-up! The portable, rugged MRC DV-III provides continuously variable output voltage control; 2-range voltmeter; 2-range milliameter; magnetic circuit breaker; pilot lights.

SPECIFICATIONS—**D.C. Range #1:** 0-60 V. @ 0-1 Ampere; .05% Ripple at max. output. **D.C. Range #2:** 0-30 V. @ 0-2 Amperes; .10% Ripple at max. output. **A.C. Range:** 0-115 V. @ 1.2 Amperes. **DIM.:** 7" x 11" x 8½". **WT.:** 24½ lbs.

For Complete Data Write for Bulletin IRE9

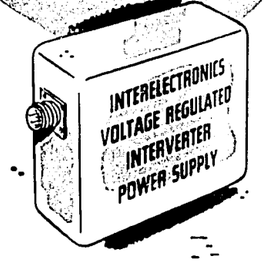
MODEL RECTIFIER CORP.

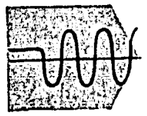
1675 UTICA AVE • BROOKLYN 34, N Y

For details, circle #462 on Reader Service Card

NEW!

DC to DC and DC to AC solid-state power converters voltage regulated, frequency controlled, for missiles, telemetering, gyros, servos





Interelectronics Inverter solid-state thyratron-like elements and magnetic components convert DC to any number of voltage regulated or controlled frequency AC or filtered DC outputs from 1 to 1800 watts. Light weight, compact, 90% or better conversion efficiency.

Ultra-reliable in operation, no moving parts, unharmed by shorting output or reversing input polarity. Complies with MIL specs for shock, acceleration, vibration, temperature, RF noise.

Now in use in major missiles, powering telemetering transmitters, radar beacons, electronic equipment. Single and polyphase AC output units now power airborne and marine missile gyros, synchros, servos, magnetic amplifiers.

Interelectronics — first and most experienced in the DC input solid-state power supply field, produces its own solid-state gating elements, all magnetic components, has the most complete facilities and know-how—has designed and delivered more working KVA than any other firm!

For complete engineering data write Interelectronics today, or call LUdlow 4-6200 in N. Y.

INTERELECTRONICS CORPORATION

2432 GR. CONCOURSE, N. Y. 58, N.Y.

For details, circle #463 on Reader Service Card

Directory II. Components

61. Power Supplies.

Dictograph Products, Inc., N.Y., 2, 4
Donner Scientific Co., Calif., 4, 15, 37, 40
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Dynamic Controls Co., Mass., 4, 15, 17, 20, 35, 37
Dynamic Electronics-New York, Inc., N.Y., 4, 15, 35, 40
E A K Research Lab., N.Y., 5, 15
E H Research Laboratories, Inc., 1922 Park Blvd., Oakland 6, Calif., 4
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Tel: GLencourt 2-1314
EPR Special Products Corp., N.Y., 2, 4, 5, 15, 20, 35, 37, 40
Eder Engrg. Co., Inc., Wis., 4, 37, 40
Edin Co., Inc., Mass., 2, 4
Eicor Div., Ill., 2, 4, 15, 20, 35, 40
Ekco Electronics, Ltd., England, 5
Elcor, Inc., Va., 4, 15, 35, 37, 40
Electric Eye Equipment Co., Ill., 4
Electric Regulator Corp., Conn., 15, 35, 40
Electrical Communications, Calif., 4, 15, 20
Electro Development Corp., Wash., 2, 4, 5, 15, 25, 35, 40
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Electromation Co., Calif., 4, 35, 40
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Electronic Assistance Corp., N.J., 2, 4, 5, 15, 20, 25, 35, 37, 40
Electronic Communications, Inc., Fla., 2, 4, 5, 15, 17, 20, 25, 35, 40
Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y., 4
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Tel: STillwell 6-8700
Electronic Measurements Co., Inc., Lewis St. & Maple Ave., Eatontown, N.J., 4, 5, 15, 20, 35, 37, 40
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Electronic Plastics Co., Calif., 35
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Emerson Electric Mfg. Co., Mo., 4, 5, 15, 25, 35, 37, 40
Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 2, 37
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Tel: VIctor 2-8400
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Entron, Inc., Md., 4, 15, 20, 40
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Espey Mfg. Co., Saratoga Industries Div., N.Y., 2, 4, 5, 15, 17, 20, 25, 30, 35, 37, 40
FXR, Inc., 26-12 Borough Place, Woodside 77, N.Y., 25, 40
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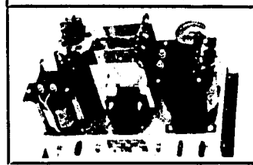
Tel: AStoria 8-2800
Fairfield Engineering Corp., Conn., 2, 4, 17, 37, 40

GATES Power Supplies Unlimited

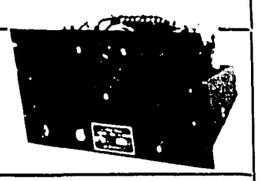


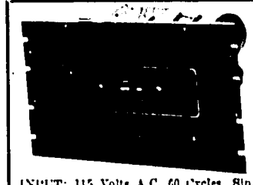
SILICON POWER SUPPLY
Model GX30-20

INPUT: 115 Volts, 1 Phase, 60 Cycles
OUTPUT: 0-34 Volts D.C. 0-20 Amperes, Continuous Duty
REGULATION: No load to Full load: 18%
RIPPLE: Below 1%
Silicon Rectifiers, High Efficiency
Dimensions: 10"x17"x3"
PRICE: $185.00 NET

SELENIUM POWER SUPPLY
Model G48-6FM

INPUT: 115 Volts A.C. 60 Cycles—Single Phase
OUTPUT: 0-48 Volts D.C., 0-6 Amperes
CONTROL: Continuously Variable over Entire Range
REGULATION: 15% No Load to Full Load
RIPPLE: 1% R.M.S.
DIMENSIONS: 19" Wide, 13" Deep x 10½" High, Fits RETMA, Western Electric Racks
PRICE: $190.00 NET



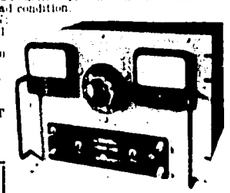


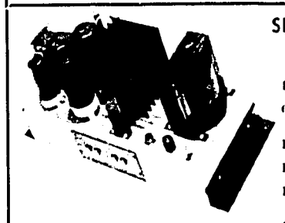
SILICON RACK MOUNT SUPPLY
Model GX30-10

INPUT: 115 Volts A.C. 60 Cycles, Single Phase
OUTPUT: 30 Volts D.C. 0-10 Amperes Continuous Duty
REGULATION: 10% No Load to Full Load
RIPPLE: Below 0.5% R.M.S.
DIMENSIONS: 8¾"H x 19"W x 10"D
PRICE: $125.00 NET

AIRCRAFT BATTERY ELIMINATOR
Model G10IF May be used for Rack or Bench

INPUT: 115 Volts A.C., 60 Cycles, Single Phase
OUTPUT: 0-28 Volts D.C., 0-20 Amperes, Continuous Duty
RIPPLE: 1% R.M.S.
Unique overload device prevents needle slam and shows overload condition.
REGULATION:
D.C.V. at full load: 28
D.C.V. at 1/10 load: 28
METERS: 2% Accuracy
PRICE: $200.00 NET

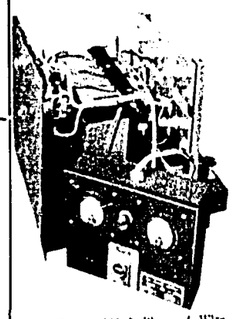




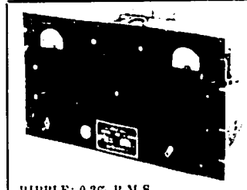
SELENIUM POWER SUPPLY
Model GX30-5

INPUT: 115 Volts A.C. 60 cycles, single phase
OUTPUT: 30 Volts D.C., 5 Amperes D.C. Continuous Duty
REGULATION: 12% No Load to full load
RIPPLE: Below 1% R.M.S.
DIMENSIONS: 7" Wide x 15" Long & Overall Height 10"
PRICE: $70.00 NET

SILICON REMOTE CONTROL



INPUT: 208/220 3 Phase, 4 Wire, 60 Cycles, AC
OUTPUT: 30 Volts D.C. 0-100 Amperes DC Continuous Duty
REGULATION: No Load to Full Load 1%
RIPPLE: 4% RMS
DIMENSIONS: Main Unit Supplied with Grilled Cover 19" Wide 17⅛" High 21" Deep



SILICON POWER RECTIFIER
Model G30-10FR

INPUT: 115 Volts A.C. 60 Cycles, Single Phase
OUTPUT: 0-30 Volts D.C., 0-10 Amperes, continuous duty
CONTROL: Continuously Variable over entire range.
REGULATION: 6% No load to full load
RIPPLE: 0.2% R.M.S.
METERS: 2% Accuracy
DIMENSIONS: 19" Wide x 13" Deep x 10½" high
PRICE: $175.00 NET

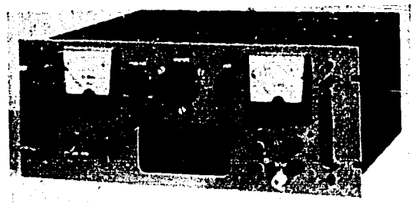
All Prices Subject to Change Without Notice

GATES ELECTRONIC COMPANY

1705 Taylor Avenue — New York 60, New York
TYrone 2-6490

For details, circle #464 on Reader Service Card

MID-EASTERN ELECTRONICS, INC.



Transistorized Power Supplies ME Series

- **Both Magnetic and Transistorized Regulation**
- **Short circuit Proof**
- **Sixty-four Basic Models provide complete flexibility.**

SPECIFICATIONS

Input: 105-125 VAC, 60 cps, Single Phase.

Output Voltage: Continuously variable over entire range specified with vernier control at all settings.

Output Current: Current specified applies to entire DC voltage range and for entire input range.

Duty Cycle: Continuous duty at full load.

Polarity: Output completely floating; either positive or negative side may be grounded. Units can be series connected.

Regulation: *Line: 0.05% for changes from 105-125 VAC.

***Load:** 0.1% for changes from zero to full load.

Ripple: Less than 0.01% or 1 mv whichever is greater

Recovery Time: Less than 50 microseconds.

Overshoot: Less than 1% of the voltage setting.

Regulated AC Output: 120 VAC, 60 cps, ±½% regulation at rear receptacle. Power equals DC power rating of supply.

Electrical Design:
Completely solid state. Only 2.5 amperes per transistor (rated at 15 amperes continuous) permitted; maximum junction temperature at maximum ambient limited to 80°C.—extreme reliability has resulted from these and similar conservative measures. Modular design permits rapid servicing.

Mechanical Design:
All components completely accessible. All wiring harnessed and located on the outer surfaces of the sides and back of "U" shaped chassis. Removing dust cover exposes all wiring and components.

Overload Protection: Automatic protection afforded by magnetic line voltage regulation circuit. No fuses necessary; automatic overload circuit cuts off supply when output current exceeds a preselected point, which is continuously variable from 20 to 120% of rated current by front panel control. Overload circuit can be defeated for charging large banks of capacitors. Continuous operation into short circuit will not damage unit in any way.

External Sensing: All Mid-Eastern supplies are equipped for remote load change sensing to maintain regulation at the load.

Ambient Temperature: 0 to 50 Degrees C, continuous duty at full load.

Cooling: High volume axial flow fan with air intake at front panel grill.

Style: 19" rack panel, engraved. Gray baked enamel finish. Black anodized dust cover, irradited chassis 15" deep.

Terminations: 5 way binding posts at front, screw terminals at rear, 6' heavy duty line cord.

Metering: 3½" 2% precision meters supplied on "M" models. Add $30.00.

* Or 10 mv whichever is greater. Regulation specs. applicable down to 5V.

STANDARD MODELS

*†Model	DC Output Volts	DC Output Amps.	Panel Height*	Price Standard Regulation	Price 0.01% Regulation
ME18-2.5	0-18	0-2.5	5¼	$ 350	$ 595
ME18-5	0-18	0-5	5¼	175	695
ME18-10	0-18	0-10	7	595	895
ME18-15	0-18	0-15	8¾	785	1095
ME18-20	0-18	0-.0	10¼	895	1395
ME18-30	0-18	0-30	7+8¾	995	1495
ME36-1	0-36	0-1	5¼	325	510
ML36-2.5	0-36	0-2.5	5¼	165	645
ME36-5	0-36	0-5	7	535	795
ME36-10	0-36	0-10	8¾	650	945
ME36-15	0-36	0-15	7+8¾	815	1075
ME36-20	0-36	0-20	2-8¾	965	1175
ME36-25	0-36	0-25	8¾+10¼	1095	1595
ME60-1	0-60	0-1	5¼	625	745
ME60-3	0-60	0-3	7	695	895
ME60-5	0-60	0-5	8¾	795	1145
ME60-10	0-60	0-10	7+8¾	965	1475
ME60-15	0-60	0-15	2-8¾	1095	1595
ME100-1	0-100	0-1	7	725	1095
ME100-2.5	0-100	0-2.5	8¾	965	1295
ME100-5	0-100	0-5	10¼	1295	1695
ME100-10	0-100	0-10	2-8¾	1595	1995
ME15C-1	0-150	0-1	7	665	755
ME15C-2	0-150	0-2	10¼	965	1395
ME150-5	0-150	0-5	2-8¾	1395	1895
ME300-.5	150-300	0-0.5	7	695	995
ME300-1	150-300	0-1	8¾	795	895
DME18-2.5	0-18 / 0-36	0-2.5 / 0-2.5	8¾	695	995
DME36-2.5	0-18 / 0-36	0-2.5 / 0-2.5	8¾	895	1195
DME60-1	0-36 / 0-60	0-2.5 / 0-1	8¾	1095	1395
DME100-1	0-60 / 0-100	0-1 / 0-1	10¼	1395	1695
DME136-2.5	0-100 / 0-36	0-1 / 0-2.5	10¼	1095	1595

* Narrow range and fixed voltage completely programmable models available within all of above voltage and current ranges. Please write for quotation.

† All models remotely programmable over a narrow voltage range.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

TERMS: Net 30 days—F.O.B. Springfield, N.J.
DELIVERY: Models listed are normally available for prompt delivery.

REPRESENTATIVES

So. River, N.J. R. E. Weber Co.	CL 7-5243
Hartford, Conn. Michael S. Coldwell, Inc.	JA 2-5832
Needham, Mass. Michael S. Coldwell, Inc.	HI 4-1142
Chicago, Ill. Kenneth W. Meyers	SP 4-6440
Detroit, Mich. J. L. Pierce Co.	UN 2-2571
Pittsburgh, Pa. Lowry Dietrich Co.	WA 1-2959
Cleveland, Ohio Lowry Dietrich Co.	SU 1-1855
Dayton, Ohio Lowry Dietrich Co.	BA 3-6042
St. Louis, Mo. Zak-Cowen & Associates, Inc.	PA 7-8559
Denver, Colo. Longstreet Smith Associates, Inc.	KE 4-5091
Dallas, Texas The Kantenberger Co.	WH 8-9535
San Antonio, Texas The Kantenberger Co.	PE 2-2151
Pasadena, Calif. George H. Vaughan Co.	SR 5-4420
Sunnyvale, Calif. William Theisner Co.	RE 9-6460
Seattle, Wash. Eicher & Co.	AT 4-1811
36 W. 40 St., N.Y.C. Export Department	PE 6-2165

OTHER MID-EASTERN TRANSISTORIZED POWER SUPPLY SERIES:

Plug-In Series
Portable Series
Sub-Chassis Series

Magnetically Regulated Series
High Voltage Series
Bias Supply Series

Please contact us or our representatives for prompt quotations on multioutput, 400 CPS and other power supplies to meet your special requirements.

32 COMMERCE ST., SPRINGFIELD, N.J.
DR 6-7130

For details, circle #465 on Reader Service Card

61. Power Supplies.

Fansteel Metallurgical Corp., North Chicago, Ill., 4, 40
See ad on pages 156-157
Tel: DExter 6-4900

Farwest Mfg. Div., Wash., 4, 5
Ferranti-Packard Electric, Ltd., Canada, 40
Ferrotran Electronics, Co., N.Y., 2, 4, 5, 20, 25, 35, 37, 40
Fidelity Amplifier, Co., Ill., 2, 4
Fidelity Instrument Corp., Pa., 2, 4, 5, 15, 17, 20, 37, 40
Film Capacitors, Inc., N.Y., 2, 5, 37
Filtron Co., Inc., N.Y., 5
First Electronics Corp., Mass., 2, 4, 5, 15, 20, 37, 40
Fisher Research Lab., Inc., Calif., 35
Flite-Tronics, Inc., Calif., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
Fluke Mfg. Co., Inc., John, Wash., 4, 5, 15, 20, 35, 37, 40

Foto-Video Laboratories, Inc., Dept. H, 36 Commerce Rd., Cedar Grove, N.J., 2, 4, 5, 15, 20, 35, 37, 40
See ad on page 490
Tel: CEnter 9-6100

Freed Transformer Co., Inc., 1713 Weirfield St., Brooklyn 27, N.Y., 2, 4, 15, 37, 40
See ad on page 410
EVergreen 6-1300

Gates Electronic Co., 1705 Taylor Ave., New York 60, N.Y., 4, 15, 17, 20, 37, 40
See ad on page 493
Tel: TYrone 2-6490

Gates Radio Co., Ill., 2, 5, 15
General Communications, Inc., Wis. 35, 40

General Devices, Inc., P.O. Box 211, Princeton, N.J., 2, 4, 35, 40
See ad on page 360
Tel: DAvis 9-2323

General Electric Co., Inc., 2, 4, 5, 17, 40
General Electric Co. Apparatus Sales Div., N.Y., 2, 4, 5, 15, 20, 35, 37, 40
General Electric Co., Technical Prods Operation, N.Y., 4, 5, 15, 25, 35, 40
General Electric Co., Pa., 2, 4, 5, 15, 17, 20, 35, 37, 40
General Electric Co., Ltd. of England, England, 35, 40
General Electronics Co., Inc., Ala., 2, 4, 15, 20, 35, 40
General Instrument Corp., F. W. Sickles Div., Mass., 17, 35

General Magnetics, Inc., 135 Bloomfield Ave., Bloomfield, N. J., 17
See ad on page 176
Tel: PIlgrim 8-2400

General Nuclear Corp., N.Y., 15, 37, 40
General Precision Lab., Inc., N.Y., 40

General Radio Co., West Concord Mass., 2, 4, 15, 20, 37, 40
See ad on Cover 4
Tel: EMerson 9-4400

Georator Corp., Va., 30
Geotronic Labs., Inc., Texas, 2, 4, 35
Glentronics, Inc., Calif., 2, 4, 5, 15, 35, 37, 40
Goslin Electric & Mfg. Co., Calif., 35, 40
Green Rectifier Co., N.J., 2, 4, 5, 15, 17, 20, 37, 40
Grimson Color, Inc., N.Y., 2, 40

Directory II. Components

61. Power Supplies.

Gulton Industries, Inc., N.J., 17, 35, 40
Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill., 2, 4, 25, 35
See ad on page 204
Tel: VAn Buren 6-6300
Hammond Mfg. Co., Ltd., Canada, 35
Hamner Electronics Co., Inc., N.J., 4, 5, 15, 20, 37
Harrel, Inc., N.Y., 2, 35
Harrison Laboratories, Inc., 45 Industrial Rd., Berkeley Heights, N.J., 4, 15, 20, 35, 37, 40
See ad on page 206
Tel: CRestview 3-9123
Harrison Labs., Inc., B.M., Mass., 2, 20
Harvey-Wells Elect., Mass., 17, 35, 37, 40, Current Regulated Power Sources
Hays Corp., Ind., 4, 15
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 37, 40
See ad on page 328
Tel: YUkon 3-3961
Hehn Engrg., Lester C., N.Y., 2, 40
Hertner Electric Co., Ohio, 2, 4, 15
Hesco Engrg., Calif., 4, 15, 35, 40
Hett Associates, Inc., N.J., 4, 5, 40
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 4, 5, 15, 25, 35, 37, 40
See ad on pages 3-18
Tel: DAvenport 5-4451
Hewson Co., Inc., N.J., 4, 5, 37
Highland Engineering Co., N.Y., 2, 4, 5, 15, 20
Hindle Transformer Co., Inc., N.J., 2, 4, 15, 20, 37
Homelite Div., Textron, Inc., N.Y., 2, 4, 20, 30, 40
Hoover Co., Ltd., Canada, 4, 5, 15, 35, 40
Hoover Electric Co., Calif., 2, 4
Horlick Co., Inc., William I., Mass., 37, 40
Hyperion, Inc., Mass., 2, 4, 5, 15, 17, 20, 35, 37, 40
Imperial Electric Co., N.Y., 30
Industrial Elect. Co., Monitor Controller Div., Mass., 2, 4, 5
Industrial Electronics of Canada, Canada, 4, 37, 40
Industrial Test Equipment Co., 55 East 11th St., New York 3, N.Y., 2, 37
See ad on page 339
Tel. GRamercy 3-4684
Industrial Transformer Corp., Pa., 2, 4, 5, 15, 17, 40
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 2, 4, 5, 15, 17, 20, 35, 37, 40
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
Internatl. Tel. & Tel. Corp., ITT Federal Div., N.J., 2, 4, 5, 15, 17, 25, 35, 37
I.T.&T. Corp., Industrial Prods. Div., Calif., 2, 4, 5, 15, 17, 20, 35, 37, 40
International Telephone & Telegraph Labs., Calif., 15, 37, 40
Invar Electronics Co., Calif., 4, 5, 15, 17, 35, 37, 40
Isotope Develop., Ltd., England, 5
Itek Corp., Mass., Special Power Supplies
Jack & Heintz, Inc., Ohio, 2, 4
Jerrold Electronics Corp., Dept. TED 33, Jerrold Bldg., Philadelphia 32, Pa., 40
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Tel: BAldwin 6-3456
Jobbins Electronics, 771 Hamilton Ave., Menlo Park, Calif., 2, 4, 15, 20, 37, 40
See ad on page 413
Tel: DAvenport 6-7110
Jodon, Inc., F. R., D.C., 4, 37, 40
Julie Research Labs., Inc., N.Y., 40
Kaar Engrg. Corp., Calif., 2, 4, 15, 35
Kaiser Electronics, Inc., N.J., 2, 4, 15, 17, 20, 25, 35, 37, 40
Kaiser Industries, Kaiser Aircraft-Elect. Div., Ohio, 17, 35
Kato Engineering Co., Minn., 2, 4, 5, 15, 37
Keithley Instruments, Inc., Ohio, 4, 5, 40
Kellogg Switchboard & Supply Co., Ill., 4, 40
Kepco, Inc., 131-38 Sanford Ave., Flushing 55, N.Y., 4, 5, 15, 17, 20, 25, 35, 37, 40
See ad on this page
Tel: INdependence 1-7000
Key Resistor Corp., Calif., 2, 4, 5, 15, 17, 20, 35, 40
Kidde & Co., Inc., Walter, N.J., 2, 4, 40
King Radio Corp., Kansas, 35
Krohn-Hite Corp., Mass., 4, 15, 20, 37, 40
Kupfrian Mfg. Corp., 157 Prospect Ave., Binghamton, N.Y., 2, 4, 5, 15, 20, 35, 40
See ad on page 492
Tel: RA 3-6426
L.E.E., Inc., D.C., 4, 40
Laboratory Equipment Corp., Mich., 4, 5, 15
Lambda Electronics Corp., 11-11 131st St., College Point 56, N.Y., 4, 15, 20, 35, 37, 40
See ad on pages 57-62
Tel: INdependence 1-8500
Land-Air, Inc., Ill., 4
Land-Air, Inc., Instrument & Electronic Div., Calif., 2, 15
Lawn Electronics Co., Inc., N.J., 4, 5, 15, 20, 37, 40
Leach Corp., Relay & Inet Div., 18435 Susana Rd., Compton, Calif., 2, 4, 15, 17, 30, 35, 40
See ad on page 521
Tel: NEvada 6-1061
Lear, Inc., Mich., 17, 30
Lear, Inc., Lear Cal Div., Calif., 35
Lee Electric & Mfg. Co., Calif., 4, 5, 17, 20, 37, 40
Leeds & Northrup Co., Pa., 40
Levinthal Electronics Prods., Inc., Calif., 5, 25
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 2, 4, 5
See ads on pages 270, 301
Tel: TExas 0-7711
Litton Industries, Airtron, Inc. Div., N.J., 25
Litton Industries, Md. Div., Md., 15, 35, 40
Lyons, Ltd., Claude, N.Y., 40
M E Labs., Calif., 25
Macarr, Inc., N.Y., 2, 4, 15, 17, 20, 37, 40
MacLaren & Co., F. B., N.Y., 40
Madigan Corp., N.Y., 4, 15, 17
Magnatran, Inc., N.J., 4, 5
Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y., 2, 4, 15, 17, 20, 35, 37, 40
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Tel: CYpress 2-6610
Magnetic Controls Co., Minn., 2, 4, 5, 15, 17, 20, 35, 40
Magnetic Research Corp., Calif., 4
Magnetico, Inc., N.Y., 35
Magnetics, Inc., Control Div., Pa., 17
Mallory & Co., Inc., P.R., Ind., 2, 35
Mandrel Industries, Inc., Calif., 2, 4, 35
Manson Laboratories, Inc., 375 Fairfield Ave., Stamford, Conn., 2, 4, 5, 20, 25, 37, 40
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Tel: DAvis 5-1391
Marconi's Wireless Telegraph Co., Ltd., N.Y., 2, 35
Marine Electric Corp., Galbraith-Pilot Marine Corp. Div., N.Y., 40

Kepco

VRPS*

the most complete line of POWER SUPPLIES

TRANSISTORIZED
MAGNETIC TUBELESS
VACUUM TUBE TYPE

*VOLTAGE REGULATED POWER SUPPLIES

KEPCO
INC.
131-38 SANFORD AVENUE
FLUSHING 55, N.Y.
INDEPENDENCE 1-7000

For details, circle #466 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Onan ELECTRIC PLANTS

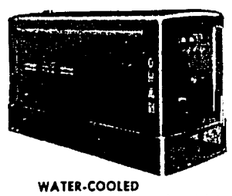
ELECTRIC PLANTS

Onan ELECTRIC PLANTS

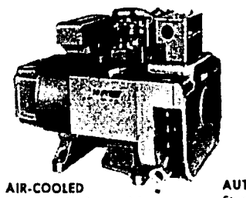
Emergency standby models for

- RADIO STATIONS
- TV STATIONS
- MICRO-WAVE RELAY
- MUNICIPAL SIGNALS

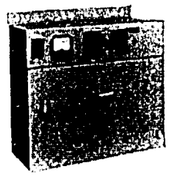
Provide electric power for communications and other uses when utility service is interrupted. Driven by gas or gasoline engines. Start automatically when power is interrupted, stop automatically when it is restored. Sizes from 1,000 to 150,000 watts in all standard voltages, 50 or 60-cycle . . . for any emergency power need.



WATER-COOLED
10 to 230KW. Housed models to 80KW. Unhoused models available in all sizes. Powered by heavy-duty gasoline or Diesel engines.



AIR-COOLED
1 to 10KW. Powered by one or two-cylinder Onan engines. Vacu-Flo cooling permits enclosed installations.

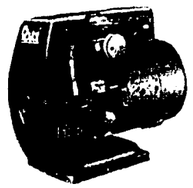


AUTOMATIC CONTROLS
Start and stop the electric plant automatically as needed. Models for all Onan plants. Instantaneous or timed cranking.

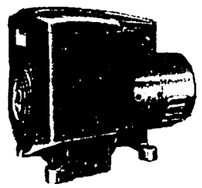
Portable and mobile models for

- MOBILE RADIO AND TV UNITS
- MARINE RADIO, RADAR
- FIELD RECORDING
- CHARGING 2-WAY RADIO BATTERIES

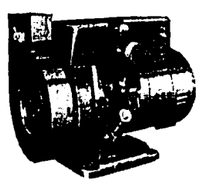
Lightweight, air-cooled types, 500 to 10,000 watts. All standard voltages A.C. Also D.C., battery charging and combination A.C.-D.C. models. Smaller units can be hand carried. Vacu-Flo cooling for enclosed installations.



SINGLE-CYLINDER, A.C.
500 to 2,500 watts. Lightweight. Can be equipped with aluminum tube frame for hand carrying.



TWO-CYLINDER, A.C.
3,500 to 10,000 watts. Smooth-running, high capacity. High speed trailers available.



BATTERY CHARGERS
D.C. output only, or one and two KW, A.C. with 30 amps D.C. for battery charging.

See your Onan distributor or write for information

D. W. ONAN & SONS INC.

ELECTRIC PLANTS GENERATORS ENGINES ENGINE-COMPRESSORS
2945 University Avenue S.E. • Minneapolis 14, Minnesota

Onan ELECTRIC PLANTS

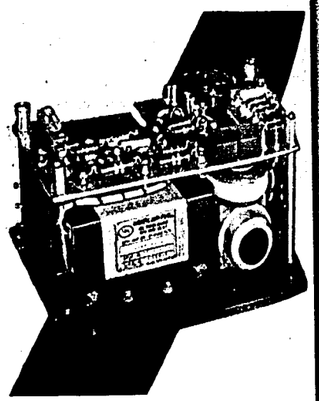
For details, circle #467 on Reader Service Card

New PRECISION FREQUENCY

STATIC INVERTER SUPPLY

INPUT 28V D.C. ± 10%
OUTPUT *Nom.* 115V ± 2%
400 CPS ± 0.01%
1 Ø (2- or 3-phase output available)
RATINGS: 30VA 50VA 100VA
Higher ratings available.

APPLICATION:
For gyro wheel supplies and where precise 400 cycle voltages are required in aircraft, radar and missile computers.



FEATURES:
PRECISION OUTPUT FREQUENCY
RUGGED
EXCELLENT WAVEFORM
SIMPLICITY OF CIRCUITRY
FAST STARTING TIME
GOOD VOLTAGE REGULATION throughout an adjustable range
ISOLATED CASE DESIGN
HIGH RELIABILITY
VIBRATION ISOLATED
COMPACT
LIGHTWEIGHT
MILITARY SPECIFICATIONS

(Send for Bulletin S-864)

MA

MAGNETIC AMPLIFIERS, INC.

632 TINTON AVENUE • NEW YORK 55, N.Y. • CYPRESS 2-1

West Coast Division
136 WASHINGTON ST. • EL SEGUNDO, CAL. • OREGON 8-3

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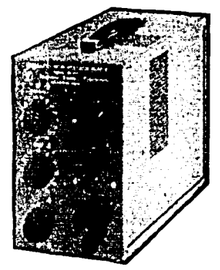
NE **PRECISION SUPPLIES**

Portable Pattern



Model	Voltage	Current
RE-1601	200-1600	0-25 Ma
RE-1602	300-1600	0-10 Ma
RE-1902	300-1900	0-25 Ma

Rack Pattern

Model	Voltage	Current
RE-1603	300-1600	0-10 Ma
RE-1610	300-1600	0-100 Ma
RE-2003	500-2000	0-25 Ma
RE-2006	500-2000	0-50 Ma
RE-3002	500-3000	0-20 Ma
RE-3004	500-3000	0-40 Ma
RE-3006	500-3000	0-60 Ma
RE-5001	500-5000	0-10 Ma
RE-5002	500-5000	0-20 Ma
RE-5003	500-5000	0-30 Ma
RE-5502	1000-5500	0-25 Ma
RE-10010	1000-10000	0-10 Ma

Features

Either positive or negative of any supply may be grounded.
Regulation: .01 to .001%
Line Stability: .05 to .005%
Long-term Stability: .01-.05% per hour, about 0.1% per day
Impedance: 1 to 5 Ohms
Ripple: 0.5 to 3 Mv P-P
Standard tubes used

Constant Current Supplies

RI-233	.01-230 Ma	0-365V

Millimeter Wave Generators

KSG-291	36.2-33.5 kmc	8.3-8.9 mm
KSG-290	33.5-29.7 kmc	8.9-10. mm
KSG-289	30-27.3 kmc	10.-11. mm
KSG-33	25-22 kmc	12.-13.6 mm

Any of these supplies can be modified or special designs built to meet specialized requirements.

Northeast Scientific Corp.
30 WETHERBEE STREET
RFD 1, SOUTH ACTON, MASS.
For details, circle #469 on Reader Service Card

Directory II. Components

61. Power Supplies.

Marine View Electronics Inc., N.Y., 2, 4, 40
Marstan Electronics Corp., N.Y., 35
Martin Co., Baltimore Div., Md., Radio-isotope Heat Sources, Reactor
Master Specialties, Calif., 4, 35
Matthew Labs., N.Y., 4, 15, 20, 35, 37, 40
Maxson Corp., Langevin Div., N.Y., 4, 15, 17, 20
Mayberry Electronics Co., Calif., 2, 4, 15, 20, 35, 40
McCurdy Radio Industries Ltd., Canada, 2, 4, 20, 35, 40
McKay Electric Co., Mich., 17, 35, 40
Menlo Park Engineering, 711 Hamilton Ave., Menlo Park, Calif., 4, 25, 40
See ad on page 373
Tel: DAvenport 6-9080
Menlo Research Lab., Calif., 5
Mercury Electronic Co., N.J., 2, 4, 15, 17, 20, 35, 37, 40
Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 2, 4, 5, 15, 17, 20, 35, 37, 40
See ad on page 494
Tel: DRexel 6-7130
Milgo Electronic Corp., Fla., 35, 40
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 15
See ad on page 416
Tel: DAvenport 4-4108
Miller Co., Sanford, N.Y., 4, 15
Mitronics, Inc., 1291 Central Ave., Hillside, N.J., 35
See ad on page 619
WAverly 6-2250
Model Rectifier Corp., 1675 Utica Ave., Brooklyn 34, N.Y., 4, 15, 35, 37, 40
See ad on page 492
Tel: CLoverdale 8-6800
Modern Industries, Inc., Calif., 2, 4, 5, 15, 20, 35, 37, 40
Moeller Instrument Co., Inc., Electronics Div., N.Y., 4, 15, 35, 37
Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo., 5
See ad on pages 126-127
Tel: EVergreen 3-3300
Monitor Controller, Mass., 2, 4
Moran Instrument Corp., Calif., 4, 5, 40
Morrow Radio Mfg. Co., Oregon, 2, 4
Motorsearch Co., Wis., 2, 4, 15, 20, 30, 40
Motorola, Inc., Ariz., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
Moulic Specialties Co., Ill., 40
Mullard Overseas, Ltd., England, 40
Multi-Products Co., Mich., 2, 4, 35
N J E Corp., N.J., 2, 4, 5, 15, 17, 20, 25, 30, 35, 37, 40
N Y T Electronics, Inc., Calif., 2, 4, 5, 15, 17, 40
Naniloa Corp., Ohio, 2, 4, 5, 15, 35
Narda Microwave Corp., Dept. IRED-3, 118-160 Herricks Rd., Mineola, L.I., N.Y., 25
See ad on pages 141-144
Tel: PIoneer 6-4650
Narda Microwave Corp., High Power Electronics Div., Dept. IRED-9, 118-160 Herricks Rd., Mineola, L.I., N.Y., 5, 25
See ad on page 145
Tel: PIoneer 6-4650
National Scientific Labs., Inc., D.C., 35
Neff Instrument Corp., Calif., 4, 15, 20, 35, 40
Networks Electronic Corp., Calif., 2, 4, 5, 15, 17, 20, 35, 37
Neutronic Associates, N.Y., 4, 5, 20, 37, 40
New York Transformer Co., Inc., N.J., 2, 4, 15, 17, 20
Nichols Ltd., R. H., Canada, 4, 5, 40
North Electric Co., N.Y., 40
North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 4, 5, 15, 20, 35, 37, 40, Current Regulated Power Sources
See ads on pages 415, 455, 591
Tel: PIoneer 7-0555
Northam Electronics, Inc., Calif., 4, 40
Northeast Scientific Corp., 30 Wetherbee St., RFD #1, South Acton, Mass., 4, 5, 15, 20, 25, 37, 40, Constant Current
See ad on this page
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Nutron Mfg. Co., Inc., N.Y., 2, 4, 15, 17, 20, 35, 37, 40
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Oltronix, Inc., Ga., 4, 5, 15, 20, 35, 40
Onan & Sons, Inc., D. W., 2945 University Ave. S.E., Minneapolis 14, Minn., 30, Transfer
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Tel: FEderal 2-1155
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 2, 4, 5, 15, 17, 20, 25, 35, 37, 40
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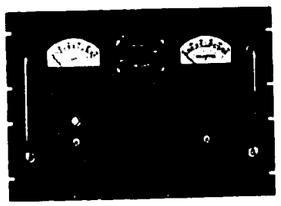
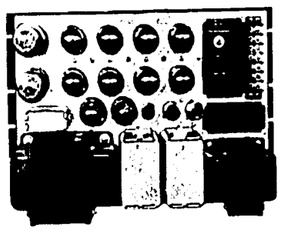
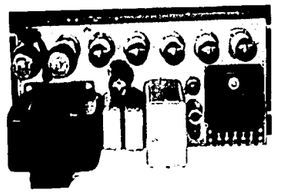
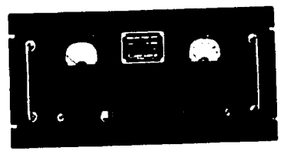
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

POWER SUPPLIES









VOLTAGE REGULATED POWER SUPPLIES

Featuring

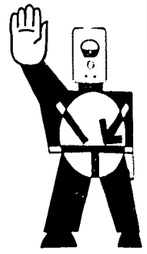
- .05% regulation for load or line variations
- 500 microvolts ripple
- 50 microseconds response time
- 10-turn voltage controls for minimum noise
- Karma (20-PPM) wire wound, low t.c. error sensing resistors
- 50 hour pre-aging
- Meters included in feed back loop for low low output impedance
- Separately fused line and load circuits
- Separate AC and DC switches
- JAN quality components
- Input: 105-125 v. 55-65 cy. single phase
- 28 Models available from stock

POWER DESIGNS INC. *presents*

SEMICONDUCTORIZED POWER SUPPLIES

featuring

ROBOTEC · HEATRAN · VOLTRAN PROTECTION



Power Designs' *Semiconductorized* Power Supplies utilize the unique properties of semiconductor devices to create new circuit concepts achieving performance, efficiency and reliability hitherto unattainable. These instruments are NOT the conventional transistorized versions of vacuum tube regulators.

ROBOTEC*

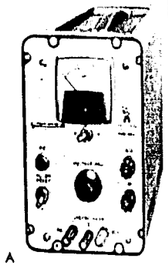
is an inherent electronic circuit producing simultaneous voltage and current cutoff upon external short circuit. The "ROBOTEC" circuit operates in 30 microseconds holding the power supply cut off until manually reset and reducing line input power to a negligible value. If an external short circuit exists the power supply cannot be turned on.

HEATRAN

is a transistorized circuit continuously monitoring dissipation in the series power transistors of the regulator system. Dissipation above a preset maximum value is automatically transferred into external vitreous enamel resistors extending from the rear of the equipment in a perforated metal cage. "HEATRAN" thus permits fewer transistors for a given power supply capacity, more compact equipment with increased reliability and practical convection cooling.

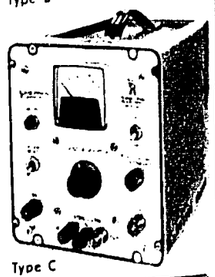
VOLTRAN

is a transistorized circuit continuously monitoring the voltage drop in the series power transistors of the regulator system. Voltages above a preset maximum are instantaneously absorbed thus protecting these transistors against line and load transients and permitting more conservative voltage derating.



Type A

Type B



Type C

MODEL 1515 1-15VDC • 0-1.5A	$159.50
MODEL 1515A 1-15VDC • 0-1.5A	$174.50
MODEL 3206 1-32VDC • 0-600MA	$174.50
MODEL 2050 1-20VDC • 5A	$289.50
MODEL 1210 1-12VDC • 0-10A	$349.50
MODEL 1010T 1-100VDC • 0-1A	$374.50
MODEL 3240 1-32VDC • 0-4A	$349.50
MODEL 105TA 1-100DVC • 0-500MA	$239.50
MODEL 5015 1-50VDC • 0-1.5A	$249.50

Dual Voltammeter on all models except model 1515

INPUT: 105-125VAC 55-440 Cy
REGULATION: .05%
RIPPLE: Model 1515, 1515A: 250 Microvolts
All Others—1.0 Millivolt
Internal Imp: Model 2050, 1210, 1010T, 3240, .005 ohms
All Others—.01 ohms

* U.S. PATENT PENDING

Rack Panel Adapters for Types A and B: Single Model RRA-15 $15.50, Dual Model RRB-15 $15.50. Rack Panel Adapters for Type C: Single Model RRA-20 $17.50, Dual Model RRB-20 $17.50. **F.O.B. Westbury N. Y. Terms, ½% 10. Net 30 days. Prices subject to change without notice. Input: 105-125 v. 55-440 cy.

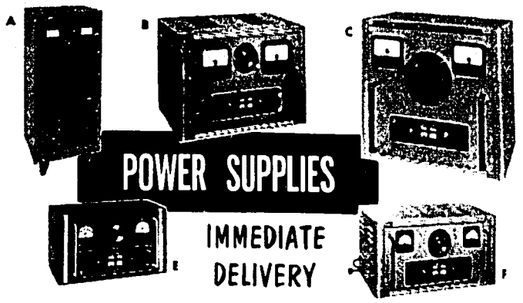
Recognized Reliability

Power Designs inc.

1700 Shames Drive, Westbury, N.Y.
Phone: EDgewood 3-6200

For details, circle #470 on Reader Service Card

Opad



POWER SUPPLIES

IMMEDIATE DELIVERY

0-32 V.D.C. ½ % Ripple

Input: 115 V.A.C. 60 Cycles, Single Phase

Amps.	Model	Style	H	W	D	Fig.
5	KM75	Rack	8¾"	19"	9½"	D
	KM75 I	Bench	9"	17"	9"	E
10	KM81	Rack	8¾"	19"	9½"	D
	KM81B	Bench	9"	17"	9"	E
20	KM87	Rack	8¾"	19"	9½"	D
	KM87B	Bench	10½"	22"	12"	F
40	KM93	Rack	12¼"	19"	13"	—
	KM93B	Bench	14"	22"	15"	B

FEATURES

- Vacuum Varnish Impregnated Magnetic Components.
- 4½" Rectangular 2% Accuracy, D.C. Panel Meters (3½" on small units).
- Controls include power switch, line and load fuses, pilot light, voltage control knob, output binding posts.
- Voltage Regulation: 1/10 Load 36 Volts Full Load 32 Volts
- Panel Type Carrying Handles.
- Convection Cooled Continuous Duty Ratings.

Bulletin No. 102

0-32 V.D.C. 4% Ripple

Input: 208 V.A.C. 60 Cycles, 3 Phase

Amps.	Model	Style	H	W	D	Fig.
100	FR100	Floor	46"	22"	18"	A
200	FR200	Floor	46"	22"	24"	A

FEATURES

- Fully Self-Protecting Circuit.
- Pushbutton Operated Magnetic Contactor.
- Indicating Type AC Input Fuses.
- Adjustable Overcurrent Control in D.C. Circuit.
- Thermal Overload Device on Rectifier.
- Overload Warning Light and Reset Button.
- 4½" Rectangular, 2% Accuracy Panel Meters.
- Low Voltage Regulation: Approx. 8%
- Ball Bearing Type Casters.
- Input Receptacle and Mating Plug.
- All receptacles, terminals and controls clearly designated.
- Budget Priced.

Bulletin No. 155

0-110 V.D.C. 1% Ripple

Input: 115 V.A.C. 60 Cycles, Single Phase

Amps.	Model	Style	H	W	D	Fig.
2.5	RS10	Rack	8¾"	19"	9½"	D
	RS10B	Bench	10½"	22"	12"	F
5	RS20	Rack	10½"	19"	13"	D
	RS20B	Bench	12¼"	22"	15"	F
10	RS30	Rack	12¼"	19"	13"	—
	RS30B	Bench	14"	22"	15"	B
20	RS40	Rack	17½"	19"	13"	—
	RS40B	Bench	19¼"	19"	15"	C

FEATURES

- Vacuum Varnish Impregnated Magnetic Components.
- Non-Aging Rectifiers (Germanium or Silicon).
- 4½" Rectangular 2% Accuracy D.C. Panel Meters (3½" on small units).
- Controls include Power Switch, Line and Load Fuses, Pilot Light, Voltage Control Knob and Output Binding Posts.
- Both D.C. Terminals above ground and isolated from A.C. Line.
- Panel Type Carrying Handles.
- Convection Cooled Continuous Duty Ratings.

Bulletin No. 204

TRANSISTOR REGULATED POWER SUPPLIES

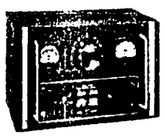
3-32 Volts D.C. ± ½% Regulation*
Input: 105-125 volts A.C., 60-400 cycles, Single phase

Amps.	Model	Style	Amps.	Model	Style
1	TR10	Rack	10	TR30	Rack
1	TR10B	Bench	10	TR30B	Bench
5	TR20	Rack	15	TR40	Rack
5	TR20B	Bench	15	TR40B	Bench

FEATURES

- Zener Diode Reference.
- Ripple less than 5 M.V.
- Vacuum varnish impregnated magnetic components.
- Short Circuit Protection.
- Controls include power switch, fuses, pilot light, voltage control knob and output binding posts.
- 2% Accuracy Panel Meters.
- Both outout terminals above ground and isolated from A.C. line.
- Panel type carrying handles.
- Continuous duty ratings.
- High efficiency.

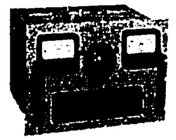
* Line and Load



GENERAL PURPOSE UNITS

OUTPUT: 0-30 Volts D.C. Unfiltered Full Wave.
INPUT: 115 V.A.C., 60 Cy., 1 ϕ.
Model GM72 5 Amperes
Model GM78 10 Amperes
Model GM84 20 Amperes
Model GM90 30 Amperes
FEATURES: 2% accuracy Panel Meters, Line and Load Fuses, Switch, Pilot Light, Binding Posts.

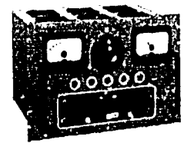
Bulletin No. 179



AIRCRAFT BATTERY SUBSTITUTE

OUTPUT: 0-30 V.D.C., 20 Amperes.
RIPPLE: Less than 1%.
INPUT: 115 V.A.C., 60 Cy., 1 ϕ.
REGULATION: 1/10 Load 35 Volts Full Load 30 Volts
FEATURES: Ammeter overcurrent protection circuit prevents needle 'slam' when starting inverters & motors.
MODEL KM88 ...Rack Mount
MODEL KM88B...Bench

Bulletin No. 100



DUAL RANGE POWER SUPPLY

OUTPUT: 0-32/64 V.D.C., 40/20 Amps.
RIPPLE: Within 1% of aver. DC.
INPUT: 115 V.A.C., 60 Cy., 1 ϕ.
FEATURES: Thermal overload protection, indicating line and load fuses, overload warning light, dual range voltmeter.
MODEL KM95 ...Rack Mount
MODEL KM95B...Bench

Bulletin No. 103

Opad **OPAD ELECTRIC COMPANY** Opad

43-8 WALKER STREET • NEW YORK 13, N Y
Telephone WOrth 6-0380

For details, circle #471 on Reader Service Card

Directory II. Components

61. Power Supplies.

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 35
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Tel: CAnal 6-7250

Plastic Capacitors, Inc., 2620 N. Clybourn Ave., Chicago 14, Ill., 4, 5, 15, 20, 25, 37, 40
See ad on page 405
Tel: DIversey 8-3735

Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 25
See ad on pages 135-136
Tel: EXeter 2-4500

Polytechnic Research & Dev. Co., Inc., N.Y., 25

Polytron Engineering, Inc., Md., 35

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Power Designs, Inc., 1700 Shames Dr., Westbury, N.Y., 4, 15, 17, 20, 35, 37, 40
See ad on page 498
Tel: EDgewood 3-6200

Power Sources, Inc., Northwest Industrial Park, South Ave., Burlington, Mass., 2, 4, 15, 17, 20, 25, 35, 40
See ad on page 430
Tel: BRowning 2-3610

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 2, 4, 5, 15, 20, 37, 40
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Tel: FLemington 900

Press Wireless Labs., Inc., Mass., 5

Pressman Associates, Inc., Pa., 4, 15, 35, 37, 40

Pyroferric Co., Inc., N.Y., Horizontal High Voltage

Q.O.S. Corp., N.Y., 5, 35

Quan-Tech Labs., 236 Mt. Kemble Ave., Morristown, N.J., 4, 15, 35, 37, 40
See ad on page 374
Tel: JEfferson 8-6350

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 5
See ad on page 267
Tel: DAvenport 1-1130

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Radio Frequency Labs., Inc., Powerville Rd., Boonton, N.J., 2, 37
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Tel: DEerfield 4-3100

Radio Receptor Co., Eng. Prods. Div., N.Y., 2, 4, 15, 20, 25, 35, 37

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Ram Electronics, Inc., N.J., 5, 15, 37, 40

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

FROM MILLIWATTS TO KILOWATTS

HIGH VOLTAGE POWER SUPPLIES AND EQUIPMENT

We have sold quantities of these power supplies to laboratories, industrial concerns, the government and universities. Only the best available selected material goes into these units, so that you will have many years of dependable service. Only a few of our standard models are shown below. Quotations on special supplies cheerfully given.

PRECISE MEASUREMENTS COMPANY

HIGH VOLTAGE POWER SUPPLIES

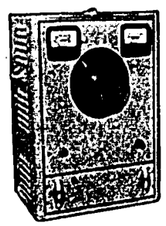
One of the most popular power supplies on the market. Completely redesigned for greater ruggedness and convenience of operation. Widely used for powering electronic equipment and for routine breakdown and insulation testing. Output voltage is well filtered D.C. which is adjustable with convenient front panel control. Input is 115 Volt, 60 cycle A.C. Equipment is available without meter, with one meter (4½"), with two meters, or with larger 6" precision 1% mirror scale movement. Regulated models offer closely stabilized output voltage regardless of line or load changes.

Model		Maximum Voltage	Price	Price Regulated Model
6001	With Kilovolt Meter	1,000	$ 75.00	
6000		2,500	60.00	
6000-A	With Kilovolt Meter	2,500	80.00	$120.00
6005		5,000	75.00	
6005-A	With Kilovolt Meter	5,000	95.00	135.00
6010		10,000	85.00	
6010-A	With Kilovolt Meter	10,000	105.00	145.00
6015		15,000	95.00	
6015-A	With Kilovolt Meter	15,000	115.00	155.00
6025-A	With Kilovolt Meter	25,000	175.00	205.00

MIRROR SCALE HIGHER ACCURACY METERS: Recommended where more exact settings or measurements are needed. Meter size has been increased to 6 inches for easier reading. Price $35.00 additional on any meter equipped model. ..... ADD $35.00

TWO METER MODEL .....

INDUSTRIAL POWER SUPPLIES



Regulated Types Available

These industrial type power supplies are built for service and efficiency. All are of the transformer type and employ husky components that have been selected for their power handling capacity. Controls are arranged so that operation is greatly simplified and a number of safety features are built in for maximum protection of personnel and equipment. Output is continuously variable from zero to full rated value. Polarity reversing models (as illustrated) can be had at additional cost.

Standard hum level 5% or less. .01% to 1% ripple available. All power supplies have automatic overload cutout control circuits. Regulated models available.

Model	Voltage	Current	Price
F-500V	0-500	3 Amp	$800.00
F-6001	0-1000	2 Amp	975.00
F-6002	0-2000	1 Amp	985.00
F-6003-A1	0-3000	100 MA	375.00
F-6003-AV	0-3000	500 MA	550.00
F-6003-AK	0-3000	1 Amp	1100.00
F-6005-A1-H	0-5000	100 MA	550.00
F-6005-AV	0-5000	500 MA	750.00
F-6005-A1K	0-5000	1 Amp	1200.00
F-6010-A1	0-10,000	100 MA	800.00
F-6020-A05	0-20,000	50 MA	975.00
F-6050-T	0-50,000	½ MA	600.00
F-6100-T	0-100,000	½ MA	1100.00

HEAVY DUTY POWER SUPPLIES

For use in applications where high voltages at extra high currents are required. Illustrated is our 100 KW Model, rated for 0 to 7,000 Volts at 14 Amperes DC. This unit is housed in a single convenient cabinet. Output voltage is regulated against line and load changes. Voltage is smoothly adjustable from zero to full output. Automatic circuits protect against overvoltage or over current conditions, turning off main power in a split second. Use of special transformer construction allows constant load drain at full rated output. All power supplies in this series are available with fixed or adjustable output and with or without regulation.

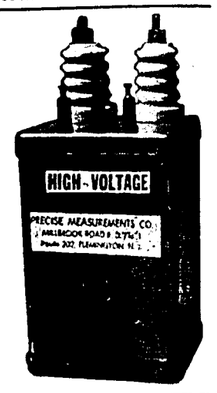
Model	Voltage	Current
A-10	0-1000	5 amperes
A-30	0-3000	5 amperes
A-31	0-3000	10 amperes
A-32	0-3000	20 amperes
A-50	0-5000	5 amperes
A-51	0-5000	10 amperes
A-72	0-7000	15 amperes
A-100	0-10,000	5 amperes
A-110	0-10,000	10 amperes
A-300	0-30,000	5 amperes

TRANSFORMERS, HIGH VOLTAGE

For experimental, industrial or production applications. These units are small and compact and rated for constant service. Primary designed for 105/115/125 Volts 60 Cycle. Secondary winding has half voltage tap. Only standard models are listed, other voltages and currents available on order.

Model	Voltage	Model	Voltage
1 KVT	1 KV	10 KVT	10 KV
2 KVT	2 KV	15 KVT	15 KV
3 KVT	3 KV	25 KVT	25 KV
5 KVT	5 KV	50 KVT	50 KV

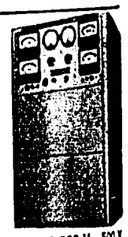
PACKAGED POWER SUPPLIES



These conveniently packaged power units will be found ideal for applications requiring minimum size and weight. Features isolated high voltage terminals permitting either the positive or negative side to be grounded. Rectifier tubes are operated from separate filament transformers so that DC output voltage can be varied from zero to full rated value. Selenium rectifier types have extra cells to assure operation under high line voltage or light loading. All standard units have well filtered DC output. Power packs with AC output available on order.

Model	Output Voltage	Current	Model	Output Voltage	Current
05-KV-5MA	500 Volts DC	5 Ma.	20-KV-1MA	20 KV DC	1 Ma.
1-KV-5MA	1 KV DC	5 Ma.	20-KV-5MA	20 KV DC	5 Ma.
2-KV-5MA	2 KV DC	5 Ma.	30-KV-1MA	30 KV DC	1 Ma.
5-KV-1MA	5 KV DC	1 Ma.	30-KV-5MA	30 KV DC	5 Ma.
5-KV-5MA	5 KV DC	5 Ma.	50-KV-1MA	50 KV DC	1 Ma.
10-KV-1MA	10 KV DC	1 Ma.	50-KV-5MA	50 KV DC	5 Ma.
10-KV-5MA	10 KV DC	5 Ma.	75-KV-1MA	75 KV DC	1 Ma.
15-KV-1MA	15 KV DC	1 Ma.	100-KV-1MA	100 KV DC	1 Ma.
15-KV-5MA	15 KV DC	5 Ma.			

CONSTANT CURRENT POWER SUPPLIES



Designed for application where output current must remain constant regardless of loading resistance changes. Used for magnet fields, plating applications, gaseous lamps. Dependable magnetic current stabilizer has no moving parts, no tubes, no transistors to replace. Simply set current to desired level, no balancing or other adjustments needed. Ideal for lamp operation since operating state ionizing voltage in no way affects lamp current. Standard hum level 5%. Lower hum levels available on order.

Model	Maximum Voltage	Maximum Current
C-25-700	25 Volts	700 Amperes
C-70-70	70 Volts	70 Amperes
C-500-10	500 Volts	10 Amperes
C-Duel 500-10	500 or 1,000 Volts	10 or 20 Amperes
C-800-2	800 Volts	2 Amperes
C-1000-100	1000 Volts	100 Amperes

Duel 500 V - 500 V, 10 Ampere Power Supply. Isolated outputs may be series or paralleled.

AC INSULATION AND BREAKDOWN TESTERS

Used in testing insulation where AC voltages are desired. Dual instruments are also available which provide choice of AC or DC output with simple toggle switch selection. Units include kilovoltmeter, current meter and automatic overload cutout circuits.

Model	Voltage	VA	AC	AC and DC Price
3000	0 to 3,000	75	$150.00	$ 250.00
3010	0 to 3,000	300	250.00	400.00
3050	0 to 3,000	1,500	500.00	650.00
3100	0 to 6,000	3,000	700.00	1,100.00
5000	0 to 5,000	75	175.00	300.00
10K	0 to 10,000	75	200.00	350.00

DIMENSIONS: Panel Height 83/4" Width 19" Depth 11"

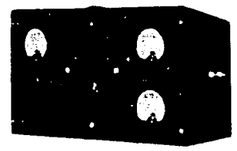
PRECISE MEASUREMENTS COMPANY

MILLBROOK LANE • R. D. 1 • FLEMINGTON, NEW JERSEY • TEL. FLEMINGTON 900

For other power supplies, see our ad on page 583.

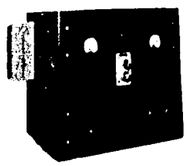
For details, circle #472 on Reader Service Card

REGULATED DC POWER SUPPLIES



Silicon-Germanium-Selenium

MAGNETIC AMPLIFIER ± 1% Voltage Regulation



- Greater reliability
- Fast response time
- Greater stability
- Operable under extreme environmental conditions
- No tubes—no warm-up
- Highly efficient

Models available: from 5 amperes to 1500 amperes, 6 volts to 250 volts.

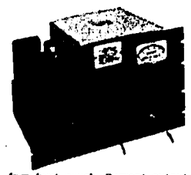
4 Page Brochure MA-1 Available

RAPID ELECTRIC COMPANY

2881 Middletown Road, New York 61, New York • TA-8-2200

For details, circle #473 on Reader Service Card

SPELLMAN HIGH VOLTAGE POWER SUPPLIES

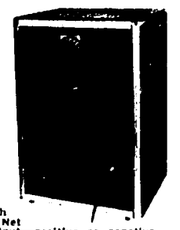


MODEL PN-30R REVERSIBLE POLARITY

Continuously Variable 1-30KV Unregulated DC Power Supply

A light, compact unit in wide use for insulation testing, precipitators and laboratory research. Polarity reversible from front panel. Current output approx. 2 ma. at 30KV; 250 microamperes at 30KV. Input: 110V AC 60 cycles. Dimensions: 19" x 10½" x 13" deep. ..... $225 Net

With meter installed on front panel ..... $275 Net

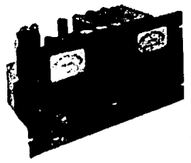


MODEL LAB-90 RF TYPE CONTINUOUSLY VARIABLE 0-90KV REGULATED DC POWER SUPPLY

Output current .7 ma. at 90KV; 1 ma. at 80KV; 2 ma. from 40KV down. Regulation better than 1% throughout entire range. Dimensions in cabinet: 28" high, 21¾" wide, 18" deep.

LAB-90 Complete with meter ..... $900 Net

Specify polarity output—positive or negative



MODEL RG-5 5KV DC REGULATED POWER SUPPLY

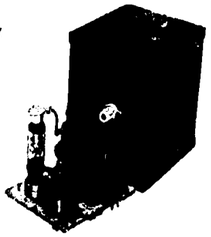
Output current 2 ma. Regulated against line and load 1%. Variable 3 to 7KV. Complete with Current and Volt Meters . $250 Net

MODEL RG-10 10KV DC REGULATED POWER SUPPLY

Output current 2 ma. Regulated against line and load 1%. Variable 7 to 12KV. Complete with Current and Volt Meters . . $260 Net

MODEL RG-15 15KV DC REGULATED POWER SUPPLY

Output current 2 ma. Regulated against line and load 1%. Variable 12 to 17KV. Complete with Current and Volt Meters . . $275 Net



MODEL 4575 5KV-1 ma. DC POWER SUPPLY

For an output voltage of 5KV DC at 1 ma., the low voltage input requirement is 230V at 50 ma. By varying the DC input the output voltage can be varied from approximately 1KV to 7½KV. Dimensions: 5¾" high x 5" deep x 4¼" wide. In completely enclosed metal housing.

MODEL 4575 ..... $32.50 Net

MODEL 4575-2 Same as above with 2 ma. output at 5KV ..... $42.50 Net

MODEL 4575PN—Same as 4575 except reversible polarity. Either positive or negative output may be grounded or left floating ..... $42.50 Net

MODEL 4575-2 PN—Same as 4575-2 except reversible polarity. Either positive or negative output may be grounded or left floating . . $82.50 Net

COMPLETE LINE OF HIGH VOLTAGE COILS—Send for complete catalog R

SPELLMAN HIGH VOLTAGE CO. INC

FORMERLY SPELLMAN TELEVISION CO. INC

3029 WEBSTER AVE. BRONX, 67, N. Y. Kingsbridge 7-0306

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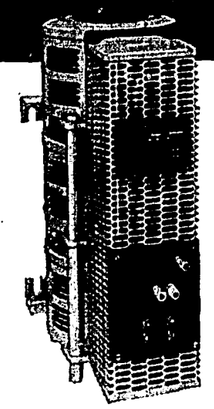
Tel: BIshop 2-1414

VARICELL D C

adjustable

A-C/D-C power supply



- VERSATILE... EITHER A-C OR D-C OUTPUT
- SMALL, COMPACT
- LOW COST PER KVA
- GOOD REGULATION
- LOW PERCENTAGE RIPPLE
- FULL CURRENT RATING AT ANY VOLTAGE SETTING

Here is a small, compact unit designed to provide a source of adjustable low a-c or d-c voltages from a-c power lines. Features greater equipment utilization and flexibility . . . a single unit does the job of several! Can be used independently or as a component. Essentially consists of a 3-phase, low voltage POWERSTAT variable transformer combined with a static d-c power supply. The power supply uses highly efficient silicon rectifier cells connected for full-wave 3-phase operation. Filtering is usually not required because the low ripple content is approximately 4.2% and ripple frequency 360 cycles at a supply frequency of 60 cycles. The a-c or d-c regulation is approximately 10% at the maximum voltage setting.

VARICELL TYPE V4050-3 RATINGS

A-C INPUT: 240 volts, 50/60 cycles, 3-phase (Primary delta connected)

A-C OUTPUT: 0-30 volts, 40 amperes, 3-phase (Secondary delta connected); 0-50 volts, 25 amperes, 3-phase (Secondary wye connected)

D-C OUTPUT: 0-35 volts, 50 amperes (Secondary delta connected); 0-60 volts, 30 amperes (Secondary wye connected)

The a-c and d-c outputs cannot be simultaneously loaded or externally interconnected. The a-c output can be used either single or three phase.

WRITE FOR VARICELL BULLETIN

THE SUPERIOR ELECTRIC COMPANY

For details, circle #475 on Reader Service Card

"TECHNICAL APPARATUS BUILDERS"

AC & DC POWER HEADQUARTERS!

TABTRON®—TABPAK®—TABTRAN®—TABSTAT®

High Current Power Supplies

Five Year Guarantee**

Variable Stepless from Zero to Full Voltage DC
Full Wave Selenium or Silicon Rectifier,
Isolation Power Transformer, Variac, Meters

***Per Factory Warrantee* — *Write Details with Meters*

Stock # Volts & Amps	Continuous Rating	
T5V60A3ØSJ	0-5 VDC @ 60Ø Amp/5% Rip	$638
T6I2V12A*	0-8 or 0-16 V DC @ 12 Amps.	$47
T6I2V12ACC*	0-16 V @ 12 A ½% Rip @ 5 A	$47
T12V25AC	0-12 V @ 25 A/5% Rip	$158
T12V50ACSJ	0-12 V @ 50 A/1% Rip/5% Reg	$225
T28V5A	0-28 WVDC @ 5 Amp	$57
T28V5ACC	Filtered (1% Ripple)	$84
T28V12A	0-28 WVDC at 12 Amp	$138
T28V12ACC	Filtered (1% Ripple)	$168
T28V12A2CC	Filtered (0.1% Ripple)	$223
T28V24A	0-28 WVDC at 24 Amp	$165
T28V24ACC	Filtered (1% Ripple)	$224
T28V30A	0-28 WVDC at 30 Amp	$305
T28V30ACC	Filtered (2% Ripple)	$408
RT35V5ACCSJ	0-35 V @ 5 A/1% Rip/= 5% Reg	$160
RT35V12ACCSJ	0-35 V @ 12 A/1% Rip/= 5% Reg	$258
RT35V12A2CCSJ	0-35 V @ 25 A/1% Rip/= 5% Reg	$395
RT35V50A3ØSJ	0-35 V @ 50 A/2% R/= 5% Reg	$648
RT35V100A3ØSJ	0-35 V @ 100 A/2% R/= 5% Reg	$756
T120V5A	0-120 VDC @ 5 Amp	$225
T120V5ACC	Filtered (1% Ripple)	$275
T220V7ACC	0-220 V @ 7 Amp/2% Rip	$325

* 2" Meters SJ/SILICON RECTI 50/2Ø6-31Ø VAC/36 / INPT

24-28VDC	CASED FILTERED RELAY SUPPLYR.	
B24VAR	24-28 VDC @ 1 Amp	$7.00
B24VER	24-28 VDC @ 2 Amp	$12.00
B24VJR	24-28 VDC @ 5 Amp	$25.00

Lo-Priced Basic DC Power Packages Isolation Transformer, Rectifier, Switch, Fuse & Way Terminals!

B3V5ØØA3ø	$322	B12V24A	$139
B12V2AA	$38	B28V5ØA	$225
B12V6AA	$140	B28V1ØØA	$405
B28V5A	$45	B115V2.5A	$81
B28V12A	$98	B220V2A	$150

SILTAB® SILICON & TEKSEL® SELENIUM POWER RECTIFIERS
To Your Specs — All Types & Current Ranges!
Types & Current Ranges for Continuous Duty & Convection Cooling
RECTIFIERS—CONVECTION COOLED†

"SILTAB"® SILICON RECTIFIERS, ONE YEAR GUARANTEED†

	FULL WAVE BRIDGE						3ø, THREE PHASE 3A						STAR						WYE					
	1ØVCT	F. W. CENTER TAP					BRIDGE						C.T.3A						H.W.3A					
	115VAC	230VAC	460VAC	575VAC	690VAC	1Ø35VAC	185VAC	37ØVAC	74ØVAC	925VAC	1295VAC	1665VAC	115VAC	23ØVAC	46ØVAC	575VAC	69ØVAC	1Ø35VAC	115VAC	23ØVAC	46ØVAC	575VAC	69ØVAC	1Ø35VAC
	15VDC	25VDC	5ØVDC	125VDC	15ØVDC	225VDC	15VDC	25VDC	5ØVDC	125VDC	15ØVDC	225VDC	15VDC	25VDC	5ØVDC	125VDC	15ØVDC	225VDC	15VDC	25VDC	5ØVDC	125VDC	15ØVDC	225VDC
	$2.3Ø	$4.9Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$2.3Ø	$4.9Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ
1A													$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ
3A	$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$3.15	$4.5Ø	$16.5Ø	$29.75	$36.ØØ	$54.ØØ	$4.75	$6.75	$24.75	$44.75	$54.ØØ	$81.ØØ	$4.75	$6.75	$24.75	$44.75	$54.ØØ	$81.ØØ
5A	$4.75	$6.75	$24.75	$44.75	$54.ØØ	$81.ØØ	$4.75	$6.75	$24.75	$44.75	$54.ØØ	$81.ØØ	$6.75	$9.45	$34.5Ø	$62.5Ø	$75.6Ø	$113.4Ø	$6.75	$9.45	$34.5Ø	$62.5Ø	$75.6Ø	$113.4Ø
1Ø	$6.75	$9.45	$34.5Ø	$62.5Ø	$75.6Ø	$113.4Ø	$6.75	$9.45	$34.5Ø	$62.5Ø	$75.6Ø	$113.4Ø	$9.45	$13.2Ø	$48.3Ø	$87.5Ø	$1Ø5.8Ø	$158.8Ø	$9.45	$13.2Ø	$48.3Ø	$87.5Ø	$1Ø5.8Ø	$158.8Ø
15A	$9.45	$13.2Ø	$48.3Ø	$87.5Ø	$1Ø5.8Ø	$158.8Ø	$9.45	$13.2Ø	$48.3Ø	$87.5Ø	$1Ø5.8Ø	$158.8Ø	$13.2Ø	$18.9Ø	$67.5Ø	$122.5Ø	$148.2Ø	$222.3Ø	$13.2Ø	$18.9Ø	$67.5Ø	$122.5Ø	$148.2Ø	$222.3Ø
2ØA	$13.2Ø	$18.9Ø	$67.5Ø	$122.5Ø	$148.2Ø	$222.3Ø	$13.2Ø	$18.9Ø	$67.5Ø	$122.5Ø	$148.2Ø	$222.3Ø	$18.9Ø	$25.2Ø	$9Ø.ØØ	$162.5Ø	$198.ØØ	$297.ØØ	$18.9Ø	$25.2Ø	$9Ø.ØØ	$162.5Ø	$198.ØØ	$297.ØØ
25A	$16.5Ø	$23.1Ø	$82.5Ø	$15Ø.ØØ	$181.5Ø	$272.25	$16.5Ø	$23.1Ø	$82.5Ø	$15Ø.ØØ	$181.5Ø	$272.25	$23.1Ø	$31.5Ø	$112.5Ø	$2Ø2.5Ø	$247.5Ø	$371.25	$23.1Ø	$31.5Ø	$112.5Ø	$2Ø2.5Ø	$247.5Ø	$371.25
3ØA	$18.9Ø	$27.3Ø	$97.5Ø	$175.5Ø	$214.2Ø	$321.3Ø	$18.9Ø	$27.3Ø	$97.5Ø	$175.5Ø	$214.2Ø	$321.3Ø	$27.3Ø	$37.8Ø	$135.ØØ	$243.ØØ	$297.ØØ	$445.5Ø	$27.3Ø	$37.8Ø	$135.ØØ	$243.ØØ	$297.ØØ	$445.5Ø
4ØA	$24.3Ø	$33.6Ø	$12Ø.ØØ	$216.ØØ	$264.ØØ	$396.ØØ	$24.3Ø	$33.6Ø	$12Ø.ØØ	$216.ØØ	$264.ØØ	$396.ØØ	$33.6Ø	$46.2Ø	$165.ØØ	$297.ØØ	$363.ØØ	$544.5Ø	$33.6Ø	$46.2Ø	$165.ØØ	$297.ØØ	$363.ØØ	$544.5Ø
5ØA	$29.7Ø	$41.Ø4	$147.ØØ	$264.5Ø	$323.4Ø	$485.1Ø	$29.7Ø	$41.Ø4	$147.ØØ	$264.5Ø	$323.4Ø	$485.1Ø	$41.Ø4	$56.7Ø	$2Ø2.5Ø	$364.5Ø	$445.5Ø	$668.25	$41.Ø4	$56.7Ø	$2Ø2.5Ø	$364.5Ø	$445.5Ø	$668.25
6ØA	$35.1Ø	$48.6Ø	$174.ØØ	$312.5Ø	$382.2Ø	$573.3Ø	$35.1Ø	$48.6Ø	$174.ØØ	$312.5Ø	$382.2Ø	$573.3Ø	$48.6Ø	$67.5Ø	$24Ø.ØØ	$432.ØØ	$528.ØØ	$792.ØØ	$48.6Ø	$67.5Ø	$24Ø.ØØ	$432.ØØ	$528.ØØ	$792.ØØ
75A	$43.2Ø	$59.4Ø	$213.ØØ	$382.5Ø	$467.4Ø	$7Ø1.1Ø	$43.2Ø	$59.4Ø	$213.ØØ	$382.5Ø	$467.4Ø	$7Ø1.1Ø	$59.4Ø	$81.ØØ	$292.5Ø	$526.5Ø	$643.5Ø	$965.25	$59.4Ø	$81.ØØ	$292.5Ø	$526.5Ø	$643.5Ø	$965.25
1ØØA	$54.ØØ	$75.6Ø	$27Ø.ØØ	$486.ØØ	$594.ØØ	$891.ØØ	$54.ØØ	$75.6Ø	$27Ø.ØØ	$486.ØØ	$594.ØØ	$891.ØØ	$75.6Ø	$1Ø2.6Ø	$372.ØØ	$67Ø.ØØ	$819.ØØ	$1228.5Ø	$75.6Ø	$1Ø2.6Ø	$372.ØØ	$67Ø.ØØ	$819.ØØ	$1228.5Ø
125A	$64.8Ø	$9Ø.ØØ	$324.ØØ	$583.2Ø	$712.8Ø	$1Ø69.2Ø	$64.8Ø	$9Ø.ØØ	$324.ØØ	$583.2Ø	$712.8Ø	$1Ø69.2Ø	$9Ø.ØØ	$121.5Ø	$445.5Ø	$8Ø1.ØØ	$981.ØØ	$1471.5Ø	$9Ø.ØØ	$121.5Ø	$445.5Ø	$8Ø1.ØØ	$981.ØØ	$1471.5Ø
15ØA	$75.6Ø	$1Ø5.3Ø	$378.ØØ	$68Ø.4Ø	$831.6Ø	$1247.4Ø	$75.6Ø	$1Ø5.3Ø	$378.ØØ	$68Ø.4Ø	$831.6Ø	$1247.4Ø	$1Ø5.3Ø	$141.9Ø	$519.75	$936.ØØ	$1144.5Ø	$1716.75	$1Ø5.3Ø	$141.9Ø	$519.75	$936.ØØ	$1144.5Ø	$1716.75
2ØØA	$97.2Ø	$135.ØØ	$486.ØØ	$874.8Ø	$1Ø69.2Ø	$1588.8Ø	$97.2Ø	$135.ØØ	$486.ØØ	$874.8Ø	$1Ø69.2Ø	$1588.8Ø	$135.ØØ	$182.25	$668.25	$1215.ØØ	$1458.ØØ	$2187.ØØ	$135.ØØ	$182.25	$668.25	$1215.ØØ	$1458.ØØ	$2187.ØØ
25ØA	$118.8Ø	$162.ØØ	$594.ØØ	$1Ø69.2Ø	$1296.ØØ	$1944.ØØ	$118.8Ø	$162.ØØ	$594.ØØ	$1Ø69.2Ø	$1296.ØØ	$1944.ØØ	$162.ØØ	$218.7Ø	$8Ø1.ØØ	$1458.ØØ	$1782.ØØ	$2673.ØØ	$162.ØØ	$218.7Ø	$8Ø1.ØØ	$1458.ØØ	$1782.ØØ	$2673.ØØ
3ØØA	$145.8Ø	$2Ø2.5Ø	$729.ØØ	$1296.ØØ	$1593.ØØ	$2389.5Ø	$145.8Ø	$2Ø2.5Ø	$729.ØØ	$1296.ØØ	$1593.ØØ	$2389.5Ø	$2Ø2.5Ø	$27Ø.ØØ	$972.ØØ	$1782.ØØ	$2187.ØØ	$3281.25	$2Ø2.5Ø	$27Ø.ØØ	$972.ØØ	$1782.ØØ	$2187.ØØ	$3281.25
4ØØA	$194.4Ø	$27Ø.ØØ	$972.ØØ	$1728.ØØ	$2124.ØØ	$3186.ØØ	$194.4Ø	$27Ø.ØØ	$972.ØØ	$1728.ØØ	$2124.ØØ	$3186.ØØ	$27Ø.ØØ	$364.5Ø	$1296.ØØ	$2376.ØØ	$2916.ØØ	$4374.ØØ	$27Ø.ØØ	$364.5Ø	$1296.ØØ	$2376.ØØ	$2916.ØØ	$4374.ØØ
5ØØA	$243.ØØ	$337.5Ø	$1215.ØØ	$2160.ØØ	$2655.ØØ	$3982.5Ø	$243.ØØ	$337.5Ø	$1215.ØØ	$2160.ØØ	$2655.ØØ	$3982.5Ø	$337.5Ø	$455.6Ø	$1620.ØØ	$2970.ØØ	$3645.ØØ	$5467.5Ø	$337.5Ø	$455.6Ø	$1620.ØØ	$2970.ØØ	$3645.ØØ	$5467.5Ø
6ØØA	$291.6Ø	$4Ø5.ØØ	$1458.ØØ	$2592.ØØ	$3186.ØØ	$4779.ØØ	$291.6Ø	$4Ø5.ØØ	$1458.ØØ	$2592.ØØ	$3186.ØØ	$4779.ØØ	$4Ø5.ØØ	$546.7Ø	$1944.ØØ	$3564.ØØ	$4374.ØØ	$6561.ØØ	$4Ø5.ØØ	$546.7Ø	$1944.ØØ	$3564.ØØ	$4374.ØØ	$6561.ØØ
75ØA	$364.5Ø	$5Ø6.25	$1822.5Ø	$3240.ØØ	$3982.5Ø	$5973.75	$364.5Ø	$5Ø6.25	$1822.5Ø	$3240.ØØ	$3982.5Ø	$5973.75	$5Ø6.25	$683.4Ø	$2430.ØØ	$4455.ØØ	$5467.5Ø	$82Ø1.25	$5Ø6.25	$683.4Ø	$2430.ØØ	$4455.ØØ	$5467.5Ø	$82Ø1.25
1ØØØA	$486.ØØ	$675.ØØ	$2430.ØØ	$4320.ØØ	$5310.ØØ	$7965.ØØ	$486.ØØ	$675.ØØ	$2430.ØØ	$4320.ØØ	$5310.ØØ	$7965.ØØ	$675.ØØ	$911.25	$3240.ØØ	$5940.ØØ	$7290.ØØ	$1Ø935.ØØ	$675.ØØ	$911.25	$3240.ØØ	$5940.ØØ	$7290.ØØ	$1Ø935.ØØ

"TEKSEL"® SELENIUM RECTIFIERS, ONE YEAR GUARANTEED†

	36VAC	72VAC	144VAC	216VAC	288VAC	432VAC	576VAC	864VAC	1152VAC	1728VAC	2304VAC	3456VAC
	32VDC	64VDC	128VDC	192VDC	256VDC	384VDC	512VDC	768VDC	1Ø24VDC	1536VDC	2Ø48VDC	3Ø72VDC
	$1.48	$2.25	$4.Ø5	$6.75	$8.1Ø	$12.15	$16.2Ø	$24.3Ø	$32.4Ø	$48.6Ø	$64.8Ø	$97.2Ø
1A	$1.48	$2.25	$4.Ø5	$6.75	$8.1Ø	$12.15	$16.2Ø	$24.3Ø	$32.4Ø	$48.6Ø	$64.8Ø	$97.2Ø
3A	$2.25	$3.15	$5.4Ø	$8.1Ø	$1Ø.8Ø	$16.2Ø	$21.6Ø	$32.4Ø	$43.2Ø	$64.8Ø	$86.4Ø	$129.6Ø
5A	$3.15	$4.5Ø	$8.1Ø	$12.15	$16.2Ø	$24.3Ø	$32.4Ø	$48.6Ø	$64.8Ø	$97.2Ø	$129.6Ø	$194.4Ø
1Ø	$4.5Ø	$6.75	$12.15	$18.9Ø	$24.3Ø	$36.45	$48.6Ø	$72.9Ø	$97.2Ø	$145.8Ø	$194.4Ø	$291.6Ø
15A	$6.75	$9.45	$16.2Ø	$24.3Ø	$32.4Ø	$48.6Ø	$64.8Ø	$97.2Ø	$129.6Ø	$194.4Ø	$259.2Ø	$388.8Ø
2ØA	$8.1Ø	$12.15	$21.6Ø	$32.4Ø	$43.2Ø	$64.8Ø	$86.4Ø	$129.6Ø	$172.8Ø	$259.2Ø	$345.6Ø	$518.4Ø
25A	$9.45	$13.5Ø	$24.3Ø	$36.45	$48.6Ø	$72.9Ø	$97.2Ø	$145.8Ø	$194.4Ø	$291.6Ø	$388.8Ø	$583.2Ø
3ØA	$1Ø.8Ø	$16.2Ø	$27.Ø	$4Ø.5Ø	$54.ØØ	$81.ØØ	$1Ø8.ØØ	$162.ØØ	$216.ØØ	$324.ØØ	$432.ØØ	$648.ØØ
4ØA	$13.5Ø	$2Ø.25	$36.45	$54.ØØ	$72.9Ø	$1Ø8.ØØ	$145.8Ø	$218.7Ø	$291.6Ø	$437.4Ø	$583.2Ø	$874.8Ø
5ØA	$16.2Ø	$24.3Ø	$43.2Ø	$64.8Ø	$86.4Ø	$129.6Ø	$172.8Ø	$259.2Ø	$345.6Ø	$518.4Ø	$691.2Ø	$1Ø36.8Ø
6ØA	$18.9Ø	$27.Ø	$48.6Ø	$72.9Ø	$97.2Ø	$145.8Ø	$194.4Ø	$291.6Ø	$388.8Ø	$583.2Ø	$777.6Ø	$1166.4Ø
75A	$21.6Ø	$32.4Ø	$54.ØØ	$81.ØØ	$1Ø8.ØØ	$162.ØØ	$216.ØØ	$324.ØØ	$432.ØØ	$648.ØØ	$864.ØØ	$1296.ØØ
1ØØA	$27.Ø	$4Ø.5Ø	$72.9Ø	$1Ø8.ØØ	$145.8Ø	$218.7Ø	$291.6Ø	$437.4Ø	$583.2Ø	$874.8Ø	$1166.4Ø	$1749.6Ø
125A	$32.4Ø	$48.6Ø	$86.4Ø	$129.6Ø	$172.8Ø	$259.2Ø	$345.6Ø	$518.4Ø	$691.2Ø	$1Ø36.8Ø	$1382.4Ø	$2Ø73.6Ø
15ØA	$37.8Ø	$56.7Ø	$1Ø1.25	$151.9Ø	$2Ø2.5Ø	$3Ø4.ØØ	$4Ø5.ØØ	$6Ø7.5Ø	$81Ø.ØØ	$1215.ØØ	$162Ø.ØØ	$2430.ØØ
2ØØA	$48.6Ø	$72.9Ø	$129.6Ø	$194.4Ø	$259.2Ø	$388.8Ø	$518.4Ø	$777.6Ø	$1Ø36.8Ø	$1555.2Ø	$2Ø73.6Ø	$3Ø73.6Ø
25ØA	$59.4Ø	$89.1Ø	$158.4Ø	$237.6Ø	$316.8Ø	$475.2Ø	$633.6Ø	$95Ø.4Ø	$1267.2Ø	$19Ø1.6Ø	$2534.4Ø	$38Ø1.6Ø
3ØØA	$72.9Ø	$1Ø8.ØØ	$194.4Ø	$291.6Ø	$388.8Ø	$583.2Ø	$777.6Ø	$1166.4Ø	$1555.2Ø	$2332.8Ø	$3Ø73.6Ø	$4665.6Ø
4ØØA	$97.2Ø	$145.8Ø	$259.2Ø	$388.8Ø	$518.4Ø	$777.6Ø	$1Ø36.8Ø	$1555.2Ø	$2Ø73.6Ø	$3Ø73.6Ø	$4147.2Ø	$6221.4Ø
5ØØA	$121.5Ø	$182.25	$324.ØØ	$486.ØØ	$648.ØØ	$972.ØØ	$1296.ØØ	$1944.ØØ	$2592.ØØ	$3888.ØØ	$5184.ØØ	$7776.ØØ
6ØØA	$145.8Ø	$218.7Ø	$388.8Ø	$583.2Ø	$777.6Ø	$1166.4Ø	$1555.2Ø	$2332.8Ø	$3Ø73.6Ø	$4665.6Ø	$6221.4Ø	$9331.2Ø
75ØA	$182.25	$273.4Ø	$486.ØØ	$729.ØØ	$972.ØØ	$1458.ØØ	$1944.ØØ	$2916.ØØ	$3888.ØØ	$5832.ØØ	$7776.ØØ	$11664.ØØ
1ØØØA	$243.ØØ	$364.5Ø	$648.ØØ	$972.ØØ	$1296.ØØ	$1944.ØØ	$2592.ØØ	$3888.ØØ	$5184.ØØ	$7776.ØØ	$1Ø368.ØØ	$15552.ØØ

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CR5003	5 Amp, .07 Henrys .6 Ohm	9.45
CR5004	12 Amp, .01 Henrys .1 Ohm	14.45
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61. Power Supplies.

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Solatron, Inc., Mass., 4
Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 35
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Tel: LYric 2-6400
Sorensen & Co., Inc., Conn., 2, 4, 5, 15, 17, 20, 35, 37, 40
Specialties, Inc., N.Y., 2, 17
Specialty Electronics Development Corp., N.Y., 2, 4, 5, 15, 35, 40
Specialty Engrn. & Electrn. Co., N.Y., 2, 5, 37, 40
Specific Products, 21051 Costanso, P.O. Box 425, Woodland Hills, Calif., 4
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Tel: DI 0-3131
Spectrol Electronics Corp., Calif., 2, 4, 5, 15, 20, 35, 40
Spellman High Voltage Co., 3029 Webster Ave., New York 67, N.Y., 4, 5, 11, 37
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Tel: KIngsbridge 7-0306
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Superior Electric Co., 590 Tripp Ave., Bristol, Conn., 2, 4, 37, 40
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Tel: LUdlow 2-9561
Syntron Co., 83 Lexington Ave., Homer City, Pa., 4, 37, 40
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Tel: GR 9-8011
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Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 2, 4, 5, 15, 17, 20, 35, 37, 40
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Telex, Inc., 1633 Eustis St., St. Paul 1, Minn., 2, 4, 17, 20, 35, 40
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Tel: MIdway 6-7211
Tel-Instrument Electronics Corp., N.J., 2, 20, 37
Temco Aircraft Corp., Electronics Div., Texas, 2, 4, 5, 15, 35

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61. Power Supplies.

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Tel: MIdway 6-2514
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Texas Instruments, Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 35
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Tel: FLeetwood 7-5411
Texas Instruments, Incorporated, Houston, Texas, 4, 15
Thermador Electrical Mfg. Co., Calif., 2, 4, 5, 15, 17, 20, 35, 37, 40
Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 2
Thordarson-Meissner, Ill., 2, 4, 35, 40
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Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 2, 4, 15, 17, 37, 40
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Tel: ELizabeth 4-5650
Trans Electronics, Inc., Calif., 2, 4, 5, 15, 20, 35, 37, 40
Transformer Technicians, Inc., Ill., 2, 4, 15, 17, 20
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Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 2, 5, 37, 40
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Video Instruments Co., Inc., Calif., 7, 15, 35, 37, 40
Vinco Electronics Corp., Conn., 4, 15, 20, 37, 40
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Wallson Assoc., Inc., 35 E. Runyon St., Newark 8, N.J., 2, 4, 5, 15, 17, 35, 40
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Tel: TAlbot 4-2600
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Wincharger Corp., E. Seventh & Division Sts., Sioux City 2, Iowa, 2, 4, 15, 30, 35
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Tel: 2-1844

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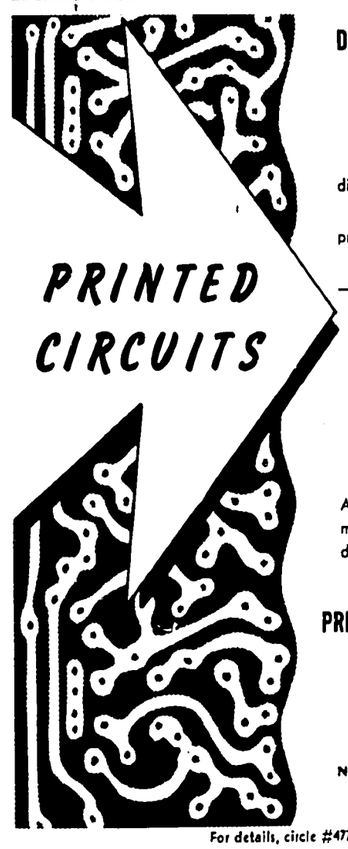
Pre-amplifiers: See class 36

Printed circuit machinery: See class 92

62. Printed & Packaged Circuits.

3. Etched or screened prewired chassis
5. Modules
7. Plug-in
8. Potted type
10. Printed electronic assemblies
15. Solder dipped prewired chassis

ACDC Electronics Inc., Calif., 5, 7, 8
ACF Electronics, Va., 5
A.R.F. Products, Inc., Ill., 3, 5, 8
Aerocoil, Inc., N.J., 3, 10
Aerolite Electronics, Co., N.J., 8, 10
Aerovox Corp., Mass., 5
Aerovox Corp., Hi-Q Div., N.Y., 10



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Tel: HEmlock 6-2230

Airtronics, Inc., D.C., 3, 7, 8, 10, 15

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American Missile Products, Calif., 3, 5, 7, 8, 10

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Anchor Specialty Mfg. Co., Inc., N.J., 10

Ansley Mfg. Co., Arthur, New Hope, Pa., 3, 5, 7, 8, 10, 15
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Tel: AXtel 7-2711

Applegate & Co., C. J., 1840 24th St., Boulder, Colo., 7, 8, 10
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Tel: HIilcrest 2-8750

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Avionics Ltd., Canada, 3, 7, 10, 15

B. J. Electronics, Borg-Warner Corp., Calif., 5, 7, 8, 15

Becks, Inc., Minn., 3, 5, 7, 10

Bel Fuse, Inc., 197 Van Vorst St., Jersey City, N.J., 5
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Tel: HEnderson 2-0463

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Buckbee Mears Co., Minn., 3

Bulova Watch Co., Electronics Div., Dept. A-1376, 40-06 62nd St., Woodside 77, N.Y., 5
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Tel: NEwtown 9-5700

Bureau of Engraving Inc., Industrial Div., Minn., 3, 7, 10, 15

CG Electronics Corp., N.M., 3, 7, 8

C & K Components, Inc., Mass., 5, 8

Camden Electronics, Inc., N.J., 3, 10, 15

Canadian Aviation Electronics, Ltd., Canada, 10

Centralab, Div. of Globe-Union Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 5, 7, 8, 10
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Tel: WOodruff 2-9200

Consult the advertisements in this issue for complete information on prices, specifications, etc.

Chicago Dynamic Industries, Inc., 1725 Diversey Blvd., Chicago 14, Ill., 10
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Tel: WE 5-4500

Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 3, 7
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Tel: NEvada 2-2000

Cinch Mfg. Co., Graphic Circuits Div., Calif., 3, 5, 7, 8, 10, 15

Circon Component Corp., Santa Barbara Municipal Airport, Goleta, Calif., 3, 10
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Tel: WOodland 7-1113

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Concord Control, Inc., 1282 Soldiers Field Rd., Boston 35, Mass., 5, 7, 10
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Tel: ALgonguin 4-5106

Corning Glass Works, 550 High St., Bradford, Pa., 3, 5
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Tel: 2-4571

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Cudner & O'Connor Co., Ill., Silk Screen Inks

Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 3, 10
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Tel: LOcust 4-3131

Danly Machine Specialties, Inc., Ill., 3, 7, 8, 10

Daven Co., N.J., 3, 5, 7, 8, 10, 15

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Dwyer Engrg. Co., Inc., Airport Rd. Nashua, N.H., 3, 10
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Tel: TUxedo 3-3206

EPR Special Products Corp., N.Y., 10

Eaton Electronics Corp., Conn., 3, 7, 10, 15

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Electralab Printed Electronics Corp., 9 North Ave., Natick, Mass., 3
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Tel: OLympic 5-0070

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Electromation Co., Calif., 7

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Engineered Electronics Co., Calif., 7, Diode Plug-In

Epsco, Inc., Mass., 5, 7, 8, 10

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 3, 5, 7, 8, 10, 15
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Tel: GLendale 6-8592

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First Electronics Corp., Mass., 8

Gates Radio Co., Ill., 3

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General Applied Science Labs., Inc., N.Y., 3, 5, 7

General Automatics, Inc., Calif., 5, 7, 10

General Electric Co., Heavy Military Electronics Dept., Defense Electronics Div., Court Street Plant, Bldg. 3-50, Syracuse, N.Y., 5, 7, 8
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Tel: GRanite 6-4411

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General Electronics Co., Inc., Ala., 3, 10

Genesys Corporation, Calif., 3, 5, 7, 8, 10, 15

Glass Products Co., See: Scientific Components, Inc.

Globe Electrical Mfg. Co., Calif., 3, 7, 10

Good Electronic Corp., Fla., 3, 5, 7, 8, 10, 15

Green Rectifier Co., N.J., 8

Gregg Electric Mfg. Co., Inc., Mass., PC Solder Tip Kit

Gulton Industries, Inc., N.J., 3, 5

Gulton Industries, Inc., N.M., 5, 7, 8, 10

Gyro Electronics Co., N.Y., 15

Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 5, 7
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Tel: UNiversity 9-9850

Hoover Electronics Co., Md., 3, 8, 10

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International Crystal Mfg. Co., Inc., Okla., 10

Jack & Heintz, Inc., Ohio, 8, 10

Jodon, Inc., F. R., D.C., 5, 7, 8, 10

Jones Div., Howard B., Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 3, 7
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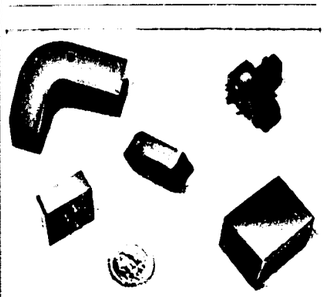
Tel: NEvada 2-2000

Keil Engrg. Prods., Inc., Mo., 3



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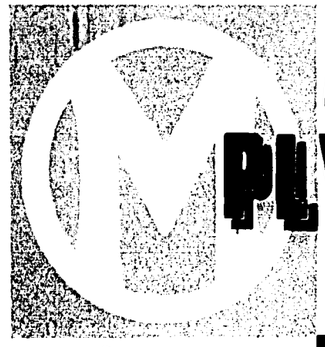

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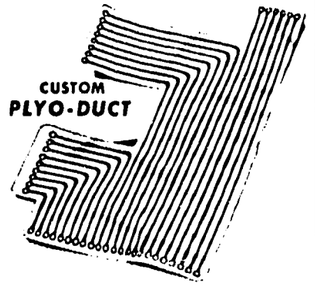

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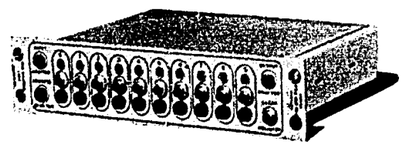

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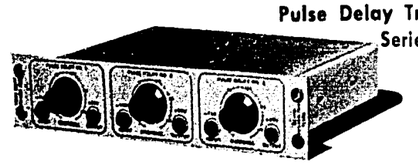

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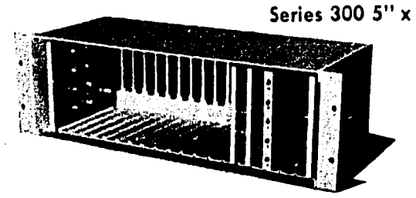

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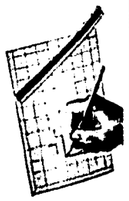

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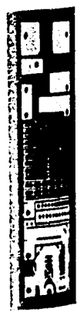

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High Power Transistors (g)												
2N155	X				30 Vcb	3 Adc	3° C/W	85°C	40 (c)	0.5	33	2
2N176	X				40 Vcb	3	—	90	45 (c)	0.5	35	2
2N234A	X				30	3	2	90	25 (c)	0.5	30	2
2N235A, B	X				40	3	2	90	40, 60 (c)	0.5	33, 36	2
2N236A, B	X			X	40	3	2	95	40, 60 (c)	0.75	33, 36	4
2N242	X				45 Vcb	2	3	100	—	—	35	1
2N255	X	X			15 Vcb	3	3	85	40	0.5	22	1
2N256	X	X			30 Vcb	3	3	85	40	0.5	25	2
2N257	X				40	—	—	85	55 (c)	0.5	35	1
2N268, A	X		X		80 Vcb	—	—	85, 90	—, 40	—, 2.0	31, —	1, —
2N285A	X			X	40	3	2	95	150 (c)	0.5	40	2
2N297			X		60 Vcb	5	2	95	70	0.5	—	50 (d)
2N301, A	X				40, 60 Vcb	3	—	—	63 (c)	0.7	33	3
2N307, A	X				35 Vcb	1, 2	5, 3	75	80	0.2	—, 27	—, 1
2N399	X	X			40	3	2	90	40 (c)	0.75	33	8 (e)
2N400	X			X	40	3	2	95	50 (c)	1.0	36	6
2N401	X	X			40	3	2	90	40 (c)	0.5	30	5 (e)
2N418			X	X	80	5	2	100	50	4.0	—	100 (d)
2N419				X	45	3	2	95	60 (c)	0.5	—	5
2N420, A			X	X	40, 70	5	2	100	50	4.0	—	—
2N637, A, B	X		X	X	40, 70, 80	5	2	100	45	3.0	—	35, 70 (d)
2N638, A, B	X		X	X	40, 70, 80	5	2	100	30	3.0	—	35, 70 (d)
2N639, A, B	X		X	X	40, 70, 80	5	2	100	23	3.0	—	35, 70 (d)
2N677, A, B, C and 2N1029, A, B, C replaced by 2N1031, A, B, C												
2N678, A, B, C and 2N1030, A, B, C replaced by 2N1032, A, B, C												
2N1031, A, B, C	X		X	X	30, 40, 70, 80	15	1.5	100	40	10.0	—	75, 125, 250 (d)
2N1032, A, B, C	X		X	X	30, 40, 70, 80	15	1.5	100	75	10.0	—	75, 125, 250 (d)
2N1073, A, B (i)	X		X		40, 80, 120	10	2.0	100	40	5.0	—	100, 150, 200 (d)
2N1136, A, B	X		X	X	40, 70, 80	5	2.0	100	75	3.0	—	35, 70 (d)
2N1137, A, B	X		X	X	40, 70, 80	5	2.0	100	115	3.0	—	35, 70 (d)
2N1138, A, B	X		X	X	40, 70, 80	5	2.0	100	150	3.0	—	35, 70 (d)
B-177	X			X	30	3	2.2	90	150 (c)	0.5	39	2
B-178	X				30	3	2.2	90	40 (c)	0.5	33	2
B-179	X				40	3	2.2	90	25 (c)	0.5	28	2
Medium Power Transistors (h)												
2N1008, A, B	X	X	X		20, 40, 60	300mA	0.15°C/mW	85	95 (c)	10mA	—	400mW (f)
2N1176, A, B	X		X		20, 40, 60	300mA	0.20°C/mW	85	50 (c)	10mA	—	300mW (f)
Military Types												
2N297A (g)	X		X	X	50	5	2.0	95	70	0.5	—	35 (f)
2N331 (h)	X		X		30 Vcb	200mA	0.15°C/mW	85	50 (c)	1.0mA	—	400mW (f)
2N1011 (g)	X		X	X	70	5	2.0	95	55	3.0	—	70 (d)
2N1120 (g)	X		X	X	70	15	1.5	95	35	10.0	—	250 (d)

(a) Vce except where noted. Equivalent Vcb's are 20-50% higher. (b) Collector dissipation is the difference between the maximum junction temperature and the mounting base temperature divided by the thermal resistance. (c) hfe, AC current gain. (d) Square wave output power. (e) Push-pull output. (f) Pc—Maximum collector dissipation 25°C. (g) TO-3 package. (h) TO-9 package. (i) Diffused-Alloy-Power DAP transistor.

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Type Number	Io Adc	PIV Vdc	Ilb	Type Number	Io Adc	PIV Vdc	Ilb	Type Number	Io Adc	PIV Vdc	Ilb
1N536	0.75	50	10 uAdc (At 25°C)	1N1434	30	50	5 mAdc (At 150°C)	1N1612	5	50	1 mAdc (At 150°C)
1N537	0.75	100	10 uAdc	1N1435	30	100	5 mAdc	1N1613	5	100	1 mAdc
1N538	0.75	200	10 uAdc	1N1436	30	200	5 mAdc	1N1614	5	200	1 mAdc
1N539	0.75	300	10 uAdc	1N1437	30	400	5 mAdc	1N1615	5	400	1 mAdc
1N540	0.75	400	10 uAdc	1N1438	30	600	5 mAdc	1N1616	5	600	1 mAdc
1N547	0.75	600	10 uAdc								

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New England Sales office: 4 Lloyd Road, Tewksbury, Massachusetts • Export Sales office: Bendix International Division, 205 E. 42nd Street, New York 17, New York
Canadian Affiliate: Computing Devices of Canada, Ltd., P. O. Box 508, Ottawa 4, Ontario, Canada

For details, circle # 87 on Reader Service Card

Directory II. Components

63. Recording Accessories.

General Transistor Western Corp., Calif., 20, Magnetic Storage Drums
Genesys Corporation, Calif., 20
Hammond Mfg. Co., Ltd., Canada, 17
Jensen Industries, Inc., Ill., 15
Jodon, Inc., F. R., D.C., 20
Johns-Manville Dutch Brand Div., Ill., Plastic Electric Tape, Rubber & Friction Tape
L.E.E., Inc., D.C., 20
Lipps Engrg., Edwin A., Calif., 10, 20
Magnasync Mfg. Co., Ltd., Calif., 17, 20
Maico Electronics, Inc., Minn., 20
Michigan Magnetics, Inc., Mich., 20
Midwestern Instruments, Inc., Okla., 20
Minicord Corp. of America, N.J., 20, 35
Minneapolis Honeywell Regulator Co., Md., 20
Minnesota Mining & Mfg. Co., Minn., 25, 50
Multicore Solders Ltd., England, 50
Norton Assoc., Inc., N.Y., 20
Nortronics Co., Inc., Minn., 20
Orradio Industries, Inc., Ala., 25
Peirce Dictation Systems, Ill., 20, 35
Radio Corp. of America, Electron Tube Div., Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 25, 50
See ad on pages 53-55
Tel: HUmboldt 5-3900
Radio Frequency Labs., Inc., Powerville Rd., Boonton, N.J., 17
See ad on page 304
Tel: DEerfield 4-3100
Rangertone, Inc., N.J., 20, 25
Recordisc Corp., N.Y., 5, 15
Recoton Corp., N.Y., 5, 15, 25
Reeves Equipment Corp., N.Y., 10, 20, 25
Reeves Soundcraft Corp., Conn., 5, 10, 15, 25, Tape Indexer
Rek-O-Kut Co., Inc., N.Y., Recording Lathes
Robins Industries Corp., N.Y., 17, 20, 35, 50
Shepard Labs., Inc., N.J., 50, Film
Shure Brothers, Inc., Ill., 20
Siegler Corp., Bogen-Presto Co. Div., N.J., 5, 10, 15, 20
Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 20
See ad on page 482
Tel: LYric 2-6400
Sound Devices, Inc., N.Y., 5, 25
Southwestern Industrial Electronics Co., 10201 Westheimer Rd., P.O. Box 22187, Houston 27, Tex., 17, 25
See ad on page 248
Tel: HO 5-3471
Stancil-Hoffman Corp., Calif., 20
Tandberg of America, Inc., N.Y., 10, 20
Telectro Industries Corp., N.Y., 17, 20, 25, 30, 50
Texas Instruments Incorporated, Houston, Tex., 20
Thompson-Ramo-Wooldridge, Inc., Calif., 25
Ultra Electroforming & Mfg. Co., N.J., Phono Record Masters
U. S. Recording Co., D.C., 25, 50
Webster Electric Co., Wis., 20
Westrex Corp., N.Y., 5, 10, 20, 25
Zephyr Products Co., N.Y., 25

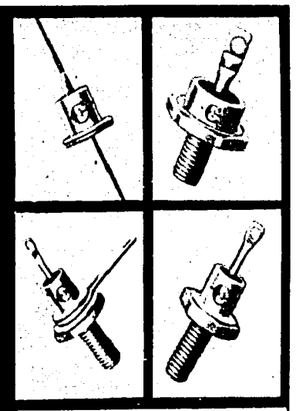
64. Rectifiers.

5. Copper oxide
7. Copper sulfide
10. Germanium
15. Selenium diodes
20. Selenium stacks
25. Silicon

Allis-Chalmers Mfg. Co., Wis., 10, 25
Arco Electronics, Inc., 64 White St., New York 13, N.Y., 25
See ad on page 399
Tel: WOrth 6-0530
Audio Devices, Inc., N.Y., 25
Audio Devices, Inc., Rectifier Division, Calif., 25
Barco, Inc., Wis., 20
Bendix Aviation Corp., Red Bank Div., Semiconductor Products, 201 Westwood Ave., Long Branch, N.J., 25
See ad on page 510
Tel: CApital 2-6220
Bradley Semiconductor Corp., Conn., 5, 15, 20
British Thomson-Houston Co., Ltd., England, 10, 25
Brown Co., Irv, N.Y., 10, 15, 20, 25
Clark Electronic Labs., Box 165, Palm Springs, Calif., 25
See ad on page 559
Tel: FAirview 8-2210
Clevite Transistor Prods., Mass., 10, 25
Columbus Electronics Corp., 1010 Saw Mill River Rd., Yonkers, N.Y., 25
See ads on pages 511, 543
Tel: YOnkers 8-1221
Conant Laboratories, Neb., 5, 20
Continental Device Corp., Calif., 25
Daystrom, Inc., Weston Instruments Div., N.J., 5
Diamond Electronics Corp., N.Y., 25
Electric Storage Battery Co., Exide Industrial Div., Pa., 25
Electronic Rectifiers, Inc., Ind., 7
Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 10
See ad on pages 110-111
Tel: GLendale 6-8592
Fansteel Metallurgical Corp., North Chicago, Ill., 20, 25
See ads on pages 156-157
Tel: DExter 6-4900

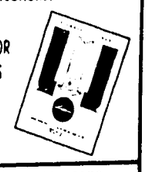
COLUMBUS SEMICONDUCTORS

... UP TO 2000 VOLTS PIV



Part of an extensive line of high performance, quality proven silicon power rectifiers... JEDEC types exceeding MIL specifications.

WRITE FOR FULL DETAILS AND SPECIFICATIONS.



