1954

IRE DIRECTORY

A YEARBOOK CONTAINING

- A RADIO ENGINEERS' DIRECTORY
- A LIST OF FIRMS AND PRODUCTS

Published by

THE INSTITUTE OF RADIO ENGINEERS, INC.

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THE INSTITUTE

THE INSTITUTE OF RADIO ENGINEERS, located at 1 East 79th Street, 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.

Founded in May, 1912, through the efforts of three far-seeing engineers, Dr. A. N. Goldsmith, J. V. L. Hogan, and R. H. Marriott, the Institute has grown from its original roster of less than fifty members gained by the merger of two small professional societies, to an international membership of over 37,000.

The Institute prepares technical papers, reports and general information of interest to radio engineers. It holds meetings and discussions throughout the United States and Canada. It maintains committees for collating and standardizing the results of technical research and development. Among the fields covered in these activities are radio communication, sound broadcasting, television, marine and aerial guidance, electron tubes, 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 Institute. The President and Vice-President are elected annually from the body of Fellows and Senior Members.

MEMBERSHIP

Membership in the Institute 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 Institute's Constitution.

MEMBERSHIP REQUIREMENTS AND DUES

GRADE	AGE	EXPERIENCE* AND REFERENCES	ENTRANCE FEE	ANNUAL DUES
FELLOW	32	Awarded only. No application permitted.	$3.00	$15.00
SENIOR MEMBER	28	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	15.00
SPECIAL MEMBER	32	Conferred only by invitation of the Board of Directors.	3.00	15.00
MEMBER	24	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	15.00
ASSOCIATE	18	Interest in radio engineering or allied field. REFERENCES: Three Fellows, Senior Members, Members, Associates, or other responsible individuals.	3.00	15.00 & 10.00[1]
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, Sec. 1–5, p. 12.

[1] $10.00 for each year within first five years of Associate membership, starting Jan. 1, 1948. After five years dues automatically increase to $15.00. Five years are retroactive from Jan. 1, 1948, and based on consecutive or intermittent membership.

[2] Special application blank required. When student status expires no entrance fee is required if immediate transfer is made to Associate.

COMMITTEES*

The Institute has established some twenty-three technical committees covering specialized fields of radio engineering. Through the Institute, 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.

CONVENTION

The Institute holds, at least once a year, a technical meeting for its entire membership. At this annual Convention, manufacturers exhibit equipment of recent design and interest to radio engineers. It is believed that by this means, mutual benefit accrues to both engineer and manufacturer through first-hand acquaintance with the activities of one another.

SECTIONS**

Sections have been established throughout the United States, Canada, Territory of Hawaii, and Argentina, to hold meetings under the aegis of the Institute. The sections of the Institute 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 special fields of interest, Professional Groups have been formed in each of several technical fields on an Institute-wide basis. These Groups organize meetings and conferences on subjects of special interest to their members. They issue, also, technical publications, called TRANSACTIONS, to provide a means for ensuring their membership proper coverage of their fields in the publications of the Institute, and for promoting recognition of their leaders among the Institute membership at large.

PUBLICATIONS OF THE INSTITUTE

Proceedings of the I.R.E.

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, for the last twenty-six years Proceedings has been published in twelve numbers annually. In 1939, the name of the journal was shortened to Proceedings of the I.R.E.

The Proceedings of the I.R.E. is the official publication of The Institute of Radio Engineers. In it appear technical papers, discussions, and communications approved by the Editorial Review Committee and the Editorial Board of the Institute, as well as IRE Standards prepared by the Institute technical committees.

To date, about 5,000 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 I.R.E. is mailed gratis to all members; subscription price to nonmembers is $18.00 per year, $19.00 to foreign destinations.

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 as follows:

Antennas and Waveguides:

Definitions of Terms, 1953.

Circuits:

Definitions of Terms in Network Topology, 1950.
Definitions of Terms in the Field of Linear Varying Parameter and Nonlinear Circuits, 1953.

Electroacoustics:

Definitions of Terms, 1951.

Electron Devices:

Methods of Measuring Noise, 1953.

Electron Tubes:

Definitions of Terms, 1950.
Methods of Testing, 1950.
Standards on Magnetrons: Definitions of Terms, 1952.
Gas-filled Radiation Counter-Tubes; Methods of Testing, 1952.
Gas-filled Radiation Counter-Tubes; Definitions of Terms, 1952.

* A list of Committees appears in the June and October issues of Proceedings of the I.R.E.

** A list of Sections and Professional Groups and their officers appears bi-monthly in Proceedings of the I.R.E.

Electronic Computers:

Definitions of Terms, 1950.

Facsimile:

Definitions of Terms, 1942.
Temporary Test Standards. 1943.

Piezoelectric Crystals:

Recommended Terminology, 1945.
Standards on Piezoelectric Crystals, 1949.

Pulses:

Definitions of Terms, Part I, 1951.
Definitions of Terms, Part II, 1952.

Radio Receivers:

Methods of Testing Frequency-Modulation Broadcast Receivers, 1947.
Methods of Testing Amplitude-Modulation Broadcast Receivers, 1948.
Tests for Effects of Mistuning and for Downward Modulation, 1949.
Open Field Method of Measurement of Spurious Radiation from Frequency-Modulation and Television Broadcast Receivers, 1951.
Definitions of Terms, 1952.

Radio Aids to Navigation:

Definitions of Terms, 1949.

Railroad and Vehicular Communications:

Methods of Testing, 1949.

Sound Recording and Reproducing:

Methods for Determining Flutter Content, 1953.

Symbols:

Abbreviations, Graphical Symbols, Letter Symbols, and Mathematical Signs, 1948.
Designations for Electrical, Electronic, and Mechanical Parts and their Symbols, 1949.
Abbreviations of Radio-Electronic Terms, 1951.

Television:

Methods of Testing Television Transmitters, 1947.
Methods of Testing Television Receivers, 1948.
Definitions of Terms, 1948.
Methods of Measurement of Television Signal Levels, Resolution, and Timing of Video Switching Systems, 1950.
Methods of Measurement of Time of Rise, Pulse Width, and Pulse Timing of Video Pulses in Television, 1950.
Methods of Measurement of Electronically Regulated Power Supplies, 1950.

Transducers:

Definitions of Terms, 1951.

Transmitters and Antennas:

Antennas, Modulation Systems, and Transmitters, Definitions of Terms, 1948.
Standards on Antennas: Methods of Testing, 1948.

Volume Measurements:

American Recommended Practice for Volume Measurements of Electrical Speech and Program Waves, 1953.

Wave Propagation:

Definitions of Terms Relating to Guided Waves, 1945.
Definitions of Terms, 1950.

American Standards:

The Institute of Radio Engineers sponsored the publication of two standards of the American Standards Association, as follows:
Loudspeaker Testing. (ASA C16.4–1942.)
Volume Measurements of Electrical Speech and Program Waves. (ASA C16.5–1942.)

AWARDS

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

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

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 calendar year, or the importance of whose contribution to electronic television shall have been realized during the preceding calendar year.

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 Gray 1953
Alda V. Bedford 1954

Morris Liebmann Memorial Prize

The Morris Liebmann Memorial Prize carries a monetary award of varying amount, derived from the income of a $10,000 endowment fund. The fund was donated by E. J. Simon to preserve the memory of Colonel Morris N. Liebmann, who gave his life in the first World War. This prize 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	W. H. Doherty . . .	1937
R. A. Weagant . . .	1920	G. C. Southworth . .	1938
R. A. Heising . . .	1921	H. T. Friis	1939
C. S. Franklin . . .	1922	H. A. Wheeler . . .	1940
H. H. Beverage . . .	1923	P. T. Farnsworth . .	1941
J. R. Carson	1924	S. A. Schelkunoff . .	1942
Frank Conrad . . .	1925	W. L. Barrow . . .	1943
Ralph Bown	1926	W. H. Hansen . . .	1944
A. H. Taylor	1927	P. C. Goldmark . . .	1945
W. G. Cady	1928	Albert Rose	1946
E. V. Appleton . . .	1929	J. R. Pierce	1947
A. W. Hull	1930	S. W. Seeley	1948
Stuart Ballantine . .	1931	C. E. Shannon . . .	1949
Edmond Bruce . . .	1932	O. H. Schade	1950
Heinrich Barkhausen .	1933	R. B. Dome	1951
V. K. Zworykin . . .	1934	William Shockley . .	1952
F. B. Llewellyn . . .	1935	John A. Pierce . . .	1953
B. J. Thompson . . .	1936	Robert R. Warnecke .	1954

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	A. W. Randalls . . .	1950
C. L. Dolph	1947	A. B. Macnee . . .	1951
W. H. Huggins . . .	1948	H. W. Welch, Jr. . .	1952
R. V. Pound	1949	Richard C. Booton, Jr. .	1953
J. F. Hull	1950	R. L. Petritz	1954

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 I.R.E., 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 recommendation of the Awards Committee.

RECIPIENTS OF THE HARRY DIAMOND MEMORIAL AWARD

A. W. Haeff	1950	Newbern Smith . . .	1952
M. J. E. Golay . . .	1951	Robert M. Page . . .	1953
Harold A. Zahl			1954

Editor's Award

The Editor's Award, established in 1948 by the Board of Directors to stimulate the use of good English in technical writing, recognizes that author who, in the opinion of the Editor of the Proceedings of the I.R.E., and upon the recommendation of the Awards Committee and the Board of Directors, submitted an outstanding paper of generally good presentation. It is administered by a subcommittee of the Awards Committee functioning as advisors to the Editor.

RECIPIENTS OF THE EDITOR'S AWARD

E. J. Barlow	1950	E. O. Johnson . . .	1953
W. W. Harman . . .	1951	M. W. Webster . . .	1953
Jerome Freedman . .	1952	P. W. Howells . . .	1954

OFFICERS AND DIRECTORS, 1912-1954

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., 1943–54; Pres., 1949; Treas., 1948.
Baker, W. R. G.	Bd. of Dir., 1940; 1946–53; Pres., 1947; Treas., 1951–54.
*Ballantine, Stuart	Bd. of Dir., 1935–37; Pres., 1935.
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.
Beverage, H. H.	Bd. of Dir., 1936–39; Pres., 1937.
Black, K. C.	Bd. of Dir., 1952.
Bown, Ralph	Bd. of Dir., 1926–29; 1937–39; Pres., 1927; V. Pres., 1926.
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.
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; Secty., 1928–29.
Clement, L. M.	Bd. of Dir., 1945.
Coggeshall, I. S.	Bd. of Dir., 1941–44; 1951–53; Pres., 1951.
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.
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.
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.
Friis, H. T.	Bd. of Dir., 1941–43.
Fuller, L. F.	Bd. of Dir., 1928.
Goldsmith, Alfred N.	Bd. of Dir., 1912–1954; Pres., 1928; Secty., 1918–27; Editor, 1912–28; 1930–53; Editor Emeritus, 1954.
Graf, A. W.	Bd. of Dir., 1952–53.
Graham, Virgil M.	Bd. of Dir., 1935–41; 1946–48.
*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.
Hammond, J. H., Jr.	Bd. of Dir., 1912–17; Treas., 1913–14.
Hanson, O. B.	Bd. of Dir., 1938–43.
Hazeltine, Alan	Bd. of Dir., 1923–28; 1936–39; Pres., 1936.
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., 1953–54.
Henney, Keith	Bd. of Dir., 1945–48.
Hewlett, W. R.	Bd. of Dir., 1950–54; 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., 1931–32.
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.
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.
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., 1952–54.
*Lowenstein, Fritz	Bd. of Dir., 1912; V. Pres., 1912.

*DECEASED.

Name	Office held
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.
McDonald, A. S.	Bd. of Dir., 1949; V. Pres., 1949.
*McNicol, Donald	Bd. of Dir., 1919–28; Pres., 1926; V. Pres., 1925.
McRae, J. W.	Bd. of Dir., 1949–54; 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.
Nichols, H. W.	Bd. of Dir., 1924–25.
Oxley, A. B.	Bd. of Dir., 1951–52.
Packard, L. E.	Bd. of Dir., 1954.
*Pedersen, P. O.	Bd. of Dir., 1939; V. Pres., 1939.
Pettit, J. M.	Bd. of Dir., 1954.
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; Editor, 1954.
Piore, E. R.	Bd. of Dir., 1951.
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., 1935–54; Pres., 1938; Treas., 1941–42; Secty., 1943–54.
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.
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.
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., 1952–54.
Sarnoff, David	Bd. of Dir., 1915–20; Secty., 1915–17.
Shackelford, B. E.	Bd. of Dir., 1945–50; 1953–54; 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; Secty., 1912–14.
Sinclair, D. B.	Bd. of Dir., 1945–54; Pres., 1952; 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.
Taylor, A. H.	Bd. of Dir., 1929–31; Pres., 1929.
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.
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.
Watson-Watt, R. A.	Bd. of Dir., 1950; V. Pres., 1950.
*Weagant, R. A.	Bd. of Dir., 1913–17.
Weber, Ernst	Bd. of Dir., 1952–54.
Webb, W. L.	Bd. of Dir., 1946.
Webster, E. M.	Bd. of Dir., 1946.
Wells, H. W.	Bd. of Dir., 1954.
Westman, H. P.	Bd. of Dir., 1930–42; Secty., 1930–42.
Wheeler, H. A.	Bd. of Dir., 1934; 1940–45.
Wheeler, L. P.	Bd. of Dir., 1940–45; Pres., 1943.
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.
Wolff, Irving	Bd. of Dir., 1952–53.
Zahl, H. A.	Bd. of Dir., 1949.
Zenneck, Jonathan	Bd. of Dir., 1933; V. Pres., 1933.

*DECEASED.

THE INSTITUTE OF RADIO ENGINEERS

(Incorporated, August 23, 1913)

CONSTITUTION

Adopted at the First Meeting of The Institute of Radio Engineers, May 13, 1912.
Amended, November 2, 1914; December 5, 1915; October 7, 1931; March 1, 1939; November 5, 1941; September 8, 1943; November 29, 1944; May 5, 1945; December 15, 1945; June 27, 1946; July 30, 1946; and August 15, 1947.

ARTICLE I

NAME AND OBJECT

SEC. 1—The name of this organization shall be The Institute of Radio Engineers, Incorporated.

SEC. 2—Its objects shall be scientific, literary, and educational. Its aims shall include the advancement of the theory and practice of radio, and allied branches of engineering and of the related arts and sciences, their application to human needs, and the maintenance of a high professional standing among its members. Among the means to this end shall be the holding of meetings for the reading and discussion of professional papers and the publication of papers, discussions, communications, and such other matters as may be appropriate for the fulfillment of its objects.

ARTICLE II

MEMBERSHIP

SEC. 1—The membership of the Institute shall consist of:

a. Fellows, who shall be entitled to all rights and privileges of the Institute.

b. Senior Members, who shall be entitled to all rights and privileges of the Institute.

c. Special Members, who shall be entitled to all rights and privileges of the Institute except the right to hold the offices of President and Vice President.

d. Members, who shall be entitled to all rights and privileges of the Institute except the right to hold the offices of President, Vice President, and Director.

e. Associates, who shall have such rights and privileges as are provided by the Bylaws. However, Associates who have maintained a continuous membership in this grade since March 1, 1939, shall have the right to vote and shall be entitled to all rights and privileges of the Institute except the right to hold any corporate office, the office of Director, and the chairmanships of standing Committees and of Sections.

f. Students, who shall have such rights and privileges as are provided by the Bylaws.

SEC. 2—The qualifications for the various grades of membership shall be specified in the Bylaws in accordance with the following principles:

a. Fellow is a grade of unusual professional distinction and shall be conferred only by invitation of the Board of Directors.

b. Senior Member is the highest professional grade for which application may be made and shall require experience or attainment reflecting professional maturity.

c. Special Member is a grade limited to those who have shown an interest in furthering the radio or allied arts and sciences and who have attained such position or prestige that by membership they shall advance the objectives of the Institute. This grade shall be conferred only by invitation of the Board of Directors.

d. Member is a professional grade limited to those who have demonstrated professional competence in radio or allied fields.

e. Associate grade shall be open to those interested in the theory or practice of radio engineering or the allied arts and sciences.

f. Student grade shall be open to those devoting a major part of their time as registered students in a regular course of study in engineering or science in a school of appropriate standing. Membership in this grade may extend a limited time after termination of student status.

SEC. 3—The requirements for admission, transfers, and severance of members shall be specified in the Bylaws.

SEC. 4—The term "allied" as used in this Constitution and Bylaws refers to electrical communication, electronics, and such other technical fields as are directly contributory to, or derived from radio.

SEC. 5—The terms "member" and "membership" when printed without an initial capital where used in this Constitution and Bylaws include all grades.

SEC. 6—The term "voting member" where used in this Constitution and Bylaws means a member entitled to vote on Institute matters.

ARTICLE III

DUES AND FEES

SEC. 1—Dues and fees shall be specified in the Bylaws.

SEC. 2—Under exceptional circumstances, the payment of fees and dues may be deferred or waived in whole or in part by the Board of Directors.

ARTICLE IV

OFFICERS AND DIRECTORS

SEC. 1—The governing body of the Institute shall be the Board of Directors and shall consist of the President, Vice President, Secretary, Treasurer, Editor, six Directors elected-at-large, three appointed Directors, one Regional Director elected by each Region, and the two most recent past Presidents.

SEC. 2—The Corporate Officers of the Institute shall be the President, Vice President, Secretary, Treasurer, and Editor.

SEC. 3—The terms of office for Directors elected-at-large shall be for three years; for appointed Directors, one year; for Regional Directors, two years; and for all Corporate Officers, one year, except as provided in Article VI, Section 1.

SEC. 4—Each year of a term of office established in Article IV shall begin with the assembly of the Board of Directors at its annual meeting and terminate with the assembly of the Board of Directors at its following annual meeting.

SEC. 5—No Corporate Officer or Director shall receive, directly or indirectly, any salary, traveling expenses, compensation, or emolument from the Institute, unless authorized by the Board of Directors or by the Bylaws.

SEC. 6—The United States and Canada, and other areas at the discretion of the Board of Directors, shall be divided into Regions, which shall be specified in the Bylaws. The Board of Directors shall delineate the Regions, make changes in the number of Regions, as it deems desirable, and number the Regions with consecutive numbers. The voting members of each Region shall elect one representative who shall thereby become a member of the Board of Directors and be designated a Regional Director.

ARTICLE V

MANAGEMENT

SEC. 1—The President shall be the regular presiding officer at meetings of the Board of Directors and at meetings of the Institute. He shall be an ex-officio member of each committee.

The Vice President shall assume the duties of the President in the absence or incapacity of the President.

In the event that neither the President nor the Vice President can personally act, the Board of Directors may elect a chairman from its membership who is authorized to perform the presidential duties during the period of the incapacity of the President and Vice President. The tenure of such temporary chairmen shall be at the discretion of the Board of Directors.

SEC. 2—The Board of Directors shall manage the affairs of the Institute. An annual report on the activities and finances of the Institute shall be made to the members.

Eight members of the Board of Directors shall constitute a quorum.

SEC. 3—The Board of Directors may make, amend, or revoke Bylaws to this Constitution. The proposed changes and reasons therefore shall be mailed to all members of the Board at least twenty days before the stipulated meeting at which the vote shall be taken. Two-thirds of all votes cast at the stipulated meeting shall be required to approve any new Bylaw, amendment, or revocation.

SEC. 4.—The Secretary shall be responsible for the preparation for all meetings of the Board of Directors and all principal meetings of the Institute and the recording of the minutes of such meetings. He shall be responsible for the correspondence of the Institute and the keeping of full records thereof, and shall be responsible for the provision of such information from them as is requested by the Board of Directors.

SEC. 5—The Treasurer, under the control of the Board of Directors, shall have general supervision of the fiscal affairs of the Institute and shall be responsible for the keeping of the books of account. An annual audit of the affairs of the Institute shall be made by certified public accountants and submitted to the Board.

SEC. 6—All funds received by the Institute shall be deposited in an account requiring the signatures of at least two of the following for withdrawal: President, Vice President, Secretary, Treasurer, and Editor. Funds from this account may be deposited in other accounts authorized and limited in size by the Board of Directors. Funds from these accounts shall be withdrawable on the signatures of authorized bonded individuals for current disbursements. Before additional funds are transferred from the first-mentioned account to another account, the individuals responsible for such other accounts shall submit a statement of the disposition of the previously expended funds to the Treasurer.

SEC. 7—All committees shall be appointed by the Board of Directors or in such manner as the Board may designate.

SEC. 8—The fiscal year of the Institute shall end with the thirty-first day of December.

ARTICLE VI

NOMINATION, ELECTION, AND APPOINTMENT OF OFFICERS AND DIRECTORS

SEC. 1—On or before July first of each year, the Board of Directors shall submit to qualified voters a list of nominations containing at least one name each for the offices of President and Vice President, at least four names for the office of Director elected-at-large, the names of all nominees for the office of Regional Director, and shall entertain nominations by petition for all of the offices specified.

Nominations by petition may be made by letter to the Board of Directors setting forth the name of the proposed candidate and the office for which it is desired he be nominated. For acceptance a letter of petition must reach the Institute office before twelve o'clock noon on the last weekday prior to August fifteenth of any year and shall be signed by at least one hundred voting members qualified to vote for the office of the candidate nominated.

Each proposed nominee shall be consulted and if he so requests his name shall be withdrawn. The names of proposed nominees who are not eligible under the Constitution shall be withdrawn by the Board.

On or before September first, the Board of Directors shall submit to all voting members as of August fifteenth, a list of nominees for the offices of President, Vice President, and Director elected-at-large, and shall submit to all such voting members of each Region a list of their nominees for the office of Regional Director, the names of the nominees for each office being arranged in alphabetical order. The ballots shall carry a statement to the effect that the order of the names is alphabetical for convenience only and indicates no preference.

Voting members shall vote for the candidates whose names appear on the list of nominees, by written ballots in plain sealed envelopes, enclosed within mailing envelopes marked "Ballot" and bearing the member's written signature. No ballots within unsigned outer envelopes shall be counted. No votes by proxy shall be counted. Only ballots arriving at the Institute office before twelve o'clock noon on the last weekday prior to October twenty-fifth shall be counted. Ballots shall be checked, opened, and counted under the supervision of the Tellers Committee between October twenty-fifth and the first Wednesday in November. The result of the count shall be reported to the Board of Directors at its next succeeding meeting and the nominees for President and Vice President, the two nominees for Director elected-at-large, and the nominees for each office of Regional Director receiving the greatest number of qualified votes shall be declared elected. In the event of a tie vote the Board shall choose between the nominees involved.

Nominees for the office of Regional Director shall be members of and live in the Regions which nominate them. They shall be elected by the voting members of the Institute in the Region. The Regional Directors from even- and odd-numbered Regions shall be chosen by the Regions in even- and odd-numbered years, respectively. In placing the Regional Representation Plan into operation, or when new Regions are established, or when changes are made in Regions, candidates for the office of Regional Director may be nominated and elected for one-year terms as required to ensure representation during the period preceding their normal election years. No Regional Director shall have his term shortened by changes in Regions. Each Region shall have a Regional Committee whose duties shall include making at least one nomination for Regional Director from its Region during election years. In the event a Regional Director dies, is unable to serve, or is disqualified by removal from the Region, the Regional Committee shall appoint a Regional Director for the unexpired portion of the term. The organization and procedure of the Regional Committees for nominating candidates for Regional Director shall be specified in the Bylaws.

SEC. 2—The Secretary, Treasurer, Editor, and three appointed Directors shall be appointed by the Board of Directors at its annual meeting to serve until the next annual meeting or until their successors are appointed and accept.

SEC. 3—The Board of Directors is authorized to fill a vacancy other than Regional Director occurring in the governing body.

ARTICLE VII

MEETINGS

SEC. 1—There shall be an annual meeting of the Board of Directors during January of each year at which newly elected officers shall begin their terms of service, and the Board shall make necessary appointments.

SEC. 2—There shall be an annual meeting of the Institute as soon as practicable after the annual meeting of the Board of Directors at which reports of the Secretary and Treasurer shall be presented.

SEC. 3—Meetings of the Board may be held at such times as are necessary to carry out the provisions of this Constitution and shall be held at such other times as any five members of the Board may determine, but only on notice to all members of the Board. The method of calling such special meetings shall be specified in the Bylaws.

ARTICLE VIII

SECTIONS AND OTHER GROUPS

SEC. 1—The Board of Directors may authorize the establishment of Sections and other groups of members for the purpose of promoting the interests of the Institute. The Board of Directors may, at its discretion, terminate the existence of any such group.

ARTICLE IX

AMENDMENTS

SEC. 1—Amendments to this Constitution may be proposed by means of a resolution adopted by the Board of Directors or by means of a petition signed by at least one hundred voting members. Such proposed amendment or amendments shall be submitted to legal counsel by the Board of Directors, and if, in the opinion of such counsel, they are in accordance with the laws under which the Institute is organized, a copy shall be mailed with a ballot to each voting member.

SEC. 2—Constitutional amendment ballots shall be mailed to the voting members at least sixty days before the date appointed for counting the ballots and the ballots shall carry a statement of the time limit for their return to the Institute office. The ballots after marking shall be placed in plain sealed envelopes, enclosed within mailing envelopes marked "Ballot" and bearing the member's written signature. Only ballots within signed outer envelopes shall be counted. No votes by proxy shall be counted. Only ballots arriving at the Institute office prior to the stated time limit shall be counted. The Tellers Committee shall count such votes and report to the Board of Directors at its next meeting. If the total vote be at least twenty per cent of the total voting membership and if at least sixty-seven per cent of all votes cast shall be favorable, the proposed amendment or amendments shall be immediately declared by the Tellers Committee to be adopted.

SEC. 3—Amendments shall take effect thirty days after their adoption but officers and officers-elect of the Institute at the time any amendment becomes effective shall continue in office until the end of the terms for which they were elected.

SEC. 4—Copies of the amendments shall be distributed to the members as soon as practicable after adoption.

SEC. 5—A complete history of amendments shall be kept in the files of the Institute.

BYLAWS

(As of May 15, 1954)

Article V, Section 3, of the Institute Constitution provides for Bylaws as follows:

"The Board of Directors may make, amend, or revoke Bylaws to this Constitution. The proposed changes and reasons therefore shall be mailed to all members of the Board at least twenty days before the stipulated meeting at which the vote shall be taken. Two-thirds of all votes cast at the stipulated meeting shall be required to approve any new Bylaw, amendment, or revocation."

MEMBERSHIP QUALIFICATIONS

SEC. 1—Fellow: The grade of Fellow shall be conferred only upon a person who is at least thirty-two years of age and who is:

a. An engineer or scientist in radio or allied fields. As such he shall have attained distinction in his profession and shall be eminently qualified to take responsible charge of important radio or allied work. He shall have been in the active practice of his profession for at least ten years, and shall have had responsible charge of important radio or allied work for at least three years, or

b. A professor of engineering or of physical science. As such he shall have attained special distinction as an expounder of the principles of engineering or of science in radio or allied fields. He shall have had at least ten years' experience as a teacher of electrical or physical subjects and shall have had responsible charge for at least three years, of a course in radio or allied subjects in a school of recognized standing, or

c. A person who has done notable original work contributing to the advancement of engineering or science in radio or allied fields, which has given him a recognized standing at least equivalent to that required for Fellow under paragraph "a" or "b," or

d. A person regularly engaged in radio or allied work for at least ten years, who, by invention or contribution to the advancement of engineering or science in radio or allied fields, or to the technical literature thereof, has attained a standing at least equivalent to that required for Fellow under paragraph "a" or "b."

SEC. 2—Senior Member: For admission or transfer to the grade of Senior Member, a candidate shall be at least twenty-eight years of age and shall be:

a. An engineer or scientist in radio or allied fields. As such he shall have been in the active practice of his profession for at least eight years, and shall have performed or taken responsibility for important engineering or scientific work in these fields for at least three of these years, or

b. A teacher of radio or allied subjects for at least eight years in a school of recognized standing. As such he shall have been in responsible charge of a major course in such subjects for at least three years, or

c. A person regularly employed in radio or allied fields for at least eight 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 Senior Member under paragraph "a," or

d. An executive who, for at least eight years, has had under his direction important engineering or research work in radio or allied fields and who is qualified for direct supervision of the technical or scientific features of such activities, or

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.

SEC. 2-A—Special Member: The grade of Special Member shall be conferred only upon a person who is at least thirty-two years of age and who meets the requirements of the grade set forth in the Constitution. Proposals for election to the grade, together with supporting information, may be presented by a member of the Board of Directors at any meeting of the Board. After full consideration at a Board meeting, the proposal, unless withdrawn, shall be placed on the agenda for action at the next Board meeting. A favorable vote of at least two-thirds of the members of the Board present shall be required for election.

SEC. 3—Member: For admission or transfer to the grade of Member, a candidate shall be at least twenty-four years of age and shall be either:

a. An engineer or scientist in radio or allied fields. As such he shall have demonstrated competence in engineering or scientific work of a professional character and shall have been in active practice of his profession for at least three years, or

b. A teacher of radio or allied subjects for at least three years. As such he shall have attained a professional standing equivalent to that required for Member under paragraph "a," or

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," or

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, or

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."

Sec. 4—Associate: For admission or transfer to the grade of Associate, a candidate shall be at least eighteen years of age and shall be interested in the theory or practice of radio engineering or of the allied arts and sciences.

Sec. 5—Student: For admission to the grade of Student, a candidate shall be

a. devoting a major portion of his time as a registered student in a regular course of study in engineering or science in a school of recognized standing, or

b. devoting a major portion of his time as a resident and registered student in a regular course of study in radio and electronics in a technical institute approved by the Board of Directors for Student membership purposes only.

Membership in this grade shall not extend more than six months beyond the termination of his student status as described above.

Sec. 6—The expression, "school of recognized standing," includes only schools which provide an engineering or scientific curriculum of not less than four years leading to a degree and which are designated as such by the Board of Directors.

Sec. 7—Graduation from a radio or allied curriculum in an accredited professional school shall be accepted as equivalent to two years' experience in radio or allied fields.

Graduation from a radio, arts and sciences or equivalent curriculum in an accredited non-professional school may be accepted as equivalent to two years' experience in radio or allied fields.

Graduation from an unaccredited radio or allied curriculum in a professional accredited school may be accepted as equivalent to one year's experience in radio or allied fields.

Full-time graduate work or part-time graduate work with teaching, in a radio or allied course in a school of recognized standing may be accepted as equivalent to professional experience.

Sec. 8—The time requirements for admission or transfer to any grade of membership may be satisfied by applying pro rata the experience of the candidate under the various alternative requirements for that grade.

Sec. 9—Members are authorized to assert Institute affiliation. In doing so, they should indicate their grade of membership and, if necessary, use the following abbreviations:

Fellow—Fellow I. R. E.
Senior Member—Sen. Mem. I. R. E.
Special Member—Spec. Mem. I. R. E.
Member—Mem. I. R. E.
Associate—Assoc. I. R. E.

Sec. 10—The emblem of the Institute is copyrighted and shall be reproduced only in connection with official business of the Institute.

MEMBERSHIP APPLICATIONS

Sec. 11—Applicants for membership shall furnish names of references as follows:

For Senior Member—Five Fellows or Senior Members.
For Member—Four Fellows, Senior Members, or Members.
For Associate—Three Fellows, Senior Members, Members, Associates, or other responsible individuals.
For Student—A member of the faculty of his school.

Sec. 12—When an applicant for Senior Member or Member shows that his work or location is such as to make impracticable compliance with Section 11, the names of persons who are familiar with his professional work may be substituted. The Admissions Committee shall exercise discretion in determining suitability of substitute references and waiving Section 11.

Sec. 13—Applications for admission or transfer to any grade of membership, except Fellow or Special Member, shall be addressed to the Board of Directors and submitted to the Institute office. Election or transfer of an applicant to any grade, except Fellow or Special Member, shall be made by two-thirds affirmative vote of the Board membership voting, or a two-thirds affirmative vote of a committee of Board members duly authorized in the Bylaws to act for the Board in electing members or transferring their membership grades.

Sec. 14—The Executive Committee is authorized to act for the Board of Directors in electing members or transferring their membership grades in the case of all except Fellow and Special Member grades, and may waive age, application, and reference requirements in the transfer of members in grade from Student to Associate. The Executive Committee shall handle readmissions on the basis of policies established by the Board of Directors.

Sec. 15—A reapplication for admission or transfer to a particular grade may be made by the applicant after the expiration of one year from the date of a rejection.

MEMBERSHIP PROPOSALS

Sec. 16—Admission or transfer to Fellow or Special Member grade shall be by invitation by the Board of Directors only.

Sec. 17—Each year, the Awards Committee shall recommend to the Board of Directors nominees for Fellow Grade not more than seventy-five (75) in number. A citation summarizing the accomplishments of the nominee shall be a part of each recommendation.

Sec. 18—Diplomas shall be presented to the newly-elected Fellows. If practicable, this presentation shall be made by the President at the next annual Convention.

Sec. 19—Before the election of any candidate to the grade of Special Member, the Board of Directors shall refer the proposal to the Public Relations Committee for study. The Public Relations Committee shall make its recommendations, with respect to each name so referred, directly to the Board of Directors.

Sec. 20—Admission or transfer to any grade except Fellow or Special Member may be proposed by any member acting as sponsor, or by the Membership Committee, by supplying to the Admissions Committee sufficient information and testimonials from the required number of references to satisfy the Admissions Committee as to qualifications. Such proposals shall be acted upon by the Admissions Committee, and if approved, transmitted to the Executive Committee for their action. If approved by the Executive Committee, an invitation blank shall be sent to the proposed member inviting him to accept the grade of membership proposed, which membership grade shall become effective automatically and immediately upon his supplying the biographical and professional information required, and paying the necessary dues and fees. The name of an invitee shall be placed on the mailing list for the Proceedings of the I.R.E. immediately upon receipt of dues and fees. The proposal and invitation blanks shall be drawn up by the Membership Committee so as to avoid unconstitutional action due to the sponsor supplying incorrect information.

Sec. 21—The Membership Committee may recommend for transfer to higher grade those members whom they think are qualified.

ADMISSIONS AND TRANSFERS

Sec. 22—The entrance fee for all grades shall be three dollars ($3) except that there shall be no entrance fee for Student grades.

Sec. 22A—No entrance fee shall be charged any non-I.R.E. member of a Joint Student Branch, who is a student member of another national engineering society which is a sponsor of the Joint Student Branch, and who applies for admission to membership in the Institute within six months of the termination of his student status.

Sec. 23—There shall be no transfer fees. A member whose grade of membership is changed during his annual dues period shall be billed pro rata for the remainder of that period.

Sec. 24—The name of every newly-admitted or transferred Senior Member, Special Member, Member, or Associate shall be published in the Proceedings of the I.R.E.

Sec. 25—When an applicant for membership is elected, the membership period shall be dated as of the first day of the month in which election occurs.

Sec. 26—The entrance fee and dues are payable on notification of election, and, if not received within six months from notification, the election shall be considered void.

Sec. 27—A notice of his election shall be sent to every newly admitted member together with a bill for his entrance fee and dues, if not previously paid, dues being computed for the annual period beginning with the first day of the month in which his election occurs. His entrance fee or dues remaining unpaid, additional bills shall be sent the newly-elected member 60 days and 120 days after notification of his election, in the last instance accompanied by a warning that his election will be considered void if his entrance fee and dues are not received within six months of his notification of election.

The names of all individuals elected to membership who fail to pay entrance fees or dues within six months of notification of election, shall be turned over to the Membership Committee.

ANNUAL DUES

Sec. 28—Every member's annual dues period and the period during which he shall receive publications of the Institute shall run concurrently with his membership period. The annual dues shall be payable in advance at the beginning of the annual dues period.

Sec. 29—For annual dues periods beginning January 1, 1951, or thereafter, the annual dues for all grades shall be fifteen dollars ($15), except for Student which shall be five dollars ($5), and except for Associate which shall be ten dollars ($10) for each year which is within the first five years of membership in any grade or grades other than Student. Beginning with the Sixth such year, the annual Associate dues shall be fifteen dollars ($15).

Sec. 30—The Board, by this Bylaw, waives the dues of each and every member of the Institute who has attained the age of 65 years and has been a member of the Institute for 35 years.

BILLING

Sec. 31—A bill covering his dues for the following year shall be mailed to every member not later than one month prior to the beginning of his annual dues period. A second bill shall be mailed after a lapse of two months to every member whose dues remain unpaid. There shall be mailed with the second bill a notice that, if the member's dues remain unpaid for four months, it shall be the duty of the Executive Secretary, in accordance with the Bylaws of the Institute, to notify the member that his membership has terminated.

After a member has been in arrears four months, his membership shall terminate and his name shall be removed from the roll of membership. Every such member shall be mailed a notice to the effect that, according to the Bylaws of the Institute, his membership in the Institute has in fact terminated. Accompanying the notice of termination shall be a final bill, with the suggestion that the member pay the bill and resume his membership. A list of terminated membership shall be turned over each month to the Membership Committee.

Membership so terminated may be resumed on payment of all dues in arrears, or on payment of a new entrance fee and current dues.

Sec. 32—For purposes of Article II, Section 1-e, of the Constitution, resumption of membership as provided under Bylaws Sections 31 and 36, shall not constitute maintenance of continuous membership.

Sec. 33—The mailing of bills or statements to the last known address of a member shall be considered a valid notice of indebtedness.

Sec. 34—On resuming membership and paying dues in arrears, a member may receive available copies of the Proceedings of the I.R.E. during the period covered by the back dues. A rebate of 25 cents per copy will be made in lieu of copies of the Proceedings of the I.R.E. not available.

SEVERANCES

Sec. 35—A member in good standing may resign by submitting a written resignation to the Secretary.

Sec. 36—Subject to the approval of the Board of Directors, a resigned member may resume his membership upon payment of current dues.

Sec. 37—To initiate action toward expulsion of a member, a written complaint must be submitted to the Board of Directors, which, if it deems the reason sufficient, shall notify the accused by letter of the charges against him and of the place and date of the hearing, which shall be at least twenty days away. The accused may present his defense in person, in writing, or by an authorized representative. There shall be a majority of the members of the Board of Directors present at the hearing and the votes cast must be unanimous in order to expel. The action of the Board of Directors shall be final and conclusive.

Sec. 38—The Secretary shall, as soon as possible after the end of each year, present to the Board of Directors a report giving the number of members of each grade at the close of the year, and the gains and losses in each grade of membership during the year as a result of elections, transfers, reinstatements, debts, resignations, failure to pay dues, and all other causes. This report shall also give the number of newly-elected members whose elections become void during the year through the failure to pay entrance fee and initial dues, and the number of newly-elected members who at the end of the year have not yet paid entrance fee and initial dues but whose election is still effective as of that date.

BOARD OF DIRECTORS

Sec. 39—The annual meeting of the Board of Directors required by the Constitution to be held during January of each year, shall be held in the office of the Institute in New York, N.Y. Scheduled meetings of the Board shall be held on the first Wednesday of May and the first Wednesday after the second Monday in November, the place to be determined by the Board at the annual meeting in January, subject to change as provided for in Sec. 40 of the Bylaws. At the annual meeting, the Board shall determine the time and place of other scheduled meetings to be held throughout the year, subject to change as provided in Sec. 40 of the Bylaws.

Sec. 40—The time or place of any scheduled Board meeting may be altered or the meeting cancelled only by consent of a majority of all Board members not less than twenty days before the original date or the new date set for the meeting, whichever is the earlier. Notice of such approved change shall be given all Board members by mailing notice not less than ten days before the original or the new date, whichever is the earlier.

Sec. 41—As provided in the Constitution, special meetings of the Board of Directors may be called by any five members of the Board on notice to all other members. Notice of such special meeting, giving the time and place of meeting, the purpose of the meeting, and the names of the Board members calling the meeting shall be mailed to all Board members not less than twenty days before the date set for the special meeting. The place of such special meetings may be only the Institute office in New York, N.Y., unless otherwise authorized by a majority vote of all Board members.

EXECUTIVE COMMITTEE

Sec. 42—The Board of Directors, in managing the affairs of the Institute according to the Constitution, shall appoint a committee of Officers and members of the Board of Directors called the Executive Committee, to exercise powers and assume duties of executive management, to the extent that the Board of Directors directs, and as outlined in Bylaws, subject to the following limitations: that the Board may, by a majority vote of those present at any meeting, overrule any act or decision of the Executive Committee, except insofar as any act has in fact been carried out, or suspend at any meeting any power conferred upon the Executive Committee, such suspension to remain in effect pending repeal of the Bylaw conferring such power, or direct any action or plan of the Executive Committee.

Sec. 43—The President, the Secretary, the Treasurer, the Editor, and at least two other members of the Board of Directors shall comprise the Executive Committee. The President shall be Chairman, the Treasurer shall be Vice Chairman, and the Secretary shall be Secretary of the Executive Committee. The terms of appointments of all members of the Executive Committee, except the President, shall start with the first meeting of the Committee after appointment and shall continue notwithstanding any change in status on the Board until the first meeting of the succeeding Executive Committee.

Sec. 44—The Executive Committee shall appoint, direct, and co-ordinate the work of all standing committees except the Appointments, Awards, Constitution and Laws, Editorial Board, Executive, Nominations, Policy Advisory, and Tellers Committees.

Sec. 45—The Executive Committee shall prepare, and present an annual budget to the Board of Directors for approval.

Sec. 46—The Executive Committee shall be responsible for the management of the office of the Institute, which shall include special activities, technical activities, office operations, accounting, advertising, and publications, and the setting of salaries (with the exception of Officers' salaries) in all instances in the limits of the budget. Such activities as the Executive Committee shall direct shall be administered by the Executive Secretary. The salary of the Executive Secretary shall be determined by the Executive Committee.

Sec. 47—The Executive Committee shall set dates and locations of conventions, conferences, and meetings of the Institute and shall manage them.

Sec. 48—The Executive Committee shall supervise the formation and operation of Sections, Professional Groups, and other groups of members and propose their approval to the Board of Directors.

Sec. 49—The Executive Committee shall direct and manage Institute standardization activities including relations with other organizations.

Sec. 50—The Executive Committee may divide its duties and responsibilities among its members as it sees fit and conduct its business as it finds necessary, and shall formulate a "Code of Administrative Practice."

Sec. 51—Minutes of the meetings of the Executive Committee shall be mailed to the members of the Board of Directors.

Sec. 52—In addition to its other duties, the Executive Committee is charged with broadly considering Institute policies, and making appropriate recommendations to the Board of Directors on its own initiative.

NOMINATIONS

Sec. 53—The Secretary shall circularize all Section chairmen and secretaries before March first of each year requesting the submission of suitable names to be considered by the Nominations Committee for the various elective offices.

Sec. 54—The Nominations Committee shall submit more than one name for each elective office.

Sec. 55—The Nominations Committee shall transmit its list of proposed nominees to members of the Board of Directors at least one week before the date at which the Board is expected to act upon them.

Sec. 56—When the Board of Directors has not scheduled a meeting to be held between August 14 and September 1 of each year, the Executive Committee is authorized to take any necessary actions on any petitions and to approve the ballot.

REGIONS

Sec. 57—The United States shall be divided into seven (7) Regions, which shall be given consecutive numbers for identification, and the eighth (8th) Region shall be the Canadian Region.

Regions which fail to maintain resonable activity may, at the discretion of the Board of Directors, be dissolved and the Sections may be absorbed into other Regions.

Sec. 58—The Regional Committee of each Region shall consist of the Regional Director, the junior past Regional Director, and two representatives of each Section in the Region, one of these to be the Chairman of the Section, and the other to be appointed by the Executive Committee of the Section from among a group comprised of the junior past Chairman and the present elected officers of the Section. Each member of the Regional Committee shall be, ex-officio, a member of the Executive Committee of his own Section. In case of necessity, a Section may be represented at a Regional Committee meeting by alternates appointed by the Section Executive Committee.

Sec. 58-1—In addition to the duties specified in the Constitution, the Regional Committee shall be expected to participate in the development of the Institute by means of suggestions, on national matters, to the Board of Directors, and on Regional and Sectional matters, to the Sections comprising the Region.

Sec. 59—Pending installation of the first Regional Director of each Region, the chairman of the largest Section numerically in the Region shall act as chairman pro tem, and the chairman pro tem shall appoint a secretary-treasurer pro tem who shall act until the secretary-treasurer of the Regional Committee is appointed.

The Regional Director shall be chairman of the Regional Committee and shall appoint a vice chairman from the membership of the committee. The chairman of the Regional Committee shall appoint a secretary-treasurer from members of the Region for a two year term concurrent with that of the chairman. The duties of the secretary-treasurer shall include correspondence, the keeping of the minutes of the committee meetings, mailing notices, handling of funds, the keeping of financial records and the submission of a report at the end of each year, and such other duties as are assigned to him by the chairman. The secretary-treasurer shall not be a voting member of the committee.

Sec. 60—Each Regional Committee shall submit to the Board of Directors by May first of the Regional election year, the names of at least one qualified nominee for the office of Regional Director. To qualify, each candidate shall indicate to the Regional Committee his acceptance of the nomination.

Sec. 61—Each member of the Regional Committee shall be of Member, Special Member, Senior Member, or Fellow grade in the Institute. Vacancies, except for Regional Director shall be filled by appointment by the Executive Committee of the Section in which the vacancy exists. The term of office shall be one year concurrent with the term of office of the Section officers.

Sec. 62—The Regional Committee shall hold at least one meeting per year. A quorum for the transaction of business at meetings of the Regional Committee shall consist of at least one-third of the members of the Committee or their alternates and shall include representatives from at least half the Sections in the Region. The chairman, or in the event of his unavailability, the vice chairman of the Regional Committee, shall be responsible for calling the necessary number of Regional Committee meetings.

SECTIONS

Sec. 63—A petition for the formation of a Section shall be signed by not fewer than twenty-five (25) members, other than Students, with mailing addresses within the territorial limits proposed in the petition.

Sec. 64—The Executive Committee, upon receipt of a petition to form a Section, and after arranging for the territory to be encompassed by the new Section, may authorize its formation. After the Section is organized and a Constitution adopted, the Executive Committee may give tentative approval to its establishment pending submission to the Board of Directors for final approval.

Sec. 65—Each Section authorized by the Executive Committee, shall within not more than six months thereafter accept and conform to a Constitution provided by the Executive Committee.

Sec. 66—No Section or any officer or representative thereof shall have any authority to contract debts for, pledge the credit of, or in any way bind, the Institute.

Sec. 67—Section Secretaries shall forward to the Secretary of the Institute a report of each meeting held by the Section and its Subsections for the presentation or discussion of papers, and at the end of each fiscal year, a financial statement for that fiscal year.

Sec. 68—Local non-compulsory financial contributions may be accepted by Sections.

Sec. 69—All Sections shall be exclusively those of the Institute. No joint Section shall be recognized. However, Sections of the Institute may cooperate with other organizations in the holding of joint meetings and may invite members of such organizations and the public to their meetings.

Sec. 70—Failure of a Section to maintain the required activities which shall include the holding of at least five meetings each year and also the maintenance of a minimum membership of twenty-five (25) members, other than Students, shall place the Section on probation. All members of the Section shall be informed of the probation by the Secretary of the Institute, who shall also call to their attention the requirements for maintaining the Section.

If the delinquency continues for a second year, a second notification to the Section membership shall be made by the Institute Secretary, and the Board of Directors shall be informed of the probationary status of the Section.

If the delinquency continues for a third year, the Section shall, thereupon, automatically be dissolved. The Secretary shall so report to the Board of Directors and so inform the Section membership.

The Board of Directors is authorized to waive, in whole or in part, the application of this Bylaw for the duration of war and six months thereafter.

Sec. 70-1—For section maintenance, the Institute shall pay to each Section for each calendar year the following sums:

One dollar and ten cents ($1.10) for each member, except Students, up to and including seven hundred, and one dollar and twenty-five cents ($1.25) for each member, except Students, over seven hundred, with mailing addresses within the territory of the Section, on December 31st of the calendar year for which payment is made, plus ten dollars ($10) per meeting for not more than ten meetings of the Section within the calendar year.

SUBSECTIONS

Sec. 70-2—In conformance with the Constitution for Sections, Sections may establish Subsections, which shall be geographical subdivisions of such Sections, subject to the same limitations and control as the Section itself.

Sec. 70-3—For each Subsection which meets the following requirements, the Institute shall pay to the Section a meeting allowance of ten dollars ($10) per meeting up to a maximum of five (5) meetings per year, during the time the Subsection remains in good standing according to the Constitution for Sections:

(a) Submission to Parent Section Executive Committee of a petition signed by twenty (20) or more members other than Students, with mailing addresses within the proposed territory;

(b) Approval of the petition by the Parent Section Executive Committee;

(c) Notification of Institute Headquarters of these actions by Parent Section and its Executive Committee with a copy of the petition;

(d) Approval by the Executive Committee of the Institute.

PROFESSIONAL GROUPS

Sec. 70-A—A petition for the formation of a Professional Group shall be signed by not fewer than twenty-five (25) members, other than Students, and shall state the proposed field of interest.

Sec. 70-B—The Executive Committee, upon receipt of a petition to form a Professional Group, may authorize its formation. After the Group is organized and a Constitution approved by the Executive Committee, the Executive Committee may give tentative approval to its establishment pending submission to the Board of Directors for final approval.

Sec. 70-C—Each Professional Group authorized by the Executive Committee shall within not more than six months thereafter adopt and conform to a Constitution which shall have been submitted to and approved by the Executive Committee. A Group Constitution may be amended by the Group subject to the approval of the Executive Committee.

Sec. 70-D—All Professional Groups shall consist exclusively of members of the Institute. No joint Professional Groups shall be recognized. However, Professional Groups of the Institute may co-operate with other organizations in the holding of joint meetings and may invite members of such organizations and the public to their meetings.

Sec. 70-E—No Professional Group or any officer or representative thereof shall have any authority to contract debts for, pledge the credit of, or in any way bind, the Institute.

Sec. 70-F—A Professional Group may not charge dues. A Group may hold or join in holding conventions or conferences and may charge for registration; but a Group may not charge for registration at a meeting, conference, or convention which it operates as part of an Institute, Section, Regional, or National meeting, conference, or convention. A Group may, but only after approval of the Executive Committee, make a charge for sending out notices to non-Group members to cover the extra expenses involved. A Group may raise revenues by other means approved by the Executive Committee.

Sec. 70-G—All members of the Institute may become members of Professional Groups in conformance with the respective Group Constitutions.

Sec. 70-H—All Professional Group meetings shall be open to all members of the Institute on an equal basis with Group members. Any member of the Institute, upon payment of charges judged to be equitable by the Executive Committee, shall receive any notices of meetings of any Group.

Sec. 70-I—All publications of Professional Groups, other than programs, notices, and the like, shall be subject to prior authorization of the Executive Committee, and shall be made available to all Institute members on an equitable basis approved by the Executive Committee.

Sec. 70-J—The Secretary-Treasurer of each Professional Group shall forward to the Secretary of the Institute a copy of each meeting notice of the Group, an annual report, and at the end of each Institute fiscal year a financial statement for that fiscal year.

Sec. 70-K—The Board of Directors may dissolve a Professional Group for any reason deemed sufficient by the Board of Directors.

STUDENT BRANCHES

Sec. 71—Upon receipt of a petition signed by a representative of the faculty and by fifteen (15) or more IRE members who are students in a school of recognized standing, the Executive Committee may authorize the establishment of an IRE Student Branch in that school.

Sec. 72—Each IRE Student Branch shall adopt and conform to a Constitution which shall have been submitted to, and approved by, the Executive Committee.

Sec. 73—Upon receipt of a petition signed by a representative of the faculty and by ten (10) or more IRE members who are students in a school of recognized standing, the Executive Committee may join with one or more other national engineering or technical societies to co-sponsor a Joint Student Branch in that school.

Sec. 73-A—Each Joint Student Branch shall adopt and conform to a constitution which shall have been submitted to, and approved by, both the IRE Executive Committee and the other co-sponsoring societies. A Joint Student Branch shall have among its officers at least a corresponding secretary who shall be a member of the IRE.

Sec. 74—No IRE Student Branch or Joint Student Branch or any officer or representative thereof shall have any authority to contract debts for, pledge the credit of, or in any way bind, the Institute.

Sec. 75—Each IRE Student Branch and Joint Student Branch corresponding secretary shall forward to the Secretary of the Institute a report of each meeting held by the Branch for the presentation or discussion of papers, and during June of each year, a financial statement for the preceding year.

Sec. 76—An IRE Student Branch or Joint Student Branch may collect dues from its members as provided in its constitution and, in addition, may accept local non-compulsory financial contributions.

Sec. 77—Failure of an IRE Student Branch or Joint Student Branch to maintain a minimum of ten (10) IRE members and to hold at least three (3) meetings each year shall place the Branch on probation. All officers and Institute representatives of the Branch shall be informed of the probation by the Secretary of the Institute, who shall also call to their attention the requirements for maintaining the Branch. If the delinquency continues for a second year, the IRE sponsorship shall automatically be withdrawn. The Secretary shall so report to the Board of Directors and so inform the officers of the Branch and Institute representative.

Sec. 78—For maintenance of an IRE or Joint Student Branch upon certification by the Institute Representative, or, in the event one has not been appointed, by a representative of the faculty, expenses of the Branch up to and including a maximum of twenty-five dollars ($25) for any one school year shall be defrayed by the Institute.

SEC. 79—The Board of Directors may dissolve an IRE Student Branch, or withdraw its sponsorship and support of a Joint Student Branch, for any reason deemed sufficient by the Board of Directors.

COMMITTEES AND REPRESENTATIVES

SEC. 80—The standing committees, each of which shall normally consist of five or more persons, shall include the following:

Admissions
Appointments
Awards
Constitution and Laws
Editorial Board
Editorial Review
Education
Executive Committee of the Board of Directors
Finance
History
Membership
Nominations
Policy Advisory
Professional Groups
Public Relations
Tellers

Antennas and Wave Guides
Audio Techniques
Circuits
Electroacoustics
Electron Devices
Electronic Computers
Facsimile
Feedback Control Systems
Industrial Electronics
Information Theory and Modulation Systems
Measurements and Instrumentation
Mobile Communications Systems
Navigation Aids
Piezoelectric Crystals
Radio Transmitters
Receivers
Research
Sound Recording and Reproducing
Standards
Symbols
Television Systems
Video Techniques
Wave Propagation

On matters which are reasonably described by the committee names, these committees or boards shall be advisory to the Board of Directors, or the Executive Committee, whichever appoints them and directs their activities. Each committee or board shall have the power to create subcommittees of its own selection.

SEC. 81—The terms of appointments to the Admissions, Awards, Constitution and Laws, Editorial Board, Editorial Review, Education, Finance, History, Membership, Nominations, Policy Advisory, Professional Groups, Public Relations, and Tellers Committees shall start with the first day of the month following appointment and continue until the date the succeeding terms of appointments take effect. Appointments shall be made to the following committees: Antennas and Wave Guides, Audio Techniques, Circuits, Electroacoustics, Electron Devices, Electronic Computers, Facsimile, Feedback Control Systems, Industrial Electronics, Information Theory and Modulation Systems, Measurements and Instrumentation, Mobile Communications Systems, Navigation Aids, Piezoelectric Crystals, Radio Transmitters, Receivers, Research, Sound Recording and Reproducing, Standards, Symbols, Television Systems, Video Techniques and Wave Propagation, each year between January first and May first, and the terms of appointment shall be from May first of the year when the appointments are made until April thirtieth of the following year; additional appointments may be made to fill vacancies or to care for special cases as the need arises, with the term of the appointment expiring April thirtieth.

SEC. 82—The Membership Committee shall include each Regional Director and the Chairman of the Membership Committee of each Section, ex-officio.

SEC. 82-A—The Awards Committee shall be chosen from among Institute members of Fellow grade.

SEC. 83—The Committee on Professional Groups shall include the Chairman of each Professional Group, ex-officio.

SEC. 83-A—The Chairman of the Finance Committee shall be chosen from among the members of the Executive Committee.

SEC. 83-B—The Public Relations Committee shall include the Chairman of each Section Publicity Committee, ex-officio.

SEC. 83-C—The Policy Advisory Committee shall consist of eight (8) members, appointed annually, all of whom shall be present or former members of the Board of Directors. At least half of the members, including the Chairman, shall be members of the then present Board of Directors. Each year, at least four (4) of the members shall be re-appointed.

SEC. 83-D—The Editorial Board shall consist of the Editor as chairman, a vice chairman, the Managing Editor, and not less than three nor more than five other members.

SEC. 84—The Appointments Committee shall be appointed by the Board of Directors at its regular November meeting. Its membership shall be chosen from those members of the Board of Directors whose terms continue through the following year and from the new Directors-elect, and shall include the President-elect. At least fourteen days before the next annual meeting of the Board of Directors, the Appointments Committee shall mail to the members of the new Board of Directors, a list of candidates for the offices of Secretary, Treasurer, Editor, and Appointed Directors, and a list of candidates to fill vacancies that exist among the Chairmen and members of the Awards, Constitution and Laws, Executive, Nominations, Policy Advisory, and Tellers Committees.

SEC. 85—The Treasurer shall make a report to the Executive Committee semi-annually at the September and March Executive Committee meetings concerning the status of the Institute's investments. The Treasurer, before making changes in the Institute's portfolios, shall report the proposed changes to the Executive Committee and obtain its approval.

SEC. 86—The President is authorized to appoint teachers of science or engineering who are Institute members as Institute Representatives. Each such Institute Representative is charged with promoting the welfare of the Institute at his school particularly in matters relating to Student membership.

SEC. 87—The Board of Directors may appoint or direct the appointment of representatives of the Institute on joint committees, boards, and other local, national, and international bodies.

PUBLICATIONS

SEC. 88—The Institute shall publish a periodical under the title, PROCEEDINGS OF THE I.R.E. The Board of Directors may establish additional publications either periodical or otherwise in character.

SEC. 89—The Executive Secretary is authorized to accept orders received after April 1, 1948, for annual subscriptions to, or individual copies of, the PROCEEDINGS OF THE I.R.E., at the following rates, including postage:

Annual Subscriptions

	U.S. and Canada	*Other Countries*
Individuals	$18.00	$19.00
Public Libraries	13.50	14.50
Colleges	13.50	14.50
Subscription Agencies	13.50	14.50
Institute members, one additional subscription	9.00	10.00

Individual Copies

Individuals	$ 2.25	$ 2.35
Public Libraries	1.65	1.75
Colleges	1.65	1.75
Subscription Agencies	1.65	1.75
Institute members, one additional copy	1.00	1.10

SEC. 90—The price of a single annual subscription to the PROCEEDINGS OF THE I.R.E. for a Fellow, Senior Member, Special Member, Member, or Associate shall be $9.00, to be included in his annual dues.

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 15, 1954; 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 15, 1954.

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 Institute for 35 years. The following symbol is used to indicate this status:

(L) *Life Member*

BIOGRAPHIES OF FELLOWS*

(As of May 15, 1954)

ACHESON, Marcus A. (A'36—M'37—F'41), Consulting Engineer, Sylvania Electric Products, Inc., 83-30 Kew Gardens Rd., Kew Gardens 18, L.I., N.Y.
Born: January 18, 1903, Denison, Tex. B.S.(E.E.), 1924, Rice Institute. Committees: 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; Tau Beta Pi, 1949.

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: Editorial Review, 1954; Modulation Systems, 1948–50.

AFFEL, Herman A. (A'14—M'40—SM'43—F'49), Assistant Vice-President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: August, 1893, Brooklyn, N.Y. S.B., 1914, Massachusetts Institute of Technology. Committees: Meetings and Papers, 1930; New York Program, 1939–49, *chairman, 1940–41;* Papers, 1931–45; Papers Review, 1946–53. Awards: Modern Pioneers Award, National Association of Manufacturers, 1940.

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. Institute Representative: Oregon State College, 1942–53. Awards: Fellow, AIEE, 1941.

ALEXANDERSON, Ernest F. W. (A'13—M'13—F'15) (L'49), 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. President, 1921; Vice-President, 1920; Manager, 1917–19; Director, 1920–23. Committees: Meetings and Papers, 1928; Standardization, 1916–23; Wave Length Regulation, 1916–19. Awards: John Ericsson Gold Medal, American Society of Swedish Engineers, 1944; 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.
Born: August 5, 1904, Samara, Russia. A.B., 1924, University of California. Committees: Annual Review, 1944–45; Antennas, 1944–49, *chairman, 1944–45;* Papers Procurement, 1947–50; Radio Transmitters, 1944–45; Standards, 1944–45; Transmitters and Antennas, 1943–44. Awards: President Certificate of Merit, 1948.

ALLEN, Edward W., Jr. (M'44—F'53), Chief Engineer, Federal Communications Commission, 13th St. & Pennsylvania Ave., Washington 25, D.C.
Born: February 14, 1903, Portsmouth, Va. E.E., 1925, University of Virginia; L.L.B., 1933, George Washington University. Committees: Papers Review, 1946–49; Wave Propagation, 1949–53. Awards: Tau Beta Pi.

ANDERSON, Clifford N. (A'19—F'34), Technical Staff, Bell Telephone Laboratories, Inc., Murray Hill, 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.

ANDERSON, Earl I. (M'40—SM'43—F'54), Assistant Manager, Industry Service Laboratory, RCA Laboratories Division, 711 Fifth Ave., New York 22, N.Y.
Born: April 19, 1907, Chicago, Ill. Professional Groups: Broadcast and Television Receivers, 1952–54, *vice-chairman, 1952–53; chairman, 1951.*

APPLETON, Edward V. (A'26—F'31), Principal and Vice-Chancellor, University of Edinburgh, The Old College, South Bridge, Edinburgh 8. Scotland.
M.A.; D.Sc; L.L.D.; F.R.S. Vice-President, 1932; Director, 1932. Committees: Meetings and Papers, 1929; Wave Propagation, 1937–38. Awards: Morris Liebmann Memorial Prize, 1929; Nobel Laureate, Physics, 1947.

ASHBRIDGE, Sir Noel (F'38), Director: Marconi's Wireless Telegraph Co., 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. President, The Institution of Electrical Engineers, 1941–42; Vice-President, 1947; President, Junior Institution of Engineers, 1949–50; MICE; MIEE. 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.

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. Awards: Exceptional Service Award, Dept. of Commerce, 1952; Honorary Doctor of Science, Lehigh University, 1952; President's Certificate of Merit, 1948.

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

BAILEY, Austin (A'25—M'25—F'36), Mobile Radio Engineer, American Telephone and Telegraph Company, 195 Broadway, New York 7, N.Y.
Born: June 9, 1893; Lawrence, Kan. A.B., 1915, University of Kansas; Ph.D., 1920, Cornell University. 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, 1947–51; New York Program, 1930–34, 1937–40, *chairman, 1931, 1938;* Professional Groups, *vice-chairman, 1952;* Sections, 1929, *chairman, 1930–33;* Tellers, *chairman, 1939–40.* Professional Groups: Vehicular Communications, Administrative Committee, 1949–54, *chairman, 1950–54.* Institute Representative; ASA Sectional Committee on Graphic Symbols and Abbreviations for Use on Drawings, 1940–54; ASA Sectional Committee on Standards for Drawings and Drafting Room Practices, 1940–54.

BAILEY, Stuart L. (A'28—M'36—SM'43—F'43), Partner, Jansky and Bailey, 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. President, 1949; Treasurer, 1948; Director, 1943–54. Committees: Admissions, 1943–44; Appointments, 1948; Awards, 1950–52; Broadcasting, *alternate, 1931–32, 1934;* Constitution and Laws, 1944, 1948, 1951; Convention, 1953; Executive, 1945–51, 1953, *vice-chairman, 1948, chairman, 1949;* Finance, 1948, 1950–51, *chairman, 1953;* Nominations, 1946–52, *chairman, 1946;* National Convention, 1947–48; Office Practices, 1947; Planning, 1947; Policy Development, 1948, 1951; Professional Groups, 1950; Public Relations, 1950, *alternate, 1945–46;* Radio Wave Propagation, 1942–45; Radio Wave Propagation and Utilization, 1945–47; Sections, 1946–47; Special Publication Fund, 1947; Wave Propagation, 1937–41, 1948–52; Winter Technical Meeting, 1946. Institute Representative: IRE-RMA Co-ordination Committee, 1949; U.S.A. National Committee, URSI, 1949–51; Executive Council, Central Radio Propagation Laboratory, 1949–51; Joint AIEE-IRE Co-ordination Councillor, 1950, 1951; Joint Technical Advisory Committee, 1949–51.

BAILEY, William F. (S'33—A'36—VA'39—SM'51—F'54), Acting Chief Engineer, Research Division, Hazeltine Corporation, 58–25 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 Systems, 1946–53; Tellers, 1953–54, *chairman, 1954.*

BAKER, W. R. G. (A'19—F'28), Vice-President in Charge of Electronics, General Electric Company, Electronics Park, Syracuse 1, N.Y.
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. President 1947; Board of Directors, 1940, 1946–54; Treasurer, 1951–54; Standards Coordinator, 1948–50. Committees: Admissions, 1941; Annual Review, 1948–49; Appointments, 1948; Awards, 1940; Broadcasting, 1935, 1948–50, *vice-chairman, 1951;* Executive, 1947–54, *chairman, 1947, vice-chairman, 1951–54;* Finance, *chairman, 1948–54;* Meetings and Papers, 1926, *alternate, 1928–29;* Membership, 1928; Nominations, 1930, 1948; Nuclear Studies, *chairman, 1948–49;* Policy Development, 1948; Preparedness, 1940–41; Professional Groups, *chairman, 1950–54;* Public Relations, 1950; Sections, 1931–32; Standardization, 1925; Sub-committee on Power Supply, 1928; Standards, 1938–40, 1948–49. Sections: Connecticut Valley, *secretary, 1938–40;* Philadelphia, *chairman, 1930–31;* Institute Representative, ASME Review Board, 1948–51.

BALDWIN, Millard W., Jr. (A'40—SM'45—F'48), Research Engineer, 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; Basic Terms Subcommittee, 1952–54; Definitions Co-ordinating Subcommittee, *chairman, 1951–53;* Methods of Testing Television Transmitters, 1945–47; Special Television Test Methods, 1940; Standards, 1949–54, *vice-chairman, 1951–54;* Subcommittee on Definitions, *chairman, 1951–53;* Television Coordination Subcommittee, *chairman, 1951–53;* Television, 1948; Television Definitions, 1945–48; Television Systems, 1949–54; Video Techniques, 1949–52.

BARNES, John L. (A'27—SM'44—F'52), Dr., Professor of Engineering, University of California, Los Angeles 24, Calif.; Consulting Mathematical Engineer.
Born: October 16, 1906, Haddonfield, N.J. B.S. and S.M. in E.E., 1928, 1929, Massachusetts Institute of Technology; A.M. and Ph.D., 1930, 1934, Princeton University. Committees: Papers Review, 1948–49; Wave Propagation, 1942–52. Institute Representative, Tufts College, 1941–42.

BARROW, Wilmer L. (A'28—VA'39—M'40—F'41), Vice-President and Chief Engineer, 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 Hochscule, Munich, Germany. Director, 1943–45. Committees: Antennas, 1945–47; Awards, 1944–45, 1948–49; Board of Editors, 1946–53; Constitution and Laws, 1943–44; Executive, 1945; Nominations, 1943, 1949; Papers, 1941–45; Papers Procurement, 1942–43; Professional Groups, 1948; Regular Papers, 1941; Research, 1946–47, 1949; Standards, 1938–41; Wave Guides, 1943–44; Wave Propagation, 1941. RMA-IRE Co-ordinating, 1948. Sections: Boston, *chairman, 1939–41.* Institute Representative, Radio Technical Planning Board, *alternate, 1944–45, 1945–46.* Awards: Morris Liebmann Memorial Prize, 1943.

BARTON, F. Sherbrooke C. B. E. (F'35), Chief Scientific Officer, Principal Director of Electronics Research and Development, Ministry of Supply, Castlewood House, 77-91, New Oxford St., London, W.C. 1, England.
Born: May 13, 1895, Nottingham, England. Scholar, 1914, St. John's College, Cambridge; M.A., 1920, University of Cambridge; B.Sc., 1920, University of London. Vice-President, 1943; Director, 1943. Member of Institution of Electrical Engineers. Committees: International Liaison, 1947. Awards: Fellow of the Institute of Physics.

BATCHER, Ralph R. (J'16—A'18—M'22—SM'43—F'50), Chief Engineer, Radio Electronics Television Manufacturers Association, 500 Fifth Ave., New York 17, N.Y.
Born: June, 1897, Dysart, Iowa. B.S.(E.E.), 1920, Iowa State College. Committees: Annual Review, *chairman, 1949–52;* Board of Editors, 1928–52; Meetings and Papers, 1927–29; Public Relations, *chairman, 1950–51;* Standards, 1949–52; Symbols, 1940–47; Television, 1939–42; Television and Facsimile, 1937–38. Institute Representative: ASA Sectional Committee (C16) on Radio, *secretary, 1951.* Awards: Member, Tau Beta Pi.

BATSEL, Max C. (A'21—F'27), Chief Engineer, Engineering Products Department, Electronics Division, Radio Corp. of America, Cooper St., Camden, N.J.
Born: June 16, 1894, Fulton, Ky. B.M.E., 1915, University of Kentucky. Director, 1933. Committees: Bibliography, 1930–32; Meetings and Papers, 1928–29; Membership, 1926–27; New York Program, 1931–33; Professional Group on Engineering Management, 1952–53; Receiving Sets, 1927–28; Standardization, 1925, 1927–30; Use of the Transmission Unit, 1928.

BAUER, Benjamin B. (S'37—A'39—SM'44—F'53), Vice-President, Engineering, Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill.
Born: June 26, 1913, Odessa, Russia. Industrial E.E. Course, 1932, Pratt Institute; E.E., 1937, University of Cincinnati. Committees: Board of Editors, 1952–53; Electroacoustics, 1945–54, *vice-chairman, 1949–53; chairman, 1954;* Papers Procurement, 1947–48; Professional Groups, 1953. Professional Groups: Audio, National *vice-chairman, 1950; chairman, 1951; Editor-in-chief of Transactions, 1952, secretary, 1953–54.* Awards: Fellow: Acoustical Society of America; Eta Kappa Nu; Eta Kappa Nu Honorable Mention Award, 1946; Sigma Xi; Tau Beta Pi.

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: Papers Review, 1947–49. Sections: Toronto, *chairman, 1936–37.* Institute Representative: University of Toronto, 1941–42. O.B.E., Canadian Government, 1946.

BEDFORD, Alda V. (A'31—SM'46—F'50), Research Engineer, 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, *secretary-treasurer, 1946, vice-chairman, 1947, chairman, 1948-49.* Awards: Modern Pioneer Award, National Association of Manufacturers, 1940; Incentive Awards, RCA Laboratories, 1949, 1950; 1954 Vladimir K. Zworykin (IRE) Television Prize Award; member Sigma Xi.

BEDFORD, Leslie H. (M'34—SM'43—F'48), Chief Television Engineer, Marconi's Wireless Telegraph Company, Ltd., Chelmsford, Essex, England.
Born: June 23, 1900, London, England. B.Sc., 1919; B.Sc. (Engi-

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

neering), 1921, University of London; M.A., 1924, Cambridge University. Awards: IEE Premium, Institution of Electrical Engineers, London, 1934; Order of the British Empire, 1943.

BEERS, George L. (A'27—M'29—SM'43—F'47), Assistant Director of Engineering, RCA Victor Division, 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.

BEGUN, S. J. (S'46—F'52), Vice-President and Director of Advance Development, Clevite-Brush Development Company, 540 E. 105th St., Cleveland 8, Ohio.
Born: December 2, 1905, Free City of Danzig. M.S., 1929; Ph.D. (Engineering), 1933, Institute of Technology, Berlin, Germany. Committees: Audio and Video Techniques, 1948–49; Electroacoustics, 1941–49; Sound Recording and Reproducing Technique, *chairman, 1949–52;* Standards, 1949-50.

BELL, John W. (M'46—F'53), General Manager, Smith & Stone Limited, Georgetown, Ont., Canada.
Born: September 2, 1911, Toronto, Ont., Canada. B.A.Sc., 1933, University of Toronto. Awards: M.B.E. (Member of the British Empire), 1943, His Majesty's Government.

BENNETT, Ralph D. (SM'44—F'52), Technical Director, Naval Ordnance Laboratory, White Oak, Silver Spring, Md.
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. Board of Directors, 1953. Committees: Awards, 1954.

BENNETT, Rawson (A'36—M'43—SM'43—F'50), Captain, United States Navy, Bureau of Ships, Navy Dept., 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.

BERANEK, Leo L. (S'36—A'41—SM'45—F'52), President, Bolt Beranek and Newman, Inc., Consultants in Acoustics, 16 Eliot St., Cambridge 38, Mass.; Associate Professor of Communication Engineering, Massachusetts Institute of Technology, Cambridge 39, Mass.; President, The Acoustical Society of America, 57 E. 55th St., New York, N.Y.
Born: September 15, 1914, Solon, Iowa. B.A., 1936; D.Sc. (Honorary), 1946, Cornell College; D.Sc., 1940; M.S., 1937, Harvard University. Committees: Audio, 1949–50; Professional Groups: Audio, 1949–52, *chairman, 1949–51.*

BERKNER, Lloyd V. (A'26—M'34—SM'43—F'47), President, Associated Universities, Inc., 350 Fifth Ave., New York 1, N.Y.; Research Associate, Carnegie Institution of Washington.
Born: February 1, 1905, Milwaukee, Wis. B.S.(E.E.), 1927, University of Minnesota; attended George Washington University. Committees: Administrative Committee, Professional Group on Nuclear Science, 1951–54, *chairman, 1954;* Board of Editors, 1941–42; Editorial Review, 1953–54; Joint Technical Advisory, 1952–53; *vice-chairman, 1953;* Papers, 1941; Wave Propagation, 1937–41. Awards: Special Gold Medal of Congress, 1930; Silver Medal of Aeronautical Institute; Gold Medal of the City of New York for Work on the Byrd Antarctic Expedition; Science Award, Washington Academy of Science, 1941; Legion of Merit, 1946; Honorary Officer of the Order of the British Empire; Member, National Academy of Sciences.

BEVERAGE, H. H. (A'15—M'26—F'28), Director, Radio Research Laboratory, RCA Laboratories Division, Radio Corporation of America, 36 Broad St., New York 4, N.Y.
Born: October 14, 1893, North Haven, Me. B.S., 1915; D.E., 1938, University of Maine. President, 1937; Director, 1936–39. Committees: Admissions, 1936, 1939, 1941–47; Awards, 1938–39, *chairman, 1938;* Board of Editors, 1932–37; High Frequency Receivers, 1930; New York Program, 1932–35; Nominations, 1942–43, *chairman, 1942;* Standards, 1934. Awards: Armstrong Medal, 1938; Medal of Honor, 1945; Morris Liebmann Memorial Prize, 1923; President's Certificate of Merit, 1948; Radio Club of America; Signal Corps Certificate of Appreciation, 1944.

BINGLEY, Frank James (A'34—M'36—SM'43—F'50), Television Research Engineer, Philco Corporation, C and 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; Papers Review, 1946–53. Awards: Gold Medal, Television Broadcasters' Association.

BISHOP, Harold (F'38), Director of Technical Services, British Broadcasting Corp., 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; Vice-President, Institution of Electrical Engineers 1948–53; President, 1953–54; Member, Institution of Mechanical Engineers; Fellow, The City and Guilds Institute, 1947.

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, Worcester Polytechnic Institute. Committees: Administrative, Board of Editors, 1952–53; Annual Review, 1948–49; Awards, 1948; Board of Editors, 1949, 1952–53; Editorial Administrative, 1948–53; Education, 1948; Frequency Modulation, 1946; 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; Research Corporation Annual Award for Contribution to Science, 1952.

BLACK, Knox Charlton (M'29—SM'43—F'49), Business Manager, Polytechnic Research & Development Co., Inc., 202 Tillary St., Brooklyn 1, N.Y.
Born: April 23, 1905, Cambridge, Mass. A.B., 1924; A.M., 1926; Ph.D., 1927, Harvard University. Director, 1952. Committees: Awards, 1951–52, *chairman, 1952;* Policy Advisory, 1953–54; Policy Development, 1949–50; Professional Groups: Airborne Electronics, 1952–54, *chairman, 1953–54;* Technical Committee, No. 4, Electro-Acoustic Devices, 1930. 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.* Sections: San Francisco, *secretary-treasurer, 1938–39; vice-chairman, 1940; chairman, 1941.*

BLACKWELL, Otto B. (M'20—F'28), Retired. 15 North Dr., Plandome, N.Y.
Born: August 21, 1884, Bourne, Mass. S.B., 1906, Massachusetts Institute of Technology. Committees: Standardization, 1920–23. 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), Director of Mathematical Research, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: December 24, 1905, Madison, Wis. A.B., 1924; M.A., 1926, Ohio State University; Ph.D., 1935, Columbia University. Committees: Circuits, 1944–47.

BOND, Donald (SM'46—F'54), Research Engineer, RCA Laboratories Division, Princeton, N.J.
Born: June, 1909, Libertyville, Ill. B.S., 1929, S.M., 1931, University of Chicago. Committees: Papers Review, 1950–53. Sections: Princeton, 1952–53.

BOOKER, Henry G. (SM'45—F'53), Professor, Dept. of Engineering Physics and School of Electrical Engineering, Cornell University, Ithaca, N.Y.
Born: December, 1910, Barking, Essex, England. B.A., 1933; Ph.D., 1936, Cambridge University. Committees: Standards 1949–52; Wave Propagation, 1949–52, *vice-chairman, 1949–50, chairman, 1950–52.* Awards: Duddell, 1946; Institution, 1947, Kelvin, 1948; Premiums, I.E.E. (London).

BOWIE, Robert M. (A'34—M'37—SM'43—F'48), Director of Engineering, Sylvania Electric Products, Inc., 1740 Broadway, New York, 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, 1953; Admissions, 1945–48; Awards, 1953; Board of Editors, 1947–53; National Convention 1950; Nuclear Studies, 1948–50; Papers Procurement, 1945–50; Research, 1946–47; Television, 1948–49; Television Systems, 1949–52, *vice-chairman, 1951–52.*

BOWLES, Edward L. (A'22—M'28—SM'43—F'47), Consulting Professor, Department of Electrical Engineering and Industrial Management, Massachusetts Institute of Technology, Cambridge 39, Mass.
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, 1929–31; Standards, 1932. Sections: Boston, *chairman, 1935–37.* Awards: Distinguished Service Medal, 1945; Honorary Commander, Civil Division of Most Excellent Order of British Empire, 1948; Presidential Medal for Merit, 1948.

BOWN, Ralph (M'22—F'25), Vice-President, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: February 22, 1891, Fairport, N.Y. M.E., 1913; M.M.E., 1915; Ph.D., 1917, Cornell University. President, 1927; Vice-President, 1926; Director, 1926–29, 1937–39. Committees: Admissions, 1939–40, *chairman, 1926;* Awards, 1928–31, 1938–41, 1946, *chairman, 1942;* Board of Editors, 1946–53; Constitution and Laws, 1929, 1937–40; Convention Policies, 1940; Finance, *chairman, 1926;* IRE-RMA Joint Technical Advisory, 1948–54, *chairman, 1951–53;* International Liaison, *chairman, 1947–49;* Meetings and Papers, 1929; Nominations, 1937, 1940–43, 1949–51, *chairman, 1944;* Receiving Sets, 1927–28; Research, 1949–50; Standards, 1941; Standardization, *chairman, 1925–26.* Awards: Medal of Honor, 1949; Morris Liebmann Memorial Prize, 1926.

BRADLEY, William E. (SM'45—F'53), Co-Director of Research—Technical, Philco Corporation, C & Tioga Sts., Philadelphia 34, Pa.
Born: January 7, 1913, Lansdowne, Pa. B.S.(E.E.), 1936, Moore School, University of Pennsylvania.

BRAINERD, John G. (A'33—M'39—SM'43—F'51), Professor and Director, Moore School of Electrical Engineering, University of Pennsylvania, 200 S. 33rd St., Philadelphia 4, Pa.
Born: August 7, 1904, Philadelphia, Pa. B.S.(E.E.), 1925; D.Sc., 1934, University of Pennsylvania. Committees: Annual Review, 1948–51; Circuits, 1947–54, *chairman, 1948–49;* Standards, 1948–54, *chairman, 1949–51.* Professional Groups: Circuit Theory, *chairman, 1950–52.* Sections: Philadelphia, chairman, 1953–54. Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949-54; ASA Sectional Committee (C16) on Radio, 1950–51; ASA Standards Council, 1950; ASA Subcommittee on General Terms, 1948.

BREIT, Gregory (SM'45—F'45), Professor, Department 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. Committees: Research 1949–50.

BRENNECKE, Cornelius G. (A'36—M'46—F'51), Professor, Head, Department of Electrical Engineering, North Carolina State College, Raleigh, N.C.
Born: August 29, 1906, New York, N.Y. B.A., 1926; B.S., 1927; E.E., 1928, Columbia University; Ph.D., 1936, New York University. Committees: Education, 1951–53. Sections: North Carolina-Virginia, 1946–49, *vice-chairman and program chairman, 1946–48, chairman, 1948–49.* Institute Representative: Lehigh University, 1943–45.

BRIGGS, Maynard (A'37—SM'46—F'54), Manager, Missile Ground Control Engineering, Westinghouse Electric Corporation, 2519 Wilkens Ave., Baltimore 3, Md.
Born: July 19, 1904, St. Paul, Minn. B.E.E., 1929, University of Minnesota. Committees: Antennas, 1944–45; Professional Groups, 1948; Standards, 1951–52; Symbols, 1940–47; Transmitters, 1944–54, *chairman, 1951–52;* Transmitters and Antennas, 1939–44; IRE-RTMA Problem #2 Committee, 1948–49; IRE-RTMA—SMPTE Coordinating Committee, 1949–52.

BRILLOUIN, Leon N. (SM'44—F'52), 88 Central Park West, New York 23, N.Y.
Born: August 7, 1889, Sevres, France. Ph.D., 1921, University of Paris.

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

BROWN, Jesse E. (A'24—M'28—SM'43—F'49), Assistant Vice-President and Chief Engineer, Zenith Radio Corporation, 6001 W. Dickens Ave., Chicago 29, Ill.
Born: September, 1902, Greenport, N.Y. Attended Cornell University, 1920–24. Director, 1938, 1947. Committees: Admissions, 1940; Awards, 1940; Frequency Modulation, 1940–46; Industrial Electronics, 1947–49; Membership, 1949–50; Modulation Systems, 1947; Nominations, 1947; Papers Procurement, 1942–45; Public Relations, 1940; Radio Receivers, 1941, 1945–49; Receivers, 1949–51; Regular Papers, 1941; Sections, 1937; Special Publications Fund, 1947; Television, 1940–48; Television Systems, 1949–52. Sections: Chicago, *secretary, 1936, chairman, 1938–39.* Institute Representative: Army Signal Association, 1947.

BRUNETTI, Cledo (A'37—SM'46—F'49), Director, Engineering Research and Development, General Mills, Inc., Mechanical Division, 2003 E. Hennepin, Minneapolis, Minn.
Born: April, 1910, Virginia, Minn. B.E.E. (with High Distinction), 1932; Ph.D., 1937, University of Minnesota. Committees: Circuits, 1944–51, *vice-chairman, 1949–50;* Papers Procurement, 1948–50; Radio Transmitters, 1946–49. Awards: National Scholarship Key; National I.A. Civic League, 1937; Outstanding Young Electrical Engineer, Eta Kappa Nu, 1941; The Material and Methods Achievement Grand Award, Materials and Methods Magazine, 1947; Naval Ordnance Development Award for Exceptional Service, United States Navy, 1945; Certificate for Outstanding Service, War Department, 1945; Certificate of Appreciation of Services, Office of Scientific Research and Development, 1945; Army-Navy Certificate of Appreciation for Outstanding Services during World War II, War and Navy Department, 1947.

BUILDER, Geoffrey (A'32—F'41), Department of Physics, University of Sydney, Sydney, N.S.W., Australia.
Born: June 21, 1906, Cue, Western Australia. B.Sc., 1928, University of Western Australia; Ph.D., 1933, King's College, London, England. Awards: Fellow, Institute of Physics, London, England.

BURKE, Charles T. (A'25—M'27—F'37), Director of Planning, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass.
Born: August 4, 1902, Watertown, Mass. S.B., 1924; S.M., 1924, Massachusetts Institute of Technology. Committees: Handbook, 1945–47; Papers Procurement, 1946; Power Supply, 1928; Receiving Sets, 1927; Standards, 1941–43.

BURNAP, Robert S. (A'30—F'47), Manager, Commercial Engineering Sec., Radio Corporation of America, Tube Division, 5th and Sussex Sts., Harrison, N.J.
Born: July 12, 1894, Monterey, Mass. S.B., 1916, Massachusetts Institute of Technology. Committees: Administrative Board of Editors, 1952–53; Annual Review, 1943–48; Awards, 1948; Board of Editors, 1944–53; Editorial Administrative, 1946–51; Electronics, 1936–45, *chairman, 1942–45;* Subcommittee on Small High Vacuum Tubes, 1936–41, *chairman, 1939–41;* Electron Tubes, *chairman, 1946–48;* Electron Tubes and Solid-State Devices, 1949–51; Handbook, 1945–47; Papers Procurement, 1942–44; Regular Papers, 1941; Standards, 1942–49; Symbols, 1940–41, 1943–47; Tellers, 1942; Electron Devices, 1952–53; Ad Hoc Committee to make Critical Review of Organization of Committee, 1952–53; Executive Group of Electron Devices, 1952. Institute Representative: ASA Subcommittee (C42.14) on Electronics, 1947–51.

BURROWS, Charles R. (A'24—M'38—SM'43—F'43), Director, School of Electrical Engineering, Cornell University, Ithaca, N.Y.
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. Committees: Annual Review, 1943–45; Circuits, 1945–50; 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, 1937–53, *vice-chairman, 1948, chairman, 1949–53;* Ithaca Subsection, *chairman, 1953–54.*

BUSIGNIES, Henri (M'42—SM'43—F'45), Vice-President, Federal Telecommunication Laboratories, Inc., 500 Washington Ave., Nutley, N.J.
Born: December 29, 1905, Sceaux, Paris, France. E.E., 1926, Institut Normal Electro-technique, Paris, France. Committees: Annual Review, 1948; Navigation Aids, 1946–51, *vice-chairman, 1948, chairman, 1949–51;* Standards, 1948–50. Awards: Presidential Certificate of Merit, 1948.

BUTTNER, Harold H. (M'27—SM'43—F'44), Vice-President, International Telephone and Telegraph Corporation, 67 Broad St., New York 4, N.Y.
Born: November 3, 1892, Porta Costa, Calif. B.S.(E.E.), 1915, University of California. Committees: Electronics, 1940; Meetings and Papers, 1929; Standards 1938–39.

BYRNE, John F. (SM'45—F'50), General Manager, Riverside Research Laboratory, Motorola, Inc., Adams and Indiana Avenues, Riverside, Calif.
Born: October 26, 1905, Cincinnati, Ohio. B.S., 1927; M.S.(E.E.), 1928, Ohio State University. Committees: Awards, 1953–54; Tellers, 1949; Panel on Electronic Countermeasures Research and Development Board, *chairman, 1949–51.* Awards: United States Navy Certificate of Commendation, February, 1947; Presidential Certificate of Merit, September, 1948.

BYRNES, Irving F. (A'23—M'39—SM'43—F'54), Vice-President in charge of Engineering, Radio Marine Corporation of America, 75 Varick St., New York 13, N.Y.
Born: October, 1898, Beacon, N.Y. Union College extension (night) courses in Electrical Engineering completed in 1926. 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'50), Research Associate, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena 4, 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. President, 1932; Editor, 1929; Director, 1929, 1932–34; Manager, 1928, 1932–34. Committees: Annual Review, 1942–49; Awards, 1928–30, 1933, *chairman, 1930.* Bibliography, 1930–31; Board of Editors, 1928–29, 1945, *chairman, 1929;* Meetings and Papers, 1928–29; Nominations, 1930, 1933–34, 1939, *chairman, 1933–34;* Papers, 1931; Piezoelectric Crystals, 1941. Sections, 1928; *chairman, 1942–49, 1951–53;* Standards, 1943–51; Administrative Committee, IRE Professional Group on Ultrasonics Engineering, 1953. Sections: Connecticut Valley, *chairman, 1927–28.* Awards: Duddell Medal, Physical Society of London, 1936; Morris Liebmann Memorial Prize, 1928.

CALDWELL, Orestes H. (M'28—SM'43—F'44), Editorial Consultant, Tele-Tech and Electronic Industries, Technician Mart Office, Catrock Rd. at Bible Corners, CosCob, Conn.
Born: March 8, 1888, Lexington, Ky. B.S.(E.E.), 1908; E.E., 1931; D.E., 1933, Purdue University. Manager, 1932; Director, 1932–35. Committees: Admissions, 1933; Annual Review, 1942–43; Board of Editors, 1946–53; Constitution and Laws, 1932–33, 1935; Nominations, 1934; Public Relations, 1942–46, 1949–50, *chairman, 1942;* Publicity, 1931–33, 1937–39, *chairman, 1934–36, 1937, 1939;* Tellers, 1932–33.

CALLAHAN, John L. (A'21—M'31—SM'43—F'53), Research Section Head, Assistant to Director of Radio Research Laboratory, RCA, RCA Laboratories Division, 66 Broad St., New York, N.Y.
Born: December 9, 1898, Minneapolis, Minn. 1919, Sorbonne, Paris; 1941, New York University. Committees: Admissions, 1944–48; Annual Review, 1940–44; Awards, 1951; Facsimile, 1939–45; *chairman, 1940–44;* Papers, 1942; Professional Group on Communications Systems, *secretary, 1952–54,* Administrative, 1952–54; Meetings, *chairman, 1952–54;* Standards, 1940–44; Symbols, 1940–41; Television and Facsimile, 1937–38; Tellers, 1949–51, *chairman, 1950.* 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, A.T. and T. Co., 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.

CAMRAS, Marvin (S'41—A'42—SM'48—F'52), Senior Physicist, Armour Research Foundation, 35 W. 33rd St., Chicago, Ill.
Born: January 1, 1916, Chicago, Ill. B.S.(E.E.), 1940, Armour Institute of Technology; M.S.(E.E.), 1942, Illinois Institute of Technology. Committees: Professional Group on Audio, 1951–54, *treasurer, 1951–53, chairman, 1953–54.* Awards: Fellow, Acoustical Society of America, 1951; 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.

CARLSON, Wendell L. (A'36—SM'47—F'49), Research Engineer, RCA 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), Applications Engineer, Guided Missiles, Varian Associates, 611 Hansen Way, 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, 1947. Sections: New Mexico, *chairman, 1948–49, 1952–53.*

CARTER, E. Finley (A'23—F'36), Vice-President and Technical Director, Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y.
Born: July 1, 1901, Elgin, Tex. B.S. 1922, Rice Institute. Director, 1943–45. Committees: Admissions, 1944; Constitution and Laws, 1945–48; Editorial Administrative, 1949–50; Executive, 1944–45. 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 Waveguides, 1949–53; Board of Editors, 1937–48; Professional Group on Antennas and Propagation, 1949–54, *chairman, 1953–54;* Standards, 1945–54; Technical Program Committee, National Convention, 1949, 1952–54. 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, 3010½ S. Calhoun, Fort Wayne 6, Ind.
Born: March, 1904, Louisville, Ky. B.S. in Physics, 1924, University of Kentucky; 1925, Cornell University; 1927–30, University of Kentucky.

CHAFFEE, E. Leon (M'17—F'21) (L'52), Professor, Applied Physics, Emeritus, Harvard University, Cambridge 38, Mass.
S.B., 1907, Massachusetts Institute of Technology; A.M., 1908; Ph.D., 1911; S.D. (Honorary), 1944, Harvard University. Vice-President, 1922; Director, 1922. Committees: Electron Tubes, 1946; Electronics, 1936–45; Membership, 1925; Papers, 1918–19; Papers Procurement, 1942–43; Regular Papers, 1941; Research, 1949–50; Standardization, 1927–31; Symbols, 1940–43; Technical Committee, No. 3, Vacuum Tubes, 1930; Vacuum Tubes, 1945. Sections: Boston, *chairman, 1932–35.* Institute Representative: Harvard University, 1941–53. Awards: Longstreth Medal of Merit, Franklin Institute, 1912.

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

CHAMBERLAIN, Adolph B. (A'27—M'30—F'41), Chief Engineer, Engineering Department, CBS Television, 485 Madison Ave., New York 22, N.Y.
Born: February 3, 1901, Franklin, Mass. Director, 1941–44. Committees: Admissions, 1940–41; Annual Review, 1947–48; Awards, 1942; Broadcast, *alternate, 1932;* Constitution and Laws, 1947; Frequency Modulation, 1940–41; Membership, 1949–50; National Convention, 1947; New York Program, 1938–42, *chairman, 1940–42;* Papers, 1942; Professional Groups, 1948–49; Public Relations, 1946; Regular Papers, 1941; Standardization, Subcommittee on the Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, 1930; Technical Committee No. 2 on Radio Transmitters and Antennas, 1929–30; Standards, 1946–50, *chairman, 1947–50;* Tellers, *chairman, 1942;* Transmitters and Antennas, 1936. Sections: Buffalo-Niagara, *chairman, 1930–31;* Rochester, *chairman, 1928–29.* Institute Representative: ASA Standard Council, 1948–49; ASA Section Committee on Definitions of Electrical Terms, 1948–49.

CHAMBERS, Dudley E. (M'41—SM'43—F'48), Consultant, Engineering Surveys and Studies, Engineering Services Division, General Electric Co., 570 Lexington Ave., New York 22, N.Y.
Born: November 27, 1905, Kansas City, Mo. A.B. 1927; E.E. 1928, Stanford University. Committees: Awards, 1948–51; Board of Editors, 1953; Education, 1953; Research, *chairman, 1949;* Standards, 1949–50. Awards: Fellow, AIEE, 1948.

CHANCE, Britton (M'46—SM'46—F'54), Professor of Biophysics, Director of the Johnson Foundation for Medical Physics, 36th & 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; Listed in American Men of Science and Who's Who; Paul Lewis Award in Enzyme Chemistry, 1950, American Chemical Society.

CHINN, Howard A. (A'42—SM'45—F'45), Chief Engineer, Audio-Video Division, 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 Review Committee, 1954; Education, 1945; Membership, 1934, 1936–38; Papers, 1935–40, 1944–45; Papers Review, 1946–52; Professional Groups, 1948; Standards, 1948; 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.

CHITTICK, Kenneth A. (A'26—SM'49—F'53), Manager, TV Receivers, RCA Victor Corporation, Front and Cooper Sts., 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; Receivers, 1951–52; Television, 1945–48; Television Systems, 1949–53. Awards: Award of Merit, RCA Victor Corp., 1948.

CHODOROW, Marvin (A'43—SM'47—F'54), Associate Professor of Physics, Microwave Laboratory, Stanford University, Stanford, Calif.
Born: July 16, 1913, Buffalo, N.Y.; B.A., 1934, University of Buffalo; Ph.D., 1939, Massachusetts Institute of Technology.

CHRISTALDI, P. Samuel (S'35—A'40—SM'44—F'52), Manager, Instrument Division, Allen B. DuMont Laboratories, Inc., 760 Bloomfield Ave., Clifton, N.J.
Born: November 26, 1914, Philadelphia, Pa. E.E., 1935; Ph.D. (Physics), 1938, Rensselaer Polytechnic Institute. Committees: Admissions, 1949–52, *chairman, 1950–51;* Measurements and Instrumentation, 1950–54, *vice-chairman, 1951–54; chairman, 1953–54;* Subcommittee on Oscillography, *chairman, 1950–53;* Standards, 1953–54. Subsection, *secretary, 1951–53.* Awards: Member, Sigma Xi; 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; Antennas and Wave-guides, 1949–50, *vice-chairman, 1949–1950;* Technical Program, 1949–50.

CLAPP, James K. (A'24—M'28—F'33), Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass.
Born: December 30, 1897, Denver, Colo. B.S., 1923; S.M., 1926, Massachusetts Institute of Technology. Committees: Editorial Review, 1954; Papers, 1931–45; Papers Review, 1946–53; Piezoelectric Crystals, 1945–53; Standards, 1934–35.

CLAVIER, Andre G. (M'30—F'39), Technical Director, Research and Development Laboratories, Federal Telecommunication Laboratories, 500 Washington Ave., Nutley 10, N.J.
Born: February 15, 1894, Cambrai, France. Licencie-es-sciences physiques et mathematiques, 1918, Sorbonne, Paris; Ingenieur diplome de l'Ecole Superieure d'Electricite, 1920, Paris, France; Professeur a l'Ecole Superieure d'Electricite, 1942–47. Committees: Admissions, 1951–52; Standards, 1952; Symbols, 1949–52, *vice-chairman 1950–51, chairman 1951–52;* Administrative Committee, Professional Group on Microwave Theory and Techniques, *chairman, 1953–54;* Administrative Committee, Professional Group on Communication Systems, 1953. President, Fifth Section, Societe des Radioelectriciens, Paris, 1945–47. Awards: Membre Laureat

de la Societe francais des Electriciens; Fellow, AIEE; Member, IEE (Great Britain). Vice-President, American Section of Societe des Ingenieurs Civils de France 1952.

CLEMENT, Lewis M. (A'14—M'17—F'26), Technical Advisor to the General Manager, Crosley Division, Avco Manufacturing Corp., Evendale Plant, Cincinnati 15, Ohio.
Born: January 25, 1892, Oakland, Calif. B.S.(E.E.), 1914, University of California. 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; Receiving Sets, 1927–28; Regular Papers, 1941; Standardization, 1929–30; Vacuum Tubes, 1929–30. Sections: Cincinnati, *chairman, 1945.*

CLEWELL, Dayton (M'49—SM'49—F'54), Director, Field Research Laboratories, Magnolia Petroleum Company, P.O. Box 900, Dallas, Tex.
Born: December 15, 1912, Berwick, Pa. B.S., 1933, Ph.D., 1936, Massachusetts Institute of Technology.

COGGESHALL, Ivan S. (A'26—M'29—F'42), Director of Planning, International Communications, Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y.
Born: September 30, 1896, Newport, R.I. President, 1951; Director, 1941–44, 1951–53. Committees: Admissions, 1934–35, 1941–42; Annual Review, 1944–47; Board of Directors, 1941–44, 1951–53; Building Fund, *vice-chairman, 1945;* Constitution and Laws, 1942, 1945–50, 1952–53, *chairman, 1948–50, 1952–53.* Executive, 1942, 1951, *chairman, 1951;* Finance, 1948–52; Membership, 1928–30, 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, *group chairman, 1945–46;* Papers Review, 1946–47; Professional Groups, 1950; Public Relations, 1943–46, *chairman, 1943–45;* Sections, 1933–35, 1938–42; Standards, 1945–46. Institute Representative: Joint IRE-RTMA Co-ordination Committee, 1951; Joint Technical Advisory Committee, 1951. Awards: Fellow, AIEE.

COLEMAN, John B. (A'25—M'29—SM'43—F'48), Assistant Director of Engineering, RCA Victor Division, Radio Corporation of America, Front and Cooper Sts., Camden, N.J.
Born: August, 1899, Indiana County, Pa. B.S.(E.E.), 1923, Carnegie Institute of Technology. Director, 1948–49. Committees: Broadcast, 1933; Constitution and Laws, 1952–53; 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 35th St., N.E., Cedar Rapids, Iowa.
Born: September 9, 1909, Kingfisher, Okla.

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.D., 1908, Sheffield Scientific School, Yale University; M.S., 1920, Massachusetts Institute of Technology; Graduate of following Army Schools: Army War College, 1938; C. & G. S. School, 1928; C. Arty. School, 1922; C. Arty. School, Advanced Course, 1927. Awards: Distinguished Service Medal, 1946, War Department; Legion of Merit, 1946, War Department; Sigma Xi, 1908, Yale University.

CONDON, Edward U. (M'42—SM'43—F'53), Director of Research and Development, Corning Glass Works, Corning, N.Y.
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 Instruments Engineering Services Section, Instrument and Nuclear Radiation Engineering Department, 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, 1942–47, *chairman, 1940, 1944–45;* Sections, 1935, 1937–48, *chairman, 1938–39, 1940–48;* Standards, 1923–33. Sections: Philadelphia, *chairman, 1934–35.* Institute Representative: ASA Sectional Committee on Acoustical Measurements and Terminology, 1936–37, 1939–46.

CORRINGTON, Murlan S. (SM'49—F'54), Group Manager, RCA, Consumer Products Division, Front and Cooper Sts., Camden, 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: Sound Recording and Reproducing, *vice-chairman, 1953.* Professional Groups: Audio, Philadelphia Chapter, 1953–54; Administrative Committee, Professional Group on Audio, Member, 1952–55; Sections: Philadelphia, Bylaws Comm., *chairman, 1952–54, treasurer, 1953–54.*

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, 1949–53, *chairman, 1952–53;* Electronics, 1938–45. Awards: Fellow, AIEE, 1951; President, New York Electrical Society, 1949–50.

COSENTINO, Adolfo T. (A'37—VA'39—F'40), Operations and Communications Superintendent (Argentina), Pan American-Grace Airways, Inc., Avenida Pte. R. Saenz Pena 788, Buenos Aires, Argentina.
Born: November 18, 1898, Buenos Aires, Argentina. Attended National School, Buenos Aires. Vice-President, 1941; Director, 1941. Committees: Sections, ex-officio, 1940–41, 1947–48. Sections: Buenos Aires, *chairman, 1940–41, 1947–48.*

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

CRAVEN, Tunis A. M. (F'29), Partner, Craven, Lohnes and Culver, Consulting Radio Engineers, 1242-53 Munsey Bldg., Washington 4, D.C. Mail: Langley, McLean P.O., Va.
Born: January 31, 1893, Philadelphia, Pa. Graduate, 1913, United States Naval Academy. Director, 1937. Committees: Broadcast, 1934; Meetings and Papers, 1930; Papers, 1932–41; Radio Transmitters and Antennas, 1930–31; Standardization, 1929–30; Subcommittee on Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, 1929–30; Subcommittee on Nomenclature, Symbols and Definitions, *chairman, 1929–30.*

CRAWFORD, Arthur B. (A'29—SM'46—F'52), Technical Staff, Radio Research Engineer, Bell Telephone Laboratories, Box 107, Red Bank, N.J.
Born: February 26, 1907, Graysville, Ohio. B.S.(E.E.), 1928, Ohio State University. Committees: Wave Propagation, 1949–54; Editorial Review, 1954.

CROSBY, Murray G. (A'25—M'38—SM'43—F'43), Radio-Electronic Consultant; President, Crosby Laboratories, Inc., Box 233, Robbins Lane, Hicksville, L.I., N.Y.
Born: September, 1903, Elroy, Wis. B.S., 1927; E.E., 1943, University of Wisconsin. 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, 1946–49; Executive, 1949; Frequency Modulation, 1940–46, *chairman, 1946;* Modulation Systems, *chairman, 1947–50;* National Convention, 1948; Papers, 1944–45; Papers Procurement, 1945; Papers Review, *chairman, 1946–51;* Policy Development, 1948–49; Professional Groups,

1948; Standards, 1946–48. Institute Representative: IRE-RETMA, Problem No. 2, *chairman, 1951.* Awards: Modern Pioneer Award, National Association of Manufacturers, 1940.

CULVER, Charles (M'20—SM'43—F'54), Senior Physicist and Dean of Professional Development, SW Research Institute, 8500 Culebra Rd., San Antonio 6, Tex.
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. Awards: Member, Acoustical Society of America; Fellow, American Institute of Electrical Engineers; Member, Scientific Research Society of America. Delta Sigma Rho, Phi Beta Kappa, Sigma Pi Sigma, Sigma Xi.

CUTTING, Fulton (M'15—F'21) (L'51), Professor of Physics and Assistant to the President, Stevens Institute of Technology, Hoboken, N.J.
Born: December 27, 1886, New York, N.Y. President, 1922; Vice-President, 1921; Manager, 1920; Director, 1921–24. Committees: Education, 1944; Investments, 1944–46.

DEARDORFF, Ralph W. (A'14—SM'44—F'51), Transmission Engineering Advisor (Communication), The Pacific Telephone and Telegraph Company, 509 South West Oak St., Portland, Ore.
Born: August 9, 1894, Portland, Ore. Sections: Portland, *chairman, 1942–43, vice-chairman, 1946–47.*

deFOREST, Lee (IRE Charter Mem.) (A'12—M'14—F'18) (L'49), Director, American Television Inc. and United Engineering Company, 1027 N. Highland Ave., Los Angeles, 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. President, Society of Wireless Telegraph Engineers, 1909–10. President, 1930; Director, 1930–32. Committees: Specifications for Steamship Radio Equipment, 1914; Wave Length Regulations, 1916. Awards: Edison Medal, 1947; IRE Medal of Honor, 1922; Legion of Honor, 1921.

DELLINGER, John Howard (F'23), 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. President, 1925; Vice-President, 1924; Director, 1924-27; Manager, 1928-31. Committees: Annual Review, 1938–43; Awards, 1934–36; Bibliography, 1930–32, 1934, *chairman, 1931–32, 1934;* Meetings and Papers, 1926, 1928, *chairman, 1928;* Nominations, 1928, 1931, 1935, *chairman, 1931, 1935;* Radio Wave Propagation, *chairman, 1942, 1945;* Receiving Sets, 1927; Revision of the Constitution, *chairman, 1927;* Standardization, 1920–25, 1927–31, *chairman, 1929–30;* Standards, 1932, 1934–41, 1943; Symbols, 1940–41, 1943–48; Use of the Transmission Unit, 1928; Wave Propagation, *chairman, 1937–41.* Sections: Washington, D.C., *chairman, 1932–33.* Institute Representative: International Electrotechnical Commission, Scandinavia, 1930; American Documentation Institute, 1944–53; ASA Sectional Committee on Electric and Magnetic Magnitudes and Units, 1936–37, 1939–48. Awards: Medal of Honor, 1938.

DELORAINE, Edmond M. (M'25—F'41), General Technical Director, International Telephone and Telegraph Corporation, 67 Broad St., New York 4, N.Y.
Born: May 16, 1898, Clichy, Seine, France. B.S., 1920, Ecole de Physique et Chimie, Branch of Paris University. Vice-President, 1946; Director, 1946. Committees: Board of Editors, 1944–45; International Liaison, 1947; Membership 1927.

deROSA, Louis A. (A'45—SM'51—F'52), Laboratory Head, Electronic Countermeasures Laboratory, Federal Telecommunication Laboratories, a division of IT&T Corp., 500 Washington Ave., Nutley 9, N.J.
Born: September 10, 1910, Tenafly, N.J. B.S.(E.E.), 1932, Polytechnic Institute. Committees: Modulation Systems, 1951–52.

DEVORE, Lloyd T. (A'42—SM'44—F'52), Manager, General Electric Company, Electronics Laboratory, Electronics Park, Syracuse, N.Y.
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.* Awards: Exceptional Civilian Service Award, 1947, War Department.

DeWITT, John H., Jr. (A'31—M'38—SM'43—F'51), President, WSM Incorporated, 301 7th Ave., N., Nashville 3, Tenn.
Born: February 20, 1906, Nashville, Tenn. Committees: Professional Groups, 1948. Awards: Sigma Xi, 1949.

d'HUMY, Fernand E. (A'41—SM'45—F'49), Director, Western Union Telegraph Company and Ramp Bldgs. Corp., 130 Park Ave., New York, N.Y.
Born: August, 1873, London, England.

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 Transmitters and Antennas, 1929–30, subcommittee, Receiving Sets, 1928. Sections: Philadelphia, *chairman, 1933–34; convention chairman, 1934.* Awards: United States Navy Certificate Commendation.

DOHERTY, William H. (A'29—M'36—SM'43—F'44), Director of Research, Electrical Communications, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: August 21, 1907, Cambridge, Mass. S.B., 1927; S.M., 1928, Harvard University; Sc.D., 1950, Catholic University of America. Director, 1951–53. Committees: Board of Directors, 1953; Editorial Review, 1954; Membership, 1943–46; Nominations, 1952–53; Policy Advisory, 1952–53; Policy Development, 1951; Professional Groups, 1948-51. Awards: Morris Liebmann Memorial Prize, 1937.

DOME, Robert B. (A'27—M'38—SM'43—F'48), Consulting Engineer, Radio and Television Department, Electronics Division, General Electric Company, Electronics Park, 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 Review, 1954; Papers, 1940–45. Awards: Sigma Xi, 1926; Coffin Award, 1936, 1948; Morris Liebmann Memorial Prize, 1951; R.E.S.A., 1951.

DOOLITTLE, Franklin M. (A'13—M'30—F'54), President, The Connecticut Broadcasting Company, 750 Main St., Hartford 3, Conn.
Born: June, 1893, New Haven, Conn. Ph.B., 1915, Yale University. Committees: Modulation Systems, 1947; Standardization: Subcommittee, Electroacoustics Devices, 1927–28.

DORSEY, Herbert Grove (M'19—F'34), Instructor in Physics, Capitol Radio Engineering Institute, 3224 16th St., N.W., Washington, 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.* Washington Academy of Sciences, Section Representative and *vice-president, 1941–54.* Awards: First Annual Award, Washington Society of Engineers, 1941; Fellow, Acoustical Society of America; AIEE.

DOW, Jennings B. (M'26—F'42), Executive Vice-President, Hazeltine Electronics Corporation, 58-25 Little Neck Pkwy., 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 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, AIEE.

DUBILIER, William (A'14—M'18—F'29) (L'53), Vice-President, Technical Director, Cornell-Dubilier Electric Corporation; President, Radio Patents Corporation, 10 E. 40th St., New York 16, N.Y.
Born: July 25, 1888, New York, N.Y. Attended Cooper Institute. Awards: Fellow, AIEE, 1925; Recipient, French Legion of Honor and made Officer of the French Academy, July, 1949.

DUMONT, Allen B. (M'30—F'31), President, 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. Committees: Standardization, 1929–31; Standards, 1932–33; 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 Award; Chevalier in National Order of French Legion of Honor, 1952.

DUNN, William L. (M'41—S'43—F'54), President, Magnecord, Inc., 225 W. Ohio St., Chicago 10, Ill.
Born: December 19, 1903, Asheville, N.C. A.B., 1926, Johns Hopkins.

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. Committees: Navigation Aids, 1949–50. Sections: Long Island Subsection, *vice-chairman, 1949, chairman, 1950.*

EASTHAM, Melville (A'13—M'13—F'25) (L'50), 8 Graygardens, E., Cambridge, Mass.
Born: June 26, 1885, Oregon City, Ore. Dr.Eng., 1946 (Honorary), Oregon State College. Treasurer, 1927–40; Manager, 1922–26; Director, 1927–41; Administrator, Building Fund, 1947–48. Committees: Admissions, 1937–39, 1941–42; Awards, 1929, 1931, 1935, 1939, 1941–42, *chairman, 1929, 1941–42;* Bibliography, 1930–32, 1934, *chairman, 1932, 1934;* Constitution and Laws, 1930–31; Education, 1944–48; Nominations, 1929–30, 1932, 1935–36, 1938–50, *chairman, 1929, 1935;* Papers, 1916–19; Revision of the Constitution 1925; Sections, 1925; Standardization, 1925, 1927–28, 1930; Subcommittee on Electro-Acoustic Devices, 1927–28; Subcommittee on Circuit Elements, 1928; Technical Committee No. 4, on Electro-Acoustic Devices, 1929–30; Standards, 1936–38; Wave Length Regulation, 1916. Sections: Boston, *secretary, 1914–15; secretary-treasurer, 1916–29, secretary, 1930–32.* Institute Representative: Engineering Index National Committee, 1926, 1939–43; Radio Broadcasting Committee, American Engineering Council, 1930, 1936, 1939, 1940; United States National Committee, Advisers on Electrical Measuring Instruments, 1936, 1939–51. Awards: Medal of Honor, 1937; New England Engineering Award, 1948; Medal for Merit, 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. Director, 1950–51. Committees: Awards, 1951; Membership, 1941–48; Papers Procurement, 1942–43; Policy Development, 1949–51; Regular Papers, 1941. Sections: Seattle, *chairman, 1929–30;* Institute Representative: University of Washington, 1941–47.

ECKERSLEY, Peter Pendleton (F'25), Telephone Manufacturing Company, St. Mary Cray, Kent, England.
Born: January, 1892, La Puebla, Mexico. Certificate of Technology, 1915, Manchester School of Technology; Higher Certificate, 1910, Bedales School. Vice-President, 1937; Director, 1937. Awards: Premium Prize Award, Institution of Electrical Engineers, 1928, 1930.

EDLEFSEN, Niels (SM'52—F'54), Director, Electro-Mechanical Engineering Department, North American Aviation, Inc., 12214 Lakewood Blvd., Downey, Calif.
Born: January 29, 1893. B.S. in Physics, 1916, Utah State College; M.A. in Physics, 1923, Ph.D. in Physics, 1930, University of California at Berkeley. Committees: Professional Group on Airborne Electronics, Los Angeles Chapter, 1952–53. Awards: Fellow, American Physical Society; Fellowship, Charles A. Coffin, 1928–30; Honorable Mention, Nobel Prize, Physics, 1939.

EDWARDS, Martin (SM'48—F'54), Manager-Engineering, X-Ray Dept., General Electric Co., 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. Awards: Fellow, AIEE, 1946.

EHRET, Cornelius D. (F'16) (L'51), Retired, 6911 Clearview St., Philadelphia 19, Pa. Practiced Patent Law, Land Title Bldg., Philadelphia, Pa. from 1902 to July 1, 1948.
Born: January 28, 1874, Erie, Pa. E.E., 1896, Cornell University; LL.B., 1901, National Law School.

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.

ELLEFSON, Bennett S. (A'38—M'44—F'48), Director of Central Engineering Laboratories, Sylvania Electric Products, Inc., 208-20 Willets Point Blvd., Bayside, L.I., 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 College. 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'50), Consulting Engineer, Hewlett-Packard Company, 395 Page Mill Rd., Palo Alto, Calif.
Born: August 20, 1884, Melbourne, Victoria, Australia. A.B., 1907; E.E., 1908, Stanford University. Committees: Increase of Membership, 1913–14.

ENGLEMAN, Christian L. (SM'46—F'54), Management and Engineering Consultant, 2480 16th 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; Advance Management, Harvard Business School, 1950. Committees: National Professional Group on Communications Systems, National Chapter, *chairman, 1954.*

ENGLUND, Carl R. (A'17—F'28) (L'52), Retired. 740 Valencia Mesa Dr., Fullerton, Calif.
Born: November 13, 1884, Sioux City, Iowa. B.S., 1909, University of South Dakota. Committees: Fundamental Units and Measurements, 1933.

ENGSTROM, Elmer W. (A'25—M'38—F'40), Executive Vice-President, RCA Laboratories, Radio Corporation of America, Princeton, N.J.
Born: August 25, 1901, Minneapolis, Minn. B.S.(E.E.), 1923, University of Minnesota; Sc.D.(Honorary), 1949, New York University. Director, 1949. Committees: Awards: 1945–47, 1949, *chairman, 1946–47;* Board of Editors, 1940–52; Nominations 1947; Public Relations, 1940; Regular Papers, 1941; Research, 1946–47, 1949–50; Television and Facsimile, 1936–38; Television, 1939–40.

EPSTEIN, David W. (A'34—SM'43—F'52), Research Section Head, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: January 11, 1908, Russia. B.S. in Physics, 1930, Lehigh University; M.S.(E.E.), 1934; D.Sc.(E.E.), 1937, University of Pennsylvania.

ESPENSCHIED, Lloyd (IRE Charter Mem.) (A'12—M'13—F'24), Independent Consultant; Retired, 1954, as Research Consultant, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: April 27, 1889, St. Louis, Mo. Pratt Institute, 1909. Manager, 1912–13, 1915–26, 1931. Committees: Admissions, 1942–47; Awards, 1919; Editing, 1914; 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, 1919. Sections: New York, *chairman, 1944–45.* Institute Representative; National Advisory Council on Radio in Education, 1936–37, 1939–40; Committee on Engineering Developments, 1941–43. Awards: Medal of Honor, 1940; AIEE Award (co-receiver), 1935; Medal Award, Television Broadcasters Association, 1944.

ESPLEY, Dennis (SM'52—F'54), Dr., Chief Engineer, Telecommunications, Research Laboratories of the G.E.C., Ltd., East Lane, North Wembley, Middlesex, England.
Born: September 19, 1906, Wellington, Shropshire, England. B.Eng. (1st Class Hons.), 1928; D.Eng., 1940, Liverpool University. Awards: Ambrose Fleming; Duddell; John Hopkinson; Officer of the Order of the British Empire (O.B.E.), 1950.

EVANS, Porter H. (M'23—F'31), Member 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. President, 1945; Director, 1942–47, 1949–51. Committees: Awards, 1943–44, 1948–49, *chairman, 1944, 1948–49;* Board of Editors, 1941–53; Circuits, 1944–51; Education, *chairman, 1944, 1950;* Executive, *chairman, 1945;* Frequency Modulation, 1941–45; Investments, 1945; Membership, 1942–43; Nominations, 1942, 1946, 1949–50, 1952, *chairman, 1948;* Papers, 1941–42; Papers Procurement, *vice-chairman, 1943–45;* Policy Development, 1948–51; Professional Groups, 1947–53, *chairman, 1949;* Public Relations, 1950–51; Regular Papers, *vice-chairman, 1941;* Research, 1946–47; Institute Representative: Ohio State University, 1941–42; AIEE-IRE Co-ordinating Committee, 1950–51; Committee on Evaluation of Bureau of Standards, 1953; Ad hoc Committee on Coordination of Student Branches, 1954. Awards: Medal of Honor, 1954.

EWING, Douglas H. (SM'46—F'54), Director, Physical and Chemical Research Laboratory, RCA Laboratories Division, Princeton, N.J.
Born: June 24, 1915, Mitchell, Ind. A.B., 1935, Butler University; M.S., 1937, Ph.D., 1939, University of Rochester. Committees: Education, 1953–54.

FANO, Robert M. (S'41—A'45—SM'48—F'54), Associate Professor of Electrical Communications, Department of Electrical Engineering, 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: Education, 1949–53; Papers Review, 1953; Professional Group on Information Theory, 1951–53.

FARNSWORTH, Philo T. (A'28—M'34—F'39), Director, Vice-President and Technical Director, Capehart-Farnsworth Co., a Division of International Telephone & Telegraph Corporation, 3700 E. Pontiac St., Fort Wayne, Ind.
Born: August 19, 1906, Beaver, Utah. D.Sc. (Honorary), 1951, Indiana Technical College. Committees: Television, 1939-41; Television and Facsimile, 1936–38. 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; Morris Liebmann Memorial Prize, 1941; Sigma Xi.

FARRAND, Clair L. (A'14—M'23—F'31), President, Farrand Optical Co., Bronx Blvd. and E. 238th 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 Electronic Equipment Dept., Electronics Division, General Electric Company, Syracuse, N.Y.
Born: March, 1897, Watervilet, N.Y. Committees: Nominating, 1947; RMA-IRE Coordination, 1945–47. Institute Representative: ASA Sectional Committee (C16) on Radio, 1949–50.

FARRINGTON, John F. (A'19—M'29—F'31), Engineer, Raytheon Manufacturing Company, Waltham, Mass.
Born: January 11, 1895, New York, N.Y. Committees: Admissions, 1938–39; New York Program, 1939.

FAULKNER, Harry (M'24—SM'43—F'53), Director, Telecommunications Engineering & Manufacturing Association, 40 Norfolk St., London, WC 2, England.
Born: April 17, 1892, Nottingham, England. B.Sc.(Eng.) London, 1911. Awards: Special Premium, Institution of Electrical Engineers, 1927.

FELCH, Edwin (A'32—M'42—SM'43—F'54), Military Systems Development Engineer, Bell Telephone Labs., Whippany, N.J.
Born: January, 1909, Madison, N.J.; A.B., Physics, 1929, Dartmouth College. Professional Groups: Administrative Committee, Instrumentation, 1950–55.

FELDMAN, Carl B. H. (A'26—VA'39—F'43), Research Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Born: March 26, 1902, St. Peter, Minn. B.S.(E.E.), 1926; M.S.(E.E.), 1928, University of Minnesota.

FERRELL, Enoch B. (A'25—M'29—SM'43—F'53), Switching Research Engineer, Bell Telephone Laboratories, 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: Papers, 1933–45. Awards: Fellow, ASQC, 1948.

FERRIS, Warren R. (SM'46—F'53), Head, Radio Astronomy Branch, Naval Research Laboratory, Washington 25, D.C.
Born: May 14, 1904, Terre Haute, Ind. B.S.(E.E.), 1927, Rose Polytechnic Institute; M.S.(E.E.), 1932, Union College; Dr. of E.E., 1946, Polytechnic Institute of Brooklyn. Committees: Electron Devices, 1951–54; Standardization, 1929–31; Standards, 1932. Awards: Sigma Xi, 1943.

FICK, Clifford G. (A'25—SM'46—F'51), Manager, Communications Research Section, Electron Physics Research 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, 1948–54.

FIELD, Lester M. (M'48—F'52), Professor, California Institute of Technology, Pasadena, Calif.
Born: February 9, 1918, Chicago, Ill. B.S. 1939, Purdue University; Ph.D., 1941, Stanford University. Committees: Papers Review, 1950–53. Awards: Honorable Mention, Outstanding Young Electrical Engineer, 1949, Eta Kappa Nu.

FIELD, Robert F. (A'18—M'30—SM'43—F'47) (L'53), 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.*

FINCH, James L. (A'19—M'28—SM'43—F'54), Assistant Chief Engineer, 66 Broad St., New York 4, N.Y.
Born: February, 1893, Grand Island, Neb. B.S. in M.E., 1915, University of Washington. Awards: Modern Pioneer, National Association of Manufacturers, 1940.

FINK, Donald G. (A'35—SM'45—F'47), Director of Research, R, T and A, Philco Corporation, Tioga and C Sts., Philadelphia 34, Pa.

Born: November 8, 1911, Englewood, N.J. B.Sc., 1933, Massachusetts Institute of Technology; M.S., 1942, Columbia University. Director, 1949–51. Committees: Annual Review, 1946–48; Appointments, 1948–49; Awards, 1947; Board of Editors, 1946–53; Editorial Board, *vice-chairman, 1954;* Handbook, 1945–47; Joint Technical Advisory, 1948–53, *vice-chairman, 1948, chairman, 1948–53;* Membership 1942–48, *chairman, 1946–48;* Navigation Aids, *chairman, 1946–51;* Papers, 1943–45; Preparedness, 1940–41; Public Relations, 1940–42; Research, 1946–47; Standards, 1946–48; Television, 1946–48, *chairman, 1948;* Television Systems, 1949–53; Tellers, 1949. Awards: Fall Meeting Plaque, 1951; Medal of Freedom, War Department, 1946; Presidential Certificate of Merit, 1948.

FINK, Lyman R. (SM'48—F'53), Manager of Engineering, Radio & Television Receiver Dept., General Electric Co., Electronics Park, Syracuse, 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. Committee: Sections, 1950–51. Sections: Syracuse, *chairman, 1949–51.*

FISK, Sir Ernest T. (M'15—F'26) (L'51), Consultant, Electronics Telecommunications, also Finance and Production, Hyde Park Hotel, Knightsbridge, London, S.W. 1.
Born: August 8, 1886, Sunburyon-Thames, Middlesex, England. 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.

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, Building Fund, 1944–45; New York Program, 1937; Papers Procurement, 1941–43; Radio Receivers, 1936–47, *chairman, 1938–41, 1945–46;* Regular Papers, 1941; Standards, 1938–41, 1945–46; Television, 1939–46; Television and Facsimile, 1938. Awards: Modern Pioneer Award, National Association of Manufacturers, 1940.

FOSTER, Ronald Martin (SM'53—F'54), Professor of Mathematics, Polytechnic Institute of Brooklyn, 85 Livingston St., Brooklyn 2, N.Y.
Born: October 3, 1896, Brooklyn, N.Y. S.B., 1917, Harvard. Committees: Circuits, 1947–52.

FRIEND, Albert (A'34—M'39—SM'43—F'54), Technical Consultant, (Engineering Sciences and Applied Physics) 381 Bala Ave., Bala-Cynwyd, 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, 1948–53, *vice-chairman, 1950–51; chairman, 1952–53;* Standards, 1952–53. Awards: Fellow, American Physical Society; Member, Sigma Xi.

FRIIS, Harald T. (A'18—M'26—F'29), Director of Research in High Frequency and Electronics, Bell Telephone Laboratories, Inc., Box 107, Red Bank, N.J.
Born: February 22, 1893, Neastved, Denmark. E.E., 1916; Dr. Eng., 1938, Royal Technical College, Copenhagen. Director, 1941–43. Committees: Admissions, 1941; Papers, 1941; Research, 1946–47. Awards: Morris Liebmann Memorial Prize, 1939.

FUBINI, Eugene G. (A'36—SM'46—F'54), Supervising Engineer, 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: Papers Review, 1949–51; Tellers, 1948; Wave Propagation, 1949–52. Awards: Presidential Certificate of Merit.

FULLER, Leonard F. (A'14—M'14—F'25), Acting Professor of Electrical Engineering and Co-ordinator of Government Research Contracts, Stanford University, Stanford, Calif.
Born: August 27, 1890. Portland, Ore. M.E., 1912, Cornell University; Ph.D., 1919, Stanford University. Manager, 1928. Committees: Admissions, 1928–29; Sections, 1926–28; Specifications for Steamship Radio Equipment, 1914; Standardization, 1916–19, 1930; Subcommittee on the Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, 1930–31; Subcommittee on Methods of Testing Apparatus, Equipment, Devices, and Materials used in Radio Transmitters and Antennas, 1930–31; Technical Committee No. 2, Radio Transmitters and Antennas, 1930–31; Transmitters and Antennas, 1929–30; Wave Length Regulation, 1916. Sections: San Francisco, *chairman, 1928–29.* Awards: Morris Liebmann Memorial Prize, 1919.

GEBHARD, Louis August (A'20—M'42—SM'43—F'49), Superintendent, Radio Div., United States Naval Research Laboratory, Washington 20, D.C.
Born: June, 1896, Buffalo, N.Y. B.S.(E.E.), George Washington University; LL.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.

GETTING, Ivan A. (SM'46—F'54), Vice-President, Engineering & Research, Raytheon Manufacturing Company, Administration Bldg., Waltham 54, Mass.
Born: January 18, 1912, New York, N.Y. S.B., 1933, Massachusetts Institute of Technology; Ph.D., 1935, Oxford University. Committees: Board of Editors, 1950–53; Editorial Review, 1954. Awards: Fellow, Institute of Physics; Fellow, American Academy of Arts & Sciences; Medal for Merit, President of the United States.

GILL, Archibald J. (M'20—F'40), Engineer-in-Chief, General Post Office, London, E.C. 1, England.
Born: May 13, 1889, Stoke-Sub-Hamdon, Somerset, England. B.Sc.(E.E.), 1909, University of London.

GILLETT, Glenn D. (A'22—M'27—F'34), Co-partner, Ulrey & Gillett, Wholesale Electric Motor Dealers, 2500 S. San Pedro St., Los Angeles 11, Calif.
Born: April 14, 1898, Sterling, Colo. A.B., 1919, Harvard University; S.B.(E.E.), 1921, Harvard Engineering School. Committees: Broadcast, 1935, 1937; Radio Wave Propagation, 1942–45; Wave Propagation, 1937–41.

GILMAN, George W. (A'29—SM'47—F'50), Director of Systems Engineering, 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, 1945–48; Frequency Modulation, 1940–42; Public Relations, 1940–41; 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.

GOLDMARK, Peter C. (A'36—M'38—F'42), President of CBS Laboratories, A Division of Columbia Broadcasting System, Inc., 485 Madison Ave., New York 22, N.Y.
Born: December 2, 1906, Budapest, Hungary. B.Sc., 1930; Ph.D., 1931, Vienna Technical College. Committees: Board of Editors, 1941–50; Television, 1939–48; Television and Facsimile, 1938; Television Systems, 1949–52. Awards: Technical Progress Medal, Television Broadcasters' Association, 1944; Morris Liebmann Memorial Prize, 1945.

GOLDSMITH, Alfred (IRE Charter Mem.) (A'12—F'15), 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. President, 1928; Secretary, 1918–27;

Editor, 1912–28, 1930–53; Editor Emeritus, 1954; Director, 1912–54. Committees: Administrative Committee of the Board of Editors, *chairman, 1951–53;* Admissions, 1925; Awards, 1930–33, 1935–38, *chairman, 1919, 1931;* Bibliography, 1934; Board of Editors, *chairman, 1928, 1930–53;* Constitution and Laws, 1935–40, *chairman, 1935;* Convention Policies, 1940; Editorial Administrative, *chairman, 1946–50;* Executive, 1942–53; Finance, 1941, *chairman, 1915;* Fiscal, 1947–48; Meetings and Papers, 1925–26; Nominations, 1929–31, 1936–40, *chairman, 1930–41;* Office Quarters 1947; Papers, *chairman 1913–19;* Planning, 1947; Special Papers, 1940–41; Membership Solicitation Policy, 1945; Standardization, *secretary, 1913, chairman, 1915–31;* Subcommittee, Circuit Elements, 1928; Standards, 1932–36; Television and Facsimile, 1936–38; Tellers, *chairman, 1932;* Wave Length Regulation, 1916, 1919, Institute Representative: ASA Standards Council, 1936, 1939–46; ASA Sectional Committee on Radio, 1935, 1939–40, *chairman 1942–48;* 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, 1941–53; National Television Systems, 1940–43, 1950–51; Panel 2, *chairman, 1942–43, 1950–51;* Joint Co-ordination Committee, IRE-AIEE, 1951. Awards: Modern Pioneer Award, National Association of Manufacturers, 1940; Medal of Honor, 1941; Townsend Harris Medal, College of the City of New York, 1942; Medal Award, Television Broadcasters Association, 1945; Founders Award, 1954; and other awards.

GOLDSMITH, Thomas T., Jr. (A'38—SM'46—F'49), Vice-President, Research, Allen B. DuMont Laboratories, Inc., 2 Main Ave., Passaic, 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; Electronics, 1942–45; Professional Groups, 1948; Regular Papers, 1941; Television, 1939–46; Tellers, 1944; Vacuum Tubes, 1945–46. Awards: Fellow, Society of Motion Picture Engineers.

GOODALL, William McH. (A'29—M'37—SM'43—F'51), Technical Staff, Bell Telephone Laboratories, Inc., Box 107, Red Bank, N.J.
Born: September 7, 1907, Washington, D.C. B.Sc., 1928, California Institute of Technology. Committees: New York Program, 1939–41; Papers Review, 1946–53; Tellers, *chairman, 1939, 1941.* Sections: Monmouth. Subsection, *secretary-treasurer, 1950, vice-chairman, 1953–54.*

***GORHAM, John E. (A'42—M'46—SM'49—F'54),** Chief, Thermionics Branch, Signal Corps Engineering Lab., Ft. Monmouth, N.J.
Born: November, 1911, Moline, Ill. B.S., 1933; M.S., 1934, Iowa State College; Ph.D., 1938, Columbia University.

GRAHAM, Virgil M. (A'24—M'27—F'35), Associate Director, Engineering Dept., Radio-Electronics-Television Manufacturers Association, Suite 1015, 500 Fifth Ave., New York 36, N.Y.
Born: January 22, 1902, Rochester, N.Y. Attended University of Rochester. 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, 1947–48;* Publicity, 1935–36; Radio Receivers, 1936–40; Regular Papers, 1941. Sections, 1930–34, *chairman, 1936–45, 1948;* Standardization, 1925, 1929–30; Subcommittee, Aircraft Receivers, *chairman, 1929–30;* Subcommittee Power Supply, 1928; Standards, 1932, 1935–43, 1945–47; Technical Committee No. 1 Radio Receivers and Parts, 1929–30; RMA-IRE Co-ordinating, *chairman, 1947–49.* Sections: Rochester, *chairman, 1926–27.* Institute Representative: ASA Sectional Committee on National Electrical Safety Code, Broadcast Reception Equipment, *alternate, 1939–48;* ASA Sectional Committe on Radio (C16), *chairman, 1949–52.*

*(Deceased)

GROVER, Frederick W. (M'17—SM'43—F'49) (L'52), 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. Institute Representative: Union College, 1941–48.

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, 1944–46; Board of Editors, 1953; Circuits, *chairman, 1944–51;* Education, 1947–48; Standards, 1944–46. Institute Representative: Massachusetts Institute of Technology, 1945–51. Awards: Presidential Certificate of Merit, 1948.

GUNN, Ross (A'35—SM'47—F'49), Director of Physical Research, United States Weather Bureau, Washington 25, D.C.
Born: May, 1897, Cleveland, Ohio. B.S.(E.E.), 1920; M.S., 1921, University of Michigan; Ph.D., 1926, Yale University. Awards: Air Safety Award, 1951; Distinguished Service Citation, United States Navy, 1945; Fellow, American Physical Society; Member, National Academy of Sciences.

GUNTHER, Clarence (A'27—SM'48—F'54), Assistant Chief Engineer, Engineering Department, Engineering Products Division, RCA Victor Division, Camden 2, N.J.
Born: June 29, 1903, Los Angeles, Calif. B.S., E.E., 1926, Princeton University. Professional Groups: Antennas and Propagation; Electronic Computers. Sections: Philadelphia, *secretary-treasurer, 1948–49; vice-chairman, 1949–50; chairman, 1950–51.* Awards: Award of Merit, 1952, Radio Corporation of America.

GUSTAFSON, Gilbert E. (A'27—M'38—F'40), Vice-President in Charge of Engineering, Zenith Radio Corporation, 6001 Dickens Ave., Chicago 39, Ill.
Born: November 15, 1905, Rock Island, Ill. Director, 1943. Committees: Admissions, 1943; Awards, 1942.

GUY, Raymond F. (A'25—M'31—F'39), Manager, Radio 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. President, 1950; Treasurer, 1947; Director, 1944–48; 1950–52. Committees: Annual Review, 1943–46; Antennas, 1944–47; Broadcasting, 1929–32; Building Fund, *vice-chairman, 1948;* Constitution and Laws, 1945–48, 1952–53; *chairman, 1946;* Education, 1945–48; Executive, 1946–47, 1950–52, *vice-chairman, 1947, chairman, 1950–52;* Fiscal, 1947–48; Finance, 1951–52; Founders, *chairman, 1947;* Frequency Modulation, 1942–46; 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, 1951–53; *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. Institute Representative; ASA Standards Council, *alternate, 1946–48;* Joint Technical Advisory Committee, 1950.

HACKBUSCH, Ralph A. (A'26–M'30–F'37), President and Manager Director, Stromberg-Carlson Company, Ltd., Toronto, Canada; President, Hackbusch Electronics Ltd., 23 Primrose Ave., Toronto, Canada.
Born: September 18, 1900, Hamilton, Ont., Canada. Vice-President, 1944; Director, 1938, 1944–46. Committees: Admissions, 1940; Awards, 1947–50; Public Relations, 1940, 1947–51; Sections, 1936–37; Standards, 1949–52. Sections: Toronto, *secretary, 1930–31, chairman, 1932–33.*

HAEFF, Andrew V. (A'34—M'40—SM'43—F'49), Head, Electron Tube Laboratories, and Associate Director, Research and

Development 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: Board of Editors, 1951–53; Editorial Administrative, 1949–51; Editorial Review, 1952; Nuclear Studies, 1948. Awards: Harry Diamond Memorial Award, 1950; Special Research Fellowship, California Institute of Technology, 1932–33.

HAFSTAD, Lawrence R. (SM'52—F'53), Director, Division of Reactor Development, U. S. Atomic Energy Commission, 1901 Constitution Ave., Washington 25, D.C.
Born: June 18, 1904, Minneapolis, Minn. B.S.(E.E.), 1926, University of Minnesota; Ph.D. (Physics), 1933, Johns Hopkins University. Committees: Annual Review, 1949–50; Nominations, *chairman, 1951;* Nuclear Studies, *chairman, 1948–50.* Professional Groups: Nuclear Science, *chairman, 1948–53;* Administrative Committee, 1951. Awards: U. S. Delegate to International Radio Union Conference in London, 1934.

HAGEN, John P. (A'37—SM'47—F'54), Superintendent, Atmosphere and Astrophysics Division, Naval Research Laboratory, 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.

HALLBORG, Henry E. (F'45), Research and Engineering Consultant on High-Frequency Propagation, and Associated Equipments. Home address, 26 Macopin Ave., Upper Montclair, N.J.
Born: April, 1884, Stockholm, Sweden. B.Sc.(E.E.), 1907, Brown University. Committees: Constitution and Laws, 1928–32; Radio Transmitters and Antennas, 1930–31; Standardization, 1929–30; Subcommittee on the Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, *chairman, 1930–31;* Subcommittee on Methods of Testing Apparatus, Equipment, Devices and Materials Used in Radio Transmitters and Antennas, 1930–31; Transmitters and Antennas, 1930.

HALLER, George L. (A'28—M'36—SM'43—F'50), Dean, College of Chemistry and Physics, The Pennsylvania State University, 123 Osmond Laboratory, State College, Pa.
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; Professional Groups: Airborne Electronics Administrative Committee, 1951–53. Sections: Dayton, *chairman, 1944–45;* Centre County Sub-section, *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, WADC, Wright-Patterson Air Force Base, Dayton, 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.* Awards: War Department Commendation, 1946.

HAMBURGER, Ferdinand, Jr. (A'32—M'39—SM'43—F'53), Professor, Electrical Engineering, Johns Hopkins University, Charles & 34th Sts., Baltimore 18, Md.
Born: July 5, 1904, Baltimore, Md. B.E., 1924; Dr. Engr., 1931, The Johns Hopkins University. Director, 1950–51. Committees: Appointments, 1951; Nominations, 1951; Policy Advisory, 1952–54. Institute Representative: Johns Hopkins University, 1941–54. Sections: Baltimore, *chairman, 1940–41.* Awards: Fellow, American Institute of Electrical Engineers, 1949.

HANSELL, Clarence W. (A'26—M'29—SM'43—F'45), Research Supervisor, Transmission, RCA Laboratories Division, Radio Corporation of America, Rocky Point, N.Y.
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.

HANSON, O. B. (A'18—M'27—F'41), Vice-President and Chief Engineer, National Broadcasting Company, Inc., 30 Rockefeller Plaza, New York 20, N.Y.
Born: February 11, 1894, Huddersfield, Yorkshire, England. Director, 1938–43. Committees: Meetings and Papers, 1929; Members, 1950; Nominations, 1944–45, 1948; Papers, 1942–45; Papers Procurement, 1942–43; Papers Review, 1946–51; 1953; Public Relations, 1940–46; Regular Papers, 1941; Standardization, 1929; Tellers, *chairman, 1941.*

HARMON, Ralph N. (A'30—SM'45—F'52), Engineering Manager, Westinghouse Broadcasting Company, Inc., 1625 K St., N.W., Washington 6, D.C.
Born: August 29, 1905, California, Pa. B.S. in E.E., 1928, Carnegie Institute of Technology. Committees: Membership, 1950–51; Technical on Television Systems, 1947–48, 1952–54. Sections: Award of Merit, U. S. Navy Bureau of Ships, U. S. Navy Ordnance, NDRC; Baltimore, *vice-chairman, 1944–45, chairman, 1945–46.* Awards: Patent Awards, Westinghouse Electric Corp.

HARNETT, Daniel E. (A'25—M'35—F'42), Engineer, General Electric Company, Electronics Park, 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; Standardization: Technical Committee No. 3, Vacuum Tubes, 1929–30.

HARTIG, Henry E. (A'36—M'41—SM'43—F'52), Professor and Head, Elect. Engrg. Dept., 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; Education, 1952–53. Sections: Twin City, *chairman, 1945–46.* Awards: Fellow, AIEE.

HARTLEY, Ralph V. L. (M'19—F'28), Retired, Formerly, Research Consultant, Bell Telephone Laboratories, Inc., Murray Hill, 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: Medal of Honor, 1946.

HARVEY, Norman L. (A'41—M'46—SM'48—F'54), Chief Engineer, 254 Rano St., Buffalo 7, N.Y.
Born: October 9, 1911, Ossian, Iowa. B.S. in E.E., 1934, Iowa State College; (Part-time graduate study) Polytechnical Institute of Brooklyn.

HAUSZ, Walter (A'44—SM'46—F'54), Manager, General Electric Advanced Electronics Center, Ithaca, N.Y.
Born: May, 1917, Queens County, N.Y. B.S., E.E., 1937; M.S., E.E., 1938, Columbia University. Committees: Admissions, 1951; Papers Review, 1951. Awards: Coffin Award, 1952, General Electric.

HAYES, John Edmund (A'39—VA'39—SM'53—F'54), Chief Engineer, Canadian Broadcasting Corporation, 1425 Dorchester St., W., Montreal, Que., Canada.
Born: February, 1910, Arcola, Sask., Canada. B.Sc., 1935, Queen's University; M.Eng., 1947, McGill University. Committees: Educational, 1946–50.

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'51), 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. President, 1936; Manager, 1923–28; Director, 1936–39. Committees: Admissions, 1925–28; Awards, *chairman, 1937–38;* Education, 1945–47; Meetings and Papers, 1925, 1927; New York Program, 1935; Standardization, 1924–28; Subcommittee on Receiving Sets, 1927–28; Subcommittee on Vacuum Tubes, *chairman, 1927;* Subcommittee on Vacuum Tube Terminology, *chairman, 1924–25.* Awards: Armstrong Medal, Radio Club of America, 1937.

HEADRICK, Lewis B. (A'36—M'38—SM'43—F'53), Staff Engineer, RCA Lancaster Lab., New Holland Pk., Lancaster, Pa.
Born: June 6, 1904, Chattanooga, Tenn. B.S. (Physics), 1926, University of Chattanooga; Ph.D. (Physics), 1930, University of Michigan. Committees: Cathode Ray and Television Tube Subcommittee of Electron Tubes and Solid State Devices, *chairman, 1946–50;* Editorial Review, 1954. Sections: Philadelphia, Lancaster Subsection, *chairman, 1952–53.*

HEINTZ, Ralph M. (A'21—M'27—F'30), 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. Sections: San Francisco, *chairman, 1931–32.*

HEISING, Raymond A. (A'20—F'23), 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. President, 1939; Treasurer, 1943–45; Manager, 1927–31; Director, 1933–35, 1939–41, 1943–45, 1947–49. Committees: Admissions, 1927, 1933, 1935–38, *chairman, 1928–30, vice-chairman, 1931;* Appointments, 1948; Constitution and Laws, 1930–34, 1941–42, 1945–50, *chairman, 1943–44, 1951–53;* Executive, *vice-chairman, 1943–45;* Investments, *chairman, 1944–46;* 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, 1948–53; Sections, *chairman, 1941–52;* Standardization, 1925. Awards: Modern Pioneer Award, Morris Liebman Memorial Prize, 1921; National Association of Manufacturers, 1940; Fellow, AIEE; Fellow, American Physical Society.

HENDERSON, John T. (A'28—SM'47—F'51), Senior Research Physicist, 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. Director, 1953–54. Committees: Professional Groups Committee, 1954. Sections: Ottawa, 1948–51, *vice-chairman, 1949–50, chairman, 1950–51.* Awards: Fellow, Royal Society of Canada, 1944; M.B.E., Dominion of Canada, 1943.

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

HERBST, Philip J. (M'41—SM'43—F'53), Manager, Communications Engineering Section, Radio Corporation of America, Camden, N.J.
Born: January 24, 1903, Philadelphia, Pa. B.S. (Physics), 1925, St. Thomas College; M.S. (Physics), 1927, La Salle College. Committees: Radio Transmitters, 1952–53, *chairman, 1953.* Sections: Philadelphia, Executive Committee, 1952–53; Papers and Meetings Committee, *chairman, 1952–53.*

HEROLD, Edward W. (A'30—M'38—SM'43—F'48), Director, Radio Tube Research Laboratory, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: October 15, 1907, New York, N.Y. B.Sc., 1930, University of Virginia; M.Sc., 1942, Polytechnic Institute of Brooklyn. Committees: Board of Editors, 1946–53; Editorial Administrative, 1946–51; Membership, 1942; Papers, 1944–45; Winter Technical Meeting, 1945. Sections: Princeton, *vice-chairman, 1948; chairman, 1949.*

HESSEL, John (A'31—VA'39—SM'48—F'53), Chief, Radio Communication Branch, Signal Corps Engineering Labs., Fort Monmouth, N.J.
Born: March 15, 1908, Grand Rapids, Mich. B.S.(E.E.), 1929; M.S.(E.E.), 1930, Univ. of Michigan. Committees: Papers Procurement, 1948–50; Professional Groups, 1953–54; Technical Program, 1954 Convention; Administrative Committee Professional Group on Communication Systems, 1952–54; Professional Group on Communication Systems, *treasurer, 1952–53;* Professional Group on Communication Systems, *chairman, 1953–54.* Awards: Tau Beta Pi; Phi Kappa Phi; Sigma Xi; Colonel, Signal Corps, USAR; Legion of Merit with Oak Leaf Cluster.

HEWLETT, William R. (S'35—A'38—M'47—F'48), Vice-President, Hewlett-Packard Company, 395 Page Mill Rd., Palo Alto, California.
Born: May 20, 1913, Ann Arbor, Mich. A.B., 1934, Stanford University; M.S., 1936, Massachusetts Institute of Technology; E.E., 1939, Stanford University. President, 1954. Director, 1950–54. Committees: Executive, 1953–54; Finance, 1953; Papers Review, 1953; Nominations, 1950–52; Policy Advisory, 1950–52, *chairman, 1952;* Sections Co-ordinator, 1953. Sections: San Francisco, *vice-chairman, 1948–49; chairman, 1949–50.*

HILL, Albert G. (SM'46—F'50), Professor of Physics; Director, Lincoln Laboratory, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 39, Mass.
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.

HILLIARD, John K. (A'25—M'29—SM'43—F'52), Chief Engineer, 9356 Santa Monica Blvd., Beverly Hills, Calif.
Born: October 22, 1901, Wyndmere, N.D. B.S., 1924, Hamline University; Ph.D. in E., University of Hollywood. Committees: Audio Techniques, 1950–52; Board of Editors, 1951–53; Professional Group on Audio, *advertising chairman, 1952.* Sections: Los Angeles, *chairman, 1933–34.* Awards: Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; Fellow, Society of Motion Picture and Television Engineers.

HINNERS, Frank A. (IRE Charter Mem.) (A'12—M'15—F'26), President, Hinners-Galanek Radio Corp., 28-14 Broadway, Long Island City 6, 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), Chief Engineer, Research Division, Hazeltine Corporation, 58-25 Little Neck Pkwy., Little Neck, L.I., N.Y.
Born: October, 1902, Pittsburgh, Pa. A.B., 1923, Columbia College; E.E., 1925, Columbia University. Committees: Board of Editors, 1952–53; Navigation Aids, *vice-chairman, 1947–52;* Task Group on Pulse Definitions, *chairman, 1950–52;* Television Systems Definitions Subcommittee, 1951–53. Sections: Long Island Subsection, *vice-chairman, 1952; chairman, 1953.* Awards: Certificate of Commendation, U. S. Navy, 1947.

HOGAN, John V. L. (IRE Charter Mem.) (A'12—M'12—F'15), President, Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y.
Born: February 14, 1890, Philadelphia, Pa. 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, *chairman, 1928, 1932–33, 1945, 1948;* Broadcasting, 1929–37; Constitution and Laws, 1928–29, 1935–36, 1954, *chairman, 1932–34;* Constitutional Amendments, *chairman, 1945;* Editing, *chairman, 1914;* Facsimile, 1939–52, *chairman, 1947–51, 1952;* Finance, 1915; Financial Matters, 1915; Increase of Membership, *chairman, 1916–19;* 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;* Revision of the Constitution, 1925–27, *chairman, 1925;* Sections, 1925; Specifications for Steamship Radio Equipment, 1914; Standardization, 1913, 1915–29, 1932, 1936–37, 1947–51; *chairman, 1916–19;* Subcommittee on Receiving Sets, 1927–28; Subcommittee on Vacuum Tubes, *chairman, 1927;* Subcommittee on Use of the Transmission Unit, *chairman, 1928.* Institute Representative; ASA Sectional Committee on Radio, 1930; ASA Sectional Committee on Radio Electrical Co-ordination, 1936, 1939–46; Joint Technical Advisory Committee, 1948–54.

HOLLMANN, Hans E. (A'48—F'53), Research Scientist, U.S. Naval Air Missile Test Center, Point Magu, Calif.
Born: November 4, 1899, Solingen, Germany. Ph.D., 1928; Dr. Habil., 1933, Technical University Berlin; Professor of Applied Physics, 1945, University of Jena.

HOLMES, Lynn C. (M'44—SM'49—F'49), Director of Research, Stromberg-Carlson Company, 100 Carlson Rd., Rochester 3, N.Y.
Born: April, 1904, Brookfield, N.Y. E.E., 1925; M.E.E., 1932; Rensselaer Polytechnic Institute. Awards: Fellow, AIEE.

HOLMES, Ralph S. (A'25—SM'45—F'52), Director, Research Contracts, 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, 1939–40. Awards: Modern Pioneer Award, National Association of Manufacturers, 1937.

HOOPER, Stanford C. (A'33—F'46), Rear Admiral, United States Navy, Retired. Consultant, 6320 Alton Rd., Miami Beach, Fla.
Born: August 16, 1884, Colton, Calif. B.S., 1905, United States Naval Academy; LL.D. (Honorary), 1948, Drury College. Committee; Increase of Membership, 1913–14. Awards: Elliot Cressen Medal, Franklin Institute; Marconi Medal of Merit; Medal of Honor, 1934; Veterans Wireless Medal.

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. Director, 1933–34. Committees: Admissions, 1933–37, 1940–42; Broadcasting 1928–32; Broadcast, 1933–37; New York Program, 1932–34, *chairman, 1933–34;* Public Relations, 1945–46; Sections, 1929–33, *chairman, 1931–32;* Television and Facsimile, 1936–38. Institute Representative: National Advisory Council on Radio in Education, 1936, 1939–40; Committee on Engineering Developments, 1941–43.

HORTON, J. Warren (A'20—F'29), 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; Standards, *chairman, 1931–32;* Technical Committee No. 3, Vacuum Tubes, 1929–30. Institute Representative; ASA Committee on Electric and Magnetic Magnitudes and Units, 1952; United States National Committee, Advisers on Symbols (International Electrotechnical Committee), 1936–37, 1939–51.

HOWES, Frederick S. (A'37—M'43—SM'43—F'50), Associate Professor, Electrical Engineering, and Director, Department of 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. Director, 1948. Committees: Awards, 1950; Education, 1945–46, 1951–53. Sections: Montreal, *chairman, 1944–45;* Canadian Council, *chairman, 1947–48.* Institute Representative: McGill University, 1941–51.

HULL, David R. (A'36—F'47), Captain, United States Navy, retired; Vice-President, General Manager, Equipment Divisions, Raytheon Manufacturing Company, Waltham 54, Mass.
Born: October, 1903, Newton, N.J. B.S., 1925, United States Naval Academy; M.S., 1933, Harvard University. Committees: Electron Tube, 1946–47; Electronics, 1943–45; Vacuum Tubes, 1945–46. Awards: Legion of Merit; Navy Commendation Ribbon.

HULL, Lewis M. (J'17—A'19—M'27—F'28), Chairman of the Board, Aircraft Radio Corporation, Boonton, N.J.
Born: February 27, 1898, Great Bend, Kan. A.B., 1917; A.M., 1918, University of Kansas; Ph.D., 1922, Harvard University. 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, 1928–31, 1935, *chairman, 1934;* Papers, 1931; Receiving Sets, 1927–28; Standardization, 1927–28; Registration of Engineers, 1940; Use of the Transmission Unit, 1928. Institute Representative: ASA Sectional Committee on Radio, 1930; National Advisory Council on Radio in Education, 1936–37, 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.C. (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 Mfg. Co., 1164 E. Court 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. Director, 1948–50. Committees: Editorial Board, 1954; Education Committee, 1954; Nominations, *chairman, 1949–51;* Papers, *1945–50;* Policy Advisory, 1948–53; Sections, 1950. Sections: Cedar Rapids, *temporary chairman, 1945; chairman,* 1946–47. Awards: Sigma Xi, 1923.

HUNTOON, Robert D. (A'40—SM'47—F'54), Associate Director of Physics, Connecticut & Van Ness Sts., Washington 25, D.C.
Born: July, 1909, Waterloo, Iowa. B.A. in Education, 1932, Iowa State Teachers College; M.S., Experimental Physics, 1935, State University of Iowa; Ph.D., Nuclear Physics, 1938, State University of Iowa. Awards: Washington Academy of Sciences Award, 1948, in physical sciences; Naval Ordnance Development Award, 1945, U.S. Navy Bureau of Ordnance; Presidential Certificate of Merit, 1948; Exceptional Service Award, Department of Commerce, 1949.

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

HUTTER, Rudolf (SM'46—F'54), Engineering Specialist, 208-20 Willets Pt. Blvd., Bayside, Queens, N.Y.
Born: February 12, 1910, Berlin, Germany. State Examination, 1936, University of Berlin (Germany); Ph.D., 1944, Stanford University, Calif.

IAMS, Harley A. (A'31—M'38—SM'43—F'50), Associate Head R&D—Guided Missile Division, Hughes Aircraft Company, Florence 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; Sigma Xi.

ISBISTER, Eric J. (A'39—SM'45—F'53), Engineering Department Head, Sperry Gyroscope Co., Div. of the Sperry Corp., Great Neck, 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, 1948–49;* New York, *treasurer, 1951–52.* Awards: Certificate of Commendation, 1947.

ISRAEL, Dorman D. (A'23—M'30—F'42), Executive Vice-President, Emerson Radio and Phonograph Corporation, 111 Eighth Ave., New York, N.Y.
Born: July 21, 1900, Newport, Ky. E.E., 1923, University of Cincinnati. Committees: Administrative, 1949–51; Editorial Review, 1954; Awards, 1943–44, 1947; Joint Technical Advisory Committee, 1952–54; Membership, 1941; National Television System Committee, 1950–53; New York Program, 1940–41; Nominations, 1946; Papers, 1940–41; Papers Procurement, *chairman, 1942–43, general chairman, 1944–47;* Professional Groups, 1951–54; Public Relations, 1940–44; RMA-IRE Coordinating, 1947–48; Radio Receivers, 1948–51; Regular Papers, *chairman, 1941;* Television and Facsimile, 1936–37; Winter Technical Meeting, 1946. Professional Groups: Broadcast and Television Receivers, *chairman, 1951–53;* Professional Group Chapters, *chairman, 1952–53.*

JACKSON, William E. (A'29—M'34—SM'43—F'51), Chief, Electronics Division, Civil Aeronautics Administration, Technical Development and Evaluation Center, Weir Cook Airport, Indianapolis 44, Ind.
Born: May 8, 1904, Bridgewater, Mass. B.S.(E.E.), 1925, Brown University. Committees: Antennas, 1944–46; Navigation Aids, 1947–48, Radio Transmitters, 1946; Transmitters, 1944–45; Transmitters and Antennas, 1938–44. Awards: Citation for service on Radio Technical Commission for Aeronautics Special Committee 1931; Cull Prize in Engineering, Brown University, 1925.

JACKSON, Willis (SM'48—F'50), Director of Research and Education, Metropolitan Vickers Electrical Co. Ltd., Trafford Park, Manchester and St. Paul's Corner, London, E.C. 4, England.
Born: October 29, 1904, Burnley, Lancs., England. D.Sc., 1936, Manchester University; Ph.D., 1936, Oxford University. Awards: F.R.S. 1953.

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. 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; Broadcasting, 1931–33, 1935–37, *chairman, 1937;* Constitution and Laws, 1932–33, 1941; Education, 1944; Frequency Modulation, 1940–43; Membership, 1925, 1928, 1941–43; Nominations, 1936–42, 1945, *chairman, 1937, 1939;* Preparedness, 1940–41; Publicity, 1936; Public Relations, 1946; Receiver Sets, 1928; Standards, 1932; Sections, 1925; Standardization, 1928–31; Use of the Transmission Unit, 1928. Institute Representative: American Documentation Institute, 1939–43; First National Conference on Educational Broadcasting, 1937; American Council on Education, Planning Committee, National Conference on Educational Broadcasting, 1936–37, 1939–43; URSI Executive Committee, 1936–37, 1939–49; ASA Sectional Committee on Radio-Electrical Coordination, 1926, 1939–46.

JARVIS, Kenneth W. (A'24—M'27—F'34), President, Jarvis Electronics Corporation, 6058 W. Fullerton Ave., Chicago 39, Ill.
Born: October 18, 1901, Mansfield, Ohio. B.E.E., 1923, Ohio State University. Committees: Radio Receivers and Parts, 1930–31; Receivers, 1947–52; Receiver Sets, 1927–28. Sections: Chicago, *chairman,* 1948–49.

JENSEN, Axel G. (A'23—M'26—F'42), Director of Television Research, Bell Telephone Laboratories, Inc., Murray Hill Laboratory, Murray Hill, N.J.
Born: February 7, 1896, Copenhagen, Denmark. E.E., 1920, Royal Technical College; Post Graduate, 1921–22, Columbia University. Director, 1954. Committees: Audio and Video Techniques, 1948; Co-ordination for International Technical Organizations, *chairman, 1950–53;* Instruments and Measurements, 1949–50; IRE, RTMA, SMPTE Television Co-ordinating Committee, *chairman, 1950–51;* Standards, 1948–50, *vice-chairman, 1949–50, chairman, 1951–53;* Television, 1939–48, *chairman, 1948;* Television and Facsimile, 1938; Television Systems, *chairman, 1949–51.* Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949–53; ASA Standards Council, 1951–53; ASA Sectional Committee (C16) on Radio, 1951–53; IRE, AIEE, ASA (C42) Definitions Co-ordinating Committee, 1949–53; IRE-AIEE Committee on Noise Definitions, 1951; CCIR Executive Committee, 1952–53.

JETT, Ewell K. (A'29—M'38—F'39), Vice-President and Director of Television, Baltimore Sunpapers, Baltimore, Md.
Born: March 20, 1893, Baltimore, Md. 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, 511 Fifth Ave., New York 17, N.Y.
Born: January, 1903, Oskaloosa, Iowa. A.B., 1924; B.S., 1926; E.E., 1927, Columbia University. Director, 1942. Committees: Board of Editors, 1946–53; Nominations, 1942; Papers Procurement, 1944–45; Radio Receivers, 1936–37, 1941–50; 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), Research Engineer, 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.

JOLLIFFE, Charles B. (M'25—F'30), Vice-President and Technical Director, Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.
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. Director, 1936–37, 1944. Committees: Admissions, 1938; Awards, 1942; Bibliography, 1930–32; Broadcast, 1932, 1936–37; Frequency Modulation, 1940–41; Meetings and Papers, 1930; Nominations, 1937, 1941; Piezoelectric Crystals, 1940; Policy Development, 1948; Preparedness, 1940–41; Subcommittee on Receiving Sets, 1927; Standardization, 1925–26, *chairman, 1928–31;* Subcommittee on Vacuum Tubes, 1927–28, *chairman, 1928;* Television and Facsimile, 1936–48. Sections: Washington, D.C., *chairman, 1929–30.* Institute Representative: American Council on Education, Planning Committee, National Conference on Educational Broadcasting, 1936–37, 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, 1945–48; Antennas and Waveguides, 1949–52; Editorial Review, 1954; Membership, 1950–52; Papers Review, 1951–53. Institute Representative: Ohio State University, 1942–45; University of Illinois, 1946–50. Sections: Columbus, sub-section, 1945.

JORDAN, John F. (A'40—M'45—SM'53—F'54), Director of Engineering & Research, The Baldwin Co., 1801 Gilbert Ave., Cincinnati, Ohio.
Born: November 23, 1908, Pittston, Pa. E.E., 1932, University of Cincinnati; Advanced Mgt. Program, 1953, Harvard University Graduate School of Business. Committees: Sections Committee, 1949–52, *chairman, 1950–51.* Sections: Cincinnati, *secretary-treasurer, 1945–46; vice-chairman, 1946–47; chairman, 1947–48.*

KAAR, Ira J. (J'22—M'29—F'41), Manager of Engineering, Electronics Division, General Electric Company, Electronics Park, Syracuse, N.Y.
Born: October 17, 1902, Dunsmuir, Calif. B.S.(E.E.), 1924, University of Utah. Director, 1939, 1948. Committees: Admissions, 1940; Annual Review, 1940–45; Awards, 1947–48; Joint Technical Advisory, 1950–52, *vice-chairman, 1950–51, chairman, 1951–52;* Nominations, 1949–50; Public Relations, 1940, 1942; Standards, 1940–45; Television, 1939–48, *chairman, 1940–46;* Television Systems, 1949–52.

KANDOIAN, Armig G. (S'35—A'36—SM'44—F'51), Head, Radio Communication Laboratory, Federal Telecommunication Laboratories, Inc., 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. Awards: Eta Kappa Nu, Honorable Mention, 1943.

KANTEBET, Shankar R. (A'25—M'31—SM'43—F'49), Director General, Overseas Communications Service, Government of India, Radio House, Apollo Bunder, Bombay 1, India.
Born: December, 1900, Kanara, Bombay, India. B.A. (Honours) M.N. Technical Scholar, 1922, Bombay University. Vice-President, 1953. Awards: A.M.I.E.E., 1928; M.I.E.(I), 1944; Marconi veteran, 1951.

KARPLUS, Eduard (A'31—F'38), Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass.
Born: September 7, 1899, Moedling, Austria. Ingenieur, 1923, Technische Hochschule, Vienna, Austria.

KEAR, Frank G. (A'24—M'31—SM'43—F'53), Consulting Radio Engineer, 1302 18th St., N.W., Washington 6, D.C.
Born: October 18, 1903, Minersville, Schuylkill County, Pa. E.E., 1926, Lehigh University; S.M.(E.E.), 1928; Sc.D.(E.E.), 1933, Massachusetts Institute of Technology. Committees: Standardization, Technical Committee on Radio Transmitters, 1929–30; Standards, 1934–35.

KELL, Ray D. (A'35—F'47), Head, Television Section, 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: Television, 1941, 1946–48; Television Systems, 1949–52. Awards: Modern Pioneer Award, National Association of Manufacturers, 1940; Stuart Ballantine Medal of the Franklin Institute, 1948.

KELLY, Mervin J. (M'25—F'38), President, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y.
Born: February 14, 1894, Princeton, Mo. B.S., 1914, Missouri School of Mines and Metallurgy, Rolla, Mo.; M.S., 1915, University of Kentucky; Ph.D., 1918, University of Chicago; D.Eng., 1936, University of Missouri; D.Sc., 1946, University of Kentucky. Committees: Standardization Subcommittee on Vacuum Tubes, 1927–29; Technical Committee No. 3, Vacuum Tubes, 1930. Institute Representative: ASA Technical Committee, Vacuum Tubes, 1930.

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: Professional Group on Airborne Electronics, *chairman, 1951;* Administrative Committee, 1951–53; Wave Propagation, 1948–51. Sections: Dayton, *chairman, 1946–47.*

KILLIAN, Thomas J. (A'47—SM'47—F'51), Chief Scientist, Office of Ordnance Research, U. S. Army, Duke University, Durham, N.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, 1947–50. 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. Committees: Mobile Communications, 1952–53; Railroad and Vehicular Communication, 1948–52. Sections: Kansas City, *vice-president, 1941–43;* Publicity, *chairman, 1951–53;* Meetings and Papers, *chairman, 1952–53.*

KING, Ronold W. P. (A'30—SM'43—F'53), Gordon Mackay Professor of Applied Physics, Cruft Lab., Harvard Univ., 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, 1944–46; Papers Review, 1952; Transmitters, 1944–45; Transmitters and Antennas, 1942–44.

KLOEFFLER, Royce G. (SM'46—F'53), Professor and Head, Dept. of Electrical Engineering, Kansas State College, Manhattan, Kan.
Born: June 18, 1890, Armada, Mich. B.S.(E.E.), 1913, University of Michigan; S.M., 1930, Mass. Institute of Technology.

KNOWLES, Hugh S. (A'25—F'41), Consulting Engineer; President and Director of Research, Industrial Research Products, 9400 Belmont Ave., Franklin Park, Ill.
Born: September 23, 1904, Hynes, Iowa. A.B., 1928, Columbia University. Committees: Annual Review, 1938–41; Board of Editors, 1945–53; Electroacoustics, 1936–41, *chairman, 1938–41, 1946–47;* Papers, 1941; Papers Procurement, 1942–43; Regular Papers, 1941; Standards, 1938–41; Symbols, 1940–41, 1943–47. Sections: Chicago, *chairman, 1934–35.*

KNOX, James B. (A'34—SM'46—F'51), General Manager, Engineering Products Dept., RCA Victor Company, Ltd., 1001 Lenoir, Montreal 30, P.Q., Canada.
Born: November, 1910, Winnipeg, Manitoba, Canada. Committees: Radio Transmitters, 1947–52.

KOCH, Winfield (A'28—SM'48—F'54), Staff Engineer, RCA-Victor Division 5-3, Camden 2, N.J.
Born: December 23, 1903, Omaha, Neb. B.S. in E.E., 1925, University of Minnesota. Committees: Receivers, 1951–53. Awards: Modern Pioneer Award, 1940, National Association of Manufacturers.

KOCK, Winston E. (SM'45—F'52), Director of Acoustics Research, Bell Telephone Labs., Inc., Murray Hill, N.J.
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: Antennas and Waveguides, 1947–51; Editorial, 1951–52; Papers Review, 1951–53; Administrative Committee, Professional Group on Antennas and Propagation, 1949–51. Awards: Outstanding Young Electrical Engineer, Eta Kappa Nu; Fellow and Member of Executive Council, Acoustical Society; Fellow, American Physical Society.

KOMPFNER, Rudolf (F'50), Member of Technical Staff, Bell Telephone Laboratories, Murray Hill, N.J.
Born: May 16, 1909, Vienna, Austria. Engineering Diploma, 1933, Technical College, Vienna; D. Phil., Oxford University.

KRAUS, John (A'32—M'43—SM'43—F'54), Professor, Department of Electrical Engineering, 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, Member, 1940–53.

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

LACK, Frederick R. (A'20—F'37), Vice-President, Western Electric Company, Inc., 120 Broadway, New York 5, N.Y.
Born: July 18, 1895, Eastbourne, England. S.B., 1925, Harvard

University. Director, 1940, 1946–47. Committees: Appointments, 1948; Awards, 1941, 1948; Board of Editors, 1946; Electronics, 1936–40; Executive, 1947; Fiscal, 1947–48; National Convention, 1947; Nuclear Studies, 1948; Office Practices, 1947; Papers, 1942–45; RMA-IRE Co-ordinating, 1948; Special Publication Fund, 1947; Tellers, 1940. Institute Representative: ASA Board of Directors, 1945–51.

LAFFERTY, James (M'46—SM'48—F'54), Research Associate, 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. Committees: Subcommittee conference on Electron Devices, 1951–53.

LAMB, James J. (A'42—SM'48—F'54), Staff Electrical Engineering Consultant, Laboratory of Advanced Research, Remington Rand, Inc., Wilson Ave., South Norwalk, Conn.
Born: November 30, 1900, Michigan, N.D. B.S.(E.E.), 1922, Catholic University of America. Committees: Papers Review, 1948–54; Receivers, 1929–30; Radio Transmitters, 1929–30; Symbols, 1929–30. Professional Groups: Electronic Computers, 1952–54.

LAMSON, Horatio W. (A'15—M'27—F'33), Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge, 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), Research, Engineer, RCA Laboratories Division, Princeton, N.J.
Born: May, 1901, Denver, Colo. Attended Detroit Junior College, 1920. Committees: Frequency Modulation, 1941–46; Modulation Systems, 1947–52; Papers Review, 1947–52.

LANGLEY, Ralph H. (A'12—M'16—F'29), Assistant to the President, Farrand Optical Company, Inc., 4401 Bronx Blvd., New York 70, N.Y.
Born: January 5, 1889, New York, N.Y. E.E., 1913, Columbia University. Committees: Admissions, 1945; Awards, 1934; Bibliography, 1930–32; New York Program 1934; Radio Telegraph and Receiver Terminology, *chairman, 1924–25;* Registration of Engineers, 1940–41; Sections, 1930–33, 1935; Standardization, 1924–27; Technical Committee No. 1, Radio Receivers and Parts, 1930; Standards, 1934–35; Wave Length Regulation, 1916. Sections: Cincinnati, *chairman, 1929–30.*

LAPORT, Edmund A. (A'25—M'27—SM'43—F'53), Chief Engineer, RCA International Division, 30 Rockefeller Plaza, New York 20, N.Y.
Born: July 2, 1902, Nashua, N.H. Committees: Annual Review, 1946–47; Policy Development, 1948; Radio Transmitters 1946–48, *chairman, 1947–48.* Institute Representative: ASA Electrical Standards Committee, 1948–51; U. S. National Committee of the International Electrotechnical Commission, 1949–51. Sections: Montreal, *chairman, 1940–42.*

LAW, 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. Awards: Television Broadcasters' Association Award, 1946.

LAW, Russell R. (A'34—M'40—SM'43—F'53), Director of Research and Development, CBS-Hytron, Danvers, Mass.
Born: January 11, 1907, Hampton, Iowa. B.S., 1929; M.S., 1931, Iowa State College; D.S., 1933, Harvard Engineering School.

LEHDE, Pendleton E. (A'14—F'27), President, Pendleton Terminal Corp., 1050 Constance St., New Orleans, La.; Owner, Electron Engineering Co.; Pres., Tidewater Terminal Co., Inc.; Pres. 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.*

LEE, Rueben (A'32—SM'45—F'54), Advisory Engineer, 2519 Wilkens Ave., Baltimore 3, Md.
Born: November, 1902, Shirland, Derbyshire, England. B.S. (E.E.), 1924, West Virginia University. Sections: Baltimore, 1945–52.

LEWIS, George H. (A'12—M'15—SM'43—F'51) (L'51), 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. Manager, 1918–19, 1923, 1926; Director, 1935. Committees: Admissions, 1929–30, 1942; Awards, 1935; Electronics, 1936–39; Facsimile, 1939–41; New York Program, *chairman, 1935, 1936;* Public Relations, 1947–48; Standardization, 1916–17, 1919, 1925, 1928–30; Symbols, 1940; Technical Committee No. 3—Vacuum Tubes, 1929–30; Television, 1939–41.

LEWIS, Willard D. (A'44—SM'52—F'54), Director of Switching Research, Bell Telephone Laboratories, 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. Awards: Naval Ordnance Development Award, United States Navy, 1946; Rhodes Scholarship, 1935.

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, Expert Consultant to the Secretary of War, 1943. 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.

LINDSAY, William W., Jr. (A'24—M'26—F'39), Consulting Engineer, Staff Electronic Engineer, Military Operations Research Division, Lockheed Aircraft Corp., Burbank, Calif.
Born: November 16, 1899, Overbrook, Pa. Privately educated, equivalent "Doktor Ingenieur" degree. Committees: Nominations, 1942; Transmitters, 1946–47. Sections, Los Angeles, *secretary-treasurer, 1928–29; chairman, 1940–41.*

LITTLE, Donald G. (A'20—M'27—F'29), Assistant Engineering Manager and Consulting Engineer, Westinghouse Electric Corporation, 2519 Wilkens Ave., Baltimore, 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; Standardization, Technical Committee No. 2, Radio Transmitters and Antennas, 1929–30; Subcommittee on Methods of Testing Apparatus, Equipment, Devices, and Materials Used in Radio Transmitters and Antennas, 1929–30; Standardization, 1931–32; Standards, 1932; Transmitters and Antennas, 1936–38. Sections: Baltimore, *chairman, 1951–52.* Awards: Fellow, AIEE.

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., 1925, Stanford University. Committees: Papers, 1945; Papers Review, 1946–52. Sections: San Francisco, *chairman, 1932–33.*

LLEWELLYN, Frederick B. (A'23—F'38), Systems Studies Engineer, 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. President, 1946; Director, 1939–48. Committees: Administrative Board of Editors, 1952–53; Awards, 1942, 1947–48, *chairman, 1947;* Board of Editors, 1949, 1952–53; Constitution and Laws, 1947, 1950; Electronics, 1939–43; Editorial Administrative, 1946–51; Executive, 1942–44, 1946, *chairman, 1946;* Finance, 1948–51; Fiscal, 1947–48; International Liaison, 1947, 1949; Investment, 1946; 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.

Institute Representative: ASA Electrical Standards Committee, 1948–51; National Research Council, Division of Engineering and Industrial Research, 1948–51; United States National Committee of the International Electrotechnical Commission, 1949–51. Awards: Morris Liebmann Memorial Prize, 1935.

LODGE, William B. (A'34—M'37—SM'43—F'49), Vice-President in Charge of Engineering, CBS Television, 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, 1946–48; 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. Member, National Academy of Science.

LOUGHREN, Arthur V. (A'24—M'29—SM'43—F'44), Director of Research, Hazeltine Corporation, 58-25 Little Neck Pkwy., Little Neck, N.Y.; Executive Vice-President, Hazeltine Research, Inc., Chicago.
Born: September 15, 1902, Rensselaer, N.Y. B.A., 1923, E.E., 1925, Columbia University. Director, 1952–54. Committees: Admissions, 1931–33; Awards, 1949–52, *chairman, 1951–52;* Finance, 1953; Membership, 1934; Papers Procurement, 1947–50; Policy Advisory, 1953–54, *chairman, 1954;* Radio Receivers, Subcommittee on Definitions, 1927–28; Standardization, Subcommittee on Vacuum Tubes, 1927–28; Standards, 1947; Television, 1940–45; Joint Technical Advisory Committee, 1951–54, *chairman, 1953–54;* Awards: Fellow, Society of Motion Picture and Television Engineers; Phi Beta Kappa; Sigma Xi; SMPTE David Sarnoff Gold Medal Award, 1953; Tau Beta Pi; U. S. Navy Certificate of Commendation, 1947.

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, Graduate Study, 1930, University of California. Committees: Papers Review, 1946–47. Sections: San Francisco, Organization Committee, 1927; Los Angeles, West Coast Convention Committee, 1952. Awards: Academy of Television Arts and Sciences Award, 1951; "Best Branch Paper" Award, Institute of Electrical Engineers, 1930; Certificate of Commendation, U. S. Navy, World War II; Certificate, War Department (U. S. Army), World War II; Eta Kappa Nu; Phi Beta Kappa; Sigma Xi; Tau Beta Pi.

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.

MacDONALD, William A. (A'19—M'26—SM'43—F'53), President and Director, Hazeltine Corporation, Little Neck, L.I., N.Y.; Chairman of the Board and Director, Hazeltine Electronics Corporation, Little Neck, L.I., N.Y.
Born: December, 1895, New York, N.Y. Attended University of Paris, 1918–19. N.Y. State Licensed Professional Engineer, 1929. Committees: Standardization Technical Committee No. I, Radio Receivers and Parts, 1930. 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, 1946–48. Sections: Ottawa, *chairman, 1947.*

MALOFF, Ioury G. (M'27—F'36), Development Engineer, Radio Corporation of America, Camden, N.J.
Born: June 3, 1899, Vladivostok, Russia. Committees: Bibliography, 1928; Papers Procurement, 1947–50; Receiving Sets, 1928; Tellers, 1940.

MALTER, Louis (A'37—SM'45—F'52), Research Physicist, RCA Laboratories, Princeton, N.J.
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 Devices, 1945–49; Electron Devices Conference Technical Subcommittee, *chairman, 1947;* Papers Review, 1945–50. Awards: Fellow, American Physical Society; Sigma Xi.

MANSON, Ray H. (M'23—F'50), Director, Stromberg-Carlson Company, 100 Carlson Rd., Rochester 3, N.Y.
Born: August 25, 1877, Bath, Me. B.S.(E.E.), 1898, E.E., 1901, D.Eng., 1933, University of Maine. President, 1931; Manager, 1927–30; Director, 1931–33. Committees: Awards, 1932, 1940; Bibliography, 1930; Nominations, 1929–30, 1932, 1934, 1940, *chairman, 1932, 1934, 1940;* Public Relations, 1940, 1947–48; Regular Papers, 1941; Standardization, 1926–30; Subcommittee on Electro-Acoustic Devices, *chairman, 1928;* Technical Committee No. 4, Electro-Acoustic Devices, 1930; Tellers, 1932–33; Television and Facsimile, 1936–38. Institute Representative: ASA Electrical Standards Committee, 1936–39.

MARKS, William S., Jr. (A'44—SM'44—F'52), Chief Engineer, Coles Signal Laboratory, Fort Monmouth, N.J.
Born: March 18, 1900, Nashville, Tenn. B.S. in E.E., 1929, Louisiana State University; Graduate work in Physics, 1935, Rutgers University.

MARVIN, Harry B. (M'31—SM'43—F'50), Section Engineer, General Electric Company, Electronics Park, Syracuse, 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, 1940–45; Papers, 1940; Papers Procurement, 1946–50.

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 Review, 1954; Papers Procurement, 1947–50; Papers Review, 1947–51, 1953; Piezoelectric Crystals, 1940–55, *chairman, 1953–55.*

McARTHUR, Elmer D. (M'42—SM'43—F'45), Manager, Electron Tube Section, General Electric Research Laboratory, The Knolls, 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.

McCULLOUGH, Jack A. (A'39—SM'52—F'53), Vice-President and Treasurer, Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif.
Born: November 25, 1907, San Francisco, Calif. Awards: Civilian Distinguished Service Medal, U. S. Navy, 1940.

McCUTCHEN, Brunson S. (A'21—M'26—F'32), Consulting Engineer; 149 Broadway, New York 6, N.Y.
Born: November 29, 1892, North Plainfield, N.J. Lit.B., 1915; E.E., 1917, Princeton University.

McDONALD, Arthur S. (M'23—F'41), Chief Engineer, Overseas Telecommunication Commission (Australia), 47 York St., Sydney, N.S.W., Australia.
Born: March 6, 1890, Castle Donnington, Victoria, Australia. Vice-President, 1949; Director, 1949. Awards: Fellow, Past President, IRE, Australia.

McELROY, Paul K. (A'25—M'27—F'31), Design Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass.
Born: August 7, 1899, Toledo, Ohio. A.B., 1920, A.M., 1921, Harvard University. Committees: Membership, 1940. Professional Groups: Quality Control, Administrative Committee, 1951–54. Sections: Boston, *secretary, 1939–41.*

McILWAIN, Knox (A'31—M'40—SM'43—F'48), Chief Consulting Engineer, Hazeltine Electronics Corporation, 58-25 Little Neck Pkwy., Little Neck, L.I., N.Y.

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, 1949–53; Admissions, 1944–45; Board of Editors, 1946, 1949–53; Circuits, 1944–45; Education, 1945; Electroacoustics, 1936–45; Electronics, 1936–38; Handbooks, 1945–47; Papers, 1942–45; Standards, 1945–46. Sections: Philadelphia, *chairman, 1935–36.* Institute 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. Sections: Ottawa, *chairman, 1946–47;* Canadian National Committee for U.R.S.I., *chairman, 1951–54.* Awards: Fellow, American Physical Society; Fellow, Royal Society of Canada; Order of the British Empire.

McRAE, James W. (A'37—F'47), Vice-President, Western Electric Co. and President, Sandia Corporation, Sandia Base, Albuquerque, N.M.
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. Director, 1949–54. President, 1953. Committees: Appointments, 1950; Awards, 1948–51; Board of Editors, 1946–52; Editorial Board, 1954; Executive, 1950–53; Finance, 1952–53; Policy Development, 1948; Standards Co-ordination, 1952; Tellers, *chairman, 1948.* Sections: New York, *chairman, 1948–49.* Awards: Eta Kappa Nu, Honorable Mention, 1943; Legion of Merit, War Department, 1945.

MEACHAM, Larned A. (A'38—SM'45—F'48), Research 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; Modulation Systems, 1950–53. Awards: Eta Kappa Nu, Outstanding Young Electrical Engineer, 1939.

MERTZ, Pierre (SM'44—F'50), Engineer, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: April, 1897, Paris, France, A.B., 1918, Ph.D., 1926, Cornell University. Committees: Editorial Review, 1954; Facsimile, 1939–54; Papers Procurement, 1945–50. Awards: Army-Navy Certificate of Appreciation, Department of Defense, 1948; Army Certificate of Appreciation, Technical Industrial Intelligence Committee, Joint Chiefs-of-Staff, 1951; Fellow, Society of Motion Picture and Television Engineers.

METCALF, George F. (A'34—M'38—F'42), Consultant, Engineering Surveys and Studies, Engineering Services Division, General Electric Company, 570 Lexington Ave., New York, N.Y.
Born: December 7, 1906, Milwaukee, Wis. B.S.(E.E.), 1928, Purdue University. Associate Editor, 1926–28. Committees: Board of Editors, 1946–53; Editorial Administrative, 1949; Electronics, 1936–41; Papers Review, *chairman, 1949–53;* Professional Groups, 1953; Tellers, 1948–49, *chairman, 1949.*

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.

MIEHER, Walter W. (A'40—M'44—SM'51—F'54), Engineering Department Head for Armament Radar, Sperry Gyroscope Co., Great Neck, N.Y.
Born: October 30, 1916, St. Louis, Mo. B.S., 1938, Washington University; 1938–40, attended Massachusetts Institute of Technology. Committees: Antennas and Wave Guides, 1947–50. Sections: Long Island, *vice-chairman, 1952–53.*

MILLER, John H. (A'19—M'25—SM'43—F'50), Vice-President for Research and Engineering, Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N.J.
Born: June 6, 1893, Oak Park, Ill. B.S.(E.E.), 1915, University of Illinois. Committees: Institute Sections, 1928; Sections 1933–34, 1938–39, *chairman, 1940, 1941–44.* Sections: Chicago, *chairman, 1927–29, secretary, 1929–30.* Institute Representative: ASA Subcommittee (C42.6) on Electrical Instruments 1949–51.

MILLER, John M. (A'17—F'20) (L'52), Retired. 2537 McClintock Rd., Apt. 4, Charlotte, N.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; Medal of Honor, I.R.E., 1953.

MINTON, John P. (F'39), "Special Leave," Research Adviser, Magnolia Petroleum Company, Field Research Department, Dallas, Tex.; Research Associate, 1952–54, Department of Physics, University of California.
Born: November 7, 1889, Wapella, Ill. Engineering, 1910, Bradley University; B.S., 1912, Massachusetts Institute of Technology; Ph.D., 1921, University of Chicago. Committees: Electroacoustic Devices, 1927–28; Membership, 1941–43. Awards: Fellow in Physics, National Research Council, University of Chicago, 1921–22; Fellow, American Physical Society, American Association for Advancement of Science.

MONTGOMERY, Alexander W. (M'31—SM'43—F'54), Director and Joint General Manager, Standard Telephones and Cables Limited, Connaught House, 63 Aldwych, London, W.C. 2, England.
Born: December 14, 1896, Manchester, Lancashire, England. B.Sc. Tech., 1921, Manchester College of Technology. Awards: Order of the British Empire, 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, 1951–53; Radio Transmitters, 1945–46, *chairman, 1945;* Standards, 1945–46, 1952; Transmitters, 1944–45; Transmitters and Antennas, 1938–44. Sections: North Jersey Subsection, *vice-chairman, 1950, chairman, 1951.*

MORTON, George A. (A'39—SM'46—F'51), Section Head, RCA Laboratories Division, 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, 1951–53; Nuclear Instruments of the Professional Group on Nuclear Science, 1954; Nuclear Studies, 1948. 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), Director of Transistor Development, Bell Telephone Laboratories, Murray Hill, N.J.
Born: September 3, 1913, St. Louis, Mo. B.S., 1935, Wayne University; M.S., 1936, University of Michigan. Committees: Electron Tubes, 1946–48; Electron Tubes and Solid State Devices, 1949–52; Electronics, 1943–45; Membership, 1943–44; Papers Review, 1953; Vacuum Tubes, 1945. Awards: Honorable Mention, Eta Kappa Nu, 1945; Alumni Award, Wayne University, 1951; University of Michigan Centennial Award, 1953.

MOUNTJOY, Garrard (A'37—M'40—SM'43—F'50), Assistant to the Executive Vice-President, A.R. & T. Electronics, Inc., 5th St. & Cornish, North Little Rock, Ark.
Born: October 21, 1905, Boscobel, Wis. B.S., 1929, Washington University. Committees: Receivers, 1942–54; Subcommittee on Methods of Testing Television Receivers, *chairman, 1947;* Subcommittee on Standards on Radio Receivers, Definition of Terms, *chairman, 1950,* Television, 1945–47. Sections: Rochester, *secretary, 1948–49, vice-chairman, 1950–51, chairman, 1952–53.* Institute Representative: ASA War Standards Committee on Methods of Measuring Radio Noise, 1945–48. Awards: Modern Pioneer Award, National Association of Manufacturers.

MUMFORD, William W. (A'30—SM'46—F'52), Technical Staff, Member, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: June 17, 1905, Vancouver, Wash. B.A., 1930, Willamette

University. Committees; National Convention Program, 1950–51. Professional Groups, Microwave Theory and Technique, Administrative Committee, *secretary-treasurer, 1952–53; vice-president, 1953–54.* Awards: Burghart Prize, 1926, Willamette University.

MURRAY, Albert F. (A'20—M'26—F'38), Consulting Television Engineer, 4707 Windom Pl., 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. Director, 1936–39. Committees: Awards, 1936; Electronics, 1937–40; Institute Sections, 1929–30, 1936; Membership, 1929–39; Papers, 1934–15; Papers Review, 1946–53; Papers Procurement, 1947–50; Television, 1939–15; Television and Facsimile, 1936–38; Television Systems, 1949–53. Sections: Philadelphia, *chairman, 1937–38.*

NELSON, Edward L. (A'19—M'25—F'38), Technical Director, Signal Corps Engineering Laboratories, Fort Monmouth, N.J.
Born: March 10, 1891, Warsaw, Ind. B.S.(E.E.), 1914, Armour Institute of Technology. Manager, 1932; Director, 1932–36. Committees: Awards, 1929; Board of Editors, 1941–53; Broadcast, *chairman, 1933–36;* Broadcasting 1928–32, *chairman, 1932;* Meetings and Papers, 1928–29; Nominations, 1932, 1935; Registration of Engineers, 1940–13; Standardization, 1927–31; Standards, 1932–36; Subcommittee on the Use of the Transmission Unit, 1928. Institute Representative: Planning Committee, National Conference in Educational Broadcasting, American Council of Education, 1936, 1939–43.

NERGAARD, Leon S. (A'29—M'38—SM'43—F'52), Research Engineer, RCA Laboratories Division, Princeton 5, N.J.
Born: September 2, 1905, Battle Lake, Minn. B.S. in E.E., 1927, University of Minnesota; M.S. in E.E., 1930, Union College; Ph.D. in Physics, 1935, University of Minnesota. Committees: Annual Review, 1948–50; Electronics, 1940–45; Electron Devices, *chairman, 1948, 1952–53;* Electron Tubes, 1946–47, *vice-chairman, 1948–49;* Electron Tubes and Solid-State Devices, *chairman, 1949–51;* Measurement and Instrumentation, 1952; Standards, 1949–51; Technical on Advanced Developments, 1944–47; Vacuum Tubes, 1945–46. Professional Groups: Electron Devices, Administrative Committee, *vice-chairman, 1952–53, chairman, 1953–54.* Institute Representative: ASA Sectional Committee (C60) on Sandardization of Electron Tubes, 1949–51, ASA Subcommittee C42.14 on Electron Tubes, 1952–53.

NIWA, Yasujiro (A'53—F'54), President, Tokyo Electrical Engineering College, 2, 2-chome, Kanda-Nishikicho, Chiyoda-ku, Tokyo, Japan.
Born: April 1, 1893, Matsusaka, Miye Prefecture, Japan. Doctor of Engineering, 1925, Tokyo University. President, the Institute of Communication Engineers of Japan, 1942–43; President, Japan Radio Society, 1943–44; President, the Institute of Electrical Engineers of Japan, 1950–51. Awards: Asano Prize from the Institute of Elec. Engineers of Japan, 1929; Imperial Prize from Japan Society of Invention, 1932; Imperial Prize from Japan Academy, 1937; Medal of Merits from the Institute of Communication Engineers of Japan, 1942.

NOBLE, Daniel E. (A'25—SM'44—F'47), Director and Vice-President in Charge of Communications and Electronics Div., Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill.
Born: October 4, 1901, Naugatuck, Conn. B.S., 1929, University of Connecticut. Committees: Annual Review, 1941–42, 1946; Modulation, 1940–45, *chairman, 1940–42;* Mobile Communication, *chairman, 1945–47, 1949–52;* Papers Procurement, 1942–43, 1947, 1949–50; Regular Papers, 1941; Standards, 1940–42.

NOIZEUX, Pedro J. (A'30—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.*

NORTH, Dwight O. (A'35—M'38—SM'43—F'43), Research Engineer, 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; Papers, 1944–45.

NORTON, Kenneth A. (A'29—M'38—SM'43—F'43), Chief, Frequency Utilization Research Section; Assistant Chief, 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, 1953; Board of Editors, 1951–53; Editorial Administrative, *alternate, 1949–51, 1952;* Navigation Aids, 1950–53; Papers Procurement, 1949–50; Papers Review, 1946–51; Radio Wave Propagation, 1942–45; Radio Wave Propagation and Utilization, 1947–48; Wave Propagation, 1937–41, 1949–53.

NYQUIST, Harry (A'39—SM'47—F'52), Retired 1954, as Assistant Director of Systems Studies, Bell Telephone Laboratories, 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.

OLIVE, Gordon W. (A'29—VA'39—F'51), Retired. RR. #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; Modulation Systems, 1947.

OLIVER, Bernard M. (A'40—M'46—SM'53—F'54), Director of Research, Hewlett-Packard Company, 395 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. Professional Groups: Instrumentation, 1953–54. Sections: San Francisco, *treasurer, 1953–54.*

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. Committees: Annual Review, 1949–50; Board of Editors, 1940–53; Editorial Review, 1954; Electroacoustics, 1932–53, *chairman, 1934–38;* Papers Procurement, 1943–47; Standards, 1934–38. Institute Representative: ASA Sectional Committee on Acoustical Measurements and Terminology, 1940–51; ASA Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1949–50.

O'NEILL, George D. (A'28—SM'46—F'49), Manager of Engineering Personnel Development, Sylvania Electric Products, Inc., Bayside, L.I., N.Y.
Born: July, 1900, Montclair, N.J. B.S., 1924, University of Michigan. Committees: Board of Editors, 1952–53; Electron Tube Conference, *chairman, 1947;* Electronics, 1936–45; Electron Tubes, 1946–48; Electron Devices, 1949–51, *vice-chairman, 1951–52, chairman, 1952–53;* Standards, 1952–54; Vacuum Tubes, 1945–46, *chairman, 1946–51.* Professional Groups: Electron Devices, *chairman, 1952–54.*

OSBORNE, Harold S. (A'14—M'29—SM'43—F'45), (L'52), 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, 1926–28.

OSWALD, Arthur A. (A'19—M'25—F'28), Transmission Systems Development Engineer, Bell Telephone Laboratories, Inc., Murray Hill, 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.

OUIMET, Alphonse J. (A'39—SM'44—F'52), General Manager, Canadian Broadcasting Corp., P.O. Box 806, Ottawa, Ont., Canada.
Born: June 12, 1908, Montreal, P.Q., Canada. B.A., 1928, St. Mary's College; B. Elect. Engrg., 1932, McGill University. Committees: Education, 1944; Television, 1946–48; Television Systems, 1949–1952. Sections: Montreal, *chairman, 1942–43.* Awards: Ross Medal, 1948, Engineering Institute of Canada.

OXLEY, Allan B. (A'25—M'33—SM'46—F'53), Chief Engineer, RCA-Victor Co., Ltd., 1001 Lenoir St., Montreal, P.Q., Canada.
Born: July 7, 1901, London, England. Director, 1951–52. Committees: Awards, 1953; Membership, 1953; Nominations, 1952–53. Sections: Toronto, *chairman, 1934–35;* Montreal, *chairman, 1939–40; 1949–50.* Awards: Member, Corporation of Professional Engineers of Quebec, Canada, 1953 and 1954.

PACKARD, David (S'34—A'41—SM'47—F'48), President, Hewlett-Packard Company, 395 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.*

PAGE, Robert M. (SM'45—F'47), Associate Director of Research for Electronics, 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. Awards: Citation O.S.R.D., 1946; Certificate of Merit, The President of the United States, 1947; Distinguished Civilian Service Award, United States Navy, 1945; Harry Diamond Memorial Award, 1953.

PANNILL, Charles J. (M'13—F'16) (L'49), Retired President and Director, RCA Institutes, Inc., and Radiomarine Corporation of America, Lawrence Park, W., Bronxville, N.Y.
Born: May 13, 1879, Petersburg, Va. Committees: Publicity, 1916–19. Sections: Washington, *secretary-treasurer, 1914, vice-chairman, 1916–19.* Awards: First Certificate of Skill in Radio, 1911, No. 1 Commercial Radio Operators License, 1912, United States Government. Pioneer Radio Communication, 1902. Successfully sent First Trans-Atlantic Radiogram, 1906. Expert Radio Aide, U. S. Navy, Assistant to Director Naval Communications, 1914–19. Decorations: Chevalier of the First Order of Leopold; Marconi Memorial Medal of Achievement, The Veteran Wireless Operators Association, 1943; Delegate, International Radio and Telecommunication Conventions, 1927–47; Delegate, London Conference Society Naval Architects and Marine Engineers, 1952.

PARKER, Henry W. (SM'48—F'52), Technical Consultant, 40–43 172 St., Flushing 58, N.Y.
Born: December 11, 1896, Brooklyn, N.Y. B.S.(E.E.), New York University. Committees: Electronics, 1935–44; Industrial Electronics, 1944–53; Papers Review, 1944–53.

PAYNE, Leonard S. (M'16—SM'43—F'49) (L'52), Chief Engineer, Canadian Overseas Telecommunication Corporation, 211 St. Sacrament St., Montreal, P.Q., Canada.
Born: February 28, 1886, London, England.

PETERSON, Harold O. (A'22—M'31—F'41), Section Head, 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: Board of Editors, 1944–53; Industrial Electronics, 1947–50; Instruments and Measurements, 1949–50; Papers, 1934–44; Radio Receivers, 1936–47; Radio Wave Propagation and Utilization, 1945–48; Standardization, Subcommittee on Aircraft Receivers, 1930–31; Standards, 1934–35; Transmitters and Antennas, 1936; Wave Propagation, 1937–41, 1949–53.

PETTIT, Joseph (S'39—A'40—M'45—SM'46—F'54), Professor of Electrical Engineering, Electronics Research Laboratory, Stanford University, Stanford, Calif.
Born: July 15, 1916, Rochester, Minn. B.S., 1938, University of California (Berkeley); E.E., 1940, Ph.D., 1942, Stanford University. Director, 1954. Committees: Receivers, 1946–51; Education, 1949–54; Policy Advisory, 1954. Institute Representative: Stanford University, 1948–51. Awards: Electronics Achievement Award, Region 7, 1952; Presidential Certificate of Merit, U. S. Government, 1949.

PICKARD, Greenleaf W. (IRE Charter Mem.) (M'12—F'15) (L'49), Chairman of Board, Pickard and Burns, Inc., 240 Highland Ave., Needham 94, Mass.
Born: February 14, 1877, Portland, Me. President, 1913; Manager, 1912; Director, 1913–15. Committees: Board of Editors, 1928–52; Bibliography, 1930–32; Constitution and Laws, 1928–31; Meetings and Papers, 1927–29; Nominations, 1929, 1933, *chairman, 1938;* Specifications for Steamship Radio Equipment, 1914; Standardization, 1914–15, 1925; Wave Length Regulation, 1916; Wave Propagation, 1937–38. Sections: Organization of Boston Section, 1914. Awards: Medal of Honor, 1926; Armstrong Medal, Radio Club of America, 1940.

PIERCE, George W. (M'12—F'15) (L'49), Rumford Professor of Physics (Emeritus), and Gordon McKay Professor of Communication Engineering (Emeritus), Research Laboratory of Physics, Harvard University, Cambridge, Mass.
Born: January 11, 1872, Webberville, Tex. B.S., 1893; M.A., 1894, University of Texas; A.M., 1899; Ph.D., 1900, Harvard University. President, 1918–19; Vice-President, 1915; Director, 1915, 1918–21. Committees: Sections, 1925, 1928; Standardization, 1914–19. Sections: Organization of Boston Section, 1914, *chairman, 1922–32.* Awards: Medal of Honor, 1929; Franklin Medal, Franklin Institute, 1943.

PIERCE, John Alvin (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; Editorial Review, 1954; Navigation Aids, 1947–50, *chairman, 1948–50;* Radio Wave Propagation and Utilization, 1945–48; Standards, 1948; Wave Propagation, 1949–50. Awards: Fellow, American Academy of Arts and Sciences; Fellow, American Association for the Advancement of Science; Morris Leibmann Prize, 1953; President's Certificate of Merit, 1948; Thurlow Award (Institute of Navigation), 1947.

PIERCE, John R. (S'35—A'38—SM'46—F'48), Director of Electronics Research, 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. Editor, 1954. Director, 1954. Committees: Editorial Board, *chairman, 1954;* Papers Procurement, *second vice-chairman, 1943.* Awards: Eta Kappa Nu, Outstanding Young Electrical Engineer, 1942; Morris Leibmann Memorial Prize, 1947.

PIORE, Emanuel R. (A'38—M'42—SM'43—F'50), Deputy Chief and Chief Scientist, Office of Naval Research, Navy Department, Washington, D.C.
Born: July 19, 1908, Wilno, Russia. B.A., 1930, Ph.D., 1935, University of Wisconsin. Director, 1951. Committees: Awards, 1949. Professional Groups: Nuclear Science, Administrative Committee, 1953.

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. Committees: Admissions, 1943–48, *vice-chairman, 1945–48;* National Convention, 1948; Sections, 1941–45; Standardization, Sub-committee on High-Frequency Receivers, 1930–31. Sections: Northern New Jersey Subsection, *treasurer, 1952–53, vice-chairman, 1943–44.* Awards: Honorary Member (Denki Tushin Gakkai), The Institute of Electrical Communication Engineers of Japan.

PONTE, Maurice J. H. (SM'48—F'54), Managing Director, Compagnie Generale de Telegraphie Sans Fil, 79 Boulevard Haussmann, Paris, France.
Born: April, 1902, Voiron, Isere, France. Sciences Doctorship, Ecole Normale Superieure of Paris (Sciences Division). Vice-President, 1954; Director, 1954.

POPPELE, J. R. (A'30—M'39—SM'43—F'50), Consulting Television and Radio Engineer, 9 Crest Circle, South Orange, N.J.
Born: February 4, 1898, Newark, N.J. Director, 1947. Committees: Building, 1945–46; Facsimile, 1940, 1942; Membership, 1939–40; National Committee, 1947; New York Program, 1940; Papers, 1942–45; Papers Procurement, 1942–43; Public Relations, 1943–46; Regular Papers, 1941.

POTTER, Ralph K. (A'25—M'26—F'41), Director, Transmission Research, Bell Telephone Laboratories, Inc., Murray Hill, 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), Manager of Manufacturing Professional Equipment Division, Canadian Radio Manufacturing Corp. Ltd., 11-17 Brentcliffe Rd., Toronto 17, Ont., Canada.
Born: September 12, 1904, London, England. B.A.Sc., 1928, University of Toronto. Director, 1949–50. Committees: Awards, 1952; Canadian Building Fund and Auditor, 1945; Members, 1951–52; Nominations, 1948–50; Radio Receivers, 1946–51. Sections: Toronto, *chairman, 1945–46.*

PRATT, Haraden (A'14—M'17—F'29), 800 Quaint Acres Dr., Silver Spring, Md.
Born: July 18, 1891, San Francisco, Calif. B.S., 1914; University of California. President, 1938; Treasurer, 1941–42; Secretary, 1943–54; Director 1935–54. Committees: Admissions, 1937; Annual Review, 1937; Appointments, *chairman, 1947;* Awards, 1937–41, 1944–45, 1948, *chairman, 1939, 1948, vice-chairman, 1945;* Board of Editors, 1941–53; Building Fund Administrator, 1947–48; Constitution and Laws, 1941, 1951; Editorial Administrative, 1947–50; Executive, *vice-chairman, 1941–42, secretary, 1943–54;* Fiscal, 1947–48, *chairman, 1947;* Investments, 1944–46; New York Program, 1933, 1935–37, *chairman, 1936, 1937;* Nominations, 1936, 1941–43, 1947–48, 1952, *chairman, 1936;* Office Quarters, 1947; Policy Development, *chairman, 1951;* Preparedness, *chairman, 1940–41;* Standardization, 1928–31; Technical Committee No. 2, Radio Transmitters and Antennas, 1930; Standards, 1932, 1934–37, *chairman, 1934–35;* Tellers, *chairman, 1936;* History, *chairman, 1953–54;* Joint Technical Advisory Committee, 1948–51. Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1930–46, 1949–54; ASA Board of Directors, 1939–41; ASA Sectional Committee on Radio, 1936–48. Radio Technical Planning Board, 1944, *chairman, 1945–48.* Awards: Medal of Honor, 1944.

PREISMAN, Albert (M'38—SM'43—F'53), Vice-President in charge of Engineering, Capital Radio Engineering Institute, 3224 16th St., N.W., Washington 10, D.C.; and Consulting Engineer.
Born: February 8, 1901, New York, N.Y. A.B., 1922, E.E., 1924, Columbia University. Committees: Admissions, 1942; Education, 1950–54; Membership, 1943–47; Papers Review 1948–53.

PRESSLEY, Jackson H. (A'20—F'31), Consulting Engineer, 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.

PRICE, Lloyd M. (A'31—SM'46—F'49), Chief Engineer, Radio Valve Company of Canada, Ltd., 189 Dufferin St., Toronto 3, Ont., Canada.
Born: August, 1897, St. Thomas, Ont., Canada. B.A.Sc., 1923, University of Toronto. Committees: Electron Tubes, 1946–47. Sections: Toronto, *chairman, 1935–36, secretary, 1934.*

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

PUGSLEY, Donald W. (A'39—M'45—SM'46—F'52), Manager of Engineering, Parts Engineering, General Electric Co., Electronics Park, Syracuse, N.Y.
Born: December, 1912, Salt Lake City, Utah. B.S., in E.E., 1935, University of Utah. Committees: Television, 1945–48; Television Systems, 1949–52. Awards: Eta Kappa Nu, Outstanding Young Electrical Engineer (Hon. Ment.), 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.S., 1933, University of Toronto. Committees: Radio Transmitter, 1947–50. Sections: Montreal, *secretary, 1941–44, chairman, 1946–47.* Canadian Council, I.R.E., *secretary, 1947–53.*

QUARLES, Donald A. (M'41—SM'43—F'54), Assistant Secretary of Defense (Research and Development), Rm. 3E-1074, Pentagon Building, Washington 25, D.C.
Born: July 30, 1894, Van Buren, Ark. A.B., 1916, Yale University; Doctor of Engineering (Honorary), 1953, University of Arkansas. Awards: AIEE, Director and Past President; Phi Beta Kappa; Sigma Xi.

QUARLES, Lawrence R. (M'42—SM'43—F'52), Professor of Electrical 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: Education, 1949–53. Sections: N.C.-Va., *chairman, 1946.*

RADFORD, William H. (A'41—SM'45—F'54), Professor of Electrical Communications, Massachusetts Institute of Technology; Division Head, 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. Committees: Education, 1946–49, *chairman, 1947–49;* Membership, 1947–48. Sections: Boston, *vice-chairman, 1946–47, chairman, 1947–48.*

RAJCHMAN, Jan A. (SM'46—F'53), Senior Research Engineer, RCA Laboratories, Princeton, N.J.
Born: August 10, 1911, London, England. Dipl.E.E., 1935, Dr. Sc., 1938, Swiss Federal Institute of Technology. Committees: Electronic Computers, 1948–53; Papers Review, 1950–52. Subcommittee on High Speed Storage Devices, *chairman, 1948;* Subcommittee on Static Storage Elements, 1952–53. Awards: Levy Medal, Franklin Institute, 1948.

RAMO, Simon (A'38—SM'44—F'50), Vice-President and Executive Director, 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: Editorial Review Board, 1954; Papers, 1941–45. Awards: Electronic Achievement Award, Pacific Region, I.R.E., 1953; Eta Kappa Nu Honorable Mention, 1941.

RANGER, Richard H. (F'37), 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.

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 of the Royal Society.

REICH, Herbert J. (A'26—M'41—SM'43—F'49), Professor of Electrical Engineering, Dunham Lab., Yale University, New Haven, Conn.
Born: October, 1900, Staten Island, N.Y. M.E., 1924, Ph.D. (Physics), 1929, Cornell University. Director, 1944, 1948–51. Committees: Admissions, 1945–46; Appointments, 1950; Awards, 1948; Board of Editors, 1943–53; Constitution and Laws, 1949–50; Education, 1945–53, *chairman, 1949–51;* Electronics,1941–45; Electron Tubes, 1945–48; Electron Tube Conference Committee; 1946, 1950, *chairman, 1951;* Electron Tubes and Solid-State Devices 1949–52. Professional Groups: Election Devices, Administrative Committee, 1952. Institute Representative: University of Illinois, 1941–43; Yale University, 1948–50. Awards: Fellow, American Physical Society.

REID, John D. (A'41—M'44—SM'46—F'49), Executive Vice-President, A.R.&T. Electronics, Inc., P.O. Box 370, North Little Rock, Ark.
Born: March, 1907, Morristown, N.J. Attended University of Pennsylvania, 1925–28. 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, 1950–52; Professional Groups, 1948, 1950; Receivers, 1946–52, *vice-chairman, 1950–52.* Sections: Cincinnati, *chairman, 1946–47.* Institute Representative: National Electronics Conference, Board of Directors, 1951. Awards: Naval Ordnance Development Award, United States Navy, 1945; Presidential Certificate of Merit, 1948.

REISZ, Eugene E. R. Home address: 225 Central Park, W., New York 24, N.Y.
Born: September 9, 1879, Budapest, Hungary. Vienna University, Austria.

REOCH, Alexander E. (M'14—F'16) (L'49), Retired. Kennebunkport, Me.
Born: April 27, 1884, Sheffield, England. E.E., 1902, Sheffield University College. Manager, 1925–27. Committees: Meetings and Papers, 1925; Standardization, 1925–26.

RETTENMEYER, Francis X. (A'26—M'29—SM'43—F'44), Executive Engineer, Philco Corp., Tioga & C Sts., Philadelphia 32, Pa.
Born: July 27, 1904, Kendrick, Okla. B.S.(E.E.), 1925, University of Colorado. Committees: Administrative Committee of the Board of Editors, 1950–53; Board of Editors, 1946–53; Membership, 1938–40; Papers, 1942–45; Papers Procurement, 1947–49; Public Relations, 1941–42; Publicity; 1939, Radio Receivers, 1936–37; Sections, 1936; Standardization, Technical Committee No. 1, Radio Receivers and Parts, 1929–30.

REUKEMA, Lester E. (A'30—SM'46—F'51), Professor of Electrical Engineering, 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, AIEE, 1946.

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

RICHMOND, Harold B. (A'14—M'23—F'29), Chairman of the Board, General Radio Company, 275 Massachusetts Ave., Cambridge 39, 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; Registration of Engineers, *chairman, 1940–43;* Standardization, 1928–30. Awards: Presidential Medal for Merit, 1947, Guided Missiles Development.

RICHTER, Walther (SM'44—F'53), Consulting Electrical Engineer, 5426 N. Kent Ave., Milwaukee 17, Wisconsin.
Born: May 17, 1900, Heidelberg, Germany. B.S., 1923, Institute of Technology, Karlsruhe, Germany. Committees: Definitions, 1952–53; Industrial Electronics, 1947–52; Papers Procurement, 1946; Professional Group on Instrumentation, Administration Committee. Awards: Fellow, American Institute of Electrical Engineers, 1942.

RINIA, Herre H. (SM'51—F'54), Director of Research of Philips Research Laboratories, Kastanjelaan St., Eindhoven, Netherlands.
Born: March 30, 1905, Cornwerd, Friesland, Netherlands. M.A. (E.E.), 1928, Delft Institute of Technology. Awards: Member of the Koninklijke Nederlandse Akademie van Wetenschappen, 1948.

RIVES, Tom C. (SM'48—F'54), Manager, Laboratories Department, General Electric Company, Electronics Park, Syracuse, N.Y.
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: Papers Review. Professional Groups: Aeronautical and Navigational Electronics, 1954; Engineering Management, 1951–54, *chairman, 1953–54.*

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

ROCKWELL, Ronald J. (A'25—M'31—SM'43—F'45), Vice-President in Charge of Engineering, Crosley Broadcasting Corporation, 140 W. Ninth St., Cincinnati, Ohio.
Born: February 5, 1904, Omaha, Neb. B.S.(E.E.), 1927; Iowa State College; E.E. (Professional), 1946. Committees: Electroacoustics, 1951–52; Sections, ex-officio, 1938–39. Sections: Cincinnati, *chairman, 1938–39.* Vice-President, Director of Engineering; I.R.E. Professional Groups.

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.

ROSE, Albert (A'36—M'40—SM'43—F'48), Physicist; Engineer, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: March, 1910, New York, N.Y. A.B., 1931, Ph.D. (Physics), 1935, Cornell University. Awards: Journal Award, Society of Motion Picture Engineers, 1946; Morris Liebmann Memorial Prize, 1946; Television Broadcasters Association Award, 1945.

ROSE, George M. (A'31—M'38—SM'43—F'54), Manager, Receiving Tube Advanced Development Group, Tube Division, Radio Corporation of America, 415 S. Fifth St., Harrison, N.J.
Born: November 22, 1907, Nashville, Tenn. B.S.(E.E.), 1928, University of North Carolina. Committees: Admissions, 1954. Awards: Modern Pioneer Award, 1940, National Association of Manufacturers.

ROYDEN, George T. (A'19—M'27—F'33), Engineer, Mackay Radio and Telegraph Company, 67 Broad St., New York 4, N.Y.
Born: June 20, 1895, Fort Clark, Tex. A.B., 1917, Engineer, 1924, Stanford University. Director, 1946. Committees: Admissions, 1941–48, *chairman, 1943–48;* Awards, 1946; Constitution and Laws, 1944, 1949; Convention Record, 1953–54; National Convention, 1946; New York Program, 1938–42; Professional Groups, 1952–53; Sections, 1941–45. Professional Groups: Communications Systems, Administrative Committee, 1952–54, *chairman, 1952–53.* Sections: San Francisco, *chairman, 1933–34.* Awards: Sigma Xi.

RUSH, Walter A. (F'36) (L'49), Retired. 200 Rideau Terr., Ottawa, Ont., Canada.
Born: April 25, 1880, London, England. Vice-President, 1942; Director, 1942.

RUST, William M., Jr. (SM'47—F'53), Chief, Geophysics Research, 1200 Main, Houston 2, Tex.
Born: January, 1907, Liberty, Tex. B.A., 1928, M.A., 1929, Ph.D., 1931, The Rice Institute. Director, 1951–52. Committees: Awards, 1953–54, *chairman, 1954;* Professional Groups, 1953. 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. Institute Representative: Committee on Aeronautic Radio Research, Department of Commerce, 1930–31; Liaison Committee on Aeronautic Radio Research, 1936–37, 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 Techn. Univ. of Denmark. Vice-President, 1951. Awards: President, Danish National Committee of URSI, 1948.

RYDER, John D. (A'29—SM'45—F'52), Dean of School of Electrical Engineering, Michigan State College, East Lansing, Michigan.
Born: May 8, 1907, Columbus, Ohio. B.E.E., 1928; M.S., 1929, Ohio State University; Ph.D., 1944, Iowa State College. Director, 1952–54. Committees: Education, 1945–46, 1949–54, *chairman, 1953–1954;* Executive, 1954; Finance, 1954; Membership Relations Co-ordinator, 1954; Papers Review, 1948–53, *chairman, 1953;* Policy Advisory, 1952–53.

SALINGER, Hans W. O. (A'37—SM'46—F'51), Research Physicist, Capehart-Farnsworth Corporation, 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), Chief Physicist, Supervisor of Accelerator Research, California Research & Development Company, Livermore, Calif.
Born: December 27, 1903, Carthage, Ill. A.B., 1926, University of Iowa. D.S. (Honorary), 1950, Cornell College; 1951, Mackay Professor of Electrical Engineering, University of California. Committees: Education, 1946; Nuclear Studies, 1948; Papers Review, 1946; Railroad and Vehicular Communications, 1945–47; Sections: East Bay Subsection, *chairman, 1953–54.*

SALZBERG, Bernard (J'25—A'30—M'38—SM'43—F'52), Consultant, Electronics Division, Naval Research Laboratory, Washington 25, D.C.
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, 1943–44; Membership, 1939–46.

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; Electronics, 1944–45; Electron Tubes, 1946–47; Electron Tubes and Solid-State Devices, 1949–52, *vice-chairman, 1950–51, chairman, 1951–52;* Papers Review, 1952–53. Research, 1949–50; Standards, 1951–52; Symbols, 1946–51; Vacuum Tubes, 1945; Sections: Mid Hudson Subsection, *chairman, 1951–52.* Awards: Paper Award, 1937.

SANDRETTO, Peter C. (A'30—M'40—SM'43—F'54), Technical Director, Federal Telecommunications Laboratory, 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: Board of Editors, 1944–52; Navigation Aids, 1946–53, *chairman, 1950–53;* Papers Review, 1942–44; Professional Groups, 1952–54; Standards, 1950–53. Professional Groups: Aeronautical Navigational Electronics, 1952–53, *vice-chairman, 1952, chairman, 1953.* Sections: Chicago, *secretary-treasurer, 1940.*

SARNOFF, David (A'12—M'14—F'17), Chairman of the Board and Chief Executive Officer, Radio Corporation of America, 30 Rockefeller Plaza, New York, N.Y.; Board Chairman, RCA Communications, Inc., RCA Institutes, Inc. and National Broadcasting Co., Inc.
Born: February 27, 1891, Uzlian, Minsk, Russia. D.Sc. (Honorary), 1927, St. Lawrence University; D.Sc. (Honorary), 1935, Marietta 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. 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. Sections: San Francisco Representation, 1915. Awards: Peter Cooper Medal for Advancement of Science, 1949; Grand Medal of Association des Ingenieurs-Docteurs of France, 1950; National Chairman, 1951, Red Cross Fund Campaign; Appointed Brigadier General, Honorary Reserve, Army of U.S., 1951; Honorary Life Member, Engineers Club of Philadelphia, 1952; Honorary Fellow, Weismann Institute of Science, Rehovoth, Israel, 1952; Member of Honor Societe Française des Ingenieurs Techniciens du Vide, 1953; Founders Award, I.R.E., 1953; First Keynoter Award, National Association of Radio-Television Broadcasters, 1953.

SCHADE, Otto H. (M'40—SM'43—F'51), Staff Engineer, RCA Tube Department, Radio Corporation of America, 415 S. Fifth St., Harrison, N.J.
Born: April 27, 1903, Schmalkalden, Germany. Attended Technische Hochschule, Berlin-Carlottenburg, 1922–24; Honorary Degree Director of Electrical Engineering, RPI, 1953. Awards: David Sarnoff Gold Medal, 1951; Fellowship Award, Society of Motion Picture and Television Engineers, 1951. Modern Pioneer Award, National Association of Manufacturers, 1940; Morris Liebmann Memorial Prize, 1950; RCA Victor Award of Merit, Radio Corporation of America, 1946.

SCHELKUNOFF, Sergei A. (A'40—F'44), Technical Staff, 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; Antennas, 1945–48; Antennas and Waveguides, 1949–51; Papers, 1942–45; Papers Review, 1946; Radio Wave Propagation and Utilization, 1945–47, *chairman, 1947;* Standards, 1947. Institute Representative: ASA Sectional Committee (C61) on Electric and Magnetic Magnitudes and Units, 1949–54. Awards: Franklin Institute Stuart Ballantine Medal, 1949; Morris Liebmann Memorial Prize, 1942.

SCHELLENG, John C. (A'23—M'25—F'28), 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; Antennas, 1944–48; Antennas and Waveguides, 1949–50; Awards, 1943; Handbooks, 1945; Radio Transmitters, 1945–47; Standardization, 1931; Subcommittee on Methods of Testing Apparatus, Equipment and Devices, 1929–30; Standards, 1936–37; Transmitters, 1944; Transmitters and Antennas, 1938–44, *chairman, 1936–37.* Institute Representative: ASA Definitions Co-ordinating Committee, 1948; ASA Sectional Committee on Definitions of Electrical Terms, 1948–50; ASA Subcommittee on Communications, *vice-chairman, 1948–51;* Joint IRE, AIEE, ASA (C42) Definitions Co-ordinating Committee, 1949–51.

SCHLEIMANN-JENSEN, Arne (A'45—SM'47—F'48), Owner and Director, Schleimann-Jensen Laboratoriet, Paternostervägen 13–17, Stockholm-Johanneshov, 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), Head, Television Research Department, Motorola, Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
Born: April, 1906, Berlin, Germany. Dipl. Eng., 1928; Doctor, Applied Physics, 1929, Technische Hochschule, Berlin. Committees: Administrative Committee, Professional Group on Broadcast and Television Receivers. Sections: Chicago, *vice-chairman, 1953.*

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

SCHOOLEY, Allen H. (A'35—SM'47—F'54), Superintendent, Electronics Division, Naval Research Laboratory, Washington 25, D.C.
Born: December, 1909, Terril, Iowa. B.S.(E.E.), 1931, Iowa State College; M.S.(E.E.), 1932, Purdue University. Professional Groups: Engineering Management, 1954. Sections: Washington, D.C., 1953–54.

SCHRADER, Harold J. (A'31—M'38—SM'43—F'54), Manager, Advanced Development, Engineering Section, Radio Corporation of America, Camden, N.J.
Born: May 2, 1900, Schuyler, Neb. 1919–23, attended University of Nebraska. Sections: Philadelphia, *vice-chairman, 1937, Chairman, 1938.*

SCHROEDER, Alfred C. (A'38—SM'46—F'54), Color Television Research Engineer, Radio Corporation of America 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, 1950–52.

SCOTT, Hermon H. (M'35—SM'43—F'52), President and Director of Engineering, Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.
Born: March 28, 1909, Somerville, Mass. B.S., 1930, M.S., 1931, Massachusetts Institute of Technology. Committees: Audio Techniques, *vice-chairman, 1950–52;* Board of Editors, 1950–53; Editorial Review, 1954; Electro-Acoustics, 1941–46. Sections: Boston, *vice-chairman, 1948–49, chairman, 1949–50.* Awards: Fellow, Acoustical Society of America; Fellow, Audio Engineering Society; John Potts Memorial Award, 1951.

SCOTT-TAGGART, John (A'18—F'35), Wynwood, Beaconsfield, Bucks., England.
Born: May 27, 1897, Bolton, Lancs., England.

SEELEY, Stuart W. (M'40—SM'43—F'43), Director, Industry Service Laboratory, RCA Laboratories Division, Radio Corporation of America, 711 Fifth Ave., New York 22, 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, 1944–47; Modulation Systems, 1947–50; Professional Groups, 1948; Receivers, 1950–52. Awards: Morris Liebmann Memorial Prize, 1948.

SHACKELFORD, Benjamin E. (A'23—M'26—F'38), Director, License Department, RCA International Division, Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.
Born: August 12, 1891, Richmond, Mo. A.B., 1912, A.M., 1913, University of Missouri; Ph.D., 1916, University of Chicago. President, 1948; Director, 1945–50, 1953–54. Committees: Appointments, 1948; Awards, 1941, 1943–44, 1950–51; Bibliography, 1930–31, *chairman, 1930;* Board of Editors, 1937–40; Building Fund, *chairman, 1944–45;* Constitution and Laws, 1946, *chairman, 1947;* Convention Policy, 1947–50; Education, 1949; Executive, 1948–49, *chairman, 1948;* Frequency Modulation, 1942–45; Institute Sections, 1929–34, *chairman, 1933;* Meetings and Papers, 1929; National Convention, 1944, 1947, *chairman, 1944;* 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, 1943; Standards, 1932. Institute 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.

SHANNON, Claude E. (S'36—M'48—SM'49—F'50), Research Mathematician, Bell Telephone Laboratories, Inc., Murray Hill, N.J.
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. Institute Representative: IRE, AIEE Committee on Noise Definitions, 1949–50. Awards: Alfred Noble Prize, AIEE, 1940; Morris Liebmann Memorial Prize, 1949.

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

SHAW, Henry S. (A'17—M'21—F'35) (L'52), Retired. R.F.D. #1, Box 294-B, Westbrook, Me.
Born: November 29, 1884, Boston, Mass. A.B., 1906, Harvard University.

SHEA, Richard F. (A'29—M'32—SM'43—F'54), Manager, Advance Planning, Laboratories Department, General Electric Company, Electronics Park, Syracuse, N.Y.
Born: September 13, 1903, Boston, Mass. B.S., 1924, Massachusetts Institute of Technology. Committees: Admissions, 1940–45; Receivers, 1938–53, *chairman, 1949–51;* Standards, 1949–53, *vice-chairman, 1954.* Sections: Connecticut Valley, *chairman, 1944;* Syracuse, *vice-chairman, 1952, chairman, 1953.*

SHELBY, Robert E. (A'29—M'36—SM'43—F'48), Director of Color TV Systems Development Project, National Broadcasting Company, Inc., 30 Rockefeller Plaza, New York 20, N.Y.
Born: July 20, 1906, Austin, Tex. B.S.(E.E.), 1927, B.A., 1928, M.A. (Physics), 1929, University of Texas. Committees: Annual Review, 1950–51; Papers Procurement, 1947–50; Papers Review, 1948–51; Standards, 1951–52; Television, 1939–48; Television and Facsimile, 1938; Television Systems, *vice-chairman, 1949–51, chairman, 1951–53.*

SHEPHERD, James E. (A'36—SM'44—F'48), Director of Electronic Tube Engineering, Sperry Gyroscope Company, Inc., Lakeville Rd., Marcus Ave., 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. Director, 1948–50. Committees: Admissions, 1944; Awards, 1951–53; Constitution and Laws, *chairman, 1949;* Convention Policy, *chairman, 1947–48;* Membership, 1943; National Convention, *chairman, 1947;* Sections, 1947–48; Tellers, 1946–47. Sections: New York, *secretary, 1944–45; vice-chairman, 1946–47; chairman, 1947–48.*

SHEPHERD, William G. (A'42—SM'49—F'52), Professor of Electrical Engineering Department, 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 Tubes and Solid State Devices, 1951–52; Electron Tube Research Conference, *chairman, 1953.*

SHOUPP, William E. (SM'45—F'51), Assistant Division Manager, Westinghouse Atomic Power Division, P.O. Box 1468, 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, 1948–51; Papers Procurement, 1949–50. Sections: Pittsburgh, *chairman, 1946–47.*

SILING, Philip F. (M'40—SM'43—F'51), Engineer-in-Charge, RCA Frequency Bureau, 30 Rockefeller Plaza, New York 20, N.Y.
Born: August 14, 1897, Oil City, Pa. Ph.B., 1917, Yale University. Committees: Nominations, 1946. Institute Representative: Joint Technical Advisory Committee, 1948–53, *chairman, 1948–49.* Awards: Sigma Xi.

SILVER, Samuel (M'46—SM'50—F'54), Professor of Engineering Science, Division 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. Awards: Guggenheim Fellowship, John Simon Guggenheim Memorial Foundation, 1953–54.

SILVERMAN, Daniel (A'42—SM'51—F'53), Exploration Research Director, Stanolind Oil and Gas Company, 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. Committee: Papers Procurement, 1947–50. Section: Tulsa, *chairman, 1951–52.* Awards: Heller Travelling Fellow, 1928–30, University of California; Medallist, 1927.

SIMON, Emil J. (IRE Charter Mem.) (M'12—F'15) (L'41), Consulting Engineer, 50 Church St., New York 7, N.Y.
Born: October 25, 1888, New York, N.Y. Attended Columbia University, 1905–1909. Secretary, 1912–14; Director, 1912–14; Manager, 1915. Committees: Publicity, 1913, 1915; Specifications for Steamship Radio Equipment, 1914; Standardization, 1915.

SINCLAIR, Donald B. (J'30—A'33—M'38—SM'43—F'43), Chief Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass.
Born: May 23, 1910, Winnipeg, Man., Canada. S.B., 1931, S.M., 1932, Sc.D., 1935, Massachusetts Institute of Technology. President, 1952; Treasurer, 1949–50; Director, 1945–54. Committees: Admission, 1948; Antennas, 1944–46; Awards, 1951; Appointments, 1951, 1954, *chairman, 1954;* Executive, 1948–50, 1952, *vice-chairman, 1949–50, chairman, 1952;* Finance, ex-officio, 1949–50, 1952–53, *treasurer, 1949–50;* Membership, 1947–48, 1950–54; Nominations, 1948–54, *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. Institute Representative: Radio Planning Board, 1945–46, *alternate, 1947–48.* Awards: Fellow, AIEE; President's Certificate of Merit, 1948; Sigma Xi.

SINCLAIR, George (A'37—SM'46—F'54), Professor, University of Toronto. (President, Sinclair Radio Labs., 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 and Waveguides, 1946–54; Editorial Review, 1951–54; Education, 1951–52; Wave Propagation, 1946–54. Professional Groups: Antennas and Propagation, *vice-chairman, 1950, chairman, 1951,* Administrative Committee, 1950–54. Institute Representative: University of Toronto, 1948–54. Sections: Toronto, *vice-chairman, 1950, chairman, 1951.* Awards: U. S. War and Navy Departments, Certificate of Appreciation, 1948.

SKIFTER, Hector R. (A'31—M'36—SM'43—F'51), President, Airborne Instruments Laboratory, 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.* Awards: Presidential Certificate of Merit, 1947.

SLEPIAN, Joseph (SM'45—F'45), Associate Director of Research, Westinghouse Electric Corporation, East Pittsburgh, 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. Awards: AIEE Award, 1933. Benjamin Garver Lamme Medal, 1942, AIEE; Edison Medal, 1948, AIEE; John Scott Medal, 1932. Elected to National Academy of Science, 1941.

SMITH, David B. (A'35—SM'44—F'48), Vice-President, Research, Philco Corporation, Tioga and C Sts., Philadelphia 34, Pa.
Born: December 3, 1911, Newton, N.J. S.B., 1933, S.M., 1934, Massachusetts Institute of Technology. Director, 1947. Committees: Frequency Modulation, 1940–46; Membership, 1949–51; Public Relations, 1947–48; Special Publications Fund, 1947; Television, 1942–48; Television Systems, 1949–52; IRE-RMA Problem No. 2 Committee. Sections: Philadelphia, *chairman, 1945–46.*

SMITH, Newbern (A'41—SM'46—F'52), Research Engineer, University of Michigan Engineering Research Institute, Willow Run Research Center, Ypsilanti, Mich.
Born: January 21, 1909, Philadelphia, Pa. B.S. in Engineering, 1930, M.S. in Engineering, 1931, Ph.D. in Physics, 1935, University of Pennsylvania. Committees: Administrative Committee of the Board of Editors, 1951–53; Board of Editors, 1951–53; Standards, 1952; Wave Propagation, 1948–52, *chairman, 1952.* Professional Groups: Antennas and Propagation, 1948–52, *chairman, 1952.*

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. in E.E., 1928, Tufts College. Committees: Antennas, 1947–48; Sub-committee on Antennas, Methods of Testing, 1947–48; Antennas and Waveguides, 1949–52; Sub-committee on Antennas and Waveguides, Waveguides and Transmission Line Definitions, 1949–50, *chairman, 1951–54.* Professional Groups: Antennas and Propagation, Administrative Committee, *secretary-treasurer, 1953–54.*

SMITH-ROSE, Reginald L. (SM'44—F'44), Director of Radio Research, Department of Scientific and Industrial Research, Charles House, Regent St., London, W. 1, 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. Vice-President, 1948; Director, 1948. Committees: Radio Wave Propagation, 1944–45; Radio Wave Propagation and Utilization, 1945–48; Wave Propagation, 1949, 1951–52. Awards: Student Premium, 1917; Wireless Premium, 1925, 1938, 1939; Duddell Premium, 1942, Institution of Electrical Engineers, London; Coronation Medal, 1937; United States Medal of Freedom with Silver Palm, 1947; Fellow, City and Guilds Institute, 1951; Commander of the Order of the British Empire, 1952.

SOUTHWORTH, George C. (M'26—F'41), Member of Technical Staff, Radio Research Engineer, Bell Telephone Laboratories, Inc., Murray Hill, 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: Meetings and Papers, 1930; Papers, 1931–34; Standardization, Circuit Elements, 1928. Professional Groups: Microwave Theory and Techniques, Administrative Committee. Awards: Louis Levy Medal, Franklin Institute, 1946; Morris Liebmann Memorial Prize, 1938; Stuart Ballantine Medal, Franklin Institute, 1947.

SPANGENBERG, Karl R. (A'34—SM'45—F'49), Professor of Electrical Engineering, Stanford University, Stanford, 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; Membership, 1941; Papers, 1943–45; Papers Procurement, 1942–43, 1945; Regular Papers, 1941. Institute Representative: Stanford University, 1942–47. Sections: San Francisco, *secretary, 1940–42, chairman, 1943–44.*

SPEAKMAN, Edwin A. (A'43—M'44—SM'48—F'54), General Manager of Fairchild Guided Missiles Division, Wyandanch, N.Y.
Born: August 14, 1909, Gratz, Pa. B.S., 1931, Haverford College. Professional Groups: Antennas and Propagation, 1949.

STEEL, W. Arthur (M'19—SM'43—F'50), Engineering Consultant, Federal Electric 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. Sections: Ottawa, *chairman, 1945–46.*

STEEN, Jerome R. (A'36—M'36—SM'43—F'50), Director of Quality Control, Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y.

Born: June 29, 1901, West Bloomfield, N.Y. B.S.(E.E.), 1923, University of Wisconsin. Committees: Annual Review, 1948; Electronics, 1944–45; Electron Tubes, 1946–47; Instruments and Measurements, 1949–53; Papers Review, 1948–53; Professional Groups, 1951–52; Standards, 1948–51; Symbols, 1945–47; Vacuum Tubes, 1945–46. Institute Representative: ASA (C67) Committee, 1951. Awards: Fellow, American Society for Quality Control.

STERLING, George E. (M'41—SM'43—F'49), Commissioner, Federal Communications Commission, 7241 New Post Office Bldg., Washington 25, D.C. Residence: Peak's Island, Me.

STEVENS, Archie M. (A'12—M'25—F'31) (L'53), Radio Engineer, International Standard Electric Corporation, 67 Broad St., New York 4, N.Y.
Born: September 22, 1887, Glidden, Iowa. A.B., 1909, Leland Stanford Junior University. Sections: Buenos Aires, *chairman, 1940.*

STONE, Ellery W. (A'14—M'16—F'24), Rear Admiral, United States Naval Reserve; President and Director, American Cable and Radio Corporation; President and Director, All America Cables and Radio, Inc.; President and Director, The Commercial Cable Co.; President and Director, Mackay Radio and Telegraph Co.; Vice-President and Director, International Telephone and Telegraph Corporation, 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; Knight Commander, British Empire, 1945; Knight of Grand Cross of St. Maurice and St. Lazarus, Italian Government, 1945; Knight of Grand Cross, San Marino, 1946; Marconi Medal of Achievement, VWOA, 1953; United States Army Distinguished Service Medal, 1945; United States Navy Distinguished Service Medal, 1946.

STRAITON, Archie W. (M'47—SM'49—F'53), Professor of Electrical Engineering and Director, Electrical Engineering Research Laboratory, Department of Electrical Engineering, The University of Texas, Austin, Tex.
Born: August, 1907, Arlington, Tex. B.S.(E.E.), 1929, M.A., 1931, Ph.D., 1939, The University of Texas. Director, 1953–54. Committees: Appointments, 1953; Nominations, 1953–54; Policy Advisory, 1953–54; Wave Propagation, 1949–54. Institute Representative: The University of Texas, 1947–50.

STRATTON, Julius A. (M'42—SM'43—F'45), Provost and Vice-President, Massachusetts Institute of Technology, Cambridge 39, Mass.
Born: May 18, 1901, Seattle, Wash. S.B., 1923, S.M., 1925, Massachusetts Institute of Technology; ScD., 1927, Technische Hochschule, Zurich, Switzerland. Director, 1948–51, 1954. Committees: Annual Review, 1945–46; Appointments, 1948; Board of Editors, 1946–53; Editorial Board, 1954; Education, 1945; International Liaison, 1949; Membership, 1947; Policy Development, 1941–51; Professional Groups, 1954; Radio Wave Propagation and Utilization, 1945, 1947–48, *chairman, 1946;* Standards, 1945–46. Awards: Presidential Medal for Merit, 1946.

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. The Institution of Electrical Engineers, Associate Member, 1933, Member, 1937. Awards: Officer of the Order of the British Empire, 1947.

SWINYARD, William O. (A'37—M'39—SM'43—F'45), Chief Engineer, Hazeltine Research, Inc., 325 W. Huron St., Chicago 10, Ill.
Born: July 17, 1904, Logan, Utah. B.S., 1927, Utah State College. Director, 1945–46. Committees: Annual Review, 1948–49; Education, 1945–48; National Convention, 1947; Radio Receivers, 1949–52, *Chairman, 1946–48;* National Convention, 1947; Radio Receivers, 1946–52, *chairman, 1946–48;* Receivers, 1949–53; Sections, 1945–50, *chairman, 1946–47,* Standards, 1947–48. Sections: Chicago, *secretary, 1943–44; chairman, 1944–45.*

SZEGHO, Constantin S. (A'41—SM'51—F'52), Vice-President in Charge of Research, The Rauland Corp., 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. Committees: Papers Review, 1952–53.

TANK, Franz (A'31—F'49), Professor of High-Frequency Technics and Physics, Swiss Federal Institute of Technology, Sternwartstrasse 7, Zurich, Switzerland.
Born: March, 1890, Zurich, Switzerland. Ph.D., 1915, University of Zurich; Professor, Swiss Federal Institute of Technology, 1922; Rector, Swiss Federal Institute of Technology, 1943–47; President, Swiss Electrotechnical Institution, 1952.

TAYLOR, A. Hoyt (M'16—F'20) (L'51), Retired. 745 W. 12th St., Claremont, Calif.
Born: January 1, 1879, Chicago, Ill. B.S., 1902, Northwestern University; Ph.D., 1909, University of Göttingen, Germany. President, 1929; Director, 1929–31. Committees: Awards, 1928–31; Meetings and Papers, 1928; Sections, 1928. Section: Washington, *chairman, 1919–28.* Awards: John Scott Medal and Premium, Board of City Trustees, Philadelphia, 1942; Medal of Honor, 1942; Medal of Merit, President of the United States, 1944; Morris Liebmann Memorial Prize, 1927.

TAYLOR, Charles H. (M'13—F'15) (L'48), 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, 1915–21, 1924–25.

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, *chairman, 1943–44.* Institute Representative: Carnegie Institute of Technology, 1944–45. Awards: George Westinghouse Award, American Society for Engineering Education, 1947.

TERMAN, Frederick E. (A'25—F'37), Dean, School of Engineering, Stanford University, Stanford, Calif.
Born: June 7, 1900, English, Ind. A.B., 1920, Engineer, 1922, Stanford University; Sc.D., 1924, Massachusetts Institute of Technology; Sc.D. (Honorary), 1945, Harvard University, and University of British Columbia, 1950. 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, 1945–47; Membership, 1939–40, 1942, 1949–50, *chairman, 1942;* Nominations, 1943, 1948–49, 1951, 1953, *chairman, 1951;* Policy Development, 1948–50; Professional Groups, 1948; Research, *chairman, 1945–48;* Standards, 1934–40, 1946. Sections: San Francisco, *secretary, 1931–32, chairman, 1939;* Institute Representative: Stanford University, 1941; National Research Council, Division of Engineering and Research, 1943–46.

THAYER, Gordon N. (SM'47–F'51), Vice-President, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y.
Born: October 6, 1908, Delta, Colo. Stevens Institute of Technology, 1926–30; M.E., 1946.

THOMAS, Henry P. (A'34—VA'39—M'44—SM'47—F'51), Engineer, General Electric Company, Electronics Park, Syracuse, N.Y.
Born: May, 1904, Boston, Mass. B.A., 1925, M.S., 1927, Harvard University. Committees: Editorial Review, 1954; Papers Review, 1946–53; Radio Wave Propagation, 1942–45; Wave Propagation, 1940–41. Awards: Coffin Award, General Electric Company, 1948.

TINUS, William C. (A'31—M'36—SM'43—F'51), Vice-President, Bell Telephone Laboratories, Inc., Whippany, N.J.
Born: October, 1905, Chicago, Ill. B.S.(E.E.), 1928, Texas Agricultural and Mechanical College. Committees: Board of Editors, 1946–53.

TOWN, George R. (A'37—SM'44—F'50), Associate Director of the Engineering Experiment Station; Professor of Electrical Engineering, Iowa State College, 104 Marston Hall, Ames, Iowa.
Born: May 26, 1905, Poultney, Vt. E.E., 1926, D.Engr., 1929, Rensselaer Polytechnic Institute. Director, 1949, 1951–53. Committees: Appointments, 1952; Awards, 1948–49; Education, 1945–48; Frequency Modulation, 1946; Membership, 1953; Papers Procurement, 1947–50. Sections: Rochester, *secretary, 1942–44, chairman, 1944–46.*

TRAVIS, Irven (SM'46—F'53), Vice-President of Research, Burroughs Corporation, Research Center, Paoli, Pa.
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. Section: 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), Engineer, RCA Laboratories Division, Princeton, N.J.
Born: February, 1906, Ithaca, N.Y. E.E., 1928, Cornell University. Committees: Membership, 1943–46; Modulation Systems, 1946–51; Papers Review, 1946–53; Standards, 1950. Awards: Eta Kappa Nu, 1927; Sigma Xi, 1951; Tau Beta Pi.

TUPPER, Bertram R. (A'36—SM'46—F'54), Manager and Chief Engineer, Northwest Telephone Company, 2226 W. 10th Ave., Vancouver 9, B.C., Canada.
Born: April 15, 1906, Vancouver, B.C., Canada. B.S., 1928, University of British Columbia. Sections: Vancouver, *chairman, 1950.*

TURNER, Hubert M. (A'14—M'30—F'37) (L'49), Associate Professor, Emeritus, of Electrical Engineering, Yale University, New Haven, Conn.
Born: July 20, 1882, Hillsboro, Ill. B.S., 1910; M.S., 1915, University of Illinois. President, 1944; Director, 1933–46. Committees: Admissions, 1936, 1939–43, *chairman, 1941–42;* Annual Review, 1937–39, 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; Nominations, 1938, 1941, 1945, *vice-chairman, 1945;* Papers, 1932–44; Papers Procurement, 1942–43; Preparedness, 1940–41; Regular Papers, 1941; Sections, 1952; Standardization, 1926–31; Standards, 1932–37, 1940–47; Symbols, 1940–44, 1946–48, *chairman, 1940–44;* Tellers, 1940. Institute Representative: Yale University, 1941–47; United States National Committee of the International Electrotechnical Commission, 1944–48; Technical Advisor, U. S. National Committee, International Electrotechnical Commission, Letter Symbols, 1946–53; Chief Delegate, United States National Committee Letter Symbols for Electrical Quantities, Paris, France, 1950; United States Paper Committee World Power Conference, London, 1950; ASA Subcommittee on Letter Symbols for Radio, 1936–54; Electrical Standards Committee 1939–46; Sectional Committee on Specifications for Dry Cells and Batteries, 1936–51; Subcommittee on Communication Symbols of Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1939–48. Chairman, ASA Sectional Committee on Letter Symbols and Abbreviations for Science and Engineering, 1940–52.

TUTTLE, W. Norris (A'26—SM'46—F'49), Engineering Consultant, General Radio Company, 275 Massachusetts Ave., Cambridge 39, 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, 1944–52, *chairman, 1949–51;* Editorial Board, 1954; Education, 1953–54; 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, Conton, S.D. B.S., 1922, A.M., 1923, University of Minnesota; Ph.D., 1926, The Johns Hopkins University; D.Sc., 1948, Case Institute; D.Sc., 1949, Kenyon College; D.Sc., 1949, Williams College; D.Sc., 1950, Johns Hopkins University; D.Sc., 1953, University of Alaska. Awards: Fellow, American Physical Society; American Academy of Arts and Sciences; Member, National Academy of Sciences, American Philosophical Society; Vice-President, American Association for the Advancement of Science, 1947; 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; C.B.E., 1949; Howard N. Potts Medal, Franklin Institute, 1950; Outstanding Achievement Medal, University of Minnesota, 1950.

ULLRICH, Edward H. (M'26—F'39), Standard Telephones and Cables, Ltd., Ilminster, Somerset, 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.

ULREY, Dayton (A'28—M'40—SM'43—F'50), Consultant, RCA Victor Division, Radio Corporation of America, Harrison, N.J.
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, 1946–50, 1952.

VAN ATTA, Lester C. (M'42—SM'43—F'52), Associate Director, Research and Development Laboratories; and Head, Microwave Laboratory; Hughes Aircraft Co., 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;* Antennas and Waveguides, 1949–51, *chairman, 1949–50;* Awards, 1953; Membership, 1953; Papers Review, 1951–53; Professional Groups, 1952–54, *vice-chairman, 1953;* Research, 1946–47, 1949–50; Standards, 1949–50. Professional Groups: Antennas and Propagation, Administrative Committee, 1951–52, *chairman, 1949–50.*

VAN DER POL, Balthasar (M'20—F'29), Director, International Radio Consultative Committee (C.C.I.R.), Palais Wilson, Geneva, Switzerland.
Born: January 27, 1889. D.Sc., 1919, Utrecht. Vice-President, 1934; Director, 1934. Committees: Electronics, 1936–40; Meetings and Papers, 1929; Wave Propagation, 1937–39. Awards: Honorary Member, Netherlands Radio Society, 1920; Knight, Order of the Orange Nassau, 1927; Medal of Honor, Institute of Radio Engineers, 1935; Knight, Order of the Netherlands Lion, 1946; Honorary President, Union Radio-Scientifique Internationale (U.R.S.I.), 1952; Valdemar Poulsen Gold Medal, Danish Academy of Technical Sciences, 1953.

VAN DYCK, Arthur F. (IRE Charter Mem.) (A'12—M'18—F'25), Staff Assistant to Vice-President and Technical Director, Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.
Born: May 20, 1891, Stuyvesant Falls, N.Y. Ph.B., 1911, Yale University. President, 1942; Manager, 1930–32; Director, 1932–35, 1939–44. Committees: Admissions, 1930–34, 1937–40, 1943, *chairman, 1932–33, 1940;* Annual Review, 1937–39, 1943–44, *chairman, 1937–39;* Awards, 1934, 1940, 1952–53; Bibliography, 1930–32; Constitution and Laws, 1933–34, 1943; Executive, 1942–43, *chairman, 1942;* Nominations, 1932, 1951; New York Program, 1934–35, 1939–40, *chairman, 1934;* 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, 1933–35; Tellers, 1932–33, 1936, *chairman, 1936.* Institute Representative: ASA Sectional Committee on Preferred Numbers, 1936, 1939–54; ASA Sectional Committee on Preferred Voltages, 100 Volts and under, 1949–50. Awards: Legion of Merit, 1946; Modern Pioneer Award, National Association of Manufacturers, 1940.

VAN DYKE, Karl S. (A'15—M'26—SM'43—F'44), 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, 1941–45; Board of Editors, 1933–40, 1947–51, 1953; Meetings and Papers, *chairman, 1929, 1930;* Membership, 1942–47; Papers, 1932–33, 1944–45; Papers Procurement, 1945–48; Papers Review, 1946; Piezoelectric Crystals, 1940–43, 1945–52. *chairman, 1940–41, 1949–51.* Standards, 1941, 1949–51. Sections: Connecticut Valley, *secretary-treasurer, 1927, chairman, 1934–35.*

VARIAN, Russel H. (A'40—SM'51—F'52), President, Varian Associates, 611 Hansen Way, Palo Alto, Calif.
Born: April 24, 1898, Washington, D.C. A.B., 1925, Stanford University; 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.

WARNECKE, Robert R. (SM'48—F'50), Technical Director, Electronics Department, Centre de Recherches de la Compagnie Générale de Télégraphie Sans Fils, 23, Rue du Maroc, Paris, France.
Born: November, 1906, Tours, France. Doctor, 1933, University of Paris. Awards: Henri Becquerel Prize, Academy of Sciences of Paris, 1945; Ancel Prize, French Society of Electricians, 1943; Silver Medal, General Syndicate of Electrical Construction, 1948; Blondel Medal, 1951; D'Aumale Prize, Academy of Sciences of Paris, 1952; I.R.E. Morris Liebmann Memorial Prize, 1954; Member of the French Society of Physics, of the French Society of Electricians, of the Society of Radioelectricians (President of the "Microwaves Section").

WATSON-WATT, Sir Robert (SM'46—F'47), Governing Director, Sir Robert Watson-Watt and Partners, Ltd., 7 Gayfere St., London, S.W. 1, England; President, Adalia Incorporated, New York, and Adalia Limited, Montreal.
Born: April 13, 1892, U.K.; D.Sc., LL.D., F.R.S.; Vice-President, 1950; Director, 1950; Awards: Hughes Medal of the Royal Society of London, 1948; Presidential Medal for Merit, 1946; Valedmar Poulsen Gold Medal, Danish Academy of Technical Sciences, 1947.

WEBB, Wilbur L. (A'35—SM'44—F'54), Manager, Missile Section, Bendix Products Division, 400 S. Beiger, Mishawaka, Ind.
Born: July, 1906, Stanberry, Mo. B.S.(E.E.), State College of Washington. Director, 1946. Committees: Admissions, 1946–47. Professional Groups: Engineering Management, 1953–54. Sections: Baltimore, *chairman, 1945.* Awards: Certificate of Commendation, U.S. Navy, 1947.

WEBER, Ernst (M'41—SM'43—F'51), Director, Microwave Research Institute; Professor and Head, Department of Electrical Engineering, Polytechnic Institute of Brooklyn, 85 Livington St., Brooklyn 2, N.Y.; President, Polytechnic Research & Development Co., 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; ScD., 1927, Technical University. Director, 1952–54. Committees: Annual Review, 1950–51; Awards, 1952–54, *chairman, 1953,* Board of Editors, 1949–51, 1953; Circuits, 1949–52; Education, 1944–51; Finance, 1952; Instruments and Measurements, 1949–52, *chairman, 1949–51;* Membership, 1941–48; Policy Advisory, 1952; Professional Groups, 1953–54, *vice-chairman, 1954;* Standards, 1949–54; *vice-chairman, 1951–53, chairman, 1954.* Professional Groups: Instrumentation, *chairman, 1952–52.* Awards, Fellow, AIEE; Fellow, American Physical Society; President's Certificate of Merit, 1948.

WEBSTER, Edward M. (A'30—M'38—SM'43—F'44), Commissioner, Federal Communications Commission, Washington 25, D.C.
Born: February 28, 1889, Washington, D.C. Director, 1946. Committees: Membership, 1940; Public Relations, 1945–46. Sections, Washington, *secretary, 1940, chairman, 1942.*

WEEKS, Paul T. (A'19—M'28—SM'43—F'54), Chief Engineer, Receiving Tube Division, Raytheon Manufacturing Co., 55 Chapel St., Newton, Mass.
Born: November, 1890, Clarksfield, Ohio. A.B., 1913, Oberlin College; Ph.D., 1917, Cornell University. Committees: Electron Devices; Papers Review. Awards: Fellow, American Physical Society; Naval Ordnance Development Award, 1945; Phi Beta Kappa; Sigma Xi.

WEINBERGER, Julius (A'13—F'25), Staff Member, RCA Laboratories Division, Radio Corporation of America, 711 Fifth Ave., New York 22, N.Y.
Born: July 22, 1893, New York, N.Y. B.S., 1913, College of the City of New York. Committees: Industrial Electronics, 1946–53; Meetings and Papers, 1929; Research, 1946–47. 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, Electronics Park, Syracuse, N.Y.
Born: September, 1897, Prairie Creek, Ind. B.S., 1921, E.E. (Professional), 1932, Rose Polytechnic Institute. Committees: Annual Review, 1950–52; Antennas, 1944–45; Radio Transmitters, 1945–53; Transmitters, 1944–45.

WELDON, James O. (A'26—SM'46—F'54), President, Continental Electronics Manufacturing Company, 4212 S. Buckner Blvd., Dallas 17, Tex.
Born: March 15, 1905, Canton, Mo.

WELLS, Harry W. (M'36—SM'43—F'53), Chairman, Upper Atmosphere Section, Carnegie Institution of Washington, Dept. of Terr. Magnetism, 5241 Broad Branch Pl., Washington 15, D.C.
Born: January 13, 1907, Washington, D.C. B.S.(E.E.), 1928, E.E., 1937, University of Maryland. Director, Region III, 1954–55. Committees: Annual Review, 1950–51; Awards, 1953; Radio Wave Propagation & Utilization, 1945–47; Standards, 1953; Wave Propagation, 1949–52, *vice-chairman, 1951–52.* Professional Groups: Antennas and Propagation, Editor, 1951–52. Sections: Washington, *secretary, 1948, vice-chairman, 1949, chairman, 1950.* Awards: Scientific Achievement, Washington Academy of Sciences, 1947.

WENDELL, Edward N. (A'26—M'33—SM'43—F'47), Managing Director, Compania Standard Electric Argentina, Calle Uruguay 1037, Buenos Aires, Argentina.
Born: August 11, 1903, Rockport, Mass. B.Sc., 1925, Massachusetts Institute of Technology.

WENDT, Karl R. (A'36—SM'46—F'54), President, Wendt-Squires, Inc., 3807 Harlem Rd., Buffalo 15, N.Y.
Born: January 1906, Coshocton, Ohio. Committees: Papers Review, 1952–53. Sections: Buffalo-Niagara, *secretary-treasurer, 1949, chairman, 1950.* Awards: RCA 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. Director, 1934, 1940–45. Committees: Annual Review, 1937, 1940–48; Awards, 1942–44, *chairman, 1943;* Bibliography, 1930–32; Board of Editors, 1940–53; Broadcast, 1935–37; Circuits, 1944–46; Editorial Administrative, 1949–52; Executive, 1943–44; Handbook, *chairman, 1945–47;* Meetings and Papers, 1929–30; Membership, 1941–42; New York Program, 1931; Nominations, 1948; Paper, 1931–33; 1935–39; Papers Procurement, 1942–44; Professional Recognition, 1947; Public Relations, 1940; Radio Receivers, 1936–37, *chairman, 1937;* Regular Papers, 1941; Special Papers, 1940–41; Standardization, 1931; Subcommittee on Electroacoustic Devices, 1927–28; Technical Committee No. 4 on Electroacoustic Devices, 1930; Standards, 1932, 1936–48, *chairman, 1940–45;* Symbols, 1946. Sections: Long Island Subsection, *chairman, 1948–49.* Institute Representative: ASA Sectional Committee on Definitions of Electrical Terms (C-42), 1948, 1950–51; National Television Systems Committee, *alternate, 1940–43.* Awards: Associate, I.E.E.; Fellow, AIEE; Modern Pioneer Award, National Association of Manufacturers, 1940; Morris Liebmann Memorial Prize, 1940; Radio Club of America; United States Navy Certificate of Commendation, 1947.

WHEELER, Lynde P. (F'28), Staff Consultant, Pickard and Burns, Inc., 240 Highland Ave., Needham 94, Mass.
Born: July 27, 1874, Bridgeport, Conn. Ph.B., 1894, Ph.D., 1902, Yale University. President, 1943; Director, 1940–45. Committees: Bibliography, 1930–32; Board of Editors, 1930–32; Executive, *chairman, 1943;* Frequency Modulation, 1940–45; Meetings and Papers, 1929–30; Membership Solicitation Policy, 1945; Nominations, 1939, 1942, 1944; Papers, 1931–32, 1934; Papers Procurement, 1942–43; Public Relations, 1945–46; Regular Papers, 1941; Standardization Subcommittee on Circuit Elements, 1928. Sections: Washington, *chairman, 1930–32.* Institute Representative: RMA-IRE Co-ordinating, 1943.

WHINNERY, John R. (A'41—SM'44—F'52), Professor, vice-chairman of Electrical Engineering, University of California, 232 Cory Hall, Berkeley 4, Calif.
Born: July 26, 1916, Read, Delta County, Colo. B.S., 1937, Ph.D., 1948, University of California. Committees: Antennas, 1948; Awards, 1952; Board of Editors, 1946–53; Handbook, 1945–47; Papers, 1944–45; Papers Procurement, 1947–50. Sections, San Francisco, *secretary-treasurer, 1949–50, vice-chairman, 1951–53, chairman, 1953–54.*

WHITE, William C. (A'15—M'25—F'40), Electronics Engineer, Research Laboratory, General Electric Company, P.O. Box 1088, Schenectady, N.Y.
Born: March 24, 1890, Brooklyn, N.Y. E.E., 1912, Columbia University. Treasurer, 1946; Director, 1943–47. Committees: Awards 1944–46, *chairman, 1945–46;* Bibliography, 1930–32; Board of Editors, 1930, 1944, 1946–53; Education, 1945–6; Executive, *vice-president, 1946;* Investments, *chairman, 1946;* Meetings and Papers, 1928–30; Membership, 1947–53, *chairman, 1953;* Nominations, 1933, 1940, 1944–46; Office Practices, 1947; Papers, 1931–44; Papers Procurement, 1944–50; Professional Recognition, *chairman, 1947;* Standardization, 1925, 1929–30; Subcommittee on Vacuum Tubes, 1927–28. Institute Representative: National Electronics Conference Board of Directors, 1947–50.

WHITTEMORE, Laurens E. (A'16—M'25—F'27), Staff Engineer, American Telephone and Telegraph Company, 195 Broadway, New York, N.Y.
Born: August 20, 1892, Topeka, Kan. A.B., 1914, Washburn College; M.A., 1915, University of Kansas. Vice-President, 1928; Manager, 1926–27, 1929; Director, 1928, 1935–37. Committees: Administrative Board of Editors, 1951–52; Annual Review, 1937–48, 1950–52, *chairman, 1940;* Awards, 1937, 1948; Bibliography, 1930–32; Board of Editors, 1929–52; Broadcast, 1933; Editorial Administrative, 1946–52; Institute Sections, *chairman, 1926;* Meetings and Papers, 1929; Membership, *chairman, 1925;* Standardization, 1920–31, *chairman, 1926–29;* Subcommittee on Direction Finding Terminology, *chairman, 1924–25;* Subcommittee on Electroacoustic Devices, 1927–28; Standards, 1932–35; 1944–52; Symbols, *chairman, 1944;* Tellers, 1934. Institute 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 on 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; Board of Editors, 1949–51, 1953; Modulation Systems, 1949–50; Nuclear Studies, 1948; Research, 1949–50.

WILLIAMS, Charles E. (J'15—A'17—M'24—SM'43—F'52), Chief Electronics Engineer, Office of Assistant Industrial Manager, U.S.N. Seattle, 2400 11th Ave., S.W., Seattle 4, Wash.
Born: March 15, 1896, Seattle, Wash. Committees: Standardization, 1929. Sections: Seattle, *chairman, 1925; secretary, 1921-22, 1924, 1935.*

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: Sections, 1947–48. Sections: Pittsburgh, *vice-chairman, 1946–47, chairman, 1947–48.* Awards: Eta Kappa Nu, 1946; President's Certificate of Merit for Outstanding Civilian Service in World War II.

WILLIAMSON, Raymond H. (A'31—M'44—SM'46—F'51), Supervisor, Microwave Systems Engineering, General Electric Company, Electronics Park, Syracuse, N.Y.
Born: April 6, 1907, Eagle Grove, Iowa. B.S.(E.E.), 1928, Iowa State College; M.S.(E.E.), 1935, Union College. Committees: Membership, 1945–46; Papers Procurement, 1947–50. Sections: Syracuse, *vice-chairman, 1948–49, chairman, 1949.*

WILMOTTE, Raymond M. (M'29—F'38), Consulting Engineer and President, Raymond M. Wilmotte, Inc., 1469 Church St., N.W., Washington 5, D.C.
Born: August 13, 1901, Paris, France. M.A., 1921, Cambridge University, England. Committees: Handbook, 1945–47; Industrial Electronics, 1947–48; New York Program, 1933; Nomenclature, Symbols and Definitions, 1929–30; Papers, 1932–33; Papers Review, 1946–51; 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.

WILSON, James R. (M'31—SM'43—F'54), Director of Electron Tube Development, 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.

WINTRINGHAM, William T. (A'26—SM'45—F'51), Engineer in Charge of Television 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; Television Systems, 1954. Sections: New York, *treasurer, 1949–50.*

WOLFF, Irving G. (A'27—VA'39—F'42), Director of Research, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J.
Born: July, 1894, New York, N.Y. B.S., 1916, Dartmouth College; Ph.D., 1923, Cornell University. Director, 1952–53. Committees: Appointments, 1952; Awards, 1954; Board of Editors, 1946–53; Board of Directors, 1952–53; Education, 1945–46 and 1948–52; Electronics, 1943–45; Meetings and Papers, 1928–30; Nominations, 1952–54; Papers, 1931–45; Sections, 1937, 1953, *chairman, 1953,* Standardization: Electroacoustic Devices, 1927–28; Technical Committee No. 4, Electroacoustic Devices, 1920–30; Use of the Transmission Unit, 1928; Sections, *chairman, 1953.* Sections: Philadelphia, *chairman, 1936–37.* Institute 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, The Ramo-Wooldridge Corporation, 8820 Bellanca Ave., 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: Citation of Honor Award for Outstanding Achievements in Field of Electronic Research and Development, Air Force Association, 1950; National Research Fellowship, California Institute of Technology, 1936.

WOOLVERTON, Robert B. (A'13—M'13—F'15) (L'49), Colonel, United States Army, Retired. 654 Twelfth 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 Representation, *chairman, 1915.*

WOONTON, Garnet A. (A'40—SM'44—F'51), Professor of Physics; Director, Eaton Electronics Research Laboratory, McGill University, Montreal, P.Q., Canada.
Born: July, 1906, London, Ont., Canada. B.A., 1925; M.A., 1931, University of Western Ontario. Committees: Education, 1945–46. Sections: London, *chairman, 1945.* Institute Representative: University of Western Ontario, 1941–47. Awards: Fellow, Royal Society of Canada, International Chairman, Commission VII, U.R.S.I.