COLUMBUS ELECTRONICS CORP.
1010 Saw Mill River Rd., Yonkers, N. Y.
YOnkers 8-1221 TWX: Yonkers, NY-1369

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Telephone: YOrkshire 8-8391

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Directory II. Components

64. Rectifiers.

Foto-Video Labs., Inc., Dept. I-1, 36 Commerce Rd., Cedar Grove, N.J., 25
See ad on page 490
Tel: CEnter 9-6100

Gates Electronic Co., 1705 Taylor Ave., New York 60, N.Y., 20, 25
See ad on page 493
Tel: TYrone 2-6490

General Electric Co., Semiconductor Prods. Dept., N.Y., 5, 10, 15, 20, 25, Silicon Controlled

General Instrument Corp., Semiconductor Div., N.J., 24

General Motors Corp., Delco Radio Div., Ind., 25

Green Rectifier Co., N.J., 10, 15, 20, 25

Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 25
See ad on page 226
Tel: UNiversity 9-9850

Hughes Aircraft Co., Hughes Prod. Div., Calif., 10, 25

Industrial Electronics of Canada, Canada, 20

International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 10, 15, 20, 25
See ad on pages 42-43
Tel: ORegon 8-6281

Internatl. Resistance Co., Pa., 15

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd.. P.O. Box 412, Clifton, N.J., 15, 20, 25
See ad on pages 148-149
Tel: NUtley 2-3600

Kellogg Switchboard & Supply Co., Ill., 15, 20

Mallory & Co., Inc., P. R., Ind., 7, 25

Microwave Assoc., Inc., Mass., 25

Miller Co., Sanford, N.Y., 20, 25

Nichols, Ltd., R.H., Canada, 5, 20

North American Electronics, Inc., Mass., 25

Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 5, 10, 15, 20, 25
See ad on page 499
Tel: WOrth 6-0380

Osborne Transformer Corp., Mich., 10, 15, 20, 25

Physics Research Labs., Inc., P.O. Box 555, Hempstead, N.Y., 5
See ad on page 306
Tel: IVanhoe 3-8299

Pyramid Electric Co., 507 26th St., Union City, N.J., 20, 25
See ad on page 404
Tel: UNion 5-1776

Radio Corp. of America, Semiconductor & Materials Div., Section I-22-NN, Route 202, Somerville, N.J., 25
See ad on page 56
Tel: RAndolph 5-4500

Radio Development & Research Corp., N.J., 20, 25

Radio Receptor Corp., Selenium Div., N.Y., 15, 20

Rapid Electric Co., 2881 Middletown Rd., New York 61, N.Y., 10, 20, 25
See ad on page 501
Tel:TAlmadge 8-2200

Raytheon Co., Mass., 10, 25

Raytheon Co., Semiconductor Div., Mass., 25

Rectico, Inc., N.J., 5, 7, 15, 20, 25

Rheem Semiconductor Corp., Dept. P13, 327 Moffett Blvd., P.O. Box 816, Mountain View, Calif., 25
See ad on page 512
Tel: YOrkshire 8-8391

St. Eloi Corp., Ohio, Titanium

Schauer Mfg. Corp., Ohio, 5

Sel-Rex Corp., N.J., 10, 25

Semicon, Inc., Mass., 25

Semi-Elements, Inc., Pa., 25

Solid State Products, Inc., Mass., 25

Standard Telephones & Cables, Ltd., England, 15, 20, 25

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 25
See ad on pages 23-25
Tel: JUdson 6-2424

Sylvania Electric Products, Inc., Semiconductor Div., Mass., 25

Syntron Co., 83 Lexington Ave., Homer City, Pa., 15, 20, 25
See ad on this page
Tel: GR 9-8011

Tarzian, Inc., Sarkes, Ind., 15, 20, 25

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 5, 7, 10, 15, 20, 25
See ad on page 502
Tel: REctor 2-6249

Texas Instruments Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 25
See ad on pages 75-78
Tel: FLeetwood 7-5411

Thermosen, Inc., Conn., 25

Transitron Electronic Corp., 168-182 Albion St., Wakefield, Mass., 25
See ad on pages 146-147
Tel: CRystal 9-4500

Trans-Sil Corp. N.J., 25

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 20, 25
See ad on pages 50-51
Tel: HUmboldt 2-4200

Union Switch & Signal, Div. of Westinghouse Air Brake Co., Braddock Ave., Pittsburgh 18, Pa., 5
See ad on pages 158-159
Tel: CHurchill 2-5000

United States Dynamic Corp., Mass., 10, 25

U.S. Semiconductor Products, Inc., 3540 W. Osborn Rd., Phoenix, Ariz., 25
See ad on page 252
Tel: APplegate 8-5591

Vickers, Inc., Electric Products Div., Mo., 15, 20, 25

Wallson Assoc., Inc., 35 E. Runyon St., Newark 8, N.J., Silicon Diode
See ad on page 311
Tel: TAlbot 4-2600

Westinghouse Electric Corp., Pa., 10, 15, 20, 25

Westinghouse Electric Corp., Semiconductor Dept., 25

Workman TV, Inc., N.J., 25

65. Rectifiers, Vacuum Tube.

5. Grid controlled
10. Mercury vapor
15. Receiving
20. Transmitting

Aerolux Lights Corp., N.Y., 10

American Elite, Inc., N.Y., 10, 15, 20

British Thomson-Houston Co., Ltd., England, 5, 10

Central Electronic Mfg., Inc., N.J., 20

Communication Equip. & Engineering Co., Ill., 10

Continental Electric Co., Ill., 5, 10, 20

Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, Calif., 5, 10, 20
See ad on pages 44-45
Tel: LYtell 1-1451

Electronic Assistance Corp., N.J., 5, 10, 15, 20

SYNTRON

"Industrial Rated"

**SELENIUM or SILICON
DIODES AND POWER RECTIFIERS**

Dependable high quality diodes and rectifiers for all types of industrial applications—welders, battery chargers, wave shaping, clippers, blocking valves, arc suppressors, cathodic protection, etc.

Send your particular Rectifier Requirements for analysis and quotation to the attention of the Rectifier Division.

SYNTRON CO., 83 Lexington Ave., Homer City, Pa.

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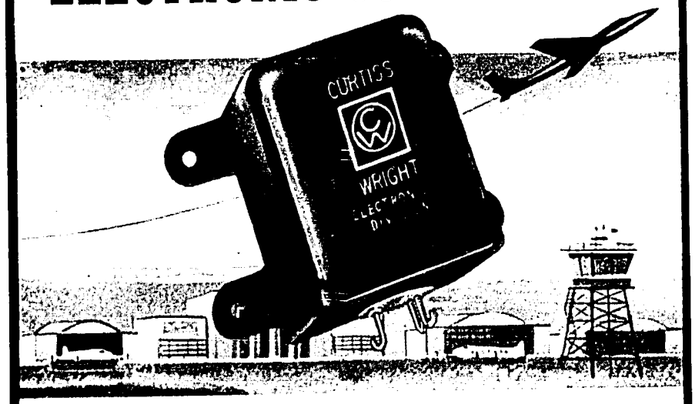
CURTISS WRIGHT

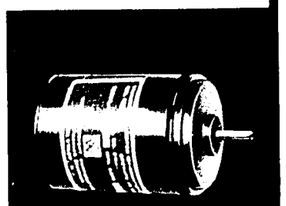
CUSTOM DESIGNED
ELECTRONIC COMPONENTS



TIME DELAY RELAYS
Instant reset — Voltage compensated

Curtiss-Wright "IR" thermal time delay relays reset the instant they are de-energized. The second cycle will always provide the same delay as the first cycle. Variations from 22 to 32 volts will not affect the time delay of the "IR" Series.

SPECIFICATIONS
Time delay.....Preset 20 to 180 seconds
Contact arrangement..SPST, DPDT OR SPDT
Temperature comp.....−65°C to +125°C
Weight:.....4½ ounces
Terminals.....Hooked solder type
Mounting.....Bracket or stud
Variations of the above relay characteristics available upon request.



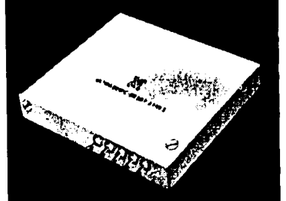
New DIGITAL MOTORS

Stepping motors for high reliability applications. Meet the requirements of assured reliability and long life for aircraft, missile and automation systems.

FEATURES | Bi-directional • Positive lock • Dynamically balanced • Simplicity of design • High pulsing rate.

New ULTRASONIC DELAY LINES

Enables development engineers to employ new concepts in existing and projected applications. Low in cost, small in size and simple to operate.



SPECIFICATIONS
Delay range.....5 to 6000 microseconds
Tolerance.....± 0.1 microsecond
Signal to noise ratio.....Greater than 10:1
Input and output impedance. 50 to 2000 ohms
Carrier frequency.....100 kc — 1 mc
Delay to pulse rise time.....Up to 800:1

WRITE FOR COMPLETE COMPONENTS CATALOG 159

ELECTRONICS DIVISION
CURTISS-WRIGHT
CORPORATION • WEST CALDWELL, N.J.

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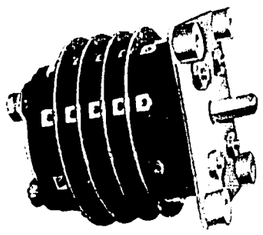
RELAYS

The Couch Type 4A Relay illustrated is one of a family of rugged relays . . . relays which exceed all environmental extremes demanded by our modern military airborne applications because of a unique patented rotary armature design. Our Bulletin 132 will tell you more. Write for it today.

SPECIFICATIONS
Contacts: 2PDT or 4PDT (Form C); dry circuit to 10 amperes
Vibration: 20G, 5 - 2000 CPS
Shock: 75G operating
Mounting: all standard designs
Pull-in power: ½ watt DC
Coil resistance: 19 to 27,000 ohms
Size and weight: 1½"D by 1½"H; 3.2 oz

JR SWITCHES



The JR Multipole Rotary Switch . . . another Couch product. Contact ratings — 10 amperes at 125VAC, 5 amperes at 125 VDC. Available in 1 - 25 sections, 8 contacts to each section, with 4 rotor types. Dimensions — 2¾"D by 5"L for 10 section switch. For Navy, and similar usage, these switches are furnished in watertight enclosures with illuminated dials.

Couch ORDNANCE INC.
3 Arlington Street
North Quincy, Mass.
A Subsidiary of S. H. Couch Co., Inc.

For details, circle #492 on Reader Service Card

Directory II. Components

65. Rectifiers, Vacuum Tube.

Electronic Enterprises, Inc., N.J., 5, 10, 20
Electrons, Inc., N.J., 5
General Electric Co., Power Tube Dept., 1 River Rd., Bldg. 267, Schenectady 5, N.Y., 5, 10, 20
See ad on page 584
Tel: FRanklin 4-2211
General Electronics, Inc., N.J., 5, 10, 15, 20
Gordos Corp., N.J., 10
Great American Electronics Corp., N.J., 15, 20
Hughes Aircraft Co., Hughes Products Div., Calif., 5, 10
Industrial Tubes, Inc., Ill., 5, 10
International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 5, 10, 20
See ad on pages 148-149
Tel: NUtley 2-3600
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 5, 10, 20
See ads on pages 270, 301
Tel: TExas 0-7711
Mitronics, Inc., 1291 Central Ave., Hillside, N.J., 15, 20
See ad on page 619
Tel: WAverly 6-2250
Mullard Overseas, Ltd., Eng., 5, 10, 15, 20
Multi-Tron Lab., Inc., Ill., 5, 15
Nuclear Corp., Central Electronic Mfg. Div., N.J., 5, 20
Pek Labs., Inc., Calif., 5, 10, 20
Penta Laboratories, Inc., Calif., 20
Radio Corp. of America, Electron Tube Div., Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 5, 10, 15, 20
See ad on pages 53-55
Tel: HUmboldt 5-3900
Resitron Labs., Inc., Calif., 20
Standard Telephones & Cables, Ltd., England, 5, 10, 15, 20
Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 15
See ad on pages 23-25
Tel: JUdson 6-2424
Tallen Co., Inc., N.Y., 10, 15, 20
Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 5, 10
See ad on page 502
Tel: REctor 2-6249
Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 15
See ad on pages 50-51
Tel: HUmboldt 2-4200
Vacuum Tube Products Co., Inc., Calif., 5
VeeTrol Engineering, Inc., Conn., 5
Westinghouse Electric Corp., Pa., 10

Relay rack panels: See class 81

Relay racks: See class 84

66. Relays.

5. Co-axial
10. D'Arsonval
15. Differential
20. Frequency selective
25. Hermetically sealed
30. Impulse
35. Keying
40. Latching
45. Mercury contact
50. Polarized
55. Power control & overload
57. Rotary
60. Sensitive
65. Stepping
70. Sub-miniature
75. Telephone
80. Time delay

Adams & Westlake Co., Ind., 45, 80
Advanced Electronics, Inc., Conn., 60
Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 60, 70
See ad on page 337
Tel: GRegory 2-5622
Aemco, Inc., Minn., 5, 25, 35, 40, 55, 60, 70
Aerocoil, Inc., N.J., 60
Aerolite Electronics Co., N.J., 60
Allard Instrument Corp., N.Y., 40
Allen-Bradley Co., Wis., 55
Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y., 5, 15, 25, 30, 40, 45, 50, 55, 57, 60, 70, 75, 80
See ad on pages 84-85
Tel: BUtterfield 8-7403
Alto Scientific Co., Inc., Calif., 80
American Instrument Co., Inc., Md., 60
Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 80
See ad on page 577
Tel: CAnal 6-1446
Argonne Electronics Mfg. Corp., N.Y., 30
Arrow-Hart & Hegeman Elect. Co., Conn., 30, 40, 55, 60, 80
Artisan Electronics Corp., N.J., 15, 25, 30, 40, 55, 57, 65
Assembly Products, Inc., Ohio, 10, 55, 60
Atlantex Corp., Mass., 75
Automatic Electric, Northlake, Ill., 15, 25, 30, 35, 40, 45, 50, 57, 60, 65, 75, 80
See ad on pages 108-109
Tel: FIllmore 5-7111
Automatic Electric Sales Corp., N.Y., 25, 30, 35, 40, 45, 50, 57, 60, 65, 75, 80
Automatic Metal Products Corp., 323 Berry St., Brooklyn 11, N.Y., 5
See ad on page 421
Tel: EVergreen 8-6057
Automatic Switch Co., N.J., 15, 20, 55, 60, 80
Avionics, Ltd., Canada, 40, 55, 75
Barber-Colman Co., Dept. 60D, 1211-9 Rock St., Rockford, Ill., 25, 40, 50, 60
See ad on page 478
Tel: WOodland 8-6833
Baso, Inc., Wis., 25, 60, 70, 80
Belling & Lee, Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 80
See ad on page 418
Tel: ENfield 3322
Belltron Co., Inc., N.J., 25, 80
Bergen Labs., Inc., 247 Crooks Ave., Clifton, N.J., 60
See ad on page 471
Tel: GRegory 3-7800

66. Relays.

Biddle Co., James G., Pa., 20
Brans-ton Corp., N.J., 25, 30, 50, 55, 57, 70, 75, 80
Bristol Co., Conn., 10, 15, 25, 50, 70
Brubaker Electronics, Inc., Calif., 25, 70
Bucknell Energ. Co., Inc., Calif., 35
Cal-Tronics Corporation, Calif., 80
Cathodeon, Ltd., Meadowcroft Labs., England, 35
Chicago Dynamic Industries, Inc., 1725 Diversey Blvd., Chicago 14, Ill., 40, 65
See ad on page 553
Tel: WE 5-4660
Cico Corporation, Calif., 80
Clare & Co., C. P., Ill., 25, 35, 40, 45, 50, 55, 65, 70, 75, 80
Clark Controller Co., Ohio, 40, 55, 80
Clark Electronic Labs., Box 165, Palm Springs, Calif., 70, 80
See ad on page 559
Tel: FAirview 8-2210
Coaxial Connector Co., Inc., N.Y., 5
Co-Engineering Co., N.J., 45, 57
Comar Electric Co., 3349 Addison St., Chicago 18, Ill., 15, 20, 25, 30, 35, 40, 55, 60, 70, 75, 80
See ad on page 186
Tel: JUniper 8-2410
Consolidated Elect. Industries Corp., Tech-Elect. Co. Div., Calif., 80
Control Corp., Minn., 20, 40, 75
Control Devices, Inc., Mich., 30
Cook Electric Co., Ill., 15, 20, 25, 30, 35, 40, 50, 55, 57, 60, 65, 70, 75, 80
Cooper-Hewitt Elec. Co., N.J., 45
Corbett Science Labs., Calif., 30, 60, 65, 80
Corona Engineering Service, N.Y., Electronic & Tilting Mercury
Couch Ordnance, Inc., 3 Arlington St., North Quincy 71, Mass., 25, 57, 70
See ad on page 514
Tel: BLuehills 8-4147
Cramer Controls Corp., Conn., 80
Cunningham, Son & Co., Inc., James, N.Y., 65
Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 80
See ad on page 514
Tel: GEneva 8-4000
Cutler-Hammer, Inc., Wis., 25, 40, 55, 65, 80
Davis Electric Co., Mo., 25, 40, 60, 70, 75
Daystrom, Inc., Weston Instruments Div., N.J., 10, 25, 70, 75, 80
Derf Radio Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 57, 60, 75
Dialtron Corp., 203 Harrison Pl., Brooklyn 37, N.Y., 80
See ad on page 517
Tel: HYacinth 7-7600
Dictograph Products, Inc., N.Y., 35, 40, 75, 80
Dietz Co., Inc., Henry G., N.Y., 65
Dominion Electrohome Industries, Ltd., Canada, 80
Durakool, Inc., Ind., 45

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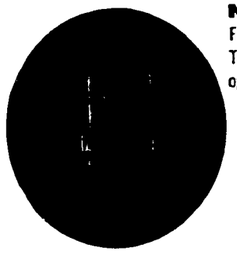
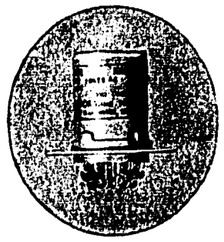
FILTORS INC.

LEADING MANUFACTURERS OF HERMETICALLY SEALED ROTARY MICRO AND SUB-MINIATURE RELAYS

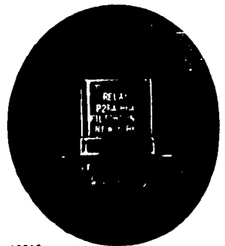


NEW!
Filtors is first with a crystal can relay for AC operation! The new Powrmite® micro-miniature relay for AC operation is the smallest, lightest AC relay made today.

NEW!
Filtors is first with relays with a built-in arc suppressed coil. In the same micro-miniature size Filtors' Powrmite is also made with a built-in arc-suppressed coil to cut radio interference a minimum of ten to one. Available also in four and six-pole sub-miniature relays. Filtors arc suppressed relays increase life and reliability of associated circuitry.



NEW!
Filtors now manufactures the smallest, lightest four and six-pole sub-miniature relays for AC operation.



POWRMITE®

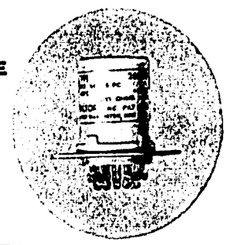
new MICRO MINIATURE relay by Filtors, leading specialists in development and manufacture of micro miniature relays.

SPECIFICATIONS:

AMBIENT TEMPERATURE RANGE	—65°C. TO +125°C.
DIELECTRIC STRENGTH	1000 VOLTS (750 VOLTS BETWEEN OPEN CONTACTS)
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C.
CONTACT ARRANGEMENT	2C (2 POLE DOUBLE THROW).
CONTACT RATING	2 AMPS RESISTIVE AT 28 VOLTS DC OR DRY CIRCUITS
SHOCK	100 Gs 11 MILLISECONDS.
VIBRATION	10—55 CPS AT .06 AMPLITUDE. 55—2000 CPS AT 30 G.
PICK-UP TIME	5 MILLISECONDS MAXIMUM AT NOMINAL COIL VOLTAGE, 25°C. TEMPERATURE.
RELEASE TIME	5 MILLISECONDS MAXIMUM.
NOMINAL COIL VOLTAGE	26.5 VOLTS DC.
COIL RESISTANCE	550 OHMS ± 10% AT 25°C.
ALTITUDE	70,000 FEET
DUTY	CONTINUOUS.
PICK-UP	RELAY SHALL PICK-UP WHEN COIL VOLTAGE IS 18 VOLTS DC MAX.

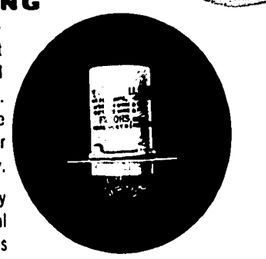
NEW!
All types of Filtors Powrmite micro-miniature relays are now available in .2 grid space in all mounting styles; .2 grid space relays feature Filtors' new "Sensi-Tork" motor, a Filtors development for greatest reliability and sensitivity.

GENERAL PURPOSE



precision manufactured under rigid quality control. Offers lightweight, rugged, compact construction for high environmental conditions. Applicable to instrument, geophysical, aircraft controls and many other circuits where high reliability and multiple switching are required. Available in 2 DPDT, 4 DPDT and 6 DPDT.

LATCHING



relay remains in "energized" position indefinitely without consuming power. As an overload relay it can be electrically reset from a remote position. Contacts can be closed by one circuit and opened by another. It has many applications in fail-safe circuits. Its small size, light weight and hermetically sealed enclosure make possible its use in airborne and other equipment. Either coil may be energized continuously without damage to the relay.

It affords the designer great latitude in circuitry, particularly in "lock-up" circuits, e.g., where the contacts of one conventional relay are used to lock-up the coil of another relay. Thus it avoids redundancy. Available in 2 DPDT, 4 DPDT and 6 DPDT.

5/8 INCH STYLE

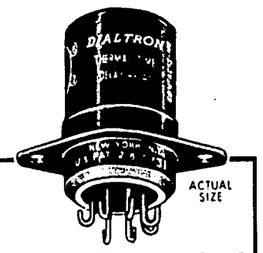
A rugged 2 pole double throw relay of small size and weight designed for high reliability under extreme conditions. Available with either 2 amp or dry circuit contacts.

Write for complete catalog

MAIN OFFICE AND PLANT Port Washington, N. Y., PO rt Washington 7 8220, WEST COAST OFFICE 13273 Ventura Blvd., Studio City, Cal., STanley 3-2770

For details, circle #493 on Reader Service Card

by DIALCO®



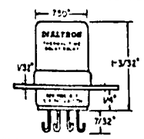
Hermetically Sealed

Rugged—built to meet conditions of

high altitude
high vibration
high temperature

DIALCO RELAYS exhibit no resonance from 5 to 1,000 CPS at 10 G's; are not damaged by 50 G's shock; are fully compensated for temperatures from −65° C to + 125° C.

Available in delays from 1 to 300 seconds; heater voltages up to 150 V. interchangeable on DC or AC of any frequency with a power drain of 4 watts. SPST normally open or normally closed contacts are rated at 6 amps at 115 V. AC or 3 amps at 28 V. DC resistive.



SUB-MINIATURE
Lightweight (3/4 oz.)
Standard 7-pin plug-in or solder terminals with mounting flange

Dialtron Corp., 203 Harrison Pl., Brooklyn 37, N. Y.

☐ Send data on Thermal Time Delay Relays to:

Name_____

Position_____

Company_____

Address_____

DIALTRON
CORP
203 Harrison Pl., Brooklyn 37, N. Y.
HYacinth 7-7600

For details, circle #494 on Reader Service Card

Directory II. Components

66. Relays.

EMI—Cossor Electronics Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 5
See ad on page 412
Tel: HAlifax 6-7491

E-T-A Products Co. of America, Ill., 55, 80

Eagle Signal Co., Ill., 25, 40, 65, 80

Ebert Electronics Corp., N.Y., 25, 40, 45, 55, 60, 80

Ecco Electronic Components Corp., N.Y., 5

Edison Industries, Thomas A., Instrument Div., 61 Lakeside Ave., West Orange, N.J., 5, 10, 15, 25, 50, 57, 60, 80
See ad on page 345
Tel: ORange 3-6500

Elastic Stop Nut Corp. of America, AGA Div., Dept. A33-86, 1027 Newark Ave., Elizabeth 3, N.J., 80
See ad on this page
Tel: ELizabeth 2-2900

ELGIN-ADVANCE RELAYS

—for aircraft, missile and industrial use

ELGIN-ADVANCE is the relay source you can depend on to meet your manufacturing requirements now and to help you keep ahead in new product development for tomorrow.

New and expanded research programs assure constantly improved performance and reliability in the design of high performance, precision type relays.

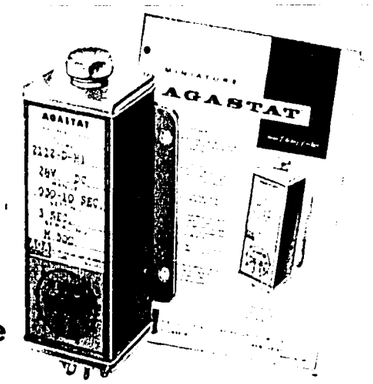
ADVANCE RELAYS

ADVANCE RELAYS

ELGIN

A PRODUCT OF ELECTRONICS DIVISION
ELGIN NATIONAL WATCH COMPANY
2435 N. NAOMI ST., BURBANK, CALIFORNIA

For details, circle #495 on Reader Service Card



Now! get complete data on

MINIATURE AGASTAT®

time/delay/relays

This free folder contains complete specs on 24 models of the miniature AGASTAT Time Delay Relay for missile, aircraft, computer, electronic and industrial applications. They're small as 1-13/16" x 4-7/16" x 1½", with adjustable timing ranges starting at .030 and as high as 120 seconds.

The folder gives operating and environmental specs, coil data, contact capacities, dimensions, diagrams of contact and wiring arrangements. *Write:* Dept. A33-86.

AGA

ELASTIC STOP NUT CORPORATION OF AMERICA

Elizabeth, New Jersey

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

For All ELECTRONIC SYSTEMS, APPLICATIONS: AIRBORNE or GROUND-BASED

the A. W. HAYDON COMPANY

offers a complete line of

TIMING DEVICES

ALTERNATING AND DIRECT CURRENT

Tough & Tiny
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Rugged & Reliable
Electronics
Time-Proven
Electro-mechanicals

PRECISION TIMING MOTORS

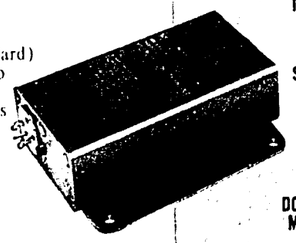
Repeat Cycle Timers
Time Delay Relays
Stop Clocks
Intervalometers
Coding Devices

ELECTRO MECHANICAL AND ELECTRONIC TIMING DEVICES

REPEAT CYCLE TIMERS

— 3" long (Typical)
— 6½ ounces basic
— 1-8 switches (Standard)
— Cycle Time 5 sec to 90 Min.
— Loads to 5 Amperes

Write for Bulletin AWH RC-301



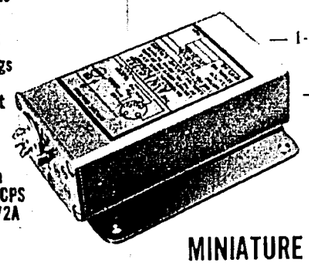
SUB-MINIATURE ELECTRO-MECHANICAL TIMING DEVICES

Features
Hermetically Sealed Housings
¼ Size
— ½ Weight of Standard Designs
1 x 2 Cross-Section
DC, 60 or 400 CPS
Meet MIL-E-5272A

TIME DELAY RELAYS

— 3" long (Typical)
— 7½ ounces basic
— 1-3 switches (Standard)
— Time Delay
— 25 Sec. to 3 Hours
— Loads to 5 Amperes

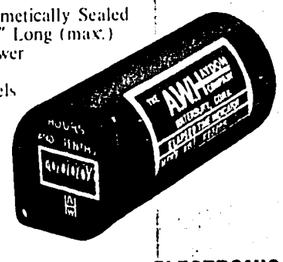
Write for Bulletin AWH TD-502



ELAPSED TIME INDICATORS

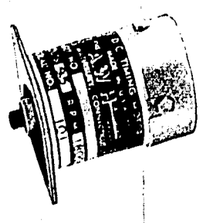
— Sub-Miniature — Hermetically Sealed
— 1¼" Diameter — 2⅜" Long (max.)
— 3 Watts maximum power
— Digital or Dial Type
— 60 cps & 400 cps models cataloged
— DC Models Available
— Meet MIL-E-5272A MIL-M-7793B

Write for Bulletin AWH ET-602 describes 400 cps models
AWH ET-603 describes 60 cps models



MINIATURE TIMING MOTORS

— Compact — High Performance
— 60 or 400 Cycle
— 15/16" Diameter — 1.7 oz.
— Direct Current
— 13/16" Diameter — 1.11 oz.
— Submit problem statement with motor requirements for recommendation

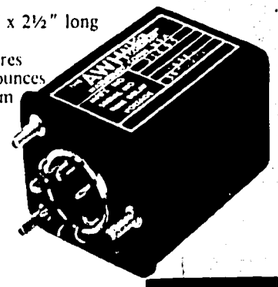


ELECTRONIC TIME DELAY RELAYS

Miniature Series

— 1 7/16" x 1 21/32" x 2½" long
— 1-4 SPDT contacts
— Loads to 10 Amperes
— Weight — only 6 ounces
— 5½ Watts maximum power

Write for Bulletin AWH TD-503

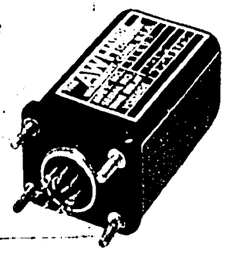


Features
Hermetically Sealed Housings
Variety of Circuits
Temperature to 250°F
Vibration to 2000 cps, 15 g
Meet MIL-E-5272A
Unique Transistorized RC Time Constant network
Time Delays 50 MS to 120 sec.

Sub-Miniature Series

— 31/32" x 1⅜" x 2" long (max.)
— 1-2 SPDT contacts
— Loads to 8 Amperes
— Weight only 3 ounces
— 4 Watts maximum power

Write for Bulletin AWH TD-504



ALSO AVAILABLE

A Complete Line of timing devices and instruments for Military, Commercial & Industrial Applications.
Write for specific literature or complete catalog.

The A.W. HAYDON Company

240 NORTH ELM STREET, WATERBURY 20, CONNECTICUT

CUSTOM DESIGN & MANUFACTURE OF ELECTRONIC AND ELECTRO-MECHANICAL TIMING DEVICES

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'DIAMOND H' RELAYS

NEW . . . High Speed Polarized Relays

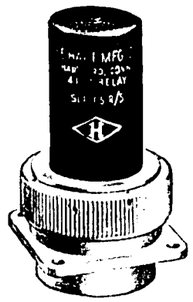
Fast action with freedom from bounce, plus high sensitivity and consistent operation with low distortion, are provided by small, rugged Series P Polarized Relays. SPDT, with two independent coils, they will handle over 1,000 pulses per second. Various coil resistances up to 5,000 ohms each coil. Contact ratings vary with switching speed but range from 60 MA to 2A with voltages to 120 AC or DC, dependent upon amperages employed.

Aircraft-Missile Series R & S Relays

Miniature, hermetically sealed 4PDT, Series R & S relays provide excellent reliability over their long service life. Electrically and physically interchangeable, the two series differ only in that Series S coils are separately sealed within the sealed cases, with organic matter eliminated from the switch mechanism for greatest reliability in dry circuits. Contacts MA to 10 A.

Special Mountings

Series R/S Relays are available with 10 standard mounting arrangements, plus a ceramic plug-in socket. MS-AN type connector mounting, illustrated at right, makes assembly, installation and field service extremely simple, while the connector provides a seal against moisture.



"Diamond H" engineers are prepared to work with you to develop variations on these relays to meet your specific requirements. Tell us your needs . . . by phone or letter.

THE HART MANUFACTURING COMPANY

265 Bartholomew Ave., Hartford 1, Conn.

Phone JAckson 5-3491

For details, circle #498 on Reader Service Card

Directory II. Components

66. Relays.

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264

Electro Mechanisms, Mfg. Co., Mechanisms, Palo Alto, Calif., 30

Electro Products Laboratories, Inc., 5, 25, 30, 35, 40, 50, 55, 57, 60, 70

Electro Mechanisms, Inc., Mechanisms, Relays, 30

Electro Mechanisms, Inc., Sunnyvale, Calif., 15, 20, 25, 30, 35, 40, 50, 55, 57, 60, 65, 70, 75, 80

Electro Snap Switch & Mfg. Co., 5, 25, 57

Electro Switch Corp. & Subsidiaries, Relays, 5, 25, 30, 40, 70, 75, 80

Electro Tec Corp., N.Y., 25

Electronic Computer Co., Phila., Pa., 30

Electronic Control Corp., Mass., 25

Electronic Specialty Co., Controls, 5, 30, 55, 80

Elgin National Watch Co., IT, 70

Elgin National Watch Co., Advance Relays Div., 2435 N. Naomi St., Burbank, Calif., 5, 25, 30, 35, 40, 55, 57, 60, 70, 75, 80

See ad on page 517
Tel: VIctoria 9-1446

Engineering Associates, Ohio, 5, 15, 30, 50, 65, 75

Ess Specialty Corp., N.J., Photoelectric

Essex Corp., RBM Div., Ind., 25, 55, 75

Evelco, Ltd., England, 10, 20, 25, 30, 35, 50, 55, 57, 60, 65, 70, 75

Eyerbod & Vignoles Ltd., England, 15, 60

Filtors, Inc., 30 Sagamore Hill Dr., Port Washington, N.Y., 40, 57, A.C. Relays

See ad on page 516
Tel: POrt Washington 7-8220

Fisher Scientific Co., Pa., 60

Franklin Dales Co., Ohio, 80

Fuchs Impulse Motor Servomechanisms, N.Y., 30

G V Controls, Inc., N.J., 20, 25, 80

General Automatic Corp., N.J., 15, 20, 30, 35, 40, 55, 60, 75, 80

General Communication Co., Mass., 5

General Controls Co., Calif., 25, 80

General Controls Co., Pac. Automatic Controls Div., Ill., 80

General Electric Co., Apparatus Sales Div., N.Y., 15, 40, 50, 55, 57, 70

General Electric Co., Pa., 55, 70

General Electric Co., Specialty Control Dept., Va., 70

General Electric Co., Ltd., England, 25, 40, 75, 80

General Hermetic Sealing Corp., 60 E Hawthorne Ave., Valley Stream, N.Y., 25

See ad on page 461
Tel: VAlley Stream 5-6060

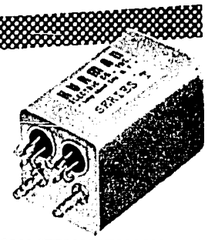
Globe Electrical Mfg. Co., Calif., 25, 40, 57, 60, 75, 80

Gordos Corp., N.J., 45

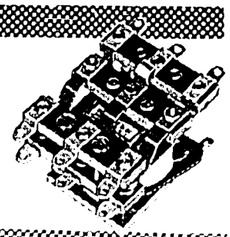
Grebach Research & Development Labs., N.Y., 10

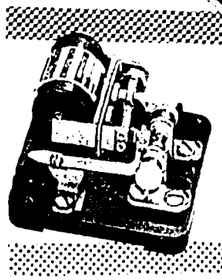
KURMAN RELAYS

SUB-MINIATURE SENSITIVE RELAY
Series 7



POWER RELAY
Series 26

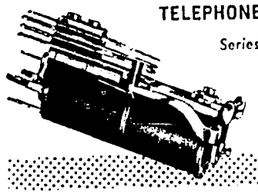




POWERFUL SENSITIVE RELAY
Series 300

MIDGET SENSITIVE RELAY
Series 23

TELEPHONE RELAY
Series A



Immediate Delivery from Leading Distributors—
Kurman Sales Agencies

SEND FOR COMPLETE CATALOG

Kurman Relays . . . hermetically sealed, dust covered and open . . . meet military specifications . . . interchangeable with other leading makes.

KURMAN ELECTRIC CO.
Subsidiary of Crescent Petroleum Corp.
191 Newel St., Brooklyn 22, N.Y.
EVergreen 3-8000

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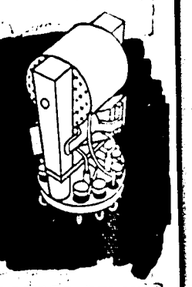
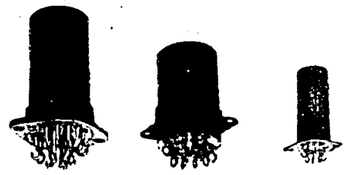
designed especially for **VIBRATION and**

The rotary-balanced armature design of Hi-G relays assures efficient operation of these important components even under severe vibration and shock — up to 20 or 30G out to 2000 cps. By design, very little momentum is built up in moving parts. For more complete information on the complete line of Hi-G relays, send for New 1959 Hi-G CATALOG.



HI-G THE [illegible] COMPLETE LINE OF *ROTARY BALANCED RELAYS*

Hi-G offers complete engineering and production facilities to manufacture relays for specific applications. Your inquiries are invited.

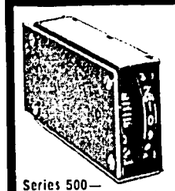


S & R TYPES | SL TYPES | SM TYPES

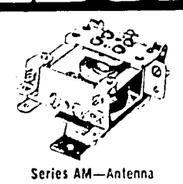
BALANCED Hi-G ROTARY **HI-G INC.,** BRADLEY FIELD/WINDSOR LOCKS, CONN.

For details, circle #500 on Reader Service Card

HILLBURN RELAYS

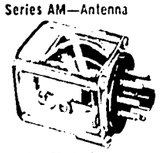


Series 500—Stepping Relay—Counter

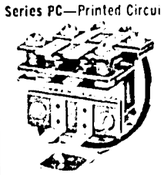


Series AM—Antenna

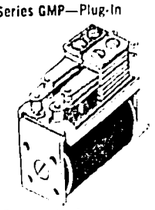
Series PC—Printed Circuit



Series GMP—Plug-In

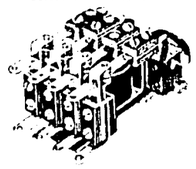


Series BG — Control



Series TA—Telephone

Series PS—Sensitive



Series ML—Power

for Reliability—

Hillburn relays are the result of careful design, evaluation, and the thorough inspection, adjustment and testing of every completed product.

Your order for Hillburn relays assures you of a quality product, "on-time" delivery and reliable performance.

Hillburn manufactures relays to your special requirements plus a complete line including:

- General Purpose
- Plate Circuit
- Industrial Control
- Printed Circuit
- Latching—Mechanical
- Latching—Magnetic
- Telephone
- Sensitive
- Stepping
- Antenna
- Polarized
- Plug-in

More than 25 types—over 500 variations to meet specific applications.

Write Dept. RE for catalog covering all relay types.

Since 1945

HILLBURN
ELECTRONIC PRODUCTS CO.
55 Nassau Ave., Brooklyn 22, N.Y.
Tel: STagg 2-3875

For details, circle #501 on Reader Service Card

what size reliable RELAYS do you need

Micro-miniature 44

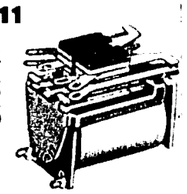
SPDT and DPDT contacts rated 2 amps at 28 VDC and 115 VAC, non-inductive. Operate time, 5 ms. max.; release 3 ms. max.—wide choice of mountings; vibration and shock resistance to meet military specifications.

Subminiature 33

Fast acting contact combinations to 6 arms per stack, 12 per relay. Contact ratings to 5 amps. Operate sensitivity (SPDT) 250 mw. min.

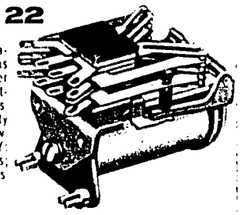
Miniature 11

Contact combinations to 8 arms per stack; 16 per relay. Contact ratings to 5 amps. Operate sensitivity (SPDT) 150 mw. min.



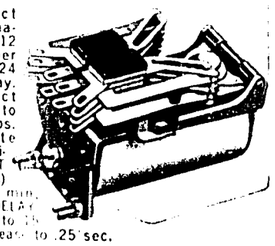
Small 22

Contact combinations to 12 arms per stack, 24 per relay. Contact ratings to 15 amps. Operate sensitivity (SPDT) 100 mw min. TIME DELAY: operate to 65 ms; release to 150 ms



Medium 66

Contact combinations to 12 arms per stack; 24 per relay. Contact ratings to 15 amps. Operate sensitivity (SPDT contacts) 60 mw min. TIME DELAY: operate to .75 sec; release to .25 sec.



Above relays available with contacts ranging from hard gold alloy for low level switching to heavy duty power; plug-in mounted, subminiature snap action contacts; open, dust tight or hermetically sealed; to meet applicable military specs. Tell us what you need or send for catalog 159.

MAGNECRAFT Electric Company
3354C W. Grand, Chicago 51, Ill.

For details, circle #502 on Reader Service Card

Directory II. Components

66. Relays.

Guardian Electric Mfg. Co., 1601R W. Walnut St., Chicago 12, Ill., 25, 30, 35, 40, 55, 57, 60, 65, 70, 75, 80
See ad on page 202
Tel: CHesapeake 3-1100

H. J. Transitions, Inc., N.J., 25, 45

Haledy Electronics Co., N.Y., 25, 45, 55

Hamilton Watch Co., Industrial Div., Pa., 80

Hamlin, Inc., Ill., 25, 45

Harrel, Inc., N.Y., 80

Hart Mfg. Co., 265 Bartholomew Ave., Hartford 1, Conn., 25, 30, 50, 55, 60, 70
See ad on page 519
Tel: JAckson 5-3491

Haydon Co., A. W., 240 N. Elm St., Waterbury 20, Conn., 80
See ad on page 518
Tel: PLaza 6-4481

Heinemann Electric Co., N.J., 25, 80

Hi-G, Inc., Bradley Field, Windsor Locks, Conn., 25, 57, 60, 70
See ad on page 520
Tel: NAtional 3-2481

Hillburn Electronic Products Co., 55 Nassau Ave., Brooklyn 22, N.Y., 25, 30, 35, 40, 50, 55, 60, 65, 70, 75
See ad on page 520
Tel: STagg 2-3875

Hi-Spec Electronics Corp., Calif., 25, 60, Miniature Thermal Time Delay Relay Testers

Hughes Aircraft Co., Hughes Prod. Div., Calif., 25, 57, 60, 65, 70, 80

Inra Corp., Mass., 40, 65, 75

Industrial Elect. Co., Monitor Controller Div., Mass., 55, 75

Industrial Timer Corp., N.J., 80

International Instruments, Inc., P.O. Box 2954, New Haven 15, Conn., 10
See ad on page 471
Tel: FUlton 7-2515

Iron Fireman Mfg. Co., Electronics Div., Ore., 25, 40, 60, 70

J B T Instrument, Inc., Conn., 20

Jack & Heintz, Inc., Ohio, 40

Jaidinger Mfg. Co., Inc., Ill., 20, 25, 40, 60, 70, 80

James Vibrapower Co., 4 [illegible] N. Rockwell St., Chicago 18, Ill., 5, 25, 5[illegible]
See ad on page 42[illegible]
Tel: COrnelia 7-[illegible]

Jennings Radio Mfg. Corp., 970 M Laughlin Ave., P.O. Box 1278, San Jose, Calif., 5, 55
See ad on page 4[illegible]
Tel: CYpress 4-[illegible]

K-[illegible] [illegible] 25, 30, 50, 70, 75, 80

Kahle & [illegible] [illegible] Staff

Kurman Electric Co., Inc., 191 Newel St., Brooklyn 22, N.Y., [illegible] 50, 55, 60, 70, 75, 80
See ad on page 52[illegible]
Tel: EVergreen 8-8[illegible]

Laird Air, Inc., Ill., 55, 70

Larson Instrument Co., N.Y., 25, 30, 35, 40, 55, 60, 80

Leach Corp., Relay & Inet Div., 3454 Susana Rd., Compton, Calif., 25, 30, 35, 40, 50, 55, 57, 60, 70, 75, 80
See ad on this page
Tel: NEvada 6-1001

Lee Electric & Mfg. Co., Calif., 55

Leland, Inc., Ill., Ohio, 25, 57, 75

Life Inst. Co., Mass., 25, 35, 55, 60, 80

Line Electric Co., N.J., 40, 75, 80

Lowenstein Electronics Corp., N.Y., 80

Luther Manufacturing Co., Calif., 70

MacDonald Wadman Co., Inc., Mass., 15, 25, 30, 35, 50, 55, 60, 70, 75, 80

Machinery Electrification, Inc., Mass., 55, 80

Mack Electric Devices, Inc., Pa., 55, 60

Macmadyne Corp., N.Y., 25, 55, 75, 79, 80

Magnecraft Electric Co., 3354C West Grand Ave., Chicago 51, Ill., 15, 25, 30, 35, 40, 55, 57, 60, 70, 75, 80
See ad on this page
Tel: EVerglade 4-6000

Magnetic Devices, Inc., Mass., 5, 57, 60

Mallory & Co., Inc., P.R., 25, 55

Maria Electronics Inc., N.Y., 25, 35, 40, 55, 60, 75, 7

Maryland Electric Ind., Co., 65, 70

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Miniature • Sub-miniature • Contactors

INTELLIGENT RELAYS
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For details, circle #503 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory.

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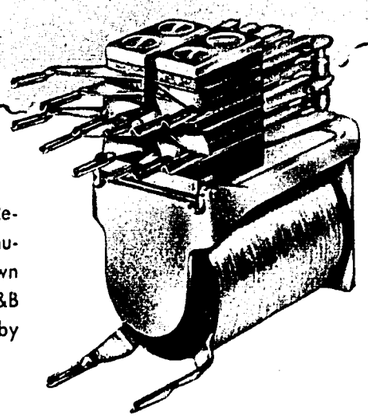
PRODUCING SPECIAL RELAYS FOR SPECIFIC NEEDS IS A P&B FORTE- IN 26 YEARS WE HAVE DESIGNED MORE THAN 20,000 VARIATIONS OF 57 BASIC RELAY TYPES- CHANCES ARE, WE CAN SAVE YOU BOTH TIME AND MONEY=



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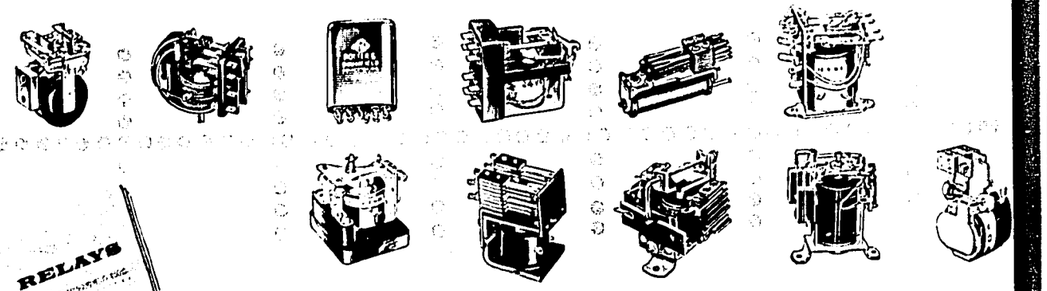

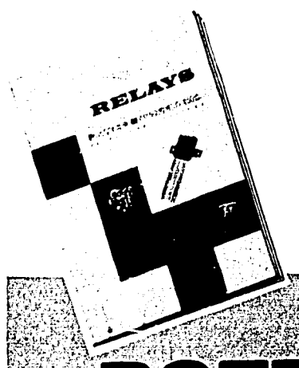

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See Potter & Brumfield relays in SWEET'S PRODUCT DESIGN FILE.

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COMMUNICATIONS
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HIGH VOLTAGE
MINIATURE
MINIATURE HERMETICALLY SEALED
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MINIATURE
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Take advantage of POLLAK engineering design service. Our factory-trained engineers are available to help you solve difficult relay, switching and electrical control problems.

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PRICE ELECTRIC
. . . Reliable Relays for Industrial and Military Use

MICRO-MINIATURE Style 6
Lightweight, crystal can type relay is simple, reliable and versatile. Ideal for miniaturized assemblies. Termination can be provided to meet most requirements.

SUB-MINIATURE Style 506
For Low Level Circuits and General Purpose use. Meets requirements of MIL-R-25018. Available with solder or plug type termination.

MINIATURE Style 570
A 6 PDT general purpose relay of simple design and high reliability. Available with isolated contact chamber for low level circuitry use. Meets the following MIL specifications and drawings: MIL-R-5757C, MIL-R-25018 (USAF), MS 24115-6 (USAF) Class B; Type II; Grade 3.

MULTIPOLE Series 2100
For military and commercial applications. Available in 2 frame sizes providing up to 6 PDT contact combinations. Available hermetically sealed.

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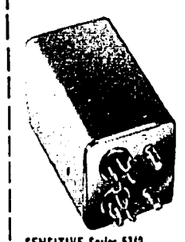

SENSITIVE Series 5340
1-inch square, hermetically sealed 1 or 2 Form C Contacts, 2 amps., 20 milli-watts per contact pole, 500-cycle vibration for military applications Temperature —65° C to 125° C.

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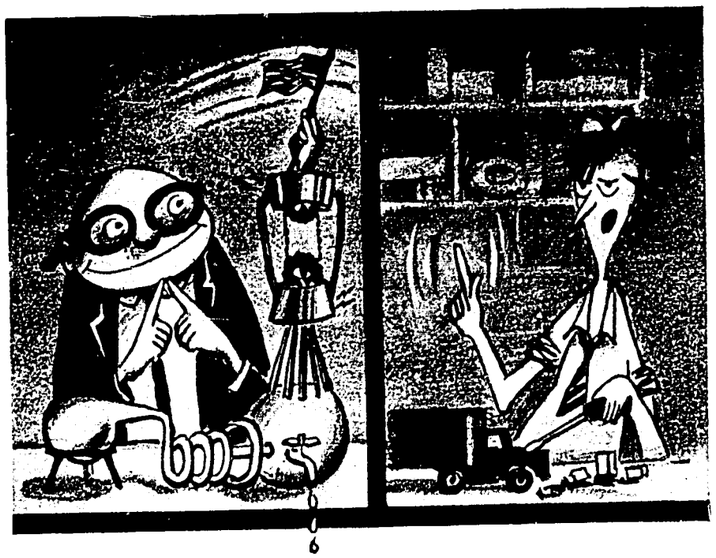
Directory II. Components

66. Relays.

Marstan Electronics Corp., N.Y., 65, 70, 80
Master Specialties, Calif., 80
Mayberry Electronics Co., Calif., 80
Mercury Contacts, Inc., Ohio, 45
Metals & Controls Div. of Texas Instruments, Incorporated, 51 Forest St., Attleboro, Mass., 25, 55, 80
See ad on page 676
Tel: ATtleboro 1-2800
Midwestern Instruments, Inc., Okla., 10, 15
Minneapolis-Honeywell Reg. Co., Minn., 55
Minneapolis-Honeywell Reg. Co., Marion Instrument Div., N.H., 10, 25, 60
Molded Insulation Co., Pa., 70
Molex Products Co., Ill., 30, 50, 55, 60
Monitor Controller, Mass., 30, 35, 40, 55, 75, 80
Muirhead & Co., Ltd., England, 15
Muirhead Instruments, Inc., N.Y., 15
Naybor Labs., Inc., E. V., N.Y., 25, 55, 70, 80
North Electric Co., N.Y., 25, 30, 35, 40, 50, 60, 65, 70, 75, 80
North Electric Co., Ohio, 15, 25, 30, 40, 50, 55, 57, 60, 65, 70, 75, 80
OK Electronics Corp., N.J., 25, 55, 80
Oak Mfg. Co., Dept. R, 1260 N. Clybourn Ave., Chicago 10, Ill., 25, 57, 65
See ad on pages 86-87
Tel: MOhawk 4-2222
Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 25, 40, 55, 60, 75, 80
See ad on pages 106-107
Tel: ORchard 5-2600
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 55
See ad on page 499
Tel: WOrth 6-0380
Pacific Relays, Inc., Calif., 25, 60, 70
Pacific Scientific Co., Calif., 25
Panseal, Inc., N.J., 80
Pendar, Inc., Calif., 20, 60, 80
Penn Keystone Corp., Conn., 25, 60, 70
Penta Laboratories, Inc., Calif., Contact Vacuum
Phaostron Instrument & Electronic Co., Calif., 25, 60, 70
Philadelphia Scientific Glass Co., Pa., 25, 45, 60
Phillips Control Corp., Ill., 25, 35, 40, 55, 70, 75, 80
Photobell Co., Inc., N.Y., 80
Photo-Crystals, Inc., Ill., 25, 45, 55, 80
Pollak Corp., Dept. B, 75-95 Freeport St., Boston 22, Mass., 5, 25, 55, 60, 70, 75
See ad on this page
Tel: AVenue 2-9550
Potter & Brumfield Div. of American Machine & Foundry Co., Princeton, Ind., 25, 30, 35, 40, 50, 55, 60, 65, 70, 75
See ad on page 522
Tel: FUlton 5-5251

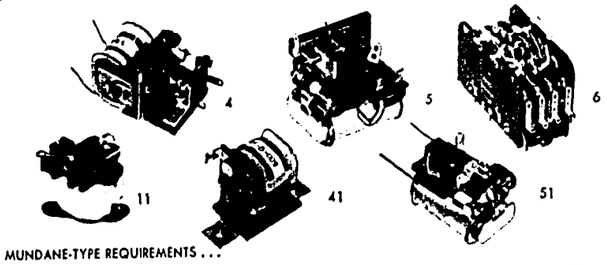


SIGMA TYPES AT YOUR SERVICE

On the left, Hardwicke J. von Cumulus exemplifies scientific inquiry in the best tradition, pondering problems of the highest order concerning interrelation of theoretical factors in sensitive relay design. His is an 0.6^{-13} world, beyond the ken of most, deaf to the Cry of the Coliseum. He's the gentleman to see if you're just wondering about the characteristics of a relay for use somewhere out of this world.

At right is Sigma's General Purpose Application Man of the Year, Mackinaw L. Mundane. Although Mackinaw will never quite understand what all the Hardwickes are muttering about, he doesn't care; he's closing in fast on some good unsophisticated jobs for Sigma relays. He's heard all about Progress, Improvement and Doing the Difficult Jobs Well, but he knows *his* bread is buttered by the guy who wants a relay that will work well, on the ground, under everyday circumstances. He will enthusiastically tell you, point blank, which Sigma type to pick for speed, quietness, price, life or some combination thereof. His customers make toys, burglar alarms, electric blanket controls, machinery controls, UL-approved items and such, and some of his favorite relays are shown below.

Actually, there's a whole crew of Mundanes here ready to jump when you speak — not at you, but up with answers. Or from a distance you can get some useful data on which to judge and select, in the form of specific relay Bulletins, or assembled within elegant covers as the NEW Sigma Catalog. Communication with H. J. von C. and other Scientists, however, is restricted to 8:30-5:00, Monday through Friday.



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LOW PRICE: Series 11 sells at less than a dollar in quantity, with mechanical life of 100,000,000 operations. DC and shaded pole AC.

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HIGH CONTACT RATING: Series 51 switches 10 amperes of incandescent lamp load yet operates on 100 mw.

HIGH SPEED: Series 41 can be operated in less than 2 milliseconds and will switch loads up to 1 ampere 100,000,000 times.

AC OPERATED: Shaded pole 41 with no rectifiers. Extremely quiet, reliable operation with switch ratings up to 5 amperes, or operating sensitivity as low as 0.06 v-a.

MAGNETIC LATCHING: Series 6 (Form Z) polar relay provides an exceptionally reliable latching contactor. Up to 4-pole double throw with no mechanical catches to wear.

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- Phillips Control
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Order Large or Small Quantities

Telephone Relays	Latching Relays
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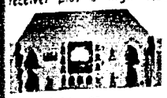
For wireline and other voice communications circuits—500 to 2500 bits/second in a 3-kc bandwidth. A fully transistorized transmitter and receiver plus a high stability clock system and a self-contained delay equalizer in a single unit—requiring 5½ in. of standard rack space. Automatically synchronized clock for detecting and regenerating received data pulses.



Sebit—25

Data input and output is serial, ground-referenced. Features low error rate and reliable performance under wide range of adverse transmission conditions. *Write for Bulletin No. 62.*

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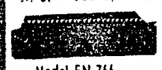
Improves data transmission accuracy by compensating for envelope delay distortion introduced by voice communications circuits. Relative delay: flat at midband, min. at bandedges—frequency of max. delay 1000, 1250, 1500, 1750, or 2000 c/s—delay range 0.8 ms to 3.5 ms in 10 steps. Input and output-600 ohms. Size—19 x 3½ x 8-in.



Model EN-766

Bulletin No. 64.

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Transistorized. Size 2½ x 4½ in. Useful for interconnecting different portions of data transmission systems—also for reliable high-speed (up to 2500 bits/sec) switching of d-c circuits to 200 ma—300 volts. Polar or neutral input and/or output. No a-c line power required. Control power less than 1 watt derived from keyed system. Interchangeable with WE 255A or similar types. Input sensitivity to 3 ma. *Bulletin No. 65.*

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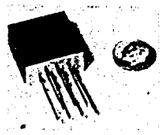

MXFD—100

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The engineering talent responsible for the equipment in this column is available for special developments either on fixed price or CPFF basis. Other significant Rixon developments and areas of experience include: 50-KW VHF Transmitter, 16-Channel Transistorized TTY Multiplex Equipment, Low Noise Preamplifiers, High Power Dummy Antenna, Antenna Matching Equipment, etc.

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DESIGN • DEVELOPMENT • MANUFACTURE
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Directory II. Components

66. Relays.

Price Electric Corp., East Church & 2nd Sts., Frederick 1, Md., 5, 25, 40, 50, 55, 57, 60, 65, 70, 75, 80
See ad on page 523
Tel: MOnument 3-5141

Radar Relay, Inc., Calif., 60

Radio Engrg. Products Ltd., Canada, 50

Regulator Equipment Corp., N.J., 55

Relay Sales, Inc., P.O. Box 186-IR, West Chicago, Ill., distributor
See ad on page 524
Tel: WEst Chicago 1100

Relays, Inc., N.Y., 15, 25, 35, 55, 60, 70, 75

Revere Corp. of America, Conn., 25, 60

Rhodes, Inc., M. H., Conn., 80

Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., Transistorized
See ad on this page
Tel: LOckwood 5-4578

Robertshaw-Fulton Controls Co., Acro Div., 2040 E. Main St., Columbus 16, Ohio, 40 General Purpose
See ad on page 555
Tel: CLearbrook 3-8531

Rowan Controller Co., Md., 5, 80

Sargent & Greenleaf, Inc., Security Devices Laboratory Div., 24 Seneca Ave., Rochester 21, N.Y., 20
See ad on page 393
Tel: HOpkins 7-3200

Sigma Instruments, Inc., 31 Pearl St., South Braintree 85, Mass., 15, 25, 30, 35, 40, 50, 55, 60, 65, 70
See ad on page 524
Tel: VIctor 3-5000

Simpson Electric Co., 5218 W. Kinzie St., Chicago 44, Ill., 10
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Tel: EStebrook 9-1121

Sivers Lab., Sweden, 5

Societe Industrielle De Sonceboz, Switzerland, 10, 80

Square D Co., Wis., 40, 55, 60, 80

Standard Electromagnetics, Inc., Md., 5, 25, 30, 60, 65, 70, 75

Standard Telephones & Cables, Ltd., England, 25, 40, 50, 65, 70, 75

Stepper Motors Corp., Calif., 57, 65

Stevens-Arnold, Inc., 7 Elkins St., South Boston 27, Mass., 15, 20, 25, 35, 50
See ad on page 430
Tel: Andrew 8-1170

Stromberg-Carlson Div., General Dynamics Corp., N.Y., 40, 65, 75

Struthers-Dunn, Inc., N.J., 15, 25, 30, 35, 40, 45, 55, 60, 65, 70, 75, 80

Sunvic Controls, Ltd., England, 80

Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 5, 57, 65
See ad on page 556
Tel: WIndsor 4-2221

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 55
See ad on page 502
Tel: REctor 2-6249

Telecomputing Corp., Calif., 25, 57, 60

Tempo Instrument, Inc., N.Y., 80

Terado Company, 1065 Raymond Ave., St. Paul 8, Minn., 25, 30, 60
See ad on this page
Tel: MIdway 6-2514

Texas Instruments, Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 55
See ad on pages 75-78
Tel: FLeetwood 7-5411

Thompson-Ramo-Wooldridge, Inc., Tapco Group, Ohio, 5

Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 15, 20, 40, 50, 55, 60, 80
See ad on pages 116-117
Tel: ELizabeth 4-5650

Transco Products, Inc., Calif., 5, 25, 70

Trepac Corp. of America, N.J., 20, 35, 50, 60

Trimount Instrument Co., Ill., Proximity

Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio, 10
See ad on page 472
Tel: 323-W

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 25, 55, 60, 80
See ad on pages 50-51
Tel: HUmboldt 2-4200

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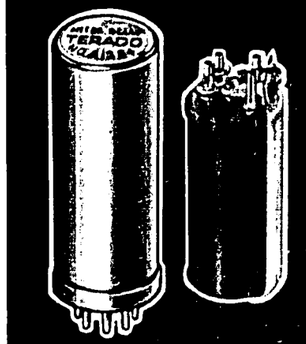
For Tube or Transistor Circuits.
Hermetic Seal
Plug In or Terminals



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- Vibration Characteristics Excellent
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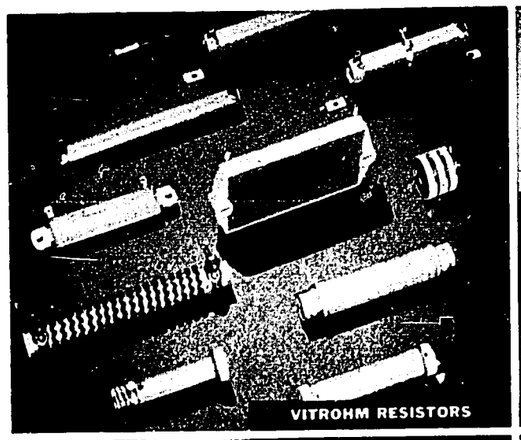

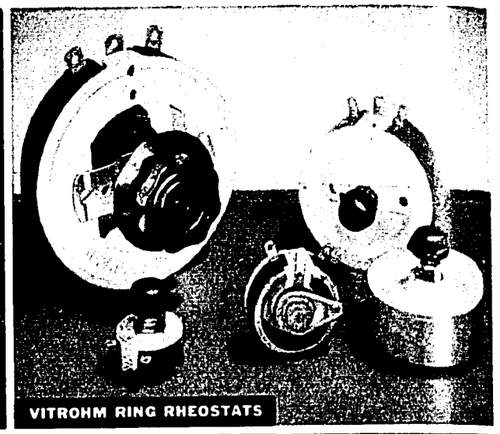

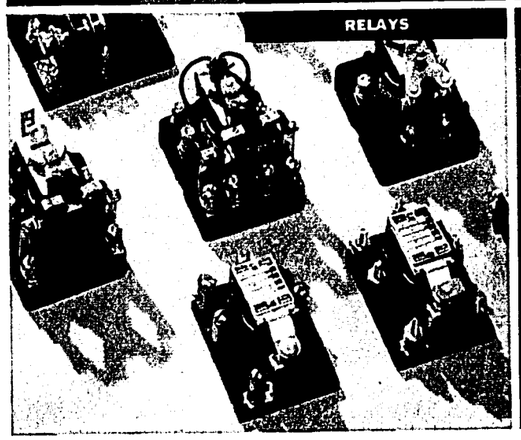

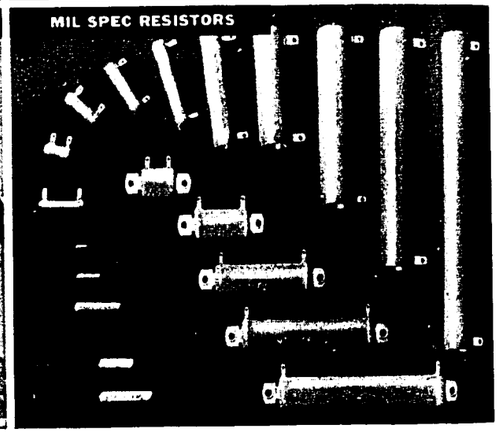

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FORM	WATTS		RESISTANCE VALUES (ohms)	
	Stock	Made to Order	Stock	Made to Order
VITROHM: Fixed	5 to 200	5 to 218	1 to 250,000	0.2 to 1,750,000
Adjustohm	10 to 200	10 to 218	1 to 150,000	0.3 to 525,000
STRIPOHM	20 to 75	20 to 75	1 to 65,000	0.1 to 115,000
AXIOHM	3, 5, 10	3, 5, 10	1 to 50,000	0.25 to 50,000
NON-INDUCTIVE	35 to 160	10 to 160	1 to 1,000	0.86 to 14,100
PLAQOHM	25 to 150	25 to 150	1 to 10,000	0.5 to 86,400
DISCOHM	24	24	1 to 4,000	1 to 5,760
RIBFLEX	Not Available	75 to 550	Not Available	0.04 to 66

VITROHM Ring Rheostats

25 W, 1 min to 5,000 max ohms
50 W, 1 min to 10,000 max ohms
100 W, 1 min to 10,000 max ohms
150 W, 1 min to 10,000 max ohms
300 W, 1 min to 2,500 max ohms

Relays

Sensitive—2 amp, 125v, a.c. max
Midget—6 amp, 125v, a.c. max
Heavy duty midget—15 amp, 125v, a.c. max
Multi-pole—10 amp, 125v, a.c. max
Heavy duty—25 amp, 125v, a.c. max

Mil Spec Resistors

All styles, all sizes, all characteristics and all resistance values listed in Military Specification MIL-R-26C. Ask for BULLETIN 12

Write for a complete listing of stocking Electronic Distributors.

Ward Leonard Electric Co., 83 South Street, Mount Vernon, N.Y. (In Canada: Ward Leonard of Canada, Ltd., Toronto.)

WARD LEONARD ELECTRIC COMPANY
MOUNT VERNON, NEW YORK

RESISTORS | RHEOSTATS | RELAYS | CONTROLS | DIMMERS

Result-Engineered Controls Since 1892

For details, circle #511 on Reader Service Card

METALLIC FILM RESISTORS by CORNING

Type N

MIL-R-10509B—½, 1, 2W at 40°C. Derating to 140°C. Up to 4.2 megohms.

MIL-R-10509C New fusion-sealed resistor. ¼-watt. Can be boiled in water without failing moisture specs. 10 ohm to 360 Kohm at 70°C., derating to 160°C.

New epoxy-coated resistors. ⅛, ¼, ½-watt at 70°C. Exceptional moisture resistance.

Low-Power

Highest resistance range of any low-power resistors. LPI-3: 3W, 125-40 K. LPI-4: 4W, 125-90 K. LPI-5: 5W, 180-110 K. LPI-7: 7W, 180-90 K. LPI-10: 10W, 180-70 K.

Also C-42 resistor: a low-cost, 2W, 70°C. resistor to meet MIL-R-11B; 130 to 1.5 K.

High-Power

Type R 7 to 115W at 40°C., derate to ½-power at 120°C.; 10 ohms to 1 megohm. To MIL-R-11804B.

Type S High-temperature to MIL-R-11804B. ½, 1, and 2W at 120°C. Up to 4.2 megohms.

Type WC-5 Water-cooled HF. Can mount direct on coax line and at RF ground potential. 35 to 200 ohms with ± 15% standard; 10 and 5% also available. Dissipates up to 5 KW.

Type H High-frequency for dummy antennas, circuit loading, damping, and terminating. 10 ohms to 1 megohm. 5 to 140W.

Type ST for highest wattage to volume ratio of any metallic oxide resistor. 2½, 5, and 10 W at 25°C., derating to 350°C. 2% and 5% tolerances.

For more information on any or all of these resistors, write for data sheets. Corning Glass Works, 550 High St., Bradford, Pa.

CORNING ELECTRONIC COMPONENTS

For details, circle #512 on Reader Service Card

Directory II. Components

66. Relays.

Union Switch & Signal, Div. of Westinghouse Air Brake Co., Braddock Ave., Pittsburgh 18, Pa., 25, 57, 60, 70
See ad on pages 158-159
Tel: CHurchill 2-5000

United States Instrument Corp., Va., 30, 40, 65, 75

U.S. Relay Co., Calif., 15, 20, 25, 40, 50, 55, 60, 70, 75, 80

Universal Relay Corp., 42 White St., New York 13, N.Y., distributor
See ad on this page
Tel: WAlker 5-9257

Varo Mfg. Co., Inc., Tex., 20

Victoreen Instrument Co., Calif., 20, 25, 30, 35, 40, 60, 65, 70, 80

Victory Engineering Corp., 114 Springfield Rd., Union, N.J., 60, 70, 80
See ad on page 541
Tel: MUrdock 8-7150

Video Instruments Co., Inc., Calif., 45

Wac Line, Inc., Ohio, 10

Ward Leonard Electric Co., 83 South St., Mt. Vernon, N.Y., 55, 60
See ad on page 526
Tel: MOunt Vernon 4-1000

Waugh Engrg. Co., Calif., 80

Wheaton Engineering Corp., Ill., 65, 80

Wilson & Co., G. C., Ohio, 80

Winatic Corp., N.Y., 55

Zenith Electric Co., Ill., 55, 80

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LARGEST STOCK OF RELAYS IN THE WORLD
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Send for Latest Catalog R

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Formerly Universal General Corp
42 White St., New York 13, N.Y. • WAlker 5-9257

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67. Resistors.

5. Carbon fixed, molded
10. Carbon, variable
15. Deposited carbon
20. Potentiometers
22. Potentiometers, precision
25. Precision film
30. Printed circuit
35. Rheostats
40. Thermistors
45. Vacuum sealed
50. Very high megohm
55. Wirewound, fixed
60. Wirewound, variable
65. Wirewound, precision

Accuracy, Inc., Mass., 20, 22, 60

Ace Electronics Associates, Inc., Dept. A3, 99 Dover St., Somerville 44, Mass., 20, 22, 60, 65
See ad on page 528
Tel: SOmerset 6-5130

Aerovox Corp., Mass., 5, 15, 20, 22, 50, 55, 65

Aerovox Corp., Cinema Engrg. Div., Calif., 20, 65

Aerovox Corp., Hi-Q Div., N.Y., 15, 25, 30

Allen-Bradley Co., Wis., 5, 10, 20, 25, 35

Allies Products Corp., Fla., 15, Precision

Analogue Controls, Inc., N.Y., 20, 22, 35, 60, 65

Argonne Electronics Mfg. Corp., N.Y., 20

Arnhold Ceramics, Inc., N.Y., 15, 25, 45, 50

Atohm Electronics, Calif., 22, 60

Automatic Products Research, N.Y., 30

Avnet Corp., Calif., 22, 25

Axel Brothers Inc., 134-20 Jamaica Ave., Jamaica 18, N.Y., 65
See ad on page 396
Tel: REpublic 9-1700

Beckman Instruments, Inc., Helipot Div., Calif., 22

Bendix Aviation Corp., Ind., 40

Biddle Co., James G., Pa., 35

Bird Electronic Corp., 30303 Aurora Rd., Solon, Ohio, RF Power & Coax
See ad on page 334
Tel: CHurchill 8-1200

Bond Electronics Corp., N.J., 30, 55, 65

Borg Equipment Div., Amphenol-Borg Electronics Corp., 120 S. Main St., Janesville, Wis., 22
See ad on page 530
Tel: PLeasant 4-6616

Bourns, Inc., Calif., 10, 20, 22, 35, 60, 65

Bradford Components, Inc., N.Y., 55, 60, 65

Brys Instrument Co., N.Y., 22, 65

Calbest Electronics Co., Calif., 20, 22, 65

Canadian Research Institute, Canada, 10, 55, 65

Carborundum Co., Globar Plant, N.Y., 5, 40

Carborundum Co., Refractories Div., N.J., 5, 40

Carter Mfg. Corp., Mass., 22

Carter Parts Co., Ill., 20, 35, 60

ACE

Potentiometers - Trimmers - Relays

RELIABILITY IN MINIATURIZATION

ACEPOT®-500 / ACEPOT X-500*

Sub-miniature, linear and non-linear potentiometers. Single turn unit, ½" size, ±2% resistance tolerance and ±0.3% ind. linearity.

actual size

Size	½" x ½"
Weight	0.25 ounce
Resistance Range	2Ω to 500K
Resistance Tolerance	±2%
Linearity	±0.3% Ind. standard
Temperature*	−55°C to 125°C*
Mechanical Rotation	Continuous or with stops
Electrical Angle	325° std. ≷ available
Resolution	0.12% for 50 K Others comparable
Torque**	.05oz./in. at 20°C (Bronze) .035oz./in. (Ballbearing)
Power	2W for 60°C rise or 2.5W for 65°C (X-500)
Mounting	Threaded bushing, servo, flush or flanged. Ganged up to 6 cups.

* X-500 standard high temperature potentiometer. Range: −55°C to 150°C.

**Jewel bearing Acepot torque of .014 ounce/inch.

ACEOHM®

Sub-miniature trimmers . . . high temperature, humidity proof for severe environment.

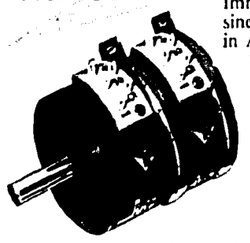
actual size

Size	1¼" x ¼" x ¼" Standard Mounting holes
Weight	0.2 ounce
Resistance Range	10Ω to 75K — Special to 150K
Mechanical Rotation	25 Turns on lead screw, adjustable over 100% of winding
Power Rating	1.6W at 40°C Derates to 0 at 225°C
Temperature Range	−55 to 225°C
Resolution	.13% for 75K Other resistances comparable
Dielectric Strength	1000 volt DC for 60 sec.
Load Life	1000 hours at 180°C
Capacitance	Extremely low distributed capacity (moulded hitemp, phenolic case & cover)

Completely sealed element. Meets and surpasses all applicable requirements of MIL-E-5272A and MIL STD. 202A.

ACEPOT®

Standard non-linear and linear potentiometers. 0.25% terminal conformity with out padding resistors. Immediately available in sine, cosine, square law and log functions in AIA sizes.



Typical Spec's:	Sine-cosine	Double Sided Square-law
Size	3"	3"
Resistance	20K ±5% driving	25K ±5% driving
Conformity	½% pk-pk	±0.25%
Function angle	360°	±180°
Power	4 watts	3 watts
Mounting	Servo	Servo

Submit your design requirements to our Engineering Group for evaluation and quotations.

ACESET®

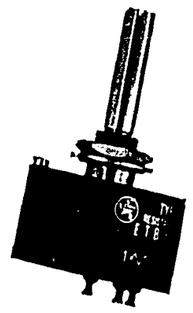
Sub-miniature Trimmers. Heat dissipation . . . 2 watts at 60°C. Immediate delivery in resistances of 50Ω to 50 K.

actual size

Size	⅓" x 5/16"
Weight	⅓ ounce, including lock washer and nuts
Resistance Range	50Ω to 100K ±10% std. tol
Linearity	±5%
Temperature Range	−55°C to +125°C
Mechanical Rotation	330° Nominal
Electrical Angle	320° Nominal
Power	2 watts for 60°C rise
Mounting	¼"-32 threaded bushing

ACEMHO*

Conductive plastic element. Infinite resolution. Extremely long life. No sudden open-circuit failure possible. Low, low noise. Meets JAN & MIL specs. Patents pending.



Size	1 3/16"
Weight	1.6 ounce
Resistance	to 5 megohm
Linearity	.5% Independent
Resolution	essentially infinite
Power	2W at 20°C
Mounting	Bushing

*Reg. applied for

ACETRIM*

Sub-miniature trimmers . . . A wide range of resistances are available in this low-cost, space and weight saving unit.

actual size

Size	½" x ½"
Weight	0.25 ounce
Resistance Range	2Ω to 250K ±5% std tol
Linearity	±3%
Temperature	−55°C to 125°C (to 150°C (X-500))
Mechanical Rotation	continuous or with stops
Electrical Angle	325° std. available
Power	2W for 60°C rise or 2.5W for 65°
Mounting	Threaded bushing, printed circuit, flush, flanged, ganged.

*Trade Mark applied for

Exact requirements for your particular applications, can be custom designed and mass produced with short lead time. All units are anti-fungus treated and fully sealed against dust, moisture and humidity. Meets applicable JAN-MIL specs including shock and vibration. Send us your specifications for engineering assistance on designs and applications. Complete Fact File and Application Data Sheets available on request. CALL, wire or teletype Dept. A3 at Ace Electronics Associates, Inc., 99 Dover Street, Somerville, Mass. SOmerset 6-5130, TWX SMVL 181.

ACEPOT® ACETRIM ACESET® ACEOHM® **ACE** ELECTRONICS ASSOCIATES INC.

For details, circle #514 on Reader Service Card

No. 1 of a series

How to assure reliability in a precision pot

Precious Metal Resistance Wires and Contacts

by H. E. HALE
Vice-President & General Manager

The reliability of precision potentiometers is directly proportional to retained accuracy over storage, rotational life, and environmental exposure; and inversely proportional to their electrical noise characteristics. Corrosion, oxidation, and foreign deposits are some of the conditions which adversely affect these factors.

Base metal resistance wires and contacts are particularly susceptible. For this reason, precious metal alloys should be specified wherever possible. Their high tensile strength and ability to remain inert to oxidizing and corrosive atmospheres are especially desirable. Electrical noise is kept at a minimum, and storage and rotational life are greatly extended. In addition, resolution and conformity are improved. These advantages more than offset the metals' higher initial costs.

Three general ranges of preferred temperature coefficients can be considered in choosing a precious metal: (a) ±20 ppm; (b) ±200 ppm; and ±600 ppm. Choice will be governed by specific design requirements.

Fairchild has pioneered the use of precious metals in potentiometer applications, and has included these materials in designs even when they have not been specified by customers as a necessary requirement. An outstanding example is the one-piece precious metal wiper found in all Fairchild linear and non-linear, high-reliability pots. In addition to the advantages outlined above, the unique wiper design provides high-deflection sensitivity and natural frequencies. Wire and contact diameters are matched to assure optimum conformity and incremental voltage steps; hardnesses are also matched for minimum degradation. These pots are available in ⅞-inch to 3-inch diameters, single- and multi-turn, in standard and high-temperature models. Accuracies are as high as .009%.

Precious metal resistance wires and contacts are examples of the many Safety Factors built in by Fairchild beyond specifications to assure reliability in performance.

You are invited to write to Dept. 31P for more information.

FAIRCHILD CONTROLS CORPORATION
COMPONENTS DIVISION

GYROS · PRESSURE TRANSDUCERS · POTENTIOMETERS · ACCELEROMETERS

225 Park Ave., Hicksville, L. I., N. Y.
6111 E. Washington Blvd., Los Angeles, Cal.

A Subsidiary of Fairchild Camera and Instrument Corporation

For details, circle #515 on Reader Service Card

Directory II. Components

67. Resistors.

Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 10, 15, 20, 30, 60
See ad on page 174
Tel: WOodruff 2-9200

Chicago Aerial Industries, Kintronic Div., Ill., 20, 22, 50, 60, 65

Chicago Telephone Supply Corp., 1142 West Beardsley Ave., Elkhart, Ind., 10, 20, 35, 55, 60, 65
See ad on page 96
Tel: JAckson 3-0210

Chicago Tel. of Calif., Inc., Calif., 10, 20, 35, 60

Circuit Instruments, Inc., Fla., 22

Clark Electronic Labs., Box 165, Palm Springs, Calif., Pressure Type
See ad on page 559
Tel: FAirview 8-2210

Clarostat Mfg. Co., Inc., N.H., 10, 15, 20, 22, 30, 35, 55, 60, 65

Computer Instrument Corp., 90 Madison Ave., Hempstead, L.I., N.Y., 10, 15, 20, 22, 25, 35
See ad on page 532
Tel: IVanhoe 3-8200

Consolidated Resistance Co. of America, N.Y., 55, 65

Continental Carbon-Div. of Wirt Co., Pa., 15, 20, 25, 30, 35, 55, 60

Corbett Science Labs., Calif., 22, 55, 65

Corning Glass Works, 550 High St., Bradford, Pa., 25, 30
See ads on pages 400, 527
Tel: 2-4571

Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 15, 20, 25, 30, 50, 55, 65
See ad on pages 34-35
Tel: LOcust 4-3131

Daven Co., N.J., 20, 25, 30, 35, 50, 55, 60, 65

Daystrom, Inc., Weston Instruments Div., N.J., 25

Daystrom Pacific, Div. of Daystrom, Inc., Calif., 20, 22, 60

DeJUR-Amsco Corp., Electronics Sales Div., 45-01 Northern Blvd., Long Island City 1, N.Y., 20, 35
See ads on pages 190, 423
Tel: RAvenswood 1-4009

Derf Radio Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 50, 55, 60, 65

DeWitt Development Co., Ill., 55

Dimeter Mfg. Co., Inc., N.Y., 55, 60

Eastern Precision Resistor Corp., N.Y., 22, 30, 55, 60, 65

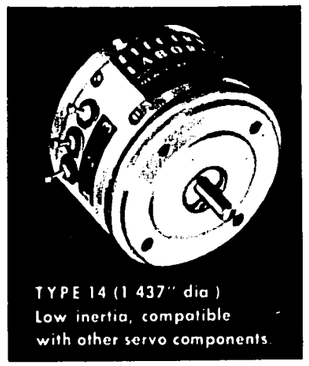
Edeliff Instruments, Calif., 20, 22

Egen Electric Co., D.C., 5

Electra Manufacturing Co., 4051 Broadway, Kansas City, Mo., 15, 25, 30
See ad on page 534
Tel: WEstport 1-6864

Predict performance!
Cut costs!
The key to dependable system performance is

RELIABILITY!



TYPE 14 (1.437" dia.)
Low inertia, compatible with other servo components.

Designers everywhere insist on the rugged reliability of precision potentiometers by Electro-Mec.

- 100% inspection of all vital characteristics.
- Glass insulated terminals.
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- Ultra-dependable resistance elements artificially aged to insure stability.
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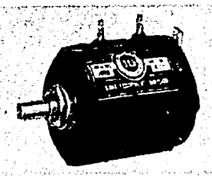
47-51 33 Street
Long Island City 1, N. Y.

All AIA Sizes .875" to 3.00" Dia.
For complete technical data write to our engineering department.

For details, circle #516 on Reader Service Card



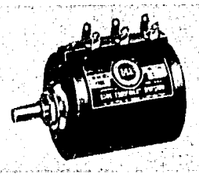
205 SERIES, 10-TURN MICROPOTS

SIZE: 1¾" dia.; 2⅛" long; shaft extension ⅞" or special to order.

LINEARITY ACCURACY: ±0.1% and 0.05% (independent or zero based).

RESISTANCES: 50 ohms to 100,000 ohms, tolerance ±5%.

POWER DISSIPATION: 5 watts at 40° C.



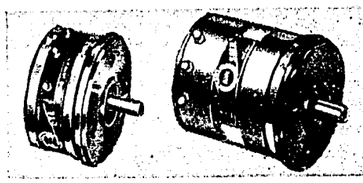
1100 SERIES, 10-TURN MICROPOTS

SIZE: 1⅞" dia.; 2⅛" long; shaft extension ⅞" or special to order.

LINEARITY ACCURACY: 0.5% to 0.1% (independent linearity).

RESISTANCES: 50 to 100,000 ohms, tolerance ±5%.

POWER DISSIPATION: 3 watts at 40° C.



900 SERIES MICROPOTS

Borg 900 Series Micropots are available in single-turn, 3-turn and 10-turn models.

SIZE: Single-turn — 2" dia.; 1⁵⁄₆₄" long
3-Turn — 2" dia.; 1⅝" long
10-Turn — 2" dia.; 2¹⁄₁₆" long
Shafts — ¼" dia.
Bushing Mount — ⅞" long
Servo Mount — ⅝" long

LINEARITY ACCURACY: Single-turn — ±.5% (independent)
3-Turn — ±0.1% (independent, zero based, or absolute reference).
10-Turn — .05% (independent, zero based, or absolute reference).

RESISTANCES: Single-Turn — 50 to 50,000 ohms
3-Turn — 15 to 60,000 ohms
10-Turn — 50 to 300,000 ohms

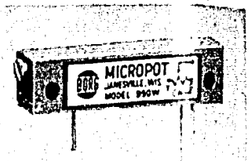
TEMPERATURE LIMITS: Tested to 350° F.

STANDARD COMPONENTS

built by BORG

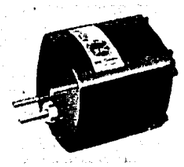
FIT MANY SPECIAL DESIGN NEEDS

Design flexibility of standard Borg components often eliminates the need for expensive, specially designed units. Borg offers a complete line of precision potentiometers, turn-counting dials and fractional horsepower motors. Many of these standard Borg components are currently on duty in missile launching platforms and firing control stations, radar and sonar equipment, computers and similar electronic apparatus. Production of standard Borg components assures quick delivery. A partial selection is shown on this page. Write for complete data on all Borg components. Ask for catalog BED-A90.



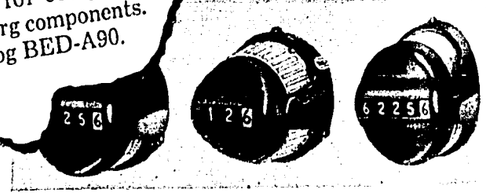
990 SERIES TRIMMING MICROPOTS

SIZE: 1¼" x 5⁄16" x 15⁄32"
RESISTANCES: 10 to 30,000 ohms standard. Other values on special order.
Tolerances — ±5% 100 ohms and over
±10% below 100 ohms
ADJUSTMENT: Screw driver slot provides adjustment of complete range in 40 turns.
TERMINALS: Printed circuit, soldered lug, insulated wire leads



PRECISION INSTRUMENT MOTORS

Borg-Motors offer you fractional horsepower motors in synchronous or induction models with or without gear-trains in 2-pole or 4-pole models for your precision equipment. Borg-Motors are totally enclosed, using precision machined die cast alloys for end bells and gear train cases. Die cast rotors, mounted on two ball bearings, assure long life, continued accuracy.



DIRECT READING MICRODIALS

Borg Direct-Reading Microdials provide the highest accuracy of perception when forced-fast-reading and setting is required because of their inline digital presentation. Borg Direct-Reading Microdials are available in 3-digit 10-turn models, 4-digit 100-turn models and 5-digit 1,000 turn models. Also available are Borg Concentric Scale Microdials which indicate the position of any multi-turn device of 10 turns or less.

WRITE FOR COMPLETE DATA ON ALL BORG COMPONENTS — CATALOG BED A90

BORG EQUIPMENT DIVISION
Amphenol-Borg Electronics Corporation
JANESVILLE, WISCONSIN

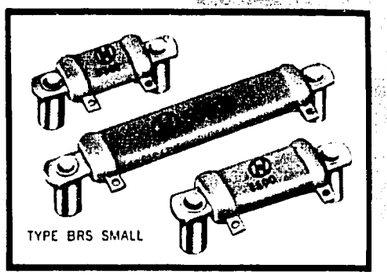
BORG ®
- MICROPOTS
- MICRODIALS
- MOTORS

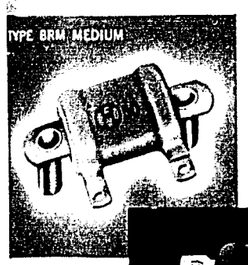
For details, circle #517 on Reader Service Card

Space Problem?

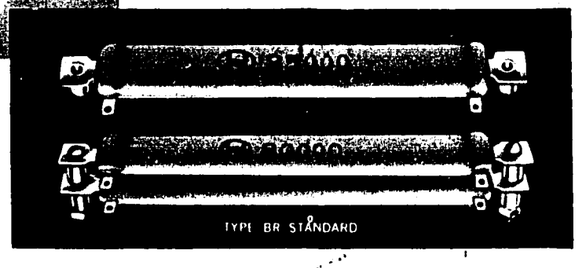
SPECIFY Blue Ribbon PRECISION SPACE-SAVER RESISTORS

...the Complete Line of Flat and Stack Mounting Wire Wound, Power Resistors





Available in Wattage Ratings from 10 to 75 W
Resistance Range from .10 to 100,000 Ohms



These High Reliability Space-savers feature matched coefficient of expansion with gray vitreous enamel covering for complete protection from overloads and environmental conditions. Aluminum thru-bracket improves heat dissipation, minimizes hot spots, allows a higher wattage rating per unit of space. Bracket construction facilitates stacking and saves additional space.

For Complete Specifications and illustrated bulletin on H-H Blue Ribbon Resistors, call or write, today!

'Gray Line' RHEOSTATS

Complete range from 25 to 1000 watts. Shock resistant construction. High temperature enamel bonding withstands greater overload.

'Gray Line' RESISTORS

Fixed, adjustable, ferrule and axial lead types for all commercial and military applications. Super-ruggedized for complete reliability.

The Mark of Quality since 1924

HARDWICK, HINDLE · INC
40 HERMON ST., NEWARK 5, NEW JERSEY

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Directory II. Components

67. Resistors.

Electro-Chemical Engraving Co., Inc., N.Y., 30

Electro-Flex Heat, Inc., Conn., 55

Electro Measurements, Inc., Ore., 20, 22, 35, 55, 60, 65

Electro-Mec Lab., Inc., 47-51 33rd St., Long Island City 1, N.Y., 20, 22, 60, 65
See ad on page 529
Tel: STillwell 6-3402

Electromath Corp., N.Y., 20, 22, 55, 60, 65

Electronic Applications, Inc., Conn., 15, 50

Electronic Plastics Co., Calif., 25, Computer Plug-in Resistors

Elektro-Serv Co., N.Y., 20, 22, 25

El-Rad Mfg. Co., Ill., 55

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 15, 25, 30
See ad on pages 110-111
Tel: GLendale 6-8592

Fairchild Controls Corp., Dept. 31P, Components Div., 225 Park Ave., Hicksville, L.I., N.Y., 22, 25
See ad on page 529
Tel: WElls 8-5600

Fenwal Electronics, Inc., Mass., 40

Look to FXC *for the best in thermistors, varistors and light dependent resistors*

Complete details, including sample kit information, furnished on request.

Say ferroxcube when you need ferrite.

FERROXCUBE
CORPORATION OF AMERICA
50 East Bridge Street, Saugerties, N. Y.

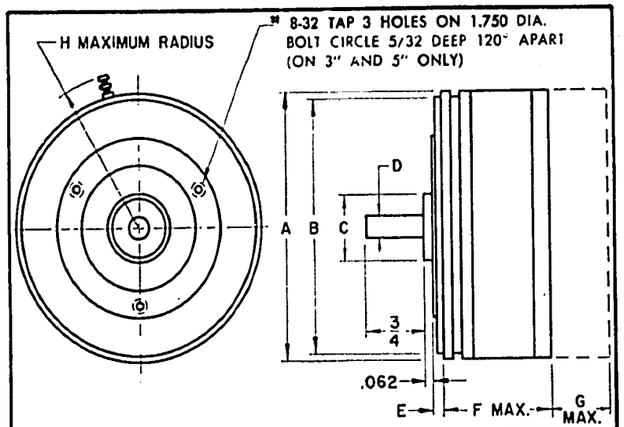
For details, circle #519 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

PRECISION CARBON FILM • POTENTIOMETERS

Infinite Resolution • Long Life • High Accuracy • Low Noise • Low Torque

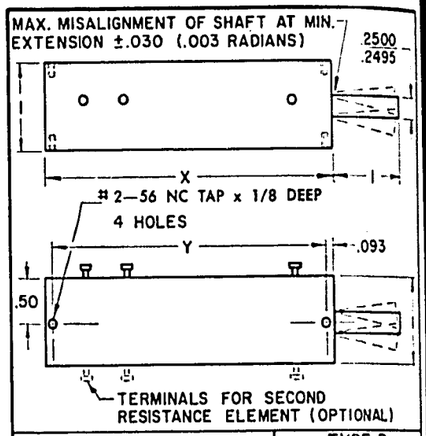
ROTARY



DIMENSIONS					
MODEL	78	105 & 106	205 & 206	305 & 306	505 & 506
A	7/8	1 3/32	2	3	5
B	.7500	1.0300	1.8750	2.8750	4.8750
C	——	——	——	.7500	.7500
D	.1250	.1250	.2500	.2500	.2500
E	.040	.040	.060	.060	.060
F	.635	.635	.985	1.350	1.870
G	.635	.635	.985	1.350	1.870
H	.570	.670	1.125	1.800	2.800

SPECIFICATIONS		
MODEL	LINEAR	SINE-COSINE
MECHANICAL ROTATION	360° CONTINUOUS	
ELECTRICAL FUNCTION ANGLE	350° NOMINAL	360°
RESISTANCE RANGE	1K-250K	500Ω-50K QUAD
BEST LINEARITY OR CONFORMITY	.1% ÷ INCH OF DIA	.3% p-p ÷ Inch of di
VIRTUAL RESOLUTION	1/75,000 ÷ INCH OF DIAMETER	
WATTAGE	DIAMETER x 2	
TEMPERATURE RANGE	—55°C TO 150°C	
TAPS, MAXIMUM NO.	DIAMETER x 6	
STARTING TORQUE (IN.-OZ.)	DIAMETER X .15	DIAMETER X .2
GUARANTEED LIFE	TO 30 MILLION CYCLES	

LINEAR MOTION



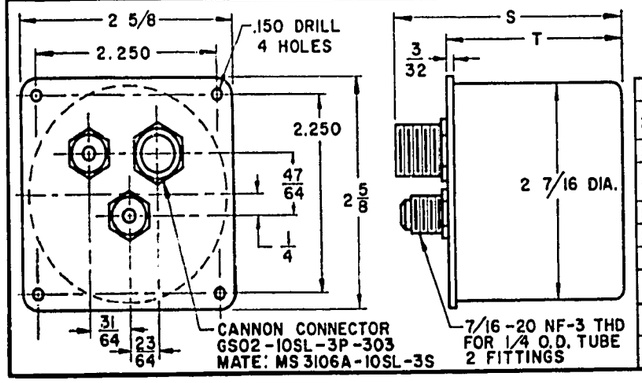
DIMENSIONS		
STROKE	X	Y
1/4" TO 1"	2.125	1.937
1" TO 2"	3.125	2.937
2" TO 3"	4.125	3.937
3" TO 4"	5.125	4.937
4" TO 5"	6.125	5.937
OVER 5"	1.125 +STROKE	.937 +STROKE

TYPE B
HEIM UNIBAL HF-3-SPHERICAL ROD END BEARING
1 1/4

TYPE C
10-32 NF2 x 1/2 LONG

SPECIFICATIONS	
RESISTANCE RANGE	250 MIN. TO 125K MAX. PER INCH OF STROKE
BEST LINEARITY	.2% ÷ LENGTH OF STROKE
VIRTUAL RESOLUTION	1/35,000 ÷ INCH OF STROKE
WATTAGE	1 WATT PER INCH OF STROKE
TEMPERATURE RANGE	—55°C TO 150°C
TAPS, MAXIMUM NO.	4 PER INCH OF STROKE
STARTING FORCE	.5 LB. MAX. AT 25°C
LIFE	TO 30 x 10⁶ STROKES DEPENDING ON CIRCUITRY

PRESSURE



SERIES 6000

1	INFINITE RESOLUTION POTENTIOMETER OUTPUT
2	PRESSURE RANGE 0-5 TO 0—5000 P.S.I. GAGE, DIFFERENTIAL, ABSOLUTE
3	LINEARITY ±0.3%
4	DIRECT COUPLED PRESSURE CAPSULE ELIMINATES BACKLASH, FRICTION AND REPEATABILITY ERRORS
5	TEMPERATURE SENSITIVITY LESS THAN .005% °C
6	HIGH OUTPUT VOLTAGE (50 VOLTS MAX. AC OR DC)
7	RUGGEDIZED FOR WORST ENVIRONMENTAL CONDITIONS

DIMENSIONS	0-100 PSI	100-5000 PSI
S	3 3/8	2 3/8
T	2 19/32	1 19/32

FIRST IN FILM POTS

CIC

WRITE FOR COMPLETE CATALOG

COMPUTER INSTRUMENT CORPORATION

90 Madison Avenue, Hempstead, L. I., N. Y.

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Directory II. Components

67. Resistors.

Ferroxcube Corp. of America, 50 E. Bridge St., Saugerties, N.Y., 40
See ads on pages 285, 361, 433, 467, 531, 617
Tel: CHerry 6-2811
Filmohm Corp., N.Y., 25, 30
First Electronics Corp., Mass., 65
Fugle-Miller Labs., Inc., 301 Central Ave., Clark, N.J., 55, 65
See ad on page 412
Tel: FUlton 1-2727
Fuji Communication Apparatus Mfg. Co., Ltd., c/o The Nissho American Corp., N.Y., 5
G-C Electronics Mfg. Co., 400 S. Wyman St., Rockford, Ill., 5, 40, 55
See ad on page 474
Tel: ROckford 2-6695
Gamewell Co., Mass., 22
General Controls Co., Calif., 20, 22, 35, 60
General Electric Co., Apparatus Sales Div., N.Y., 20, 35, 55, 60
General Electric Co., Industry Control Dept., Va., 55, 60, 65
General Electric Co., Magnetic Materials Section, Mich., 40
General Radio Co., West Concord, Mass., 20, 22, 35, 55, 60, 65
See ad on Cover 4
Tel: EMerson 9-4400
General Resistance, Inc., 577 E. 156th St., New York 55, N.Y., 55, 65
See ad on this page
Tel: CYpress 2-1500
General Transistor Corp., 91-27 138th Pl., Jamaica 35, N.Y., 30, 65
See ads on pages 137-140
Tel: HIckory 1-1000
Giannini Controls Corp., Calif., 22
Giannini Controls Co., N.J. Div., N.J., 22
Gray Instrument Co., Pa., 22, 55, 65
Guidance Controls Corp., 110 Duffy Ave., Hicksville, L.I., N.Y., 20, 22
See ad on page 349
Tel: WEIls 8-9500
Gulton Industries, Inc., N.J., 40
Handley, Inc., Calif., 20, 22, 60, 65
Hardwick, Hindle, Inc., 40 Hermon St., Newark 5, N.J., 20, 35, 55, 60
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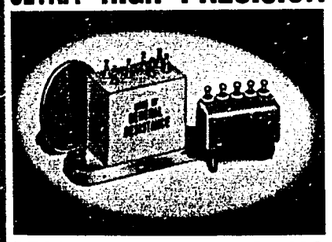
Tel: MArket 2-8200
Helipot Corp., Calif., 22
Herzog Miniature Lamp Works, Inc., N.Y., 45
Howell Instrument Co., Tex., 20, 22, 35, 60
Hubbard Electronics, Inc., Calif., 20
Humphrey, Inc., Calif., 22
Industrial Instruments, Inc., N.J., 65
Instrument Resistors Co., N.J., 55, 65
International Resistance Co., Pa., 5, 10, 15, 20, 22, 25, 55, 60, 65
Julie Research Labs., Inc., N.Y., 55, 65
K-F Development Co., 2606 Spring St., Redwood City 1, Calif., 20, 22, 50, 65, High Voltage
See ad on page 535
Tel: EMerson 8-5670
Kelvin Electric Co., 5907 Noble Ave., Van Nuys, Calif., 65
See ad on page 414
Tel: STate 2-6662
Kenru Co., N.J., 30, 55
Key Resistor Corp., Calif., 15, 25, 55, 65
Keystone Carbon Co., 1935 State St., St. Mary's, Pa., 40
See ad on page 153
Tel: TE 4-1591
Lectrohm, Inc., Ill., 30, 55, 60
Lesa, S.P.A., Italy, 10, 20, 60
Lewis Engineering Co., 339 Church St., Naugatuck, Conn., 40
See ad on page 610
Tel: PArk 9-5253
Mallory & Co., Inc., P. R., Ind., 5, 10, 20, 30, 35, 55, 60, 65
Markite Corp., N.Y., 22
Marsland Engrg., Ltd., Canada, 55
Maurey Instrument Corp., Ill., 22

ULTRA-HIGH PRECISION



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If it can be made, GenRes will make it! GenRes, for instance, can supply 400-cycle Resistor Networks with accuracies as high as ±.005% for such critical applications as summing circuits, voltage dividers and binary networks. Custom-engineered and mass-produced GenRes Resistor Networks, made to meet the most stringent electrical and mechanical specifications, can save you time and money!

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GenRes application-engineered, ultra-high reliability Precision Wirewound Resistors, accurate to .01% over a wide temperature range, include axial, lug, printed circuit and radial lead encapsulated types to meet any requirement. For complete data on rugged, proven GenRes standard, ceramic or temperature-compensating Wirewound Resistors write for complete catalog.

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New, novel GenRes "Go-No-Go" Wheatstone Bridge offers a guaranteed accuracy of .0035%! This precision-engineered instrument also features: .0005% sensitivity; a six-dial decade; up to ±.01% for full scale deflection. Operates as go, no-go Limit or Wheatstone Bridge from 10 to 111,111,100 ohms. Write for Bulletin P-100.

GenRes

GENERAL RESISTANCE, INC.

577 East 156th Street
NEW YORK 55, NEW YORK

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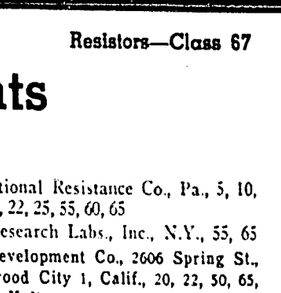
WHY WAIT?



If you need a
2" SINE-COSINE POTENTIOMETER

that delivers
0.5%—OR EVEN .25%—PEAK-TO-PEAK ACCURACY

with a
RESISTANCE RANGE OF 70K OHMS PER QUADRANT

YOU CAN HAVE IT TODAY

For more than a year, we've been supplying this 2" unit in servo, 3 hole mount, and modular design (for stacking flexibility), to the simulator and computor fields. If you'd like to see it, just give us a call or drop us a line. *We'll take one from a production run* and send it right over. We'll be happy to discuss your drawings with you, design prototype models to your specifications, or simply send you literature and data sheets on our line of precision potentiometers which we design and manufacture in sine-cosine, square law, single sided squares and secant functions that meet applicable sections of MIL specifications.

MICRO-LECTRIC DIVISION of MICRO MACHINE WORKS
19 Debevoise Avenue, Roosevelt, L. I., N.Y. • FRexport 8-3222

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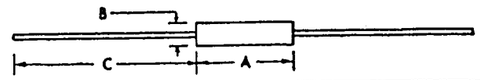
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

now, one source ELECTRA offers you all of these precision resistors

All Electra resistors are designed to meet or exceed Mil-R-10509C. Your request will bring complete specifications and characteristics on any or all types by return mail. In addition to resistors, Electra manufactures a complete line of Ceramic Disc and Plate Capacitors. For complete details, see your local representative, or write for catalog and price schedules.

DEPOSITED CARBON



Electra Part No.	Mil Style	Wattage	Mil Resistance Range	Manufactured Resistance Range	Maximum Rated Voltage	Length A ±1/32	Dia. B ±1/32	Leads Dia.	Lead Length C ±1/8
DC1/8		1/8		10 ohms 350 K	250	5/16	3/32	#22	1-1/2
DC1/8X		1/8		100 ohms 1 meg	250	5/16	3/32	#22 capless	1-1/2
DC1/4A	RN10X	1/4	10 ohms 750 K	10 ohms 1 meg	300	15/32	3/32	#22	1-1/2
DC1/4X		1/4		100 ohms 2 meg	300	7/16	1/8	#22 capless	1-1/2
DC1/2C		1/2		10 ohms 2 meg	350	1/2	11/64	#20	1-1/2
DC1/2A	RN20X	1/2	10 ohms 2.0 meg	10 ohms 2.5 meg	350	5/8	11/64	#20	1-1/2
DC1/2B	RN70B	1/2	100 ohms 2.5 meg	10 ohms 5 meg	350	23/32	7/32	#20	1-1/2
DC1/2		1/2		10 ohms 5 meg	350	13/16	11/64	#20	1-1/2
DC1	RN25X	1	10 ohms 4.99 meg	10 ohms 10 meg	500	*15/16	19/64	#20	1-1/2
DC2	RN30X	2	30 ohms 10 meg	15 ohms 50 meg	750	*2-1/16	19/64	#20	1-1/2

*Tol. ± 1/16

DEPOSITED CARBON PLASTIC ENCAPSULATED

						±.010	±.010		±1/8
DCM1/8	RN60B	1/8	100 ohms 1 meg	10 ohms 1 meg	250	.410	1.42	#22	1-1/2
DCM1/4	RN65B	1/4	10 ohms 2 meg	10 ohms 2 meg	300	.600	.225	#22	1-1/2
DCM1/2	RN70B	1/2	10 ohms 2.5 meg	10 ohms 5 meg	350	.755	.270	#20	1-1/2
DCM1	RN75B	1	10 ohms 5 meg	10 ohms 10 meg	500	1.115	.400	#20	1-1/2
DCM2	RN80B	2	30 ohms 10 meg	15 ohms 50 meg	750	*2.240	.400	#20	1-1/2

*Tol. ± .030

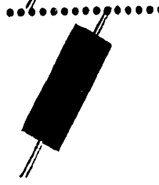
DEPOSITED CARBON HERMETICALLY SEALED

						±.010	±.010		±1/8
HC40		1/8		10 ohms 350 K	150	*.281	.160	#22	1-1/2
HC10	RN60B	1/8	100 ohms 499 K	10 ohms 1 meg	250	.427	.155	#22	1-1/2
HC8	RN65B	1/4	10 ohms 2 meg	10 ohms 2.5 meg	300	.646	.240	#20	1-1/2
HC12	RN70B	1/2	10 ohms 3.5 meg	10 ohms 5 meg	350	.833	.250	#20	1-1/2
HC6	RN75B	1	10 ohms 5 meg	10 ohms 10 meg	500	1.115	.400	#20	1-1/2
HC7	RN80B	2	30 ohms 10 meg	15 ohms 50 meg	750	*2.240	.400	#20	1-1/2

*Tol. ± 1/32

PRECISION CARBON FILM (HIGH TEMPERATURE)

CF1/8	RN60B	1/8	10 ohms 1 meg	10 ohms 1 meg	250	.375 +1/16 −1/32	.125 +.040 +.010	#20	1-1/2 ±1/8
CF1/4	RN65B	1/4	10 ohms 2 meg	10 ohms 2 meg	300	.625 +1/32 −1/16	.1875 +1/16 −1/32	#20	1-1/2 ±1/8
CF1/2	RN70B	1/2	10 ohms 2.5 meg	10 ohms 5 meg	350	.750 +1/32 −1/16	.250 +1/32	#20	1-1/2 ±1/8



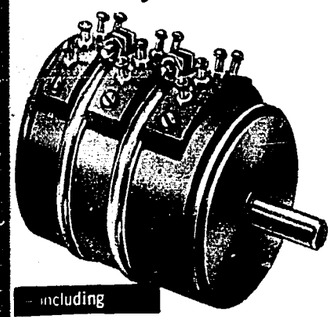
PRECISION MOLDED METAL FILM

MF 1/8	RN60C	1/8	30 ohms 500 K	30 ohms 500 K	250	.406 ±.015	.135 ±.010	±22	1-1/2 ±1/8
MF 1/4	RN65C	1/4	50 ohms 1 meg	50 ohms 1 meg	300	.594 ±.015	.210 ±.015	±22	1-1/2 ±1/8
MF 1/2	RN70C	1/2	50 ohms 1.5 meg	50 ohms 1.5 meg	350	.750 ±.020	.265 ±.015	±20	1-1/2 ±1/8
MF 1	RN75C	1	50 ohms 4 meg	50 ohms 4 meg	500	1.110 ±.020	.395 ±.020	±20	1-1/2 ±1/8
MF 2	RN80C	2	100 ohms 10 meg	100 ohms 10 meg	750	2.239 ±.020	.400 ±.020	±20	1-1/2 ±1/8

Electra MANUFACTURING COMPANY • 4051 Broadway • Kansas City, M

For details, circle #523 on Reader Service Card

Precision Potentiometers by RATTRAY



including

- MINIATURE TYPES
- SUB-MINIATURES
- MULTI-GANG UNITS
- STANDARD TYPES

featuring

- HIGH ACCURACY
- LOW TORQUE
- EXCELLENT RESOLUTION
- LOW NOISE

Rattray experience-engineered precision potentiometers are supplied in types that meet most electronic applications. Complete research and development facilities, and unique winding techniques, make it possible to produce custom designs to the most critical military and commercial specifications. All-metal construction of mounting and aligning surfaces provides precise mechanical interchangeability. Precise electrical performance is obtained by detailed quality checks throughout production. Special winding machines assure high resolution and function accuracy.

New Handbook Available ... precision potentiometers ... helpful tech ... information ... designers and ... users.

Call or write Rattray now for catalog or quotations on your potentiometer applications.

GEORGE RATTRAY & COMPANY
A Division of Hardwick, Hindle, Inc.
116-08 MYRTLE AVENUE
RICHMOND HILL 18, N. Y.

For details, circle #524 on Reader Service Card

Directory II. Components

67. Resistors.

Mepco, Inc., 37 Abbett Ave., Morristown, N.J., 5, 15, 25, 55, 65
See ad on page 154
Tel: JEfferson 9-2000

Metavac, Inc., N.Y., 25, 50, Coaxial

Micro-Lectric Div., Micro Machine Works, 19 Debevoise Ave., Roosevelt, L.I., N.Y., 20, 22, 60
See ad on page 533
Tel: FReeport 8-3222

Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 50
See ad on page 494
Tel: DRexel 6-7130

Miller Electro-Research Labs., Wis., 65

Miller Research Labs., Wis., 65

Milwaukee Resistor Co., Wis., 30, 55, 60, 65

Minco Products, Inc., Minn., 22

Minneapolis-Honeywell Reg. Co., Rubicon Instruments Div., Pa., 65

Mitronics, Inc., 1291 Central Ave., Hillside, N.J., 45
See ad on page 619
Tel: WAverly 6-2250

Model Rectifier Corp., 1675 Utica Ave., Brooklyn 34, N.Y., 35
Se ad on page 492
Tel: CLoverdale 8-6800

Montek Associates, Inc., Utah, 65

Muirhead & Co., Ltd., England, 55, 65

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National Electric Controller Co., Ill., 35, 60

Naz-Dar Co., Ill., 30

Non-Linear Systems, Inc., Del Mar Airport, Del Mar, San Diego, Calif., 65
See ad on page 230
Tel: SKyline 5-1134

Norden-Ketay Corp., Precision Components Div., N.Y., 20, 22

Northern Plastics Corp., Wis., 30

Nucleonic Products Co., Inc., Calif., 40

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 20, 25, 35, 45, 55, 60, 65
See ad on pages 106-107
Tel: ORchard 5-2600

Onondaga Pottery Co., Electronics Div., 1858 W. Fayette St., Syracuse 1, N.Y., 30
See ad on page 507
Tel: HO 8-1681

Osborne Electronic Sales Corp., Ore., 20, 22, 60, 65

Pacific Resistor Co., Calif., 30, 55, 60, 65

Pacific Science Co., Calif., 22, 65

Painton & Co., Ltd., England, 15, 20, 35, 50, 55, 60, 65

PRECISION RESISTORS

RESISTORS, PRECISION, WIRE-WOUND

General purpose, steatite forms
Encapsulated to MIL-R-93-A
Encapsulated resistor assemblies
High voltage to 1000 kv
Air- or oil-immersion applications
Matched pairs to 0.01%
Zero—temperature—coefficient sampling resistors
Shunts
Compensating resistors—nickel, Balco, and copper
Fixed attenuators

POTENTIOMETERS, PRECISION, WIRE-WOUND

Military and civilian applications
General EIA dimensioning

K-F Development Co
2606 Spring Street
Redwood City 1, California

For details, circle #525 on Reader Service Card

VERNISTAT*

a.c. potentiometers
(linear and non-linear)
adjustable function generators
(adjustable non-linear potentiometers)
variable ratio transformers

- Low output impedance (as low as 40 ohms) with high input impedance (as high as 200,000 ohms)
- High resolution (up to 0.004%)
- Low phase shift (as low as 0.2 minutes)
- High linearity (as low as 0.01%)

***Vernistat** (R)—A new design concept that unites in one compact device the best features of both the precision autotransformer and the multiturn potentiometer.

write for data

vernistat

Perkin-Elmer *Corporation*
777 Main Avenue, Norwalk, Conn.

For details, circle #526 on Reader Service Card

SAGE

"SILICOHM" POWER RESISTORS

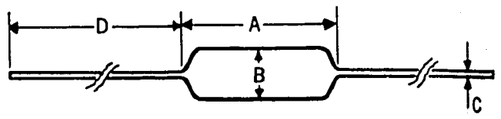
(WIRE WOUND)

OFFER THESE UNIQUE FEATURES:

- **PRECISION** (tolerances to ± .05%)
- **LOW T.C. OF RESISTANCE** (± 20 ppm/°C)
- **INSULATED** (1000 V-RMS Dielectric Strength *MIN.*)
- **HIGH TEMPERATURE** (derated to 275°C)
- **STABILITY** (.5% *MAX.* lifetime drift)

PROMPT DELIVERY
Order direct or through your distributor. A special department for prototype quantities insures shipment within one week of receipt of order.

TYPE "S" AXIAL LEAD UNITS SILICONE-COATED



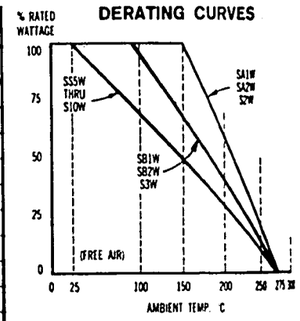
TYPE "CS" AXIAL LEAD UNITS SILICONE-COATED METAL-SHEATHED (for clip-mounting)

DIMENSIONS (Tabulated below)

DESIGNATION		RATING (Watts)		NOMINAL DIMENSIONS				MIN.-MAX. RESISTANCES	
SAGE	MIL-R-26*	SAGE	MIL*	A	B	C	D	INDUCTIVE	NON-INDUCTIVE
SA1W	—	1	—	½"	3/32"	.032"	2"	.05– 12,000	3– 2,500
SB1W	—	1	—	11/16"	3/32"	.032"	2"	.05– 20,000	5– 5,000
SA2W	RW59	2	2.5	½"	3/16"	.032"	2"	.05– 15,000	3– 3,000
SB2W	—	2	—	13/16"	3/16"	.032"	2"	.05– 25,000	6– 6,000
S2W	—	2	—	⅝"	¼"	.040"	2"	.05– 20,000	5– 5,000
S3W	—	3	—	¾"	½"	.040"	2"	.05– 30,000	8– 7,500
SS5W	—	5	—	⅞"	5/16"	.040"	2"	.05– 50,000	13–12,500
SR5W	RW57	5	5	1"	5/16"	.040"	2"	.05– 60,000	15–15,000
SL5W	—	5	—	1⅛"	5/16"	.040"	2"	.05– 70,000	17–17,500
SS7W	—	7	—	1¼"	5/16"	.040"	2"	.05– 80,000	20–20,000
SR7W	RW55	8	5	1⅜"	¾"	.040"	2"	.05–125,000	30–30,000
SS10W	RW58	10	8	1 13/16"	⅛"	.040"	2"	.05–175,000	40–40,000
S10W	RW56	10	10	1 15/16"	⅛"	.040"	2"	.05–200,000	50–50,000

*MIL Standard Resistors to Characteristic "G"

DERATING CURVES

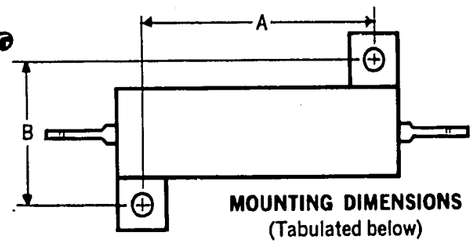


How to Use Dimension Charts in Ordering:

EXAMPLE: The order is for

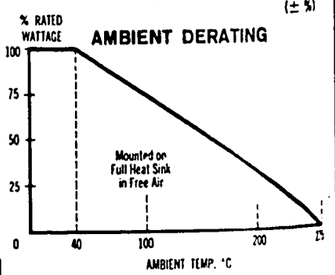
850	SR5W	1000	1
Quantity	Designation	Resistance	Tolerance (± %)

TYPE "M" CHASSIS-MOUNTED UNITS



MOUNTING DIMENSIONS (Tabulated below)

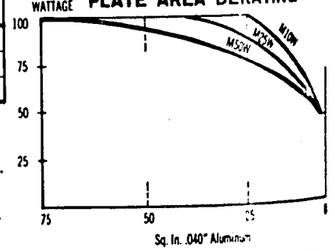
AMBIENT DERATING



DESIGNATION		RATINGS (WATTS)		MOUNTING DIMENSIONS		RESISTANCES	
SAGE	MIL-R-18546*	SAGE	MIL*	A (±.005")	B (±.005")	MIN.	MAX.
M10W	—	10	—	.562"	.625"	.05	25,000
M25W	RH25	20	15	.719"	.781"	.05	50,000
M50W	RH50	40	30	1.562"	.844"	.05	175,000

*MIL Standard Resistors to Characteristic "G"

PLATE AREA DERATING



NOTE: "N" prefix to any given designation denotes non-inductive winding; example, 850 NSR5W1000-1.

SAGE

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1-1/8" Diameter

TYPE RV6
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1/2" Diameter
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REON
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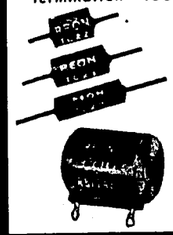

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Pendar, Inc., Calif., 55

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Perkin-Elmer Corp., Vernistat Div., 777 Main St., Norwalk, Conn., 22, AC
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Tel: VIctor 7-2441

Phaostron Instrument & Electronic Co., Calif., 5, 15, 55, 60

Physics Research Labs., Inc., P.O. Box 555, Hempstead, N.Y., 22
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Tel: IVanhoe 3-8299

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Sage Electronics Corp., 2 Country Club Rd., East Rochester, N.Y., 55, 65
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Speer Carbon Co., Speer Resistor Div., Pa., 5

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244.

Shallcross

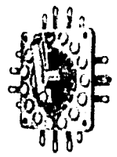
PRECISION WIREWOUND RESISTORS

Small, Shallcross "P-Type" encapsulated resistors offer unmatched stability and reliability for critical applications. All are reverse-pi wound on multiple-section epoxy resin bobbins then hermetically-sealed in a tough epoxy coating.

"P-Type" resistors are offered in a complete range of commercial and military types with radial leads, axial leads, or lug terminals. Military types meet or exceed MIL-R-93A (85°C ambient) and MIL-R-9444 (125°C ambient) requirements—including salt water immersion tests. Standard tolerances—1%, 0.5%, 0.25%, 0.1%, and 0.05%. Close tolerances and matched pairs a specialty. *Write for Bulletin L-30.*

ROTARY SELECTOR SWITCHES

STANDARD SWITCHES



Single-Pole, instrument-type switches using silicone-impregnated steatite or phenolic decks. ¼" laminated silver or solid brass contacts and multiple-leaf wiper arms. Positive, long-life ball-bearing detent. Up to 4 decks. Many optional special features. *Bulletin L-31.*

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Assembled by Shallcross from stock, interchangeable parts, the "12,000" Series offers custom-built quality without the delay and cost of specials. Solid silver contacts and collector rings on steatite decks. 0.0025 Ω contact resistance. 1 to 3 poles per deck, up to 10 decks. Adjustable stop. Optional detent. *Bulletin L-32.*

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Only 1¾" square by 1" deep for first deck, ⅝" for additional decks. Silver alloy button contacts and multi-leaf wipers maintain low contact resistance. Glass fibre Silicone-laminate decks for outstanding humidity, moisture and salt-spray resistance. 1 to 4 poles per deck. 1 or 2 hole mounting. Easily-positioned, adjustable stops. *Bulletin L-45A.*

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. . . 1 micro-ohm to 10^{4} megohms.
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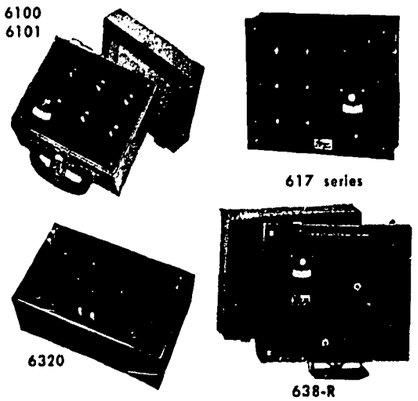

Model Number	Measurement Accuracy	Maximum Setting	Minimum Setting	Circuit	Special Features
6100	±0.1% +0.01Ω (.1Ω to 11.11 MegΩ)	11.11 MegΩ	0.001Ω	Fault Location—Wheatstone	Fault Location by Murray, Varley, Hilborn & Fisher Loop Tests.
6101	±0.1% +0.01Ω (1Ω to 11.11 MegΩ)	11.11 MegΩ	0.001Ω	Wheatstone	Four dial rheostat usable as decade box.
6320	±0.02% +0.01Ω (1Ω to 11.11 MegΩ)	111.11 MegΩ	0.00001Ω	Wheatstone	Most accurate five dial Shallcross bridge for direct resistance measurement.
	±0.05% to ±20% on separate "+" and "—" percent selectors. (1Ω to 10 MegΩ)	11.111 MegΩ	0.0001Ω	Percent Limit	Rapid "GO-NO GO" percent limit testing. Built-in adjustable comparison standard.
638-R	±0.75% or better (.001Ω to 1Ω)	11.11Ω	0.000001Ω	Kelvin	Overlapping Kelvin and Wheatstone ranges selected with single ratio dial.
	±0.2% +0.01Ω (1Ω to 11.11 MegΩ)	11.11 MegΩ	.001Ω	Wheatstone	
6350	±1%, (100Ω to 10 MegΩ) ±2%, (10 MegΩ to 10,000 MegΩ) ±5%, (above 10,000 MegΩ)	1.111 x 10^{9} MegΩ	0.01Ω	Wheatstone with d-c Amplifier	Modular construction dual range power supply, null indicator-amplifier, for 115V. 60 cycle operation.
617 Series	±0.1% to ±20% on separate "+" and "—" selectors from a minimum resistance consistent with number of dials in use to the maximum settings.	111,111Ω 1,111,110Ω 11,111,100Ω	0.1Ω *1Ω 10Ω	Percent Limit	For rapid "GO-NO GO" percent limit testing. Hand or foot operated for production testing. All models also usable for direct resistance measurements. Binding post for external d-c power supply.
	1±0.2% +0.01Ω from a minimum consistent with number of dials in use to the maximum setting.	111,111Ω 1,111,110Ω 11,111,100Ω	0.1Ω *1Ω 10Ω	Wheatstone	

† Except 617B and 617J ±0.1% ±0.01Ω. * Except 617G, 0.01Ω.

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Available as single unmounted decades or as complete decade resistance boxes with 1 to 6 dials. Steps as low as 0.01 ohm; total resistance as high as 11,111,100 ohms.

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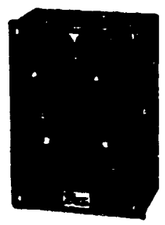

Laboratory-type voltage dividers used in bridge circuits, for measuring rotary potentiometer linearity, in synchro-test delta bridge circuits, and in other uses requiring maintained accuracy and high resolution. Kelvin-Varley or Potentiometer circuits available in eight 4 and 5 dial models.

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Directory II. Components

67. Resistors.

Sprague Electric Co., Mass., 15, 25, 30
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Stackpole Carbon Co., Pa., 5, 10
Standard Telephones & Cables, Ltd., England, 25
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See ads on pages 422, 424, 426, 481, 502, 562, 570, 588
Tel: LUdlow 2-9561
Symphony Electronics Corp., Calif., 5
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N.J., 20, 35, 55
See ad on page 556
Tel: WIndsor 4-2221
Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 35, 40, 45
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Tel: REctor 2-6249
Technology Instrument Corp., Calif., 20, 22, 25
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Tel: COlonial 3-7711
Tech-Ohm Resistor Corp., N.Y., 15, 25, 30, 55, 60, 65
Telewave Laboratories, Inc., N.Y., 25
Texas Instruments Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 5, 15, 25, 30
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Voak Engineering Co., Calif., 22
Ward Leonard Electric Co., 83 South St., Mt. Vernon, N.Y., 35, 55
See ad on page 526
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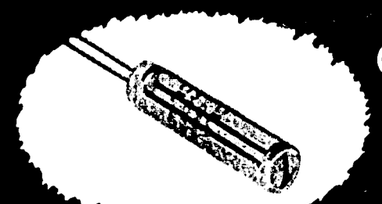

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67. Resistors.

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Welwyn International, Inc., Ohio, 15, 20, 25, 35, 45, 50, 55, 60, 65
White Industrial Div., S. S., Dept. PR, 10 E. 40th St., New York 16, N.Y., 5, 50
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Tel: MUrray Hill 3-3015
Winslow Co., Inc., N.J., 22, 50
Workman TV, Inc., N.J., 40, 55
Wuerth Tube-Saver Corp., Mich., Surgistor Overload Device

Retaining rings: See class 87

Rheostats: See class 67

Rivets: See class 87

Screws: See class 87

Selenium diodes and stacks:
See class 64

68. Semi-Conductors.

5. Germanium diodes
6. Photoconductors
7. Silicon diodes
10. Transistors, junction
15. Transistors, point contact
20. Transistors, alloy junction
25. Transistors, diffused base
30. Transistors, surface barrier

American Elite, Inc., N.Y., 5
Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 5, 7, 10, 20
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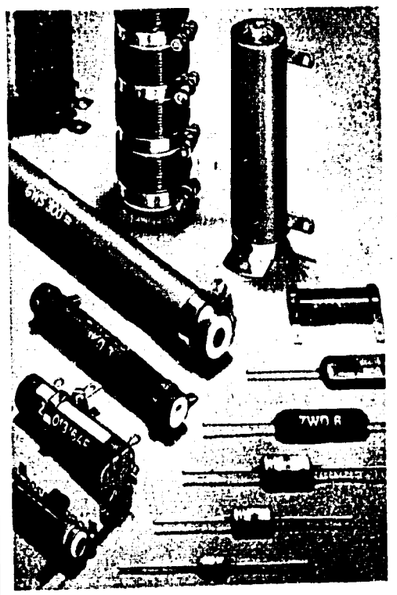
Tel: WEIls 1-6200
Audio Devices, Inc., Rectifier Division, Calif., 7
Bendix Aviation Corp., Red Bank Div., Semiconductor Products, 201 Westwood Ave., Long Branch, N.J., 7, 10, 20
See ad on page 510
Tel: CApital 2-6220
Bendix Aviation Corp., Research Laboratories Div., Mich., 5, 7, 10, 15, 20, 25, 30
Bomac Labs., Inc., Salem Rd., Beverly, Mass., 7
See ad on page 172
Tel: WAlker 2-6000



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Phone: BEekman 3-8870

Directory II. Components

68. Semi-Conductors.

Bradley Semiconductor Corp., Conn., 7

Braun Tool & Instrument Co., Inc., 141 Fifth Ave., Hawthorne, N.J., transistor clips
See ads on pages 459, 543, 551
Tel: HAwthorne 7-1773

British Thomson-Houston Co., Ltd., England, 5, 7, 10, 15

Brown Co., Irv, N.Y., 7

CBS Electronics Div., CBS, Inc., 100 Endicott St., Danvers, Mass., 5, 7, 10, 20, 25
See ad on page 576
Tel: SPring 4-2360

Clairex Corp., 19 W. 26th St., New York 10, N.Y., 6
See ad on page 540
Tel: MUrray Hill 4-0940

Clevite Corp., M.B.H. Div., Germany, 5, 7, 10

Clevite Transistor Prods., Mass., 5, 7, 10

Columbus Electronics Corp., 1010 Saw Mill River Rd., Yonkers, N.Y., 7
See ads on pages 511, 543
Tel: YOnkers 8-1221

Continental Device Corp., Calif., 7

Continental Electric Co., Ill., Lead Sulphide

Delco Radio, Div. Gen. Motors Corp., Ind., 20, Power

Eastman Kodak Co., Apparatus & Optical Div., 343 State St., Rochester 4, N.Y., 6
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Tel: LOcust 2-6000

Ebauches, S. A., Dep. Semiconducteurs, Switzerland, 10, 20

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 5
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Tel: GLendale 6-8592

Fairchild Semiconductor Corp., Dept. E-59, 545 Whisman Rd., Mountain View, Calif., 25
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General Instrument Corp., Automatic Div., N.J., 5, 7

General Instrument Corp., Semiconductor Div., N.J., 5, 7

General Motors Corp., Delco Radio Div., Ind., 20

General Transistor Corp., 91-27 138th Pl., Jamaica 35, N.Y., 5, 10, 20, 25
See ads on pages 137-140
Tel: HIckory 1-1000

Grace Electronic Chemicals, Inc., 101 N. Charles St., Baltimore 1, Md., Silicon
See ad on page 442
Tel: PLaza 2-7699

Green Rectifier Co., N.J., 5, 7

Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 7
See ad on page 226
Tel: UNiversity 9-9850

Hughes Aircraft Co., Hughes Prod Div., Calif., 5, 7, 10, 15, 20, 25, 30

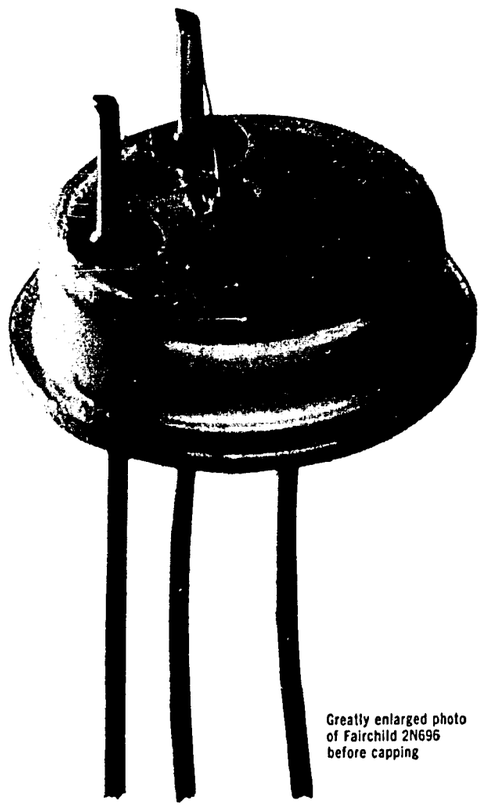
Hughes Products, Semiconductor Div., 500 Superior Ave., Newport Beach, Calif., 5, 7, 10, 20, 25
See ad on page 544
Tel: LI 8-0671

Industro Transistor Corp., 35-10 36th Ave., Long Island City 6, N.Y., 20
See ad on page 545
Tel: EXeter 2-8000

FAIRCHILD SILICON MESA TRANSISTORS

IN BOTH POLARITIES

Four models of great importance to the computer-circuit designer



Greatly enlarged photo of Fairchild 2N696 before capping

Important – because for high-speed switching, Fairchild's 2N696, 2N697, 2N1131 and 2N1132 are the most advanced transistors available. They are solid-state diffusion devices, a type that is certain to dominate computer-circuit applications in the future because of its superior combination of speed, power and reliability. Fairchild Semiconductor Corporation was first to offer solid-state diffused NPN silicon transistors of such high performance – and again first in offering PNP silicon transistors closely matching these NPN transistors in both high frequency and DC characteristics. All are in quantity production and available from stock.

Speed and power in combination
80 milli-micro-second rise time is typical. Two-watts dissipation at 25°C. and 10 ohms maximum saturation resistance provide high-current capability even at elevated junction temperatures.

Utmost reliability
Storage at 300° C. in excess of 1000 hours caused no serious changes in these transistors, assuring a large safety factor at operating temperatures. Mesa construction as shown in enlarged photograph provides extraordinary ruggedness by eliminating suspension of any significant masses. Units have survived 22,000g, 4-millisecond duration shock test without damage.

NPN and PNP closely matched
The circuit designer need no longer be limited by unavailability of PNP transistors. Fairchild has them. And they are closely matched to the NPN transistors in DC characteristics, affording opportunities for circuit designs based on complementary symmetry.

PNP

ABSOLUTE MAXIMUM RATINGS (25° C.)

V_{CER} – Collector to emitter voltage	30v
V_{CBO} – Collector to base voltage	40v
V_{EBO} – Emitter to base voltage	5v
Total dissipation at case temperature 25° C.	2 watts
at case temperature 100° C.	1 watt

ELECTRICAL CHARACTERISTICS (25° C.)

SYMBOL	CHARACTERISTIC		MIN.	TYPICAL	MAX.	TEST CONDITIONS	
h_{FE}	D. C. pulse current gain	2N1131	15		45	I_C=-150mA	V_C=-10V
		2N1132	30		90		
$V_{BE\ SAT.}$	Base saturation voltage			1.0V	1.5V	I_C=-150mA	I_B=-15mA
$V_{CE\ SAT.}$	Collector saturation voltage			0.9V	1.5V	I_C=-150mA	I_B=-15mA
h_{fe}	Small signal current gain at f=20mc			2.5		I_C=-50mA	V_C=-10V
C_{ob}	Collector capacitance			35μμf	45μμf	I_E=-0mA	V_C=-10V
I_{CBO}	Collector cutoff current			.01μA	1.0μA	V_C=-30V	T=-25° C.
				5.0μA	100μA	V_C=-30V	T=150° C.

NPN

ABSOLUTE MAXIMUM RATINGS (25° C.)

V_{CER} – Collector to emitter voltage	40v
V_{CBO} – Collector to base voltage	60v
V_{EBO} – Emitter to base voltage	5v
Total dissipation at case temperature 25° C.	2 watts
at case temperature 100° C.	1 watt

ELECTRICAL CHARACTERISTICS (25° C.)

SYMBOL	CHARACTERISTIC		MIN.	TYPICAL	MAX.	TEST CONDITIONS	
h_{FE}	D. C. pulse current gain	2N696	20		60	I_C=150mA	V_C=10V
		2N697	40		120		
$V_{BE\ SAT.}$	Base saturation voltage			1.0V	1.3V	I_C=150mA	I_B=15mA
$V_{CE\ SAT.}$	Collector saturation voltage			0.5V	1.5V	I_C=150mA	I_B=15mA
h_{fe}	Small signal current gain at f=20mc			5		I_C=50mA	V_C=10V
C_{ob}	Collector capacitance			20μμf	35μμf	I_E=0mA	V_C=10V
I_{CBO}	Collector cutoff current			.01μA	1.0μA	V_C=30V	T=25° C.
				5.0μA	100μA	V_C=30V	T=150° C.

For specification sheets, write Dept. E-59

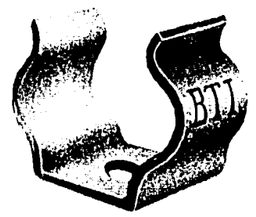
545 WHISMAN ROAD • MOUNTAIN VIEW, CALIFORNIA • YO 8-8161

FAIRCHILD SEMICONDUCTOR CORPORATION

For details, circle #535 on Reader Service Card

BTI

TRANSISTOR CLIPS



BTI Transistor Retainers and Clips feature many mechanical variations depending upon application. Available with no twist tabs, back holding plates, soldering lugs, or with tab mounted clips for special printed circuit applications.

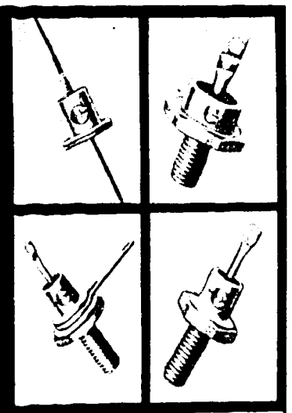
Write for Bulletin #E-102.

BRAUN TOOL & INSTRUMENT Company, Inc.
141 Fifth Ave., Hawthorne, N. J.

For details, circle #536 on Reader Service Card

COLUMBUS SEMICONDUCTORS

...UP TO 2000 VOLTS PIV

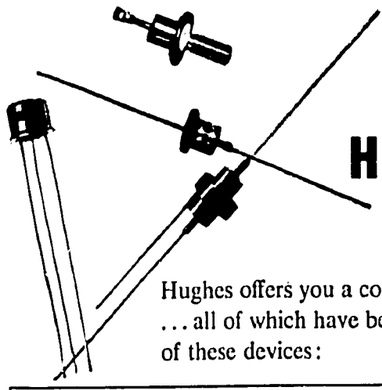


Part of an extensive line of high performance, quality proven silicon power rectifiers... JEDEC types exceeding MIL specifications.

WRITE FOR FULL DETAILS AND SPECIFICATIONS.

COLUMBUS ELECTRONICS CORP.
1010 Saw Mill River Rd., Yonkers, N. Y.
YOnkers 8-1221 TWX: Yonkers, NY-1369

For details, circle #537 on Reader Service Card



HIGH PERFORMANCE HUGHES SEMICONDUCTORS

Hughes offers you a complete line of high performance semiconductor devices ... all of which have been engineered for extreme reliability. Here is a sample of these devices:

DIODES—The envelope of one-piece, fusion-sealed construction gives you complete protection from contamination and moisture penetration. Maximum body dimensions: .107"x .265". Gold plated leads: .020"x1", nominal.

Standard point-contact germanium, containing a large number of individual types each with outstanding features all its own.

High-conductance fast-recovery germanium, typified by low forward impedance and excellent transient response.

Standard silicon, featuring high-temperature operation and characterized by good forward conductance together with extremely high back resistance.

High conductance silicon, characterized by extremely low dynamic forward impedance together with excellent reverse characteristics and uniform forward characteristics.

Quick recovery silicon, combining exceptionally low capacity, high current capabilities, low reverse leakage, and fast recovery.

Gold bonded, with fast recovery plus high forward conductance, low reverse leakage, high peak inverse voltage.

Voltage Regulator, featuring low dynamic resistance and exceptional long-term stability over wide temperature ranges. E.I.A. types.

Parametric Amplifier Diodes, for use in cavity parametric amplifier. Have produced noise temperatures of 100°K at room temperature and 50°K liquid nitrogen cooled.

CAPACITORS—Tiny, reliable devices whose capacitance is determined by the applied DC voltage. They are characterized by high Q and a wide capacitance range. The famous Hughes glass envelope is utilized.

RECTIFIERS—Hughes offers you efficient silicon rectifiers with voltage ratings up to 1000 volts, and—in the glass package—current ratings up to 400 mA.

Higher ratings up to 3 amperes and 1,000V are available in EIA stud mount and top hat packages.

All the popular EIA type numbers are available on both glass and metal packages.

TRANSISTORS—*Germanium* NPN *and* PNP alloy junction transistors for high-speed switching applications at low and medium current levels.

Silicon PNP alloy junction transistors for switching and amplifying applications at low to medium current levels.

Silicon PNP *Double-Diffused Mesa* (DDMT) high frequency transistor switches and IF amplifiers operable at low to medium current levels.

In addition to semiconductor devices, also available are CAST SILICON DOMES in a wide variety of sizes.

For additional information concerning any of the products described above, you are invited to call or write the Hughes Semiconductor sales office nearest you. They are located at:

Boston, 4 Federal Street; Woburn, Mass.; WOburn 2-4824
Newark, 80 Mulberry Street; Newark 2, N. J.; MArket 3-3520
San Francisco, 535 Middlefield Road; Palo Alto, Calif.; DA 6-7780
Syracuse, 224 Harrison Street; Syracuse 2, N. Y.; GRanite 1-0163
Chicago, 6120 West North Ave.; Chicago 39, Ill.; NAtional 2-0283
Philadelphia, 1 Bala Avenue; Bala-Cynwyd, Penn.; MOhawk 4-8365
Los Angeles, 690 N. Sepulveda; El Segundo, Calif.; OR 8-6125

Or write Hughes Products, Marketing Department,
SEMICONDUCTOR DIVISION, NEWPORT BEACH, CALIFORNIA.
For export write: Hughes International, Culver City, California

Creating a new world with ELECTRONICS

HUGHES PRODUCTS

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SEMICONDUCTOR DEVICES • STORAGE AND MICROWAVE TUBES • CRYSTAL FILTERS • OSCILLOSCOPES • RELAYS • SWITCHES • INDUSTRIAL CONTROL SYSTEMS

COMPUTER AND SWITCHING TRANSISTORS

2N425 2N426 2N427 2N428

This series of Germanium PNP alloy junction transistors are designed and 100% tested to close parameters for computer and switching applications where medium or high-speed as well as high current switching are required.

The reliability and stability of these transistors are assured by closely controlled techniques of manufacture. The mechanical design and hermetic seal of the TO-9 case enables these Industro transistors to meet or exceed the mechanical and environmental requirements of military standard MIL-T-19500A.

We specialize in fulfilling requirements for specially selected parameters.

Write for full information on the more than 80 types in our line.

INDUSTRO
TRANSISTOR CORPORATION
35-10 36th Ave.
Long Island City 6, N. Y.

For details, circle #539 on Reader Service Card

Directory II. Components

68. Semi-Conductors.

International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 7
See ad on pages 42-43
Tel: ORegon 8-6281

International Telephone & Telegraph Corp., ITT Components Div., 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 7
See ad on pages 148-149
Tel: NUtley 2-3600

Kemtron Electron Products, Inc., Mass., 5, 7

Microwave Assoc., Inc., Mass., 7

Miller Co., Sanford, N.Y., 7

Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minn., 20

Mitronics, Inc., 1291 Central Ave., Hillside, N.J., 15
See ad on page 619
Tel: WAverly 6-2250

Motorola Communications & Electronics, Inc., Ill., 5, 7, 10, 15, 20, 25, 30

Motorola, Inc., Ariz., 5, 7, 10, 15, 20, 25, 30

Mullard Overseas, Ltd., England, 5, 10

National Semiconductors, Ltd., Canada, 6

North American Electronics, Inc., Mass., 7

Nucleonic Products Co., Inc., Calif., 5, 6

Ohio Semiconductors, Inc., 1035 W. Third Ave., Columbus 8, Ohio, Hall Effect Devices
See ad on page 95
Tel: AX 4-4938

Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 5
See ad on pages 106-107
Tel: ORchard 5-3600

Pacific Semiconductors, Inc., Calif., 7, 25

Philco Corp., Lansdale Tube Co. Div., Church Rd., Lansdale, Pa., 5, 7, 10, 20, 25, 30
See ad on page 546
Tel: ULysses 5-4681

Radio Corp. of America, Defense Elec Prod., N.J., 5, 7, 10, 15, 20

Radio Corp. of America, Electron Tube Div., Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 6
See ads on pages 53-55
Tel: HUmboldt 5-3900

Radio Corp. of America, Semiconductor & Materials Div., Section I-22-NN, Route 202, Somerville, N.J., 5, 7, 10, 20, 25
See ad on page 56
Tel: RAndolph 5-4500

Radio Development & Research Corp., N.J., 7, 10

Raytheon Co., Mass., 5, 7, 10, 20

Kodak

Q• What is a Kodak Ektron Detector?

A: It is a semi-conductive resistor. The photosensitive area can be laid down in any pattern. Response extends to 3.5 microns in the infrared. Unaffected by vibration; high signal-to-noise ratio.

Q: What can it be used for?

A: For such applications as an infrared sensor in weapons systems, and in instrumentation for process control, analysis, and safety.

Q: How can I get the facts about spectral response, types, availabilities, and the like?

A: By writing for a new brochure called "Kodak Ektron Detectors."

Write to:

Apparatus and Optical Division

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

For details, circle #540 on Reader Service Card

PHILCO TRANSISTORS

SURFACE BARRIER TRANSISTORS (SBT*)

TYPE	GAIN h_{fe}	FREQUENCY f_{max} in mc	APPLICATIONS
2N128	40	60	General communications; MIL specifications
2N240	30	Switching rates 20mc	High-speed switch; controlled hole storage and saturation characteristics; MIL specifications
2N299	22db @ 10mc	110	Tuned amplifier; MIL specifications
2N300	18	95	Video amplifier; MIL specifications
2N344	22	50	General purpose; narrow beta spread (11-33)
2N345	35	50	General purpose; similar to 2N344 with higher beta; MIL specifications
2N346	20	75	General purpose; like 2N344 and 2N345 but higher frequency

*Philco Corp. for Surface Barrier Transistor

MICRO ALLOY TRANSISTORS (MAT*)

TYPE	GAIN h_{FE}	FREQUENCY f_{max} in mc	APPLICATIONS
2N393	95	60	High-speed, high-gain switch; MIL specifications
2N1122	95	60	High-speed, high-voltage level switch
2N1122A	95	60	Higher voltage level operation

*Trademark Philco Corp. for Micro Alloy Transistor

MICRO ALLOY DIFFUSED-BASE TRANSISTORS (MADT*)

TYPE	GAIN	FREQUENCY f_{max} in mc	APPLICATIONS
2N499	10db @ 100mc	320	VHF amplifier; MIL specifications
2N501	h_{FE} 35	Switching rates 40mc	Ultra-fast switch; typical t_r 9 mμsec; t_s 9 mμsec; t_f 7 mμsec; MIL specifications
2N501A	h_{FE} 35	Switching rates 40mc	Rated at 100°C; MIL specifications
2N502	10db @ 200 mc	700	VHF amplifier; MIL specifications
2N502A	10db @ 200 mc	700	Rated at 100°C; MIL specifications
2N503	12.5db @ 100mc	420	VHF amplifier
2N504	46db @ 455kc	Minimum 50	IF amplifier; high level logic switch
2N588	14db @ 50mc	250	General purpose RF-IF amplifier

*Trademark Philco Corp. for Micro Alloy Diffused-base Transistor

MICRO-MINIATURE TRANSISTORS

TYPE	GAIN h_{fe}	FREQUENCY $f_{\alpha b}$ in mc	APPLICATIONS
2N207	100	2	Low level amplifier; particularly suited for hearing aid use; N.F.* 15db max
2N207A	100	2	Low level amplifier; particularly suited for hearing aid use; N.F.* 10db max
2N207B	100	2	Hearing aid input stage; other extremely low noise applications; N.F.* 5db max
2N534	150		High voltage amplifier switch
2N535	100	2	General purpose; 85°C max temperature rating; N.F.* 10db max
2N535A	100	2	General purpose; 85°C max temperature rating; N.F.* 5db max
2N535B	100	2	General purpose; 85°C max temperature rating; N.F.* 0db max
2N536	h_{FE} 100	2	Low level switch at pulse rates up to 150kc

*Noise Factor at 1μv reference level across 1000 ohms

SILICON SURFACE ALLOY TRANSISTORS (SAT*)

TYPE	GAIN h_{fe}	FREQUENCY f_{max} 15mc	APPLICATIONS
2N495	15		General purpose; MIL specs
2N496	h_{FE} 10	f_T 11mc**	High-speed switching; MIL specs

*Trademark Philco Corp. for Surface Alloy Transistor **Frequency for beta=1

BILATERAL TRANSISTOR

TYPE	GAIN h_{FE}*	FREQUENCY $f_{\alpha b}$ 500kc	APPLICATIONS
2N462	45		Controlled pulse response (max t_{on} and t_{off} 12 μsec)

*Forward and inverse

MEDIUM FREQUENCY TRANSISTORS

TYPE	GAIN h_{FE}	FREQUENCY $f_{\alpha b}$ in mc	APPLICATIONS
2N597	70	4.5	High-voltage general purpose amplifier and switch; TO-9 case
2N598	85	7.5	500kc logic switching; TO-9 case
2N599	105	18	Logic switching rates up to 1mc; core driver; TO-9 case
2N600	85	7.5	500kc switching; 1 watt peak power dissipation for 0.1 sec; stud mount
2N601	105	18	High-power core driver; typical rise time 0.1 μsec; stud mount
2N1123	70	4.5	High-voltage power amplifier and switch; stud mount

PULSE AMPLIFIER TRANSISTORS

TYPE	GAIN h_{FE} h_{fe}	FREQUENCY	APPLICATIONS
2N670	100	$f_{\alpha b}$ 700kc	High peak current pulse amplifier; relay driver
2N671	100	$f_{\alpha b}$ 650kc	High power version of 2N670; stud mount
2N672	20 (Sat.)	0.5 μsec max t_r	High-current switching core driver; controlled rise, fall and store times
2N673	20 (Sat.)	0.5 μsec max t_r	High power version of 2N672; stud mount

MEDIUM POWER TRANSISTORS

TYPE	GAIN h_{FE}	FREQUENCY $f_{\alpha b}$ in mc	APPLICATIONS
2N223	h_{fe} 110	0.6	Audio driver; exceptional beta lin.
2N224	90	0.51	Audio output; exceptional beta linearity; available as matched pair (2N225)
2N226	60	0.4	Audio output; exceptional beta linearity; available as matched pair (2N227)
2N1124	Min h_{fe} 40	Minimum 0.4	E3-51 based high-voltage, general purpose industrial amplifier
2N1125	h_{fe} 100	Minimum 1	E3-51 based high-voltage, medium frequency amplifier and switch
2N1126	Min h_{fe} 40	Minimum 0.4	E3-51 based high-power, high-voltage, general purpose industrial amplifier; stud mount
2N1127	100	Minimum 1	E3-51 based high-power, high-voltage, medium frequency amplifier and switch; stud mount
2N1128	h_{fe} 100	1	E3-51 based audio driver
2N1129	165	0.75	E3-51 based high-gain transistor for amplifier and switching
2N1130	125	0.75	E3-51 based general purpose audio transistor

POWER TRANSISTORS

TYPE	GAIN	FREQUENCY $f_{\alpha e}$ in kc	APPLICATIONS
2N386	33db @ 5w PO	Minimum 7	High-voltage general purpose amplifiers; relay actuators and power converters
2N387	33 db @ 5w PO	Minimum 6	High-voltage general purpose amplifiers; relay actuators and power converters

PHILCO

LANSDALE TUBE COMPANY DIVISION

LANSDALE, PENNSYLVANIA

TRANSISTOR CENTER U.S.A.

Directory II. Components

68. Semi-Conductors.

Raytheon Co., Semiconductor Div., Mass., 5, 7, 10, 20, 25

Rheem Semiconductor Corp., Dept. P 13, 327 Moffett Blvd., Mountain View, Calif., 7, 10, 25
See ad on page 512
Tel: YOrkshire 8-8391

Rogers Electronic Tubes & Components, Canada, 5, 7, 10, 20

Semicon, Inc., Mass., 7

Semi-Elements, Inc., Pa., 5, 7

Shockley Transistor Corp., Calif., 7, Four-Layer

Silicon Transistor Corp., 150 Glen Cove Rd., Carle Place, L.I., N.Y., 7, 25
See ad on page 548
Tel: PIoneer 2-4100

Single Crystal Corp. of Amer., Pa., 5, 7, 10, 15, 20, 25, 30

Solid State Products, Inc., Mass., 25

Sonex, Inc., Pa., Transistor Curve Tracer

Sperry Gyroscope Co. of Canada, Ltd., Canada, 7, 15

Sperry Rand Corp., Sperry Semiconductor Div., Conn., 7, 10, 20, 25

Sprague Electric Co., Mass., 30

Standard Telephones & Cables, Ltd., England, 5, 7, 10, 20, 25, 30

State Laboratories, Inc., 649 Broadway, New York 12, N.Y., 5, 10, 20
See ad on page 581
Tel: ORegon 7-8400

Sylvania Electric Products, Inc., Semiconductor Div., Mass., 5, 7, 10, 20, 25

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5, 7, 10, 20, 25
See ad on page 23-25
Tel: JUdson 6-2424

Syntron Co., 83 Lexington Ave., Homer City, Pa., 7
See ad on page 513
Tel: GR 9-8011

Tarzian, Inc., Sarkes, Ind., 7

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 5, 7, 10, 15, 20
See ad on page 502
Tel: REctor 2-6249

Texas Instruments Incorporated, Semiconductor-Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 7, 10, 20, 25, Transistors, Silicon, Germanium
See ad on pages 75-78
Tel: FLeetwood 7-5411

Be sure to consult the advertisements in this issue for complete information on products. Directory listings cannot tell you everything you want to know about a company's products. For example, the Silicon Transistor Corporation advertisement on page 548 gives complete specifications on their entire line of semiconductors.

Thermosen, Inc., Conn., 7

Thompson-Ramo-Wooldridge, Inc., Calif., 5, 7, 30

Transitron Electronic Corp., 168-182 Albion St., Wakefield, Mass., 5, 7, 10, 20, 25
See ad on pages 146-147
Tel: CRystal 9-4500

Trans-Sil Corp., N.J., 7

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 20
See ad on pages 50-51
Tel: HUmboldt 2-4200

United Components, Inc., N.J., 7

United States Dynamic Corp., Mass., 5, 7, 10, 15, 20, 25, 30

U.S. Semiconductor Prods., Inc., 3540 W. Osborn Rd., Phoenix, Ariz., 7
See ad on page 252
Tel: APplegate 8-5591

Westinghouse Electric Corp., Pa., 5, 7, 10, 15, 20, 25, 30

Westinghouse Electric Corp., Semiconductor Dept., Pa., 5, 7, 10, 20, 25

Servo-Mechanisms: See class 28

Shafts, flexible: See class 87

Signal generators, AM & FM: See class 26

Signal generators, TV: See class 35

Silicon crystals: See class 47

Silicon diodes: See class 68

Silicon rectifiers: See class 64

Slides, chassis: See class 84

Slip rings: See class 44

69. Sockets.

5. Capacitor, plug-in sockets
10. Crystal
15. Diode
17. Pilot light
18. Printed circuit
20. Receiving tube
25. Transistor
30. Transmitting tube
35. UL approved industrial types

Accurate Electronics Corp., Ohio, 5, 15, 17, 18, 25

Aerolite Electronics Co., N.J., 10, 17

Aerovox Corp., Mass., 20

Alden Products Co., 121D N. Main St., Brockton 64, Mass., 17
See ads on pages 419, 691
Tel: JUniper 3-0160

69. Sockets.

Amatom Electronic Hardware Co., Inc., N.Y., 17

American Electronics Co., N.Y., 10

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 10, 20, 35
See ad on page 166
Tel: BIshop 2-1000

Bassett, Inc., Rex, Fla., 10

Belling & Lee, Ltd., Great Cambridge Rd., Enfield, Middlesex, England, 18
See ad on page 418
Tel: ENfield 3322

Blinn Co., Delbert, Calif., 15

Burndy Corp., H. H. Buggie Div., Ohio, 18

Cerberus, GMBH, Switzerland, 30

Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 10, 18, 20, 25, 30, 35
See ad on pages 48-49
Tel: NEvada 2-2000

Circon Component Corp., Santa Barbara Municipal Airport, Goleta, Calif., 10, 15, 17, 18
See ad on page 484
Tel: WOodland 7-1113

Cleveland Metal Spec. Co., Ohio, 18

Component Mfg. Service, Inc., Mass., 10, 35

Derf Radio Co., N.Y., 5, 10, 15, 17, 18, 20, 25, 30, 35

Dialight Corp., 60 Stewart Ave., Brooklyn 37, N.Y., 17, 35
See ad on page 484
Tel: HYacinth 7-7600

Eagle Electric Mfg. Co., Inc., N.Y., 17, 35

Eastern Ins. Wire Corp. & Circle F Mfg. Co., N.J., 17, 35

Eby, Inc., Hugh H., Pa., 10, 18, 20, 25, 30

Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, Calif., 30
See ad on pages 44-45
Tel: LYtell 1-1451

Eldema Corp., Calif., 17

Electronic Techniques, Inc., Calif., Custom

Enflo Corp., N.J., 10

Garlock Packing Co., Garlock Electronic Products, Camden 1, N.J., 10, 20, 25
See ad on page 682
Tel: WOodlawn 4-0370

General Cement Mfg. Co., Div. of Textron Inc., 400 S. Wyman St., Rockford, Ill., 17
See ad on page 474
Tel: ROckford 8-9661

Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 25
See ad on page 552
Tel: FLeetwood 4-1040

International Crystal Mfg. Co., Inc., Okla., 10

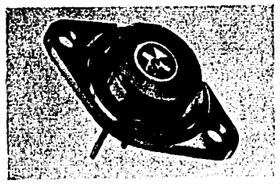
International Electric Ind., Inc., N.Y., 35

I. T. & T. Royal Elect. Corp. Div., R.I., 35

semiconductors

SILICON TRANSISTOR CORP.

All semiconductor products, manufactured by Silicon Transistor Corp., are made to rigid quality control standards emphasizing comprehensive environmental and life testing to the most severe military specifications.



TRANSISTORS

STC Diffused silicon NPN high power transistor: 60 V, 4 amp, 50 Watts.
Low saturation resistance: 0.7 ohms typical.
Hermetically sealed in TO-3 package. Typical applications: Class A and Class B amplifiers, power converters; relay replacement and controls; power switches; high level D. C. amplifiers and power supply regulators.

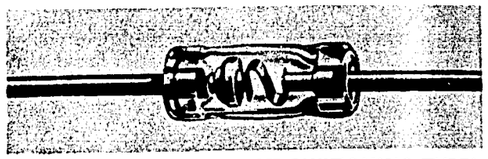
HIGH RELIABILITY DIODES

General purpose, high conductance, fast recovery, high temperature silicon circuit diodes in a hermetically sealed subminiature glass package. **Typical applications:** Commercial and industrial computer and military circuitry. Inquiries invited for special purpose types.

SILICON DIODES—GENERAL PURPOSE TYPES

TYPE	MAX. FORWARD D.C. VOLT. V @ mA	MAX. REV. D.C. CURR. @ MAX. REV. WKG. VOLT. μA @ 25°C	μA @ 150°C	MAX. REV. WKG. VOLT.	MIN. REV. VOLT @ 100 μA & 25°C	MAX. AV. FORWARD CURR. @ 25°C mA	@ 150°C mA
1N456	1.0 @ 40	0.025	5	25	30	90	
1N457	1.0 @ 20	0.025	5	60	70	75	
1N458	1.0 @ 7	0.025	5	125	150	55	
1N459	1.0 @ 3	0.025	5	175	200	40	
1N461	1.0 @ 15	0.5	30	25	30	60	
1N462	1.0 @ 5	0.5	30	60	70	50	
1N463	1.0 @ 1	0.5	30	175	200	30	
1N464	1.0 @ 3	0.5	30	125	150	40	
1N482	1.1 @ 100	0.25	30	36	40	100	25
1N482A	1.0 @ 100	0.025	15	36	40	200	50
1N482B	1.0 @ 100	0.025	5	36	40	200	50
1N483	1.1 @ 100	0.25	30	70	80	100	25
1N483A	1.0 @ 100	0.025	15	70	80	200	50
1N483B	1.0 @ 100	0.025	5	70	80	200	50
1N484	1.1 @ 100	0.25	30	130	150	100	25
1N484A	1.0 @ 100	0.025	15	130	150	200	50
1N484B	1.0 @ 100	0.025	5	130	150	200	50
1N485	1.1 @ 100	0.25	30	180	200	100	25
1N485A	1.0 @ 100	0.025	15	180	200	200	50
1N485B	1.0 @ 100	0.025	5	180	200	200	50
1N486	1.1 @ 100	0.25	50	225	250	100	25
1N486A	1.0 @ 100	0.05	25	225	250	200	50
1N487	1.1 @ 100	0.25	50	300	330	100	25
1N487A	1.0 @ 100	0.1	25	300	330	200	50

Operating Temperature Range —80°C to 200° C
Maximum power dissipation 250 mW @ 25° C



SILICON DIODES—FAST SWITCHING TYPES

TYPE	MAX. FORWARD D.C. VOLT. V @ mA	MAX. REV. D.C. CURR. @ MAX. REV. WKG. VOLT. μA @ 25°C	μA @ 100°C	MAX. REV. WKG. VOLT.	MIN. REV. VOLT. @ 100μA & 25°C	REVERSE RECOVERY
1N625	1.5 @ 4	1.0	30	20	30	400k Ω min. in 1 μ sec.†
1N626	1.5 @ 4	1.0	30	35	50	400k Ω min. in 1 μ sec.†
1N627	1.5 @ 4	1.0	30	75	100	400k Ω min. in 1 μ sec.†
1N628	1.5 @ 4	1.0	30	125	150	400k Ω min. in 1 μ sec.†
1N629	1.5 @ 4	1.0	30	175	200	400k Ω min. in 1 μ sec.†
1N658**	1.0 @ 100	0.05 @ 50V	25@ 50V+150°C	100	120	80k Ω min. in 0.3 μ sec.‡

†Switching from 30 mA to 35 volts. Modified IBM "Y" circuit.
‡Switching from 5 mA to 40 volts. JAN 256 Circuit.
Operating temperature range —80°C to +150°C. Maximum power dissipation 200 mW @ 25° C. Derate at 1.6 mW/°C above 25° C.

SILICON DIODES CONTROLLED FORWARD TYPES

TYPE	FORWARD VOLT DROP @ 10 mA VOLTS	MAX. REV. D.C. CURR. @ MAX. REV. WKG. VOLTS μA @ 25°C	μA @ 150°C	MAX. WKG. VOLT	MIN. REV. V. @ 100 μA & 25°C	MAX. AV. FORWARD CURR. @ 25°C mA	@ 150°C mA
STC 101	.7 to .74	0.025	15	35	40	200	50
STC 102	.7 to .74	0.025	5	35	40	200	50
STC 103	.7 to .74	0.025	15	70	80	200	50
STC 104	.7 to .74	0.025	5	70	80	200	50
STC 105	.7 to .74	0.025	15	130	150	200	50
STC 106	.7 to .74	0.025	5	130	150	200	50
STC 107	.7 to .74	0.025	15	180	200	200	50
STC 108	.7 to .74	0.025	5	180	200	200	50

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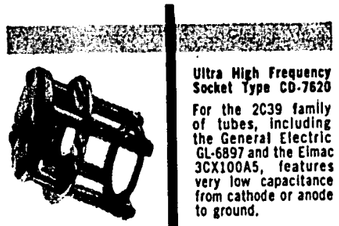

Ultra High Frequency Socket Type CD-7620

For the 2C39 family of tubes, including the General Electric GL-6897 and the Eimac 3CX100A5, features very low capacitance from cathode or anode to ground.

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For the Western Electric 6280/416B planar type triode. Has 18 spring fingers making contact with the RF cathode; specially designed beryllium copper contacts.

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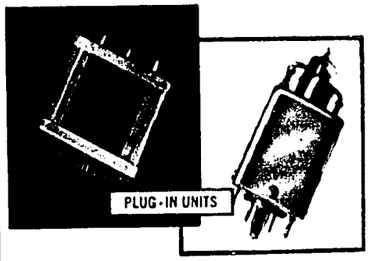

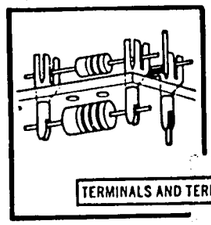

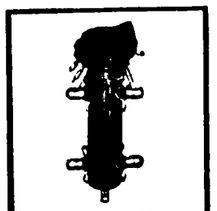

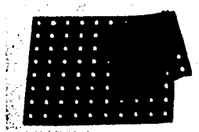

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TELEPHONE: CHAPMAN 5-1076

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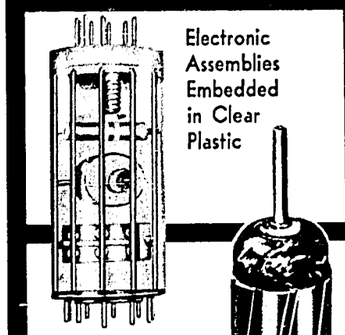
airflyte SLIP RING ASSEMBLIES and COMMUTATING SWITCHES



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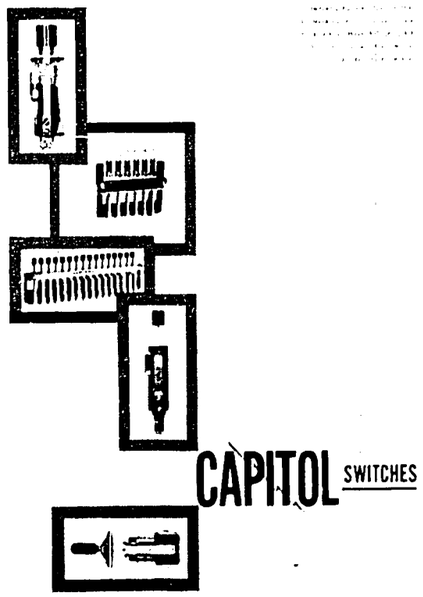

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- Computer systems
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36 BALMFORTH AVENUE DANBURY, CONNECTICUT
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69. Sockets.

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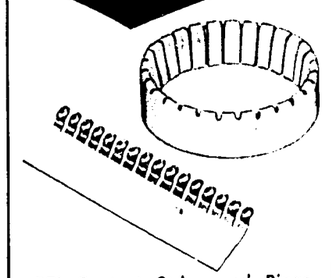

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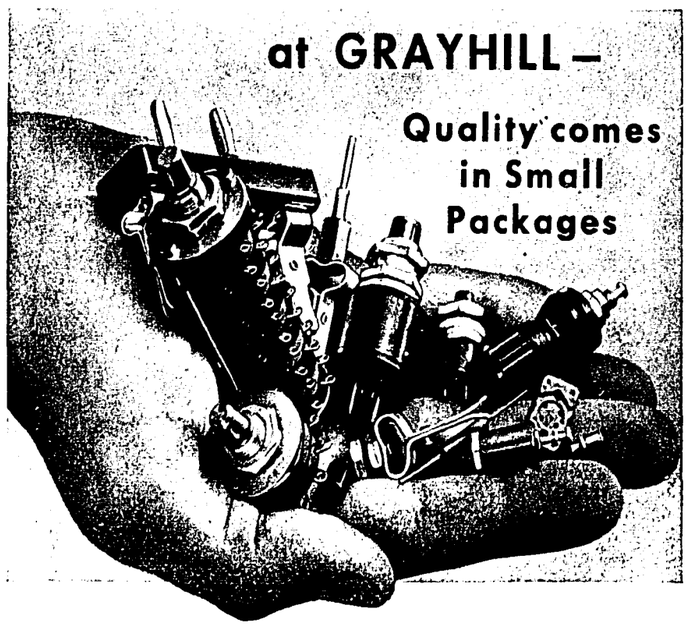

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Grayhill INC.

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Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 50, 65, 80
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Hart Mfg. Co., 265 Bartholomew Ave., Hartford 1, Conn., 16, 18, 35, 40, 50, 55, 80
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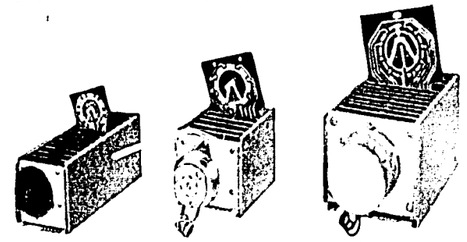

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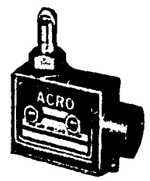

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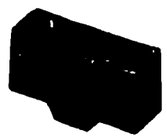

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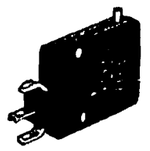

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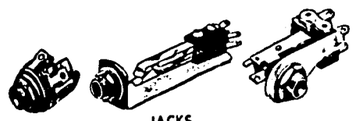

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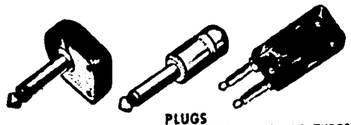

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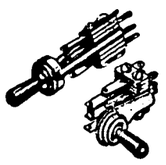

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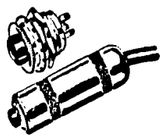

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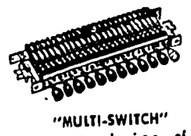

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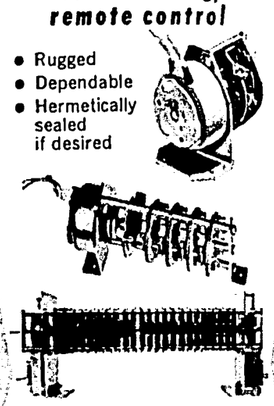

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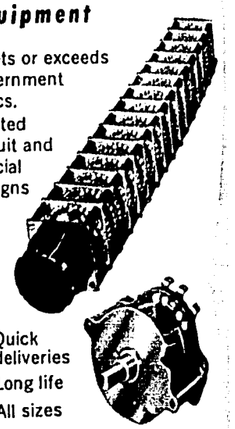

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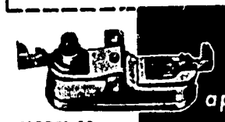

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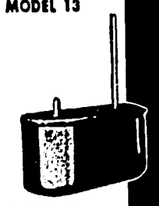

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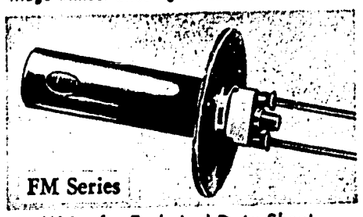

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E.M.I. Electronics Ltd., England, 5, 10

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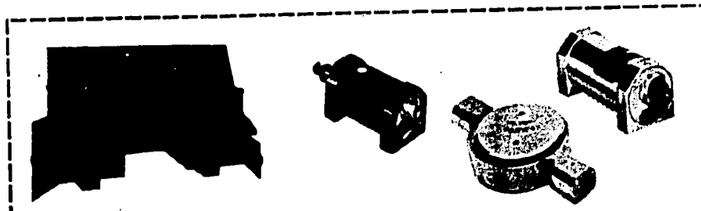

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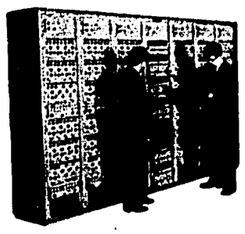

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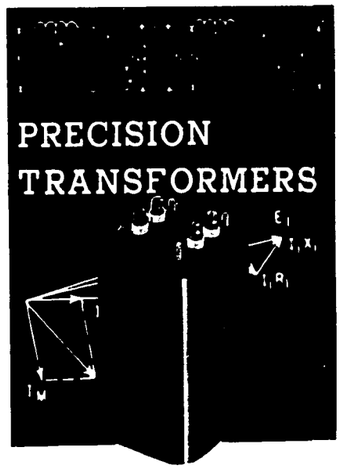

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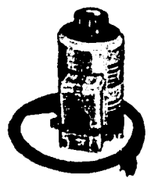
TYPE 20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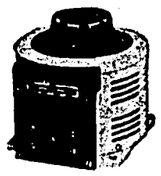
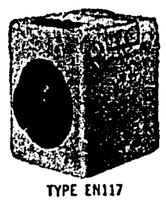
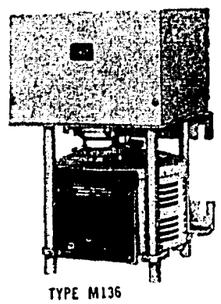
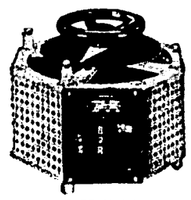
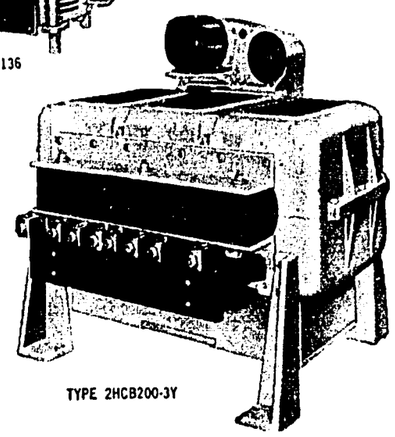

TYPE 126


TYPE EN117


TYPE M136


TYPE 1156C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136-236 SERIES

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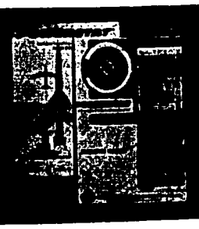

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Directory II. Components

73. Transformers.

Artronic Instrument Co., Md., 25, 55, 65, 80

Atlantex Corp., Mass., Ceramic Elements

Atlantic Transformer Corp., Conn., 5, 10, 15, 25, 27, 40, 42, 45, 55, 80, 85, 87

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Audio Development Co., Minn., 5, 10, 15, 25, 35, 43, 45, 55, 65, 80, 85

Automatic Coil Co., Inc., 195 Sackett St., Brooklyn 31, N.Y., 35, 60
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Tel: ULster 2-5454

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Tel: DAvis 7-1123

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Chicago Electronic Engineering Co., 3223 W. Armitage Ave., Chicago 47, Ill., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 87
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Chicago Magnetic Control, 1616 N. Damen Ave., Chicago 47, Ill., 5, 10, 15, 25, 27, 30, 40, 42, 45, 50, 52, 65, 80, 87, 95
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Tel: ARmitage 6-7400

Chicago Standard Transformer Corp., 3501 W. Addison St., Chicago 18, Ill., 5, 15, 25, 27, 30, 40, 42, 45, 50, 55, 65, 70, 75, 80, 87, 90, 95
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Coil Winders, Inc., 100 New York Ave., Westbury, L.I., N.Y., 5, 10, 15, 25, 27, 30, 35, 40, 42, 45, 50, 52, 55, 60, 65, 80, 85, 87, 90, 95
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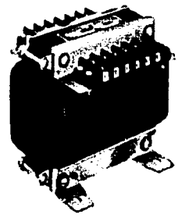
CONTROL REACTORS



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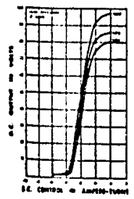

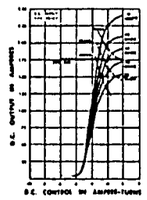

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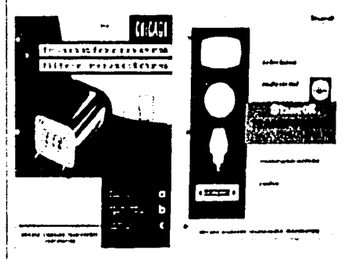

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Crittenden Transformer Works, Inc., Calif., 15, 25, 27, 40, 45, 65
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73. Transformers.

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General Radio Co., West Concord, Mass., 5, 15, 40, 42, 80, 90
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Tel: EMerson 9-4400
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Hughey & Phillips, Inc., 3200 N. San Fernando Blvd., Burbank, Calif., 40
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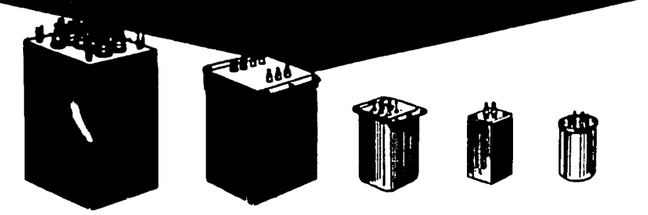

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

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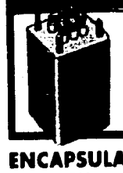


HERMETIC
Ceramic compression terminals. Stud type mounting. Schematic. Baked enamel finish, MIL-T-27A.

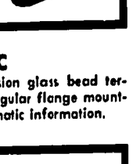
ENCAPSULATED HIPERSIL
Bracket mounting. Epoxy impregnation and coating. Resists environmental extremes.

SUB-MINIATURE MIL CASE
Hermetic. Ceramic compression terminals. ¾" x ¾" x 1⅛" H. Wt. 1⅛ oz. MIL-T-27A Grade 4, class R.

MINIATURE MOLDED
Epoxy cast. Resists environmental extremes. For plug-in printed circuits. .040 pins ⅞" x 1⅝₂" x ⅞" H. Wt. 1¾ oz.

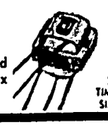
ENCAPSULATED POWER
Bracket mounting. Used in portable equipment where terminals must be brought out from Transformer.

HIGH TEMPERATURE OPEN FRAME
For Airborne Applications, Teflon, Mylar, and Silicone insulations used. Flat bracket mounting.



HERMETIC
High compression glass bead terminals. Rectangular flange mounting. Full schematic information.

ULTRA-MINIATURE (UM-F)
Resin impregnated. 4" color coded leads for dip soldering. Size ⅜" x ⅜" x ⅜". Wt. .08 oz.



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I.M.C. Magnetics Corp., Gray & Kuhn Div., N.Y., 55, Blocking Oscillator
Illumitronic Engineering, 680 E. Taylor Ave., Sunnyvale, Calif., 60
See ads on pages 412, 686
Tel: REgent 9-2395
Inductor Engrg., Inc., Del., 80
Industrial Transformer Corp., Pa., 5, 10, 15, 25, 27, 40, 42, 43, 50, 52, 55, 65, 75, 80, 85, 87, 90, 95
Industron Corp., Mass., 27
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 5, 10, 15, 25, 27, 35, 40, 42, 45, 50, 52, 55, 60, 65, 80, 85, 95
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Tel: LUdlow 4-6200
International Telephone & Telegraph Labs., Calif., 5, 15, 25, 35, 50, 60, 65, 80
Jack & Heintz, Inc., Ohio, 10, 15, 25, 40, 45, 80
James Vibrapowr Co. 4050 N. Rockwell St., Chicago 18, Ill., 5, 10, 15, 25, 27, 45, 50, 65, 87
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Tel: COrnelia 7-6333
Jerrold Electronics (Canada) Ltd., Canada, 75
Jobbins Electronics, 771 Hamilton Ave., Menlo Park, Calif., 10, 15, 25, 35, 52, 55, 60, 65, 90, 95
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Tel: DAvenport 6-7110
K-V Transformer Corp., Conn., 5, 15, 25, 27, 40, 42, 43, 45, 50, 52, 55, 65, 80, 85, 87, 95
Kapitol Magnetic Corp., Ill., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87
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Tel: GRegory 2-1000
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Tel: STate 2-6662
Kenyon Transformer Co., Inc., N.J., 5, 10, 15, 25, 27, 40, 42, 45, 50, 55, 65, 80, 85, 87
Kepco, Inc., 131-38 Sanford Ave., Flushing 56, N.Y., 95
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Tel: INdependence 1-7000
Kessler Co., Inc., Frank, N.Y., 5, 15, 25, 40, Sub-Miniature
Keystone Products Co., N.J., 5, 10, 15, 25, 27, 30, 40, 43, 45, 50, 55, 65, 80
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Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 5, 10, 15, 25, 27, 30, 35, 40, 42, 45, 50, 52, 55, 65
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Tel: TExas 0-7711
Ling Systems, Inc., Calif., 43
Litton Industries, Airtron, Inc., Div., N.J., 43
Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 15, 25, 30, 35, 40, 42, 43, 45, 50, 55, 60, 65, 70, 75, 80, 87, 95
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Magnetics Research Co., 255 Grove St., White Plains, N.Y., 80
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Tel: WHite Plains 9-9588
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Marconi's Wireless Telegraph Co., Ltd. N.Y., 95
Marine Electric Corp., Galbraith-Pike Marine Corp. Div., N.Y., 5, 10, 15, 25, 27, 35, 40, 45

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- Quality coil winding

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Directory II. Components

73. Transformers.

Marine View Electronics, Inc., N.Y., 60
Martin Co., Baltimore Div., Md., 5, 15, 43, 55, 60, 80
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Microlab, 71 Okner Parkway, Livingston, N.J., 43
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Tel: WYman 2-5700
Microtran Co., Inc., 145 E. Mineola Ave., Valley Stream, N.Y., 5, 15, 25, 27, 40, 42, 45, 50, 52, 55, 75, 85, 87
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Tel: LOcust 1-6050
Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 15, 95
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Tel: DRexel 6-7130
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New England Scientific Instruments Co., 238 Main St., Cambridge 42, Mass., 80
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Tel: KIrkland 7-1997
New England Transformer Co., Inc., Mass., 5, 15, 25, 27, 40, 42, 45, 55, 65, 80, 87
New York Coil Co., Inc., Pa., 5, 10, 15, 25, 27, 45, 50, 55, 60, 65, 95
New York Transformer Co., Inc., N.J., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87
North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 35, 55, 60, 80, 85
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Tel: PIoneer 7-0555
Nothelfer Winding Labs., Inc., P.O. Box IRE, Ewingville Rd., Trenton, N.J., 10, 15, 27, 40, 42, 45, 55, 65, 80
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Tel: EX 2-7117
Ogden Coil & Transformer Co., Ill., 5, 10, 15, 25, 27, 40, 45, 55, 65, 87, 90, 95
Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 90
See ad on pages 106-107
Tel: ORchard 5-2600

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THE IRE Directory Product Classifications have both a pattern and a purpose. They differ widely from most product indexes, deliberately. They aim to organize the hundreds of products and services of a complex technical industry according to the way engineers think. The result is a division of all products and services into three fundamental indexes into which 102 basic classifications have been organized.

For detailed identification, these 102 products and services, grouped in the 3 indexes, are further defined into 857 named products. We have tried to avoid oversimplification, and a tremendous amount of information is given by our product number system. But, the basic indexing adds speed. Purely alphabetical directories are as slow and cumbersome as a telephone book. IRE engineers have liked our system better!

You will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products which are in the form of "Complete Equipment" form the first fundamental group. Yet, the same manufacturer may also appear in the "Component Parts" section. This system gives subject grouping for speed and convenience. A directory should aid a man who has forgotten some detail, or product name. Ours helps by grouping products as one would *think*.

For safety, an alphabetical "terminology" index is given in the pink pages. You will note also that after each firm, its products are listed by number code in the alphabetical list, and that sub-classifications shown by number code in the product indexes give much detail. Just a little study of the system will help you get great good from this book.

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SOLA AC and DC voltage regulation

Continuous, automatic, maintenance-free

Sola Constant Voltage Transformers and Regulated DC Power Supplies provide dependable, regulated output voltage. Their output regulation is unaffected by wide variations in input voltage.

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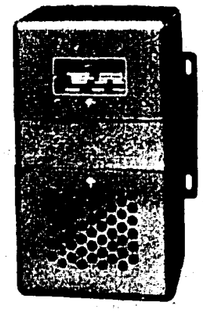
Each Sola Regulated DC Power Supply incorporates a constant voltage transformer in combination with a semi-conductor rectifier and a high-capacitance filter section. This combination makes the power supply compact, dependable, and efficient; and assures sustained output voltage in the face of pulse or intermittent loads, or heavy, short-time overloads.

Constant Voltage Transformers

Sola Constant Voltage Transformers



***Standard Sinusoidal Type** provides voltage regulation of ±1% with primary voltage variations as great as ±15%. With less than 3% total rms harmonic content in their output voltage wave, these units are desirable for use with equipment having elements sensitive to power frequencies harmonically related to the fundamental. Available in nine ratings, 60va to 7.5kva.*

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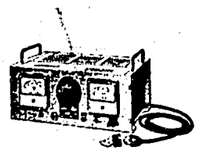

***Adjustable Sinusoidal Type** provides ±1% regulated voltage output—one output adjustable from 0-130 volts and one fixed at 115 volts. Has less than 3% total rms harmonic content in output voltage. Portable for use in shop or laboratory, or mount on standard relay rack.*

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Sola Constant Voltage DC Power Supplies

For intermittent...variable ...pulse...or high-current loads

Compact, rugged Sola Constant Voltage DC Power Supplies provide output regulated within ±1% over line voltage variations as great as ±10%. Their output contains ripple voltage of 1% total rms or less. They have exceedingly low output impedance. Output is in the "ampere" range. The high, short-time overload capacity handles intermittent and pulse loads without serious voltage drop or damage to components.

***Fixed-output-voltage designs** are available in six stock models with ratings from 24v @ 6a to 250v @ 1a. They are extremely compact, light-weight, and moderately priced in proportion to their power output and performance.*

***Adjustable-output designs** provide a considerable range of regulated dc test voltages. Accessory handles offer portability and permit self-stacking. Six models are available with outputs ranging from 5v @ 7a to 400v @ 0.6a.*

Write for Circular 11-DC for additional information on Sola DC Power Supplies

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Directory II. Components

73. Transformers.

Ortho Filter Corp., Paterson Ave., Paterson 1, N.J., 5, 10, 15, 25, 40, 45, 55, 65, 80
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Tel: MUlberry 4-5858

Osborne Electronic Sales Corp., Ore., 5, 10, 15, 25, 27, 35, 40, 42, 43, 45, 50, 52, 55, 60, 65, 80, 85, 90, 95

Osborne Transformer Corp., Mich., 5, 10, 15, 27, 40, 42, 45, 50, 52, 65, 80, 85, 87, 95

Oxford Components, Inc., Ill., 5, 10, 40, 42, 45, 50, 52, 75, 87, 90

Oxford Electric Corp., Ill., 5, 30, 40, 45, 87

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Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 55, 80
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Tel: BRadshaw 2-6141

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Partridge Transformers Ltd., Eng., 5, 15, 25, 27, 40, 45, 50, 55, 87, 95

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Pearson Electronics, Inc., Calif, 55, High Voltage

Penn-East Engineering Corp., Pa., 5, 15, 25, 45, 65

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Perkin-Elmer Corp., Vernistat Div., 777 Main Ave., Norwalk, Conn., Variable Ratio
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Tel: VIctor 7-2441

Perkin Engineering Corp., Calif., 10, 15, 25, 27, 40, 42, 45, 65, 80, 95

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Physics Research Labs., Inc., P.O. Box 555, Hempstead, N.Y., 10, 52, 95
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Polyphase Instrument Co., Pa., 15, 25, 35, 42, 52, 55, 65, 80

Power Industries Co., Inc., Ill., 5, 25, 27, 30, 35, 40, 42, 43, 45, 50, 52, 55, 65, 80, 85, 87

Precise Measurements Co., Millbrook Lane, R.D. 1, Flemington, N.J., 27, 45, 65
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Tel: FLemington 900

Precision Electronics, Inc., 48 Merrick Rd., Rockville Centre, L.I., N.Y., 5, 10, 15, 25, 27, 30, 35, 40, 42, 43, 45, 50, 52, 55, 60, 70, 75, 80, 85, 87, 90
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R. K. Mfg. Co., Ill., 5, 10, 15, 25, 35, 40, 42, 45, 55, 70, 75, 87

R-S Electronics Corp., 435 Portage Ave., Palo Alto, Calif., 15, 27, 35, 55, 60
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Tel: DAvenport 1-1130

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Radar Measurements Corp., 190 Duffy Ave., Hicksville, N.Y., 43
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Radio Development & Research Corp., N.J., 15, 25, 45, 80, 95

Radio Engrg. Labs., Inc., N.Y., 5, 10, 15, 25, 27, 40, 42, 45, 55, 60, 65, 95

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Redman Electronics Corp., Conn., 55, 60, 80, 85

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Rixon Electronics, Inc., 2414 Reedie Dr., Silver Spring, Md., 25, 55, 80
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Tel: LOckwood 5-4578

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Scala Radio Co., Calif., 75

Sciaky Bros., Inc., Ill., 45

Servomechanisms, Inc., Calif., 15, 80

Signal Transformer Co., 1661 McDonald Ave., Brooklyn 30, N.Y., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87, 95
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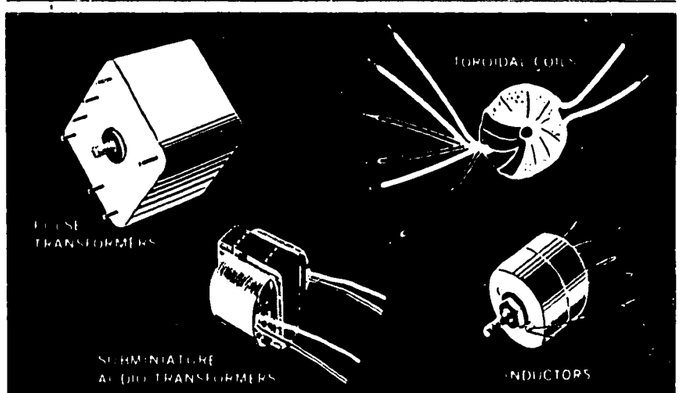
Tel: ESplanade 6-0615



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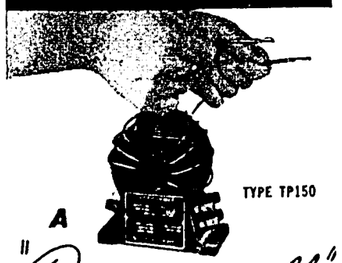
FLEXIFORMER
PACKAGED TRANSFORMER PRIMARY



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"Do-it-yourself"
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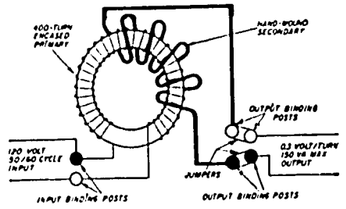
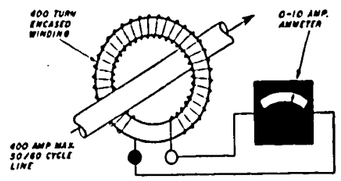


FLEXIFORMER type TP150 has an input rating of 120 volts, 50/60 cycles single phase and an output rating of 150 VA. The voltage of the secondary is proportional to the number of turns hand wound through the center opening. The correct number of turns is determined by dividing the desired output voltage (plus approximately 25%) by 0.3 which is the volt/turn ratio of the FLEXIFORMER.

A CURRENT TRANSFORMER



FLEXIFORMER type TP150 becomes the secondary winding when used as a current transformer. A current carrying conductor passing through the center opening serves as the primary. When used with a 0-1 ampere ammeter, currents up to 400 amperes can be measured with an accuracy of 1% at 60 cycles. Can be used as portable units or fastened permanently in place.

WRITE FOR FLEXIFORMER BULLETIN

THE SUPERIOR ELECTRIC COMPANY
590 Tripp Avenue Bristol Connecticut

For details, circle #572 on Reader Service Card

TRESCO
3824-28 Terrace St.
Philadelphia 28, Penna.
Telephone IVyridge 3-1383

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NO ORDER TOO SMALL
NO ORDER TOO LARGE

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73. Transformers.

Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada, 43, 60
See ad on page 595
Tel: CHerry 4-5519

Sioux Radio Products, S.D., 35, 60, 80

Sivers Lab., Sweden, 43

Skysweeper, Inc., Ill., 5, 10, 15, 25, 27, 40, 45, 87

Smallwood Ltd., S. G., Canada, 30, 35, 60, 75

Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., 95
See ad on page 568
Tel: BIshop 2-1414

Specialties, Inc., N.Y., 15, 25, 40

Spellman High Voltage Co., 3029 Webster Ave., New York 67, N.Y., 27, 60
See ad on page 501
Tel: KIngsbridge 7-0306

Spencer-Kennedy Labs., Inc., Mass., 75

Sperry Rand Corp., Sperry Microwave Electronics Co. Div., Fla., 43

Spivey Inc., James S., D.C., 55

Sprague Electric Co., Mass., 15, 55, 80

Square D Co., Wis., 45

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Stanwyck Coil Co., E., 75 Carson Ave., Newburgh, N.Y., 35, 42, 60, 80, 90
See ad on page 417
Tel: JOhn 1-3030

Stanwyck Winding Co., Inc., N.Y., 35, 60, 80

Stavid Engineering, Inc., N.J., 5, 15, 27, 45, 55

Sterling Transformer Corp., 297 N. 7th St., Brooklyn 11, N.Y., 5, 10, 15, 25, 27, 40, 42, 45, 65, 85, 87, 95
See ad on page 571
Tel: STagg 2-4200

Summit Coil Co., N.J., 27, 35, 60, 75

Superex Electronics Corp., N.Y., 5, 35, 60

Superior Electric Co., 590 Tripp Ave., Bristol, Conn., 90
See ads on pages 422, 424, 426, 481, 502, 562, 570, 588
Tel: LUdlow 2-9561

Sylvania Electric Products Inc., Mass., 5, 10, 15, 25, 40, 45, 50, 52, 55, 80

Technical Apparatus Builders, 169GB Liberty St., New York 6, N.Y., 10, 15, 25, 27, 40, 45
See ad on page 502
Tel: REctor 2-6249

Technical Appliance Corp., N. Main St., Sherburne, N.Y., 43, 60
See ad on page 382
Tel: SHerburne 7-2211

Technical Materiel Corp., 700 Fenimore Rd., Mamaroneck, N.Y., 60
See ad on page 352
Tel: OWens 8-4800

Technitrol Engineering Co., Pa., 55

Tele Coil Co., N.J., 25, 30, 60

Telecomputing Corp., Calif., 15, 25, 52, 55, 65

Telectro Industries Corp., N.Y., 5, 15, 27, 45, 55, 60, 70, 90, 95

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73. Transformers.

Teleradio Engineering Corp., N.Y., 30, 35, 50, 70

Telex, Inc., Dept. 101, 1633 Eustis St., St. Paul 1, Minn., 5, 10, 15, 25, 27, 40, 42, 45, 55, 65, 80, 85, 87, 95
See ads on pages 466, 569
Tel: MIdway 6-7211

Temco Aircraft Corp., Electronics Div., Texas, 40, 43, 45, 55, 95

Tensor Electric Dev. Co., Inc., N.Y., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 85, 87, 90, 95

Thermador Electrical Mfg. Co., Calif., 5, 15, 25, 27, 35, 40, 42, 45, 50, 52, 55, 65, 80, 87, 90, 95

Thordarson-Meissner, Ill., 5, 10, 15, 25, 27, 30, 40, 42, 43, 45, 50, 52, 55, 60, 65, 70, 75, 80, 85, 87, 90, 95

Topper Mfg. Co., Inc., N.Y., 25, 85

Topping Electronics, Ltd., Canada, 60, Ferrite

Toroidal Co., Ohio, 80

Torotel, Inc., Mo., 5, 10, 15, 25, 42, 50, 52, 65, 80

Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5, 15, 25, 35, 40, 45, 65, 80
See ad on pages 116-117
Tel: ELizabeth 4-5650

Transformer Design, Inc., of Milwaukee, Wis., 5, 10, 15, 25, 27, 40, 42, 43, 45, 50, 52, 55, 65, 75, 85, 87

Transformer Engineers, Calif., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80

Transformer Specialty Co., Pa., 15, 25, 40, 45

Transformer Technicians, Inc., Ill., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 87, 95

Transformers, Inc., N.Y., 5, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87

Translite Electronics Corp., Ill., 70

Transonic, Inc., Calif., 5, 10, 15, 25, 27, 40, 43, 45, 50, 52, 55, 65, 80, 87, 90, 95

Trenton Transformer Corp., N.J., 15, 25, 27, 40, 42, 45

Tresco, Inc., 3824-28 Terrace St., Philadelphia 28, Pa., 5, 15, 25, 27, 35, 40, 42, 45, 55, 65, 87
See ad on page 570
Tel: IVyridge 3-1383

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 5, 15, 25, 30, 35, 40, 42, 43, 45, 50, 55, 60, 65, 70, 75, 80, 87, 95
See ad on page 63
Tel: EXmont 7-2145

Trigger Electronics Co., N.Y., 5, 15, 25, 27, 35, 42, 45, 55, 75, 80, 85, 90

Trompeter Coil Mfg. Co., Inc., Calif., 25, 27, 45, 55, 65, 80

Twenty First Century Electronics, Inc., Calif., 27

Ultra Electronics Mfg. Co., N.Y., 5, 15, 25, 27, 35, 40, 42, 45, 50, 52

United Metal Products Co., N.Y., 5

United States Electronics Co., N.J., 5, 15, 25, 35, 40, 45

U.S. Science Corp., N.Y., 5, 15, 25, 27, 35, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87, Inc., Calif., 5

United Transformer Corp., 150 Varick St., New York 13, N.Y., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 65, 80, 85, 87, 90, 95
See ad on Cover 2
Tel: ALgonquin 5-3500

Universal Toroid Coil Winding, Inc., 171 Coit St., Irvington 11, N.J., 5, 15, 35, 40, 42, 45, 55, 60, 65, 80, 85
See ad on page 418
Tel: ESsex 4-9800

Universal Transistor Prods., N.Y., 15, 25, 27, 80, 95

Universal X-Ray Products, Inc., Ill., 27

Uptegraft Mfg. Co., Pa., 45

Utrad Corp., Ind., 5, 10, 15, 25, 27, 40, 42, 45, 50, 52, 55, 80, 87

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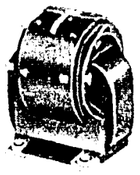
400 CPS TRANSFORMER CLIPPER SERIES
For Minimum Size and Minimum Weight



● Contour Molded ● Hipersil Cores

Cat. No.	Secondary Volts	Secondary Amps	Rms V Insulation	Primary Volts	Mold Size	Maximum Operating Ambient	List Price
4[illegible]	6.3 CT	.8	1500	115	SM3	100 C	18.50
4[illegible]	6.3 CT	1.2	1500	115	SM2	100 C	18.50
4[illegible]	6.3 CT	6.75	1500	110 115 120	2	100 C	26.50
4[illegible]	6.3 6.3	6.9 7.7	1500 1500	115	3	90 C	21.70
4[illegible]	6.3 CT	7.2	1500	115	35	125 C	27.50
4[illegible]	6.3 6.3 6.3	7 7 3.5	1500 1500 1500	120	35	80 C	26.50
4[illegible]	6.3 CT 6.3 CT	7 7	1500 1500	120	4	100 C	31.90
4[illegible]	6.3 6.3 6.3	11.7 2.93 0.3	1500 1500 1500	115	4	90 C	31.90
4[illegible]	6.3 CT	12.3	1500	115	5	100 C	29.50
4[illegible]	25 CT	0.6	1500	115	SM1	100 C	21.00
4[illegible]	6.3 6.3 6.3	2.4 2.5 2.7	1500 1500 1500	115	3	100 C	23.50
4[illegible]	6.3 CT	2	1500	115	SM1	100 C	21.00
4[illegible]	6.3 CT	3	1500	115	1A	100 C	21.80
4[illegible]	6.3 CT	5	1500	115	2	100 C	22.60
4[illegible]	5.0 CT	3	2500	115	SM1	100 C	21.00
4[illegible]	5.0 CT	6	2500	115	2	100 C	22.60
4[illegible]	14.1	3	1500	115	3	100 C	22.50
4[illegible]	21	9	1500	115	4	65 C	25.00
4[illegible]	26	0.5	1500	115	SM1	55 C	29.50
4[illegible]	26 CT	1.5	1500	115	3	65 C	21.20
4[illegible]	28 CT 6.3 CT	0.75 7A	1500 1500	115	2	65 C	31.80
4[illegible]	52 CT	.192	1500	115	SM1	100 C	22.75
4[illegible]	90 CT	4.5	1500	115	9	100 C	41.00
4[illegible]	115	05	1500	115	SM2	100 C	16.80
4[illegible]	105 115 125	0.4	1500	105 115 125	2	90 C	26.30
4[illegible]	115	2.63	1500	115	8	100 C	35.00
4[illegible]	334	025	1500	115	SM1	120 C	19.30
4[illegible]	26 CT	3	1500	115	4	100 C	25.50
4[illegible]	26 CT	5	1500	115	6	100 C	29.60
4[illegible]	52 CT	2	1500	115	5	100 C	28.10

FILAMENT POWER

MOLD NO.	OVERALL DIMENSIONS L	W	H	MTG. DIMENSIONS F	G	APP. WT. (LBS.)	MTG. METH.
SM3	1	1-1/4	1-3/16	1	Note 1	0.06	Note 1
SM2	1-1/2	1-1/4	1-11/16	1	Note 1	0.10	Note 1
SM1	1-1/2	1-1/2	1-11/16	1-1/8	Note 1	0.16	Note 1
1	1-13/16	1-7/8	1-13/16	1-1/4	1-7/16	0.25	Note 2
1A	1-11/16	1-17/32	1-13/16	1-5/32	1-1/8	0.25	Note 2
2	2	1-15/16	2-1/8	1-9/32	1-1/4	0.40	Note 2
3	2-5/16	1-13/16	2-1/8	1-9/32	1-7/16	0.45	Note 2
35	2-1/16	2-3/8	2-3/16	1-17/32	1-11/16	0.70	Note 2
4	2-5/16	2-3/8	2-9/16	1-17/32	1-11/16	0.90	Note 2
5	2-3/4	2-3/8	2-7/8	1-17/32	2-3/16	1.20	Note 2
6	2-3/4	2-5/8	3-1/8	1-17/32	2-3/16	1.50	Note 2
7	3	2-7/8	3-3/8	1-25/32	2-1/2	2.00	Note 2
8	3-3/8	2-7/8	3-3/8	1-25/32	2-1/2	2.50	Note 2
83	3-3/4	3-1/4	3-3/8	2-1/4	3	3.25	Note 3
86	3-3/4	3-3/4	3-3/8	2-3/4	3-1/8	4.25	Note 3
9	4-1/16	3-3/8	3-7/8	2-3/16	3-1/2	5.00	Note 3
10	4-1/2	3-15/16	3-15/16	2-3/4	3-1/8	6.00	Note 3

Note 1—SM series are two hole mounting with holes on center line. #4-40 Pem nuts are fastened to the bracket.
Note 2—#6-32 Pem nuts on bracket are standard.
Note 3—#8-32 Pem nuts on bracket are standard.

● Dielectric test voltages:
PRIMARIES 1000 Volts RMS
SECONDARIES 1500 Volts RMS
● All primaries 380-1000 cps
● Epoxy resin used as encapsulant
● Prices subject to change without notice

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Stagg 2-4200

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THE Bendix® ELECTRON TUBE YOU NEED IS HERE!

GROUP I—RECEIVING TUBES

HY-G-200®

EIA Type No.	JAN Type No.	PROTO-TYPE	BENDIX Type No.	DESCRIPTION
5838		6X5	TE-3	RECTIFIER. Full-wave
5839	5839	6X5	TE-2	RECTIFIER. Full-wave
5852	5852	6X5	TE-5	RECTIFIER. Full-wave
5992	5992	6V6	TE-8	AMPLIFIER. Beam power
5993	5993	6X4	TE-10	RECTIFIER
6106	6106	5Y3	TE-22	RECTIFIER
6385		2C51/5670	TE-21	MINIATURE TWIN TRIODE
6486		6AS6	TE-11	MINIATURE PENTODE
6582		6AK5	TE-35	MINIATURE PENTODE

HY-G-300®

(Reliable, hard glass, ceramic spacers, 300°C Bulb Temperature Rating)

6080WB		6AS7	TE-46	TWIN TRIODE
6082A		6082	TE-55	TWIN TRIODE
6094	6094	6AQ5/6005/6095	TE-18	MINIATURE AMPLIFIER
6384	6384	6AR6/6098	TE-27	AMPLIFIER Beam power
6486A		6AS6	TE-43	MINIATURE RF PENTODE
6582A		6AK5	TE-44	MINIATURE RF PENTODE
6754		412A	TE-36	RECTIFIER. Full-wave
6851		5751	TE-42	MINIATURE TWIN TRIODE
6853		5Y3	TE-45	BANTAM RECTIFIER. Full-wave
6854		2C51/5670	TE-47	MINIATURE TWIN TRIODE
6877		½ 6080	TE-48	MINIATURE TRIODE
6889		Top Cap 6384	TE-52	AMPLIFIER. Beam power
6900		5687	TE-54	MINIATURE TWIN TRIODE
		3D21B	TE-74	AMPLIFIER

COMPUTER TUBES

6888		7AK7	TE-40	GATED PENTODE

GROUP II—MICROWAVE TUBES

EIA Type No.	JAN Type No.	BAND	BENDIX Type No.	DESCRIPTION
2K50	2K50	K	TE-4	REFLEX KLYSTRON
6116	6116	X	TE-62	REFLEX KLYSTRON
6541		K	TE-30	REFLEX KLYSTRON
6584		C	TE-38	REFLEX KLYSTRON
		Ka	TE-37	REFLEX KLYSTRON
		Ka	TE-53	REFLEX KLYSTRON
6845	6845 (US Navy)	X	TE-59	REFLEX KLYSTRON
6940		X	TE-58	REFLEX KLYSTRON
		K	TE-60	REFLEX KLYSTRON
		X	TE-61	REFLEX KLYSTRON
		V	TE-67	BACKWARD-WAVE OSCILLATOR
		C	RXB-103401	TRAVELLING-WAVE TUBE AMPLIFIER
		V	TE-66	BACKWARD-WAVE OSCILLATOR
		V	TE-71	BACKWARD-WAVE OSCILLATOR
		V	TE-75	BACKWARD-WAVE OSCILLATOR

GROUP III—GAS AND SPECIAL TUBES

SPECIAL PURPOSE GAS TUBES

EIA Type No.	JAN Type No.	BENDIX Type No.	DESCRIPTION
5643	5643	TD-17	SUBMINIATURE XENON THYRATRON (MIL SPEC)
5643		TD-37	SUBMINIATURE XENON THYRATRON (COMMERCIAL SPEC)
5947		TT-2	TEMPERATURE LIMITED DIODE
5960		TD-1	COLD CATHODE DISCHARGE
		TD-45	COLD CATHODE DISCHARGE
		TD-28	COLD CATHODE TETRODE THYRATRON
6142		TD-9A	GAS DIODE VOLTAGE REGULATOR
		TD-19	GAS DIODE VOLTAGE REGULATOR
6144		TT-1	NOISE DIODE
6352		TT-29	SUBMINIATURE TEMP LIMITED DUAL-DIODE
6361		TT-25	SINGLE CONVECTRON
5845		TT-30	MINIATURE TEMPERATURE-LIMITED DIODE
7414		TD-60	TIME TOTALIZER
7416		TD-36	CONSTANT FIRING DIODE

GROUP IV—GAS NOISE SOURCE TUBES

Frequency Range KMC	Band	Waveguide Number	Bendix Type Number	EIA Type Number	Mount Type	Recommended Mode of Operation	Anode Current MA	Tube Drop Volts	Excess Noise Ratio DB
1.12-1.70	L	RG-69/U	TD-21	6881	90°H	D.C.	250	65	15.2
			TD-29	7101	90°H	A.C. & D.C.	250	130	18.0
2.6-3.95	S	RG-48/U	TD-12	6358	10°E	D.C.	250	80	15.2
			TD-22	6782	90°H	A.C. & D.C.	250	45	15.2
2.6-3.95	S	RG-48/U	TD-34	7148	10°E	D.C.	250	165	18.0
3.30-4.90	S	WR-229	TD-24	6852	10°E	A.C. & D.C.	250	65	15.2
5.85-8.20	X	RG-50/U	TD-10	6356	10°E	D.C.	250	70	15.2
8.20-12.40	X	RG-52/U	TD-11	6357	10°E	D.C.	200	75	15.2
			TD-23	6882	10°E	D.C.	200	115	18.0
8.20-12.40	X	RG-52/U	TD-40	—	10°E	Pulse	200	85	15.2
12.4-18.00	KU	RG-91/U	TD-18	6684	10°E	D.C.	200	70	15.2
18.0-26.5	K	RG-53/U	TD-13	6359	10°E	D.C.	200	65	15.2

GROUP V—SPARK GAPS

Type No.	DC Breakdown KV	Initial Pulse Breakdown KV	Repetitive Pulse Breakdown KV	Watts Maximum Dissipation	Peak Discharge Watts-Second	Fault Surge Current Amps	Isotope Stabilization	Initial Equipment Usage	Configuration
TG-25	0.400			3	2		Yes	Safety	1
TG-26	0.75			5	2	1000	Yes	Safety	2
TG-27	1.0			5	5	1000	Yes	Safety	2
TG-30	2.0	3.0	2.7	5	14	2000	Yes	Safety	2
TG-34	5.0	8.5	5.5	5	19	3000	Yes	Safety	2
TG-37	10.0	20.0	15.0	5	22	4000	Yes	Safety	2
TG-56	20.0	23.0		7.5	30	5000	Yes	Safety	4
TG-60	50.0			7.5	50	6000	Yes	Safety	4

Many other models of Bendix gas noise source and spark gap tubes besides those shown here are available. There is also a HY-G-500 line of metal ceramic receiving tubes. For a completely up-to-date list, write BENDIX AVIATION CORPORATION, EATONTOWN, NEW JERSEY.

West Coast Sales & Service: 117 E. Providencia Ave., Burbank, Calif.
Export Sales & Service: Bendix International Division, 205 E. 42nd St., New York 17, N.Y.
Canadian Distributor: Computing Devices of Canada, Ltd., P.O. Box 508, Ottawa 4, Ontario

Red Bank Division Bendix

For details, circle #575 on Reader Service Card

Directory II. Components

73. Transformers.

Valor Electronics, Inc., Calif., 55
Vanguard Electronics Co., Calif., 35, 60
Vari-L Co., Inc., 432 Fairfield Ave., Stamford, Conn., 65, 80
See ad on page 254
Tel: FIreside 8-0091
Varo Mfg. Co., Inc., Tex., 5, 10, 15, 25, 27, 35, 40, 42, 45, 52, 55, 60, 65, 80, 95
Virginia Electronics Co., Inc., D.C., 5, 25, 35, 45, 50, 52, 60, 90
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Transmitters, airborne & airport: See class 1

Transmitters, amateur: See class 2

Transmitters, broadcast: See class 7

Transmitters, facsimile: See class 11

Transmitters, microwave: See class 18

Transmitters, mobile: See class 20

Transmitters, point-to-point: See class 24

Transmitters, radar: See class 25

Transmitters, single sideband: See class 29

Transmitters, telegraph & teleprinter: See class 33

Transmitters, telemeter: See class 34

Transmitters, television: See class 7

Traveling wave tubes: See class 76

Trimmers: See class 42

Tube parts, vacuum: See class 99

Tubes, paper: See class 87

74. Tubes, Receiving.

5. Cathode-ray
7. Ceramic
10. Miniature
15. Standard types, glass & metal
20. Sub-miniature
25. TV Picture-color
30. TV Picture-monochrome

American Elite, Inc., N.Y., 5, 10, 15, 20
American Radio Co., Inc., N.Y., 10, 15, 20
Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 10, 20, 25
See ad on pages 38-39
Tel: WElls 1-6200
Autometric Corp., N.Y., 25
Bendix Aviation Corp., Ind., 5, 7, 10, 15
Bendix Aviation Corp., Mich., 7, 10, 20
Bendix Aviation Corp., Red Bank Div., Electron Tube Section, Route 35, Eatontown, N.J., 7, 10, 15, 20
See ad on page 572
Tel: LIberty 2-2000
British Indust. Corp., Genalex Div., N.Y., 5, 10, 15
CBS Electronics Div., Columbia Broadcasting System, Inc., 100 Endicott St., Danvers, Mass., 5, 10, 15
See ad on page 576
Tel: SPring 4-2360
Calvert Electronics, Inc., N.Y., 5, 7, 10, 15, 20, 25, 30
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Electronic Tube Corp., Pa., 5
Electronica Industrial Ltd., Brazil, 30
Ericsson Corp., L. M. (Stockholm 32, Sweden), 649 Broadway, New York 12, N.Y., 5, 10, 15, 20, 25
See ad on page 581
Tel: ORegon 7-8400
Ferranti Electric, Inc., Electronics Div., N.Y., 5
Ferranti-Packard Electric, Ltd., Canada, 5
Freeland Products Co., La., 5
General Electric Co., Cathode Ray Tube Dept., Electronics Park, Syracuse, N.Y., 5
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Hughes Aircraft Co., Hughes Products Div., Calif., 5, 25
Intelex Systems, Inc., N.Y., 10, 15
J.S.H. Electronics Co., Calif., 5, 7, 10, 15, 20
Jan Hardware Mfg. Co., Inc., N.Y., 5, 25
Kip Electronics Corp., 29 Holly Place, P.O. Box 562, Stamford, Conn., 10, 20, 25, 30
See ad on page 579
Tel: DAvis 5-1551
Litton Industries, Inc., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 5, 10, 15
See ad on pages 64-65
Tel: LYtell 1-8411
Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5
See ad on page 66
Tel: CRestview 4-7411
Mackay Research Labs., Ariz., 5
Marconi's Wireless Telegraph Co., Ltd., N.Y., 15, 20, 25, 30
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National Union Electric Corp., Ill., 5
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Packard Bell Electronics Corp., 12333 W. Olympic Blvd., Los Angeles 64, Calif., 5
See ad on page 246
Tel: BRadshaw 2-6141
Philadelphia Scientific Glass Co., Pa., 15

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

Custom-designed General Electric Cathode Ray Tubes Improve Display-equipment Performance

Today's industrial and military display applications require the finest in cathode-ray-tube technology.

At General Electric, each customer requirement is analyzed to help the customer determine the tube design best suited to it. Should a new or improved type be needed, a veteran G-E engineering-manufacturing task force researches, custom-designs, and produces the appropriate tube.

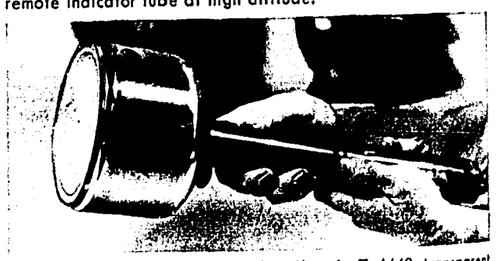
General Electric's fully integrated Cathode Ray Tube Department includes research-and-development engineering and laboratories, design engineering, and manufacturing and marketing engineering facilities. Also available is the experience gained through company-wide work in virtually every engineering and scientific field.

For immediate answers to your display problems, call or write Regional Sales Managers R. E. McBride, M. B. Lees, or A. N. Reagan—General Electric Company, Cathode Ray Tube Department, Electronics Park, Syracuse, N. Y. 555-1

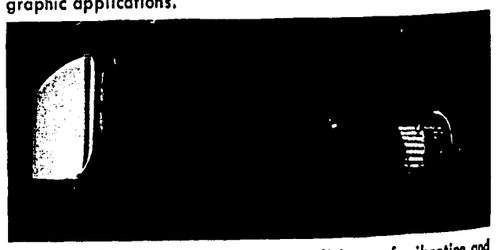
Large (16") GL-4623 electrostatic deflection tube was custom designed for critical processed-video use . . . can be furnished to meet specific pattern-distortion requirements.

From G.E.'s CRT Development Laboratory came the GL-4619 21-inch, closed-circuit TV monitor tube, which provides more than 1000-line resolution in critical airport operations.

Tiny (1½") GL-4580 electrostatic deflection tube, developed by G-E manufacturing-engineering task force, performs as vital remote indicator tube at high altitude.



Thoroughly researched and job-tailored, Z-4448 transparent phosphor tube offers ultra-high resolution for specialized photographic applications.



Designed for use under severe conditions of vibration and humidity, two-gun GL-4386 4 x 6" electrostatic deflection tube meets all design specs, is successfully job proven.

Progress Is Our Most Important Product

GENERAL ELECTRIC

I want a "Whatcha-ma-call-it?"

It's a "thinga-ma-jig that....."

How often have you struggled to remember the name of a component or electronic item. . . . Just could not think quickly what it is called?

YOU CAN FIND IT IN THE IRE DIRECTORY!

because

(1) The IRE Directory classifies products by purpose and use.

(2) Its listings are fundamental—the way an engineer thinks.

(3) "Terminology" is cross indexed in the pink pages —condensed, simple, not mixed in with firm names.

(4) Ads face listings thus helping to identify products by actual pictures.

(5) Product code numbers reduce complex and duplicate listings, saving you "searching" time and effort.

Study it . . . save it . . . work it.

THE INSTITUTE OF RADIO ENGINEERS

1 East 79th Street, New York 21, N.Y.

Directory II. Components

74. Tubes, Receiving.

Philco Corp., Lansdale Tube Co. Div., Church Rd., Lansdale, Pa., 5, 10, 15, 30
See ad on page 546
Tel: ULysses 5-4681

Radio Corporation of America, Electron Tube Div., Section 1-22-Q, 415 S. Fifth St., Harrison, N.J., 5, 7, 10, 15, 20, 25, 30
See ad on pages 53-55
Tel: HUmboldt 5-3900

Rank Cintel, Ltd., England, 5, 25, 30

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Raytheon Co., Mass., 5, 7, 10, 15, 20

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Sonotone Corp., Dept. X00-109, P.O. Box 200, Elmsford, N.Y., 10, 20
See ad on page 482
Tel: LYric 2-6400

Standard Telephones & Cables, Ltd., England, 5, 10, 15, 20, 30

State Laboratories, Inc., 649 Broadway, New York 12, N.Y., 5, 10, 15, 20
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Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5, 7, 10, 15, 20, 25, 30
See ad on page 23-25
Tel: JUdson 6-2424

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 7
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Tel: ARmory 1-0163

Thomas Electronics, Inc., N.J., 5, 25

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 5, 10, 15, 20, 30
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Tel: HUmboldt 2-4200

Vacuum Tube Products Co., Inc., Calif., 5, 25

Waterman Products Co., Inc., 2445 Emerald St., Philadelphia 25, Pa., 5
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Tel: GArfield 6-8600

Wells Co., Inc., Gary, N.Y., 15

Westinghouse Electric Corp., Electronic Tube Div., P.O. Box 284, Elmira, N.Y., 5, 10, 15, 20
See ad on page 580
Tel: REgent 9-3611

Wiltec Electronics, Inc., Conn., 10, 20

For more information on any of the products advertised in this issue, use the Reader Service card just inside the back cover.

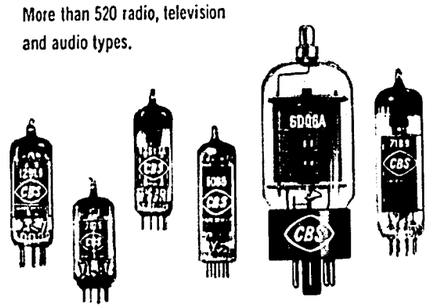
More Reliable Products through Advanced-Engineering

CBS®

ELECTRON TUBES

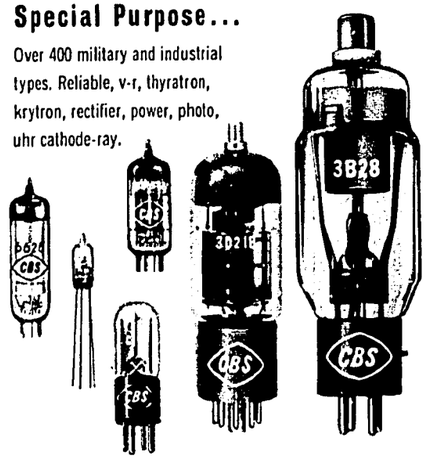
Receiving...

More than 520 radio, television and audio types.



Special Purpose...

Over 400 military and industrial types. Reliable, v-r, thyratron, krytron, rectifier, power, photo, uhr cathode-ray.



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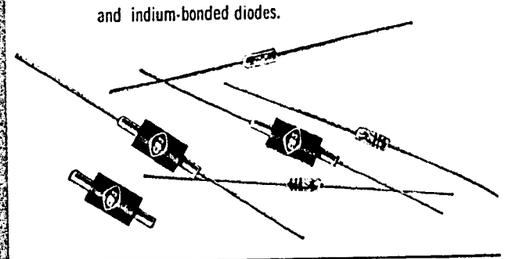
SEMICONDUCTORS

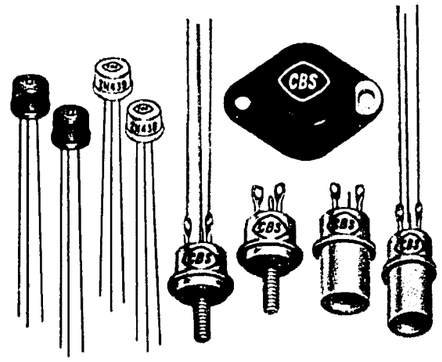
Diodes...