YOUNG, Charles J. (A'35—SM'45—F'53), Research Engineer, RCA Laboratories Division, RCA, Princeton, N.J.
Born: December 17, 1899, Cambridge, Mass. B.A., 1921, Harvard. Committees: Annual Review, 1944–46; Board of Editors, 1941–46; Facsimile, 1939–46, 1949–54; *chairman, 1944–46, vice-chairman, 1949–52;* Papers Procurement, 1947; Standards, 1944–46; Television and Facsimile, 1936–38. Awards: Modern Pioneer Award, National Association of Manufacturers, 1946.

YOUNG, Leo C. (A'19—M'29—SM'43—F'43), Consultant, Naval Research Laboratory, Washington 25, D.C.
Born: January 12, 1891, Danville, Ill. Sections: Washington, *secretary, 1938–39, chairman, 1940.* Awards: Fellow, AIEE; Fellow, AAAS; President's Certificate of Merit, 1946.

ZAHL, Harold A. (A'39—SM'46—F'50), Director of Research, Signal Corps Engineering Laboratories, 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. Director, 1949. Committees: Administrative Committee of the Board of Editors, 1953; Board of Editors, 1951–53; Editorial Administrative, 1949–52; Electroacoustics, 1936–37; Electronics, 1943–44. Awards: Harry Diamond Award, 1954; Legion of Merit, Department of the Army, 1945.

ZENNECK, Jonathan A. W. (F'48), Professor, Retired, Experimental Physics Laboratory, Institute of Technology, Munich, Germany; Geheimer Regierungsrat.
Born: April 15, 1871, Ruppertshofen, Wuerttenberg, Germany. D.Sc., 1894, University of Tuebingen, Germany; Dr. Ing. (Honorary), Institute of Technology, Dresden, 1928; Vice-President, 1933; Director, 1933. Committees: Standardization, 1915–17, 1927. 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 Verdienst Kreur des Verdienstordens, 1952. Honorary President, Deutches Museum, 1953.

ZOTTU, Paul D. (A'31—M'38—SM'43—F'44), President, Consulting Engineer, Electronic Heating Corporation, 66 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;* Membership, 1947–48; Papers Procurement, 1946; Standards, 1945, 1947. Awards: Hyat Award, Plastics Industry.

ZWORYKIN, Vladimir K. (M'30—F'38), Director of Electronic Research, Vice-President and Technical Consultant, RCA Laboratories Division, David Sarnoff Research Center, Radio Corporation of America, Princeton, N.J.
Born: July, 1889, Mourom, Russia. E.E., 1912, Petrograd Institute of Technology; Ph.D., 1926, University of Pittsburgh; D.Sc., 1938, Brooklyn Polytechnic Institute. Committees: Board of Editors, 1944–53. Awards: Medal of Honor, 1951; Morris Liebmann Memorial Prize, 1934; Modern Pioneer Award, National Association of Manufacturers, 1940; Rumford Medal, American Academy of Arts and Sciences, 1941; Overseas Award, British Institution of Electrical Engineers, 1939; 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; Society of Motion Picture and Television Engineer Progress Medal Award, 1951; AIEE Edison Medal, 1952; Fellow, AIEE, American Physical Society, American Association for the Advancement of Science; Member, Electron Microscope Society of America, National Academy of Sciences of U.S.A.; American Philosophical Society; National Research Council; Sigma Xi; Officer of French Academy of Science.

MEMBERSHIP ROSTER

The following list gives in alphabetical order the names of all members, except those of student grade, as of May 15, 1954.

A

AAGAARD, JAMES S. (S'48–A'53), Home: 7119 N. Paulina St., Chicago 26, Ill.

AALSETH, EARL P. (S'50–A'52), Geologist, Ameada Petroleum Corp., P.O. Box 1009, Williston, N.D.

AALTONEN, TIM K. (S'49–A'53), Engr., Com. Lab., Panoramic Radio Prod., Inc., 10 S. 2nd Ave., Mt. Vernon, N.Y.

AARON, BERTRAM D. (S'40–A'45–M'48–SM'51), Engr., Sales Consultant, Bomac Labs., 1 Salem Rd., Beverly, Mass.

AARON, M. ROBERT (S'49–A'52), Mem. Tech. Staff, Bell Tel. Labs., Murray Hill, N.J.

AARONS, CIVIA R. (A'49), 2108A S. John Russell Circle, Elkins Park, Pa.

AARONS, JULES (S'44–A'51), Project Scientist—Solar Noise Studies, Cambridge Research Center, 224 Albany St., Cambridge, Mass.

AARONSON, DAVID A. (S'46–A'53), Project Supvr., Canadian Aviation Electronics, Ltd., 6214 Cote Deliesse Rd., Montreal, P.Q., Canada.

AAS, EUGENE A. (A'47), Staff Mem., Sandia Corp., Albuquerque, N.M.

AAS, Herbert G. (S'50–A'51), Elec. Engr., United Aircraft Research Dept., 400 Main St., E. Hartford, Conn.

AASEN, CURTIS L. (S'50–A'51), Electronics Engr., Hqs., USMC, Washington 25, D.C.

AASGAARD, PER U. (M'54), Intermediate Engr., Canadian Marconi Co., 2442 Trenton Ave., Montreal, P.Q., Canada.

ABAJIAN, HENRY B. (M'46), Pres., Westbury Electronics, Inc., 40 Urban Ave., Westbury, L.I., N.Y.

ABASCAL, NESTOR (M'47), Home: 3709½ Clarington Ave., Los Angeles 34, Calif.

ABATE, ANTHONY (M'45), Plant Mgr., Melpar, Inc., 10 Potter St., Cambridge, Mass.

ABBATIELLO, JOSEPH M. (A'54), Pres., Aura Mfg. Co., Inc., 119 Chestnut St., New Haven, Conn.

ABBE, RYUKEN (A'54), Radio Engr., Toyo Com. Equipment Co., Ltd., 3-484 Tsukagoshi, Kawasaki, Japan.

ABBEY, KIRK (A'46), Supervisory Electronic Scientist, USN Electronics Lab., San Diego 52, Calif.

ABBITT, CHARLES W. (A'50), Maj. USAF, Directorate of Requirements, Hq. USAF, Washington 25, D.C.

ABBOTT, WILTON R. (M'45–SM'46), Sr. Research Engr., No. American Aviation, Inc., 12214 Lakewood Blvd., Downey, Calif.

ABBOUD, FUAD L. (S'50–A'51), Special Grad. Research Asst., Michigan State College, East Lansing, Mich.

ABDEL-DAYEM, ALY H. (A'53), Lecturer, Faculty of Engrg., Chatby, Alexandria, Egypt.

ABDUN-NABI, ZAKI (S'50–A'52), Elec. Engr., Sloan-Kettering Institute for Cancer Research, 444 E. 68 St., New York 21, N.Y.

ABEL, ADAM E. (A'41–SM'45), Asst. Director of Engrg. & Research, Radio Div., Bendix Aviation Corp., E. Joppa Rd., Baltimore 4, Md.

ABEL, CHARLES F. (A'44), Chief Engr., Wrather-Alvarez Broadcasting, Inc., 1405 5 Ave., San Diego 1, Calif.

ABEL, FRANK W. (S'49–A'50), Project Engr., P.R. Mallory Co., 3029 E. Washington St., Indianapolis 6, Ind.

ABEL, FRED (S'50–A'52), Elec. Engr., Andrew Alford Consulting Engrs., 299 Atlantic Ave., Boston, Mass.

ABEL, HARRY L. (M'46), Principal Production Officer, Ministry of Supply (Directorate of Electronic Production), Castlewood House, New Oxford St., London, W.1., England.

ABEL-HARRY, CLIFFORD B. (A'47), Chief Electro-Acoustic Engr., Hawley Products, Ltd., Garman Rd., Northumberland Park, Tottenham, London, N. 17, England.

ABELL, GURDON R., JR. (A'47), Chief, Implementation Sect., SAC & MATS Systems Lab., Rome Air Development Center, USAF, Griffiss Air Force Base, Rome, N.Y.

ABELOW, IRA L. (A'52), Pres., Basic Resources Corp., 84 William St., New York, N.Y.

ABEND, IRVING J. (M'45), Project Engr., Presto Recording Corp., Paramus, N.J.

ABERCROMBIE, GEORGE D. (A'52), Radio Instructor, Radio Repairman & Communications Chief, U.S. Army, Hq., Det. 7809 SCU, APO 403, c/o PM., New York, N.Y.

ABERE, EUGENE J. (S'52–A'53), Tester, GE (Electronic Div.), Kent St., Utica, N.Y.

ABERER, JOSEPH C. (A'48), Elec. Engr., Garden City Engrg. Co., 1714 S. Halsted St., Chicago 8, Ill.

ABERNATHY, HOMER D. (A'48), Electronic Engr., CAA, P.O. Box 1689, Ft. Worth 1, Tex.

ABERNATHY, OSCAR R. (S'50–A'51), General Telephone Co. of Calif., 660 E St., San Bernardino, Calif.

ABERNATHY, THOMAS C. (A'49), Transmitting Plant Supervisor, Radio Station WSUN, & WSUN-TV, St. Petersburg, Fla.

ABEYTA, ISAAC (A'51), Electronic Engr., U. S. Signal Corps, Ft. Monmouth, N.J.

ABFALTER, HUBERT F. (S'35–A'39–SM'54) Chief Engr., WTVP, Decatur Prairie Television Co., Shellabarger Knoll, Decatur, Ill.

ABILOCK, SOLOMON (A'49), Asst. Chief Engr., Pilot Radio Corp., 37-06 36 St., L.I. City 1, N.Y.

ABJANICH, GEORGE S. (S'47–A'49–M'51), Electronic Test Engr., Edo Corp., College Pt. 56, N.Y.

ABJORNSON, CARL A. (S'49–A'49), Elec. Engr., Naval Air Turbine Test Station, Trenton, N.J.

ABLIN, HENRY L. (S'52–A'54), Pvt. (MOS 1394), Lab. Research Asst., Elec. Engr.), U. S. Army, 2191th ASU, Ft. George G. Meade, Md.

ABOUSSLEMAN, WILLIAM C. (M'42–SM'43), Production Mgr., Century Engineers, Inc., 2701 Naomi St., Burbank, Calif.

ABRAHAM, GEORGE (S'41–A'42–M'45), Electronic Scientist, Naval Research Lab.; Pres., Intercollegiate Broadcasting System, Washington, D.C.

ABRAHAM, IRVING (A'54), Owner, ABC Radio Service, 161 E. Gun Hill Rd., Bronx 67, N.Y.

ABRAHAM, JOSEPH (S'50–A'51), Electronic Engr., Cook Research Labs., 8100 Monticello, Skokie, Ill.

ABRAHAM, LEONARD G. (SM'46), Dir. of Electronics, Sandia Corp., Sandia Base, Albuquerque, N.M.

ABRAHAM, LEONARD G., JR. (S'49–A'54), Research Assoc., GE Research Lab., The Knolls, Schenectady, N.Y.

ABRAHAM, RICHARD P. (S'50–A'52), Home: 2025 San Diego St., San Francisco 16, Calif.

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BP6—Beaumont-Port Arthur
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CH15—Chicago
CIN5—Cincinnati
CL4—Cleveland
COL4—Columbus
CR5—Cedar Rapids
CV1—Connecticut Valley
DAY5—Dayton
DEN5—Denver
DET4—Detroit
DFW6—Dallas-Fort Worth
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EC4—Elmira-Corning
EMP4—Emporium
EO5—Evansville-Owensboro
EP7—El Paso
FW5—Fort Wayne
HAM8—Hamilton
HAW7—Hawaii
HOU6—Houston
HUN6—Huntsville
IND5—Indianapolis
INY7—Inyokern
KC5—Kansas City
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LI2—Long Island
LON8—London
LOU5—Louisville
LR5—Little Rock
MI6—Miami
MIL5—Milwaukee
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NO6—New Orleans
NY2—New York
OC6—Oklahoma City
OL5—Omaha-Lincoln
OT8—Ottawa
PHI3—Philadelphia
PHX7—Phoenix
PIT4—Pittsburgh
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PR13—Princeton
ROC4—Rochester
RU4—Rome-Utica
SA6—San Antonio
SAC7—Sacramento
SCH2—Schenectady
SD7—San Diego
SEA7—Seattle
SF7—San Francisco
SL5—Saint Louis
SLC7—Salt Lake City
SY4—Syracuse
TC5—Twin Cities
TOL4—Toledo
TOR8—Toronto
TUL6—Tulsa
VAN8—Vancouver
WA3—Washington, D. C.
WIL4—Williamsport
WIN8—Winnipeg

UNITED STATES

ALABAMA

Aliceville (HUN-6)
Summerville, J. W. (A)

Auburn (AT-6)
O'Kelley, H. E. (M)
Steere, R. M. (SM)
Summer, H. M. (A)
Wilder, J. M. (A)

Birmingham (HUN-6)
Adamson, H. D. (A)
Gray, C. M. (A)
Hammond, J. L., Jr. (A)
Humphreys, T. G., Jr. (A)
Jones, R. M., Jr. (A)
Little, S. C. (A)
Lowery, H. R. (A)
Minton, R. E. (A)
Rutledge, H. F., Jr. (A)
Shortley, W. M. (A)
Uthlaut, H. T., Jr. (A)
Wood, T. D., Jr. (A)

Cullman (HUN-6)
Buxton, J. E. (A)

Fairfield (HUN-6)
Clements, C. C. (A)
Day, W. R., Jr. (A)
Weeks, J. P. (A)

Foley (AT-6)
Stutsman, R. S. (A)

Frisco City
Johns, J. H. (A)

Huntsville (HUN-6)
Allen, W. S. (A)
Angele, W. (A)
Bailey, R. M. (A)
Ballew, H. W. (M)
Bankowski, V. C. (A)
Barr, T. A. (A)
Beardsley, H. S. (A)
Bennett, R. A. (A)
Bratcher, A. L. (M)
Breuer, H. (A)
Bridges, J. K. (A)
Brown, S. P. (A)
Brock, C. O. (A)
Chapman, R. W. (A)
Childers, F. M. (A)
Cook, H. E. (A)
Cox, T. J., Jr. (A)
Currie, R. E. (A)
Davidson, J. K. (A)
Digesu, F. E. (A)
Dolle, W. C. (A)
Douma, J. E. (A)
Downs, S. W., Jr. (A)
Drost, E. (A)
Dudley, H. J. (M)
Dyess, C. H. (A)
Edwards, R. L. (A)
England, R. E. (A)
Everhard, F. U., Jr. (A)
Farrior, J. S., Jr. (A)
Fisher, M. R., Jr. (A)
Frasco, W. V. (A)
French, D. E. (A)
French, H. S. (A)
Frost, W. O. (A)
Gary, H. T. (A)
Graham, A. S. (A)
Greenwood, T. L. (A)
Haeger, J. R. (M)
Hallowes, J. P., Jr. (A)
Hammond, R. L. (A)
Harnway, R. C. (A)
Harper, J. W. (A)
Harrison, G. S. (A)
Hirschler, O. H. (A)
Hobert, O. A. (A)
Hosenthien, H. H. (A)
Howell, J. E., Jr. (A)
Johnston, S. L. (SM)
Kimmons, W. L. (A)
Lakebrink, R. T. (A)
Loeb, W. S. (A)
Lucas, J. H. (A)
Lynch, W. L. (A)
McLaney, R. W. (A)
Martin, R. C. (A)
Miller, H. G. (A)
Moore, F. B. (A)
Morgan, C. G. (A)
Murphree, F. J., Jr. (A)
Neal, W. O. (A)
Norman, J. E. (M)
Parker, C. W. (A)
Pittman, W. C. (A)
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Powell, J. T., Jr. (A)
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Richard, J. M. (A)
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Sarge, A. E. (A)
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Smith, L. B. (A)
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Stuhlinger, E. (A)
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Taylor, H. M. (A)
Taylor, H. M., Jr. (A)
Triche, A. B. (A)
Vincent, H. F. (A)
Walthour, R. L. (A)
Weaver, T. H. (A)
Weiner, A. (M)
Wells, B. C. (A)
White, J. R. (A)
Wimpey, J. L. (A)
Wood, L. P. (A)

Maxwell AFB (AT-6)
Stinson, I. F. (M)

Mobile (NO-6)
Baucum, P. G. (M)
Mahan, O. C. (M)

Montgomery (AT-3)
Chappuis, C. K. (SM)
Gould, G. T., Jr. (SM)
Lehr, O. A. (A)

Opelika (AT-6)
Murphy, C. E. (A)

Tuscaloosa (HUN-6)
Littlefield, J. T. (A)
Ruark, A. E. (M)
Shaver, F. T. (A)

ARIZONA

Cortado
Strang, R. P. (A)

Douglas (PHX-7)
Allen, W. (M)

Gilbert (PHX-7)
Peabody, S. J. (A)

Glendale (PHX-7)
Burns, C. L. (A)
Edwards, M. J. (A)

Globe (PHX-7)
Snively, H. A. (A)

Jerome (PHX-7)
Mayper, V., Jr. (A)
Ruddock, K. A. (A)

Klagman
Wallace, P. H. (A)

Marana (PHX-7)
Wong, B. G. (A)

Mesa (PHX-7)
Peterson, D. G. (A)
Sabin, W. D. (A)
Smith, D. A. (A)

Phoenix (PHX-7)
Adams, W. L. (A)
Anderson, W. J. (A)
Anderson, H. R. (A)
Ashton, M. W. T. (A)
Baum, R. V. (A)
Benham, M. J. (A)
Berens, G. F. (SM)
Blackert, R. O. (A)
Bottom, V. E. (M)
Brown, D. W. (A)
Bushong, J. G. (A)
Butterfield, F. E. (M)
Carter, D. F. (A)
Cassutt, R. J. (A)
Chadek, T. J. (A)
Chambers, J. A. (SM)
Clark, C. J. (M)
Conrad, E. (A)
Cook, G. W. (A)
Cook, M. F. (M)
Creighton, A. M., Jr. (M)
Cuckler, V. A. (A)
Culver, J. E. (A)
Debel, C. A. (A)
Diehl, H. A. (A)
Diven, L. (A)
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Englund, R. A. (A)
Fenton, N. L. (A)
Ferguson, W. F. (A)
Fritz, C. B. (A)
Geppert, D. V. (A)
Giltinan, T. L. (A)
Graham, B. (SM)
Greer, P. H. (A)
Ham, N. C. (A)
Hammond, J. R. (A)
Hancock, G. W. (A)
Hitt, W. R. (M)
Hershey, L. M. (SM)
Heyser, R. C. (A)
Hume, A. S. (SM)
Jacobsen, A. B. (SM)
Jones, J. E. (A)
Kemmeries, F. D. (A)
Kirby, S. H. (M)
Knowles, W. N. (A)
Noon, J. R. (A)
Nyswander, R. E. (A)
McClanathan, G. L. (A)
McFaul, Z. F. (A)
McKee, R. M. (A)
Meyer, C. F., Jr. (SM)
Miller, H. K. (A)
Miller, R. H. (A)
Morgan, H. L. (M)
Morrison, F. (M)
Morton, D. E. (A)
Paine, J. A. (A)
Pennington, R. J. (A)
Phillips, T. A. (M)
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Pool, E. B. (A)
Pringle, D. L. (A)
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Safford (PHX-7)
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Scottsdale (PHX-7)
Carden, M. W., Jr. (A)
Dahl, W. E. (A)
Enzler, A. J. (A)
Estes, C. L. (M)
Gabrielson, R. G. (A)

Sonoita (PHX-7)
Boice, F. S. (A)

Tempe (PHX-7)
Harkins, D. (A)
Merritt, C. H. (M)

Tucson (PHX-7)
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Bartholomew, D. (A)
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Mascari, P. F. (A)
Myers, J. L. (A)
Peirce, T. F. (A)
Plummer, R. T. (M)
Poulson, W. A. (A)
Prisbrey, D. (A)
Quigg, K. R. (A)
Record, W. V. (M)
Simpson, E. J. (A)
Smith, J. (A)
Steward, H. E. (SM)
Stultz, L. R. (M)
Swartz, A. (A)
Walker, G. A., Sr. (M)
Young, W. E. (A)

Wickenburg (PHX-7)
Yount, R. G. (A)

Yuma (PHX-7)
Reddicks, J. E. (A)

ARKANSAS

Eldorado (LR-5)
Jennings, C. S., Jr. (A)
Sorrells, W. E. (A)

England (LR-5)
McClanahan, W. J. (A)

Everton (LR-5)
Wightman, E. R. (SM)

Fayetteville (LR-5)
Alls, C. R. (A)
Cannon, W. W. (A)
Coleman, J. T. (A)
Naugle, R. B. (A)
Raible, R. W. (A)
Ralls, R. H. (M)

Ft. Smith (LR-5)
Duvall, G. (A)
Logan, W. L. (A)
Miller, J. C. (A)

Hope
Klipsch, P. W. (SM)

Hot Springs
Papoulias, V. P. (A)

Little Rock (LR-5)
Carson, C. J. (M)
Clayton, J. W. (A)
Cooke, H. F. (A)
Dillaplain, V. L. (SM)
Edwards, J. M. (A)
Emery, R. H. (A)
Garrett, O. R. (A)
George, E. E. (SM)
Grubbs, C. E. (A)
Hale, W. B. (A)
Hammett, W. F. (A)
Harington, C. F. (A)
Hegar, E. A. (SM)
Jewell, A. G. (A)
Menees, W. (A)
Phillips, G. D. (A)
Phillips, J. B. (A)
Raley, J. K. (A)
Reid, J. D. (F)
Russell, J. O. (A)
Spilman, J. C. (A)
Waller, J. L. (A)
Wilson, F. J. (M)
Winn, D. L. (SM)
Woolfolk, R. L. (A)
Wylie, J. E. (A)

Malvern
Beem, R. M. (SM)
Nider, M. E. (A)

North Little Rock (LR-5)
Mountjoy, G. (F)
Scott, G. H. (SM)
Stewart, W. F. (SM)
Wood, M. L. (A)

Pine Bluff (LR-5)
Thompson, E. E. (A)

Pocahontas
Dickson, E. L. (A)

Scott (LR-5)
McRae, J. P. (A)

Siloam Springs (LR-5)
Anderson, M. K. (A)
Smith, C. E. (M)

CALIFORNIA

Acampo (SAC-7)
Rinaudo, R. F. (A)

Alameda (SF-7)
Branum, D. R. (A)
Campbell, G. R. (A)
Hall, T. D. (A)
Kaifer, R. C. (A)
McNulty, J. W. (M)
Moore, J. M. (A)
Mueller, W. M. (A)
Thompson, E. M. (A)

Albany (SF-7)
Elsken, R. H. (A)
Sorensen, E. G. (M)
Williamson, S. R. (M)

Alhambra (LA-7)
Buchanan, R. A. (A)
Bunker, E. R., Jr. (A)
Cary, H. H. (A)
Gleim, R. A. (A)
Gum, J. D. (A)
Horton, D. K. (A)
Houdyshell, H. H., Jr. (A)
Lazurus, A. (A)
Lowe, M. E. (M)
Mueller, F. W. (A)
Munsey, C. J. (A)
Seidner, O. R. (A)
Tallman, C. R. (A)
Thompson, W. C., Jr. (M)
Ule, L. A. (M)
Weeks, A. D. (A)

Altadena (LA-7)
Alrich, J. C. (A)
Bain, M. B. (A)
Black, L. (M)
Braun, V. J. (SM)
Chalmers, P. H. (A)
Ellis, D. D., Jr. (A)
Fearman, E. L. (A)
Gismot, W. (A)
Goldstein, S. J., Jr. (A)
Gossland, J. K. (SM)
Heacock, R. L. (A)
Hopkins, W. L. (A)
Ingall, W. E. (A)
Israelsen, B. P. (A)
James, J. N. (A)
Johnson, H. S. (M)
Johnson, R. T. (A)
Krueger, R. E. (M)
Lewis, R. S. (A)
Linnes, K. W. (A)
Locanthi, B. N. (A)
Lolass, A., Jr. (A)
Mallinckrodt, A. J. (A)
Neuland, J. G. (A)
Neumeyer, B. W. (A)
Nielsen, C. L. (M)
Riedel, J. C. (A)
Scull, J. R. (M)
Shaw, N. H. (A)
Shuey, C. W. (A)
Sink, R. L. (SM)
Sinnette, J. T., Jr. (A)
Sibilia, L. (A)
Sirri, N. (A)
Smyth, R. K. (A)
Stephenson, H. G., Jr. (A)
Tallman, C. R. (A)
Talmo, R. E. (A)
Tehan, M. F. (A)
Thurman, R. V. (A)
West, L. E. (SM)
Whipple, R. C. (A)
York, L. M. (A)
Young, W. D. (A)

Anaheim (LA-7)
Duffy, B. A. (A)
Jeschke, A. W. (A)
Lamers, K. W. (A)
Lindberg, A. C. (A)
Meyer, A. W. (A)
Rassier, D. B. (A)

Angwin
Manning, K. P. (A)
Neilsen, I. R. (A)

Apple Valley (LA-7)
Slaughter, R. G. (A)

Aptos (SF-7)
Wrathall, G. R. (A)

Arcadia (LA-7)
Anderson, R. I. (A)
Bageaux, A. G. (A)
Bacus, R. A. (A)
Clack, H. W. (A)
Duncan, D. B. (A)
Eland, R. C. A. (M)
Fiske, J. J. (M)
Fletcher, T. C. (M)
Fox, M. (M)
Galavan, T. P. (A)
Grobecker, A. J. (M)
Holmes, P. J. (A)
Horton, E. J. (A)
Jarmie, T. W. (SM)
Johnson, R. E. (A)
Madsen, E. C. (M)
Marshall, R. (A)
Pitzer, R. L. (A)
Pride, E. W. (M)
Seiler, R. (A)
Stimson, J. D. (A)
Waldschmidt, N. E. (A)

Arlington (LA-7)
Bishop, B. E. (A)
Bowden, D. A. (A)
Fine, A. (A)
Gilpin, A. B. (A)
Hata, F. T. (M)
Kudela, A. F. (A)
Rosen, H. H. (SM)
Whalen, P. K. (A)
Witbeck, L. H. (A)

Associated (SF-7)
Mittelman, L., Jr. (A)

Atherton (SF-7)
Eldred, W. N. (SM)
Gammell, H. C. (A)
Gastineau, L. (A)
Gray, K. B. (A)
Held, H. E. (VA)
Jones, R. M. (SM)
Kawe, R. W. (M)
Scofield, P. F. (SM)
Sheffield, R. F. (A)

Azusa (LA-7)
Thorpe, R. W. (M)

Bakersfield (LA-7)
Buchholz, C. W. (A)
Hood, H. E. (A)
Whiting, W. E. (M)

Balboa Island (LA-7)
Hansen, E. H. (SM)

Baldwin Park (LA-7)
Bethard, C. T. (A)

Bell (LA-7)
Louie, W. (A)
Zelenay, J. (A)

Bellflower (LA-7)
Aikman, G. N. (A)
Anday, W. S. (A)
Bean, R. C. (A)
Bigelow, H. L., Jr. (M)
Brown, H. W. (VA)
Cline, J. F. (SM)
Knepper, R. C. (A)
Lehtone, L. L. (A)
Pentecost, E. E. (M)
Schwab, B. B. (A)
Stansch, H. C. (A)
Thompson, M. F. (A)

Bell Gardens (LA-7)
Adams, R. L. (A)
Collier, G. H. (A)
Henderson, F. B. (A)

Belmont (SF-7)
Alff, W. H., Jr. (A)
Churchon, S. P. (A)
Harp, M. C. (A)
Hyne, A. D. (A)
Parmenter, E. W. (A)
Towne, A. E. (M)

Berkeley (SF-7)
Acker, R. C. (A)
Aiken, W. R. (A)
Anderson, J. D. (A)
Anger, H. O. (A)
Axtell, J. D., Jr. (M)
Badger, G. M. W. (A)
Brandtel, K. C. (A)
Bloom, M. S. (M)
Boboricken, S. (A)
Bonner, H. W. (A)
Buffum, J. H. (A)
Castanera, T. E. (A)
Chenoweth, W. G. (A)
Cole, C. E. (A)
Corey, V. B. (A)
Davis, D. D. (VA)
Donner, D. F. (A)
Ellsworth, R. L. (A)
Farly, G. M. (SM)
Fass, S. J. (VA)
Fong, J. W. (A)
Freeman, E. D. (A)
Haubrock, F. W. (M)
Heard, H. G. (A)
Hoagland, S. A. (A)
Holcomb, R. H. (A)
Johnson, B. M. (A)
Katz, A. (A)
Korman, M. M. (A)
Larsh, A. E. (A)
Laudeman, J. A. (A)
MacIntyre, R. M. (A)
Mack, D. A. (M)
Maeschner, E. E. A. (A)
Mains, M. C. (A)
Matthaei, G. L. (A)
Maughmer, J. M. (A)
Meisling, T. H. (A)
Melvin, R. M. (A)
Meyer, J. H. (M)
Morton, P. L. (SM)
Nelson, R. S., Jr. (A)
Nelson, W. H. (SM)
Noller, W. E. (SM)
Ogg, R. D. (M)
Pritchett, W. S. (M)
Reinholtz, W. H. (A)
Relf, K. E. (A)
Reukema, L. E. (F)
Schmidt, F. G. (A)
Schroder, R. D. (SM)
Scott, H. J. (SM)
Sedon, P. H. (A)
Serang, A. M. (A)
Shiu, P. D. C. (A)
Silva, L. M. (A)
Silver, S. (SM)
Simonton, M. E. (A)
Skiff, E. W. (A)
Sleeper, G. E., Jr. (SM)
Sloan, D. H. (SM)
Smith, A. J. (A)
Smith, B. H. (SM)
Smith, O. J. M. (SM)
Stubbins, W. F. (M)
Turner, S. E. (A)
Van de Riet, E. K. (A)
Viales, L. O. (A)
Vogelsberg, F. E. (A)
Wang, E. H. (A)
Whinnery, J. R. (F)
Williams, C. S. (A)
Wing, C. (A)
Woodyard, J. R. (VA)
Wulfhorst, J. H. (A)

Beverly Hills (LA-7)
Albin, F. G. (A)
Appleford, L. R. (A)
Avrech, N. (A)
Barnett, A. H. (A)
Berliner, O. (A)
Black, S. H. (A)
Boyd, W. L. (A)
Butler, D. S. (A)
Craig, J. C. (A)
Craig, L. J. (A)
Crawford, A. A. (SM)
Levin, S. (M)
Lichterman, G. (M)
Mackey, R. C. (A)
Marks, M. L. (A)
Morrison, S. C. (A)
Nutt, J. H. (A)
Paskusz, G. H. (A)
Rosa, G. N. (A)
Rutherford, C. E. (SM)
Sharpe, L. E. (A)
Tidmarsh, G. P. (A)
Viles, F. M., Jr. (A)
Weiss, L. H. (M)
Winchell, R. W. (A)
Wolcott, C. F. (SM)
Zint, K. E. (SM)

Bishop (LA-7)
Rudolph, E. G. (A)
Wolf, J. E. (A)

Brawley (SD-7)
Markling, J. C. (A)

Buena Park (LA-7)
Sprong, D. C. (A)

Burbank (LA-7)
Abscher, G. E. (M)
Babcock, D. F. (A)
Bennett, P. L. (M)
Bercovitz, N., Jr. (A)
Berger, J. B. (A)
Berkheimer, R. I. (A)
Borchers, N. L. (A)
Brockway, D. C. (VA)
Brown, W. A. (A)
Bunce, J. W. (A)
Campbell, A. F. (A)
Campbell, D. E. (SM)
Chester, C. L. (A)
Cochran, E. D. (M)
Combes, R. M. (SM)
Davidson, L. G. (A)
Davis, W. K. (A)
Draper, J. K. (A)
Dye, W. G. (A)
Edgerton, A. K. (A)
Everett, F. A. M. (VA)
Falk, F. W. (A)
Falk, J. W. (A)
Fredendall, B. F. (VA)
Futchik, A. J. (A)
Gilbert, E. M. (A)
Harrington, F. C. (A)
Hathaway, J. C. (A)
Hickerson, R. L. (A)
Hileman, D. L. (A)
Hoff, K. (SM)
Holmes, W. T. (M)
Jackson, R. S. (A)
Johnson, C. E. (A)
Lagomarsini, G. C. (M)
Larse, G. L. (A)
Lehan, F. W. (SM)
Linsley, A. O. (A)
Lumenello, K. A. (A)
Marosz, M. J. (A)
Martin, W. R. (A)
McCleery, J. J. (A)
Merrill, J. A. (A)
Michell, G. A. (A)
Mitchell, J. A. (A)
Mosier, R. R. (A)
Mueller, W. A. (VA)
Mullich, G. L. (A)
Nicol, R. A. (M)
Olson, O. P. (A)
Peters, R. L. (A)
Quist, R. C. (A)
Robinson, J. A. (A)
Romandia, P. R. (A)
Scarborough, T. H. (A)
Schwartz, H. (A)
Schwartz, N. A. (M)
Seitz, F. R. (VA)
Sell, D. D. (A)
Shaw, R. A. (A)
Shrader, V. L. (A)
Sibley, A. E. (A)
Sigler, H. R., Jr. (A)
Sloan, C. S. (A)
Slocomb, G. M. (A)
Smith, C. A., Jr. (A)
Stevens, R. W. (A)
Stork, J. E. (M)
Ter Veen, L. A. G. (A)
Waddell, B. L. (A)
Wagner, G. O. (A)
Wagner, H. B. (A)
Weatherford, R. V. (A)
White, R. A. (A)
Whitten, G. A. (A)
Williams, N. H. (A)
Wissel, F. A. (SM)
Woodard, T. C. (A)
Woods, H. D. (M)
Wunderman, I. (A)
Zilm, C. F. (A)
Zuehlke, E. R. (A)

Burlingame (SF-7)
Dernham, C. R. (A)
Fleming, H. B. (A)
Gates, W. F. (A)
Haines, W. D. (M)
Hart, A. L. (A)
McCann, R. E. (A)
McVea, N. C. (A)
Ogilvie, A. R. (SM)
Peck, C. D. (SM)
Reinartz, J. L. (SM)
Wood, R. A. (A)
Wunderlich, G. F. (SM)

Calabasas (LA-7)
Hedene, T. H. (SM)

Camarillo (LA-7)
Benson, C. L. (A)
Canning, R. G. (M)
Gleason, M. J. (A)
Hearn, O. E. (SM)
Jennett, N. E., Jr. (A)
Kanze, A. J. K. (A)
Manahan, G. F. (A)
Neuron, E. (A)
Sternke, E. C. (SM)
Terbush, H. W. (A)
Wenters, R. L. (A)
York, R. A. (A)

Cambria
Schultek, L. R. (A)

Campbell (SF-7)
Critchlow, A. J. (A)
Duer, S. J. (A)
Flewelling, G. B. (A)
Hanson, L. W. (A)

Canoga Park (LA-7)
Bertucci, J. F. H. (M)
Block, E. B. (A)
Corbin, G. C. (A)
Frankiewich, C. (A)
Lander, R. F. (A)
Meyer, D. R. (A)
Mooney, G. F. (A)
Ropa, R. L. (M)

Carmel (SF-7)
Chitwood, J. S. (A)
Ross, A. (A)

Carmichael
Kelliher, J. E. (VA)

Carpenteria
Keller, E. G. (A)

Chatsworth
Jurnecka, J. E. (A)

Castro Valley (SF-7)
McFarlane, H. B. (A)

China Lake (INY-7)
Allen, P. S. (M)
Armstrong, T. K. (A)
Ashbrook, F. M. (SM)
Beresford, D. R. (A)
Biberman, L. M. (M)
Boyle, J. M. (A)
Christman, T. J. (M)
Clark, D. B. (A)
Craft, A. M. (A)
Creusere, M. C. (A)
Davis, F. H. (A)
Dember, A. B. (A)
Deyoe, D. C. (A)
Domen, S. L. (A)
Dorsey, S. E. (M)
Drucker, A. N. (A)
Ducoff, G. (A)
Everett, J. A. (A)
Ewing, D. L. (M)
Farrington, H. W. (A)
Ferris, A. B. (A)
Field, W. A. (A)
Freeman, C. F. (A)
Gado, L. G. (A)
Gregory, J. H. (SM)
Harris, J. F. (A)
Harris, S. E. (A)
Howell, F. S. (SM)
Hurst, G. W. (A)
Jackson, B. B. (A)
Jeung, J. L. (A)
Johnson, G. C. (A)
Keyes, J. C. (M)
Kim, P. K. S. (A)
Kirsch, H. (A)
Koster, R. A. (A)
Larsen, C. L. (A)
Lawrence, R. E. (A)
Lee, R. E. (M)
Madden, J. P. (A)
McLane, J. J. (A)
Merriam, R. T. (A)
Mitchell, P. P. (A)
Newburgh, H. (M)
Olcovich, T. A. (A)
Oliver, L. R. (A)
Ollikkal, E. E. (A)
Olsen, R. C. (A)
Pigaty, J. B., Jr. (A)
Pike, B. W. (M)
Rosenberg, H. W. (M)
Schimmel, G. (A)
Shield, R. G., Jr. (A)
Simecka, W. B., Jr. (A)
Sumnicht, H. I. (A)
Swift, I. H. (A)
Sykes, L. (A)
Urban, L. R. (A)
Vore, W. E. (M)
Warner, S. D. (A)
Warr, G. D. (M)
Wickenden, R. C. (A)
Wong, T. (A)

Chula Vista (SD-7)
Bard, H. B. (A)
Chiles, J. R., Jr. (A)
Hauk, G. L. (A)
Schulman, M. (A)
Steiner, F. A. (A)
Varian, R. H. (A)

Claremont (LA-7)
Carroll, L. R. (A)
Depew, H. D., Jr. (A)
Dunifon, J. W. (A)
Hardy, W. G. (A)
Hemphill, F. A. (A)
Konkel, T. C. (A)
Moynihan, J. F. (M)
Odekirk, M. D. (A)
Pile, D. H. (M)
Sterling, W. V. (A)
Taylor, A. H. (F)
Wildman, R. C. (M)
Young, C. W. (M)

Coalinga
Anderson, S. P. (A)

Compton (LA-7)
Begley, W. W. (M)
Cooper, J. R. (M)

Green, C. S. (A)
Hodgson, R. W. (A)
Myers, W. A. (A)
Noar, R. (A)
Owens, W. W. (A)
Snider, I. A. (A)
Swan, R. L. (A)
Valenti, R. J. (A)
Weber, W. R. (A)

Concord (SF-7)
Bogdanoff, A. G. (A)
Fairbrother, F., Jr. (A)
Nielsen, G. A. (A)
Voelker, F. (A)

Corona (LA-7)
Adrian, D. J. (A)
Bastedo, G. R. (SM)
Bell, D. E. (M)
Brown, L. E. (M)
Brown, V. A. (M)
Bogue, H. (A)
Codier, E. O. (A)
Davis, R. G. (A)
Emerson, R. R. (A)
Fletcher, R. C. (A)
Hamilton, R. E. (A)
Harris, E. A., Jr. (A)
Husten, B. F. (SM)
McCroskey, A. A. (M)
Scharp, G. A. (A)
Skramstad, H. K. (SM)
Thomas, H. A. (SM)
Todd, B. J. (A)
Van Orsdel, K. A. (A)
Walters, A. W. (A)
Weider, H. H. (A)
Whiteley, T. B. (A)
Wood, B. C. (A)

Coronado (SD-7)
Aymar, E. (VA)
Franks, B. W. (M)
Garard, E. A. (SM)

Corte Madera
Walters, A. M. (A)

Covelo (SF-7)
Brown, E. L. (M)

Covina (LA-7)
Carlson, H. (A)
Clark, J. H. (SM)
Jones, J. G. (VA)
Knox, N. W. (M)
Mathisen, W. D. (A)
McAllister, M. W. Jr. (A)
McCormick, E. M. (SM)
Metzger, H. W. (A)
Skaggs, E. R. (A)
Sylvester, G. E. (A)

Crescent City (SF-7)
Stoll, J. L. (A)

Culver City (LA-7)
Allen, B. G. (A)
Althaus, E. S. (A)
Aselline, J. A. (A)
Bailey, J. C. (M)
Bakeman, D. C. (A)
Barlow, D. S. (SM)
Barnett, J. T. (A)
Birdsall, C. K. (A)
Buell, F. D. (A)
Burns, G. A. (VA)
Campbell, R. A. (A)
Carpenter, S. L. (A)
Chalfin, N. L. (A)
Chiappinelli, B. A. (A)
Clarke, R. L. (A)
Cohee, A. V. (A)
Corcoran, J. J. (A)
Craven, W. A., Jr. (A)
Creacy, J. N. (A)
Cronin, W. J. (M)
Curl, G. W. (A)
De Bord, M. J. (A)
Denton, R. F., Jr. (A)
Dersch, W. C. (A)
Deutsch, R. (A)
De Villier, J. (A)
Dodak, M. (A)
Doiz, A., Jr. (A)
Doshay, I. (A)
Durham, L. G. (A)
Elliott, R. S. (SM)
Euler, K. C. (A)
Fletcher, J. C. (A)
Follis, F. R. (M)
Fort, J. E. (A)
Frank, C. E. (A)
Frankel, S. (SM)
Gates, H. P., Jr. (M)
Gillmer, A. H. (A)
Goldman, S. J. (A)
Gould, E. W. (A)
Guptill, H. R. (A)
Hall, N. L. (SM)
Hartmann, W. A., Jr. (A)
Hedges, C. P. (M)
Herrnfeld, F. P. (SM)
Hiebie, M. E. (SM)
Hollands, L. C. (SM)
Iversen, A. H. (A)
Jacobs, J. E. (A)
Janken, S. (A)
Jerrems, A. S. (SM)
Johnson, D. H. (A)
Julian, R. S. (M)
Karl, D. R. (A)
Kaufman, J. (SM)
King, D. L. (A)
Klestadt, B. (A)
Lane, C. A. (A)
Lakatos, E. (SM)
Leon, H. L. (A)
Low, H. (A)
McCoy, J. G. (A)
McFadden, B. W. (A)
Mohr, M. E. (SM)
Morrow, C. T. (A)
Newlon, A. E. (SM)
Norby, H. A. (A)
North, H. Q. (SM)
Nuttall, H. V. (A)
Parode, L. C. (A)
Paulos, P. J. (A)
Proud, W. H. (A)
Reeves, J. T. (A)
Rolt, G. H. (A)
Rosen, S. A. (A)
Rubel, J. H. (A)
Rudin, M. B. (A)
Sakharoff, A. G. (A)
Sampson, J. C. F. (A)
Schieke, C. F. (A)
Schonheinz, E. J. (A)
Senf, G. A. (A)
Shallon, S. C. (A)
Shank, R. J. (SM)
Sittner, W. R. (SM)
Smith, H. M. (A)
Stone, E. S. (A)
Taylor, T. T. (M)
Thompson, B. V. (SM)
Tobin, G. C. (A)
Tudor, B. J. (A)
Valentine, R. H. (A)
Vall, A. E. (A)
Van Atta, L. C. (F)
Walters, W. H. (A)
Ward, H. R. (A)
Weber, G. J. (A)
Westenhaver, J. L. (A)
Woltz, R. (A)
Woodruff, T. E. (A)
Young, G. O. (SM)

Cupertino (SF-7)
Bettendorff, O. A. (A)
Daniels, J. W. (A)
Foster, C. P., Jr. (A)
Gillmeister, F. W. (VA)
Stein, N. (M)
Varian, R. H. (F)
Ware, H. W., Jr. (A)

Daly City (SF-7)
Ballard, L. L. (A)
Collings, E. L. (A)

Danville
Norris, N. J. (A)
Ossenbeck, F. J. (A)

Davis (SAC-7)
Jacob, F. C. (A)

Del Mar (SD-7)
Widenmann, J. A. (M)

Denair
Sayre, M. B. (A)

Downey (LA-7)
Agaisoff, J. (A)
Asawa, C. K. (A)
Bell, H., Jr. (A)
Bower, J. L. (SM)
Bunker, R. S. (A)
Butler, A. G. (VA)
Cahn, S. L. (M)
Comyns, L. S. (A)
Crandon, L. H. (M)
Dunklee, L. H. (A)
Edlefsen, N. E. (SM)
Erdley, H. F. (A)
Farrand, W. A. (M)
Hasin, S. L. (A)
Henry, J. L., Jr. (A)
Hodson, W. G. (SM)
Jahimiak, R. (A)
Johnson, M. W. (M)
Kilpatrick, L. L. (A)
Kukel, J. (A)
Laubenstein, R. A. (A)
Larsen, H. F. (A)
Leicester, J. F. (A)
Lotterman, C. (A)
Macurak, A. (A)
Murphy, R. J. (A)
Popp, D. R. (A)
Rabbin, I. G. (M)
Rasmussen, C. F. (A)
Shelley, R. G. (A)
Shirley, J. M. (A)
Singleton, H. E. (SM)
Spencer, R. L. (A)
Strauss, L. (A)
Switzer, W. L. (A)
Szabo, J. E. (A)
Taylor, L. A. (A)
Wall, V. W. (A)
Westwick, J. (A)
White, J. G. (A)
Williams, N. (A)
Wolfe, A. E., Jr. (A)
Worden, D. M. (A)
Yoshii, H. (A)

Duarte (LA-7)
Baker, C. W. (A)
Bertrem, C. J. (A)
Flatten, O. H. (A)
Sprague, W. G. (A)
Tucker, M. C. (A)

East Palo Alto (SF-7)
Iseri, C. H. (A)
Learnard, H. P. (A)

Edwards (INY-7)
Coe, J. C. (M)
Creswell, F. (A)
Dover, J. J. (M)
Lynne, S. (M)

Edwards AFB (INY-7)
Lienhard, J. T. (A)

El Cajon (SD-7)
Bond, C. H. (SM)
Burton, K. M. (A)
Cunningham, E. E. (A)
Dana, J. J. (M)
Eikelman, J. A., Jr. (A)
Heibeck, H. L. (A)
Moore, J. E. (A)
Pitt, C. J. (A)
Quintana, I. M. (A)
Sherburne, C. J. (M)
Sievers, S. S. (M)
Soltesz, E. S. (A)

El Centro (SD-7)
Womack, J. R. (A)

El Cerrito (SF-7)
Barnes, J. W. (A)
Bryant, C. R. (A)
Carrick, G. R. (A)
Gray, H. F., Jr. (M)
Jensen, R. H. (A)
Lawrence, M. J. (A)
Lutz, I. C. (M)
Meade, J. P. (A)
Patterson, S. J. (A)
Scott, N. B. (A)
Warren, W. J. (SM)
Watson, H. M. (M)

El Monte (LA-7)
Atherton, C. A. (A)
Dolde, L. A. (A)

El Segundo (LA-7)
Ganahl, P. J. (A)
Garon, R. J. (M)
Johnson, R. A. (A)
Linquist, W. I. (A)
Mesak, C. (A)
Russell, G. M. (M)
Snyder, W. A. (M)

El Sobrante (SF-7)
Thomason, T. H. (A)

Emeryville (SF-7)
Cowley, P. E. A. (A)
Greene, G. B. (A)

Encino (LA-7)
Benbrooks, L. A. (A)
Combs, M. E. (A)
Doersam, P. D. (SM)
Fortescue, G. H. (A)
Humphreys, J. D. (M)
Hurodo, K. W. (A)
McAffee, P. (A)
O'Halloran, J. F. (M)
Pischel, E. F. (SM)
Scanlan, J. A. (A)
Schollard, R. J. (A)
Seltzer, L. J. (A)

Escondido (SD-7)
Mathes, R. C. (SM)
Moore, R. M. (VA)

Eureka (SF-7)
Olson, A. E. (A)
Smullin, W. B. (A)

Exeter (SF-7)
Egger, S. L. (A)
White, W. L. (A)

Fairfield (SF-7)
Romans, W. E. (A)
Shapiro, H. L. (A)

Fair Oaks (SAC-7)
Chesney, A. P. (SM)
Petersen, M. C. (A)

Flintridge (LA-7)
Blasier, H. E. (VA)

Fontana (LA-7)
Wilson, V. C. (A)
Wayman, J. M. (A)

Fort Jones (SAC-7)
Fowler, J. A. B. (A)

Fresno (SF-7)
Bartlett, P. R. (A)
Chambers, G. A. (A)
Foin, O. F., Jr. (M)
Gallegos, B. R. (A)
Hancock, J. B. (A)
Mealey, K. L. (A)
Shohara, S. (A)
Theodore, C. (A)

Fullerton (LA-7)
Barnes, J. L. (F)
Bowers, J. L. (A)
Chapman, C. W. (SM)
Clark, C. M. (A)
Clarke, W. R. (A)
Cother, R. H. (A)
Englund, C. R. (F)
Harding, G. A. (A)
Hart, M. T. (M)
Henderson, F. B. (A)
Hoff, R. G. (A)
Hoffman, M. (A)
Janeway, R. K. (A)
Kerber, S. M. (M)
Kohlenberger, C. W. (A)
Manhart, R. A. (A)
Moore, J. R. (SM)
Riffle, L. V. (A)
Roberson, R. E. (SM)
Tilley, A. E. (M)

Gardena (LA-7)
Bartling, M. H. (A)
Cowan, H. W. (A)
Densky, J. C. (A)
Geisert, F. W. (A)
Halliday, R. G. (A)
Harris, A. W. (M)
Kelly, P. M. (M)
Lanzinger, D. J. (A)
Magnuson, V. P. (A)
Maxwell, R. L. (A)
Olson, N. L. (A)
Palm, A. W. (A)
Taber, J. E. (A)
Tarot, A. (A)
West, S. F. (A)

Garden Grove (LA-7)
Linton, T. B. (A)
Means, P. S. (A)
Phillips, A. H. (A)
Schnitger, A. W. (A)
Taylor, C. A., Jr. (A)
Vandal, W. L., Jr. (A)

Garvey (LA-7)
Fairbanks, A. F. (A)

Glendale (LA-7)
Auerbach, M. (A)
Bassett, D. M. (A)
Beans, J. B. (A)
Bible, R. E. (A)
Brandon, E. T. (A)
Bridges, R. L. (A)
Brown, C. M. (A)
Campbell, R. L. (SM)
Chase, W. P. (A)
Cox, J. A. (A)
Ericson, R. L. (A)
Foster, D. E. (F)
Geib, D. G. (A)
Glassford, H. A. (A)
Goodman, K. (A)
Greenwood, D. T. (A)
Hasche, J. C. (A)
Kent, G. R. (A)
Koehler, L. K. (A)
Koerner, C. T. (VA)
Krill, C. K. (A)
Larter, T. C. (A)
Lee, R. K. P. (A)
Lobenber, T. J. (A)
Loomis, D. F. (A)
Magnuson, R. W. (A)
McCleese, H. M. (A)
Nuut, A. (A)
Paul, F. A. (M)
Perrin, C. A. (A)
Read, G. W. (VA)
Sandy, R. J. (A)
Seabaugh, D. A. (A)
Shahan, O. (A)
Stagnaro, J. A. (SM)
Steele, E. E. (A)
Swenson, A. N., Jr. (A)
Thompson, R. W. (A)
Woodring, R. L. (A)
Worthen, W. L. (A)
Wright, D. (VA)
York, E., Jr. (A)

Glendora (LA-7)
Grinnell, A. L. (M)
Sparling, W. N. (M)
Walker, W. D. (A)
Wolfe, C. M. (VA)

Granada Hills (LA-7)
Flanders, H. R. (A)
Gustafson, K. D. (A)
Law, L. R. (A)
Midcalf, W. A. (A)
Phillips, G. A. (A)
Troutman, A. E. (A)
Valery, N. A. (A)

Hamilton (SF-7)
Gibbs, J. B. (A)
Hintz, H. F. (A)
Temoyan, J. D. (M)

Hanford
Nelson, R. A. (A)

Hawthorne (LA-7)
Beauchamp, E. P. (M)
Berry, D. C. (A)
Brewer, C. P. (M)
Cornell, L. L. (A)
Decuir, L. E. (A)
Erznoznik, F., Jr. (M)
Gerson, H. (A)
Hall, C. A. (A)
Heaverlo, H. D. (A)
Holbrook, J. G. (M)
James, E. (A)
Langdon, J. G. (A)
Lund, W. W., Jr. (M)
McCann, F. A. (A)
St. John, E. E. (M)
Van Vorhis, J. L. (A)
Walters, R. F. (A)
Wright, R. E. (A)

Hayward (SF-7)
Kippenhan, D. O. (A)
Prosser, T. F. (A)
Ruzic, J. (A)

Hermosa Beach (LA-7)
Cleary, J. D. (A)
George, R. E. (A)
Kelly, R. S. (A)
Knox, R. M. (A)
MacGarvey, E. R. (A)
McVey, B. D. (A)
Ransom, J. E. (A)
Rheams, C. J. B. (M)
Roland, L. F. (A)
Scott, R. G. (A)
Van Velzer, V. C. (A)
Wagner, R. E. (A)

Hollydale (LA-7)
Stone, L. M. (A)

Hollywood (LA-7)
Arand, E. M. (M)
Askins, J. J., Jr. (A)
Benham, E. E. (M)
Bowman, L. H. (SM)
Braddy, J. A. (A)
Bryant, H. L. (A)
Caldwell, P. G. (SM)
Carlson, C. G. (SM)
Cox, M. B., Jr. (A)
Davis, J. I. (A)
Deen, J. R. (M)
Denechaud, R. G. (VA)
Denney, B. H. (A)
Duay, T. M. (A)
Finney, B. W. (A)
Galloway, W. J. (A)
Glaze, G. O. (M)
Gong, H. J. (A)
Inouye, G. T. (A)
King, L. E. (A)
Kupfer, R. C. (SM)
Lubcke, H. R. (F)
Manus, G. C. (A)
Miller, G. B. (VA)
Moody, R. C. (SM)
Neely, N. B. (M)
Newcomb, R. (SM)
Pape, M. (A)
Pett, L. E. (M)
Pourtales, J. R. (A)
Putter, K. (A)
Reiche, L. P. (A)
Ross, E. H. (M)
Saxton, A. H. (A)
Schick, H. G. (M)
Schreiber, W. F. (A)
Siera, M. M. (A)
Stafford, J. W. (M)
Stark, H. P. (A)
Stoddart, R. R. (SM)
Templin, E. W. (SM)
Thatcher, J. W. (SM)
Tylka, J., Jr. (A)
Van Groos, J. C. (SM)
Yeager, H. (SM)

Huntington Park (LA-7)
Allen, R. M. (A)
Beck, J. W. (A)
Dowers, A. A. (VA)
Griffith, M. H. (VA)
Olson, W. J. (A)

Imperial Beach (SD-7)
Williamson, R. J. (A)

Indio (LA-7)
Hensen, G. H. (A)
Mountain, C. F. (A)

Inglewood (LA-7)
Ambrose, E. G. (A)
Anderson, A. T. (M)
Arant, C. W. (M)
Baines, E. L. (A)
Beleskas, S. M. (A)
Browne, J. D. (A)
Conklin, D. E. (A)
Coombs, W. J. (A)
Connely, R., Jr. (A)
Dahl, J. D. (A)
Ellingboe, J. K. (A)
Gasper, C. A. (A)
Gaston, J. B. (A)
Glascock, R. D. (A)
Gregory, C. N., Jr. (A)
Gustin, J. T. (A)
Hack, N. R. (A)
Howes, R. E. (A)
Kazarian, D. G. (A)
Klein, E. F. (A)
Larsen, C. W., Jr. (A)
Leedy, C. A. (A)
Malone, H. L. (A)
Mann, D. A. (A)
Maurer, A. K. (A)
McCready, K. F. (M)
Miller, F. A. (A)
Mund, M. A. (A)
Najemwik, G. F. (A)
Nelson, E. W. (A)
Poundstone, J. R. (A)
Raymond, J. L. (A)
Schull, G. R. (M)
Seaton, A. F. (A)
Silva, W. (VA)
Stevens, J. E. (M)
Sur, J. (A)
Thrall, L. L. (A)
Umlauf, E. W. (M)
Wose, A. W. (M)
Wick, O. F. (A)
Widenhoefer, J. G. (A)
Wiggins, E. T. (A)
Willcocks, S. J. (A)
Winter, J. A. (A)
Zak, E. T. (A)

Inverness (SF-7)
Matthews, W. I. (M)
Streich, R. J. (VA)

Inyokern (INY-7)
Toporeck, E. R. (SM)

Jackson (SAC-7)
Van Thiel, J. (VA)

Kentfield (SF-7)
Conrad, R. C. (M)
Woerner, J. J. (M)

Kenwood (SF-7)
Hosmer, E. A. (SM)

Kingsburg
Kidd, T. L. (M)

Klamath
Stoll, J. L. (A)

La Canada (LA-7)
Brewer, M. S. (A)
Gerhard, H. D. (M)
Grill, F. J. (A)
Faris, E. M. (A)
Hamilton, H. J. (A)
Henry, D. S. (A)
Huntington, A. (M)
Hylkema, C. G. (A)
Kenkel, H. H. (SM)
Koerner, T. W. (A)
MacMillan, R. S. (A)
Newberry, A. W. (A)
Parks, R. J. (A)
Peoples, J. E. (A)
Rhoads, J. A. (SM)
Rosman, A. S. (A)
Schor, F. W. (SM)
Seeley, W. M., Jr. (A)
Slaughter, D. W. (A)
Weil, F. M. (M)
Wolfe, H. (M)

La Crescenta (LA-7)
Davis, F. W. (A)
Ermatinger, C. E. (A)
Goodman, F. R. (A)
Hirschberg, W. J. (A)
Hughes, W. R. (SM)
Nielsen, J. J., Jr. (SM)
O'Neil, W. T. (A)
Petry, C. B. (SM)
Pratt, J. H. (SM)
Silvertooth, E. W. (M)
Smith, S. S. (M)
Sweetnam, G. E. (A)
White, G. S. (A)
Willey, J. D. (A)

LaFayette (SF-7)
Davis, R. W. (A)
Hunter, J. (A)
Keller, J. E. (A)
Kirsten, F. A. (A)
Morrison, K. G. (M)
Rector, R. H. (A)
Salisbury, W. W. (F)
Waddell, J. F. (SM)

La Habra (LA-7)
Bechtold, I. C. (SM)
Blake, F. G., Jr. (SM)
Grannemann, W. W. (A)
Karsh, H. (A)
Mueller, T. D. (A)
Redwood, R. C., Jr. (A)
Scheuer, R. D. (A)
Stack, G. C. (A)
Unterberger, R. R. (M)
Wheeler, R. W. (A)

La Jolla (SD-7)
Bishop, H. O. (SM)
Chadbourne, H. L. (A)
Coleman, G. M. (A)
Cotcher, A. L. (A)
Flarity, W. H. (A)
Fox, E. M. (M)
Madsen, R. G. (M)
Michael, F. J. (A)
Rees, B. A. (A)
Ritchart, R. C. (A)
Theobald, D. J. (A)

Lakewood (LA-7)
Kohn, I. A. (A)
Schroeder, R. L. (A)
Swayze, D. W. (A)

La Mesa (SD-7)
Cary, R. J., Jr. (A)
Christensen, R. J. (SM)
Clapp, E. B. (A)
Cleveland, W. C., Jr. (M)
Demers, E. F. (A)
Fisher, H. G. (A)
Fishman, M. (A)
Folland, D. F. (SM)
Grumbein, P., Jr. (VA)
Hardin, C. A. (A)
Hill, D. M. (M)
Huckle, D. R. (A)
Hulbert, S. G. (A)
Ivans, W. S., Jr. (SM)
Lowe, D. M. (A)
Loveberg, A. G., Jr. (A)
McAdam, J. C. (M)
Moody, D. G. (M)
Raper, A. J. (A)
Reynolds, Z. D. (A)
Runyan, T. W. (A)
Smyth, J. B. (SM)
Teeter, W. L. (SM)
Webb, J. A. (A)
Whitaker, J. L. (A)

Lancaster (LA-7)
Bravo, M. V. (A)
Menasco, L. C. (A)
Michalek, A. R. (A)
Pfeiffer, D. A. (A)
Ransdell, P. N. (A)
Thomas, R. (M)

La Verne (LA-7)
Buehler, M. E. (A)
Flanders, A. E. (A)
Riley, O. V. (M)

Lawndale (LA-7)
Bullock, W. W. (M)
Dye, R. R. (A)
Hannum, A. J. (A)
Pearson, R. E. (M)

Lemon Grove (SD-7)
Bocchio, T. R. R. (A)
Valasek, H. H. (A)

Livermore (SF-7)
Billinghurst, E. M. (A)
Bothun, R. B. (A)
Caestensen, H. K. (A)
Crew, B. L. (A)
Curry, C. R. (A)
Everson, C. T. (A)
Glaze, R. H. (A)
Griffith, J. E. (A)
Inami, F. K. (A)
Kalibjian, R. (A)
Karpen, R. L. (A)
Kenrich, C. M. (A)
Krause, O. H. (A)
Levinthal, J. G. (A)
McDonald, H. C., Jr. (A)
Molzahn, D. W. (A)
Murnighan, R. J. (A)
Nofrey, L. C. (A)
Owrgn, H. M. (A)
Price, G. W. (M)
Salisbury, J. D. (A)

Long Beach (LA-7)
Ames, B. C. (M)
Andersen, E. A. (M)
Anderson, F. A. (A)
Ashcraft, A. E., Jr. (A)
Beatty, W. M. (A)
Beau, J. F. (A)
Beck, J. W. (A)
Bet, D. V. (A)
Blowers, R. C. (A)
Bonem, E. J. (A)
Brown, R. W. (A)
Buckley, J. W. (A)
Buterbaugh, J. N. (A)
Campora, M. T. (A)
Cherney, J. F. (A)
Cherney, R. W. (A)
Cole, B. T. (A)
Cosgrave, S. J. (A)
Dahlin, R. K. (A)
Dean, N. W. (A)
Dillard, G. B. (A)
Drankhan, O. W. (A)
Drozd, D. H. (A)
Edwards, R. F. (A)
Farrand, C. E. (A)
Feldner, L. (A)
Fether, W. B. (A)
Fonda, B. G. (SM)
Frieberg, M. (A)
Gardner, F. H. (SM)
Geer, W. (SM)
Gemulla, W. J. (A)
Grammes, E. G., Jr. (A)
Greenslade, R. S. (A)
Hansen, R. A. (A)
Hetlinger, F. J. (A)
Himler, G. J. (M)
Hunter, W. L. (A)
Jimenez, J. W. (A)
Jones, B. R. (M)
Jones, G. V. (A)
Kaspin, S. (M)
Knecht, R. O. (A)
Koppel, R. L. (A)
Ley, E. W. (A)
Loewenstein, C. N. (A)
Luttrell, J. A., Jr. (M)
McCann, M. J. (A)
McCaron, S. I. (A)
McLaughlin, J. A. (M)
Miller, E. F. (A)
Mintz, M. (A)
Moorhouse, T. R. (A)
Morris, G. R. (A)
Muniak, C. (A)
Page, R. K. (A)
Pelc, T. (A)
Petersen, E. L. (M)
Peterson, W. D. (A)
Pierson, L. E. (A)
Porter, B. W. (M)
Price, E. L. (A)
Rowe, J. A. (A)
Rupert, M. J. (A)
Salisbury, D. L. (A)
Schiffelbein, W. L. (A)
Schneider, W. J. (A)
Sims, J. L. (A)
Sisco, W. B. (M)
Skene, R. A. (A)
Slavitt, J. (A)
Soergel, D. G. (M)
Stephens, H. M. (A)
Stevens, S. S. (SM)
Stewart, W. E. (M)
Stone, M. M. (A)
Stouse, L. E., Jr. (A)
Strasburger, T. J. (A)
Walkley, S. E. (A)
Whistler, W. J. (A)
Wicks, D. S. (SM)
Wiley, F. L. (A)
Talmage, G. E. (A)
Tapp, J. E. (M)
Thomsen, G. A. (A)
Thresh, J. L. (A)
Trapp, J. A. (A)
Trevithick, J. A. (A)
Trussell, A. B. (M)
Wells, W. W. (A)
Wiley, F. L. (A)
Wright, B. (SM)

Loomis (SAC-8)
Mellott, K. W. (A)

Los Altos (SF-7)
Avis, A. J. A. (A)
Bagley, A. S. (A)
Beeson, R. H. (A)
Bennion, D. R. (A)
Bernard, J. D. (A)
Blumberg, M. (M)
Brown, J. F. (SM)
Burkhard, F. J. (M)
Christensen, W. V. (A)
Cogswell, W. P. (SM)
Eldredge, E. E. (SM)
Elwell, C. F. (F)
Ginzburg, C. P. (A)
Ginzton, E. L. (F)
Giulie, J. D. (A)
Gould, G. P. (A)
Hackley, G. E. (A)
Hanisch, W. R. (M)
Hathaway, E. C. (A)
Heintz, R. M., Jr. (A)
Hodges, E. B. (A)
Hunter, P. B. (SM)
Kirkpatrick, G. R. (A)
Lorence, E. L. (A)
Mantius, H. K. (A)
McGuigan, W. D. (M)
Miller, H. C. (VA)
Murphy, E. J. (SM)
Myers, W. D. (SM)
Nelson, B. E. (A)
Noe, J. D. (SM)
Olson, J. H. (M)
Overacker, H. E. (SM)
Pappas, N. L. (A)
Rocklitz, H. C. (A)
Rockwell, W. S. (A)
Scholes, H. M. (M)
Schrock, N. B. (SM)
Secard, L. L. (A)
Sifford, B. M. (A)
Stanley, C. B. (M)
Tetenbaum, S. J. (A)
Van Reneselaer, C. (SM)
Vehn, R. E. (A)
Wholey, W. B. (SM)
Wilder, K. T. (A)

Los Angeles (LA-7)
Aaron, B. D. (M)
Abascal, N. (M)
Ackerlind, E. (SM)
Adachi, T. (A)
Ahlport, B. T. (A)
Alagna, G. I. (A)
Alessi, V. J. (A)
Allen, D. F. (M)
Allen, F. C. (A)
Allen, W. L. (A)
Allgeyer, G. O. (A)
Ambrosio, A. (A)
Anderson, D. N., Jr. (A)
Anderson, K. W. (SM)
Andres, A. J. (A)
Angwin, B. S. (SM)
Anker, E. R. (A)
Antell, S. (A)
Arnold, H. J. (A)
Azaren, D. (A)
Badertscher, R. O. J. (A)
Bailin, L. L. (SM)
Baker, B. W. (A)
Baker, C. L. (A)
Baker, J. J. (A)
Baker, M. L. (A)
Baldwin, L. W. (SM)
Balugo, J. J. (A)
Baranoff, A. J. (SM)
Barkan, V. (A)
Bartlome, R. D. (A)
Bassett, R. K. (M)
Barnhart, W. H. (A)
Battocletti, J. H. (A)
Bayley, R. M. (A)
Becker, H. (M)
Begovich, N. A. (A)
Bell, W. D. (A)
Bellman, H. C. (A)
Belz, A. R. (A)
Bennett, R. R. (A)
Beranek, J. A. (SM)
Bernstein, P. P. (A)
Beroza, P. P. (M)
Bertrem, C. J. (A)
Beutler, F. J. (M)
Bialek, J. (A)
Blackman, B. G. (SM)
Blair, D. R. (A)
Blake, J. B. (M)
Blasberg, L. A. (A)
Bocast, D. R. (A)
Bodenstein, J. (A)
Bodge, A. H. (A)
Boggs, C. A. (SM)
Boling, H. E. (A)
Bonness, Q. L. (M)
Bonney, R. B. (SM)
Bookee, J. R. (A)
Borgeson, P. W. (A)
Borofka, R. P. (A)
Bovich, E. J. (A)
Bowler, G. E. (SM)
Bradley, J. L. (A)
Bravo, A. (A)
Britton, C. W. (A)
Brockway, W. W. (VA)
Brooks, W. O. (M)
Brown, B. J. (A)
Brown, P. M. (A)
Brown, J. A. (A)
Brownstone, N. (A)
Brubaker, G. P., Jr. (A)
Bucknell, W. H. (VA)
Burbeck, D. W. (A)
Burke, J. J. (A)
Burnham, J. (M)
Burns, B. E. (A)
Burnsweig, J., Jr. (M)
Burr, K. L. (A)
Cadman, A. O. (A)
Cain, E. L. (A)
Cain, G. H., Jr. (A)
Carlson, E. H., Jr. (A)
Carr, J. W. (A)
Carson, J. W. (A)
Casarow, L., Jr. (A)
Cataldo, J. T. (M)
Chandler, J. A. (A)
Cheston, H. C. (A)
Chew, T. W. (SM)
Chlavin, A. (A)
Chown, J. B. (A)
Clark, A. C. (A)
Clark, D., Jr. (A)
Clark, F. J. (A)
Clark, R. W. (VA)
Clark, T. C. (SM)
Clock, D. P. (A)
Cole, B. M. (SM)
Cole, F. H. (VA)
Collins, W. C. (A)
Conviser, H. (VA)
Cooper, P. V. (A)
Corner, K. T. (M)
Crabb, R. C. (A)
Crooke, V. E. (A)
Crowe, J. W. (A)
Culver, W. L. (A)
Cunningham, E. W. (VA)
Curran, G. W. (SM)
Curtis, E. C. (A)
Curtiss, A. N. (SM)
Darling, J. K. (A)
Dasgupta, A. K. (A)
Daspit, J. L. (A)
Davis, H. (A)
Davis, R. (M)
Dawson, S. L. (A)
De Forest, L. (F)
Dea, D. V. F. (M)
De Lano, R. H. (A)
Deming, H. N. (A)
Dempster, B. (SM)
Dempster, R. J. (A)
Denny, W. I. (A)
Denton, R. F., Jr. (A)
Derchan, H. L. (A)
Dethlefsen, D. G. (A)
Dexter, G. W. (A)
Dietrich, J. E. (A)
Digby, J. F. (SM)
Dill, J. M. (A)
Dillon, R. S. (A)
Dine, F. E. (A)
Dobbertin, W. H. (A)
Dobyns, H. B. (A)
Domike, D. A. (A)
Doolittle, K. H. (A)
Downes, L. (M)
Dresselhouse, P. H. (A)
Drummond, E. J. (A)
Duggie, R. L. (A)
Dunn, G. R. (A)
Dunnigan, F. A. (A)
Duvall, L. L. (A)
Dye, R. C. (A)
Eckert, J. A., Jr. (M)
Edelsohn, C. R. (A)
Edelson, L. F. (A)
Edgerton, A. D. (A)
Edgerton, D., Jr. (A)
Edson, M. (M)
Edwards, J. (M)
Edwards, J. N. (A)
Edwards, R. O. (A)
Ekmanian, D. J. (A)
Ekparian, J. (A)
Elliott, J. W. (A)
Elliott, P. C., Jr. (A)
Ellsworth, A. R. (A)
Emerson, R. W. (A)
Enenstein, N. H. (A)
Engel, H. L. (A)
Epstein, H. (A)
Estep, C. R. (VA)
Euler, L. J., Jr. (A)
Evans, H. W. (A)
Ewing, L. R. (A)
Fails, W. A. (M)
Favreau, R. R. (A)
Felgus, J. I. (A)
Fenn, W. H. (SM)
Ferguson, W. M. (A)
Ferreira, R. (A)
Filman, N. J. (M)
Fine, E. (A)
Finkelstein, S. I. (A)
Firle, T. E. (A)
Firth, E. (A)
Fischer, B. (A)
Fisher, L. L. (M)
Fjeldsted, N. B. (A)
Fling, J. J. (A)
Flynt, F. V. (A)
Fodor, F. H. (VA)
Forrest, C. B. (A)
Foulon, F. (M)
Frady, W. E. (A)
Francis, J. P. (A)
Frear, G. C. (A)
Freedman, L. M. (A)
Frink, F. W. (SM)
Fritz, W. (A)
Fugate, K. O. (A)
Fujimoto, T. V. (A)
Fuller, T. D. (A)
Futterman, M. (A)
Gabler, R. T. (SM)
Gaines, B. R. (SM)
Ganzenhuber, J. H. (A)
Garafalo, J. J. (A)
Geissinger, G. I. (A)
Gerlough, D. L. (M)
Gertsch, E. P. (SM)

Gibbs, F. R. (A)
Gibson, M. M. (A)
Gichtin, A. L. (A)
Gillett, G. D. (F)
Golbert, S. A. (A)
Goldstein, H. H. (A)
Gorden, H. C. (A)
Gore, M. R. (A)
Gottfried, R. E. (A)
Gottier, T. L. (SM)
Gould, R. G. (A)
Gourrich, G. E. (M)
Grabbe, E. M. (A)
Grant, E. W. (M)
Grantham, G. W. (A)
Green, J. S. (A)
Green, J. W. (A)
Green, W. G. (A)
Greenbaum, M. (A)
Grigg, R. W. (A)
Grignon, L. D. (SM)
Gross, F. A. (A)
Guerrero, E. S. (M)
Gunny, E. R. (A)
Gurley, J. G. (A)
Gustafson, L. A. (A)
Gutcheon, W. Y. (A)
Guthrie, W. R. (A)
Guy, S. A. (A)
Haas, R. W. (A)
Hageman, D. H. A. (A)
Hall, E. C. (A)
Hall, T. S. (A)
Hamilton, D. J. (A)
Hammer, L. W. (A)
Hammond, A. L. (A)
Hance, H. V. (M)
Hansen, H. R. (A)
Hare, G. H. (A)
Harmon, W. S. (SM)
Harper, R. B. (M)
Harris, R. C. (A)
Harris, W. R. (A)
Hartman, A. M. (A)
Hatch, M. (A)
Hecht, B. (M)
Heckert, R. E. (A)
Heilfron, J. (A)
Helland, J. C. (M)
Henschke, R. A. (A)
Herold, H. L. (A)
Hershberger, W. D. (SM)
Hill, C. K. (A)
Hill, D. M. (A)
Hill, W. B. (A)
Hilliard, J. K. (F)
Hilsdale, F. A. (A)
Himes, R. (M)
Hirschfield, G. (A)
Hodder, W. K. (A)
Hoffman, L. A. (A)
Hoffman, S. (A)
Hogan, J. D. (A)
Holcomb, D. R. (A)
Holdsworth, D. M. (A)
Holstead, A. J. (A)
Holt, D. E. (A)
Hoo, E. (A)
Hornbostel, W. G. (A)
Horrell, M. W. (SM)
Huckabee, V. C. (A)
Hughes, B. S. (A)
Hughes, H. M. (M)
Hughes, W. A. (M)
Hull, R. E. (A)
Hund, E. (A)
Hunter, W. O. (M)
Huskey, H. D. (A)
Hyden, I. F. (M)
Iannelli, E. (M)
Ireland, F. (SM)
Jackson, B. B. (A)
Jackson, K. R. (M)
Jamison, J. W., Jr. (A)
Jeffs, C. R., Jr. (A)
Jevons, L. O. (A)
Johnson, J. S. (A)
Johnson, R. M. W. (M)
Johnston, D. L. (A)
Jones, D. (A)
Joseph, H. (A)
Justice, L. E. (A)
Kagan, M. F. (A)
Kahrilas, P. J. (M)
Kalson, N. H. (A)
Kaminow, I. P. (A)
Kappel, T. J. (A)
Kappler, M. O. (SM)
Katayama, T. T. (A)
Kaufman, S. (A)
Kaufman, A. B. (M)
Kayner, H. J. (SM)
Keating, J. J. (M)
Keenan, E. L. (A)
Kelly, D. A. (SM)
Kelly, D. H. (A)
Kelly, K. C. (A)
Kennedy, F. M. (SM)
Kennedy, M. E. (SM)
Keppel, R. A. (A)
Kibler, P. J. (SM)
Kilpatrick, H. N. (A)
Kirkman, H. L. (A)
Kimbrough, W. R. (A)
King, E. F. (SM)
King, E. N. (A)
King, J. E. (A)
King, L. G. (A)
King, S. W. (A)
Kirkman, H. L. (A)
Kishi, F. H. (A)
Kitabayashi, T. (A)
Klapper, E. (A)
Klein, S. I. (A)
Klein, W. S. (M)
Kline, R. L. (A)
Kluehe, W. (A)
Knaul, J. E. (A)
Knoll, D. W. (A)
Knowles, W. S. (A)
Knowlton, O. H., Jr. (A)
Knopoff, L. (A)
Kodera, C. F. (A)
Koenig, W. A. (A)
Kopp, E. H. (A)
Koukol, J. F. (A)
Kovach, L. D. (A)
Krause, C. A. (A)
Krausz, R. (A)
Kreager, P. C. (A)
Kroemer, J. R. (A)
Krone, I. (M)
Kryske, L. E. (A)
Kuhlman, F. M. (A)
Kuratani, K. K. (A)
Kurz, L. A. (A)
Lader, L. J. (SM)
Lanning, W. M. (A)
Lark, E. J. (M)
Larrimer, J. K. (A)
Laschiver, J. (M)
Lavas, G. P. (A)
La Violette, R. F. (A)
Lebduska, R. L. (M)
Lebell, D. (A)
Leitch, W. S. (SM)
Leitner, B. B. (A)
Leitner, R. G. (SM)
Leonard, D. L. (A)
Levine, L. (A)
Lew, C. (A)
Lew, H. W. (A)
Lewis, B. G. (M)
Lichty, J. R. (A)
Lieberknecht, J. A. (A)
Lieberman, I. J. (A)
Leitzan, A. A. (A)
Lindenberg, S. (M)
Lindsay, W. W., Jr. (F)
Lipman, C. E. (M)
Lissauer, S. (A)
Little, F. A. (M)
Lockard, R. E., Jr. (A)
Lockwood, R. (A)
Losee, F. A. (A)
Lovejoy, R. E. (SM)
Lowhurst, H. G. (A)
Lund, W. W. (A)
Luth, P. A., Jr. (M)
Lutz, S. G. (SM)
Lyons, L. J. (A)
MacKenzie, L. G. (A)
Macklin, T. G. (A)
Magid, M. (A)
Maguire, W. W. (A)
Malbrain, J. P. (A)
Malcolm, L. (A)
Mancini, R. A. (A)
Manderfeld, E. C. (SM)
Margol, L. (A)
Margolin, A. R. (A)
Markakis, M. J. (A)
Marmont, G. H. (M)
Martin, R. A. (M)
Mason, C. W. (M)
Mathany, L. E. (A)
Mathews, W. E. (M)
Matsumoto, E. (A)
Mautner, L. (SM)
McAllister, J. T. (A)
McClellan, L. D. (A)
McClintock, D. G. (A)
McClure, D. H. (A)
McCoy, R. E. (M)
McKechnie, R. M. (A)
McLaughlin, F. G. (A)
McMahon, M. E. (A)
McRae, F. B. (M)
McRee, B. R. (M)
McRuer, D. T. (A)
Meier, D. A. (A)
Meissner, K. H. (SM)
Melniker, B. (A)
Messner, G. P. (A)
Metcalf, D. E. (M)
Mettler, R. F. (A)
Meyer, A. W. (A)
Meyers, R. C. (A)
Michels, L. (A)
Michaels, L. S. (M)
Milham, R. F., Jr. (A)
Miller, K. M. (SM)
Miller, R. J. (A)
Miller, W. B. (M)
Millstone, S. D. (A)
Milton, L. A. (M)
Mintz, E. (M)
Mirakentz, A. (A)
Mitchell, B. B. (A)
Mitchell, P. R. (A)
Miyata, J. J. (A)
Mock, R. E. (A)
Mockbee, R. L. (A)
Modlinski, W. M. (A)
Monroe, A. J. (A)
Moore, G. M., Jr. (A)
Moore, R. T. (A)
Morrison, R. (A)
Moss, J. F. (A)
Mueller, G. J. (SM)
Munger, J. C. (A)
Murakami, P. K. (A)
Murufas, P. P. (A)
Myer, J. H. (M)
Myers, K. E. (A)
Neal, F. R. (A)
Neelands, R. (A)
Nelson, C. S., Jr. (A)
Nichols, F. J. (M)
Niebuhr, J. E. (A)
Nishball, J. L. (A)
Noble, J. J. (M)
Noland, A. R. (A)
Noorland, M. (A)
Norris, W. F. (A)
Nourse, R. B. (A)
O'Connor, G. J. (M)
Odlum, F. H., Jr. (A)
Oleesky, S. S. (SM)
Oliverio, A. P. (M)
Oodrys, A. A. (A)
Ordesch, W. E. (A)
Orr, J. A. (A)
Osborne, W. E. (A)
Osborn, R. H. (A)
Overmier, C. S. (A)
Ovitt, M. D. (A)
Paeth, K. L. (A)
Papas, C. H. (A)
Parker, A. T. (M)
Parsons, G. W. (A)
Patton, W. L. (A)
Perrine, C. D., Jr. (A)
Perry, R. H. (A)
Peterson, C. E. (A)
Peterson, F. V. (A)
Pfeffer, I. (A)
Phister, M., Jr. (A)
Pidhayny, D. D. (A)
Pierce, C. G. (M)
Pipes, L. A. (M)
Politis, S. (A)
Pollak, M. (SM)
Post, G. (A)
Pound, A. E. (A)
Pregler, R. A. (A)
Proctor, D. R. (SM)
Prothers, L. T. (A)
Profumo, V. J. (A)
Ramo, S. (F)
Rappaport, R. B. (A)
Rawson, M. D. (A)
Reed, R. G. (A)
Reed, R. H. (A)
Reedy, C. W. (M)
Regan, E. D. (A)
Regnier, N. J. (A)
Reidel, J. E. (A)
Reimer, R. N. (A)
Reinsch, F. J. (A)
Reyes, C. M. (M)
Reynolds, G. W. (A)
Rich, A. P. (M)
Richards, J. A. K. (SM)
Richards, W. S. (VA)
Ridenour, L. N., Jr. (SM)
Riek, F. O., Jr. (A)
Riser, C. R. (A)
Rittersbacher, J. E. (A)
Roberts, L. L., Jr. (A)
Robinson, W. H. (A)
Rodda, E. N. (A)
Rodgers, P. W. (A)
Rogers, T. A. (M)
Roney, R. K. (A)
Rorden, R. J. (A)
Rose, H. B. (A)
Rose, W. (A)
Rosenberg, J. (M)
Rosenberg, R. E. (A)
Ross, M. N.
Rothe, C. W. (A)
Rufo, J. D. (M)
Rupp, V. T. (A)
Ruppenthal, W. (A)
Russak, A. (A)
Rutherford, B. J. (A)
Rutkin, B. B. (A)
Rypinski, C. A., Jr. (A)
Salamonovich, G. M. (A)
Sanders, L. L. (A)
Sanders, R. W. (A)
Saparstein, R. L. (A)
Saturensky, G. (A)
Sawyer, G. E. (VA)
Schachat, T. (M)
Scharf, W. (A)
Schindler, M. (M)
Schmidt, B. F. (A)
Schmidt, J. C. (M)
Schmitz, J. F. (A)
Schneidewind, N. F. (A)
Schnitger, A. W. (A)
Schoen, S. (M)
Schonbrun, L. M. (A)
Schott, F. W. (M)
Schreiber, E. H. (SM)
Schulte, R. W. (A)
Sciuto, F. A. (A)
Scoville, R. R. (SM)
Seader, L. D. (A)
Seaver, W. (A)
Secretan, F. (A)
Segel, D. L. (A)
Seid, E. (A)
Seidman, J. J. (M)
Selleck, R. S. (M)
Semel, D. (A)
Sensiper, S. (SM)
Sepmeyer, L. W. (SM)
Shappee, R. M. (A)
Sharp, R. L. (A)
Shaw, R. G. (M)
Shaw, L. B. (A)
Shearer, R. W. (A)
Shepard, W. (A)
Shepherd, H. F., Jr. (A)
Shiowitz, M. (A)
Shoulders, H. D. (M)
Shuler, M. H. (M)
Sievers, E. S. (A)
Sigmon, L. C. (SM)
Silent, H. C. (VA)
Singman, R. (A)
Sinn, G. (A)
Sisson, R. L. (M)
Skinner, M. R. (A)
Slogar, J. W. (A)
Sloman, F. A. (A)
Slote, L. H. (A)
Skoller, M. (A)
Smith, C. C. (A)
Smith, G. F. (A)
Smith, H. A. (VA)
Smith, L. B. (A)
Smith, P. E. (A)
Smith, R. A. (A)
Smith, R. T. (A)
Snell, H. R. (M)
Snitzer, T. L. (A)
Snow, V. M. (A)
Snyder, R. M. (A)
Sodaro, J. F. (SM)
Soderquist, G. W. (A)
Sofen, I. A. (A)
Sollars, R. C. (M)
Somers, F. J. (SM)
Sommer, J. G. (A)
Speer, W. S. (A)
Sperling, P. (SM)
Spriggs, A. J. (SM)
Stahl, R. (A)
Stanton, R. S. (VA)
Stegen, R. J. (A)
Sterns, W. G. (M)
Steward, M. H. (A)
Stewart, A. A. (A)
Stokes, L. S. (A)
Stoltz, J. R. (A)
Stoltz, P. G. (A)
Stone, C. A. (A)
Straube, G. F. (A)
Strumwasser, E. (M)
Stuart-Williams, R. (M)
Sutherland, L. C. (A)
Swanson, E. R. (SM)
Takahashi, A. Y. (A)
Tanielian, G. (A)
Tauber, R. W. (M)
Taylor, G. J. (A)
Tellez, J. M. B. (M)
Tendick, C. B., Jr. (A)
Tetherow, R. C. (A)
Thompson, G. L. (A)
Thompson, R. B. (A)
Thorensen, R. (A)
Thorp, W. E. (SM)
Tickell, E. B. B. (A)
Tinsley, W. E. (M)
Toeppen, M. K. (SM)
Tomash, E. (A)
Tong, K. C. (A)
Trautman, D. L., Jr. (M)
Uecke, E. H. (A)
Urey, G. M. (A)
Urlovic, W. C. (A)
Valliant, J. G. (M)
Van Kirk, F. W. (A)
Velasco, F. C. (A)
Veneklasen, P. S. (M)
Villa, R. (A)
Vitzelio, R. B. (A)
Vladimir, L. O. (SM)
Vorndran, J. W. (A)
Walker, F. R. (SM)
Wallace, D. C. (VA)
Waller, R. W. (A)
Walley, B. (SM)
Wanlass, S. D. (A)
Ward, R. A. (M)
Warner, D. E. (SM)
Warrington, W., Jr. (A)
Warshaw, M. (A)
Watanabe, E. (A)
Waters, W. P. (M)
Webb, J. R. (A)
Weber, J. W. (A)
Weinberg, L. (M)
Weingarten, R. (A)
Weintraub, H. H. (A)
Welliver, C. L. (M)
Wells, J. L. (M)
Wells, R. M. (A)
Wersen, D. T. (M)
Werts, L. C. (A)
Whiston, R. W. (M)
White, C. R. (A)
Wigger, R. C. (A)
Wilke, W. E. (A)
Wilkinson, L. E. (A)
Williams, J. V. (SM)
Wilson, H. G. (A)
Winslow, R. B. (A)
Wilson, L. W. (M)
Winters, B. C. (M)
Wipson, J. W. (A)
Witten, E. L. (M)
Wizelman, A. (A)
Wohl, J. (A)
Wolverton, R. W. (A)
Wood, G. D. (A)
Wooldridge, D. E. (F)
Worthen, K. J. (M)
Worthington, J. H. (A)
Woster, S. H., Jr. (A)
Wright, P. B. (A)
Wybrow, E. (M)
Yamashiro, J. M. (A)
Yatskin, G. C. (M)
Yeiser, J. O. (A)
Yoder, D. R. (A)
Yonemoto, N. (A)
Young, R. D. (A)
Yucht, G. (A)
Zeitzew, H. (A)
Zimmerman, F. M. (A)
Zipf, A. R. (A)
Zipper, I. (A)
Zukin, A. S. (A)
Zweizig, J. R. (A)

Los Banos (SF-7)
Hunt, M. D. (A)

Los Gatos (SF-7)
Bautista, J. (A)
Bramley, N. V. (A)
Campbell, A. B. (A)
Couzin, R. I. (M)
Drake, L. J. (A)
Goodard, W. A. (A)
Heintz, R. M. (F)
Hummell, K. H., Jr. (A)
Jaffe, J. S. (A)
Jeffers, n, J. E. (A)
Kaufman, J. (SM)
Moore, J. D. (A)
Rolph, D. B. (A)
Sund, H. E., Jr. (A)

Lucerne Valley
Knowlton, C. S. (A)

Lynwood (LA-7)
Gerken, G. H. (M)
Krogstad, J. K.

Malibu (LA-7)
Metcalf, H. E. (SM)
Moseley, J. A. (A)
Pike, J. M. (A)
Yeardsley, W.A.C.A. (M)

Manhattan Beach (LA-7)
Anderson, R. S. (A)
Ball, L. G. (A)
Berntsen, P. L. (A)
Clapp, R. W. (M)
Clay, J. D. (A)
Curtis, C. W. (A)
Dobbins, W. E. (A)
Evans, J. C. (A)
Fulton, A. S. (A)
Genco, F. (A)
Gibbons, C. A. (A)
Haas, D. B. (A)
King, J. (A)
Kirkland, V. D. (A)
Knittle, L. L. (A)
McPherson, R. G. (A)
Moore, J. M. (A)
Mullins, W. H. (A)
Obray, D. C. (A)
Plummer, D. (SM)
Rodman, S. B. (A)
Shoemaker, H. L. (A)
Sinclair, J. G., Jr. (A)
Starkey, M. J. (A)
Stewart, E. A. (A)
Suffield, F. G. (SM)
Swarthe, E. (SM)
Talcott, G. P. (M)
Tillotson, J. H. (A)
Taylor, C. K. (A)
Tucker, V. L. (A)
Vandegrift, R. B. (SM)
Van Horne, T. B. (A)
Walz, R. F. (SM)

Mar Vista (LA-7)
Jamieson, J. L. (A)

Mather Field (SAC-7)
Claar, D. E. (A)
Neudorfer, W. L. (A)
Randolph, R. C. (A)

Maywood
Campbell, B. R. (A)
Stenger, F. J. (M)

McClellan A.F.B. (SAC-7)
Fells, W. E. (M)

Menlo Park (SF-7)
Boysen, J. A. (A)
Broderick, D. L. (A)
Cameron, E. G. (SM)
Clark, C. B. (M)
Ellis, A. R. (SM)
Fleischer, A. (A)
Granger, J. V. (SM)
Grinich, V. H. (A)
Grow, R. W. (A)
Gunn, L. W. (A)
Helwig, N. C. (A)
Hilton, E. A. (A)
Hiroteu, G. S. (A)
Holtmann, E. H. (A)
Huggins, R. A. (SM)
Jobbins, C. W. (A)
Kaar, J. M. (VA)
King, R. C. (M)
Lennert, F. G., Jr. (SM)
Luckenbach, R. R. (A)
McCullough, J. V. (A)
Morgan, V. T. (A)
Morris, F. W., Jr. (SM)
Nevins, J. E., Jr. (M)
Petrak, J. R. (SM)
Priedigkeit, J. H. (SM)
Robbiano, P. P. (M)
Rockwell, R. G. (A)
Salmon, V. (SM)
Silhavy, W. M. (A)
Shellhammer, W. I. (A)
Sherman, R. L. (M)
Sorenson, K. G. (A)
Sphar, C. H. (VA)
Stampalia, I. J., Jr. (A)
Stanbury, R. J. (A)
Swanson, J. P. (A)
Thormahlen, W. H. (A)
Trumbull, A. F. (A)
Vallarino, A. R. (A)
Vane, A. B. (M)
Westburg, V. B. (A)
Willrodt, M. J. (A)

Merced (SF-7)
Pinsky, B. (A)

Millbrae (SF-7)
McCullough, J. A. (F)
Moore, K. A. (M)
Murdock, C. E. (A)
Poe, W. E. (A)

Mill Valley (SF-7)
Behringer, D. S. (M)
Smith, H. H. (A)
Vreeland, R. W. (A)
Woodward, W. J. (A)

Mira Loma (LA-7)
Prell, R. V. (A)

Modesto (SAC-7)
Bates, W. H., Jr. (VA)
Farrelle, P. S. (M)
Ohnikian, P. K. (A)
Stone, J. A. (A)

Monrovia (LA-7)
Bell, N. W. (A)
Bremner, D. S. (A)
Hawes, R. C. (A)
Kee, J. W. (A)
Larson, M. H. (M)
Lawler, R. H. (A)
Lothringer, R. C. (A)
Madden, T. J., Jr. (A)
Parkinson, C. B., Jr. (M)
Tong, S. R. (A)
Wilkins, W. H. (M)

Montara (SF-7)
Whitney, W. L. (A)

Montebello (LA-7)
Doeleman, H. (A)
Hodge, J. (M)
Peterson, W. R. (A)

Montecito (LA-7)
Quam, R. W. (A)

Monterey (LA-7)
Alker, C. A. (A)
Bauer, R. E. (M)
Bauer, W. M. (M)
Bacon, W. L. (A)
Baumgartner, W. S. (M)
Chaney, J. G. (SM)
Church, R. (A)
Corvi, J. A. (A)
Cotton, M. L. (A)
Downing, J. J. (M)
Flagg, D. J. (A)
Frey, A. R. (SM)
Fucile, F. B. (A)
Glet, G. R. (SM)
Glasgow, R. S. (SM)
Herron, R. G. (A)
Hoisington, D. B. (SM)
Johnson, W. F. (A)
Kahal, R. (SM)
Kaluger, M. M. (A)
Kile, R. L. (M)
Klamm, C. F., Jr. (A)
Leff, B. (M)
Mark, R. B. (A)
Miller, R. L. (M)
Norris, W. E. (M)
Riggin, J. D. (M)
Rothauge, C. H. (A)
Sheingold, A. (M)
Smith, W. C. (A)
Spears, R. W. (M)
Stanton, G. (A)

Monterey Park (LA-7)
Kliment, P. (A)
Perry, J. T. (A)
Winn, W. S. (A)
Zoller, C. J. (A)

Montrose (LA-7)
Bullock, R. E. (A)
Christilaw, J. S. (A)
Gurske, V. P. (A)
Hamilton, H. J. (A)
Haurlan, P. N. (M)
Higgins, S. F. (A)
Jensen, A. K. (M)
La Gasse, S. G. (A)
Van Patten, W. D. (A)

Moraga (SF-7)
Tibbetts, D. R. (SM)

Mountain View (SF-7)
Addleman, L. A. (A)
Allen, T. L. (M)
Bohlke, P. G. (SM)
Booth, R. E. (M)
Budd, W. E. (A)
Burkhart, R. N. (A)
Dabinden, D. T. (A)
Davis, J. H. (A)
Farley, W. W. III (SM)
Farlow, C. C. (A)
Harrison, H. W. (A)
Jesse, E. (A)
Kafitz, P. H. (M)
Kellogg, H. A. (A)
Kyle, W. F., Jr. (A)
Leifer, M. (SM)
Leng, R. B. (SM)
Luhrs, H. M. (A)
Mancebo, T. W. (A)
Mathers, G. C. (A)
Moreno, T. (A)
Maccono, F. J. (VA)
O'Neill, J. R. (A)
Peterson, C. J. (A)
Pfost, R. F. (A)
Rich, G. C. (SM)
Richeson, W. E. (A)
Rowe, R. M. (A)
Schiffman, B. M. (A)
Show, O. C. (A)
Soderstrum, J. C. (A)
Sperry, A. B. (A)
Stead, D. A. (A)
Summers, J. W. (A)
Symons, R. S. (A)
Thon, W. (A)
Twersky, V. (A)
Weeks, R. L. (A)
Wihtol, W. (A)

Mount Wilson (LA-7)
Barnes, R. B. (VA)
Knight, J. B., Jr. (SM)

Muroc (INY-7)
Titus, R. W. (A)

Napa (SF-7)
Cattell, G. W. (SM)
Guyton, C. W. (A)
Roberts, W. L. (A)
Shelton, W. C. (M)
Sorensen, A. G. (A)

National City (SD-7)
Fredlund, F. A. (A)
Schaefer, J. V. V. (A)
Vann, I. M., Jr. (M)
Yager, J. C. (A)

Newport Beach (LA-7)
Helperin, J. (A)
Hennigar, N. E. (A)

Newark (SF-7)
Gastelum, J. W. (A)

Norco (LA-7)
Brown, M. H. (A)

North Fork (SF-7)
Pearson, D. R.

North Highlands (CHI-5)
Dutton, I. L. (M)
Land, D. W. (A)

North Hollywood (LA-7)
Abousseleman, W. (SM)
Absher, G. E. (M)
Arman, A. J. (A)
Arne, R. E. (A)
Beaudine, D. M. (A)
Bertolet, E. C. (M)
Blaine, R. F. (A)
Burkart, E. H., Jr. (A)
Burrell, J. E. (A)
Busenkell, C. C. (SM)
Campbell, B. K. (A)
Ceccarini, R. E. (A)
Chandler, C. W. (A)
Clark, J. F. (M)
Curtis, J. P. (A)
Cutler, S. (A)
Daniel, R. L. (M)
DeBaun, J. R. (A)
Derderian, N. (A)
Dickerson, D. H. (M)
Dorsey, M. (A)
Elster, S. (A)
Endsley, G. T. (A)
Farnsworth, H. D. (VA)
Filizola, V. F. (A)
Forbath, F. P. (A)
Gardner, L. B. II (A)
Goodrich, P. E. (A)
Gove, E. L. (SM)
Herter, V. E., Jr. (M)
Harrison, W. H. (A)
Huntsman, H. F. (A)
Jensen, K. K. (M)
Jones, J. W. (M)
Klotz, E. (A)
Leonard, N. E. (A)
Lowy, M. A. (A)
Martin, V. G. (SM)
Mleczko, E. L. (M)
Mobley, M. P., Jr. (M)
Mont, C. H. (A)
Montgomery, D. R. (A)
Moore, V. (SM)
Morrison, A. I. (A)
Nelson, G. A. (A)
Pastor, C. C. (A)
Pincus, L. (M)
Rawlins, R. E. (SM)
Rosene, K. T. (A)
Scott, H. A. (A)
Short, K. R. (A)
Smith, M. H. (A)
Stalford, W. E. (M)
Sullivan, J. R. (M)
Sumner, T. B. (A)
Toomin, H. (M)
Tucker, R. E. (M)
Vincent, R. C. (M)
Volpe, F. (A)
Vrooman, D. H. (A)
White, R. H. (A)
Wilson, J. W. (A)
Wilson, O. B., Jr. (A)
Winkler, J. L. (A)
Woodward, E. O. (A)

Northridge (LA-7)
Ainsworth, M. J. (SM)
Bass, L. J. (A)
Blight, A. F., Jr. (A)
Danish, A. A., Jr. (A)
Meutzer, S. C. (A)
Miller, F. G. (A)
Stoddert, T. M. (M)
Telle, G. R. (A)
Wyland, G. P. (M)
Zimmerman, R. L. (A)

Norton, A.F.B. (LA-7)
Young, K. A. (A)

Norwalk (LA-7)
Bradt, A. J. (A)
Brandes, R. E. (A)
Campbell, D. H. (A)
Clark, D. E. (A)
Huggins, W. G. (A)
Jones, K. N. (A)
LoCascio, R. J. (A)
Loop, D. M. (A)
Mitsutomi, T. (A)
Morgan, R. C. (SM)
Schmied, W. F., Jr. (A)
Thurman, E. J. (A)
Tosspon, A. E. (A)

Novato (SF-7)
Donegon, R. E. (A)
Fray, R. S. (A)
Gipple, H. W. (A)
Lingle, R. H., Jr. (A)
Lord, W. P. (M)
Newdorfer, W. L. (A)
O'Neal, K. R. (A)

Oakland (SF-7)
Andersen, V. O. (A)
Anderson, O. A. (A)
Andrews, W. F. (A)
Avery, H. T. (A)
Barale, J. J. (A)
Baumgartner, J. V. (A)
Black, L. J. (F)
Cagle, D. S. (A)
Carter, L. J., Jr. (A)
Chew, B. H. (A)
Clark, O. (A)
Cone, D. R. (A)
Conn, J. A. (A)
Daverio, A. J. (A)
Dell, H. R. (A)
Dorr, R. (A)
Downey, C. E. (A)
Drake, H. B. (M)
Feldman, N. E. (A)
Forbes, A. C. (SM)
Gausmann, W. H. (A)
Gennett, D. F., Jr. (A)
Gilliland, W. D. (M)
Glessner, J. M. (M)
Harbidge, E. A. (A)
Hom, N. P. (A)
Jenkins, K. D. (A)
Jiu, R. (A)
Jones, M. H. (A)
Kan, G. (A)
Lar Rieu, E. A., Jr. (M)
Lee, L. K. (SM)
Lee, S. (A)
Malone, W. C., Jr. (A)
Mone, E. A. (A)
Morrison, G. E. (A)
Murray, H. D., Jr. (A)
Olson, S. R. (A)
Park, C. W. (SM)
Patterson, H. R. (SM)
Pattison, A. (A)
Penther, C. J. (SM)
Pigozzi, L. J. (A)
Rosenberg, J. M. (M)
Schnepple, W. F. (A)
Schwemin, A. J. (A)
Steed, W. P. (A)
Upham, F. T. (A)
Wahlgren, W. W. (SM)
White, D. F. (A)
Wolfe, H. T. (A)

Ocean Park (LA-7)
Moskwa, S. J. (A)

Oceanside (SD-7)
Ulmer, H. W. (A)

Ontario (LA-7)
Abramis, D. (M)
Bessette, A. (A)
Calderwood, K. J. (A)
DeWitt, C. P. (A)
Haddon, R. E. (A)
Hale, D. R. (A)
June, R. H. (A)
Pollock, R. D. (M)
Ransil, R. J. (A)
Resnik, A. E. (A)
Ritter, E. (SM)
Sommer, H. H. (A)
Sutton, O. D. (M)

Orange (LA-7)
Elliott, M. S. (A)
Lephakis, A. J. (M)

Orinda (SF-7)
Bumstead, C. R. (M)
Noble, M., Jr. (A)
Thunen, G. W. (A)

Oroville (SAC-7)
Bird, J. R. (SM)
Gregory, R. M. (A)

Oxnard (LA-7)
Akers, R. F. (A)
Aller, J. C. (A)
Anderson, T. J. (A)
Ankerstar, R. H. (A)
Ausbourne, R. K. (A)
Binkley, M. (A)
Bowen, W. A., Jr. (M)
Bradford, W. O. (M)
Brown, W. C. (M)
Cornwall, E. A., Jr. (A)
Cassidy, R. E. (A)
Crippa, E. R. (M)
Darden, R. R., Jr. (M)
Fauvre, R. F. (A)
Fields, M. H. (M)
Ford, J. P. (A)
Fossier, M. W. (M)
Gleason, J. L. (A)
Gomez, P. D. (A)
Gosley, A. W. (A)
Green, C. A. (A)
Harris, B. E., Jr. (A)
Hernon, D. J. (A)
Hoefener, C. E. (A)
Hollmann, H. E. (F)
Horn, R. H. (A)
Hudson, R. (A)
Hughes, D. D. (A)
Ishii, F. K. (A)
Keigher, J. P. (A)
Lambert, G. M. (A)
La Plant, O. (M)
Lathrop, P. A. (A)
Lund, F. H. (A)
Masin, G. F. (M)
McDaniel, D. Z. (A)
McIntyre, R. D. (A)
Miller, W. A. (A)
Mockus, J. M. (M)
Moore, M. H. (A)
Mumma, J. W. (A)
Nawalinski, T. E. (A)
Newman, D. B. (A)
Novo, R. B. (A)
Palter, N. H. (SM)
Porter, J. R. (A)
Ramsay, W. R. (A)
Sander, M. H. (A)
Schneider, P. R. (A)
Seamer, C. W. (A)
Sedlacek, W. C. (M)
Snow, R. B. (A)
Solferino, T. A. (A)
Sorden, L. V. (A)
Spranger, P. B. (A)
Stone, J. E. (A)
Swallow, D. S. (A)
Wood, L. E. (A)
Yalen, S. (A)
Zopf, D. O. (A)

Pacific Grove (SF-7)
Monson, D. J. (M)

Pacific Palisades (LA-7)
Alberts, W. A. (A)
Albrecht, A. (SM)
Alexander, M. A. (M)
Arndt, W. F. (SM)
Barker, C. B., Jr. (SM)
Beagles, R. (SM)
Brewer, A. F. (SM)
Danenberg, L. W. (A)
Garber, R. S. (A)
Giffin, K. A. (M)
Graham, W. (A)
Green, D. J. (A)
Greene, G. M. (SM)
Hadden, F. A. (A)
Haeff, A. V. (F)
Halloran, R. G. (A)
Howard, L. W. (SM)
Jams, H. (F)
Kauke, J. R. (A)
Kelsey, A. L. (A)
Larson, H. T. (A)
Le Grand, C. (A)
Lengyel, B. A. (SM)
Mallett, J. D. (A)
Mayner, G. S. (A)
McCann, J. G. (A)
McCharles, J. R. (M)
McCloud, W. W. (A)
Membury, P. J. (A)
Miller, B. F. (SM)
Muchmore, R. B. (SM)
Oser, E. A. (SM)
Paddock, O. K. (M)
Quarfoot, H. B. (VA)
Romig, H. G. (SM)
Sarkissian, H. H. (A)
Schwank, R. T. (A)
Smith, S. T. (SM)
Spandau, E. P. (SM)
Tyson, O. A. (A)
Van Ackere, M. G. (A)
Whelan, D. E. (A)

Pacoima (LA-7)
Bixson, L. L. (A)
Briggs, J. G. (A)
Deyo, A. E. (A)
Fingeretti, J. A. (A)
Franco, M. (M)
Ingebretsen, E. E. (A)
Jacobson, R. (A)
Kortman, C. M. (A)
Martin, D. L. (A)
McCabe, A. P. (M)
Turnbull, J. S., Jr. (A)
Zechiel, W. J. (A)

Palo Alto (SF-7)
Arnold, C. A. (A)
Arnold, D. T. (A)
Baker, G. H. (A)
Battelle, R. B. (A)
Bauer, B. (SM)
Beaver, W. L. (A)
Bolljahn, J. T. (SM)
Brown, A. S. (SM)
Carnahan, C. W. (F)
Caruthers, R. S. (SM)
Chamberlain, W. S. (A)
Chan, W. W. (A)
Cherry, D. D. (A)
Chiang, F. C. (A)
Christensen, P. C. (A)
Clark, J. W. (M)
Clarke, K. K. (A)
Clelland, F. W., Jr. (SM)
Clifford, D. G. (SM)
Code, J. A. (SM)
Cone, D. I. (SA)
Corbell, P. I., Jr. (M)
Crapuchettes, P. W. (M)
Crumly, C. B. (A)
Daniel, R. D. (A)
De Grasse, R. W. (A)
Dunbar, A. S. (SM)
Eldredge, A. L. (A)
Elliott, H. F. (F)
Filmer, J. C. (A)
Fisher, G. (SM)
Floyd, W. B., Jr. (A)
Fong, A. (SM)
Ford, V. S. (A)
Fuller, L. F. (F)
Gallagher, W. J. (A)
Gerling, J. E. (A)
Gillette, P. R. (SM)
Goldberg, J. (A)
Goodman, D. H. (SM)
Grass, J. W. (A)

Griese, R. H. (A)
Hall, E. G. (M)
Hamilton, R. H., Jr.
Hand, B. P. (A)
Hans, W. J. (A)
Harman, W. A. (A)
Heckinger, R. G., Jr. (A)
Hennies, S. R. (M)
Hewlett, W. R. (F)
Heywood, J. E. (A)
Hilbers, G. R. (A)
Holden, G. R. (A)
Honey, R. C. (A)
Isberg, R. A. (SM)
Jakubowski, W. (A)
Jarvis, W. E. (A)
Jensen, R. C. (A)
Jepsen, R. L. (A)
Johnson, W., Jr. (A)
Jones, C. B. (SM)
Kabell, J. (A)
Kennedy, H. D. (A)
Kerwin, W. J. (A)
Kirkwood, R. L. (A)
Knapp, S. L. (A)
Krause, R. A. (SM)
Kruse, F. W., Jr. (A)
LaForge, L. H., Jr. (SM)
Leo, R. E. (A)
Mahurin, C. R. (M)
Malling, L. R. (VA)
Marsh, M. D. (M)
McBride, G. H. (M)
Miller, S. W. (A)
Moran, J. F. (A)
Morgan, E. C. (A)
Mosley, J.
Nelson, F. A. (A)
Nelson, R. B. (M)
Nitz, L. C. (A)
Oliver, B. M. (F)
Packard, D. (F)
Patton, P. B. (A)
Pearson, P. A. (M)
Porter, N. E. (SM)
Poulter, H. C. (A)
Pruitt, F. L. (A)
Quinn, R. A. (A)
Roberts, L. A. (A)
Robinson, A. L. (SM)
Rockwood, C. C. (A)
St. Clair, M. W. (A)
Scheuch, D. (SM)
Serniuk, W. (SM)
Shimizu, J. K. (A)
Shortall, J. W., Jr. (A)
Singleton, R. C. (A)
Smith, S. L. (A)
Snyder, W. (A)
Soderstrom, H. W. (M)
Stearns, H. M. (SM)
Steele, C. W. (A)
Steele, R. C. (A)
Stelter, E. C. (A)
Swain, J. R. (A)
Tomlin, W. T. (A)
Turner, T. F. (A)
Veltfort, T. E., Jr. (A)
Villard, O. G., Jr. (SM)
Wagener, W. G. (SM)
Walker, L. F. (M)
Ward, C. E. (M)
White, F. M., Jr. (A)
Whitehurst, R. N. (A)
Wickett, W. A. (A)
Winkler, R. H. (A)
Wise, W. L. (A)
Wyatt, W. C. (A)
Yadoff, O. (SM)
Zeidler, H. M. (M)
Zevenbergen, J. W. (A)
Zitelli, L. T. (A)
Zinky, W. R. (A)

Palos Verdes Estates (LA-7)
Brewer, G. R. (M)
Caldwell, J. J., Jr. (SM)
Clement, A. J. F. (A)
Dazey, M. H. (A)
Flynn, F. J. (SM)
Hannum, D. E. (M)
Hebenstreit, W. B. (SM)
Hook, A. S. (A)
Keen, L. C. (SM)
Krogh, R. A. (A)
Mallinckrodt, C. O. (SM)
Moore, C. C., Jr. (A)
Peterson, W. E. (SM)
Reitz, L. P., Jr. (SM)
Stevens, F., Jr. (A)
Wagenseil, W. (SM)
Walance, C. G. (A)
Williams, C. (A)
Williams, L. E. (A)

Paramount (LA-7)
Acker, W. W. (A)
Child, C. H. (M)

Pasadena (LA-7)
Adler, J. A. (A)
Ames, W. S. (A)
Angus, D. G. (A)
Ashby, R. M. (SM)
Bacon, R. N. (A)
Bagley, G. D. (SM)
Barasch, M. V. (SM)
Beatty, C. G. (A)
Bemis, R. C. B. (A)
Benioff, H. (VA)
Bewley, L. L. (A)
Blackman, W. S. (A)
Blatterman, H. L. (M)
Bolton, M. W. (A)
Booth, F. O., Jr. (A)
Bradish, W. M. (A)
Braun, T. H. (M)
Burke, H. E., Jr. (SM)
Cady, W. G. (F)
Cartwright, V. F. (M)
Charpentier, D. E. (M)
Chase, N. C. (A)
Coker, F. B. (A)
Conn, R. B. (M)
Crossett, E. C. (VA)
Cummings, C. I. (A)
Cummins, R. G. (M)
David, J. (A)
Davis, D. C. (A)
Dennison, P. R. (A)
De Valve, R. H. (A)
Dixon, W. J. (A)
Donoho, P. L. (A)
Downs, G. W., Jr. (SM)
Dwyer, R. J. (VA)
Ellis, A. T. (A)
Erdman, D. C. (A)
Everitt, R. S. (A)
Field, L. M. (F)
Fish, K. L. (A)
Ford, J. R. (A)
Frank, M. E. (A)
Gates, C. R. (A)
Gilbertson, B. I. (A)
Gilchriest, C. E. (A)
Gleghorn, G. J. (A)
Goeppinger, A. L. (M)
Goodell, E. M. (M)
Goodwin, P. S. (SM)
Gosswiller, R. O. (A)
Gould, R. W. (A)
Granger, W. E. (A)
Gratton, R. E. (A)
Grove, H. G. (A)
Hamilton, R. C. (A)
Harden, P. A. (M)
Hawn, L. R., Jr. (M)
Herber, J. C. (SM)
Hiraoka, F. A. (A)
Holden, W. H. T. (SM)
Holmes, W. R. (A)
Hoskins, E. E. (A)
Howes, E. T. (VA)
Johnson, R. W. (SM)
Kalbach, J. F. (SM)
Kelley, J. R. (A)
Knickrehm, A. F. (A)
Kowallis, O. K. (A)
Kirsten, C. C. (A)
Larey, B. W. (A)
Leader, R. E. (A)
Liljegren, L. K. (A)
Little, G. R. (A)
Maass, C. F. (A)
Marshall, J. G. (A)
Martel, H. C. (A)
Mattson, E. (A)
McCool, J. M. (A)
McFarlane, M. D. (SM)
McGee, H. A. (A)
Miller, G. J. (A)
Molander, A. B. (A)
Moran, R. B., Jr. (SM)
Morison, R. (A)
Moseley, F. L. (SM)
Motta, N. (A)
Mundt, E. (A)
Myers, V. V., Jr. (A)
Neff, G. A. (A)
Newhouse, G. B. (A)
Nicholson, W. Q. (M)
Oshiro, F. K. (A)
Owen, R. P. (SM)
Palmer, J. H. (A)
Pickering, W. H. (SM)
Ramstedt, C. F. (A)
Ray, P. J., Jr. (A)
Reckitin, E. (A)
Reynolds, R. A. (A)
Riddle, F. M. (A)
Riggins, H. C. (A)
Robbins, D. (A)
Robertson, G. R. (A)
Robinson, L. P. (A)
Ross, I. (A)
Rutishauser, R. W. (M)
Scarbrough, A. D. (A)
Schwartz, E. D. (A)
Sefton, W. E. (A)
Sellars, R. F. (A)
Shadle, P. W. (M)
Shaffer, P. A., Jr. (A)
Shapiro, H. (A)
Shultise, Q. M. (M)
Simmons, E., Jr. (VA)
Skeeters, R. N. (A)
Slaton, J. H. (A)
Slavin, M. (A)
Sly, W. G. (A)
Smith, H. A. P. (A)
Smith, M. C. (M)
Spaulding, C. P. (A)
Stensgaard, C. P., Jr. (A)
Strassner, R. M. (M)
Swan, M. L. (M)
Tarca, E. L. (A)
Thomson, B., Jr. (A)
Tejada-Flores, L. H. (A)
Thurston, J. M. (SM)
Toeppe, W. J., Jr. (A)
Toukdarian, R. Z. (A)
Underwood, C. J., Jr. (A)
Vail, R. W. (A)
Vernon, F. L., Jr. (A)
Waller, R. L. (A)
Wanlass, L. K. (A)
Warner, A. H. (M)
Watts, E. W. (M)
Wedel, J. J., Jr. (M)
Westlake, P. R. (A)
Whitney, M. G. (A)
Wieland, C. W. (A)
Williams, R. W. (A)
Wilson, G. P. (SM)
Wilson, M. C. (A)
Wohlwill, H. E. (M)
Younger, U. E. (A)
Zarem, A. M. (A)

Pebble Beach (SF-7)
Goodard, E. G. (SM)
Menneken, C. E. (A)

Petaluma (SF-7)
Boutz, F. E. (M)
Garzoli, F. F. (A)
Pendleton, L. S. (A)
Ravenscroft, H. A. (A)

Pico (LA-7)
Fuller, C. A. (A)
Gross, J. E. (A)
Nelson, E. K. (A)
Swanson, R. L. (A)

Piedmont (SF-7)
Brooks, R. E. (A)
Cole, C. H. (VA)
Evans, C. P. (M)
Forster, A. G. (VA)
Hill, C. M. (A)
Hudson, I. (A)

Pinole
Kimes, R. E. (A)

Playa Del Rey (LA-7)
Beckwith, H. W. (A)
Fischer, M. K. (M)
Hayes, E. A. (SM)
Kennedy, W. R. (A)
Woods, W. A. (VA)

Pleasanton (SF-7)
Wharton, C. B. (A)

Point Mugu (LA-7)
Clayton, J. F. (A)
Elliott, G. L. (A)
Graham, W. (A)
Johnson, L. B. (A)
Lund, T. J. (A)
Montalbano, M. (A)
Parsons, R. L. (A)
Ross, P. A. (A)
Reid, I. H. (VA)
Smith, R. R. (A)
Wallis, W. R. (A)
Welch, C. H. (A)

Pomona (LA-7)
Allen, J. W. (SM)
Allen, J. R. (A)
Birch, R. S. (A)
Blackwell, M. B. (A)
Broyes, R. S. (A)
Chrystie, H. (M)
Collins, W. G. (M)
Craig, F. D. (M)
Drake, W. A. (A)
Drescher, L. (A)
Dutcher, L. R. (A)
Ellis, G. M. (SM)
Freese, P. G. (A)
Giannetto, C. (M)
Gottier, R. L. (A)
Hain, J. L. (A)
Harris, H. F. (A)
Hopper, B. (A)
Horne, C. F., Jr. (SM)
Hyman, R. M. (A)
Jackson, J. C. (A)
Kamena, J. G. (A)
Kidwell, W. M. (SM)
Killion, D. G. (A)
Knight, J. D. (A)
Kring, J. D., Jr. (A)
Lloyd, A. T. (M)
Lock, R. W. (A)
Marino, L. A., Jr. (A)
Michaels, L. (SM)
Mickelson, J. R. (A)
O'Brien, J. C. (SM)
Orpin, L. H. (SM)
Parsons, N. L. (A)
Pope, J. C. (A)
Rayhin, M. W. (M)
Rue, C. A. (A)
Schertz, C. W. (A)
Schock, J. O. (SM)
Shimada, G. (A)
Smith, D. I. (A)
Soward, R. (M)
Stevenson, W. A. (M)
Sticht, R. J. (A)
Stokely, R. G. (M)
Symonds, R. J. (A)
Towler, W. R. (M)
Trostler, R. M. (A)
Ward, W. S. (A)
Ware, C. H. (A)
Watkins, E. L. (A)
Wessels, P. S. (M)
White, M. A. (A)
Wingard, C. G. (A)

Port Hueneme (LA-7)
Burgar, D. G. (A)
Hood, E. B. (A)
Link, W. F. (A)
McQuiston, W. R. (M)
Metcalfe, J. D. (A)
Ziherl, E. J. (A)

Puente (LA-7)
Allison, R. E. (SM)
Linebarger, P. J. (A)
McMahon, J. E. (M)
Olsen, V. O. (A)

Ramona (SD-7)
Brown, A. F. (A)

Rancho Santa Fe (SD-7)
Baker, R. H. (M)

Redlands
Seifert, F. F. (M)

Redondo Beach (LA-7)
Bissett, T. B. (A)
Boyer, J. M. (A)
Crane, G. B. (A)
Dutton, O. B. (A)
Emmerich, L. (A)
Glowacki, W. J., Jr. (A)
Jacobi, W. J. (A)
Linhart, T., Jr. (A)
Lundstrom, O. C. (A)
Lytle, A. C., Jr. (A)
Newton, S. H. (A)
Smith, S. L. (M)
Stephenson, D. L. (M)
Stroud, S. G. (A)
Willis, M. R. (A)

Redwood City (SF-7)
Allgren, W. E. (M)
Amara, R. C. (A)
Babintzeff, V. A. (A)
Barkley, J. W., Jr. (A)
Bloom, G. (A)
Bradford, C. W. (A)
Covell, D. F. (A)
Data, C. D. (A)
Dumas, K. L. (A)
Eshleman, V. R. (A)
Freise, W. H. (A)
Grimm, R. A. (A)
Haag, M. W. (VA)
Halina, J. W. O. (A)
Harper, J. W. (A)
Hedberg, H. E. (A)
Hopner, E. (M)
Hulett, H. R. (A)
Hummel, C. V. (A)
Johnston, H. (A)
Kebby, M. H. (A)
Knipe, W. M. (A)
Lacy, P. D. (A)
Langevine, R. Z. (M)
Leming, T. L. (A)
Leslie, F. E. (M)
Levinthal, E. C. (SM)
Litton, C. V. (F)
Luebke, W. R. (A)
McAlpine, W. N. (A)
Melton, J. F. (A)
Miller, R. E. (M)
Morris, A. J. (SM)
Patterson, G. K. (SM)
Pillsbury, A. F. (A)
Reed, D. E. (M)
Reyling, G. F. (A)
Romander, H. (SM)
Rudee, E. (A)
Russell, E. B., Jr. (A)
Scarborough, D. S. (A)
Show, O. C. (A)
Stahl, R. J. (M)
Stokem, M. D. (A)
Strom, R. L. (A)
Svendsen, G. D. (A)
Thompson, R. E. (A)
Tinney, F. B. (VA)
Tipping, C. C., Jr. (M)
West, E. B., Jr. (A)

Reseda (LA-7)
Chaiken, L. (A)
Colander, R. E. (SM)
Coogan, J. H. (A)
Dulin, J. J. (A)
Garland, M. D., Jr. (A)
Goulet, T. A. (A)
Harlan, R. E. (A)
Hoffart, H. M. (A)
Jakubowski, M. C. (A)
Katz, I. (A)
Keeter, R. E. (A)
Lienhard, T. G. (A)
Milwitt, W. (SM)
Murray, R. W., Jr. (M)
Nauss, B. M. (A)
Peterson, J. A. (A)
Plank, C. (M)
Politi, E. Y. (A)
Rosenbloom, A. (A)
Rudy, E. W. (A)
Schultheis, H. B., Jr. (A)
Underberger, G. M. (A)
Wood, J. R. (A)
Woodson, W. L. (A)

Rialto (LA-7)
Eldridge, A. J. (A)

Richmond (SF-7)
Airhart, R. Y. (A)
Brubaker, E. A. (A)
Corl, J. L. (M)
Gordon, J. F. (SM)
Hamilton, E. P. (A)
Jacobs, H. N. (M)
Kelper, R. G. (A)
Lovell, E. L. (A)
Lowe, C., Jr. (VA)
Mingst, H. C. (A)
Schrader, G. F. (M)
Stephenson, P. L. (A)
Wilson, G. L. (A)

Ridgecrest (INY-7)
Kimball, G. D. (A)
Tkachuk, J. J. (M)

Rio Linda (SAC-7)
Turkot, A. (A)

Rivera
Schmidt, J. N. (A)
Shade, R. R. (A)

Riverside (LA-7)
Atchison, F. S. (SM)
Berns, K. L. (A)
Blutman, E. (SM)
Bower, G. G. (M)
Davis, W. W. (M)
De Marco, R. J. (A)
Dick, J. O. (A)
Fournier, L. W. (A)
Hansen, E. N. (A)
Humphreys, T. I. (SM)
Ireland, R. C. (A)
Knoob, G. B. (A)
Kopulsky, S. (A)
Lamm, R. A. (SM)
Lance, H. W. (M)
Lapham, E. G. (SM)
Lichtman, S. V. (SM)
Lundquist, C. R. (SM)
Mayeda, T. A. (A)
Meggers, W. F., Jr. (M)
Montelatise, G. D. (A)
Pawley, M. G. (SM)
Powers, A. B. (M)
Rein, W. W. (A)
Rowe, D. E. (SM)
Sledge, O. D. (SM)
Smith, R. P. (A)
Williams, L. L. (A)
Williams, W. F. (A)
Yourdon, F. R. (A)

Robles Del Rio
Nason, C. H. W. (A)

Rolling Hills (LA-7)
Cummins, J. W. (SM)
McMahon, G. V. (M)
Reichert, D. G. (A)
Swanson, W. V. (M)
Tillotson, J. H. (A)

Rosemead (LA-7)
Crawford, G. N. (A)
Ferl, R. H. (A)
Morenz, P. W. (A)

Roseville
Wester, E., Jr. (A)

Running Springs (LA-7)
Hollinrake, J. M. (A)

Sacramento (SAC-7)
Bairos, C. A. (A)
Bennett, R. C. (M)
Berger, E. W. (M)
Breuer, H. J. (M)
Broderson, L. V. (A)
Dickinson, I. E. (A)
Driggs, L. O. (A)
Durr, E. (A)
Ernst, E. C. (A)
Feeney, C. J. (A)
Godfrey, X. W. (M)
Hart, W. H. (A)
Hill, W. C. (SM)
Hudson, C. A. (A)
Johnson, W. A. (A)

Kemp, E. M. (A)
Klinke, E. R. (A)
Knoll, D. W. (A)
Koch, W. F. (M)
Leecing, R. W. (A)
Liviakis, G. J. (A)
Lowe, D. G. (A)
Martin, G. E. (A)
Martin, N. A. (M)
Mason, C. F. (A)
McKinnon, R. J. (A)
Miller, J. R. (VA)
Miura, A. (A)
Naschke, E. S. (M)
Nielson, R. W. (A)
Oates, T. L. (VA)
O'Connell, E. D. (A)
Russell, M. F. (A)
Scotch, C. (A)
Slater, A. P. (A)
Slater, H. C. (M)
Smart, M. E. (A)
Spadoni, A. F. (A)
Spracklen, R. K. (A)
Stronce, G. S. (M)
Starzec, J. S. (A)
Whitby, E. R. (A)

Salinas (SF-7)
Delorimier, J. B. (A)
Lowe, N. (A)
Wright, O. N. (A)

San Anselmo (SF-7)
Berryhill, J. L. (M)
Bouquet, F. L., Jr. (A)
Kimball, G. D. (A)
Pitman, D. R. (A)

San Bernardino (LA-7)
Abernathy, O. R. (A)
Beard, E. M. (A)
Canfield, E. R. (A)
Carson, E. L. (A)
Ewing, G. W. (A)
Featherstone, S. J. (M)
Harinec, R. G. (A)
Joe, R. H. (A)
Kimmel, R. (A)
Pettit, H. L. (A)
Titcomb, R. D. (A)
Verbance, A. (A)

San Bruno (SF-7)
Bouquet, F. L., Jr. (A)
Evans, W. S. (M)
Haegele, R. W. (M)
Johnstone, F. C. (A)
Preist, D. H. (M)
Reis, C. S. (A)
Snoddy, R. E. (A)
Sorg, H. E. (M)
Tate, N. C. (A)
Welch, J. R. (M)

San Carlos (SF-7)
Abraham, W. G. (A)
Ayer, W. E. (SM)
Burgess, J. E. (M)
Byrne, P. F. (VA)
Carter, J. M. (SM)
Chittenden, W. R. (A)
Cool, L. R. (A)
Cooper, J. I. (A)
Crane, M. (A)
Cummings, K. M. (SM)
Fisher, W. C. (SM)
Gillen, D. A. (A)
Greene, H. A., Jr. (SM)
Gregg, D. P. (A)
Heflin, W. H. (A)
Jipp, J. (M)
Johnson, J. B. (A)
Johnson, R. E. (A)
Jolly, J. A. (A)
Joseph, W. F. (A)
Kovalevski, N. N. (A)
Lichenstein, M. I. (A)
Maltzer, I. (A)
Marsh, C. J. (A)
McAulay, W. H. (VA)
Norcross, J. B. (A)
Patton, W. R. (M)
Paul, R. S. (A)
Peirce, J. A. (A)
Rudisuhle, E. J. (A)
St. Clair, M. W. (A)
Sebald, L. E. (A)
Smaha, N. F. (A)
Stachiewicz, B. R. (M)
Stolaroff, M. J. (M)
Walter, C. A. (A)
Winenow, R. E. (A)
Zellmer, N. A. (A)

San Diego (SD-7)
Abbey, K. (A)
Abel, C. F. (A)
Ahrens, H. R. (A)
Altman, D. E. (A)
Anderson, J. S. (VA)
Anthony, D. J. (A)
Applin, R. H. (A)
Austin, R. W. (M)
Bailey, D. G. (A)
Bange, E. E. (A)
Beauregard, W. G. (A)
Bell, W. C. (A)
Bernard, W. B. (SM)
Bernstein, H. E. (SM)
Beyer, C. M. (M)
Block, K. A. (A)
Boelens, J. (A)
Bossoletti, J. E. (A)
Bowers, R. W. (VA)
Bowles, R. D. (A)
Bowman, W. B. (A)
Brackett, R. T. (A)
Brady, M. E. (A)
Bremmer, R. A. (A)
Brokaw, H. R. (M)
Brooks, J. L. (M)
Browder, J. W. (M)
Bossoletti, J. E. (A)
Bowman, W. B. (A)
Brunswick, H. D. (A)
Burke, A. T. (M)
Burkhardt, R. H. (A)
Burnett, W. L. (M)
Bush, E. W. (A)
Bush, T. A., Jr. (A)
Byrnes, F. X. (M)
Campbell, W. D. (A)
Caporaletti, G. A. (A)
Carden, G. L. (A)
Cardoza, H. L. (A)
Carter, D. (A)
Caspers, J. W. (A)
Cattermole, G. B. (A)
Cawley, J. H., Jr. (A)
Chadwick, R. F. (A)
Chasinowitz, G. (A)
Chazotte, M. M., Jr. (A)
Clark, J. E. (A)
Comstock, R. L. (A)
Coombs, G. F. (A)
Cox, J. E. (A)
Cram, C. C. (M)
Crispell, H. L. (M)
Crowell, D. D. (A)
Curl, G. H. (A)
Dameson, L. G., Jr. (M)
Dausman, R. H. (M)
Davis, A. F. (A)
Davis, J. S. (A)
Day, J. P. (M)
Delicath, R. C. (M)
Derenthal, R. J. (A)
Dickens, R. D. (A)
Dickstein, H. D. (A)
Dodd, G. M. (M)
Doig, J. H. (VA)
Donahue, J. (M)
Drayner, A. H. (A)
Dunn, C. E. (A)
Edson, G. L. (A)
Evans, A. R. (A)
Farmer, A. A., Jr. (A)
Fish, W. Y. (A)
Focke, A. B. (SM)
Frankos, D. T. (A)
Freres, C. H. (M)
Gabrielson, H. C. (A)
Garcia, G. E. (A)
Geren, K. E. (A)
Goddard, W. R., Jr. (M)
Gordon, R. A. (A)
Gottwald, C. H. (A)
Granman, E. G. (A)
Hallinger, D. J. (A)
Hall, R. F. (A)
Halonen, C. A. (A)
Hamann, O. F. (A)
Harris, L. G. (A)
Hartin, W. J. (A)
Hatchett, S. E. (SM)
Hayes, W. R. (A)
Hedlund, K. W. (A)
Herbert, W. J. (A)
Heritage, D. P. (A)
Heritage, J. L. (A)
Hicks, C. N. (A)
Hix, R. C. (A)
Hixson, E. L. (A)
Hoffman, R. J. (A)
Hoffman, W. C. (A)
Holcomb, D. E., Jr. (A)
Holloway, J. (SM)
Holmes, G. B. (A)
Holmes, R. P. (A)
Honer, R. E. (A)
Hopkins, R. U. (M)
Hughes, L. R. (A)
Ingram, R. G. (A)
Jones, H. G. (M)
Kalbfell, D. C. (SM)
Kaplan, M. N. (A)
Karcher, E. R. (M)
Keeler, P. M. (A)
Keeran, R. V. (A)
Keith, I. W. (A)
Kerr, H. C., Jr. (A)
Kiernan, E. F. (SM)
Kinnally, J. W. (M)
Kirkman, R. A. (SM)
Lambert, T. M. (A)
Langston, J. F. (A)
LaZelle, L. (A)
Lee, H. E. (M)
Lee, R. H. (A)
Leeds, M. F. (A)
Leftwich, L. L. (M)
Leger, R. M. (SM)
Leib, J. E. (A)
Liddiard, G. E. (A)
Lock, R. W. (A)
Logue, S. H. (A)
Long, J. V. (VA)
Luebben, R. G. (A)
Makinson, H. O. (M)
Martin, F. C., Jr. (A)
Martin, G. E. (A)
Maxfield, J. P. (SM)
McDaniel, G. A. (A)
Merrill, J. E., Jr. (A)
McGehee, C. R. (A)
McKnight, C. L. (A)
McNally, I. L. (SM)
McNaney, J. T. (SM)
Michael, F. J. (A)
Miller, C. N. (A)
Miller, R. H., Jr. (M)
Moe, C. R. (SM)
Montalvo, E. (A)
Moore, E. J. (M)
Moore, W. E. (A)
Morgan, R. B. (SM)
Mortenson, W. R. (A)
Moulton, A. B. (M)
Mulvey, J. X., Jr. (A)
Naive, L. A. (A)
Nault, F. J. (A)
Ogram, R. L. (A)
Ohlinger, P. M. (M)
Olds, O. S. (M)
Ong, A. M. (A)
Pagels, W. (A)
Parker, A. B. (M)
Parker, B. E. (SM)
Parker, S. E. (A)
Parks, V. H. (A)
Peek, G. E. (A)
Perkins, B. M. (A)
Phillips, E. T. (A)
Pickens, G. O. (A)
Pine, T. G. (A)
Poe, C. M. (A)
Prather, A. W. (M)
Proctor, D. (A)
Ratkevich, A. E. (A)
Ravey, D. L. (A)
Redelings, J. T. (A)
Reid, J. H. (SM)
Robinson, E. B. (SM)
Rockowitz, J. B. (A)
Rogers, S. (SM)
Rose, A. E., Jr. (A)
Roshon, A. H., Jr. (M)
Rountree, W. R. (A)
Russell, P. E. (A)
Russell, W. F. (A)
Salzar, D. E. (A)
Sampson, J. C. F. (A)
Sandler, B. (A)
Sarnaw, W. J. (A)
Sauer, W. F. (A)
Schart, W. J. (A)
Schreiber, O. W. (A)
Schwidetzky, W. H. (A)
Scott, J. E., Jr. (M)
Sessions, S. H. (M)
Shaw, L. L., Jr. (A)
Shear, H. J., Jr. (A)
Sherwood, R. M. (SM)
Silberman, R. T. (M)
Silva, B., Jr. (A)
Skillman, B. D. (M)
Small, B. I. (M)
Smith, W. R. (A)
Spilmer, B. H. (A)
Squibb, W. F. (VA)
Stephenson, R. G. (CM)
Steppler, R. V. (M)
Stewart, W. A. (A)
Stoeckert, E. D. (A)
Story, H. (M)
Strother, C., Jr. (A)
Sullivan, W. A., Jr. (A)
Tabler, J. G. (A)
Taylor, W. G. (M)
Thadnum, O. (A)
Thatcher, E. W. (SM)
Thiel, W. H. (M)
Thomas, J. J. (A)
Tibbals, L. (VA)
Tirrell, C. W. (M)
Trolese, L. G. (SM)
Trumbo, D. E. (A)
Tucker, J. A. (A)
Turner, P. M. (A)
Tyrrell, R. A. (A)
Ulloa, F. D. (A)
Van Caster, J. C. (A)
Van Horn, I. H. (M)
Velasco, J. W. (A)
Viles, F. L. (A)
Volberg, H. W. (A)
Wade, O. (A)
Wambsganss, B. (A)
Ward, D. M. (A)
Weisbrod, S. (A)
Wells, A. T. (A)
Wells, M. T. (M)
Wells, T. C. (A)
Wells, W. B. (VA)
Werner, H. C. (A)
Werner, H. C. (A)
Westerwick, R. A. (A)
Willard, F. H. (A)
Wilson, W. D. (A)
Winans, G. L. (A)
Wolff, H. G. (M)
Woodside, W. T. (A)
Yager, E. K. (M)
Zable, W. J. (A)
Zagon, A. R. (A)
Zimmerman, J. K. (A)
Zumkehr, J. L. (A)
Zuranski, R. C. (A)

San Fernando (LA-7)
Anderson, K. B. (A)
Bailey, C. C. (A)
Bauer, J. A. (A)
Carlson, D. G. (A)
Coltin, A. H. (A)
Duncan, J. R. (A)
Girouard, L. O., Jr. (A)
Graber, R. E. (M)
Griffith, C. D. (A)
La Petra, F. E. (A)
Moore, J. G. (A)
Richter, F. O. (A)
Robinett, D. B. (A)
Starr, I. M. (A)
Walters, L. G. (A)
Warne, V. J. (VA)
Woodbeck, R. J. (A)

San Francisco (SF-7)
Agins, B. R. (A)
Akerberg, E. D. (A)
Alley, W. D. (A)
Anderson, R. W. (M)
Baldwin, R. S. (VA)
Barger, F. A. (A)—APO
Beasley, W. A. (SM)
Beatrez, R. A. (A)
Berte, D. W. (A)
Bierman, C. W. (A)
Blasdel, F. G., Jr. (A)
Boatright, B. C. (M)
Bolstridge, L. J. (A)
Booth, G. H. (A)
Boss, L. J. (M)
Bourne, C. P. (A)
Bowie, R. L. (A)
Brace, F. R. (M)
Bradshaw, L. (A)
Bright, H. S. (SM)
Brinton, R. L. (SM)
Brown, R. L. (A)
Buhrman, H. M. (A)
Bundy, C. W. (SM)
Bush, L. A. (A)
Calvert, C. C. (A)
Carlson, H. J. (A)
Carnes, F. W. (M)
Chaffee, C. W. (A)
Chapman, G. H. (M)
Cheu, E. D. (SM)
Clark, B. L. (M)
Clarke, G. W. (A)
Conroy, C. L. (A)
Content, E. J. (SM)
Convery, T. J. (A)
Cooke, L. G. (M)
Cowden, R. C. (A)
Dale, J. D. (A)
Damonte, J. B. (A)
Danielson, E. G. (VA)
Darmento, J. (A)
Davidson, J. D. (A)
Davis, R. A. (A)
Davy, L. H. (A)
Dent, W. U. (A)
D'Evelyn, R. P. (A)
Dixon, F. C. (A)
Doty, J. C. (A)
Durakov, J. S. (A)
Dye, D. L. (A)
Dudley, J. A. (A)
Dunlap, H. B. (M)
Eachus, W. J. (A)
Elderkin, C. D. (A)
Faithorn, N. R. (M)
Fong, B. W. (A)
Franke, A. A., Jr. (A)
Freiermuth, V. J. (M)
Gallo, F. J. (A)
Galloway, R. E., Sr. (M)
Gapasin, F. G. (M)
Geary, J. T. (A)
Gee, H. W. (A)
Goldsmith, A. (M)
Graf, E. A. (A)
Greulich, H. J. (A)
Grzesik, J. (A)
Halstead, F. H., Jr. (A)
Hammett, R. L. (M)
Hankel, E. M. (A)
Hanscom, W. W. (SM)
Haus, R. (A)
Hauser, J. R. (A)
Hawkins, E. R., Jr. (A)
Hessler, W. G., Jr. (A)
Hicks, J. M. (A)
Hoag, D. S. (M)
Hoeflich, A. F. (A)
Hoffman, L. E. (A)
Hom, S. (A)
Houston, R. W. (A)
Hudson, J. C. (A)
Hughes, J. M. (A)
Hurlbut, G. N. (A)
Hussey, W. J. (VA)
Ingersoll, J. C. (A)
Jenkins, C. D., Jr. (A)
Johnston, J. G. (A)
Jolley, N. A. (A)
Jones, F. W. (A)
Jones, J. J. (A)
Kafafian, J. (M)
Kalb, H. N. (A)
Karp, P. W. (A)
Kaufman, A. W. (VA)
Kaufman, F. H. (A)
Kawai, W. T. (A)
Kees, A. A. (M)
Kelley, T. B. (A)
Kiyoi, G. T. (A)
Klein, A. L. (A)
Knight, L. J. (A)
Kochenderfer, W., Jr. (A)
Kotzum, J. (A)
Kramer, J. (VA)
Kurtz, S. K. (A)
Ladwig, H. A. (A)
Landells, J. H. (A)
Lasky, P. G. (A)
Lee, F. B. (A)
Lee, J. A. (A)
Lee, R. J. (A)
Lee, R. W. (A)
LeGrand, H. R. (A)
Leopold, J. M. (A)
Lewis, E. L. (A)
Liewald, V. R. (A)
Lippincott, D. K. (SM)
Little, W. A. (A)
Lucas, F. G. (A)
Lumsden, K. M. (A)
Lusted, L. B. (SM)
Mancuso, W. (A)
Manfroi, N. A. (A)
Markey, L. T., Jr. (A)
Marsh, W. A. (A)
Marshall, E. G. (M)
Marshall, E. L. (A)
Massoglia, F. P. (A)
McBride, W. J., Jr. (SM)
McCarley, H. H. (SM)
McCollough, E. C. (A)
McConnell, V. (A)
McCormish, W. J. (A)
McDade, J. J., Jr. (A)
McEwan, A. J. (A)
McFadden, R. R. (A)
McKay, H. B. (A)
McKinley, W. D. (A)
McMenomey, J. M. (M
McNeil, L. H. J. (A)
McQueeney, K. A. (A)
Meader, H. W. (A)
Melnicoe, S. A. (M)
Mercer, W. T. (A)
Miller, C. M. (M)
Modlin, C. J. (M)
Morrison, A. C. (VA)
Most, N. (M)
Moulin, H. J. (A)
Murphrey, J. G. (M)
Nawrocki, J. T. (A)
Newell, R. S. (A)
Newnan, H. L. (M)
Nikonenko, P. V. (M)
Notthoff, A. P., Jr. (A)
Nyberg, R. A. (A)
Nye, W. H. (M)
Oberg, E. A. (A)
Oberg, V. H. (A)
O'Neil, J. A. (A)
Pacher, F. A. (A)
Pallas, C. M. (A)
Parisky, R. N. (A)
Paull, J. O. (A)
Pette, D. C. (A)
Phillips, R. H. (M)
Pinkney, J. L. (A)
Pitta, G. G. (A)
Plotnikoff, G. P. (A)
Pryor, W. L., Jr. (SM)
Purvis, R. O. (A)
Ranks, J. E. (A)
Reiff, G. A. (A)
Rende, A. A. (A)
Richardson, A. S. (M)
Richardson, W. F. (A)
Ritter, F. O. (A)
Roach, F. L. (A)
Robertson, L. C. (A)
Rogers, R. N. (A)
Rostrom, R. W. (A)
Roth, I. (A)
Ryan, L. E. (M)
Saylor, R. A. (A)
Scrievers, B. J. (A)
Seelig, K. V. (A)
Sharman, H. M. (A)
Shaskey, E. N. (M)
Smith, A. W. (A)
Smith, S. B. (SM)
Stairs, W. F. (A)
Stand, T. R. (A)
Stevens, C. L. (A)
Stewart, J. (A)
Stortz, R. A. (A)
Svendsen, E. C. (A)
Tanaka, G. J. (A)

Tay, J. C. (A)
Terrill, F., Jr. (A)
Thille, R. W. (A)
Tognazzini, M. O. (A)
Ujifusa, R. L. (A)
Unsworth, R. G. (A)
Watz, N. P. (A)
Wenger, L. S. (SM)
West, J. P. (M)
Whalley, J. M. (A)
Wheeler, F. K. B. (A)
Whelan, F. X., Jr. (A)
Whitehead, E. A. (M)
Wholey, C. W. (A)
Williams, L. T. (A)
Williams, P. A. (VA)
Williams, T. G. (A)
Winbigler, W. K. (A)
Wislon, C. B. (A)
Wojcik, B. M. (M)
Wollenberg, H. A. (M)
Wong, H. F. (A)
Wong, W. E. (A)
Wood, E. P., Jr. (A)
Wood, G. V. (M)
Wood, J. F. (A)
Wood, R. J., Jr. (A)
Woodruff, R. L. (A)
Woolverton, R. B. (F)
Wright, O. (M)
Yanagihara, F. T. (A)
Zilles, F. (A)

San Gabriel (LA-7)
Alverson, J. G. (M)
Appel, R. M. (A)
Baird, H. S. (A)
Bowman, J. Y. (A)
Donner, W. (M)
Fesko, J., Jr. (A)
Fitzwater, W., Jr. (M)
Gardner, J. A. (A)
Hogg, J. E. (M)
Lincoln, C. C., Jr. (A)
Lindesmith, J. L. (A)
Nuban, E. (A)
Painchaud, P. A. (A)
Reilly, R. (A)
Spargo, P. W. (A)
Stevens, R. (SM)
Tanaka, R. I. (A)
Wahlstrom, G. (A)
Weaver, C. E. (VA)
Yee, A. W. (A)

Sanger (SF-7)
Jones, C. H. (A)

San Jose (SF-7)
Beaumont, J. O. (A)
Bixby, L. H., Jr. (A)
Bowdle, R. R. (A)
Bramley, N. V. (A)
Chao, S. C. (A)
Christopherson, W. A. (A)
Dinapoli, F. C. (A)
Dowling, R. H. (M)
Engwicht, H. (SM)
Ewing, A. E. (A)
Haanstra, J. W. (A)
Hagopian, J. J. (M)
Hancock, N. (A)
Hasen, J. E. (A)
Hurt, C. V. (A)
Isaacson, R. G. (A)
Jesse, E. (A)
Libby, L. L. (SM)
Luke, J. W. (A)
Martin, H. F. (A)
Mukai, M. (A)
McCullough, J. S. (M)
Perry, R. L. (M)
Quement, F. J. (VA)
Rambo, W. R. (SM)
Ross, H. C. (A)
Rothe, M. E., Jr. (A)
Stevens, L. D., Jr. (A)
Stuart, G. S. (A)
Townsend, C. K. (A)
Van Ess, J. C. (A)
Wood, F. B. (A)

San Leandro (SF-7)
Albrecht, J. F. (A)
Bidwell, H. H. (A)
Cerruti, B. A. (A)
Damron, S. S. (A)
Fenton, A. P. (A)
Holloman, C. J. (A)
Klessling, R. C. (A)
Silverman, B. P. (A)

San Lorenzo (SF-7)
Donahue, W. J. (A)
Maas, R. R. (A)
Winningstad, C. N. (A)

San Luis Obispo (LA-7)
Culbertson, J. T. (A)
Freshour, S. G. (A)
Lyman, R. P. (SM)
Radius, C. (SM)
Roney, E. L. (M)
Wolf, H. K. (M)
Wills, J. R. (A)

San Mareo (SF-7)
Jones, M. S. (M)

San Marino (SF-7)
Cahalan, E. T. (VA)
Crouch, C. A. (A)
Gauldin, C. B. (A)
Herbert, C. (SM)
Irwin, E. M. (A)
Mauritz, F. E. (M)
Nikirk, T. E. (VA)
Sanders, L., Jr. (A)
Shultz, E. P. (VA)
Whistler, J. P. (SM)

San Mateo (SF-7)
Andrews, C. A., Jr. (A)
Bartholomew, H. C. (A)
Berg, C. H. (A)
Chow, B. (M)
Demere, R. M., Jr. (A)
Downie, W. A. (M)
Erickson, L. G. (SM)
Haylock, F. B. (M)
Heaton, J. S. (A)
Heller, R. E. (A)
Janakos, N. (A)
Jaski, T. (A)
Jipp, J. (M)
Johnson, W. J., Jr. (A)
Line, G. D. (M)
Maninger, R. C. (M)
Maudens, L. C. (A)
Morrison, W. L., Jr. (A)
Newman, R. J. (A)
Oshima, K. (A)
Pitts, H. L. (SM)
Selsted, W. T. (SM)
Shaw, C. E. (A)
Smith, M. O. (A)
Stoddard, D. J., Jr. (A)
Sutherland, R. I. (A)
Taylor, E. D. (A)
Taylor, R. A. (A)
Zweifel, F. A. (M)

San Pablo
Molzahn, V. L. (A)
Tajima, G. K. (A)

San Pedro (LA-7)
Carlson, C. O. (A)
Ransom, D. H. (M)
Young, H. A. (SM)

San Rafael
Catania, C. J. (A)
Freeman, W. L. (A)
Matthews, D. W. (A)
Schaub, L. E. (A)
Wells, F. D. (A)

Santa Ana (LA-7)
Berger, L. L. (A)
Brown, C. S. (A)
Kosar, W. S., Jr. (A)
Levering, C. A. (VA)
McCandless, J. B. (M)
Newman, C. (A)
Persons, L. D. (A)
Porter, W. R. (A)
Sprague, Z. (A)

Santa Barbara (LA-7)
Benton, R. F. (A)
Brun, G. E. (A)
Dawley, R. L. (A)
Gardner, B. R. (A)
Johnson, S. F. (M)
Kingman, G. M. (M)
Maki, G. J. (SM)
McCaughna, J. R. (M)
McEuen, A. H. (A)
McWilliams, J. D. (A)
Pack, H. G. (A)
Paul, A. D. (M)
Pressley, J. H. (F)
Smith, D. S. (A)
Smith, H. W. (A)
Stout, D. (A)
Thomsen, P. H. (SM)
Whitacre, D. P., Sr. (M)

Santa Clara (SF-7)
Gonzalez, J. (A)
Nau, R. H. (SM)
Watson, K. J. (M)
Yagi, H. S. (A)

Santa Cruz (SF-7)
Jackson, C. L. (A)
Ottem, I. E. (A)
Wheeler, D. E. (A)

Santa Maria
Simas, F. O. (A)

Santa Monica (LA-7)
Ambler, F. E. (A)
Arsenault, W. R. (A)
Bachman, C. G. (A)
Bakst, A. A. (A)
Bertram, S. (SM)
Blumenthal, I. S. (A)
Bomeisler, R. E. (A)
Brubaker, J. W. (M)
Buckman, G. H. (A)
Butt, C. (M)
Carver, F. R. (SM)
Cary, L. W., III (A)
Combs, W. E. (A)
Cruse, P. M. (A)
DeLucia, E. V. (A)
D'Nelly, G. O. (A)
Doersam, P. D. (SM)
Eads, J. J., Jr. (A)
Eagan, J. A. (A)
Edison, E. (A)
Eisenstein, A. M. (A)
Erickson, R. L. (A)
Escher, P. H. (A)
Everest, F. A. (SM)
Exner, W. L. (A)
Fredericks, I. T. (A)
Freytag, R. C. (A)
Gage, B. M. (A)
Gardner, J. M. (A)
Georges, L. (A)
Gumbart, H. E. (A)
Hadlock, C. K. (A)
Herr, D. L. (SM)
Hierath, D. C. (M)
Karalukas, J. (A)
Kennedy, C. B. (A)
Kidd, A. T. (M)
Klinge, W. H. (A)
Koontz, D. E. (A)
Krantz, C. H. (VA)
Lalande, B. H., Jr. (A)
Lesser, J. (M)
Lutze, D. L. (A)
Lyons, L. H. (A)
MacDonald, I. T. (A)
Maloney, W. F. (A)
Margolis, M. (A)
McKenna, Q. C. (A)
Melara, J. D. (A)
Michaud, R. E. (A)
Mikkelson, M. E. (A)
Morrow, J. E. (M)
Naef, C. A. (A)
Neidefter, C. R. (A)
Plew, H. E., Jr. (A)
Quandt, R. L. (A)
Quavraux, H. F. (A)
Rauschkolb, A. J. (A)
Raymond, R. C. (SM)
Reese, R. F. (SM)
Rosenberg, M. (A)
Rumer, W. I. (A)
Ryland, M. E. (A)
Salzer, J. M. (A)
Smith, J. E. (A)
Snow, W. B. (SM)
Somers, R. J. (A)
Stafford, R. M. (A)
Steenson, B. O. (A)
Stineman, V. E. (M)
Tate, W. R. (A)
Tatum, F. A. (A)
Trumpy, J. W. (A)
Uncapher, K. W. (A)
Vitek, W. J. (A)
Ware, W. H. (SM)
Wehner, R. S. (M)
Whitaker, J. N. (SM)
Wilson, D. W. (M)
Wilson, K. M. (A)

Santa Paula (LA-7)
Merrill, H. M. (VA)
Sharp, J. M. (VA)
Wymore, R. H. (A)

Santa Rosa (SF-7)
Kruse, C. J. (A)
Merrill, G. E. (A)
Penniwell, A. F. (A)
White, M. E. (A)

Santee (SD-7)
Freedman, S. (SM)

Saratoga (SF-7)
Brolly, A. H. (SM)
Nettesheim, H. P. (A)
Stone, A. H. (A)
Stoner, F. E. (SM)

Saugus
Weinstein, E. M. (A)

Seal Beach (LA-7)
Grieve, W. R. (A)

Seaside
Hammond, G. C. (A)
Monson, D. J. (M)

Sepulveda (LA-7)
Corey, E. J. (A)
Hughes, E. L. (A)
Olson, C. P., Jr. (M)
Rigg, G. L. (SM)
Thompson, T. H., Jr. (A)

Sherman Oaks (LA-7)
Bezera, G. (A)
Caldwell, W. D. (A)
Cartheuser, W. (A)
Crownover, J. W. (A)
Dean, J. P. (A)
Epstein, S. (A)
Fields, L. (A)
Foote, S. H. (A)
Gehlke, E. C. (A)
Knudson, J. A. (A)
Loeber, N. C. (A)
Margerum, D. L. (A)
Monderer, B. A. (M)
Monroe, J. C. (A)
Morrissey, D. J. (A)
Pratt, A. (SM)
Russell, D. C. (M)
Rutland, D. F. (A)
Schinazi, B. N. (A)
Silverstein, M. M. (A)
Wiggins, G. P. (A)
Zeuschner, R. F. (A)

Sierra Madre (LA-7)
Dowling, K. T. (A)
Hall, F. W. (SM)
Phillips, E. V. (A)
Ruth, L. C. (M)
Sheriff, D. R. (M)
Siegmeth, A. J. (M)
Timothy, K. O. (A)

Solana Beach (SD-7)
Pederson, H. T. (A)

Somis (LA-7)
Beymer, E. H. (A)
Harvey, J. P. (A)

South Arcadia
Montgomery, D. N. (A)

South Gate (LA-7)
Dickinson, H. (A)
Dreessen, W. B. (A)
Gilliam, C. E. (A)
Steiner, F. W. (A)
Sward, W. O. (A)
Zeoli, G. W. (A)

South Palo Alto (SF-7)
Beaver, W. L. (A)
Huynen, J. R. (M)

South Pasadena (LA-7)
Bartel, W. B. (A)
Bishop, J. F. (A)
Franklin, P. G. (A)
Gardner, F. M. (A)
Nelson, K. L. (A)
Reedy, P. H. (VA)
Schauweeker, H. E. (A)
Schwarzmann, W. A. (A)
Shrock, J. B. (SM)
Stott, R. F. (A)
Tryzna, T. S. (A)
Wood, W. S. (A)

South San Francisco (SF-7)
Broekemeier, A. E. (A)
Mainland, R. (A)
Reece, O. A. (A)
Tripp, A. L. (M)
Whitney, W. L. (A)
Wood, R. W. (A)

South Whittier (LA-7)
Rousey, W. A. (A)

Stanford (SF-7)
Arfin, B. (A)
Abraham, R. P. (A)
Ash, E. C. (A)
Barnard, G. A. (M)
Barnes, C. W., Jr. (A)
Benedict, D. L. (SM)
Blanchard, H. P. (M)
Buss, R. R. (SM)
Carter, P. S., Jr. (A)
Caryotakis, G. (A)
Chang, N. C. (A)
Chodorow, M. (SM)
Christie, J. W. (A)
Clarke, L. G. (A)
Cohn, S. B. (SM)
Craig, R. A. (A)
Doll, E. B. (SM)
Dunn, D. A. (A)
Durfey, G. K. (A)
Edson, W. A. (SM)
Eldredge, K. R. (SM)
Evans, W. E., Jr. (A)
Gallagher, J. J. (A)
Gallagher, P. B. (A)
Gamson, E. R. (A)
Goldfarb, E. M. (A)
Grace, D. J. (A)
Hammond, S. B. (A)
Harman, W. W. (SM)
Harris, D. B. (SM)
Helliwell, R. A. (SM)
Henderson, K. W. (A)
Hobson, J. E. (M)
Hom, F. M. (SM)
Honey, J. F. (SM)
Hoover, W. G. (A)
Jasberg, J. H. (A)
Jones, E. M. T. (A)
Kaisel, S. F. (SM)
Kamphoefner, F. J. (SM)
Kautz, W. H. (A)
Kincheloe, W. R., Jr. (A)
Kino, G. S. (A)
Kohl, W. H. (SM)
Leadabrand, R. L. (A)
Lebacqz, J. V. (M)
Long, R. A. (A)
Lynch, W. M. (M)
Manning, L. A. (A)
McWhorter, M. M. (A)
Melville, R. W. (M)
Moll, K. D. (A)
Moore, E. J. (SM)
Morita, T. (A)
Morrin, T. H. (M)
Nalos, E. J. (SM)
Narud, J. A. (A)
Pettit, J. M. (SM)
Putz, J. L. (A)
Rice, P. J., Jr. (SM)
Ross, J. M. (A)
Ruetz, J. A. (A)
Rynn, N. (SM)
Seidmore, D. L. (M)
Sonkin, S. (M)
Spangenberg, K. (F)
Steinberg, E. B. (SM)
Susskind, C. (M)
Tai, C. T. (SM)
Tanner, R. L. (A)
Taylor, J. (A)
Terman, F. E. (F)
Trorey, A. W. (A)
Turner, F. M. (A)
Tuttle, D. F., Jr. (M)
Van Biene, F. K. (A)
Varenhorst, V. D. (A)
Waterman, A. T., Jr. (A)
Watkins, D. A. (A)
Weaver, D. K., Jr. (A)
Wernli, J. M. (A)
Whitby, O. (SM)
Wightman, B. A. (A)
Wright, M. (A)

Stockton (SAC-7)
Anson, C. T. (VA)
Echandi, J. (A)
Fegan, A. A. (A)
Greene, M. B. (A)
Herriman, T. D. (A)
Matsuo, D. T. (A)
Welch, H. E. (A)

Studio City (LA-7)
Blasi, E. A. (SM)
Rutkin, B. B. (A)
Smith, W. W. (A)

Sunland
Chernof, J., Jr. (A)
Fielding, B. L. (M)
Gehlke, D. A. (SM)

Sunnyvale (SF-7)
Acker, A. E. (A)
Andrews, C. A. (A)
Case, M. D. (VA)
Conner, C. C. (A)
Gallichotte, J. H. (A)
Goldsborough, R. R., Jr. (M)
Hansen, H. W., Jr. (A)
Hartke, D. C. (A)
Hjestand, N. P. (A)
Kean, D. W. (A)
Snider, D. A. (A)

Sunset Beach
Sadler, E. J. (A)

Sun Valley (LA-7)
Buie, J. L. (A)
Gold, C. H. (A)
Peterson, M. C. (A)
Sisson, A. R. (A)

Taft
Neill, W. J. (A)

Tarzana (LA-7)
Borders, J. B. (A)
Brown, N. M., Jr. (A)
Dickinson, G. R. (M)
Eliason, M. C. (SM)
Ellison, M., Jr. (A)
Favors, H. A. (A)
Green, R. D. (A)
Rhoad, E. J. (M)
Welch, W. E. (M)
Williams, M. A. (SM)

Temple City (LA-7)
Armagost, H. C. (VA)
Chaney, J. F. (A)
Harrison, A. E. (A)
Heffner, E. K. (A)
Kling, W. R. (A)
Nasiruddin (A)
Roberts, R. E. (A)

Thousand Oaks
Kalemkarian, G. (A)
Schnert, P. J. (A)

Torrance (LA-7)
Brewer, J. W. (A)
Busuttil, H. L. (A)
Coy, L. H., Jr. (A)

Eckdahl, D. E. (A)
Golightly, R. T. (A)
Hudspeth, T. (A)
Lambert, J. M. (A)
Laverty, N. P. (M)
Meng, E. D. (A)
Norris, R. M. (A)
Oliver, J. R. (M)
Rovenstine, J. A. (A)
Sanders, R. C. (A)
Sprague, R. E. (A)
Stephenson, R. O. (A)

Tujunga
Holmes, L. O. (A)
Kreuder, N. L. (A)

Turlock (SAC-7)
Jorge, C. D. (A)

Tustin (LA-7)
Becker, D. R. (A)

Twenty Nine Palms (LA-7)
Roble, A. R. (A)

Upland (LA-7)
Agerholm, M. (M)
Hempy, R. L. (M)
Kimball, J. L. (A)
Penland, C. L. (A)
Takenaka, G. (M)
Taylor, A. D. (A)

Vallejo (SF-7)
Angst, D. C. (A)
Ballieu, H. L. (A)
Bougher, W. G. (A)
Bril, D. H. (A)
Clemens, G. W., Jr. (A)
Ekstrand, P. A. (SM)
Frosolone, A. (A)
Fuller, G. R. (A)
Hanley, R. J. (A)
Mann, F. E. (M)
Murray, J. L. (A)
O'Bryan, R. L. (A)
Quick, T. C. (A)
Timmerman, H. A. (A)
Traver, J. W. (A)
Zech, A. W. (A)

Valley Center
Ketchum, D. L. (A)

Van Nuys (LA-7)
Anderson, G. R. (M)
Bernds, E. L. (A)
Bettencourt, V. S. (A)
Blancher, D. W. (A)
Boyd, J. C. (A)
Brunner, R. H. (M)
Cain, J. A. (A)
Carter, S. T. (A)
Cohen, J. E. (A)
Crowther, E. E. (A)
Dadant, P. M. (A)
Dinning, J. R. (A)
Fredman, N. E. (A)
Gallenson, L. (A)
Gaunt, R. P. (M)
Giesecke, G. R. (A)
Gion, J. A. (A)
Goodwin, J. W. (A)
Green, A. P. (A)
Hammond, J. R. (A)
Hussey, J. G. (M)
Jacobson, S. (A)
Johnson, R. D. (A)
Jones, A. C. (A)
Kahn, F. (A)
Kesselman, M. S. (A)
Kettler, R. F., Jr. (A)
Klecker, G. J. (A)
Klemens, W. P. (A)
Kroll, W. (A)
Lacy, R. R. W. (M)
Lesch, S. (M)
Lester, P. S. (A)
Lofquist, D. J. (A)
Loretz, N. F. (A)
Lovick, E., Jr. (A)
Lyon, R. E. (A)
Mallach, L. W. (SM)
Marshall, R. W. (A)
Martin, W. L. (A)
Marygold, G. E. (A)
McClanahan, R. T. (M)
McNabb, J. W. (A)
Merrill, D. H. (A)
Miller, C. E. (SM)
Morgan, R. L. (M)
Morris, G. H. (A)
Murray, R. E. (A)
Nelson, R. M. (A)
Nibbe, G. H. (SM)
Olsefsky, C. C. (A)
Paller, J. L. (A)
Pangborn, H. W. (SM)
Parker, W. H., Jr. (SM)
Peterson, R. W. (A)
Radmacher, D. S. (M)
Randolph, R. C. (A)
Rodgers, J. L. (A)
Rosen, H. A. (A)
Ross, W. J. (A)
Russo, R. (A)
Sherwood, D. M. (SM)
Smith, G. W. (A)
Smith, J. C. (A)
Stewart, C. O. (A)
Sutton, W. R. (A)
Tasker, R. (A)
Urman, B. S. (M)
Wald, K. A. (A)
Whitlock, J. R. (A)
Whitman, K. C. (A)
Williams, W. E. (M)
Wilson, R. A. (A)
Wolman, L. L. (A)
Wood, D. O. (A)
Woodbury, E. J. (A)
Wythe, D. H., Jr. (A)

Venice (LA-7)
Bonney, L. A. (A)
Canning, R. G. (M)
Capps, J. W. (A)
Cochran, K. W. (A)
Cowart, B. E. (A)
Day, R. A. (A)
DeLey, E. (A)
Diamond, P. (M)
Drummond, E. J. (A)
Ehrlich, M. J. (SM)
Evans, W. T. (M)
Graham, J. M., Jr. (A)
Gunning, W. F. (A)
Hunter, W. T. (A)
Johnson, G. (A)
Johnson, H. R. (A)
Kinaga, T. (A)
Kiser, K. W. (A)
Landis, R. I. (A)
Lewi, J. B. (A)
Love, E. E. (A)
Potter, N. A., Jr. (A)
Robbins, W. M., Jr. (A)
Ruderman, M. (A)
Russell, G. M. (M)
Steenson, B. O. (A)
Stuver, H. J. (A)
Tufts, R. M. (A)
Wilkinson, J. H. (A)
Wilson, T. A. (M)

Ventura (LA-7)
Arnold, W. F. (M)
Baugh, H. W. (A)
Bernhardt, E. C. (A)
Crippen, C. E. (SM)
Dame, R. O. (A)
Koehler, E. C. (A)
MacDonald, W. L. (A)
Pruett, J. W. (A)
White, R. F. (A)

Victorville
Grace, E. H., Jr. (A)
Sample, D. R. (A)
White, J. L. (A)

Visalia (SF-7)
Tanner, T. B. (A)

Vista
Albert, S. L. (A)

Walnut Creek (SF-7)
Chase, R. C. (A)
Cooper, R. D. (A)
Dale, P. R. (A)
Eukel, W. W. (A)
Hansen, H. M. (M)
Mitchell, J. R. (A)
Payne, H. B. (A)
Thomas, R. E. (A)

Weaverville
Mosley, R. B. (A)
Snyder, W. G. (A)

Westchester
Seufert, F. J., Jr. (A)
Stanton, R. S. (VA)

West Covina (LA-7)
Arford, F. W. (A)
Barker, R. D. (M)
Dickey, R. G. (A)
Homer, C. W. (A)
Hurley, R. B. (A)
Jacobs, H. M. (A)
Kemp, G. H. (A)
Kempf, W. F., Jr. (A)
Ming, D. L. (A)
Quackenbush, R. E. (A)
Ross, H. H., Jr. (A)
Smith, R. A. (A)
Stoehr, W. F. (M)
Stone, R. E. (A)

West Los Angeles (LA-7)
Ambrosio, B. F. (A)
Carson, D. G. (A)
Gordon, G. (A)
Gray, J. B. (SM)
Lewis, D. E. (A)
Loy, Y. S. (A)
Mizell, M. H. (A)
Mullin, J. T. (M)
Perry, C. S. (A)
Scoffone, R. G. (A)
Wright, E. C. (M)

Westmorland (SF-7)
Austin, H. B. (M)
Scharrer, R. G. (A)
Stout, D. L. (M)

Westwood Village (LA-7)
Fleischmann, F. A. (A)

Whittier (LA-7)
Abbott, W. R. (SM)
Amendt, L. E. (A)
Antista, B. A. (A)
Armstrong, A. B. (A)
Armstrong, A. C. (A)
Barnett, R. S. (M)
Bell, H. A. (A)
Brainin, S. M. (M)
Campbell, A. T. (M)
Carlson, R. S. (A)
Conly, E. R. (A)
Correa, F. (A)
Davenport, C. M. (M)
Davidson, E. D. (A)
Del Duca, A. (A)
Downey, W. F. (A)
Elbinger, B. (A)
Falls, M. P. (SM)
Fischer, J. J. (A)
Geiger, R. F. (A)
Gow, K. P. (A)
Hall, C. R. (A)
Harriman, D. E., Jr. (A)
Hobbs, W. D., Jr. (A)
Holmes, E. A. (SM)
Ingersoll, E. R. (A)
Jackson, M. O. (A)
Joerger, J. C. (A)
Keifer, L. F., Jr. (A)
Kent, S. S. (A)
Kleinhofer, B. A. (SM)
Klepinger, L. H. (M)
Kounalis, L. E. (M)
Krausz, A. (SM)
Kreider, P. A. (A)
Lockhart, E. H. (A)
Long, F. R. (A)
Marsh, J. A. (SM)
Martin, P. W. (A)
McClellan, D. H. (A)
McCoy, R. N. (A)
Meigs, V. C. (A)
Moody, R. E. (A)
Morgan, M. L. (A)
Noe, L. B. (A)
O'Brien, E. J. (SM)
Parker, N. F. (A)
Polder, J. H. (A)
Prather, R. D. (A)
Randall, G. M. (A)
Savant, C. A. (A)
Savant, C. J., Jr. (A)
Sawyer, H. F. (A)
Schmidt, F. W. (SM)
Shutt, S. G. (A)
Smith, L. C. (A)
Smith, R. B. (A)
Starkey, D. J. (A)
Stoney, W. E. (A)
Thomas, E. E. (A)
Triman, E. L. (M)
Vorie, I. N. (VA)
Wanlass, C. L. (A)
White, L. M. (A)
Wolking, D. H. (A)
Yetter, W. P. (A)
Zoller, C. J. (A)

Wilmington
Ahrens, G. W. (M)
Harris, H. M. (A)

Woodland (SAC-7)
Burrow, W. B. (A)

Woodland Hills (LA-7)
Berman, H. (A)
Corduan, A. E. (A)
Ellis, J. W., Jr. (A)
Jamieson, H. W. (SM)
Mann, D. O. (A)
Moore, J. A. (A)
Morgan, H. C. (A)
Ottinger, D. P., Jr. (A)
Perry, R. E. (A)
Sandberg, H. L. (M)
Schroeter, R. G. (A)
Scott, L. W. (M)
Towle, R. W. (M)

Woodside (SF-7)
Dawson, P. F. (A)
Eitel, W. W. (SM)
Paul, R. S. (A)
Rock, A. J. (A)
Ryland, B. G. (M)
Smith, H. W., Jr. (A)

COLORADO

Arvada
Murahata, S. (A)
Sargent, R. E. (A)
Spano, A. J. (A)

Black Hawk (DEN-5)
Gutierrez, M. (A)

Boulder (DEN-5)
Ahlbeck, W. H. (A)
Applegate, C. J. (A)
Axtell, J. C. (A)
Barclay, C. (A)
Barghausen, A. F., Jr. (A)
Barsis, A. P. (M)
Bitter, C. R., Jr. (A)
Carlin, P. W. (A)
Decker, M. T. (A)
De Gregorio, J. F. (A)
Dougherty, H. T. (A)
Estin, A. J. (A)
Freudenberg, H. O. (A)
Fulton, F. F., Jr. (A)
Goerke, V. H. (M)
Herbstreit, J. W. (SM)
Hornberg, K. O. (SM)
Hubbard, R. W. (A)
Janes, H. B. (M)
Johnson, D. S., Jr. (A)
Johnson, E. E. (A)
Jones, R. N. (A)
Kirby, R. S. (M)
Krueger, R. E. (M)
Maloney, L. J. (A)
Miller, H. L. (A)
Norton, K. A. (F)
Ostrow, S. M. (SM)
Phelps, F. P. (A)
Rice, P. L. (M)
Stutz, R. J. (A)
Stacey, D. S. (SM)
Thompson, H. A. (A)
Wells, P. I. (A)
Worcester, W. G. (A)

Colorado Springs (DEN-5)
Ashby, G. L. (M)
Behnke, A. O. (SM)
Evans, R. E. (A)
Holmgren, W. A. (A)
Lanxon, R. C. (A)
Liggans, C. E. (A)
McGavin, R. E. (A)
Ness, G. L. (A)
Peterson, C. F. (M)
Russell, J. D. (M)
Victoreen, J. A. (SM)
Zinky, W. R. (A)

Delta (DEN-5)
Pace, R. A. (M)

Denver (DEN-5)
Abelow, I. L. (A)
Bedford, S., Jr. (A)
Bishop, H. L., Jr. (M)
Blankenship, L. F. (M)
Bliss, W. R. (M)
Bowen, R. G. (M)
Broders, E. L. (A)
Bromberger, B. B. (A)
Butts, J. H. (A)
Coombs, V. C. (SM)
Cruse, A. W. (SM)
Cullen, J. G. (A)
Deutsch, K. T. (M)
DeZonia, W. J. (M)
Drummond, F. A. (A)
Dunn, L. J. (A)
Ekrem, T. C. (A)
Fingado, F. H. (M)
Fleming, C. W. (A)
Forsman, E. H. (M)
Fraser, R. L. (A)
Fuqua, C. (M)
Garretson, H. W. (A)
Grace, J. R. (SM)
Hathaway, C. M. (SM)
Hedberg, C. A. (SM)
Jestice, A. L. (A)
Johnson, H. S. (A)
Kirkpatrick, R. L. (A)
Knight, S. J., Jr. (A)
McAdam, W. W. K. (SM)
McLoud, W. C. (M)
Meyer, D. E., Jr. (A)
Miles, C. W. (A)
Morrissey, T. G. (SM)
Morroni, D. J. (A)
Mrazek, D. A. (A)
Mueller, A. G. (A)
Olson, C. G. (A)
Peterson, S. B. (M)
Petterson, W. N. (M)
Post, E. A. (SM)
Potter, W. D. (A)
Pyle, J. C. (A)
Raper, A. J. (A)
Reno, H. (A)
Rhoden, V. C., Jr. (A)
Robertson, A. L. (A)
Robinson, M. E. (A)
Sakaguchi, H. K. (A)
Sharp, H. (A)
Shreive, T. S. (M)
Smilley, J. D. (A)
Smith, W. F., Jr. (A)
Stewart, M. J. (A)
Stiefel, K. E. (A)
Swanson, R. E. (M)
Timpte, C. C. (A)
Todd, F. J. (M)
Transue, J. A. (A)
Vislisel, R. L. (A)
Wallack, C. A. (M)
Wang, C. S. (A)
Webb, R. C. (M)
Whipple, R. C. (A)
Willard, J. H. (A)
Williams, A. L., Jr. (M)

Engelwood (DEN-5)
Blanchard, R. R. (M)
Cobbs, D. M. (M)
Globe, R. W. (A)
Johler, J. R. (A)
Kemper, J. A. (A)
Reaser, R. R. (A)
Thaxton, H. A. (A)

Estes Park (DEN-5)
Shideler, E. M. (SM)

Flagler (DEN-5)
Howe, G. A. (A)

Fort Collins (DEN-5)
Bottom, V. E. (M)
Britton, C. C. (A)
Dean, J. E. (M)

Fort Morgan
Lum, H. E. (A)
Zambo, J. E. (A)

Grand Junction (DEN-5)
McCormick, C. E. (A)

Golden (DEN-5)
Fletcher, H. E. (SM)

Kit Carson
Zimmerman, A. A. (A)

Lakewood (DEN-5)
Rinker, E. A. (A)

Littleton (DEN-5)
Eagon, D. G. (A)
Stewart, S. J. (A)

Loveland
Kelley, E. K. (SM)

Pueblo (DEN-5)
George, J. E. (A)
Middleton, D. S. (M)
Uffelman, K. F. (A)

Salida (DEN-5)
James, V. N. (SM)
Sachs, J. (A)

Sedalia (DEN-5)
Carter, F. W. (A)

Trinidad
Walker, W. G. (A)

Wellington (INY-7)
Evans, W. O. (A)

Wheatridge (DEN-5)
Clyne, W. E. (SM)

CONNECTICUT

Ansonia (CV-1)
Fitzpatrick, J. J. (A)

Berlen
Dickon, A. J. (A)

Bethel (CV-1)
Beschle, R. G. (A)
Pearlman, L. S. (M)
Warner, F. C. (M)

Bethlehem (CV-1)
Van Lieshout, L. J. A. (SM)

Bloomfield (CV-1)
Lowderback, C. J. (M)
Whitney, D. J. (A)

Branford
Anderson, R. A. (A)
Nettleton, E. L. (A)

Bridgeport (CV-1)
Bruntil, I. M. (M)
Gilchrist, E. S. (A)
Hartman, R. B. (A)
Held, R. W. (A)
Koscor, J. H. (A)

Lapinski, C. S. (A)
Merryman, P. (SM)
Mike, J. G. (A)
Mikusky, C. J. (A)
Milliken, B. J. (A)
Nye, D. D. (A)
Paradise, R. Y. (A)
Pensiero, L. R. (A)
Ragonese, F. L. (A)
Rescoe, J. M. (A)
Rosenberg, H. A. (A)
Saslovsky, S. (A)
Stanio, D. D. (A)
Stanley, P. F. (A)
Warren, R. E. (A)
Zahn, E. (A)

Bristol (CV-1)
Hildebrandt, W. J. (A)
Jones, M. C. (A)
Nelson, A. B. (SM)
Scherff, L. S. (M)
Vaughan, E. W. (SM)
Williams, J. J. (A)

Brookfield
Gordon, T. M., Jr. (A)
McFee, R. (A)

Brooklyn (CV-1)
Halford, J. H. (M)
Vroom, E. (XM)

Byram (CV-1)
Marchand, N. (SM)

Cheshire (CV-1)
Hoffman, G. O. (A)
Johnston, J. E. (A)
Thomas, A. R. (A)

Chestnut Hill (CV-1)
Munson, B. (A)

Clinton
Passera, A. L. (A)

Danbury (CV-1)
Arendt, E. J. (A)
Bendz, W. I. (M)
Boesch, A. H. (A)
Brannian, W. R. (A)
Campbell, C. A. (M)
Concelman, C. W. (A)
Elias, L. G. (SM)
Henry, E. A. (M)
Johns, N. H. (A)
McClure, C. G. (A)
Minton, W. C. (A)
Moran, J. H. (A)
Olha, W. R. (A)
Rowley, W. E. (A)
Van Valkenburg, H. E. (A)
Webb, R. H. (A)

Darien (CV-1)
Ghirardi, A. A. (SM)
Jacobson, L. (A)
Liston, M. D. (A)
Mac Gregor, R. R. (A)
McElrath, G. (SM)
Mills, C. A. (M)
Moffat, W. H. (SM)
Smith, P. B. (A)
Sattem, I. (A)
Starr, J. O. (M)
Stephanz, G. H. (A)

Derby (CV-1)
Riccio, L. A. (A)

East Hampton (CV-1)
Wilkes, R. C. (A)

East Hartford (CV-1)
Aas, H. G. (A)
Acker, A. E. (A)
Feinstein, H. (A)
Hollister, A. R. (A)
Honeck, H. C. (A)
Wadsworth, G. B., Jr. (A)

East Haven
Clinton, H. H. (A)

East Norwalk (CV-1)
Byington, R. E. (A)
Henrich, W. H. (M)
Randmer, J. A. (SM)
Warner, E. J. (A)

Easton (CV-1)
Cummings, C. S. II (A)

Fairfield (CV-1)
Autouri, V. A. (M)
Baron, R. G. (A)
Bishop, N. (SM)
Di Mattia, A. L. (A)
Hutchinson, F. B. (A)
Paneyko, M. (A)
Roper, C. G. (A)

Glastonbury (CV-1)
Perry, T. (A)
Russell, A. A. (A)
Swain, R. S. (A)
Waterman, A. (M)
Winkler, V. D. (A)

Granby
Hodson, J. S. (A)

Greenwich (CV-1)
Anderson, W. C. (VA)
Barrett, E. T. (M)
Burroughs, G. S. (VA)
Coleman, J. V. (A)
Evans, T. P. (SM)
Otis, A. N., Jr. (A)
Williams, J. B., Jr. (A)

Groton (CV-1)
Blaisdell, K. L. (SM)
Cominsky, J. M. (A)
Cottone, C. V. (A)
Hagland, B. R. (A)
Herrera, J. C. (A)
Jennings, J. L. (A)
Malinguaggio, P. (A)
Melancon, L. (A)
Miller, K. K. (M)
Murphy, R. E., Jr. (A)
Powell, J. L., Jr. (A)
Schaechter, S. (A)
Weatherlow, H. R. (A)

Guilford (CV-1)
Fisker, E. H. (A)
Kelsey, P. C. (M)
Von Winkle, W. A. (A)

Hamden (CV-1)
Dun Klee, W. F. (M)
Etter, H. H. (A)
Hewitt, C. D. (A)
Hovey, D. P. (A)
Hubelbank, S. H. (A)
King, F. T. (A)
Lyons, W. J., Jr. (A)
McNamara, F. T. (A)
Meier, A. S. (A)
Quackenbush, E. C. (A)
Salaman, R. G., Jr. (A)
Schoor, M. G. (A)
Smoko, J. F. (A)
Stancliff, V. A. (A)

Hartford (CV-1)
Bourret, C. J. (A)
Britton, R. C. (A)
Broderick, H. M. (A)
Capasso, G. F. (A)
Doolittle, F. M. (SM)
French, E. C. (VA)
Galin, J. L. (A)
Latina, M. S. (A)
Lee, J. H. (A)
Moffitt, G. R., Jr. (A)
Moses, S. (A)
Piskor, J. (A)
Roth, W. (A)
Shor, N. (M)
Vadersen, C. W. (M)
Waffle, W. M. (M)
Woodward, R. W. (SM)
Zaslow, J. (A)

Hazardville (CU-1)
Peck, W. C. (M)

Jewett City (CV-1)
Rawicz, L. (LA)

Kensington
Sokoloski, J. T. (A)

Lebanon
Smith, A. G. (A)

Lyme
Owens, J. E. (A)

Madison (CV-1)
Burch, J. E., Jr. (A)
Hanson, N. L. (A)

Manchester (CV-1)
Anton, R. F. (A)
Azinger, R. P. (A)
Baker, R. G. (A)
Britton, R. C. (A)
Cronin, C. E. (A)
Dean, C. M. (A)
Stanek, W. F. (A)
Turek, R. F. (A)
Winlund, E. S. (M)

Meriden (CV-1)
Lavin, H. (A)
Nowakoski, D. B. (A)
Rettenmeyer, P. F. (A)

Middlefield
Aleks, E. J. (A)

Middletown (CV-1)
Cannata, A. L. (A)
Heinzmann, J. D. (A)
Holley, J. S. (A)
Snow, C. A., Jr. (A)
Thompson, L. (SM)
Tuccio, M. S. (A)
Van Dyke, K. S. (F)

Milford (CV-1)
Baldwin, A. L., Jr. (A)
Cohen, H. P. (A)
Conger, W. H. (A)
Lyman, H. T. (SM)
Morling, T. W. (A)
Roberts, T. E., Jr. (A)
Seadale, S. A. (A)
Willing, H. A. (A)

Milldale
Fontana, J. A. (A)

Monroe (CV-1)
Engelberger, J. K. (A)

Mystic (CV-1)
Atwood, W. A., Jr. (A)
Bassett, J. E. (A)
Goldman, M. (A)
Merritt, N. A. (A)

New Britain
Martin, H. E. (A)

New Canaan (CV-1)
Bancroft, C. (A)
Canepa, M. (A)
Castle, D. H. (SM)
Conron, W. H. (SM)
Gray, J. L. (A)
Hamme, R. D. (A)
Offenhauser, W. H., Jr. (A)
Pichert, J. (A)
Waldron, T. J. (A)

New Haven (CV-1)
Abbatiello, J. M. (A)
Baltrush, J. J. (A)
Barker, R. C. (A)
Bergmann, H. M. (A)
Black, D. G. (M)
Bloom, T. (A)
Breit, G. (F)
Cannon, J. F. (M)
Conrad, A. G. (SM)
Cunningham, W. J. (M)
Curtis, R. C. (SM)
Gage, R. T. (A)
Genera, V. A. (A)
Giangarra, B. J. (A)
Giangarra, L. A. (A)
Gibson, J. E. (A)
Grew, L. B. (SM)
Heller, J. H. (A)
Izenour, G. C. (M)
Jackson, R. W. (M)
Jacobson, E. R. (A)
Kamens, B. R. (M)
Kelly, H. S. (A)
Krauss, H. L. (SM)
MacDonald, K. J. (A)
Mauro, A. (A)
May, J. C. (M)
Millard, A. M. (SM)
Oestreicher, D. L. (A)
Ordung, P. F. (SM)
Pagano, E. L. (A)
Popylisen, D. J. (A)
Pottle, C. (A)
Reich, H. J. (F)
Rodgers, P. W. (A)
Rohloff, H. E. (M)
Ross, D. A. (A)
Rowland, L. (A)
Rubin, H. B. (VA)
Schultheiss, P. M. (A)
Shank, R. R. (A)
Sherman, E. W. (A)
Skalnik, J. G. (A)
Sundius, H. W. (SM)
Temple, L. M. (SM)
Thomas, L. E., Jr. (A)
Turner, H. M. (F)
Tuteur, F. B. (A)
Wakeman, C. B. (A)
Wogrin, C. A. (A)

Newington (CV-1)
Bliss, P. (M)
Davidson, D. D. (A)
Marchese, J. H. (A)
Witkowski, A. J., Jr. (A)

New London (CV-1)
Adams, W. S., Jr. (A)
Bangs, G. A. (A)
Barry, C. J. (A)
Bass, S. (A)
Berg, R. A. (M)
Bishop, H. M. (A)
Bonwit, K. S. (A)
Brace, L. H. (A)
Cohen, M. H. (A)
Corkran, R. L., Jr. (A)
Duker, J. M. (A)
Fahy, E. J. (A)
Fournier, R. V. (A)
Fucci, S. (A)
Glaser, W. A. (A)
Haefner, S. J. (VA)
Halabi, T. (A)
Hazard, W. R. (A)
Heindsmann, T. E. (M)
Herchenreder, H. (A)
Hoag, J. B. (SM)
Horton, J. W. (F)
Ide, J. M. (SM)
Jellerson, F. R. (A)
Kroenert, J. T. (SM)
Loda, C. J. (SM)
Merrill, J. (M)
Norris, C. B. (A)
Olson, C. L. (A)
Pfautz, C. E. (A)
Pollak, D. (SM)
Rager, G. T. (A)
Rubega, R. (A)
Sando, J. R. (A)
Schulkin, M. (A)
Smith, B. M. (A)
Sussman, H. (SM)
Terkanian, H. (A)
Turner, R. W. (A)
Videberg, J. (A)
Weissberg, E. (A)
White, C. E. (M)
White, D. M. (A)
Wilkens, W. B. (SM)
Wilms, H. J., Jr. (A)

Newton
Geary, L. W. F. (A)

Newtown (CV-1)
Hoag, O. (SM)

Niantic (CV-1)
Leuze, W. F. (A)
Pearson, C. A. (M)
Mason, J. B. (A)
Versoy, I. R., Jr. (A)

Noroton (CV-1)
Mason, H. L. (A)
Tisdale, G. E. (A)

Noroton Heights
Wood, W. A. (A)

Northford (CV-1)
Baker, R. R. (A)

North Guilford (CV-1)
Partridge, R. E., Jr. (A)

North Madison (CV-1)
Fountain, H. F. (A)

North Stamford
Doolittle, H. D. (M)

North Woodbury (CV-1)
Petit, F. W. (A)

Norwalk (CV-1)
Carne, E. B. (A)
Delany, E. B. (A)
Flynn, T. F. (A)
Gabor, W. D. (A)
Georgi, E. A., Jr. (A)
Gulland, G. R. (SM)
Harris, R. V. (A)
Kohn, S. T. (A)
Magida, N. H. (A)
Mehr, M. H. (A)
Miller, T. W. (A)
Neuman, G. J. (A)
Roggenstein, E. O. (M)
Schulz, H. R. (SM)
Smith-Vaniz, W. R., Jr. (A)
Van Vliet, W. G. (A)
Von Kummer, F. G. (A)
Wines, W. R. (A)

Norwich (CV-1)
LaVallee, G. E. (A)
Lee, R. F. (A)

Oakdale (CV-1)
Whannel, R. L. (A)
Worster, J. R. (A)

Old Greenwich (CV-1)
Cassidy, J. J., Jr. (A)
Fenn, W. W. (A)
Filgate, J. T. (SM)
Fulton, O. H., Jr. (M)
Harrington, R. H., Jr. (A)
Harris, J. S. (SM)
Lemmo, T. J. (A)
Lott, A. L. (M)
Van Dyck, A. F. (F)

Old Lyme (CV-1)
Fanelli, F. A. (A)

Old Saybrook (CV-1)
Radom, R. (A)

Plainville (CV-1)
Cutler, M. A. (A)
Davis, R. B. Jr. (A)
Forman, J. (M)
Hooper, W. D. (A)
Moreno, V. N. (A)
Post, R. F. (M)

Portland (CV-1)
Pollock, A. H. (A)

Putnam (CV-1)
Bernier, E. J. (A)
Bosworth, C. D. (A)
Roller, E. R. (A)

Quaker Hill (CV-1)
Barrila, F. L. (A)
Gubin, S. (SM)
Nash, H. (A)
Sentell, F. N. (A)
Wilkinson, C. W. (A)

Redding Ridge (CV-1)
Rand, P. S. (M)

Ridgefield (CV-1)
Baker, J. H. (A)
Doll, H. G. (SM)
Duerig, W. H. (A)
Ferre, M. C. (M)
Frey, H. B. Jr. (M)
Harry, J. B. (A)
Hering, K. W. (A)
Huston, O. H. (M)
Kunz, K. S. (A)
Lebel, J. D. (A)
Miller, G. K. (SM)
Peck, W. D. (A)
Resides, W. C. (SM)
Runyan, R. A. (M)
Segesman, F. F. (A)
Sloughter, G. S. (SM)
Sloughter, W. J. (SM)
Stewart, T. E., Jr. (A)
Wesley, C. A. (A)

Riverside (CV-1)
Budelman, F. T. (A)
Burns, R. F. (A)
Fingerle, W., Jr. (SM)
Henchcliffe, A. L. (A)
Long, R. (A)
Ryan, W. R. (M)
Sontheimer, C. G. (A)

Rockville (CV-1)
Schinn, B. J. (A)
Toth, W. E. (A)
Weston, F. B. (VA)

Seymour (CV-1)
Fryncko, P. (A)
Michaelson, W. (A)

Shelton (CV-1)
Beatrice, F. J. (A)
Zaskalicky, J. J. (M)

Simsbury (CV-1)
Griffin, D. C. (A)
Somers, B. A. (VA)
Stocking, M. H. (A)
White, J. A. (A)

Southbury (CV-1)
Harris, W. T. (SM)

South Coventry
Knapp, C. H. (A)

Southington (CV-1)
Raymond, G. H. (M)
Shilling, C. R. (A)

South Norwalk (CV-1)
Beltz, G. E. (A)
Benson, K. B. (M)
Carne, E. B. (A)
Crosman, L. P. (A)
Day, J. N. (A)
Duncan, H. S. (SM)
Greunke, O. V. (A)
Karg, L. A. (A)
Kaye, M. (A)
Lamb, J. J. (SM)
Watts, D. E. (A)
Winter, C. W. (A)
Yellin, H. (M)

Southport (CV-1)
Armstrong, C. W. (A)
Bachman, W. S. (M)
Evans, R. E. (A)

Springdale (CV-1)
Couch, W. M., Jr. (A)
Klyce, B. H. (SM)
Lefferson, J. (A)
Ottaviano, M. (A)

Weden, C. V., Jr. (A)
Yanagisawa, S. T. (SM)

Stamford (CV-1)
Bailey, E. M. (A)
Baker, G. W. (A)
Basim, D. S. (SM)
Beeny, L. S. (A)
Bozak, R. T. (SM)
Branson, N. G. (A)
Brown, W. J. (SM)
Buckley, R. E. (A)
Corson, B. R. (A)
Geist, H. J. (SM)
Haedecke, A. P. (SM)
Helterline, L. L., Jr. (A)
Hoehn, A. F. (A)
Kaufman, A. L. (A)
Kiser, J. L. (SM)
Kramer, A. (A)
Leftwich, R. F. (A)
Lent, E. L., Jr.
Mintzer, L. (A)
Molday, B. V. (SM)
Penney, A. W. (A)
Plehaty, S. L. (A)
Rendell, G. (A)
Rider, P. Z. (M)
Roberts, F. B. (A)
Ruddock, W. F. (A)
Sackler, A. A. (A)
Salzman, C. F., Jr. (A)
Scherer, B. L. (A)
Schwarz, F. (A)
Siegel, J. R. (A)
Silver, N. (A)
Singer, E. (A)
Skehan, J. W. (A)
Steinberg, E. B. (SM)
Tabisz, S. C. (A)
Van Breems, A. (A)
Veremakis, C. (A)
Wahlberg, E. C. (A)
Wachowski, H. P. (A)
Weiner, S. L. (A)
Wilder, M. P. (A)

Stepney
Weller, B. L. (A)

Stonington (CV-1)
York, E. P. (A)

Storrs (CV-1)
Johnson, G. W. (A)
Kay, M. (A)
Knauss, H. P. (M)
Kochenberger, R. J. (SM)
Lindorff, D. P. (A)
Lucal, H. M. (A)
Robb, E. J. (A)
Sherman, J. (A)
Timoshenko, G. S. (A)
Williams, L. E. (SM)

Stratford (CV-1)
Craig, G. F. (M)
Detar, D. R. (SM)
Fox, F. J. (M)
Frost, R. R. (A)
Hubbard, R. G. (A)
Kaiser, A., Jr. (A)
Sebas, J. M., Jr. (A)

Talcottville (CV-1)
Howard, L. L. (A)

Terryville (CV-1)
Andrus, A. M. (A)
Krenicki, J. (A)
Parry, W. W. (A)

Torrington (CV-1)
Gerbl, H. S. (M)
Silver, L. (A)

Trumbull (CV-1)
Balogh, J. J., Jr. (A)
Dresser, W. R. (SM)
Howard, N. S. (A)
Lahana, P. (M)

Unionville (CV-1)
Neill, G. W. (A)

Wallingford (CV-1)
Brazee, J. A. (A)
Ehler, A. F. (A)
Schaefer, R. W. (A)
Tuttle, R. W. (M)

Warehouse Point (CV-1)
Frame, N. R. (A)

Waterbury (CV-1)
Bryson, R. W. (A)
Bushy, A. E. (A)
Cannizzaro, Ef. (A)
Fullieru, R. (A)
Hales, F. B. (A)
Jensen, J. A. (A)
McLeod, K. A. (A)
Nicholson, W. E. (A)
Pesce, W. J. (A)
Pichard, L. A. (A)
Platt, F. L., Jr. (A)
Quinn, Q. O. (M)
Siff, A. W. (A)
Somers, D. L. (A)
Winchell, A. M. (VA)

Waterford (CV-1)
Bastow, J. G., Jr. (A)
Dunn, C. M. (M)
Gartner, C. L. (M)
Smith, R. H. (A)

Watertown (CV-1)
Getsinger, W. J. (A)

West Cheshire (CV-1)
Brackington, H. F. (M)

West Hartford (CV-1)
Andersen, W. A. (M)
Block, A. V. (A)
Doremus, J. A. (SM)
Ferla, S. J. (A)
Grammer, G. (A)
Hall, G. M. (A)
Handy, F. E. (VA)
Harris, D. J. (A)
Hatton, A. T. (A)
Holt, H. W. (SM)
Rich, L. G. (M)
Shuskus, A. J. (A)
Smith, N. F., Jr. (SM)
Stoddard, J. E. (A)
Suiters, C. W. (A)
Warner, S. E. (SM)

West Hartford-Elm (CV-1)
Lalanne, R. L. (A)

West Haven (CV-1)
Burleson, C. T. (A)
Kricek, J. V. (A)
Parker, R. H. (A)
Zweig, F. (A)

Westport (CV-1)
Ammerman, D. W. (SM)
Brumbraugh, G. M., Jr. (A)
Chadwick, M. P. (SM)
Dewitz, G. H. (M)
Ellis, L. W., Jr. (A)
Haggott, J. C. (A)
Mason, F. G. (A)
Neenan, C. J. (M)
Rackey, C. A. (SM)
Roshkind, H. (A)
Vasques, H. A. (A)

Wethersfield (CV-1)
Avery, S., Jr. (A)
Beal, E. W. (M)
Bernard, D. T. (A)
Cox, N. W. (A)
Harden, L. R. (A)
House, L. G. (M)
Mitchell, J. A. (A)
Quayle, G. (A)

Willimantic
Carino, J. J. (A)
McGee, C. G. (A)

Wilton (CV-1)
Erstad, J. (A)
Levick, H. (A)

Windham Center (CV-1)
Miller, A. C. (SM)

Windsor
White, J. A. (A)

Windsor Locks (CV-1)
Aldrich, H. P. (A)
Kidwell, N. E. (M)

Winsted (CV-1)
Lescarbeau, R. F. (M)

DELAWARE

Claymont (PHI-3)
Hughes, R. M. (A)

Greenville (PHI-3)
Tribou, P. W. (M)

Milford
Drummond, W. D. (A)

Newark (PHI-3)
Bueche, H. S. (A)
Evans, E. D., Jr. (A)
Lindsay, J. C. (A)
Lutz, B. C. (A)
Toivonen, I. A. (A)
Young, M. G. (SM)

New Castle (PHI-3)
Hampton, L. R. (A)
Magel, A. (A)

Rehoboth
Chambers, G. R. (A)
McDaniel, F. (M)
Salin, J. A. (M)

Seaford
Cooke, R. M. (A)

Wilmington (PHI-3)
Albright, C. M., Jr. (A)
Conner, H. G. (A)
Covington, A. W. (A)
Dell, C. G. (A)
Fusfeld, M. (A)
Gallagher, G. J. (A)
Greeff, C. E. (M)
Harrison, W. E., Jr. (A)
Horak, R. J. (A)
Horne, W. J., Jr. (A)
Horny, D. A. (A)
Kelly, G. E., Sr. (A)
Liddicoat, C. A. (A)
McMillen, R. C. (A)
Myette, R. F. (A)
Owens, J. E. (A)
Pastell, D. L. (A)
Perkins, J. R. (SM)
Stinger, H. J. (M)
Taylor, E. S. (A)
Walsh, R. R. (A)
Wild, R. F. (SM)

DISTRICT OF COLUMBIA

Anacostia (WA-3)
Riccobono, S. (VA)
Upp, C. B. (SM)

Washington (WA-3)
Aceto, L. J. (A)
Achard, F. H.
Adair, G. P. (F)
Adams, R. J. (SM)
Abraham, G. (M)
Albertson, F. W. (SM)
Albright, J. D. (M)
Alexander, H. R. (A)
Algor, M. M. (A)
Allibone, F. L., Jr. (A)
Allman, F. L. (VA)
Allred, C. McK. (A)
Altomare, R. E. (M)
Anderton, H. L. (A)
Andrae, P. H., II (A)
Andrew, W. M. (M)
Ansell, E. O. (M)
Applebaum, A. (A)
Arnett, H. D. (M)
Arnold, P. N. (SM)
Atwell, R. G. (A)
Awramik, J., Jr. (M)
Back, G. I. (SM)
Bagg, T. C. (M)
Bailey, A. B. (A)
Bailey, H. (A)
Bailey, S. L. (F)
Bailey, S. O. (A)
Baldwin, C. H. (A)
Ball, N. T. (SM)
Bank, W. J. (A)
Batson, J. A. (A)
Battison, J. H. (SM)
Bearce, L. S. (A)
Beatty, R. W. (SM)
Beck, C. L. (A)
Beck, H. M. (M)
Behme, A. E. (A)
Belford, K. R. (A)
Beltz, W. H. (SM)
Benditzky, E. (A)
Benjamin, V. E. (A)
Benns, W. E., Jr. (A)
Berg, W. B., Jr. (A)
Berry, J. E. (A)
Best, N. R. (SM)
Birmingham, H. P. (M)
Birnbaum, G. (A)
Blachman, N. M. (SM)
Black, R. R. (SM)
Blair, C. R. (A)
Blake, L. V. (M)
Blake, R. F. (A)
Blau, W. (A)
Blumberg, W. J. (A)
Bode, G. F. (A)
Bohnert, J. L. (M)
Bonham, L. L. (A)
Booth, R. M., Jr. (A)
Bortniker, E. (A)
Bourland, L. T. (SM)
Boyd, J. E. (A)
Boymel, B. R. (SM)
Brady, C. L. (SM)
Brady, F. B. (SM)
Brantley, W. W. (M)
Brenner, M. (M)
Brester, W. A. (VA)
Bridge, W. H. (A)
Brittle, D. F., Jr. (A)
Brodzinsky, A. (A)
Brogden, J. W. (A)
Brooks, J. F. (A)
Brown, T. H. (VA)
Brush, J. W. (A)
Bryan, J. W. (A)
Bryant, F. B. (A)
Bull, W. I. (SM)
Bullock, G. M. (M)
Burbage, G. H. (A)
Burgess, W. B. (SM)
Busch, C. R. (A)
Butler, P. (A)
Butt, H. R. (A)
Byrnes, E. M. (A)
Cacheris, J. C. (M)
Campagna, J. H. (M)
Campanella, S. J. (A)
Campbell, J. K. (A)
Candido, J. V. (SM)
Carl, M. H. (A)
Carley, W. S. (SM)
Carlsten, E. E. (A)
Carnes, W. T., Jr. (SM)
Carter, H. J. (SM)
Carter, J. M. (A)
Carter, M. B. (M)
Carter, R. A. (A)
Carterette, A. A., Jr. (M)
Chase, D. G. (A)
Chernikoff, L. (A)
Chin, J. W. (A)
Chromy, B. J. (VA)
Clark, H. L. (A)
Clark, J. F., Jr. (SM)
Clarke, A. S. (SM)
Clasen, S. M. (A)
Cleeton, C. E. (SM)
Coates, R. J. (A)
Codel, M. (A)
Collier, J. W. (M)
Collins, J. (M)
Colvin, R. (VA)
Conklin, H. A., Jr. (A)
Cook, C. C. (A)
Corkill, J. F. (M)
Cotton, A. F. R. (M)
Couper, W. P. (A)
Coward, R. W. (A)
Crandall, W. R. (M)
Craven, T. A. M. (F)
Crenca, J. J. (A)
Culver, R. H. (VA)
Cummings, J. J. (SM)
Damoc, C. (A)
Daniels, W. H. (A)
Daubenheyer, H. W. (M)
Davies, R. C. (A)
Davis, B. L. (A)
Davis, G. C. (SM)
Davis, G. H., Jr. (A)
Davis, L. B. (M)
Davis, T. McL. (SM)
Davis, W. J. (A)
DeAgro, R. P. (A)
Decker, K. M. (A)
Dellinger, J. H. (F)
DeMilia, J. (A)
DeVore, C. (A)
Diambra, H. M. (A)
Dienier, H. C., Jr. (A)
Difford, L. A. (A)
Dillard, E. L. (VA)
Dinger, H. E. (SM)
Dinnick, G. M. (M)
Dixon, G. P. (SM)
Doane, J. E. (M)
Dodrill, G. E. (SM)
Doong, H. (A)
Dorrell, R. E. (M)
Dorsey, H. G. (F)
Dropkin, H. (A)
Duncan, F. B. (A)
Dunlavy, J. H., Jr. (A)
Dunn, J. E. (M)
Durieux, C. W. (A)
Duryee, J. B. (A)
Eachus, J. J. (SM)
Early, D. M. (A)
Easton, R. L. (M)
Eilbert, R. L. (A)
Elbourn, R. D. (M)
Ellerman, K. E. (A)
Elliott, H. H., Jr. (A)
Emery, M. (A)
Engleman, C. L. (SM)
Ennis, A. G. (A)
Ertman, R. J. (A)
Erwin, V. R. (M)
Falk, M. B. (A)
Favorov, P. A. (A)
Feinstein, J. (M)
Fellers, R. G. (SM)
Ferris, W. R. (F)
Fields, R. E. (A)
Figer, W. (A)
Finch, W. G. H. (SM)
Fine, H. (A)
Finkel, A. (A)
Finn, P. L. (M)
Finney, W. J. (SM)
Fischman, M. (A)
Flaherty, J. B., Jr. (M)
Flarity, W. H. (A)
Fleischer, A. (A)
Fleming, E. W. (A)
Fleming, H. D. (A)
Fleming, J. (A)
Floegel, M. E. (A)
Florman, E. F. (A)
Fluhr, F. R. (A)
Flynn, J. E. (A)
Ford, R. R. (A)
Franklin, P. J. (SM)
Franks, H. J. (A)
Franta, A. L. (A)
Fraser, G. R. (M)
Fratianni, S. V. (A)
Fraumann, J. W. (A)
Frazier, H. S. (SM)
Freeman, J. J. (SM)
Freniere, D. L. (A)
Freudberg, R. L. (A)
Friedberg, I. S. (A)
Friedman, D. C. (A)
Fuller, I. W., Jr. (A)
Gabriel, W. F. (A)
Galane, I. B. (SM)
Gall, J. E. (VA)
Gallant, C. J. (A)
Garrison, M. M. (SM)
Gautney, G. E. (M)
Gaylord, R. E. (M)
Gebhard, L. A. (F)
George, S. F. (SM)
George, W. D. (VA)
Gessner, R. J. (A)
Gignoux, F. E., Jr., (A)
Gillette, K. G. (VA)
Ginsberg, M. B. (A)
Gladding, E. B. (M)
Gleason, R. F. (A)
Glorioso, A. R. (A)
Goldberg, H. (SM)
Golden, T. S., Jr. (A)
Good, C. A., Jr. (A)
Goodman, S. (A)
Goodnow, A. C. (VA)
Gordon, S. H. (A)
Gormley, P. (A)
Goumas, N. P. (A)
Grady, D. F. (A)
Graettinger, W. F. (A)
Graham, H. U. (SM)
Greathouse, D. E. (A)
Grebenkemper, C. J. (A)
Green, D. G. (A)
Green, W. C. (VA)
Greene, B. (A)
Greene, R. M. (A)
Greene, W. E. (M)
Greer, J. W. (SM)
Gridley, D. H. (A)
Grimm, R. E. (M)
Grimstad, E. J. (A)
Grobowski, Z. V. (A)
Groverman, A. B. (M)
Gruber, J. R. (A)
Guarino, P. A. (SM)
Gumina, L. V. (A)
Gunn, R. (F)
Gustafson, C. E. (A)
Guthrie, F. P. (SM)
Guthrie, R. C. (VA)
Haag, S. J. (SM)
Haddock, F. T., Jr. (A)
Hadjidemetriou, D. S. (A)
Hafstad, L. R. (F)
Hagen, J. P. (SM)
Hagerty, G. E. (M)
Hall, E. L. (SM)
Hamid, M. (A)
Hanley, T. E. (SM)
Hannon, J. R. (A)
Hare, C. M. (A)
Harmon, R. N. (F)
Harris, F. D. (A)
Harrison, H. (SM)
Harrison, J. H. (A)
Harter, J. R. R. (M)
Haskins, R. L. (SM)
Hastings, H. F. (VA)
Haueter, R. C. (A)
Hayden, F. L. (A)
Head, H. T. (SM)
Heaton, V. E. (SM)
Hedberg, R. W. (A)
Hedge, L. B. (A)
Heinmiller, D. R. (A)
Heister, C. F. (SM)
Hekimian, N. C. (A)
Held, J. C. (A)
Heller, A. (M)
Helt, F. R., Jr. (A)
Hemenway, D. F. (A)
Hennessy, R. G. (A)
Hens, R. J. (A)
Henson, R. F. (A)
Hepler, D. S. (A)
Herbert, L. G. (A)
Herman, H. (A)
Herring, R. A., Jr. (A)
Hickock, C. H. (A)
Himmelstein, S. (A)
Hipson, L. J. (M)
Hodge, M. H., Jr. (A)
Hodges, M. F. (SM)
Hoffman, L. (A)
Hollingsworth, K. M. (A)
Holmboe, L. W. (M)
Hopkins, C. (M)
Horman, F. L. (M)
Hornung, J. L. (SM)

Howard, D. D. (A)
Howe, E. R., Jr. (A)
Howe, W. E. W. (M)
Hunt, C. M. (SM)
Huntoon, R. D. (SM)
Hurvitz, H. (M)
Inscoe, R. A. (M)
Irvine, G. W. (A)
Isely, F. C. (SM)
Isenhour, C. N. (A)
Jacob, F. (A)
Jacobson, I. J. (A)
Jacoby, A. (A)
Jacocks, T. B. (VA)
Jansky, C. M., Jr. (F)
Jesswein, A. J., Jr. (A)
Jickling, R. M. (A)
Joffe, N. (A)
Johnston, E. L. (VA)
Jones, C. L. (A)
Jones, C. T. (A)
Jones, H. St. C., Jr. (A)
Jones, M. L. (M)
Kalmus, H. P. (SM)
Kaufman, J. (SM)
Kaufman, M. G. (M)
Kear, F. G. (F)
Keller, J. W. Jr. (M)
Keller, J. E. (A)
Kellerman, K. F. (SM)
Kelley, J. R. (M)
Kemp, J. C. Jr. (A)
Kennedy, R. L. (SM)
Kershner, S. W. (A)
Kessler, S. (A)
Keys, C. A. (A)
Kimball, L. L. (A)
Kindell, P. E. (A)
King, A. F. (A)
King, A. M. (A)
Kinyon, R. T. (A)
Kirby, R. C. (A)
Kirsch, R. A. (A)
Kirshner, J. M. (A)
Kirvida, L. (A)
Klamm, G. E. (A)
Klima, W. M. (A)
Kluck, J. H. (A)
Kohler, H. W. (SM)
Kolkedy, J. G. (M)
Kouchnerkavich, T. A. (VA)
Kramer, E. R. (A)
Krasnick, B. (A)
Krason, C. (A)
Kraus, D. G. (A)
Kraus, R. W. (A)
Kray, E. (A)
Kropf, R. G. (A)
Krupen, P. (M)
Kube, H. D. (A)
Kuder, M. L. (A)
Kunetz, G. J. (A)
Kurner, C. J. (A)
Kyser, R. H. (A)
Laker, E. F. (A)
Landsman, L. (A)
Lantz, P. A. (A)
Larson, G. S. (A)
Larson, R. E. (A)
Latt, H. A. (A)
Lawsine, L. (M)
Leavitt, W. E. (A)
Le Craw, R. C. (A)
Lee, P. H. (SM)
Lee, W. (M)
Lehfeldt, H. J. (A)
Leibowitz, R. C. (A)
Leidy, K. L. (A)
Leifer, J. C. (A)
Leinbach, H. J., Jr. (A)
Leiner, A. L. (M)
Leiphart, J. P. C. (A)
Leppert, M. L. (VA)
Levy, I. J. (A)
Light, L. (A)
Liimatainen, T. (M)
Lide, A. M. (V)
Link, J. H. (VA)
Link, J. C. (A)
Lipscomb, J. L. (A)
Liss, F. T. (A)
Little, R. P. (M)
Loeber, C. W. (M)
Lohnes, G. M. (SM)
Long, A. (A)
Long, M. C. (A)
Long, R. P. (SM)
Looney, C. H., Jr. (A)
Lorentz, E. F. (A)
Lorenzen, H. O. (VA)
Loucks, P. G. (VA)
Love, S. D. (A)
Lovejoy, E. W. (SM)
Lowell, R. (A)
Lowy, W. M. (A)
Luecker, G. (A)
Lund, C. O. (A)
Luttrell, B. H., Jr. (A)
Lyons, H. (SM)
MacGregor, E. I. R. (SM)
MacGregor, W. R. (SM)
Machlin, A. (A)
Mackenzie, C. M. (A)
Maddox, C. H. (SM)
Malden, R. M. (SM)
Main, W. F., Jr. (A)
Mallinson, F. C. (SM)
Mallon, T. A. (A)
Mantek, P. A. (A)
Marini, J. W. (A)
Markell, J. H. (SM)
Marti, N. F. (A)
Martin, J. F. (A)
Martin, K. L. (A)
Martin, P. J. (A)
Martin, T. J. (A)
Martinez, J. I. (A)
Maskaleris, C. L. (A)
Massey, M. M. (M)
Masters, R. W. (SM)
Masterson, J. P. (A)
Mathes, R. H. (A)
May, J. C. (A)
Mayer, C. H. (M)
Mayo, R. D. (A)
Mayo-Wells, W. J. (SM)
Mazur, D. G. (A)
McAllister, J. A. (A)
McBee, C. D. (A)
McClain, E. F. (SM)
McClenon, D. (SM)
McIntosh, F. H. (M)
McLaughlin, D. J. (M)
McNary, J. C. (SM)
Mead, O. J., Jr. (SM)
Meade, J. L. (A)
Meares, C. W. (A)
Medrow, K. R. (M)
Metz, H. I. (SM)
Meyer, R. B. (SM)
Miles, K. G. (M)
Miles, P. D. (SM)
Miranda, R. T. (A)
Mirick, C. B. (SM)
Mitchell, F. T., Jr. (SM)
Mitchell, M. B., Jr. (A)
Mitoma, E. Y. (A)
Mizell, B. B. (A)
Montgomery, B. E. (SM)
Moore, A. H. (M)
Moore, C. G., Jr. (A)
Moore, H. N. (A)
Morgan, E. D. (A)
Morrison, R. F., Jr. (A)
Mostafa, K. (A)
Mount, E. V. (A)
Moyer, W. A., Jr. (A)
Muncy, J. H. (M)
Murray, A. F. (F)
Myer, D. A. (SM)
Neely, G. M. (VA)
Nelson, L. (A)
Newlon, A. E. (SM)
Newman, W. P. (A)
Newman, N. (A)
Nordenberg, H. M. (A)
Norgorden, O. (A)
Norris, P. C. (A)
Oblazney, A. A. (A)
O'Brythim, D. H. (A)
O'Connell, J. D. (SM)
Odarenko, T. M. (SM)
Oertel, M. F. (A)
Ohlson, A. (A)
Oleyar, M., Jr. (A)
Olin, I. D. (A)
Orr, M. S. (A)
Ornstein, E. (A)
Osborn, M. E. (A)
Ottinger, G. L. (A)
Otto, E. D. (M)
Ould, R. S. (VA)
Owens, R. B. (SM)
Owren, L. (A)
Page, E. C. (SM)
Page, R. M. (F)
Page, V. E. (M)
Paine, H. G. (M)
Palik, F. (VA)
Palmer, C. E., Jr. (A)
Parker, R. D. (SM)
Pastell, D. L. (A)
Paul, A. W. (M)
Pepper, W. H. (A)
Pernice, J. R. (SM)
Perritte, J. L. (A)
Peterkin, E. W. (A)
Peters, M. W. (M)
Petersen, R. P. (SM)
Peterson, H. L. (A)
Petes, J. (A)
Petkof, B. (A)
Petrini, A. A. (A)
Petry, C. A. (SM)
Peyton, P. B., Jr. (A)
Phillips, T. H. (A)
Pierce, J. F. (VA)
Pierce, O. B. (A)
Plummer, C. B. (SM)
Plummer, W. E. (SM)
Polak, H. (M)
Poland, W. B., Jr. (A)
Ponterio, F. V. (A)
Pontious, C. E. (A)
Ports, D. C. (SM)
Potter, R. S. (A)
Powles, F. T. (SM)
Pratt, H. A. (M)
Pressnall, J. R. (A)
Pugh, M. E. (A)
Pynn, G. W. (A)
Quarles, D. A. (SM)
Racine, R. F. (A)
Rambo, L. W. (A)
Ransom, R. A. (A)
Rasmussen, A. R. (M)
Ratti, J. N. (A)
Ray, H. A., Jr. (M)
Ray, S. R. (A)
Redcay, P. W. (M)
Reed, O. W. B., Jr. (SM)
Reed, S. F. (M)
Reese, J. S. (VA)
Reid, J. G., Jr. (SM)
Renner, J. J. (M)
Reynard, A. I. (SM)
Richardson, W. M. (SM)
Richter, A. R. (M)
Rietzke, E. H. (SM)
Rigby, S. (A)
Ripnitz, A. (A)
Ritz, W. A. (M)
Rivers, J. W. (A)
Robertson, B. S., Jr. (A)
Robinson, C. A. (A)
Rodenhi, D. L. (A)
Rohlfs, C. A. (A)
Rohrer, R. E. (M)
Rohrich, G. J. (VA)
Rosenberg, H. L. (A)
Rosenthal, S. (A)
Ross, C. W. (SM)
Ross, I. T. (A)
Rothenberg, N. B. (A)
Rowland, H. L. (A)
Royce, R. K. (A)
Rubin, S. (A)
Russ, J. A. (VA)
Ryan, A. H. (SM)
Ryan, W. E. (A)
Ryssy, J. W. (VA)
Sakiotis, N. G. (A)
Salerno, J. (A)
Salisbury, L. L., Jr. (A)
Salzberg, B. (F)
Samuel, J. (A)
Sanders, W. E. (A)
Sarbacher, G. W., Jr. (A)
Sarbacher, R. I. (SM)
Sawtelle, E. M. (A)
Scal, R. K. F. (SM)
Schairer, N. J. (A)
Schenk, P. J. (SM)
Schlesman, C. H. (SM)
Schleter, G. C. (VA)
Schloss, J. K. (A)
Schmalbach, S. (M)
Scholnick, S. A. (A)
Schooley, A. H. (SM)
Schrack, R. A. (A)
Schrenk, M. H. (SM)
Schuttig, L. A. (SM)
Schuyler, W. E., Jr. (M)
Schweitz, E. P. (A)
Scobey, J. E., Jr. (A)
Segal, P. M. (SM)
Segal, R. L. (A)
Selby, M. C. (SM)
Selgin, P. J. (A)
Shamp, D. J. (A)
Shapiro, G. (A)
Sharp, N. S. (A)
Sharpe, C. B. (A)
Sheets, M. J. (A)
Sherertz, P. C. (A)
Sherman, W. K. (VA)
Sidorov, A. G. (A)
Sigman, M. (A)
Silberstein, R. (SM)
Siling, P. F. (F)
Siller, J. (A)
Silliman, R. M. (SM)
Silver, S. H. (A)
Simas, V. R. (A)
Simmons, A. J. (A)
Simon, A. (A)
Simonton, L. J. (A)
Simpson, P. A. (A)
Simpson, R. L. (A)
Sing, M. L. (A)
Small, C. F. (M)
Smeby, L. C. (SM)
Smith, C. N. (A)
Smith, D. C. (A)
Smith, E. R. (A)
Smith, F. A. B. (A)
Smith, J. E. (SM)
Smith, N. (F)
Smith, P. L. (M)
Smith, R. W. (A)
Snider, C. C. (A)
Snyder, E. O. (A)
Snyder, S. S. (A)
Sommer, J. G., Jr. (A)
Sorensen, G. L. (A)
Sorensen, R. L. (A)
Sorrows, H. E. (A)
Spatz, S. (A)
Spencer, S. W. (M)
Sreb, J. H. (A)
Stafford, B. H. (M)
Staheli, G. D. (A)
Stanwick, T. (SM)
Stair, R. (SM)
Staub, D. W. (A)
Stecca, A. J. (A)
Stein, M. (A)
Stewart, R. B. (SM)
Stine, P. T. (M)
Stormer, W. J. (A)
Stroble, R. R. (A)
Strothers, H. (A)
Stubbs, E. D., Jr. (A)
Sturm, P. J. (SM)
Sugar, G. R. (M)
Summers, S. D. (SM)
Suski, H. M. (SM)
Sutherland, J. A. (A)
Svechnikov, V. A. (A)
Taber, H. E. (SM)
Taira, W. C. (A)
Taishoff, S. J. (A)
Talkin, A. I. (A)
Tall, R. E. (A)
Tasaka, T. (A)
Temple, F. B. (A)
Tersoff, A. I. (A)
Thomas, L. W. (SM)
Thompson, D. G. (A)
Thompson, R. T., Jr. (A)
Thornhill, A. F. (A)
Titcomb, F. C. (A)
Tozzi, L. M. (A)
Trafton, D. C. (SM)
Trexler, J. H. (A)
True, V. (A)
Trumpfeller, L. W. (A)
Tuckerman, L. P. (SM)
Tun, M. T. (A)
Turnbull, H. A. (A)
Turner, G. S. (SM)
Tuve, M. A. (F)
Valge, J. (A)
Vallandigham, W. W. (A)
Vignali, J. A. (A)
Vleck, D. H. (A)
Voznak, E. (M)
Wade, D. A. L. (A)
Wagner, T. C. G. (A)
Wald, B. (A)
Walden, G. R. (A)
Waldschmitt, J. A. (SM)
Walker, A. P. (SM)
Walker, H. R. (A)
Warner, D. P. (A)
Wallace, J. D. (SM)
Waterman, P. (A)
Watkins, W. H. (M)
Watson, D. L. (A)
Watts, F. C. (A)
Watts, J. M. (M)
Weber, W. J., Jr. (A)
Webster, E. M. (F)
Weedman, W. F. (M)
Wegstein, J. H. (A)
Weidemann, H. K. (A)
Weimer, E. W. (M)
Weinberg, M. (A)
Weinberger, A. (A)
Weiss, F. (A)
Weiss, G. H. (A)
Wells, H. W. (F)
Wells, P. E. (A)
Wennberg, H. A., Jr. (A)
Wentworth, H. B. (A)
Wernz, G. L. (A)
Werth, M. W. (M)
West, J. S. (A)
White, C. F. (M)
White, W., Jr. (A)
White, W. A. (A)
Whitelock, L. D. (SM)
Whitlock, M. B., Jr. (A)
Wieder, H. H. (A)
Wilcox, R. H. (A)
Wilcox, R. L., Jr. (M)
Wildermuth, J. L., Jr. (A)
Wilkinson, D. A. (A)
Willard, J. M. (A)
Williams, C. H. (VA)
Williams, J. R. (M)
Williams, R. E. (M)
Williston, S. S. (A)
Willoughby, J. A. (SM)
Wilmotte, R. M. (F)
Windsor, R. N. (A)
Winslow, R. B. (A)
Winston, G. C. (A)
Winter, R. E. (A)
Works, H. A. (A)
Worne, B. E. (M)
Worsley, C. C. (A)
Wright, J. H. (M)
Wright, R. B. (VA)
Wunderley, R. H. (A)
Yagelowich, J. J. (A)
Yancey, J. D., Jr. (A)
Yaplee, B. S. (A)
Yarbrough, K. A. (A)
Young, E. W. (A)
Young, H. M. (A)
Young, J. S. (A)
Young, L. C. (F)
Zandonini, E. M. (M)
Zastrow, K. D. (A)
Zeck, R. W. (M)
Zielinski, C. A. (M)
Zirm, R. R. (A)
Zucker, M. S. (A)

FLORIDA

Arlington
Kenyon, T. N. (A)

Auburndale (MI-6)
Whitehurst, C. H., Jr. (A)

Bartow (MI-6)
Morrison, H. G. (A)

Belle Glade (MI-6)
Clemans, C. S. (SM)
Miles, F. R. (A)

Bradenton
Brown, J. M. (A)
Lampkin, G. F. (VA)
Whitehead, C. C., Jr. (A)

Clearwater (MI-6)
Abernathy, T. C. (A)
Reynolds, G. E., Jr. (A)

Cocoa (CF-6)
Aitkin, K. M. (M)
Bower, G. E. (A)
Broen, J. H., Jr. (A)
Compton, B. J. (A)
Dollar, J. H. (A)
George, T. S. (SM)
Majcher, C. L. (A)
Mead, M. C., Jr. (A)
Moody, R. B. (A)
Morris, H. N. (M)
Olson, R. E. (A)
Richards, J. R. (A)
Strinkowski, N. W. (A)
Summer, C. F., Jr. (M)
Williams, A. F., Jr. (A)

Cocoa Beach (CF-6)
Bernhard, H. A. (A)
Campbell, R. (A)
Finke, H. G. (A)
Hopper, F. E. (A)
Pierce, W. E. (A)
Siegel, J. S. (A)
Thoman, C. A. (M)
Wever, L. R. (M)

Coral Gables (MI-6)
Birch, R. S., Jr. (A)
Burns, M. C. (A)
Craig, P. H. (SM)
Epperson, W. H. (VA)
Eubanks, J. M. (A)
Gebhart, J. H. (A)
Harris, V. E. (A)
Richard, J. D., Jr. (A)
Roberts, F. G., Jr. (VA)
Wise, D. O., Jr. (A)

Dade City (MI-6)
Rosier, N. E. (A)

Dania (MI-6)
Young, P. A. (M)

Daytona Beach (MI-6)
Emmons, A. W. (A)
George, E. M. (M)

De Barry
Alley, W. D. (A)

De Land
Garrison, C. P. (A)
Kelsey, E. L. (A)

Delray Beach
Muse, D. W. (A)

Eau Gallie (CF-6)
Ackerman, S. L. (SM)
Beach, A. R. (SM)
Bernard, E. E. (A)
Coapman, J. W. (SM)
Doane, H. J. (M)
Duryee, J. B. (A)
Hines, W. S. (A)
Holmes, T. G. (A)
Johnson, R. A. (M)
McFarland, D. J. (A)
Miller, R. T. (A)
Moline, J. C. (A)
Neff, R. R. (A)
Peters, J. C. (A)
Petersen, J. A. (A)
Preece, B. P. (A)
Preece, R. G. (A)
Shupe, P. G. (A)
Spooner, J. E. (A)
Weiss, H. R. (A)
West, K. A. (M)
Wynn, J. B., Jr. (M)

Eglin AFB (AT-6)
Allmon, E. C. (A)

Baxter, W. D. (A)
Branch, G. E. (SM)
Dille, A. C. (A)
Heyroth, J. W. (A)
Kirlin, W. F. (A)
Robinson, W. J., Jr. (A)
Snyder, G. H. (VA)
Winter, H. (SM)
Wright, R. K. (A)

Fort Lauderdale (MI-6)
Bassett, R. E., Jr. (VA)
Fruin, R. J. (A)
Hall, I. A., Jr. (M)
Hicks, W. S. (A)
Menefee, H. R. (A)
Pritchard, W. S. (A)
Stetson, H. T. (VA)
Stone, F. C. (A)
Thompson, H. V. (SM)

Fort Meyers (MI-6)
Dashiell, E. V. (M)
Lynch, A. H. (SM)
Weber, D. C. (M)

Fort Pierce (MI-6)
Braden, J. R. (A)

Fort Walton (AT-6)
Agrelius, K. C. (A)
Barkman, R. N. (A)
Basham, R. S. (A)
Bloomquist, J. C. (A)
Boedy, D. D. (A)
Brown, M. J. (A)
Clark, L. E. (A)
Davenport, F. S. (A)
Falkenberg, H. R. (M)
Fleming, G. C. (A)
Hendrikson, A. E. (A)
Howard, F. E., Jr. (M)
Jones, G. C. (M)
Reed, R. C. (M)

Gainesville (CF-6)
Bliss, G. B. (A)
Brown, R. F. (A)
Chamberlin, R. M. (M)
Chen, W. H. W. (A)
Clanton, J. D., Jr. (A)
Dietz, D. P. (A)
Eadie, D. (SM)
Johnson, R. C., Jr. (A)
Larsen, M. J. (SM)
Latour, M. H. (M)
Morris, A. C., Jr. (A)
Nelson, P. H. (SM)
Priem, E. S. (A)
Pumphrey, F. H. (SM)
Sashoff, S. P. (SM)
Schrader, G. F. (A)
Shaffer, C. V. (SM)
Tedder, P. M. (A)
Weil, J. (SM)
Wood, W. A. (A)
Zetrouer, W. F., II (A)

Green Cove Springs (MI-6)
Ryan, C. M. (SM)

Greenville
Marshall, H. A. (A)

Hialeab
Jamieson, J. G. (A)

Hollywood
Hieronymus, T. G. (SM)
Klise, K. W. (M)
McWilliams, L. C. (A)
Smith, W. N. (M)

Homestead (MI-6)
Sheppard, H. S. (M)

Indian Rocks (MI-6)
Andrews, E. F. (VA)

Indian Rocks Beach
Smith, F. S. (VA)

Jacksonville (MI-6)
Boggs, G. D. (A)
Boyer, L. R. (A)
Brand, C. W. (A)
Conover, W. V. (A)
Dandelake, J. (M)
Ffoulkes, C. E. (M)
Franks, B. W. (M)
Martindale, N. B. (A)
Newberry, D. A. (M)
Newnham, J. A. (A)
Osmundsen, G. A. (A)
Randles, W. C. (M)
Vordermark, E. B. (M)

Keystone Heights
Browning, H. H. (A)

Key West (MI-6)
Brooks, J. F. (M)
Chandler, R. D. (A)
Cobb, R. D. (A)
Douglass, W. A. (A)
Forman, A. H., Jr. (A)
Gillette, R. L., Jr. (A)
Hollis, R. H. (A)
McMasters, P. A. (M)
Nairn, J. B. (A)
Sims, R. U. (A)
Vette, W. J. (M)
Wineman, T. S. (A)
Ziegler, R. E. (A)

Lutz
Wallace, S. K. (A)

Lakeland
Cromer, E. G. (A)

Lake Wales
Kimbrel, G. M. (M)

Lake Worth
Larkin, J. P. (M)
Wood, W. H. (M)

Lynn Haven
Kittle, M. O. (A)

Mary Esther
Huntley, K. L. (M)
Lynch, F. R. (A)

Melbourne (CF-6)
Anderson, G. F. (A)
Barnett, B. E. (A)
Bishop, R. P. (A)
Carroll, L. O. (A)
Cohen, P. (A)
Culver, L. R. (SM)
Denius, H. R. (SM)
Dillon, J. D. (M)
Dorsett, E. A. (M)
Dryden, R. E. (M)
Eddins, W. T. (M)
Froustra, B. (A)
Gilbreath, R. E., Jr. (A)
Hicks, W. S. (A)
Howard, D. C., Jr. (M)
Jenkins, J. L. (M)
Johnson, A. (M)
Keith, C. E. (M)
Little, W. E. (A)
McCone, G. L. (M)
McGregor, A. D. (A)
Painter, P., Jr. (M)
Pierce, W. E. (A)
Preston, L. S. (A)
Price, H. J. (SM)
Scharla-Nielsen, H. (M)
Shaw, G. S. (SM)
Vansant, F. T. (VA)
West, C. F. (M)
Wicker, G. E. (A)
Wisner, R. M. (SM)

Melbourne Beach (CF-6)
Bruck, G. G. (SM)

Melrose
Gano, O. R. (A)

Merritt Island (CF-6)
Philbin, J. T. (A)

Miami (MI-6)
Adcock, S. E. (VA)
Ashley, C. L. (M)
Barwick, M. N. (A)
Bernard, H. F. (A)
Boundy, G. G. (SM)
Bryant, C. S. (A)
Buckler, D. R. (M)
Bugnolo, D. S. (A)
Carlton, C. (A)
Cheng, K. Y. (A)
Cohen, L. D. (A)
Driest, C. W. (A)
Easterbrook, L. J., Jr. (A)
Elmore, H. J. (A)
Evans, H. (A)
Fuller, R. E. (A)
Goetz, O. E. (A)
Hart, E. D. (A)
Hastings, L. E. (M)
Herrmann, N. P. (A)
Jones, R. M. (M)
Jones, T. J. (A)
Jorgensen, O. J. (A)
Kimball, E. W. (SM)
Kinney, W. E. (M)
Koivu, H. I. (A)
Larking, G. L. (A)
Lee, W. M. (A)
Lewis, E. W. (VA)
Malone, E. P. (A)
Mangus, G. (A)
McClymonds, C. C. (A)
McGlade, D. J. (A)
Middleton, T. F., Jr. (A)
Morphonios, A. G. (A)
Nairn, J. B. (A)
Palmer, R. P. (A)
Reid, T. D. (A)
Rider, F. E. (SM)
Rondel, V. D. (A)
Sammon, P. J. (M)
Sanders, A. W. (A)
Schneider, M. (A)
Scott, M. C., Jr. (SM)
Shamblin, H. D. (M)
Sharwin, N. S. (A)
Shattuck, J. C. (A)
Shay, J. A. (M)
Shearer, S. L. (A)
Smith, A. P. (M)
Snyder, A. D. (A)
Stephens, F. H., Jr. (A)
Taylor, J. C. (M)
Ware, P. (SM)
Wicks, C. E. (A)
Williams, G. P. (A)

Miami Beach (MI-6)
Albert, D. (A)
Greene, A. N. (A)
Hooper, S. C. (F)
Rosenson, A. H. (A)
Senauke, A. (SM)
Shropshire, A. W. (VA)
Solomon, B. D. (A)

Miami Springs (MI-6)
Atkins, G. T. (M)
Cook, C. (A)
Mehrling, H. W. (M)
Murr, V. E. (VA)
Olson, M. S. (A)

Milton (AT-6)
Filcher, D. E. (A)

North Miami (MI-6)
Castle, C. X. (M)
Gunn, C. R. (A)
Lockwood, E. C. (SM)
Sawyer, J. L. (A)

Orlando (CF-6)
Adams, I. D. (A)
Benfield, C. W. (A)
Gober, R. H. (A)
Hawley, D. T. (M)
Lantz, J. D. (A)
Mantey, W. F. (A)
Mesa, A. M., Sr. (SM)
Rhein, G. W. (M)
Soltero, V. (A)
Yarbrough, J. E. (SM)

Palm Beach (MI-6)
Cheney, J. F. (M)

Panama City (AT-6)
Bell, L. W. (A)
Byrne, D. A. (A)
Conner, J. F. (A)
Erickson, E. E. (A)
Hawkins, E. M. (A)
Koesy, C. B. (A)
Marley, S. B. (A)
Miller, C. E., Jr. (A)
Moody, J. G. C. (A)
Myers, J. C. (SM)
Neff, R. W. (A)

Patrick AFB
Baxter, W. D. (A)
Doerr, W. H. (A)
Friedland, M. S. (A)
Hicks, R. L. (A)
Reinecke, H., Jr. (A)
Westerfield, E. E. (A)

Pensacola
Mason, J. S. (M)

Plant City (MI-6)
Cockrell, J. H. (A)
Sipple, R. L. (A)

Port Orange
Rast, G. J., Jr. (A)

Rockledge
Sarte, V. J. (A)
Thompson, J. F. (A)

St. Augustine (MI-6)
Berger, M. (A)

St. Cloud (MI-6)
Ryder, P. E. (A)

St. Petersburg (MI-6)
Cooper, C. B. (A)
Gray, F. (A)
Herb, J. W. (M)
Horner, G. F. (A)
Kent, R. (SM)
Link, L. J. (VA)
Poast, L. M. (VA)
Thornton, W. H. (M)

Sanford
Wright, J. C. (A)

Shalimar
Overton, B. H. (SM)

South Miami (MI-6)
Lucas, F. B. (M)
Rich, R. S. (A)

Starke (MI-6)
Mathews, B. E. (A)

Tallahassee
Ford, H. P., Jr. (A)
Kemic, C. S. (A)

Tampa (MI-6)
Brice, J. R. (A)
Evans, J. F. (A)
Hackert, W., Jr. (A)
Harnett, C. E. (A)
Heidgen, B., Jr. (A)
Hollander, A. G. (A)
Jean, R. P. (VA)
King, C. J. (M)
Meksraitis, J. J. (A)
Mitchell, J. H. (M)
Moor, W. L. (A)
Murphy, R. (M)
Rosenzvaig, J. E. (A)
Straubel, E. P. (A)

Titusville (CF-6)
Morford, T. H. (A)

Tyndall AFB
Ebersole, H. R. (A)

Ueta
Knowles, D. M. (A)

Umatilla (CF-6)
Vossberg, C. A. (A)

Valpariso (AT-6)
Hlavaty, E. M. (A)
Vermillion, R. K. (A)

Vero Beach (MI-6)
Chorpening, C. M. (M)
Paddock, D. G. (M)

West Miami (MI-6)
Speirs, G. E. (A)

West Palm Beach (MI-6)
Campbell, C. A. (SM)
Cohen, M. J. (SM)
Coleman, J. H. (A)
Edleman, V. W. (A)
Richard, R. H. (A)

Winter Park (CF-6)
Gay, J. L. (A)
Rhein, G. W. (M)

GEORGIA

Albany (AT-6)
Gober, R. H. (A)
Muse, A. W. (A)
Thibodeau, J. E. (A)

Atlanta (AT-6)
Aderhold, H. J. (A)
Akerman, B. (SM)
Badgett, A. F. (A)
Bangs, P. C. (M)
Barr, E. W. (A)
Berry, G. C. (A)
Bird, R. M. (A)
Boland, C. E. (A)
Bondy, H. A. (VA)
Borman, A. P. (A)
Boyd, J. E. (SM)
Bradley, W. H. (M)
Branch, B. S. (A)
Bromfield, G. M. (M)
Buchanan, D. B. (M)
Bugg, K. W. (M)
Butterfield, J. L. (A)
Bylander, E. G. (A)
Clayton, L., Jr. (A)
Cole, J. C., Jr. (A)
Corriher, H. A., Jr. (A)
Dasher, B. J. (A)
Daugherty, C. F. (M)
Dean, H. G., Jr. (M)
Duggan, R. S., Jr. (A)
Fausett, F. (SM)
Fielder, D. C. (SM)
Finn, D. L. (A)
Foster, H. O. (A)
Flynt, E. R. (A)
Fraser, D. W. (M)
Geeslin, J. W. (M)
Gentry, W. E. (A)
Gradick, L. E. (A)
Grivet, P. E. (M)
Hawkins, W. E. (M)
Hawthorne, G. B., Jr. (A)
Henry, C. A. (A)
Herndon, P. H., Jr. (SM)
Hiatt, W. C. (A)
Hogg, J. C., Jr. (A)
Holder, F. P. (A)
Holley, E. (A)
Holmes, E. G. (M)
Howard, G. M. (SM)
Huddleston, T. E. (A)
Jenkins, P. M. (A)
Johnson, W. D. (M)
Jones, C. T. (A)
Jones, W. B., Jr. (M)
Kleinman, R. L. (A)
Lammers, E. S., Jr. (SM)
Lenoir, S. P., Jr. (A)
Lindsey, E. B., Jr. (M)
Livingston, J. L. (A)
Long, M. W. (A)
Marquand, R. E. (A)
McCorvey, A. (M)
McKey, D. B. (M)
Meadows, H. E., Jr. (A)
Martin, R. A. (M)
Mauldin, H. W., Jr. (A)
Meek, R. E. (A)
Murphy, B. (A)
Parkins, F. A. (M)
Parris, R. D. (A)
Prince, M. D. (A)
Ragsdale, H. W. (SM)
Ralls, J. W. (A)
Reid, H. L. (VA)
Rice, L. P. (A)
Rivers, T. A. (A)
Robinson, G. P., Jr. (A)
Sarver, J. R. (A)
Schooley, C. E. (SM)
Smith, A. G. (A)
Smith, S. R. (SM)
Strain, C. E. (A)
Teegardin, H. H. (A)
Tolan, J. H. (A)
Totman, S. (M)
Turner, C. J., Jr. (A)
Voegeli, F. E. (A)
Wallace, J. M., Jr. (A)
Walsh, J. R., Jr. (A)
Walters, J. M. (A)
White, W. H. (M)
Widerquist, V. R. (M)
Wilensky, E. (A)
Witt, S. N., Jr. (A)
Wright, W. W. (A)

Augusta (AT-6)
Flewelling, J. D. (SM)
McKewen, W. R. (A)
Newton, R. L. (A)
Roder, C. C. (VA)
Swink, J. E. (A)
Tarpley, M. W. (A)

Bainbridge (AT-6)
Phelps, R. W. (A)

Brookhaven
Gunson, D. O. (M)

Camp Gordon (AT-6)
Janes, C. W. (SM)
Ryason, R. R. (A)

Camp Stewart
Davison, R. E. (A)

Chamblee (AT-6)
Bratcher, W. H. (A)
Carter, R. C. (A)
Hollis, J. S. (A)
McCoy, M. B. (A)
Needs, W. R. (A)

College Park (AT-6)
Billings, R. H. (A)

Columbus (AT-6)
Bunn, C. N. (A)
Gamble, J. A. (M)
Hogencamp, H. C. (SM)
Jenkins, S. P., Jr. (A)
Thomas, D. H. (A)
Mann, M. E., Jr. (A)

Commerce
Carson, J. R. (A)

Dalton (AT-6)
Andrews, J. S. (A)

Decatur (AT-6)
Currie, C. H. (A)
Dewar, H. D. (A)
Hammond, W. M. (A)
Holbrook, R. A. (M)
Huey, C. G. (M)
Jones, H. D., Jr. (A)
McEver, W. L. (A)
Morris, R. B. (A)
Robertson, D. W. (A)
Sorelle, J. L. (A)

East Point
Brewer, R. V. (A)

Emory University (AT-6)
Dailey, R. S. (A)
Fattig, W. L. (M)

Forest Park
Adamson, H. D. (A)

Fort Benning
Meyer, J. C. (A)

Macon (AT-6)
Bernard, E. E. (A)
Farber, E. (A)
Merrihew, H. W. (A)

Marietta (AT-6)
Dunphey, H. B., Jr. (A)
Holliday, F. S. (M)
Hunter, H. A. (M)
McCurley, E. A. (A)
Rush, O. A., Jr. (A)
Tolle, W. T. (A)
Toole, P. C. (M)
Wrigley, W. B. (A)

Powder Springs
Luedtke, A. (A)

Rome
Jones, A. E. (M)
Starr, R. A. L. (M)

Savannah (AT-6)
Bahlay, A. (M)
Goodman, K. E. (A)
Herriott, J. K., Jr. (A)
Holt, D. G. (A)
Jenkins, E. A. (A)
McNabb, R. E. (M)
Wood, E. W. (A)

Smyrna (AT-6)
Hurst, H. C. (A)
Riley, J. M. (A)
Speer, T. K. (A)
Schwartz, A. J. (A)
Wagner, K. D., Jr. (A)

Thomasville
Poole, J. W. (A)

Valdosta
Salter, N. H. (A)

Waycross
Taylor, C. H. (A)

West Point
Strother, F. P. (A)

IDAHO

Bayview (SEA-7)
Price, V. G. (M)

Boise (SLC-7)
Hinshaw, R. M. (A)
Oberbillig, D. D. (M)
Ryman, J. L. (A)
Sutton, R. B. (A)

Hagerman (SLC-7)
Tucker, M. (A)

Idaho Falls (SLC-7)
Boland, J. F. (A)
Burdick, E. E. (A)
Chapman, H. R. (A)
Criddle, C. B. (M)
McCollom, K. A. (M)
Mills, N. W. (A)
Purcell, R. B. (A)
Smith, G. L. (A)
Thomas, M. E. (A)
Thompson, J. B. (A)

McCall
Leavitt, R. F. (A)

Meridan
Johntz, J. A., Jr. (A)

Moscow
Craine, L. B. (M)

Mountain Home AFB
Esson, R. C. (A)

Nezperce (SEA-7)
Wysong, G. H. (A)

Pocatello (SLC-7)
Heinrich, F. (A)
Kuehne, A. (A)
Ritland, H. O. (A)

Twin Falls
Foss, M. L. (A)
Weaver, C. S. (A)

Weiser
Miller, E. C. (A)

ILLINOIS

Abingdon
Weir, E. J. (A)

Algonquin (CHI-5)
Tanrath, E. G. (A)

Alton (SL-5)
Cochran, H. E. (A)
Day, R. T., Jr. (A)
Ullrich, D. P. (A)

Antioch (CHI-5)
Balsamello, J. (A)
Pechousek, T. W. (A)
Zale, W. J. (A)

Arenzville
Ore, F. R. (A)

Argo (CHI-5)
Pickens, D. H. (SM)

Arlington Heights (CHI-5)
Gaarder, K. M. R. (M)
Heisig, G. J. (A)
Kelly, J. W. (M)
Kopp, C. J. (M)
Kuykendall, J. H. (A)
Lee, W. (A)
McCarty, J. M. (A)
Mueller, A. A. (A)
Patterson, W. S. (VA)
Remley, H. L. (M)
Ross, E. O. (M)
Stout, E. R. (A)
Wallace, H. S. (A)
Weed, A. C., Jr. (M)
Weirich, E. M. (A)
Weltin, O. K. (SM)
Wieneck, Z. (M)

Atlanta (CHI-5)
Speciale, J. S. (A)

Aurora (CHI-5)
Dieter, R. E. (A)
Lamb, C. W. (A)
Seid, H. R. (A)

Barrington (CHI-5)
Aram, N. W. (M)
Price, R. L. (SM)

Batavia (CHI-5)
Novak, E. K. (A)
Poons, A. L. (A)

Belleville (SL-5)
Fitzsimmons, R. S. (M)
Frierdich, W. J. (A)
Frogge, W. F. (A)
Gillien, L. J. (M)
Johnson, P. B. (M)
Joseph, E. L. (A)
Onsgard, C. P. (A)
Peck, G. B. (A)
Pfister, R. C. (A)
Reiniger, R. A. (A)
Sparks, R. S. (A)
Sarikas, R. H. (M)
Steward, R. L. (A)
Stewart, J. H. (A)
Swantz, F. W. (M)

Bellwood (CHI-5)
Baltezore, R. C. (A)
Belville, J. R. (A)
Bergo, E. S. (A)
Bostia, A. F. (A)
Castor, R. W. (A)
Coolidge, J. E. (A)
Hauptli, J. T. (A)
Kafka, N. (A)
Krieg, B. E. (A)
Marik, E. (A)
Stones, A. E. (M)

Belvidere (CHI-5)
Foote, G. A. (A)
Marshall, T. G., Jr. (A)

Bensenville (CHI-5)
Druz, W. S. (SM)
Hilton, F. L. (A)
Landeck, J. H. (M)
Lomasney, J. M. (M)
Peterson, W. J. (M)
Ripperger, W. A. (A)
Sullivan, E. F. (M)
Swanson, C. W. (A)

Berkeley
Drobish, R. W. (A)

Berwyn (CHI-5)
Benetka, K. E. (A)
Berkovec, J. W. (A)
Bigelow, R. P. (A)
Burns, E. E. (SM)
Callahan, B. E. (A)
Cermak, C. W. (M)
Datwyler, W. F. (A)
Davis, R. H. (A)
Fanta, F. A., Jr. (A)
Fligel, F. J. (A)
Gago, W. J. (A)
Glozer, A., Jr. (A)
Hajic, E. J. (A)
Hefner, T. D. (A)
Jarrette, V. (SM)
Jennings, J. J. (A)
Jiral, J., Jr. (A)
Knop, C. M. (A)
Komarek, E. E. (A)
Kovar, G. F. (A)
Long, J. F., Jr. (A)
Mrazek, W. F. (M)
Pakan, J. J. (M)
Potenza, G. W. (A)
Prentiss, J. G. (SM)
Russ, W. E. (M)
Schimpf, R. G. (M)
Sirvatka, W. E. (A)
Sladek, N. J. (A)
Strachota, E. F. (A)
Stubblings, W. E. (A)
Valach, C. F. (M)
Veverka, G. C. (A)
Weiss, H. (A)
Wittmann, R. C. (A)
Zboran, L. (A)

Bloomington (CHI-5)
Moulic, W. E., Jr. (M)

Blue Island (CHI-5)
Damm, G. J. (A)

Bourbonnais
Keast, D. E. (A)

Broadview (CHI-5)
DeBoth, R. E. (A)
Gray, R. O. (M)
Pallissard, J. W. (A)
Ross, H. M. (A)

Brookfield (CHI-5)
Blanchard, M. A. (A)
Collins, E. A. (M)
Dyke, E. (SM)
Foeste, W. E. (SM)
Frihart, H. N. (M)
Hathaway, V. C., Jr. (A)
Holpuch, D. J. (A)
Keranen, E. W. (M)

Calumet City
Thomas, R. R. (A)

Canton
Miller, H. E. (A)

Carlinville (CHI-5)
Ferketich, G. (A)

Carmi (EO-5)
Johnson, R. N. (A)

Champaign (CHI-5)
Albright, W. G. (M)
Annis, R. W. (A)
Brunn, K. R. (A)
Chin, T. N. (A)
Coleman, P. D. (A)
Driggers, B. H. (A)
Dunn, E. J. (A)
Fry, W. J. (A)
Golubjatnikov, O. (A)
Hatfield, J. P. (A)
Howard, L. L. (M)
Hundley, T. C. (A)
Johnson, M. S. (A)
King, H. E. (A)
Leichner, G. H. (A)
Meagher, R. E. (M)
Wainscott, J. M. (M)
Warnock, R. L. (A)
Williams, D. G. (A)
Wittels, J. L. (A)
Wu, H. S. (A)

Chester (SL-5)
Rockwell, D. A. (A)

Chicago (CHI-5)
Aagaard, J. S. (A)
Abraham, J. (A)
Ackerman, N. A. (A)
Adams, K. (M)
Adamson, A. C. (A)
Addison, W. G. (A)
Adison, J. C. (A)
Adler, H. J. (SM)
Affrunti, A. J. (M)
Akerman, S. (A)
Adler, R. (F)
Aklinski, M. J. (A)
Albin, A. L. (M)
Alessio, S. A. (A)
Alexanoff, E. (A)
Ambos, C. (A)
Anderson, G. W. (A)
Anderson, M. E. E. (A)
Anderson, R. L. (A)
Anderson, R. S. (A)
Anderson, T. W., Jr. (M)
Anderson, W. J. (A)
Andres, L. J. (SM)
Andresen, E. H. (SM)
Anner, G. E. (A)
Aoyama, F. S. (A)
Apger, F. E. (A)
Argall, G. J. (A)
Arnow, C. L. (A)
Aronson, H. A. (A)
Audo, P. D. (A)
Avella, P. S. (A)
Azelickis, A. N. (A)
Backman, K. E. H. (A)
Baker, G. M. (A)
Balikov, M. H. (A)
Ball, R. M. (A)
Balousek, M. W. (A)
Ban, G. R. (A)
Baptist, W. G. (M)
Baron, T. (A)
Barut, A. O. (A)
Basko, A. (A)
Bauman, H. W. (M)
Beane, G. F., Jr. (A)
Becker, H. W. (M)
Bedrosian, E. (A)
Bee, R. E. (M)
Beeson, W. E. (A)
Beier, L. W. (M)
Belopavlovich, P. (A)
Beneke, E. H. (A)
Bennett, G. T. (SM)
Berg, H. O. (A)
Bergen, H. A. (A)
Berger, D. (A)
Berkey, W. E. (M)
Bernat, L. (A)
Bernreuter, H. A. (SM)
Bialek, S. T. (A)
Biernat, W. M. (A)
Bills, G. R. (A)
Bigelow, R. P. (A)
Blahna, C. (SM)
Bloomenthal, S. (M)
Bluzat, C. R. (A)
Boesen, G. F. (A)
Bonk, G. V. (A)
Bonnell, D. W. (A)
Borman, W. M. (A)
Borth, J. W. (A)
Bowen, J. L. (VA)
Boyd, G. M. (A)
Boyll, L. O. (A)
Branscome, E. O. (A)
Brauer, H. H. (SM)
Brennan, L. E. (A)
Brimmer, W. R. (A)
Brittain, G. H. (M)
Brittin, F. L. (SM)
Brock, W. R. (A)
Brown, J. O. (A)
Brown, J. S. (SM)
Brown, R. V. (A)
Browne, B. (A)
Bruch, R. (VA)
Brugliera, F. J. (A)
Brymer, D. B. (A)
Buchholz, F. G. (A)
Buckley, J. K. (A)
Bull, R. W. (A)
Bunce, D. S. (A)
Burgwald, G. M. (A)
Buri, F. J. (A)
Burmeister, M. A. (M)
Burns, R. P. (A)
Buzzard, C. R. (A)
Bryne, W. C., Jr. (A)
Byrnes, W. P. (M)
Callahan, H. R. (M)
Callanan, J. A. (SM)
Callegari, P. B. (A)
Camillo, C. (A)
Camras, M. (F)
Cape, K. E. (A)
Cappels, J. L. (M)
Carlson, D. A. (A)
Carlson, G. I. (A)
Carroll, C. T. (M)
Carter, A. J., Jr. (A)
Casciotti, R. J. (A)
Catlin, L. F. (A)
Cesario, D. J. (A)
Chalberg, H. W. A. (SM)
Chalmers, E. D. (A)
Chandler, J. F. (A)
Chang, H. (A)
Chapp, J. M. (A)
Cherry, R. E. (A)
Child, F. T. (A)
Chittenden, G. W. (A)
Chodl, C., Jr. (A)
Choon, G. C. (A)
Christensen, R. T. (A)
Chulsky, I. (A)
Claras, C. W. (M)
Clardy, L. (M)
Clark, D. E. (SM)
Clark, R. A., Jr. (M)
Clavier, P. A. (M)
Cleveland, V. K. (A)
Cohan, O. (A)
Cohen, T. A. (SM)
Cohn, C. M. (A)
Cohn, G. I. (SM)
Cohn, J. (A)
Contos, P. G. (A)
Contri, A. (A)
Cook, R. H. (M)
Correia, F., Jr. (A)
Coulter, W. H. (A)
Cox, C. R. (SM)
Craine, W. P. (A)
Crampton, G. W. (M)
Crane, S. D. (SM)
Cunningham, B. B. (A)
Currier, M. G. (M)
Curtis, R. H. (A)
Cutter, R. H. (A)
Czepopski, W. P., Jr. (A)
Dahlin, E. K. (M)
Daly, W. E. (A)
Daniels, H. B. (M)
D'Arcy, E. W. (MS)
Darsch, A. P. (A)
Davidson, P. (A)
Davis, G. L. (A)
Davis, S. (A)
Decho, K. R. (A)
Deck, G. J. (A)
Dellaan, J. (A)
Del Ciello, R. R. (A)
Dehiban, R. (M)
Demmer, L. T. (A)
DeRose, R. A. (A)
Dervishian, E. (M)
Devine, W. F. (SM)
Dezettel, L. M. (A)
Dimmer, R. P. (SM)
Dirkers, N. A. (A)
Donaldson, R. J. (SM)
Dover, J. (A)
Drozt, P. (A)
Druz, W. S. (SM)
DuChatellier, R. (A)
DuMay, E. C. (A)
Duncan, C. W. (M)
Dunlap, J. F. (A)
Eakin, J. H. (A)
Ebert, D. H. (A)
Ecklund, R. E. (A)
Ellett, A. (SM)
Ellis, C. O. (M)
Elsner, R. F. (A)
Eltgroth, M. J. (M)
Endo, C. M. (A)
Eness, O. M. (A)
Epstein, M. (A)
Everett, J. E. (M)
Fabian, S. H. (A)
Fardoux, R. M. (A)
Farley, J. E. (A)
Fasick, R. C. (SM)
Fassl, F. R. (A)
Faulkner, A. H. (M)
Feldman, H. (A)
Fenton, M. J. (A)
Ferris, W. T. (VA)
Fetterman, D. M. (VA)
Fields, T. (A)
Figlewicz, R. C. (A)
Filips, R. P. (A)
Finison, H. J. (M)
Finlay, G. E. (A)
Fischer, A. J. (A)
Fischer, J. (A)
Fisher, B. A. (SM)
Fitzpatrick, J. V. (A)
Flesher, G. T. (A)
Flocken, L. H. (SM)
Flour, W. (A)
Flowers, A. A. (A)
Floyd, E. C. (M)
Fluskey, C. J. (A)
Foley, R. R. (A)
Fonte, G. (A)
Foster, G. E. (M)
Fox, M. L. (A)
Franklin, H. B. (A)
Franklin, W. S. (SM)
Frantz, N. (A)
Freeman, R. L. (SM)
Friedman, I. B. (A)
Fritchle, F. P. (A)
Fudaley, S. L. (A)
Fuglestad, K. R. (A)
Fujimoto, J. J. (A)
Fujimoto, K. K. (A)
Fukuhara, K. K. (A)
Fuller, F. C. (A)
Furst, U. R. (M)
Gabel, J. F. (A)
Gale, W. L. (A)
Galejs, J. (A)
Galluppi A. J. (A)
Gardberg, J. (A)
Garstang, W. W. (SM)
Gassner, F. (A)
Gawel, E. W. (A)
Gehmlich, A. P. (A)
Geist, G. W. (A)
Genovese, A. N. (A)
Gens, H. J. (A)
Gerlach, A. A. (SM)
Germain, J. (A)
Gershater, S. H. (M)
Gershon, J. J. (M)
Gerstein, B. (A)
Giacchetti, A. C. (A)
Gimpel, D. (A)
Giolitto, A. P. (A)
Gjertsen, E. J. (A)
Glasby, W. E. (M)
Glenn, R. J. (A)
Glentzer, K. V. (SM)
Glyptis, N. (A)

Godawski, T. J. (A)
Goh, C. C. (A)
Goldfus, S. M. (A)
Goldhaber, J. C. (M)
Goldsmith, P. (A)
Goldstein, M. (M)
Goldsworthy, W. T. (A)
Gooch, M. W. (A)
Gordon, E. S. (A)
Gore, W. C. (M)
Gornick, S. A. (A)
Gorozdos, R. E. (A)
Goss, W. (M)
Graf, A. W. (SM)
Graffam, P. S. (A)
Gray, D. (VA)
Gronemeier, H. J. (A)
Gross, E. J. (A)
Gruen, H. E. (A)
Gruenloh, G. J. (A)
Gudmundson, R. R. (A)
Guzzey, J. E. (M)
Halinton, H. (M)
Halligan, W. J. (A)
Halpern, H. S. (M)
Halverson, S. L. (A)
Hamilton, V. P. (A)
Hamme, R. J. (A)
Hamre, H. G. (A)
Hanik, P. (VA)
Hanner, J. B. (A)
Hansen, R. O. (A)
Hansen, W. H. (VA)
Hardy, H. C. (SM)
Hargis, R. N. (A)
Harrigan, G. S. (SM)
Harris, B. J. (A)
Harris, E. F. (A)
Hartmann, C. L. (A)
Hassel, K. E. (SM)
Hassler, E. B. (A)
Hay, E. (A)
Hayashida, B. N. (M)
Hayes, H. D. (SM)
Heathershaw, R. T. (A)
Hencke, J. M. (A)
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Hill, C. F. (A)
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Hines, J. W. (M)
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Hjermstad, H. (VA)
Hoehn, A. J., Jr. (SM)
Hoffman, H. E. (M)
Holmes, D. D. (A)
Holpuch, C. J. (M)
Holubow, H. (M)
Honda, M. (A)
Horde, J. W. (A)
Hori, S. (A)
Horn, L. H. (SM)
Hotz, M. (A)
Howe, J. K. (M)
Huber, R. H. (A)
Huston, P. D. (A)
Hutcheon, R. S. (A)
Hynes, E. A. (A)
Ihde, W. M. (SM)
Imerson, H. E. (A)
Ingram, C. (A)
Inman, J. F. (SM)
Inoue, N. S. (A)
Inberner, M. P. (A)
Iverson, F. A. (A)
Jablonsky, J. G. (A)
Jackson, J. J. (A)
Jacob, F. N. (SM)
Jacobsen, I. (A)
Jacobsohn, D. H. (A)
Jacobson, L. (A)
Jahnigen, F. W. (A)
Jahnke, C. E. (A)
Javid, M. (A)
Jensen, J. O. (VA)
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Johnson, J. T. (A)
Johnson, W. S., Jr. (A)
Jones, A. H. (A)
Jones, T. E. (A)
Jorgensen, N. A. (A)
Joumbert, J. L. (A)
Jur, C. J. (A)
Kahn, J. J. (A)
Kalman, J. (A)
Kaluzna, I. J. (A)
Kaminsky, L. M. (A)
Kampschoer, J. F. (A)
Kampys, J. E. (A)
Kane, J. R. (A)
Kantner, H. H. (M)
Kaplan, H. (A)
Karantzis, J. (A)
Karel, L. G. (A)
Karet, R. M. (A)
Karow, K. A. (A)
Karr, R. J. (A)
Kasal, K. (A)