Comprehensive lines of reliable general-purpose and indium-bonded diodes.

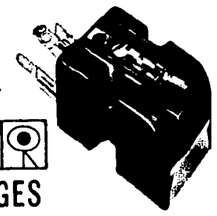


Transistors...

Wide range of reliable PNP power, NPN power, NPN switching transistors.



Also a quality line of cartridges and styli.



COLUMBIA
CD STEREO CARTRIDGES

FOR DATA on specific types or lines, write CBS Electronics: *Tubes and cartridges* — Danvers, Massachusetts, *Semiconductors* — Lowell, Massachusetts.

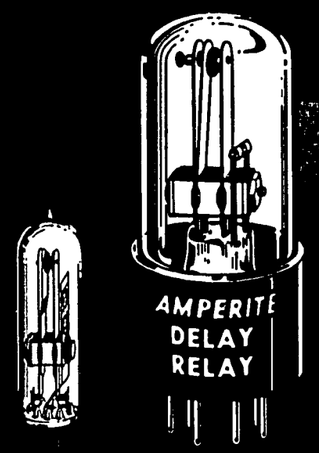
CBS ELECTRONICS Electronic manufacturing division of Columbia Broadcasting System, Inc.

Sales Offices: **Danvers, Mass.,** 100 Endicott St., SPring 4-2360 • **Lowell, Mass.,** 900 Chelmsford St., GLenview 4-0446 • **Newark, N. J.,** 32 Green St., MArket 3-5832 **Melrose Park, Ill.,** 1990 N. Mannheim Rd., EStebrook 9-2100 • **Los Angeles, Calif.,** 2120 S. Garfield Ave., RAymond 3-9081.

For details, circle #577 on Reader Service Card

AMPERITE PREFERRED

by design engineers—because they're
MOST COMPACT • SIMPLEST • MOST ECONOMICAL
HERMETICALLY SEALED



Thermostatic DELAY RELAYS

2 to 180 Seconds

Actuated by a heater, they operate on A.C., D.C., or Pulsating Current.

Hermetically sealed. Not affected by altitude, moisture or climate changes.

SPST only—normally open or closed.

Compensated for ambient temperature changes from —55° to +70° C. Heaters consume approximately 2 W and may be operated continuously. The units are rugged, explosion-proof, long-lived, and—inexpensive!

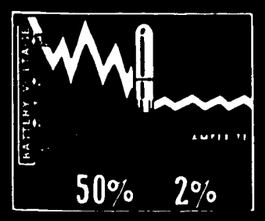
TYPES: Standard Radio Octal and 9 Pin Miniature. List Price, $4.00. Standard Delays.

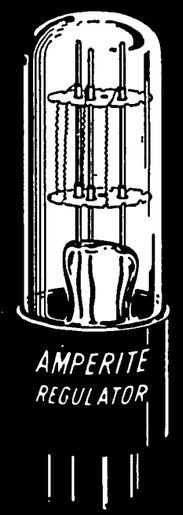
Also—Amperite Differential Relays: Used for automatic overload under voltage or under current protection.

PROBLEM? Send for Bulletin No. TR-81

BALLAST REGULATORS

Amperite Regulators are designed to keep the current in a circuit automatically regulated at a definite value (for example 0.5 amp.) For currents of 60 ma. to 5 amps. Operate on A.C., D.C., or Pulsating Current.





Hermetically sealed, they are not affected by changes in altitude [illegible] to 90 C° of humidity. Rugged [illegible]. List Price, $3.00.

Write for 4 page Technical Bulletin No. AB-51

AMPERITE CO. Inc., 561 Broadway, New York 12, N. Y.
Telephone: CAnal 6-1446
In Canada: Atlas Radio Corp. Ltd., 50 Wingold Ave., Toronto 10

For details, circle #578 on Reader Service Card

Directory II. Components

75. Tubes, Special Purpose.

5. Electrometer tubes
10. Geiger-Mueller
15. Photo multiplier
25. Thyratrons
30. Voltage regulators & ballasts
35. X-Ray

Aerolux Light Corp., N.Y., 10, 25, 30

Alectric Mfg. Co., Wis., 25

Amglo Corp., 4333 N. Ravenswood Ave., Chicago 13, Ill., Flash Tubes
See ad on pages 477, 577
Tel: BUckingham 1-2727

Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 10, 15, 25, 30, 35
See ad on pages 38-39
Tel: WEIls 1-6200

Amperite Co., Inc., 561 Broadway, New York 12, N.Y., ballast
See ad on this page
Tel: CAnal 6-1446

Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 10, 30
See ads on pages 327, 418, 579
Tel: EVergreen 6-5715

AMGLO

Grid Controlled Flashtubes

- Used extensively for automotive timing, wheel balancing and other stroboscopic applications.
- Capable of flashing at rates up to several thousand per minute when operated at 400—600 volts.
- Can be used with electrolytic or oil capacitors, 1 to 2 Mfd at high flash rates, 2 to 4 Mfd at rates to 1800 per min.
- Non-polarized, may be accidentally or purposely (to increase life) reversed without harm.
- Special tubes of all kinds promptly made.

Write for Descriptive Literature

AMGLO CORPORATION
Pioneers in Flashtubes
4339 No. Ravenswood, Chicago 13, Ill.

For details, circle #579 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory pages 161-264

THE VICTOREEN INSTRUMENT COMPANY
5806 HOUGH AVENUE • CLEVELAND 3, OHIO

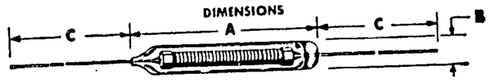
GLASS-SEALED DEPOSITED CARBON RESISTORS

RESISTOR DATA CHART

TYPE	RESISTANCE	TOLERANCE	VOLTAGE COEF. % / V	TEMP. COEF. % /°C	MAX. W.V.	WATTAGE	MAX. TEMP. °C	DIMENSIONS A (MAX)	DIMENSIONS B (MAX)	DIMENSIONS C (MIN)
RX2	1 Meg to 50 Meg	1,2,5,10,20 Note 1	—.0002	—0.08	3000	1	125	2	.413	1½
RX3	1 Meg to 200 Meg	1,2,5,10,20 Note 2	—.0002	—0.08	10,000	3	125	3¼	.413	1½
RX4	200 ohm to 50 Meg	1,2,5	—.0002	—0.06	800	5	200	2	.413	1½
RX5	200 ohm to 200 Meg	1,2,5 Note 3	—.0002	—0.05	2000	10	200	3¼	.413	1½
RX8	100 ohm to 10 Meg	1,2,5	—.0002	—0.05	750	2	200	1½	.240	1¾

NOTE: 1: 1% and 2% tolerance available only below 20 meg.
2: 1%, 2% and 5% tolerance available only below 100 meg.
3: 1% and 2% tolerance available only below 100 meg.

DIMENSIONS



HI-MEG RESISTORS

GLASS SEAL: HI-MEGS are vacuum sealed in a glass envelope which is treated with a special silicone varnish which keeps the resistor relatively free from the effects of moisture.

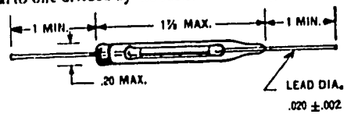
RESISTANCE: HI-MEG resistors are available in values from 10^8 to 10^{14} ohms.

TOLERANCE: HI-MEG resistors can be supplied in the following tolerances: 1% below 10^{12} ohms, 2% and 5% below 10^{13} ohms, and 10% over the entire range.

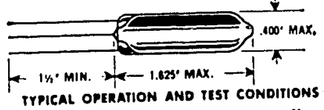
MAXIMUM WORKING VOLTAGE: 1000 volts.

MAXIMUM OPERATING AMBIENT TEMPERATURE: 100°C.

POWER RATING: The power rating for any HI-MEG resistor is equal to one divided by the resistance in megohms.



ELECTROMETER TRIODE
VX-55



TYPICAL OPERATION AND TEST CONDITIONS

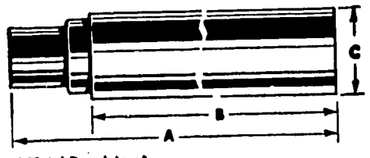
E_f	1.25	Volts	I_p	95	μa
I_f	10.0	ma	G_m	110	μmho
E_g	7.5	Volts	I_g	5×10^{-14}	amp
E_g	−2.2	Volts	M_u	2.1	

ELECTROMETER TETRODE
5800/VX-41A

AS A TETRODE ELECTROMETER

Plate Voltage	+4.5	Volts	Transconductance	15	μmhos
Accelerator Grid Voltage (g_1)	+3.4	Volts	Plate Current	12	μa
Control Grid Voltage (g_2)	−3	Volts	Accelerator Grid Current	300	μa
Amplification Factor	1		Control Grid Current	10^{-11}	Amp

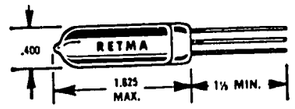
CORONA TYPE VOLTAGE REGULATORS



Commonly Used Metal Regulators*

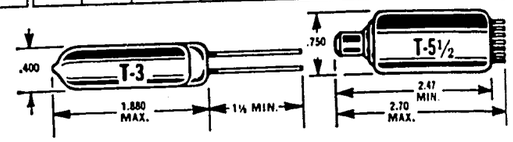
TYPE	VOLTAGE RANGE	TOLERANCE	NOM. TEST POINT	CURRENT MAX.	CURRENT MIN.	REGULATION 100-1000μa	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C
M105B	5 KV-10 KV	±500V	500μa	1000μa	50μa	7½%	6½	5	1¼
M105	10 KV-20 KV	±500V	500μa	1000μa	100μa	10%	6½	5	1¼
M108	10 KV-20 KV	±500V	500μa	1000μa	100μa	7%	9½	8	1¼
M126	20 KV-25 KV	±500V	500μa	1000μa	100μa	10%	7½	6	1½
M128	20 KV-27 KV	±500V	500μa	1000μa	100μa	7%	9½	8	1½

CORONA TYPE VOLTAGE REGULATORS



R.E.T.M.A. Types

TYPE	NOM.	TOLERANCE	NOM. TEST PT.	CURRENT IN μa MIN.	CURRENT IN μa MAX.	CURRENT IN μa PEAK	REGULATION VOLTS	REGULATION CURRENT RANGE
5950	700V	± 15V	25μa	5	100	150	14V	5-100μa
5841	900V	± 18V	25μa	5	100	150	18V	5-100μa
6143	1200V	± 24V	25μa	10	100	150	24V	5-150μa
6119	2000V	±100V	25μa	15	100	150	40V	5-100μa

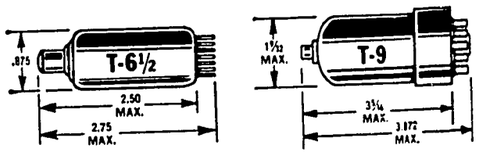


Commonly Used Models in T-3 Size*

TYPE	NOM. TEST PT.	TOLERANCE	NOM.	CURRENT IN μa MIN.	CURRENT IN μa MAX.	CURRENT IN μa PEAK	REGULATION VOLTS	REGULATION CURRENT RANGE
GV3B-400	50μa	±10V	400V	5	150	300	15V	5-150μa
GV3B-600	50μa	±10V	600V	5	150	300	20V	5-150μa
GV3A-900	50μa	±15V	900V	10	250	350	25V	10-250μa
GV3A-1200	50μa	±30V	1200V	10	250	400	40V	10-250μa
GV3A-1500	50μa	±30V	1500V	15	300	500	50V	15-300μa
GV3A-2000	50μa	±50V	2000V	15	300	500	75V	15-300μa

Commonly Used Models in T-5½ Size*

TYPE	NOM.	TOLERANCE	NOM. TEST PT.	CURRENT IN μa MIN.	CURRENT IN μa MAX.	CURRENT IN μa PEAK	REGULATION VOLTS	REGULATION CURRENT RANGE
GV5B-700	700V	±20V	100μa	10	250	350	25V	10-250μa
GV5B-900	900V	±25V	100μa	10	300	500	30V	10-300μa
GV5B-1000	1000V	±30V	100μa	10	300	500	35V	10-300μa
GV5A-1200	1200V	±36V	100μa	10	400	600	40V	10-400μa
GV5A-2200	2200V	±65V	100μa	20	800	1000	50V	20-800μa
GV5A-3000	3000V	±90V	100μa	30	1000	1200	75V	30-1000μa



Commonly Used Models in T-6½ Size

TYPE	NOM. VOLTAGE	TOLERANCE	NOM. TEST PT.	CURRENT IN μa MIN.	CURRENT IN μa MAX.	CURRENT IN μa PEAK	REGULATION**
GV6A-450	450	±11V	500μa	20	1000	1300	30V
GV6A-1000	1000	±25V	500μa	30	1000	1500	42V
GV6A-2500	2500	±63V	500μa	50	1500	3500	100V
GV6A-3000	3000	±75V	500μa	50	1000	3500	70V

**This regulation is the change in voltage over the useful range of current from MIN. to MAX.

Commonly Used Models in T-9 Size

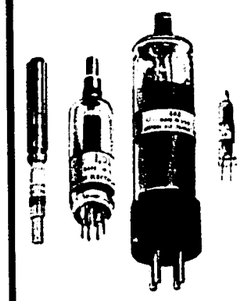
TYPE	NOM. VOLTAGE	TOLERANCE	NOM. TEST PT.	CURRENT IN μa MIN.	CURRENT IN μa MAX.	CURRENT IN μa PEAK	REGULATION**
GV9A-600	600	±15V	1000μa	50	1500	2000	25V
GV9A-1000	1000	±25V	1000μa	50	1750	2200	45V
GV9A-2000	2000	±50V	1000μa	50	3500	4200	80V
GV9A-3000	3000	±75V	1000μa	50	2700	7000	110V

**This regulation is the change in voltage over the useful range of current from MIN. to MAX.

*T-3 size voltage regulators are available in any desired nominal voltage ±2% from 400 volts to 2000 volts at the customary test point of 50 ua. T-5½ size voltage regulators are available in any desired nominal voltage ±3% from 400 volts to 6000 volts at the nominal test point at 100 ua. Metal regulators are available in any desired voltage ±500 volts from 7½ KV. to 27½ KV. at the customary test point of 500 ua. All other characteristics such as maximum and minimum currents, regulation, etc., may be interpolated from the table.

For details, circle #580 on Reader Service Card

SOLVE YOUR REGULATED HIGH VOLTAGE PROBLEMS NOW WITH RELIABLE ANTON CORONA DISCHARGE V-R TUBES



ANTON CORONA DISCHARGE V-R TUBES

have been found to be extremely reliable over the wide range of military shock, temperature, current and voltage requirements. Fixed and adjustable tubes are available to stabilize voltages from 300 V—30 KV at currents below several milliamperes with voltage tolerances within ± 1%. MIL approved types available. Well suited for use as voltage reference tubes, stabilizing all high voltage-low current power supplies and for control of high voltage, accelerating potentials of cathode ray devices (radar scopes, TV, etc.). Send for valuable FREE application and design notes.

ANTON ELECTRONIC LABORATORIES, INC.

A subsidiary of United States Hoffman Machinery Corporation

1226 FLUSHING AVE., BROOKLYN 37, N. Y.
For details, circle #581 on Reader Service Card

SPECIAL PURPOSE ELECTRON TUBES!

KIP Electronics — designers and manufacturers of these original and exclusive types:

- Triple Coincidence Thyratrons
- Transistor Indicators
- Display and Memory Diodes
- Low Drain Heater Cathode Triodes
- Cold Cathode Diodes and Triodes
- U. H. F. Diodes and Triodes
- Linear Display Counters
- Logarithmic Diodes
- Binary Counters
- Trigger Tubes

These tubes are made in many sizes with various ratings. If you have any tube problem, KIP will solve it . . . in fact, they may have already done so.

For information write

KIP ELECTRONICS CORP.
STAMFORD, CONN.

For details, circle #582 on Reader Service Card

Directory II. Components

75. Tubes, Special Purpose.

Bendix Aviation Corp., Ind., 25, 30

Bendix Aviation Corp., Red Bank Div., Electron Tube Section, Route 35, Eatontown, N.J., 10, 25, 30
See ad on page 572
Tel: LIberty 2-2000

British Industries Corp., Garrard Div., N.Y., 10, 15, 25

British Thomson-Houston Co., Ltd., England, 25

CBS Electronics Div., Columbia Broadcasting System, Inc., 100 Endicott St., Danvers, Mass., 25, 30
See ad on page 576
Tel: SPring 4-2360

Calvert Electronics, Inc., N.Y., 5, 10, 15, 25, 30, 35

Central Electronic Mfg., Inc., N.J., 5

Comet, Ltd., Switzerland, 35

Continental Electric Co., Ill., 10, 15, 25

DuMont Labs., Inc., Allen B., N.J., 15

E A K Research Lab., N.Y., 10, 35

E. M. I. Electronics Ltd., England, 15

Edgerton, Germeshausen & Grier, Inc., Mass., 25, Ceramic

Ekco Electronics Ltd., England, 10

Electronic Enterprises, Inc., N.J., 25

Electronic Products Co., N.Y., 10, 30

Electrons, Inc., N.J., 25

Ericsson Corp., L. M. (Stockholm 32, Sweden), 649 Broadway, New York 12, N.Y., 15, 25, 30
See ad on page 581
Tel: OREgon 7-8400

Farnsworth Electronics Co., Div of I. T. & T., Ind., 15

Fenwal, Inc., Mass., 75

Ferranti Electric, Inc., Electronics Div., N.Y., 5, 35

General Electric Co., Power Tube Dept., 1 River Rd., Bldg. 267, Schenectady 5, N.Y., 25
See ad on page 584
Tel: FRanklin 4-2211

General Electric Co., X-Ray Dept., Wis., 35

General Electrodynamics Corp., Inc., 15, Storage

General Electronics, Inc., N.J., 25

Industrial Tubes, Inc., Ill., 25

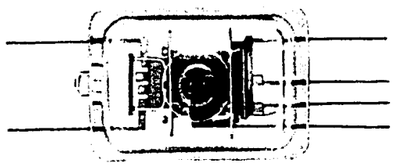
International Telephone & Telegraph Co., ITT Components Div., 700 Kingsland Rd., P.O. Box 412, Clifton, N.J. 25
See ad on pages 148-149
Tel: NUtley 2-3600

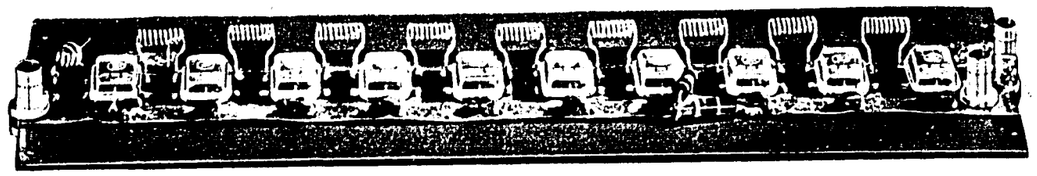
I. T. & T., Kuthe Labs. Div., Inc., N.J., 25

J. S. H. Electronics Co., Ltd., 15, 25, 30, 35

Kip Electronics Corp., 29 Holly Place, P.O. Box 562, Stamford, Conn., 25, 30, cold cathode
See ad on this page
Tel: DAvis 5-1551

Westinghouse tube engineering... serving the nation through imagination





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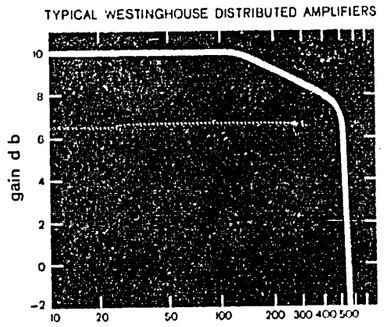

with Westinghouse distributed amplifiers

The new Westinghouse Match Box Tubes provide distributed amplifiers with response to 550 MC.

Match Box tubes surpass conventional tubes in high frequency performance and resistance to vibration. Tubes lie flat . . . no height problem . . . eliminates sockets, fits printed circuits.

Westinghouse Distributed Amplifiers can be designed with various frequency pass bands. They're especially suited for electronic counter-measure circuits and for high-speed, high-frequency oscilloscopes. We'd welcome the opportunity to design and build your Distributed Amplifiers.

CHARACTERISTICS WX3683

Heater 6.3 Volts	0.2 amperes
Plate current	8 milliamperes
Transconductance	5100 micromhos
Plate Voltage	180 volts

Write for complete information.

YOU CAN BE SURE...IF IT'S Westinghouse
Electronic Tube Division Elmira, N. Y.

For details, circle #583 on Reader Service Card

Directory II. Components

75. Tubes, Special Purpose.

Landsverk Electrometer Co., Calif., 5, 10

Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 25
See ads on pages 270, 301
Tel: TExas 0-7711

Litton Industries, Inc., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 35
See ad on pages 64-65
Tel: LYtell 1-8411

Litton Industries, Inc., Electron Tube Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 25
See ad on page 66
Tel: CRestview 4-7411

Machlett Labs., Inc., Conn., 35

Mackay Research Labs., Ariz., 15, 25, 35

Marconi's Wireless Telegraph Co., Ltd., N.Y., 25, 30

Mullard Overseas, Ltd., England, 5, 10, 15, 25, 30

Multi-Tron Lab., Inc., Ill., 10, 30, 35

National Electronics, Inc., 628 North St., Geneva, Ill., 25, Ignitrons
See ad on page 586
Tel: GEneva 7000

National Union Electric Corp., Ill., 30

North American Philips Co., Inc., Philips Labs., Div., N.Y., 10

Nuclear Corp. of America, Inc., Mo., 10, 15

Pek Labs., Inc., Calif., 35

Penta Laboratories, Inc., Calif., 25

Philips Electronics, Inc., N.Y., 10, 35

Radiation Research Corp., N.Y., 30

Radio Corporation of America, Electron Tube Div., Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 15, 25, 30
See ad on pages 53-55
Tel: HUmboldt 5-3900

Rank Cintel, Ltd., England, 5, 10, 15

Rauland Corp., Ill., 25, 35

Raytheon Co., Mass., 5, 10, 25, 30, 35

Resitron Labs., Inc., Calif., 35

Rogers Electronic Tubes & Components, Canada, 5, 10, 15, 25, 30, 35

Signalite, Inc., N.J., 30

Standard Telephones & Cables, Ltd., England, 25, 30

State Laboratories, Inc., 649 Broadway, New York 12, N.Y., 5, 15, 25, 30
See ad on this page
Tel: ORegon 7-8400

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 25
See ad on pages 23-25
Tel: JUdson 6-2424

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 30
See ad on page 502
Tel: REctor 2-6249

Thermosen, Inc., Conn., 30

Tracerlab, Inc., Mass., 5, 10

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 25, 30
See ad on pages 50-51
Tel: HUmboldt 2-4200

United Electronics Co., N.J., 25, 30

Universal Transistor Products, N.Y., 10, 15

Universal X-Ray Products, Inc., Ill., 35

Vacuum Tube Products Co., Inc., Calif., 25

Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio, 5, 10, 30
See ad on page 578
Tel: ENdicott 1-6200

Western Radiation Lab., Calif., 10, 15

Westinghouse Electric Corp., Electronic Tube Div., P.O. Box 284, Elmira, N.Y., 15, 25, 30
See ad on page 580
Tel: REgent 9-3611

Westinghouse Electric Corp., Pa., 35

Wiltec Electronics, Inc., Conn., 25, 30

76. Tubes, Transmitting.

5. ATR & TR types
10. Air-cooled power tubes
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25. Klystrons
30. Magnetrons
35. Monoscope tubes
40. Traveling wave
45. Water-cooled power tubes

American Elite, Inc., N.Y., 10, 40

American Radio Co., Inc., N.Y., 40, Carcinotron

Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 10, 25, 30, 40, 45
See ad on pages 38-39
Tel: WElls 1-6200

Applied Radiation Corp., Calif., 25

Bendix Aviation Corp., Ind., 25, 40

Bendix Aviation Corp., Mich., 25, 30, 40

Bendix Aviation Corp., Red Bank Div., Electron Tube Section, Route 35, Eatontown, N.J., 25, 30, 40
See ad on page 572
Tel: LIberty 2-2000

Bomac Laboratories, Inc., Salem Rd., Beverly, Mass., 5, 25, 45
See ad on page 172
Tel: WAlker 2-6900

Burnell & Co., Inc., [illegible], N.Y., 5, 10, 25, 30, 35, 40

Burroughs Corp., [illegible], England, 25, 30, 45

CBS Electronics Div., Columbia Broadcasting System, Inc., 200 Endicott St., Danvers, Mass., 10
See ad on page 576
Tel: SPring 4-[illegible]

Calvert Electronics, [illegible], N.Y., 5, 10, 20, 25, 30, 35, 40, 45

Canadian Marconi Co., Canada, 25, 40

Cathodeon Ltd., Meadowcroft, [illegible], England, 15, 20, 35, Vidicons

Central Electronic Mfg., Inc., N.Y., 5, 10, 45

DuMont Labs., Inc., Allen B., N.Y., 25

EMI Electronics Ltd., England, 25, 30

Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, Calif., 10, 25, 40, 45
See ad on pages 44-45
Tel: LYtell 1-1451

Electronic Enterprises, Inc., N.J., 10

Electrons, Inc., N.J., 10

Engineering Associates, Ohio, 25, 30

Ericsson Corp., L. M. (Stockholm 32, Sweden), 649 Broadway, New York 12, N.Y., 10, 25, 30, 40, 45
See ad on this page
Tel: ORegon 7-8400

Ferranti Electric, Inc., [illegible], N.Y., 5, 25, 30

Freeland Products Co., Inc., [illegible]

General Electric Co., Power Tube Dept., 1 River Rd., Bldg. 267, Schenectady 5, N.Y., 10, 20, 25, 30, 40, 45, Voltage tunable Magnetrons
See ad on page 584
Tel: FRanklin 4-2211

L M ERICSSON
SPECIAL PURPOSE TUBES
WRITE TO THE AUTHORIZED U.S. AGENTS:
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649 Broadway, New York 12, N.Y.
ORegon 7-8400

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A LEADER IN CREATIVE MICROWAVE TECHNOLOGY

REFLEX KLYSTRON OSCILLATORS
Self-Contained and External Cavity

5837	750-3000	160	50	325	10		0.675	1A
		40	15	300				
RK-5777	600-2350	160	100	400	0 to 5	.15	0.985	1A
6BM6	750-3000	160	50	325	300		0.650	1A
		40	10	300	10			
2K28A	1500-3750	140	95	300	300	±.15	0.650	1A
5981	1245-1460	100	40	225		±.05	0.455	2C
RK-5778	1800-4620	150	100	300	−5 to 5	.15	0.985	3A
6BL6	1600-4000	121	—	300			0.675	1A
	2000-4500	45	25	300	0			
	3600-5500	72	25	300				
5836	1600-5500	121	—	300	10		0.675	1A
		45	25					
5721	2000-12,000	150	50	1000	4 to 18	±.040	0.580	1A
		125	100	1000		±.025		3A
		40	20	1250		±.040		
726B	2883-3173	150	110	300		−0.1 to +0.1	0.440	2C
6236	3800-7600	125	90	1000	4 to 18	±.1	0.580	1A-3A
726-C	2700-2960	100	85	300		−.1 to +.05	0.440	2C
6043	2950-3275	175	150	300	300	±.15	0.650	1A
		50	25	250	250			
2K29	3400-3960	106	85	300		−.1 to +.05	0.440	2C
2K56	3840-4460	100	80	300		−.1 to +.05	0.440	2C
QK-381	4100-4450	4.5	3.0	250		−.10 to +.05	0.440	2C
2K22	4240-4910	115	75	300		−.1 to +.05	0.440	2C
		—	5	1250			0.575	1A
2K48	4000-11,000	—	5	1250				3A
		—	20	1250				
		—	20	1250				
6115A	5100-5900	100	70	300		−.10 to +.05	0.440	2C
QK-412	5100-5900	100	70	300		−.10 to +.10	0.440	2C
RK-6037	5120-5430	30	20	300	0 to −200		••	4C
QK-754	5925-6425	1400	1000	750		−0.2 to +0.2	0.650	2A
QK-549	5925-6450	120	100	300		−.1 to +.1	0.440	2C
QK-461	5925-6450	120	100	300		±0.1	0.440	2C
QK-404	5925-6450	120	100	300		−.10 to +.10	0.440	2C
5976	6200-7425	110	85	300		−.10 to +.10	0.440	2C
QK-531	6575-6875	110	85	300		−.1 to +.1	0.650	2A
QK-755	6575-7125	1400	1000	750		−0.2 to +0.2	0.440	2C
2K26	6250-7060	100	80	300		±0.1	0.440	2B
QK-422	7125-8125	150	100	300		0 to −.20		
kK-6390	6870-10,750	80	55	1250	2 to 16	±.025	0.580	1A
		80	55					3A
QK-532	6875-7125	110	85	300		−.1 to +.1	0.440	2C
QK-623	7125-7650	110	85	300		−.1 to +.1	0.440	2C
QK-758	7125-7750	1400	1000	750		−0.2 to +0.2	0.650	2A
QK-645	7125-8500	250	120	375			0.440	2B
QK-661	7125-8500	1400	1000	750		−0.1 to +0.1	0.675	2B
QK-752	7125-7750	110	90	300		−0.1 to +0.1	0.440	2A
QK-759	7750-7750	1400	1000	750		−0.2 to +0.2	0.650	2A
QK-753	7750-8400	110	90	300		−0.1 to +0.1	0.440	2A
QK-742	8500-9600	35	12	250		0.0 to −0.1	1.200	5B
2K25	8500-9660	32	20	300		0 to −.20	0.440	2C
		22	15					
2K45	8500-9660	32	20	300	−35 to +35		0.762	4C
6116	8500-9660	32	20	300	0 to −280		••	4C
6940	8500-9660	32	20	300	0 to −280		••	4C
RK6310	8500-10,000	70	50	300		0 to −.20	1.20	2B
RK6312	8500-10,000	70	50	300		0 to −.20	1.20	2B
RK6316	8500-10,000	70	50	300		0 to −.20	1.20	2B
QK-414	9660-10,250	20	15	300		−.10 to +.10	0.440	2C
QK448	12,000-13,800	85	50	300		±.05	0.675	2B
RK-6178	15,750-16,250	25	20	300		−.20 to −.60	0.675	2B
RK-6573	15,500-17,000	25	20	300		−.20 to −.60	0.675	2B
QK-306	18,000-22,000	40	10	1800	−20 to −100	−1.0	0.580	2B
*RK6253	18,000-22,000	40	10	1800	−20 to −100	−1.0	0.580	2B
2K31	22,000-25,000	40	10	1800	−20 to −100	−1.0	0.580	2B
*RK6254	22,000-25,000	40	10	1800	−20 to −100	−1.0	0.580	2B
QK-463	24,500-27,500	40	10	1800	−20 to −125	−1.0	0.580	2B
QK-289	§27,270-30,000	20	10	2250	−20 to −250	To be Specified	0.580	2B
QK-290	§29,700-33,520	20	10	2250	−20 to −250	To be Specified	0.580	2B
QK-291	§33,520-36,250	18	5	2250	−20 to −250	To be Specified	0.580	2B
QK-292	§35,100-39,700	10	5	2250	−20 to −200	To be Specified	0.580	2B
QK-293	34,900-42,800	5	—	2500	−20 to −200	To be Specified	0.580	2B
QK-294	40,000-51,800	5	—	3000	−20 to −200	To be Specified	0.580	2B
QK-295	•	To be Spec.		3500	−20 to −200	To be Specified	0.580	2B

†1 = Mechanical Inductive
2 = Mechanical Capacitive
3 = Non-Contacting Plunger
4 = Thermal Capacitive
5 = External Cavity

• 2 Tubes Necessary to Cover From 50,000 to 60,000 Mc

A = Coaxial Cable
B = Waveguide
C = Coaxial to Waveguide
*With UG/425/U Output Flange
§Typical Operating Range

••Klystron .470 Tuner .825

MAGNETRON OSCILLATORS

RK4J30	23.5	2.2	1220-1232	2	27.0	46.0	.0009	600.0	
RK5J26	23.5	2.2	1220-1350	3	27.5	46.0	.0009	400.0	
RK6317	2.5	85.0	1250-1350	3	53.0	50.0	.0025	1000.0	
QK327	8.25	78.0	2700-2850	3	61	115	.00072	3500	
RK5586	16.0	3.1	2700-2900	3	28.0	55.0	.0005	700.0	
RK6518	13.0	40.0	2700-3010	2	41.0	87.5	.0006	1500.0	
RK6410A	8.2	79.0	2750-2860	2	71.0	130.0	.0007	4500.0	
RK6406A	8.8	79.0	2850-2910	2	52.0	85.0	.0006	1750.0	
RK2J67	6.3	1.5	2795-2855	3	18.0	25.0	.001	150.0	
RK2J66	6.3	1.5	2845-2905	3	18.0	25.0	.001	150.0	
RK2J34	6.3	1.5	2700-2740	2	20.0	30.0	.001	285.0	
RK2J33	6.3	1.5	2740-2780	2	20.0	30.0	.001	285.0	
RK2J30	6.3	1.5	2860-2900	2	20.0	30.0	.001	285.0	
RK4J35	16.0	3.1	2700-2740	2	28.0	70.0	.0005	900.0	
RK4J34	16.0	3.1	2740-2780	2	28.0	70.0	.0005	900.0	
RK4J33	16.0	3.1	2780-2820	2	28.0	70.0	.0005	900.0	
RK4J32	16.0	3.1	2820-2860	2	28.0	70.0	.0005	900.0	
RK4J31	16.0	3.1	2860-2900	2	28.0	70.0	.0005	900.0	
RK5657	16.0	3.1	2900-3100	3	30.0	55.0	.0005	700.0	
RK2J70	6.3	1.25	3030-3110	2	7.0	8.0	.001	20.0	
RK2J71	6.3	1.25	3190-3201	2	47.0	50.0	.0014	700.0	
RK6402	8.3	43.0	3430-3570	3	31.0	60.0	.001	650.0	
RK6695	16.0	3.1	3430-3570	3		.10	.03	CW	.011
RK6177	6.3	0.6	4268-4350	4	36	60	.001	1000	
QK632	5.0	19.0	5250-5310	2	14.0	14.0	.001	75.0	
QK456	6.3	1.50	5360-5400	2	2.75	2.0	.002	800	
QK682	5.0	1.5	5400-5900	3	2.0	1.5	.003	400	
QK735	5.0	1.0	5400-5900	3	21.5	22.0	.001	175.0	
RK6344	11.0	11.0	5450-5825	3	24.5	24.0	.001	250.0	
QK662	5.0	5.0	5450-5825	3	36	60	.001	1000	
QK539	5.0	19.0	5450-5510	2	14.0	14.0	.001	45.0	
RK2J51A	6.3	1.0	8500-9600	3	28.0	25.0	.0008	200	
RK6249A	9.0	14.4	8500-9600	3	3.5	0.91	.045	1220	
RK6248	6.3	5.0	8700-8900	3	12.0	12.0	.001	40.0	
RK2J50	6.3	1.0	8750-8900	2	4.1	0.5	.0005	0.40	
RK6229J	5.0	.45	8900-9400	3	12.0	12.0	.001	40.0	
RK2J49	6.3	1.0	9000-9160	2	12.8	12.0	.001	40.0	
QK367	6.3	1.0	9015-9075	2	15.0	13.5	.001	75.0	
RK6967A	6.3	2.9	9205-9285	2	12.8	12.0	.001	40.0	
RK2J56A	6.3	1.0	9215-9275	2	1.4	0.9	.002	.06	
QK362A	5.0	.60	9300-9500	3	33	40	.00105	430	
QK172	6.0	30.0	9330-9420	2	12.8	12.0	.001	40.0	
RK2J55	6.3	1.0	9345-9405	2	27.5	30.0	.002	225.0	
RK6002	4.0	40.0	9230-9404	2	40	70	.000875	1000	
QK624	3.6	36.0	9340-9440	2	5.5	4.5	.002	7.0	
RK2J42	6.3	0.5	9345-9405	2	5.5	4.5	.002	7.0	
RK2J42H	6.3	0.5	9345-9405	2	12.0	12.0	.001	40.0	
RK730A	6.3	1.0	9345-9405	2	12.0	12.0	.001	40.0	
RK725A	6.3	1.0	9345-9405	2	24.0	12.0	.0025	70.0	
QK324	4.8	12.0	15850-16160	2	24.0	12.0	.0025	70.0	
QK702	4.8	12.0	15840-16160	3	24.0	12.0	.0025	70.0	
RK6841	4.0	10.5	16410-16625	2	16.5	14.0	.0009	45.0	

STORAGE TUBES

RK6835/QK464A	Storage Tube	Electric	Magnetic	Magnetic	600	Single
QK411A	Storage Tube	Electric	Electrostatic	Electrostatic	400	Single
QK703	Storage Tube	Electric	Magnetic	Magnetic or Electrostatic	1000	Control Dual
QK685	Storage Tube	Electric	Magnetic	Magnetic or Electrostatic	1000	Single
QK345	Simulator	Visual	Magnetic	Magnetic	—	Single
QK767	Simulator	Visual	Magnetic	Magnetic or Electrostatic	—	Single

BACKWARD WAVE OSCILLATORS

						Power Output mW				
QK691	2000-4000	150-1400	0-100	20-45	100	0	80-1000	63	13
					250	10			
QK528	3600-7200	170-1400	0-100	15-40	50	0	20-300	63	18
					150	5			
QK610	6700-11,400	250-1400	0-150	15-35	75	0	20-300	63	13
					250	6			

• Class 1 = Tunable CW
2 = Fixed Frequency-Pulsed
3 = Tunable-Pulsed
4 = CW Electro-Mech. Freq. Mod.
5 = Fixed Frequency-CW

One Source For All Your Requirements

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Also Available—A line of Backward Wave Oscillators, Traveling Wave Tubes, Amplitrons* Storage Tubes, and Other Special Types.

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Microwave and Power Tube Division
Waltham 54, Mass.

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3 SPECIFIC WAYS

in which "Proceedings of the I R E" serves the advertiser differently and more effectively than other publications.

1. Pre-Specification Selling

Because "Proceedings of the I R E" publishes basic research and engineering application articles it is closely studied by those design engineers who must "keep ahead of the market." Often, the research published leads the industry production by from two to six years! The alert engineer, who needs this amount of time for his own design applications and for tooling up and changing the production in his own factory, studies the "Proceedings of the I R E" carefully. Its articles keep him abreast with the changes that will inevitably come and make it possible for him to be ready for them. This is the time for you to sell the unknown engineer designing the never-dreamed-of-product "before it happens!" It is an insurance that you will be ahead of the market instead of behind it.

2. Personal Connection to the Individual

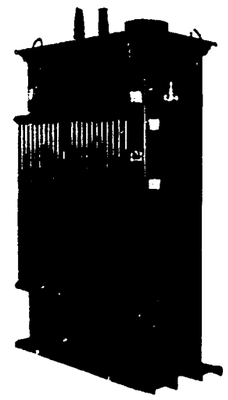
The Institute of Radio Engineers is an engineering society for individual engineers who must qualify on their own education, experience and engineering work. Thus, the magazine follows the reader as his private possession, wherever he goes. Wherever new engineering progress is developing, the work is done by individual engineers—and it is these men that must be sold! Only the engineer knows enough to specify and buy in a highly technical industry. Selling is a matter of reaching the minds of men because *a company cannot sign a purchase order.* Wherever radio engineering activity is the greatest, companies employ I R E members. An engineer moves into a new job in advance of production and with him goes "Proceedings of the I R E," with all the advertising you so urgently need to place where engineering activity is the greatest.

3. Economy

It is a specific purpose of the Insitute of Radio Engineers that its advertising rates should benefit and help the industry grow, by being economical. Part of the economy of a tax-free organization is thus passed on to advertisers in the form of low-cost advertising to a high-quality audience. The page rate per thousand engineers of "Proceedings of the I R E" is the lowest in the radio-electronic industry by deliberate intent. Thus, the Institute finds an extra way that it can help the firms that hire its engineers to gain new business at lower costs.

THE INSTITUTE OF RADIO ENGINEERS
ADVERTISING DEPARTMENT
72 W. 45th St.
New York 36, N.Y.

INDUSTRIAL SERVICE
PACKAGED POWER SUPPLIES



For use in applications where large amounts of DC output power is required. Input is usually 220 V. or 460 V., three phase (single phase types also available). Output is rectified DC which is completely isolated so that either side can be grounded. All units use new type WIDE AREA silicon rectifiers. No tubes or other delicate parts to replace or wear out. Forward resistance is very low, resulting in excellent voltage regulation. Special cell balance precautions guard against surge damage. Simply connect one of these units to the power lines and obtain direct current output. Variable voltage output is obtainable by adjusting input voltage. Standard models are listed below. Good delivery on other voltages and currents.

Model	Output Voltage	DC Current
100-100	100 Volts	100 Amps
100-1000	100 Volts	1000 Amps
500-50	500 Volts	50 Amps
500-500	500 Volts	500 Amps
1000-50	1000 Volts	50 Amps
1000-100	1000 Volts	100 Amps
3000-10	3000 Volts	10 Amps
3000-50	3000 Volts	50 Amps
5000-10	5000 Volts	10 Amps
5000-25	5000 Volts	25 Amps
10,000-2	10,000 Volts	2 Amps
10,000-5	10,000 Volts	5 Amps
20,000-2	20,000 Volts	2 Amps
20,000-5	20,000 Volts	5 Amps
30,000-2	30,000 Volts	2 Amps
30,000-5	30,000 Volts	5 Amps

PRECISE MEASUREMENTS COMPANY
Millbrook Lane • R.D. 1
Flemington, New Jersey
Tel: STate 2-2100

For other power supplies see our ad on page 500

For details, circle #774 on Reader Service Card

Directory II. Components

76. Tubes, Transmitting.

General Electrodynamics Corp., Tex., Vidicon
General Electronics, Inc., N.J., 10
Grimson Color, Inc., N.Y., Vidicon
Huggins Labs., Inc., Calif., 40
Hughes Aircraft Co., Hughes Products Div., Calif., 40
Industrial Tubes, Inc., Ill., 10
Intelex Systems, Inc., N.Y., 40
International Telephone & Telegraph Corp., ITT Components Division, 100 Kingsland Road, P.O. Box 412, Clifton, N.J., 10, 20, 40, 45
See ad on pages 148-149
Tel: NUtley 2-3600
J.S.H. Electronics Co., Calif., 5, 10, 15, 20, 25, 30, 35, 40, 45
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 10
See ads on pages 270, 301
Tel: TExas 0-7711
Litton Industries, Inc., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 5, 10, 25, 30, 35, 40, 45
See ad on pages 64-65
Tel: LYtell 1-8411
Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 5, 25, 30, 40
See ad on page 66
Tel: CRestview 4-7411
Machlett Labs., Inc., Conn., 10, 20, 45
Mackay Research Labs., Ariz., 30
Marconi Instruments, 111 Cedar Lane, Englewood, N.J., 40
See ad on page 318
Tel: LOwell 7-0607
Marconi's Wireless Telegraph Co., Ltd., N.Y., 10, 20, 25, 30, 35, 40, 45
Metco, Inc., Mass., 5, 25, 30, 40
Microwave Assoc., Inc., Mass., 5, 30
Microwave Electronics Corp., Calif., 40
Mullard Overseas Ltd., England, 10, 25, 30, 40, 45
National Electronics, Inc., 628 North St., Geneva, Ill., 45
See ad on page 586
Tel: GEneva 7000
North American Philips Co., Inc., Philips Labs., Div., N.Y., 25, 30, 40
Nuclear Corp., Central Electronics Mfg. Div., N.J., 5, 10, 45
Pek Labs., Inc., Calif., 10, 40, 45
Penta Laboratories, Inc., Calif., 10
Philco Corp., Govt. & Ind'l Div., Pa., 45
Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 25
See ad on pages 135-136
Tel: EXeter 2-4500
Radio Corp. of America, Defense Elec. Prods., N.J., 5, 10, 20, 30, 40, 45
Radio Corp. of America, Electron Tube Div., Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 10, 15, 20, 30, 35, 40, 45
See ad on pages 53-55
Tel: HUmboldt 5-3900
Rauland Corp., Ill., 20, 40
Raytheon Co., Mass., 10, 25, 30, 40, 45

GE Power TUBES

First Choice

FOR MILITARY AND COMMERCIAL APPLICATIONS

Pioneering research, precision manufacture and advanced testing, combined with forty years' design and application experience . . . these are the reasons why you should make General Electric Power Tubes your first choice for military and commercial applications.

- Klystrons
- Thyratrons
- Ignitrons
- Magnetrons
- Voltage-Tunable Magnetrons
- Metal-Ceramic Tetrodes
- Camera Pick-up Tubes
- Traveling-Wave Tubes
- Parallel-Plane Microwave Tubes
- High-Power Duplexers
- High-Power Waveguide Filters
- Special Purpose Tubes

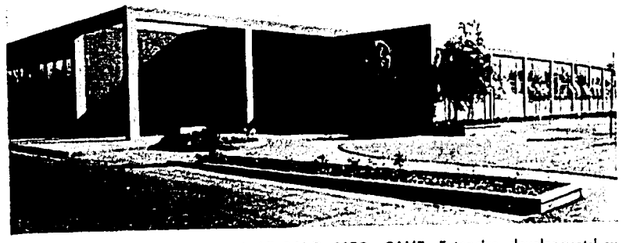
Contact your nearest General Electric power tube representative for availability, delivery and technical information on any of the above products. *Power Tube Department, General Electric Company, Schenectady 5, New York.*

EASTERN REGION
General Electric Company—Power Tube Sales
200 Main Avenue—Clifton, New Jersey
Phones: (Clifton) GRegory 3-6387
(In N.Y.C.) WIsconsin 7-4065, 6, 7, 8

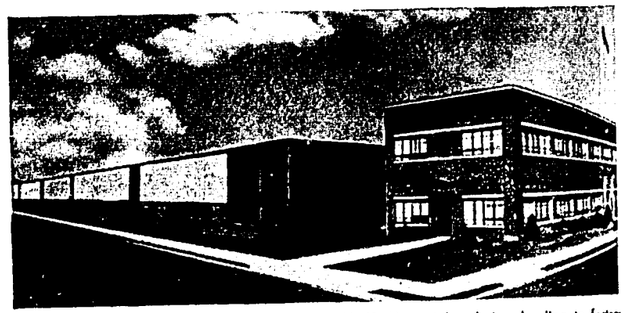
CENTRAL REGION
General Electric Company—Power Tube Sales
3800 North Milwaukee Ave.—Chicago 41, Ill.
Phone: SPring 7-1600

WESTERN REGION
General Electric Company—Power Tube Sales
11840 West Olympic Boulevard
Los Angeles 64, California
Phones: GRanite 9-7765; BRadshaw 2-8566

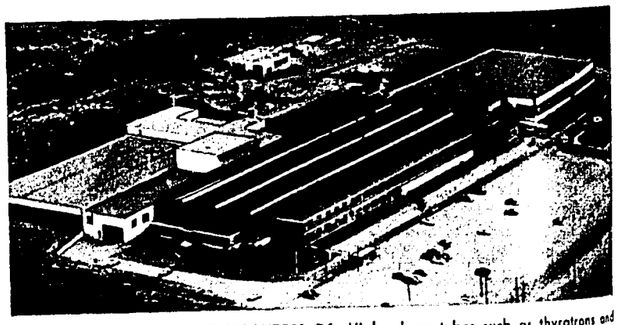
GOVERNMENT SALES
General Electric Company—Power Tube Sales
Building 267—Schenectady, New York
Phone: FRanklin 4-2211



G-E MICROWAVE LABORATORY AT PALO ALTO, CALIF. Extensive developmental programs covering microwave tubes and techniques are carried out in these modern facilities



G-E POWER TUBE PLANT AT SCHENECTADY, N. Y. Here, tube design leading to factory production is accomplished; here, also, are produced the larger, more complex products.



G-E POWER TUBE PLANT AT SCRANTON, PA. High-volume tubes such as thyratrons and parallel-plane tubes are precision-manufactured here in this 213,000-square-foot plant.

Progress Is Our Most Important Product

GENERAL ELECTRIC

9545-8481-21

Directory II. Components

76. Tubes, Transmitting.

Raytheon Co., Microwave and Power Tube Div., Waltham 54, Mass., 10, 25, 30, 40, 45, Amplitrons, Backward Wave Oscillators
See ad on page 582
Tel: TWinbrook 9-8400

Resitron Labs., Inc., Calif., 10, 45, Vidicon Camera

Rogers Electronic Tubes & Components, Canada, 5, 10, 15, 20, 25, 30, 35, 40, 45

Sperry Gyroscope Co. of Canada, Ltd., Canada, 25, 40

Sperry Rand Corp., Sperry Elect. Tube Div., Fla., 25, 40

Sperry Rand Corp., Sperry Gyroscope Div., Electron Tube Div., N.Y., 25, 40

Standard Telephones & Cables, Ltd., England, 10, 40, 45

State Laboratories, Inc., 649 Broadway, New York 12, N.Y., 10, 25, 30, 45
See ad on page 581
Tel: ORegon 7-8400

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5, 10, 20, 25, 30, 40
See ad on pages 23-25
Tel: JUdson 6-2424

Sylvania Electric Products, Inc., Special Tube Operations, 500 Evelyn Ave., Mountain View, Calif., 5, 25, 30, 40
See ad on pages 26-27
Tel: YOrkshire 8-6211

Sylvania Electric Products, Inc., Sylvania Electronic Systems Div., Mass., 5, 30, 40

Tung-Sol Electric, Inc., 1 Summer Ave., Newark 4, N.J., 10
See ad on pages 50-51
Tel: HUmboldt 2-4200

United Electronics Co., N.J., 10, 45

Varian Associates, Tube Div., 611 Hansen Way, Palo Alto 2-BG-59, Calif., 10, 25, 40, 45
See ad on pages 118-119
Tel: DAvenport 6-4000

Wave Particle Corp., Calif., 30, 40

Westinghouse Electric Corp., Electronic Tube Div., P.O. Box 284, Elmira, N.Y., 20, 25, 30, 40, 45
See ad on page 580
Tel: REgent 9-3611

Westrex Corp., N.Y., 10, 45

Tuning Coils: See class 43

Tuning forks: See class 31

77. Tuners.

5. AM tuners
10. FM tuners
15. Klystron
20. Microwave
25. TV tuners
30. UHF & VHF

Acoustical Mfg. Co., Ltd., England, 5, 10

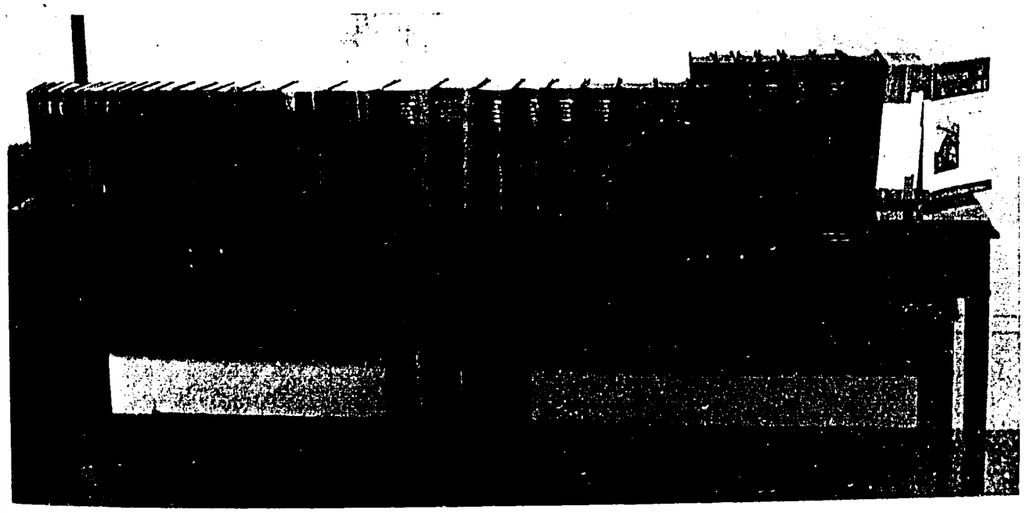
Aircom, Inc., 48 Cummington St., Boston, Mass., 15, 20
See ad on page 590
Tel: COpley 7-9115

Aircom, Inc., N.J., 15, 20

Airtronix Dev. Corp., N.Y., 5, 10

Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 20, 30
See ad on page 590
Tel: HAncock 6-2150

Be sure to consult the advertisements in this issue for complete information on products. Directory listings cannot tell you everything you want to know about a company's products. For example, the National Electronics, Inc., advertisement on page 586 gives complete specifications on their entire line of electron tubes.



FORTY-SEVEN YEARS OF RADIO-ELECTRONIC HISTORY

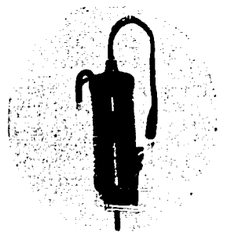
are recorded in "Proceedings of the IRE." The photo above shows the issues from 1912 through 1947—twelve years of rapid advances and earth-shaking accomplishments are not even included in this panorama of progress! Since publication of its first issue, "Proceedings of the IRE" has paced and pioneered in every field of radio from the first vacuum tube through today's giant computers and tiny transistors. The engineers who write, read and use this magazine have transformed the world in forty-seven short years! Is it any wonder that so many advertisers believe these engineers must learn about their products in the fact-packed advertising pages of "Proceedings of the IRE"?

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

NATIONAL ELECTRONICS, INC.

GENEVA • ILLINOIS • U.S.A.

ELECTRONIC TUBES FOR INDUSTRY



NL-1051 IGNITRON

NL-1052 IGNITRON

NL-3C23 THYRATRON

NL-740 THYRATRON

NL-635 RECTIFIER

WRITE FOR INDIVIDUAL TUBE DATA SHEETS FOR FULL DETAILS.

IGNITRONS

TYPE NUMBER	VOLTS	MAXIMUM RATINGS				TYPE OF COOLING
		Maximum Demand	Corresponding Current DC-Amps	Maximum Current DC-Amps	Corresponding Demand	
NL-1001	250-600	150 Kva	4.9	9.0	50 Kva	Convection
NL-1005	250-600	600 Kva	30.2	56	200 Kva	Forced air
NL-1011	250-600	600 Kva	30.2	56	200 Kva	Water
NL-1012	250-600	1200 Kva	75.6	140	400 Kva	Water
NL-1013	250-600	2400 Kva	192.	355	800 Kva	Water
NL-1014	250-600	4800 Kva	486.	900	1600 Kva	Water
NL-1022	1500 peak	1200 peak	16	56	336 peak	Water
NL-1051	250-600	600 Kva	30.2	56	200 Kva	Water
NL-1052	250-600	1200 Kva	75.6	140	400 Kva	Water
NL-1053	250-600	2400 Kva	192	355	800 Kva	Water
NL-1054	250-600	4800 Kva	486	900	1600 Kva	Water
NL-5550	250-600	300 Kva	12.1	22.4	100 Kva	Water clamp

THYRATRONS

TYPE NUMBER	GAS FILLING	DC OUTPUT AMPS.	PEAK RATING AMPS.	PEAK INVERSE VOLTS	FILAMENT VOLTS	FILAMENT AMPS	TYPE OF COOLING
NL-3C23	Arg & Merc.	1.5	6	1250	2.5	7	Convection
NL-393A	Arg & Merc.	1.5	6	1250	2.5	7	Convection
NL-632B	Mercury	2.5	30	1500	5.0	5	Convection
NL-710L	Arg & Merc.	2.5	30	1500	2.5	9	Convection
NL-710/6011	Arg & Merc.	2.5	30	1500	2.5	9	Convection
NL-714	Arg & Merc.	1	3	1250	2.5	5	Convection
NL-715/5557	Mercury	1	3	5000	2.5	5	Convection
NL-716	Arg & Merc.	1	8	1250	2.5	6.3	Convection
NL-720,L	Arg & Merc.	2.5	30	1500	2.5	9	Convection
NL-732	Arg & Merc.	30	225	1500	2.5	55	Convection
NL-740,L,P	Arg & Merc.	4	50	1500	2.5	16	Convection
NL-760,L,P	Arg & Merc.	6.4	77	1500	2.5	21	Convection
NL-5559/FG57	Mercury	2.5	15	1000	5.0	4.6	Convection
NL-5560/FG95	Mercury	2.5	15	1000	5.0	4.6	Convection
NL-5632/C3J	Xenon	2.5	30	1250	2.5	9	Convection
NL-5665/C16J	Xenon	18.0	160	1250	2.5	31	Convection
NL-5684/C3J/1	Xenon	2.5	30	1250	2.5	9	Convection
NL-6014/C1K	Xenon	1	8	1250	2.5	6.3	Convection

HALF WAVE RECTIFIERS

NL-615	Mercury	2.5	10	2000	2.5	7	Convection
NL-617	Mercury	5	20	1000	2	12	Convection
NL-618,L,P	Xenon	6.4	40	900	2.5	18	Convection
NL-619	Mercury	6	20	300	2	12	Convection
NL-623	Mercury	15	45	500	2.5	20	Convection
NL-635,L,P	Arg & Merc.	6.4	77	1000	2.5	18	Convection
NL-643	Mercury	15	90	700	2.5	23	Convection
NL-649/5834	Mercury	2	10	900	2.5	7	Convection
NL-653/5835	Mercury	3	12	900	2.5	10	Convection
NL-5558/FG32	Mercury	2.5	15	5000	5	4.5	Convection

FULL WAVE RECTIFIERS

NL-604,L	Arg & Merc.	2.5	10	900	2.5	11.5	Convection
NL-606,L	Arg & Merc.	6.4	25.6	900	2.5	17	Convection

For details, circle #587 on Reader Service Card

Directory II. Components

77. Tuners.

Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 10
See ad on page 178
Tel: HAymarket 1-6800

Alto Scientific Co., Inc., Calif., 10, 30
Amelco, Inc., Calif., 5, 10, 20, 30
American Communications Corp., N.Y., 5
American Electronics Co., N.Y., 5
American Elite, Inc., N.Y., 10
Ampex Audio, Inc., Calif., 5, 10
Arkay, Inc., N.Y., 5, 10

Arra Corp., (Antenna & Radome Research Assoc.), 1 Bond St., Westbury, L.I., N.Y., 20
See ad on page 389
Tel: EDgewood 4-8770

Audio-Video Corp., N.Y., 5, 10
Beam-Echo, Ltd., England, 5, 10
Bendix Aviation Corp., Jones Elect. Co., M. C., Conn., 30

Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 20
See ad on page 170
Tel: LOwell 3-9511

Blonder-Tongue Labs., Inc., N.J., 5, 10, 30
British Industries Corp., Leak Div., N.Y., 10
British Thomson-Houston Co., Ltd., England, 20
Browning Labs., Inc., N.H., 10

Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 20
See ad on page 592
Tel: STillwell 6-1706

Calbest Electronics Co., Calif., 5, 10
Canadian Westinghouse Co., Ltd., Elect. Div., Canada, 30
Channel Master Corp., N.Y., 5, 10
Conrac, Inc., Calif., 25

Corning Glass Works, 550 High St., Bradford, Pa., 10, 30
See ads on pages 400, 527
Tel: 2-4571

Demornay-Bonardi, 780 S. Arroyo Parkway, Pasadena, Calif., 20
See ad on pages 120-121
Tel: SYcamore 2-4142

Diamond Antenna & Microwave Corp., Mass., 15, 20
Dictograph Products, Inc., N.Y., 5, 10
Dominion Electrohome Industries, Ltd., Canada, 5, 10

Douglas Microwave Co., Inc., Dept. R-9, 252 E. Third St., Mt. Vernon, N.Y., 20
See ad on pages 40-41
Tel: MOunt Vernon 8-6900

Dunn Engrg. Assoc., Inc., Mass., 20
Dynamic Electronics-New York, Inc., N.Y., 5, 10, 25, 30
E.M.I. Electronics, Ltd., England, 15
Electro-Voice, Inc., Radio Mfg. Engrg. Div., Ill., 10, 30
Electronic Applications, Inc., Conn., 10
Electronic Communications, Inc., Fla., 20, 30

Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y., 5, 10
See ad on page 295
Tel: STillwell 6-8700

Emerson Radio & Phonograph Corp., Md., 30

Empire Devices Products Corp., 37 Prospect St., Amsterdam, N.Y., 15, 20, 30
See ad on page 91
Tel: VIctor 2-8400

Engineering Associates, Ohio, 15, 20, 25, 30

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 5, 10
See ad on pages 110-111
Tel: GLendale 6-8592

Espey Mfg. Co., Saratoga Industries Div., N.Y., 5, 10, 20
Ferrotran Electronics Co., N.Y., 5
Fisher Radio Corp., N.Y., 5, 10
General Electric Co., Radio Receiver Dept., Conn., 5, 10
General Electronic Labs., Inc., Mass., 30
General Instrument Corp., F. W. Sickles Div., Mass., 5, 10, 25, 30
Gombos Co., Inc., John, N.J., 20

Gorham Mfg. Co., Electronics Div., 333 Adelaide Ave., Providence 7, R.I., 15, 20, 30
See ad on page 593
Tel: WIlliams 1-1000

Granco Products, Inc., N.Y., 10

Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill., 20
See ad on page 204
Tel: VAn Buren 6-6300

Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 5, 10
See ad on page 328
Tel: YUkon 3-3961

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif., 20
See ad on pages 3-18
Tel: DAvenport 5-4451

I. T. & T. Corp., Industrial Prods. Div., Calif., 25

JFD Electronics Corp., 1462 62nd St., Brooklyn 4, N.Y., 30
See ad on page 406
Tel: DEwey 1-1000

J-V-M Microwave Co., Ill., 20, 30
Karg Labs., Inc., Conn., 10
Knight Electronics, Ill., 5, 10

LEL, Inc., 384 Oak St., Copiague, L.I., N.Y., 30
See ad on page 372
Tel: AMityville 4-2200

Lambda-Pacific Engr., Inc., Calif., 20
Ling Systems, Inc., Calif., 20
Litton Industries, Airtron, Inc. Div., N.J., 20

Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 15, 20
See ad on page 66
Tel: CRestwood 4-7411

M P Engineering Co., Conn., 5, 10
Mallory & Co., Inc., P. R., Ind., 25, 30
Marsland Engrg., Ltd., Canada, 25
McIntosh Laboratory, Inc., N.Y., 5, 10
Meridian Metalcraft, Inc., Calif., 20
Meteo, Inc., Mass., 15, 20
Microtronics, Inc., N.J., 30
Microwave Assoc., Inc., Mass., 20
Miller Co., J. W., Calif., 5, 10
Motorola, Inc., Ariz., 20, 30

Narda Microwave Corp., Dept. IRED-3, 118-160 Herricks Rd., Mineola, L.I., N.Y., 20
See ad on pages 141-144
Tel: Pioneer 6-4650

Newcomb Audio Products Co., Calif., 5, 10

Oak Mfg. Co., Dept. R, 1260 N. Clybourn Ave., Chicago 10, Ill., 25, 30
See ad on pages 86-87
Tel: MOhawk 4-2222

Pilot Radio Corp., N.Y., 5, 10

Pitometer Log Corp., 237 Lafayette St., New York 12, N.Y., 20, 30
See ad on page 323
Tel: CAnal 6-7250

Polarad Electronics Corp., 43-20 34th St., Long Island City 1, N.Y., 15, 20
See ad on pages 135-136
Tel: EXeter 2-4500

Polydoroff & Assoc., D.C., 5, 10, 25, 30
Polytechnic Research & Dev. Co., Inc., N.Y., 15, 20
Precision Radiation Instruments, Inc., Calif., 5, 10

Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., 20
See ad on page 390
Tel: WEstmore 9-8900

Radar Measurements Corp., 190 Duffy Ave., Hicksville, N.Y., 20
See ad on page 322
Tel: OVerbrook 1-5600

Radio Components, Ltd., Canada, 25
Rhein Sound System, Inc., Conn., 5, 10
Saratoga Industries, N.Y., 5, 10
Sargent-Rayment Co., Calif., 5, 10
Siegler Corp., Bogen-Presto Co. Div., N.J., 5, 10
Sivers Lab., Sweden, 20
Specialty Engrn. & Electrn. Co., N.Y., 30
Sperry Rand Corp., Sperry Elect. Lab. Div., Fla., 20
Sperry Rand Corp., Sperry Gyroscope Div., Electr. Tube Div., N.Y., 15
Sperry Rand Corp., Sperry Microwave Electronics Co. Div., Fla., 20
Standard Coil Products Co., Inc., Calif., 25, 30
Standard Coil Products Co., Inc., Ill., 25, 30
Standard Coil Products, Ltd., Canada, 10, 25, 30
Sterling Precision Corp., 17 Mattnecock Ave., Port Washington, N.Y., 20
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Stromberg-Carlson Div., General Dynamics Corp., N.Y., 5, 10
Systems, Inc., Fla., 15, 20

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244.

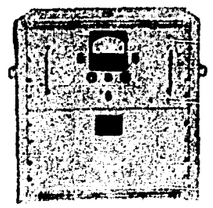
STABILINE

Automatic

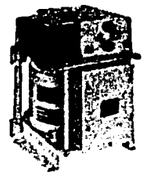
VOLTAGE REGULATORS

with rated outputs from

0.25 to 100 KVA



TYPE EMT4115



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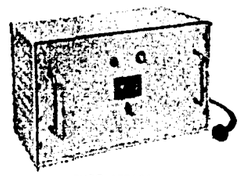
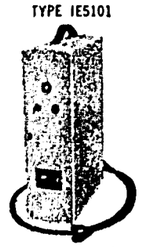
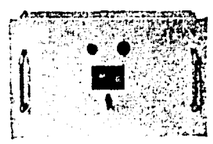


TYPE IE5101

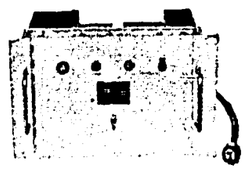
TYPE IE5102R



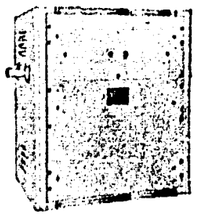
TYPE IET51002



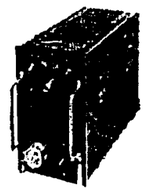
TYPE IET5101R



TYPE TM7101R



TYPE TM7105



TYPES IEH5101 and TMH7101

TYPE IEH5101R

STABILINE automatic voltage regulators deliver a constant output voltage regardless of variations in input voltage or changes in load current. Each is a precision built unit subject to the most rigid manufacturing specifications, inspected at every stage of manufacture, checked and rechecked to assure published performance characteristics. Several series are available to meet the particular requirements of any application.

EMT SERIES
Electro Mechanical Transistorized

Consist of POWERSTAT variable transformer, detector circuit, auxiliary transformer. Highly efficient, correct faster than most automatic voltage regulators. Maintain constant voltage to loads up to 100 KVA without waveform distortion. Control circuit is completely transistorized.

IE SERIES
Instantaneous Electronic

Completely electronic with no moving parts. Hold output voltage to within ±0.1 percent for wide line variations and within ±0.15 percent for any load current change or load power factor change from .5 lagging to unity. Waveform distortion never exceeds 3%.

IET SERIES
Instantaneous Electronic Transistorized

Feature a transistorized circuit. Output voltage remains within a 0.5 volt bandwidth for any and all variations in line voltage, load current and load power factor (0.25 volt bandwidth for input voltage changes only; 0.25 volt bandwidth for load current and power factor changes from lagging 0.5 to unity).

TM SERIES
Tubeless Magnetic

Have no tubes, transistors or moving parts. For unattended locations or where maintenance is impossible over long time periods. Response time for ordinary line and/or load changes is within ½ second; accuracy is within a 1.0 volt bandwidth.

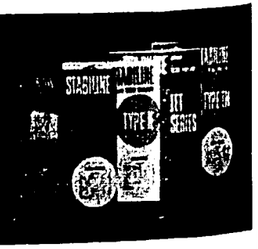
STABILINES
for High Frequency Applications

Meet the light weight and small size requirements for 400 cycle use. Built to meet military specifications.

THE SUPERIOR ELECTRIC COMPANY

590 Tripp Avenue, Bristol, Connecticut

Write for complete STABILINE Bulletin 416



For details, circle #588 on Reader Service Card

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77. Tuners.

Tapetone, Inc., Mass., 30
Tarzian, Inc., Sarkes, Ind., 25, 30
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Telectro Industries Corp., N.Y., 5, 10, 15
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Trutone Electronics, Inc., Calif., 5, 10
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Victor R.F. & Microwave Co., Mass., 15, 20
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Turntables: See class 32

Vacuum tube parts: See class 99

Vacuum tube rectifiers: See class 65

Vacuum tube voltmeters: See class 12

Vaccum tubes, receiving: See class 74

Vacuum tubes, special purpose: See class 75

Vacuum tubes, transmitting: See class 76

78. Vibration Controls.

5. Vibration & shock mounts
10. Isolation pads

American Latex Products Corp., Calif., 5
Barry Controls, Inc., Mass., 5, 10
Boston Felt Co., Mass., 5, 10
Ehrenpreis, Consulting Engrg., David, N.Y., 5, 10
Federal Shock Mount Corp., Div. Korfund Co., Inc., N.Y., 5, 10
Finn & Co., Inc., T. R., N.J., 5, 10
Fisher Scientific Co., N.Y., 10
General Cable Corp., Metal Textile Corp. Div., N.J., 10
Geotechnical Corp., Tex., 10
Johns-Manville, N.Y., 10
Litton Industries, Md. Div., Md., 5, 10
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Robinson Technical Prods., Inc., N.J., 5, 10
Technical Wire Products, Inc., N.J., 10
Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 5
See ad on page 464
Tel: LAsall 7-8400
Wayne Kerr Corp., 1633 Race St., Philadelphia 3, Pa., 5
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Tel: GArfield 5-2844

Vibrators: See class 45

Voltage converters: See class 45

Voltage regulated power supplies: See class 61

Voltage regulating vacuum tubes: See class 75

79. Voltage Regulators.

5. Automatic
10. Manually operated
15. Varistors

ACF Industries, Inc., Avion Div., N.J., 5
Acme Electric Corp., 44 Water St., Cuba, N.Y., 5, 10
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Aerolux Light Corp., N.Y., 5
Amelco, Inc., Calif., 5
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Applegate & Co., C. J., 1840 24th St., Boulder, Colo., 5
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Tel: HIllcrest 2-8750
Armour Electronics, Calif., 5, 10
Beckman Instruments, Inc., Systems Div., Calif., 5
Bendix Aviation Corp., Ind., 5
Bergen Laboratories, Inc., 247 Crooks Ave., Clifton, N.J., 5
See ad on page 471
Tel: GRegory 3-7800
British Thomson-Houston Co., Ltd., England, 5
CBC Electronics Co., Pa., 5
Canadian Research Institute, Canada, 5, 15
Carborundum Co., Globar Plant, N.Y., 15
Carborundum Co., Refractories Div., N.J., 15
Central Transformer Co., Ill., 5
Chicago Standard Transformer Corp., 3501 W. Addison St., Chicago 18, Ill., 5, 10
See ad on page 563
Tel: INdependence 3-7400

79. Voltage Regulators.

Curtiss-Wright Corp., Electronics Div., West Caldwell, N.J., 5
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Tel: GEneva 8-4000
Deltron, Inc., Pa., 5, 10
Donner Scientific Co., Calif., 5
Electric Auto Lite Co., Ohio, 5
Electric Machinery Mfg. Co., Minn., 5
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Espey Mfg. Co., Saratoga Industries Div., N.Y., 5
Ferrotran Electronics Co., N.Y., 5
Fidelity Instrument Corp., Pa., 5
Fisher Scientific Co., Pa., 10
Gates Radio Co., Ill., 5
General Electric Co., Ind., 5
General Electric Co., Apparatus Sales Div., N.Y., 5, 10
General Electric Co., Magnetic Materials Section, Mich., 15
General Radio Co., West Concord, Mass., 5, 10
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Tel: EMerson 9-4400
Green Rectifier Co., N.J., 5
Hammond Mfg. Co., Ltd., Canada, 10
Hoffman Electronics Corp., Semiconductor Div., 930 Pitner Ave., Evanston, Ill., 5, 15
See ad on page 226
Tel: UNiversity 9-9850
International Rectifier Corp., 233 Kansas St., El Segundo, Calif., 5, Zener Diode
See ad on pages 42-43
Tel: ORegon 8-6281
International Telephone & Telegraph Corp., ITT Components Division, 100 Kingsland Rd., P.O. Box 412, Clifton, N.J., 15
See ad on pages 148-149
Tel: NUtley 2-3600
Jack & Heintz, Inc., Ohio, 5
Kaiser Electronics, Inc., N.J., 5
Kenyon Transformer Co., Inc., N.J., 5
Kepco, Inc., 131-38 Sanford Ave., Flushing 55, N.Y., 5
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Tel: INdependence 1-7000
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Lindberg Engineering Co., Ill., 5
Magnetic Amplifiers, Inc., 632 Linton Ave., New York 55, N.Y., 5, 10
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Tel: CYpress 2-6610
Magnetic Controls Co., Minn., 5
Marstan Electronics Corp., N.Y., 5
Matthew Labs., N.Y., 5
Microtran Co., Inc., 145 E. Mineola Ave., Valley Stream, N.Y., 10
See ad on page 566
Tel: LOcust 1-6050
Mid-Eastern Electronics, Inc., 32 Commerce St., Springfield, N.J., 5
See ad on page 494
Tel: DRexel 6-7130
National Electric Controller Co., Ill., 10

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

From the AMCI Catalogue

AUTOMATIC IMPEDANCE PLOTTERS

- *Continuous impedance display with frequency*
- *Available in portable and rack-mounted units*

Type	Frequency Range (mc)	Line Size
12	2.5-250	Type N
11-Q	30-400	Type N
11-PS	180-1100	Type N

SLOTTED LINES

TYPE 1026-4

- *Residual swr under 1.010*
- *Rated error in detected signal under 1.005*
- *Available with a wide variety of tapered reducers*

Type	Frequency Range (mc)	Impedance (ohms)
1026-13	50-3000	50 or 75
1026-8	75-3000	50 or 75
1026-6	100-3000	50 or 75
1026-4	150-3000	50 or 75
1026-2	300-3000	50 or 75

COAXIAL SWITCHES

TYPE 1038

- *High power ratings; swr under 1.06*
- *Pressurized*
- *Motor-driven and manually operated models*

Type	Frequency Range (mc)	Line Size
1038	0-450	6⅛"
1136	0-500	3⅛"
Very high peak power models for radar applications		
1038-HV	0-450	6⅛"
1136-HV	0-500	3⅛"

INSTRUMENT LOADS

TYPE 1108B

- *High stability; very low swr*
- *Nearly all transmission line sizes*

Type	Frequency Range (mc)	Line Size	Max SWR
1108B	0-1100	Type N	1.02
2120	0-1000	⅞"	1.03
1112	0-1000	1⅝"	1.03
1110	0-650	3⅛"	1.03

HYBRIDS

TYPE 1104

- *Very broad band*
- *Very low residual unbalance*

Type	Frequency Range (mc)	Max. SWR	Residual Unbalance (db)
1027-K	60-120	1.4	−50
1027-L	120-240	1.4	−50
1027-M	240-480	1.5	−50
1027-N	480-960	1.6	−50
1098	960-1600	1.6	−40
1102	1600-2400	1.5	−40
1104	2400-3600	1.5	−34
1100-K	60-120	1.4	−55
1100-L	120-240	1.4	−55
1100-M	240-480	1.5	−55
1100-N	480-960	1.6	−55
1099-N	800-960	1.2	−50
1099-O	975-1175	1.2	−50
1024	TV Channels 2-13	1.05	−50

OTHER PRODUCTS

TAPERED REDUCERS
LINE STRETCHERS
DIPLEXING FILTERS
VOR ANTENNAS
TV BROADCASTING ANTENNAS — directional and omnidirectional
ADJUSTABLE MATCHING NETWORKS
IMPEDANCE STANDARD LINES

ANTENNA SYSTEMS — COMPONENTS — AIR NAVIGATION AIDS — INSTRUMENTS

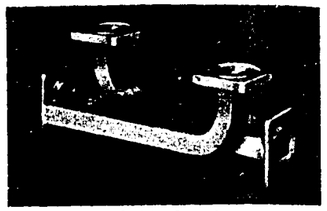
AMCI **ALFORD** Manufacturing Company
299 ATLANTIC AVE BOSTON MASS

For details, circle #589 on Reader Service Card

MICROWAVE COMPONENTS

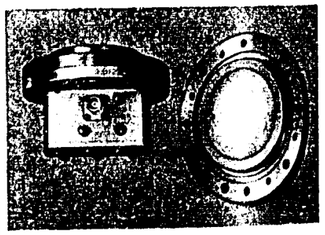
Series and Shunt Tees
Hybrid Tees
Precision Bends
Coax-Waveguide Adapters
Straight Sections
Twists
Tapered Transitions
Waveguide Stands

MICROWAVE TEST EQUIPMENT



Cross-Guide Couplers
High-directivity Couplers
Crystal Mounts
Bolometer Mounts
Attenuators
Fixed Loads
Sliding Loads
Sliding-screw Tuners
Sliding Shorts
E-H Tuners
Double Stub Tuners
Sliding-line Phase Shifters
Hybrid Phase Shifters
Dielectric Phase Shifters

ANTENNAS



Missile Beacon Antennas
Missile Telemetering Antennas
Gain Standard Horns
Gain Standard Dipoles
Helix Antennas
Horns

MICROWAVE INSTRUMENTS

Klystron Supplies
VSWR Amplifier
Power Meter
Crystal Calibrator

AIRCOM INCORPORATED
48 CUMMINGTON ST., BOSTON, MASS

For details, circle #590 on Reader Service Card

Directory II. Components

79. Voltage Regulators.

Nichols, Ltd., R. H., Canada, 5
North Electric Co., N.Y., 5, 15
North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, L.I., N.Y., 5
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Tel: PIoneer 7-0555
Ohmite Mfg. Co., 3692 Howard St., Skokie, Ill., 10
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Tel: ORchard 5-2600
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 5, 10
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Tel: WOrth 6-0380
Perkin Engineering Corp., Calif., 5, 10, 15
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Philips Electronics, Inc., N.Y., 5
Power Designs, Inc., 1700 Shames Dr., Westbury, N.Y., 5
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Power Sources, Inc., Northwest Industrial Park, South Ave., Burlington, Mass., 5
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Tel: BRowning 2-3610
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Radio Engrg. Labs., Inc., N.Y., 5, 10
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Raytheon Co., Mass., 5
Regulator Equipment Corp., N.J., 5
Saratoga Industries, N.Y., 5
Sel-Rex Corp., N.J., 5, 10
Servo-Tek Products Co., Inc., 1086 Goffe Rd., Hawthorne, N.J., 5
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Tel: HAwthorne 7-3100
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., 5
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Tel: BIshop 2-1414
Specialty Engrn. & Electrn. Co., N.Y., 5
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Tel: POrt Washington 7-7200
Superior Electric Co., 590 Tripp Ave., Bristol, Conn., 5
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Tel: LUdlow 2-9561
Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 5, 10, 15
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Tel: REctor 2-6249
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Tel-Instrument Electronics Corp., N.J., 5
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Topping Electronics, Ltd., Canada, 5, Transistor
Torwico Electronics, Inc., 1090 Morris Ave., Union, N.J., 5
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Tel: ELizabeth 4-5650
Transitron Electronic Corp., 168-182 Albion St., Wakefield, Mass., Silicon
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Tel: CRystal 9-4500
Universal Transistor Prods., N.Y., 5, 10
Vickers, Inc., Electric Products Div., Mo., 5
Victory Engineering Corp., 114 Springfield Rd., Union, N.J., 15
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Tel: MUrdock 8-7150
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Wickes Engineering & Construction Co., N.J., 5

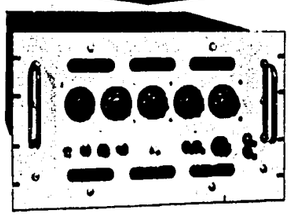
Voltmeters: See class 56

Voltmeters, vacuum tube: See class 12

Washers: See class 87

Wattmeters: See class 56

NORTH HILLS'



CURRENT GOVERNOR
Model CS-11
for *Constant Current*

- Precision Current Source
- Gyro Torquer Supply
- Transistor and Diode Tester

High Accuracy · Excellent Stability · Programmable

For testing and measurement of gyros, transistors, diodes, clutches, solenoids, meters, other current sensitive devices.

- Current Range is 1μa to 100 ma with 5 decades — digital in-line readout —
- Regulation and stability 0.002% —
- Accuracy 0.02%

In use by leading companies for gyro torquer supply, transistor avalanche test, diode PIV test, clutch testing, calibration.

Literature describing this and other constant current sources from 0.1μa to 30 amp. may be obtained from

nh NORTH HILLS ELECTRIC COMPANY, INC
402 SAGAMORE AVE., MINEOLA, N.Y. Pioneer 7-0555

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80. Waveguides & Accessories.

3. Cavities
5. Couplings
10. Crystal-detectors
15. Crystal mounts
20. Directional couplers
25. Duplexers
30. Flexible waveguides
35. Horns
40. Hybrid junctions
43. Isolators
45. Multipliers
47. Phase Shifters
50. Probes
55. Rigid waveguides
60. Rotary Joints
65. Sampling lines, reflectors, etc.
70. Switches
75. Terminations
80. Transmission lines
82. Unfinished castings

ACF Industries, Inc., Arnold Div., N.J., 25
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Ad-Yu Electronics Lab., Inc., 249 Terhune Ave., Passaic, N.J., 47
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Tel: GRegory 2-5622
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Aircom, Inc., 48 Cummington St., Boston, Mass., 3, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80
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Airflyte Electronics Co., 540 Ave. A, Bayonne, N.J., 60, 70
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Tel: HEmlock 6-2230
Alford Mfg. Co., 299 Atlantic Ave., Boston 10, Mass., 40
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Amphenol-Borg Electronics Corp., Industrial Products Danbury Kurman Div., Conn., 15, 20, 40, 55
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Andrew Corp., Ill., 5, 30, 35, 47, [illegible]
Applied Radiation Corp., Calif., 5
Applied Research, Inc., 70 S. Bayles Ave., Port Washington, N.Y., 75, Multicouplers
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Tel: POrt Washington 7-8707
Arra Corp., (Antenna & Radome Research Assoc.), 1 Bond St., Westbury, L.I., N.Y., 5, 10, 15, 20, 25, 35, 40, 43, 47, 55, 65, 75, 80
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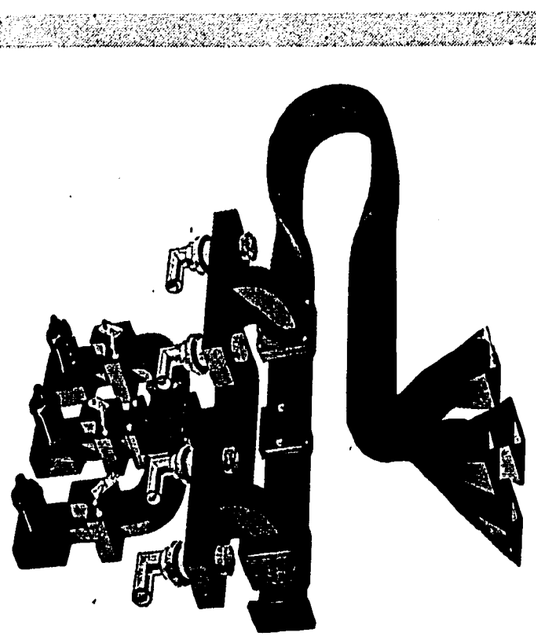
Tel: EDgewood 4-8770
Atomitron, Inc., N.Y., 3, 5, 10, 15, 20, 25, 30, 35, 40, 43, 45, 50, 55, 60, 65, 70, 75, 80

SUPPOSE YOU DREAMED UP ONE LIKE THIS?



It does happen, you know . . . an inspired twist, a new application . . . a microwave component that seems impossible to produce.

Yet, so many fine ideas lie dormant . . . never leave the design board for want of production know-how, like the microwave assembly below. Luckily, in this case, the illustration is only an artist's conception. But suppose you dreamed it up and it had to be produced, with all its complicated bends, exacting tolerances, specialized finishes.

That's where the many years of unique production experience and the unusual facilities of Budd Stanley could help you in so many ways.

For we at Budd Stanley are manufacturing specialists in microwave components only. We constantly tackle the seemingly impossible design and engineer new production methods of our own to accomplish its manufacture . . . exactly as you specified it.

So, if you are designing or wish to specify a component that seems difficult to produce . . . write, phone or wire us. We'll be glad to lend our know-how to your problem.

BUDD · STANLEY CO., INC. *43-01 22nd Street · Long Island City 1, N. Y.*

Tel. STillwell 6-1706

Cable address: "BUDDSTAN"

specialists in microwave application

For details, circle #592 on Reader Service Card

Directory II. Components

80. Waveguides & Accessories.

Avionics, Ltd., Canada, 10, 20, 25, 75
B. J. Electronics, Borg-Warner Corp., Calif., 40
Babcock Relays, Inc., Calif., 3, 25, 35, 40, 55, 80
Bean & Co., Morris, Ohio, 82
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Bomac Laboratories, Inc., Salem Rd., Beverly, Mass., 3, 25, 40
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Tel: WAlker 2-6000
British Thomson-Houston Co., Ltd., England, 3, 5, 10, 15, 20, 35, 40, 43, 47, 50, 55, 60, 70, 75
Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 3, 5, 10, 15, 20, 25, 30, 35, 40, 43, 47, 50, 55, 60, 65, 70, 75, 80
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Tel: STillwell 6-1706
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Caswell Electronic Corp., Calif., 3, 5, 15, 20, 25, 35, 40, 43, 47, 50, 60, 70, 75, 80
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Control Electronics Co., Inc., 10 Stepar Pl., Huntington Station, L.I., N.Y., 3, 10, 15, 20, 45, 75
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Tel: HAmilton 7-7961
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Tel: VAn Buren 6-6300

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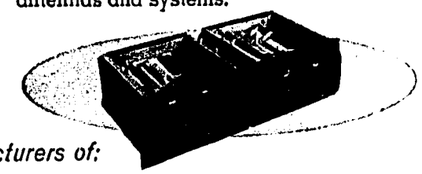

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

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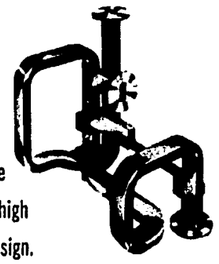

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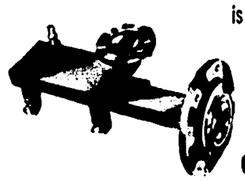

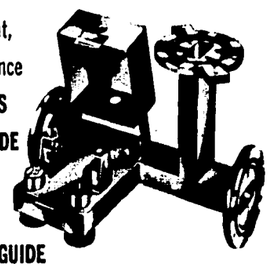

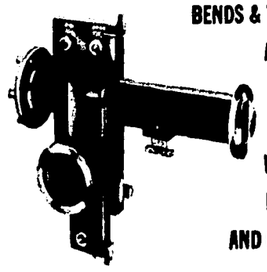

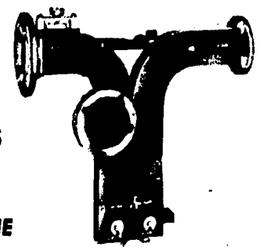

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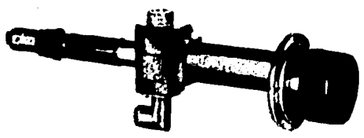

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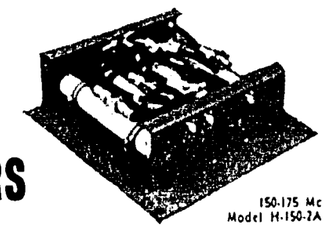

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Shallcross Mfg. Co., 20 Preston St., Selma, N.C., 70
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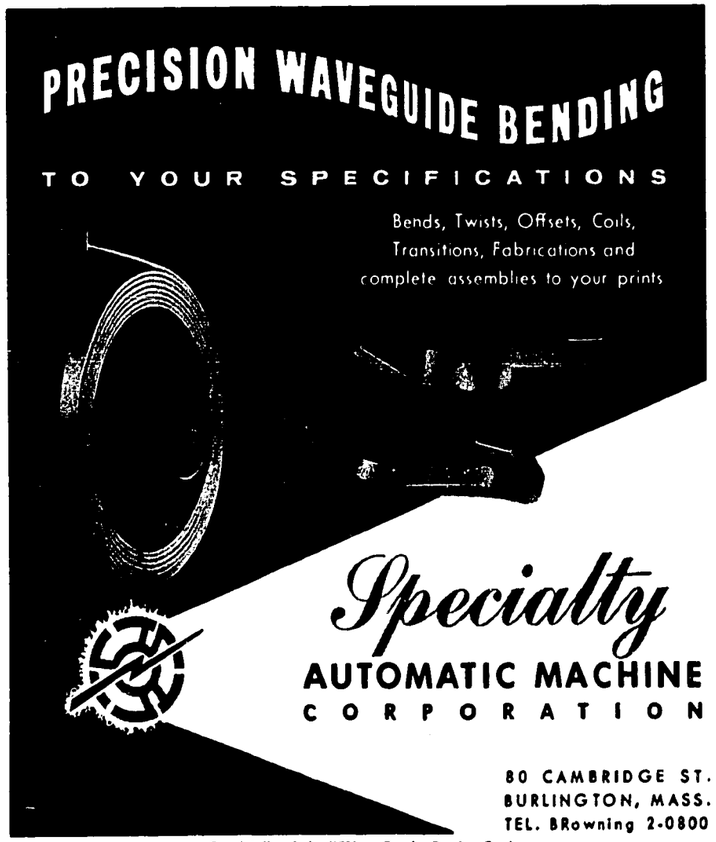

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X-Ray tubes: See class 75

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1960 IRE DIRECTORY

Directory III Materials & Services

Fabricators, Machinery

22 major groups 187 products

The products and services of the radio-electronics industry have been organized into three basic directories:

I. Complete Equipment

II. Components

III. Materials & Services

Within these three basic directories, 102 major product and service groups are numbered consecutively throughout. Under each of these 102 classes a further breakdown is given, showing in detail by a system of code numbers after each firm listed what specific products within the class are manufactured by that firm.

For a terminology cross-index listing the 857 subproducts in alphabetical order, consult the pink section preceding page 1.

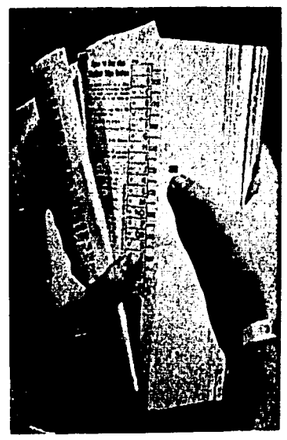
The first few times you use this EDGE INDEX

follow the "How to use" instructions slowly—one step at a time. After that you will be able to open easily and almost instantly to the section that you seek.

Machol edge indexes covering the alphabetical section and each of the three major directory groups will be found on pages 161, 265, 365, and 597.

HOW TO USE

1. Bend the Directory almost double with the back cover page on the inside.
2. Hold in your right hand with your four fingers near to the bound edge and your right thumb near the middle of the open side of this page.
3. From the heavy or light line symbol adjacent to the subject you seek, run your eyes across the page edges until you reach the horizontally corresponding symbol.
4. OPEN THERE!



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For complete list of products and services, arranged alphabetically for fast reference, see the pink section preceding page 1.

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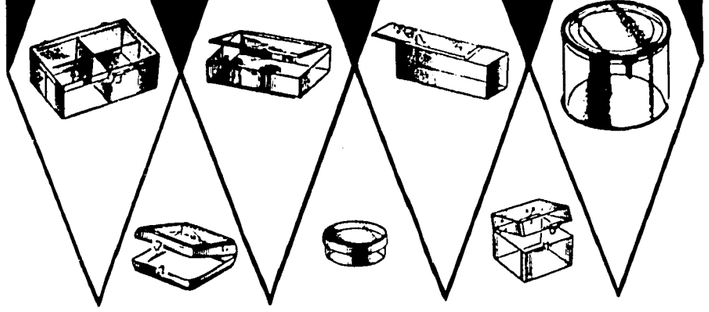

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81. Cabinets, Consoles, Boxes, Enclosures & Panels.

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7. Boxes, Metal
8. Boxes, plastic
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ABC Sound Engrg. Co., N.Y., 10, 25

A.L.A. Industries, Inc., N.Y., Cabinet Backs

A & P Metal Products Mfg. Corp., N.Y., 5, 7, 10, 11, 12, 15, 22

Abalon Precision Mfg. Corp., N.Y., 5, 7, 10, 11, 12, 15, 22

Adler Electronics, Inc., N.Y., 22

Aero Electronics Co., Ill., 5, 15

Aircraft Armaments, Inc., Md., 12

Air-Shields, Inc., Pa., 5

Airtronics, Inc., D.C., 5, 7, 10, 11, 12, 15

Albano Co., Inc., N.Y., 5, 10, 11, 22, Honeycomb Material

Althor Products, N.Y., 8

Amco Engineering Co., 7333 W. Ainslie St., Chicago 31, Ill., 5, 7, 10, 11, 12, 15
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Tel: UNderhill 7-8500

Amelco, Inc., Calif., 5

American Aluminum Co., 230 Sheffield St.-D, Mountainside, N.J., 5, 7, 10, 11, 12
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Tel: ADams 3-3500

American Brass Co., Conn., 7

American Communications Corp., N.Y., 7

American Electronics, Inc., American Data Div., N.Y., 5, 7, 10, 11, 12

American Insulator Corp., Pa., 8, 20

Anchor Specialty Mfg. Co., Inc., N.J., 5, 10, 12, 15, 25

Argos Products Co., Ill., 11, 25, Speaker Enclosures

Arkay, Inc., N.Y., 20

Artisan Metal Works Co., Ohio, 5, 7, 10, 11, 15, 22

Directory III. Materials & Services

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Atkins & Merrill, Inc., Post Rd., Sudbury, Mass., 20, Consoles, Housings
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Tel: HIlltop 3-8822

Audio-Video Corp., N.Y., 7, 12, 15

Automatic Control Co., Minn., 5, 7, 12

Avco Corp., Nashville Div., Tenn., 5, 12

Bailey Meter Co., Ohio, 10

Baker Co., Inc., Me., 5, 12

Baltic Metal Products Co., N.Y., 7, 12, 15

Beemer Engrg. Co., Pa., 5, 8, 20

Bernard-Franklin Co., Inc., Pa., 12

Berneo Engrg. Corp., Ind., 5, 7, 10, 11, 12, 15

Bingham Mfg. Co., J. F., Mass., 7, 12

Bingham Mfg. Co., Florida Metal Fabrication Co., Fla., 7, 12

Bolling Industries, Inc., Pa., 8, 10

Boonton Molding Co., N.J., 8, 20

Bradley Industries, 1654 N. Damen Ave., Chicago 47, Ill., 8
See ad on page 598
Tel: ARmitage 6-8197

British Industries Corp., Wharfedale Div., N.Y., 25

British Industries Corp., Widney-Dorlec Div., N.Y., 5, 11, 12, 15

Brooks & Perkins, Inc., Mich., 5, 7, 10, 11, 12, 15

Brooks Radio & TV Corp., N.Y., TV Cabinets

Buck Engrg. Co., Inc., N.J., 5, 7, 10, 11, 12, 15

Calbest Electronics Co., Calif., 25

Cambridge Pattern Works, Inc., Mass., 11, 25

Camera Equipment Co., Inc., Dept. IRE, 315 W. 43rd St., New York 36, N.Y., 22
See ad on page 357
Tel: JUdson 6-1420

Canadian Aviation Electronics, Ltd., Canada, 5, 7, 12, 15

Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N.Y., Panels
See ad on page 637
Tel: CIrcle 6-0460

Centronix, Inc., Fla., 5, 7, 12

Churchill Lighting Corp., Mass., 5, 7, 12, 15

Columbia Metal Box, Inc., N.Y., 5, 7, 10, 11, 12, 15

Communication Equip. & Engineering Co., Ill., 10, 12, 15

Conn-Craft Co., Conn., 10

Connecticut Instrument Corp., Conn., 10

Conrad & Moser, N.Y., 5, 7, 10, 11, 12, 15

Consolidated Molded Prods. Corp., Pa., 8

Control Devices, Inc., Mich., 5, 7, 8, 10, 11, 12, 15

Controlled Atmosphere Enclosure Corp., 5, 8, 20, 22, Dry Boxes & Test Hood

Cook Electric Co., Inland Test Labs. Div., Ill., 5, 7, 10, 11, 12, 15

Corry-Jamestown Mfg. Corp., Pa., 7, 10, 12, 15

Craig Systems, Inc., Dept. H-1, 361 Merrimack St., Lawrence, Mass., 5, 7, 12, 15, 22, Mobile Shelters and Trailers
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Tel: MUrdock 8-6961

Croname, Inc., Ill., 5, 11, 12

Crosby Laboratories, Inc., N.Y., 10, 11, 12

Cutler Metal Products Co., N.J., 5, 7, 10, 11, 12, 15

Daco Instrument Co., N.Y., 10

Dahlstrom Metallic Door Co., N.Y., 5, 7, 10, 11, 12, 15

Davies Molding Co., Harry, Ill., 8, 11, 20

Devco Engrg., Inc., N.J., 5, 10, 12

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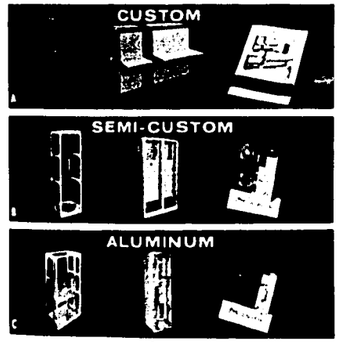

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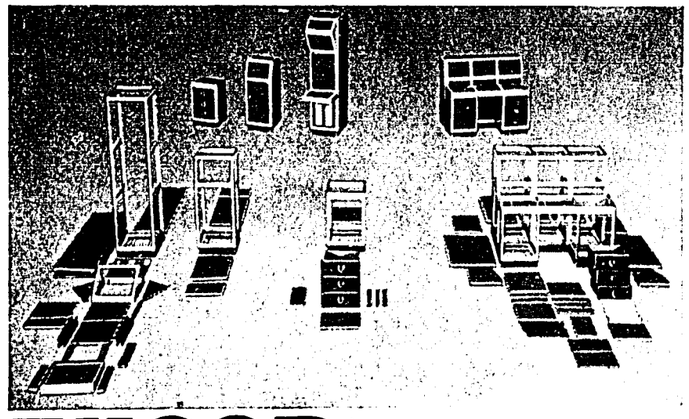

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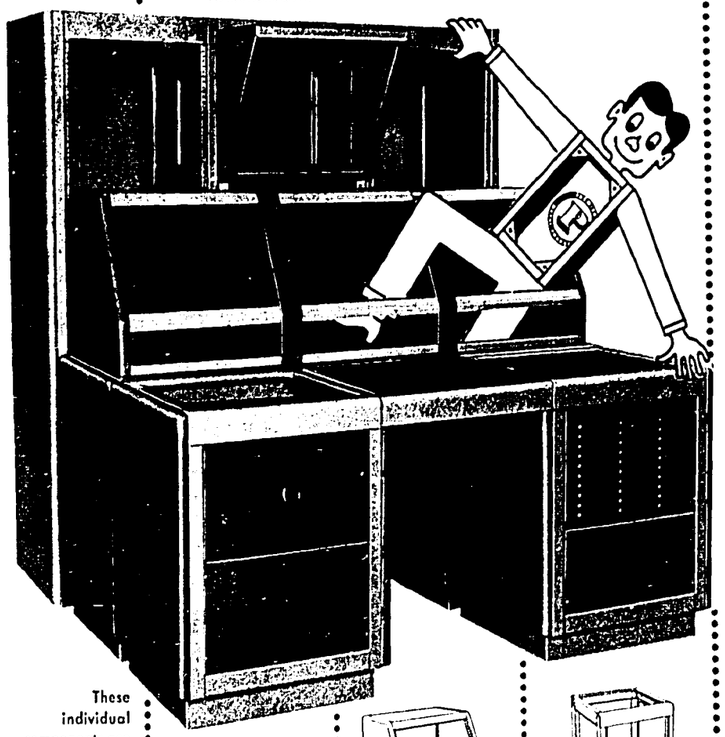

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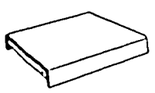
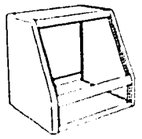
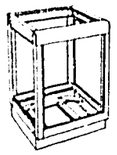
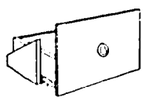

WORK TOP


SLOPING CONSOLE CABINET


PEDESTAL FRAME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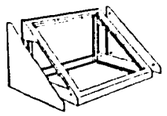
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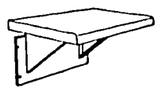
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Dumont Airplane & Marine Instruments, Inc., Pa., 5, 7, 10, 11, 12, 15
Dura Plastics of N.Y., Inc., N.Y., 8, 25
Dynawood Corp., Calif., 25
EPM Corp., N.Y., 5
Eastern Foilcal Nameplate Corp., N.J., 25
Edo Corp., N.Y., 12
Ehrenpreis, Consulting Engrg., David, N.Y., 5, 7, 8, 10, 11, 12, 15, 20, 22, 25
Ehrick Co., Fred, N.Y., Canvas Bags & Covers
Electric Auto Lite Co., Ohio, 10
Electro-Chemical Engraving Co., Inc., N.Y., 5, 7, 10, 11, 12
Electro-Voice, Inc., E.V. Instrument Div., Mich., 5, 25
Electronic Plastics Corp., N.Y., 8
Electronic Techniques, Inc., Calif., 5, 7
Elgin Metalformers Corp., Dept. 1227, 630 Congdon Ave., Elgin, Ill., 5, 12, 15
See ad on page 599
Tel: SHerwood 1-3490
Elzee Metal Products Co., Inc., N.Y., 5, 7, 10, 11, 12, 15, 22
Erwood, Inc., Ill., 7, 10, 11, 12, 15
Etched Products Corp., N.Y., 10
Eugene Engrg. Co., Mass., 5, 7, 10, 11, 12
Falls Metal Works, N.J., 7, 10, 11, 12
Falstrom Co., N.J., 5, 7, 10, 11, 12, 15, 22
Farwell Metal Fabricating, 73 W. Fairfield Ave., St. Paul 7, Minn., 7, 9, 12, 15
See ad on page 601
Tel: CApital 4-5318
Fischer & Porter Co., Pa., 10, 11
Fisher & Crome, Pa., 10
Food Mach. & Chem. Corp., Calif., 22
Formica Metal Products Co., Mass., 5, 7, 12, Tables & Benches
Furane Plastics, Calif., 8, 20, 25
Gables Engrg., Inc., Fla., 10, Lighted
General Aviation & Electronics Mfg. Co., N.J., 5, 7, 10, 11, 12, 15, 22
General Electric Co., Distrib. Assemblies Dept., Conn., 7, 12
General Electric Co., Specialty Electronic Components Dept., N.Y., 25
Goldsman Co., Pa., 5, 7, 10, 11, 12, 22, 25
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Granite State Mach. Co., Inc., N.H., 5, 7, 10, 12, 15
Great Eastern Metal Products Co., Division of Gemp Manufacturing Corp., 22 Woodworth Ave., Yonkers 2, N.Y., 7
See ad on page 601
Tel: GReenleaf 6-7300
Green Rectifier Co., N.J., 5, 7, 12
Hallett Mfg. Co., Calif., 5
Halliburton, Inc., Mfg. Div., Calif., 5, 7, 11, 12, 22
Hammond Mfg. Co., Ltd., Canada, 5, 7, 10, 11, 12, 15
Handee Household Products, Inc., N.Y., 5, 7, 12

Directory III. Materials & Services

81. Cabinets, Consoles, Boxes, Enclosures & Panels.

Hardigg Industries, 1 W. Main St., South Hadley Falls, Mass., 22, Cushioning
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Tel: JEfferson 3-6863
Hartley Products Co., N.Y., 25
Harwood Mfg. Co., Ill., 5, 7, 12
Heath Co., Subsidiary of Daystrom, Inc., 305 Territorial Rd., Benton Harbor 4, Mich., 25
See ad on page 328
Tel: YUkon 3-3961
Heldor Mfg. Corp., N.J., 5, 7, 10, 11, 12, 15, 22
Henry & Miller Industries, Inc., N.J., 5, 7, 10, 11, 15
Houston Fearless Corp., Calif., 12, 15
Howard Precision, Inc., N.J., 5
Hudson Tool & Die Co., Inc., 18-38 Malvern St., Newark 5, N.J., 7
See ad on page 29
Tel: MArket 4-1802
Hughes-Treitler Mfg. Corp., N.Y., 5, 10, 11, 12, 15
IE Manufacturing, Ill., 5, 7, 8, 10, 11, 12, 15, 20, 22
Independent Metal Fabricators, Inc., N.Y., 5, 7, 10, 11, 12, 15
Industrial Acoustics Co., Inc., N.Y., Soundproof Rooms
Jacksonville Metal & Plastics Co., Fla., 5, 7, 8, 10, 11, 12, 15, 20
Jamison Plastic Corp., N.Y., 8, 20
Jan Hardware Mfg. Co., Inc., N.Y., 5, 7, 12
Javex Electronics, Calif., 8
Jodee Plastics Co., N.Y., 8, 10, 11, 20
Johns-Manville, N.Y., 10
Karlson Assoc., Inc., N.Y., 25
Kerrco Products, Neb., 10, 20
Kling Metal Spinning & Stamping Co., N.Y., 7
Koch & Sons, H., Calif., 8
Kollman Case Corp., Ind., 22, 25
Kurz-Kasch, Inc., Ohio, 20
Kuss Industries, Inc., Pa., 5, 7, 12, 15, 22
LMB-Heeger, Inc., Calif., 7, 12, 15
Laboratory Furniture Co., Inc., N.Y., Test & Work Benches
Laminated Sheet Products Corp., Mass., 8
Lansing Sound, Inc., J. B., Calif., Loudspeaker Enclosures
Lavelle Aircraft Corp., Pa., 5
Leach Corp., Relay & Inet Div., 18435 Susana Rd., Compton, Calif., 10, 12, 15
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Tel: NEvada 6-1061
Life Instrument Co., Inc., Mass., 8, 11
Lowell Mfg. Co., Mo., 12, For Loud Speakers
Lyman Electronic Corp., Mass., 10, 15, 20
[illegible] Mfg. Co., [illegible] 11, 12, 15
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[illegible] 15, 22
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[illegible] Conn., 5, 10, 12
McMillan Industrial [illegible]
Measurement [illegible] 7, 10, 11, 12, 15, 22
Meridian Metalcraft, [illegible] 7
Metal Fabricators Corp., [illegible] 11, 12, 15, 22
Metalcraft, Inc., N.Y., 5, 7, 10, 12, 15, 22
Metallic Arts of New England, Inc., Mass., 5, 7, 10, 11, 12, 15
Metalphoto Corp., Ohio, 10
Micarta Fabricators, Inc., Ill., 10
Middletown Mfg. Co., Conn., 5, 7, 10, 11, 12, 15
Midget Louver Co., Conn., Louvers
Mid West Metal Products, Inc., Kans., 5, 7, 10, 11, 12, 15, 22

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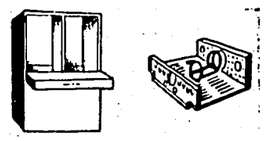

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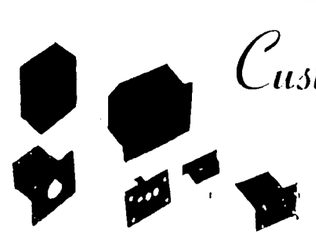

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Motson & Co., Walter, N.J., 5, 11, 22, 25
Muckle Mfg., Co., Minn., 7, 11, 12, 22
Mutual Electronic Industries Corp., N.Y., 10
N Y T Electronics, inc., Calif., 10
Norbute Corp., Metalab Equipment Co., N.Y., Lab. Cabinets, Metal or Wood
North Electric Co., N.Y., 15

North Shore Nameplate, Inc., 214-27 Northern Blvd., Bayside 61, N.Y., 10
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Tel: BAyside 4-4000

Northwest Indust., Ltd., Canada, 8, 10, 11
O'Brien Electric Corp., Calif., 12, 15
Oerlikon Tool & Arms Corp. of America, N.C., 5, 7, 10, 11
Oppenheimer Plastics, Inc., Pa., 5, 7, 8, 10, 20
Oxford Components, Inc., Ill., 25
P.B.R. Mfg. Co., Pa., Dollies
Pan-Air Electronics Corp., Calif., 7, 8, 10

Panob Corp., 49 Beech St., Port Chester, N.Y., 10, Edgelighted
See ad on page 683
Tel: WEstmore 9-3066

Paraplegics Mfg., Co. Inc., Ill., 5

Par-Metal Products Corp., 32-42 49th St., Long Island City 3, N.Y., 5, 7, 12, 15
See ad on page 621
Tel: AStoria 8-8905

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 5, 7, 10, 11, 12, 22
See ad on page 687
Tel: EVerglade 4-2122

Plasteck, Inc., Okla., 10, Edge Lighted Panels, Dials & Knobs
Pneumafil Corp., N.C., 5, 12, 15
Powers Co., J. J., Ill., 7
Precision, Inc., Minn., 5, 7, 12

Premier Metal Products Co., 337 Manida St., New York 59, N.Y., 5, 7, 10, 11, 12, 15, Modular Console
See ad on page 600
Tel: WYandotte 1-6600

Printloid, Inc., N.Y., 8
Q-Line Mfg. Corp., N.Y., 5, 7, 11, 12, 15, 22
Quality Name Plate, Inc., N.J., 10, 11
REF Mfg. Corp., N.Y., 5, 7, 8, 10, 11, 12, 15, 20, 22
R. J. Audio Products, Inc., N.Y., 25
R. N. R. Metal Products, Inc., N.Y., 7
Radar Relay, Inc., Calif., Annunciator Panels
Radiatronics, Inc., Calif., 5, 7, 12, 22
Reiner Electronics Co., Inc., Pa., 5, 7, 10, 11, 12, 15, 22
Richardson Co., Ill., 8, 20
Riester & Thesmacher Co., Ohio, 7, 11, 12
Rimak, Inc., Calif., 5, 7, 10, 11, 12, 15
Ross Metals Co., Milton, Pa., 5, 7, 8, 11, 20
Rumple, Inc., Calif., 25

Saxton Products, Inc., Wire and Cable Div., 4320 Park Ave., New York 57, N.Y., 8, 20
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Tel: WEllington 3-6400

Scientific Wood Cabinet Co., N.J., 5, 10, 11, 25
Seismograph Service Corp., Seiscor Mfg. Co., Div., Okla., 5, 12, 22
Sessions & Son, J. H., Conn., 22
Shamban & Co., W. S., Calif., 8, 20
Sheltered Workshops, Inc., Calif., 25

Shielding, Inc., 66 N. Read Ave., Riverton, N.J., 5
See ad on page 240
Tel: TAlmadge 9-1433

Skydyne, Inc., River Rd., P.O. Box 1106, Port Jervis, N.Y., 7, 8, 11, 12, 20, 22
See ads on pages 245, 602
Tel: POrt Jervis 3-2241

Sloan Co., Calif., Annunciator Panels
Smith Inc., H. H., N.Y., 11
Spaulding Fibre Co., Inc., N.Y., 8, 11, 22
Specialty Engrn. & Electrn. Co., N.Y., 5, 7, 12, 22, 25
Spincraft, Inc., Wis., 5, 11
Standard Electric Time Co., Mass., 10, 12

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 5, 7, 8, 10, 11, 12, 15, 20, 22, 25
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Stevens Walden, Inc., Mass., 7, 12

Sun Dial Corp., P.O. Box 326, Caldwell, N.J., 10
See ad on page 647
Tel: CApital 6-4334

Sun Electric Corp., Ill., 5, 10, 11
Supreme Process Co., N.Y., 10, 15
Swenson Co., Inc., V. H., N.J., 8, 10, 11, 20
T A Mfg. Corp., Calif., 11
Tabet Mfg. Co., Inc., Va., 7, 10, 12, 15
Taffet Radio & Television Co., N.Y., 5, 7, 10, 11, 12, 15
Tech Art Plastics Co., N.J., 8, 10, 20

Technical Apparatus Builders, 109 GB Liberty St., New York 6, N.Y., 7, 12, 15
See ad on page 502
Tel: REctor 2-6249

Technical Service Corp., Ky., Scope and Lab Dolly
Teiner Co., Roland, Mass., 7, 11
Telectro Industries Corp., N.Y., 5, 22

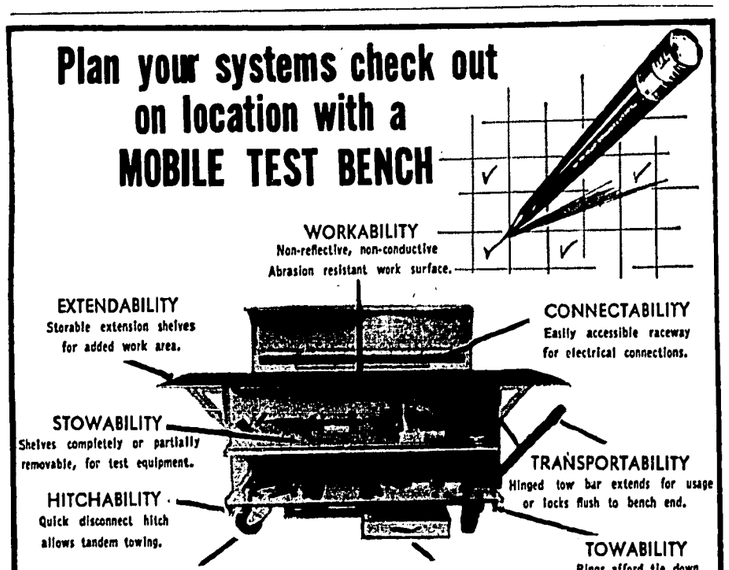
Teletronics Laboratory, Inc., 54 Kinkel St., Westbury, L.I., N.Y., 10, 11, 12
See ad on page 308
Tel: EDgewood 3-1027

Temperature Engineering Corp., N.J., 5
Toeco Metal Products, Inc., N.Y., 5, 7, 10, 11, 12, 15
Transformer Metal Products Corp., N.Y., 7, 12

Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 10
See ad on page 465
Tel: LIbertyville 2-3700

Trump, Walter N., Kan., 10
United Aircraft Prods., Inc., Ohio, 5, 7, 12, 15

Plan your systems check out on location with a MOBILE TEST BENCH



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Directory III. Materials & Services

81. Cabinets, Consoles, Boxes, Enclosures, & Panels.

United States Chemical Milling Corp., Calif., 5, 7, 8, 12, 15
U.S. Radium Corp., N.J., 10
University Loudspeakers, Inc., N.Y., 25
Valtronic Corp., N.Y., 5, 8, 20, 25, Formica

Vector Electronic Co., 1100 Flower St., Glendale 1, Calif., 5, 7
See ad on page 549
Tel: CHapman 5-1076

Waldom Electronics, Inc., Ill., 8, 10, 11, 20
Warminster Fiberglass Co., Pa., 20
Warren Mfg. Co., Inc., Mass., 7, 12, 15, 25
Washington Aluminum Co., Inc., Md., 5, 7, 8, 10, 11, 12, 15, 22
Waterbury Companies, Inc., Conn., 8, 20
Wells Co., Inc., Gary, N.Y., 15

Western Devices, Inc., 600 W. Florence Ave., Inglewood, Calif., 12, 15
See ad on page 624
Tel: ORegon 8-7827

Westgate Lab., Inc., Ohio, 10, 11
White Aircraft Corp., Mass., 5, 7, 10, 11, 12, 15, 22, 25
Whitman Saddle Mfg. Co., Leather Instrument Case Div., Ohio, 11 (leather)
Wyco Metal Products, Calif., 5, 7, 12, 15
Zero Mfg. Co., Calif., 5, 7, 11, 12, 22
Zenith Plastics Co., Calif., 8, 20, Radomes

Cable Clips: See class 87

82. Cable & Wire.

1. Aluminum
5. Antenna feeder line
7. Clad wire
10. Co-axial cables
15. Copper, bare
17. Cord sets
20. Enamel coated
25. Low-loss, high-frequency types
30. Magnet wire
32. Microphone
34. Plated
35. Precious & rare metals wire
40. Pre-formed wire harnesses
45. Rubber insulated
50. Shielded
55. Synthetic insulated
60. Wire mesh
65. Woven wire braid

A K Mfg. Co., Inc., Ill., 10, 17, 25, 32, 40, 50, 55, 65
A-1 Precision Products, Calif., 7
Acme Wire Company, Conn., 20, 30, 55
Advanced Electronics Inc., Conn., 40
Aero Research Instrument, Co., Inc., Ill., 3, 35, 40, 50
Aerolite Electronics Co., N.J., 17, 40

Alden Products Co., 121D N. Main St., Brockton 64, Mass., 17, 40
See ads on pages 419, 691
Tel: JUniper 3-0160

Allied Allegri Co., N.J., 40
Alloys Unlimited, Inc., N.Y., 3, 7, 20, 30, 34, 35

Alpha Wire Corp., 200 Varick St., New York 14, N.Y., 10, 15, 17, 20, 25, 30, 32, 40, 45, 50, 55, 65
See ad on page 604
Tel: ALgonquin 5-5400

Aluminum Co. of America, Pa., 3, 30, 45
Amelco, Inc., Calif., 40
American Brass Co., Conn., 15
American Electric Cable Co., Mass., 7, 10, 15, 17, 25, 32, 40, 50, 55, 65
American Leonic Mfg. Co., Pa., 3, 7, 15, 34, 35
American Silver Co. Inc., N.Y., 7, 35

American Super Temperature Wires, Inc., 10 W. Canal St., Winooski, Vt., 10, 30, 50, 55
See ad on page 605
Tel: UNiversity 2-9636

Amphenol-Borg Electronics Corp., Amphenol Cable & Wire Div., Ill., 5, 10, 25, 32, 50, 55

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 40
See ad on page 166
Tel: BIshop 2-1000

Anaconda Wire & Cable Co., N.Y., 3, 10, 15, 20, 25, 30, 32, 45, 50, 55
Anaconda Wire & Cable Co., Sequoia Wire & Cable Co., Calif., 7, 10, 25, 32, 34, 35, 50, 55, 65
Andrew Antenna Corp., Ltd., Canada, 10
Andrew Corp., Ill., 5, 10
Ansonia Wire & Cable Co., R.I., 5, 7, 10, 25, 32, 50, 55
Anthony & Co., J. L., R.I., 15, 35
Apex Wire & Cable Corp., N.Y., 10, 17, 55
Asco Wire & Cable Co., Conn., 20, 30, 55
Associated American Winding Machinery, Lab., Inc., N.Y., 20, 30
Associated Engrg. Corp., Mass., 17
Associated Engrg. & Mfg., N.J., 7
Atlantic & Pacific Wire & Cable, N.Y., 3, 5, 7, 10, 15, 17, 20, 25, 30, 32, 34, 40, 45, 50, 55
Audio-Video Corp., N.Y., 10, 32, 45, 50
Avionics Corp. of America, Pa., 17, 40
B&M Electric Corp., N.Y., 17

Baker Platinum Div., Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 7, 35, 60
See ad on page 198
Tel: BIgelow 3-0030

Beam Instruments Corp., N.Y., 3, 5, 7, 10, 17, 25, 32, 45, 50, 55
Belden Mfg. Co., Ill., 3, 7, 10, 15, 17, 20, 25, 30, 32, 45, 50, 55, 65
Bendix Aviation Corp., Ind., 40, 50

Bendix Aviation Corp., Scintilla Div., Delaware Ave., Sidney, N.Y., 45, 50, 65
See ad on page 170
Tel: LOwell 3-9511

Berkshire Electric Cable Co., Mass., 10, 32, 50, 55

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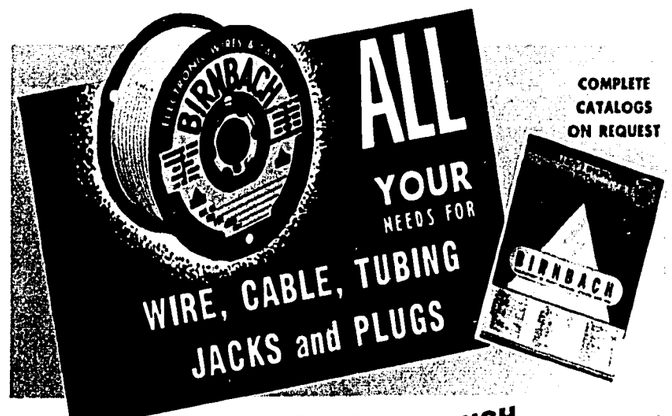

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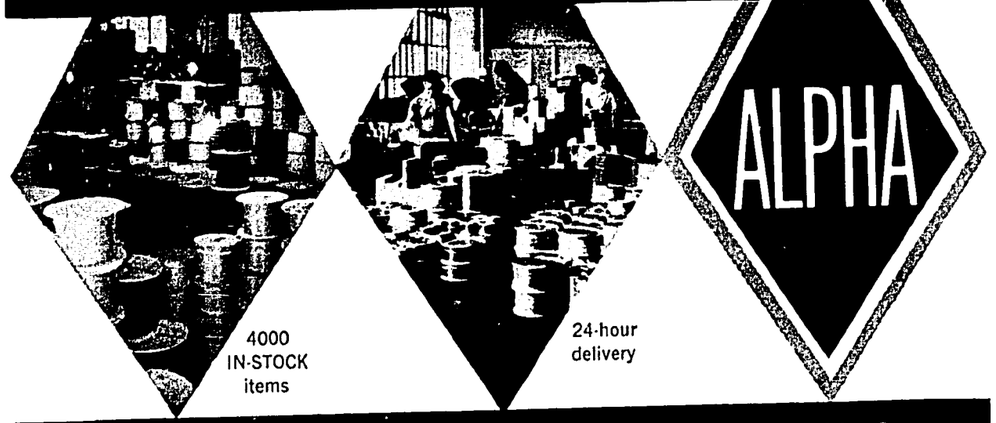
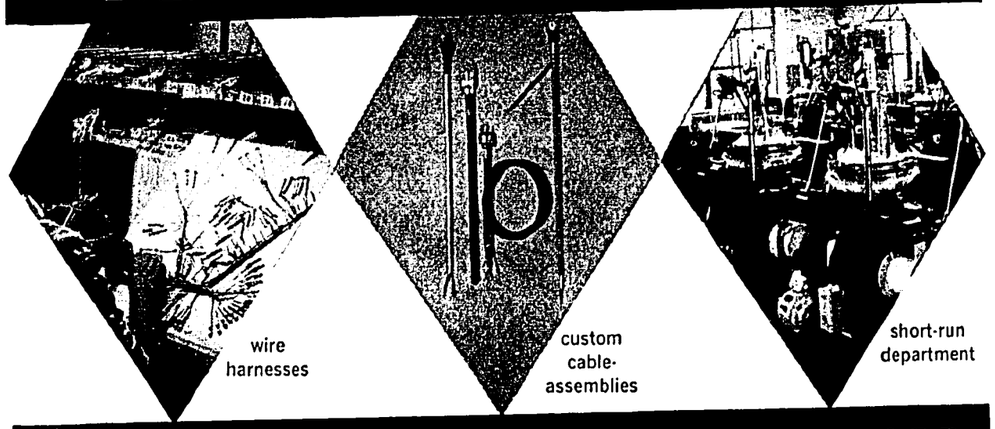


EVERYTHING IN WIRE PROCESSING



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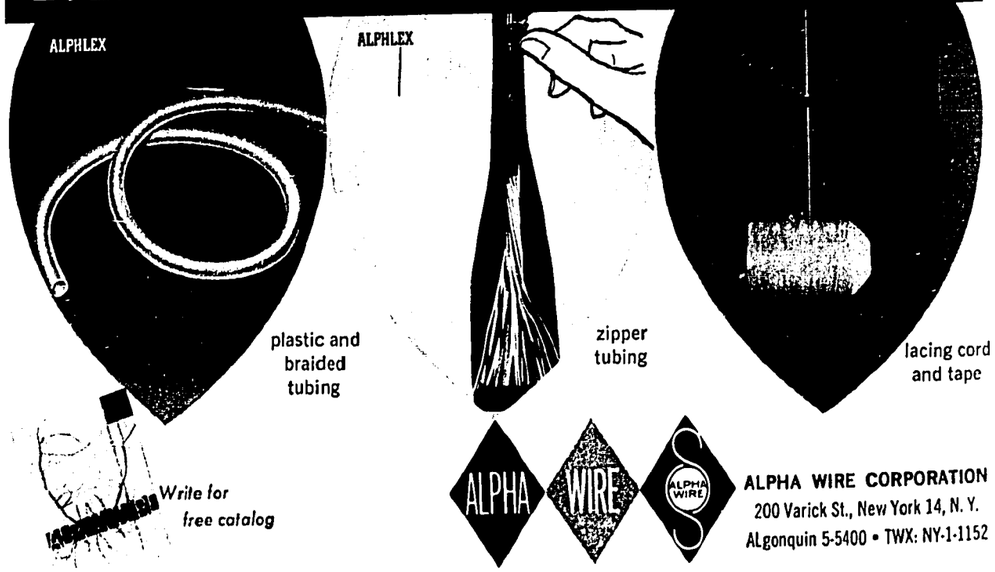

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ALgonquin 5-5400 • TWX: NY-1-1152

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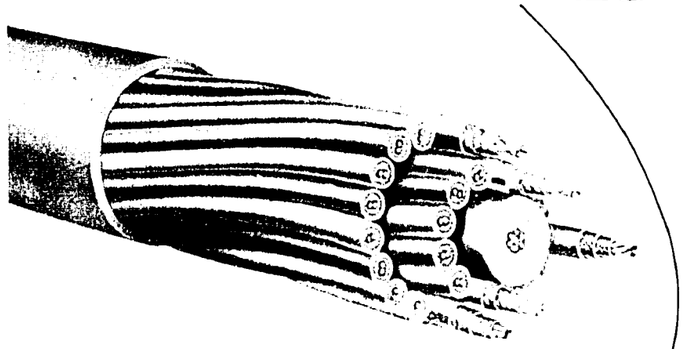

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MAGNET WIRE • LEAD WIRE • MINIATURE CABLES • JUMBO CABLES
LACING CORDS • TUBING • SPECIALTY WIRE • TEFLON TAPES

Wire or Cable	Primary Insulation	Colors MIL-Std-104	Operating Temperature	Jackets	Remarks
Cables-Class H	Teflon,* Extruded or Tape Wrapped	Solid & Striped	−90°C – +260°C	1. Teflon 2. Impregnated Glass	Any combinations of conductors and shielding required
Cables-Class A	Teflon, Extruded or Tape Wrapped	Solid & Striped	−54°C – +105°C	Nylon Braid Nylon Ext PVC	Any combinations of conductors and shielding required
Cables-Coaxial	Teflon, Extruded	Jackets Only Solid & Striped	−90°C – +260°C	Teflon, Kel-F, Impregnated Glass	Conforms to MIL-C 17B and MIL-C-8721
Magnet Wire	Teflon Film	Solid Only	−90°C – +260°C	———	Conforms to MIL-W-19583 Type III
	Silicone or Isonel Film	Natural	to 155°C	———	Conforms to MIL-W-19583 Type II
High Temperature Hook-up Wire	Teflon, Extruded or Tape Wrapped	Solid & Striped	−90°C – +260°C	———	Conforms to MIL-W-16878, Types E & EE or other special specifications as required
	Extruded Silicone Rubber	Solid	−55°C – +200°C	Teflon Impregnated Glass, Nylon, Dacron	Conforms to MIL-W-16878 Types F & FF
Thin Wall Hook-up Wire	Teflon, Extruded or Tape Wrapped	Solid & Striped	−90°C – +260°C	———	Operating voltage 300 v rms
Airframe Wire	Teflon Tape Plus Impregnated Glass	Solid Only	−60°C – +205°C	———	Conforms to MIL-W-7139A
Sub Miniature Hook-up Wire	Teflon Film	Solid Only	−90°C – +260°C	———	Double quad coating for small diameter at 300 v rms
Hook-up Wire	Polyvinyl Chloride	Solid & Striped	−55°C – +105°C	———	MIL-W-16878, Types B, C & D. Plain or with Nylon coating
	Extruded Silicone Rubber	Solid	−55°C – +150°C	Teflon Impregnated Glass, Nylon, Dacron	Conforms to MIL-W-8777A

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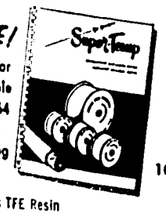

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Agents in principal electronic manufacturing areas

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Directory III. Materials & Services

82. Cable & Wire.

Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 2, 5, 10, 15, 17, 20, 25, 30, 34, 45, 50, 55, 65
See ad on page
Tel: WAlker 5-7...

Bliss Electronics Co., N. ...

Boston Insulated Wire & ... Mass., 10, 25, 47, 50

Bram Metallic ... Pa., 15, 20, 5...

Brand & Co., Inc., W. ... 25, 32, 40, 50, 55

Breeze Corp., Inc., N. ...

Bridgeport Brass Co., Conn., ...

CBC Electronics Co., Pa., 40

Cable Designs Inc., N.Y., 10, 17, 30, 40, 45, 50, 55, 65

Calbest Electronics Co., Calif., 40

Calcon Mfg. Co., Inc., Pa., 5, 5, 30, 17, 30, 32

Cannon Electric Co., Dept. 425, 3208 Humboldt St., Los Angeles 31, Calif., 40
See ad on page 184
Tel: CApital 5-1251

Carol Cable Co., R.I., 10, 17, 32, 45, 50

Cerro de Pasco Corp. Sub Rochester Prod. Corp., Conn., 10, 25, 30, 45, 50, 55

Channel Master Corp., N.Y., 5

Chase Brass & Copper Co., Sub Kenosha Copper Corp., Conn., 5, 15, 20, 30, 35, 50, 60

Chester Cable Corp., N.Y., 5, 10, 17, 17, 25, 32, 50, 55

Chester-Morton Electronics Corp., P... 17, 40

Chicago Dynamic Industries, Inc., 1725 Diversey Blvd., Chicago 14, Ill., 40
See ad on page 553
Tel: WE 5-4600

Cico Corp., Calif., 40

Cohn Corp., Sigmund, 121 S. Columbus Ave., Mt. Vernon, N.Y., 5, 20, 35, 55
See ad on page 607
Tel: MOunt Vernon 4-3...

Columbia Wire & Supply ... 10, 15, 17, 25, 32, 40, 45

Communication Products ...

Conray Corporation ... Connecting Cable

Consolidated Wire & ... 5, 7, 10, 15, 17, 2... 65

Continental Wire ... 32, 50, 55

Cooper & Sons Inc. ... 35

Co-Operative Industries, Inc., N.Y., 30, 50, 65

Copperweld Steel Co., Pa., 5, 7, 30, 45, 45, 50, Copper Covered Steel

Copperweld Steel Co., Flexo Wire Div., N.Y., 5, 7, 15, 34, 65

HUDSON WIRE COMPANY

makers of quality fine wire for over 55 years

America's pioneer wire specialists offer you wire products conforming to MIL and NAS specifications in the types and sizes you need!

HIGH TEMPERATURE TEFLON* INSULATED MAGNET WIRES (−90°C to +250°C)

Conductors: Soft or Annealed Copper per JAN-W-583. Insulations: Single, Double, Triple or Quad thickness. Sizes 18 to 50.

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Conductors: Conventional Copper. Film Insulations: Enamel, EZ-Sol (nylon), Hud-Sol (polyurethane), Formvar, Siliclad (silicone) & Isonel 175, all single and heavy. Film Sizes AWG 14 to 50. Fabric Insulations: Celanese, Nylon, Silk, Cotton and Orlon, all single & heavy over bare wire or film. Fabric Colors: All solids and tracers. Fabric sizes AWG 20 to 40. All combinations of Film & Fabric insulations are available.

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SPECIAL INSULATED WIRES

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Conductors: Bare wires in a wide choice of non-ferrous metals. Coated and Clad wires in Silver Plated, Tin Plated, Nickel Plated and Copperclad. Concentric stranding, Bunched stranding, Rope stranding in finished Sizes AWG 6 to 32.

Hudson also manufactures a full line of Solid Round Bare Wires, Silver Plated Wires, Fuse Wires and Flat Wires, Electrical and Mechanical

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Plants — Ossining, N. Y. — Wilson 1-8500 • TWX 964
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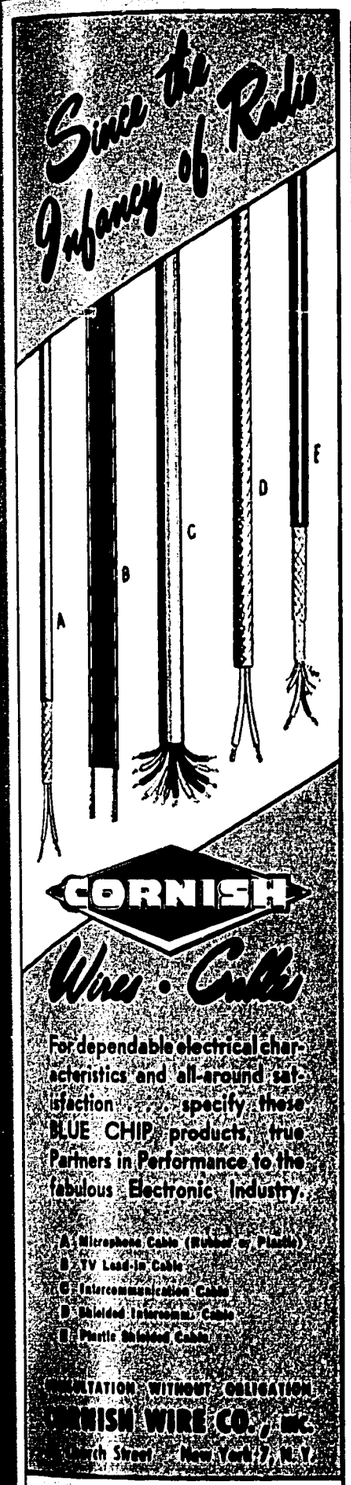

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Directory III. Materials & Services

82. Cable & Wire.

Cornish Wire Co., Inc., 50 Church St., New York 7, N.Y., 17, 32, 40, 45, 50, 55
See ad on this page
Tel: BArclay 7-5140

Crescent Co., Inc., R.I., 17, 32, 45, 50

Crucible Steel Co., of America, Pa., 30

Dalweld Co., Inc., N.Y., 3, 35

Dayton Aircraft Products, Inc., Fla., 5, 7

Dictograph Products, Inc., N.Y., 7, 32

Dielectric Materials Co., Ill., 10, 25, 32, 50, 55, 65

Driver Co., Wilbur B., 1875 McCarter Highway, Newark 4, N.J., 20
See ad on page 188
Tel: HUmboldt 2-5550

Driver-Harris Co., 201 Middlesex St., Harrison, N.J., 20
See ad on page 194
Tel: HUmboldt 3-4800

Eagle Electric Mfg. Co., Inc., N.Y., 17, 55

Eagle Electronics Corp., Conn., 50, 55

Eastern Insulated Wire Corp. & Circle F Mfg. Co., N.J., 17, 40, 55

Eastern Smelting & Refining Corp., Mass., 35

Ecco Electronic Components Corp., N.Y., 17, 40

Edison Industries, Thomas A., Instrument Div., 61 Lakeside Ave., West Orange, N.J., 10, 25
See ad on page 345
Tel: ORange 3-6800

Electric Auto Lite Co., Ohio, 15, 20, 30, 35, 40, 45, 50, 55, 65

Electric Cords & Supply Co., Calif., 10, 17, 40, 45, Power Supply Cord

Electrical & Physical Instrument Corp., N.Y., 10

Electro-Miniatures Corp., N.J., 40

Electronic Applications, Inc., Conn., 32, 50

Electronic Assembly Co., Inc., Mass., 40

Electronic Cable Corp., 126 Jackson St., Cambridge 40, Mass., 40
See ad on page 609
Tel: TRowbridge 6-7250

Electronic Parts Mfg. Co., Inc., N.J., 7

Emerson Radio & Phonograph Corp., Md., 40, 45, 50, 55

Empire Electronics Co., Inc., N.J., 17, 40, RF & Power

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Precious Metal Wires for Potentiometers and Resistance Thermometers.

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Directory III. Materials & Services

82. Cable & Wire.

Enflo Corp., N.J., 7

Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 7, 20, 35, 65
See ad on page 198
Tel: BIgelow 3-0030

Entron, Inc., Md., 10

Essex Wire Corp., Ill., 17, 40, 45

Factory Enterprises, Inc., Pa., 60

Fairbanks Wire Co., Inc., N.Y., 30, 55

First Electronics Corp., Mass., 17, 40

Foote Mineral Co., Pa., 35

Fort Wayne Metals Inc., Ind., Stainless Steel Wire

Garron Aircraft Supply, Inc., N.Y., 3

Gavitt Wire & Cable Co., Amerace Corp., Div., Mass., 10, 15, 40, 45, 50, 55

General Cable Corp., N.Y., 3, 5, 10, 15, 17, 20, 25, 30, 32, 40, 45, 50, 55, 60

General Cable Corp., Metal Textile Corp. Div., N.Y., 7

General Electric Wire & Cable Dept., R.I., 30, 35, 17, 45, 5[illegible]

General Life Assur[illegible]

Gi[illegible]

Gore & Associates, Inc., W. L., 487 Papermill Rd., Newark, Del., 3, 5, 7, 10, 15, 25, 34, 40, 50, 55, 60, 65, Multiple Conductor

See ad on page 608
Tel: ENdicott 8-8325

Hackensack Cable Corp., 116 Orchard St., Hackensack, N.J., Guy, Dead & Antenna Cable

See ad on page 608
Tel: HUbbard 7-[illegible]

Hal-Hen Co., N.Y., 17

Hallett Mfg. Co., Calif., 20, 25, 45, 50, 65

Hartwood Glass & Metals Co., N.Y., Glass Tipped Actuator Wires

Hatfield Wire & Cable, Commercial Copper-Steel Indust. Div., N.J., 3, 5, 7, 10, 15, 25, 32, 45, 50, 55

Haveg Industries, Inc., Delaware, 7, 10, 25, 30, 50, 55

Hitemp Wires, Inc., N.Y., 7, 10, 20, 30, 40, 50, 55

Holyoke Wire & Cable Corp., Mass., 10, 15, 17, 40, 50, 55, 65

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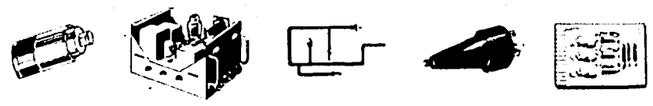

We specialize in the design and manufacture of cable and harness assemblies, molded and encapsulated assemblies, printed circuit assemblies, and chassis assemblies. The latest commercial and military techniques are used in manufacturing to insure a high degree of reliability.

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600 Volts RMS service, dielectric strength 2.2 KV AC spark test 3.0 KV

INSO PART NO.	AWG and Stranding	Diameter Insulation (nominal)	Weight per 1000 ft.
6E-26	26 (19 x 38)	0.013"	1.67
6E-24	24 (19 x 36)	0.034"	2.23
6E-22	22 (19 x 34)	0.0445"	3.28
6E-20	20 (19 x 32)	0.0527"	5.13
6E-18	18 (19 x 30)	0.063"	7.43
6E-16	16 (26 x 30)	0.0745"	10.60
6E-14	14 (37 x 24)	0.0921"	17.13

IN PRODUCTION • IMMEDIATE DELIVERY
All colors, solid and striped

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- 6 mil wall Type "E" (MIL-W-16878C) . . . passes ALL spec. requirements (with a thinner wall). *600 volt RMS, 2.2 KV test.*
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- Shielded and Jacketed construction with no embedment of braid.
- Special cables engineered to your specific environmental and space requirements.

INSO Electronic Products, Inc.
WIRE & CABLE DIVISION
of
Adam Consolidated Industries, Inc.
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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory [illegible]

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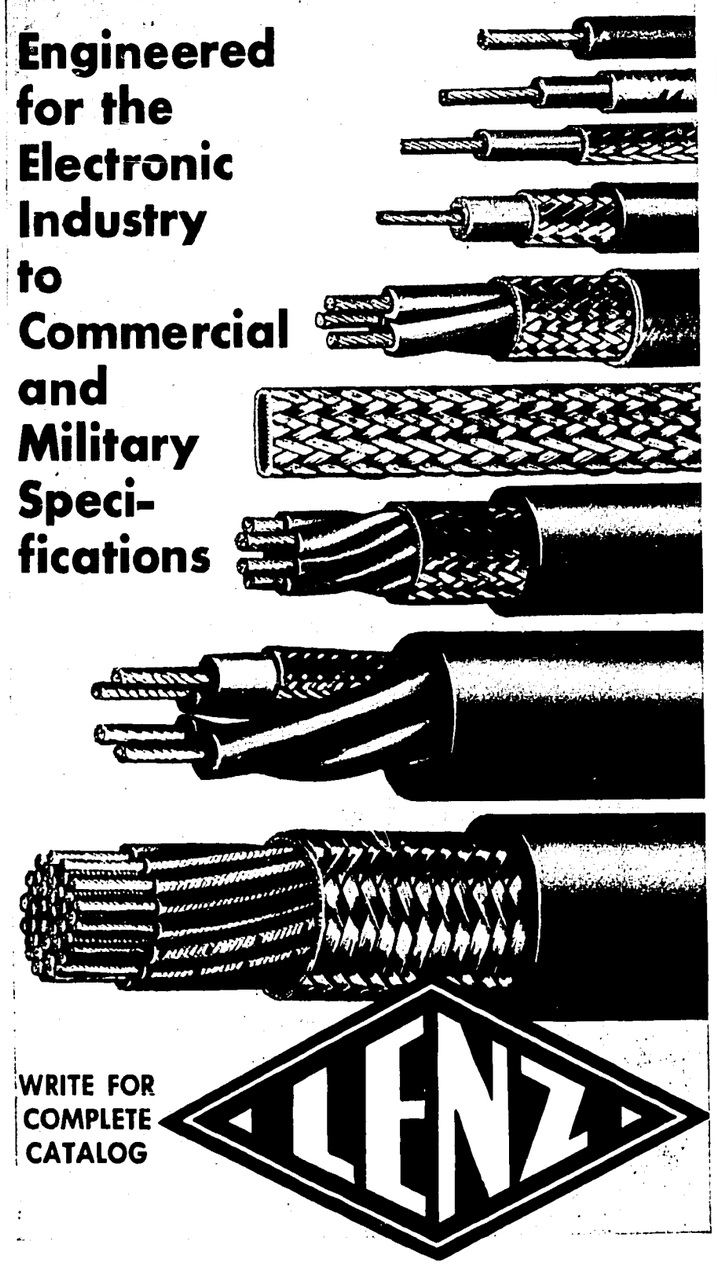
Engineered for the Electronic Industry to Commercial and Military Specifications



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HOMOGENEOUS
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HIGH TEMPERATURES
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CABLES CAN INCLUDE:
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CADMIUM BRONZE
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VINYL COATED
COMPLETE STOCKS

MANUFACTURERS HACKENSACK Cable CORPORATION OF WIRE ROPE
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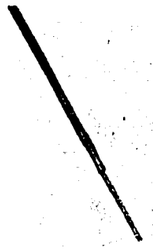
LEWIS WIRE PRODUCTS



TEFLON* INSULATED HOOKUP WIRE, —90°C to +250°C
MIL-W-16878B, TYPES E and EE

For Missiles, Computers and Electronic Assemblies

Miniaturization and complex electronic assemblies are simplified with the use of Teflon insulated wire. It is unaffected by soldering-iron temperatures, has a low coefficient of friction and will not heat-age as it contains no plasticizers to cause failure due to brittleness. Resistant to chemicals and solvents, Teflon insulated wire provides superior dielectric strength with minimum wall thickness. Manufactured with silver coated copper conductor in 600 volt and 1000 volt ratings in A. W. G. sizes from 32 thru 10.

600 VOLT AIRCRAFT WIRE TO MIL-W-7139A

A qualified product for high temperature applications requiring superior solvent resistance, high insulation resistance and circuit reliability.

Silver coated copper conductor, insulated with Teflon and Teflon-glass tapes, covered with a Teflon-glass braid having a Teflon finish. Manufactured in A. W. G. sizes 22 thru 4/0, also available in sizes 6 thru 22 with a type 302 stainless steel braid applied over all.

* Dupont trademark

The LEWIS ENGINEERING CO
Naugatuck Connecticut
WIRE DIVISION

Specialists in High Temperature Wires and Cables

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MORE THAN 2200

SIZES AND TYPES OF:

MAGNET WIRE	LITZ WIRE
TINNED COPPER WIRE	BARE COPPER WIRE
SILVER PLATED WIRE	BRAIDED COPPER WIRE
NICKEL ALLOY WIRE	MANGANIN WIRE
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COTTON — GLASS — SILK — SILICONE — ASBESTOS — CEROC TEFLON
ALKANEX — THERMALON — SODEREZE — ETC. ETC.

NOT ALL SIZES IN ALL INSULATIONS! BUT ENOUGH TO GET THE WHEELS ROLLING IN A HURRY.

SAME DAY SHIPMENT—THAT'S OUR DISH!

THE MOST DIVERSIFIED STOCK OF MAGNET AND RELATED WIRES HOUSED UNDER ONE ROOF ANYWHERE!

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CAnal—6-0900
"SINCE 1947"

MAGNET WIRE INCORPORATED T. M. REG.

MAGNET WIRE INCORPORATED T. M. REG.

For details, circle #618 on Reader Service Card

82. Cable & Wire.

Hoskins Mfg. Co., Mich., 25, 34

Hubbell, Inc., Harvey, Conn., 40

Hudson Wire Co., 62 Water St., Ossining, N.Y., 3, 15, 20, 30, 34, 55, 60, 65
See ad on page 606
Tel: WIlson 1-8500

Hudson Wire Co., Winsted Div., Conn., 3, 15, 20, 25, 30, 34

ITI Electronics, Inc., N.J., 40

Illumitronic Engrg. Co., 680 E. Taylor Ave., Sunnyvale, Calif., 5, 7, 15, 20, 30, 34
See ads on pages 412, 686
Tel: REgent 9-2395

Indium Corp of America, 1678 Lincoln Ave., Utica 4, N.Y., Indium
See ad on page 679
Tel: SWift 7-1630

Industrial Television, Inc., N.J., 40

Inso Electronic Products, Inc., 1200 Commerce St., Union, N.J., 25, 30, 50, 55
See ad on page 609
Tel: MUrdock 6-4258

International Electric Ind., Inc., N.Y., 5, 10, 17, 32, 40, 45, 55

International Telemeter Corp., Ampervision Div., Calif., 10, 25

I. T. & T. Royal Elect. Corp. Div., R.I., 10, 17, 25, 32, 45, 50, 55

Jelliff Mfg. Corp., C. O., Conn., 20, 60, 65, Resistance Wire

Jerrold Electronics (Canada), Ltd., Canada, 10

Jersey Specialty Co., Inc., N.J., 5, 17

Kanthal Corp., Conn., 20

Keisers Industries, Inc., Pa., 40

Kennecott Copper, Okonite Co., Subsidiary, N.J., 3, 5, 10, 25, 32, 45, 50, 55, 65

Kinney Co., Inc., Joseph, Pa., 7

Knickerbocker Annunciator Co., N.Y., 10, 15, 17, 20, 25, 30, 32, 45, 50, 55, 60, 65

Kupfrian Mfg. Corp., 157 Prospect Ave. Binghamton, N.Y., 40
See ad on page 492
Tel: RA 3-6426

Lab-Tronics, Inc., Ill., 10, 17, 32, 50

Leach & Garner Co., Ind. Div., Mass., 7, 34, 35

Lenz Electric Mfg. Co., 1759 N. Western Ave., Chicago 47, Ill., 10, 32, 50, 55, 65, hookup wire
See ad on page 608
Tel: ARmitage 6-4454

Leviton Mfg., Co. Inc., N.Y., 17, 20, 45, 50, 55

Lewis Engineering Co., 339 Church St., Naugatuck, Conn., 7, 10, 50, 55, high temp. resistant
See ad on this page
Tel: PArk 9-5253

Ling Systems, Inc., Calif., 40

Little Falls Alloys, Inc., 199 Caldwell Ave., Paterson 1, N.J., 3, 7, 34, 35
See ad on page 611
Tel: LAmbert 5-1014

Loyola Laboratories, Calif., 15

MacKay, Inc., A. D., N.Y., 3, Rare to Order, 15, 35, 60

MacLeod & Hanopol, Inc., Mass., 40

Directory III. Materials & Services

82. Cable & Wire.

Magnet Wire, Inc., 25 Walker St., New York 13, N.Y., 15, 20, 30, 34, 55, Resistance, Litz Wire, Tinned Copper
See ad on page 610
Tel: CAnal 6-0900

Mandex Mfg. Co., Inc., Ill., 40

Mandrel Industries, Inc., Calif., 40, 55

Manger Electric Co., Conn., 40

Mark Products Co., 5439 Fargo Ave., Skokie, Ill., 5
See ad on page 383
Tel: ORchard 5-1500

Markel & Sons, L. Frank, School Lane, Norristown, Pa., 25, 50, 55, Teflon & Silicone Rubber
See ad on page 652
Tel: BRoadway 2-8960

Metal Textile Corp., N.J., 60

Metals & Controls Div. of Texas Instruments, Incorporated, 51 Forest St., Attleboro, Mass., 34, 35
See ad on page 676
Tel: ATtleboro 1-2800

Microdot, Inc., Calif., 10

Miljan, Inc., Calif., 40, 50, Flat Teflon Cable

Modelectric Products Co., Inc., N.J., 40

Modern Adhesives & Elect., Inc., N.Y., 20, 25, 30, 55, Aluminum Foils, Copper

Mohawk Wire & Cable Corp., Mass., 10, 25, 32, 50, 55

Molecu-Wire Corp., N.J., 3, 15, 20, 35, Resistance

Montrose Products Co. Inc., Mass., 10, 25, 32, 50, 55, 65

Mutual Electronic Industries Corp., N.Y., 10, 32, 45, 50, 60, 65, All are Elastic

Nanfloa Corp., Ohio, 5

National Wire & Cable Corp., Calif., 3, 5, 7, 10, 15, 17, 20, 25, 30, 32, 34, 35, 40, 45, 50, 55, 60, 65, Systems Control Cables

Neptune Meter Co., Revere Corp. of America Sub., Conn., 40, 45, 50, 55

Nesor Alloy Products Co., N.J., 3, 7, 15, 34, 35, 65

New England Electrical Works, Inc., N.H., 15, 20, 25, 34, 65, Litz

New England Tape Co., Mass., 55

Ney Co., J. M., Maplewood Ave., Bloomfield 1, Conn., 20, 35
See ad on page 678
Tel: (Hartford) CHapel 2-2281

Nonotuck Mfg. Co., Mass., 15

Northern Electric Co., Ltd., Canada, 3, 10, 15, 32, 45, 50, 55

Northwest Indust., Ltd., Canada, 40

Owens-Corning Fiberglass Corp., N.Y., Insulation Reinforcement

Pacific Automation Products, Inc., Calif., 17, 45, 50, 55

Pacific Resistor Co., Calif., 55

Panseal, Inc., N.J., 40

Paraplegic Mfg., Co. Inc., Ill., 17, 40

Parkside Wire Co., Ill., 10, 15, 17, 20, 30, 32, 34, 45, 50, 55, 65

Paul & Stein Bros., Inc., E. H., N.Y., 3, 60

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 50
See ad on page 687
Tel: EVerglade 4-2122

Permonite Mfg Co., Ill., 40

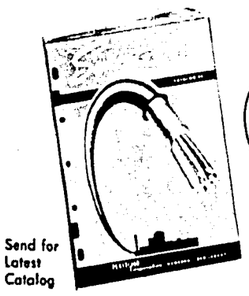
Phalo Plastics Corp., Mass., 5, 10, 17, 25, 32, 40, 50, 55

Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N.Y., 3, 10, 15, 20, 25, 30, 34, 45, 55
See ad on page 612
Tel: PLaza 5-8300

Phillips Insulated Wire Co., Inc., Box 366, Pawtucket, R.I., 20, 25, 30, 34, 35, 40, 45, 50, 55, 60, 65

Photocircuits Corp., Glen Cove, N.Y., 3, 10, 15, 17, 32, 40, 50, 55

Plastic Wire & Cable Corp., 15, 17, 32, 40, 50, 55



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TV twin-leads, coaxial cable, hook-up wire, rotor antenna cable, custom engineered multi conductor cable. For prices, samples and technical data, contact your nearest Plastoid representative. (See list in manufacturers' section).

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(Thermoplastic Insulation and Jacket)

COAXIAL CABLES
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Including Low-Temperature, Non-Contaminating Jackets
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Microphone Cables
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TEFLON INSULATED WIRE & CABLE
MIL-W-16878A TYPES "E" & "EE"
Multi-conductor Cables
Teflon Coaxial Cables
MIL-W-7139A

RADIO AND ELECTRONIC HOOK UP WIRE
MIL-W-76A (superseding JAN-C-76)
MIL-W-16878B (types B, C & D, with & without nylon jackets)
Underwriters Laboratory — 80°, 90°, 105°
(PVC insulation, nominal walls of .008, .015, .031, .047 & with braided outercovering or extruded nylon jacket)

AIRCRAFT WIRE & CABLE
MIL-W-5086A MIL-W-5274A
MIL-C-7078A MIL-W-7072A
MIL-W-8777A

NAVY SHIPBOARD CABLE
MIL-C-915A & MIL-C-21948

REA TELEPHONE CABLE
(Spec PE-14)

MULTI PAIR RURAL DISTRIBUTION WIRE

TRAFFIC CONTROL CABLES
(Specs IMSA 19 & 20)

POWER CONTROL CABLES
(Specs IPCEA & IMSA
(Thermoplastic Insulation and Jacket)

AIRPORT LIGHTING CABLE

PLASTOID Corporation

Synkote Insulated Wire and Cable is "Manufactured by the mile-tested by the inch"

Plant: HAMBURG, N. J. • Offices: Long Island City, N. Y.

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Special Purpose Wire

titanium · phosphor bronze · BERYLLIUM COPPER Silvercote · ALUMINUM · ni-clad-ti · FOR CERAMIC TO METAL BRAZING

Consider WIRE and the importance of its function in your product. Whether a highly engineered application or a simple stapling purpose, your choice of the proper alloy or composition, temper and type of wire could mean success or failure during crucial test

• OTHER NON-FERROUS
Precision gauges from ½ to .002 Close tolerances held
SPRING WIRE · WIRE FOR INSTRUMENTS · ELECTRONICS · STRAND FOR WIRE ROPE AND BRAIDED APPLICATIONS · MANDREL WIRE — WIRE FOR FORMS — RIVETS — STAPLING — OTHER

LITTLE FALLS ALLOYS INCORPORATED
199 Caldwell Avenue Paterson 1, N. J.

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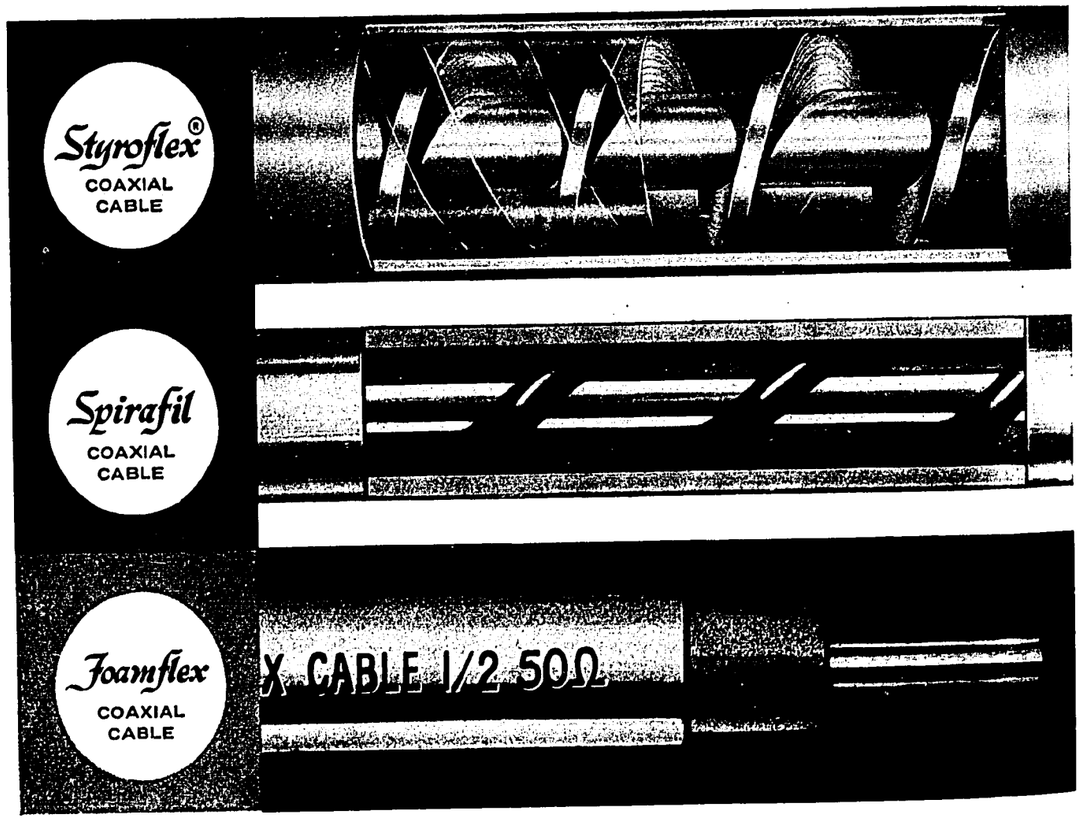
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory pages 161-264

Finest line of High Frequency Cables in the communications field!

- No radiation
- Low attenuation
- Excellent frequency response
- Uniform electrical properties over wide temperature variations
- Unlimited operating life
- Continuous 1000′ lengths

Matching fittings for all cables are available from several sources.



PHELPS DODGE COPPER PRODUCTS
CORPORATION
300 PARK AVENUE, NEW YORK 22, N. Y.

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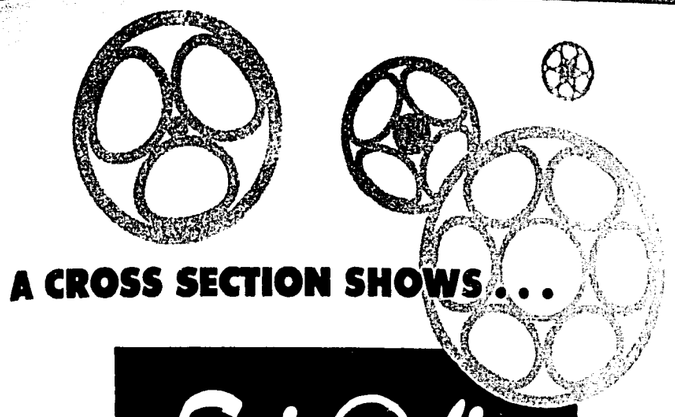

A CROSS SECTION SHOWS . . .

Spir-O-line® COAXIAL CABLE

for Maximum Efficiency in RF Transmission

Take a cross section of world-wide engineering opinion and you'll find that Prodelin's Spir-O-line* — aluminum sheathed, semi-flexible air dielectric coaxial cable — is preferred because it offers:

- Power Ratings Comparable to Solid Dielectric Line
- Very Low Attenuation Similar to Rigid Air Dielectric Line
- Consistent, Low VSWR Typical of Solid Dielectric Line
- Superior Strength — All Aluminum Outer Conductor
- Choice of Regular, Hi-Temp, or Corrosion-Proof Versions

50 Ohm Lines Available
in 3/8", 1/2", 7/8", 1 5/8", and 3 1/8" diameters

Spir-O-lok® CONNECTORS

These unique connectors for Spir-O-line coaxial cable form the world's fastest, strongest joint. Spir-O-lok* eliminates the use of special tools, welding, soldering, and special assembly techniques . . . and a Spir-O-lok connection can be re-made repeatedly without redressing the cable end or replacing connector parts.
All cable sizes, connectors, adapters, and couplings in stock and available now.

ANTENNAS and TRANSMISSION LINES
Prodelin Inc
KEARNY, NEW JERSEY, U.S.A.

WRITE FOR CATALOG 591 TODAY!

Dept. I-8 • 307 Bergen Ave. • Kearny, N. J.

MANUFACTURER OF THE WORLD'S FINEST TRANSMISSION LINES

*PATS. PENDING

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Directory III. Materials & Services

82. Cable & Wire.

Plastoid Corp., 42-61 24th St., Long Island City 1, N.Y., 5, 10, 25, 42, 55
See ad on page 611
Tel: STillwell 6-6200

Porter Co., Inc., H. K., Pa., 5, 10, 45, 50, 55, 60, 65

Precision Tube Co., Inc., Pa., 10, 40

Prodelin, Inc., Dept. I-8, 307 Bergen Ave., Kearny, N.J., 3, 5, 10, 25
See ad on this page
Tel: WYman 1-8600

Progress Electronics Co., 107 Franklin St., New York 13, N.Y., 10, 15
See ad on pages 71-74
Tel: CAnal 6-5611

R.M.S. Assoc., N.Y., 40

Raytherm Corp., Calif., 10, 25, 50, 55

Rea Magnet Wire Co., Inc., Ind., 5, 15, 20, 30

Rego Insulated Wire Co., N.J., 5, 10, 17, 32, 55, 65

Revere Corp. of America, Conn., 25, 40, 50, 55

Rex Corp., Mass., 10, 25, 50, 55

Rhode Island Insulated Wire Co., Inc., R.I., 10, 17, 32, 45, 50

Robertshaw-Fulton Controls Co., Aeronautical Instrument Div., Calif., 40

Robertson Electric Co., Inc., 124 S Elmwood Ave., Buffalo 2, N.Y., 17, 40, cable, molded; multi-conductor and coaxial cable splice cases
See ads on pages 425, 615
Tel: MAdison 6658

Rockbestos Products Corp., Conn., 10, 30, 50, 55, 57

Rockland Insulated Wire & Cable Co., Inc., N.Y., 10, 32, 35, 40, 50, 55

Roeblings Sons Corp., John A., N.J., 15, 20, 30, 45, 50, 55

Rome Cable Corp., N.Y., 3, 15, 25, 30, 30, 45, 50

Ross Metals Co., Milton, Pa., 30

Royal Electric Corp., R.I., 10, 17, 32, 45, 50, 55

Runzel Cord & Wire Co., Ill., 5, 10, 45, 50, 55, 65, Instrument Panel Cords

Sag Harbor Indust., Inc., N.Y., 30

Sanders Assoc., Inc., N.H., 30, 50

Saxton Products, Inc., Wire and Cable Div., 4320 Park Ave., New York 57, N.Y., 3, 5, 7, 10, 15, 20, 25, 30, 32, 34, 45, 50, 55, 65
See ad on page 615
Tel: WEllington 3-6400

Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 3, 20, 30, 34, 35
See ad on page 616
Tel: WHite Plains 9-4757

Siemens & Halske, A. G., Germany, 10

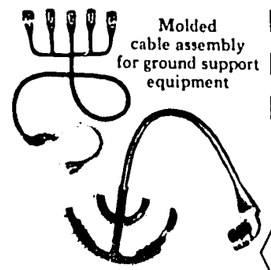
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory pages 181-244

Directory III. Materials & Services

82. Cable & Wire.

Simplex Wire & Cable Co., Mass., 3, 10, 32, 45, 50, 55
Skysweeper, Inc., Ill., 40
Slepian & Co., Arthur, Conn., 20, 30
Smith, Inc., H. H., N.Y., 17, 45
South River Metal Products Co., Inc., N.J., 3
Spargo Wire Co., Inc., N.Y., 15, 34
Spectra-Strip Wire & Cable Corp., Calif., 40
Sprague Electric Co., Mass., 30
Standard Metals Corp., Mass., 15, 34, 35
Standard Telephones & Cables, Ltd., England, 10, 32, 45, 50, 55
Stretch Wire Corp., N.Y., 10, 17, 50
Sunshine Scientific Instrument, Pa., 40
Supa Insulations, Inc., N.C., 10, 30
Superior Cable Corp., N.C., 10, 32, 50, 55
Surface Conduction Inc., N.Y., 5, 10, 25
Surprenant Mfg. Co., 172 Sterling St., Clinton, Mass., 3, 10, 25, 34, 40, 45, 50
See ad on page 79
Tel: EM 5-6331
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 7, 34
See ad on pages 23-25
Tel: JUdson 6-2424
Sylvania Electric Products Inc., Chemical & Metallurgical Div., Pa., 34
Sylvania Electric Products Inc., Parts Division, Warren, Pa., 3, 7, 34
See ad on page 28
Tel: WArren 3220
Tape Cable Corp., N.Y., 50, 55
Techalloy Co., Inc., Pa., 7, 35
Technical Wire Products, Inc., N.J., 60
Telcon, Inc., Dept. E61, P.O. Box 216, Pacific Palisades, Calif., 5, 10, 25, 50, 55
See ad on page 616
Tel: GL 4-4043
Tenna Mfg. Co., Ohio., 3, 30, 17, 50, 65
Tensolite Insulated Wire Co., Inc., West Main St., Tarrytown, N.Y., 5, 7, 19, 25, 30, 32, 50, 55, 65
See ad on page 614
Tel: MEdford 1-2300
Texas Instruments Incorporated, S-C Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 7, 35
See ad on pages 75-78
Tel: FLeetwood 7-5411

ROBERTSON MOLDED HARNESSES MEAN PROTECTION



against deterioration caused by acids, oils, fuels, flame, ozone, water or moisture.

against abrasion, shock, fungi, and temperature extremes.

Robertson molded cable assemblies have been painstakingly engineered and built to the same standards of military precision and dependability as the underwater devices, missile control systems, and mobile electronic equipment for which they are designed.

Robertson Electric Co., Inc.
124 S. Elmwood Ave. • Buffalo 2, N.Y.
Established in 1895

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Tensolite
RELIABLE HIGH TEMPERATURE WIRE & CABLE

Tensolite facilities are devoted exclusively to the engineering and manufacturing of miniature plastic insulated wire and cable—featuring Teflon insulation for high temperature (—90 deg. C. to +250 deg. C.) applications. 100 percent inspections before, during and after manufacture, part of the most rigid quality control program in the industry, assures reliability of the finished product.

"TEFLON"® INSULATED CABLE

From large sizes using 6 AWG wire, down to subminiature cables with 36 AWG single conductors, Tensolite makes multi-conductor cables to your specifications. Tensolite cables utilize the maximum number of conductors in a minimum of area—saving weight and space. They're available as ribbon cable or in standard round configurations. For demanding applications, we recommend individual conductors of our FLEXOLON wire.

HOOK-UP WIRE

TYPE E-EE TO MIL-W-16878

FLEXOLON WIRE

A new concept in high temperature insulation developed by Tensolite's research and development laboratories. FLEXOLON wire provides the best properties of wrapped and extruded fluorocarbon insulation. Important features of this versatile hook-up and lead wire are:

- Solid colors and striped combinations.
- Most flexible of all hook-up wire construction.
- High temperature range of —90 deg. C. to +250 deg. C.
- Greatest miniaturization in MIL-SPEC hook-up wire (smallest hook-up wire in the world).
- High dielectric strength (far exceeds required 600 V and 1000 V ratings).
- Consistent concentricity.
- Superior cut-through resistance.

TENSOLON WIRE

Insulated with TFE fluorocarbon high temperature resin.

Choose from:

Spiral wrapped...with special cross-lapped construction and unlimited color coding; striping that meets commercial and military specifications.

Extruded...featuring an extruded homogeneous Teflon TFE resin (solid and inked stripe combinations).

TENSOLEX WIRE

Insulated with extruded vinyl plastic.

Types B and C meet MIL-W-16878. They are high temperature hook-up wires rated for continuous use from —55 deg. C. to +105 deg. C. with or without nylon jackets.

TENSOLEX WIRE

Types WL and SRIR are manufactured in accordance with the joint Army-Navy specification JAN-C-76 (Qualification approval Certificates Nos. 13725 and 13606A).

Types LW and MW are general purpose hook-up wires specifically designed for radio, instrument, and military electronic applications. Designed to meet MIL-W-76A, they are recommended for use at temperatures up to 80 deg. C. in the internal wiring of electrical and electronic equipment.

TENSOLITE WRAPPED VINYL WIRE

Super-flexible wire designed for miniaturization applications at operating temperatures from —40 deg. C. to +60 deg. C.

AIRFRAME WIRE

TENSOLON AIRFRAME WIRE

Insulated with high-temperature resin, it is manufactured in compliance with MIL-W-7139A. Important features are:

- —90 deg. C. to +250 deg. C. temp. range.
- 600 Volt and prescribed overload operation.
- Rugged, abrasion resistant construction.
- Short-time operation in event of fire.
- High resistance to chemicals.
- Excellent flexibility.

COAXIAL CABLE

TENSOLON MINIATURE COAXIAL CABLE

Designed to meet MIL-C-17B, it is ideal for high frequency operation from —90 deg. C. to +250 deg. C. Insulation assures extremely low loss, high dielectric strength, and complete resistance to moisture and chemicals. A great variety of outer jackets permits the selection of cable well suited for many application requirements.

MAGNET WIRE

TUFFLON MAGNET WIRE

High temperature Teflon insulated magnet wire—designed to meet MIL-W-19583—is ideal for coils and windings requiring high temperature application. It is supplied in wall thicknesses ST, HT, TT and QT and AWG sizes 18 through 44.

OTHER PRODUCTS

Ignition Cable
Asbestos Wire to MIL-C-25038
Antenna Wire
Thermocouple Wire
Low Capacitance Cable
Air Dielectric Cable
Low Noise Cable
Tempered Magnet Wire
Double Quad Lead Wire
Wire Coated with Teflon 100X FEP Resin
100% Shielded Wire
Ribbon Cable Shielded and Unshielded
Teflon Inks
Bondable Wire
Etched Wire
High Flex Wire and Cable
Nickel Plated Conductor

Tensolite INSULATED WIRE CO., INC.
West Main Street, Tarrytown, New York • Telephone MEdford 1-2300
Pacific Division: 1516 N. Gardner Street, Los Angeles, California
Flexolon, Tensolon, Tensolex, Tufflon and Tensolite are trademarks of Tensolite Insulated Wire Co., Inc.® Teflon is a registered trademark of the ® du Pont Company.

For details, circle #623 on Reader Service Card

FLEXIBLE AND EXTRA FLEXIBLE
CABLES TO "MIL. SPEC."
With Certificate of Compliance and Source Inspection

- We normally maintain stock in the following mil. spec. cables; MIL.-W-C-3432A, W-16878, W-76A, C-3884 and many others.
All are available with Certificate of Analysis and Certificate of Compliance.
- We also specialize in long and short runs of special items with excellent delivery.
- In stock also: Phelps Dodge Spirafil, Styroflex, and Foamflex.
- Also available: Special cables, telephone constructions, hook-up wire, power cords, shielded constructions, and special materials—all in stock. Or we will fabricate . . . large or small runs.
- We also have facilities to cut, strip, lug, notch, slot or perform other operations on various types of wire and cable. Write today for more information . . .

SAXTON PRODUCTS, INC.
4320 Park Ave. New York 57, N.Y.—WE 3-6400

For details, circle #624 on Reader Service Card

Thermax Wire Corp., N.Y., 10, 25, 32, 50, 55
Time Wire & Cable Co., Inc., Conn., 5, 10, 25, 32, 34, 50, 55
Titan Metal Mfg. Co., Pa., Brass Wire
Topper Mfg. Co., Inc., N.Y., 25, 30, 40
Transradio, Ltd., England, 10
Tricon Mfg. Co., Ill., 35
Trimm Inc., 400 W. Lake St., Libertyville, Ill., 17
See ad on page 465
Tel: LIbertyville 2-3700
Twin Lock Inc., Calif., 17
United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 3
See ads on pages 541, 681
Tel: BEekman 3-8870
United States Chemical Milling Corp., Calif., 7, 17, 40, 50
U.S. Steel, American Steel & Wire Div., Ohio, 10, 15, 20, 25, 30, 32, 50, 55
U.S. Steel Corp., Pa., 15, 60
Univox Corp., N.Y., 10
Vector Associates, Inc., N.Y., 40
Victor Electric Wire & Cable Corp., R.I., 3, 5, 7, 10, 15, 17, 25, 32, 40, 50
Wah Chang Corp., 233 Broadway, New York 7, N.Y., 35, 65
See ad on page 680
Tel: COrtlandt 7-0887
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83. Ceramics.

5. Coil forms
10. Custom fabrication
12. Ferrites
15. Insulators
17. Metallized
20. Proprietary forms
25. Yttrium iron garnet

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American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 5, 10, 15, 17
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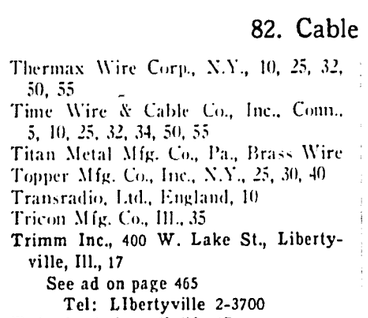

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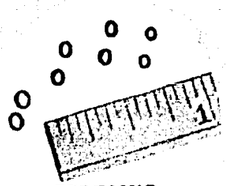

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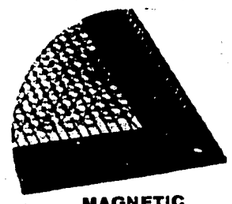

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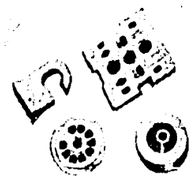
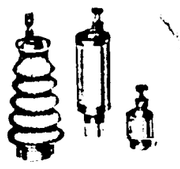


STEATITES



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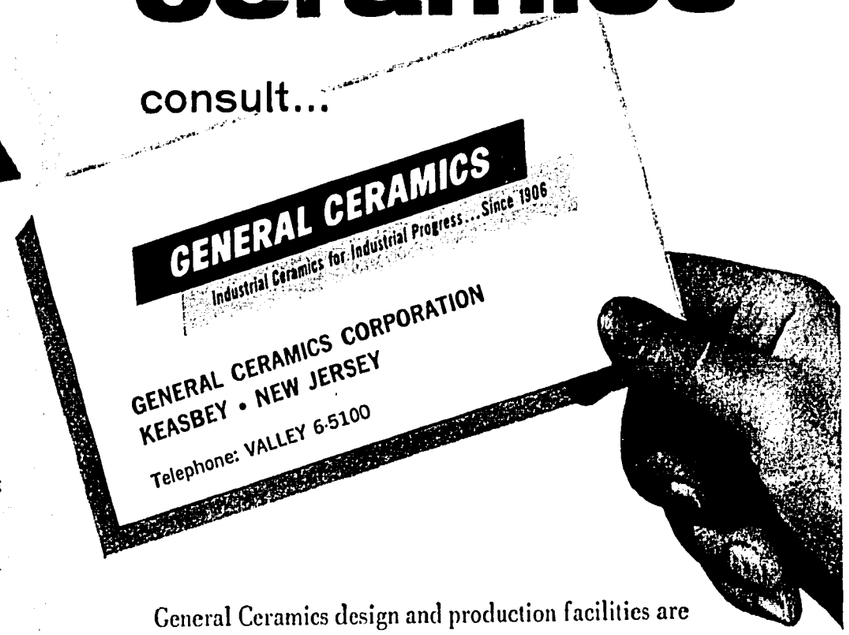

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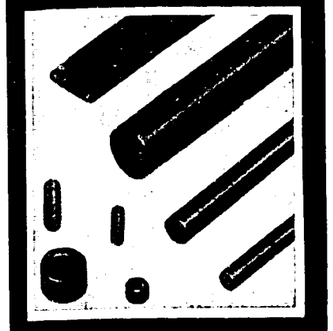

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Mycalex Corporation of America, 125-B Clifton Blvd., Clifton, N.J., 5, 10, 15, 20
See ad on page 102
Tel: PRescott 9-8866

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National Ceramic Co., N.J., 5, 15, 17
National Moldite Co., N.J., 5, 12
National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5, 15
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Norrich Plastics Corp., 107-109 West 18th St., New York 11, N.Y., 5, 10, 15
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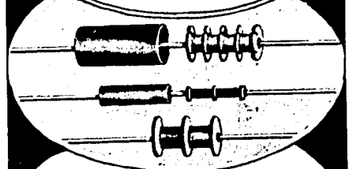

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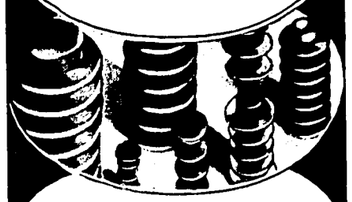

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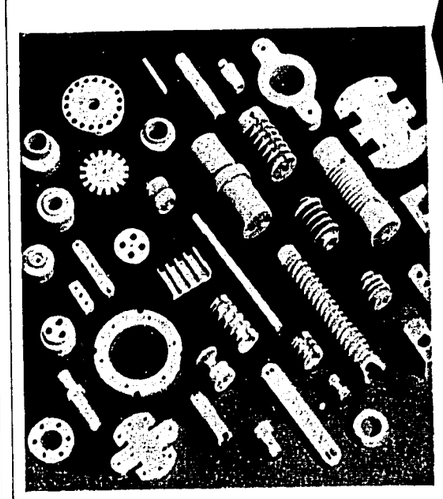

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Western Gold & Platinum Co., Calif., 10, 15
Wind Turbine Co., 248 E. Market St., West Chester, Pa., 15
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84. Chassis, Racks & Slides.

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15. Relay racks & cabinets
20. Steel chassis

AA Metal Products, Inc., Vt., 5, 15, 20
A & P Metal Prods. Mfg. Corp., N.Y., 5, 10, 15, 20
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Tel: UNderhill 7-8500
American Aluminum Co., 230 Sheffield St.-D, Mountainside, N.J., 5, 10, 15
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Anchor Specialty Mfg. Co., Inc., N.J., 5, 15, 20
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Tel: OWens 9-4000
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Centronix, Inc., La., 15, 20
Chassis-Trak, Inc., 525 S. Webster St., Indianapolis 19, Ind., 10, 15
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Conrad & Moser, N.Y., 5, 15, 20
Control Devices, Inc., Mich., 5, 10, 15, 20
Cook Electric Co., Inland Test. Labs. Div., Ill., 5, 10, 15, 20
Corry-Jamestown Mfg. Corp., Pa., 15, 20
Craig Systems, Inc., Dept. H-1, 361 Merrimack St., Lawrence, Mass., 15
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Dumont Airplane & Marine Instrument Inc., Pa., 5, 15, 20
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Grand Sliding Mechanisms, Inc., [illegible]
Grant Pulley & Hardware Corp., 48 High St., West Nyack, N.Y., 10
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Green Rectifier Co., N.J., 5, 20
Hammond Mfg. Co., Ltd., Canada, 5, 10, 15, 20
Hanner Electronics Co., Inc., N.J., 20
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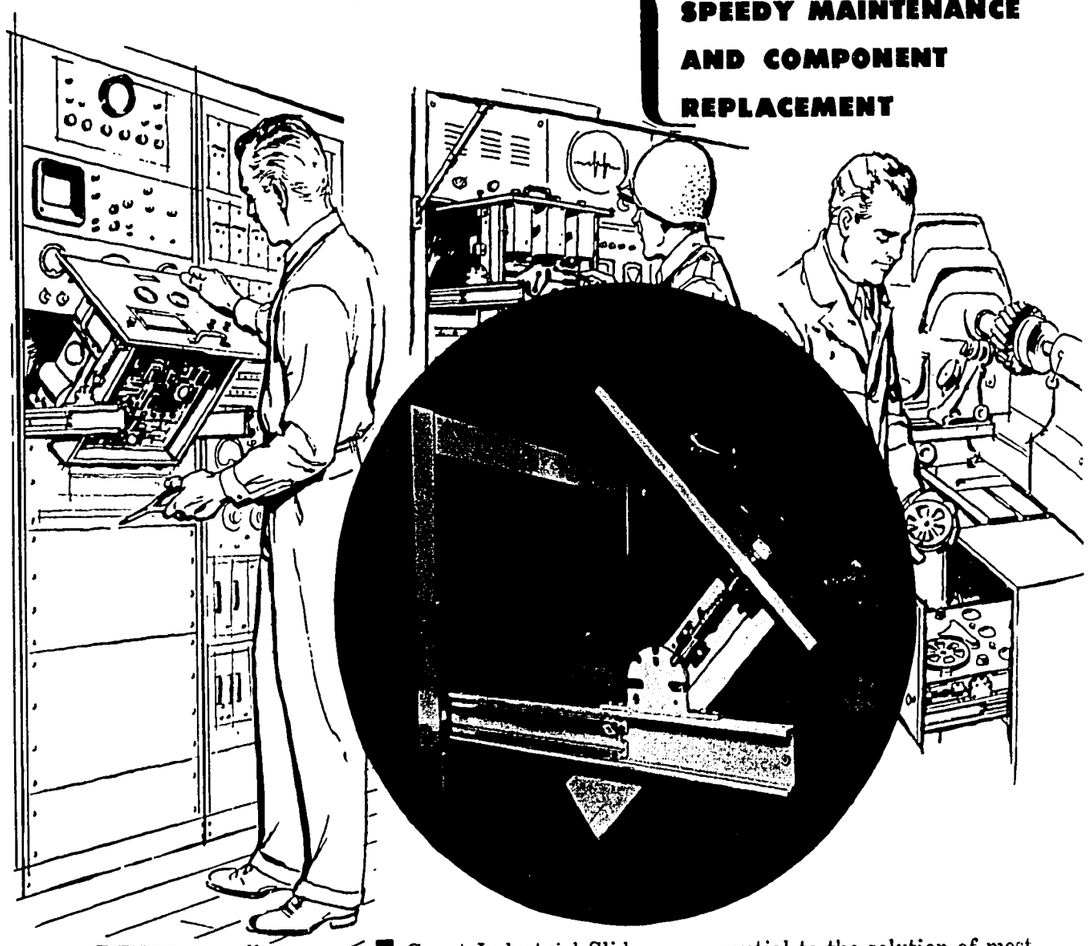

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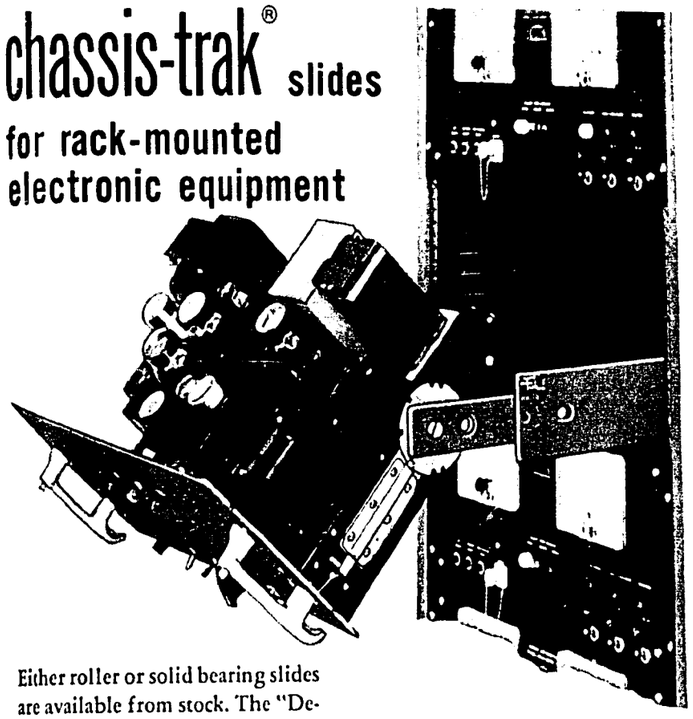
for rack-mounted electronic equipment



Either roller or solid bearing slides are available from stock. The "Detent" model locks in 7 tilt positions. The "Basic" model tilts with no lock assembly. The "EZ Mount" model tilts from mounting on front cabinet rail. These models are available in either lightweight or heavy-duty styles.

Chassis-Trak slides, formed from cold rolled-steel, give complete accessibility and faster servicing . . . and the ultra-thin design means you can cut engineering costs by mounting 17" chassis in 19" standard stock racks. Plus, a wide bearing area design increases rigidity and reduces the possibility of binding due to misalignment.

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Select the right slide for your application

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Basic	CTRB	X	X	X	X	X	X	X	X	X	175
Detent	CTRD			X	X	X	X	X	X	X	175
Cradle Track	CTEZ				X	X	X	X	X	X	125
Heavy Duty Basic	CTHRB				X	X	X	X	X	X	275
Heavy Duty Detent	CTHRD				X	X	X	X	X	X	275

SOLID BEARING SLIDES	MODEL	SLIDE LENGTH 10	11	12	14	16	18	20	22	24	LBS. MAX. LOAD
Basic	CTB	X	X	X	X	X	X	X	X	X	175
Detent	CTD			X	X	X	X	X	X	X	175
Light Weight	CTL				X	X	X	X	X	X	100
Heavy Duty Basic	CTHB				X	X	X	X	X	X	250
Heavy Duty Detent	CTHD				X	X	X	X	X	X	250

chassis trak inc.

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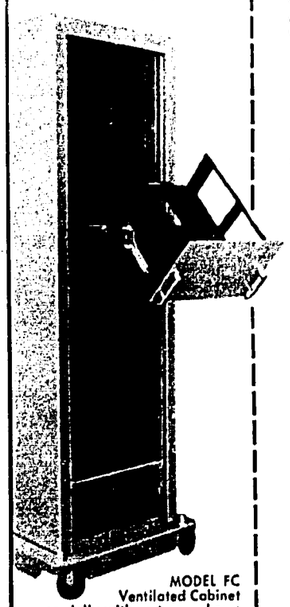

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Panseal, Inc., N.J., 5, 10, 15
Pantek Co., Calif., 10, 15, 20
Parameters, Inc., N.Y., 10, 15
Parke Mathematical Labs., Inc., Mass., 15

Parke, Nathan Grier, Bedford Rd., Carlisle, Mass., 15
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Parzen, Benjamin, N.Y., 10, 15, 25, 30
Patterson Moos, Div. of Universal Winding Co., N.Y., 10, 15
Peeco Corp., Calif., 15, 20
Pek Labs, Inc., Calif., 10
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Pickett & Eckel, Inc., Calif., 15, 20
Pierce, George C., Supvr. Products Services, Va., 15
Piezo Products Co., Mass., 10, 15
Plamondon, A. D., Consultant, Ill., 15, 25
Point Consulting Co., Pa., 5, 10, 15, 20, 25, 30
Power Industries Co., Inc., Ill., 10, 20

Premier Instrument Corp., 33 New Broad St., Port Chester, N.Y., Microwave
See ad on page 390
Tel: WEstmore 9-8900

Pressman Associates, Inc., Pa., 15
Process & Instruments, N.Y., 15, 20
Radio Engrg. Co., N.Y., 15, 25
Railway Communications, Inc., Mo., 15
Rangertone, Inc., N.J., 5
Reeves Soundcraft Corp., Conn., 5
Resdel Engrg. Corp., Calif., 15
Rich Electronics, Inc., Fla., 5, 10, 15, 20, 25
Robinette Co., W. C., Calif., 15, 20
Roller, Mike, Inc., N.Y., 15, 20
Rosenberg Assoc., Paul, N.Y., 5, 10, 15, 20, 25, 30

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PErshing 5-2501

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Ross & Assoc., Donald, Mo., 10, 15, 20, 25, 30
Rototest Labs., Inc., Calif., 5, 10, 15
Rountree, J. G., Tex., 25, 30
Ruckelshaus Labs., Inc., John G., N.J., 10, 15, 20
St. Eloi Corp., Ohio, 10, 15
Sands Associates, Inc., Calif., 15
Sanial Labs., N.Y., 5, 15
Scatter Communications, Inc., Md., 15, 25
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Sel-Rex Corp., N.J., 10, 15, Electro Plating
Semicon, Inc., Mass., 15
Ser Co., Mass., 15
Shamp Scientific Supply Co., D.C., 15
Simmonds Aerocessories, Inc., N.Y., 15

Sinclair Radio Laboratories, Ltd., Box 179, Downsview P.O., 70 Sheffield St., Toronto 15, Canada, 5, 15
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Tel: CHerry 4-5519

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Solid State Electronics Co., Calif., 15
Sonex, Inc., Pa., 15
Soroban Engineering, Inc., Fla., 15
Space Electronics Corp., Calif., 15
Specialty Engrn. & Electrn. Co., N.Y., 15, 20
Spectrum Instruments, Inc., N.Y., 5, 15

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State Testing Laboratory, Inc., Conn., 20
Statistical Instrument Co., N.Y., 15
Stavid Engineering, Inc., N.J., 10, 15, 20

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, N.Y., 15, 20
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Strempel Instrument Corp., N.Y., 15, 20
Summers and Mills, Inc., Tex., 5, 15
Surface Conduction, Inc., N.Y., 30
Systems Development, Inc., N.Y., 15
Systems, Inc., Fla., 10, 15

Systems Laboratories Corp., 14852 Ventura Blvd., Sherman Oaks, Calif., 15
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Tel: STate 9-0501

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Tech Art Plastics Co., N.J., Insulation

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 10, 15
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Tel: REctor 2-6249

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Westgate Lab., Inc., Ohio, 10, 15, 20

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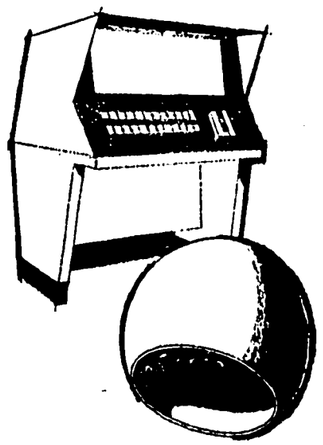

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Wheeler Laboratories, Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 15, 25, 30
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Winkler Laboratories, Ariz., 15
Winner, Lewis, 152 W. 42nd St., New York 36, N.Y., 15, 25, 30
See ad on this page
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Custom Builders: See class 90

Custom fabrication, ceramics: See class 83

Custom fabrication, plastics: See class 86

Development laboratorie See class 90

Dials: See class 87

Distribution: See class 102

Education: See class 100

Electro-plating: See class 86

Embedment: See class 86

Engraving machines: See class 92

Envelopes, vacuum tube: See class: 99

Export & Import: See class 102

86. Fabricators & Services.

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10. Electro-plating
12. Encapsulation
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A.P.M. Corporation, 252 Hawthorne Ave., Yonkers, N.Y., 30
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Ackerman-Gould Co., 10 Neal Ct., P.O. Box 188, Oceanside, L.I., N.Y., 32
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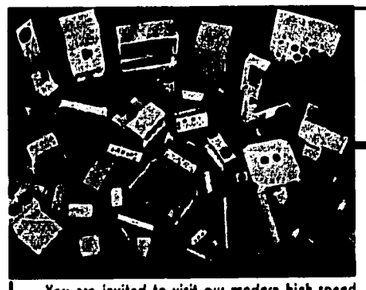

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86. Fabricators & Services.

Acme Wire Company, Conn., 12, 20, 30
Acoustica Associates, Inc., Dept. IRE, Fairchild Ct., Plainview, N.Y., 5
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Tel: JUniper 3-0160
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Allied Research & Engr. Div., Allied Record, Calif., 10
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American Insulator Corp., Pa., 50
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Arrow Machinists & Fabricators, 154 E. 3rd St., Mt. Vernon, N.Y., 5, 10, 25, 35, 40
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Tel: OWens 9-4000
Art Wire & Stamping Co., 21 Boyden Pl., Newark 2, N.J., 5, 35
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Atlantic Research Corp., Va., 5
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Automatic Coil Co., Inc., 195 Sackett St., Brooklyn 31, N.Y., 35, 45
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Bacon Industries, Inc., Mass., 12
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Barker & Williamson, Inc., Pa., 5, 12
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Becks, Inc., Minn., 5
Beemer Engrg. Co., Pa., 45, 50
Bell Aircraft Corp., Niagara Frontier Div., N.Y., 5
Bendix Aviation Corp., Bendix Radio Div., Md., 5
Biggs Co., Carl H., Calif., 12, 20
Bill Jack Scientific Instrument Co., Calif., 5
Bingham Mfg. Co., J. F., Mass., 5
Bingham Mfg. Co., Florida Metal Fabrication Co., Fla., 5

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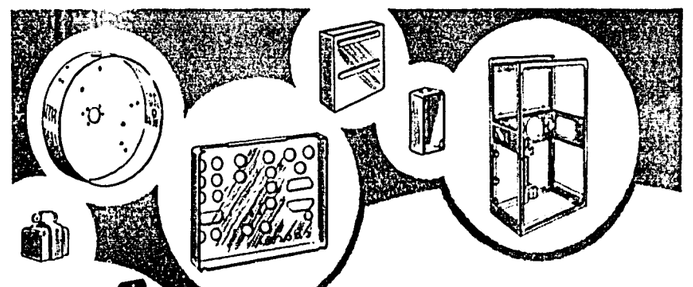

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Bonny Mfg. Corp., Mass., 45, 50
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Brilhart Plastics Sales Corp., N.Y., 12, 45, 50
Brooks & Perkins, Inc., Mich., 5, 10, 35
Buck Engrg. Co., Inc., N.J., 5
Bud Radio, Inc., Ohio, 5, 35
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CBC Electronics Co., Pa., 5
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Cadre Industries Corp., N.Y., 5
Cal-Tronics Corporation, Calif., 5
Canadair, Ltd., Missile & Systems Div., Canada, 5
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Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N.Y., 15, 32
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Canadian Research Institute, Canada, 5, 15
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Cohan-Epner Co., Inc., Dept. I.R.E., 142 West 14th St., New York 11, N.Y., 10
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Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 5, 10, 12
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Devilbiss Metal Fabricators Co., Mich., 5
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Division Lead Co., Ill., 35
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Dynamic Instrument Corp., N.Y., 5
EMI—Cossor Electronics, Ltd., 301 Windsor St., Woodside, Halifax, N.S., Canada, 12
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Engineered Electronics Co., Calif., 5, 40
Engineering Associates, Ohio, 5
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Epoxy Products, Inc., 137 Coit St., Irvington 11, N.J., 12
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Farwell Metal Fabricating, 73 W. Fairfield Ave., St. Paul 7, Minn., 5, 35
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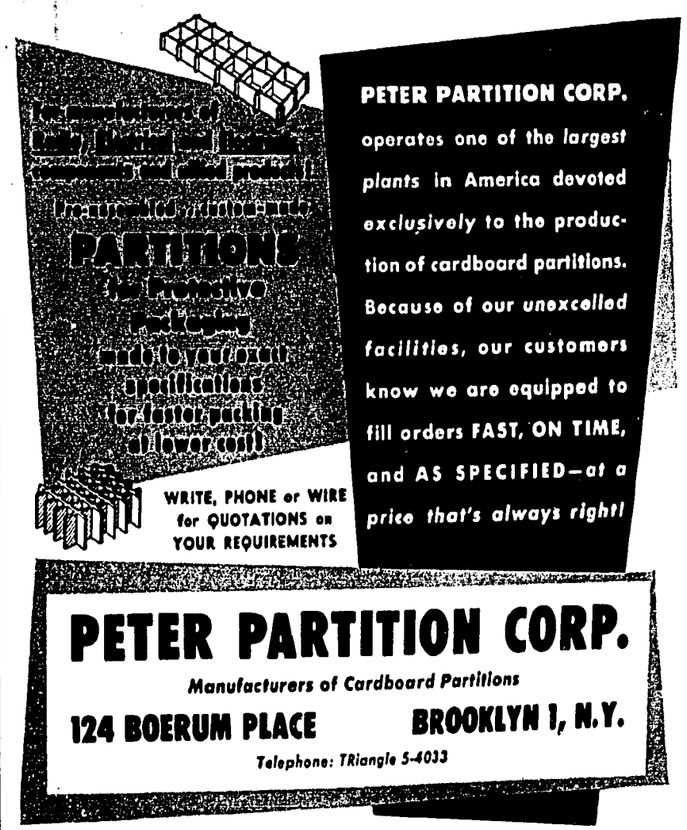

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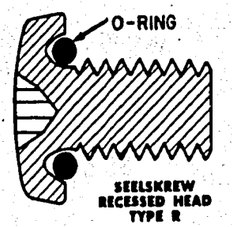

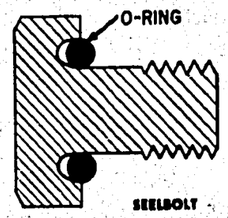

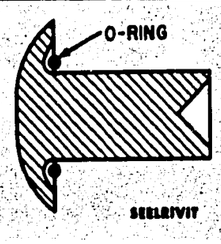

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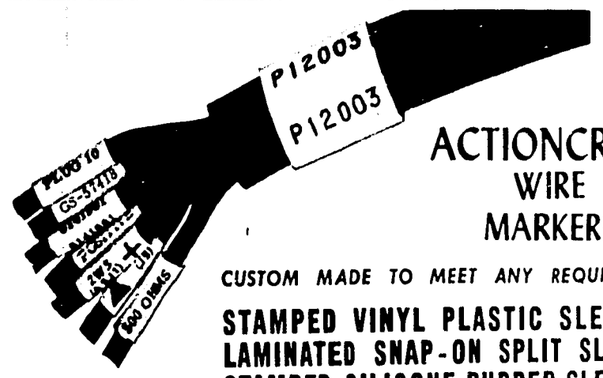

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STAMPED SILICONE RUBBER SLEEVING

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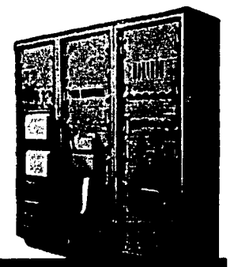

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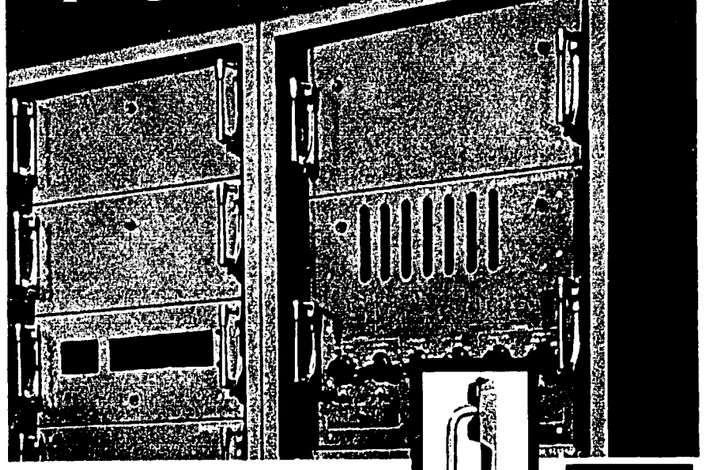

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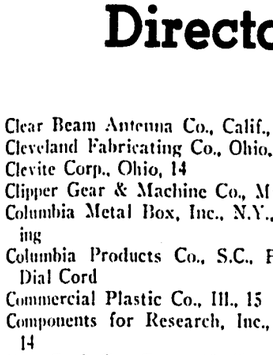
PERMA-CODE WIRE MARKERS



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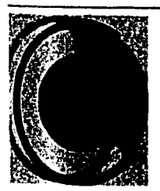

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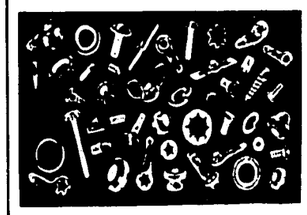

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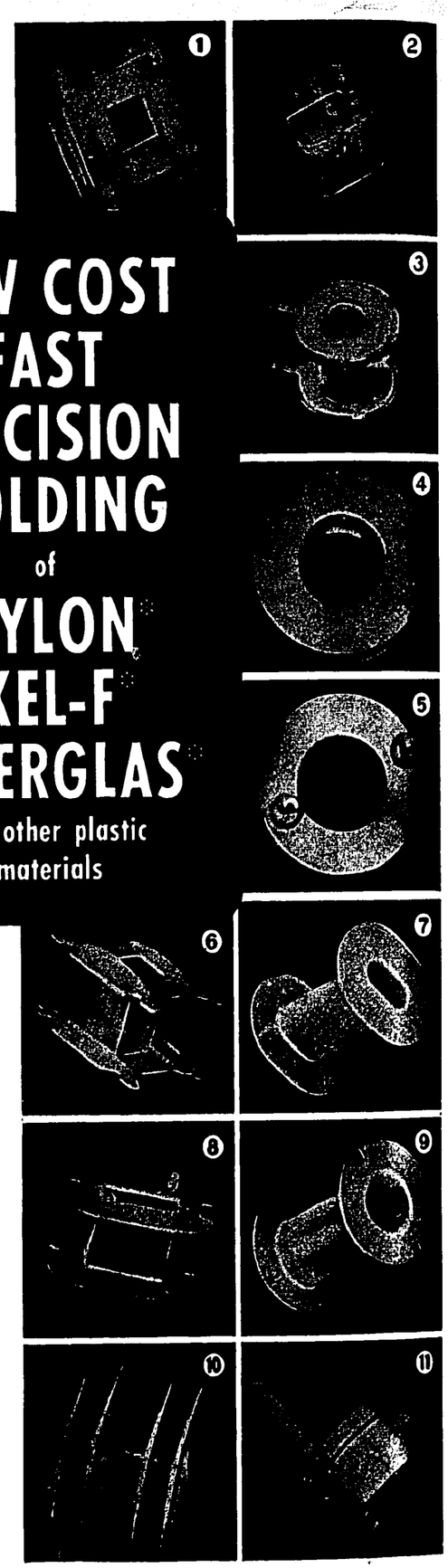

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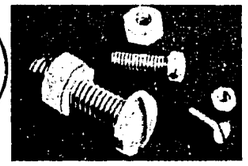

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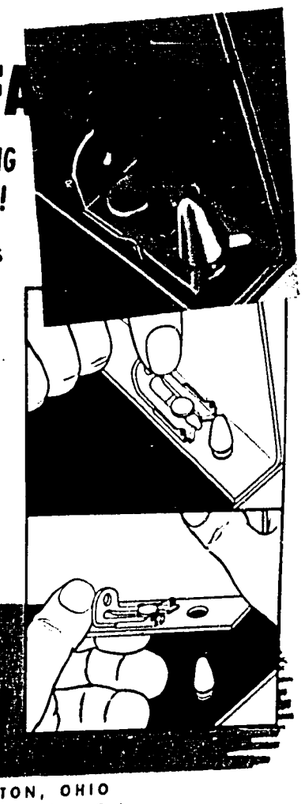

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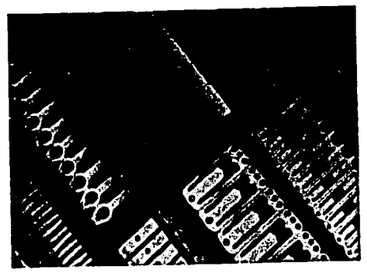

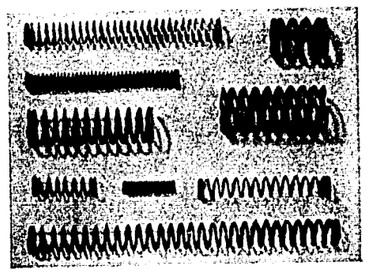

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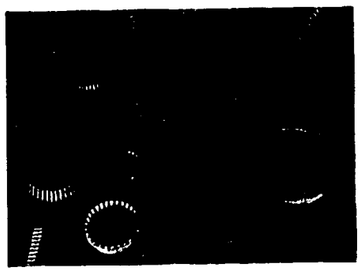

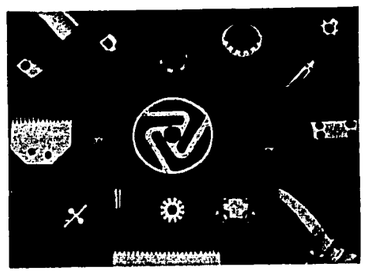

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Hermes Plastics, Inc., N.Y., 42, 45

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Tel: MArket 4-1802

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Tel: 2598

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Illinois Tool Works, Fastex Div., Ill., 15, 21, 33, 51, 54, 63

Illinois Tool Works, Shakeproof Div., Ill., 21, 57, 58

Illumitronic Engineering, 680 E. Taylor Ave., Sunnyvale, Calif., 15, 36
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Tel: REgent 9-2395

Industrial Devices, Inc., N.J., 12

Industrial Elect. Rubber Co., Ohio, 27, 33, 64

Industrial Engravers, Inc., N.Y., 18, 45

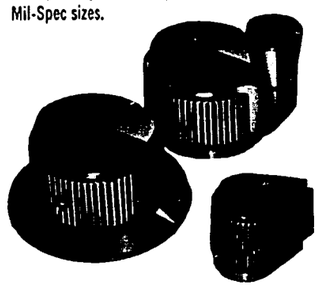
Industrial Retaining Ring Co., N.J., 51

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

NATIONAL

MIL-SPEC KNOBS

In stock! For immediate delivery! And produced by National!... a complete line of standard plastic control knobs made in conformance with MS-91528. There are four basic types: round, pointer, spinner (each with or without skirts) and dial skirted round ... available in three different shaft sizes. Finishes are gloss, matte, or to your color specifications ... in all Mil-Spec sizes.



Knobs: Made of plastic, type III, class H2, per Specification L-P-349. Set Screws: Cadmium plated, class 3, type II, per Specification QQ-P-416. Inserts: Brass, composition 4, hard, per Specification QQ-B-613.

NATIONAL CHOKES

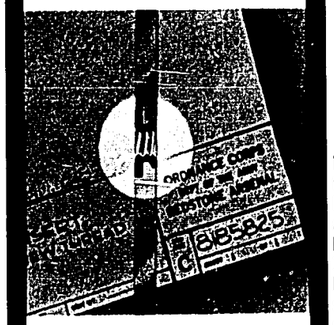
R-45 series, a new family of ferrite bead chokes for use as filament chokes, parasitic suppressors, and series elements of low-pass filters for frequencies from 5 to 200 mc. Insulated with an impregnated fiberglass sleeving, these chokes will handle 2 amperes of filament current with voltage drop of less than 0.02 volts, temperatures to the Curie point of 125°C.

R-40 series ferrite-core chokes... extremely high Q for small size. They are primarily for use in networks and filters at frequencies from 50 kc to 1500 kc, and as resonant elements in IF and RF circuits. Fungus-proof varnish impregnation per MIL-V-137A.

R-25 series MIL-inductance chokes for high frequency circuits, as filament chokes and peaking coils, inductance per MIL-C15305A, coil forms per MIL-P-14, and impregnation per MIL-V-173A.

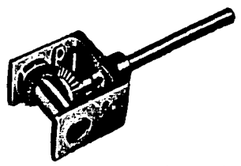
R-33, R-50 and R-60 series RF coils are wound on molded phenolic forms per MIL-P-14 and coated with a tough, fungus-resistant varnish. R-50-10 choke is wound on a powdered-iron coil form instead of phenolic.

NATIONAL'S EXCLUSIVE "FLUSH MOUNT" CAPTIVE NUTS

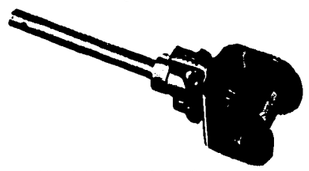


Flush fit on **both** sides of aluminum sheet to provide permanent tapped holes.
Available in Five sizes for use in metal thickness from 1/16" up—in thread sizes from 2/56 up. No special tooling required. Drilled or Punched round hole ± .002 only requirement.
MATERIAL: Stainless steel 303 as per MIL S-853A.
FINISH: Passivated as per MIL P-12011.
Four additional types also available, including one type which provides a permanent thread in thin aluminum that meets MIL SPECS P-11268, E-5400 and E-16400. A complete line of CAPTIVE STUDS is also available.

PRECISION RIGHT ANGLE AND VERNIER DRIVES



Type PRAD: Right angle drive for remote operation of low torque units. Designed for continuous low-speed operation (loads up to 50" ounces), and intermittent high speed operation (up to 500 RPM) with loads up to 100" ounces. Less than 1½° backlash; drives and shafts of various lengths; various size output hubs; brass gears; stainless steel shafts, bushings and sleeves; die cast zinc housings.



Type RAD: Right angle drive. For ganging capacitors, potentiometers or other parts in heretofore inaccessible locations on chassis. Die cast zinc housing gears.

Type AN: Time-tested vernier mechanism. Designed for use with any 3/16" National knobs and others. Drive ratio: 5 to 1; drive shafts: 3/16", 1/4" or to specifications; fully insulated output shaft coupling; output hub fits ¼" shaft; readily adaptable to many types of drives.

Type AVD: Vernier mechanism. Similar to type AN (above) except that output-shaft is non-insulated. Dimensions: over-all diameter 2-9/16", length 1-15/32"

OTHER NATIONAL COMPONENTS

In addition to knobs, chokes, drives and captive hardware, National Radio Company also manufactures a complete line of dials, coil forms, condensers, tanks, grid and plate caps, IF transformers, tube and crystal sockets, ceramic insulators, bushings, spreaders, couplings, terminal assemblies, other electronic and electro-mechanical components. For specific design or development applications problems, write or call.

NATIONAL RADIO COMPANY, INC.

A wholly owned Subsidiary of National Company, Inc.

Melrose 76, Mass.

For details, circle #674 on Reader Service Card

Directory III. Materials & Services

87. Hardware & Findings.

Industrial Teconics, Inc., Mich., 14, High Temp.
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Instrument Specialties Co., Inc., 284-A Bergen Blvd., Little Falls, N.J., 60
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Metal & Wood Fastening Devices Co., Canada, 21, 54
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Meyercord Co., Ill., 42, 45
Mica Insulator Co., Minn. Mining & Mfg. Co., Div., N.Y., 18, 27, 33, 45
Micarta Fabricators, Inc., Ill., 18, 45
Middlesex Paper Tube Co., Inc., Mass., 16
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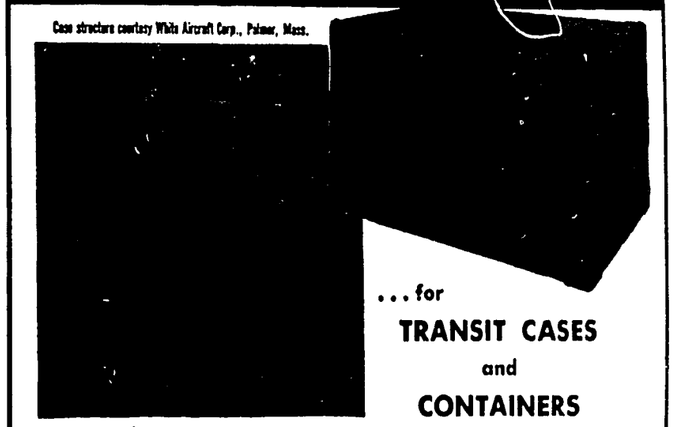
Minnesota Rubber Co., Minn., 33
Minor Rubber Co., Inc., N.J., 14, 27, 33, 51, 63, 64

NEW ADJUSTABLE CATCHES HANDLES TO ARMED FORCES SPECIFICATIONS



Case structure courtesy White Aircraft Corp., Palmer, Mass.

...for TRANSIT CASES and CONTAINERS

ADJUSTABLE CATCH NO. 250-45. Also available for flush mounting and with other variations.

Secure Holding • Easy Engagement
RAPID RELEASE
Designed to function at 500 lbs.
Stress strength to 3000 lbs.

Above illustrated case, 30" x 30" x 36", with eight Nielsen 250-45 catches passed armed forces drop test of 4 feet on all corners, protecting 236 lbs. of instruments, also meeting requirements for waterproof seal and screening from elements.

A VARIED LINE OF CATCHES AND HANDLES

Descriptive literature on request. Design features to meet your specific requirements. Inquiries invited on application problems.

COMPRESSION SPRING DRAW PULL CATCH No. SC-B-83314-42 with springs concealed. Provides 70 lbs. holding tension on standard specification.

RECESSED HANDLE No. H560 shown mounted on case above. Available in steel or aluminum.

SURFACE HANDLE No. H845 to meet Armed Forces Specification MIL-T-945.

NIELSEN HARDWARE CORPORATION
770 WETHERSFIELD AVE., HARTFORD 1, CONN.

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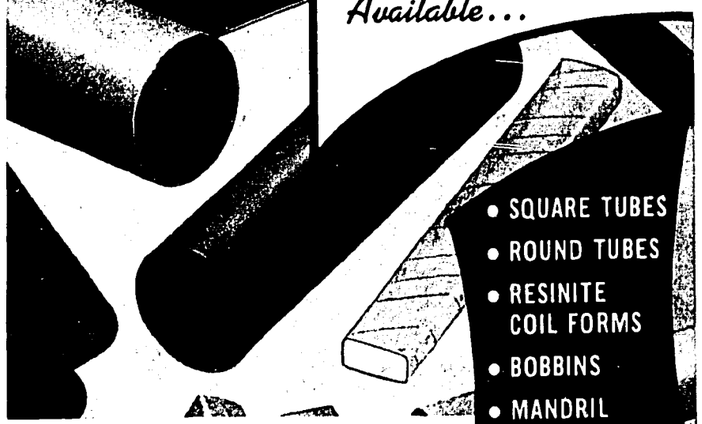
PRECISION

The Only **COMPLETE COIL FORM SERVICE** *Available...*



- SQUARE TUBES
- ROUND TUBES
- RESINITE COIL FORMS
- BOBBINS
- MANDRIL SERVICE
- FABRICATING SERVICE

SQUARE AND RECTANGULAR TUBES

Produced in any length, shape or size from 1/16" to 8", wall thickness from .010 to .125. Fabricated from dielectric kraft, fish paper, acetate, other patented materials or combinations. Bowed sidewall or Di-Formed construction.

ROUND TUBES

Produced in any decimal size up to 8" I.D. Fabricated from kraft, fish paper, cellulose acetate, mylar, polystyrene, quinterra, fibre glass and other dielectric materials.

RESINITE COIL FORMS

These coil forms have the highest resistivity of any resinated product. Furnished plain, embossed, internally threaded or triangular shape . . . also flyback transformer forms.

BOBBINS

Supplied round, square or rectangular. Cores fabricated from any of the above materials. Metal, asbestos, plastic or fibre flanges. Constructed to fit smaller spaces and permit multiple winding.

MANDRIL SERVICE

Accurately ground steel and aluminum coil mandrils at cost economy comparable to commonly used undependable wood or undersized steel mandrils.

FABRICATING SERVICE

We have modern high speed equipment to provide you with any special shape or form . . . rolled, spun, flared, punched or formed to your particular requirement.

Ask about Precision's complete coil form service. Request informative bulletin.

PRECISION PAPER TUBE COMPANY
2062 West Charleston Street, Chicago 47, Illinois
Plant No 2: 1 Flower Street, Hartford, Conn
Representatives throughout United States and Canada

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Modern Adhesives & Elect., Inc., N.Y., Foil Adhesive Labels & Tapes
Molded Insulation Co., Pa., 55
Molding Corp. of America, R.I., 12
Moody Machine Prods. Co., Inc., R.I., 55
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Spartan Marking Corp., Ill., 18

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A...*use North Shore* *pressure sensitive, etched and anodized* ALUMINUM FOIL NAMEPLATES

THERMA-MARK®...Peel backing and press onto any surface without fasteners. No water ...no heat...no chemical solvents needed.

THERMA-CAL®...For problem surfaces such as curved, painted or crinkle finishes. May be heat or solvent activated in seconds to form a permanent bond.

SPEEDY-CAL®...For non-critical applications like smooth or flat surfaces. Simply immerse in water at room temperature, remove backing and press into place.

North Shore nameplates can be obtained in any color or color combination, with matte or shiny finishes. No limitation on style of type face or design. Colors are etched and anodized permanently into the metal surface, will not fade or run. Widely used for insignia, trade marks, installation and operating plates, dials, schematics and instructions. North Shore nameplates meet weather, salt-spray, abrasive and temperature requirements of Mil Specs.