Kayser, D. R. (A)
Kearse, G. P. (SM)
Keller, W. P. (A)
Kelly, E. P., Jr. (M)
Kelsey, L. C. (A)
Kemnitz, W. F. (A)
Kennedy, J. P. (SM)
Kennedy, J. A. (M)
Kenney, M. W. (SM)
Kiefer, J. C. (M)
Kietzer, J. E. (A)
Kilburn, A. B. (A)
Kingwill, H. S. (A)
Klacka, J. A. (A)
Klapperich, A. J. (VA)
Kloga, P. J. (A)
Kmiec, W. J. (A)
Koenig, H. G. (A)
Koerner, F. A. (A)
Kohn, E. B. (A)
Kohner, M. (SM)
Kolberg, E. G. (A)
Komm, J. (A)
Kopeny, L. J. (A)
Kouba, J. T. (A)
Koutsoukos, F. (A)
Kowitz, A. E. (A)
Krahe, L. R. (M)
Kraitsik, N. I. (A)
Krakora, J. J., Jr. (SM)
Kramer, A. W. (VA)
Kramer, K. (SM)
Kransz, P. A. (M)
Kravitz, J. S. (A)
Krc, P. S. (A)
Krefft, H. H. (M)
Kroll, J. B. (A)
Kratenansky J. S. (A)
Krueger, R. M. (SM)
Krueger, W. F. (A)
Krumhardt, C. (A)
Krus, G. D. (A)
Kuffel, L. A. (M)
Kulik, L. (A)
Kulosa, A. Jr. (A)
Kuniyuki, R. M. (A)
Kunst, A. F. (A)
Kurinsky, J. S. (A)
Kurland, J. J. (A)
Kusack, W. P. (A)
Kuitek, G. L. (A)
Kwiatek, W. K. (A)
Lamons, R. P. (A)
Land, D. W. (A)
Lang, H. K. (A)
Lapin, S. P. (M)
LaRocca, J. J. (A)
LaRose, A. P. (M)
Larsen, P. J. (SM)
Larson, R. J. (A)
Larson, R. W. (A)
Larson, W. L. (SM)
Lassila, A. A. (A)
Laythe, R. F. (A)
Leedy, H. A. (SM)
LeMay, K. E. (A)
Lencioni, C. C., Jr. (A)
Lenox, W. S. (A)
Leonhardi, J. O. (A)
Leoni, A. J. (M)
Leopold, L. (A)
Lerner, I. S. (M)
Leslie, W. A. G. (A)
Leszko, N. J. (A)
Levandis, J. J. (A)
Levi, J. S. (M)
Levine, J. M. (A)
Levine, M. B. (A)
Lewin, H. (A)
Lewis, R. E. (M)
Lewis, W. A. (SM)
Liberman, A. (SM)
Liepold, R. B. (A)
Lindholm, C. R. (A)
Lipinski, W. C. (A)
Liston, K. L. (A)
Littlewood, W. N. (A)
Lockhart, R. W. (SM)
Lopez, J. L. (A)
Lorenc, R. M. (A)
Lubeck, W. A. (A)
Lucas, D. T. (A)
Lucas, G. W. (A)
Luecke, G. N. (A)
Luttgens, H. C. (SM)
Lynch, T. H. (A)
Lytle, C. W. (SM)
MacAskill, R. B., Jr. (A)
MacLean, N. W. (M)
Macres, G. S. (A)
Magnuski, H. (SM)
Magnuson, R. J. (M)
Maidak, A. M. (A)
Malinowski, S. (A)
Man, J. V. (M)
Mankin, A. H. (M)
Mansfield, R. (M)
Margowsky, H. (M)
Mariner, T. H. (A)
Markarian, M. V. (A)
Marquardt, J. A. (A)
Marsh, S. V. (A)
Marshall, C. E. (VA)
Marsland, H. W. (A)

Marszalek, H. L. (A)
Martin, L. (SM)
Massie, H. B. (A)
Masters, E. W. (SM)
Matthews, L. E. (A)
Maximoff, B. S. (A)
McCarthy, H. J. (A)
McClelland, W. B. (M)
McDonald, J. J. (A)
McDonell, W. J. (VA)
McDougall, D. S. (M)
McFarland, R. B. (A)
McKnight, R. W. (A)
McLean, A. R. (A)
McMahon, D. W. (A)
McManus, J. E. (A)
McNeill, H. N. (A)
Meehan, E. L. (A)
Meinema, H. (A)
Meixner, E. J. (A)
Messinger, H. P. (A)
Meuer, A. (A)
Meyer, A. (A)
Michalski, R. A. (A)
Mikos, E. J. (A)
Miller, E. L. (A)
Miller, R. J. (A)
Minkus, F. (A)
Mintz, F. (M)
Mitchell, L. W. (A)
Mitchell, T. E. (A)
Mittelmann, E. (SM)
Mnichowicz, J. S. (A)
Mohler, R. D. (A)
Molnar, I. (SM)
Molyneaux, R. J. (A)
Moon, R. J. (SM)
Moore, W. T. (A)
Morgan, G. M. (M)
Morris, L. P. (VA)
Moulton, G. E. (A)
Mueller, E. L. (A)
Mueller, F. L. (A)
Murphy, J. L. (SM)
Murphy, T. C. (A)
Myers, J. A., Jr. (M)
Myse, A. G., Jr. (A)
Nakata, C. K. (A)
Neben, H. M. (M)
Nelson, R. A. (A)
Nelson, W. E. (A)
Nerwin, H. N., Jr. (A)
Neumark, J. (A)
Newman, J. E. (A)
Niederman, B. (A)
Nienaber, F., Jr. (A)
Nierman, L. W. (A)
Noble, D. E. (F)
Noda, T. T. (A)
Novic, R. H. (A)
Novy, J. F. (SM)
Obog, L. F. (M)
O'Brien, E. (VA)
O'Brien, E. G. (A)
O'Connor, C. J. (A)
Offner, F. (SM)
Ogasawara, T. B. (A)
Okuma, T. M. (A)
Oldfield, R. L. (A)
Olson, E. L. (M)
Olson, G. A. (A)
Olson, V. W. (M)
Orr, B. B. (A)
Ostrand, K. T. (A)
Owca, A. E. (A)
Owen, G. E., Jr. (A)
Ozker, T. (M)
Pacholke, F. (SM)
Padva, P. D. (A)
Palm, H. A., Jr. (A)
Paly, M. (A)
Panec, G. A. (M)
Pankos, J. F. (A)
Paradise, M. E. (SM)
Park, G., Jr. (M)
Parker, W. E. (A)
Parkinson, J. A. (A)
Parry, H. J. (A)
Patrick, A. L. (A)
Patrick, W. S. (A)
Paulos, L. B. (A)
Pavela, H. W. (M)
Pendleton, J. R. (A)
Pennella, M. O. (A)
Perlin, H. (A)
Perlman, M. (A)
Peterson, C. D. (A)
Peterson, C. H. (M)
Peth, R. (A)
Petrovick, M. L. (A)
Petitto, S. D. (A)
Peto, C. (A)
Pettegrew, J. B. (A)
Petzing, E. W. (VA)
Pfaff, E. R. (SM)
Phinney, T. W. (A)
Pipes, C. P. (A)
Pitalis, P. H. (A)
Poclus, J. B. (A)
Podlusky, M. V. (A)
Pollack, I. H. (M)
Pospisil, J. F. (A)
Post, J. W. (A)
Potocki, F. E. (A)

Potter, J. D. (A)
Powell, C. S. (A)
Powell, J. M. (A)
Powell, R. W. (A)
Pozdol, A. J. (A)
Prince, R. T. (A)
Procter, S. A. (A)
Pryst, T. S. (M)
Quateman, M. H. (A)
Quinn, B. O. (A)
Quinn, J. L. (M)
Race, R. T. (A)
Radcliffe, A. J., Jr. (A)
Rahmel, H. (SM)
Ramirez, L. (A)
Rasins, W. L. (A)
Rattray, A. I. (M)
Raucher, W. L. (A)
Read, C. T. (A)
Redfield, S. I. (A)
Reed, W. O. (VA)
Reeves, A. C. (A)
Reinhold, W. D. (A)
Rennick, J. L. (SM)
Rett, H. C. (A)
Revor, R. J. (M)
Rice, P. (A)
Richter, F. A. (M)
Riddel, O. A. (VA)
Roach, W. E. (A)
Robert, J. M. (A)
Roberts, E. A. (SM)
Robins, H. M. (A)
Rockwood, C. C. (A)
Rodriguez, A. E. (VA)
Rogers, G. F. (SM)
Rokes, N. W. (A)
Romanelli, J. (A)
Ronning, H. (A)
Roschke, E. M. (SM)
Rose, J. K. (VA)
Rosencranz, R. (A)
Rosenman, L. (A)
Ross, E. H. (SM)
Rossetti, A. (A)
Rossi, C. V. (M)
Roth, T. A. (A)
Rotter, A. (A)
Rowe, T. L. (SM)
Rubinfien, D. (M)
Rusnak, M. (A)
Rymas, S. J. (A)
Sabel, A. R. (A)
Saffro, Y. L. (A)
Saltzberg, B. (SM)
Saltzberg, T. (A)
Sammons, F. D. (A)
Sanabria, J. M. (A)
Sances, A., Jr. (A)
Saudinaitis, E. (A)
Savage, L. E. (M)
Schaffner, G. (A)
Scharding, R. M. (A)
Schlesinger, W. A. (VA)
Schlote, R. H. (A)
Schmidt, L. D. (A)
Schmidt, W. E. (A)
Schnell, F. H. (SM)
Schoeneck, W. H. (A)
Schover, D. S. (SM)
Schram, P. J. (A)
Schreiner, L. W. (SM)
Schrot, E. H. (SM)
Schulte, O. (A)
Schultz, C. W. (M)
Schumacher, H. W. (A)
Schumacher, J. H. (SM)
Schurak, K. M. (A)
Schwartz, B. S. (A)
Schwartz, J. (A)
Schwarzenbach, E. E. (VA)
Seestedt, H. C. (A)
Segal, A. A. (M)
Seligmann, P. (A)
Seow, L. (A)
Shallcross, G. P. (A)
Shapin, T., Jr. (A)
Shapira, F. M. (A)
Shapiro, L. (A)
Shapiro, M. D. (A)
Shevick, P. (A)
Shonerock, R. C. (M)
Shulman, A. (M)
Shuppert, W. G. (A)
Shure, S. N. (VA)
Siegel, D. T. (M)
Sienkiewicz, S. V. (A)
Simpson, C. E. (A)
Sinclair, D. C. (A)
Siff, A. W. (A)
Sivin, L. (A)
Skaritka, R. (A)
Skrip, E. D. (A)
Sloan, A. C. (A)
Slugodzki, L. K. (VA)
Smeltzer, J. C. (A)
Smith, A. B. (SM)
Smith, C. H., Jr. (A)
Smith, D. B., Jr. (A)
Smith, R. B. (M)
Solomon, J. L. (SM)
Soma, R. (A)
Soria, R. M. (SM)
Soufal, F. H. (A)

Spano, A. (A)
Spisak, G. C. (A)
Spitz, H. (A)
Splitt, F. G., Jr. (A)
Sprayberry, F. L. (VA)
Stadler, R. (A)
Stahl, J. E., Jr. (A)
Stan, J. (A)
Starzec, F. (A)
Stecker, J. W. (A)
Steele, A. J. (A)
Steen, W. J. (M)
Steinberg, E. E. (A)
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Stemm, R. E. (M)
Stene, W. M. (A)
Stenerson, C. K. (A)
Stettler, C. O. (A)
Sternlicht, L. (A)
Stone, C. H. (SM)
Stone, E. W. (A)
Stone, R. S. (A)
Stonevic, V. R. (A)
Sugimoto, J. (A)
Surowiec, D. S. (A)
Suson, I. (A)
Sussman, M. (A)
Suzuki, E. (A)
Swain, J. E., Jr. (A)
Swan, L. L. (A)
Swanson, B. E. (M)
Swanson, C. R. (M)
Swanson, W. G. (A)
Swanstrom, N. C. (A)
Swenson, R. A. (A)
Swinyard, W. O. (F)
Switzenberg, E. A. F. (M)
Sydejko, J. F. (A)
Szegho, C. S. (F)
Tado, S. T. (A)
Takahashi, K. (A)
Tamura, V. (A)
Tanana, E. J. (A)
Tenenberg, L. (A)
Terleckyi, J. (A)
Teske, H. O. (A)
Teslik, J. A. (A)
Thompson, J. E. A)
Thompson, O. I. (M)
Timmings, G. H. (SM)
Tlapa, J. A. (M)
Toback, P. L. (A)
Todd, S. R. (SM)
Tornheim, H. (A)
Toy, T. G. (A)
Trimarco, F. J. (A)
Trittenbach, J. M. (SM)
Tucker, D. P. (SM)
Turner, J., Jr. (VA)
Tutle, E. G. (A)
Tuttle, F. M., Jr. (A)
Uhl, M. H. (A)
Unger, E. E. (M)
Uyeda, M. M. (A)
Vaccaro, A. C. (A)
Valcik, L. (A)
Vale, S. D. (A)
Vance, W. H., Jr. (M)
Vanderwerf, J. L. (A)
Varone, R. A. (SM)
Verbanec, W. R. (A)
Vernon, R. R. (A)
Vogt, A. R. (A)
Vuchetich, J. B. (A)
Wachowski, H. M. (M)
Wajda, J. P. (A)
Wakabayashi, G. J. (A)
Walding, E. C. (A)
Walker, L. G. (SM)
Waller, E. E. (A)
Wallin, G. (A)
Walovich, J. J. (M)
Walters, P. M. (A)
Warnke, G. F. (M)
Watkins, D. M. (A)
Watson, P. C. (A)
Watstein, J. I. (M)
Wazlo, C. J. (A)
Weaver, W. B. (M)
Webb, E. M. (A)
Weber, L. J. (SM)
Weber, R. I. (VA)
Wein, F. (A)
Weir, A. G. (A)
Weisenburger, F. M. (A)
Weissman, R. M. (SM)
Welcome, W. W. (A)
Wells, R. E. (A)
Wenninger, F. L. (M)
West, R. E. (A)
Wheeler, G. D. (M)
White, J. F., Jr. (A)
Whitney, S. D. (A)
Wickline, B. D. (M)
Wike, E. A. (A)
Wildman, A. J. (A)
Williams, C. E. (A)
Williams, S. D. (A)
Wingert, R. R. (A)
Wischnia, H. F. (A)
Wisner, C. V., Jr. (A)
Wisnowski, W. C. (A)
Wolf, M. (A)

Wolfe, F. R., Jr. (SM)
Wolff, J. R. (A)
Wolken, I. I. (A)
Wollin, E. (A)
Wood, C. E. (A)
Wood, P. E. (A)
Woodland, J. M. (A)
Woodman, A. J. (A)
Woodruff, A. E. (VA)
Woods, A. A. (VA)
Wray, P. G. (A)
Wszolek, W. (A)
Yeslin, A. (A)
Zaabel, C. W. (A)
Zaida, W. L. (A)
Zelinski, F. P. (A)
Zeller, H. R. (A)
Zilis, G. S. (A)
Zimmerman, D. A. (A)
Zitkus, A. J. (A)
Zupansky, M. (A)
Zusman, D. (A)

Chicago Heights (CHI-5)
Brown, W. (A)
Buzzelli, T. S. (A)

Cicero (CHI-5)
Biba, R. J. (A)
Davis, C. J. (A)
Hajek, A. F. (A)
Hollich, F. J. (A)
Jezek, J. E. (A)
Jones, W. V., Jr. (A)
Jucius, S. W. (A)
Rabier, J. L. (SM)
Rous, W. H. (A)
Slad, G. F. (A)
Whiting, R. F. (A)

Clarendon Hills (CHI-5)
Hessler, O. G. (SM)
Jurnecka, J. E. (A)
Knox, J. G. (M)
Marks, M. (SM)
Sayles, H. L. (A)
Silberg, W. F. (A)

Collinsville (SL-5)
Roschke, T. H., Jr. (A)
Sobotka, H. J. (A)

Congress Park
Ives, G. M., Jr. (SM)

Crystal Lake (CHI-5)
Friend, H. H. (SM)
Hawkins, B. C. (A)
Smith, G. B. (A)

Danville (CHI-5)
Booth, R. C. (M)

Decatur (CHI-5)
Abfalter, H. F. (A)
Cupp, E. W. (A)
Fathauer, G. H. (SM)
Hines, H. H. (A)

Deerfield
Carr, D. G. (A)
Clough, K. (VA)
Nielsen, R. S. (A)
Phillips, W. E. (VA)
Weber, A. J. (A)

Des Plaines (CHI-5)
Adams, E. C. (A)
Bernin, V. M. (A)
Brooks, W. L. (M)
Bushman, S. F. (M)
Carr, R. W. (A)
Cortright, R. D. (M)
DeBusman, D. J. (A)
Doering, J. H., Jr. (A)
Fountain, B. C., Jr. (A)
Goldstein, R. (A)
Henrich, C. A. (A)
Hills, E. G. (A)
Himebrook, F. C. (A)
Jahnke, C. E. (A)
Krizanosky, A. (A)
Koenig, G. (A)
Langstaff, R. H. (M)
Lauffenburger, H. A. (A)
Leslie, W. G. A. (A)
Loughman, R. H. (A)
Marco, F. (SM)
McIlvaine, D. K. (A)
Medal, R. J. (M)
Muhs, R. L. (A)
Naslund, R. S. (VA)
Payne, R. A. (A)
Robinson, B. H. (A)
Sciez, L. C. (A)
Smith, P. A. (A)
Stanonis, A. F. (A)
Sundt, E. V. (SM)
Taylor, E. H. (SM)
Utter, R. A. (A)

Dixon
Schmidt, E. R. (A)

Downers Grove (CHI-5)
Bateman, L. A. (A)
Brookshier, W. K. (A)
Courchene, H. B. (SM)
Eddy, W. L. (A)
Goertz, R. C. (A)
Harder, R. B. (VA)
Johnson, A. R. (A)
Peckhart, M. A. (A)
Prokes, P. H. (M)
Wood, R. E. (SM)

Dundee (CHI-5)
Boswau, H. P. (SM)

Dwight
Seabert, F. (A)

East St. Louis (SL-5)
Barnard, G. E. (A)
Kenney, C. L. (A)
Wise, H. G. (M)

Edwardsville (SL-5)
Viere, A. J. (A)

Effingham (SL-5)
Burlingame, C. W. (A)
Delong, W. A. (A)
Isear, J. A., Jr. (A)

Elgin (CHI-5)
Irelan, H. F. (A)
Kadow, A. C. (A)
Kult, M. L. (M)
Lang, G. W. (VA)
Soper, G. T. (A)

Elmhurst (CHI-5)
Aberer, J. C. (A)
Arnold, G. G. (A)
Beck, V. R. (SM)
Beier, M. G. (M)
Blum, G. E. (A)
Byrne, J. F. (F)
Canfield, H. H. (A)
Chelgren, A. E. (A)
Cox, B. O. (A)
Davis, J. (SM)
DeShong, J. A., Jr. (SM)
Disney, V. H. (SM)
Foot, N. J. (A)
Grimalla, A. G. (A)
Haines, D. G. (SM)
Hissong, A. L. (M)
Jacker, E. W. (SM)
Johnson, G. A. (M)
Kasmar, R. A. (M)
Kearney, L. E. (A)
Lindsay, W. R. (M)
Madland, G. R. (A)
Mittman, E. E. (A)
Moore, G. F. D. (A)
Probeck, C. (SM)
Ramler, W. J. (A)
Richards, S. P. (A)
Ronzheimer, S. P. (M)
Russell, W. W. (M)
Schultz, C. J. (A)
Schultz, E. H. (SM)
Seavey, R. W. (A)
Steinhoff, I. J. (A)
Torode, S. W. (A)
Troxel, R. E. (A)
Von Fredersdorff, G. C. (A)
Webster, S. K. (M)
Weidenhamer, B. C. (A)
Williams, P. B. (SM)
Winemiller, H. R. (M)
Witzel, A. B. (A)

Elmwood Park (CHI-5)
Bell, D. L. (A)
Christianson, H. J. (M)
Coon, W. B. (A)
D'Orio, A. F. (A)
Githens, T. A. (A)
Parmet, B. S. (SM)
Scheffel, A. G. (A)

Evanston (CHI-5)
Beam, R. E. (SM)
Bronwell, A. B. (SM)
Brown, A. C. L. (M)
Busch, A. E. (M)
Calvert, J. F. (SM)
Christian, H. S. (A)
Clark, J. T. (SM)
Cook, S. M. (A)
Cotter, W. F. (SM)
Cozzens, W. B. (A)
Crossley, A. (SM)
Davis, H. G., Jr. (A)
Deal, H. B. (SM)
Dere, G. B. (A)
Early, C. D., Jr. (A)
Fisher, F. E. (A)
Ford, D. J. (A)
Hammond, C. R. (A)
Helley, R. M. (A)
Hopkin, A. M. (A)
Horwitz, S. J. (M)
Huxtable, C. K. (SM)

Lawton, B. E. (M)
Loughridge, D. H. (SM)
Lyon, J. A. M. (SM)
Maltby, A. I. (A)
Markin, J. (SM)
Mayes, P. E. (A)
Miles, C. L. (A)
Nitchals, J. L. (A)
Nordby, R. M. (A)
Orner, R. J. (M)
Peck, E. R. (A)
Prell, G. A. (A)
Reichenbach, R. K. (A)
Rollefson, K. E. (SM)
Saberson, C. J. (A)
Sabin, E. R. (A)
Smythe, E. H. (SM)
Spiegel, L. (M)
Tempka, J. A. (A)
Toth, W. S. (M)
Van Tepmond, H. K. (A)
Van Ness, J. E. (A)
Wendt, R. H. (VA)
Williams, J. T. (A)
Wing, A. H., Jr. (SM)
Ziegler, G. E. (SM)

Evergreen Park (CHI-5)
Hirsch, A. (A)
Kostyal, S. P. (A)

Fairbury (CHI-5)
Eilers, C. G. (A)

Flossmoor
Caywood, T. E. (M)
Crago, P. H. (A)

Forest Park
Sellen, D. E. (A)
Shelton, E. D. (A)

Fort Sheridan (CHI-5)
Elam. E. M. (A)

Franklin Park (CHI-5)
Brewster, F. C. (SM)
Bridges, J. E. (A)
Brumbach, J. F. (M)
Reges, A. (A)
Stroh, W. J. (A)
Wolnik, E. W. (A)

Freeport (CHI-5)
Coleman, J. J. (M)
Delmilow, L. L. (A)
Nesterode, B. W. (A)
O'Connell, G. (VA)

Gary
Ireland, R. P. (M)

Geneva (CHI-5)
Bowman, D. S. (M)
Ewald, E. R. (A)
Griffin, W. F., Jr. (M)
Junkins, A. H. (M)
Robbins, R. W. (SM)
Soderquist, R. K. (A)
Wohlert, A. M. (A)

Glencoe (CHI-5)
Brown, J. E. (F)
Carlson, G. R. (A)
Ferry, J., Jr. (A)
Heuer, C. H. (M)
Kurland, J. J. (A)
Michaels, J. A. (A)
Pollen, L. K. (A)
Spiegel, G. W. (M)

Glen Ellyn (CHI-5)
Christensen, A. (M)
Cisne, L. E. (A)
Groslovich, S. J. (A)
Hupert, J. J. (SM)
Kidd, W. E. (SM)
Kleker, J. H. (A)
Knowles, H. S. (F)
Lincicome, J. R. (A)
Tingley, E. M., Jr. (A)
Wolff, K. A. (A)
Woolsey, R. J. (M)

Glenview (CHI-5)
Bell, J. F. (A)
Dunn, W. L. (SM)
English, W. C. (M)
Ferguson, J. C., Jr. (M)
Freeman, W. H. (M)
Goss, C. G. (A)
How, F. B. (A)
Jorgensen, C. M. (SM)
Lewis, G. E. (A)
Masek, J. R. (A)
Pivan, D. B. (M)
Stiles, J. E. (M)
Stubner, J. W. (A)

Golf (CHI-5)
Boyajian, J. A. (SM)

Granite City (SL-5)
Kozma, E. Z. (A)

Rasche, D. O. (A)
Tatosian, V. (A)

Grays Lake (CHI-5)
Jarvis, G. R. (A)
Olson, C. F. (A)

Great Lakes (CHI-5)
Bishop, R. I. (M)
Boop, J. H. (A)
Kuranko, C. G. (A)
Ress, J. (A)
Sergeant, R. C. (M)
Shoemaker, W. F. (A)

Harristown (CHI-5)
Levy, S. L. (M)

Harvey
Karlson, A. T. (M)

Hazelcrest (CHI-5)
Berry, R. F. (A)

Highland
Wood, H. C. (A)

Highland Park
Arnolt, A. K. (A)
Cherry, W. L., Jr. (A)
Darlington, H. T., Jr. (A)
Durkee, C. E. (M)
Glasel, W. B. (A)
Hudgins, W. D. (SM)
Kiver, M. S. (A)
Miller, E. S. (M)
Mills, G. G. (A)
Pepperberg, L. (M)
Sanders, M. (A)
Schafer, W. W. (A)
Schwalm, W. A. (SM)
Tinkham, R. J. (M)

Hillside (CHI-5)
Brandt, I. L. (A)
Eidem, R. H. (A)
Sedik, J. J. (A)

Hines (CHI-5)
Gunter, J. F. (A)

Hinsdale (CHI-5)
Clark, J. M. (SM)
Conn, R. A. (A)
Doyle, E. J. (SM)
Dumanowski, R. J. (A)
Hanson, A. N. (A)
MacDonald, A. A. (SM)
Schulz, R. F. (A)

Hollywood (CHI-5)
Poll, V. M. (A)
Setzke, H. A. (M)
Zenner, R. E. (SM)

Homewood
Crotty, R. E., Jr. (A)
Hall, H. H. (A)
Medkeff, R. J. (A)
Powell, C. L. (A)

Ingleside (CHI-5)
Eick, M. K. (A)
Reese, K. E. (M)

Itasca
Florman, L. W. (M)

Joliet (CHI-5)
Collins, T. F. (A)
Davis, C. H. (M)
Harris, S. J. (SM)
Harrison, L. E. (A)
Szegda, A. (A)
Wentherford, H. L. (A)

Jonesboro
Kinder, H. R. (A)

Kansas (CHI-5)
Lacy, L. Y. (SM)

Kenilworth
Howell, E. R., Jr. (A)

La Grange (CHI-5)
Brodie, G. H. (M)
French, J. C. (A)
Hagey, W. C. (SM)
Kikta, J. M. (A)
Knouf, R. J. (SM)
Kongable, L. S. (A)
Medill, J. W. (M)
Read, R. A., Jr. (A)
Sander, W. E. (A)
Smith, Z. R. (A)
Snelling, E. A. (M)
Wakefield, S. J. (A)

La Grange Park
Hansen, C. A. (M)
Wehrle, R. (A)
Weill, A. E. (A)

Lake Forest (CHI-5)
Barrett, A. M., Jr. (A)
Faulks, H. R. (A)

Lake Zurich (CHI-5)
Barter, L. D. (A)

Lemont (CHI-5)
Brar, S. S. (A)
Chu, J. C. (A)
Connor, D. W. (A)
Purinton, R. M. (M)
Todd, A. C. (M)
Whalen, J. F. (M)

Libertyville (CHI-5)
Bottorff, P. A. (VA)
Bruna, R. F. (M)
Henderson, M. C. (A)
Martin, W. S. (M)
Perkins, H. T. (A)
Strickland, J. L. (A)
Zellmer, W. G. (A)

Lincoln
Deal, J. H. (A)
Knochel, R. F. (M)

Lincolnwood (CHI-5)
Beusman, R. M. (SM)
Moskow, H. J. (M)
Waterman, H. C. (A)

Litchfield
Ehret, J. R. (A)

Lockport
Carter, O. M. (VA)
Moffatt, V. J. (A)

Lombard (CHI-5)
Baroch, G. F. (A)
Bartha, S. J. (A)
Berry, R. E. (A)
Borchardt, R. L. (A)
Clark, B. H. (A)
Dunbar, E. A. (A)
Dyer, J. H. (M)
Finke, W. W. (A)
Fyler, G. W. (SM)
Grisanti, J. L. (A)
Gunn, D. L. (A)
Haggstrom, R. W. (A)
Hotchkiss, C. S. (M)
Jackson, W. C. (SM)
McCreary, H. J. (SM)
Patchell, J. T. (A)
Pomon, J. D. (A)
Puhalski, D. (A)
Sebastian, R. W. (A)
Tschannen, R. F. (SM)
Witt, C. E. (M)

Lyons (CHI-5)
Albert, A. A. (A)

Marengo (CHI-5)
Arnold, R. M. (VA)
Lewis, H. A. (A)

Marion (SL-5)
Kenyon, F. R. (VA)
McGee, K. (M)

Marissa (SL-5)
Church, C. J. (M)

Matteson (CHI-5)
Blocki, W. G. (A)
Feehery, J. T. (A)
Miller, G. E. (A)

Maywood (CHI-5)
Del Camp, S. M. (A)
Forst, P. P., Jr. (A)
Green, E. G. (A)
Hale, G. R. (A)
Komm, P. M. (VA)
Mages, L. J. (A)
Richards, H. F. (A)
Schlesinger, K. (SM)
Schultz, R. H. (A)
Tahl, J. E. (A)

McHenry (CHI-5)
Butler, J. J. (A)

Melrose Park (CHI-5)
Bachhuber, R. A. (A)
Eckmann, L. G. (A)
Petzner, R. W. (A)
Hulla, E. L. (M)
Jaster, D. R. (A)
Pufahl, E. R. (M)
Zimmerman, J. (A)

Mokena (CHI-5)
McCain, G. (A)

Monmouth
Ekblaw, W. E., Jr. (A)

Morrison (CHI-5)
Van Osdol, R. L. (VA)

Morton Grove (CHI-5)
Lange, W. W. (A)
Trowbridge, F. (A)
Weber, J. P., Jr. (M)

Mt. Prospect (CHI-5)
Bastian, E. (A)
Bierwirth, R. A. (M)
Carlson, E. V. (A)
Krempel, F. M. (A)
Stover, D. H. (A)

Mount Vernon
Burlingame, C. W. (A)

Mundelein (CHI-5)
Chudd, R. G. (A)

New Providence (CHI-5)
Williamson, R. J. (A)

Niles
Enright, F. E. (A)
Seider, J. P. (A)

North Aurora (CHI-5)
McIlvaine, O. T. (A)

Northbrook (CHI-5)
Grunwald, R. (M)
Hoffman, R. V., Jr. (M)
McJohnston, C. A. (A)
Sherrick, D. C. (M)

North Chicago
Jefferson, J. E. (A)
Nevin, M. E. (A)
Weixler, H. J. (M)

Northfield (CHI-5)
Green, L. F. (A)
Lang, J. A. (A)

Northlake (CHI-5)
Cawthon, E. F. (A)
Rathbun, E. R. Jr. (A)

North Lake City
Dolhar, J. L. (A)
Romano, S. S. (A)

North Riverside (CHI-5)
Laban, J. (M)
Tofani, H. D. (A)

Norwood Park Twp. (CHI-5)
Casey, E. A. (A)
Rahnert, R. G. (A)

Oak Lawn (CHI-5)
Blevins, E. L. (A)
Hultberg, R. M. (A)
Sukup, J. P. (A)
Zoubek, C. M. (M)

Oak Park (CHI-5)
Anderson, C. M. (A)
Armstrong, M. M. (A)
Bauer, B. B. (F)
Beitz, R. E. (A)
Blevins, E. L. (A)
Bockelheide, A. W. (A)
Bryan, R. H. (VA)
Cotsworth, A., III (A)
Craig, L. E. (A)
Danz, E. J. (A)
Dore, A. J. (A)
Drobish, R. W. (A)
Duffy, E. J. (M)
Everitt, B. W. (A)
Fitch, W. M., Jr. (M)
Glum, D. E. (A)
Goebel, E. S. (M)
Goldberg, B. A. (A)
Graziano, V. (A)
Hartley, R. L. (A)
Ives, R. D. (M)
Jablonski, R. E. (A)
Kroger, M. G. (A)
Larson, R. P. (A)
Laube, W. C., Jr. (A)
Le Baron, T. (A)
Leiner, F. C. (A)
Lind, H. V. (A)
Linell, C. S. (A)
Luce, R. C. (A)
Maier, R. H. (A)
Marsh, R. E. (A)
Marsh, W. F. (A)
McMillan, D. N. (A)
Mehaffey, W. R. (SM)
Murphy, O. R. (A)
O'Sullivan, W. T. (A)
Petersen, E. H. (M)
Peterson, R. M. (M)
Pye, H. C. (VA)
Sinninger, D. V. (SM)
Sprunger, R. W. (A)
Staunton, J. J. J. (SM)
Van Scovoc, J. N. (SM)
Weber, F. V. (A)
Welker, J. J. (A)
Wise, G. H. (M)
Yoder, R. S. (SM)
Zender, R. G. (SM)

O'Fallon (SL-5)
Brown, J. (M)
Chamberlain, P. E. (M)
Eike, O. M. (M)

Ohio (CHI-5)
Griffin, R. E. (A)

Olney (EO-5)
Miller, A. M. (A)

Orient
Sakonyi, F. W. (A)

Orland Park (CHI-5)
Yang, R. F. H. (A)

Oswego
Wallace, G. A., Jr. (A)

Ottawa (CHI-5)
Ftacek, J. J. (A)
Meyer, C. H. (A)

Palatine (CHI-5)
Currey, C. H. (A)
Powers, J. S. (M)
Ryan, R. J. (A)
Thompson, R. T. (A)
Timberlake, F. A. (SM)
Warner, T. R. (A)

Palos Heights (CHI-5)
Brown, M. H. (A)
Scheldorf, M. W. (SM)
Woodbury, H. L. (A)

Palos Park (CHI-5)
Cairnes, W. E. (SM)

Park Forest (CHI-5)
DeHorn, C. E. (M)
Ducker, J. D. (A)
Foster, A. D. (M)
Gartner, A. J. (A)
Heffner, R. W. (A)
Kubilius, A. A. (M)
Lynch, R. G. (A)
Maravich, R. (A)
Mirkin, M. (A)
Whitmore, R. C. (A)

Park Ridge (CHI-5)
Betz, C. R. (A)
Boyers, J. S. (SM)
Crow, R. P. (M)
De Cola, R. (SM)
Edwards, F. W. (M)
Erwood, J. (SM)
Fischer, F. C., Jr. (A)
Fredine, E. L. (M)
Gannaway, R. (SM)
Hansen, T. A. (SM)
Hooper, P. B. (A)
Johnson, W. C. (A)
Knauss, R. G. (A)
Mead, L. R. (SM)
Mroz, M. (SM)
Mueller, A. J. (A)
Passow, E. B. (SM)
Ralph, J. T. (M)
Silver, J. F. (VA)
Smith, P. S. (SM)
Thrun, A. G. (VA)
Whitlock, M. C. (A)

Pecatonica (CHI-5)
Van Antwerp, M. C. (VA)

Peoria (CHI-5)
Hassler, S. S. (A)
Larosche, J. R. (A)
Rohrer, C., Jr. (A)
Royal, D. E. (A)
Ticen, W. E. (A)

Plainfield
Hartong, H. H. (A)

Prairie View (CHI-5)
Liepelt, E. E. (A)

Prospect Heights (CHI-5)
Blinoff, W., Jr. (A)
Drechsel, R. E. (A)
Mitchell, W. T. (A)

Quincy (CHI-5)
Damm, F. (A)
Gray, R. D. (A)
Hoyt, W. A. (A)
Oliver, G. W. (A)
Stratman, H. G. (A)
Weibler, C. T. (SM)

Reevesville
Choate, R. L. (A)

Ringwood (CHI-5)
Thompson, A. C. (M)

River Forest
Cusack, J. A. (A)
D'Orio, P. A. (SM)
Gustafson, G. E. (F)
Maciszewski, A. H. (SM)
Orwin, R. J. (M)
Schultz, A. A. (M)
Smith, A. P. (A)

River Grove (CHI-5)
Augustine, A. F. (A)
Bousky, S. (SM)
Green, L. H. (A)
Iversen, R. L. (M)
Tarantur, S. (A)

Riverside (CHI-5)
Bigelow, J. F. (SM)
Brooks, R. D. (SM)
Cihak, W. E. (A)
Fligel, W. P. (A)
Kean, W. F. (SM)
Wesselman, E. (VA)

Rochester
Kessler, W. D. (A)

Rockford (CHI-5)
Berglund, D. B. (A)
Bullen, C. V. (M)
Campbell, R. H. (A)
Eisengrein, R. H. (A)
Elliott, H. R. (M)
Hand, C. A. (VA)
Hetchler, L. F. (A)
Kyburz, U. L. (A)
Steiner, J. E. (A)
Tveit, T. J. (A)
Ward, L. A. (A)

Rock Island (CR-5)
Cone, J. H. (M)
Lynch, L. J. (A)
Pierce, F. W. (SM)
Roberts, J. O. (A)
Sinnett, R. J. (M)

Roselle (CHI-5)
Cape, H. J. (A)

Roxana (SL-5)
Stallard, F. C. (A)

Saint Anne (CHI-5)
Bernier, V. A. (A)

Saint Charles (CHI-5)
Nelson, D. A. (A)
Supitilov, M. C. (SM)
Winston, R. H. (SM)

Scott AFB
Goodman, S. N. (A)
Vigen, M. E. (A)

Silvis (CR-5)
Whitaker, R. O. (A)

Skokie (CHI-5)
Bixler, O. C. (SM)
Bogner, I. (M)
Carter, R. W. (A)
De Janovich, C. R. (A)
Dite, W. (A)
Firestone, W. L. (SM)
Fruth, H. F. (SM)
Galitz, R. J. (A)
Geiges, K. S. (SM)
Kelley, W. A. (A)
Loizzo, V. J. (A)
McDonald, D. C. (SM)
O'Callaghan, J. J. (SM)
Osborn, R. L. (A)
Pawlowski, F. L. (A)
Petersen, C. C. (M)
Pierce, C. B. (M)
Schloss, C. M., Jr. (A)
Schwennesen, D. (A)
Stanonis, A. F. (A)
Thomas, R. G. (A)
Weiland, R. L. (A)
Weisz, W. I. (M)
Whitman, M. R. (A)
Wickstrom, S. T. (M)
Zarky, B. (M)

South Chicago
Kahn, L. (VA)

Sparta (SL-5)
Richard, C. W. (SM)

Springfield (CHI-5)
Clement, I. C. (A)
Johnson, M. C. (A)
Leach, E. A. (SM)
McCormick, J. E. (A)
Oram, D. K. (VA)
Stock, B. L. (A)
Wilcox, S. R. (A)
Wood, H. C. (A)

Streator (CHI-5)
Chase, R. J. (A)
Crassia, C. C. (A)
Gotch, J. X. (A)
Griffin, J. W. (A)
Martin, H. R. (A)

Summit (CHI-5)
Berberek, W. J. (A)

Table Grove (CHI-5)
Harlan, J. R. (A)

Taylorville (CHI-5)
De Vore, G. D. (A)
Trapp, R. R. (A)

Trenton (CHI-5)
Eisenmayer, A. L. (A)

Urbana (CHI-5)
Anderson, J. M. (A)
Anner, G. E. (A)
Bailey, A. D. (A)
Barkson, J. A. (SM)
Bauman, P. A. (A)
Boatwright, L. T. (A)
Brearley, H. C., Jr. (A)
Brown, R. M. (M)
Crothers, M. H. (M)
Dahms, L. B. (A)
Dougal, A. A. (A)
Du Hamel, R. H. (A)
Duncan, J. W. (A)
Dyson, J. D. (A)
Emery, W. L. (SM)
Ernst, E. W. (A)
Everitt, W. L. (F)
Farnsworth, G. W. (A)
Fett, G. H. (SM)
Ghose, R. N. (M)
Gilden, M. (A)
Gooch, J. D. (A)
Hansen, R. C. (A)
Hayden, E. C. (A)
Holshouser, D. F. (M)
Hudson, P. K. (SM)
Inoue, N. S. (A)
Jensen, R. S. (A)
Johnk, C. T. (M)
Johnston, R. H. (M)
Jordan, E. C. (F)
Kaufman, I. (A)
Kirkwood, B. D. (A)
Knoebel, H. W. (A)
Kudlich, R. A. (A)
Kuhlman, E. A. (A)
Lincicome, D. C. (A)
Martin, C. B. (A)
Mast, P. E. (A)
McVay, M. S. (SM)
Murrell, T. A. (A)
Nash, J. P. (M)
Reed, M. B. (SM)
Rheams, C. J. B. (M)
Robertson, J. E. (A)
Ryder, J. D. (F)
Sandquist, J. W. (A)
Schwartz, E. W. (A)
Schwarzlose, P. F. (M)
Silverman, B. (A)
Smith, R. S. (A)
Trogdon, R. L. (A)
Tykociner, J. T. (SM)
Wainwright, R. M. (SM)
Wax, N. (M)
Webb, H. D. (SM)
Welkowitz, W. (A)
Wier, J. M. (A)

Villa Park (CHI-5)
Beaver, F. A. (A)
Fernandez, D. T. (VA)
Gorbunoff, A. (VA)
Kimmel, L. D. (A)
Kirby, T. H. (A)
Mathews, C. A., Jr. (A)
Norberg, L. R. (M)
Sparf, W. H. (A)
Voss, H. J. (A)
Zaruba, E. J. (SM)

Washington (CHI-5)
Ebel, A. J. (SM)
Planck, R. M. (VA)

Watseka (CHI-5)
Cox, L. H. (M)

Waukegan (CHI-5)
Anderson, C. A. (A)
Jensen, H. R. (A)
Krasovec, A. C. (A)
Nevin, M. E. (A)
Tucker, G. L. (M)

Westchester (CHI-5)
Beckwith, J. R. (SM)
Gabriel, R. R. (A)
Frankart, W. F. (M)
Modry, J. F. (A)

West Chicago (CHI-5)
Hummel, H. J. (A)
Jepson, M. R. (A)
Merda, W. R. (A)

Western Springs (CHI-5)
Bracken, J. F. (A)
Cottrell, B. P. (A)
Dondanville, R. V. (SM)
Duncan, D. C. (VA)
Hungerford, N. C. (A)
Kailus, P. (A)
Levy, G. F. (SM)
Scott, W. S. (A)
Weeks, R. R. (M)
Whitney, M. E. (SM)

Wheaton (CHI-5)
Batts, R. L. (SM)
Bruce, L. G. (A)
Calobrisi, P. (A)
Dickinson, R. V. C. (A)
Frank, C. W. (M)
Gaskins, S. M. (A)
Gouverneur, M. F. H. (A)
Hayworth, D. F. (SM)
Klem, R. F. (M)
Kunde, W. W., Jr. (A)
Matthews, G. D. (M)
Mayberry, L. A. (SM)
McNicol, F. R. (A)
Parker, N. W. (A)
Pugh, N. R. (A)
Quist, W. G. (A)
Reber, G. (SM)
Rist, D. H. (A)
Sengel, P. A. (VA)
Squires, E. G. (M)
Stansberry, C. L. (A)
Upton, E. C., Jr. (A)
Ward, A. G. (A)
Witte, R. (M)

Wheeling
Naber, J. S. (M)

Wilmette (CHI-5)
Bercaw, O. M., Jr. (A)
Coates, R. S. (A)
Crossley, R. C. (A)
Gorder, L. O. (A)
Hale, E. H. (A)
Schnell, W. J. (SM)
Shuey, L. S. (A)
Smith, E. L. (A)
Sorsen, S. L. (A)
Steel, F. R., Jr. (A)
Thomas, L. R. (M)
Waterfall, F. E. (SM)

Winnetka (CHI-5)
Carlson, G. R. (A)
Carroll, W. P. (A)
Hart, J. W. (A)
Jarvis, G. R. (A)
Jarvis, K. W. (F)
Morrison, R. T. (M)

Winfield (CHI-5)
Stillman, M. C. (M)

Wonder Lake
Kiciak, C. J. (A)

Wood Dale
Noskowicz, T. S. (A)
Washburn, C. A. (A)

Wood River (SL-5)
Pyle, H. S. (A)

Woodstock (CHI-5)
Hill, R. G. (A)

Zion
Craig, J. D. (A)

INDIANA

Advance
Waters, F. J. (A)

Anderson (IND-5)
Gardner, R. A. (A)
Hart, J. M. (A)
Heller, R. E. (A)
Holt, D. L. (M)
Layton, V. W. (A)
Phlegar, C. L., Jr. (M)
Reynolds, B. G. (A)

Angola (FW-5)
Ax, L. S. (M)
Kline, A. J. (A)
Martin, W. W. (A)
Milkie, R. W. (A)
Rugg, D. A. (A)
Southern, C. D. (A)
Westenhaver, M. E. (A)

Arcadia (IND-5)
Nightenhelser, K. W. (A)

Auburn (FW-5)
Capen, G. A. (A)

Aurora (CIN-5)
Achatz, R. V. (VA)

Beech Grove (IND-5)
Power, W. L. (A)

Bloomington (EO-5)
Bahr, W. B. (A)
Cummings, M. M. (M)
Gelzer, J. R. (M)
Hahn, J. H. (A)
Krepps, J. E., Jr. (A)
Lawrence, A. H. (A)
Siddons, G. F. (A)
Sonntag, W. A. (M)
Svanascini, A. L. (SM)
Tarzian, S. (SM)

Bluffton (FW-5)
Wolfgang, L. G. (A)

Bremen
Green, H. V. (A)

Bridgeport
Abel, F. W. (A)

Camp Atterbury (IND-5)
Briner, C. D. (A)

Cedar Grove (CIN-5)
Verkley, B. M. (A)

Chesterfield (IND-5)
Hallenbeck, S. M. (A)

Clayton (IND-5)
Winton, H. J. (A)

Columbus (IND-5)
Ashby, A. T. (A)
Harden, R. D. (A)
Hurlbut, P. R. (A)
McGregor, R. B. (M)
Silva, A. D., Jr. (A)
Silva, L. F. (A)
Stambaugh, D. W. (A)
Warren, R. (M)

Crawfordsville (IND-5)
Rogers, C. C. (A)

Crown Point
Franz, B. E. (A)

Dayton
Yost, K. E. (A)

East Chicago
Olivotto, A. J. (A)

East Columbus
Hertzog, W. K. (A)

Elkhart (CIH-5)
Best, J. G. (A)
Budd, W. H. (M)
Harrell, J. B. (A)
Houck, H., Jr. (A)
Hudock, E. (A)
Kent, E. L. (SM)
Kieffer, G. H. (A)
Krauss, S. L. (A)
Lindahl, H. C. (A)
McDonald, L. J. (A)
Moore, C. C. (M)
Raftree, L. K. (M)
Smith, R. A. (A)
Turner, B. S. (M)
Vaksvik, A. J. (A)

Evansville (EO-5)
Baldridge, B. H. (M)
Barrick, W. E. (A)
Brannon, D. L. (A)
Decker, R. H. (A)
Driggers, B. H. (A)
Fischer, N. C. (A)
Flackbert, W. D. (A)
Gehres, F. A. (SM)
Gregory, E. C. (A)
Hatfield, P. E. (A)
Hennel, J. R. (A)
Isear, J. A., Jr. (A)
Joest, R. L. (A)
Kappes, A. V. (A)
Kees, H. (SM)
Kellough, S. H. (A)
McGhee, G. L. (A)
Miegl, A. K. (A)
Plummer, L. A. (A)
Quirk, J. A. (A)
Raburn, L. E. (SM)
Schoene, R. L. (SM)
Schoeny, E. P. (A)
Schultz, W. F. (A)
Schwartz, B. A. (A)
See, R. M. (A)
Shellito, H. H. (A)
Spencer, J. M., Jr. (A)
Stoltz, G. F. (A)
Thompson, R. D. (A)
Williams, W. A. (A)
Willis, H. W. (M)
Ziegler, G. E. (SM)

Floyd Knobs (LOU-5)
Marven, E. L. (M)

Ft. Wayne (FW-5)
Ackworth, D. L. (A)
Adams, G. E. (A)
Armstrong, R. H. (A)
Attard, A. E. (A)
Bartel, R. C. (A)
Beach, H. W. (M)
Benning, G. L. (A)
Bickel, S. O. (A)
Blake, N. A. (A)
Blount, E. M. (M)
Boucheron, P. (SM)
Brent, C. H., Jr. (A)
Brock, C. R. (A)
Broseghini, B. L. (A)
Bruzek, J. M. (A)
Busse, C. A. (A)
Carpenter, D. L. (A)
Carter, G. W. (A)
Cawein, M. (SM)
Clarke, B. E. (A)
Clements, L. E. (A)
Collier, R. E. (M)
Conway, J. F., Jr. (SM)
Cronkwright, R. E. (A)
Culler, D. M. (A)
Davis, D. W. (A)
Dimond, J. (A)
Dixon, D. E. (A)
Dreisbach, R. H. (VA)
Eiden, G. E. (A)
Elmore, E. P., Jr. (A)
Farnsworth, P. T. (F)
Fisher, D. E. (A)
Fisher, H. F. (VA)
Fong, S. G. (M)
Forbes, H. R. (A)
Frakes, S. E. (A)
Freimann, F. (A)
Friedman, S. (A)
Fromm, K. N. (M)
Giffin, G. S. (A)
Givens, R. C. (M)
Godsey, W. J. (M)
Goss, C. B. (A)
Gough, L. E. (A)
Grant, R. L. (A)
Grosvenor, H. D. (A)
Guichard, R. S. (A)
Haack, R. W. (A)
Haller, M. N. (A)
Hardwick, C. L. (M)
Harris, A. S. (A)
Hart, J. M. (A)
Hawkins, W. G. (M)
Henderson, J. A. (A)
Hessler, J., Jr. (A)
Hockstra, C. F. (SM)
Holt, J. F. (A)
Houser, N. W. (A)
Huwe, R. A. (A)
Iffland, J. J. (SM)
James, D. C. (M)
Johnson, L. (A)
Jones, R. B. (M)
Jordal, V. M. (A)
Jouvenat, J. M. (A)
Kaufman, A. R. (A)
Keirman, F. J. (A)
Keithley, R. D. (A)
Kennedy, W. H. (M)
Kiltie, O. (M)
Kleist, R. A. (A)
Knauer, P. E. (A)
Koenig, E. W. (A)
Kreager, C. R. (A)
Lambert, V. L. (A)
Larson, C. C. (SM)
Lawburgh, R. H. (A)
Letto, A. R. (A)
Lewis, A. G. (A)
Leysath, W. Q. (A)
Lima, E. J. T. (A)
Lin, C. S. (A)
Long, J. A. (A)
Lovegren, P. B. (A)
Lowe, B. W. (A)
Lukas, J. M. (A)
Martin, D. W. (SM)
Mathews, R. H. G. (SM)
Mattausch, A. J. (A)
Mayle, A. T., Jr. (SM)
Mayle, L. F. (SM)
McCormick, R. E. (SM)
McDirmit, E. L. (A)
McGregor, G. L. (A)
Menig, D. R. (M)
Meyer, R. J. (A)
Miller, L. S. (A)
Monda, S. M. (A)
Montalbano, V. (A)
Moore, V. F. (A)
Neill, W. J. (A)
Nelson, D. F. (A)
Nelson, G. L. (A)
Newman, J. H. (M)
Norris, B. J. (A)
O'Connor, R. A. (A)
Ozaki, G. K. (A)
Pantazin, T. (A)
Paxton, R. W. (A)
Powell, D. S. (SM)
Price, A. B. (A)
Rankin, J. A. (SM)
Rasley, D. R. (SM)
Ratts, B. H. (SM)
Rhodes, R. D. (A)
Richards, C. A. (A)
Richards, G. A. (A)
Rodgers, P. D. (A)
Root, C. S. (SM)
Rudnick, P. (SM)
Russell, R. S. (A)
Ryan, H. T. (A)
Sabo, J. (A)
Salinger, H. W. G. (F)
Samuels, J. C. (A)
Sanders, R. W. (SM)
Saxe, R. E. (A)
Schenk, K. W. (M)
Scott, H. B. (A)
Sessler, J. G. (A)
Sharp, J. W. (SM)
Schauer, J. W. (A)
Shaw, L. E. (A)
Silvey, J. O. (A)
Slater, T. L. (M)
Slick, E. P. (M)
Sloan, W. R. (A)
Smith, F. P. (A)
Spradlin, K. M. (A)
Stanley, C. V. (A)
Stoakes, W. L. (A)
Storke, F. P., Jr. (A)
Swartwout, R. E. (A)
Valentine, F. C. (A)
Weidner, E. J. (A)
Wexler, M. P. (A)
White, E. A. (A)
Whitney, J. A. (A)
Whittington, R. C. (A)
Wilson, C. H. (A)
Worsham, R. E. (A)
Wright, A. (M)
Yoder, L. E. (M)
Zieger, C. H. (A)
Zwayer, B. E. (A)

Gary (CIH-5)
Buccicone, V. S. (M)
Hesky, E. A. (A)
Ireland, R. P. (M)
Jones, W. V. (A)
Kidwell, E. W., Jr. (A)
Klinvex, S. H. (A)
Moran, L. L. (A)
Mundell, E. H. (A)
Pamler, R. G. (M)
Penovich, F. J. (A)
Scubelek, A. L. (A)
Shirk, K. C. (VA)
Thanos, H. (A)
Trachsel, W. H. (A)
Vedo, J. B. (A)

Goshen (CIH-5)
Brown, R. (A)
Corporon, R. P. (A)
Webber, L. E. (A)

Granger (CIH-5)
Frazier, R. K. (A)

Griffith (CIH-5)
Vereb, A. J. (A)

Hammond (CIH-5)
Boyan, M. J. (A)
Kaprocki, F. E. (A)
Kneen, W. (M)
Roedel, J. (A)
Whitesell, L. G. (A)

Hoagland (FW-5)
Gabrielsen, F. T. (A)

Hudson (FW-5)
Tressler, J. B. (A)

Huntington (FW-5)
Chambers, W. A. (A)
Cozad, J. W. (A)
Smart, R. E. (A)

Indianapolis (IND-5)
Abel, F. W. (A)
Alley, P. O. (A)
Anderson, S. R. (A)
Arvin, M. J. (A)
Askren, P. S. (A)
Astholz, P. T. (M)
Aust, R. J. (M)
Barnes, R. E. (A)
Barrelle, R. J. (A)
Bechtel, B. (A)
Berntsen, W. H. (A)
Boyle, B. H. (M)
Braunagel, M. V. (A)
Breitwieser, C. J. (VA)
Brown, H. J. (A)
Bruning, A. M. (A)
Carson, H. E. (A)
Clinger, E. C. (A)
Coatney, A. E. (M)
Coffin, P. D. (A)
Cox, J. A. (A)
Crawford, A. L. (A)
DeVoe, L. M. (A)
Drilling, N. G. (A)
Dunn, J. V. (A)
Easterday, R. B. (A)
Erwood, R. G. (M)
Evans, A. G. (A)
Farrell, C. (A)
Fischer, J. W. (A)
Flint, R. B. (A)
Foerster, R. P. (A)
French, A. B. (A)
French, B. V. K. (SM)
Garrigus, W. E. (A)
Gribben, J. C., Jr. (A)
Gross, F. J. (A)
Harden, J. G. (SM)
Hofeld, J. G. (M)
Holland, H. A. (A)
Holland, H. S. (A)
Howe, D. R. (A)
Hromada, J. C. (SM)
Hurley, H. C. (A)
Jackson, W. E. (F)
Jones, M. N. (A)
Judkins, J. R. (A)
Kerney, R. W. (A)
Koch, R. C. (A)
Kocher, M. E. (A)
Kuehr, R. C. (A)
Liggett, R. M. (A)
Macnabb, V. C. (A)
Mallory, H. R. (A)
Mann, R. W. (A)
Manning, W. L. (SM)
Marasco, F. A. (M)
Marshall, L. C. (SM)
Maxwell, J. W. (SM)
May, C. W. (A)
McGillem, C. D. (M)
McKeand, R. W. (A)
McLawler, M. S. (A)
McWhorter, W. F. (A)
Meadows, F. D. (SM)
Middleton, A. E. (A)
Miller, F. (A)
Miller, W. E. (A)
Minton, R. W. (A)
Montgomery, J. L. (A)
Morton, K. L. (A)
Myers, W. D. (M)
Nelson, J. B. (A)
Norsell, H. C. (A)
Peoples, J. F. (M)
Ray, J. (A)
Reager, A. M. (VA)
Reiskind, H. I. (SM)
Reynolds, J. H. (M)
Roeschlein, E. R. (A)
Rosser, T. N. (SM)
Schafer, G. E. (A)
Schager, R. J. (A)
Scheidenhelm, R. (A)
Schultz, A. J. (SM)
Schulz, E. A. (A)
Selig, B. L. (A)
Shelton, P. J. (A)
Slater, I. M. (SM)
Strols, E. F. (A)
Stuart, D. M. (SM)
Styner, T. L. (A)
Taggart, S. E. (M)
Trout, C. C. (M)
Tudor, E. C. (M)
Tulauskas, L. (SM)
Vizanko, D. J. (A)
Walker, R. S. (A)
Watson, J. T. (M)
Weaver, R. J. (A)
Welge, V. (SM)
White, B. J., Jr. (A)
Wisner, H. L. (A)
Wolff, H. R. (SM)
Wright, J. L., Sr. (A)
Young, E. A. (A)

Kokomo (IND-5)
Atkinson, J. R. (A)
Brandon, W. S. (A)
Brinkerhoff, D. E. (A)
Busby, L. A. (A)
Carlson, E. C. (A)
Caylor, R. N. (A)
Doversberger, K. W. (A)
Gaiser, M. W. (VA)
Guyton, J. H. (A)
Holmes, J. S. (A)
Jenkins, R. L. (A)
Laitinen, L. K. (A)
Manahan, M. J. (A)
Martin, D. W. (A)
Mason, J. M. (A)
Peterson, C. K. (A)
Prewitt, T. A. (A)
Pyle, H. (A)
Rector, C. V. (A)
Rieth, H. F. (A)
Ruff, D. O. (A)
Schwarz, B. A. (SM)
Siefken, R. M. (A)
Vogt, K. S. (A)
Zeps, H. (A)

Lafayette (IND-5)
Clark, J. R. (SM)
Evans, H. R. (M)
Freeman, S., Jr. (M)
Haxby, R. O. (SM)
Markarian, H. (A)
Oorthuys, H. J. (M)
Porter, F. A. (A)
Siskind, R. P. (SM)
Truxal, J. G. (A)

La Porte (CHI-5)
Tobar, K. L. (A)

Lawrenceburg (CIN-5)
Beehler, J. (A)

Liberty (CIN-5)
Bethge, C. E. (A)

Logansport (IND-5)
Harrell, D. M. (M)

Michigan City (CHI-5)
Wittke, R. F. (A)
Zerber, F. A. (A)

Mishawaka (CHI-5)
Bergemann, G. T. (A)
Bostwick, W. E. (M)
Burns, J. E. (A)
De Ruyck, A. R. (A)
Dewaelsche, D. R. (A)
Ewing, R. D. (M)
Koch, W. J. (A)
Ohlemacher, R. F. (A)
Pilcher, R. M. (A)
Reiser, W. (A)
Rosselot, G. A. (A)
Sutton, J. R. (A)
Webb, W. L. (SM)
Whiffen, R. E. (SM)
Wood, D. F. (M)
Wright, C. R. (A)

Muncie (IND-5)
Budd, M. A. (A)
Burton, D. A. (A)
Legum, A. G. (A)
Van Arsdol, F. L. (A)

Munster (CHI-5)
Stevens, R. E. (A)

New Albany (LOU-5)
Eve, D. R. (A)
Richards, W. W. (A)

New Haven
Fullerton, R. D. (M)
Hallmark, C. E. (SM)

North Liberty (NY-2)
Adams, A. W. (M)

Notre Dame (CHI-5)
Coomes, E. A. (SM)
Ellithorn, H. E. (SM)
Kempf, K. R. (A)
Pilp, A. T. (A)
Ross, A. E. (SM)
Stauder, L. F. (A)

Orleans (LOU-5)
Friedman, E. (A)

Osceola (CHI-5)
Ludwig, A. R. (A)

Ossian (FW-5)
Penn, W. D. (M)

Portland (IND-5)
Eastwood, W. J. (A)

Plymouth
Orlowski, E. (A)

Princeton
Borland, R. P. (A)

Rensselaer (CHI-5)
Boesch, R. (A)

Richmond (CIN-5)
Koehring, N. G. (A)
Maddox, R. D. (M)
Young, K. W. (A)

Saint Meinrad (EO-5)
Ringeman, O. E. (A)

Salem (LOU-5)
Wilson, R. A. (A)

Sandborn (EO-5)
Begeman, R. H. (A)

Seymour (IND-5)
Beldon, R. R. (A)
Bennett, E. V., Jr. (A)

Sheridan (IND-5)
McKinney, N. P. (A)

South Bend (CHI-5)
Briggs, R. H. (A)
Deranek, P. T. (A)
Durbin, H. M. (A)
Grant, J. H. (A)
Grinius, L. L. (A)
Halpin, E. P. (SM)
Harding, R. L. (A)
Hoffman, C. H. (A)
Jacobs, B. (A)
Jaffe, B. (A)
Kaplan, R. (A)
Knoblock, E. C. (A)
Kunz, W. J., Jr. (SM)
La Salle, E. (A)
Mauk, M. E. (A)
Modesitt, M. B. (A)
North, R. L. (A)
O'Neil, A. R. (A)
Papai, D. S. (A)
Quigley, A. J. (A)
Reynick, D. A. (A)
Smith, A. J., Jr. (A)
Solomon, P. (A)
Strauss, J. W. (A)
Weiler, G. (A)
Wooldridge, A. L. (A)

South Whitey (FW-5)
Hargerl, W. W. (SM)

Speedway (IND-5)
Setzer, L. E. (A)
Stanley, E. R. (A)

Sullivan
Nash, W. L. (A)

Tell City (EO-5)
Hall, J. M., Jr. (A)

Terre Haute (IND-5)
Bratsberg, W. P. (A)
Moench, H. A. (SM)

Valparaiso (CHI-5)
Alinsky, J. W. (A)
Book, E. G. (M)
Bullis, E. E. (A)
Harris, W. C. (A)
Hershman, J. B. (SM)
Maynard, C. A. (SM)
Packman, M. E. (VA)
Plamondon, A. D., Jr. (SM)
Shewan, W. (M)

Vincennes (EO-5)
Blevins, L. G. (A)

Waldron (IND-5)
Miller, D. C. (A)

Warsaw (CHI-5)
Daniel, L. E. (A)

Waynedale (FW-5)
French, I. F. (M)

West Lafayette (IND-5)
Beldon, R. R. (A)
Burnett, J. R. (A)
Butt, N. C. (A)
Cage, J. M. (SM)
Cooper, G. R. (A)
DeAndrade, W. C. (M)
Donovan, R. F. (A)
George, R. H. (SM)
Happell, G. E. (A)
Hardesty, G. A. (M)
Hayt, W. H., Jr. (M)
Heim, H. J. (VA)
Hesselberth, W. M. (A)
Hunt, E. B. (A)
Kemmerly, J. E. (A)
Masnaghetti, R. K. (A)
Partridge, G. R. (A)
Rockwood, C. H. (A)

Whiting (CHI-5)
Bell, J. E. (A)
Oster, W. (A)
Walter, G. W. (A)

Woodburn (FW-5)
Bertsche, G. (A)

Zionsville
Heimburger, W. M. (A)

IOWA

Ames (DMA-5)
Cassell, W. L. (SM)
Coover, M. S. (SM)
Evans, W. H. (A)
Gade, D. W. (M)
Griffin, J. E. (A)
Haahr, D. K. (A)
Haas, M. H. (M)
Harper, C. E. (A)
Harris, E. B. (A)
Hughes, W. L. (A)
Jeffery, T. H. (A)
Keeney, M. G. (A)
Prudhom, A. L. (A)
Read, A. A. (A)
Richardson, G. A. (SM)
Stewart, R. M., Jr. (M)
Town, G. R. (F)
Triska, C. J. (A)
Von Tersch, L. W. (SM)

Ankeny (DMA-5)
Johnston, D. H., Jr. (A)

Atkins (CR-5)
Taschner, A. H. (A)

Bettendorf
Fischer, L. A. (A)
Hutchison, R. P. (A)

Boone
Bowes, J. D. (A)
Garretson, D. (A)

Burlington (CR-5)
Allen, J. W. (A)
DeMott, J. (A)
Eck, E. J. (A)
Ertz, C. S. (A)
Hawk, J. M. (A)
Loomis, G. L. (SM)
Miller, R. C. (SM)
Olson, B. A. (A)
Ross, K. B. (VA)
Sechler, A. J., Jr. (M)
Simmons, C. A. (M)
Taylor, D. L. (A)

Bussey (DMA-5)
Bussey, J. D. (A)

Carroll
Polking, U. H. (A)

Cedar Rapids (CR-5)
Abrams, H. T. (A)
Anderson, A. E. (A)
Anderson, W. G. (A)
Andrade, E. A. (M)
Antrim, G. H. (A)
Anway, A. C. (A)
Arcand, R. T. (A)
Arens, R. P. (A)
Arnold, D. C. (SM)
Babillus, J. (SM)
Bellew, R. W. (A)
Bellville, W. H. (A)
Beranek, W. J. (A)
Berg, O. H. (A)
Bettin, R. (A)
Bigger, W. H. (A)
Biggs, J. A. (SM)
Blair, R. O. (A)
Bradley, D. J. (A)
Breed, W. M. (A)
Bright, M. D. (A)
Broadhead, S. L., Jr. (M)
Bruene, W. B. (SM)
Buffington, L. R. (A)
Canfield, R. E. (A)
Caquelin, M. W. (A)
Carlson, D. V. (A)
Carlson, K. L. (A)
Carney, D. A. (A)
Carter, G. D. (A)
Coble, R. B. (A)
Collins, A. A. (F)
Cox, R. T. (SM)
Craft, L. M. (M)
Craiglow, R. L. (A)
Crawfis, E. D., Jr. (A)
Cribbs, R. D. (A)
Dalton, J. L. (M)
Davenport, K. R. (A)
DeLong, V. R. (A)
Dickens, J. A. (A)
Dill, F. J. (A)
Duff, R. E., Jr. (A)
Dunn, R. S. (A)
Eckess, W. S., Jr. (A)
Elliott, W. S. (A)
Emerson, R. E. (A)
England, L. C. (A)
Erickson, G. A. (A)
Fedde, C. D. (A)
Fellhauer, H. E. (A)
Finger, P. R. (A)
Fink, J. G. (M)
Fischer, R. J. (A)
Fletcher, K. L. (A)
Follensbee, W. M. (A)
Ford, D. W. (A)
Foster, J. W. (M)
Frey, H. B. (A)
Friedrichs, J. P. (A)
Fritze, E. H. (M)
Gallagher, D. C. (A)
Gates, R. S. (A)
Gerks, I. H. (SM)
Giacoletto, J. P. (A)
Goetz, J. L. (A)
Goldman, B. M. (A)
Graham, N. L. (A)
Greenberg, S. R. (A)
Hancock, N. W. (M)
Hartsock, R. D. (A)
Hausten, D. R. (A)
Hawley, A. A. (A)
Heath, J. W. (A)
Hedgcock, W. T., Jr. (A)
Henrici, C. R. (SM)
Hime, N. S. (A)
Hirsch, H. D. (A)
Hixenbaugh, G. P. (M)
Hodgin, D. M. (A)
Hoeft, R. H. (A)
Hollister, R. H. (A)
Holmes, D. W. (A)
Hubbard, M. R. (M)
Hudek, V. R. (M)
Hulce, R. L. (A)
Jacobson, H. P., Jr. (A)
Johnson, F. W. (A)
Johnson, L. E. (A)
Jones, W. B. (A)
Jordan, C. F. (A)
Klehfoth, W. G. (M)
Kopp, R. W. (A)
Lehman, H. W. (M)
Levy, E. S. (A)
Lieske, E. W. (M)
Loop, D. E. (A)
Ludvigson, M. T. (A)
Malmleaf, W. R. (A)
March, G. W. (A)
Maresh, R. L. (A)
Mark, J. G. (A)
Martin, E. L. (A)
Martz, F. W. (A)
Mayer, A. F. (A)
McClellan, J. C., Jr. (A)
McConnell, T. E. (SM)
McCoy, D. O. (SM)
McCreary, R. L. (SM)
McElroy, J. C. (A)
McGraw, R. C. (A)
Miedke, R. C. (A)
Mitchell, A. T. (A)
Mitchell, R. M. (SM)
Moody, J. M. (M)
Morrison, S. M. (A)
Most, N. S. (A)
Myhre, P. K. (SM)
Nelson, N. P. (A)
Newell, D. E. (A)
Nordstrom, G. J. (M)
Oleson, F. C. (A)
Olson, R. L. (A)
Pappenfus, E. (SM)
Patton, H. W. (A)
Perry, V. G. (A)
Pickering, R. F. (A)
Pierce, R. J. (SM)
Plotkin, L. E. (M)
Read, E. F. (A)
Rector, J. D. (A)
Rennekamp, E. E. (A)
Repp, D. E., Jr. (A)
Ringoen, R. M. (M)
Roberts, B. W. (A)
Robson, C. A. (M)
Rollert, C. R. (M)
Rowley, R. J. (A)
Schulte, F. E. (A)
Schuster, H. E. (A)
Schwittek, E. W. (A)
Scott, A. J. (A)
Shanklin, J. P. (M)
Shupe, R. V. (A)
Skar, R. C. (A)
Smith, J. W. (SM)
Spalti, J. K. (A)
Stansbury, R. H. (A)
Stephens, T. C. (SM)
Stewart, C. (A)
Stimson, R. L. (A)
Stover, H. A. (A)
Thompson, P. (A)
Thornley, E. B. (A)
Tinch, C. S., Jr. (A)
Tollefson, R. D. (A)
Truesdell, R. M. (A)
Uhrik, R. L. (A)
Vander-Hamm, R. L. (A)
Vaughn, K. E. (M)
Vrbik, J. (A)
Wainwright, L. F. (M)
Ware, L. A. (SM)
Weldon, J. M. (A)
Western, R. E. (A)
Westcot, J. L. (A)
Western, R. E. (A)
Wetzel, G. N. (A)
White, R. C. (A)
Wilson, M. F. (A)
Windus, W. A. (A)
Winter, L. E. (A)
Wulfsberg, A. H. (SM)
Wulfsberg, P. G. (SM)
Zarris, W. A. (A)

Council Bluffs (OL-5)
Copeland, J. H. (A)
Hansen, B. P. (M)
Moss, T. L. (VA)
Snyder, E. H. (A)
Stewart, A. C. (M)

Crawfordsville (CR-5)
Cherryholmes, C. D. (A)

Cresco (CR-5)
Polashek, E. J. (A)

Davenport (CR-5)
Arvidson, P. G. (M)
Hayes, C. W. (A)
Karwath, A. A. (A)
Keefe, J. W. (A)
Petersen, V. L. (A)
Ramsey, R. C. (A)
Sprague, D. L. (A)

Des Moines (DMA-5)
Amoo, L. R. (A)
Bartlett, F. E. (M)
Bobenhouse, C. J. (M)
Clark, R. V. (A)
Clearly, R. E. (M)
Eastman, J. W. (M)
Foster, F. H. (A)
Graves, W. H. (A)
Gusler, F. C. (A)
Loyet, P. A. (SM)
Luther, R. E. (A)
Miller, O. M. (A)
Murphy, G. L. (A)
Patterson, J. L. (A)
Price, R. E. (A)
Quentin, C. F. (A)
Rissler, H. D. (VA)
Snyder, R. E. (A)
Sparks, W. J., Jr. (A)
Sperelakis, P. (A)
Stauffer, R. E. (VA)
Tennant, O. A. (M)

Dubuque
Hancock, R. I. (A)

Ft. Dodge (DMA-5)
Kersten, P. M. (A)
Smith, O. H. (A)
Wirkler, W. H. (M)

Gilmore City
Seaver, G. E. (M)

Grinnell (DMA-5)
Bucksbaum, A. M. (A)
Denny, W. B. (A)

Independence (CR-5)
Blank, W. A. (A)

Iowa City (CR-5)
Edberg, R. A. (M)
Easler, W. O. (A)
Fankhauser, J. E. (M)
Hunter, T. A. (F)
Lonsdale, E. M. (SM)
Malmberg, P. (A)
Menzer, C. H. (SM)
Ware, L. A. (SM)

Manson (DMA-5)
Richards, G. L. (A)

Marion (CR-5)
Moorhead, P. E. (A)
Perry, R. A. (A)
Rennels, J. R. (A)
Rooks, H. B. (A)
Smith, M. S. (SM)
Sterner, E. L. (A)
Strebe, A. C., Jr. (A)
Van Tilbury, J. D. (A)

Mechanicsville (CR-5)
Bates, L. D. (A)

Morning Sun
Sheafor, J. D. (A)

Mt. Vernon (CR-5)
Parker, G. W. (M)
Rodes, W. D. (A)

Mt. Zion (CR-5)
Campbell, D. B. (A)

Muscatine (CR-5)
Hansen, W. N. (A)

Newhall (CR-5)
Rathje, H. C., Jr. (A)

Oelwein (CR-5)
Hecht, R. K. (A)
McGinnis, S. E. (A)
McMurray, D. D. (A)

Sioux City (OL-5)
Call, G. R. (A)
Smith, A. H. (A)

Unionville
Heckart, H. A. (A)

Vinton
Nicodemus, K. L. (A)

Waterloo (CR-5)
McCasland, G. R. (A)

West Burlington (CR-5)
Faulkner, H. E. (A)

KANSAS

Augusta (KC-5)
Green, J. W. (A)

Belle Plaine (KC-5)
Vowell, C. O. (A)

Bethel (KC-5)
Barnes, O. C. (A)

Boicourt (KC-5)
Witcher, J. F. (A)

Bonner Springs (KC-5)
Wickersham, P. D. (A)

Caldwell
Wencel, M. L. (A)

Caney (KC-5)
Johnson, R. W. (A)

Cherryvale (KC-5)
McGinness, C. C. (A)

Colby (KC-5)
Riepl, C. W. (A)
Snider, V. E. (A)
Unruh, S. W. (A)

Council Grove (KC-5)
Wilson, R. R., Jr. (A)

Dodge City (KC-5)
Patrick, D. J. (A)

Eudora (KC-5)
Joslin, D. E. (A)

Fort Leavenworth (KC-5)
Holmes, H. B. (M)
Johnson, R. M. (A)
Obenchain, I. (SM)

Forbes AFB
McHugh, J. E., III (A)

Gardner (KC-5)
Gault, W. E. (A)
Reed, D. M. (M)

Halstead (KC-5)
Bookwalter, E. C. (A)

Hutchinson (KC-5)
Hamilton, S. (A)
Manship, J. F. (M)

Independence (KC-5)
Bennett, H. L. (A)
Benton, W. J. (A)

Kansas City (KC-5)
Ayres, R. C. (SM)
Beebe, J. A. (A)
Curtis, G. L. (A)
Davis, V. M. (A)
Dunwoodie, D. E. (A)
Fischer, E. (A)
Fisher, G. F. (A)
Gardner, C. L. (A)
Hanson, P. C. (A)
Hope, D. L. (M)
Mathews, V. M., Jr. (A)
McCoy, J. L. (A)
Morrell, P. W. (A)
Pool, M. A. (A)
Radar, D. F. (A)
Rogers, A. L. (A)
Stillson, J. W. (A)
Wade, E. A. (A)
Watt, E. M. (A)
Williams, C. S. (A)
Wilson, D. R. (A)

Larned
Hewson, K. D. (A)

Lawrence (KC-5)
Ashley, J. R. (A)
Lukenbill, R. S. (A)
Reed, A. C. (A)
Rummer, D. I. (M)
Sommerville, D. I. (A)
Wilson, D. G. (SM)
Yeh, C. (SM)

Liberal
Seegers, J. A. (A)

Lincoln
Sheppard, G. E. (M)

Manhattan (KC-5)
Allen, C. D. (A)
Ax, L. S. (M)
Burns, L. V. (A)

Cowan, C. D. (A)
Ford, W. R. (M)
Kloeffler, R. G. (F)
Lavin, H. P. (A)
Wolfe, J. E. (SM)

Marysville (KC-5)
Brega, L. B. (A)
Martin, R. L. (SM)
Parker, H. L. (A)

Merriam (KC-5)
Ellis, T. H. (A)

Mission (KC-5)
Battey, H. B. (SM)
Fayman, D. L. (A)
Hart, L. D. (A)
Jones, M. R. (SM)
Omer, C. L. (SM)
Richie, S. M. (SM)
Robb, L. S. (A)
Shirer, H. W. (A)
Wearth, A. W. (M)

Mulvane (KC-5)
Ruppe, K. E. (A)

Olathe (KC-5)
Howe, R. B. (A)
Krout, H. L. (A)
Lewko, J., Jr. (A)

Overland Park (KC-5)
Betros, L. A. (M)
Fetter, R. W. (A)
Files, C. O. (M)
Gay, W. D. (M)
Hyer, F. K. (A)
Jaedicke, E. R. (A)
Kroencke, E. A., Jr. (A)
Lane, J. W. (A)
Rode, J. J. (A)
Vilander, N. E. (A)
Wagner, F. R. (M)
Wells, R. A. (A)
Wolfe, C. L. (A)

Parsons (KC-5)
Tierney, P. V. (A)

Pittsburg (KC-5)
Hughes, L. E. (A)

Prairie Village (KC-5)
Babbit, E. B. (A)
Chester, W. G. (M)
Collins, M. F. (M)
Gessert, E. C., Jr. (A)
Hax, D. H. (A)
Hoffman, G. R. (A)
Hoyt, W. S. (M)
Inderwiesen, F. H., Jr. (M)
Jacobson, R. E., Jr. (M)
Johnson, D. E. (A)
Love, B. E. (VA)
Peterson, R. A. (M)
Robinett, L. L., Jr. (A)
Spannuth, W. H. (M)
Van Zant, R. R. (A)
Vogt, G. A. (A)

Preston
Nichols, R. A. (A)

Russell
Willman, R. B. (A)

Shawnee (KC-5)
Goll, W. E. (A)

Sunflower (KC-5)
Spry, M. C. (A)

Topeka (KC-5)
Brown, E. B. (A)
Costelow, J. A. (A)
Dickensheets, L. (A)
Francis, M. C. (A)
Grantham, R. B. (A)
Hole, W. G. (A)
James, E. (A)
Liu, C. K. (A)
Mannell, L. H. (A)
Meyer, M. T. (A)
Thompson, J. D. (A)
Thompson, R. L. (A)
Voiles, G. E. (A)
Wayne, J. W. (A)

Vliets
Backman, H. D. (A)

Wamego (KC-5)
Buatte, L. A., Jr. (A)

Whitewater (KC-5)
Bell, B. W. (A)

Wichita (KC-5)
Abramson, C. R. (A)
Allen, C. D. (A)
Ayres, W. R. (SM)
Beener, M. A. (A)
Bereman, E. W. (A)
Black, H. L. (A)
Boedeker, H. F. (A)
Brown, J. W. D. (M)
Byers, G. D. (A)
Byers, H. O. (M)
Carttar, G. L. (A)
Coker, J. H. (A)
Cord, C. E. (A)
Courtney, I. E. (A)
Davis, H. C. (A)
Delk, E. T. (M)
Depew, H. H. (A)
Dole, J. (A)
Dunlap, M. E. (M)
Eberle, R. W. (A)
Gozinsky, J. R. (A)
Harper, J. M. (A)
Haupt, C. D. (A)
Heithecker, L. F. (M)
Hill, A. L. (A)
Hink, K. G. (M)
Hutton, L. I. (A)
Johnson, V. N. (A)
Johnson, W. C. (A)
Keene, A. W., Jr. (A)
Kinnaman, R. L. (A)
Klatt, W. K. (A)
Knowlton, R. F. (M)
La Barge, R. A. (A)
Leighton, C. P. (A)
Lundgren, P. L. (A)
McAlearney, P. H. (A)
Miller, C. E. (A)
Miller, H. C. (SM)
Miller, M. D. (M)
Newby, H. H. (M)
Patterson, D. L. (A)
Patterson, J. W. (A)
Piper, E. (A)
Pyle, K. W. (M)
Rogers, L. W. (A)
Root, M. R. (A)
Smith, G. B. (M)
Smith, G. C. (A)
Studebaker, J. E. (A)
Swift, H. G. (M)
Thiel, J. E. (A)
Vandegrift, A. E. P. (A)
Warner, D. E. (A)
Wehrman, P. G. (A)
Weigel, E. (A)
Weist, W. R., Jr. (A)
Womack, R. H. (A)

Winfield (CHI-5)
Headrick, L. L. (A)

KENTUCKY

Anchorage (LOU-5)
Williams, L. A. (M)

Ashland (CIN-5)
Curry, J. W. (A)
Weaver, C. W. (A)

Bellevue (CIN-5)
Rohrer, R. S. (A)
Werrmann, C. A. (A)

Bowling Green (LOU-5)
Logsdon, H. E. (A)

Buechel (LOU-5)
Henson, C. E. (M)
Ryckman, W. D., Jr. (A)

Burlington
Conner, J. C. (A)

Campbellsville (LOU-5)
Crawley, J. B. (A)

Covington (CIN-5)
Curtis, W. T. (A)
Goode, J. P. (A)
Grosse, R. H. (A)
Hanna, G. W. (A)
Hughes, J. B. (A)
Jeffries, C. E. (A)
Odenthal, L. H. (A)
Rivers, J. L. (A)
Schipper, R. J. (M)
Schraer, L. J. (A)
Taglauer, E. R. (A)
Topmiller, C. H. (VA)

Danville
Shaw, M. R., Jr. (M)

Elsmere
Roth, H. B. (A)

Erlanger (CIN-5)
Lee, R. A. (A)
Schultz, R. L. (A)
Weaver, J. A. (A)

Fort Knox (LOU-5)
Gebhard, R. F. (A)
Ross, W. C. (A)
Winterberger, H. P. (A)

Fort Thomas (CIN-5)
Fowler, N. B. (SM)
Kolo, R. E. (SM)
Sims, T. W. (A)

Frankfort (LOU-5)
Johns, K. B. (A)
Weber, L. C. (A)
Webster, R. S. (A)

Glascow
Sadler, C. C. (A)

Jeffersontown (LOU-5)
Hewitt, L. G. (M)
Lyle, I. W., Jr. (M)

Lexington (LOU-5)
Allison, N. B. (A)
Baker, L. L. (A)
Graham, P. J. M. (A)
Helt, S. (M)
Lang, E. T. (A)
O'Neal, R. K. (A)
Rafajko, M. (A)
Smith, G. E. (A)
Yount, W. R. (A)

Louisville (LOU-5)
Alpiger, W. E. (A)
Arnold, B. F. (A)
Bell, R. V. (A)
Burdg, C. E. (A)
Cart, R. E. (A)
Cohen, D. (A)
Covert, J. L. (A)
Eibeck, A. C. (A)
Fife, S. T. (SM)
Fox, J. C. (M)
Gates, S. H. (A)
Hanes, F. P. (A)
Hill, E. C. (M)
Hope, C. R. (M)
Hudson, W. E. (M)
Kimmel, E. J. (A)
Koller, O., Jr. (A)
La Vielie, W. R. R. (M)
Maine, R. E. (A)
McAfee, C. S. (A)
McIntosh, D. (A)
Miller, E. J. (A)
Miller, L. A. (A)
Mills, R. W. (A)
Morrison, W. J. (A)
Neher, B. (A)
Nevitt, R. G. (A)
Osborn, R. F. (A)
Probst, M. C. (M)
Reiling, G. E. (A)
Ryan, W. J. (A)
Schwalbe, M. I. (SM)
Skaggs, E. P. (A)
Smith, H. T. (M)
Summerford, A. C. (SM)
Sweets, F. M. (M)
Towner, O. W. (SM)
Vogele, F. C. (A)
Winges, C. D. (A)
Yunk, G. W. (A)

Ludlow (CIN-5)
Reynolds, D. J. (VA)

McRoberts (LOU-5)
Varson, T. R. (A)

Newport (CIN-5)
Fields, G. S. (A)
Humphrey, H. A. (A)
Rothfuss, R. G. (A)

Olive Hill (CIN-5)
Barker, E. E. (A)

Owensboro (EO-5)
Bailey, R. L. (A)
Boeckman, J. F. (A)
Bowie, W. S. (SM)
Boxx, J. P. (A)
Bryant, J. A. (A)
Byars, W. F. (A)
Carter, M. G. (SM)
Coomes, P. S. (A)
Cotter, G. W. (A)
Davenport, J. E. (M)
Davis, E. L. (M)
Davies, L. B. (SM)
Dorris, R. M. (A)
Field, R. W. (M)
Freeman, H. H. (A)
Gage, G. H., Jr. (M)
Haase, A. P. (SM)
Hawley, O. D. (M)
Hayes, F. L. (A)
Horne, O. P. (A)
Horton, C. E. (M)
Lattin, W. J. (A)
Maddle, J. F. (M)
McCool, C. D. (M)
McCulley, C. R., Jr. (A)
McKinnis, C. E. (A)
Mickey, D. D., Jr. (A)
Millis, W. T. (SM)
Moe, R. E. (SM)
Mullersman, F. H. (A)
Newhall, S., Jr. (A)
Niehaus, E. H. (A)
Phelps, J. H. (M)
Phillips, A. H. (A)
Reynolds, C. L. (M)
Robb, J. H. (A)
Roberts, L. E., Jr. (A)
Rush, J. W. (A)
Ryan, J. D. (A)
Somerville, J. R., Jr. (A)
Steele, R. M. (A)
Taylor, C. L. (A)
Tucker, J. G. (A)
Wofford, D. R. (A)

Paducah (EO-5)
Richards, W. W. (A)

Paris (LOU-5)
Miller, L. W. (A)

Philpot (EO-5)
Jackson, J. E. (A)

Princeton
Sell, W. E., Jr. (A)

Salvisa (LOU-5)
Gritton, D. M. (A)

Somerset
Parsons, J. A. (A)

South Fort Mitchell
Schonk, K. W. (M)

Sturgis
O'Nan, R. L. (A)

Williamsburg (LOU-5)
Gatliff, J. B., Jr. (A)

Winchester (LOU-5)
Hastings, J. C. (A)

LOUISIANA

Alexandria (NO-6)
Amitis, E. J. (A)
Giaco, V. J. (A)
Herman, J. J. (A)
Moore, T. E. (A)

Arabi (NO-6)
Brown, R. G. (A)
Mondy, H. C. (M)

Barksdale AFB (DFW-6)
Derey, C. H. (A)
Fritsch, H. C., Jr. (A)
Moreland, H. H. (A)

Bastrop (NO-6)
Green, W. M., Jr. (A)

Baton Rouge (NO-6)
Allan, D. K. (M)
Case, E. E. (A)
Crum, F. M. (A)
Heine, A. E. (A)
Lyon, D. J. (A)
McLean, L. V. (M)
Mobley, R. C. (A)
Voss, C. H., Jr. (A)

Bossier City
Nicholson, C. L. (A)
Ott, W. F. (M)

Camp Polk
Falk, B. (A)

Crowley (NO-6)
Bailey, C. L. (A)

De Quincy (BP-6)
Vincent, R. S. (A)

Dodson (NO-6)
Erholm, W. H. (M)

Golden Meadow (NO-6)
Brady, J. A., Sr. (A)

Gretna (NO-6)
Hero, G. A., III (A)

Harvey (NO-6)
Chapman, D. C. (A)
Karney, T., Jr. (A)

Jennings
Kenner, W. M. (A)

Lacombe (NO-6)
Rust, J. J. (A)

Lafayette (NO-6)
Boudreaux, F. J. (A)

Lake Charles (BP-6)
Anderson, H. V. (SM)
Briggs, H. B., Jr. (A)
Filzen, J. N. (A)
Moses, E. C. (A)
Parks, W. B. (A)
Streiff, J. P. (M)
Webb, E. J. (A)
White, R. A. (A)

Monroe
Erdel, S. (A)
McGee, F. M. (M)
O'Brien, D. D. (A)

New Orleans (NO-6)
Adkins, J. M. (M)
Allen, G. (A)
Atkins, R. E. (A)
Becker, H. C. (A)
Bloom, J. D., Jr. (SM)
Bordenave, L. R. (A)
Burris, L. B. (A)
Chapin, M. F. (M)
Craig, G. H. (A)
Cronvich, J. A. (VA)
Domec, J. D. (A)
Du Treil, L. J. N. (SM)
Fahrmeier, M. I. (A)
Freeland, W. T. (M)
Freeman, G. A., Jr. (A)
Gordon, C. K. (M)
Hart, W. M., Jr. (A)
Hutch, A. L. (A)
Hutson, R. N. (A)
Kampen, A. C. (A)
Landry, N. R. (A)
Lehde, P. E. (F)
Lodato, J. S. (A)
Melancon, N. J. (A)
Monroe, W. J. (M)
Morris, J. C. (A)
Often, C. G. (A)
Olson, H. G. (A)
Otto, J. L. (A)
Parlwa, M. N. (A)
Pechon, A. J. (A)
Peirce, G. H. (VA)
Perkins, C. C. (A)
Petrik, J. S. (A)
Price, G. A., Jr. (M)
Remond, F. X. (A)
Riddle, L. G. (SM)
Rooney, J. D. (M)
Roussel, G. A. (M)
Scroggins, C. M., Jr. (M)
Sherman, W. R. (SM)
Spencer, J. C. (A)
Talbot, W. S. (A)
Tong, E. (A)
Tyrolf, E. O., Jr. (A)
Viosca, H. L., Jr. (A)
Wood, G. W. (SM)
Woods, T. D. W. (VA)
Yacich, P. J. (M)
Yarbrough, L. E. (A)

Rayne (NO-6)
Bailey, B. H., Jr. (M)

Ruston
Owen, W. E. (A)

Shreveport (DFW-6)
Benson, M. C. (A)
Craig, W. H. (A)
Garrett, E. D. (A)
Hurley, L. (A)
Long, F. V. (SM)
Lott, J. C. (A)
Maddox, C. H. (VA)
Murray, J. M. (A)
Murray, J. W. (A)
Nuttall, E. D. (M)
Randolph, A. M. (A)
Turley, J. R. (A)
Whitley, J. P. (A)

Sligo
Schiess, M. C. (A)

Sulphur (BP-6)
Albright, A. L. (M)
McNamara, J. E. (M)

Theall (NO-6)
Lejeune, O. J. (A)

Vivian (DFW-6)
Janik, J. L. (A)

MAINE

Auburn
Nichols, G. P., Jr. (A)

Augusta (BOS-1)
Graves, P. P. (M)
Parker, R. H. (M)

Bailey Island (BOS-1)
Bixby, H. O. (SM)

Bangor (BOS-1)
Creamer, W. J. (SM)
Dressler, J. W. (M)
Libbey, W. M. (A)

Biddeford (BOS-1)
Deters, A. A. (A)

Brunswick (BOS-1)
Little, N. C. (VA)

Calais (BOS-1)
Reynolds, J. C. (M)

Camden (BOS-1)
Tibbetts, G. C. (A)

Cape Elizabeth (BOS-1)
Smith, D. H. (SM)

Caribou (BOS-1)
Robinson, W. C. (A)

Cumberland Center (BOS-1)
Baldwin, R. L. (A)

Cumberland Mills
Wellcome, F. L., Jr. (A)

Fairfield
Kramer, J. V. (A)

Kennebunkport (BOS-1)
Reoch, A. E. (F)

Orono (BOS-1)
Blake, C. (A)
Seal, P. M. (SM)

Portland (BOS-1)
Brewer, L. F. (A)
Chandler, J. (A)
Gray, L. E., Jr. (A)
Hodgkins, R. W. (SM)
Karcher, R. W. (A)
Kozineski, W. (A)
Quimby, W. O. (A)

Presque Island AFB
Hitzenhammer, A. D. (SM)

Randolph
Newell, G. R. (A)

Raymond (BOS-1)
Marshall, J. R. (A)

Saco
Kozloff, J. (A)

Sanford
Daly, R. H. (A)

Sedgwick (BOS-1)
Whitten, C. L. (A)

South Portland (BOS-1)
Harris, R. G. (A)

Union (BOS-1)
Whitney, L. F. (M)

Waldoboro (BOS-1)
Cooney, J. R. (A)

Westbrook
Shaw, H. S. (F)

MARYLAND

Aberdeen (BAL-3)
Beswick, J. D. (A)
Birdsey, G. J. (M)
Blodgett, W. G. (A)
Broverman, H. L. (A)
Frasher, M. M. (A)
Hartnett, J. D. (A)
Haskin, R. H. (A)
Hill, F. E. (M)
Hodge, A. H. (VA)
Hunsicker, J. E. (A)
Jefferis, R. A. (A)
Katzenberger, H. S. (A)
Kellogg, C. H. (A)
Lecrone, J. G. (A)
Leeder, J. (A)
Misey, J. J. (A)
Monroe, K. E. (A)
Montague, N. C. (A)
Morris, C. S. (A)
Pochop, D. R. (A)
Seewald, E. C. (A)
Spence, H. W. (A)
Spencer, D. K. (A)
Stoller, M. D. (M)
Wallin, C. H. (A)
Wetter, N. E. (A)
Westermeier, T. F. (A)
Wolff, G. (A)
Zancanata, H. W. (A)

Accident
Friend, C. K. (A)

Accokeek (WA-3)
Harris, F. H. (A)

Andrews AFB (BAL-3)
Thorp, H. R. (A)

Annapolis (BAL-3)
Albright, E. L. (M)
Bruce, C. A. (A)
Daley, J. L. (M)
Dalyrimple, H. C. (A)
Goodhue, W. W. (VA)
Lamartin, F. H. (A)
Leydorf, G. E. (A)
Maling, H. F., Jr. (M)
Mumford, E. R. (A)
Watts, G. J. (A)

Arbutus (BAL-3)
Donsbach, W. R. (M)
Pastel, M. P. (A)

Army Chemical Center (BAL-3)
Stormes, J. M. (A)

Arnold (BAL-3)
Ecker, J. L. (A)
Gregory, L. W. (SM)
Parnell, W. S. (A)

Baltimore (BAL-3)
Abel, A. E. (SM)
Airth, H. B. (A)
Allen, J. E. (A)
Alpert, I. S. (A)
Andersen, A. (M)
Anderson, C. F. W. (M)
Andreatta, J. H. (A)
Arnold, D. R. (A)
Ashmead, H. E. (SM)
Atran, L. (A)
Axelby, G. S. (A)
Bailey, C. W. Jr. (A)
Bailey, R. T. (M)
Baker, A. L. (A)
Baker, D. A. (M)
Baker, E. E., Jr. (M)
Baker, F. A. (A)
Baker, R. H. (M)
Balthis, D. L. (M)
Barlow, A. D. (A)
Barnes, A. E. (A)
Barrack, C. M. (A)
Barthel, D. R. (A)
Basil, I. T. (A)
Beckman, N. W. (A)
Bender, W. W. (SM)
Bentley, F. C. (A)
Betsh, K. W. (A)
Bias, G. H., Jr. (A)
Blasbalg, H. (A)
Bloom, L. (A)
Bloomer, T. M. (SM)
Boenning, C. B. (M)
Booth, J. D. (VA)
Bosse, M. L. (A)
Botha, D. G. (A)
Bowen, J. R. (A)
Boykin, J. R. (SM)
Bradley, E. J. (A)
Briggs, M. R. (SM)
Broady, S. N. (A)
Brodwin, M. E. (A)
Brown, C. M. (A)
Buchan, J. F. (A)
Buehl, G. C. (A)
Bulik, C. (A)
Byerly, E. H. (A)
Byrod, R. B. (M)
Callahan, J. F. (A)
Carpenter, L. B. (A)
Chapin, E. W. (M)
Check, R. C. (SM)
Chiroma, L. D. (A)
Chrisman, D. W. (M)
Chrzanowski, E. J. (A)
Chuma, N. (A)
Clark, C., Jr. (A)
Claus, O. R., Jr. (A)
Clifford, R. F. (A)
Clifford, R. W. (M)
Cohen, H. A. (M)
Cole, A. E., Jr. (A)
Cole, E. B., Jr. (M)
Collins, A. D. A. (M)
Congdon, K. P. (A)
Cooper, S. (A)
Corey, S. A. (A)
Cosman, A. (A)
Coulter, E. L. (A)
Crane, R. B. (A)
Crocker, G. M., Jr. (A)
Crosby, E. L., Jr. (M)
Csepely, J. A. (A)
Cullom, J. H. (A)
Dalle Mura, P. H. (A)
Danner, R. V. (A)
Darnowsky, M. (A)
Darr, J. E. (A)
Davenport, F. S. (A)
Davidson, A. L., Jr. (A)
Davies, L. E. (A)
Davis, J. S., Jr. (A)
Davis, J. W. (M)
Deal, D. L. (A)
Deise, L. F. (M)
Denton, G. W. (A)
Derda, J. A. (A)
De Socio, G. (SM)
Dickens, W. D. (A)
Dillow, J. C. (A)
Disney, J. G., Jr. (A)
Dobyns, H. B. (A)
Doroshow, S. R. (A)
Doyle, R. E. (A)
Duff, J. S. (A)
Dullinger, A. G., Jr. (A)
Dunlap, I. J., Jr. (A)
Duquet, E. A. (A)
Durham, B. H. (A)
Durnal, R. G. (A)
Eby, J. T. (A)
Eckels, A. E. (VA)
Eckenroth, H. F. (A)
Eckstein, G. (A)
Eilert, C. A. (A)
Elliott, L. (A)
Evans, R. E. (A)
Epstein, R. A. (A)
Ewanus, W. (A)
Fallon, G. P. (SM)
Farmer, W. C., Jr. (A)
Farrell, R. J. (A)
Farrell, W. C. (M)
Faulis, D. R. (A)
Ferg, A. P. (A)
Fell, T. (A)
Felt, N. E., Jr. (A)
Fenichel, I. (A)
Ferris, R. C. (A)
Field, F. W. (A)
Fino, J. J. (A)
Fischer, F. W. (SM)
Fisher, C. E. (A)
Fitch, J. A. (M)
Fleeman, P. J. (A)
Flower, D. W. (A)
Flowers, W. P. (A)
Foley, W. V. (A)
Frankenfield, C. C. (A)
Franz, W. J. (A)
Fraser, J. T. (M)
Frattali, F. A. V. (A)
Frederick, L. G. (A)
Friedmann, D. C. (A)
Friesser, J. M. (A)
Frisco, L. J. (A)
Frutchter, C. L. (A)
Fuller, F. J. (SM)
Fuqua, H. G. (M)
Gable, M. L. (A)
Gambrill, R. D. (A)
Garrett, W. O. (A)
Gates, A. F. (A)
Gault, A. A. (A)
General, J. (SM)
Gershberg, D. N. (A)
Gerwig, C. H., Jr. (A)
Gigante, G. A. (A)
Glaser, E. M. (A)
Godlewski, V. J. (A)
Goldenthal, S. (A)
Gore, W. C. (M)
Gott, E. (A)
Graf, H., Jr. (VA)
Grauberger, W. E. (A)
Grauling, C. H., Jr. (M)
Gray, A. R. (A)
Green, R. E., Jr. (A)
Griffith, B. H. (M)
Griffiths, W. W., Jr. (A)
Grossman, D. (A)
Gunter, F. B. (SM)
Hagelgans, E., Jr. (A)
Hale, W. B. (A)
Hall, F. T., Jr.
Hall, O. C. (A)
Hall, R. J. (A)
Haller, E. J. (A)
Hamburger, F., Jr. (SM)
Hamby, J. O. (A)
Hammond, J. G. (SM)
Hanks, H. C. (A)
Hardy, F. S. (A)
Harris, B. L. (A)
Harris, H. N. (A)
Harris, J. F. (SM)
Harrop, I. H. (A)
Hauck, V. D. (SM)
Haydon, G. W. (A)
Haynes, F. B. (SM)
Hazel, W. M. (A)
Heath, G. F. (A)
Heck, J. R. (SM)
Hefte, C. B. (A)
Hemphill, A. (M)
Henderson, R. J. (SM)
Henry, R. M., Jr. (A)
Henthorn, J. E. (A)
Herwald, S. W. (SM)
Higby, R. F. (A)
Hiltz, F. F. (A)
Hing, A. O. (A)
Hirsch, A. E., Jr. (A)
Hlavka, L. F. (A)
Hoffman, C. P. (A)
Hoffman, P. A. (A)
Hogue, G. E. (A)
Holdt, D. H. (A)
Hollis, T. W., Jr. (A)
Holman, J. G. (A)
Hom, W. R. (A)
Hood, I. A. (M)
Hornstein, L. (A)
Horrigan, J. S. (A)
Houck, J. W. (A)
Houghton, R. B. (A)
Houston, G. P. III (SM)
Houston, J. A. (A)
Hrybyk, W. L. (A)
Hucke, H. M. (SM)
Huffman, D. L. (A)
Hugging, W. H. (A)
Hunt, W. W. (A)
Hurley, W. A. (M)
Hutchinson, J. O. (A)
Jackson, H. L. (M)
James, J. L. (A)
Janssen, H. K. (A)
Jenkins, J. (SM)
Jenks, J. C. (A)
Jett, E. K. (F)
Johnson, M. P. (A)
Johnson, P. S. (M)
Jones, M. L. (SM)
Jones, W. C. (M)
Juchno, E. A. (A)
Kammerman, P. E. (A)
Kardos, M. (A)
Karpa, P. (A)
Kaste, O. C. (A)
Kay, J. S. (A)
Keary, H. F. (A)
Kegel, A. G. (M)
Kempf, R. A. (VA)
Kent, L. L. (A)
Kephart, D. C. (A)
Kerr, D. E. (VA)
Khoury, N. (A)
Khu, E. B. C. (A)
Kiley, W. H., Jr. (A)
Killman, R. T. (A)
Kinder, H. R. (A)
King, D. D. (M)
Kinn, T. P. (SM)
Klaasen, B. J. (A)
Kline, C. R. (A)
Klitsch, L. L. (A)
Knox, C. B. (A)
Konigsberg, R. L. (A)
Kornfield, M. (A)
Kovasznay, L. S. G. (SM)
Kovski, J. J. (SM)
Kraybill, M. E., Jr. (M)
Kreis, J. F. (A)
Kuegler, G. K. (A)
Kumm, W. H. (A)
Kurek, A. H. (A)
Lamb, W. G. (A)
Lambert, J. R. (M)
Larson, K. T. (A)
Lau, C. B. (A)
Lawson, E. J. (A)
Layton, C. L. (A)
Leahy, F. N. (A)
Leap, G. A. (A)
Lee, F. G. (A)
Lee, R. L. (A)
Lees, R. E. (A)
Leffel, F. E., Jr. (A)
Leish, J. (A)
Leone, H. A. (A)
Levy, D. S. (A)
Liebman, P. M. (A)
Lindemann, H. B. (A)
Linsenbardt, A. E. (A)
Lisiecki, M. (A)
Little, D. G. (F)
Lokke, G. A. (A)
London, C. (SM)
Louk, G. V. (A)
Lubbert, G. L. (M)
Macewka, N. (M)
Mack, K. M. (M)
MacKenzie, J. E. (SM)
Mackes, D. V. (A)
Main, R. C. (SM)
Mannas, R. G. (A)
Manner, C. E. (A)
Marcroft, H. C. (SM)
Markham, A. S. (M)
Markwalter, J. L., Jr. (M)
Marshall, P. J., Jr. (A)
Marthens, A. S. (M)
Martin, J. A. (A)
Martin, W. L. (A)
Masters, H. M. (A)
Mattern, J. (A)
Matysek, J. J. (A)
Mauro, E. A. (A)
Maxwell, R. F., Jr. (A)
Mayer, R. H. (A)
Mazurkiewicz, H. G. (M)
McAdie, C. H. (M)
McBride, J. F. (A)
McCombe, D. H. (A)
McDonald, H. S. (A)
McDonough, J. T. (A)
McNally, H. R. (A)
Meara, V. T. (M)
Meier, W. M. (A)
Messner, R. W. (M)
Mester, J. C. (A)
Meyer, A. W. (A)
Miles, M. W. (A)
Miller, C. F. (M)
Miller, C. R. (A)
Miller, J. M. (SM)
Miller, L. A. (A)
Mitchell, W. C. (A)
Molloy, G. C. (A)
Molz, K. F. (M)
Moore, C. R., Jr. (A)
Morgan, R. H. (A)
Morris, W. P. (M)
Morse, F. A. (A)
Mott, O. B. (M)
Mowery, V. O. (A)
Mueller, E. J. (A)
Mueller, M. T. (A)
Mullins, F. G. (A)
Mundell, K. C. (A)
Munnell, E. T. (A)
Murray, J. B. (A)
Mutch, J. J. (A)
Naidich, H. H. (A)
Newberg, I. L. (A)
Newton, H. C. (M)
Nims, A. A., Jr. (SM)
Nobles, C. E. (SM)
Nopper, C. G. (A)
O'Donnell, R. J. (A)
Ogland, J. W. (SM)
Orr, R. V. (A)
Oster, E. W., Jr. (A)
Packard, R. F. (A)
Page, F. T. (A)
Palmer, W. D. (A)
Park, A. R. (A)
Parks, H. L. (A)
Parrish, W. F. (A)
Parzen, P. (SM)
Paska, R. A. (A)
Paxton, C. L. (A)
Pearce, J. M. (SM)
Perlin, A. I. (A)
Pieper, G. E. (SM)
Pierson, C. D., Jr. (SM)
Piltz, F. (A)
Pipkin, J. E. (M)
Price, B. F. (M)
Pullen, K. A., Jr. (M)
Rambo, S. I. (SM)
Ranft, W. Q. (A)
Range, M. A. (A)
Raynes, H. D. (A)
Real, P. (A)
Reis, H. J. (M)
Reyers, R. R. (M)
Richardson, W. R. (A)
Richmond, I. D. (A)
Riley, R. N. (A)
Ringenbach, M. E. (A)
Roberts, H. D. (A)
Rockwell, P. (SM)
Rodbell, D. S. (A)
Roedel, S. (A)
Rohner, A. J. (M)
Romano, G. F. (A)
Rooten, A. (A)
Rosenblum, I. L. (A)
Rossi, A. D. (A)
Roth, S. A. (A)
Rothar, D. E. (M)
Roush, R. G. (M)
Royce, H. W. (A)
Ruehl, G. C., Jr. (M)
Ruthenberg, W. G. (A)
Ryan, C. C. (A)
Sanford, R. W. (A)
Sanner, G. E. (A)
Sargent, C. R. (M)
Scanga, W. A. (A)
Schafer, H. G. (A)
Scharfman, H. (A)
Scheneman, E. E. (A)
Schlicher, K. G. (M)
Schreyer, S. D. (A)
Schutz, H. (SM)
Schwarzkopf, J. (A)
Sefton, H. B., Jr. (A)
Seiberlich, J. S. (M)
Seibold, W. F. (M)
Seldon, W. Z. (A)
Seman, A. E., Jr. (A)
Senger, F. A. (A)
Shannon, H. H. (A)
Shaw, G. D. (A)
Shelford, L. L. (A)
Shelor, E. G., Jr. (M)
Schoenberger, G. C. (A)
Sichelstiel, B. A. (A)
Siedband, M. P. (M)
Siegel, W. (A)
Skaggs, J. W. (A)
Slavin, M. (A)
Slottow, H. G. (A)
Smeltzer, R. F. (A)
Smith, E. L., Jr. (A)
Smith, J. G. (A)
Smith, J. S. (M)
Smith, K. W. (A)
Smoot, W. L. (A)
Soroka, B. (A)
Spencer, P. H. (A)
Spicer, W. T. (M)
Spiegel, S. S. (M)
Stein, E. F. (A)
Stephenson, J. O. (A)
Sternbach, S. J. (A)
Stewart, N. H. (SM)
Stone, K. A. (M)
Stout, G. P. (SM)
Stout, J. V. (M)
Strandberg, P. R. (A)
Stull, K. S. (M)
Sturgill, C. L. (A)
Sturtevant, C. E. (M)
Sullenger, J. E., Jr. (A)
Sussman, M. M. (A)
Sweigart, A. S. (A)
Tarkoff, P. B. (M)
Tashjian, D. R. (SM)
Taylor, M. (VA)
Teddlie, E. A. (A)
Theisinger, L. P. (A)
Thomas, A. G. (A)
Thomas, C. E., Jr. (A)
Thompson, E. H. (A)
Thompson, F. J. (A)
Tischler, M. (M)
Titus, C. K. (A)
Todes, R. S. (A)
Tolj, H. D. (A)
Towles, W. B. (A)
Travers, J. F., Jr. (A)
Trent, J. E. (A)
Trinite, G. M., Jr. (A)
Trinter, V. E. (A)
Tuttle, L. (VA)
Ulman, L. J. (A)
Van Duzer, K. W. (A)
Van Meter, J. L. (A)
Vergara, W. C. (SM)
Viener, A. H. (M)
Visher, W. A. (A)
Vore, M. P. (A)
Waldorf, S. K. (SM)
Wall, J. J. (A)
Walls, A. B. (A)
Ward, T. L. (A)
Warner, H. V. (A)
Waters, R. H. (A)
Waters, W. M. (A)
Watts, H. M. (SM)
Wedge, T. E. (A)
Weinberger, H. L. (M)
Welsted, I. G. (A)
Wheeler, M. S. (A)
Whitney, A. (SM)
Wilkes, L. D. (A)
Wilkins, R. P. (A)
Wilkinson, R. L. (A)
Williams, A. D. (A)
Williams, W. S. (A)
Wilner, J. T. (SM)
Wiltse, J. C., Jr. (A)
Wimer, A. S., Jr. (M)
Windley, W. D. (A)
Wing,, J. (A)
Wissman, A. J. (A)
Witt, F. J. (A)
Wolfe, B. (M)
Wolfe, R. E. (A)
Wong, J. B. (A)
Woodard, W. W. (M)
Woodyard, R. H. (A)
Woppman, G. H. (A)
Worrell, E. A. (A)
Yaffe, T. H. (A)
Yarbrough, H. B. (M)
Yoder, A. A. (A)
Young, L. (M)
Young, R. L., Jr. (A)
Zacharia, H. (A)
Zamoyta, J. A. (A)
Zimmerman, R. (A)

Bel Air (BAL-3)
Buck, R. D. (A)
Dunn, D. J., Jr. (A)
Ulrich, W. J. (A)

Beltsville (WA-3)
Biggerstaff, W. F. (A)
Norris, K. H. (M)

Bethesda (WA-3)
Apstein, M. (SM)
Arsem, C. (M)
Astin, A. V. (SM)
Atwood, N. A. (SM)
Baluta, R. E. (A)
Bedford, P. L. (M)
Boese, W. C. (SM)
Bush, G. P. (SM)
Calhoon, T. G. (A)
Cannon, R. E., Jr. (M)
Curtis, R. W. (SM)
Delort, R. (M)
Distad, M. F. (SM)
Doyle, E. M. (M)
Dubois, H. F. (A)
Ellsworth, W. C. (SM)
Fong, L. B. C. (SM)
Gerwin, H. L. (SM)
Grant, C. R. (A)
Grantham, R. E. (SM)
Hall, R. M. (A)
Hartz, J. E. (SM)
Hoff, R. S. (M)
Huffman, R. E. (A)
Ikelman, G. J. (A)
Jacobs, D. H. (A)
Jervis, E. R. (SM)
Karagiorgis, N. D. (A)
Karr, P. R. (A)
Kelley, J. J. (A)
Lent, W. C. (SM)
Levy, J. E. (M)
Lilly, J. C. (A)
Loucks, I. H. (SM)
Mahaffey, G. N. (VA)
McBirney, H. R. (A)
McDowell, W. E. (A)
Meissner, P. (A)
Melton, B. S. (SM)
Mickey, L. (VA)
Montgomery, G. F. (M)
Noble, F. W. (A)
Noble, J. S. (A)
Pendleton, T. A. (A)
Queen, J. L. (A)
Rainville, L. E. (A)
Ream, D. L. (A)
Richards, A. P. (SM)
Ring, A. D. (VA)
Rist, A. E. (SM)
Roccati, A. J. (A)
Roddy, V. S. (VA)
Senf, H. R. (SM)
Seymour, G. B. (A)
Shoemaker, R. F. (A)
Shulz, R. S. (M)
Siewers, D. C. (A)
Smith, K. A. H. (A)
Sommer, H. (A)
Spillane, L. W. (A)
Stewart, J. L. (A)
Stinchfield, J. M. (SM)
Viera, F. Jr. (A)
Ware, R. S. (A)
Webb, G. N. (M)
Wenzinger, C. J., Jr. (A)
Wheeler, L. B. (M)
Wogan, R. S. (A)
Wolzien, E. C. (M)
Youden, W. W. (A)

Bladensburg (WA-3)
Crabill, P. F., Jr. (A)
Hiller, A. J. (A)

Brandywine (WA-3)
Conner, L. M. (A)

Burtonsville (WA-3)
Claypool, W. S. (VA)
McInteer, W. H. (A)

Cambridge (BAL-3)
Alexander, R. M. (A)
Coburn, A. H. (A)
Orr, G. M. (A)

Capitol Heights (WA-3)
Hengstler, J. J. (A)

Catonsville (BAL-3)
Barnhart, E. F. (A)
Behler, R. J. (SM)
Burnside, C. J. (SM)
Cole, D. P. (A)
Combellick, T. A. (A)
Crompton, R. H. (A)
Des Lauriers, E. L. (A)
Hicks, C. S. (M)
Hoffman, H. C. (A)
Jacob, M. I. (M)
Johnson, J. L. (SM)
Kinsman, W. D. (M)
Kuss, P. W. (A)
Lakins, B. B. (A)
MacDonald, A. A. (SM)
Meek, W. F. (A)
Miller, C. J. (A)
Miller, C. W. (M)
Norris, R. N. (A)
Phelps, G. H. (SM)
Sima, R. L. (A)
Singel, J. B. (A)
Smith, H. B. (M)
Wolf, F. H. (A)

Cheltenham (WA-3)
Meyer, J. A. (A)

Chesapeake Beach (BAL-3)
Goetze, A. J. (A)
Grosvenor, A. C. (SM)
Lesko, N. J. (A)
Pavetto, J. C. (A)
Whiting, W. K. (A)

Cheverly (WA-3)
Beegle, D. H. (SM)
Davis, R. E. (M)
Gough, J. H. (SM)
Mehrbach, E. (M)
Sly, R. D. (A)
Waldo, G. V. (VA)
Woolley, P. V. (A)

Chevy Chase (WA-3)
Ainsworth, E. F. (A)
Alexander, S. N. (A)
Anderson, O. J. (SM)
Apuli, J. A. (SM)
Brady, J. B. (SM)
Caporale, P. (SM)
Cottony, H. V. (SM)
Cramer, G. F. (A)
Dougherty, J. G., Jr. (A)
Engel, F. H. (SM)
Frederick, C. L. (M)
Gordon, D. I. (A)
Henry, J. H. (A)
Hummel, C. F. (A)
Keller, J. W., Jr. (M)
Kelley, G. W., Jr. (VA)
LaVier, E. C. (A)
Marshall, B. O., Jr. (A)
Michalowicz, J. C. (M)
Mills, M. H. (SM)
Morton, R. C. (A)
Piore, E. R. (F)
Reamer, E. D. (A)
Saito, S. (A)
Schafer, R. H. (A)
Tanke, H. F. (VA)
Tynan, W. A. (A)
Walls, H. J. (SM)
Williams, S. B. (SM)
Wright, J. W. (VA)

Chillum (WA-3)
Price, J. F. (A)
Rattner, S. (SM)
Turner, W. R. (M)

Clinton (WA-3)
Hortman, J. D. (A)
Talbot, B. V. (A)

Cockeysville (BAL-3)
Healey, D. J. III (M)
McComas, A. D., Jr. (A)

Colesville (WA-3)
Davis, W. L. (A)

College Park (WA-3)
Allen, W. K. (A)
Beyer, G. L., Jr. (M)
Brown, J. (M)
Cooper, H. W. III (A)
Corcoran, G. F. (SM)
Etzweiler, G. A. (A)
Headrick, J. M. (M)
Helmsing, L. C. (A)
King, C. L. (A)
Lewis, J. K. (A)
Morse, W. R. (SM)
Pear, C. B., Jr. (VA)
Price, H. W., Jr. (M)
Reed, H. R. (SM)
Thompson, D. G. (A)
Weber, J. (SM)

Crownsville (BAL-3)
Martin, G. E. (A)

Cumberland (WA-3)
Stern, H. (SM)

District Heights (WA-3)
Lamm, C. M., Jr. (A)

Dundalk (BAL-3)
Frank, B. A. (A)
Hanley, N. B. (A)

East Riverdale (WA-3)
Gran, R. W. (A)
McCann, R. T. (A)
Owen, E. A. (SM)
Sikes, R. E. (A)
Smith, E. D. (SM)
Walker, A. G. (A)

Edgewater (BAL-3)
Rosenberry, W. W. (A)

Edgewood (BAL-3)
Jacobs, R. (A)
Lanford, H. W., Jr. (SM)

Ednor (WA-3)
Dimmno, J. J. (A)

Elkridge (BAL-3)
McCoy, H. L. (A)
Nupp, R. E. (A)
Robinson, W. (A)

Elkton (BAL-3)
Merrill, R. E. (A)

Ellicott City (BAL-3)
Goldbach, A. C. (A)
Mabry, F. S. (SM)
Tharp, N. B. (SM)

Essex (BAL-3)
Cook, H. A. (M)
Goldsmith, J. (SM)
Watson, J. E. (A)

Finksburg (BAL-3)
Rundlett, L. M. (M)

Fort Meade (BAL-3)
Johnson, R. M. (A)
E. (A)

Forest Green (BAL-3)
White, E. A. (A)

Frederick
Corcoran, J. W. (A)
Metzger, F. E. (A)
Phillips, B. E. (A)
Price, O. I. (A)
Price, O. I., Jr. (A)

Friendship Airport (BAL-3)
Pratt, J. W., Jr. (M)

Fullerton
Nesbitt, W. E. (A)

Gaithersburg (WA-3)
Adams, J. T. (A)
Chamberlain, J. T. (A)
Freienmuth, W. L. (A)
Van Horn, J. E. (M)

Garrett Park (WA-3)
Aylor, R. P., Jr. (VA)

Glen Arm (BAL-3)
Hershfield, S. (SM)
Jones, O. J., Jr. (SM)
Wood, L. E. (M)

Glen Burnie (BAL-3)
Arnold, D. E. (M)
Asaki, G. G. (A)
Bevan, W. R. (A)
Bias, G. H., Jr. (A)
Borski, G. K. (A)
Browde, A. (A)
Brown, E. A. (A)
Burr, W. E. (A)
Chauvin, D. M. (A)
Frame, T. E. (A)
Granger, C. E. (A)
Hartley, H. F., Jr. (SM)
Hayden, H. P. (A)
Heazel, V. M., Jr. (A)
Koethler, G. H., Jr. (A)
Lee, R. E. (M)
Little, W. E. (A)
Mathieu, R. E. (M)
McClellan, C. E. (SM)
Mooney, D. H., Jr. (A)
Musk, H. A. (M)
Rexroad, R. A. (A)
Shafer, M. W. (A)
Shiely, A. R., Jr. (A)
Sullivan, P. H. (A)
Tomlinson, C. C. (M)
Valenta, M. F. (A)
Veraa, C. F. (M)
Willis, A. H. (M)
Wilson, H. C. (A)
Winter, G. W. (M)

Glencoe (BAL-3)
Raboy, B. (A)

Glenmont (WA-3)
Regnier, R. C. (A)

Greenbelt (WA-3)
Jones, G. R. (A)
Justman, S. (A)
Seaward, P. E. (A)

Hagerstown (WA-3)
Fuller, B. K. (A)
Maycock, J. C. (A)
McIntire, G. W. (A)
Pitzer, C. L. (A)
Pitzer, H. B. (A)

Harman (BAL-3)
Rix, E. H. (M)

Havre De Grace (BAL-3)
Arnold, N. W. (M)
Halio, M. (A)
Putnam, R. E. A. (VA)
Richard, V. W. (A)
Roark, G. L. (A)
Roediger, F. E. (A)
Veazie, C. E. (A)

Hillcrest Heights (WA-3)
Lynch, D. W. (M)

Hollywood (WA-3)
Young, C. H. (A)

Hughesville (WA-3)
Smith, W. H. (A)

Huntingtown (BAL-3)
Voisich, J. (A)

Hyattsville (WA-3)
Attmore, R. G. (A)
Baldini, B. P. (A)
Becker, W. E., Jr. (A)
Bevitt, W. D. (VA)
Blumenthal, L. J. (A)
Borden, T. G. (A)
Bowers, M. D. (A)
Breeskin, S. D. (A)
Byrd, R. E. (A)
Campbell, L. E. (A)
Chitty, H. W. (M)
Cohen, C. L. (A)
Colligan, J. A. (A)
Copeland, A. L. (A)
DeBolt, H. E. (A)
Fagin, S. L. (A)
Faram, H. D. (A)
Fisher, E. M. (A)
Flyer, I. N. (A)
Gager, F. M. (SM)
Gale, M. (A)
Giessler, W. L. (A)
Gipe, R. C. (A)
Globe, S. (A)
Greenwald, S. (A)
Hickenlooper, M. M. (A)
Hirschel, L. R. (A)
Hutchinson, E. M. (A)
Ingalls, R. S. (A)
Kaiser, Q. C. (A)
Kenny, M. (A)
Kordes, R. R. (A)
Kuhn, H. T. (A)
Kulikowski, E. F. (SM)
Kuzminsky, I. (A)
Landried, H. H. (A)
Lane, A. L. (A)
LaPointe, J. C. (A)
Lyon, H. H. (VA)
Magnus, E. M. (A)
Marcus, M. (A)
Marzetta, L. A. (A)
Meister, R. (A)
Messenheimer, A. D. (A)
Moseley, J. C., Jr. (A)
Palasky, E. C. (A)
Pamphilon, L. E. (A)
Paterrd, F. A. (A)
Peeler, G. D. M. (M)
Pendleton, E. E. (A)
Perecinic, W. S. (A)
Pike, W. N. (M)
Redden, M. S., Jr. (M)
Sandock, J. (A)
Schuchard, E. A. (M)
Shawe, M. E. (A)
Silverstein, A. (A)
Smokler, M. I. (A)
Starobin, A. F. (A)
Thalhamer, A. L. (A)
Tucker, J. E., Jr. (A)
Viezbicke, P. P., Jr. (A)
Ward, H. T., Jr. (A)
Weinstein, M. S. (A)
Wooster, M. O. (A)

Kensington (WA-3)
Aflanasiev, K. J. (M)
Ahern, C. R. (A)
Alexander, F. C. (SM)
Alldredge, L. R. (M)
Batten, J. C. (A)
Bell, W. S. (M)
Betzer, W. E. (A)
Butenhoff, R. L. (A)
Carpenter, R. C. (M)
Cooperman, J. I. (A)
Crone, J. L. (M)
Davis, H. B. O. (A)
Davis, J. J. (A)
Hart, F. J. (A)
Horton, B. M. (A)
James, W. G. (SM)
Joseph, H. M. (SM)
Kaiser, J. A., Jr. (M)
MacQuivey, D. R. (M)
Mader, D. W. (A)
Meadows, L. A. (SM)
Meese, K. J. (A)
Miller, F. B. (A)
Morey, F. C. (M)
Morse, A. O. (A)
Myrick, J. C. (M)
Nagle, J. J. (A)
Parker, M. J. (M)
Pincus, S. (A)
Radabaugh, E. L. (M)
Riblet, H. B. (SM)
Rosenberg, R. S. (A)
Saunders, E. R. (A)
Sheppard, I. J. (M)
Spinks, A. W. (A)
Spriggs, J. O. (A)
Staake, D. B. (A)
Sulzer, P. G. (A)
Sweeney, J. F. (A)
Wears, L. R. (A)
Webster, E. (A)
Yaffee, P. (M)

Kingsville
Tribe, P. (A)

Landover
Nye, J. W. (A)
Sencenbaugh, D. W. (A)

Landover Hills (WA-3)
Moltrup, G. R. (M)

Lanham (WA-3)
Hotchkin, E. E. (A)
Peshel, R. L. (A)
Sera, F. (M)
Stoops, C. W. (M)

Laurel (WA-3)
Ball, I. D. (SM)
Cameron, S. H. (A)
Craig, A. G. (VA)
Kimble, A. (A)
O'Connor, G. S. (A)
Roberts, W. K. (M)
Sanders, J. F. (A)
Shinn, E. N. (A)
Sipes, D. W. (M)
Straughn, J. B. (M)

Lexington Park (WA-3)
Bartels, W. S. (M)
Browne, W. M. (SM)
Fender, F. G. (A)
Russell, C. M. (SM)
Wilson, R. T. (SM)

Linthicum (BAL-3)
Cheetham, R. P. (A)
Kennedy, P. (A)
Kuehn, H. S. (A)
Lohr, L. A. (A)
Petrou, N. V. (SM)
Rustad, L. W. (M)
Soboleski, W. P. (A)

Linthicum Heights (BAL-3)
Bolt, C. A., Jr. (A)
Collins, Z. L. (M)
Dempsey, M. E. (A)
Garrett, C. L. (A)
Kraeger, G. W. (A)
Lee, R. (SM)
Markland, R. M., Jr. (A)
Rayment, C. V. (A)
Rogers, C. H. (A)
Schmid, O., Jr. (A)
Vea, T. H. (A)

Lutherville (BAL-3)
Barritt, R. C. (M)
Ellen, S. T. (M)

Monkton (BAL-3)
Puckett, D. W. (M)

Mt. Airy (BAL-3)
Nikirk, H. S. (A)

Mt. Rainier (WA-3)
Barton, R. (A)
Flanagan, J. D. (A)
Kent, J. S. (A)
Sheitelman, H. D. (M)
Slominski, T. V. (A)
Spencer, H. L. (M)
Van Sutphin, B. (A)
Velgos, P. (A)

Mt. Washington
Short, V. (A)

North Linthicum (BAL-3)
James, C. L. (A)
Mack, M. C. (M)
Scott, J. K. (A)

Owings Mills (BAL-3)
Hyder, H. R., III (M)
Omberg, A. C. (SM)
Thomas, C. Y. (M)

Park Hall (WA-3)
Leopard, G. W. (A)

Pasadena (BAL-3)
Brady, D. J. (A)
Fox, R. C. (A)

Patuxent River (WA-3)
Andrews, L. V. A. (A)
Belcher, A. C. (A)
Christian, O. R. (A)
Cook, K. S. (A)
Doughy, G. J. (A)
Dogantzis, B. E. (A)
Haushalter, C. H. (A)
Hymowitz, E. W. (A)
Keith, E. N. (A)
Kunstman, R. W. (A)
Long, M. G. (A)
Martin, W. A., Jr. (A)
McLarin, M. (A)
Miller, P. G. (A)
Nasipak, V. (A)
Sweet, R. A. (A)
Yulo, C. (A)

Phoenix (BAL-3)
Davis, R. J. (SM)
Munson, L. A. (A)

Pikesville (BAL-3)
Boehringer, R. R. (A)
Marie, C. S. (M)
McDade, J. G. (A)
Schrank, H. E. (M)
Wright, R. E. (M)

Potomac Heights (WA-3)
Bissett, E. B. (A)

Prince Georges County (WA-3)
Epstein, A. M. (A)

Randallstown (BAL-3)
Dietz, J. H. (A)
Mannel, W. M. (A)

Reisterstown (BAL-3)
Duncan, R. S. (A)
McConnel, W. G. (SM)

Relay (BAL-3)
Reynolds, D. W. (A)

Riderwood (BAL-3)
Claborn, K. D. (A)

Riverdale (WA-3)
Channon, K. F., Jr. (A)
Davies, G. L. (SM)
Johnson, C. L., Jr. (A)
Leverington, R. D. (A)
Mitchell, D. (M)
Reukauf, D. C. (A)
Sonnabend, J. S. (A)
Stimmette, H. L. (A)
Withrow, W. E. (A)

Rockville (WA-3)
Anderson, B. E. (A)
Arnstein, P. B. (A)
Auremanne, M. J. (M)
Barnard, G. L. (A)
Beecher, D. W. (A)
Biser, M. H. (SM)
Blow, T. C. (A)
Bowman, J. E. (A)
Brodie, A. H. (M)
Dye, J. E. (A)
Elam, P. E. (A)
Fitzgerald, R. T. (A)
Forsyth, W. A., Jr. (A)
George, N., Jr. (A)
Gilliland, H. W. (A)
Grady, T. J. (A)
Haltiwanger, J. C. (A)
Hardin, C. D. (M)
Heilprin, L. B. (A)
Hibberd, P. A. (A)
Jones, M. W. (M)
Kolsrud, E. R. (A)
Libby, E. C. (A)
Luke, G. W., Jr. (A)
Miller, R. J. (A)
Morison, C. T. (A)
Morse, M. S. (SM)
Rabal, N. S. (A)
Sawitz, P. H. (M)
Snyder, S. (A)
Story, V. V. (SM)
Stovall, H. E. (A)
Teres, B. W. (A)
Waters, J. A., Jr. (A)
Watkins, C. F. (A)
Witt, R. P. (M)

Rogers Heights
Dodgson, J. G. (A)
Wahle, J. J. (A)

Ruxton (BAL-3)
Harrison, P. W. (SM)
Martin, A. C. (M)

Saint Michaels (BAL-3)
Lewis, G. (F)

Severna Park (BAL-3)
Butler, H. J. (M)
Hastings, M. S. (M)
Hayes, M. E. (SM)
Strong, M. E. (A)
Young, A. F. (A)

Silver Spring (WA-3)
Abramovich, M. N. (SM)
Anderson, E. A. (A)
Anderson, H. C. (VA)
Anderson, H. W. (SM)
Anspacher, W. B. (SM)
Aristei, J. (M)
Bacon, E. J. (M)
Barnard, E. H. (A)
Barse, G. R. (A)
Bassett, R. S. (A)
Beach, E. H. (M)
Beaulieu, A. J. (A)
Bell, L. F. (A)
Bennett, R. D. (F)
Bernstein, B. (A)
Biosca, L. F. (VA)
Blackburn, C. A. (A)
Block, K. A. (A)
Bohn, A. L. (A)
Bond, E. G. (M)
Bonwit, S. E. (A)
Bowman, H. A. (A)
Braun, C. M. (VA)
Bridge, H. P. (A)
Brimberg, M. M. (SM)
Brown, C. W. (SM)
Brown, D. E. (A)
Brown, H. K. (A)
Brown, J. H. (A)
Buchanan, W. D. (A)
Buckingham, S. A. (A)
Buehler, J. H. (A)
Bush, G. B. (A)
Byer, D. L. (M)
Cahn, R. H. (A)
Campbell, S. S. (A)
Cancro, C. A. (A)
Carleton, H. (A)
Carpenter, R. J. (A)
Chwastyk, A. M. (A)
Cohen, J. (M)
Cook, F. W. (VA)
Cook, W. F. (M)
Costrell, L. (M)
Cote, A. J., Jr. (A)
Cotta, A. C. (M)
Craig, P. M., Jr. (A)
Culling, E. J. (A)
Davis, M. F. (A)
Dawley, J. R. (M)
Deacon, N. E. (A)
Demarr, J. D. (VA)
Devol, L. (A)
Dipell, R. E., Jr. (A)
Dobbins, B. D. (M)
Dorsett, J. W., Jr. (A)
Doud, R. D. (A)
Dungan, L. B. (A)
Durkovic, J. (M)
Dye, R. E. (A)
Edwards, P. L. (A)
Ellis, R. T., Jr. (A)
Emch, G. F. (A)
Fanning, B. B. (A)
Flato, M. (A)
Freeburger, B. P. (A)
Fund, S. R. (SM)
Funkhouser, R. E., Jr. (A)
Gago, F. J. (A)
Gardenhour, A. J., Jr. (A)
Gardner, E. P. (A)
Gilbert, J. N. (A)
Gilder, G. (A)
Gilford, S. (A)
Gillean, M. E. (A)
Gilliam, F. P. (A)
Gisser, M. (A)
Glassco, P. B. (SM)
Gleason, R. J. (SM)
Goldstein, G. D. (A)
Gordon, H. L. (M)
Gossard, W. H. (A)
Gragnani, O. J. (A)
Grant, E. C. (A)
Grantham, R. W. (A)
Greene, E. E. (M)
Greene, F. M. (M)
Greenwald, M. H. (A)
Grisamore, N. T. (A)
Guida, J. A. (SM)
Haberland, E. R. (M)
Hadady, R. E. (M)
Halvorsen, H. W. (A)
Hamblen, J. W. (M)
Hammack, J. W. (A)
Hammond, N. B. (A)
Hardy, A. O. (A)
Hayden, L. O. (A)
Haynes, J. M. (A)
Hedrich, A. L. (M)
Henry, R. L., Jr. (A)
Herider, E. D. (M)
Hickley, T. J. (SM)
Hiltner, R. P. (A)
Hoadley, J. C. (SM)
Hoffman, C. W. (A)
Holbrook, R. O. (SM)
Hollis, J. L. (SM)
Holt, A. W. (A)
Hosea, M. E. (A)
Huber, C. E. (A)
Hurlburt, E. H. (SM)
Jacques, A. T. (M)
Jenkins, P. M. (A)
Johnston, T. F. (M)
Jordan, S. A., Jr. (A)
Kanter, J. I. (A)
Katzin, M. (SM)
Kaufman, B. A. (A)
Keck, A. (M)
Kee, J. W. (A)
King, W. P. (A)
Kirkland, G. I. (M)
Klapper, E. (A)
Klein, W. J. J. (M)
Klink, G., Jr. (A)
Knodle, R. L. (A)
Knowles, R. B. (M)
Kolsrud, E. R. (A)
Krasnick, B. (A)
Krebs, W. N. (VA)
Kreis, A. L. (VA)
Kreitzer, H. M. (M)
Kuck, J. H. (SM)
Laden, H. N. (A)
Landis, P. E. (SM)
Larsen, J. (SM)
Larson, R. C. (M)
Latson, F. W. (A)
Leach, J. H. (M)
Leinfelder, E. J. (A)
Leonard, F. M. (M)
Leslie, C. B. (A)
Longley, P. B. (A)
Looney, H. C. (A)
Lord, J. B. (A)
Lord, N. W. (A)
Lun, M. J. (A)
Marrara, C. (A)
Marsh, D. S. (A)
Martin, K. H. (SM)
McCarter, G. B. (A)
McDonald, L. W. (A)
McDuffie, G. E., Jr. (M)
Melton, G. H. (A)
Melvin, E. A. (A)
Mengel, J. T. (SM)
Merchant, W. J. (SM)
Messera, J. R. (A)
Michelsen, P. F. (A)
Muchmore, T. F. C. (M)
Nagy, A. W. (SM)
Neely, J. C. (A)
Norwood, H., Jr. (A)
Oakes, J. B. (A)
Ober, H. E. (SM)
Page, C. H. (SM)
Patton, R. E. (A)
Petritz, R. L. (A)
Pettingill, S. A. (M)
Plotkin, G. N. (M)
Plotkin, I. (A)
Portmann, P. A. (M)
Pratt, H. (F)
Preisman, A. (SM)
Prugh, T. A. (M)
Randolph, J. P., Jr. (A)
Redler, W. M. (A)
Redmond, J. J. (SM)
Reed, H. Z. (M)
Renick, M. R., Jr. (A)
Ribner, M. (A)
Rice, L. W. (VA)
Rice, S. M. (M)
Robel, R. B. (SM)
Robertson, T. M. (A)
Robinson, R. O., Jr. (SM)
Rolfe, R. G. (A)
Rosenberg, J. D. (M)
Ross, R. R. (M)
Rotkin, I. (SM)
Rowland, R. W. (A)
Rudigier, J. J., Jr. (A)
Rueger, L. J. (SM)
Sackman, R. (A)
Sayler, A. W. (A)
Scheets, D. F. (A)
Scholl, G. S. (A)
Schulman, J. R. (A)
Scillian, G. L. (SM)
Seaton, J. W. (M)
Seymour, H. A. (A)
Sheppard, T. W. (M)
Shoaf, J. H. (M)
Shotts, W. E. (A)
Shreckengost, R. C. (A)
Silverman, H. M. (A)
Small, P. (A)
Smith, J. F. (A)
Smith, L. D. (A)
Smollett, R. J. (A)
Snow, C. E. (A)
Solow, M. (M)
Spencer, D. L. (A)
Spenser, C. W. (A)
Sprinkle, M. C. (A)
Sterling, G. E. (F)
Stockebrand, T. C. (A)
Sullivan, J. J. (A)
Swanson, E. E. (A)
Tampico, J. (SM)
Taylor, R. E. (A)
Tellman, H. A. (SM)
Terrell, R. L. (VA)
Teske, J. A. (A)
Thynell, G. M. (A)
Toense, E. R. (A)
Toense, R. A., Jr. (A)
Totah, E. J. (M)
Trainer, R. F. (A)
Tregidga, A. C. (SM)
Trout, P. A. (A)
Udelson, B. J. (A)
Uglow, K. M., Jr. (A)
Vann, W. L. (A)
Vilas, E. T. (A)
Wales, R. O. (A)
Walters, F. M. III (A)
Walters, L., Jr. (M)
Waltz, W. R. (A)
Ward, H. T., Jr. (A)
Weichbrod, J. (SM)
Weiland, F. A. (A)
Weinschel, B. O. (SM)
Wetmore, G. B. (A)
White, N. (SM)
White, P. E. P. (A)
Williams, E. M. (A)
Wilson, C. A. (A)
Wise, J. W. (M)
Witow, M. I. (M)
Wyman, R. C. (M)
Young, J. D. (SM)
Zefting, A. H. (M)
Zisk, S. H. (A)

Solomons
Ikerd, H. M. (A)

Sparks (BAL-3)
Macnichol, E. F., Jr. (A)

Spencerville (WA-3)
Smith, W. L. (SM)

Stevenson (BAL-3)
Caplan, N. (M)

Suitland (WA-3)
Conroy, R. J. (A)
Homrighous, J. H. (A)

Takoma Park (WA-3)
Anderson, L. D. (A)
Black, C. J. (M)
Blank, S. (A)
Cassedy, E. S., Jr. (A)
Clark, G. L. (A)
Darne, F. R. (A)
Finneran, R. J. (A)
Gerber, H. (A)
Hayth, W. D. (A)
Heising, W. P. (A)
Hibbard, W. D., Jr. (A)
Irons, H. R. (A)
Moore, W. J. (A)
Nicolaisen, G. A. (A)
Reader, W. A. (A)
Spalding, J. P. (SM)
Thrift, S. R. (M)
Toth, E. (SM)
Triplett, T. R. (A)
Yost, C. F. (A)

Timonium (BAL-3)
Pfund, C. E. (A)

Towson (BAL-3)
Ackerman, W. W. (A)
Allison, D. M., Jr. (A)
Barnhill, R. B. (M)
Bath, C. C. (A)
Beam, L. W. (A)
Bowers, C. E. (A)
Brown, D. (A)
Clotworthy, J. H. (A)
Colvin, J. W. (M)
Cooper, G. (A)
Cosby, J. R. (M)
Coyle, P. L. (A)
Edwards, R. B. (M)
Ellstrom, R. V. (A)
Fales, D., III (A)
Fasulo, J. L. (A)
Frazier, R. V. (A)
Gage, D. D. (A)
Gimon, E. E. (M)
Glacken, R. E. (A)
Goodale, D. M. (A)
Graffis, L. F. (SM)
Gurtz, J. (M)
Hammond, J. W. (SM)
Hanna, R. E. (A)
Hatfield, G. I. (A)
Heller, D. M. (SM)
Horsman, J. O. (A)
Hsu, C. C. (A)
Isley, C. T., Jr. (A)
King, E. J. (A)
Kochevar, H. J. (M)
Kraft, E. A. (A)
Kudo, F. M. (A)
Laning, W. A. (M)
Larkins, E. B. (M)
Leder, A. (A)
Lynch, D. S. (SM)
Markwalter, J. L., Jr. (M)
McLeod, B. C. (A)
Phalen, F. W. (A)
Prather, W. W. (A)
Purinton, H. G. (M)
Randolph, G. W. (M)
Rice, C. I. (SM)
Riggs, R. N. (A)
Scheiner, S. R. (SM)
Shackelford, H. L. (A)
Shropshire, H. C., Jr. (A)
Sims, W. H., Jr. (VA)
Slager, D. M. (A)
Spalding, J. P. (SM)
Stewart, W. H. (A)
Stader, F. E. (A)
Streisand, J. L. (A)
Strickroth, G. J. (SM)
Taylor, J. H. (SM)
Thomas, E. C. (A)
Thomas, R. K. (SM)
Tisdale, S. E. (A)
Vana, C. J. (A)
Wallace, B. E., Jr. (A)
Walter, G. M. (M)
Welsted, I. G. (A)
West, W. S. (A)
White, G. R. (SM)

Williamson, J. H. (M)
Woodrow, G. U., Jr. (M)
Wooten, J. R. (A)
Yates, L. R. (A)

University Park
Sparrow, E. L. (A)

Washington Grove
Seaton, S. L. (SM)

West Hyattsville (WA-3)
Berry, R. J. (A)
Bitz, E. A. (A)
Faram, H. D. (A)
Ferrara, A. A. (A)
Kennedy, E. D. (A)
Marchetta, P. (A)
New, C. H. (A)
Ryon, J. C. (A)
Stahl, B. E. (VA)
Summerfield, P. N. (A)

Westminster (BAL-3)
Bennighof, R. H. (A)
Buffington, C. T. (A)

Wheaton (WA-3)
Notz, W. A. (A)
Powell, R. M. (M)
Woodside, G. E., Jr. (A)

Wheaton Heights (WA-3)
Baechtel, A. R. (A)

White Marsh (BAL-3)
Francis, J. P. (A)

White Oak (WA-3)
Suozzi, J. J. (A)

Woodbine (BAL-3)
Mullinix, N. E. (A)

Woodmoor (WA-3)
Smith, C. B. (A)

MASSACHUSETTS

Abington (BOS-1)
Mielke, E. A. (A)
Pearson, H. S. (A)
Pihl, G. E. (A)

Acton (BOS-1)
Searle, R. W. (A)

Agawam (CV-1)
Rackliffe, R. J. (A)
Stefanik, S. M. (A)

Allston (BOS-1)
Allen, D. F. (A)
Bresnick, H. L. (A)
Futran, S. M. (A)
Kennan, M. G. (A)
Luftman, A. S. (A)
Pick, G. C. (A)
Purnaiya, M. G. (A)

Amesbury (BOS-1)
Hambleton, P. N. (SM)

Amherst (CV-1)
Langford, J. W. (A)

Andover (BOS-1)
Brown, J. M. (M)
Rounds, W. A. (A)
Zink, A. J., Jr. (SM)

Arlington (BOS-1)
Benkley, F. G. (A)
Bogart, R. M. (A)
Breitbord, J. L. (A)
Buuck, W. P. (M)
Carlson, A. W. (A)
Carroll, T. J. (M)
Chang, S. H. (SM)
Clark, R. G. (SM)
Clark, W. A., Jr. (A)
Cohen, M. S. (A)
Cole, B. R. (A)
Connelly, M. E. (A)
Cowie, R. J. (VA)
De Lisle, J. E. (A)
Donnelly, F. J., Jr. (A)
Eisenstadt, B. M. (A)
Granlund, J. (A)
Gustaff, A. J. (A)
Hanson, G. (A)
Hawkins, R. S. (A)
Hiatt, R. E. (M)
Holt, R. B. (SM)
Hovannesian, A. S. (M)
Kessel, B. (A)
Knight, H. M. (A)
Lally, V. E. (A)
Martin, W. R. (M)
McKee, D. A. (A)
Maserian, L. (M)
Michaelis, H. P. (M)
Morrow, W. E. (A)
Nelson, J. R. (SM)
Owen, S., Jr. (A)
Pierce, J. A. (F)
Plotts, E. L. (SM)
Robinson, W. H. (M)
St. Jean, L. E. (A)
Sheridan, W. F. (A)
Spencer, R. C. (SM)
Stutt, C. A. (A)
Torrey, B. M. (SM)
Trenholme, W. M. (A)
Von Recklinghausen, D. (A)
Voutselas, T. (A)
Warren, R. M. (A)
Woo, W. D. (SM)

Arlington Heights (BOS-1)
Lamson, H. W. (F)

Ashby (BOS-1)
Coleman, D. L., Jr. (M)

Ashland (BOS-1)
Rice, J. W. (A)
Tanigawa, G. (A)

Assinippi (BOS-1)
Cary, T. R., Jr. (M)

Athol (BOS-1)
Hastings, A. E. (A)
Higgins, W. F. (A)

Attleboro (BOS-1)
Blottman, J. B., Jr. (A)
Channing, W., Jr. (A)

Auburndale (BOS-1)
Crane, J. D., Jr. (A)
Fallows, R. S. (A)
Finneran, W. J. (A)
Freedman, N. (A)
Kadish, J. E. (SM)
Lee, R. A. (A)
Ryan, C. E. (M)

Avon (BOS-1)
Chappell, I. C. (A)

Ayer (LR-5)
Edwards, J. L. (A)
Erskine, H. E. (A)

Bedford (BOS-1)
Bailey, D. L. (M)
Baker, R. H. (A)
Barker, H. R., Jr. (M)
Barrett, R. M. (M)
Canty, W. J. (A)
Capen, E. B. (A)
Detwiler, S. P. (A)
Dulac, A. A. (M)
Fidler, R. R. (A)
Field, W. G. (A)
Friedman, M. (A)
Guthrie, D. (A)
Hammond, G. H. (SM)
Harrison, J. R. (VA)
Jensen, J. (A)
Key, E. L. (A)
Kirshner, H. J. (A)
Lay, C. A., Jr. (A)
Levy, S. L. (M)
Nelson, R. R. (A)
Pearce, P. F. (A)
Robinson, A. W. (A)
Sears, N. E., Jr. (A)
Shansky, D. (M)
Sherburne, A. E. (A)
Stewart, A. K. (A)
Wolfe, R. (A)
Wulfsberg, K. N. (A)
Zraket, C. A. (A)

Belmont (BOS-1)
Barry, J. G. (SM)
Blackburn, J. F. (A)
Cox, W. W. (A)
Craig, J. W. (A)
Crosby, R. C. (M)
Cullen, F. P. (A)
Dolbear, B. L. (SM)
Duncan, N. L. (A)
Elliott, C. I. (A)
Erickson, P. W. (SM)
Faran, J. J., Jr. (A)
Gray, H. L. (A)
Handy, R. A. (A)
Hellenbrand, C. M. (A)
Hildebrand, J. G., Jr. (VA)
Hunt, F. V. (F)
Johnson, L. T., Jr. (A)
Kerwin, E. M., Jr. (A)
Kirkland, R. E. (A)
Klemperer, H. (A)
Lilly, R. G. (M)
Linvill, W. K. (M)
McElroy, P. K. (F)
Mercer, W. R. (SM)
Murphy, J. E. (A)
O'Day, M. D. (VA)
Petrishen, J. (A)
Reed, J. (SM)
Reintjes, J. F. (SM)
Shoemaker, P. B. (A)
Simons, J. C., Jr. (A)
Smith, B. H. (A)
Teixeira, N. A. (A)
Van Wechel, R. J. (A)
Wagner, C. A. (A)
Wagner, R. W. (M)
Wang, A. (SM)
Weingarten, J. (A)
Wells, W. I. (A)
White, A. D. (A)
Woodward, R. H. (A)

Berlin
Krackhardt, R. H. (A)

Beverly (BOS-1)
Benson, E. D. (A)
Biggs, O. H. (A)
Brown, N. J. (A)
Cooper, A. H. (A)
Dillaby, E. F. (VA)
Ferris, P. A. (A)
Flashner, G. (A)
Gysan, R. L. (A)
Heins, H. (A)
Odom, G. R. (M)
Perron, R. R. (M)
Porter, R. G. (VA)
Prescott, G. A. (A)
Reash, C. W. (SM)
Richardson, L. D. (A)
Ryan, H. G. (M)
Straney, K. O. (A)

Bolton (BOS-1)
Wilson, H. M. (SM)

Boston (BOS-1)
Adams, G. J. (SM)
Atchley, D. W., Jr. (M)
Bairnsfather, R. R. (A)
Baptiste, G. F. (A)
Barassi, C. L. (A)
Bardfield, M. L. (A)
Bates, G. F. (A)
Baumann, A. (A)
Blitz, D. (M)
Braslau, N. (A)
Brodhead, W. M. (A)
Brooking, B. M. E. (A)
Burdick, G. E. (M)
Carlson, E. S. (A)
Chin, B. M. (A)
Chin, F. K. (A)
Cohen, H. I. (A)
Cohler, E. U. (A)
Cole, A. D. (A)
Coleman, A. F. (SM)
Collins, J. L. (SM)
Cowperthwait, F., Jr. (A)
Creighton, J. E. (A)
Cross, H. H. (A)
Dallin, E. B. (SM)
Dean, N. J. (M)
Delaney, R. P. (A)
Di Nozzi, A. D. (A)
Dolansky, L. O. (SM)
Dorschug, H. A. (SM)
Downes, A. B. (A)
Drake, J. W. (A)
Dunbar, F. E. (A)
Ehrman, L. (A)
Ellis, W. R. (A)
Epstein, H. D. (A)
Essigmann, M. W. (SM)
Faulkner, W. H., Jr. (A)
Fontana, L. (A)
Foundas, G. J. (A)
Fricker, S. J. (A)
Gerber, I. B. (A)
Gianoukos, W. A. (A)
Goldberg, H. B. (A)
Gordon, B. M. (A)
Hallenstein, N. A. (VA)
Hannigan, W. T. (M)
Hastings, T. M., Jr. (SM)
Hom, R. N. G. (A)
Hughes, G. W. (A)
Humphrey, W. S. (A)
Jorgensen, S. W. (A)
Kasowski, S. E. (A)
Keller, E. W. (A)
Kiesling, P. W., Jr. (A)
Kim, Y. S. (A)
Kletsky, E. J. (A)
Langevin, R. A. (M)
Laprelle, M. V. (A)
Leonard, R. R. (A)
Lewis, G. A. (A)
Lewis, P. M. (A)
Loewenthal, M. (A)
Macdonald, C. J. (A)
Madek, J. J. (A)
McPherson, R. R. (A)
Micol, R. L. (A)
Millen, S. G. (A)
Moon, R. F. (A)
Moy, M. (A)
Murdoch, G. A. (A)
Nakasato, J., Jr. (A)
Palmer, H. T. (A)
Parszik, P. J. (A)
Pendleton, F. C. (A)
Plaisance, S. F. (A)
Powers, K. H. (A)
Preo, J. M. (A)
Rines, D. (VA)
Russell, L. (A)
Ruze, J. (M)
Santelmann, W. F., Jr. (A)
Saunders, A. C. W. (M)
Schaefer, J. H. (A)
Schindler, J. A. (A)
Schnall, E. (A)
Segel, H. P. (A)
Sferrino, V. J. (A)
Sherman, P. (A)
Sirbola, G. (A)
Skolnik, M. I. (A)
Strobach, F. (A)
Treachman, A. E. (SM)
Toperzer, R. S. (M)
Ullman, H. A. (A)
Waite, S. (VA)
Wild, A. F. (A)
Wong, H. Y. (A)
Woodward, J. H. (SM)
Woods, R. E. (A)
Zaxman, B. (A)

Boxboro (BOS-1)
Gundersen, N. A. (A)

Braintree (BOS-1)
Brennen, J. E. (A)
Dionne, J. H. (A)
Myrbeck, E. R. (M)

Bridgewater (BOS-1)
Wilber, L. C. (M)

Brighton (BOS-1)
Appleman, M. A. (A)
Cavanagh, A. (A)
Gada, N. (A)
Hanopol, L. (VA)
Montanari, R. E. (A)
Murray, M. W. (A)
Nowell, R. E. (A)
Riceman, S. (A)
Rochefort, J. S. (A)
Sharaf, H. M. (A)
Somers, L. (A)
Waldman, M. D. (A)
Wallace, G. S. (VA)
Wolf, S. M. (A)
Yurt, X. (VA)

Brockton (BOS-1)
Fortier, O. V. (A)
James, P. G., Jr. (A)
MacLeod, A. D. (M)
Sampson, E. J. (A)

Brookline (BOS-1)
Aldrich, F. W. (A)
Anfenger, E. (M)
Bartzoff, B. (A)
Bartzoff, J. S. (A)
Bloom, J. H. (A)
Cooper, G. (A)
Davidson, D. (A)
Fox, H. M. (A)
Frazer, J. F. (A)
Gallagher, E. F. (A)
Garber, T. A. (A)
Gerhardt, R. H. (A)
Golembe, S. N. (M)
Hollander, G. L. (M)
Ladd, D. W. (A)
Lerner, H. A. (A)
Lewis, M. C. (A)
Lourie, N. M. (A)
Margolin, M. C. (A)
Marino, D. J. (A)
Mathews, K. C. (M)
Merle, C. W. (A)
Nyhen, E. M. (M)
Polayes, M. B. (A)
Ramler, D. A. (A)
Rappaport, M. B. (VA)
Snow, S. D. (A)
Verano, F. (A)
Wong, G. W. (A)

Burlington (BOS-1)
Morris, R. V. (A)

Cambridge (BOS-1)
Adams, J. Q. (A)
Adler, R. B. (SM)
Alford, A. (F)
Alperin, N. N. (A)
Anderegg, J. S. (A)
Arthurs, E. (A)
Ausin, H. A. (M)
Bagley, P. R. (A)
Bard, R. E. (SM)
Baruch, J. J. (M)
Batchelder, L. (SM)
Baumann, R. H. (A)
Benfield, A. E. (SM)
Berg, R. S. (A)
Bers, A. (A)
Best, R. L. (M)
Biernson, G. A. (A)
Bishop, W. B. (M)
Bolt, R. H. (SM)
Booton, R. C. (A)
Boucher, G. F. (A)
Bousquet, A. G. (SM)
Bowles, E. L. (F)
Box, F. M. (A)
Bradshaw, E. R., Jr. (A)
Brennen, D. G. (M)
Brown, G. S. (SM)
Brown, J. H. (A)
Buckley, E. F. (M)
Burke, C. T. (F)
Bussgang, J. J. (A)
Busteed, P. E. (A)
Cady, C. A. (SM)
Caldwell, E. E. (M)
Carpenter, C. H. (A)
Carr, K. L. (A)
Cerrillo, M. V. (SM)
Chaffee, E. L. (F)
Champeny, J. C. (A)
Clafton, R. E., Jr. (A)
Clapp, J. K. (F)
Clapp, R. E. (A)
Clayton, J. M. (SM)
Coburn, W. K. (M)
Conley, P. (A)
Corey, B. W. (A)
Daggett, N. L. (A)
Dawes, H. H. (M)
De Bettencourt, J. (A)
De Blois, S. W. (M)
De Wolf, N. (M)
Dickinson, M. M., Jr. (A)
Downing, R. E. (VA)
Draper, C. S. (A)
Dudley, B. (SM)
Dunn, B. C., Jr. (A)
Dyett, E. G., Jr. (A)
Eames, A. M., Jr. (M)
Eastham, M. (F)
Easton, I. G. (SM)
Elias, P. (A)
Elkan, J. (A)
Elkind, J. I. (A)
Ewen, H. I. (SM)
Fallows, E. M. (A)
Fano, R. M. (SM)
Farley, B. G. (A)
Fitts, R. E. (A)
Flanagan, J. L. (A)
Forgie, J. W. (A)
Frank, R. W. (A)
Friedman, A. L. (A)
Gardiner, K. W. (A)
Gesteland, R. C. (A)
Gilman, M. A. (VA)
Glass, W. G. (A)
Glucksman, H. A. (A)
Goldstein, M. H. (A)
Graham, J. W. (A)
Grande, V. J. (A)
Gray, H. L., Jr. (M)
Gray, J. C. (M)
Gray, T. S. (SM)
Grim, W. M., Jr. (A)
Gross, E. E., Jr. (SM)
Grossimon, H. P. (A)
Guillemin, E. A. (F)
Haas, V. B., Jr. (A)
Hall, O. E. (A)
Hamilton, D. H., Jr. (A)
Harney, P. J. (M)
Harrison, C. W. (M)
Hazen, H. L. (SM)
Heart, F. E. (M)
Heckbert, A. I. (A)
Hersh, J. F. (A)
Hickman, R. W. (SM)
Hilgedick, W. C. (SM)
Hill, A. G. (F)
Hillger, R. E. (SM)
Hogan, W. D. (A)
Horn, H. S. (M)
Houser, H. D. (A)
Huffman, D. A. (A)
Hughes, A. D. (A)
Irish, F. E., Jr. (A)
James, G. E. (A)
Janszen, A. A. (M)
Jayne, A. W. (A)
Jeffrey, R. C. (A)
Jervis, E. W., Jr. (A)
Jones, N. T. (A)
Jursik, J. (A)
Kaiser, J. F. (A)
Karplus, E. (F)
Kennedy, P. (A)
Kent, G. (A)
Kessler, J. A. (SM)
Kingston, R. H. (A)
Kinnard, K. F. (A)
Klein, J. A. (A)
Kolis, R. D. (A)
Kosowsky, D. I. (A)
Lahanes, C. J. (A)
Lake, C. J. (A)
Laspina, C. A. (A)
Lawrance, R. B. (SM)
Lazarkis, P. J. (A)
Lee, F. F. (A)
Leonhard, J. (A)
Levin, M. J. (A)

Lewis, F. D. (SM)
Littlejohn, H. C. (A)
Logemann, H., Jr. (M)
Luong, V. B. (A)
Luse, J. D. (A)
Lyman, F., Jr. (VA)
MacKenzie, A. K. (A)
MacRakis, M. S. (A)
Margolin, B. (A)
Martin, D. (VA)
Martin, L. B. (A)
Mason, S. J. (SM)
Matz, C. H. (SM)
McAleer, H. T. (A)
McClung, W. C. (M)
McCoy, R. T. (A)
McGinnis, C. E. (M)
McGowan, E. A. (A)
Merk, R. V. R. (A)
Meyer, R. G. H. (SM)
Middleton, D. (M)
Mimno, H. R. (VA)
Minnick, R. C. (A)
Mooers, C. N. (A)
Morgenstern, J. C. (A)
Moritz, C. (A)
Nevins, J. L., Jr. (A)
Nottingham, W. B. (SM)
Olsen, K. H. (A)
Paine, B. B. (A)
Parker, E. O., Jr. (A)
Pease, W. M. (A)
Perry, A. X. (A)
Peterson, A. P. G. (SM)
Pfaff, R. J. (A)
Pierce, G. W. (F)
Pike, A. L. (A)
Pomper, V. H. (M)
Pontecorvo, P. J. (SM)
Poppe, C. W. (A)
Pote, A. J. (SM)
Powers, D. A. (M)
Quint, A. S. (M)
Radford, W. H. (SM)
Ramdell, T. C. (A)
Randolph, R. V. (A)
Rediker, R. H. (A)
Reiner, J. (A)
Reza, F. (M)
Richmond, H. B. (F)
Richmond, R. B. (SM)
Rubenstein, A. H. (A)
Ruplenas, R. J. (M)
Russell, W. J. (A)
Saylor, W. R. (SM)
Schwartz, S. (M)
Scotney, J. H. (M)
Sevian, E. A. (A)
Sheingold, D. H. (A)
Siegel, A. (A)
Sinclair, D. B. (F)
Sircar, A. K. (A)
Smith, A. H., Jr. (A)
Smith, M. T. (SM)
Smullen, L. D. (SM)
Smulowicz, B. (A)
Soderman, R. A. (SM)
Sokal, N. O. (A)
Spencer, R. H. (A)
Sponsler, J. W. (A)
Stein, S. (A)
Strandberg, M. W. P. (SM)
Stratton, J. A. (F)
Stuart, R. W. (A)
Susskind, A. K. (A)
Thiessen, A. E. (SM)
Thompson, G. S. (A)
Tittle, H. C. (A)
Toman, K. (A)
Trautham, H., Jr. (M)
Travers, P. (A)
Tucker, C. E. (SM)
Tucker, F. L. (A)
Vanderburgh, A., Jr. (A)
Van Meter, D. (M)
Van Voorhis, S. N. (SM)
Verzuh, F. M. (M)
Vilbig, F. (SM)
Walters, S. H. (SM)
Wang, A. (SM)
Wang, S. (A)
Ward, J. E. (A)
Ward, W. W. (A)
Wargo, J. J. (A)
Warren, J. R. (A)
Webb, H. A. J. (M)
Webster, F. A. (A)
Webster, W. G. (SM)
Wentworth, A. M. (A)
Westphal, W. B. (A)
Wheatland, D. P. (A)
Whelan, C. R. (M)
Whelden, J. W. (A)
Whelpton, J. P. (A)
White, S. A. A. (A)
Wiener, F. M. (SM)
Wildes, K. L. (A)
Willenbrock, F. K. (A)
Wingate, S. A. (A)
Wood, R. V., Jr. (M)
Woodson, H. H. (A)
Woodward, C. A., Jr. (SM)
Worthen, C. E. (SM)
Wu, R. S. (A)
Yamron, J. (A)
Youngblood, W. A. (A)
Youtz, P. (A)
Zucker, F. J. (A)

Canton (BOS-1)
Dunleavey, F. S. (A)
Lawton, D. C. (M)

Carlisle (BOS-1)
Davis, J. C., Jr. (A)
Macmillan, R. R. (A)

Charlestown
Noonan, J. T. (A)

Chelmsford (BOS-1)
McCormack, T. L. (A)
Palmer, W. F. (A)

Chelsea (BOS-1)
Barabush, A. (A)
Wolfson, W. (A)

Cheshire (CV-1)
Leonard, S. C. (VA)
McNamara, R. E. (A)

Chestnut Hill (BOS-1)
Bond, E. E. (M)
Cook, G. V. O. (A)
Frank, W. I. (A)
McFarlan, R. L. (SM)
Miller, A. (A)
Pastan, H. L. (A)
Richards, P. I. (A)
Wicks, W. F. (A)

Chicopee (CV-1)
Guertin, R. J. (A)
Szatrowski, Z. T. (A)
Zdeb, S. E. (A)

Chicopee Falls (CV-1)
Bigda, F. J. (A)
Dulchinos, J. (A)

Clinton
Dyer, R. F., Jr. (A)

Cochituate (BOS-1)
Alexander, W. G. (SM)
Bean, O. E. (A)
Faigen, I. M. (A)

Cohasset (BOS-1)
Massa, E. A. (SM)
Massa, F. (VA)
Taft, E. A., Jr. (A)

Concord (BOS-1)
Burley, R. M. (A)
Davenport, W. B., Jr. (M)
Ehrenfried, A. D. (SM)
Entticknap, R. G. (SM)
Fellows, G. E. (A)
Hague, W. M., Jr. (M)
Harris, J. N. (A)
Haywood, W. J. (A)
Hollingsworth, L. M. (SM)
Forrester, J. W. (SM)
Janvrin, W. A., Jr. (SM)
Kelner, R. C. (A)
Kilham, L. F., Jr. (M)
Labounty, J. E. (A)
Lane, D. S. (M)
Macdonald, W. S. (M)
Mack, R. A. (A)
Parke, N. G., III (M)
Penfield, H. (A)
Roberts, G. T. (A)
Scott, R. E. (A)
Seamans, J. O. (A)
Sebring, P. B. (M)
Siebert, W. M. (A)
Slade, M. G. (A)
Sullivan, D. L. (A)
Tuttle, W. N. (F)
Walen, R. S. (A)
Walworth, W. Y. (A)
Watt, C. W., Jr. (M)
Westcott, V. C. (A)
Whitehorn, R. M. (A)
Whitman, J. A. (A)
Zerfas, G. J. (A)

Dalton (CV-1)
Ciaschini, W. (A)

Danvers (BOS-1)
Carter, G. E., Jr. (M)
Castle, R. L. (A)
Dickson, D. C. (A)
Heck, N. A. (A)
Kauders, E. (A)
Koen, F. T. (A)
Law, R. R. (F)
May, H. E. (SM)
Morey, R. F. (A)
Record, F. A. (A)
Van Horne, J. L. (A)
Weinburg, E. F. (A)
Wroblewski, T. (A)

Dedham (BOS-1)
Helm, G. D. (A)
Jackson, R. E., Jr. (A)
Jenks, F. A. (SM)
Lord, J. S. (A)
Searle, C. L. (A)

Dorchester (BOS-1)
Berman, J. (A)
Berner, A. S. (M)
Biagiotti, R. J. (A)
Callahan, R. J. (A)
Di Loreto, A. A. (A)
Goldberg, J. (A)
Goldstein, D. S. (A)
Herzberg, R. F. (A)
Kriger, L. V. (A)
Labitt, B. H. (A)
Lenson, S. (M)
Lerner, H. A. (A)
Morley, H. B. (M)
Polito, V. J. (A)
Rabb, M. (A)
Renner, G. W. (A)
Ross, R. H. (A)
Rubinovitz, J. I. (A)
Saltzberg, W. (A)
Shnitzler, R. K. (M)
Siedlecki, J. C. (A)
Silberberg, R. W. (A)
Slawsby, N. (A)
Sternick, S. H. (A)
Stone, I. M. (A)
Zopatti, R. C. (A)

Dover (BOS-1)
Cook, J. H. (SM)
Swana, J. J. (A)

East Boston (BOS-1)
Welling, A. J. (A)

East Brookfield (BOS-1)
Houlihan, R. P. (A)

Easthampton (CV-1)
Gnacek, W. J. (A)
Mesh, T. J. (A)

East Longmeadow (CV-1)
Landers, T. P. (A)

East Lynn
Kazules, A. J. (A)

East Natick (BOS-1)
Horton, W. P. (A)
Massard, R. L. (A)

East Pepperell (BOS-1)
Wood, R. (SM)

East Walpole (BOS-1)
Burrell, R. E. (A)
Olivier, R. M. R. (A)
Stewart, R. F. (A)

East Weymouth (BOS-1)
Hickok, F. A. (A)

Essex (BOS-1)
Hanley, L. D. (A)
Sletten, C. J. (A)

Everett (BOS-1)
Boyages, A. (A)
Cosentino, A. V. (A)
Finkle, M. (A)
Gantt, E. D. (A)
Halchak, J. R. (A)
Pickett, W. H. (A)
Plemenos, F. A. (A)

Fairhaven (BOS-1)
Remillard, W. J. (A)
Robinson, W. M. (SM)

Fall River (BOS-1)
Paradis, A. W. (A)
Picard, H. F. (A)
Powers, W. J. (A)
Rigby, R. T. (A)
Ryan, J. E. (A)
Wilkinson, E. J. (A)

Falmouth (BOS-1)
Johnston, A. T.
O'Leary, J. P. (A)

Feeding Hills (CV-1)
Call, S. S. (A)

Fitchburg (BOS-1)
Arthur, G. M. (A)
Maillet, A. J. (A)
Pandiscio, A. A. (A)
Testarmata, N. R. (A)

Florence
Dewey, J. B. (A)

Fort Devens
Scott, W. H., Jr. (A)

Foxboro (BOS-1)
Dubley, T. C. (A)
Gebel, H. W. (A)
Johnson, L. T., Jr. (A)
Scanlon, W. C. (A)
Sturgeon, S. S. (VA)
Terrell, G. C. (A)
Wells, C. H. (A)

Framingham (BOS-1)
Duggan, O. T. (A)
Earl, R. J. (M)
Forgione, E. A. (A)
Fraim, E. G. (A)
Gillette, J. S. (A)
Hall, R. T. (A)
Krulee, R. L. (A)
Palughi, J. F., Jr. (A)
Pendleton, B. W. (A)
Phillips, T. L. (M)
Rosen, L. (M)
Ungvary, R. L. (M)

Framingham Center (BOS-1)
Buckland, F. A. (A)
Keleher, A. E., Jr. (M)

Franklin (BOS-1)
Handel, N. E. (M)

Gardner (BOS-1)
Richelieu, C. C. (M)

Georgetown
Nunan, K. W., Sr. (A)

Gloucester (BOS-1)
Hammond, J. H., Jr. (SM)
Kistes, P. J. (A)
Purington, E. S. (SM)
Short, J. A., Jr. (A)

Great Barrington (CV-1)
Allison, R. F. (M)
Hemmes, R. T. (M)
Markham, I. F. (A)

Greenbush (BOS-1)
Brooks, G. W. (M)

Greenwood
Newcombe, D. A. (A)

Groveland (BOS-1)
Earle, N. E. (A)

Hamilton (BOS-1)
Bosse, W. F. (SM)
Nichols, H. F., Jr. (A)
Peek, S. C. (SM)

Harvard (BOS-1)
Beauregard, W. G. (A)

Haverhill (BOS-1)
Atwood, D. J., Jr. (A)
Feldman, E. J. (A)
Hlavacek, A. R. (A)
Krinsky, B. D. (A)
Safran, L. (A)

Haydenville (CV-1)
Curtis, L. F. (SM)

Hingham (BOS-1)
Broster, G. S. (A)
Drisko, B. B. (A)
Harris, C. C. (SM)
Hyland, R. C. (A)
Pratt, F. (VA)
Wood, J. O. (M)

Holliston (BOS-1)
Heineck, A. W. (A)
Nobles, F. L. (A)
Valpey, R. S., Jr. (A)

Holbrook (BOS-1)
Burleson, C. T. (A)
Wisneski, W. F. (M)

Holyoke (CV-1)
Hampson, F. W. (A)
Junkins, C. E., Jr. (A)
Kennedy, D. J. (A)
King, F. H. (A)
Marek, L. W. (A)
Marek, M. B. (A)
Thibodeau, R. A. (M)
Wernick, H. (A)

Hopedale (BOS-1)
Tinkham, M. E. (A)

Hyde Park (BOS-1)
Bonica, J. S. (A)
Burke, W. T. (A)
Martinson, R. M. (A)
Noyes, J. E. (A)
Rich, A. L. (A)
Sims, B. S. (A)
Stanney, W. J. (M)

Ipswich (BOS-1)
Baker, J. R., Jr. (A)
Bergerdn, W. F. (A)
Carroll, I. (A)
Chu, G. Y. (A)
Dwork, L. E. (SM)
Happ, W. W. (A)
Huong, C. (A)
Marshall, M. R. (A)
McMillan, E. B. (SM)
Newhall, E. (A)
Plaisted, A. H. (A)
Richardson, D. A. (A)
Sweetser, L. R. (M)
Unger, D. M. (A)
White, H. B. (A)

Jamaica Plain (BOS-1)
Arenberg, D. L. (A)
Kondi, S. E. (A)
McDonnell, J. Q. (A)
Petraitis, A. J. (A)
Rocheleau, G. S. (M)
Sheehan, J. A. (A)

Lawrence (BOS-1)
Ameen, S. J. (A)
Blanchette, C. F. (A)
Chontoian, P. (A)
Hadad, J. D. (A)
Higgins, J. T. (A)
Minicucci, R. P. (A)
Pappas, J. (A)
Pray, E. B. (M)

Leicester
Day, L. R. (M)

Leominster
Campbell, S. V. (A)

Leverett (CV-1)
Roys, C. S. (SM)

Lexington (BOS-1)
Arsenault, J. R. (A)
Bennett, R. K. (A)
Burgess, L. M. (M)
Chaffee, M. (M)
Chu, L. J. (F)
Chute, D. H. (M)
Corwin, G. (A)
Dearborn, F. K. (M)
Dentler, C. E. (A)
Emerson, W. P. (A)
Follick, C. E. (A)
Freeman, L. D. (A)
Goldberg, S. (M)
Hale, R. C. (M)
Hall, W. M. (SM)
Hammett, T. F. (A)
Harrington, J. V. (A)
Hauser, W. H. (M)
Hufton, C. D. (A)
Hutchins, W. R. (SM)
Kelley, L. M. (A)
Kendall, P. R. (M)
Kline, F. S. (VA)
Knauss, H. C. (SM)
Kramp, K. M. (A)
Lane, J. F., Jr. (A)
Lewis, R. W. (A)
Maartmann-Moe, R. (A)
MacDonald, D. A. (A)
Mackechnie, H. K. (M)
Martel, C. W. (SM)
Mathes, R. E. (SM)
McLeod, W. W., Jr. (A)
Mitchell, J. L. (A)
Naka, F. R. (A)
Nelson, A. A. (A)
Northrop, P. A. (VA)
O'Neill, S. J. (A)
Packard, R. H. (M)
Parker, H. H. (A)
Pilkington, E. J. (VA)
Prescott, R. S. (M)
Reed, J. C. (A)
Reegan, J. E. (M)
Rehler, K. M. (A)
Richardson, A. W. (A)
Rullman, R. G. (A)
Scheible, W. R. (M)
Sherman, H. (SM)
Sokol, G. M. (A)
Spearin, F. W., Jr. (A)
Stevens, R. T. (A)
Storer, J. E. (A)
Uskavitch, C. W. (A)
Warner, G. L. (A)
Weiss, H. G. (SM)
Williams, S. B. (A)
Winsor, P. L. (A)
Yewell, P. G. (M)
Zieman, H. E. (A)

Lincoln (BOS-1)
Boehmer, H. W. (SM)
Scott, H. H. (F)
Wellman, B. (VA)

Littleton (BOS-1)
Houghton, R. W. (M)
McElroy, T. R. (A)

Longmeadow (CV-1)
Bassett, E. D. (A)
Cohen, M. (VA)
Gostyn, E. (M)

Lowell (BOS-1)
Aslanian, A. (A)
Chaput, R. L. (A)
Eckert, T. A. (M)
Gavriel, S. N. (A)
Giddis, A. N. (A)
Glasheen, R. W. (M)
Jones, R. L. (A)
Landry, L. H. (VA)
Marcotte, A. G. (A)
McPartland, P. H. (A)
Michaels, A. G. (M)
Sachs, R. (SM)
Simmons, W. J., Jr. (A)
Wholey, L. T. (A)

Lynn (BOS-1)
Bakalar, D. (A)
Cunningham, J. E. (A)
Dresios, S. C. (A)
Dumanian, J. A. (M)
Gates, E. K. (A)
Gitelman, E. (A)
Len, R. G. (A)
Manna, E. E. (A)
Marie, C. G. (A)
Quamo, P. P. (A)
Radnor, R. R. (A)
Roche, J. F. (M)
Smith, R. T. (A)
Waite, D. P. (A)
Whittaker, H. F., Jr. (A)

Lynnfield
Moore, R. L. (A)

Malden (BOS-1)
Benkus, P. D. (A)
Brown, O. C., Jr. (A)
Cutler, C. I. (A)
Heft, E. J. (A)
Hood, C. R. (A)
Krinsky, J. (M)
Linell, A. E. (A)
Lowe, M. E. (M)
Meyer, R. A. (A)
Nelson, C. V. (M)
Oxman, M. H. (M)
Schwarzlander, H. (A)
Walsh, J. F. (A)
Werlin, A. M. (A)
Whitcraft, W. A., Jr. (M)
Williams, E. E. (M)
Zabusky, N. J. (A)
Zantos, N. G. (A)

Manchester (BOS-1)
Hadfield, B. M. (SM)

Mansfield
Sabin, E. A. (M)
Sheldon, E. J., Jr. (A)

Marblehead (NO-6)
Chun, H. H. (VA)
Cutting, E. (A)
Dane, F. W. (SM)
Fuller, J. H. (A)
Golden, N. J. (A)
Gray, D. J. (A)
Hubbard, M. M. (SM)
Laurent, J. A., Jr. (A)
Martin, W. H. (A)
Stromeyer, C. F. (VA)
Stuart, R. M. (A)
Tassinari, S. P. (A)

Marion (BOS-1)
Francis, S. A. (A)
Warriner, R. R. (A)

Marlboro (BOS-1)
Clark, F. E. (A)

Marlborough (BOS-1)
Cheatham, T. P., Jr. (A)

Mattapan (BOS-1)
Dratch, J. E. (A)
Fertig, K. (A)
Ginsberg, I. (A)
Stone, I. C. (A)

Maynard
Walsh, J. J. (A)

Medfield (BOS-1)
Glauberman, M. H. (A)
Jewell, R. L., Jr. (M)
Short, W. P. (SM)
Waddell, R. B. (A)

Medford (BOS-1)
Belinski, A. M. (A)
Bookman, R. E. (A)
Butcher, S., Jr. (A)
Demetrick, J. S. (SM)
De Young, J. A. (A)
Fiorello, E. A. (A)
Fischer, H. L. (A)
Frost, A. D. (A)
Hangstefer, J. B. (M)
Hobbs, C. F. (SM)
Hokanson, H. P., Jr. (A)
Howell, A. H. (SM)
Jewell, R. L., Jr. (M)
Memzies, R. W. (A)
Mingins, C. R. (SM)
Mofenson, J. (M)
Morelli, A. (A)
Pearson, A. L. (A)
Pote, W. J. (A)
Quinn, W. T., Jr. (A)
Rosato, F. J. (M)
Slobodzinski, E. J. (A)
Smith, R. L. (A)
Spongberg, R. C. (A)
Stevens, W. J. (A)
Stone, M. L. (A)
Twombly, B. B. (A)

Melrose (BOS-1)
Black, P. B. (SM)
Burwen, R. S. (A)
Chapin, R. B. (A)
Fittz, R. U., Jr. (A)
Ghen, W. R. (A)
Henriksen, F. R. (A)
Lewis, E. W. (A)
Meader, R. B. (M)
Peterson, J. W. (A)
Rogers, W. S. (A)
Young, N. H. (A)

Melrose Highlands
Dickson, A. W. (M)

Methuen
Dinsmore, C. H. (M)
Hurd, P. A. (A)
Woodburn, E. S., Jr. (A)

Milford
Kurlansky, S. (A)

Millis (BOS-1)
Goodman, L. (M)
Sanders, E. W. (M)
Woods, W. C., Jr. (M)

Milton (BOS-1)
Arnold, C. E. (M)
Bradshaw, D. B. (A)
Day, W. J. (A)
Donovan, A. C. (A)
Gerber, A. (A)
Metcalfe, I. J. (M)
Moats, R. R. (M)
Smith, W. A. (A)

Natick (BOS-1)
Alexander, R. (A)
Bastow, W. R. (M)
Benoit, G. F. (A)
Beswick, A. G. (A)
Blaisdell, A. A. (A)
Driscoll, J. F. (A)
Driscoll, V. (A)
Fishbein, S. B. (SM)
Friedman, B. L. (A)
Gerdes, J. W. (A)
Heaton, R. G. (A)
Holmes, K. O. (A)
Hosmer, B. E. (A)
Husman, P. A. (A)
Lockhart, H. H. (A)
Long, R. G. (A)
Mackiernan, A. W. (A)
Meyer, M. A. (A)
Miller, H. A. (A)
Nicola, R. N. (A)
Nye, J. H. (M)
Platt, H. J. (A)
Reinert, D. O. (A)
Repella, N. (A)
Rescoe, J. M. (A)
Ricardi, L. J. (A)
Rubin, R. (A)
Topol, S. (A)
Vant, L. M. (M)
Walker, R. V. (A)
White, M. M. (A)

Needham (BOS-1)
Adams, H. E. (A)
Alessi, P. A. (M)
Alpert, E. (A)
Anderson, F. J. (A)
Baldwin, P. K. (SM)
Bullard, A. H., Jr. (A)
Creaser, C. W., Jr. (M)
Crocker, D. C. (A)
Dean, F. R. (A)
Eckhardt, D. L. (SM)
Feuerstein, E. (A)
Heathcote, E. B. (A)
Henry, J. M. (VA)
Hodge, E. (A)
Keay, D. M. (A)
Lees, J. W., Jr. (A)
Mahoney, T. F. (M)
Paananen, R. A. (A)
Pease, M. C., II (SM)
Rote, W. A. (M)
Rowland, H. J. (SM)
Sargent, H. P., Jr. (A)
Shelton, E. J., Sr. (A)
Smith, H. J. (VA)
Tiffany, G. B. (A)
Trachtenberg, R. (A)
Turner, J. L. (A)
Whittmore, H. B. (A)
Whittier, E. W. (VA)
Wolfe, J. A. (A)
Wyke, A. A. (M)

Needham Heights (BOS-1)
Crowley, D. J., Jr. (A)
Kinne, C. B. (A)
Logan, C. A. (A)
Mork, R. P. (M)
Rettig, A. S. (A)

New Bedford (BOS-1)
Bailey, W. M. (SM)
Dresselhouse, P. H. (A)
Fanning, J. J., Jr. (A)
Goldstein, A. G. (A)
Gonsalves, L. (A)
Horrocks, S. W. (VA)
Klemm, G. H. (A)
Levin, I. J. (A)
Pickett, J. H. (M)
Saltus, G. E. (A)
Silva, C. C., Jr. (A)
Whiteside, J. S., Jr. (A)

Newbury (BOS-1)
Christiansen, D. D. (A)
Corning, J. J. (A)
Lynch, R. E. (A)

Newburyport (BOS-1)
Bedrosian, P. G. (A)
Borman, S. H. (A)
Fyler, N. F. (A)
Crenier, R. P. (A)
Hadley, W. C. (A)
Harcher, A. J. (A)
Lemnios, W. Z. (A)
Wimpy, E. K. (A)
Wright, M. E., III (A)

Newton (BOS-1)
Arnold, W. F. (M)
Baker, A. (A)
Balmuth, N. (A)
Borts, R. B. (A)
Burgarella, J. P. (A)
Burnett, E. F. (A)
Cohen, C. L. (A)
Day, J. E. (A)
Dean, W. B. (A)
Fine, E. C. (M)
Hogin, P. E. (A)
Kadet, J. (SM)
Lowery, W. E. (M)
McCormack, R. L. (SM)
Michelson, M. (A)
Morse, C. H. (A)
Oszy, A. J. (M)
Pucel, R. A. (A)
Rockwood, A. C. (SM)
Rubin, M. D. (M)
Rudenberg, H. G. (M)
Smith, M. D. (A)
Weiss, B. J. (A)
Wheeler, L. P. (F)
Woolf, J. (A)

Newton Center (BOS-1)
Cone, W. W. (A)
Hough, H. O. (A)
Jacobs, B. S. (M)
Kellner, R. L. (M)
Launary, J. (A)
Pickard, G. W. (F)
Robinson, S. (A)
Segal, S. (A)
Wantuch, E. (M)
Ward, A. E. (M)
Wheeler, G. J. (SM)
Zimbel, W. S. (A)
Zottu, P. D. (F)

Newton Highlands (BOS-1)
Cummings, S. J. (M)
De Clue, J. L. (A)
Friree, F. L. (A)
Muckenhoupt, F. W. (A)
Sallen, M. J. (A)
Sheinwold, L. S. (A)
Yamins, H. G. (M)

Newton Lower Falls (BOS-1)
Farnsworth, E. P. (A)
Lindsay, G. A. (M)

Newton Upper Falls (BOS-1)
Fisher, R. E. (A)
Murachvet, J. (M)
Smith, L. C. (SM)

Newtonville (BOS-1)
Baller, M. D. (M)
Dunnet, W. J. (A)
Fricks, R. E. (M)
Galagan, S. (A)
Handly, E. J. (A)
Hattery, W. V. (A)
Hatton, W. L. (A)
Hearside, M. G. (M)
Hogan, D. L. (A)
Twicken, S. (A)
Roossin, N. (M)
Stockman, W. E. (M)
Woodward, C. A. (A)

Norfolk (BOS-1)
Howard, G. E. (SM)

North Adams (CV-1)
Allison, W. M. (A)
Brafman, H. E. (A)
Devey, G. B. (M)
Dorst, S. (A)
Fabricius, J. H. (M)
Fermanian, A. (M)
Galbraith, J. S. (A)
Geiser, D. T. (M)
Henry, A. L. (A)
Hobson, L. D. (A)
Lamouneaux, R. A., Jr. (A)
Lehovec, K. (SM)
Neville, J. T. (A)
Purpura, E. (A)
Remillard, G. J. (A)
Robinson, P. (M)
Sprague, R. C. (SM)
Stoneham, C. E. (A)
Tyler, R. H. (A)
Zuleeg, R. (A)

North Andover
Silverman, D. M. (A)

Northampton
Ciaffardini, A. N. (A)
Combie, A. A. (A)
King, A. D. (A)

North Beverly (BOS-1)
Briggs, R. S. (A)

North Billerica (BOS-1)
Sloan, G. H. (A)

North Chelmsford (BOS-1)
Hathaway, S. W. (M)

North Dartmouth
Kalaw, L. (SM)
Simmons, F. A. (A)

North Easton (BOS-1)
Ames, D. (A)
Allen, L. W. (A)
Goveia, J. F. (A)

North Quincy (BOS-1)
Kelly, J. J. (A)
White, T. J., Jr. (A)

North Reading
Millen, J. (VA)

Norwood (BOS-1)
Burns, H. S. (M)
Glynn, J. J. (A)
Gronroos, E. (A)
Johnson, H. A. (A)
Kleps, E. W. (A)
Lang, K. T. (A)
Purdy, W. E. (A)
Sall, I. (A)

Ocean Bluff (BOS-1)
Rollins, D. F. (A)

Osterville (BOS-1)
Coleman, C. H. (A)

Otis AFB (CV-1)
Worley, A. B. (M)

Palton
Alexander, D. C. (M)

Paxton (BOS-1)
Alexander, D. C. (M)
Stannard, G. E. (A)

Peabody (BOS-1)
Harris, J. M. (A)
Koskinen, G. K. (A)
Maguire, W. M. (A)
Osepchuk, J. M. (A)

Pittsfield (CV-1)
Ayer, W. T. (A)
Boyajian, A. (SM)
Chertok, S. L. (A)
Delson, J. K. (A)
Forman, A. H., Jr. (A)
Hardy, E. R. (A)
Landers, J. J. (A)
Lubin, S. (M)
Mentcher, I. (A)
McCoy, E. C. (A)
Merriam, R. H. (A)
Neubert, W. E. (A)
Noble, W. O. (A)
Pack, E. L. (A)
Pierce, J. L. (A)
Podolski, G. A. (A)
Podolsky, L. (SM)
Poirier, G. R. (A)
Ringlee, R. J. (A)
Smith, L. D. (A)
Velkers, G. D. (A)

Pocasset (BOS-1)
Bennett, P. E. (A)

Quincy (BOS-1)
Briana, A. M. (M)
Burak, M. (A)
Burr, G. S. (A)
Cohen, A. (A)
Grass, A. M. (VA)
Hartel, R. R. (M)
Hudson, H. K. (SM)
Malmberg, R. A. (A)
McLaughlin, W. C. (A)
Osgood, R. C. (A)
Whitham, G. E. (A)
Zinchuk, M. (A)

Randolph (BOS-1)
Edwards, L. (. (A)
Flaherty, F. L., Jr. (A)
Sibley, R. C. (A)

Reading (BOS-1)
Caithress, W. (A)
Caywood, R. W. (A)
Conary, W. R. (A)
Hagan, R. A. (M)
Hill, J. E. (M)
Kuczun, C. G. (A)
Lindsay, J. E. (A)
Morrison, D. A. (A)
Parsons, R. L., Jr. (M)
Shapiro, M. L. (A)
Skitzki, P. (M)
Smith, W. R. (M)
Taylor, N. H. (SM)
Zitzow, H. P. (A)

Revere (BOS-1)
Abel, F. (A)
Di Venuti, A. L., Jr. (A)
Hass, E. W. (A)
Harwood, E. (A)
Kates, W. A. (A)
Rosenbaum, B. (A)
Rotman, W. (A)
Sico, A. (A)
Tranfaglia, T. E. (A)

Rockland (BOS-1)
Hills, W. L. (A)

Roslindale (BOS-1)
Di Giorgio, J. A., Jr. (M)
George, G. F. (M)
Goodway, J. T. (A)
Kostecki, W. (A)
Murray, J. P. (A)
Palmer, P. J. (A)
Parnagian, H. R. (A)

Roxbury (BOS-1)
Bovarnick, M. L. (A)
Crandell, P. A. (A)
Gray, E. L. (A)
Greenberg, S. A. (A)
Metten, W. H. (M)
Snyder, R. L. (A)
Walker, R. M. (SM)
Wolf, S. H. (A)

Rutland (BOS-1)
Eriksen, B. K. (A)

Salem (BOS-1)
Gagnon, R. L. (A)
Lesch, F. A. (A)

Saugus (BOS-1)
Bradbury, R. A. (A)

Saxonville (BOS-1)
Engman, G. E. (A)

Scituate (CV-1)
Lemmon, W. S. (SM)

Sharon (BOS-1)
Cushman, R. W. (A)
Lakari, R. W. (M)
Teicher, S. W. (A)

Shrewsbury (BOS-1)
Harrington, E. W. (A)

Somerset (BOS-1)
Ironfield, R., Jr. (A)
Lopes, R. E. (A)
Wardle, W. F. (A)

Somerville (BOS-1)
Dorian, J. M. (A)
Fasciano, E. R. (A)

Kalakowsky, C. B. (A)
Kolster, C. C. (SM)
Levy, A. O., Jr. (A)
McNamara, W. E. (A)
Paskauskas, C. N. (A)
Rider, D. V. (M)
Shortall, A. V., Jr. (A)
Vaccaro, P. (A)
Vaughan, T. J. (A)

South Acton (BOS-1)
Bergman, C. W. (A)
Kienow, O. E. (M)
Palmer, F. J. (A)

South Boston (BOS-1)
Slanina, E. P. (A)
Spelios, J. S., Jr. (A)
Stevens, E. F. (A)
Vitkus, P. L. (A)

Southbridge (NY-2)
Hagopian, R. H. (M)
Hobbs, M. (SM)
Reiffen, B. (A)
Tillyer, E. D. (SM)
Traub, A. C. (A)
Wells, J. M. (SM)

South Chatham (BOS-1)
O'Day, A. C. (A)

South Dartmouth
Davis, S. L. (SM)
Fitzsimmons, T. J. (A)
Golenpaul, C. (A)

South Hadley Falls (CV-1)
Davey, H. J. (A)

South Hamilton (BOS-1)
Wolfskill, J. R. (SM)

South Lincoln (BOS-1)
Brown, D. R. (M)
Fullerton, A. L., Jr. (M)
Gibbs, N. E. (A)
Gross, T. A. O. (M)
Lush, M. J. (A)
Ostroff, E. D. (A)
Wilson, M. S. (A)

South Natick (BOS-1)
Horan, W. H. (A)

South Peabody (BOS-1)
Hiser, P. K. (A)

South Sudbury (BOS-1)
Brown, K. E. (A)
Caldwell, R. J. (SM)
Chenez, R. D. (A)
Keith, W. W. (A)
Throckmorton, K. L. (A)

South Weymouth (BOS-1)
Briggs, F. R. (A)
Enemark, R. B. (A)
Fisher, A. B. (M)
Fitts, R. W. (A)
Hall, J. R. (M)
Hill, H. F. (VA)
Wilson, R. T. (A)

Springfield (CV-1)
Andrews, W. J. (A)
Bedard, G. O. (M)
Cameron, J. A. (M)
Carlson, F. A. (A)
Cooney, S. M., Jr. (A)
Cushing, T. F. (VA)
Da Prato, C. L. (A)
Dewey, C. S. (A)
Eisenmann, J. F. (A)
Fenton, A. F. (A)
Fratar, F. J. (M)
Gagne, F. W. (A)
Giguere, R. G. (A)
Goldberg, D. (A)
Gregory, J. G. (M)
Houck, S. C. (A)
Knarr, C. E. (M)
Lyman, J. R. (A)
Norkin, H. (A)
Pappalardo, A. J. (A)
Plummer, C. H. (A)
Richardson, H. M. (SM)
Sable, A. J. (A)
Salame, G. (A)
Townsend, G. R. (A)
Webber, F. G. (SM)

Squantum (BOS-1)
Bobroff, D. L. (M)
Jones, T. F., Jr. (SM)

Stoneham (BOS-1)
De Agazio, E., Jr. (A)
Finley, A. D. (M)
Gardner, H. A. (M)
Perkins, K. C. (A)

Stoughton (BOS-1)
Croxville, W. B. (M)
Dolan, R. P., Jr. (A)
Linney, F. J., Jr. (A)
McGarvey, J. P. (A)
Salzberg, E. (A)
Scripture, F. R. (A)
Shechet, M. L. (A)

Sudbury (BOS-1)
Forbes, G. D. (M)
Hand, S. E. (SM)

Swampscott (BOS-1)
Ludlam, W. A. (A)
Zimmerman, H. J. (SM)

Taunton (BOS-1)
Lawlor, J. A. (A)

Topsfield (BOS-1)
Harrington, E. C. (M)
Roche, T. F. (A)

Tyngsboro (BOS-1)
Spindell, F. A. (SM)

Waban (BOS-1)
Berg, A. L. (A)
Ellis, R. H. (A)
Morrison, L. H. (SM)
Parisi, F. E. (A)
Spencer, P. L. (SM)
Sprague, R. M. (A)
Young, K. A. (SM)

Wakefield (BOS-1)
Bianco, J. F. (A)
Dolan, F. J. (A)
Hooper, W. G., Jr. (A)
Howe, S. E. (A)
Jappe, H. C. (A)
Lynch, E. E. (SM)
Rich, E. S. (SM)

Walpole (BOS-1)
Austin, C. S. (A)
Willis, J. C. (A)

Waltham (BOS-1)
Abate, A. (M)
Aoyama, H. T. (A)
Baxter, L., II (A)
Bickford, W. J. (A)
Blais, P. D. (A)
Bowe, J. J. (A)
Bowers, W. B. (M)
Brady, J. P., Jr. (A)
Brown, D. F. (A)
Brunton, D. A. (A)
Chernosky, E. J. (M)
Chittenden, K. M. (A)
Clark, N., Jr. (A)
Clarke, A. C. (A)
Cohen, S. H. (A)
Colten, B. (A)
Coppola, G. J. (A)
Coroniti, S. C. (M)
Cox, J. R., Jr. (A)
Davisson, R. R. (A)
Devereux, J. G. (A)
Dixon, R. K. (M)
Drake, W. W., Jr. (A)
Dukat, F. M. (M)
Durfee, G. H. (A)
Ehrlich, S. L. (A)
Englund, E. T. (A)
Favret, A. G. (M)
Finnegan, F. G. (A)
Getting, I. A. (SM)
Gibson, S. K. (M)
Gilmour, W. E. (A)
Grenier, H. N. (A)
Guba, R. F. (A)
Guiney, R. J. (A)
Hannon, S. (M)
Harper, R. (A)
Hines, P. P. (A)
Hughes, G. E. (A)
Hull, D. R. (F)
Hurney, P. A., Jr. (A)
Jackson, S. R. (A)
Jacobs, H., Jr. (A)
Jones, J. W. (M)
Jones, R. V., Jr. (A)
Kelly, T. J. (A)
Kennedy, D. P. (A)
Kokidko, A. (A)
Kurth, H. H. (SM)
Lehr, C. G. (M)
Lester, D. R. (A)
Lowe, W. R., Jr. (A)
Mandell, A. (SM)
Marcley, W. E. (A)
Marshall, A. R. (A)
Mavroides, J. G. (A)
Melanson, W. W. (A)
Mergy, A. E. (A)
Metz, F. A. (SM)
Newman, P. (M)
Nichols, N. B. (SM)
O'Neil, C. E. (A)
Parkinson, G. B. (A)
Porter, A. D. (A)
Price, R. A. (A)
Ray, G. H., Jr. (A)
Reach, R. W., Jr. (A)
Reed, R. D. (M)
Reifel, H. (A)
Riblet, H. J. (A)
Rodimon, C. C. (M)
Rogers, T. F. (M)
Sallen, R. P. (A)
Saltzberg, W. (A)
Santangelo, J. (M)
Saunders, N. T. (A)
Schrimpf, H. W. (A)
Shapiro, S. (A)
Shaw, G. J. (M)
Sherman, D. (A)
Skowron, J. F. (A)
Smith, D. W. (A)
Soltes, A. S. (A)
Stevens, K. N. (A)
Stockman, H. (SM)
Stone, O. L. (A)
Strang, D. B. (M)
Sutro, L. (A)
Taylor, K. A. (M)
Thomas, H. J., Jr. (A)
Thompson, D. C. (A)
Tucker, N. (A)
Vacca, R. H. (SM)
Vassian, H. (A)
Von Alven, W. H. (M)
Walker, C. E. (A)
Waters, R. A. (M)
Weichardt, H. H. (M)
Welts, J. (A)
Westmark, J. E. (A)
Whitney, D. B. (M)
Wilson, E. F. (A)
Windsor, R. B. (SM)
Zettler, W. R. (A)
Zimmer, J. T. (A)

Watertown (BOS-1)
Altieri, J. R. (A)
Andres, N. E., Jr. (A)
Antman, M. A. (SM)
Aronow, S. (A)
Bagnall, J. J. (A)
Beddoe, A. C. (M)
Beloungie, L. W. (A)
Bosch, F. M. (A)
Chacran, J. J. (A)
Clark, D. L. (A)
Clements, D. F. (M)
Crosby, R. E., Jr. (M)
De Shon, H. C. (A)
Dieterich, E. J. (A)
Epstein, D. J. (M)
Field, R. F. (F)
Graustein, W. W., Jr. (M)
Hall, H. P. (A)
Hampson, E. R. (A)
Harden, C. M. (M)
Huntley, W. F. (M)
Kunstadt, G. H. (M)
Le Fort, D. T. (A)
Lenhardt, L. J. (A)
Mills, A. L., Jr. (M)
Mudgett, W. L. (A)
Parker, R. (A)
Paul, T., Jr. (M)
Pritchard, W. L. (SM)
Read, V. H. (A)
Richmond, M. R. (A)
Robinson, M. P. (M)
Samson, E. W. (SM)
Schlener, J. E. (A)
Sletten, R. P. O. (A)
Terzian, V. V. (A)
Whittier, R. J. E. (M)
Wiesner, J. B. (F)
Wolf, E. W. (A)

Waverly (BOS-1)
Hopkins, R. C. (A)
Mekota, J. E., Jr. (A)
Nilssen, R. H. (A)
Rose, L. J. (A)

Wayland (BOS-1)
Campbell, R. E. (VA)
Dolce, S. L. (A)
Gillespie, C. N. (A)
Hodgkinson, W. S. (A)
Kather, E. N. (M)
Larkin, K. T. (M)
Proctor, H. E., Jr. (A)
Soorsoorian, S. A. (M)

Webster (BOS-1)
Chapin, R. S. (SM)
Lanman, T. W. (A)

Wellesley (BOS-1)
Alden, J. M. (A)
Bobrow, E. N. (A)
Brainerd, H. B. (SM)
Bristol, H. B. (M)
Buckbee, J. A. (M)
Charow, W. J. (A)
Frelich, P. D. (A)
Hart, H. M. (SM)
Hauttaniemi, B. W. (A)
Jacobson, R. V. (A)
Jones, B. R. (M)
McDowell, L. S. (SM)
Newton, G. C., Jr. (M)
O'Donnell, A. J., Jr. (SM)
Plough, C. T., Jr. (A)
Silverman, R. A. (M)
Speas, C. A. (A)
Thomson, E. C. (A)
Weil, T. A. (A)
Weis, J. L. (M)

Wellesley Hills (BOS-1)
Banks, D. S. (A)
Berger, R. (M)
Caldwell, R. P. (A)
Chaffee, R. E. (SM)
Eager, M. (SM)
Greene, C. G. (SM)
Hall, J. D. (A)
Heick, B. K. (VA)
Humphrey, G. S. (A)
Murphy, W. M., Jr. (A)
O'Donnell, T. F. (A)
Schley, L. L. (A)
Slattery, T. G. (SM)
Walsh, J. E. (M)
Weeks, P. T. (SM)

Wenham (BOS-1)
Schafer, E. W. (SM)
Tarr, R. K. (A)

West Acton (BOS-1)
Clark, R. U. (A)
Cohan, L. (A)
Panetta, A. R. (A)
Pfingsten, J. A. (A)
Stevenson, G. D. (A)

West Boylston (BOS-1)
Surprenant, A. H. (A)

West Concord (BOS-1)
Bean, E. W., Jr. (A)
Borden, E. D. (A)
Cleveland, A. W. (M)
Davis, C. E. (M)
Hatch, R. M., Jr.
Holtje, M. C. (A)
Robinson, M. P., Jr. (A)
Romaine, G. E. (A)

West Falmouth
Austin, J. F. (A)

West Groton (BOS-1)
Jackson, R. H. (A)

West Lynn (BOS-1)
Blacquier, J. R. (A)
Cunningham, J. E. (A)
White, A. (A)

West Medford (BOS-1)
Lanciani, D. A. (A)
Memishian, J. (A)
Slack, C. B. (A)
Stevens, C. A. (SM)

West Newton (BOS-1)
Armstrong, D. G. (A)
Beers, W. T. (A)
Devane, M. E. (A)
Farrington, J. F. (F)
Gottschalk, W. M. (M)
Halder, G. W. (M)
Hergenrother, R. C. (SM)
Horrigan, J. B. (A)
Ingalls, R. P. (A)
Jones, W. J. (SM)
MacDowell, K. M. (A)
Manning, C. J. (A)
Myers, H. L. (M)
Parkin, T. R. (A)
Pekin, H. T. (SM)
Slusher, W. E. (A)
Smith, J. E. (SM)
Spencer, P. L. (A)
Wilcox, R. B. (M)

Weston (BOS-1)
Alstad, N. J. (A)
Bark, A. (M)
Beveridge, H. N. (A)
Brown, W. C. (VA)
Burt, W. G., Jr. (M)
Conard, R. W. (A)
Dairiki, S. (A)
Dewey, O. L. (A)
Green, P. E., Jr. (A)
Gross, F. A. (VA)
Hills, C. E., Jr. (VA)
Kahler, R. C. (A)
Kirkpatrick, D. N. (SM)
Powers, D. M. (A)
Ready, W. A. (SM)
Ricker, H. (A)
Thomas, J. E., Jr. (SM)
Van Rennes, A. B. (M)

West Roxbury (BOS-1)
Bagby, R. B. (A)
Downing, J. T. (A)
Doyle, F. A. (A)
Haddad, S. G. (A)
Hourihan, A. M. (A)
Johnson, P. C. (A)
Kapsalis, J. N. (A)
Saad, T. S. (A)
Smith, R. V. (A)
Sullivan, P. A. (A)
Thomas, J. E. (A)

West Somerville (BOS-1)
Brown, D. M. (M)
Curtin, J. J., Jr. (A)

West Springfield (CV-1)
Burnet, K. H. (M)
Rich, E. A. (A)

Westwood (BOS-1)
Abrahamson, F. H. (A)
Arlin, M. N. (M)
Brock, G. W., Jr. (M)
Brown, C. H. (A)
Gere, A. J. (A)
Hildebrant, B. M. (A)
Lane, C. R. (SM)
Paddock, R. B. (A)
Westbom, A. C., Jr. (A)

Weymouth (BOS-1)
Torney, F. L., Jr. (A)
Wise, D. P. (SM)

Whitman
Gallimore, J. W. (A)
Simmons, E. C. (M)

Williamsburg (WA-3)
Williston, S. S. (A)

Williamstown (CV-1)
Christopher, A. J., Jr. (A)
Curry, J. R. (A)
Gray, D. A. (A)
Hunicke, R. L. (M)
Ness, O. A. (A)
Peck, D. B. (A)
Postle, A. H. (A)
Richardson, T. F., Jr. (A)
Rowland, W. H. (A)
Scarborough, F. S. (A)
Schimmel, J., III (M)
Sheehan, R. P. (A)
White, J. A. (A)

Willimansett (CV-1)
Songayllo, A., Jr. (A)

Winchester (BOS-1)
Babakian, J. (M)
Bacon, F. S. (M)
Beranek, L. L. (F)
Blanchard, J. T. (M)
Bramley, F. E. (M)
Browning, G. H. (SM)
Byers, W. F. (M)
Cade, P. J. (A)
Chandler, G. E. (M)
Freedman, J. (SM)
Fritch, D. J. (A)
Hanson, P. R. (M)
Ivers, J. H. (SM)
Jackson, W. E. (A)
King, R. W. P. (F)
Leach, H. H. (A)
Martin, S. T. (SM)
McCusker, J. H. (A)
McFarlane, D. J. (M)
McVicar, K. E. (A)
Parks, F. B. (SM)
Purrington, R. L. (M)
Redding, F. W., Jr. (A)
Sawyer, D. S. (A)
Segerstrom, C. A., Jr. (SM)
Tunnicliffe, W. W. (A)
Watts, C. B. (A)

Winthrop (BOS-1)
Diaz, L. V. (A)
Esakov, D. A. (A)
Hooper, W. G., Jr. (A)
McDonald, F. J. (A)
MacGregor, D. F. (A)
Rivers, R. A. (A)
Walker, J. R. (A)

Woburn (BOS-1)
Bettencourt, J. P. (A)
Coggins, D. I. (M)
Corderman, C. L. (A)
Cullen, A. E., Jr. (A)
Dawson, J. W. (SM)
Hassett, F. C. (A)
Katz, L. (SM)
Lawler, J. J. (A)
MacDonald, K. J. (A)
Martin, P. E. (A)
Mead, D. C. (SM)
Rice, D. H. (A)
Sutherland, J. J. (M)
Ulm, E. H. (M)
Yeiter, M. R. (A)

Wollaston (BOS-1)
Anderson, A. S. (A)
Bixby, W. L. (A)
Burgoyne, C. L. (A)

Edmonston, A. S. (A)
Martinson, C. D. (A)
McNamara, T. J. (A)

Worcester (BOS-1)
Achramowicz, M. J. (A)
Browning, E. A. (A)
Connolly, J., S.J. (A)
Devletoglou, A. E. (A)
Didio, R. E. (A)
Eteson, D. C. (A)
Gearin, J. H., Jr. (A)
Goldstein, I. (A)
Hoogasian, H. (A)
Hoogasian, L. (A)
Howe, D. W., Jr. (M)
Howes, D. E. (VA)
Karazia, R. J. (A)
Luzgauskas, E. M. (A)
Manley, H. J. (A)
Manoog, J. C. (M)
Newell, H. H. (SM)
Newman, H. C. (A)
Noll, P. W. (M)
Oliver, D. S. (A)
Pareseau, P. H. (M)
Sanderson, G. H. (A)
Shulman, L. (A)
Sulkoskik, W. M. (A)
Wadsworth, W. B. (M)
Wolniewicz, R. S. (A)

MICHIGAN

Ada (DET-4)
Barfuss, J. D. (A)

Allegan (DET-4)
Boll, R. W. (M)
Borsi, P. N. (A)

Allen Park (DET-4)
Bledsoe, J. A. (A)
Hogle, R. C. (A)
Solarczyk, F. W. (A)
Tosh, W. M. (M)

Ann Arbor (DET-4)
Anderson, M. J. (A)
Attwood, S. S. (SM)
Bartman, F. L. (M)
Batten, H. W. (A)
Bauer, W. F. (A)
Bethel, H. W. (A)
Black, J. R. (A)
Boyd, J. A. (M)
Bozoian, M. (A)
Bradley, R. W. (A)
Breikss, I. P. (A)
Brown, R. K. (A)
Butler, T. W., Jr. (A)
Callan, R. W. (A)
Carr, J. W., III (M)
Chaney, L. W. (A)
Cohen, G. S. (A)
Constant, J. N. (A)
Cottrell, D. E. (A)
Dautremont, J. L., Jr. (A)
DeHart, W. R. (A)
Dicker, P. E. (A)
Donaldson, J. W. (A)
Dow, W. G. (F)
Dute, J. C. (A)
Early, H. (SM)
Etiz, F. (A)
Farris, H. W. (A)
Frese, R. E. (A)
Garner, H. L. (A)
Gilbert, E. G. (A)
Hall, G. O. (A)
Haneman, V. S., Jr. (A)
Hansen, R. J. (A)
Harding, W. G. (A)
Harvey, W. M., Jr. (A)
Henry, E. E. (A)
Hok, G. (SM)
Holland, L. N. (SM)
Howe, R. M. (M)
Johnston, R. W. (A)
Kazda, L. F. (A)
Knox, J. L. (A)
Kroll, R. T. (A)
Lampert, S. R. (A)
Lanning, H. E. (A)
Liang, D. (A)
Loughry, B. W., Jr. (A)
Macnee, A. B. (M)
McMillan, S. H. (A)
Miller, M. H. (A)
Moynihan, G. F., Jr. (A)
Needle, J. S. (A)
Nichols, A. D. (A)
Orr, L. W. (A)
Pantek, H. R. (A)
Peterson, G. E. (SM)
Pool, M. H. (A)
Rauch, L. L. (SM)
Reiher, H. F. (A)
Remley, F. M., Jr. (A)
Rogers, P. H. (A)
Rollin, R. A., Jr. (A)
Rothschild, D. R. (A)
Rowe, J. E. (A)
Rupke, E. (A)
Sanford, J. R. (M)
Sattinger, I. J. (SM)
Schaefer, E. J. (A)
Schoderbek, J. J. (A)
Schulte, H. F., Jr. (A)
Schupp, A. A., Jr. (A)
Scott, N. R. (SM)
Scott, W. F. (A)
Smith, H. L. (M)
Sondeen, P. (A)
Spencer, N. W. (SM)
Sperling, L. (A)
Stewart, J. L. (M)
Stout, M. B. (SM)
Strand, J. (A)
Thefoll, D. V. (A)
Tu, J. C. (A)
Vallelunga, J. (A)
Waldman, A. (A)
Wasserman, R. (VA)
Watkins, K. S. (A)
Welch, H. W., Jr. (SM)

Battle Creek (DET-4)
Gilbert, E. O. (A)
Thunder, L. C. (A)

Bay City (DET-4)
Bowden, F. J. (A)
Woody, F. (A)

Belleville (DET-4)
Allen, J. K. (A)
Benner, B. (A)

Benton Harbor (CHI-5)
Buhl, W. T. (VA)
Estkowski, M. H. (A)
Fiebich, E. C. (A)

Berkley
DeHaan, R. F. (A)
Dubois, D. A. (A)
Gannon, M. T. (SM)
Norris, W. J. (A)
Onia, J. (A)
Stewart, J. E. (A)

Berrien Springs (CHI-5)
Lashier, H. M. (A)

Birmingham (DET-4)
Adams, R. L. (M)
Armil, R. W. (A)
Benaglio, R. V. (A)
Booth, F. E., Jr. (A)
Burge, F. L. (A)
Butler, R. I. (A)
Chapman, F. W. (SM)
Fahringer, W. H. (A)
George, E. E (M)
Jackson, T. R. (A)
Martens, H. A. (M)
McDonnell, W. F. (M)
Mika, H. S. (SM)
Munro, G. M. (A)
Olson, D. R. (A)
Oxford, C. J., Jr. (A)
Smith, H. B. (A)
Somerville, A. (A)

Brooklyn
Cottrell, M. (VA)

Buchanan (CHI-5)
Burroughs, L. R. (A)
Hagey, L. P. (A)
Overlay, J. P. (A)
Tomcik, D. J. (A)
Wiggins, A. M. (SM)
Wood, J. F. (A)

Charlotte (DET-4)
Rypstra, B., Jr. (A)

Chelsea (DET-4)
Bridgman, A. D., Jr. (A)

Clawson (DET-4)
Christensen, V. E. (A)
Dougherty, R. H. (A)

Coldwater
Munn, E. H., Jr. (A)

Concord
Norton, F. R. (SM)
Warnock, E. W. (M)

Davison (DET-4)
Robbins, S. (A)

Dearborn (DET-4)
Best, F. G. (M)
Boltz, H. A. (M)
Calladine, G. T. (A)
Emery, R. R. (A)
Ference, M., Jr. (SM)
Fisk, R. H. (A)
Huber, P. (VA)
Llen, C. E. (VA)
Loutzenhiser, C. F. (A)
McLaren, I. H. (A)
Popkiewicz, F. (A)
Roberts, G. A. (A)
Scherba, M. B. (A)
Smith, E. H. (M)
Stevens, M. G. (A)
Stretanski, P. A. (A)

Detroit (DET-4)
Allured, R. B. (SM)
Almas, S. L. (M)
Amick, R. H. (A)
Atems, E. (M)
Bailey, T. F. (A)
Bandoian, P. (A)
Bazydlo, H. A. (A)
Blett, E. B. (VA)
Blumberg, D. (A)
Brauning, G. E. (A)
Brauning, T. W. (A)
Brede, E. F. (A)
Brooks, J. H. (A)
Brosch, H. T. (A)
Brummer, J. W. (A)
Buchanan, A. B. (SM)
Buehler, F. A. (M)
Burley, H. A. (A)
Bushor, W. E. (A)
Butcher, J. H. (A)
Byers, A. E. (A)
Caffrey, T. J. (A)
Capron, R. W. (M)
Chiavarini, E. W. (M)
Ciliax, D. I. (A)
Clark, E. H. (A)
Clark, R. R. (M)
Clayton, G. H. (A)
Coleman, H. B. (A)
Corte, R. L. (A)
Cotton, R. J. (SM)
Cowles, E. D. (A)
Craig, A. D. (A)
Currie, J. H. (A)
Da Roza, F. G. (A)
Davidson, E. W. (A)
Davis, C. (VA)
DeBolt, A. L. (A)
Denstadet, E. C. (SM)
Donovan, R. (A)
Driver, J. P. (A)
Drouillard, C. T. (A)
Dubois, R. C. (A)
Eisler, G. (A)
Ferguson, D. R. (A)
Fisk, N. C. (SM)
Fitzner, B. J. (A)
Forgacs, R. L. (A)
Forsythe, E. H. (A)
Freeman, L. R. (A)
Friedenthal, A. (M)
Gach, R. C. (A)
Ganschow, D. C. (A)
Gardiner, S. R. (A)
Garelis, C. (A)
Gasparovitch, S. (A)
Gillis, E. L. (A)
Gillmore, R. M., Jr. (A)
Goodman, G. (A)
Gottesman, N. H. (A)
Green, K. E. (M)
Greenfield, H. (A)
Gregory, A. J. (A)
Gundersen, R. E. (A)
Hagerty, J. J. (A)
Hall, A. C. (SM)
Hamilton, R. E., Jr. (A)
Hanes, M. (A)
Hanysz, E. A. (A)
Hartz, F. M. (A)
Head, J. W. (M)
Hein, D. W. (A)
Heiser, S. (SM)
Hellworth, R. W. (A)
Hemenway, B. J. (A)
Hess, H. M. (M)
Hevron, W. W. (A)
Hill, F. E. (A)
Hock, R. E. (A)
Horn, E. M. (A)
Howard, L. R. (M)
Hubbard, W. B. (A)
Hyland, L. A. (SM)
Jaworowicz, J. H. (A)
Jean, W. H. (A)
Jennings, F. S. (A)
Johnson, E. C., Jr. (A)
Johnson, K. E. (A)
Jones, C. W. (A)
Kamm, V. C. (A)
Keibzak, W. M. (M)
King, L. E. (VA)
Kivimaki, V. C. (A)
Kocher, C. F. (M)
Konopka, E. P. (A)
Korby, I. (A)
Korzeniowski, E. M. (A)
Kossuth, A. K. (A)
Kowalski, L. E. (A)
Krauer, J. H. (A)
Krug, E. G. (A)
Kruger, F. W. (A)
Krulikoski, S. J., Jr. (A)
Kuba, R. E. (A)
Kubala, A. M. (A)
Larin, F. (A)
Lawrence, S. C. (M)
Lee, E. H. I. (SM)
Leggatt, G. E., Jr. (A)
Leibich, R. E. (A)
Lesinsky, F. (M)
Lessem, M. (A)
Leydorf, G. F. (SM)
Licht, G. L. (A)
Liddel, U. (SM)
Lindsay, I. C. (A)
Lipkin, L. (A)
Lippmann, S. A. (M)
Loh, F. C. H. (A)
Loiacono, J. V. (A)
Longerich, E. P. (A)
Love, E. J. (M)
Luttermoser, R. L. (A)
Luzer, H. J. (A)
Madgett, W. H. (A)
Madsen, J. R. (A)
Mallon, R. H. (A)
Manning, D. C. (M)
Master, W. R. (A)
Matuch, R. A. (A)
McCartin, L. M. (A)
McFatridge, J. E. (A)
Mendel, F. S. (A)
Metevia, E. E. (A)
Michaels, C. L. (A)
Milek, H. (A)
Millet, L. F. (M)
Mills, R. J. (A)
Minidis, A. (M)
Miwa, G. Y. (A)
Montgomery, R. D. (A)
Monticello, W. A. (A)
Morin, D. C., Jr. (A)
Mueller, W. C. (M)
Nartonis, W. C. (A)
Newell, C. J. (A)
Newton, J. D. (A)
Niehaus, D. J. (A)
Nutter, M. J. (A)
Nymberg, R. J., Jr. (A)
O'Brien, D. J. (A)
Osborne, R. L. (VA)
Pascoe, D. (A)
Payne, D. V. (A)
Pecar, A. J. (A)
Penhollow, H. A. (VA)
Piper, C. A. (SM)
Rasquin, J. R. (A)
Rausch, W. D. (A)
Reiher, H. F. (A)
Reiss, N. D. (M)
Renkiewicz, R. (A)
Retko, E. (A)
Reust, R. (A)
Riemer, R. L. (A)
Rissi, T. L. (A)
Ritchie, D. J. (A)
Robb, D. E. (SM)
Robinson, T. (A)
Ross, H. G. (A)
Roush, F. H. (VA)
Rudolph, I. W. (A)
Runkle, E. G., Jr. (A)
Rykala, T. P. (A)
Scanlan, R. J. (VA)
Schmeisser, K. R. (M)
Schmuck, R. Q. (A)
Scott, D. E. (A)
Scott, T. T. (A)
Selvidge, H. (SM)
Sims, R. C. (A)
Skinner, A. M. (A)
Smith, B. F. (VA)
Spry, R. J. (A)
Stahl, T. H., Sr. (A)
Steinhoff, H. W. (A)
Sterling, S. (M)
Stevens, R. R. (A)
Stocker, D. V. (A)
Sullivan, R. P. (A)
Szajna, E. F. (A)
Taplin, L. B. (A)
Taylor, C. W. (A)
Taylor, K. J. (A)
Tevlin, R. J. (A)
Theodoroff, T. J. (A)
Thompson, T. E. (A)
Tierney, T. (A)
Tompos, S. F. (A)
Travis, E. W. (A)
Turkish, M. C. (A)
Tuskal, M. A. (A)
Varterasian, J. H. (A)
Vogel, C. I. (A)
Walker, J. R. (A)
Walton, H. E. (A)
Waltz, F. M. (A)
Ward, D. B. (A)
Warnick, A. (A)
Webb, A. E. (A)
Weldman, J. S. (A)
Weiler, E. F., Jr. (SM)
Welsand, J. B. (A)
Williams, W. B. (SM)
Winter, R. J. (A)
Winters, C. S. (A)
Wood, T. A. (A)
Wooster, A. F. (A)
Yamauchi, T. T. (A)
Yaskoff, R. S. (A)
Ziniuk, M. A. (M)
Zito, P. J. (A)
Zuss, C. L. (A)
Zukowski, J. A. (A)

East Ann Arbor (DET-4)
Fawcett, R. G. (A)

East Detroit (DET-4)
Boyda, M. C. (A)
Pence, W. K. (A)
Weagel, K. D. (A)

East Grand Rapids (DET-4)
Friedman, S. N. (M)

East Jordan (DET-4)
Leu, T. W. (A)

East Lansing (DET-4)
Abboud, F. L. (A)
Ebert, I. O. (A)
Evans, R. J. (M)
Hemmye, J. H. (A)
Pennington, R. B. (A)
Vidro, E. F., Jr. (A)

Farmington (DET-4)
McIntire, E. L. (A)
Rockafellow, S. C. (M)
Thomsen, T. R. (A)

Ferndale (DET-4)
Amman, E. A. (A)
Clark, J. E. (A)
Erickson, E. A. (A)
Gardner, D. C. (M)
Seleno, A. A. (A)

Flint (DET-4)
Brennan, J. B. (A)
Colosi, A. (A)
Ernst, C. E. (A)
Hansen, H. B. (A)
Holl, W. H. (A)
Loshbough, P. A. (A)
McBride, W. J. (A)
Miller, R. C. (A)
Riegle, G. W. (A)
Ryan, G. E. (VA)
Savage, L. A. (A)

Freeland
Carpenter, R. H. (VA)

Grand Blank (DET-4)
Jacobs, M. A. (A)

Grand Junction
Krieger, H. C. (A)

Grand Rapids (DET-4)
Anderson, T. G. (A)
Bateman, G. H. (SM)
Batte, J. T. (M)
Bell, R. E. (A)
Berg, R. C. (A)
Bergenroth, L. C. (A)
Boyd, C. H. (A)
Braverman, R. (A)
Calahan, L. F. (A)
Carrington, W. A. (A)
Costanzo, P. A. (M)
Davis, R. L. (VA)
DeJong, P. G. (A)
Gaydos, G. J. (VA)
Glardina, J. F. (A)
Golder, L. (A)
Gorton, E. D. (A)
Hansen, H. J., Jr. (A)
Hoop, R. E. (A)
Lundquist, L. E., Jr. (A)
McCurdy, D. L. (A)
McKay, R. L. (M)
Moses, R. C. (M)
Naylor, A. F. (A)
Puca, Q. J. (A)
Scholten, L. M. (A)
Segal, B. (M)
Stevens, L. G. (M)
Van Zoest, C. (A)
Voice, C. C. (A)

Grandville
Korb, A. W. (M)

Grass Lake (DET-4)
James, F. M. (M)

Grosse Pointe
Mackenzie, E. P. (A)
Martz, A. F., Jr. (A)

Grosse Pointe Farms (DET-4)
Book, E. (A)
Hittel, L. A., Jr. (A)

Grosse Pointe Park (DET-4)
Logan, M. F. (A)

Grosse Pointe Woods (DET-4)
Byerlay, H. L. (SM)
Dacken, L. L. (VA)
Delmerge, A. H. (A)
Gulevich, J. H. (A)

Hamman, P. E. (A)
Membery, A. H. ( )
Russell, R. M. (SM)

Harper Woods
De Claire, A. G., Jr. (A)

Hastings (DET-4)
Branch, R. (VA)
Slocum, G. V. (A)

Hazel Park (DET-4)
Erway, P. B. (A)
Schubring, N. W. (A)

Highland Park (DET-4)
Gould, H. S. (M)
McDaniel, G. H., III (A)
Shileds, R. A., Jr. (A)
Stinson, R. C. (VA)
Van Dusen, H. J. (A)

Holland (DET-4)
Tysse, H. L. (VA)

Houghton (MIL-5)
Jones, R. J. (M)
Oswald, J. A. (A)

Huntington Woods (DET-4)
Lendway, J. M. (A)
Schiffman, J. (A)
Wilton, V. A. (M)

Inkster (DET-4)
Bailey, C. B., Jr. (A)
Harrigan, P. M. (A)
Rheaume, R. O. (A)
White, O. (A)

Jackson (DET-4)
Arasim, J., Jr. (A)
Baker, F. J. (A)
Bradin, J. S. (A)
Efting, H. J. (A)
Fisk, H. V. (A)
Foy, S. (A)
Grimm, R. A. (A)
Hungerford, R. S. (A)
Longman, E. R. (M)
Prokop, F. J. (A)
Ruppel, D. (A)
Sorem, H. (A)
Westrate, M. C. (A)
White, R. T. (M)
Wilson, A. G. (A)

Kalamazoo (DET-4)
Fetzer, J. E. (SM)
Lee, C. E. (A)
Marburger, W. G. (A)
Moehring, W. D. (A)
Wells, L. V. (SM)
Woods, O. R. (A)

Lansing (DET-4)
Bennett, C. T. (A)
Loomis, W. E. (A)
Walton, P. E., Jr. (A)
Winters, L. C. (A)

Leslie (DET-4)
Stansfield, S. J. (M)

Lincoln Park (DET-4)
Ambie, H. A. (A)
Tank, H. F. (VA)

Livonia (DET-4)
Halsted, L. R. (A)
Spragg, L. A. (M)

Marshall (DET-4)
Brownell, G. T. (SM)

Marysville (DET-4)
Stoner, M. J. (A)

Midland (DET-4)
Adler, S. E. (A)
Ayers, E. D. (M)
Bauss, H. H. (A)
Grebe, J. J. (M)
Ruhl, H. D., Jr. (A)
Woodland, P. C. (A)

Milan
Nace, P. E. (A)

Monroe
Cooley, P. (A)

Mt. Clemens (DET-4)
Donovan, M. A., Jr. (A)
Gudaitis, W. V. (A)
Miller, C. E. (A)

Mt. Morris
Anderson, H. J. (M)

Muskegon (DET-4)
Castenholz, F. R. (M)
Hammer, R. V. (A)

Muskegon Heights
Sanborn, R. H. A)

New Boston
Niswonger, B., Jr. (A)

Niles (CHI-5)
Beach, H. R. (A)
Beaverson, W. A. (A)
Corey, F. B. (A)
Kennedy, R. L. (A)

North Street
Wood, E. E. (A)

Oak Park (DET-4)
Babala, J. (A)
Ferrara, G. (M)
Fishbeck, K. H. (A)
Hart, D. E. (A)
Hutchinson, R. W. (A)
Marguis, A. (A)
Michaels, P. A. (A)
Shackman, N. (A)
Wolf, S. B. (A)

Petoskey (DET-4)
Horniman, N. L. (A)

Pinckney (DET-4)
Beattie, L. A. (A)

Plymouth (DET-4)
Chapelle, W. E. (A)
Joehlin, N. C. (A)

Pontiac (DET-4)
Cook, W. N. (A)
Filkins, L. D. (A)
Fowler, T. W., Jr. (A)
McCall, W. A. (M)
Ragsdale, W. H. (M)
Smith, L. G., Jr. (A)
White, D. C. (A)

Port Austin (DET-4)
Bradfute, G. A., Jr. (A)

Pullman (DET-4)
Robinson, G. D. (VA)

Richmond (DET-4)
Clark, N. M. (A)

River Rouge
Haney, C. A. (A)
Scrimshire, J. B., Jr. (A)
Shepley, L. (A)

Rives Junction (DET-4)
Monroe, D. G. (A)

Rochester (DET-4)
Jouppi, A. F. (A)
Pennanen, V. W. (A)
Wiggins, T. B. (A)

Roscommon
Klemetti, R. O. (A)

Roseville (DET-4)
Cumeralto, Q. C. (M)
Hoehn, A. M. (A)
Hunter, J. S., Jr. (A)
Melvedt, H. (M)

Royal Oak (DET-4)
Andrews, G. B. (A)
Briggs, F. F. (A)
Coates, A. L. (VA)
Dunbar, H. C. (A)
Edwards, C. M. (SM)
Frincke, P. O. (M)
Hall, J. R. (A)
Harokopus, W. P. (A)
Johnston, R. W. (A)
Larime, L. H. (SM)
Loring, L. W. (A)
McCollum, S. B. (A)
Montross, R. A. (A)
Nauman, J. G. (A)
Reinhold, H. W. (M)
Satullo, A. R. (A)
Schooley, M. H. (A)
Solley, S. W. (A)
Wanttaja, G. E. (A)
Watschke, M. V. (A)
Werden, A. H., Jr. (A)
Wilmot, W. R. (M)
Zimmerman, W. A. (A)

Saginaw (DET-4)
Boettcher, A. J. (A)
Hrivnak, A. (A)
Hummer, J. L. (M)
Kelb, A. J. (A)
Parker, H. W. (SM)
Volz, H., Jr. (A)
Williams, R. T. (A)

St. Clair Shores (DET-4)
Adkins, H. T. (A)
Dill, C. L., Jr. (M)
Niles, J. R. (A)
Silberberg, W. T. (A)
Spero, A. F. (A)

St. Joseph (CHI-5)
Bergen, H. A. (A)

Saline (DET-4)
Hedges, H. G. (A)

Samaria (DET-4)
Humiston, H. A. (SM)

Sault Ste. Marie (MIL-5)
Champion, R. W. (A)
Klingler, R. R. (A)

Selfridge AFB
Joiner, E. R. (A)

South Haven (DET-4)
Freeman, D. B. (A)

Stevensville
Gaarder, K. M. R. (M)

Swartz Creek (DET-4)
Murphy, E. F. (A)

Three Rivers (FW-5)
Lancaster, R. G. (A)
Perkins, M. L. (VA)

Traverse City (DET-4)
Biederman, L. M. (M)
Langs, D. W. (A)

Trenton (DET-4)
Mills, G. L. (A)
Thornton, C. H. (A)

Utica (DET-4)
Rousseau, A. L. (A)

Van Dyke
Strang, J. M. (A)

Walled Lake (DET-4)
Belprez, G. R. (M)
Hart, A. D. (M)
Ristow, H. E. (M)

Washington (DET-4)
Lax, B. (A)

Wayne (DET-4)
Pappas, J. (A)

Whitmore Lake (DET-4)
Podewils, N. R. (A)

Willow Run
Kruger, V. (A)

Wyandotte (DET-4)
Beecher, A. E. (A)
Clark, R. K. (VA)
Dolsen, J. A. (M)
Moore, J. B. (VA)
Wesser, C. H. (SM)
Workman, W. B. (A)

Ypsilanti (DET-4)
Anderson, M. J. (A)
Augustus, L. M. (VA)
Blikken, W. A. (A)
Blythe, R. (M)
Breymaier, R. W. (A)
Cutrona, L. J. (SM)
Gaskill, R. A. (A)
Godde, H. H. (SM)
Harwood, F. E. (A)
Hoagbin, J. E. (M)
Kelly, D. V. (A)
Kruger, V. (A)
Larrowe, B. T. (A)
Miller, R. E. (A)
Ohlosson, R. L. (A)
Peterson, W. W. (A)
Schafitz, S. A. (M)
Sherman, H. W. (A)
Van Valkenburg, E. S. (A)
Weinert, B. R. (A)
Wheatley, W. A. (A)
Wilbur, E. T. (M)
Wilcox, G. A. (A)
Williams, R. O. (SM)

MINNESOTA

Anoka (TC-5)
Anderson, I. H. (M)
Collier, G. X. M. (VA)
Hornsby, J., Jr. (A)
Longfellow, R. C. (SM)

Brewster
Schlatter, J. J. (A)

Champlin (TC-5)
Lautzenheiser, R. W. (A)

Crookston (TC-5)
Thompson, F. M. (A)

Duluth (TC-5)
Bolger, A. E. (A)
Persons, C. B. (SM)
Vergun, A. (A)

Excelsior (TC-5)
Dawson, O. D. (A)
McCadden, M. M. (A)
Nichols, R. F. (A)

Faribault (TC-5)
Folsom, D. E. (M)
Hyde, J. E., Jr. (A)

Fergus Falls (TC-5)
Coffin, W. R. (M)

Glen Lake (TC-5)
Biltz, F. J. (A)

Hopkins (TC-5)
Carlson, K. J. (M)
Roka, E. G. (A)
Stucky, N. P. (A)

Mankato (TC-5)
Ellis, G. A. (A)

Maple Plain (TC-5)
Vincent, A. M. (A)

Minneapolis (TC-5)
Adams, F. L. (A)
Adkisson, W. M. (A)
Ainsworth, F. W. (A)
Alderson, R. C. (A)
Anderson, E. M. (A)
Anderson, G. P. (A)
Anderson, L. T. (M)
Anderson, P. M. (M)
Angle, S. L. (A)
Bakken, E. E. (A)
Baldwin, J. H. (M)
Barbour, R. E. (A)
Bergan, K. N. (A)
Blazer, F. H., Jr. (A)
Block, E. J. (A)
Bonrud, L. O. (A)
Bramsen, E. A. (A)
Branstad, D. H. (A)
Bristol, S. L. (A)
Brunetti, C. (F)
Burrell, W. P. (A)
Casey, T. J. (A)
Christensen, T. W. (A)
Cray, S. R. (A)
Croft, W. S. (A)
Croze, M. W. (A)
Cummings, K. C. (A)
Dale, N. N. (A)
De Block, E. T. (A)
Dinter, H. A., Jr. (A)
Disser, C. J. (M)
Dubbe, R. F. (A)
Dundovic, J. F. (A)
Eckstein, E. A. (A)
Engelman, C. W. (M)
Ewart, J. M. (A)
Fanyo, W. P. (A)
Featherstone, R. P. (A)
Field, B. W. (A)
Fossceen, I. J. (A)
Frohbach, H. F. (A)
Gergen, J. L. (A)
Gise, F. G., Jr. (A)
Gottlieb, D. C. (A)
Graves, H. C. (A)
Grindheim, E. A. (A)
Gustafson, H. A. (A)
Hallaway, A. B. (M)
Halling, J. H. (A)
Hansen, G. F. (A)
Harding, E. W. (M)
Harris, L. A. (A)
Hartig, H. E. (F)
Hartig, H. L. (A)
Haxby, B. V. (A)
Headen, H. V. (M)
Herrmann, F. W. (M)
Hill, B. M. (A)
Hirashima, H. K. (M)
Hird, F. S. (M)
Hunt, G. W., Jr. (A)
Huss, S. J. (A)
Iverson, M. W. (A)
Johnson, G. H. (A)
Johnson, H. C. (A)
Kalb, R. M. (SM)
Kelar, J. (SM)
Kelsey, J. R. (A)
Kershaw, J. A. (A)
Ketchum, J. R. (A)
Knox, M. E. (M)
Kruse, J. E. (A)
Kubicek, W. G. (M)
Laitinen, W. R. (A)
Lambert, R. F. (A)
Lampert, L. F. (A)
Langlie, L. O. (A)
Lehnert, W. E. (A)
Lindgren, H. A. (A)
Little, G. W. (A)
Macpherson, C. H. (A)
Markusen, D. L. (M)
Matthys, R. J. (A)
McElroy, W. J. (A)
McGinnis, W. J. (M)
Mellon, G. E. (A)
Moerke, R. W. (A)
Mooers, H. T. (A)
Moore, J. H. (SM)
Muckenhirn, O. W. (M)
Murray, J. H. (A)
Museus, H. V. (A)
Needham, D. P. (A)
Nelson, E. J. (A)
Nerheim, E. (A)
Newman, M. M. (A)
Ney, E. P. (A)
Nunn, E. C. (A)
O'Brien, E. G. (A)
O'Brien, H. G. (A)
Olsen, M. R. (A)
Olson, K. A. (A)
Ostberg, E. H. (A)
Paidosh, R. L. (A)
Pearson, V. H. (A)
Pedersen, I. C. (SM)
Pidcock, R. E. (A)
Porrazzo, R. J. (A)
Potter, R. E. (A)
Pree, W. G. (M)
Premack, J. (M)
Prince, J. P. (A)
Raymond, H. A. (A)
Rehne, H. K. (A)
Reid, J. M. (A)
Reinke, R. F. (A)
Renk, B. J. (A)
Riordan, J. V. (A)
Roberts, H. A. (A)
Rogers, J. R. (SM)
Saari, V. R. (A)
Schmitt, O. H. (SM)
Schott, O. A. (M)
Schuck, O. H. (SM)
Schulz, S. W. (M)
Sear, A. W. (SM)
Seils, H. A. (M)
Sell, R. L. (A)
Shabatura, D. P. (A)
Shelquist, M. G. (A)
Shepherd, W. G. (F)
Sherman, J. M. (SM)
Snegoski, J. J. (A)
Snow, S. F. (A)
Spargo, T. G. (A)
Sprecher, N. D. (A)
Stewart, W. E. (SM)
Stone, N. T. (A)
Storm, J. F. (A)
Stucky, N. P. (A)
Thoen, R. L. (A)
T'Kach, H. V. (M)
Tobin, R. D., Jr. (A)
Toth, D. H. (A)
Van der Ziel A. (SM)
Vikla, A. M. (A)
Walkup, L. A. (A)
Warhol, N. (A)
Weber, R. G. (A)
Weyrauch, H. E. (M)
Wilson, W. R. (M)

Mound (TC-5)
Harrison, J. L. (A)

New Brighton (TC-5)
Kittrell, R. L. (A)
Lind, A. L. (A)
Schwantes, R. C. (A)

Northfield (TC-5)
Jensen, M. C. (M)

North St. Paul (TC-5)
Hill, J. L. (M)

Plainview (TC-5)
Stitch, B. D. (A)

Red Wing (TC-5)
Jelatis, D. G. (A)
Lee, G. M. (A)

Renville (TC-5)
Francis, O. T. (VA)

Richfield (TC-5)
Doherty, R. P. (A)
Vint, J. L. (A)

Rochester (TC-5)
Brown, L. M. (A)
Cross, R. W. (A)
Farrall, W. R. (A)
Floyd, R. A., Jr. (A)
Gleichauf, T. J. (A)
Griffith, T. J. (A)
Herrick, J. F. (M)
Jones, R. E. (SM)
Senstad, P. D. (A)

Rosemount (TC-5)
Chiswell, E. (A)

St. Louis Park
Neveaux, R. J. (A)

St. Paul (TC-5)
Anderson, H. W. (A)
Arndt, R. B. (A)
Barnes, J. C. (SM)
Bartlett, V. W. (A)
Baumgaertner, C. J. (A)
Beck, V. W. (A)
Behymer, D. J. (A)
Benassi, D. A. (A)
Berry, H. W. (A)
Bolenbaugh, J. E. (A)
Bratschi, R. W. (A)
Callen, M. W. (A)
Campbell, R. N. (A)
Cohen, A. A. (SM)
Coll, N. B. (SM)
DeVir, J. F. (A)
Edblund, A. J. (A)
Erickson, R. S. (A)
Foreman, J. J. (A)
Fullwiler, F. K. (A)
Giles, M. M. (A)
Glewwe, C. W. (A)
Graebner, M. S. J. (A)
Green, S. S. (A)
Gunderson, R. D. (A)
Hardenbergh, G. A. (A)
Herzfeld, V. E. (A)
Hess, P. N. (A)
Hilker, B. R. (M)
Hill, B. F. (A)
Hoover, L. R. (A)
Hulstrand, B. E. (A)
Jensen, W. (M)
Kalinke, J. (M)
Kleason, D. B. (A)
Knoblauch, A., Jr. (A)
Komatsu, G. A. (A)
Lahue, P. M. (M)
Latvalla, R. W. (A)
Lode, T. (A)
Mayo, P. M. (A)
Maze, R. O. (A)
McLane, R. C. (A)
Moe, W. J. (A)
Mullaney, F. C. (SM)
Murray, D. A. (M)
Nellis, W. M. (M)
Nelson, E. A. (A)
Nelson, R. C. (A)
Nielsen, E. G. (A)
Pence, C. J. (A)
Piecha, L. M. (M)
Pierce, A. J. (A)
Prom, G. J. (A)
Purcell, C. J. (A)
Rowan, T. D., Jr. (A)
Rowland, C. A., Jr. (A)
Sabine, L. (A)
Snyder, E. F. (A)
Somermeyer, H. F. (A)
Stahmann, J. R. (A)
Sundry, O. J. (A)
Swyrya, M. (A)
Von Behren, R. A. (M)
Wells, W. S. (A)
Wesman, C. (A)
Wesslund, R. E. (A)
Williams, G. I. (A)
Winget, W. F. (A)
Zimmer, E. D. (A)

South St. Paul (TC-5)
DePoy, J. A. (A)

Stillwater (TC-5)
Bashara, N. M. (M)

Walker (TC-5)
Tipple, R. J. (A)

Waseca (TC-5)
Hager, F. M., Jr. (SM)
Johnson, E. F. (VA)
Kozan, F. J. (A)
Lyford, T. (A)

Wayzata (TC-5)
Johnson, L. E. (M)
Wagner, F. C. (A)
Young, S. B. (VA)

West St. Paul (TC-5)
Bouwman, B. J. (A)

White Bear Lake
Edstrom, C. A. (A)
Pool, K. C. (M)

MISSISSIPPI

Baldwyn (HUN-6)
Peach, S. E. (M)

Biloxi (NO-6)
Clayton, M. W. (A)
Davidson, R. E. (A)
Hartwell, W. T. (A)
Howe, W. F. (M)
Ingling, T. M. (A)
Kornman, J. A. (A)
Lester, V. R. (A)
Quirk, W. J. (A)
Scarborough, S. M. (A)
Shoemaker, W. J. (A)
Van Loon, R. M. (A)
Williams, E. A. (M)

Greenwood (HUN-6)
Johnson, H., Jr. (A)
Jones, C. H. (A)
Perkins, E. G. (A)

Greenville (HUN-6)
Jeu, L. H. (A)
Kittleman, M. (A)

Jackson (NO-6)
Benson, G. G. (M)
Courtenay, J. A. (SM)
Daniels, L. H. (A)
Hurst, K. J. (A)
Stietenroth, J. D. (A)

Keesler AFB (NO-6)
Beehler, L. A. (A)
Boyens, R. D. (A)

Knob Noster
Kuhlman, E. A. (A)

Laurel (NO-6)
Maxey, H. L. (A)

Madison
McKay, F. C. (M)

Natchez (NO-6)
Bowers, D. E. (A)
Denton, T. L. (A)

Pascagoula
Anderson, L. G. (A)

Pass Christian (NO-6)
Helwick, E. A. (A)

Poplarville
Dreyer, R. F. E. (A)

Sledge (EP-7)
Parnell, C. C., Jr. (A)

State College (HUN-6)
Fitzgerald, D. F. (A)
Hutchison, P. T. (A)
Simrall, H. C. (SM)

Troy
Walker, J. A. (A)

University (HUN-6)
Cullen, A. B., Jr. (A)
Ross, J. D. (A)

MISSOURI

Affton (SL-5)
Brickler, J. B. (M)
Nurre, H. H., Jr. (A)
Shirling, G. K. (M)
Toeneboehn, C. C. (M)
Winters, D. E. (A)

Berkeley (SL-5)
Joerding, E. R. (A)

Brentwood (SL-5)
Hall, R. S. (A)
Hicks, H. J. (M)
Miller, G. L. (A)
Mohrman, R. F. (A)
Wiese, A. H. (M)

Callao (SL-5)
Holman, J. S. (A)

Cape Girardeau (SL-5)
Clippard, R. W. (A)
Hirsch, O. C. (M)
Uelsmann, W. G. (A)
Vandeven, D. W. (A)
Wilson, C. (A)

Clayton (SL-5)
Andersen, A. R. (A)
Augustine, R. J. (A)
Johnson, H. L. (A)
Vene, J. M. (A)

Columbia (SL-5)
Cox, C. L. (A)
Johnston, J. L. (A)
Lago, G. V. (M)
Lamb, J. F. (M)
McAdams, H. T. (A)
Tudor, J. R. (A)
Waldelich, D. L. (SM)
Wallis, C. M. (SM)
Weise, D. (A)

Creve Coeur (SL-5)
Lechtreck, L. W. (A)

Desloge (SL-5)
Blackwell, W. C. (A)

Eminence (SL-5)
French, R. W. (A)

Ferguson (SL-5)
Dobyne, J. C., Jr. (A)
Henderson, H. W. (A)
Reed, D. L. (A)
Rekart, A. F. (VA)

Florissant (SL-5)
Fenton, R. J. (A)
Furdyce, S. W. (M)
Jacobsmeyer, H. T. (M)
Pondrom, A. J. (A)

Fulton
Nickles, R. W. (A)

Glendale (SL-5)
Hexem, J. (A)
Malsbary, J. S. (M)
Rustemeyer, G. L. (A)

Grain Valley
Harmon, R. C. (M)

Grandview (KC-5)
Wolfe, L. G. (A)

Harrisonville
Stearns, C. F. (A)

Hickman Mills (KC-5)
Ashley, W. H., Jr. (A)
Bergren, A. L. (SM)
Grimmet, L. J. (A)
Hailey, W. (A)
King, E. J., Jr. (SM)
Newton, K. V. (SM)

Independence (KC-5)
Forristal, J. A. (A)
Hathhorn, W. R. (A)
Johnson, C. L. (A)
Lelbold, F. H. (A)
Moler, A. R. (VA)

Jennings (SL-5)
Lawson, R. G. (A)
Yarian, E. L. (A)

Joplin (KC-5)
Boyce, E. (A)

Kansas City (KC-5)
Alig, R. J. (A)
Anderson, R. W. (A)
Anderson, T. V. (A)
Artman, R. G. (A)
Barker, F. L. (A)
Bell, W. E. (A)
Berry, F. M. (M)
Bettis, M. E. (A)
Bishop, G. W. (M)
Boutros, O. L. (M)
Boyles, J. O. (A)
Braidwood, D. W. (A)
Butler, R. W. (SM)
Chinn, F. T. (A)
Clarke, A. G. (A)
Constant, P. C., Jr. (M)
Cook, K. H. (A)
Curtis, C. V. (M)
Davis, S. E. (A)
Devoll, C. W. (A)
Easterday, M. R. (M)
Epstein, S. (A)
Fernane, J. (M)
Foster, C. L. (SM)
Fouts, A. L. (M)
Fry, W. E. (A)
Gibbs, D. R. (A)
Glass, A. H. (M)
Goldenberg, H. E. (M)
Gordon, J. M. (A)
Hadley, J. F. (A)
Harris, J. B. (M)
Harrison, A. E. (M)
Harrison, R. E. (A)
Heffelfinger, J. B. (SM)
Hercules, W. P. (A)
Heyde, H. C. (M)
Hoover, W. C. (A)
Jarboe, R. A. (A)
Johnson, W. R. (A)
Jones, F. S. (M)
Kay, J. P. (A)
Keith, J. M. (A)
Kennedy, J. L. (A)
Kerbs, W. A. (A)
Kimball, C. N. (F)
Kolen, N. (A)
Lamb, W. L., Jr. (M)
Lane, C. A., Jr. (M)
Lansdown, W. D. (A)
Long, J. W. (A)
Lutes, R. K. (M)
Martin, E. J., Jr. (A)
McAllister, M. J. (A)
McCaffrey, E. J. (A)
McCall, E. A. (M)
Meador, B. M. (M)
Medley, R. L. (A)
Miller, C. V. (A)
Moore, H. H. (M)
Morgan, H. K. (SM)
Morse, L. H., Jr. (M)
Nail, P. L. (A)
Nigg, D. T. (A)
Nuttall, A. F. (A)
Parks, J. V. (A)
Powell, K. W. (A)
Pulliam, C. S. (A)
Rathke, J. E. (A)
Reese, I. C. (M)
Reitz, W. H. (A)
Robertson, J. P. (A)
Rosine, L. L. (A)
Rovang, R. J. (A)
Salzer, C. E. (VA)
Sandefur, K. L. (A)
Scheil, R. H. (A)
Schilling, J. T. (A)
Schwerin, E. B. (SM)
Shapiro, E. (A)
Shontz, L. A., Jr. (A)
Shroyer, H. M. (A)
Slusher, R. W. (A)
Smith, C. B. (A)
Stedman, J. D. (A)
Stone, J. B. (A)
Stout, H. L. (SM)
Taylor, G. L. (SM)
Troeglen, K. (SM)
Uhrig, R. B. (A)
Van Gundy, C. G. (VA)
Van Horn, J. H. (SM)
Walter, G. W. (A)
Welborn, D. L. (A)
Werner, W. F. (A)
Werner, W. T. (A)
White, J. D., Sr. (A)
White, R. N. (SM)
Whittle, O. W. (A)
Wilcox, J. V. (SM)
Wilder, M. K. (A)
Williams, L. E. (A)
Williams, M. (A)
Wollskill, R. F. (SM)
Yoeman, S. J. (A)
Young, C. D., Jr. (A)

Kirksville (SL-5)
Rogers, H. D. (A)

Kirkwood (SL-5)
Barnes, J. A. (A)
Binzel, M. S. (A)
Dubuque, T. J. (A)
Helmreich, L. W. (A)
Hermon, R. (M)
Laws, C. R. (A)
McAllister, J. C. (A)
Pectol, J. L. (A)
Risk, J. E. (A)
St. Vrain, W. E. (M)
Winter, D. F. (SM)
Yount, T. L. (SM)

Liberty (KC-5)
Budd, R. W. (M)
Hilton, W. A. (A)
Lovan, J. E. (M)

Louisburg
Watson, J. F. (A)

Maplewood (SL-5)
Earley, J. M. (A)
Huebschen, R. G. (A)

Monett (KC-5)
Balden, J. M. (A)

Monroe City
Hirner, J. A. (A)

Moscow Mills (SL-5)
Withers, J. S. (A)

Normandy (SL-5)
Lowell, T. B. (A)
Murty, E. H. (M)
Stephens, E. T. (A)
Volk, J. A. (VA)

North Kansas City (KC-5)
Bishop, W. T., Jr. (SM)
Pierce, C. H. (M)

Overland (SL-5)
Lienhard, O. W. (A)

Palmyra (SL-5)
Hansbrough, F. G. (A)

Perry (SL-5)
Davis, C. L. (SM)

Pierce City
Smerdon, W. D. (A)

Richmond (KC-5)
Basham, R. (A)

Richmond Heights (SL-5)
Cummings, G. M. (SM)
Harris, R. L., Jr. (A)
Lentz, J. T. (A)

Rolla (SL-5)
Choate, R. L. (A)
Kouns, W. D., Jr. (A)
Mitchum, M. M. (A)
Nolte, R. E. (M)
Poe, C. C., Jr. (A)
Rittenhouse, J. W. (M)

St. Ann (SL-5)
Davies, H. W. (A)

St. Charles (SL-5)
Hommes, H. E. (A)
Jordan, J. D. (A)

St. Joseph (KC-5)
Clark, R. M. (A)
Koch, J. W. (M)
Lux, K. E. (A)
Simonds, R. L. (A)

St. Louis (SL-5)
Ancona, J. A. (A)
Apel, C. K. (A)
Behr, J. L. (A)
Beller, E. H. (A)
Bennetsen, W. J. (M)
Benson, R. W. (M)
Berland, H. K. (M)
Bitzer, R. J. (M)
Black, D. R. (A)
Booker, R. W. (A)
Brent, L. L. (M)
Brooks, J. L. (M)
Bubb, F. W., Jr. (A)
Caglia, A. J. (A)
Ceries, R. E. (A)
Chambers, R. M., Jr. (A)
Cherer, M. J., Jr. (A)
Cobb, H. A., Jr. (A)
Connell, J. B. (A)
Cook, A. B. (A)
Cornell, J. I. (SM)
Crosby, H. A. (A)
Decker, D. D. (A)
Detchemendy, J. A. (A)
Devereux, J. (A)
Dreifke, G. E. (A)
Drogge, R. F. (A)
Duchek, H. W. (A)
Dunn, C. A. (A)
Efthim, C. (A)
Faust, C. W. (A)
Fiedler, G. J. (SM)
Fillmore, F. A. (M)
Fisler, R. E. (A)
Fox, G. W. (SM)
Fuerst, R. J. (A)
Furfine, A. L. (A)
Griffiths, O. H. (M)
Habing, P. B. (A)
Hains, V. H. (A)
Hannon, J. P. (M)
Harris, H. H. (A)
Harrison, C. E. (SM)
Harvey, H. (SM)
Heitzeberg, C. H. A. (A)
Hoffman, H. T. (A)
Hollandsworth, W. J. (A)
Honnell, P. M. (SM)
Hubenschmidt, W. E. (A)
Jastram, P. S. (M)
Kathrinus, N. W. (A)
Keil, E. W. (A)
Koerner, C. C. (A)
Lenkerd, J. P. (M)
Lennert, A. E. (M)
Lowell, B. W. (A)
Ludwig, H. (A)
Lynch, F. R. (A)
Mayer, M. F., Jr. (A)
McDaniel, O. S. (SM)
McGary, W. T. (A)
McHoney, L. M. (SM)
McSherry, J. H. (A)
Miller, G. L. (A)
Minnich, D. J. (M)
Mollman, L. A. (M)
Murphy, C. H. S. (SM)
Niemi, L. T. (A)
O'Shaughnessy, V. P. (A)
Pauls, G. C. (A)
Polk, G. D. (A)
Pyle, J. L. (A)
Quick, J. R. (A)
Rasche, D. (A)
Robb, W. S. (A)
Roberts, E. M., Jr. (M)
Rosenkoetter, E. A. (A)
Sack, V. M. (A)
Sayer, J. D. (A)
Schaeperkoetter, L. C. (A)
Scheplin, D. J. (A)
Schillinger, E. J. (A)
Schwarz, C. J. (SM)
Sevett, R. (A)
Sheehan, J. S. (A)
Shepard, W. D. (M)
Siegel, I. D. (A)

Siepman, A. B. (A)
Small, F. R. (SM)
Sorensen, W. N. (A)
Stertmann, W. E. (A)
Stocker, D. O. (A)
Thielen, H. H. (A)
Tims, E. F. (A)
Tindall, H. D. (A)
Treece, M. A. (A)
Tsao, P. Y. S. (A)
Twombly, J. W. (A)
Upton, L. (A)
Vogel, E. H. (M)
Wendt, R. F. (A)
Young, A. E. (M)
Zehr, N. J. (SM)
Zurbriggen, J. H. (A)

Springfield (KC-5)
Baker, L. E. (A)
Bauer, F. (M)
Curry, W. F. (A)
Morwood, R. C. (A)
Payne, W. E. (A)
Trotter, C. E. (A)
Wheat, W. M. (A)

University City (SL-5)
Busch, M. A. (A)
Butler, J. G., Jr. (A)
Motchan, H. L. (A)
O'Hare, E. F. (SM)
Ross, D. K. (A)
Taylor, J. J. (A)

Webster Groves (SL-5)
Frazier, R. L. (M)
Keiser, B. E. (A)
Sigman, H. M. (M)
Smith, H. N. (M)

MONTANA

Billings
Kiichli, J. A. (M)
Lundquist, F. E. (A)

Bozeman (SEA-7)
Penwell, G. N. (A)
Seibel, R. C. (M)

Butte (SEA-7)
Kerns, R. L. (A)
McCourt, A. R. (A)

Fort Benton
Warden, R. H. (A)

Glendive (SEA-7
Corcoran, M. E. (A)

Great Falls (SEA-7)
Dawson, W. S. (A)
Johanson, E. H. (A)
Lopuch, A. J. (A)
Parker, J. E. (VA)

Havre (SEA-7)
Hiebert, R. P. (A)

Helena (SEA-7)
Hughes, E. A. (A)

Missoula
Coughlan, G. B. (A)
Taylor, A. S. (M)

Plentywood (SEA-7)
Cole, R. C. (A)

Wolf Point (SEA-7)
Vincent, L. P., Jr. (M)

NEBRASKA

Alliance
Klesner, J. L. (A)

Beatrice (OL-5)
Emerson, W. R. (A)

Bellevue (OL-5)
Hower, P. A. (M)

Bertrand
Norton, M. H. (A)

Broken Bow (OL-5)
Crawford, B. (A)
Risk, G. (A)

Grand Island (OL-5)
Lynch, U. L. (M)

Hastings (OL-5)
Allison, D. B. (A)
Bender, S. P. (A)
Watson, B. (A)

Hebron (OL-5)
Uphoff, R. D. (A)

Holdrege
Seide, J. H. (M)

Imperial
Karns, K. B. (A)

Kearney (OL-5)
Beshore, P. S. (VA)

Lincoln (OL-5)
Chamberlain, I. J. (A)
Church, A. K. (A)
Davis, B. E. (SM)
Hare, M. D. (M)
Hutton, W. I. (M)
Jensen, J. C. (SM)
Norris, F. W. (SM)
Robertson, A. J. L. (A)
Robison, W. C. (A)
Rook, C. W. (M)
Soderholm, L. H. (A)
Watson, G. W. (A)
Wight, V. H. (M)
Winkler, C. W. (VA)

McCook (OL-5)
Lenwell, L. W. (A)

Morrill (OL-5)
Campbell, W. O. (A)

North Platte (OL-5)
Griffin, D. C. (A)

Ogallala (OL-5)
Wiles, Q. T. (A)

Omaha (OL-5)
Bates, A. G. (M)
Becker, H. W. (M)
Borcher, E. J. (A)
Brown, M. H. (SM)
Curry, H. D. (M)
Flynn, G. (M)
Flyr, J. G. (A)
Garrigus, N. F. (A)
Hadsell, G. C. (M)
Israel, L. J. (M)
Jelinek, G. S. (A)
Kolar, A. (A)
Kotera, W. J. (VA)
Krogstad, M. O. (A)
McGowan, M. L. (M)
Nicholson, T. (M)
Peck, R. E. (A)
Poole, J. A. (A)
Ralls, R. H. (M)
Rogers, J. A. (A)
Rogers, W. M. (A)

Overton
Wycoff, K. H. (A)

Platte Center
Kluge, M. E. (A)

Ralston (OL-5)
Doll, C. L. (A)

Sutherland (OL-5)
Townsend, J. G. (M)

Weeping Water
Olive, D. W. (A)

NEVADA

Las Vegas (LA-7)
Le Von, M., Jr. (A)
Patten, R. B. (A)
Rugar, J., Jr. (M)
Wieland, C. W. (A)

Mercury
Adler, C. S. (A)

Reno (SAC-7)
Garrott, W. L. (A)
Sandorf, I. J. (SM)

Wells
Davis, D. A. (A)

NEW HAMPSHIRE

Bedford (BOS-1)
Forget, T. W. (M)

Brookline (BOS-1)
Sommers, D. J. (A)

Berlin (BOS-1)
Coulombe, J. N. (A)

Canterbury (BOS-1)
Grace, G. M. (M)

Chesham (BOS-1)
Struthers, F. W. (VA)

Concord (BOS-1)
Bartelink, E. H. B. (SM)
Cheney, E. A. (A)
Evans, C. B. (M)

Derry
Dollinger, K. (M)
Szczuka, S. J. (A)

Dover (BOS-1)
Boyle, D. A. (A)
Menefee, H. R. (A)
Mucher, G. J. (VA)
Youngblood, I. J. (A)

Durham (BOS-1)
Blanchard, F. A., Jr. (A)
Winn, A. L. (M)

East Lempster (BOS-1)
Heiser, W. W. (A)

East Rochester
Ashton, D. (A)

Exeter
Carbonneau, V. J. (A)

Francestown (BOS-1)
Bailey, A. B. (SM)

Goffstown (BOS-1)
Rust, W. F., Jr. (SM)

Gorham (BOS-1)
Works, A. R. (A)

Hampton (BOS-1)
Leoutsakos, G. N. (A)

Hanover
Curtis, H. W. (M)
Morgan, M. G. (SM)
Pratt, B. (A)

Lyme (BOS-1)
Johnson, G. L. (SM)
Wood, J. A., Jr. (SM)

Manchester (BOS-1)
Apostolos, T. (M)
Boulay, H. E. (A)
Castor, A. H. (A)
Chandler, V. H. (SM)
Halle, C. (A)
Spector, M. S. (A)
Tilton, D. S. (A)
Westlake, N. L., Jr. (A)
Wilkinson, H. W. (M)

Milford (BOS-1)
Romney, E. (A)

Nashua (BOS-1)
Blitz, D. (M)
Butler, J. L. (A)
Hawes, R. B. (A)
LeVan, J. D. (A)
Newson, E. G. (A)
Putnam, P. (A)
Rich, D. A. (A)
Sanders, R. C., Jr. (VA)

Portsmouth (BOS-1)
Heineman, J. T. (VA)
Lorenz, P. E. (A)
Molla, J. J. (A)
Schweizer, E. G. (M)

Windham (BOS-1)
Goulder, M. E. (A)

NEW JERSEY

Allendale (NY-2)
Havstad, H. (VA)
Richardson, C. M. (A)
Seburger, C., Jr. (A)

Allenhurst (NY-2)
Haddock, J. W. (A)
Lewis, H. M. (SM)

Allenwood (NY-2)
Silva, A. A. (M)

Allwood (NY-2)
Koch, S. J. (A)

Alpha (NY-2)
Schaefer, J. B. (SM)

Andover (NY-2)
Ostlund, E. M. (SM)

Arlington (NY-2)
Durie, J. C., Jr. (A)

Asbury Park (NY-2)
Acker, M. (A)
Bauer, P. S., Jr. (A)
Chaskin, H. (A)
Diebold, B. A. (M)
Dravneek, W. R. (M)
Eason, C. R. (A)
Eisenberger, A. J. (A)
Ercolino, M. D. (A)
Greer, W. R., Jr. (SM)
Jones, J. D. (M)
Lamorte, M. F. (A)
Lipman, N. (A)
Reilly, V. E. (M)
Resnick, A. (A)
Singer, E. M. (A)
Spergel, J. (A)
Steinberg, J. (A)
Stinehifer, H. E. (M)
Strasser, S. (A)
Trinkaus, B. B. (A)
Weitz, S. (A)
Wiener, A. (A)

Atlantic City (PHI-3)
Cogan, S. (A)

Atlantic Highlands (NY-2)
Barrett, L. C., Jr. (A)
Bremer, M. M. (A)
Broadwell, H. S. (A)
Durrer, J. H. (A)
Keen, H. J. (A)
Krinsky, S. S. (A)
Massey, W. F. (A)
Petersen, P. B. (M)
Rojak, F. A. (A)
Zuckerman, B. (A)

Audubon (PHI-3)
Beers, R. A. (SM)
Carrell, R. M. (A)
Fitzpatrick, A. G. (A)
Gerber, P. D. (VA)
Haining, L. E. (A)
Hsueh, C. Y. (A)
Jacobi, R. J. (A)
Klamo, A. E. (A)
Kozanowski, H. N. (SM)
Lewis, R. J. (SM)
Massari, J. P. (A)
McCollor, R. L. (M)
Perez, A. A. (A)
Perry, R. A. (A)
Perry, S. V. (VA)
Potts, J. B. (A)
Rolf, T. E. (M)
Ryan, V. F., Jr. (A)
Smalts, F. W. (VA)
Stasz, C. E. (M)
Wang, T. (A)

Avenel (PRI-3)
Felton, L. E. (M)
Hampshire, J. R. (A)
Shuskus, J. M. (A)

Avon (NY-2)
Cordray, R. E. (A)
Egley, T. H. (A)
Rothschild, M. (SM)

Baptistown (NY-2)
Schaaf, F. W. (A)

Barnegat (NY-2)
Morrison, J. G. (A)

Barrington (PHI-3)
Dickson, D. C., Jr. (A)
Fisher, C. D. (M)
McCulley, J. M. (A)
Murphy, J. J. (A)
Poorte, G. E. (A)
Wynne, J. J. (A)

Basking Ridge (PRI-3)
Farmer, W. B. (M)
Goddard, C. T. (SM)
Hasley, A. D. (SM)
Hull, R. W. (M)
Pentico, G. W. A. (M)
Power, D. W. (SM)

Bayonne (NY-2)
Demko, J. G. (A)
Eager, G. S., Jr. (A)
Hyman, L. T. (A)
Kessler, S. (A)
Kulik, V. A. (A)
Ledakowich, J. C. (A)
Mack, E. J. (A)
Panfile, P. A. (A)
Pfeffer, P. (M)
Richter, R. (A)
Rosenthal, S. W. (M)
Schnipper, A. (A)
Skibneski, C. E. (A)

Belford (NY-2)
Glendinning, W. B. (A)
Sposato, F. J. (A)

Bellemead (PRI-3)
Minks, F. A. (SM)

Belleville (NY-2)
Altman, H. (A)
Armstrong, T. R. (A)
Boyce, W. F. (A)
Edwards, K. A. (M)
Gallagher, P. (A)
Gallay, H. (M)
Gerard, W. A. (A)
Gruss, R. F. (A)
Jones, C. E., Jr. (A)
Kearney, J. J. (A)
Koch, H. J. (A)
LaMarca, P. J. (A)
Lange, J. R. (A)
Mock, W. C., Jr. (M)
Mumford, E. L. (A)
Rocloffs, E. H. (A)
Sherman, V. W. (SM)
Singer, F., Jr. (A)
Taylor, A. R. (A)
Taylor, I. R. (M)
Tutty, J. E. (A)
Wallace, F. C. (SM)
Warren, J. E. (M)
Winship, T., Jr. (A)

Belmar (NY-2)
Boxer, V. (M)
Gaither, L. E. (SM)
Gelernter, B. (A)
Jarema, E. D. (A)
Kampinsky, A. (A)
Kiely, D. J., Jr. (A)
Lee, A. S. J. (M)
Marzano, A. M. (A)
Owens, H. L. (M)
Shefters, S. (A)
Stepien, W. (A)
Stone, H. A. G. (A)
Stone, M. V. H. (A)
Townes, W. D. (A)
Wagner, H. M. (SM)
Wasserman, J. (A)

Bergenfield (NY-2)
Abend, I. J. (M)
Bright, T. F. (A)
Crawford, A. R. (A)
Curtis, R. W. (A)
Fee, D. R. (A)
Grube, W. O. (A)
Ham, D. L. (A)
Jones, M. E. (A)
Kerner, S. J. (A)
Meadow, S. (M)
Metzger, S. (SM)
Musselman, H. (A)
Pettigrew, A. F. (A)
Summerlin, W. O. (A)

Berlin (PHI-3)
Chasteen, J. W., Jr. (M)

Berkeley Heights (NY-2)
Anderson, J. R. (M)
Ferrar, R. C. (SM)
Quate, C. F. (A)
Shaffer, R. A. (A)
Shapiro, L. (A)

Bernardsville (PRI-3)
Schmid, E. R. (A)
Shomer, J. E. (A)
Tapley, T. E. (M)

Bloomfield (NY-2)
Ashbrook, J. M. (A)
Atkins, C. E. (SM)
Atwood, H., Jr. (M)
Baracket, A. J. (SM)
Bates, J. K., Jr. (A)
Bell, R. W. (A)
Berkowitz, M. D. (A)
Bliss, E. E. (A)
Brindley, H. H. (A)
Coon, C. E. (VA)
Crowley, J. F. (A)
Davis, R. C. (A)
De Rosa, L. A. (F)
De Ryder, H. (VA)
Dettman, M. C. (M)
Everett, L., Jr. (SM)
Garrahan, P. G. (A)
Gordon, R. F. (A)
Grandmont, P. E. (M)
Hansen, J. A. (A)
Hawk, W. H. (A)
Hayes, W. A. (M)
Heberling, W. W., Jr. (A)
Ivey, H. F. (SM)
Jarmick, R. J. (A)
Johnson, V. L. (A)
Kelso, R. J. (A)
Kimaman, G. W. (M)
Kling, N. (A)
Kreer, J. G., Jr. (SM)
Laitinen, M. W. (M)
Lederer, E. A. (SM)
McCarty, J. R. (A)
McNall, J. W. (SM)
Mead, R. (A)
Menne, R. S. (A)
Messinger, E. W. (A)
Mitchell, A. V. (A)
Mitchell, C. D. (SM)
Pike, D. E. (A)
Polkinghorn, F. A. (F)
Rhodes, H. A. (A)
Roberts, E. L. (A)
Saks, H. L. (A)
Schotland, R. M. (A)
Seldon, M. (A)

Sloan, F. M. (A)
Stephenson, H. L. (A)
Sturtevant, H. B., Jr. (A)
Taylor, H. P. (A)
Wallace, P. A. (A)
Wetzel, K. C. (A)
Widell, E. G. (SM)
Wood, G. R., Jr. (M)
Zelen, H. J. (A)
Zinmeister, W. J. (A)

Bloomingdale (NY-2)
Myhre, R. (A)
Vandervoort, A. (A)

Bogota (NY-2)
Gilcher, V. (A)

Boonton (NY-2)
Anderson, N. J. (A)
Braun, C. G. (A)
Christensen, H. (M)
Cook, L. (VA)
Daly, I. W. (A)
Daugherty, R. M. (SM)
Downsbrough, G. A. (A)
Drake, F. H. (SM)
Franks, C. J. (SM)
Hazlehurst, E. (VA)
Houlroyd, G. F. (A)
Hull, C. J. (A)
Hull, L. M. (F)
King, P. B., Jr. (SM)
Kruger, H. A. (A)
Mannik, G. (A)
March, P. S. (VA)
McCouch, G. P. (SM)
Minter, J. (VA)
Montcalm, S. R. (SM)
Newell, R. A. (A)
Paine, R. C. (SM)
Parkes, A. W., Jr. (SM)
Pittenger, A. W. (A)
Pittenger, R. C. (A)
Plahn, R. W. (A)
Redington, J. H. (SM)
Richardson, A. G. (SM)
Richardson, S. A. (A)
Selin, F. R. (A)
Urbach, K. (SM)
Van Beuren, J. M. (A)
Zavoda, J. P. (M)
Zayac, F. R. (A)

Bound Brook (PRI-3)
Brown, W. A. R. (A)
Gerhardt, G. E. (A)
Ginsberg, L. H. (A)
Romano, V. J. (A)
Uphoff, R. L. (A)

Bradley Beach (NY-2)
Blackwell, E. L. (A)
Brown, M. A. (A)
Caparn, C. (A)
Holtum, A. G., Jr. (M)
Levy, S. J. (SM)
Macallister, A., Jr. (A)
Rosmovsky, P. (M)

Breton Woods (NY-2)
Rottner, A. W. (A)

Bridgeton (NY-2)
Kingan, J. (A)

Brielle (NY-2)
Taylor, G. W. (A)

Brookside (NY-2)
Adams, E. W., Jr. (A)
Dean, F. C. (A)

Brown Mills (PHI-3)
Barton, C. H. (M)

Burlington (NY-2)
Dubrow, W. (A)

Caldwell (NY-2)
Folsom, W. A. (A)
Hotopp, A. H., Jr. (SM)
Hotopp, K. A. (A)
Janes, A. W. (A)
McBrair, H. C. (A)
Schoenbaum, J. R. (SM)
Sutherlin, L. (SM)
Vogel, W. H., Jr. (A)
Williams, W. J., Jr. (A)

Camden (PHI-3)
Adler, B. (A)
Auerbach, B. (A)
Bagby, C. K. (A)
Batsel, M. C. (F)
Baumgardner, E. W. (A)
Bieganski, W. J. (A)
Boenecke, C. A. (M)
Bonshock, S. N. (A)
Bowen, D. C. (A)
Bradshaw, G. V., Jr. (A)
Cantafie, L. J. (A)
Caron, E. J. (A)
Cimorelli, J. T. (SM)
Comninos, D. A. (A)
Cornell, J. A. (A)
Cramer, R. E., Jr. (M)
Crosby, D. R. (SM)
Davis, A. C. (M)
Dennis, J. (A)
Dibrell, J. W. (M)
Dickens, B. L. (A)
Dion, D. F. (A)
Di Paolo, L. M. (A)
Domin, F. J. (A)
Egan, J. F., Jr. (A)
Edwards, N. E. (M)
Feyerherm, M. P. (M)
Finkelstein, M. B. (M)
Foley, A. A. (A)
Fricke, R. H. (A)
Gola, A. S. (A)
Goldman, L., Jr. (M)
Gunther, C. A. (SM)
Har'el, A. (A)
Hasenberg, W. (SM)
Herbst, P. J. (F)
Howard, E. G. (A)
Howe, V. V. C. (A)
Hunt, C. M. (A)
Jacobowitz, H. (A)
Jones, L. F. (SM)
Katella, A. J. (A)
Keefe, J., Jr. (A)
Kettler, A. H. (SM)
Kidd, M. C. (SM)
Koch, W. R. (SM)
Kornfield, N. R. (A)
Koros, L. L. (SM)
Kreuzer, B. (M)
Lacy, W. H. (A)
Lauer, H. (A)
Lawton, R. S. (A)
Lewis, L. L. (M)
Libbey, R. L. (A)
Lippel, B. (A)
Luck, D. G. C. (F)
Maloff, I. G. (F)
Mandelkehr, M. M. (A)
McDermid, W. L. (A)
McNaughton, N. (M)
Metzger, G. V. (A)
Miller, E. H. (A)
Mintzer, A. I. (A)
Morton, H. W. (A)
Murdock, W. G. (A)
Nelson, R. A. (A)
Nikolayuk, N. (A)
North, G. R. (A)
Ossenbeck, F. J. (A)
Reade, R. B. (A)
Rosenberg, A. L., Jr. (A)
Rowe, H. C. (A)
Sands, W. F. (SM)
Smith, T. A. (SM)
Spencer, H. H. (A)
Stearns, G. W. (A)
Stott, H. B. (M)
Sullivan, T. P. (A)
Teasdale, R. D. (SM)
Trainer, M. A. (SM)
Trimble, J. E. (A)
Vilkomerson, B. S. (SM)
Walter, J. C. (SM)
Waters, G. B. (A)
Watts, W. W. (A)
Weiman, W. W. (A)
Wilson, R. E. (A)
Woldow, A. F. (A)
Woods, W. E. (A)

Caristadt (NY-2)
Hanft, K. E. (A)
Kaiser, A. W. (A)
Lowers, C. E. (SM)
Markosian, V. (SM)
Rabinowitz, J. (A)

Carteret (PRI-3)
Mazurek, F. (A)

Cedar Grove (NY-2)
Amos, B. (M)
Bossi, E. W. (A)
Bulkley, A. W. (M)
Coan, E. M. (A)
Cole, H. W. (M)
Eshelman, C. R. (A)
Gorss, C. G., Jr. (A)
Hartmann, J. C. (A)
Himmel, L. (SM)
Jones, D. M. (A)
Kelley, J. J. (A)
Kellom, B. K. (A)
Kramer, A. S. (SM)
Luongo, J. (A)
Moore, E. B. (M)
Olson, H. M. (M)
Reeves, E. H. (A)
Rennenkampf, L. J. (M)
Rickett, S. B. (A)
Sensenig, W. A. (A)
Shackelford, C. L. (SM)
Van Duyne, J. P. (A)
Weckwerth, H. A. (A)
Weitmann, O. (SM)
Whittle, R. L. (SM)

Chatham (NY-2)
Andrew, H. B. (A)
Babcock, W. C. (M)
Bobeck, A. H. (A)
Brewer, S. T. (A)
Bryant, N. W. (SM)
Closson, H. T. (A)
Cousins, V. M. (VA)
Duckworth, G. W. (M)
Felch, E. P. (F)
Filo, J. P. (A)
Fitzpatrick, C. A. (A)
French, H. N. (M)
Guenther, R. (M)
Hadley, A. M. (A)
Hensel, W. G. (VA)
Herud, E. C. (A)
Hillberg, E. A., Jr. (A)
Houghton, E. W. (SM)
Klesse, W. R. (M)
Koch, D. G. (A)
Moorehead, G. H. (VA)
Morrow, S. R. (A)
Peterson, A. C., Jr. (SM)
Pryslak, N. E. (SM)
Radcliffe, F. E. (A)
Rose, R. H., II (M)
Rupp, O. R. (A)
Simkins, Q. W. (A)
Smoot, A. W. (M)
Sproul, P. T. (SM)
Sweeny, C. P. (SM)
Taylor, P. H. (VA)
Thal, H. L., Jr. (A)
Underwood, M. D. (A)
Vaughan, H. E. (SM)
Wakefield, P. R. (A)
Wintringham, W. T. (F)
Wirsz, N. C. (A)
Wolf, D. A. (A)
Word, J. A. (SM)
Yocom, W. H. (A)

Chester (NY-2)
Hill, G. V. (A)
Hubbell, B. (M)
Seeley, R. M., Jr. (A)

Clayton (PHI-3)
Breitwieser, G. F. (A)

Cliffside Park (NY-2)
Koppl, W. J. (SM)
Lefebvre, R. E. (A)

Clifton (NY-2)
Alter, R. S. (A)
Anway, H. E. (A)
Arditi, M. (SM)
Arp, R. H. (A)
Ault, C. F. (M)
Battel, F. A. (A)
Bonvouloir, F. D. (A)
Brady, J. F. (SM)
Butler, E. W. (SM)
Campbell, E. J. (A)
Carow, W. M. (A)
Christaldi, P. S. (F)
Davidoff, F. (M)
Dolan, F. J. (A)
Elbert, C. H. (A)
Glomb, W. L. (A)
Gordon, J. P. (A)
Green, M. W. (M)
Hagen, G. D. (M)
Harrison, C. J. (SM)
Hayman, W. H. (A)
Herbin, L. (A)
Hobbs, J. (A)
Horvath, A. (SM)
Howard, R. C. (A)
Hval, H. N. (A)
Hylas, A. E. (A)
Jeans, J. R. (A)
Kass, J. S. (A)
Kern, G. A. (A)
Kret, D. B. (A)
Kucera, F. M. (A)
Lieberman, H. (A)
Linhardt, R. J. (M)
Mandzik, M. N. (A)
Mangaudis, R. A. (A)
Mihalik, J. J. (A)
Morris, A. E. (A)
Morrow, R. A. (A)
Murphy, G. G. (A)
Oswold, R. L. (A)
Pollack, L. (A)
Postal, R. H. (A)
Quinlan, D. E. (A)
Quintal, R. J. (A)
Reichert, W. G., Jr. (A)
Ronald, T. T. (A)
Santord, E. E. (A)
Schneiderman, M. (A)
Schreiner, S. M. (A)
Seidel, H. (A)
Snadyc, A. M. (A)
Snell, P. A. (M)
Solomon, K. (A)
Spiro, N. J. (A)
Stein, S. (A)
Stewart, J. A. (VA)
Von Hirsch, A. F. (A)
Wallace, R. P. (SM)
Wainwright, E. A., Jr. (A)
Williams, C. E. (M)

Clinton (PRI-3)
Tidd, E. D. (A)

Closter (NY-2)
Grenier, G. H. (M)
Grenier, T. B. (A)
Lawrence, R. J. (M)
Martin, S. J. (A)

Collingswood (PHI-3)
Ackerman, M. J. (VA)
Andrews, D. R. (M)
Aron, S. (A)
Aronson, A. I. (A)
Aurand, J. A. (A)
Beauchemin, A. K. (M)
Besel, H. W. (A)
Bothwell, T. P. (A)
Brotzman, E. S. (SM)
Buck, D. G. (M)
Burooiy, T. J. (A)
Casolaro, R. N. (A)
Chaney, W. G. (A)
Clark, E. L. (SM)
Coffin, B. E., Jr. (A)
Crawford, R. D. (A)
Cubbage, J. F. (A)
Cutter, H. H. (A)
Davis, C. E. (A)
Dehm, R. E. (A)
Duffin, J. D. (A)
Eiselein, J. E. (SM)
Endres, R. O. (M)
Erdman, R. G. (A)
Fabbioli, L. F. (A)
Facer, R. S. (A)
Farnett, E. C. (A)
Fast, H. (A)
Field, G. R. (A)
Fillebrown, S. M. (A)
Garabedian, H. B. (A)
Gilmore, J. P. (SM)
Gluyas, T. M., Jr. (SM)
Goodman, H. (A)
Goodrich, H. C. (SM)
Gray, R. K. (A)
Hans, M. F. (A)
Holshouser, J. R., Jr. (A)
Hurford, W. L. (VA)
Kolar, R. F. (A)
Kowal, A. (A)
Kreitzberg, S. B. (A)
Lewis, J. R. (A)
Lind, A. H. (A)
Matson, L. E., Jr. (A)
Meeker, W. F. (M)
Mertens, L. E. (A)
Muggleworth, J. C. (A)
Muoio, A. W. (A)
Neubauer, J. R. (M)
Olson, C. L. (A)
Paley, L. I. (A)
Pascalar, H. G. (A)
Pettengill, G. W. (M)
Phares, R. L. (A)
Phillips, L. B. (M)
Polk, C. (A)
Post, D. B. (A)
Ray, P. R. (A)
Roe, J. H. (SM)
Sable, J. D. (A)
Samartino, R. F. (A)
Schmitt, E. J. (A)
Selby, E. O. (VA)
Sheridan, E. W. (A)
Shoaf, J. R., II (SM)
Shoop, G. N. (A)
Skorup, G. E. (M)
Smith, J. N. (A)
Sobolewski, F. (A)
Stanger, L. (A)
Steen, S. P. (A)
Stupp, R. W. (VA)
Talmage, F. E. (SM)
Theiss, J. B. (A)
Thomson, D. N. (A)
Turner, A. H. (VA)
Van Niman, R. T. (M)
Welble, N. R. (VA)
Weidemann, R. F. (A)
Weise, D. S. (A)
White, R. J. (A)
Woodward, B. J. (VA)
Yin, H-B (A)

Coytesville (NY-2)
Smith, M. G. (A)

Cranbury (PRI-3)
Glaimo, E. C., Jr. (A)
Green, J. R. (M)
Lefkowitz, I. (A)
Moncrieff-Yeates, A. (M)
Morgan, J. M. (M)
Peter, R. W. (SM)
Shankweiler, R. G. (VA)

Cranford (NY-2)
Fu, C. (A)
Kitty, F. J. (M)
Low, R. C. (A)
Silverman, D. (A)
Smith, R. F. (A)
Sullivan, H. J. (M)
Taris, C. M. (A)
Woodruff, M. W. (M)

Crescent Park (NY-2)
Zusman, A. G. (A)

Cresskill (NY-2)
Langan, J. E. (A)
Smith, W. G. (A)
Stebbins, M. D. (A)
West, J. L. (A)

Deal (NY-2)
Bennett, H. S. (SM)
Klayton, M. H. (SM)

Delanco (PHI-3)
Potter, E. H. (SM)

Delawanna (NY-2)
LaPlant, W. P. (A)

Demarest (NY-2)
Foster, J. D. (M)

Denville (NY-2)
Backer, L. A. (VA)
Eells, M. M. (SM)
Gilbert, E. A. (M)
Mindes, A. S. (A)
Molloy, C. T. (SM)
Porter, E. A. (A)
Renwick, E. B., Jr. (M)
Sanderson, A. E. (A)
Vanek, L. J. (VA)
Zieger, J. A. (A)

Dover (NY-2)
Benson, R. K. (A)
Harris, J. R. (M)
McCrory, J. R. (A)
Moss, A. M. (A)
Waxler, D. (A)
Widenor, P. E., Jr. (A)

Dumont (NY-2)
Apfel, G. J. (A)
Hammond, M. L. (A)
Normando, N. J. (A)
Schwerin, P. (SM)
Strain, M. (A)
Sundberg, A. (A)

Dunellen (PRI-3)
Helenek, A. R. (A)
Lamphear, G. (A)
Lautenberger, H. W. (A)

East Keansburg (NY-2)
Narze, J. S. (A)

East Orange (NY-2)
Arnts, F. D., Jr. (A)
Aster, A. K. (A)
Bartels, R. H. (A)
Bartholomew, C., Jr. (A)
Blake, R. E. (A)
Bondy, M. (A)
Cagle, B. B. (A)
Cameron, J. A. (A)
Conrad, T. E., Jr. (M)
Coonce, H. E. (A)
Crooke, A. W. (A)
Di Sciullo, E. V. (A)
Fleisher, M. O. (A)
Forrer, M. P. (A)
Foster, R. M. (SM)
Foyer, D. R. (A)
Gawler, H. C. (SM)
Geiss, G. K., Jr. (A)
Gilleo, M. A. (A)
Halline, E. G. (A)
Hess, R. C. (M)
Jeffers, N. L. (SM)
Jensen, T. F. (A)
Keim, F. J., Jr. (A)
Kendall, B. W. (SM)
Kleppinger, R. E. (M)
Knight, M. B. (M)
Laube, O. T. (VA)
Lindon, J. (A)
Macalpine, W. W. (SM)
Magee, T. T. (A)
Marshall, B. O. (A)
McCarroll, A. K. (A)
McCarroll, J. F., Jr. (A)
Meadows, H. R. (A)
Meyers, S. T. (SM)
Mitchell, J. K. (SM)
Newman, R. J. (SM)
Nickless, W. H. (A)
Powers, S. J. (M)
Petruzzelli, R. T. (A)
Ruston, J. (M)
Sandretto, P. C. (SM)
Sanger, D. M. (A)
Schoenberger, W. J. (SM)
Seebald, H. A. (A)
Siekanowicz, W. W. (A)
Smith, H. H. (M)

Spencer, M. C. (VA)
Sussman, E. B. (M)
Vaccaro, F. E. (A)
Waskiewicz, L. R. (A)

East Paterson (NY-2)
Ariessohn, E. R. (M)
Canty, E. T. (A)
Earnshaw, E. F., Jr. (A)
Heiser, W. H. (A)
Hesse, H. R. (M)
Hoffman, P., Jr. (A)
Judge, W. J. (A)
Maron, M. (M)
Masonson, M. (A)
Reiner, A. (A)
Rollman, R. F. (M)
Spector, B. (A)
Tissot, T. P., Jr. (M)
Williams, R. J. (A)
Wolfish, H. H. (A)
Zitovsky, S. A. (A)

East Rutherford (NY-2)
Kesgen, E. W. (M)
Skalski, W. A. (A)
Star, M. (A)

Eatontown (NY-2)
Abeyta, L. (A)
Albright, A. R. G. (M)
Barton, D. K. (A)
Caffery, J. V., Jr. (A)
Caldwell, W. O. (SM)
Dixon, L. F. (A)
Epstein, G. S. (A)
Friend, H. C. (A)
Gaskell, R. J. (A)
Gikow, E. (A)
Graham, R., Jr. (A)
Harmuth, H. F. (M)
Heilein, J. V. (A)
Hodson, L. M. (M)
Kesselman, W. A. (A)
Lending, R. D. (A)
Meijer, R. R. (SM)
Menzel, H. W. (A)
Occhiogrosso, T. (M)
Scheier, L. (A)
Schwartz, A. J. (A)
Shannahan, J. C. (M)
Weil, D. S. (A)

Elberon (NY-2)
Bady, I. (A)
Berger, R. M. (SM)
Betts, P. H. (SM)
Blum, M. S. (A)
Cavenaugh, D. E. (A)
Doxey, W. L. (M)
Gerber, E. A. (A)
Gould, W. B., III (A)
Hatkin, L. (A)
Lundy, C. (SM)
Malkin, S. (VA)
Moss, H. (A)
Prichard, A. C. (SM)
Schafer, J. P. (SM)
Sussdorf, R. R. (M)
Tanzman, H. D. (A)
Trauben, W. (A)
Woodworth, J. D. (A)
Wynne, W. M. (VA)

Elizabeth (NY-2)
Abrahamovsky, J. J. (A)
Barr, F. M. (A)
Blaisdell, W. C. (SM)
Bronstein, N. (A)
Frank, L. H. (A)
Green, L. N. (A)
Greenberg, N. S. (A)
Harkins, P. B. (SM)
Hold, H. W. (A)
Immen, G. H. (M)
Jakub, J. J. (A)
Lo, A. W. (A)
Madonia, T. S. (A)
Medway, A. D. (A)
Nelson, D. E. (M)
Pecing, R. G. (A)
Pedersen, F. C. (A)
Peterson, T. A., Jr. (M)
Ruscus, P. V. (A)
Scature, C. (A)
Singer, C. H. (SM)
Stubbe, R. R. (M)
Verdibello, A. A. (A)
Walsh, L. (VA)

Emerson (NY-2)
Dorney, P. E. (M)
Handelman, S. M. (A)
Solow, S. (A)

Englewood (NY-2)
Anick, G. (A)
Dern, H. (A)
Dunn, R. H. (A)
Elders, D. S. (A)
Hillman, L. (M)
Karlan, J. H. (A)
Kuehn, R. L. (M)
Maher, T. P. (A)
Saliba, G. J. (SM)
Thomas, E. R. (VA)
Tucker, W. J., Jr. (M)

Englewood Cliffs (NY-2)
Savory, W. A. (M)

Erlton (PHI-3)
Lindenberg, E. C. (A)
Mechler, E. A. (SM)
More, C. C. (VA)
Mullen, C. V. (A)

Essex Fells (NY-2)
Henneberger, T. C., Jr. (A)
Knoop, W. A., Jr. (M)

Fair Haven (NY-2)
Chappell, J. F. (A)
Corkran, D. H. (M)
Davis, D. P. (A)
Fast, S. (A)
Fox, K. H. (SM)
Hanley, J. F. (VA)
Hessel, J. (F)
Kolar, E. F. (SM)
Lang, L. M. (SM)
Lartaud, H. R. (SM)
Ohl, R. S. (SM)
Puzio, P. S. (A)
Russell, W. J., Jr. (A)
Triolo, F. J. (M)
Van Deusen, G. L. (SM)
Young, J. A., Jr. (A)
Zahl, H. A. (F)

Fairlawn (NY-2)
Bary, V. (A)
Bawer, L. I. (M)
Benjamin, F. (M)
Blumkin, R. (A)
Bond, L. (M)
Bradburd, E. (A)
Bradford, D. C. (A)
Brodsky, J. L. (A)
Carlin, B. (A)
Cooper, B. (A)
Diepeveen, N. (A)
Fischer, L. O. (VA)
Franz, K. A. (A)
Gaines, R. I. (A)
Gulack, J. G. (A)
Hill, E. (VA)
Hoberman, M. J. (A)
Kaylin, R. R. (M)
Kuhn, R. W. (A)
Kuras, H. F. (A)
Lafferty, R. E. (M)
Mansberg, H. (A)
Moroze, M. W. (M)
Moskowitz, S. (M)
Perry, M. A. (A)
Petruska, P. C. (A)
Perry, M. A. (A)
Petruska, P. C. (A)
Priest, R. B. (A)
Rizzo, J. E. (A)
Rosett, E. (A)
Sachs, H. S. (A)
Scarr, H. F. (SM)
Schacher, D. L. (A)
Schwartz, E. I. (A)
Spector, M. (A)
Stein, E. (A)
Troast, W. H. (A)
Zerkin, M. (A)

Fairview (NY-2)
Maurice, J. M. (A)
Pattanaro, B. A. (A)

Fanwood (NY-2)
Hower, M. M. (A)
Rogers, D. H. (A)

Farmingdale (NY-2)
Burke, M. H. (A)
Rock, F. E. (A)

Fayson Lakes (NY-2)
Huettner, O. A. (M)

Flanders (NY-2)
Johnson, J. R. (M)

Flemington (PRI-3)
Hoffmann, K. G. (A)

Florham Park (NY-2)
Bachman, W. J. (SM)
Brunson, R. A. (M)
Littell, J. G. (M)
Sullivan, M. V. (A)

Fords (PRI-3)
Gumbs, J. (A)
Sulzer, R. F. (A)

Fort Dix (PRI-3)
Poss, E. (A)
Shock, W. R. (A)

Fort Lee (NY-2)
Bird, E. H. (A)
Davies, R. J. (A)
Frisch, F. W. (A)
Gannett, E. K. (A)
Grant, M. S. (A)
Marcus, J. A. (A)
Morrow, H. W. (M)
Moses, K. (A)
Neu, W. J. (A)
Rubino, J. W. (A)
Stansfield, F. H. (A)
Stromwall, C. W. (VA)
White, L. E. (A)

Fort Monmouth (NY-2)
Backman, F. F. (A)
Barnett, F. M., Jr. (A)
Barrow, D. M. (A)
Bernard, J. T. (A)
Bond, F. E. (M)
Brazee, G. (SM)
Burns, R. O. (SM)
Corum, D. R. (A)
Crissman, P. C. (A)
Dickson, F. H. (A)
Flowers, R. B., Jr. (A)
Foster, F. N. (A)
Guest, W. T. (SM)
Hall, W. W., Jr. (M)
Hieken, C. (A)
Hyde, N. E. (M)
Jack, R. W. (A)
Justus, J. R. (A)
King, C. J., Jr. (SM)
Langs, D. W. (A)
Lechner, R. J. (A)
Linder, R. P. (A)
Long, E. D. (A)
Mann, J. R. (A)
McLaughlin, W. J. (A)
McNall, J. F. (A)
Moseman, P. (A)
Nash, H. (A)
Pederson, J. A. (A)
Perkins, O. D. (SM)
Schmidt, M. A. (A)
Stern, D. M. (A)
Timmerman, F. (M)
Van Harlingen, W. (SM)

Franklin Lakes (NY-2)
Piccoli, P. E. (A)
Pulchlopek, M. P. (A)

Freehold (NY-2)
Bastian, C. W. (A)
Buck, D. T. (A)
Hersh, H. J. (SM)
Katz, S. (A)
Lawn, F. (A)
Pochmerski, D. (A)
Quinn, W. H. (A)

Frenchtown (PRI-3)
Powell, J. A. (M)

Garfield (NY-2)
Di Stadio, D. (A)
Godlewski, L. J. (A)
Sudia, A. T. (A)

Gillette (NY-2)
Kannenberg, W. F. (SM)
Rystedt, T. (M)

Glassboro (PHI-3)
Deml, A. J. (A)
Wittenburg, C. W. (A)

Glendora (PHI-3)
Galopin, A. (A)

Glen Ridge (NY-2)
Bagnall, V. B. (SM)
Brubaker, P. M. (A)
Dorff, L. A. (SM)
Hall, R. E. (VA)
Heinzerling, E. W. (A)
Higley, R. J. (A)
Hoffman, R. B. (SM)
Hopgood, R. C. (A)
Kirchner, K. F. (SM)
Laport, E. A. (F)
Olsen, E. U. (VA)
Reveal, P. A. (M)
Ritter, E. W. (SM)
Schenck, A. K. (M)
Seidler, R. L. (A)
Tambling, R. L. (A)
Wilson, C. R. (A)

Glen Rock (NY-2)
Abrams, I. (A)
Becken, E. D. (M)
Browne, R. (A)
Clark, L. E. (VA)
Fischer, L. G. (SM)
Lukas, W. (A)
Ringer, R. L., Jr. (M)
Sanger, R. B. (A)

Gloucester (PHI-3)
Barger, J. R. (A)
Bertrand, W. T. (A)
Cornet, E. (M)
Daiber, E. M. (A)
Day, J. B. (A)
Feibel, R. L. (M)
Lee, D. N. (A)
King, W. F. (A)
Nielson, B. M. (A)
Plaut, A. S. (A)
Reed, P. B. (M)
Saeger, W. (A)

Great Notch (NY-2)
Affelder, C. (M)
Berkley, C. (A)
Godley, P. F., Jr. (A)
Mathis, G. (M)
Shaw, J. L. (SM)

Hackensack (NY-2)
Cortizas, A. P. (A)
Elwell, H. G., Jr. (A)
Feoranz, F. J. (A)
Kunnes, H. (A)
Liguori, A. (A)
Lupo, F. J. (A)
Marsten, R. B. (SM)
McKenzie, A. A. (SM)
Reed, S. I. (A)
Schentes, M. J. (A)
Wylde, W. N. (M)

Hackettstown
Dinzl, R. A. (A)
Ebersol, E. T., Jr. (M)
Ouellette, L. A. (A)
Wertman, R. C. (M)

Haddonfield (PHI-3)
Achenbach, J. D. (A)
Anlage, J. J. (A)
Armbruster, G. J. (A)
Bailey, R. E. (M)
Baker, R. H. (A)
Beard, A. D. (A)
Beers, G. L. (F)
Benner, A. H. (M)
Benner, R. H. (SM)
Blodgett, E. D. (SM)
Boerner, T. J. (SM)
Boyd, E. A. (A)
Braddock, E. (M)
Brandt, M. M. (M)
Brock, F. M. (A)
Brown, L. (M)
Buchanan, J. M. (A)
Bullock, J. B. (M)
Busby, J. W. (A)
Chien, K. L. (A)
Chittick, K. A. (F)
Cochran, S. W. (SM)
Cole, D. D. (SM)
Coleman, J. B. (F)
Cooper, H. V. (A)
Corrington, M. S. (SM)
Covely, F. D., III (SM)
Cunningham, O. B. (SM)
Dennison, R. C. (A)
Denton, B. E. (SM)
Deuitch, D. E. (A)
Dewitt, C. C. (A)
Douma, T. (A)
Drenick, R. (SM)
Durwell, R. S. (A)
Easter, F. C. (A)
Ehrich, W. G. (A)
Estey, H. E. (A)
Falkowitz, M. (A)
Felix, E. H. (SM)
Fitzgerald, T. J., Jr. (A)
Flodman, L. G. (SM)
Forbes, E. J. (A)
Fujii, W. M. (A)
Garcia, A. (A)
Garden, M. (A)
Gavinski, V. A. (A)
Gehman, J. B. (M)
Gerlach, R. K. (A)
Gloystein, E. E. (A)
Gray, F. D. (M)
Guerber, H. P. (A)
Guhn, J. R. (A)
Hall, J. R. (A)
Harris, W. A. (A)
Haynes, H. E. (M)
Heibig, W. A. (A)
Herrmann, F. J. (SM)
Hobbs, L. C. (A)
Hochman, D. (A)
Hoffman, W. H. (M)
Horowitz, L. A. (M)
Howery, R. W. (A)
Hubbard, B. L. (VA)
Iahnuzzi, W. P. (A)
Joffe, I. (A)
Johnson, E. O. (SM)
Kalkman, E. C. (A)
Kelly, G. E. (A)
Kennedy, C. J. (A)
Kerfoot, B. P., Jr. (A)
King, R. E. (A)
Kirkwood, L. R. (SM)
Klamo, A. E. (A)
Lapidos, R. W. (A)
Lasby, R. O. (A)
Love, J. E. (VA)
Luddy, E. N. (M)
Lundgren, D. L. (A)
Lyndon, W. L. (SM)
Mahler, J. (A)
Maron, I. (A)
Mathwich, H. R. (A)
McCoy, J. F. (A)
McGaughey, P. C. (M)
Meisenheimer, R. L. (SM)
Moule, W. N. (A)
Murakami, T. (M)
Nasitano, A. C. (A)
Newton, I. T., Jr. (SM)
Nicholson, B. E. (M)
Nishimura, G. H. (A)
Ohler, A. E. (A)
Peterson, C. E. (A)
Pochls, V. J. (A)
Poucel, W. H. (A)
Pratt, D. (VA)
Pritchard, E. M. (SM)
Pyle, M. O. (A)
Ridgely, N. R., Jr. (A)
Robinson, J. E. (A)
Rose, H. E. (A)
Ross, G. T. (A)
Rudd, R. B. (A)
Rudner, M. A. (SM)
Schrader, H. J. (SM)
Scott, C. H., Jr. (A)
Scull, W. E., Jr. (M)
Shapiro, L. (M)
Sheetman, N. (A)
Shively, E. H. (A)
Sonnenfeldt, R. W. (SM)
Spielberg, A. M. (A)
Staras, H. (SM)
Starner, C. J. (A)
Stone, F. B. (SM)
Strickland, K. T. (A)
Sublette, I. H. (A)
Sullivan, J. L. (A)
Sutherland, E. F. (A)
Taylor, D. M. (A)
Taylor, J. P. (A)
Timms, A. S. (A)
Trouant, V. E. (SM)
Turner, R. R. (M)
Underwood, J. F. (M)
Waldauer, F. D. (A)
Wallace, H. L. (A)
Watson, S. H. (SM)
Weiss, M. V. (M)
Welsh, R. R. (SM)
Welsher, C. E. (VA)
Wentworth, J. W. (A)
Wetzel, L. D. (A)
Wheeler, B. F. (SM)
Widmann, F. W. (A)
Willman, R. C. (SM)
Wolf, L. J. (SM)

Haddon Heights (PHI-3)
Aitel, M. L. (A)
Boehm, P. P. (A)
Carlson, D. J. (A)
Darnell, W. E. (SM)
Derenbecher, W. J., Jr. (A)
Eulo, G. R. (M)
Ferber, L. W. (A)
Franke, J. L. (SM)
Goodman, G. H. (SM)
Gunter, D. L. (M)
Hartmann, H. (A)
Kolesnik, M. (A)
Latham, N. D. (A)
McDonald, J. E. (A)
McMorrow, C. F. (A)
Moore, E. E. (A)
Pan, W. Y. (SM)
Parker, J. R. (A)
Perry, R. P. (A)
Renfrow, R. J. (A)
Roys, H. E. (SM)
Solomon, K. (A)
Stanko, E. (SM)
Williamson, W. H., Jr. (A)
Wolcott, R. G. (M)
Woll, H. J. (M)

Hainesburg (NY-2)
Bird, H. H. (A)

Haledon (NY-2)
Heller, K. A. (A)
Petersen, H. J. (A)

Hamburg (NY-2)
O'Brien, J. F. (A)
Tomey, J. G. (M)

Hammonton (PHI-3)
Campanella, M. J. (A)
Reber, P. W. (A)

Harrington (NY-2)
McElroy, G. E. (M)

Harrison (NY-2)
Arams, F. R. (A)
Barton, R. H. (A)
Bertin, E. P. (M)
Bitinas, J. (A)
Brown, B. B. (A)
Burnap, R. S. (F)

Burnett, C. E. (SM)
Collins, R. M. (A)
Dusault, R. A., Jr. (A)
Eberly, H. L. (SM)
Freedman, N. S. (SM)
Hirlinger, J. F. (SM)
James, W. M. (SM)
Kelly, R. L. (SM)
McElwee, E. M. (SM)
McLaughlin, K. M. (SM)
Nelson, R. E. (M)
Perkins, T. B. (M)
Poch, S. (M)
Rose, G. M., Jr. (SM)
Shaw, G. R. (F)
Talpey, R. G. (SM)
Ulrey, D. (F)

Harbourton (PRI-3)
Reed, R. D. (A)

Hasbrouck Heights (NY-2)
Goldberg, S. R. (A)
Green, N. H. (A)
Hamlin, J. C. (A)
Henry, R. F. (A)
Kiebert, M. V., Jr. (SM)
Weiner, M. J. (VA)
Zablocky, G. W. (A)

Haskell (NY-2)
Ryan, H. J. (M)

Haworth (NY-2)
Guy, R. F. (F)
Osborn, P. H. (VA)

Hawthorne (NY-2)
Fellows, E. T. (A)
Kross, V. (A)
Philpott, L. R. (SM)

Hazlet
Harries, W. (M)
Morley, A. R. (A)

Hewitt (NY-2)
White, R. E. (SM)

Highland Park (PHI-3)
Andreasen, I. (A)
Braun, M. (A)
Cooper, P. W. (A)
Darling, D. C. (A)
Hensperger, E. S. (A)
Molony, D. A. (A)

Highlands
Weiss, R. A. (SM)

Hillsdale (NY-2)
Marchand, O. P. (A)
Marriner, A. W. (A)
Marsh, C. O., Jr. (A)
Volger, W. A. (A)

Hillside (NY-2)
Irwin, R. P. (M)
Kahant, C. G. (A)
Repac, R. (A)

Hi-Nella (PHI-3)
Perzley, W. (A)

Hoboken
Merrill, L. L. (SM)
Neitzert, C. (A)
Simberkoff, J. A. (A)
Simberkoff, S. W. (A)

Hohokus (NY-2)
Baird, C. W. (A)
Markus, J. (M)
Saul, E. R. (A)
Spaulding, H. K. (A)

Holmdel (NY-2)
De Lange, O. E. (A)

Hopewell
Drake, J. B., IV (A)
Thompson, J. A. (A)

Hudson Heights (NY-2)
Zeier, A. J. (A)

Interlaken
Todd, W. (M)

Irvington (NY-2)
Albanese, D. F. (A)
Andrews, J. L. (A)
Andrews, R. J. (A)
Bizon, M. J. (A)
Blake, J. T. (A)
Bosch, C. (A)
Caspar, C. W., Jr. (A)
Colehower, C. H., Jr. (M)
Drexler, J. (A)
Forrest, L. (A)
Goldshine, A. D. (A)
Kosmaczewski, I. (A)
Levine, S. (M)
Mommo, E. J. (VA)
Nesselroth, M. D. (A)
Osganna, J. F., Jr. (A)
Rosenbluth, M. L. (A)
Roth, M. (A)
Sauer, H. (A)
Stiles, M. G. (A)
Wolfe, R. M. (A)
Zablocki, H. S. (A)
Zaepfel, C. G. (A)
Zmuda, E. J. (A)

Iselin (PRI-3)
Austin, F. H. (A)
Bennett, F. K. (A)
Bentivegna, M. J. (A)
Kaplan, M. (A)

Jamesburg (PRI-3)
Brown, V. L. (A)

Jersey City (NY-2)
Allen, R. J. (A)
Balter, L. (M)
Brogan, J. M. (A)
Clark, H. R. (A)
Deichert, R. W. (A)
De La Parra, A. E. (A)
Deskur, K. J. (A)
Dzula, G. (A)
Genser, A. (A)
Gildart, L. W. (A)
Haugk, G. (A)
Ittleson, J. S. (A)
Keane, J. E. (A)
Kovarik, H. (A)
Leslie, F. (VA)
Lindner, N. J. (A)
Loiterman, L. (A)
Motsek, M. (A)
Ockene, N. J. (A)
Putt, D. R. (A)
Regueiro, W. R. (A)
Scherzer, K. (A)
Schwarzschild, B. (A)
Smith, W. M. (VA)
Wiack, R. J. (A)
Wormcke, W. (M)
Zelinski, A. (A)

Keansburg (NY-2)
Longo, J. F. (A)

Kearny (NY-2)
Bondon, L. A. (SM)
Brady, J. F. (SM)
Eng, J. W. (A)
Gillies, W. (A)
Helwig, W. J. (A)
Kaczynski, R. F. (A)
Koblenz, A. M. (A)
Laikevich, A. (A)
Lewis, R. F. (A)
Nordahl, J. G. (SM)
Pearson, D. B. (M)
Percival, W. R. (M)
White, H. R. (M)

Kenilworth
Osburn, C. M. (M)

Keyport (NY-2)
Baumann, D. A. (A)
Blumberg, L. (A)
Ellis, B. E. (A)
Gutleber, F. S. (A)
Schlaak, N. F. (SM)

Lake Hiawatha (NY-2)
Bremer, H. A. (VA)
Stone, S. A. (A)
Townsend, W. A. (A)

Lake Parisspany
Nasto, S. N. J. (A)

Lakewood (NY-2)
Cobleuz, A. (SM)
Drukaroff, I. (A)
Lipetz, N. (A)
Mangold, E. T. (A)

Landing (NY-2)
Grissler, H. W. (M)

Laurelton (NY-2)
Pramshefer, T. W. (A)
Vorwerk, F. A. (A)

Lawrenceville
Kihn, H. (SM)

Leonia (NY-2)
Ackerman, B. F., Jr. (A)
Burger, F. J. (A)
Christie, F. W. (A)
Dietsch, C. G. (SM)
Gonzalez, V. M. (A)
Hetzel, G. L. (A)
Kennedy, T. R., Jr. (SM)
Sargeant, C. E. (VA)
Schild, P. (A)
Tenenbaum, E. (A)
Watson, W. J. (A)

Lincoln Park (NY-2)
Keefe, O. A. (A)
Lewis, W. H. (A)

Linden (NY-2)
Braun, L. (A)
Franklin, R. M. (A)
Jordan, C. J. (A)
Kardauskas, E. (A)
Rice, L. S. (A)
Riley, G. B. (A)

Little Falls (NY-2)
Bluhm, R. W. (A)
Brown, A. R. (A)
Goldman, H. (A)
Kocan, J. (A)
Morris, G. F. (A)
Nord, H. H. (M)
Pacini, H. P. (M)
Pellock, J. (A)
Talamini, A., Jr. (SM)
Tate, R. (A)

Little Ferry (NY-2)
Gambuti, P. F. (A)
Gartner, J. J. (M)
Rosenberg, A. (A)
Zabransky, E. (A)

Little Silver (NY-2)
Borgeson, C. A. (SM)
Bracken, J. R. (A)
Brueckmann, H. L. (SM)
Butler, H. (M)
Craig, L. H. (SM)
Cushman, J. K. (A)
Garoff, K. (A)
Harrison, D. J. H. (A)
Havel, J. M. (M)
Huebner, D. L. (M)
Jensen, A. M. (M)
Kent, C. E. (A)
Kilgore, G. R. (SM)
King, H. D. (A)
Klenk, L. M. (SM)
Lowry, L. R. (SM)
Mack, A. (A)
Marks, W. S., Jr. (F)
Meyer, H. F. (SM)
Miller, L. (SM)
Mond, L. I. (VA)
Morris, M. M. (SM)
Novick, G. (A)
Pick, L. A. (A)
Poteet, D. P. (VA)
Senn, G. F. (SM)
Sharp, C. E. (A)
Shive, S. L. (SM)

Livingston (NY-2)
Bishop, J. B. (SM)
Bunt, E. N. (A)
Crofts, C. B. (A)
Galanty, H. (A)
Gifford, J. S. (A)
Gray, G. E. (A)
Meirer, W. L. (VA)
Mennie, J. H. (M)
Plouffe, R. L. (A)
Prawdzik, C. A. (M)
Rudensey, M. B. (M)
Safford, F. J. (SM)
Stone, S. A. (A)
Ussery, P. W. (A)

Locust (NY-2)
Massell, E. (M)

Lodi (NY-2)
Constantin, L. L. (M)
Hagmann, N. (VA)
Lappin, D. (A)
Meyer, R. W. (A)
Urbry, L. E., Jr. (A)

Long Branch (NY-2)
Alston, W. H. (A)
Anderson, B. S. (SM)
Arons, E. L. (A)
Barr, H. (A)
Bassler, S. G. (M)
Benanti, M. A. (A)
Berman, G. (A)
Bledsoe, A. G. (A)
Bradley, T. D. (A)
Breckman, J. N. (A)
Brown, A. (SM)
Bryan, J. F. (A)
Burkhard, H. F. (A)
Chernow, M. (M)
Coleman, A. H. (A)
Davis, H. (M)
Davis, S. (M)
Doughty, S. D. (A)
Ducore, H. (M)
Dwin, D. (A)
Gordon, L. L. (M)
Goubau, G. J. E. (A)
Greenspan, S. (A)
Grubman, S. (M)
Gubin, L. L. (A)
Guttwein, G. K. (A)
Hamer, H. (A)
Hosemann, J. H. (A)
Insterman, H. E. (VA)
Jacoby, D. L. (M)
Jakubowski, G. C. (A)
Knapp, R. L. (A)
Kullback, I. (A)
Lippel, B. (A)
Maddox, R. G. (M)
Martin, J. R. (A)
Marx, D. H. (A)
McKinley, R., Jr. (A)
Mencher, H. (A)
Picus, F. (A)
Ragsdale, R. G., Jr. (A)
Reder, F. H. (A)
Russell, W. D. (A)
Sandoval, J. (A)
Schach, S. (A)
Search, R. W. (A)
Shirley, T. L. (A)
Skobel, M. (SM)
Thompson, J. R. (A)
Tomaini, F. J. (M)
Vieweger, A. L. (SM)
Weaver, M. W. (A)
Weinstock, M. (A)
Williams, H. P. (A)
Winters, A. L. (A)
Young, H. D. (A)
Ziller, M. A. (A)

Lyndhufst (NY-S)
Friberg, V. (A)
Gilmore, A. C., Jr. (A)
Gilroy, R. B. (A)
Horbach, S. (M)
Hughes, M. J. (M)
Robinson, G. D. (A)
Van Kody, H. (A)

Madison (NY-2)
Baker, H. W., Jr. (M)
Barney, H. L. (SM)
Carter, H. T. (M)
Clark, O. (M)
D'Heedene, A. R. (SM)
Dimock, P. V. (SM)
Ebert, D. H. (A)
Ellis, B. T., Jr. (SM)
Harris, S. (A)
Howard, E. J. (SM)
Kenyon, R. R. (A)
Livera, A. L. (M)
Marble, F. (SM)
Neunzig, R. C. (A)
Nowell, R. E. (A)
Phillips, W. E., Jr. (M)
Roetken, A. A. (F)
Ross, A. T. (SM)
Ruckelshaus, J. G. (SM)
Schmied, J. W. (VA)
Skellet, A. M. (SM)
Smith, J. W. (SM)
Swain, R. G. (A)
Thomas, B. J. (M)
Thompson, C. F. (A)
Ulrich, V. K. (SM)
Vogelsong, J. H. (M)
Wilson, L. M. (A)

Magnolia (PHI-3)
Foley, T. U. (A)

Mahwah (NY-2)
Boffo, A. P. (A)
Constantine, P. M. (A)
Eslinger, R. L. (A)
Sielski, A. T. (A)

Manasquan (NY-2)
Bedrosian, S. D. (A)
Botha, D. G. (A)
Cline, D. E. (M)
Gibbons, D. R. (VA)
Meyerson, M. (A)
Nelson, E. I. (F)
Schor, H. (M)
Wagner, R. L. (A)

Manasquan Beach (NY-2)
Baganz, A. (A)

Manville (PRI-3)
Pontus, A. M. (M)

Maple Shade (PHI-3)
Davis, J. T. (A)
Griffith, B. D. (A)
Kerk, C. T. (A)
Smith, V. J. (A)
Warren, M. V. (A)

Maplewood (NY-2)
Alexander, A. A. (A)
Bahrs, R. D. (A)
Bailey, B. (A)
Barkley, H. F. (VA)
Bosshart, R. F. (A)
Carpenter, L. B. (A)
Coachman, J. E. (A)
Cunningham, F. W. (SM)
Dickey, D. W. (M)
Gruenberg, H. S. (A)
Hankinson, F. K. (A)
Hazeltine, A. L. (F)
Hemmer, F. A., Jr. (A)
Humphrey, H. C. (VA)
Johnson, J. B. (F)
Moon, R. B. (A)
Prosser, T. C. (A)
Pruden, H. M. (SM)
Schaffer, M. J. (A)
Sippach, F. W. (A)
Vance, H. C. (SM)
Worne, B. E. (M)
Youngstrom, N. C. (VA)

Margate City (PHI-3)
Thron, B. K. (M)

Marlboro (NY-2)
Bernard, J. L., Jr. (VA)

Marlton
Thowless, E. A. (A)

Marawan (NY-2)
Chartoff, M. (A)
Dix, T. S., Jr. (SM)
Fisher, W. W. (A)
Oster, F. J. (A)
Reiffen, B. (A)
Ronson, H. T. (A)
Wilshinsky, I. (A)
Wurthmann, G. E. (A)

Maywood (NY-2)
Babcock, W. E. (M)
Benenson, C. A. (A)
Calafati, S. S., Jr. (M)
Fichtl, R. R. (A)
Honig, A. R. (A)
Klarman, K. J. (A)
Koechel, W. P. (VA)
Koehler, J. A. (A)
Maasik, C. (A)
Murphy, A. W. (A)
Salem, J. (A)
Seibert, J. L. (SM)
Seisler, M. (A)
Standig, H. L. (A)
Woods, C. R. (A)

Medford Lakes (PHI-3)
Edwards, H. D. (A)
Liddle, R. W., Jr. (A)

Medford Pines (PHI-3)
Grever, J. L. (A)

Mendham (NY-2)
Lewis, W. D. (SM)

Menlo Park (NY-2)
Schnebbe, A. D. (A)

Merchantville (PRI-3)
Arbuckle, F. M. (M)
Barkow, W. H. (A)
Buder, S. H. (M)
Combellack, E. M. (M)
Darling, W. (A)
Drubin, M. (A)
Fell, W. F. (M)
Fox, E. D. (A)
Gallo, P. (SM)
Gihring, H. E. (SM)
Gilmore, W. C. (A)
Gore, E. M. (A)
Grieser, G. J. (A)
Hamm, N. H. (M)
Hopkins, A. R. (SM)
Kampf, R. J. (A)
Keeffe, T. A. (A)
Kephart, E. T. (A)
Koppenhauer, J. T. (A)
Lappin, L. S. (SM)
Lawrence, W. L. (VA)
Layer, J. H. (A)
Lewis, E. S. (A)
Long, F. (A)
Long, K. G. (A)
Luther, A. C., Jr. (A)
Malmgren, A. G. (A)
Marsh, D. R. (M)
McKinney, R. S. (A)
Oman, N. J. (VA)
Orr, J. R. (A)
Patterson, E. B. (SM)
Petry, G. F. (VA)
Sanborn, J. W. (SM)
Small, C. E. (A)
Smiley, J. W. (A)
Staton, M. G. (M)
Story, T. H. (SM)
Swierczak, P. C. (A)
Taylor, J. R. (A)
Terrell, R. L. (A)
Thompson, L. E. (SM)
Vonderschmitt, B. V. (A)
Washburn, E. M. (SM)
Young, J. E. (SM)

Metuchen (PRI-3)
Bubb, A. H. (M)

Claypool, H. W. (A)
Dranetz, A. (M)
Fernald, O. H. (A)
Hautzik, R. M. (A)
Henley, E. J. (A)
Jacobs, R. A., Jr. (M)
Johnson, L. E. (A)
Kasner, E. (A)
Kmosko, J. A. (A)
Kornetz, N. S. (SM)
Kuck, R. G. (A)
Larson, G. C. (SM)
Lempert, I. E. (M)
Lerner, A. M. (A)
Ley, G. S. (SM)
MacDonald, A. F. (SM)
Petermann, L. A. (M)
Sampson, F. A. (A)
Schiffmayer, G. F. (M)
Schofield, C. R. (A)
Sienkiewicz, L. J. (M)
Sillman, D. (SM)
Vandenburgh, A. A. (A)

Middlesex
Schreiber, O. P. (A)
Warren, R. E. (A)

Middletown (NY-2)
Hayes, F. A. (A)
Kerr, S. A. (A)
Miller, S. E. (SM)
Wyman, J. H. (SM)

Midland Park (NY-2)
Brophy, W. T. (A)
Cotellessa, R. F. (A)
Feldkamp, L. P. (A)

Millburn (NY-2)
Freeman, R. H. (A)
Hoth, D. F. (SM)
Leef, G. R. (A)
Marks, R. L. (M)
Morris, R. M. (SM)
Thompson, K. A. (A)
Vreeland, W. E. (A)

Millington (NY-2)
Beatty, W. H. (A)
Harrison, C. W. (A)

Milltown (PRI-3)
Meyer, R. C., Jr. (A)

Millville (PHI-3)
Fath, J. A., Jr. (A)
Monari, A. J. (A)

Monmouth Beach (NY-2)
Bland, J. G. (A)

Montclair (NY-2)
Adams, P. R. (SM)
Baker, C. I. (SM)
Busignies, H. (F)
Dorfman, J. (M)
Du Bois, J. H. (SM)
Gabriel, E. Z. (M)
Gage, W. M. (A)
Harmon, H. D. (A)
Haynes, H. S. (A)
Kauffman, C. W. (A)
Lane, F. A. (VA)
Leedy, R. L. S. (A)
Leighton, H. W. (A)
Maginnis, W. P. (SM)
Muller, C. R. (SM)
Okress, E. C. (SM)
Peer, G. C. (A)
Raadow, A. (M)
Rose, F. C. (A)
Snyder, H. H. (A)
Sprague, V. G. (VA)
Thomas, H. E. (SM)
Timm, R. S. (M)
Vosburgh, M. C. (A)
Wheeler, C. M. (SM)
Yamagami, Y. (A)
Yates, C. R. (A)

Moonachie
Olson, C. B. (A)

Moorestown (PHI-3)
Apolenis, C. J. (A)
Baker, H. F. (A)
Bright, D. C. (SM)
Bucher, T. T. N. (A)
Gillespie, H. C. (A)
Greenwood, H. T., III (M)
Hill, N. R. (A)
Holmes, D. B. (SM)
Jose, R. S. (M)
Lindsay, J. E. (A)
Luty, R. C., Jr. (A)
Merrill, R. B. (A)
Nishino, H. H. (A)
Ort, D. L. (A)
Palm, K. E. (A)
Poch, W. J. (SM)
Price, J. F. (M)
Rettenmeyer, F. X. (F)
Rexon, L. (M)
Sauber, J. W. (M)
Saunders, W. F. (A)
Sheeder, A. M. (A)
Snyder, R. L., Jr. (SM)
Vance, D. H. (A)
Vick Roy, J. W. (A)
Wege, H. R. (SM)
Whitman, C. L. (A)
Williams, E. A. (A)
Zwiep, T. C. (A)

Morganville (NY-2)
Lavoie, S. D. (A)

Morris Plains (NY-2)
Anderson, H. P. (A)
Fawcett, D. G. (A)
Fleckenstein, W. O. (A)
Fleming, H. M. (A)
Freeman, W. C., Jr. (SM)
Gardoff, I. M. (A)
Geils, J. W. (M)
LaManna, R. J. (A)
Link, T. V. (A)
Oliwa, W. S. (A)
Rosier, H. L. (A)
Schontzler, J. G. (A)
Serahban, A. H. (A)
Townley, R. C. (M)
Van Iderstine, A. (A)
Wilde, A. E., Jr. (A)

Morristown (NY-2)
Bell, R. C. (A)
Clary, W. T., Jr. (A)
Colby, N. C. (A)
Crater, T. V. (A)
D'Albora, J. B., Jr. (SM)
DeSoer, C. A. (A)
Duszak, H. (M)
Early, J. M. (A)
Ehrlich, N. (A)
Evans, P. H. (F)
Favin, D. L. (A)
Filmer, W. L. (VA)
Gillson, M. H. (SM)
Githens, J. A. (A)
Goldfarb, S. (A)
Grenier, T. J. (A)
Hagelbarger, D. (A)
Hagner, D. R. (A)
Jacobs, O. B. (A)
Kellogg, W. M. (SM)
King, R. A. (M)
Lang, H. J. (M)
Larish, R. W. (A)
Leoser, T. S. (SM)
Lowell, R. J. (A)
Markle, R. E. (A)
Marston, W. T. (A)
Martin, E. O. (A)
Mason, D. R. (A)
Miessner, B. F. (F)
Miller, E. O. (A)
Morrison, H. (SM)
Munk, P. R. (A)
Nessmith, J. T., Jr. (A)
Parrott, A. D. (M)
Paul, C. E. (A)
Pederson, C. W. (A)
Perrier, J. F. (M)
Pierson, V. F. (A)
Roberts, S. C. (A)
Rowen, J. H. (A)
Saloom, J. A. (A)
Schmit, D. F. (F)
Slade, B. N. (M)
Smith, P. D. (A)
Souders, E. R. (A)
Spollen, F. J. (A)
Starrett, J. S. (SM)
Sumpter, P. B. (A)
Thayer, P. H., Jr. (M)
Walbesser, W. J. (A)
Welch, K. A. (A)
Wilder, K. T. (A)
Williams, D. E. (A)
Winternitz, T. W. (A)

Mountain Lakes (NY-2)
Bareiss, M. (SM)
Beck, R. J. (A)
Black, W. L. (SM)
Claassen, F. S. (A)
Engelmann, H. F. (SM)
Gabel, W. (M)
Honnell, M. A. (SM)
Houck, H. W. (SM)
Hughes, R. W. (SM)
Hurst, W. F. (A)
Jackson, F. R., Jr. (SM)
Jacobus, W. M. (A)
Krist, H. K. (SM)
Moore, W. C. (SM)
Nexon, V. J. (A)
Nordstrom, B. H. (SM)
Noyes, A., Jr. (SM)
Osterland, E. (SM)
Tyzzer, H. J. (SM)
Webster, F. D. (SM)
White, W. F. (A)

Mountainside (NY-2)
Anderson, A. E. (M)
Anderson, T. N. (A)
Browne, G. W. (M)
Kniazuk, M. (A)
Sears, P. R. (M)
Wagner, S. J. (SM)

Mountain View (NY-2)
Dilatush, E. (M)

Mount Arlington (NY-2)
Hart, J. P. (A)
Hegelson, B. P. (A)

Mount Ephraim (PHI-3)
Steoger, J. E. (A)
Taylor, J. M., Sr. (M)

Mount Holly (PHI-3)
Langelo, V. A. (A)
Million, J. W., Jr. (SM)
Pruitt, D. L. (A)
Twinam, J. R. (A)
Westcott, H. H. (A)

Mount Royal
Clement, B. R. (A)

Murray Hill (NY-2)
Aaron, M. R. (A)
Affel, H. A. (F)
Alsberg, D. A. (SM)
Anderson, C. N. (F)
Anderson, R. E. (A)
Andrews, F. T., Jr. (A)
Baldwin, G. L. (A)
Baldwin, M. W., Jr. (F)
Bangert, J. T. (SM)
Bashkow, T. R. (A)
Bennett, W. R. (SM)
Berger, U. S. (SM)
Beyer, J. W. (SM)
Black, D. M. (SM)
Bleisch, G. W. (A)
Bode, H. W. (F)
Bollman, J. H. (SM)
Bown, R. (F)
Braga, F. J. (M)
Budlong, W. A. (A)
Bullock, D. B. (A)
Burton, E. T. (SM)
Campbell, M. E. (SM)
Carbrey, R. L. (M)
Church, S. E. (A)
Cleveland, H. M. (M)
Clogston, A. M. (SM)
Cobb, L. J. (M)
Cocker, J. T. (A)
Cook, J. S. (A)
Cornell, W. A. (M)
Cronburg, C. L., Jr. (M)
Custer, C. J. (VA)
Cutler, C. C. (A)
Darlington, S. (SM)
Darnell, P. S. (SM)
David, E. E., Jr. (A)
Dennis, F. R. (M)
Depp, W. A. (SM)
Doba, S., Jr. (A)
Doherty, W. H. (F)
Drazy, E. J. (A)
Dunlap, K. S. (A)
Eberhart, E. K. (SM)
Edwards, P. G. (SM)
Eglin, J. M. (A)
Ehrbar, R. D. (SM)
Elmendorf, C. H. (SM)
Fagen, M. D. (M)
Fair, I. E. (VA)
Fairweather, B. A. (A)
Fay, C. E. (SM)
Ferguson, J. G. (SM)
Ferrell, E. B. (F)
Finch, T. R. (M)
Fischer, H. B. (SM)
Fisher, H. J. (SM)
Fisk, J. B. (SM)
Flegal, J. R. (SM)
Flood, J. D., Jr. (A)
Friis, R. W. (SM)
Glass, M. S. (VA)
Goodale, W. D., Jr. (A)
Graham, R. E. (M)
Graham, R. S. (SM)
Gray, M. C. (A)
Green, E. I. (SM)
Grossman, A. J. (M)
Haines, A. B. (A)
Hallenbeck, F. J. (SM)
Hamming, R. W. (A)
Hartman, C. D. (VA)
Harvey, F. K. (A)
Heberlein, A. A. (SM)
Hefele, J. R. (SM)
Heffner, H. (A)
Herr, F. J. (A)
Heskett, H. (M)
Hines, M. E. (M)
Hollenberg, A. V. (SM)
Hopper, A. L. (SM)
Horton, A. W., Jr. (SM)
Hudack, J. M. (SM)
Israel, J. O. (SM)
Jansen, J. J. (A)
Jensen, A. G. (F)
Johanson, A. E. (M)
Jordan, H. G. (A)
Kammerer, F. W. (VA)
Keith, C. R. (A)
Kelley, R. A. (A)
Kerata, L. G. (SM)
Kerwien, A. E. (SM)
King, F. H. (A)
Kinsburg, B. J. (M)
Kinzer, J. P. (SM)
Kirkpatrick, W. E. (VA)
Klapp, C. D. (A)
Kock, W. E. (F)
Koerner, L. F. (VA)
Kolding, A. R. (A)
Kompfner, R. (F)
Kretzmer, E. R. (A)
Kuh, E. S. (A)
Kummer, O. (SM)
Lebert, A. W. (VA)
Levin, S. A. (VA)
Lewis, H. A. (SM)
Linvill, J. G. (A)
Lozier, J. C. (SM)
Lund, N. (A)
Madsen, R. L. (A)
Maggio, J. B. (SM)
Manley, J. M. (SM)
Marrison, W. A. (SM)
Martin, W. H. (SM)
Mason, W. P. (F)
McDavitt, M. B. (M)
McGuigan, J. H. (A)
McKay, K. G. (M)
McNally, J. O. (SM)
Meacham, L. A. (F)
Mendel, J. T. (A)
Mendenhall, H. E. (SM)
Michaels, S. E. (SM)
Miller, R. A. (A)
Millman, S. (SM)
Mischler, W. D. (A)
Moll, J. (A)
Molnar, J. P. (SM)
Moore, E. F. (A)
Moore, G. E. (M)
Morton, J. A. (F)
Mottram, E. T. (SM)
Munn, A. J. (A)
Myers, P. B. (A)
Nebel, C. N. (A)
Nielsen, G., Jr. (A)
Norwine, A. C. (SM)
Oswald, A. A. (F)
Owens, C. D. (SM)
Packard, G. N. (M)
Pederson, D. O. (A)
Penick, D. B. (VA)
Perry, A. (A)
Phelps, J. W. (A)
Pierce, J. R. (F)
Pomeroy, A. F. (SM)
Potter, R. K. (F)
Raisbeck, G. (SM)
Reichle, W. E. (SM)
Reiling, P. A. (VA)
Robertson, G. H. (A)
Rogers, R. M. (A)
Runyon, J. P. (A)
Ryder, R. M. (SM)
Schelkunoff, S. A. (F)
Schimpf, L. G. (SM)
Schneider, H. A. (A)
Schott, L. O. (A)
Schramm, C. W. (SM)
Sears, R. W. (SM)
Shannon, C. E. (F)
Sharp, W. O. (M)
Shockley, W. (SM)
Siepian, D. (A)
Southworth, G. C. (F)
Spencer, A. E., Jr. (A)
Stammerjohn, L. W. (A)
Stansel, F. R. (SM)
Straube, H. M. (SM)
Sykes, R. A. (SM)
Taylor, E. R. (VA)
Thomas, D. E. (SM)
Thompson, H. K. (A)
Thulin, C. W. (SM)
Tien, P. K. (A)
Townsend, M. A. (SM)
Trent, R. L. (M)
Tryon, J. G. (M)
Uhlir, A., Jr. (A)
Valdes, L. B. (M)
Veazie, E. A. (VA)
Walsh, D. E. (A)
Walters, G. B. (A)
Warner, A. W., Jr. (M)
Watson, H. A. (M)
Wickliffe, P. R., Jr. (A)
Williams, O. L. (A)
Wilson, J. R. (SM)
Winter, H. F. (A)
Wood, I. E. (A)
Woodmansee, B. S. (SM)
Wright, S. B. (SM)
Yoeger, R. E. (A)
Young, C. H. (SM)
Young, L. G. (SM)

Neptune (NY-2)
Ackerman, J. C. (M)
Allen, J. A. (A)
Armstrong, R. W. (VA)
Bert, J. E. (A)
Daniels, T. E. (A)
Danko, S. F. (M)
Dickman, A. (A)
Evers, J. T. (VA)
Frevert, A. W. (M)
Hull, J. F. (M)
Lavin, H. D. (A)
Mazel, L. G. (A)
Speaker, H. B. (A)
Stodola, E. K. (SM)
Swingle, D. M. (M)
Woodyard, O. C. (M)

Neptune City (NY-2)
Mudgett, A. H. (A)

Neshanic
Kuthe, H. K. (VA)

Netcong (NY-2)
Reichard, W. C. (VA)

Newark (NY-2)
Abrams, H. (A)
Acosta, F. B. (A)
Balash, F. J. (A)
Barabutes, T. (A)
Beeler, T. L. (A)
Berkery, E. A. (A)
Bird, S. P. (A)
Bohnstedt, C. E. (A)
Boyson, C. V. (A)
Bremer, F. V. (SM)
Broutman, C. A. (A)
Butler, W. E. (A)
Caprarola, L. J. (A)
Carluccio, J. (A)
Cert, A. E. (A)
Cohen, S. (SM)
Coppola, A. A. (A)
Davis, M. G. (A)
Denney, J. M. (A)
Donohoe, L. J. (A)
Fairfield, H. (A)
Farese, V. C. (A)
Fernandes, J. G. (A)
Fishman, S. (SM)
Fogarty, L. L. (A)
Fressola, B. C. (A)
Gilbert, R. W. (M)
Giordano, A. F. (A)
Gladden, C. T. (A)
Glick, C. L. (A)
Goldberg, D. L. (A)
Gomez, E. (A)
Grantges, R. F. (A)
Greenberg, H. (A)
Greenwood, T. S. (A)
Gropp, B. P. (A)
Gross, J. I. (A)
Guarino, P. A. (A)
Henry, T. J. (SM)
Hergenhan, O. (A)
Hoefle, R. R. (A)
Holdman, M. (A)
Hooven, M. D. (SM)
Houghton, H. V., Jr. (A)
Irby, R. F. (A)
Jensen, D. C. (A)
Kang, C. L. (A)
Kenney, C. M. (A)
Klapach, P. (A)
Klappholz, L. (A)
Klein, M. (M)
Koppelon, R. (SM)
Kunkel, E. A., Jr. (A)
Kups, E. F. (A)
Kwast, V. B. (M)
Lamb, F. X. (VA)
Lamoreaux, F. H. (A)
Lebleboojian, G. (A)
Leisenring, J. G. (A)
Maczali, G. J. (A)
Martin, A. J. (A)
McCormick, D. A. (M)
Mearns, A. B. (A)
Meinholtz, H. J. (A)
Mellen, E. R. (SM)
Meo, M. (A)
Miller, J. H. (F)
Mitchell, M. E. (A)
Morelock, O. J. (SM)
Morgan, W. H. (A)
Murdock, B. B. (A)
Nagy, J., Jr. (A)
Nahay, L. P. (A)
Newman, L. (A)
Niemann, L. H. (A)
Noll, J. C. (A)
Peldunas, A. P. (A)
Perna, P. J. (A)
Plost, R. H. (A)
Plaza, A. (A)
Popyk, J., Jr. (A)
Ranger, R. H. (F)
Rawson, H. B. (A)
Rosenzweig, I. (A)
Ross, P. L. (A)
Russell, F. A. (M)
Scharkess, H. (M)
Schooley, R. W., Jr. (A)

Sennewald, P. F. (A)
Stansbury, E. J. (A)
Stephens, C. W. (A)
Surenian, D. (A)
Thomas, A. W. (A)
Tiffin, C. M. (A)
Vernick, J. N. (A)
Vreeland, J. B. (A)
Walker, R. D. (A)
Wallenstein, J. P. (A)
Weber, R. M. (A)
Wells, D. H. (A)
Wildenberg, H. I. (A)
Wing, O. (A)
Wolkstein, H. J. (A)
Yaroshko, P. (A)
Zick, B. A. (A)
Zilker, W. H. (A)

New Brunswick (PRI-3)
Barnette, W. E. (A)
Butenko, J. W. (A)
Cahill, R. M. (A)
Fich, S. (M)
Freedman, L. A. (A)
Haeseler, P. R. (A)
Heilmann, P. E. (A)
Kaden, G. (A)
Klemmer, A. E. (A)
Longo, C. V. (M)
Meyerhoff, A. A. (A)
Moore, T. H. (A)
Morris, M. J. (A)
Porter, H. D. (A)
Potter, J. L. (SM)
Rosenthal, L. (SM)
Selinsky, J. J. (A)
Stenfancic, K. (A)
Weil, G. M. (A)
Weintraub, W. B. (A)
Williams, R. L. (A)

New Milford (NY-2)
Alexander, S. B. (A)
Chadney, H. B. (A)
Cohen, N. L. (A)
Ewert, A. C. (M)
Franzel, I. H. (A)
Frye, F. X. (A)
Gardner, R. O. (A)
Hafemeister, R. F. (M)
Hammerich, H. A. (A)
Harris, G. D. (A)
Heir, D. H. (A)
Labagh, E. L. (A)
MacDermid, B. W. (A)
Mills, H. J. (A)
Olson, R. E. (M)
Patremio, S. R. (M)
Phelps, R. B. (M)
Reich, P. J. (M)
Roth, H. (A)
Shaw, A. B. (M)
Shaw, W. (M)
Taris, J. (M)
Umles, M. S. (A)

New Providence (NY-2)
Alexander, E. J. (A)
Andrews, H. W. (A)
Borden, C. C., Sr. (M)
Chruney, M. (A)
Levenbach, G. J. (M)
Malthaner, W. A. (SM)
Quinn, J. L., Jr. (A)
Simonds, R. E. (M)
Steele, R. B. (A)
Sullivan, J. W. (A)
Susen, C. P. (A)
Teltscher, E. S. (A)
Tendick, F. H., Jr. (A)
Thomas, G. B., Jr. (SM)
Upthegrove, H. N. (A)
Weaver, C. E. (A)
Welber, I. (A)

New Vernon
Young, F. C. (A)

Nixon (PRI-3)
Bocchieri, A. J. (A)
Maurer, M. S. (A)
Richardson, J. N. (A)
Shenk, J. J. (A)
Unger, R. J. (A)
Zapotocky, A. C. (M)

Normandy Beach
Shanahan, J. C. (M)

North Arlington (NY-2)
Balter, S. A. (A)
Berger, M. (A)
Bruning, J. M. (M)
Sodvary, J. W. (A)

North Bergen (NY-2)
Biamonte, O. A. (A)
Cox, J. L. (A)
Dundatscheck, E. P. (A)
Dunn, W. J. (A)
Fennick, B. (A)
Feucht, R. E. (A)
Frieborn, J. K. (A)
Goble, A. S., III (A)
Harms, F. G. (A)
Horner, R. G. (A)
Oliver, G. E. (SM)
Perlis, H. J. (A)
Wolter, H. R. (A)

North Caldwell (NY-2)
Adamson, A. A. (SM)
Baldwin, W. O. (A)
Clark, T. G. (A)
Grieg, D. D. (SM)
Poff, J. K. (M)
Siemens, R. H. (SM)
Steadman, A. (A)

North Hackensack (NY-2)
Gumaer, H. (A)

North Long Branch
Reusch, R. K. (A)

North Merchantville
Obert, M. J. (SM)

North Plainfield (NY-2)
Deeley, P. M. (SM)
Dinzik, D. J. (A)
Gordon, M. J. (A)
Noble, M. L. (A)
Ottobre, J. N. (A)
Vergon, T. F. (A)
Wahl, A. (A)
Warren, C. W. (A)

Norwood (NY-2)
Brick, F. R., Jr. (SM)
Vieth, W. G. (M)

Nutley (NY-2)
Alexander, B. (M)
Altman, F. J. (M)
Bondy, J. O. (A)
Bryant, J. H. (SM)
Bucher, F. X. (SM)
Capen, H. N. (SM)
Cater, J. R. (M)
Clavier, A. G. (F)
Cookson, A. E. (SM)
Cornwell, R. C. (M)
Davis, R. C. (SM)
De Vany, B. V. (M)
Dishal, M. (SM)
Ellis, R. (A)
Fahnestock, R. J. (A)
Felsenheld, R. A. (M)
Frederick, R. E., Jr. (A)
Goldan, T. J. (A)
Gray, R. E. (VA)
Greenfield, G. (A)
Groce, J. C. (A)
Gronberg, H. C. (VA)
Hamilton, G. E. (SM)
Hall, J. (A)
Happe, W. H., Jr. (A)
Hoagland, K. A. (SM)
Jones, M. A. (A)
Kandoian, A. G. (F)
Kearns, W. P. (A)
Lott, R. E., Jr. (A)
Lundburg, F. J. (SM)
Magdeburger, P. E. (A)
Mangolds, B. (M)
Marchese, T. J. (SM)
Millar, W. M. (A)
Miller, R. J. (A)
Parzen, P. (SM)
Peifer, A. G. (M)
Polyzou, J. (A)
Rogoff, M. (M)
Rutherford, R. E. (A)
Rymer, R. H. (A)
Schildknecht, R. O. (A)
Shapiro, O. (M)
Sichak, W. (M)
Spahr, P. K., Jr. (A)
Stacey, J. M. (A)
Stevens, F. J. (M)
Swinney, J. G. C., Jr. (SM)
Troutman, J. E. (A)
Turvey, F. P., Jr. (A)
Tyminski, W. V. (A)
Uhler, K. W. (M)
Van Vechten, R. K. (A)
Waer, R. R. (A)
Ware, P. M., Jr. (A)
Westbrook, E. P. (A)
Wickersham, W. H. (SM)
Wing, A. K., Jr. (SM)
Wirth, C. H. (A)
Young, N. H. (SM)
Zaret, M. E. (SM)
Zeliff, R. J. (A)

Oakland
Noble, R. B. (A)

Oaklyn (PHI-3)
Brown, E. L. (A)
Christiansen, W. G. (A)
Endy, W. M. (A)
Fiet, O. (SM)
Gluda, H. W. (A)
Henderson, R. A. (SM)
Neely, W. J. (A)
Putzrath, F. L. (A)
Salani, J. M. (A)
Sass, E. J. (M)
Scheldorf, R. D. (VA)

Oceanport (NY-2)
Koeile, A. R. (A)
Nylander, G. A. (A)
Schnabolk, H. L. (A)
Stromberg, R. E. (M)

Ocean City (PHI-3)
Conner, B. C. (A)
Glawson, T. J. (A)

Old Bridge (PRI-3)
Ganson, D. M., Jr. (A)
Koch, J. G. (A)

Oldwick (PRI-3)
Wittwer, N. C., Jr. (A)

Oradell (NY-2)
Brackett, H. H. (VA)
Bruce, W. D. (A)
Schwartz, H. C. (A)
Veutter, C. S. (A)

Orange (NY-2)
Burkhart, W. H. (A)
Fromer, M. (A)
Gardner, P. S. (A)
Grayson, E. L. (M)
Hardwick, F. (M)
Helfrich, J. H. (A)
Kenyon, R. R. (A)
Kindberg, E. V. (A)
Milbrodt, P. E. (A)
Myers, B. R. (A)
Poletti, G. (A)
Suydam, C. H. (M)
Terry, C. B. (A)

Oxford (NY-2)
Bartron, H. H. H. (A)

Packanack Lake (NY-2)
Beaver, H. E. (A)
Bentley, A. Y. (SM)
Brown, P. F. (M)
Fockler, W. G. (SM)
Keefer, D. E. (A)
Merrill, H. B., Jr. (A)
Nestlerode, C. D., Sr. (A)
Reese, H., Jr. (M)
Wescoat, W. L. (A)
Wixson, F. C. (A)
Zusi, F. C. (A)

Palisade (NY-2)
Andrews, E. (A)
Coppell, F. K. (A)
Schnoll, N. (SM)

Palisades Park
Karolkiewicz, D. J. (A)

Palmyra (PHI-3)
Ennis, F. J. (A)
Foerster, W. (A)
Gorski, A. A. (A)
Hilbourn, C. L. (A)
Rammer, C. A. (M)
Ringer, H. N. (A)
Robinson, H. A. (SM)
Waring, J. W. (A)
Woestman, J. W. (A)
Woodward, C. P. (A)
Yewdall, G. E. (A)

Paramus (NY-2)
Ankenbrock, C. A. (A)
Braun, W. E. (A)
Brown, T. G. (A)
Chanes, H. (M)
Deiss, E. W. (A)
Evander, H. S. (A)
Feller, M. (A)
Haefner, C. G. (A)
Honeiser, V. P. (A)
Manoly, A. E. (A)
Petrina, R. J. (A)
Poarch, M. F. (A)
Robertson, J. D. (A)
Schenkel, F. W. (A)
Stahl, P. D. (M)
Struck, H. E. (A)
Wehrlin, R. F. (A)
West, S. S. (A)
Young, R. (M)

Park Ridge (NY-2)
Ecklund, E. (SM)
Frear, R. B. (A)
Germann, J. D. (A)
Sturm, N. (A)

Parlin (PRI-3)
Panos, R. J. (A)

Parsippany (NY-2)
Eccles, T. L. (A)
Krause, C. K. (VA)
Stanton, S. W. (VA)
Zenk, G. E. (A)

Passaic (NY-2)
Backus, A. S. (A)
Brussel, E. H. (A)
Bunn, H. L. (A)
Crystal, A. H. (A)
Currier, P. J. (A)
Dalkiewicz, J. M. (A)
De Bell, J. M., Jr. (A)
Dehoney, R. J. (A)
Dresner, J. (A)
Dumont, A. B. (F)
Faust, W. E. (A)
Hair, G. R., Jr. (A)
Hettinger, S. (A)
Muench, W. H. (A)
Peretko, H. T. (M)
Schkolnick, H. (A)
Schmidt, L. (A)
Schultz, R. T. (A)
Seats, P. (A)
Sher, A. (A)
Smith, P. W. (A)
Stoj, F. R. (A)
Suszek, E. J. (A)
Von Savage, J. (A)
Wakeman, R. P. (M)
Webster, G. C. (A)
Yu, Y. P. (A)

Paterson (NY-2)
Biagi, A. D. (A)
Binneveld, H. A. J. (A)
Bruggeman, J. T. (A)
Buchinger, M. J. (A)
Butterworth, J. W. (SM)
Carlson, O. E. (M)
Cole, W. S. (A)
Di Ruggeriero, M. A. (A)
Durgin, L. A. (A)
Eckstein, N. A. (A)
Edwards, A., Jr. (A)
Emaus, J. L. (A)
Evans, N. L., Jr. (A)
Gariano, W. F. (A)
Geller, W. (A)
Gillette, D. (A)
Goforth, J. L. (A)
Grimes, W. M., Jr. (A)
Grower, B. B. (A)
Haefell, J. E. (A)
Hansen, R. K. (A)
Lome, J. B. (A)
Lucas, E. F. (A)
Martin, J. A. (A)
Papanou, D. S. (A)
Potash, J. (A)
Rich, P. A. (A)
Sarratt, E. R. (M)
Sautner, J. (A)
Seergy, C. M. (A)
Shea, R. A. (SM)
Thiegartner, G. J. (A)
Volpe, D. F. (A)

Paulsboro (PHI-3)
Gross, S. D. (A)
Michelson, H. J. (A)

Pemberton (PHI-3)
Beckenstein, M. (A)

Pennington (PRI-3)
Fernsler, G. L. (SM) *

Pennsauken (PHI-3)
Bauer, J. A. (SM)
Benzuly, H. J. (A)
Conner, W. J., Jr. (A)
Deranian, M. (A)
Dietch, L. (M)
Eckel, C. C. (A)
Hobson, N. L. (A)
Houston, R. S. (M)
Inglis, A. F. (SM)
Kaplan, M. (A)
Ksiazez, F. T. (A)
Munson, J. K. (M)
Nangle, F. J., Jr. (A)
Nossen, E. J. (A)
Prokop, F. J. (A)
Reeder, C. E. (A)
Roberts, W. L. (M)
Salani, J. M. (A)
Shaver, K. C. (A)
Uphoff, F. B. (A)
Willey, J. R. (A)
Yen, J. T. (A)

Penns Grove (PHI-3)
Garrett, L. B., Jr. (A)
Tipton, W. F. (M)

Pequannock (NY-2)
Brown, W. G. (A)
Schmidt, C. R. (M)

Perth Amboy (PRI-3)
Ceres, G. V. (A)
Garretson, T. A. (M)
Jesse, S. A. (A)
Marcy, S. P. (A)
Mikkelsen, W. R. (A)
Moravek, J. J. (A)

Phillipsburg (NY-2)
Haring, D. R. (A)
Hill, C. A. (A)

Pitman (PHI-3)
Andrade, L. (A)
Brown, I. N. (SM)
Chaney, A. L., Jr. (A)
Luckock, W. J. (M)
Parker, S. R. (M)
Thomas, W. F. (A)

Plainfield (NY-2)
Barr, H. J. (A)
Boise, E. B. (A)
Cowperthwait, W. L., Jr. (M)
Edson, J. O. (SM)
Hardin, L. L., Jr. (SM)
Haydu, G. K. (A)
Hunter, F. L., Jr. (A)
Hunter, W. B. (A)
Kelly, H. P. (A)
Magers, T. M. (A)
Perks, A. F. (A)
Satter, H. W. (A)
Schneider, W. A. (A)
Smith, A. E. (M)
Snyder, C. L. (A)
Soga, M. (M)
Streeter, T. W., Jr. (A)
Stull, R. J. (SM)
Townsend, G. B. (A)
Wallace, R. L. (SM)
Warren, C. A. (SM)
Wehrle, A. W. (A)
Woody, M. W. (A)

Point Pleasant
Scharmann, L. E. (A)

Pompton Lakes (NY-2)
Anderson, G. M. (SM)
McDevitt, J. J., Jr. (A)
McEwan, A. W. (M)
McNary, B. D. (M)
Merieh, H. J. (A)
Romain, D. O. (A)
Sellers, G. W. (M)
Wachter, J. E. (A)

Pompton Plains (NY-2)
Arnold, A., Jr. (A)
Casey, R. F. (A)
Cavanagh, R. T. (A)
Guilfoyle, R. J. (M)
Kelly, M. L. (A)
Millard, J. W. (A)
Nielsen, A. H. (A)
Palmer, R. C. (M)
Pauloski, S. H. (A)
Sayer, W. H., Jr. (A)
Thompson, R. D. (M)

Pottersville (PRI-3)
Peery, W. E. (VA)

Preakness (NY-2)
Brown, A. T. (A)
Noll, J. W. (A)

Princeton (PRI-3)
Allen, H. C. (SM)
Armstrong, L. D. (M)
Baker, G. M. K. (M)
Barco, A. A. (SM)
Barton, L. E. (SM)
Baugh, C. W. (M)
Beam, W. R. (A)
Becker, H. C. (A)
Bedford, A. V. (F)
Behrend, W. L. (SM)
Binstock, P. L. (A)
Bittmann, E. E. (M)
Bliss, W. H. (SM)
Bond, D. S. (SM)
Borkan, H. (A)
Braden, R. A. (SM)
Brown, G. H. (F)
Burns, L. L., Jr. (SM)
Burnside, D. G. (SM)
Burrill, C. M. (SM)
Carlson, W. L. (F)
Carpenter, M. M., Jr. (A)
Chambers, F. T., III (A)
Chandler, C. H. (SM)
Chandler, H. M., Jr. (M)
Cheeseman, P. R. (A)
Clement, P. R. (A)
Cowan, E. J. (M)
Crane, H. D. (A)
Creager, F. L. (M)
Dalzell, C. W. (A)
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)
Engstrom, E. W. (F)
Epstein, D. W. (F)

Claypool, H. W. (A)
Dranetz, A. (M)
Fernald, O. H. (A)
Hautzik, R. M. (A)
Henley, E. J. (A)
Jacobs, R. A., Jr. (M)
Johnson, L. E. (A)
Kasner, E. (A)
Kmosko, J. A. (A)
Kornetz, N. S. (SM)
Kuck, R. G. (A)
Larson, G. C. (SM)
Lempert, I. E. (M)
Lerner, A. M. (A)
Ley, G. S. (SM)
MacDonald, A. F. (SM)
Petermann, L. A. (M)
Sampson, F. A. (A)
Schiffmayer, G. F. (M)
Schofield, C. R. (A)
Sienkiewicz, L. J. (M)
Sillman, D. (SM)
Vandenburgh, A. A. (A)

Middlesex
Schreiber, O. P. (A)
Warren, R. E. (A)

Middletown (NY-2)
Hayes, F. A. (A)
Kerr, S. A. (A)
Miller, S. E. (SM)
Wyman, J. H. (SM)

Midland Park (NY-2)
Brophy, W. T. (A)
Cotellessa, R. F. (A)
Feldkamp, L. P. (A)

Millburn (NY-2)
Freeman, R. H. (A)
Hoth, D. F. (SM)
Leef, G. R. (A)
Marks, R. L. (M)
Morris, R. M. (SM)
Thompson, K. A. (A)
Vreeland, W. E. (A)

Millington (NY-2)
Beatty, W. H. (A)
Harrison, C. W. (A)

Milltown (PRI-3)
Meyer, R. C., Jr. (A)

Millville (PHI-3)
Fath, J. A., Jr. (A)
Monari, A. J. (A)

Monmouth Beach (NY-2)
Bland, J. G. (A)

Montclair (NY-2)
Adams, P. R. (SM)
Baker, C. I. (SM)
Busignies, H. (F)
Dorfman, J. (M)
Du Bois, J. H. (SM)
Gabriel, E. Z. (M)
Gage, W. M. (A)
Harmon, H. D. (A)
Haynes, H. S. (A)
Kauffman, C. W. (A)
Lane, F. A. (VA)
Leedy, R. L. S. (A)
Leighton, H. W. (A)
Maginnis, W. P. (SM)
Muller, C. R. (SM)
Okress, E. C. (SM)
Peer, G. C. (A)
Razlow, A. (M)
Rose, F. C. (A)
Snyder, H. H. (A)
Sprague, V. G. (VA)
Thomas, H. E. (SM)
Timm, R. S. (M)
Vosburgh, M. C. (A)
Wheeler, C. M. (SM)
Yamagami, Y. (A)
Yates, C. R. (A)

Moonachie
Olson, C. B. (A)

Moorestown (PHI-3)
Apolenis, C. J. (A)
Baker, H. F. (A)
Bright, D. C. (SM)
Bucher, T. T. N. (A)
Gillespie, H. C. (A)
Greenwood, H. T., III (M)
Hill, N. R. (A)
Holmes, D. B. (SM)
Jose, R. S. (M)
Lindsay, J. E. (A)
Luty, R. C., Jr. (A)
Merrill, R. B. (A)
Nishino, H. H. (A)
Ort, D. L. (A)
Palm, K. E. (A)
Poch, W. J. (SM)
Price, J. F. (M)
Rettenmeyer, F. X. (F)
Rexon, L. (M)
Sauber, J. W. (M)
Saunders, W. F. (A)
Sheeder, A. M. (A)
Snyder, R. L., Jr. (SM)
Vance, D. H. (A)
Vick Roy, J. W. (A)
Wege, H. R. (SM)
Whitman, C. L. (A)
Williams, E. A. (A)
Zwiep, T. C. (A)

Morganville (NY-2)
Lavoie, S. D. (A)

Morris Plains (NY-2)
Anderson, H. P. (A)
Fawcett, D. G. (A)
Fleckenstein, W. O. (A)
Fleming, H. M. (A)
Freeman, W. C., Jr. (SM)
Gardoff, I. M. (A)
Geils, J. W. (M)
LaManna, R. J. (A)
Link, T. V. (A)
Oliwa, W. S. (A)
Rosier, H. L. (A)
Schontzler, J. G. (A)
Sepahban, A. H. (A)
Townley, R. C. (M)
Van Iderstine, A. (A)
Wilde, A. E., Jr. (A)

Morristown (NY-2)
Bell, R. C. (A)
Clary, W. T., Jr. (A)
Colby, N. C. (A)
Crater, T. V. (A)
D'Albora, J. B., Jr. (SM)
DeSoer, C. A. (A)
Duszak, H. (M)
Early, J. M. (A)
Ehrlich, N. (A)
Evans, P. H. (F)
Favin, D. L. (A)
Filmer, W. L. (VA)
Gillson, M. H. (SM)
Githens, J. A. (A)
Goldfarb, S. (A)
Grenier, T. J. (A)
Hagelbarger, D. (A)
Hagner, D. R. (A)
Jacobs, O. B. (A)
Kellogg, W. M. (SM)
King, R. A. (M)
Lang, H. J. (M)
Larish, R. W. (A)
Leoser, T. S. (SM)
Lowell, R. J. (A)
Markle, R. E. (A)
Marston, W. T. (A)
Martin, E. O. (A)
Mason, D. R. (A)
Miessner, B. F. (F)
Miller, E. O. (A)
Morrison, H. (SM)
Munk, P. R. (A)
Nessmith, J. T., Jr. (A)
Parrott, A. D. (M)
Paul, C. E. (A)
Pederson, C. W. (A)
Perrier, J. F. (M)
Pierson, V. F. (A)
Roberts, S. C. (A)
Rowen, J. H. (A)
Saloom, J. A. (A)
Schmit, D. F. (F)
Slade, B. N. (M)
Smith, P. D. (A)
Souders, E. R. (A)
Spollen, F. J. (A)
Starrett, J. S. (SM)
Sumpter, P. B. (A)
Thayer, P. H., Jr. (M)
Walbesser, W. J. (A)
Welch, K. A. (A)
Wilder, K. T. (A)
Williams, D. E. (A)
Winternitz, T. W. (A)

Mountain Lakes (NY-2)
Bareiss, M. (SM)
Beck, R. J. (A)
Black, W. L. (SM)
Claassen, F. S. (A)
Engelmann, H. F. (SM)
Gabel, W. (M)
Honnell, M. A. (SM)
Houck, H. W. (SM)
Hughes, R. W. (SM)
Hurst, W. F. (A)
Jackson, F. R., Jr. (SM)
Jacobus, W. M. (A)
Krist, H. K. (SM)
Moore, W. C. (SM)
Nexon, V. J. (A)
Nordstrom, B. H. (SM)
Noyes, A., Jr. (SM)
Osterland, E. (SM)
Tyzzer, H. J. (SM)
Webster, F. D. (SM)
White, W. F. (A)

Mountainside (NY-2)
Anderson, A. E. (M)
Anderson, T. N. (A)
Browne, G. W. (M)
Kniazuk, M. (A)
Sears, P. R. (M)
Wagner, S. J. (SM)

Mountain View (NY-2)
Dilatush, E. (M)

Mount Arlington (NY-2)
Hart, J. P. (A)
Hegelson, B. P. (A)

Mount Ephraim (PHI-3)
Steoger, J. E. (A)
Taylor, J. M., Sr. (M)

Mount Holly (PHI-3)
Langelo, V. A. (A)
Million, J. W., Jr. (SM)
Pruitt, D. L. (A)
Twinam, J. R. (A)
Westcott, H. H. (A)

Mount Royal
Clement, B. R. (A)

Murray Hill (NY-2)
Aaron, M. R. (A)
Affel, H. A. (F)
Alsberg, D. A. (SM)
Anderson, C. N. (F)
Anderson, R. E. (A)
Andrews, F. T., Jr. (A)
Baldwin, G. L. (A)
Baldwin, M. W., Jr. (F)
Bangert, J. T. (SM)
Bashkow, T. R. (A)
Bennett, W. R. (SM)
Berger, U. S. (SM)
Beyer, J. W. (SM)
Black, D. M. (SM)
Bleisch, G. W. (A)
Bode, H. W. (F)
Bollman, J. H. (SM)
Bown, R. (F)
Braga, F. J. (M)
Budlong, W. A. (A)
Bullock, D. B. (A)
Burton, E. T. (SM)
Campbell, M. E. (SM)
Carbrey, R. L. (M)
Church, S. E. (A)
Cleveland, H. M. (M)
Clogston, A. M. (SM)
Cobb, L. J. (M)
Cocker, J. T. (A)
Cook, J. S. (A)
Cornell, W. A. (M)
Cronburg, C. L., Jr. (M)
Custer, C. J. (VA)
Cutler, C. C. (A)
Darlington, S. (SM)
Darnell, P. S. (SM)
David, E. E., Jr. (A)
Dennis, F. R. (M)
Depp, W. A. (SM)
Doba, S., Jr. (A)
Doherty, W. H. (F)
Drazy, E. J. (A)
Dunlap, K. S. (A)
Eberhart, E. K. (SM)
Edwards, P. G. (SM)
Eglin, J. M. (A)
Ehrbar, R. D. (SM)
Elmendorf, C. H. (SM)
Fagen, M. D. (M)
Fair, I. E. (VA)
Fairweather, B. A. (A)
Fay, C. E. (SM)
Ferguson, J. G. (SM)
Ferrell, E. B. (F)
Finch, T. R. (M)
Fischer, H. B. (SM)
Fisher, H. J. (SM)
Fisk, J. B. (SM)
Flegal, J. R. (SM)
Flood, J. D., Jr. (A)
Friis, R. W. (SM)
Glass, M. S. (VA)
Goodale, W. D., Jr. (A)
Graham, R. E. (M)
Graham, R. S. (SM)
Gray, M. C. (A)
Green, E. I. (SM)
Grossman, A. J. (M)
Haines, A. B. (A)
Hallenbeck, F. J. (SM)
Hamming, R. W. (A)
Hartman, C. D. (VA)
Harvey, F. K. (A)
Heberlein, A. A. (SM)
Hefele, J. R. (SM)
Heffner, H. (A)
Herr, F. J. (A)
Heskett, H. (M)
Hines, M. E. (M)
Hollenberg, A. V. (SM)
Hopper, A. L. (SM)
Horton, A. W., Jr. (SM)
Hudack, J. M. (SM)
Israel, J. O. (SM)
Jansen, J. J. (A)
Jensen, A. G. (F)
Johanson, A. E. (M)
Jordan, H. G. (A)
Kammerer, F. W. (VA)
Keith, C. R. (A)
Kelley, R. A. (A)
Kersta, L. G. (SM)
Kerwien, A. E. (SM)
King, F. H. (A)
Kinsburg, B. J. (M)
Kinzer, J. P. (SM)
Kirkpatrick, W. E. (VA)
Klapp, C. D. (A)
Kock, W. E. (F)
Koerner, L. F. (VA)
Kolding, A. R. (A)
Kompfner, R. (F)
Kretzmer, E. R. (A)
Kuh, E. S. (A)
Kummer, O. (SM)
Lebert, A. W. (VA)
Levin, S. A. (VA)
Lewis, H. A. (SM)
Linvill, J. G. (A)
Lozier, J. C. (SM)
Lund, N. (A)
Madsen, R. L. (A)
Maggio, J. B. (SM)
Manley, J. M. (SM)
Marrison, W. A. (SM)
Martin, W. H. (SM)
Mason, W. P. (F)
McDavitt, M. B. (M)
McGuigan, J. H. (A)
McKay, K. G. (M)
McNally, J. O. (SM)
Meacham, L. A. (F)
Mendel, J. T. (A)
Mendenhall, H. E. (SM)
Michaels, S. E. (SM)
Miller, R. A. (A)
Millman, S. (SM)
Mischler, W. D. (A)
Moll, J. (A)
Molnar, J. P. (SM)
Moore, E. F. (A)
Moore, G. E. (M)
Morton, J. A. (F)
Mottram, E. T. (SM)
Munn, A. J. (A)
Myers, P. B. (A)
Nebel, C. N. (A)
Nielsen, G., Jr. (A)
Norwine, A. C. (SM)
Oswald, A. A. (F)
Owens, C. D. (SM)
Packard, G. N. (M)
Pederson, D. O. (A)
Penick, D. B. (VA)
Perry, A. (A)
Phelps, J. W. (A)
Pierce, J. R. (F)
Pomeroy, A. F. (SM)
Potter, R. K. (F)
Raisbeck, G. (SM)
Reichle, W. E. (SM)
Reiling, P. A. (VA)
Robertson, G. H. (A)
Rogers, R. M. (A)
Runyon, J. P. (A)
Ryder, R. M. (SM)
Schelkunoff, S. A. (F)
Schimpf, L. G. (SM)
Schneider, H. A. (A)
Schott, L. O. (A)
Schramm, C. W. (SM)
Sears, R. W. (SM)
Shannon, C. E. (F)
Sharp, W. O. (M)
Shockley, W. (SM)
Siepian, D. (A)
Southworth, G. C. (F)
Spencer, A. E., Jr. (A)
Stammerjohn, L. W. (A)
Stansel, F. R. (SM)
Straube, H. M. (SM)
Sykes, R. A. (SM)
Taylor, E. R. (VA)
Thomas, D. E. (SM)
Thompson, H. K. (A)
Thullin, C. W. (SM)
Tien, P. K. (A)
Townsend, M. A. (SM)
Trent, R. L. (M)
Tryon, J. G. (M)
Uhlir, A., Jr. (A)
Valdes, L. B. (M)
Veazie, E. A. (VA)
Walsh, D. E. (A)
Walters, G. B. (A)
Warner, A. W., Jr. (M)
Watson, H. A. (M)
Wickliffe, P. R., Jr. (A)
Williams, O. L. (A)
Wilson, J. R. (SM)
Winter, H. F. (A)
Wood, I. E. (A)
Woodmansee, B. S. (SM)
Wright, S. B. (SM)
Yoeger, R. E. (A)
Young, C. H. (SM)
Young, L. G. (SM)

Neptune (NY-2)
Ackerman, J. C. (M)
Allen, J. A. (A)
Armstrong, R. W. (VA)
Bert, J. E. (A)
Daniels, T. E. (A)
Danko, S. F. (M)
Dickman, A. (A)
Evers, J. T. (VA)
Frevert, A. W. (M)
Hull, J. F. (M)
Lavin, H. D. (A)
Mazel, L. G. (A)
Speaker, H. B. (A)
Stodola, E. K. (SM)
Swingle, D. M. (M)
Woodyard, O. C. (M)

Neptune City (NY-2)
Mudgett, A. H. (A)

Neshanic
Kuthe, H. K. (VA)

Netcong (NY-2)
Relchard, W. C. (VA)

Newark (NY-2)
Abrams, H. (A)
Acosta, F. B. (A)
Balash, F. J. (A)
Barabutes, T. (A)
Beeler, T. L. (A)
Berkery, E. A. (A)
Bird, S. P. (A)
Bohnstedt, C. E. (A)
Boyson, C. V. (A)
Bremer, F. V. (SM)
Broutman, C. A. (A)
Butler, W. E. (A)
Caprarola, L. J. (A)
Carluccio, J. (A)
Cert, A. E. (A)
Cohen, S. (SM)
Coppola, A. A. (A)
Davis, M. G. (A)
Denney, J. M. (A)
Donohoe, L. J. (A)
Fairfield, H. (A)
Farese, V. C. (A)
Fernandes, J. G. (A)
Fishman, S. (SM)
Fogarty, L. L. (A)
Fressola, B. C. (A)
Gilbert, R. W. (M)
Giordano, A. F. (A)
Gladden, C. T. (A)
Glick, C. L. (A)
Goldberg, D. L. (A)
Gomez, E. (A)
Grantges, R. F. (A)
Greenberg, H. (A)
Greenwood, T. S. (A)
Gropp, B. P. (A)
Gross, J. I. (A)
Guarino, P. A. (A)
Henry, T. J. (SM)
Hergenhan, O. (A)
Hoefle, R. R. (A)
Holdman, M. (A)
Hooven, M. D. (SM)
Houghton, H. V., Jr. (A)
Irby, R. F. (A)
Jensen, D. C. (A)
Kang, C. L. (A)
Kenney, C. M. (A)
Klapach, P. (A)
Klappholz, L. (A)
Klein, M. (M)
Koppelon, R. (SM)
Kunkel, E. A., Jr. (A)
Kups, E. F. (A)
Kwast, V. B. (M)
Lamb, F. X. (VA)
Lamoreaux, F. H. (A)
Lebleboojian, G. (A)
Leisenring, J. G. (A)
Maczali, G. J. (A)
Martin, A. J. (A)
McCormick, D. A. (M)
Mearns, A. B. (A)
Meinholtz, H. J. (A)
Mellen, E. R. (SM)
Meo, M. (A)
Miller, J. H. (F)
Mitchell, M. E. (A)
Morelock, O. J. (SM)
Morgan, W. H. (A)
Murdock, B. B. (A)
Nagy, J., Jr. (A)
Nahay, L. P. (A)
Newman, L. (A)
Niemann, L. H. (A)
Noll, J. C. (A)
Peldunas, A. P. (A)
Perna, P. J. (A)
Pfost, R. H. (A)
Plaza, A. (A)
Popyk, J., Jr. (A)
Ranger, R. H. (F)
Rawson, H. B. (A)
Rosenzweig, I. (A)
Ross, P. L. (A)
Russell, F. A. (M)
Scharkess, H. (M)
Schooley, R. W., Jr. (A)

Sennewald, P. F. (A)
Stansbury, E. J. (A)
Stephens, C. W. (A)
Surenian, D. (A)
Thomas, A. W. (A)
Tiffin, C. M. (A)
Vernick, J. N. (A)
Vreeland, J. B. (A)
Walker, R. D. (A)
Wallenstein, J. P. (A)
Weber, R. M. (A)
Wells, D. H. (A)
Wildenberg, H. I. (A)
Wing, O. (A)
Wolkstein, H. J. (A)
Yaroshko, P. (A)
Zick, B. A. (A)
Zilliger, W. H. (A)

New Brunswick (PRI-3)
Barnette, W. E. (A)
Butenko, J. W. (A)
Cahill, R. M. (A)
Fich, S. (M)
Freedman, L. A. (A)
Haeseler, P. R. (A)
Hellmann, P. E. (A)
Kaden, G. (A)
Klemmer, A. E. (A)
Longo, C. V. (M)
Meyerhoff, A. A. (A)
Moore, T. H. (A)
Morris, M. J. (A)
Porter, H. D. (A)
Potter, J. L. (SM)
Rosenthal, L. (SM)
Selinsky, J. J. (A)
Stenfancic, K. (A)
Weil, G. M. (A)
Weintraub, W. B. (A)
Williams, R. L. (A)

New Milford (NY-2)
Alexander, S. B. (A)
Chadney, H. B. (A)
Cohen, N. L. (A)
Ewert, A. C. (M)
Franzel, I. H. (A)
Frye, F. X. (A)
Gardner, R. O. (A)
Hafemeister, R. F. (M)
Hammerich, H. A. (A)
Harris, G. D. (A)
Heir, D. H. (A)
Labagh, E. L. (A)
MacDermid, B. W. (A)
Mills, H. J. (A)
Olson, R. E. (M)
Patremio, S. R. (M)
Phelps, R. B. (M)
Reich, P. J. (M)
Roth, H. (A)
Shaw, A. B. (M)
Shaw, W. (M)
Taris, J. (M)
Umles, M. S. (A)

New Providence (NY-2)
Alexander, E. J. (A)
Andrews, H. W. (A)
Borden, C. C., Sr. (M)
Chruney, M. (A)
Levenbach, G. J. (M)
Malthaner, W. A. (SM)
Quinn, J. L., Jr. (A)
Simonds, R. E. (M)
Steele, R. B. (A)
Sullivan, J. W. (A)
Susen, C. P. (A)
Teltscher, E. S. (A)
Tendick, F. H., Jr. (A)
Thomas, G. B., Jr. (SM)
Upthegrove, H. N. (A)
Weaver, C. E. (A)
Welber, I. (A)

New Vernon
Young, F. C. (A)

Nixon (PRI-3)
Bocchieri, A. J. (A)
Maurer, M. S. (A)
Richardson, J. N. (A)
Shenk, J. J. (A)
Unger, R. J. (A)
Zapotocky, A. C. (M)

Normandy Beach
Shanahan, J. C. (M)

North Arlington (NY-2)
Balter, S. A. (A)
Berger, M. (A)
Bruning, J. M. (M)
Sodvary, J. W. (A)

North Bergen (NY-2)
Blamonte, O. A. (A)
Cox, J. L. (A)
Dundatscheck, E. P. (A)
Dunn, W. J. (A)
Fennick, B. (A)
Feucht, R. E. (A)
Frieborn, J. K. (A)
Goble, A. S., III (A)
Harms, F. G. (A)
Horner, R. G. (A)
Oliver, G. E. (SM)
Perlis, H. J. (A)
Wolter, H. R. (A)

North Caldwell (NY-2)
Adamson, A. A. (SM)
Baldwin, W. O. (A)
Clark, T. G. (A)
Grieg, D. D. (SM)
Poff, J. K. (M)
Siemens, R. H. (SM)
Steadman, A. (A)

North Hackensack (NY-2)
Gumaer, H. (A)

North Long Branch
Reusch, R. K. (A)

North Merchantville
Obert, M. J. (SM)

North Plainfield (NY-2)
Deeley, P. M. (SM)
Dinzik, D. J. (A)
Gordon, M. J. (A)
Noble, M. L. (A)
Ottobre, J. N. (A)
Vergon, T. F. (A)
Wahl, A. (A)
Warren, C. W. (A)

Norwood (NY-2)
Brick, F. R., Jr. (SM)
Vieth, W. G. (M)

Nutley (NY-2)
Alexander, B. (M)
Altman, F. J. (M)
Bondy, J. O. (A)
Bryant, J. H. (SM)
Bucher, F. X. (SM)
Capen, H. N. (SM)
Cater, J. R. (M)
Clavier, A. G. (F)
Cookson, A. E. (SM)
Cornwell, R. C. (M)
Davis, R. C. (SM)
De Vany, B. V. (M)
Dishal, M. (SM)
Ellis, R. (A)
Fahnestock, R. J. (A)
Felsenheld, R. A. (M)
Frederick, R. E., Jr. (A)
Goldan, T. J. (A)
Gray, R. E. (VA)
Greenfield, G. (A)
Groce, J. C. (A)
Gronberg, H. C. (VA)
Hamilton, G. E. (SM)
Hall, J. (A)
Happe, W. H., Jr. (A)
Hoagland, K. A. (SM)
Jones, M. A. (A)
Kandoian, A. G. (F)
Kearns, W. P. (A)
Lott, R. E., Jr. (A)
Lundburg, F. J. (SM)
Magdeburger, P. E. (A)
Mangolds, B. (M)
Marchese, T. J. (SM)
Millar, W. M. (A)
Miller, R. J. (A)
Parzen, P. (SM)
Peifer, A. G. (M)
Polyzou, J. (A)
Rogoff, M. (M)
Rutherford, R. E. (A)
Rymer, R. H. (A)
Schildknecht, R. O. (A)
Shapiro, O. (M)
Sichak, W. (M)
Spahr, P. K., Jr. (A)
Stacey, J. M. (A)
Stevens, F. J. (M)
Swinney, J. G. C., Jr. (SM)
Troutman, J. E. (A)
Turvey, F. P., Jr. (A)
Tyminski, W. V. (A)
Uhler, K. W. (M)
Van Vechten, R. K. (A)
Waer, R. R. (A)
Ware, P. M., Jr. (A)
Westbrook, E. P. (A)
Wickersham, W. H. (SM)
Wing, A. K., Jr. (SM)
Wirth, C. H. (A)
Young, N. H. (SM)
Zaret, M. E. (SM)
Zeliff, R. J. (A)

Oakland
Noble, R. B. (A)

Oaklyn (PHI-3)
Brown, E. L. (A)
Christiansen, W. G. (A)
Endy, W. M. (A)
Fiet, O. (SM)
Gluda, H. W. (A)
Henderson, R. A. (SM)
Neely, W. J. (A)
Putzrath, F. L. (A)
Salani, J. M. (A)
Sass, E. J. (M)
Scheldorf, R. D. (VA)

Oceanport (NY-2)
Koelle, A. R. (A)
Nylander, G. A. (A)
Schnabolk, H. L. (A)
Stromberg, R. E. (M)

Ocean City (PHI-3)
Conner, B. C. (A)
Glawson, T. J. (A)

Old Bridge (PRI-3)
Ganson, D. M., Jr. (A)
Koch, J. G. (A)

Oldwick (PRI-3)
Wittwer, N. C., Jr. (A)

Oradell (NY-2)
Brackett, H. H. (VA)
Bruce, W. D. (A)
Schwartz, H. C. (A)
Yeutter, C. S. (A)

Orange (NY-2)
Burkhart, W. H. (A)
Fromer, M. (A)
Gardner, P. S. (A)
Grayson, E. L. (M)
Hardwick, F. (M)
Helfrich, J. H. (A)
Kenyon, R. R. (A)
Kindberg, E. V. (A)
Milbrodt, P. E. (A)
Myers, B. R. (A)
Poletti, G. (A)
Suydam, C. H. (M)
Terry, C. B. (A)

Oxford (NY-2)
Bartron, H. H. H. (A)

Packanack Lake (NY-2)
Beaver, H. E. (A)
Bentley, A. V. (SM)
Brown, P. F. (M)
Fockler, W. G. (SM)
Keefer, D. E. (A)
Merrill, H. B., Jr. (A)
Nestlerode, C. D., Sr. (A)
Reese, H., Jr. (M)
Wescoat, W. L. (A)
Wixson, F. C. (A)
Zusi, F. C. (A)

Palisade (NY-2)
Andrews, E. (A)
Coppell, F. K. (A)
Schnoll, N. (SM)

Palisades Park
Karolkiewicz, D. J. (A)

Palmyra (PHI-3)
Ennis, F. J. (A)
Foerster, W. (A)
Gorski, A. A. (A)
Hilbourn, C. L. (A)
Rammer, C. A. (M)
Ringer, H. N. (A)
Robinson, H. A. (SM)
Waring, J. W. (A)
Woestman, J. W. (A)
Woodward, C. P. (A)
Yewdall, G. E. (A)

Paramus (NY-2)
Ankenbrock, C. A. (A)
Braun, W. E. (A)
Brown, T. G. (A)
Chanes, H. (M)
Deiss, E. W. (A)
Evander, H. S. (A)
Feller, M. (A)
Haefner, C. G. (A)
Honeiser, V. P. (A)
Manoly, A. E. (A)
Petrina, R. J. (A)
Poarch, M. F. (A)
Robertson, J. D. (A)
Schenkel, F. W. (A)
Stahl, P. D. (M)
Struck, H. E. (A)
Wehrlin, R. F. (A)
West, S. S. (A)
Young, R. (M)

Park Ridge (NY-2)
Ecklund, E. (SM)
Frear, R. B. (A)
Germann, J. D. (A)
Sturm, N. (A)

Parlin (PRI-3)
Panos, R. J. (A)

Parsippany (NY-2)
Eccles, T. L. (A)
Krause, C. K. (VA)
Stanton, S. W. (VA)
Zenk, G. E. (A)

Passaic (NY-2)
Backus, A. S. (A)
Brussel, E. H. (A)
Bunn, H. L. (A)
Crystal, A. H. (A)
Currier, P. J. (A)
Dalkiewicz, J. M. (A)
De Bell, J. M., Jr. (A)
Dehoney, R. J. (A)
Dresner, J. (A)
Dumont, A. B. (F)
Faust, W. E. (A)
Hair, G. R., Jr. (A)
Hettinger, S. (A)
Muench, W. H. (A)
Peretko, H. T. (M)
Schkolnick, H. (A)
Schmidt, L. (A)
Schultz, R. T. (A)
Seats, P. (A)
Sher, A. (A)
Smith, P. W. (A)
Stoj, F. R. (A)
Suszek, E. J. (A)
Von Savage, J. (A)
Wakeman, R. P. (M)
Webster, G. C. (A)
Yu, Y. P. (A)

Paterson (NY-2)
Blagi, A. D. (A)
Binneveld, H. A. J. (A)
Bruggeman, J. T. (A)
Buchinger, M. J. (A)
Butterworth, J. W. (SM)
Carlson, O. E. (M)
Cole, W. S. (A)
Di Ruggeriero, M. A. (A)
Durgin, L. A. (A)
Eckstein, N. A. (A)
Edwards, A., Jr. (A)
Emaus, J. L. (A)
Evans, N. L., Jr. (A)
Garlano, W. F. (A)
Geller, W. (A)
Gillette, D. (A)
Goforth, J. L. (A)
Grimes, W. M., Jr. (A)
Grower, B. B. (A)
Haefeli, J. E. (A)
Hansen, R. K. (A)
Lome, J. B. (A)
Lucas, E. F. (A)
Martin, J. A. (A)
Papanou, D. S. (A)
Potash, J. (A)
Rich, P. A. (A)
Sarratt, E. R. (M)
Sautner, J. (A)
Seergy, C. M. (A)
Shea, R. A. (SM)
Thiegartner, G. J. (A)
Volpe, D. F. (A)

Paulsboro (PHI-3)
Gross, S. D. (A)
Michelson, H. J. (A)

Pemberton (PHI-3)
Beckenstein, M. (A)

Pennington (PRI-3)
Fernsler, G. L. (SM)

Pennsauken (PHI-3)
Bauer, J. A. (SM)
Benzuly, H. J. (A)
Conner, W. J., Jr. (A)
Deranian, M. (A)
Dietch, L. (M)
Eckel, C. C. (A)
Hobson, N. L. (A)
Houston, R. S. (M)
Inglis, A. F. (SM)
Kaplan, M. (A)
Kaiazez, F. T. (A)
Munson, I. K. (M)
Nangle, F. J., Jr. (A)
Nossen, E. J. (A)
Prokop, F. J. (A)
Reeder, C. E. (A)
Roberts, W. L. (M)
Salani, J. M. (A)
Shaver, K. C. (A)
Uphoff, F. B. (A)
Willey, J. R. (A)
Yen, J. T. (A)

Penns Grove (PHI-3)
Garrett, L. B., Jr. (A)
Tipton, W. F. (M)

Pequannock (NY-2)
Brown, W. G. (A)
Schmidt, C. R. (M)

Perth Amboy (PRI-3)
Ceres, G. V. (A)
Garretson, T. A. (M)
Jesse, S. A. (A)
Marcy, S. P. (A)
Mikkelsen, W. R. (A)
Moravek, J. J. (A)

Phillipsburg (NY-2)
Haring, D. R. (A)
Hill, C. A. (A)

Pitman (PHI-3)
Andrade, L. (A)
Brown, I. N. (SM)
Chaney, A. L., Jr. (A)
Luckock, W. J. (M)
Parker, S. R. (M)
Thomas, W. F. (A)

Plainfield (NY-2)
Barr, H. J. (A)
Boise, E. B. (A)
Cowperthwait, W. L., Jr. (M)
Edson, J. O. (SM)
Hardin, L. L., Jr. (SM)
Haydu, G. K. (A)
Hunter, F. L., Jr. (A)
Hunter, W. B. (A)
Kelly, H. P. (A)
Magers, T. M. (A)
Perks, A. F. (A)
Satter, H. W. (A)
Schneider, W. A. (A)
Smith, A. E. (M)
Snyder, C. L. (A)
Soga, M. (M)
Streeter, T. W., Jr. (A)
Stull, R. J. (SM)
Townsend, G. B. (A)
Wallace, R. L. (SM)
Warren, C. A. (SM)
Weihrle, A. W. (A)
Woody, M. W. (A)

Point Pleasant
Scharmann, L. E. (A)

Pompton Lakes (NY-2)
Anderson, G. M. (SM)
McDevitt, J. J., Jr. (A)
McEwan, A. W. (M)
McNary, B. D. (M)
Merish, H. J. (A)
Romain, D. O. (A)
Sellers, G. W. (M)
Wachter, J. E. (A)

Pompton Plains (NY-2)
Arnold, A., Jr. (A)
Casey, R. F. (A)
Cavanagh, R. T. (A)
Guilfoyle, R. J. (M)
Kelly, M. L. (A)
Millard, J. W. (A)
Nielsen, A. H. (A)
Palmer, R. C. (M)
Pauloski, S. H. (A)
Sayer, W. H., Jr. (A)
Thompson, R. D. (M)

Pottersville (PRI-3)
Peery, W. E. (VA)

Preakness (NY-2)
Brown, A. T. (A)
Noll, J. W. (A)

Princeton (PRI-3)
Allen, H. C. (SM)
Armstrong, L. D. (M)
Baker, G. M. K. (M)
Barco, A. A. (SM)
Barton, L. E. (SM)
Baugh, W. (M)
Beam, W. R. (A)
Becker, H. C. (A)
Bedford, A. V. (F)
Behrend, W. L. (SM)
Binstock, P. L. (A)
Bittmann, E. E. (M)
Bliss, W. H. (SM)
Bond, D. S. (SM)
Borkan, H. (A)
Braden, R. A. (SM)
Brown, G. H. (F)
Burns, L. L., Jr. (SM)
Burnside, D. G. (SM)
Burrill, C. M. (SM)
Carlson, W. L. (F)
Carpenter, M. M., Jr. (A)
Chambers, F. T., III (A)
Chandler, C. H. (SM)
Chandler, H. M., Jr. (M)
Cheeseman, P. R. (A)
Clement, P. R. (A)
Cowan, E. J. (M)
Crane, H. D. (A)
Creager, F. L. (M)
Dalzell, C. W. (A)
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)
Engstrom, E. W. (F)
Epstein, D. W. (F)

Epstein, J. (SM)
Estrin, G. (A)
Estrin, T. A. (A)
Ewing, D. H. (SM)
Fischer, J. T. (A)
Flory, L. E. (SM)
Forgue, S. V. (SM)
Fredendall, G. L. (SM)
Garretson, E. B. (A)
George, R. W. (SM)
Giacoletto, L. J. (SM)
Gibson, W. G. (A)
Hackley, R. A. (A)
Hart, H. C. (M)
Harvey, R. L. (SM)
Hegyi, I. J. (M)
Hemman, R. J. E. (M)
Herkart, P. G. (M)
Herold, E. W. (F)
Herman, F. (A)
Herzog, G. B. (A)
Holmes, R. S. (F)
Hook, H. O. (A)
Houghton, W. D. (A)
Hoyler, C. N. (SM)
Hubbard, B. R. (VA)
Hufford, G. (A)
Hutter, E. C. (A)
Jenny, D. A. (A)
Jensen, A. S. (SM)
Johnson, E. O. (M)
Johnson, H. (SM)
Johnson, W. C. (SM)
Karns, M. E. (SM)
Kazan, B. (A)
Keizer, E. O. (SM)
Kell, R. D. (F)
Kessler, J. O. (A)
Klensch, R. J. (A)
Klopfenstein, R. W. (M)
Knoll, M. (SM)
Kurshan, J. (SM)
Landon, V. D. (F)
Langberg, E. (A)
Law, H. B. (F)
Leyton, E. M. (SM)
Lindenblad, N. E. (F)
Linder, E. G. (SM)
Liu, F. F. (A)
Lohman, R. D. (M)
MacLean, K. G. (SM)
Malter, L. (F)
Martin, D. A. (A)
Martinelli, C. C. (SM)
Mather, N. W. (M)
Mederos, T. S., Jr. (M)
Mesner, M. H. (SM)
Miele, A. A. (A)
Moore, D. G. (M)
Morrison, W. C. (SM)
Morton, G. A. (F)
Mueller, C. W. (SM)
Nergaard, L. S. (F)
Nicoll, F. H. (SM)
Norman, F. H. (A)
North, D. O. (F)
Olive, G. A. (A)
Olson, C. V. (M)
Olson, H. F. (F)
Pankove, J. I. (A)
Pensak, L. (SM)
Peterson, D. W. (A)
Pike, W. S. (M)
Pomerene, J. H. (M)
Pritchard, D. H. (M)
Pyne, I. B. (A)
Rajchman, J. A. (F)
Ramberg, E. G. (SM)
Rankin, J. B. (A)
Raymond, C. A. (A)
Roberts, W. V. (F)
Robinson, J. G. (A)
Robinson, K. W. (A)
Rodgers, G. M. (A)
Rose, A. (F)
Roush, G. E. (M)
Schairer, O. S. (SM)
Schwartz, J. W. (A)
Scott, T. M. (A)
Serrell, R. (SM)
Smith, J. P. (SM)
Smith, P. T. (SM)
Snyder, R. F. (SM)
Sommer, A. H. (SM)
Spears, H. (A)
Stabler, E. P. (A)
Stone, R. P. (SM)
Surber, W. H., Jr. (M)
Sutherland, A. D. (M)
Sziklai, G. C. (SM)
Tolson, W. A. (SM)
Trevor, B. (F)
Tuska, C. D. (SM)
Vose, C. H. (SM)
Wadlin, M. L. (A)
Wallmark, J. T. (A)
Ward, S. A. (M)
Webster, W. M. (A)
Weimer, P. K. (SM)
Westneat, A. S., Jr. (SM)
Wilkinson, W. C. (M)
Williams, T. R. (A)
Wolff, I. (F)
Wong, S. Y. (A)
Woodbridge, D. E. (A)
Woodward, O. M., Jr. (A)
Yamada, D. A. (A)
Young, C. J. (F)
Zworykin, V. K. (F)

Princeton Junction (PRI-3)
De Remer, K. R. (A)
Matheson, R. M. (A)
Pidgeon, R. E., Jr. (A)
Richey, J. L. (SM)

Prospect Park
Serra, E. M. (A)

Radburn (NY-2)
Eaton, R. D. (M)
Silver, M. (A)

Rahway (NY-2)
Basarab, J., Jr. (A)
Bellingham, L. C. (A)
Coler, B. A. (A)
Gegenheimer, R. F. (A)
Grill, C. (A)
Jones, E. L. (A)
Lucier, O. S. (A)
Robinson, G. D. (A)
Sarullo, M. J. (A)

Ramsey (NY-2)
Buyer, E. M. (A)
Friedman, D. (A)
Gray, L. F. (M)
Mason, R. S. (A)
Paschetto, D. D. (A)

Rancocas
Korman, N. I. (SM)

Red Bank (NY-2)
Anderson, E. C. (SM)
Babb, D. D. (A)
Bawden, H. G. (M)
Beck, A. C. (SM)
Billick, P. (A)
Budenkaye, A. C. (M)
Burawski, J. A. (A)
Bush, J. A. (A)
Crawford, A. B. (F)
Dathe, L. C. (A)
Deblasio, C. (A)
Domidion, W. G., Jr. (A)
Edwards, C. F. (A)
Egli, J. J. (A)
Feist, W. E. (SM)
Forney, R. E. (A)
Fow, B. F. (A)
Fox, A. G. (SM)
Frankel, H. (M)
Gerhold, R. A. (M)
Goodall, W. M. (F)
Gordon, L. (M)
Gougoulis, G. H. (A)
Hiltner, E. B. (A)
Hunt, D. W. (M)
Hunt, L. E. (SM)
Jakes, W. C., Jr. (SM)
Johnson, G. D. (VA)
Karp, A. (M)
Keigher, B. J. (A)
Kiger, L. L. (A)
King, A. F. (SM)
Krevsky, S. (SM)
Kulinyi, R. A. (M)
Kummer, W. H. (A)
Lacy, R. E. (SM)
Legg, W. E. (A)
Levine, R. H. (A)
Levy, L. G. (A)
Lindner, G. H. (A)
Lindner, H. G. (SM)
Maloney, T. E. (M)
Mancino, V. J. (A)
Marcille, R. E. (A)
Martin, J. E. (A)
McConnell, K. R. (SM)
Menhennett, G. H. (M)
Moody, C. S. (A)
Moore, J. C., Jr. (M)
Nisenhoff, N. (M)
Olshansky, P. (A)
Papier, J. H. (A)
Petrillo, S. E. (A)
Pitzer, J. F. (A)
Pustelnyk, M. (A)
Ring, D. H. (SM)
Robertson, S. D. (SM)
Rose, C. F. P. (SM)
Rothstein, J. (A)
Rowe, H. E. (A)
Schelleng, J. C. (F)
Sharpless, W. M. (SM)
Sher, H. T. (A)
Sherburne, F. B. (A)
Siderman, J. A. (M)
Siegel, P. (A)
Singer, H. (A)
Stangl, F. P. (M)
Stanley, H. T. (A)
Tillotson, L. C. (SM)
Weiss, M. T. (A)
Winn, W. F. (A)
Wopat, J. W., Jr. (A)
Wright, D. S. (A)
Zalesky, S. J. (M)
Zarin, A. (A)

Ridgefield (NY-2)
Dardano, L. B. (A)
Dolinko, L. (A)
Fristensky, C. A. (A)
Geiling, H. F. (A)
Priftis, S. (A)
Roth, M. C. (M)
Sokol, S. (A)

Ridgewood (NY-2)
Armstrong, C. A. (SM)
Bickel, R. C. (A)
Boyle, G. G. (A)
Cahill, W. J. (VA)
Davids, D. A. (A)
Dean, W. W. (SM)
DeLeon, J. (A)
DeMars, S. A. (A)
Eichenberger, N. F. (A)
Engel, G. C. (A)
Fitts, W. F. (A)
Fry, W. A., Jr. (A)
Holt, A. C. (SM)
Howite, R. (A)
Johnson, F. H. (A)
Keetch, W. A. (A)
Klein, G. H. (A)
Labagh, E. L. (A)
McCormick, S. T., Jr. (A)
Mulligan, J. H., Jr. (SM)
Pain, D. H. (A)
Puckette, C. M., Jr. (M)
Rogers, T. I. (SM)
Sands, L. G. (SM)
Simpson, L. C. (SM)
Titus, E. S. (A)
Troell, R. E. (A)
Underhill, E. M. (SM)
Warsher, A. (M)

Ringwood (NY-2)
Engert, G. W. (A)

Riverdale (NY-2)
Hegeman, B. L. (A)

River Edge (NY-2)
Anolik, B. S. (M)
Baum, E. (A)
Bochet, F. J. (A)
Colman, L. (A)
Ennis, F. T. (VA)
Howitt, G. (A)
Izzo, A. J. M. (A)
Kennedy, A. (SM)
Levine, A. M. (A)
Levitsky, J. (A)
Mazzola, J. R. (SM)
O'Connor, R. A. (M)
Samuelson, C. D. (VA)
Slack, S. J. (A)

Riverside (PHI-3)
Good, M. B. (A)
Warner, F. N. (A)

Riverton (PHI-3)
Benware, R. T. (SM)
Chapman, L. J. (A)
Collings, F. C., Jr. (M)
Good, L. H. (M)

River Vale (NY-2)
Lambert, F. D. (A)

Rochelle Park (NY-2)
Carroll, J. M. (A)
Hancock, P. L. (A)
Stolte, J. J. (A)
Studwell, A. E. (A)
Uzel, F., Jr. (A)

Rockaway (NY-2)
Carne, G. G. (SM)
Uiga, E. (A)
Woodruff, G. N. (A)

Roseland (NY-2)
Ahlstedt, T. E. (SM)
Richardson, G. G. (A)

Roselle (NY-2)
Preuss, E. A. (A)

Roselle Park (NY-2)
Arkwright, L. P. (A)
Helm, R. J. (A)
Legendre, V. (M)
Olsen, R. F. (A)
Reichert, W. G., Jr. (A)

Rumson (NY-2)
Blom, B. V. (SM)
Friis, H. T. (F)
Golay, M. J. E. (SM)
Gruol, J. W. (M)
McDonald, C. K. (A)
Ribe, M. L. (A)
Stega, E. A. (M)
Strothman, R. A. (M)

Runnemede (PHI-3)
Oda, D. J. (A)
Tucker, B. W. (A)

Rutherford (NY-2)
Edmunds, J. J., Jr. (A)
Felt, L. (A)
Higgins, L. A. (A)
Keller, W. N. (A)
Kerver, N. E. (A)
Kline, M. B. (SM)
Lohrenz, C. (A)
Loring, B. L. (A)
Manty, W. A. (SM)
Merrill, J. B. (A)
Monack, A. J. (SM)
Muniz, R. (SM)
Reenstra, W. A. (A)
Ruckl, D. H. (M)
Sakate, F. S. (A)
Sammon, A. C. (A)
Schneider, A. E. (M)
Scott, G. R. (M)
Seigler, J. D. (A)
Simpson, W. F. (VA)
Van Winkle, E. W. (SM)
Vogt, R. J. (A)
Walter, C. W. P. (SM)
Wattson, H. B. (SM)
Wilmarth, R. W. (M)

Salem (PHI-3)
Bailey, L. W. (SM)
Morton, R. S. (VA)
Perlsweig, A. M. (A)

Scotch Plains (NY-2)
Bell, J. S. (A)
Fisher, J. H. (M)
Harkless, E. T. (A)
Montllor, J. A. (A)

Secaucus (NY-2)
Bartlett, B. R. (A)
Eickhorn, C. R., Jr. (A)
Tonn, J. L. (A)

Sea Girt (NY-2)
Cottingham, J. H. (A)
Geissinger, E. L. (A)

Sewell (PHI-3)
Brunt, N. F. (A)
Woodward, J. D. (SM)

Short Hills (NY-2)
Adams, R. T. (A)
Budenbom, H. T. (SM)
Carroll, M. J. (SM)
Doré, A. J. (A)
Guppy, J. W., Jr. (A)
Huber, G. H. (SM)
Jones, H. B., Jr. (A)
Opie, A. (M)
Schisel, J. (SM)
Steers, W. F. (SM)
Tucker, J. P. (VA)
Vanderbilt, S. (A)
Whittemore, L. E. (F)
Wright, A. K. (SM)
Ziegler, A. W. (SM)

Shrewsbury (NY-2)
Attwood, S. W. (M)
Brown, A. L. (A)
Covici, W. (A)
Czerwinski, W. P. (M)
Mittelman, W. (A)
Petkofsky, L. (A)
Rehm, W. L. (M)
Ross, A. H. (SM)

Sicklerville (PHI-3)
Ayres, J. J. (M)

Singac
Fetko, J. F. (A)
Krell, J. (A)

Skillman (PRI-3)
Hamner, L. H. (A)

Somerville (PRI-3)
Larky, N. D. (A)
Parr, H. M. (A)

South Amboy (PRI-3)
Rauth, R. G. (A)

South Orange (NY-2)
Augenblick, H. A., Jr. (A)
Baker, D. (A)
Billets, M. P. (A)
Bonanno, J. L. (SM)
Friedman, A. B. (A)
Harris, W. A. (SM)
Miller, H. J. (SM)
Neary, J. F. (A)
Pike, G. W. (A)
Poppele, J. R. (F)
Royden, G. T. (F)
Stanwick, C. A. (VA)
Wooldridge, A. C. (SM)

South Plainfield (NY-2)
Bellew, F. N. (A)
Johnson, A. B. (A)
Tesno, R. R. (A)

South River (PRI-3)
Bernard, W., Jr. (A)
Blanchard, C. K. (A)

Sparta (NY-2)
Hussey, L. W. (SM)
Lundstrom, A. A. (SM)

Springfield (NY-2)
Aitelli, F. P. (A)
Emmel, L. L. (A)
Field, W. T. (VA)
Hartz, W. W. (A)
Jelen, M. J. (SM)
Keppert, G. D. (A)
Ozsvath, D. R. (M)
Rogers, A. W. (M)

Spring Lake (NY-2)
Bozzelli, J. F. (A)
Huber, W. A. (SM)
Slattery, J. J. (SM)
Voigt, G. (A)

Spring Lake Heights
Acker, R. E. (A)

Stanhope (NY-2)
Carmichael, R. L. (A)

Stelton
Reed, E. D. (A)

Stockton
Wolcott, J. R. (A)

Stratford (PHI-3)
Corr, J. J. (A)
Shellock, J. V. (A)

Succasunna (NY-2)
Limberg, A. C. (A)

Summit (NY-2)
Albrecht, H. W. (M)
Anderson, F. B. (SM)
Ansorge, H. W. (A)
Becker, F. K. (A)
Bennett, A. F. (M)
Bishop, J. D. (A)
Black, H. S. (F)
Block, F. G. (A)
Butenbach, R. W. (A)
Clithero, W. H., Jr. (A)
De Rienzo, F., Jr. (A)
Distler, J. E. (A)
Dudley, H. W. (SM)
Evans, H. W. (SM)
Feldman, C. B. (F)
Fewer, D. R. (A)
Gammie, J. (M)
Grierson, C. A. W. (SM)
Grieser, T. J. (M)
Hammell, R. (A)
Hanchett, G. D., Jr. (SM)
Harley, J. B. (VA)
Hartley, R. V. L. (F)
Hatch, R. W. (A)
Hathaway, S. D. (A)
Heising, R. A. (F)
Hensel, M. L. (A)
Hughes, H. K. (M)
Johnson, R. L. (M)
Jordan, D. R. (A)
Kilss, A. (A)
Kircher, R. J. (SM)
Lommasson, T. E. (M)
Lundry, W. R. (SM)
Luscher, R. W. (M)
Marshall, R. W. (M)
McDowell, H. L. (A)
Means, W. J. (SM)
Michon, A. E. (M)
Moster, C. R. (A)
Nast, D. W. (A)
Orth, R. T. (SM)
Ratajczak, R. A. (A)
Raynsford, C. K. (A)
Sandamark, P. I. (M)
Schwenker, J. E. (A)
Shepard, F. H., Jr. (A)
Steiger, B. F. (A)
Stiles, K. P. (SM)
Thielen, L. R. (A)
Thompson, T. H. (A)
Toy, W. N. (A)
Von Rosenberg, C. E. (A)
Weppler, H. E. (M)

Sussex (NY-2)
Bliss, D. C. (A)
Maher, J. R. (A)

Taunton Lakes
Wagoner, R. G. (A)

Teaneck (NY-2)
Atlas, Z. (A)
Chalmers, W. G. (A)
Chin, E. (A)
Easterling, M. F. (A)
Galbraith, J. E. (A)
Goldberg, A. A. (M)
Hartnett, E. J. (A)
Hunt, D. G. (A)
Jacobs, B. H. (A)
Joller, C. R. (A)
Klein, M. E. (M)
Luhrs, C. H. (M)
Mezger, G. R. (VA)
Mohr, A. R. (A)
Nestor, G. (M)
Preston, J. G. (VA)
Pulley, A. A. (VA)
Quance, F. R. (A)
Sather, O. J. (SM)
Sheer, C. (SM)
Thurston, W. R. (SM)
Tsao, T. C. (SM)
Verseput, P. C. (A)
Wachter, F. W., Jr. (A)
Wohlberg, A. W. (A)

Tenafly (NY-2)
Arrigo, L., Jr. (A)
Bender, W. G. (A)
Border, B. (A)
Copp, W. C. (A)
Davis, R. H. (A)
Hull, R. E. (A)
Murphy, F. W. (A)
Paulson, G. A. (A)
Shotliff, L. A. (SM)
Swensen, J., Jr. (A)
Unger, W. H. (M)
Woodbury, J. R. (A)

Teterboro (NY-2)
Robinson, C. S. (M)
Sprung, R. A. (A)

Thorofare (PHI-3)
Small, H. E. (A)

Titusville (PRI-3)
Dilley, J. E. (A)

Toms River (NY-2)
Wood, H. V. (A)
Zelnick, S. (A)

Totowa (NY-2)
Monsees, W. A. (A)

Totowa Boro (NY-2)
Heinis, F. W. (A)
Wehner, J. H. (A)

Trenton (PRI-3)
Abjornson, C. A. (A)
Allwine, H. S. (A)
Ballard, R. C. (SM)
Carver, L. A. (M)
Czyzewski, E. T. (A)
DeVeaux, E. C. (M)
Di Giuseppe, A. (A)
Fireman, P. (M)
Harris, F. M. (VA)
Hawks, B. (A)
Kellock, J. H., Jr. (A)
Lancaster, T. W. (A)
Miller, R. (A)
Newhart, E. L. (A)
Orlowski, J. S. (A)
Power, J. B. (A)
Preisig, J. O. (A)
Ralston, G. (M)
Raser, E. G. (M)
Robbins, L. S. (A)
Sakson, P. J. (A)
Strother, W. F. (A)
Wentzel, A. G., Jr. (M)
Yard, E. M. (M)

Union (NY-2)
Anderson, N. E. (M)
D'Agostino, V. F. (A)
Edwards, J. B. (VA)
Faughnan, J. F. (A)
Hill, L. O. (A)
Hultquist, J. F. (A)
Lambert, G. W. (A)
Metzler, R. (A)
Penk, C. (A)
Sapoff, M. (A)
Smithline, H. (A)
Treuhaft, M. A. (SM)

Union City (NY-2)
Bonazza, W. J. (A)
D'Amico, C. J. (A)
De Carlo, A. P. (A)
Donat, O. E. (A)
Hughes, K. E. (A)
Kelly, R. J. (A)
Kettmann, H. W. (A)
Kulesha, K. J. (A)
Lee, J. P. (A)
Markunas, J. P. (A)
Matto, V. G. (A)
Musto, A. A. (A)
Newman, A. W. (M)
O'Brien, J. F. (A)
Ollick, E. (A)
Pizzigoni, A. (A)
Ricca, R. F. (A)
Tahan, E. N. (A)
Vaughan, C. B. (A)

Upper Montclair (NY-2)
Benner, T. A. (M)
Bibbins, L. L. (A)
Borden, E. W. (A)
Burnett, J. H. (M)
Chipp, R. D. (SM)
De Long, O. A. (VA)
Godley, P. F. (VA)
Goldsmith, T. T., Jr. (F)
Hallborg, H. E. (F)
Hicks, B. A. (M)
Hulst, G. D. (M)
Humphrey, R. A. (SM)
Hunkins, H. R. (VA)
Nelson, E. P. (SM)
Nietsch, H. E. (A)
Osborne, H. S. (F)
Patten, S. F. (SM)
Roemisch, J. L. (SM)
Ruiter, J. H., Jr. (SM)
Siegel, R. (A)
Terhune, H. R. (SM)
Warner, H. M. (A)
Whitley, E. G. (A)

Vaux Hall (NY-2)
Accardo, N. A. (A)
Rundstedt, R. J. (A)

Verona (NY-2)
Baxter, C. L. (A)
Beltz, W. F. (A)
Buck, D. C. (A)
Butler, H. R. (VA)
Curtis, L. B. (A)
Griffith, B. G. (VA)
Jacobs, G. W. (M)
Kram, W. (A)
Lewinter, S. W. (A)
Peet, E. C. (M)
Scheraga, M. (A)
Smith, H. R. (A)
Steen, J. E. (A)
Tobler, C. R. (A)
Tompson, E. C. (A)
Van Brunt, L. B. (A)

Vincentown
Shelton, C. T. (A)
Warren, C. S. (A)

Waldwick (NY-2)
Bailey, R. S. (SM)
Broderick, N. E. (A)
French, H. A. (SM)
Gottfried, N. J. (M)
Lupfer, W. C. (A)
Russell, A. W. (SM)

Wanamassa (NY-2)
Carp, G. (A)
Clark, A. R. (A)
Goldberg, B. (SM)
Goldberg, W. P. (M)
Greenblum, C. (A)
Grundy, W. E. (A)
Hixson, J. D. (M)
Kuhnapfel, R. H. (A)
Miller, M. (A)
Steelman, K. C. (A)
Treston, P. (A)

Washington (NY-2)
Aten, D. C. (M)
Feindel, A. (M)

Watchung
Armstrong, D. T. (A)
Warren, C. A. (SM)

Weehawken (NY-2)
Brody, N. (A)
Hatke, F. L. (A)

Wenonah (PHI-3)
Eldridge, G. C., Jr. (A)
Starr, D. A., Jr. (A)
Sterner, J. F. (SM)

West Allenhurst (NY-2)
Brockel, H. W. (A)
Friedrich, V. L. (A)
Sugarman, R. H. (A)

West Caldwell (NY-2)
Brundage, J. H. (SM)
Capodanno, R. T. (SM)
Cobb, W. A. (M)
Crump, E. E. (M)
Eberhard, L. E. (VA)
Hampshire, R. A. (VA)
Lynn, P. R. (A)
McKechnie, J. S. (SM)
Miller, H. P., Jr. (SM)
Myers, R. H. (A)
Rigrod, W. W. (A)
Schade, O. H. (F)
Schade, O. H., Jr. (A)
Wilson, L. F. (A)

West Collingswood (PHI-3)
Daly, G. M. (SM)
Erwin, G. E. (A)
Genetta, T. L. (A)
Lundgren, D. L. (A)
Montijo, R. E., Jr. (A)
O'Brien, J. A. (A)
Santamaria, S. (A)
Scattergood, R. (A)
Tannenbaum, D. A. (A)
Thomas, L. P. (M)
Valenti, R. P. (A)

West End (NY-2)
Doughty, S. D. (A)
Epstein, M. (A)
Feigenbaum, I. A. (A)
Ikrath, K. (A)
Kahn, D. (M)
Landberg, A. (A)
Stone, H. B. (A)
Tobias, W. T. (M)

West Englewood (NY-2)
Anthony, I. B. (A)
Anthony, R. L. (A)
Bitner, R. E. (A)
Brown, W. G. (A)
Dwork, L. E. (SM)
Scott, D. A. (A)
Shenk, E. R. (SM)
Walsh, A. A. (SM)
Wilbur, E. C. (VA)
Zabransky, R. J. (A)

Westfield (NY-2)
Augustadt, H. W. (SM)
Bacon, D. R. (A)
Bishop, J. C., Jr. (A)
Blonder, I. S. (A)
Burns, G. K. (VA)
Cunniff, T. W. (M)
Follingstad, H. G. (A)
Goldsmith, B. M. (SM)
Hutchinson, H. P. (SM)
Ingalls, D. A. (A)
Knights, J. E., Jr. (M)
Leggett, E. P. (A)
Longley, R. M., Jr. (A)
Luster, E. W. (A)
MacLean, N. W. (M)
Melhose, A. E. (M)
Moons, A. G. (A)
Nein, H. R. (M)
O'Reilly, J. P. (A)
Peterson, L. J. (M)
Pulley, L. A. (VA)
Sieglin, C. O. (SM)
Smith, K. D. (SM)
Stillwell, A. L. (SM)
Tongue, B. H. (A)
Van Tassel, E. K. (SM)
Wilkes, D. P. (SM)
Wohlgemuth, A. J. (A)

West Long Branch (NY-2)
Deisinger, D. A. (SM)
Farlee, R. J. (A)
Fisher, A. J. (A)
Gormley, R. S. (SM)
Griffith, P. E. (SM)
Levine, S. (A)
Salvano, D. P. (A)
Wolinsky, A. (A)

West Milford (NY-2)
Goebel, R. J. (A)

Westmont (PHI-3)
Beezer, J. E. (A)
Brown, E. M. (A)
Condon, S. F. (A)
Grundmann, G. L. (SM)
Lev, S. N. (VA)
Myers, B. D., Jr. (A)
Sinnett, C. M. (SM)

West New York (NY-2)
Allan, G. H. (A)
Kelluhn, R. E. (M)
Lang, C. W. (A)
Mendez, C. (A)
Parrott, R. D. (M)
Takajian, J. S. (A)

West Norwood (NY-2)
Griffin, A. T. (A)

West Orange (NY-2)
Booth, R. P. (SM)
Crowley, H. L. (SM)
Crowley, K. I. (M)
Dooner, J. L. (A)
Edison, T. M. (VA)
Goldstein, M. K. (SM)
Grady, C. B., Jr. (A)
Hetherington, G. V. (A)
Higgins, W. H. C. (SM)
Higgs, R. E. (M)
Kishpaugh, A. W. (SM)
Metzger, J. F. (A)
Milner, C. M. (M)
O'Connor, J. T. (A)
Padalino, J. J. (M)
Panter, P. F. (SM)
Perkins, G. C. (VA)
Puder, R. K. (A)
Reed, E. D. (A)
Reise, H. A. (SM)
Riemenschneider, N. L. (M)
Ryan, F. M. (F)
Shamis, S. S. (M)
Shangraw, C. C. (SM)
Snow, H. A. (VA)
Somers, R. M. (SM)
Swift, E. W. (A)
Tulchin, H. (A)
Wolf, A. B. (A)
Woodruff, D. L. (A)

West Paterson (NY-2)
Beckers, A. E. (M)
MacMillan, T. S. (A)

West Trenton
Kunicki, H. R. (A)

Westwood (NY-2)
Dunn, W. J. (A)
Gregory, G. S. (SM)
Hammerschmidt, A. L. (SM)
Hoeper, H. B. (A)
Murnighan, R. J. (A)
Spanos, W. M. (A)

Whippany (NY-2)
Albersheim, W. J. (SM)
Anderson, A. B. (A)
Baird, J. A. (A)
Baldwin, E. G. (A)
Bohren, A. K. (SM)
Bower, M. M. (M)
Carlisle, H. C., Jr. (A)
Carretta, P. M. (M)
Clement, A. W. (SM)
Dague, G. I. (A)
Dale, G. V. (VA)
De Motte, F. E. (A)
Doctor, D. E. (A)
Dodds, W. J. (SM)
Dominick, J. (M)
Dungan, M. R. (M)
Ebers, J. J. (SM)
Enright, D. J. (A)
Felker, J. H. (SM)
Frantz, D. R. (M)
Frantz, G. R. (SM)
Giloth, P. K. (A)
Haase, W. D. (A)
Hammann, P. L. (SM)
Helm, H. A. (M)
Hewitt, W. H., Jr. (SM)
Hibbert, J. J. (A)
Hoffmann, E. H. (M)
Hough, R. R. (SM)
Kovach, L. (A)
Jenny, H. K. (SM)
Johnson, G. D. (SM)
Lane, R. F. (SM)
Leighton, J. (M)
Lenigan, T. E. (VA)
Lowell, R. (A)
MacWilliams, W. H., Jr. (SM)
Martin, J. F. (A)
Matthews, J. G. (A)
Mattingly, R. L. (M)
McCoy, J. C. (SM)
Merriam, F. F. (SM)
Miller, W. F. (A)
Morrison, E. D. (A)
Morrison, J. F. (F)
Morrison, L. W. (VA)
Mraz, W. L. (SM)
Mumford, W. W. (F)
Myers, G. H. (A)
Newhouse, R. C. (SM)
Nimmecke, F. E. (SM)
Olmstead, N. C. (SM)
Ong, F. C. (SM)
Pardee, S., Jr. (A)
Petrich, L. G. (A)
Pittman, R. C. (A)
Schafersman, R. L. (A)
Schnebbe, A. D. (A)
Sherman, S. (A)
Short, R. A. (A)
Simons, B. H. (A)
Sinclair, R. O., Jr. (SM)
Skene, A. A. (SM)
Smith, C. A. (SM)
Smith, P. H. (F)
Spence, P. W. (M)
Taft, C. R. (SM)
Thatcher, W. H. (M)
Tinus, W. C. (F)
Townley, R. K. (SM)
Troe, J. L. (A)
Von Aulock, W. H. (A)
Wall, R. A. (M)
Weeks, G. E. (VA)
Wentz, J. F. (SM)
Winoms, R. C. (A)
Younker, E. L. (M)

Wildwood (PHI-3)
Eberle, H. (A)

Wildwood Crest (PHI-3)
Barrett, C. S. (A)

Williamstown (PHI-3)
Roberts, M. J. (A)
Walecki, V. (A)

Woodbridge
O'Toole, J. J. (M)
Warner, H. K. (M)

Woodbury (PHI-3)
Alderman, J. M. (A)
Bateman, L. J. (A)
Billstein, R. W. (A)
Burton, J. R. (A)
Frank, A. J. (A)
Halket, D. R. (A)
Herr, J. R. (A)
Jackson, A. (A)
Neubert, H. A., Jr. (A)
Seeberger, L. M. (SM)
Sharp, R. F. (M)
Sheppard, W. H. (A)
Skinner, R. L. (A)
Stark, J., Jr. (A)
Underhill, B. B. (SM)
Wamsley, B. N. (A)
Wasson, H. M. (A)

Woodlynne (PHI-3)
Johnson, R. V. (A)
Miller, J. P. (VA)
Sattler, E. W., Jr. (A)
Siukola, M. (A)

Woodridge (NY-2)
Bruno, G. A. (A)
Legrand, J. S. (VA)
Vockel, A. P. (A)

Woodstown (PHI-3)
Schiller, R. P. (A)

Wrightstown
Crupi, D. W. (A)

Wyckoff (NY-2)
Baasch, H. C. (M)
Bradley, J. K. (SM)
Chambers, A. B. (A)
Menes, H. (A)
Oesterle, A. G., Jr. (A)
Partridge, E. M., Jr. (A)
Samson, R. L. (A)
Scholtes, D. R. (A)

Yardville (PRI-3)
Bozowski, S. (A)
Edwards, L. M. (A)

NEW MEXICO

Alamogordo (EP-7)
Aldous, C. N. (A)
Apa, F. E. (A)
Arnold, N. E. (A)
Beckley, T. L. (A)
Brown, A. E. (A)
Clapp, G. V., Jr. (A)
Cress, R. B. (A)
Davidson, H. K. (A)
Dodd, S. C. (A)
Dufford, D. E. (A)
Folan, W. (A)
Greene, J. F. (A)
Harrington, M. W. (A)
Horning, T. D. (A)
Jaenke, M. G. (A)
Johnson, R. R. (M)
Kuerschner, H. (A)
Lane, C. A., Jr. (M)
Looney, G. R. (A)
Lovell, R. E. (M)
Lux, M. O. (M)
Maes, W. J. (A)
Mahaffey, R. F. (M)
McCasland, R. S. (A)
McFadden, E. R. (M)
Mony, A. J. (A)
Muehlner, J. W. (M)
Poteracke, J. L. (A)
Shear, H. J., Jr. (A)
Shepherd, J. H. (A)
Sherman, J. M. (A)
Staples, Z. B. (A)
Steele, O. A. (M)
Stotts, W. S. (A)
Tantzen, R. G. (A)
Torrible, A. W. (A)
Vick Roy, J. W. (A)
Webb, R. C. (A)

Albuquerque (AL-7)
Aas, E. A. (A)
Abraham, L. G. (SM)
Allen, B. (A)

Allenworth, J. A. (A)
Althouse, J. E. (A)
Ames, J. R. (M)
Arnett, W. (SM)
Arnot, G. A., Jr. (M)
Atkins, W. R. (A)
Bachand, G. (SM)
Baker, R. P. (A)
Ball, K. E. (SM)
Baltz, L. E. (A)
Banks, T. G., Jr. (SM)
Barcroft, J. R. (A)
Basore, B. L. (A)
Bidwell, C. H. (SM)
Bircher, P. H. (A)
Biskner, L. J. (SM)
Bittner, B. J. (M)
Blair, J. E. (M)
Boettcher, G. E. (A)
Bolinger, N. C. (A)
Bradley, W. A. (A)
Briscoe, W. C. (A)
Brooks, E. P. (M)
Bryson, V. E. (A)
Bueffel, B. H., Jr. (SM)
Burk, P. O. (A)
Burke, B. (A)
Butler, E. R. (A)
Butler, R. B. (A)
Butt, N. C. (A)
Campbell, A. A. (M)
Carman, W. H. (M)
Carr, B. J. (A)
Carr, E. A. (A)
Carrick, D. S. (M)
Cassidy, B. F. R. (A)
Checketts, E. L. (A)
Church, P. K. (A)
Church, T. S. (SM)
Cole, H. H. (M)
Connell, J. C. (M)
Cook, K. W. (A)
Couden, D. V. (A)
Courtney, J. M. (SM)
Creveling, R. (SM)
Cunningham, F. B. (M)
Daly, W. J. (A)
Daughton, G. B. (M)
Davis, J. F. (A)
Deer, J. W. (A)
De Lorenzo, R. J. (A)
Dike, S. H. (SM)
Dossey, J. L. (A)
Durham, H. B. (A)
Ekeroot, S. F. (A)
Eldridge, A. J. (A)
Elliott, N. J. (A)
Ellis, R. M. (SM)
Engquist, A. R. (A)
Ferner, R. O. (M)
Finch, H. D. (M)
Findlay, J. H. (SM)
Fine, A. M. (A)
Fleisener, C. L. (A)
Fletcher, E. E. (M)
Fligner, O. M. (A)
Fliss, A. D. (A)
Fontana, R. E. (SM)
Ford, G. T. (A)
Fossum, D. E. (SM)
Foster, C. E. (M)
Fowler, G. A. (SM)
French, L. E. (SM)
Frenkel, L. J. (M)
Furse, A. (A)
Gamara, N. J. (M)
Garblik, A. M. (SM)
Gillespie, E. S. (A)
Gilman, E. L. (A)
Given, F. J. (SM)
Glaser, R. G., Jr. (A)
Glass, R. E. (SM)
Glenn, A. J. (A)
Goff, W. S., Jr. (A)
Gose, F. A., Jr. (SM)
Gross, J. E. (A)
Haase, J. A. (A)
Hafer, F. L. (A)
Halliday, J. R. (M)
Hays, C. (A)
Heinrich, B. F. (A)
Henry, D. E. (A)
Henry, W. E. (A)
Hessemer, R. A., Jr. (A)
Hicks, C. W. (SM)
Hight, S. C. (SM)
Hill, V. (A)
Hilleary, H. W. (A)
Hinde, J. E. (A)
Hodges, E. M. (A)
Holland, E. R. (A)
Hopkins, L. A., Jr. (M)
Howell, H. R. (A)
Humphris, R. R. (A)
Hunter, W. C. (M)
Hyde, W. L. (A)
Iverson, M. M. (A)
Jacques, R. B. (M)
Janza, F. J. (A)
Jenkins, W. S. (A)
Jeske, H. O. (A)
Jessen, P. L. (A)
Johnson, G. S. (A)
Johnson, R. E. (A)
Jones, M. C. (A)
Jones, R. D. (M)
Kahn, H. S. (A)
Kelley, R. W. (A)
King, C. J. (A)
Klink, E. J. (M)
Koontz, R. H. (A)
Kral, I. H. (A)
Lambert, R. P. (A)
Lareau, J. G. (A)
Lathrop, L. L. (A)
Lawrence, G. H. (A)
Lee, W. W., Jr. (A)
Le Fever, C. F. (A)
Leonard, H. O. (A)
Lindsay, J. D. G. (M)
Little, F. A. (M)
London, R. E. (A)
Long, B. J. (A)
Lotze, H. R. (A)
Lusk, T. D. (A)
Maki, C. E. (A)
Marker, T. F. (SM)
Mathews, R. P. (M)
Max, A. J. (SM)
Maxon, J. S. (M)
Mayfield, J. D. (A)
McCann, R. P. (M)
McCarthy, F. M. (VA)
McGehee, R. M. (A)
McLay, J., Jr. (A)
McRae, J. W. (F)
Meuer, E. A. (A)
Miles, A. R. (M)
Miller, E. G., Jr. (SM)
Miller, G. L. (A)
Miller, L. G. (A)
Mills, G. S. (A)
Milton, O. (A)
Minck, J. L. (A)
Minnear, L. H. (A)
Moore, L. D. (A)
Moore, R. K. (M)
Morton, W. B. (M)
Murray, R. R. (A)
Myre, W. C. (M)
Nelson, D. J. (A)
Newlin, G. C. (A)
Noe, J. B. (M)
Nowlin, D. K. (A)
Nylander, R. F. (A)
Olson, D. M. (A)
Oltman, H. G., Jr. (A)
Opperman, R. H. (A)
Oyster, D. E. (M)
Pace, E. C. (A)
Paddison, L. J. (A)
Padilla, D. J. (A)
Pafford, W. B. (M)
Palmer, J. E. (M)
Palmer, P. R. (A)
Patterson, H. H., Jr. (A)
Peckham, V. D. (A)
Peurifoy, R. L., Jr. (A)
Polakowski, W. G. (A)
Poole, R. E. J. (SM)
Poulsen, H. L. (A)
Powell, N. E. (M)
Price, H. J. (A)
Purdue, C. H. (A)
Randall, T. M. (A)
Rehberg, J. C. (M)
Reid, H. J. (A)
Reintjes, I. C. (A)
Ress, J. (A)
Reynolds, R. S. (M)
Rockey, G. H. (SM)
Rocks, J. K. (A)
Roeschke, C. W. (SM)
Rue, A. K. (A)
Sander, H. H. (A)
Schauer, J. D. (M)
Senter, C. H. (SM)
Shoup, J. P. (SM)
Simmons, J. M., Jr. (M)
Sinkew, E. J. (A)
Sisbe, C. F. (A)
Skinner, F. L. (A)
Skinner, L. V. (SM)
Smart, T. E. (M)
Smith, J. D. (M)
Smith, L. R. (A)
Smith, V. M. (A)
Smoll, L. A. (M)
Sparks, D. (A)
Spence, R. C. (M)
Starrett, W. R. (A)
Stattel, R. J. (A)
Stimpson, E. C., Jr. (A)
Stockley, C. H., Jr. (A)
Swain, R. R. (VA)
Tillman, J. E. (SM)
Trukken, H. R. (A)
Van Every, A. (A)
Villers, D. (A)
Vulgan, E. J. (A)
Walker, H. C. (A)
Walker, H. E. (SM)
Washburn, B. W. (A)
Washburn, C. A. (A)
Watkins, L. C., Jr. (SM)
Watterberg, J. (A)
Webb, D. M. (A)
Webber, G. H. (A)
Weber, M. (M)
Weimer, R. E. (A)
Wells, M. A. (A)
West, R. E. (A)
Westcott, H. S. (M)
Wilde, N. (M)
Wilds, R. B. (M)
Williams, C. S., Jr. (A)
Williams, R. H. (A)
Wood, E. E. (A)
Wooley, R. E. (A)
Wright, O. L. (M)
Wulfe, R. F. (A)
Yesselman, C. (A)
Zimmerman, W. L. (A)
Zinn, T. B., Jr. (A)

Carlsbad (EP-7)
Smith, M. E. (A)

Cedar Crest (AL-7)
Marron, J. J. (A)
Urguhart, K. J. (M)
Yoder, E. R. (A)

Farmington (AL-7)
Bowles, M. E. (M)

Holloman AFB (EP-7)
Compton, B. J. (A)
Jackson, K. J. (A)
Levin, K. L. (M)
Margulies, I. (A)
Marlow, H. C. (A)
Show, G. W. (A)
Willard, D. S. (M)

La Mesa
Dunn, A. R. (A)

Las Cruces
Adams, E. S., Jr. (A)
Allen, C. A. (A)
Allen, K. J. (A)
Aufderheide, J. H. (A)
Bennett, A. O. (A)
Birdsell, G. (M)
Boone, B. B. (A)
Burton, E. B. (A)
Cohn, M. (A)
De Rosa, A. L. (A)
Dingman, E. H. (A)
Frei, J. (A)
Fussell, L. B. (A)
Garber, L. F. (A)
Gatkin, T. E. (VA)
Godley, W. P. (A)
Goff, R. H. (A)
Guire, C. W. (A)
Hackmann, P. F. (A)
Hammond, L. A. (M)
Hemingway, F. S., Jr. (M)
Ingerson, W. E. (A)
Jackson, H. J. (A)
Keenan, M. J. (A)
Keys, D. D. (A)
Krivanich, M. A. (A)
Miller, V. L. (A)
Minichiello, R. (A)
Neuman, R. E. (A)
Norman, M. (A)
Petitjean, A. E. (A)
Scott, R. C. (A)
Spittle, S. E. (M)
Steele, R. W. (M)
Waller, S. L. (A)
Welch, C. M. (M)
Wilgus, D. S. (A)
Williams, R. O. (M)
Young, J. F. (A)
Young, K. J. (A)

Los Alamos (AL-7)
Aiello, W. P. (A)
Boyd, T. J., Jr. (A)
Briscoe, W. L. (A)
Brousseau, A. T. (A)
Brower, H. P. (A)
Brown, C. J. (M)
Brown, L. J. (A)
Byington, P. W. (M)
Crew, W. H. (SM)
Deal, J. B., Jr. (A)
Doremire, F. E. (A)
Dudley, J. A. (A)
Featherston, J. R. (A)
Freyman, R. W. (A)
Garrett, R. E. (A)
Glore, J. P. (A)
Grant, L. P. (M)
Harrington, D. C. (A)
Hayes, B. (A)
Heyman, H. (SM)
Hiebert, R. D. (A)
Hull, D. E. (A)
Hull, J. A. (A)
Huntington, R. C. (A)
Janco, M. (A)
Jennings, H. K. (M)
Johnstone, C. W. (SM)
Kassing, G. M. (A)
Kemp, E. L. (A)
Lamb, J. K. (SM)
Lang, H. J. (A)
Lilienthal, J. R. (A)
Mason, H. (M)
Mathis, G. P. (A)
McCloud, B. J. (A)
Parsons, J. H. (M)
Peck, R. C. (A)
Rawcliffe, A. S. (SM)
Ruehle, R. A. (A)
Scott, A. E. (A)
Trogdon, F. H. (A)
Watts, R. J. (SM)
Weber, W. (M)
Weintraub, L. (A)
Whitmer, R. F. (A)
Winston, J. G. (A)

Mesilla Park
Hancock, W. L. (A)

Mountain Park (EP-7)
Billups, E. E. (A)
Rothman, M. I. (M)

Raton (AL-7)
Pitts, D. S. (A)

Roswell (EP-7)
Burke, J. F. (M)
Guros, F. S. (A)
Palmer, E. B. (A)
Oslake, J. J. (A)
Ridgill, J. R. (A)
Swatek, P. W. (A)

Sandia Base (AL-7)
Lorentz, N. A. (M)

Sandia Park (AL-7)
Vearout, D. K. (A)

Sandoval (AL-7)
Smith, W. T. (SM)

Sante Fe (AL-7)
Davis, M. E. (A)
Martin, C. F. (VA)
Nikolakakis, H. J. (A)
Woodward, M. W. (SM)
Wright, P. H. (A)

State College (EP-7)
Brown, H. A. (A)
Flaherty, J. B., Jr. (M)
Haas, H. W. (A)
Jones, A. E. (A)
Karp, A. L. (A)

Sunpot
Schiffmacher, E. R. (M)

Tijeras (AL-7)
Middleton, A. D. (SM)

Tularosa (EP-7)
Crom, G. C. (SM)
Martin, W. T. (A)
Suska, J. T., Jr. (A)

NEW YORK

Albany (SCH-2)
Dewire, D. S. (M)
Felker, G. E., Jr. (M)
Gage, L. S. (A)
Johnson, G. L. (M)
Marin, I. L. (A)
Martin, W. D. (A)
Otis, G. E. (A)
Passman, A. J., Jr. (A)
Pino, J. P. (A)
Portanova, M. C. (A)
Pulliam, S. B. (A)
Schwedock, B. (A)
Uphoff, E. C. (A)
Wilbur, D. A. (SM)

Albertson (LI-2)
Cashman, H. W. (A)
Engel, L. (A)
Kelvin, W. (A)
Robinson, D. L. (A)
Sullivan, G. D. (M)
Westman, H. P., Jr. (A)

Alfred (EC-4)
Burzycki, M. (A)

Arplaus (SCH-2)
Robinson, D. (A)

Altamont (SCH-2)
Bleichner, C. W. (SM)
Fortington, W. H. (M)
Hackley, C. L. (M)
Pennoyer, R. T. (SM)
Trest, L. S., Jr. (A)
Washburn, F. L., Jr. (A)

Amityville (LI-2)
Adams, J. P. (A)
Barone, S. A. (SM)
Brockner, C. E. (SM)
Isherwood, H. (A)
Palmer, W. (SM)
Schabbehar, E. A. (A)
Sixbey, S. R. (A)
Watkins, J. E. (A)

Amsterdam (SCH-2)
Bohanske, T. A. (A)
Dillon, J. E. (A)
Garratt, P. M. (A)
Zawilinski, J. L. (A)

Ansonia Station (NV-2)
Schlegel, H. G. (A)

Apalachin (BI-4)
Sweet, M. E. (A)

Ardsley (NY-2)
Dornhoefer, W. J. (A)
Glaser, P. F. (A)
Graveson, R. T. (A)
Kafalas, C. (A)
Prestholdt, O. (M)

Armonk (NY-2)
Burfeindt, K. L. (A)
Hector, L. G. (SM)
Kneale, A. T. (M)

Arverne
Foschi, E. J. (A)

Astoria (LI-2)
Asmundsson, E. (A)
Bedoian, B. (A)
Benesch, E. J. (A)
Berhley, F. E. (A)
Breitzer, D. I. (A)
Chittick, C. (A)
Iversen, R. J. (SM)
Jagerman, D. L. (M)
Lanzisero, N. T. (A)
Levene, R. A. (A)
McDonough, V. T. (M)
Petrocelli, V. (A)
Pighi, L. H. (A)
Rivera-Cardona, B. A. (A)
Schwab, D. (M)
Seelig, G. (M)
Sopchick, F. J. (A)
Strauss, H. J. (A)
Treitel, W. S. (A)
Vaishampayan, R. K. (A)
Zunitch, D. M. (A)

Auburn (SV-4)
Blanchard, J. W. (A)
House, H. J. (A)
Johnson, W. G., Jr. (A)
O'Connor, C. R. (A)

Averill Park (SCH-2)
Bashford, H. L. (A)
Montross, J. G. (M)
Runkle, L. D. (A)

Babylon (LI-2)
Albin, F. I. (A)
Bleil, F. J. (SM)
Brown, M. W., Jr. (A)
Buff, C. (M)
Cleary, D. F. (A)
Gollhofer, P. J. (M)
Limansky, I. (A)
Lory, J. (A)
Rafferty, W. G. (A)
Scott, R. (A)
Spillane, L. R. (A)
Turnage, R. E., Jr. (A)

Bainbridge (BI-4)
Lias, R. B. (M)

Baldwin (LI-2)
Browning, S. D. (VA)
Dayton, F. R. (A)
De Valve, R. H. (A)
Fraser, R. M. (M)
Furst, R. E. (M)
Hartmann, Z. (M)
Hertzberg, A. (A)
Hinsdale, E. M., Jr. (SM)
Hults, E. H. (M)
Kopp, R. E. (A)
Sall, C. W. (M)
Salzer, R. I. (A)
Schwint, K. F. (A)
Storey, A. E. (A)
White, C. E. (A)

Baldwin Harbor
Knaack, F. E. (A)

Baldwinsville (SYR-4)
Byers, W. S. (A)
Cockburn, C. D. (M)
Cooper, J. V. B. (M)
Cronshey, R. W. (A)
Custin, T. G. (M)
Downey, R. L. (A)
Farmer, R. A. (A)
Fishback, K. H. (A)
Jensen, R. C. (SM)
Jones, W. H. (A)
Lester, B. R. (SM)

Morris, W. J. (A)
North, S. M. (A)
Quinn, W. M., Jr. (A)
Rhodehamel, A. J. W. (A)
Robbins, E. R. (A)
Smoll, A. E. (M)
Winchester, D. S. (A)

Ballston Lake (SCH-2)
Amstutz, R. W. (A)
Bristol, T. R. (M)
Canfield, E. B. (A)
Coffey, W. N. (A)
Crownover, W. P. (A)
Hamren, S. D. (A)
Jachym, T. M. (A)
Niemann, E., Jr. (A)
Rankin, A. E. (SM)
Reynolds, M. T. (M)
Stillwell, H. R. (A)

Ballston Spa (SCH-2)
Bischoff, A. F. H. (SM)
Schwartz, T. G., III (A)

Batavia (ROC-4)
Marandino, N. J. (M)

Bath (EC-4)
Alexander, J. J. (A)
Barney, W. H., Jr. (A)
Evon, J. (A)
Fink, J. H. (A)
Flood, J. L. (A)
Gloates, E. (A)
Mechas, M. (A)
Miller, C. F. (SM)
Overstrom, A. R. (A)
Payne, W. J. (A)
Pridmore, T. C. (M)
Schwartz, E. (A)
Spicer, W. A. (A)
Szilasi, A. (SM)

Bayside (LI-2)
Adler, L. L. (A)
Battaglia, C. V. (A)
Battle, R. F. (A)
Bedlock, H. D. (SM)
Berge, P. J. (A)
Bernstein, J. L. (A)
Bloom, L. R. (M)
Bonney, H. W. (A)
Bracco, D. J. (M)
Briskin, H. B. (A)
Burke, E. W., Jr. (A)
Charton, S. (M)
Cohen, S. B. (A)
Compton, H. B. (A)
Cooperstein, M. (M)
Costa, T. A. (A)
Cuddy, E. J. (A)
D'Avino, R. F. (A)
Day, S. M. (A)
De France, J. J. (SM)
Dembinski, L. J. (A)
Ellefson, B. S. (F)
Ellis, H. R. (A)
Farel, V. M. (SM)
Fine, A. M. (A)
Finley, C. G. (A)
First, D. (A)
Fischer, R. W. (A)
Fishner, S. (A)
Gardiner, C. E. (M)
Gatti, W. (A)
Gauger, R. H. (A)
Gellert, J. (A)
Glasser, H. (A)
Gonzalez, W. (A)
Graham, V. M. (F)
Gross, L. (M)
Gross, V. (A)
Herman, J. H. (A)
Hill, C. V. (A)
Hunt, H. W. (A)
Hutter, R. G. E. (F)
Jacob, G. W. (M)
Janis, P. (SM)
Kahan, I. (A)
Kaufman, D. (A)
Kellerman, D. (A).
Kiessling, G. A. (A)
Kraus, M. (A)
Kroeger, R. D. (A)
Laufman, T. D. (A)
Lepic, R. E. (A)
Levine, S. (SM)
Lewis, B. F. (A)
Lieber, S. (M)
Livingston, D. C. (SM)
Lynch, J. A. (A)
Maffei, E. V. (A)
Martin, E. J. (M)
Mealy, J. T. (A)
Meinheit, C. E. (M)
Miner, W. A., Jr. (SM)
Nadler, B. D. (M)
Nord, R. H. (M)
Noyer, R. O. (M)
O'Bryan, H. M. (M)
O'Neill, G. D. (F)
Pinkham, G. E. (A)
Podeyn, G. J., Jr. (A)
Postman, M. H. (A)
Potts, T. J., Jr. (M)
Prufer, E. F. (A)
Rabin, G. C. (A)
Reinhardt, S. (A)
Relis, M. J. (M)
Ressler, H. C. (SM)
Reynolds, M. R. (A)
Richter, E. (A)
Rolfe, F. R. (A)
Salz, N. P. (M)
Sem-Sandberg, S. (A)
Shipley, D. W. (M)
Smith, H. H. (A)
Smith, M. (A)
Suito, T. (A)
Sussman, N. (M)
Swatko, J. J. (A)
Talle, C. A. (A)
Troxler, L. J. (SM)
Waller, H. H. (M)
Whalley, W. B. (SM)
White, R. C. (A)
Williams, G. W., Jr. (A)

Bayside Hills (LI-2)
Gradza, E. E. (A)

Bay Shore (LI-2)
Cady, R. T. (A)
Gaenzle, J. B. (M)
Gilmer, L. B. (A)
Leedham, R. (A)

Bayville (LI-2)
Bartolomei, G. G. (A)
Hotine, W. (M)

Beacon (NY-2)
Conover, D. G. (A)
Craft, J. L. (A)
Cummings, C. E. (M)
Greene, N. E. (A)
Mazure, A. (A)
Thompson, D. B. (A)

Bedford Hills (NY-2)
Ferguson, A. (A)
Huntington, W. J., Jr. (A)
Jackson, R. W. (A)
Stewart, J. A. (A)
Vogeler, R. A. (M)

Beechhurst (LI-2)
Coundjeris, A. (SM)
Dalessandro, J. A. (A)

Belle Harbor (LI-2)
Mondschein, M. (A)
Schure, A. (A)

Bellerose (LI-2)
Altman, D. (A)
Biss, R. P. (A)
Bolton, G. E. (A)
Brown, R. W. (A)
Chaber, R. K. (A)
Clark, F. K. (A)
Farber, H. (A)
Fay, F. H. (A)
Fialkov, H. (A)
Garrigan, T. E. (A)
Hettich, R. E. (A)
Hing, K. M. L. (A)
Homeyer, W. (A)
Jacobs, C. E., Jr. (M)
Leahy, R. E. (A)
Ley, B. J. (A)
McGinn, J. F. (A)
Ocheret, R. (A)
Purdy, R. L. (A)
Shologon, R. S. (M)
Trock, R. (M)
Wengryn, M. (A)
Ziblatt, R. (A)

Bellerose Manor (LI-2)
Buchsbaum, W. H. (M)

Bellmore (LI-2)
Glaser, E. M. (SM)
Jackson, C. H. (A)
Noble, W. A. (A)
Packard, K. S., Jr. (M)
Ruggi, A. G. (A)
Russo, A. J. (A)
Wellman, F. C. (A)

Bethpage (LI-2)
Barlowe, M. (A)
Beaumariage, D. C. (M)
Biloon, R. F. (A)
Bogner, R. D. (A)
Bostick, G. (M)
Brown, R. M. (A)
Fred, G. (A)
Nelson, V. H. (A)
Nosal, P. (M)
Russell, D. H. (A)
Peterson, R. M. (A)
Schenck, H. F. (A)
Schoenfeld, R. L. (A)

Binghamton (BI-4)
Burton, W. E. (A)
Carr, F. P., Jr. (A)
Corderman, S. A. (A)
Decker, D. M. (A)
Decker, G. A. (VA)
Egan, S. H. (A)
Foss, F. A. (A)
Fuchiek, R. J. (A)
Garvey, E. J. (M)
Haddad, J. A. (M)
Hajko, H. J. (A)
Hallinan, C. (M)
Hayes, M. H., Jr. (A)
Hemstreet, H. S. (A)
Hewitt, E. W. (A)
Hicken, J. (SM)
Higgs, P. T. (A)
Hunt, J. M. (M)
Kampf, H. A. (M)
Kelley, A. A. (M)
Klinko, E. H. (A)
Lavender, R. W. (M)
Ling, O. T. (M)
Lockhart, B. W. (A)
Mailhot, P. J. (A)
McPheeters, D. W. (A)
Merchant, J. H. (M)
Montague, H. R. (A)
Montgomery, A. (A)
Morgan, W. A. (A)
Nash, R. W. (A)
New, R. F. (A)
Peterson, R. E. (A)
Quinn, T. J. (A)
Raymond, C. G. (A)
Reed, G. G. (A)
Ricciardelli, G. (A)
Rice, P. P. (A)
Rowley, R. A. (M)
Shaw, W. A. (A)
Stantz, L. H. (M)
Strong, D. G. (A)
West, J. L. (A)

Black Creek (EC-4)
Lewis, R. M. (A)

Blue Point (LI-2)
Wright, J. C. (A)

Bowmansville
MacArthur, R. C. (A)

Breesport
Scullin, C. H. (M)

Brentwood (LI-2)
Gissi, J. N. (A)
Gould, G. B. (A)
Samoluk, D. (A)

Briarcliff Manor (NY-2)
Urban, C. (A)

Bridgehampton (LI-2)
Chatfield, B. H. (A)

Brightwaters (LI-2)
Becker, S. (A)
Faltin, J. W. (SM)
Geiger, J. M. (A)
Lang, J. G. (VA)
Margolin, J. (A)

Brewerton
Wassilak, E. J. (A)

Bronx (NY-2)
Abraham, I. (A)
Ackerman, D. D. (A)
Adelsberg, J. (A)
Adler, C. (A)
Allen, M. H. (A)
Anapol, J. (A)
Arcidiacono, J. (A)
Auerbacher, W. F. (SM)
Axelrod, A. (A)
Barbella, A. M. (A)
Barkey, R. (A)
Barosin, S. (A)
Baumoel, D. (A)
Bennett, A. I. (A)
Berkoff, S. (M)
Bernstein, E. (A)
Berson, A. S. (A)
Bertan, L. L. (A)
Bertero, E. P. (A)
Betlejewski, F. J. (A)
Blasbalg, S. (A)
Blaustein, S. E. (A)
Bodin, M. (A)
Bondarenko, A. J. (A)
Brain, B. (A)
Bregman, M. W. (A)
Brenner, M. (A)
Brownstein, N. (A)
Buchalter, M. (A)
Burg, H. (A)
Byrnes, I. F. (SM)
Carroll, J. J. (A)
Cash, W. I. (A)
Chang, S. S. L. (SM)
Chanzit, L. (A)
Charmatz, A. W. (A)
Chernin, S. (A)
Chirlian, P. M. (A)
Cohen, A. B. (A)
Cohen, D. (A)
Cohen, M. H. (A)
Cohn, M. R. (A)
Cosentino, A. A. (M)
Cosonas, A. (A)
Cristina, A. A. (A)
Cubert, J. S. (A)
Cuccia, J. F. (A)
Cynamon, J. J. (A)
D'Amico, V. J. (A)
Darnovsky, A. (A)
Davidson, G. M. (A)
DeSalvo, A. F. (SM)
Deshields, A. E. (A)
Dickstein, M. (A)
Dickstein, S. R. (A)
Divins, B. (A)
Doran, J. W. (A)
Dragonetti, J. V. (A)
Duder, J. J. (A)
Duffy, J. J. (A)
Dujack, R. L. (A)
Einsohn, I. A. (A)
Eisenberg, I. (A)
Epstein, S. (A)
Eisenberger, A. J. (A)
Fassberg, M. (A)
Federing, A. M. (VA)
Feerst, I. (A)
Ferrantelli, J. (A)
Fidelman, D. (A)
Flosdorf, F. H. (A)
Flynn, W. J. (A)
Friedman, E. H. (A)
Friedman, O. (A)
Garrett, B. R. (A)
Geller, M. (A)
Gery, S. W. (A)
Giannattasio, A. R. (A)
Gilewitz, A. (A)
Giordano, A. M. (A)
Girodias, R. M. (A)
Glatt, G. M. (A)
Glueckler, E. J. (A)
Golden, H. (A)
Gordon, R. L. (A)
Gottlieb, P. (A)
Greenberg, S. (A)
Greenblatt, S. (A)
Gross, S. (A)
Gunderson, R. W. (M)
Harmatuk, S. N. (M)
Harris, B. (A)
Harrison, R. I. (A)
Hefter, M. (A)
Heller, M. F. (A)
Hemmila, A. (A)
Insalaco, J. J. (M)
Kantrowitz, P. (A)
Kass, E. J. (A)
Kaswen, M. (A)
Kay, M. (A)
Klose, R. C. (A)
Knight, R. W. (A)
Kobi, J. (A)
Komuves, R. E. (A)
Kulik, H. S. (A)
Lampert, L. (A)
Langenthal, H. (A)
Lefkowitz, E. (A)
Lehr, S. (A)
Leichtman, J. A. (A)
Levy, E., Jr. (A)
Lewinski, J. (A)
Lieberman, L. (A)
Linder, A. (A)
Linhardt, R. J. (A)
Lubin, M. (A)
Marinace, R. C. (A)
Matarese, J. (A)
Mathis, C. E. (A)
Mayers, J. C. (A)
Meyers, J. G. (SM)
Miller, M. P. (A)
Muchnick, P. (A)
Nesenoff, N. (A)
Newman, L. (A)
Nieminski, W. V. (A)
Nissen, J. H. (M)
Olick, J. (A)
Philactos, C. J. (A)
Pintell, R. H. (SM)
Plofker, N. H. (A)
Plotkin, M. N. (A)
Potak, I. W. (A)
Rabinovici, B. (A)
Raiti, J. J. (A)
Reiss, E. V. (A)
Rensin, E. (A)
Richman, D. W. (A)
Roberts, G. (A)
Roberts, H. (A)
Rodriguez, P. E. (A)
Rooney, W. V. (A)
Rosenfeld, A. (A)
Ross, A. (A)
Roth, A. Q. (A)
Rothbart, A. (A)
Rubel, S. J. (A)
Samuelian, B. (A)
Schack, R. H. (A)
Schick, W. (A)
Schiffman, M. M. (A)
Schlossberg, H. (A)
Schmerler, S. (A)
Schmidt, H. (A)
Schneider, G. (A)
Schneider, M. (A)
Shapiro, M. (A)
Shaw, D. (A)
Shecter, E. S. (A)
Shegirian, P. (A)
Siegall, B. (A)
Silberman, A. (A)
Simon, I. A. (A)
Simon, M. L. (A)
Smith, G. J. (A)
Smith, J. S. (A)
Sobel, L. (A)
Solomonoff, R. J. (A)
Spiegel, R. E. (A)
Sporty, S. (A)
Squires, C. (A)
Stern, E. (A)
Stiefel, A. A. (A)
Sullivan, E. (A)
Taub, J. J. (A)
Tefel, A. J. (A)
Teitler, A. (SM)
Trott, G. G. (A)
Tucker, M. H. (A)
Tullman, N. L. (A)
Victor, H. W. (SM)
Wachspress, M. H. (A)
Ward, B. R. (M)
Wasserman, H. (A)
Waxler, B. (M)
Weinberg, S. B. (A)
Weiss, L. M. (A)
Weiss, S. (A)
Weissman, S. (A)
Wolf, E. (A)
Wolin, D. (A)
Wolotkin, A. (A)
Zaslavsky, S. (A)
Zeines, B. (A)
Zinn, A. W. (A)
Zuckerbraun, J. (A)

Bronxville (NY-2)
Bowyer, K. M. (A)
Foxe, M. (A)
Halsall, M. (A)
Langley, R. H. (F)
McCoy, R. D. (A)
Ossoff, A. (A)
Pannill, C. J. (F)
Wasserman, J. (A)
Whittemore, D. B. (A)

Brookhaven
Handloser, J. S. (M)

Brooklyn (NY-2)
Abilock, S. (A)
Abrahamsen, A. (A)
Abrams, I. (A)
Abramson, J. (A)
Acker, J. L. (A)
Albanese, P. (A)
Albanese, V. J. (A)
Allen, T. (A)
Altonji, E. R. (A)
Ammirati, S. (A)
Anderson, C. L. (A)
Angelastro, S. P. (A)
Angelo, E. J., Jr. (A)
Anker, R. W. (A)
Antman, H. S. (A)
Anton, N. G. (SM)
Appelbaum, G. (A)
Arkus, H. (A)
Arnold, E. R. (A)
Aron, M. (SM)
Aron, N. (A)
Aronoff, M. (A)
Aronowitz, L. (A)
Arzt, G. D. (A)
Ascione, R. (A)
Ashinsky, M. (A)
Ashley, H. R. (A)
Ashlan, E. E. (A)
Backlnoff, B. (A)
Bahret, R. W. (A)
Bailey, G. E. (A)
Bailin, R. C. (A)
Balas, P., Jr. (A)
Bambara, J. E. (M)
Barr, P. (A)
Baumel, I. D. (A)
Bayer, I. (A)
Beach, R. (SM)
Beaver, M. W. (A)
Becker, L. (A)
Beidler, S. (M)
Belzer, H. H. (SM)
Bellare, D. (SM)
Belove, C. (A)
Belsky, M. L. (A)
Benanti, M. A. (A)
Benjamin, S. H. (A)
Berger, M. (A)
Bergstein, L. E. (A)
Berlin, J. (A)

Berliner, J. M. (A)
Bernfeld, M. (A)
Bernstein, G. (A)
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Berridge, G. J. (A)
Besmertnik, J. (A)
Beter, R. H. (A)
Bialkowski, M. (A)
Bifano, V. J. (A)
Bingham, R. J. (A)
Binzer, C. (A)
Black, K. C. (F)
Blazek, H. F. (A)
Blecher, F. (A)
Bloomberg, H. (M)
Bogossian, Z. (A)
Boles, S. (A)
Bongiorno, A. (A)
Bonin, G. C. (A)
Borowski, E. (A)
Borst, J. M. (VA)
Botwin, L. (SM)
Boyer, J., Jr. (VA)
Boyle, B. (A)
Brady, T. D. (A)
Brazdonis, J. (A)
Brennan, J. (A)
Bressner, G. (A)
Bricker, L. N. (A)
Bridgeman, T. H. (A)
Brodheim, E. (A)
Broman, H. F. (M)
Brower, J. D. (M)
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Burt, C. A. (A)
Burton, N. H. (A)
Caban, L. C. (M)
Callaghan, E. P. (A)
Camack, C. W. (A)
Cammer, H. R. (M)
Canavan, J. J. (M)
Candiotti, J. (A)
Cardeta, A. E. (A)
Carnall, C. J. (A)
Capellupo, F. V. (A)
Caren, E. (A)
Caretto, H. L. (A)
Carlin, I. J. (SM)
Carlin, J. (A)
Cass, J. (A)
Cassidy, F. T. (A)
Castagnaro, D. (SM)
Catalano, J. F. (A)
Catapano, R. L. (A)
Chaikind, S. L. (A)
Chavkin, L. (A)
Chays, S. (A)
Ciano, F. J. (A)
Clementi, V. M. (A)
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Collins, K. (A)
Comminos, R. (A)
Conley, W. H. (A)
Conroe, A. H. (A)
Coppola, A. S. (A)
Crane, R. L. (A)
Crofford, M. (A)
Curtin, J. N. (M)
Czyzyk, S. K. (A)
D'airo, J. (A)
D'airo, L. J. (A)
D'Amato, E. J. (A)
D'Amato, R. J. (A)
D'Antonio, R. G. (A)
Danziger, A. (M)
Darch, N. S. (A)
Day, G. (SM)
Dean, M. A. (A)
De Grande, R. S. (A)
Dery, G. F. (A)
De Satnick, S. (A)
Deutsch, L. (A)
Deutsch, S. (A)
Diamond, E. H. (A)
Diamond, J. M. (A)
Dieli, S. A. (A)
Diemer, F. P. (A)
Digiulio, E. M. (A)
Dinbart, M. (A)
Dover, B. M. (A)
Drosin, A. B. (A)
Dubner, M. (A)
Dugot, R. S. (A)
Dunne, J. R. (A)
Eckert, G. F. (A)
Edelberg, S. (A)
Edwards, D. S. (A)
Egolf, R. S. (SM)
Elefant, J. (A)
Emilio, G. A. (A)
Fabricatore, A. J. (A)
Faske, A. A. (A)
Feder, E. I. (A)
Feinson, R. J. (A)
Fellberg, L. (A)
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Feuichel, M. (A)
Fetsch, J. T. (SM)
Findlay, D. A. (A)
Fink, M. (A)
Finke, H. A. (M)
Finnegan, E. T. (A)
Fiore, M. (A)
Firschein, O. (A)
First, M. H. (A)
Fischler, A. (A)
Fischmann, A. F. (M)
Fishman, T. (A)
Forman, I. (A)
Forman, J. B. (A)
Forman, P. (A)
Fox, J. (SM)
Frank, J. (A)
Frankel, A. (A)
Frawley, J. E. (A)
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Frisch, E. S. (A)
Fusco, A. (A)
Gabriel, F. C. (A)
Gagliano, A. F. (A)
Gallant, M. B. (A)
Galligan, T. J. (A)
Gancie, J. J. (A)
Garshelis, I. J. (A)
Gartner, J. K. (A)
Gatzke, F. W. (A)
Gaunt, W. B., Jr. (A)
George, D. E. (M)
Gershen, B. J. (A)
Gershuny, M. M. (A)
Grinsberg, M. P. (M)
Gilbert, I. B. (A)
Giordano, A. B. (SM)
Giordano, P. J. (A)
Glantz, L. M. (M)
Glassman, S. H. (A)
Glist, S. (A)
Glowalla, J. (A)
Goetz, H. (A)
Gold, R. D. (A)
Goldberg, E. (A)
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Goldstein, H. (A)
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Goldstein, M. (A)
Gorczycki, E. (A)
Gorelick, G. (A)
Goronin, A. (A)
Gorowitz, M. (A)
Gottlieb, A. W. (A)
Govinsky, W. (A)
Gray, G. A. (A)
Grebler, M. (A)
Green, E. H. (A)
Green, M. (A)
Green, W. F. (A)
Greenberg, H. (A)
Greenberg, L. (A)
Greenidge, G. (A)
Greenspan, J. (M)
Greenspan, L. E. (A)
Greenwald, C. (A)
Grelck, H. L. (M)
Grib, B. F. (A)
Griffin, W. J. (A)
Gruen, H. (A)
Gruenberg, E. L. (SM)
Gumas, G. (A)
Gurian, S. D. (M)
Guttman, J. (A)
Hachemeister, C. A. (SM)
Halpern, H. M. (A)
Hammer, H. (A)
Hammer, R. M. (A)
Hammerstein, H. A. (A)
Hanft, H. (M)
Hanson, E. D. (A)
Harder, J. F. (A)
Harrigan, A. M. (A)
Harris, L. (SM)
Hart, G. K., Jr. (A)
Hashmall, M. (A)
Hawkins, R. (A)
Heller, J. I. (SM)
Hembrooke, E., Jr. (VA)
Henion, T. T. (A)
Herman, S. (A)
Hermida, R. J. (A)
Hirschman, H. (A)
Honig, W. M. (M)
Hopkins, E. J. (VA)
Horn, A. M. (A)
Horowitz, I. M. (A)
Horowitz, J. (A)
Huang, H. (A)
Hurwitz, A. M. (A)
Hutson, L. S. (A)
Hyman, A. (A)
Jacobowitz, A. (A)
Jacobs, M. G. (A)
Jaffe, D. L. (SM)
James, W. S., Jr. (M)
Jarschauer, I. (A)
Jaworzki, A. M. (A)
Johnson, A. E., Jr. (A)
Johnson, B. F. (A)
Jones, A. B., Jr. (SM)
Jorysz, A. (M)
Joyce, M. V., Jr. (A)
Kadin, J. (A)
Kagan, H. (A)
Kahn, H. S. (A)
Kahn, W. K. (A)
Kalish, I. N. (A)
Kantrowitz, W. (A)
Kaplan, I. (A)
Kaplan, J. (A)
Kaplowitz, M. (A)
Kashar, A. S. (A)
Kashtan, S. (A)
Kassel, A. (A)
Kassel, C. (A)
Katz, G. M. (M)
Katz, S. (A)
Katz, S. H. (A)
Katzelnick, H. (A)
Kaufman, H. B. (A)
Kaufman, L. (A)
Kaufman, M. N. (A)
Keefe, G. (A)
Kerman, M. (A)
Kings, W. E., Jr. (A)
Kipperman, W. (A)
Kirdahy, E. (M)
Kirtman, F. (A)
Klapper, J. (A)
Klavens, N. I. (A)
Klein, A. M. (A)
Klevans, S. E. (A)
Kline, A. (A)
Kline, M. (M)
Klipper, S. (A)
Klug, S. H. (A)
Knowles, C. C. (A)
Koffer, M. (M)
Korbin, A. D. (A)
Korek, M. (A)
Korf, S. (A)
Korkes, H. (A)
Korn, I. I. (A)
Kozitzky, W. J. (A)
Kramer, B. H. (A)
Kramer, M. (A)
Krieger, P. (M)
Krimsky, W. J. (A)
Kuch, B. L. (A)
Kullback, M. (A)
Kurss, H. (A)
Kurtz, J. A. (VA)
Kurtzman, S. P. (A)
Kushner, D. (A)
Kuzmyak, M. G. (A)
Laemmel, A. E. (A)
Lampert, M. A. (A)
Lauder, F. (A)
Landow, I. S. (A)
Langille, N. A. (A)
Laskin, H. J. (A)
Lawrence, S. (M)
Lazarus, F. F. (A)
Leber, A. N. (A)
Lebowitz, L. L. (A)
Lebowitz, R. A. (A)
Lederman, S. (A)
Leesemann, W. B., Jr. (SM)
Leff, R. J. (A)
Leib, K. G. (A)
Lem, H. N. (A)
Letzter, A. O. (A)
Levin, H. L. (A)
Levin, S. (A)
Levine, I. (A)
Levine, S. (A)
Levine, S. (A)
Levy, L. (VA)
Levy, W. A. (A)
Lewis, M. B. (A)
Lewyt, A. M. (SM)
Liebell, E. (A)
Lieberman, J. L. (A)
Likel, H. C. (SM)
Lindeman, B. (M)
Lisiansky, W. (A)
Loshin, A. M. (A)
Lovoff, A. (SM)
Lowe, M. (M)
Luber, L. (A)
Lubkin, S. (SM)
Lundin, J. A. (A)
Machlis, J. (A)
MacLean, W. (A)
Maedel, G. F. (SM)
Malchman, F. L. (A)
Malina, M. (A)
Mandel, M. (A)
Mansky, L. (A)
Marantz, S. A. (A)
Marshall, S. L. (A)
Martin, D. P. (M)
Mason, H. J., Jr. (A)
Mazur, S. (A)
Mazziotti, I. J. (A)
McCormick, L. P. (A)
McGill, J. J. (A)
McGuire, T. J. (A)
McPhearson, L. G. (A)
Medici, N. (A)
Meher, J. A. (A)
Meixner, R. P. (A)
Merenda, C. T. (A)
Meth, I. (M)
Meyers, S. (A)
Milazzo, S. (M)
Miller, S. S. (M)
Miller, W. A. (A)
Mitchell, S. L. (A)
Mittman, S. A. (A)
Monleone, J. (A)
Monroe, J. (A)
Montuori, A. V. (A)
Moore, J. B. (SM)
Mordkowitz, I. (A)
Morgen, M. (A)
Morris, A. A. (A)
Morton, A. R. (SM)
Moses, A. I. (A)
Moss, J. A. (A)
Most, D. (A)
Musacchio, A. A. (A)
Musicaro, J. S. (A)
Myers, H. S. (A)
Nachtigall, S. (SM)
Nastasi, M. (A)
Neidorf, E. (A)
Nelson, B. C. (A)
Nelson, H. C. (A)
Nelson, J. L. (A)
Nelson, M. (A)
Nelson, W. (A)
Nelson, W. F. (A)
Neveroski, W. J. (A)
Newdorf, A. S. (A)
Newman, S. (A)
Nirenberg, A. (A)
Nozick, S. (A)
Odessey, P. H. (A)
O'Donnell, J. P. (A)
Oliner, A. A. (SM)
Ost, S. B. (A)
Oxley, J. E. (A)
Pagano, K. J. (A)
Pajak, A. W. (A)
Palatinus, A. C. (A)
Parke, H. G. (A)
Pearlman, L. (A)
Pelavin, M. H. (A)
Pelitsch, E. J. (A)
Pelner, N. (A)
Penikas, G. (A)
Perliss, R. E. (A)
Perlman, I. (A)
Perlman, S. (SM)
Pesca, F. J. (A)
Peters, A. D. (A)
Pettersen, E. S. (A)
Pickel, A. B. (A)
Pignataro, F. P. (M)
Pivnik, S. I. (A)
Place, H. (A)
Politzi, V. P. (A)
Pollack, B. H. (M)
Pollack, M. (M)
Poole, A. L. (A)
Popper, J. N. (A)
Portnoy, A. (A)
Posner, W. (A)
Prasinos, T. (A)
Priefer, C. E. (A)
Pugliese, L. (A)
Radicchi, P. O. (A)
Rappoport, J. F. (A)
Rauch, M. (A)
Reader, M. (A)
Reed, D. S. (A)
Reichenthal, A. (A)
Reichfield, S. (A)
Reinish, G. B. (A)
Reiss, R. I. (A)
Richards, A. (A)
Rifkin, W. B. (A)
Riley, C. D. (A)
Ritter, R. E. (A)
Rivman, J. (A)
Roberts, R. P. (A)
Robinson, H. L. (A)
Rodstein, A. (A)
Rogers, F. A. (A)
Rolinski, A. J. (A)
Rolnik, J. A. (A)
Romano, V. (A)
Roselli, D. J. (A)
Rosen, A. (A)
Rosenberg, D. (A)
Rosenberg, M. (A)
Ross, A. (A)
Ross, H. (A)
Rothman, L. (A)
Rowe, I. (M)
Rubens, D. A. (A)
Rubin, W. L. (M)
Sacco, V. (A)
Sachs, M. (A)
Sadowski, H. (A)
Salica, R. R. (A)
Salij, Z. B. (A)
Salz, H. (A)
Sawelson, A. I. (A)
Schachter, J. (A)
Schaten, P. (A)
Schermer, D. (A)
Schiffres, P. (A)
Schmerler, S. (A)
Schneider, R. M. (A)
Schoemer, A. W. (A)
Schulman, F. D. (A)
Schwartz, A. (A)
Schwartz, P. (A)
Sears, C. B. (A)
Seewald, E. J. (M)
Segal, J. B. (A)
Segner, S. M. (A)
Segreto, A. J. (A)
Selender, H. (A)
Selvaggio, N. J. (A)
Shaffer, A. (M)
Shaller, A. (A)
Shapiro, J. (A)
Shapiro, P. (A)
Shaw, R. F. (SM)
Shepetin, M. (A)
Shivack, I. M. (A)
Shubel, E. J. (A)
Shulman, J. (A)
Siclari, V. (A)
Sigler, A. (A)
Silver, B. L. (VA)
Silverberg, M. (A)
Simon, L. H. (A)
Simone, C. F. (A)
Simonelli, N. A. (A)
Sinsheimer, W. J. (A)
Sira, M. A., Jr. (A)
Sirota, N. (M)
Sisskind, S. G. (A)
Skeist, S. M. (M)
Slaker, F. A. (A)
Slatic, G. A. (A)
Slobodin, L. (A)
Smith, E. J. (A)
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Smykowski, C. P. (A)
Smoliar, G. D. (A)
Sobel, A. (A)
Sobel, A. D. (SM)
Sokol, L. L. (A)
Solomon, S. M. (A)
Sontag, H. M. (M)
Soreny, E. V. (A)
Spector, L. (A)
Spellman, F. C. (A)
Spencer, G. D. (A)
Spero, W. I. (A)
Stahl, C. (A)
Staiano, A. J. (A)
Steckler, A. (A)
Stein, H. H. (A)
Steinberg, W. A. (A)
Stewart, B. L. (A)
Stone, A. P. (A)
Summerville, R. W. (A)
Suttenberg, S. (A)
Sweet, L. O. (A)
Swetsky, M. (A)
Swift, W. C. G. (A)
Talley, D. (SM)
Teitelbaum, M. (A)
Tellerman, J. (A)
Temple, W. J. (A)
Templeman, L. I. (A)
Thompson, M. A. (A)
Tocci, D. P. (A)
Trachtenberg, J. M. (A)
Trimboli, B. J. (A)
Tulgan, S. S. (A)
Turczyn, W. A. (M)
Uslan, S. D. (M)
Vagt, H. T., Jr. (M)
Vallese, L. (SM)
Veder, A. (A)
Viola, V. (A)
Vitale, P. A. (A)
Vitrogan, D. (SM)
Volpe, C. D. (A)
Waas, G. J. (A)
Wagner, R. C. (A)
Walker, A. S. (A)
Wallace, R. W. (A)
Wambold, R. F. (M)
Ward, W. P. (A)
Warner, E. R. R. (A)
Watine, M. N. (A)
Watstein, L. (A)
Weber, E. (F)
Weinberg, M. (A)
Weiner, L. H. (A)
Weinstein, D. C. (A)
Weinstein, H. M. (A)
Weinstein, W. (A)
Weintraub, I. (A)
Weiss, A. A. (A)
Weissenstern, M. (A)
Weitz, M. K. (A)
Werman, H. M. (A)
Werner, G. L. (M)
Willes, R. L. (A)

Williams, D. G. (A)
Wind, M. (SM)
Witt, L. A. (A)
Wnuk, S. (A)
Wolf, E. M. (A)
Wolk, N. (A)
Wollman, E. (A)
Yusem, S. (A)
Zaretsky, A. (A)
Zarouni, A. (A)
Zawderer, J. (A)
Zbar, P. B. (M)
Zeidner, S. (A)
Zeiger, L. B. (VA)
Zeisler, W. E. (A)
Zetekoff, A. (M)
Zimet, M. M. (A)
Zimmerman, L. (A)
Zimnoch, J. J. (A)
Zisselman, A. (A)
Zivitofsky, F. I. (A)
Zupnick, I. N. (M)
Zweibel, J. (A)
Zweifler, I. (A)

Brooktondale (SY-4)
Jacomini, O. J. (A)
Johnson, E. M. (A)
Masterson, J. T. (A)

Buffalo (BN-4)
Allen, J. K. (A)
Anderson, M. J. (A)
Anderson, R. T. (M)
Arrison, C. R., Jr. (A)
Bargmau, M. (A)
Barrowcliff, T. A. (A)
Bauer, L. H. (A)
Baumler, F. R. (A)
Bennett, J. E. (A)
Benson, R. A. (A)
Bergerson, W. (A)
Bossler, F. B. (A)
Brantley, J. Q., Jr. (A)
Browder, L. P. (A)
Brown, R. M. (A)
Buettner, R. B. (A)
Burdick, D. D. (A)
Caserta, J. N. (A)
Champness, N. A. (SM)
Chang, C. C. (A)
Chapman, S. (SM)
Chimera, A. J. (A)
Chipchak, J. S. (A)
Ciany, M. C. (A)
Clausen, E. B. (A)
Clune, E. F. (A)
Copper, G. S. (A)
Cours, T. M. (A)
Cuddihy, W. F. (A)
Davies, R. W. (A)
Davis, D. L. (M)
Davis, J. E. (A)
Davis, M. (A)
Dunn, J. L. (A)
Dybowski, A. J. (VA)
Earl, H. D. (M)
Earshen, J. J. (A)
Faik, B. (A)
Falkenbach, G. J. (A)
Faraone, J. (A)
Farber, J. (A)
Fischer, F. P. (SM)
Fisher, F. M. (A)
Fisk, N. H. (A)
Flood, W. A., Jr. (A)
Fogel, C. M. (A)
Fryer, W. D. (A)
Gavin, R. F. (A)
Geigher, W. L. (A)
Gibbons, H. M. (A)
Green, E. E. (A)
Guggi, W. B. (A)
Hacker, G. J. (A)
Halsted, G. P. (A)
Hannan, T. P. (A)
Harvey, N. L. (SM)
Hayre, H. S. (A)
Hershberger, R. W. (A)
Hettinger, M. (A)
Hill, L. L. (A)
Hoffman, K. B. (SM)
Hoffman, R. S. (A)
Holley, M. V. (M)
Holly, J. A. (A)
Horton, A. B., Jr. (A)
Horvath, J. O. (A)
Houck, G. S. (A)
Huber, C. W. (VA)
Hunting, R. A. (A)
Iddings, H. G., Jr. (SM)
Jackson, R. W. (A)
Jans, J. T. (A)
Jarosik, N. A. (M)
Jennings, R. W. (A)
Joseph, R. D. (A)
Judd, A. E. (A)
Kahn, D. A. (A)
Kane, B. P. (A)
Kay, R. H. (A)
Kell, R. E. (A)
Kieshauer, F. W. (A)
Kingsley, R. J. (M)
Kinsell, W. L. (SM)
Kitchin, H. W. (SM)
Kreinheder, D. E. (A)
Kuffert, J. E. (A)
Kurchin, A. (A)
Lanning, W. E. (A)
Lautz, C. F., Jr. (A)
Lebid, J. (A)
Lerner, T. (A)
LeVan, W. I. (A)
Lindberg, E. (A)
Linderman, J. S. (A)
Loebner, E. E. (M)
Lynch, V. J. (A)
Marchinlak, A. E. (A)
Markes, R. T. (A)
Martin, F. C. (A)
Mennen, H. (A)
Michnik, L. (A)
Mitscher, R. W. (A)
Moncton, H. S. (M)
Newbold, R. F. (M)
Newman, H. L. (M)
Nixon, P. E. (A)
Nowack, R. W. (A)
Nuckolls, R. G. (SM)
Okonski, C. B. (A)
Okun, A. M. (M)
Olney, V. W. (A)
Orlowski, C. J. (A)
Phillips, J. (A)
Powell, D. R. (A)
Price, E. L. (A)
Puttick, A. W. (A)
Reisch, L. P. (A)
Rety, E. E. (A)
Ridgeway, F. B. (M)
Rizzo, S. J. (A)
Rosenfelder, G. S. (A)
Rusnak, W. (A)
Schiess, G. (A)
Schultze, W. J. (A)
Schwartz, E. C. (A)
Schwartz, J. H. (A)
Shah, C. N. (A)
Shub, L. (A)
Simpson, C. L. (M)
Slater, R. H. (A)
Smith, R. H. (A)
Sobiech, C. A. (A)
Spoon, G. E. (A)
Steeb, E. C., Jr. (A)
Stevens, H. V. (A)
Stieber, A. (A)
Sullivan, P. E. (M)
Swartzel, K. D. (SM)
Tanner, W. E. (A)
Taylor, F. E. (A)
Territo, J. N. (A)
Thalner, R. R. (SM)
Thornton, W. M. (A)
Toma, C. J. (A)
Toth, G. L. (A)
Troll, W. C. (A)
Unger, W. J. (A)
Van Allen, J. W. (A)
Van Every, B. (A)
Vhuri, A. L. (A)
Vlay, G. J. (A)
Waas, G. J. (A)
Watson, W., II (A)
Waud, E. C. (VA)
Weinberg, D. H. (A)
Welch, D. P. (M)
Wendt, K. R. (F)
Wilkins, F. W. (A)
Wittman, J. H. (A)
Zimmerman, E. A. (A)

Burnt Hills
Wagner, B. F. (A)

Caledonia (ROC-4)
Angevine, O. L., Jr. (SM)

Cambria Heights (LI-2)
Cohen, S. A. (A)
Fangmann, G. (A)
Margolis, A. B. (A)

Camden (RU-4)
Hickey, J. B. (A)

Camillus (SY-4)
Gordon, R. T. (A)
Place, J. F. (A)
Schweers, O. H. (SM)

Carle Place (LI-2)
Andrews, B. H. (M)
Barbaccia, A. J. (A)
Drasney, G. C. (A)
Lincoff, W. (A)
Matthews, L. M. (M)
Richardson, F. L. (M)

Cato (SY-4)
Sproul, S. (A)

Catskill (NY-2)
Gardner, C. B. (A)

Cazenovia (SY-4)
Chamberlain, P. L. (A)
Healy, D. W., Jr. (M)
Winslow, W. R. (A)

Cedarhurst (LI-2)
Dick, T. M. (M)
Levine, A. M. (A)
Mercier, A. E. (VA)
Norris, S. (A)

Centereach (LI-2)
Clark, M. J. (A)

Centerport (LI-2)
Dergance, W. (A)
Klaus, G. H. (M)
Rezek, R. M. (A)

Central Islip (LI-2)
Myers, R. T. (A)

Chappaqua (NY-2)
Buttolph, J. D. (A)
Dellenbaugh, F. S., III (A)
D'Humy, F. E. (F)
Kellogg, D. S. (A)
Le Vay, T. C. (M)
Short, W. P. (SM)
Taggart, C. E. (A)
Washburne, B. P. (M)

Cheektowaga (BN-4)
Maltais, W. E. (A)

Chittenango (SY-4)
Floyd, G. H. (M)

Churchville (ROC-4)
Chapin, D. W. (A)

Clarence (BN-4)
Dobson, H. R. (A)
Doolittle, J. H. (SM)
Greatbatch, W. (A)
Morrison, R. W. (A)
Mott, R. M. (A)
Pelton, F. M. (A)
Popovich, B. (A)

Clay (SY-4)
Carlson, E. R. (A)
Hall, G. D. (A)
Lee, A. E. (A)

Cleverdale (SCH-2)
Mead, M. S., Jr. (SM)

Clinton (RU-4)
Grisetti, R. S. (A)
Mayer, H. F. (SM)
McMillan, R. E. (M)

Clyde (ROC-4)
Ritter, V. H. (A)
York, R. A. (SM)

Cold Spring-on Hudson
Olsen, L. V. (A)

College Point (LI-2)
Fury, A. E. (A)
Hoffman, R. A. (A)
Rilling, J. C. (A)
Shostak, M. (A)
Steven, M. O. (A)
Stiepel, G. W. (A)
Wappler, A. C. (A)

Cohoes (SCH-2)
Vogel, G. J. (A)

Commack (LI-2)
James, G. W. (M)

Conesus (ROC-4)
Young, F. C. (SM)

Constantia (SY-4)
Day, R. G. (A)

Coram (LI-2)
Sondericker, J. H., Jr. (A)

Corfu (ROC-4)
Mech, H. D. (A)

Corning (EC-4)
Asher, J. W. (A)
Bell, A. N. (A)
Brouneus, H. A. (A)
Cammen, M. M. (M)
Condon, E. U. (SM)
Craumer, H. S. (A)
Guyer, E. M. (M)
Hocker, J. P. (M)
Jessen, F. A., Jr. (A)
Knysh, W. J. (A)
Mann, R. H. (A)
Marafioti, J. J. (A)
McKnight, W. H. (A)
Muller, J. S. (A)
Nitsche, J. E. (A)
Rigg, R. W. (M)
Sackinger, J. R. P. (A)
Shaw, M. R., Jr. (M)
Sheldon, J. L. (SM)
Voss, R. O. (A)
Wetmore, W. L. (A)

Cornwall-on-Hudson (NY-2)
Hollberg, R. W. (A)

Corona (LI-2)
Di Franco, J. V. (A)
Dubin, L. (A)
Jeantet, M. P. (A)
Milano, J. (A)
Pafundi, M. T. (A)
Silbar, J. I. (A)
Strauss, G. M. (A)

Crestwood (NY-2)
Krauer, O. (A)

Croton-on-Hudson (NY-2)
Crawford, P., Jr. (M)
Fischer, S. (A)
Lescarboura, A. C. (SM)

Cuba (EC-4)
Blum, R. J. (A)

Delanson (SCH-2)
Dibb, G. (A)

Delmar (SCH-2)
Johnson, G. L. (M)
Rechnitzer, B. W. (A)

Denver
Numann, G. W. (A)

De Pew (BN-4)
Edmiston, R. B. (A)

Dewitt (SYR-4)
Buchwald, C. E. (SM)
Clark, H. T. (SM)
Devore, L. T. (F)
Gifford, R. P. (M)
Harnett, D. E. (F)
Hausz, W. (SM)
Perkins, D. W. (A)
Peterson, E. F. (M)
Simon, C. J. (M)
Taylor, F. W. (M)

Dobbs Ferry (NY-2)
Altman, N. G. (A)
Crawford, R. V. (SM)
Espersen, G. (SM)
MacLane, A. B. (A)

Douglaston (LI-2)
Agree, I. (A)
Barth, J. E. (A)
Batcher, R. R. (F)
Cramer, S. (A)
DeFloria, R. N. (A)
Dumaresq, J. (A)
Greenwald, M. S. (A)
Long, F. A. (A)
McClellan, G. B. (SM)
Merten, D. J. S. (SM)
Milkman, N. (A)
Ruvin, A. E. (A)
Shaneck, R. B. (SM)
Todd, P. G. (A)
Tyson, B. F. (SM)
Weinstein, G. (A)

Dryden (SY-4)
McCary, R. O. (A)

East Aurora (BN-4)
Frazier, R. E. (M)
Hopkins, J. E. (M)
Scrafford, R. L. (A)

Eastchester (NY-2)
Gallios, G. C. (A)

East Elmhurst (LI-2)
Gordon, S. M. (A)

East Hampton (LI-2)
Dominy, J. F., Jr. (A)

East Hempstead (LI-2)
Aba, R. S. (A)
Fay, A. H. (A)
Keen, H. S. (A)
Reynolds, L. G. (A)
Slack, W. J. (M)
Vanaglia, E. J. (M)

East Meadow (LI-2)
Basil, A. (A)
Boyce, J. (A)
Brownman, H. L. (A)
Byron, M. (A)
Dlugatch, L. (M)
Duggan, J. R. (SM)
Farber, B. (A)
Frerking, H. W. (A)
Frost, S. (M)
Gaskins, F. J. (A)
Grob, B. (M)
Grodzinsky, S. (A)
Gruber, P. (A)
Jurow, S. (A)
Kauper, L. T. (A)
Kors, A., Jr. (A)
Newman, S. O. (A)
Noviloff, E. B. (M)
Parker, S. (A)
Preti, L. L. (A)
Redowian, M. (A)
Rothlein, B. J. (SM)
Silbiger, R. J. (A)
Sills, M. M. (A)
Stevens, S. (M)
Volz, N. A. (A)
Yuni, W. (A)

East Northport (LI-2)
Wallace, R. A. (A)

East Norwich (LI-2)
Churchill, D. B. (M)
Fowler, C. A. (A)
Garretson, C. M. (A)

East Rockaway (LI-2)
Brown, W. (M)
Cohen, G. (A)

East Syracuse (SY-4)
Anderson, S. E. (A)
Downie, J. W. (SM)
Ellis, L. M. (M)
Galbraith, R. A. (SM)
Glasford, G. M. (SM)
Horsch, J. R. (A)
Hu, M. K. (A)
Hu, Y. S. (A)
Hyde, H. L. (A)
Intrator, A. M. (A)
Johnson, M. A. (M)
King, C. F. (M)
Kordalewski, A. P. (M)
Lepage, W. R. (SM)
Lothes, R. N. (A)
Morrison, R. H. (M)
Mueller, W. J. (M)
Nash, C. C., Jr. (A)
Pallidino, M. J. (A)
Phillips, A. B. (A)
Rivera, C. R. (A)
Rosen, C. A. (M)
Sherman, J. H., Jr. (A)
Wilson, G. G. (M)

East Williston (LI-2)
Doucette, A. R. (M)
Galella, P. F. (SM)
Packer, L. (A)
Schulz, R. F. (A)

Eden (BN-4)
Pontius, J. C. (M)

Eggertsville (BN-4)
Beach, J. B. (A)
Borkowski, C. J. (M)
Eckert, E. H. (A)
Hardy, L. H. (M)
Harvey, H. F. (A)
Mezger, C. C. (A)
Raney, J. J. (SM)
Reimagel, R. E. (SM)
Schneeberger, R. F. (A)

Ellenville (BN-4)
Bloch, D. G. (A)
Lo, Y. T. (A)

Elma (BN-4)
Hunt, R. A. (A)

Elmhurst (LI-2)
Berendsen, C. G. (A)
Blumenstock, N. R. (A)
Christie, C. J. (A)
D'Amico, V. (A)
Elkin, B. P. (A)
Elser, A. C. (A)
Erdman, A. (A)
Francoeur, G. R. (A)
Frank, L. E. (A)
Kestenbaum, H. S. (A)
Leonard, E. V. (M)
Pelzer, B. (A)
Pincus, M. (M)
Rebel, G. L. (A)
Secan, H. (M)
Shapiro, L. C. (SM)
Stubler, R. E. (A)
Toufexis, S. (M)
Tymann, T. J. (A)
Weida, R. L. (A)
Wohl, C. J. (A)

Elmira (EC-4)
Airey, R. K. (A)
Aldrich, D. F. (M)
Argyle, B. E. (A)
Argyle, L. C. (A)
Ausfresser, H. D. (A)
Cherry, S. J. (SM)
Dart, H. F. (SM)
Dickey, C. W. (A)
French, A. F. (A)

Gallagher, H. E. (A)
Greene, T. A. (M)
Hayter, W. R., Jr. (A)
Johnson, W. C. (A)
Knochel, W. J. (VA)
Knowles, D. D. (SM)
Kroul, G. W. (A)
Lederer, E. A. (SM)
Lempert, J. (SM)
Link, V. F. (A)
Lucy, C. J. (A)
Moran, W. G. (A)
Muldoon, R. P. (A)
Mulligan, J. M. (A)
Ramich, C. E. (M)
Riggen, T. K. (M)
Riggs, J. O. (A)
Scheetz, H. A. (A)
Sheehe, J. M. (A)
Splann, M. T. (A)
Stelmak, J. P. (M)
Stoddard, R. N. (A)
Upshaw, V. (M)
Weingarten, I. R. (A)
White, L. E. (A)
Wood, E. F., Jr. (A)

Elmira Heights (EC-4)
Washburn, G. W. (A)

Elmont (LI-2)
Ballard, F. (A)
Cronin, D. (A)
Dong, J. G. (A)
Dressler, R. (A)
Gould, S. (A)
Griffen, K. A. (A)
Griffing, W. W. (A)
Hanover, A. M. (A)
Jacobs, A. B. (A)
Kuck, G. P. (A)
Kuhn, J. J. (A)
Lee, S. R. (A)
Rhodes, M. L. (A)
Seidman, A. H. (A)
Strazzulla, R. L. (A)

Elmsford (NY-2)
Carlisle, R. W. (SM)
Carlisle, S. F., Jr. (A)
Greenbaum, W. H. (M)
Kranz, F. W. (SM)
Myers, H. W. (M)
Oess, F. G. (A)
Pearson, H. A. (VA)
Von Baudissin, J. (VA)

Elsmere (SCH-2)
Maguire, H. S. (A)

Endicott (BI-4)
Aldrich, D. H. (A)
Ayers, J. G., Jr. (A)
Baldauf, D. R. (A)
Black, T. L. (A)
Branning, H. F. (A)
Brooke, A. W. (A)
Diaz, J. (A)
Gerould, L. D. (A)
Hambergen, A. (A)
Hardie, F. H. (A)
Johnson, R. M. (A)
Kramer, N. H. (A)
La Joie, Z. A. (A)
Lamy, R. C. (A)
Lohman, I. H., Jr. (M)
Mathers, H. W. (A)
Miller, W. C. (A)
Mulock, L. E. (A)
Nuss, H. C. E. (A)
Perrin, L. A. (A)
Polak, R. (A)
Pratt, R. E. (A)
Pratt, R. L. (M)
Pyle, C. L. (A)
Raiter, S. J. (A)
Reynolds, A. C., Jr. (M)
Roehm, F. J. (M)
Shatz, J. R. (A)
Shell, E. F. (M)
Southard, C. D. (A)
Strup, C. F., Jr. (M)
Swarthout, N. M. (M)
Veburg, J. C. (A)
Willard, D. D. (A)
Yurgartis, W. C. (A)

Endwell (BI-4)
Frehsee, R. (A)
Katz, A. J. (A)
O'Connor, D. G. (SM)
Schunk, H. F. (A)
Yeager, C. J. (A)

Farmingdale (LI-2)
Daniels, H. J. (A)
Delalio, L. D. (A)
Gneses, M. I. (A)
Krayer, G. (A)
Maguire, J. P. (A)
Niewenhous, J. H. (A)
Ragni, V. F. (A)
Seitz, S. S. (A)
Spector, A. (A)
Tchinnis, M. F. (A)
Theroux, E. J. (A)

Far Rockaway (LI-2)
Beer, A. S. (A)
Haynes, N. M. (M)
Liegey, P. R. (A)
Mandel, M. (A)
Rosenzweig, G. E. (A)

Fayetteville (SY-4)
Campbell, C. M. (M)
Costas, J. P. (A)
Deerhake, F. M. (SM)
Gangberg, F. (A)
Gethmann, R. B. (M)
Gunn, A. C. (SM)
Hartman, D. K. (A)
Jones, J. L. (SM)
Messer, H. G. (SM)
Mushrush, R. S., Jr. (A)
Ryerson, J. D. (A)
Thomas, H. P. (F)
Trotter, G. C. (M)
Vadasz, A. J. (SM)
Waugh, G. T. (M)

Ferndale (LI-2)
Schwartz, N. (A)

Fishkill (NY-2)
Hallock, D. G. (A)
Pullis, F. D. (A)
Stahl, W. L. (SM)

Floral Park (LI-2)
Ahern, W. R. (SM)
Axtelle, G. E., Jr. (A)
Becchetti, F. J. (A)
Buble, F. L. (A)
Dorman, D. (A)
Eberle, E. E. (M)
Fink, A. (A)
Gaglianello, J. W. (A)
Garrand, L. W. (SM)
Geyer, A. J. (A)
Gunnell, G. T. (VA)
Hallden, A. R. (A)
Halpern, M. (A)
Imboden, G. J. (A)
Jones, M. W. (A)
Kefalas, G. P. (A)
Knox, R. W. (A)
Knubble, H. (M)
Lazarchik, R. E. (A)
Loebl, W. W. (A)
Loecher, G. S. (A)
Loynes, O. H. (VA)
Marshall, T. A. (A)
McGowen, T. C. (A)
McNamara, T. R. (A)
Mengani, C. M. (A)
Meyer, J. W. (A)
Montesano, S. J. (A)
Mooney, V. J. (A)
Nixon, G. M. (VA)
Novick, R. (A)
Rarick, J. B. (A)
Remily, W. M. (A)
Rhoads, A. S., Jr. (A)
Rogers, W. (A)
Schmidt, R. D. (A)
Sion, E. (A)
Spittal, W. R. (A)
Toomey, J. F. (M)
Tuerck, W., Jr. (A)
Weidmann, L. J. (M)
Whitford, J. R. (A)
Winslow, R. G. (A)

Flushing (LI-2)
Altmann, S. (A)
Amedeo, P. (A)
Arany, D. M. (SM)
Atlas, H. T. (A)
Auerbach, L. (A)
Auerbach, M. (SM)
Aull, W. (SM)
Baasch, T. L. (A)
Barber, A. W. (VA)
Barry, S. (A)
Beck, A. T. (A)
Becker, H. R. (A)
Berkowitz, M. W. (A)
Bettan, M. I. (A)
Blass, J. (M)
Boyer, J. M. (SM)
Brody, J. (A)
Cap, S. T. (A)
Casper, S. (A)
Clerkin, C. R. (A)
Climent, L. J. (M)
Cohen, A. L. (A)
Courter, H. M. (A)
Craft, C. J., III (A)
Crowder, H. A. (A)
Crowhurst, N. H. (SM)
Dawson, H. E. (A)
De Clerck, C. E. (A)
Del Giorno, A. E. (A)
Doulos, N. P. (A)
Driscoll, F. X. (A)
Erhardt, K. D. (A)
Evans, J. (A)
Farber, R. J. (A)
Fein, B. (A)
Feinman, G. (A)
Feitler, J. (A)
Felsen, L. B. (A)
Fredricks, I. (A)
Freedman, M. M. (M)
Fugazzi, C. (A)
Geick, G. H. (A)
Gerber, M. M. (A)
Gleimer, B. (M)
Goodman, I. (A)
Gould, L. M. (A)
Granoff, N. H. (A)
Greenberg, D. R. (M)
Greiger, G. (A)
Harris, H. I. (A)
Hatfield, L. N. (SM)
Hebel, E., Jr. (A)
Hershler, A. (A)
Hertz, S. (A)
Hillman, K. (A)
Hrbek, G. W. (A)
Huebscher, H. (A)
Jacobs, G. (A)
Jacobson, R. I. (SM)
Jasik, H. (SM)
Jensen, R. A. (A)
Johanson, P. (A)
Joyce, K. J. (A)
Juhas, L. A. (A)
King, M. (A)
Klein, H. (A)
Knapp, J. Z. (A)
Koffman, H. J. (A)
Kornbluth, A. E. (A)
Kritz, J. (M)
Kupferberg, K. M. (M)
Laighton, A. K. (A)
Lang, R. M. (A)
Langer, P. L. (A)
Lawrence, G. (A)
Lee, T. K. (A)
Leimbach, R. C. (A)
Lenczowski, T. M. (A)
Leskinen, J. I. (A)
Levinson, S. (A)
Ley, B. J. (A)
Lindeman, R. J. (A)
Lipin, B. (A)
Loveman, B. D. (A)
Lustig, H. E. (A)
Lynch, W. J. (A)
Lyons, W. (SM)
Malmken, W. J. (A)
Mahren, A. A. (A)
Mann, H. (A)
Marcus, M. (A)
Markantes, P. N. (A)
Martin, P. S. (M)
Mayo, H. L. (A)
Mecol, J. C. (M)
Middleton, R. G. (A)
Millman, J. (SM)
Minneman, M. J. (SM)
Mohr, H. F. (A)
Natchipolsky, M. (A)
Necol, J. C. (M)
Neeck, J. E. (A)
Newhoffer, F. L. (A)
Nistal, G. E. (A)
Olson, O. F. (M)
Pace, F. P. (A)
Paradis, B. (A)
Parker, G. (A)
Parker, H. W. (F)
Pater, O. C. (A)
Pawelko, M. J. (A)
Pierce, V. M. (A)
Press, M. (SM)
Retzger, L. I. (A)
Rifkin, M. S. (M)
Ripple, J. W. (A)
Roberts, A. K. (A)
Rosen, B. (A)
Rosen, M. (A)
Rothmel, B. J. (A)
Rothstein, M. (SM)
Rubin, S. (A)
Russ, B. H. (VA)
Salkind, E. (A)
Sanial, A. J. (SM)
Sard, E. W. (A)
Schlegel, R. A. (A)
Schneiderman, S. (A)
Schroeder, K. R. (A)
Schroter, R. G. (A)
Schwartz, E. (A)
Schwartz, H. (A)
Seabury, E. M. (M)
Siegmann, M. J. (A)
Sleminski, E. (SM)
Silver, H. (A)
Small, B. (A)
Smith, L. (A)
Sohne, G. C. (A)
Solzberg, S. A.
Steinhardt, L. (A)
Strauss, K. J. (A)
Strysko, W. J. (A)
Tepper, H. H. (M)
Thropp, C. H. (VA)
Tung, S. P. (A)
Walrath, D. J. (A)
Weiland, G. H. (A)
Weir, W. R. (M)
Weiser, S. (A)
Weissman, J. G. (M)
Williams, G. W. (M)
Wolf, F. E., Jr. (A)
Wright, R. G., Jr. (A)
Youdin, M. (M)
Zion, H. (A)

Forest Hills (LI-2)
Abere, E. J. (A)
Algase, L. I. (M)
Bass, S. D. (A)
Baum, S. H. (VA)
Bendett, R. M. (A)
Canavaciol, F. E. (SM)
Caplan, N. (A)
Carlat, B. (SM)
Cheng, C. C. (A)
Cohen, E. (A)
Cretella, S. A. (A)
Davidson, R. (A)
Della-Corte, J. P. (SM)
Dick, A. I. (A)
Dietz, H. G. (A)
Fendrich, L. (A)
Fonseca, A. P. (A)
Freeman, E. E. (SM)
Gleimer, L. (A)
Goldbaum, S. (A)
Grayson, K. B. (A)
Gross, J. (A)
Harmatz, H. J. (A)
Hogan, J. V. (A)
Hollywood, J. M. (SM)
Jacobs, M. (A)
Julle, J. (A)
Kamm, E. (A)
Kantor, G. (M)
Kao, C. C. (M)
Kearny, D. H. (A)
Keogh, R. J. (A)
Koenig, R. H. (A)
Krainin, S. (A)
Leeds, M. (A)
Levin, M. S. (A)
Levine, S. B. (A)
Lidz, S. (A)
Losher, M. I. (A)
Maldini, P. A. (A)
Mann, A. (A)
Margosian, J. W. (SM)
Micalowsky, M. (A)
Mitchell, W. M. (A)
Newton, A. (A)
Ohman, B. U. (A)
Ottenberg, E. C. (A)
Ottenberg, L. A. (A)
Palester, J. (A)
Pease, C. H. (A)
Polak, H. L. (A)
Polcyn, S. J., Jr. (A)
Pritkin, L. (A)
Rabin, R. (A)
Rich, M. W. (A)
Roder, A. (A)
Sandor, A. (SM)
Schiller, H. H. (A)
Scott, J. E. (A)
Seidner, J. H. (M)
Seliger, V. H. (A)
Sheffield, B. (A)
Staschover, L. (A)
Toepel, W. A. (A)
Weiner, S. L. (A)
Wu, W. I. L. (SM)
Zelazo, N. K. (SM)

Fort Edward (SCH-2)
Flood, F. R. (M)
Grahame, F. W. (A)

Fort Niagara (BN-4)
Derflinger, H. L., Jr. (A)

Franklin Square (LI-2)
Affias, I. M. (M)
Avallone, A. (A)
Balogh, J. (A)
Berinsky, M. (A)
Biberacher, R. (A)
Blaisdell, H. L. (SM)
Daskam, E., Jr. (M)
Elion, H. A. (A)
Hallisey, R. J. (A)
Isaacs, S. J. (A)
Kennedy, J. E., Jr. (A)
Kirby, M. J. (M)
Klerk, R. H. (A)
Kraemer, E. H. (A)
Krueger, D. H. (A)
Lee, V. C. (A)
Lipson, W. (M)
Mahler, L. J. (A)
Makstein, F. I. (A)
Margulies, F. (A)
McNealus, A. L. (A)
Meyer, F. (A)
Schisler, C. W. (A)
Schwalbe, J. H. (A)
Schwartz, L. J. (A)
Shanney, W. I., Jr. (A)
Winer, J. D. (M)

Franklinville (BN-4)
Elfman, R. S. (A)
Koval, E. R. (M)

Freeport (LI-2)
Antony, C. (M)
Belderok, H. C. (A)
Butterworth, G. S. (A)
Campani, L. M. (A)
Dolphy, E. L. (VA)
Drach, J. G. (A)
Elar, P. A. (A)
Johnson, G. R. (M)
Kahn, L. R. (M)
Prichard, J. S. (A)
Russell, G. A. (M)
Sebold, A. J. (A)
Smedes, R. L. (A)
Smith, D. P. (M)
Sokolov, J. (A)
Spargo, J. S. (A)
Terry, P. H. (A)
Tricamo, V. A. (M)

Fresh Meadows (LI-2)
Barash, L. F. (A)
Eaton, J. E. (M)
Feingold, W. (A)
Freeman, O. S., Jr. (A)
Gebhardt, J. W. (A)
Holloway, H. R. (M)
Koppel, A. U. (A)
Meltzer, H. S. (A)
Phillips, A. H. (A)
Richman, D. (SM)
Schwaninger, J. W. (A)
Went, J. J. (A)
White, E. S. (SM)

Galway (SCH-2)
David, W. R. (A)
Lemmerman, E. R. (A)

Garden City (LI-2)
Alcott, E. H. (A)
Allen, H. E. (SM)
Allert, W. T. (A)
Barnaby, R. H. (A)
Beetham, R. B. (A)
Berglund, E. B. (SM)
Bernslev, J. T. (A)
Carroll, J. M. (M)
Caswell, J. N. (A)
Dunn, L. J. (SM)
Edwards, R. S. (A)
Fisher, D. L. (SM)
Frank, K. F. (M)
Fricker, J. N. (M)
Gemmill, F. Q. (A)
Gengarelly, T. (A)
Grunsky, C. E. (SM)
Hancock, J. R. (A)
Heins, J. L. (VA)
Helms, M. E. (A)
Hesse, A. N. (VA)
Hinds, J. E., Jr. (A)
Keim, D. Y. (VA)
Learned, V. (SM)
Lester, J. M. (SM)
Marston, R. S. (M)
McKesson, L. J. (SM)
Mellor, W. N. (VA)
Meranda, J. I. (M)
Monfort, R. A. (SM)
Rau, D. S. (SM)
Ruth, E., III (SM)
Sarett, D. P. (A)
Schreitmueller, R. F. (A)
Seymour, J. W. (A)
Shannon, W. W. (A)
Shaper, H. B. (A)
Shepherd, J. E. (F)
Sweeney, W. R. (A)
Wies, G. (M)
Winchell, W. H. (VA)

Garden City Park (LI-2)
Braun, L., Jr. (A)

Garden City South (LI-2)
Schlessel, J. H. (A)

Geneva (ROC-4)
Benda, D. (M)
Long, C. P. (A)
Philip, R. M. (A)
Smith, S. S. (A)

Glen Cove (LI-2)
Buchtenkirch, A. J. (A)
Carberry, J. F. (A)
Davis, W. M. (A)
Doncese, G. (A)
Downs, J. W. (SM)
Duffy, D. P. (A)
Firth, L. G., Jr. (A)
Gebhardt, R. J. (A)
Glassman, S. (M)
Haner, L. (A)
Jorge, A. (A)
Kiser, W. L. (SM)
McDonough, J. A. (SM)
Moreno, C. A. (A)
Scott, G. G. (A)
Whealy, J. E. (SM)

Glendale (LI-2)
Chapman, R. F. (M)
Glazer, C. R. (M)
Sperber, A. O. (M)
Trelewicz, E. R. (A)
Vought, N. F. (M)
Veit, F. (A)
Wirfel, W. M., Jr. (A)

Glenford (NY-2)
Johnson, J. D. (A)

Glenham
Keniston, H. E. (A)

Glen Head (LI-2)
Cetrone, V. C. (A)
Cooke, W. T. (SM)
Gorrill, W. S. (SM)
Hanson, G. N. (SM)
Keeneth, J. A. (A)
Mansur, F. (M)
Martin, E. E. (A)
Reed, F. C., Jr. (A)
Swanson, E. H. (M)
Widenor, M. D. (A)
Williams, R. B., Jr. (A)
Zylla, H. R. (A)

Glen Oaks (LI-2)
Bee, R. E. (A)
Berriman, M. (A)
Broder, A. (A)
Dolin, M. (A)
Doucette, A. R. (M)
Dunn, B. B. (A)
Eaton, R. S., Jr. (A)
Eichel, J. H. (SM)
Enlow, P. M. (A)
Franks, C. V. (A)
Gates, W. L. (A)
Greenbaum, J. R. (M)
Greene, A. H. (A)
Gutman, J. H. (A)
Heller, Z. H. (A)
Hittner, C. (A)
Imgram, R. H. (A)
Kaelin, B. A., Jr. (A)
Lazarchik, R. E. (A)
Leck, D. E. (A)
Lowe, F. B. (A)
Magenheim, B. (A)
Mullin, J. F. (A)
Nowack, E. W., Jr. (A)
O'Connor, W. A., Jr. (A)
Paley, W. D. (A)
Pollack, P. (M)
St. John, K. M. (A)
Skahill, B. J., Jr.
Sink, W. C. (A)
Sweenie, G. C. (A)
Tiedeman, I. B. (A)

Glen Oaks Village (LI-2)
Denman, E. D. (A)
Greene, E. B. (A)

Glens Falls (SCH-2)
Foster, L. W. (SM)
Frank, A. (A)
Harrington, D. J. (M)
Polimerou, L. G. (A)
Wells, H. D., Jr. (M)

Glenwood Landing (LI-2)
Gaylor, R. (A)

Golden Bridge
Groves, Q. D. (A)

Goshen (NY-2)
McClean, J. F. (SM)

Gowanda (BN-4)
Allen, M. B. (A)

Grand Island (BN-4)
Arthur, R. J. (A)
Barnes, J. A. (A)
Hattersley, T. E., Jr. (A)
Hayles, C. J. (M)
Jackamonis, G. (A)
Prast, J. W. (A)

Great Neck (LI-2)
Arthur, G. R. (M)
Bachman, H. L. (A)
Baller, H. (SM)
Barber, B. T. (A)
Barney, K. H. (A)
Beck, D. H. (SM)
Benjamin, J. N. (SM)
Bidell, F. W. (A)
Boop, W. E. (M)
Bradley, G. G. (M)
Branham, D. W. (A)
Browning, J. H. (A)
Chaikin, M. (A)
Cook, C. E. (A)
Crawford, J. D. (SM)
Croly, J. W. (A)
Croney, K. A. (A)
Crosby, R. W. (A)
Dalman, G. C. (SM)
Davis, C. W. (M)
Davis, W. J. (A)
DeFries, H. A. (A)
Dettinger, D. (SM)
Dostal, F. X. (A)
Dugan, J. F. (A)
Dunlap, O. E., Jr. (SM)
Elbinger, L. P. (SM)
Ellis, P. H. (A)
Ettenberg, M. (SM)
Forsberg, K. E. (A)
Frank, R. L. (M)
Frantz, W. P. (M)
Frattura, J. D. (A)
Frische, C. A. (SM)
Fuller, E. J. (A)
Gittleman, R. (A)
Graham, J. S. (A)
Halpern, W. (A)
Hannan, P. W. (A)
Hauser, A. A., Jr. (M)
Helf, W., Jr. (A)
Henning, R. E. (M)
Heyliger, G. E. (A)
Hinchey, R. L. (A)
Hronek, R. L. (A)
Isbister, E. J. (SM)
Jahn, D. M. (A)
Jasik, C. (A)
Jones, D. D. (A)
Kahn, M. B. (SM)
Koch, J. F. A. (A)
Landauer, W. E. (A)
Larick, S. H. (M)
Latham, G. R., IV (A)
Leeds, G. G. (A)
Levers, E. O. (A)
Lian, K. T. (A)
Lundquist, G. A. (A)
MacLean, W. D. (A)
Magno, H. T. (SM)
Marcuvitz, N. (VA)
Martinson, C. M. (A)
Mayerson, M. I. (M)
McClure, R. E. (A)
Messner, W. S. (A)
Meyer, E. G. (A)
Milton, J. (A)
Milton, L. (A)
Moerman, N. A. (M)
Morgan, J. F. (A)
Mulligan, J. R. A., Jr. (A)
Mundo, C. J., Jr. (A)
Nachemson, P. R. (A)
Onyskin, M. (M)
Palmer, R. D. (A)
Pasek, D. M. (SM)
Paulson, C. R. (M)
Planteroth, J. A. (A)
Plummer, D. K. (M)
Potter, J. T. (A)
Poulos, N. M. (A)
Powell, T. (A)
Proctor, D. W. (A)
Proctor, E. K., Jr. (SM)
Redlien, H. W., Jr. (A)
Rickert, H. H. (A)
Roake, W. C. (M)
Rohm, W. B. (A)
Rosenberg, S. L. (A)
Sawyer, H. S. (A)
Schwartz, B. (A)
Schwartz, L. S. (SM)
Schwiebert, H. (A)
Shutterly, H. B. (A)
Spencer, B. F. (SM)
Spencer, N. A. (A)
Sperling, J. G. (M)
Steber, W. C. (A)
Strawbridge, R. B. (M)
Sturgeon, W. S. (M)
Sussman, H. (SM)
Swern, L. (M)
Tenenbaum, F. (A)
Thatcher, E. V. (SM)
Tomivasu, K. (SM)
Toppmeyer, R. B. (A)
Van Davelaar, F. S. (A)
Velsiage, E. P. (A)
Wagner, R., Jr. (A)
Wathen, R. L. (M)
Welch, T. J. (A)
Wengenroth, R. D. (A)
Wheeler, H. A. (F)
Whitfield, E. W. (A)
Wilder, J. E. (A)
Williams, F. H. (M)
Winter, N. L. (M)
Wolfe, M. L. (A)
Wright, G. B. (A)
Yale, W. H. (A)
Ziegler, F. W. (A)

Greenlawn
Schoenfeld, K. (VA)

Greenvale
Hansel, P. G. (SM)
Siegmund, E. L. (A)
Groton (SY-4)
Clark, M. M. (A)
Hall, R. E. (A)
Jones, C. E. (M)

Guilderland Center (SCH-2)
Barlow, D. P. (A)
Fleck, J. J. (A)

Hamburg (BN-4)
Fiedler, L. (M)

Hamilton Beach (LI-2)
Pihl, R. L. (A)

Hampton Bays (LI-2)
Turner, F. T. (M)

Harpursville (BI-4)
Friedlander, A. T. (M)
Lawrence, N. S. (M)

Harrison (NY-2)
Bohl, L. L., Jr. (A)
De Pasquale, R. H. (M)
Katz, L. (A)
Meyer, C. A. (SM)
Volpe, M. J. (A)

Hartsdale
Engelhardt, G. B. (VA)
Gillis, J. F. (A)

Hastings-on-Hudson (NY-2)
Batchelor, J. C. (SM)
DeMuro, T. M. (A)
Fenaughty, A. L. (A)
Lodge, W. B. (F)
Miller, D. H. (VA)

Haverstraw (NY-2)
Finkelstein, D. (A)

Hawthorne
Didinger, G. H., Jr. (A)
Hales, E. B. (A)
Hill, D. R. (A)
Knox, R. V. (A)
McCaffrey, H. F. (A)

Hempstead (LI-2)
Beitner, C. R. (A)
Bellmar, C. L. (A)
Bradley, J. J. (A)
Cornes, R. W. (SM)
Dannals, E. W. (SM)
Dean, W. N. (A)
Diorio, J. (A)
Fener, H. (A)
Johnson, H. E. (A)
Mandl, G. P. (M)
Peters, J. L. (VA)
Rich, C. E. (A)
Roberts, F. G. (A)
Smitkin, L. (A)
Skirrow, J. E. (A)
Stewart, J. W. (A)
Thwing, R. W. (A)
Verton, M. P. (A)
Westover, T. A. (A)
Wright, G. B. (A)
Yuran, T. (A)

Henrietta (ROC-4)
Hamlin, N. B. (A)

Hewlett (LI-2)
Metcalfe, D. (SM)

Hicksville (LI-2)
Abjanich, G. S. (M)
Adams, B. L. (A)
Blasenheim, I. (A)
Bradley, J. R. (A)
Burns, R. C. (SM)
Chatterton, E. L. (SM)
Cohen, L. D. (A)
Coleman, S. F. (A)
Craib, J. F. (SM)
Crosby, M. G. (F)
Dagararian, H. O. (M)
Donals, A. B. (A)
Dudeck, M. P. (A)
Easterday, J. L. (A)
Evans, T. L. (A)
Fordon, W. A. (A)
Gallagher, C. A. (A)
Goodman, J. (A)
Hagan, T. G. (A)
Hagedorn, H., Jr. (A)
Hayes, W. A. (A)
Heacock, W. J., Jr. (A)
Jung, C. W. (A)
Kaufman, W. (A)
Kawaller, J. (A)
Kimball, L. R. (A)
Lally, P. M. (A)
Leffingwell, W. B. (A)
Loth, P. A. (A)
Marcinko, F. C. (A)
Marsden, W. Y. (A)
Masucci, C. (A)
Mehr, A. (A)
Oberlies, J. L. (A)
O'Connor, W. A., Jr. (A)
Parsons, E. G. (M)
Popik, M. J. (A)
Richman, M. A. (M)
Rigden, C. A. (A)
Roberts, L. W. (A)
Sauer, G. (A)
Saur, R. D. (A)
Sherman, E. H. (M)
Sicuranza, C. A. (A)
Stateman, M. J. (SM)
Sullivan, R. J. (SM)
Tilly, V. F. (M)
Tribken, E. R. (A)
Variano, V. V. (A)
Walsh, C. (SM)
Wasson, I. (A)
Welch, A. B. (A)
Zampino, F. J. (A)
Zimmerman, S. (M)

Highland (NY-2)
Christiansen, C. L. (A)
Cole, G. W. (A)
Lindsay, R. L. (M)
Morgan, J. C. (A)
Thompson, L. J. (A)
Vislocky, J. (A)

Hillsdale
Sabeff, S. S. (M)

Holland Patent (RU-4)
Armstrong, N. A. (A)
Bennison, G. K. (M)
Pulhamus, W. R. (M)
Ryerson, J. L. (A)

Hollis (LI-2)
Amling, S. L. (A)
Auerbach, A. A. (A)
Bellare, D. (SM)
Brook, R. H. (A)
Caputo, N. J. (VA)
Daly, J. J. (A)
Edell, J. J. (A)
Elkins, R. (A)
Froehlich, F. J. (A)
Haggens, D. (A)
Karvel, C. T. (A)
Klein, H. M. (A)
Lobel, D. (A)
Mahland, E. W. (M)
Paull, M. (A)
Ridenour, W. S. (A)
Schlafly, H. J., Jr. (SM)
Small, H. (A)
Squire, F. M. (A)
Williams, H. C. (M)

Hollis Wood
Kellner, M. (A)

Hoosick Falls (SCH-2)
Case, C. C., Jr. (A)

Hopewell Junction (NY-2)
Edwards, N. P. (A)
Femmer, M. E. (A)
Lebanoff, L. (A)

Hornell (EC-4)
Haley, A. J. (A)

Horseheads (EC-4)
Betts, B. J. (A)
Cox, G. L. (A)
Larson, R. G. (M)
Rogell, P. (A)
White, R. A. (SM)

Howard Beach (LI-2)
Yamamoto, G. H. (A)

Hudson Falls (SCH-2)
Cohen, M. (A)
Roberts, W. H. (M)
Scoville, M. E. (SM)
Warner, D. F. (M)

Huntington (LI-2)
Barbour, C. W., Jr. (SM)
Bostwick, L. S., Jr. (M)
Cahill, F. C. (SM)
Copel, M. (M)
Dosch, T. J. (A)
Ferriter, D. T. (SM)
Gilmartin, J. J., Jr. (M)
Gretz, R. W. (A)
Hartman, L. A. (A)
Hegler, R. E. (A)
Howell, S. N. (A)
Hughes, F. (M)
Irick, J. (A)
Joss, E. T. (VA)
Kenyon, D. E. (SM)
Litchford, G. B. (M)
Lyons, R. C. (A)
McCoy, J. H. (SM)
McProud, C. G. (M)
Nehrbas, T. C. (A)
Robbins, L. E. (A)
Roel, E. L. (A)
Sammis, S. L., Jr. (M)
Singer, J. S. (A)
Stengel, J. F., Jr. (A)
Sterling, R. W. (A)
Tyndall, R. M. (M)
Weaver, S. E. (A)
Wheeler, R. B. (A)

Huntington Station (LI-2)
Aske, V. H. (M)
Atturd, G. M. (M)
Atwood, S. (VA)
Bostrom, R. C. (A)
Chubbuck, E. L. (M)
Coale, F. S. (A)
Emerson, J. (SM)
Fastenav, F. H., Jr. (M)
Frangoulis, S. I. (M)
Fraser, R. (M)
Freundlich, M. M. (SM)
Kerzner, N. A. (A)
Lehr, P. (SM)
Meichner, F. T. (M)
Mezger, G. (VA)
Newdale, E. I. (A)
Noji, T. T. (A)
Olson, C. W. (A)
Papamarcas, G. (A)
Pruszynski, C. C. (A)
Richey, N. B. (A)
Roller, W. P. (A)
Russell, J. A., III (A)
Safran, M. (A)
Stokes, B. C. (M)
Wantv, B. G. (A)
Williams, R. J. (A)

Hyde Park (NY-2)
Coopper, R. A. (A)
Eckelman, P. F. (A)
Henle, R. A. (A)
Herdina, F. E. (M)
Holmes, C. E. (A)
Lawson, H. C. (A)
Moyer, J. J. (A)
Muenzer, B. M. (A)
Whitenack, R. M. (A)

Ilion (RU-4)
Momberger, P. E. (A)

Irvington (NY-2)
Duffendack, O. S. (SM)
Kohler, T. R. (A)
LaPlante, R. A. (A)
Robertson, H. E. (M)
Wyatt, K. S. (A)

Island Trees (LI-2)
Goldstein, A. (A)

Islip (LI-2)
Daubaras, E. J. (M)
Wiener, W. A. (A)

Ithaca (SY-4)
Amemiya, H. (A)
Ankrum, P. D. (A)
Augustine, J. A. (A)
Baird, A. D. (A)
Blair, W. W. (A)
Bolgiano, R., Jr. (A)
Booker, H. G. (F)
Bray, D. W. (A)
Bryant, N. H. (A)
Burrows, C. R. (F)
Burton, G. L. (M)
Charton, P. W. (A)
Colbert, S. M. (A)
Credle, A. B. (VA)
DeNeuf, D. K. (SM)
Deutch, H. M. (M)
Dickinson, R. H. (M)
Dunn, S. B. (A)
Eastman, L. F. (A)
Field, M. J. (A)
Fitterer, C. E. (A)
Gamble, G. W. (A)
Godwin, C. J., Jr. (A)
Gordon, W. E. (M)
Gorker, G. E. (A)
Hafstrom, J. R. (SM)
Haskell, J. W. (A)
Hazebrook, H. (A)
Hesse, H. R. (A)
Heydt, H. L. (M)
Holden, W. D. (A)
Horton, W. H. (M)
Howland, I. R. (A)
Humphrey, T. R. (A)
Ingalls, C. E. (SM)
Jankowski, H. (M)
Kaplan, S. M. (A)
Kascha, G. E. (A)
Katz, E. S. (A)
Kirchner, P. H. (A)
Kopeloff, B. G. (A)
Kurihara, Y. (A)
Leeking, A. M. (A)
Matt, S. (A)
McGaughan, H. S. (M)
McLean, T. (SM)
McMullen, C. W. (A)
Millman, G. H. (SM)
Moeder, W. D. (A)

Nichols, B. (A)
Oldfield, H. R., Jr. (SM)
Olmsted, D. T. (A)
Perry, F. M. (SM)
Rayl, G. J. (A)
Reed, G. W. (A)
Rider, L. S. (A)
Roberts, C. R. (A)
Rogers, R. G. (A)
Rooney, T. J. (A)
Rudwick, B. H. (A)
Rupp, E. W., Jr. (A)
Sample, G. A. (A)
Sanford, J. R. (M)
Shalloway, A. M. (A)
Sherman, R. G. (A)
Schmidt, R. A. (A)
Smith, E. K., Jr. (M)
Smith, F. G., Jr. (SM)
Smith, G. S. (A)
Smith, H. G. (A)
Spear, E. D. (M)
Stanton, J. W. (A)
Swanseen, H. W. (A)
Travis, J. B., Jr. (A)
Wagner, L. S. (A)
Warriner, B. (SM)
Weaver, P. F. (A)
Webb, J. S. (SM)
West, G. P. (A)
Wilson, R. D. (A)
Wooley, R. L. (SM)
Youtcheff, J. S. (M)
Zimmerman, S. W. (SM)

Jackson Heights (LI-2)
Berens, J. (A)
Billet, F. G. (A)
Bonda, D. (A)
Botta, A. J. (A)
Bryerman, G. J. (A)
Cole, W. J., Jr. (A)
Davidson, J. J. (A)
Deitz, J. L. (A)
Dinga, E. W. (A)
Dzik, S. (A)
Eisenhauer, F. E. (A)
Fama, C. S. (A)
Feay, D. I. (A)
Feltzin, A. (A)
Ferraute, J. F. (A)
Flores, I. (A)
Flum, E. (A)
Foster, J. E. (A)
Gommo, F. J. (M)
Hall, R. C. (A)
Herlinger, L. F. (A)
Hertzberg, R. E. (A)
Hollabaugh, M. G. (M)
Immarco, A. E. (A)
Johnston, H. (A)
Kassel, P. (A)
Kelley, L. A. (VA)
Kozicki, H. (A)
Lavan, D. A. (A)
Levy, B. (A)
MacKenzie, R. P. (A)
Mahoney, T. J., Jr. (A)
Nemchuk, W. J. (A)
Paterno, P. M. (A)
Pleasure, M. (M)
Rehberg, C. F. (A)
Rudis, M. (A)
Salzer, R. M. (A)
Schiavoni, T. V. (A)
Shaw, D. (A)
Solt, H. B. (M)
Striedniq, L. J. (A)
Sudinsky, L. (A)
Torian, J. T. (A)
Vartanian, V. (A)
Weil, K. (A)
Wortzman, S. K. (A)

Jamaica (LI-2)
Baldwin, T. W. (A)
Barlam, T. (A)
Beck, A. J. (A)
Belchis, S. (A)
Benamy, D. A. (A)
Berger, M. (M)
Berke, L. C. (A)
Berkowitz, B. (M)
Bicknese, F. H. (M)
Bodow, J. (A)
Boronow, F. S. (A)
Chanko, P. N. (A)
Chow, W. T. (SM)
Dow, J. B. (F)
Eland, P. D. (A)
Faytak, A. J. (A)
Feltman, A. V. (A)
Flum, E. (A)
Freeman, H. (M)
Gewirtz, A. (A)
Goldschmidt, A. M. (A)
Hacker, S. J. (A)
Horvath, J. S. (A)
James, A. V. (A)
Kratsch, P. H. (A)
Lee, H. T. (M)
Linquiti, A. A. (A)
MacDonald, W. W. (SM)
McCabe, P. I. (A)
Mehlman, S. J. (SM)
Morgenstern, A. (A)
Ostroff, A. (A)
Paledes, T. P. (M)
Peck, C. L. (A)
Robbins, A. (M)
Robinson, J. H. (A)
Roseo, L. S. (A)
Shainis, M. J. (M)
Sheftelman, E. H. (A)
Shottenfeld, R. (A)
Stein, D. R. (M)
Theodoseau, T. (A)
Vaffiades, B. C. (A)
Weber, J. H. (A)
Young, C. B., Jr. (M)