Contact your local General Electric Supply Company for samples, literature, complete information, or wire, write or phone direct to:

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214-27 Northern Blvd., Bayside 61, N.Y. • BAyside 4-4000 • TWX: LPT • Teletype: NY 4-1975 • Cable: NORPLATE

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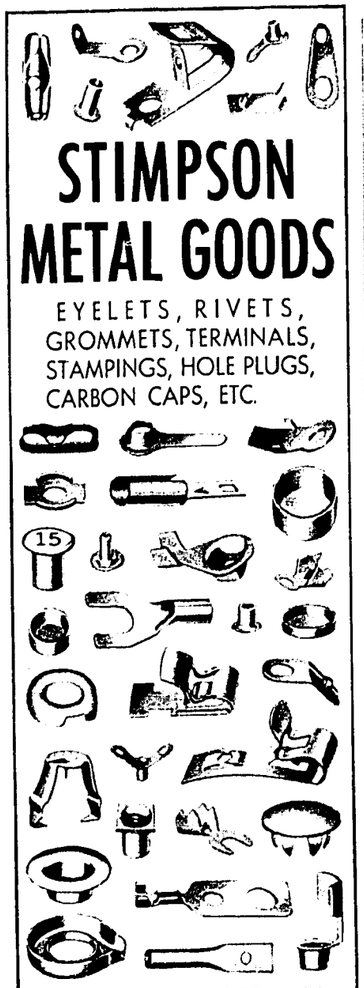
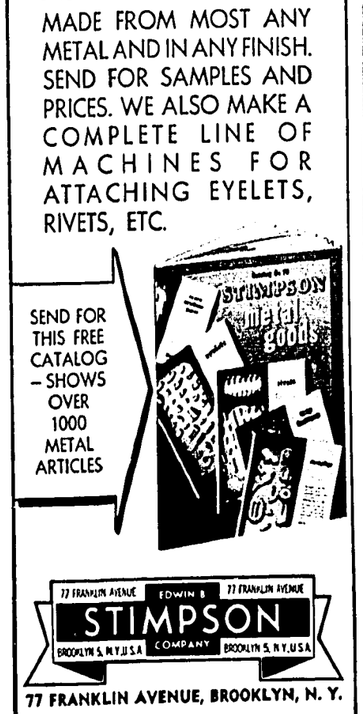


STIMPSON METAL GOODS

EYELETS, RIVETS, GROMMETS, TERMINALS, STAMPINGS, HOLE PLUGS, CARBON CAPS, ETC.



MADE FROM MOST ANY METAL AND IN ANY FINISH. SEND FOR SAMPLES AND PRICES. WE ALSO MAKE A COMPLETE LINE OF MACHINES FOR ATTACHING EYELETS, RIVETS, ETC.

SEND FOR THIS FREE CATALOG – SHOWS OVER 1000 METAL ARTICLES

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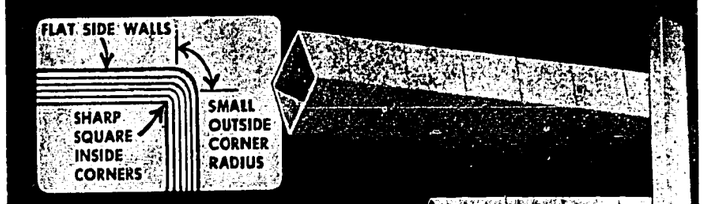
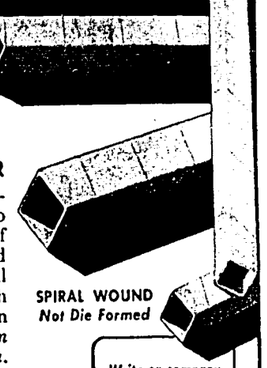
Better Coils begin with PARAFORMED PAPER TUBES



- *No sharp outside edges to cut wire*
- *No need for wedges to tighten wire*
- *Permits winding coils to closer tolerances*
- *Allows faster stacking of wound coils*
- *Has full rigidity and physical strength*



ANY SIZE—SQUARE OR RECTANGULAR

PARAFORMED paper tubes simplify coil winding operations and speed production, yet cost no more. In the exclusive PARAFORM method of tube making, no artificial heat or pressure is used —*Paraforming* takes place at the time of spiral winding. Hi-Dielectric. Hi-Strength. Kraft, Fish Paper, Acetate, Red Rope or any combination wound on automatic machines. *Produced from stock arbors or special sizes engineered for you.* Can also be supplied in regular or with slight bow.

Write on company letterhead for STOCK ARBOR LIST *of over 2000 sizes*

PARAMOUNT PAPER TUBE CORP.

618 LAFAYETTE STREET, FORT WAYNE 2, INDIANA

Manufacturers of Paper Tubing for the Electrical Industry Since 1931

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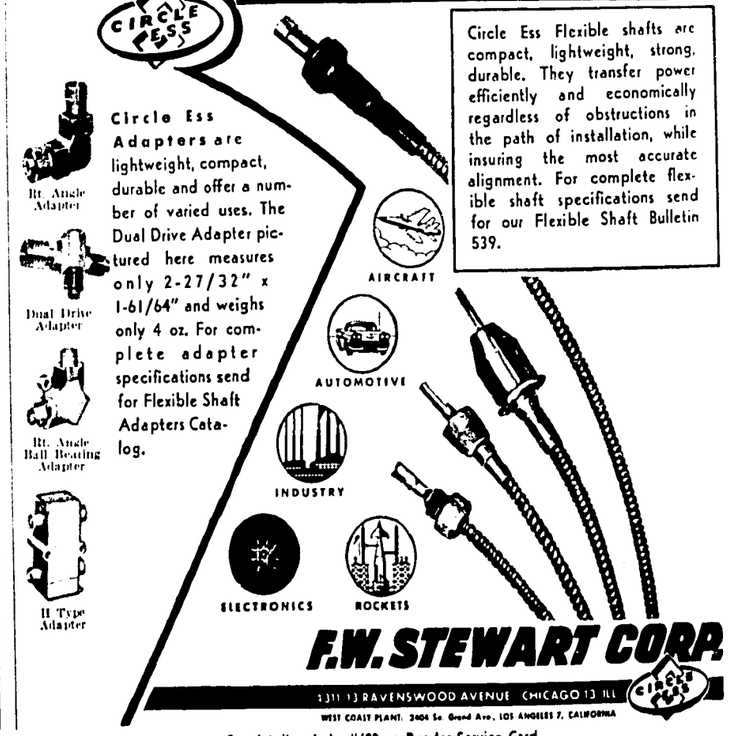
FOR MANY FIELDS

CIRCLE ESS

Circle Ess Flexible shafts are compact, lightweight, strong, durable. They transfer power efficiently and economically regardless of obstructions in the path of installation, while insuring the most accurate alignment. For complete flexible shaft specifications send for our Flexible Shaft Bulletin 539.



Circle Ess Adapters are lightweight, compact, durable and offer a number of varied uses. The Dual Drive Adapter pictured here measures only 2-27/32" x 1-61/64" and weighs only 4 oz. For complete adapter specifications send for Flexible Shaft Adapters Catalog.

F.W. STEWART CORP.

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WEST COAST PLANT: 3404 So. Grand Ave., LOS ANGELES 7, CALIFORNIA

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Made to the Highest Degree of Accuracy

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PROTECT YOUR PRODUCT

at point of strain

Protect product saleability too — by insuring long life for cords, cables and conductors. Genuine "GRIPMASTER" Strain Reliefs provide these vital features—

- ★ Anchor cords to housing
- ★ Eliminate taping or threading
- ★ Prevent unraveling
- ★ Prevent cord pull damage
- ★ All sizes and styles
- ★ Easy to apply
- ★ Inexpensive

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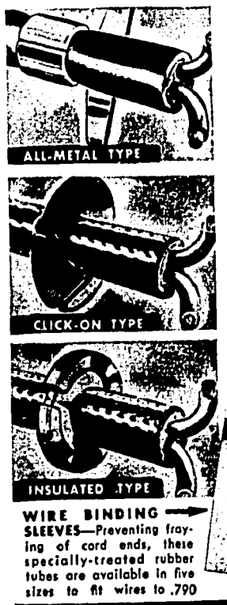
4 WAYS TO END ALL CORD AND CABLE SERVICE FAILURES *Economically*



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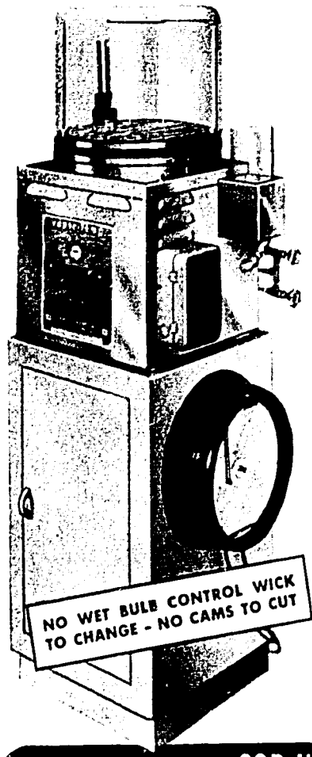

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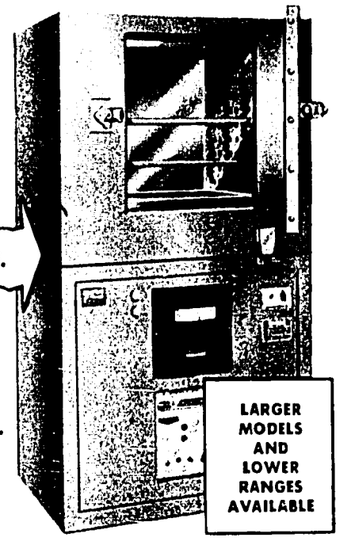

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12. Electric heaters & elements
15. Induction heating
20. Ovens

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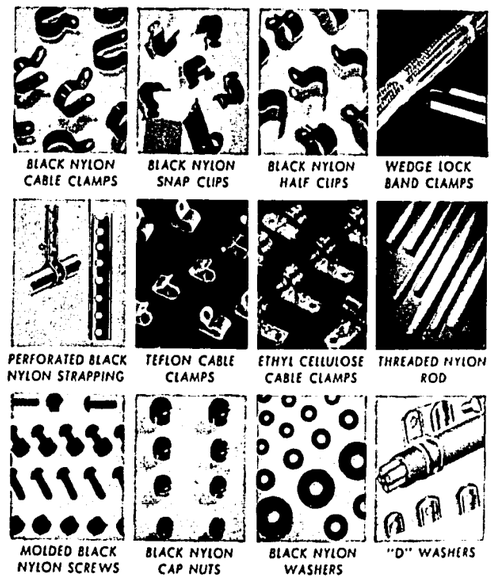

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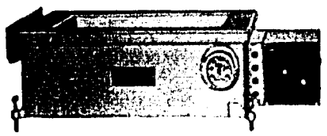

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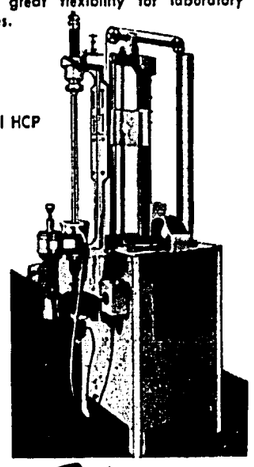
Model HCP



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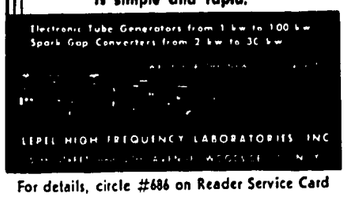

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89. Insulating Materials.

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10. Cambric tubing
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20. Cotton tapes
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50. Rubber
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Hitemp Wires, Inc., N.Y., 40, 55, Teflon Tape & Tubing
Hooker Chem. Corp., Durez Plastics Div., N.Y., 40, 55
Houghton Labs., Inc., N.Y., 40
Illumitronic Engineering, 680 E. Taylor Ave., Sunnyvale, Calif., 15, 40
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Tel: REgent 9-2395
Industrial Accessories, Inc., N.J., 60
Industrial Elect. Rubber Co., Ohio, 50, 55, 60
Insl-X Co., Inc., N.Y., 40, 50, 55
Insulating Fabricators, Inc., N.J., 30, 35, 40, 60
Insulation Mfg., Corp., Ill., 5, 10, 20, 25, 30, 38, 40, 55, 60, Mica
Internatl. Wax Refining Co., N.Y., 55
Isochem Resins Corp., R.I., 40, 55
Isocyanate Products Inc., Del., 40
Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 15, 60
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Tel: MIllington 7-0385
Jodee Plastics Co., N.Y., 40
Johns-Manville, N.Y., 15, 20, 25, 30, 35, 38, 40, 50, 55, 60
Johns-Manville, Dutch Brand Div., Ill., 20, 25, 50, 55
Kendall Co., Polyken Sales Div., Ill., 20, 25
Kirchberger & Co., Inc., M., N.J., 10, 15
Koppers Co., Inc., Plastics Div., Pa., 40
Laminated Sheet Products Corp., Mass., 40, 60
Lamtex Industries, Inc., N.Y., 30, 40
Landes Electronic Fasteners, N.Y., 10, 30
Landsverk Electrometer Co., Calif., 40
Lapp Insulator Co., Inc., Radio Specialties Div., Le Roy, N.Y., 15
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Tel: LE Roy 385
Lee Chemical Corp., Walter, N.Y., 30, 35, 40, 60, Teflon Tape
Louthan Mfg., Co., Ohio, 15
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Marblette Corp., N.Y., 40, 55
Markel & Sons, L. Frank, School Lane, Norristown, Pa., 30, 55, 60, Tubing
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Tel: BRoadway 2-8960
Materials for Electronics, Inc., N.Y., 15
McGraw-Edison Co., National Electric Coil, Ohio, 5, 20, 25, 30, 35, 38, 40, 50, 55, 60
Mesa Plastics Corp., Calif., 40
Mica Corp., Calif., 40

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Directory III. Materials & Services

89. Insulating Materials.

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Micacraft Products, Inc., N.J., Mica
Micarta Fabricators, Inc., Ill., 40
Middlesex Paper Tube Co., Inc., Mass., 38
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 15
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Tel: DAvenport 4-4108
Minnesota Mining & Mfg. Co., Minn., 5, 10, 15, 20 25, 30, 35, 38, 40, 55, 60
Minnesota Mining & Mfg. Co., Chemical Div., Minn., 40, 50, 55
Minnesota Mining & Mfg. Co., Electrical Products Div., Minn., 20, 25, Plastic Tapes
Minnesota Rubber Co., Minn., 50, 60
Minor Rubber Co., Inc., N.J., 40, 50, 55, 60
Mitchell Rand Mfg. Corp., Insulation Div., N.Y., 5, 20, 25, 40, 55
Molded Insulation Co., Pa., 30
Molex Products Co., Ill., 40
Mosinee Paper Mills Co., Wis., 38
Murata Mfg. Co. Ltd., Japan, 15
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Mystik Adhesive Products, Inc., Ill., 25, 60
Narrow Fabric Co., Pa., 30
National Ceramic Co., N.J., 15
National Engrg. Prod., Inc., D.C., 40
National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 40
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Tel: YOnkers 8-6400
National Vulcanized Fibre Co., Del., 40
National Wire & Cable Corp., Calif., 40
Natvar Corp., N.J., 5, 10, 25, 30, 40, 55, 60
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New England Tape Co., Mass., 40, 55, 60
Newman Corp., M. M., Mass., 40, Cable Binding
Newth Rubber Co., R.I., 50
Nopco Chemical Co., Plastics Div., N.J., 40, Foamed
Norrich Plastics Corp., 107-109 West 18th St., New York 11, N.Y., 10, 15, 30, 38, 40, 50
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Page-Madden Co., N.Y., 15
Paul & Stein Bros., Inc., F. H., N.Y., 40
Pee-Wee Molding Corp., N.Y., 40
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Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 35
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Tel: EVerglade 4-2122
Permacel, N.J., 20, 25, 38, 40, 55, 60
Pilgrim Products Inc., Mass., 38, 40
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Polymer Corp. of Pa., Dept. RB, 2140 Fairmont Ave., Reading, Pa., 40, 55
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Tel: FRanklin 6-5791
Porter Co., H. K., Delta Star Elec. Div., Thomas Works, Ohio, 15
Precision Metal Products Co., Mass., 40
Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 38, 40, 55
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Tel: ARmitage 6-5200
Prince Rubber Co., Inc., N.Y., 40, 50, 55
Products Research Co., Calif., 40, 50, 55, 60
Quartzite Processing Inc., Mass., 15
Raybestos-Manhattan, Inc., Pa., 40, 50, 55, 60, Asbestos Tapes
Resin Consultants & Mfg. Co., Inc., N.Y., 40
Rex Corp., Mass., 40, UHF
Richardson Co., Ill., 40
Robertson Electric Co., Inc., 124 S. Elmwood Ave., Buffalo 2, N.Y., 40, 50, 60
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Rogers Corp., Conn., 38, 40, 50, 55, 60
Ross Metals Co., Milton, Pa., 40
St. Regis Paper Co., N.Y., 40
Saxonburg Ceramics, Inc., Pa., 15
Schweitzer, Inc., Peter J., Mass., 38
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Spaulding Fibre Co., Inc., N.Y., 38, 40
Star Porcelain Co., N.J., 15
Stevens Products, Inc., N.J., 30, 40, 60
Steward Mfg. Co., D. M., Tenn., 15
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Sulfex Corp., N.Y., 10, 30, 40
Sun Chemical Corp., Electro-Technical Products Div., N.J., 5, 25, 38, 40, 60
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Tel: LOwell 8-4555
Synthane Corp., Pa., 30, 38, 40, 60
Taylor Electric, Inc., Mich., 40
Taylor Fibre Co., Pa., 40, 60
Tech Art Plastics Co., N.J., 15, 30, 40, 50, 55, 60
Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 15
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Tel: ARmory 1-0163
Technical Tape Corp., N.Y., 20, 25, 40, 55
Technicraft Co., Mass., 40, 55
Telegraph Condenser Co., England, 15
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Tetrafluor, Inc., Calif., 40
Tevco Insulated Wire, Calif., 40
Thermo Materials, Inc., Calif., 15
Thompson Fiber Glass Co., H. L., Calif., 25, 30, 55
Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 15, 40
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Tel: PIlgrim 3-7797
Topper Mfg. Co., Inc., N.Y., 15, 40, 60
Trimount Plastic Co., Inc., Mass., 25, 40
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Union Carbide Corp., Silicones Div., N.Y., 60
United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 15, 35
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Tel: BEekman 3-8870
U.S. Stoneware Co., Alite Div., P.O. Box 119, Orrville, Ohio, 15
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Tel: GEdney 5-3427

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Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 40, 50
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Warren Wire Co., Vt., 25
Waterbury Companies, Inc., Conn., 40
Western Gold & Platinum Co., Calif., 15
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90. Laboratories & Custom Builders.

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10. Pilot run plants
15. Research & development labs
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20. Testing & certifying organizations

ACF Electronics, Va., 5, 10, 17
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Abrams Instruments Corp., Mich., 5, 15, 20
Acton Laboratories, Inc., 536 Main St., Acton, Mass., 15, 20
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Tel: COlonial 3-7756
Adair Engrg. Co., George P., D.C., 5, 15, 20
Adler Electronics, Inc., N.Y., 5, 15
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Aircraft Armaments, Inc., Md., 5, 10, 15
Aircraft Electronics, Ariz., 5, 10, 15
Airtronics, Inc., D.C., 5, 15, 17
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All Products Co., Communication Prods. Div., Texas, 5, 15
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Cadre Industries, Corp., N.Y., 5
California Computer Products, Inc., Calif., 15
California Institute of Technology, Jet Propulsion Lab., Calif., 15, Rockets & Guided Missiles
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Tel: MOhawk 4-1741
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Douglas Aircraft Co., Inc., Calif., 15
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Engineering Model Lab., Inc., Mass., 5, 15
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Gabriel Co., Gabriel Electronics Division, 135 Crescent Rd., Needham Heights 94, Mass., 5, 10, 15
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Industrial Elect. Rubber Co., Ohio, 15, 17
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Instruments for Industry, Inc., 101 New South Rd., Hicksville, L.I., N.Y., 5, 15, Video Amplifier
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Interference Measurement Lab., N.Y., 15, 20
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Jack & Heintz, Inc., Ohio, 15, 20
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Jansky & Bailey, Inc., D.C., 5, 10, 15, 20
Johns Hopkins Univ., Operations Research Office, Md., 15, Operations Research
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Kaiser Industries Corp., W. Coast Elect. Lab., Calif., 15
Kall, Albert R., Pa., 15
Kaman Aircraft Corp., Nuclear Div., Colo., 5, 15
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Kennedy & Co., D. S., 155 King St., Cohasset, Mass., 5, 15
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Knight Corp., Ewen, Mass., 10, 15
Labko Scientific, Inc., Okla., 5, 10, 15
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Landsverk Electrometer Co., Calif., 15
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 15
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Lear, Inc., Mich., 5
Lehigh Engr Associates, N.J., 15
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Lessells & Associates, Inc., Mass., 5, 15, 20
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Litton Industries, Inc., Electronic Equipments Div., 336 N. Foothill Rd., Beverly Hills, Calif., 15, Navigation and Computation
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Tel: CRestview 4-7411
Lockheed Aircraft Corp., California Div., Dept. 2710, 2400 N. Hollywood Way, Burbank, Calif., Aircraft Electronics
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Tel: TRiangle 7-2711
Lockheed Aircraft Corp., Missiles & Space Div., Dept. J-93, P.O. Box 504, 962 W. El Camino Real, Sunnyvale, Calif., 15, Military
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Tel: REgent 9-4321
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Lumatron Electronics, Inc., Dept. IR-60, 68 Urban Ave., Westbury, L.I., N.Y., 5, 10, 15
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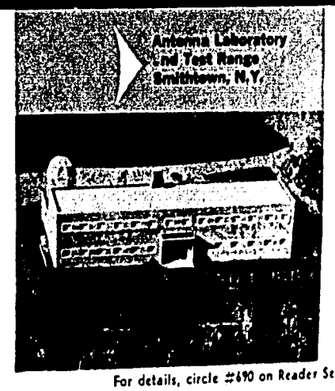

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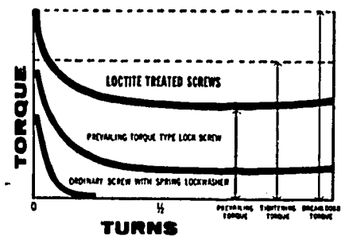

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Tel: STate 9-0501

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 5, 15, 20
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Technical Design & Development Co., Mass., 5, 10, 15
Technicraft Co., Mass., 5
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Tel: EDgewood 3-1027

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Clark Electronic Laboratories, Box 165, Palm Springs, Calif., Pressure Sensitive Paint
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Tel: FAirview 8-2210

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Columbia Technical Corp., 61-12 31st Ave., Woodside 77, L.I., N.Y., 5, 10, 15, 20, 25, 27, 30
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Tel: AStoria 8-7401

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Tel: PRospect 4-1000

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Tel: ROckford 8-9661

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Polymer Corp. of Pa., Dept. RB, 2140 Fairmont Ave., Reading, Pa., 15, 27
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Tel: FRanklin 6-5791
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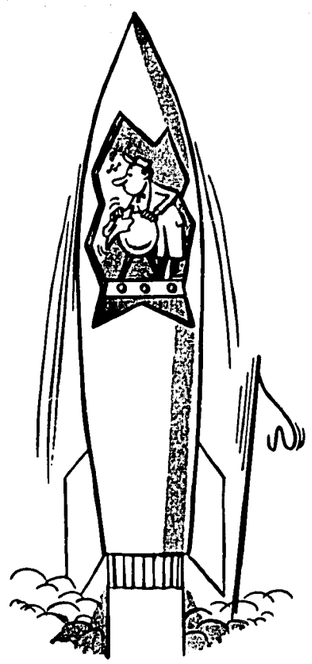
Reilly Tar & Chemical Corp., Ind., Cold & Hot Protective Coatings, Enamels
Resin Consultants-Mfg. Co., Inc., N.Y., 24, 30, Epoxy Adhesives



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92. Machinery & Tools.

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7. Battery chargers
10. Coil winding machines
15. Dehydrators
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25. Marking & engraving machines
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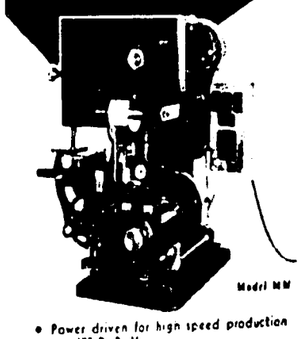

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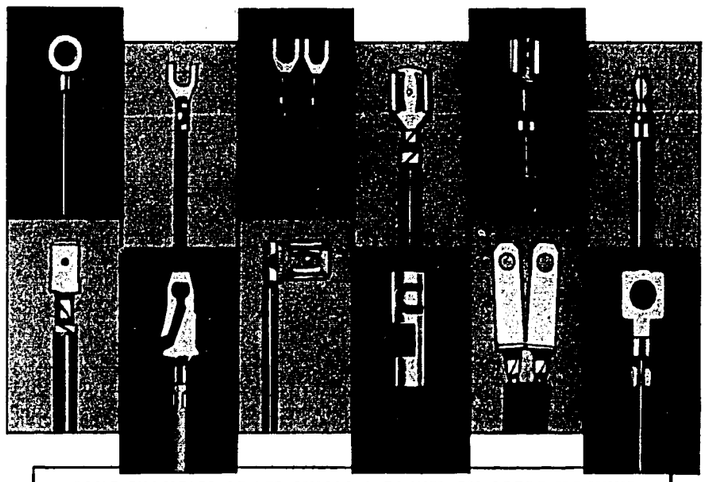
DO YOU NEED *Automation* FOR FINISHING WIRE LEADS WITH TERMINALS ATTACHED?



SOME EXAMPLES OF TERMINALS ATTACHED BY ARTOS MACHINE

NEW ARTOS TA-20-S Performs 4 Operations *Automatically!*

Artos TA-20-S with guard raised

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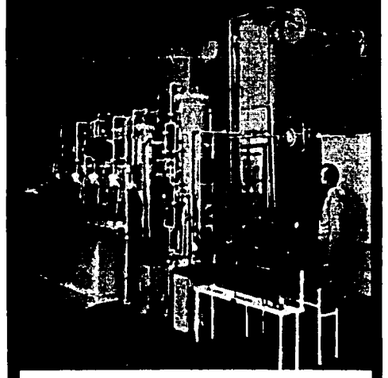
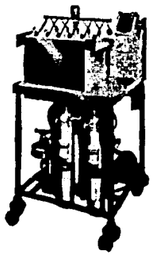


18,000,000 *ohm* WATER

This Barnstead equipment in series consists of sand and carbon filter, high-capacity 4-bed demineralizer, 2 Barnstead® high-purity Stills, tin-lined tank, mixed-bed demineralizer, MF® Submicron filter, tin-lined heater. RESULT: 18,000,000 ohm water in production quantities, free from organics, bacteria, and submicroscopic particles down to 0.15 micron.



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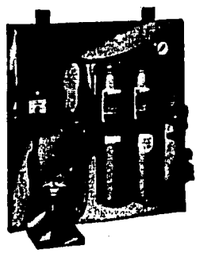

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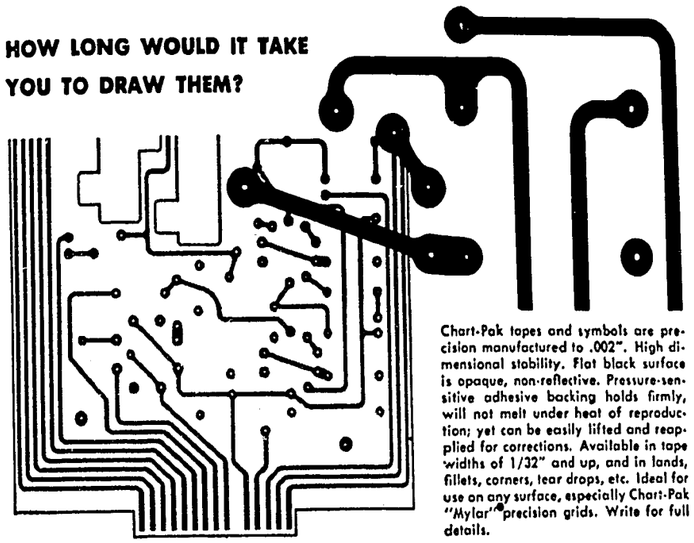

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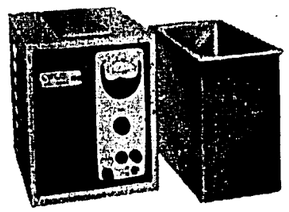

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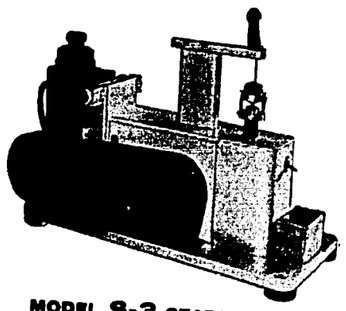

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Smallest of our family of machines for both internal and external winding in lamination stacks.

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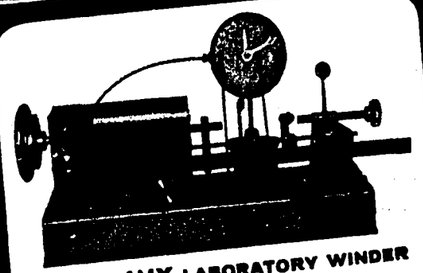
One of several types of toroid winders for inductances, auto transformers, rheostats, etc.



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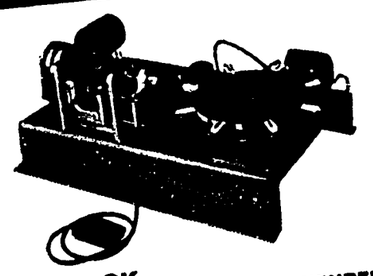
The world's most versatile winding machine for all types of radio frequency coils as well as bobbins, transformers, resistors, etc. Features continuous gain or feed adjustment and our exclusive adjustable cam.



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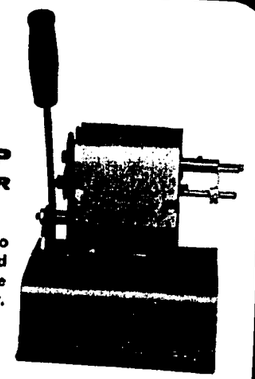
Coils with up to 60 turns produced in a single stroke of the lever.



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One of our several models to wind many coil types on a completely automatic or semi-automatic basis.

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TWEEZER WELD

Precision Resistance Welding Equipment

NOW produce up to 6,000 welds per hour . . . automatically . . . with one operator.

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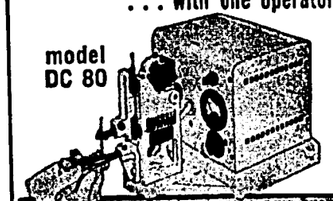

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- New TW5 low friction welding head
- Stored energy panel of 80 Watt second capacity
- Discharge time of 0.0008 to 0.0012 second
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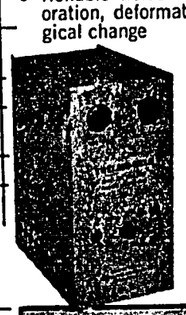
- Reliable welds without discoloration, deformation, metallurgical change



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6" wide
10½" high
8½" deep

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- 1 KVA capacity utilizing semiconductors.
- Also ideally suited with high speed automatic machinery.
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- Welding time: ½ cycle (8 milliseconds) to 10 cycles (160 milliseconds).

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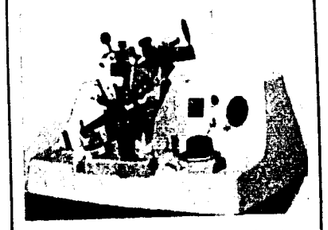
GORMAN Coil Winding Machine produces toroids 0.062 in. id. to 2 in. od.



Model 400 handles No. 46 to No. 26 wire. Three rollers support core to be wound. Core is rotated evenly through 360 deg. with assembly tilted toward the operator so he can see through it to readily view winding process. Rollers open outward at the same angular rate to coil will maintain its same center relation to wire-holding nozzle.

Position of core holder assembly can be moved forward, backward, upward. Each winding can be done automatically. Speed is variable from 0 to 1,200 turns per min. A counter drives a Selsyn receiver to show the number of turns. There is also provision for instant stopping.

Model 400 operates on 115 v., 50/60 cy. Weight: 50 lbs. Dimensions: 22 in. long by 10 in. high.

Send for complete details

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Dept. D-1
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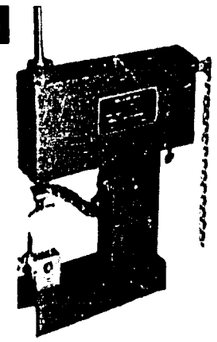

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Bench welding head with foot or air operation Pressure 1 to 20 lbs. Precise, linear, motion. Stroke 2". Easy to set up and to jig up.

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For miniature and subminiature welds. Pressure ½ ounce to 3 lbs. For wire welds .0005 to .020" dia., other very small parts. Ball bearing operation, ultra low mass.

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automatically
WITH THE MOST COMPLETE LINE OF AUTOMATIC COIL WINDING EQUIPMENT EVER OFFERED TO THE ELECTRICAL ELECTRONICS INDUSTRIES

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For automatic winding of high precision sine-cosine and linear potentiometers.
FEATURES:
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Core feed adjustable in increments from .00004" to .024" per revolution
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AWO
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FEATURES:
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Winds up to 4 flangeless coils simultaneously

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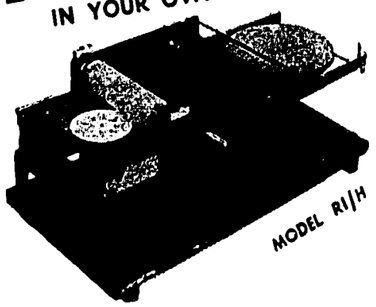

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General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 55
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Tel: ROckford 8-9661
General Electric Co., Apparatus Sales Div., N.Y., 7, 30
General Electric Co., Pa., 7
General Kinetics, Inc., Va., 33
General Metals Corp., Adel Precision Prods., Calif., Valves & Hydraulic Pumps
General Nuclear Corp., N.Y., 7
General Research & Supply Co., Mich., 25, 28
General Ultrasonics Co., Conn., 33
Genisco, Inc., Calif., 45
Gillies Co., Inc., Duncan M., Mass., 25
Gorman Machine Corp., Dept. D, 480 S. Main St., Randolph, Mass., 10
See ads on pages 665, 667
Tel: WOodlawn 3-4440
Green Instrument Co., Inc., Mass., 25
Green Rectifier Co., N.J., 5, 7
Gregg Electric Mfg. Co., Inc., Mass., 30
Gulton Industries, Inc., N.J., 32, 33, 34
H&H Machine Co., Inc., Pa., Custom Built Machinery
Halm Instrument Co., Inc., N.Y., 10, Special Automatic Machinery
Harder Co., Donald C., Calif., 10
Hardman Co., Inc., H. V., N.J., Metering Mixing Dispenser
Hermes Plastics, Inc., N.Y., 25
Hexacon Electric Co., 161 W. Clay Ave., Roselle Park, N.J., 30
See ad on page 666
Tel: CHestnut 5-6200
High Vacuum Equipment Corp., Mass., 35, 40
Hillyer Corp., N.J., Printed Circuit Drilling Machine
Hirschmann Co., Inc., Carl, 30 Park Ave., Manhasset, L.I., N.Y., 10, 20
See ad on page 666
Tel: MAnhasset 7-5300
Hoffman Co., P. R., 321 Cherry St., Carlisle, Pa., 20
See ad on page 437
Tel: CArlisle 1090
Holub Industries, Inc., Ill., 55
Huck Mfg. Co., Mich., Driving Tools
Hull Corp., Hatboro, Pa., 5, 27, 40, Potting Equipment
See ad on this page
Tel: OSborne 5-5000
Hunter Tool Co., Calif., 20, 55
Hydraulic Press Mfg. Koehring Co. Div., Ohio, 27
Hyge Machines, Convair Div., Calif., Shock Exciters
Ideal Industries, Inc., Ill., 20, 55
Imra Corp., Mass., 20, Tension Gage
Induction Heating Corp., N.Y., 55
Industrial Systems Co., N.J., Metal & Plastic Parts Cleaning Equipment
Industrial Winding Machinery Corp., P.O. Box 62, New York 5, N.Y., 10
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Tel: WHitehall 3-1754
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 7
See ads on pages 358, 428, 492
Tel: LUdlow 4-6200
International Eastern Co., 601 Sixth Ave., New York 1, N.Y., 25, 28
See ad on page 666
Tel: ALgonquin 5-3296
International Pump & Machine Works, N.J., 35, 40
Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 5
See ad on page 619
Tel: MIllington 7-0385
Itek Corp., Mass., 20, 25, 30, 50
Jennings Machine Corp., Pa., Rod, Tubing Insulation, Extruders of Teflon

new DESIGN in PERFORMANCE VERSATILITY

NO CAMS . . . NO GEARS
Infinitely variable pitch, traverse and speed. Single and multiple winding. Close or space winding.

HEAVY DUTY
COIL WINDING MACHINES
For High Production and Laboratory

—ALSO—
Toroid Winding Machines
Armature Winding Machines
Stator Winding Machines
Braider Bobbin Winders
Re-winding and Spooling Machines
Pail Packaging Machines
Slot Insulating Machines
Wire Take-ups (constant tension)
Take-offs (stands, pails, overhead)
Wire Tension Meters, etc.

Send Specifications • No Obligation

INDUSTRIAL WINDING MACHINERY Corp.
P.O. Box 62 New York 5, N.Y.
WHitehall 3-1754

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STANDARD MOLDING PRESSES
- Fully-Automatic
- Self-Contained
- Compr. & Transf.
- Stock Models
- Custom Units

MANUFACTURED AND SOLD BY
HULL-STANDARD CORPORATION
HATBORO, PA.

OVER 25 YEARS SERVICE TO THE PLASTICS INDUSTRY

Vacuum Equipment for
- ENCAPSULATING
- POTTING
- IMPREGNATING

MANUFACTURED AND SOLD BY
HULL *Corporation*
HATBORO, PA.

YOUR PARTNERS FOR PROFITABLE PRODUCTION

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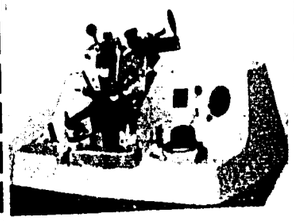
GORMAN
TOROID WINDER
Model 600



- Toroids from .055 I.D. to 2 inches O.D.
- Wire sizes from #46 to #26
- Speed from 0 to 1200 turns per minute
- Dynamic Braking for instant stop
- Automatic Sector & Bank winding
- Accurate all-Transistor turns counter
- Jockey Stick for core positioning while winding
- Portable: 50 pounds

Send for complete details.

GORMAN MACHINE CORP.
Dept. D
480 S. Main St. Randolph, Mass.
WOodlawn 3-4440

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264

Directory III. Materials & Services

92. Machinery & Tools.

Johnson Assoc., Walter A., N.Y., 45
Johnson Research Corp., N.Y., Drafting Aids
Jones & Lamson Machine Co., Vt., Optical Comparators
Kahle Engineering Co., 3322 Hudson Ave., Union City, N.J., 10, 20, 25, 28, 30, 35, 50, Semiconductor Machinery
See ad on page 668
Tel: UNion 7-6500
Kanthal Corp., Conn., 5, 10, 15
Kalsey-Hayes Co., Utica Drop Forge Tool Div., N.Y., 55, Pliers & Wire Wrapping Tools
Kemode Mfg. Co., Inc., N.Y., 30, Non-Electric Cartridge Heated
Kingsley Machine Co., 850 Cahuenga Blvd., Hollywood 38, Calif., 25, Wire
See ad on this page
Tel: HOllywood 9-7243
Kinney Mfg. Div., New York Air Brake Co., 3631 Washington St., Boston 30, Mass., Vacuum Valves
See ad on page 151
Tel: JAmaica 4-3220
Klein & Sons, Inc., Mathias, Ill., 20, 55, Pliers & Cutters
Koehring Co., Hydraulic Press Mfg. Co., Div., Ohio, 20, 27, Injection Molder
Krengel Mfg. Co., Inc., N.Y., 25
Kwikheat Mfg. Co., Calif., 30
L.A.B. Corp., N.Y., 45
L & R Mfg. Co., N.J., 33
Lear, Inc., Lear-Romec Div., Ohio, 40
Lemert Engineering Co., Inc., Ind., 20, 28, Riveters
Levin & Son, Louis, Inc., Calif., 20
Lewyt Mfg. Corporation, N.Y., 15, Air Conditioners
Lignacraft, N.Y., 28
Ling Electronics, Inc., 1515 S. Manchester Ave., Anaheim, Calif., 45
See ads on pages 270, 301
Tel: TExas 0-7711
Litton Engineering Labs., P.O. Box 949, Grass Valley, Calif., 20, 35, 40
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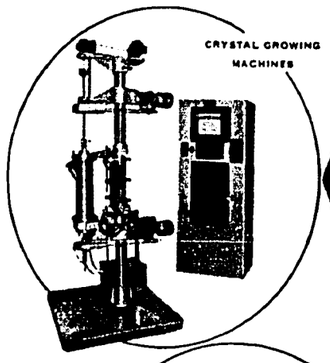
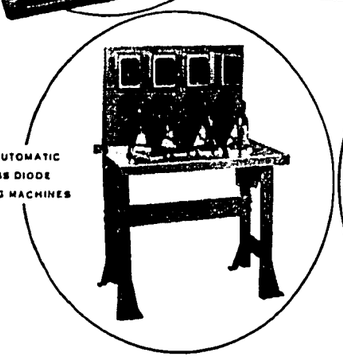
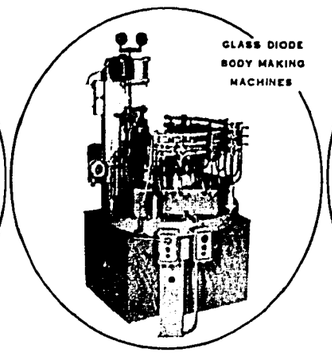
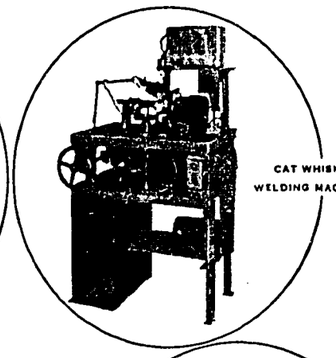
Tel: GRass Valley 1739
Lenz Electric Equipment Co., Ohio, 25, 30



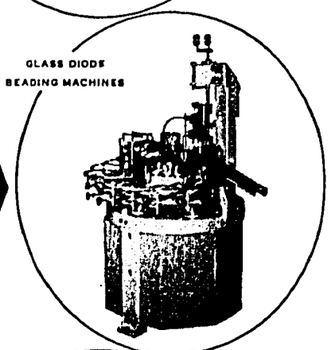
We have created over one thousand DIFFERENT KINDS of electronic production machines!

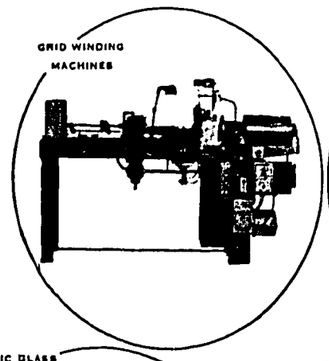


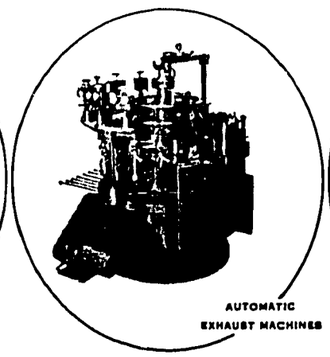


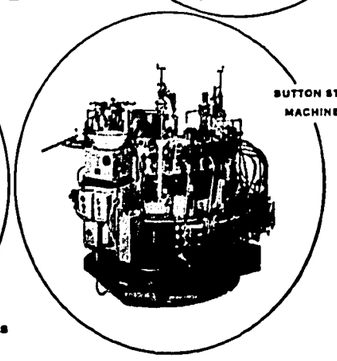


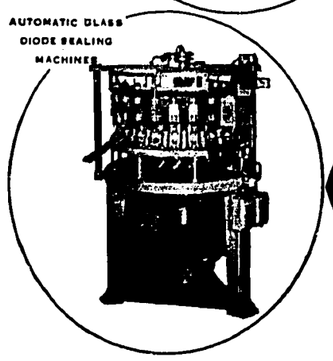
Whether for semiconductor or electronic tube production, each has exceeded customers' specifications. And each was tested under actual operating conditions before shipment.











Can you use this kind of engineering service and cost saving automation on YOUR business? CALL OR WRITE US.

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ENGINEERING COMPANY
WORLD'S LARGEST EXCLUSIVE BUILDER
OF MACHINERY FOR THE ELECTRONIC INDUSTRY

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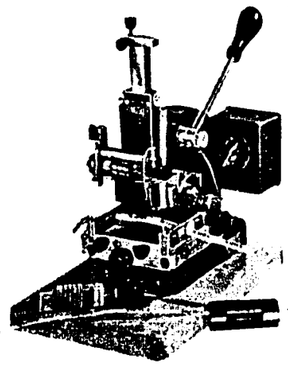
ELIMINATE COSTLY COLOR CODING



CODE MARK YOUR OWN WIRE WITH A KINGSLEY WIRE-MARKING MACHINE

Now you can permanently mark each wire with its own individual circuit number, at any desired spacing. You can reduce wire inventories because only one color of wire is necessary for as many codes as desired.

Simplify your assembly methods and speed production with the same machine that has proved so successful in the aircraft industry. Special machines are available for marking flexible vinyl sleeves.

Write for complete information.

KINGSLEY MACHINE CO.
850 Cahuenga, Hollywood 38, Calif.

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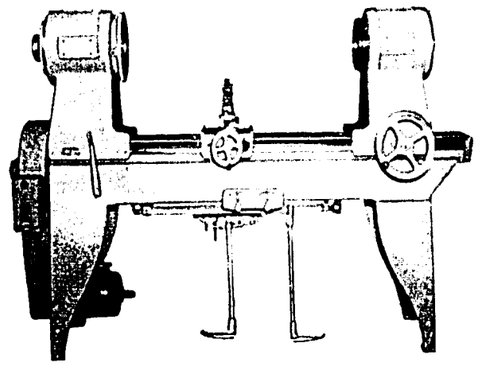


NEW **MODEL ESA $3200.00** Price f.o.b. Grass Valley **NEW**

STANDARD EQUIPMENT

Two face plates
One collet draw-in bar
One 6-fire seven jet burner assembly
Hand carburetion control
Foot pedal control of air or nitrogen supply and of oxygen-gas volume
Main air valve controlling air in either or both spindles
½ h.p. Motor, 230 volt, three phase, single speed, 60 cycle, AC
Face plate wrench
One motor belt
One motor pulley

General Specifications

Variable Speed Drive — Electronic Control (As shown) Available at extra cost

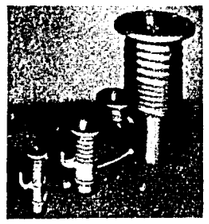
Maximum length overall	84"	Spindle hole diameter	7⅛"
Maximum width overall	24"	Radial clearance above apron	13¾"
Maximum length spindle nose to spindle nose	47"	Net weight	Approx. 1250 pounds
		Approx. shipping weight	1500 pounds

Litton Engineering Laboratories
Grass Valley, California • P. O. Box 949
For details, circle #714 on Reader Service Card

ONE CONVENIENT SOURCE
for ALL Your High and Ultra-High Vacuum Needs

Now that you've decided that you can make a better product cheaper by using high or ultra-high vacuum processing, why not do it the easy way? Save time, money, and frustration by taking advantage of the "one stop" service offered by NRC. This is your one convenient source of a complete line of high and ultra-high vacuum components, equipment, and systems, PLUS a wealth of practical information on how to use them profitably.

VACUUM PUMPS, GAUGES, VALVES



VACUUM PUMPS

NEW DIFFUSION PUMPS
Up to 50% more speed and less height. Permit more compact construction of furnaces, coaters, or other high-vacuum equipment. Can double capacity of your present installation.

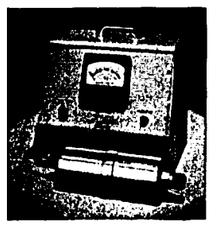
MECHANICAL
Single and two-stage from 1.25 to 400 CFM. Gas Ballast keeps pump oil uncontaminated by condensables.

BOOSTER AND DIFFUSION
Oil and mercury. Capacities 10 to 60,000 CFM. Pressures below 10^{-7} mm Hg. Special low backstreaming models available.

MECHANICAL BOOSTER
Provides "clean" vacuum to below 10^{-4} mm Hg. Capacities 250 to 4,500 CFM.

ULTRA-HIGH VACUUM PUMPS
Molecular drag, titanium adsorber, and ion pumps for very clean vacua to 10^{-12} mm Hg.

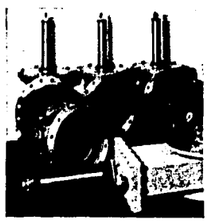
VACUUM GAUGES



Model 520 Alphatron® Ionization Gauge. Range 1000 — 0.0001 mm Hg.

Wide line of direct reading, total pressure gauges for accurate measurement from atmosphere to less than 10^{-12} mm Hg. Thermocouple, Pirani, and ionization gauges, including Alphatron®, burn-out proof, ultra-high vacuum, and conventional types.

VACUUM VALVES AND HARDWARE



Air release, ball, throttling, high conductance, angle, wye, globe, and slide valves. Manual and air operation. Bronze, mild and stainless steel, aluminum. Bellows and O-ring sealed. Sizes from ¼" to 36". ALSO seals, flexible connectors, cold traps, and accessories.

TANTALUM SINTERING AND OTHER VACUUM FURNACES

High temperature resistance furnace Model 2915. 4400°F in three minutes. Pressures to 1 x 10^{-5} mm Hg. Large 6" I.D. x 10", three phase, long life heating element.

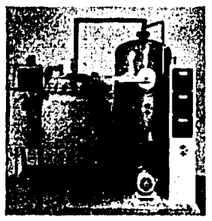
NRC has built and operated more high vacuum furnaces than any other organization in the world. Among these are batch and semi-continuous, resistance and induction, tantalum sintering furnaces. Other induction and resistance furnaces with capacities from 2 to 5000 lbs. Cold mold and skull arc furnaces with capacities from 2 to 10,000 lbs.

LEAK DETECTORS AND SYSTEMS

Inexpensive Model 4902 finds leaks as small as 10^{-8} cc/sec. Rugged, convenient, simple, fast recovering, it guarantees repetitive results.

Bench, rotary, in-line, etc., systems for production line quality control of relay cases, transistor housings, hermetic and glass to metal seals, wave guides, etc. Halogen and helium sensitive detectors for leak locating in manufactured products and in vacuum and other process equipment.

VACUUM IMPREGNATING AND DRYING



Pilot plant or production line drying, degassing, and impregnating systems for improving the dependability and electrical characteristics of capacitors, transformers, cables, and other components.

HIGH ALTITUDE TEST CHAMBERS

Standard chambers with diameters, 12" to 66" for simulating altitudes to 100 miles. Special chambers for altitudes to 400 miles.

SEMI-CONDUCTOR PRODUCTION EQUIPMENT

Low-cost standard furnace for growing single crystals of silicon, germanium, and intermetallic compounds.

Belljar and tank vacuum metallizers, diameters 12" to 66", for depositing thin films to precisely controlled thicknesses of from one molecule to several mils.

Two-zone 5" diameter muffle vacuum heat treating furnace.

ULTRA-HIGH VACUUM SYSTEMS

Standard and special systems for pressures to 10^{-12} mm Hg. incorporating improved ultra-high vacuum components.

NRC
EQUIPMENT CORPORATION

DEPT. 12, CHARLEMONT ST., NEWTON 61, MASS.
A Subsidiary of National Research Corporation

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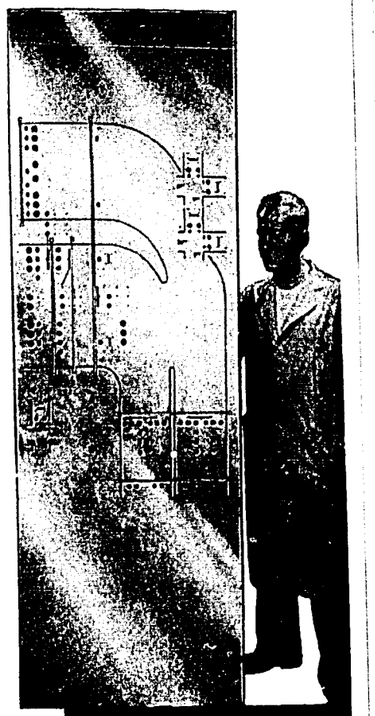
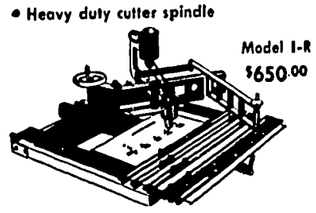
Now—
NO plate too small—
2138
NO panel too big



NO size limits on engraving

ENGRAVES 18"x6" RECTANGLE IN ONE SET-UP

- Takes up only 2 feet of bench space
- Engraving chassis can be detached from base and placed directly on workpiece of *any dimension*
- Self-centering workholder cuts down set-up time
- Heavy duty cutter spindle



Model I-R
$650.00

Request our 28-page illustrated catalog YR-3 on your business letterhead.

new hermes ENGRAVING MACHINE CORP.
154 West 14th Street New York 11, N.Y.

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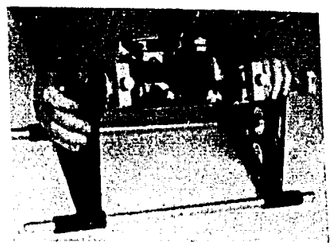
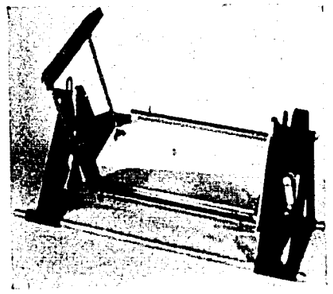
PRODUCTION FIXTURES

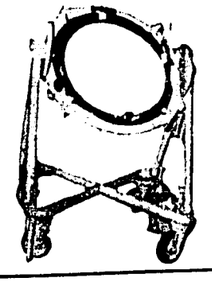


Attention Methods Engineers

Production Tool and Fixture assemblies save you time and money in your wiring and assembly departments. "Tiny-Fix," your third hand, positions miniature chassis, terminal boards and connectors in proper alignment which results in quicker and more efficient work.



The S-12-W above differs from our standard friction and index models in that it offers worm drive that gives positive positioning even under heavy stress. The PF-20-C floor model precision fixture is designed to level and rigidly support the bulky but delicate chassis assemblies required by recent developments in the missile and related industries. 36 inch height at pivotal centers permits the rotation of assemblies as wide as 50 inches through 360 degrees in two planes.



Adapters similar to those shown in the assembly fixtures above are designed by our engineering staff to meet your specific requirements.

Write us for our catalog and current list of firms now using our equipment in the electronic industry.

PRODUCTION TOOL AND FIXTURE CO.
37 WEST MAIN STREET
OYSTER BAY, N.Y.
Telephone: OYster Bay 6-0009

For details, circle #717 on Reader Service Card

Directory III. Materials & Services

92. Machinery & Tools.

Luxo Lamp Corp., N.Y., Work Lamps
MacDonald & Co., Calif., 20
Markem Machine Co., N.H., 25
Martindale Electric Co., [illegible], 30, 45
Marlowe & Co., Inc., Pa., 25
McGraw Edison Co., Power [illegible] Div., Elgin, Ill., Pa., 15
McKenna Labs., Calif., 50
Metal Spun Wave Deflector Co., Calif., 50
Metal & Thermit Corp., N.J., 50
Meter-Mix Corp., Mass., 20
Methode Mfg. Corp., 7447 W. Wilson Ave., Chicago 31, Ill., 25
See ad on page 505
Tel: UNderhill 7-9600
Mico Instrument Co., Mass., 10, 27
Micro Balancing, Inc., N.Y., Dynamic Balancing Machine
Micromech Mfg. Corp., N.J., Watchmkr Machine
Microtronics, Inc., N.J., 20
Milford Rivet & Machine Co., Conn., Rivet Setters
Miller Electric Mfg. Co., Inc., Wis., 50
Millers Falls Co., Mass., 20
Milman Engineering Co., Calif., 20, Leadscrew Mach. & Drill Presses
Montek Associates, Inc., Utah, 55
Moody Machine Prods. Co., Inc., R.I., Tools
Morris Co., J. L., Mass., Taps & Dies
Multicore Solders, Ltd., [illegible], 55
Murata Mfg. Co., Ltd., Japan, 55
Murphy & Miller, Inc., Ill., 15
Mytron Mfg. Co., Calif., 27
N R C Equipment Corp., Dept. 12, 160 Charlemont St., Newton 61, Mass., 5, 40
See ad on page 670
Tel: DEcatur 2-5400
Narda Ultrasonics Corp., Dept. IRED-4, 625 Main St., Westbury, L.I., N.Y., 33
See ad on pages 80-81
Tel: EDgewood 3-5400
National Ultrasonics [illegible], 25, 55
Nelson Vacuum Pump Co., Calif., 50
New Hermes Engraving Machine Corp., 154 W. 14th St., New York 11, N.Y., 25
See ad on this page
Tel: WAtkins 4-7373
New [illegible] Tool Corp., N.Y., 50
New York Air Brake Co., Kinney Mfg. Div., 3031 Washington St., Boston 30, Mass., 40, Vacuum Values
See ad on page 151
Tel: JAmaica 4-3220
New York Air Brake Co., Vacuum Equip. Div., N.J., 5, 40
Newman Corp., M. M., Mass., 50
Nichols, Ltd., R. H., Canada, 7

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The Industrial Airbrasive is doing jobs that were previously thought impossible! By gas-propelling a precise stream of fine particles it gives a *fast, cool, shockless* cutting or abrading action. It is equally useful as a laboratory instrument or a mass-production tool. Every day new applications in the electronics field are being found.

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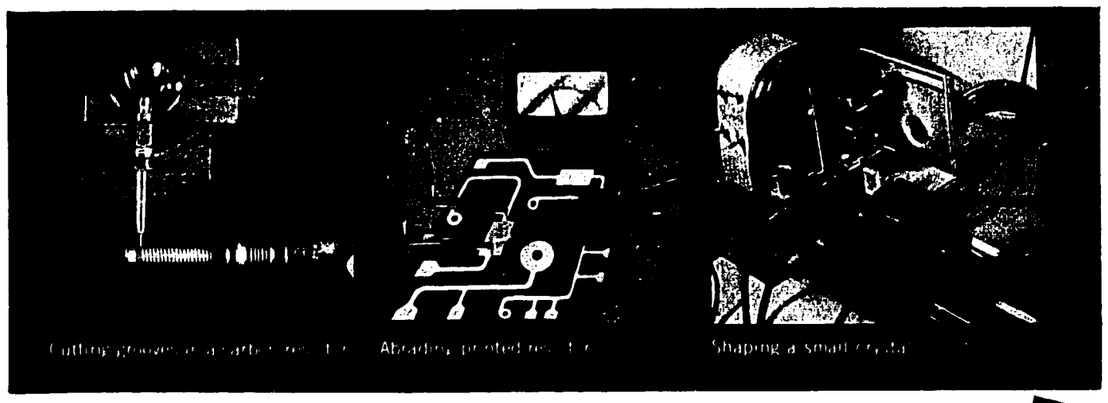
...AND MANY OTHERS!

Send us samples of your most difficult cutting problems and let us test them for you at no cost!

1074



Cutting grooves in a ceramic core Abrading printed circuits Shaping a small crystal

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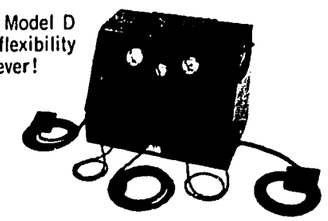

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Norton Co., Mass., 20, Ultrasonic Abrasives
Numberall Stamp & Tool Co., N.Y., 25
Onan & Sons, Inc., D. W., 2945 University Ave., S.E., Minneapolis 14, Minn., 7
See ad on page 496
Tel: FEderal 2-1155
O'Neil-Irwin Mfg. Co., Minn., 20, Precision Metal Working Mach.
Opad Electric Co., 43-8 Walker St., New York 13, N.Y., 7
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Tel: WOrth 6-0380
Oryx Sales Co., Calif., 30, Miniature
Paragon-Revolute Corp., N.Y., 20, Automatic Blueprinting Machine
Peck & Harvey Mfg. Corp., Ill., White Print Copier
Peer, Inc., Mach., 7, 50
Perkins Machine & Gear Co., Mass., 10
Phillips Process Co., Inc., N.Y., 25, Inks Only
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Pioneer Machine Works, Inc., N.Y., 35, CRT Sealers
Podgor Co., Inc., Joseph E., Pa., Silk Screen Material
Popper & Sons, Inc., N.Y., 25
Precision Scientific Co., Ill., 40
Preis Engraving Machine Co., N.J., 25
Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, L.I., N.Y., 20
See ad on page 671
Tel: OYster Bay 6-0009
Progressive Tool & Die Co., Mass., 20, 27, 55
Radex Corp., Ill., Electrostatic Precipitator
Radial Cutter Mfg. Corp., N.J., Carbide Tipped Saws & Cutters
Radio Corp. of America, Electron Tube Division, Section I-22-Q, 415 S. Fifth St., Harrison, N.J., 35
See ad on pages 53-55
Tel HUmboldt 5-3900
Raytheon Co., Mass., 7, 32, 50
Red Point Corp., Calif., 40, Impregnating Machine
Reeve Electronics, Inc., Ill., Wire Pretinning Machine
Republic Aviation Corp., N.Y., 7
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Robinson Machine Co., Inc., N.J., Metering Pumps
Rollan Electric Co., Ill., Tension Controls
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Scitaky Bros., Inc., Ill., 50
Scientific Electric, Inc., N.J., 50
Scientific Engineering Laboratories, 1510 Sixth St., Berkeley 10, Calif., 40
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Tel: LAndscape 6-2772
Segal, Edward, N.Y., 20, 28, Tube Pin Staking Machine
Sel-Rex Corp., N.J., 7
Sheffield Corp., Ohio, 20, 32
Sherman Mfg. Co., H. B., Machine Crimping Tools
Sonotone Corp., Dept. X60-109, P.O. Box 200, Elmsford, N.Y., 7
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Tel: LYric 2-6400
Standard Gage Co., Inc., N.Y., Dimensional Gages
Standard Tool & Mfg. Co., N.J., 20, 35
Stanley Tools, Conn., Screw Drivers, Other Hand Tools
Star Expansion Industries Corp., N.Y., Pin Aligners and Wiring Plugs
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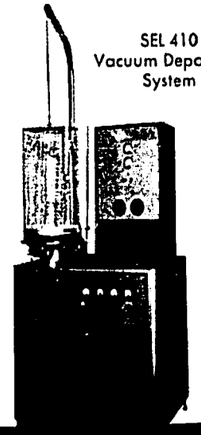

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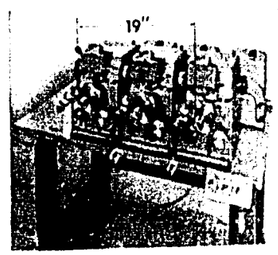
Adjustable Length

Up to 4 heads easily handled by operator without shifting position. Each head winds random wound Bobbin Coils, Solenoids, Repeater Coils or Resistors up to 2½" long and up to 4" OD. Each head individually motorized and easily portable.

Exclusive time-saving convenient front loading—spindle faces operator. Winding traverse infinitely adjustable—no cam changing.



Note extreme compactness

Up to 7000 RPM winding speed. Exclusive features: 1) Slow-start eliminates wire breakage. 2) Extra economy positive stopping magnetic brake. 3) Instant automatic brake release.

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The most complete line of coil winding equipment made

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Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264

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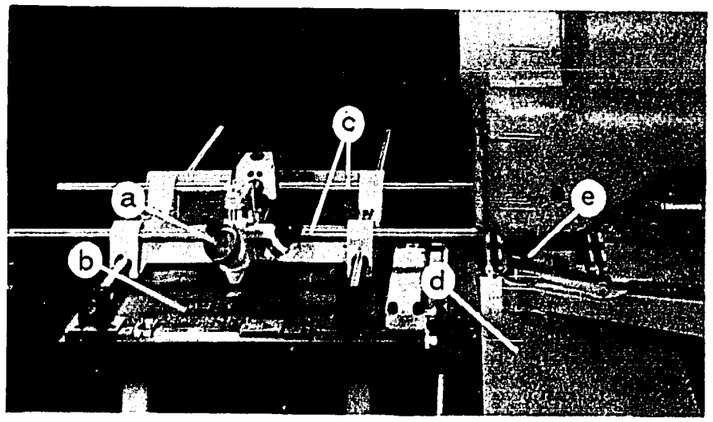
...this profitable STRIPPIT way!



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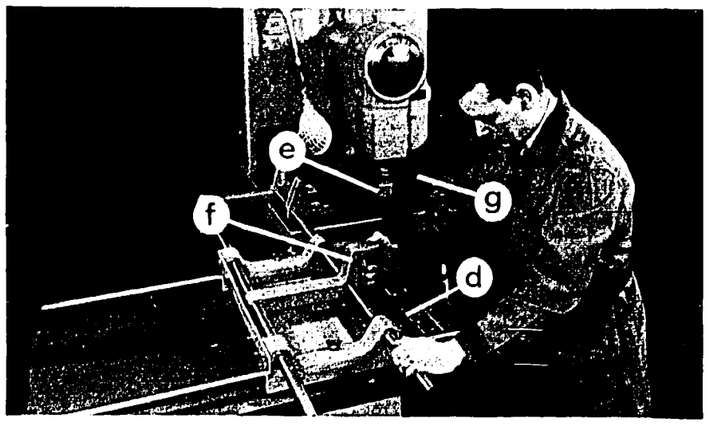

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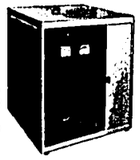

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Stueck, Inc., W. Whitney, Conn., 20
Sturtevant Co., P. A., Ill., Torque Wrenches
Swenson Co., Inc., V.H., N.J., 27
Swift Textile Metalizing & Laminating Corp., Conn., 20

Syntron Co., 83 Lexington Ave., Homer City, Pa., 7
See ad on page 513
Tel: GR 9-8011

Taft-Pierce Mfg. Co., R.I., 20
Taylor-Winfield Corp., Ohio, 50

Technical Apparatus Builders, 109GB Liberty St., New York 6, N.Y., 7
See ad on page 502
Tel: REctor 2-6249

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Temperature Engineering Corp., N.J., 40
Thomas Electronics, Inc., N.J., 35
Thomas Instrument Co., N.Y., 55
Trico Fuse Mfg. Co., Wis., Fuse Pullers
Trion, Inc., Pa., Air Cleaners
Tubular Rivet & Stud Co., Mass., 20
Tuck Mfg. Co., Mass., 20, Hand Tools
Ungar Electric Tools, Inc., Calif., 30
Union Carbide Corp., Linde Co. Div., N.Y., 30, 50
Union Elect-Sonics Corp., Mass., Ultrasonic Cleaners
United Shoe Machinery Corp., Mass., 20
U. S. Burke Machine Tool Div., Ohio, 20, 28, Crystal Slicing Mach.
United States Dynamic Corp., Mass., 7, 15, 20, 35, 40
U. S. Electrical Tool Co., Ohio, 20
U. S. Tool Co., Inc., N.J., 20
Unitek Corp., Weldmatic Div., Calif., Stored Energy
Universal Drafting Machine Corp., Ohio, Drafting Machines & Scales

Universal Mfg. Co., Inc., 1168 Grove St., Irvington 11, N.J., 10, Taping Machine
See ad on this page
Tel: ESsex 4-9800

Universal Winding Co., Dept. 165, P.O. Box 1605, Providence 1, R.I., 10
See ad on page 674
Tel: WIlliams 1-5200

Utica Drop Forge & Tool, Kelsey-Hayes Co. Div., N.Y., 55
Vaco Products Co., Ill., 20
Vacuum Specialties Co., Inc., Mass., 35
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Varian Associates, Instrument Div., Calif., 40

Veeco Vacuum Corp., 86-E Denton Ave., New Hyde Park, L.I., N.Y., 40
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Tel: PIoneer 6-1161

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Tel: ALgonquin 4-7842

Virginia Electronics Co., Inc., Div. of Resistance
Vulcan Electric Co., Mass., 30

Wales Strippit, Inc., 246 Buell Rd., Akron, N.Y., 20, 28, Hole Punching & Notching
See ad on page 674
Tel: AKron 9441

Wall Mfg. Co., Pa., 30

Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 55
See ad on page 474
Tel: ROckford 8-9661

Wassco Electric Products Corp., Fla., 30
Weidemann Machine Co., Pa., 20, 25, Turret Punch Presses
Welch Scientific Co., W. M., Ill., 40
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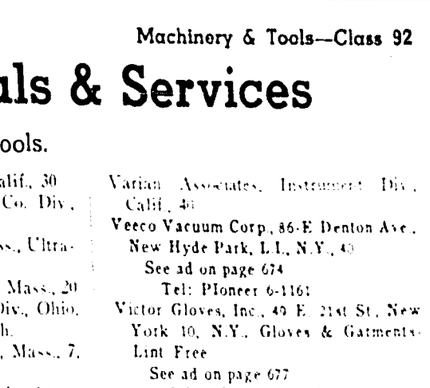
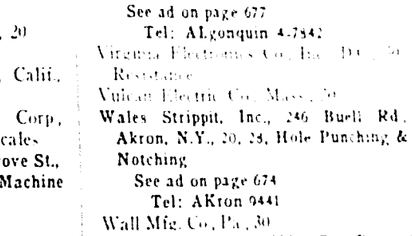
- Ask to be included on our mailing list so as to receive important latest releases.



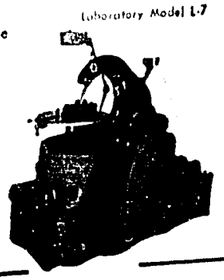
S 3 Model with Inductance Comparator (for winding to pre-set Inductances)



Portoroyd Model P19 Portable Taping Machine

Laboratory Model L-7

Model U-9



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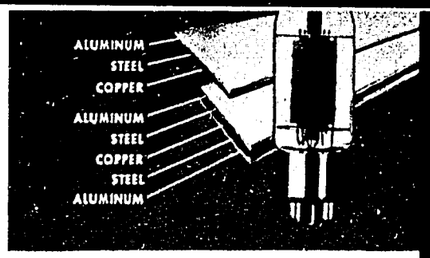

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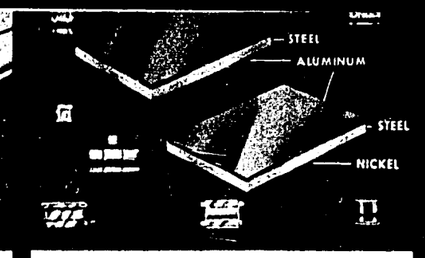
Three-layer and five-layer materials used for anodes in rectifier and amplifier tubes. Provide longer power output life . . . uniform heat dissipation . . . high electrical conductivity . . . improved anode reradiation . . . and reduce costs.



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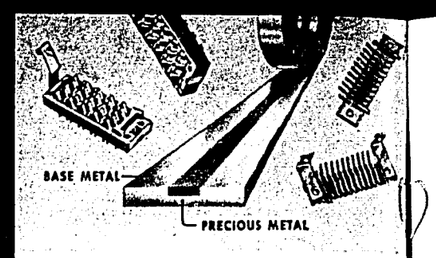

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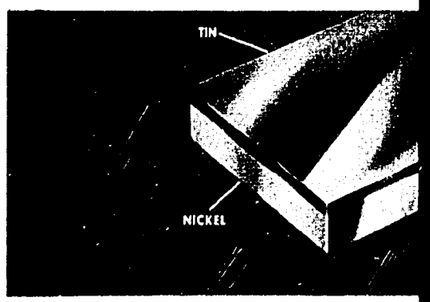
High reliability of connectors, clips, terminals obtained by using gold and other precious metal alloy stripe materials . . . place high performance materials in the contact areas . . . cost-savings and improved performance over gold electroplated parts.



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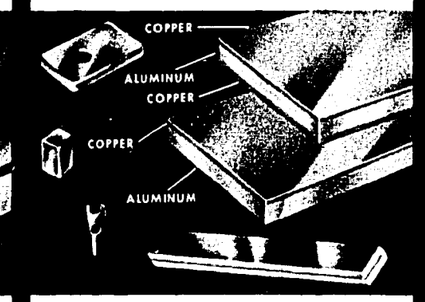
A number of combinations of clad metals are available for use on base tabs, lead wires, whisker wires, base materials and enclosures in silicon and germanium diodes, transistors and germanium power transistors.



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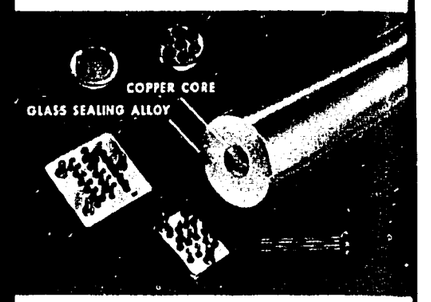

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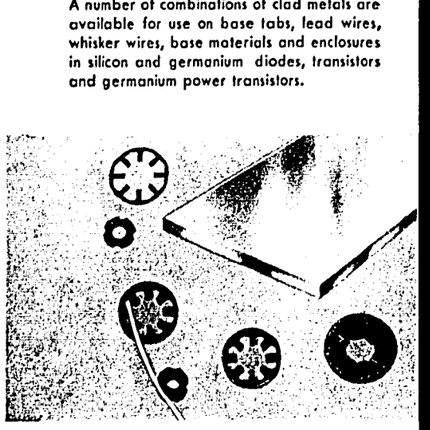

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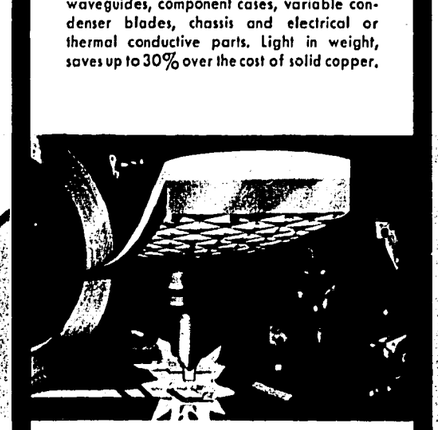

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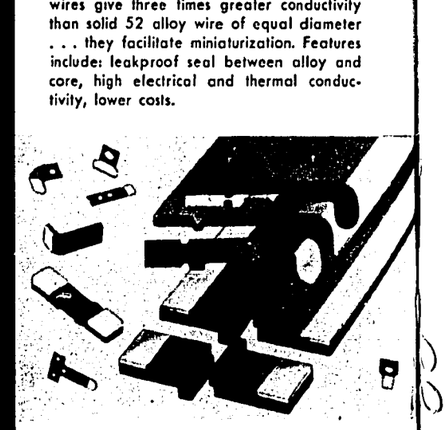

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92. Machinery & Tools.

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Wen Products, Inc., Ill., 30
Western Electronic Products Co., Calif., 55
Westline Products Div., Calif., 25
White Industrial Div., S. S., Dept. PR, 10 E. 40th St., New York 16, N.Y., Abrasive Unit
See ad on page 672
Tel: MUrray Hill 3-3015
Whitney Metal Tool Co., Ill., 20
Wilder Mfg. Co., Inc., N.Y., Soldering Iron Holders
Wiremold Co., Conn., Electrical Multiple Outlet
Worklon, Inc., N.Y., Lint Free Clothing
Wybar Electronics, Inc., N.Y., 55
X-Acto, Inc., Handicraft Tools, Inc., N.Y., Replaceable Knife Blades
Xcelite, Inc., N.Y., Screw Drivers, Nut Drivers, Pliers, Wrenches
Yardney Electric Corp., 40-50 Leonard St., New York 13, N.Y., 7
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Tel: WOrth 6-3100
Zephyr Mfg. Co., Inc., Electronics Div., Calif., 20, 30
Zagar, Inc., Ohio, 28
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Magazines: See class 101

Manufacturers representatives: See class 102

Markers and tags: See class 87

Mesh, wire: See class 82

Metal stamping & spinning: See class 86

93. Metals.

5. Alloys
10. Copper
15. Ferrous
17. Metallic oxides
20. Non-ferrous, excluding copper
25. Powdered
30. Precious & rare

Accurate Specialties Co., Inc., N.Y., 5, 10, 20, 30
All State Welding Alloys Co., Inc., N.Y., Brazing Alloys
Allegheny Ludlum Steel Corp., Pa., 5, 15
Alloyd Research Corp., Mass., 5, 10, 15, 17, 20, 25, 30
Alloys Unlimited, Inc., N.Y., 5, 20, 25, 30
Alpha Metals, Inc., N.J., 5, 20, 25, 30, High Purity
Aluminum Co. of America, Pa., 5, 20, 25
American Brass Co., Conn., 5, 10
American Metal Climax, Inc., N.Y., 5, 10, 20, 25, 30
American Platinum & Silver Div., Engelhard Industries, Inc., 231 New Jersey Railroad Ave., Newark 5, N.J., 20, 30
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93. Metals.

Anthony & Co., J. J., R.I., 5, 10, 15, 20, 25, 30
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Autotronic Co., Div. of Hi-Q Sound Co., N.Y., 5, 15
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Baker Contact Div., Engelhard Industries, Inc., 207 Grant Ave., East Newark, Harrison P.O., N.J., 5, 25, 30
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Bethlehem Apparatus Co., Inc., Pa., Mercury
Bishop & Co., J., Platinum Works, Pa., 5, 20, 30, Bimetals
Borolite Corp., Pa., 5, 25
Brainin Co., C. S., 318 Washington St., Mount Vernon, N.Y., 30
See ad on page 551
Tel: MOunt Vernon 8-5500
Bram Metallurgical & Chemical Co., Pa., 5, 10, 20, 25, 30
Bridgeport Brass Co., Conn., 5, 10, 20, 30
Brooks & Perkins, Inc., Mich., 5, 20
Brush Beryllium Co., Ohio, 5, 10, 15, 20
C M Mfg. & Machine Co., N.J., 20, Tungsten Molybdenum
Cannon-Muskegon Corp., Mich., 5, 15
Carborundum Metals Co., N.Y., 17
Carpenter Steel Co., Pa., 15
Channel Master Corp., N.Y., 20
Chase Brass & Copper Co., Inc., and Kennecott Copper Corp., 5, 10, 15, 20, 30
Cohn Corp., Sigmund, 121 S. Columbus Ave., Mt. Vernon, N.Y., 30
See ad on page 607
Tel: MOunt Vernon 4-5300
Columbian Carbon Co., Mapico Iron Oxides Unit, 380 Madison Ave., New York 17, N.Y., 17
See ad on this page
Tel: MUrray Hill 7-2500

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- Welded assemblies
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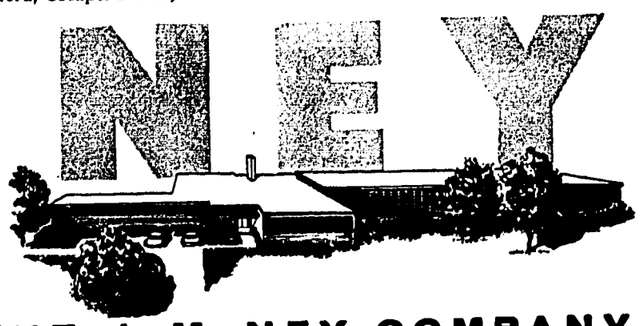

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93. Metals.

Consolidated Mining & Smelting Co. of Canada, Ltd., Metal Sales Div., Canada 5, 20, 25, 30

Cross Co., H., 15 Beekman St., New York 38, N.Y., 5, 20
See ad on page 679
Tel: WOrth 2-2044

Crucible Steel Co. of America, Pa., 5, 15

Crucible Steel Co. of America, Vacuum Metals Div., N.Y., 5, 10, 15, 20

Dalweld Co., Inc., N.Y., 5, 10, 30

Davis-K Products Co., N.Y., 30

Deringer Metallurgical Corp., Ill., 5, 30

Division Lead Co., Ill., 5, 20, 25

Driver Co., Wilbur B., 1875 McCarter Highway, Newark 4, N.J., 5, 20
See ad on page 188
Tel: HUmboldt 2-5550

Driver-Harris Co., 201 Middlesex St., Harrison, N.J., 5, 20
See ad on page 194
Tel: HUmboldt 3-4800

Electro Tec Corp., N.J., 30

Electronic Parts Mfg. Co., Inc., N.J., 5, 20

Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 5, 10, 30
See ad on page 198
Tel: BIgelow 3-0030

Englehard, Inc., Charles, N.J., 30

Fansteel Metallurgical Corp., North Chicago, Ill., 5, 20
See ad on pages 156-157
Tel: DExter 6-4900

Ferricore, Inc., 15, 25

Foote Mineral Co., Pa., 5, 17, 20, 25, 30

Fusion Engineering Co., Ohio, 25

General Aniline & Film Corp., Antara Chemicals Div., N.Y., 15, 25

General Electric Co., Lamp Wire & Phosphors Dept., Ohio, Tungsten

Gibson Electric Co., Pa., 10, 20, 25, 30

Goldsmith Brothers, S&R Co., Ill., 25, 30

Goodmans Industries, Ltd., England, 45

Hamilton Watch Co., Industrial Div., Pa., Foils

Hamilton Watch Co., Pa., 5, 10, 15

Handy & Harman, N.Y., 25, 30

Haynes Stellite Co., Union Carbide Div., Ind., 5, 20

Heavy Minerals Co., Tenn., 17

Hoskins Mfg. Co., Mich., 5, 20

Indium Corp. of America, 1678 Lincoln Ave., Utica 4, N.Y., 5, 20, 30, Indium
See ad on page 679
Tel: SWift 7-1630

International Nickel Co., Inc., N.Y., 5, 20

Investment Casting Co., N.J., 15, 20

Kearfott Co., Inc., 1500 Main Ave., Clifton, N.J., 17, 25
See ad on page 348
Tel: GRegory 2-1000

King Laboratories, Inc., N.Y., 5, 30

Kinney Co., Inc., Joseph, Pa., Clad Wire, Steel & Copper Invar

Kulite Tungsten Co., N.J., 20, 25, Cobalt, Tungsten & Molybdenum

Leach & Garner Co., Ind. Div., Mass., 5, 30

MacKay, Inc., A. D., N.Y., 5, 10, 15, 17, 20, 25, 30

Magnetic Powders, Inc., Pa., 25

Mallory & Co., Inc., P. R., Ind., 25

Materials for Electronics, Inc., N.Y., 30

Directory III. Materials & Services

93. Metals.

Metal Hydrides, Inc., Mass., 5, 20, 25

Metals & Controls Div. of Texas Instruments, Incorporated, 51 Forest St., Attleboro, Mass., 5, 25, 30
See ad on page 676
Tel: ATtleboro 1-2800

Metz Refining Co., N.J., 5, 25, 30

National Lead Co., N.Y., 5, 20, 25

National Moldite Co., N.J., 15, 17, 25

National U.S. Radiator Corp., Plastic Metals Div., N.Y., 15, 17, 25

Nesor Alloy Products Co., N.J., 5, 10, 15, 30

New Jersey Zinc Co., N.Y., 5, 20, 25

New Process Metals, Inc., N.J., 5, Rare Earth Metals

Ney Co., J. M., Maplewood Ave., Bloomfield 1, Conn., 5, 30
See ad on page 678
Tel: (Hartford) CHapel 2-2281

Nuclear-Chicago Corp., Ill., 30

Pacific Scientific Co., Calif., 30

Paul & Stein Bros., Inc., F. H., N.Y., 30, Aluminum Foil

Pease & Curren, Inc., R.I., 30

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 5, 15, 25, 30
See ad on page 687
Tel: EVerglade 4-2122

Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N.Y., 5, 10
See ad on page 612
Tel: PLaza 1-3200

Pheoll Mfg. Co., Inc., Ill., 15, 20

Porter Co., Inc., H. K., N.J., 5, 10, 15, 20

Precision Metalsmiths, Inc., Ohio, 5, 10, 15, 20

Precision Tube Co., Inc., Pa., 5, 10, 20

Production Metals, Inc., N.Y., 20

Republic Foil, Inc., Conn., Aluminum Foil

Research Chemicals, Calif., 5, 17, 30

Revere Copper & Brass, Inc., N.Y., 5, 10, 20

Rubber & Asbestos Corp., N.J., Adhesive-Coated Copper

St. Eloi Corp., Ohio, 30

Schweitzer, Inc., Peter J., Mass., Zinc Metallized Capacitor Tissue, Zinc Metallized Mylar

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Somers Brass Co., Inc., Conn., 5, 10, 15 Stainless Only, 20, 30

Standard Metals Corp., Mass., 5, 30

Stieh Chemicals, Inc., N.Y., 17, 20

Superior Carbon Products, Inc., Ohio, 5, 25

Sylvania Electric Products, Inc., Chemical & Metallurgical Div., Pa., 20, 25

Techalloy Co., Inc., Pa., 5, 15

Technic, Inc., R.I., 30

Technic, Inc., Ill., 30

Temco Aircraft Corp., Electronics Div., Tex., Titanium

Texas Instruments Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Tex., 5, 10, 30
See ad on pages 75-78
Tel: FLeetwood 7-5411

Titan Metal Mfg. Co., Pa., 20, Bronze Welding Alloys

Trancoa Chemical Corp., 312-326 Ash St., Reading, Mass., 20
See ad on page 134
Tel: REading 2-3900

Tricon Mfg. Co., Ill., 30

Tri-State Plastic Molding, Ky., 30

Union Carbide Corp., Haynes Stellite Co. Div., Ind., 5, 25

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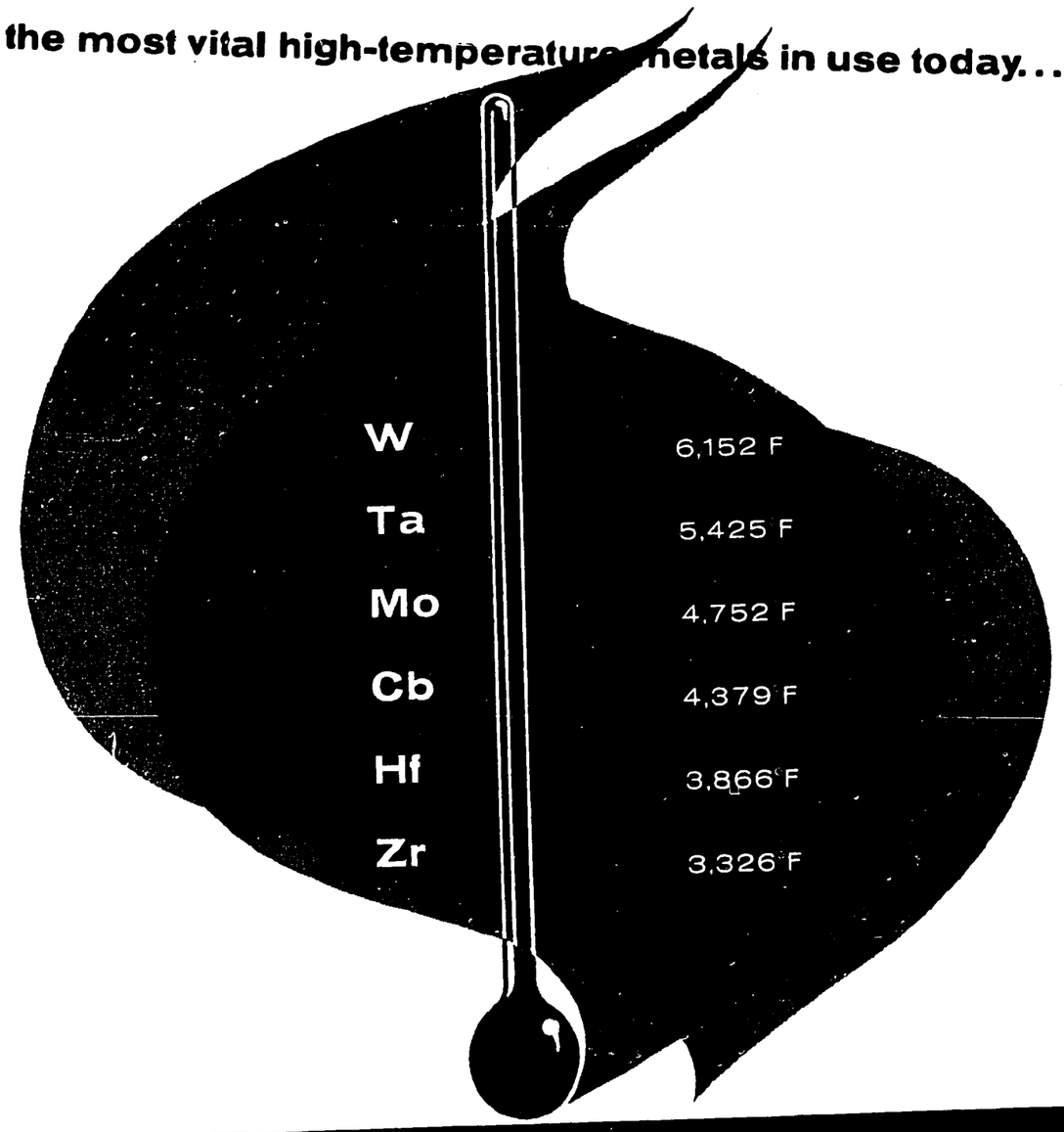

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Directory III. Materials & Services

93. Metals.

Union Carbide Corp., Union Carbide Metals Co., N.Y., 5, 15, 17, 20, 25

United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 5, 30
See ads on pages 541, 681
Tel: BEekman 3-8870

U.S. Steel Corp., Pa., 5, 15

Wah Chang Corp., 233 Broadway, New York 7, N.Y., 17, 20, 25, 30
See ad on page 680
Tel: COrtlandt 7-0887

Waterbury Rolling Mills, Inc., Conn., 5, 10

Western Gold & Platinum Co., Calif., 30

Westinghouse Elect. Corp., Lamp Div., N.J., 20

Wildberg Bros. Smelting & Refining Co., Calif., 30

Wilkinson Co., Calif., 30

Williams & Co., Pa., 17, 25, Magnetic Iron Oxides

Williams Gold Refining Co., Inc., 2978 Main St., Buffalo 14, N.Y., 5, 20, 25, 30
See ad on this page
Tel: UNiversity 7204

Wilson Div., H. A., Engelhard Industries, Inc., U. S. Highway 22, Union, N.J., 5, 10, 15, 17, 20, 25, 30
See ad on page 198
Tel: MUrdock 6-6600

Moisture-proofing: See class 86

94. Molded Products.

5. Insulators
10. Knobs & parts
15. Proprietary moldings

A-1 Precision Products, Calif., 10, 15

Accurate Electronics Corp., Ohio, 5, 10, 15

Airflyte Electronics Co., 540 Ave. A, Bayonne, N.J., 15
See ad on page 550
Tel: HEmlock 6-2230

Amatom Electronic Hardware Co., Inc., N.Y., 10

American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 5
See ad on page 180
Tel: AMherst 5-3411

American Molded Products Co., Ill., 5, 15, Magnetic Tape Reels, Wire Spools —Plastic, TV Yoke Cases, Covers & Insulators

Anti-Corrosive Metal Products Co., N.Y. 15

Aries Labs., Inc., Conn., 15

Armel Electronics, Inc., N.Y., 5

Atkins & Merrill, Inc., Post Rd., Sudbury, Mass., 15
See ad on page 628
Tel: HIlltop 3-8822

Bastian Bros. Co., N.Y., 5

Beemer Engrg. Co., Pa., 5

Blinn Co., Delbert, Calif., 10, 15

Bodnar Industries, Inc., N.Y., 10

94. Molded Products.

Bonny Mfg. Corp., Mass., 5

Boonton Molding Co., N.J., 5, 10

Borolite Corp., Pa., 15

Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 5
See ad on page 174
Tel: WOodruff 2-9200

Ceramic Spec. Co., Inc., Ohio, 5

Chemplast, Inc., N.J., 5

Chester-Morton Electronics Corp., Pa., 15

Collectronix Corp., N.Y., 15

Colman Electronic Prods., Inc., Tex., 10

Consolidated Molded Prods. Corp., Pa., 10, 15

Continental-Diamond Fibre Corp., Del., 5

Crystal-X Corp., Pa., 5, 10, 15

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Beekman 3-8870

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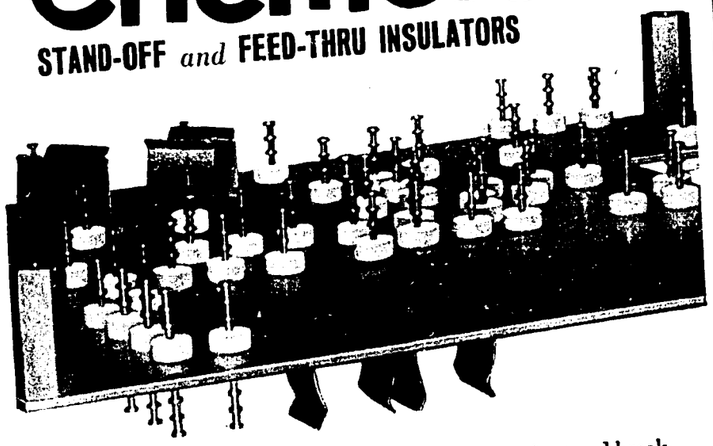
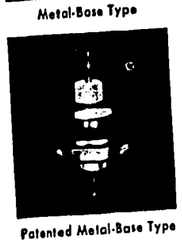


Compression-Mounted Type

Metal-Base Type



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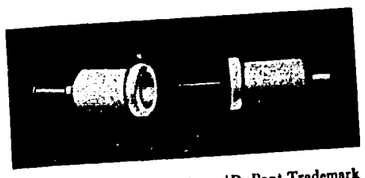

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94. Molded Products.

Dale Products, Inc., 1318 28th Ave., Columbus, Neb., 10
See ad on pages 34-35
Tel: LOcust 4-3131

Davies Molding Co., Harry, Ill., 10, 15
Davis Plastics Co., Joseph, N.J., 15
Dayton Aircraft Products, Inc., Fla., 15
Deutsch Co., Electronic Components Div., Calif., 15

Dimco-Gray Co., 212 E. Sixth St., Dayton 2, Ohio, 10
See ad on page 639
Tel: BAldwin 2-6703

Dixon Corp., R.I., 5
Eastern Foilcal Nameplate Corp., N.J., 15
Eby, Inc., Hugh H., Pa., 5, 10
Electric Auto Lite Co., Ohio, 5, 10
Electronic Mechanics, Inc., N.J., 5, 15
Electronic Techniques, Inc., Calif., 15
Emerson & Cuming, Inc., Mass., 15
Emerson Plastics Corp., N.Y., 5
Enflo Corp., N.J., 5, 15

Epoxy Products, Inc., 137 Coit St., Irvington 11, N.J., Compression Molded Epoxy
See ad on page 150
Tel: ESsex 5-6000

Erie Resistor Corp., 644 W. 12th St., Erie 6, Pa., 10
See ad on pages 110-111
Tel: GLendale 6-8592

Erwood, Inc., Ill., 5, 10, 15
Excellex Electronics, Inc., N.Y., 10, 15
Fawn Plastics Co., Inc., Md., 10
Ferricore, Inc., N.J., 15
First Electronics Corp., Mass., 15
Fluorulon Labs., Inc., N.J., 5, 15

G-C Electronics Mfg. Co., 400 S. Wyman St., Rockford, Ill., 10
See ad on page 474
Tel: ROckford 2-6695

Garde Mfg. Co., R.I., 5

Garlock Packing Co., Garlock Electronic Products, Camden 1, N.J., 5, 10, 15
See ad on this page
Tel: WOodlawn 4-0370

General Products Corp., N.Y., 15

General Radio Co., West Concord, Mass., 5, 10
See ad on Cover 4
Tel: EMerson 9-4400

Glastic Corp., Ohio, 5

Gries Reproducer Corp., 168 Beechwood Ave., New Rochelle, N.Y., 5, 10, 15
See ad on page 639
Tel: NEw Rochelle 3-8600

Haveg Industries, Inc., Del., 5, 15
Hays Mfg. Co., Pa., 5, 15
Houston Fearless Corp., Calif., 15

Hydro Molding Co., 100 Sharron Ave., Plattsburgh, N.Y., 5, 10, Molded Nylon
See ad on page 638
Tel: 2598

Illinois Tool Works, Fastex Div., Ill., 15
Industrial Devices, Inc., N.J., 5, 10, 15
Industrial Elect. Rubber Co., Ohio, 5, 15, Rubber
Insulation Mfg. Corp., Ill., 5

Directory III. Materials & Services

94. Molded Products.

Jamison Plastic Corp., N.Y., 5, 10
Jan Hardware Mfg. Co., Inc., N.Y., 5, 10
Janco Corp., Calif., 10
Johnson Co., E. F., Minn., 5, 10
Kerrco Products, Neb., 10
Kinn Electronics Corp., Md., 15
Kurz-Kasch, Inc., Ohio, 10, 15
Lamtex Industries, Inc., N.Y., 5
Landsverk Electrometer Co., Calif., 5, 15
Lee Chemical Corp., Walter, N.Y., 25
Lelanite Corp., Mass., Dunnage
Lerco Electronics, Inc., Calif., 10, 15
Litton Industries, U. S. Engineering Co. Div., Calif., 10
Luzerne Rubber Co., N.J., 15
Mandex Mfg. Co., Inc., Ill., 15
Martin Co., Baltimore Div., Md., 15

Methode Mfg. Corp., 7447 W. Wilson Ave., Chicago 31, Ill., 15
See ad on page 505
Tel: UNderhill 7-9600

Metox, France, 5

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 10
See ad on page 416
Tel: DAvenport 4-4108

Minor Rubber Co., Inc., N.J., 5, 15
Molded Insulation Co., Pa., 10, 15
Molding Corp. of America, R.I., 5, 10, 15
Molex Products Co., Ill., 5, 10, 15
Montek Associates, Inc., Utah, 5, 10, 15
Moore Corp., Irving B., Mass., 5, Rubber O-Rings
Motorola, Inc., Ariz., 5

Mueller Electric Co., 1558Y E. 31st St., Cleveland 14, Ohio, 5
See ad on page 465
Tel: PRospect 1-5225

Mutual Electronic Industries Corp., N.Y., 10

Mycalex Corp. of America, 125-B Clifton Blvd., Clifton, N.J., 5, 15
See ad on page 102
Tel: PRescott 9-8866

National Radio Co., Inc., Subsidiary of National Co., Inc., 37 Washington St., Melrose 76, Mass., 5, 10
See ad on page 642
Tel: NO 5-4800

New England Laminates Co., Inc., Conn., 15

Norrich Plastics Corp., 107-109 W. 18th St., New York 11, N.Y., 5, 10
See ad on page 152
Tel: WAtkins 4-8360

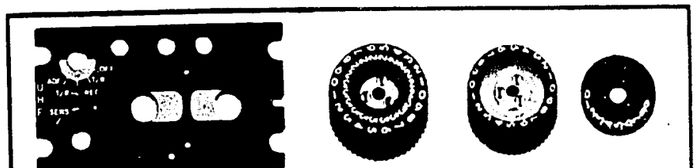
Northwest Plastics, Inc., Minn., 15
Ny-Glass, Inc., Calif., 15
Oppenheimer Plastics, Inc., Pa., 5, 10
Owens-Illinois, Sub. of Kimble Glass Co., Ohio, 5
Pacific Transducer Corp., Calif., 10
Painton & Co., Ltd., England, 10

Panob Corp., 49 Beech St., Port Chester, N.Y., 10
See ad on this page
Tel: WEstmore 9-3066

Patent Button Co. of Tenn., Inc., Tenn., 10
Pickett & Eckel, Inc., Calif., 15
Pioneer Electroponents Corp., N.Y., 5, 10
Plastic Mold & Engineering Co., R.I., 5, 10, 15
Raytheon Co., Mass., 10
Remler Co., Calif., 15
Richardson Co., Ill., 5

Robertson Electric Co., Inc., 124 S. Elmwood Ave., Buffalo 2, N.Y., 15
See ads on pages 425, 615
Tel: MAdison 6658

Rogan Brothers, 8009 N. Monticello Ave., Skokie, Ill., 5, 10, 15
See ad on this page
Tel: ORchard 5-1233



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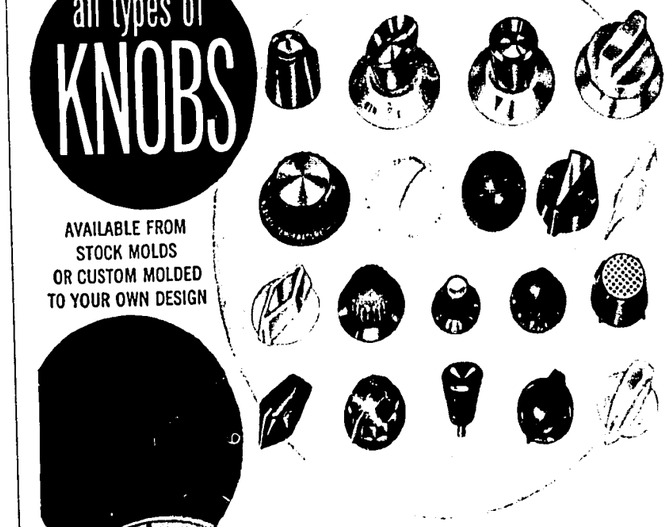
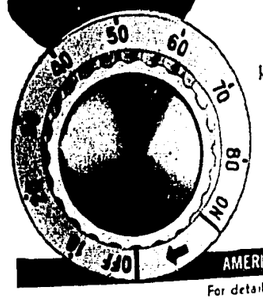
all types of KNOBS



AVAILABLE FROM STOCK MOLDS OR CUSTOM MOLDED TO YOUR OWN DESIGN



Shown above are just a few of the many Rogan knobs available from stock molds. No tool charge. Fast delivery. Markings can be branded to fit your requirements. Special shaft holes at nominal cost. Send for details and free catalog.

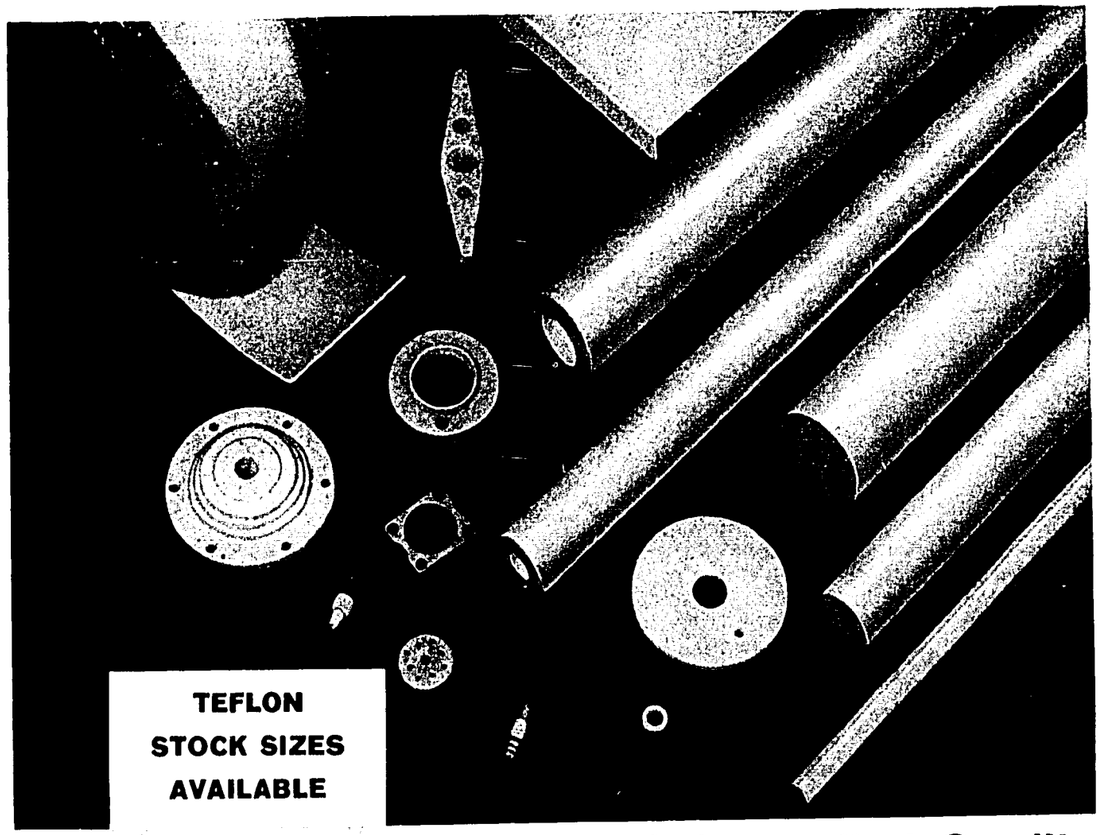
ROGAN BROTHERS

8009 N. Monticello • Skokie, Illinois

AMERICA'S FOREMOST MOLDERS AND BRANDERS OF PLASTIC KNOBS

For details, circle #736 on Reader Service Card

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.



TEFLON STOCK SIZES AVAILABLE

ROD
Diameter: ⅛" to 7¼"
in various lengths

TUBING (rigid)
O.D. ½" to 12"
I.D. ¼" to 6½"
depending on O.D.

SHEET
Thickness: 1/16" to 2"
Sizes: 12" x 12", 24" x 24", and 48" x 48"

TAPE
Thickness: .001" to .125"
Widths: ¼" to 18"
Ten fade-proof colors

SPAGHETTI TUBING
AWG sizes 30 to 0.
Thin and regular wall thickness
Ten fade-proof colors for coding

THIN WALL TUBING
I.D. ⅛" to 1"
Wall thickness: .030" to .050"

ROUND AND SQUARE BEADING
Round: Diam. .030" to .150"
Square: .020" to .156"
across the sides

For 100% Controlled Quality —Specify POLYPENCO®

. . . a complete range of TEFLON* and other TFE Fluorocarbon Stock Shapes

You make the most of the valuable properties of TFE fluorocarbon resin products when you specify POLYPENCO. The reason? All stock produced by The Polymer Corporation of Pennsylvania is inspected and tested from the raw material to the finished product. Thus, constant electrical and physical properties, and maximum dimensional stability are maintained.

New, exclusive Ultrasonic testing provides quick, dependable detection of internal voids and flaws to assure you uniformly dense shapes "clear through" for cost saving production and reliable finished products.

POLYPENCO Teflon rod, tubing, sheet and tape are available nation-wide in the sizes to meet your requirements. Custom fabrication is also available, if desired.

POLYPENCO's engineering staff stands ready to help you solve any specific problem. For their assistance or for technical information and purchase specifications write to The Polymer Corporation of Pa., Department RB, Reading, Pa.

Prompt Delivery from Sales Representatives and Distributors coast-to-coast.

POLYPENCO

The Polymer Corporation of Penna. • Reading, Pa.

Export: Polypenco, Inc., Reading, Pa., U.S.A.