Jamaica Estates (LI-2)
Bernstein, J. (SM)
Busharis, J. G. (A)
Selbmann, R. W. (A)

Jamaica Hill (LI-2)
Wylie, T. F., Jr. (A)

Jamestown (BN-4)
Anderson, S. E. (A)
Babcock, T. R. (A)
Crissey, D. L. (A)
Heston, W. S. (M)
Rulifson, R. R. (A)

Jamesville (SY-4)
Pugsley, D. W. (F)

Jericho
Hartel, R. (A)
Houseworth, G. H. (A)
Nichols, P. A. (A)

Johnson City (BI-4)
Alman, J. (A)
Bosman, E. H. (M)
Cantwell, R. J. (A)
Caulfield, J. T. (A)
Demer, F. M. (A)
Ingram, J. J. (A)
Kaufman, J. (A)
Pittsley, E. L. (M)
Shield, C. F., Jr. (A)
Stilwell, G. R., Jr. (A)
Stouppe, J. J. (A)
Upham, S. W. (M)
Wagenseller, G. W. (A)

Katonah (NY-2)
Hilliard, W. P. (VA)

Kenmore (BN-4)
Arnes, R. W. (A)
Baxter, F. C., Jr. (A)
Braggins, R. D. (A)
Browne, J. F. (A)
Byrne, E. R. (A)
Carson, R. D. (A)
Curtis, R. E. (A)
Edighoffer, E. A. (A)
Essen, O. E. (A)
Foster, G. C. (A)
Goundry, R. A. (A)
Haney, D. W. (M)
Hoover, H. D. (A)
Kaushagen, W. M. (SM)
Kiefer, C. F., Jr. (A)
Kworr, W. G., Jr. (A)
Kwit, C. J. (A)
Lamy, R. H. (A)
Laurien, L. M. (A)
Leggiere, D. D. (A)
Less, F. L. (A)
McCullough, F. S. (A)
Myers, J. F. (SM)
Oxley, V. C. (A)
Paige, A. (A)
Riggs, J. H. (A)
Roess, T. L. (A)
Schlichter, E. S. (A)
Siegel, V. H. (M)
Skalbania, F. R. (A)
Stephenson, H. B. (M)
Vanacore, T. (VA)
Weatherbee, W. H. (A)
Wiley, V. H. (A)
Wixson, E. S. (A)

Kerhonkson (NY-2)
Greenberg, H. (A)

Kew Garden Hills
Schwartz, M. B. (A)

Kew Gardens (LI-2)
Acheson, M. A. (F)
Appel, H. G., Sr. (A)
Ashley, A. (A)
Bartram, R. H. (A)
Berman, H. M. (M)
Brilmayer, E. W. (A)
Carlan, L. B. (M)
Espenschied, L. (F)
Gehrke, F. E. (SM)
Goodwin, V. D. (VA)
Graham, R. E. (M)
Kaye, M. (A)
Kent, L. I. (A)
Lurye, J. R. (A)
Marcus, D. H. (A)
Mazzel, A. L. (SM)
Moritz, S. I. (A)
Palmer, R. N. (SM)
Pressman, R. (A)
Raphael, M. S. (A)
Rufus, D. (A)
Saunders, C. L. (A)
Schindler, J. P. (A)
Smith, C. R. (SM)
Taylor, J. M. (A)
Trotter, W. E. (A)
Weindorf, D. R. (A)
Weiss, M. (A)
Wheeler, W. R. (M)
Wiesner, L. (A)
Wilson, A. L. (M)

Kingston
Donohue, D. C. (A)

Kirkville (SY-4)
Winfield, W. S. (M)

Lake George (SCH-2)
Strempel, E. L. (A)

Lake Mahopac (NY-2)
Criscione, A. J. (A)

Lake Ronkonkoma (LI-2)
DeSimone, D. J. (A)
Pine, C. C. (M)

Lake Success (LI-2)
Aveney, R. J. (M)
Barnes, R. S. (A)
Barrow, W. L. (F)
Delany, F. J. (A)
Webber, H. E. (SM)

Lakewood
Nelson, V. A. (A)

Larchmont (NY-2)
Aboun-Nabi, Z. (A)
Adler, J. T. (A)
Adler, B. (SM)
Auditore, C. J. (SM)
Cammer, M. (M)
Cooper, W. H. (SM)
Dunwell, S. W. (M)
Gallone, W. J. (A)
Gordon, J. E. (A)
Harris, C. M. (A)
Johnson, E. M. (SM)
Jones, G. I. (SM)
Kerby, G. A. (A)
Levy, M. L. (SM)
McVity, L. H. (A)
Mullenger, K. E. (A)
Plowman, F. R. (A)
Roberts, E. A. (A)
Rudd, W. C. (M)
Schneider, J. R. (A)
Watson, E. F. (SM)

Latham (SCH-2)
Bass, C. F. (A)

Laurelton (LI-2)
Brenner, R. A. (M)
Cassidy, M. E. (A)
Elvan, M. (A)
Glaser, M. (SM)
King, P. D. (A)
Lurie, E. M. (VA)
Parry, J. P. (A)
Robinson, R. J. (A)
Shapiro, D. L. (M)
Shulman, I. (A)
Zeilikowitz, L. J. (A)

Lee Center (RU-4)
Brunette, G. E. (A)
De Minco, A. P. (SM)
Kunze, A. A. (SM)

Leroy (ROC-4)
Lapp, R. S. (VA)

Levittown (LI-2)
Anderson, D. K. (A)
Arcate, J. A. (A)
Bales, C. W. (A)
Bergdahl, L. A. (A)
Brodek, W. J. (A)
Buehrle, W. E., Jr. (A)
Bush, F. J. (A)
Caligiuri, J. F. (A)
Chadwick, J. H., Jr. (A)
Clothier, C. M. (A)
Connors, T. J., Jr. (A)
Conway, J. F. (A)
Cope, R. H., Jr. (A)
Craig, A. F. (M)
Crush, J. F. (A)
D'Agostino, J. V. (A)
Davis, E. W. (A)
DiMatteo, P. L. (A)
DiMeglio, E. (A)
Doliton, M. H. (A)
Figge, E. E. (A)
Flynn, W. J. (A)
Friedman, E. D. (SM)
Fry, W. H. (A)
Gahn, D. E. (A)
Haley, J. T. (A)
Haussig, L. (A)
Heermans, J. W. (A)
Holland, J. W. (A)
Hollopeter, W. C. (A)
Hughes, F. J. (A)
Jackson, T. T. (A)
James, F. J. (A)
Janes, W. M. (A)
Keely, A. W. (A)
Lee, K. O. (A)
Levine, D. (A)
Marion, J. F. (M)
McCullough, J. H. (A)
Michel, P. C. (SM)
Middleton, E. R. (A)
Morgan, W. E., Jr. (A)
Mosolgo, R. E. (A)
Offutt, W. B. (A)
Olthius, R. W. (A)
Perkowski, T. F. (A)
Postel, H. (A)
Poulos, B. J. (A)
Purnell, L. S. (M)
Rhodes, B. S. (A)
Rickett, R. J. (M)
Rudich, I. (A)
Savalli, F. P. (A)
Shepherd, L. P. (A)
Sherman, S. (SM)
Siegel, L. I. (A)
Simon, J. M. (M)
Solomon, C. (A)
Stone, W. R. (A)
Tatz, A. (SM)
Trlantafellow, W. (A)
Vetter, W. F. (A)
Walker, A. C. (A)
Weiss, M. (A)
Wels, B. G. (A)
White, J. D., Jr. (VA)
Woodcock, E. L. (SM)

Lewiston (BN-4)
Buranich, G. F. (M)
Vincent, W. R. (A)

Liberty (NY-2)
Mauer, W. V. (A)

Lincolndale (NY-2)
Bruns, W. H. (M)

Lindenhurst (LI-2)
Castaneda, R. A. (A)
Church, T. A. (A)
Mayerhofer, S. R. (A)
Morgenstern, O. A. (A)
Rohner, G. J. (M)
Tate, H. J. (A)

Lisle
Hanford, R. W. (SM)

Little Neck (LI-2)
Bailey, W. F (SM)
Bernstein, B. (A)
Binns, J. R. (VA)
Burr, R. P. (SM)
Cerino, R. (A)
Clark, D. P. (M)
Cosby, J. C. (M)
Dean, C. E. (SM)
Duffy, M. P. (A)
Dunn, B. B. (A)
Dunning, O. M. (SM)
Eisaman, L. C. (A)
Forrest, J. C. (A)
Hana, T. C. (VA)
Hirsch, C. J. (F)
Kapp, C. E. (A)
Kunicky, B. F. (VA)
Lane, C. C. (A)
Loughlin, B. D. (SM)
Loughren, A. V. (F)
MacDonald, W. A. (F)
McIlwain, K. (F)
Mesa, J. O. (SM)
Nagel, K. H. (A)
Nickel, W. S. (A)
Nurmela, G. E. (A)
Okrent, J. (SM)
Page, C. E. (A)
Rado, J. A. (SM)
Tiger, H. S. (A)
Tobin, M. W. (A)
Tucker, S. A. (SM)
Weinberg, S. (SM)
Wilson, J. E. (A)
Wilson, W. H. (M)
Young, V. J. (SM)
Zimmer, E. W. (A)

Liverpool (SY-4)
Applebaum, S. P. (A)
Bentley, A. D. (A)
Brown, C. J. (A)
Brown, W. W. (SM)
Capri, M. F. (A)
Clark, M. E. (SM)
Fisk, R. E. (M)
Fondrk, J. S. (A)
Forney, J. F. (A)
Fowler, A. K. (A)
Freestone, H. T. (A)
Fye, R. P. (A)
Goetter, W. F. (A)
Grimmett, C. A. (A)
Hansen, R. J. (M)
Hart, J. E. (A)
Hassel, E. W. (M)
Henry, G. V., Jr. (A)
Hoeger, W. G. (A)
Hsu, H. (A)
Junken, L. H. (VA)
Kious, G. A. (A)
Lawrence, B. J. (SM)
Lewis, R. V. (SM)
Locke, J. R., Jr. (M)
Millham, R. L. (M)
Miner, C. R. (SM)
Neelands, L. J. (M)
Novak, W. D. (A)
Popejoy, I. J. (A)
Relyea, R. (A)
Spirer, H. F. (A)
Swing, M. (M)
Tillman, W. F. (A)
Walker, O. F. (SM)
Wayne, C. R. (M)
Williamson, J. C. (A)

Lockport (BN-4)
Bulmore, H. R. (A)
Dahl, F. J., Jr. (A)
Martin, C. E. (A)
Rupp, R. B. (A)

Locust Valley (LI-2)
Barber, R. G. (A)
Matuszek, F. A. (A)

Long Beach (LI-2)
Arnaud, J. P. (F)
Burkhalter, R. M. (A)
Caras, B. (A)
Gurien, S. (A)
Meehan, J. D. (A)
Puig, J. A. (A)
Rubin, A. (A)
Wurman, G. (A)

Long Island City (LI-2)
Abrahams, S. (A)
Alterman, F. J. (M)
Amatneek, K. V. (A)
Andronaco, P. A. (A)
Bagno, S. M. (VA)
Balamuth, L. (A)
Buda, P. V. (A)
Cahn, B. L. (M)
Collins, W. G. (A)
Depiola, F. J. (A)
DeVaney, R. J. (A)
DeVincent, J. (A)
Dzilvelis, A. A. (A)
Fairman, H. E. (A)
Farhi, S. (A)
Farkas, J. (A)
Fletcher, R. (A)
Fox, B. (SM)
Goodman, H. (A)
Groder, M. L. (SM)
Haring, L. L. (A)
Johnston, W. F. (A)
Kessler, F. (A)
Klein, M. S. (A)
Kraus, C. J. (A)
Matylewich, T. D. (A)
McConnell, J. H. (SM)
Mecca, S. (A)
Monturo, J. B. (A)
Mulder, H. E. (A)
Nemeroff, I. (A)
Pagano, C. N. (A)
Penabad, J. (A)
Rosin, A. (A)
Rubin, S. W. (M)
Sartorio, D. R. (A)
Shaler, D. (A)
Shanahan, W. J. (A)
Simkovich, J. R. (A)
Simmonds, J. (A)
Skaperdas, D. O. (A)
Snyder, S. J. (M)
Spera, R. L. (A)
Tai, J. H. Y. (A)
Tavetian, H. E. (A)
Wald, D. (A)
Watson, R. R. (A)

Loudonville (SCH-2)
Gisser, D. G. (A)
Jernakoff, G. (A)
Rulison, J. P. (M)

Lynnbrook (LI-2)
Dixon, L. G. (M)
Dunn, J. F. (A)
Ebert, J. E. (SM)
Fuchs, G. W. (A)
Koch, R. F. (M)
Magin, J. J. (A)

Merlin, A. G. (A)
Richardson, K. (A)
Rogers, R. D. (A)
Rossoff, A. L. (A)
Ruppel, A. E. (A)
Surette, W. E., Jr. (A)
Teommey, G. H., Jr. (SM)

Lyons (ROC-4)
Eckert, E. R. (A)

Malba (LI-2)
Lindberg, R. (A)

Malverne (LI-2)
Deans, W. L. (A)
Gurevics, D. (A)
Hepburn, J. C. (A)
Pollack, I. (M)
Rojas, F. R. (SM)
Sauer, H. E. (A)
Schneider, R. E. (VA)
Tanck, H. (VA)
Van Rosenbergh, W. (A)

Mamaroneck (NY-2)
Drake, E. S. (A)
Romero, R. F. (A)
Stevens, A. M. (F)
Vollenweider, A. D. (M)

Manhasset (LI-2)
Bomba, J. S. (A)
Brown, H. A. (SM)
Friebele, E. J. (VA)
Grant, E. F. (SM)
Hamlett, R. T. (SM)
Hathaway, J. L. (SM)
Lechich, G. D. (A)
Love, F. B. (A)
Meyer, H. E., Jr. (M)
Nickel, F., Jr. (VA)
Srebroff, C. M. (SM)

Marathon (SY-4)
Wilson, R. M. (A)

Marcellus (SY-4)
Devine, G. F. (M)

Maspeth (LI-2)
Clinton, R. E. (A)
Hall, J. D. (A)
Jaworowski, B. R. (A)
Kabrisky, M. J. (A)
Kline, L. M., Jr. (A)
Martin, P. T. (A)
Richter, H. L. (A)
Tullius, A. B. (M)

Massapequa (LI-2)
Ashus, A. (A)
Barzilai, G. (SM)
Baunach, E. L. (VA)
Biegen, A. J. (A)
Bonner, W. A., Jr. (A)
Coffman, B. C. (M)
DiToro, M. J. (SM)
Elliott, J. O. (A)
Given, I. (M)
Haneman, F. G. (A)
Harris, M. R. (A)
Krueger, A. C. (M)
Lindow, I. L. (VA)
Marcinkawski, E. R. (A)
Martin, J. L. (A)
Mautner, R. S. (SM)
Read, L. P., Jr. (A)
Ross, K. J. (A)
Sail, A. H. (A)
Tahara, G. R. (A)
Tanenbaum, M. S. (A)
Thoman, R. E. (A)
Tressa, F. J. (M)

Massapequa Park (LI-2)
Bergman, C. F. (A)
Bubbers, J. J. (A)
Hermelin, L. S. (SM)
Judin, H. (A)
Kaufman, I. (A)
Scharf, E. (A)
Smith, H. D. (A)
Swearingen, T. J. (M)

Massena (SY-4)
Bond, N. T. (A)

Mastic Beach (LI-2)
Fuelling, P. W. (A)

Mattydale (SY-4)
Baer, J. A. (A)
Barlow, L. C. (A)
Humphrey, J. G. (A)
Smith, S. L. (A)

Merrick (LI-2)
D'Amico, S. P. (A)
Grossman, M. (A)
Hammond, E. B., Jr. (SM)
Knight, P. (A)
Lindenfelser, W. A. (A)
McConaughy, R. L. (A)
Paul, I. (M)
Randall, G. A. (SM)
Sahm, E. J. (A)
Squitieri, A. (A)
Woodbury, C. P. (M)

Middle Island
Adams, T. H. (A)

Middle Village
Harrison, S. W. (M)
King, C. N. (A)
O'Neill, E. P. (A)
Powers, J. T. (M)

Miller Place (LI-2)
Bartow, J. E. (A)

Milton (NY-2)
Hickey, H. G. (A)
Scott, A. E. (A)

Milton-on-Hudson
Anderson, R. L. (A)

Mineola (LI-2)
Auld, J. S. (A)
Avery, R. E. (SM)
Berge, R. G. (M)
Bisby, J. F. (SM)
Bock, E. L. (SM)
Brockman, M. H. (M)
Brown, L. L. (A)
Caddell, R. (A)
Close, R. N. (A)
Comstock, G. C. (SM)
Decker, S. M. (A)
Dieli, F. J. (A)
Du Long, P. R. (A)
Exley, L. (A)
Fellendorf, G. W. (M)
Fromm, W. E. (SM)
Fubini, E. G. (SM)
Graber, L. J. (A)
Graef, R. L. (VA)
Guarrera, J. J. (A)
Harvey, G. L. (A)
Hendler, A. J. (A)
Hicks, W. M. (A)
Hockenjos, R. M. (A)
Hoffman, E. J. (SM)
Horn, A. M., Jr. (A)
Ihrig, L. C. (M)
Johnson, J. H. (A)
Jones, B. F., Jr. (VA)
Josias, C. S. (A)
Karpen, E. W. (A)
Kearney, J. W. (SM)
Kezer, C. F. (M)
Kozak, J. P. (A)
Lebenbaum, M. T. (SM)
Lilly, J. L. (A)
Lloyd, J. W., Jr. (A)
Lombardi, M. W. (A)
Lombardo, P. P. (A)
Lowman, R. V. (M)
Lynch, W. A. (SM)
McFarland, J. E. (SM)
McGregor, J. C. (SM)
Meyer, G. E. (A)
Mieher, W. W. (SM)
Miller, D. M. (SM)
Morton, G. W. (M)
Newhall, F. A. (A)
Papas, J. (A)
Pasqua, L. (A)
Price, R. C. (A)
Pride, D. W. (A)
Prunty, P. F. (A)
Rubenson, J. G. (SM)
Schrader, L. W., Jr. (A)
Schweber, S. C. (A)
Scordato, M. (A)
Skifter, H. R. (F)
Smyth, F. J. (A)
Sommers, C. E. (A)
Spencer, W. H. (A)
Stephenson, J. G. (SM)
Stewart, S. W. (M)
Strum, P. D. (A)
Tionaytis, C. J. (A)
Tolles, W. E. (M)
Torn, L. J. (M)
Wang, C. C. (SM)
White, W. D. (SM)
Woodward, J. E. (M)

Minetto (SY-4)
Dodge, P. A. (A)

Monroe (NY-2)
Sperr, A. E. (A)
Volkommer, W. A. (VA)

Monticello (NY-2)
Fleischer, A. P. (A)

Montour Falls (EC-4)
Shepard, W. H. (A)

Moravia
Ward, H. T. (A)

Mount Kisco (NY-2)
Athey, S. W. (SM)
Doyle, R. J. (A)
Fredrick, A. H. (A)
Garretto, L. A., Jr. (A)
Halstead, W. S. (SM)
Sands, E. A. (A)

Mount Vernon (NY-2)
Achtellik, G. (A)
Augustine, R. O. (M)
Bloom, F. J. (A)
Brenner, B. (VA)
Brown, W. R. (A)
Buchbinder, M. M. (A)
Callahan, J. P. (A)
Campbell, C. H. (M)
Carlson, L. C. (A)
Freedman, D. D. (A)
Gayet, P. J. (A)
Gibson, C. B., Jr. (A)
Gurdus, H. W. (A)
Herz, H. L. (A)
Hineline, H. D. (A)
Hirsch, J. D. (A)
Jurafsky, A. J. (M)
Pestone, A. A. (A)
Podell, S. (M)
Rampel, G. G. (A)
Rosenbaum, A. H. (VA)
Rosenberg, P. (SM)
Seer, H. G. (A)
Sonkin, D. (SM)
Spann, R. G. (A)
Stone, C. G., Jr. (A)
Strongin, J. (M)
Wallace, M. (SM)
Winkelstein, R. A. (A)
Zang, T. (A)

Munsey Park
Heindel, H. J. (SM)

Nanuet (NY-2)
Pike, F. R. (A)

Nassau (SCH-2)
Merchant, R. (A)
Smith, G. H. (A)

Neponsit (LI-2)
Goldfein, S. F. (A)
Sylvane, A. A. (SM)
Zinn, S. (A)

Newburgh (NY-2)
Digenova, F. (A)
Evans, R. C. (A)
Mochel, R. S. (A)
Peck, N. D. (A)
Youngblood, H. R. (M)

New City
Doellner, L. J. (A)

Newfield (SY-4)
Barrett, A. J. (A)

New Hartford (RU-4)
Bussey, H. C. (A)
Convertino, R. O. (A)
Edgett, R. S. (A)
Everts, W. J. (M)
Green, H. H. (M)
Hafstrom, W. F. (M)
Hogan, E. V., Jr. (A)
Hornak, P. M. (A)
Shibata, A. M. (A)
Walker, R. K. (A)
Watts, P. M. (A)
Ricci, B. E. (A)

New Hyde Park (LI-2)
Anderson, D. B. (M)
Angevine, R. A. (A)
Blackstone, H. (A)
Blankmeyer, W. A. (A)
Borgelt, W. E. (A)
Boziwick, G. E. (A)
Brodkowicz, J. S. (A)
Bruce, G. B. (VA)
Camp, S. N. (A)
Colbert, R. P. (A)
Contrastan, D. P. (A)
Deloi, D. J. (M)
Dittenhoefer, H. F. (A)
Duffy, A. F. (A)
Ellis, F. W. (A)
Friedman, I. (M)
Haas, P. (VA)
Harris, W. T. (A)
Hevesh, A. H. (A)
Jones, L. E. (A)
Kaplan, M. (A)
Kirschner, A., Jr. (A)
Kurtz, D. P. (A)
Liebman, H. S. (A)
Loughlin, R. G. (A)
Madrick, S. A. (A)
Martin, E. T. (SM)
Mathisen, H. A. (A)
McDonald, J. F. (A)
McKee, L. H. (M)
Metzger, W. (A)
Meyer, W. E. (A)
Neidert, J. H. (A)
Noyes, A. E. (A)
O'Brien, T. H. (A)
Odom, C. H. (A)
Orazio, A. F. (A)
Podlesny, R. F. (A)
Proskauer, R. (A)
Robbins, I. M. (A)
Sherbin, L. E. (M)
Sherry, R. S. (A)
Stamps, G. M. (M)
Weber, R. L. (A)
White, W. T. (SM)
Wimmer, A. A. (A)
Wittenberg, R. C. (A)
Wolf, E. G. (A)
Yorinks, A. (SM)

New Paltz (NY-2)
Gay, T. W., Jr. (A)

New Rochelle (NY-2)
Anraud, R. J. (A)
Bennett, R. S. (SM)
Burnell, L. G. (SM)
Burnett, L. L., Jr. (A)
Busch, W. R. (VA)
Carter, W. F. (A)
Costa, M. J. (A)
Fisher, S. G. (A)
Friedman, T. B. (SM)
Goldberg, M. I. (A)
Goodale, E. D. (SM)
Greibach, E. H. (SM)
Gutterman, A. Z. (M)
Hemming, C. B. (A)
Herrmann, J. E. (A)
Krasner, H. J. (A)
Lahm, G. P. (A)
Pels, E. (A)
Pray, G. E. (SM)
Reed, J. (SM)
Reilly, W. J. (A)
Reiner, S. (A)
Schwartz, H. E., Jr. (A)
Shapiro, H. (H)
Shelley, E. F. (SM)
Temple, D. I. (A)
White, F. E., Jr. (VA)
Williams, J. E. (A)
Winkelstein, R. A. (A)

New York City (NY-2)
Abercrombie, G. D. (A)
Abramovich, D. (A)
Adams, G. G. (A)
Adams, J. F., Jr. (A)
Adams, M. D. (SM)
Addamo, J. H. (A)
Adler, W. (M)
Aldor, E. (A)
Alexander, L. (VA)
Alfieri, G. J. (A)
Allen, J. H. (A)
Allen, M. E. (A)
Alliot, E., Jr. (A)
Almquist, M. L. (A)
Altman, W. J. (A)
Altschul, E. R. (A)
Altschuler, H. M. (A)
Amarel, S. (A)
Amy, E. V. (SM)
Anagnost, A. L. (A)
Anderson, A. G. (A)
Andrasko, J. P. (VA)
Andrews, C. (A)
Andrews, E. G. (A)
Ankenbrandt, F. L. (SM)
Anspach, K. E. (M)
Antonion, G. H. (A)
Autosy, S. J. (M)
Appel, H. W. (SM)
Apriletti, C. A. (A)
Aram, R. A. (A)
Arnold, J. W. (SM)
Arnson, L. (SM)
Aronoff, M. (SM)
Asen, R. (A)
Assadourian, F. (SM)
Austein, E. E. (A)
Austrian, R. B. (SM)
Bachman, G. F. (A)
Backman, F. F. (A)
Badoyannis, G. M. (A)
Baer, R. H. (A)
Baer, T. M. (A)
Bailey, A. (F)
Bailey, G. E. (SM)
Baker, G., Jr. (A)
Baker, G. H. (A)
Bales, N. M. (M)
Balfour, L. S. (A)
Baran, P. (A)
Barash, S. A. (A)
Barkley, W. J. (SM)
Barrett, A. E. (SM)
Barron, L. (A)
Barstow, J. M. (SM)
Bartlett, T. L. (M)
Bartolf, H. P. (A)
Barton, G. R. (A)
Bartram, J. F. (A)
Baruch, S. N. (A)
Batcheller, A. (SM)
Baulch, E. L. (A)
Baum, M. C. (A)
Baum, R. F. (A)
Beagan, W. J. (A)
Beck, L. (A)
Beckham, C. L. (A)
Beers, Y. (M)
Bein, W. (A)
Beiser, L. (A)
Belli, J. L. (A)
Bell, W. L. (A)
Beller, W. C. (A)
Bemis, E. W. (SM)
Bemis, P. S. (A)
Benedikt, J. (A)
Benjamin, S. K. (A)
Bennett, H. W. (M)
Bereza, A. (A)
Berg, A. (A)
Berger, L. (A)
Berger, L. J. (A)
Bergherr, W. (A)
Bergman, S. (A)
Berkely, E. C. (A)
Berkner, L. V. (F)
Berl, S. (A)
Berman, R. (A)
Bernard, P. (A)
Bernstein, A. L. (A)
Bernstein, R. (A)
Bernstein, S. (A)
Besner, A. (M)
Beverage, H. H. (F)
Bibbero, R. J. (SM)
Bickel, H. J. (A)
Biggs, E. M., Jr. (M)
Billet, F. G. (A)
Birenbaum, L. (A)
Black, E., Jr. (SM)
Blackman, R. B. (A)
Bland, G. F. (A)
Blickstein, M. J. (A)
Blodgett, D. F., Jr. (A)
Blomquist, E. A. (A)
Blumenberg, A. (A)
Blumenstock, A. (A)
Blye, P. W. (SM)
Bocharoff, G. M. (VA)
Bodeen, G. S. (A)
Bodle, D. W. (M)
Boguslawski, H. A. (SM)
Boland, E. J. (SM)
Bolsey, E. J. (A)
Bolton, A. (A)
Bonnberger, D. C. (VA)
Bonner, M. K. (A)
Borders, C. R. (A)
Borner, R. C. (A)
Boronow, E. L. (A)
Bose, J. H. (VA)
Bostwick, L. G. (VA)
Boughtwood, J. E. (M)
Bouie, W. (M)
Bowie, R. M. (F)
Boyd, R. C. (A)
Boyman, J. W. (A)
Bradley, F. R., Jr. (M)
Bradley, L. W. (A)
Bramhall, F. B. (SM)
Braunfeld, M. T. (M)
Brenneman, D. (M)
Bresler, A. D. (A)
Bright, R., Jr. (M)
Brillouin, L. N. (F)
Bristol, R. W. (A)
Brittain, J. F. (A)—APO
Brociner, V. (M)
Broder, A. (A)
Bromberg, J. J. (A)
Brookner, E. (A)
Brosman, D. T. (A)
Brown, D. S. (VA)
Brown, F. L. (A)
Brown, J. T. L. (VA)
Brown, P. M. (A)
Brown, R. I. (A)
Brown, R. L. (A)
Brownell, H. R. (A)
Brunet, M. (SM)
Buckles, R. A., Jr. (M)
Buffo, B. (SM)
Bullington, K. (SM)
Burger, E. (A)
Burghard, G. E. (SM)
Burke, A. L. (SM)
Burke, R. L. (A)
Busch, A. (A)
Buttner, H. H. (F)
Byam, L. A., Jr. (M)
Cadek, J. (A)
Calderaro, A. A. (A)
Caldwell, C. M. (SM)
Caldwell, O. H. (F)
Callahan, J. L. (F)
Callais, R. T. (M)
Cambridge, C. G. (SM)
Cammarata, J. (A)
Campbell, E. A. (A)
Campbell, J. M. (A)
Campbell, R. D. (F)
Canavan, T. P. (A)
Carduner, W. (VA)
Carlebach, W. M. (VA)

Caro, L. G. (A)
Carpenter, R. E. (A)
Carreau, G. (A)
Carter, E. F. (F)
Cassell, J. L. (VA)
Cassidy, J. J. (A)
Castown, R. W. (A)
Cedarholm, J. P. (A)
Cervantes, H. T., Jr. (A)
Chaffee, J. G. (SM)
Chamberlain, A. B. (F)
Chamberlain, L. J. (A)
Chandler, J. A. (A)
Chapel, I. J. (M)
Chen, T. S. (A)
Cheng, B. K. (A)
Chin, H. (A)
Chin, H. C. (A)
Chin, P. H. (A)
Chinn, H. A. (F)
Chisholm, T. L., Jr. (A)
Chislow, J. H. (A)
Christensen, J. W. (SM)
Chu, H. (A)
Cinelli, H. L. (A)
Clark, A. B. (SM)
Clemens, G. J. (A)
Clinton, P. J. (M)
Clubb, R. D. (A)—FPO
Clutts, C. E. (A)
Coe, R. L. (SM)
Coggeshall, I. S. (F)
Cohen, A. J. (A)
Cohen, B. C. (A)
Cohen, B. G. (A)—FPO
Cohen, E. (A)
Cohen, M. M. (A)
Cohn, E. M. (A)
Cohn, H. (SM)
Cohn, I. H. (A)
Coles, F. A. (SM)
Colton, R. B. (SM)
Comitz, P. (A)
Connelly, J. J. (A)
Connor, G. C. (VA)
Cooley, A. G. (M)
Cooper, F. S. (A)
Corbin, J. E. (A)
Correa, H. A. (A)
Corwith, H. P. (F)
Costello, A. W. (A)
Court, H. R. (A)
Cowan, F. A. (SM)
Cowan, S. R. (A)
Coxhead, H. B. (SM)
Crane, P. H. (A)
Crapo, S. T. (A)
Cravis, H. (A)
Crews, F. H. (VA)
Crimmins, T. J. (A)
Crystal, D. G. (A)—FPO
Cumming, L. G. (SM)
Cunzenhauser, A. (A)
Curtis, R. E. (A)—APO-42
Cutler, S. N. (A)
Cutting, F. (F)
Dabrowski, H. L. (A)
Dahlbom, C. A. (M)
Davey, J. R. (A)
Davidson, W. F. (SM)
Davies, R. H. (SM)
Davis, R. F. (A)
DeDufour, W. F. (A)
Deerhake, W. J. (A)
De Fino, D. P. (A)
DeLoraine, E. M. (F)
De Micco, A. (A)
Denny, C. R. (A)
Deschamps, G. A. (SM)
Desnoes, A. B. (A)
Detweiler, D. C. (A)
Deutsch, E. M. (A)
De Vito, M. F. (A)
De Vries, W. L. (A)
Dewey, G. C. (A)
Diamond, S. (M)
Dickieson, A. C. (SM)
Dickson, J. F. (M)
Diebold, A. E. (A)
Diebold, J. T. (A)
Dietrich, F. (VA)
Dilson, J. (A)
Dintenfass, J. (A)
Dominguez, M. J. (A)
Donald, D. D. (SM)
Doniger, J. (A)
Donovan, W. E. (SM)
Dorf, R. H. (M)
Dorfman, N. G. (A)
Douglas, D. A. (A)
Dowds, H. M. (A)
Drake, J. B., IV (A)
Dressel, H. O. (M)
Droste, G. T. (A)
Dubbs, B. (M)
Dubilier, W. (F)
Dubs, E. E. (A)
Dunckel, P. B. (A)
Dunlap, C. R. (SM)
Dunn, E. J., Jr. (A)
Dunne, H. P. (A)
Durkee, A. L. (VA)
Duskis, E. F. (A)
Dutterera, W. S. (SM)
Eason, L. (A)
Eaton, W. W. (SM)
Echtman, L. (A)
Edling, E. A. (A)
Edmonds, R. H. (M)
Edwards, R. (SM)
Egert, S. S. (A)
Eggart, G. J., Jr. (A)
Ehrlich, C. N. (VA)
Eichwald, B. (SM)
Elliott, M. M. (A)
Elliott, S. J. (VA)
Elmore, W. B. (A)
Elsea, I. W. (M)
Emberson, R. M. (SM)
Engle, V. M. (M)
Engstrom, O. D. (SM)
Eoyang, T. T. (SM)
Epstein, R. R. (A)
Ernst, R. F. (A)
Eslinger, L. H. (A)
Estelle, W. E. (M)
Esternaux, F. L. (A)
Ettlinger, A. B. (M)
Facey, J. W. (VA)
Faige, M. D. (SM)
Fairchild, S. M. (A)
Falkinburg, Sgt. R. (A)
Farkas, F. S. (SM)
Farley, J. (A)
Farrand, C. L. (F)
Farrelly, E. K. (A)
Farrelly, R. J. (A)
Feeney, J. M. (A)
Feher, E. (A)
Feintuch, H. (A)
Feldt, R. (SM)
Feng, S. C. (A)
Ferber, D. (A)
Ferrell, O. P. (A)
Finch, J. L. (SM)
Fingerhood, S. A. (A)
Finkelstein, M. J. (A)
Fiorletta, A. A. (A)
Fish, P. (SM)
Fishberg, S. (VA)
Fisher, A. (A)
Fitch, W. A. (SM)
Fitzgerald, E. T. (A)
Flaum, T. (A)
Fleming, C. C. (M)
Flemming, F. L. (M)
Florant, L. E. (A)
Fogel, L. J. (M)
Forman, A. J. (A)
Forman, I. (A)
Forman, I. (A)
Fowler, J. A., III (A)
Fox, S. (A)
Franchina, M. A. (A)
Franke, H. C. (A)
Franklin, G. F. (A)
Franklin, L. F. (A)
Franklin, L. W. (SM)
Freed, A. (A)
Freed, L. (A)
Freed, R. D. (A)
Freiman, M. J. (A)
French, C. C. (A)
Freudenberg, B. (SM)
Frey, A. F. (A)
Frezzolini, D. (VA)
Friedman, H. J. (A)
Friedman, I. (A)
Friedman, L. C. (A)
Frishauf, S. H. (M)
Fritsche, A. J. (A)
Frum, A. (A)
Fuchs, A. M. (A)
Gaillard, R. L. (A)
Galanter, M. (A)
Gale, R. J. (A)
Galluppi, F. B. (A)
Gams, T. C. (A)
Gancher, I. (A)
Gannett, D. K. (SM)
Gaski, T. J. (A)
Gast, R. W. (M)
Gavalakis, G. (A)
Gellman, E. S. (A)
Gerard, D. R. (A)
Gerb, B. (A)
Gersch, W. M. (A)
Gerstein, M. G. (A)
Gertzis, S. (A)
Giannini, G. M. (SM)
Gibbons, J. (A)
Gibson, C. H. (A)
Gibson, O. B. (SM)
Giese, R. C. (SM)
Giguere, E. F. (SM)
Gilbert, J. J. (SM)
Gillette, E. H. (A)
Gilman, G. W. (F)
Ginsberg, A. J. (A)
Girdwood, J. (A)
Glaser, J. L. (SM)
Glazer, B. G. (A)
Glick, H. (A)
Glickstein, J. (A)
Godofsky, M. (A)
Gold, J. I. (A)
Goldberg, H. D. (A)
Goldberg, H. S. (A)
Golden, D. (A)
Goldman, S. (A)
Goldmark, P. C. (F)
Goldmuntz, L. A. (A)
Goldschmidt, K. (A)
Goldsmith, A. N. (F)
Goldsmith, A. S. (A)
Goodfriend, L. S. (A)
Goodstein, L. P. (A)
Gordon, L. (A)
Gordon, S. (A)
Gormley, P. M. (A)
Gottlieb, H. B. (A)
Goyder, C. W. (SM)
Grabois, B. (A)
Grace, F. C. (M)
Graham, C. B. (A)
Graham, H. D. (A)
Grandizio, L. A. (A)
Greene, R. J. (A)
Greenough, H. V., Jr. (M)
Greenquist, R. E. (A)
Greenstein, P. (VA)
Greer, L. H. (A)
Gregal, J. (M)
Greig, W. G. (A)
Greven, P. J. (M)
Greig, J. H. (A)
Grigoraki, N. M. (A)
Gribsby, T. N. (A)
Grillo, J. (SM)
Groginsky, H. L. (A)
Gross, R. D. (A)
Grosselfinger, W. H. (SM)
Grossman, F. J. (A)
Grossman, H. (SM)
Grossman, M. (A)
Grover, H. G. (SM)
Gruber, A. E. (A)
Grundfest, H. (SM)
Grundy, A. B., Jr. (A)
Grybowski, T. M. (A)
Guild, B. (SM)
Gundy, P. L. (M)
Gunn, D. W. (M)
Guterman, F. H. (M)
Guterman, H. C. (SM)
Haase-Dubosc, A. A. (M)
Hackenberg, J. H. (M)
Haertig, M. M. (A)
Hagen, A. A. (A)
Hahn, H. R. (A)
Hajnik, A. T. (A)
Handelman, R. B. (A)
Handleman, M. (A)
Hanousek, R. A. (A)
Hanson, O. B. (F)
Hara, B. (VA)
Hardwick, A. H. (SM)
Harnack, W. P. (A)
Harris, C. M. (SM)
Harris, E. A. (A)
Harris, H. J. (A)
Hartley, S. H. (M)
Harvey, D. M. (A)
Haselton, M. L. (M)
Hauptschein, A. (A)
Havens, A. C. B. (A)
Havens, B. L. (SM)
Hayes, K. V. (A)
Hayes, P. J. (A)
Hearn, R. B. (SM)
Hecht, G. (SM)
Heck, R. F. (A)
Helt, S. (M)
Henney, K. (F)
Hershberger, W. O., Jr (VA)
Herz, H. (A)
Hester, F. A. (SM)
Highstrete, B. A. (A)
Hille, P. F., Jr. (A)
Hillyer, C. (M)
Hinkley, J. W. (SM)
Hinrichs, C. A. (A)
Hinrichs, J. H. (A)
Hirvi, H. E. (A)
Hodges, A. R. (SM)
Hodgson, A. R., Jr. (SM)
Hoedemaker, R. W. (A)
Hoffmann, R. R., Jr. (A)
Hogan, J. V. L. (F)
Hogan, R. L. (A)
Holder, C. R., Jr. (A)
Holland, J. H. (A)
Hollander, J. M. (A)
Homer, W. F. (A)
Homic, S. G. (A)
Honaman, R. K. (SM)
Horan, J. J. (A)
Hosokawa, K. (A)
Hovgaard, O. M. (SM)
Howard, M. S. (M)
Howell, W. J. (SM)
Hsieh, T. T. H. (A)
Hunter, G. T. (M)
Huntley, H. R. (SM)
Hurd, C. C. (A)
Hurtado, C. B. (A)
Huston, Q. E. (A)
Hyneman, J. R. (SM)
Ikeda, T. (A)
Ingles, H. C. (SM)
Ingram, S. B. (SM)
Isele, H. A. (A)
Israel, D. D. (F)
Iwahashi, K. K. (A)
Iwaniwsky, A. A. (A)
Jackson, H. H. (A)
Jacobs, C. F. (M)
Jacoby, N. (A)
Janiszewski, F. A. (A)
Jansky, C. M. (A)
Jarecky, J. L. (A)
Jatlow, J. L. (SM)
Javitz, A. E. (A)
Joel, A. E., Jr. (A)
Johnson, H. C. L. (A)
Johnson, H. W. (SM)
Johnson, J. K. (F)
Johnson, L. R. (A)
Johnson, R. E. (SM)
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Johnson, W. H. (A)
Joliffe, C. B. (F)
Jones, E. D. (M)
Jones, H. L., Jr. (A)
Jones, H. W. (SM)
Jones, T. A. (A)
Jones, W. (A)
Jones, W. G. (A)
Joseph, B. (A)
Joyal, H. J. (M)
Julie, L. (A)
Jutson, R. P. (SM)
Juviler P. H. (A)
Kahn, A. (SM)
Kahn, I. (A)
Kallmann, H. E. (SM)
Kamen, I. (SM)
Kantor, F. L. (A)
Kaplan, M. (A)
Karda, W. O. (M)
Karmiol, E. D. (A)
Karp, J. R. (A)
Kasai, G. S. (A)
Katzmann, F. L. (A)
Kaufmann, H. A. (A)
Kavanaugh, J. C. (A)
Kaylor, R. L. (A)
Keller, A. C. (SM)
Kelly, M. J. (F)
Kendall, J. A. (A)
Kenney, J. F. (A)
Kent, G. J. (SM)
Kent, R. A. (A)
Kiel, J. H. (A)
Kievit, B. (SM)
Kilian, L. H. (A)
Killgore, H. S. (M)
Kimons, E. (A)
King, F. (SM)
King, J. W., Jr. (M)
Kirlloff, A. (M)
Kishi, H. J. (A)
Klass, P. J. (A)
Klein, R. M. (SM)
Kluver, J. W. (A)
Knobbe, L. J. (A)
Knowlton, A. D. (SM)
Koehler, A. O. (A)
Koenig, W., Jr. (A)
Kofler, E. J. (A)
Kohn, D. (A)
Kolarcik, J. J. (A)
Kopecky, G. F. (M)
Korn, S. J. (A)
Kraepelien, H. V. (M)
Krakauer, S. M. (A)
Kranc, G. (A)
Krasnick, S. (A)
Krause, A. M. (A)
Kreisberger, S. (A)
Krescholleck, F. W. (A)
Kronengold, M. (A)
Kruesi, G. G. (A)
Kuhn, A. S. (SM)
Kunc, F. (VA)
Kundler, H. H. (A)
Kunik, I. J. (A)
Kurrelmeyer, B. (SM)
Kurzrok, R. M. (A)
Laas, I. E. (A)
Lacey, H. F. (A)
Lack, F. R. (F)
La Hiff, W. J. (A)
Lamb, R. U. (A)
Landis, M. (M)
Lavi, V. (A)
Lebel, C. J. (SM)
Lederman, A. (A)
Lee, C. Y. (A)
Leed, D. (SM)
Leibman, M. H. (A)
Lemly, F. W. (A)
Lentz, J. J. (A)
Leopold, G. R. (A)
Lerman, H. (A)
Lesman, E. (A)
Lesnick, R. (A)
Levens, L. M. (SM)
Levey, L. (A)
Levin, R. (A)
Levine, D. J. (M)
Levine, R. J. (A)
Levit, M. (A)
Levy, M. G. (A)
Lewis, G. (M)
Libby, T. M. (SM)
Lieberman, D. (A)
Lieberman, E. (A)
Lincoln, J. K. (A)
Lindsay, M. H. A. (SM)
Link, R. E. (A)
Lipsky, S. E. (A)
Littner, G. H. (A)
Llewellyn, F. B. (F)
Lockwood, L. W. (A)
Loesing, J. B., Jr. (A)
London, F. H. (A)
Long, M. B. (VA)
Loomis, A. L. (F)
Lowenstein, M. (A)
Lukashewitz, P. (A)
Lundquist, G. J. P. (A)
Luntz, J. D. (A)
Luskin, B. (A)
Lynch, J. B. (A)
Mabry, J. H. (A)
Mabuchi, O. (A)
MacMullen, A., Jr. (A)
Madigan, J. P. (A)
Magid, A. (M)
Mahler, R. J. (A)
Maloney, T. C. (A)
Mapes, C. M. (SM)
Marcinkowski, C. J. (A)
Marcinkowski, H. L. (A)
Marcus, P. (A)
Marin, F. L. (A)
Markel, A. (A)
Marolda, J. (A)
Marshall, A. D. (A)
Martin, A. E. (SM)
Martin, H. B. (SM)
Martin, P. (A)
Martin, R. D. (M)
Martin, R. F. (A)
Marx, E. A. (SM)
Marx, F. L. (SM)
Maser, H. (SM)
Mason, W. (SM)
Massy, F. M. (A)
Matsuoka, M. E. (A)
Mattison, G. H. (A)
Matusler, R. (A)
Mavromatis, A. (A)
Mayer, A. (A)
McCann, T. A. (A)
McClintock, R. K. (SM)
McCluskey, V. (M)
McCutchen, B. S. (F)
McGuire, T. S. (A)
McLaughlin, T. (A)
McManus, T. J. (A)
McNally, W. P. (M)
McPartland, T. J. (A)
McPherson, J. C. (SM)
McSweeny, R. (SM)
McWhan, B. (A)
Mealy, G. H. (A)
Meaney, M. H., Jr. (A)
Mears, W. E. (A)
Mehring, A. C. (A)
Merkler, F. T. (M)
Merl, K. C. (A)
Merrill, B. (M)
Merrill, R. G. (A)
Mertz, P. (F)
Meslener, G. J. (A)
Metcalf, G. F. (F)
Meyer, B. (A)
Meyer, W. C. (A)
Meyers, M. (A)
Meyerson, A. H. (M)
Miccioli, A. A. (A)
Miccioli, A. R. (A)
Michael, H. (M)
Michaels, H. M. (A)
Michelotti, L. A. (A)
Mieville, L. C. V. (M)
Milenbach, H. (A)
Millar, J. Z. (SM)
Miller, H. G. (M)
Miller, K. S. (M)
Mills, B. E., (SM)
Mills, H. J. (VA)
Milner, J. J. (A)
Miraglia, J. M. (A)
Misenheimer, H. N. (SM)
Mitchell, D. (SM)
Mitchell, H. F., Jr.
Mitchell, I. A. (VA)
Mitchell, T. H. (SM)
Moeremans, R. N. (A)
Monk, N. (SM)
Moore, C. E. (M)
Moore, S. F. (A)
Moran, T. G. (A)
Morillo, M. A. (A)
Mottel, S. (A)
Moylan, J. D. (A)
Muller, J. H. (SM)
Murbach, J. F. (A)
Murino, C. C. (A)
Murphy, J. J. (A)
Murphy, O. J. (SM)
Myers, M. C., Jr. (M)
Nagel, C. E., Jr. (A)
Naidamast, D. (A)
Nans, E. A., Jr. (A)
Napoli, A. E. (A)

Nash, A. (A)
Nashman, A. E. (A)
Nathan, A. M. (A)
Naumann, E. A. (A)
Nedell, E. (A)
Nelson, M. D. (A)
Neuwirth, P. (A)
Nevitt, H. J. B. (SM)
Nicholides, E. C. (A)
Nielsen, H. V. (VA)
Nieteruk, C. J. (A)
Nordin, N. E. (A)
Norton, E. L. (SM)
Novik, W. (A)
Nowogrodzki, M. (A)
Nyquist, H. (F)
O'Brien, R. S. (SM)
O'Connor, J. J. (A)
Oettinger, A. G. (A)
O'Hea, J. T. (A)
O'Leary, D. F. (A)
Oliver, G. A. (A)
Oliver, O., Jr. (A)
Onder, K. (SM)
O'Neill, L. H. (A)
Oppenheimer, F. W. (A)
Oritz, E. (A)
Osbahr, B. F. (SM)
Ostheimer, F. R. (A)
Ostrolenk, S. (VA)
Owen, C. H. (VA)
Owyang, G. H. (A)
Ozolins, L. (M)
Packer, S. S. (M)
Paddock, D. (A)
Pansch, H. J. (A)
Panzen, W. (A)
Pardes, H. I. (A)
Parisier, M. (A)
Parker, J. D. (SM)
Parmer, M. E. (A)
Parrott, J. H., Jr. (A)
Paskin, M. (A)
Pataki, E. (A)
Paul, F. H. (A)
Paul, G. S. (VA)
Paullsen, H. (M)
Pearson, H. (A)
Peborde, R. J. (A)
Pegler, H. M. (A)
Pegler, J. A. (A)
Pegram, G. B. (VA)
Peifer, W. A. (A)
Pellegrinelli, G. L. (A)
Pelton, R. G. (M)
Peltz, L. G. (A)
Pelzman, L. (A)
Perkins, E. H.
Perlman, R. R. (A)
Pernick, H. L. (A)
Peskin, E. (SM)
Peterson, E. (SM)
Peterson, R. A. (A)
Petranek, L. (A)
Petrasek, A. C. (SM)
Petrides, T. (A)
Pettai, R. (A)
Pfleger, K. W. (SM)
Pfund, E. T., Jr. (M)
Phanos, S. (A)
Phelps, R., Jr. (A)
Phillbin, S. H. (A)
Phinney, E. D. (SM)
Pincus, R. M. (A)
Pinz, B. M. (A)
Pippenger, C. R. (M)
Pitlik, H. (A)
Pitman, D. A. (M)
Pizzuti, F. D. (M)
Platt, S. (A)
Platzman, M. M. (M)
Plesset, K. (A)
Polin, H. S. (A)
Ponemon, R. D. (M)
Ponsolle, W. J. (VA)
Post, R. D. (A)
Postove, H. (A)
Poulos, M. (A)
Poynter, L., Jr. (A)
Pranitch, J. (A)
Predmore, E. E. (A)
Press, A. (A)
Prigozy, S. (A)
Prihar, Z. (SM)
Prisament, N. T. (A)
Puckett, T. H. (A)
Purgett, L. J. (SM)
Quanrud, O. G. (M)
Quinby, R. E. (A)
Quinn, J. C., Jr. (A)
Quirk, W. B. (M)
Racker, J. (A)
Ragazzini, J. R. (SM)
Raju, T. V. B. (M)
Randolph, G. C. (A)
Randolph, S. B. (A)
Rankin, R. L. (SM)
Ransom, G. B. (A)
Rapaport, H.
Rarity, J., Jr. (A)
Rask, O. N. (A)
Rea, W. T. (SM)
Read, O. (A)
Reeves, J. J. (M)
Rehm, M. P. (M)
Reich, S. M. (A)
Reicher, M. D. (A)
Reid, W. (A)
Reiner, M. (M)
Reiss, L. (A)
Rella, J. D. (A)
Relson, M. (M)
Rembert, R. P. (A)
Renaud, H. G. (A)
Renne, H. S. (SM)
Reusch, R. K. (A)
Reynolds, G. (A)
Rice, S. O. (SM)
Richard, S. J. (M)
Richardson, H. L. (SM)
Richman, P. L. (A)
Rider, J. F. (VA)
Ridings, G. H. (M)
Rivera, E. R. (A)
Rivera, J. J. (A)
Robertson, C. B. (M)
Robin, N. (A)
Robinson, A. S. (A)
Robinson, F. F. (A)
Robinson, H. A. (SM)
Rochford, J. L. (A)
Rocke, A. (A)
Rod, R. L. (SM)
Rodenhouse, E. (M)
Rogan, J. J. (SM)
Rojas, R. R. (A)
Rommes, H. I. (SM)
Rose, A. F. (SM)
Rose, T. T. (A)
Rosenberg, N. A. (A)
Rosenthal, C. W. (A)
Ross, B. R. (A)
Ross, D. P. (A)
Ross, G. G. (M)
Ross, R. D. (A)
Ross, R. M. (M)
Rossnick, M. (A)
Roth, J. E., Jr. (A)
Rothschild, R. F. (M)
Rothschild, R. S. (A)
Rothschild, R. S. (A)
Rowley, E. G. H. (A)
Rubenstein, A. L. (A)
Rubenstein, S. E. (A)
Rubin, J. (A)
Ruddley, J. (A)
Rugg, D. A. (A)
Runyon, C. R., Jr. (VA)
Rusinow, K. (A)
Russell, J. B., Jr. (SM)
Ruttenberg, S. (A)
Sadenwater, P. O. (A)
Safir, R. (A)
Sager, N. (A)
Sahulka, R. J. (A)
Salazar, L. A. (A)
Samuel, R. (M)
Samuels, M. (A)
Sanders, R. G. (A)
Sanders, W. J. (A)
Sanford, V. M. (A)
Saporta, L. J. (A)
Sarasohn, H. M. (M)
Sarnoff, D. (F)
Saron, R. (A)
Saunders, H. M. (A)
Saunders, H. O., Jr. (A)
Sawka, R. J. (A)
Scallion, R. (A)
Schaller, J. (A)
Schapiro, W. M. (A)
Scharfer, H. (A)
Schauer, R. F. (A)
Scheiner, M. L. (A)
Schetzen, M. (A)
Schillinger, A. G. (A)
Schlaikjer, J. E. (M)
Schleicher, H. M. (A)
Schlenger, S. B. (A)
Schmertz, R. C., Jr. (A)
Schneider, P. (A)
Schneider, S. (A)
Scholz, C. E. (SM)
Schreiber, W. B., JR. (A)
Schreiner, K. E. (A)
Schupak, L. (A)
Schutzman, E. (A)
Schwartz, A. A., Jr. (A)
Schwartz, H. T. (A)
Schwartz, L. (A)
Schwartz, M. (A)
Schwartz, M. J. (A)
Schwartz, P. L. (A)
Schwartz, S. L. (A)
Schwarz, R. J. (M)
Sciorra, A. F. (A)
Scollar, I. (A)
Seadler, S. E. (A)
Sear, H. (A)
Sears, J. F. (SM)
Seay, P. A. (A)
Seckler, H. N. (A)
Seeley, E. S. (SM)
Seeley, S. W. (VA)
Segal, R. J. (M)
Seger, L. (VA)
Seidler, S. W. (A)
Seklemian, R. S. (A)
Semple, W. E. (A)
Shackelford, B. E. (F)
Shackleton, S. P. (SM)
Shamir, J. (A)
Shamos, M. H. (M)
Shapiro, D. I. (A)
Shapiro, E. B. (A)
Shapiro, G. (A)
Shaw, B. (A)
Shaw, R. F. (SM)
Shea, J. F. (A)
Shecklen, G. F. (A)
Shelby, R. E. (F)
Sheldon, M. (A)
Shenk, E. R. (SM)
Sher, F. D. (A)
Sherman, J. B. (SM)
Sherman, P. (A)
Sherman, S. (A)
Sherry, L. I. (A)
Sherwood, H. R. (M)
Shiepe, E. M. (M)
Shipman, W. A. (SM)
Shirley, G. (A)
Shlonsky, L. (A)
Shmoys, J. (M)
Shobet, N. (M)
Shuck, T. L. (A)
Shute, E. R. (SM)
Sieber, H. F., Jr. (A)
Siegal, A. (A)
Siegmund, H. O. (SM)
Silber, A. (A)
Simon, E. J. (F)
Simpson, M. (M)
Singer, L. M. (M)
Skelley, C. L. (A)
Skrobisch, A. (A)
Slate, M. W. (A)
Slater, D. (A)
Slawson, W. J. (M)
Sloyan, T. J. (A)
Smith, A. V. (M)
Smith, C. I. (A)
Smith, D. M. (A)
Smith, F. W. (M)
Smith, G. M. (VA)
Smith, P. C. (A)
Smith, T. C. (M)
Smith, W. C. (A)
Smulin, R. (A)
Snow, G. M. (A)
Solomon, M. N. (A)
Solov, H. H. (A)
Sonnenschein, A. H. (A)
Southall, T. W. (M)
Spain, A. I. (A)
Spangenberg, L. F. (M)
Spangler, S. T. (M)
Spett, H. (A)
Spiccens, C. P. (A)
Spira, J. S. (M)
Spitalny, M. (M)
Sponable, E. I. (SM)
Sporn, S. R. (A)
Staehler, R. E. (A)
Stamler, L. (A)
Stansfield, J. Q. (A)
Stanton, F. (SM)
Statsinger, J. (A)
Stavrinaki, A. G. (A)
Stern, J. R. (F)
Steinman, B. (SM)
Steuhammer, H. T. (A)
Sterk, A. A. (A)
Sterling, J. J. (A)
Stern, J. L. (A)
Stern, R. M. (A)
Sternick, L. (A)
Stevenson, L. A., Jr. (A)
Steves, P. J. (A)
Stiefel, R. C. (A)
Stobbe, J. A. (SM)
Stock, D. J. R. (A)
Stone, E. W. (F)
Stone, N. (M)
Stone, W. G. (A)
Strack, W., Jr. (A)
Strauss, L. (A)
Strauss, R. (A)
Streifus, C. A. (A)
Striehy, M. E. (SM)
Sumner, E. E. (M)
Swallow, C. E., Jr. (A)
Swanson, J. W. (SM)
Swenson, W. J. (A)
Symons, W. E. (M)
Szabo, W. (A)
Szeremeta, P. J. (A)
Szucs, A. S. (A)
Tabor, J. H. (A)
Taffet, M. S. (A)
Taishoff, J. (M)
Talley, T. J., III (M)
Tatum, F. W. (SM)
Taub, H. (A)
Taylor, C. C. (M)
Taylor, C. H. (F)
Taylor, P. G. (M)
Taylor, W. H., Jr. (SM)
Thatcher, T. W., Jr. (A)
Thayer, G. N. (F)
Thiehlemont, A. H. (VA)
Thomas, O. D., Jr. (A)
Thompson, R. G. (SM)
Tichenor, W. B. (A)
Tidd, W. H. (SM)
Tierney, W. L. (SM)
Tint, G. (A)
Tiryakian, A. (A)
Torgow, E. N. (A)
Toton, E. J. (A)
Toulon, P. M. G. (SM)
Traver, H. A. (M)
Trevor, J. B., Jr. (M)
Truckses, D. E. (SM)
Tschanen, W. (A)
Tucker, A. G. (A)
Tucker, R. S. (SM)
Tuckerman, L. S. (A)
Tudor, J. E. (A)
Turner, E. (A)
Turner, T. L. (A)
Tutoli, J. G. (A)
Tuttle, C. W. (A)
Tykulsky, A. (A)
Ulrich, W. (A)
Urbanski, L. J. (A)
Uttal, J. A. (M)
Uttendorfor, E. A. (M)
Vafiades, W. (A)
VanDerVeen, H. (VA)
Van Wambeck, S. H. (SM)
Vaughan, J. A. (M)
Vehling, R. H. (VA)
Velonis, C. (A)
Viebranz, A. C. (A)
Vincent, C. J. (A)
Vogel, H. O. (A)
Votava, Y. (M)
Wager, G. C. (A)
Walker, J. B. (M)
Walker, R. M. (SM)
Walsh, A. L. (A)
Walsh, J. B. (A)
Walsh, J. P. (A)
Walsh, J. V. (A)
Wankel, F. A. (SM)
Warren, B. (A)
Warshaw, C. H. (A)
Watson, B. (A)
Weaver, A. (A)
Weaver, W. P. (A)
Weber, H. J. (A)
Weber, L. A. (A)
Wechsler, M. S. (A)
Weil, R. T., Jr. (SM)
Weinberger, E. F. (A)
Weinberger, J. (F)
Weindling, F. (A)
Weinman, M. (A)
Weinroth, S. A. (A)
Weinshenker, T. J. (A)
Weisfeld, B. R. (A)
Weisman, I. (A)
Weiss, G. D. (A)
Weissman, E. (A)
Wendell, E. N. (F)
Wentzel, M. G. (A)
Werner, R. L. (SM)
Wernick, J. I. (A)
Wernlein, C. E., Jr. (A)
Wertz, H. S. (SM)
Westheimer, M. (A)
Weyer, E. R. (A)
Whalen, B. F. (A)
Wheeler, G. W. (A)
White, M. F. (M)
White, S. D. (SM)
Whitmore, R. C. (A)
Wilberg, H. J. (A)
Wichmann, T. F. (A)
Wichtendahl, W. J. (A)
Wiesendanger, M. U. (A)
Willett, E. (A)
Willis, F. H. (VA)
Wilmer, P. (A)
Willson, F. E. (A)
Wilson, I. G. (SM)
Wilson, R. S. (A)
Winkler, A. (A)
Winner, L. (M)
Winter, H. (SM)
Winter, J. W. (A)
Winters, A. (A)
Wise, R. J. (SM)
Wise, W. H. (SM)
Wojciechowski, B. M. (SM)
Wolf, H. (SM)
Wolf, I. (A)
Wolf, S. K. (SM)
Wolff, F. M. (A)
Wolfthal, D. A. (A)
Wolters, J. T. (A)
Wong, N. F. (A)
Wood, J., Jr. (M)
Woodworth, F. B. (SM)
Worthen, G. B. (A)
Wotton, R. C. (A)
Wouk, V. (M)
Wright, J. W. (SM)
Wright, S. E. (A)
Wu, B. T. T. (A)
Wunderlich, N. E. (M)
Yamasaki, A. A. (M)
Yieh, T. (M)
Yokelson, B. J. (A)
Yostpille, J. J. (A)
Young, H. H. (A)
Young, R. O. (A)
Young, W. R., Jr. (SM)
Zadeh, L. A. (M)
Zaghi, J. P. (A)
Zeamans, H. R. (VA)
Zechnowitz, A. L. (A)
Zeigler, K. I. (A)
Zelman, B. B. (A)
Zemanian, A. H. (A)
Zentner, J. E. (A)
Zernoske, D. (A)
Zippler, W. N. (A)
Zuckerberg, H. (A)
Zutkoff, A. I. (A)
Zwick, G. (A)

New York Mills (RU-4)
McMurdie, T. E. (A)

Niagara Falls (BN-4)
Alaimo, J. J. (A)
Andrews, J. V. (A)
Bough, C. F. (A)
Carter, C. S., Jr. (A)
Collins, D. F. (A)
Covrella, E. (A)
Davis, H. M. (A)
De Vita, A. J. (A)
Emes, H. R. (M)
Gleason, M. H. (A)
Kasper, H. W. (A)
Lapic, J. R. (A)
Lee, L. H. (A)
Leming, J. G. (A)
Lidbury, F. A. (SM)
Morrison, H. V. (A)
Ozaki, G. K. (A)
Potter, C. E. (A)
Rager, D. M., Jr. (A)
Rowe, R. G. (SM)
Sarkees, V. T. (A)
Schildhauer, W. E. (M)
Shulman, H. (A)
Suganuma, P. K. (A)

North Babylon (LI-2)
Olszewski, W. R. (A)
Revere, R. W. (A)

North Baldwin (LI-2)
Kappelmann, G. E. (A)

North Bellmore (LI-2)
Beckhardt, T. G. (M)
Dolin, R. (M)
Dvorak, C. J. (M)
Giulianelli, R. M. (A)
Lipkin, W. (A)
Kunz, G. A. (A)

North Merrick (LI-2)
Branker, H. E. (M)
Greenstein, E. (A)
Leggio, J. (SM)
Schoenfuss, A. F. (A)
Schwenker, R. B. (M)
Thogersen, G. O. (A)
Tolseh, I. H. (M)

North Pelham (NY-2)
Isole, J. J., Jr. (A)

Northport (LI-2)
DeWitt, D. (SM)
Lockwood, M. D. (M)
Watson, R. F. (M)

North River
Simon, W. C. (SM)

North Rockville Center (LI-2)
Melman, I. J. (SM)

North Syracuse (SY-4)
Apple, L. S. (M)
Bartley, W. P. (A)
Bassett, L. A. (A)
Blackstock, R. S. (A)
Rockstiegel, R. B. (A)
Brown, S. R. (A)
Chynoweth, W. R. (A)
Colley, L. E. (A)
Corbell, I. T., Jr. (A)
Coullard, J. B. (SM)
Craig, E. L. (A)
Deitzler, R. P. (A)
Eaton, R. C. (SM)
Ehrhart, E. H. (A)
Elkins, R. A. (A)
Ellis, C. L. (A)
Evans, W. E. (M)
Felice, J. J. (A)
Fiet, J. H., III (A)
Frieling, E. (A)
Garrett, D. E. (A)
Ginder, M. E. (A)
Greenwood, P. E., Jr. (A)
Grimm, H. H. (M)
Howell, E. K. (M)
Hunstad, C. E. (A)
Kuhn, D. H. (M)
May, R. W. (M)

McGlashan, K. W. (A)
Mitchell, E. E. (A)
Muschamp, R. A. (M)
Nease, J. (A)
Playcan, C. T. (A)
Potter, H. C. (A)
Powell, B. O., Jr. (A)
Rausch, R. H. (A)
Records, J. K. (A)
Reibert, F. A. (A)
Revercomb, H. E. (M)
Roberts, E. G., Jr. (M)
Roth, E. L. (A)
Rudolph, R. H. (M)
Shumway, N. R. (A)
Smee, P. G. (SM)
Smith, J. S. (A)
Smith, P. J. (M)
Spencer, G. W. (A)
Stokes, C. L. (A)
Tidwell, B. B. (A)
Venema, H. J. (A)
Wasilak, E. J. (A)
Wilts, J. R. (A)
Wintle, H. C. (M)
Wood, R. F. (A)
Zenon, Z. (A)

North Tarrytown (NY-2)
Akin, R. M. (VA)
Palmquist, C. A. (A)
Vavra, J. M. (A)

North Tonawanda (BN-4)
Bryzinski, T. F. (A)
Johnston, G. D. (A)
Schmidt, F. M. (VA)
Sheehan, J. F. (A)
Taber, R. F. (A)

North Troy (SCH-2)
Belck, H. B. (M)

North Valley Stream (LI-2)
Sodaro, J. A. (A)

North White Plains (NY-2)
Casabona, A. M. (A)

Norwich (BI-4)
Hamilton, O. M. (A)
Knudson, L. I. (M)

Norwood (SVR-4)
Bruckmann, F. E. (A)

Nyack (NY-2)
Miller, H. M. (A)
Murphy, R. P. (A)

Oakdale (LI-2)
Van Weele, J. C. (M)

Oceanside (LI-2)
Agopin, A. (A)
Campbell, T. A. (A)
Levenstein, H. A. (A)
Ritter, L. (A)
Savet, P. H. (A)
Schrader, W. A. (M)
Silken, H. (A)
Urbanik, J. G. (A)

Old Westbury (LI-2)
Curtis, R. C. (VA)

Olcott
Ketcham, W. R. (A)

Orchard Park (BN-4)
Ball, M. T. (A)

Ossining (NY-2)
Stavis, G. (M)
Washburn, W. K. (A)
Webb, J. C. (A)

Oswego
Czirr, L. R. (A)

Owego
Knox, L. A. (M)

Oyster Bay
Dyer, J. N. (F)
Erni, J. B. (A)
George, H. A. (A)
Hollingsworth, R. L. (M)
Walpert, J. R. (A)

Ozone Park (LI-2)
Foley, T. P. (A)
Mellard, J. (A)
Rook, S. (A)
Saltsburg, S. S. (A)
Schuster, D. (A)
Sicuranza, A. J., Jr. (A)
Simon, L. (A)
Visich, F. J. (A)

Painted Post (EC-4)
Dawson, A. W. (A)

Patchogue (LI-2)
Chandler, G. G. (A)
Farrar, J. H. (A)
Kleinberger, R. (A)
Wise, A. (A)

Pattersonville
Oakes, W. S. (A)

Pawling (NY-2)
Coughlin, J. J. (A)

Pearl River (NY-2)
Fulmer, N. C. (M)
Porter, H. A. (A)

Peekskill (NY-2)
Cox, H. C. (A)
Fezer, H. (M)
Juanillo, J. J. (A)
Lewis, E. J. (A)
Milinowski, A. S. (VA)
Stein, V. J. (A)
Todd, S. E. (A)
Walder, B. (A)
West, R. L. (A)

Pelham (NY-2)
Aaltonen, T. K. (A)
Chenery, P. J. (M)
Kruse, L. C. (A)
Noneman, F. A. (A)
Nowick, C. A. (M)
Skinner, F. J. (SM)

Pelham Manor (NY-2)
Callan, J. M. (A)
Kalt, C. G. (A)

Penfield (ROC-4)
Atwood, B. E. (SM)
Berch, W. H. (A)
Heit, J. C. (A)
Huie, J. A. (A)
Tennant, M. J. (A)

Pittsford (ROC-4)
Perry, R. N. (M)
Ozone, K. (A)

Plainedge (LI-2)
Rice, J. (M)

Plainview (LI-2)
Crane, R. (M)
Fox, E. I. (A)
Heiss, W. H. (A)
Jones, A. J. (A)
Klein, R. C. (M)
Knecht, R. A. (A)
Lanning, W. C. (M)
Lawson, H. W., Jr. (A)
Levine, S. W. (SM)
Pollack, H. W. (A)
Segall, J. (A)
Simkins, R. S. (A)
Wershoven, G. A. (A)

Plandome (LI-2)
Blackwell, O. B. (F)
DiBlasi, J. (SM)
Hoeppner, C. H. (SM)
Klein, R. C. (M)
Striker, R. G. (A)

Plattsburgh (SCH-2)
Fox, R. S. (A)

Pleasant Valley (NY-2)
Martin, R. R. (A)
Ordemann, F. A., Jr. (A)

Pleasantville (NY-2)
Berger, F. B. (SM)
Butt, S. P., Jr. (A)
Dewhirst, T. P. (VA)
Dieter, N. H., Jr. (A)
Eisele, W. A. (A)
Freud, E. L. (A)
Gamertsfelder, G. R. (SM)
Garman, R. L. (SM)
Gillette, F. N. (A)
Greenwood, I. A., Jr. (M)
Hannahs, W. H. (M)
King, G. W. (A)
Lee, R. W. (SM)
Lurie, W. B. (SM)
McGuire, E. C. (A)
McKendry, J. K. (A)
Melliger, A. W. (M)
Miller, A. G. (A)
Parr, A. F. W. (A)
Poehler, H. (A)
Pourciau, L. L. (A)
Reed, H. J., Jr. (SM)
Saltzman, H. (M)
Tull, W. J. (SM)
Ward, J. C. (A)
Woloschak, K. (SM)
Wood, A. G. (A)

Port Chester (NY-2)
Barker, D. R. (M)
Houck, G. B., Jr. (A)
Hutchinson, R. B. (M)
Koppl, W. J. (SM)
Toman, J. J. (A)

Port Crane
Slater, C. F. (A)

Port Jefferson (LI-2)
Burditt, W. F. (A)
Carter, P. S. (F)
Dow, O. E. (VA)
Hansell, C. W. (F)
Munzer, L. F. (M)

Port Jervis
Weill, R. L. (A)

Port Washington (LI-2)
Aitken, R. K. (A)
Anderson, E. I. (SM)
Baston, W. M. (M)
Burroughs, H. A. (SM)
Craig, D. R., Jr. (A)
Cronauer, E. A. (A)
Doersam, C. H., Jr. (SM)
Durkee, C. H. (M)
Edgerly, J. J. (A)
Halenbeck, A. D. (A)
King, R. W., Jr. (A)
Knights, C. F. (A)
Little, D. S. (SM)
Littlejohn, J. D. (A)
Mac Adam, W. W. K. (SM)
Marsh, K. W. (SM)
McBrian, J. E. (A)
Moore, F. H. (A)
Murdoch, A., Jr. (SM)
Naylor, E. V. (A)
Pacent, H. C. (A)
Robberson, E. L. (A)
Schreiner, E. D. (A)
Sioles, G. W. (M)
Sparacino, R. R. (A)
Tawney, G. L. (SM)
Veronda, C. M. (SM)
Witten, A. L. (SM)

Potsdam (SY-4)
Record, F. A. (A)
Reich, R. J. (A)
Salerno, J. (A)
Trinkle, F. J. (A)

Poughkeepsie (NY-2)
Abell, G. R., Jr. (A)
Abruzzo, J. (M)
Albanes, N. J. (A)
Amdahl, G. M. (A)
Anderson, J. V. (A)
Applequist, J. E. (A)
Arneth, A. P., Jr. (A)
Astrahan, M. M. (M)
Bailey, S. H. (A)
Bartelt, J. E. (A)
Bashe, C. J. (A)
Bauer, E. W. (A)
Beattie, H. S. (A)
Beatty, H. J., Jr. (A)
Beeby, P. A. (A)
Beesley, J. P. (A)
Benoit, R. E. (A)
Berger, A. W. (A)
Beverly, N. E. (A)
Blakely, R. T. (SM)
Blessing, R. R. (A)
Blust, C. D. (A)
Breiding, E. J. (A)
Brennemann, A., Jr. (A)
Brock, J. P. (A)
Bruce, G. D. (A)
Buchholz, W. (M)
Buley, T. L. (A)
Bullard, R. L. (A)
Bunyar, P. A. (M)
Capozzi, R. V. (A)
Carrothers, G. H. (A)
Coates, W. H. (A)
Conrod, C. D. (A)
Coombs, J. M. (A)
Counihan, R. G. (A)
Crago, R. P. (A)
Crawford, D. J. (A)
Crawford, J. K. (A)
Davis, C. M. (A)
Dean, K. W. (M)
DeLano, R. B., Jr. (A)
Dorrell, C. E. (A)
Emery, R. W. (A)
Evans, B. O. (A)
Foley, J. H. (A)
Fox, P. E. (SM)
Fritz, E. L. (A)
Frizzell, C. E. (A)
Gayle, A. (A)
Goetz, J. A. (A)
Goldman, E. H. (A)
Goodman, H. C. (A)
Gordon, C. R. (A)
Graham, H. W. (A)
Grecco, J. A. (A)
Gregory, R. A. (A)
Haynes, M. K. (A)
Housman, B., Jr. (A)
Hunter, L. P. (SM)
Jackson, P. W. (A)
Johnson, J. R. (A)
Johnston, F. E., Jr. (A)
Jones, H. S. (A)
Kanter, L. E. (A)
Keeley, J. F. (A)
Keller, E. A. (A)
Kilcrease, D. L. (A)
Kippenhan, B. W. (A)
Koelsch, A. C., Jr. (A)
Lampe, A. W. (A)
La Porte, G. L. (M)
Lawrence, D. G. (A)
Little, J. B. (SM)
Logue, J. C. (A)
Lowrie, R. W. (A)
Luhn, H. P. (M)
Mac Sorley, O. L. (SM)
McMillan, E. C. (A)
Merwin, R. E. (A)
Moore, J. W. (A)
Mundrick, E. L. (A)
Murtha, G. A. (A)
Mussell, H. A. (A)
Mutter, W. E. (M)
Nanes, M. (A)
Nordyke, H. W., Jr. (A)
Noyes, R. A. (A)
O'Farrell, J. J., Jr. (M)
Oliva, F. J. (A)
Paddock, J. A. (A)
Paley, M. O. (A)
Palmer, R. L. (SM)
Patterson, D. A. (A)
Perlini, R. (A)
Phelps, B. E. (M)
Phillips, F. G., Jr. (A)
Quick, A. E., Jr. (M)
Reinheimer, H. J., Jr. (A)
Richards, R. K. (A)
Roberts, W. (A)
Rochester, N. (SM)
Ross, H. D., Jr. (A)
Royston, M. F. (SM)
Russell, L. A. (A)
Saling, D. M. (M)
Samuel, A. L. (F)
Santino, L. (A)
Sarahan, B. L. (A)
Schmidt, L. M. (A)
Schmitz, J. V. (A)
Shultz, G. L. (A)
Sih, K. Y. (A)
Sindelar, F. J. (A)
Slonaker, R. D. (A)
Sochor, J. J. (A)
Sollie, S. A. (SM)
Spatz, P. (A)
Stewart, R. A. (M)
Stock, J. A. (A)
Swanson, R. E. (A)
Taub, S. (A)
Taylor, O. P. (SM)
Ulfsparre, L. O. (A)
Underhill, G. H. (M)
Verven, S. J. (A)
Wagner, E. G. (A)
Walston, C. E. (A)
Walthers, G. A. (A)
Walter, G. (A)
Ward, R. H. (A)
Weber, F. A. (A)
Whalen, R. J. (A)
Whalen, R. M. (A)
Whitmore, D. C. (A)
Williams, B. W. (A)
Willson, E. S. (SM)
Winkler, W. H. (A)
Witt, V. R. (A)
Wolensky, W. (A)
Wolfe, I. P. (A)

Poundridge
Tingley, G. R. (A)

Prattsburg (EC-4)
Carlton, M. D. (M)

Queens (LI-2)
Buegler, R. J. (A)
Goldstein, W. (A)
Paley, W. D. (A)
Schloss, A. (A)
Teevan, G. H. (A)

Queens Village (LI-2)
Anderson, D. H. (A)
Chieffo, A. B. (A)
Davis, M. (A)
Feldman, S. (A)
Gerych, W. E. (A)
Goldstone, L. O. (M)
Griemsmann, J. W. E. (A)
Hansen, E. L. (M)
Hickman, W. C. (A)
Hill, E. B. (A)
Hoffer, L. H. (A)
Kleinoder, J. (A)
Krowenberg, M. H. (SM)
Liebriedis, K. (M)
Monsees, F. G. (A)
Nelson, E. P. (A)
Osterndorf, J. F. (A)
Schmidt, H. P. (A)
Tennis, J. E. (M)
Urban, W. D. (A)
Wohl, R. J. (M)
Woodward, A. E. (A)
Yeager, J. R. (A)

Rego Park (LI-2)
Astrow, M. (A)
Geismar, G. G. (A)
Gilbert, R. C. (A)
Gluck, J. (A)
Green, P. S. (A)
Herbstman, M. I. (M)
Hershkowitz, M. (A)
Hochman, S. (A)
Kassler, R. (A)
Landauer, A. (A)
Martin, R. E. (M)
Norton, H. N. (M)
Oscar, R. W. (A)
Oseas, J. (A)
Pollak, F. (A)
Rothenberg, N. (A)
Weiner, L. H. (A)

Rennsselaer (SCH-2)
Stuarts, A., Jr. (M)
Wetmore, G. C. (A)

Rexford (SCH-2)
Cobine, J. D. (SM)

Richmond Hill (LI-2)
Bernard, E. L. (A)
Egan, W. G. (A)
Feulner, F. A. (A)
Foley, J. J. (A)
Henn, W. (A)
Jacobs, F. (VA)
Jensen, A. J. (A)
Koenig, R. H. (A)
Sartory, J. J. (A)
Seckler, P. J. A. (A)
Selnick, L. L. (A)
Turnow, W. F. (A)
Walberg, A. G. (A)
Yellen, A. F. (A)
Zanichkowsky, M. (A)

Ridgewood (LI-2)
Brinker, H. (A)
La Via, J. (M)

Riverdale (NY-2)
Fein, M. J. (SM)
Froelich, C. (A)
Lambert, L. B. (A)

Riverhead (LI-2)
Braaten, A. M. (SM)
Brandinger, J. J. (A)
Goddard, D. R. (SM)
Hansell, G. E. (SM)
Leis, W. S. (A)
Moore, H. A. (A)
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)
Wickizer, G. S. (SM)

Rochester (ROC-4)
Anderson, R. E. (A)
Andzer, A. (A)
Balling, A. W. (VA)
Barr, E. M. (M)
Bellor, W. F. (M)
Blow, A. W. (M)
Boyd, R. K. (A)
Brewer, W. L. (M)
Brown, L. W. (M)
Brumley, C. H. (A)
Burrows, H. R. (A)
Chesna, J. (A)
Cohen, G. H. (A)
Cottier, L. A. (A)
Cox, P. G. (A)
Curtis, S. R. (SM)
Cushing, C. S. (A)
Dahl, A. H. (M)
Dasburg, A. V. (M)
Demong, M. D. (A)
Dixon, E. O. (SM)
Enslein, K. (SM)
Fine, L. (A)
Fink, E. J. (A)
Freehafer, J. E. (M)
Gardner, K. J. (M)
Gerharz, R. J. (A)
Gilhousen, L. E. (A)
Glandon, A. E. (A)
Grammer, R. A., Jr. (A)
Green, V. H. (A)
Guenther, J. H. (M)
Guth, R. (A)
Hailes, W. D. (SM)
Haupt, G. H. (SM)
Hausler, W. B. (A)
Herrick, M. P. (SM)
Herrman, R. F. (A)
Holmes, L. C. (F)

Holstrom, A. (SM)
Howard, W. J. (A)
Huntington, M. B. (VA)
Intini, A. V., Jr. (A)
James, C. L. (A)
Jamieson, D. F. (A)
Johnstone, N. J. (A)
Karker, E. C. (M)
Kendall, H. C. (SM)
Kende, G. (SM)
Kennedy, R. P., Jr. (M)
Klumb, H. J. (VA)
Kohl, W. B. (A)
Ladd, J. H. (M)
Lake, A. E., Jr. (A)
Lankes, L. R. (SM)
Lyke, E. F. (M)
Malone, W. J. (A)
Manson, R. H. (F)
Marsh, G. E. (M)
Matterson, R. G. (A)
McArdle, B. L. (SM)
McCumber, D. E. (A)
Mitchell, F. A. (A)
Moffat, D. (A)
Moore, E. G. (A)
Morken, D. A. (A)
Morse, J. E. (A)
Mosher, R. M. (A)
Mott, G. R. (M)
Murphy, W. L. (A)
Neff, W. H. (A)
Nunan, J. K. (A)
O'Brien, B. C. (SM)
Ossmann, E. A. (A)
Peed, A. C., Jr. (A)
Pendergrass, H. L. (A)
Prasil, A. (A)
Rausa, G. J. (A)
Reinke, R. V. (A)
Richter, W. (M)
Robbins, R. E., Jr. (A)
Rodgers, J. A. (SM)
Ronbeck, J. E. (A)
Rubenstein, C. F. (A)
Sacha, R. J. (A)
Sass, L. J. (A)
Schifino, A. G. (M)
Searcy, C. E. (A)
Sedor, W. J. (A)
Sheve, H. C. (VA)
Slaymaker, F. H. (M)
Stephenson, E. D. (A)
Stern, M. A. (A)
Stevenson, H. (M)
Stolze, W. J. (M)
Stoutz, C. O., Jr. (A)
Tapernoux, P. J. (A)
Tholstrup, H. (SM)
Traino, C. (A)
Traub, R. A. (A)
Trott, M. (M)
Trotter, H., Jr. (SM)
Turner, W. (M)
Veal, T. G. (M)
Vincent, A. W. (SM)
Wheeler, J. L. (M)
Whitman, R. N. (A)
Wilcox, D. D., Jr. (A)
Worden, O. L. (A)
Yeaton, E. C. (A)
Young, J. W. (A)
Zefting, A. H. (M)

Rockaway Beach (LI-2)
Edelstein, H. N. (A)
Flomenhaft, L. (A)
Schwartz, C. J. (A)

Rockaway Park (LI-2)
Goldstein, W. (A)

Rockville Center (LI-2)
Bensen, H. (A)
Coleman, J. (A)
Corrarino, C. W. (SM)
Delligatti, S. F. (A)
DeWeese, H. W. (SM)
Duke, V. J. (SM)
Gilman, B. S. (A)
Harris, H. (A)
Hellige, H. C. (A)
Hinners, F. A. (F)
Hopkins, J. J. (M)
Lee, R. L. (A)
Leuteritz, H. C. (VA)
McCartney, E. (A)
Nuebling, C. A. (A)
Perry, J. S. (A)
Phelps, R. J. (A)
Quatraro, W. (A)
Rich, E. M. (A)
Riker, W. E. (A)
Saffitz, I. M. (A)
Singer, F. J. (SM)
Stotz, C. C. (A)
Uzmann, J. G. (SM)
White, H. A. (A)
Wille, R. A. (A)
Wolff, F. (A)

Rocky Point (LI-2)
Aird, A. W. (VA)
Goldstine, H. E. (SM)
Martin, C. A. (VA)
Peterson, L. E. (A)
Watson, C. W. (A)
Young, L. L. (A)

Rome (RU-4)
Alfie, C. L. (M)
Ashcroft, D. L. (A)
Barreto, J. M. (A)
Beauchamp, A. J. (M)
Benoit, R. C., Jr. (SM)
Berge, R. I. (A)
Berliner, J. (A)
Boutillette, R. H. (A)
Boxer, R. (A)
Bromley, J. E. (A)
Calicchia, J. L. (A)
Carlson, H. A. (M)
Carney, P. G. (VA)
Chasek, N. E. (A)
Colangelo, L. P. (A)
Cosgrove, T. (SM)
Crowley, H. J. (A)
Cruickshank, J. E. (SM)
Darrow, F. M. (A)
Davis, H. (SM)
De Lutis, T. (M)
Diamond, F. I. (A)
Eannarino, J. M. (A)
Eitches, I. (M)
Ellis, T. E., Jr. (A)
Feiner, A. (A)
Fitchett, R. N., Jr. (A)
Forte, M. P. (A)
Friedman, H. (M)
Frolich, A. J. (A)
Gabelman, I. J. (SM)
Graham, R. C. (A)
Heavner, W. S. (A)
Herson, J. L. (M)
Holliday, R. H. (A)
Horowitz, S. (A)
Jaeger, M. (A)
Jenkins, E. A. (A)
Jones, E. D., Jr. (M)
Jones, F. W., A)
Kaiser, E. E. (A)
Kant, M. (A)
Kirshner, D. R. (A)
Lambert, J. (M)
Larsen, P. N. (A)
Lepper, W. E. (A)
Levine, M. (A)
Libby, R. L. (A)
Loreto, D. R. (M)
Maggio, T. (A)
Malowicki, E. (A)
Manley, T. M. (M)
Martini, S. (A)
Mazzola, F. D. (A)
Mirman, I. (SM)
Montague, G. H. (A)
Morelli, M. (A)
Moskowitz, F. (SM)
Moyant, G. C. (A)
Munzer, E. N. (M)
Neeley, A. C. (A)
Newton, D. J., Jr. (A)
Nyberg, J. J. (A)
Palmer, L. N. (A)
Pavane, M. M. (M)
Peterpaul, C. A. (A)
Pipher, R. W. (A)
Pope, W. T., Jr. (M)
Posternak, H. (A)
Pranke, J. A. (A)
Ratynski, M. V. (M)
Rehrig, E. S. (A)
Richardson, H. W. (A)
Richter, H. (A)
Ricketts, P. E. (M)
Rosenberg, S. (SM)
Ruterman, E. R. (A)
Schlegelmilch, R. O. (SM)
Schulte, O. (A)
Scott, E. C. (A)
Setrin, M. (A)
Sharki, P. (M)
Storrs, E. N. (M)
Strom, C. A., Jr. (SM)
Szalach, F. E. (A)
Taffel, B. R. (A)
Tallman, O. G. (SM)
Tannenhaus, A. M. (M)
Taschler, E. J. (A)
Tepper, S. J. (A)
Thompson, J. M. (SM)
Turner, W. P. (A)
Vaccaro, J. (A)
Vogelman, J. H. (SM)
Votava, Y. (A)
Warner, M. (M)
Webb, H. E. (M)
Webb, T. E. (A)
Wells, L. R., Jr. (A)
Williams, L. E. (A)
Winkler, E. H. (M)
Wisniewski, S. J. (M)
Worthington, D. T. (A)
Worthington, J. W., Jr. (M)
Zinn, T. B., Jr. (A)

Ronkonkoma (LI-2)
Gold, T. (M)

Roosevelt (LI-2)
Adachi, W. Y. (VA)
Beck, G. S. (A)
Brown, E. M. (A)
Forster, E. E. (A)
Gager, C. H. (A)
Popkin-Clurman, J. R. (SM)
Randazzo, J. J. (A)
Uzzo, A., Jr. (A)

Rosedale (LI-2)
Di Paola, R. G. (A)
Epstein, M. (A)
Haneman, W. J. (A)
Rodriguez, L. H. (A)

Roslyn (LI-2)
Chapman, A. K. (M)
Rimmler, F. F. (A)
Sege, T. D. (M)
Susskind, S. E. M. (A)
Wild, J. J. (A)
Winters, B. C. (A)

Roslyn Harbor (LI-2)
Ming, A. (M)

Roslyn Heights (LI-2)
Anstett, F. D. (M)
Bourke, W. A. (M)
Browder, J. E. (M)
Chiei, F. D., Jr. (M)
Corwin, A. (A)
Crist, P. W. (SM)
Day, W. B. (A)
Drucker, D. A. (A)
Easton, A. (SM)
Gray, J. E. (A)
Harges, M. T. (M)
Harris, H. C., Jr. (M)
Joline, E. S. (A)
Kahn, H. (M)
Knutson, H. C. (A)
Loeb, M. (A)
Roth, H. H. (A)
Rudd, J. E. (A)
Seeley, S. W. (F)
Skipper, L. C. (SM)
Slaughter, G. K. (SM)
Smith, C. A. (M)
Spielberger, S. C. (A)
Star, J. (SM)
Weinmann, R. H. (M)
Willenbecher, J. F. (SM)
Willey, F. G. (M)
Winship, L. T. (A)
Yelsey, B. (M)

Rush (ROC-4)
Finnigan, C. W. (SM)

Rye (NY-2)
Davis, D. (A)
Deri, H. B. (A)
Eaves, A. J. (SM)
Lamarque, J. W. (VA)
Lawton, L. M., Jr. (A)
Paul, C. H. (A)

St. Albans (LI-2)
Behr, J. (A)
Ceccanti, L. P. (A)
Englert, H. E. (A)
Heller, R. C. (A)
Parker, H. L. (A)
Pryzbyla, E. M. (A)
Reisman, S. J. (M)
Rothenberg, S. M. (VA)
Sessions, R. W. (A)
Stella, R. (A)
Vetter, R. F. (A)

St. James (LI-2)
Samson, G. C. (A)

Sanborn (BN-4)
Whitson, A. L. (A)

Sands Point (LI-2)
Deakin, G. (VA)
Hayward, G. H. (A)
Langerman, H. (A)

Saratoga Springs
Ant, E. B. (A)
Fox, D. W. (A)
Samsky, B. S. (SM)
Saslow, S. (M)

Saugerties
Stifler, W. W., Jr. (A)
Wright, A. W. (A)

Scarsdale (NY-2)
Butler, G. H. (A)
Fein, B. (A)
Fox, W. C. O. (M)
Griffiths, R. W. (M)
Heller, S. (A)
Hultquist, J. A. (M)
King, K. L. (SM)
McKirdy, R. W. (M)
Mina, P. P. (A)
Monroe, R. B. (SM)
Reed, H. A. (A)
Seitz, F. A. (VA)
Slaybaugh, C. W. (SM)
Stephens, M. C. (A)
Sterman, R. S. (A)
Turner, A. (VA)
Wagenhals, E. R. (M)

Schenectady (SCH-2)
Abraham, L. G. (A)
Adams, G. E. (A)
Alexanderson, E. F. (F)
Allen, C. C. (A)
Alley, R. P. (A)
Alt, W. G. (A)
Anderson, G. J. (A)
Anderson, R. E. (M)
Bailey, F. M. (SM)
Beggs, J. E. (SM)
Bernstein, S. (A)
Biggs, J. P. (A)
Billingsley, F. C. (A)
Blanning, R. B. (A)
Borgese, A. J. (A)
Borst, D. W. (A)
Bowers, R. E. (A)
Bowne, W. L. (M)
Boyd, M. R. (A)
Brandes, P. D. (A)
Brate, D. C. (A)
Burnett, K. N. (A)
Burroughs, E. H. (A)
Chaston, A. N. (A)
Clark, S. C., Jr. (A)
Cleary, C. J., Jr. (A)
Cohen, A. (A)
Colgin, J. R. (A)
Collett, W. L. (A)
Collins, R. N. (A)
Cooper, B. (M)
Cruger, B. W. (A)
De Baryshe, B. D. (A)
Dehn, R. A. (M)
De Santis, V. J. (SM)
De Walt, K. C. (SM)
Dickey, F. E. (SM)
Dickinson, T. M. (VA)
Duckwald, C. S., Jr. (A)
Dunham, S. B. (M)
Ellert, F. J. (A)
Ellis, S. S. (A)
Eshbach, J. R. (A)
Evans, J. T., Jr. (A)
Farr, T. C. (A)
Fick, C. G. (F)
Ford, W. A. (SM)
Frick, C. W. (SM)
Fritschel, E. H. (SM)
Gable, A. C. (SM)
Gardner, G. F. (VA)
Gehrig, J. W. (A)
Grabowski, S. J. (M)
Graham, J. M. (A)
Gravel, J. P. J. (A)
Griffin, G. J., Jr. (A)
Grover, F. W. (F)
Gundrum, E. L. (A)
Gurdak, E. D. (A)
Gurewitsch, A. M. (SM)
Habermann, R., Jr. (A)
Hagnauer, R. A., Jr. (A)
Hall, R. N. (SM)
Hansen, W. O. (M)
Hawkins, D. W. (SM)
Hellar, M. W., Jr. (A)
Henyan, G. W. (VA)
Herrmann, G. M. (SM)
Hickey, J. S., Jr. (SM)
Hilbert, E. A. (A)
Jacobi, G. T. (A)
Jarek, J. J. (A)
Jeter, W. C. (A)
Jones, H. E. (A)
Kessler, G. W. (A)
Kettlety, R. W. (A)
Kirchmayer, L. K. (A)
Kish, F. (A)
Koch, A. R. (SM)
Kohl, H. F. (A)
Kowalczyk, A. C. (A)
Kunz, L. C., Jr. (M)
Lafferty, J. M. (SM)
Lang, J. M. (A)
Larson, R. W. (SM)
Lawson, J. L. (SM)
Lee, E. S. (SM)
Lemmond, C. O. (A)
Lippitt, D. L. (A)
Loeper, C. J. (A)
Lyman, D. G. (A)
Maginniss, F. J. (A)
Manfredi, R. E. (A)
Masnik, M., Jr. (A)
Mayes, T. L., Jr. (A)
McArthur, E. D. (F)
McCormick, E. D. (A)
McMullen, G. D. (A)
Meahl, H. R. (SM)
Mihran, T. G. (A)
Milford, R. E. (A)
Miller, F. A., Jr. (A)
Milton, R. T. (A)
Moles, F. J. (SM)
Moore, R. E. (A)
Morell, C. A. (A)
Morgan, R. E. (A)
Mumford, L. G. (A)
Murray, K. W. (A)
Nakamura, H. (A)
Nelson, J. E. (SM)
Newman, R. W. (M)
Nielsen, R. D. (A)
Norgaard, D. E. (SM)
Ogle, H. M. (SM)
Owen, E. R. (M)
Owens, O. G. (M)
Patterson, F. G. (VA)
Pester, R. F. (A)
Peters, P. H., Jr. (A)
Peterson, G. R. (A)
Petty, R. W., Jr. (A)
Pickert, C. E. (A)
Pravda, M. F. (A)
Prince, D. C. (SM)
Pritchard, R. L. (A)
Purcell, W. J. (A)
Reed, R. I. (SM)
Reque, S. G. (A)
Rice, C. T. (SM)
Roark, G. L. (M)
Robertson, R. E. (M)
Robinson, R. D. (A)
Rocha, H. A. F. (A)
Rothe, F. S. (A)
Russ, R. B. (SM)
Russell, J. F., Jr. (A)
Rustay, R. C. (A)
Sampson, E. S. (SM)
Schaffer, C. A. (M)
Schussele, J. H. (A)
Schwarzhaupt, P. J. (VA)
Shain, E. (A)
Shuey, R. L. (M)
Skolka, K. M. (A)
Smith, R. L. (SM)
Sollecito, W. E. (A)
Stefkovits, P. (A)
Summerhayes, H., Jr. (SM)
Swanson, R. W. (A)
Taylor, L. A. (VA)
Teare, W. H. (SM)
Thayer, R. W. (A)
Thorson, H. L. (SM)
Thuesson, R. G. (A)
Turrentine, R. E. (A)
Verzulli, J. U. (A)
Waldron, W. K. (A)
Watson, R. P. (SM)
Watters, R. L. (A)
Webber, S. E. (SM)
White, W. C. (F)
Whitten, J. R. (A)
Wilson, V. C. (A)
Woodward, G. F. (A)
Zecher, R. O. (A)

Schoharie (SCH-2)
Jacobs, G. B. (A)

Scipio Center (SY-4)
Matuzich, J. D. (A)

Scotia (SCH-2)
Bowles, L. T., Jr. (M)
Chambers, D. E. (F)
Clapp, C. W. (A)
Cook, E. D. (F)
Coolidge, A. W., Jr. (M)
Curtis, T. P. (SM)
Driskill, R. D. (A)
Elder, T. A. (SM)
Fraenckel, V. H. (A)
Gardiner, P. C. (SM)
Jakowatz, C. V. (A)
Kramer, R. S. (A)
McFall, R. W. (SM)
Muntz, W. E. (SM)
Roberts, S. (M)
Rozas, F. (A)
Samsel, R. W. (A)
Shepard, B. R. (SM)
Travis, E. F. (SM)
Volkers, W. K. (SM)
Wade, E. J. (A)
Wilson, T. M. (M)

Scottsville (ROC-4)
Benin, Z. (SM)

Sea Cliff (LI-2)
Brown, B. (A)
Bushing, H. L. (A)
Flackbert, A. C. (SM)
Klein, M. M. (A)
Reichert, K. R., Jr. (A)
Singleton, C. M. (M)

Seaford (LI-2)
Battle, F. H., Jr. (A)
Drago, P. (A)
Grumich, J. (SM)
Ladof, L. G. (M)
Levinson, I. (A)
McPherson, D. L., III (A)
Seigle, R. K. (M)
Weston, S. (SM)

Seneca Falls (ROC-4)
Burroughs, F. L. (SM)
Cowden, D. G. (M)
Dickinson, W. A. (SM)
Faust, A. C. (A)
Fogg, G. E., Jr. (A)
Gessford, R. K. (SM)
Greenberg, I. D. (A)
Jablonski, R. W. (A)
Jans, J. T. (A)
Kahl, M. L. (SM)
Keen, A. W. (SM)
Kaawitz, M. (SM)
Mackey, D. G. (A)
Ottemiller, W. H., Jr. (SM)
Peck, H. D., Jr. (A)
Pfister, G. H. (M)
Shields, R. R. (M)
Stone, E. O. (A)
Stone, R. W. (SM)
Swan, R. A., Jr. (M)

Shenorock (NY-2)
Renke, A. (A)

Sherburne (BI-4)
Brown, H. H. (M)
Leitner, R. T. (A)
Lippitt, K. H. (M)
Lunddahl, T. (SM)
Voorhaar, F. R. (M)

Sidney (BI-4)
Sluis, M. H. (A)
Struble, R. C. (A)

Silver Creek (BN-4)
Gull, R. A. (SM)

Slingerlands (SCH-2)
Bowie, W. G. (SM)
Dillenback, G. R., Jr. (A)

Sloatsburg (NY-2)
Stevenot, H. A. (A)

Snyder (BN-4)
Balint, A. T. (SM)
Breeden, F. C. (M)
Forster, H. F. (A)
Hultberg, C. A. (SM)
Lawton, J. G. (A)
McDonough, S. L. (A)
Richmond, G. E., Jr. (A)
Robins, B. W. (SM)
Sanders, E. R. (SM)
Schantz, J. D. (SM)
Squires, W. K. (M)
Wagner, R. W. (M)
Whyman, E. W. (SM)

Sodus Point (ROC-4)
Hunter, N. E. (A)

Solvay
Shofstall, N. F. (SM)

Southampton (LI-2)
Buckingham, W. D. (A)
Hildreth, A. E., Jr. (A)
Lamar, R. E. (A)

South Farmingdale (LI-2)
Saur, R. D. (A)

Southold (LI-2)
Luke, R. O. (A)

South Ozone Park (LI-2)
Lizzio, J. (A)
Morris, R. L. (A)
St. Clair, B. W. (A)
Weiner, F. (A)

Spencerport
Sibley, H. C., Jr. (A)

Springfield Gardens (LI-2)
Berthold, R. V. (A)
Portantino, A. (A)

Spring Glen (NY-2)
Green, J. (M)

Spring Valley (NY-2)
Cook, S. (A)
Faist, C. A. (A)
Rosenbaum, J. (M)
Welan, I. (A)

Staatsburg (NY-2)
Vance, V. G. (A)

Staten Island (NY-2)
Anderson, A. L. (A)
Auriema, R. C. (A)
Avins, J. (SM)
Bellis, R. P. (A)
Bremmer, L. F. (SM)
Brossok, W. C. (A)
Culicetto, P. J. (A)
Donovan, T. F. (A)
Embrechts, A. C. (SM)
Gallonio, A. A. (A)
Gannett, E. (A)
Garthwaite, J. L. (A)
Gunther, F. A. (SM)
Kiely, G. F. (A)
Kostriza, J. A. (M)
Lala, A. (A)
La Penna, F. W. (A)
Levine, M. E. (M)
Mallin, J. A. (A)
Martenson, R. B. (A)
Nagy, W. Z. (A)
Panicillo, T. B. (A)
Radgowski, S. P. (A)
Reeves, J. F. (A)
Robinson, M. (A)
Rodwin, G. (SM)
Ruedisueli, R. W. (A)
Shea, J. W. (A)
Snyder, V. A. (A)
van Bemmelen, H. M. (A)
Vavoudis, S. N. (A)
Weinberg, T. L. (A)
Zucker, S. M. (A)

Stewart AFB
Chambers, G. R. (A)

Stewart Manor (LI-2)
Moore, F. H. (A)
Ruddy, W. (A)

Stittville
Sprinz, E. (A)

Stony Brook (LI-2)
Dean, J. C. (A)
Medd, J. S. (SM)
Woodruff, E. T. (A)

Stony Point (NY-2)
Favre, R. M. (A)

Stone Ridge (NY-2)
Darrell, R. D. (A)
Van Winkle, H., Jr. (A)

Suffern (NY-2)
Frachtman, H. E. (A)
Hammel, D. G. (A)

Sunnyside (LI-2)
Bolnick, F. I. (A)
Capon, N. J. (A)
Castrignano, R. A. (M)
Clemens, R. W. (A)
Feldman, J. (A)
Majlinger, A. (A)
Ross, G. F. (A)

Syosset (LI-2)
Abrams, C. F. (A)
Beardsworth, R. (A)
Benjaminson, A. (A)
Charlton, J. (A)
DeBordelaben, S. L. (A)
Erickson, J. S. (SM)
Espenlaub, W. C. (A)
Forrest, G. E. (M)
Freeman, S. M. (A)
Greenleaf, F. D. (SM)
Hollister, D. G. (A)
Hutchinson, I. N. (A)
Jagoe, R. W. (A)
Lang, H. M. (A)
Mueller, F. J. (A)
Nittoli, A. J. (A)
Reisch, R. P. (A)
Samuelson, D. S. (M)
Schroeder, K. R. (M)
Thomas, E. U. (M)
Thompson, J. L. (A)
Ward, J. W. (M)
Wilcomb, E. F. (SM)
Willcox, P. D. (A)

Syracuse (SY-4)
Abrahams, I. C. (SM)
Ackley, E. H. (A)
Adams, W. B. (A)
Allen, J. E. (SM)
Altes, S. K. (M)
Anderson, A. F. (A)
Andrews, P. D. (SM)
Aronson, C. A. (SM)
Arsem, A. D. (SM)
Bachman, C. H. (VA)
Bahr, R. J. (A)
Bailey, J. S. (M)
Bakeman, O. R. (A)
Baker, L. T. (A)
Baker, W. R. G. (F)
Balabanian, N. (A)
Baldwin, C. F. (SM)
Barhydt, C. R. (SM)
Barton, L. M. (SM)
Bass, L. (SM)
Baxter, L. M. (A)
Beard, C. E. (A)
Beguin, F. P. (SM)
Belamarich, J. P. (A)
Belle Isle, A. G. (A)
Berger, J. (A)
Bias, F. J. (SM)
Biele, R. J. (SM)
Bischoff, E. L. (A)
Bradbury, B. (M)
Brearley, H. C., Jr. (A)
Broms, B. H. (A)
Broughton, W. G. (VA)
Brown, J. S. (A)
Brown, R. J. (A)
Buchanan, H. R. (A)
Cacavelos, A. A. (M)
Cadwell, E. B. (A)
Caffery, T. P. (A)
Cahn, C. R. (A)
Callahan, G. F. (A)
Campbell, V. C. (SM)
Carrillo, E. B. (A)
Carson, R. E. (SM)
Casselberry, R. L. (A)
Chafaris, G. J. (A)
Chapman, J. K. (SM)
Cheng, D. K. (SM)
Chivers, C. C. (A)
Chow, W. F. (SM)
Cisler, M. C. (SM)
Clark, P. B. (A)
Clark, R. E. (M)
Cleary, E. P. (A)
Clement, R. R. (M)
Cochran, N. B. (M)
Cohen, L. R. (A)
Cole, F. G. (A)
Connelly, D. C. (A)
Copp, J. H. (SM)
Cottle, D. W. (A)
Coykendall, J. C. (SM)
Crosby, H. M. (SM)
Cummings, A. P. (VA)
Cunniff, J. F. (A)
Dale, J., Jr. (A)
Dall, A. B. (A)
Davids, H. H. (SM)
Davidson, R. A. (A)
Davis, R. J. (A)
De Garmo, A. V., Jr. (A)
Dewire, G. M. (A)
Dokas, J., Jr. (A)
Dome, R. B. (F)
Duncan, K. W. (A)
Eachus, E. D. (A)
Earls, H. G. (M)
Eber, L. O., Jr. (A)
Edens, G. E. (M)
Edwards, K. A. (A)
Eliot, A. B. (A)
Ellis, C. R. (A)
Estes, R. M. (A)
Evans, H. J. (SM)
Fancher, H. B. (SM)
Fank, F. B. (A)
Farrell, J. J. (F)
Faullin, R. R. (M)
Field, B. (A)
Fields, H., Jr. (A)
Fink, L. R. (F)
Fitzmorris, S. R. (M)
Fong, K. (A)
Foster, R. F. (SM)
Fritschel, P. G. (A)
Galidas, P. (A)
Gannett, G. L. (A)
Garber, S. M., Jr. (A)
Gardner, D. R. (SM)
Gentry, F. E. (A)
Geyer, B. H., Jr. (A)
Ghandhi, S. K. (A)
Gibbons, E. H., Jr. (A)
Gildersleeve, R. E. (A)
Glassmaker, L. G. (A)
Glenn, A. B. (SM)
Goldman, S. (SM)
Goldstein, H. (A)
Golinsky, M. (A)
Good, W. E. (SM)
Goodwin, A. R. (A)
Gruen, W. J. (SM)
Guckenheimer, E. (A)
Guyer, E. (A)
Hall, W. H. (SM)
Hamlett, J. G. (A)
Harrington, R. F. (A)
Heaton, H. T. (A)
Hebert, E. J., Jr. (A)
Heiden, C. M. (SM)
Heil, H. (SM)
Hellerman, H. (A)
Herzog, E. E. (A)
Herzog, E. F. (SM)
Holtz, R. E. (A)
Holtzclaw, B. L. (A)
Howells, P. W. (M)
Hurley, D. T. (A)
Hutchins, C. M. (M)
Huyler, L. E., Jr. (A)
Hyde, W. F., Jr. (A)
Ingerson, F. A. (A)
Jeffers, W. M. (A)
Jenkins, W. M. (A)
Johnson, C. W. (A)
Johnson, G. L. (A)
Johnson, R. M. (M)
Johnson, S. O. (A)
Johnston, P. G. (A)
Kaar, I. J. (F)
Kalmus, F. (A)
Karlberg, B. G. (A)
Keister, J. E. (SM)
Kenefake, E. W. (SM)
Keonjian, E. (SM)
Kerr, J. S. S. (A)
Killion, R. H. (A)
Kim, J. C. S. (A)
Kinzie, M. E. (A)
Kirkpatrick, G. M. (M)
Kluender, E. C. (SM)
Knox, R. L. (A)
Korolenko, A. (A)
Kozinski, R. E. (A)
Krackhardt, E. M. (A)
Kuecken, J. A. (A)
Lacy, W. K. (A)
Lasher, C. C. (SM)
Learned, A. J. (M)
Leeder, H., Jr. (M)
Leeds, L. M. (SM)
Leinweber, L. F. (A)
Lemon, S. G. (A)
Lesk, I. A. (A)
Lett, R. P. (SM)
Lidovitch, S. B. (A)
Liggett, W. E. (A)
Lillo, C. L. (A)
Linderman, O. E. (A)
Linker, J. B., Jr. (A)
Linnertz, R. C. (A)
Lippert, H. B. (M)
Lloyd, C. G. (SM)
Lob, C. G. (A)
Lucas, V. M. (M)
Lynch, I. E. (A)
Lynn, L. H. (SM)
MacKenzie, W. G. (A)
MacLeod, W. R. (M)
Maier, L. C., Jr. (M)
Maloney, W. J. (A)
Manke, A. G. (SM)
Marcum, D. (A)
Marsa, A. R. (A)
Marvin, H. B. (F)
Mather, D. L. (A)
Maxwell, D. E. (SM)
Mayo, B. R. (A)
Mayoral, G. A. (SM)
McAllister, J. F., Jr. (SM)
McConoughey, S. R. (A)
Meehan, J. A. (A)
Mellott, R. N. (A)
Merrigan, C. F. (A)
Merrithew, R. F. (A)
Mickelson, T. H. (A)
Mikaelian, M. (A)
Millett, R. G. (A)
Mills, J. B. (A)
Morlock, W. J. (SM)
Moseley, S. T. (A)
Mullen, E. B. (A)
Mullin, L. A. (SM)
Nelson, C. E. (A)
Nelson, J. W., Jr. (SM)
Ocko, R. (A)
Olson, F. A. (M)
Palmquist, M. L., Jr. (A)
Pan, P. M. (M)
Pardee, O. O. (A)
Parlas, J. L. (SM)
Passarelli, W. F. (A)
Perreault, D. A. (A)
Peterson, E. H., Jr. (A)
Petrie, A. F. (A)
Pfefer, B. L. (SM)
Phillips, J. M., Jr. (A)
Phillips, J. N. (SM)
Pinkerton, D. C. (SM)
Platts, G. F. (SM)
Plusc, I. (M)
Polisse, L. F. (M)
Polzin, E. M. (A)
Portz, H. G. (A)
Priest, C. A. (F)
Quinn, H. H., Jr. (A)
Randall, D. P. (SM)
Rearwin, E. W. (A)
Rector, R. V. (SM)
Reilly, L. W. (A)
Reinsmith, G. M. (A)
Reynolds, F. M. (VA)
Reynolds, R. H., Jr. (A)
Rice, N. O. (M)
Richardson, R. L. (A)
Rives, T. C. (SM)
Robbins, J. H. (A)
Roelofs, S. R. (A)
Roesch, R. G. (A)
Rubin, I. E. (M)
Saby, J. S. (SM)
Sadowsky, S. S. (A)
Samulon, H. A. (SM)
Santa, M. M. (A)
Schaffner, J. S. (A)
Schick, N. E. (SM)
Schlecht, M. F. (A)
Schultz, R. E. (A)
Schupp, G. A., Jr. (A)
Scuitto, T. J. (A)
Sedlack, G., Jr. (A)
Seely, S. (SM)
Shaw, C. A. (A)
Shea, R. F. (F)
Shelter, R. L. (A)
Shepp, R. E. (M)
Shofstall, N. F. (SM)
Sorbye, K. E. (A)
Spain, F. K. (A)
Spence, D. W. (M)
Spitzer, C. F. (M)
Squires, W. F. (A)
Starkey, G. M. (M)
Stern, A. P. (A)
Stone, E. W. (A)
Stone, R. F. (M)
Suran, J. J. (A)
Svitek, G. A. (A)
Swank, W. B. (A)
Teich, P. J. (A)
Thomas, W. P., Jr. (A)
Thor, R. C. (A)
Tillman, J. T., Jr. (A)
Towlson, H. G. (SM)
Vaccaro, R. A. (A)
Van Aken, H., Jr. (A)
Villeneuve, A. T. (A)
Vize, J. F. (A)
Wakefield, W. F. (A)
Watts, D. E. (SM)
Webb, T. E. (A)
Weir, I. R. (F)
Weiss, H. (A)
Wellinger, R. P. (M)
Wellner, F. R. (M)
Whelchel, G. P., Jr. (A)
Whistler, W. T. (A)
Wick, R. S. (A)
Wiggen, J. F. (A)
Wilcox, J. F. (SM)
Williamson, R. H. (F)
Wolf, G. T. (A)
Yadavalli, S. V. (A)
Yerian, C. S. (SM)
Yost, D. E. (A)
Young, M. C. (A)
Zellmer, L. R. (A)
Zierdt, C. H., Jr. (M)
Zimmer, C. R. (A)

Tappan (NY-2)
Petra Kos, N. (A)
Ulrich, E. C. W. (A)

Tarrytown (NY-2)
Cartoon, G. P. (A)
Evans, F. (A)
Hollis, W. C. (SM)
Medon, R. R. (A)
Minich, C. H. (A)
Moffett, R. (SM)
Rae, J. R. (SM)
Shein, S. (A)

Thornwood (NY-2)
Belcher, R. D. (A)
Bollari, L. (A)
Burns, G. D. (A)
Hall, H. D. (A)
Orth, F. (M)

Tonawanda (BN-4)
Babcock, L. F. (A)
Babcock, T. R. (A)
Bondy, M. F. (A)
Carr, C. E. (A)
Chester, E. B. (A)
Chipman, J. R. (A)
Dumas, R. E. (A)
Field, T. O. (A)
Gauthier, L. P. (A)
Giori, F. A. (M)
Harpster, W. T. (A)
Hedgecock, D. M. (A)
Janowsky, R. H. (A)
Koons, E. E. (A)
Krowl, G. W. (A)
Plicato, W. L. (A)
Reese, J. S. (A)
Rockman, I. A. (A)
Root, R. E. (A)
Shrum, L. R. (A)
Shuart, J. F. (A)
Skinner, G. M. (M)
Wolcott, J. R. (A)
Zehr, R. M. (A)

Troy (SCH-2)
Babits, V. A. (SM)
Beers, R. F. (A)
Campese, N. H. (A)
Chernoch, J. (A)
Chismark, A. H. (A)
Hall, C. F. (A)
Harris, H. D. (VA)
Hasserdji, G. K. (A)
Hutchinson, D. F. (A)
Kunz, C. J., Jr. (A)
Lococo, S. (A)
Love, A. L. (A)
McLaughlin, W. J. (M)
Mortenson, K. E. (A)
Norvik, F. L. (SM)
Quine, J. P. (A)
Servis, W. A. (A)
Stoker, W. C. (SM)

Trumansburg (SY-4)
Beers, R. B. (A)

Tuckahoe (NY-2)
Austin, K. B. (VA)
Arbuthnott, J., Jr. (A)
Belchis, S. (A)
Brooks, L. P. (A)
Collison, P. B. (SM)
Drew, C. E. (SM)
Dunn, C. J. (A)
Engel, J. S. (A)
Hillman, P. L. (A)
Lichtenstein, M. J. (M)
Lundgren, P. R. (A)
McGinnis, F. (M)
Porterfield, E. A. (A)
Reitman, J. (A)
Sheer, S. (A)
Steinberg, M. I. (A)
Troster, M. (A)
Vincent, R. M. (A)
Waldron, R. E. (M)
Zatorsky, E. F. (VA)

Uniondale (LI-2)
Fragola, C. F. (A)
Gould, R. V. (SM)
Johl, M. J. (A)

Upton (NY-2)
Adams, R. R. (A)
Bittner, J. W. (A)
Blewett, J. P. (A)
Chase, R. L. (A)
Cowan, F. P. (M)
Graham, M. (M)
Higinbotham, W. A. (SM)
Kuper, J. B. H. (SM)
Madey, R. (A)
Maher, E. F. (A)
Plotkin, M. (A)
Rankowitz, S. (A)
Rheaume, R. H. (M)
Weiss, M. M. (M)

Utica (RU-4)
Ainsworth, M. G. (A)
Anderson, C. T. (M)
Antonucci, P. (A)
Bailey, D. C. (A)
Baldwin, G. F. (A)
Barker, J. (A)
Barnum, A. R. (A)
Bates, E. L. (A)
Bendel, S., Jr. (A)
Blum, H. (A)
Bouchard, G. O. (A)
Chow, A. V. (A)
Colin, L. (A)
Dickson, W. H. (A)
Dondero, R. L. (A)
Dowdell, J. T. (A)
Duran, F. A., Jr. (A)
Feldman, I. (A)
Goldberg, O. D. (A)
Goretsky, L. M. (A)
Hocking, L. J. (A)
Hogel, A. A. (A)
Holmquist, J. A. (A)
Jenkins, O. D. (A)
Johnson, M. R. (SM)
Kapfer, V. C. (A)
Kenyon, H. P., Jr. (A)
Kuehl, W. J. (A)
Kulmus, R. J. (M)
Layton, D. T., Jr. (A)
Maldonado, B. (A)
Moore, S. F., Jr. (A)
Moran, J. F., Jr. (A)
Oot, R. F. (A)
Orear, E. (M)
Pankiewicz, C. L. (A)
Pereda, E. F. (A)
Perry, H. E. (A)
Peterson, N. J. (A)
Romanelli, P. A. (A)
Rosenberg, M. W. (A)
Salmento, S. J. (A)
Slaughter, J. E. (A)
Uren, D. E. (A)
Weigel, R. L. (A)
Wexler, C. H. (A)
Willard, C. H. (A)
Zachary, R. A., Jr. (M)
Zawada, J. D. (A)

Valhalla (NY-2)
Mainberger, W. A. (M)

Valley Stream (LI-2)
Agress, M. C. (M)
Beaton, C. R. (M)
Davis, S. (A)
Durbin, E. (A)
Elderkin, C. J. (A)
Farkas, R. D. (A)
Gangale, F. S. (A)
Goodstein, J. (A)
Griesan, G. F. (A)
Hansen, J. A. (SM)
Haughey, J. W. (A)
Jackson, B. A. (M)
Jackson, D. E. (A)
Jacobson, N. (A)
Kalmar, J. O. (A)
Kappauf, E. F. (A)
Lidz, S. (A)
MacDonald, A. H. (A)
Mancke, R. B. (M)
Match, M. J. (A)
Miller, G. (A)
Muth, J., Jr. (A)
Nelson, R. T. (M)
Perenic, L. J. (SM)
Peyser, W. P. (SM)
Redding, J. D., Jr. (A)
Rokosz, A. J. (A)
Ruth, R. L. (A)
Sanchez, H. M. (A)
Schlang, A. (A)
Schottland, F. D. (SM)
Vogel, E. (A)
Wessbecher, F. W. (A)
Woerner, R. G. (A)
Woodbury, W. F. (M)

Vernon (RU-4)
Boothroyd, G. A. (A)

Verona (RU-4)
Miller, T. A. (A)

Vestal (BI-4)
Allen, F. K. (A)
Alman, J. (A)
Bartholy, F. E. (VA)
Bolton, W. D. (A)
Bowen, E. C. (A)
Bussey, R. L. (A)
Cooper, A. E. (A)
Daykin, D. R. (A)
Farr, L. E., Jr. (A)
Grace, C. H. (A)
Greene, J. E. (A)
Kornbluh, A. J. (A)
Lawson, F. R. (A)
Leimer, J. J. (A)
Marcy, H. T. (M)
Norton, J. M. (A)
Pederson, R. H. (A)
Robbins, N. P. (A)
Rogers, M. D. (A)
Summers, W. P. (A)
Vacca, L. N. (A)
Valenta, G. W. (A)
Williams, C. W. (A)
Woodson, R. A. (SM)

Wantagh (LI-2)
Alter, J. (SM)
Arndt, W. R. (SM)
Bauer, W. C. (A)
Bean, F. E. (A)
Behringer, N. C. (A)
Berler, R. M. (A)
Bischoff, J. J. (A)
Bloom, L. (A)
Breese, H. R. (A)
Breese, M. E. (M)
Brown, C. J. (A)
Ellis, H. J., Jr. (A)
Fahnestock, J. D. (A)
Gaynor, E. (M)
Gibbs, E. D. (A)
Goodman, D. M. (SM)
Greene, J. C. (M)
Grossman, R. (A)
Holcombe, P. G. (A)
Horton, G. L. (A)
Hughes, J. G. (A)
Jacobson, R. S. (A)
Lenfest, G. C. (A)
Levey, A. W. (M)
McKee, W. D. (A)
McCrary, D. E. (A)
Mills, N. B. (A)
Nelson, R. P. (A)
Norde, L. (SM)
O'Donnell, J. J. (A)
Ratner, M. (A)
Rawitz, H. (A)
Ruderfer, M. (A)
Sachar, H. N. (A)
Salzberg, A. (A)
Sarfaty, J. (A)
Sferrazza, P. J. (A)
Smith, P. G. (A)
Sokol, A., Jr. (A)
Steen, D. R. (A)
Sunder, J. E. (A)
Vang, J. P. (A)
Waters, M. L. (A)
Weiss, M. (A)
Verdon, G. W. (M)
Zeichnek, D. (A)
Zeitz, A. (SM)

Wappingers Falls (NY-2)
Baker, C. T., Jr. (A)
Braude, E. J. (A)
Case, P. W. (A)
Coe, G. J. (A)
Collins, G. B. (A)
Disney, J. V. (A)
Domenico, R. J. (A)
Dye, W. G. (A)
Fernekees, J. E. (M)
Geisler, H. J. (A)
Heath, H. F., Jr. (A)
Hickerson, J. E. (A)
Jackman, W. L. (M)
Keller, R. E. L. (A)
Lego, J. M. (M)
Medla, E. (A)
Nutter, E. H. (A)
Parker, M. P. (A)
Robins, R. D. (A)
Seimes, M. S. (A)
Slagle, W. C. (A)
Stierhoff, G. C. (A)
Wild, H. K. (A)
Winger, W. D. (A)

Waterloo (ROC-4)
Burdick, G. A. (M)
Osborn, C. M. (A)
Riska, G. G. (M)

Water Mill (LI-2)
Deibert, C. R. (M)

Watertown (SYR-4)
Bonadio, G. (A)
Morgan, C. W. (A)
Sweeney, J. E. (M)

Waterville (RU-4)
Cooper, F., Jr. (A)
D'Hoostelaere, A. C. (A)
Stone, D. J., Jr. (A)

Watervleit (SCH-2)
Lavoo, N. (M)
Raschke, R. R. (A)

Webster (ROC-4)
Pottraschke, C. F. (M)
Sienkiewicz, A. H. (A)
Trousdale, R. B. (M)
Vosteen, R. E. (A)

Wellesville (EC-4)
Ayer, D. R. (A)
Clarke, R. L. (A)

West Albany (SCH-2)
Maurer, J. W. (A)

West Branch (RU-4)
Rush, S. (SM)

West Falls (BN-4)
Holmes, W. S. (M)

West Hempstead (LI-2)
Blinn, W. J. (A)
Buck, J. D. (A)
Buckman, S. L. (A)
Childs, A. F. (M)
Cohen, H. (A)
Erlick, P. S. (A)
Evans, C. L. (A)
Fairweather, R. W. (A)
La Rosa, R. (A)
Levine, H. A. (SM)
Levinson, E. (A)
Lorch, J. (M)
Platt, W. D. (A)
Rockett, F. H., Jr. (A)
Simmons, J. C. (M)
Sinnott, J. (A)
Thiede, F. C. W. (VA)
Voelpel, J. (A)
Weintraub, R. (A)
Westman, H. P. (SM)
Williamson, R. G. (A)

West Islip (LI-2)
Bell, R. W. (A)
Damast, M. A. (A)
Eglit, W. F. (M)
Stenecker, R. G. (A)

West Park (NY-2)
Reynolds, D. J. (A)

West Point (NY-2)
Ekberg, W. A. (M)
Gillette, E. C., Jr. (A)
Green, J. W., Jr. (SM)
Pankowski, B. J. (A)
Strohm, W. E. (M)
Tetley, W. H. (M)
Voegeli, F. E. (A)
Wozencraft, J. M. (A)

West Seneca (ROC-4)
Nowicki, J. J. (A)

Westbury (LI-2)
Abajian, H. B. (M)
Averett, S. S. (A)
Boecker, A. (A)
Borken, A. (A)
Chiu, J. H. S. (A)
Dasher, P. M. (A)
Davis, S. (A)
Dorne, A. (M)
Douglas, W. S. (A)
Figlia, J. R. (M)
Fishman, G. N. (A)
Gitlin, S. A. (A)
Gledhill, A. P. (A)
Hellmann, R. K. (VA)
Hoffman, H. L. (A)
Johnston, J. B., Jr. (A)
Kelleher, R. L. (A)
Kenny, J. A. (A)
Kolb, J. A. (A)
Lehtonen, E. W. (A)
Logan, R. W. (A)
MacVeety, R. C., Jr. (A)
Margolin, J. (M)
Morfin, H. W. (A)
Oldmixon, R. (A)
O'Meara, T. J. (A)
Procop, L. W. (A)
Parker, E. J. (A)
Richards, G. F. (M)
Rosar, M. T. (A)
Rosenthal, M. M. (A)
Schumacker, A. L. (VA)
Smith, H. M. (A)
Smith, W. G. (A)
Speakman, E. A. (F)
Stitch, M. (A)
Torkildsen, R. A. (A)
Truhlar, G. (A)
Waicule, D. (A)
Waller, W. E. (M)
White, J. R. (A)
Wilkerson, J. R. (SM)
Wilson, L. B. (M)
Zaremba, C. J. (A)

Westport (SCH-2)
Smith, I. D., Jr. (A)

Westernville
Clawson, G. T. (A)
Mackey, C. L. (A)
Naresky, J. J. (M)

White Plains (NY-2)
Arcand, A. T. (A)
Atlee, R. Y. (A)
Bernardi, A. R. (A)
Bloom, W. E. (A)
Brackmann, W. J. (M)
Campanale, A. J. (A)
Carter, W. S. (A)
Cohn, E. (A)
Comstock, D. C. (A)
Desnoyers, H. (M)
Fearing, J. L. (VA)
Fetherolf, J. M. (A)
Finkler, R. A. (A)
Flower, R. A. (A)
Gano, A. S. (SM)
Garcia, J. R. (A)
Gaston, G. I. (M)
Gilbert, J. (M)
Glancy, R. C., Jr. (SM)
Green, H. (A)
Gresko, J. J. (M)
Gronner, A. (SM)
Hackett, A. J. (A)
Harris, E. R. (M)
Hillmann, D. A. (A)
Jacobus, H. R. (SM)
Jenkins, H. C. (M)
Jurgen, R. K. (M)
Kaye, H. W. (M)
Kothe, E. W. (A)
Lake, J. R. (A)
Lambert, F. C. (A)
Lehman, W. (A)
MacDonald, W. D. (A)
Machover, C. (A)
Mele, B. T. (A)
Mountain, J. D. (A)
Murphy, T. J. (A)
Pickles, S. (SM)
Preston, F. S. (M)
Schimmel, H. (A)
Schleicher, M. (A)
Schlesinger, E. R. (A)
Shaw, D. B. (SM)
Shortt, H. L. (M)
Sieger, J. (SM)
Speed, R. B. (VA)
Speller, J. B. (SM)
Stuart, A. F. (A)
Weinstein, I. (A)
Ziokowski, A. (SM)
Zisserman, M. (A)

Whitesboro (RU-4)
Bunger, J. W. (M)
Davis, D. M. (A)
Ewing, L. M. (SM)
Giles, J. W. (A)
Griffith, W. A. (A)
Grimm, R. S. (A)
Hartnett, G. C. (A)
Ketchum, P. M. (SM)
Kovacs, F. M. (A)
Krzysiak, E. F. (A)
Muldoon, W. J. (A)
Pritchard, H. T. (A)
Riddle, P. (A)
White, R. L. (A)

Whitestone (LI-2)
Birnham, D. Z. (A)
Cawood, D. W. (M)
Di Ceclo, S. A. (M)
Dunefsky, M. (A)
Foodim, C. (SM)
Gottlieb, G. J. (A)
Greenberg, S. (A)
Greene, I. (A)
Grumet, A. (A)
Haywood, O. G. (SM)
Herbig, A. J. (A)
Jordan, D. B. (A)
O'Connell, R. J. (A)
O'Connell, T. P. (A)
Perkjian, A. J. (A)
Piller, S. E. (A)
Pomerantz, M. (A)
Rotker, W. (A)
Sandler, H. (A)
Schatz, F. W. (A)
Smith, J. W. (SM)
Sobel, I. J. (A)
Sorenson, E. (A)
Vogel, R. Q. (M)
Von Kunits, P. (M)

Williamsville (BN-4)
Corp, D. E. (A)
Gnau, D. V. (A)
Hart, W. E. (M)
Kuhn, H. G. (M)
Maylott, C. F. (SM)
Maynard, H. M. (M)
Pifer, M. J. (SM)
Snyder, W. W. (M)
Syverson, C. L. (A)
Tanguay, A. R. (A)
Wightman, C. W., Jr. (A)

Williston Park (LI-2)
Ghirlando, F. L. (A)
Gillespie, C. H., Jr. (A)
Hopkins, G. C. (M)
Koskos, P. (SM)
Lerch, Q. A., Jr. (A)
Losow, H. C. (A)
Lovell, J. A. (A)
Maisto, N. S. (A)
Matthews, E. W., Jr. (A)
Napolin, S. (A)
Parsons, B. L. (A)
Rolfs, J. C. (M)
Spergel, P. (A)

Wilson (BN-4)
Schneider, R. J. (A)

Woodhaven (LI-2)
De Size, L. K. (A)
Hintz, R. T. (VA)
Michel, C. A. (A)
Reitlinger, A. (A)
Reuther, D. W. (A)
Schaefer, A. E. (A)
Scheen, J. (A)
Sloan, R. R. (M)
Smith, W. J. (A)
Winter, D. W. (A)
Wolber, R. R. (A)
Zarakas, A. (A)

Woodmere (LI-2)
Bach, H. M. (A)
Bresson, J. (A)
Crystal, F. H. (A)
Kahgan, J. J. (M)

Woodside (LI-2)
Bukofzer, R. (A)
Carey, E. D. (A)
Dechovitz, H. (A)
Fraleigh, J. B. (A)
Garbarini, G. S. (A)
Grebe, A. H. (A)
Green, W. (A)
Jahoda, J. R. (A)
Karas, J. P. (A)
Keith, W. S. (A)
King, L. H. (A)
Parzen, B. (SM)
Quinn, J. A. (A)
Rabinowitz, M. H. (A)
Rafferty, J. J. (A)
Reuman, W. H. (A)
Richter, F. G. (A)
Santer, M. O. (A)
Stavitski, L. X. (A)
Strong, J. J., Jr. (A)

Woodstock (NY-2)
Van Rijn, J. C. (SM)

Wyandanch (LI-2)
Gaffney, F. J. (SM)
Graham, W. (A)
Hanlon, R. M. (M)
Johnston, W. A., Jr. (M)

Wyckoff (NY-2)
Zomber, G. L. (M)

Yonkers (NY-2)
Balletta, A. G. (A)
Bartlett, S. C. (SM)
Bastian, A. L. (A)
Bernstein, R. (A)
Burnel, N. (A)
Campbell, J. A. (A)

Castriota, L. J. (M)
Davidoff, S. (M)
Douglas, R. H. (M)
Findeis, W. J. (A)
Fried, J. (A)
Garbowitz, L. (A)
Genz, W. F. (A)
Geoghegan, J. P. (A)
Giovanni, G. (A)
Goetzl, M. (M)
Goldstein, A. L. (A)
Grabowski, J. L. (A)
Hertsch, G. (A)
Hesse, G. L. (A)
Humphrey, R. M. (A)
Husenita, J. (A)
Jordan, E. I. (A)
Knauert, W. F. (M)
Korewick, J. (A)
Kostyshyn, B. (A)
Kreik, J. F. (A)
Lisewski, E. E. (A)
Looney, L. A. (VA)
Lynch, D. F., Jr. (A)
Lynch, H. G. (A)
Maurer, J. A. (A)
Moran, J. A., Jr. (A)
Morse, M. (A)
Neumann, K. L. (A)
Orefice, G. T. (A)
Paris, H. F. (A)
Paterra, A. F. (A)
Patraiko, F. L. (A)
Perelman, I. B. (A)
Post, F. L. (A)
Regan, H. T. (A)
Resnicow, L. (A)
Roth, S. S. (A)
Schreiner, R. J. (A)
Staudt, W. (A)
Stein, R. S. (SM)
Taffet, W. (A)
Tarowsky, H. (A)
Webb, R. A. (A)
Yablonsky, D. M. (A)

Yorktown Heights (NY-2)
Matarainen, K. O. (M)
Teschmacher, H. W. (SM)

Yorkville (RU-4)
Kraft, W. R. (A)
Pietrafesa, D. (A)

NORTH CAROLINA

Ahoskie
Savin, C. S. (A)

Asheville
Chambers, W. M. (A)
Morgan, Z. K., Jr. (A)
Wade, R. A. (A)

Aurora (NC-3)
Cayton, C. R. (A)

Beaufort (NC-3)
Slater, R. C. (M)

Black Mountain (NC-3)
Huffman, J. C. (A)

Burlington (NC-3)
Alsabrook, C. M. (A)
Apple, H. L. (M)
Barlow, J. E. (A)
Bize, J. T., Jr. (A)
Day, J. L. (M)
Fox, M. L. (A)
Hastings, C. L. (M)
Kelly, I. E. (A)
Morris, K. G. (A)
Parris, W. J. (A)
Sees, J. H. (A)
Severance, F. D. (A)
Smith, C. P. (A)
Smith, H. O. (A)
Turner, R. E. (A)
Turrini, J. J. (M)

Candler (NC-3)
Brown, J. R. (A)

Cary (NC-3)
Cormack, W. J., Jr. (A)
Humphrey, A. L., Jr. (A)
Rood, H. W. (A)
Sherwood, J. M., Jr. (A)

Chapel Hill (NC-3)
Adams, W. (A)
MacIntyre, A. B. (A)

Charlotte (NC-3)
Anderson, A. C. (A)
Britt, C. L., Jr. (A)
Brown, F. R. (A)
Bush, T. K. (M)
Carey, J. G. (SM)
Carr, L. O. (A)
Caudle, L. L., Jr. (M)
Chaney, H. L. (M)
Dycus, R. W. (A)
Hardin, L. H. (A)
Hicklin, W. H., Jr. (A)
Howard, T. E. (M)
Kickler, E. M. (A)
Luscombe, C. F. (M)
McCray, H. R., Jr. (A)
Miller, J. M. (F)
Minor, M. J. (SM)
Ramsey, R. W. (VA)
Ramsey, R. W., Jr. (A)
Stewart, A. E. (VA)
Walker, L. L. (A)
Xenakis, S. N. (A)

Clemmons
Dearing, M. (A)

Clinton (NC-3)
Bell, L. T. (A)

Durham (NC-3)
Bartlett, G. W. (A)
Bowers, G. (A)
Cook, J. G. (A)
Killian, T. J. (F)
Owen, H. A., Jr. (M)
Pierce, J. F. (SM)
Rudisill, J. A., Jr. (A)
Seeley, W. J. (SM)

Elizabethtown (NC-3)
Baird, J. W. (A)

Elon College
Welsh, W. A. (SM)

Fayetteville (NC-3)
Hedson, H. D. (A)
Ikner, J. J., Jr. (A)

Fort Bragg (NC-3)
Dobson, D. B. (A)
Pryga, J. F. (A)
Zimmerman, D. N. (A)

Gastonia (NC-3)
Franevski, M. (M)
Millers, C. W. (A)

Germantown (NC-3)
Long, E. S. (A)

Gibsonville (NC-3)
Rudisill, M. E. (A)

Goldsboro (NC-3)
Trueblood, D. B. (M)

Greensboro (NC-3)
Adams, T. N. (M)
Aitkenhead, J. (A)
Annas, P. D. (M)
Atcheson, S. E. (M)
Bescherer, E. A. (SM)
Best, R. H. (A)
Boyle, H. R. (M)
Brooker, E. G., Jr. (A)
Cable, R. L., Jr. (A)
Gardiner, J. G. (SM)
Hall, R. P. (A)
Harmon, W. A., Jr. (M)
Johnson, W. H. (A)
Langston, J. W. (A)
Malone, W. H. (M)
Marteena, J. M. (VA)
Rea, R. C. (A)
Schaffer, L. I. (A)
Shore, E. B. (A)
Stanton, G. L. (A)
Strandberg, C. F. (A)
Wescott, J. C. (A)
Yelverton, W. M. (A)

Greenville
Landry, E. P. (A)

Hendersonville (NC-3)
Jones, H. T. (A)

Hickory (NC-3)
Long, T. E. (A)

High Point (NC-3)
Bivins, J. F. (SM)
Caldwell, D. J. (M)
Portare, S. A. (A)

Hubert (NC-3)
McLendon, J. T., Jr. (A)

Jamestown
Moore, R. L. (M)

Kinston (NC-3)
Hurt, A. B., Jr. (A)

Laurinburg
Phillips, G. W. (A)

Lexington (NC-3)
Myers, A. S., Jr. (A)

Lumberton (WC-3)
Howell, J. E. (M)

Manteo
Shannon, B. F. (A)

Matthews (NC-3)
Mullis, C. B. (A)

Madison
Idol, C. A. (A)

Mebane
Mincey, J. H. (A)

Monroe
Sutton, G. L. (A)

Mt. Airy (NC-3)
Epperson, R. D. (A)
Epperson, R. H. (A)

New Bern
Haire, B. G. (A)
McKnight, V. J. (A)

Newton (NC-3)
Whisenhunt, J. A. (A)

Pfafftown (NC-3)
Garrison, W. H. (M)

Raleigh (NC-3)
Askew, J. B. (A)
Baldwin, C. M., Jr. (A)
Bloodworth, G. M. (A)
Brennecke, C. G. (F)
Carson, V. S. (SM)
Colvert, F. T. (A)
Corns, R. B. (A)
Crenshaw, D. M. (A)
Dawkins, L. L. (SM)
Duncan, V. D. (M)
Hall, W. H. C. (A)
Hartenstein, W. G. (A)
Higgins, J. F. (A)
Hoadley, G. B. (SM)
Holland, R. W. (A)
Hulick, H., Jr. (SM)
Jenkins, B., Jr. (A)
Kahn, S. H. (M)
Litzaw, H. R. (A)
Manning, E. G. (M)
McArthur, C. S., Jr. (A)
McCotter, J. L., Jr. (A)
McCrary, D. G. (A)
McKenzie, A. D. (A)
Meadow, W. L. (M)
Moore, C. H. (A)
Nelson, M. W., Jr. (A)
Oom, D. G. (A)
Overton, J. W. (A)
Ramey, R. L. (A)
Rothstein, R. I. (A)
Russell, J. F., Jr. (A)
Sanford, B. E. (A)
Scoggin, W. G., Jr. (A)
Sloop, W. B. (A)
Speed, W. J. (M)
Stearns, H. F. (A)
Stephenson, J. W. (A)
Sugg, C. H. (A)
Thorne, M. G. (A)
Tompkins, E. H., Jr. (A)
Zindler, G. F. (A)

Reidsville (AT-6)
Craddock, H. C., Jr. (A)

Sanford (NC-3)
Buchanan, T. B. (A)

Shelby
Mathis, J. E. (A)

Washington (WC-3)
Metts, L. W. (A)

Wendell (NC-3)
Todd, M. C. (M)

Wilmington (NC-3)
Alexander, C. S. (A)
Aycock, E. H. (A)
Mitton, D. V. (A)
Peebles, N. A. (A)

Winston-Salem (NC-3)
Adkins, F. L., Jr. (A)
Arnold, H. H. (SM)
Baity, A. C., Jr. (A)
Bean, H. L. (A)
Bean, R. C. (A)
Beard, C. E. (VA)
Bernhard, H. H. (A)
Bertie, C. E. (SM)
Bolston, L. (A)
Brown, P. A. (A)
Burley, F. E. (SM)
Carpenter, L. C. (A)
Coan, J. O., Jr. (A)
Corderman, R. C. (SM)
Cox, C. W. (A)
Daly, J. A. (SM)
Disher, R. S. (A)
Dresser, P. L. (A)
Dukes, J. D. (A)
Fisher, R. W. (M)
Gegenheimer, W. C. (SM)
Gerth, J. H. (SM)
Gordon, J. R. (M)
Gray, R. P. (A)
Hackenberg, F. U. (A)
Haines, M. D. (A)
Hamilton, R. D. (A)
Hanks, W. R. (A)
Heard, B. E. (A)
Hedrick, P. F. (SM)
Hege, A. L. (A)
Hoffman, W. R. (VA)
Hopper, F. L. (SM)
Hunter, P. H. (M)
Hyatt, W. R., Jr. (M)
Ivester, H. E. (A)
James, B. O. (A)
King, L. C. (A)
Lanford, W. E. (M)
Leonard, A. B. (A)
Libby, V. A. (A)
March, R. C. (A)
McFarland, R. T. (M)
McGrath, H. E. (A)
McMillin, D. L. (A)
Merchant, S. A., Jr. (A)
Miller, J. R. (A)
Miller, O. R. (A)
Moore, W. C. (A)
Morgan, G. T. (A)
Morris, W. L. (A)
Norwood, C. A. (A)
Oliver, C. W. (A)
O'Neal, O. R. (A)
Palmer, C. W. (SM)
Perich, M. (A)
Peters, R. A. (SM)
Pickett, R. T., III (A)
Porter, G. R. (A)
Reisenweaver, W. B. (M)
Rollick, W. D. (A)
Rossler, R. A. (A)
Rudroff, M. G. (A)
St. Clair, R. O. (A)
Salerno, A. (A)
Sharpe, E. F. (A)
Siphers, J. W. (A)
Smith, A. D., Sr. (A)
Smith, C. M., Jr. (SM)
Smith, F. C. (A)
Spikula, R. W. (A)
Stavrou, N. C. (A)
Stewart, J. C. (A)
Tardiff, R. C. (A)
Tarrant, S. R. (A)
Taylor, J. R. (A)
Tyack, L. C. (SM)
Van Cott, J. M. (A)
Van Doeren, C. A. (VA)
Ward, D. L. (A)
Ward, F. E. (A)

NORTH DAKOTA

Bismarck (TC-5)
Murdoch, J. P. (A)
Nelson, I. (M)
Zobel, E. R. (A)
Vavra, H. G. (A)

Buffalo (TC-5)
Gruneich, E. A. (A)

Cooperstown
Kuzmich, G. (A)

Dickinson
Smith, S. M. (A)

Fargo (TC-5)
Anderson, E. M. (A)
Foerster, A. C. (A)
Hetland, J. M. (VA)
Jallen, G. A. (A)

Grand Forks (TC-5)
Thomforde, C. (M)

Northwood (TC-5)
Halverson, R. P. (A)

Williston (TC-5)
Aalseth, E. P. (A)

OHIO

Ada
Davis, D. W. (SM)

Akron (AK-4)
Arman, C. E. (A)
Barnett, C. B. (A)
Berg, B. (M)
Berkey, R. H. (A)
Bettis, L. W. (A)
Bock, A. W. (A)
Bosomworth, G. P. (VA)
Bubb, W. J. (A)
Byrne, R. M. (M)
Chimera, V. J. (A)
Ciocca, F. J. (A)
Cleckner, D. C. (SM)
Colletti, N. (A)
Curtis, W. P., Jr. (A)
Deuser, D. A. (A)
DiCaudo, V. J. (A)
Eddey, E. E. (A)
Feldsman, W. O., Jr. (A)
Foley, J. S. (A)
Fordham, C. E. (A)
Forman, H. L. (A)
Funk, R. W. (M)
Gerhart, G. J. (A)
Goedde, H. A. (A)
Gunsten, R. T. (A)
Halijak, C. A. (M)
Hann, D. D. (A)
Helber, C. A. (M)
Hermansdorfer, J. E. (A)
Hively, R. L. (A)
Hix, E. W. (A)
Hogsed, H. B. (A)
Huffman, E. B. (A)
Iffland, H. L. (A)
Jonard, H. A. (A)
Jubin, T. A. (A)
Kane, C. G., Jr. (A)
Kelly, K. O. (M)
Kime, J. M. (A)
Knopp, I. L. (M)
Kostolansky, V. A., Jr. (A)
Lambert, C. O. (M)
Lanier, H. F. (M)
Leibowitz, S. (A)
Lewis, A. M. (A)
Michaelis, T. D. (A)
Miglicco, P. S. (A)
Miller, J. H. (A)
Monaghan, K. J. (A)
Nank, W. A. (A)
Nellis, R. E. (A)
Nelson, J. L. (A)
Nerhood, H. E. (A)
Newton, N. P. (M)
Paden, H. R. (A)
Pasquier, C. J. (A)
Peden, M. (A)
Perrin, B. J. (A)
Phares, D. P. (A)
Redmond, J. F. (A)
Richman, M. A. (M)
Riggs, A. L. (A)
Ringo, K. A. (A)
Roberts, L. H. (A)
Rohrich, C. G., Jr. (M)
Ryburn, P. W. (M)
Sabol, R. W. (A)
Shaffer, R. C. (M)
Shingler, D. F. (A)
Shiveley, H. G. (A)
Smith, P. C. (SM)
Snooks, W. E. (A)
Strang, J. R. (A)
Stukey, L. E. (A)
Thurnes, D. F. (A)
Vaughan, R. L. (A)
Walker, R. D. (A)
Watkins, W. H. (A)
Weinsheimer, W. E. (A)
Weyrick, R. C. (A)
Winkler, M. A. (A)
Wright, J. L. (A)
Yarnall, W. M. (A)

Alliance (HK-4)
Foulks, E. D. (A)
Smith, A. E. (A)

Alpha
Hall, J. J. (A)

Amlin (COL-4)
Rife, W. E. (SM)

Antwerp (FW-5)
Hislop, A. Q. (A)

Arcanum
Weber, S. E. (A)

Astabula (BN-4)
Morrison, H. F. (A)
Stevenson, L. M. (A)

Ashville
Young, P. D. (A)

Athens (COL-4)
Green, D. B. (VA)

Atwater (AK-4)
Meilander, W. C. (A)

Avon (CL-4)
Child, R. W. (A)
Gilbert, H. G. (A)

Avon Lake (CLE-4)
Dobosy, J. F. (SM)

Barberton (AK-4)
Austin, A. O. (F)
Bell, J. (A)
Cooper, G. P. (A)
Dittrich, W. A. (A)

Guthrie, F. W. (A)
Kelley, J. B. (M)
Miller, D. A. (M)
Pope, A. E. (A)
Tompkins, F. G. (M)
Whitehurch, N. E. (M)

Bay Village (CL-4)
Day, J. W. (A)
Friswold, F. A. (A)
Odell, M. P. (SM)
Schneider, P. (A)
Smith, C. W. (A)
Smith, T. H. (M)

Bedford (CL-4)
Bell, A. R. (A)
Jerome, W. R. (VA)
Kessler, J. C. (A)
Washko, F. H. (A)
Weaver, J. H. (A)

Berea (CL-4)
Blackman, C. P. (A)
Cleary, R. E. (A)
Epperson, J. B. (SM)
Hulme, W. P. (A)
Miles, T. O. (A)
Sanderson, R. B. (A)
Sharp, E. M. (A)

Bethel
Krody, J. L. (A)

Beverly (P1T-4)
Morgan, W. S. (A)

Bexley (COL-4)
Brooke, E. F. (M)

Bladen (CIN-5)
Steele, C. P. (A)

Bluffton (TOL-4)
Triplett, M. M. (A)
Triplett, W. R. (A)

Bowling Green (TDL-4)
Synnamon, J. H. (A)

Brady Lake (AK-4)
Cory, R. W. (A)

Brecksville (CL-4)
Brooks, R. C. (A)
Csensich, J. E. (A)
Dietrich, J. W. (A)
Hutton, W. G. (SM)
Nace, A. S. (SM)
Strong, H. E. (A)
Ulrich, J. F. (VA)

Bridgeport
Snefsky, E. A. (A)

Brooklyn (CL-4)
Andrews, F. C. (A)
Wood, R. M. (M)

Brookville
King, H. B. (M)

Canton (AK-4)
Arnold, E. N. (A)
Becher, W. D. (A)
Burtner, R. L. (SM)
Cable, J. A. (A)
Coppock, R. A. (M)
Duff, J. E. (A)
Greenham, R. L. (A)
Jameson, W. B. (A)
Koenig, J. G. (A)
Leist, L. G. (M)
Matzinger, J. R. (M)
Rohrer, G. W. (M)
Vignos, J. P. (A)
Walker, N. S. (VA)
Yary, N. (A)

Centerville (DAY-5)
Piety, E. W. (SM)
Puterbaugh, W. H. (A)
Rineer, I. (A)

Chagrin Falls
Kilroy, J. W. (M)
Shields, E. T. (A)

Chesterland (CL-4)
Mumma, H. A., Jr. (A)

Cheviot (CIN-5)
Spinner, L. N. (A)

Chillicothe (CIN-5)
Pulliam, P. E. (A)
Stewart, H. C. (A)

Cincinnati (CIN-5)
Adams, C. E., Jr. (A)
Alberts, W. S. (SM)
Albright, G. F. (A)
Ashman, A. B. (A)
Berberich, R. J. (A)
Bereskin, A. B. (SM)
Blair, D. (A)
Boothe, A. M. (A)
Bopp, C. (SM)
Bradmiller, R. W. (A)
Bratt, M. J. (A)
Breunig, W. H. (A)
Brockway, R. M. (A)
Brouse, H. L. (SM)
Brussard, E. J. H. (SM)
Cavanaugh, H. D. (A)
Clement, L. M. (F)
Collins, J. T. (A)
Cook, H. L., Jr. (A)
Cramer, L. F. (A)
Davison, F. A. (A)
Decker, R. H. (A)
Delker, A. G., Jr. (A)
Doctor, B. (A)
Doerr, W. H. (A)
Dold, C. W. (A)
Dowling, E. C. (A)
Duncan, D. B. (A)
Dutton, C. E. (VA)
Ebbeler, J. R. (M)
Edwards, R. L., Jr. (A)
Einbinder, L. W. (A)
Emmerling, E. J. (A)
Fenstermacher, A. L. (A)
Ferrell, D. (A)
Fleck, J. A. (A)
Ficke, H. C. (A)
Fischer, R. E. (M)
Fischler, P. E. (M)
Foster, A. P. (M)
Frommer, J. C. (SM)
George, P. H. (A)
Georger, L. J. (A)
Gieringer, C. K. (SM)
Glover, D. (A)
Griffin, W. H. (A)
Grosch, H. R. J. (SM)
Gulden, W. W. (M)
Haehnle, C. G. (M)
Harmon, C. J. (A)
Hauser, G. G. (A)
Heinzelman, G. J. (M)
Heising, C. R. (A)
Heller, E. A. (A)
Hentz, E. G. (A)
Herb, A. P. (A)
Herman, L. R. (A)
High, R. A. (A)
Himes, H. D. (A)
Hoeflein, H. F. (A)
Hoeltge, E. J. (A)
Hogan, C. M. (SM)
Holub, P. E. (A)
Hosea, R. A. (A)
Humphrey, W. R. (A)
Inderhees, J. A. (A)
Jacobs, A. (M)
Jenkins, R. A., Jr. (A)
Johnson, P. C. (A)
Johnson, W. C. (A)
Jones, E. M. (M)
Jordan, D. M. (VA)
Jugend, H. E. (A)
Kay, E. D. (A)
Kelly, C. M. (SM)
Kennedy, D. D. (M)
Kirschner, A. G. (A)
Kiss, J. S. (M)
Kleinman, J. M. (A)
Kniss, P. M. (A)
Knoblaugh, A. F. (M)
Kuck, B. M. (M)
Lambert, R. (A)
LaTaste, C. D. (A)
Lehman, R. H. (A)
Lehnhoff, R. G. (M)
Lepple, H. (M)
Linblad, T. N. (A)
Livezey, F. M. (A)
Lorah, P. W. (A)
Lucas, E. J. (A)
Luhn, P. J. (A)
Magnus, J. A. (A)
Maher, R. A. (M)
Martin, D. W. (SM)
McDonald, J. M. (SM)
McGehee, W. W. (M)
McNeely, W. E. (A)
Mentink, A. F. (A)
Mette, R. J. (A)
Meyer, A. (M)
Miller, R. E. (A)
Montgomery, W. D. (M)
Morse, C. (A)
Murphy, R. L. (A)
Murray, J. W. (A)
Nason, D. B. (M)
Nathan, R. (M)
Nebolsky, S. (A)
Needles, W. F., Jr. (A)
Nord, G. L. (M)
Novy, E. W. (M)
Overman, C. I. (A)
Price, H. J. (SM)
Quitter, J. P. (M)
Ragen, J. R. (A)
Rakel, R. H. (A)
Rhoads, D. O. (A)
Rice, L. (A)
Rockwell, R. J. (F)
Sasser, T. (A)
Schenck, R. L. (M)
Schroeder, W. R. (VA)
Schwarz, H. G. (A)
Scott, V. J., Jr. (A)
Shadley, F. C. (A)
Shaw, C. B., Jr. (A)
Sheese, O. C. (A)
Shirk, W. B. (SM)
Siefker, R. G. (A)
Smith, W. R. (A)
Staab, P. C. (A)
Stacy, R. A. (M)
Starek, R. A. (A)
Stegman, T. E. (A)
Stuhlbarg, S. M. (A)
Taylor, G. O. (M)
Tenenholtz, R. (A)
Timperman, E. J. (A)
Tupman, L. M. (A)
Turrell, R. M. (M)
Tyberg, A. H. (A)
Uphaus, R. H. (A)
Vandoch, S. C. (A)
Veilleux, R. M. (A)
Verkley, B. M. (A)
Voltaggio, F., Jr. (A)
Wahl, A. C. (M)
Ward, W. H. (A)
Wayne, W. C., Jr. (A)
Weber, C. E. (M)
Wedig, F. L., Jr. (SM)
Weinberg, D. (A)
Wetz, R. H. (M)
Whatley, R. L. (M)
Whatley, W. W. (A)
Williamson, G. F. (M)
Winder, C. F. (A)
Winkle, L. (A)
Wood, J. J. (A)
Wyzenbeek, A. (A)
Zimov, L. R. (A)
Zito, A. J. (A)

Clayton (DAY-5)
Hammel, R. E. (A)

Cleveland (CL-4)
Ackerman, E. K. (SM)
Anderson, F. D. (A)
Bakos, M. A. (M)
Banshak, W. G. (A)
Bartelme, R. R. (A)
Bechmann, R. (SM)
Begun, S. J. (F)
Benkelman, G. F. (SM)
Berg, D. F. (A)
Blauvelt, R. C. (SM)
Blount, R. (M)
Bossard, G. L. (M)
Briggs, R. F. (M)
Brincka, J. J. (A)
Broudy, R. M. (A)
Brown, C. W. (A)
Cameron, D. B. (M)
Campbell, J. H. (M)
Caskey, H. B. (M)
Chase, W. H. (SM)
Chatterton, L. N. (A)
Coffe, S. A. (A)
Collins, D. L. (M)
Cornell, P. M. (A)
Corsaro, L. J. (A)
Crows, H. (A)
Crozier, R. W. (A)
Cull, R. R. (M)
Dailey, R. (A)
Dambach, R. A. (A)
Dannemiller, J. R. (A)
David, B. W. (SM)
Delany, R. H. (A)
Dietrich, E. S. (A)
Dittenberger, R. J. (A)
Dittoe, R. E., Jr. (A)
Dougherty, J. P. (A)
Elmendorf, D. E. (A)
Elze, R. P. (A)
Everett, F. C. (VA)
Freeland, A. F. (A)
Farr, H. J., Jr. (A)
Ferrier, J. M. (A)
Frederico, B. D. (M)
Friedberg, M. R. (SM)
Galati, V. J. (A)
Gehrke, E. P. (A)
Geiger, D. L. (A)
Gerhan, C. F. (A)
Germano, C. P. (A)
Glaeser, A. F. (A)
Grace, C. H. (A)
Granger, L. V. (M)
Grasson, W., Jr. (A)
Gross, I. A. (SM)
Guild, E. G. (A)
Haas, M. L. (A)
Heckelman, R. W. (A)
Henkel, G. F. (A)
Herring, C. E. (A)
Hill, J. S. (SM)
Himelar, S. L. (A)
Howard, W. A. (SM)
Hubbard, J. W. (A)
Humphrey, A. J. (A)
Humrick, R. J. (A)
Ingledue, E. F. (M)
Jackson, W., Jr. (A)
Jacques, G. E. (A)
Jaffe, H. (SM)
Jaffe, L. (M)
Jira, J. W. (M)
Johns, L. T. (M)
Kantura, R. G. (A)
Keachie, J. H. (SM)
Kinkaid, J. C. (A)
Kohler, E., Jr. (VA)
Kres, A. J. (A)
Lannan, P. E. (SM)
Leemon, W. (A)
Leonard, S. E. (SM)
Lind, R. P. (A)
Lister, G. H. (SM)
Lomaz, D. D. (A)
Ludwig, S. (M)
Lutz, C. H. (SM)
Lyon, E. (A)
Maciag, E. T. (A)
Madden, W. H. (A)
Managan, W. W. (M)
Marsal, P. (M)
Mason, N. O. (A)
Mazur, E. F. (A)
McCollister, D. R. (A)
McKee, J. M. (A)
Menagh, F. H. (SM)
Moravek, E. J. (A)
McNeel, E. L. (A)
Meder, R. (A)
Morrow, L. A. (M)
Morse, B. K. (A)
Mosher, C. C. (A)
Nash, H. C. (A)
Neuwirth, K. R. (A)
Newborg, D. S. (A)
Newell, P. A. (A)
Oberrender, G. F., Jr. (A)
Oestermeyer, C. F. (A)
O'Gara, J. J. (A)
O'Hearn, W. F., Jr. (A)
Onysyk, J. (A)
Patton, N. E. (A)
Petrarca, T. (A)
Pettus, R. (A)
Pierce, D. E. (A)
Piwonka, W. G. (A)
Plakadis, A. P. (VA)
Potter, N. M. (VA)
Pulaski, M. E. (A)
Riley, R. M. (A)
Rodgers, R. C. (M)
Roeger, R. E. (A)
Saint-Amour, P. M. (A)
Sanderson, J. K. (M)
Schlosser, H. (A)
Schneider, R. F. (A)
Schramm, F. B. (M)
Seaton, G. (A)
Seldner, K. (A)
Semenluk, M. H. (A)
Seybold, J. F. (A)
Shandy, G. P. (M)
Sharp, F. R. (M)
Sheetz, J. I. (A)
Sherman, K. S. (SM)
Shipley, L. L. (A)
Sindelar, E. E. (A)
Smith, J. B. (A)
Snedeker, M. L. (SM)
Sollock, L. (A)
Stevens, H. E. (M)
Stoffel, L. L. (A)
Tasch, A. (A)
Temes, C. L. (A)
Temes, C. L. (A)
Thayer, J. W. (A)
Thurston, E. G. (A)
Ulmer, R. M. (A)
Van Arsdale, L., Jr. (SM)
Vinton, B. W. (M)
Warren, J. B. (A)
Watson, B. S. (A)
Weiss, W. A. (A)
Wells, M. (A)
Welman, V. A. (A)
Wermelskirchen, L. M. (A)
Whipple, G. D. (M)
Whittaker, B. H. (M)
Whitwell, O. D. (A)

Cleveland Heights (CLE-4)
Fox, R. A. (SM)
Gerstenberger, E. L. (A)
Glauberman, L. (A)
Heller, H. H. (M)
Hooper, J. R., Jr. (A)
Hoover, D. B. (A)
Horwitz, G. (A)
Hudson, A. E. (A)
Johannesen, J. D. (A)
Koeblitz, W. E. (A)
Lowenstein, J. F. (A)
Mattiat, O. E. (A)
Newman, H. B. (A)
Phillipps, L. E. (SM)
Scott, E. P. (A)
Shearer, R. L. (M)
Smith, C. E. (SM)
Westbrook, R. D. (A)
Wills, R. H. (A)

Clinton (AK-4)
Caulkins, F. A. (M)
Holler, J. R. (M)

College Hill (CIN-5)
Stewart, A. W. (M)

Columbus (COL-4)
Anthony, G. E. (A)
Antonevich, J. N. (A)
Autery, R. M. (A)
Bacon, J. (A)
Bauer, W. (M)
Beer, A. C. (A)
Benedict, G. R. (A)
Bertsch, R. A. (A)
Betz, C. R. (A)
Blessing, H. L. (A)
Bollinger, L. E. (A)
Boone, E. M. (SM)
Bridges, D. B. J. (A)
Bryant, L. L. (A)
Bulman, W. E. (A)
Carter, C. J. (A)
Chapman, C. M. (A)
Chope, W. E. (A)
Cohen, M. H. (A)
Cornetet, W. H., Jr. (A)
Cosgriff, R. L. (A)
Cox, H. L., Jr. (A)
Crane, N. B., Jr. (A)
Crowley, T. H. (A)
Damon, E. K. (A)
Dankworth, J. F. (A)
Dawirs, H. N. (A)
Dew, C. G. (A)
Dunson, P. M. (A)
Ellis, R. E. (A)
Frame, R. H. (A)
Gay, J. W. (A)
Gebhardt, C. C. (A)
Guernsey, E. D. (A)
Hayden, J. R. (A)
Higgy, R. C. (SM)
Hines, J. N. (A)
Hover, P. B. (A)
Jacoby, G. R. (A)
Jaeger, J. H. (SM)
Jones, E. A. (A)
Joost, A. E. (M)
Kopriver, E. O. (A)
Kouyoumjian, R. G. (A)
Kraus, J. D. (SM)
Kreis, R. J. (M)
Lawrence, G. M. (A)
Leonard, J. D. (A)
Levis, C. A. (A)
List, B. H. (A)
Lodge, L. L. (A)
Lorenz, T. J. (A)
Martin, R. E. (A)
Masters, R. W. (SM)
McFarland, R. S. (A)
McNichols, H. B. (A)
McPherson, G., Jr. (M)
Mendenhall, W. S., Jr. (A)
Merrill, R. L. (M)
Meitzmaier, M. E. (A)
Mitchell, J. P. (A)
Molloy, G. P. (SM)
Mueller, G. E. (SM)
Myers, O. C. (A)
Nafzger, L. H. (VA)
Orr, W. (A)
Paskell, E. (A)
Pattee, H. E. (A)
Perry, R. E. (A)
Peters, L., Jr. (A)
Phillips, C. E. (A)
Porter, C., Jr. (A)
Pressel, P. I. (A)
Radley, S. A. (A)
Randall, J. E. (A)
Reynolds, F. D. (A)
Roehm, J. D. (A)
Rumsey, V. H. (SM)
Sackett, W. T., Jr. (A)
Sanborne, J. M. (A)
Schneider, H. U. (A)
Seale, C. L. (A)
Sharr, P. C. (A)
Sherwood, E. M. (VA)
Sianti, W. (A)
Skitek, G. G. (M)
Sloan, C. B. (M)
Spitsbergen, M. (A)
Stember, L. H., Jr. (A)
Stewart, J. A. (A)
Stoutenburg, D. V. (A)
Tamplin, G. R. (A)
Thurston, M. O. (SM)
Tice, T. E. (A)
Tracy, R. C. (A)
Truxall, F. W. (A)
Walter, C. H. (A)
Ward, R. C. (A)
Warren, C. E. (SM)
Webster, R. E. (A)
Weimer, F. C. (M)
Wetherbee, J. K. (A)
Williams, J. C. (A)

Wolf, F. A. (A)
Wolfe, P. N. (A)
Yaw, D. F. (A)
Young, D. A. (VA)
Young, G. W. (A)

Conneaut (BN-4)
Dvorsky, A. L. (A)
Elston, J. A. (A)
Freidner, G. E. (A)
Keskinen, A. R. (SM)
Morrell, G. A., Jr. (A)
Sanfield, W. (A)

Cuyahoga Falls (AK-4)
Boyce, W. E. L. (A)
Brown, D. L. (A)
Burke, J. T. (M)
Davis, H. P. (A)
Diamantides, N. D. (A)
Evans, D. C. (A)
Flowers, H. L. (SM)
Glancy, D. R. (M)
Guethlein, J. J. (A)
Hartig, E. O. (A)
Hegbar, H. R. (SM)
Hines, T. H. (A)
Holmes, G. A. (A)
Kachurchak, C. (A)
Kennedy, E. D. (SM)
Mason, D. F. (A)
McCauley, C., Jr. (M)
McElwee, J. F. (A)
Meneley, C. A. (SM)
Miller, R. F. (A)
Morrill, C. D. (M)
Paxton, R. K. (A)
Rose, W. A. (A)
Saunders, S. R. (A)
Shackelford, W. T., III (M)
Sibila, K. F. (SM)
Steiner, W. L. (M)
Toman, W. J. V. (M)
Tracy, T. J. R. (A)
Trutko, J. M. (A)
Vance, P. R. (A)
Waldvogel, J. (M)

Dayton (DAY-5)
Adams, E. L. (SM)
Akin, P. A. (A)
Aleo, J. (A)
Allard, L. C., Jr. (A)
Allen, C. F. (A)
Allen, F. W. (A)
Althouse, J. M. (A)
Amrheim, O. C. (A)
Amundson, F. A. (A)
Anderson, J. R. (A)
Archer, R. F. (A)
Arenstein, G. H. (SM)
Aschbacher, S. J. (A)
Aulbach, C. E. (A)
Babuet, W. F. (A)
Baker, W. H. (M)
Baran, M. (SM)
Barchenger, B. W. (A)
Barker, W. J. (M)
Bartman, H. M. (A)
Barton, W. F. (M)
Bassett, D. M. (SM)
Beck, S. A. (A)
Becker, R. H. (A)
Beresford, H. E., Jr. (A)
Biddle, W. G. (M)
Birochak, E. (A)
Blacksmith, P., Jr. (A)
Bliss, G. B. (SM)
Boario, W. R. (A)
Bockenstedt, P. J. (A)
Boedeker, H. F. (A)
Boehme, C. D. (A)
Bordewisch, J. F. (A)
Borgelt, E. H. (A)
Bornhorst, K. F. (A)
Boyle, H. G. (A)
Braden, P. F. (A)
Braun, W. G. (M)
Braverman, N. (A)
Brothers, A. L., Jr. (M)
Brown, C. T., Jr. (A)
Brunelly, J. J., Jr. (A)
Bruns, C. R. (A)
Bryan, C. R., Jr. (A)
Bunnell, W. J. (A)
Butler, G. T., Jr. (A)
Butsch, L. M., Jr. (A)
Byrd, E. W. (A)
Campbell, D. L. (A)
Carney, J. J. (A)
Carothers, F. S., Jr. (A)
Carpantier, V. J. (M)
Caskey, O. G. (A)
Castanias, J. E. (SM)
Chapman, J. M. (A)
Charnock, L. J. (SM)
Chase, R. H. (A)
Cherpeski, R. P. (M)
Christian, H. K. (A)
Cichanowicz, H. J. (A)
Clark, A. H. (M)
Clark, P. H. (SM)
Close, P. B. (A)
Clute, D. G. (M)
Cochran, E. V. (A)
Combs, J. A. (A)
Conrad, C. G. (M)
Conrad, C. G. (M)
Cook, E. E. (M)
Cooper, E. H. (M)
Cooper, R. E., Jr. (A)
Copp, R. S. (A)
Cory, H. E. (A)
Couch, P. W. (A)
Cox, S. M. (A)
Crain, R. B. (A)
Croner, A. J. (M)
Cronin, W. M. (SM)
Curp, W. C. (A)
Daggett, E. H. (A)
Davis, C. H. (A)
Davis, E. C. (M)
Davis, W. B. (A)
Day, J. G. (A)
Deegan, T. J. (A)
Deeken, J. W. (A)
Deis, W. E. (A)
DeLisle, A. B. C. (A)
DeLuna, J. (M)
Dennis, J. L. (SM)
Desch, J. R. (A)
Dicke, A. H. (A)
Dietrich, D. J. (M)
Dow, D. G. (A)
Doyle, W. A. (A)
Duckwitz, W. G. (SM)
Dunn, F. S. (A)
Easley, L. E. (M)
Eckert, C. C. (SM)
Edwards, D. F. (A)
Egger, R. J. (A)
Elfenbein, W. (A)
Ellis, C. E., Jr. (A)
Ely, C. H. (A)
Falkowski, A. J. (M)
Farinet, F. A., Jr. (A)
Federlin, H. M. (M)
Fedotin, L. S. (A)
Feik, R. L. (SM)
Fensler, W. E. (M)
Ferguson, J. L. (A)
Finocharo, J. J. (M)
Fisher, P. A. (A)
Fix, O. W. (A)
Flanningam, L. A. (A)
Fouse, G. T. (SM)
Framme, R. J. (SM)
Franklin, C. S. (SM)
Fried, W. R. (A)
Friedman, H. (M)
Froggott, J. W., Jr. (A)
Fucci, E. A. (A)
Fugua, S. W. (A)
Galbraith, H. J. (A)
Galyean, M. W. (A)
Garrett, E. T. (A)
Georgi, J. P. (A)
Gerdemann, E. A. (A)
Gerdes, C. V. (A)
Getty, J. N. (A)
Gibbons, T. J. (SM)
Gibbs, L. L. (A)
Gieseeke, H. (A)
Glan, G. (SM)
Glenn, L., Jr. (A)
Glidewell, J. L., Jr. (A)
Goldfarb, B. J. (SM)
Goldman, A. (SM)
Goldman, C. C. (A)
Gregersen, K. J. (A)
Griffing, B. L. (SM)
Grillmeier, E. J. (A)
Gross, E. H. (A)
Guelzow, C. W. (A)
Guernsey, G. F. (SM)
Gulden, E. V. (M)
Hall, T. F. (A)
Hallman, L. B., Jr. (F)
Harmon, W. L. (A)
Harnett, R. J. (A)
Harrell, R. D. (A)
Hartwigsen, C. K. (A)
Hartzell, R. A. (A)
Hauser, P. D. (M)
Hayes, T. J. (M)
Hazen, R. R. (A)
Hazlett, W. D. (A)
Heffner, P. V. (A)
Helbig, E. M. (A)
Helldoerfer, C. S. (M)
Hemler, C. E. (A)
Henderson, A. B. (SM)
Hepfer, J. W. (A)
Herzog, W. F. (A)
Hesse, A. W. (A)
Heyd, J. W. (SM)
Hill, B. E. (A)
Hill, M. A. (M)
Hilsabeck, D. M. (M)
Hilt, W. M. (A)
Hinman, W. H. (A)
Hirshfield, J. L. (A)
Holloway, F. L. (SM)
Hood, W. L. (M)
Houpis, C. H. (A)
Hovey, W. J. (A)
Huckaby, J. H. (A)
Huff, R. L. (A)
Hull, R. S. (SM)
Hunt, M. L. (A)
Huster, L. W. (A)
Hutchinson, J. H. (A)
Ittelson, R. W. (SM)
Jacobs, M. (SM)
Jacobs, Y. (A)
Jahren, A. S., Jr. (M)
James, R. L. (SM)
Jamieson, F. P. (A)
Janer, R. (M)
Javorsky, J. J. (A)
Jerrell, J. H. (A)
Johnson, C. L. (A)
Johnson, D. A. (A)
Johnson, R. A. (M)
Jones, L. K., Jr. (A)
Jones, W. D. (M)
Jurgielewicz, S. S. (A)
Karabatch, F. (A)
Keller, C. N. (A)
Kennedy, J. B. (A)
Kern, J. I. (M)
Kesler, C. K. (A)
Kessler, C. W. (A)
Kester, R. E. (SM)
Keto, J. E. (F)
Kidd, G. B. (VA)
Kieburtz, R. B. (A)
Kienker, J. E. (A)
Kilheffer, L. D. (SM)
Kirlin, W. F. (A)
Klein, W. (A)
Knight, A. R. (SM)
Koenig, P. E. (SM)
Kohls, G. F. (A)
Kovacik, W. P. (A)
Kozloff, V. S. (A)
Kreitzburg, H. L., Jr. (M)
Krenzer, B. A. (M)
Kress, O. C. (A)
Lafferty, R. E. (A)
Lahn, F. C. (A)
Lairmore, G. E. (A)
Langston, G. A. (A)
Laschever, N. L. (SM)
Lathrop, R. C. (A)
Lauth, R. E. (A)
Lawrence, J. T. (M)
Lawson, S. A. (SM)
Lawyer, J. E. (A)
Lees, M. B., Jr. (A)
Lemonis, P. E. (A)
Levine, D. (M)
Lewis, C. H. (A)
Littell, C. C., Jr. (M)
Little, T. D. (A)
Lloyd, L. H. (M)
Lockwood, G. C. (A)
Long, L. E. (SM)
Long, R. E. (M)
Lord, A. S. (A)
MacCallum, J. M., Jr. (A)
Magee, T. H. (A)
Marshall, C. J. (SM)
Marvin, P. R. (SM)
Matthews, A. R. (M)
Mawdsley, R. L. (SM)
Mayhew, P. W. (M)
McCarthy, C. J. (A)
McCoy, O. Z. (A)
McElroy, G. A. (A)
McIlrath, R. J. (A)
McKeehan, W. F. (A)
McLaughlin, C. E. (M)
McLean, M. H. (A)
McLennan, M. A. (M)
McRae, A. H. (SM)
Mead, C. E. (A)
Mehron, M. E. (A)
Mendelson, D. A. (A)
Merwin, R. L., Jr. (A)
Meuche, C. H. (M)
Meyer, B. W. (A)
Michalski, E. H. (A)
Miller, J. E. (M)
Miller, R. A. (M)
Mohr, D. B. (A)
Monk, J. D. (A)
Moore, D. R. (A)
Moore, J. E. (A)
Morrison, C. D. (A)
Morrison, C. L. (A)
Muirhede, J. C. (A)
Mullen, J. P. (A)
Mumma, R. E. (SM)
Murray, P. R. (SM)
Meyers, R. P. (A)
Myszko, R. (A)
Nelson, N. A. (SM)
Nettleingham, M. D. (A)
Nicholson, J. K. (A)
Nielson, W. C. (A)
Nierstheimer, P. H. (A)
Noble, J. C. (M)
Noland, J. W. (A)
Null, F. E. (A)
Oebels, C. J. (A)
O'Neil, W. F. (A)
Ostrem, R. E. (A)
Otto, K. A. (A)
Overcash, F. J. (A)
Overholser, W. E. (A)
Overholt, R., Jr. (SM)
Owen, H. W. (SM)
Palm, W. A. (A)
Parker, A. P. (VA)
Pasek, J. (A)
Perdzock, R. C. (A)
Perper, L. (SM)
Peters, A. L., Jr. (SM)
Petit, A. H. (SM)
Pinson, C. C. (M)
Pirie, F. E. (A)
Pitinsky, L. (M)
Pokorny, J. J. (SM)
Ponticello, J. A. (A)
Powell, D. B. (A)
Powlis, A. (A)
Quam, D. L. (A)
Raabe, H. P. (A)
Rappaport, G. (SM)
Raso, F. A. (A)
Rautio, R. W. (A)
Rawhouser, R. (M)
Reeves, O. T. (A)
Regnier, L. A. (A)
Rice, K. J. (A)
Richard, P. R. (A)
Richards, E. L. (M)
Richmond, L. P. (SM)
Ridenour, P. W. (M)
Robbins, C. G. (A)
Robertson, G. M. (A)
Robertson, L. C. (A)
Rogers, A. J. (SM)
Rohlinger, D. J. (A)
Root, L. W. (M)
Rose, L. H. (SM)
Rothammer, W. H. (SM)
Rottenberg, M. J. (A)
Rounds, J. M. (A)
Russ, F. J. (SM)
Russell, H. J. (A)
Rychlik, R. F. (SM)
Rynda, T. C. (A)
Sadow, R. M. (A)
Sandor, L. K. (M)
Sather, R. O. (SM)
Sauer, R. J. (M)
Scarborough, C. S. (A)
Schantz, G. W. (A)
Scheer, G. H. (SM)
Schmeck, J. S. (A)
Schommer, G. R. (A)
Schonover, R. W. (A)
Schoonover, W. C. (A)
Schram, S. M., Jr. (SM)
Schreiber, E. J. (M)
Schulherr, R. M. (A)
Schwennesen, A. B. (M)
Scott, S. D. (A)
Segen, S. A. (A)
Selover, E. E. (A)
Sen, W. J. (SM)
Seneeal, T. L. (SM)
Shannon, F. J., Sr. (SM)
Shearer, W. G. (A)
Shekels, H. D. (SM)
Shelton, J. T. (A)
Shipp, R. L., Jr. (M)
Shively, D. F. (A)
Showen, L. (SM)
Siek, J. R. (A)
Siff, R. G. (A)
Silvestre, H. (A)
Sinclaire, L. W. (A)
Simopoulos, N. T. (A)
Smex, C. H. (SM)
Smith, D. A. (A)
Smith, D. (A)
Smith, F. W. (A)
Snow, J. E. (M)
Sogn, L. T. (A)
Sonnanstine, E. H., Jr. (A)
Spence, R. F. (A)
Spencer, R. H. (A)
Springer, L. D. (A)
Springer, P. W. (SM)
Stankosky, J. J. (M)
Stanton, J. S. (M)
Stees, H. S., Jr. (A)
Stephan, P. W. (A)
Stewart, J. R. (A)
Stimmel, R. G. (A)
Stockert, J. J. (A)
Stolzenbach, R. W. (SM)
Storck, H. C. (M)
Stouch, D. H. (M)
Striebel, D. R. (A)
Strother, J. F. (A)
Sturgill, L. G. (M)
Tarranta, G. (A)
Taylor, P. B. (SM)
Taylor, R. A. (A)
Teegarden, J. W. (A)
Thomas, C. P. (A)
Thomas, E. R. (A)
Thompson, C. W. N. (A)
Thresher, W.E. (M)
Thumser, L. F., Jr. (A)
Thurston, C. D. (A)
Tomberg, S. (A)
Troetschell, W. O. (A)
Troy, P. (A)
Turner, E. M. (M)
Vaccaro, E. E. (A)
Vangunten, L. F. (M)
Van Horn, J. W. (A)
Velesky, J. J. (M)
Vendely, B. (A)
Vinz, F. L. (A)
Voltaggio, F., Jr. (A)
Wallin, W. (M)
Walling, G. P. (A)
Wamboldt, H. (A)
Warner, W. V. (A)
Warshawsky, L. M. (A)
Warwick, J. D. (A)
Watton, A., Jr. (SM)
Webb, W. C., Jr. (A)
Webster, A. L. (A)
Wehner, G. L. (A)
Wehner, G. K. (M)
Wehrman, R. B. (A)
Weiner, G. (A)
Weis, C. F. (M)
Weiss, E. J. (A)
Weissman, S. (SM)
Welch, C. A. (A)
Whelan, R. E. (A)
White, S. B. (A)
Wichmann, T. F. (A)
Wiegert, P. G., Jr. (M)
Wieland, E. S. (SM)
Wilkinson, J. E. (M)
Williams, H. L. (A)
Winston, C. B. (A)
Winterhalter, P. B. (A)
Winters, W. D. (A)
Wolford, C. E. (A)
Wright, T. O. (A)
Wyse, D. S. (A)
Wyse, H. G. (A)
Yarbrough, L. A. (M)
Volles, J. (SM)
Yoshida, H. (A)
Young, J. K. (A)
Young, L. McC. (SM)
Zalusky, C. W. (A)
Zeun, W. C. (A)
Zieman, C. M. (A)
Zimmerman, R. F. (M)
Zwissler, H. R. (A)

Deer Park
Sheridan, C. J. (A)

Doylestown
Nuss, R. J. (A)

East Cleveland (CL-4)
Howard, G. T. (A)
Hunt, C. R. (A)
McNeill, T. J. (A)
Schunemann, C. F. (M)
Serota, R. M. (A)
Ward, D. O. (A)

East Liverpool
Walsh, T. M. (A)

Elmore (TOL-4)
Bay, R. J. (A)

Elyria (CL-4)
Finegold, I. (A)

Enon (DAY-5)
Garman, D. F. (A)

Euclid (CLE-4)
Armstrong, H. L. (A)
Bieda, S. J. (A)
Calderhead, H. J. (M)
Frenk, D. R. (A)
Pfaff, R. W. (A)
Sheffs, J. F. (A)
Stevko, P. J. (A)
Yeager, J. R. (A)
Zbacnik, E. V. (A)

Ewington (CIN-5)
Terry, L. B. (A)

Fairborn (DAY-5)
Adamson, L. B. (M)
Anderson, H. L. (A)
Archer, C. J. (SM)
Buxton, R. W. (A)
Carroll, C. F. (SM)
Chin, W. Y. (A)
Conway, B. B. (A)
De Camp, P. W. (A)
De Jonghe, J. J. (A)
Ebert, H. P. (A)
Faust, R. L. (A)
Groszewski, D. J. (M)
Guenthner, F. K. (A)
Helms, W. B. (A)
Hines, C. A. (A)
Hybskmann, V. L. (A)
Kouri, F. G. (SM)
Levy, J. (A)
Lieber, M. (A)
Manlove, W. R. (A)
Maver, I. S. (SM)
McDowell, M. S. (A)
Miller, F. P. (A)
Miller, G. S. (A)
Peterson, L. S. (A)

Reber, J. H. (A)
Rizos, J. G. (SM)
Scott, J. E. (SM)
Stecher, LeR. (A)
Timineri, A. A. (A)
Trader, J. E. (A)
Truman, L. N. (A)
Vanderpool, H. D. (A)
Varga, M. J., Jr. (A)
Whitlock, R. S. (A)
Wolaver, L. E. (A)
Zingg, J. F. (A)

Foster
Porter, J. R. (A)

Fostoria
Peck, J. L. (A)

Franklin (DAY-5)
Bryant, V. D. (M)

Fremont (TOL-4)
Leite, R. C. (A)
Swartzlander, G. W. (A)

Gahanna (COL-4)
Daugherty, W. M. (A)

Galion (AK-4)
Blashfield, W. H. (A)
Brenton, G. P. (M)
Crissinger, W. W. (A)
Haferd, F. H. (A)
Lewis, F. C. (A)
Murphy, C. E. (A)
Van Valkenburgh, R. (A)
Willyard, C. H. (A)

Gallipolis (CIN-5)
JaQuay (A)

Garfield Heights
Kress, M. (A)

Gates Mills (CL-4)
Eggerding, H. B. (A)

Genoa
Nitschke, N. C. (A)

Germantown (DAY-5)
Belanger, F. (M)
Burns, J. H. (A)

Girard (AK-4)
Williams, W. C. (A)

Grafton
Wack, C. B. (A)

Granville (COL-4)
Taylor, L. L. (A)

Grove City (COL-4)
Barbee, V. A. (A)

Groveport (COL-4)
Minor, W. C. (M)

Hamilton (CIN-5)
Anderson, J. L. (A)
Bange, D. A. (A)
Bange, J. B. (A)
Mize, J. L. (A)
Purdy, J. A. (A)
Staege, S. A. (VA)
Stump, A. M. (M)
Wear, J. (A)
Winkeljohann, A. (A)

Hicksville (TOL-4)
Applegate, H. E. (SM)

Hubbard
Keller, T. B., Jr. (A)
Werner, S. A. (A)

Huron (CLE-4)
Keefe, J. R., Jr. (A)
Wilber, B. E. (A)

Ironton (CIN-5)
Loftis, H. J. (VA)

Kent (AK-4)
Cobbs, E. R. (A)
McClary, D. A. (A)
Norris, P. C. (A)
Wightman, E. E. (M)

Kingston (CIN-5)
Leasure, R. B. (M)

Lafferty (PIT-4)
Sulek, F. (A)

Lakewood (CL-4)
Auth, L. V., Jr. (A)
Bidlack, C. S. (VA)
Bledsoe, R. E. (A)
Evers, A. J. (A)
Flack, S. G. (VA)
Hamman, G. B. (M)
Jacob, W. P. (M)
Pierce, R. M. (SM)
Sanders, N. D. (A)
Seielstad, H. D. (SM)
Smolensky, G. S. (A)
Thacker, C. E. (A)
Torsch, C. E. (SM)
Webner, R. D. (M)
White, G. M. (M)

Lancaster (COL-4)
Gamble, E. H. (SM)
Good, J. A. (M)
Hudson, R. S. (A)
Iler, G. W. (M)
Magestro, J. C. (A)
Robinson, D. F. (M)

Lebanon
Wadsworth, N. L. (A)

Leipsic (TOL-4)
Barber, L. E. (A)
Swiderski, E. F. (A)

Lorain (CL-4)
Goodell, W. A. (M)
Heisner, D. A. (M)
Herrick, R. H. (SM)
Huge, H. M. (A)
Kauffman, H. C. (M)
Romoser, P. E. (A)

Louisville (AK-4)
Boudler, A. G. (A)

Loveland
Hancock, H. E. (M)
Reed, J. E. (A)
Sanborn, R. H. (A)
Sparks, B. H. (A)

Lyndhurst (CL-4)
Dalasta, F. (M)

Madeira
Schneider, C. A. (M)

Mansfield (AK-4)
Cassidy, R. J. (M)
James, R. B. (A)
Kissel, M. M. (A)
Naborowski, J. G. (A)

Maple Heights (CL-4)
Chevron, R. R. (A)
Crail, A. C. (M)
Radcliffe, T. J. (A)

Maplewood (TOL-4)
Hodge, R. M. (A)

Marietta (PIT-4)
Clark, C. E. (A)

Martins Ferry
Daubenmeyer, H. L., Jr. (A)

Mason (DAY-5)
Lantzer, F. N. (M)
Walker, R. E. (A)

Massillon (AK-4)
Horton, M. C. (A)
Schwab, C. B. (M)

Masury
Werner, S. A. (A)

Mayfield Heights (CLE-4)
Hitt, J. J. (A)
Karbo, D. J. (A)
Reilly, E. J. (A)

Medway (DAY-5)
Cool, P. E. (A)
Kercher, R. B. (A)
Price, L. B. (A)
Soorin, A. J. (A)

Mentor (CLE-4)
Ryan, W. J.

Miamisburg
Gnagey, L. B. (A)
Schreiber, P. W. (A)

Middletown (CIN-5)
Christner, E. N. (VA)
Westerlund, K. I. K. (A)

Minford (CIN-5)
Braddock, R. C. (A)
Marsh, J. H., Jr. (A)

Mingo Junction (PIT-4)
Crisante, A. E. (A)

Mt. Healthy (CIN-5)
Bass, H. (SM)
Holst, P. F. G. (SM)

Mt. Vernon (COL-4)
Woodward, R. O. (A)

Munroe Falls
Nickson, R. W. (A)
Purcell, W. E. (A)

Napoleon (TOL-4)
Honeck, B. H. (A)
Roessing, E. F. (A)

New Carlisle (DAY-5)
Clark, T. P. (A)
Goode, R. M. (M)
Jeffers, G. N. (A)
Lewis, La. V. (A)
Lower, R. (SM)
Marak, G. E. (A)
Maxim, W. A. (A)
Shanteau, N. G. (A)
Thom, A. R. (M)
Wenger, F. E. (A)

New London
Eddleston, J. H. (A)

Newton
Earle, E. W. (A)

New Washington
Kreim, W. J. (A)

North Canton (AK-4)
Allaback, W. (A)
Bushnell, R. H. (A)
Gray, D. W. (M)
Haas, D. L. (A)
Stahl, M. D. (VA)
Wehl, G. E. (A)
Zurcher, L. A. (A)

No. College Hill
Stewart, A. W. (M)

N. Olmsted
Kennedy, D. D. (M)
Weiler, R. J. (A)

Norwood (CIN-5)
Eisemann, R. K. (A)
Willsey, R. H. (A)

Oakwood (FW-5)
Colwell, R. E. (SM)

Oberlin
Howe, C. E. (M)
Young, M. L. (A)

Olmsted Falls (CL-4)
Thomas, B. M. (A)

Orrville
Rouvalis, G. (A)

Ottawa (TOL-4)
Forbush, E. G. (A)
Goodkin, S. S. (A)
Moen, J. W. (A)
Schoonover, D. J. (A)

Oxford
Teetzel, F. M. (A)

Painesville
Plaisted, R. J. (A)

Park Ridge
Passow, E. B. (SM)

Parma (CL-4)
Berardi, C. S. (A)
Dombey, W. C. (A)
Gartman, A. R. (A)
George, W. C. (SM)
Manley, E. B. (A)
Miller, K. W. (A)
Millin, I. (A)
Schindler, R. W. (A)
Sommer, R. A. (A)
Tuma, W. S. (A)

Parma Heights (CL-4)
Boyd, B. (M)
Brinkman, H. A. (A)
Chandler, J. A. (A)
Prusha, G. J. (A)

Perrysburg (TOL-4)
Forman, H. R. (A)
Griss, C. H. (M)

Piqua (DAY-5)
Sprinkle, R. E. (M)

Portage
Klopfenstein, L. R. (A)

Port Clinton (TOL-4)
Hrupcho, J. J. (A)
Morgan, W. O. (A)
Wozniak, A. J. (A)

Portsmouth (CIN-5)
Gilmer, C. J. (A)

Ravenna (AK-4)
Braden, W. V. (A)
Morton, R. F. (A)

Redding
Eckenrode, R. L. (A)

Reynoldsburg (COL-4)
Chute, R. D. (M)
Walker, K. A. (A)

Rocky River (CL-4)
Clauer, C. K. (A)
Douglass, J. D. (A)
Kazarian, R. (A)
Mentzer, P. K. (M)
Stover, F. J., Jr. (A)

Rossford (TOL-4)
Perch, D. F. (A)

Rossmoyne (CIN-5)
Woodcock, C. A. (A)

Rushtown (CIN-5)
Stubbs, D. L. (M)

St. Bernard (CIN-5)
Makinson, G. E. (VA)
St. Villiers, D. R. (A)

St. Clairsville
Skoff, J., Jr. (A)

Sandusky (CL-4)
Conlin, H. T. (A)
Derrick, W. A. (A)
Edwards, D. E. (A)
Feick, J. C., Jr. (A)
Fraser, R. J. (A)
Freyberg, J. A. (A)
Hummer, E. W. (A)
Kenyon, H. S. (SM)
Larkin, E. D. (A)
Searle, L. M. (M)
Wild, J. H. (A)

Shaker Heights (CL-4)
Gotschall, G. D. (A)
Kail, W. F. (A)
Keithley, J. F. (M)
Rickards, W. H. (A)
Seidman, S. M. (A)
Slor, A. D. (A)

Sharonville
Kerhulas, A. T. (A)
Mark, W. R. (A)

Shelby
McPherson, R. W. (A)

Sidney (TOL-4)
Ulman, W. H. (A)
Wibel, D. (A)

Silverton (CIN-5)
Bertram, M. A. (A)

South Euclid (CL-4)
Davis, W. C. (SM)
Louden, W. C. (A)
Monroe, R. T., Jr. (A)
Schwartz, L. W. (A)

Solon
Sahli, B. E. (A)
Saint-Amour, J. D. (A)

Springfield (DAY-5)
Anderson, J. C. (A)
Baer, C. E. (SM)
Beedy, R. (A)
Bell, A. L. (SM)
Carey, R. M. (M)
Castillo, H. T. (A)
Cunningham, H. W. (A)
Davis, C. R. (A)
Hockman, P. E. (M)
Jones, T. G., Jr. (A)
McLaughlin, I. L. (A)
Myers, E. E. (A)
Nizyborski, E. S. (A)
Parker, A. J. (M)
Pingel, N. D. (A)
Rosenberg, H. J. (SM)
Stuetzer, O. M. (SM)

Spring Valley (DAY-5)
Cunningham, R. F. (SM)
Hearsum, D. R. (M)
Holt, T. (A)
Horst, W. R. (A)

Stow (AK-4)
Andresen, G. J. C. (A)

Sugar Creek (PIT-4)
Machan, R. D. (A)

Sylvania (TOL-4)
Boudouris, A. (M)

Tallmadge (AK-4)
Jackson, D. H. (A)
Farnsworth, N. B. (M)
Mead, R. J. (M)

Terrace Park (CIN-5)
Jordan, J. F. (F)

Tiffin (TOL-4)
Hartman, R. E. (A)

Toledo (TOL-4)
Allsop, A. F. (A)
Ambrose, J. (A)
Beins, J. K. (M)
Bell, R. E. (A)
Birk, E. V. (A)
Bitter, A. R. (SM)
Brillhart, M. F. (A)
Brown, W. R. (A)
Cameron, D. F. (M)
Chapman, L. B. (A)
Czajka, R. F. (A)
Davey, D. F. (A)
Drescher, L. L. (A)
Eash, G. H. (A)
Ewing, D. J., Jr. (A)
Flick, J. R. (A)
Franks, C. V. (A)
Galambos, L. G. (A)
Garing, H. R. (M)
Grambich, H. F. (A)
Hawley, F. S. (A)
Hedler, R. C. (A)
Herrick, K. P. (A)
Holmes, H. R. (A)
Hubbard, C. L. R. (A)
Ingersoll, G. F. (A)
Jakab, J. J. (A)
Kearney, J. P. (SM)
Keck, M. W. (M)
Ketcham, A. R. (M)
Kirchenbauer, C. C. (SM)
Kistner, H. R. (A)
Kitchen, F. J. (A)
Klinger, D. E. (A)
Kotlewski, J. P. (A)
Krajewski, S. J. (A)
Laker, F. J., Jr. (A)
Larson, R. G. (M)
Lippmann, R. J. (A)
Marsh, R. H. (A)
McCown, W. E. (A)
McGee, J. W. (M)
Meeker, J. G. (A)
Melcher, R. J. (A)
Morrison, E. (A)
Nagy, L., Jr. (A)
Neuert, H. L. (VA)
Patay, J. J. (A)
Petty, D. E. (A)
Pickens, H. V. (A)
Pierce, E. W. (A)
Plummer, J. H. (M)
Rees, V. C. (A)
Robert, A. J. (A)
Rowe, H. N. (M)
Rynder, L. S. (M)
Scherer, R. T. (A)
Schillo, T. B. (SM)
Schnell, W. S. (A)
Schoor, V. M. (A)
Seppeler, W. C. (A)
Sexton, E. M. (M)
Sheehan, F. J. (A)
Sprengel, W. L. (A)
Stringfellow, W. M. (SM)
Szymkowiak, E. (A)
Thomson, C. R. (M)
Thorpe, C. R. (A)
Vincent, H. B. (SM)
Walker, R. J. (A)
Weeber, R. E. (A)

Trotwood (DAY-5)
Barkley, M. M. (SM)

Troy (DAY-5)
James, F. E. (A)
Rogers, R. M. (M)
Schmidt, H. J. (A)

Uhrichville (PIT-4)
Charlton, V. E. (A)

Union (DAY-5)
Apple, R. C. (VA)

Uniontown
Perry, R. C. (A)
Welch, G. H. (M)

University Heights (CL-4)
Bletcher, A. L. (A)
Goldfarb, J. (A)
Roth, M. S. (M)
Williams, H. C. (M)

Vandalia (DAY-5)
Johnston, H. C. (SM)
Mayer, J. M. (A)

Van Wert (FW-5)
Conley, W. H. (A)
Lindsay, J. T. (A)

Vermilion-on-the-Lake (CL-4)
Gall, C. E. (A)

Wadsworth (AK-4)
Blair, L. R. (A)

Walbridge (TOL-4)
Corathers, C. N. (A)

Warren (AK-4)
Atwood, W. L. (SM)
Ensall, T. (M)
Parlas, J. L. (M)

Waverly (CHI-5)
Kinker, D. E. (A)
Swiger, J. M. (A)

W. Carrollton
Williamson, J. A. (A)

Westlake
Fletcher, E. S. (SM)

West Portsmouth (CIN-5)
Wiltshire, R. S. (A)

W. Richfield (AK-4)
Bear, N. (A)

W. Toledo
Rees, V. C. (A)

Wickliffe
Schilling, M. O. (M)
Schwaller, F. A. (A)

Willoughby (CLE-4)
Goodman, P. D. (M)
Mason, R. F. (A)
Viton, E. J. (A)

Wooster
King, R. E., Jr. (A)

Worthington (COL-4)
Clutter, E. C. (A)
Crooks, R. K. (SM)
Davis, W. C. (M)
Gahm, W. L. (A)
Kean, P. M., Sr. (A)
Kreuz, W. E. (A)
Neubauer, R. A. (A)
Roode, R. J. (A)
Van Buskirk, R. C. (A)
Work, R. A., Jr. (A)

Wyoming (CIN-5)
Bolenbaugh, R. K. (M)
Diehl, J. A. (A)
Walcher, J. F. (A)

Xenia (DAY-5)
Anderson, C. W. (VA)
Arment, D. E. (A)
Doran, R. J. (SM)
Doyle, C. E. (A)
Georgia, A. (M)
Knight, L. B. (M)
Manor, N. D. (A)
Mead, W. L. (M)
Morgan, D. E. (A)
Noble, H. V. (SM)
Nordlund, R. J. (SM)
Palmer, J. C. (A)
Philips, S. C. (A)
Sides, J. D. (A)

Yellow Springs
Carr, D. L. (A)
Colbert, C. (SM)

Youngstown (AK-4)
Cherpack, J., Jr. (A)
Conroy, M. J. (A)
Dieringer, F. A. (VA)
Kikta, E. J. (A)
Phillips, R. G. (A)
Recklies, F. W., Jr. (A)
Ross, N. V., Jr. (A)
Small, J. P. (A)
Umbach, L., Jr. (A)
Wallen, A. C. (A)

Zanesville (PIT-4)
Hunt, W. A. (M)
Thompson, C. O. D., Jr. (A)

OKLAHOMA

Ardmore (OC-6)
Kimball, V. L., Jr. (M)
Lewis, R. E. (A)

Atoka (OC-6)
Glover, B. W. (M)

Bartlesville (TUL-6)
Adams, M. M. (A)
Bondurant, J. E. (A)
Greening, J. P. (A)
Hensley, W. A. (M)
Johnson, E. W. (A)
Kindred, R. L. (A)
Kuntz, G. L. (A)
Marsden, R. S., Jr. (M)
Owen, J. D. (A)
Parsons, J. R. (A)
Piety, R. G. (VA)
Tolin, E. D. (A)

Bethany (OC-6)
Hill, W. M. (M)

Broken Arrow (TUL-6)
Hawkins, J. E. (A)
Smith, D. (A)

Dewey
Kling, S. R. (A)

Duncan
Hulme, J. R. (A)

Enid (OC-6)
Garriott, O. K. (A)

Frederick (OC-6)
Jones, J. D., Jr. (SM)

Garber
See, R. M. (A)

Guthrie (OC-6)
Hulsey, R. E. (A)

Kingfisher (OC-6)
Thomas, C. W., Jr. (A)

Midwest City (OC-6)
Bierach, K. F., Jr. (M)
De Rosa, G. D. (A)
McDonald, T. K. (M)
Miller, J. W. (M)
Moser, J. F. (A)
Wallach, C. (M)
Woods, A. L. (M)

Norman (OC-6)
Amin, M. R. (A)
Challenner, A. (A)
Dorsett, L. G. (A)
Farrar, C. L. (M)
Green, B. B. (A)
Harman, D. G. (M)
Harp, C. E. (SM)
Mathis, H. F. (SM)
Rennie, D. P. (A)
Tuma, G. (A)
Wright, N. E. (A)

Oklahoma City (OC-6)
Adams, C. W. (M)
Ashby, R. H. (M)
Ashley, A. B. (M)
Barnett, J. E. (A)
Battenburg, N. (A)
Bird, D. W. (A)
Black, E. (M)
Bolay, C. E. (A)
Brown, R. W., Jr. (A)
Bruno, A. R. (A)
Chu, T. M. (A)
Clifton, J. L. (A)
Clinkenbeard, H. A. (A)
Crippen, E. G. (A)
Daniels, C. L. (M)
Dayton, W. P. (A)
Eastman, C. W. (A)
Easum, C. M. (M)
Ebner, W. H. (A)
Foster, E. W. (M)
Fricks, W. H. (M)
Hammer, F. E. (A)
Hannan, C. V., III (A)
Hart, C. O. (M)
Hazelwood, C. A. (A)
Herrmann, F. (M)
Holt, G. W. (M)
Jackson, J. H., Jr. (M)
Jenkins, K. A. (M)
Kobos, F. (A)
Labarthe, L. C. (A)
Ledbetter, R. P. (M)
Lucey, W. E. (M)
Lyons, E. F. (A)
Macadam, J. F. (M)
Marriman, H. J. (M)
McClung, R. R. (M)
McCown, J. R. (M)
McGowan, C. W. (A)
McKinley, H. W. (SM)
Mueller, C. W. (M)
Myers, E. N. (A)
Oliver, D. S. (M)
Pickens, F. T., III (A)
Ramsey, O. B., Jr. (A)
Ricciotti, S. (M)
Rosenberry, W. J. (M)
Sheaffer, C. F. (VA)
Spooner, A. J. (M)
Straiton, J. C. (M)
Thomas, M. W. (A)
Thompson, L. V. (M)
Todd, H. A. (M)
Trexler, V. L. (A)
Weisiger, J. M. (M)
Wight, G. S. (A)
Williams, F. G. (A)
Zelinger, F. F. (M)
Zuhn, W. E., Jr. (M)

Perry (TUL-6)
Bailey, J. M. (A)

Ponca City (TUL-6)
Brown, G. L. (A)
Doty, W. E. N. (A)
Hall, M. L. (A)
Horwitz, L. B. (A)
Moxley, S. D., Jr. (A)
Overall, G. J. (A)
Wann, L. D. (A)

Quinlan (OC-6)
McFadin, R. L. (A)

Sand Springs (TUL-6)
Bradley, W. H. (A)
Russell, J. D. (A)
Stullken, R. D. (A)

Shawnee (OC-6)
Cowan, P. J. (A)
Johnson, L. W. (A)
Kolp, J. S. (M)
Wayne, J. W. (A)

Stillwater (TUL-6)
Barton, J., Jr. (A)
Betts, A. L. (M)
Buck, R. F. (A)
Fristoe, H. (SM)
Johnson, D. L. (SM)
Jones, H. L. (SM)
Norman, R. H. (A)
Schedler, E. W., Jr. (A)

Tinker AFB (OC-6)
Weaver, T. H., Jr. (M)
Williams, L. D. (A)

Tulsa (TUL-6)
Alexander, W. A. (A)
Allen, E. C. (A)
Alme, J. N. (A)
Arrington, R. A. (A)
Austin, R. A. (A)
Baker, J. T. (A)
Barkalow, D. E. (M)
Bennett, A. D. (A)
Bieber, H. P., Jr. (A)
Biggs, M. A. (A)
Billington, P. R. (A)
Blackman, B. A. (A)
Blackman, B. A. (A)
Bonav, L. R. (A)
Born, W. T. (SM)
Broding, R. (SM)
Brown, R. E. (A)
Brown, R. T. (A)
Bryan, R. G. (A)
Buffum, C. E. (SM)
Bunday, D. L. (SM)
Burns, K. N. (A)
Burton, R. G. (A)
Bushnell, J. M., Jr. (A)
Cooper, J. R. (A)
Cordell, R. L. (A)
Crawford, R. L. (A)
Crossland, E. J. (A)
Crow, M. W. (A)
Damerow, R. O. (A)
Dabse, C. A. (A)
David, W. O. (A)
Davis, D. R. (A)
Day, C. E. (M)
Deming, J. M. (A)
Dennis, J. R. (A)
Dikmen, B. (A)
Donley, M. M. (A)
Draheim, L. H. (M)
Dunn, C. S. (A)
Durham, E. R. (A)
Earle, D. E. (A)
Earthman, J. C. (A)
Eckard, P. E. (A)
Egan, D. G. (M)
Eisler, J. D. (SM)
Elliott, F. J. (A)
Fallini, G. P. (A)
Ferguson, H. B. (A)
Field, H. S. (A)
Finn, R. S. (A)
Freeman, F. R. (A)
Freymuth, J. J., Jr. (A)
Gaylor, W. R., Jr. (A)
Giles, C. S. (A)
Gilmartin, T. (M)
Gladson, G. G. (A)
Goetz, L. P. (SM)
Goss, V. J. (A)
Green, G. C. (A)
Hadley, C. F. (SM)
Harper, F. N. (A)
Hearn, D. P. (A)
Hibbard, H. C. (A)
Hidy, J. H. (SM)
Hollingsworth, R. B. (A)
Hooker, L. H. (A)
Huber, A. J. (A)
Hunsicker, W. R. (A)
Hussey, C. V., Jr. (A)
Irvin, R. G. (A)
Jacobs, G. G. (A)
Jatras, S. J. (M)
Kammerzell, C. E. (A)
Kartman, D. J. (A)
Keller, B. H. (A)
Kenton, J. K. (A)
Kimsey, H. L. (A)
Kirby, R. A. (A)
Koeppel, B. W. (A)
Lang, H. M. (A)
Lash, C. C. (SM)
Lippman, L. (A)
Lynn, R. D. (A)
Mahoney, E. H. (A)
Marcucci, R. L. (A)
Marshall, B. R. (A)
Martin, H. H., Jr. (A)
Martin, M. M. (A)
Massmann, P. J. (A)
McCarter, E. R. (A)
McCaskill, R. B. (A)
McCoy, B. F. (A)
McManis, L. B. (SM)
Miller, J. W. (SM)
Miller, R. A. (A)
Misch, F. E. (A)
Moon, C. L. (A)
Newton, G. R. (SM)
Nichols, R. L. (A)
North, R. C., Jr. (M)
O'Brien, D. G. (A)
Orsak, A. J. (A)
Ownby, W. G. (A)
Peterson, G. (SM)
Phillips, H. W. (A)
Pierce, W. A. (A)
Rasmussen, H. E. (A)
Ray, W. E. (A)
Redding, P. B. (A)
Richardson, T. W. G., Jr. (A)
Robinson, T. P. (A)
Roderick, W. P., Jr. (A)
Rodgers, V. P., Jr. (A)
Roe, E. O. (A)
Scott, C. B. (A)
Seideman, I. M. (A)
Shelton, H. C. (A)
Silverman, D. (F)
Smith, L. H. (A)
Sorge, W. A. (A)
Stafford, J. A. (M)
Stevens, T. W. (A)
Stover, E. B., Jr. (A)
Stufflebeam, C. E. (A)
Sutherlin, R. F. (A)
Sweeny, A. C. (A)
Swift, G. (M)
Teel, A. D., Jr. (A)
Thompson, R. R. (SM)
Thompson, W. A. (A)
Thomsen, H. S. (A)
Tucker, B. L. (A)
Watson, R. E. (A)
Weir, J. B. (A)
Weldon, W. J. (A)
Werlin, J. H. (A)
Whitehill, H. J., Jr. (A)
Whitney, J. W. (A)
Wiese, A. A. (A)
Wilcox, N. E. (A)
Wilcox, R. L. (A)
Willits, G. N. (A)
Wilson, B. F. (A)
Wright, P. W. (A)
Zimmerman, C. W. (A)
Zongker, R. C. (A)

Watonga
Simonds, C. W. (A)

OREGON

Albany (POR-7)
Lennard, R. L. (A)

Astoria (POR-7)
Stumpf, R. J. (A)

Beaverton (POR-7)
Clifford, D. E. (A)
Gasser, C. D. (A)
Jenkins, R. W. (M)
Kraxberger, G. S. (A)
Liedtke, J. A. (A)
McAllister, W. H. (A)
Mendoza, D. C. (A)
Moulton, C. H. (M)
Thompson, W. S. (A)
Tinker, F. B. (A)

Condon
Tiedeman, C. R. (A)

Corvallis (POR-7)
Albert, A. L. (F)
Ballard, B. J. (A)
Barclay, W. J. (SM)
Feikert, G. S. (SM)
Hunnicutt, A. L. (A)
McMillan, F. O. (SM)
Merritt, R. P. (A)
Michael, R. R. (M)
Nelson, D. J. (A)
Sein, M. M. (A)
Stone, L. N. (A)
Yunker, E. A. (SM)

Eugene (POR-7)
Goldberg, P. A. (A)
Hoppe, P. R. (A)
Spaulding, L. R. (M)
Surdam, E. L. (M)
Whipple, M. M. (A)

Forest Grove
Heesacker, L. L. (A)

Gresham (POR-7)
Marsh, W. E. (M)

Klamath Falls
Cramer, K. H. (A)
Woodward, C. (A)

Lake Grove
Olsen, R. K. (SM)

Lake View (POR-7)
Strong, D. E. (A)

McMinnville (POR-7)
Anderson, C. M. (A)

Medford
Walker, V. G. (VA)

North Bend (POR-7)
Crawford, D. B. (A)

Oswego (POR-7)
Bauder, G. E. (A)
Ely, T. T. (M)
Smith, D. E. (VA)

Pendleton (POR-7)
Holt, T. N. (A)
Wiley, V. E. (A)

Philomath (POR-7)
Plunkett, D. T. (A)

Portland (POR-7)
Arnstein, G. P. (A)
Bargfeld, F. G. (A)
Bishop, A. R. (M)
Bookwalter, L. S. (VA)
Brittain, V. M. (M)
Broms, B. H. (A)
Broughall, H. S. (M)
Brown, F. M. (M)
Burnside, C. A. (A)
Calnon, D. C., Jr. (A)
Carpenter, C. B. (SM)
Cutting, W. A. (M)
Dallas, W. K. (A)
Davis, R. J. (A)
Deardorff, R. W. (F)
Donoghue, J. J. (M)
Duba, L. (A)
Eastlund, L. C. (A)
Edmonds, S. C. (A)
Ehr, J. R. (A)
Ellis, D. G. (A)
Ellis, P. V. (A)
Ellison, G. C., Jr. (M)
Foster, J. C. (M)
Gert, E. B. (A)
Gotcher, A. W. (A)
Grossenbacher, A. C. (A)
Harmer, H. S. (A)
Heath, H. W. (A)
Henderson, J. E. (A)
Herren, R. A., Sr. (M)
Herrmann, T. A. (A)
Holtzman, M. (M)
Hood, F. D. (M)
Horseman, T. E. (A)
Jackson, F. E. (A)
James, S. D. (A)
James, T. W. (M)
Johnson, R. F. (A)
Kidd, D. E. (A)
Koroch, L. R. (A)
Leech, E. R. (A)
Long, L. A. (A)
Lum, J. S. (A)
Lund, C. W. (SM)
Marihart, D. J. (A)
Marsters, L. E. (A)
McCann, F. H. (SM)
McLennan, J. D. (A)
Meissner, E. R. (M)
Miller, F. E. (SM)
Miller, V. F. (A)
Morey, A. M. (M)
Morin, L. A. (A)
Murdock, M. J. (M)
Murphy, R. T. (A)
Nelson, D. E. (A)
Newhouse, D. R. (A)

Nolan, C. A. (A)
Ogden, J. E. (A)
Parks, H. F. (A)
Paul, B. R. (VA)
Peterson, R. M. (A)
Pittard, F. L. (A)
Polits, W. J. (A)
Pooley, R. R. (A)
Poulin, R. A. (A)
Pyle, S. H. (A)
Quinn, A. C. (A)
Raupach, R. C. (A)
Rhiger, R. R. (M)
Richmond, A. E. (M)
Riley, J. C. (A)
Ritter, H. C. (A)
Roberts, J. M. (A)
Roberts, M. L. (A)
Rogers, E. J. (A)
Ropiequet, R. L. (A)
Schmidt, R. W. (A)
Schmitt, G. W. (A)
Scott, E. D. (SM)
Scott, H. D. (A)
Sells, G. B. (M)
Singleton, H. C. (SM)
Strain, D. C. (A)
Taskett, D. A. (A)
Thompson, A. (A)
Trump, W. E. (A)
Tunturi, A. R. (A)
Tyle, A. R. (M)
Vassallo, W. H. (A)
Vollum, H. (SM)
Warchol, E. J. (M)
Webber, W. B. (M)
Weitzel, E. F. (A)
White, L. C. (M)
Wilson, D. R. (A)
Winkler, L. R. (VA)
Witty, H. E. (A)
Woodward, W. E. (A)
Worden, A. E. (A)

Salem
Wane, W. M. (A)

The Dalles (POR-7)
Sterley, R. R. (A)

Warrenton
Knotts, R. B. (A)

PENNSYLVANIA

Abington (PHI-3)
Dibos, R. A. (M)
Tarzian, V. (A)

Akron (PHI-3)
Miller, L. D. (A)

Aldan (PHI-3)
McCurdy, H. B. (M)
Paivinen, J. O. (A)

Aliquippa (PIT-4)
Rusenko, G. (A)
Salmento, S. J. (A)
Tomeo, A., Jr. (A)

Allentown (PHI-3)
Allerton, G. L. (A)
Bolez, E. C. (A)
Buehler, P. R. (A)
Burcham, N. P. (A)
Burke, A. M. (A)
Cordaro, C. F. (A)
Donaldson, W. L. (M)
Erhart, D. L. (A)
Hansen, E. (VA)
Lisicky, A. J. (A)
Newhard, C. E. (M)
Odell, N. H. (A)
Paulsen, J. F. (A)
Pietenpol, W. J. (M)
Purcell, R. H. (SM)
Ronci, V. L. (SM)
Savadelis, I. C. (A)
Sawyer, B. (A)
Simpson, A. D. (SM)
Slota, W. (A)
Strauss, R. (M)
Sweeney, P. M. (A)
Taylor, R. R. (VA)
Tooker, H. A. (A)
Van Haste, W. (M)
Von Ohlsen, L. H., Jr. (A)
Wieder, E. J., Jr. (A)
Young, C. S. (SM)
Zuk, P. (A)

Allison Park (PIT-4)
Eames, F. M., Jr. (A)
Phillips, D. E., Jr. (A)

Altoona (PIT-4)
Burgoon, G. R. (A)
Kilgore, W. (A)
Reitz, N. J. (SM)

Ambler (PHI-3)
Allen, W. W., Jr. (A)
Clark, G. F. (M)
Colussi, E. J. (A)
Kuzma, P. Jr. (A)
Mauchly, J. W. (A)
O'Meara, W. J. (A)
Parnell, J. (M)
Schoenberg, J. P. (SM)
Swift, M. E. (SM)
Voorhoeve, E. W. (A)

Angels (PHI-3)
Decino, A. (SM)

Archbald (PHI-3)
Bechtol, H. (M)
Mageoch, N. H. (M)

Ardmore (PHI-3)
Brookfield, R. F. (A)
Cheng, T. (A)
Gittelman, A. B. (A)
Grieser, T. F. (A)
Merrigan, A. F. (A)
Shew, W. W. (A)
Zentgraf, J. A. (A)

Ardsley (PHI-3)
Helfrich, N. (A)
Hinkelman, T. D. (A)
Rabe, W. A. (A)
Schweiss, W. W. (M)

Ashland
Taber, C. J., Jr. (A)

Bakerstown (PIT-4)
Mag, A. (VA)

Bala-Cynwyd (PHI-3)
Friend, A. W. (SM)
Julstedt, E. C. (A)
Sunstein, D. E. (SM)
Taylor, J. R. (A)
Trumper, D. K. (A)

Beaver
Eash, J. J. (A)
McKowen, R. T. (A)
Jefferies, D. W. (A)

Bellefonte (EMP-4)
Lyon, C. M. (A)
Passow, R. L. (M)

Bernville
Gantert, A. (A)

Berwyn (PHI-3)
Bullard, H. (A)
Hoburg, G. G. (A)
Phelan, L. T. (A)
Thomas, T. R. (A)
Williams, R. J. (A)

Bethayres
Smith, F. E. (A)

Bethlehem (PHI-3)
Appleman, C. G. (A)
Austin, R. C. (A)
Boandl, J. S. (A)
Curtis, R. B. (A)
Downing, H. L. (VA)
Embree, M. L. (A)
Hanson, F. E. (SM)
Irvine, M. M. (A)
Karakash, J. J. (SM)
Kircher, C. J. (A)
Lisle, J. (A)
MacFarland, H. T. (A)
Mode, D. E. (SM)
Nitschke, N. E. (A)
Wagner, R. E. (M)

Bloomsburg
Webb, H. E. (A)

Boalsburg
Cannon, J. B., Jr. (A)

Brackenridge
Monnier, H. E. (A)

Braddock
Zygmunt, H. J. (M)

Bradford
Craumer, H. S. (A)
Schermerhorn, F. G. (A)

Bridgeport (PHI-3)
Banks, W. B. (A)
Krell, A. J. (A)
Kutner, N. H. (A)
Liggans, C. E. (A)
Wellard, C. L. (A)

Bridgeville (PIT-4)
Wirant, J. A. (A)

Bristol (PHI-3)
Annett, M. E. (A)
Mathis, J. D. (A)
O'Grady, J. J. (A)
Lombardini, P. P. (A)
Werbickas, J. P. (A)

Broomall (PHI-3)
Benn, R. E. (M)
Dunn, E. B. (M)
Gray, R. L., Jr. (A)
Jones, J. W. (A)
McCarty, F. H. (A)
Mercado, P. D. (A)
Steelman, A. T., Jr. (A)
Streater, A. L. (A)
Thompson, L. G. (A)
Watkling, R. W. (A)

Broughton
Gibson, F. C. (A)

Bryn Athyn (PHI-3)
Simons, K. A. (M)

Bryn Mawr (PHI-3)
Baird, G. A. (A)
Gyllenhaal, P. R. (A)
Hertzberg, J. M. (M)
Marshall, J. N. (M)
Masterson, E. (M)
Moore, M. J. (A)
Okada, R. I. (A)
Reich, A. L. (A)
Townsend, C. C., Jr. (A)
Wu, H. H. (A)

Bustleton (PHI-3)
Just, G. A. (A)

Butler (PIT-4)
Conabee, C. R. (A)
Hertz, K. L. (A)
McIndoe, C. W. (A)

Camp Hill (PHI-3)
Berry, J. D. (A)
Dugan, D. J. (A)
Eisenhard, S. E., Jr. (A)
Knerr, G. R. (A)
Morris, G. W. (VA)

Canonsburg (PIT-4)
Krulce, F. R. (A)
Sulkowski, E. L. (A)

Carlisle (PHI-3)
Hill, B. C., Jr. (SM)
Mann, C. W. (A)
Meyers, K. D. (A)
Minnich, E. L. (M)
Ryesky, S. (M)
Samuelson, W. H. E. (A)
Spease, G. E. (A)
Sundius, R. E. (A)
Van Gavree, R. L. (A)
Wildermuth, J. R. (M)

Carnegie (PIT-4)
Varussi, F. P. (A)

Centralia (WIL-4)
Loftus, W. E. (A)

Chalfont (PHI-3)
Curtis, C. T. (M)
Mulherin, E. M. (M)

Cheltenham (PHI-3)
Himner, F., Jr. (A)
Hoagland, C. C. (SM)
Pinter, P. J. (M)
Sheldon, H. (M)

Chester (PHI-3)
Goodman, J. (A)
Kienzle, H. G. (A)
Thorpe, W. H. (A)

Chestnut Hill
Woods, L. J. (SM)

Churchville (PHI-3)
Kerk, D., Jr. (A)
Uphoff, F. B. (A)

Clarks Summit (PHI-3)
Hershenson, L. H. (A)
Lambert, C. R. (M)
Mack, D. W. (A)
Rathje, E. (A)
Ringland, R. S. (SM)
Tate, J. B. (M)
Thomas, J. E. (A)

Claysburg (PIT-4)
McKenna, J. V. (A)

Clearfield (EMP-4)
Black, A. M. (A)
Boyd, J. C. (SM)
Diehl, W. F. (F)
Swoffer, E. R. (A)

Clifton Heights (PHI-3)
Bradley, W. E. (A)
Kurkjian, E. (A)
Slavics, J. W. (A)
Smith, F. W. (SM)

East Petersburg (PHI-3)
Morrell, A. M. (M)

East Pittsburgh (PIT-4)
Brown, B. K., Jr. (A)
Coles, D. K. (SM)
Hanna, C. R. (SM)
Hansen, J. R. (A)
Hollandbeck, R. F. (A)
Hutcheson, J. A. (F)
Kadak, E. (M)
Leonard, F. J. (A)
Malmberg, P. R. (M)
McCoubrey, A. O. (SM)
Menes, M. (A)
Moynihan, J. D. (A)
Ohlmann, R. C. (A)
Osbon, W. O. (VA)
Rowe, W. D. (A)
Schneeberger, R. J. (SM)
Sims, D. S. (A)
Slepian, J. (F)
Smith, C. H., Jr. (A)
Vogl, T. P. (A)

East Vandergrift (PIT-4)
Matonak, L. A. (A)

Ebensburg (PIT-4)
Thomas, J. F. (A)

Edinboro (BN-4)
Windsor, R. T. (A)

Eightyfour
Obenland, D. K. (A)

Elizabethtown (PHI-3)
Roland, C. E. (A)

Elkins Park (PHI-3)
Aarons, C. R. (A)
Beetz, H. J. (A)
Bienbaum, J. W. (A)
Bloomfield, J. A. (A)
Chang, S. V. (A)
Greenwood, R. W. (A)
Hansen, A. N. (A)
Kansas, R. (A)
Keiper, F. P., Jr. (A)
Kraus, M. H. (A)
Krutter, H. (SM)
Leshan, J. J. (A)
Lilly, C. H. (A)
Mertz, H. W. (A)
Neumann, A. J. (M)
Overdeer, R. H. (A)
Parry, C. A. (SM)
Rath, H. B. (A)
Rothschild, L. I., Jr. (A)
Simon, W. (A)
Warshaw, C. H. (A)
Zaslav, B. (A)

Ellwood City (PIT-4)
Hohl, R. W. (A)
Lesnick, R. (A)
Powell, R. M. (M)

Emporium (EMP-4)
Ackman, C. W. (A)
Ackman, H. E. (SM)
Allen, J. S. (M)
Anderson, W. J. (M)
Andrews, R. W. (M)
Baldwin, A. V. (SM)
Bergdahl, R. F. (A)
Bisso, R. J. (A)
Boden, E. H. (A)
Bogart, P. M. (A)
Boots, W. K. (M)
Brunner, G. V. (SM)
Buescher, W. E. (M)
Burwell, A. C., Jr. (SM)
Buschmann, W. T. (A)
Campbell, V. H. (SM)
Carlstrom, T. H. (M)
Clark, J. H. (A)
Clausen, R. P. (SM)
Cooley, R. M. (SM)
Couch, L. J. (A)
Curry, G. T. (SM)
Dander, D. A. (M)
Detweiler, J. E. (A)
Dole, L. H. (A)
Dolnick, A. L. (SM)
Dresser, S. R., Jr. (A)
Early, J. M. (A)
Erdle, P. J. (A)
Fisher, R. L. (M)
Fromell, H. J. (A)
Gausman, T. E. (A)
Golla, E. F. (A)
Gorman, V. R. (A)
Grund, J. B. (M)
Guild, R. D. (M)
Hagman, H. B. (A)
Hamlin, W. O. (A)
Heitner, A. J. (M)
Hench, H. S., Jr. (M)

Hesser, C. B. (M)
Kackauskas, J. J. (A)
Kahl, E. (M)
Kamler, H. V., Jr. (A)
Klinestiver, G. H. (SM)
Lambert, R. L. (SM)
Lankard, G. M. (A)
Lantzy, W. E. (A)
Maguire, L. R. (M)
McGee, R. J. (A)
McKain, J. L. (M)
McKeirnan, M. F. (M)
McNaughton, R. A. (M)
Melzer, H. (VA)
Merkel, M. A. (A)
Mueller, W. P. (SM)
Neuber, R. E. (SM)
Overmier, E. E. (SM)
Palen, H. A. (M)
Palmateer, R. E. (SM)
Pawlikowski, S. L. (A)
Peterson, A. W. (M)
Peterson, W. J. (A)
Pope, L. A. (A)
Quigley, F. T. (M)
Quint, G. L. (A)
Reinhardt, P. M. (M)
Rishell, G. L. (M)
Robbins, J. D. (M)
Rolf, W. R. (SM)
Sassaman, P. H. (SM)
Schultz, A. J. (SM)
Sechler, A. L., Jr. (M)
Shaidnagle, R. H. (A)
Simon, P. R. (A)
Slinkman, R. W. (SM)
Stumpff, H. G. (M)
Vergason, D. L. (M)
Walsh, R. J. (M)
Winnette, E. A. (A)

Erie (BN-4)
Davidson, A. R. (M)
Foster, J. H. (M)
Hestor, K. L. (A)
Minnium, B. B. (SM)
Mong, R. C. (A)
Orr, R. W. (VA)
Page, R. S. (A)
Raub, L. A. (VA)
Richardson, E. (A)
Steward, H. E. (A)
Taylor, G. P. (M)
Tuznik, R. H. (A)
Van Arsdell, J. C., Jr. (M)
Veit, N. J. (A)
Wolfskill, J. M. (A)

Essington (PHI-3)
Hill, R. D. (A)

Evans City
Wahl, M. H. (A)

Fairless Hills
Weinheimer, F. E., Jr. (A)

Feasterville (PHI-3)
Fleury, P. E. (A)
Lofton, J. H. (M)
Pfeffer, J. B. (A)

Flourtown (PHI-3)
Bartels, H. C. (A)
O'Brien, J. F., Jr. (A)
Stobbe, W. M. (A)

Fort Washington (PHI-3)
Rees, W. M., Jr. (A)
Schantz, J. S. (VA)

Frackville (PHI-3)
Troyanoski, W., Jr. (A)

Freeland
Kiseloski, J. M. (A)

Freedom (PIT-4)
Swartz, F. E. (A)

Fullerton (PHI-3)
Bower, F. H. (M)
Bradford, C. E. (A)

Gibsonia (PIT-4)
Gates, P. W. (A)

Gladwyne (PHI-3)
Dever, J. A. (A)
Eckert, P. J., Jr. (SM)
Owings, J. L. (A)

Glassport (PIT-4)
Czarnecki, E. J. (A)
Leib, F. E. (A)

Glen Lyon (PHI-3)
Jarecki, S. J. (A)

Glen Moore (PHI-3)
Carpenter, J. H. (A)

Glen Olden (PHI-3)
Brown, I. (A)
Killion, R. E., (A)
Liston, J. (A)
Teetsel, W. P. (A)
Thompson, R. L. (A)
Tidd, T. J. (A)
Wynhoff, F. J. (A)

Glen Rock (PHI-3)
Jensenius, J. S. (A)

Glen Shaw (PIT-4)
Alexander, F. C., Jr. (M)
Horlbeck, W. E. (M)
Kinney, R. V. (A)
Patterson, T. A., Jr. (A)

Glen Side (PHI-3)
Bamford, H. S. (SM)
Benge, J. R. (VA)
Bobb, L. J. (M)
Bowman, J., Jr. (A)
Brown, D. G. (A)
Cooper, D. T. (VA)
Daniels, R. G. (A)
O'Neal, C. D. (A)
Stein, H. B. (A)
Trinkle, W. S. (M)
Wilson, H. R. (A)

Green Lane (PHI-3)
Rabb, J. W. (M)

Greensburg (PIT-4)
Dimasi, L. A. (A)
Stark, R. E. (VA)

Groveton (PIT-4)
Petrowski, P. (A)

Gwynedd Valley (PHI-3)
Milligan, G. M. (A)
Robinson, R. R. (A)

Hanover (PHI-3)
Rohrbaugh, P. A. (A)

Harrisburg (PHI-3)
Bair, J. H. (A)
Bishop, A. B. (A)
Cramer, B. G. (A)
Crowell, H. E. (A)
Gray, N. L. (A)
Heist, H. E., Jr. (A)
Kelley, O. G. (A)
Lehman, N. D. (A)
Middleton, W. W. (M)
Moretz, L. A. (A)
Peffer, R. M. (A)
Reisman, E. (A)
Romey, L. M. (M)
Wiley, L. G. (M)

Hatboro (PHI-3)
Anderson, S. E. (A)
Barry, F. N. (VA)
Bartik, W. J. (A)
Brenner, W. F. (A)
Bristow, F. E. (M)
Brooks, C. E. (M)
Bucks, R. M. (A)
Bugay, J. P. (A)
Buscher, D. G. (M)
Caffrey, G. H. (A)
Davenport, E. J. (A)
Doerfel, H. V. (A)
Fedde, G. A. (A)
Foley, T. J. (A)
Gelardi, M. (VA)
Gleiter, W. C. (M)
Grzywacz, W. (A)
Gulick, E. C. (SM)
Harrison, R. K. (A)
Howard, J. R. (A)
Long, M. L., Jr. (SM)
Machuta, A. J. (A)
Martin, H. B. (A)
Miller, R. L. (A)
Moulton, S. W. (A)
Munster, A. C. (M)
Nelson, C. R. (SM)
Noll, E. M. (A)
O'Malley, M. (A)
Royce, E. R. (M)
Saboe, J. (M)
Saylor, R. R. (M)
Schwab, P. E. (A)
Senausky, P. V. (A)
Spacie, R. W. (A)
Steele, E. R. (A)
Suter, H. (SM)
Tiley, J. W. (M)
Tremblay, H. G. (A)

Hatfield
Insinger, R. H., Jr. (A)

Haverford (PHI-3)
Benham, T. A. (SM)
Crawford, A. L., Jr. (SM)

Havertown (PHI-3)
Amelotti, E. (A)

Bardonner, W. J., Jr. (A)
Benham, T. A. (SM)
Chen, T. C. (A)
Crockett, J. G. (M)
Currie, A. H. (A)
Dougherty, J. W. (M)
Eckersley, A. (A)
Endres, J. M., Jr. (A)
Fink, E. A. (M)
Fryburg, C. H. (A)
Fulmer, J. W. (VA)
Gibson, H. D. (VA)
Gilligan, T. E., Jr. (A)
Lund, G. E. (A)
Mayer, R. (M)
Miehle, W. (M)
Palmer, G., Jr. (A)
Riegel, R. B. (A)
Sabaroff, S. (M)
Sachs, A. F. (M)
Shea, E. T. (A)
Sohon, H. (SM)
Thomas, R. G. (A)
Titus, C. H. (A)
Trifari, F. R. (SM)
Zappacosta, A. D. (M)

Hazleton (PHI-3)
Gans, J. S. (A)
Lucian, T. F. (SM)

Hershey (PHI-3)
Smith, E. C. (A)

Hilliards (PIT-4)
Boyd, D. B. (A)

Hollidaysburg (PIT-4)
Carter, J. A. (A)

Holmes
Kranzley, A. S. (A)
Warner, H. (A)

Homer City (PIT-4)
Ramaley, C. W. (A)

Homestead
Link, T. V. (A)

Honesdale (PHI-3)
Risse, J. A. (A)

Hummelstown (PHI-3)
Alger, P. B. (A)

Huntington Valley (PHI-3)
Barsky, H. S. (M)
Boothroyd, W. P. (SM)
Dempster, B. W. (A)
Genzlinger, V. (A)
Hayward, J. W. (VA)
Jensen, R. O. (A)
Lee, C. F. (A)
Matthews, A. C. (SM)
Schroeder, A. C. (SM)
Spielman, S. C. (SM)
Thompson, M. L. (SM)
Young, C. P. (SM)

Imperial (PIT-4)
Hutchinson, T. C. (A)
Hutchinson, V. M. (A)

Indiana (PIT-4)
Hitchcock, R. C. (SM)
Yarmack, J. E. (SM)

Irwin (PIT-4)
Agnew, N. F. (A)
Brook, A. (A)
Place, W. P. (A)

Ithan
Dilks, U. C. S. (M)

Ivyland (PHI-3)
Bicking, H. P. (A)
Lauerdale, D. M. (A)
Lee, W. S. (A)

Jeanette
Kihchel, O. D. (M)

Jeddo
Kallessar, J. J. (A)

Jenkintown (PHI-3)
Block, E. (A)
Clark, W. R. (SM)
Drenchko, J. D. (A)
Koehler, J. F. (SM)
Laurent, G. J. (SM)
Liebscher, A. (SM)
Michaels, C. J., Jr. (A)
Peltz, W. J. (SM)
Stewart, G. H. III (A)

Jermyn
Krizanosky, A. (A)

Johnstown (PIT-4)
Ackley, R. M. (A)
Campbell, T. E. (A)
Coleman, M. J. (M)
Friedman, M. I. (A)
Kardos, L. F. (A)
Kocsan, E. S. (A)
Litman, L. (A)
Straub, N. L. (A)
Weidner, D. M. (A)

Johnsville (PHI-3)
Drenchko, J. D. (A)
Mitchell, F. O. (A)
Nupp, W. D. (A)
Oliver, J. K. (A)
Vasaka, C. S. (A)

Kennerdell (PIT-4)
Smith, S. A. (A)

Kennett Square (PHI-3)
Moore, C. B. (A)

Kingston
Sakoski, C. (A)
Shaw, W. R. (A)

Lafayette Hill (PHI-3)
Adamson, R. G. (M)
Bloomsburgh, R., Jr. (M)
Clifford, M. L. (A)

Lake Lynn
Shibler, W. (A)

Lancaster (PHI-3)
Almond, W. R. (A)
Andrews, W. J. (A)
Ayer, R. B. (SM)
Ballard, D. C. (SM)
Bennett, W. P. (M)
Benway, R. E. (A)
Brackbill, C. R. (SM)
Brett, G. F. (M)
Comins, A. W. (SM)
Dyall, W. T. (SM)
Fock, H. W. (A)
Forman, J. M. (M)
Freund, W. H. (M)
Fry, H. M. (SM)
Gebert, V. D. (A)
Glover, A. M. (SM)
Gordon, A. D. (A)
Grimm, A. C. (SM)
Hagmann, R. W. (A)
Hammarsand, F. G. (M)
Headrick, L. B. (SM)
Hillegass, H. N. (A)
Holmes, J. L. (A)
Hoover, M. V. (M)
Hudson, J. L. (A)
Jamison, A. F. (A)
Janes, R. B. (SM)
Kaseman, P. W. (A)
Kazanowski, H. F. (M)
Kistler, R. L. (A)
Lemeshka, M. B. (M)
Littlefield, B. Z. (A)
Magestro, J. C. (A)
Mandell, G. E. (A)
Mathlot, J. E. (M)
McNees, S. G. (M)
McNickle, R. E. (M)
Mengle, L. I. (A)
Metzger, P. A. (A)
Moodey, H. C. (SM)
Nekut, A. G. (SM)
Podall, B. H. (A)
Ransom, D. J. (A)
Reed, R. E. (A)
Richards, P. A. (SM)
Rotow, A. A. (SM)
Rueggeberg, W. (M)
Scholes, G. S. (A)
Scott, G. W., Jr. (SM)
Seelen, H. R. (SM)
Smith, C. P. (SM)
Spitzer, E. E. (SM)
Stankovich, D. (A)
Swedlund, L. E. (SM)
Sweet, A. P., Jr. (A)
Tandy, P. C. (A)
Uyeda, Y. (M)
Van Ormer, D. D. (A)
Vargo, J. (A)
Veith, F. S. (SM)
Wamsley, D. H. (SM)
Weaver, J. L. (A)
Wenger, R. S. (SM)
Wilhelm, J. F. (SM)
Wiseman, P. E., Jr. (A)
Yingst, T. E. (A)

Landisville
Sandford, W. H., Jr. (A)

Langhorne (PHI-3)
Annett, M. E. (A)
Brown, J. N. (A)
Ryan, T. J. (M)

Lansdale (PHI-3)
Criss, G. B. (A)
Gable, N. P. (M)
Ishler, H. K. (SM)
Kennemer, J. R. (A)
Lyle, A. E. (SM)
Malotte, D. W. (A)
Misra, R. P. (SM)
Pratt, G. W. (M)
Robinson, S. A. (SM)
Schlegel, E. S. (A)
Schmitz, C. F., Jr. (A)
Smith, W. E. (A)
Spencer, G. R. (A)
Tague, C. B., Jr. (A)

Lansdowne (PHI-3)
Ambrogi, J. N., Jr. (A)
Baskin, E. B. (A)
Brumbaugh, J. M. (SM)
Carlson, P. N. (A)
Felton, W. W. (SM)
Geasey, R. E. (A)
Harman, G. E., Jr. (A)
Kotheimer, W. C. (A)
Micheli, A., Jr. (A)
Sulpizio, T. J. (A)
Tunnell, G. W. (A)

Lansford
DuBoskey, D. D. (A)

Latrobe
Albert, D. E. (A)
Shaffer, R. E. (A)
Smith, B. J. (A)

Lemoyne
Beebe, W. J. (A)
Smiley, W. A. (VA)

Levittown (PHI-3)
Barnes, W. L. (A)
Bensky, L. S. (A)
Berfield, R. G. (A)
Bernstein, F. (A)
Boscia, S. J. (A)
Cilyo, F. F., Jr. (M)
Dixon, G. P. (A)
Dunn, T. E. (A)
Epstein, H. (A)
Etkin, H. A. (SM)
Fernandez-Rivas, L. A. (A)
Glassman, F. P. (A)
Golden, H. W. (A)
Goldstone, B. J. (A)
Greenfield, M. (A)
House, H. J. (A)
Hurford, A. C. (A)
Insalaco, P. J. (A)
Kahn, H. (A)
Lamnin, M. (A)
Lin, H. C. (A)
Linden, A. E. (A)
Maddox, J. A. (A)
McGalliard, W. V. (A)
Nachman, M. W. (A)
Perlman, M. (M)
Potosky, M. (A)
Powell, W. E., Jr. (A)
Rhodes, R. N. (A)
Rosen, B. H. (A)
Selikson, B. (A)
Stern, S. (A)
Weinberg, A. D. (A)
Wilcox, J. E. (A)
Wood, R. F., Jr. (A)
Wydra, W. S. (A)

Lewisburg (WIL-4)
Bosted, N. P. (A)
Bowler, D. L. (A)
Irland, G. A. (M)
Mathias, J. P. (A)
Scheer, F. H. (SM)
Walker, R. C. (M)

Lewistown (WIL-4)
Gardner, G. F. (A)

Library (PIT-4)
Pudlak, A. (A)
Ramey, R. A. (M)

Line Lexington (PHI-3)
Laskin, R. S. (A)

Lock Haven
Hartwell, H. G. (M)

Loupurex (PIT-4)
LaSota, L. S. (A)

Lynnport
Klingaman, G. W. (A)

Macungie (PHI-3)
Feller, J. R. (A)

Malvern (PHI-3)
Lane, J. H. (A)
Wachter, W. J. (A)

Manoa (PHI-3)
Reynolds, D. E. (M)
Vetack, J. E. (A)

Manor (PIT-4)
Anderson, J. W. (A)

Mars (PIT-4)
Berninger, J. W. (A)

McKeesport (PIT-4)
Andrews, F. J. (M)
Biss, M. W. (A)
Durnal, R. G. (A)
Morrison, E. L., Jr. (A)
Vogt, W. G. (A)
Wilson, F. A. (A)

Meadowbrook (PHI-3)
Bingley, F. J. (F)
Dolberg, C. E. (SM)
Fink, D. G. (F)
Lukens, R., Jr. (SM)
Reese, J. R. (A)
Reynolds, V. F. (A)
Walker, H. (VA)

Meadville (PIT-4)
Brown, R. L. (M)

Mechanicsburg
Hertzler, P. H. (A)

Mechanicsville (PHI-3)
Brown, H. W. (A)

Media (PHI-3)
Miller, A. F. (M)
Porter, T. J. (A)
Salati, O. M. (SM)
Tonooka, S. (A)
Woerner, L. G., Jr. (A)

Melrose Park
Mallinson, R. E. (A)

Merion (PHI-3)
Emurian, A. D. (SM)
Lawler, E. D. (A)
Trilling, T. R. (A)

Middletown (PHI-3)
Unger, J. W. (A)

Millersville (PHI-3)
Mark, J. T. (A)
Nicholson, J. F. (A)
Smith, E. M. (A)
Weaver, J. E. (A)

Mill Hall
Schnering, C. J. (M)

Mohnton (PHI-3)
Fister, T. J. (A)

Monessen (PIT-4)
Ferencz, F. (A)

Monongahela (PIT-4)
Mucci, G. (A)

Montoursville
Wellendorf, J. J. (M)

Morristown
Webb, D. J. (SM)

Morrisville (PHI-3)
French, C. G. (A)

Morton (PHI-3)
Bargellini, I. P. L. (SM)
Smith, J. W. (M)
Ward, E. P. (A)

Mount Carmel (WIL-4)
Schneider, C. P. (A)

Mount Joy (PHI-3)
Dock, S. J. (A)
Martin, I. E. (A)

Mount Morris (PIT-4)
Talentinow, J. (A)

Nanticoke (PHI-3)
Cancellari, N. J. (M)
Hyzinski, B. (A)
Pensyl, J. F. (A)

Narberth (PHI-3)
Brustmann, J. A. (SM)
Clapp, R. G. (SM)
Forstall, E. L. (SM)
Jeffries, S. A. (A)
Williamson, J. F. (VA)

Neffsville (PHI-3)
Ethridge, R. O. (A)
Harsh, M. D. (A)

Nesquehoning (PHI-3)
McMichael, H. E. (A)

New Brighton
Klucarich, S. (A)

New Britain
West, H. (A)

New Castle
Sines, W. U., Jr. (A)

New Cumberland (PHI-3)
Gordon, W. J. (A)
Hanemann, H. A., Jr. (A)

New Hope (PHI-3)
Bradley, W. E. (F)
Chadwick, P. S. (A)
Goodwin, W. N., Jr. (SM)

New Kensington
Signorella, J. E. (A)
Tallerico, A. (A)

Newtown (PHI-3)
Beck, K. H., Jr. (A)
Olson, E. G. (A)

Newtown Square (PHI-3)
Bachofer, H. L. (A)
Johnson, F. L. (M)
Livesay, R. (A)
Shawhan, E. N. (A)
Stevens, D. L. (M)

Newville (PHI-3)
McElwain, J. L. (M)

Noble
Hilliard, D. M. (A)

Norristown (PHI-3)
Anders, R. D. (A)
Anderson, D. C. (A)
Applegarth, A. R., Jr. (SM)
Briggs, T. H. (SM)
Eney, I. N. (A)
Paxson, R. F. (A)
Place, S. W. (VA)
Roberts, F. R. (A)
Rogers, R. F. (A)
Thomas, J. K. (A)
Zern, R. T. (VA)

North Braddock (PIT-4)
Kosciik, W. E. (A)
Roskos, R. G. (A)

North Hills (PHI-3)
Germain, R. C. (A)
Hansen, A. N. (A)
Moore, W., Jr. (M)
Reichert, H. A. (A)

Northumberland (WIL-4)
Ford, R. W. (M)

North Wales (PHI-3)
Burkart, D. P. (A)
Henderson, F. C. (M)
Ottolini, D. F. (A)
Shurley, R. M. (A)

North Warren
Wagner, H. A. (SM)

Norwood (PHI-3)
McWilliams, G. R. (A)
Niu, T. C. T. (A)

Oakmont
Colten, J. L. (A)

Oberlin (PHI-3)
Henry, A. T. (A)

Olyphant
Krenitsky, P. (A)

Orefield
Allerton, G. L. (SM)

Oreland (PHI-3)
Axford, W. R. (A)
Chudleigh, W. H., Jr. (SM)
Hargens, C. W. (SM)
Hooper, G. A. (M)
Isaacs, R. A. (A)
Jackson, R., Jr. (A)
Keener, C. E. (A)
Lockhart, J. C. (A)
Michael, F. R. (M)
Nelson, F. H. (A)
Preston, G. W. (SM)

Oxford (PHI-3)
Mallalieu, F. R. (A)

Palmerton (PHI-3)
Kannapel, W. A. (A)
Swanson, H. E. (A)

Paoli (PHI-3)
Caplan, D. I. (A)
Dahlberg, R. S., Jr. (SM)
Dinackus, H. G. (A)
Gluck, S. E. (A)
Overmiller, C. M. (VA)
Reiss, H. R. (M)
Schafer, R. H. (A)
Smith, P. C. (SM)
Taylor, H. W. (M)

Paradise (PHI-3)
Lorch, E. A. (A)

Paxinos (WIL-4)
Farr, K. E. (SM)

Perkasie (PHI-3)
Moll, W. H. (A)
Smith, H. B. (A)

Philadelphia (PHI-3)
Adamson, P. R. (A)
Aires, R. H. (M)
Akeroyd, A. (A)
Albright, R. B. (SM)
Alexander, E. M. (A)
Alpert, D. (A)
Altemus, W. C. (A)
Alter, A. R. (SM)
Ames, M. E., Jr. (M)
Amstutz, R. W. (A)
Anderson, D. C. (A)
Andress, P. M. (M)
Andrews, K. E. (A)
Andrews, P. C. (A)
Angell, J. B. (A)
Applegate, C. E. (A)
Attarian, R. V. (M)
Auerbach, I. L. (SM)
Backer, C. M. (M)
Balmer, D. W. (M)
Banks, J. (A)
Barnes, G. H. (A)
Barnes, W. E. (A)
Bash, I. F. (A)
Baumann, J. A. (A)
Beane, T. E. (A)
Beardwood, J. T. (A)
Bechler, W. C., Jr. (VA)
Beck, C. (A)
Beck, C. A. (A)
Beckman, C. (A)
Bell, R. A. (M)
Beltramo, J. R. (A)
Bennon, M. (A)
Benson, S. E. (A)
Berez, I. (A)
Berger, A. (A)
Berkowitz, R. S. (A)
Bernbaum, B. (A)
Bernbaum, L. M. (M)
Best, D. T. (A)
Beter, R. H. (A)
Biberman, L. S. (A)
Binstock, L. (A)
Birx, D. L. (A)
Bixler, D. A. (M)
Blumenthal, E. I. (A)
Boghosian, W. H. (M)
Bogusz, J. F. (A)
Bonaccorsi, J. R. (A)
Bonanni, O. A. (A)
Bonn, T. H. (A)
Boyajian, M. M. (A)
Boyle, R. C. (A)
Brachman, R. J. (A)
Bradshaw, J. L. (A)
Brady, P. B. (SM)
Brainerd, J. G. (F)
Brandt, W. E. (A)
Briles, W. F. (A)
Broomall, J. M. (SM)
Brothers, J. T. (SM)
Brown, E. A. (A)
Brown, L. R. (SM)
Brown, R. B. (A)
Brown, W. J. (A)
Broxmeyer, C. (A)
Brunner, D. H. (A)
Bryan, J. S. (A)
Bryson, H. C., Jr. (M)
Buchanan, J. P. (M)
Buggy, R. V. (M)
Burgett, M. I., Jr. (SM)
Burney, O. F., Jr. (A)
Busser, J. H. (A)
Butterfoss, E. J. (A)
Butts, L. E. (A)
Buzby, J. A. (A)
Bycer, B. B. (A)
Byers, A. C. (SM)
Caines, H. R. (A)
Caldwell, W. H. (A)
Callaghan, J. W. (A)
Campbell, E. R., Jr. (A)
Capek, S. J. (A)
Carapellotti, L. T. (A)
Carignan, R. J. (A)
Cavileer, F. E. (A)
Chamberlin, N. K. (A)
Chambers, C. C. (SM)
Chambers, G. S. (A)
Chamow, M. F. (A)
Chance, B. (SM)
Chapline, J. D., Jr. (A)
Chase, C. T. (SM)
Chatten, J. B. (A)
Chatterton, E., Jr. (A)
Chedaker, J. (A)
Chow, S. H. (A)
Chressanthis, A. G. (A)
Christen, A. L. (H)
Churchill, H. J. (M)
Cianela, D. J. (M)
Clark, G. (A)
Clark, W. A. (A)
Clarke, C. E. (A)
Closson, L. E. (SM)
Cohen, B. H. (A)
Cohen, F. (A)
Coker, J. A. (M)
Cola, R. A. (A)
Coles, R. V. (SM)
Colocousis, J. (SM)
Colodny, S. H. (SM)
Connor, J. A. (M)
Conrad, M. (A)
Cooley, C. C., Jr. (A)
Cora, A. M., Jr. (A)
Creamer, E. M., Jr. (A)
Creed, W. G. (A)
Cummings, E. J. (A)
Darack, O. C. (A)
Davies, R. S. (A)
Davisson, O. C. (A)
DeCoatesworth, C. G. (A)
Dectrow, T. X. (M)
Delling, H. W. (A)
Devenny, C. F., Jr. (A)
De Zube, L. H. (M)
Di Campli, B. A. (A)
Diem, G. W. (M)
Diem, J. M. (A)
Doerfel, H. V. (A)
Doland, G. D. (M)
Doto, N. J. (A)
Dove, J. B. (A)
Dowds, T. A. (A)
Duncan, R. D., Jr. (SM)
Dunn, R. A. (A)
Earnshaw, D. P. (SM)
Eble, B. B. (A)
Eckert, J. F., Jr. (A)
Ederer, N. (A)
Eells, W. A. (A)
Ehret, C. D. (F)
Ehret, R. J. (SM)
Emerson, K. H. (SM)
Engle, J. L. (A)
Epstein, H. (A)
Estersohn, H. (A)
Ett, A. H. (M)
Evans, W. R., Jr. (A)
Fan, S. (A)
Farmar, F. E. (A)
Fasko, E. A. (A)
Fath, J. P. (A)
Faust, A. C. (A)
Fegley, K. A. (A)
Fernbach, M. (A)
Fierstein, J. H. (A)
Filderman, J. (A)
Fink, L. III (M)
Fisher, E. J. (A)
Fisher, F. (A)
Flomenhoft, M. (A)
Flood, F. T. (A)
Florence, V. H. (M)
Fogarty, J. D. (A)
Foley, G. M. (SM)
Follensbee, W. R. (A)
Forster, W. H. (SM)
Foster, W. P. (M)
Fox, B. (M)
Frank, A. L. (A)
Frear, W. (SM)
Freeland, E. C. (SM)
Frekot, J. J. (A)
Friedman, G. H. (A)
Friedman, M. (A)
Friedman, M. (M)
Frost, F. K. (A)
Gardner, R. K. (A)
Garfinkel, A. R. (A)
Geer, D. A. (A)
Gelchis, M. V., Jr. (A)
Gelles, A. J. (A)
Gelzinis, P. P., Jr. (A)
George, M. E. D. (A)
Georgens, H. H., Jr. (A)
Geselwitz, D. B. (A)
Gilbert, W. E. (SM)
Gillies, J. H. (SM)
Giordano, M. J. (A)
Gittens, V. S. (A)
Glace, K. (M)
Glassman, I. (M)
Godsho, A. P. (SM)
Golden, R. K. (M)
Goldhirsh, M. (A)
Goldstein, I. E. (SM)
Goodman, R. M. (A)
Goodwin, D. P. (A)
Gordon, H. L. (A)
Gottlieb, M. (A)
Gottschalk, J. M. (A)
Grabiec, J. J. (M)
Grande, F. M. (A)
Gravel, A. J. (A)
Gray, H. J., Jr. (A)
Greenberg, E. L. (A)
Greenberg, S. B. (A)
Gross, I. (A)
Gross, L. S. (A)
Grossman, S. (A)
Gudis, R. S. (A)
Haas, N. V. (A)
Hackenyos, C. W. (A)
Haigh, L. E. (A)
Haimowitz, B. (M)
Haines, B. P. (A)
Haines, J. H. (A)
Halev, I. (M)
Halprin, J. (A)
Halsted, C. P. (A)
Hamilton, S. (SM)
Hand, G. C., Jr. (A)
Hardiman, E. R. (A)
Harding, L. M. P. (A)
Hardy, N. (A)
Harms, A. D., Jr. (A)
Harrison, W. E. (A)
Hatchwell, J. A. (A)
Hawthorne, E. I. (SM)
Hazeltine, A. V. (A)
Heacock, R. J. (A)
Heckelman, T. J. (M)
Heinaman, H. B., Jr. (A)
Hendrixson, L. H. (M)
Henninger, J. H. (M)
Henry, W. P. (A)
Herman, E. S. (A)
Herrmann, D. C. (A)
Herscher, M. B. (A)
Hershfield, L. L. (A)
Hicks, J. J. (A)
Hill, E. W. (A)
Hillman, J. (A)
Hinds, J. L., Jr. (A)
Hobgood, M. P. (A)
Hockeimer, H. E. (M)
Hoffman, E. (A)
Honda, H. (A)
Horwood, A. M., Jr. (VA)
Horan, E. F. (A)
Horn, C. H. (M)
Horwitz, J. D. (A)
Hudson, C. F. (A)
Hunt, D. F. (A)
Husband, R. E. (A)
Hyams, I. (A)
Innes, F. T. (A)
Jacobson, L. J. (M)
Jednacz, J. E. (A)
Jessen, F. A., Jr. (A)
Johnson, E. C. (SM)
Jones, A. G. (A)
Jones, C. H. (SM)
Jones, J. T., Jr. (A)
Jones, L. F. (A)
Joseph, D. (A)
Jung, J. P. (M)
Jurskis, A. (M)
Kalista, S. A. (A)
Kall, A. R. (A)
Kalus, S. (A)
Kannapel, W. A. (A)
Katinos, L. J. (A)
Katz, S. (A)
Kauders, R. M. (M)
Kauffmann, J. A. (A)
Kelly, J. J. (A)
Kenny, H. W. (A)
Keough, D. D. (A)
Kerwan, J. P. (A)
Kilpatrick, D. G. (A)
Kimel, H. (A)
King, S. M. (A)
Kingsley, B. (A)
Kinzinger, W. C. (A)
Kirsch, A. L. (A)
Kishpaugh, A. W. (H)
Klein, S. (A)
Koenigsberg, D. (A)
Koldner, M. (A)
Kolts, R. C. (A)
Konrad, L. (A)
Koon, W. S. (A)
Kosich, R. J. (A)
Koss, N. A. (A)
Kozak, M. J. (A)
Kranton, J. (A)
Krasney, S. (A)
Kraus, C. R. (M)
Kraus, F. A. (A)
Kravitz, A. B. (A)
Krieg, S. (A)
Ku, Y. H. (SM)
Kugler, F. (A)
Kyne, T. (A)
Ladenson, M. (A)
Lagore, J. A. (SM)
Lande, A. J. (A)
Landrey, L. R. (SM)
Larsen, R. L. (A)
Lathrop, R. J. (A)
Lawrence, D. H. (A)
Lawrence, J. D., Jr. (A)
Lazinski, R. H. (A)
Leader, R. (A)
Lee, D. H. (A)
Leitch, J. G. (SM)
Leondes, C. T. (A)
Lewis, G. (VA)
Lieb, A. B. (A)
Liebersohn, A. (A)
Lindley, P. L. (A)
Lobel, D. J. (A)
Loeb, J. W. (A)
Loftus, J. A. (A)
Loginow, S. (SM)
Losew, W. S. (A)

Low, F. (A)
Lukoff, H. (A)
Lundberg, C. F., Jr. (A)
Lynch, T. J. (A)
Mac Donald, H. E. (M)
Macfadden, W. C. (VA)
Machler, R. C. (SM)
Maddox, J. L., Jr. (A)
Magasiny, I. P. (A)
Magness, P. L., Jr. (A)
Maguire, J. A. (A)
Major, R. P. (M)
Malaker, S. F. (M)
Malta, S. V. (A)
Mapp, H. S. (A)
Markowitz, R. S. (A)
Marks, E. I. (A)
Marple, M. O. (A)
Marsten, J. (SM)
Martire, J. A. (A)
Miser, B. (A)
Mason, E. A. (A)
Mason, J. R. (A)
Masurat, G. (A)
Matthews, E. L., Jr. (A)
Mauger, R. S. (A)
Maxwell, F. H. (A)
Mayer, D. B. (M)
Mayer, D. F. (A)
McCarron, F. J. (A)
McCoskrie, D. (A)
McDowell, A. P., Jr. (M)
McEnroe, J. M., Jr. (A)
McHugh, R. J. (A)
McKay, W. (A)
McKee, G. R., Jr. (A)
McKenna, J. R. (A)
McKnight, C. F. (A)
McLeod, W. K. (A)
Medoff, J. L. (A)
Merrihew, H. W. (A)
Merritt, J. E. (A)
Messenger, G. C. (A)
Meyer, S. (M)
Milewski, C. A. (M)
Miller, E. (A)
Miller, F. (A)
Miller, M. (A)
Mills, R. E. (A)
Montgomery, A. P., (SM)
Moore, R. C. (SM)
Moritz, K. C. (M)
Morton, W. B., Jr. (M)
Moskowitz, N. (A)
Mott, R. J. (A)
Mouradian, H. (VA)
Mozenter, M. J. (A)
Mulvey, J. A. (A)
Muroff, J. M. (A)
Murphy, E. G. (M)
Mustico, J. (A)
Myers, A. S., Jr. (SM)
Myers, G. T. (A)
Namaroff, J. H. (A)
Natkin, H. B. (A)
Neppel, W. C. (A)
Neuber, H. K. (VA)
Neimbich, T. J. (A)
Newman, E. L. (A)
Newmeyer, D. R. (A)
Nichol, A. V. (SM)
Nicholson, V. (A)
Nishimura, J. Y. (A)
Norton, R. (A)
Nowak, R. F. O. (A)
Olevsky, B. (A)
Olewine, W. P. (A)
Olsen, T. W. (A)
Olken, H. (A)
Orth, R. B. (A)
Packer, W. H. (A)
Paffas, E. D. (A)
Partin, M. E. (A)
Pasiczuyk, I. (A)
Perkins, G. O. (A)
Peters, A. E. (A)
Peterson, E. F., Jr. (M)
Petri, W. H., Jr. (A)
Pfifferling, F. (A)
Pharo, E. W., Jr. (M)
Pitman, J. E. (A)
Piontkowski, J. S. (A)
Platt, B. E. (A)
Podell, E. J. (A)
Poellnitz, F. D. (A)
Popaduk, G. F. (M)
Pressman, A. (M)
Prince, A. (A)
Raffa, P. E. (A)
Randall, N. C. (A)
Rapposelli, E. (A)
Rataski, C. P. (SM)
Reel, W. R. (A)
Richman, R. R. (A)
Richter, F. (A)
Riebman, L. (M)
Riester, H. A., Jr. (M)
Ritchey, O. W. (A)
Robins, M. N. (A)
Rodgers, L. M. (SM)
Rohr, J. G. (A)
Rolnick, M. A. (A)
Romar, A. F. (M)
Romanofsky, N. K. (A)
Roschen, J. (A)
Roseman, H. M. (A)
Rosenberg, H. (A)
Rosenstein, G. M. (A)
Rosenthal, D. (A)
Ross, I. L. (A)
Rothwarf, F. (A)
Rovins, J. J. (A)
Rowe, A. J. (A)
Rowe, C. R. (SM)
Ruben, H. (SM)
Rubinoff, M. (A)
Rudnick, J. J. (A)
Russo, J. S. (A)
Sachs, H. L. (A)
Sarkisian, J. (A)
Saunders, R. (A)
Sayer, T. C. (A)
Schaefer, H. W. (A)
Schifreen, C. S. (A)
Scholes, W. R. (A)
Scholtes, P. W. (A)
Schrader, R. H. (A)
Schwan, H. P. (M)
Schulz, R. B. (M)
Schwartz, I. (A)
Schwartz, M. (A)
Schwartz, R. F. (M)
Schwartzberg, H. L. (M)
Seif, E. (A)
Seligman, J. M. (A)
Sheaffer, I. M., Jr. (A)
Shalabender, R. A. (A)
Sheppard, C. B. (M)
Sher, N. (M)
Sherman, A. (A)
Sherman, M. B. (A)
Sherman, S. M. (SM)
Shields, J. D. (A)
Showers, R. M. (M)
Shucker, S. (A)
Shulman, M. B. (A)
Sichel, A. T. (VA)
Siedlarz, J. B., Jr. (A)
Siemen, H. A. (A)
Simmons, C. D. (A)
Skavicus, A. J. (A)
Slampyak, S., Jr. (A)
Slawek, J. E. (A)
Smith, A. W. (A)
Smith, B. D. (A)
Smith, D. B. (F)
Smith, J. H., Jr. (A)
Songster, G. F. (A)
Soorenko, T. (A)
Spady, R. J. (A)
Spandorfer, L. M. (A)
Spector, E. N. (A)
Speed, D. K. (A)
Spence, J. F., Jr. (A)
Spencer, R. W. (A)
Spiegel, R. M. (A)
Stambaugh, J. C. (M)
Stangler, D. M. (A)
Stanton, L. (M)
Stanwood, R. H. (A)
Starks, W. H. (A)
Stein, M. (A)
Steinberg, B. D. (A)
Steinberg, S. (A)
Stephenson, J. M. (A)
Stern, J. M. (A)
Stock, D. C. (A)
Stovall, J. R., Jr. (M)
Stratton, C. H. (A)
Stubbs, G. S. (A)
Suckle, B. W. (A)
Sullivan, H. B. (A)
Susskind, I. N. (A)
Swerdloff, B. (A)
Sysko, S. J. (M)
Szymanski, W. C. (A)
Talambiras, R. P. (A)
Tarpley, R. E. (VA)
Teacher, C. F. (A)
Tellier, J. C. (SM)
Ten-Cate, W. L. (A)
Thibodeay, L. E. (A)
Todd, C. R. (A)
Tompkins, J. S. (A)
Torrey, R. D. (A)
Tou, J. (A)
Tourshou, S. (A)
Trachtenberg, B. M. (A)
Trachtman, J. (M)
Traub, E. H. (SM)
Travis, I. (SM)
Trocky, E. V. (A)
Turner, M. L., Jr. (A)
Turner, R. J. (A)
Twist, G. A. (A)
Urkowitz, H. (A)
Uasler, W., Jr. (A)
Utman, R. E. (M)
Vallieire, E. G. (A)
Van Basselaere, L. J. (A)
Van Horn, J. C. (SM)
Van Name, J. M. (A)
Vantine, H., Jr. (SM)
Varallo, F. A. (A)
Vasilevskis, H. S. (A)
Violante, R. V. (A)
Virgadamo, F. (M)
Voegtlin, E. (A)
Watson, R. E. (A)
Weber, H. C. (A)
Weidknecht, C. J., Jr. (A)
Weinberg, I. (A)
Weiner, J. R. (A)
Weiner, M. (A)
Weinstock, W. W. (A)
Weise, R. C. (VA)
Weisenfeld, S. (A)
Weiss, S. (A)
Werner, C. P. (A)
West, W. P. (SM)
Whitby, L. S. (A)
White, J. P. (A)
Wightman, R. R. (M)
Willenborg, E. J. (A)
Williams, A. J., Jr. (SM)
Williams, J. B. (SM)
Wills, W. P. (SM)
Wilsker, O. (A)
Wilson, L. D. (M)
Winzemer, A. M. (SM)
Wise, B. (A)
Witkin, E. (SM)
Wojcicki, F. J. (A)
Wojick, J. J. (A)
Wolf, A. A. (A)
Wolin, L. (SM)
Wolin, S. (SM)
Woll, C. F. (SM)
Wood, H. O. (SM)
Wood, J. R. (A)
Woodcock, V. E. (M)
Wye, R. E. (A)
Wyeth, F. H. (A)
Wylen, J. (A)
Yang, C. (A)
Yang, T. (A)
Yarbrough, S. L. (SM)
Yetter, E. W. (M)
Young, R. T. (A)
Yutz, R. W. (A)
Zappacosta, J. A. (A)
Zebrowitz, S. (A)
Zimmerman, M. S. (A)

Phoenixville
Kaufmann, H. W. (A)

Pineville (PHI-3)
Gallagher, V. C. (A)
Schreiner, W. A. (A)

Pittock
Shyhalla, N. (A)

Pittsburgh (PIT-4)
Anderson, A. E. (M)
Angello, S. I. (SM)
Aronson, M. H. (M)
Barron, F. E. (M)
Bartholomew, R. R. (A)
Baughman, G. W. (SM)
Bean, R. H. (A)
Beardsley, R. R. (M)
Bennett, A. L., Jr. (A)
Benson, H. C. (A)
Blair, H. A., Jr. (A)
Bossart, P. N. (SM)
Bowman, J. R. (SM)
Boyer, J. L. (A)
Bright, R. L. (A)
Brinda, J., Jr. (A)
Browder, F. E. (M)
Burgard, G. J. (A)
Bush, N. E. (A)
Busse, C. C. (M)
Caplan, H. M. (A)
Caywood, W. P., Jr. (SM)
Chosky, P. (A)
Christensen, B. (A)
Clement, P. F. (VA)
Cole, N. D. (SM)
Coltman, J. W. (SM)
Coombs, S. H. (A)
Covert, J. R. (A)
Creps, R. H. (A)
Dean, W. C. (A)
Decker, R. O. (A)
Depian, L. (A)
Diamond, H. (M)
DiCarlo, V. J. (A)
Dodd, A. E. (A)
Dollens, D. J. (A)
Duckett, E. J. (SM)
Eiter, W. F. (A)
Engel, F. A., Jr. (M)
Evans, R. (A)
Fitzsimmons, D. P. (SM)
Flaherty, J. M. (A)
Franz, J. P., Jr. (A)
Gilbert, C. W. (M)
Gill, H. A. (SM)
Grace, J. N. (A)
Graul, T. A. (M)
Greenwood, J. H. (SM)
Hall, C. T. (M)
Hall, R. L. (A)
Hamilton, W. H. (SM)
Henkels, H. W. (M)
Hoffman, R. C. (A)
Holland, J. T., Jr. (A)
Holzman, G. R. (A)
Hovey, B. K. (SM)
Huggler, L. R. (A)
Imboden, H. B. (A)
Jackson, A. H. (A)
Je Schonek, A. A. (A)
Jones, C. H. (SM)
Jones, D. H. (A)
Jones, G. E., Jr. (A)
Jonnath, A. J. (A)
Kaiser, H. R. (M)
Keay, F. W. (A)
Kenney, T. C. (SM)
Ketterer, R. L. (M)
Knox, W. G. (A)
Krasik, S. (A)
Krauss, W. N. (A)
Law, B. E. (A)
Lazich, B. (SM)
Leahy, E. F. (A)
Lesnick, D. R. (A)
Libenschek, R. S. (A)
Litot, P. A. (A)
Lowe, F. B. (A)
Luther, G. M. (A)
Lybarger, S. F. (SM)
Maas, W. C. (A)
Mac Alister, A. (A)
Mac Gregor, R. J. (A)
Madsen, C. J. (SM)
Markle, R. L. (A)
Marlowe, E. W. (M)
Marshall, S. C. (A)
Mathias, R. A. (A)
McConaughy, D. L. (M)
McConnell, R. A. (SM)
McCoy, W. B. (A)
McCreary, H. S., Jr. (A)
McIntosh, R. O. (SM)
McKinley, J. G. (A)
Middleton, M., Jr. (A)
Miller, W. M. (VA)
Moore, G. E. (M)
Mundy, J. L. (M)
Murphy, A. T. (A)
Nagel, G. W. (SM)
Nelkin, A. (A)
O'Brien, F. E. (A)
O'Donnell, T. J. (A)
O'Shea, J. G. (M)
Pakala, W. E. (SM)
Pappas, P. E. (A)
Perkins, H. A., Jr. (A)
Peters, L. J. (SM)
Pickholtz, L. (A)
Plutt, J. A., Jr. (A)
Potter, W. S. (A)
Rau, F. J. (A)
Reed, J. F., Jr. (A)
Reihing, J. V., Jr. (A)
Roberts, R. W. (A)
Robertson, A. S. (M)
Roeder, J. R. (A)
Ropar, J. M. (A)
Rover, G. H. (A)
Ruth, D. K. (A)
Ryan, T. M. (A)
Sander, H. F. (A)
Schatz, E. R. (SM)
Schultz, J. J. (A)
Schultz, M. A. (SM)
Shafer, W. L. (A)
Shagam, E. M. (A)
Shaner, J. R. (A)
Shaw, V. G. (SM)
Shen, K. M. (A)
Shoupp, W. E. (F)
Silverman, R. (A)
Single, C. H. (A)
Snefsky, E. A. (A)
Sparrow, R. F. (A)
Staubitz, E. J. (VA)
Stepka, A. J. (A)
Strasser, A. (A)
Suter, S. G. (A)
Tanner, G. O. (A)
Taylor, K. A. (A)
Taylor, W. E., Jr. (A)
Taylor, W. J. (A)
Teare, B. R., Jr. (F)
Thompson, J. H. (A)
Tunell, R. H. (A)
Twaska, V. M. (A)
Uleman, T. (M)
Van Nice, R. I. (A)
Vendeland, R. N. (A)
Vogeley, C. E., Jr. (SM)
Walden, A. (A)
Walker, T. J. (A)
Wang, E. H. (A)
Watkins, K. E. (A)
Williams, E. M. (SM)
Woodford, J. B., Jr. (A)
Wyckoff, R. D. (SM)
Zabetakis, S. G. (A)
Zionts, S. (A)

Pittston (PHI-3)
Miller, A. N. (A)

Plains
Olszewski, L. V. (A)

Plymouth Meeting (PHI-3)
Jensen, C. L. (A)
Krantz, F. H. (A)

Portage (PIT-4)
Boyles, C. W. (A)

Pottstown (PHI-3)
Oister, G. K. (A)
Standhardt, O. C. (A)

Prospect Park (PHI-3)
Beeby, E. W. (A)

Pulaski (PIT-4)
Bourgeois, N. A., Jr. (A)

Quakertown (PHI-3)
Bartholomew, R. G. (M)
Cole, W. P. (SM)
Hendricks, P. S. (VA)
Keil, O. C., Jr. (M)
Moose, L. F. (A)
Shower, E. G. (SM)

Radnor (PHI-3)
Ashmead, D., III (M)

Reading (PHI-3)
Brobst, A. K. (A)
Hall, H. S. (A)
Hornberger, J. E. (M)
Landis, H. O. (VA)
Le Blanc, C. E. (A)
Rose, F. L. (A)
Schilling, R. G. (A)

Riddlesburg (PIT-4)
Repogle, J. O. (A)

Ridgway (EMP-4)
Cowles, R. J. (A)
Talatt, M. E. (A)

Ridley Park (PHI-3)
Douthwaite, W., Jr. (A)
Given, W. H., III (A)
Tompkins, H. E. (M)

Rixford (EMP-4)
Herbert, H. W. (A)

Ronks (PHI-3)
Perry, H. E. (A)

Rosemont
Halstead, W. K. (A)

Roslyn (PHI-3)
Barnett, G. F. (M)
Baumgartner, W. H. (A)
Beaver, J. A., Jr. (M)
Davidson, D. R. (A)
Douglass, F. W. (A)
Pearson, S. S. (A)
Shirley, R. C. (A)
Silverman, J. B. (A)
Speights, M. T. (A)
Stadig, S. V. (M)
Thomas, J. E. (A)

Rydal (PHI-3)
Clarke, L. A. (A)
Ferrill, T. M., Jr. (SM)
Grimditch, W. H. (SM)
Herr, R. F. (SM)

St. Marys (EMP-4)
Dressel, H. (A)
Hoffman, R. R. (SM)
McKnight, G. P. (M)
Neff, A. K. (A)
Pierson, I. S. (VA)
Speer, J. S., III (A)
Veley, H. N. (SM)

Saxonburg (PIT-4)
Cooper, R. W. (A)

Schwenksville (PHI-3)
Richard, C. D., Jr. (M)

Scranton (PHI-3)
Brown, R. J. (V)
Cooke, K. R. (A)
Corwin, N. J. (M)
Gluck, M. (A)
Greenfield, A. (A)
Kohn, S. A. (A)
Miller, W. A. (A)
Pettersen, R. J. (A)
Quinn, J. M. (A)
Santilli, R. A. (A)
Schiller, J. (A)
Slutter, W. R. (A)
Smith, G. (A)
Weiss, H. (A)
Witkowski, J. F. (VA)

Secare
Wagenseller, J. E. (A)

Selerstville (PHI-3)
Soltau, R. H. (A)

Selinsgrove (WIL-4)
Moshier, L. S., Jr. (A)

Sewickley (WA-3)
Hilburn, E. O. (A)

Shamokin (WIL-4)
Thompson, W. B. (M)

Sharon (PIT-4)
Douglas, W. H. (A)
Fisher, S. G. (A)
Greene, R. L. (A)
Jones, L. S. (A)
Laing, J. T. (A)
Newell, W. E. (A)
Schafitz, S. A. (A)
Schatz, R. A. (A)
Zahniser, R. M. (A)

Sharpurg (PIT-4)
Staniszewski, J. R. (A)

Shenandoah
Kiseleski, J. M. (A)

Shrewsbury
Sechrist, C. F., Jr. (A)

Smethport (EMP-4)
Peterson, C. A. (A)
Willardson, F. W. (M)

Solebury (PHI-3)
Algeo, B. C., Jr. (SM)

Souderton (PHI-3)
Baghurst, W. F. (A)

Southampton (PHI-3)
Dangremond, I. L. (A)
Lex, R. G., Jr. (A)
Ogletree, W. A. (A)
Wernlund, R. F. (A)

South Williamsport (WIL-4)
Lavo, H. J. (M)

Spring City (PHI-3)
Clevenstine, W. M. (A)

Springdale (PIT-4)
Duris, M. W. (A)
Valiasek, J. W. (A)

Springfield (PHI-3)
Albee, M. M. (A)
Ebling, W. F., Jr. (A)
Eichert, E. S. (SM)
Herz, A. J. (SM)
Hoepfner, K. B. (A)
Laiming, H. J. (SM)
Metzger, A. C. (A)
Mitchell, W. J., Jr. (A)
Rhea, H. E. (A)
Schneider, S. (A)
Simpson, O. (SM)
Sylvester, R. A. (M)
Warshaw, I. (M)
Weiss, E. (M)

Spring House (PHI-3)
Pritchard, C. A. (A)
Sims, J. C., Jr. (M)

Springtown (PHI-3)
Vance, R. L. (SM)

State College (EMP-4)
Ammerman, C. R. (SM)
Baker, W. L. (A)
Bastuscheck, C. P. (A)
Bloomquist, W. B. (A)
Bogar, J. E. (A)
Breazeale, W. M. (SM)
Brown, W. N., Jr. (SM)
Brownfield, L. B. (A)
Cannon, J. B., Jr. (A)
Chubb, W. R., Jr. (A)
Crossley, G. L. (SM)
Curry, T. F. (A)
Deysher, J. B. (A)
Diamant, H. B. (A)
Doerr, C. W. (A)
Ebaugh, P. (A)
Fessler, A. L. (M)
Files, W. D. (A)
Freed, P. J. (SM)
Gedance, A. R. (A)
Haller, G. L. (F)
Harbolis, S. S., Jr. (A)
Harris, D. E. (A)
Harvey, H. B. (A)
Higdon, R. V. (SM)
Hunter, R. P. (SM)
Jenkins, J. W. (A)
John, F. T. (A)
Kay, J. W. (A)
Key, C. L., Jr. (A)
Knausenberger, G. E. (A)
Kush, L. J. (M)
Leiss, W. J. (M)
Lopez, A. F. (M)
McLucas, J. L. (SM)
Megarger, L. R., Jr. (A)
Nearhoof, H. J. (A)
Richers, E. E. (A)
Riddle, R. L. (A)
Schneider, H. L. (A)
Schrag, R. L. (M)
Skipper, R. E. (A)
Snyder, N. (SM)
Staples, R. L. (A)
Stavely, E. B. (M)
Tomlinson, J. M. (A)
Walker, E. A. (M)
Walker, J. C. F., III (A)
Walker, J. P., Jr. (A)
Waynick, A. H. (SM)
Yezerinac, J. C. (A)

Stiles
Saganowich, J. T. (A)

Strafford (PHI-3)
Patterson, T. T. (A)

Strausstown (PHI-3)
Anthony, G. C. (A)

Sunbury (WIL-4)
Bower, H. W. (A)
Carr, G. W. (M)
Dideum, M. A. (A)
Gaul, W. L. (A)
Housekeeper, R. H. (A)
McClane, C. T. (M)
Neidig, K. E. (M)
Reitz, H. W. (A)
Rossig, E. W. (M)
Shoos, J. P. (A)

Swarthmore (PHI-3)
Barus, C. (A)
Hayes, R. S. (VA)
Patterson, G. W. (A)
Roberts, G. A. (M)
Satterthwaite, W. F. (A)

Sykesville (EMP-4)
Lesko, J. (A)

Tamaqua
Johnson, A. T. (A)

Tarentum
McCarthy, E. A. (A)
Harbaugh, J. R. (A)

Telford (PHI-3)
Price, H. K. (A)

Temple
Mueller, P. L. (A)

Throop (PHI-3)
Yatsko, F. P. (A)

Towanda
Engisch, R. A. (A)
Owen, E. R. (A)

Trafford (PIT-4)
Breakey, G. A. (A)

Trevose
Hanson, L. B. (A)

Tunkhannock
Inman, A. D. (A)

Turtle Creek (PIT-4)
Brendle, T. A. (A)
Coleman, W. E. (M)
Renkiewicz, H. F. (A)

Tyrone
Kearney, H. B., Jr. (VA)

Upland (PHI-3)
Phillips, C. C., III (A)

Upper Darby
Charp, S. (SM)
Doyle, R. E. (A)
Garkav, E. (A)
Gumacos, C. (A)
Houser, W. G. (A)
Kenoslan, H. (M)
Mankoff, L. L. (A)
McCoy, C. T. (SM)
Millet, J. M. (A)
Pappas, C. (M)
Peckham, M. A. (A)
Pope, R. A. (A)
Santaguida, C. (A)
Weinberg, H. M. (A)

Valencia (PIT-4)
Findley, R. W. (A)

Verona (PIT-4)
Brannen, P. M. (M)
Hollobaugh, R. C. (M)
Niu, T. C. T. (A)
Stineman, J. W., Jr. (A)

Villanova
Klekotka, J. A. (M)
Sheker, E. B. (A)
Wallingford (PHI-3)
Howard, J. H. (SM)
Remorenko, M. S. (A)
Robinson, I. E. (A)

Warren
Myers, S. J. (A)
Wanner, L. R. (M)

Warrington (PHI-3)
Beggs, G. E., Jr. (SM)
Clarance, A. L. (A)
McGlone, J. M. (M)

Washington (PIT-4)
Loffredi, A. J. (A)
Paul, D. R. (A)

Wayne (PHI-3)
Gaddis, A. H. (A)
Lewis, F. C. (A)
MacInnes, N. A. (A)
Wu, H. H. (A)

Waynesboro (PHI-3)
Marlow, W. C., Jr. (VA)

Weatherly (PHI-3)
Carlson, R. F. (SM)
Kiser, N. L. (SM)

Weisel
Hansburg, M. (A)

Wescoesville
Schlichter, E. S. (A)

Wesleyville (BN-4)
Larson, K. E. (A)

West Chester (PHI-3)
Green, R. E., Jr. (A)
Haner, L. P. (SM)
Hayes, H. J., Jr. (M)
Kieselbach, R. (A)
Munns, M. (A)
Veldhuis, A. C. (M)

West Homestead (PIT-4)
Cauley, T. K. (A)

West Middlesex (PIT-4)
Herr, C. E. (A)

West Pittston (PIT-4)
Barritt, R. C. (A)
Black, G. R. (A)
Melvin, J. T. (A)

Wilkes-Barre (PHI-3)
Epstein, J. N. (A)
Hohmann, G. D. (A)
Hohmann, L. A., Jr. (A)
Shuster, E. F. (VA)

Wilkinsburg (PIT-4)
Booker, C. A., Jr. (A)
Jones, C. I. (A)
Jones, R. M. (A)
Paulson, C. T. (A)

Williamsport (WIL-4)
Amey, G. B. (A)
Bresee, W. H. (A)
Canning, J. H. (SM)
Douglass, C. P. (SM)
Drummeter, W. (A)
Fechter, M. R. (A)
Grow, R. E. (A)
Henry, F. T. (M)
Lepley, R. C. (SM)
Petts, R. G. (M)
Snook, J. E. (A)
Teno, E. (A)
White, H. A. (M)

Willow Grove (PHI-3)
Bowley, R. J. (VA)
Cole, W. G. (A)
Kreitler, C. E. (A)
Lounsberry, E. P. (A)
Lynn, R. B. (A)
Martin, J. A., Jr. (A)
Mason, C. F. (A)
Mason, E. C. (A)
Metz, L. C., Jr. (A)
Oliver, W. G. (M)
O'Lone, C. J. (A)
Phillips, J. W. (A)
Remich, J. E. (A)
Saltzman, A. R. (A)
Shaw, H. H. (A)
Silverman, E. (A)
Steward, R. R. (A)
Zohn, R. L. (A)

Woodlyn (PHI-3)
Russo, L. J. (A)

Wyncote (PHI-3)
Craig, P. M. (SM)
Dorris, R. C. (M)
Gold, M. B. (A)
Kinnier, D. (M)

Wyndmoor (PHI-3)
Fowler, C. J. (SM)

Wynnewood (PHI-3)
Collins, H. B., Jr. (A)
Dohan, W. R. (VA)
Fisher, J. F. (SM)
Johnson, N. (M)
Leas, J. W. (SM)
Meverhoff, A. J. (A)
Sumerlin, W. T. (SM)

Wyoming (PHI-3)
Casterlin, A. N. (A)
Marshall, J. F. (M)

Wyomissing (PHI-3)
Bunnell, N. R. (A)
Huyett, W. I. (A)

Yardley (PHI-3)
Blackmon, H. E. (A)

Yoadon (PHI-3)
Hastings, J. A. (A)
Molieri, J. T. (A)
Myers, E. F. (A)
Wiggins, B. E. (A)

York (PHI-3)
Anderson, A. W. (A)
Bower, W. H. (A)
DeVoll, R. L. (SM)
Faber, M. (A)
Feder, J. H. (A)
Frost, E. L. (A)
Funk, R. E. (A)
Gardner, R. W. (A)
Giesecke, H. W. (A)
Goodling, G. G., Jr. (VA)
Haas, W. I. (A)
Hirsch, R. O. (A)
Hubley, G. W. (A)
Knapp, R. L. (A)
Kreager, P. H. (M)
Lynch, H. L. (A)
Megargel, L. R., Jr. (A)
Pieschner, H. (M)
Staub, R. J. (A)
Stonesifer, R. A. (A)
Swengel, R. C. (A)
Umolehy, K. F. (SM)
Ulrich, W. J. (SM)
Walker, H. (SM)

RHODE ISLAND

Barrington (BOS-1)
Anderson, C. W. (A)
Carmody, T. P. (A)
Thornley, H. W. (VA)

Central Falls
McPeake, R. B. (A)

Cranston
Cardillo, A. (A)
Clayton, J. W., Jr. (A)
Iannotti, J. D. (A)
Socia, B. L. (A)

East Greenwich
Burn, J. M., Jr. (A)
Tyler, E. M. (A)
Wong, G. J. (A)

East Providence
Parker, G. I. (A)

Edgewood
Kowalik, J. S. (A)

Johnston
Sardelli, H. A. (A)
Sardelli, W. G. (A)

Kingston (BOS-1)
Billmyer, C. M. (A)
Haas, R. S. (A)
Kline, J. (M)
Mowbray, W. H. (A)
Prince, M. J. (A)

Manville
Hembise, P. M. (A)

Middletown (BOS-1)
LaVallee, M. L. (A)
Murphy, W. F., Jr. (A)
Ridenour, H. E. (A)

Newport (BOS-1)
Baer, E. W. (A)
Bowerman, R. H. (A)
Craig, A. G., Jr. (A)
Gooley, R. M. (A)
Heartz, L. (M)
Mathison, W. W. (A)
Meader, R. O. (M)
Murphy, E. J. (A)
Sawyer, R. S. (A)
Sologiozy, C. S. (A)

Oakland Beach
Kimble, C. B. (A)

Pawtucket
Courchene, E. E., Jr. (A)
Nichols, A. J. (A)
Stacy, J. E. (SM)

Providence (BOS-1)
Angulo, C. M. (M)
Barlow, H. B., Jr. (A)
Barry, D. T. (A)
Bliss, Z. R. (A)
Bromberg, H. (A)
Cook, D. R. (A)
Dandreta, W. (VA)
Farrell, F. X. (M)
Fine, S. (A)
Gordon, M. F. (M)
Klemer, B. H. (A)
Markey, J. T. (A)
Murtaugh, W. A. (M)
Regan, J. V., Jr. (A)
Ruina, J. (A)
Testa, E. (A)
Tilley, H. H. (SM)
Truell, R. (SM)
Verrecchia, T. A. (A)
Weisberg, A. M. (A)

Riverside (BOS-1)
Allen, G. W. (A)
Bushnell, R. R. (A)

Rumford (BOS-1)
Arnold, R. D. (A)
Prior, T. C. J. (M)
Prior, T. K. (A)

Tiverton (BOS-1)
Lizotte, O. A. (M)

Valley Falls (BOS-1)
Bailey, L. E. (A)

Warren (BOS-1)
Bowen, H. C. (A)

Warwick (BOS-1)
McLaughlin, R. G. (A)
Thoresen, J. C. (A)

West Barrington (BOS-1)
Coppolino, L. S. (A)

Westerly (BOS-1)
Crandall, C. P. (A)
Finocchiaro, E. C. (A)

Woonsocket (BOS-1)
Petrides, C. (A)

SOUTH CAROLINA

Aiken (AT-6)
Bancroft, L. C. (A)
Karlson, E. L. (M)
Rahner, H. B. (A)

Charleston (AT-6)
Bailey, J. H. (VA)
Birchfield, W. P. (A)
Buehler, E. R. (A)
Calabrese, J. F. (A)
Edmonds, J. B. (A)
Goldberg, H. S. (A)
Hamilton, W. T. (M)
Harpole, J. L. (A)
Herring, O. L., Jr. (A)
Lax, C. B. (SM)
McCoy, F. G. (SM)
Powers, E. W. (M)
Rhoads, W. C. (A)
Schachte, W. L. (SM)
Schleppegrell, J. R. (A)
Smith, F. A. (A)

Charleston Heights (AT-6)
Fraedrich, D. K. (A)
Jonas, A. (A)
Jones, R. W. (M)
Lyerly, E. E. (A)

Clemson (AT-6)
Adams, L. C. (A)
Long, J. T. (A)
Tingley, F. T. (A)

Columbia (AT-6)
Lambert, R. D., Jr. (M)
Romanyszyn, M. T. (A)
Scott, A. L. (A)
Snyder, R. J. (A)
Teenle, R. P. (A)
Willoughby, D. E. (A)

Drayton (AT-6)
Burdette, C. J. (A)

Florence (AT-6)
Beamer, G. T. (A)
Zeigler, E. N., Jr. (A)

Greenville (AT-6)
Garrison, W. E. (M)
Kalisky, A. (A)
Pace, M. W. (A)
Sellars, E. A. (A)
Takacs, S. T. (A)
Tate, G. D. (M)

Isle of Palms (AT-6)
Fowler, E. B. (A)
Quinn, F. S., Jr. (A)

Moncks Corner (AT-6)
Volf, L. F. (A)

Mount Pleasant (AT-6)
Bennett, J. H. V. S. (A)

Myrtle Beach (AT-6)
Brown, W. J. (A)

Naval Base (AT-6)
Blount, H. L. (M)
Cook, W. H., Jr. (A)
Flynn, L. A. (A)

North Charleston (AT-6)
Beisel, R. W. (M)
Booker, J. P. (M)
Gatch, C. E. (A)
Smith, J. E. (M)
Thomason, J. G. (M)

Orangeburg
O'Cain, W. L. (A)

Pendleton
Klein, N. E. (VA)

Summerville (AT-6)
Metts, M. C. (A)

Waylyn Naval Base (AT-6)
Lane, J. P. (A)

SOUTH DAKOTA

Alexandria (TC-5)
Pitts, M. J. (A)

Arlington (TC-5)
Dill, E. C. (M)

Astoria (TC-5)
Hogie, W. I. (A)

Brookings (TC-5)
Cheadle, J. N. (M)

Huron (TC-5)
Meile, J. W. (A)

Mansfield (TC-5)
Albin, H. L. (A)

Marvin (TC-5)
Hicks, P. A. (A)

Mitchel (TC-5)
Walsh, J. D. (A)

Pierre (TC-5)
Jones, M. G. (A)

Rapid City (TC-5)
Colgan, A. R. (A)
Mayer, F. N. (A)
Nelson, E. A. (M)

Sioux Falls (TC-5)
Froke, L. C. (A)
McKenna, W. E. (M)
Pierce, M. E. (A)
Warren, L. C. (A)

Springfield (TC-5)
Bedwell, T. H. (M)

Vermilion (TC-5)
Graf, S. J. (M)

Watertown (TC-5)
Smedley, J. A. (A)

Weaver (TC-5)
Michaels, G. (A)

TENNESSEE

Bristol (AT-6)
Gray, C. S. (SM)
King, L. A. (A)
Herbert, J. D. (A)
Kay, L. (A)
Russell, N. E. (A)
Smith, B., Jr. (SM)
Wilson, E. M. (A)

Chattanooga (AT-6)
Barnes, B. B. (A)
Dean, W. E., Jr. (A)
Hochdorf, M. (A)
Meagher, A. W. (A)
Smith, R. T. (A)
Terrell, J. M., Jr. (A)
Thurnauer, H. (VA)
Young, B. A. (A)

Clarksville (HUN-6)
Bailey, J. H. (A)

Cleveland (AT-6)
Stuart, W. D. (A)

Concord (AT-6)
Reyling, P. M. (M)

Cordova
Downs, H. I. (A)

Donelson (HUN-6)
Pearsall, S. H. (M)

Fountain City (AT-6)
Eason, O. (A)
Rothrock, H. B. (VA)

Franklin (HUN-6)
Hobbs, R. V. (A)

Goodlettsville (HUN-6)
Genung, N. W. (A)

Johnson City (AT-6)
Garland, O. K. (A)

Kingsport (AT-6)
Davis, G. M. (A)
Devaney, R. G. (A)
Hughes, J. W. (A)

Kingston (AT-6)
Kelley, G. G. (A)

Knoxville (AT-6)
Affel, R. G. (A)
Allen, J. W. (A)
Bodziok, P. J. (A)
Bradley, J. A., Jr. (A)
Bradshaw, R. L. (A)
Burgener, R. C. (A)
Eckel, J. R., Jr.
Evans, R. C. (A)
Horton, J. R. (M)
Kennedy, W. J. (A)
King, S. (A)
Lear, W. E. (SM)
Oakes, L. C. (A)
Price, J. R. (A)
Quinn, R. L. (A)
Schultz, F. V. (SM)
Tillman, J. D., Jr. (M)
Waterman, H. B. (M)

Madison (HUN-6)
Powell, M., Jr. (A)

Manchester (HUN-6)
Chapek, H. T. (A)
Whitehurst, J. D. (A)

Martin (HUN-6)
Ams, J. E. (A)

Memphis (HUN-6)
Browning, J. W. (A)
Busler, L. F., Jr. (A)
Clark, R. N. (A)
Dalton, W. D. (A)
Fitzgerald, G. M. (A)
Futrell, G. K. (A)
Hull, J. (A)
Marsh, W. (A)
Leonard, C. V. (A)
McCraw, L. E. (A)
McLin, J. T. (A)
Orr, W. S. (A)
Raney, W. (A)
Reeves, O. W. (A)
Stewart, R. B. (A)
Viser, J. H., Jr. (A)
Walker, J. A. (A)

Milan (HUN-6)
Messner, K. H. (A)

Millington (HUN-6)
McKnight, D. R. (A)

Nashville (HUN-6)
Anderson, W. G. (A)
Arnold, T. G., Jr. (A)
Bright, F. W. (M)
Broden, B. W. (A)
Campbell, J. S. (M)
DeWitt, J. H. (F)
Dymond, C. (VA)
Gates, H. A. (SM)
Goodloe, R. R. (A)
Graham, E., Jr. (A)
Hill, W. A. (A)
Hucaby, R. L. (M)
Kearley, R. L., Jr. (A)
Montgomery, L. H. (SM)
Rawls, L. E. (A)
Reynolds, G. A. (M)
Schumann, F. (SM)
Shelton, A. C. (M)
Stauverman, R. J. (A)
Sutton, A. T. (A)
Williams, E. E. (A)

Norris (AT-6)
Manning, F. W. (A)

Oak Ridge (AT-6)
Adams, R. K. (A)
Banta, H. E. (M)
Brashear, C. (A)
Christophel, G. H. (A)
Currens, A. B. (A)
Detterman, R. L. (A)
Donaldson, M. R. (A)
Evans, E. C. (M)
Fairstein, E. (A)
Fort, W. G. S. (M)
Gerhard, W. J. (A)
Green, F. P. (A)
Groothuis, S. E. (A)
Hagen, E. W. (A)
Hanauer, S. H. (A)
Holt, G. A. (M)
Judish, J. P. (M)
Knowles, D. J. (M)
MacPhee, J. (A)
Norman, J. E. (M)
Pigg, J. C. (M)
Redford, J. L. (A)
Reynolds, J. W. (A)
Richards, H. K. (VA)
Ritter, R. C. (A)
Roof, R. R. (A)
Schede, R. W. (A)
Scott, D. W. (A)
Shipley, E. D. (A)
Sidnam, R. D. (A)
Southern, A. L. (A)
Sparger, H. T., Jr. (A)
Walchli, H. E. (M)
Zachry, D. S. (A)

Raleigh (HUN-6)
Frase, E. C., Jr. (M)

Sewart AFB (AT-6)
Goldberg, A. S. (A)
McGilvra, G. E. (A)

Signal Mountain (AT-6)
Richmond, R. E. (A)

Tullahoma (HUN-6)
Morreal, J. A. (A)
Pope, R. H. (A)
Severin, J. A. (A)

TEXAS

Abilene (DFW-6)
Farmer, P. E. (M)
Henley, R. D. (A)

Alice
Walters, W. T. (A)

Amarillo (DFW-6)
Hankison, W. C. (A)
Harris, H. W. (M)
Martin, J. L. (M)
Michalk, E. R. (A)
Rivers, M. D. (A)
Torrey, W. H. (A)
Williams, A. M. (A)

Anson (DFW-6)
Gill, R. M. (A)

Arlington (DFW-6)
Bushart, G. J., Jr. (A)
Hutcheson, G. C. (SM)
Ladine, D. A. (A)
Purcell, W. E. (A)
Martin, R. L. (M)
Raymond, W. D. (A)
Watson, D. E. (A)

Austin (SA-6)
Adams, R. M. (A)
Anderson, C. D. (A)
Baltzer, O. J. (SM)
Barclay, J. N. (SM)
Bondy, M. A. (A)
Britt, C. O. (A)
Brooks, F. E., Jr. (M)
Cook, G. R. (A)
Crain, C. M. (M)
Daniels, T. E. (SM)
Davis, A. (SM)
Deakins, G. (A)
Deam, A. P. (M)
Dubose, G. P. (A)
Ellis-Brown, R. (A)
Evans, J. D. (A)
Freund, G. J. (A)
Fannin, B. M. (A)
German, J. P. (A)
Graf, C. R. (A)
Hartwig, W. H. (M)
Heard, J. F. (A)
Holly, L. C. (A)
Huggins, L. L. (A)
Hylfin, T. M. (A)
Kirksey, T. W. (A)
Kreuz, L. B. (SM)
LaCoste, L. J. B. (A)
LaGrone, A. H. (SM)
Lauderdale, D. M. (A)
Lentz, W. H. (A)
Macklin, R. J. (A)
McKinney, C. M. (SM)
Metcalf, D. F. (M)
Mitchell, M. B., Jr. (A)
Opiela, A. D., Jr. (A)
Reynolds, R. B. (A)
Ripperger, E. A. (A)
Runyan, W. R. (A)
Rummel, E. C. (A)
Smith, H. W. (M)
Smith, S. E. (M)
Straiton, A. W. (F)
Straiton, J. W. (SM)
Tinton, C. D. (A)
Tolbert, C. W. (M)
Wallace, R. H. (A)
White, G. E. (SM)
Widener, M. W. (A)
Williams, C. E. (A)
Williams, C. S. (M)

Ballinger
Kelley, W. C. (A)

Beaumont (BP-6)
Aubey, L. J. (A)
Bordeman, M. H. (A)
Burgess, C. H. (A)
Bush, C. R. (VA)
Cherry, L. B. (M)
Collins, J. P. (A)
Cunningham, R. E. (A)
Davis, V. E. (A)
DeSutter, D. H. (M)
Dickerson, M. L. (A)
Eckles, W. W., Jr. (A)
Ferguson, I. D. (A)
Haves, J. T. (A)
Horn, B. B. (A)
Hughes, B. F. (M)
Kay, L. E. (M)
Kirby, R. P. (A)
Laughlin, C. E. (M)
Lawrence, T. B. (M)
McDaniel, L. W. (M)
Medlin, R. O. (A)
Montague, L. E. (A)
Morgan, J. G. (A)
Mounce, C. O. (A)
Musick, A. L., Jr. (A)
Normand, A. J. (A)
Ott, L. G. (A)
Pace, T. L. (A)
Petkovsek, J., Jr. (SM)
Phillips, P. S. (A)
Shane, Z. G. (A)
Smith, H. K. (A)
Southwell, J. D. (SM)
Stockard, L. C. (M)
Straughn, W. L., Sr. (M)
Wearden, P. L. (A)
Whitmeyer, L. J., Jr. (A)
Winterhalter, A. (A)

Bellaire (HOU-6)
Ball, D. F. (M)
Barnette, L. A. M. (SM)
Bender, J. C. (M)
Borden, R. R. (A)
Cowles, L. G. (SM)
Herzog, G. (SM)
Huffman, C. H. (A)
Hulmdorff, E. P. (M)
Loofbourrow, R. J. (M)
Mann, R. W. (SM)
Mazzagatti, R. P. (A)
Mear, A. M. (A)
Nelsen, H. H. (A)
Schafer, E. L. (A)
Stelzer, R. B. (A)
Thomson, W. E. (A)
Wheeler, H. T. (M)

Biggs AFB (EP-7)
Robson, A. B., Jr. (A)

Blooming Grove (DFW-6)
Crocker, B. G. (A)
Crocker, J. A. (A)

Brady (SA-6)
Byler, H. C., Jr. (A)

Brownfield (DFW-6)
Spear, R. B. (M)
Venters, J. B. (A)

Brownsville (SA-6)
Brand, J. J. (M)
Johnston, H. M. (A)
Martin, G., Jr. (A)

Bryan (HOV-6)
Sosolik, F. J. (A)

Canyon (DFW-6)
Thompson, C. E. (A)

Castroville (SA-6)
Burges, E. G., Jr. (A)

Center (BP-6)
Riley, H. E. (A)

Childress (DFW-6)
Fyfe, B. (A)

Cleburne
Graham, H. L. (A)

College Station (HOU-6)
Dillingham, H. C. (SM)
Hansen, P. (M)
Jonas, L. K. (M)
Mellon, A. W. (SM)

Commerce (DFW-6)
Sparkman, W. A., Jr. (M)

Cooper (DFW-6)
Hodges, S. E. (A)

Corpus Christi (SA-7)
Dunn, E. C. (A)
Lockhart, H. B. (A)
Mayberry, J. H. (A)
Taylor, P. (M)

Corsicana (DFW-6)
Jackson, M. L. (A)

Dallas (DFW-6)
Albano, J. (SM)
Ankele, E. T., Jr. (M)
Arnett, R. A. (SM)
Aymond, E. F., Jr. (A)
Bailey, W. R. (M)
Becklund, O. A. (SM)
Bickel, R. L. (A)
Blocker, R. E. (A)
Brachman, M. K. (M)
Branum, M. C. (A)
Brawner, C. A., Jr. (A)
Brewer, H. D. (A)
Brock, F. A. (M)
Brown, L. E. (A)
Brown, R. A. (A)
Brown, R. L., Jr. (M)
Bruland, R. V. (M)
Bullock, M. W. (M)
Burg, K. E. (A)
Campbell, J. R. (A)
Campbell, M. S. (A)
Carter, P. G. (A)
Caruth, J. L. (M)
Chapman, A. B. (VA)
Chenault, H. P. (A)
Clewell, D. H. (SM)
Childress, C. B. (A)
Collins, F. (SM)
Congdon, R. L. (SM)
Conrad, R. S. (SM)
Crandell, C. F. (M)
Cullum, A. E., Jr. (F)
Curtis, G. D. (A)
Daniell, C. M. (SM)
Daniher, C. E. (A)
DeLong, C. O., Jr. (A)
Doherty, D. T. (A)
Dosher, R. T., Jr. (M)
Dowell, K. P. (A)
Drennan, J. B. (A)
Dunnegan, T., Jr. (A)
Dutton, C. G. O. (A)
Dyer, F. C. (A)
Earhart, C. E. (SM)
Edwards, H. T. (A)
Ellis, W. C. (M)
Elkins, C. C., Jr. (M)
Elmore, C. M., Jr. (A)
Englehart, C. F. (A)
Eriksen, E. M., Jr. (A)
Evans, A. D. (A)
Findley, L. K. (SM)
Flath, E. H., Jr. (M)
Flynn, J. G., Jr. (A)
Fox, C. H. (M)
Frauman, C. I. (M)
Frobese, C. W. (M)
Geisel, F. J. (A)
Gilder, E. E. (A)
Godbey, J. J. (A)
Godbey, J. K. (M)
Gragert, W. J. (A)
Granberry, D. S. (SM)
Green, J. A. (SM)
Green, P. M. (A)
Griffith, B. W., Jr. (SM)
Gudzin, M. G. (A)
Hasfele, D. M. (M)
Haggerty, P. E. (SM)
Hallford, B. R. (A)
Hampton, J. W. (M)
Harmon, F. I. (M)
Hathaway, W. L. (A)
Headington, N. L., (A)
Hedeman, W. R., Jr. (SM)
Heizer, K. W. (A)
Herman, H. F. (A)
Hertel, P., Jr. (A)
Hewlett, T. N. (A)
Hirschberg, J. K. (A)

Hoehn, G. L., Jr. (M)
Holaday, D. F. (M)
Holt, I. D. (A)
Homsy, J. H. (SM)
Horne, K. M., Jr. (A)
Hunt, J. T. (A)
Hutchinson, N. D. (A)
Ince, N. S. (A)
Ingraham, J. H. (A)
Irwin, C. B., Jr. (A)
Jones, J. F. (A)
Jones, T. L. (SM)
Joyce, R. E. (A)
Jurek, W. M. (A)
Kantor, H. I. (A)
Kaver, M. (A)
Keener, R. F. (A)
Kelly, R. W. (A)
Kelsay, W. D. (A)
Kennedy, F. H., Jr. (SM)
Klein, J. H. (A)
Knight, J. H. (A)
Koepsel, W. W. (A)
Kuehne, W. (M)
Lane, E. F. (A)
Lawrence, L. J. (A)
Leedom, J. N. (M)
Levelle, A. S. (M)
Lewis, M. T. (M)
Lincoln, J. P. (A)
Lineback, J. T. (A)
Linker, C. L. (A)
Lipscomb, E. W. (SM)
Logan, J. J. (A)
Loper, G. B. (M)
Loras, J. (A)
Macdonald, J. R. (A)
Mace, J. W. (A)
Mallory, V. (M)
Martin, D. O. (M)
Martin, G. W., Jr. (A)
Mason, A. E., Jr. (A)
Mason, J. S. (M)
Mathis, J. D. (SM)
Maxson, G. W. (A)
McAnally, D. G. (A)
McDermott, E. (VA)
McNeely, J. S. (SM)
Meinholdt, D. W. (A)
Meyer, A. A. (A)
Miller, J. C., Jr. (A)
Miller, N. D. (A)
Mills, R. L. (M)
Minton, J. A., Jr. (A)
Mitchell, W. R. (VA)
Moseley, T. B. (M)
Moyer, J. N. (A)
Mut, S. C. (A)
Naab, P. J. (A)
Neitzel, E. B. (A)
Nelson, S. R. (A)
Nelson, T. J. (A)
Newell, B. J. (A)
Nilson, O. J. (A)
Norkus, B. S. (M)
Norvell, E. W. (A)
Norvell, K. A. (A)
Ocnaschek, F. J. (A)
Olson, R. W. (SM)
Oster, R. E. (A)
Palmquist, J. F. (SM)
Paslay, L. C. (VA)
Paxton, T. N. (A)
Peacock, R. M., Jr. (A)
Penn, W. D. (SM)
Peterson, D. A. (SM)
Poole, W. S. (A)
Prickett, T., Jr. (M)
Reed, B. S. (A)
Reiffin, J. L. (A)
Relyea, J. R. (A)
Renner, D. S. (VA)
Riser, H. N. (A)
Roberts, J. D. (A)
Robinson, G. C. (M)
Roby, J. W., Jr. (M)
Rogers, T. E. (A)
Ross, C. C. (VA)
Rountree, J. G. (SM)
Russell, C. A. (A)
Rutherford, C. R. (M)
Scammel, B. C. (A)
Schafer, N. B. (A)
Schultz, P. A. (A)
Schwalm, C. M. (A)
Seay, C. F., Jr. (SM)
Shaw, B. E. (A)
Shepherd, M., Jr. (SM)
Shook, E. M. (A)
Shuffler, R. M. (SM)
Smallwood, J. L. (A)
Smith, F. G. (A)
Smith, H. J. (M)
Smith, J. E. (A)
Smith, J. H. (M)
Sorkin, S. A. (A)
Spieker, L. J. (A)
Spieker, M. (A)
Stinson, L. W. (A)
Stone, R. M. (A)
Stover, J. S. (M)
Stribling, J. L., Jr. (A)
Strom, L. D. (A)
Stroup, R. M., Jr. (A)
Summers, G. C. (A)
Teal, G. K. (SM)
Thompson, J. H., Jr. (SM)
Thornhill, J. W. (SM)
Tobolowsky, J. L. (A)
Tucker, D. J. (SM)
Tullius, R. F. (M)
Vilbig, J. L., Jr. (A)
Wadel, L. B. (M)
Waite, H. M. (A)
Walker, M. C. (M)
Wallace, R. M. (A)
Wallis, T. F., Jr. (A)
Waltz, D. M. (M)
Waters, W. F. (M)
Webb, J. O. (A)
Weefall, W. W. (A)
Weeks, R. M. (M)
Weenhouse, N. P. (A)
Welch, O. R. (A)
Weldon, J. O. (SM)
Wenger, W. D. (SM)
West, H. B., Jr. (A)
Wilkinson, J. D. (A)
Winston, G. R. (M)
Wolff, E. A. (A)
Wood, H. A. (A)
Wissemann, H. J. (SM)
Wright, T. A. (A)
Yarbrough, A. D. (A)
Zemanek, J., Jr. (A)
Zwaska, L. G. (A)

Del Rio (SA-6)
Donaldson, C. A. (M)

Denison (DFW-6)
Mayor, W. G. (A)
Schumann, W. A. (A)

Denton (DFW-6)
Perkins, G., Jr. (A)

Dickinson (HOU-6)
Gracey, J. O. (A)

Duncanville
Jerrins, R. K. (A)

Edinburg
Meiners, W. H. (A)

Ellington AFB (HOU-6)
MacDonald, C. O. (A)

El Paso (EP-7)
Alexander, W. R. (A)
Anders, J. V. (A)
Beattie, F. E. (A)
Bell, B. E. (A)
Brown, J. S. (A)
Bryan, W. C. (A)
Bunda, F. E. (M)
Byrd, C. B. (A)
Chapman, C. W. (A)
Clark, W. E. (A)
Coleman, M. H. (A)
Crosson, J. W. (M)
Danielson, F. H. (M)
Dann, J. A. (A)
DeLuca, L. A. (A)
Dobkowski, J. T. (A)
Dryden, E. R., Jr. (A)
Dubbs, W. M. (M)
Fleer, W. A. (A)
French, C. E. (M)
Fulkerson, T. E. (M)
Glassgow, C. R. (A)
Graham, D. A. (M)
Hale, L. C. (A)
Hangartner, J. E. (M)
Hayes, R. W. (M)
Hoefling, J. E. (A)
Hopp, H. W. (M)
Hopper, M. C. (A)
Howeisen, H. T. (A)
Hutt, C. E. (A)
Isenson, R. S. (M)
Kampe, E. A. (M)
Kelley, H. A. (M)
Kotovsky, S. K. (A)
Lovitt, S. A. (A)
Lubke, G. W. (A)
Lynch, D. J. (M)
Marchesano, J. E. (M)
Markowitz, H. (M)
Martin, W. C. (A)
Maury, J. H. (M)
McGraw, J. E. (SM)
Melland, B. T. (A)
Michael, L. E. (A)
Miller, W. E., Jr. (A)
Morgan, W. R. (A)
Neilson, C. C. (A)
Oglesby, W. D. (A)
O'Neal, C. L. (A)
Packard, A. E. (A)
Reeves, T. M. (A)
Rexroad, W. F. (A)
Reynolds, D. E. (M)
Robson, A. B., Jr. (A)
Salter, R. A. (A)
Snow, L. L. (A)
Spanier, B. (M)
Stone, R. F. (A)
Stone, S. H., Jr. (A)
Stuart, J. F. (SM)
Talbott, E. P. (VA)
Tuttle, J. B. (A)
Vesser, W. C. (A)
Wasser, N. (M)
Wedekind, D. E. (A)
Wells, A. T. (A)
White, L. H. (M)
Williams, W. K. (M)

Farmers Branch (DFW-6)
Millis, E. G. (A)

Fort Bliss
Carnuccio, J. N. (A)
Clanton, H. M. (SM)
Corkhill, J. M. (A)
Daughtery, T. S. (M)
Fernstrom, C. H. (A)
Long, J. H. (A)
Mackinnon, A. J. (A)
Mankiewicz, E. J. (A)
Murnick, A. J., Jr. (M)
Orman, L. M. (SM)
Oswald, H. (A)
Sell, W. B. (SM)
Zarbertski, E. I. (A)

Fort Hood
Lemasters, H. G. (A)
Weber, E. V. (A)

Fort Worth (FW-6)
Abernathy, H. D. (A)
Asendorf, J. A. (A)
Barrett, L. S. (A)
Baumgarte, P. H. (A)
Bateman, J. W. (A)
Biesel, R. W. (M)
Blandford, J. T., Jr. (A)
Bodin, J. A. (A)
Brothers, J. E. (A)
Brust, M. F. (A)
Bryan, K. W. (A)
Burke, J. F. (M)
Cantrell, W. E. (M)
Clark, J. E., Jr. (A)
Clutterman, D. R. (A)
Cochran, U. E. (A)
Collup, D. E. (SM)
Coursey, J. R. (M)
Danner, O. G. (M)
Dickerson, J. D. (A)
Dinsmore, J. T. (A)
Dodd, J. M. (A)
Guyton, R. D. (A)
Hites, W. H. (A)
Hogan, A. W. (M)
Howes, R. B., Jr. (M)
Kelton, W. (M)
Kent, A. H., Jr. (A)
Keplinger, M. (M)
Kimzey, T. (M)
Koski, J. I. (M)
Laprad, Q. C. (A)
LeGette, J. L. (A)
Lynch, B. (M)
Lynch, J. S. (A)
Macune, C. W. (A)
Matthews, K. B. (A)
Mayfield, S. A. (A)
McKee, C. W. (VA)
McMillin, J. M., Jr. (A)
Metcalf, J. E. (A)
Neher, H. T. (A)
Niedrauer, J. J. (A)
Olesen, D. H. (A)
O'Neal, R. D. (SM)
Palmer, J. E. (VA)
Peterson, W. E. (A)
Philpot, J. W., Jr. (A)
Prior, R. R. (A)
Raines, R. F. (M)
Rea, R. W. (M)
Richardson, D. J. (M)
Robertson, G. H. (A)
Sandlin, G. L. (M)
Shell, W. H. (A)
Shepherd, M. F. (M)
Shipman, H. F. (A)
Simmons, D. J. (A)
Simpson, R. H. (A)
Sissom, A. W. (SM)
Siuernell, R. B. (A)
Sonlat, E. (A)
Spears, M. F. (A)
Spradlin, J. D. (M)
Stinson, R. C., Jr. (SM)
Summers, G. L. (A)
Sumner, G. C. (SM)
Sybenga, P. M. (M)
Taulman, D. C. (M)
Teasdale, A. R., Jr. (A)
Thompson, A. C. (A)
Walton, H., Jr. (A)
Wendlandt, C. W. (A)
Wentworth, G. E. (A)
White, L. E. (M)
Wolanski, H. S. (A)

Freeport (HOU-6)
Coker, S. G. (A)
Ferguson, R. W. (A)

Friendswood (HOU-6)
Havard, W. L. (A)

Galveston (HOU-6)
Benson, W. H., Jr. (A)
Hulteen, C. K. (A)
Johnson, E. W. (A)
Lee, J. L. (A)
Pearce, O. M. (A)

Garland (DFW-6)
Campbell, H. G. (A)
Cawood, J. L. (A)
Davis, P. D., Jr. (SM)
Fuller, W. D. (M)
Furnell, W. W., Jr. (A)
Gilmer, J. R. (A)
Harton, P. L. (A)
Holt, W. J., Jr. (M)
Lynn, J. C. (A)
Mitchell, W. D. (A)
Tackett, H. A. (A)
Williams, B. M. (A)
Yeager, D. L. (A)

Graham (DFW-6)
Easter, B. H. (A)

Grand Prairie (DFW-6)
Buehrle, C. D. (A)
Christofferson, A., Jr. (A)
Crockett, J. S. R. (A)
Howell, J. S., Jr. (A)
Kollar, T. J. (A)
Lanier, R. E. (A)
McAnally, G. W. (A)
Myers, J. (A)

Greenville (DFW-6)
Smith, B. J. (M)

Harlington Air Force Base
Beaudette, C. G. (A)

Hempstead
Sherron, R. J., Jr. (A)

Hereford (DFW-6)
Surber, D. H. (A)

Houston (HOU-6)
Anthony, J. P. (A)
Armstrong, R. E. (A)
Arthur, M. A. (SM)
Asbury, R. T. (M)
Atkinson, C., Jr. (A)
Austin, F. M. (SM)
Ball, J. D. (A)
Bambach, A. W. (A)
Beeman, K. R. (M)
Beyer, A. R. (A)
Beyer, J. A. (A)
Black, V. G. (A)
Blanchard, A. (SM)
Bodden, A. L., Jr. (A)
Booker, J. L. (A)
Borden, R. R. (A)
Bost, M. E. (A)
Bradley, R. C., Jr. (A)
Braden, S. M. (A)
Bricaud, J. M. (SM)
Brougher, R. M. (M)
Browning, C. L. (A)
Buck, H. M. (M)
Buechner, R. H. (SM)
Bulhon, J. J. M. (M)
Burrows, R. C., Jr. (A)
Busacker, J. W. (A)
Bush, R. S. (M)
Byers, E. G. (SM)
Calhoun, C. W. (A)
Campbell, J. R. (A)
Canup, R. E. (M)
Caplan, R. S. (SM)
Carlisle, C. H. (M)
Carlton, L. A., Jr. (A)
Carter, W. H., Jr. (SM)
Chinski, G. R. (SM)
Chun, M. E. (SM)
Clerk, M. C. (A)
Codington, J. H. (VA)
Cornett, J. R. (M)
Crews, I. B. (A)
Crossland, O. C. (A)
Curry, C. P. (A)
Curry, W. L. (A)
Dewan, J. T. (M)
Dixon, T. K., Jr. (A)
Douglas, J. E. (A)
Drisdale, T. B. (A)
Dunkel, J. R., Jr. (A)
Dupree, E. M. (SM)
DuRapau, J. J. (A)
Edwards, W. H. (A)
Elliott, L. E., Jr. (A)
England, L. T. (A)
Erath, L. W. (M)
Feagin, F. J. (M)
Francis, C. A. (M)
Franklin, P. E. (M)
Frosch, A. (A)
Gardner, D. H. (VA)
Geddes, L. A. (A)
Gerry, P. W. (A)
Godfrey, R. M. (A)
Gollwitzer, L. H. (A)
Green, L. M. (A)
Greenwood, H. M. (A)
Greer, W. J. (SM)
Gundlach, E. E. (A)
Hale, E. M. (M)
Hall, H. E. (A)
Hallenburg, J. K. (M)
Hanus, F. J. (A)
Harbaugh, A. W. (M)
Hatchl, S. (A)
Hawkins, D. W. (A)
Hegar, D. T. (A)
Heintz, K. O. (M)
Helken, E. W. (M)
Hicks, F. M. (A)
Hiltpold, L. E. (M)
Hougen, H. C. (M)
Hubbard, C. L. (M)
Hudgins, W. T., Jr. (A)
Hunt, C. J. (A)
Hurlbert, L. L. (A)
James, W. B. (A)
Jameson, J. P. (A)
Johns, R. W. (A)
Johnson, H. L. (A)
Johnson, O. B. (M)
Jones, A. H. (A)
Kannenstine, F. M. (VA)
Kaufman, S. (M)
Keep, H. A. (A)
Klicpera, M. F. (A)
Kokesh, F. P. (M)
Lamb, J. E. (A)
Langwell, J. F. (A)
Lenert, R. H., Jr. (A)
Madeley, P. E. (A)
Martin, G. I. (SM)
Martin, S. A., Jr. (M)
Masterson, H. T. (M)
Matthews, C. R. (A)
Maunder, E. R. (A)
McArthur, H. K. (A)
McCabe, L. L. (SM)
McConnell, H. E. (VA)
McKay, G. C., Jr. (A)
McNatt, W. E. (M)
Melton, D. P. (M)
Melton, G. F. (A)
Menger, W. M. (A)
Miller, W. B. (A)
Mims, A. J. (M)
Mitchell, J. L. (A)
Monkhouse, J. R. (M)
Moore, R. D., Jr. (A)
Muery, R. W. (A)
Mullan, L. A. (M)
Murphy, T. R. (A)
Neuenschwander, E. (M)
Neuman, L. J. (A)
O'Brien, J. G. (A)
Ording, J. R. (A)
Otis, D. C. (M)
Owen, W. W. (A)
Packard, D. (A)
Palmer, C. C. (M)
Palmer, O. M., Jr. (A)
Parker, R. H. (A)
Parsons, R. W. (A)
Pearson, J. B. (M)
Peay, L. W., Jr. (M)
Pecot, V. D. (A)
Phelps, W. (A)
Phillips, F. S. (M)
Pierson, A. L. (A)
Rank, W. B. (M)
Ransome, R. L. (M)
Reynolds, R. C. (A)
Rhodes, M. (A)
Richards, D. E. (A)
Richardson, J. G. (A)
Robinson, J. C. (A)
Robidoux, F. T. (A)
Rockwell, G. O. (SM)
Rust, W. M., Jr. (SM)
Saseen, J. H. (M)
Savage, K. D. (A)
Sawyer, W. G. (A)
Schmidt, H. (A)
Schmuck, R. H. (M)
Schwartz, R. J. (A)
Scott, R. W. (A)
Sears, G. D. (M)
Sears, H. A. (M)
Scixas, A. D. (A)
Shane, Z. G. (A)
Sharp, E. C., Jr. (A)
Sharpe, M. O. (SM)
Shawver, E. F. (M)
Simonds, F. W. (A)
Skellie, A. C. (A)
Smith, F. C., Jr. (M)
Steward, W. B. (SM)
Stickley, D. F. (A)
Stotler, D. E. (A)
Sullivan, C. L., Jr. (M)
Sundt, P. C. (A)
Sutton, R. A. (M)
Tanguy, D. R. (M)
Taylor, A. D. (A)
Teal, E. E. (A)
Thornton, L. C. (A)
Thornton, R. D. (A)

Tullos, F. N. (M)
Turner, C. G. (SM)
Valcik, J. H. (A)
Vogel, C. B. (M)
Walker, H. O., Jr. (A)
Warfield, R. L. (A)
Washburn, W. M. (A)
Waters, J. S. (VA)
Weber, M. E. (A)
Weidner, C. P. (A)
Welz, W. C. (M)
Wendenburg, C. F. (A)
Whitaker, T. N. (M)
Wickham, W. S. (A)
Wilson, C. V., Jr. (A)
Wischmeyer, C. R. (SM)
Woelst, K. H. (A)
Wofford, J. H. (A)
Wofford, W. D., Jr. (A)
Wolff, L. E. (A)
Wright, R. H. (A)
Zapalac, R. (A)
Zenor, H. M. (SM)

Hutchins (DFW-6)
Ayres, R. J. (M)

Irving (DFW-6)
Daniel, D. B. (A)
Dillon, P. (M)
Haskins, D. E. (A)
Herriott, A. H. (A)
Kramer, C. V. (A)
Legette, J. L. (A)
MacDonald, F. H. (A)
Price, W. E. (SM)
Raits, E. J. (M)
Shoulders, K. R. (M)
Stanphill, J. R. (M)
Storey, B. (M)
Swafford, T. W., Jr. (M)
Thomas, C. R. (A)

Jacksonville (DFW-6)
Laurie, B. (M)

Killeen (DFW-6)
Adams, H. J. (A)

Kingsville (SA-6)
Guinn, J. R., Jr. (A)
Rawls, H. F. (A)
Sprunk, W., Jr. (A)

Lake Jackson (HOU-6)
Williams, W. E. (A)

Lamarque (HOU-6)
Campbell, D. E. (A)

Lampasas (DFW-6)
Mason, A. F., Jr. (A)

Longview (DFW-6)
Bean, R. N. (A)
Maxwell, K. D. (A)
Webb, E. E. (M)

Lubbock (DFW-6)
Bryant, R. S. (A)
Fagan, J. R. (A)
Houston, C. E. (M)
Joiner, J. B. (A)
Lee, R. F. (M)
Lewis, R. H. (A)
Rosson, J. W. (A)
Spuhler, H. A. (A)

Lufkin (BP-6)
Hill, F. C. (M)
McFarlane, H. M. (A)
Saxon, M. (SM)

Marlin (DFW-6)
McBeath, H. M., Jr. (A)

McGregor (DFW-6)
Brashear, R. T. (A)

McLean (DFW-6)
Patterson, J. M. (A)

Mesquite
Lowrey, T. M., Jr. (A)

Midland (DFW-6)
Fuller, C. M. (M)
Graham, W. L. (A)
Jenkins, E. W., Jr. (A)
Yates, T. (A)

Mineral Wells (DFW-6)
Mitchell, D. H. (SM)

Nacogdoches
Kruse, O. E. (A)

Nederland (BP-6)
Coburn, E. D. (M)
Crowder, B. S. (A)
McGuire, C. B. (A)
Musselwhite, J. C., Jr. (A)
Radford, J. V. (A)

Odessa (DFW-6)
McCartney, J. D. (A)

Olden (DFW-6)
Evetts, S. G. (A)

Orange (BP-6)
Alexander, J. E. (M)
Jones, J. N. (A)
Odell, A. C. (A)

Pasadena (HOU-6)
Clarke, C. V., Jr. (A)
Davis, J. L. (A)
Gulihur, D. L. (M)

Perryton (DFW-6)
Smoot, R. L., Jr. (A)

Port Arthur (BP-6)
Bonner, J. F. (A)
Branick, B. W. (A)
Escagne, I. E. (A)
Kelly, W. T. (A)
Krute, E. H. (A)
Redwine, O. W. (A)

Rusk (DFW-6)
Urdal, S. (A)

San Angelo (SA-6)
Baker, J. D. (A)
Neubauer, C. A. (A)
Royalty, M. C. (M)

San Antonio (SA-6)
Adams, R. M. (A)
Adamson, W. V. (A)
Anderson, W. L. (A)
Arnold, J. B. (A)
Bailey, J. E. (M)
Beckwith, J. E. (M)
Brogan, P. A. (A)
Buchanan, H. (A)
Cadena, D. G. (A)
Case, B. (A)
Chase, W. R. (A)
Clark, T. H. (SM)
Clee, L. W. (A)
Crockett, A. E. (A)
Culver, C. A. (SM)
Cunningham, J. B. (A)
Decker, E. E. (A)
Dorchester, R. A. (A)
Douglas, J. H. (A)
Duepner, F. (A)
Dunlap, R. H. (A)
Edmonson, J. W. E. (A)
Erlandson, P. M. (SM)
Fretz, O. G. (SM)
Gallagher, J. D. (M)
Glenn, R. F. (A)
Haigh, J. B. (A)
Hallam, J. T. (VA)
Hamm, W. J. (SM)
Hasbrook, A. F. (A)
Hedrick, L. C. (SM)
Hill, L. P. (M)
Holland, R. J. (A)
Hopper, R. W. (A)
Houghton, E. G. (M)
Hyman, K. R. (M)
Ing, G. W. (A)
Jeffers, C. L. (SM)
Johnson, C. R. (A)
Kiley, W. A. (A)
King, J. D. (A)
Knapp, A. J. (A)
Kolodzie, S. (A)
Kroh, H. C. (A)
Lusk, E. C. (A)
Marshall, F. M. (M)
McDonald, C. J. (A)
McHugh, E. L. (A)
Meyer, E. F. (A)
Miller, C. M. (A)
Minton, J. P. (F)
Ohman, J. (SM)
O'Meara, J. P. (M)
Parr, J. O., Jr. (M)
Patton, A. D. (M)
Pawkett, L. E. (A)
Peterson, R. K. (A)
Pomy, H. J. (M)
Porter, J. B. (M)
Prucha, M. J., Jr. (M)
Remaley, C. W. (A)
Rhodes, M. H. (A)
Rives, J. B. (A)
Ruthman, S. M. (A)
Schock, W. R. (A)
Sears, D. (A)
Sibul, L. H. (A)
Siegel, H. A. (A)
Simpson, S. H., Jr. (SM)
Smith, R. J., Jr. (A)
Sowa, C. P. (A)
Sullivan, M. C. (M)
Tarrodaychik, P. (M)
Thiemens, A. A. (A)
Thorn, D. C. (A)
Travers, D. N. (A)
Turner, H. C. (A)
Wilkes, C. P. (M)
Zumwalt, B. C. (A)

Santa Anna
Johnson, D. M. (A)

Seguin (SA-6)
Gillespie, L. H. (A)
Zuehl, W. R. (A)

Seminole (DFW-6)
Tomlinson, Z. G. (A)

Sherman (DFW-6)
Zombolds, G. P. (A)

Sinton (SA-6)
Mayer, E. G. (M)

South Houston
Lathrop, W. A. (A)

Sunray
Perkins, C. S. (A)

Temple (DFW-6)
Crusinberry, W. O. (M)
Neuse, D. H. (A)

Texas City (HOU-6)
Combs, J. F. (A)
DaPrato, B. F. (A)

Tulia
Rodgers, S. M. (A)

Tyler (DFW-6)
Grice, C. F. (M)
Thompson, O. E. (A)
Wileman, R. A. (M)

Waco (DFW-6)
Appleman, L. H. (VA)
Fulwiler, R. J. (A)
Jones, R. C., Jr. (A)
Schwetman, H. D. (SM)

Wichita Falls (DFW-6)
Adams, J. (A)
Horn, W. F. (A)
Van Winkle, R. E. (A)
Wiley, H. T. (A)

Wills Point (DFW-6)
Riley, J. H. (A)

Yoakum
Beardsley, W. S. (A)

UTAH

Bountiful (SLC-7)
Allen, R. L. (A)

Clarkston (SLC-7)
Thompson, V. W. (A)

Draper (SLC-7)
Orgill, M. R. (A)

Dugway (SLC-7)
Cunningham, R. W. (A)

Garfield
Kounalls, L. E. (A)

Layton (SLC-7)
Loomis, F. E. (A)

Logan (SLC-7)
Blanthorn, B. L. (A)
Clark, C. (SM)
Cole, L. S. (SM)
Jones, W. L. (A)
Kartchner, K. A. (A)
Laird, A. G. (A)
Loosle, J. W. (A)

Manti (SLC-7)
Sondrup, A. O. (A)

Ogden (SLC-7)
Kershaw, J. H., Jr. (A)
Lane, R. S. (A)
Lee, G. F. (M)
Woods, F. W. (A)

Payson (SLC-7)
Hales, D. B. (A)
Tew, D. E. (A)
Squire, R. W. (A)

Roy (SLC-7)
Arrington, A. C. (A)

Salt Lake City (SLC-7)
Ahearn, J. M. (A)
Alley, C. L. (A)
Baldwin, J. M. (SM)
Barney, C. A. (VA)
Burn, C. A. (A)
Carman, F. C. (A)
Clayton, V. E. (A)
Cozzens, D. (M)
Diehl, C. E. (M)
Gates, F. Y. (A)
Glantz, R. H. (A)
Greene, O. E. (A)
Gunderson, A. L. (A)
Haycock, O. C. (SM)
Hoggan, M. J. (A)
Hooper, J. S. (A)
Howard, S. L. (A)
Hubbard, J. J. (A)
Johnson, D. R. (A)
Monsen, G. L. (A)
Nelson, C. V. (M)
Nielsen, R. D. (A)
Noffsinger, D. T. (A)
Paulson, E. T. (A)
Pound, E. F. (A)
Price, C. S. (A)
Richardson, R. (A)
Robinson, W. H. (A)
Rudd, F. S. (A)
Seely, E. A. (A)
Van Valkenburg, M. (SM)
Weinberg, P. (A)

Sandy (SLC-7)
Atwood, K. W. (A)

Spanish Fork (SLC-7)
Hone, S. J. (A)

Tooele
Naylor, A. W. (A)
Salisbury, R. O. (A)

VERMONT

Bennington (BOS-1)
Lillie, D. F., Jr. (A)
Timbie, W. H. (SM)

Brattleboro
Cambell, R. H., Jr. (A)
Hadden, G. H. (M)

Burlington (BOS-1)
Horvath, C. (A)
Knight, R. H. (A)
Rolfe, H. D. (A)
Steinmann, W. L. (A)

Northfield (BOS-1)
Jenkinson, J. V. (A)
Marsh, R. F. (A)

Putney (BOS-1)
Smith, M. K. (A)

South Woodstock
Garceau, L. (VA)

Springfield (BOS-1)
Lush, W. G. (SM)

VIRGINIA

Alexandria (WA-3)
Aasen, C. L. (A)
Alba, C. J. (A)
Ashenden, G. K., Jr. (M)
Ashley, D. S. (M)
Babcock, R. L. (A)
Ballard, A. H. (A)
Balwanz, W. W. (A)
Bargh, P. F. (A)
Bayston, T. E. (A)
Behme, A. E. (A)
Bergman, C. E. (A)
Beth, E. W. (A)
Bewig, K. W. (SM)
Branch, G. E. (SM)
Brown, L. (A)
Camp, G. D. (SM)
Campbell, C. C. (A)
Clark, J. L. (SM)
Cole, R. I. (SM)
Collup, D. O. (SM)
Compton, M. E., Jr. (A)
Coulter, D. C. (A)
Crawford, E. W. (M)
Cripe, C. W. (A)
Cronin, D. W. (A)
Darcey, R. J. (A)
Davis, T. R. (A)
Dellar, R. H. (A)
Dickey, F. R., Jr. (A)
Dixon, J. T. (A)
Dupree, W. F. (A)
Eagle, G. R. (A)
Eggerton, W. H. (A)
Erdle, F. E. (A)
Farago, J., Jr. (A)
Fivel, M. J. (A)
Flynn, H. (A)
Freeman, J. T. (A)
German, F. M. (A)
Gill, C. W. (A)
Gills, L. C. (A)
Giser, H. W. (A)
Goeser, J. N. (A)
Goll, L. O. (SM)
Harper, H. (A)
Harris, J. E., Jr. (A)
Hausman, A. H. (A)
Hedrick, C. E. (A)
Hirst, W. B., Jr. (A)
Hopkins, A. F., Jr. (SM)
Isenhour, G. N. (A)
Jensen, P. A., Jr. (A)
Jolkovski, J. (A)
Jones, R. H., Jr. (M)
Kelleher, K. S. (SM)
King, M. E. (SM)
King, W. M. (M)
Kings, L. (M)
Knoer, H. (A)
Koblick, S. N. (A)
LaFevre, L. M. (A)
Lair, J. R. (VA)
Larson, C. O. (SM)
Lerner, L. (A)
Longfellow, B. S. (M)
Lorenz, R. J. (A)
McGuire, T. B. (A)
Meador, A. B., Jr. (A)
Meloy, T. (SM)
Melville, J. E. (A)
Merer, G. E. (SM)
Miller, J. W. (A)
Montague, H., III (A)
Morrow, C. M. (A)
Pachuta, J. R. (A)
Parker, C. V. (SM)
Pasciuti, R. A. (A)
Peake, H. J. (SM)
Pichetto, P. B. (A)
Price, H. W., Jr. (M)
Puro, W. O. (A)
Purple, W. C., Jr. (M)
Ragsdale, R. G., Jr. (A)
Raybuck, C. B. (SM)
Reiser, D. (A)
Remmlein, C. D. (A)
Ringwalt, D. L. (M)
Rochelle, R. W. (A)
Rose, J. (M)
Seddon, J. C. (A)
Shea, J. H. (A)
Shoemaker, J. R. (SM)
Shumaker, J. L. (M)
Sibold, A. P., Jr. (A)
Smith, B. D., Jr. (A)
Smith, W. J. (A)
Stapp, I. P. (A)
Stastny, G. F. (A)
Stewart, C., Jr. (SM)
Stuckert, E. M. (SM)
Swanson, M. W. (SM)
Taylor, W. B. (A)
Thompson, L., Jr. (SM)
Tourville, G. A. (M)
Tucker, G. K. (A)
Tucker, J. W. (A)
Underwood, R. W. (A)
Varela, A. A. (SM)
Vary, W. L. (A)
Von Dohlen, H. W. (VA)
Watson, D. L. (A)
Weid, A. C. (M)
Weinstein, A. (A)
White, D. R. J. (M)
White, E. L. (SM)
Wiewara, E. J. (M)
Williams, H. M. (M)
Wolfe, B. F. (A)

Annandale (WA-3)
Benzon, C. G. (VA)
Black, L. (M)
Bowers, W. E. (A)
Bramhall, E. H. (SM)
Clark, J. C. (A)
Garlan, H. (M)
Gravlee, G. P. (A)
Johnson, C. Y. (A)
Nolen, J. F. (A)
Richman, H. R. (M)
Willis, H. W. C. (SM)

Arlington (WA-3)
Abbitt, C. W. (A)
Albee, C. (M)
Alde, R. O. (A)
Altman, S. S. (M)
Ankers, R. E., Jr. (M)
Atkinson, E. E. (A)
Ballard, J. L. (A)
Banks, C. R. (SM)
Bankson, H. D. (A)
Bartlett, O. H., Jr. (A)
Bauer, P. S. (VA)
Bawer, R. (A)
Beck, E. A. (A)
Beecher, W. C. (A)
Belcher, H. P. (A)
Bennett, R. (F)
Berghoefer, F. G. (A)
Black, J. G. (A)
Boehm, W. R. (A)
Bolden, R. L. (M)
Borsody, B. F. (M)
Bowman, D. F. (SM)
Bridges, J. M. (SM)
Buchanan, O. R. (VA)
Buckner, R. P. (A)
Burcham, D. P. (M)
Burleson, M. M. (A)
Burris-Meyer, H. (SM)

Butts, R. S. (M)
Byrd, H. F. (A)
Campbell, W. H. (SM)
Cervenka, F. J. (SM)
Chasnov, B. (A)
Child, A. A. (A)
Christie, C. B. (A)
Clark, G. E., Jr. (A)
Clark, R. L. (SM)
Clark, S. F. (A)
Clements, S. E. (SM)
Cobb, M. W. (A)
Cochran, J. L. (M)
Cohen, J. (M)
Cole, P. P. (A)
Cole, W. M., Jr. (A)
Cook, D. C. (A)
Cook, L. H., Jr. (A)
Cormack, J. G. (A)
Craver, J. N. (M)
Davie, M. C. (SM)
Davis, C. H. (A)
Dellitt, J. P. (A)
Dennison, B. H., Jr. (SM)
Dickinson, W. T. (A)
Dingley, E. N., Jr. (SM)
Dove, P. S. (M)
Doyle, W. T. (A)
Dozier, E. C. (A)
Duncan, P. B. (M)
Durkee, J. D. (M)
Dutton, W. P. (A)
Eisenschmied, A. M. D. (A)
Ellinger, P. B. (A)
Engstrom, H. T. (SM)
Ellis, R. E. (M)
Ernst, A. A. (M)
Etter, W. A. (M)
Ewing, J. H. (M)
Gale, M. (A)
Gauss, H. (A)
Gibson, G. B. (SM)
Girard, E. J. (SM)
Glasser, O. J. (SM)
Glauber, J. J. (SM)
Gleason, D. H. (A)
Gregory, C. A. (M)
Griffin, L. L. (A)
Griffin, S. J. (A)
Groves, W. E. (SM)
Hackman, E. H. (VA)
Harding, G. C. (M)
Hauber, E. N. (M)
Hay, G. W. (A)
Heasley, C. J., Jr. (A)
Higgins, F. V. (M)
Hillstrom, W. B. (A)
Holmes, W. M. (A)
Jensen, G. L. (M)
Jones, R. C., Jr. (A)
Joseph, E. C. (A)
Kazebee, C. R. (A)
Knight, C. R. (SM)
Kreck, J. A. (A)
Kudlich, K. H. (A)
Lane, T. B., Jr. (A)
Larue, R. S. (A)
Lee, J. M. (SM)
Lindseth, C. O. (A)
Little, S. (A)
Long, G. A., Jr. (M)
Lotz, W. E., Jr. (A)
Lyons, R. E. (A)
Madden, P. G. (A)
Marsh, H. S. (M)
Martin, D. K. (SM)
Martin, O. L. (M)
May, J. P. (A)
Mayer, D. S. (A)
McCachren, W. S. (SM)
McClurg, G. H. (SM)
McConnell, I. R. (M)
McCracken, L. G. M. (A)
McMurtray, H. W. (A)
Meier, D. J. (M)
Mendu, S. W. M. (A)
Merkel, H. E. (A)
Merritt, E. A. (A)
Miller, J. L. (M)
Miller, R. E. (A)
Montgomery, J., III (A)
Moore, W. H. (M)
Morgan, A. H. (M)
Mould, J. C. (A)
Nahman, N. S. (A)
Nash, P. E. (SM)
Nelson, C. W., Jr. (A)
Norman, L. S., Jr. (A)
Ollive, J. F. (A)
Parris, D. S. (A)
Peake, F. E., Jr. (A)
Powell, R. C. (A)
Price, R. L. (A)
Prittig, J. W. (A)
Probert, L. J. (A)
Quinn, R. B. (M)
Rector, D. A. (A)
Reed, A. C. (A)
Rickerson, D. M. (A)
Robinson, H. E. (M)
Robinson, K. L. (A)
Ross, E. S. (A)
Rossmiller, A. L. (A)
Roth, J. F. (A)
Schaaf, R. H. (M)
Schuette, H. (A)
Selby, L. A. (A)
Shaw, H. F. (A)
Shepard, D. H. (M)
Sherer, L. M. (SM)
Sieck, L. W. (M)
Sinback, W. R. (M)
Smith, C. V. L. (SM)
Smith, E. L., Jr. (A)
Smith, R. O. (SM)
Spear, L. P. (A)
Spies, M. C. (VA)
Sprowls, P. H. (M)
Stec, C. L. (SM)
Stein, A. J. (A)
Stephan, H. W. (VA)
Stewart, C. H., II (A)
Stewart, J. M. (A)
Stoholm, E. M. (A)
Sullivan, A. H., Jr. (SM)
Sutton, B. L. (A)
Syphax, W. T. (A)
Thames, W. M. (SM)
Thomasson, H. B. (A)
Tidball, F. E. (M)
Tieman, C. R. (SM)
Trotter, B. E. (A)
Valentine, W. B. (A)
Veatch, J. P. (SM)
Volk, C. M. (A)
Ward, Q. E. (A)
Ware, M. (M)
Wearn, W. C. (A)
Webb, P. L. (A)
Weihe, V. I. (SM)
Whipple, L. G. (A)
White, C. E. (M)
Whitney, R. J. (A)
Wittig, W. L. (A)
Yarosh, N. P. (A)
Young, A. H. (A)

Ashland (NC-3)
Jones, T. W., Jr. (A)

Blacksburg (NC-3)
Ebert, H. C. (M)
Eller, J. E., Jr. (A)
Miller, R. H. (A)
Thompson, D. (M)
Wright, R. R. (SM)

Bristol
Cooper, W. G. (A)
Neal, R. E. (A)

Buena Vista (NC-3)
Bray, J. L., Jr. (A)

Bumpass
Kramer, A. W. (SM)

Charlottesville (NC-3)
Beazell, H. L. (A)
Burn, J. W., Jr. (A)
Fleming, R. F., Jr. (A)
Girsmen, M. F. (A)
Goeller, L. F., Jr. (A)
Grymes, J. R. (A)
Harris, O. R. (SM)
Mace, J. C. (SM)
Quarles, L. R. (F)
Roberts, J. M. (SM)
Siegel, C. M. (A)
Updike, O. L. (A)

Christiansburg (NC-3)
Gannaway, T. C. (A)

Clifton
Duncan, R. L. (SM)

Colonial Beach (NC-3)
Brooks, F. E. (M)

Cradock
Shepherd, J. F. (A)

Dahlgren (NC-3)
Cardwell, B. B., Jr. (A)
Dyal, J. O., Jr. (A)
Gros, J. R. (M)
Harkavy, V. M. (SM)
Henderson, J. (A)
Payne, J. N. (M)
Potter, R. R. (A)
Rouiller, C. A., Jr. (A)
Sanford, D. C. (A)
Shultz, L. R. (A)

Danville (NC-3)
Lea, H. D. (A)
Motley, L. C. (A)

Dunn Loring (WA-3)
Griffin, P. W. (M)

Fairfax (WA-3)
Gartzke, F. J. (A)
Lee, F. N. (A)
Seccombe, W. T. (A)
Sharp, D. W. (A)

Falls Church (WA-3)
Allen, E. W., Jr. (M)
Anderson, W. L. (A)
Andrew, R. T. (A)
Arnold, J. B. (A)
Bateman, R. (A)
Bates, J. F. (A)
Billheimer, C. R. (M)
Bird, G. T. (M)
Boggs, G. E. (M)
Boland, J. N. (VA)
Bouchey, S. H. (A)
Bradford, H. K. (M)
Brady, R. F. (SM)
Brooks, L. C. (A)
Broughton, T. G., Jr. (A)
Brown, H. B. (M)
Bull, J. T. (A)
Bunting, J. H. (A)
Carland, E. (A)
Carr, S. O. (M)
Colby, P. R. (SM)
Combs, D. D. (A)
Coss, W. L. (A)
Croy, J. R. (M)
Courtis, R. P. (VA)
Davis, E. D. (A)
Davis, J. N. (M)
Deeter, C. R. (M)
Delgado, R. (A)
Detrick, D. M. (A)
Diehl, E. J. (SM)
Disenhaus, N. (A)
Donies, W. (A)
Dula, A. M. (A)
Eisele, E. J. (A)
Estrada, L. (A)
Fleming, L. (SM)
Fulton, W. L., Jr. (A)
Garafola, J. R. (A)
Garrett, L. F. (A)
Giles, R. C. (M)
Gundy, G. L. (A)
Haas, D. L. (A)
Harben, L. A. (M)
Harrison, C. E. (A)
Harry, H. E. (SM)
Hill, R. B. (A)
Hinman, W. S., Jr. (SM)
Hohos, J. A. (A)
Jackson, C. H. (SM)
Jahr, E. F. (M)
Kovar, M. M. (A)
Lambert, T. A. (A)
La Montagne, R. S. (M)
Mack, S. J. (A)
Marshall, E. L. (VA)
Maton, G. L. (A)
McDowell, R. B. (SM)
McMahon, J. H. (A)
Moffet, J. A. (M)
Moore, H. S. (A)
Munkasey, P. F. (A)
Murdock, B. J. (A)
Norman, S. W. (M)
Owens, A. T. (A)
Patterson, K. P. (A)
Poritzky, S. B. (A)
Proferes, N. J. (A)
Randall, H. (SM)
Ray, H. B. (M)
Renton, R. J. (M)
Rixse, J. A. (A)
Rogers, C. J. (A)
Rogers, G. J. (A)
Rowland, E. T. (M)
Schweitzer, D. C. (A)
Scott, R. M. (A)
Scott, S. R. (SM)
Shapiro, S. (A)
Skrivseth, A. G. (SM)
Smith, W. M. (SM)
Sotak, J. W. (A)
Stiles, R. G. (A)
Sunde, D. H. (A)
Svedlow, J. D. (A)
Swinney, R. W. (M)
Thrasher, P. M., Jr. (A)
Tucker, E. A. (SM)
Tuller, W. G. (SM)
Turner, J. S. (SM)
Vandivere, E. F., Jr. (A)
Vignali, J. A. (A)
Wallace, J. F. (A)
Wedin, A. C. (SM)
Whiting, W. K. (A)
Winick, A. B. (A)
Wolfand, D. (A)
Wooten, A. D. (A)
Zartman, I. F. (M)

Farmville
Hogge, C. R., Jr. (A)

Fort Belvoir (WA-3)
Gang, R. E. (A)
Hall, G. D. (A)
Talley, W. K. (A)
Weile, W. K. (A)
Wells, E. H. (A)

Fort Monroe (NC-3)
Rison, D. M. (A)

Fort Myer (WA-3)
Turner, W. P. (A)

Fredericksburg
Hall, G. L. (M)

Hampton (NC-3)
Andrews, R. E. (A)
Boyer, W. J. (A)
Bradbury, J. T. (M)
Bradley, E. H. (A)
Brett, C. F. (A)
Brummer, E. A. (A)
Culver, W. N. (A)
Groce, D. C. (A)
Hastings, C. E. (SM)
Haywood, V. M. (M)
Howard, J. S., Jr. (A)
James, V. G. (A)
Kolderup, L. E. (A)
Perkinson, D. A. (A)
Premo, D. A. (A)
Ridenour, S. (A)
Rogers, W. H., Jr. (A)
Russell, J. A., Jr. (A)
Sanders, C. H., Jr. (A)
Skinner, N. W. (A)
Swafford, J. E. (M)
Turnage, H. C. (A)
Vavra, P. H. (A)
Vernon, A. W. (A)
White, J. R. (A)
Wood, R. M., Jr. (A)

Harrisonburg (NC-3)
Braun, W. L. (SM)

Langley AFB (NC-3)
Harvey, C. C. (M)
Jeys, E. H. (A)
Shore, J. D. (A)
Zakowski, L. F. (A)

Leesburg (WA-3)
Carr, L. H. (VA)
Martin, W. H. (M)

Lexington
Miller, E. A. (M)

Lorton (WA-3)
Davis, G. W. (A)

Manassas (WA-3)
Stogsdill, M. R. (A)

McLean (WA-3)
Creuta, J. (VA)
Dee, H. E. (A)
Gumb, D. F. (A)
Heckel, R. D. (M)
Nagy, J. J. (A)
Parker, R. O. (A)
Shaull, J. M. (SM)
Smith, A. E. (SM)
Smith, J. M. (A)
Smoot, W. S., III (A)

New Alexandria
Adams, E. S. (A)

Newport News (NC-3)
Albro, P. W. (A)
Arrington, J. L., II (A)
Bjerke, J. O. (A)
Bunker, W. M. (A)
Comstock, A. L. (A)
Courtney, R. H., Jr. (M)
Lederer, P. S. (A)
Louer, P. E. (A)
McFall, C. H., Jr. (A)

Norfolk (NC-3)
Barnett, H. A., Jr. (A)
Bartlett, R. L. (A)
Benson, S. A. (A)
Berrier, J. J., Jr. (A)
Camp, W. W. (A)
Councill, J. W. (M)
Croom, W. J. (A)
Crumley, R. W. (A)
Davis, E. E. (A)
Davis, G. W. (A)
Dozier, J. J., Jr. (A)
Eimstad, H. A. (A)
Furland, F. W. (A)
Gretes, W. P. (A)
Holleman, R. W., Jr. (A)
Kaserman, F. S. (VA)
Koontz, C. E. (A)
Lindell, R. L. (M)
Marcum, W. F. (A)
Mixon, R. W. (A)
Moll, M. (A)
Newman, A., Jr. (A)
Peffer, J. C. (SM)
Powell, F. E., Jr. (A)
Pressly, W. H. (A)
Roman, R. (A)
Ryscuck, J. (A)
Sanderson, R. F. (A)
Scott, H. A. (A)
Shelton, D. F. (A)
Slaughter, W. R. (A)
Steidley, J. W. (SM)
Trahadias, P. N. (A)
Thompson, L. H. (A)
Wiseman, R. C. (A)

North Arlington (WA-3)
Rexroat, L. D. (M)

Ocean View (NC-3)
Vansant, W. G., Jr. (A)

Phoebus
Cooper, W. N. (A)

Poquoson (NC-3)
Burlock, J. (A)

Portsmouth (NC-3)
Barr, L. V. (A)
Busby, E. S., Jr. (A)
Cox, J. C. (A)
Dickson, A. L. (A)
Dorn, R. E. (A)
Friel, F. J., Jr. (VA)
Hickman, R. S. (A)
Miller, C. L. (A)
Peghiny, J. W. (A)
Petersen, M. E. (A)
Rusche, C. L. M. H. (A)
Rusinko, S. (A)

Quantico (WA-3)
Williams, R. G. (A)

Quinby
Cameron, C. E. (A)

Richmond (NC-3)
Alley, R. E. (A)
Bailey, R. C. (SM)
Clark, W. J. (A)
Conte, T. M. (SM)
Dickinson, J. O. (M)
Eubank, R. N. (M)
Golding, R. M. (A)
Holup, A. C. (A)
Kibby, J. R. (A)
Kyle, J. W. (M)
Lee, W. M. (M)
Miller, A. G. (A)
Palmer, O. A., Jr. (A)
Sturm, F. L. (A)
Thorpe, R. A. (A)
Toms, E. C. (A)
Wendt, F. S. (A)
Woods, D. C. (M)
Wrisley, J. C. (A)

Roanoke (NC-3)
Briggs, J. P. (A)
Newman, J. E. (A)

Sabot
Jones, T. W., Jr. (A)

Salem (NC-3)
Thornton, R. R. (A)

South Norfolk
Tusinski, J. (A)

Springfield (WA-3)
Alderson, W. S. (A)
Bergquist, P. N. (M)
Graim, R. J. (A)
Hamilton, E. E. (A)
Kirby, R. L. (A)
Klotz, J. W. (M)
Wright, C. S. (A)

Sterling (WA-3)
Richardson, R. M. (A)

Victoria (NC-3)
Underwood, W. B. (A)

Vienna (WA-3)
Cooke, N. M. (SM)
Crane, R. R. (A)
Johnson, L. E. (M)
Marsteller, H. H. (A)
Meisinger, H. P.
Stotler, H. J. (A)
Wimmer, P. L. (A)

Virginia Beach (NC-3)
Humphries, J. H. (A)
Niemi, R. I. (A)

Warrenton
Thornwall, J. C. (A)

Warwick (NC-3)
Fuhrmeister, P. F. (A)

Waynesboro (NC-3)
Curtis, D. D. (A)
Duncan, W. L. (A)
Klann, P. A. (A)

Williamsburg (NC-3)
Carr, B. C., Jr. (A)
Haney, F. (A)

Woodbridge
Kiblinger, W. H. (A)
Schupak, L. (A)

Yorktown (NC-3)
Gustafson, A. J., Jr. (A)

WASHINGTON

Bellevue (SEA-7)
Banks, R. B. (A)
Black, J. C. (A)
Chewning, W. H. (A)
Crane, W. K. (SM)
Fogle, R. G. L., Jr. (A)
Jones, L. E. (SM)
Lomax, J. B. (A)
Montgomery, R. A. (A)
Natton, A. W. C. (A)
Sheldon, J. K. (A)
Smith, C. R. (SM)
Taylor, J. M. (A)
Thompson, A. G. (A)
Thurston, A. H. (A)

Bellingham (SEA-7)
Harper, E. E. (A)
Peringer, P. (A)

Bothell (SEA-7)
Fleming, H. A. (M)
Mcleod, J. S. (A)

Bremerton (SEA-7)
Gruwell, F. N. (M)
Hart, A. S., Jr. (A)
Levin, R. J. (A)
Linkletter, R. L. (A)
Louie, P. Y. (A)
Lyngstad, E. O. (M)
Mason, J. E. (M)
Milden, C. W. (A)
Miller, D. J. (A)
Mills, T. L. (A)
Schwartz, M. J. (A)
Striebel, J. E. (A)
Tufts, W. F. (A)
Vulliet, P. O. (A)
Whittier, M. L. (A)

Burton
Shahan, R. L. (A)

Centralia (SEA-7)
Lippincott, E. W. (M)

College Place (SEA-7)
Brown, R. H. (M)

Cosmopolis
Walker, J. (A)

Cove (SEA-7)
Parker, J. R. (A)

Dash Point (SEA-7)
Boze, J. L. (A)

Deer Harbor (SEA-7)
Tippery, M. W. (M)

Edmonds
Gallwey, K. L. (A)
Gunderson, H. A. (A)
Martin, J. W. (A)

Ellenburg (SEA-7)
Lowe, W. G. (A)

Ephrata (SEA-7)
Backman, J. A. (A)
Griffiths, F. J. (A)

Everett (SEA-7)
Burgh, A. J. (A)
Gleason, E. W. (A)
Jones, W. F. (A)

Fairchild
Stroman, C. F. (A)

Fort Lawton
Kent, G. H. (A)

Gig Harbor (SEA-7)
Berkheimer, R. H. (M)
Rice, M. H. (M)

Hoquiam (SEA-7)
Husby, A. O. (A)

Kennewick (SEA-7)
Schilling, R. D. (A)

Keyport (SEA-7)
Hammill, C. W. (A)

Lakeside (SEA-7)
Hatch, J. A. (A)

Longview (POR-7)
Collins, E. H. (A)

Marysville
Short, R. C. (A)

Mercer Island (SEA-7)
Biggs, J. D., Jr. (A)
Fitch, J. L. (A)
Goddess, E. D. (SM)
Hagler, D. L. (M)
May, E. L. (A)
Maynard, J. F. (SM)
Porad, B. L. (A)
Setaro, J. E. (A)

Mingral (SEA-7)
Rowe, V. G. (M)

Neah Bay (SEA-7)
Montague, L. L. (A)

Oak Harbor (SEA-7)
Baker, N. C. (A)
Deschamps, T. (A)
Dimmitt, E. E. (A)

Olympia (SEA-7)
Bigelow, R. W. (A)
Christensen, A. B. (VA)
Rummens, W. S. (A)
Swift, J. D. (A)

Opportunity
Payne, R. S. (A)

Pasco (SEA-7)
Crumb, D. F. (A)
Shiplett, K. E. (A)

Port Angeles
Keller, N. E. (A)

Port Blakely (SEA-7)
Baer, G. W. (A)
James, G. F. (A)
McCarty, E. W. (M)

Poulsbo (SEA-7)
Hollis, R. H. (A)
Thorne, C. M. (A)

Pullman (SEA-7)
Harbour, R. D. (A)

Puyallup (SEA-7)
Haugen, O. B. (A)
Herr, M. D. (M)

Ravensdale (SEA-7)
Cockrill, W. C. (A)

Renton (SEA-7)
Cavanaugh, J. T. (A)
Hood, L. I. (A)

Richland (SEA-7)
Anderson, R. K. (A)
Althoff, P. C. (A)
Campbell, D. A. (A)
Clark, R. G. (A)
Connally, R. E. (A)
Davis, R. A. (A)
Forsman, M. E. (A)
Helgeson, G. L. (A)
Libby, H. L. (A)
Ludwig, M. J. (A)
Jacobs, I. M. (M)
Reddie, J. S. (A)
Simsen, C. A. (A)
Spear, W. G. (A)
Test, L. D. (A)
Wood, M. R., Jr. (A)
Worlton, D. C. (A)

Seahurst (SEA-7)
Stroebel, J. C. (SM)

Seattle (SEA-7)
Aburano, P. F. (A)
Albin, J. E. (A)
Altizer, B. B. (A)
Ashleman, F. C., Jr. (A)
Armour, R. B. (A)
Armstrong, C. W. (A)
Bach, R. O. (SM)
Baer, D. D. (A)
Bahr, L. A. (A)
Baker, J. C. (A)
Barger, G. K. (A)
Barger, S. D. (A)
Bargian, H. (A), APO
Bark, R. S. (M)
Beals, E. L. (A)
Belleville, L. M. (SM)
Bennett, S. D. (SM)
Bergseth, F. R. (A)
Berntsen, D. G. (A)
Betten, C. B. (A)
Birch, J. S. (A)
Bishop, D. J. (A)
Boileau, O. C., Jr. (A)
Brett, E. D. (A)
Brockway, B. W. (A)
Brogdon, L. (A)
Brott, F. J. (SM)
Brudwig, A. H. (M)
Bull, W. A. (A)
Burns, E. B. (A)
Bush, B. E., Jr. (A)
Bushman, F. W. (M)
Caproni, G. A. (A)
Carmody, W. F. (A)
Chambers, G. R. (A)
Chase, R. F. (M)
Clark, L. G. (A)
Cochran, L. B. (SM)
Cockrill, M. S. (A)
Colvin, R. S. (A)
Consego, B. J. (A)
Craig, D. I. (A)
Dalby, T. G. (A)
Decker, J. L. (A)
Densmore, M. E. (A)
De Polo, J. L. (A)
Dooley, J. E. (A)
Dorband, A. E. (A)
Dorrateague, P. E. (M)
Dorwart, R. J. (A)
Drummond, W. D. (A)
Duncan, J. A. (M)
Early, E. W. (A)
Eastman, A. V. (F)
Ebken, A. F., Jr. (M)
Eckart, J. H. (A)
Eldridge, D. F. (A)
Eisenbach, M. E. (A)
Ellerbeck, K. H. (VA)
Embree, R. R. (A)
Erwin, E. V. (A)
Estes, F. B. (VA)
Evenson, H. J. (A)
Fancher, V. M. (A)
Fantin, P. J. (A)
Fargo, R. J. (A)
Fender, K. L. (A)
Ferguson, R. E. (A)
Fisher, R. C. (SM)
Fluke, J. M. (M)
Fonda, K. A. (A)
Foss, R. N. (A)
Foster, J. H. (A)
Foster, N. H. (SM)
Fowler, B. V. (A)
Friedland, R. J. (A)
Frost, F. N. (M)
Frost, J. D. (A)
Galloway, W. (A)
Garcia, S. C. (M)
Gelbach, H. R. (A)
Gellert, M. E. (A)
Gilbertson, S. R. (A)
Gill, C. C. (A)
Gilmore, E. H. (A)
Glaser, R. A. (A)
Goo, A. M. S. (A)
Gorski, A. A. (A)
Grantham, M. D. (A)
Hale, R. E. (A)
Harms, R. G. (M)
Harrison, A. E. (SM)
Harrold, W. T. (A)
Hatfield, J. B. (A)
Havens, J. D. (A)
Hayashi, M. (A)
Henry, W. O. (A)
Hermanson, K. P. (A)
Hernstad, J. A. (A)
Hillbiber, D. F. (A)
Hill, W. R., Jr. (M)
Himoe, C. E. (M)
Hoard, G. L. (SM)
Hoffman, G. (A)
Hoglund, R. H. (M)
Hollingsworth, G. L. (A)
Horn, H. T. (A)
Illman, R. W. (A)
Larson, L. A. (A)
Lawrence, S. C., Jr. (A)
Leight, J. (A)
Lennstrom, C. O. (A)
Leonard, P. W. (A)
Lerchenmueller, W. (A)
Lewis, L. J. (SM)
Lind, P. C. (A)
Linder, W. J. (M)
Louie, C. H. (A)
Lundberg, R. M. (A)
Jennings, A. L. (A)
Johnson, J. F. (SM)
Johnson, K. L. (A)
Johnson, O. E. (A)
Johnson, R. L. (A)
Jones, E. A. (A)
Jones, J. (M)
Jones, W. L. (A)
Jordan, W. D. (A)
Judson, H. H., Jr. (A)
Kaminoff, M. (A)
Karr, C. S. (A)
Kearl, J. A. (A)
Kellar, J. B. (A)
Kendall, E. L. (A)
Kennedy, W. A. (A)
Kenoyer, H. W. (A)
Kindall, E. W. (A)
Kiskaddon, W. V. (A)
Knox, W. B. (A)
Koethe, J. W. (A)
Kohl, P. H. (A)
Kostrey, M. J. (A)
Kuzeja, C. (A)
Lee, R. C. (A)
Lloyd, W. M. (A)
Lucid, J. R. (A)
Manning, V. R. (A)
Marsolan, V. C. (SM)
Martilla, A. H. (A)
Mattsen, E. A. (A)
Maurer, R. A. (A)
McCarthy, D. W. (A)
McHenry, G. A. (A)
McInnis, A. K., Jr. (A)
McKay, W. M. (VA)
McKenna, B. D. (A)
McLane, A. R. (M)
Mendenhall, G. G. (M)
Middlebrooks, J. L. (A)
Miller, C. E. (A)
Moses, H. L. (A)
Mossman, F. B. (SM)
Neal, E. T. (A)
Nelson, D. D. (A)
Nelson, N. P. (A)
Newell, S. E. (A)
Nichols, W. R. (M)
Nielsen, L. M. (A)
Noland, L. J. (A)
Noyes, J. C. (A)
Numrich, H. J. (A)
Nunner, R. J. (M)
Nutting, D. C. (M)
Olson, B. V. (A)
Olson, D. L. (A)
Olson, N. K. (M)
Omeara, J. D. (A)
Omoth, M. J. (A)
Orth, J. W. (A)
Ostrom, C. W. (A)
Page, F. E. Jr. (M)
Paisley, M. R. (A)
Palmer, V. L. (M)
Park, J. R. (A)
Parr, E. D. (A)
Parrott, J. E. (M)
Pascual, R. A. (M)
Paterson, J. M. (M)
Pedersen, R. E. (M)
Perkins, L. C. (A)
Perletti, P. V. (A)
Perman, E. M. (A)
Perry, F. E. (A)
Perry, R. E. (A)
Petrich, R. O. (M)
Polcuch, A. F. G. (A)
Polking, U. H. (A)
Poppe, R. F., Jr. (A)
Post, M. O. (A)
Pratt, L. M. (A)
Quantz, R. G. (A)
Randall, H. L. (A)
Ratcliffe, C. A. (A)
Read, R. W. (A)
Rehkopf, C. L. (M)
Reid, R. D. (A)
Reilly, J. A. (A)
Renfro, H. E. (VA)
Renhard, J. A. (SM)
Retzlaff, E. E. (A)
Reuther, C. R. (A)
Robbins, F. D. (A)
Roberts, B. J. (A)
Roberts, W. T. (A)
Robinson, R. B. (A)
Rogers, W. E. (SM)
Saarl, E. S. (A)
St. John, I. S. (A)
Samson, C. A. (A)
Sander, C. M. R. (A)
Sauber, P. T. (A)
Scott, C. V. (A)
Scovill, J. M. (A)
Sharp, B. M. (A)
Shaw, E. B. (A)
Sheldon, J. K. (A)
Sheppard, J. J., Jr. (A)
Shipek, R. H. (A)
Shook, W. A. (A)
Shubert, W. (A)
Siddons, W. J. (A)
Simler, L. L. (M)
Simons, R. J. (A)
Small, R. E. (A)
Smith, M. R. (A)
Smith, W. B. (A)
Speir, F. H. (SM)
Stedman, C. K. (SM)
Stout, T. M. (A)
Strauss, B. (A)
Strohecker, J. P. (A)
Swain, C. W. (A)
Swarm, H. M. (M)
Swindlehurst, W. C. (A)
Takemura, T. P. (A)
Talcott, M. S. (A)
Tary, J. (A)
Tate, J. A. (A)
Temple, P. E. (A)
Thomasson, L. T. (A)
Thompson, K. J. (M)
Thompson, M. E. (A)
Titefsky, E. J. (A)
Todaro, C. N. (A)
Tolmie, J. R. (SM)
Traub, L. A. (M)
Tustin, W. (M)
Vermilion, E. E. (A)
Viele, D. D. (A)
Von Tobel, R. (A)
Wagner, W. J. (SM)
Wall, R. E., Jr. (A)
Walsh, J. J. (A)
Warshawsky, J. (A)
Wedin, A. G. (SM)
Weinstein, G. (A)
Wellens, E. J. (A)
Williams, C. E. (F)
Willson, A. R. (SM)
Willson, K. R. (A)
Winder, D. E. (A)
Wood, F. P. (A)
Woodbury, J. W. (A)
Woodhouse, G. H. (A)
Wright, C. P. (A)
Young, K. J. (A)

Soap Lake (SEA-7)
Fogard, D. C. (A)

Spokane (SEA-7)
Brune, F. A. (A)
Caruana, P. A. (A)
Coates, F. M. (M)
Connelly, S. B. (A)
Gorman, D. P. (M)
Green, W. L. (M)
Klinke, E. R. (A)
MacLean, T. W. (A)
Mead, H. W. (M)
Morrison, H. L. (M)
Sparling, A. G. (SM)
Storms, H. H. (VA)
Switzer, W. H. (A)
Trebby, F. J. (M)
Tucker, J. R. (A)

Suquamish (SEA-7)
Byer, E. D. (SM)

Tacoma (SEA-7)
Barnett, K. G. (A)
Curtis, G. N. (A)
Erwin, R. L. (A)
Hartwell, S. A. (A)
Hendry, A. J. (A)
Lund, R. E. (A)
McClamrock, J. M. (A)
McDonough, D. M. (SM)
Miller, G. E. (A)
Patrick, W. B. (A)
Perkins, M. G. (A)
Shiplett, K. E. (A)
Trip, R. E. (A)
Utterback, W. J. (M)

Vancouver (POR-7)
Christensen, H. E. (A)
Porter, A. L., Jr. (A)
Roesler, R. W. (A)
Wohlgemuth, D. G. (A)
Wright, W. E. (A)

Vashon (SEA-7)
Bey, W. I. (M)

Walla Walla (SEA-7)
Parmelee, W. G. (A)
Wilken, B. W. (A)

Wenatchee
Scroggs, J. P. (A)
Wallace, J. (SM)

Yakima (SEA-7)
Morrill, D. W. (A)

WEST VIRGINIA

Alma
Nichols, G. C. (A)

Buckhannon (PIT-4)
Powell, G. M. (A)

Charleston (PIT-4)
Apgar, R. R., Jr. (A)
Brick, G. R. (A)
Bowen, H. R. (A)
Dixon, W. E. (A)
Hawkins, R. L. (A)
Law, F. S. (A)
Lockwood, E. H. (A)
Lovett, R. S. (A)
Miller, H. E. (A)
Nichols, D. S., Jr. (A)
York, D. E. (A)
Zaharis, G. (A)

Clarksburg (PIT-4)
Hough, R. D. (M)

Dunbar (PIT-4)
Roger, L. J. (M)

Fairmount
McDowell, M. H. (A)

Grafton
Sinsel, P. W (A)

Huntington (PIT-4)
Bromley, R. A. (A)
Hawes, J. G. (A)
Marshall, D. F. (A)
McNeill, L. P. (A)
Peters, J. A. (A)
Phillips, R. L. (A)
Roberts, V. B. (A)

Keyser
Patrick, A. T. (A)

Maldea
Hammer, A. C. (A)

Martinsburg (PIT-4)
Frank, J. (A)

Morgantown (PIT-4)
Colwell, R. C. (SM)
Keener, E. L. (A)
Seibert, C. B. (M)
Utt, O. L. (A)

Moundsville (PIT-4)
Jones, J. W. (M)

Parkersburg (PIT-4)
Rexroad, W. F. (A)
Spence, R. C. (A)

St. Albans (PIT-4)
Counts, D. C. (A)
Fertig, R. B. (A)

South Charleston (PIT-4)
Rogers, L. J. (M)

Welch
Kish, F. (A)

Weston (PIT-4)
McEwuen, J. E. (A)

Wheeling (PIT-4)
Levenson, D. W. (A)
Rollins, E. A. (A)

WISCONSIN

Antigo (TC-5)
Parfitt, R. J. (A)

Appleton (MIL-5)
Grist, F. J., Jr. (A)

Beloit
Schutz, G. C. (SM)

Cuba City (MIL-5)
Hauser, D. J. (A)

Cudahy (MIL-5)
Patrick, P. J. (A)

Eau Claire (TC-5)
Jorgenson, T. O. (M)
Morawetz, F. (M)

Elm Grove (MIL-5)
Bailey, T. J. (A)
Evans, J. A. (M)

Ettrick (TC-5)
Rogne, R. J. (A)

Fond du Lac (MIL-5)
Jensen, K. S. (SM)

Fort Atkinson (MIL-5)
Anthes, J. (A)

Grafton (MIL-5)
Konig, V. A. Y. (A)
Pionkowski, E. F. (M)
Rubinstein, H. W. (A)

Hartland
Harry, W. R. (VA)

Janesville (MIL-5)
Brandt, R. W. (SM)
Clay, W. A. (VA)
Gates, C. E. (M)
Glander, H. H. (A)
Harris, R. J. T. (A)
Middleton, J. A. (A)
Petranek, D. J. (A)
Pollard, W. J. (A)
Williams, C. R. (A)
Zielske, R. J. (A)

Kenosha (CHI-5)
Bauer, W. E. (A)
Boehm, R. F., Jr. (A)
Broughton, G. E. (A)
Grevenow, W. A. (A)
Heide, S. M. (A)
Kovachik, E. (A)
MacDowell, G. E. (A)
Neumann, H. J. (A)
Osterlund, S. G. S. (M)
Thiel, W. (A)

La Crosse (TC-5)
Leeman, A. (M)
McCabe, K. E. (A)
Steele, T. S. (A)
Wiedman, R. E. (A)

Lake Nebagamon (TC-5)
Caspers, G. E., Jr. (A)

Madison (MIL-5)
Beamsley, G. V. (A)
Brown, C. J. (A)
Caldwell, R. R. (A)
Choksy, N. H. (A)
Christensen, A. A. (A)
Davidson, C. H. (A)
Gilson, W. E. (SM)
Groenier, R. S. (M)
Hahn, N. G. (A)
Hughes, M. W. (A)
Kelley, W. V. (VA)
Koehler, G. (SM)
Navratil, C., Jr. (A)
Noble, D. S. (A)
Ottum, R. W. (A)
Parent, R. J. (M)
Peterson, H. A. (SM)
Retherford, R. C. (A)
Rideout, V. C. (SM)
Scheibe, E. H. (SM)
Skiles, J. J. (A)
Swift, W. B. (A)
Vanko, J. A. (A)
Wickhem, R. J. (A)
Young, C. E. (A)

Manitowoc (MIL-5)
Reed, D. M. (M)

McFarland (MIL-5)
Pierce, R. L. (A)

Menomonee Falls (MIL-5)
Luecke, M. W. (A)
Ruff, H. M. (A)
Van Alstyne, A. (M)

Merrill (TC-5)
Bartelt, C. H. (A)

Middleton (MIL-5)
Miller, J. B. (A)

Milwaukee (MIL-5)
Asnicar, D. V. (A)
Atwood, A. R. (A)
Austin, E. N. (A)
Baird, J. T. (A)
Baker, W. R. (A)
Barszcz, A. M. (A)
Baumeister, E. A. (A)
Beaudoin, L. W. (A)
Behagen, E. L. (A)
Boyd, B. (M)
Brown, H. W. (A)
Burkhalter, B. L. (A)
Burns, R. E. (A)
Butler, L. W. (M)
Calhoun, M. C. (A)
Camell, D. M. (A)
Cordes, E. L. (M)
Crabtree, R. L. (A)
Crowell, G. F. (M)
Dilger, L. E. (A)
Doyen, R. G. (A)
Doylen, D. H. (M)
Ebel, F. E. (A)
Eckert, F. A., Jr. (VA)
Eder, R. H. (A)
Edwards, M. A. (SM)
Elliot, W. H. (M)
Farber, E. R. (A)
Frater, G. A. (A)
Gainer, W. P. (M)
Ganiere, H. C. (A)
Geiger, L. C. (A)
Gennrich, A. (A)
Hebal, W. H. (M)
Henry, J. R. (A)
Hesse, M. H. (A)
Hoffmann, P. F. (A)
Hogan, H. A. (A)
Horvath, A. E. (A)
Hudzinski, R. J. (A)
Jacobs, J. E. (A)
Johnson, K. R. (A)
Kaetel, H. C. (VA)
Kaiser, E. H. (A)
Kane, E. W. (M)
Kasdorf, G. R. (A)
Khouri, A. S. (A)
Kilby, J. S. (A)
Kilpinen, R. L. (A)
Kluge, J. E. (A)
Knopow, H. S. (A)
Koch, M. E. (A)
Kortright, F. U. (A)
Kroch, R. S. (A)
Kulhelm, C. R. (A)
Kurylo, E. F. (A)
Laeser, P. B. (M)
Lecus, C. M. (A)
Limpel, E. J. (M)
Little, C. W., Jr. (M)
Makela, L. V. (A)
Maklary, J. R. (A)
Makowski, J. J. (A)
Matthews, R. B. (M)
Matthias, L. H. (VA)
McCarthy, R. R. (A)
Mereen, D. E. (M)
Mort, V. A. (A)
Mueller, H. W. (A)
Naughton, G. J. (VA)
Ollenburg, M. A. (A)
Olson, R. C. (A)
Paalu, A. (M)
Pfeifer, J. W. (VA)
Pirofer, D. J. J. (A)
Regis, R. J. (A)
Richardson, M. S. (VA)
Richter, W. (F)
Rodewald, M. V. (A)
Roethle, R. H. (A)
Runft, A. J. (A)
Saari, L. V. (M)
Sandberg, A. J., Jr. (A)
Scheer, D. (A)
Schlehlein, G. J. (A)
Schlicke, H. M. (SM)
Sherwood, E. T. (SM)
Singer, D. F. (A)
Smith, C. C. (A)
Snowdon, A. C. (A)
Sperry, L., Sr. (A)
Steffen, R. V. (A)
Sutinen, C. P. (SM)
Tait, R. B. (A)
Van Zeeland, F. J. (SM)
Van Zeeland, W. A. (M)
Waigand, L. E. (A)
Wandrey, H. B. (A)
Webber, L. E. (A)
Weller, D. A. (SM)
West, B. M. (A)
Wiener, R. (A)
Wille, E. A. (A)
Williams, S. B. (A)
Wilson, R. F. (A)
Wittkop, C. F. (A)
Wolff, R. L. (M)
Woods, K. C. (A)
Wrege, L. A. (A)
Wulliman, J. C. (A)
Young, T. P. (A)
Zoesch, A. C. (A)
Zolin, F. H. (A)
Zwarra, H. J. (A)
Zwieke, W. R. (A)

Neenah
Zabel, L. W. (M)

Oshkosh (MIL-5)
Howarth, A., Jr. (A)
Williams, N. (A)

Port Atkinson
Dunbar, L. B. (M)

Poynette
Lambert, L. W. (A)

Prescott (TC-5)
Borner, E. F. (A)

Princeton
Kalupa, C. J. (A)

Racine (MIL-5)
Benedict, D. E. (A)
Chaniga, J. A. (A)
Johnson, W. H. (M)
Raaen, H. W. (A)
Smithana, D. R. (A)
Young, R. G. (A)

River Falls (TC-5)
Pearson, R. P. (A)

Saukville
Nunn, E. D. (M)

Sheboygan (MIL-5)
Mayer, H. J. (A)

South Milwaukee (MIL-5)
Barger, J. L. (A)

Sparta (TC-5)
Heasty, C. N. (A)

Thiensville (MIL-5)
Barthel, E. A. (A)

Tomahawk (TC-5)
McGinnis, H. J. (M)

Walworth (MIL-5)
Longley, J. K. (A)

Waterford (MIL-5)
Cummings, H. R. (M)
Swain, A. T. (A)

Waukesha (MIL-5)
Randall, A. E. (A)
Ritzow, N. R. (A)

Waupaca (TC-5)
Danielsen, A. C. (M)

Wausau (TC-5)
Zielesch, B. E. (M)

Wauwatosa (MIL-5)
Pinnow, R. L. (A)
Visser, A., Jr. (A)
Watts, W. E. (M)
Wollaeger, L. A. (A)

West Allis (MIL-5)
Reinke, H. J. (M)
Sielicki, A. J. (M)
Taylor, E. D. (A)
Thoman, R. M. (A)
Wright, B. G. (A)

West Depere (MIL-5)
Stangel, W. (A)

West Salem (TC-5)
Rhoades, H. G. (A)

Whitefish Bay (MIL-5)
Helgeson, V. L. (A)

Williams Bay (MIL-5)
Gibson, J. G. (A)

WYOMING

Casper (DEN-5)
Hathaway, D. L. (SM)

Cheyenne (DEN-5)
Grove, W. C. (A)
Hallen, E. (M)

Eden
Nelson, C. E. (A)

Laramie (DEN-5)
Clawson, L. F., Jr. (A)
Mallory, W. M. (M)
Willhard, W. J. (A)

Rawlins
Seaverson, O. I. (VA)

Sheridan (DEN-5)
Peterson, A. D. (A)
Stanton, J. M. (M)

Upton (DEN-5)
Rinehart, B. H. (VA)

Wheatland (DEN-5)
Leet, D. N. (A)

ALASKA

Anchorage
Donohoe, T. K. (A)
Duncan, J. G. (M)
Hannon, G. A. (A)
Hart, B. H. (A)
Johnson, C. A. (A)
Little, J. T. (A)
Long, J. E. (A)
Lulofs, J. R. (A)
McMillan, J. D. (A)
Morley, L. N. (A)
Ordonia, J. M. (A)
Silven, J. W. (A)
Singleton, R. L. (A)
Smith, C. H. (M)
Walden, J. M. (M)
Walker, R. E. (M)
Walker, R. T. (M)
Wheaton, T. H. (A)
Whittaker, G. A. (A)

Angoon
Whitney, J. E. (A)

College
Swenson, G. W., Jr. (SM)

Cordova
Callisen, F. I. (A)

Fairbanks
Shurtleff, C. H. (A)

Ketchikan
Achard, R. H., Jr. (A)

Petersburg
Pierce, E. R. (A)

Spenard
Rogers, D. C. (A)
Wayer, C. F., Jr. (A)

ARGENTINA

Bahia Blanca
Paez-Segui, J. C. (A)

Banfield (BA)
Jaccard, R. H. (A)

Beccar
Weiss, G. (SM)

Bella Vista
Bolwig, A. C. (A)

Buenos Aires (BA)
Arbo, O. (A)
Andrews, G. J. (SM)
Antonocci, R. H. (A)
Baldwin, E. V. (A)
Barbieri, M. (A)
Baumann, C. (A)
Benjamin, M. (A)
Bermudez, J. (A)
Bertola, J. (A)
Brandt, L. (A)
Burundarena, C. A. (A)
Calvino, J. A. (A)
Canepa, A. M. (A)
Canepa, J. A. (A)
Cassiet, A. H. (M)
Castaldi, A. B. (M)
Castro, S. (A)
Cerrato, E. (A)
Cook, W. A. (SM)
De Ridder, L. E. (A)
Dickson, A. R. K. (A)
Di Marco, A. (SM)
DiNunzio, P. (A)
Feinstein, J. (A)
Frias, D. E. (SM)
Garrido, R. H. (A)
Giron, D. G. (A)
Glucksmann, A. (A)
Goldberger, R. (A)
Gonzalez, F. (A)
Grant, I. C. (SM)
Grinberg, E. E. (A)
Guzzi, P. N. (SM)
Hayes, G. W. (A)
Kirkscether, E. J. (A)
Krahenbuhl, G. (A)
Laconca, F. (A)
Lafon, J. B. (A)
Levin, J. (A)
Licht, F. (A)
Lojkasek, T. C. (A)
Maget, R. (A)
Malvarez, L. M. (SM)
Marelli, R. V. (A)
Martinez, J. (A)
Martinez, P. E. (A)
McCallum, C. A. (A)
McLoughlin, R. P. (SM)
Neistadt, R. B. (A)
Noizeux, P. J. (F)
Noviks, B. (A)
Novillo, H. L. (A)
Penin, R. L. (A)
Picard, A. (A)
Pinasco, S. F. (A)
Pluss, C. P. (SM)
Pulver, M. (A)
Ross, J. G. (A)
Rossi, C. S. E. (A)
Rubio, J. M. (A)
Rueda, J. V. (A)
Schwartz, O. (A)
Scott, R. H. (SM)
Sitkovsky, V. (A)
Steiner, J. I. (M)
Steube, F. R. (A)
Strauss, E. (A)
Vaio, C. A. (A)
Valdes, S. A. (A)
Van Der Lee, A. C. (M)
Van Spankeren, G. (SM)
Von Trentini, G. (SM)
Ziger, A. (A)
Zollfrei, C. D. (A)

Florida, F. C. G. M.
Nuber, S. E. (A)

Hurlingham (BA)
Cosentino, A. T. (F)

Lopez (BA)
Arnaud, J. P. (SM)
Collazo, J. A. (A)

Puerto Belgrano (BA)
Tufro, A. (A)

Ranelagh, FCNGR
Schweimer, K. P. (A)

San Isidro
Coriat, J. L. (A)

San Miguel De Tucuman (BA)
López de Zavalia, R. J. (A)

Santa Fe
Munoz Detoro, A. (A)

AUSTRALIA

NEW SOUTH WALES

Bankstown
Ferguson, G. S. (A)

Bexley
Wardale, A. H. (M)

Burwood
Builder, G. (F)

Canberra
Hibbard, L. U. (A)

Chippendale
Cooper, B. F. (M)

Enfield
Hall, G. G. (M)

Glebe
Scott, H. G. (M)

Inverell
Battle, O. E. (A)

Kirribilli
Martin, A. F. (A)

Longueville
Beard, M. (A)
Swire, B. E. (A)

Mosman
Wyles, D. G. (SM)

Orange
Crouch, E. C. (A)

Ramscate
Larkin, J. H. (A)

Sydney
Allsop, R. C. (SM)
Bardin, W. F. (SM)
Bean, L. P. R. (SM)
Bushby, T. R. W. (SM)
Cansick, N. V. C. (A)
Dobbie, L. G. (SM)
Fowler, A. (M)
Gutmann, F. (M)
Hansen, I. C. (M)
Hirschel, H. P. (M)
Hooke, L. A. (SM)
Kerr, F. J. (SM)
Langford-Smith, F. (SM)
McDonald, A. S. (F)
Mingay, O. F. (SM)
Minnett, H. C. (A)
Munro, G. H. (SM)
Parish, H. C. (VA)
Ryan, R. D. (A)
Shaw, R. H. (M)
Stevenson, M. H. (SM)
Thom, F. W. P. (SM)
Wade, C. F. N. (SM)
Warner, J. (A)

Thornleigh
Hope, R. S. (M)

Vaucluse
Hall, L. S. (SM)

West Ryde
Benson, J. E. (SM)

QUEENSLAND

Brisbane
Ham, G. (VA)
Oliver, E. (M)
Webster, H. C. (M)

SOUTH AUSTRALIA

Adelaide
Pybus, A. W. L. (SM)
Willoughby, E. O. (A)

Plympton
Davies, R. J. C. (A)

VICTORIA

Ballarat
McCulloch, G. R. (VA)

Beaumaris
Murphy, W. T. (M)

Canterbury
Coate, E. F. (A)

Ellwood
Warner, G. A. (M)

Heathmont
Kennewell, E. M. (A)

Ivanhoe
Cakanovskis, E. (A)

Melbourne
Brodribb, M. I. (A)
Brownless, S. F. (VA)
Cannon, A. H. (A)
Caro, D. E. (A)
Collins, R. J. (A)
Cox, L. V. (A)
Faudell, C. L. (SM)
Glover, A. J. G. (A)
Hooper, E. M. (VA)
Rubenstein, S. J. (VA)
Skelton, T. H. (SM)

Richmond
Webb, A. L. C. (VA)

WEST AUSTRALIA

Perth
Hayman, W. G. (A)

BELGIUM

Antwerp
Cornet, J. F. (A)
Van Dyck, E. A. (A)

Brussels
Bernaert, A. L. J. (A)
Goldberg, E. (A)
Pierce, J. R. (A)
Tavernier, G. C. (M)
Van de Velde, F. J. (A)

Charleroi
Desirant, M. C. (A)

Ghent
Buys, W. L. (M)
Van den Meersche, A. (VA)

Mons
Harmegnies, P. A. (A)

Putte
Liekens, A. F. (A)

Uccle-Brussels
Marique, J. (M)

BAHAMAS

Nassau
Ingraham, K. R. (M)

BERMUDA

Hamilton
Lawson, C. J. V. (M)

Pembroke
Watlington, F. W. (A)

Warwick
Harries, J. H. O. (SM)

BOLIVIA

La Paz
Weil, R. B. (A)

BRAZIL

Isabel Rio
Pradal, H. A. (A)

Porto Alegre
Peizoto, E. S. (SM)

Rio de Janeiro
Bonapace, H. (M)
Carmo, A. C., Jr. (A)
Costa, H. (A)
De Andrade, P. E. (A)
De Britto-Pereira, M. (M)
De Bustamante, I. S. (A)
De Medeiros, L. A. (VA)
De Oliveira, A. M. (SM)
Dutra, L. G. L. (A)
Frederico, J. C. B. (A)
Grant, F. W. (A)
Greis, W. F. (A)
Heininger, W. W. L. (A)
Lacombe, C. G. (A)
Lezan, G. R. (A)
Leinhard, J. G. (M)
Mesiano, C. (A)
Nina, J. P. (A)
Obermuller, W. F. (M)
Pareto, Neto, J. V. (VA)
Portella, S. M. (A)
Ramos, Z. P. (A)
Ritter, G. (A)
Schenck, H. H. (SM)

Sao Jose Dos Campos
Senise, J. T. (A)

Sao Paulo
Barros, Barreto, L. A. (A)
Bastos, P. M. D. (A)
Batista, W. C. (A)
Beaman, W. G. (A)
Brandt, W. L. (A)
Christian, W. (A)
Dantine, W. A. (A)
Da Rosa, A. V. (A)
De Arruda, P. R. (A)
De Macedo, A., Jr. (M)
De Mello, G. H. (A)
Fanta, P. (M)
Gilmore, E. M. (M)
Girardelli, L. R. L. (A)
Goldmann, R. D. (A)
Goldberger, N. (A)
Guimaraes, B. Q. (A)
Heinke, C. B. R. (M)
Kaminitz, P. H. (A)
Kimbark, E. W. (M)
Langdon, G. G. (A)
Levy, G. I. (M)
Meyer, L. V. (A)
Perini, J. (A)
Reynolds, D. K. (SM)
Rimai, L. (A)
Rubin, L. (M)
Sherman, F. L. (A)
Smit, J. (A)
Stamopoulos, C. D. (SM)
Stokes, H. S. (SM)
Woelz, A. L. (M)

BRITISH EAST AFRICA

KENYA

Nairobi
Gross, J. (M)
Hastings, D. J. (M)
Paterson-Jones, E. (SM)
Pegrume, S. A. (M)
Proud, E. (M)
Smailes, G. (A)
Talbot-Jones, R. V. (M)

TANGANYIKA

Moshi
Greig, C. (M)

BRITISH WEST AFRICA

GOLD COAST

Accra
Fisk, B. C. (A)

SIERRA LEONE

Freetown
Bruce, J. R. (VA)

BRITISH WEST INDIES

Trinidad
Borde, E. H. (A)

BURMA

Rangoon
Ba'hli, F. (A)
Doe, U. P. (A)

ECUADOR

Quito
Jacobson, H. P., Jr. (A)
Rota, L. (M)

EGYPT

Alexandria
Abdel-Dayem, A. H. (A)
Assaf, E. J. (A)
Mostafa, A. E. (SM)

Cairo
Abu-Kandeel, A. A. (M)
Attya, F. S. (M)
El Harty, A. K. (M)
El Koteury, A. S. (A)
El Melehya, M. (A)
Fouad, M. E. (SM)
Grdseloff, L. (M)
Hurd, F. K. (M)
Mahmoud, A. A. (M)
Mahmoud, H. M. (A)
Makar, R. T. (A)
Mortada, I. O. (M)
Reda, M. S. (M)
Shakir, M. M. (M)

Giza
El-Said, M. A. H. (SM)

BRITISH GUIANA

Georgetown
De Freitas, J. F. (A)

Rio Demerara
Greaves, H. A. (M)

BRITISH WEST INDIES

Jamaica
Gauntlett, G. A. R. (M)

Trinidad
Fung, J. H. (A)

CANAL ZONE

Balboa
Corey, J. F. (A)
Young, J. W. (VA)

Balboa Heights
Carleton, E. O. (A)

Cristobal
Mason, J. L. (A)

Curunou
Marshall, J. G., Jr. (A)

Rodman
Loman, J. W. (A)

CANADA

ALBERTA

Bruderheim
Kittlitz, R. S. (A)

Calgary (VAN-8)
Allan, W. K. (A)
Caldwell, L. W., Jr. (A)
Cooper, R. J. G. (A)
Davis, A. P. (A)
Larson, V. C. (A)
Lawrie, D. W. (A)
Partin, W. (A)
Rosen, E. W. (A)
Thompson, H. C. (A)
Underhill, R. W. (A)
Wilson, T. M. (A)
Zelonka, F. A., Jr. (A)
Zowtiak, J. (A)

Camp Wainwright (VAN-8)
MacIntosh, R. L. (A)

Edmonton (VAN-8)
Cable, R. P. (A)
Carty, D. G. (A)
Donovan, L. N. (A)
Hall, T. W. (A)
Lambert, R. F. (A)
Lexier, G. S. M. (A)
MacDonald, D. L. (A)
Meek, T. J., Jr. (A)
Michie, C. G. (A)
Obolensky, G. (A)
Peterson, D. A. (A)
Porteous, J. W. (SM)
Rice, G. R. A. (A)
Schafer, E. D. W. (A)
Smith, O. A. (VA)
Welling, E. A. (A)

St. Albert (VAN-8)
Usher, R. (A)

BRITISH COLUMBIA

Castlegar (VAN-8)
Thorp, W. W. (A)

Courtney
Saunders, M. E. (M)

Esquimalt (VAN-8)
Davidson, H. H. A. (SM)
Madill, C. L. (M)
Nasmyth, P. W. (M)

Holberg (VAN-8)
Stott, W. (A)

Hollyburn P. O.
Manders, D. F. (M)
Miles, W. F. (A)

Kemano (VAN-8)
Mac Donald, J. A. (A)

Nanaimo
Pirart, M. A. (A)

Nelson (VAN-8)
Auld, B. A. (A)
Jeffery, A. P. (A)

North Vancouver (VAN-8)
Fitzgerald, M. W. (A)
Riddell, A. I. (A)
Schroter, R. G. (A)
Wilson, C. M. (A)

Penticton (VAN-8)
Paton, I. W. (A)

Prince George (VAN-8)
Watson, A. J. (A)

Sea Island (VAN-8)
Witt, H. R. (A)

South Burnaby
Tripp, H. H. (A)

Steveston (VAN-8)
Wighton, J. J. (A)

Trail (VAN-8)
Gowans, W. K. (A)

Vancouver (VAN-8)
Breeze, J. E. (SM)
Cameron, D. I. (A)
Carpenter, D. D. (SM)
Chandler, A. H. (A)
Chandler, G. C. (SM)
Chisholm, E. (A)
Corby, L. A. (A)
Cuddeford, R. A. (A)
Cushing, T. D. (M)
Davenport, E. (A)
Davidson, G. K. (M)
Fedoroff, L. N. (A)
Fraser, F. S. (M)
Freeman, E. F. (A)
Gray, J. S. (A)
Green, M. (M)
Hale, S. T. (A)
Hepburn, J. T. (M)
Hill, C. J. (A)
Hilton, B. C. (A)
Hings, D. L. (VA)
Holmes, A. T. (A)
Hoyles, H. A. (A)
Itenson, V. A. (A)
Kersey, L. R. (M)
Knight, A. G. (A)
Knight, G. M. (A)
Kolbeins, E. N. (A)
Lynch, T. G. (A)
Marsh, R. A. (A)
McCarter, W. L. (A)
McDonald, R. C. (A)
McGrath, E. F. (A)
McLennan, D. E. (A)
Moore, A. D. (M)
Neveroski, F. (A)
Norman, R. O. (M)
Palmer, H. (A)
Pye, R. M. (A)
Robson, E. E. (M)
Smith, C. R. (A)
Spencer, R. E. (A)
Stewart, J. A. (A)
Terrell, D. S. (A)
Tindoll, J. B. (A)
Trainor, W. J. (M)
Tupper, B. R. (SM)
Varah, L. A. (A)
Wade, D. (VA)

Victoria (VAN-8)
Blyth, G. S. (A)
Weir, R. C. (A)

West Kildonan
Scammel, R. E. (A)

West Vancouver (VAN-8)
Bennett, W. F. (A)
Bonnett, J. D. W. (A)
Brown, T. J. (A)
Kent, N. S. (A)

MANITOBA

Carman
Hacket, F. J. (A)

Churchill
Yankewicz, W. W. (A)

Fort Garry (WIN-8)
Haakensen, H. M. (M)
White, T. J. (A)

Lac du Bonnet (WIN-8)
Uhlman, J. C. (A)

Norwood (WIN-8)
Barschel, E. (A)

St. James
Kennedy, A. E. (A)
Welch, R. C. (A)

St. Vital (WIN-8)
Hreczuch, S. F. (A)
Perry, S. G. (A)
Spencer, G. M. (A)

Transcona (WIN-8)
Royko, W. (M)

West Kildonan
Denyer, J. H. N. (A)

Winnipeg (WIN-8)
Ardelian, T. E. (M)
Bass, J. R. (A)
Body, H. T. (A)
Brown, J. R. B. (A)
Buchmeier, H. P. G. (M)
Cahoon, R. D. (SM)
Charron, J. H. A. (A)
Cross, I. F. (SM)
Cunningham, A. B. (A)
Demasson, A. N. (A)
Diamond, M. (M)
Dusang, E. B. (M)
Galpin, W. H. (A)
Gissing, H. R. (SM)
Grausdin, P. (A)
Greenaway, J. (M)
Gregory, B. J. (A)
Hancharek, J. (A)
Hooper, A. W. (A)
Horner, S. G. L. (SM)
Hoye, W. (A)
Jex, J. F. (A)
Kennedy, A. E. (A)
Kinnear, H. E. (A)
Kyle, D. V. (A)
MacDonald, P. A. (SM)
Mahaffy, J. D. (A)
McLaren, G. A. (A)
Mestery, S. (A)
Poloway, A. A. (A)
Pulfer, J. K. (A)
Reynolds, J. F. W. (A)
Salton, L. V. (SM)
Schuff, P. G. (A)
Seals, M. L. (A)
Shaver, H. B. (A)
Simister, R. M. (A)
Sloker, G. H. (A)
Stillwater, J. (A)
Thomson, D. R. (A)
Tinkler, R. F. (M)
Wallace, G. R. (A)
Williams, N. A. (SM)
Williams, S. A. (A)
Wolff, E. R. (A)
Wormell, H. T. (M)

NEW BRUNSWICK

Fredericton (MON-8)
Cassidy, S. B. (A)
Galbraith, R. A. H. (SM)

Petitcodiac
McCully, G. R. (A)

Sackville (MON-8)
Hart, E. S. (A)
Smith, H. M. (SM)

Saint John (MON-8)
Bishop, J. G. (A)
George, J. N. S. (A)
Mahler, J. H. (A)

NEWFOUNDLAND

St. Johns (MON-8)
Au, G. D. (A)
Witherstone, E. D. (M)

NOVA SCOTIA

Cornwallis (MON-8)
Pimenoff, V. J. (A)

Greenwood
Ruddell, J. F. (A)

Halifax (MON-8)
Burchill, G. H. (A)
Duston, R. F. (A)
Fowlie, W. D. (A)
Greig, A. W. (A)
Jefferson, W. E. (M)
Lee, F. B. (A)
Murray, C. W. (A)
Pippy, G. A. (A)
Wood, W. (A)

Sydney (MON-8)
Oulton, G. R. (A)

ONTARIO

Agincourt (TOR-8)
Collins, G. S. (A)
Reesor, G. E. (A)

Ajax (TOR-8)
Bayly, B. D. F. (F)
Chaplin, N. J. (A)
Gates, R. E. (A)
Philp, H. E. (A)

Aldershot
Allred, L. D. (A)

Ancaster (HAM-8)
Foy, R. H. (A)
Gamard, P. (A)
Ratz, A. G. (M)
Ruse, E. (M)

Arnprior (OT-8)
Boire, P. C. (A)
Godby, E. A. (A)
Montagnon, N. B. (A)

Ashburn
Anderson, W. H. (M)

Ayler West (LON-8)
Jackson, A. (M)

Barriefield (MON-8)
Sneddon, W. D. (A)

Beamsville (HAM-8)
Bodo, A. (A)

Belleville (TOR-8)
Blacker, H. L. (A)
Burkett, K. V. (M)
Duke, A. M. (A)
Fort, D. E. (A)
Hunt, C. A. (A)
Lund, D. M. (A)
Moore, N. A. (A)
Punchard, J. C. R. (F)
Shewchuk, P. D. (A)
Sillitoe, S. (VA)
Smith, R. L. (SM)
Tanner, R. H. (SM)
Williamson, R. (A)

Blenheim (LON-8)
Chase, G. A. (A)

Brantford (HAM-8)
Langton, B. W. (A)
Walker, M. L. (A)

Burlington (HAM-8)
Beaumont, G. F. (M)
Hicks, E. P. (A)

Campbellford (TOR-8)
McCulloch, A. R. (A)

Camp Borden (TOR-8)
Hockin, W. J. (A)

Carlton Place (OT-8)
Britney, O. L. (M)

Chatham (LON-8)
Richardson, C. H. (A)

City View (OT-8)
Caton, W. A. (M)
Crouser, E. E. (A)
Risteen, H. C. (A)
Smith, W. B. (M)

Cliffcrest P. O.
Holmquist, C. A. (A)

Clinton (LON-8)
Boyczuk, F. P. (A)
Bury, G. J. (M)
Heal, J. A. (A)
Miller, B. G. (M)

Deep River (OT-8)
Cooper, W. (A)
DeGray, E. H. (A)
Drew, T. D. (A)
Dunlop, D. P. (A)
Langmuir, D. B. (SM)

Deseronto (TOR-8)
Leavitt, J. N. (A)

Don Mills (TOR-8)
Breckenridge, A. G. (A)

Dundas (HAM-8)
Athens, R. G. (SM)
Bennett, H. W. (A)

Eastview (OT-8)
Henderson, D. P. (A)

Fort Erie (HAM-8)
Eng, T. S. (A)

Fort William (TOR-8)
Andrews, G. R. (A)
Musselman, A. L. (A)

Foxboro
Waller, M. J. (M)

Galt
Sweet, J. L. (A)

Gananoque
Olive, G. E. (F)

Georgetown (HAM-8)
Bell, J. W. (F)
Rugg, H. H. (M)

Guelph (HAM-8)
Brown, R. M. (A)
Irwin, G. J. (SM)
Mackay, F. S. (SM)
Robinson, C. A. (VA)

Hamilton (HAM-8)
Adair, R. J. (A)
Anderson, J. W. (M)
Attack, H. G. (A)
Bennett, H. W. (A)
Cantlon, C. F. (M)
Chapman, C. W. (M)
Cheek, W. A. (A)
Cheston, T. C. (SM)
Connor, J. J. (A)
Conquest, E. A. (A)
Davis, C. C. (A)
Dean, W. W. H. (SM)
Demasson, A. N. (A)
Edwards, F. H. (M)
Elvidge, R. E. (A)
Farley, T. S. (SM)
Fromanger, A. L. (M)
Gomard, P. (A)
Gray, W. W. (A)
Gregson, J. H. (A)
Griffiths, H. D. (A)
Harris, L. R. (A)
Hayward, J. R. (M)
Hore, H. B. (A)
Houlding, J. D. (M)
Jazbutis, A. (A)
Jeynes, W. E. (M)
Kelterborn, W. H. (SM)
Lillo, M. L. (A)
Litwin, J. D. (A)
Lord, G. W. (A)
Lucyk, J. (M)
Mason, V. V. (SM)
Merritt, H. J. (M)
McIlroy, C. R. (A)
Miedema, H. (SM)
Moody, R. N. (A)
Olson, E. (SM)
Ottolenghi, A. M. (A)
Parent, A. M., Jr. (A)
Plumley, S. J. (A)
Price, C. C. (A)
Ratz, H. C. (A)
Reader, W. R. (A)
Rice, H. (SM)
Rogers, E. L. (A)
Ryll, E. (A)
Sandler, A. A. (A)
Schneider, S. S. (SM)
Seljak, A. A. (A)
Sievert, A. H. (SM)
Slater, H. (A)
Smith, C. J. (A)
Smith, W. D. (A)
Staryk, M. (A)
Stauffer, R. L. (A)
Thomas, E. A. (M)
Thomson, J. R. (A)
White, R. H. (A)
White, W. (M)
Wiffin, R. F. (A)
Wilk, J. (A)
Williams, J. K. (M)
Williamson, D. B. (A)
Wynn, W. W. (A)

Iondale Heights (TOR-8)
Johnston, K. S. (A)
Murphy, W. L. (A)
Yablo, S. (A)

Kenora (TOR-8)
Brereton, C. H. (SM)
Jones, A. W. (M)

Kettleby (TOR-8)
Borth, L. A. (A)

King
Stubbs, R. A. (A)

Kingston (OT-8)
Campling, C. H. R. (A)
Cox, G. C. (A)
Omond, P. H. (A)
Robinson, M. R. (A)
Stewart, H. H. (A)
Thompson, R. (A)
Willing, W. R. (A)

Kitchener (HAM-8)
Aikenhead, B. A. (A)
Banks, F. A. O. (M)
Clark, W. B. (SM)
Collins, A. D. (A)
Cox, G. M. (SM)
Dankwardt, R. W. (A)
DuVall, J. M. (A)
Enns, E. G. (A)
Marsland, J. W. (A)
Ritz, E. A. (A)
Rosebrugh, R. K. (A)
Smallwood, S. G. (A)
Tamoski, H. J. (A)

Lakeview (TOR-8)
Sullivan, J. K. (A)

Lansing
Fisher, G. W. (A)
Leaver, E. W. (M)

Leaside (TOR-8)
Bain, J. D. (M)
Brereton, R. L. (M)
Brophy, R. M. (SM)
Byers, V. J. (SM)
Fitzallen, J. H., Jr. (M)
Gillespie, R. M. (A)
Houlgrave, A. G. (A)
Noble, D. E. (A)
Simmonds, L. C. (VA)
Stewart, G. L. (M)
Thompson, W. H. (A)
Unger, J. H. W. (A)
Van Dyk, T. (A)
Webster, C. G. (A)
Wiggins, J. D. (A)

Lobo (LON-8)
Onn, W. R. (A)

London (LON-8)
Allen, R. L. (A)
Aselstyne, J. G. (A)
Bach, J. R. (SM)
Blackburn, W. J. (A)
Blackwell, J. H. (M)
Conway, W. R. (M)
Crossan, G. W. (M)
Davis, R. E. (A)
Dearle, R. C. (SM)
Downs, E. E. (A)
Ferguson, A. F. (M)
Fisher, F. J. (A)
Foster, G. L. (M)
Graham, B. (SM)
Gurd, R. H. (A)
Hosker, G. R. (M)
Hudson, G. W. (A)
Hunt, F. R. (A)
Jackson, N. B. (A)
Jarmain, E. R. (M)
Jeffery, J. (A)
Johnston, S. N. A. (A)
Kipp, C. F. (A)
Lansing, L. M. (A)
Luke, R. W. (M)
MacDonald, C. F. (A)
Montreuil, R. E. (A)
Moore, J. D. B. (M)
Noble, F. K. (A)
Nunn, W. A. (A)
Peters, G. A. (M)
Prodger, A. (A)
Richards, R. S. (M)
Robertson, J. D. (A)
Robitaille, G. A. (M)
Rumbold, D. G. (A)
Ruth, C. G. (M)
Sanders, G. E. (A)
Stewart, T. W. W. (A)
Suchard, D. G. (M)
Tull, E. H. (M)
Warr, R. J. (M)
Wilton, R. (SM)

Markham
Dodge, A. (A)

Mimico
Dudley, D. J. (A)

Monotick
Allworth, J. C. (A)

Mt. Hamilton
Rutledge, C. H. (A)

Newtonbrook (TOR-8)
Ainlay, A. (M)
Hedley, C. E. (A)
Penrose, R. M. (A)

New Toronto (TOR-8)
Boyd, R. S. (A)
Wood, L. R. (A)

Niagara Falls (HAM-8)
Chernish, G. (SM)

Nobleton (TOR-8)
Goodfellow, B. B. (A)

North Park P. O. (TOR-8)
Deacon, F. W. (A)
Dulmage, H. B. (A)
Luke, L. M. (A)

North York (TOR-8)
Verschuur, J. J. (M)

Oakville (HAM-8)
Ticknor, A. E. (A)

Orangeville (HAM-8)
Clewes, T. W. (M)

Osgoode (OTT-8)
Godby, E. A. (A)

Oshawa (TOR-8)
Fox, S. J. (A)
Hunt, J. W. (A)
Jamroz, A. (M)
Marchand, W. C. (A)

Ottawa (OT-8)
Ballard, B. G. (SM)
Beauchesne, L. A. (A)
Bennett, J. R. G. (A)
Bennett, L. F. (A)
Bradley, J. H. (A)
Bresee, C. W. (A)
Broten, N. W. (A)
Burtnyk, N. (A)
Cairns, F. V. (A)
Carroll, D. V. (SM)
Castleman, D. H. (A)
Chaba, P. (M)
Chapman, J. H. (A)
Chown, B. F. (A)
Chrome, J. T. (A)
Coburn, G. S. (A)
Collins, J. A. (M)
Corbett, L. V. (A)
Couzens, D. T. (A)
Covington, A. E. (M)
Cox, L. G. (A)
Cumming, W. A. (M)
Curran, W. T. (A)
Curtis, R. W. (A)
Davidson, D. W. (A)
Dennis, J. (A)
Des Brisay, A. W. Y. (M)
Dingwall, R. A. (A)
Doherty, L. H. (M)
Dover, W. (A)
Fawcett, G. M. (VA)
Felice, A. J. (A)
Field, G. S. (SM)
Field, P. A. (VA)
Filippino, J. F. (A)
Forsyth, P. G. (SM)
Gagnon, A. D. (A)
Glinski, G. (SM)
Grainger, G. E. (A)
Grant, A. S. G. (M)
Grant, D. A. (A)
Gruenberg, H. (A)
Halverson, H. D. (A)
Hamilton, A. C. (A)
Hammond, E. K. F. (A)
Hay, D. R. (A)
Heenan, N. J. (A)
Henderson, J. P. (SM)
Henderson, J. T. (F)
Hendry, A. (A)
Hood, R. T. (A)
Hudson, A. C. (M)
Jones, S. G. (A)
Kalra, S. N. (M)
Kenney, J. R. (A)
Kenniger, A. (M)
Kitces, S. (A)
Kleeger, A. A. (A)
Knights, S. F. (SM)
Lake, G. T. (A)
Langille, R. C. (A)
Lavrenck, W. (A)
Lazecki, S. (M)
Leask, R. D. (A)
Levy, M. M. (SM)
Lomas, E. G. (SM)
Loutit, J. A. (M)
Lynch, J. A. M. (M)
MacDonald, V. C. (A)
MacKinnon, K. A. (F)
MacNair, E. A. (A)
Makow, D. M. (A)
Marion, T. M. (A)
Marshall, W. M. (M)
Matte, G. (A)
Matthies, J. G. (A)
Matusiak, M. E. (A)
McBurney, R. E. (A)
McDowell, W. J. (A)
McGrail, J. J. (M)
McIntosh, B. A. (A)
McIntosh, J. A. (A)
McKendry, B. A. (M)
McKinley, D. W. R. (F)
McLeish, C. W. (M)
Medd, W. J. (M)
Merriman, H. O. (VA)
Merritt, H. J. (M)
Miller, G. A. (SM)
Milne, A. R. (A)
Modley-Jones, H. S. (A)
Newton, K. G. D. (A)
Nikkel, R. F. (A)
Nixon, F. G. (A)
Noel, R. Y. M. (A)
Norton, J. A. (A)
Owimet, J. A. (F)
Page, D. F. (A)
Park, F. R. (M)
Parkhill, D. F. (A)
Pattenson, C. F. (A)
Prendergast, W. R. (A)
Redhead, P. A. (A)
Reiche, H. (M)
Richards, R. S. (M)
Ross, C. W. (A)
Roue, J. E. (M)

Ruedy, R. (A)
Rush, W. A. (F)
Searle, W. M. (A)
Sheffield, A. G. (M)
Simpson, F. W. (A)
Smith, A. H. R. (SM)
Smith, D. L. (A)
Smith, F. E. (A)
Smyth, H. R. (SM)
Soucy, C. I. (SM)
Staniforth, A. (A)
Steele, K. A. (A)
Stoleson, H. N. (A)
Stewart, G. H. (A)
Stock, E. H. (A)
Swail, J. C. (A)
Tahirali, G. W. (A)
Vogan, E. L. (A)
Von Baeyer, H. J. (SM)
Wackid, C. B. (A)
Walsh, H. E. (M)
Webb, E. L. R. (SM)
White, W. E. (SM)
Wong, J. Y. (A)
Yurko, M. (M)
Zambarelon, J. T. (A)

Ottawa West (OTT-8)
Aksim, V. E. (A)

Peterborough
Berube, P. A. (A)

Picton (TOR-8)
Chinnick, R. F. (A)

Pine Grove (TOR-8)
James, W. E. (M)

Port Arthur (TOR-8)
Hunter, W. C. (A)

Port Credit (TOR-8)
Etches, E. D. (M)
McLean, D. F. (M)
McTaggart, J. E. (A)
Publicover, A. M. (A)
Roy, D. R. (A)
Sinclair, A. M. (A)

Port Rowan
Martin, J. O. (A)

Prescott (OT-8)
Andrews, A. G. (A)
Patience, A. M. (SM)

Rockcliffe
Kuhn, B. G. (A)
Sturrock, J. K. (A)
Webb, P. R. W. (A)

St. Catherines (HAM-8)
Gillard, W. H. (M)
McCaffrey, B. I. (M)

St. Thomas
Warder, J. C. (M)

Sarnia (LON-8)
Rosen, A. N. (A)
Thomas, A. (M)

Sault Ste. Marie (TOR-8)
McRae, D. W. (A)

Scarboro
Harrison, M. A. (A)
Keen, W. (A)

Scarboro Bluffs P. O. (TOR-8)
Long, R. G. (M)
Lynch, T. G. (A)
Taylor, M. K. (SM)

Selkirk (HAM-8)
Hoover, S. G. (A)

Streetsville (TOR-8)
Meredith, C. C. (M)

Sunbury (OT-8)
Hitchcock, T. J. (A)

Swansea (TOR-8)
Bow, A. (A)

Thornhill
Poulter, R. C. (SM)

Timmins (TOR-8)
Amendola, B. (A)
Mott, E. D. (A)

Toronto (TOR-8)
Armstrong, A. T. R. (A)
Armstrong, H. D. (VA)
Arnold, C. P. C. (A)
Artkin, W. H. (A)
Baart, J. G. (A)
Bain, J. R. (SM)
Baldwin, C. O. (M)
Balmer, P. D. (SM)
Barclay, A. P. H. (SM)
Barclay DeTolly, G. E. (A)
Beaudoin, D. P. (A)
Bell, C. W. (A)
Bell, H. C. (A)
Bennett, C. J. (A)
Bergstad, P. A. (A)
Berry, F. G. (A)
Blanchard, J. L. (A)
Bond, S. (A)
Boorman, K. S. (A)
Brand, P. M. (SM)
Breymayer, K. (A)
Bridgland, C. J. (SM)
Bridgman, J. M. (M)
Brodsky, S. (A)
Brown, C. J. (A)
Buckles, F. G. (A)
Bullock, R. G. (M)
Burgess, N. M. (M)
Burke, A. C. (M)
Butler, C. A. (A)
Byers, H. G. (SM)
Carew, S. J. H. (M)
Carley, R. R. (A)
Cary, F. C. (M)
Casciato, L. (A)
Chew, Y. P. (A)
Choat, W. F. (M)
Chisholm, K. G. (M)
Christensen, A. G. (A)
Clark, A. L. (A)
Cole, W. A. (SM)
Cook, R. M. (A)
Courtice, H. A. (A)
Cox, H. G. (A)
Coxall, N. (M)
Dakin, O. C. (M)
Davidson, J. W. (M)
Davies, B. E. (A)
Dawson, H. S. (SM)
Dennis, E. M. (A)
Dworkin, A. E. (A)
Edson, D. A. (A)
Eastwood, C. (M)
Eaton, G. F. (M)
Evan-Jones, W. (A)
Evans, C. R. (A)
Evis, F. A. (A)
Fabb, N. R. (A)
Farrell, G. L. (A)
Flagg, D. G. (A)
Flemons, R. S. (A)
Fletcher, M. W. (M)
Flynn, M. W. (A)
Ford, W. J. (A)
Gattoni, L. I. (A)
Geiger, D. G. (SM)
Gladys, S. J. (A)
Godfrey, G. F. (A)
Gracey, T. G. (A)
Graham, G. L. (A)
Graham, H. E. (A)
Grant, H. S. (A)
Guess, A. L. (A)
Haiblen, A. H. D. (A)
Hames, A. L. (A)
Hamilton, H. E. S. (A)
Hanna, F. M. (SM)
Harris, D. L. (A)
Harris, K. B. (A)
Heath, F. J. (SM)
Heenan, P. J. (A)
Helwig, C. G. (M)
Henderson, V. L. (SM)
Herbert, E. C. (A)
Hobbs, F. B. (VA)
Hodgson, A. D. (SM)
Holm, H. R. (A)
Holmquist, C. A. (A)
Horn, K. H. (A)
Hughes, J. K. (M)
Hull, S. E. (A)
Hulme, H. (A)
Humeniuk, P. (SM)
Hunter, J. B. (M)
Isserstedt, G. (M)
Jackson, C. M. (M)
Jackson, H. W. (SM)
Jagger, C. E. (A)
Jones, R. (A)
Katchky, M. (A)
Kates, J. (A)
Kelk, G. F. (M)
Kerfoot, J. H. (A)
Kerr, A. (M)
Knowlton, K. R. (M)
Knudsen, D. F. (A)
Kozak, R. V. (A)
Kravetz, A. J. (A)
Kuhn, H. G. (SM)
Lenz, H. G. (A)
Levitt, M. (A)
Liddell, W. E. (A)
Lochanko, A. A. (M)
Longstaff, F. M. (A)
Longstaffe, J. R. (CA)
Looney, B. W. (A)
Love, S. F. (M)
Low, A. R. (M)
Lower, W. M. (A)
Lowry, C. A. L. (M)
Lyons, K. C. (A)
Macaulay, D. H. (A)
MacGregor, H. D. (M)
MacKenzie, K. (A)
Mackie, A. S. (A)
Marshall, O. H. (A)
Martin, R. H. (A)
Mathers, F. F. (A)
Maxwell, J. (A)
McCloskey, K. P. (A)
McCurdy, G. E. (M)
McFadden, H. W. (M)
McGibbon, G. D. (A)
McIlroy, C. R. (A)
McKelvie, J. L. (A)
McKim, W. J. G. (A)
McLaughlin, G. H. (A)
McVity, J. R. G. (A)
Millen, T. I. (SM)
Mitchener, H. G. (M)
Moes, G. (M)
Moore, D. W. (A)
Morfitt, D. C. (A)
Morgulis, I. A. (A)
Mosher, F. M. (A)
Mudry, J. (A)
Muller, R. A. (SM)
Myerson, P. (A)
Naylor, R. W. (A)
Newcombe, R. P. (A)
Newhall, E. E. (A)
Norris, C. A. (SM)
Nylin, M. E. (A)
Ormiston, J. W. (A)
Otsuki, J. S. (A)
Paisley, S. R. (A)
Palin, E. L. (SM)
Parker, D. L. (A)
Patterson, M. C. (M)
Pearce, B. G. (A)
Pieck, H. (M)
Pipe, G. E. (A)
Pond, J. F. (M)
Pointon, C. G. (A)
Ponzo, L. S. (A)
Pouliot, J. A. (A)
Pounsett, F. H. R. (F)
Price, E. G. (A)
Price, L. M. (F)
Price, T. D. (A)
Pryzdial, E. F. (A)
Putz, H. R. (A)
Pynn, R. D. (A)
Reale, E. P. (A)
Richards, G. A. (A)
Richardson, G. E. (A)
Robertson, J. J. C. (VA)
Robinson, W. A. (A)
Rogers, H. Z. (A)
Rose, A. B., Jr. (A)
Rosenthal, A. L. (SM)
Ross, T. C. (A)
Sale, P. A. (A)
Sandison, T. A. (A)
Sawitzki, N. (A)
Scholfield, W. D. (A)
Schultz, R. M. (A)
Schwegler, H. C. (A)
Scott, C. R. (A)
Scott, J. V. (A)
Sharf, W. A. (A)
Shino, J. S. (A)
Shoemaker, H. F. (M)
Siezen, G. J. (SM)
Sinclair, G. (SM)
Smith, W. R. (M)
Smoke, W. A. (A)
Soanes, S. V. (A)
Sparks, B. B. (A)
Speck, R. W. (A)
Spence, C. E. (A)
Stasior, R. A. (A)
Stavrou, S. (A)
Stein, H. H. (A)
Steinberg, L. M. (A)
Stocco, S. L. (A)
Stoddart, T. W. H. (M)
Story, R. (A)
Stratton, B. L. (A)
Subotich, Z. (A)
Swan, E. O. (SM)
Szekely, Z. (A)
Taylor, A. K. (A)
Taylor, L. A. (A)
Tomes, S. R. (SM)
Toye, J. M. (M)
Tuchak, W. G. (A)
Turchan, P. J. (A)
Turko, D. A. (A)
Turner, K. A. (A)
Turner, R. J. A. (M)
Virmani, B. D. (A)
Vural, B. (A)
Ward, R. F. (A)
Warren, J. R. (SM)
Weedon, G. F. C. (A)
Welk, S. A. (A)
Western, C. (A)
Westrick, E. W. (M)
White, B. H. (A)
Whyte, J. R. (M)
Wilburn, P. E. J. (A)
Williams, A. R. (A)
Williams, E. J. (A)
Williams, J. H. M. (A)
Williams, J. K. (M)
Wilson, R. W. (M)
Wright, T. C. (A)

Toronto Island
Wilson, R. W. (M)

Trenton (TOR-8)
Baxter, E. G. (M)
Elliott, L. W. (A)
Forman, T. F. (A)
Holmes, W. H. (A)

Unionville (TOR-8)
Rogers, J. A. (M)

Uplands (OT-8)
Berube, J. P. G. (A)
Pfeiffer, J. T. (VA)

Walkerville
Walker, G. B. (A)

Wallaceburg (LON-8)
Heath, R. E. (A)
Lawson, R. (A)

Waterdown (HAM-8)
Van Marle, J. C. (M)

Waterloo (HAM-8)
Falconer, G. W. (A)
Frazer, A. W., Jr. (A)

Welland
Weir, D. B. (A)

Westboro (OT-8)
Henshaw, C. H. (A)

West Hill (TOR-8)
Sokolowski, W. E. (A)

Weston (TOR-8)
Macumber, M. G. (A)
Thomson, J. M. (SM)

Wexford P. O. (TOR-8)
Bacon, W. H. (A)
Colsh, H. O. (A)
Lang, G. R. (A)
Orrett, W. S. (A)
Stapley, B. E. (A)
Wright, D. J. (A)

Whitby (TOR-8)
Jackson, K. A. (SM)
McLeod, J. W. (M)

Willowdale (TOR-8)
Armitage, G. G. (M)
Baskus, J. R. (A)
Elliot, A. W. D. (M)
French, R. (A)
Game, L. C. (A)
Gillies, G. A. (A)
Hamulen, A. H. D. (A)
Harteen, J. F. C. (M)
Holroyd, W. H. (A)
Kernohan, E. J. (A)
Meyer, W. H. (A)
Mounce, G. R. (M)
Paterson, S. G. (M)
Paulin, W. P. (M)
Purvy, T. W. (M)
Secord, A. H. (A)
Sheppard, R. D. B. (M)
Yacinmec, P. (M)
Young, J. A. I. (A)

Wilson Heights P. O. (TOR-8)
Cohen, H. A. (A)

Windsor (LON-8)
Chick, R. W. (A)
Gray, R. W. (A)
Ittniant, L. (A)
MacGregor, A. R. (A)
Ruse, W. A. (A)
Shirley, Q. H. (A)
Virtue, G. L. (A)
Walker, G. B. (A)

Woodbridge (TOR-8)
Posnikoff, P. W. (M)

York Mills (TOR-8)
Ainsworth, A. L. (SM)
Hackbusch, R. A. (F)
Paterson, S. G. (M)

PRINCE EDWARD ISLAND

Charlottetown
Rogers, K. S. (A)

QUEBEC

Acton Vale
Boisvert, M. (A)

Asbestos
Halischuk, E. (A)

Aylmer, East (MON-8)
Ling, T. G. (M)
Wells, G. (A)

Baie D'Urfe (MON-8)
Booker, C. C. (A)

Beaconfield (MON-8)
Paddon, J. W. (SM)

Beaurepaire (MON-8)
Lisle, J. R. D. (M)
Watson, A. D. (M)

Beloiel
Kirkby, R. L. (M)

Charlesbourg Village (MON-8)
Fortin, R. A. (A)

Charny (MON-8)
Lapointe, J. (A)

Dorion
Hanna, J. L. (A)

Dorval (MON-8)
LaFerriere, P. J. (A)
Peirce, R. W. (A)
Tritter, A. O. (A)

Drummondville (MON-8)
Marceau, J. P. (VA)
McWilliam, E. A. (VA)
Payette, R. (A)

Granby (MON-8)
Sterling, J. A. (A)

Hampstead
Kingan, J. J. (SM)
Wallace, O. C. S. (A)

Hull (OT-8)
Haney, W. L. (M)
Rowlatt, J. H. (M)

Isle Bigras (MON-8)
Clarkson, L. (M)

Joliette (MON-8)
Ladouceur, C. (A)

Lachine (MON-8)
Chapman, K. F. (A)
Clarke, J. L. (A)
France, J. R. (A)
Isaac, V. E. (A)
Kelsey, E. S. (SM)
Muirhead, C. R. (SM)
Smith, D. E. (A)
Wright, F. D. (M)

Lakeside
Anderson, D. A. (A)
Sutherland, J. G. (M)

Laurent
Nadon, J. (A)

Levis (MON-8)
Vaillancourt, R. M. (A)

Longueuil City
Simard, L. R. (A)

Montagnes (MON-8)
Vallieres, M. G. (A)

Montmagny (MON-8)
Jobidon, L. (A)

Montreal (MON-8)
Aaronson, D. A. (A)
Adderson, S. N. (A)
Allen, D. E. (A)
Anderson, D. A. (SM)
Andrews, W. G. (A)
Argue, T. A. (A)
Aston, J. D. (SM)
Athersych, F. B. (M)
Aubin, W. I. (A)
Audet, H. A. (M)
Baily, F. A. A. (M)
Bantin, W. F. (A)
Barrow, F. A. (VA)
Barry, A. (A)
Baylis, G. F. (A)
Beaulieu, W. R. (M)
Bell, S. L. (A)
Bellringer, C. C. E. (M)
Bernier, J. C. (SM)
Berube, R. (A)
Biggar, H. P. (M)
Boisvert, C. (A)
Bonneville, S. (SM)
Bosisio, R. G. (A)
Bricout, P. A. (M)
Burridge, M. V. (A)
Campbell, J. A. (SM)
Cardella, O. (A)
Challis, W. L. (A)
Chipman, R. A. (SM)
Chipps, G. E. (A)

Christmas, W. I. (A)
Clarke, H. W. (A)
Clarkson, G. A. (M)
Clement, L. J. J. (A)
Coffin, G. C. (M)
Conroy, J. M. (SM)
Cooke, R. W. (SM)
Cox, J. R. G. (A)
Daudjis, G. P. F. (M)
Dasko, G. J. (A)
Desaulniers, R. R. (M)
Desser, M. S. (A)
Dinnin, A. J. (A)
Ditkofsky, H. (M)
Dorey, J. D. (A)
Doutre, B. G. (M)
Dubreuil, E. J. (M)
East, L. A. W. (SM)
Elliot, G. (M)
Farnell, G. W. (A)
Fisher, C. B. (A)
Fisher, F. S. (M)
Fisher, S. T. (SM)
Fisk, P. (A)
Flom, M. (A)
Fortin, C. (A)
Fratkin, B. (A)
Freeman, R. E. (SM)
Frennette, C. (M)
Galloway, N. D. (A)
Ginsberg, G. (A)
Goldie, H. J. (A)
Gorfinkel, G. G. (A)
Gravel, J. J. O. (A)
Gregory, A. H. (M)
Groome, G. R. (M)
Haberl, J. F. (A)
Hall, J. S. (A)
Hall, R. D. (A)
Hastings, R. (M)
Hatzidakis, K. (A)
Hayes, J. E. (SM)
Hobbs, N. M. (A)
Hodge, N. H. (A)
Holten, C. U. (A)
Howes, F. S. (F)
Hudon, G. F. (A)
Hunt, A. B. (SM)
Jackson, J. E. (SM)
Jaderholm, H. W. (VA)
Jamieson, F. C. (A)
Jamshedjii, J. S. (A)
Johnson, E. F. (A)
Julien, G. J. C. (A)
Kahan, J. G. (M)
Kahn, I. (A)
Kassner, M. H. (A)
Katz, L. (A)
Kaufman, H. (A)
Kelly, T. W. (A)
Kelton, M. R. (M)
Knox, J. B. (F)
Krupa, J. E. (A)
Kubina, S. J. (A)
Lalonde, R. P. (A)
Laporte, J. M. (M)
Lavallee, P. (A)
Lavis, A. R. (A)
Lefebvre, R. A. (A)
Legault, E. G. (M)
Leitch, D. H. (A)
Litchfield, J. F. (A)
Livis, M. J. (A)
Lord, L. M. (A)
Lott, T. M. (M)
Lumsden, R. B. (M)
Lurion, E. (A)
Mackenzie, D. G. (M)
MacKimmie, G. B. (A)
Manoukis, D. N. (A)
Marcotte, J. (M)
Margolick, F. H. (M)
Marshall, G. K. (A)
Marshall, J. L. (M)
Martin, J. H. (A)
Matthews, R. P. (SM)
McDonald, D. J. (SM)
McGuire, C. H. (SM)
McKeel, P. D. (SM)
McMurray, J. L. (VA)
McNeil, B. T. (M)
Meunier, J. (M)
Mockler, T. P. (A)
Moen, H. P. (A)
Nachfolger, N. (A)
Newman, D. A. H. (A)
Newton, W. K. (A)
Nichols, W. A. (SM)
Nienaltowski, W. (M)
Norton, R. J. (A)
Olding, N. R. (M)
Olive, G. W. (F)
Ornstein, W. (A)
Oxley, A. B. (F)
Patrick, K. R. (SM)
Pauch, J. E. (M)
Pavlasek, T. J. F. (M)
Payne, L. S. (F)
Pearce, E. C. (A)
Pearson, L. (A)
Peedo, E. (A)
Penton, R. E. (A)
Pinnell, J. E. (M)
Poznanski, Z. (A)
Preziosi, F. W. (A)
Provost, P. (A)
Pscheidt, K. (A)
Pullan, E. (A)
Redmond, G. W. (A)
Redpath, D. C. (A)
Reeves, R. (A)
Reid, D. T. (A)
Richardson, W. G. (SM)
Roach, C. L. (A)
Robbins, M. A. (A)
Robillard, P. A. (A)
Rolland, S. F. (M)
Ross, A. T. (A)
Roth, S. (A)
Rousseau, M. (M)
Russell, W. D. (A)
Schneider, G. O. K. (A)
Schwartz, H. H. (M)
Scott, W. W. (A)
Shearer, C. W. (M)
Sherman, B. N. (A)
Siocos, C. A. (A)
Skarbek, I. R. (M)
Smith, F. A. (A)
Smith, R. A. (A)
Soderland, A. G. (A)
Stauffer, G. L. (A)
Steel, W. A. (F)
Summers, L. I. (A)
Sutherland, J. G. (M)
Sweeny, T. V. (M)
Thivierge, R. D. (A)
Thrasher, P. J. (A)
Tipple, H. L. (M)
Turnbull, J. A. (A)
Underwood, W. H. (A)
Vincent, J. P. (A)
Vogel, N. I. (M)
Wagner, S. (A)
Walker, A. S. (M)
Wallace, R. J. (SM)
Warren, F. G. R. (SM)
Watson-Watt, R. (F)
Wells, A. F. (M)
Whitehead, J. R. (SM)
Williams, A. G. (A)
Wilson, S. S. (A)
Woonton, G. A. (F)
Ziemelis, V. (A)

Noranda
Aitchison, J. H. (A)

Outermont
Koblin, Saul (A)

Pointe Claire (MON-8)
Booth, S.

Port Alfred (MON-8)
Gagnon, L. A. (A)

Quebec (MON-8)
Boulet, L. (A)
Caron, J. Y. (A)
Demers, P. (A)
Dion, A. (A)
Dumas, J. E. (A)
Hamel, Y. (A)
Keeping, K. J. (A)
Letarte, M. (A)
Lortie, A. L. (A)
Nadeau, A. G. (M)
Neal, J. T. (A)
Robichaud, L. P. A. (A)
Roumbanis, T. (A)
St. Hilaire, R. J. J. (A)
Sarault, G. E. (M)
Somers, H. (A)
Surtees, W. J. (M)
Watson, G. D. (A)

Riviere de Loup (MON-8)
Lavoie, L. (M)
Montgomery, V. A. (A)

Rosemere Terrebonne (MON-8)
Cotton, T. D. (M)

St. Bruno
Davis, J. F. (A)

St. Hilaire Station (MON-8)
Llewellyn-Thomas, E.R.C. (M)

St. Hubert (OT-8)
Gough, M. F. (A)
Lindsey, G. R. (A)

St. Hyacinthe (MON-8)
Doiron, J. A. B. (A)
Leclerc, J. G. (A)

St. Jerome (MON-8)
Dubuc, J. C. (A)
Gascon, J. C. (A)

St. Lambert (MON-8)
Couture, G. (A)
Ferris, H. A. (SM)
Hammond, R. E. (SM)
Watson, D. J. (M)
Wilmot, R. D. (A)

St. Paul L'Ermite (MON-8)
Malcolm, F. W. (M)

Ste. Foy (MON-8)
Roberts, D. M. (A)

Ste. Therese de Blainville (MON-8)
Farmer, E. W. (SM)

Sillery (MON-8)
Boisvert, M. (A)
DuBerger, P. (A)
Tillotson, J. G. (A)

Sorel (MON-8)
Lunan, H. S. (A)

Town of Mt. Royal (MON-8)
Bird, L. T. (M)
Borden, B. C. (A)
Dobridge, R. W. (M)
Douglas, J. C. (A)
Glegg, K. C. M. (A)
Hasell, F. W. (M)
Jackson, K. A. (SM)
Letts, R. (M)
Lunn, H. J. (A)

Valois
Seabrook, H. B. (M)

Verdun (MON-8)
Archambault, G. (M)
Charlebois, J. G. (A)
Morrison, W. B. (A)

Ville St. Laurent (MON-8)
Aasgaard, P. U. (M)
Doucet, M. (A)
Fabiszewski, H. (M)
Hamilton, H. A. (A)
Hanna, D. C. (M)
MacRae, R. M. (A)
Moore, L. R. (A)
Oakes, H. S. (A)
Rethoret, R. H. (A)

Ville St. Michel (MON-8)
Jedrychowdki, J. L. (SM)

Westmount (MON-8)
Anderson, L. W. (A)
Pinnell, S. E. A. (M)
Raynsford, R. P., Jr. (M)

Yamachiche (MON-8)
Bird, C. H. R. (VA)

SASKATCHEWAN

Eldorado
Weaver, J. H. (A)

Lucky Lake
Funk, J. A. (A)

Regina (WIN-8)
Mowbray, D. R. (A)

Saskatoon (WIN-8)
Forst, W. D. (A)
Hoskins, L. C. (M)
McNamara, A. G. (M)
Michalenko, A. (A)

YUKON TERRITORY

Whitehorse
Berube, J. P. G. (A)

CEYLON

Colombo
Sivagnanasunderam, T. (A)
Soysa, N. (A)

CHILE

Punta Arenas
Femenias, J. L. (A)

Santiago
Bretignere, J. D. R. (A)
Vallarino, A. D. (A)

Sewell
Collyer, J. H. (M)

CHINA

Hopei
Jen, L. (A)

Shanghai
Loo, T. C. (SM)

COLOMBIA

Barranquilla
Denyer, E. H. (A)
Villadamigo, R. D. (M)

Bogota
Amore, I. (M)
Arboleda, C. E. (A)
Arce, H. H. (M)
De Boer, J. J. (A)
Estevez, C. L. (M)
Gabriunas, K. B. (A)
Jimenez, A. B. (A)
Morales, T. N. (A)
Rafael, R. O. (A)

Cartagena
Ochoa, A. (A)

COSTA RICA

San Jose
Craigie, S. M. (SM)

CUBA

Camaguey
Valdes-Diaz, R. A. (A)

Havana
Cerra, M. B. (A)
Chisholm, E. E. (A)
Condom, I. A. S. (SM)
Cordova, P. A. (A)
De Mello, W. (SM)
De Cubas, J. D. (A)
Estrada-Castro, C. J. (A)
Madariaga, J. F. (A)
Martinez, B. (M)
Mayor, R. (A)
Montes, J. V. (A)
Pella, A. (A)
Polanco, G. (A)
Ramirez, C. G. (A)
Rodriguez, E. (A)
Torres-Ruiz, J. G. (A)
Valdes Pages, E. (A)
Valladares, J. A. (M)

Mariano
Guiral, R. L. (VA)

Oriente
Reguera, J. J. (A)

CYPRUS

Limassol
Abouchanab, M. T. (M)

Nicosia
Dennis, F. L. (M)
Katzelis, N. G. (M)

CZECHOSLOVAKIA

Prague
Bena, J. J. (A)
Horna, O. A. (A)
Nadler, M. (A)

DENMARK

Bagsvaerd
Elnegaard, E. (A)

Copenhagen
Bang, M. W. (SM)
Carstens, L. (A)
Gronlund, M. P. S. (A)
Grue, O E. (A)
Gudmandsen, P. E. (A)
Jacobsen, H. V. (M)
Larsen, B. F. (A)
Lund, C. O. (A)
Michaelsen, J. (A)
Morch, V. H. (A)
Nielsen, B. A. (A)

Gentofte
Langaard, E. (A)
Pedersen, N. T. (A)
Svensson, R. (A)

Hellerup
Nielsen, J. O. (SM)
Pedersen, G. (VA)
Rybner, J. (F)

Herlev
Hansen, G. K. F. (M)

Lyngby
Christensen, C. L. (A)
Nag, D S. (A)

Naerum
Kjaer, V. (A)

Sorgenfri
Bruun, G. (A)

Struer
Jensen, S. E. (A)

Virum
Bruun, G. (A)
Jorgensen, B. (A)

DOMINICAN REPUBLIC

Ciudad Trujillo
Bethal, C. D., Jr. (SM)
Heffernan, H. J. (A)

ECUADOR

Quito
Rota, L. (M)

EIRE

Dublin
Ferguson, J. D. (SM)
Folan, A. J. P. (A)
Poole, H. I. (A)
Slator, S. L. (A)

ENGLAND

BEDFORDSHIRE

Luton
Sowerby, J. M. (A)

BERKSHIRE

Abingdon
Fry, D. W. (A)
Wells, F. H. (SM)

Aldermaston
Liebmann, G. (A)

Bermingham
Allen, W. S. (SM)

Longworth
Cooke-Yarborough, E. (M)

Maiden Head
Barrett, J. (A)
Cotty, W. F. (A)

Reading
Patterson, T. C. (SM)
Sperring, F. E. (M)

Wantage
Cox, R. J. (M)

BUCKINGHAMSHIRE

Gerrards Cross
Morton, H. B. (M)

Great Missenden
Reyner, J. H. (SM)

High Wycombe
Simmonds, J. C. (A)

Marlow
Ludgate, F. E. (SM)

Newport Pagnell
Boswell, I. I. (A)

Olney
Stuff, A. C. (A)

Slough
Diver, F. G. (SM)
Wilkens, A. F. (SM)

Stoke Poges
McLean, F. C. (SM)

CAMBRIDGE

Cambridge
Belrose, J. S. (A)
Dalgleish, J. W. (SM)
Edwards, B. J. (SM)
Germany, L. W. (M)
Gnanalingam, S. (M)
Moullin, E. B. (SM)
Pound, J. P. (M)
Rao, G. V. (M)
Rao, J. (M)
Ratcliffe, J. A. (F)

Histon
Townsend, F. H. (SM)

CHESHIRE

Cheadlehulme
Fielding, E. A. (A)

Chester
Hunt, T. W. (M)

Port Sunlight
Thomas, H. A. (SM)

Stockport
Grimsdale, R. L. (M)
Weaver, C. (M)

Timperley
Vernon, B. H. (A)

Wirral
Higham, E. H. (M)

CORNWALL

Porthcurno
Hillier, R. J. (A)

CUMBERLAND

Seaton
Williams, C. E. (A)

DERBY

Derby
Buckland, V. (A)

DORSET

Beaminster
Bird, R. J. (SM)

DURHAM

Paterlee County
Angell, A. G. H. (SM)

EAST SUSSEX

Hastings
Mortlock, A. (A)

ESSEX

Barking
Bulgin, A. F. (SM)

Brentwood
Gooday, R. A. H. (M)

Burnham-on-Crouch
Robertson, N. C. (SM)

Chelmsford
Amey, S. H. (A)
Anderson, E. W. (SM)
Cafferata, H. (M)
Churchman, A. (A)
Cooper, V. J. (A)
Deeley, A. R. (A)
Helsdon, P. B. (A)
Partington, G. E. (A)
Maunsell, H. I. G. (A)
Sarkar, N. (M)
Stubbs, P. Q. (A)

Danbury
Eckersley, T. L. (F)
Young, A. J. (A)

Gidea Park
Pitts, W. J. (A)

Great Baddow
Esterson, M. (A)
Thomasson, J. G. (A)

Harlow
Lea-Wilson, C. P. (M)

Hornchurch
Parker, J. W. (A)

Ilford
Bailey, G. J. (A)
O'Brien, D. (M)

Little Baddow
Thomasson, J. G. (A)

Romford
Stott, H. T. (SM)

Southend-On-Sea
Bhatnagar, H. M. (M)
Davis, T. J. A. (A)
Kannan, S. (A)

Writtle

GLOUCESTERSHIRE

Bristol
Crouch, P. W. (M)

HAMPSHIRE

Andover
Cook, K. L. W. (A)

Christchurch
Fisher, E. C. (M)

Ensworth
Barnsdale, E. A. (A)

Farnborough
Dale, T. G. M. (M)
Debski, J. M. (M)
Hobday, S. W. (M)
Reid, D. G. (VA)

Havant
Rzymowski, E. (A)

Portsmouth
Bettinson, S. F. (M)
Silvester, D. D. (M)

HERTFORDSHIRE

Aldenham
Johnson, D. L. (A)

Baldock
Pollard, J. (M)

Cockfosters
Cattanes, E. (A)

Harpenden
James, M. (M)

Hatfield
Wall, E. (A)

Letchworth
Bird, R. (A)
Cartwright, J. R. (SM)

New Barnet
Allen, W. G. (M)

Radlett
Hedges, T. C. (A)
House, H. A. G. (SM)

Rickmansworth
Montgomery, A. W. (F)

St. Albans
Fryer, L. (A)
Hornby, F. R. (A)

Ware
Hicks, B. W. (M)

Watford
Ayers, J. L. (M)

KENT

Beckenham
Crawley, H. J. (A)
Herdman, T. L. (A)
Kiryluk, W. (A)

Bexleyheath
Brown, D. C. (A)

Bromley
Stoner, C. R. (M)
Sutherland, J. G. A. (SM)

Cranbrook
Rouse, F. W. D. (A)

Dover
Smye-Rumsby, B. A. A. (A)

Edenbridge
Whitehouse, M. H. L. (M)

Hayes
Binyon, B. (SM)

Keston
Graf, V. V. (A)

Longfield
Scully, C. T. (SM)

Orpington
Eckersley, P. P. (F)
Harrison, K. W. (SM)
Lawrence, E. (A)
Saraga, W. (SM)

Otford
Brooke, H. A. (SM)

Rochester
Vedy, L. G. (A)

St. Mary Cray
Cook, C. A. (A)

Sevenoaks
Brooke, H. A. (SM)
Van Hasselt, M. (SM)

Sidcup
Ashbridge, N. (F)
Spagnoletti, P. H. (A)

LANCASHIRE

Accrington
Bleasdale, J. (A)
Bleasdale, W. W. (A)

Bolton
Roberts, J. G. (M)

Burnley
English, E. H. (A)

Glazebrook
Rouse, F. W. D. (A)

Liverpool
Chalmers, D. (A)

Loughborough
Ellesworth, G. (SM)

Manchester
Bowden, B. V. (SM)
Brown, R. H. (M)
Roberts, W. G. (A)
Ross, J. D. (A)
Scarby, N. H. (SM)
Williams, F. C. (SM)

Morecambe
Oliver, W. (A)

Oldham
Brooks, G. R. (M)

Prescot
Muir, L. M. (A)

St. Helena
Quinn, J. T. (M)

Southport
Fennessy, J. R. (M)

Standish Near Wigan
Falcon, G. L. (M)

Ulverston
Oxley, R. F. (SM)

LINCOLNSHIRE

Boston
Silson, R. G. (A)

LONDON

Abel-Harry, C. B. (A)
Adorian, P. (SM)
Aina, C. O. (A)
Bainbridge-Bell, L. H. (VA)
Bargery, C. J. (A)
Barnsdale, E. A. (A)
Barton, F. S. (F)
Bearup, T. W. (SM)
Beck, A. H. W. (A)
Bedford, L. H. (F)
Biship, H. (F)
Bloom, R. A. (A)
Boyle, H. (M)
Budge, R. K. (A)
Conway, T. D. (A)
Crosfield, J. F. (A)
Dawe, F. W. (A)
Dawes, E. J. (SM)
Dent, F. D. (A)
Dunn, S. C. (A)
Earp, C. W. (SM)
Emery, E. J. (SM)
Faulkner, H. (F)
Feltham, C. F., Jr. (A)
Finney, R. (A)
Fisk, E. (F)
Flack, W. L. (SM)
Glendinning, W. (A)
Godbold, B. C. (M)
Goldup, T. E. (SM)
Green, R. R. (SM)
Greig, J. (SM)
Griffiths, W. H. F. (SM)
Guobadia, A. S. (A)
Gutman, J. H. (A)
Hamilton, D. (VA)
Heaton-Armstrong, L. J. (SM)
Hersch, W. (M)
Jackson, W. (F)
Jezierski, E. C. J. (A)
Karodia, A. M. (A)
Kinross, R. I. (A)
Knight, S. G. (A)
Lamont, K. (M)
Lawson, K. W. (M)
Layzell, L. M. (M)
Lewis, P. S. (A)
Lyons, C. L. (SM)
Mayer, C. G. (SM)
McLaren, J. H. (A)
Meyer, L. W. (SM)
Mirk, D. B. (SM)
Mitchell, J. (A)
Munns, E. F. (M)
Nissim, S. (A)
Nowicki, J. R. (A)
Okamura, S. (A)
Parr, G. (SM)
Paynter, A. E. (M)
Pocock, H. S. (SM)
Primich, R. I. (A)
Rantzen, H. B. (SM)
Ringham, G. B. (SM)
Roberts, R. S. (VA)
Rose, A. (A)
Rose, S. P. (A)
Russell, G. M. (A)
Schwarz, H. F. (A)
Shelley, B. J. (M)
Singh, H. (A)
Smillie, P. V. (M)
Starr, C. H. (SM)
Straughan, T. A. (M)
Strong, C. E. (F)
Troutbeck, W. H. (VA)
Tuck, W. A. (A)
Valder, F. L. (M)
Walker, H. (SM)
Wilson, A. G. (M)
Wrede, D. F. (M)
Wynn, R. T. B. (SM)

MIDDLESEX

Enfield
Lee, E. M. (SM)
Oldham, C. A. (A)
Sly, R. J. (A)
Strafford, F. R. W. (SM)
White, G. J. (M)

Greenford
MacLachlan, V. D. (M)

Heston
Williams, H. P. (SM)

Northolt
Mole, G. (A)

Pinner
Horne, R. W. (M)

Potters Bar
Capelli, M. P. (M)

Ruislip
O'hanlon, D. M. V. (M)

South Ruislip
Singh, W. K. (A)

Stanmore
Barrett, J. (A)
Harvey, J. R. (SM)
Sheppard, T. W. (A)

Twickenham
Felton, N. F. (M)
Gill, A. J. (F)
Morley, J. E. (A)

Wembley
Espley, D. C. (SM)

Winchmore Hill
Payne, C. E. (VA)

NORFOLK

Gorleston-on-Sea
Rayment, K. I. (A)

Great Yarmouth
Dyson, A. A (VA)
Hayes, J. (A)

NORTHAMPTON

Kingsthorpe
Kaye, J. B. (VA)

NORTHUMBERLAND

Newcastle-on-Tyne
Hare, J. (A)
Hodgson, C. C. V. (M)
Parsons, D. R. (SM)

Whitley Bay
Keer, A. (M)

NOTTINGHAMSHIRE

Beeston
Hancock, G. N. (SM)
Pollard, J. R. (M)

Bilsthorpe
Stokes, R. (A)

Sheffield
Benson, F. A. (M)

SOMERSETSHIRE

Burnham-on-Sea
Thomas, W. D. (A)

Ilminster
Macnee, D. H. (SM)
Ullrich, E. H. (F)

Saltford
Horrigan, E. W. (M)

SOUTHAMPTON

Portsmouth
Silvester, D. D. (M)

STAFFORD

Stoke-on-Trent
Gautby, H. R. B. (A)

Walsall
Hardcastle, C. (A)

Wolverhampton
Amey, C. R. (A)
Taylor, D. H. J. (A)

SUFFOLK

Ipswick
Inskip, F. A. (VA)

Lowestoft
Wiegerinck, H. T. J. (M)

SURREY

Banstead
Smith-Rose, R. L. (F)

Cheam
Bond, W. (SM)

Coulsdon
Clemett, C. J. (M)

Croydon
Thompson, A. E. (SM)

East Horsley
Milsom, W. T. (A)

East Molesey
Coursey, P. R. (A)

Elstead
Nobbs, W. J. (A)

Epsom
Stone, D. (M)

Farnham
Clarke, G. F. (A)

Guilford
Williams, R. C. G. (SM)

Hindhead
Rowe, J. H. (A)
Scott-Taggart, J. (F)

Horley
Abel, H. L. (M)

Near Redhill
Bruce, D. C. (M)

Richmond
Dias, G. C. (A)
Head, J. E. (VA)

Sandorstead
Dupree, F. H. (SM)
Hale, J. A. D. (A)

Seale
Hickson, P. W. (SM)

S. Croydon
Carpenter, R. E. H. (SM)

Surbiton
Brennand, R. (A)
Kerr-Wallwe, R. B. (M)

Tadworth
Somerville, T. (SM)

Weybridge
Veevers, J. F. (A)

Woking
Gabriel, R. P. (VA)
Latham, C. (M)

Worcester Park
Walker, T. H. (M)

SUSSEX

Hove
Copp, J. (A)

Worth
Abel, H. L. (M)
Wilkinson, S. H. (M)

WARWICKSHIRE

Birmingham
Allen, W. S. (SM)
Jones, H. H. (A)
Truscott, D. N. (A)

Coventry
Allan, R. G. (A)
Keen, A. W. (M)
McCall, D. R. (M)
Wilson, R. (A)

Rugby
Hulme, F. H. (M)
Kinman, T. H. (SM)
Price, M. (M)

WILTSHIRE

Chippenham
Stokes, R. (A)

Devizes
Savage, W. B. (M)

Malmesbury
Irvin, J. L. (A)
Parry, R. Y. (SM)

Salisbury
Robinson, B. R. (M)

Shrivenham
Younson, E. J. (M)

Watchfield near Swindon
Hatton, W. L. (A)

WORCESTERSHIRE

Dudley
Nicholls, J. (M)

Evesham
Smith, C. (A)
Sturley, K. R. (SM)

Malvern
Carter, R. H. A. (SM)

YORKSHIRE

Bradford
Patchett, G. N. (M)

Leeds
Forte, S. S. (A)
Westwood, D. (M)

Sheffield
Benson, F. A. (M)
Russell, C. R. (A)

ETHIOPIA

Addis Ababa
Gouin, P. L. (A)

FIJI ISLANDS

Suva
Exon, F. C. (SM)

FORMOSA

Hsinchu, Taiwan
Bourret, P. L. (M)

Hwalian
Wang, C. C. (A)

Taipeh
Hian-Yao, O. (A)
Wang, C. C. (A)

FRANCE

CORREZE

Brive
Roncier, R. (M)

EURE

Vernon
Brodin, J. (A)

JEUMONT

Dufossez
Ducastel, G. (A)

PROVENCE

Nice
Gustinelli, J. J. L. (M)

RHONE

Lyon
Boilley, E. J. M. (A)

SEINE

Antony
Fromageot, A. P. A. (SM)

Asnieres
Kraemer, G. (SM)

Bagneux
Voge, J. P. (SM)

Bois-Colombes
Cosnard, F. F. (A)

Boulogne
Nill, A. A. (A)

Clichy
Warin, M. (A)

Cour Bevoie
Esculier, G. G. (M)

Fontenay-Aux-Roses
Surdin, M. M. (SM)

Le Vallois
Frisquet, R. (A)
Gandin, P. (A)

Malakoff
Besson, P. (M)

Neuilly-Seine
Dreyfus, P. L. (A)
Lapostolle, P. M. (SM)
Lochard, J. C. (A)

Pantin
Churg, E. (A)

Paris
Aarons, J. (A)
Aigraim, P. R. (A)
Angot, A. M. (SM)
Blassel, P. P. (A)
Bloch, R. M. (A)
Chauchat, J. N. (M)
Chauvierre, M. (SM)
Cohen, R. (A)
David, P. B. (SM)
Fabricant, P. (VA)
Gerten, N. (A)
Ghertman, L. (A)
Giboin, E. (SM)
Goudet, G. (SM)
Grivet, P. A. (A)
Guenard, P. R. G. (SM)
Labin, E. (SM)
Lebail, P. E. (M)
Lehmann, G. J. (SM)
Levy, L. (M)
Mandel, P. (A)
Maurice, F. (A)
Moisson, A. A. (SM)
Nozieres, H. (A)
Ortusi, J. A. (SM)
Piel, G. J. (M)
Ponte, M. J. H. (SM)
Sirel, M. (A)
Simon, J. C. (SM)
Touraton, E. R. (SM)
Vassy, E. J. (A)

Villemomble
Warnecke, R. R. (F)

Vicennes
Bacquet, E. H. (A)

SEINE ET MARNE

Fontainebleau
Manov, F. S. (A)

SEINE ET OISE

Brunoy
Thun, R. J. (M)

Essonnes
Behm, L. F. (A)

Le Vesinet
Bussat, R. M. A. (A)
Raymond, F. H. (SM)

Mareil-Marly
Berline, S. D. (SM)

Saint Cloud
Goublin, R. O. (A)

Versailles
De Coligny, G. (M)
Prache, P. M. (M)

GERMANY

Althegnenberg
Zenneck, J. (F)

Darmstadt
Walther, A. (SM)

Dusseldorfer
Matare, H. F. (SM)

Friedrichsdorf
Wagner, K. W. (F)

Hamburg
Peters, J. F. (SM)

Hessen
Stucken, H. (A)

Hohentwiel
Alten Pohl, D. (M)

Muenchen
Ahmed, A. L. I. (A)
Kleen, W. J. (SM)
Overby, H. (M)
Sauseng, O. G. (A)
Zinke, O. (SM)

Neuershausen
Hess, H. A. (A)

Rehweg
Rothe, H. (M)

Ulm/Donau
Bruck, L. (M)
Malsch, J. R. (M)

GREECE

Athens
Cassapoglou, C. B. (A)
Constantinidis, P. (A)
Kariambas, N. (A)
Pezopoulos, K. N. (SM)
Stamopoulos, C. D. (SM)
Tavaniotis, C. (M)
Vallianatos, I. G. (A)
Vaskas, T. B. (A)

Canea
Ichihakis, M. A. (A)

Corinthos
Sazaklis, N. G. (A)

Rhodes
Shannon, G. J. (A)

GUATEMALA

Guatemala City
Engel, R. W. (A)
Garrison, H. L. (A)
Moller, H. A. (A)

HAWAII

HAWAII

Hawi (HAW-7)
Donaldson, W. G. (A)

Hilo
Izumi, G. Y. (A)

KAUAI

Lihue
Neifert, K. G. (A)

MAUI

Puunene
Honea, L. W. (A)

Wailuku (HAW-7)
Arveschouz, N. F. (A)
Chong, W. S. (A)
Katahara, S. (A)
Reber, G. (SM)

MOLOKAI

Kualapuu
Gordon, H. L. (M)

OAHU

Aiea Heights
Allison, J. B. (A)
Andrews, F. D. (A)
Kelly, V. (A)

Ewa
Powell, L. H. (VA)

Honolulu (HAW-7)
Abstein, H. T., Jr. (A)
Alden, R. M. (A)
Anderson, J. W. (A)
Atherton, J. B. (A)
Chang, D. C. (A)
Chang, R. H. M. (A)
Chow, W. H. P. (A)
Chun, H. W. M. (A)
Colmar, P. V. (SM)
Counsil, O. R. (M)
Edwards, N. R. (A)
Ege, T. (A)
Erdman, J. P. (A)
Evans, C. R. (M)
Fenner, P. R. (A)
Fong, C. S. (A)
Fuchikami, A. H. (A)
Gilbert, L. H. (VA)
Goo, J. F. S. (A)
Grubb, D. L. (M)
Higa, K. (A)
James, F. L. (A)
Janitschke, E. O. (VA)
Kam, P. V. T. (A)
Kang, Y. O. (A)
Kato, R. S. (A)
Kung, L. (A)
Leong, A. K. (A)
Lewbel, S. H. (M)
Lindemann, E. G. (A)
Lozo, K. G. (A)
Maertz, W. A. (A)
Masching, R. G. (A)
Mercer, I. G. (M)
Miyake, I. (VA)
Nakamura, O. S. (A)
Palmer, D. L., Jr. (A)
Pang, D. L. (A)
Pickarski, S. (M)
Piety, E. A. (A)
Rotolo, N. V. (M)
Sanders, J. R. (A)
Schluemer, R. D. (A)
Schoen, E. C. (A)
Shimabukuro, G. T. (A)
Skewis, J. B. (A)
Smith, H. C. (M)
Stagner, G. H. (A)
Takase, R. H. (VA)
Tanaka, T. (A)
Teeuw, J. W. (A)
Tucker, W. K., Jr. (A)
Vaughan, V. (A)
Warren, H. E. (A)
Young, M. F. (A)

Kahuku
Gray, G. P. (VA)
Tamura, L. T. (A)

Kaneohe
Graves, J. E. (A)
Hill, R. R. (M)
Tanigawa, N. F. (A)
Turner, H. E. (M)
Walker, P. M. (A)

Lanikai
Bowker, R. F. (M)
Brenessel, A. (A)
Browne, C. W. (A)
Clark, G. W. (SM)
Da Shiell, D. H. (M)
Dawson, L. R. (M)
Farinon, W. B. (SM)
Hunter, G. H. (A)
Neau, O. T. (A)
Tittle, J. F. (A)
Vittum, M. S. (M)
Willard, R. S., Jr. (A)

Pearl Harbor (TH-7)
Mason, F. L. (SM)

Wahiawa (HAW-7)
Hahn, G. I. P. (A)
Janda, E. G. (A)
Lee, R. T. S. (A)
Ulisse, T. (A)

Waialua (TH-7)
Hendricks, J. C. (A)
Nishimura, K. K. (A)

HONDURAS

La Lima
Hannay, H. F. (A)

HONGKONG

Birkenhead, W. D. (M)
Braude, A. N. (M)
Li, N. F. C. (M)
Luk, Y. K. (A)
Monfon, L. (A)
Wang, T. S. (SM)

HUNGARY

Budapest
Egri, E. (A)

ICELAND

Reykjavik
Thorkelsson, S. (A)

INDIA

Adyar
Rao, V. V. L. (SM)

Agra Cantt
Joshi, K. D. (A)

Ahmedabad
Kotadia, K. M. (M)

Andhra State
Krishnamurti, T. (M)
Ramaswamy, S. (A)

Annamalainagar
Vijayaraghavan, K. (M)

Aurangabad
Saifuddin (M)

Bamrauli
Sengupta, D. P. (M)

Bandra
Katrak, B. J. (A)

Bangalore
Biswas, N. N. (A)
Chatterjee, R. (A)
Ramachandran, P. (A)
Rao, P. L. S. (M)
Sreenivasan, A. P. (A)
Sreenivasan, K. (SM)
Thacker, M. S. (A)

Baroda
Bhonsle, S. B. (A)
Sen, S. M. (M)

Basavangudi
Rao, P. L. S. (M)

Belguam
Paramasivayya, G. S. (M)

Bengal
Das, P. N. (M)

Bihar
Dasgupta, A. K. (A)

Bombay
Bulsara, M. S. (A)
Conesa, R. (M)
Dastur, J. B. (A)
Gandhi, C. D. (A)
Huang, G. T. C. (A)
Husein, A. E. (A)
Kamat, V. Y. (A)
Katre, V. S. (A)
Khambata, A. J. (A)
Khot, C. G. (A)
Marathe, D. H. (SM)
Mehta, G. K. (A)
Merchant, V. V. (A)
Phadke, K. R. (A)
Phatak, R. K. (SM)
Shankar, M. V. (M)
Shroff, T. R. (A)
Sidhu, H. S. (M)
Subramaniam, C. S. (M)
Sukhadia, P. U. (M)
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Telang, V. S. (M)
Ventraman, M. P. (A)
Williams, I. J. S. (M)

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Burmanray, P. N. (A)
Chatterjee, S. D. (SM)
Correa, W. R. (A)
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Ghosh, S. R. (A)
Kar, D. C. (A)
Mukerji, M. M. (M)
Mukherjee, H. (A)
Raha, H. N. (M)

Chingleput
Filipowsky, R. (A)

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Sarma, P. H. N. B. (M)

Dadar
Katre, V. S. (A)

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Prasad, K. V. K. (M)
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Basha, V. N. (A)

Faridabad
Balasundaram, N. (SM)

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Jubbulpore C. P.
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Ramabhadran, S. (A)

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Mayo, L. E. (A)
Orbell, R. J. (A)
Walding, N. N. (A)

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Smith, C. A. (A)

Gisborne
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Field, A. N. (A)

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Ahmed, W. (M)
Qureshi, Z. A. (A)

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Ahmad, M. M. (A)

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Ahmad, M (M)
Ahmad, R. (SM)
Ahmed, G. (A)
Aziz, S. A. (SM)
Farrell, R. L. (M)
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Rafi, M. A. (M)
Rizvi, W. A. (A)
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Stocker, G. A. (M)
Ullah, I. (A)

Lahore
Mahmud, M. (M)
Mumtaz ud Din, S. (SM)
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Lyallpur
Rauf, A. (M)

Punjab
Sarwari, M. A. (A)

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Chu, M. (A)

PAPUA

Port Moresby
Gee, W. C. (SM)

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Castro, H. R. (A)
Matallana, J. R. (M)
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Djeddah
Andreou, A. J. (M)

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Dejong, A. C. (A)
Dunbar, J. (A)
Gilmour, R. R. (M)
Russell, K. L. (A)

Kimberley
Morris, H. R. (A)

Stellenbosch
Olen, C. L. (A)

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West Africa
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Grobler, J. J. (M)
Simons, A. H. (SM)

Honeydew
Morris, R. (A)

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Aron, C. L. (A)
Beard, R. G. (M)
Berkowitz, R. (A)
Bozzoli, G. R. (SM)
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Jacobs, A. J. (M)
Jamieson, R. T. (A)
Krause, V. R. (M)

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Lichtenstein, A. H. (A)
Lipschitz, S. (M)
Silbermann, H. (SM)
Sive, F. (A)
Stephen, I. R. G. (A)
Suttner, R. (A)
Van Gogh, W. D. (M)
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Haupt, G. E. (A)
Malan, D. G. (A)
Van Niekerk, T. (A)
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Roodepoort
Rex, D. F. (A)

Springs
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Montevideo
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Guimaraes, A. (A)
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Lopez, A. L. (SM)
Pachano, P. I. (A)
Santos, P. J. (M)
Suarez-Flamerich, O. (A)
Vargas, A. (A)
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Edo Miranda
Nikken, P. H. G. (SM)
Siblesz, G. M. (A)

Maricaibo
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Collins, E. W. J. (A)

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Colwyn Bay
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YUGOSLAVIA

Albert, V. R. (M)

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How to Use Our Business and Product Sections

The Business and Product Sections of this Directory are included for the service of members so that this book will be complete as an index of an industry—listing Engineers, the Businesses they have founded, and the Products they have created for radio, television, communications, and electronics.

The following 4 Sections of the IRE DIRECTORY are:

Part		Page
1	Pink Section—Alphabetical List of Products & Group Arrangement	i-viii
2	Complete-Data-Spreads Section	2-128
3	Company List of Radio-Electronic Manufacturers	131-237
4	Product Index of Engineering Equipment and Parts —Advertisers Index—Facing Cover III	241-581

SECTION 2

Part 2 is one of the most informative and valuable sections of this Directory. Here manufacturers are supplying engineers with the maximum amount of detailed information possible through the use of multiple page spreads of their products (see page 2). The purpose of this section is to give the engineer a complete and ever available catalog file right in his IRE Directory where he can always see it easily and quickly. We believe that the services of this section will be of the utmost help to you.

SECTION 3

2760 firms have supplied us voluntarily with information about the components, equipment and services which they render the radio-electronic industry. The manufacturers are listed alphabetically in this section beginning on page 131 and ending on page 237. 1168 non-manufacturers such as distributors and representatives are listed under heading 10, a special directory. This index therefore gives the names of manufacturers of specific products available for purchase, with their addresses and code numbers indicating 104 types of products which they offer.

The completeness of this list depended on information voluntarily supplied us. Our most vigorous efforts may not have made it complete, but the excellent cooperation received from most of the industry is directly responsible for the up-to-dateness of our product data. We will welcome additions and suggestions for the 1955 edition.

SECTION 4

The Product sections start on page 241 and continue through 581. In both the alphabetical and the product indexes advertisers who have made it financially possible to provide a really comprehensive Directory to IRE members, have been listed in bold face type with a cross index to the page on which their display advertisement appears—giving complete information on their products and services. Non-advertisers have been listed in the product indexes giving firm name and state only. For full address the reader must turn to the alphabetical index for these companies.

To find the manufacturers of a given product, let us say "Audio Amplifiers" look this product up in the Pink Section, preceding page 1. You will see that it is classification Number 1. A full listing of audio amplifier manufacturers starts on page 241. Turn to this classification in part 4.

As a service to engineers, both buyer and seller, we have included a list of 1168 firms and individuals who are distributors. Each name is further classified by number to indicate its place in the field—representative, distributor, exporter, etc. This is class #104, starting on page 559.

There are several other helpful indexes. Advertisers are given on pages 583-584 (inside back cover); and an index to 1954 Radio Engineering Show Exhibitors and Proceedings Advertisers who are in this Directory is on pages 116-128.

To get a comprehensive picture of what a given firm manufactures for engineers in our field, you will find in the alphabetical index of companies that all their products are listed by code number after the firm's name and address. These products are classified into ten separate Product Directories, serving basic sections of our industry. We have tried vigorously to make this truly a useful "Radio Engineers Directory."

Please submit all changes, corrections, additions and classification questions to Industry Research Div., Institute of Radio Engineers, 1475 Broadway, New York 36, N.Y.

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 583-584.

Key to Products, Pink Section.

Index to Spreads, 1.

Guide to Machol Thumb Indexes facing 240, 270, 400 & 476.

2	PART I COMPLETE DATA SPREADS
131	PART II ALPHABETICAL COMPANY LIST
241	PART III APPARATUS
271	PART IV COMPONENTS
401	PART V INSTRUMENTS & CONTROLS
477	PART VI SERVICES & MATERIALS

The Machol system will help you find both alphabetical and product sections swiftly.

INSTRUCTIONS

1. **With the Directory open on the desk, bend the book almost double in your left hand, with your thumb just above this box.**
2. **From one-line or two-line symbol adjacent to the letter or subject you seek, run your eye across horizontally to a corresponding page-edge symbol.**
3. **Open there with right hand.**



LICENSE NO. 25
MACHOL EDGE INDEX PATENT #2680630

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1954 Edition prepared by The Advertising Department of The Institute of Radio Engineers, 1475 Broadway, New York 36, N.Y.
William C. Copp, Mgr.; Lillian Petranek, Asst.; Carl Maier, Production; Frank G. MacAloon, Research.

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1954 IRE DIRECTORY
Complete-Data-Spreads

The full spirit of the IRE DIRECTORY is to give the reader-engineer "facts" in complete detail, and specific enough to be of useful service. Our advertisers have recognized this, and many have made their copy presentation full of useful specifications and illustrations.

Actually, a Directory Publisher cannot hope to describe products adequately in standardized listings. Only the Advertiser, using display space, and with his own intimate knowledge of his service or product, can do that job right.

The advertisers listed below have done their utmost to provide the reader with engineering data in full detail, through spreads and catalogs filed in this book for easy access and permanent reference. This can prove to be the most useful part of the 1954 IRE DIRECTORY to you.

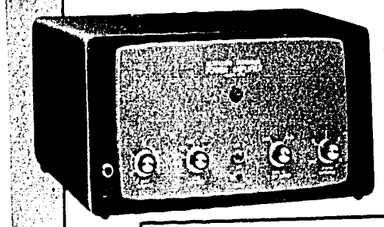
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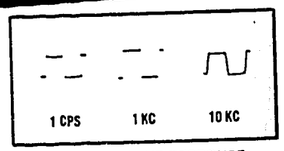
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krohn-hite

INTRODUCES 5 NEW INSTRUMENTS





SQUARE WAVE RESPONSE

1 ULTRA-LOW DISTORTION

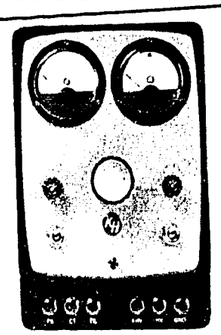
power amplifier

DELIVERING **99.99999996%*** **DISTORTION-FREE POWER**

MODEL UF-101 SPECIFICATIONS

POWER OUTPUT..50 watts from 15 cps to 20 kc ±1 db
FEEDBACK..... 80 db
FREQUENCY RESPONSE ±0.5 db from 0.5 cps to 30 kc ±3 db from 0.03 cps to 70 kc
DYNAMIC RANGE.....110 db
OUTPUT IMPEDANCE. 2, 4, 8, 16 and 450 ohms
VOLTAGE GAIN..14 db or 30 db to 16 ohm output
PRICE.....$350.00

*Typical harmonic distortion at 1,000 cps is 0.002% in voltage or 0.00000004% in power at 30 watts.



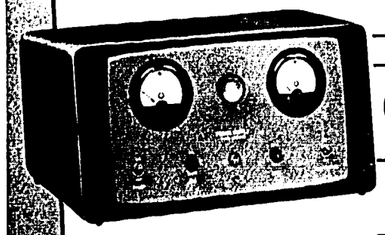
	Model	Voltage	Current	Impedance		Output		Price
				D.C.	A.C.	Bias	Heater	
2	UHR-220	0-500v	0-200ma	0.01	0.1	0-150v, 0-5ma	12.6v ac, 4a CT	$350.00
3	UHR-225	150-500v	0-200ma	0.01	0.1	—	12.6v ac, 4a CT	$300.00

NEW UHR SERIES power supplies

FEATURING **ultra-high regulation**

OVER THE **entire** OPERATING RANGE

- Regulation 0.001%
- Extremely low dc and ac impedance
- Ripple less than 100 microvolts
- Transient response 0.001 milliseconds

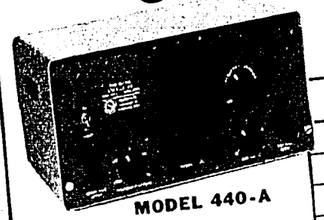


	Model	Voltage	Current	Impedance		Output		Price
				D.C.	A.C.	Bias	Heater	
4	UHR-240	0-500v	0-500ma	0.005	0.05	0-150v, 0-5ma	5-13v dc, 5a CT	$550.00
5	UHR-245	150-500v	0-500ma	0.005	0.05	—	12.6v ac, 10a CT	$450.00

PRESENTS THIS PROVEN GROUP OF electronic instruments

8 WIDE-RANGE AUDIO oscillators

0.001 cps to 520 kc



MODEL 440-A

Features

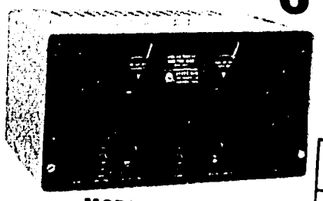
- Frequency range, continuous from 0.001 cps. to 100 kc
- Distortion less than 0.1% at any output level
- Excellent frequency stability and resetability
- Amplitude variation less than ±0.25 db
- Frequency calibration ±1%
- Both Sine and Square Waves simultaneously
- Hum less than 0.1% at any output level

Model	Frequency Range	Frequency* Accuracy	Output	Distortion	Power Consumption	Price
400-A	.009 cps to 1.1 kc	2%	25 mw/10v	1%	45 watts	$350.00
410-A**	.02 cps to 20 kc	2%	10 mw/5v	1/10%	150 watts	$950.00
420-A	.35 cps to 52 kc	2%	25 mw/10v	1%	45 watts	$290.00
430-B**	4.5 cps to 520 kc	2%	50 mw/10v	1%	45 watts	$120.00
400-C***	.009 cps to 1.1 kc	2%	100 mw/10v	1%	65 watts	$375.00
420-C***	.35 cps to 52 kc	2%	100 mw/10v	1%	65 watts	$325.00
440-A**	.001 cps to 100 kc	1%	100 mw/10v	1/10%	120 watts	$495.00
440-B**	1 kc to 100 cps	1/20%	100 mw/10v	1/10%	110 watts	$950.00

All oscillators except 430-B and 440-B have both sine wave and square wave.

6 VARIABLE ELECTRONIC filters

0.01 cps to 200 kc



MODEL 330

Features

- Unity Pass band gain with 24 db/octave attenuation rates and reduced corner frequency attenuation
- Ultra-low frequency coverage with adjustable center frequency and band width
- Low internally generated noise
- Input and output buffer stages
- Electronic regulated supplies
- Five decade bands

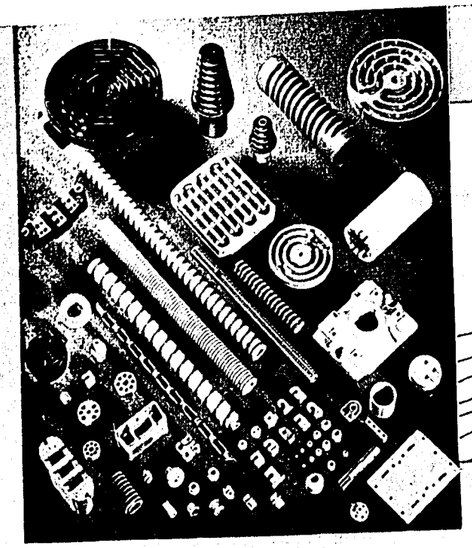
Model	Type	Frequency Range	Frequency* Accuracy	Noise & Hum	Power Consumption	Price
310-A**	Band Pass	20 cps to 200 kc	10%	3 mv	40 watts	$275.00
330-A**	Band Pass	.02 cps to 2 kc	5%	0.1 mv	50 watts	$450.00
330-M**	Band Pass	0.2 cps to 20 kc	5%	0.1 mv	50 watts	$450.00
340-A	Servo	0.1 cps to 100 cps	5%	10 mv	40 watts	$350.00
350-A**	Rejection	.02 cps to 2 kc	5%	0.1 mv	50 watts	$450.00
360-A**	Rejection	20 cps to 200 kc	10%	5 mv	40 watts	$275.00

*Slightly higher at ends of dial.
***Rack panel construction.
**Available for rack mounting at $5.00 additional.

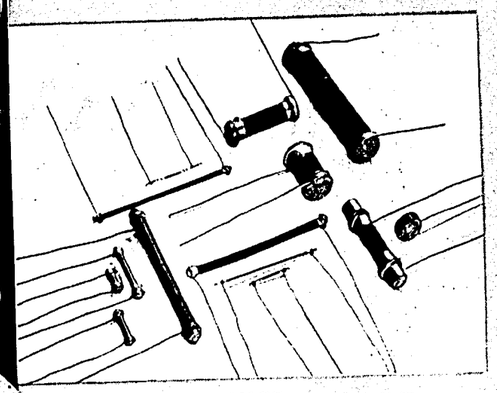
A NEW **CATALOG** GIVING COMPLETE DESCRIPTIONS OF THE ENTIRE LINE IS AVAILABLE UPON REQUEST. PLEASE WRITE

krohn-hite
INSTRUMENT COMPANY
Dept. B, 580 MASS. AVE., CAMBRIDGE 39, MASS.

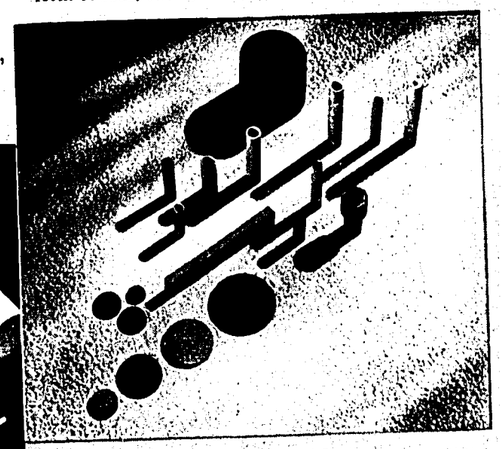
Stupakoff PRODUCTS

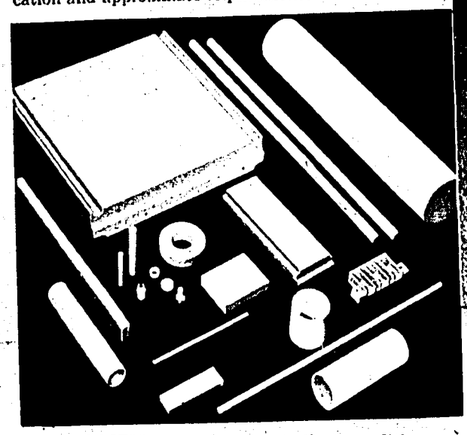


CERAMIC PRODUCTS—Stupakoff is a leading supplier of pressed, extruded, machined, ground and assembled ceramic products for electrical and electronic applications, for all voltages, frequencies and temperatures. Specialized resistor ceramics, metallized ceramics, high thermal shock resisting ceramics and ceramic dielectrics are described below. Send for information, giving proposed application and approximate requirements.



RESISTOR CERAMICS—Stupakoff Temperature-Sensitive Resistors are used for temperature indicating or measuring equipment such as Radiosonde, for infra-red light source and for heating elements. Supplied complete with terminals, in the form of rods, tubes, discs, bars, rings, etc.





STUPALITH—Where thermal shock conditions prevail, parts made of STUPALITH will withstand extremely severe service. Stupakoff makes parts ranging from a fraction of an ounce to several pounds in weight, in simple or intricate shapes, by pressing, extrusion, casting or ramming.

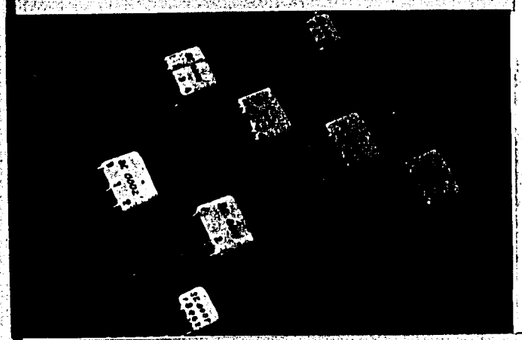
Two principal compositions are ordinarily employed: "zero" expansivity compositions, and nonporous compositions having near-zero expansivities. For parts requiring a high degree of dimensional accuracy, our production process includes machining or grinding to precision tolerances. Safely used at temperatures up to 2400°F.

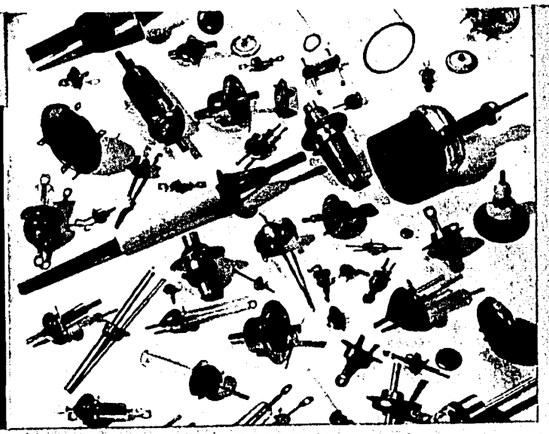
CERAMIC DIELECTRICS—Stupakoff makes general purpose Ceramic Dielectrics for by-pass, lead through blocking, standoffs and trimmer applications. Temperature compensating Ceramic Dielectrics have coefficients from P-100 to N-2700, and high K materials up to K-6000. Made in the form of tubes, discs and special shapes, plain or silvered.

STUPAKOFF CERAMIC & MANUFACTURING CO.
LATROBE, PENNSYLVANIA
DIVISION OF THE CARBORUNDUM COMPANY

for Electrical and Electronic Applications

CERAMIC ASSEMBLIES





PRINTED CIRCUITS—By combining resistors and capacitors of precision values, in circuits designed in accordance with the requirements of individual applications, Stupakoff printed circuits save space and weight, speed assembly, reduce costs, minimize assembly errors. Soldered connections are reduced by 25% to 80%, assemblies are lighter and more compact, production time is reduced and better products are made. Sturdy, compact, accurate.

METALLIZED CERAMICS

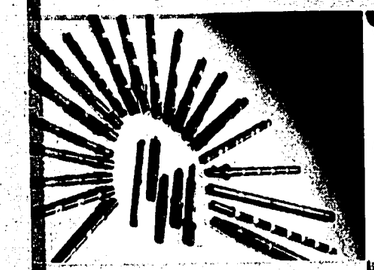
The rotor shafts shown below consist of metal bands attached securely to ceramic rods and are typical of Stupakoff precision manufacture. On a mass production basis, concentricity of components, for example, is held to less than ±0.001 in.

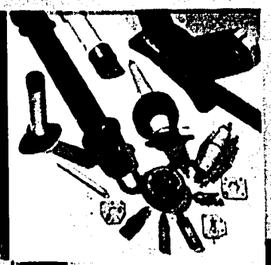
Readily available in production quantities.

KOVAR-GLASS SEALS

Perfectly closed and durable air-tight assemblies are made with Stupakoff Kovar-Glass Seals. The use of hard glass for these seals provides the highest degree of protection against thermal shock and weathering. Kovar is the ideal metal for such seals because its expansion characteristics closely match those of the hard glass to which it is readily bonded. The resulting seals are uniform in quality and easily assembled.

Stupakoff Seals are available in a wide variety of standard sizes and designs, and can be made in many special forms, as indicated by the illustration above. Extensive experience has given Stupakoff the engineering and manufacturing knowledge and skill to produce Kovar-Glass Seals that are made accurately, uniform and dependable. We will gladly submit samples and quotations.



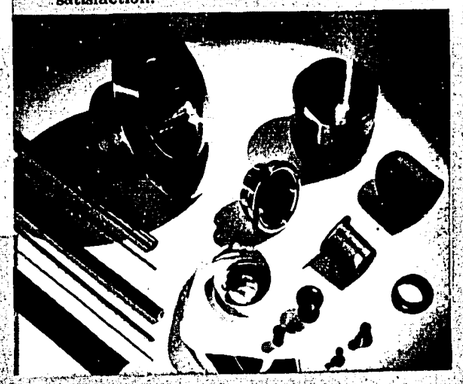




STRAINS, STAND-OFFS

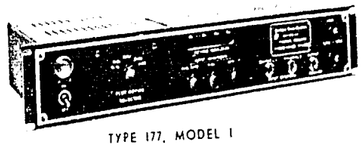
The metallized strains, spreaders and standoffs shown above and to the right are precision-made, and meet the most exacting requirements.

KOVAR METAL—The ideal alloy for glass sealing, Kovar matches the expansivity of hard glass over the entire working temperature range. It resists mercury attack, has ample mechanical strength and seals readily with simple oxidation procedure. It is available as sheet, strip, foil, rod, tube, wire—or fabricated into cups, eyelets, leads and other shapes. The prominent users of KOVAR and the length of time they have employed this metal are convincing proof of satisfaction.

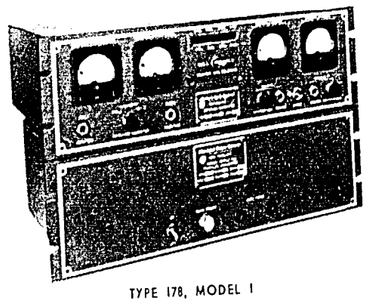


Commerce and the Military write THEIR SPECIFICATIONS to...

NEW! TWINPLEX COMMUNICATION UNITS



TYPE 177, MODEL 1



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.

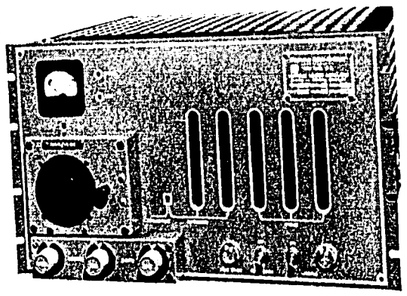
The transmitting equipment consists of the Twinplex Combiner Type 177 Model 1 and an RF Frequency Shift Keyer such as the Northern Radio Type 105 Model 4. The Combiner converts the four possible conditions of two telegraph signals (M1-M2, M1-S2, S1-M2, S1-S2) respectively into one of four voltages related in a 0-1-2-3 manner. The Combiner output voltage modulates the FS Keyer.

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.

NEW VARIABLE MASTER OSCILLATOR

- *Long-time stability 1 cycle per megacycle*
- *Variable to ANY frequency from 2 to 4 mc within 1 part per million*



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 has sufficient output to replace existing oscillators wherever a more stable and variable unit is required. 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 value pre-set on the switches and holds with an accuracy that exceeds that of most temperature-controlled crystal oscillators.

The unit also provides a crystal controlled Beat Frequency oscillator for use in single or diversity receiving systems to provide stabilized BFO injection to the receivers.

An output is also provided from the high stability time base oscillator to make available its 100 KC frequency for use as a secondary standard. The stability of this output is one part in five million over any 12-hour period.

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 or 230 ± 10%: Approximately 1 cycle per megacycle.

Output Level: ½ watt into 75 ohm load. Level control on rear of chassis.

Readibility: ± 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.

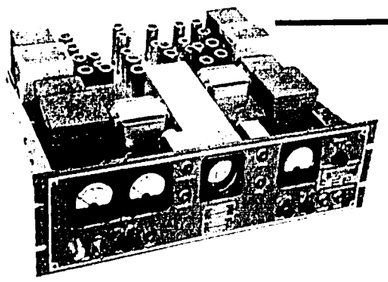
TIME BASE CRYSTAL OSCILLATOR

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 part per million for thirty days.

Output Level: Approximately 2 volts.

Output Impedance: Approximately 100,000 ohms.



TYPE 174,
MODEL 1

FREQUENCY SHIFT DIVERSITY CONVERTER

For use with either single-receiver frequency diversity systems or 2-receiver space diversity systems. The Type 174 Model 1 provides solid copy of signals which are 14 db below white noise level—making it the outstanding unit of today. 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).

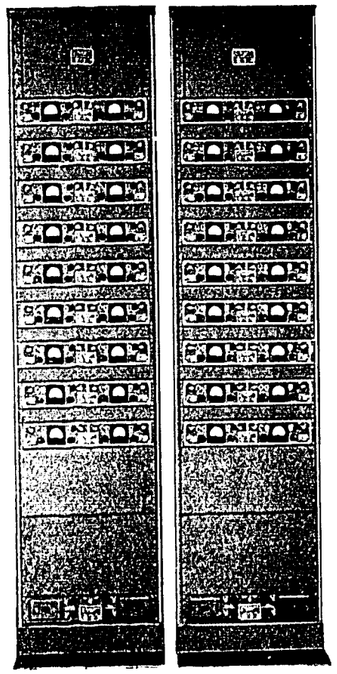
Keying Speed: Maximum of 40 dot cycles with narrow band frequency diversity. Up to 400 dot cycles with the wide band networks.

Monitor: 2-inch Cathode Ray tube
Input phone jack
2 input volume level indicators
1 output current indicator

NORTHERN RADIO COMMUNICATIONS EQUIPMENT

The Industry's Complete Line of High Quality Communications Equipment

RADIO MULTIPLEX SYSTEMS ★ MULTI-CHANNEL TONE SYSTEMS ★ DIVERSITY RECEIVERS STANDARD FREQUENCY SHIFT KEYERS ★ LOW FREQUENCY SHIFT KEYERS ★ FREQUENCY SHIFT CONVERTERS ★ TONE FILTERS ★ TONE KEYERS ★ DEMODULATORS ★ LINE AMPLIFIERS ★ MASTER OSCILLATORS ★ MONITORS ★ TWINPLEX EQUIPMENT



MULTI-CHANNEL FREQUENCY SHIFT TELEGRAPH SYSTEMS

Today's constantly growing demand for greater, faster, more dependable communications has made the need for improved Multiplex equipment more acute than ever before. In response to this need, Northern Radio Company now makes available several new Frequency Shift Multi-Channel Telegraph Systems. Reflecting the heritage of Northern Radio's constant research and precision manufacture over the years, these multi-channel systems display novel concepts of design together with outstanding performance, fidelity and operating economy.

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 applications as Telemetering, Control Circuits and Servo-Mechanisms. Instantaneous and complete sending end 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.

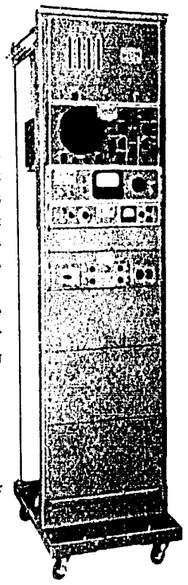
The audio frequency shift principle of transmission provides for high fidelity of signal reproduction over a wide range of signal levels as well as under severe noise or interference conditions. Circuit requirements of any speed, shift and center frequency can readily be met. The systems illustrated is 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.

TEST BAY FOR TONE TELEGRAPH SYSTEMS

The Northern Radio Company Test Bay for Tone Telegraph Systems provides a complete terminal of test apparatus for testing, alignment and maintenance of Multi-channel Frequency Shift Telegraph Systems.

When used with such equipment, it performs the following main functions: (1) rapid and simple precision measurements of mark, space and center frequencies at both sending and receiving terminals; (2) precision frequency adjustment of FS Tone Keyers to specified channel Frequencies; (3) accurate tuning of FS Converter Units; (4) rapid evaluation of signal distortion; (5) measurements of tone and telephone line levels at both receiving and transmitting ends; (6) measurement of telephone line attenuation; (7) over-all system checks and alignment; (8) performance tests of Tone Multiplex Systems and associated equipment; (9) quick localization of systems faults; and (10), monitoring of all wave forms such as keying, keyed tone, etc.

The Test Bay consists of Electronic Square Wave Keyer (Dotter), Cathode Ray Oscilloscope, Frequency Counter, Volume Level Indicator and Rack including blank panels, patch cords and test probes.



TYPE 168
MODEL 1

TONE CHANNELING SYSTEMS

Complete package systems of Multi-Channel Tone Equipment (both AM and Frequency Shift) are available for line or radio link systems.

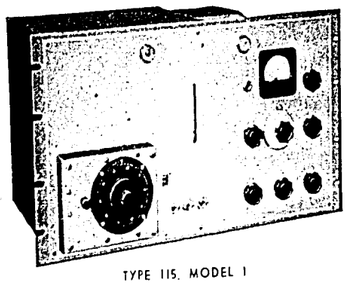
For full data on the complete line, write now for catalog PD-54

NORTHERN RADIO COMPANY, inc. *Pace-Setters in Quality Communication Equipment*

147 WEST 22ND STREET, NEW YORK 11, N. Y. **WATKINS 9-9117**

NORTHERN RADIO COMMUNICATIONS EQUIPMENT

VARIABLE MASTER OSCILLATOR



TYPE 115, MODEL 1

Principally used in diversity reception to supply local common oscillator injection voltage to receivers. Crystal oscillator for BFO. The Variable High Frequency section gives stability equivalent to that of non-temperature controlled crystal oscillators. It is also equipped with three crystal controlled frequencies for operation of receivers on a fixed frequency basis. The variable high frequency oscillator is provided with local crystal oscillator for spot checking of twenty points within its range.

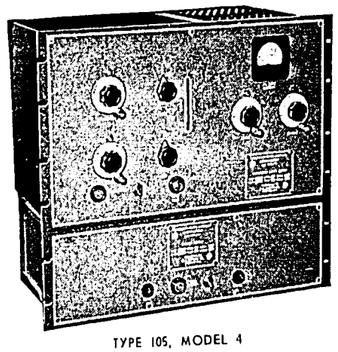
TECHNICAL DATA

Variable HFO output frequency	2-32 mcs continuous
Fixed Frequency crystals	2-4 mcs for output frequencies of 2-32 mcs
Output impedance	72 ohms coaxial cable
Output level	2 watts 2-4 mcs, 0.5 watts 4-32 mcs
Variable HFO Stability	20 cps per mc for ambient change +25° C.
	5 cps per mc for ± 10% Line Voltage
	20 cps per mc for resettability
	20 cps per mc for readability

This unit can also be used as a transmitter exciter or for laboratory measuring purposes.

FREQUENCY SHIFT KEYER

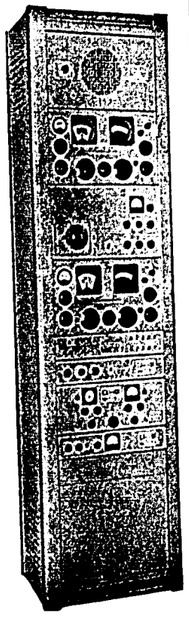
incorporates the following outstanding features:



TYPE 105, MODEL 4

Frequency shift dial adjusts "Mark" and "space" frequencies equally above and below the carrier position, which remains fixed. • Simplified frequency setting permits only the upper side band tuning indication to be visible on the meter over substantially all of tuning range. • Direct reading frequency calibration of shift from 0 to 1000 cycles. • Direct reading frequency calibration of mixer and output tuning dials from 2.5 to 6.7 mc, or 1.75 to 4.5 mc. • Direct reading of calibration of output frequency vernier ± 600 cycles. • Pulse shaping circuit to permit operation within assigned band-width with no adjacent channel radiation. • Highly stable temperature controlled oven with temperature control of ± 0.1° C. at 60° with heaters on 4 sides of inner oven. • Component ratings according to JAN Specs provide greater assurance of trouble-free operation.

DUAL DIVERSITY RECEIVER

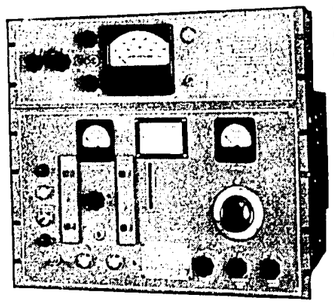


TYPE 110, MODEL 5

Used for dual spaced diversity reception in high speed radio tele-printer, telegraph or telephone service, using any common modulation, such as FS, CW, ICW, phone, etc. Complete receiver is housed in a rack type, fully enclosed cabinet. Provided with specially modified receivers, monitor speaker, IF monitor, master oscillator, and the necessary patching arrangement. Can be supplied with any combination of terminal equipment for reception of radio tele-printer, undulator tape and program service, or for remote use where the intelligence is transmitted via landline or UHF link.

Receiver is shown with terminal equipment as recommended for general communications usage. The units are (top to bottom) Monitor speaker, Receiver #1, Variable Master Oscillator, Receiver #2, Patching Panel, IF Monitor, Converter, Tone Keyer, Blank panels.

FREQUENCY and SHIFT MONITOR SYSTEM



METER: TYPE 127, MODEL 2
MONITOR: TYPE 106, MODEL 4

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 outputs. 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/degree 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.

For full data on the complete line, write now for catalog PD-54

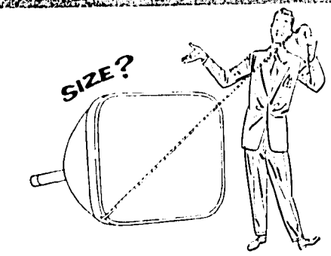
NORTHERN RADIO COMPANY, inc. *Pace-Setters in Quality Communication Equipment*

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SYLVANIA RADIO and TV TUBES



What are your *Aluminized Picture Tubes* Problems?



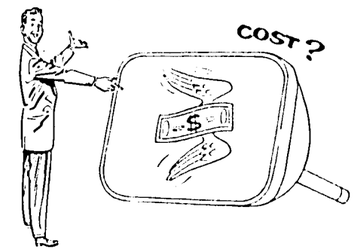
Now Sylvania offers a full line!

Today, because of greatly increased facilities and improved manufacturing techniques, Sylvania is in a position to offer you perfect answers to your aluminized picture tube problems.

And, much more than your physical spec requirements, Sylvania Aluminized Tubes also offer the finest *performance!* These tubes give whiter whites and blacker blacks . . . a 6-times better picture contrast.

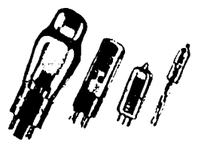
This means Sylvania's new aluminized tubes make your sets stand out ahead of competition. The improvement is obvious . . . and immediate. And the low prices will amaze you!

For the full story concerning Sylvania's complete aluminized tube line, and how they can help your future sales, write a note on your letterhead to Dept. 4R-75, Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.





. . . and for the finest in Receiving Tubes



During more than a quarter of a century, Sylvania Receiving Tubes have earned a world-wide reputation for the finest quality and performance. So remember—for any electronic application, there's a Sylvania Electronic Tube.

SYLVANIA

LIGHTING • RADIO • ELECTRONICS • TELEVISION

CRYSTAL DIODES, *DUO-DIODES & VARISTORS*

SYLVANIA CRYSTAL DIODES

TYPE	DESCRIPTION	MAXIMUM RATINGS AT 25° C: CONTINUOUS REVERSE WORKING VOLTAGE (VOLTS)	MAXIMUM RATINGS AT 25° C: RECURRENT PEAK ANODE CURRENT (MA.)	MAXIMUM RATINGS AT 25° C: AVERAGE ANODE CURRENT (MA.)	MAXIMUM RATINGS AT 25° C: PEAK REVERSE VOLTAGE FOR ZERO DYNAMIC RESISTANCE (VOLTS MIN.)	CHARACTERISTICS AT 25° C: FORWARD CURRENT AT + 1 VOLT (MA. MIN.)	CHARACTERISTICS AT 25° C: REVERSE CURRENT MA MAX
1N34	General Purpose Diode	60	150	50	75	5	50 @ — 10V, 800 @ — 50V
1N34A	General Purpose Diode	60	150	50	75	5	30 @ — 10V, 500 @ 50V
1N35	Matched Duo-Diode (Note 1)	50	60	22.5	75	7.5	10 @ — 10V
1N38	100 Volt Diode	100	150	50	120	3	6 @ — 3V, 625 @ — 100V
*1N38A	100 Volt Diode	100	150	50	120	4	6 @ — 3V, 500 @ — 100V
1N39	200 Volt Diode	200	150	50	225	3.0	200 @ — 100V, 800 @ — 200V
1N40	General Purpose Varistor (Note 2)	25	60	22.5	75	12.75 @ 1.5V	35 @ — 10V
1N41	General Purpose Varistor (Note 2)	25	40	22.5	75	12.75 @ 1.5V	35 @ — 10V
1N42	100 Volt Varistor (Note 2)	100	50	22.5	120	12.75 @ 1.5V	800 @ — 100V
1N54	High Back Resistance Diode	50	150	50	75	5	10 @ — 10V
1N54A	High Back Resistance Diode	50	150	50	75	5	7 @ — 10V, 100 @ — 50V
1N55	150 Volt Diode	150	150	50	170	3	300 @ — 100V, 800 @ — 150V
1N55A	150 Volt Diode	150	150	50	170	4	500 @ — 150V
1N56	High Conduction Diode	40	200	60	50	15	300 @ — 30V
1N56A	High Conduction Diode	40	200	60	50	15	300 @ — 30V
1N58	100 Volt Diode	100	150	50	120	4	700 @ — 100V
1N58A	100 Volt Diode	100	150	50	120	4	600 @ — 100V
1N59	250 Volt Diode	260	150	50	275	3.0	800 @ — 250V
1N60	Video Detector Diode	25	150	50	30	Note 3	Note 4
1N67	High Back Resistance Diode	80	100	35	100	5.0	5 @ — 5V, 50 @ — 50V
*1N69	General Purpose Diode	60	125	40	75	5	50 @ — 10V, 850 @ — 50V
1N71	Low Impedance Varistor (Note 5)	40	200	60	50	15	300 @ — 30V
*1N81	High Back Resistance Diode	40	90	30	50	3	10 @ — 10V
1N82	UHF Mixer Diode { Note	—	—	—	Note 6	——	——
1N82A	UHF Mixer Diode { Note	—	—	—	Note 6	——	——
1N105	Video Detector Diode	25	150	50	30	Note 3	Note 4
1N109	Harmonic Generator Diode	15	150	50	75	Note 7	——
1N111	Computer Diode	60	150	25	75	5	Note 8
1N112	Computer Diode	60	150	25	75	5	Note 8
1N113	Computer Diode	60	150	25	75	2.5	Note 8
1N114	Computer Diode	60	150	25	75	2.5	Note 8
1N115	Computer Diode	60	150	25	75	2.5	Note 8
1N119	Computer Diode	60	150	25	75	5	Note 8
1N120	Computer Diode	60	150	25	75	5	Note 8
1N132	Video Detector Diode	25	150	50	30	Note 10	Note 4
1N172	UHF Mixer Diode	—	—	—	Note 6	——	——

Note 1 – Units are matched in the forward direction at 1 volt so that the current flowing through the lower resistance unit is within 10% of that through the higher resistance unit. Ratings are shown for each diode.

Note 2 – Consists of four specially selected and matched diodes whose resistances are balanced within ±2.50% in the forward direction at 1.5 volts. For additional balance, the forward resistance of each varistor pair is matched to within three ohms. Ratings shown are for each diode.

Note 3 – Units are tested in a circuit employing an input of 1.6 volts rms at 40 MC, 75% modulated at 400 cycles. Demodulated output across a 4700 ohm resistor shunted by a 5 $\mu\mu$f capacitor is a minimum of 1.55 volts peak to peak.

Note 4 – Minimum specified reverse resistance applies to all points between 0 and −10 volts with 60 cps sweep.

* Indicates JAN type

Note 5 – Consists of four specially selected diodes whose forward currents are matched within a range of 1 ma. with 1 volt applied. Ratings shown are for each diode.

Note 6 – The 1N82, 1N82A, and 1N172 are low noise and low conversion loss UHF television mixer crystals. The noise factor of the 1N82 is 15 db max., that of the 1N82A and the 1N172 is 14 db max. The noise factor is measured at 700 mc with a local oscillator drive (bias current) of 0.5 ma.

Note 7 – Units are tested in a circuit employing a fundamental frequency of 126 MC. The rectified 3rd harmonic output is 0.5 ma. minimum.

Note 8 – Minimum specified reverse resistance applies at 55°C for all points between −10V and −50V with 60 cps sweep.

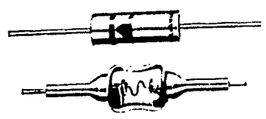
Note 9 – Reverse recovery time for these units is specified and defined as the time required for the diode to recover to a given reverse current when the operating voltage necessary to give 30 ma. forward conduction is rapidly switched to −35 volts.

Type	Reverse Current μa max	Reverse Resistance ohms min.	Recovery Time μsec max
1N119	700	50K	0.5
	87.5	400K	3.5
1N120	700	50K	0.5
	175	200K	3.5

Note 10 – Units are tested in a circuit employing an input of 0.1 volts rms at 44 MC. Rectified output is a minimum of 140 μa with a 3600 ohm load and 65 uh shunted by 5 $\mu\mu$f capacitor.

Note 11 – Normally supplied with ½" minimum leads but will be supplied without leads for clip-in applications upon request.

The polarity of all Sylvania crystals is indicated by a graphic symbol →|— on the body, the arrow of which indicates the direction of easier (conventional) current flow.



Sylvania Germanium Diodes are long-life, lightweight, heaterless components that have found hundreds of applications in clippers, limiters, discriminators and other circuits calling for low power rectification at frequencies up to several hundred megacycles. They have low shunt capacity and no contact potential. Convenient pigtail leads eliminate the need for mounting hardware.

Sylvania Duo-Diodes consist of two matched diodes mounted in a single unit.

Sylvania Varistors, types 1N40, 1N41 and 1N42, consist of 4 specially selected and matched germanium diodes whose resistances are balanced within ±2.5% in the forward direction at 1.5 volts. Sylvania Varistor Type 1N71 consists of 4 matched low impedance diodes, whose forward currents are within a range of 1 ma. with +1 volt applied.

Ratings shown are for each diode. Types 1N40, 1N42 and 1N71 are plug-in type; 1N41 is lug type.

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MICROWAVE COMPONENTS and CRYSTALS, Transistors, Photodiodes and Glow Transfer Tubes



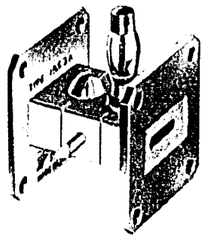
6BL6

KLYSTRONS

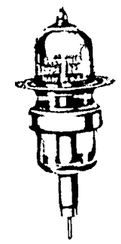
Sylvania Types 6BL6 and 6BM6 are intended for use as c.w. oscillators. They are of the separate cavity type, with oscillation frequency depending chiefly on external tuning. 6BMA, 5836 and 5837 are suitable for either c.w. or pulsed operation. Write for catalog EC-40B.

TR's and ATR's

Sylvania TR and ATR Tubes are used chiefly as automatic electronic transmit-receive switches in radar equipment. For full data on complete line call your nearest Sylvania Sales office.



1B63A



ROCKET TUBES

Sylvania Rocket Tubes are planar-electrode disc-seal triodes for use as oscillators and amplifiers at frequencies up to 3300 mc. Design permits broad band 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 1200 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 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 3000 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 intended for use as a c.w. amplifier-multiplier up to 3000 mc.

6BA4–High gain, low noise, UHF television amplifier.



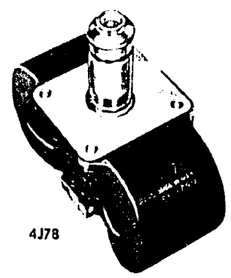
PENCIL TUBES

5794–is intended for use at 1680 mc as a c.w. oscillator.

5876–is intended for use at 1700 mc as a UHF triode for c.w. oscillator, amplifier and frequency multiplier operation.

6263–high mu triode with 11 watts dissipation for use as oscillator or amplifier at 500 mc or frequency multiplier in the range 250-1000 mc.

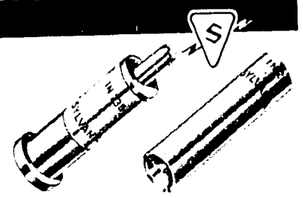
6264–medium mu triode with 11 watts dissipation for use as oscillator or amplifier at 500 mc or frequency multiplier in the range 250-1000 mc.



4J78

MAGNETRONS

The Sylvania family of Magnetrons operates in the shf band at peak power levels ranging from 7 to 300 kw and at average power ranging from 14 to 300 watts. 2J42 and 6027 are of the vane type; 4J50, 4J52 and 4J78, hole and slot. All are supplied with magnet. Write for bulletin EC-37C.

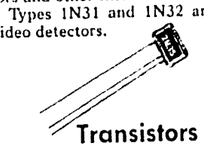


Sylvania Silicon Diodes

1N21B, 1N21C, 1N23B, 1N23C, 1N25, 1N26, 1N53 and 1N78 are used chiefly as first detectors in radar and other microwave superheterodyne receivers.

Type 1N79 is designed for use in microwave test probes, power indicators and other instruments.

Types 1N31 and 1N32 are used as video detectors.



Transistors

Hermetically sealed. Leads can be clipped for plug-in applications.

2N32–Point contact for pulse and switching circuits in large signal medium speed applications.

2N34–PNP Junction general purpose amplifier for high gain, low power, low frequency circuits.

2N35–NPN Junction designed for audio amplifier use.

2N68 – PNP Junction medium gain, high power, output transistor. Provides 3 watts output in push pull Class B amplifier.

3N21 – Point Contact tetrode for switching and small signal applications.



Glow Transfer Tubes

Cold cathode, bi-directional, direct reading decade counter tubes, 350 volt supply.

6476–Multiple output cathode–25 volts output across cathode resistor.

6482–Single output cathode–15 volts output across cathode resistor.



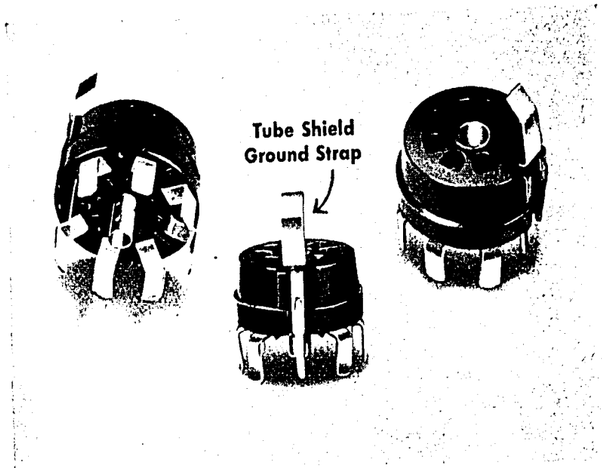
Photodiode 1N77A

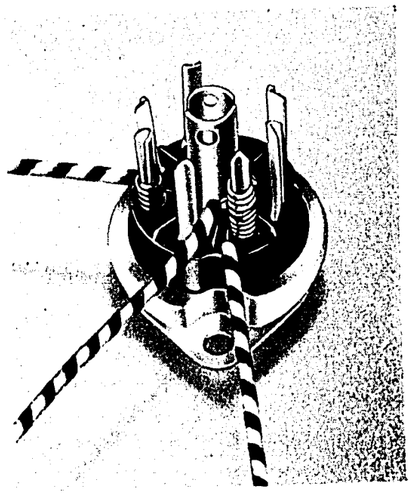
Miniature highly sensitive junction photodiode for operation in visible and infra-red regions. Peak sensitivity at 15,000 Angstrom units.

For complete information on any or all of these Sylvania Electronic products write to: Sylvania Electric Products Inc., Dept. 4E-75, 1740 Broadway, New York 19, N. Y.

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NEW SYLVANIA SOCKETS Save Assembly Time...Cut Costs ...Improve Performance!





Look over these new Sylvania 7-pin Miniature Printed-circuit Sockets. Contacts and center shield are shaped so that sockets can be stacked one upon another for automatic feeding and assembly. Small slots are used on the circuit board to receive the contacts. This results in stronger chassis construction.

Only one socket assembly need be stocked since terminals can be interconnected by printing the circuit on the chassis board rather than using a metallic connecter on the socket itself.

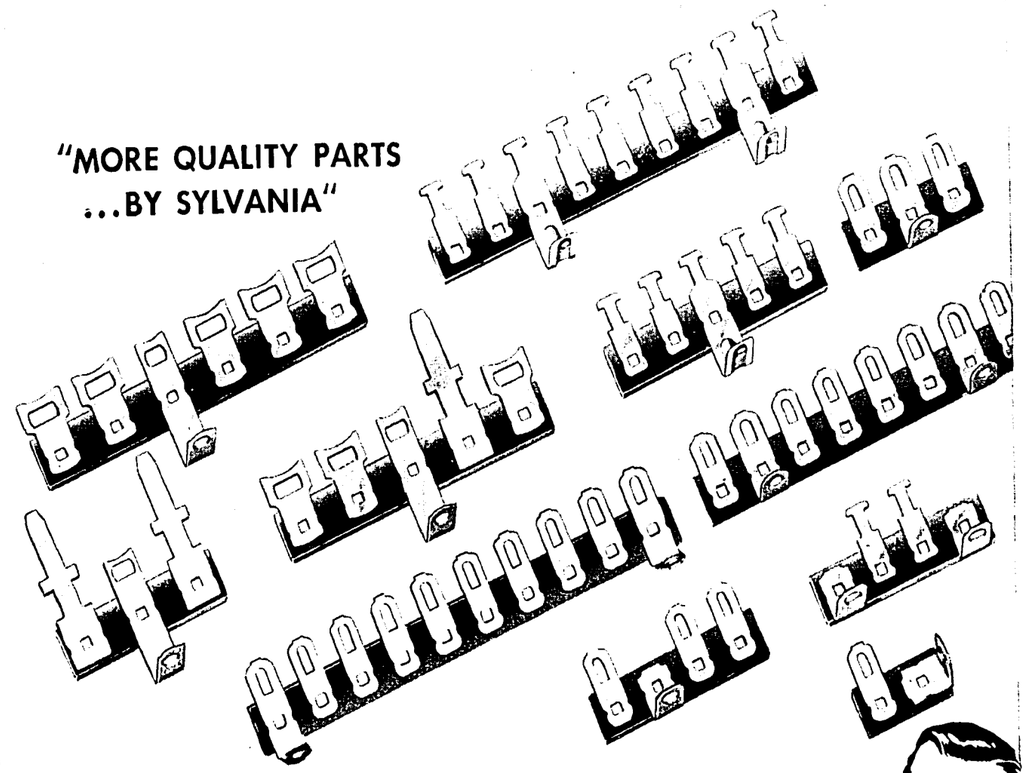
Insulator is molded of general-purpose or low-loss phenolic. Contacts are brass or phosphor bronze, plated to suit your specification. Supplied with or without center shield. Now available in 7-pin construction with 9-pin miniature and other types to follow. Tube Shield Ground Strap can also be furnished.

Also find out about the New Sylvania Solderless-type Sockets for wire-wrapped connections. These are now being made in all 7 and 9-pin miniature sizes. Contacts are shaped to provide reliable connections with the use of present wire-wrapping tools.

For full information concerning these or other Sylvania parts, or special quality components engineered to your own specifications, write to Dept. 4A-75, Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.

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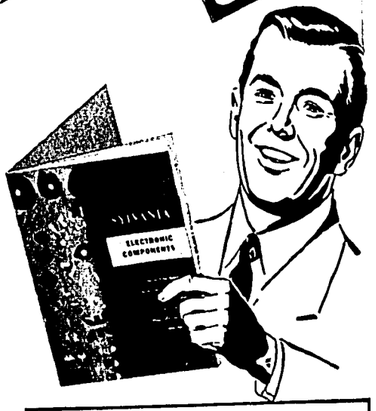
"MORE QUALITY PARTS ...BY SYLVANIA"



Sylvania now offers you a wide variety of highest quality terminal strips . . . equipped with from 2 to 10 lugs . . . depending on style, suitable for many different applications. 3 different styles are available in spacing sizes of ⅜" and ½" spacings. 2 types are available with lugs in 2 to 10 positions. The 3rd type is available with 2 to 7 lugs.

Insulators are made of NEMA grade P laminated phenolic—chocolate waxed, unwaxed or XXX P natural phenolic, waxed or unwaxed. Lugs are of brass, solder plated. Contacts are brass or cadium-plated steel. Sylvania Terminal Strips can be supplied to your specifications.

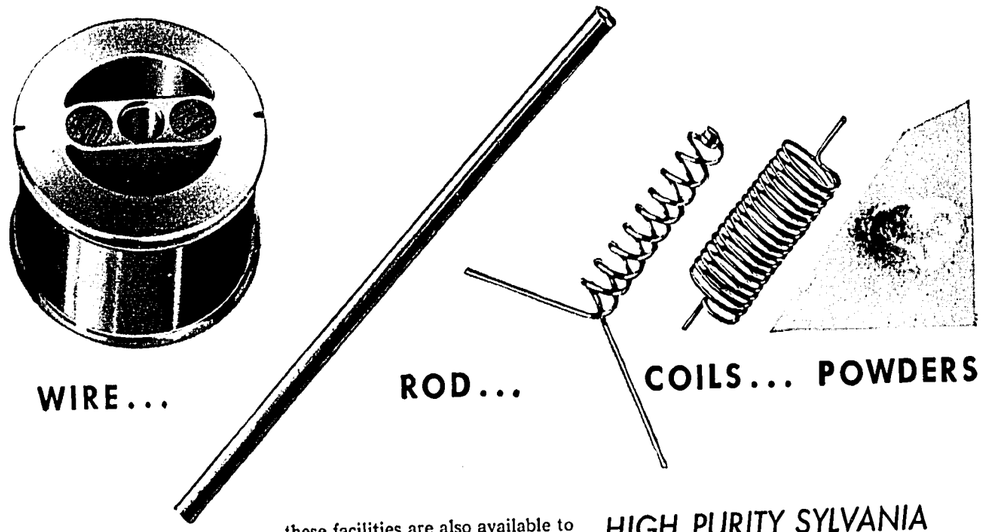
Today, with enlarged, modern plastic molding equipment and metal stamping facilities, Sylvania offers you precision-built components of highest quality. For new illustrated sheets showing the complete line of Sylvania Terminal Strips and other radio and electronic components now available, write to: Sylvania Electric Products Inc., Dept. 4A-75, 1740 Broadway, New York 19, N. Y.



SEND FOR THIS CATALOG

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TUNGSTEN AND CHEMICAL PRODUCTS



WIRE... ROD... COILS... POWDERS

Sylvania Tungsten wire, rod, and components are quality controlled from ore to finished products and tested in the laboratory and in the field. Suppliers to all leading manufacturers in the radio and television industry, Sylvania offers you tungsten and chemical products that meet the highest standards of purity, precision, and uniformity.

Let Sylvania help you

Sylvania maintains large diversified metallurgical and chemical laboratories for the development and perfection of its many products. Today, these facilities are also available to help you. Sylvania engineers, Sylvania "know-how," and Sylvania equipment will aid you in product development or in the solution of tough manufacturing problems.

If it's a question concerning anything . . . from a precision, custom-made tungsten wire to a specially-ground tungsten part, or from a high-purity phosphor to germanium dioxide for your crystals . . . put it up to Sylvania. A note on your letterhead will bring you the information you require. Address: Dept. 4T-75, Sylvania Electric Products Inc., 1740 Broadway, N. Y. 19, N. Y.



Initial sintering of a tungsten ingot formed by high compression of tungsten metal powder.



Section of metallurgical laboratory of Sylvania engineering department.

HIGH PURITY SYLVANIA TUNGSTEN and CHEMICAL PRODUCTS NOW AVAILABLE INCLUDE:

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Radio Heater and Grid Wire
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Gold Plated Wire
Ground Seal Rod
Formed or Ground Parts
Cut and Bevelled Pieces
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Molybdenum

Wire, Rod
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Potassium Silicate • Etching Inks
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Silicon • Germanium

Phosphors

Cathode Ray Tube Phosphors

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COMPLETE COVERAGE

Amplifiers
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Bolometer Mounts
Carrier Oscillators
Coaxial Instruments
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Directional Couplers
Distortion Analyzers
Electronic Counters
Electronic Tachometers
FM Monitors
Frequency Counters
Frequency Converters
Frequency Meters
Frequency Standards
Function Generators
Interpolation Oscillators
Low Pass Filters
Microwave Test Equipment
Nuclear Scalers
Oscillators
Power Meters
Power Supplies
Pulse Generators
Signal Generators
Slotted Sections
Square Wave Generators
Standing Wave Indicators
Time Interval Meters
TV Monitors
Vacuum Tube Voltmeters
VHF Bridge
Video Test Oscillators
Waveform Analyzers
Waveguide Equipment

hp

SHORT FORM CATALOG

Hewlett-Packard offers over 250 measuring instruments for manufacturing, industrial and scientific research, equipment maintenance, communications and military use.