**DuPont Trademark for fluorocarbon resins*

For details, circle #737 on Reader Service Card

Directory III. Materials & Services

94. Molded Products.

Ross Metals Co., Milton, Pa., 5, 10, 15
Rotary Devices Corp., N.J., 15

Saxton Products, Inc., 4320 Park Ave., New York 57, N.Y., 15
See ad on page 615
Tel: WEllington 3-6400

Shamban & Co., W. S., Calif., 5, 10, 15
Silicone Insulation, Inc., N.Y., 5
Slip Ring Co. of America, Calif., 10
Smith, Inc., H. H., N.Y., 5, 10, 15
States Co., Conn., 10
Stevens Products, Inc., N.J., 5
Superior Carbon Products, Inc., Ohio, 15
Superior Porcelain Co., W.Va., 5

Superior Steatite & Ceramic Corp., 89 W. Forest Ave., Englewood, N.J., 5
See ad on page 620
Tel: LOwell 8-4555

Swenson Co., Inc., V. H., N.J., 5, 10, 15

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 10, 15
See ad on pages 23-25
Tel: JUdson 6-2424

Sylvania Electric Products, Inc., Parts Division, Warren, Pa., 10, 15
See ad on page 28
Tel: WArren 3220

Tech Art Plastics Co., N.J., 5, 10, 15

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 5
See ad on page 621
Tel: ARmory 1-0163

Titan Metal Mfg. Co., Pa., Pressure Die Castings, Forgings, Brass Rods, Special Shapes
Topper Mfg. Co., Inc., N.Y., 5
Tri-State Plastic Molding, Ky., 15
United States Electronics Corp., N.J., 15
Viking Industries, Inc., Calif., 5
Waldom Electronics, Inc., Ill., 10

Motors: See class 58

Nameplates: See class 87

Neon lights: See class 60

Nuts: See class 87

Packaging: See class 86

Packaging materials: See class 87

Paints: See class 91

Permanent magnets: See class 55

Phosphors: See class 99

Pins & prongs: See class 99

Plastic fabrication & molding: See class 86

95. Plastics.

5. Extrusions
7. Laminations
10. Raw powders
15. Rods
20. Sheets
25. Tubes

AA Metal Products, Inc., Vt., 20
Ace Fabricators, Ill., 20
Ace Plastic Co., N.Y., 5, 15, 25
Allied Chemical Corp., Plastics & Coal Chemicals Div., N.Y., 5, 7, 10

Alpha Wire Corp., 200 Varick St., New York 14, N.Y., 25
See ad on page 604
Tel: ALgonquin 5-5400

American Cyanamid, Formica Corp., Subsid., Ohio, Copperclad Laminates
American Products Mfg. Co., La., 15, 20, 25
American Printed Circuits Co., N.J., 7, 20
American Quartz Labs., Inc., Plastics Div., N.Y., 25
Anchor Plastics Co., Inc., N.Y., 5, 15, 25
Aries Labs., Inc., Conn., 10
Arlin Mfg. Co., Mass., 7

Atkins & Merrill, Inc., Post Rd., Sudbury, Mass., 7
See ad on page 628
Tel: HIlltop 3-8822

Auburn Mfg. Co., Conn., 5, 15, 20, 25
Beemer Engrg. Co., Pa., 5, 7, 15, 20, 25
Blinn Co., Delbert, Calif., 5
Bomyte Co., Pa., 7
Bonny Mfg. Corp., Mass., 5, 15, 20, 25
Borden Chemical Co., Calif., 15, 20, 25
Brand & Co., Inc., William, Conn., 5, 25
Celanese Corp. of America, N.Y., 10, 20
Celanese Corp. of America, Plastics Div., N.J., 5, 10, 20

Chart-Pak, Inc., 250 River Rd., Leeds, Mass., 20
See ad on page 663
Tel: JUstice 4-5446

Chemfab Corp., N.Y., 25
Chemical Products Corp., R.I., Plastisols
Chemplast, Inc., N.J., 5, 7, 15, 20, 25
Cleveland Container Co., Ohio, 25
Comco Plastics, Inc., N.Y., 15, 20, 25
Commercial Plastic Co., Ill., 5, 15, 20, 25
Commercial Plastics & Supply Corp., N.Y., 5, 7, 15, 20, 25
Continental Can Co., Inc., 7
Continental-Diamond Fibre Corp., Del., 5, 7, 15, 20, 25
Cortland Industries, Inc., Ill., 7, 15, 20, 25

95. Plastics.

Crane Packing Co., Ill., 5, 15, 20, 25
Crystal-X Corp., Pa., 5, 15, 20, 25
Davis Plastics Co., Joseph, N.J., 5, 7, 15, 20, 25
Dielectric Materials Co., Ill., 5, 25

Dilectrix Corp., Allen Blvd. & Grand Ave., Farmingdale, N.Y., 25
See ad on page 651
Tel: CHapel 9-7999

Dixon Corp., R.I., 5, 15, 20, 25
Dow Corning Corp., Mich., 10

Du Pont de Nemours & Co., Inc., Div. 56, Wilmington 98, Del., 10
See ad on page 660
Tel: PRospect 4-1000

Dura Plastics of N.Y., Inc., N.Y., 15, 20, 25
Duralith Corp., Pa., 7
Durez Plastics Div., Hooker Electrochemical Co., N.Y., 10, Resins
Electrical Insulation Co., Inc., N.Y., 7, 20, 25
Electronic Mechanics, Inc., N.J., 15, 20, 25
Electronic Plastics Corp., Mass., 15, 20, 25
Electronic Plastics Corp., N.Y., 15
El-Tronics, Inc., Warren Components Div., Pa., 15
Emerson & Cuming, Inc., Mass., 7, 15, 20, 25
Emerson Plastics Corp., N.Y., 5, 7, 15, 20, 25
Epoxy Products, Inc., 137 Coit St., Irvington 11, N.J., 20, 25
See ad on page 150
Tel: ESsex 5-6000

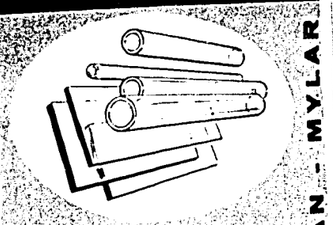
Fiske Corp., N.J., 5, 7, 15, 20, 25
Farley & Loetscher Mfg. Co., Iowa, 7, 20
Fiber Fabricators Co., Inc., Ill., 7, 15, 20, 25
Fiber Glass Industries, Inc., 7, 15, 20, 25
Fisher & Crome, Pa., 7, 15, 20, 25
Flexrock Co., Pa., 5, 7, 15, 20, 25
Fluorglas Labs., Inc., N.J., 5, 7, 15, 20, 25
Fort Hill Engraving Co., Inc., Mass., Precision Cut Letters
Furane Plastics, Calif., 7, 15
Garlock Packing Co., Garlock Electronic Products, Camden 1, N.J., 5, 7, 15, 20, 25
See ad on page 682
Tel: WOodlawn 4-0370

General Electric Co., Laminated Products Dept., Ohio, 7, 15, 20, 25
Gering Products, Inc., N.J., 5, 20, 15, 25
Glasply Corp., N.Y., 7, 15, 20, 25
Gore & Associates, Inc., W. L., 487 Papermill Rd., Newark, Del., 25
See ad on page 668
Tel: ENdicott 8-8325

Halogen Insulator & Seal Corp., 7, 15, 20, 25
Haveg Industries, Inc., Del., 5, 7, 15, 20, 25
Hays Mfg. Co., Pa., 7, 20

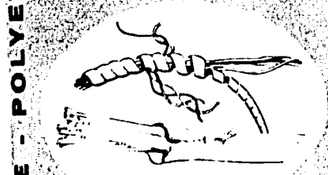
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 687-745

plastic

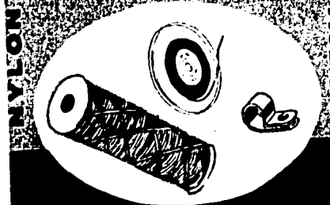


NYLON - TEFLON - POLYSTYRENE - POLYETHYLENE - PHENOLIC
CELLULOSE - RULAN - MYLAR
ACRYLIC - VINYL - ETHYLENE CEL

Illumitronic has the most complete line of PLASTIC ROD, TUBING and SHEET.



Also HARNESSING and CABLING materials:
ZIPPERTUBING
SPIRAL WRAP
SPIRAL COVER
VINYL SLEEVING
LACING CORD
CABLE CLAMPS
PLASTIC ROD
TUBING and SHEET



illumitronic
sunnyvale, california
engineering

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Hermes Plastics, Inc., N.Y., 20
Hooker Chem. Corp., Durez Plastics Div., N.Y., 10
Houston Labs., Inc., N.Y., 10, 15, 20, 25

Illumitronic Engineering Co., 680 E. Taylor Ave., Sunnyvale, Calif., 5, 7, 15, 20, 25
See ads on pages 412, 686
Tel: REgent 9-2395

Insulating Fabricators, Inc., N.J., 7, 15, 20, 25
Insulation Mfg. Corp., Ill., 7, 15, 20, 25
International Resistance Co., Pa., 7
Isochem Resins Corp., R.I., 15
Jodee Plastics Co., N.Y., 5, 15, 20, 25
Johns-Manville, N.Y., 7, 15, 20, 25
Koppers Co., Inc., Plastics Div., Pa., 10, Resins, Film
Laminated Sheet Products Corp., Mass., 7, 15, 20, 25
Lamtex Industries, Inc., N.Y., 7, 15, 25
Lee Chemical Corp., Walter, N.Y., 5, 7, 15, 20, 25
Luzerne Rubber Co., N.J., 5, 15, 20, 25
Marblette Corp., N.Y., 15, 20, 25

Markel & Sons, L. Frank, School Lane, Norristown, Pa., 5, 25
See ad on page 652
Tel: BRoadway 2-8960

Mesa Plastics Corp., Calif., 10, 15, 20
Meter-Mix Corp., Mass., 5
Mica Corp., Calif., 7, 20
Mica Insulator Co., Minn. Mining & Mfg. Co. Div., N.Y., 7, 15, 20, 25
Micarta Fabricators, Inc., Ill., 7
Midwest Plastic Products Co., Ill., 20
Minnesota Mining & Mfg. Co., Minn., 5, 7, 10, 15, 20, 25
Minnesota Mining & Mfg. Co., Chemical Div., Minn., 10
Minor Rubber Co., Inc., N.J., 5, 15, 20, 25
Mitchell Rand Mfg. Corp., Insulation Div., N.Y., 10

Mycalex Corp. of America, 125-B Clifton Blvd., Clifton, N.J., 15, 20
See ad on page 102
Tel: PRescott 9-8866

National Moldite Co., N.J., 25

National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 15, 20, 25
See ad on page 462
Tel: YOnkers 8-6400

National Vulcanized Fibre Co., Del., 5, 15, 20, 25
New England Laminates Co., Inc., Conn., 7, 20
New England Tape Co., Mass., 5, 25

New Hermes Engraving Machine Corp., 154 W. 14th St., New York 11, N.Y., 7
See ad on page 671
Tel: WAtkins 4-7373

Nopco Chemical Co., Plastics Div., N.J., Foamed

Norrich Plastics Corp., 107-109 W. 18th St., New York 11, N.Y., 15, 20, 25
See ad on page 152
Tel: WAtkins 4-8360

Northern Plastics Corp., Wis., 7, 20
Ny-Glass, Inc., Calif., 7, 25
Oppenheimer Plastics, Inc., Pa., 7
Owens-Corning Fiberglass Corp., N.Y., Reinforcements
Peeco Corporation, Calif., 7
Penn Fibre & Specialty Co., Inc., Pa., 7, 15, 20, 25
Permacel, N.J., 20, 25
Pickett & Eckel, Inc., Calif., 10
Pilgrim Products, Inc., Mass., 7, 15, 20, 25
Plastic Mold & Engineering Co., R.I., 5
Plastics Engineering Co., Wis., 10

Polymer Corp. of Pa., Dept. RB, 2140 Fairmont Ave., Reading, Pa., 5, 10, 15, 20, 25
See ad on page 684
Tel: FRanklin 6-5791

Precision Metal Products Co., Mass., 15, 20, 25

Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 25
See ad on page 644
Tel: ARmitage 6-5200

Prince Rubber Co., Inc., N.Y., 15, 20, 25
Raybestos-Manhattan, Inc., Pa., 5, 7, 15, 20, 25
Republic Aviation Corp., N.Y., 7
Rex Corp., Mass., 5, 15, 20, 25
Richardson Co., Ill., 7, Copper Clad, 15, 20, 25
Rogers Corp., Conn., 7, 10, 15, 20, 25
Ross Metals Co., Milton, Pa., 5, 7
St. Regis Paper Co., N.Y., 7, 15, 20, 25

Saxton Products, Inc., 4320 Park Ave., New York 57, N.Y., 5, 15, 25
See ad on page 615
Tel: WEllington 3-6400

Shamban & Co., W. S., Calif., 5, 7, 15, 20, 25, Kel-F, Teflon, Nylon Film
Shell Chemical Corp., N.Y., Epoxy Resins
Silicone Insulation, Inc., N.Y., 5, 7, 15, 20, 25
Sparta Mfg. Co., Ohio, 5, 7, 15, 20, 25
Spaulding Fibre Co., Inc., N.Y., 7, 15, 20, 25
Stanpat Co., N.Y., 7
Stevens Products, Inc., N.J., 7, 25
Suflex Corp., N.Y., 5

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5
See ad on pages 23-25
Tel: JUdson 6-2424

Synthane Corp., Pa., 7, 15, 20, 25
Taylor Electric, Inc., Mich., 5, 20, 25
Taylor Fibre Co., Pa., 7, 15, 20, 25
Tech Art Plastics Co., N.J., 7, 15, 20, 25
Technical Tape Corp., N.Y., 5
Telectro Industries Corp., N.Y., 7, 20
Tetrafluor, Inc., Calif., 5, 7, 10, 15, 20, 25
Teveo Insulated Wire, Calif., 5
Thompson Fiber Glass Co., H. L., Calif., 7

Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 15, 20
See ad on page 620
Tel: PIlgrim 3-7797

Trimount Plastic Co., Inc., Mass., 7, 20
Tri-Point Plastics, Inc., N.Y., 5, 15, 25
U. S. Rubber Co., N.Y., 5, 7, 20
Victor Electric Wire & Cable Corp., R.I., 5
Warminster Fiberglass Co., Pa., 7
Welcraft Prods. Co., Inc., Ind., 5
Westlake Plastics Co., Pa., 5, 7, 15, 20, 25
Willson Camera Co., Inc., Pa., 7
Wirekraft, Inc., Ind., 5, 25
Zenith Plastics Co., Calif., 7
Zippertubing Co., Calif., 25

Directory III. Materials & Services

Precious metals: See class 93

Prongs, vacuum tube: See class 99

Proprietary forms, ceramic: See class 83

Proprietary molding, plastic: See class 94

Publishing: See class 101

Pumps, vacuum: See class 92

Racks: See class 84

Representatives, manufacturers: See class 102

Research laboratories: See class 90

Retaining rings: See class 87

Rivets: See class 87

Sales & service: See class 102

Screen Rooms: See class 12

Screws: See class 87

Shaft locks: See class 99

Shafts, flexible: See class 87

Shielded enclosures: See class 12

96. Shielding Materials.

5. Microwave 10. Radio frequency

Air-Maze Corp., Ohio, 10
Auburn Mfg. Co., Conn., 5, 10
Bar-Ray Products, Inc., N.Y., X-Ray
Bogart Mfg. Co., N.Y., 5

Braun Tool & Instrument Co., Inc., 141 Fifth Ave., Hawthorne, N.J., 5, 10
See ads on pages 459, 543, 551
Tel: HAwthorne 7-1773

Cico Corp., Calif., 10
Cook Electric Co., Inland Test Labs Div., Ill., 5, 10
Co-operative Industries, Inc., N.J., 10
Emerson & Cuming, Inc., Mass., 5, 10

Epoxy Products, Inc., 137 Coit St., Irvington 11, N.J., Environmental
See ad on page 150
Tel: ESsex 5-6000

Factory Enterprises, Inc., Pa., 10
Filmohm Corp., N.Y., 5
General Cable Corp., Metal Textile Corp. Div., N.J., 5, 10
Goodrich Co., B. F., Sponge Products Div., Conn., 5, Absorbets

Gore & Associates, Inc., W. L., 487 Papermill Rd., Newark, Del., 5, 10
See ad on page 608
Tel: ENdicott 8-8325

Gulton Industries, Inc., N.M., 5, 10
Hallett Mfg. Co., Calif., 5, 10

NETIC CO-NETIC

TAPE DATA PRESERVERS

Keep Data Clear, Distinct, Without Distortion

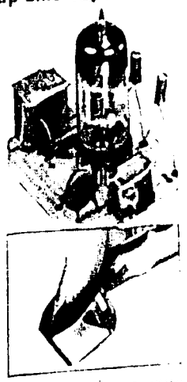
Permanently maintain original fidelity of recorded data on automation programming tapes, telemetering, broadcast, video and hi-fi tapes by diverting all damaging magnetic fields. Magnetic shielding qualities not affected if sturdy Netic Co-Netic containers are dropped or vibrated. Containers do not retain residual magnetism nor require periodic annealing.

Successfully provide simultaneous high and low intensity shielding plus high and low frequency shielding from all damaging extraneous fields produced by generators, power supplies, transformers, magnetic tables on surface grinders, magnetic chucks, de-gaussers, soldering irons, motors, power lines, welding machines, solenoids, etc. around factories, laboratories, military installations, and radio and TV stations. Available in many convenient round or rectangular shapes. Write for sizes and prices today.

MAGNETIC SHIELD DIVISION PERFECTION MICA CO.
1322 No. Elston Avenue • Chicago 22, Illinois

LOWER COST MAGNETIC SHIELDING

Co-Netic & Netic Foils Permit Max. Miniaturization, Improved Performance ... Extremely Versatile—Readily Cut to Any Shape, Wrap Like Tape



How Co-Netic & Netic foils lower your magnetic shielding costs: 1- You use less shielding material because our foils are only .004" thick and they tailor easily to exact shape required, minimizing waste. 2- Permit simple shielding of odd shapes and hard-to-get at components, saving valuable time and eliminating tooling costs and inflexibility of rigid metals. These advantages make possible much smaller and less costly systems, as components may be positioned in close proximity without interference from damaging magnetic fields.

These foils are non-shock sensitive, non-retentive, require no periodic annealing. They effectively shield electrostatic and magnetic fields over a wide range of intensities. Both foils available from stock in any desired length in various widths.

Co-Netic & Netic foils are successfully solving many types of magnetic shielding problems in numerous critical satellite, missile, magnetic tape and other military, airborne, electronic and laboratory applications. These foils can help you solve your magnetic shielding problems.

MAGNETIC SHIELD DIVISION PERFECTION MICA CO.
1322 No. Elston Avenue • Chicago 22, Illinois
Originators of Permanently Effective Netic Co-Netic Magnetic Shielding

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KESTER SOLDER

FIRST CHOICE FOR EVERY APPLICATION...

Kester "44" Resin-Core Solder

The Solder that's widely used in the electronic industry for TV, radio and similar applications. Has a new activated resin flux that permits the fastest soldering operation. Absolutely non-corrosive and non-conductive. Supplied on 1-, 5- and 20-lb. spools.

Kester "Resin-Five" Core Solder

Standard "accelerated" resin flux for easy soldering of such metals as copper, zinc, brass, nickel-plate and others. Ideal for printed circuit work. Available in all tin and lead combinations. Non-corrosive and non-conductive. In 1-, 5- and 20-lb. spools.

Kester Plastic Rosin-Core Solder

Time-proved "standard" in the electrical-electronic industry. Kester's Plastic Rosin is plasticized, preventing decomposition and permanently preserving the full fluxing quality of the original rosin; it's completely non-corrosive, non-conductive and fungus resistant. Available in wide range of tin-lead combinations, core sizes. In 1-, 5- and 20-lb. spools.

KESTER "SOLDERFORMS"

The original pre-formed solder, supplied in exact sizes, shapes and formulations for every production line or assembly requirement. Flux-filled or solid washers, discs, rings of every description, engineered to your needs.

KESTER SPECIALIZED FLUX-CORE SOLDERS

The formulation and production of special flux-core solders for any specific application is a famous Kester feature . . . the logical outgrowth of over 60 years' experience in serving the soldering needs of all types of industry.

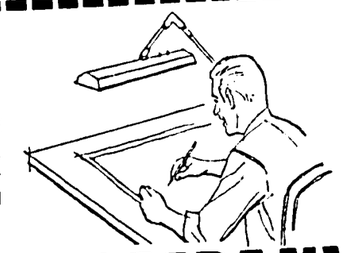
KESTER SOLDERING FLUXES

Scientifically compounded to make all soldering operations easier, faster, more economical, the four basic types of Kester Fluxes include 160 different formulations.

FREE: WRITE today for 78-page Kester technical manual, "Solder . . . its Fundamentals and Usage."

CALL ON KESTER FOR ENGINEERING ASSISTANCE

Since 1899, Kester's business has been SOLDER. With this background, your particular soldering problem is quickly solved to your entire satisfaction. There's no obligation of any kind . . . ever! Call —write—wire for the details.



KESTER SOLDER COMPANY

4219 Wrightwood Ave. • Chicago 39, Illinois

Newark 5, New Jersey • Anaheim, California • Brantford, Canada

OVER 60 YEARS' EXPERIENCE IN SOLDER AND FLUX MANUFACTURING

For details, circle #740 on Reader Service Card

Directory III. Materials & Services

96. Shielding Materials.

Hexcel Products, Inc., Md., 10, Honeycomb Core Materials

Instrument Specialties Co., Inc., 284-A Bergen Blvd., Little Falls, N.J., 5, 10
See ad on page 640
Tel: CLifford 6-3500

Jan Hardware Mfg. Co., Inc., N.Y., 5
Kaman Aircraft Corp., Nuclear Div., Colo., 5
Kinney Co., Inc., Joseph, Pa., 10
McMillan Industrial Corp., Mass., 5, 10
Metal Textile Corp., N.J., 10
Metavac, Inc., N.Y., 5, 10

Mycalex Corp. of America, 125-B Clifton Blvd., Clifton, N.J., Nuclear
See ad on page 102
Tel: PRescott 9-8866

National Moldite Co., N.J., 10
National Wire & Cable Corp., Calif., 10
Nuclear-Chicago Corp., Ill., Lead

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 5, 10
See ad on page 687
Tel: EVerglade 4-2122

Radar Design Corp., N.Y., 5 Absorbers
Shamp Scientific Supply Co., D.C., 5

Shielding, Inc., 66 N. Read Ave., Riverton, N.J., 5, 10
See ad on page 240
Tel: TAlmadge 9-1433

Sterling Precision Corp., 17 Matinecock Ave., Port Washington, L.I., N.Y., 5
See ads on pages 306, 351
Tel: POrt Washington 7-7200

Swift Textile Metalizing & Laminating Corp., Conn., 5, 10
Technical Wire Products, Inc., N.J., 5, 10
Telectro Industries Corp., N.Y., 5, 10
York Co., Inc., Otto H., N.J., 10
Zippertubing Co., Calif., 10

Shields, tube: See class 99

Sockets: See class 69

Soldering Irons & Guns: See class 92

97. Solder.

5. Acid core
10. Fluxes
15. Plain
20. Precious metal
25. Pre-forms
30. Rosin core

Accurate Specialties Co., Inc., N.Y., 5, 10, 15, 20, 25, 30
Allen Co., Inc., L. B., Ill., 10
Alloys Unlimited, Inc., N.Y., 15, 20, 25
All-State Welding Alloys Co., Inc., N.Y., 10, 20, Aluminum
Alpha Metals, Inc., N.J., 5, 10, 15, 20, 25, 30

97. Solder.

Aluminum Co. of America, Pa., 15
Ambroid Co., Mass., 10

American Platinum & Silver Div., Engelhard Industries, Inc., 231 New Jersey Railroad Ave., Newark 5, N.J., 20, 25
See ad on page 198
Tel: MArket 2-8025

American Silver Co., Inc., N.Y., 10, 20
American Smelting & Refining Co., N.Y., 5, 15, 30
Anchor Metal Co., Inc., N.Y., 5, 10
Anthony & Co., J. L., R.I., 15, 20

Art Wire & Stamping Co., 21 Boyden Pl., Newark 2, N.J., 25
See ad on page 695
Tel: HUmboldt 4-2100

Bigelow Mfg. Corp., N.J., 32
Bow Solder Products Co., Inc., N.Y., 5, 10
Chase Brass & Copper Co., Sub.-Kennecott Copper Corp., Conn., 15, 20
Chemalloy Electronics Corp., Calif., 15, Aluminum-Fluxless
Dalweld Co., Inc., N.Y., 10, 20
Decimeter Products Co., Colo., 10
Division Lead Co., Ill., 5, 10, 15, 25, 30
Drake Electric Works, Inc., Ill., 5, 30
Drakenfeld & Co., Inc., B. F., N.Y., 20
Electrovert, Inc., N.Y., 10, 15, 30

Engelhard Industries, Inc., 113 Astor St., Newark 2, N.J., 10
See ad on page 198
Tel: BIgelow 3-0030

Fairmount Chemical Co., Inc., N.Y., 10
Forney Industries, Aviation Div., Colo., 10
Fusion Engineering Co., Ohio, 10, 25
General Findings & Supply Co., Industrial Div., Mass., 25
Glaser Lead Co., Inc., N.Y., 5, 10, 15, 20, 25, 30
Goldsmith Bros. S&R Co., Ill., 10, 20
Handy & Harman, N.Y., 10, 20, 25
Johnson Mfg. Co., Inc., Iowa, 10, 15, 25, 30

Kester Solder Co., 4219 Wrightwood Ave., Chicago 39, Ill., 5, 10, 15, 20, 25, 30
See ad on page 688
Tel: BElmont 5-1601

LMB-Heeger, Inc., Calif., 10
Leach & Garner Co., Ind. Div., Mass., 20
London Chemical Co., Inc., Ill., 15, 20, 30

Metals & Controls Div. of Texas Instruments Incorporated, 51 Forest St., Attleboro, Mass., 20
See ad on page 676
Tel: ATtleboro 1-2800

Metz Refining Co., N.J., 20
Mico Instrument Co., Mass., 10, 30
Multicore Sales Corp., N.Y., 10, 30
Multicore Solders, Ltd., England, 5, 10, 15, 25, 30
National Lead Co., N.Y., 5, 10, 15, 20, 25, 30
National Wire & Cable Corp., Calif., 30
New York Solder Co., Inc., N.Y., 5, 15, 30
Pacific Scientific Co., Calif., 20
Ruby Chemical Co., Ohio, 5, 10, 30
Sargeant & Wilbur Heat Treating Corp., R.I., 10, 20
Shanda Lab, Inc., N.J., 10
Standard Metals Corp., Mass., 20
Superior Flux & Mfg. Co., Ohio, 10
Tricon Mfg. Co., Ill., 5, 10, 15, 20, 25, 30, Silver
Union Carbide Corp., Linde Co. Div., N.Y., 10
Union Electronics Corp., Mass., 10
Western Gold & Platinum Co., Calif., 20, 25
Wildberg Bros. Smelting & Refining Co., Calif., 20
Wilkinson Co., Calif., 20
Williams Gold Refining Co., 2978 Main St., Buffalo 14, N.Y., 15, 20, 25
See ad on page 681
Tel: UNiversity 7204
Wilson Div., H. A., Engelhard Industries, Inc., U. S. Highway 22, Union, N.J., 20
See ad on page 198
Tel: MUrdock 6-6660

Spacers & insulators, vacuum tube: See class 99

Spinning, metal: See class 86

Springs: See class 87

Stamping, metal: See class 86

Strain reliefs: See class 87

Surplus dealers: See class 102

Tags & Markers: See class 87

Tape, adhesive: See class 87

Tape, insulating: See class 89

Tape, lacing: See class 87

Tape, magnetic recording: See class 63

Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-264.

KULKA

TERMINAL BLOCKS

MOLDED BARRIER CONSTRUCTION

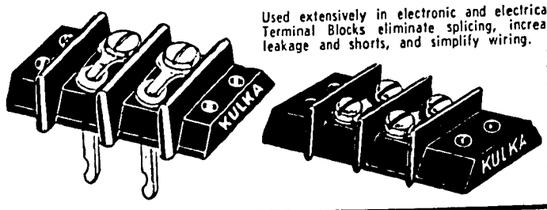
Kulka terminal blocks, used extensively in electrical and electronic assemblies, eliminate splicing, increase insulation, stop leakages and shorts, and generally simplify wiring work.

Molded of high tensile strength bakelite for general commercial use, they are available in other materials made in full compliance with latest military specifications, MIL-M-14E, covering CFG, MFE, MME, MDG, MAI-60, GDI-30, PM14, and other types of special plastics.

Kulka terminal blocks are made in many styles and sizes for varied applications. With 1 to 26 terminals, depending on size. Supplied with or without marker strips which may be printed or plain, or blocks can be engraved.

Write for Latest Kulka Terminal Block Catalog!

WIDEST SELECTION OF TYPES AND SIZES



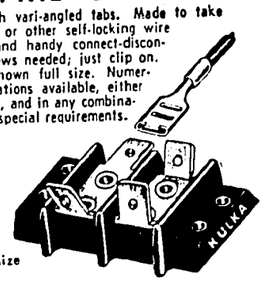
Used extensively in electronic and electrical assemblies, Kulka Terminal Blocks eliminate splicing, increase insulation, stop leakage and shorts, and simplify wiring. In widest range of types, sizes, insulating materials, terminals, etc. Here shown are two types of popular 600 Series. There's a Kulka Terminal Block for every need!

MINIATURE BLOCKS

409 Series is ideal for miniaturization. Shown full size. Only 4⅜" long for 21 terminals. 5/16" wide with barrier. Also available with one-sided and two-sided soldering lug. Also with threaded holes taking 4-40 screws for mounting through chassis, if desired.

"KILPTITE" BLOCKS

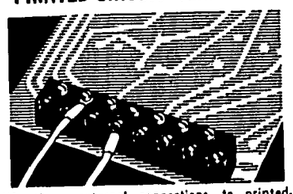
Available with vari-angled tabs. Made to take AMP, Burndy or other self-locking wire lugs. Fast and handy connect-disconnect; no screws needed; just clip on. 800 Series shown full size. Numerous tab variations available, either flat or angled, and in any combination to meet special requirements.



SERIES 800

Shown full size

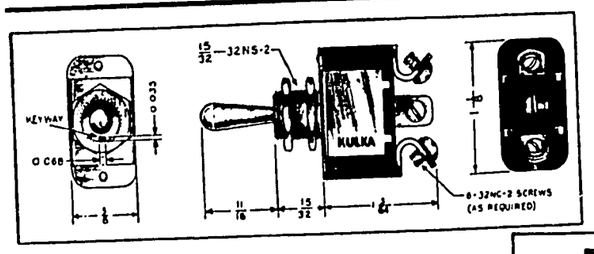
PRINTED-CIRCUIT TERMINALS



Simplify those external connections to printed-circuit boards, no matter how jammed up. Kulka 520 Series miniature terminal blocks mount on board. Terminal pins below slip into standard mounting holes for dip-soldering. Screw terminals. Readily connected or disconnected. 2 to 24 terminals. Entire assembly can be encapsulated.

NAVY BOARDS

Heavy-duty terminal blocks in the widest range of types, materials, sizes. Here shown one-quarter size is a Navy Terminal Board made to drawing 9000, Series S6505 B, 73214, Rev. H. Supplied in MAI-60 glass-filled Alkyd as per MIL-M-14 with latest revision. Threaded studs of manganese-bronze, molded in plastic. Slotted brass nuts. Typical of the "specials" developed and produced by Kulka.



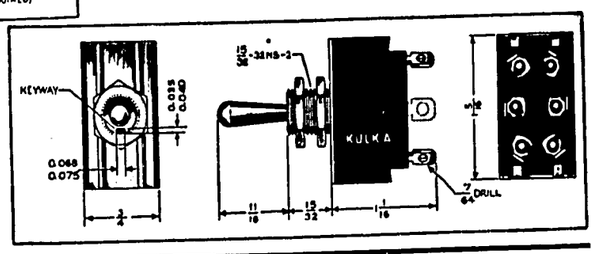
Single-Pole Switches: Series ST 40, with screw terminals, shown at left. Widest choice of types in concise tabular form presented in Kulka literature available on request.

Double-Pole Switches: Series ST 52 with solder lugs, shown below. Wide choice of types in concise tabular form presented in Kulka literature available on request.

ELECTRONIC SWITCHES

Made to Joint Army-Navy specifications—JAN-S-23, MIL-S-21195, MIL-S-6745 and MIL-S-3950A, for electronic, aircraft and communication uses. Designed for quick, easy, one-hole mounting. Ruggedly built for long, trouble-free service. Operating cycles are above minimum required by specifications.

All metal parts treated against corrosion. Switches come with mounting nuts and sleeve lock-washer. All switches made to MIL-S-3950A and MIL-S-6745 are supplied with toggle seal. Units are tested regularly by quality control in production procedure, insuring top performance.



KULKA ELECTRIC CORP.

633-643 SO. FULTON AVENUE • MOUNT VERNON, N. Y.

Telephone: MOunt Vernon 4-4024 — 4025 — 4026 — 4027

Write for CATALOG . . .

Detailed information on the Kulka Line of Wiring Devices, sent on request. Let us collaborate on your problems and requirements.

For details, circle #741 on Reader Service Card

Design Electronic Controls for RELIABILITY IN SERVICE with Alden Components for PLUG-IN UNIT CONSTRUCTION

Be sure your Engineers are working with the Alden Handbook of plug-in unit design. Presents complete line of basic components of tremendous flexibility for adapting your equipment to plug-in construction.

REQUEST FREE 250-PAGE "ALDEN HANDBOOK"

1. *Unitize your circuitry in compact vertical planes using Alden Terminal Card Mounting System.*

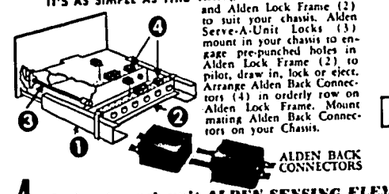
You can use Alden Terminal Mounting Card with Alden Miniature Terminals, Jumper Strip and Sockets staked to accommodate any circuitry — making complete units ready for housing. Components snap into unique Alden Terminals, are held ready for soldering.

2. To mount this vertical circuitry, ALDEN PLUG-IN PACKAGES AND CHASSIS give tremendous variety with standard components

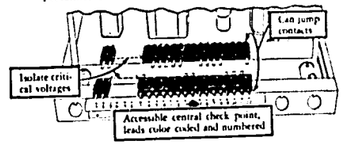
Alden components provide standard plug-in or slide-in housings—with spares, your circuits become units replaceable in 30 seconds.

3. Give chassis easily traceable interconnects and 30-second replacement with ALDEN SERVE-A-UNIT KIT

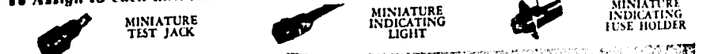
IT'S AS SIMPLE AS THIS Arrange Alden Side Rails (1) and Alden Lock Frame (2) to suit your chassis. Alden Serve-A-Unit Locks (3) mount in your chassis to engage pre-punched holes in Alden Lock Frame (2) to pilot, draw in, lock or eject. Arrange Alden Back Connectors (4) in orderly row on Alden Lock Frame. Mount mating Alden Back Connectors on your Chassis.



GIVING YOU 1) Chassis that plugs in, locks and ejects with half turn of the wrist. 2) leads so beautifully organized, accessible and identified that non-technical personnel can service.



4. *Assign to each unit ALDEN SENSING ELEMENTS — to spot trouble instantly:*



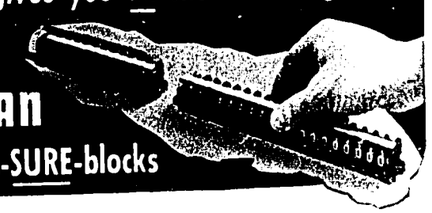
1210 N. Main St., Brockton 64, Mass.

ALDEN PRODUCTS CO.

From Alden's Line of Ready-made Components for Unitized Plug-in Unit Construction.

For details, circle #742 on Reader Service Card

No other terminal block — sectional or one-piece gives you all the advantages of



BUCHANAN

MD sectional pres-SURE-blocks

NO WASTE CIRCUITS—Reduce material costs, save space. Supplied assembled in 20 snap-fit section lengths. Pull off or add groups for any length block.

SMALLER INVENTORY—Only 2 different parts (contact and end sections). No running out of needed items.

MORE CIRCUITS IN AVAILABLE SPACE—Increase contact capacity, decrease jumpering. Group common wires (equivalent to 1 #22 thru 1 #8) in tubular contacts. Contacts on 7/16" centers. 10 circuits 4 7/16", plus 2 1/32" for each complete block.

NO TERMINALS OR LUGS—Eliminate lugging costs. Tubular contacts provide secure, efficient connections.

NO HIDDEN CIRCUIT MARKINGS—Unobscured top marking area minimizes errors. Integral or separable strips.

QUICKER TO INSTALL AND CHANGE—Hand assembled, no fixtures or hardware. Mount only every 12 sections. Add circuits without removing mounting screws.

LOW INSTALLED COST—Competitive with conventional blocks of similar rating.

Separate Sections or Factory-Assembled Blocks
Flat Base or Channel Mounting • Tubular or Strap-Screw Contacts
Fanning Strips • Conservative 750-volt A.I.E.E. rating

Tubular contacts fully approved.

Write for Bulletin RD-60.

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BUCHANAN
ELECTRICAL PRODUCTS CORPORATION
431 U.S. 22, HILLSIDE N.J.

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Directory III. Materials & Services

98. Terminals.

5. Terminal blocks & strips
10. Terminals, rivet or stud
15. Terminals, wire end

A-1 Precision Products, Calif., 5

Accurate Electronics Corp., Ohio, 5, 10; Flexible Shaft Couplers

Aeronautical Electric Co., 5656 Northwest Highway, Chicago 46, Ill., 5
See ad on page 483
Tel: SPring 4-5200

Mac, Inc., Calif., 5, 10, 15

Alden Products Co., 1210 N. Main St., Brockton 64, Mass., 10, 15
See ads on page 419, 691
Tel: JUniper 3-0160

Allen-Bradley Co., Wis., 5

Allied Allegri Co., N.J., 5

Alpine Electronic Co., Inc., Conn., 10

Amatom Electronic Hardware Co., Inc., N.Y., 5, 10

American Brass Co., Conn., 15

American Printed Circuits Co., N.J., 5

Amphenol-Borg Electronics Corp., Amphenol Connector Div., 1830 S. 54th Ave., Chicago 50, Ill., 5
See ad on page 166
Tel: BIshop 2-1000

Anderson Electric Co., Ala., 15

Armel Electronics, Inc., N.Y., 5, 10; Sockets, Relays

Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport 5, Conn., 10
See ad on page 177
Tel: EDison 4-4124

Beckman Instruments, Inc., Helipot Div., Calif., 5

Berg Mfg. Corp., Pa., 5, 10, 15

Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 5, 15
See ad on page 603
Tel: WAlker 5-6980

Buchanan Electrical Products Corp., 431 U.S. 22, Hillside, N.J., 5, 15
See ad on this page
Tel: WAverly 3-7474

Burndy Corp., H. H. Buggie Div., Conn., 5

Burndy Corp. Omaton Div., Richards Ave., Norwalk, Conn., 5, 15
See ad on page 421
Tel: TEmple 8-4711

Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass., 5, 15
See ad on page 693
Tel: TRowbridge 6-2810

Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N.Y., 5
See ad on page 637
Tel: CIrcle 6-0450

Carroll Pressed Metal, Inc., Ohio, 5

Sealectro PRESS-FIT® TEFLON* TERMINALS

ONE-PIECE Sealectro Teflon Terminals (eliminating hardware, such as screws, nuts, washers, lockwashers, sealing) save material, labor, time, trouble.

Here is the outstanding selection of types and sizes—over 800 different miniature and subminiature standoffs and feedthrus; jacks and plugs; connectors; taper-pin receptacles. Wide choice of lug styles and platings. And available in nine RETMA code colors for circuit and function designations.

Sealectro Insertion Tool Directory assures correct insertion of each Press-Fit type, while Sealectro's application-engineering service insures complete satisfaction.

Small Quantities: For the convenience of prototype designers, development labs, special equipment builders, experimenters and others, Sealectro Press-Fit terminals are stocked by industrial distributors. Sixty-odd types most generally used, are available locally.

Production Quantities: Deal directly with the Sealectro plant. The local Sealectro field representative is always "at your service!"

STANDOFFS

Wide selection of miniature sizes in voltage ratings up to 4000. For components stressing higher voltages rather than space-saving. Choice of lug styles and platings. In nine RETMA code colors.

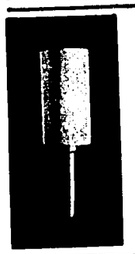
Also in subminiature sizes for miniaturization programs. Operating voltages up to 750. Choice of lugs, platings, colors.

FEEDTHRUS

In miniature sizes and choice of lugs including hollow-tube style, facilitating connections through metal chassis or casing. Voltage ratings up to 5500 in larger sizes. Subminiature sizes for ultra space-saving, in voltage ratings up to 750. Choice of lug styles, platings, code colors.

JACKS

Rugged miniature and subminiature test-point jacks featuring either stamped or machined beryllium-copper contact members with bull-dog grip. Take standard instrument test probes or companion plug. Ideal for test points on metal panels, connecting to circuitry or components for external testing, and for unbreakable metal-plate patch-cord boards. In nine RETMA code colors. Plus New Right-Angle Printed-Circuit Jack. Write for samples.



PLUGS

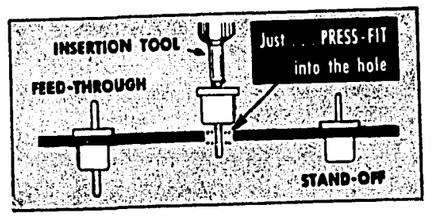
Choice of types and sizes. Used in conjunction with Press-Fit jacks, and also as male member of breakaway connectors. Connecting wire slips through hollow-tube probe and is dip-soldered. In nine RETMA code colors.

TAPER PIN

Individually-insulated precision-machined receptacles for standard taper pins, taking advantage of the simple, fast, economical Press-Fit installation. Available in feedthru and standoff types, as well as high-voltage designs with extra-long leakage path. In nine RETMA code colors.

* REG. T.M. PEND.

Install them FAST and TO LAST!



Fastest, simplest, most economical terminal installation, in three steps: (1) Punch or drill hole; (2) Countersink entrance edge according to Sealectro's time-tested specs; (3) With Sealectro-approved insertion tool in chuck of drillpress (power off) or hand arbor press, center over hole and apply pressure, smoothly and easily seating the Press-Fit terminal in place. That's all there is to it. And genuine Sealectro Press-Fit terminals stay put—for keeps!

Sealectro CONHEX

SUB-MINIATURE R.F. CONNECTORS

Radically different. Probably *better*. And you can tell them at a glance—by their *hexagonal* bodies. The only connectors that can be wired and rewired in factory, lab, shop or field, *without special tools*. Typical advantages:

Successfully withstand pull-out strain in excess of 20 lbs.

Captivated contacts insure proper engagement of mating parts.

Clamping parts, insulators and contacts readily assembled on cable before insertion in connector body.

Gold-plated hex stock allows assembly with usual pliers or small wrench.

Contacts soldered to center conductor of cable, insuring proper connections.

No distortion of cable insulation that might affect electrical characteristics.

Flexible design accepts all RG-188/U MIL cable diameters.

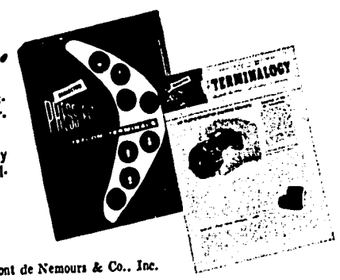
50-OHM "CONHEX" TYPES SHOWN

Type 3000 Cable Plug	Type 3002 Panel Receptacle	Type 3004 Cable Feedthru
Type 3001 Cable Jack	Type 3003 Panel Jack	Type 3005 Right-Angle Plug

In several other popular types.
Also available in 75- and 95-ohm impedance sizes.

* TM reg. pend.

Send for them . .



The big Sealectro "Press-Fit" catalog acknowledged as the "bible" of Teflon terminals — is yours for the asking.

Also a free subscription to the bi-monthly TERMINALOGY, dealing with terminal developments, applications, installations.

Write on your business stationery!

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For details, circle #744 on Reader Service Card

Directory III. Materials & Services

98. Terminals.

Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 5
See ad on pages 48-49
Tel: NEvada 2-2000

Circon Component Corp., Santa Barbara Municipal Airport, Goleta, Calif., 10, 15
See ad on page 484
Tel: WOodland 7-1113

Cleveland Metal Spec., Co., Ohio, 5, 15

Continental Connector Corp., 34-63 56th St., Woodside 77, N.Y., 5
See ad on page 423
Tel: TWining 9-4422

Continental-Diamond Fibre Corp., Del., 5

Control Devices, Inc., Mich., 5

Cortland Industries, Inc., Ill., 5

Curtis Dev. & Mfg. Co., Wis., 5

Dalmore Corp., Mass., 5, 10

Dante Elec. Mfg. Co., Conn., 15

Duralith Corp., Pa., 5

EPM Corp., N.Y., 5

Eby, Inc., Hugh H., Pa., 15

Electric Terminal Corp., R.I., 10, 15

Electrical Insulation Co., Inc., N.Y., 5

Electronic Applications, Inc., Conn., 5, 10

Electronic Mechanics, Inc., N.J., 5, 10

Electronic Plastics Corp., Mass., 5, 10

Electronic Techniques, Inc., Calif., 5, 10

Emerson Plastics Corp., N.Y., 5

Emmco Plastic Fabricators, Mass., 5

Enflo Corp., N.J., 5

Excellex Electronics, Inc., N.Y., 5, 15

Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 5, 10, 15
See ad on page 637
Tel: IRving 8-5744

Fiber Fabricators Co., Inc., Ill., 5

Fidelity Amplifier Co., Ill., 5

Fisher & Crome, Pa., 5

GOE Engineering Co., Calif., 10

Garde Mfg. Co., R.I., 5, 10, 15

Garlock Packing Co., Garlock Electronic Products, Camden 1, N.J., 10
See ad on page 682
Tel: WOodlawn 4-0370

General Avia. & Electronics Mfg. Co., N.J., 5

General Cement Mfg. Co., Div. of Textron, Inc., 400 S. Wyman St., Rockford, Ill., 5
See ad on page 474
Tel: ROckford 8-9661

General Components, Inc., N.Y., 5, 10, 15

General Electric Co., Wiring Device Dept., R.I., 15

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Glastic Corp., Ohio, 5

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Godfrey Mfg. Co., Ill., 5

Hallett Mfg. Co., Calif., 15

Heldor Mfg. Corp., N.J., 5, 10, 15

Hermes Plastics, Inc., N.Y., 5

Hobson Bros., Inc., Ill., 5

Hollingsworth Co., Solderless Terminal Div., Pa., 15

Hu-Bar Terminals, Inc., Calif., 10

IE Manufacturing, Ill., 15

Illinois Tool Works, Shakeproof Div., Ill., 15

Jamison Plastic Corp., N.Y., 5

Jones Div., Howard B., Cinch Mfg. Co., 1026 S. Homan Ave., Chicago 24, Ill., 5
See ad on pages 48-49
Tel: NEvada 2-2000

Kolton Electric Mfg. Co., N.J., 5

Kulka Electric Corp., 633-643 S. Fulton Ave., Mt. Vernon, N.Y., 5, 10, 15
See ad on page 690
Tel: MOunt Vernon 4-4024

Lab-Tronics, Inc., Ill., 15

Laminated Sheet Products Corp., Mass., 5

Landes Electronic Fasteners, N.Y., 10, 15

Lee Chemical Corp., Walter, N.Y., 5

Lerco Electronics, Inc., Calif., 5, 10

Litton Industries, U.S. Engineering Co., Div., Calif., 5, 10, 15

Malco Tool & Mfg. Co., Ill., 10, 15

Mandex Mfg. Co., Ill., 5

Marine View Electronics, N.Y., 5

Mica Insulator Co., Div. of Minnesota Mining and Mfg. Co., N.Y., 5

Micarta Fabricators, Inc., Ill., 5

Microdot, Inc., Calif., 15

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5
See ad on page 416
Tel: DAvenport 4-4108

Miller Co., J. W., Calif., 5

Molded Insulation Co., Pa., 5

Molding Corp. of America, R.I., 5

Molex Products Co., Ill., 5, 10, 15

Morse Co., Frank W., Mass., 15

Murdock Corp., Mass., 5

National Ceramic Co., N.J., 5

National Tel-Tronics Corp., 52 St. Casimir Ave., Yonkers, N.Y., 5
See ad on page 462
Tel. YOnkers 8-6400

Norrich Plastics Corp., 107-109 West 18th St., New York 11, N.Y., 5, 10
See ad on page 152
Tel: WAtkins 4-8360

North Electric Co., N.Y., 5

North Electric Co., Ohio, 5, 10, 15

Northern Plastics Corp., Wis., 5

Oppenheimer Plastics Inc., Pa., 5

PIC Design Corp., N.Y., 5

Patton-MacGuyer Co., R.I., 15

Peck Spring Co., Conn., 5, 10

Penn Fibre & Specialty Co., Inc., Pa., 5

Permonite Mfg. Co., Ill., 5

Photo-Chemical Products, N.Y., 5

Pilgrim Products, Inc., Mass., 5, 10

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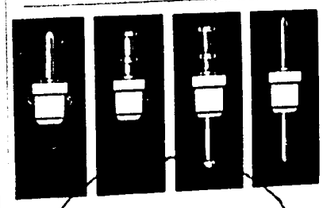

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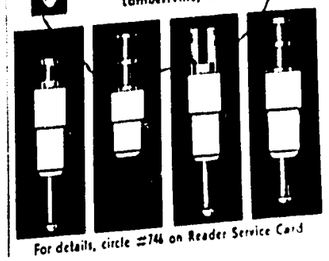

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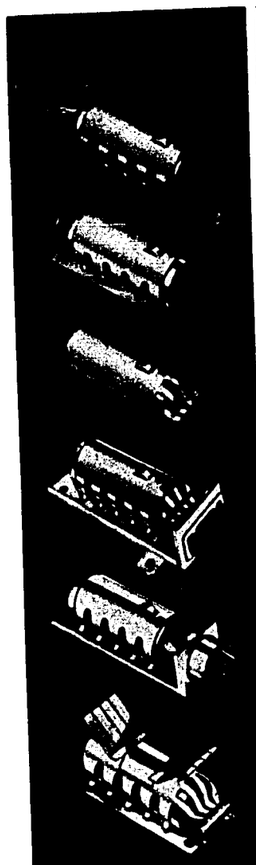
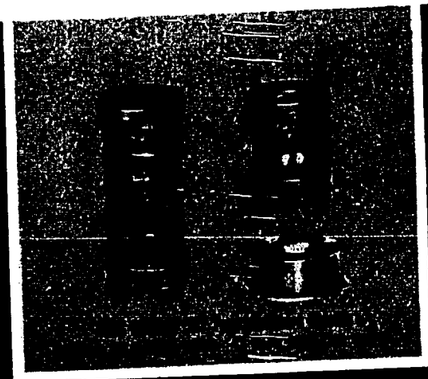
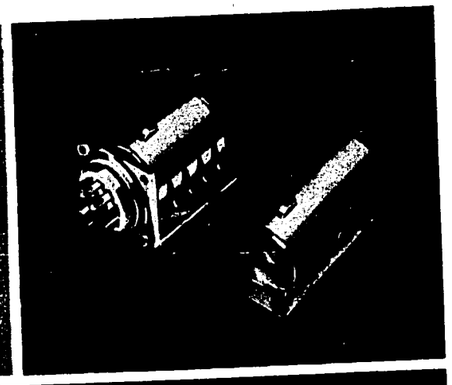
Code numbers shown after each firm refer to product or service sub-classes listed at the beginning of each product classification. Complete addresses will be found in the Alphabetical Directory, pages 161-244.







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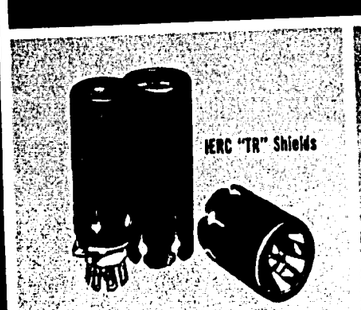

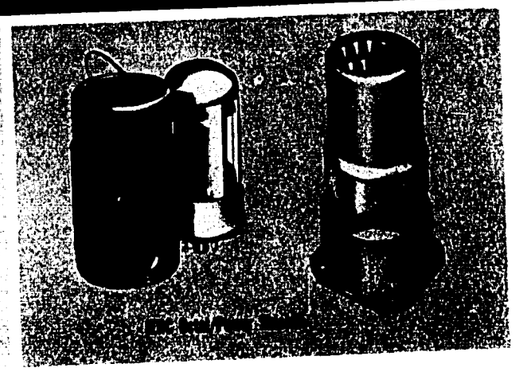

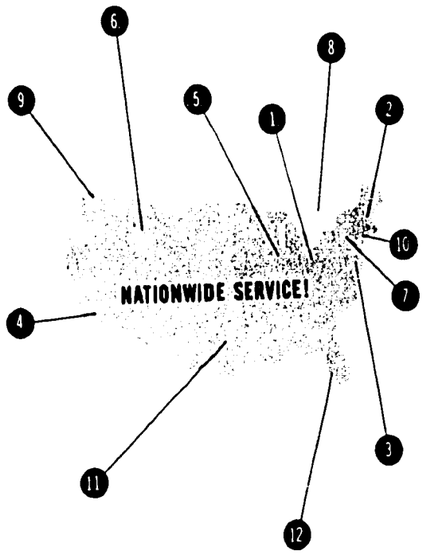

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   Branch: P.O. Box 797, Canaan, Conn.
3. **WILLIAM JONES**—1107 Echo Court North, Hampton Village, Towson 4, Md.—VAlley 3-2434.
   Branches: 332 S. Forklanding Rd., Maple Shade, N.J.—NOrmandy 3-2450.
   1437 Kenilworth Dr., S.W., Atlanta, Ga.—PLaza 5-5318, 711 Magnolia Ave., Orlando, Fla.—GArden 4-6298, 70 N.W. 36 Court, Miami 35, Fla.—Highland 8-0349.
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7. **REED-TOLLEFSON CORPORATION**—2815 Monroe Ave., Rochester 18, N.Y.—HIllside 5-0450.
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Directory III. Materials & Services

98. Terminals.

Pioneer Electroponents Corp., N.Y., 5, 10
Poly-Scientific Corp., Va., 5, 10, 15
Precision Metal Products Co., Mass., 5, 10
Reese, Inc., J. Ramsey, N.Y., 5, 10, 15
Reeves Instrument Corp., N.Y., 5
Rimak, Inc., Calif., 5, 10
Rosan, Inc., Calif., 10, 15
Ross Metals Co., Milton, Pa., 5
Sangamo Electric Co., Ill., 5
Sealectro Corp., 610 Fayette Ave., Mamaroneck, N.Y., 5, 15
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Tel: OWens 8-5600
Sherman Mfg. Co., H. B., Mich., 15
Silicone Insulation, Inc., N.Y., 5
Slip Ring Co. of America, Calif., 5
Smith Inc., H. H., N.Y., 5, 10, 15
Spruce Pine Mica Co., N.C., 5
States Co., Conn., 5
Steinen Mfg. Co., Wm., N.J., 10
Stewart Stamping Co., N.Y., 15
Stimpson Co., Inc., Edwin B., 77 Franklin Ave., Brooklyn 5, N.Y., 10, 15
See ad on page 646
Tel: ULster 5-3131
Strat-O-Seal Mfg. Co., Ill., 5, 10
Superior Carbon Products, Inc., Ohio, 5
Sweet Mfg. Co., Mass., 10, 15
Taurus Corp., 8 Coryell St., Lambertville, N.J., 10
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Tech Art Plastics Co., N.J., 5
Telegraph Condenser Co., Ltd., United Insulator Div., England, 5, 10, 15
Thomas & Betts Co., Inc., N.J., 5, 15
Thompson-Bremer & Co., Ill., 15
Tri-Dex Co., Calif., 5
Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 5
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Tel: LIbertyville 2-3700
Tri-Point Plastics, Inc., N.Y., 5
Tubular Rivet & Stud Co., Mass., 10
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United States Instrument Corp., Va., 5
Vaco Products Co., Ill., 5
Vector Electronic Co., 1100 Flower St., Glendale 1, Calif., 5, 10
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Voak Engineering Co., Calif., 15
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Walsco Electronics Mfg. Co., Div. of Textron, Inc., 100 W. Green St., Rockford, Ill., 5
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Waterbury Companies, Inc., Conn., 10
Winchester Electronics, Inc., Conn., 10, 15
Zeirick Mfg. Corp., N.Y., 10, 15

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Testing services: See class 90

Tools: See class 92

Tube clamps & shields: See class 99

Tube sockets: See class 69

Tuning forks: See class 31

Vacuum pumps: See class 92

99. Vacuum Tube Parts.

99. Vacuum Tube Parts.

5. Anodes
10. Envelopes, glass
15. Envelopes, metal
20. Getters
25. Grids & grid wire
30. Guns & gun parts
32. Lead wires
35. Phosphors
40. Pins & Prongs
42. Shaft locks
45. Spacers & insulators
50. Stampings
52. Tube bases
55. Tube caps
60. Tube clamps
65. Tube shields
70. Tubing—cathode

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Allegheny Ludlum Steel Corp., Pa., 45
Alloys Unlimited, Inc., N.Y., 32, 50
Amatom Electronic Hardware Co., Inc., N.Y., 42
American Brass Co., Conn., 5, 40, 50
American Lava Corp., Cherokee Blvd. & Manufacturers Rd., Chattanooga 5, Tenn., 45, 50, 70
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Tel: AMherst 5-3411
Art Wire & Stamping Co., 21 Boyden Pl., Newark 2, N.J., 5, 25, 30, 32, 40, 50
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Asheville-Schoonmaker Mica Co., Va., 45
Associated Engrg. & Mfg., N.J., 5, 30, 35, 50, 52
Augat Bros., Inc., 33 Perry Ave., Attleboro, Mass., 60
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Tel: ATtleboro 1-2202
Autoscrew Co., N.Y., 5
Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport 5, Conn., 40
See ad on page 177
Tel: EDison 4-4124
Birtcher Corp., Industrial Div., Calif., 60
Bon-De Electronic Labs., Inc., Mass., 10

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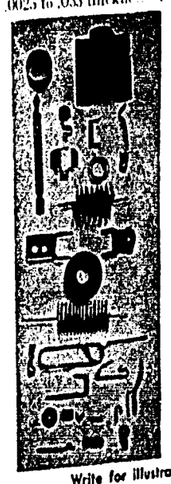

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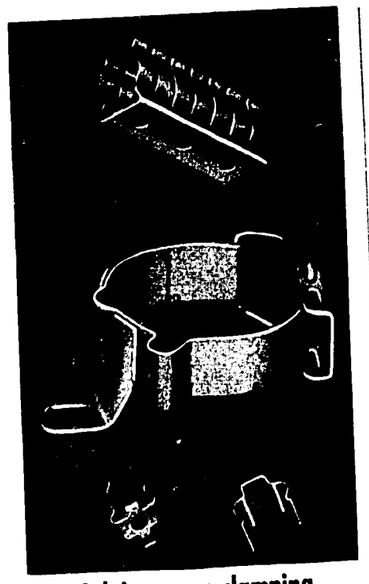

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Tel: HAwthorne 7-1773

C.M. Mfg. & Machine Co., N.J., 32

Carborundum Co., Refractories Div., N.J., 15, 32, 45

Centralab, Div. of Globe-Union, Inc., 920 E. Keefe Ave., Milwaukee 1, Wis., 45
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Tel: WOodruff 2-9200

Cohn Corp., Sigmund, 121 S. Columbus Ave., Mount Vernon, N.Y., 25
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Tel: MOunt Vernon 4-5300

Continental-Diamond Fibre Corp., Del., 50

Continental Electric Co., Ill., 5, 20, 25, 32, 65

Diamonite Products Mfg. Co., Ohio, 45

Division Lead Co., Ill., 5, 50

Driver Co., Wilbur B., 1875 McCarter Highway, Newark 4, N.J., 25
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General Cable Corp., Metal Textile Corp. Div., N.J., 25, 65

General Electric Co., Lamp Wire & Phosphors Dept., Ohio, 35

General Electric Co., Large Lamp Div., Ohio, 32, 35, 70, Lamp Bases

General Findings & Supply Co., Industrial Div., Mass., 50

George Products Co., N.J., 50, 70

Getters Electronics, Inc., N.Y., 20

Greer Stop Nut Co., Ill., 42

Haydu Electronic Products, Inc., N.J., 50

Henry & Miller Industries, Inc., N.J., 65

Hoffman Engrg. Corp., Conn., Matrices-Display Tubes

Howard Precision, Inc., N.J., 15, 30, 50, 55

International Electronic Research Corp., 145 W. Magnolia Blvd., Burbank, Calif., 60, 65
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Tel: VIctoria 9-2481

Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 52
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Jan Hardware Mfg. Co., Inc., N.Y., 42, 45, 65, CR Tube-Bezel

Johnson & Hoffman Mfg. Corp., N.Y., 5, 30, 50, 55, 70

Kimble Glass Co., Ohio, 10

King Laboratories, Inc., N.Y., 20, 50

Kirchberger & Co., Inc., M., N.J., 45, 55

Lancaster Glass Corp., Ohio, 10

Livingston Electronic Corp., N.J., 65

MacKay, Inc., A. D., N.Y., 20, 35

Magnetic Metals Co., Hayes Ave. at 21st St., Camden 1, N.J., 65
See ad on page 436
Tel: WOodlawn 4-7842

Magnetics, Inc., Dept. P-69, P.O. Box 391, Butler, Pa., 65
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Tel: BUtler 7-3787

Mandex Mfg. Co., Inc., Ill., 65

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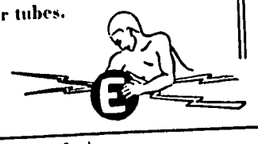

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99. Vacuum Tube Parts.

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Metallic Arts of New England, Inc., Mass., 65, Made of Mu Metal

Metals & Controls Div. of Texas Instruments Incorporated, 51 Forest St., Attleboro, Mass., 5, 20, 25, 32, 50
See ad on page 676
Tel: ATtleboro 1-2800

Methode Mfg. Corp., 7447 W. Wilson Ave., Chicago 31, Ill., 65
See ad on page 505
Tel: UNderhill 7-9600

Metpro, Inc., R.I., 50, 55, 65

Micaeraft Products, Inc., N.J., 45

Microtronics, Inc., N.J., 50

Middletown Mfg. Co., Conn., 50

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 42, 55, 60, 65
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Tel: DAvenport 4-4108

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Norrich Plastics Corp., 107-109 West 18th St., New York 11, N.Y., 30, 40, 45, 52, 55
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Tel: WAtkins 4-8360

North American Philips Co. Inc., Philips Labs. Div., N.Y., Cathodes

Northern Plastics Corp., Wis., 45, 50

Owens-Illinois, Sub. of Kimble Glass Co., Ohio, 10

Page-Madden Co., N.Y., 45

Paramount Products Co., Inc., N.J., 5, 30, 50

Patton-MacGuyer Co., R.I., 50

Peerless Electronics Inc., Calif., 60

Perfection Mica Co., Magnetic Shield Div., 1322 N. Elston Ave., Chicago 22, Ill., 65
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Tel: EVerglade 4-2122

Philadelphia Scientific Glass Co., Pa., 10

Pioneer Electroponents Corp., N.Y., 40, 45

Radio Corp. of America, Electron Tube Division, Section I-22-Q, 415 South Fifth St., Harrison, N.J., 5, 20, 25, 30, 32, 35, 45, 50, 52, 55
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Romac Products Co., N.Y., 5, 15, 20, 25, 50

Ross Metals Co., Milton, Pa., 45, 52

S & B Machine & Tool Co., Inc., N.J., 50, 55, 60

Scientific Electronic Laboratories, 866 Bergen St., Newark 8, N.J., 5, 10, 15, 30, 32, 52
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Tel: BIgelow 3-8675

Smith Inc., H. H., N.Y., 42, 45, 50, 60, 65

Spincraft, Inc., Wis., 15

Steinen Mfg. Co., Wm., N.J., 50

Steward Mfg. Co., D. M., Tenn., 45

Suffolk Products Corp., N.Y., 65, CRT

Superior Electronics Corp., N.J., 30, Gun Mounts

Superior Steatite & Ceramic Corp., 89 W. Forest Ave., Englewood, N.J., 45
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Tel: LOwell 8-4555

Superior Tube Co., Pa., 70

Sweet Mfg. Co., Mass., 15, 30, 32, 45, 50, 55, 60, 65

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 25, 30, 32, 35, 50, 52
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Tel: JUdson 6-2424

Sylvania Electric Products Inc., Chemical & Metallurgical Div., Pa., 25, 35

Sylvania Electric Products Inc., Parts Div., Warren, Pa., 5, 30, 32, 40, 50, 52, 55, 70
See ad on page 28
Tel: WArren 3220

Technical Ceramics & Lava Corp., 85 Fifth Ave., Paterson 4, N.J., 45, 52
See ad on page 621
Tel: ARmory 1-0163

Technical Wire Products, Inc., N.J., 65

Techniques, Inc., N.J., 50

Texas Instruments, Incorporated, Semiconductor—Components Div., P.O. Box 312, 13500 N. Central Expressway, Dallas, Texas, 5, 32, 50
See ad on pages 75-78
Tel: FLeetwood 7-5411

Thomas Electronics, Inc., N.J., 50

Times Facsimile Corp., 540 West 58th St., New York 19, N.Y., 60
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Tel: JUdson 2-3030

Tricon Mfg. Co., Ill., Small Stampings

Ultra-Violet Products, Inc., Calif., 35

Uniform Tubes, Inc., Pa., Seamless Ferrous & Non Ferrous Metal Tubing

Union Carbide Corp., Kemet Co. Div., Ohio, 20, 25, Silicon Monoxide

Union Carbide Corp., National Carbon Co. Div., N.Y., 5

United Mineral & Chemical Corp., 16 Hudson St., New York 13, N.Y., 35, 45, 45, 50, 60, 65
See ads on pages 541, 681
Tel: BEekman 3-8870

U.S. Radium Corp., N.J., 25

Victory Mica Mfg. Co., Inc., 1329 39th St., Brooklyn 18, N.Y., Mica Spacers
See ad on page 653
Tel: GEdney 5-3427

Volkert Stampings, Inc., N.Y., 25, 30, 45, 50, 65

Westinghouse Elect. Corp., Lamp Div., N.J., 25, 32, 35, 52

Wrought Washer Mfg. Co., Wis., 50

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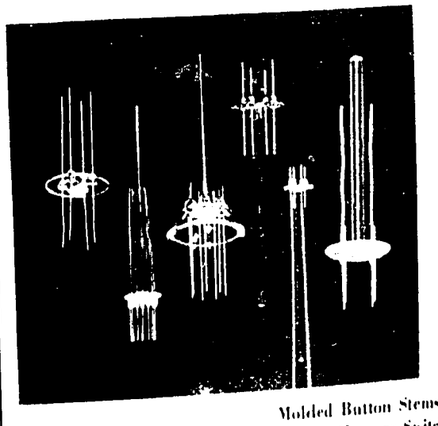

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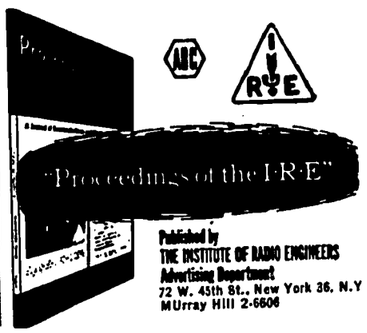

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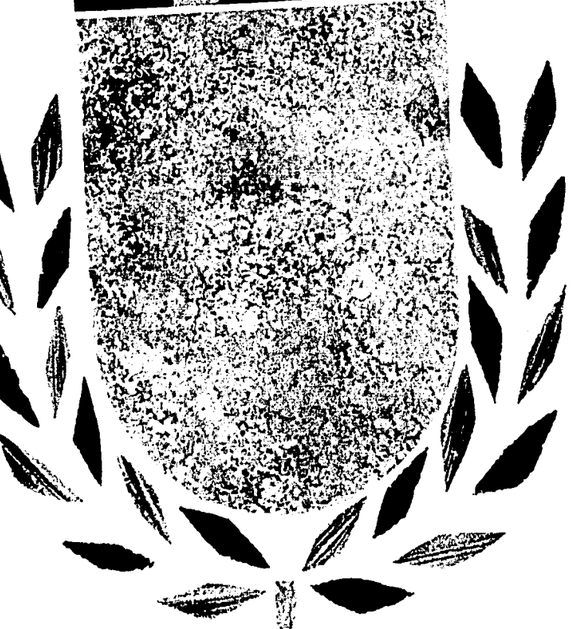

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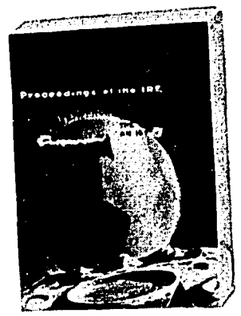

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Standard Radio Parts, Inc., 218 N. 1st Ave., Tuscon, Ariz., 10 (NEDA)

ARKANSAS

Teague Electronics, South Highway 61, Blytheville, Ark., 10 (NEDA)
White Radio Supply Co., D., 1222 Main St., Little Rock, Ark., 10 (NEDA)
Martin Wholesale Radio Supply, 1207 W. Kingshighway, Paragould, Ark., 10 (NEDA)
Lavender Radio & TV Supply, 520 E. 4th St., Texarkana, Ark., 10 (NEDA)

CALIFORNIA

Moye Co., Robert G., 116 S. Stoneman Ave., Alhambra, Calif. 15
Wood Co., Ash M., P.O. Box 1031, Arcadia, Calif., 15 (ERA)
Valley Radio Supply Co., 716 Baker St., Bakersfield, Calif., 10 (NEDA)
Kruedick-Folcar Elect., 2428 Shattuck Ave., Berkeley, Calif., 10 (NEDA)
Pacific Rad. Supply, Inc., 2801 Shattuck Ave., Berkeley, Calif., 10 (NEDA)
Harmon Co., W. S., 121 N. Roberston Blvd., Beverly Hills, Calif., 15 (ERA)
Mitchell Co, C. H., 9015 Wilshire Blvd., Beverly Hills, Calif., 15
Moxon Sales, G. E., 480 S. Robertson, Beverly Hills, Calif., 15
Stern & Co., I. R., 4109 Burbank Blvd., Burbank, Calif., 15 (ERA)
Weightman & Associates, 4029 Burbank Blvd., Burbank, Calif., 15 (ERA)
Sodara Co., 9400 Culver Blvd., Culver City, Calif., 15
Stevens Co., Thomas L., 5444 S. Sepulveda Blvd., Culver City, Calif., 15 (ERA)
Dealers Elect. Supply Co., 800 Broadway St., Eureka, Calif., 10 (NEDA)
DeJarnatt Radio Wholesale, 223 Fulton St., Fresno, Calif., 10 (NEDA)
Inland Elect. Suppliers, 843 Divisadero, Fresno, Calif., 10 (NEDA)
Gates Co., Howard A., 1819 Harmon Pl., Glendale, Calif., 15, 20
Weatherford Co., R. V., 6921 San Fernando Rd., Glendale, Calif., 10 (NEDA)
Western Electronic Supply, 1214 South Brand Blvd., Glendale, Calif., 10 (NEDA)
Grant Snyder Co., Lee, 1418 N. Highland, Hollywood, Calif., 15 (ERA)
Hollywood Radio Supply, 5606 Hollywood Blvd., Hollywood, Calif., 10 (NEDA)
Instruments for Measure, 3455 Cahuenga Blvd., Hollywood, Calif., 15 (ERA)
Key Electronics, Inc., 8533 Sunset Blvd., Hollywood, Calif., 15 (ERA)
Miller Co., Gerald B., P.O. Box 1471, Hollywood, Calif., 15 (ERA)
Cook Electronics, Inc., 210 E. Hardy St., Inglewood, Calif., 10 (NEDA)
Gilbert Co., M. B., 1708 Centinela Ave., Inglewood, Calif., 15 (ERA)
Newark Electric Co., 4747 W. Century Blvd., Inglewood, Calif., 10 (NEDA)
Universal Dist., Inc., 4642 W. Century Blvd., Inglewood, Calif., 10 (NEDA)
Scott Radio Supply, Inc., 266 Alamitos Ave., Long Beach, Calif., 10 (NEDA)
Whitehead Radio Co., 4680 Long Beach Blvd., Long Beach, Calif., 10 (NEDA)
Alderson Co., Wes, 3050 Overland Ave., Los Angeles, Calif., 15 (ERA)
Appleton Co., Inc., Harry, 36 San Fernando Rd., Los Angeles, Calif., 15 (ERA)
Avnet Corp., 5877 Rodeo Rd., Los Angeles, Calif., 10 (NEDA)
Barron Co., W. J., 1406 S. Grand Ave., Los Angeles, Calif., 15 (ERA)
Barstow & Doran, Inc., 1408 S. Grand Ave., Los Angeles, Calif., 15 (ERA)
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Berman Co., Jack, 1141 S. La Cienega Blvd., Los Angeles, Calif., 15 (ERA)
California Elect. Supply, 11801-11 W. Pico Blvd., Los Angeles, Calif., 10 (NEDA)
Caltron Products Co, 3518 W. Pico Blvd., Los Angeles, Calif., 15
Cochrane-Barron Co., 544 S. Mariposa, Los Angeles, Calif., 15 (ERA)
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Emmet Co., Frank A., 2837 W. Pico Blvd., Los Angeles, Calif. 15 (ERA)
Erlanger Sales Co., 4217 W. Jefferson Blvd., Los Angeles, Calif., 15 (ERA)
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Feldman Co., Henry, 1244 S. Grand Ave., Los Angeles, Calif., 15 (ERA)
Geist Co., W. K., 3177 Glendale Blvd., Los Angeles, Calif., 15 (ERA)
Heeger, Inc., 1011 Venice Blvd., Los Angeles, Calif., 15 (ERA)
Holmes Co., Carl E., 107 N. Ave. 64, Los Angeles 42, Calif., 15 (ERA)
Jurin Co., Syd, 1628 S. Bentley Ave., Los Angeles, Calif., 15 (ERA)
Kierulff Electronics, Inc., 820 W. Olympic Blvd., Los Angeles, Calif., 10 (NEDA)
Kittleson Co., H. A., 416 N. Labrea Ave., Los Angeles, Calif., 15 (ERA)
Knight Co., W. Bert, 10377 West Pico Blvd., Los Angeles, Calif., 15 (ERA)
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Mueller Electronic Sales, 3225 Exposition Pl., Los Angeles, Calif., 15 (ERA)
Olander & Co., Roland, 6313 Santa Monica Blvd., Los Angeles, Calif., 15 (ERA)
Owens Co., Lee H., 1102 S. Western, Los Angeles, Calif., 15 (ERA)
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Permuth Electronic Assoc., 5057 W. Washington Blvd., Los Angeles, Calif., 15 (ERA)
Radio Equipment Dist., 1340 S. Olive, Los Angeles, Calif., 10 (NEDA)
Radio Prods. Sales, Inc., 1501 S. Hill St., Los Angeles, Calif., 10 (NEDA)
Roberts & Assoc., E. V., 5068 W. Washington Blvd., Los Angeles, Calif., 15 (ERA)
Ross & Co., Malcolm, 1623 S. LaCienega, Los Angeles, Calif., 15 (ERA)
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Strassner Co., Richard A., 1557 N. Western, Los Angeles, Calif., 15 (ERA)
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Wiley Co., Paul F., 1632 Silverlake Blvd., Los Angeles, Calif., 15 (ERA)
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Relco, Inc., 6625 Foothill Blvd., Oakland, Calif., 10 (NEDA)
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White & Co., 788 Mayview Ave., Palo Alto, Calif., 15 (ERA)
A-F Associates, 385 E. Green St., Pasadena, Calif., 15 (ERA)
Electronic Supply Corp., 2085 E. Foothill Blvd., Pasadena, Calif., 5, 10, 15
Empire Elect. Dist., Inc., 37 East Union St., Pasadena, Calif., 10
Luscombe Engrn. of L.A. 1129 S. Fair Oaks Ave., Pasadena, Calif., 15 (ERA)
McCarthy Assoc., 1055 E. Walnut, Pasadena, Calif., 15 (ERA)
Vaughan Co., G. H., 2366 E. Foothill Blvd., Pasadena, Calif., 15 (ERA)
Wesco Electronics, 1244 E. Colorado St., Pasadena, Calif., 10 (NEDA)
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Long & Associates, Brewster-Warren Bldg., Redwood City, Calif., 15 (ERA)
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Ross Co., David H., 534 El Camino Real, San Carlos, Calif., 15 (ERA)
Nystrom Brothers Co., 2426 Fourth Ave., San Diego, Calif., 10 (NEDA)
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Brandt Co., E. W. 1122 Folsom St., San Francisco, Calif., 15 (ERA)
Eber Electronics, 160 10th St., San Francisco, Calif., 10 (NEDA)
Edisco-Elect. Dist. Co., 5901 Mission St., San Francisco, Calif., 10 (NEDA)
Eichorn & Melchior, Inc., 749 Bryant St., San Francisco, Calif., 15
Fortune Electronics, Inc., 1321 Mission St., San Francisco, Calif., 10 (NEDA)
Howard & Assoc., G. M., 1301 6 St., San Francisco, Calif., 15 (ERA)
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Logan Sales Co., 150 8th St., San Francisco, Calif., 15 (ERA)
Meyer & Ross, 113 10th St., San Francisco, Calif., 15 (ERA)
Moulthrop Co., F. W., 575 Tenth St., San Francisco, Calif., 15 (ERA)
Moulthrop & Hunter, 165 11th St., San Francisco, Calif., 15 (ERA)
Nott & Co., L.A., 1061 Howard St., San Francisco, Calif., 15 (ERA)
Pacific Wholesale Co., 1850 Mission St., San Francisco, Calif., 10 (NEDA)
Prudy Co., William J., 312 Seventh St., San Francisco, Calif., 15
Radio Parts Supply Co., 281 Ninth St., San Francisco, Calif., 10 (NEDA)
San Francisco Rad. & Supply, 1282-84 Market St., San Francisco, Calif., 10 (NEDA)
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Hill Co., J. T., 420 S. Pine St., San Gabriel, Calif., 15 (ERA)
Rissi, Al J., 8417 E. Las Tunas Dr., San Gabriel, Calif., 15 (ERA)
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Quement Dealers Elect., Box 527, San Jose, Calif., 10 (NEDA)
Schad Elect. Supply, Inc., 1180 Denise Way, San Jose, Calif., 10 (NEDA)
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Yarbrough Sales Co., 2636 Mission St., San Marino, Calif., 15 (ERA)
Harruss-Koetke Sales Co., 204 E. Hillsdale Blvd., San Mateo, Calif., 15 (ERA)
Newman Co., H. L., 56 41st Ave., San Mateo, Calif., 15 (ERA)
Abbett Co., E. B., 345 Francisco Blvd., San Rafael, Calif, 10 (NEDA)
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Wesco Sales Co., 2837 Wilshire Blvd., Santa Monica, Calif., 15 (ERA)
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Jewett Co., Samuel O., 13537 Addison St., Sherman Oaks, Calif., 15 (ERA)
Macs Radio Supply, 8320-22 Long Beach Blvd., South Gate, Calif., 10 (NEDA)
Dunlap Radio & TV Supply, 27 North Grant St., Stockton, Calif., 10 (NEDA)
Atohm Electronics, 7648 San Fernando Rd., Sun Valley, Calif., 5, 10, 15
Mann Assoc., Martin, 14751 Keswick St., Van Nuys, Calif., 15 (ERA)
Podolcee Sales Co., W. M., 315 N. Leland Ave., W. Covina, Calif., 15 (ERA)

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Golliher, W. B., 1003 Grandview Ave., Boulder, Colo., 15 (ERA)
D&M Electronic Supply, 717 N. Weber St., Colorado Springs, Colo., 10 (NEDA)
Peyser & Co., 1501 N. Weber, Colorado Springs, Colo., 15
Bowen Co., R. G., 721 S. Broadway, Denver 9, Colo., 15 (ERA)
Cluphf & Assoc., Stan., 75 S. Cody Court, Denver 15, Colo., 15 (ERA)
Connors Co., W. H., 375 Birch St., Denver 20, Colo., 15 (ERA)
Electronic Parts Co., 20 W. 13th Ave., Denver, Colo., 10 (NEDA)
Fistells Elect. Supply Co., 1001 Bannock St., Denver, Colo., 10 (NEDA)
Hytronic Measurements, 2240 So. Adams St., Denver, Colo., 15
Hyde Electronics Co., 888 S. Lipan St., Denver, Colo., 15 (ERA)
Koether-Cox Co., 110 W. 13 Ave., Denver 4, Colo., 15 (ERA)
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Moss Sales Co., Box 428, 1530 13 Ave., Greeley, Colo., 15 (ERA)
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CONNECTICUT

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Westconn Electronics, Inc., 195 Colorado Ave., Bridgeport, Conn., 10 (NEDA)
Bahr Sales Co., 183 North Rd., Colebrook, Conn., 15 (ERA)
Bozak Sales Co., P.O. Box 1166, Darien, Conn., 10
Bevin-Wilcox Line Co., East Hampton, Conn., 10
Whitehead Co., John F., P.O. Box 177, Guilford, Conn., 15 (ERA)
Coldwell, Inc., Michael S., 289 Fairfield Ave., Hartford 6, Conn., 15 (ERA)
Electrical Supplies, Inc., 225 Walnut St., Hartford, Conn., 10
Kahn & Co., Inc., 541 Windsor St., Hartford, Conn., 10
Modern Radio Supply Co., 1224 Farmington, Kensington, Conn., 10 (NEDA)
Lavin Assoc., Henry, P.O. Box 196, Meriden, Conn., 15 (ERA)
United Electronic Supply, 49 E. Main St., New Britain, Conn., 10 (NEDA)
Ammrad Co., 843 Grand Ave., New Haven, Conn., 10
Electrical Mfrs. Services, 265 Church St., New Haven, Conn., 20
Equipment Sales Co., Inc., P.O. Box 6098, New Haven, Conn., 15
Aikins Electronic Supply, 1531 Broad St., New London, Conn., 10 (NEDA)
Aikins Electronic Supply, 198 Water St., Norwich, Conn., 10 (NEDA)

Perron & Co., Inc., Ray, 36 Louis St., Trumbull, Conn., 15 (ERA)
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New England Area Representatives, P.O. Box 184, Yalesville, Wallingford, Conn., 15 (ERA)
See ad on page 711

Bond Radio Supply, 439 W. Main St., Waterbury, Conn., 10 (NEDA)
Hatton & Co., Arthur T., 1000 Farmington Ave., W. Hartford, Conn., 15 (ERA)
Nief Assoc., Paul W., 15 Oak St., Westport, Conn., 15 (ERA)

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Delaware Electronic Supply, 220 W. 4 St., Wilmington, Del., 10
Radio Electric Ser. Co., 3rd & Tatnall Sts., Wilmington, Del., 10 (NEDA)

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Gallant, Inc., 201 Constitution Ave., Washington, D.C., 20
Shamp Scientific Supply, 1500 Massachusetts Ave., Washington, D.C., 15
Silberne Radio & Elec. Co., 3300 Georgia Ave., Washington, D.C., 10 (NEDA)

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Baldwin, Inc., Verne, 1940 N.W. 54th St., Miami, Fla., 10 (NEDA)
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Cooper Radio Co., 675 N.W. 11th St., Miami, Fla., 10 (NEDA)
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Herman Radio Supply Co., 1365 N.W. 23rd St., Miami 36, Fla., 10 (NEDA)
Miami Elect. Dist., Inc., 419 N.W. 79th St., Miami, Fla., 10 (NEDA)
Radio TV Parts Dist., Inc., 2611 N.W. 21st Ter., Miami, Fla., 10 (NEDA)
Walder Radio & Appliance, 1809 N.E. Second Ave., Miami 32, Fla., 10 (NEDA)

Geartner Co., Jack, 823 86 St., Miami Beach, Fla., 15
Lee Assoc., R. F., 711 Magnolia Ave., Orlando, Fla., 15
Grice Electronics, Inc., 300 E. Wright St., Pensacola, Fla., 10 (NEDA)
Radio Accessories Co., P.O. Box 3590, Sarasota, Fla., 10 (NEDA)
Kinkade Radio Supply Co., 1707 Grand Central, Tampa, Fla., 10 (NEDA)
Leader Elect. Dist., Inc., 3411 S. Dale Mabry Hgwy., Tampa, Fla., 10 (NEDA)
Radio Accessories Co., P.O. Box 372, Tampa, Fla., 10 (NEDA)
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Hollingsworth & Still, 508 Whitehead Bldg., Atlanta, Ga., 15 (ERA)
Tel: MUrray 8-5878
Jackson Electronic Supply, 840 Marietta St., N.W., Atlanta, Ga., 10 (NEDA)
Kennon Co., W. N., 7 Camden Rd., N.E., Atlanta 9, Ga., 15 (ERA)
Tel: TRinity 4-5566
Nickerson Co., Frank C., 1202 Zonolite Rd., N.E., Atlanta 6, Ga., 15 (ERA)
Tel: TRinity 5-8908
Smith Co., Maitland K., 208-14 St., N.W., Atlanta, Ga., 15 (ERA)
Tel: TRinity 5-8031
Southeastern Radio Parts, 442 W. Peachtree St., N.W., Atlanta, Ga., 10 (NEDA)
Specialty Dist. Co., Inc., 763 Juniper St. N.E., Atlanta, Ga., 10 (NEDA)
Prestwood Electronics Co., 1445 Greene St., Augusta, Ga., 10 (NEDA)
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McCorvey Co., V. Avis, 215 Church St., Decatur, Ga., 15 (ERA)
Tel: DRake 7-6167
Hayden Assoc., Paul, P.O. Box 331, East Point, Ga., 15 (ERA)
Tel: POplar 6-0261
Electronic Dist., Inc., 995 Riverside Dr., Macon, Ga., 10 (NEDA)

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Nylen Bros. & Co., Ltd., 820 S. Beretania St., Honolulu, Hawaii, 10 (NEDA)
Peity Factors, Inc., Gene, 2030 Home Rule St., Honolulu 17, Hawaii, 15
Precision Radio, Ltd., 1160 S. King St., Honolulu, Hawaii, 10 (NEDA)
Radio-TV Corp., Ltd., 777 Ala Moana, P.O. 3920, Honolulu, Hawaii, 10 (NEDA)
Radio Wholesale & Supply, 610 Ward Ave., P.O. 3768, Honolulu, Hawaii, 10 (NEDA)
Service Motor Co., Ltd., 91 S. King St., Honolulu, Hawaii, 10 (NEDA)

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Kopke Electronics Co., Box 4236, Boise, Idaho, 10 (NEDA)
Schwendiman Distributing, 380 E. St., Idaho Falls, Idaho, 10 (NEDA)
A&J Distributing Co., 0119-9th St., Lewiston, Idaho, 10 (NEDA)
United Elect. Wholesale, 328 Third St., East, Twin Falls, Idaho, 10 (NEDA)

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Knaggs Co., H. W., 7503 Melba Lane, Belleville, Ill., 15 (ERA)
Tel: CEntral 1-1853
Chicago Rivet & Mach. Co., 950 S. 25th Ave., Bellwood, Ill., 15
Lampley Radio Co., 810 N. McLeansboro St., Benton, Ill., 10 (NEDA)
Lurtz Electric Co., 219-221 N. Illinois St., Benton, Ill., 10 (NEDA)
B-B & W, Inc., 6634 W. Cermak Dr., Berwyn, Ill., 10 (NEDA)
Alverson Sales Co., 217 E. Front St., Bloomington, Ill., 10 (NEDA)
Suter TV Supply, Inc., 1009 North Park St., Bloomington, Ill., 10 (NEDA)
Delta Distributing, 2357 York St., Blue Island, Ill., 10 (NEDA)
Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 10 (NEDA)
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Anderson & Assoc., Inc., B., 6835 W. Higgins, Chicago 31, Ill., 15 (ERA)
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Angel & Co., Jay C., 2743 W. Peterson Ave., Chicago, Ill., 15 (ERA)
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Arpio Sales, Inc., 4305 N. Lincoln Ave., Chicago, Ill., 10 (NEDA)
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Bluzat Co., Rene, 6322 N. Milwaukee, Chicago 46, Ill., 15 (ERA)
Tel: SPring 4-1500
Booth & Assoc., Claude, 4000 W. North Ave., Chicago, Ill., 15 (ERA)
Tel: OL 7-2810
Bowman & Co., J. G., 513 E. 75th St., Chicago, Ill., 10 (NEDA)
Bruning Co., A. H., 1758 Lawrence Ave., Chicago 40, Ill., 15 (ERA)
Tel: EDgewater 4-0989
Burgoyne Co., William, 7001 N. Clark St., Chicago 26, Ill., 15 (ERA)
Tel: HOllycourt 5-2112
Chamneys, Inc., 4740 W. Chicago Ave., Chicago, Ill., 10 (NEDA)
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Tel: SPring 4-3535
Cumming & Assoc., Bruce, 6029 W. Belmont Ave., Chicago 34, Ill., 15 (ERA)
Tel: MErrimac 7-3770
Devonshire Electronics, 15 E. 111th St., Chicago, Ill., 10 (NEDA)
Diethert Co., Inc., Russ., 2030 W. Montrose Ave., Chicago 18, Ill., 15 (ERA)
Tel: LOngbeach 1-7627
Dolin Sales, D., 3553 W. Peterson, Chicago 45, Ill., 15 (ERA)
Tel: JUniper 8-3738
Doyle Co., William J., 7002 N. Western Ave., Chicago, Ill., 15 (ERA)
Tel: ROgers Park 1-3130
Electronic Sales Co., C., 3020 N. Cicero Ave., Chicago 41, Ill., 15
Ellinger Sales Co., W. H., 6571 N. Olmsted Ave., Chicago 31, Ill., 15 (ERA)
Tel: ROdney 3-4154
Ellinger Sales Corp., 6540 Northwest Highway, Chicago 31, Ill., 15 (ERA)
Tel: ROdney 3-1570
Engineered Sales Co., Inc., 3592 Milwaukee Ave., Chicago 41, Ill., 15 (ERA)
Tel: PEnsacola 6-0555
Engle Co., Karl D., 4742 N. Sheridan Rd., Chicago 40, Ill., 15 (ERA)
Tel: UPtown 8-6363
Felleisen Co., Theodore, 5841 W. Montrose Ave., Chicago 34, Ill., 15 (ERA)
Tel: SPring 7-1060
Fitzsimmons Assoc., Inc., 6124 Milwaukee Ave., Chicago 30, Ill., 15 (ERA)
Tel: NEwcastle 1-7660
Friedman Co., Morton L., 2814 W. Balmoral Ave., Chicago 15, Ill., 15 (ERA)
Tel: LOngbeach 1-4257
Gassner & Clark Co., 6644 N. Western Ave., Chicago, Ill., 15 (ERA)
Tel: ROgers Park 4-6121
Gebhard Co., Harry W., 5129 W. Devon Ave., Chicago, Ill., 15 (ERA)
Tel: ROdney 3-3636

Directory III. Materials & Services

Gianaras Sales Co., 5435 N.W. Highway, Chicago 30, Ill., 15 (ERA)
Tel: SPring 4-4600
Gormak Co., 7001 N. Clark St., Chicago 26, Ill., 15 (ERA)
Tel: ROgers Park 4-6366
Green & Assoc., Loren F., 5218 W. Diversey Ave., Chicago, Ill., 15 (ERA)
Tel: PAlisade 5-6824
Grove Electronic Supply, 4103 W. Belmont Ave., Chicago, Ill., 10 (NEDA)
Halinton, Harry, 6400 N. Leoti Ave., Chicago 46, Ill., 15 (ERA)
Tel: ROdney 3-2132
Higgins Co., Royal J., 10105 S. Western Ave., Chicago 43, Ill., 15 (ERA)
Tel: CEdarcrest 3-7388
Howard Electronic Sales, 4140 Archer Ave., Chicago, Ill., 10 (NEDA)
Hunter Assoc., Thomas B., 4441 W. Irving Park Rd., Chicago, Ill., 15 (ERA)
Tel: SPring 7-2500
Hutmacher Assoc., Inc., R. R., 6647 N. Oliphant Ave., Chicago 31, Ill., 15 (ERA)
Tel: NEwcastle 1-3248
Joseph, Inc., Irving, 5959 W. Fullerton Ave., Chicago, Ill., 10 (NEDA)
Kadell Sales Assoc., Inc., 5875 N. Lincoln Ave., Chicago 45, Ill., 15 (ERA)
Tel: LOngbeach 1-3042
Karet-Margolin, Inc., 13 W. Hubbard St., Chicago 10, Ill., 15 (ERA)
Tel: WHitehall 4-6345
Key-Men Sales, Inc., 5500 N. Menard, Chicago 30, Ill., 15 (ERA)
Tel: SPring 4-1444
Knoblock & Malone, Inc., 1603 N. Newland, Chicago 35, Ill., 15 (ERA)
Tel: NAtional 2-4005
Krueger Co., Ringland M., 5306 W. Lawrence Ave., Chicago 30, Ill., 15 (ERA)
Tel: PEnsacola 6-3107
Langhaus-Levy Assoc., 5317 Cottage Grove Ave., Chicago 15, Ill., 15 (ERA)
Tel: DO 3-5344
Levin-Sacks & Assoc., 2639 Peterson, Chicago 45, Ill., 15 (ERA)
Tel: ROgers Park 4-7082
Linz & Assoc., William M., 6322 N. Cicero Ave., Chicago 46, Ill., 15 (ERA)
Tel: MUlberry 5-2022
Lukko Sales Corp., 4900 N. Elston Ave., Chicago, Ill., 10 (NEDA)
Magnuson Co., Edward, 3349 W. Irving Park Rd., Chicago, Ill., 15 (ERA)
Tel: JUniper 8-2613
McCarthy Co., L. C., 7117 Addison St., Chicago 34, Ill., 15 (ERA)
Tel: KIldare 5-7976
Merquip Co., 5904 W. Roosevelt Rd., Chicago, Ill., 10 (NEDA)
Midwest Electronics, 6907 N. Western Ave., Chicago, Ill., 10 (NEDA)

102. Distribution.

5. Export & import
10. Jobbers & wholesalers
15. Manufacturers representatives
20. Sales & service
25. Surplus dealers

Mulay Co., Sam J., 1717 W. 74 St., Chicago 36, Ill., 15 (ERA)
Tel: GRovehill 6-4000
Nagel, Inc., Arthur, 918-925 E. 55th St., Chicago, Ill., 10 (NEDA)
Nation Wide Radio Co., 572 W. Randolph St., Chicago, Ill., 10 (NEDA)
National Elect. Dist. Assoc., 343 S. Dearborn St., Chicago, Ill., 10
Newark Electric Co., 223 W. Madison St., Chicago, Ill., 10 (NEDA)
Olson Radio Warehouse, 4101 Milwaukee Ave., Chicago, Ill., 10 (NEDA)
Pilgrim Distributing Co., 1230 E. 53rd St., Chicago, Ill., 10 (NEDA)
Pivan Engineering Co., 2820 Peterson Ave., Chicago 45, Ill., 15 (ERA)
Tel: BRiargate 4-0135
Radio TV Supply Co., 4343 W. Armitage Ave., Chicago, Ill., 10 (NEDA)
Ridley Assoc., 1551 N. Austin Blvd., Chicago 51, Ill., 15 (ERA)
Tel: TUxedo 9-2940
Sarkis & Co., Henry, 5608 N. Western Ave., Chicago 45, Ill., 15 (ERA)
Tel: ARdmore 1-3774
Schubert, Arthur J., 6335 N. California Ave., Chicago 45, Ill., 15 (ERA)
Tel: ROgers Park 1-6254
Sittler Corp., 18 N. Ada St., Chicago, Ill., 10, 15
Smith Co., Oren H., 221 W. Huron St., Chicago 10, Ill., 15 (ERA)
Tel: SUperior 7-7919
Star Electronics Dist., 7734 S. Halsted St., Chicago, Ill., 10 (NEDA)
Stemm, R. Edward, 5681 W. Lake St., Chicago 44, Ill., 15 (ERA)
Tel: ESterbrook 9-2700
Stemm, Royal A., 21 E. Van Buren St., Chicago 5, Ill., 15 (ERA)
Tel: WEbster 9-4840
Stolz-Wicks, Inc., 8110 South Western Ave., Chicago, Ill., 10 (NEDA)
Swinke & Co., W. F., 541 Diversey Pkwy., Chicago 14, Ill., 15 (ERA)
Tel: BIttersweet 8-4343
Tatro & Assoc., Frank B., 6022 N. Rogers Ave., Chicago 46, Ill., 15 (ERA)
Tel: KEystone 9-4535
Taylor Co., Robert F., 308 W. Washington St., Chicago 6, Ill., 15 (ERA)
Tel: ANdover 3-1808
U.S. Radio-TV Supply, 6346 S. Ashland Ave., Chicago, Ill., 10 (NEDA)
Walker-Jimieson, Inc., 311 S. Western Ave., Chicago, Ill., 10 (NEDA)
Whitmore & Assoc., R. C., 605 N. Michigan Ave., Chicago 11, Ill., 15 (ERA)
Tel: MOhawk 4-1904
Withers & Ropek, Engrs., 5439 W. Division St., Chicago 51, Ill., 15 (ERA)
Tel: AUstin 7-7292
Warner Co., Dayton L., 815 MacArthur Dr., Chicago Heights, Ill., 15 (ERA)
Tel: SKyline 4-0028
Bud Electronic Supply Co., 114 E. North Ave., Danville, Ill., 10 (NEDA)
York Radio & TV Corp., 518 E. Prairie, Decatur, Ill., 10 (NEDA)
Ritter Sales Co., P.O. Box 64, Deerfield, Ill., 15 (ERA)
Tel: WHedrow 5-1400
Kleker Co., Jerome H., 177 Sunset Ave., Glen Ellyn, Ill., 15 (ERA)
Tel: GLen Ellyn 2297
Rose & Co., J. K., 1116 Linden Ave., Highland Park, Ill., 15 (ERA)
Tel: AMbassador 2-5581
Radio Doctors Supply House, 892 W. Station St., Kankakee, Ill., 10 (NEDA)
Bauman Sales Co., R. H., 210 S. Lodge Lane, Lombard, Ill., 15 (ERA)
Tel: [Chi.] KEystone 9-3108
Hamilton Co., W. F., 8728 N. Olcott, Niles 31, Ill., 15 (ERA)
Tel: CEntral 6-5005
Haskell Assoc., 202 N. Marion, Oak Park, Ill., 15 (ERA)
Tel: EUclid 6-5741
Hill-Gray, Inc., 127 Harrison, Oak Park, Ill., 15 (ERA)
Tel: ES 8-7050
Marsh & Assoc., Walter F., 308 N. Scoville Ave., Oak Park, Ill., 15 (ERA)
Tel: EUclid 6-1782
Melvin Electronics, Inc., 541 Madison St., Oak Park, Ill., 10 (NEDA)
Herberger Radio Supply, 136 First Ave., Peoria, Ill., 10 (NEDA)
Pettit Co., Inc., George, 349 N. Ashland, River Forest, Ill., 15 (ERA)
Tel: FOrest 9-8940
Rockford Controls Co., 7423 W. North Ave., River Forest, Ill., 25 (ERA)
Tel: PResident 1-8430
Roussey & Assoc., Inc., R. F., 426 Edgewood Pl., River Forest, Ill., 15 (ERA)
Tel: FOrest 9-6523
McBride Sales Co., J. J., 328 E. Burlington St., Riverside, Ill., 15 (ERA)
Tel: RIverside 7-8131
Tri-City Radio Supply Co., 1919 Fourth Ave., Rock Island, Ill., 10 (NEDA)
Sisson Sales Co., D. L., Box 220, 113 Bradley, Roselle, Ill., 15 (ERA)
Tel: TWinbrook 4-3837

Wilton Tool Mfg. Co., Inc., 9525 Irving Park Rd., Schiller Park, Ill., 10

Bruce Harold, 1120 E. Capitol, Springfield, Ill., 10 (NEDA)

Suter TV Supply, Inc., P.O. Box 1148, Springfield, Ill., 10 (NEDA)

Relay Sales, Inc., P.O. Box 186-IR, West Chicago, Ill., 10
See ad on page 524
Tel: WEst Chicago 1100

Bronillette & Assoc., W. G., 1558 Newcastle Ave., Westchester, Ill., 15 (ERA)
Tel: FIlmore 5-6500

Hausten Co., Dave., 607 E. Willow Ave., Wheaton, Ill., 15 (ERA)
Tel: MOntrose 8-7312

Mykroy, Inc., Wheeling & Hintz Rds., Wheeling, Ill., 10 (NEDA)

INDIANA

Clancy & Co., Joe, P.O. Box 269, Angola, Ind., 15 (ERA)

Southern Sales Co., Box 105, Lakeshore Dr., Angola, Ind., 15 (ERA)

Electronic Parts, Inc., 1003 S. Main St., Elkhart, Ind., 10 (NEDA)

Components Engrg. Corp., 508 Old Nat'l. Bank Bldg., Evansville, Ind., 15

Bieberich & Sons, W. W., 2817 Plaza Dr., Fort Wayne, Ind., 15 (ERA)

Hoemig Sales Co., 3405 Butler Ct., Fort Wayne, Ind., 15 (ERA)

Homsher Co., Burton F., 2018 Jessie Ave., Fort Wayne, Ind., 15 (ERA)

Meily Co., William A., 4017 S. Harrison, Fort Wayne, Ind., 15 (ERA)

Midwest Electronics Supply, 2016 Webster St., Fort Wayne, Ind., 10 (ERA)

Needler Co., E. S., Box 2407, Fort Wayne 6, Ind., 15 (ERA)

Paul Sales Co., 2609 Broadway, Fort Wayne, Ind., 15

Valentine, Inc., F. C., 511 Ft. Wayne Bank Bldg., Fort Wayne, Ind., 15 (ERA)

Blind Assoc., Inc., 4920 West 16 St., Indianapolis, Ind., 15 (ERA)

Brown Distributing Co., 3746 College Ave., Indianapolis, Ind., 10 (NEDA)

Devoe Co., Leslie M., 4010 Washington Blvd., Indianapolis, Ind., 15 (ERA)

Fishman Assoc., Paul B., 4440 N. Campbell Ave., Indianapolis, Ind., 15 (ERA)

Keith Co., Jack, 1719 E. 52 St., Indianapolis, Ind., 15 (ERA)

MacNabb, Schroeder & Loomis, 820, E. 64 St., Indianapolis, Ind., 15 (ERA)

Morris, Cunningham Assoc., 6208 N. College Ave., Indianapolis, Ind., 15 (ERA)

Reinhardt Co., Kenneth G., 1719 E. 52 St., Indianapolis, Ind., 15 (ERA)

Schefiler Co., Charles, 1133 Navajo Trail, Indianapolis, Ind., 15 (ERA)

Schulz Co., Edwin A., 721 Sherwood Dr., Indianapolis, Ind., 15 (ERA)

Thomas & Sukup, Inc., 5226 N. Keystone Ave., Indianapolis, Ind., 15 (ERA)

Whitesell & Assoc., R. O., 6620 E. Washington St., Indianapolis, Ind., 5 (ERA)

Kirsch Sales Co., 107 Wabash, LaFontaine, Ind., 15 (ERA)

Moakler Electronic Supply, 500 E. Chestnut, Jeffersonville, Ind., 10

Bowman & Assoc., Jess, 257 Lincolnway, Valparaiso, Ind., 10 (NEDA)

IOWA

Deeco, Inc., 618 First St., N.W., Cedar Rapids, Iowa, 10

Gifford-Brown, Inc., 618-1st St., N.W., Cedar Rapids, Iowa, 10

Iowa Rad. & Supply Co., Inc., 719 Center Point Rd., Cedar Rapids, Iowa, 10 (NEDA)

Vrbik Co., Jerry, 625 Guaranty Bldg., Cedar Rapids, Iowa, 15

World Radio Labs., 3415 W. Broadway, Council Bluffs, Iowa, 10

Dunlap Electronics, Inc., 764 9th St., Des Moines, Iowa, 10, 15

Gifford-Brown, Inc., 1400 Walnut St., Des Moines, Iowa, 10 (NEDA)

Iowa Radio Corp., 1212 Grand Ave., Des Moines, Iowa, 10 (NEDA)

Mid-State Dist. Co., 1201 Grand Ave., Des Moines, Iowa, 10 (NEDA)

Radio Trade Supply Co., 1224 Grand Ave., Des Moines, Iowa, 10 (NEDA)

Boe Distributing Co., 1605 Rockdale Rd., Dubuque, Iowa, 10 (NEDA)

Mid-State Dist. Co., 429 W. Second St., Ottumwa, Iowa, 10 (NEDA)

Burghardt Radio Supply, 701 5th St., Sioux City, Iowa, 10 (NEDA)

Dukes Radio Co., 209-6th St., P.O. 1227, Sioux City, Iowa, 10 (NEDA)

KANSAS

Acme Radio & TV, Inc., 327 W. 4th St., Hutchinson, Kan., 10 (NEDA)

Roes & Co., H. A., 2601 Cherry, Kansas City, Kan., 15 (ERA)

Scholz Co., Paul G., 8402 Longview Rd., Kansas City, Kan., 15 (ERA)

Video Supply, 731 Central Ave., Kansas City, Kan., 10 (NEDA)

Walters Radio Supply, 3645 Main, Kansas City, Kan., 10 (NEDA)

Sutton & Co., Fred E., 928 Massachusetts Ave., Lawrence, Kan., 10 (NEDA)

Zimmer Sales Co., 5620 Woodward, Merriam, Kan., 15 (ERA)

Inland Associates, 6047 Howe Dr., Mission, Kan., 15

Terwilliger Sales Co., 7133 W. 80 St., Overland Park, Kan., 15 (ERA)

Radio Supply Co., 736 N. Santa Fe, Salina, Kan., 10 (NEDA)

Acme Radio Supply, 412 E. 10th St., Topeka, Kan., 10 (NEDA)

Carroll Radio & TV Supply, 1123 W. 6th St., Topeka, Kan., 10 (NEDA)

Signal Radio Supply, 115 Kansas, Topeka, Kan., 10 (NEDA)

Excel Distributors, 118 W. Second St., Wichita, Kan., 10 (NEDA)

Interstate Elect. Supply, 230 Ida St., Box 2018, Wichita, Kan., 10 (NEDA)

Radio Supply Co., Inc., 115 Laura, Wichita, Kan., 10 (NEDA)

Standard Products, Inc., 650 E. Gilbert, Wichita, Kan., 15, 20

KENTUCKY

Ashland Rad. Supply Co., 2125 Winchester Ave., Ashland, Ky., 10 (NEDA)

Crescent Radio Supply, 212 W. 10th St., Bowling Green, Ky., 10 (NEDA)

Saville Ra-Tele-Nics Lab, 1125 Russell St., Covington, Ky., 15 (ERA)

Randolph & Hale, Inc., 729 E. 4th St., Hopkinsville, Ky., 10 (NEDA)

Radio Equip. Co., Inc., 480 Skain St., Lexington, Ky., 10 (NEDA)

Tel-Rad Electronics, Inc., 1401 Delaware Ave., Lexington, Ky., 10 (NEDA)

Archy Electronics, 540 E. Gray St., Louisville, Ky., 10 (NEDA)

Cobb Sales Co., 220 W. Breckinridge St., Louisville, Ky., 15 (ERA)

Peerless Elect. Equip. Co., 2210 South 7th St., Louisville, Ky., 10 (NEDA)

Warren Radio Co., 455 S. 31st St., Paducah, Ky., 10 (NEDA)

Southern Distributors, 3802 Lexington Rd., St. Mathews, Ky., 10 (NEDA)

LOUISIANA

Central Radio Supply, P.O. Box 1688, 601 N. Third St., Alexandria, La., 10 (NEDA)

Electronic Supply Co., Inc., 1753 N. 21st St., Baton Rouge, La., 10 (NEDA)

Louisiana Radio & TV Dist., 1645 Plank Rd., Baton Rouge, La., 10 (NEDA)

Lafayette Rad. Equip., Inc., 1023 Simcoe St., Lafayette, La., 10 (NEDA)

Ralph's Radio Elect. Supply, 3004 Cameron St., Lafayette, La., 10 (NEDA)

Wholesale Radio Equip., Inc., 1722 Common St., Lake Charles, La., 10 (NEDA)

Hale & McNeil, P.O. Box 23, 421 Walnut St., Monroe, La., 10 (NEDA)

Bell Radio Supply Co., 2627 Tulane Ave., New Orleans, La., 10 (NEDA)

Columbia Radio & Supply Co., P.O. Box 13127, 3940 3rd St., New Orleans, La., 10 (NEDA)

Crescent Radio & Supply, P.O. Box 2408, 537 S. Claiborne, New Orleans, La., 10 (NEDA)

Electronic Parts Corp., 223-225 N. Broad St., New Orleans, La., 10 (NEDA)

Southern Radio Supply Co., 1909 Tulane Ave., New Orleans, La., 10 (NEDA)

Opelousas Radio Equip Co., 240 N. Court St., Opelousas, La., 10 (NEDA)

Koelemay Sales Co., Inc., 2530 Linwood Ave., Shreveport, La., 10 (NEDA)

Ports Electronics Parts, 2423 Southern, Shreveport, La., 10 (NEDA)

Directory III. Materials & Services

MAINE

Radio Supply Co., Inc., 26 Cross St., Auburn, Me., 10 (NEDA)

Maine Elect. Supply Corp., 494 Broadway, Bangor, Me., 10 (NEDA)

Powell Radio Supply, 115 Water St., Hallowell, Me., 10 (NEDA)

Maine Elect. Supply Corp., 148 Anderson St., Portland, Me., 10 (NEDA)

MARYLAND

American Dist. Co., 1200 N. Fulton Ave., Baltimore, Md., 10 (NEDA)

Berman Co., Inc., Henry O., 10-12 E. Lombard St., Baltimore, Md., 10 (NEDA)

Daniels, Inc., L. J., P.O. Box 6864, Baltimore, Md., 15

Edgerly Instrument Labs., 2022 St. Paul St., Baltimore, Md., 20

Kann-Ellert Elect., Inc., 9 S. Howard St., Baltimore, Md., 10 (NEDA)

Lee Assoc., Inc., S. S., 2419 Old Frederick Rd., Baltimore, Md., 15

Olin Electronic Supply, 6009 Eastern Ave., Baltimore, Md., 10 (NEDA)

Radio Electric Service, 5 N. Howard St., Baltimore, Md., 10 (NEDA)

Spartana Co., Inc., A. R., 239 N. Gay St., Baltimore, Md., 10 (NEDA)

Wholesale Radio Parts Co., 308 W. Redwood St., Baltimore, Md., 10 (NEDA)

Rosen & Assoc., Gene, 9501 Wadsworth Dr., Bethesda, Md., 15 (ERA)

Zimmerman Wholesalers, 162 Bedford St., Cumberland, Md., 10 (NEDA)

Stoddard Supply Co., 354 S. Cannon Ave., Hagerstown, Md., 10 (NEDA)

Zimmerman Wholesalers, 114 E. Washington St., Hagerstown, Md., 10 (NEDA)

Standard Electronics, 301 Snow Hill Rd., Salisbury, Md., 10 (NEDA)

Leinau Co., Charles, 9427 Georgia Ave., Silver Spring, Md., 15 (ERA)

Taylor Co., Morris F., 9431 Georgia Ave., Silver Spring, Md., 15 (ERA)

Barnhill & Assoc., R. B., P.O. Box 6892, Towson, Md., 15 (ERA)

J-H Electronic Sales Co., Box 6844, Towson, Md., 15 (ERA)

Wilkinson, Inc., Robert L., 707 Stevenson Lane, Towson 4, Md., 15 (ERA)

MASSACHUSETTS

Muddle Assoc., John V., 74 Union St., Ashland, Mass., 15 (ERA)
Tel: TRinity 3-7091

Chamberlin Co., Harold A., Bedford Airport, Bedford, Mass., 15 (ERA)
Tel: CRestview 4-0044

Drew Assoc., Inc., 56 The Great Rd., P.O. Box 467, Bedford, Mass., 15 (ERA)
See ad on this page
Tel: CRestview 4-7232

102. Distribution.

5. Export & import
10. Jobbers & wholesalers
15. Manufacturers representatives
20. Sales & service
25. Surplus dealers

Kelly Co., Wm. T., 77 Lovett St., Beverly, Mass., 15 (ERA)
Tel: WA 2-0065

Akeroyd Co., Arthur E., 2311 John Hancock Bldg., Boston 16, Mass., 15 (ERA)
Tel: HAncock 6-2433

Anderson Sales Co., 177 State St., Boston, Mass., 15 (ERA)
Tel: CApitol 7-2980

Bernard Thal, 791 Tremont St., Boston, Mass., 15, 20

Cramer Electronics, Inc., 811 Boylston St., Boston, Mass., 10 (NEDA)

Demambro Radio Supply Co., 1095 Commonwealth Ave., Boston, Mass., 10 (NEDA)

Gerber Radio Supply Co., 1900 Columbus Ave., Boston, Mass., 10 (NEDA)

MacDonald-Wadman Co., 459 Stuart St., Boston, Mass., 15 (ERA)
Tel: COmmonwealth 6-2336

Mayer Co., A. W., 895 Boylston St., Boston, Mass., 10 (NEDA)

Perron & Co., Inc., Ray, 1870 Centre St., Boston 32, Mass., 15 (ERA)
See ad on page 710
Tel: FAirview 3-1008

Radio Shack Corp., 730 Commonwealth Ave., Boston, Mass., 5, 10

Representatives Corp., 10 High St., Boston, Mass., 15 (ERA)
Tel: HAncock 6-0541

Segel Co., Charles, 1262 Commonwealth Ave., Boston 34, Mass., 15 (ERA)
Tel: BEacon 2-4334

Sturgeon, Inc., Paul R., 25 Huntington Ave., Boston 16, Mass., 15 (ERA)
Tel: CO 6-7705

Ware Radio Supply Co., 913 Centre St., Brockton, Mass., 10 (NEDA)

For details circle #759 on Reader Service Card

Broger Instru. Sales Co., 48 Pearl St., Brookline, Mass., 15 (ERA)
Tel: BE 2-4804

Brown Co., Kenneth L., 54 Atherton Rd., Brookline, Mass., 15 (ERA)
Tel: BEacon 2-3969

Eastern Electronic Sales, 145 University Rd., Brookline, Mass., 15 (ERA)
Tel: ASpinwall 7-5675

Gerber Sales Co., Inc., 48 Pearl St., Brookline, Mass., 15 (ERA)
Tel: BEacon 2-2425

Segel Co., Inc., Henry P., 386 Washington St., Brookline 46, Mass., 15 (ERA)
Tel: BEacon 2-7525

Sturdy Co., Inc., R. H., 32 Kennard Rd., Brookline, Mass., 15

Yewell Assoc., Middlesex Turnpike, Burlington, Mass., 15 (ERA)
Tel: BRowning 2-9000

Bridge Co., Ray, 100 Memorial Dr., Cambridge, Mass., 15

Electrical Supply Corp., 205 Alewife Brook Pkwy., Cambridge, Mass., 10 (NEDA)

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Midland Manufacturing Company, Inc.
Manufacturers of Quartz Crystals for Electronic Frequency Control, Crystal Filters.