Each *-hp-* instrument gives you the economies of fast, accurate performance, broad usefulness, and dependable service. Each has the familiar *-hp-* characteristics of simple operation, minimum adjustment, independence of line voltage or tube changes, generous overload protection and highest quality design and construction.

This catalog gives brief details of major *-hp-* instruments. For complete information, see your *-hp-* representative, or write direct.

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-hp- Oscillators — Signal Generators .01 to 10,000,000 cps

-hp- 200 SERIES AUDIO OSCILLATORS



Four widely used *-hp-* oscillators have been redesigned into two compact, lightweight instruments offering wider frequency range, more operating simplicity, highest accuracy and stability. New Models 200AB and 200CD replace Models 200A through 200D, retain the time-tested RC circuits that insure constant output, low distortion; require no zero set. *-hp-* also offers Model 202D for sub-audio, audio, supersonic and carrier tests; and Model 200I, a spread-scale oscillator for interpolation or where frequency must be known precisely.

-hp- 650A TEST OSCILLATOR



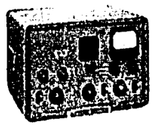
Highly stable, wide band (10 cps to 10 mc) multi-purpose test oscillator for audio, supersonic, video, and rf measurements. Output variable 30 μv to 3 v. Frequency response flat ± 1 db. Output impedance 600 ohms, or 6 ohms with voltage divider. $490.00△.

Instrument	Primary Uses	Frequency Range	Output	Price
-hp- 200AB	Audio tests	20 cps to 40 kc	1 watt/24.5 v	$120.00
-hp- 200CD	Audio, ultrasonic tests	5 cps to 600 kc	160 mw/20 v *	150.00
-hp- 200I	Interpolation and frequency measurements	6 cps to 6 kc	100 mw/10 v	225.00
-hp- 200T	Telemetry, carrier current tests	250 cps to 100 kc	160 mw/20 v *	350.00
-hp- 201B	High quality audio tests	20 cps to 20 kc	3 w/42.5 v	250.00
-hp- 202A	Low frequency measurements	.01 cps to 1 kc	20 mw/10 v	465.00△
-hp- 202B	Low frequency measurements	½ cps to 50 kc	100 mw/10 v	365.00△
-hp- 202D	Low frequency measurements	2 cps to 70 kc	100 mw/10 v	275.00
-hp- 204A	Portable, battery operated	2 cps to 20 kc	2.5 mw/5 v	175.00
-hp- 205A	High power audio tests	20 cps to 20 kc	5 watts	405.00△
-hp- 205AG	High power tests, gain measurements	20 cps to 20 kc	5 watts	440.00△
-hp- 205AH	High power supersonic tests	1 kc to 100 kc	5 watts	565.00△
-hp- 206A	High quality, high accuracy audio tests	20 cps to 20 kc	+15 dbm	565.00△
-hp- 230A	Carrier test oscillator	35 cps to 35 kc	+14 dbm/600 ohms	275.00
-hp- 233A	Carrier test oscillator	50 cps to 500 kc	3w/600 ohms	475.00
-hp- 234A	Carrier test oscillator	160 cps to 160 kc	+14 dbm/600 ohms	300.00
-hp- 650A	Wide range video tests	10 cps to 10 mc	15 mw/3 v	490.00△

*Open circuit. Internal impedance 600 ohms.

-hp- Distortion, Wave Form Analyzers — 20 cps to 20 kc

-hp- 330B DISTORTION ANALYZER



Measures distortion as low as 0.1%, 20 cps to 20 kc. Measures noise voltages as low as 100 μv. High sensitivity, high stability, broad applicability for broadcast, laboratory or production. Wide band 20 db gain input amplifier. Built-in VTVM usable separately. $410.00△.

FM, AM-FM MODELS

-hp- 330C, for FM broadcasters, includes VU meter meeting F.C.C. requirements. *-hp- 330D,* for AM-FM broadcasters, includes AM detector to rectify AM carrier, plus VU meter employed in model 330C. Model 330C, $440.00△. Model 330D, $455.00△.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 300A	Wave form analyzer	30 cps to 16 kc	Variable selectivity; measuring range 1 mv to 500 v	$625.00
-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	455.00△
SQUARE WAVE GENERATOR				
-hp- 210A	Transient and frequency response	20 cps to 10 kc	Output 50 v peak-to-peak 1,000 ohm impedance	150.00

-hp- Vacuum Tube Voltmeters — 2 to 700,000,000 cps

-hp- 400D VACUUM TUBE VOLTMETER



Best *-hp-* voltmeter 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 dbm. 10 megohm input impedance insures negligible loading on circuits under test. New amplifier circuit with 56 db mid-range feedback assures utmost stability, freedom from change due to external conditions. $225.00.

Instrument	Primary Uses	Frequency Range	Voltage Range	Input Impedance	Price
-hp- 400A	General purpose ac measurements	10 cps to 1 mc	.005 to 300 v 9 ranges	1 megohm 24 μμfd shunt	$185.00
-hp- 400B	Low frequency ac measurements	2 cps to 100 kc	.005 to 300 v 9 ranges	10 megohms 24 μμfd shunt	195.00
-hp- 400D	Wide range ac measurements. High sensitivity	10 cps to 4 mc	.0001 to 300 v 12 ranges	10 megohms 14 μμfd shunt	225.00
-hp- 404A	Portable, battery operated	2 cps to 50 kc	.0005 to 300 v 11 ranges	10 megohms 20 μμfd shunt	185.00
-hp- 410B	Audio, rf, VHF measurements; dc voltages; resistances	20 cps to 700 mc	.1 to 300 v 7 ranges	10 megohms 1.5 μμfd shunt	245.00

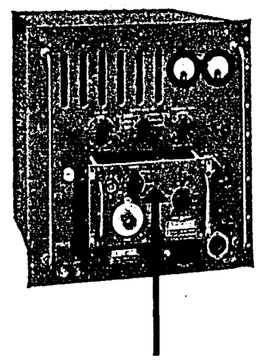
-hp- Voltmeter Accessories (not listed) include voltage dividers, connectors, shunts and multipliers to extend the useful range of your equipment.

△ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

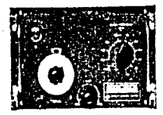
Data subject to change without notice. Prices f.o.b. factory.

NEW! 524B ELECTRONIC COUNTER

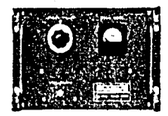
with plug-in units to fit your exact measuring need



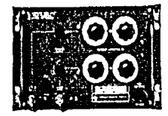
-hp- 524B Counter with -hp- 525A Frequency Converter



-hp- 525B Frequency Converter



-hp- 526A Video Amplifier



-hp- 526B Time Interval Unit

Frequency 10 cps to 220 mc, interval 1 μsec to 100 days and period 0 cps to 10 kc—all are measured instantly, automatically, directly by the revolutionary new *-hp-* 524B. You buy just the instrumentation you need; later add inexpensive plug-in units to double, triple versatility of this complete coverage instrument. Operation requires no calculations or technical training. Counter has high impedance, sensitivity, accuracy, quality construction. $1,915.00△.

-hp- 525A Frequency Converter extends Counter's basic 10 cps to 10 mc range to 100 mc; increases video sensitivity to 0.1 v, 10 cps to 10 mc. $225.00.

-hp- 525B Frequency Converter gives Counter range from 100 to 220 mc at 0.25 v sensitivity. $225.00.

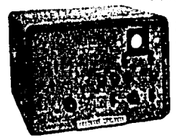
-hp- 526A Video Amplifier increases Counter's sensitivity between 10 cps and 10 mc to 10 millivolts for low level work. $125.00.

-hp- 526B Time Interval Unit measures interval 1 μsec to 100 days with accuracy of 0.1 μsec ± 0.001%. Reads direct in seconds, milliseconds, microseconds. $150.00

(Plug-in units supplied in aluminum storage cases)

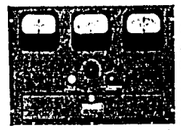
Other -hp- Frequency Measuring and Monitoring Equipment

-hp- 100D SECONDARY FREQUENCY STANDARD



Swift, sure frequency comparison, new convenience in standardizing with minimum external equipment. 100 μsec time markers, built-in oscilloscope, sine or rectangular waves. Low output impedance; short-time stability 1/1,000,000. Performs most functions of primary standards in audio, rf or supersonic ranges. $615.00△.

-hp- 335E TV MONITOR



Channels 2 through 83. Exceeds F.C.C. requirements. Compact, only 12¼" high, rack mounted. Low cost, all purpose, for visual and aural frequency monitoring, percentage aural modulation. Long-term dependability, precise accuracy, highest stability, no adjustment during operation. Forced ventilation, remote indication features. $1,950.00.

-hp- 512A/B FREQUENCY CONVERTERS



Two new *-hp-* Frequency Converters extend range of *-hp-* 524A Electronic Counter without loss of accuracy and with increased sensitivity. *-hp-* 512A covers frequencies 10 to 100 mc, 512B covers 100 to 220 mc. Complex setups eliminated, are easily used by non-technical personnel. *-hp-* 512A, 512B, $350.00.

-hp- 522B ELECTRONIC COUNTER



Compact, low cost, versatile instrument for frequency, period *or* time measurements. Range 10 cps to 100 kc. Reads direct in cps, kc, seconds or milliseconds. Count automatically reset, action repetitive. Stability of time base 5/1,000,000. Display length variable. Easily used by untrained personnel. $915.00△.

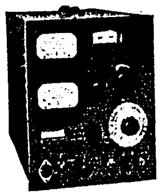
Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 100C Secondary Standard	Audio, supersonic calibration	100 kc, 10 kc, 1 kc, 100 cps	Accurate within ± .001% Sine waves only	$ 465.00△
-hp- 100D Secondary Standard	Frequency, time measurements	100 kc, 10 kc, 1 kc, 100 cps, 10 cps	Stability 1/1,000,000 (short-time) Sine or rectangular output. Marker pips	615.00△
-hp- 335B Frequency Monitor	FM broadcast station monitor	88 to 108 mc	Frequency deviation ± 3 kc; accuracy ± .001%; modulation 0 to 100 kc	935.00
-hp- 335E TV Monitor	TV visual, aural and % mod. monitor	Channels 2 through 83	Indicates visual, aural carrier frequency deviation, % modulation aural carrier	1,950.00
-hp- 500A Frequency Meter	Rapid frequency measurements	10 cps to 50 kc	10 ranges ± 2% accuracy. Input 0.5 to 200 volts	210.00
-hp- 505A Electronic Tachometer	Measurements of high speed machinery	600 to 3,000,000 rpm	10 ranges ± 2% accuracy	220.00
-hp- 505B Electronic Tachometer	Same as 505A	10 to 50,000 rps	Same as 505A except calibrated in rps	220.00
-hp- 510A Mixer	Measure frequency continuously with -hp- 500A and 100 D/C	20 cps to 200,000 cps	Mixes two frequencies, delivers difference to -hp- 500A	200.00
-hp- 512A Frequency Converter	Extends -hp- 524A range to 100 mc	100 kc to 100 mc	Fast, direct readings of signals to 100 mc with 524A. No charts, interpolation. Min. input 0.01 v	350.00
-hp- 512B Frequency Converter	Gives -hp- 524A range 100 to 220 mc	100 mc to 220 mc	Same as 512A except for frequency coverage and input 0.14 v RMS min.	350.00
-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- 522A Electronic Counter	Wide-range frequency, period measurements	10 cps to 100 kc	Frequency measuring gate time is 1 sec. or multiples; standard frequency counted for period measurement 100 kc	790.00△
-hp- 522B Electronic Counter	Wide-range frequency, period, time interval measurements	10 cps to 100 kc	Measures rate of occurrences 0.00001 to 100,000/sec.; time interval 10 μsec to 27.8 hrs.; periods of frequency count 1/1,000, 1/100, 1/10, 1, 10 sec. and multiples. Direct readings in cps, kc, sec. and millisec.	915.00△

△ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.

-hp- Signal Generators—10 to 11,000 mc

-hp- 612A UHF-TV SIGNAL GENERATOR



450 to 1,200 mc. Master oscillator-power amplifier generator for UHF-TV measurements including gain, selectivity, sensitivity, image rejection. Directly set and read; no charts, no interpolation. Low incidental fm, high-quality broad band video modulation to 5 mc. May be modulated internally or externally, amplitude modulated or pulse modulated. (Good rf pulses 0.2 μsec or longer.) $1,200.00.

Instrument	Frequency Range	Characteristics	Price
-hp- 608A	10 to 500 mc	Output 0.1 μv to 1 v into 50 ohm load. Pulse or CW modulation. Direct calibration.	$ 850.00
-hp- 612A	450 to 1,200 mc	Output 0.1 μv to 0.5 v into 50 ohm load. Pulse, CW or amplitude modulation to 5 mc. 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 0.071 v into 50 ohm load. Pulse, CW, FM or square wave modulation. Direct calibration.	2,250.00
-hp- 623B	5,925 to 7,725 mc	Output 70 μv to 0.223 v into 50 ohm load. FM or square wave modulation. Separate power meter and wave meter section.	1,750.00
-hp- 624B	8,500 to 10,000 mc	Output 3.0 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- Waveguide Test Equipment—2.6 to 18 kmc

Basic, low-cost elements offer utmost flexibility for assembly of exact instrumentation required. Each unit covers entire range of its waveguide size. Simple, sturdy mechanical design; 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" 5.85–8.2 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.
Adapter, Waveguide to Coax		S281A $75.00	G281A $55.00	J281A $50.00	H281A $45.00	X281A $35.00	
Cover to choke flange		S290A $65.00	G290A $50.00	J290A $35.00	H290A $25.00	X290A $15.00	P290A $20.00
Attenuators, Fixed 6, 10, 20 db		S370 $75.00	G370 $65.00	J370 $65.00	H370 $60.00	X370 $55.00	P370 $60.00
Flap, 25 db max.		S375A $110.00	G375A $100.00	J375A $90.00	H375A $80.00	X375A $50.00	P375A $65.00
Calibrated, precision		S380A $260.00		J382A $300.00	H382A $300.00	X382A $250.00	P382A $250.00
						X421A $75.00	
Detector Mounts	420A $50.00						
	440A† $85.00	S485A† $125.00	G485B† $95.00	J485B† $90.00	H485B† $85.00	X485B† $75.00	P485C■ $110.00
Thermistor Mounts (Fixed tuned)■	477A $75.00		G487A $95.00	J487A $90.00	H487A $80.00	X487A $75.00	
				J530A $120.00	H530A $120.00	X530A $120.00	P530A $150.00
Frequency Meters, Reaction							
Directional Couplers, Cross Guide: 20, 30 db		S750 $100.00	G750 $85.00	J750 $70.00	H750 $60.00	X750 $50.00	
Directional Couplers, Multi Hole: 3, 10, 20 db		S752 $260.00	G752 $170.00	J752 $140.00	H752 $120.00	X752 $100.00	P752A $135.00
Universal Waveguide Carriage	809B for frequencies 3,000 to 18,000 mc $160.00						
Slotted Sections, Waveguide		S810A* $450.00	G810B§ $90.00	J810B§ $90.00	H810B§ $90.00	X810B§ $90.00	P810B§ $90.00
Waveguide Tees, Series		S840A $100.00	G840A $85.00	J840A $65.00	H840A $50.00	X840A $35.00	P840A $40.00
Shunt		S841A $100.00	G841A $85.00	J841A $65.00	H841A $50.00	X841A $35.00	P841A $40.00
Hybrid		S845A $130.00	G845A $115.00	J845A $100.00	H845A $75.00	X845A $50.00	P845A $55.00
Transformers, Slide Screw		S870A $170.00	G870A $140.00	J870A $135.00	H870A $130.00	X870A $125.00	P870A $130.00
E-H		S880A $225.00	G880A $155.00	J880A $145.00	H880A $135.00	X880A $130.00	P880A $135.00
						X885A $250.00	
Waveguide Phase Shifter							
Terminations, Low Power		S910A $45.00	G910A $40.00	J910A $35.00	H910A $30.00	X910A $25.00	P910A $30.00
Terminations, High Power		S912A $125.00				X912A $75.00	
Moving Load		S914A $100.00	G914A $75.00	J914A $70.00	H914A $60.00	X914A $50.00	P914A $55.00
Adjustable Shorts		S920A $80.00	G920A $70.00	J920A $65.00	H920A $60.00	X920A $50.00	P920A $55.00
Broad Band Probe	442B $35.00	All Frequencies					
Broad Band Probe, Untuned	444A $50.00	All Frequencies					

†For use with bolometer or crystal. ‡For use with bolometer only. *Complete assembly including carriage. §Mounts in 809B Carriage—See next page.
■ Includes Thermistor, installed. See page 6.

△ *Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.*

Data subject to change without notice. Prices f.o.b. factory.

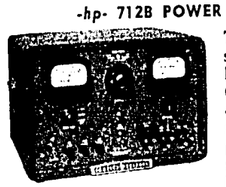
-hp- Regulated Power Supplies

-hp- 715A POWER SUPPLY



-hp- 715A is a versatile source of regulated beam and reflector voltage for operating most test bench klystron tubes. Beam voltage 250 to 400 v; reflector voltage 0 to 900 v; 6.3 v filament. Internal, 1,000 cps square wave modulation, also 60 cps fm modulation, both on reflector voltage. $300.00.

-hp- 712B POWER SUPPLY



This new *-hp-* instrument features high regulation of 0.01%, 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△.

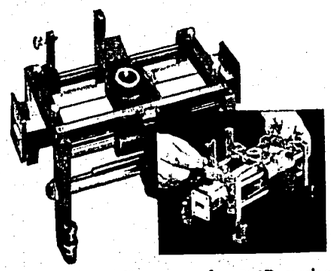
Instrument	Primary Uses	Characteristics	Price
-hp- 710A Power Supply	General purpose regulated plate and filament supply for lab and field use	180 to 360 volts at 75 milliamperes	$ 85.00
-hp- 710B Power Supply	Same as 710A	100 to 360 volts at 75 milliamperes	100.00
-hp- 712B Power Supply	Similar to 710A/B. Meets requirements for heavy duty field and lab work	0 to 500 volts at 200 milliamperes 0.01% regulation	365.00△
-hp- 715A Klystron Power Supply	Regulated beam, reflector source for low power klystrons	250 to 400 volts at 50 milliamperes	300.00
-hp- 717A Klystron Power Supply	Regulated beam, reflector source for Type 5721 klystrons	800 to 1,000 volts at 25 milliamperes	375.00

Equipment below available for most waveguide frequencies

See table at left for data, prices.

-hp- 809B UNIVERSAL PROBE CARRIAGE

-hp- 810 WAVEGUIDE SLOTTED SECTIONS



Convenient, all-purpose *-hp-* 809B carriage operates with six different *-hp-* slotted sections, waveguide and coaxial. Mounts sections covering frequencies 3,000 to 18,000 mc—*sections interchange in 30 seconds!* Precision-built carriage calibrated in mm to 0.1 mm; dial gauge may be mounted. Operates with *-hp-* 442B Broad Band Probe and *-hp-* 440A Coaxial Detector in combination; or with *-hp-* 444A Untuned Probe.

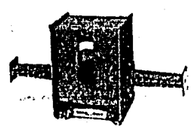
-hp- 810A/B Slotted Sections. -hp- 810B, for mounting in 809B carriage, is a flanged waveguide section with accurately machined slot tapered at ends to minimize reflection. Available in 5 waveguide bands, 3.95 thru 18.0 kmc. *-hp-* S810A, complete slotted section assembly including probe carriage. Available for 2.6 to 3.95 kmc band only.

-hp- 420A CRYSTAL DETECTOR



Employs a silicon crystal to detect rf signals in Type N coaxial line. Covers frequencies 10 mc to 12.5 kmc. Flat frequency response, excellent conversion efficiency. Uses modified 1N21 crystal.

-hp- X382A PRECISION ATTENUATOR



Precision broad band attenuation to 50 db. Completely independent of frequency; phase shift constant all attenuations. Calibrated range 0 to 50 db, maximum error ± 2% of db reading. 8,200 to 12,400 mc. VSWR less than 1.15 full range. Radical new design with rotating attenuator films.

-hp- 281A WAVEGUIDE-COAX ADAPTERS



For convenient transition between waveguide and coax systems. Each unit covers a full waveguide range with VSWR less than 1.25. Equipped with Type N connectors.

-hp- 444A UNTUNED PROBE



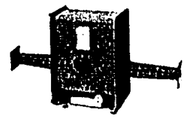
A 1N26 crystal plus small antenna in a convenient, easy-to-use housing. Variable penetration depth, no tuning required. Sensitivity equal to single- or double-tuned probes. Frequency range: 2.6 to 18.0 kmc. Mounts in 809B Carriage.

-hp- 487A THERMISTOR MOUNT



For fast, accurate waveguide power measurements. Each mount covers full range of its waveguide frequency. No tuning required, VSWR less than 1.5. Rugged construction, high temperature coefficient permanent thermistors virtually eliminate delays due to detector element burn-out.

-hp- X885A PHASE SHIFTER



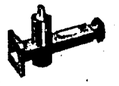
For accurate, precisely controlled phase variation throughout X-Band frequencies. Ideal for microwave impedance, transmission measurements, antenna and system design. Direct reading, low power absorption, 360° (electrical) range.

-hp- 752 MULTI-HOLE COUPLER



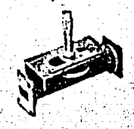
Directional couplers available in 2 models with coupling factors of 10 and 20 db ± 0.7 db over full range of a waveguide. VSWR better than 1.05. Directivity 40 db or better over entire range. Available as a 3-terminal network.

-hp- 485B DETECTOR MOUNTS



To measure power over complete waveguide range in conjunction with *-hp-* 430B Power Meter and barretter. Also measures relative level, or detects rf energy using 1N21 or 1N23 crystal. Semi-tuned by movable short to VSWR 1.25.

-hp- 870A SLIDE SCREW TUNERS



For flattening waveguide systems. The position and penetration of a probe is adjusted to set up a VSWR which is used to cancel existing VSWR in system. VSWR values up to 20 can be corrected with accuracy of 1.02 VSWR.

△ *Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.*

Data subject to change without notice. Prices f.o.b. factory.

Microwave Power Measuring Equipment

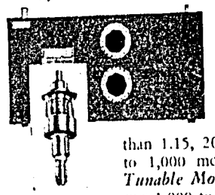
-hp- 430B MICROWAVE POWER METER



No computations! Provides instantaneous, automatic power readings *direct* in db 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. Operates with all mounts in adjacent table. $250.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 430B Microwave Power Meter	Measurement of rf power	Depends on Bolometer mount	.01 to 10 mw ± 5% accuracy	$250.00
-hp- 475B Tunable Bolometer Mount	Measurement of rf power	1,000 to 4,000 mc	Matches 50-ohm line to 100 or 200 ohms	200.00
-hp- 476A Universal Bolometer Mount	Measurement of rf power	10 to 1,000 mc	No tuning required VSWR less than 1.25	85.00
-hp- 477A Coaxial Thermistor Mount	Measurement of rf power	10 to 10,000 mc	Broad band, low VSWR, no tuning	75.00
-hp- 485 Waveguide Detector Mount	Measurement of rf power	2,600 to 18,000 mc	Full coverage of waveguide band	See Table page 4
-hp- 487A Waveguide Thermistor Mount	Measurement of rf power	4,000 to 12,000 mc	Full coverage, no tuning, 1.5 VSWR	See Table page 4

-hp- 475B/476A BOLOMETER MOUNTS



-hp- 476A Universal Bolometer Mount measures rf power 10 to 1,000 mc. No tuning or adjustment. VSWR less than 1.15, 20 to 500 mc; 1.25, 10 to 1,000 mc. $85.00. *-hp- 475B Tunable Mount* (upper), continuous 1,000 to 4,000 mc. $200.00.

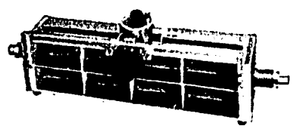
-hp- 477A COAXIAL THERMISTOR MOUNT



For frequency range 10 mc to 10 kmc. VSWR less than 1.5. Thermistor element is 200 ohm negative. Input connector type N, output Type BNC. $75.00.

Microwave Impedance Measuring Equipment

-hp- 805A/B COAXIAL SLOTTED SECTION



Range 500 to 4,000 mc. High accuracy, high stability, negligible slope, minimum leakage. Exclusive parallel plane design, VSWR of basic section and connectors, 1.04. *-hp-* 805A, 50 ohms, Type N coaxial connector. *-hp-* 805B, 46.3 ohms, for 7/8" rigid transmission lines. $475.00.

-hp- 806B COAXIAL SLOTTED SECTION

For continuous coverage at all frequencies from 3,000 to 12,000 mc. For use with *-hp-* 809B carriage. Section and connector VSWR 1.04 to 8,000 mc. 50 ohm impedance, negligible slope. Type N connectors, $200.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 360A-D Low Pass Filters	Eliminates harmonic voltages from UHF systems	Cutoff frequencies A-700 mc B-1,200 mc C-2,200 mc D-4,100 mc	50 db rejection at 1.2 cutoff freq.	$ 40.00
-hp- 415A Standing Wave Indicator	VSWR indicator or null indicator	300 to 2,000 cps Normal freq. 1,000 cps	0 to 60 db. attn. Max. sensitivity 0.3 μv	200.00
-hp- 416A Ratio Meter	Measure reflection coefficient, VSWR	1,000 cps ± 40 cps	Min. 3 millivolts or 0.3 μv; accuracy ±2%	365.00△
-hp- 417A VHF Detector	VHF bridge detector (for -hp- 803A)	10 to 500 mc	Approx. 5μv sensitivity	250.00
-hp- 803A VHF Bridge	Measurement of VHF impedance, VSWR	50 to 500 mc	2 to 2,000 ohms impedance — 90° to + 90° phase angle	495.00
-hp- 805A Coaxial Slotted Section	Measurement of VSWR	500 to 4,000 mc	For Type N Connectors, flexible cables	475.00
-hp- 805B Coaxial Slotted Section	Same as above	Same as above	For rigid 7/8" RG44/U line	475.00
-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	Supports 806B section, also G, J, H, X and P 810 Waveguide sections		Accepts 442B and 444A probes	160.00



-hp- 803A VHF BRIDGE

Gives fast, direct readings of any impedance between 50 and 500 mc. Measures by sampling electric and magnetic fields in transmission line. Usable for comparative measurements 5 to 700 mc. Impedance range 2 to 2,000 ohms. Phase angle —90° to + 90°, at 52 mc and above. Also measures SWR, % reflected power, VHF system flatness. $495.00.



-hp- 417A VHF DETECTOR

For use with 803A Bridge; or general laboratory use. Super-regenerative receiver, 10 to 500 mc. 5 bands. Approx. 5 μv sensitivity over entire band. Direct reading frequency control, thoroughly shielded. $250.00.



-hp- 415A STANDING WAVE INDICATOR

For all wavguide or coaxial slotted sections. Gives readings in VSWR or db. Single frequency operation; 300 to 2,000 cps. Low noise level, 0.3 μv sensitivity, 60 db. calib. attenuator. $200.00.

△ *Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.*

Data subject to change without notice. Prices f.o.b. factory.

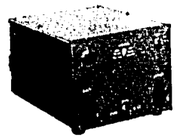
Amplifiers for General Use and Fast-Circuit Work

-hp- 460A/B AMPLIFIERS



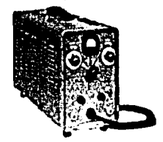
Complete instrumentation for distortion-free fast pulse measurement. *-hp- 460A Wide Band Amplifiers*, in cascade with *-hp- 460B Fast-Pulse Amplifiers* offer up to 90 db gain, 125 v open circuit output. This permits full deflection of 5XP CRT, or 2-inch deflection of 5CP tubes. Rise time 0.0026 μsec; can amplify milli-microsecond pulses; gives over 100 mc bandwidth to your standard oscilloscope. 460A, $185.00; 460B, $225.00. Connecting cables, plugs, accessories—prices on request.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 450A Amplifier	General purpose lab amplifier	5 to 1,000,000 cps	20 and 40 db gain freq. response + ½ db	$ 140.00
-hp- 460A Amplifier	Wide band, pulse amplification	100 kc to 140 mc	20 db gain, rise time 0.0026 μsec.	185.00
-hp- 460B Amplifier	Pulse amplification, high output	100 kc to 140 mc	15 db gain, 125 peak volts	225.00
-hp- 490A Traveling-Wave Tube Amplifier	Amplification and pulse modulation	S-Band—2 to 4 kmc	High gain, low noise, broad band 35 db gain	1,100.00
-hp- 491A Traveling-Wave Tube Amplifier	Power gain to 1 watt	S-Band—2 to 4 kmc	30 db gain	1,100.00



-hp- 450A AMPLIFIER

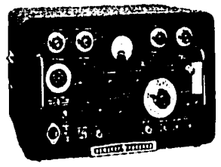
Time-tested, general purpose instrument, 20 db or 40 db gain, for use wherever wide frequency range and high stability are needed. 10 cps to 1 mc. Negligible phase shift, no spurious responses. $140.00.



-hp- 490A/491A TRAVELING-WAVE TUBE AMPLIFIERS

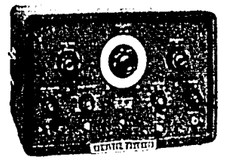
Two new broad band linear instruments providing a new, simple way to amplify, modulate, or increase power to 1 watt. Full S-Band coverage—2 to 4 kmc; 30 and 35 db gain, millimicrosecond pulse modulation, radical new coupled-helix design. High gain, low noise. *-hp-* 490A, $1,100.00. *-hp-* 491A, $1,100.00 (Includes capsulated tube).

-hp- 624B X-BAND TEST SET



High level, direct reading, *portable* test set simplifies lab or field work at frequencies from 8,500 to 10,000 mc. Rf output .223 v max. High stability attenuator reduces level by 100 db. May be pulsed or fm modulated. Separate section measures external rf power or external frequency. Ideal one-piece unit for measuring sensitivity and selectivity, tuning and power level of radar, gunfire and beacon systems. $2,265.00△.

-hp- 212A PULSE GENERATOR



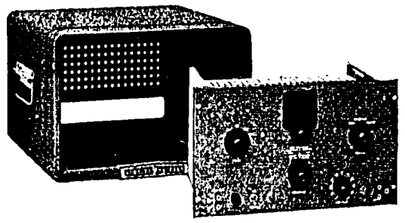
Provides continuously variable, high power "fast pulses" of superior wave form. Combines broad general usefulness with 0.02 μsec rise and decay time to meet requirements of radar, TV and nuclear work. Pulse length variable 0.07 to 10 μsec; minimum overshoot; 50 watt peak power (50 v to 50 ohms load). 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 pulses available in advance of, or following, output pulse. $565.00△.

New Streamlined All-Metal -hp- Cabinets

3 mounting options, greater flexibility of use

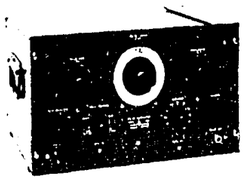
Now you can buy *-hp-* instruments mounted any of three ways, and, later on, change to any other mounting you wish. This new versatility means greater utilization of your *-hp-* instruments, and can also increase the flexibility of your entire instrument setup.

Cabinets. *-hp-* instruments having the standard 10½" x 19" panel are now available in standardized *-hp-* AC 44 aluminum-and-steel cabinets. Equipped with sturdy carrying handles, these cabinets give



your *-hp-* instruments greater protection, better ventilation, and a clean, rugged, modern appearance. Either the separate back cover or the cabinet itself can be removed quickly and easily. Cabinets are finished in wrinkle grey matching the *-hp-* grey baked enamel panel faces. Cabinet, with instrument, $15.00; separately, $25.00.

End frames. To increase flexibility and convenience of *-hp-* instruments for bench use, *-hp-* Model 17 End Frames are offered. These frames are of heavy gauge aluminum, equipped with sturdy carrying handles and finished in *-hp-* grey baked enamel. They fit all late model *-hp-* instruments with panel size 10½" x 19", and may be attached in moments. *-hp-* 17 End Frames, $7.50 set.



Rack mounting. Many *-hp-* instruments are basically rack mounting and can be installed directly into 19" relay racks. Many other *-hp-* instruments can be equipped for relay rack mounting at slight additional charge. A complete list of instruments available for rack mounting will be sent on request.



Smaller *-hp-* instruments, too, are now being delivered in new, streamlined cabinets. *-hp-* 512A/B Frequency Converter, illustrated, shows the rugged, lightweight metal cabinet now offered with such instruments as *-hp-* 200AB, 200CD, 410B and 715A.

△ *Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.*

Data subject to change without notice. Prices f.o.b. factory.



complete coverage

In electronic test instruments, Hewlett-Packard gives you complete coverage several different ways.

In development -*hp*- engineer teams are continually at work designing and producing accurate, helpful new instruments that meet and anticipate the demands of electronics.

In instrumentation the -*hp*- line is the world's largest and most complete. You choose from over 250 instruments the ones that provide exactly the measuring coverage you require.

In frequency coverage -*hp*- makes nearly every kind of useful electronic test instrument. And, for almost all useful frequencies, too. For example, -*hp*- signal generators offer solid frequency coverage from 10 to 11,000 mc; -*hp*- voltmeters from 2 to 700,000,000 cps, oscillators from 0.01 to 10,000,000 cps.

In personal service— -*hp*- has selected the best independent organizations in America to give you personal help with measuring problems. Electronics specialists—men trained by Hewlett-Packard—save you time by helping select the exact -*hp*- instrumentation you need—and following through to be sure the equipment is properly utilized to serve you best. These men are located in major business centers—as near as your telephone. Call them when you need personal help, — in your plant, today.

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SPERRY GYROSCOPE COMPANY

SPERRY KLYSTRON TUBES and *Microline*† INSTRUMENTS

Stemming from its sponsorship of the development of the klystron in 1938, Sperry has had vast experience in the manufacture of these tubes for low, medium and high power applications. As a result of Sperry's pioneering in microwave measuring techniques, this company has a complete line of *Microline* instruments which include every type of device essential to precision measurement, in the entire microwave field.

For further information on the equipment listed below or on new development of klystrons and microwave test units, write or telephone our Special Electronics Department or our nearest District Office.

KLYSTRONS

Type	Description	Frequency Range in MC	Output Power	Beam Voltage	Reflector Voltage
SRL17	Reflex Oscillator	750 to 990	5w	1000	0 to -1500
3K23	Reflex Oscillator	950 to 1150	5w	1000	0 to -1500
SRL7C	Reflex Oscillator	1850 to 2350	10w	1000	0 to -1000
2K41	Reflex Oscillator	2660 to 3310	250mw*	1250	0 to -250
2K42	Reflex Oscillator	3300 to 4200	250mw*	1250	0 to -250
2K43	Reflex Oscillator	4200 to 5700	250mw*	1250	0 to -250
2K44	Reflex Oscillator	5700 to 7500	250mw*	1250	0 to -250
2K39	Reflex Oscillator	7500 to 10,300	250mw*	1250	0 to -250
2K25	Reflex Oscillator	8500 to 9600	20mw	300	55 to -220
SRC43 Series	Reflex Oscillator	5925 to 8100	1w	750	0 to -300
SRU-55	Reflex Oscillator	14,000 to 17,500	25mw	300	0 to -150
SAC-19	Amplifier Oscillator	6000 to 6300	6w	625	none
SAS28	Cascade Amplifier	** 2600 to 2900	125w	4000	none
2K35	Cascade Amplifier	2730 to 3430	25w	3000	none
SAC41	Cascade Amplifier	3700 to 4200	10w	750	none
SAC9G	Cascade Amplifier	4970 to 5934	9w	1000	none
SAC43	Cascade Amplifier	** 4800 to 5300	500w	5200	none
SAL39	Pulsed Cascade Amp (1% duty cycle)	960 to 1215	80kw	20,000	none
SAX30	Pulsed Amplifier (3.5% duty cycle)	** 9100 to 9500	525w	5000	none
SAX22	Pulsed Amplifier (2.5% duty cycle)	** 9100 to 9500	1.5kw	17,000	none
SMS27	Frequency Multiplier	** 250 to 270 in ** 2500 to 2700 out	350mw	1000	none
SMC11	Frequency Multiplier	** 215 to 825 in ** 3256 to 6000 out	400 mw	1000	none
Series SMX32	Amp.-Freq. Multiplier	** 4500 to 5250 in ** 9000 to 10,500 out	1.5w	1000	none
SMK30	Amp.-Freq. Multiplier	** 4700 to 5200 in **23,500 to 26,000 out	600mw	1500	none

*Minimum Output Power

**Pretuned by manufacturer to center frequency specified by customer. An individual tube has only trimmer tuning.

†See Adapter Section for klystron tube fittings.

BARRETTER AND THERMISTOR MOUNTS

Model	Description	Barretter or Thermistor Type	Frequency Range-kmc	Max. VSWR	Fittings Input	Fittings Output
554	⅞" Coaxial Barretter and Thermistor	811 550	82-2.0	1.5 1.5	UG-46 U	BNC
163	Type N Coaxial	821	2.5-2.7	1.8	Type N Plug	UHF
85	Type N Coaxial	821	2.1-2.9	1.8	Type N Plug	UHF
164	Type N Coaxial	821	2.9-3.1	1.8	Type N Plug	UHF
215	2"x1" Waveguide	821	3.4-4.5	1.5	UG-149A U	UHF
423A	2"x1"		5.0-5.9	1.5	UG-149 U	BNC
83A	2"x1" Waveguide	821	4.6-5.65	1.5	UG-149A U	UHF
253	1½"x¾" Waveguide	821	5.3-6.6	1.5	UG-344 U	UHF
212	1½"x¾" Waveguide	821	6.0-7.6	1.5	UG-344 U	UHF
184	1"x½" Waveguide	821	8.5-9.6	1.5	UG-39 U	UHF
219C	1"x½" Thermistor Waveguide	543	8.5-9.6	1.5	UG-39 U	BNC
965A	702x 391	543	12.4-18	1.5	UG-4A U	BNC

BARRETTER ELEMENTS

811 125 OHMS see Barretter and Thermistor Mounts
821 200 OHMS see Barretter and Thermistor Mounts

THERMISTOR ELEMENTS

543 see Barretter and Thermistor Mounts
550 see Barretter and Thermistor Mounts

IMPEDANCE METERS

Model	Frequency Range-kmc	Reading Accuracy	Transmission Line Size	Detector Element	Flanges Input	Flanges Output
391A	0.5-4.0	0.1mm	⅞" Coaxial	1N21B*	UG-46 U	UG-45 U
299	2.6-4.0	0.1mm	1"x½"	1N21B*	UG-214 U	UG-214 U
101B	1.95-6.0	0.1mm	2"x1"	1N23B*	UG-149A U	UG-149A U
201	5.3-8.2	0.1mm	1½"x¾"	1N23B*	UG-344 U	UG-344 U
145	8.1-12.4	0.1mm	1"x½"	1N23B*	UG-39 U	UG-39 U
420	18.0-26.5	0.01mm	½"x¼"	1N26	UG-425 U	UG-425 U
346	26.5-40.0	0.01mm	360"x.220"	1N53	UG-383 U	UG-383 U

*The Model 421 barretter element can also be used.

IMPEDANCE TRANSFORMERS

Model	Type	Description	Frequency Range-kmc	Max. VSWR	Fittings
34A	Triple Stub	⅞" Coaxial	1.7-4.5	50	UG-46 U and UG-45 U
137	Double-Stub	⅞" Coaxial	2.06-10.4	10	UG-214 U and Type N Jack
301	Double-Slug	1"x½"	2.6-4.0	2.14	UG-149A U
109A	Double-Slug Waveguide	2"x1"	3.95-6.0	30	UG-149A U
117B	Susceptance Waveguide	2"x1"	3.95-6.0	30	UG-149A U
202	Susceptance Waveguide	1½"x¾"	5.3-8.2	30	UG-344 U
178	Susceptance Waveguide	1"x½"	8.1-12.4	30	UG-39 U
116	Double-Slug Waveguide	1"x½"	8.1-12.4	3.14	UG-39 U

†T.M. Reg. U. S. Pat. Off.

FREQUENCY METERS

Model	Description	Type*	Frequency Range-kmc	Absolute Accuracy	Fittings R-F	Fittings Video
124C	Broadband Coaxial	T	.66-3.0	1/1000	Type N	UHF
S22	Detector Wavemeter Kit	T&A	2.4-3.4	1/2000	Type N	UHF
291A	Cavity	T&A	2.575-3.78	1/10,000	Type N	BNC
27B	Coaxial	T	3.5-6.5	1/1000	Type N	UHF
28B	Cavity	T&A	4.01-6.0	1/10,000	UG-149A/U	UHF
207A	Coaxial	T	5.3-8.1	1/2000	Type N	BNC
208B	Cavity	T&A	5.49-8.1	1/10,000	UG-344/U	BNC
126	Coaxial	A	8.1-10.2	1/2000	UG-39/U	
273	Cavity	T&A	8.1-11.9	1/10,000	UG-39/U	UHF
348	Cavity	T&A	13.8-18.0	1/1000	UG-419/U	
349	Cavity	T&A	19.0-26.0	1/1000	UG-425/U	
350	Cavity	T&A	26.5-39.0	1/1000	UG-381/U	

*T—Transmission A—Absorption

DIRECTIONAL COUPLERS

Model	Description	Frequency Range	Attenuation-db	Fittings
517	⅛" Coaxial	.24-48	20-30-40	UG/46/U*
519	⅛" Coaxial	.48-96	20-30-40	UG-46/U*
480	⅛" Coaxial	.96-1.99	20-30-40	UG-46/U*
467	¼" Coaxial	1.99-4.0	20-30-40	UG-46/U*
306	3"x1½" Waveguide	2.6-4.0	30	UG-214/U
544	3"x1½" Waveguide	2.6-4.0	40	UG-214/U
545	3"x1½" Waveguide	2.6-4.0	50	UG-214/U
233	2"x1" Waveguide	4.0-6.0	24	UG-149A/U
321	2"x1" Waveguide	4.0-6.0	30	UG-149A/U
322	2"x1" Waveguide	4.0-6.0	40	UG-149A/U
209	1½"x¾" Waveguide	5.3-8.1	24	UG-344/U
237	1½"x¾" Waveguide	5.3-8.1	30	UG-344/U
305	1¼"x⅝" Waveguide	7-10	20	UG-51/U
546	1¼"x⅝" Waveguide	7-10	30	UG-51/U
547	1¼"x⅝" Waveguide	7-10	40	UG-51/U
235	1"x½" Waveguide	8.1-12.4	20	UG-39/U
419	1"x½" Waveguide	8.1-12.4	30	UG-39/U
234	1"x½" Waveguide	8.1-12.4	40	UG-39/U
388	0.702"x0.390" Waveguide	12.4-17.0	20	UG-419/U
413A	½"x¼" Waveguide	18.0-26.5	20	UG-595/U
414A	½"x¼" Waveguide	18.0-26.5	30	UG-595/U
415	½"x¼" Waveguide	18.0-26.5	40	UG-425/U
405A	0.360"x0.220" Waveguide	26.5-36.0	20	UG-599/U
429A	0.360"x0.220" Waveguide	26.5-40.0	10	UG-599/U

*Input fitting. Main line output UG-45/U. Secondary line output, UG-46/U. Adapters (Models 352A and 217) convert these units to Type N.

ATTENUATORS

Model	Description	Frequency Range-kmc	Attenuation Range-db	Waveguide Size	Fittings
127A	Precision ± .2db	29-32mc	15-95	—	UHF
110	Variable	4.0-6.0	0-20	2"x1"	UG-149A/U
134	Calibrated ± .5db	8.5-9.6	2-45	1"x½"	UG-39/U
173	Fixed ± .5db	8.5-9.6	3	1"x½"	UG-39/U
174	Fixed ± .5db	8.5-9.6	6	1"x½"	UG-39/U
183	Fixed ± .5db	8.5-9.6	10	1"x½"	UG-39/U
152A	Variable	8.1-12.4	0.5-20	1"x½"	UG-39/U
375A	Variable	12.4-18.0	1-15	0.702"x0.391"	UG-419/U
374A	Variable	26.5-40	1-20	0.360"x0.220"	UG-599/U

TERMINATIONS

Model	Description	Frequency Range-kmc	Power Capacity Watts	Max. VSWR	Fittings
637	⅛" Coaxial	.65-3.5	12	1.4	UG-46/U
308	3"x1½" Waveguide	2.6-4.0	1	1.04	UG-214/U
105	2"x1" Waveguide	3.95-6.0	1	1.04	UG-149A/U
113	2"x1" Waveguide	4.0-6.0	210	1.10	UG-149A/U
214	1½"x¾" Waveguide	5.3-8.2	1	1.04	UG-344/U
213	1½"x¾" Waveguide	5.3-8.2	150	1.10	UG-344/U
150	1"x½" Waveguide	8.1-12.4	1	1.04	UG-39/U
246	1"x½" Waveguide	8.1-12.4	100	1.10	UG-39/U
402	0.360"x0.220" Waveguide	26.5-40.0	18	1.15	UG-381/U
495	1"x½" Waveguide	8.1-12.4	5	Tunable	UG-39/U

HIGH POWER WAVEGUIDE TERMINATIONS

Model	Description	Frequency Range-kmc	Power* Capacity	Max. VSWR	Fittings (Similar to)
563	3"x1½" Waveguide	2.6-4.0	2500w Avg. 2.2 Meg. w (Peak)	1.15	UG-214/U
564	2"x1" Waveguide	3.95-6.0	1.5kw Avg. 1.4 Meg w (Peak)	1.15	UG-149A/U
565	1¼"x¾" Waveguide	7.0-10.0	350w Avg. 350kw (Peak)	1.15	UG-51/U
566	1"x½" Waveguide	8.1-12.4	500w Avg. 700kw (Peak)	1.15	UG-39/U
567	½"x¼" Waveguide	18.0-26.5	40w Avg. 80kw (Peak)	1.15	UG-595/U

*At atmospheric pressure

ELECTRONIC INSTRUMENTS

Model 84C Wattmeter Bridge*
Model 123B Wattmeter Bridge*
Model 555 Klystron Power Supply—see Klystrons
Model 296B Microwave Receiver
Model 38A F. M. Test Set (Commercial equivalent of the TS-147/B) X band
Model 539 VSWR Test Set X band

*See Barretter & Thermistor Section for units applicable to these bridges.

DETECTORS AND MIXERS

Model	Description	Frequency Range-kmc	Crystal	Fittings Input	Fittings Local Osc.	Fittings Output
337C	Mixer ¼" Coaxial	2.6-4.0	1N23	Type N Female	Type N	UHF
111B	Detector Sect.	3.95-6.0	1N23B	UG-149A/U	none	UHF
338	Mixer	3.95-5.85	1N23B	Type N	Type N	UHF
339	Mixer	5.85-8.2	1N23B	Type N	Type N	UHF
206A	Detector Sect.	5.3-8.2	1N21B*	UG-344/U	none	BNC
360A	Detector 1"x½" Waveguide	8.1-9.6	1N23B*	UG-39/U	none	BNC
379	Mixer	8.1-12.4	1N23B	UG-39/U	UG-39/U	UHF
357A	Detector 0.702" x0.391" Waveguide	12.4-18.0	1N26	UG-419/U	none	BNC
358	Detector ½"x¼" Waveguide	18.0-26.5	1N26	UG-425/U	none	UHF
359A	Detector 0.360" x0.220" Waveguide	26.5-40.0	1N53	UG-549/U	none	BNC

*The model 821 barretter element can also be used.

ADAPTERS

Model	Description	Frequency Range-kmc	Fittings	
352A	⅛" Coaxial to Type N	0-4.0	UG-45/U	Type N Jack
217	⅛" Coaxial to Type N	0-4.0	UG-46/U	Type N Jack
354A	⅛" Coaxial to ⅞" Coaxial	0-4.0	UG-45/U	UG-45/U
355A	⅛" Coaxial to ⅞" Coaxial	0-4.0	UG-46/U	UG-46/U
250	3"x1½" Waveguide to Type N	2.6-4.0	UG-214/U	Type N Jack
144A	3"x1½" Waveguide to ⅞" Coaxial	2.6-4.0	UG-214/U	UG-45/U
248	2"x1" Waveguide to Type N	3.95-6.0	UG-149A/U	Type N Jack
100A	2"x1" Waveguide to ⅞" Coaxial	3.95-6.0	UG-140/U	UG-149A/U
204	1½"x¾" Waveguide to Type N	5.3-8.2	UG-344/U	Type N Jack
249	1¼"x⅝" Waveguide to Type N	7.0-10.0	UG-51/U	Type N Jack
167A	1"x½" Waveguide to Type N	8.1-12.4	UG-39/U	Type N Jack
486A	SKL to 1"x½" Waveguide Transformer Adapter	8.1-12.4	UG-39/U	SKL

UG-275/U SKL Cable End Plug.
UG-276/U SKL Right Angle Plug.
UG-131/U SKL Type N Jack Adapter.

TEES

Model	Description	Frequency Range-kmc	Fittings
165A	1"x½" Waveguide—Series Tee	8.1-12.4	UG-39/U
166A	1"x½" Waveguide—Shunt Tee	8.1-12.4	UG-39/U
406	1"x½" Waveguide—Magic Tee	8.1-12.4	UG-39/U

SHORTS

Model	Description	Frequency Range-kmc	Fittings
636	⅛" Coaxial	.7-4.0	UG-46/U
114A	2"x1" Waveguide	3.95-6.0	UG-149A/U
203	1½"x¾" Waveguide	5.3-8.2	UG-344/U
377	1"x½" Waveguide	8.1-12.4	UG-39/U
372	0.702"x0.391" Waveguide	12.4-18.0	UG-419/U
373A	½"x¼" Waveguide	18.0-26.5	UG-595/U
371A	0.360"x0.220" Waveguide	26.5-40.0	UG-381/U

SPERRY GYROSCOPE COMPANY

Division of The Sperry Corporation · Great Neck, New York

Cleveland · San Francisco · Seattle · Los Angeles · New Orleans · Brooklyn

In Canada · Sperry Gyroscope Company of Canada Limited Montreal Quebec

JENNINGS VACUUM COMPONENTS

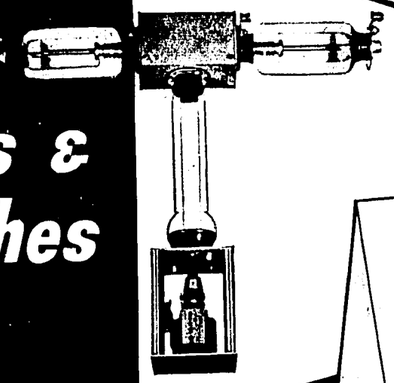
Variable Capacitors



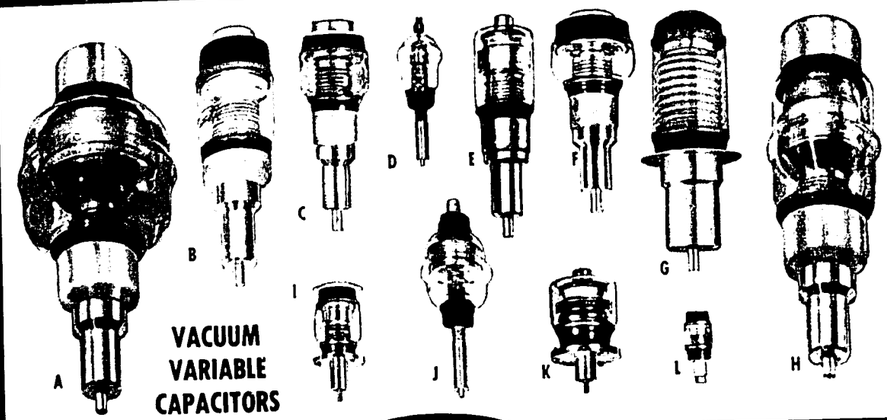


Fixed Capacitors

Relays & Switches

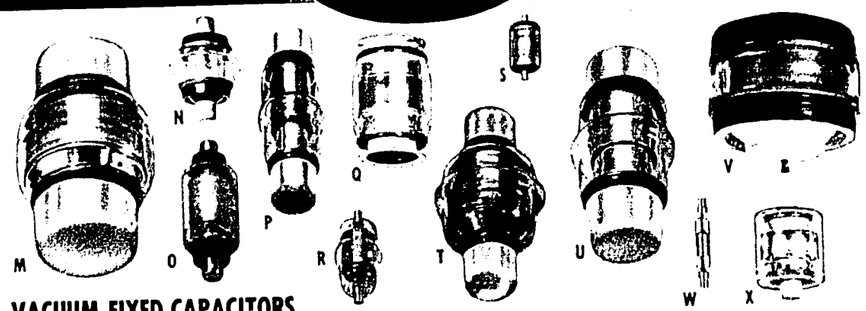


Jennings® RADIO
VACUUM ELECTRONIC COMPONENTS

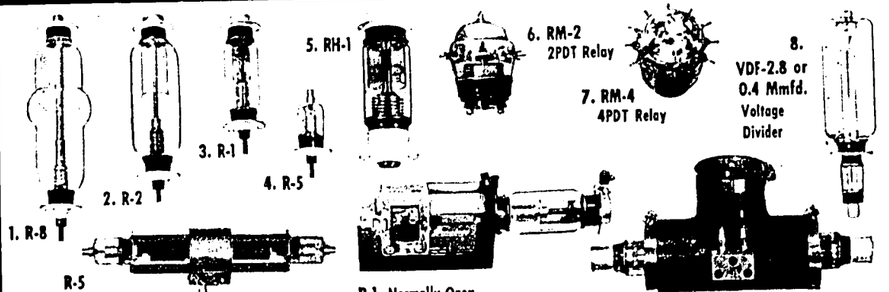


VACUUM VARIABLE CAPACITORS

Jennings RADIO ®
VACUUM ELECTRONIC COMPONENTS



VACUUM FIXED CAPACITORS



VACUUM SWITCHES & RELAYS

- BAKELITE or GLASS INSULATION
- AC or DC SOLENOIDS
- NO, NC or SPDT
- OVERLOAD, KEYING, AND COAX RELAYS

JENNINGS RADIO MANUFACTURING CORPORATION · 970 McLAUGHLIN AVE. P.O. BOX 1278 · SAN JOSE 8, CALIFORNIA

VARIABLE CAPACITORS

FIGURES	NICKEL TYPES	COPPER TYPES	CAPACITY MMFD	PEAK VOLTAGE KILOVOLTS	RMS AMPERES NCKL.	RMS AMPERES CPPR.	NOMINAL DIMENSIONS: OVERALL LENGTH	MAX. O.D.	CONTACT DIA.	MOUNTING CENTERS
D	T		5-25	20	10.5		6 3/8	2 1/4	1/2 x 5/8	4 1/8
J		TC	5-25	20		20	6 5/8	2 1/8	3/8	4 3/8
L		ECS	2-8, 3-30	10, 15		20	2 7/8	1 3/8	1	2 1/8
D	AT		10-50, 15-75	20, 25, 30	10.5		6 3/4	3	1/2 x 5/8	4 3/8
J		ATC	10-50	20, 30		20	7	3 1/8	3/8 x 5/8	4 5/8
J		ATCS	10-150, 15-190	7.5, 10, 15		20	7	3 1/8	3/8 x 5/8	4 1/2
K		VAC	4-40	10		42	4 5/8	2 3/4	1/2 x 7/8	.....
I		GCS	5-100	7.5, 10, 15		30	4 5/8	2 1/8	2 1/8	3 3/8
E		UCS	5-200, 10-300	7.5, 10, 15		42	8 3/4	2 5/8	7/8 x 2	4 5/8
E		UCS	10-375, 10-400, 25-500	7.5, 10, 15		42	9	3 1/8	7/8 x 2	4 7/8
F		UCSF	5-250, 12-500	7.5, 10, 15		60	7 3/4	3 5/8	2	.....
I		UCSL	4-250	3, 5		30	4	2 1/4	2 1/8	2 1/2
C		UCSL	4-500, 5-750, 7-1000	3, 5		42	7 5/8	3 1/8	2	3 1/2
C		UCSL	20-2000	2, 3		42	8 3/8	3 1/8	2	4 1/4
K		UCSV	8-110	7.5, 10, 15		60	4 3/4	3	7/8	.....
K		UCSV	100-250	7.5, 10, 15		60	5 1/4	3	7/8	.....
K		UCSVH	8-35	25, 35		60	4 3/4	3	7/8	.....
G		UCSM	4-500	7.5, 10, 15		80	10 5/8	3 5/8	2 x 3/8	6
B		UCSX	25-700, 25-1000	7.5, 10, 12		60	9 3/4	3 3/4	2 x 3 1/8	5
F		UCSXF	10-1000, 20-1500	7.5, 10, 12		60	9 3/4	5 1/8	3 1/8	4 7/8
F		UCSXF	50-2000, 50-2300	5, 7.5, 10		60	10	5 1/8	3 1/8	5 1/8
B		UCSXH	10-200	35, 45		60	10 3/4	4 1/2	2	5 1/2
F		UCSXH	20-450	35, 40		60	10	5 1/8	3 1/8	5 1/8
A	U	UC	50-250	10, 15, 20	21	60	11 1/2	5	2	6 1/2
A	UH	UHC	10-75, 75-150	35, 45, 55, 60	21	60	12	5	2	7
H	UX	UXC	25-500	10, 15, 20	21	60	14	5	3 1/8	7 3/4
H	UXH	UXHC	25-150	35, 45, 55	21	60	14 3/8	5	3 1/8	8 1/4
A	VMM	VMMC	50-1000, 100-2000	10, 15	35	125	15 7/8	6 1/8	4 1/8	9
A		VMMC	100-5000	5, 7.5, 10		125	19 1/2	9 1/4	4 1/8	11 7/8
A	VMMH	VMMHC	10-250, 25-450	35, 45, 55	21	125	16	8 1/8	4 1/8	8 3/4
A		VMMHC	60-1000	35, 40, 45		125	19 1/2	9 1/4	4 1/8	11 7/8

NOTE: Adjustable Capacitors are available to cover range of 8 mmfd to 1000 mmfd at 10 KV.

FIXED CAPACITORS

O	VC	VCC	6, 12, 25, 50, 75, 100, 150	20, 30	14	60	6 1/2	2 5/8	7/8	5 7/8
O	VC	VCC	200, 250	20, 30	14	60	6 1/2	2 3/4	7/8	5 7/8
R	W		6, 12, 25, 50, 100	20	10.5		4 1/4	2 1/4	3/8	3 1/8
W	X		5, 10, 15, 20, 25	17	7		3 1/4	1 1/8	3/8	2 1/8
W	Y		1, 2, 3, 4, 5	17	7		3 1/4	3/4	3/8	2 1/8
X		JCS-1	25, 50, 75, 100, 150	7.5, 10, 15		42	3 3/4	2 1/8	7/8	3 1/4
S		JCS-2	10, 20, 25, 50	7.5, 10, 15		20	2 3/4	1 1/2	3/8	2 1/4
X		JCS	250	7.5, 10, 15		42	3 3/4	2 5/8	7/8	3 1/8
X		JCS	500	7.5, 10, 15		42	4	3 1/8	7/8	3 1/2
X		JCS	1000	7.5, 10, 12		42	4 5/8	3 5/8	2	3 7/8
Q		JCSH	75	35, 45, 55, 60		42	4	2 7/8	7/8	3 3/8
X		JCSL	100	3, 5		20	2 5/8	1 1/2	3/8	2 1/4
S		JCSL	250	3, 5		20	2 5/8	1 7/8	3/8	2 1/8
S		JCSL	500, 750	3, 5		42	3 7/8	2 1/8	7/8	3 3/8
X		JCSL	1000, 1500	3		42	3 3/4	2 7/8	7/8	3 1/4
X		JCSL	2000	2		42	4	2 7/8	7/8	3 1/2
X		JC-2	25, 50, 75, 100	20, 30		42	4	3 1/4	7/8	3 1/4
N		JC-3	20, 40, 50, 60	35, 45, 55, 60		140	8 1/4	3 1/2	2	6 1/4
P		JC-4	75, 100, 125	35, 45, 55, 60		175	9 1/4	5	3 1/8	7
U		JC-5	200	35, 45, 55, 60		225	11 1/4	7	4 1/8	8 3/4
U				10, 15, 20	21	120	8 3/8	5	2	6 1/4
T	M	MC	500, 750, 1000	25, 30	21	120	9 1/4	5	2	7 1/4
T	ML	MLC	500, 750, 1000	10, 15	35	125	9 1/4	6 1/8	4 1/8	6 3/4
M	MM	MMC	1500, 2000	5, 7.5, 10		125	15 1/2	9 1/4	4 1/8	11 7/8
M		MMC	5000	35, 45, 55	21	125	9 1/4	6 1/8	4 1/8	6 3/4
M	MMH	MMHC	450	35, 40, 45		125	15 1/2	9 1/4	4 1/8	11 7/8
M		MMHC	1000	10, 15		75	4 1/8	4 1/8	2	3
V		MC-1	500, 750, 1000	10, 15		125	5	6 1/8	3 1/8	4
V		MMC-1	2000							

NOTE: Feed-thru Capacitors and glass standoff insulators are available on special order.

VACUUM SWITCHES & VOLTAGE DIVIDER

FIGURE	TYPE	DESCRIPTION	PEAK KILOVOLTS	RMS AMPS				
3	R-1	Vacuum Switch	50, 60	55	6 5/8	1 7/8	2 1/8	5
2	R-2	Vacuum Switch	50, 60, 70	50	8 1/2	2 5/8	2 1/8	6 5/8
4	R-5	Vacuum Switch	20	50	4	1 1/2	3/8 x 2 1/8	2 5/8
1	R-8	Vacuum Switch	40, 70, 85	100 (RF)	10 1/4	3 3/8	2 1/8	8 3/8
5	RH-1	Vacuum Switch	40, 50	200	7 1/8	3	3	6
6	RM-2	2PDT Vacuum Relay	12	10 (RF)	3 1/2	3 1/2	.....	.....
7	RM-4	4PDT Vacuum Relay	12	10 (RF)	3 1/2	3 1/2	.....	.....
9	RC-2	SPDT for 51.5 ohm, 3 1/8" Coax. Line	20	50 (RF)	.....	.....	.....	.....
8	VDF	Vac. Capacitor Voltage Divider	40, 50, 60	.....	9 1/2	2 1/2	5/8	6 1/2 x 2 5/8

NOTE: Switch current ratings approximately 50% at 10 megacycles.
ALL CURRENT RATINGS BASED ON 75° F. TEMPERATURE RISE.

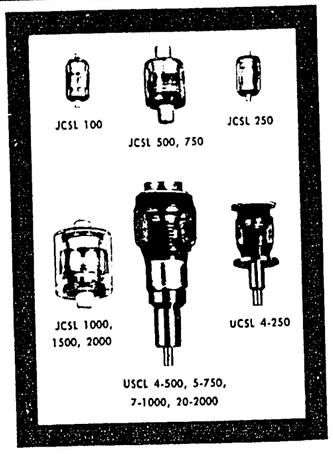
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Jennings RADIO
VACUUM ELECTRONIC COMPONENTS

JENNINGS VACUUM CAPACITORS
ADDED DURING THE PAST YEAR
TO PROVIDE WIDER CAPACITY RANGES AND HIGHER POWER RATINGS

LOW POWER CAPACITORS

The JCSL fixed and the UCSL variable series rated at 2 to 5 KV now include fixed capacities of 100, 250, 500, 750, 1000, 1500, and 2000 mmfd as well as variable capacity ranges of 4 - 250, 4 - 500, 5 - 750, 7 - 1000, and 20 - 2000 mmfd.

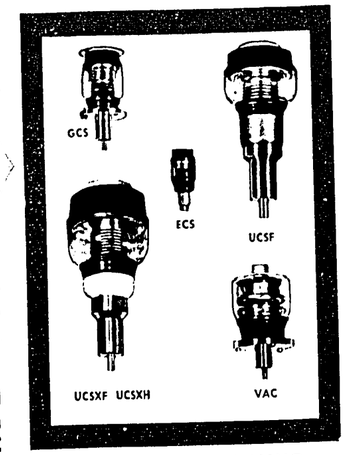


MEDIUM POWER CAPACITORS

More plates have been added to the UCS and UCSX series to give wider capacity ranges with the same movement. At a voltage rating of 10 KV, we now have the UCSF 5 - 250 and 12 - 500 mmfd as well as the UCSXF 7 - 1000, 20 - 1500, 25 - 2000, and 50 - 2500 mmfd.

At the same voltage rating of 10 KV, we also have added two small variables—the ECS 3 - 30, and the GCS 5 - 100 mmfd.

Finally, in the medium power field we have developed a non-linear tuning capacitor designed specifically for amateur service—the VAC 4 - 40 mmfd rated at 42 amperes rms at 10 KV.



HIGH POWER CAPACITORS



More plates have also been added to the UCSXH to create a new unit similar to the UCSXF shown above. The new UCSXH is rated at 35 KV and has a capacity range of 20 - 500 mmfd.

The capacity ranges of the VMMC and the VMMHC have been increased in the same way to give us the VMMC 100 - 5000 mmfd rated at 5 to 10 KV (and 100 amperes) and the VMMHC 60 - 1000 mmfd rated at 35 to 45 KV. Two new fixed capacitors using the same plates will also soon be available. These are the MMC 5000 mmfd rated at 5 to 10 KV and the MMHC 1000 mmfd rated at 35 KV.

VACUUM SWITCHES AND RELAYS Of the switches shown on the preceding pages, the R-8, RM-2, RM-4, and RC-2 switches and relays have been added during the past year.

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GUDEMAN

CAPACITORS

Paper-dielectric, plastic-film dielectric, metalized paper, dry electrolytic and ceramic capacitors are manufactured for commercial and military use. Among these types are high-temperature miniature paper-dielectric capacitors to meet the requirements of Specification MIL-C-25A. Other types manufactured are high-voltage paper-dielectric glass-cased capacitors, paper-dielectric capacitors in cardboard tubing, dry electrolytic capacitors in metallic or cardboard case, plastic-film dielectric capacitors in rectangular case and disc-type ceramic capacitors. Special capacitors are also designed and manufactured to meet individual requirements.

NOISE SUPPRESSION FILTERS

Low-pass, high-pass and band-pass filters are designed and manufactured to meet specifications for military and commercial applications. In addition, R-F Interference Filters for screen-booth application to handle high current with negligible voltage drop are manufactured.

PULSE TRANSFORMERS

Miniature pulse transformers are designed and manufactured to meet individual requirements for high-temperature applications. They are hermetically sealed in either metallic containers or encapsulated in epoxy resin. Metallic case types are furnished with either pig-tail or plug-in terminals. Encapsulated resin types are made with pig-tail terminals only.

DELAY LINES

Fixed, continuously variable, and decade delay lines are designed with either lumped or distributed parameters for operation over temperature ranges of — 65°C to + 125°C. Gudeman delay lines possess low attenuation and low coefficient of thermal delay. Encased in fibre tubing, hermetically sealed containers, or encapsulated in epoxy resin.

Detailed Information On Request

THE COMPANY
340 WEST HURON ST. • Chicago 10, Ill

MFG BRANCHES CHELSEA, MICH • SUNNYVALE, CAL • LOS ANGELES, CAL

Germanium Products

POINT CONTACT DIODES

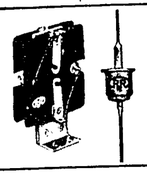


The interior of the RRCo. Diodes is vacuum filled with a flexible wax material which is chemically and electrically inert. Because of this the diode is excellently protected against the effects of moisture and contamination from the surrounding air.

1N34	1N54	1N64
*1N34A	1N54A	1N65
1N35	1N55	*1N69
1N38	1N55A	*1N70
1N38A	1N58	1N72
1N48	1N58A	1N75
1N51	1N60	*1N81
1N52	1N63	1N110

*JAN type

DIFFUSED POWER DIODES



Featuring very low forward resistance along with high back resistance which results in high rectification efficiencies of close to 100%. Intended for power rectification service.

1N91	1N152
1N92	1N153
1N93	1N158
1N151	

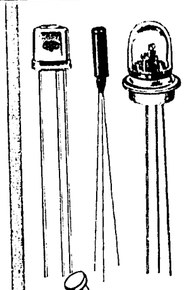
COMPUTER DIODES



Recommended for applications requiring stability, long life and higher temperature operation. Thousands in use meeting special requirements.

1N111
1N112
1N113
1N114
1N115

TRANSISTORS



Types RR14, RR20, RR34, 2N34, 2N36, 2N37 and 2N38 intended for applications in low level audio circuits. Particularly applicable where small size and economy of operation are desirable.

Type RR21 intended for applications in low level audio circuits requiring power outputs in the 10 milliwatt range.

Type RR38 intended for applications requiring economy of operation at low power levels. Particularly applicable as the output stage for hearing aids and personal receivers.

Type RR66, photo transistor.

Types RR83 and RR87 intended for service in switching applications such as flip-flop, multivibrator and pulse circuits.

RR14	†RR83
RR20	†RR87
RR21	2N34
RR34	2N36
RR38	2N37
*RR66	2N38

*Photo Transistor
†Computer Transistor

Our engineers will be glad to offer suggestions regarding your Germanium Diode and Transistor applications without obligation. For further information write for the following bulletins:

PG16A – Replacement Guide.
PG24 – Computer Diodes.
PG23 – General Diodes & PNP Transistors.
PG25 – Diffused Junction Power Diodes.
PG26 – 1N110 Measuring Technique.
PG27 – Photo Transistor.

NOTE:
The art of manufacturing germanium products is constantly changing as new methods and techniques are developed. New products and variations of the old are continuously added to our line. Write us requesting the latest information.

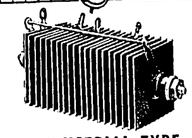
Really Reliable

Seletron and Germanium Division
RADIO RECEPTOR COMPANY, INC.
In Radio and Electronics Since 1922
SALES OFFICES: 251 WEST 19TH STREET, NEW YORK 11, N.Y., WATKINS 4-3633, FACTORIES IN BROOKLYN, N. Y.

Selenium Rectifiers

Really Reliable

INDUSTRIAL TYPE RECTIFIERS



These have proved reliable through years of service in various voltage and current combinations up to several hundred kilowatts. Useful for a multitude of applications: power supplies, magnetic amplifiers, electroplating, battery charging, etc.

HALF-WAVE RADIO TYPE RECTIFIERS



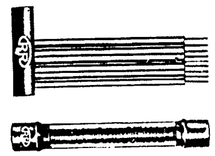
These stacks can meet the needs of many small power applications as for instance, relay operation. Millions are in use in radio and TV. Available for black and white as well as color TV in ratings up to 750 MA.

EMBEDDED RECTIFIERS



For adequate protection in military and other stringent uses. Recommended for use where size and weight are important considerations such as in aircraft applications.

CARTRIDGE ASSEMBLES



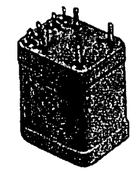
. . . From tiny, single cell diodes to several thousand volts. Phenolic or glass encased, wide range of half-wave, bridge and center tap types.

HIGH TEMPERATURE TYPES



These selenium rectifiers are capable of operating in an ambient temperature of 125°C. with no increase in the size of the cell as compared with a similar rectifier operating in a normal ambient.

HERMETICALLY SEALED UNITS



Built to special requirements to meet unusually severe conditions. Designed to meet individual needs.

RECTIFIERS FOR MAGNETIC AMPLIFIERS

Designs will be submitted to meet individual requirements.

Our engineering department will be glad to aid you in the solution of your rectifier problems. Submit your requirements and let us make recommendations . . . without obligation, of course! See our catalog in Sweet's Product Design file.

For additional information write for the following bulletins:

P-177—Listing Industrial and Half-wave Radio Types.
P-172—Selenium Diodes.
P-178—Cartridge assemblies.

RR Seletron

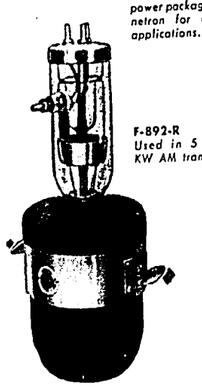
Seletron and Germanium Division
RADIO RECEPTOR COMPANY, INC.
In Radio and Electronics Since 1922
SALES OFFICES: 251 WEST 19TH STREET, NEW YORK 11, N.Y., WATKINS 4-3633, FACTORIES IN BROOKLYN, N. Y.

Dependable Electronic Tubes for...

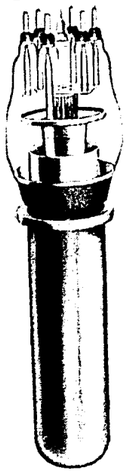
TRANSMITTING · RECTIFYING · INDUSTRIAL SPECIAL PURPOSE · TELEVISION



4J52
65 Kilowatt peak power packaged magnetron for airborne applications.



F-892-R
Used in 5 and 10 KW AM transmitters.



5918
High power triode for broadcast communications and industrial applications.

Basic Technical Data Covering Complete Line of FEDERAL POWER TRIODES

Type	Description	Cooling*	Max. Plate Dissipation	Mu	Max. Plate Input	Max. DC Plate Volt.	Max. Freq. for Max. Ratings	Filament Voltage
F-3X2500A3	HF Triode	A	2.5 KW	20	8 KW	4,000	110 MC	7.5
F-3X2500F3	HF Triode	A	2.5	20		6,000	30	7.5
F-7C23	Pulse Triode	A	1.2	25		17,000	5	11.0
F-7C25	HF Triode	A	2.5	25	5.6	4,500	50	11
F-7C26	HF Triode	A	1	17	3	3,000	150	9.0
F-8C25	AF Triode	A	5	6	10	5,000		7
F-9C23	RF Triode	W	25	32	50	15,000	20	22
F-9C28	AF Triode	W	40	4.75	100	15,000		7.5
F-9C29	AF Triode	A	20	4.75	50	15,000		7.5
F-9C30	RF Triode	W	40	42	120	15,000	20	7.5
F-9C31	RF Triode	A	20	42	100	15,000	20	7.5
F-110X	RF Triode	W	25	40	50	20,000	3	28
F-124-A	RF Triode	W	40	42	135	20,000	20	13.6
F-124R	RF Triode	A	20	42	100	20,000	20	13.6
F-125-A	AF Triode	W	40	4.75	100	15,000		13.6
F-127-A	RF Triode	A	0.2	38	0.95	3,000	30	10
F-128-A	RF Triode	A	0.6	36	3	3,500	30	11
F-129-B	RF Triode	W	7.5	26	18	12,000	30	18
F-129-R	RF Triode	A	5	26	18	12,000	30	18
F-132-A	AF Triode	A	0.6	10	1.8	3,500		11
F-134	RF Triode	W	150	21	450	20,000	22	25
F-212E	RF Triode	A	0.275	16	0.7	2,000	4.5	14
F-220CA/320BA	RF Triode	A	5	40	22.5	15,000	4	21.5
F-220C/320B	RF Triode	W	10	40	22.5	15,000	4	21.5
F-342-A	RF Triode	W	25	40	50	20,000	4	20
F-343-A	RF Triode	W	10	40	36	18,000	4	21.5
F-343-AA	RF Triode	A	5	40	20	18,000	4	21.5
F-631	RF Triode	W	25	40	50	20,000	3	28
F-862-A	RF Triode	W	100	45	200	20,000	1.6	33
F-891	RF Triode	W	6	8.5	18	12,000	1.6	11/22
F-891-R	RF Triode	A	4	8.5	15	10,000	1.6	11/22
F-892-A	RF Triode	W	10	50	30	15,000	1.6	11/22
F-892-R	RF Triode	A	4	50	18	10,000	1.6	11/22
F-898-A	RF Triode	W	100	45	200	20,000	1.6	16.5
F-5604	HF Triode	A	10	19.5	32.5	12,500	22.5	11
F-5606	RF Triode	W	10	50	30	15,000	1.6	22
F-5619	HF Triode	W	20	19.5	32.5	12,500	22.5	11
F-5658	RF Triode	W	20	20.5	60	10,500	25	12
F-5666	HF Triode	W	12.5	21	20	10,000	22.5	11
F-5667	RF Triode	A	7.5	21	20	10,000	22.5	11.0
F-5668	RF Triode	W	20	50	28	14,000	5	22
F-5669	RF Triode	A	10	50	28	14,000	5	22
F-5680	HF Triode	A	2.5	25	12	6,000	30	13.0
F-5771	RF Triode	W	22.5	20	60	12,500	25	7.5
F-5874	AF Triode	W	7.5	6	15	6,000		7
F-5917	HF Triode	W	5.	20	8	4,000	110	7.5
F-5918	RF Triode	W	70	37	300	17,500	22	11
F-5919	RF Triode	A	35	37	175	17,500	22	11
F-5996	HF Triode	A	2.5	25	12	6,000	30	13.0
F-6009	HF Triode	W	6	25	12	6,000	30	13
F-6179	AF Triode	W	50	4.75	120	15,000		27.2
F-6366	HF Triode	A	3	25	7	5,500	30	11
F-6367	HF Triode	A	3	25	12	6,200	30	13
F-6399	HF Triode	W	5	25	7	6,200	30	11

* A=Forced Air Cooling W=Water Cooled

FEDERAL PULSED MAGNETRONS

Type	Description	Oper. Freq. Mc/sec	Oper. Volt. KV	Min.* Power Output KW	Output Transmission Line
2J31	Fixed freq.-External Magnet	2840 ± 20	20.0	240	Coax
2J32	Fixed freq.-External Magnet	2800 ± 20	20.0	240	Coax
2J33	Fixed freq.-External Magnet	2760 ± 20	20.0	240	Coax
2J36-A	Fixed freq.-External Magnet	9085 ± 80	11.5	28	Waveguide
2J49	Fixed freq.-External Magnet	9080 ± 80	12.0	40	Waveguide
2J55	Fixed freq.-Packaged	9375 ± 30	12.0	40	Waveguide
2J56	Fixed freq.-Packaged	9245 ± 30	12.0	40	Waveguide
4J52	Fixed freq.-Packaged	9375 ± 30	15.0	65	Waveguide
5J26	Tunable-External Magnet	1220–1350	27.5	400	Coax

*Duty cycle .001

FEDERAL RECTIFYING TUBES

Type	Description	Max. Peak Inverse Volt.	Max. Peak Current (Amps.)	Filament Voltage
F-869-B	Mercury Vapor	20,000	10	5
F-857-B	Mercury Vapor	22,000	40	5
F-575-A	Mercury Vapor	15,000	6	5
F-673	Mercury Vapor	15,000	6	5
F-315-A	Mercury Vapor	15,000	6	5

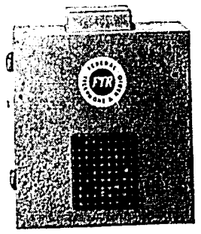
HANDBOOK OF TUBE OPERATION

72 Page booklet giving complete technical data on how to obtain longer service life from your power vacuum tubes. Write Dept. K-5105 for your copy.



Federal Telephone and Radio Company
A Division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
100 KINGSLAND ROAD, CLIFTON, N. J.
In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

Federal's MOBILE RADIO COMMUNICATION EQUIPMENT for INDUSTRIAL USE



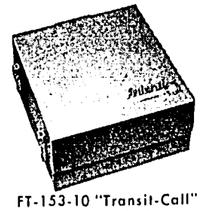
FT-153-A-10CZ
TRANSMITTER RECEIVER



134 A
CONTROL UNIT

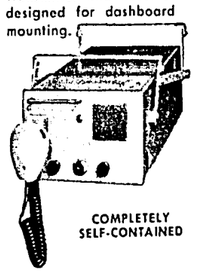
FT-153-A-10CZ Fixed-Station equipment designed for office desk installation, with telephone-type control.

Improve plant operations with Federal Mobile Radio equipment. More efficient dispatch of fork-lift trucks, cranes, yard trucks to jobs within and around factory buildings. Easy to install —Low in cost—Dependable operation. Three types of equipment available with RF power output of 10 watts at 162 Mc.

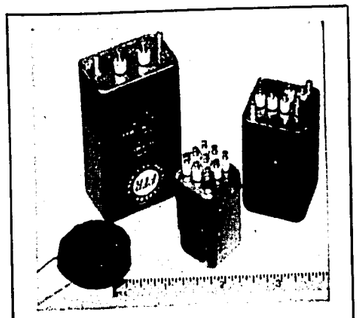


FT-153-10 "Transit-Call" Transmitter and Receiver for standard mounting. Total weight is under 29 pounds.

FT-156 "Transit-Call" Transmitter and Receiver designed for dashboard mounting.



COMPLETELY SELF-CONTAINED



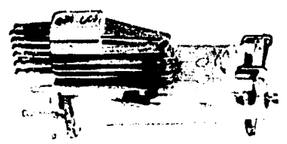
MINIATURE TRANSFORMERS

Miniature Hermetically Sealed input, output and inter-stage Audio Transformers, featuring Federal's new hermetically sealed terminal. Hermetically sealed power transformers and chokes. Meets government specifications.

TELEPHONE TYPE RELAYS



Telephone type relays available with a wide variety of contact combinations and ratings. Single and double coil combinations are available with coil resistances ranging from a few ohms to several thousand ohms.



DELAY LINES and PULSE TRANSFORMERS

Delay Lines:

The new Federal Delay Lines are of the lumped constant type. They are compact, lightweight, efficient and meet military requirements. They are hermetically sealed against dust, dirt and moisture.

RANGE OF DELAY.....0.3 to 45 microseconds
IMPEDANCE RANGE.....100 to 10,000 ohms
MINIMUM RISE TIME.....0.5 microseconds

Pulse Transformers:

Of miniaturized construction, compact and efficient. Meet government specifications and are hermetically sealed.

DUTY CYCLE.....1 maximum PULSE WIDTH.....5 to 7.0 microseconds
RISE TIME.....05 microseconds minimum

FILTERS

Various filters are available including high-pass, low-pass and band-pass for audio and carrier type applications. Meet commercial and military specifications. Hermetically sealed against dust, dirt and moisture. Use toroidal type high Q coils.

TOROIDS

With high Q performance they are self shielding and available in hermetically sealed cases, encapsulated, or unsealed and to meet military requirements.

POWER TRANSFORMERS

Hermetically sealed, compact, rugged and high quality types to meet commercial and military specifications. Meet Class A, B or H temperature requirements. Also available in lightweight, high temperature, 400 cycle aircraft type.

FEDERAL TRANSFORMERS ARE DESIGNED AND BUILT TO MEET CUSTOMER SPECIFICATIONS.

MINIATURE ANTI-CAPACITY SWITCHING KEY



For airborne and other equipment—whenever compactness and light weight are prime factors. A miniature, light-weight design with 8 "Break-Make" contacts. Two groups of 12 contact springs each are actuated by a molded phenolic drive roller with a simple motion of the lever. Both sides are non-locking. Contact springs are molded into units of 4 springs each, formed and pre-tensioned which will reduce adjusting of springs after assembly to a minimum. The complete spring pileup consists of 6 interlocking molded blocks, mounted into frame with a screw. Meets military requirements.

"SINGLE-CRYSTAL-STABILIZED" GERMANIUM DIODES *Featuring* HERMETICALLY-SEALED CONSTRUCTION

Designed to be built into compact modern electronic equipment. Even under adverse conditions it will insure long life and the ultimate in reliable performance.

These Types Available:

1N34 . . . 1N34A . . . 1N38 . . . 1N38A . . . 1N39 . . . 1N48 . . . 1N51 . . . 1N52 . . . 1N54 . . . 1N54A . . . 1N55 . . . 1N55A . . . 1N56 . . . 1N56A . . . 1N58 . . . 1N58A . . . 1N63 . . . 1N64 . . . 1N65 . . . 1N69 . . . 1N70 . . . 1N75 . . . 1N81.

Federal — RADIO-TV SELENIUM RECTIFIERS















The revolutionary circuit elements that have led the way to important design advances in TELEVISION & RADIO RECEIVERS & ELECTRONIC EQUIPMENT

Wherever DC power is required there is a Federal Radio-TV Selenium Rectifier to do the job... and do it with an efficiency and reliability that is backed by the outstanding reputation of Federal—America's oldest and largest manufacturer of Selenium Rectifiers.

•Federal Cat. No.	Max. Output MA-DC	Max. Input (RMS) Volts	MA	Min. Ser. Res. Ohms	Peak Inverse Volts (Max.)	Peak Current (Max.)	△Construction and Nom. Cell Size	Application
1159	20	130	54	50	380	200	⅜" Dia. (T)	B+ Booster; Bias
1263A	65	130	135	35	380	500	11/16" Square (E)	B+ Radio, UHF Converter
1002A	65	130	175	22	380	750	1" Sq. (E)	B+ AC-DC (5 tube)
1003A	75	130	200	22	380	1000	1" Sq. (E)	B+ 3-way Radios
1101A	100	130	270	22	380	1000	1¼" Sq. (E)	B+ Radios, Television
1004A	100	130	270	22	380	1500	1¼" Sq. (E)	B+ Radios, Television
1005A	150	130	410	15	380	2000	1-17/32" Sq. (E)	B+ Radios, Television
1006A	200	130	540	5	380	2500	1-17/32" Sq. (E)	B+ Television
1028A	250	130	675	5	380	3000	1-17/32" Sq. (S)	B+ Booster; Bias
1090A	300	130	810	5	380	3250	1⅝" Sq. (S)	B+ Television
1231A	325	130	880	5	380	3500	1⅝" Sq. (S)	B+ Television
1261A	350	130	945	5	380	3500	1¾" Sq. (S)	B+ Television
1023A	350	130	1080	5	380	3000	2" Sq. (S)	B+ Television
1130A	300	130	1200	5	380	4500	2" Sq. (S)	B+ Television
1021A	450	130	1600	5	380	6000	2½" Sq. (S)	B+ Television
1200A	600	130	2000	5	380	7500	2½" Sq. (S)	Vibrator
1223A	750	130	270	22	460	1000	1¼" Sq. (E)	B+ Television
1014A	100	160	1200	5	460	4500	2" Sq. (S)	B+ Booster
1022A	450	160	54	50	740	200	⅜" Diam. (T)	Vibrator Doubler
1233	20	260	200	22	460	750	1" Sq. (S)	Vibrator Doubler
1007A	75	160*	270	22	460	1000	1½" Sq. (S)	Vibrator Doubler
1008A	100	160*	540	5	460	2000	1-17/32" Sq. (S)	Bridge Rectifier
1009A	200	160*	175	....	35	750	1" Sq. (E)	Bridge Rectifier
1015	150	25	350	....	35	1500	1¼" Sq. (E)	Bridge Rectifier
1016	300	25	700	....	35	3000	1-17/32" Sq. (E)	B+ Television
1017	600	25	2000	5	570	7500	2½" Sq. (S)	Battery Charger
1229A	750	195	.....	....	.....	.....	4¼" lg. (Mtg. Plt.)	Bias Rectifier
1018	1600	26‡	.....	....	35	750	1" Sq. (E)	
1001A	75	20	200	....				

△(E) Eyelet. (S) Stud. (T) Paper Tube.

*These rectifiers have two sections—characteristics given apply to one section only; if both sections are used in series, voltage input is 320 volts.

†The characteristics given for this rectifier are based on its use in a half-wave rectifier circuit with a 3-cell battery load.

‡The characteristics given for this rectifier are based on its use in a full-wave rectifier circuit with a 3-cell battery load.

•'A' after code number indicates locking lug.



FEDERAL'S RADIO-TV SELENIUM RECTIFIER HANDBOOK

80 pages of valuable designs, characteristics and application. Available for 50 cents (coin only).

SELENIUM RECTIFIER EQUIPMENTS

QUALITY-BUILT

MAGNETIC AMPLIFIERS

Powered by Quality Controlled

Federal

SELENIUM RECTIFIERS

Presently used in a wide range of successful applications for industry and the Armed Forces, such as:

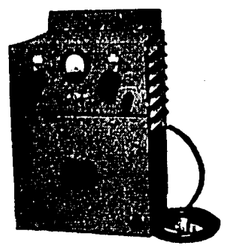
- Voltage Control
- Temperature Control
- Current Control
- Photoelectric Control
- Speed Control
- Counting
- Position Control
- Automatic Regulation

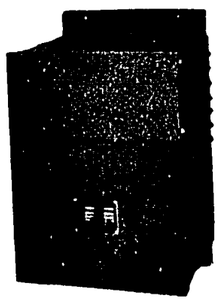
Federal Selenium Rectifiers, in partnership with the right magnetic components, provide Magnetic Amplifiers outstanding for:

Stability • Accuracy • Long Life
High Gain • Fast Response
Low-cost Operation

Submit your magnetic amplifier requirements to Federal—write to Dept. F-4104

POWER SUPPLIES: Designed to furnish a dependable and constant source of D-C power. Whether for industrial or laboratory use, these equipments are available in sizes to serve your requirements. For industrial requirements they are used to power magnetic equipment such as chucks, brakes, clutches, screens, separators, drums and pulleys, and also provide power for lifting magnets, relays, circuit-breakers and D-C motors.





Code Number	A-C Input Volts	Phase	Cycles	D-C Output Volts	Amps.
FTR 3246-BS*	115	1	60	6	10
FTR 3352-BS	115	1	50/60	5/10	20/10
FTR 3093-AS*	115	1	60	12	3
FTR 3138-BS*	115	1	60	12	5
FTR 3185-AS*	115	1	60	12	7.5
FTR 3339-BS	115/230	1	50/60	6-24	18
FTR 3341-AS	115	1	50/60	28	5
FTR 3128-BS**	115	1	60	22-30	10
FTR 3300-DS	115	1	60	2-32	50
FTR 3340-BS	115	1	50/60	5-70	12
INDUSTRIAL					
FTR 3115-JS	115	1	50/60	115	1
FTR 3116-BS	115	1	50/60	115	5
FTR 3117-HS	115	1	50/60	115	10
FTR 3117-JS	230	1	50/60	115	10
FTR 3152-AS	220/440	3	50/60	115/230	4.4/2.2
FTR 3153-AS	220/440	3	50/60	115/230	6.6/3.3
FTR 3154-AS	220/440	3	50/60	115/230	8.8/4.4
FTR 3155-AS	220/440	3	50/60	115/230	13/6.5
FTR 3228-BS	220/440	3	50/60	115/230	26/13

**Filtered and regulated equipment. *Filtered.

Federal — ENGINEERING & MANUFACTURING FACILITIES

THE SELENIUM RECTIFIER DIVISION

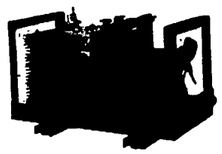
Offers Its Outstanding Engineering and Manufacturing Facilities to

GOVERNMENT CONTRACTORS

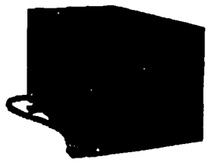
Consult us for Aircraft, Ground and Naval Requirements



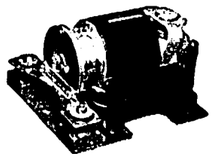
HEAVY-DUTY FEDERAL SELENIUM RECTIFIER



FTR 3146-BS AIRCRAFT POWER SUPPLY



FTR 3414-AS GROUND AIRCRAFT POWER SUPPLY



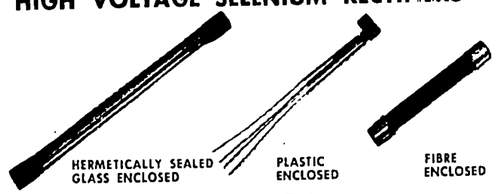
FTR 3141-CS CLIP-IN VOLTAGE REGULATOR

The Selenium Rectifier Division of Federal—the nation's headquarters for selenium rectifiers—is ready to serve you with start-to-finish production of power supplies, battery chargers, voltage regulators, engine starters, cathodic protection and other units—compact, rugged, quiet, dependable power equipments designed for any DC output.

Federal knows selenium rectifiers. Federal has unmatched power conversion experience . . . an experience backed by years of successfully meeting the rigid requirements of contracts for military equipments. And Federal has the capacity to deliver your orders—when you want them!

Mail us your specifications today!

HIGH VOLTAGE SELENIUM RECTIFIERS



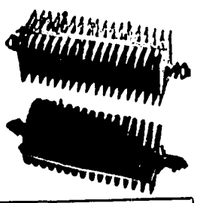
HERMETICALLY SEALED GLASS ENCLOSED — PLASTIC ENCLOSED — FIBRE ENCLOSED

Federal Code Number	DC Output Voltage	Max. Output MA-DC	Max. Peak Inverse Voltage	AC Input Voltage
147H110Q1	1400	8	4000	1400
147H 82Q1	1050	8	3000	1050
147H 55Q1	700	8	2000	700
147H 28Q1	350	8	1000	350

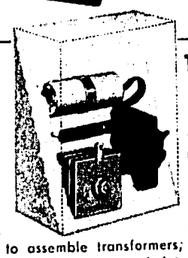
SELENIUM RECTIFIERS *for Industrial Service* From AC to DC . . . Millowatts to Kilowatts



Low-cost power conversion . . . efficient, dependable . . . from a-c to d-c. Introducing new, broad range adaptability in diverse fields, conditions and applications. They obtain direct current from any alternating current source. They are small, light, easy to install. They meet all needs of an unattended service.



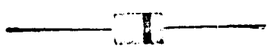
FOR COMPLETE DATA Write for Federal's Data Booklet on Selenium Rectifiers. An informative guide to characteristics and applications of the industry's most comprehensive line of high quality rectifiers. Address Dept. F-4104.



The FEDERAL System of ENCAPSULATION

Federal's method of encapsulating selenium rectifiers and allied components presents an entirely new approach to civilian and military equipment design — particularly where environmental or other unusual conditions necessitate special applications. It is now possible to assemble transformers, capacitors, resistors and other components—interconnected—into single blocks of equipment. Such assembly facilitates the replacement of individual as well as entire groups of components without the necessity of time-consuming repairs. Assures excellent thermal shock characteristics and resistance to vibration and cracking of the sealed unit over wide temperature ranges. Embedments withstand low temperatures to −65°C, as well as high temperatures to plus 125°C. Send for Bulletin F-534 for complete details.

FEDERAL CONTACT PROTECTOR



Federal's Contact Protectors are a sure way to longer life for relay contacts, eliminating circuit failure and interference caused by arcing.

1. Suppresses contact arcing
2. Extends Contact Life by more than 1000 times
3. Reduces circuit failure due to contact erosion (locking, surging, etc.)
4. Minimizes RF Interference
5. Has negligible effect on speed of operation of circuit
6. Needs no attention
7. Is easily installed
8. Requires little space
9. Is low in cost
10. Available as hermetically sealed unit to meet all JAN specifications.

Federal Telephone and Radio Company

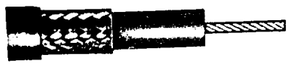
A Division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

100 KINGSLAND ROAD, CLIFTON, N. J.

In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

FEDERAL VARIETY OF CABLE TYPES

Federal's cable department produces a variety of H-F cable types. Some of these cables are produced by Federal *exclusively*. All are made to the most exacting standards of quality and control. The materials used are the finest research has developed, assuring top electrical characteristics. Initial dimensional precision helps to maintain stability over a wide temperature range.



SOLID DIELECTRIC COAXIAL CABLES

consist of a solid or stranded inner conductor, dielectric material, one or two copper wire braids, a synthetic resin protective jacket and, in some cases, a protective armor or metal braid. Dual coaxial cables are similar in design to the solid dielectric types, except that two accurately-spaced inner conductors are used.



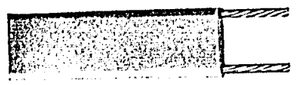
LOW-CAPACITANCE COAXIAL AIR-SPACED CABLES

have a construction similar to that of the solid dielectric types, except that air is made a portion of the dielectric. One method of accomplishing this effect and still maintaining a high dielectric strength is through a construction involving an inner conductor in a thin-walled dielectric tube. This is achieved by means of a dielectric thread wound in a long spiral.



SPIRAL DELAY, HIGH IMPEDANCE LINES

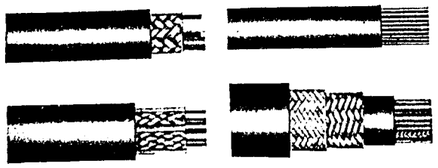
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Federal also manufactures many types of plastic-insulated wires and multi-conductor cables for television, intercom and numerous special purposes.

COMMUNITY TV COAXIAL CABLE

FEDERAL'S "BIG 5"—The answer to any Community TV Lead-in problem . . . Engineered for long life, low line loss and DEPENDABLE all-weather signal transmission . . . over the longest link. Federal's K-14, RG-11/U and RG-59/U are the H-F coaxials you can specify with utmost confidence . . . for community TV Distributing Systems in any area . . . for any amplifier system used.

Wherever the annoying, profit-eating problems of signal leakage and revenue loss exist, the answer is Federal's new K-125 and K-126 *non-radiating* alternates for RG-11/U and RG-59/U—used in conjunction with Federal's K-14 — the primary lead-ins famous for lowest line loss, long cable runs and fewer amplifiers required. Both K-125 and K-126 are *double-shielded* and *double-jacketed*.

All of the "BIG 5" are made to Federal's high standards of quality — and that means *dependable, all-weather transmission performance!*

Principal characteristics of Federal's "BIG 5" of Community TV

TYPE	ZO Impedance Ohms	Capacitance per ft. micro-micro farads	ATTENUATION DB per 100 Feet 50Mc	100Mc	200Mc	400Mc	Jacket OD Mils (Max.)	Weight per 1000 Ft. (lbs.)
K-14	71	21.5	.57	0.70	1.42	2.3	885	392
RG-11/U	75	20.5	1.5	2.15	3.2	4.7	415	89
RG-59/U	73	21	2.7	4.0	5.7	8.5	250	36
K-125	75	20.5	1.5	2.15	3.2	4.7	470	127
K-126	73	21	2.7	4.0	5.7	8.5	325	79

COMPLETE COAXIAL CABLE ASSEMBLIES also are available from Federal to meet your requirements. This service offers the same "Precision Production" that made Federal the outstanding name in coaxial cables.

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It's Federal for . . . EVERY H-F TRANSMISSION LINE REQUIREMENT

Std. Jacket	Type Low Temp. Black Jacket △	ZO Impedance Ohms	Nominal Capacitance Per Foot Micro-Micro Farads	Nominal Attenuation 100 Mc. Db/100 Ft.	Inner Conductor Strands ●	Braid +	Jacket ×
RG-5A/U	RG-5B/U	50	28.5	2.4	S1	C260	V335
RG-6/U	RG-6A/U	76	20	2.8	CW1	S264	NCV339
RG-7/U		100	12.5	2.0	C1	C304	V379
RG-8/U	RG-8A/U	52	29.5	2.1	C7/#21	C340	V415
RG-9A/U	RG-9B/U	51	30	2.3	S7/#21	(2)S355	NCV430
RG-10/U††	RG-10A/U††	52	29.5	2.1	C7/#21	C340	NCV475
RG-11/U	RG-11A/U	75	20.5	2.1	T7/#26	C340	V415
RG-12/U††	RG-12A/U††	75	20.5	2.1	T7/#26	C340	NCV475
RG-13/U	RG-13A/U	74	20.5	2.1	T7/#26	C355	V430
RG-14/U	RG-14A/U	52	29.5	1.4	C1	C463	NCV558
RG-15/U		76	20	1.5	CW1	(2)C463	V558
RG-17/U	RG-17A/U	52	29.5	.85	C1	C760	NCV885
RG-18/U††	RG-18A/U††	52	29.5	.85	C1	C760	NCV945
RG-19/U	RG-19A/U	52	29.5	.68	C1	C990	NCV1135
RG-20/U††	RG-20A/U††	52	29.5	.68	C1	C990	NCV1195
RG-21/U	RG-21A/U	53	29	14.0	Res. wire	(2)S264	NCV339
RG-22A/U	RG-22B/U	95	16	4.0	*C7/0.0152"	(2)T355	NCV430
RG-23/U	RG-23A/U	125	12	1.7	*C7/#21	C845x446	V960x670
RG-24/U††		125	12	1.7	*C7/#21	C845x446	1034x735
RG-29/U		53.5	28.5	4.2	C1	C150	PE184
RG-34/U	RG-34A/U	71	21.5	1.8	C7/#21	C540	V640
RG-35/U††	RG-35A/U††	71	21.5	.70	C1	C760	NCV945
RG-54A/U		58	26.5	3.1	C7/0.0152"	T220	PE250
RG-55/U		53.5	28.5	4.2	C1	T176	PE206
RG-57/U	RG-57A/U	95	17	3.0	*C7/#21	T540	V640
RG-58/U	RG-58B/U	53.5	28.5	4.2	C1	T150	V200
RG-58A/U	RG-58C/U	50	28.5	5.3	T19/0.0071"	T150	V200
RG-59/U	RG-59A/U	73	21	3.8	CW1	C191	V250
RG-62/U	RG-62A/U	93	13.5	3.1	CW1	C191	V250
RG-63/U	RG-63B/U	125	10.	2.0	CW1	C340	V415
RG-65/U	RG-65A/U	950	44		C1	C340	V415
RG-71/U		93	13.5	3.1	CW1	T208	PE250
RG-74/U††	RG-74A/U††	52	29.5	1.4	C1	C463	NCV615
RG-79/U††		125	10	2.0	CW1	C340	V475
RG-79B/U††		125	10	2.0	CW1	C340	NCV475
RG-86/U		200	7.8	.56	*C7/#21		PE665x300
RG-108/U	RG-108A/U	76	24.5		*T7/#28	T177	NCV240
RG-111/U††	RG-111A/U††	95	16	4.0	*C7/0.0152"	T355	NCV490
FTR TYPES							
K-14		71	21.5	.70	C1	C760	NCV885
K-38		72	22	4.0	C7/#30	C195	V250
KT-107		72	22	6.1	*C7/#28	C191	NCV250
K-109A		160	8.3	8.0	B1	T232	V282
K-111		300	4.2	3.4	*B1	C435x235	V490x290
K-113		34	39	4.5	T41/#34	C150	V200
K-200		200	7.8	.56	*C7/#21		PE665x300

+ C—Copper, T—Tinned Copper, S—Silver Plate Copper, B—Bronze, OD in mils (max.)
× V—Vinyl, PE—Polyethylene, NCV—Non-contaminating Vinyl, OD in mils (max.)
△ See information in column to right under RG Type Cables.
†† Armored (Jacket dimension given is over armor)
* 2 inner conductors.
● Inner Conductor Strands column indicates material by same abbreviations as +- CW—copperweld.

An Original Development by Federal

RG TYPE CABLES

WITH THE NEW LOW-TEMPERATURE NON-CONTAMINATING THERMOPLASTIC JACKET

Federal is supplying low temperature non-contaminating jackets on all cable types which now call for it and will also supply such compounds for specific cables to meet customers' requirements. The low temperature, non-contaminating jacket was an original Federal development.

The new RG types are outstanding for their longer service life under the most adverse conditions. Their non-contaminating feature means there is no reduction in dielectric strength due to molecular migration.

New HR* WIRES

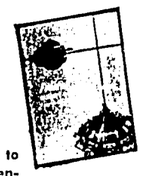
14 to 24 AWG

High impact strength, resists thermal shock. Impervious to the action of corrosive chemicals and highly resistant to most organic solvents. Water absorption is nil therefore the corona formations and surface flash-over are minimized. Low cold flow. Covers a wide temperature range (—55°C—150°C) to cover any application for hook-up wire. Also can be used at lower temperatures and higher temperatures for short periods.

TEFLON INSULATED WIRE and CABLES

Your inquiries are invited on these new Federal wires and cables.

*Heat Resistant



FOR COMPLETE DATA

Write for Federal's Catalog on HF Cables. An informative guide to characteristics and applications of the industry's most comprehensive line of high quality HF Cables. Address Dept. D-3104.

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problems?

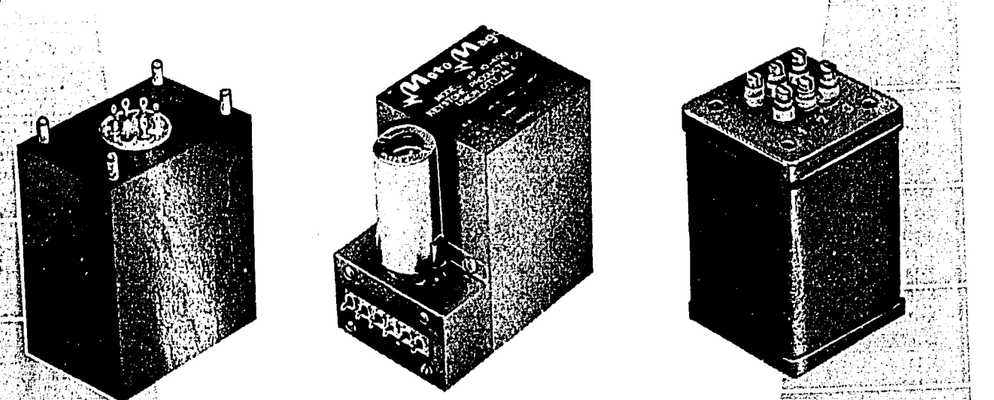
let KEYSTONE custom-engineer the most effective solution

When just an ordinary transformer or magnetic amplifier won't do, call on KEYSTONE — a leading producer of custom-engineered equipment to meet unusually difficult specifications.

Standard or subminiature transformers available to provide unique electronic accuracy, special quality, lower weight, or other critical factors.

New KEYSTONE "Moto Mag" pre-designed magnetic amplifiers lick problems before they get started — save precious engineering time. By utilizing these pre-engineered "Moto Mags" in servos, computers, remote control devices, and other variable phase power units you'll save planning headaches and production dollars.

We'll be glad to demonstrate how "Moto Mags" can work effectively for you.

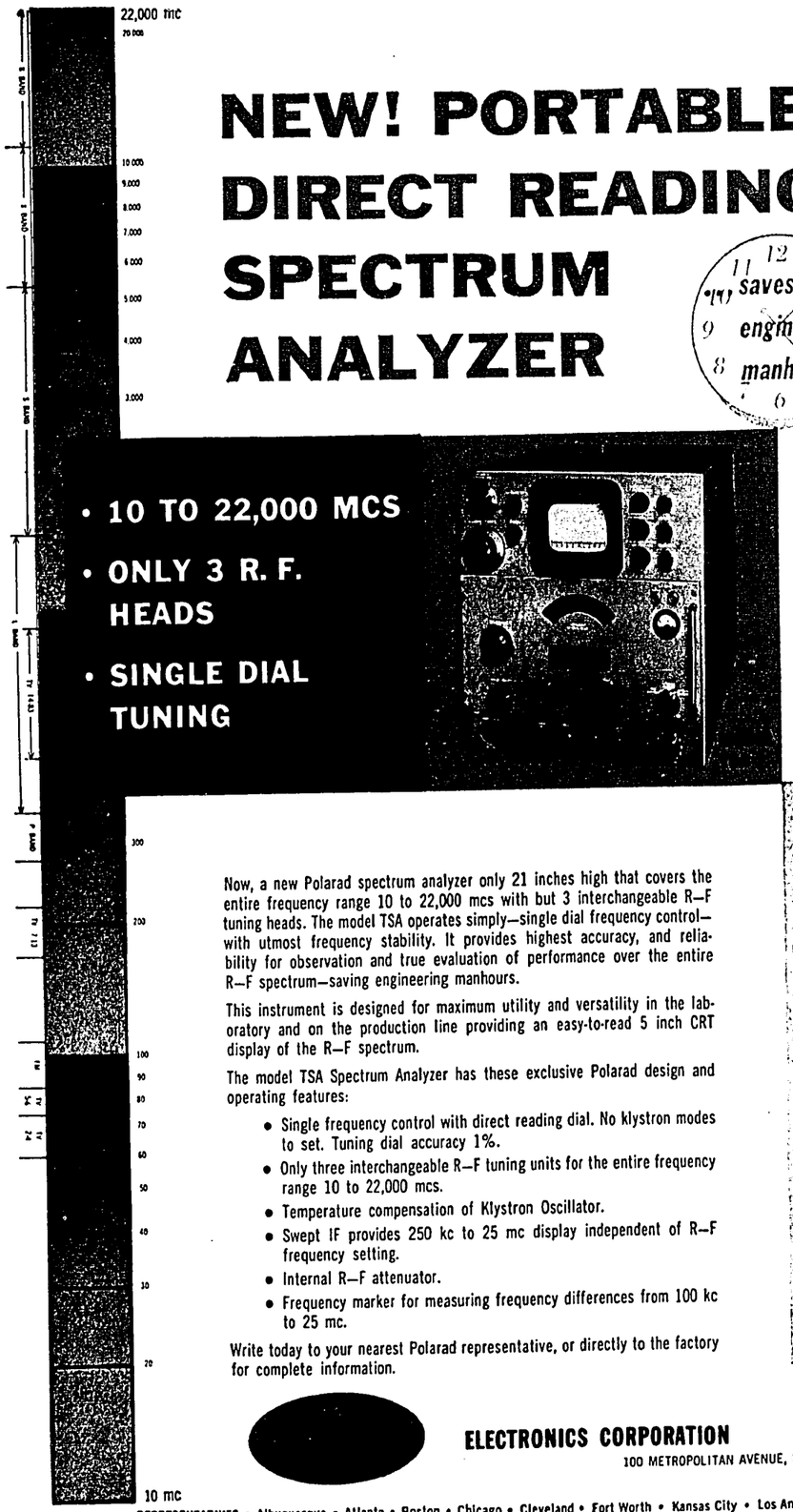


Write, wire or phone for additional details, technical information and quotes — now!

KEYSTONE PRODUCTS COMPANY

UNION CITY 2, N. J. UNION 6-5400

NEW! PORTABLE DIRECT READING SPECTRUM ANALYZER



saves 9 engineering manhours

- 10 TO 22,000 MCS
- ONLY 3 R. F. HEADS
- SINGLE DIAL TUNING

Now, a new Polarad spectrum analyzer only 21 inches high that covers the entire frequency range 10 to 22,000 mcs with but 3 interchangeable R—F tuning heads. The model TSA operates simply—single dial frequency control—with utmost frequency stability. It provides highest accuracy, and reliability for observation and true evaluation of performance over the entire R—F spectrum—saving engineering manhours.

This instrument is designed for maximum utility and versatility in the laboratory and on the production line providing an easy-to-read 5 inch CRT display of the R—F spectrum.

The model TSA Spectrum Analyzer has these exclusive Polarad design and operating features:

- Single frequency control with direct reading dial. No klystron modes to set. Tuning dial accuracy 1%.
- Only three interchangeable R—F tuning units for the entire frequency range 10 to 22,000 mcs.
- Temperature compensation of Klystron Oscillator.
- Swept IF provides 250 kc to 25 mc display independent of R—F frequency setting.
- Internal R—F attenuator.
- Frequency marker for measuring frequency differences from 100 kc to 25 mc.

Write today to your nearest Polarad representative, or directly to the factory for complete information.

Model No.	Equipment
Model TSA	Spectrum Display and Power Supply
Model STU-1	R-F Tuning Unit 10-1,000 mc.
Model STU-2	R-F Tuning Unit 910-4,560 mc.
Model STU-3	R-F Tuning Unit 4,370-22,000 mc.

SPECIFICATIONS:

Frequency Range: 10 mc to 22,000 mc

Frequency Accuracy: 1%

Resolution: 20 kc

Frequency Dispersion: Electronically controlled, continuously adjustable from 50 kc/in. to 7 mc/in.

Input Impedance: 50 ohms

Over-all Gain: 120 db

Attenuation: RF....Internal: 120 db continuously variable IF....60 db continuously variable

Input Power: 400 watts

ELECTRONICS CORPORATION

100 METROPOLITAN AVENUE, BROOKLYN 11, NEW YORK

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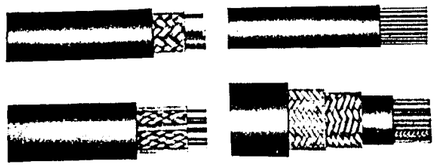
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RG-6/U	RG-6A/U	76	20	2.8	CW1	S264	NCV339
RG-7/U		100	12.5	2.0	C1	C304	V379
RG-8/U	RG-8A/U	52	29.5	2.1	C7/#21	C340	V415
RG-9A/U	RG-9B/U	51	30	2.3	S7/#21	(2)S355	NCV430
RG-10/U††	RG-10A/U††	52	29.5	2.1	C7/#21	C340	NCV475
RG-11/U	RG-11A/U	75	20.5	2.1	T7/#26	C340	V415
RG-12/U††	RG-12A/U††	75	20.5	2.1	T7/#26	C340	NCV475
RG-13/U	RG-13A/U	74	20.5	2.1	T7/#26	C355	V430
RG-14/U	RG-14A/U	52	29.5	1.4	C1	C463	NCV558
RG-15/U		76	20	1.5	CW1	(2)C463	V558
RG-17/U	RG-17A/U	52	29.5	.85	C1	C760	NCV885
RG-18/U††	RG-18A/U††	52	29.5	.85	C1	C760	NCV945
RG-19/U	RG-19A/U	52	29.5	.68	C1	C990	NCV1135
RG-20/U††	RG-20A/U††	52	29.5	.68	C1	C990	NCV1195
RG-21/U	RG-21A/U	53	29	14.0	Res. wire	(2)S264	NCV339
RG-22A/U	RG-22B/U	95	16	4.0	*C7/0.0152"	(2)T355	NCV430
RG-23/U	RG-23A/U	125	12	1.7	*C7/#21	C845x446	V960x670
RG-24/U††		125	12	1.7	*C7/#21	C845x446	1034x735
RG-29/U		53.5	28.5	4.2	C1	C150	PE184
RG-34/U	RG-34A/U	71	21.5	1.8	C7/#21	C540	V640
RG-35/U††	RG-35A/U††	71	21.5	.70	C1	C760	NCV945
RG-54A/U		58	26.5	3.1	C7/0.0152"	T220	PE250
RG-55/U		53.5	28.5	4.2	C1	T176	PE206
RG-57/U	RG-57A/U	95	17	3.0	*C7/#21	T540	V640
RG-58/U	RG-58B/U	53.5	28.5	4.2	C1	T150	V200
RG-58A/U	RG-58C/U	50	28.5	5.3	T19/0.0071"	T150	V200
RG-59/U	RG-59A/U	73	21	3.8	CW1	C191	V250
RG-62/U	RG-62A/U	93	13.5	3.1	CW1	C191	V250
RG-63/U	RG-63B/U	125	10.	2.0	CW1	C340	V415
RG-65/U	RG-65A/U	950	44		C1	C340	V415
RG-71/U		93	13.5	3.1	CW1	T208	PE250
RG-74/U††	RG-74A/U††	52	29.5	1.4	C1	C463	NCV615
RG-79/U††		125	10	2.0	CW1	C340	V475
RG-79B/U††		125	10	2.0	CW1	C340	NCV475
RG-86/U		200	7.8	.56	*C7/#21		PE665x300
RG-108/U	RG-108A/U	76	24.5		*T7/#28	T177	NCV240
RG-111/U††	RG-111A/U††	95	16	4.0	*C7/0.0152"	T355	NCV490
FTR TYPES							
K-14		71	21.5	.70	C1	C760	NCV885
K-38		72	22	4.0	C7/#30	C195	V250
KT-107		72	22	6.1	*C7/#28	C191	NCV250
K-109A		160	8.3	8.0	B1	T232	V282
K-111		300	4.2	3.4	*B1	C435x235	V490x290
K-113		34	39	4.5	T41/#34	C150	V200
K-200		200	7.8	.56	*C7/#21		PE665x300

+ C—Copper, T—Tinned Copper, S—Silver Plate Copper, B—Bronze, OD in mils (max.)
× V—Vinyl, PE—Polyethylene, NCV—Non-contaminating Vinyl, OD in mils (max.)
△ See information in column to right under RG Type Cables.
†† Armored (Jacket dimension given is over armor)
* 2 inner conductors.
● Inner Conductor Strands column indicates material by same abbreviations as -|- CW—copperweld.

An Original Development by Federal

RG TYPE CABLES

WITH THE NEW LOW-TEMPERATURE NON-CONTAMINATING THERMOPLASTIC JACKET

Federal is supplying low temperature non-contaminating jackets on all cable types which now call for it and will also supply such compounds for specific cables to meet customers' requirements. The low temperature, non-contaminating jacket was an original Federal development.

The new RG types are outstanding for their longer service life under the most adverse conditions. Their non-contaminating feature means there is no reduction in dielectric strength due to molecular migration.

New HR* WIRES

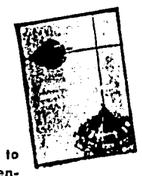
14 to 24 AWG

High impact strength, resists thermal shock. Impervious to the action of corrosive chemicals and highly resistant to most organic solvents. Water absorption is nil therefore the corona formations and surface flash-over are minimized. Low cold flow. Covers a wide temperature range (—55°C—150°C) to cover any application for hook-up wire. Also can be used at lower temperatures and higher temperatures for short periods.

TEFLON INSULATED WIRE and CABLES

Your inquiries are invited on these new Federal wires and cables.

*Heat Resistant



FOR COMPLETE DATA

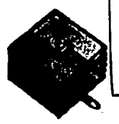
Write for Federal's Catalog on HF Cables. An informative guide to characteristics and applications of the industry's most comprehensive line of high quality HF Cables. Address Dept. D-3104.

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Federal — RADIO-TV SELENIUM RECTIFIERS















The revolutionary circuit elements that have led the way to important design advances in TELEVISION & RADIO RECEIVERS & ELECTRONIC EQUIPMENT

Wherever DC power is required there is a Federal Radio-TV Selenium Rectifier to do the job... and do it with an efficiency and reliability that is backed by the outstanding reputation of Federal—America's oldest and largest manufacturer of Selenium Rectifiers.

•Federal Cat. No.	Max. Output MA-DC	Max. Input (RMS) Volts	MA	Min. Ser. Res. Ohms	Peak Inverse Volts (Max.)	Peak Current (Max.)	△Construction and Nom. Cell Size	Application
1159	20	130	54	50	380	200	⅜" Dia. (T)	B+ Booster; Bias
1263A	65	130	135	35	380	500	11/16" Square (E)	B+ Radio, UHF Converter
1002A	65	130	175	22	380	650	1" Sq. (E)	B+ AC-DC (5 tube)
1003A	75	130	200	22	380	750	1" Sq. (E)	B+ 3-way Radios
1101A	100	130	270	22	380	1000	1" Sq. (E)	B+ Radios, Television
1004A	100	130	270	22	380	1000	1¼" Sq. (E)	B+ Radios, Television
1005A	150	130	410	15	380	1500	1¼" Sq. (E)	B+ Radios, Television
1006A	200	130	540	5	380	2000	1-17/32" Sq. (E)	B+ Television
1028A	250	130	675	5	380	2500	1-17/32" Sq. (E)	B+ Booster; Bias
1090A	300	130	810	5	380	3000	1-17/32" Sq. (S)	B+ Television
1231A	325	130	880	5	380	3250	1⅝" Sq. (S)	B+ Television
1261A	350	130	945	5	380	3500	1⅝" Sq. (S)	B+ Television
1023A	350	130	945	5	380	3500	1¾" Sq. (S)	B+ Television
1130A	300	130	1080	5	380	3000	2" Sq. (S)	B+ Television
1021A	450	130	1200	5	380	4500	2" Sq. (S)	B+ Television
1200A	600	130	1600	5	380	6000	2½" Sq. (S)	B+ Television
1223A	750	130	2000	5	380	7500	2½" Sq. (S)	Vibrator
1014A	100	160	270	22	460	1000	1¼" Sq. (E)	B+ Television
1022A	450	160	1200	5	460	4500	2" Sq. (S)	B+ Booster
1233	20	260	54	50	740	200	⅜" Diam. (T)	Vibrator Doubler
1007A	75	160*	200	22	460	750	1" Sq. (S)	Vibrator Doubler
1008A	100	160*	270	22	460	1000	1¼" Sq. (S)	Vibrator Doubler
1009A	200	160*	540	5	460	2000	1-17/32" Sq. (S)	Bridge Rectifier
1015	150	25	175	....	35	750	1" Sq. (E)	Bridge Rectifier
1016	300	25	350	....	35	1500	1¼" Sq. (E)	Bridge Rectifier
1017	600	25	700	....	35	3000	1-17/32" Sq. (E)	B+ Television
1229A	750	195	2000	5	570	7500	2½" Sq. (S)	Battery Charger
1018	1600	26‡	.....	....	.....	.....	4¼" lg. (Mtg. Pll.)	Bias Rectifier
1001A	75	20	200	....	35	750	1" Sq. (E)	

△(E) Eyelet. (S) Stud. (T) Paper Tube.

*These rectifiers have two sections—characteristics given apply to one section only; if both sections are used in series, voltage input is 320 volts.

†The characteristics given for this rectifier are based on its use in a half-wave rectifier circuit with a 3-cell battery load.

‡The characteristics given for this rectifier are based on its use in a full-wave rectifier circuit with a 3-cell battery load.

•'A' after code number indicates locking lug.



FEDERAL'S RADIO-TV SELENIUM RECTIFIER HANDBOOK

80 pages of valuable designs, characteristics and application. Available for 50 cents (coin only).

SELENIUM RECTIFIER EQUIPMENTS

QUALITY-BUILT

MAGNETIC AMPLIFIERS

Powered by Quality Controlled

Federal

SELENIUM RECTIFIERS

Presently used in a wide range of successful applications for industry and the Armed Forces, such as:

- Voltage Control
- Temperature Control
- Current Control
- Photoelectric Control
- Speed Control
- Counting
- Position Control
- Automatic Regulation

Federal Selenium Rectifiers, in partnership with the right magnetic components, provide Magnetic Amplifiers outstanding for:

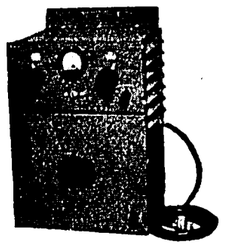
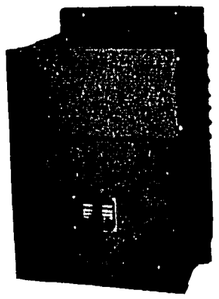
Stability • Accuracy • Long Life
High Gain • Fast Response
Low-cost Operation

Submit your magnetic amplifier requirements to Federal—write to Dept. F-4104

POWER SUPPLIES: Designed to furnish a dependable and constant source of D-C power. Whether for industrial or laboratory use, these equipments are available in sizes to serve your requirements. For industrial requirements they are used to power magnetic equipment such as chucks, brakes, clutches, screens, separators, drums and pulleys, and also provide power for lifting magnets, relays, circuit-breakers and D-C motors.

Code Number	A-C Input Volts	Phase	Cycles	D-C Output Volts	Amps.
FTR 3246-BS*	115	1	60	6	10
FTR 3352-BS	115	1	50/60	5/10	20/10
FTR 3093-AS*	115	1	60	12	3
FTR 3138-BS*	115	1	60	12	5
FTR 3185-AS*	115	1	60	12	7.5
FTR 3339-BS	115/230	1	50/60	6-24	18
FTR 3341-AS	115	1	50/60	28	5
FTR 3128-BS**	115	1	60	22-30	10
FTR 3300-DS	115	1	60	2-32	50
FTR 3340-BS	115	1	50/60	5-70	12
INDUSTRIAL					
FTR 3115-JS	115	1	50/60	115	1
FTR 3116-BS	115	1	50/60	115	5
FTR 3117-HS	115	1	50/60	115	10
FTR 3117-JS	230	1	50/60	115	10
FTR 3152-AS	220/440	3	50/60	115/230	4.4/2.2
FTR 3153-AS	220/440	3	50/60	115/230	6.6/3.3
FTR 3154-AS	220/440	3	50/60	115/230	8.8/4.4
FTR 3155-AS	220/440	3	50/60	115/230	13/6.5
FTR 3228-BS	220/440	3	50/60	115/230	26/13

**Filtered and regulated equipment. *Filtered.

Federal — ENGINEERING & MANUFACTURING FACILITIES

THE SELENIUM RECTIFIER DIVISION

Offers Its Outstanding Engineering and Manufacturing Facilities to

GOVERNMENT CONTRACTORS

Consult us for Aircraft, Ground and Naval Requirements



HEAVY-DUTY FEDERAL SELENIUM RECTIFIER



FTR 3146-BS AIRCRAFT POWER SUPPLY

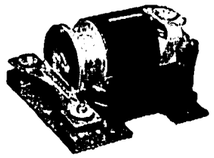
The Selenium Rectifier Division of Federal—the nation's headquarters for selenium rectifiers—is ready to serve you with start-to-finish production of power supplies, battery chargers, voltage regulators, engine starters, cathodic protection and other units—compact, rugged, quiet, dependable power equipments designed for any DC output.

Federal knows selenium rectifiers. Federal has unmatched power conversion experience . . . an experience backed by years of successfully meeting the rigid requirements of contracts for military equipments. And Federal has the capacity to deliver your orders—when you want them!

Mail us your specifications today!

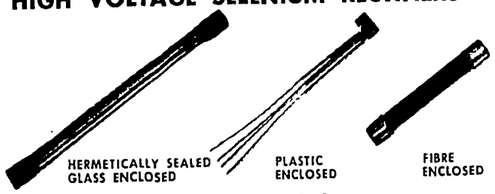


FTR 3414-AS GROUND AIRCRAFT POWER SUPPLY



FTR 3141-CS CLIP-IN VOLTAGE REGULATOR

HIGH VOLTAGE SELENIUM RECTIFIERS



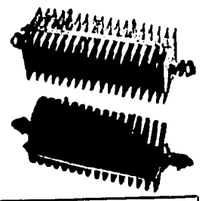
HERMETICALLY SEALED GLASS ENCLOSED — PLASTIC ENCLOSED — FIBRE ENCLOSED

Federal Code Number	DC Output Voltage	Max. Output MA-DC	Max. Peak Inverse Voltage	AC Input Voltage
147H110Q1	1400	8	4000	1400
147H 82Q1	1050	8	3000	1050
147H 55Q1	700	8	2000	700
147H 28Q1	350	8	1000	350

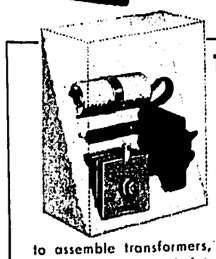
SELENIUM RECTIFIERS *for Industrial Service* From AC to DC . . . Millowatts to Kilowatts



Low-cost power conversion . . . efficient, dependable . . . from a-c to d-c. Introducing new, broad range adaptability in diverse fields, conditions and applications. They obtain direct current from any alternating current source. They are small, light, easy to install. They meet all needs of an unattended service.



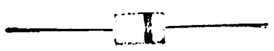
FOR COMPLETE DATA Write for Federal's Data Booklet on Selenium Rectifiers. An informative guide to characteristics and applications of the industry's most comprehensive line of high quality rectifiers. Address Dept. F-4104.



The FEDERAL System of ENCAPSULATION

Federal's method of encapsulating selenium rectifiers and allied components presents an entirely new approach to civilian and military equipment design — particularly where environmental or other unusual conditions necessitate special applications. It is now possible to assemble transformers, capacitors, resistors and other components—interconnected—into single blocks of equipment. Such assembly facilitates the replacement of individual as well as entire groups of components without the necessity of time-consuming repairs. Assures excellent thermal shock characteristics and resistance to vibration and cracking of the sealed unit over wide temperature ranges. Embedments withstand low temperatures to −65°C, as well as high temperatures to plus 125°C. Send for Bulletin F-534 for complete details.

FEDERAL CONTACT PROTECTOR



Federal's Contact Protectors are a sure way to longer life for relay contacts, eliminating circuit failure and interference caused by arcing.

1. Suppresses contact arcing
2. Extends Contact Life by more than 1000 times
3. Reduces circuit failure due to contact erosion (locking, surging, etc.)
4. Minimizes RF Interference
5. Has negligible effect on speed of operation of circuit
6. Needs no attention
7. Is easily installed
8. Requires little space
9. Is low in cost
10. Available as hermetically sealed unit to meet all JAN specifications.

Federal Telephone and Radio Company

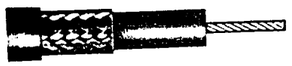
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100 KINGSLAND ROAD, CLIFTON, N. J.

In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

FEDERAL VARIETY OF CABLE TYPES

Federal's cable department produces a variety of H-F cable types. Some of these cables are produced by Federal exclusively. All are made to the most exacting standards of quality and control. The materials used are the finest research has developed, assuring top electrical characteristics. Initial dimensional precision helps to maintain stability over a wide temperature range.



SOLID DIELECTRIC COAXIAL CABLES

consist of a solid or stranded inner conductor, dielectric material, one or two copper wire braids, a synthetic resin protective jacket and, in some cases, a protective armor or metal braid. Dual coaxial cables are similar in design to the solid dielectric types, except that two accurately-spaced inner conductors are used.



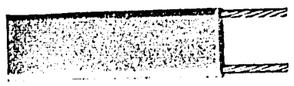
LOW-CAPACITANCE COAXIAL AIR-SPACED CABLES

have a construction similar to that of the solid dielectric types, except that air is made a portion of the dielectric. One method of accomplishing this effect and still maintaining a high dielectric strength is through a construction involving an inner conductor in a thin-walled dielectric tube. This is achieved by means of a dielectric thread wound in a long spiral.



SPIRAL DELAY, HIGH IMPEDANCE LINES

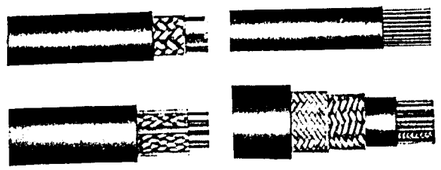
There are four types available with delays of 1 microsecond per foot; .2 microsecond per foot; .1 microsecond per foot and .042 microsecond per foot. 1 microsecond per foot delay line is ideal for color TV use.



TELEVISION ANTENNA LEAD-IN WIRE

consists of two accurately-spaced conductors over which is extruded the dielectric material. These lead-in wires have no braid, jacket or armor except in special cases. The advances in television have meant ever-new approaches to the design of TV lead-in to the point where it has taken many varied forms, the latest being the tubular shaped "pipeline" lead-in.

SPECIAL CABLE PROBLEMS



Federal Telephone and Radio Corp. maintains a stock of most of the required types. When requirements are so special that they cannot be met by Federal's cable types, Federal research and engineering facilities are readily available to develop any new cable constructions. Charges are based on quantity. Special Orders — like all Federal production — are executed under the high standards maintained by Federal "Quality Control." Every length of cable is carefully checked to see that it meets *all* tests indicated for the type ordered. Toughness, heat resistance, moisture resistance, dielectric strength, cold-bend — these are just a few of the many tests that must be passed before approval for shipment is given. Federal's consulting service is yours for the asking.

Federal also manufactures many types of plastic-insulated wires and multi-conductor cables for television, intercom and numerous special purposes.

COMMUNITY TV COAXIAL CABLE

FEDERAL'S "BIG 5"—The answer to any Community TV Lead-in problem . . . Engineered for long life, low line loss and DEPENDABLE all-weather signal transmission . . . over the longest link. Federal's K-14, RG-11/U and RG-59/U are the H-F coaxials you can specify with utmost confidence . . . for community TV Distributing Systems in any area . . . for any amplifier system used.

Wherever the annoying, profit-eating problems of signal leakage and revenue loss exist, the answer is Federal's new K-125 and K-126 *non-radiating* alternates for RG-11/U and RG-59/U—used in conjunction with Federal's K-14 — the primary lead-ins famous for lowest line loss, long cable runs and fewer amplifiers required. Both K-125 and K-126 are *double-shielded* and *double-jacketed*.

All of the "BIG 5" are made to Federal's high standards of quality — and that means *dependable, all-weather transmission performance!*

Principal characteristics of Federal's "BIG 5" of Community TV

TYPE	ZO Impedance Ohms	Capacitance per ft. micro-micro farads	ATTENUATION DB per 100 Feet 50Mc	100Mc	200Mc	400Mc	Jacket OD Mils (Max.)	Weight per 1000 Ft. (lbs.)
K-14	71	21.5	.57	0.70	1.42	2.3	885	392
RG-11/U	75	20.5	1.5	2.15	3.2	4.7	415	89
RG-59/U	73	21	2.7	4.0	5.7	8.5	250	36
K-125	75	20.5	1.5	2.15	3.2	4.7	470	127
K-126	73	21	2.7	4.0	5.7	8.5	325	79

COMPLETE COAXIAL CABLE ASSEMBLIES also are available from Federal to meet your requirements. This service offers the same "Precision Production" that made Federal the outstanding name in coaxial cables.

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Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

It's Federal for . . . EVERY H-F TRANSMISSION LINE REQUIREMENT

Std. Jacket	Type Low Temp. Black Jacket △	ZO Impedance Ohms	Nominal Capacitance Per Foot Micro-Micro Farads	Nominal Attenuation 100 Mc. Db/100 Ft.	Inner Conductor Strands ●	Braid +	Jacket ×
RG-5A/U	RG-5B/U	50	28.5	2.4	S1	C260	V335
RG-6/U	RG-6A/U	76	20	2.8	CW1	S264	NCV339
RG-7/U		100	12.5	2.0	C1	C304	V379
RG-8/U	RG-8A/U	52	29.5	2.1	C7/#21	C340	V415
RG-9A/U	RG-9B/U	51	30	2.3	S7/#21	(2)S355	NCV430
RG-10/U††	RG-10A/U††	52	29.5	2.1	C7/#21	C340	NCV475
RG-11/U	RG-11A/U	75	20.5	2.1	T7/#26	C340	V415
RG-12/U††	RG-12A/U††	75	20.5	2.1	T7/#26	C340	NCV475
RG-13/U	RG-13A/U	74	20.5	2.1	T7/#26	C355	V430
RG-14/U	RG-14A/U	52	29.5	1.4	C1	C463	NCV558
RG-15/U		76	20	1.5	CW1	(2)C463	V558
RG-17/U	RG-17A/U	52	29.5	.85	C1	C760	NCV885
RG-18/U††	RG-18A/U††	52	29.5	.85	C1	C760	NCV945
RG-19/U	RG-19A/U	52	29.5	.68	C1	C990	NCV1135
RG-20/U††	RG-20A/U††	52	29.5	.68	C1	C990	NCV1195
RG-21/U	RG-21A/U	53	29	14.0	Res. wire	(2)S264	NCV339
RG-22A/U	RG-22B/U	95	16	4.0	*C7/0.0152"	(2)T355	NCV430
RG-23/U	RG-23A/U	125	12	1.7	*C7/#21	C845x446	V960x670
RG-24/U††		125	12	1.7	*C7/#21	C845x446	1034x735
RG-29/U		53.5	28.5	4.2	C1	C150	PE184
RG-34/U	RG-34A/U	71	21.5	1.8	C7/#21	C540	V640
RG-35/U††	RG-35A/U††	71	21.5	.70	C1	C760	NCV945
RG-54A/U		58	26.5	3.1	C7/0.0152"	T220	PE250
RG-55/U		53.5	28.5	4.2	C1	T176	PE206
RG-57/U	RG-57A/U	95	17	3.0	*C7/#21	T540	V640
RG-58/U	RG-58B/U	53.5	28.5	4.2	C1	T150	V200
RG-58A/U	RG-58C/U	50	28.5	5.3	T19/0.0071"	T150	V200
RG-59/U	RG-59A/U	73	21	3.8	CW1	C191	V250
RG-62/U	RG-62A/U	93	13.5	3.1	CW1	C191	V250
RG-63/U	RG-63B/U	125	10.	2.0	CW1	C340	V415
RG-65/U	RG-65A/U	950	44		C1	C340	V415
RG-71/U		93	13.5	3.1	CW1	T208	PE250
RG-74/U††	RG-74A/U††	52	29.5	1.4	C1	C463	NCV615
RG-79/U††		125	10	2.0	CW1	C340	V475
RG-79B/U††		125	10	2.0	CW1	C340	NCV475
RG-86/U		200	7.8	.56	*C7/#21		PE665x300
RG-108/U	RG-108A/U	76	24.5		*T7/#28	T177	NCV240
RG-111/U††	RG-111A/U††	95	16	4.0	*C7/0.0152"	T355	NCV490
FTR TYPES							
K-14		71	21.5	.70	C1	C760	NCV885
K-38		72	22	4.0	C7/#30	C195	V250
KT-107		72	22	6.1	*C7/#28	C191	NCV250
K-109A		160	8.3	8.0	B1	T232	V282
K-111		300	4.2	3.4	*B1	C435x235	V490x290
K-113		34	39	4.5	T41/#34	C150	V200
K-200		200	7.8	.56	*C7/#21		PE665x300

+ C—Copper, T—Tinned Copper, S—Silver Plate Copper, B—Bronze, OD in mils (max.)
× V—Vinyl, PE—Polyethylene, NCV—Non-contaminating Vinyl, OD in mils (max.)
△ See information in column to right under RG Type Cables.
†† Armored (Jacket dimension given is over armor)
* 2 inner conductors.
● Inner Conductor Strands column indicates material by same abbreviations as +. CW—copperweld.

An Original Development by Federal

RG TYPE CABLES

WITH THE NEW LOW-TEMPERATURE NON-CONTAMINATING THERMOPLASTIC JACKET

Federal is supplying low temperature non-contaminating jackets on all cable types which now call for it and will also supply such compounds for specific cables to meet customers' requirements. The low temperature, non-contaminating jacket was an original Federal development.

The new RG types are outstanding for their longer service life under the most adverse conditions. Their non-contaminating feature means there is no reduction in dielectric strength due to molecular migration.

New HR* WIRES

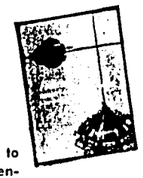
14 to 24 AWG

High impact strength, resists thermal shock. Impervious to the action of corrosive chemicals and highly resistant to most organic solvents. Water absorption is nil therefore the corona formations and surface flash-over are minimized. Low cold flow. Covers a wide temperature range (—55°C—150°C) to cover any application for hook-up wire. Also can be used at lower temperatures and higher temperatures for short periods.

TEFLON INSULATED WIRE and CABLES

Your inquiries are invited on these new Federal wires and cables.

*Heat Resistant



FOR COMPLETE DATA

Write for Federal's Catalog on HF Cables. An informative guide to characteristics and applications of the industry's most comprehensive line of high quality HF Cables. Address Dept. D-3104.

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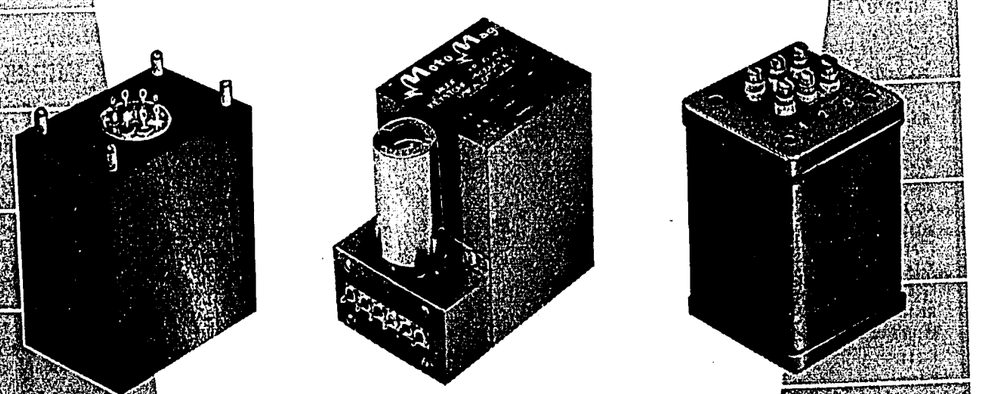
problems?

let KEYSTONE custom-engineer the most effective solution

When just an ordinary transformer or magnetic amplifier won't do, call on KEYSTONE — a leading producer of custom-engineered equipment to meet unusually difficult specifications.

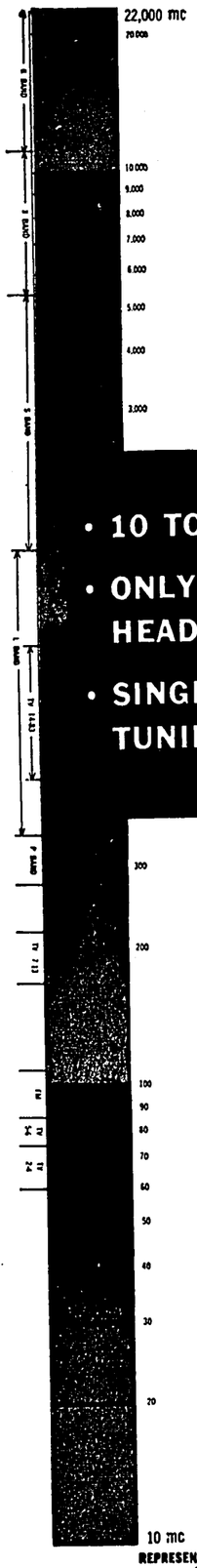
Standard or subminiature transformers available to provide unique electronic accuracy, special quality, lower weight, or other critical factors.

New KEYSTONE "Moto Mag" pre-designed magnetic amplifiers lick problems before they get started — save precious engineering time. By utilizing these pre-engineered "Moto Mags" in servos, computers, remote control devices, and other variable phase power units you'll save planning headaches and production dollars. We'll be glad to demonstrate how "Moto Mags" can work effectively for you.



Write, wire or phone for additional details, technical information and quotes — now!

KEYSTONE PRODUCTS COMPANY
UNION CITY 2, N. J.—UNION 6-5400



NEW! PORTABLE DIRECT READING SPECTRUM ANALYZER

saves engineering manhours!

- 10 TO 22,000 MCS
- ONLY 3 R. F. HEADS
- SINGLE DIAL TUNING



Model No. Equipment
Model TSA Spectrum Display and Power Supply
Model STU-1 R-F Tuning Unit 10-1,000 mc.
Model STU-2 R-F Tuning Unit 910-4,560 mc.
Model STU-3 R-F Tuning Unit 4,370-22,000 mc.

SPECIFICATIONS:
Frequency Range: 10 mc to 22,000 mc
Frequency Accuracy: 1%
Resolution: 20 kc
Frequency Dispersion: Electronically controlled, continuously adjustable from 50 kc/in. to 7 mc/in.
Input Impedance: 50 ohms
Over-all Gain: 120 db
Attenuation: RF—internal: 120 db continuously variable IF—60 db continuously variable
Input Power: 400 watts

Now, a new Polarad spectrum analyzer only 21 inches high that covers the entire frequency range 10 to 22,000 mcs with but 3 interchangeable R—F tuning heads. The model TSA operates simply—single dial frequency control—with utmost frequency stability. It provides highest accuracy, and reliability for observation and true evaluation of performance over the entire R—F spectrum—saving engineering manhours.

This instrument is designed for maximum utility and versatility in the laboratory and on the production line providing an easy-to-read 5 inch CRT display of the R—F spectrum.

The model TSA Spectrum Analyzer has these exclusive Polarad design and operating features:

- Single frequency control with direct reading dial. No klystron modes to set. Tuning dial accuracy 1%.
- Only three interchangeable R—F tuning units for the entire frequency range 10 to 22,000 mcs.
- Temperature compensation of Klystron Oscillator.
- Swept IF provides 250 kc to 25 mc display independent of R—F frequency setting.
- Internal R—F attenuator.
- Frequency marker for measuring frequency differences from 100 kc to 25 mc.

Write today to your nearest Polarad representative, or directly to the factory for complete information.

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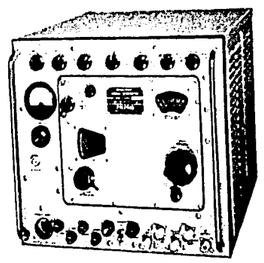
POLARAD
MICROWAVE EQUIPMENT

for complete coverage of the range 10 to 50,000 MCS/SEC.

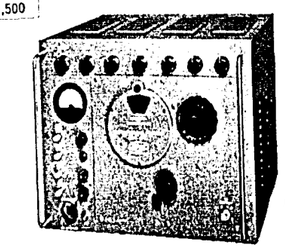
MICROWAVE SIGNAL GENERATING EQUIPMENT

950-11,500 MC

Model No.	Frequency Range MCS/sec.
MSG-1	950-2400
MSG-2	2150-4600
MSG-3	4450-8000
MSG-4	6950-10,800
MSG-4A	6950-11,500



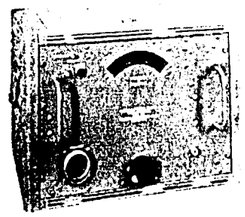
MSG 3-4



MSG 1-2

Signal Generators
Direct reading, single dial frequency control, with internal FM and pulse modulation circuits, as well as provisions for external synchronization. Delayed and undelayed sync output. Frequency accuracy ± 1%. Attenuator accuracy ± 2 db. Extremely stable. Rugged construction.

650-10,750 MC



Signal Sources
Microwave power output with a direct reading, single dial frequency control. Provisions for external square wave and FM modulation.
Model KX, Klystron Power Supply, especially designed for Polarad Signal Sources is available. Works with all 5 models. Has 1000 cps square wave output for modulating purposes. Stable output.

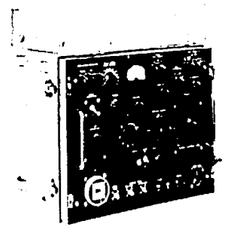
MINIMUM POWER AVAILABLE FROM POLARAD SIGNAL SOURCES IN THE RANGE OF 650 TO 10,750 MC

FREQUENCY RANGE		MODEL SSR 650-1350MC	MODEL SSL 1050-2350MC	MODEL SSS 2200-4550MC	MODEL SSM 4350-8250MC	MODEL SSF 8000-10,750MC
MINIMUM POWER AVAILABLE (mw)	Low Range	150	40	15	10	10
	Middle Range	400	150	60	20	30
	High Range	100	100	40	15	10

12,700-50,000 MC

Signal Generators—12.7-39.7 KMC—A new line of signal generators covering the K and Q Bands. Internal square wave modulation and provisions for external modulation. Power meter to check internal R.F. and external source R.F. Power.

Signal Sources—12.7-50.0 KMC—A new line of signal sources providing microwave power in the K, Q and V Bands. Internal square wave modulation and provisions for external modulation.



Signal Generators Model No.	Frequency Range in KMC	Signal Sources Model No.
SG-X12	12.8 to 17.5	SS-1218
SG-6178*	15.75 to 16.25	SS-1516
SG-QK368*	16.25 to 16.75	SS-1617
SG-6253	18.0 to 22.0	SS-1822
SG-6754	22.0 to 25.0	SS-2225
SG-QK289	27.27 to 30.0	SS-2730
SG-QK140	29.7 to 33.52	SS-3033
SG-QK291	33.52 to 36.25	SS-3336
SG-QK292	35.1 to 39.7	SS-3540
	37.1 to 42.6	SS-3742
	41.7 to 50.0	SS-4150

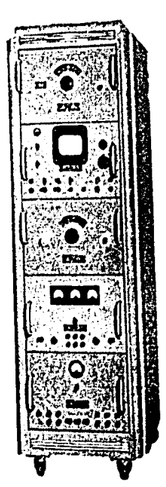
*Provided with internal pulse and FM modulation.

MICROWAVE SIGNAL ANALYZING EQUIPMENT

10-35,000 MC

LSA Laboratory Spectrum Analyzer
with 5 interchangeable R.F. heads

R.F. Head	Frequency Range in MC
LTU-1	10–1000
LTU-2	940–4500
LTU-3	4460–16,520
LTU-4	15,000–21,000
LTU-5	20,850–35,000

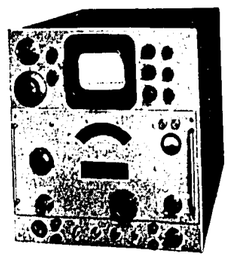


5 interchangeable R.F. heads provide continuous coverage from 10 MC to 35,000 MC. Single dial tuning allows for quick and simple display of any frequency spectrum. Frequency dispersion from 250 KC to 25 MC with an internal marker measuring frequency differences up to ± 12.5 MC on a 5 in. CRT display.

10-21,980 MC

TSA Bench Model Spectrum Analyzer
with 3 interchangeable R.F. heads

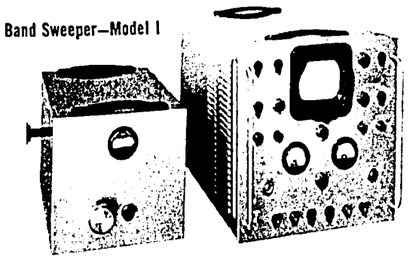
R.F. Head	Frequency Range in MC
STU-1	10–1000
STU-2	915–4560
STU-3	4370–21,980



3 interchangeable R.F. heads provide continuous coverage from 10 MC to 21,980 MC in a portable, table-top spectrum analyzer. Single dial tuning allows for quick and simple display of any frequency spectrum. Frequency dispersion from 250 KC to 25 MC with an internal marker measuring frequency differences up to ± 12.5 MC on a 5 in. CRT display.

8500-9600 MC

X Band Sweeper—Model I



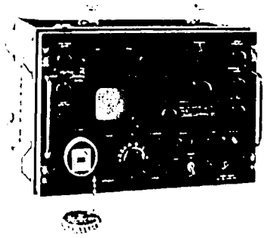
A new X-Band Sweep Generator provides R.F. energy swept continuously from 8,500 to 9,600 MC. Allows the use of UHF testing techniques in the microwave region. Two independent sweep amplifiers provide a simultaneous visual display of reflection and transmission characteristics.

Output Variation: ± 1 DB max. | Frequency Range: 8,500-9,600 MC
Sweep Rate: 12 CPS. | Output: + 12 DBM.

12,700-39,700 MC

Spectrum Analyzers

Model No.	Frequency Range KMC
SA-X12	12.8 to 17.5
SA-6178	15.75 to 16.25
SA-QK368	16.25 to 16.75
SA-6253	18.0 to 22.0
SA-6254	22.0 to 25.0
SA-QK289	27.27 to 30.0
SA-QK140	29.7 to 33.52
SA-QK291	33.52 to 36.25
SA-QK292	35.1 to 39.7



A new line of portable spectrum analyzers covering the K and Q Bands, presenting the frequency distribution of R.F. energy on a 3 in. CRT display. The units are self-contained including an R.F. section, display unit and power supply.

MICROWAVE GENERAL LABORATORY EQUIPMENT

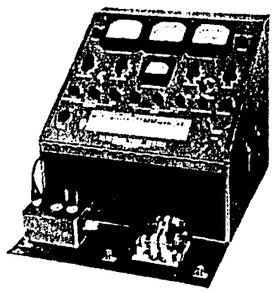
DC-11,000 MC

Micro Power Meter—Model P-1

Measures RMS power from DC to 11,000 MC, utilizing a single power sensitive probe. The elimination of hot wire barreters and other delicate components enables the probe to withstand overloads up to 150% without burnout or other damage. Simple operation. Rugged construction.



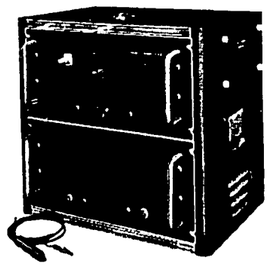
Frequency Range: DC-11,000 MC
Single Probe Operation
Power Ranges: 0-20 mw
0-100 mw



Klystron Tube Tester—Model K-100

Compact, portable instrument designed to test performance quality of all commercially available klystron type tubes. Provides complete metering facilities, control adjustments and convenient tube data chart. Safety features.

10 CPS-20 MC



Wide Band Video Amplifier—Model VT

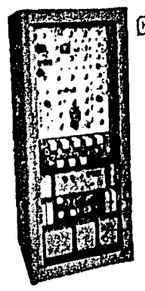
An oscilloscope deflection amplifier for the measurement and viewing of pulses of short duration and rise time.

Frequency Response: flat from 10 cps to 20 mc.
Amplifier Gain: 320 (50 db.)
Phase: Linear with frequency.
Output: 120 V. pk. to pk.

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POLARAD
COLOR TV
& B/W EQUIPMENT

TV PICTURE AND SIGNAL GENERATING EQUIPMENT



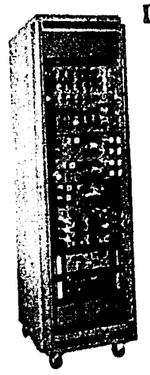
Color Synchronizing Generator—Model PT-201

Furnishes NTSC color TV subcarrier frequency component and contains divider network to yield 31.5 KC signal. Provides driving, blanking and synchronizing pulses, as well as vertical and horizontal dots for linearity checks. Utmost stability assured by driving all pulses from leading edge of crystal controlled oscillator.

Output Signals: (4 to 6 Volts, 75 Ohms, pos. & neg. polarity):
Synchronizing Signal
Camera Blanking Signal
Horizontal Drive Signal
Vertical Drive Signal
Composite Video Output
NTSC Color Subcarrier Freq. (3.579545 mc/s)

Black & White Synchronizing Generator—Model PT-104

Same as color synchronizing generator. Furnished without Subcarrier Frequency Generator.



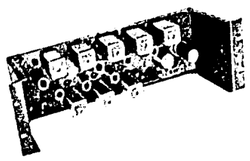
Color Bar Generator—Model PT-203

Provides color TV test signals, NTSC standards, for color TV equipment, networks and components. Supplies complete composite video signal in the form of seven fundamental color bars simultaneously with seven gradations of gamma bars.

Output Signals: Composite Video (2 outputs) (Sync. negative & positive)
Signal Information:
7 Bars of Color
7 Bars of Gamma Gradations
White Dot Pattern (Vert. and Hor.)
Ext. Video Input for Mixing:
2 Volts neg. polarity

Other Equipment Available

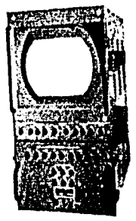
An NTSC Color TV Flying Spot Scanner, furnished as a completely packaged unit supplying a standard color video signal. And, a Monoscope Signal Source—Model PT-102 used for transmitting a laboratory quality black and white test pattern.



Color Subcarrier Frequency Generator —Model PT-202

Modifies any existing standard (B/W) synchronizing generator in accordance with NTSC color TV standards by supplying NTSC color subcarrier frequency of 3.579545 mc/s ± 0.0003%. Also, contains divider network to yield 31.5 KC signal.

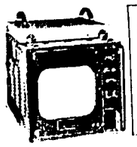
TV MONITORING EQUIPMENT



Color Video Monitor—Model M-200

Consists of two portable units —uses 15 inch RCA tri-color Kinescope. Checks quality of NTSC color video signals in studio, on transmission, or in factory. Excellent synchronizing stability. Displays highest definition transmitted pictures with exceptionally good color rendition. All controls on front panel. Instrument may be rack mounted or employed as field test equipment.

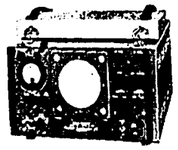
Signal Polarity: Positive, Negative, Balanced
Input Video Signal: 0.5 to 2.0 Volts, peak to peak
Input Impedance: 66 mmf across 2.2 megohms
Resolution: 250-300 lines (Full Utilization of NTSC Color Signal Bandwidth)
Linearity: Better than 2% across raster, Horizontal and Vertical



Studio Picture Monitor—Model M-105

A portable instrument used to check the picture quality of video signals in either a black/white or color television system. The unit employs a 12½" aluminized kinescope and is capable of presenting high definition transmitted pictures.

Signal Polarity: Positive, Negative, Balanced
Input Video Signal: 0.25 to 2.0 Volts, peak to peak
Input Impedance: 66 mmf across 470,000 ohms
Retrace Time: 4 microseconds
Resolution: Greater than 450 lines



Portable Wave Form Monitor—Model TO-1

Portable instrument designed for waveform analysis and amplitude measurement of NTSC color and B/W video signals in television circuits. It may be used, however, as a general purpose instrument. Means are provided for calibrating or comparing signals observed, and for selecting desired vertical amplifier bandwidth.

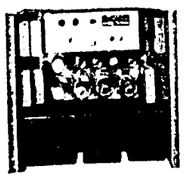
Deflection sensitivity: Greater than 0.1 Volts/In.
Hor. expansion: 20 tube diameters
Input Signal Level: 0.05 to 300 Volts peak to peak
Frequency Response Vertical Amplifier:
I.R.E. —3.5 db at 2 mc.
Normal —3.0 db at 4 mc.
Line Test—3.0 db at 6 mc.

Other Monitors Available:

Model M-102: High quality picture and wave form monitor.

Model 102MPS: 7" Kinescope, portable picture monitor.

GENERAL EQUIPMENT



Power Supplies

Model No.	Output Voltage	Output Current
PT-110	400-450 V.	250-300 Ma
PT-111	250-300 V.	100-400 Ma
PT-111D*	250-300 V.	100-400 Ma
PT-112	250-300 V.	150-800 Ma

*Double Output



ELECTRONICS CORPORATION

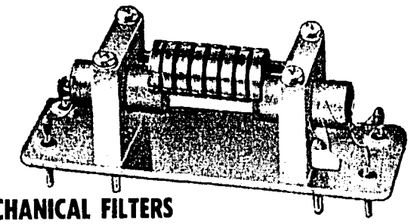
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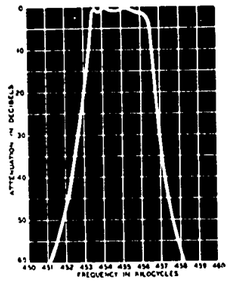
COLLINS INDUSTRIAL COMPONENTS

During the past 20 years Collins Radio Company has pioneered many of the outstanding advancements in the radio-communications and electronics industry. Collins engineers had to develop unique and unusual systems and components to meet the superior standards of Collins equipment. These components, plus application recommendations, are now available to the electronics industry. Collins industrial components can help you. Send the coupon below for complete information.

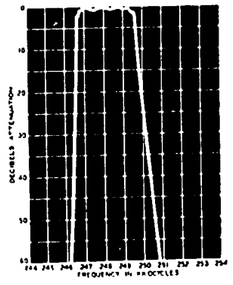


MECHANICAL FILTERS

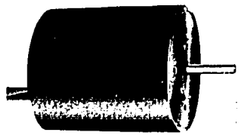
Compact, permanently tuned band pass filters for intermediate frequency amplifier applications. Mechanical elements of the filter provide characteristics close to the ideal rectangular selectivity curve. It is a hermetically sealed component requiring no adjustments. Selectivity curves for two of the 23 standard Mechanical Filters are reproduced at right.



Type F455B-31 Center frequency, 455 kc, band-width, 3.1 kc; plug-in terminal arrangement.

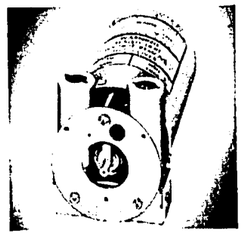


Type F250Z-2 – Center frequency, 248.2 kc; bandwidth, 3.2 kc; solder terminal arrangement.



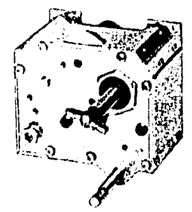
Collins HYSTERESIS MOTORS

Useful for driving timing devices, facsimile equipment, commutators, or any device which must rotate at an absolutely constant speed regardless of load or line voltage variations. Type 370A-1 Wide Band Synchronous Motor is illustrated . . . produces synchronous rotation from motionless to 30,000 RPM.



Collins OSCILLATORS

Long famous for their accuracy and stability, Collins Variable Frequency Oscillators are now available. They give transmitters, receivers, frequency standards or test equipment accurate linear dial calibration and superb stability. Collins Oscillators are available in a number of frequency ranges.



Collins AUTOTUNES AND AUTOPOSITIONERS

Collins Autotunes, the basis for both remotely and directly controlling automatic tuning of high quality communication equipment, are suitable for many industrial applications. Collins Autopositioners are used where up to 20, or more, pre-determined, fixed positions are needed. Available as individual units or in complete systems.

COLLINS RADIO COMPANY

Cedar Rapids, Iowa

11 W. 52nd Street, NEW YORK 36
1930 Hi-Line Drive, DALLAS 2
2700 W. Olive Avenue, BURBANK
COLLINS RADIO COMPANY OF CANADA, LTD.
74 Sparks St., OTTAWA, ONTARIO

Please send me complete information on:

Mechanical Filters ☐ Autotunes ☐
Oscillators ☐ Hysteresis Motors ☐

NAME_____

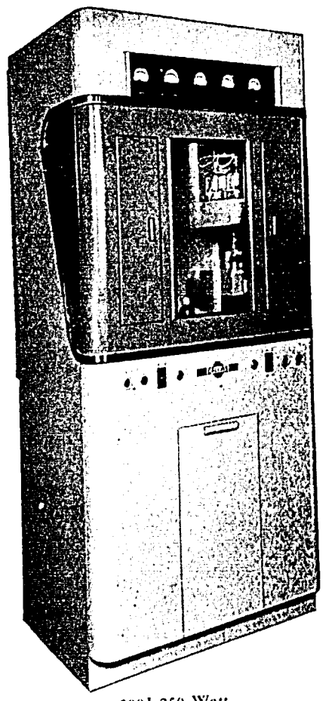
ADDRESS_____

FIRM OR COMPANY_____

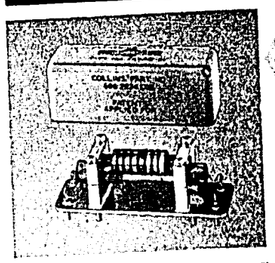
CITY_____ STATE_____

RADIO-ELECTRONIC by COLLINS

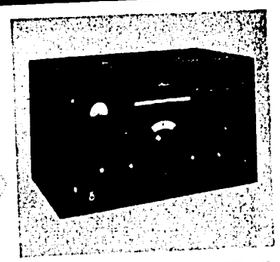
• broadcasting • amateur • aviation



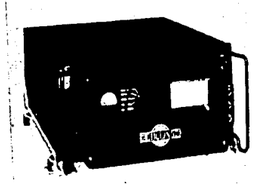
300J 250 Watt
Broadcast Transmitter



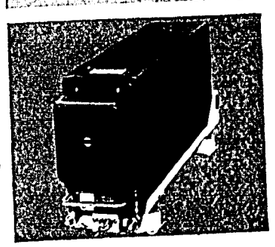
Collins Mechanical Filter



75A-3 Amateur Receiver



618S 144-Channel HF Transceiver



51X 360-Channel VHF Communication Receiver

BROADCAST TRANSMITTERS

AM	250/100 watts
300J	1000/500 watts
20V	5000/1000 watts
21E	10,000/5000 watts
21M	

SPEECH EQUIPMENT AND ACCESSORIES

Collins complete line for AM and FM broadcasting is listed in the Collins Speech Equipment Catalog. It pictures and describes a wide variety of high quality speech input consoles, remote equipment, rack mounted audio units, test and control apparatus, transducers, power supplies, meter and jack panels, terminal boards, cabinets — everything needed in building a new station or modernizing an old one. Collins Speech Equipment Catalog should be kept in the files of all broadcast engineers as a standard reference work. Your nearest Collins office will be glad to supply a copy to your station upon request.

INDUSTRIAL COMPONENTS

Autotune, a Collins patented automatic rotary positioning device used for accurate remote control of communication receivers and transmitters by means of adjustable positions. It can also be used for the control of many types of industrial equipment.
Autopositioner, a mechanism which will set a shaft accurately to any one of several fixed positions by remote control. It is fast and quiet and is built for long service.
Hysteresis Motors, 370A Series motors designed primarily for operation from vacuum tubes. Have split windings for operation directly from the plate circuits of two push-pull direct-coupled amplifiers driven 90 degrees out of phase. High starting torque . . . absolute synchronous rotation.
Mechanical Filter gives a close approach to the ideal rectangular selectivity curve by using resonant mechanical elements, rather than tuned electrical circuits. Many operating frequencies and band widths are available. When used in a receiver's IF strip, the carrier and one sideband of an AM signal can be accepted while the other sideband is rejected. 3 kc bandwidth filter is ideal for AM or SSB.

AMATEUR EQUIPMENT

75A-3 Receiver incorporates the Collins Mechanical Filter — a new concept in receiver performance. Either 3 kc or 800 cycle bandwidth selected by a front-panel switch. AM signals can be tuned to accept the carrier and either one of the sidebands at will while the other sideband is rejected. Ideal for reception of single sideband signals. It is an extremely stable double conversion superheterodyne receiver, covering the 160, 80, 40, 20, 15, 11 and 10 meter bands. Permeability tuned; crystal controlled h-f oscillator; dial calibrated directly in frequency; extremely sensitive with great tuning accuracy and high signal to noise ratio; 50 db image rejection on all bands; automatic noise limiter; amplified, delayed AVC with quick recovery; miniture tubes.
Price including 3 kc mechanical filter, less speaker $530.00
10" speaker in matching cabinet 20.00
35C-2 Low Pass Filter inserted in well shielded transmission line from 32V-1, 2, or 3, provides approximately 75 db attenuation of harmonic emissions at the television frequencies. Price $40.00

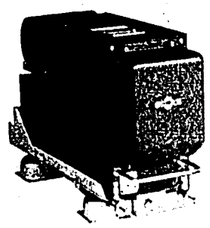
AVIATION EQUIPMENT

618S 144-Channel HF Transceiver, 100 watt power output on 144 crystal controlled channels. Automatically tuned elements insure maximum flexibility and high power output.
180L-2 Antenna Tuning Unit, automatically matches 618S output to aircraft antenna. Can be used with any transmitter having an output impedance adjustable to 52 ohms and 50 to 150 watts power output.
51R-3 VHF Navigation Receiver, fulfills navigation and communication receiving requirements of all types of military, commercial and private aircraft using the 108 to 136 megacycle band.
17L-3 180-Channel VHF Airborne Transmitter, frequency range 118.0 to 135.9 megacycles. All 180 channels easily selected on a simple, positive remote control system. Power output conservatively rated at 8 watts.
17L-4 360 Channel VHF Transmitter, ½ ATR size to make room for additional equipment. 25 watt power and 360 automatically tuned channels assure instantaneous VHF communications in all high density areas. Maximum stability is maintained through pretuned crystals. Maximum selectivity is assured with 50 kc spacing.

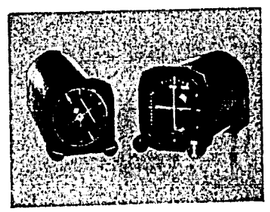
EQUIPMENT RADIO

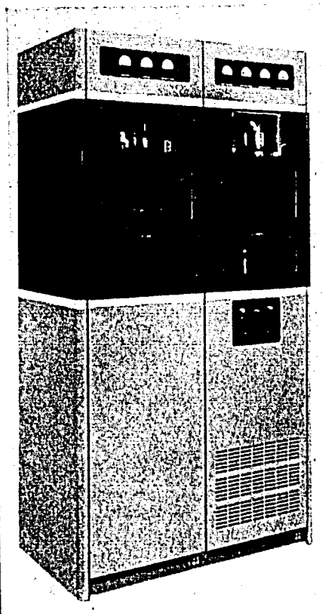
• communications

51V-2 Glide Slope Receiver



Approach Horizon and Course Indicator, Collins FD-103 Integrated Flight System





430 Series Communication Transmitter



30K-5 2-Channel Communication Transmitter

Spurious radiation and harmonic interference kept to a minimum. Unit weighs 25 lbs.
17M 360-Channel VHF Airborne Transmitter, full 360 channels in the range of 118.0 -135.9 mc. 50 watt power output with phone emission. Meets ARINC Spec. #520.
51X 360-Channel VHF Airborne Communications Receiver, companion to 17M and 17L-4 Transmitters. Complete new design to meet ARINC Spec. #520 for 45 kc bandwidth. Has the sensitivity, selectivity and spurious response rejection characteristics required for flight and airport traffic control.
51Z Marker Beacon Receiver is completely dependable, highly selective and free from spurious response. Operates lights with minimum "twilight" indication.
37J-3 VHF Airborne Omni-range Antenna, for use with 51R-3 navigation receiver. Drag, 2.63 lbs. at 250 m.p.h.
37R-1 VHF Airborne Communication Antenna, for use with Collins VHF two-way communications system.
37P Airborne Glide Slope Antenna mounts on nose of aircraft, and provides greatly improved pickup and receiver performance.
51V-2 Glide Slope Receiver, designed for reception of 90/150 cps tone modulated glide slope signals on any of the twenty channels in the UHF range.
Collins FD-103 Integrated Flight Systems simplifies ILS approaches by presenting precise steering information in conjunction with simplified pictorial type instruments. Instrumentation also simplifies enroute navigation.
Collins NC-101 Navigation System, provides the pilot continuous position information by automatically computed triangulation, using two VOR systems.

478C IFS Test Equipment, bench tester for IFS Computer, automatic pilots and other flight director equipments.
479T-2 Signal Generator, a precise ramp-test equipment for airborne VOR localizer and glide slope receivers.
479S-3 Audio Signal Generator is used in precision bench testing of omni-range, localize and glide slope receivers. Output signals for VOR, localizer, and glide slope audio circuit investigations are provided.

GROUND STATION EQUIPMENT

430 Series Transmitters, choice of 12 different models — 1 or 2 kw, conservatively rated — phone, CW or FSK. Transmission on any of ten instantly selectable, pre-set channels over entire range from 2 to 30 mc. Common sub-unit construction provides wide variety and low cost.
30K-5 Transmitter, 2 channels, pretuned to any frequency between 2 and 30 mc. 300 w CW. 250 w phone.
32RA-9 Transmitter, 4 channels, pretuned to any frequency between 1.5 and 15 mc. 75 w CW. 50 w phone.
51J-3 Receiver provides continuous coverage from 500 kc to 30 mc, with very high stability and tuning accuracy.
51M-7 VHF Rack Mounting Receiver, single channel, pretuned to any frequency between 118 and 136 mc.
51N-2 Receiver, single channel, for A1, A2 and A3 reception, pretuned to any frequency between 2 and 24 mc. Mechanical filter kits available.
242F VHF Transmitters, rack mounted, providing single frequency operation between 118.0 and 136.0 mcs. Choice of 200 watts or 50 watts power into 52 ohms.

In requesting complete technical information on any Collins products please specify equipment type number.

For engineering excellence in Radio-Electronic equipment —

COLLINS RADIO COMPANY Cedar Rapids, Iowa

11 W. 42nd St., NEW YORK 36
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1930 Hi-Line Drive, DALLAS 2

Dogwood Road, Fountain City, KNOXVILLE

COLLINS RADIO COMPANY OF CANADA, LTD., 74 Sparks St., Ottawa, Ont.

I want the facts about Collins Microwave.

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COMPANY_____

ADDRESS_____

CITY_____ STATE_____

Send this coupon today . . .



Get this booklet by return mail

and find out why Collins Microwave will serve you best.

You'll want all the facts in this informative booklet, but this is the story in a nutshell. Collins can do your communications and remote control jobs better because they're *specialists* in radio-electronic design and manufacture. Collins' extensive experience and success in the aviation, broadcast and amateur radio fields supply the required background and facilities to deliver microwave systems that represent the ultimate in dependability. If your plans include the use of Microwave, be sure you get assured performance and quality. Why not mail the coupon now.



COLLINS RADIO COMPANY Cedar Rapids, Iowa

11 W. 42nd St., NEW YORK 36 1930 Hi-Line Dr., DALLAS 2 2700 W. Olive Ave., BURBANK

Collins Radio Company of Canada, Ltd., 74 Sparks Street, OTTAWA, ONTARIO

1954 IRE Directory

ELECTRONIC *Test and Production* INSTRUMENTS

ELECTRONICS & X-RAY DIVISION · F-R MACHINE WORKS, INC. ·

For the producer of electronic or microwave systems, FXR provides a distinctive service . . . with quality components that measure up to the finest standards of design, craftsmanship and performance. The FXR line of Test and Production Microwave Equipment consists of Electronic Instruments and Waveguide Components.

These Electronic Instruments, which include Antenna Pattern Analyzers and High Power Pulse Modulators, were designed throughout by FXR engineers and produced in quantity in our own large plant. The Waveguide Components consist of such units as rotary joints, waveguide switches, horns, cavities, dummy antennas and loads, antenna scanners, and duplexers.

Whether for tube production, radar systems, microwave relay units, or guided missile applications . . . whether the project is large or small . . . FXR has the experience and facilities to produce your special needs accurately, swiftly—at lowest cost.

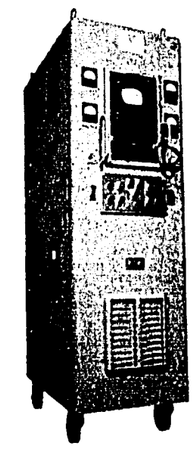
Custom Engineered and Built

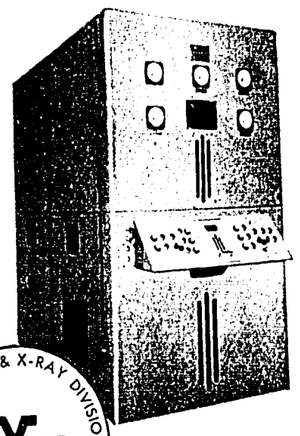
HIGH POWER PULSE MODULATORS

These rugged line type modulators are custom engineered for continuous operation. Ease of operation, minimum of high voltage hazard, and maximum accessibility of all components are uppermost considerations in the design.

14 MEGAWATT UNIT
Type Z821A

- Input voltage 440 or 550 volts—3 phase
- Internal signal generator for trigger pulse
- Output pulse for external synchronization
- Motor driven high voltage and heater controls
- Automatic voltage backdown on magnetron sparking
- Output voltage—90 kv at 160 amperes
- Output Z = 560 ohms
- PFN—2.0 microseconds at 500 cycles/sec
- Maximum duty = .001
- Internal pulse voltage and current viewing facilities



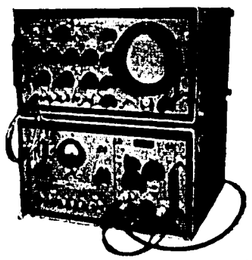


ONE MEGAWATT UNIT
Type Z820A

- Input Voltage—190–250 V single phase
- Provisions for mounting internal synchroscope
- Remote control operation
- Motor driven high voltage and heater controls
- Output Z = 1000 ohms
- PFN1—0.5 microseconds at 2000 cycles/sec
  PFN2—2.5 microseconds at 400 cycles/sec
- Internal pulse voltage and current viewing facilities

Custom Engineered and Built

ANTENNA PATTERN ANALYZERS
Type T705A



FXR ANTENNA PATTERN ANALYZERS are general purpose test equipments designed for measuring the radiation patterns of rotating antenna systems. The analyzer, a receiver and indicator unit, has the following characteristics:

- Visual pattern display
- Response vs angle of rotation
- 1 to 10 kmc
- Four plug-in r-f heads
- Superheterodyne receiver
- Single knob oscillator control
- CW or pulsed operation
- Field or laboratory use

Data subject to change without notice. Prices on application.

ELECTRONICS & X-RAY DIVISION · F-R MACHINE WORKS, INC. ·



Electronics & X-Ray Division

F-R MACHINE WORKS, Inc.

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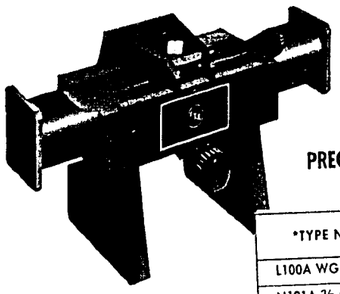
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PRECISION MICROWAVE TEST EQUIPMENT

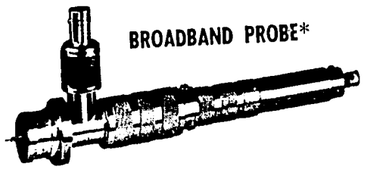
With its comprehensive line of Precision Microwave Test Equipment, FXR has developed a new, fresh-as-grass approach to the problems of microwave measurement. Every FXR product has been carefully evaluated in the light of latest advanced developments, the greatest accuracy and convenience in use, and the *cost*-conscious needs of the *quality*-conscious engineer who employs it . . . in the laboratory and on the production line. A large, fully equipped FXR plant . . . a well-rounded, growing staff of seasoned engineers . . . are capable of fulfilling your exact requirements with the fastest service in the industry, at costs well below the "sit-and-wait" variety.



PRECISION SLOTTED SECTIONS

*TYPE NO.	FREQUENCY RANGE (kmc/sec)
L100A WG	1.12 to 1.70
N101A 3⅜ COAX	1.00 to 4.00
N101B 3⅜ COAX	4.00 to 10.00 (½ λ 2.60 to 10.00)
V101A 7⅞ COAX	1.00 to 4.00

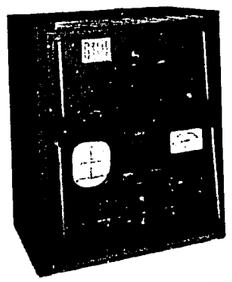
*See Waveguide Test Equipment Chart for "S" to "U" series.



BROADBAND PROBE*

TYPE NO.	FREQ. RANGE (kmc/sec)	BARRETTER TYPE	CRYSTAL TYPES	USED WITH FXR SLOTTED SECTIONS
B200A	1.00 to 12.40	821	1N21B and 1N23B	L100A S101A W101A N101A H101A X101A N101B C101A

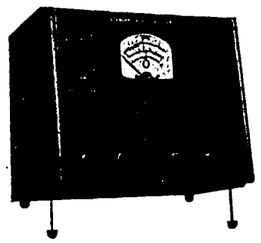
*Dual tuned. NOTE: 1N23B crystal and 821 barretter supplied.



SPECTRUM ANALYZERS

SPECIFICATIONS SUMMARY
Interchangeable RF Heads
Push-Pull Deflection, both amplifiers
I-F Amplifier: Center frequency—20 mc
Bandpass—50 kc
Gain—Cascade input, approx. 110 db
Sweep Rate—10 to 20 cps
Frequency Dispersion—1 to 10 mc/inch
Viewable Pulse Lengths—0.2 to 2.0 micro-seconds
4½ inch panel meter
5 inch oscilloscope tube

TYPE NO. (Includes Power Supply Type Z800A)	R-F HEAD TYPE NO.	FREQ. RANGE (mc/sec)	FREQ. CAL. ACCURACY (mc/sec)
S700A	S900A	2400-3400	±1.0
S700B	S900B	3000-3700	±1.0
X700A	X900A	8500-9600	±4.0



STANDING WAVE AMPLIFIER

SPECIFICATIONS SUMMARY
VSWR Range to 100
Noise level less than .03 microvolts
Maximum sensitivity: 0.1 microvolts
Variable, metered bolometer bias
Automatic bolometer protection
Low impedance output jack
Adjustable tilting panel

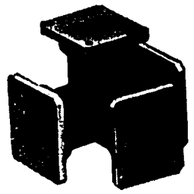
TYPE NO.	FREQ. RANGE
B810A	300 to 4000 Narrow Band: 1000 cps



DIRECT READING FREQUENCY METERS

*Type 410

*See Waveguide Test Equipment Chart.



WAVEGUIDE TEES AND BENDS

SERIES AND SHUNT TEES	HYBRID TEES	90° BENDS
*Type 620, 621	*Type 622	*Type 623, 624

*See Waveguide Test Equipment Chart.

WAVEGUIDE TEST EQUIPMENT—2.6 to 40.0 kmc

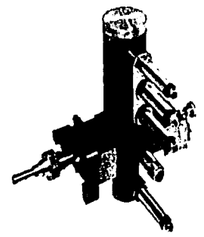
INSTRUMENT	"S" 3"x1½" 2.6-3.95 kmc	"H" 2"x1" 3.95-5.85 kmc	"C" 1½"x¾" 5.85-8.2 kmc	"W" 1¼"x⅝" 7.05-10.0 kmc	"X" 1"x½" 8.2-12.4 kmc	"Y" .622"x.311" ID 12.4-18.0 kmc	"K" .420"x.170" ID 18.0-26.5 kmc	"U" .280"x.140" ID 26.5-40.0 kmc
Slotted Sections, Waveguide	S101A	H101A	C101A	W101A	X101A	Y102A	K102A	U102A
Flap Attenuator	S151A	H151A	C151A	W151A	X151A	Y151A	K151A	U151A
Detector Mount					X211A*	Y205A†	K205A†	U212A
Waveguide Tuners, Slide Screw	S311A	H311A	C311A	W311A	X311A	Y311A		
E/H						Y312A	K312A	U312A
Frequency Meters, Direct Reading			C410A	W410A	X410A			
Adapters, Coax to Waveguide	S601A	H601A	C601A	W601A	X601A			
Waveguide Tees, Series	S620A	H620A	C620A	W620A	X620A	Y620A	K620A	U620A
Shunt	S621A	H621A	C621A	W621A	X621A	Y621A	K621A	U621A
Hybrid	S622A	H622A	C622A	W622A	X622A	Y622A	K622A	U622A
Waveguide Bends, 90° E-Plane	S623A	H623A	C623A	W623A	X623A	Y623A	K623A	U623A
90° H-Plane	S624A	H624A	C624A	W624A	X624A	Y624A	K624A	U624A

*CRYSTAL OR BOLOMETER †TUNABLE



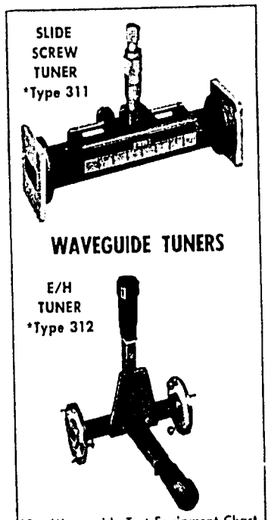
STANDARD MISMATCH

TYPE NO.	VSWR	ELECTRICAL SPECIFICATIONS
*X510D	1.20	Frequency Range: 8.20 to 12.40 kmc/sec Accuracy Range: 1.19 to 1.21 VSWR



2K28 OSCILLATOR CAVITY

TYPE NO.	FREQ. RANGE (kmc/sec)
N750A	2.40 to 3.45



SLIDE SCREW TUNER *Type 311

E/H TUNER *Type 312

WAVEGUIDE TUNERS

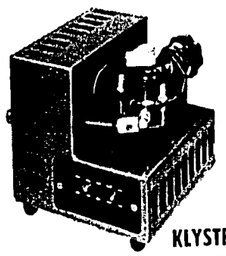
*See Waveguide Test Equipment Chart.

TYPE NO.	FREQ. RANGE (kmc/sec)	TUBE-TYPE
W760A	8.50 to 9.60	*2K25
X760A	8.50 to 9.60	*2K25

*Not supplied.



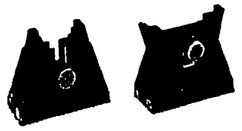
SHIELDED TUBE MOUNTS



KLYSTRON TUBE MOUNT

TYPE NO.	**USED WITH TUBE TYPES	FREQ. RANGE (kmc/sec)	INPUT CONNECTOR	OUTPUT CONNECTOR	POWER SUPPLY ACCESS. CABLES
*N761A	2K42 2K43 2K44 2K39	3300-4200 4200-5700 5700-7500 7500-10,300	Jones P-2410-DB	UG-23B/U	Z761L (For PRD 801A) Z761M (for Sperry 555)

*Accessory cables not included. **Not supplied.



TRANSMISSION LINE STANDS

TYPE NO.	USED WITH TRANSMISSION LINE SIZE (inches)
Z910A	3 x 1½, WG 1½ x ¾, WG 2 x 1, WG 1¼ x ⅝, WG 1 x ½, WG
Z910B	0.622 x 0.311 ID, WG 0.420 x 0.170 ID, WG 0.280 x 0.140 ID, WG ⅜ to ⅞ COAX

OTHER AVAILABLE FXR UNITS

(not illustrated)

COAXIAL DETECTOR—N210A
WAVEGUIDE TERMINATION—X501A
WAVEGUIDE SHORT—X630A



Electronics & X-Ray Division
F-R MACHINE WORKS, Inc.
26 12 BOROUGH PLACE WOODSIDE 77 N Y



DIRECT READING Frequency Meters

DESIGNED for easier, more accurate readings...

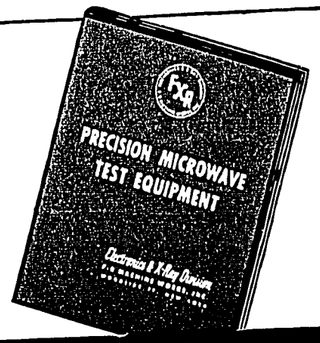
Tried and true—the FXR Type 410A Direct Reading Frequency Meters give you bull's-eye accuracy, right to the exact reading spot. No more jiggling of many dials, no more complicated calculations. Human error factor is eliminated. These dependable FXR units provide the most convenient means available for determining oscillator frequency in the microwave region.

- .08% ACCURACY
- FULL WAVEGUIDE FREQUENCY RANGE
- DIRECT READING
- HIGH Q
- NOMINAL 30% ABSORPTION DIP
- BACKLASH-FREE OPERATION

TYPE	FREQUENCY RANGE
C410A	5.85 to 8.20 KMC/S
W410A	7.05 to 10.00 KMC/S
X410A	8.20 to 12.40 KMC/S

DELIVERY FROM STOCK • PRICE $125 EACH*

Write today for new catalog of complete line of FXR Precision Microwave Test Equipment



SLOTTED SECTIONS
PROBES
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ELECTRONICS & X-RAY DIVISION · F-R MACHINE WORKS, INC. · FXR



Electronics & X-Ray Division

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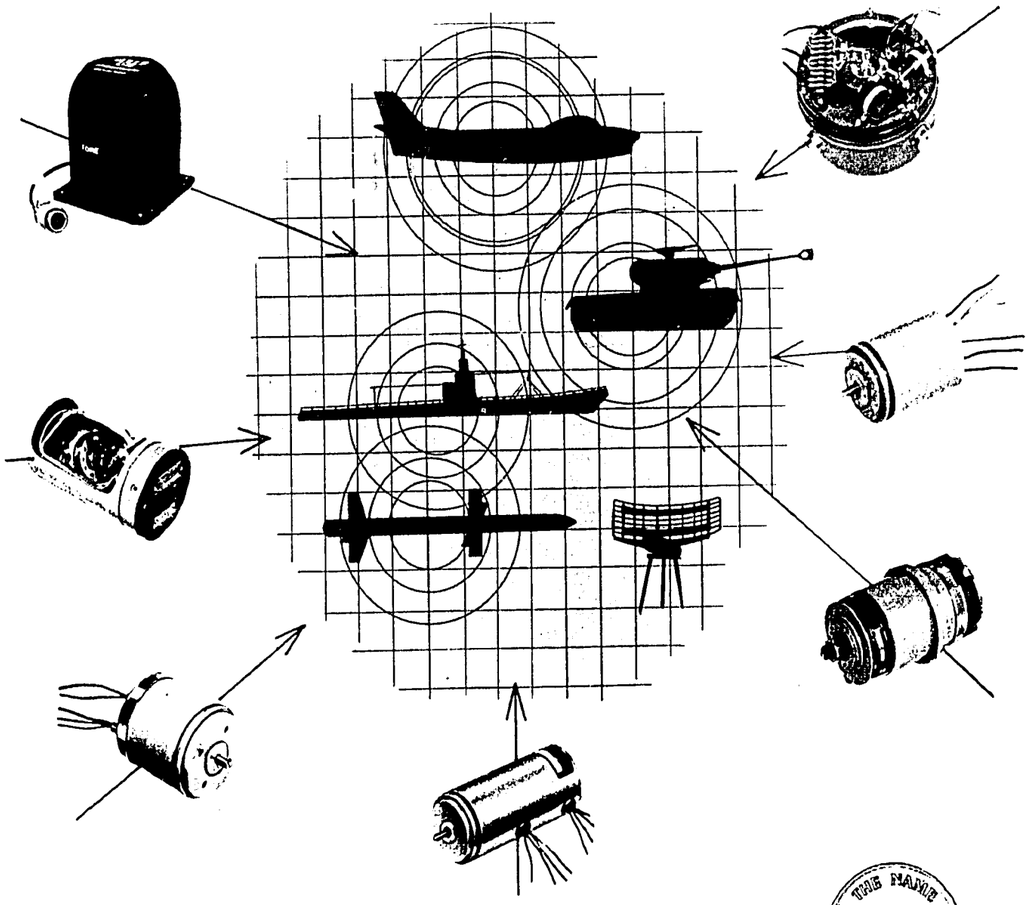
26-12 BOROUGH PLACE. WOODSIDE 77. N. Y.

*Data and prices subject to change without notice.

ECLIPSE-PIONEER

Eclipse-Pioneer

Reference Catalog of Precision Components for SERVO-MECHANISM and COMPUTING EQUIPMENT



ECLIPSE-PIONEER DIVISION

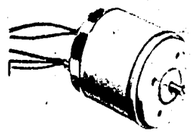
THE NAME Bendix AVIATION CORPORATION MILLIONS TRUST

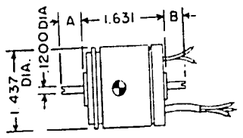
TETERBORO, NEW JERSEY

AY-200 SERIES AUTOSYN® SYNCHROS

TYPE No.	FUNCTION
AY-20( )-1	Multi-Power Transmitter
AY-20( )-2	Synchronous Receiver
AY-20( )-3	Control Transformer
AY-20( )-4	Single Power Transmitter
AY-20( )-5	Control Transformer (High Impedance)
*AY-20( )-25	Control Transformer
*AY-20( )-26	Transmitter
AY-20( )-34	Control Transformer (Grease Lubricated Bearings)
AY-22( )-3	Resolver
AY-22( )-5	Resolver (High Impedance)
*AY-22( )-25	Resolver
AY-22( )-27	Resolver (Double Heavy Brushes)

*Corrosion resistant





TYPICAL NO.	Dimen. A	Dimen. B
AY-200-1	1/4"	0
AY-201-1	1/2"	0
AY-202-1	7/16"	3/8"

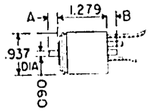
TYPE No.	FUNCTION
AY-22( )-34	Resolver (Grease Lubricated Bearings)
*AY-22( )-38	Resolver (High Impedance)
AY-23( )-3	Differential (Servo Applications)
AY-23( )-4	Differential (Synchronous Applications)
*AY-23( )-25	Differential
AY-23( )-34	Differential (Grease Lubricated Bearings)
AY-24( )-5	Resolver (Omni Applications)
AY-25( )-24	Resolver (High Frequency)
*AY-25( )-39	Resolver (High Frequency)
AY-26( )-3	Resolver (Control Transformer)

®Registered trademark Bendix Aviation Corporation

AY-500 SERIES "PYGMY" AUTOSYNS

TYPE No.	FUNCTION
AY-50( )-2	Receiver
AY-50( )-3	Control Transformer
AY-50( )-4	Transmitter
AY-50( )-5	Control Transformer (High Impedance)
AY-50( )-25	Control Transformer
AY-50( )-26	Transmitter





*Corrosion resistant

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

TYPE No.	FUNCTION
AY-52( )-3	Resolver
*AY-52( )-25	Resolver
AY-53( )-3	Differential
*AY-53( )-25	Differential
AY-54( )-5	Resolver
AY-55( )-24	Resolver (High Frequency)

ORDNANCE AND NAVY TYPE AUTOSYN SYNCHROS

TYPE No. ECLIPSE-PIONEER	TYPE No. MILITARY	FUNCTION
AY-1100-1	11CX4A	Control Transmitter
AY-1100-2	11CT4A	Control Transformer
AY-1601-1	15CX4A	Control Transmitter
AY-1601-2	15CT4A	Control Transformer
AY-1601-5	15TR4A	Torque Receiver
AY-1631-3	15CDX4A	Control Differential Transmitter
AY-1900-8	18CT6A	Control Transformer
AY-2400-1	23CX4	Control Transmitter
AY-2400-2	23CT4	Control Transformer
AY-2400-3	23CDX4	Control Differential Transmitter
AY-2400-4	23TX4	Torque Transmitter
AY-2400-5	23TR4	Torque Receiver
AY-2400-9	23CX6	Control Transmitter
AY-2400-10	23CT6	Control Transformer
AY-2400-12	23TX6	Torque Transmitter
AY-2400-13	23TR6	Torque Receiver
AY-2401-1	23CX4A	Control Transmitter
AY-2401-2	23CT4A	Control Transformer





TYPE No. ECLIPSE-PIONEER	TYPE No. MILITARY	FUNCTION
AY-2401-4	23TX4A	Torque Transmitter
AY-2401-5	23TR4A	Torque Receiver
AY-2401-10	23CT6A	Control Transformer
AY-2401-12	23TX6A	Torque Transmitter
AY-2401-13	23TR6A	Torque Receiver
AY-2430-7	23TDX4	Torque Differential Transmitter
AY-2430-8	23TDR4	Torque Differential Receiver
AY-2451-3	23CDX4A	Control Differential Transmitter
AY-2451-7	23TDX4A	Torque Differential Transmitter
AY-3200-9	31TX4A	Torque Transmitter
AY-3200-10	31TR4A	Torque Receiver
2323-1	1HCT	Control Transformer
2324-1	1HG	Transmitter
2325-1	1HDG	Differential Transmitter
2330-1	1F	Receiver
2333-1	2R	Double Receiver
2343-1	1D	Differential Receiver



SERVO MOTORS



LOW INERTIA

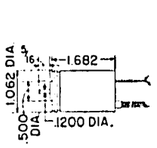
Type Number	Rated Voltage Phase 1	Rated Voltage Phase 2	Max. Power Input Total (Watts)	No Load Speed (RPM)	Stall Torque (Oz. in)	Torque To Inertia Ratio (Radians/sec²)
CK-1000-1	40	50	7	5500	0.28	10,000
CK-1000-2	42	42	7	5500	0.28	10,000
CK-1000-4	26	50	7	5500	0.28	10,000
CK-1006-7	18	18	5	10000	0.13	13,000
CK-1018-7	18	18	5	10000	0.13	13,000
*CK-1022-13	115	115 57.5	12	4800	1.45	33,800
*CK-1025-13	115	115 57.5	12	4800	1.45	33,800
*CK-1026-13	115	115 57.5	12	4800	1.45	33,800
*CK-1027-14	115	115 57.5	7	6200	0.63	41,500
*CK-1027-15	115	180 90	7.2	6200	0.63	41,500
*CK-1028-16	26	26	6	10000	0.28	13,000
*CK-1029-17	26	50	6	5500	0.4	14,000
*CK-1031-18	26	55	9	6400	0.35	10,000
CK-2000-1	64	64	30	7200	2.7	46,000

Type Number	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·sec²)
CK-2000-3	100	130	30	7200	2.7	46,000
CK-2000-4	95	95	30	7200	2.7	46,000
CK-2000-5	110	110	30	6600	3.0	4,700
CK-2006-1	64	64	30	7200	2.6	70,000
CK-2006-3	100	130	30	7200	2.6	70,000
CK-2006-4	95	95	30	7200	2.6	70,000
CK-2006-5	110	110	30	6600	3.0	5,700
CK-3000-1	110	220	80	3700	14.0	3,750
CK-3000-2	220	290	80	3700	14.0	3,750
*X-1224641-1	110	110	30	6600	3.0	5,700
*X-1224642-1	64	64	30	7200	2.6	70,000
*X-1224642-3	100	130	30	7200	2.6	70,000
*X-1224642-4	95	95	30	7200	2.6	70,000

*Corrosion Resistant

AY-190 SERIES AUTOSYNS

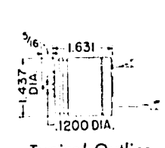
TYPE No.	FUNCTION
AY-190	Transmitter
AY-191	Control Transformer
AY-192	Resolver
AY-193	Differential
AY-194	Receiver



All Corrosion Resistant

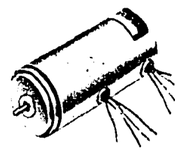
LINEAR AUTOSYN SYNCHROS

TYPE No.	APPLICATION
AY-141	High Temperature
AY-172	High Temperature
AY-173	Standard Temperature
AY-179	Standard Temperature



Typical Outline

RATE AND MOTOR GENERATORS



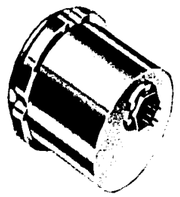
TYPE	FUNCTION	RATED VOLTAGE PHASE 1	RATED VOLTAGE PHASE 2	MAX. POWER INPUT TOTAL (WATTS)	NO LOAD SPEED (RPM)	STALL TORQUE (OZ. IN.)	TORQUE TO INERTIA RATIO (Radians/Sec.²)	GEN. OUTPUT (VOLTS)
*FV-100-5	Motor Gen.	26	26	9.5	10000	0.28	10,000	0.3/1000
*FV-101-5	Motor Gen.	26	26	9.5	10000	0.28	10,000	0.3/1000
FV-2000-1	Motor Gen.	64	64	30	7200	2.6	70,000	0.3/1000
FV-2001-2	Motor Gen.	115	115	30	6600	3.0	70,000	0.3/1000
FV-3000-1	Motor Gen.	110	220	80	3700	14.0	3,750	0.15/1000
*FT-102-5	Rate Gen.	18	.....	3.5	.....	.....	.....	0.3/1000
*X-1214382	Motor Gen.	26	26	9.7	6000	2.6	21,000	0.5/1000
*X-1220798	Motor Gen.	110	110	30	7000	2.6	10,000	0.3/1000

*Corrosion resistant

ECLIPSE-PIONEER

NOW!...

from the world's largest producer of gyros...



RATE GYRO

Type No. 15814-1-A

Overall Size—2" x 2"

MOTOR: 26 volts, 400 cps. 3 phase with rated speed of 22,000 rpm and a rotor moment of inertia of 175 gram-cm².

PICKOFF: 26 volts, 400 cps, single phase with "E" type variable coupling. With resistive load of 10,000 ohms, tuned output is 6 to 7 volts at maximum rate. Null is 30 millivolts with an armature travel of 2½° to 3° either side of null.

DAMPING: Accomplished by fluid flotation of gimbal. Damping factor is 0.5 to 0.7 of critical, but values up to and including 1.0 of critical can be provided.

NATURAL FREQUENCY: 50-55 cps (undamped).

WARM-UP TIME: One minute.

RANGE: Maximum rate is 450 ± 20°/second. Minimum detectable rate is less than 1.5°/second. Other maximums and minimums are available.

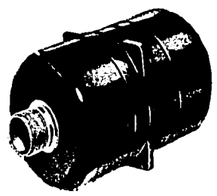
ENVIRONMENTAL CHARACTERISTICS: −20°F. to 140°F. temperature operating range. Maximum shock is 60 g. Vibration operating range of 5 g. from 20 to 300 cps. Positive hermetic seal.

WEIGHT: 13.5 ounces complete with mounting bracket and electrical connector.

FREE GYRO

Type No. 14108-1-A

Overall Size—3⅜" x 5 5/16"



MOTOR: 26 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 1° per minute when subjected to Scorsby test at amplitude of ± 15° and rate of approximately 6 cpm (corrected for earth's rotation).

PICKOFF: Autosyn type with peak value of 20 volts. Initial slope of output voltage curve about null position is 0.35 volts per degree ± ten per cent. Phase shift is less than 20 degrees. Residual voltage is less than 50 mv.

WARM-UP TIME: Within two minutes.

OPERATING LIFE: Rated at 500 hours.

ENVIRONMENTAL CHARACTERISTICS: Maximum operating temperature of 195°F. and a minimum of −20°F. Maximum allowable shock is 60 g. with maximum operating vibration of 7 g. (from 10 to 500 cps). Maximum excursion not to exceed 0.5 inches. Positive hermetic seal.

WEIGHT: Approximately 4.2 lbs.

CAGING AND UNCAGING: Can be caged remotely by applying 26 volts, 400 cps, single phase and 28 volts DC power. Will cage from any position of gimbals within 30 seconds with gyro rotor at full speed. Application of 28 volts DC will uncage within 0.1 seconds.



HERMETICALLY SEALED

ROLL GYRO TRANSMITTER

Type XD 790412

Power requirements	.45 volts, 3 phase, 800 cps
Gyro speed	22000 RPM
Gyro moment	3300 gram cm²
Acceleration time	7 minutes @ 45 volts 15 minutes @ 75 volts
Weight	6.0 pounds
Size	4⅞" dia.—5 5/64" long
Drift	below 0.5°/minute
Precession under 3RPS	below 1.2°/minute
Caging time	1 minute (28 volts D.C.)
Pickoff excitation	6 volts, 5000 cps 1Φ and 26v 400 ⏦ 1Φ
Pickoff output	60 mv./degree

COMPLETE FREEDOM ON 2 AXIS

TWO AXIS - GRAVITY ERECTED

VERTICAL GYRO TRANSMITTER

Type No. 14104-1

Diam.—6⅛" Height—6¾"

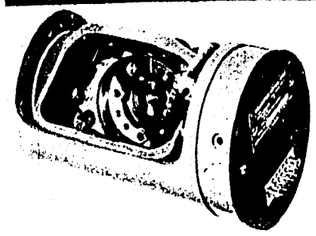
Weight—6¼ lbs.



Designed for use as a remote vertical reference where vertical stabilization is required. The instrument is essentially an electrically driven, vertical-seeking gyro with separate Autosyn transmitter pick-offs on the pitch and bank axes. Sealed in an aluminum case against environmental conditions.

- *Operating temperature range:* −55°C to +70°C.
- *Operational limits:* 360° in roll and pitch with controlled tumbling of the pitch axis at near 90°.
- *Erection device:* A two-ball erection system maintains the gyro in a vertical position to within ¼° of vertical position with respect to the earth.
- *Caging:* From any position at full rotor speed in less than 45 seconds.

VERTICAL GYRO TRANSMITTER FOR RADAR AND AUTO PILOT CONTROL



TYPE 14110-1-A

FEATURES: Includes quick erecting mechanism which makes the remote unit ready for operation within 3 minutes. • Two ball erection system. • Non-tumbling stops. • Inclined axis (1 degree) to minimize turn error.

Power Requirement . . . 115 v, 1 phase, 400 cps Starting . . . 19 w .9 P.F. Running . . . 13 w .85 P.F.

Gyro Speed . . . 22000 RPM

Erection rate (normal) . . . 3°/minute

Weight . . . 2¾ lbs.

Size . . . 3⅛ diameter x 5 11/16 long

Gyro Moment . . . 600 gram cm²

Autosyn excitation . . . 26 v, 400 cps

ECLIPSE-PIONEER DIVISION

TETERBORO, NEW JERSEY

WATCH JOHNSON & HOFFMAN FOR THE LATEST DEVELOPMENTS IN COLOR TV PICTURE AND RECEIVING TUBE PARTS AND COMPONENTS

COLOR TUBE PARTS

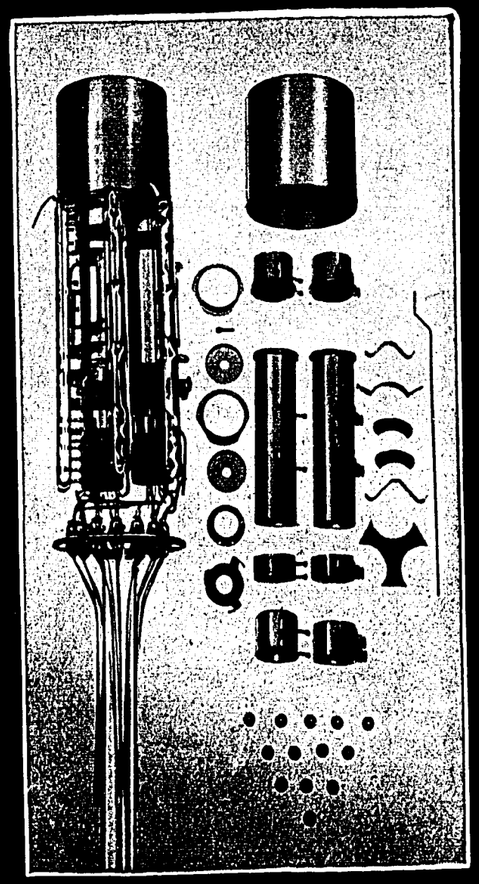
Johnson & Hoffman Mfg. Company Announces a Complete Line of Color Tube Gun Parts and Components

After months of intensive tooling and preparation, Johnson & Hoffman Mfg. Co. is now geared up to immediately supply a complete line of Color Picture Tube Parts in small or mass production quantities. From the smallest stem eyelet to the large convergence lens cup we are completely and permanently tooled in our own plant to produce all parts now utilized in color tube applications.

The same deep drawing techniques successfully pioneered by Johnson & Hoffman Mfg. Co. for black and white CR tubes are now being applied to the production of seamless anodes, grids and other parts employed in the new color gun designs.

If you have a technical problem in connection with your particular gun design requirements, we will be pleased to extend competent assistance and service. Our experience may suggest valuable possibilities which may improve your product and reduce costs.

Depend on Johnson & Hoffman Mfg. Co. for your complete source of precision crafted parts for both color and black and white tube applications.



The Tri-Color gun illustrated features Johnson & Hoffman Mfg. Co. parts now currently available to the industry.

Leading Cathode Ray Gun & Tube manufacturers are already specifying Johnson & Hoffman Mfg. Co. parts for their color tube designs in addition to their standard requirements for black and white tube parts and sub assemblies comprising Electro-Magnetic, Electro-Static, Internal Focusing Designs, both in Glass Post and Ceramic Construction.

Your inquiries for special or standard parts will receive prompt and courteous attention.



Johnson & Hoffman Mfg. Co.

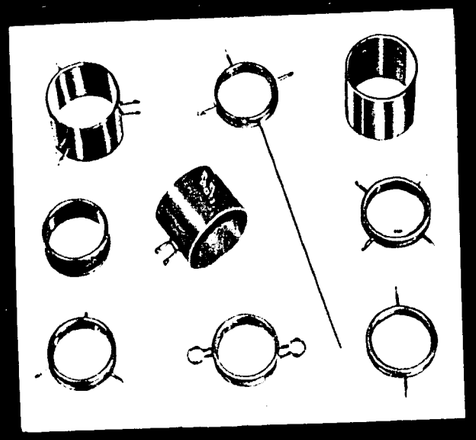
31 East Second Street, Mineola, L.I., N.Y.

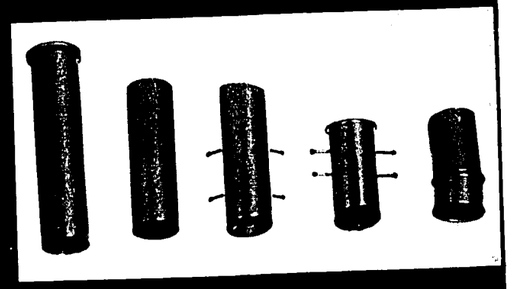
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Preferred Electronic Parts • Components by J & H ••

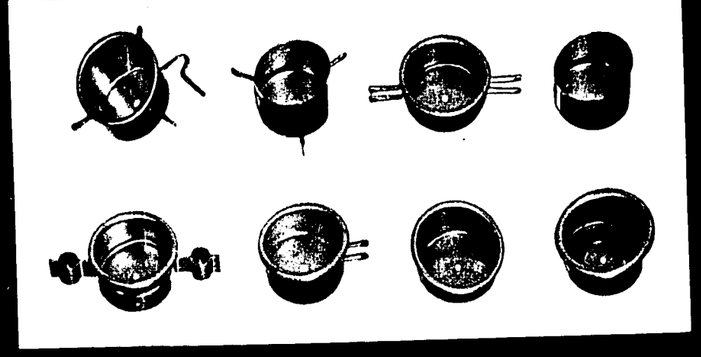




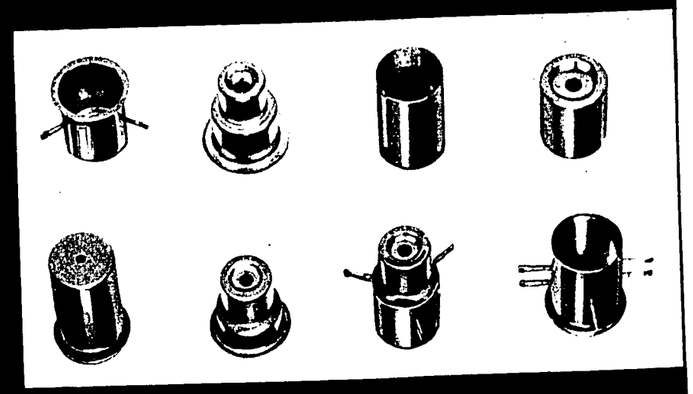
ANODES and ANODE ASSEMBLIES

o

FOCUS RINGS and ASSEMBLIES

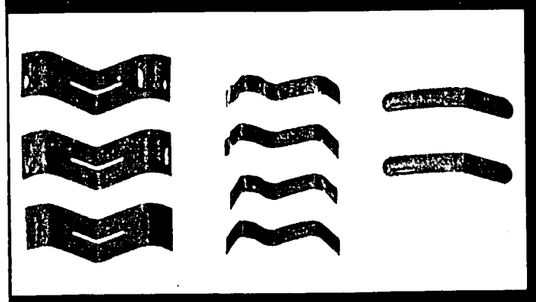


No. 2 GRIDS and NO. 2 GRID ASSEMBLIES

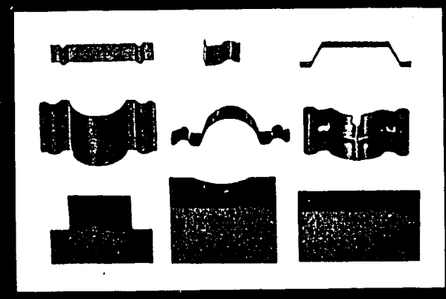


TOP and BOTTOM FOCUS LENS and LENS ASSEMBLIES

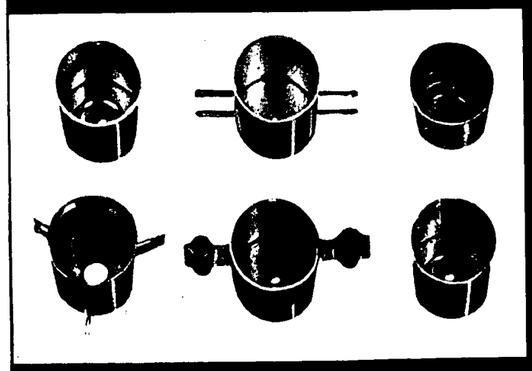
ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE



TOP APERTURE BULB SPACER SNUBBERS

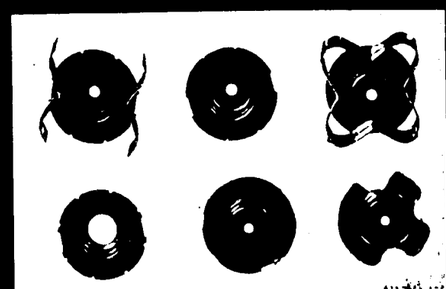


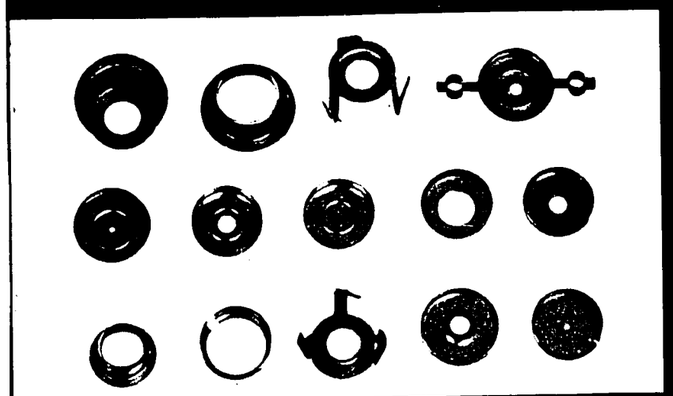
ANODE and GRID SUPPORT STRAPS, DEFLECTION PLATES, CONNECTORS



NO. 1 GRIDS and NO. 1 GRID ASSEMBLIES

TOP APERTURE BULB SPACERS





APERTURE CUPS, CATHODE SPACERS and RETAINERS

ELECTRONIC J&H PARTS

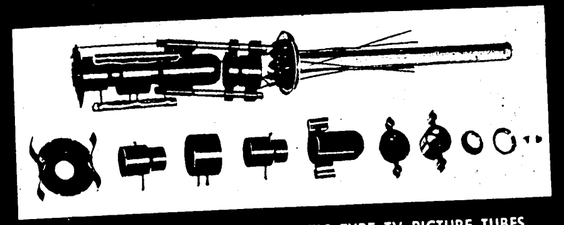
Johnson & Hoffman Manufacturing Co.

31 East Second Street, Mineola, L. I., N. Y.

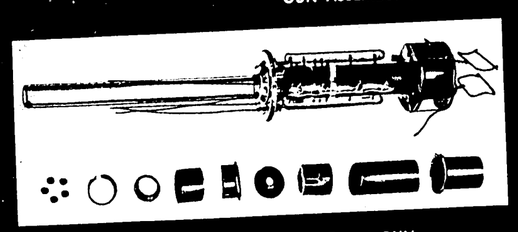
Telephone — Ploneer 2-3333

ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE

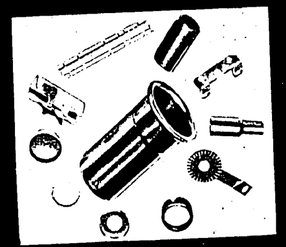
Johnson & Hoffman gun parts lend themselves to present Color Tube gun designs. We are also actively engaged in development work on special parts for advanced color tube gun applications.

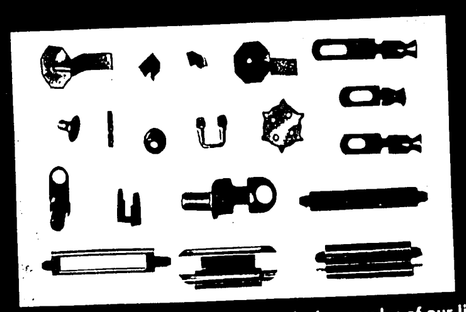


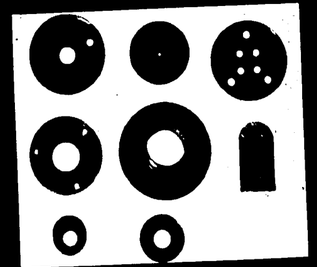
GUN ASSEMBLY FOR ELECTRO-STATIC TYPE TV PICTURE TUBES.



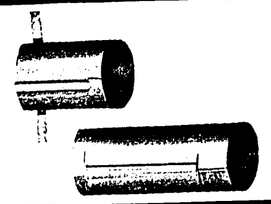
NEW IMF (Internal Magnetic Focus) GUN





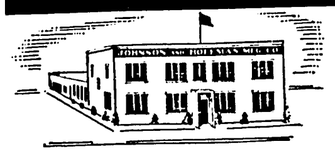


Illustrated above are typical examples of our line of standard and special electronic items currently being produced for leading manufacturers.



Illustrated are lockseam anodes which are now available in various lengths and are being produced on new U. S. tool multi slide equipment which we have acquired as a further expansion of our present metal fabricating facilities. These parts, along with other radio and electronic items such as plates, supports, shields, and other staked and lockseam products will be cataloged as they are made available to the industry.

Your inquiries for these and any other parts components will receive courteous and prompt consideration.



Johnson & Hoffman Mfg. Co.

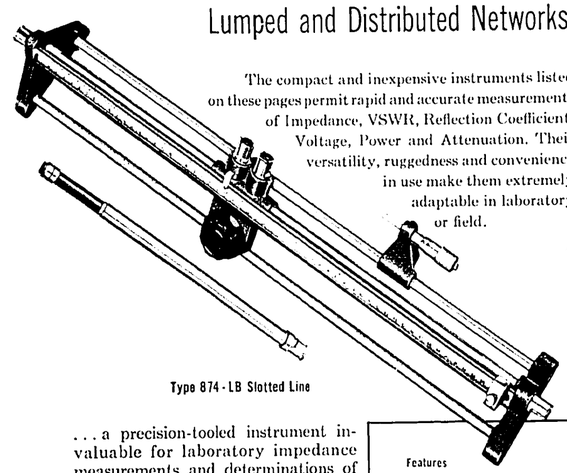
31 East Second Street, Mineola, L.I., N.Y.

Telephone — Ploneer 2-3333

ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE

Unit Instruments and Coaxial Accessories for VHF-UHF MEASUREMENTS

on Antennas, Lines, Coaxial Components, Lumped and Distributed Networks and Circuits



Type 874-LB Slotted Line

The compact and inexpensive instruments listed on these pages permit rapid and accurate measurements of Impedance, VSWR, Reflection Coefficient, Voltage, Power and Attenuation. Their versatility, ruggedness and convenience in use make them extremely adaptable in laboratory or field.

. . . a precision-tooled instrument invaluable for laboratory impedance measurements and determinations of VSWR or mismatch . . . at any frequency from 300 to 5000 Mc.

Superior electrical characteristics and many operating conveniences, coupled with compactness and light weight, make this device extremely useful in field work as well as in the development laboratory.

In no other way are the fundamentals of high-frequency wave propagation more effectively illustrated. The Slotted Line clearly indicates positions of minima and maxima, and determines voltage-amplitudes and effects of different load terminations. It is a widely useful, low-cost demonstration piece for college or high school laboratory classes.

Features

Frequency Range: 300 Mc to 5000 Mc

Accuracy: constancy of probe coupling ±2½% or better

Characteristic Impedance: 50 ohms ±1%, throughout — inner conductor is supported at its ends only, minimizing discontinuities

Connectors: Type 874 with standing-wave ratio less than 1.05 to 4000 Mc

Probe Penetration: fully adjustable

Probe Travel: 50 cm

Probe-Carriage Drive: free sliding for rapid travel, vernier for fine adjustment

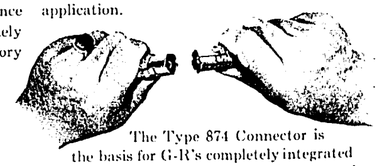
Scale: calibrated in centimeters — can be shifted to simplify calculations

Accessory Micrometer Vernier: for measurement of high standing-wave ratios by the "width of minimum" method

Portability: weighs only 8½ lbs.

Type 874-LB Slotted Line with crystal detector	$220.00
Type 874-D20 Adjustable Stub for tuning with crystal	$11.00
Type 874-LV Micrometer Vernier Attachment	$23.00

These are reliable, light-weight equipments in which specific functions are isolated in separate compact units. Combinations of these units permit innumerable setups for almost any vhf-uhf application.

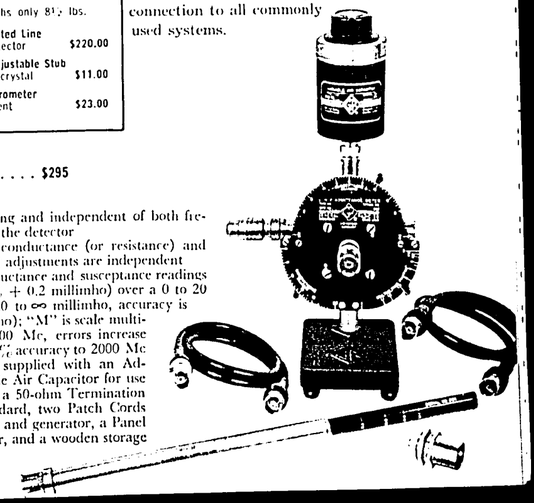


The Type 874 Connector is the basis for G-R's completely integrated system for u-h-f measurements. Any two of these connectors plug smoothly into each other, completely eliminating the need for male and female parts — electrical uniformity is excellent — all units are designed for use on 50-ohm systems.

★ ★ ★

The field of application for the Slotted Line and Admittance Meter is much enlarged due to the many accessories now available for measurements on antennas, lines, coaxial components, and lumped and distributed networks.

The Constant-Impedance Adjustable Line simplifies impedance measurements and eliminates line-length corrections between measuring point and unknown — the Balun and new Adaptors to v-h-f and u-h-f transmission lines make possible accurate measurements on balanced tv receiving-antennas and transmitting systems — the Component Mount and Insertion Unit provide a means for accurate high-frequency measurements of resistors, capacitors, and inductors — a variety of Adaptors permit connection to all commonly used systems.



Type 1602-B Admittance Meter $295

The Type 1602-B Admittance Meter is a versatile instrument for the rapid and accurate measurement of admittance, impedance or VSWR over a 20 to 1500 Mc range — direct reading between 41 and 1500 Mc. It can be used to match a load to a line, to compare directly the impedance of one circuit or component to that of another, as well as for direct impedance measurements.

★ Scales are direct reading and independent of both frequency and calibration of the detector

★ No sliding balance — conductance (or resistance) and susceptance (or reactance) adjustments are independent

★ Accuracy of both conductance and susceptance readings up to 1000 Mc is ± (3% + 0.2 millimho) over a 0 to 20 millimho range — from 20 to ∞ millimho, accuracy is ± (3$\sqrt{M}$% + 0.2 millimho); "M" is scale multiplying factor — above 1000 Mc, errors increase slightly — for matching, 3% accuracy to 2000 Mc

★ Admittance Meter is supplied with an Adjustable Stub and Variable Air Capacitor for use as susceptance standards, a 50-ohm Termination for the conductance standard, two Patch Cords for connection to detector and generator, a Panel Connector for the detector, and a wooden storage case.



874-B Basic Connector for rigid, 50-ohm, air-dielectric coaxial line $1.15



874-C Cable Connector for 50-ohm, 874-A2 Cable or equivalent ... $1.70

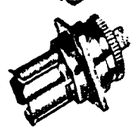
874-C8 for RG-8/U Cable $1.70

874-C58 for RG-29/U, RG-55/U, RG-58/U Cable $1.70

874-C62 used with RG-62/U (not matched) $1.70



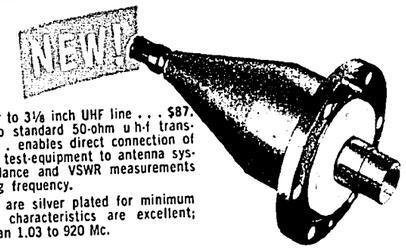
874-P Panel Connector has adaptor and nut for panel mounting and fits 874-A2 Cable — 874-P8, 874-P58, 874-P62 are available for use with other cables. Price is $2.50 each, for any listed.



874-PB has flanges for panel mounting; 874-PB8, 874-PB58, 874-PB62 also available for other cables. $2.50 each

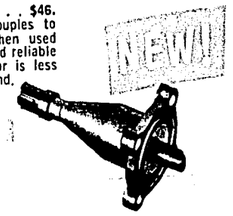


874-Y Cliplock rolls around mated connectors holding them securely in place. 10 Cliplocks $1.75

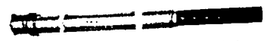


874-QU3 Adaptor to 3⅛ inch UHF line . . . $87. . . . couples to standard 50-ohm u-h-f transmission line . . . enables direct connection of any G-R coaxial test-equipment to antenna systems for impedance and VSWR measurements at the operating frequency.

These elements are silver plated for minimum loss. Electrical characteristics are excellent; VSWR is less than 1.03 to 920 Mc.

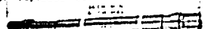


874-QV2A Adaptor to 1⅝ inch line . . . $46. . . . similar to 874-QU3 except couples to 51.5-ohm v-h-f transmission line. When used with the Admittance Meter for rapid and reliable antenna testing, VSWR of this adaptor is less than 1.02 over the complete v-h-f band.



874-D20 Adjustable Stub with calibrated cm-scale indicating position of termination; 20 cm travel $11.00

874-D50 Adjustable Stub 50-cm travel; movable marker replaces scale $12.00



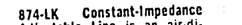
874-LA Adjustable Line (not constant impedance) with 25-cm travel $14.50



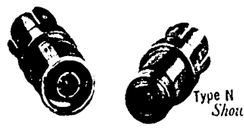
874-L10 10-Cm Air Line with 874-B Connector at each end $5.00

874-L20 20-Cm Air Line ... $5.50

874-L30 30-Cm Air Line ... $6.00

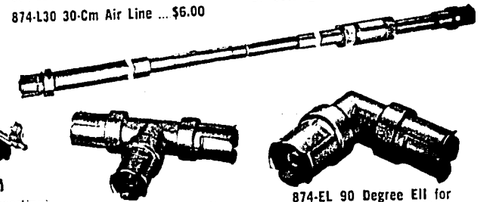


874-LK Constant-Impedance Adjustable Line is an air-dielectric, coaxial line which telescopes to change length; 50-ohm impedance remains constant along line regardless of setting $36.00



Type N *Shown*

To Adapt to Type	Order G-R Type (Jack)	(Plug)	Price
N	874-QNJ	874-QNP	$3.75 & $4.5
C	874-QCJ	874-QCP	$4.75 & $6.
BNC	874-QBJ	874-QBP	$4.75 & $4.
UHF	874-QUJ	874-QUP	$4.00 & $4.
HN	874-QHJ	874-QHP	$6.50 & $6.



874-Z Stand for supporting coaxial systems; includes heavy base, horizontal and vertical rods and three universal clamps ..$15.00

874-T Tee for connecting elements in shunt with a coaxial line $8.50

874-EL 90 Degree Ell for right-angle bends . $6.50



874-A2 Polyethylene Cable is 50-ohm ± 5%, double shielded with good flexibility . . . . 27c/ft for 25 ft or more; 50c/ft for less

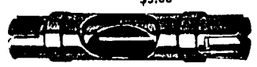


874-WN Short Circuit Termination for establishing reference conditions $2.25

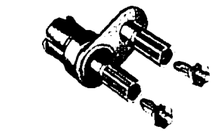
874-WN3 has "short" 3-cm further away $2.75



874-JR Rotary Joint permits rotation of one section with respect to other $9.00



874-LR Radiating Line enables coupling to field within a line $7.50

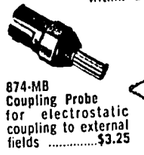


874-Q7 Adaptor to G-R Type 774 Connector $3.75



874-R20 Flexible Line— 3-ft. 874-A2 double-shielded cable with 874-C Connectors $6.00

874-R21 Patch Cord — 3-ft. single-shielded, 50-ohm cable with 874-C8 Cable Connectors $5.50



874-WO Open Circuit Termination with shielding cap $1.75

874-WO3 with "open" 3-cm further down the line $2.50



874-MB Coupling Probe for electrostatic coupling to external fields $3.25



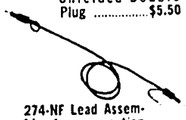
874-MA Adjustable Coupling Loop can be clamped in any desired position $5.50

874-WM 50-ohm Termination provides impedance match to 50-ohm systems from dc to several thousand Mc ... $17.50

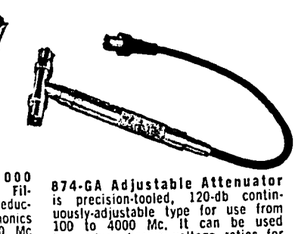
874-Q2 Adaptor for connecting Type 874 system to Type 274 Connector, binding posts, banana plugs . $3.50



874-Q6 Adaptor fits G-R Type 274-NF Lead Assembly $2.25



274-NF Lead Assembly for connection to 874-Q6 Adaptor, 274-ND Shielded Plug and 838-A Alligator Clips . $2.00



874-F1000 Low-Pass Filter for reducing harmonics above 1000 Mc $10.00

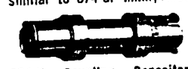
874-F500 Low-Pass Filter cuts off at 500 Mc $16.00

874-GA Adjustable Attenuator is precision-tooled, 120-db continuously-adjustable type for use from 100 to 4000 Mc. It can be used to produce known voltage ratios for attenuation measurements and for converting oscillators simply and inexpensively into signal generators when used with the Type 874-MR Mixer Rectifier $55.00

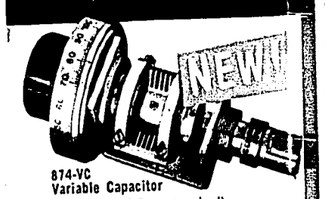


874-GF 20-db Fixed Attenuator with maximum power input of ½ watt and 0.5 db accuracy to 2000 Mc; useful to 5000 Mc $18.00

874-GG 10-db Fixed Attenuator similar to 874-GF $18.00



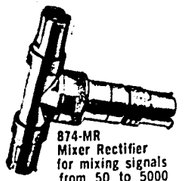
874-K Coupling Capacitor, blocks dc and low audio frequencies $8.50



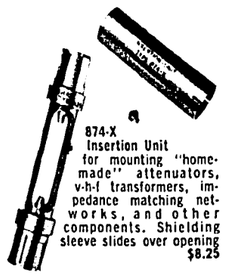
874-VC Variable Capacitor
(Shielded Case supplied)

is a general-purpose tuning element for use at lower frequencies where adjustable stubs and lines are inconvenient because of their large physical sizes.

The unit features milled aluminum rotor and stator, high-temperature polystyrene insulation, precision ball bearings for smooth operation, an accurately-engraved dial drum and well-shielded enclosure. Capacitance variation is 56 $\mu\mu$f at 1 kc. Minimum capacitance setting remains essentially constant at 14 $\mu\mu$f to 200 Mc; maximum capacitance setting is 70 $\mu\mu$f to 50 Mc . . **$42.50**



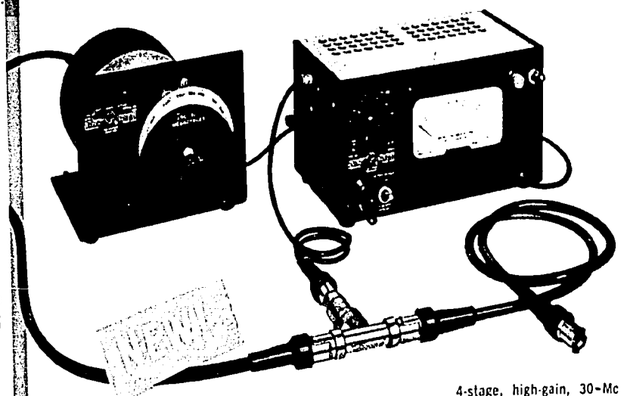
874-MR Mixer Rectifier for mixing signals from 50 to 5000 Mc — minimum conversion loss. Used with a G-R Unit Oscillator and the Type 1216-A I-F Amplifier as an accurate high-frequency detector system $32.50



874-X Insertion Unit for mounting "home-made" attenuators, v-h-f transformers, impedance matching networks, and other components. Shielding sleeve slides over opening $8.25



874-M Component Mount for minimizing stray effects when measuring impedance of R-L-C components and other circuit combinations, from dc to 5000 Mc. Can be used with Slotted Line or Admittance Meter. 874-WN3 and 874-WO3 are supplied to simplify measurements .....$25.00, complete



Type 874-UB Balun . . . $75.
Shown with accessory 874-D20 Stubs and 874-Z Stand

a coaxial transformer which uses an artificial half-wave line for converting from balanced to unbalanced impedance. Range is 54 to 1000 Mc — instrument is tuneable for maximum accuracy.

Frequency Range (Megacycles)	Type (Two of each required)	Total Price
470 to 1000	874-D20 Adjustable Stubs	$22.00
350 to 525	874-D20 Adjustable Stubs and 874-L10 Air Lines	$32.00
275 to 380	874-D20 Adjustable Stubs and 874-L20 Air Lines	$33.00
225 to 280	874-D20 Adjustable Stubs and 874-L30 Air Lines	$34.00
170 to 280	874-D50 Adjustable Stubs and 874-L30 Air Lines	$36.00
174 to 216	874-VC Variable Capacitors and 874-L10 Air Lines	Price available on request
140 to 174	874-VC Variable Capacitors and 874-L20 Air Lines	
88 to 140	874-VC Variable Capacitors and 874-L30 Air Lines	
54 to 88	874-VC Variable Capacitors and 874-XL Series Inductors	

The Balun enables accurate impedance and VSWR measurements on balanced systems with readily-available unbalanced measuring equipment such as the G-R Admittance Meter and Slotted Line. When the Balun is used with the Constant-Impedance Adjustable Line and Admittance Meter, *balanced impedance* is read directly on the meter scales.

Supplied at no additional cost: Type 874-UB-P1 terminal for use with 300-ohm systems; a Type 874-WN3 Short-Circuit Termination and a Type 874-WO3 Open-Circuit Termination to facilitate tuning.

Type 1216-A Unit I-F Amplifier . . . . $365.

Shown above with 874-MR and 1209-A Unit Oscillator

the basic element in a high-frequency null detector for use with Slotted Line, Admittance Meter and other measuring equipment. The signal to be detected and a local-oscillator frequency are mixed in the Type 874-MR Mixer Rectifier to produce a 30-Mc difference frequency which is detected by this I-F Amplifier. With this system, any signal from 50 to 5000 Mc may be reliably and conveniently detected.

4-stage, high-gain, 30-Mc amplifier is terminated in rectifier and panel meter — modulation on signal is amplified by cathode follower with 0.4 Mc bandwidth and is available at binding posts for monitoring

90-db amplifier gain over 0.7 Mc bandwidth at 30-Mc center frequency — bandwith sufficiently wide to detect pulsed signals

High Sensitvity — less than 2 μvolts from 400-ohm source for 1% meter deflection; 50 μvolts for full scale deflection

Accurate built-in 70-db attenuator provides reliable measurement of relative signal levels — enables accurate high-frequency attenuation measurements

Two internal power supplies in Unit — one for the amplifier and one for the local oscillator to be used in detection

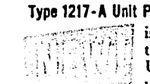
AVC provided for null-detection

Dimensions are 5⅛ x 10½ x 6⅜ inches; Net Weight is 8¼ lbs.

Price on request



Type 1217-A Unit Pulser . . . $225.



is a highly useful addition to the growing line of G-R Unit Instruments. When used with other Unit Instruments and Accessories, it permits . . . transient studies on a wide variety of networks . . . pulse modulation over the complete vhf-uhf television band . . . square-wave testing of amplifiers . . . and a wide variety of other pulse measurements.

Large Variety of Pulse Repetition Rates — 30, 60, 100, 200, 500 cycles, 1, 2, 5, 10, 20, 50, 100 kilocycles

Wide Range of Pulse Durations — continuous coverage from 0.2 μsec to 60,000 μsec

Fast Rise Time — 0.05 μsec; fall time is 0.15 μsec with open circuit shunted by 15 $\mu\mu$f and 1MΩ — top of pulse is flat to within 5% of maximum amplitude at all times.

Excellent Stability — no time jitter visible on scope

High Pulse Amplitude — permits use as time delay circuit — may be used directly on deflection plates of oscilloscope

Variable Pulse-Amplitude Control—permits zero to maximum settings

Output Voltage—20 v, on open circuit, for positive or negative pulses

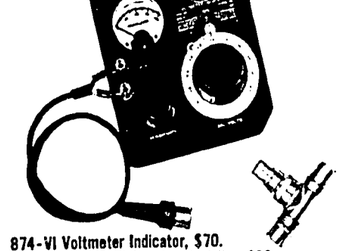
Output Impedance—200 ohms for positive pulses, 1500-ohms for negative

Self-Contained Oscillator — unit is independent of external synchronizing signals

External Synchronization — where other repetition rates are required, 25 v rms is sufficient for locking from 0 c to 100 kc

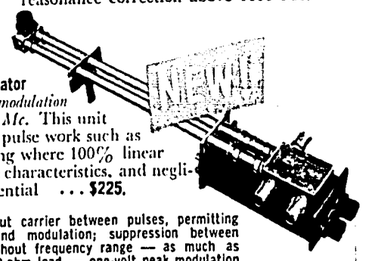
Power Supply — Type 1203-A Unit Power Supply is recommended

Dimensions are 10⅜ x 5¾ x 6¼. Net Weight is 5¼ lbs.



874-VI Voltmeter Indicator, $70.
and 874-VR Voltmeter Rectifier, $30.
Connecting Cord, $5.50

are used in conjunction to measure or monitor voltage, and for converting oscillators into 50-ohm signal generators. A crystal detector is used in the Voltmeter-Rectifier. The Indicator consists of a microammeter, sensitivity control and 60-cycle circuit for calibrating the crystal at any desired level between 0.1 and 2 volts. Measurement accuracy is ±0.05 volt. Frequency range, 15 to 2500 Mc subject to reasonance correction above 1000 Mc.



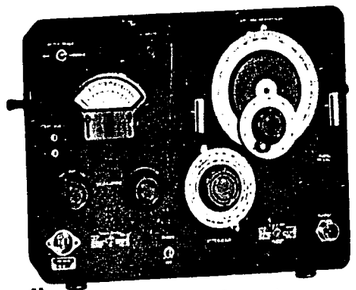
Type 1000-P7 Balanced Modulator
. . . for full 100% amplitude modulation of frequencies from 60 to 2500 Mc. This unit is particularly designed for pulse work such as radar and tv receiver testing where 100% linear modulation, good rise-time characteristics, and negligible incidental f-m are essential . . . **$225.**

Unique design bucks out carrier between pulses, permitting maximum double-sideband modulation; suppression between pulses is 60 db throughout frequency range — as much as 10 mv r-f output into 50-ohm load — one-volt peak modulation produces full r-f output from zero initial condition — price available on request.



Type 1000-P6 Crystal Diode Modulator . $40.
permits wide band, amplitude modulation of oscillators over a 20 to 1000 Mc carrier range. With this modulator, any standard tv-receiver's video signals can be used to "picture modulate" a signal generator operating at any vhf or uhf frequency . . . 50-millivolts r-f and 0.2 volt at modulation terminals produces 30% amplitude modulation; modulating frequencies may be any value from 0 to 5 Mc.

Since 1915
Manufacturers of Electronic Apparatus for Science and Industry

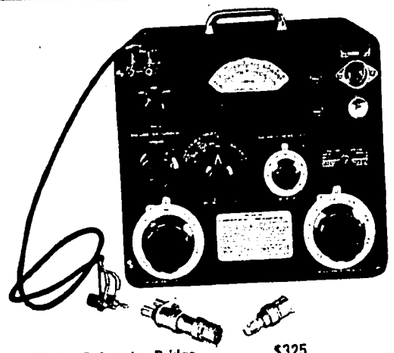


VHF and UHF Standard Signal Generator

Butterfly Tuning Circuit has wide range and no sliding contacts . . . frequency-calibration accuracy is ± 1%, direct reading . . . attenuator provides continuously-adjustable voltages from 0.5 μv to 1.0 volt, open circuit . . . internal 1-kc amplitude modulation; provision made for 30-cycle to 15-kc external modulation, adjustable from 0 to 50% with panel dial . . . panel meter indicates carrier output-voltage or modulation percentage.

Type 1021-AV,
50 to 250 Mc . $595.
Type 1021-AU,
250 to 920 Mc . $615.

These units are reliable, easily-operated power sources widely used in measurements with bridges, slotted lines and other coaxial equipment.



Type 1651-A Bolometer Bridge . . . $325.

a flexible bridge-circuit for measuring r-f power in the milliwatt range; useful in educational laboratories as well as in industrial research and development for innumerable applications. A variety of G-R Thermistor Units and Bolometer Holders are available for measurements from 0 to 500 mw. Other measurements can be made using a variety of power-sensitive elements with resistances from 25 to 400 ohms at frequencies up to 4000 Mc.

Unit oscillators

are compact and highly-efficient sources of power for maximum versatility. They are ideally adapted for use in industrial laboratory or college experimentation class. One Type 1203-A Power Supply and several oscillator sections permit maximum coverage at minimum cost.

Type 1211-A *Unit Oscillator* . *0.5 to 50 Mc* . **$295.**
Type 1215-A *Unit Oscillator* . *50 to 250 Mc* . **$190.**
Type 1208-A *Unit Oscillator* . *65 to 500 Mc* . **$190.**
Type 1209-A *Unit Oscillator* . *250 to 920 Mc* . **$235.**



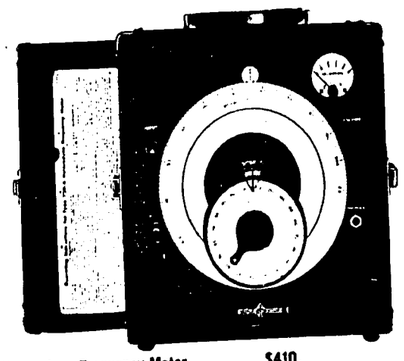
Type 1203-A *Unit Power Supply, for use with Unit Oscillators* . . . . . **$40.**



Type 1213-A Unit Crystal Oscillator . . . $130.

a source of standard frequencies at very-high and ultra-high frequencies. The heart of the unit, the crystal, is plated, wire mounted to absorb shock, hermetically sealed, and has low temperature coefficient of frequency. (Type 1203-A Power Supply recommended).

When adjusted to Station WWV, instrument-stability of approximately one part per million can be relied upon for a number of hours.



Type 720-A Heterodyne Frequency Meter . . . $410.

a completely self-contained and portable instrument for rapid and accurate measurement of frequencies from 10 to 3000 Mc (fundamental range, 100-200 Mc.)

Measurement accuracy is ±0.1%. Many operating conveniences: butterfly tuned circuit avoids difficulties inherent in u-h-f tuning; adjustable panel-antenna eliminates need for direct connection to source under measurement; panel meter, internal speaker or terminals for head-phones available for detection.

GENERAL RADIO Company

275 Massachusetts Avenue, Cambridge 39, Massachusetts, U. S. A.

90 West Street **NEW YORK 6**
8055 13th St., Silver Spring, Md. **WASHINGTON, D. C.**
920 S. Michigan Avenue **CHICAGO 5**
1000 N. Seward Street **LOS ANGELES 38**

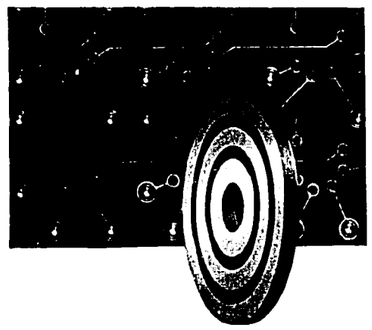
ADMITTANCE METERS	MODULATION METERS	SIGNAL GENERATORS
AMPLIFIERS	MOTOR CONTROLS	SOUND & VIBRATION METERS
COAXIAL ELEMENTS	NULL DETECTORS	STROBOSCOPES
DISTORTION METERS	OSCILLATORS	TV & BROADCAST MONITORS
FREQUENCY MEASURING APPARATUS	PARTS & ACCESSORIES	U-H-F MEASURING EQUIPMENT
FREQUENCY STANDARDS	POLARISCOPES	UNIT INSTRUMENTS
IMPEDANCE BRIDGES	PRECISION CAPACITORS	VARIACS
LIGHT METERS	PULSE GENERATORS	V-T VOLTMETERS
MEGOHMMETERS	R-L-C DECADES	WAVE ANALYZERS
	R-L-C STANDARDS	WAVE FILTERS

CDF Continental-Diamond Fibre

HELPS YOU IMPROVE DESIGN
HELPS YOU SIMPLIFY PURCHASING
HELPS YOU SPEED PRODUCTION

METAL CLADS

For Printed Circuit Metal Clad Stock



Metal Clad laminates are finding wide usage in printed circuit applications. Printed circuit technique involves the printing of an electronic circuit upon a metal clad laminate surface using an acid resisting ink. In a subsequent acid etching operation, the unwanted metal foil surface which is not under the printed portion of the foil, is etched away leaving only the circuit pattern or, that part of the metal foil which is under the inked portion of the laminate. Write for technical bulletin.

Dilecto METAL CLADS

Printed circuits depend upon stable, uniform core material and Dilecto has years of proven insulation service (Dilecto is a laminated thermo-setting plastic made only by C-D-F from paper, cotton, glass or asbestos fabric base, or a mat base). Normally, only the better electrical grades of phenolic resin laminates, such as grades XXXP-24 and XXXP-26, are used for metal clad sheet stock. Other grades such as XXP-13, XXX-13, or GB-28M may be supplied with copper clad surfaces upon special order. Outstanding are copper clad C-D-F grades XXXP-24 and XXXP-26. These are hot punching grades with high insulation resistance. New C-D-F Catalog GF-54 gives complete data on these and other Dilecto grades including glass base metal clad laminates. Write for your copy today.

Teflon* METAL CLADS

Glass fiber cloth is coated with Teflon resin and laminated into C-D-F- GB-112T sheet stock. This base withstands high heat (200°C. maximum operating temperature) with the dissipation factor and dielectric constant extremely low over a wide frequency range. The adhesive film used to bond the metal to the Teflon laminate, does not degrade the inherently good electrical properties of the core material. GB-112T has practically zero water absorption, so a METAL CLAD with this core offers consistent high insulation resistance with excellent dimensional and electrical stability.

* Du Pont Trade Mark.

METAL CLAD Surfaces

Copper foil (usually .0014" or .0028" thick) is bonded on one or both faces of the sheet grade of Dilecto selected. The foil used is a special grade of electrolytic deposition copper particularly adoptable for cementing onto laminated materials. An adhesive film is placed between the metal and the Dilecto, and cemented during the pressing and curing cycle. When closer tolerances are required, C-D-F sands the Dilecto to the required thickness before bonding. Aluminum or other metal alloys may be supplied.

Better Bond Strengths

One of the most important physical properties of a metal clad product is its peel strength, the pounds pull required to separate the foil surface from the core material. Working with years of laminating know-how, C-D-F has been successful in obtaining the following average test values for its METAL CLAD sheet stocks:

	Lbs. pull per 1" wide
XXXP-26 plus .00135" copper	5 to 8
XXXP-26 plus .0027" copper	7 to 10
XXXP-26 plus .0015" aluminum	9 to 12
GB-112 Teflon plus .00135" copper	6 to 9

Sheet sizes: Dilecto grades—38 x 38", 38 x 42"
Teflon grades—16 x36"

MICABOND

Only the finest mica splittings are used in Micabond tapes, plates, tubes and fabricated parts. They are placed for completely leakproof coverage, with strong binders used. Available in a wide range of sizes with many different backings including fiberglas, silk, cellophane. cotton and paper. Micabond Tapes are hand laid; flexible sheets are both hand and machine laid; both retain their electrical insulating properties at elevated temperatures.

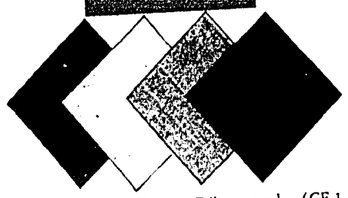
New . . . Micabond Fiberglas! When you need maximum reliability under high temperature service, resistance to mechanical abuse, coupled with the maximum safety factor, specify Micabond Fiberglas sheets, tapes, wrappers. Composed of India Mica splittings, bonded with flexible resin and faced on one or both sides with impregnated Fiberglas cloth, these new C-D-F products are superior to varnished fiberglas combinations in deeply imbedded "hot spot" applications. Write for technical bulletin and samples.

CONTINENTAL-DIAMOND FIBRE CO.

MOLDED AND LAMINATED PLASTICS—FOR ELECTRICAL INSULATION...

LAMINATED PLASTICS

DILECTO



Dilecto, a laminated phenolic material, meets the need for a non-metallic lightweight insulating material that is moisture resistant, good electrically, strong and adaptable to all fabricating operations. Some grades have exceptionally high mechanical strength—tensile, flexural, impact; others have high dielectric strength, high insulation resistance, high arc resistance and low loss factor.

Dilecto is a laminated material made from a base of either cellulosic paper; heavy or fine weave woven cotton fabric or mat; asbestos paper, woven asbestos fabric or mat; woven glass fabric or mat; and is coated with a synthetic resin.

The selection of the proper base material, the proper resin in the correct proportion, is C-D-F's job, but the end user must realize how important it is that he fully understands what dividend results can be gained mechanically, and electrically, and from a cost standpoint, by getting the very best C-D-F material for the project. Here is a brief, yet complete listing of Dilecto sheet grades, each one with a combination of proven characteristics built into the material for the specific job.

POST-FORMING: Certain Dilecto grades (CF-1, XF, GB-SF, MEC-1F) may be formed to special shapes by heating and placing in an inexpensive cold mold. The thermoelastic properties of these Dilecto laminates open many production and design opportunities. Already widely used by the aircraft industry, Post-Forming Dilecto merits full investigation by every alert manufacturer. Write for complete C-D-F engineering service.

DILECTO ROLLED OR MOLDED TUBING finds wide usage in radio and electrical equipment because of excellent insulating and mechanical properties. Impregnated paper or fabric is rolled on a mandrel between heated pressure rolls, then oven baked or press cured in a heated mold to set up the resin.

SHEET GRADE CLASSIFICATIONS (Rod and Tubing similar to sheet stock)

X For mechanical applications when electrical properties are secondary.
P For punching (paper-based grades).
XX For electrical applications requiring mechanical strength.
XXX For high humidity applications with minimum cold flow.
L For mechanical applications requiring fine machining.
C For mechanical applications requiring toughness plus impact strength.
For chemical and special applications.
CE and LE For electrical uses requiring greater toughness than paper-based grades.
GB For applications requiring heat resistance and high mechanical strength. For high heat applications.

Note: Various C-D-F grades, identified by numbers affixed to the grade classification, are available. Ask for catalog GF-54.

INSULATION

TEFLON

OUTSTANDING PROPERTIES

HEAT RESISTANCE: Due to the non-flammability and high heat resistance of Teflon,* it easily meets both Class B and Class H, AIEE standards for maximum hot spot insulation temperature. Teflon coated glass fabric laminates withstand 250°C. continuously and up to 300°C. intermittently. One factor which influences the heat resistance of Teflon is that there is no apparent degradation from oxygen, which has a definite degrading effect on silicone materials.

* Du Pont Trade Mark

MOISTURE RESISTANCE: A Teflon laminate has practically zero water absorption and its electrical properties are little affected after long exposure to high humidity. Teflon is unaffected by fungus and temperature changes. Not only has it lower moisture absorption than any other laminate known, but it tends to repel water . . . . retaining high surface insulation resistance properties even under extreme humidity conditions.

DIELECTRIC STRENGTH: The dissipation factor and dielectric constant of Teflon laminates are both extremely low over a wide frequency range. From 60 to 100 megacycles, the dissipation factor range is between .005 to .0005 and the dielectric constant ranges from 2.8 to 2.5 when measured in a field perpendicular to laminations. As corona will slightly degrade Teflon, care should be taken in designing parts used at voltages over 2500. Sharp corners, and other contributing factors to corona should be avoided.

CHEMICAL INERTNESS: Resistant to hot corrosive salts and most concentrated acids. Pure Teflon is unaffected by all known chemical agents, excepting molten alkali metals and, under special conditions, fluorine and chlorine trifluoride. Glass supported Teflon, when exposed at cut edges, is affected only by those chemicals which attack glass. Otherwise, its properties remain the same.

TEFLON TYPICAL PROPERTY VALUES COMPARED WITH GLASS-BASED LAMINATES

	TEFLON (Unsupported)	TEFLON GB-28T (teflon resin)	DILECTO GB-112S (Silicone resin)	DILECTO GB-28M (Melamine resin)	DILECTO GB-112D (Phenolic resin)
Dissipation Factor, 1 megacycle	.0005	.0007	.001	.012	.018
Dielectric Constant, dry, 1 megacycle	1.90	2.60	3.4	7.2	5.
Loss Factor, 1 megacycle	.001	.002	.004	.090	.090
Dielectric Strength, Short time	900	700	450	500	700
Perpendicular to Laminations Step by step (1/32" thick) VPM	800	500	400	350	600
Arc Resistance, Seconds	250*	160*	225	195	4
Maximum Constant Operating Temp. C°.	250	250	200	175	140
Flexural Strength Lengthwise		13	30	48	24
Flexural Strength Crosswise		11	27	40	20
(Thousands of psi)					
Water Absorption, %, 24 hours (1/16" thick)	Negligible	.03	.20	1.7	2.

* Will not form complete conducting path. Arc continues indefinitely but material gradually erodes away on full time continuous arc.

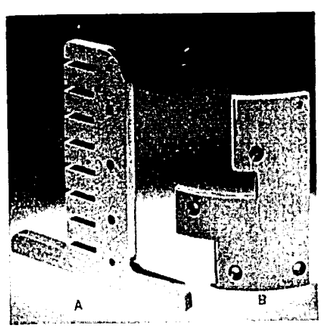
CONTINENTAL-DIAMOND FIBRE CO.

. . . . . FOR EVERY APPLICATION IN ELECTRONIC MANUFACTURING

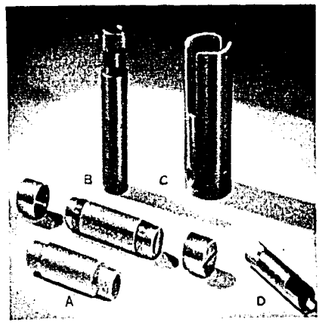
FABRICATED AND FORMED

VULCANIZED FIBRE

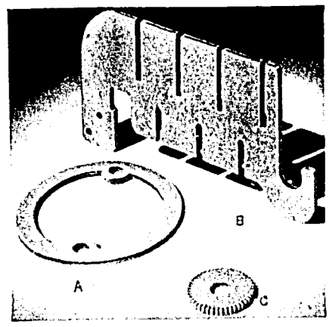
FAST . . . . AT LOW COST . . . . DEPENDABLY



A. Sheet stock, sand, smooth saw, drill, smooth saw to shape, radius three corners, gang saw notches. B. Sheet stock, hand saw rough blanks, form, smooth saw width, length and shape, radius edges, drill with jig, countersink.



A. Tube, automatic screw machine, turn shoulders, champfer and thread end, thread other. B. Tube (long pieces), smooth saw, tap threads, screw machine, (small pieces) auto. screw machine, thread, knurl, champfer, cut off. C. Tube, smooth saw to length, punch twice, countersink. D. Tube, automatic screw machine, champfer, cut off, punch.



A. Sheet stock, shear strips, punch. B. Sheet stock, shear, punch blank, gang saw notches. C. Sheet stock, shear strips, punch blank, mill notches.

SHEETS • TUBES • RODS • RECEPTACLES

Vulcanized Fibre is a wonderful material if you know where to use it and how to buy it. We suggest on many jobs that it's best to do the fabrication and forming in C-D-F's shops. Why? Because C-D-F knows how. Since 1895 the company has put fibre to work in everything from buggy axle bushings to metal clad radio parts. The handling of thousands of set-ups for high speed, low cost production runs gives C-D-F an "experience bank" to draw from. Shop supervisors have a wealth of short cuts, little tricks that result in lower prices for you. They know the material and its peculiarities.

TOUGH, RESILIENT, STRONG

How long has it been since you examined the unique properties and wide range of C-D-F fibre grades? Vulcanized Fibre is arc resistant, mechanically strong, non-corroding, half the weight of aluminum. Repeated moistening and drying in forming insignificantly alters the nature, structure or quality of the fibre.

Since C-D-F has their own paper mill, uniform, quality control is made possible. Special grades are more easily developed.

A BIG, RELIABLE SOURCE

C-D-F does business with the largest tonnage users of sheet, rod and tube fibre in the world. This means good deliveries, good prices, reliable products for every new customer. You deal with a materials engineer, a C-D-F man who knows how to give you the most value in Diamond Vulcanized Fibre. If you want to improve design, simplify purchasing, speed production, use Diamond Fibre and the facilities of C-D-F. Write for catalog, free test samples, or send us your print for quotation.

MECHANICAL PROPERTIES OF DIAMOND VULCANIZED FIBRE

Property	Sheet thickness, tube wall or rod diameter	SHEETS Bone CW	SHEETS Bone LW	SHEETS Commercial CW	SHEETS Commercial LW	TUBES	RODS Bone	RODS Commercial
Tensile Strength	Up to 1/8"	6500	8500	6000	8000	6500	8500	8000
	Over 1/8 to 1/2	6000	8000	5500	7500	6500	8000	7500
	Over 1/2	....	....	5000	7000	6500	....	7000
Flexural Strength	Up to 1/2"	13,000	15,000	12,000	14,000		15,000	14,000
	Over 1/2	....	....	11,000	13,000		....	13,000
Compressive & Axial Strengths	Up to 1/8"					10,000		
	Over 1/8 to 1/16					9000		
	All thicknesses or diameters	30,000		20,000			8000	6,000

RESIN-IMPREGNATED FIBRE

VULCOID

Only C-D-F supplies Vulcoid in sheets, tubes, rods, and fabricated parts. Made from Diamond Vulcanized Fibre that has been uniformly impregnated with a special resin, Vulcoid is a material approved and identified by the Underwriters' Laboratories as Class A Insulation. Natural greenish-tan in color, it is economical, easy to machine and punch. Property-wise, Vulcoid is an intermediate grade between Commercial Fibre and XX phenolic Dilecto.

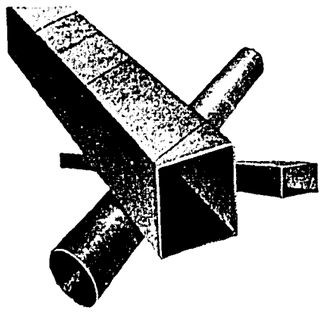
USES: (requiring arc resistance and mechanical strength)—contact and connectors panels, knife switch arms and guides, arc deflector spacer bushings; (requiring dielectric strength and moisture resistance)—electrical fixture insulation, wiring devices, plugs, receptacles; (requiring moisture and arc resistance)—motor and transformer lead bushings and terminal blocks.

CONTINENTAL-DIAMOND FIBRE CO.

MOLDED AND LAMINATED PLASTICS....FOR THE ELECTRONIC INDUSTRY

ENGINEERING UNLIMITED

SPIRAL TUBING



GOOD DIELECTRIC STRENGTH • LOW DIELECTRIC LOSS PROPERTIES
GOOD MECHANICAL STRENGTH & MOISTURE RESISTANCE

C-D-F is a dependable source of supply for all of your coil form spiral tubing needs. Uniform, high product quality is maintained by rigid standards of manufacture. C-D-F offers you fabricating skill, backed by exacting technical and inspection control. A recent C-D-F development is Grade 5 Constant Torque Tubing for use in coil forms. After the threaded iron tuning core is inserted and finally adjusted, you obtain the same stable torque rating. Constant Torque features: exact internal threading . . . every thread engaged. 3-point contact with core prevents binding and permits positive tuning and re-tuning. Outer surface of tube has no weak spots, no external embossing to cause cement leakage. Available in lengths up to 14" to take .248" to .250" core with 28 threads per inch and also 6-32, 8-32 and 10-32 screw sizes. Write for samples. Grade 5 Tubing is also custom-fabricated by C-D-F in conventional shapes to accommodate other sizes of tuning cores. C-D-F produces spiral tubing in grade to meet most requirements. Use the Grade Selector Chart when requesting samples and additional information. Write for folder ST-53.