Stepper Motors Corporation
Stepping Motors, Automatic Pulse Timers, Synchro-Positioners.

Birtcher Corporation (Industrial Division)
Tube and Component Retention and Cooling Devices, Transistor or Diode Heat Radiators.

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FAirview 3-1008
Branch: 36 Louis St., Trumbull, Connecticut
AMherst 8-9631

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LABORATORY STANDARD INSTRUMENTS
PUSHBUTTON, LEVER SWITCHES
HIGH VOLTAGE TEST SETS
THERMISTORS, VARISTORS

BEEDE INSTRUMENT
CINCH, JONES
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MOSSMAN
PESCHEL
VICTORY ENGINEERING

Ray Perron Bill Connors Frank Raftery Al Maude
John Ferrari Les Creaser Bob McKelvey

For details circle #761 on Reader Service Card

Greene Organization, Inc., Dan, P.O. Box 124, Cambridge 38, Mass., 15 (ERA)
See ad on this page
Tel: UNiversity 4-2220

Hathaway Electr., Inc., G. M., 238 Main St., Cambridge, Mass., 15 (ERA)
Tel: KI 7-0380

Rodgers Assoc., Chapin Rd., Hampden, Mass., 15 (ERA)
Tel: REpublic 3-8428

Boeing Co., John E., P.O. Box 235, Lexington, Mass., 15 (ERA)
Tel: VOlunteer 2-2500

Purinton, Inc., Richard, 11 Muzzey St., Lexington, Mass., 15 (ERA)
Tel: VOlunteer 2-8300

Willson Sales Co., 60 Beach St., Marblehead, Mass., 15 (ERA)
Tel: NEptune 8-4016

Durrell Distributors, 222 Mystic Ave., Medford, Mass., 10 (NEDA)

Deveer Co., Robert L., 1492 Highland Ave., Needham, Mass., 15 (ERA)
Tel: HIllcrest 4-4200

Harris Co., Stanley A., 1241 Highland Ave., Needham, Mass., 15 (ERA)
Tel: HIllcrest 4-4780

Mosher & Peyser Co., 945 Great Plain Ave., Needham, Mass., 15 (ERA)
Tel: HIllcrest 4-1400

White Sales Co., Inc., 945 Great Plain Ave., Needham 92, Mass., 15 (ERA)
Tel: HIllcrest 4-3676

Smith & Purdy Assoc., 21 Kearney Rd., Needham Hgts., Mass., 15

Greene-Shaw Co., Inc., 341-347 Watertown St., Newton, Mass., 10 (NEDA)

Friedman Assoc., M. W., 98 Osborne Path, Newton Center, Mass., 15

Oakley, Inc., Tim, 148 Needham St., Newton Heights, Mass., 15 (ERA)

Schuft Co., Howard J., 815 Washington St., Newtonville, Mass., 15 (ERA)
Tel: LAsell 7-5304

C & I Distributors, Inc., 228 Pleasant St., Northampton, Mass., 10 (NEDA)

Pilgrim Elect. Supply Co., 26-30 School St., Quincy, Mass., 10 (NEDA)

Goss Co., Jack, 99 Highland Ave., Somerville, Mass., 15 (ERA)
Tel: PRospect 6-2262

New England Area Representatives, Inc., 99 Highland Ave., Somerville 43, Mass., 10
See ad on page 711
Tel: PRospect 6-2262

Cushing, Inc., T. F., 1026 Bay St., Springfield, Mass., 10 (NEDA)

Soundco Electronic Supply, 147 Dwight St., Springfield, Mass., 10 (NEDA)

Sydlee Electronic Supply, 453 Worthington St., Springfield, Mass., 10 (NEDA)

Young & Young of Springfield, 169 Spring St., Springfield, Mass., 10

Instrument Dynamics, Inc., 11 Albion St., Wakefield, Mass., 15 (ERA)
Tel: CRystal 6-5100

Saunders & Co., 375 Moody St., Waltham 54, Mass., 15 (ERA)
Tel: TWinbrook 4-6071

Schley Co., L. L., 70 Coolidge Hill Rd., Watertown, Mass., 15 (ERA)
Tel: WAlnut 6-0235

Directory III. Materials & Services

Gray Co., Robert W., 572 Washington St., Wellesley, Mass., 15 (ERA)
Tel: CEdar 5-5296

Pray Sales, W. B., 44 Washington St., Wellesley Hills, Mass., 15

Scott Co., Michael, 90 Edmunds Rd., Wellesley Hills, Mass., 15

Gysan Co., Richard L., 12 Foster St., Wenham, Mass., 15 (ERA)
Tel: WAlker 2-5770

Ingeber Co., L. K., 41 Cross St., W. Newton, Mass., 15

Hooker Co., Samuel C., 397 Highland Ave., Winchester, Mass., 15 (ERA)

Technical Impex Corp., 750 Main St., Winchester, Mass., 5

Radio Maintenance Supply, 80 Thomas St., Worcester, Mass., 10 (NEDA)

Worcester Pressed Steel, 100 Barber Ave., Worcester, Mass., 15

MICHIGAN

Wedemeyer Elect. Supply, 213-217 N. Fourth Ave., Ann Arbor, Mich., 10 (NEDA)

Warren Radio Co., 93 W. Bidwell St., Battle Creek, Mich., 10 (NEDA)

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West Side Radio & TV Supply, 7521 Wyoming Ave., Dearborn, Mich., 10 (NEDA)

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Beitel Co., Wayne, 13209 Fenkell, Detroit 27, Mich., 15 (ERA)

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Ferguson Electronic Supply, 2306 Puritan Ave., Detroit, Mich., 10 (NEDA)

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Liddle Co., Edwin F., 18925 Grand River Ave., Detroit 23, Mich., 15 (ERA)

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Merchant & Co., Inc., 18411 W. McNichols, Detroit 19, Mich., 15 (ERA)

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Nor-West TV & Radio Supply, 20926 Schoolcraft, Detroit, Mich., 10 (NEDA)

Radio Specialties Co., Inc., 456 Charlotte Ave., Detroit, Mich., 10 (NEDA)

Radio Supply & Engrg. Co., 90 Selden Ave., Detroit, Mich., 10 (NEDA)

Reno Radio Co., 1314 Broadway, Detroit, Mich., 10, 20

Rathsburg Assoc., Jack., 4140 Van Dyke Ave., Detroit 14, Mich., 15 (ERA)

Rubin, Ben Z., 16222 Cheyenne Ave., Detroit, Mich., 15

Shaffer Co., Grant, 14241 Fenkell Ave., Detroit, Mich., 15 (ERA)

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Erickson Elect. Wholesale, 1201 Woodward Heights, Ferndale, Mich., 10 (NEDA)

Shalco, Inc., 23525 Woodward Ave., Ferndale 20, Mich., 15 (ERA)

Lifsey Distributing Co., 1409 N. Saginaw, Flint, Mich., 10 (NEDA)

Shand Radio Specialties, 2608 Leith St., Flint, Mich., 10 (NEDA)

Radio Electronic Supply, 505 Jefferson, S.E., Grand Rapids, Mich., 10 (NEDA)

Morrow Sales, Jim, 76 Louise Ave., Highland Park, Mich., 15 (ERA)

Fulton Radio Supply Co., 1208 Greenwood Ave., Jackson, Mich., 10 (NEDA)

Matteson Electronics, Inc., 1617 E. Michigan Ave., Jackson, Mich., 10 (NEDA)

Warren Radio Co., 1710 S. Westnedge Ave., Kalamazoo, Mich., 10 (NEDA)

Electric Products Sales, 427 E. Michigan Ave., Lansing, Mich., 10 (NEDA)

Fulton Radio Supply Co., 2710 Alpha St., Lansing, Mich., 10 (NEDA)

Offenhauer Co., 1719 W. Hillside St., Lansing, Mich., 10 (NEDA)

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Northwest Radio, 123 E. First St., Duluth, Minn., 10 (NEDA)

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Bartleson Co., Bill, 3390 Oak Grove, Suite 502, Minneapolis, Minn., 15 (ERA)

Bauman Co., 3033-35 Lyndale Ave. S., Minneapolis, Minn., 10 (NEDA)

Bonament Heyda Co., 6101 Auto Clive Rd., Minneapolis, Minn., 15 (ERA)

Electronic Center, Inc., 107 Third Ave. N., Minneapolis, Minn., 10 (NEDA)

Foster Co., Mel, 2402 Hennepin Ave., Minneapolis, Minn., 15 (ERA)

Franklin Co., Merrill, 338 E. Franklin Ave., Minneapolis, Minn., 15 (ERA)

Gibb Co., Clark R., 2400 Hennepin, Minneapolis, Minn., 15 (ERA)

Hagestad & Assoc., E. O., 4519 Laguna Dr., Minneapolis, Minn., 15 (ERA)
Hamilton & Bale Assoc., 3359 Republic Ave., Minneapolis, Minn., 15 (ERA)
Hill Co., Fred B., 6110 Excelsior Blvd., Minneapolis, Minn., 15 (ERA)
Oszman Co., Elmer W., 12 E. 25 St., Minneapolis, Minn., 15 (ERA)
Kirkeby Co., Marvin H., 204 Sunnyridge Ave., Minneapolis, Minn., 15 (ERA)
Northern State Sales Co., 1400 Park Ave., Minneapolis, Minn., 15 (ERA)
Northwest Radio-Elect. Supply, 52 S. 12th St., Minneapolis, Minn., 10 (NEDA)
Richardson & Co., H. M., 9 E. 22 St., Minneapolis, Minn., 15 (ERA)
Ripley, Ray, 7222 James Ave. S., Minneapolis, Minn., 15 (ERA)
Stan Clothier Co., Inc., 12 W. 58 St., Minneapolis, Minn., 15 (ERA)
Stark Radio Supply Co., 71 S. 12th St., Minneapolis, Minn., 10 (NEDA)
Warner Co., A. J., 5322 29 Ave., S., Minneapolis, Minn., 15 (ERA)
Elliott & Hanson Co., 119 First Ave., N.W., Rochester, Minn., 10 (NEDA)
Crossley Associates, Inc., 842 Raymond Ave., St. Paul, Minn., 15, 20
Electronic Distributing, 891 Vandalia, St. Paul, Minn., 10 (NEDA)
Engelbretson Co., Wm., 906 Ottawa Ave., St. Paul 18, Minn., 15 (ERA)
Northport Engrn., Inc., 1729 Selby Ave., St. Paul 4, Minn., 15 (ERA)

MISSISSIPPI

Parham Electronics Co., 511 Larner St., Greenwood, Miss., 10 (NEDA)
Helwick Radio & Tel. Supply, 1516 30th Ave., Gulfport, Miss., 10 (NEDA)
Ellington Radio, Inc., 824 S. Gallatin, Jackson, Miss., 10 (NEDA)
May & Jackson, 930 Bailey Ave., Jackson, Miss., 10 (NEDA)
Swan Distributing Co., Inc., 342 N. Gallatin St., Jackson, Miss., 10 (NEDA)
Teague Electronics, 714 S. Gallatin St., Jackson, Miss., 10 (NEDA)
Parham & Pate Co., Hi-Way 45, S., Tupelo, Miss., 10 (NEDA)

MISSOURI

Suedekum Elect. Supply Co., 2215 Broadway, Cape Girardeau, Mo., 10 (NEDA)
Maynard Co., L. W., 139 N. Central Ave., Clayton 5, Mo., 15 (ERA)
McCune Co., John N., P.O. Box 216, Florissant, Mo., 15 (ERA)
McDowell-Redlingshafer, 140 Pomano, Florissant, Mo., 15 (ERA)
Central Mo. Distributing, 324 E. Capitol Ave., Jefferson, Mo., 10 (NEDA)
Vignola Assoc., Carmine A., 1202 Peyton Dr., Box 569, Jefferson City, Mo., 15 (ERA)
Brotherson Co., M., 515 N. Byers Ave., Joplin, Mo., 10 (NEDA)
Four-State Radio & Supply, 402 Wall St., Joplin, Mo., 10 (NEDA)
Assoc. Elect. Supply Co., 5423 Troost Ave., Kansas City, Mo., 10 (NEDA)
Bettis Co., Maury E., 406 W. 34 St., Kansas City, Mo., 15 (ERA)
Burstein-Applebee Co., 1012 McGee St., Kansas City, Mo., 10 (NEDA)
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Farris Co., Inc., R. W., 406 W. 34 St., Kansas City, Mo., 15 (ERA)
Florence Co., L. F., 406 W. 34 St., Kansas City, Mo., 15 (ERA)
Forristal-Young Sales Co., 405 Broadway, Kansas City, Mo., 15 (ERA)
Fry & Co., W. E., 406 W. 34 St., Kansas City, Mo., 15 (ERA)
Henshaw Radio Supply, 3617-19 Troost, Kansas City, Mo., 10 (NEDA)
Hoenig-Myers Assoc., 4538 Main, Kansas City, Mo., 15 (ERA)
Jones Electronic Sales, 3627 S. Main St., Kansas City, Mo., 10 (NEDA)
Kay Sales Co., 2600 Grand Ave., Kansas City 8, Mo., 15 (ERA)
Kelly-Schmitz-Winkeler, 7449 Broadway, Kansas City, Mo., 15 (ERA)
Leemark Assoc., P.O. Box 8467, Kansas City, Mo., 15
Manhattan Radio & Equip., 2538 Grand Ave., Kansas City, Mo., 10 (NEDA)
McDowell-Redlingshafer, 1103 E. Armour, Kansas City, Mo., 15 (ERA)
McGrade Co., E. W., Box 8876, Kansas City, Mo., 15 (ERA)
Radiolab, Inc., 1612 Grand Ave., Kansas City, Mo., 10 (NEDA)
Somers & Co., F. C., 17 & Main Sts., Kansas City, Mo., 15 (ERA)
Thibau Co., A. R., 210 W. 8 St., Kansas City, Mo., 15 (ERA)
Kelly Sales Co., Jack, 972 N. Geyer Rd., Kirkwood 22, Mo., 15 (ERA)
Tri-State Electronics, P.O. 218, 536 E. Pine Blvd., Poplar Bluff, Mo., 10 (NEDA)
Acme Radio Supply, Inc., 829 S. 10th St., St. Joseph, Mo., 10 (NEDA)
St. Joseph Radio & Supply, 720 S. 9th St., St. Joseph, Mo., 10 (NEDA)
Ashe Radio Co., Walter, 1125 Pine, St. Louis, Mo., 10 (NEDA)
Brown Radio Co., Tom, 3924 Washington Ave., St. Louis, Mo., 10 (NEDA)
Crown Elect. Dists., Inc., 2300 N. Union Blvd., St. Louis, Mo., 10 (NEDA)
Deltronics Distributing, 5239 Delmar St., St. Louis, Mo., 10 (NEDA)
Ehinger Electronics, Inc., 2501-03 S. Jefferson, St. Louis, Mo., 10 (NEDA)
Fixman Engrg. Co., Gordon, 8160 Stanford Ave., St. Louis, Mo., 15
Forristal-Young Sales Co., 8147 Delmar, St. Louis 24, Mo., 15 (ERA)
Interstate Supply Co., 4445 Gustine Ave., St. Louis, Mo., 10 (NEDA)
Kathrinus & Co., Norman W., 4356 Duncan Ave., St. Louis 10, Mo., 15 (ERA)
Kelly-Schmitz-Winkeler, 3938 Lindell Blvd., St. Louis 8, Mo., 15 (ERA)
Lowell Co., Theodore B., P.O. Box 21, Normandy Beach, St. Louis 21, Mo., 15 (ERA)
Radonics, 5040 Easton Ave., St. Louis, Mo., 10 (NEDA)
Sebright & Co., Russ D., 7120 W. Florissant St., St. Louis 20, Mo., 15 (ERA)
Van Sickle Radio Co., 1113 Pine St., St. Louis, Mo., 10 (NEDA)
Radio & TV Supply, Inc., 810 W. 16th St., Sedalia, Mo., 10 (NEDA)
Reed Radio & Supply Co., Main P.O. Box 149, Springfield, Mo., 10 (NEDA)

MONTANA

Parts House, Inc., 106 11th St., W., Billings, Mont., 10 (NEDA)
Radio Electronics Supply, 110 Tenth St., S., Great Falls, Mont., 10 (NEDA)

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Central Radio Supply, Inc., 518 W. First St., Hastings, Neb., 10 (NEDA)
General Radio & TV Co., 322 S. 12th Ave., Lincoln, Neb., 10 (NEDA)
Hicks Radio Co., 1422 "O" St., Lincoln, Neb., 10 (NEDA)
Leuck Radio Supply, 243 S. 11th St., Lincoln, Neb., 10 (NEDA)
Valley Electronic Supply, Rt. 2, 2015 Beverly Blvd., North Platte, Neb., 10 (NEDA)
J-B Distributing Co., 1616 Cass St., Omaha, Neb., 10 (NEDA)
Omaha Appliance Co., 2222 Leavenworth, Omaha, Neb., 10 (NEDA)
Radio Equip Co., 2852 Douglas St., Omaha, Neb., 10 (NEDA)
Sidles Co., 7302 Pacific St., Omaha, Neb., 10 (NEDA)

NEVADA

Radio & Sound Supply, 25 E. California St., Las Vegas, Nev., 10 (NEDA)
Radio Supply Co., Nevada, 720 Tahoe St., Reno, Nev., 10 (NEDA)

NEW HAMPSHIRE

Evans Radio, P.O. Box 312, Concord, N.H., 10 (NEDA)

NEW JERSEY

Kearns Elect. Products Co., 300 N. Mississippi Ave., Atlantic City, N.J., 10 (NEDA)
Dixon Co., Samuel A., 208 Russell Ave., Barrington, N.J., 15 (ERA)
Midstate Radio Supply Co., 157 W. White Horse Pike, Berlin, N.J., 10 (NEDA)
Berger Electronics Supply, 241 Bloomfield Ave., Bloomfield, N.J., 10 (NEDA)
Dickison Sales Co., Inc., 300 Broadway, Camden, N.J., 15 (ERA)
Maguire & Co., J. A., 116 N. 7 St., Camden 2, N.J., 15 (ERA)
Radio Electric Service Co., 513 Cooper St., Camden, N.J., 10 (NEDA)
Bright Star Industries, 600 Getty Ave., Clifton, N.J., 10

Directory III. Materials & Services

Eastern Radio Corp., 1074 Main Ave., Clifton, N.J., 10 (NEDA)
Production Engrg. Corp., 173 Sargeant Ave., Clifton, N.J., 15
Bancroft & Co., H. S., 209 Cooper St., Westmont, Collingswood, N.J., 15 (ERA)
Columbia Distributors, Columbia Heights, Columbia, N.J., 10 (NEDA)
International Dist. Co., 185 Central Ave., East Orange, N.J., 10 (NEDA)
Leader Elect. Supply Co., 72 Prince St., Elizabeth, N.J., 10 (NEDA)
Central Associates, 44 N. Dean St., Englewood, N.J., 15
Schwartz Co., Mel, 39-16 Tierney Pl., Fair Lawn, N.J., 15
Ringer Co., R. L., P.O. Box 114, 14 Glen Ave., Glen Rock, N.J., 15
Braddock, Edward, P.O. Box 305, Haddonfield, N.J., 15
Feefe Electronic Sales, 228 E. Kings Hwy., Haddonfield, N.J., 15 (ERA)
Moyer Co., Harold A., P.O. Box 14, Haddonfield, N.J., 15 (ERA)
Sherwood Distributors, 1255 Liberty Ave., Hillside, N.J., 10 (NEDA)
Simberkoff Sales Co., 68 Hudson St., Hoboken, N.J., 15 (ERA)
Munsell & Co., Eugene, 34 Exchange Pl., Jersey City, N.J., 5
Nidisco, Jersey City, Inc., 713 Newark Ave., Jersey City, N.J., 10
Schwartz Co., Adolph, 15 Exchange Pl., Jersey City, N.J., 15 (ERA)
Shulan & Co., Wally, 880 Bergen Ave., Jersey City, N.J., 15 (ERA)
Steinberg Co., H. A., 880 Bergen Ave., Jersey City, N.J., 15 (ERA)
Electronic Associates, Long Branch Ave., Long Branch, N.J., 15, 20
Nelson-Platt Sales Co., 312 Cherry Hill Blvd., Merchantville, N.J., 15 (ERA)
Trinkle Sales Co., 7675 Maple Ave., Merchantville, N.J., 15 (ERA)
Brennan Co., F. X., 180 Glenridge Ave., Montclair, N.J., 15 (ERA)
Fields & Simon Sales Co., 109 Valley Rd., Montclair, N.J., 15 (ERA)
Freeman-Assoc., L. C., 24 Stephen St., Montclair, N.J., 15
Foley Assoc., Andrew A., P.O. Box 155, Moorestown, N.J., 15 (ERA)
Federated Purchaser, Inc., 1021 U.S. Rt. 22, Mountainside, N.J., 10 (NEDA)
William Radio Supply Co., 265 Woodbridge Ave., New Brunswick, N.J., 10 (NEDA)
Cerf & Co., Art 744 Broad St., Newark N.J., 15 (ERA)
Electronic Marketers, Inc., 25-27 Hoyt St., Newark, N.J., 10 (NEDA)
Krich-New Jersey, Inc., 428 Elizabeth Ave., Newark, N.J., 10 (NEDA)

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Galasso Co., David P., 382 Franklin Ave., Nutley 10, N.J., 15 (ERA)
Williams & Assoc., V. W., 1100 White Horse Pike, Oaklyn, N.J., 15 (ERA)
Federal Electric Corp., Industrial Park, Paramus, N.J., 20
Jersey Elect. Dist. Co., 524 21st Ave., Paterson, N.J., 10 (NEDA)
Boenecke Assoc., 5505 Westfield Ave., Pennsauken, N.J., 15 (ERA)
Houser Assoc., 188 Water St., Perth Amboy, N.J., 15 (ERA)
Williams Co., Carl B., 154 S. Main St., Phillipsburg, N.J., 10 (NEDA)
Richardt Co., John W., Rt. 46, Pine Brook, N.J., 15 (ERA)
Union TV Parts Co., 800 South Ave., Plainfield, N.J., 10 (NEDA)
Miller Co., Harry, Red Bank, N.J., 15 (ERA)
Barker Sales Co., 339 S. Broad Ave., Ridgefield, N.J., 5
Unisco, Inc., 1061 Linden Ave., Ridgefield, N.J., 10, 15
Finley Co., Robert, 307 Lincoln Bldg., Ridgewood, N.J., 15 (ERA)
Gawler-Knoop Co., 178 Eagle Rock Ave., Roseland, N.J., 15
Banfield Assoc., C. S., P.O. 292, Rutherford, N.J., 15
Gentry Co., Richard L., 15 Park Ave., Rutherford, N.J., 15 (ERA)
Masters TV Supply Co., 96 N. Caston Ave., Somerville, N.J., 10 (NEDA)
Barrett Border & Co., 121 Oak St., Tenafly, N.J., 15 (ERA)
Gray Assoc., Harold, 40 Tenafly Rd., Tenafly, N.J., 15

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For names and addresses of manufacturing firms, see Alphabetical Directory, pages 161-264.

Allen & Hurley, 23 S. Warren St., Trenton, N.J., 10, 20

Fineburgs, 533 S. Broad St., Trenton, N.J., 10 (NEDA)

Snyder Co., Inc., V. A., 2165 Morris Ave., P.O. Box 184, Union, N.J., 15
See ad on this page
Tel: MUrdock 8-6100

Bressler Co., Jules J., 4808 Bergenline Ave., Union City, N.J., 15 (ERA)

Dealers Electronics Co., 817 13th St., Union City, N.J., 10 (NEDA)

Hughes Co., Kenneth E., 4808 Bergenline Ave., Union City, N.J., 15
See ad on page 713
Tel: UNion 7-3204

Pyramid Supply Co., 1707 New York Ave., Union City, N.J., 10 (NEDA)

Hinck Sales Co., Edwin B., N. Mountain Ave., Upper Montclair, N.J., 15

Garten-Assoc., L. A., 645 Eagle Rock Ave., W. Orange, N.J., 15

NEW MEXICO

Electronic Parts Co., Inc., 222 Truman St., N.E., Albuquerque, N.M., 10 (NEDA)

Kittleson Co., 210 Cagua Dr., Albuquerque, N.M., 15

Valley Engineering Co., 601 Cedar St., P.O. Box 2, Los Alamos, N.M., 10 (NEDA)

NEW YORK

Fort Orange Radio Dist., 904 Broadway, Albany, N.Y., 10 (NEDA)

Reagan Co., J. A., 45 N. Lake Ave., Albany, N.Y., 15 (ERA)
Tel: ALbany 6-9649

Taylor Co., E. E., 465 Central Ave., Albany 5, N.Y., 10 (NEDA)

Adirondack Radio Supply, 185 W. Main St., Amsterdam, N.Y., 10 (NEDA)

Berliant Assoc., 96 S. Grand Ave., Baldwin, L.I., N.Y., 15 (ERA)
Tel: BAldwin 3-1636

Taylor Corp., B. B., 2270 Grand Ave., Baldwin, L.I., N.Y., 15, (ERA)
Tel: BAldwin 3-8000

Tylinsky Co., Frank, 73-63 Bell Blvd., Bayside 64, N.Y., 15 (ERA)
Tel: HOllis 4-8927

Federal Electronics, Inc., 188 State St., Binghamton, N.Y., 10 (NEDA)

Stack Electronics, 25 State St., Binghamton, N.Y., 10 (NEDA)

Bay Electronics Dis., Inc., 1736 Jerome Ave., Bronx, N.Y., 10 (NEDA)

Bronx Wholesale Radio, 472 E. Fordham Rd., Bronx, N.Y., 10 (NEDA)

Haas Electronics Co., 862 Southern Blvd., Bronx, N.Y., 10 (NEDA)

National Radio Dist. Corp., 1165 Southern Blvd., Bronx, N.Y., 10 (NEDA)

Post Electronics, 3445 Boston Rd., Bronx, N.Y., 10 (NEDA)

Saxton Products, Inc., 4320 Park Ave., Bronx, N.Y., 5, 10, 15

Tri-Par Distributing Co., 1558-1558A White Plains, Bronx, N.Y., 10 (NEDA)

Wescon Electronics, Inc., 580 E. Fordham Rd., Bronx, N.Y., 10 (NEDA)

Wilco Radio Distributors, 383 E. 138th St., Bronx, N.Y., 10 (NEDA)

AMA Electronics Corp., 1635 Bedford Ave., Brooklyn, N.Y., 10 (NEDA)

Bay Electronic Corp., 3480 Nostrand Ave., Brooklyn, N.Y., 10 (NEDA)

Benray Electronics Corp., 485 Coney Island Ave., Brooklyn, N.Y., 10 (NEDA)

Brown Co., Inc., Irv, 1500 Carroll St., Brooklyn 13, N.Y., 15 (ERA)
Tel: HYacinth 3-1379

Buchman, Sam, 860-2 Atlantic Ave., Brooklyn, N.Y., 10 (NEDA)

Fishel Assoc., J. C., 22 Prospect Pk., Brooklyn, N.Y., 15, 20, 25

Green-Tele-Radio Dist., 472 Sutter Ave., Brooklyn, N.Y., 10 (NEDA)

Hy-Grade Electronics, Inc., 9216 Church Ave., Brooklyn, N.Y., 10 (NEDA)

Laco Electronics Co., Inc., 4924 4th St., Brooklyn, N.Y., 10 (NEDA)

National Radio Parts Dist., 572-4 Albany Ave., Brooklyn, N.Y., 10 (NEDA)

Quad Electronics, Inc., 555 Union Ave., Brooklyn, N.Y., 10 (NEDA)

Siclari, Vincent, 979 40th St., Brooklyn, N.Y., 15, 20

Tallen Co., Inc., 159 Carlton Ave., Brooklyn 5, N.Y., 25

TV Parts, Inc., 2169 Coney Island Ave., Brooklyn, N.Y., 10 (NEDA)

Dymac, Inc., 2329 Main St., Buffalo, N.Y., 10 (NEDA)

Farber Assoc., Maury, 417 Root Bldg., Buffalo 2, N.Y., 15 (ERA)
Tel: MOhawk 3543

Genesee Radio & Parts Co., 2550 Delaware Ave., Buffalo 16, N.Y., 10 (NEDA)

Huron Electronics Supply, 324-326 N. Oak St., Buffalo, N.Y., 10 (NEDA)

Jackson Co., Robert W., 833 Ellicott Sq. Bldg., Buffalo 3, N.Y., 15 (ERA)
Tel: MAdison 3306

Lamb Co., Robert F., 1807 Elmwood Ave., Buffalo, N.Y., 15

Radio Electric Products, 186 E. Genesee St., Buffalo, N.Y., 10 (NEDA)

Radio Equipment Corp., 147 Genesee St., Buffalo, N.Y., 10 (NEDA)

Scheller Electronics Corp., 929 Kensington Ave., Buffalo 15, N.Y., 10 (NEDA)

Summit Distributors, Inc., 916 Main St., Buffalo, N.Y., 10 (NEDA)

Sunset Electronics, Inc., 3670 Sheridan, Buffalo 26, N.Y., 10 (NEDA)

Peet & Co., D. R., 545 N. Main St., Canandaigua, N.Y., 15

Mannfred Electronics Corp., 102-09 Northern Blvd., Corona, N.Y., 10 (NEDA)

Quartin, Murray, 1425 Eric Lane, East Meadow, N.Y., 15

Director Assoc., Murray, 115-62 237 St., Elmont, N.Y., 15 (ERA)
Tel: CUrtis 3-6823

Hughes Co., Kenneth E., P.O. Box 54, Fayetteville, N.Y., 15
See ad on page 713
Tel: NEptune 7-9531

Bettan Sales, Marty, 167-16 73 Ave., Flushing, N.Y., 15 (ERA)
Tel: OLympia 7-6659

British Elect. Sales Co., Oakland Gardens, Flushing, N.Y., 15

Ellis & Assoc., Harold R., Oakland Gardens, Flushing 64, N.Y., 15 (ERA)
Tel: FLushing 7-5220

Harris, Inc., Arthur M., 42-34 195 St., Flushing, N.Y., 15 (ERA)
Tel: FLushing 7-7350

Technical Representative, 137-21 70th Ave., Flushing, N.Y., 15

Weiland Co., George H., 76-49 168 St., Flushing, N.Y., 15 (ERA)
Tel: OLympia 8-4061

Baum Co., Sydney H., 70-15 Fleet St., Forest Hills, N.Y., 15 (ERA)
Tel: BOulevard 3-8101

Dynamic Elect., N.Y., Inc., 73-39 Woodhaven Blvd., Forest Hills, N.Y., 20

Jefferson, Inc., Ray, 40 E. Merrick Rd., Freeport, N.Y., 20

Scott Co., George G., 6 Stuart Dr., W., Glen Cove, N.Y., 15

Fulton County Distr. Co., 16 Bleeker St., Gloversville, N.Y., 10

E.R.A., Inc., 340 Great Neck Rd., Great Neck, N.Y., 15 (ERA)
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Joseph Assoc., Ben, 43 S. Middle Neck Rd., Great Neck, N.Y., 15 (ERA)
Tel: HUnter 7-9395

Leeds Co., Inc., Gerard G., 12 Crampton Lane, Great Neck, N.Y., 15 (ERA)
Tel: HUnter 2-7784

Pacent Engrg. Corp., 310 Northern Blvd., Great Neck, N.Y., 15, 20

Components Sales Corp., 218 E. Hartsdale Ave., Hartsdale, N.Y., 15
See ad on page 364
Tel: SCarsdale 5-1050

Davis Electronics Corp., 204 Main St., Hempstead, N.Y., 10 (NEDA)

Kubrick & Yurman, 475 S. Franklin St., Hempstead, N.Y., 15 (ERA)
Tel: IVanhoe 3-7230

R & S Electronic Sales, P.O. Box 217, Hempstead, N.Y., 10, 15, 20

Standard Parts Corp., 277 N. Franklin St., Hempstead, N.Y., 10 (NEDA)

Hunter & Salisbury, Inc., 87 Broadway, Hicksville, N.Y., 15 (ERA)
Tel: WElls 8-1080

Associated TV Service Corp., 86-06 37th Ave., Jackson Heights, N.Y., 20

Argonne Electronics Mfg., 165-11 South Rd., Jamaica, N.Y., 5, 10, 15

Lafayette Radio Corp., 165-08 Liberty Ave., Jamaica, N.Y., 5, 10, 20

Peerless Radio Dist., Inc., 92-32 Merrick Rd., Jamaica, N.Y., 10 (NEDA)

Permag Corp., 88-06 Van Wyck Expressway, Jamaica 18, L.I., N.Y., 10
See ad on page 469
Tel: Olympia 7-1818

Travco Associates, 148-03 Hillside Ave., Jamaica 35, N.Y., 15
See ad on this page
Tel: OLympia 7-8630

Miller Assoc., Gilbert E., 47 Birchwood Park Dr., Jericho, N.Y., 15 (ERA)
Tel: OVerbrook 1-6335

Arace Electronic Dist., 16 Van Dusen St., Kingston, N.Y., 10 (NEDA)

Miller Co., Ben, P.O. Box 72, Little Neck, N.Y., 15 (ERA)
Tel: BAyside 4-4673

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Wadsworth Mfg., Assoc., 509 Balsam St., Liverpool, N.Y., 15 (ERA)
Tel: OLdfield 2-7043

Dalis, Inc., H. L., 35-35 24th St., Long Island City, N.Y., 10 (NEDA)

Electronic Supply Corp., 41-08 Greenpoint Ave., Long Island City, N.Y., 10 (NEDA)

Gray Assoc., Harold, 21-10 33rd Rd., Long Island City, N.Y., 15

Kaelber & Mack, 1 Park Ave., Manhasset, N.Y., 15 (ERA)
Tel: MA 7-1459

Spellman Co., Fred, 200 Plandome Rd., Manhasset, N.Y., 15 (ERA)
Tel: MA 7-3399

Adelphi Electronics, Inc., 142 Mineola Blvd., Mineola, N.Y., 10 (NEDA)

Arrow Electronics, Inc., 525 Jericho Turnpike, Mineola, N.Y., 10 (NEDA)

Schweber Electronics, 60 Herricks Rd., Mineola, L.I., N.Y., 10
See ad on page 402
Tel: PIoneer 6-6520

Burlingame Associates, 510 S. Fulton Ave., Mount Vernon, N.Y., 15
See ad on page 264
Tel: MOunt Vernon 4-7530

Kopple Assoc., John J., 9 W. Prospect Ave., Mt. Vernon, N.Y., 15 (ERA)
Tel: MO 4-5577

Radelco, Inc., 240 W. First St., Mt. Vernon, N.Y., 10 (NEDA)

Sonkin Assoc., David, 10 Fiske Pl., Mt. Vernon, N.Y., 15 (ERA)
Tel: MO 9-9809

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Adelman Co., Leon L., 25 Chittenden Ave., New York 33, N.Y., 15
See ad on page 715
Tel: SWinburne 5-1145

Adson Radio & Electric Co., 189 Greenwich St., New York, N.Y., 10 (NEDA)

Allen Communications, Inc., 1845 Broadway, New York, N.Y., 10, 20

Allied Plastic Supply Corp., 75 Cliff St., New York, N.Y., 10

Altec Service Co., 161 6th Ave., New York, N.Y., 20

American Advancement Corp., 50 Broadway, New York, N.Y., 5, 15

American Laubscher Corp., 250 W. 57th St., New York, N.Y., 5

Atlas Electronics Corp., 1317 First Ave., New York, N.Y., 10 (NEDA)

B & B Distributors, 221 Greenwich St., New York, N.Y., 5, 10, 20, 25

Barry Electronics Corp., 512 Broadway, New York 12, N.Y., 10
See ad on page 715
Tel: WAlker 5-7000

Beam-Echo International, 23 Park Pl., New York, N.Y., 5

Breuer Co., Inc., R. E., 10 Columbus Cir., New York 19, N.Y., 15 (ERA)
Tel: COlumbus 5-0440

Camber Co., Marty, 1700 York Ave., New York 28, N.Y., 15 (ERA)
Tel: ENdicott 9-4222

Center Industrial Elect., 74 Cortlandt St., New York, N.Y., 10 (NEDA)

Communications Equip. Co., 343 Canal St., New York, N.Y., 25

Cooper-Simon & Co., 400 E. 79 St., New York, N.Y., 15 (ERA)
Tel: LE 5-2900

Coronet Electronic, Inc., 120 Liberty St., New York, N.Y., 10

Cosmic Instruments, Inc., 50 Broadway, New York, N.Y., 5, 15

Crane & Egert Corp., 97 Reade St., New York 13, N.Y., 15 (ERA)
Tel: WOrth 4-0996

Dale Electronic Co., 319 W. 14th St., New York, N.Y., 10 (NEDA)

Dana-Beach Co., 101 Park Ave., New York 17, N.Y., 15, 20

Delsam Radio-TV, 2665 Grand Concourse, New York, N.Y., 20

Diamond Drill Carbon Co., 244 Madison Ave., New York, N.Y., 5, 10, 20

Dietrich Co., Earl, 110 E. End Ave., New York 28, N.Y., 15 (ERA)
Tel: LEhigh 5-6590

Egert Co., Samuel S., 97 Reade St., New York 13, N.Y., 15 (ERA)
Tel: WOrth 4-0996

Electronic Surplus Brok., 148 Chambers St., New York, N.Y., 25

Electronic Tube Sales, 74 Cortlandt St., New York 7, N.Y., 10
See ad on this page
Tel: BArclay 7-4140

Electronic Wholesalers, 5047 Broadway, New York, N.Y., 10 (NEDA)

Electronics Center, Inc., 211 W. 19th St., New York, N.Y., 10 (NEDA)

Emelton Electronics Co., 71 W. Broadway, New York, N.Y., 10

Empire Electronics Co., 74 Cortlandt St., New York, N.Y., 25

Ercona Corp., Dept. L-1, 16 W. 46th St., New York 36, N.Y., 5, 15
See ad on page 418
Tel: CIrcle 5-3840

Filnor Products, Inc., 101 W. 31 St., New York, N.Y., 5, 15

Fischer Dist., Inc., C., 211 W. 19th St., New York, N.Y., 10 (NEDA)

Fordham Radio Supply Co., 265 E. 149th St., New York, N.Y., 10 (NEDA)

Forrest Co., Bernard J., 102 Warren St., New York, N.Y., 15 (ERA)
Tel: CO 7-1711

Freed & Co., Leo, 420 Lexington Ave., New York 17, N.Y., 15 (ERA)
Tel: LExington 2-4771

Gancher Co., Louis, 468 W. Broadway, New York, N.Y., 25

Glass Assoc., Ed., 250 W. 57 St., New York, N.Y., 15 (ERA)
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Graybar Electric Co., Inc., 420 Lexington Ave., New York, N.Y., 10

Greylock Elect., Supply Co., 554 W. 168th St., New York, N.Y., 10 (NEDA)

Greenberg Assoc., Jerry, 514 Broadway, New York 12, N.Y., 15 (ERA)
Tel: WAlker 5-4433

Greenwich Sales Co., 84 Cortlandt St., New York, N.Y., 10, 25

Harrison Radio Corp., 225 Greenwich St., New York, N.Y., 10 (NEDA)

Hartley Products Co., 521 E. 162nd St., New York, N.Y., 5, 15

Harvey Radio Co., Inc., 103 W. 43rd St., New York, N.Y., 10 (NEDA)

Heller Assoc., Joseph L., 250 W. 57 St., New York 19, N.Y., 15 (ERA)
Tel: JUdson 6-8898

Instrument Center, 55 Reade St., New York, N.Y., 5, 15

Interstate Electronics, Inc., 227 Fulton St., New York 7, N.Y., 10
See ad on page 403
Tel: BEekman 3-8780

Kahant Associates, 11 Park Pl., New York, N.Y., 15

Kahgan Sales Corp., 1261 Broadway, New York 1, N.Y., 15 (ERA)
Tel: MU 4-7727

Lafayette Radio, 100 Sixth Ave., New York, N.Y., 10

Landsberger Plastics Co., 550 Fifth Ave., New York, N.Y., 15

Leonard Radio, Inc., 69 Cortlandt St., New York, N.Y., 10 (NEDA)

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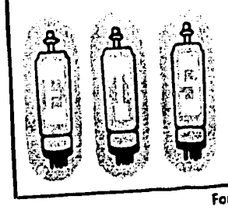

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Marcy Assoc., Robert J., 1776 Broadway, New York, N.Y., 15 (ERA)
Tel:: CIrcle 5-3880

Metropolitan Overseas Supply Corp., 1133 Broadway, New York, N.Y., 5, 10, 15, 25

Milgray Electronics, Inc., 136 Liberty St., New York, N.Y., 10 (NEDA)

Milo Electronic Corp., 530 Canal St., New York, N.Y., 10 (NEDA)

Morse Sales, Irv., 150 Broadway, New York 38, N.Y., 15 (ERA)
Tel: COrtlandt 7-2913

National Radio Dist., 1790 First Ave., New York, N.Y., 10 (NEDA)

Newhope Corporation, 6 E. 39 St., New York 16, N.Y., 15 (ERA)
Tel: LExington 2-7372

New Yorker Elects. Co., Inc., 40 E. 21 St., New York, N.Y., 10, 15

Pickett, James M., 205 E. 66 St., New York 21, N.Y., 15 (ERA)
Tel: TRafalgar 9-0520

Progress Electronics Co., 107 Franklin St., New York 13, N.Y., 10
See ad on pages 71-74
Tel: CAnal 6-5611

R M C Assoc., 236 E. 75th St., New York, N.Y., 15

Radio Merchandise Sales, Inc., 2016 Bronxdale Ave., New York, N.Y., 10, 20

Radio Research Instrument Co., 550 Fifth Ave., New York 36, N.Y., 25
Tel: JUdson 6-4691

Radio Wire & TV, Inc., 165-08 Liberty Ave., Jamaica, N.Y., 10

Radiophon Corp., 509 Madison Ave., New York, N.Y., 5, 15

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Sanford Electronics Corp., 157 Chambers St., New York, N.Y., 10 (NEDA)

Siemens N. Y., Inc., 350 Fifth Ave., New York, 15

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Sylvania International, 1740 Broadway, New York, N.Y., 5

Tab, 111 Liberty St., New York, N.Y., 5, 10, 25

Terminal Radio Corp., 85 Cortlandt St., New York, N.Y., 10 (ERA)

Tobias & Co., D. F., 30 Church St., N.Y. 17, N.Y., 15 (ERA)
Tel: COrtlandt 7-4349

United Elect. Supply Co., 1991 Broadway, New York, N.Y., 10 (NEDA)

Universal Relay Corp., 42 White St., New York 13, N.Y., 10
See ad on page 527
Tel: WAlker 5-9257

Weber Assoc., Jack, 63 E. 9 St., New York, N.Y., 15 (ERA)
Tel: GRamercy 3-7813

Western International Co., 45 Vesey St., New York, N.Y., 10, 15

Westrex Corp., 111 8th Ave., New York, N.Y., 5, 15, 20

Wolf Co., O. C., Box 32, Onondaga, N.Y., 15 (ERA)
Tel: HOward 9-0649

Masin Co., O. F., 1 Wolfs Lane, Pelham, N.Y., 15 (ERA)
Tel: PElham 8-4510

Aaron, Paul D., Professional Bldg., Port Washington, N.Y., 15 (ERA)
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Carduner Sales Corp., 80 Shore Rd., Port Washington N.Y., 15 (ERA)
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American Electronics, Inc., 482 St. Paul St., Rochester, N.Y., 10 (NEDA)

Case Electronic Supply, 82 St. Paul St., Rochester, N.Y., 10 (NEDA)

Hi-C Radio Electronics, 109 State St., Rochester, N.Y., 10 (NEDA)

Masline Electronics, Inc., 192-196 Clinton Ave., Rochester, N.Y., 10 (NEDA)

Richter Corp., William, 790 Linden Ave., Rochester, N.Y., 15

Rochester Radio Supply, 600 E. Main St., Rochester, N.Y., 10 (NEDA)

Wolfe-Marsey Sales Co., 74 Park Ave., Rochester 7, N.Y., 15 (ERA)
Tel: GReenfield 3-9088

Rywel Sales, Inc., 100 N. Village Ave., Rockville Centre, N.Y., 15

Fishner, Stanley, 120 Colonel Dr., Rome, N.Y., 10, 15

Rome Electronics, Inc., 108 Spring St., Rome, N.Y., 10 (NEDA)

B & D Distributing Co., 639 Tompkins Ave., Rosebank, N.Y., 10 (NEDA)

Aaron P. E., Bertram D., P.O. Box 186, Roslyn, N.Y., 15 (ERA)
Tel: MAyfair 1-0630

Hicks, W. M., 4 Spruce St., Roslyn, N.Y., 15 (ERA)
Tel: MAnhasset 7-6150

Lichter Co., William, 26 Teakwood Lane, Roslyn, N.Y., 15 (ERA)
Tel: MAyfair 1-2636

Aeroconomy Agency, P.O. Box 1001, Schenectady, N.Y., 15, 20

Electric City Radio Supply, 2460 Albany St., Schenectady, N.Y., 10 (NEDA)

Grimmers Elect. Parts Supply, 41 No. Brandywine Ave., Schenectady, N.Y., 10 (NEDA)

Schenectady Electronic Dist., 1708 Altamont Ave., Schenectady, N.Y., 10 (NEDA)

Drexler Co., Chester, 3 Lee Dr., S. Farmingdale, L.I., N.Y., 15

Allen, Inc., Leonard D., P.O. Box 32, Salina Stat., Syracuse 8, N.Y., 15 (ERA)
Tel: GRanite 8-4195

Berndt Radio Co., W. E., 655 S. Warren St., Syracuse, N.Y., 10 (NEDA)

Franklin Co., W. A., 2 Standish Ter., Syracuse 3, N.Y., 15 (ERA)
Tel: GIbson 6-1120

Lanzendorf, Oren G., 513 Cumberland Ave., Syracuse, N.Y., 15

Roberts & O'Brien, P.O. Box 1076, Syracuse 1, N.Y., 10 (NEDA)

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Troy Television, 85 5th Ave., Troy, N.Y., 10 (NEDA)

Land-C-Air Sales Co., 140 Marbledale Rd., Tuckahoe, N.Y., 15 (ERA)
Tel: WOodbine 1-4700

Stang Sales Co., 271 Columbus Ave., Tuckahoe, N.Y., 15 (ERA)
Tel: SPencer 9-6868

Valley Elect. Labs., Inc., 1415 Oriskany St., W., Utica 4, N.Y., 10 (NEDA)

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Tel: LOcust 1-2444

Avnet Electronic Corp., 70 State St., Westbury, N.Y., 10 (NEDA)

Hassall, Inc., John, P.O. Box 2242, Westbury, N.Y., 15

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Hoffman Co., Howard Louis, 804 Newbridge Ave., Westbury, N.Y., 15 (ERA)
Tel: EDgewood 4-5600

All-State Welding Alloys, 249-55 Ferris Ave., White Plains, N.Y., 5, 10, 15, 20

Westchester Elect. Supply, 602-610 Mamaroneck Ave., White Plains, N.Y., 10 (NEDA)

Wapler, Bert, P.O. Box 18, Whitestone, N.Y., 10

Boro Electronics, Inc., 69-18 Roosevelt Ave., Woodside, N.Y., 10 (NEDA)

Blair Sales Co., Inc., 45 S. Broadway, Yonkers, N.Y., 15 (ERA)
See ad on this page
Tel: YOnkers 3-0150

Brown Assoc., Jack, 207 Rosedale Rd., Yonkers, N.Y., 15 (ERA)
Tel: SP 9-7330

Shaw Co., Samuel A., 361 Central Park Ave., Yonkers, N.Y., 15 (ERA)
Tel: YOnkers 3-5700

Yonkers Elect. Supply, Inc., 541 Nepperhan Ave., Yonkers, N.Y., 10 (NEDA)

NORTH CAROLINA

Freck Radio & Supply Co., 38 Biltmore Ave., Asheville, N.C., 10 (NEDA)

Longs Distributing Co., 260 Biltmore Ave., Asheville, N.C., 10 (NEDA)

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MacVictor Elect. Supply, 318 N. Church St., P.O. Box 3236, Concord, N.C., 10 (NEDA)

Atcheson & Adams., 601 N. Elm St., Greensboro, N.C., 15 (ERA)
Tel: BRoadway 2-6838

Johannesen Elect. Co., Inc., 312-314 N. Eugene St., Greensboro, N.C., 10 (NEDA)

Tonkin & Schiffer Co., 1013 Huffman St., Greensboro, N.C., 15 (ERA)
Tel: BRoadway 3-5578

Victor Radio-TV Supply, 1058 3rd Ave., Dr., N.W., Hickory, N.C., 10 (NEDA)

Southeastern Radio Supply, 411-15 Hillsboro St., Raleigh, N.C., 10 (NEDA)

Steen-Taylor Electronics, 217 E. Council St., Salisbury, N.C., 10 (NEDA)

Buthan Inc., 4924 Oleander Dr., Wilmington, N.C., 15 (ERA)
Tel: ROger 2-5749

Dalton-Hege Radio Supply, 924 W. 4th St., Winston-Salem, N.C., 10 (NEDA)

Electronic Distributors, P.O. Box 4657, Winston-Salem, N.C., 10 (NEDA)

Lee Assoc., Inc., S. S., P.O. Box 906, Winston-Salem, N.C., 15

NORTH DAKOTA

Bristol Distributing Co., 419 N. Pacific Ave., Fargo, N.D., 10 (NEDA)

Radio Equipment Co., 624-2nd Ave., N., Fargo, N.D., 10 (NEDA)

OHIO

Olson Radio Warehouse, 260 S. Forge St., Akron, Ohio, 10 (NEDA)

Sun Radio Co., 110 E. Market St., Akron Ohio, 10 (NEDA)

Warren Radio Co., 71 S. Broadway, Akron, Ohio, 10 (NEDA)

Morrisons Radio Supply, 331 Center St., Ashtabula, Ohio, 10 (NEDA)

Nace Co., Allen, Box 146, Brecksville, Ohio, 15 (ERA)
Tel: CRestview 7-8215

Burroughs Radio, Inc., 2705 Fulton Rd., N.W., Canton, Ohio, 10 (NEDA)

Herrlinger Distributing, 15th & Vine Sts., Cincinnati, Ohio, 10 (NEDA)

Holub & Hogg Co., 1400 Sycamore St., Cincinnati, Ohio, 10 (NEDA)

Mytronic Co., 2145 Florence Ave., Cincinnati, Ohio, 10 (NEDA)

Sheridan Assoc., Inc., Roselawn Center Bldg., Cincinnati, Ohio, 15

Steinbergs, Inc., 633 Walnut St., Cincinnati, Ohio, 10 (NEDA)

United Radio, Inc., 1314 Vine St., Cincinnati, Ohio, 10 (NEDA)

Warren Radio Co., 1669 Central Parkway, Cincinnati, Ohio, 10 (NEDA)

Baehr, Greenleaf Assoc., 14700 Detroit, Cleveland 7, Ohio, 15 (ERA)
Tel: LA 1-8468

Baier Co., Arthur H., 12417 Cedar Rd., Cleveland 6, Ohio, 15 (ERA)
Tel: FA 1-5644

Brauer & Assoc., Walter J., 15631 Lakewood Hgts. Blvd., Cleveland 7, Ohio, 15 (ERA)
Tel: LAkewood 1-7268

Dannemiller Assoc., J. R., 3955 Lee Rd., Cleveland 28, Ohio, 15 (ERA)
Tel: LOngacre 1-4567

Daugherty Co., F. A., 6025 Mayfield Rd., Cleveland 24, Ohio, 15 (ERA)
Tel: HIllcrest 9-1122

Dolfuss, Jr. & Co., Chas. H., 2108 Payne Ave., Cleveland 14, Ohio, 15 (ERA)
Tel: PRospect 1-1270

Edwards Lohse & Co., 2123 E. 9 St., Cleveland 15, Ohio, 15 (ERA)
Tel: TOwer 1-5753

Landfear Co., J. M., 12429 Cedar Rd., Cleveland, Ohio, 15 (ERA)
Tel: FA 1-4533

Levin & Assoc., Sid., 6252 Mayfield Rd., Cleveland 24, Ohio, 15 (ERA)
Tel: HIllcrest 2-8340

Midwest Sales Co., 3219 W. 117 St., Cleveland 11, Ohio, 15 (ERA)
Tel: WInton 1-2700

Morrow Co., Les A., 3123 W. 117 St., Cleveland 11, Ohio, 15 (ERA)
Tel: CL 1-5700

Olsen Co., John O., 16201 Shaker Blvd., Cleveland 20, Ohio, 15 (ERA)
Tel: SKyline 2-5444

Peters Co., Robert W., 350 E. 215 St., Cleveland 23, Ohio, 15 (ERA)
Tel: ANdrews 1-2330

Pioneer Electronic Supply, 2115 Prospect Ave., Cleveland, Ohio, 10 (NEDA)

Radio-Electronic Parts, 3235 Prospect Ave., Cleveland, Ohio, 10 (NEDA)

Rauer Co., Frank W., 4144 Marvin Ave., Cleveland 9, Ohio, 15 (ERA)
Tel: MElrose 1-8350

Roth Sales Co., Mike, 13947 Cedar Rd., Cleveland 18, Ohio, 15 (ERA)
Tel: YE 2-4262

Schroeder Sales Co., 2309 Prospect Ave., Cleveland 15, Ohio, 15 (ERA)
Tel: MAin 1-5075

Scott & Steffen, Inc., 1836 Euclid Ave., Cleveland 15, Ohio, 15 (ERA)
Tel: TOwer 1-2626

Seaway Electronic Supply, 10014 Carnegie Ave., Cleveland, Ohio, 10 (NEDA)

Warren Radio Co., 5403 Prospect, Cleveland, Ohio, 10 (NEDA)

Buckeye Elect. Dist., Inc., 242-246 E. Long St., Columbus, Ohio, 10 (NEDA)

Electronic Supply Corp., 134 East Long St., Columbus, Ohio, 10 (NEDA)

Hughes-Peters, Inc., 111-117 E. Long St., Columbus, Ohio, 10 (NEDA)

Lehner Co., J. W., 367 Brynhild Rd., Columbus 2, Ohio, 15 (ERA)
Tel: AMherst 8-5260

McFadden Sales Co., 150 E. Broad St., Columbus 15, Ohio, 15 (ERA)
Tel: CApitol 1-3363

Pugh Co., C. L., 2144 Riverside Dr., Columbus 21, Ohio, 15 (ERA)
Tel: HUdson 8-4855

Directory III. Materials & Services

Seay Co., H. H., 3850 Fairlington Dr., Columbus 21, Ohio, 15 (ERA)
Tel: BElmont 1-3043

Whitehead Radio Co., 124 E. Long St., Columbus, Ohio, 10 (NEDA)

Allied Supply Co., Inc., 359 W. Monument Ave., Dayton, Ohio, 10 (NEDA)

Kohler Assoc., Ernie, 2600 Far Hills Ave., Dayton, Ohio, 15

Srepco, Inc., Box 7, N. Dayton Sta., Dayton, Ohio, 10 (NEDA)

Stotts Friedman Co., 108 N. Jefferson St., Dayton, Ohio, 10 (NEDA)

Fair Radio Sales, 132 S. Main St., Lima, Ohio, 25

Lima Radio Parts Co., 600 N. Main St., Lima, Ohio, 10 (NEDA)

Burroughs Radio, Inc., 218 Second St., Marietta, Ohio, 10 (NEDA)

Marietta Rad. & TV Supply, 221 Second St., Marietta, Ohio, 10 (NEDA)

Hausfeld Radio Supply, 116 N. Third St., Steubenville, Ohio, 10 (NEDA)

Blocki Assoc., Bill, 2280 Liberty Rd., Stow, Ohio, 15 (ERA)
Tel: OVerdale 8-4277

Chilcote Sales Co., Jim, 636 Nesslewood, Toledo, Ohio, 15 (ERA)
Tel: CHerry 1-3826

Howards Electronic Supply, 135-17th St., Toledo, Ohio, 10 (NEDA)

Lifetime Electronics, 1501 Adams St., Toledo, Ohio, 10 (NEDA)

Warren Radio Co., 1002 Adams St., Toledo, Ohio, 10 (NEDA)

Atkind, Irving, 821 Burman Ave., Trotwood, Ohio, 15

Radio Specialties, 136 Pine Ave., S.E., Warren, Ohio, 10 (NEDA)

Bear Corp., Neal, 3435 Streetsboro Rd., W. Richfield, Ohio, 15 (ERA)
Tel: OLiver 9-3331

Weller-Rahe Co., P.O. Box 212, Worthington, Ohio, 15 (ERA)
Tel: TUxedo 5-7819

Armies Electronics, 320 W. Federal St., Youngstown, Ohio, 10 (NEDA)

Thompson Radio Supplies, 110 S. Sixth St., Zanesville, Ohio, 10 (NEDA)

OKLAHOMA

Dulaneys Distg. Co., 100 N.W. 44th St., Oklahoma City, Okla, 10 (NEDA)

Electronic Supply Co., 212 N.W. Tenth St., Oklahoma City, Okla., 10 (NEDA)

Johnson Wholesale Electronics, 927 N.W. First St., Oklahoma City, Okla., 10 (NEDA)

Radio Supply Inc., 724 N. Hudson, Oklahoma City, Okla., 10 (NEDA)

Trice Wholesale Elect., 800 N. Hudson St., Oklahoma City, Okla., 10 (NEDA)

Oil Capital Elect. Corp., 708 South Sheridan, Tulsa, Okla., 10 (NEDA)

102. Distribution.

5. Export & import
10. Jobbers & wholesalers
15. Manufacturers representatives
20. Sales & service
25. Surplus dealers

OREGON

Hay & Carman, Inc., 768 Lincoln St., Eugene, Ore., 10 (NEDA)

Walker Co., Verl G., P.O. Box 1586, Medford, Ore., 10 (NEDA)

Burcham Co., Don H., P.O. Box 4098, Portland, Ore., 15 (ERA)
Tel: CApital 7-3830

Central Distributors, 1331 N.W. Couch St., Portland, Ore., 10 (NEDA)

Lee Co., Inc., Dave M., 3527 N.E. Union Ave., Portland, Ore., 15 (ERA)
Tel: ATlantic 8-5796

Minthorne Co., Roger M., 0673 S.W. Taylors Rd., Portland 29, Ore., 15 (ERA)
Tel: CH 6-4556

Portland Radio Supply Co., 1234 S.W. Stark, Portland, Ore., 10 (NEDA)

Saelens Radio Co., Inc., 1605 N.W. Everett, Portland, Ore., 10 (NEDA)

TV & Radio Supply Co., 1327 S.E. Grand Ave., Portland, Ore., 10 (NEDA)

Weber Co., Dale G., 8 S.E. Clay St., Portland, Ore., 15 (ERA)
Tel: BElmont 4-7671

Willamette Radio Supply, 2460 State St., Salem, Ore., 10 (NEDA)

PENNSYLVANIA

Pearson Sales Co., R. T., 1125 York Rd., Abington, Pa., 15 (ERA)
Tel: TUrner 7-0186

Peters, Inc., A. A., 231 No. 7th St., Allentown, Pa., 10 (NEDA)

Steedle Co., Norman D., 1005 N. 19th St., Allentown, Pa., 10 (NEDA)

Quinlan Co., D. G., National Bank Bldg., Ambler, Pa., 15 (ERA)
Tel: MItchell 6-7250

Rothenheber & Co., 53 Cricket Avt., Ardmore, Pa., 15 (ERA)
Tel: TRinity 7-9090

Friedman, Martin, 7 Heather Rd., Bala-Cynwyd, Pa., 15 (ERA)
Tel: Mohawk 4-6090

Beil & Whitaker, Inc., 504 Hickory St., Bethlehem, Pa., 15 (ERA)
Tel: UN 6-4424

Buss Radio Elec. Supply, 431 W. Broad St., Bethlehem, Pa., 10 (NEDA)

Marks Parts Co., 317 Braddock Ave., Braddock, Pa., 10 (NEDA)

Powell Electronics Sales, 457 Mill St., Bristol, Pa., 10 (NEDA)

Humes Sales, David, 124 Lee Circle, Bryn Mawr, Pa., 15 (ERA)
Tel: LAwrence 5-6469

Barrons Radio Supply, 333 E. Jefferson St., Butler, Pa., 10 (NEDA)

Delaware Valley Elect. Supply, W. Baltimore Pike, Clifton Heights, Pa., 10 (NEDA)

Biggs & Co., J. Alan, P.O. Box 450, Doylestown, Pa., 15 (ERA)
Tel: FIllmore 8-9457

Kellar & Co., Hal, 653 Ferne Blvd., Drexel Hill, Pa., 15 (ERA)
Tel: CLearbrook 9-6758

Stobbart Co., Arthur J., 56-14 Revere Rd., Drexel Hill, Pa., 15 (ERA)
Tel: CLearbrook 9-3881

Feagley, Charles W., P.O. Box 111, Easton, Pa., 10, 15

A. G. Radio Parts Co., 939 Township Lane, Elkins Park, Pa., 10 (NEDA)

Duncombe Co., J. V., 1011 W. Eighth St., Erie, Pa., 10 (NEDA)

Jordan Electronic Co., 1130 German St., Erie, Pa., 10 (NEDA)

Warren Radio, Inc., 1315 Peach St., Erie, Pa., 10 (NEDA)

Hevner Co., Donald S., 1528 Spring Mill Rd., Gladwyne, Pa., 15 (ERA)
Tel: LAwrence 5-9727

Technical Representation, 220 S. Easton Rd., Glenside, Pa., 15 (ERA)
Tel: TUrner 7-1325

Elect. Wholesalers, Inc., 1922 A Paxton St., Harrisburg, Pa., 10 (NEDA)

Radio Distributing Co., 915 South 13th St., Harrisburg, Pa., 10 (NEDA)

Fairbanks Co., Howard L., 1615 Darby Rd., Havertown, Pa., 15 (ERA)
Tel: GRanite 2-2467

Satterthwaite Co., W. E., P.O. Box 664, Havertown, Pa., 15 (ERA)
Tel: SUnset 9-9600

Stinson-Mustico Co., 2124 Darby Rd., Havertown, Pa., 15 (ERA)
Tel: HIlltop 7-0922

Laird Equipment Co., P.O. Box 108, Jenkintown, Pa., 15

Barno Radio Co., 927 Walnut St., McKeesport, Pa., 10 (NEDA)

McKeesport Electronics, 1661 Fifth Ave., McKeesport, Pa., 10 (NEDA)

Jeffries, Inc., Samuel A., 105 Forrest Ave., Narberth, Pa., 15 (ERA)
Tel: MOhawk 4-8500

Television Parts Co., 509 5th Ave., New Brighton, Pa., 10 (NEDA)

Frederick Jr. Co., C. William, 800 W. Washington St., Norristown, Pa., 15 (ERA)
Tel: BRoadway 9-7560

A. C. Radio Parts Co., 1539 W. Passyunk Ave., Philadelphia, Pa., 10 (NEDA)

Allied Elec. App. Parts, 1320 W. Erie Ave., Philadelphia, Pa., 10 (NEDA)

Almo Radio Co., 913 Arch St., Philadelphia, Pa., 10 (NEDA)
Tel: VIctor 4-9100

Andco Sales-Engr., Inc., 5823 Green St., Philadelphia, Pa., 15 (ERA)

Arlen Supply Co., 6026 Market St., Philadelphia, Pa., 10 (NEDA)

Barnett Bros. Radio Co., 622 Arch St., Philadelphia, Pa., 10 (NEDA)

Baron Associates, The Presidential A-710, Philadelphia, Pa., 15

Blumenstein Co., Hal, 14 Trent Dr., Philadelphia, Pa., 15 (ERA)
Tel: MIdway 9-9523

CRT Dist. Co. of Penn., 13 South 21st St., Philadelphia, Pa., 10 (NEDA)

Cooper Co., Richard J., 3507 Wellington, Philadelphia, Pa., 15 (ERA)
Tel: MAyfair 4-5486

Danby Radio Corp., 19 S. 21st St., Philadelphia, Pa., 20

Duncan & Assoc., W. I., 5452 Charles St., Philadelphia Pa., 15

Edmunds Co., Edmund J., 101 N. Lexington Ave., Philadelphia, Pa., 15 (ERA)
Tel: HIlltop 6-6472

Erdman Co., Kenneth B., 7908 High School Rd., Philadelphia, Pa., 15 (ERA)
Tel: CApital 5-5099

Estersohn, Harry, 5727 Wister St., Philadelphia, Pa., 15 (ERA)
Tel: VIctor 8-8484

Hautenchild Co., George, 949 E. Godfrey Ave., Philadelphia, Pa., 15 (ERA)
Tel: PIoneer 4-0847

Herbach & Rademan, Inc., 1204 Arch St., Philadelphia, Pa., 10 (NED)

Hughes Co., Kenneth E., 101 N. 33rd St., Philadelphia 4, Pa., 15
See ad on page 713
Tel: EVergreen 6-3130

Lazar Radio Co., Nathan, 4231 Lancaster Ave., Philadelphia, Pa., 10 (NED)

Leban Assoc., Albert D., 218 Lloyd Lane, Philadelphia, Pa., 15 (ERA)
Tel: MIdway 2-9047

Lectronic Distributors, 727 Arch St., Philadelphia, Pa., 10 (NED)

Lectronic Research Labs., 715 Arch St., Philadelphia, Pa., 5, 10, 15

Lewis Co., Herman, 1622 68 Ave., Philadelphia, Pa., 15 (ERA)
Tel: LIvingston 8-1281

MacDonald, Inc., Samuel K., 1531 Spruce St., Philadelphia, Pa., 15 (ERA)
Tel: KIngsley 5-1205

Naudain-Bohaker Co., 846 Suburban Stat. Bldg., Philadelphia, Pa., 15 (ERA)
Tel: RIttenhouse 6-3185

Newson & Assoc., C. H., 150 Terminal Ave., Philadelphia, Pa., 15 (ERA)
Tel: CH 8-0282

Nolan & Assoc., John J., 314 W. Sparks St., Philadelphia, Pa., 15 (ERA)
Tel: WAverly 4-1595

O'Hara Co., Brendan C., 5040 City Line Ave., Philadelphia, Pa., 15 (ERA)
Tel: GReenwood 3-3654

Paragon Sales Co., 111 S. 22 St., Philadelphia, Pa., 15 (ERA)
Tel: RIttenhouse 6-7060

Penn Electronic Parts Co., 5303 Frankford Ave., Philadelphia, Pa., 10 (NED)

Powell Co., Harold H., 2102 Market St., Philadelphia, Pa., 10 (NEDA)

Radio Elec. Service Co., North-West 7th & Arch St., Philadelphia, Pa., 10 (NEDA)

Radio Electric Shop, 631 S. 60th St., Philadelphia, Pa., 20

Randall Co., Ken, 121 N. Broad St., Philadelphia, Pa., 15 (ERA)
Tel: LOcust 4-2151

Rosen & Co., Raymond, Parkside Ave. & 51st St., Philadelphia, Pa., 10 (NEDA)

Shelps Co., George A., 1625 Spruce St., Philadelphia, Pa., 15 (ERA)
Tel: KIngsley 6-1066

Sidney Wagner Elec. Supply, 4632 N. 5th St., Philadelphia, Pa., 10 (NEDA)

Steinberg & Co., Albert, 2520 N. Broad St., Philadelphia, Pa., 10 (NEDA)

Stratton Co., C. H., 514 E. Wadsworth Ave., Philadelphia, Pa., 15 (ERA)
Tel: CH 7-7869

White Co., Harry J., 1839 W. Albanus St., Philadelphia, Pa., 15 (ERA)
Tel: DA 9-1880

Cameradio Co., 1121 Penn Ave., Pittsburgh 22, Pa., 10 (NEDA)
See ad on this page
Tel: EXpress 1-4000

Electronics Parts Co., 5744 Baum Blvd., Pittsburgh, Pa., 10 (NEDA)

Keps Elec. Co., Elec. Div., 5000 Baum Blvd., Pittsburgh, Pa., 10 (NEDA)

Levine, Albert, 11 Jonquil Pl., Pittsburgh, Pa., 15 (ERA)
Tel: LOcust.1-7027

Lowry Dietrich Co., 1404 Swantek St., Pittsburgh 4, Pa., 15 (ERA)

Mates Hy, 5510 Hobart St., Pittsburgh, Pa., 15 (ERA)
Tel: HA 1-8998

Podolny Co., James H., 4716 Coleridge St., Pittsburgh 1, Pa., 15 (ERA)

Radio Parts Co., 6401 Penn Ave., Pittsburgh, Pa., 10 (NEDA)

Rogers Corp., C. R., 5210 Liberty Ave., Pittsburgh, Pa., 10 (NEDA)

Root & Co., Gene S., 733 Vallevista Ave., Pittsburgh, Pa., 15 (ERA)
Tel: HIland 1-0800

Tanner & Covert Assoc., 300 Mt. Lebanon Blvd., Pittsburgh, Pa., 15 (ERA)
Tel: LO 1-5067

Tydings Co., 933 Liberty Ave., Pittsburgh, Pa., 10 (NEDA)

Yarussi Co., F. P., 312 Spring Valley Rd., Pittsburgh 16, Pa., 15 (ERA)
Tel: CAnal 1-4676

Barbey Co., Inc., George D., Second & Penn Sts., Reading, Pa., 10 (NEDA)

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B. & R. Electric Co., 26 Railroad St., St. Marys, Pa., 10 (NEDA)

General Radio & Refrigeration, 1129 Wyoming Ave., Scranton, Pa., 10 (NEDA)

Sharon Electronics Supply, 1336 E. State St., Sharon, Pa., 10 (NEDA)

Park, E. L., 651 Paddock Rd., Southampton, Pa., 15 (ERA)
Tel: ELmwood 7-7805

Penn Industrial Elect. Co., P.O. Box 661, State College, Pa., 10, 20

Wholesale Electronics, 503 N. Chester Rd., Swarthmore, Pa., 10 (NEDA)

Zimmerman Wholesalers, 104 W. Peter St., Uniontown, Pa., 10 (NEDA)

Robinson Co., I. E., 7404 W. Chester Pike, Upper Darby, Pa., 15

Leff Radio Parts Co., M., 247 W. 8th Ave., W. Homestead, Pa., 10 (NEDA)

General Radio-Refrige. Co., 396 S. Main St., Wilkes Barre, Pa., 10 (NEDA)

Graham Assoc., Wilfrid, 610 Latham Dr., Wynnewood, Pa., 15 (ERA)
Tel: MIdway 9-3027

Lowery, Inc., L. D., 50 E. Wynnewood Rd., Wynnewood, Pa., 15 (ERA)
Tel: MIdway 2-9100

RHODE ISLAND

Adams-McGregor Assoc., 66 Lakeview Rd., Lincoln, R.I., 15 (ERA)
Tel: CO 9-5816

SOUTH CAROLINA

Wholesale Radio Supply Co., 515 E. Bay St., Charleston, S.C., 10 (NEDA)

Dixie Radio Supply Co., 1700 Laurel St., Columbia, S.C., 10 (NEDA)

Horlacher & Barrett, 1740 Blanding St., Columbia, S.C., 10 (NEDA)

Southern Electronics, Inc., 355-65 N. Irby St., Florence, S.C., 10 (NEDA)

Hemcor, Inc., 481 Union St., Spartanburg, S.C., 10 (NEDA)

SOUTH DAKOTA

McKenzie Distributors, Inc., 209 S. First Ave., Sioux Falls, S.D., 10 (NEDA)

Burghardt Radio Supply, 621 Fourth St., S.E., Watertown, S.D., 10 (NEDA)

TENNESSEE

Roden Electric Supply Co., 104 E. State St., Bristol, Tenn., 10 (NEDA)

Curle Radio Supply Co., 439 Broad St., Chattanooga, Tenn., 10 (NEDA)

Randolph & Williams, 204 Carter St., Columbia, Tenn., 10 (NEDA)

Randolph & Parks, Inc., 36 W. 2nd St., Cookeville, Tenn., 10 (NEDA)

Warren Radio Co., 1216 St. John Ave., Dyersburg, Tenn., 10 (NEDA)

Rush Co., L. K., 425-29 N. Royal St., Jackson, Tenn., 10 (NEDA)

Radio Electric Supply Co., 961 E. Sullivan St., Kingsport, Tenn., 10 (NEDA)

102. Distribution.

5. Export & import
10. Jobbers & wholesalers
15. Manufacturers representatives
20. Sales & service
25. Surplus dealers

Chemcity Radio-Elec. Co., 2211 Dutch Valley Rd., Knoxville, Tenn., 10 (NEDA)

Roden Electrical Supply, 708 Central St., N.W., Knoxville, Tenn., 10 (NEDA)

Smith Electronic Supply, 301 E. Magnolia Ave., Knoxville, Tenn., 10 (NEDA)

Bluff City Distributing, Box 418, Memphis, Tenn., 10 (NEDA)

Cartwright & Bean, 560 S. Cooper St., Memphis, Tenn., 15 (ERA)

Electronic Supply, Inc., 1100 Union, Memphis, Tenn., 10 (NEDA)

Engelman Co., 3205 Crump Ave., Memphis 12, Tenn., 15 (ERA)

Uffer & Co., Frank G., 1318 Madison Ave., Memphis, Tenn., 10 (NEDA)

Electra Distributing Co., 1914 W. End Ave., Nashville, Tenn., 10 (NEDA)

Randolph & Rice, 1213 McGavock St., Nashville, Tenn., 10 (NEDA)

Randolph & Holt, 212 E. Coffee St., Tullahoma, Tenn., 10 (NEDA)

TEXAS

R & R Electronic Co., 802 N. Walnut, Abilene, Tex., 10 (NEDA)

Alltronics Supply, Inc., 1401 W. Seventh Ave., Amarillo, Tex., 10 (NEDA)

R & R Electronic Co., 707 Adams St., Amarillo, Tex., 10 (NEDA)

West Texas Elect. Co., 401 Adams St., Amarillo, Tex., 10 (NEDA)

Electronic Headquarters, 310 Willow St., Austin, Tex., 10 (NEDA)

Hargis-Austin, Inc., 410 Baylor, Austin, Tex., 10 (NEDA)

Standard Radio Supply, Inc., 309 Lavaca, Austin, Tex., 10 (NEDA)

Montague Radio Dist. Co., 760 Laurel St., Beaumont, Tex., 10 (NEDA)

Sterling Radio, 1160 Laurel, Station A, Beaumont, Tex., 10 (NEDA)

Electronic Equip. & Eng., 805 S. Staples St., Corpus Christi, Tex., 10

Leader Electronic Supply, 1701 Morgan Ave., Corpus Christi, Tex., 10

Wicks Radio Equip. Co., 513-15 S. Staples St., Corpus Christi, Tex., 10

Airep Engrg. Co., P.O. Box 4843, Dallas, Tex., 15

Allied Components, Inc., 2517 Converse St., Dallas 7, Tex., 15 (ERA)

All-State Distg. Co., 2411 Ross Ave., Dallas, Tex., 10 (NEDA)

Ammon & Woods Assoc., 5602 E. Mockingbird Lane, Dallas, Tex., 15 (ERA)

Anderson Co., Geo. E., 1901 Griffin, Dallas 2, Tex., 15 (ERA)

Aymond Co., Edward F., 4312 Maple Ave., Dallas 19, Tex., 15 (ERA)

Barnes Co., Arnold, Dallas 19, Tex., 15 (ERA)

Berthold Sales Co., 4411 Maple Ave., Dallas 19, Tex., 15 (ERA)

Branum Co., P.O. Box 14348, Dallas 34, Tex., 15 (ERA)

Campion Sales Co., 9002 Chancellor Row, Dallas 35, Tex., 15 (ERA)

Central Electronics, 4117 Maple Ave., Dallas, Tex., 10 (NEDA)

Crabtrees Wholesale Elec., 2608 Ross Ave., Dallas, Tex., 10 (NEDA)

Corry Co., Hal F., 6314 Hillcrest Ave., Dallas 5, Tex., 15 (ERA)

Crockett-Lund & Co., 2204 Griffin St., Dallas 2, Tex., 15 (ERA)

Danby Co., Robert W., 2517 Cedar Springs Rd., Dallas, Tex., 15 (ERA)

Delzell-Maynard Sales Co., 2013 Cedar Springs, Dallas 1, Tex., 15 (ERA)

Equipment & Service Co., 7118 Envoy Ct., Dallas, Tex., 15, 20

Gross & Co., Fred, 14025 Denton Dr., Dallas, Tex., 15 (ERA)

Guenther, John B., P.O. Box 1926, Dallas 21, Tex., 15 (ERA)

Hart Co., Sam, 1210 Old Gate Lane, Dallas 18, Tex., 15 (ERA)

Hays Co., W. R., 3416 Rosedale St., Dallas, Tex., 15 (ERA)

Kantenberger Co., 711 Reverchon Dr., Dallas, Tex., 15

Lawrence Sales Co., P.O. Box 13026, Dallas, Tex., 15

Lieberman & Assoc., Hank, 6005 Northwood Rd., Dallas, Tex., 15 (ERA)

Lucas Sales Co., Chas., 2004 S. Beckley, Dallas 16, Tex., 15 (ERA)

McKinney Sales Co., J. F., 1330 N. Industrial Blvd., Dallas, Tex., 15 (ERA)

Nesbitt Co., Robert E., 1925 Cedar Springs, Dallas 1, Tex., 15 (ERA)

Packard Assoc., 404 Love Field Air Term., Dallas 35, Tex., 15 (ERA)

Schoonmaker Co., J. Y., 5328 Redfield Ave., Dallas 35, Tex., 15 (ERA)

Sinks Co., R. M., P.O. Box 11726, Dallas 18, Tex., 15 (ERA)

Smith Co., J. Earl, P.O. Box 35331, Dallas 35, Tex., 15 (ERA)

Southern Rad. Supply, Inc., 3137 Ross Ave., Dallas, Tex., 10 (NEDA)

Southwest Elect. Indust., 4515 Prentice, Dallas, Tex., 15 (ERA)

Texport Co., 2147 Farrington, Dallas 7, Tex., 15 (ERA)

Thomson Engrg. Service, 2712 W. Mockingbird Lane, Dallas, Tex., 15

Wholesale Elect. Supply, 2800 Ross Ave., Dallas, Tex., 10 (NEDA)

Wilkinson Brothers Co., P.O. Box 1169, Dallas, Tex., 10 (NEDA)

Wyborny & Yount Co., 408 Merchandise Mart, Dallas 1, Tex., 15 (ERA)

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Murray Hill 2-6606

102. Distribution.

Denison Radio Supply, 310 W. Woodard, Denison, Tex., 10 (NEDA)
McNicol, C. C., 811 N. Estrella St., El Paso, Tex., 10 (NEDA)
R & R Supply Co., Inc., 2531 E. Yandell, El Paso, Tex., 10 (NEDA)
Engineering Assoc., Inc., 2912 Stanley, Ft. Worth, Tex., 15 (ERA)
Scooters Rad. Supply Co., S. Freeway & Vickery, Ft. Worth, Tex., 10 (NEDA)
Spears Co., Mitchell, 3801 Westcliff Rd., S., Ft. Worth, Tex., 15, 20
Swieco, Inc., 1518 E. Lancaster, Ft. Worth, Tex., 10 (NEDA)
Angie Radio & TV Supply, 2005 Crawford St., Houston, Tex., 10 (NEDA)
Beyer & Co., A. R., 1318 Polk Ave., Houston, Tex., 10 (NEDA)
Hall, Inc., R. C. & L. F., 1901 Chenevert, Houston, Tex, 10 (NEDA)
Klicpera Co., M. F., P.O. Box 3113, Houston, Tex., 15 (ERA)
Sterling Radio Prods., Inc., P.O. Box 1746, Houston, Tex., 10 (NEDA)
Wofford Electronics Parts, 3808 Crawford St., Houston, Tex., 10 (NEDA)
B & L Radio-TV Supply, Inc., 2424 Texas Ave., Lubbock, Tex., 10 (NEDA)
R & R Supply Co., Inc., P.O. Box 1360, Lubbock, Tex., 10 (NEDA)
Rio Radio Supply Co., 608-10 S. Broadway, McAllen, Tex., 10 (NEDA)
Greater Texas Elect., Inc., 30 Industrial Loop, Midland, Tex., 10 (NEDA)
Diehl Radio & TV Supply, 2120 Seventh St., Port Arthur, Tex., 10 (NEDA)
Modern Electronic Co., 2000 Broadway, San Antonio, Tex., 10 (NEDA)
Radio & TV Parts Co., 1828 N. St. Marys St., San Antonio, Tex., 10 (NEDA)
Sherman Electronics Supply, 720 San Pedro, San Antonio, Tex., 10 (NEDA)
South Texas Rad. Sup. Co., 647 S. Presa St., San Antonio, Tex., 10 (NEDA)
McCulloch Wholesale TV, 811 W. 13th St., Texarkana, Tex., 10 (NEDA)
Best Electronics, 324 N. 18th St., Waco, Tex., 10 (NEDA)
Hargis Co., Inc., 1205 Washington Ave., Waco, Tex., 10 (NEDA)

UTAH

Ballard Supply Co., 3109 Washington Blvd., Ogden, Utah, 10 (NEDA)
Tri-State Electronic Supply, 2217 Liesel Ave., Ogden, Utah, 10 (NEDA)
Gates Co., F. Y., 200 S. Main St., Salt Lake City, Utah, 15
O'Loughlins Radio Supply, 113 E. 3rd South St., Salt Lake City, Utah, 10 (NEDA)
Stevenson Co., Ralph, 2045 Walker Lane, Salt Lake City, Utah, 15

VERMONT

North Radio, 211 North St., Bennington, Vt., 10 (NEDA)

VIRGINIA

Industry Services, Inc., 122-126 S. Wayne St., Arlington, Va., 10 (NEDA)
Jay Company, 2420 Wilson Blvd., Arlington, Va., 15
Rucker Elect. Prods., Co., 1213 Wilson Blvd., Arlington, Va., 10 (NEDA)

Directory III. Materials & Services

Virginia Radio Supply Co., 715 Henry Ave., Charlottesville, Va., 10
Womack Electronics Corp., P.O. Box 521, Danville, Va., 10 (NEDA)
Lee Assoc., Inc., 1107C W. Broad St., Falls Church, Va., 15
Cain Electronics Co., 14th & Monticello Ave., Norfolk, Va., 10 (NEDA)
Priest Electronics, Inc., 6431 Tidewater Dr., Norfolk, Va., 10 (NEDA)
Radio Parts Dist. Co., 128 W. Olney Rd., Norfolk, Va., 10 (NEDA)
Radio Supply Co., 711 Granby St., Norfolk, Va., 10 (NEDA)
Banner Electronics, Inc., 2224 Chamberlayne Ave., Richmond, Va., 10 (NEDA)
Johnston-Gasser Co., Inc., 3023 W. Marshall St., Richmond, Va., 10 (NEDA)
Meridian Electronics, Inc., 1001 W. Broad St., Richmond, Va., 10 (NEDA)
Radio Supply Co., Inc., 3302 W. Broad St., Richmond, Va., 10 (NEDA)
Richmond Electronic Supply, 800 W. Cary St., Richmond, Va., 10 (NEDA)
Dixie Appliance Co., P.O. Box 601, Roanoke, Va., 10 (NEDA)
McKnight Electronics, Inc., 405 Shenandoah Ave., N.W., Roanoke, Va., 10
Peoples Radio & TV Sup., 1015 Moorman Rd., N.W., Roanoke, Va., 10 (NEDA) (NEDA)
Radio Supply Co., Inc., 2009 Williamson Rd., Roanoke, Va., 10 (NEDA)
Roanoke Elect. Supply, Inc., 1322 Williamson Rd., Roanoke, Va., 10 (NEDA)
Southern Elect. Co., 818 Greenville Ave., Staunton, Va., 10 (NEDA)

WASHINGTON

Geiger Radio, W. A., 1101 Columbia, Ellensburg, Wash., 10 (NEDA)
Pringle Radio Wholesale, 2101 Colby Ave., Everett, Wash., 10 (NEDA)
Arva, Inc., 1320 Prospect, Seattle, Wash., 15 (ERA)
Tel: MAine 2-0177
Backer Co., James J., 221 W. Galer St., Seattle 99, Wash., 15 (ERA)
Tel: ATwater 3-6470
Forland-Drake Assoc., 1806 Bush Pl., Seattle 44, Wash., 15 (ERA)
Tel: EAst 3-8545
Garretson Rad., Supply, Inc., 2416-Second Ave., Seattle, Wash., 10 (NEDA)
Haight Co., Fred H., 3212 Eastlake Ave., Seattle 2, Wash., 15 (ERA)
Tel: East 2-1818
Levinson Co., Harry, 1117 Second Ave., Seattle, Wash., 15 (ERA)
MAine 2-5433
Johnston Co., Ray, 1011 E. 69 St., Seattle 15, Wash., 15 (ERA)
Tel: LAkeview 4-5170
Marsh Agencies, Inc., 2601 First Ave., Seattle 1, Wash., 15 (ERA)
Tel: MAin 2-8761
Merritt Co., Ron, 1320 Prospect, Seattle, Wash., 15 (ERA)
Tel: MU 2-7337
Northwestern Agcys., Inc., 4130 1st Ave., S., Seattle 4, Wash., 15 (ERA)
Tel: MAin 3-8882

102. Distribution.

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Pacific Elect. Sales Co., 1209 First Ave., Seattle, Wash., 10 (NEDA)
Paramount Agencies, 3131 Western Ave., Seattle, Wash., 15 (ERA)
Tel: ATwater 4-1840
Parsons & Co., C. B., 3028 First Ave., Seattle 1, Wash., 15 (ERA)
Tel: MUtual 2-6780
Porter Co., Burt C., 1209 Poplar Pl., Seattle, Wash., 15 (ERA)
Tel: EAst 3-8330
Schultz Co., N. R., 4227 Airport Way, Seattle 8, Wash., 15 (ERA)
Tel: MAin 4-8650
Seatronics, Inc., Forland, 1806 Bush Pl., Seattle, Wash., 15
Seattle Radio Supply, Inc., 2117 Second Ave., Seattle, Wash., 10 (NEDA)
Smith Sales Co., Don, 2320 N. 45th St., Seattle 3, Wash., 15 (ERA)
Tel: MElrose 3-3160
Strum Co., Samuel, 1612 Broadway, Seattle 22, Wash., 15 (ERA)
Tel: EAst 3-6177
Western Elect. Supply Co., 717 Dexter Ave., Seattle, Wash., 10 (NEDA)
Widdekind Co., M. K., 222 First St., Seattle, Wash., 15 (ERA)
Tel: ATwater 4-4869
Columbia Elect. & Mfg. Co., 3420 E. Ferry Ave., Spokane, Wash., 10 (NEDA)
Northwest Electronics, E. 730 First Ave., Spokane, Wash., 10 (NEDA)
Taylor Distributing Co., E., 206 Augusta, Spokane, Wash., 10 (NEDA)
Tel-Electric Dist., Inc., 734 N. Division, Spokane, Wash., 10 (NEDA)
C. & G. Radio Supply Co., 2502-6 Jefferson Ave., Tacoma, Wash., 10 (NEDA)
Wible Radio Supply, Inc., 2360 S. Fawcett Ave., Tacoma, Wash., 10 (NEDA)
Palmer, Inc., M. V., 4108 N.W. Fruit Valley Rd., Vancouver, Wash., 5, 10, 15, 20
Mid-State Rad. Supply, Inc., 611½ N. Wenatchee Ave., Wenatchee, Wash., 10 (NEDA)

WEST VIRGINIA

Meyers Electronics, Inc., 813 Bluefield Ave., Bluefield, W.Va., 10 (NEDA)
Chemcity Rad. & Elect. Co., 103 Clendenin St., Box 2066, Charleston, W.Va., 10 (NEDA)
Mountain Elect., Inc., 708 Ibgley Ave., Charleston, W.Va., 10 (NEDA)
Electronic Supply, Inc., 422 Eleventh St., Huntington, W.Va., 10 (NEDA)
Gen. Electronics Dist., Inc., 735 Main St., Wheeling, W.Va., 10 (NEDA)

WISCONSIN

Bushland Radio Specialty, 19 W. Spring St., Chippewa Falls, Wis., 10
Fond du Lac Distributors, 152 S. Macey St., Fond du Lac, Wis., 10 (NEDA)
Harris Radio Supply, 289 N. Main St., Fond du Lac, Wis., 10 (NEDA)
Neslo, Inc., 715-14th Ave., Green Bay, Wis., 10 (NEDA)
Northern Radio-TV Supply, 1585 Main St., Green Bay, Wis., 10 (NEDA)
Stark Radio Supply Co., 131 S. 6th St., La Crosse, Wis., 10 (NEDA)
Radio Distributors, 418 Oak St., Madison, Wis., 10 (NEDA)
Millers Electronic Supply, 1329 N. Broadway, Menomonie, Wis., 10 (NEDA)
Ackerman Radio Sales, 3861 N. 35th, Milwaukee, Wis., 10 (NEDA)
Barco, Inc., Box 1222, Milwaukee, Wis., 15
Central Radio Parts Co., 1723 W. Fond du Lac Ave., Milwaukee, Wis., 10 (NEDA)
Marsh Radio Supply Co., 838 N. 4th St., Milwaukee, Wis., 10 (NEDA)
Radio Parts Co., Inc., 940 N. 27th St., Milwaukee, Wis., 10 (NEDA)
Taylor Electric Co., 4080 N. Port Washington Rd., Milwaukee, Wis., 10 (NEDA)
Standard Radio Parts Co., 1244 State St., Racine, Wis., 10 (NEDA)

WYOMING

House Radio & Supply Co., 4012 Central Ave., Cheyenne, Wyo., 10 (NEDA)

CANADA

Lomas Co., E. G., 227 Laurier Ave., W., Ottawa, Canada, 5, 15, 20
A. T. R. Armstrong, Ltd., 700 Western Rd., Toronto, Canada, 15 (ERA)
Burke Electric-X-Ray Co., 63 Yorkville Ave., Toronto, Canada, 20
Electro Sonic Supply Co., 343 Yonge St., Toronto, Canada, 10 (NEDA)
Pointon Co., Charles G., 6 Alcina Ave., Toronto 23, Canada, 15
McLennan, Ltd., D. Eldon, 1624 W. 3 Ave., Vancouver 9, Canada, 15
S & T Sales, Ltd., 120 E. Cordova St., Vancouver, Canada, 5, 10, 20

JAPAN

Technical Factors, Ltd., 1, Nishi-Nanachome, Ginza, Tokyo, Japan, 15

MEXICO

Brena & Cia, Jones, Apartado 2250, Mexico, D.F. Mex., 15 (ERA)
Oskam Representaciones, William L., Charles Ave., Mexico L.D.F. Mex., 15 (ERA)

"Distribution" listings are arranged alphabetically by states and by cities within each state. For names and addresses of manufacturing firms, see Alphabetical Directory, pages 161-264.

28 Fields of Special Interest-

The 28 Professional Groups are listed below, together with a brief definiton of each, the name of the group chairman, and publications to date.

* Indicates publications still available

Aeronautical and Navigational Electronics

Annual fee: $2.

The application of electronics to operation and traffic control of aircraft and to navigation of all craft.

Mr. Lewis M. Sherer, Chairman, RTCA, Washington, D.C.

31 Transactions, *5, *6, *8, & *9, and *Vol. ANE-1, Nos. 2 and 3; Vol. 2, No. 1-3; Vol. 3, No. 2; Vol. 4, No. 1, 2, 3; Vol. 5, No. 2, 3, 4; Vol. 6, No. 1, 2.

Antennas and Propagation

Annual fee: $4.

Technical advances in antennas and wave propagation theory and the utilization of techniques or products of this field.

Mr. Arthur Dorne, Chairman, Dorne & Margolin, Westbury, L.I., N.Y.

26 Transactions, *Vol. AP-2, No. 1-3; AP-4, No. 4; AP-5, No. 1-4; AP-6, No. 1, 2, 3, 4; AP-7, No. 1, 2, 3.

Audio

Annual fee: $2.

Technology of communication at audio frequencies and of the audio portion of radio frequency systems, including acoustic terminations, recording and reproduction.

Dr. A. B. Bereskin, Chairman, EE Dept., Univ. of Cincinnati, Cincinnati 21, Ohio

48 Transactions, *Vol. AU-1, No. 6; *Vol. AU-2, No. 1, 4-6; Vol. AU-3, No. 1, 3, 5; Vol. AU-4, No. 1, 5-6; Vol. AU-5, No. 1, 2, 3, 4, 5, 6; AU-6, No. 1, 2, 3, 4, 5, 6; AU-7, No. 1, 2, 3, 4.

Automatic Control

Annual fee: $2.

The theory and application of automatic control techniques including feedback control systems.

Mr. John E. Ward, Chairman, Servomechanisms Lab., MIT, Cambridge 39, Mass.

7 Transactions, PGAC-3-4-5-6, AC-4, No. 1.

Broadcast & Television Receivers

Annual fee: $2.

The design and manufacture of broadcast and television receivers and components and activities related thereto.

Mr. Gilbert C. Larson, Chairman, Raytheon Mfg. Co., River Road, Waltham, Mass.

23 Transactions, *7, 8; BTR-1, No. 1-4; BTR-2, No. 1-2-3; BTR-3, No. 1-2; BTR-4, No. 2, 3-4; BTR-5, No. 1, 2.

Broadcasting

Annual fee: $2.

Broadcast transmission systems engineering, including the design and utilization of broadcast equipment.

Mr. George E. Hagerty, chairman, Westinghouse, 122 E. 42nd St., New York 17, N.Y.

13 Transactions, No. 2, 4, 6, 7, 8, 9, 10, 11, 12, 13.

Circuit Theory

Annual fee: $3.

Design and theory of operation of circuits for use in radio and electronic equipment.

Mr. Sidney Darlington, Chairman, Bell Tel. Labs., Murray Hill, N.J.

24 Transactions, CT-2, No. 4; CT-3, No. 2; CT-4, No. 2-4; CT-5, No. 1, 2, 3, 4, CT-6, No. 1, 2.

Communications Systems

Annual fee: $2.

Radio and wire telephone, telegraph and facsimile in marine, aeronautical, radio-relay, coaxial cable and fixed station services.

Mr. J. E. Schlaijker, Chairman, IT&T, 67 Broad St., New York 4, N.Y.

14 Transactions, CS-2, No. 1; CS-5, No. 2, 3; CS-6, No. 1, 2; CS-7, No. 1, 2.

Component Parts

Annual fee: $3.

The characteristics, limitation, applications, development, performance and reliability of component parts.

Mr. J. J. Drvostep, Chairman, Sperry Gyroscope Co., Great Neck, N.Y.

16 Transactions, Vol. CP-3, No. 2; CP-4, No. 1, 2, 3-4; CP-5, No. 1, 2, 3, 4; CP-6, No. 1, 2.

Education

Annual fee: $3.

To foster improved relations between the electronic and affiliated industries and schools, colleges, and universities.

Dr. R. L. McFarlan, Chairman, 20 Circuit Rd., Chestnut Hill 67, Mass.

7 Transactions, Vol. E-1, No. 3, 4; E-2, No. 1, 2, 3.

Electron Devices

Annual fee: $3.

Electron devices, including particularly electron tubes and solid state devices.

Dr. W. M. Webster, Chairman, RCA Labs., Princeton, N.J.

25 Transactions, *Vol. ED-1, No. 3-4; ED-3, No. 2-3-4; ED-4, No. 2-3, 4; ED-5, No. 1, 2, 3, 4; ED-6, No. 1, 2.

Electronic Computers

Annual fee: $2.

Design and operation of electronic computers.

Mr. Richard O. Endres, Rese Engineering Co., 731 Arch St., Philadelphia, Pa.

30 Transactions, EC-4, No. 4; EC-6, No. 2, 3; EC-7, No. 1, 2, 3, 4; EC-8, No. 1, 2.

Engineering Management

Annual fee: $3.

Engineering management and administration as applied to technical, industrial and educational activities in the field of electronics.

Dr. Henry M. O'Bryan, Sylvania Elec. Products, 730 3rd Ave., New York 17, N.Y.

15 Transactions, EM-3, No. 2, 3; EM-4, No. 1, 3, 4; EM-5, No. 1-4; EM-6, No. 1, 2.

Engineering Writing and Speech

Annual fee: $2.

The promotion, study, development, and improvement of the techniques of preparation, organization, processing, editing, and delivery of any form of information in the electronic-engineering and related fields by and to individuals and groups by means of direct or derived methods of communication.

Mr. T. T. Patterson, Jr., Chairman, RCA Bldg. 13-2, Camden, N.J.

4 Transactions, Vol. EWS-1, No. 2; EWS-2, No. 1, 2.

Human Factors in Electronics

Annual fee: $2.

Development and application of human factors and knowledge germane to the design of electronic equipment.

Mr. Curtis M. Jansky, Chairman, Royal McBee Corp., Port Chester, N.Y.

-IRE's 28 Professional Groups

Industrial Electronics

Annual fee: $3.

Electronics pertaining to control, treatment and measurement, specifically, in industrial processes.

Mr. J. E. Eiselein, Chairman, RCA Victor Dev., Camden, N.J.

10 Transactions, *PGIE-1-3-5-6-7-8, 9, 10.

Information Theory

Annual fee: $3.

Information theory and its application in radio circuitry and systems.

Dr. Peter Elias, Chairman, MIT, Cambridge 39, Mass.

17 Transactions, PGIT-4, IT-1, No. 2-3; IT-2, No. 2, 3; IT-3, No. 1, 2, 3, 4; IT-4, No. 1, 2, 3, 4; IT-5, No. 1, 2.

Instrumentation

Annual fee: $2.

Measurements and instrumentation utilizing electronic techniques.

Mr. L. C. Smith, Chairman, Image Electronics Inc., 2300 Washington St., Newton Lower Falls 62, Mass.

14 Transactions, 4; Vol. 1-6, No. 2, 3, 4; Vol. 1-7, No. 1, 2, 3, 4; Vol. 1-8, No. 1.

Medical Electronics

Annual fee: $3.

The use of electronic theory and techniques in problems of medicine and biology.

Mr. W. E. Tolles, Chairman, Airborne Instruments Lab., Mineola, N.Y.

14 Transactions, 8, 9, 11, 12, ME-6, No. 1, 2.

Microwave Theory and Techniques

Annual fee: $3.

Microwave theory, microwave circuitry and techniques, microwave measurements and the generation and amplification of microwaves.

Dr. A. A. Oliner, Microwave Research Institute, 55 Johnson St., Brooklyn 1, N.Y.

26 Transactions, MTT-4, No. 3-4; MTT-5, No. 2, 3, 4; MTT-6, No. 1, 2, 3, 4; MTT-7, No. 2, 3.

Military Electronics

Annual fee: $2.

The electronics sciences, systems, activities and services germane to the requirements of the military. Aids other Professional Groups in liaison with the military.

Mr. Henry Randall, Chairman, Office of Asst. Secy. Defense, Pentagon, Washington, D.C.

6 Transactions, MIL-1, No. 1; MIL-2, No. 1; MIL-3, No. 2, 3.

Nuclear Science

Annual fee: $3.

Application of electronic techniques and devices to the nuclear field.

Dr. A. B. Van Rennes, Chairman, Bendix Aviation Corp., Detroit 35, Mich.

13 Transactions, NS-1, No. 1; NS-3, No. 2, 3; NS-4, No. 2; NS-5, No. 1, 2, 3, NS-6, No. 1, 2.

Production Techniques

Annual fee: $2.

New advances and materials applications for the improvement of production techniques, including automation techniques.

Mr. L. M. Ewing, Chairman, General Electric Co., Syracuse, N.Y.

6 Transactions, No. 2-3, 4, 5, 6.

Radio Frequency Techniques

Annual fee: $2.

Origin, effect, control and measurement of radio frequency interference.

Mr. J. P. McNaul, Chairman, Signal Corps, USA's RDL, Ft. Monmouth, N.J.

1 Transaction, RF-1, No. 1.

Reliability and Quality Control

Annual fee: $3.

Techniques of determining and controlling the quality of electronic parts and equipment during their manufacture.

Mr. P. K. McElroy, Chairman General Radio Co., West Concord, Mass.

16 Transactions, *3, 4-5-6, 10, 11, 12, 13, 14, 15, 16.

Space Electronics and Telemetry

Annual fee: $2.

The control of devices and the measurement and recording of data from a remote point by radio.

Mr. C. H. Hoeppner, Chairman, Radiation, Inc., Melbourne, Fla.

12 Transactions, TRC-1, No. 2-3; TRC-2, No. 1; TRC-3, No. 2, 3; TRC-4, No. 1; SET-5, No. 1, 2.

Ultrasonics Engineering

Annual fee: $2.

Ultrasonic measurements and communications, including underwater sound, ultrasonic delay lines, and various chemical and industrial ultrasonic devices.

Dr. Wilfred Roth, Chairman, Roth Lab., Hartford, Conn.

7 Transactions, PGUE-1, 3, 5, 6, 7.

Vehicular Communications

Annual fee: $2.

Communications problems in the field of land and mobile radio services, such as public safety, public utilities, railroads, commercial and transportation, etc.

Mr. A. A. MacDonald, Chairman, Motorola, Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.

12 Transactions, 5, 8, 9, 10, 11, 12.

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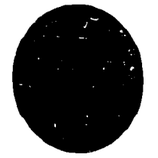

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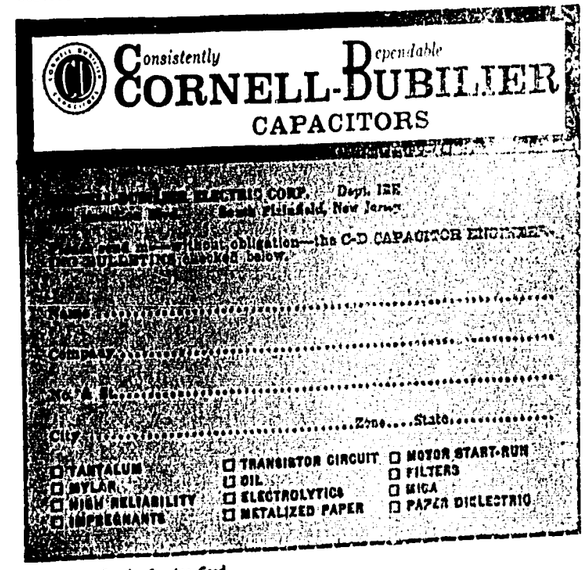

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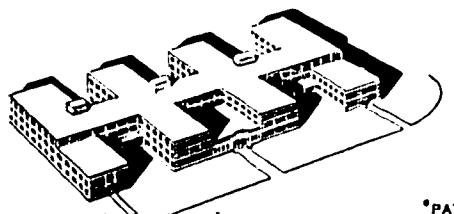

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