AVAILABLE GRADES

IMPREGNATED

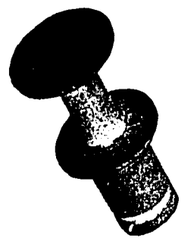
1 General Electrical and Mechanical Grade. ○
1A Electrical and Mechanical Grade—Special Punching. ○
2 Mild Stapling, Riveting, and Post Forming Quality. ○
2A Intermediate Fabricating and Stapling Quality. ○
3 Severe Stapling, Riveting, and Post Forming Quality. ○
5 Constant Torque and Formed-to-Shape Coil Form Tubing. △
6 Special for High Humidity Applications. ○
6A Extra Hard, High Strength Tubing. ○
7 Soft Varnished Kraft Tubing. ○ □
7A Hard, Rigid Rectangular Tubing. □
8 Varnished Diamond Insulation—Tubing. ○
9 "Deflection Coil" Tubing. ○
10 Larger Size, Heavy Wall Tubing for Mechanical Uses. ○

UNIMPREGNATED

20 Special Wound in Specified Combinations of kraft paper, fish paper, etc. ○ □
21 Plain Kraft Paper Tubing. ○ □
22 Plain Diamond Insulation Tubing. ○
23 Plain Chipboard Tubing. ○

○ Round
△ Formed (fluted shape)
▽ Formed and Notched
□ Square, Rectangular

SPOOLS SMALL, ECONOMICAL



A radio coil manufacturer wanted small spools, less costly than those machined down from round stock, much stronger than molded bobbins. C-D-F supplied this: a rolled Dilecto tube is grooved on one end . . . stepped down in the middle . . . then notch cut on the other end for a flush fit. C-D-F uses a special adhesive to bind the three parts (the body and two Dilecto spool heads) together. The assembly is sufficiently strong to withstand the outward pressure of the wire. The spool never loses it's head! Because Dilecto is resistant to high heat and high humidity, many corrosive and chemical actions, it can be used for many coil and electronic applications.

SALES OFFICES

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BOSTON SALES OFFICE 1245 Hancock St., Quincy 69, Mass.	Granite 2-2150
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SPARTANBURG, S. C. 834 Hayne St.	Spartanburg 3-6397
TULSA, OKLA. 204 S. Cheyenne St.	5-6189

Pacific Coast Representative
MARWOOD LIMITED

SAN FRANCISCO 3, CAL. 357 Ninth Street	Hemlock 1-7893
SEATTLE 4, WASH. 1714 First Avenue, South	Elliot 4747
PORTLAND 4, ORE. 209 S.W. First Avenue	Beacon 5123
LOS ANGELES 13, CALIF. 320 East 3rd Street	Mutual 3241

Canadian Representative
DIAMOND STATE FIBRE CO. OF CANADA LTD.
46 Holinger Rd., Toronto 13, Ontario, Canada

CDF *Continental-Diamond Fibre*

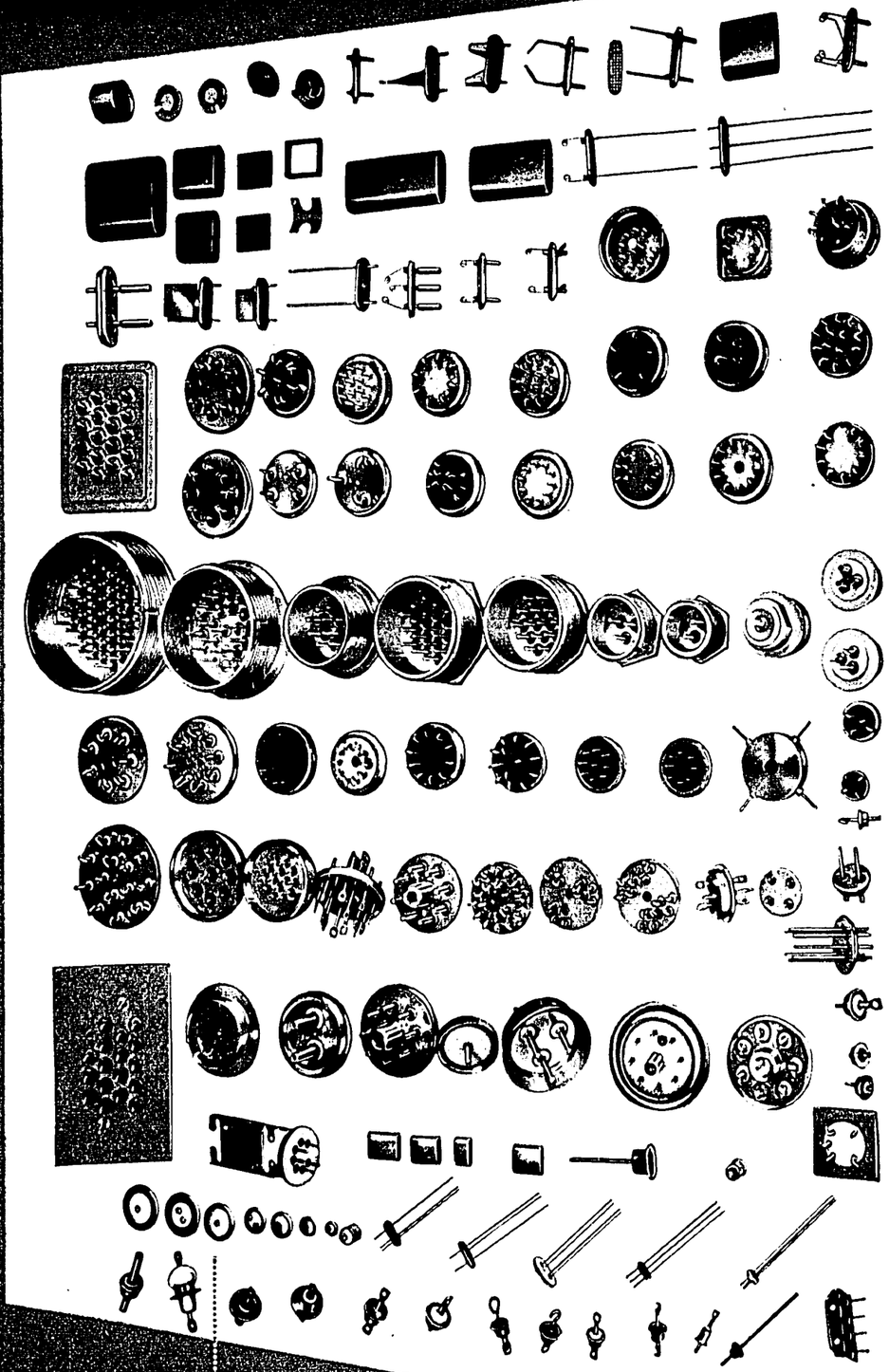
CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK III, DELAWARE

PLANTS:
NEWARK, DELAWARE
BRIDGEPORT, PENNSYLVANIA
MARSHALLTON, DELAWARE
SPARTANBURG, S. C.
VALPARAISO, INDIANA



Executive Offices: NEWARK, DELAWARE
Export Department: Bridgeport, Penna., U.S.A.

CONTINENTAL-DIAMOND FIBRE CO.



WHAT DO YOU

SPECIFY

L. L. Constantin & Co.

NEW INDICATING FUSE POSTS

FOR 3AB & 3AG FUSES

Fulfilling a wide need for a fuse post which indicates by means of a light when a fuse is blown, Littelfuse has developed a line of Indicating Fuse Posts in ratings up to 15 amperes and 500 volts. In normal use the indication light, located in the extractor knob, is shunted by the fuse and does not light. When the fuse blows, the open circuit voltage is thrown across the lamp which then lights, indicating that the fuse is blown.

DESIGN FEATURES

1 Smallest on the market. 2⅜" overall, ¾" above panel, 1⅝" below panel, including the solder terminals.

2 The most positive indication. Light is completely above panel to provide 360° indication from any point.

3 Rugged. Molded black high strength bakelite body; tough translucent nylon non-breakable knob of fingertip design. No sharp points or knurls.

4 Can be manufactured to meet government requirements of water-proofing and fungus resistance.

5 Mounts on 1-1/16" minimum center to center, dimension, knob, 15/16 OD, body mounts in ⅝" diameter "D" non-turning hole; ⅝-18 thread on body.

6 Post extracts fuse with knob removal.

7 Contact pressure on fuse–5 to 8 lbs.

8 Since the lamps are in shunt with the fuse, the minimum rating ¼ ampere, maximum 15 amperes as above.

9 For standard commercial application a half twist bayonet type of lock between knob and body will be used. Where it is desirable and necessary that the unit be splash and/or water-proof from front panel, "O" rings will be added between the knob and the body and between the body and the panel, and the locking design will be changed to a threaded screw type instead of the bayonet style.

10 Identification. In order to provide positive identification of each different voltage range, the knob and the body will be clearly marked. This obviates the necessity for non-interchangeability between ranges, and/or color coding.

11 Both solder terminals protrude from the bottom of the unit for easier assembly in equipment.

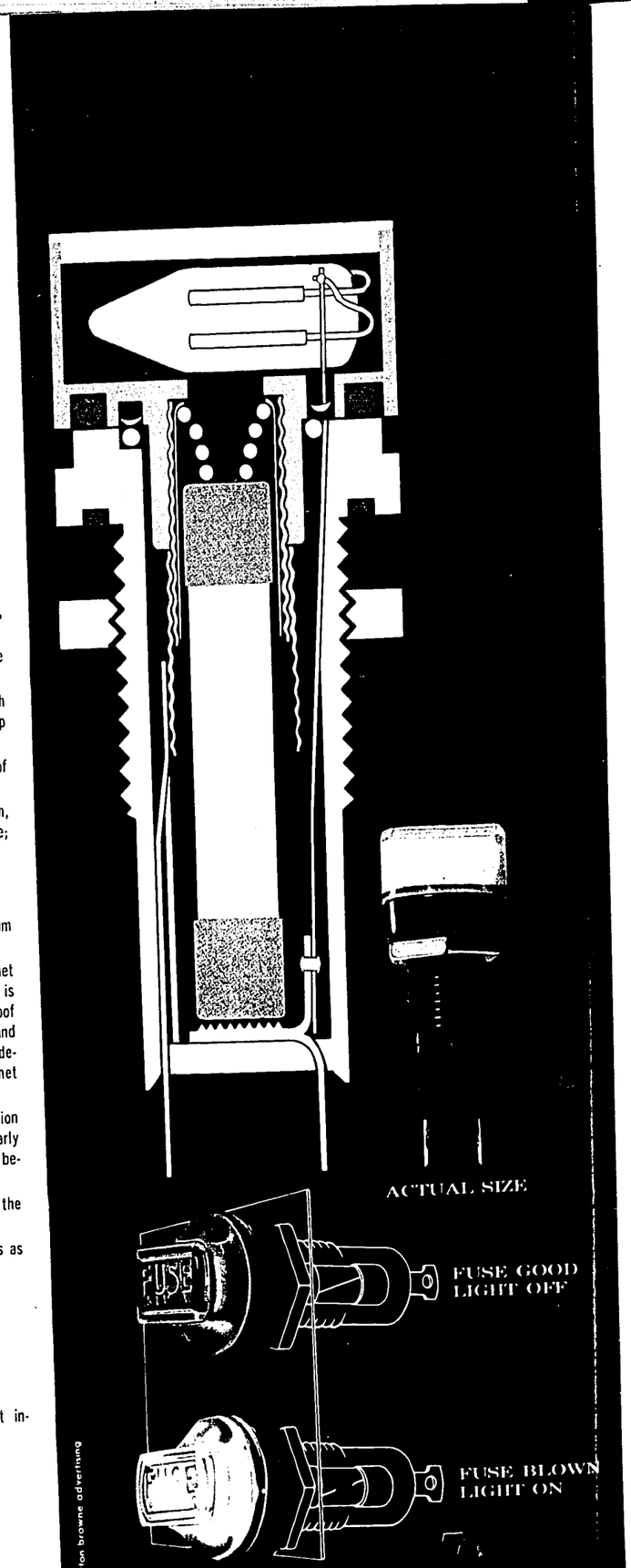
The post will be available for six different voltage ranges as follows:

6- 8 volts using an incandescent lamp.
10- 32 volts using an incandescent lamp.
32- 48 volts using an incandescent lamp.
90-130 volts using a neon lamp.
135-250 volts using a neon lamp.
260-500 volts using a neon lamp.

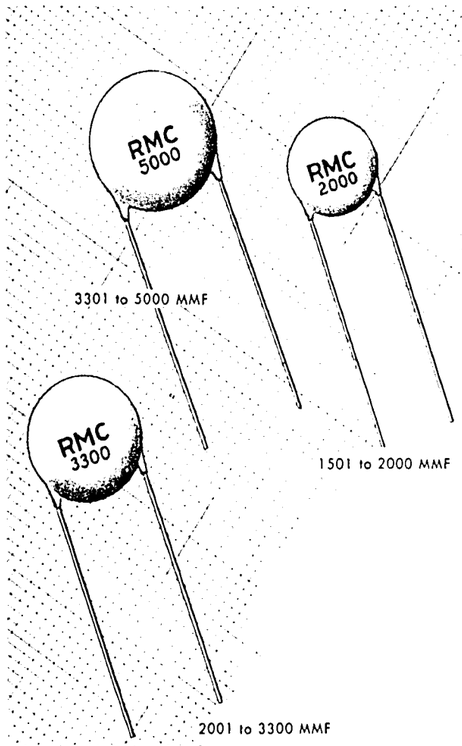
The variety of voltage ranges provides maximum light intensity and long life. Lamps protected by series resistors.

LITTELFUSE

Des Plaines, Ill.



burton browne advertising

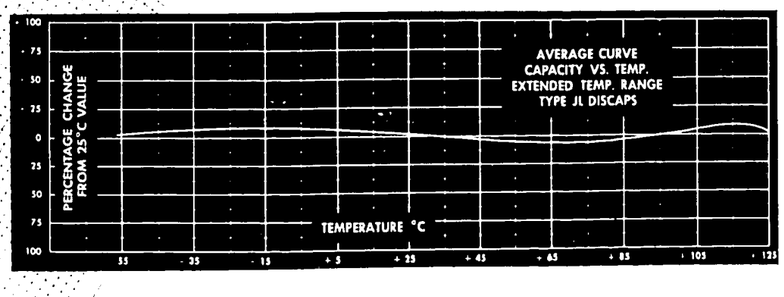


investigate the advantages of Type JL RMC DISCAPS®

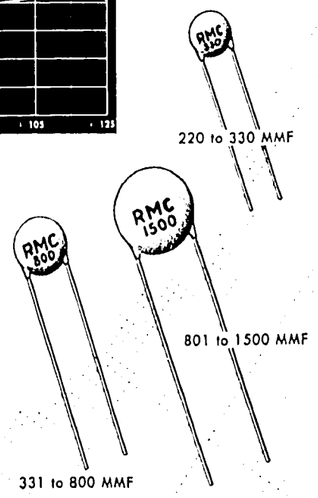
More and more of the leading electronics, radio and TV manufacturers are specifying Type JL DISCAPS as the ideal cost saving replacement for paper or general purpose mica capacitors. In addition to a lower initial cost, Type JL DISCAPS feature smaller size and greater mechanical strength to effect additional economies in production assembly.

This series is manufactured in a wide range of capacities and offers exceptional stability over an extended temperature range. The maximum capacity change between −60° C and +125° C is only ±7.5% of capacity at 25° C. Type JL DISCAPS have a standard working voltage of 1000 V.D.C. and are available in tolerances of ±10% or ±20%.

Our engineers are prepared to work with you on problems requiring standard or special types of ceramic capacitors, write today.



POWER FACTOR: 1% max. @ 1 K C (initial)
POWER FACTOR: 2.5% max. @ 1 K C, after humidity
WORKING VOLTAGE: 1000 V.D.C.
TEST VOLTAGE (FLASH): 2000 V.D.C.
LEADS: No. 22 tinned copper (.026 dia.)
INSULATION: Durez phenolic—vacuum waxed
INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms
AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms
CAPACITY TOLERANCE: ± 10% ± 20% at 25° C



DISCAP CERAMIC CAPACITORS

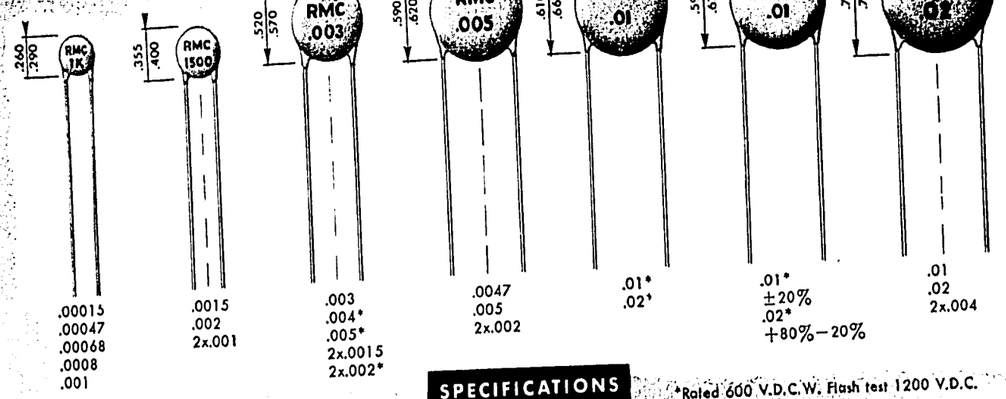
RMC

RADIO MATERIALS CORPORATION

GENERAL OFFICE: 3325 N. California Ave., Chicago 18, Ill.

FACTORIES AT CHICAGO, ILL. AND ATTICA, IND.

Heavy-Duty By-Pass DISCAPS TYPE B



.00015
.00047
.00068
.0008
.001

.0015
.002
2x.001

.003
.004*
.005*
2x.0015
2x.002*

.0047
.005
2x.002

.01*
.02*

.01*
±20%
.02*
+80%−20%

.01
.02
2x.004

*Rated 600 V.D.C.W. Flash test 1200 V.D.C.

SPECIFICATIONS

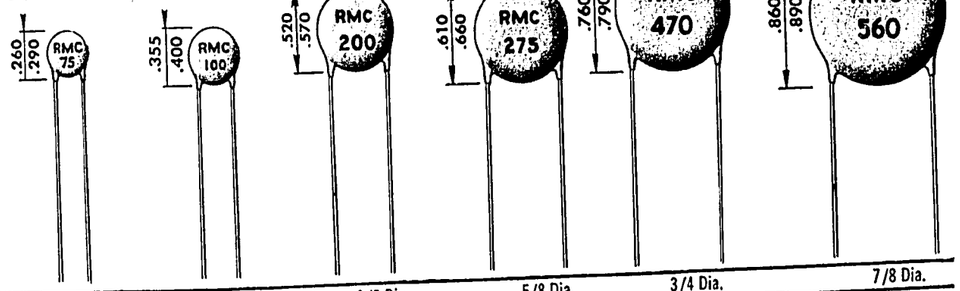
GMV TYPE

POWER FACTOR: 1.5% Max. @ 1 KC (initial)
POWER FACTOR: 2.5% Max. @ 1 KC (after humidity)
WORKING VOLTAGE: 1000 V.D.C.
TEST VOLTAGE (FLASH): 2000 V.D.C.
LEADS: No. 22 tinned copper (.026 dia.)

INSULATION: Durez phenolic—vacuum waxed
INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms
AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms

RMC DISCAPS

Temperature Compensating DISCAPS TYPE C



TC	1/4 Dia.	5/16 Dia.	1/2 Dia.	5/8 Dia.	3/4 Dia.	7/8 Dia.
P-100	1- 3 MMF	4- 9 MMF	10- 20 MMF	48- 62 MMF	63-100 MMF	101-150 MMF
NPO	2- 12	13- 27	28- 47	48- 62	63-100	101-150
N- 33	2- 12	13- 27	28- 47	57- 68	69-110	111-150
N- 75	2- 15	16- 27	28- 56	61- 75	76-140	141-150
N- 150	2- 15	16- 30	31- 60	76- 90	91-130	131-190
N- 220	3- 15	16- 30	31- 75	76-100	101-150	151-190
N- 330	3- 15	16- 30	31- 75	81-120	121-200	201-240
N- 470	3- 20	21- 40	41- 80	151-180	181-300	301-350
N- 750	5- 25	26- 56	57-150	201-250	251-330	331-560
N-1500	15- 50	51-100	101-200	201-275	276-470	471-560
N-2200	47- 75	76-120	121-200			

Temperature coefficients up to N-5200 available on special order.

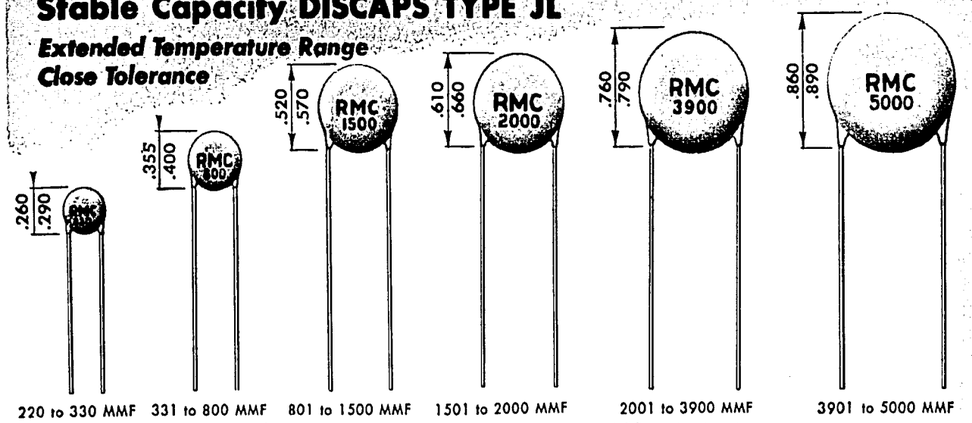
SPECIFICATIONS

POWER FACTOR: Over 10 MMF less than .1% at 1 megacycle. Under 10 MMF less than .2% at 1 megacycle.
WORKING VOLTAGE: 1000 V.D.C.
TEST VOLTAGE (FLASH): 1750 V.D.C.
CODING: Capacity, tolerance and TC stamped on disc
INSULATION: Durez phenolic-vacuum waxed

INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms
AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms
LEADS: No. 22 tinned copper (.026 dia.)
TOLERANCES: ±5% ±10% ±20%
These capacitors conform to the RTMA specification for Class 1 ceramic condensers.
The capacity of these condensers will not change under voltage.

Stable Capacity DISCAPS TYPE JL

Extended Temperature Range
Close Tolerance



220 to 330 MMF | 331 to 800 MMF | 801 to 1500 MMF | 1501 to 2000 MMF | 2001 to 3900 MMF | 3901 to 5000 MMF

SPECIFICATIONS

POWER FACTOR: 1% max. @ 1 K C (initial)
POWER FACTOR: 2.5% max. @ 1 K C, after humidity
WORKING VOLTAGE: 1000 V.D.C.
TEST VOLTAGE (FLASH): 2000 V.D.C.
LEADS: No. 22 tinned copper (.026 dia.)

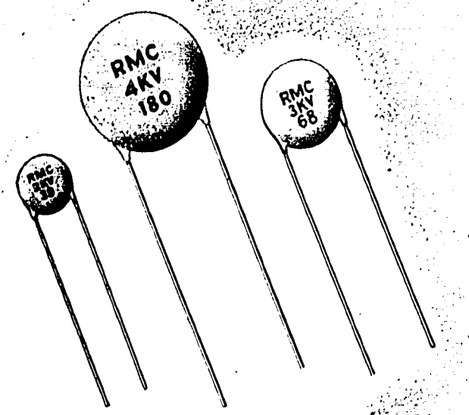
INSULATION: Durez phenolic—vacuum waxed
INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms
AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms

CAPACITY TOLERANCE: ±10% ±20% at 25° C

...the MONEY SAVING Replacement for Mica and Tubular Ceramic Condensers

HIGH VOLTAGE DISCAPS

for yoke and other applications



SPECIFICATIONS

POWER FACTOR: .1% Max. @ 1M C (initial)
POWER FACTOR: 2.5% Max. @ 1 M C, after humidity
WORKING VOLTAGE: 2000, 3000, 4000, 5000, 6000 V.D.C.
TEST VOLTAGE: 4000, 6000, 8000, 10,000, 12,000 V.D.C.
LEADS: No. 22 tinned copper (.026 dia.)
INSULATION: Durez phenolic—vacuum waxed
INITIAL RESISTANCE: Guaranteed higher than 7500 megohms
AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms
TOLERANCES: ±5% ±10% ±20%

Now available in any capacity between 5 MMF and 330 MMF

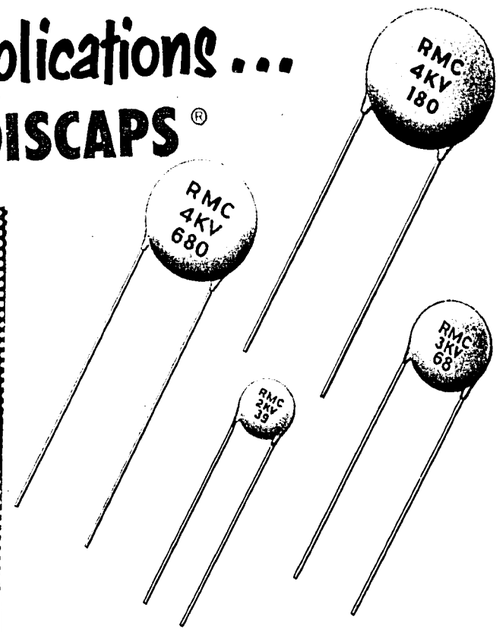
DISCAP CERAMIC CAPACITORS

RADIO MATERIALS CORPORATION
GENERAL OFFICE: 3325 N. California Ave., Chicago 18, Ill.
FACTORIES AT CHICAGO, ILL. AND ATTICA, IND.

for critical voltage applications...
RMC HIGH VOLTAGE DISCAPS®

CAPACITY	DIELECTRIC	SIZE	AVAILABLE CAPACITY TOLERANCES
	2-KV		
331-470	1200-K	5/16"	±20% GMV
471-1000	1200-K	1/2"	±20% GMV
1001-2700	HI K	5/16"	GMV
2701-5000	HI K	3/4"	GMV
5001-10000	HI K	3/4"	GMV
	3-KV		
220-500	1200-K	5/8"	±20% GMV
501-1000	1200-K	5/8"	±20% GMV
1001-5000	HI K	3/4"	GMV
	4-KV		
181-680	1200-K	3/4"	±20% GMV
681-1000	HI K	5/8"	GMV
	5-KV		
131-330	1200-K	7/8"	±20% GMV
331-1000	HI K	7/8"	GMV
	6-KV		
101-220	1200-K	1/4"	±20% GMV
221-470	1200-K	7/8"	±20% GMV
221-1000	HI K	7/8"	GMV
471-1000	HI K	7/8"	GMV

POWER FACTOR: 1.5% Max. (@ 1 KC (initial)
INSULATION: Durez phenolic—vacuum waxed



Discaps with a dielectric of 1200 K or over are not recommended for deflection yokes or other 15,750 cycle applications.

CAPACITY	DIELECTRIC	SIZE	AVAILABLE CAPACITY TOLERANCES
	2-KV		
5-47	N-750	5/16"	5-10-20% GMV
48-68	N-750	1/2"	5-10-20% GMV
69-82	N-750	5/8"	5-10-20% GMV
83-130	N-750	5/8"	5-10-20% GMV
131-200	N-1500	5/8"	5-10-20% GMV
201-250	N-1500	3/4"	5-10-20% GMV
251-330	N-1500	7/8"	5-10-20% GMV
	3-KV		
5-15	N-750	5/16"	5-10-20% GMV
16-20	N-750	1/2"	5-10-20% GMV
21-56	N-1500	5/8"	5-10-20% GMV
57-180	N-1500	5/8"	5-10-20% GMV
181-240	N-1500	3/4"	5-10-20% GMV
241-330	N-1500	7/8"	5-10-20% GMV
	4-KV		
5-68	N-1500	7/8"	5-10-20% GMV
69-180	N-1500	7/8"	5-10-20% GMV
	5-KV		
5-30	N-1500	5/8"	5-10-20% GMV
31-60	N-1500	3/4"	5-10-20% GMV
61-130	N-1500	7/8"	5-10-20% GMV
	6-KV		
5-20	N-1500	3/4"	-10-20% GMV
21-100	N-1500	7/8"	-10-20% GMV

POWER FACTOR: .1% Max. (@ 1M C (initial)
INSULATION: Durez phenolic—vacuum waxed

HIGH VOLTAGE DISCAPS
for yoke and other applications

RMC DISCAPS assure the voltage safety factor required in deflection yoke or special electronic applications. These RMC high voltage DISCAPS are rated at 2000, 3000, 4000, 5000, and 6000 volts DC.

Now available in any capacity between 5 MMF and 10000 MMF, their smaller size and lower initial cost offer definite production ease and overall savings.

If you want proof that DISCAPS are the outstanding ceramic capacitors write us about your specific requirements and we will forward samples.

DISCAP CERAMIC CAPACITORS

RMC

RADIO MATERIALS CORPORATION
GENERAL OFFICE: 3325 N. California Ave., Chicago 18, Ill.
FACTORIES AT CHICAGO, ILL. AND ATTICA, IND.

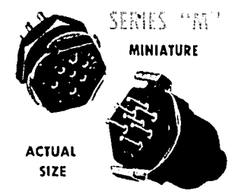
Winchester Electronics INCORPORATED

MINIATURE and SUB-MINIATURE

ELECTRICAL CONNECTORS

The Accepted Standard
For QUALITY • COMPACTNESS • RUGGEDNESS
LIGHT WEIGHT • DEPENDABILITY

With components of precision manufacture . . . through strictest quality control standards . . . to assure long and dependable trouble-free service.



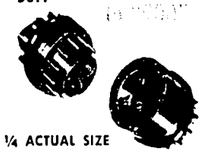
SERIES "M" MINIATURE
ACTUAL SIZE
4, 5, 7, 9 Contacts



HERMETIC PLUG (Round Hole)
Used with "M" Receptacles
ACTUAL SIZE



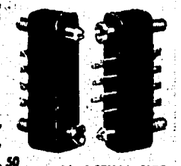
SUB-MINIATURE
7, 14, 20, 26, 29, 34 Contacts
ACTUAL SIZE



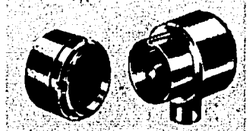
HEAVY DUTY
¼ ACTUAL SIZE
Used in "AN" Shells



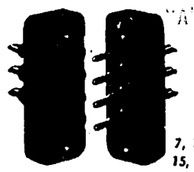
HERMETIC PLUG
ACTUAL SIZE
Used with "MRE" Receptacles



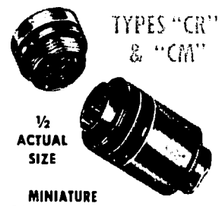
MINIATURE
7, 8, 9, 14, 18, 20, 21, 26, 34, 41, 50 75 Contacts
⅔ ACTUAL SIZE



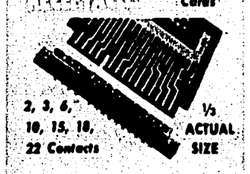
WATERPROOF
4 or 9 Contacts
⅓ ACTUAL SIZE



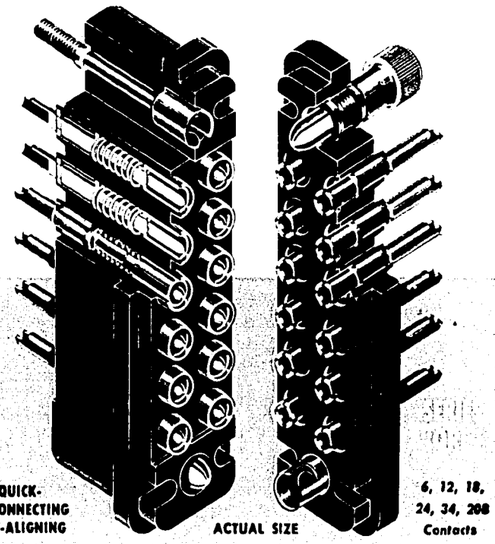
AIRCRAFT
½ ACTUAL SIZE
7, 10, 15, 18 Contacts



TYPES "CR" & "CM"
½ ACTUAL SIZE
MINIATURE PRESSURE-TIGHT



Used with Printed Circuit Cards
2, 3, 6, 10, 15, 18, 22 Contacts
⅓ ACTUAL SIZE



QUICK-DISCONNECTING SELF-ALIGNING
ACTUAL SIZE
6, 12, 18, 24, 34, 208 Contacts

Always a pioneer in this field, Winchester Electronics initially established the use of mineral-filled melamine for insert bodies and gold plating over silver plating on contacts, having long realized their values. Today, these principles of design and manufacture are widely accepted in industry as those necessary to meet quality requirements.

Many years of engineering experience and manufacturing skill are the basic component of every connector bearing the Winchester Electronics name . . . plus these features:

POLARIZATION: *All connectors have positive polarizing features that make incorrect mating impossible.*

SELF-ALIGNING: *Individually floating contacts assure proper play for self-alignment.*

WIPING ACTION *of contacts insures positive electrical contact at all times.*

MOLDED MELAMINE BODIES: *Mineral-filled (in accordance with MIL-P-14, type MME) provide high arc and dielectric resistance as well as mechanical strength. One-piece molded bodies eliminate unnecessary creepage paths and reduce the number of moisture and dust pockets.*

PRECISION MACHINED CONTACTS: *Pins from brass bar and sockets from spring temper phosphor bronze bar are gold plated over silver for consistent low contact resistance, prevention of corrosion and ease of soldering.*

Winchester Electronics, Inc. Products and Designs are Available Only From Winchester Electronics, Inc.

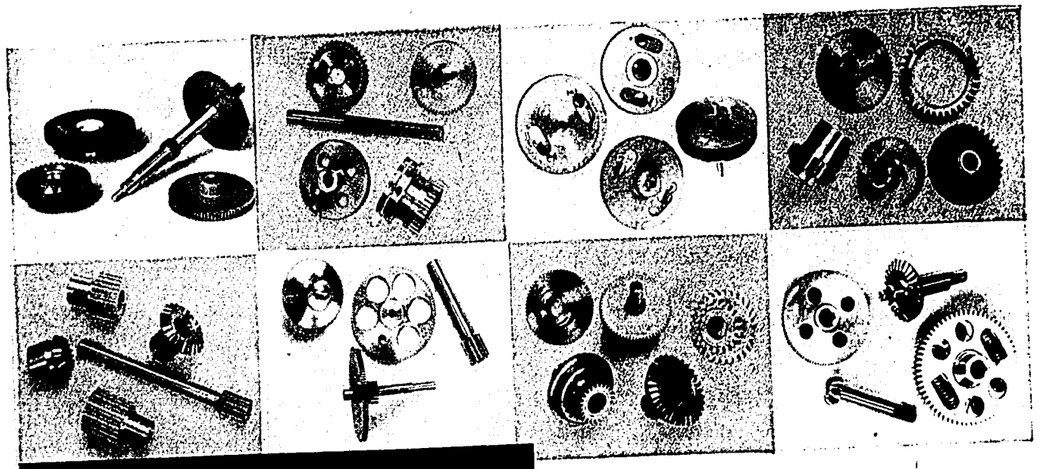
Many features are covered by our Patents: Nos. 161900, 162792, 2411861, 2466370, 2513080, 2526325, 2532538, 2633482 and 2659872.

Write or phone our Sales Department for data on connectors listed here, or many other standard and special types available . . . or for solutions to difficult connector problems.

Winchester Electronics INCORPORATED

NORWALK, CONNECTICUT, U.S.A.

West Coast Branch: 1729 WILSHIRE BOULEVARD • SANTA MONICA, CALIFORNIA



For Specialized Electronic Equipment...

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For the answers to your **MINIATURE MOTOR** *problems,*

Mission-Western Engineers offer an unusually wide range of basic miniature motor designs. We have available more than fifty basic types, including axial and centrifugal blower designs to cover the great variety of equipment adaptations. Our basic motor designs range from .001 to 2 H.P., from 50 to 1,000 cycles in frequency and in any voltage range required. Complete motor design service available. For further information or a copy of our motor catalog #254, write Mission-Western Engineers, Inc.,* 132 West Colorado Street, Pasadena 1, California.

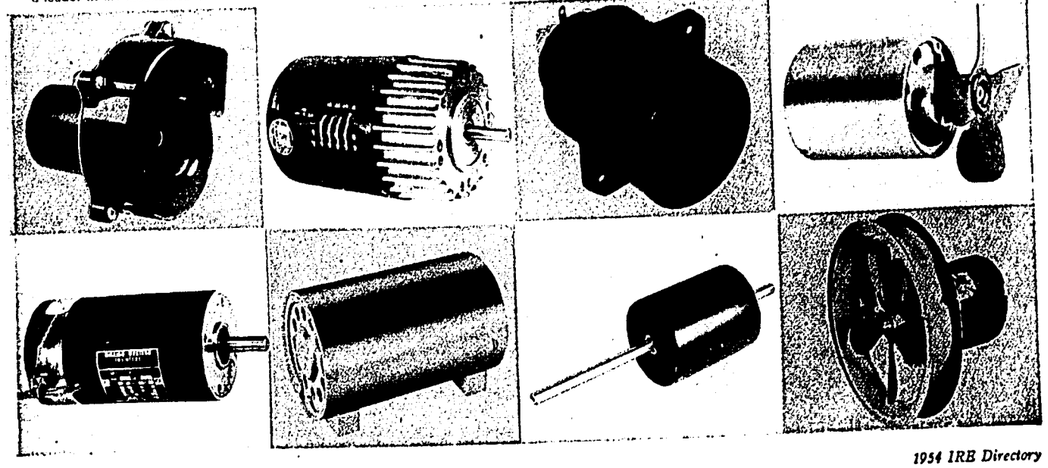
*An affiliate of Western Gear Works, since 1888 a leader in the mechanical power transmission field.

HIGH PRECISION GEARS
and precision fine pitch gearing

from 200 to 6 Diametral Pitch and dimensions from .125" to 10" diameter. Western Gear Works makes available complete engineering and manufacturing facilities for the application of high precision gearing and gear drives in electronics equipment. For assistance, without obligation, write Executive Offices, Western Gear Works, P.O. Box 182, Lynwood, Calif.

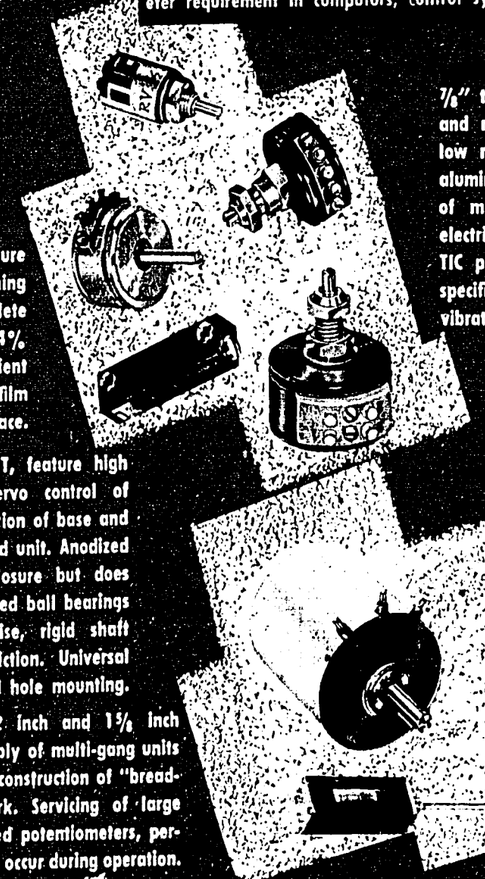
PLANTS AT LYNWOOD, PASADENA, BELMONT, SAN FRANCISCO, (CALIF.), SEATTLE, HOUSTON—REPRESENTATIVES IN PRINCIPAL CITIES

WESTERN GEAR WORKS
Since 1888
PACIFIC-WESTERN PRODUCTS | POWER TRANSMISSION GEARS • MACHINERY •
PACIFIC GEAR & TOOL WORKS · SOUTH WESTERN GEAR WORKS



TIC precision potentiometers

LOOK TO TIC for the most complete line of advanced PRECISION POTENTIOMETER designs for every application. TIC engineering means outstanding potentiometer performance in your system. The extreme variety of standard models available guarantees the optimum specifications and dimensions, whatever your potentiometer requirement in computors, control systems, and precision instrumentation.



potentiometers are available in miniature and sub-miniature sizes. Type RVH1 has been especially designed for operation at high ambient temperatures. All designs feature rugged construction and excellent stability under adverse environmental conditions.

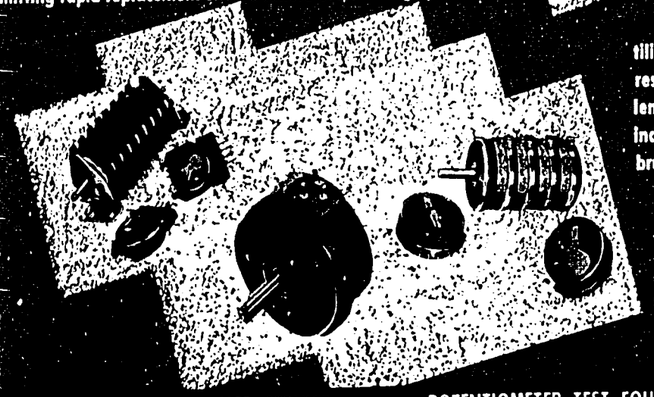
potentiometers, Type RFT, feature infinite resolution for super-fine trimming adjustments in instrumentation. Complete shaft rotation represents less than 4% of available resistance variation. Convenient size and shape permit stacking of Metfilm unit for optimum use of limited panel space.

potentiometers, type M10T, feature high electrical accuracy resulting from servo control of resistance windings. One piece construction of base and mounting surfaces yields precise, rugged unit. Anodized aluminum cover provides sealed enclosure but does not support working parts. Spring loaded ball bearings housed in single bore provide precise, rigid shaft support with very low rotational friction. Universal mount offers choice of servo or tapped hole mounting.

construction, available in 2 inch and 1⅝ inch diameter potentiometers, allows assembly of multi-gang units as required by user, greatly simplifies construction of "breadboard" circuitry in experimental work. Servicing of large systems is facilitated by use of unitized potentiometers, permitting rapid replacement should failure occur during operation.

precision potentiometers ranging from ⅞" to 3" in diameter feature high linearity and resolution, together with long life and low noise. Rugged one-piece construction of aluminum base and close mechanical tolerances of mounting surfaces assure realization of electrical accuracy in external system. Standard TIC potentiometers will meet applicable MIL specifications for humidity, salt spray, shock, vibration, and corrosion resistance.

functional outputs are available in most standard TIC potentiometers, including sinusoidal, logarithmic, and square laws—and many others. In addition, TIC engineers will design highly accurate non-linear potentiometers based on mathematical data submitted for special applications.



potentiometers, Type RVT, are actuated by rectilinear rather than rotary motion of shaft. Wide range of resistance values can be furnished in units with stroke lengths from ½ inch to 12 inches. Special design permits inclusion of up to three resistance elements with separate brush arms and take-offs in a single housing.

types ST18 and STC18 ball-bearing potentiometers are designed to conform to the latest industrial standard potentiometer dimensions. Now high electrical and mechanical precision can be achieved within a minimum volume. Type STC18 embodies convenience of unitized construction. Also available with plug-in type mounting as type RVBC 1⅝.

CUSTOMER SERVICE · POTENTIOMETER TEST EQUIPMENT · TECHNICAL LITERATURE
ENVIRONMENTAL TESTING · RESEARCH · CUSTOM DESIGN · PROTOTYPE MODELS

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535A Main St., Acton, Mass. COlonial 3-7711

West Coast Eng'r'g. Facility, 731 No. LaBrea Ave., Hollywood, Calif., WHitney 0108

Standard TIC Precision and Trimmer Potentiometers

	TYPE	DESCRIPTION	CASE DIAM. (in)	RESISTANCE Range (ohms)	RESISTANCE Tolerance Std	RESISTANCE Tolerance Special	INDEPENDENT LINEARITY Std	INDEPENDENT LINEARITY Special	WINDING ANGLE Angle Std	WINDING ANGLE Toler. Std	Nonlinear Windings Available	Conservative Power Rating (watts at 25°)	Wgt. (oz) Single Cup	MOUNTINGS AVAILABLE Servo	Tapped Hole	Thr'd Bushing
PRECISION POTENTIOMETERS	RVP3	High Precision	3	100 to 200K	±5%	±1%	±0.2%	±0.1%	320°	±3°	√	6	7	√	√	
	RV3 and RVLL3	Molded-Bakelite	3	100 to 200K	±5%	±1%	±1.0%	±0.25%	315°	±3°	√	8	4		√	
	RV2	General-purpose	2	100 to 100K	±5%	±1%	±0.5%	±0.2%	320°	±3°	√	4	3	√	√	
	RVC2	Unitized	2	100 to 100K	±5%	±1%	±0.5%	±1.5%	320°	±3°	√	4	3	√(Universal)	√	
	RVBC2	Ball-bearing Unitized	2	100 to 100K	±5%	±1%	±0.5%	±0.2%	320°	±3°	√	4	3	√(Universal)	√	
	ST18 *	Ball-Bearing Standardized	1¾	100 to 100 K	±5%	±1%	±0.5%	±0.2%	320°	±2°	√	3	3	√		
	RVBC1⅝ *	Unitized plug-in	1⅝	100 to 100 K	±5%	±1%	±0.5%	±0.25%	320°	±3°	√	3	1	√	√	
	RV1⅝	Intermediate	1⅝	100 to 100 K	±5%	±1%	±0.5%	±0.25%	320°	±3°	√	3	2¼	√	√	
	RVP1	Miniature	1	100 to 50 K	±5%	±2%	±1.0%	±0.5%	320°	±5°	√	2	½	√		
	RVP⅞	Sub-miniature	⅞	100 to 25 K	±5%	±2%	±2.0%	±0.7%	320°	±5°		2	½	√		
TRIMMERS	RVH1	High Temperature	1	100 to 5 K	±5%	±2%	±5%		320°	Nominal		2 at 80°C	¾			√
	RV⅞	Miniature	⅞	100 to 25 K	±5%	±2%	±5%		320°	Nominal		2	½			√
	RV½	Sub-miniature	½	50 to 15 K	±10%	±5%	±5%		300°	Nominal		1.5	¼			√

*See Next Page

GENERAL SPECIFICATIONS

ELECTRICAL

Coin-silver overtravels: 10° nominal at each end of winding.
Taps: Available at desired points.
Rated temperature coefficient of resistance wire: 0.002% per °C.
Ambient temperature range: −55°C to +80°C (to +145°C for RVH1).
Equivalent noise resistance: 140 ohms, maximum.
Dielectric strength: 1000V DC breakdown test, 1-sec duration. except RV3, RVLL3 (2000V DC)

MECHANICAL

Housing: Precision-machined aluminum with corrosion-resistant Alumilite finish (except Bakelite RV3, RVLL3 and stainless-steel RV½)
Mechanical rotation: 360° continuous; limit stops available.
Starting torque: Less than 1 oz-in (1½ oz-in for RV3, RVLL3, ½ oz. in for ST18, STC18).
Life: 1 million operations at 60 rpm, or less.

STANDARD TIC NON LINEAR PRECISION POTENTIOMETERS

TYPE	DESCRIPTION	CASE DIAM.	WINDING RESISTANCE Total	WINDING RESISTANCE Toler.	INDEPENDENT CONFORMITY	Function Angle	Conservative Power Rating (watts at 25°)	Weight (oz)	MOUNTING Servo	MOUNTING Tapped Hole
RVP3-S59	Sine-Cosine	3	20K	±5%	±0.5% peak-to-peak	360°	4	7	RVP3-S156)	√
RVP3-S200	Double-sided square-law	3	25K	±5%	±0.25% of total V	360°	3	7	√	(RVP3-S121)
RVP3-S208	50 db Logarithmic (Exponential)	3	15K	±5%	±2% constant fractional	320°	1.5	7	√	(RVP3-S204)
RV2-S373	Sine function	2	9.5K	±10%	±2% peak-to-peak	360°	2.5	3	√	(RV2-S336)
RV2-S417	20 db Logarithmic (Exponential)	2	3.6K	±5%	±1% of total V	281°	2.5	3	√	(RV2-S412)
RV1⅝-S247	Single-sided square-law	1⅝	10K	±5%	±0.5% of total V	350°	2.5	2¼	√	(RV1⅝-S245)

GENERAL SPECIFICATIONS

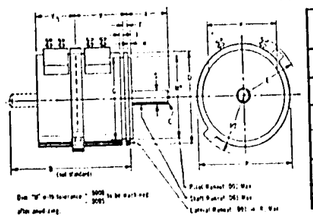
Electrical

Rated temperature coefficient of resistance wire: 0.002% per °C.
Ambient temperature range: −55°C to +80°C.
Equivalent noise resistance: 140 ohms, maximum.
Dielectric strength: 1000V DC breakdown test, 5-sec duration.

Mechanical

Housing: Precise-machined aluminum with corrosion-resistant Alumilite finish.
Mechanical rotation: 360° continuous.
Starting torque: Less than 1 oz-in.
Life: 500,000 complete revolutions at 60 rpm, or less.

MECHANICAL DIMENSIONS, SERVO-MOUNT POTENTIOMETERS



TYPE	DIMENSIONS A	B	C	D	E	F	G	H	I	K	M	R	R2	S	V	V1
RVP ⅞	1 or spec	as spec	¼x45°	.875	⅜	.062	.750	.062	.062	½	.7812* .7807	1⅛	.531	.1250 .1247	.505	.365
RVP 1	1 or spec	as spec	¼x45°	1.062	29/32	.062	.968	.062	.062	¾	.9688* .9683	1⅜	.625	.1250 .1247	.599	.552
RV 1⅝	1 or spec	as spec	1/32x45°	1.656	1 1/32	.093	1.463	.062	.078	1⅜	1.468 1.467	1⅝	1 9/32	.2500 .2495	1.035	.785
RV 2	1 or spec	as spec	1/32x45°	2.000	1⅜	.093	1.870	.062	.078	1¾	1.875 1.874	2 1/64	1.187	.2500 .2495	1.193	.978
RVP 3	1 or spec	as spec	1/32x45°	3.000	1⅞	.093	2.870	.062	.125	2	2.875 2.874	3 1/64	1.700	.2500 .2495	1.223	.978
TOLERANCE	±1/32	±.010		±.005	max	±.005	±.005	±.005	±.005	max	*	max	max		max	max

STANDARD TIC TRANSLATORY POTENTIOMETERS

TYPE	DESCRIPTION	STROKE (and winding) LENGTH (in)	CONSERVATIVE POWER RATING (watts)	WEIGHT (oz)	RESISTANCE Range (ohms/in)	RESISTANCE Tolerance Std	RESISTANCE Tolerance Special	INDEPENDENT LINEARITY (% of max)	NON-LINEAR WINDINGS AVAILABLE	MULTIPLE WINDINGS	MOUNTING	TYPE
RVT	Translatory	2½	2.5	6	100 Ω/in to 25 K/in	±5%	±1%	±1%	√	Up to 3 independent windings in same housing	Threaded bushing and rear-end bracket	RVT
		5	5	10								
		8	6	13								
		12	8	20								

GENERAL SPECIFICATIONS

Electrical

Coin-silver overtravels: 1/32" nominal at each end of winding.
Taps: Available at desired points.
Rated temperature coefficient of resistance wire: 0.002% per °C
Ambient temperature range: −55°C to +80°C
Dielectric strength: 1000V DC breakdown test, 5-sec duration

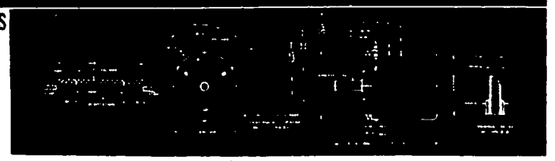
Mechanical

Housing: Precision-machined aluminum with corrosion-resistant Alumilite finish.
Mechanical stroke: Determined by limit stops.
Life: 1 million operations at 1" per sec, or less.
Depth Behind Panel: Stroke Length Plus 1⅛ inches
Cross section of Housing 1¼" x 1¼"

TECHNOLOGY INSTRUMENT CORP.

535A Main St., Acton, Mass. COlonial 3-7711 — West Coast Eng'r'g. Facility, 731 No. LaBrea Ave., Hollywood, Calif., WHitney 0108

TIC ADVANCED PERFORMANCE MULTITURN POTENTIOMETERS



Servo potentiometer Type M10T servo-corrected for .025% linearity at low cost. Winding may be corrected for resistive loads of at least twenty times the potentiometer total resistance. Extraordinary mechanical precision and high electrical accuracy combine with unique method of servo-controlled winding of the resistance element to produce a new concept in multiturn precision potentiometers.

Electrical Specifications

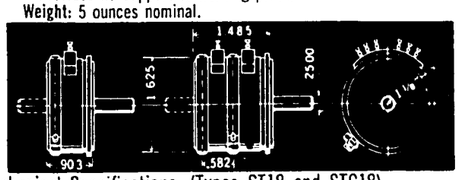
Resistance Range: 1000 ohms to 10,000 ohms ± 5%.
Independent Linearity: 0.05% standard, 0.025% or better, special.
Effective Electrical Angle: 3600° +1° −0°.
Power Rating: 5 watts at 40°C derated to zero at 80°C.
Leakage Resistance: Terminals to shaft 50 megohms minimum 500 volts DC.
Voltage Breakdown: All terminals shall withstand 1000 volts (rms) AC to shaft.
Ambient Temperature Range: −55°C to +80°C.
End Coil Resistance: .025% of total resistance (maximum).
Equivalent Noise Resistance: 100 ohms maximum.
Temperature Coefficient of Resistance Wire: .00002 per °C.

Mechanical Specifications

Base and Bearings: One piece machined aluminum base houses spring-loaded ball bearings in a single through bore.
Mounting: Universal type offers choice of servo or tapped hole mounting.
Mechanical Rotation: 3660° ±2.5° limited by rugged lead screw stops which withstand 100 inch pounds applied torque.
Maximum Starting Torque: 1.3 inch ounces at 20°C.
Terminals: Gold-flash, blind solder pot.
Enclosure: Corrosion-resistant stainless steel cover, bonded to base to exclude dirt, moisture, and corrosive atmosphere. Provides no support to working parts.
Weight: 5 ounces nominal.

TIC STANDARDIZED BALL BEARING PRECISION POTENTIOMETERS

Type ST18



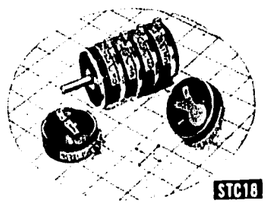
Types ST18 and STC18 feature compactness, ball bearings for low friction, and high electrical accuracy. Linear and non-linear windings are available. Servo-mount dimensions conform to latest industrial standards. Type STC18 is electrically identical to Type ST18 with unitized construction to permit rapid assembly and dis-assembly of ganged units by user. Also available with plug-in type mounting as Type RVBC1-5/8.

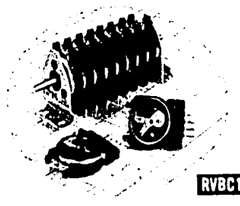
Electrical Specifications: (Types ST18 and STC18)

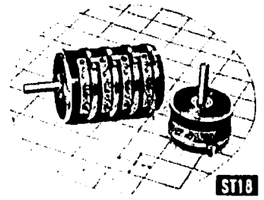
Resistance Range: 100 ohms to 100 K ohms ±5% standard, ±1% special.
Independent Linearity: 0.5% of total resistance standard, to 0.2% of total resistance special.
Winding Angle: 320° ±2° standard. ±0.5° special. Non-standard winding angles available.
Power Rating: 3 watts at 25°C derated to zero at 80°C.
Ambient Temperature Range: −55°C to +80°C.
Temperature Coefficient of Resistance Wire: .00002 per °C.
Taps: Available at specified locations on the resistance winding.
Equivalent Noise Resistance: 140 ohms maximum.
Voltage Breakdown: 1000 volts DC all terminals to shaft.

Mechanical Specifications: (Types ST18 and STC18)

Housing: One-piece machined aluminum base with black alumilite, corrosion-resistant finish.
Bearings: Two ball bearings for low rotational friction.
Mechanical Rotation: 360° continuous or limited by stops if specified.
Maximum Starting Torque: 0.5 ounce inches per section.
Ganging:
Type ST18 units may be ganged on a straight through shaft, using one-piece stainless steel clamp rings which permit precise phasing of ganged units.
Type STC18 features unitized construction allowing user to assemble multi-gang units with ease. Spring-loaded drive-arm joins sliders of successive sections, limiting backlash to 0.06° per ganged section.
Weight: 3 oz. for single section, 1 oz. per additional section.


STC18


RVBC1-5/8


ST18

TIC PRECISION POTENTIOMETER TEST EQUIPMENT

For the measurement of potentiometer noise, linearity, and non-linear conformity. **Write for complete specifications.**

Type 394-A PONOGOMETER® (Potentiometer Noise Tester)

A precision potentiometer noise tester designed for laboratory and production control in the manufacture of single or multiturn potentiometers. Monitoring the transient contact noise resistance appearing between the wiper and resistance element, both audible and visual indications are given when threshold level is exceeded.

Range: Equivalent Noise Resistance threshold level adjustable from 10 to 5000 ohms. Lower levels can be set up by means of accessory equipment.
Wiper Exciting Current: Constant 1 milliampere. For other values accessory current sources can be set up.

TIC PRECISION POTENTIOMETER HANDBOOK AND CATALOG



A truly authoritative reference on the theory, design, performance, and application of precision potentiometers. Handbook includes detailed and illustrated engineering description of

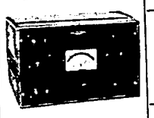
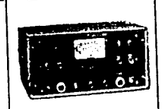
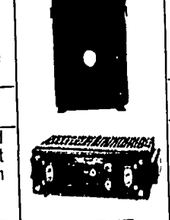
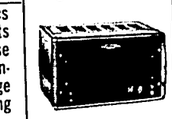
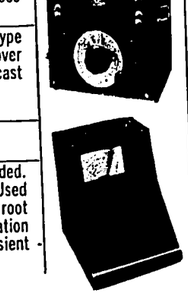
- Potentiometer terminology
- Circuits for optimum potentiometer adjustment
- Non-linear loading techniques
- Causes of resolution and residual noise
- Potentiometer design and construction procedures

and many other pertinent subjects. Catalog section, included under same cover as handbook, lists complete specifications on standard TIC potentiometers and test equipment. Loose-leaf format permits the accumulation of technical information on new developments in potentiometer design and new TIC models as they are introduced. Price: $2.00 per copy, (including subscription to future material.)

TECHNOLOGY INSTRUMENT CORP.

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TECHNOLOGY INSTRUMENT CORP.

			PHASE ANGLE RANGE
MEASURING	**PRECISION**		
Type 320-AB Phase Meter PROVEN PERFORMANCE EASE OF READING SIMPLICITY OF OPERATION	For direct 0-360° Phase angle measurements. Used in conjunction with Audio Facilities, Ultrasonics, Servo-mechanisms, Geophysics, Vibration, Acoustics, Aerial Navigation, Electric Power Transformation, Signalling, and mechanical applications of Torque Measurement, Dynamic Balancing and Printing Register.		0-360° without ambiguity
Type 322-A Precision Phase Meter HIGH PRECISION EXTREME ACCURACY VERSATILITY	Phase measurements from 0-360° without ambiguity. Highly stable and sensitive circuitry plus precision meter scales provide utmost accuracy of measurements, even with most complex wave-forms. Used in similar applications to type 320-AB where extreme precision is required.		0-360° without ambiguity
Type 324-A Video Phase Meter WIDE FREQUENCY RANGE HIGH ACCURACY DIRECT READINGS	For rapid and accurate measurement of Phase Angle through the Video Range. Used in Phase Equalizing Networks, Single Sideband Video Translation, Reactance Tube Modulators, Phase Shift Oscillators, Chromaticity Sub-Carriers TV, Neutralization Circuits, Broadband Negative Feedback Circuits, Polyphase Selectivity Methods, Antenna Array Phasing, and Phase Delay Line Measurement.		0-360° without ambiguity
Type 704-A Secondary Phase Standard EXCELLENT STABILITY HIGH INPUT IMPEDANCE NEGLIGIBLE DISTORTION	Precision electronic Phase Shifter. Shifts phase of sinusoidal signal by any angle 0-360° in four 90° ranges. Used for measurement with Phase Shifting Capacitors, Time Base Circuits, Transmission Networks, Multi-phase Voltage Rotation, Phase Detection Circuits, AC Thyratron Control, Feed Back Amplifiers, Servo Systems, Synchros, Resolvers, Power Factor, Gyros, and CRO Sweeps.		0-360° Variable
Type 706-A Ultra-Sonic Phase Standard HIGH PRECISION EXCELLENT STABILITY SIMPLICITY OF OPERATION	Generates two voltage signals whose phase difference is known to ±0.1°. Multiple frequency Lissajous pattern is used for precise indication of angles established. Operation is at a single predetermined frequency specified by the user. For precise calibration of radar ranging circuits and phase detectors as well as for phase measurements.		0-360° Variable
Type 7000-A Primary Phase Standard LISSAJOUS PRESENTATION EXTREME ACCURACY CALIBRATES PRECISELY	Generates two sinusoidal voltages whose phase relationship may be determined with ease to within ±0.05° or better. Multiple frequency Lissajous pattern presentation is independent of calibration of precision phase shifter. Used in highly precise calibration of phase sensitive devices and for phase measurements in amplifiers, synchros and resolvers.		0-360° Variable
AMPLIFIERS			FREQUENCY RANGE
Type 500-A Wide Band Decade Amplifier WIDE BAND RESPONSE HIGH STABILIZED GAIN ZERO PHASE SHIFT	Featuring high input impedance, low output impedance, and compactness, this general purpose laboratory instrument provides 20 volts output over wide frequency range with stabilized gains of 10, 100, and 1000.		5cps—2 mc on gain 10 5cps—1.5mc on gain 100 5cps—1 mc on gain 1000
Type 501-A Compressor Amplifier WIDE INPUT RANGE UNIFORM OUTPUT NEGLIGIBLE DISTORTION	Accepts an input signal of varying amplitude and provides output signal having the same waveform, of nearly constant amplitude. Operation is effective over a large input dynamic range and a wide frequency range with essentially zero distortion.		100cps to 1.0mc for compression
Type 511-A Power Amplifier NEGLIGIBLE DISTORTION HIGH VOLTAGE OUTPUT LEVEL PHASE SHIFT COMPENSATION	Low distortion, low noise and excellent phase characteristics throughout the frequency range 50cps-50kc. Four outputs available to match various loads (5, 25, 200 or 1200Ω). Phase compensation circuit permits overall phase shift to be maintained at a constant value with varying gain. Output voltage up to 120 volts into a 1200Ω load. Operates into loads varying from pure resistance to pure reactance.		50cps to 30kc (down 1 db at 50kc)
OSCILLATOR			FREQUENCY RANGE
Type 410-A RF Oscillator EXCELLENT STABILITY HIGH OUTPUT LEVEL LOW OUTPUT IMPEDANCE	12 volts available from 100 kc to 10 mc. with minimum distortion. Up to 30 volts obtainable. 1000 cycle modulation provided. Used as a signal source for radio frequency bridges, transfer oscillator for frequency counters, and for general laboratory measurements.		100kc to 10mc in six bands
IMPEDANCE MEASUREMENTS			FREQUENCY & IMPEDANCE RANGES
Type 310-A Z-Angle® Meter EASE OF OPERATION HIGH ACCURACY VERSATILITY	Measures impedance directly in polar coordinates as an impedance magnitude in ohms, and phase angle in degrees: *ZLo*. Used in measurement of impedance, inductance, capacitance, resistance, dissipation factor (D), storage coefficient (Q), and plotting impedance functions. Internal sources of 60 and 400 cycles.		30cps to 2kc 0.5-100k ohms 30cps to 20kc 0.5-6000 ohms 30cps to 40kc 0.5-5000 ohms
Type 311-A RF Z-Angle® Meter EASE OF OPERATION FREEDOM FROM COMPUTATIONS RAPIDITY	Companion instrument to Type 310-A Z-Angle Meter, Type 311-A offers same convenient impedance measurements over RF band. For laboratory use and measurement of broadcast antennas and transmission lines.		100kc to 200kc 10-5000 ohms 100kc to 1mc 10-1000 ohms 100kc to 2mc 10-500 ohms
VECTOR ANALYSIS			MAGNITUDE RANGES
Type 250-A Complex Plane Analyser VERSATILE EASILY OPERATED ELIMINATES COMPUTATION	Complex vectors quickly and accurately multiplied and divided. Simplifies network analysis and control system design. Used with vector plots on complex frequency plane to solve root locus problems, antenna array design, plotting propagation patterns, fitter design, frequency response and transient behavior.		Input: 7 to 200 or 1/7 to 1/200 Summing: 1 to 10±10

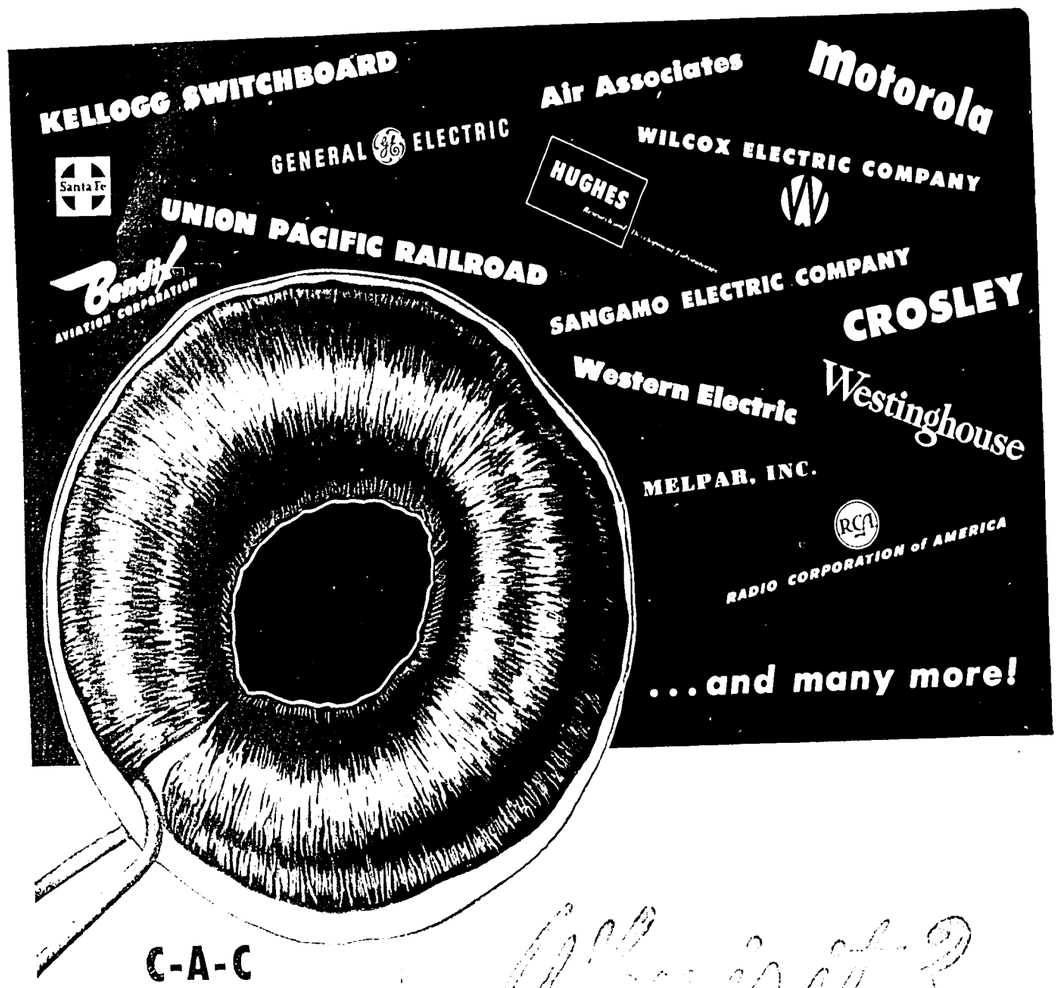
535A MAIN STREET, ACTON, MASSACHUSETTS COlonial 3-7711

FREQUENCY RANGE	ABSOLUTE ACCURACY	INCREMENTAL ACCURACY	METER SCALES	INPUT AMPLITUDE	INPUT IMPEDANCE	RECORDER OUTPUT	DIMENSIONS (In cabinet) Wide	High	Deep
20 cps—100kc	1% of full scale +3°	±0.25°	0-36° 0-90° 0-180° 0-360°	1-170 volts (peak)	10 meg. shunted by 13uuf.	0-10ma. (into 500 ohms max.)	21½"	8⅜"	10⅜"
20 cps—1mc	±1° (20 cps to 20kc)	±0.1° (up to 20 kc)	0-360° 0-30° (any 30° seg.)	2-30 volts (peak)	4.7 meg. shunted by 13uuf.	0-5v. dc (across 10K max.)	19½"	14½"	16½"
20kc—4.5mc	±4° over entire range	±0.25° over entire range	0-360° 0-90° (any 0-90° seg.)	2-300 volts (peak)	10 meg. shunted by 14uuf.		21"	9¾"	14⅛"
Single frequency between 60 cps—20kc 60, 400, 1000 or 20000 cps standard	within 2° (where applied frequency within ±0.2% of rated)	±0.1° (where applied frequency within ±0.2% of rated)		.01-15 volts (rms)	.47 meg. shunted by 13 uuf.	OUTPUT IMPEDANCE approx. 100 ohms	21½"	8⅜"	12¾"
Single frequency between 20kc—200kc 82kc standard	within 0.1° any dial setting			OUTPUT AMPLITUDE Approx. 10 volts (rms) across 5k⁇ or more		approx. 200 ohms	21"	9¾"	14⅛"
Single frequency between 60 cps—20kc	at least 0.05° multiples of 1° established to 0.02°			10 volts (rms) across 5k (min.)		approx. 100 ohms.	19½"	31½"	20"

VOLTAGE GAIN	OUTPUT VOLTAGE	OUTPUT IMPEDANCE	HARMONIC DISTORTION	PHASE SHIFT	INPUT AMPLITUDE	INPUT IMPEDANCE	HUM AND NOISE (INPUT SHORTED)			
10,100 or 1000 ±2%	20 v. max. across 20k⁇ load	approx. 200⁇		0±2° 20cps-100kc		160 megohms shunted by 7uuf.	60db below nominal output level	13¼"	5"	9⅜"
COMPRESSION RATIO 40/1 (32db) 500cps to 1.0mc	Constant 0.25 v. (±0.4db) thru compression range	1000⁇ (max.) for frequencies above 500cps	1.5% max. (0.5% with 40 volts input)	0±2° 100cps-20kc RESPONSE TIME Approx. 0.1 sec	1.25-50 volts for compression	10 megohms shunted by 10uuf.	45db below nominal output level	9¾"	5½"	8"
VOLTAGE GAIN Position 1 1.4 Position 2 2.8 Position 3 8.0 Position 4 21.0	OUTPUT POWER 12.8w (max) 13.0w (max) 15.1w (max) 12.0w (max)	OPTIMUM LOAD 5 ohms 25 ohms 200 ohms 1200 ohms	1.0% max. (0.5% at 10 w output)	PHASE SHIFT 1.0°±1.5° 50cps-10kc (compensated)	7 volts (max.) for rated distortion	100K ohms shunted by 10uuf.	15mv. (max.)	15¾"	8½"	10¾"
FREQUENCY CALIBRATION	MODULATION	OUTPUT IMPEDANCE	OUTPUT VOLTAGE							
±0.5% or better	1000cps (internal)	approx. 50 ohms	30 volts max. (12 volts max. for optimum distortion)					15⅛"	8¼"	12⅜"
MAGNITUDE ACCURACY	PHASE ANGLE RANGE	PHASE ANGLE ACCURACY	VOLTAGE APPLIED TO UNKNOWN	INTERNAL OSCILLATOR						
±1% above 10 ohms	0° to ±90° Direct reading	±2° for rated frequency and impedance range	approx. .04 volts	60 cycle and 400 cycle ±1.0%				10⅞"	10"	14⅞"
±3%	0° to ±90°	±4° for rated frequency and impedance	0.32 to 1 volt					10⅞"	10"	14⅞"
VECTORS ACCEPTED	ANGULAR RANGES	AVERAGE SUMMING ACCURACY	METER SCALES							
Up to 10	Input: 0° to ±357° Summing: 0° to ±3600°	Approx. 1% in angle and log-magnitude	Angular Scale: 0° to +360° and −360° to 0° Antilog magnitude scale: 1 to 10 and 10 to 1 Log_{10} scale: 0 to 1 Direct log-magnitude scale: 1 to 200					10¾"	12½"	13¼"

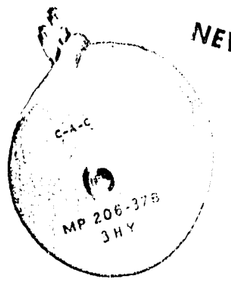
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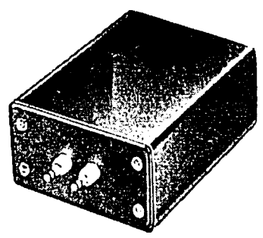
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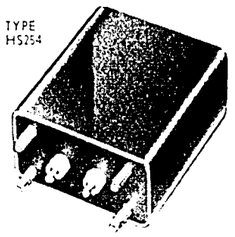
TYPE HS715



DIMENSIONS

Length	2-9 16"
Width	1-5 16"
Height	2-13 16"
Weight	14 oz
Mounting	2-1 16 x 11 16"
Screws	6 32" studs
Cutout	7/8 x 1 2"

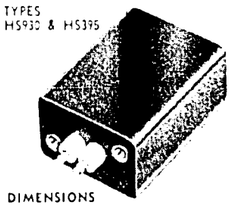
TYPE HS254



DIMENSIONS

Length	1-29 32"
Width	1"
Height	2-1 4"
Weight	8 oz
Mounting	1-5 16 x 9 16"
Screws	6 32" studs
Cutout	7 8 x 1 2"

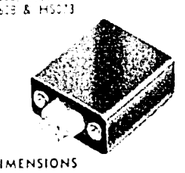
TYPES HS930 & HS395



DIMENSIONS

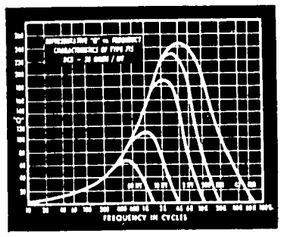
Length	1-9 32"
Width	11 16"
Height	1-23 32"
Weight	4 oz
Mounting	7 8 x 9 32"
Screws	4 40" studs
Cutout	1 2 x 5 16"

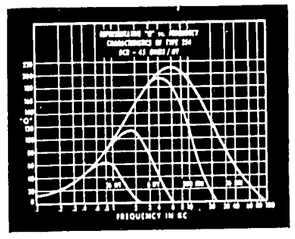
TYPES HS206 HS848 HS618 & HS703

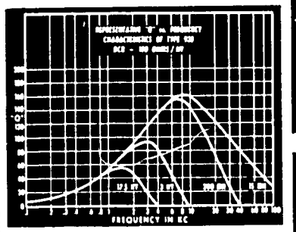


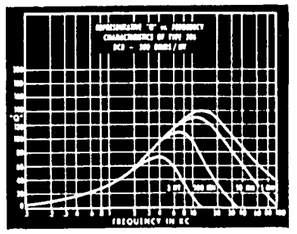
DIMENSIONS

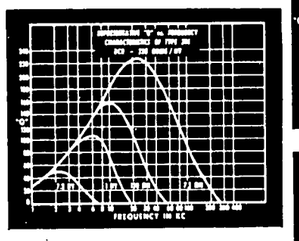
Length	1-1 16"
Width	1 2"
Height	1-1 4"
Weight	1.5 oz
Mounting	3 4"
Screws	4 40" studs
Cutout	1 2 x 5 16"

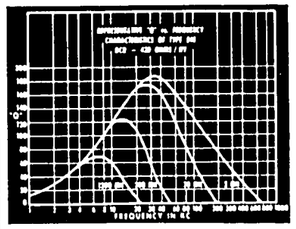


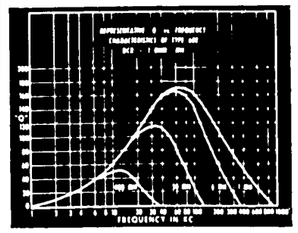


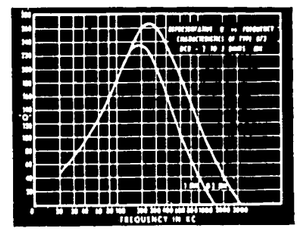












LIST OF STOCKED UNITS

All other values and types on Special Order

Suffix Number	HS 206—	HS 930—	HS 254—	HS 715—
— 1	5.0 MH	5.0 MH	20 MH	24 MH
— 2	6.0 MH	6.0 MH	24 MH	30 MH
— 3	7.2 MH	7.2 MH	30 MH	36 MH
— 4	8.6 MH	8.6 MH	36 MH	43 MH
— 5	10 MH	10 MH	43 MH	50 MH
— 6	12 MH	12 MH	50 MH	60 MH
— 7	15 MH	15 MH	60 MH	72 MH
— 8	17.5 MH	17.5 MH	72 MH	86 MH
— 9	20 MH	20 MH	86 MH	100 MH
—10	24 MH	24 MH	100 MH	120 MH
—11	30 MH	30 MH	120 MH	150 MH
—12	36 MH	36 MH	150 MH	175 MH
—13	43 MH	43 MH	175 MH	200 MH
—14	50 MH	50 MH	200 MH	240 MH
—15	60 MH	60 MH	240 MH	300 MH
—16	72 MH	72 MH	300 MH	360 MH
—17	86 MH	86 MH	360 MH	430 MH
—18	100 MH	100 MH	430 MH	500 MH
—19	120 MH	120 MH	500 MH	600 MH
—20	150 MH	150 MH	600 MH	720 MH
—21	175 MH	175 MH	720 MH	860 MH
—22	200 MH	200 MH	860 MH	1.00 HY
—23	240 MH	240 MH	1.00 HY	1.20 HY
—24	300 MH	300 MH	1.20 HY	1.50 HY
—25	360 MH	360 MH	1.50 HY	1.75 HY
—26	430 MH	430 MH	1.75 HY	2.00 HY
—27	500 MH	500 MH	2.00 HY	2.40 HY
—28	600 MH	600 MH	2.40 HY	3.00 HY
—29	720 MH	720 MH	3.00 HY	3.60 HY
—30	860 MH	860 MH	3.60 HY	4.30 HY
—31	1.00 HY	1.00 HY	4.30 HY	5.00 HY
—32	1.20 HY	1.20 HY	5.00 HY	6.00 HY
—33	1.50 HY	1.50 HY	6.00 HY	7.20 HY
—34	1.75 HY	1.75 HY	7.20 HY	8.60 HY
—35	2.00 HY	2.00 HY	8.60 HY	10.0 HY
—36	2.40 HY	2.40 HY	10.0 HY	12.0 HY
—37	3.00 HY	3.00 HY	12.0 HY	15.0 HY
—38		3.60 HY	15.0 HY	17.5 HY
—39		4.30 HY	17.5 HY	20.0 HY
—40		5.00 HY	20.0 HY	24.0 HY
—41		6.00 HY	24.0 HY	30.0 HY
—42		7.20 HY	30.0 HY	36.0 HY
—43		8.60 HY	36.0 HY	43.0 HY
—44		10.0 HY		50.0 HY
—45		12.0 HY		60.0 HY
—46		15.0 HY		
—47		17.5 HY		

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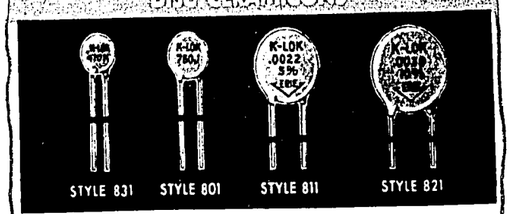
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ERIE HIGH VOLTAGE CERAMICONS



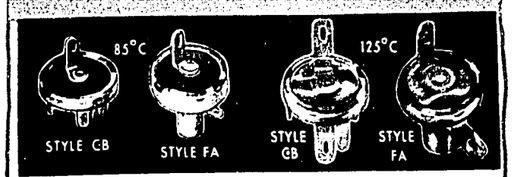
Erie offers a wide selection of disc and molded-type ceramicons for high voltage service. Available in ratings between 1000 V. and 30 KV. for high potential tuning, by-passing and filtering applications.

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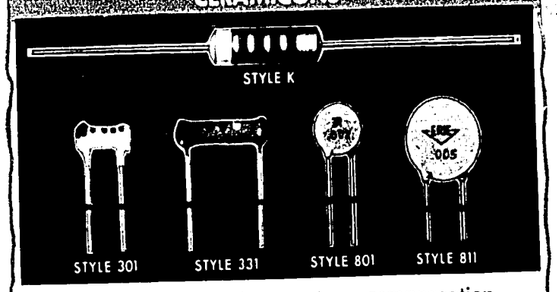
Values up to .0047 mfd at 500 V. are available in tolerances as close as ± 5%. Capacity variations with temperature, age and voltage are exceptionally small. A truly premium capacitor.

ERIE BUTTON MICA CAPACITORS



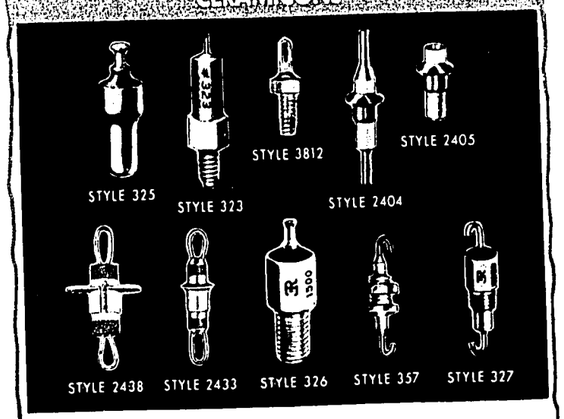
Values from 15 mmf to 8100 mmf are available in tolerances as close as ± 2%. Rated at 500 VDCW. "Q" value exceeds 1000 for values above 100 mmf. Available for maximum operating temperatures of 85°C. and 125° C. Extremely low inductance makes these very compact capacitors ideal for VHF and UHF applications.

ERIE BY-PASS AND COMPENSATING CERAMICONS



To meet exacting temperature compensation, by-passing, coupling and filtering requirements. Compensating units available from .75 to 1380 mmf. "Hi-K" by-pass units available from 100 mmf to .01 mfd.

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Erie offers a wide selection of chassis—mounting capacitors designed to overcome radiation and critical by-passing problems. Available in both temperature compensating and "Hi-K" materials. Manufactured in values up to 1500 mmf with 500 V. rating.

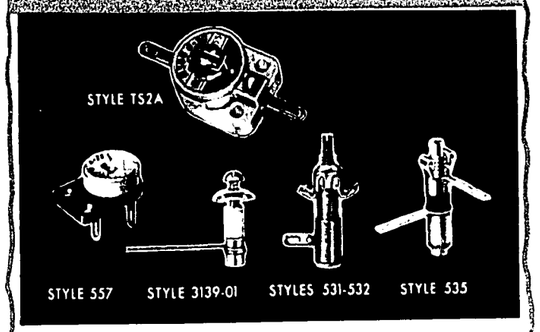
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HOLLY SPRINGS, MISSISSIPPI • LONDON, ENGLAND • TRENTON, ONTARIO

ERIE

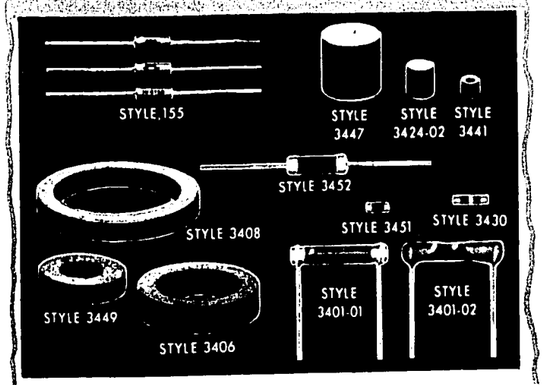
dependable electronic components

ERIE TRIMMER CAPACITORS



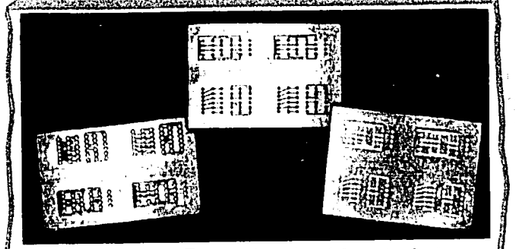
The largest and most versatile family of plastic and temperature compensating ceramic trimmer capacitors are available from Erie, to meet difficult tuner and converter requirements.

ERIE RESISTANCE PRODUCTS



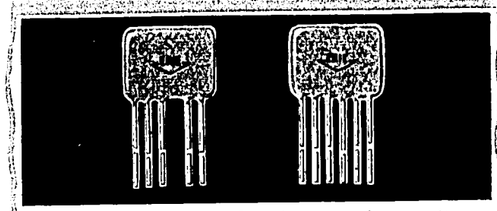
Erie has 25 years experience in the design and manufacture of high quality resistor products. Among these products are precision pyrolytic resistors, high voltage resistors and ignition noise suppressors. Complete facilities available to produce a wide variety for specific applications.

ERIE EMBOSSED CIRCUITRY



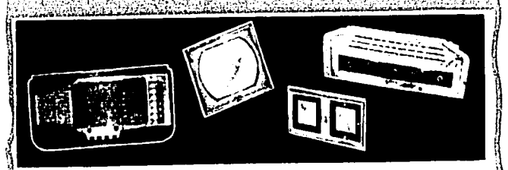
The exclusive Erie printed wiring technique provides a circuit pattern actually embedded in the surface of a high grade laminated phenolic. Will withstand severe soldering temperatures without peeling. Drastically reduces assembly costs.

ERIE PRINTED CIRCUITS



By combining several resistors and capacitors into one rigid compact package Erie is able to offer many design and production advantages. A wide selection of diode filters, plate couplers and special circuits are available.

ERIE CUSTOM MOLDED PLASTICS



A pioneer in injection molded plastics, Erie specializes in custom molded name plates, dials, TV masks and other precision items that not only require close tolerances but also have the eye-catching sales appeal of three dimension beauty.

Ceramicon, Hi-K, K-LOK, GP, Button, and Plexicon are registered trade names of Erie Resistor Corporation.

ERIE RESISTOR CORP.
ERIE RESISTOR CORPORATION . . . ELECTRONICS DIVISION
Main Offices and Factories: ERIE, PA.
Sales Offices: Cliffside, N. J. • Camden, N. J. • Chicago, Ill. • Detroit, Mich.
Cincinnati, Ohio • Fort Wayne, Ind. • Los Angeles, Calif. • Toronto, Ontario
Manufacturing Subsidiaries:
HOLLY SPRINGS, MISSISSIPPI • LONDON, ENGLAND • TRENTON, ONTARIO

STAC



FIXED RESISTORS

JAN-R-11 TYPES

Styles RC10, RC20, RC21, RC30, RC31, RC41, and RC42.

Write for Stackpole Bulletin J-2.

½-, 1-, and 2-Watt Sizes in all RTMA Preferred Values

Fully insulated and moisture-protected by phenolic sleeves, Stackpole resistors are available in all standard values for radio, television, military and commercial uses. In addition, Stackpole offers special resistors for automotive, lightning arrestor, capacitor discharge, surge and other uses. *Write for Stackpole Catalog RC-9.*

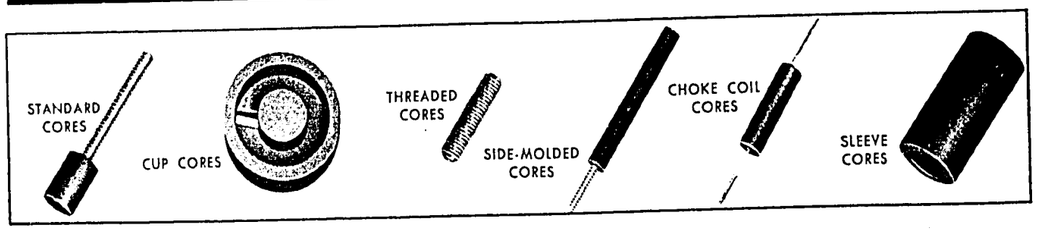


VARIABLE RESISTORS

VERSATILE SWITCHES

Small, reliable line switches are made in ratings and circuitry for every need including auto radio applications.

Stackpole offers a dependable selection of volume and tone controls, potentiometers, etc. for radio, TV, instruments, and other equipment. Single, ganged, and concentric shaft designs are available in values from 500 ohms to 5 megohms and in ratings from .5 watt. Types range from the midget LR control for TV to the conservatively rated .6 watt Type LP for heavier duty use. Special taps, extended bushings or other features can be supplied. *Write for Catalog RC-9.*

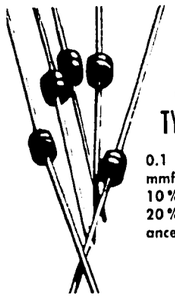


IRON CORE HEADQUARTERS

The widespread use of high Q coils with a consequent reduction in complicated circuitry has resulted in no small part from Stackpole engineering that has made new and better iron cores available at attractive prices. Stackpole production includes practically all types in common use—including cores for high- and low-frequency coils and transformers, chokes, and side-molded types for permeability tuning—as well as numerous types and adaptations made for special uses.

For all styles—standard or special—Stackpole manufacturing techniques assure iron cores of outstanding dependability and uniformity. *Write for Catalog RC-9.*

Fixed Composition CAPACITORS



47 TYPES

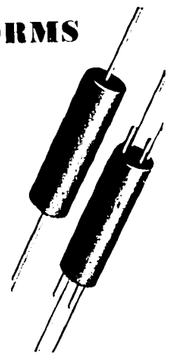
0.1 to 10.0 mmf. 5%, 10%, and 20% tolerances.

Type GA

Unmatched for low cost, high stability, and scarcely larger than ½-watt resistors, Stackpole "GA" capacitors are the most efficient way to couple or by-pass R-F circuits. Sturdily molded of high-dielectric constant material, these low-value capacitors have physical and electrical advantages that save assembly and testing time in virtually every R-F circuit. *Write for Catalog RC-9.*

MOLDED COIL FORMS

for fast, low cost assembly



Inexpensive Stackpole molded coil forms permit smaller coils and pave the way for simplified point-to-point wiring with a minimum of soldered connections. Either axial or hairpin leads, securely anchored, are available. Types can also be supplied with iron core sections, thereby increasing Q materially, decreasing the amount of wire for a given inductance, and reducing stray magnetic fields. Write for details and samples to specifications.

KPOLE

Ceramag®

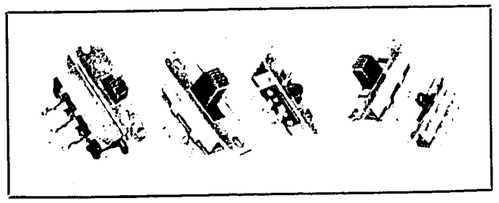
THE REALLY UNIFORM FERROMAGNETIC CORES



Lower Losses with Higher Efficiency . . . Lighter Weight . . . Smaller Sizes . . . Much Higher Permeability

Standard Stackpole Ceramag Cores provide permeabilities on the order of 10 to 1 or higher by comparison with conventional iron cores. In addition, they have less corona effect and operate much cooler due to eddy current losses resulting from their high resistivity.

The remarkable uniformity of Ceramag Cores has long made them first choice of leading television producers. Typical applications include use as cores for flyback transformers, cathode ray tube deflection yokes, width control; low-loss inductors; I-F pulse and coupling transformers; and various others where Ceramag offers distinct advantages. Details on standard and special Ceramag grades are covered in *Bulletin RC-9A.*



LOW COST SWITCHES

for instruments, radios, appliances, toys, small motors and similar uses

Dress up your product—add to its convenience and "saleability" with these sturdy, low-cost slide switches! Over 20 fractional amperage and new 3 amp. types for fractional HP motors are available. Most types can be supplied with or without detent, spring-return, or other features to match your specifications *exactly.* Modifications, including adaptations for rotary or plunger action, can be produced economically. *Write for new Stackpole Switch Bulletin RC-9B.*

CARBON & GRAPHITE SPECIALTIES



Solve Friction, Temperature, Corrosion, Shaft Sealing, Arcing, and many other problems

Anodes • Battery Carbons • Bearing Materials • Brazing Furnace Boats • Brushes of all types for rotating electrical equipment • Carbon and Graphite and Molded Metal Contacts • Chemical Carbons • Clutch Rings • Dash Pot Plungers • Electric Furnace Heating Elements • Electrolytic Anodes • Friction Segments • Glass Molds • Carbon Ground Rods • Mercury Arc Rectifier Anodes • Metal-Graphite Contacts • Power Tube Anodes • Rail Bonding Molds • Rare Metal Contacts • Resistance Welding and Brazing Tips • Seal Rings (for gas or liquid) • Special Molds and Dies • Salt Bath Rectification Rods • Spectrographite • Trolley and Pantograph Shoes • Voltage Regulator Discs • Water Heater and Pasteurization Electrodes • Welding Carbons • Welding Plates and Paste •

CARBON-GRAPHITE DATA BOOK

Newly revised and enlarged, Stackpole Catalog 40A contains helpful data on carbon, graphite, and carbon-graphite properties and their engineering uses.





GET THIS BIG 48 Page CATALOG

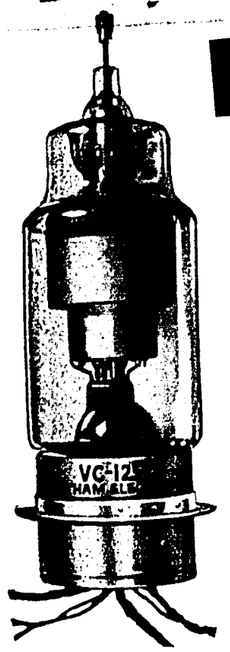
Catalog RC-9 gives detailed specifications on the latest Stackpole Electronic Components described on these pages. Write on your business letterhead for your copy.

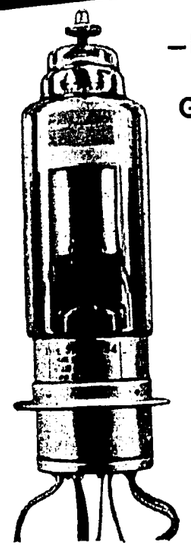
ELECTRONIC COMPONENTS DIVISION

STACKPOLE CARBON COMPANY, ST. MARYS, PENNSYLVANIA

CHATHAM
ELECTRONIC TUBES

Hydrogen Thyratrons —for Pulse Voltage Generation







ELECTRICAL DATA*				
Type	VC-1258	5949/1907	5948/1754	VC-1257
Maximum Peak Forward Anode Potential	1000 volts	25000 volts	25000 volts	38000 volts
Maximum Peak Anode Current	20 amps	500 amps	1000 amps	2000 amps
Maximum Average Anode Current	0.05 amps	0.50 amps	1.0 amps	2.0 amps
Maximum Heating Factor (epy x prr x ib)	1.0×10^8	6.25×10^9	9.0×10^9	—
Nominal Filament Power	12.6 watts	95 watts	190 watts	230 watts
Hydrogen Reservoir	No	Yes	Yes	Yes

*More detailed information on electrical and mechanical data will be supplied on request.

TYPE VC-1257
Hydrogen filled, zero bias thyratron with hydrogen generator for generation of pulse power up to 40 megawatts.

TYPE 5948/1754
Hydrogen filled, zero bias thyratron with hydrogen reservoir for generation of peak pulse power up to 12.5 megawatts.

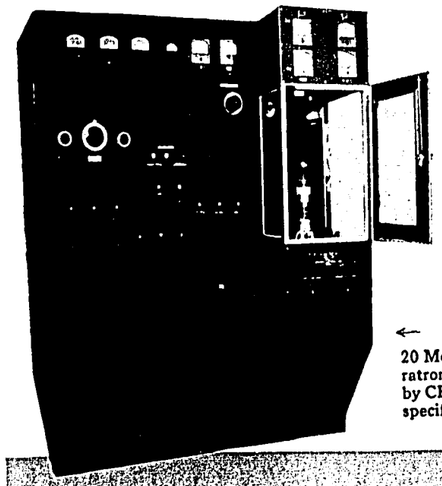
TYPE 5949/1907
Hydrogen filled, zero bias thyratron with hydrogen reservoir for generation of peak pulse power up to 6.25 megawatts.



TYPE VC-1258
Zero bias miniature hydrogen thyratron for the generation of peak pulse power up to 10 KW.

A NEW CONCEPT OF HYDROGEN THYRATRON DESIGN! The tubes illustrated represent a departure from conventional hydrogen thyratron designs and are a result of several years of concentrated development work. They are primarily employed in the generation of peak voltages with durations in the order of microseconds.

Custom-built Electronic Equipment

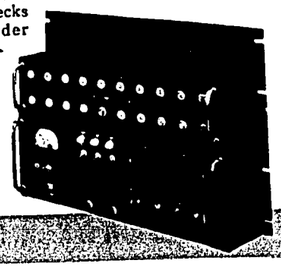


CHATHAM specializes in the development, design, and construction of custom-built electronic equipment to exactly meet customers' requirements. Our capable staff of engineers will furnish prompt estimates or, if desired, will call to discuss your problem personally. Call or write today.



5 Megawatt radar modulator built by CHATHAM to rigid government standards.

Pulse life test equipment built by CHATHAM checks receiver type tubes under pulse conditions. →



← 20 Megawatt Hydrogen Thyratron Test Equipment built by CHATHAM to customers' specifications.

ELECTRONICS
AND EQUIPMENT

Electronic Tubes



Ruggedized Type Tubes

The following tubes fully conform to JAN specifications and can be supplied promptly, usually direct from stock:

5R4WGY 2D21W
6AL5W OC3W
6H6WGT OD3W
25Z6WGT 2050W



TYPE 6AS7G TWIN POWER TRIODE

A Twin power triode, intended primarily for voltage regulation. Features triode balance within ±10% at rated plate current, absence of plate current drift and grid current. Heater 6.3 volts, 2.5 amps. Characteristics for each section: Amp. factor 2.0, mutual conductance 7000 micromhos, plate res. 270 ohms, plate dissipation 13 watts.



TYPE 1Z2 RECTIFIER

A small bulb, high voltage, vacuum rectifier. Low cathode heating power and low dielectric losses make tube suitable for radio frequency supply circuits. Filament 1.25 volts, .275 amps. Inverse peak anode voltage 15000, average plate current 1.5 ma., peak anode current 8.5 ma.



TYPE 6336 TWIN POWER TRIODE

A reliable twin power triode intended primarily for voltage regulation. Features high perveance and plate dissipation. Heater 6.3 volts, 4.75 amps. Characteristics for each section: Amp. factor 2.7, mutual conductance 11000 micromhos, plate resistance 250 ohms, plate dissipation 30 watts.



TYPE 395-A COLD CATHODE GAS TRIODE

Requires no filament supply and is used in many grid controlled rectifier and relay applications. Maximum D.C. anode current— 10 ma. Maximum D.C. anode voltage—150 volts



TYPE 4B32 RECTIFIER

A rugged half-wave Xenon filled rectifier. Operates in any position throughout an ambient temperature range of −75°C to +90°C. Filament 5 volts, 7.5 amp... Inverse peak anode voltage 10,000 average anode current 1.25 amps.



TYPE 5651 WA VOLTAGE REFERENCE TUBE

A reliable and rugged cold cathode voltage reference tube designed for extreme stability over a wide ambient temperature range. Operating voltage 86 volts, operating current 1.5 to 3.5 ma. Voltage regulation, 2 volts maximum.



TYPE 3B28 RECTIFIER

This rugged half-wave Xenon filled rectifier will operate in any position and throughout an ambient temperature range of −75°C to +90°C. Filament 2.5 volts, 5.0 amps... Inverse peak plate voltage 10,000, average anode current .25 amp.

Chatham Vacuum Switches

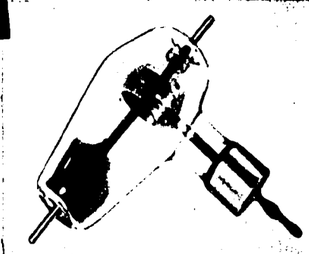
TYPE 1S22 (illustrated) is a mechanically actuated, single-pole, double-throw, glass vacuum switch. This and other types can be supplied.

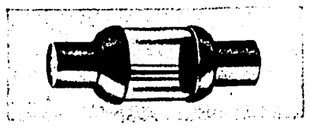
SPECIFICATIONS

HOLD OFF VOLTAGE: Internal—10,000 volts rms; External* (at 27,000 feet altitude)—10,000 volts rms; External* (at 40,000 feet altitude)—7,500 volts rms.

INTERRUPTING RATING, RESISTIVE LOAD: 1,000 operations life at 10,000 v, ac, rms—10 amp, ac, rms; 1,000,000 operations life at 10,000 v, ac, rms — 2 amp, ac, rms; 500,000,000 operations life at 10,000 v, ac, rms—0.1 amp, ac, rms.

NET WEIGHT (approx.) ——— 2 ozs. MAXIMUM WIDTH (overall) ——— 4½ ins.
MAXIMUM LENGTH (overall) ——— 3⅝ ins. MAXIMUM THICK. (overall) ——— 1⅛ ins.
*at 50% humidity





HIGH VOLTAGE VACUUM FUSES

Can be supplied by Chatham to exact customers' specifications if ordered in adequate quantity. Call or write for full particulars and quotes.

CHATHAM ELECTRONICS CORP.
EXECUTIVE AND GENERAL OFFICES: LIVINGSTON, NEW JERSEY
PLANTS AND LABORATORIES: NEWARK AND LIVINGSTON, NEW JERSEY

CATHALOY*

CATHALOY A30** *For long life*

This is an active grade 0.1% aluminum-nickel alloy designed for use in high speed electron tube production. Exhaustive testing has confirmed it as a preferred replacement for active alloys with silicon and magnesium reducing elements. Its chief advantages are long life, rapid activation, no interface impedance, no inter-electrode leakage caused by sublimed films, and a high emission value.

Composition

Aluminum.....07/.12%	Copper.....0.10% max.
Silicon.....03% max.	Carbon.....08% max.
Magnesium.....01/.06%	Titanium.....02% max.
Iron.....0.10% max.	Nickel plus Cobalt..99% min.
Manganese....0.12% max.	

Physical Properties

Density..... .322 lb./cu. in.

Temperature coefficient of resistance..... .00895 ohm/ohm/°F. (32°—212°F.)

Electrical resistivity..... { 55.08 ohms/Cmf (68°F.) / 159.18 ohms/Cmf (1000°F.)

Temperature coefficient of expansion..... 8.97 x 10^{-6} in./in./°F. (68°—932°F.)

Mechanical Properties***

Temper	Tensile Strength (x 1000 psi)	Yield Strength (x 1000 psi) 0.2% offset	% Elongation in 2 inches	Rockwell Hardness
Annealed	75 max.	15/30	55/30	B70 max.
Half hard	70/90	35/75	27/12	B65/80
Hard drawn	90/120	75/105	18/8	B80/100

Cathaloy A30 is used wherever an active alloy is now specified. The new features of this material will permit long life with freedom from interface buildup. It is recommended for general purpose entertainment type electron tubes.

CATHALOY A31 *For strength*

This is a premium grade 4% tungsten-nickel alloy designed for cathode use in ruggedized electron tubes. The necessity for this new alloy for indirectly heated cathodes has been demonstrated by the increase in requirements for strength, long life and reliability. Under electron tube test, Cathaloy A31 has demonstrated high hot strength and maintenance of good emission characteristics over long periods of life.

Composition

Tungsten...3.75/4.25%	Copper.....0.10% max.
Silicon..... .05% max.	Carbon.....08% max.
Magnesium. .01/.06%	Titanium.....02% max.
Iron.....0.10% max.	Nickel plus Cobalt 95.25% min.
Manganese 0.12% max.	

Physical Properties

Density.....0.323 lb./cu. in.

Temperature coefficient of resistance..... .00549 ohm/ohm./°F. (32°—212°F.)

Electrical resistivity..... { 96.61 ohms/Cmf (68°F.) / 145.30 ohms/Cmf (1000°F.)

Temperature coefficient of expansion..... 8.74 x 10^{-6} in./in./°F. (100°—930°F.)

Mechanical Properties***

Temper	Tensile Strength (x 1000 psi)	Yield Strength (x 1000 psi) 0.2% offset	% Elongation in 2 inches	Rockwell Hardness
Annealed	80 max.	20/40	50/30	B80 max.
Half hard	80/100	60/85	25/12	B80/95
Hard drawn	100/125	80/105	12/4	B95/110

Cathaloy A31 is resistant to bowing during assembly and processing. Its recommended use is for any electron tubes subjected to shock and vibration.

*Reg. U.S. Trademark **Manufactured under U.S. Patent

****These are average values representing the mechanical properties to be expected of normal wall tubes useful in comparison with other materials. These do not represent the mechanical properties of very small thin wall tubing.*



...a new series of cathode alloys from SUPERIOR TUBE

CATHALOY P50 *For extremely long life*

This is a passive grade nickel alloy designed for extremely long life, reliable electron tubes. Experiments with Cathaloy P50 in electron tubes have shown the low rate of barium evolution, minimum of sublimation, and freedom from interface impedance required of passive cathodes. Cathaloy P50 is the only passive alloy available commercially in seamless and WELDRAWN* forms. It is also supplied in lockseam cathode form.

Composition

Silicon..... .02 max.	Copper..... .05 max.
Magnesium..... .01 max.	Carbon..... .05 max.
Iron..... .05 max.	Titanium..... .01 max.
Manganese..... .02 max.	Nickel plus Cobalt Balance

Physical Properties

Density..... 0.322 lb./cu. in.

Temperature coefficient of resistance..... .01190 ohm/ohm/°F. (32°—212°F.)

Electrical resistivity..... { 46.06 ohms/Cmf (68°F.) / 159.82 ohms/Cmf (990°F.)

Temperature coefficient of expansion..... 8.69 x 10^{-6} in./in./°F. (86°—932°F.)

Mechanical Properties***

Temper	Tensile Strength (x 1000 psi)	Yield Strength (x 1000 psi) 0.2% offset	% Elongation in 2 inches	Rockwell Hardness
Annealed	75 max.	30 max.	50/33	B70 max.
Half Hard	75/95	33/75	25/12	B75/90
Hard Drawn	95/120	75/105	10/4	B90/105

Cathaloy P50 is used for power output tubes requiring low grid emission and for tubes which need a seamless passive cathode. This alloy is especially treated to provide good uniformity.

STANDARD ELECTRONIC PRODUCTS

Superior Tube is the world's leading fabricator of nickel sleeves for indirectly heated oxide-coated cathodes in electron tubes. These parts are manufactured to exact specifications within close tolerances and using a wide variety of different alloys. Superior Tube engineers can work hand in hand with you to develop parts and special characteristics.

Cathode Sleeves. Made in round, oval, elliptical and rectangular shapes. These cathodes are available in:

Seamless—from .010" to .121" O.D. inclusive with wall thicknesses from .0015" to .005" inclusive. Larger diameters and heavier walls can also be produced. May be cut to practically any length desired. Bead (emboss) may be located anywhere except within .040" from the end of the cathode.

Lockseam** Produced from nickel strip especially rolled for the purpose. From .040" to .185" O.D. inclusive with wall thicknesses from .0021" to .0035". Lengths are from 9 mm to 50 mm inclusive. Vertical and circumferential beads permissible.

Disc Cathode. Superior is now ready to offer to the industry a new disc cathode for use in guns for color TV picture tubes. This is smaller in design than the present assembly which has been used so successfully in monochrome guns for the past eight years. In addition to the two big advantages of the present type disc cathode, namely choice of materials and close control of the E dimension (distance from the top of ceramic to top of emission cap), the new assembly has the following advantages:

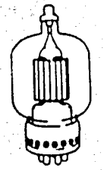
1. The cathode surface area is reduced, which means less power input.
2. Lower heat radiation due to less power, which means constant temperature and cooler continual operation.
3. A smaller shank and emission cap, which means better transmission of electrons to the TV screen.
4. The smaller guns which are now possible permit the manufacturer to bring the guns closer together in the mount. This means better control of the deflection of the electron beams.

Electronics Division, Superior Tube Company
2515 Germantown Ave., Norristown, Pa.
Please send me technical information and literature on the products checked below:

- ☐ CATHALOY A30
- ☐ CATHALOY A31
- ☐ CATHALOY P50
- ☐ Standard Cathode and anode materials
- ☐ Glass sealing alloys
- ☐ Nickel & Nickel alloy tubing

Name.....
Department.....
Company.....
Street.....
City.....Zone.....State.....

EIMAC - 20 years of Leadership!



TETRODES

4-65A
4-125A
4-250A
4-400A
4-1000A
4PR60A
4W20000A
4X150A
4X150D
4X150G
4X500A
4X500F



TRIODES

2C39A
3W5000A3
3W5000F3
3W10000A3
3X2500A3
3X2500F3
3X3000A1
3X3000F1
6C21
25T
35T
35TG
75TH
75TL
100TH
100TL
152TH
304TH
304TL
450TH
450TL
592/3-200A3
750TL
1000T
1500T
2000T

PENTODE

4E27A/5-125B



DIODES AND RECTIFIERS

2-01C
2-25A
2-50A
2-150D
2-240A
2-2000A
KY21A
RX21A
250R
253
866A
872A
8020 (100R)



KLYSTRONS

3K20, 000LA
3K20, 000LF
3K20, 000LK
3K50, 000LA
3K50, 000LF
3K50, 000LK
1K015XA
1K015XG

TETRODES

TRIODES

PENTODE

KLYSTRONS

EIMAC TUBE TYPE	MAXIMUM RATINGS: Plate Dissipation Watts	Plate Voltage	Plate Current Milliamperes	Grid Dissipation Watts	Screen Voltage	Screen Dissipation Watts	ELECTRICAL CHARACTERISTICS: Filament, Volts	Filament, Amperes	Amplification Factor	Transconductance umhos
4-65A	65	3000	150	5	400	10	6.0	3.5	5	4000
4-125A	125	3000	225	5	400	20	5.0	6.5	5.9	2450
4-250A	250	4000	350	10	600	35	5.0	14.5	5.1	4000
4-400A	400	4000	350	10	600	35	5.0	14.5	5.1	4000
4-1000A*	1000	6000	700	25	1000	75	7.5	21	7.0	10,000
4PR60A*	60	20,000	†	†	1500	8	26	2.25	†	†
4W20,000A**	20,000	8000	15,000	60	1500	200	10	30	5.5	75,000
4X150A*	150	1250	250	2	300	12	6.0	2.6	5	12,000
4X150D*	150	1250	250	2	300	12	26.5	.57	5	12,000
4X150G*	150	1250	250	2	300	15	2.5	6.25	5.0	12,000
4X500A*	500	4000	350	10	500	30	5.0	13.5	6.2	5200
4X500F*	500	4000	350	10	500	30	5.0	13.5	6.2	5200
2C39A*	100	1000	125‡	2	...	..	6.3	1.0	100	22,000
6C21	300	30,000	†	†	...	..	8.2	17.0	30	6100
3W5000A3**	5000	6000	2500	150	...	..	7.5	51	20	20,000
3W5000F3**	5000	6000	2500	150	...	..	7.5	51	20	20,000
3W10,000A3**	10,000	5000	10,000	100	...	..	10	30	20	55,000
3X2500A3*	2500	6000	2500	150	...	..	7.5	51	20	20,000
3X2500F3*	2500	6000	2500	150	...	..	7.5	51	20	20,000
3X3000A1*	3000	6000	2500	50	...	..	7.5	51	5	11,000
3X3000F1*	3000	6000	2500	50	...	..	7.5	51.0	5	11,000
25T	25	2000	75	7	...	..	6.3	3.0	24	2500
35T	50	2000	150	15	...	..	5.0	4.0	39	2850
35TG	50	2000	150	15	...	..	5.0	4.0	39	2850
75TH	75	3000	225	16	...	..	5.0	6.25	20	4150
75TL	75	3000	225	13	...	..	5.0	6.25	12	3350
100TH	100	3000	225	20	...	..	5.0	6.3	38	4500
100TL	100	3000	225	15	...	..	5.0	6.3	14	3000
152TH	150	3000	450	30	...	..	5 or 10	12.5 or 6.25	20	8300
152TL	150	3000	450	25	...	..	5 or 10	12.5 or 6.25	12	7150
250TH	250	4000	350	40	...	..	5.0	10.5	37	5600
250TL	250	4000	350	35	...	..	5.0	10.5	14	2650
304TH	300	3000	900	60	...	..	5 or 10	25 or 12.5	20	16,700
304TL	300	3000	900	50	...	..	5 or 10	25 or 12.5	12	16,700
450TH	450	6000	600	80	...	..	7.5	12.0	38	6650
450TL	450	6000	600	65	...	..	7.5	12.0	18	5000
592/3-200A3	200	3500	250	25	...	..	10.0	5.0	25	3600
750TL	750	10,000	1000	100	...	..	7.5	21.0	15	3500
1000T	1000	7500	750	80	...	..	7.5	15.5	35	9050
1500T	1500	8000	1250	125	...	..	7.5	24.0	24	10,000
2000T	2000	8000	1750	150	...	..	10.0	23.5	23	11,000
4E27A/5-125B	125	4000	200	5	750	20	5.0	7.5	5.0	2150

	Frequency Range Mc.	Collector Dissipation Watts	Beam Voltage	Beam Current Amperes	TV Peak Synchronizing Level	CW Power Amplifier
3K20,000LA**	470-580	20,000	14,000	1.7	5500	5500
3K20,000LF**	580-720	20,000	14,000	1.7	5500	5500
3K20,000LK**	720-890	20,000	14,000	1.7	5500	5500
3K50,000LA**	470-580	50,000	19,500	2.56	12,000	10,000
3K50,000LF**	580-720	50,000	19,500	2.56	12,000	10,000
3K50,000LK**	720-890	50,000	19,500	2.56	12,000	7500

	D-C Resonator Voltage	Resonator Dissipation	D-C Cathode Current	D-C Repeller Voltage	Heater Voltage	Heater Current	Frequency Range
1K015XA	350	15	45	0 to –500	6.3	0.80	8700-9400
1K015XG***	350	15	45	0 to –500	6.3	0.80	8700-9400

*Requires forced-air cooling
**Water-cooled
***Waveguide Output Connections
‡Cathode Current
†Pulse Modulator

SEE NEXT PAGE

EITEL-McCULLOUGH, INC.
San Bruno, California

Since 1934 Eimac electron-power tubes have been specified by leading engineers for all types of military and commercial application.

The incomparable performance, reliability and quality of Eimac tubes has enabled Eitel-McCullough, Inc. to become the world's largest manufacturer of transmitting tubes in just two decades.

DIODES AND RECTIFIERS

TYPE	HIGH VACUUM TYPES: FILAMENT VOLTAGE	FILAMENT CURRENT AMPS.	PEAK INVERSE VOLTAGE	CURRENT AMPS. PEAK PLATE	AVERAGE PLATE CURRENT MA.
2-01C	6.3	0.4	1,000	0.010	
2-25A	6.3	3.0	25,000	1.0	50
2-50A	5.0	4.0	30,000	1.0	75
2-150D	5.0	13.0	30,000	3.0	250
2-240A	7.5	12.0	40,000	4.0	500
2-2000A	10.0	25.0	75,000	12.0	750
250R	5.0	10.5	60,000	2.5	250
253	5.0	10.0	15,000	2.5	275
8020(100R)	5.0	6.5	40,000	1.5	100
	MERCURY VAPOR TYPES				
*KY21A	2.5	10.0	11,000	3	750
RX21A	2.5	10.0	11,000	3	750
866A	2.5	5.0	10,000	1	250
872A	5.0	7.5	10,000	5	1250

*Grid Controlled

VACUUM CAPACITORS

TYPE	VARIABLE CAPACITY	RATING RF PEAK	TYPE	FIXED PRICE	FIXED CAPACITY	RATING RF PEAK
VVC60-20	10-60 mmfd	20-KV	VC6-20	$15.00	6 mmfd	20-KV
VVC2-60-20	Split Stator 5-30 mmfd	40-KV	VC6-32	17.25	6 mmfd	32-KV
	Parallel 20-120 mmfd	20-KV	VC12-20	16.50	12 mmfd	20-KV
VVC4-60-20	Split Stator 10-60 mmfd	40-KV	VC12-32	20.00	12 mmfd	32-KV
	Parallel 40-250 mmfd	20-KV	VC25-20	20.00	25 mmfd	20-KV
			VC25-32	23.25	25 mmfd	32-KV
			VC50-20	24.25	50 mmfd	20-KV
			VC50-32	27.50	50 mmfd	32-KV

AIR SYSTEM SOCKETS

TYPE	FOR USE WITH TUBE TYPE
4X150A/4000	4X150A or 4X150D
4X150A/4010	4X150A or 4X150D
4-400A, 4000	4-400A
4-1000A, 4000	4-1000A

HEAT DISSIPATING CONNECTORS

TYPE	HOLE DIA.
HR-1	.052
HR-2	.0625
HR-3	.070
HR-4	.1015
HR-5	.125
HR-6	.360
HR-7	.125
HR-8	.570
HR-9	.570
HR-10	.500

IONIZATION GAUGE

100 IG

An electronic vacuum pressure gauge.
Filament voltage 3.5 to 7.5 volts.

VACUUM SWITCH

VS-2
Single pole double throw switch within a high vacuum adaptable for high voltage switching.

VS-6
For high peak current, high voltage pulse service.

PREFORMED CONTACT FINGER STOCK

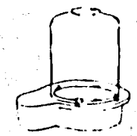
WIDTH
17/32"
31/32"
1-7/16"

A prepared strip of spring material slotted and formed into a series of fingers designed to make sliding contact.

Eimac TUBES

EITEL-McCULLOUGH, INC.
San Bruno, California

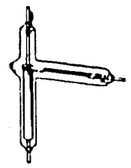
Export Agents: Frazar & Hansen, 301 Clay St., San Francisco, Calif.



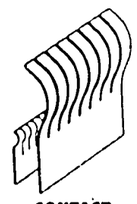
AIR SYSTEM SOCKETS
4-400A/4000
4-400A/4006*
4-1000A/4000
4-1000A/4006*
4X150A/4000
4X150A/4006*
4X150A/4010
4X150A/4011*
*Replacement Chimneys



ACCESSORIES
HR Heat dissipating connectors
Preformed Contact Finger Stock



VACUUM SWITCH
VS-2
VS-6



CONTACT FINGER STOCK
17/32"
31/32"
1-7/16"

VARIABLE VACUUM CAPACITORS
VVC60-20
VVC2-60-20
VVC4-60-20

ION GAUGE
100 IG Ion gauge

VACUUM CAPACITORS
VC6-20
VC6-32
VC12-20
VC12-32
VC25-20
VC25-32
VC50-20
VC50-32

TUBE EXTRACTOR
4X150

FOR COMPLETE COVERAGE

insist on

Bomac

MICROWAVE PRODUCTS

- gas switching tubes
- shutter tubes
- hydrogen thyratrons
- magnetrons
- duplexers
- diodes

WE INVITE YOUR INQUIRIES REGARDING

- engineering
- development
- production

For further information and [illegible] above products, write or call Technical Publications.

Bomac LABORATORIES, INC.
BEVERLY MASSACHUSETTS

GAS SWITCHING TUBES

BAND	FREQUENCY	POWER LEVEL (KW Max)	TYPE	DESCRIPTION	TUBE DESIGNATION
L	900-1200	450	TR	Cell Type, One Disc, Fixed-Tuned	1B23
L	1075-1095	1	TR	Electrodeless Discharge, Fixed-Tuned	1B40
L	1215-1355	450	TR	Cell Type, Two Disc, Tunable	6322/BL-25
L	1215-1355	2000	TR	Tunable	BL-18
L	1220-1365	2000	TR	Band Pass, Fixed-Tuned	BL-37
L	1250-1350	4000	Pre TR	Band Pass, Fixed-Tuned	BL-96
L	1285	2000	ATR	Low Q, Fixed-Tuned, Tuned in ½ Height Guide	BL-38
L	1250-1350	550		Gas Switching Window	5939A
S	2600-3000	750	TR	Band Pass, Fixed-Tuned	1B58
S	2600-3000	750	TR	Band Pass, Fixed-Tuned	6117
S	2600-3000	750	TR	Dual 1B58	BL-87
S	2700-3300	350	TR	Cell Type, Two Disc, Fixed-Tuned	7218
S	2700-3400	450	TR	Ruggedized 1B27 without tuner knob	BL-31
S	2700-3400	450	TR	Cell Type, Two Disc, Tunable	1B27
S	2900-3200	750	TR	Band Pass, Fixed-Tuned	5853
S	3100-3500	750	TR	Band Pass, Fixed-Tuned	5927
S	3350-3750	750	TR	Band Pass, Fixed-Tuned	1B55
S	2700-2900	750	Pre TR	Band Pass, Fixed-Tuned	1B38
S	3400-3700	750	Pre TR	Band Pass, Fixed-Tuned	1B54
S	2750	750	ATR	Fixed-Tuned	1B44
S	2750	750	ATR	1944, 15μ Recovery Time	BL-41
S	2800	1000	ATR	Fixed-Tuned	6024/ATR387
S	2850	750	ATR	Fixed-Tuned	1B56
S	2850	750	ATR	1B56, 15μ Recovery Time	BL-40
S	2950	750	ATR	Fixed-Tuned	5792
S	3050	750	ATR	Fixed-Tuned	5793
S	3200	750	ATR	Fixed-Tuned	5921
S	3325	750	ATR	Fixed-Tuned	1B57
S	3400	750	ATR	Fixed-Tuned	5922
S	3479	750	ATR	Fixed-Tuned	1B53
S	3625	750	ATR	Fixed-Tuned	1B52
C	5200-5530	1000	TR	Band Pass, Fixed-Tuned	5925/TR
C	5220-5340	1000	TR	Dual TR	BL-86
C	5400-5900	700	TR	Dual 5865, Band Pass, Fixed-Tuned	BL-60
C	5400-5900	300	TR	Band Pass, Fixed-Tuned	5865/TR361
C	5450-5650	20	TR	Integral Cavity, Tunable	BL-46
C	5365	1000	ATR	Fixed-Tuned	6022/ATR332
C	5435	300	ATR	Fixed-Tuned	BL-52
C	5640	300	ATR	Fixed-Tuned	6081/ATR407
C	5640	300	ATR	Fixed-Tuned, Contact Mount	6455/BL-61
C	5370-5430	100		Complete Duplexer, Integral TR & ATR	BL-88
Xb	6000-7100	500	TR	Integral Cavity, Tunable	1B50
Xb	6425	500	ATR	Fixed-Tuned	1B51
X	8490-9560	1000	TR	5863 with Full Flanges and no Struts	BL-82
X	8490-9560	1000	TR	Band Pass, Special Flange, for use in RG 51/U Guide	5863
X	8490-9578	200	TR	Band Pass, Fixed-Tuned	1B63A
X	8490-9578	200	TR	Band Pass, Fixed-Tuned, Long Life	1B63B
X	8490-9578	200	TR	Band Pass (1B63A), Fixed-Tuned	6035
X	8490-9578	250	TR	1B63A, for RG 51/U Guide	6232/TR427
X	8490-9578	250	TR	Dual 1B63A	6334/BL-27
X	8490-9578	200	TR	6334 Tapped Flanges both sides	BL-78
X	8490-9578	200	TR	6334 Plus Separate Channel 1B63A	BL-81
X	8490-9578	250	TR	6334 with 1μ Recovery Time at 1 db point	BL-84
X	8500-9600	1000	TR	Dual TR for use in 51/U Guide	BL-71
X	8490-9600	100	TR	Integral Cavity, Tunable	1B24A
X	8490-9600	100	TR	Integral Cavity, Tunable	1B60
X	8490-9600	100	TR	No Reservoir, Tube Flanges do not protrude beyond UG39/U & UG40/U Flanges	6378/BL-62
X	8490-9600	30	TR	No Reservoir	BL-30
X	8541-9862	75	TR	Cell Type, Two Disc, Fixed-Tuned	724B
X	10000-10500	100	TR	Integral Cavity, Tunable	BL-51
X	8750	250	ATR	Fixed-Tuned	1B37A
X	8750	250	ATR	(1B37A) Mounting Flange Flat within .003"	6034
X	8750	250	ATR	Miniature 1B37A, Contact Mount	6369
X	8750	250	ATR	1B37A with KA	BL-94
X	8800	250	ATR	BL-43 for RG 51/U Guide	BL-54
X	8800	250	ATR	5883 in 6393 Outline for use in 51/U Guide	BL-69
X	8800	250	ATR	Fixed-Tuned	5883
X	9300	250	ATR	Fixed-Tuned	1B35A
X	9300	250	ATR	(1B35A) Mounting Flange Flat within .003"	6033
X	9300	250	ATR	1B35A with K.A.	6214
X	9300	250	ATR	Miniature 1B35A, Contact Mount	6304/BL-43
X	9300	250	ATR	Miniature 1B35A with Special Flange	6393/BL-68
X	9300	250	ATR	6393 Tuned in Half Height Guide .900 x .200 I.D. Guide	6396
X	9375	500	ATR	5864 in 6393 Outline for use in 51/U Guide	BL-70
X	9375	500	ATR	BL-43 for RG 51/U Guide	BL-55
X	9375	250	ATR	1B35A Outline, Fixed-Tuned	BL-45
X	9375	500	ATR	Fixed-Tuned, Tuned in RG 51/U Guide	5864/ATR321
X	9300-9450	10		Cross Guide Duplexer, BL-29 Beacon Application	BL-47
X	9300-9450	100		Cross Guide Duplexer	BL-29

BAND	FREQUENCY	POWER LEVEL KW Max.	TYPE	DESCRIPTION	TUBE DESIGNATION
Ku	15000-17000	100	TR	Dual TR	BL-35
Ku	15000-17000	100	TR	Single BL-35	BL-56
Ku	16300-16700	40	TR	Integral Cavity, Tunable	BL-16
Ku	16500	40	ATR	Fixed-Tuned	BL-15
K	23350-24950	35	TR	Band Pass, Fixed-Tuned	6282/BL-11
K	23630-24580	100	TR	Integral Cavity: Tunable	1B26
K	23630-24580	100	TR	1B26 No Reservoir	BL-67
K	24000	75	ATR	Fixed-Tuned	1B36

DUAL AND TRIPLE TR'S

BAND	FREQUENCY	POWER LEVEL (KW Max.)	TYPE	DESCRIPTION	TUBE DESIGNATION
S	2600-3000	750	TR	Dual	BL-87
C	5220-5340	1000	TR	Dual	BL-86
C	5400-5900	700	TR	Dual 5865	BL-60
X	8490-9578	200	TR	Dual 1B63A	6334/BL-27
X	8490-9578	200	TR	6334 Tapped Flanges Both Ends	BL-78
X	8490-9578	250	TR	6334 Plus Separate Channel 1B63A	BL-81
X	8500-9600	1000	TR	Large X Band Wave Guide	BL-71
Ku	15000-17000	100	TR	Dual	BL-35

BOMAC SHUTTER TUBES

BAND	FREQUENCY	POWER LEVEL (KW Max.)	TR TUBE TYPE	OPERATING VOLTAGE	OPERATION TYPE	TUBE DESIGNATION
C	5200-5530	1000	5925	28VDC	TR Shutter	BL-309
C	5395-5905	1000	5865	28VDC	TR Shutter	BL-311
X	8490-9560	200	BL-82	28VDC	TR Shutter	BL-310
X	8490-9578	200	1B63A	28VDC	TR with self-locking shutter	BL-314
X	8490-9578	200	6334, BL-27	28VDC	TR Shutter	BL-307
X	8490-9578	200	1B63A Special	28VDC	TR Shutter	BL-308
X	8490-9578	200	1B63A	28VDC	TR Shutter	BL-312
X	8490-9600	30	6378	28VDC	TR Shutter	BL-313

The above tubes available for 6 volt AC DC operation upon request.

GAS SHUTTER TUBES

K	24300-27000	Low Level	BL-11	28VDC-Ballast	Switch	BL-53
S	2700-3400	Low Level	1B27	28VDC-Ballast	Switch	BL-301
					Operating Time <1μ	

TUNING CAVITIES

BAND	FREQUENCY	DESCRIPTION	TUBE DESIGNATION
X	9249.7-9250.3	Temperature compensated ±0.3 MC from 0°C to 100°C	1Q22
X	9279.7-9280.3	Temperature compensated ±0.3 MC from 0°C to 100°C	1Q23

MIXER DIODES

BAND	FREQUENCY (MC)	CONVERSION LOSS (db MAX.)	NOISE RATIO (MAX.)	VSWR (MAX.)	RANGE IF IMPEDANCE	TUBE DESIGNATION
L	900	Noise figure tests on this UHF Diode can be made in special mixers according to customer requirements.				1N82
S	3060	6.5	2.0			1N21B
S	3060	6.5	2.0			1N21BR
S	3060	5.5	1.5			1N21C
S	3060	5.5	1.5			1N21CR
X	9375	6.5	2.7			1N23B
X	9375	6.5	2.7	•	•	1N23BM
X	9375	6.5	2.7			1N23BR
X	9375	6.5	2.7	•	•	1N23BMR
X	9375	6.0	2.0	1.50	325-475	1N23C
X	9375	6.0	2.0	1.50	325-475	1N23CR
X	9375	4.8	1.7	1.25	300-400	1N23D
X	9375	4.8	1.7	1.25	300-400	1N23DR
	See Bomac Test Spec. 1N23BM					

VIDEO DIODES

TYPE	Continuous Reverse Working Voltage (Volts Max)	Reverse Voltage for Zero Dynamic Resistance (Volts min)	Forward Current at +1 Volt (ma Min)	Average Anode Current (ma Max)	Recurrent Peak Anode Current (ma Max)	Instantaneous Surge Current (ma Max for 1 sec)	Reverse Currents @ -3v	@ -5v	@ -10v	@ -50v	@ -100v	Rectification Efficiency (% Min)
1N60	25	30	4.0	50	150	500						50 at 24.5 MC
1N40**	25	75	12.75	22.5	60	100			40			
1N35*	50	75	7.5	22.5	60	100			10			
1N34A	60	75	5.0	50	150	500			30	500		
1N34	60	75	5.0	50	150	500			50	800		
1N69	60	75	5.0	40	125	400			50	850		35 at 100 MC
1N111***	60	70	5.0	25	150	500			25	125		
1N112***	60	70	5.0	25	150	500			50	250		
1N38	100	120	3.0	50	150	500	6				625	
1N38A	100	120	4.0	50	150	500	5				500	

* The type 1N35 is a pair of matched germanium diodes assembled in brackets for easy mounting. The resistance of the units are matched to within 10% at 1.0 volt in the forward direction. Ratings shown are for each diode.

** The type 1N40 consists of four matched germanium diodes whose resistances are balanced within ±2.5% in the forward direction at 1.5 volts. In addition, the forward resistances of each pair of crystals are matched within 3 ohms. The crystals are mounted on a standard octal base which is enclosed in compact metal radio tube shell. Ratings shown are for each diode.

*** Diodes 1N111 and 1N112 are specifically designed and tested for computer use. The reverse resistance of these diodes is measured at +55°C by sweeping Eb/Ib from 0 to −70 volts at 60 cps. Recovery time measurements are made at 0.5 and 3.5μ. To insure maximum stability all units are visually observed for any evidence of flutter, drift, hysteresis, zero or negative AC resistance in the reverse voltage region, or increasing AC resistance with increasing forward voltage.

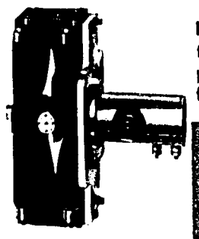
PRESSURIZING WINDOWS

BAND	FREQUENCY	WAVE-GUIDE SIZE	TYPE MOUNTING	DESCRIPTION	WINDOW DESIGNATION
S	2800	48 U	Solder	Oval, Kovar Finish	BL-124
S	2800	48 U	Solder	Oval Viewing Window, Optically Clear	BL-127
C	5350	49 U	Solder	Oval, Kovar Finish	BL-141
Xb	5550	50 U	Solder	Oval, Kovar Finish	BL-134
Xb	6500	50 U	Solder	Oval, Kovar Finish	BL-123
X	8500-9600	52 U	Choke	Mica Window, Rectangular, 4 Mounting Holes, Plated	BL-132
X	8800	52 U	Choke	Round, Plated	BL-119
X	9080	52 U	Choke	Round; Plated	BL-112
X	9080	52 U	Choke	Round; Plated	BL-117
X	9100	52 U	Choke	Round; Plated, 4 Mounting Holes	BL-122
X	9100	51 U	Choke	Round; Plated, 4 Mounting Holes	BL-139
X	9245	52 U	Choke	Round; Plated, 4 Mounting Holes	BL-106
X	9250-9405			Round, Plated, Tapered at Edge	BL-126
X	9310	52 U	Solder	Oval, Kovar Finish (0.3 db loss)	BL-125
X	9310	51 U	Solder	Oval, Kovar Finish	BL-107
X	9310	52 U	Solder	Oval, Kovar Finish	BL-114
X	9375	51 U	Choke	Round, Plated, 4 Mounting Holes	BL-105
X	9500	52 U	Solder	BL-114, Centered 9500 ± 100 MCS	BL-136
Ku	16500	91 U	Solder	Oval, Kovar Finish	BL-116
				Pressure Viewing Window, 1" Iris, Deep Drawn Cup	BL 135

HYDROGEN THYRATRONS

PEAK ANODE VOLTAGE (KV Max)	PEAK ANODE CURRENT (Amps Max)	AVERAGE ANODE CURRENT (Ma Max)	PEAK TRIGGER VOLTAGE (VOLTS Min)	TYPE
1.0	20	50	175	1258
3.0	35	45	175	3C45
3.0	35	45	175	6130
			High Altitude	
8.0	35	45	175	5959 E41
3.0	35	45	175	
			3C45 in T-8 Bulb	
			3 Pillar Stem	BL-253
3.0	35	45	175	
			3 Pillar Stem	BL 255
8.0	90	100	175	4C35
8.0	90	100	175	
			Low Jitter 4C35	BL-254
8.0	90	100	175	
			Wafer Base	5957 E37A
16.0	325	200	200	5C22
16.0	325	200	200	
			Low Jitter	HT415

MAGNETRONS

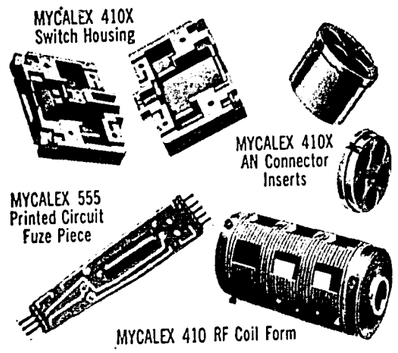


Bomac has available tunable and fixed tuned magnetrons with high peak RF powers for pulsed service in the higher frequency bands.

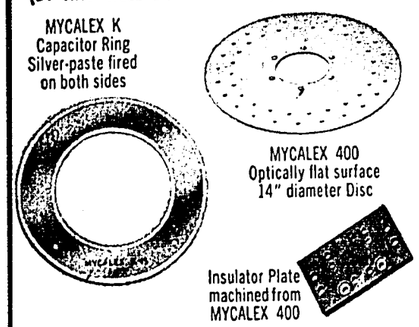
Bomac LABORATORIES, INC.
BEVERLY MASSACHUSETTS

MYCALEX glass-bonded mica

MOLDABLE
(BY MYCALEX CORPORATION OF AMERICA ONLY)



MACHINABLE
(BY ANY WELL EQUIPPED SHOP)



MYCALEX glass-bonded mica is the unique CERAMOPLASTIC

MYCALEX glass-bonded mica has ceramic rigidity, much of ceramic temperature endurance, plus greater dimensional precision than any plastic or ceramic; MYCALEX glass-bonded mica can be molded and machined like a plastic. Dimensional stability and temperature endurance are superior to any plastic, and complex insert inclusions can be tightly molded. Incorporating the best features of both ceramics and plastics plus some special ones of its own, MYCALEX glass-bonded mica is the unique ceramoplastic.

PROPERTIES

- Electrically stable; properties are unvarying with age.
- Low electrical loss.
- High dielectric strength.
- High arc resistance — cannot carbonize.
- Can be machined, ground or lapped to as close tolerances as any metal.
- Permanent dimensional stability. Free from warpage, cold flow or age distortion.
- Unaffected by humidity — zero moisture absorption.
- Impervious to water, oil, organic solvents.
- High temperature endurance.
- High thermal shock resistance.
- Inserts may be included in molded grades.
- Resistant to radiation effects.

NOTE: The MYCALEX glass-bonded mica materials, designated below, are all exclusive formulations of and manufactured only by the Mycalex Corporation of America.

THERE ARE DIFFERENT GRADES FOR DIFFERENT PURPOSES

410	555	KM Series	400	500	K Series
Continuous operating temperature limit 650°F. This grade of MYCALEX glass-bonded mica is moldable with or without inserts.	Continuous operating temperature to 900°F. A new grade of MYCALEX glass-bonded mica having high temperature endurance; moldable with or without inserts.	Moldable, not readily machinable capacitor dielectric of MYCALEX glass-bonded mica, with dielectric constant indicated by KM number such as 10, 20, 30, etc.	Continuous operating temperature limit 700°F. Readily machinable grade of MYCALEX glass-bonded mica. Not moldable, inserts must be cemented in.	A new superior grade of MYCALEX glass-bonded mica for higher continuous temperatures to 1000°F. Readily machinable; not moldable, inserts must be cemented.	Machinable capacitor dielectric of MYCALEX glass-bonded mica, with higher dielectric constant indicated by K numbers such as 10, 15, 20, etc.

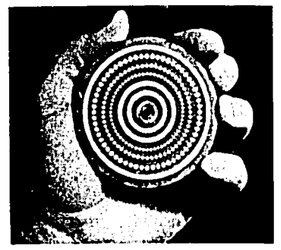
MYCALEX CORPORATION OF AMERICA

World's largest manufacturer of glass-bonded mica products—Owners of MYCALEX patents and trade-marks

world's most nearly perfect INSULATION

Switches, Commutator Plates by MYCALEX ELECTRONICS CORPORATION

Under exclusive license of Mycalex Corporation of America



Top view of a MYCALEX 410 commutator made to the exceptionally high standards of manufacture required for the Air Materiel Command and other government projects. Only MYCALEX glass-bonded mica could provide the mechanical, dimensional and electrical properties that such precision products require.

Rear view of the same commutator. It is precision injection-molded, has 180 or 108 contacts and three coin silver slip rings. These tight inserts will take repeated soldering and violent temperature change with no loosening. Mycalex Electronics Corporation is ready to produce similar complex combinations of metal and insulation to your designs. Just call or write today.

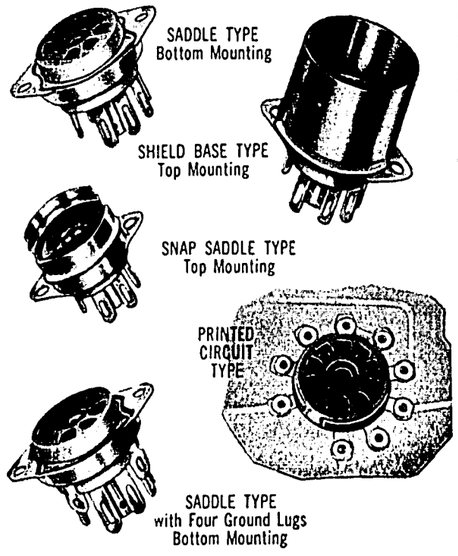


WHAT MYCALEX glass-bonded mica CAN CONTRIBUTE TO ELECTRICAL DESIGN

Electrical components of given capacities can be made smaller, more compact, and lighter in weight when the high thermal endurance, structural strength, dimensional precision, dimensional stability, and ideal balance of insulating properties of MYCALEX glass-bonded mica are employed. Tight inserts eliminate corona and produce tight seals. Printed circuit elements can be tied into inserts.

Tube Sockets by MYCALEX TUBE SOCKET CORPORATION

Under exclusive license of Mycalex Corporation of America



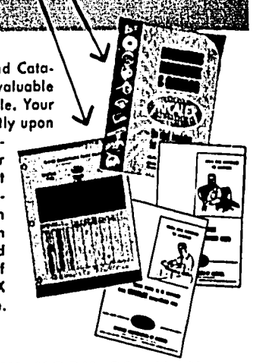
Our engineers are ready to advise you

If you will send us sketches, blueprints or models of any products in which MYCALEX glass-bonded mica might be used as electrical insulation, our engineers will be glad to make suggestions as to the most economical and effective ways to employ our products in your designs. Address requests to J. H. DuBois, Vice President-Engineering, at Clifton, N. J. address below.

THE COMPLETE STORY IS YOURS FOR THE ASKING

Mycalex Corporation of America is the world's largest manufacturer of glass-bonded mica products. Our facilities are devoted exclusively to the manufacture of glass-bonded mica products, and actually exceed those of the rest of the industry combined. Our extensive research, development and engineering departments are completely integrated with an ultra modern manufacturing plant. These facts are stated to emphasize the quality of the engineering service offered, without obligation, to our present and potential customers.

Our Engineers Handbook and Catalog is recommended as a valuable addition to your technical file. Your copy will be sent free promptly upon request. If you want to machine MYCALEX, ask for our informative free booklet "From One Machinist To Another"; also "How to Design Parts to be Machined from MYCALEX glass-bonded mica." A complete file of Data Sheets on MYCALEX Tube Sockets also available.



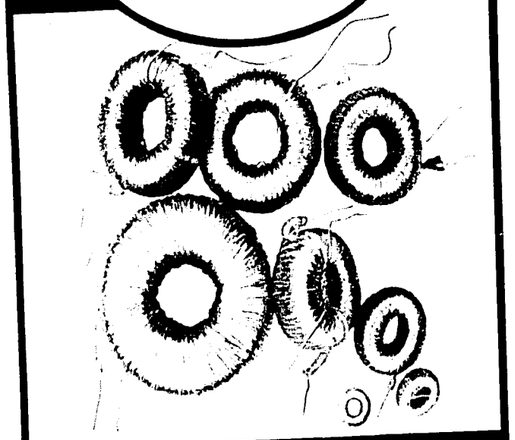
SINCE 1919 MYCALEX THE INSULATOR ®

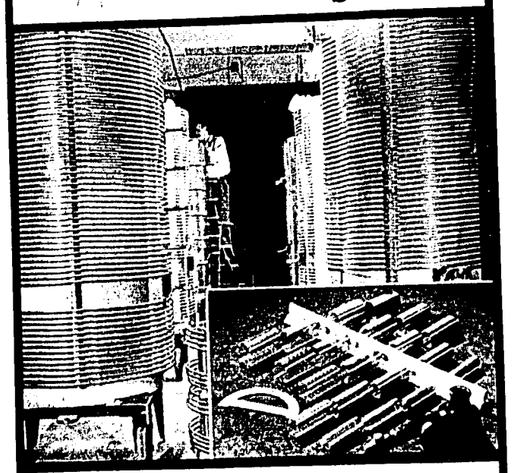
Executive Offices: 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

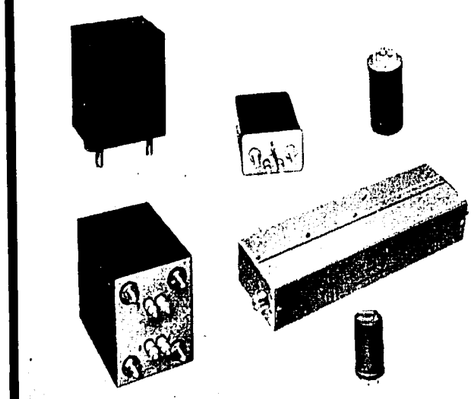
Address inquiries to

General Offices and Plant: 111-A CLIFTON BLVD., CLIFTON, N. J.

B&W Components, Coils, Sub-Assemblies







B&W TOROIDS

From sub-miniature types tinier than a Lifesaver to husky "doughnuts" bigger than a telephone dial . . . if it's toroidal, B&W makes it. Over 20 years experience in winding all types of coils for military, commercial, and amateur electronic gear goes into these B&W Toroids.

Small quantities for prototypes or large production runs can be promptly supplied to your exact specifications. Or, if you prefer, B&W engineers will gladly work with you in developing new toroids for your particular needs.

B&W "AIR-WOUND" INDUCTORS

Highly efficient "air-wound" coils embodying extremely low losses, real space saving economy, and minimum weight were first pioneered by B&W. Now, backed by over 20 years experience in this specialized field, B&W offers a complete line of "air-wound" inductors in types ranging from the versatile "Miniductor" to large, high power commercial units.

In addition to these standard items, B&W regularly manufactures coils for special requirements. These range in size up to the giant coils illustrated and may be designed for virtually all r-f applications.

Inquiries for any requirements will be given prompt consideration.

B&W FILTERS and TOROIDAL ASSEMBLIES

These space-saving toroidal units are a direct result of B&W's specialized experience in designing and manufacturing all types of toroids and associated assemblies.

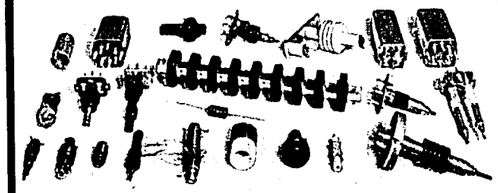
Whether you need standard high-pass, low-pass, band-pass, or band-suppression filters or discriminators for r-f or audio frequencies . . . chances are B&W engineers have produced similar equipment in their collective engineering experience.

What's more, B&W's unmatched production facilities and full complement of test equipment assure that specifications will be matched in each and every unit.

B&W MULTIPLE-LAYER COILS and CHOKES

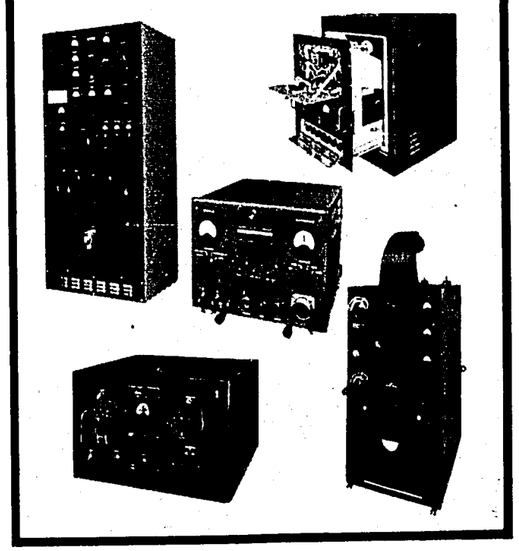
Universal-pie, progressive-universal, bank wound, solenoid . . . in fact just about any kind of coil you can name has been produced by B&W. Types range from subminiature inductors and midget r-f, oscillator, i-f, and choke coils to giant tank coils and chokes for high power transmitters or other r-f service.

B&W is fully equipped to design, produce, and test coils of practically any dimensions and with electrical characteristics to meet exacting requirements.



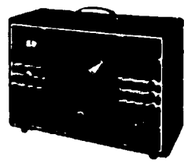
B&W COMMUNICATIONS EQUIPMENT

Complete Radio Relay System • Mobile or Fixed Station Radio Teletype Systems • Control Units for Teletype Systems • Direction Finding Equipment • Single or Dual Diversity Teletype Receiver Converters • Frequency Shift Teletype Exciter Units, MO or Crystal • Low, Medium, and High Power Radio Transmitters • High Power r-f Amplifiers • Switching Equipment.



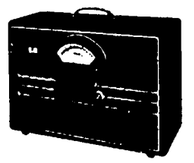
In addition to complete facilities for designing, manufacturing and testing special communications equipment for military and commercial applications, B&W carries a complete line of products for amateur radio uses. Write for details today.

B&W LABORATORY TEST INSTRUMENTS



AUDIO OSCILLATOR
Model 200

30c-30kc range
± 1db 30c-15kc
1% stability



AUDIO FREQUENCY METER
Model 300

0-30kc in 6 ranges
0.25 volts min. input
5% accuracy
Handles wave form ratios up to 8:1.



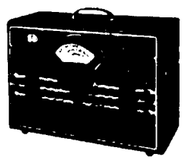
SINE WAVE CLIPPER
Model 250

Provides clipped sine wave for examining audio transients and response. Does the work of a square wave generator at less cost.



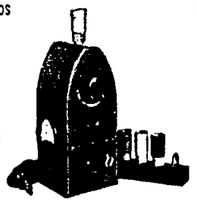
LINEAR DETECTOR
Model 404

400kc-30mc range
± 1db 20c-50kc
Balanced or unbalanced inputs.
Combines r-f detection & audio bridging.



DISTORTION METER
Model 400

30c-15kc on fundamentals to 45kc on harmonics
0.3 volts min. input
0.5 db accuracy



DIP METER
Model 600

1.75mc-260mc with 5 coils. 500 ua meter . . . adjustable sensitivity. Monitoring jack & B+ OFF Switch. Shaped for use in hard-to-get-at places.

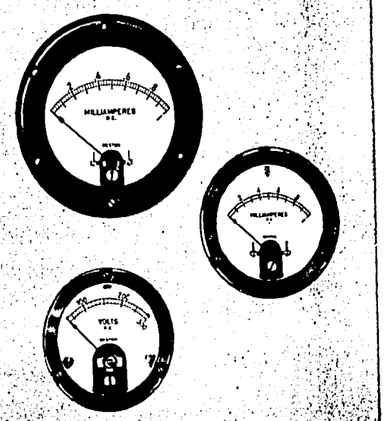
BARKER & WILLIAMSON, INCORPORATED 237 Fairfield Avenue, Upper Darby, Pa.



yet **WESTON**
RUGGEDIZED INSTRUMENTS
remain operable and accurate!

There's no guesswork about *ruggedizing* instruments at WESTON. Duplicates of *all* the approved equipment for testing – including the High Shock Hammers . . . the Vibrating and Tumbling equipment . . . the Temperature, and Moisture Cycling cabinets – all are here in the WESTON test department continually *proving* the soundness of WESTON'S ruggedized design. Thus you can *be sure* each instrument not only meets the specifications for ruggedized instruments, but will also *prove* its superior ruggedness in service. WESTON Ruggedized instruments now are available for A-C and D-C requirements in 2½", 3½" and 4½" sizes. Bulletin giving complete information sent on request. WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J. 6917

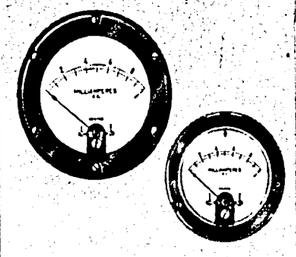
WESTON RUGGEDIZED INSTRUMENTS ARE AVAILABLE FOR A-C AND D-C IN 2½", 3½", 4½" SIZES.



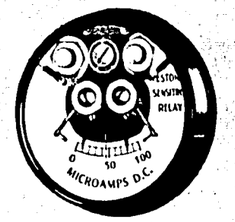
WESTON *Instruments*

designer's INSTRUMENT guide

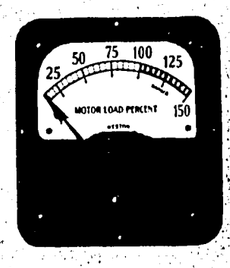
RUGGEDIZED INSTRUMENTS —to military specifications, available in 2½", 3½" and 4½" sizes in D-C, movable iron A-C, rectifier type A-C and thermo instruments. All have sealed, externally operated zero correctors—shock-resisting, flat plastic windows—and connection terminals molded into internal rubber.



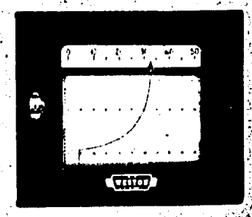
ULTRA-SENSITIVE RELAYS —extremely compact and rugged relays which operate on values as low as ½ microampere or ¼ millivolt, direct from thermocouples, resistance bulbs or other generators of minute current. Handle substantial wattage at 110 volts on non-chattering magnetic contacts. Available with single or double contacts, fixed or adjustable, manual or solenoid reset.



"MOTOR LOAD %" METERS —WESTON "per-cent load" ammeters and wattmeters make it easy for operators to secure optimum production from lathes, milling machines, automatics, grinders, etc. Prevent overloading—reduce tool breakage—assure uniform quality with fewer objects. Other scale calibrations available.



RECORDING POTENTIOMETER —ideal for built-in needs because of its extreme compactness plus ruggedness and simplicity. Ranges changed simply by inserting required range standards. Chart speeds changed by simple screwdriver adjustment. Plug-in amplifier removed in a jiffy since no soldered connections are used.



Literature on any of the above instruments sent on request.
WESTON Electrical Instrument Corporation,
614 Frelinghuysen Avenue, Newark 5, New Jersey.

8106

WESTON *Instruments*

PRODUCTS OF . . . . "THE HOUSE OF RESISTORS"**

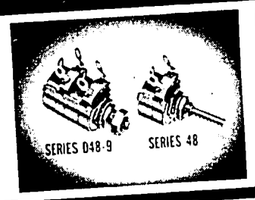
COMPOSITION-ELEMENT CONTROLS (Series 48)

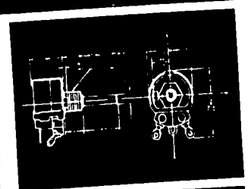
Pat Pending

5/8 DIA. FOR MINIATURIZATION

Linear, 500 ohms to 5 megohms. Taper, 2,500 ohms to 2.5 megohms. 10% resistance at 50% C.W. rotation. Rated at 0.2 watt for linear units. 300° rotation. Shaft locking device may be incorporated upon request. Single and multiple units available.

Engineering Bulletin No. 121





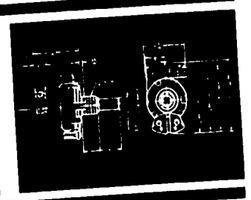
COMPOSITION-ELEMENT CONTROLS (Series 47)

15/16 DIA.

Linear, 500 ohms to 5 megohms. Tapered, 1,000 ohms to 5 megohms. Rated at 0.25 watt for linear units. Standard taps at 30% or 70% of effective rotation. 300° rotation without switch; 330° with switch.

Engineering Bulletin No. 117



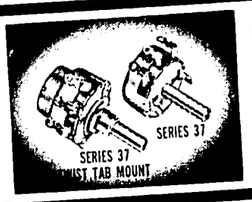


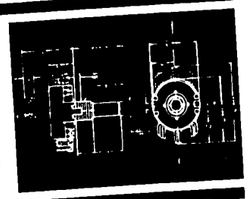
COMPOSITION-ELEMENT CONTROLS (Series 37)

1-1/8 DIA.

Linear, 500 ohms to 10 megohms. Tapered, 1,000 ohms to 10 megohms. Rated at 0.5 watt for linear units. Standard taps at 37½%, 50% and 62½% of effective rotation. 300° rotation without switch; 330° with switch.

Engineering Bulletin No. 112





COMPOSITION-ELEMENT CONTROLS (Series 51)

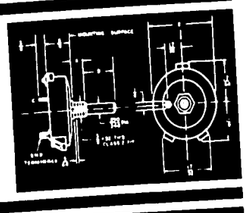
Pat Pending

2" DIA., HI-VOLTAGE, HI-RESISTANCE

Resistance range: 5,000 ohms to 50 megohms for linear units. Rated at 1 watt. Insulation, 10,000 volts D.C. to ground. 4,000 volts maximum across end terminals.

Engineering Bulletin No. 119





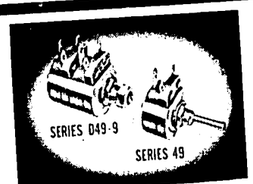
WIRE WOUND CONTROLS (Series 49)

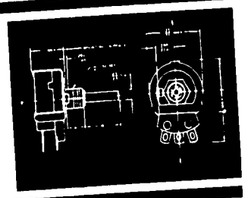
Pat Pending

3/4 DIA. FOR MINIATURIZATION

Linear, 10 to 10,000 ohms. Rated at 1 watt. Mechanical and Electrical rotation 300° - 360°. Mechanical rotation available: Max. 355°. Electrical. Shaft locking device may be incorporated. In single or multiple units.

Engineering Bulletin No. 104



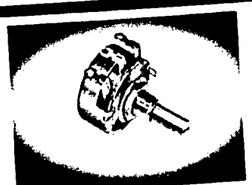


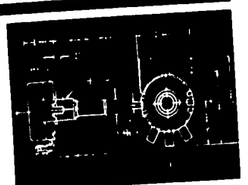
WIRE WOUND CONTROLS (Series 43)

1-1/8 DIA.

Linear, 1 to 10,000 ohms. Tapered, submit your requirements. Rated at 2 watts, for linear units. Mechanical rotation 300°. Electrical 280° without switch, 260° with switch.

Engineering Bulletin No. 116



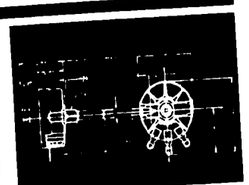


WIRE WOUND CONTROLS (Series 58)

Linear, 1 to 50,000 ohms. Tapered, 5 to 25,000 ohms. Non-inductive 1 to 12,000 ohms, linear only. Linear, 3 watts. Mechanical rotation 300°. Electrical 280° without switch, 240° with switch.

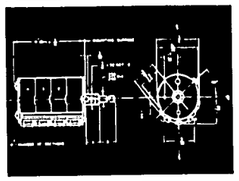
Engineering Bulletin No. 118

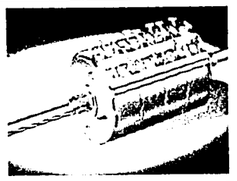




** Trade Mark
*Reg. U. S. Pat. Office

CLAROSTAT MFG. CO., INC.
DOVER, NEW HAMPSHIRE



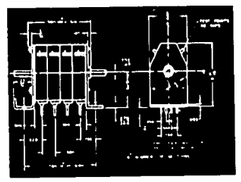


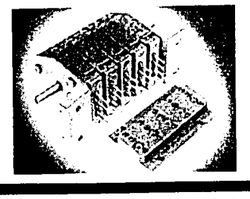
HIGH-PRECISION CONTROLS (Series 42a)

Pat Pending

Up to 18 sections in one unit assembly. Single shaft. No back lash. Linear, 10 to 100,000 ohms standard. Max. resistance, 350 ohms per degree of rotation. Tapered, submit your requirements. Linearity up to ±0.5%. Power rating for linear units, 3 watts per section. Standard rotation, Mech. 290°, Elec. 280°.

Engineering Bulletin No. 142



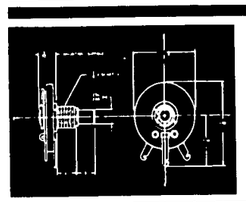


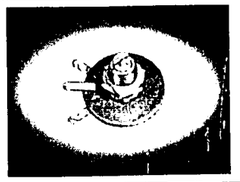
PLUG-IN ULTRA-PRECISION (Series 52)

Pat Pending

Multiple sections in one unit assembly. Single shaft. Linear, 10 to 100,000 ohms suggested values. Up to 200,000 ohms available. Resistance tolerance ±0.5%, where resolution permits. Linear and non-linear available to ±0.25%. Power rating for linear units, 3 watts at 40° C per section. Effective rotation 355°. Continuous rotation or limited rotation.

Engineering Bulletin No. 152



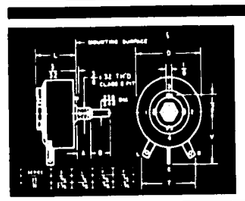


WIRE WOUND CONTROLS (Series MH)

"HUMDINGER" *

Ultra-compact potentiometer or rheostat. 2 to 1,000 ohms, only. Linear resistance-frequency. Rating, 1 watt. Intermediate taps available. Metal dust-proof cover available.

Engineering Bulletin No. 103



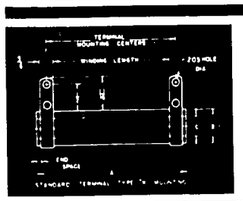


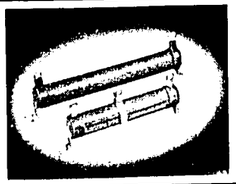
POWER RHEOSTATS (Series 25 & 50)

Pat. 2,340,524

Full power rating even at ⅛ of rotation. 25 watt, 1 to 2,500 ohms. 50 watt, 1 to 5,000 ohms. Linear and tapered. Tandem units available. 25G and 50G approved under MIL-R-6749 specifications.

Engineering Bulletin No. 115

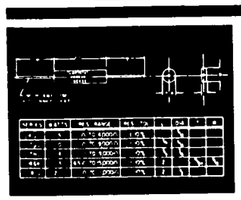


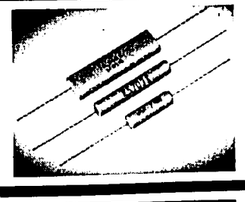


"GREENOHM"* POWER RESISTORS

Fixed, 4 to 200 watts; adjustables, 10 to 200 watts. 5% for values of 50 ohms and higher; 10% for values below 50 ohms; 1% special. Intermediate taps, upon order. Widest choice of mountings and terminals. Non-inductive units made to specifications.

Engineering Bulletin No. 113

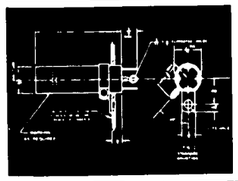




"GREENOHM JR."* POWER RESISTORS (Series GJ)

C7GJ, 7 watt, 0.5 to 5,000 ohms. C4GJ, 4 watt, 0.5 to 1,000 ohms. Standard resistance tolerance ±10%. Breakdown voltage between surface and resistance element, 2500 volts A.C. Ceramic tube casing. Inorganic materials throughout. Pigtail terminals, standard.

Engineering Bulletin No. 110





STANDEE* SERIES KS — ABOVE-CHASSIS-MOUNTED POWER RESISTORS

AKS	10 WATT, 1 TO 6,000 OHMS	1
AKS	15 WATT, 1 TO 9,000 OHMS	2
AKS	20 WATT, 1 TO 12,000 OHMS	2½
AKS	25 WATT, 1 TO 15,000 OHMS	3
AKS	50 WATT, 1 TO 20,000 OHMS	4

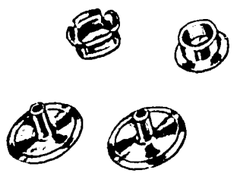
Standard resistance tolerance ±10%

Engineering Bulletin No. 146

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CLAROSTAT MFG. CO., INC.
DOVER, NEW HAMPSHIRE

Tailor-Made Fasteners in Volume Quantities



MINIATURE BATTERY CONNECTORS

For use with small "B" batteries; afford quick and positive polarized electrical connections and worthwhile space savings on small electronic equipment.

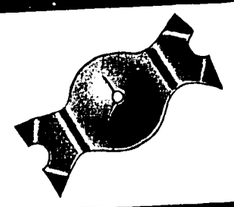


PLASTIC INDICATOR PLUG

Snap-in type, all plastic, lettered indicator plug button for electrical appliances. Can be moulded in ornamental or functional designs. For blind applications. Removable.

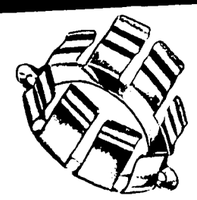
FISHTAIL RATCHET PLATE

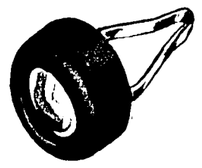
Made in a wide range of sizes to hold on smooth metal, die-cast or plastic studs. For use on refrigerators, radio cabinets, washing machines and other products to hold medallions, nameplates, etc.



VIBRATOR GROUNDING FASTENERS

Holds 1½" dia. beaded or non-beaded vibrator. Vibrator Can grounded to chassis. Holding prongs designed to hold several types of Cans.





RUBBER FOOT

Snap-in Rubber Foot for Record Changers and Phonograph Mountings eliminates threaded member, lock washer and nut thereby speeding assembly time and reducing costs.

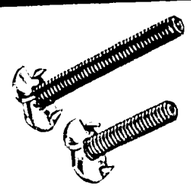


NYLON SNAP-IN NUT

Designed for the attachment of shelf supports or channels to porcelained sheet metal liners. Used with sheet metal screws they provide high pull-out values and no chippage.

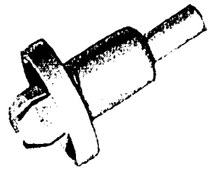
SPEAKER MOUNTING BOLT

Pronged head prevents bolt from turning in speaker panel during application of nut and lock washer, permits one-side attachment providing production-line savings.



SHELF SUPPORTS

Plastic Shelf Supports designed to snap into porcelained hole. Driven pin expands Trimount section securing fastener without porcelain chippage. Variety of shapes and sizes.





PLUG BUTTONS

Made to snap into hole sizes ⅜" to 3". Can be embossed with ornamental or functional designs. Removable. Supplied with various finishes, in a variety of shapes and sizes.



QUICKEY FASTENER

Eliminates need for welding or swaging studs to sheet metal stampings, facilitates nesting, eliminates damage in transit because Quickey snaps in just before final assembly.

TRIMOUNT STUDS

Designed to hold two or more thicknesses of material together. Easily installed by hand. Insure vibration proof attachment. Permanent or removable attachment. Wide variety of shapes and sizes.



DOT

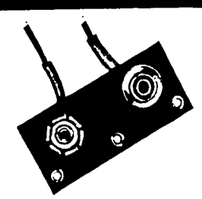
Parts illustrated are representative of the thousands of different specialized fasteners and allied devices designed and manufactured in volume by United-Carr and its subsidiaries for leading manufacturers of electronic equipment. United-Carr's wide and varied experience with special fastening problems in the automotive, aviation and appliance fields provides an unequaled background of technical knowledge which may well be applicable to your special needs.

UNITED-CARR

FASTENER CORP.

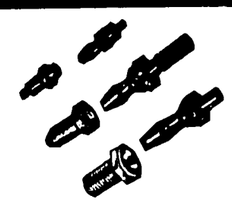
CAMBRIDGE 42, MASSACHUSETTS

Ucinite Electrical Assemblies



BATTERY CONNECTORS

Wired snap-on units for use with batteries equipped with United-Carr electrical snap fasteners. Wiring to customer's specifications.

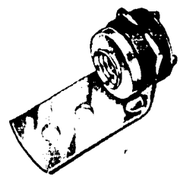


BANANA PINS

Four sizes of plugs with one-piece beryllium copper springs. Adaptable mounting ends in threaded, staking, or solder lug types. Similar Mating Jacks also available.

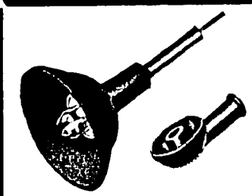
SHOCK MOUNTS

Offered in several sizes—brackets and durometer of rubber bushings can be varied. With threaded Teenuts or plain bushings. Insulated versions if needed.



ANODE CONNECTORS

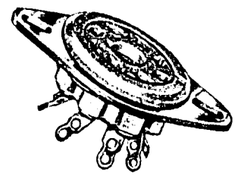
Plug button contacts for positive, firm connections. Corona resistant neoprene or silicon shields in straight or right angle types. Wiring to customers specifications.





TUBE CAPS

Positive gripping, heat treated steel springs in corona resistant metal housing. Insulated or non-insulated. Wired to specifications. Type shown has silicon shield for special application.

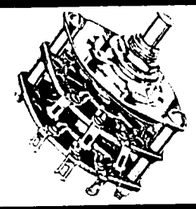


TUBE SOCKETS

Ceramic octals and special types. Ring or saddle mounting. Open ended plates for shock mounting with rubber grommets. J A N types.

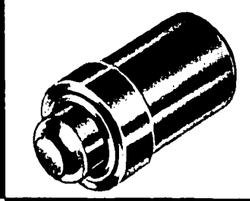
SWITCHES

Oak type switches manufactured as a licensee. Variety of rotary and push-button assemblies to specifications.



SNAP SWITCHES

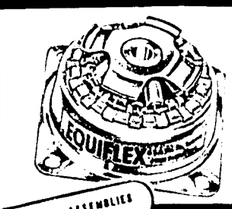
Precision, momentary contact push-button switches. Small and dependable. Several circuit arrangements. Water tight version shown.





TEST JACK

Ucinite's quality jack for .080 probes. Beryllium copper contacts. Nylon insulation in colors. Metal shell for firm dependable mounting.

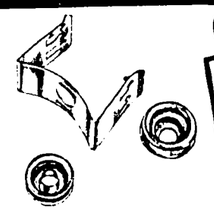


VIBRATION ISOLATORS

Equiflex (1 to 1 ratio) metal mounts ensure long life, fit small spaces, can be used in any direction. Three sizes, cup or plate mountings.

METAL STAMPINGS

Volume production in Metal stampings. Years of engineering and tooling skill available to solve your particular problem.



ELECTRICAL ASSEMBLIES
Ucinite
RADIO AND AUTOMOTIVE

With years of specialized experience in the electronics field and complete facilities for the volume production of small metal stampings as well as the assembly of metal to plastic and ceramic components, Ucinite is fully equipped to supply you with special electrical parts and assemblies...designed, assembled, wired and marked to your specifications. For complete design, engineering and production service, call your nearest Ucinite field engineer.

The UCINITE Company

DIVISION OF UNITED-CARR FASTENER CORP.

Newtonville 60, Massachusetts

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America's finest coil lacquer...the accepted standard for VHF and UHF service.



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One Source For

POWERSTAT VARIABLE TRANSFORMERS

deliver a continuously adjustable output voltage from a-c power lines

A POWERSTAT variable transformer is an autotransformer of toroidal core design with a movable brush tap that is rotated to deliver any required output voltage from zero to, or above, line voltage. Important features include: excellent regulation, high efficiency, conservative ratings, zero waveform distortion, rugged mechanical construction and smooth control. Numerous standard POWERSTATS in ratings from 150 VA to 100 KVA are available for 120, 240 and 480 volt, single and three phase operation. Most are offered in either manual or motor-driven models. The chart lists some of the most-called-for types. Others — designed for specific applications — are available for every requirement. Consult us about your specific needs.



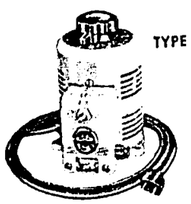
TYPE 10



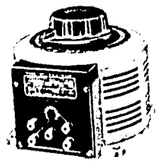
TYPE 20



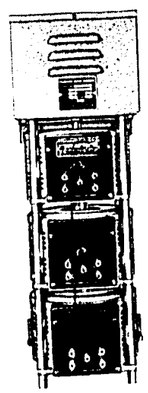
TYPE 116U



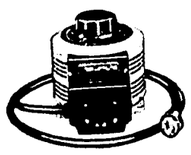
TYPE 116



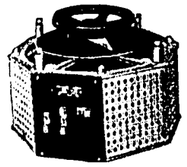
TYPE 136



TYPE 5M136-3



TYPE 2PF136



TYPE 1156

Line Voltage	Output Voltage	Maximum Output Amp.	Maximum Output KVA	Frequency	Type	Approx. Net	Weight Shipping	Motor Speeds
120	0-132	1.25	0.165	†60	*10	1.8	3	
	0-140	3.0	0.42	†60	*20	4	6	
	0-140	7.5	1.0	50/60	*116U	10	11	
	0-140	7.5	1.0	50/60	*116	11	12	
	0-140	7.5	1.0	50/60	3PF116	11	12	
	0-140	7.5	1.0	50/60	3TF116	11	12	
	0-140	7.5	1.0	50/60	*136	22	25	5, 15, 30, 60
	0-140	20.0	2.8	50/60	*F136	22	25	5, 15, 30, 60
	0-140	20.0	2.8	50/60	*2PF136	23	26	
	0-140	20.0	2.8	50/60	*2TF136	23	26	
	0-140	20.0	2.8	50/60	*3PF136	23	26	
	0-140	20.0	2.8	50/60	*3TF136	23	26	
	0-140	20.0	2.8	50/60	*136-2P	47	53	5, 15, 30, 60
	0-140	40.0	5.6	50/60	1156	73	80	6, 14, 19, 45
	0-140	45.0	6.3	50/60	F1156	74	81	6, 14, 19, 45
	0-140	45.0	6.3	50/60	1156-2P	150	170	6, 14, 19, 45
	0-140	90.0	12.6	50/60	1156-3P	225	295	6, 14, 19, 45
	0-140	135.0	18.9	50/60	1156-4P	330	420	14, 19, 45
	0-140	180.0	25.2	50/60	1156-6P	500	600	14, 19, 45
240	0-264	1.25	.33	†60	*10-2E	4.5	5.0	
	0-280	3.0	.84	50/60	*216U	10	11	
	0-280	3.0	.84	50/60	*216	11	12	
	0-280	3.0	.84	50/60	3PF216	11	12	
	0-280	3.0	.84	50/60	3TF216	11	12	
	0-280	7.5	2.1	50/60	*116U-2S	17	22	
	0-280	7.5	2.1	50/60	*116-2S	18	23	
	0-280	9.0	2.5	50/60	*236	22	25	5, 15, 30, 60
	0-280	9.0	2.5	50/60	*F236	22	25	5, 15, 30, 60
	0-280	9.0	2.5	50/60	*2PF236	23	26	
	0-280	9.0	2.5	50/60	*2TF236	23	26	
	0-280	9.0	2.5	50/60	*3PF236	23	26	
	0-280	9.0	2.5	50/60	*3TF236	23	26	
	0-280	20.0	5.6	50/60	*136-2S	45	51	5, 15, 30, 60
	0-280	28.0	7.8	50/60	1256	73	80	6, 14, 19, 45
	0-280	28.0	7.8	50/60	F1256	74	81	6, 14, 19, 45
	0-280	45.0	12.6	50/60	1156-2S	144	164	6, 14, 19, 45
	0-280	56.0	15.7	50/60	1256-2P	150	170	6, 14, 19, 45
	0-280	84.0	23.5	50/60	1256-3P	225	295	6, 14, 19, 45
	0-280	112.0	31.4	50/60	1256-4P	330	420	14, 19, 45
	0-280	168.0	47.0	50/60	1256-6P	500	600	14, 19, 45
480	0-560	3.0	1.7	50/60	*216U-2S	17	22	
	0-560	3.0	1.7	50/60	*216-2S	18	23	
	0-560	9.0	5.0	50/60	*236-2S	45	51	5, 15, 30, 60
	0-560	28.0	15.7	50/60	1256-2S	144	164	6, 14, 19, 45
	0-560	56.0	31.4	50/60	1256-4PS	330	420	14, 19, 45
	0-560	84.0	47.0	50/60	1256-6PS	500	600	14, 19, 45
Three Phase 120	0-132	1.25	.28	†60	*10-2E	4.5	5.0	
	0-140	3.0	.73	†60	*20-2D	9.0	12	
	0-140	7.5	1.8	50/60	*116U-2D	17	22	
	0-140	7.5	1.8	50/60	*116-2D	18	23	
	0-140	20.0	4.8	50/60	*136-2D	45	51	5, 15, 30, 60
	0-140	45.0	10.9	50/60	1156-2D	144	164	6, 14, 19, 45
	0-140	90.0	21.8	50/60	1156-4D	320	410	14, 19, 45
	0-140	135.0	32.7	50/60	1156-6D	490	590	14, 19, 45
240	0-240	1.25	.52	60	10-3E	7.0	8.0	
	0-240	3.0	1.2	60	20L-3Y	14.0	17.0	
	0-280	3.0	1.5	50/60	*216U-2D	17	22	
	0-280	3.0	1.5	50/60	*216-2D	18	23	
	0-280	3.0	1.5	†60	*116U-3Y	26	36	
	0-280	7.5	3.6	†60	*116-3Y	27	37	
	0-280	7.5	3.6	50/60	*236-2D	45	51	5, 15, 30, 60
	0-280	9.0	4.4	†60	*136-3Y	68	77	5, 15, 30, 60
	0-280	20.0	9.7	50/60	1256-2D	144	164	6, 14, 19, 45
	0-280	28.0	13.6	50/60	1156L-3Y	215	280	6, 14, 19, 45
	0-240	45.0	18.7	50/60	1256-4D	320	410	14, 19, 45
	0-280	56.0	27.2	50/60	1256-6D	490	590	14, 19, 45
	0-280	84.0	40.7	50/60	1156L-6Y	500	600	14, 19, 45
	0-240	90.0	37.4					
480	0-560	3.0	2.9	†60	*216U-3Y	26	36	
	0-560	3.0	2.9	†60	*216-3Y	27	37	
	0-560	9.0	8.7	†60	*236-3Y	68	77	5, 15, 30, 60
	0-560	28.0	27.2	†60	1256-3Y	215	280	6, 14, 19, 45
	0-560	56.0	54.3	†60	1256-6Y	500	600	14, 19, 45

*These units are supplied with an "L" terminal which allows connecting in the field to limit the output voltage to the applied voltage. If "L" type connection is required on other models, the "L" must be included in the type number when ordering.

†When these POWERSTATS are "L" connected so that the output voltage does not exceed the applied voltage, the frequency range is 50/60 cycles.

SEND FOR POWERSTAT BULLETIN P553G

STANDARD TYPES FOR VARIED APPLICATIONS

POWERSTAT VARIABLE TRANSFORMERS for

OIL-COOLED OPERATION



TYPE O-1126

By immersing a POWERSTAT in transformer oil, the rating above normal air operation is increased and duty in a corrosive atmosphere is possible. A standard line is offered in various ratings and sizes.

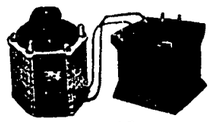
EXPLOSIVE ATMOSPHERES



TYPE X-1126

To provide safe operation in hazardous areas where a small arc of spark could cause an explosion, explosion proof POWERSTATS are available. Standard models are approved by Underwriters' Laboratories for Class 1, Group D service.

HIGH CURRENT NEEDS



2106LC

Relatively large amounts of power can be controlled by a small POWERSTAT when used in conjunction with a fixed-ratio transformer. This combination is known as a POWERSTAT Line Corrector. It can be used to correct line voltage variations to maintain a specified output voltage and to supply a limited output voltage range. A multitude of ratings are available

LIMITED OUTPUT RANGE

Look to SUPERIOR ELECTRIC for all VOLTAGE CONTROL NEEDS

Voltage Control Apparatus

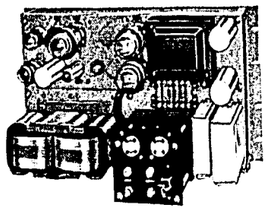
STABILINE AUTOMATIC VOLTAGE REGULATORS

maintain a constant output voltage regardless of line or load changes

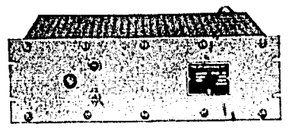
MADE IN 2 DISTINCT TYPES TO MEET YOUR NEEDS EXACTLY

TYPE IE (INSTANTANEOUS ELECTRONIC)

. . . for the most exacting control. Completely electronic with no moving parts. Correction is instantaneous. Waveform distortion never exceeds 3%. Output is held to within ± 0.1 per cent of nominal for wide line variations and to within ± 0.15 per cent for any load current or load power factor change from lagging .5 to leading .9. Standard types are listed below. Special units can be engineered to meet specific requirements.



TYPE IE5101R



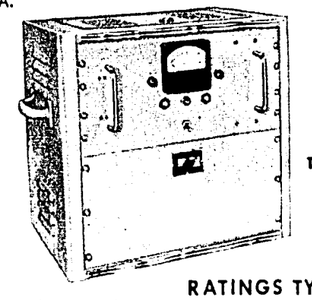
TYPE IE51002R

RATINGS TYPE IE

Input Voltage Range	Output Voltage Range	Frequency In Cycles	Load Range In Amperes	Load Power Factor Range	Rated Output KVA	Type
95–135	110–120	60±10%	0–2.2		0.25	IE51002
95–135	110–120	60±10%	0–2.2		0.25	IE51002R
95–135	110–120	60±10%	0–4.5		0.5	IE51005
95–135	110–120	60±10%	0–4.5		0.5	IE51005R
95–135	110–120	50±10%	0–4.5	.5 lagging	0.5	IEL51005
95–135	110–120	50±10%	0–4.5		0.5	IEL51005R
195–255	220–240	50±10%	0–2.2		0.5	IEL52005
195–255	220–240	50±10%	0–2.2	to	0.5	IEL52005R
95–135	110–120	60±10%	0–8.5		1.0	IE5101
95–135	110–120	60±10%	0–8.5		1.0	IE5101R
95–135	110–120	50±10%	0–8.5	.9 leading	1.0	IEL5101
95–135	110–120	50±10%	0–8.5		1.0	IEL5101R
195–255	220–240	50±10%	0–4.5		1.0	IEL5201
195–255	220–240	50±10%	0–4.5		1.0	IEL5201R
95–135	110–120	60±10%	0–22.0		2.5	IE5102
95–135	110–120	60±10%	0–22.0		2.5	IE5102R
195–255	220–240	60±10%	0–11.0		2.5	IE5202
195–255	220–240	60±10%	0–11.0		2.5	IE5202R
195–255	220–240	50±10%	0–11.0		2.5	IEL5202
195–255	220–240	50±10%	0–11.0		2.5	IEL5202R
95–135	110–120	60±10%	0–43.5		5.0	IE5105
195–255	220–240	60±10%	0–22.0		5.0	IE5205

TYPE EM (ELECTRO MECHANICAL)

. . . for controlling large industrial loads or providing zero waveform distortion. Consists of an electronic detector circuit controlling a motor-driven POWERSTAT variable transformer that feeds a buck-boost auxiliary transformer. Features include: high efficiency, insensitivity to magnitude and power factor of load and no effect on system power factor. Standard models are offered in ratings from 2 to 100 KVA.

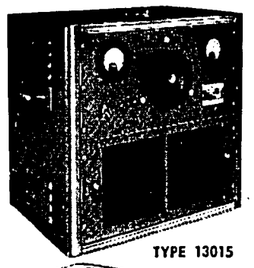


TYPE EM4115

RATINGS TYPE EM

Nominal Output Voltage	Input Voltage Range	Output Voltage Range	Output Current (Amperes)	Output KVA	Type
Single Phase 115	95–135	110–120	17.5	2.0	EM4102
			52.0	6.0	EM4106
			130.0	15.0	EM4115
230	195–255	220–240	32.5	7.5	EM4207
			120.0	27.5	EM4228
460	400–520	420–460	15.0	6.6	EM4407
			40.0	17.6	EM4418
Three Phase 230	195–255	220–240	25.0	10.0	EM6210Y
			38.0	15.0	EM6215Y
			50.0	20.0	EM6220Y
			113.0	45.0	EM6245Y
			175.0	70.0	EM6270D
460	400–520	420–460	16.0	12.5	EM6412Y
			22.0	17.5	EM6417Y
			33.0	25.0	EM6425Y
			66.0	50.0	EM6450Y
			100.0	75.0	EM6475Y
	420–500	420–460	131.0	100.0	EM64100Y

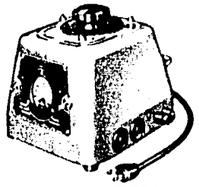
SEND FOR STABILINE BULLETIN S351



TYPE 13015

VARICELL D-C POWER SUPPLIES

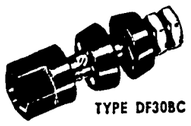
. . . the ideal source of stabilized and regulated variable d-c voltages from a-c power lines. Output is not affected by line or load changes. Send for Bulletin V1051.



TYPE UC1M

VOLTBOX A-C POWER SUPPLIES

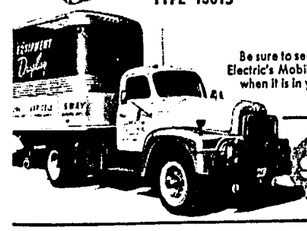
. . . are compact portable instruments that eliminate the need for collecting a variable transformer, voltmeter and connection leads for tests involving variable a-c voltages. Numerous types for every need are described in Bulletin P553G.



TYPE DF30BC

5-WAY BINDING POSTS

. . . offer permanent clamping, spade lug, clip-lead, looping and clamping, or banana plug connections. Complete insulation, 30 amp. current capacity, 1,000 volts working voltage. Available in black or red for polarity or circuit identification. Send for Bulletin BP652.



Be sure to see Superior Electric's Mobile Display when it is in your area.

THE SUPERIOR ELECTRIC COMPANY

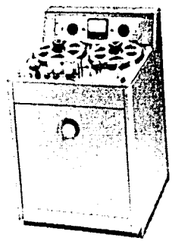
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Bristol, Connecticut

AMPEX
MAGNETIC RECORDERS

the finest tape recorders

AMPEX AUDIO RECORDERS

For uses where utmost reliability, "perfect" fidelity and accuracy of timing are of prime importance, Ampex Tape Recorders are universally preferred. America's four major broadcasting networks, the country's leading phonograph record manufacturers and various important musical organizations are among those whose usage has established Ampex as the world's standard of excellence in sound recording.



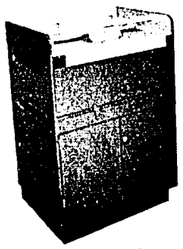
Series 300 console



Series 350 table top console on base



Series 600 single case portable



Model 450 console on base

SERIES 300—THE SUPREME AMPEX

These, the finest of the Ampex line, are the machines used where speaking or musical performances justify the best recordings it is possible to make. Because of their supreme reliability, the 300 Series machines are used by major radio networks to originate, delay and rebroadcast important radio shows. Record manufacturers use the Series 300 for master recordings because of their high signal-to-noise ratio and low flutter and wow.

SERIES 350—THE STANDARD AMPEX

Newest of Ampex's general purpose audio recorders, the 350 has a 30° slant on the top-plate. This puts reels, editing knobs and all controls within easier reach of the operator. Tape editing is faster and less tedious. A three motor tape transport (also used on the higher priced Model 300) provides excellent tape control and utmost reliability of operation. The Series 350 is unusually accessible for servicing.

SERIES 600—THE MOST VERSATILE AMPEX

The Series 600 brings Ampex standards of quality within the reach of the most limited budget. Weighing less than 28 pounds, the Ampex 600 is the first truly miniaturized recorder which can provide full professional quality for remote broadcast pickups, schools and conservatories, high fidelity enthusiasts and other semi-professional users.

MODEL 450—FOR BACKGROUND MUSIC

For background music, automatic broadcasting and TV test patterns, the Model 450 Continuous Tape Reproducer provides up to 8 hours of continuous unrepeated program. The Model 450 uses 14-inch NARTB reels with double track pre-recorded tapes. Starting, stopping, reversing and program repeating are controlled automatically with no attention from a standby operator.

SERIES 3200—FOR TAPE DUPLICATION

Designed to make duplicate tapes at minimum labor cost, the Ampex Tape Duplicator makes from 1 to 10* duplicates simultaneously and employs a time-saving speedup. Double track tapes are made in one pass. Fidelity is high (see specifications). Duplicates of any standard tape speed can be made from masters of any standard speed.

User has the option of buying from 1 to 10 slaves to operate from one master unit.

***SPECIFICATIONS**

	SERIES 300	SERIES 350	SERIES 600	MODEL 450	SERIES 3200
Frequency Response (Tape speeds shown are not all available in all models)	15 in/sec—30 to 15,000 cps ± 2 db 7½ in/sec—40 to 15,000 cps (40 to 10,000 cps ± 2 db) (down no more than 4 db at 15,000 cps) 3¾ in/sec—50 to 7,500 cps (50 to 5,000 cps ± 2 db) (down no more than 4 db at 7,500 cps)				
Signal-to-Noise Ratio (by NARTB standards)	Over 60 db	Over 60 db	Over 55 db	Over 50 db	Over 45 db
	(for full track machines at optimum speed)				
Flutter and Wow	Under 0.1% rms at 15 in/sec	Under 0.2% rms at 15 in/sec	Under 0.25% rms at 7½ in/sec	Under 0.25% rms at 7½ in/sec	Under 0.2% rms at any speed

AMPEX CORPORATION
934 Charter Street • Redwood City, California

BRANCH OFFICES: New York, Chicago, Atlanta, San Francisco and College Park, Maryland (Washington, D. C., area)

DISTRIBUTORS IN PRINCIPAL CITIES (Listed in Telephone Directory under "Recording Equipment") Canadian General Electric Company in Canada

for every field of use

AMPEX DATA RECORDERS

Ampex magnetic tape machines retain test data in "live" electrical form. Hence a playback of the data is like a rerun of the original test. The tremendous "memory capacity" of magnetic tape retains more complete and detailed information than any other data recording method. The data can be scanned, speeded up, slowed down, automatically reduced or converted to any other electrical, visual or physical form. To cover the widest range of data situations, Ampex data recorders are offered with various frequency ranges, numbers of tracks and modes of recording.

F-M CARRIER TYPE RECORDER—MODEL 306*

Explosions, shock waves, geophysical data and other highly transient phenomena can be recorded on the Model 306 with excellent "instantaneous" accuracy. Because the data signals modulate an fm carrier, the accuracy of the recording is unaffected by minor tape imperfections.

Also, the Model 306 is able to record the vast majority of all mechanical occurrence, since it covers the extremely useful frequency range from 5000 cycles/sec. down to zero (D.C.).

OPTIONS: *One to 14 tracks*
Rack, console or combination mounting
Record and playback, record only or playback only

WIDE RANGE DIRECT RECORDER—MODEL 307*

With a frequency response from 100 to 100,000 cycles per second, the Model 307 is particularly suited to steady state data occurring over a wide range of frequencies. The 307 has had extensive application in fm-fm telemetering, sharing this field with the Model 500 described below.

OPTIONS: *Same as Model 306*

PULSE WIDTH RECORDER—MODEL 303*

This model can record any type of phenomena that lends itself to pulse width coding. Pulses can range from 60 to 1000 microseconds and will be accurate in duration to closer than 2 microseconds. Since each track on the machine may record commutated data consisting of many channels, it is possible to record hundreds of parallel data channels on one tape on a Model 303 machine.

OPTIONS: *Same as Model 306*

"LOW FLUTTER" WIDE RANGE RECORDER—MODEL 500

The Model 500 is a four-track, two-speed magnetic tape recorder designed to achieve extreme stability of tape motion while recording information in the frequency range between 100 and 100,000 cycles. Thus it is able to record fm-fm telemetering data without introducing any objectionable data error from small variations in tape speed. It has the lowest known flutter and wow characteristics of any tape recorder—less than 0.1% peak-to-peak by RDB standards.

Console mounting only
Four tracks only

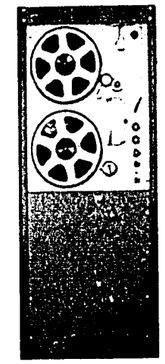
SEISMIC DRUM RECORDER—MODEL 700

The Model 700 is a highly specialized instrument for seismic exploration for oil. It records 26 channels of information in fm-modulated form on a single tape, 4"x40 1/16". The tape is mounted on a constant speed drum, and is replaceable after each test shot. Frequency response is within ± 1 db from 3½ to 300 cps, with a corresponding dynamic range of more than 45 db. The total time alignment between all data channels is closer than 1 millisecond.

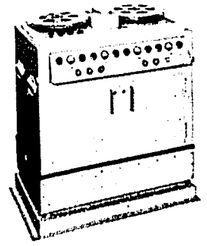
Rack mounting only

**These models are available as two-track Combination Recorders. One 303 track plus one 307 track becomes a Model 309; one 306 track plus one 307 track becomes a Model 311.*

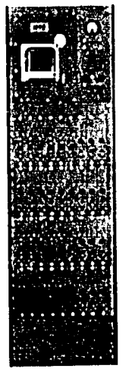
Write today for further information and complete specifications.



Series 300 data recorder in rack mounting.



Ampex Model 500 Recorder



Ampex Model 700 Drum Recorder

AMPEX CORPORATION
934 Charter St., Redwood City, California

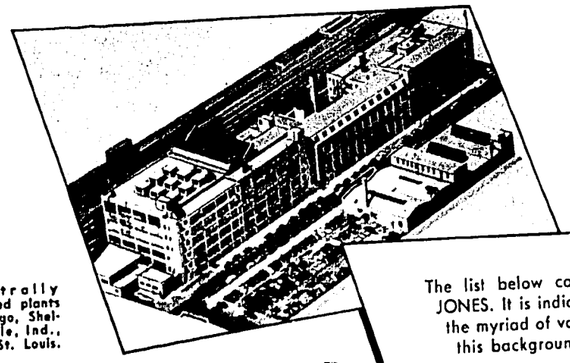
BRANCH OFFICES:
New York, Chicago, Atlanta, San Francisco and College Park, Maryland (Washington, D. C., area)

DISTRIBUTORS:
Radio Shack, Boston; Bing Crosby Enterprises, Los Angeles; Southwestern Engineering & Equipment, Dallas and Houston; Canadian General Electric Company in Canada.

AMPEX
MAGNETIC RECORDERS

FOR THE ★STANDARD IN METAL PLASTIC ASSEMBLIES:

CONSULT CINCH-JONES-



Centrally located plants Chicago, Shelbyville, Ind., and St. Louis.

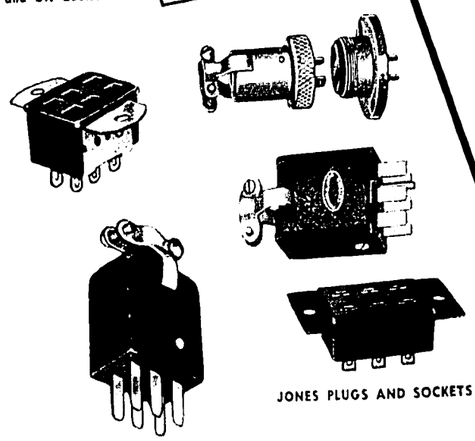
BARRIER TYPE TERMINAL STRIPS, PLUGS, SOCKETS AND FANNING STRIPS

The list below comprises the products of both CINCH and JONES. It is indicative of their wide scope; and also indicates the myriad of variations and redesigning that is possible with this background of production experience.

TERMINAL ASSEMBLIES: Blocks, boards in laminated and molded, assembled with lugs, pins, screw terminals, contacts, clips, turret lugs and other hardware to specifications.

The components are shown here for variety, types and uses, and are not necessarily in comparative size.

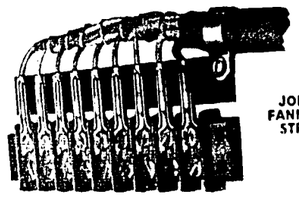
- ANTENNA JACKS
- BANANA PINS AND JACKS
- BARRIER TERMINAL STRIPS
- FANNING STRIPS
- BATTERY PLUGS & SOCKETS
- BINDING POSTS
- DIODE SOCKET
- CONNECTORS, MULTI CONTACT
- FUSE STRIPS, BLOCKS & BOARDS
- GRID CAPS
- GRID CAP SHIELDS
- HERMETICALLY SEALED TUBE SOCKETS
- METAL STAMPINGS
- MICRO-CONNECTORS
- MOUNTING DEVICES
- PHONO TIP JACKS
- PRINTED CIRCUIT, CONNECTORS
- SHIELDS, TUBE-MINIATURE & NOVAL & BASES SOLDERING LUGS—200 VARIATIONS
- STRAP NUTS
- TRANSISTOR SOCKET
- TUBE HOLDERS—SPRING TYPE
- VIBRATOR PLUGS AND SOCKETS



JONES PLUGS AND SOCKETS



JONES BARRIER TYPE TERMINAL STRIPS

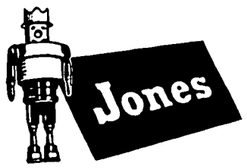


JONES FANNING STRIPS

The steadily expanding variety of plugs and sockets produced at the JONES Division has a wide range of the highest quality electrical and mechanical parts to efficiently fill every need.

SEND FOR COMPLETE CATALOG

Cat. No. 20 will give you complete data (electrical characteristics, etc.). Your request for this catalogue or for quotes on special products will be promptly answered.

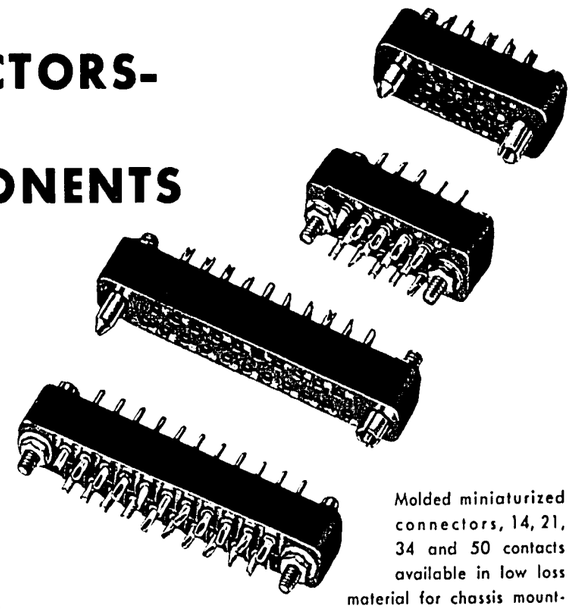


HOWARD B. JONES DIVISION
CINCH MANUFACTURING CORPORATION
1026 S. Homan Ave. • Chicago 24, Illinois

SOCKETS, CONNECTORS-

CINCH COMPONENTS

ARE ★ STANDARD — ADEQUATE FACILITIES ASSURE SERVICE



Molded miniaturized connectors, 14, 21, 34 and 50 contacts available in low loss material for chassis mounting applications.

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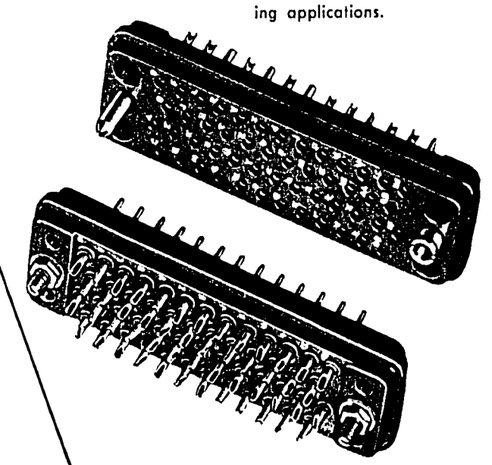
- Tube (Receiver, Transmitter and Special): Battery, all types
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- Crystal
- Electrolytic
- Glass Type; 4 to 7 prong laminated
- Infra-red Ray Tube
- High Altitude Airborne Types
- Kinescope; Magnal, Duodecal, Diheptal
- Loktal-Miniature-Multiplug-Noval-Octal (Molded bakelite, steatite, teflon, Kel-F and laminated)
- Plexicon
- Printed Circuit
- Special Sockets to Specs
- Sub-Miniature; Hearing Aid Types
- TV; 110V Circuit Breakaway
- Vibrator
- Pencil Tube Transistor
- Diode



CINCH NOVAL NINE PRONG



CINCH-ERIE PLEXICON

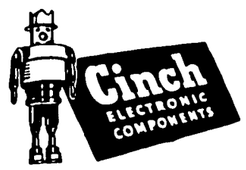


★ CINCH metal plastic assemblies fully perform the service for which they were designed and often have anticipated the engineering needs of the future. So that today, judged by demand and usage, CINCH components are "the standard".

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CINCH components available at leading electronic jobbers — *everywhere.*

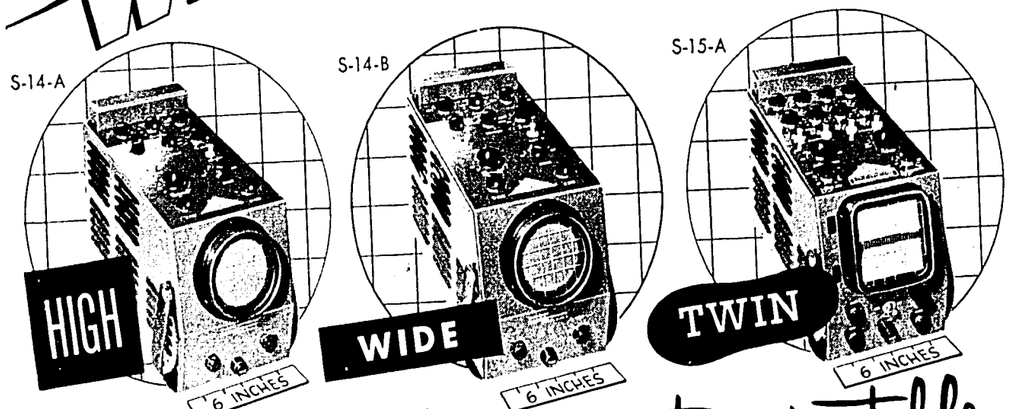
Send for complete catalog, No. 51; contains data on all of the CINCH electronic components. Requests on company letterheads will be promptly answered.



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Waterman POCKETSCOPE

The Pocket-Size Oscilloscope



...light...compact...accurate...portable

Featuring small size, light weight and outstanding performance the HIGH, WIDE and TWIN POCKETSCOPES have become the "triple threat" of the oscilloscope field. Their incomparable versatility, reliability and accuracy heve skyrocketed this team of truly portable instruments into unparalleled demand. Each oscilloscope features DC coupled amplifiers in both vertical and horizontal channels.

HIGH

The S-14-A HI-GAIN POCKETSCOPE provides the optimum in oscilloscope flexibility for analysis of low-level electrical impulses. Extremely light weight (12¾ lbs.), compact in size (12 x 5¾ x 7 in.), dependable and accurate in performance. Vertical and horizontal channels: 10mv rms/inch with response within 2DB from DC to 200 KC and pulse rise of 1.8 μs . . . non-frequency discriminating attenuators and gain controls with internal calibration of trace amplitude . . . repetitive or trigger time base with linearization from ½ cycle to 50 KC with ± sync or trigger.

WIDE

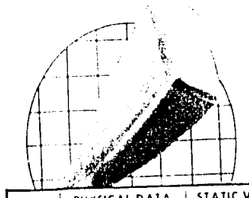
The S-14-B WIDE BAND POCKETSCOPE is ideal for investigations of transient signals, DC signals, aperiodic pulses or recurrent waveforms. Vertical channel: 50 mv rms/in. within —2DB from DC to 700 KC . . . pulse rise time of 0.35 μs. Horizontal channel: 0.15v rms/in. within —2DB from DC to 200 KC . . . pulse rise of 1.8 μs. Attenuators and gain controls are non-frequency discriminating . . . trace amplitude calibration . . . repetitive or triggered time base from ½ cycle to 50 KC . . . ± sync or trigger . . . trace expansion, filter graph screen and many other features . . . 14 lbs. . . . 12 x 6 x 7 inches.

TWIN

The S-15-A POCKETSCOPE is a portable, twin tube, high sensitivity oscilloscope with two independent vertical as well as horizontal channels. It is indispensable for investigation of electronic circuits in industry, school and laboratory. Vertical channels 10 mv rms/in. with response within—2DB from DC to 200 KC and pulse rise time of 1.8 μs . . . horizontal channels 1v rms/in. within —2DB from DC to 150 KC . . . non-frequency discriminating controls . . . internal signal amplitude calibration . . . linear time base from ½ cycle to 50 KC, triggered or repetitive, for both horizontal channels.

S-11-A

The S-11-A INDUSTRIAL POCKETSCOPE is a small, compact (5x7x11 inches), and lightweight (8¾ lbs.) instrument for observing electrical circuit phenomena. The flexibility of the POCKETSCOPE permits its use for AC measurements as well as for DC. The vertical and horizontal amplifiers are capable of reproducing within —2DB from DC to 200 KC with a sensitivity of 0.1v rms/in. . . . repetitive time base from 3 cycles to 50 KC continuously variable throughout its range . . . variations of input impedance, line voltage or controls do not "bounce" the signal—the scope stabilizes immediately.



RAYONIC CATHODE RAY TUBES BY WATERMAN

TUBE	PHYSICAL DATA		STATIC VOLTAGE		DEFLECTION*		LIGHT OUTPUT**
	FACE	LENGTH	A3	A2	VERT	HOR	
3JP1	3"	10"	3000	1500	111	150	352
3MP1	3"	8"		750	99	104	33
3RP1	3"	9.12"		1000	61	86	44
3SP1	1.5x3"	9.12"		1000	61	86	44
3XP1	1.5x3"	8.875"		2000	33	80	218

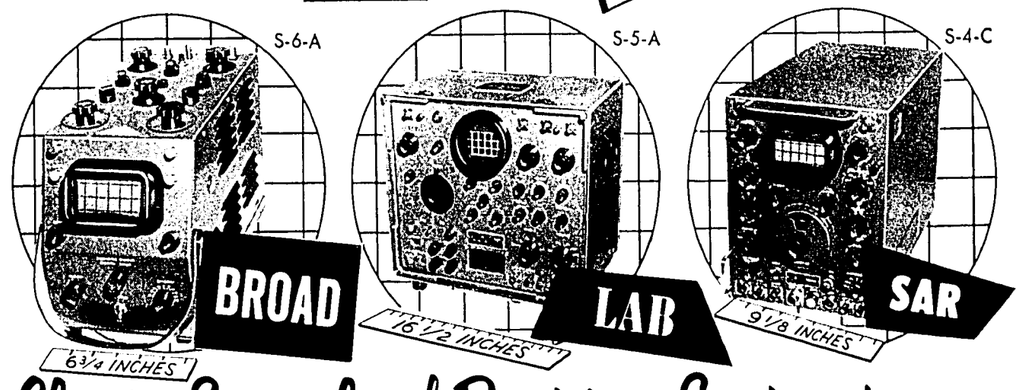
Deflection in volts per inch.
***Light output of an element of a raster line (one mm long and not exceeding .65 mm in width) in microlumens.*

The basic properties of the cathode ray tube that concern the designer or the user are: deflection sensitivity, unit line brightness, line width, static voltage requirements and physical size. A comparison between cathode ray tubes manufactured by Waterman Products Company is shown in the table adjoining. These tubes are available in P1, P2, P7 and P11 phosphors. 3JP1, 3JP7, 3SP1 and 3XP1 are available as JAN tubes.

Write for your complimentary copy of "POCKETSCOOP" • Official Waterman publication.

PULSESCOPE by Waterman

The Oscilloscope that Portrays the Pulse



Classic Examples of Precision Engineering...

The PULSESCOPES are cathode ray tube oscilloscopes that portray the attributes of the pulse: shape, amplitude, duration and time displacement. All PULSESCOPES have internally generated markers with the basic difference that in the SAR PULSESCOPE the markers initiate the sweep while in the others the sweep starts the markers.

BROAD

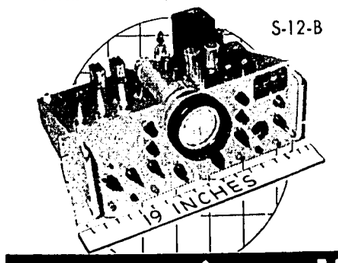
The S-6-A BROAD BAND Scope is a PULSESCOPE in performance, POCKETSCOPE in size. The instrument measures DC as well as AC signals. Unique DC calibration methods permit rapid measurements of either positive or negative, AC or DC signals. Vertical amplifier sensitivity of 0.2v rms/inch, and response to 5 mc within 3DB . . . pulse rise time of 0.1 μs . . . internal markers from 1 to 1000 μs . . . repetitive or trigger sweep from 5 cycles to 500 KC with 5X sweep expansion . . . sweep, marker and DC calibrating voltage available externally. Size 8½ x 6¾ x 13¾ in. Weight 22 lbs. Operates from 50 to 400 cycles at 115 volts AC.

LAB

The S-5-A LAB PULSESCOPE is a JANized (Gov't Model No. OS-26) portable, AC, wide band-pass, laboratory oscilloscope ideal for pulse as well as general purpose measurements. Internal delay of 0.55 μs permits observation of pulse leading edge. Includes precision amplitude calibration, 10X sweep expansion, internal trace intensity time markers, internal trigger generators and many other features. Video amplifier 0.1v p to p/inch . . . pulse rise time of .035 μs or response to 11 mc. 1.25 to 125,000 μs triggered or repetitive sweep . . . internally generated markers from 0.2 to 500 μs . . . trigger generator from 50 to 5000 pps. for internal and external triggering. Operates from 50 to 400 cycles at 115 volts AC.

SAR

The S-4-C SAR PULSESCOPE is a JANized (Gov't Model No. OS-4) portable instrument (31.5 lbs.) for precision pulse measurements for radar, TV and all electronic measurements. Portrays all attributes of the pulse . . . internal crystal controlled markers of 10 and 50 μs available for self-calibration . . . in R operation a small segment of the A sweep is expandable for detailed observation with a direct-reading calibrated dial accurate to 0.1%. Video amplifier band-pass up to 11 mc . . . optional video delay 0.55 μs . . . pulse rise and fall time better than 0.07 μs . . . R pedestal (sweep) 2.4 to 24 μs . . . video sensitivity of 0.5v. p to p/inch. Easily convertible from μs to yards. Operates from 50 to 400 cycles at 115 volts AC.



RAKSCOPE

Because the panel is only 7" high and fits any standard rack, the S-12-B RAKSCOPE admirably fills the need for a small oscilloscope of wide versatility. With all the features of the S-11-A POCKETSCOPE, the RAKSCOPE is JANized (Gov't Model No. OS-11), and has many additional advantages; the sweep, from 5 cycles to 50 KC, is either repetitive or triggered . . . vertical and horizontal amplifiers are 50 mv rms/inch with band-pass from 0 to 200 KC . . . special phasing circuitry for frequency comparison.

WATERMAN PRODUCTS CO., INC.

WATERMAN PRODUCTS

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CABLE ADDRESS, POKETSCOPE, PHILA.

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COMPLETE MILITARY LINE AVAILABLE.

POPULAR MILITARY TYPES ILLUSTRATED.

CORRESPONDING COMPLETE LINE FOR COMMERCIAL APPLICATIONS ALSO AVAILABLE.

6 acres of plant area . . . over 1000 employees . . . making ALL TYPES of variable resistors by the million . . . for ALL your requirements. CTS SPECIALIZES in precision mass production of variable resistors and associated switches . . . makes nothing else.

Most controls available with switches and in concentric shaft tandems or with two controls operating on one shaft. Also available with locking bushing, water sealed bearing and many other special features not illustrated.

Immediate delivery from stock on many JAN-R-94, JAN-R-19 and other types.



WRITE FOR ILLUSTRATED CATALOG—
Describes Electrical and Mechanical characteristics, Special Features and Constructions of a complete line of variable resistors for military and civilian use. Includes dimensional drawings of each resistor.

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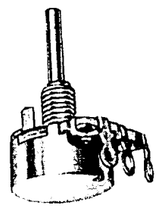
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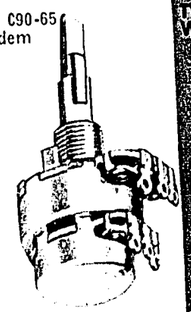
CHICAGO TELEPHONE SUPPLY
Corporation

1/2 watt 70°C, 3/4" diameter miniaturized variable composition resistor.

TYPE 65
(Miniaturized)

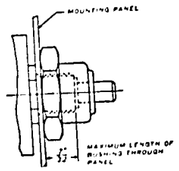


TYPE C90-65
Tandem



UNPRECEDENTED PERFORMANCE CHARACTERISTICS

Types 65, 90 and 95 are specially designed for military communications equipment subject to extreme temperature and humidity ranges: −55°C to +150°C ...aridity to saturation.



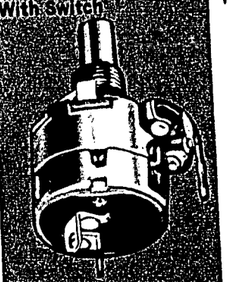
WATER SEALED MOUNTING AND BEARING FOR TYPES

1 watt 70°C, 15/16" diameter variable composition resistors.

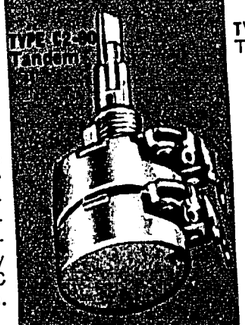
TYPE 90



TYPE GC-90
With Switch



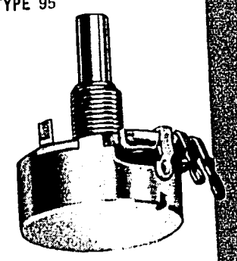
TYPE C2-90
Tandem



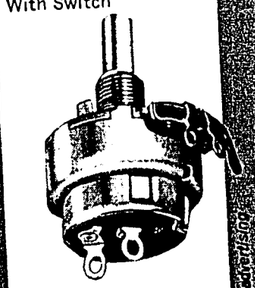
Meets JAN-R-94
type RV4

2 watt 70°C, 1-1/8" diameter variable composition resistor. Also available with other special military features not covered by JAN-R-94.

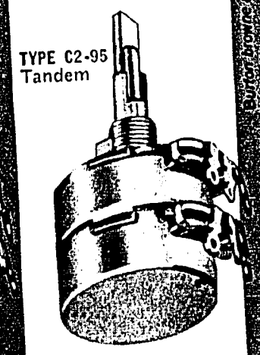
TYPE 95

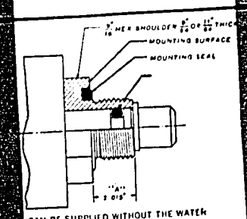


TYPE GC-95
With Switch



TYPE C2-95
Tandem





(CAN BE SUPPLIED WITHOUT THE WATER SEALED MOUNTING SHOULDER)

WATER SEALED MOUNTING AND BEARING FOR TYPES 45, 35, 90, 95, 25, 252.

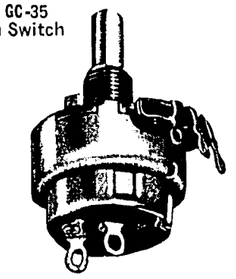
Meets JAN-R-94
type RV3

1/2 watt 1-1/8" diameter variable composition resistor. Also available with other special military features not covered by JAN-R-94.

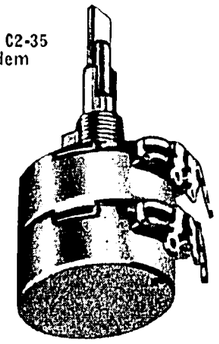
TYPE 35

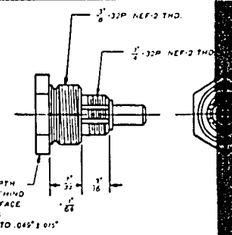


TYPE GC-35
With Switch



TYPE C2-35
Tandem



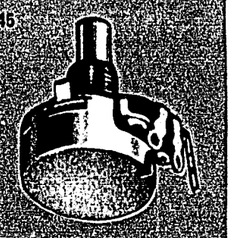


LOCKING BUSHINGS FOR

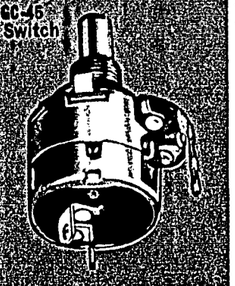
Meets JAN-R-94
type RV2

1/4 watt 15/16" diameter variable composition resistor. Also available with other special military features not covered by JAN-R-94.

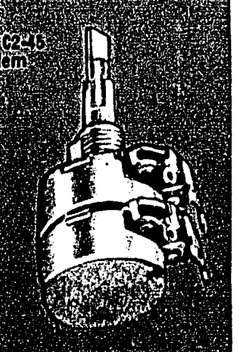
TYPE 45



TYPE GC-45
With Switch



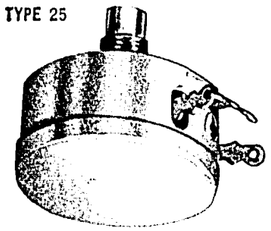
TYPE C2-45
Tandem



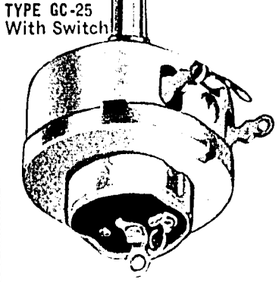
Meets JAN-R-19
types RA25 and RA30

4 watt 1-17/32" diameter variable wirewound resistor. Also available with other special military features not covered by JAN-R-19.

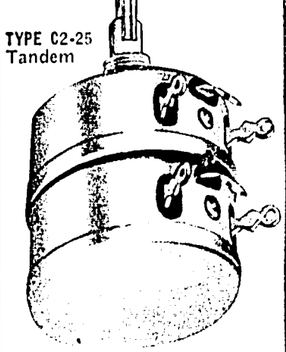
TYPE 25



TYPE GC-25
With Switch



TYPE C2-25
Tandem



LOCKING BUSHINGS FOR CONTROL

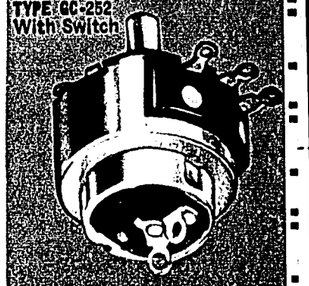
Meets JAN-R-19
type RA20

2 watt 1-17/64" diameter variable wirewound resistor. Also available with other special military features not covered by JAN-R-19.

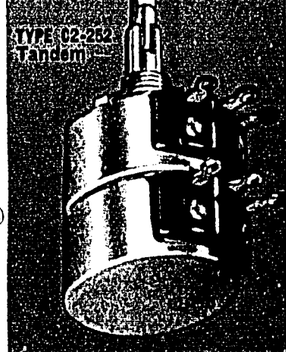
TYPE 252



TYPE GC-252
With Switch



TYPE C2-252
Tandem



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...anything in between!

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TRANSFORMERS

...y specifications
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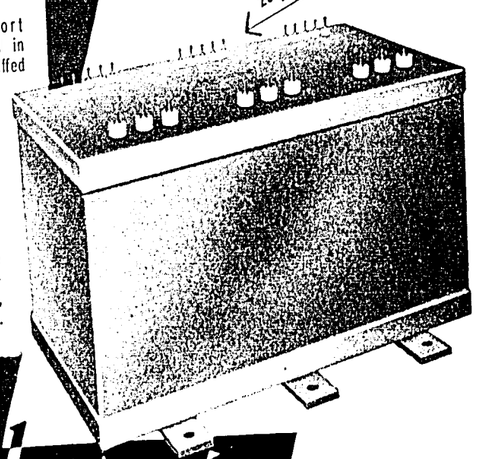
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Alden Products Co. (S, P)	296
Allied Radio Corp. (P)	568
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Andrew Corp. (S, P)	420
Applied Science Corp. of Princeton (S, P)	174
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Arnold Engineering Co. (S, P)	134
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Bourns Laboratories (S, P)	360
Buggie, Inc., H. H. (S, P)	298
Burgess Battery Co. (S)	276
Burlington Instrumental Co. (S, P)	327

(Continued on page 118)

To give you a complete selling program to radio and electronic engineers,

IRE provides all 3!

1 **"Proceedings of the I.R.E."**

puts your product promotion monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 41,625 (ABC)

2 **IRE DIRECTORY**

provides 35,000 engineers educated to buy and specify with your detailed product data for ready reference all year long.

3 **RADIO ENGINEERING SHOW**

...the eye-opening event of each radio-electronic year...where over 40,000 engineers come to you for all that's new.

For complete facts, ask IRE about all 3!

Engineers are educated to specify and buy.

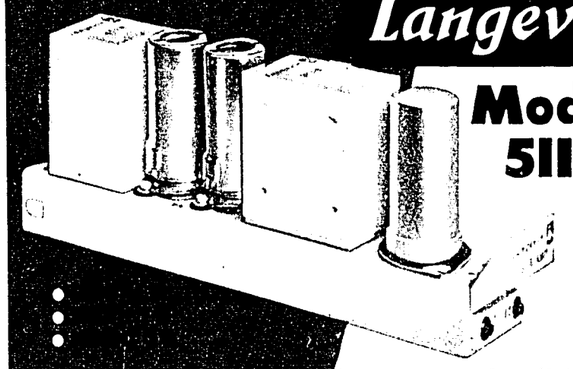
The Institute of Radio Engineers

Adv. Dept.
1475 Broadway
New York 36, N. Y.
BRyant 9-7550

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...VELOPED

Langevin

Model 5116



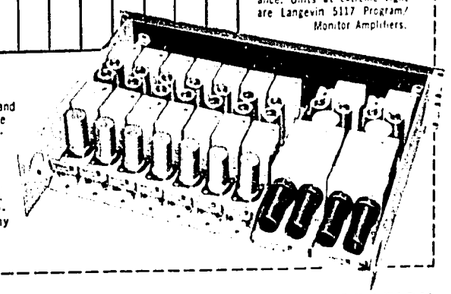
...clusion in facilities
... FCC requirements

...ug-in, two stage, low noise, preamplifier or ...r use in radio and TV broadcast systems, ... systems. While important space saving has ...of this amplifier, Langevin sacrificed none of ...pendability which make the Langevin Model ...terion of excellence. In fact performance char- ...y improved. Included are such quality features ...nectors and push-button metering facilities.

SPACE SAVING THAT REALLY COUNTS!

61% reduction in volume permits mounting of 33 Model 5116 units in the space required by 12 of the very popular Langevin Model 116-B.

Photo below, illustrates the extremely compact racking possible with the new Model 5116. Note complete accessibility and uncongested appearance. Units at extreme right are Langevin 5117 Program/Monitor Amplifiers.

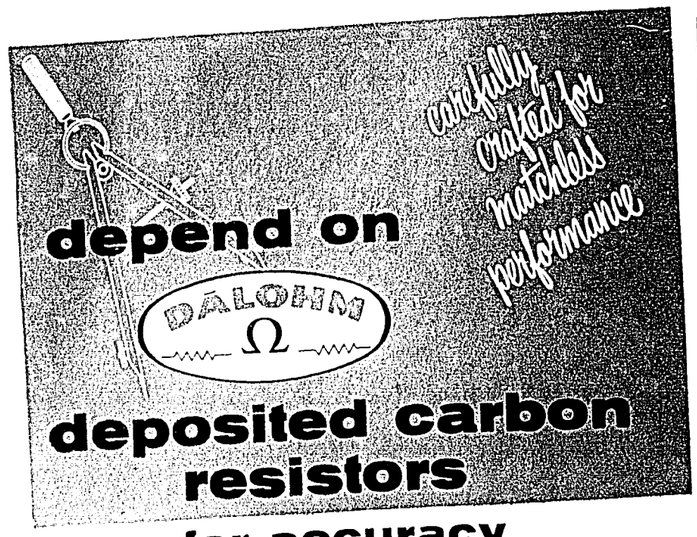


WRITE TODAY—

for complete data and specifications on the Langevin line of miniature plug-in equipment including program, booster and monitor amplifiers, power supplies, etc. Please address requests on company letterhead.

LANGEVIN MANUFACTURING CORPORATION
37 WEST 65th STREET, NEW YORK 23, N. Y.

A SUBSIDIARY OF THE W. L. MAXSON CORPORATION



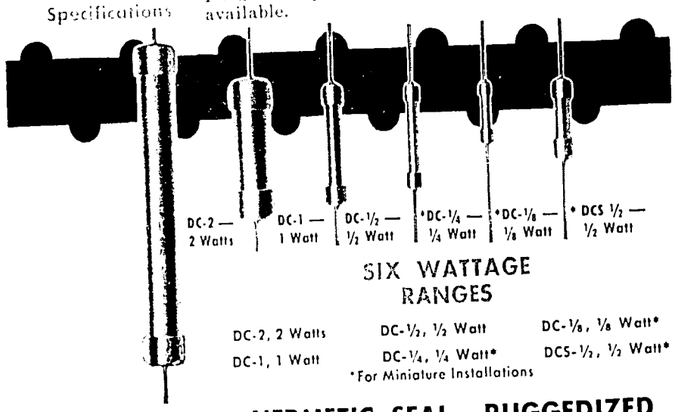
for accuracy and stability

Dalohm deposited carbon resistors are manufactured under rigid controls to deliver matchless performance and economy in any high-low resistance range.

Pure carbon in crystalline form is bonded to a selected ceramic core, and then sealed against moisture with a special silicone coating having high di-electric strength, excellent thermal conductivity, and high resistance to abrasion.

- From 1 Ohm to 200 Megohms, depending on type.
- Temperature coefficient 150 PPM per degree C for lower resistance ranges up to 500 PPM per degree C for higher ranges.
- 1% accuracy, 2%, 5%, and 10% tolerances also available.

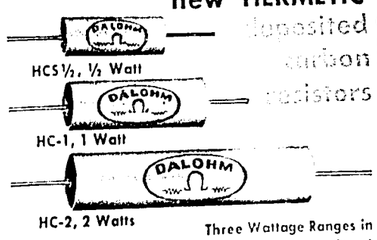
Meet MIL-R-10509-A Specifications



SIX WATTAGE RANGES

DC-2, 2 Watts
DC-1, 1 Watt
DC-½, ½ Watt
DC-¼, ¼ Watt*
DC-⅛, ⅛ Watt*
DCS-½, ½ Watt*
*For Miniature Installations

new HERMETIC SEAL—RUGGEDIZED



hermetic seal resistors

Completely solder sealed in a newly-developed envelope of non-hydroscopic ceramic. Ideally suited for use in UHF equipment where only the optimum of quality may be tolerated. Ruggedized for incorporation into "snap-in" component clips. Production tested for resistance to thermal shock, salt-water immersion and humidity.

Three Wattage Ranges in Resistance Ranges to 200 Megohms
Standard Tolerance 1%

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DALE PRODUCTS, INC.
Columbus, Nebraska, U.S.A.

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Electrical & Phys. Instr. Corp. (P)	412
Electro Engineering Products Co. (P)	337

(Continued on page 120)

Where a great industry turns for greater growth!



In the annual **IRE DIRECTORY**, a complex radio-electronic industry is organized, coded, simplified and "indexed for use." Men, firms, products—all are listed as vital working information for 35,000 IRE members who feed on facts to give their vast industry even greater growth.

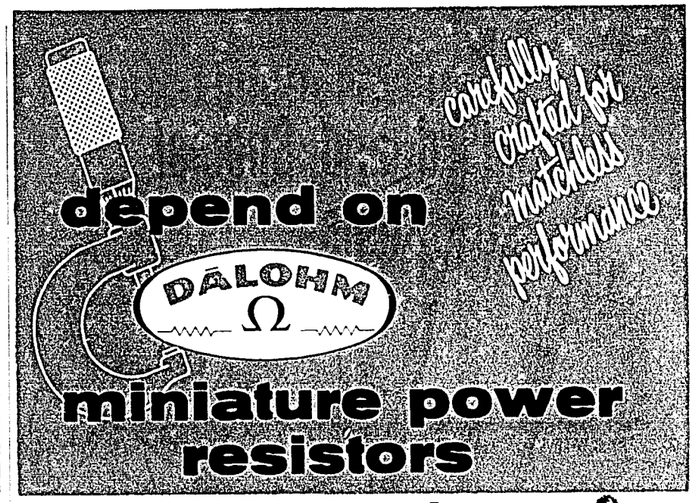
Never before has there been such need for standardization of products used, bought and sold in the radio-electronic field. The **IRE DIRECTORY** is pioneering and helping to establish industry-wide product standardization including definition of terms.

Because of its recognized service to engineers, because it is their industry encyclopedia, the **IRE DIRECTORY** is your basic selling medium in which one message works 365 days of the year. In planning next year's budget, set aside sufficient funds to put your best facts forward in the 1955 **IRE DIRECTORY**.

Engineers are educated to specify and buy.

IRE DIRECTORY

Published by
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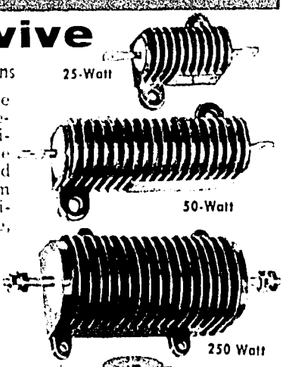


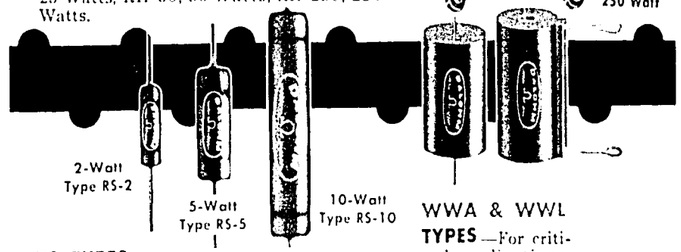
...made to survive

Conform to Applicable JAN and MIL Specifications

Dalohm miniature power resistors—the answer to those tight specifications—are carefully designed and skillfully made for all applications where the equipment must survive the most severe environmental, shock and vibration conditions. Completely welded from terminal to terminal, coated with special silicone material, and impervious to moisture, salt ions, vapor, and gases.

RH TYPES—Silicone sealed in a die-cast, black anodized radiator finned housing and mounts on sub-panel for maximum heat dissipation. Three wattage ranges: RH-25, 25 Watts, RH-50, 50 Watts, RH-250, 250 Watts.





RS TYPES—Silicone sealed offering high di-electric strength, maximum heat dissipation, and maximum resistance to abrasion. Three wattage ranges: RS-2, 2 Watts; RS-5, 5 Watts, RS-10, 10 Watts.

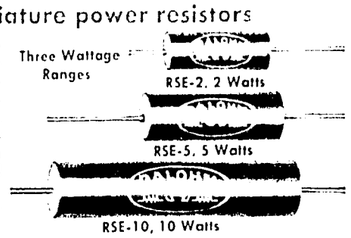
- Temperature coefficient 0.00002 Deg. C
- Ranges from 0.1 Ohm to 55,000 Ohms depending on type
- Tolerances 0.05%, 0.1%, 0.25%, 0.5%, 1%, 3%, 5%.

WWA & WWL TYPES—For critical applications. Encapsulated for Hermetic sealing. Built to surpass MIL-R-93A.

- Temperature coefficient 0.00002 Deg. C
- Ranges from 0.05 Ohm to 3 Megohms
- Tolerances as low as 0.05%

new ruggedized miniature power resistors

Dalohm "ruggedized" miniature power resistors answer not only the space problem, but the shock problem. They are designed for trouble-free performance under the most exacting and demanding conditions of shock and vibration. Sealed in silicone and housed in black metal tubing. (Suggested mounting clip: Atlas E-E Corp.). Same characteristics as RS Types.



write, wire or call — 1318 28th Ave. Phone 2139

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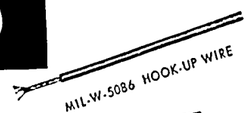
Export Dept. Pan Mar Corp., 1270 Broadway, N. Y., N. Y.
In Canada, Teletronics Corp., Ltd., Toronto and Montreal

Standard and Special Constructions—



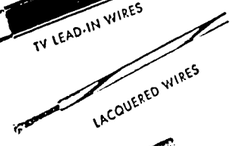
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WIRES & CABLES

—FOR EVERY ELECTRICAL AND ELECTRONIC NEED!



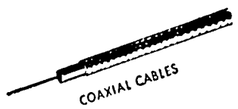














It pays to make CHESTER quality-engineered wire and cables your standard for both commercial and military requirements. Every foot of conductor bearing the Chester label is laboratory tested and service-proven to perform as specified. Chester extra-strength plastic coatings are made super-durable for longer life and smooth pliability assures the easier working qualities that speed wiring production.

NEW CHESTER BULLETINS
Complete data and specifications on quality conductors for all electronic wires and cables will be supplied promptly. Call or write, today!



CHESTER CABLE CORP.
CHESTER, NEW YORK

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Epco Products, Inc. (P)	383
Eraser Co., Inc., Rush Wire Stripper Div. (P)	530
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Glenco Corp. (S, P)	284
Godley Co., Paul (P)	488
Gordon Associates, Inc. (P)	488
Gramer Transformer Corp. (P)	Cover III
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Gudebrod Bros. Silk Co., Inc. (S, P)	509
Gudeman Co., The (S)	29
Gulton Mfg. Corp. (S, P)	177

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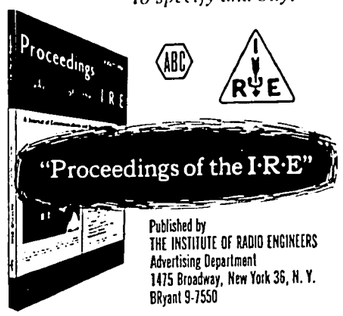
Sub-miniaturization is ITTY BITTY BIG BUSINESS

"Sub-miniaturization" actually is a self-contradictory word because as radio components are engineered down to thimble and pinhead size, electronic applications in industry become wider and greater. Very soon, a tumbler-full of complex radio-electronic equipment will fly an airplane! Circuits have been flattened to postcard size, and radio-tubes to matchheads. "Radio" becomes a part of every industry!

The fast, far-reaching growth of the radio-electronic industry has been made possible by a vast amount of technical nourishment. More than 1,000 technical meetings a year are held by IRE's 38,000 members in eighty-one active sections in every part of the English speaking world. The volume of published information required to feed this engineered progress is enormous.

For forty years, without need of change of name or direction, The Institute of Radio Engineers has published its "Proceedings of the I·R·E"—a monthly magazine by radio-electronic engineers, for radio engineers. It is an unabridged, accurate, working textbook. 481 advertisers use its pages to keep their products before design men . . . to sell in the pre-specification stage of this dynamic industry.

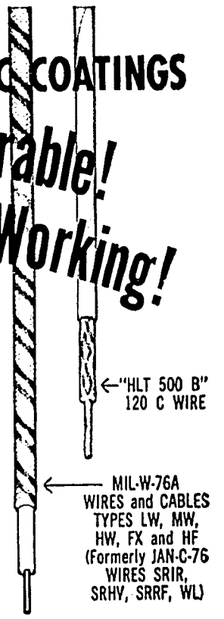
Engineers are educated to specify and buy.



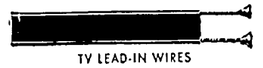
Published by
THE INSTITUTE OF RADIO ENGINEERS
Advertising Department
1475 Broadway, New York 36, N. Y.
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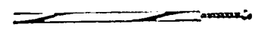
THESE RUGGED PLASTIC COATINGS —are Super-durable! —Easier Working!

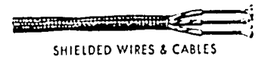


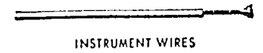


















These quality-engineered plasticord and plasticote constructions are available in types to meet all military and commercial wiring specifications. Chester super-durable plastic coatings offer easier-working qualities that speed wiring production . . . and extra strength that adds years to wiring life. For complete wiring dependability—connect it with Chester, the name for quality in wires and cables!

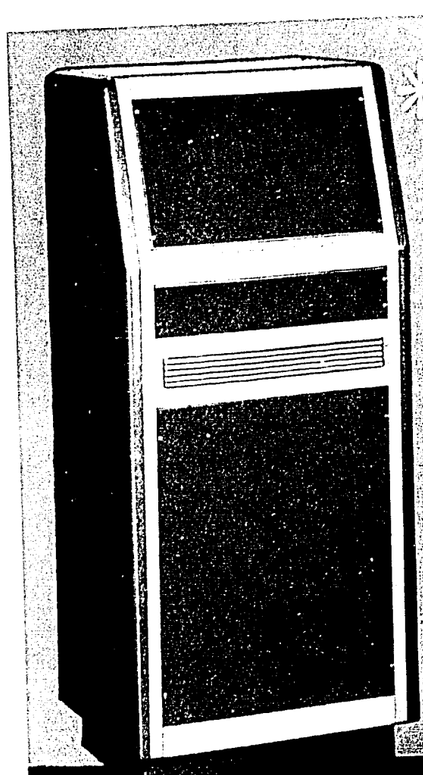
CALL OR WRITE TODAY FOR LITERATURE AND SAMPLES!

Check your wiring needs with Chester, now. Complete information on standard constructions will be sent promptly. If you need custom constructions, Chester can build them quickly and economically.



CHESTER
plasticord-plasticote®
WIRES & CABLES

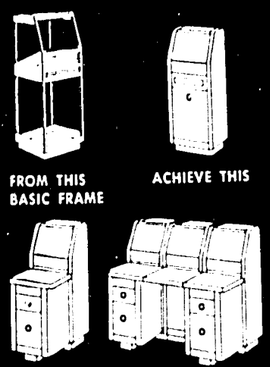
CHESTER CABLE CORP.
CHESTER, NEW YORK



avoid high-cost custom construction with the NEW...

EMCOR

MODULAR ENCLOSURE SYSTEM



NOW, every custom construction advantage — beauty, quality, accessibility, great strength — plus endless flexibility — is yours in the EMCOR Modular Enclosure System — *at new* low production prices* — up to 80% less than custom construction! Units are assembled in only a few minutes with TINNERMAN *Speed Nuts* and hardened *Phillips Head Screws* — all furnished — even the screwdriver.

For full information on the EMCOR System, EMCOR Stacking and Instrument Cabinets, as well as other EMCOR products write:

Nothing rivals the beauty of an EMCOR installation.

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Heppner Mfg. Co. (S, P)	324
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Hudson Radio & Tel. Corp. (P)	578
Hudson Tool & Die Co. (S, P)	162
Hughes Aircraft Co. (S, P)	194
Illinois Condenser Co. (S, P)	196
Impedance, Inc. (P)	431
Industrial Hardware Mfg. Co., Inc. (S, P)	371
Industrial Test Equipment Co. (S, P)	471
Instrument Corp. of Amer. (P)	220
Instrument Specialties Co., Inc. (P)	510
International Instruments, Inc. (S)	331
International Radiant Corp. (S)	440
International Rectifier Corp. (P)	352
J-B-T Instruments, Inc. (S)	184
JFD Mfg. Co., Inc. (S, P)	286
Jennings Radio Mfg. Corp. (S, P)	25-28
Johnson & Hoffman Mfg. Co. (P)	55-58
Kahle Engineering Co. (P)	532
Kahn, Leonard R. (P)	488
Kay Electric Co. (S, P)	436
Kearfott Company, Inc. (S, P)	414
Kent Co., F. C. (S)	432
Kenyon Transformer Co., Inc. (S, P)	386
Kester Solder Company (S, P)	546
Keystone Electronics Co. (S, P)	310
Keystone Products Co. (P)	38
Knights Co., James (S, P)	313
Kollsman Instrument Div., Standard Coil Products Co. (P)	216
Krohn-Hite Instrument Co. (S, P)	2-3
Kulka Electric Mfg. Co., Inc. (S)	511
Langevin Mfg. Corp. (S, P)	116-117
Lavoie Laboratories, Inc. (S, P)	312

(Continued on page 121)

The magic evolution of radiation—controlled by the radio tube—has entered its third great epoch.

EARS!

First came the audio stage, expressed in radio: signal, human voice and glorious fidelity in music

EYES!

Second: video in television, even now changing to soul satisfying color.

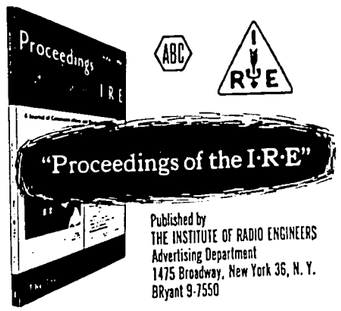
BRAINS!

And now comes the era of the electronic computer—the signal that is detected, stored (remembered, if you wish) totalled and graphed; solving problems too staggering and monotonous for the human mind.

The electronic computer's base component is the radio tube. Its design and production is the brilliant product of the radio engineer. Advances in the computer, which soon will be as commonly used as the typewriter and adding machine, have been aided by "history making issues" of "Proceedings of the I·R·E".

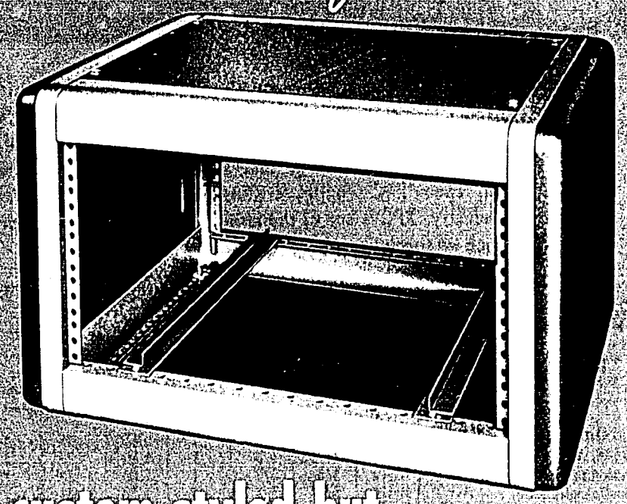
The era of the electronic computer opens a vast new manufacturing market. The surest and most economical way to sell to it is by reaching the minds of men who design and make computers—radio and electronic engineers. "Proceedings of the I·R·E" puts your selling message monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 41,625 (ABC).

Engineers are educated to specify and buy!



Published by
THE INSTITUTE OF RADIO ENGINEERS
Advertising Department
1475 Broadway, New York 36, N. Y.
BRyant 9-7550

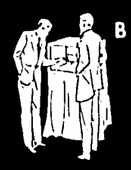
"The Jewel Box of Enclosures"



custom styled but production priced...

EMCOR

INSTRUMENT CABINET



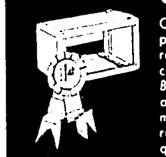
BEAUTY

The most beautifully styled cabinet available. Worthy of housing the finest instrumentation. Added eye-appeal for your equipment makes selling job easier.



FLEXIBILITY

Stack vertically or horizontally. Lock together in minutes with TINNERMAN *Speed Nuts*. Chassis guides and supports provided for easy adjustment to chassis of varying widths. Choice of 3 types of ventilation.



QUALITY

Construction of smooth, premium quality cold rolled steel—electronically controlled welds. *Bonderite* treatment on all metal surfaces for maximum adhesion and rust protection. Highest quality, smooth baked enamel finish in 2-tone gray... insures easy nuclear decontamination.



ACCESSIBILITY

Maintenance and production assembly men appreciate the easy accessibility. Top, bottom, back and both ends quickly removable with a screwdriver. Removal of chassis or instrument to get at any part eliminated.

EMCOR

ELGIN METALFORMERS CORPORATION
902 NO. LIBERTY ST. • ELGIN, ILLINOIS
PHONE ELGIN 7225



WRITE FOR CATALOG and PRICES

QUALITY RESISTORS

rpc

• WIRE WOUND PRECISION • HERMETICALLY SEALED
• ENCAPSULATED • HIGH VOLTAGE • HIGH FREQUENCY • HIGH MEGOHM

Advanced production methods, most modern equipment, and scientific skill have resulted in RPC's ability to manufacture resistors in large quantities at reasonable cost. Quality product, reasonable price and prompt delivery are assured. Large and small quantity orders are promptly filled. Today RPC supplies resistors to the best known names in American industry. RPC is one of the largest manufacturers of these resistors in which we specialize.

WIRE WOUND PRECISION RESISTORS	RPC Type	Spec. Mil-R-93A	Dimensions (Inches) Length	Diam.	Resistance Min. (Ohms)	Max. (Meg.)	Watts Jan Mil	Comml.
STANDARD TYPE A Lug terminals or radial wire leads as noted	AFB*	RB15	15/32	1/2	.1	.650	.25	.5
	AGB*	RB15	15/32	5/8	.1	1.00	.25	.5
	AFC*	RB16	5/8	1/2	.1	1.00	.33	.75
	AGC*	RB16	5/8	5/8	.1	1.50	.33	.75
	AFF*	RB17	1	1/2	.1	2.00	.5	1.
	AGF*	RB17	1	5/8	.1	3.00	.5	1.
	AJS	RB18	1-9/32	11/16	.1	5.00	.5	1.25
	ALP	RB19	2-1/16	13/16	.1	10.	1.	2.
ENCAPSULATED TYPE L Lug terminals or radial wire leads as noted	LFB*	RB15	15/32	9/16	.1	.650	.25	.5
	LFC*	RB16	5/8	9/16	.1	1.00	.33	.75
	LFF*	RB17	1	9/16	.1	2.00	.5	1.
	LJS	RB18	1-9/32	3/4	.1	5.00	.5	1.25
	LLP	RB19	2-1/16	7/8	.1	10.	1.	2.
	LCB	.....	7/16	7/16	1.	.300	.20	.40
	LCC	.....	5/8	7/16	1.	.550	.25	.50
ENCAPSULATED TYPE L LA, LC, LF are radial wire leads. Others are axial	LAB	.....	9/16	5/16	1.	.150	.....	.35
	LAF	RB52**	13/16	5/16	1.	.400	.25	.5
	LCD	RB52**	13/16	15/32	.5	1.00	.25	.5
	LA	.....	1/4	5/16	1.	.100	.....	.25
	LC	.....	3/8	5/16	1.	.200	.....	.3
	LF	.....	5/8	5/16	1.	.400	.....	.25
	LEB	.....	1/2	1/2	1.	.500	.....	.5
	LED	.....	5/8	1/2	1.	1.00	.....	.65
	LEF	.....	1.00	1/2	.5	2.00	.....	1.0
MIDGETS TYPE C Axial wire leads	CAB	.....	9/16	9/32	1.	.150	.....	.35
	CAF	RB52**	13/16	9/32	1.	.400	.25	.5
	CCD	RB52**	13/16	13/32	.5	1.00	.25	.5
TYPE S Hermetically sealed Axial wire leads	SCB	.....	9/16	11/32	1.	.150	.....	.35
	SCF	RB52**	13/16	11/32	1.	.400	.25	.5
	SED	RB52**	13/16	15/32	.5	1.00	.25	.5
TYPE K Lug terminals	KCB	.....	7/16	3/8	1.0	.300	.....	.4
	KCC	.....	5/8	3/8	1.0	.550	.....	.5
SUB-MINIATURE TYPE J Wire leads	JA	.....	1/4	1/4	1.	.100	.....	.25
	JC	.....	3/8	1/4	1.	.200	.....	.3
	JF	.....	5/8	1/4	1.	.400	.....	.35

Resistance tolerance 1% standard. 0.5,%, 0.25%, 0.1%, 0.05%, 0.02% available.

• Normally furnished with lug terminals. Add W to RPC type where wire leads are required.

•• Proposed MIL type.

Note: Low TC alloy wire used for all resistors except when otherwise specified. Wattage rating can be substantially increased by use of glass or silicone covered wire. WRITE FOR DETAILS.

RESISTANCE PRODUCTS CO.
714 RACE ST. HARRISBURG, PENNA.

SPECIALIZING IN THE MANUFACTURE OF QUALITY RESISTORS IN ANY AMOUNT

Hello Again!

Many of the advertisers in the 1954 IRE DIRECTORY have greeted you before as exhibitors in the 1954 Radio Engineering Show, or as advertisers in PROCEEDINGS OF THE I.R.E. during 1954. These advertisers are listed below, identified with an S for Show exhibitors, and a P for PROCEEDINGS advertisers.

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McCoy Electronics Co. (S, P)	315
McGraw-Hill Book Co., Inc. (S, P)	556
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Metal Textile Corp. (P)	480
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Mico Instrument Co. (P)	533
Microlab (P)	319
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Millen Mfg. Co., Inc., James (S, P)	548
Milwaukee Gas Specialty Co. (S)	357
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Moloney Electric Co. (S)	388
Moseley Co., F. L. (S, P)	452
Mueller Electric Co. (P)	512
Mycalex Corp. of America (S, P)	94-95
N.R.K. Mfg. & Eng. Co. (S, P)	432
Narda Corp. (S, P)	461
National Carbon Co., Div. of Union Carbide & Carbon Co. (S, P)	208
New London Instr. Co. (S, P)	438
Ney Company, J. M. (S, P)	377
Northeast Scientific Co. (S, P)	344
Northern Radio Co., Inc. (S, P)	6-8
Olympic Metal Prods. Co., Inc. (S, P)	167
Optical Film Eng. Co. (S, P)	530
Oster Mfg. Co., John (S, P)	337
Ostlund, Evert M. (P)	489
Panoramic Radio Products, Inc. (S, P)	437
Paramount Paper Tube Corp. (S, P)	514
Parke Mathematical Labs., Inc. (P)	489
Par-Metal Products Corp. (S, P)	289
Pentron Corp., The (P)	253
Permag Corp. (P)	327
Phaostron Co. (S, P)	333

(Continued on page 126)

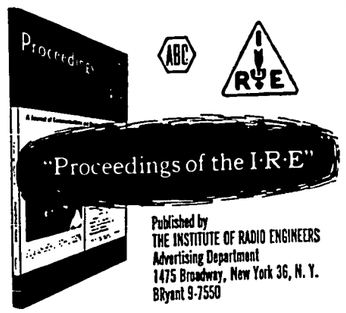
From servo-mechanisms to electronic computers, "RADIO" is a way of THINKING!

Far-reaching progress in the radio-electronic field is no "happy accident." Television, electronic computers and the "radiation" power of the atom, which soon will be harnessed to industry were not discovered . . . they were engineered.

From "fission" to "computation," these engineering achievements are accomplished through an enormous process of information exchange — the methodical and brilliant teaming together of engineering *thinking* to solve a problem. In radio this work has been done deliberately by a growing engineering society, through its meetings and published proceedings, which unleash the creative minds of men.

In 1953, "Proceedings of the I·R·E" published 1818 text pages, exclusive of product news and departmental features. This is the word-count equivalent of seven 500-page textbooks on radio-electronics for engineers. It exceeds the contents of the next two contemporary publications put together. This "high" in genuine reader service was logically matched by advertising worth over a half-million dollars, by firms investing in the engineers' reading interest and benefiting by it.

Engineers are educated to specify and buy!



ABC

I·R·E

Published by
THE INSTITUTE OF RADIO ENGINEERS
Advertising Department
1475 Broadway, New York 36, N. Y.
BRyant 9-7550

QUALITY RESISTORS

rpc

• WIRE WOUND PRECISION • HERMETICALLY SEALED
• ENCAPSULATED • HIGH VOLTAGE • HIGH FREQUENCY • HIGH MEGOHM

RPC resistors are designed for use in test instruments, meters, electronic computers, and scientific equipment. These units are made to meet Government Specifications and rigid industrial requirements. The high standard of these units is maintained by using *only* the finest materials and quality control methods. All test equipment and standards used for checking and calibrating are of a type equalled by only a few of the leading laboratories.

STYLE	RPC Type	Watts Max. (Commercial)	Volts Max.	Dimensions (Inches) Length	Diam.	Resistance Min.	Max. Megohms
HIGH VOLTAGE RESISTORS TYPE B % Tolerances 15, 10, 5, 3, Matched Pairs 2%	BBF*	1	3,500	1	5/16	.050 Meg.	100,000
	BBM*	2	7,500	1-3/4	5/16	.100 Meg.	250,000
	BBR*	3	15,000	3	5/16	.200 Meg.	500,000
	BBV*	5	30,000	5-1/2	5/16	.400 Meg.	1,000,000
	BFQ	4	15,000	2-1/2	9/16	.200 Meg.	500,000
	BFT	6	25,000	4	9/16	.400 Meg.	1,000,000
	BFW	10	40,000	6-1/2	9/16	.700 Meg.	1,000,000
Type D— Bands and Ferrules	DPW	20	35 KV	6-1/2	1-1/8	1.0 Meg.	100,000
	DPX	30	65 KV	10-1/2	1-1/8	2.0 Meg.	100,000
	DVY	50	90 KV	14-1/2	1-1/2	4. Meg.	100,000
	DZW	30	40 KV	6-1/2	2	2.5 Meg.	100,000
	DZZ	90	125 KV	18-1/2	2	7.5 Meg.	100,000
HIGH MEGOHM RESISTORS % Tolerance 10, 5	HBF*	1	3,500	1	11/32	5 Meg.	25 Million
	HBM*	2	7,500	1-3/4	11/32	10 Meg.	50 Million
	HBR*	3	15,000	3	11/32	20 Meg.	100 Million
HIGH FREQUENCY RESISTORS TYPE F % Tolerances 20, 15, 10, 5	FAC□	1/4	250	9/16	.10	30 Ohms	10
	FBF*	1	375	1	5/16	20 Ohms	25
	FBM*	2	750	1-3/4	5/16	35 Ohms	50
	FBR*	3	1,400	3	5/16	65 Ohms	100
	FBV	5	2,600	5-1/2	5/16	120 Ohms	100
	FFQ	4	1,100	2-1/2	9/16	30 Ohms	50
	FFT	6	1,900	4	9/16	50 Ohms	75
	FFW	10	3,100	6-1/2	9/16	80 Ohms	100
Type G— Bands and Ferrules	GPW	20	2,750	6-1/2	1-1/8	35 Ohms	50
	GPX	30	4,750	10-1/2	1-1/8	60 Ohms	100
	GVY	50	6,750	14-1/2	1-1/2	65 Ohms	100
	GZW	30	3,000	6-1/2	2	25 Ohms	100
	GZZ	90	8,500	18-1/2	2	60 Ohms	100

• Normally supplied with lug terminals; can be supplied with wire leads if specified.

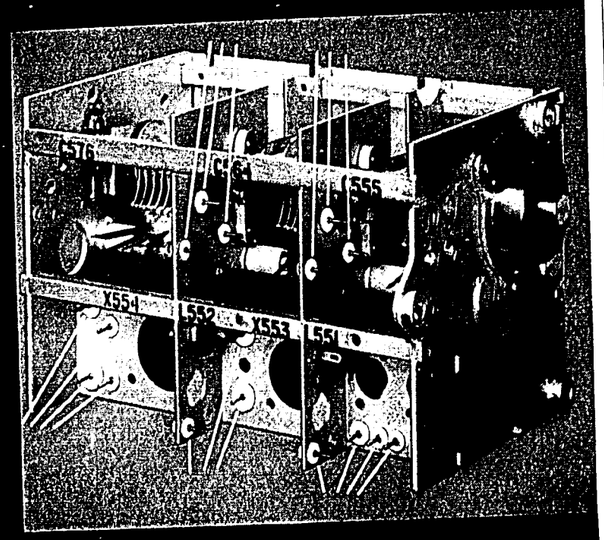
□ Axial wire leads only.

WRITE FOR CATALOG AND COMPLETE INFORMATION.

RESISTANCE PRODUCTS CO.
714 RACE ST. HARRISBURG, PENNA.

SPECIALIZING IN THE MANUFACTURE OF QUALITY RESISTORS IN ANY AMOUNT

replacing GLASS with TEFLON



Chemelec Stand-Off and Feed-Through Insulators

● Tough, resilient TEFLON made these miniatures possible—and **BETTER**—than glass-insulated components.

COMPRESSION MOUNTING, without breakage.

WITHSTAND SHOCK and vibration in service.

NO ADDITIONAL HARDWARE NEEDED.

ASSEMBLY COSTS GREATLY REDUCED.

THE PLASTIC'S "MEMORY" securely locks insulators permanently in place. Minimum pull test 10 lbs., insulator to deck, hardware to insulator.

MINIATURIZATION is easily accomplished.

SEVEN STOCK SIZES, including sub-miniatures, in both Stand-Off and Feed-Through types. Other dimensions feasible.

WRITE for Chemelec Bulletin EC-1153.

UNITED STATES

FLUOROCARBON PRODUCTS INC. DIVISION

CAMDEN 1, NEW JERSEY

Hello Again!

Many of the advertisers in the 1954 IRE DIRECTORY have greeted you before as exhibitors in the 1954 Radio Engineering Show, or as advertisers in PROCEEDINGS OF THE I.R.E. during 1954. These advertisers are listed below, identified with an S for Show exhibitors, and a P for PROCEEDINGS advertisers.

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Phelps Dodge Copper Products Corp. (S, P)	484
Photo Chemical Products (S, P)	498
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Precision Paper Tube Co. (P)	512
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Radio Receptor Co., Inc. (S, P)	30-31
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Schweber Electronics (P)	579
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Sel-Rex Precious Metals, Inc. (P)	536
Sensitive Research Instrument Corp. (S, P)	449
Servo Corp. of America (S, P)	236
Servomechanisms, Inc. (S, P)	417
Shielding, Inc. (S, P)	442
Simpson Electric Co. (S, P)	334
Sola Electric Co. (S, P)	391
Sound Apparatus Co. (P)	453
Southern Electronics Co. (S, P)	285
Spellman Television Co., Inc. (P)	344
Sperry Gyroscope Co. (S, P)	23-24
Sponge Rubber Products Co. (S)	520
Stackpole Carbon Co. (P)	84-85
Standard Piezo Co. (S, P)	222
Stelma, Inc. (S)	439
Stevens-Arnold, Inc. (S, P)	304

(Continued on page 128)



Goodness! Such growth!

During the past five years, the radio-electronic industry's spectacular growth has been paced by the increase of advertising pages in the annual IRE DIRECTORY.

In the 1949 edition, 158 advertisers took 133 pages. In the 1954 IRE DIRECTORY, the number of advertisers mushroomed to 501 and advertising pages numbered 358—an increase of 168% over the '49 edition.

The IRE DIRECTORY sells year 'round by serving over 35,000 IRE members who daily are developing and perfecting remarkable new devices. To sell ahead, put your product story before radio-electronic engineers who are planning ahead ... in the 1955 IRE DIRECTORY.

Engineers are educated to specify and buy.

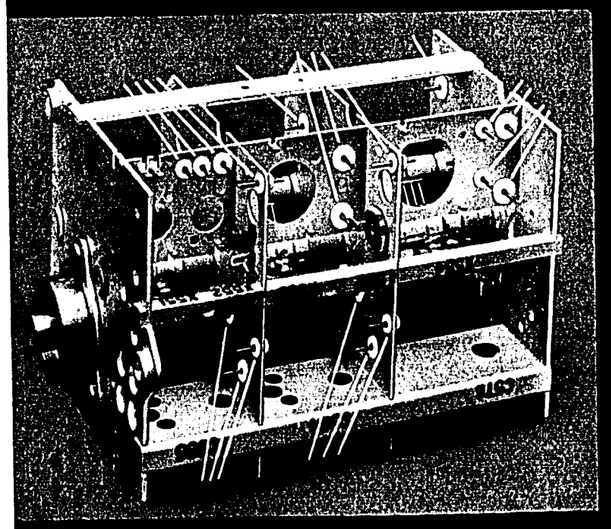
IRE DIRECTORY

Published by

The Institute of Radio Engineers

Adv. Dept., 1475 Broadway, New York 36, N. Y. BRyant 9-7550

...for superior service and economy



Chemelec Stand-Off and Feed-Through Insulators

● TEFLON's superior insulating characteristics made these miniatures possible—and **BETTER**—especially for high frequency, high voltage or current, high temperature service.

HIGHER surface and volume resistivity.

LOWER loss factor and dielectric constant.

HIGHER dielectric strength.

WIDER service temperature range (—110°F to +500°F).

ZERO water absorption (A.S.T.M. Test).

WON'T CARBONIZE under arcing.

WON'T DC-plate.

NON-FLAMMABLE, non-gassing, chemically inert.

INVESTIGATE Chemelec Stand-Off and Feed-Through Insulators for superior service and lower assembly costs.

SEVEN STOCK SIZES, including sub-miniatures. Other dimensions feasible.

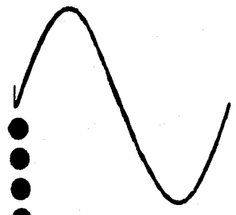
WRITE for Chemelec Bulletin EC-1153.

GASKET COMPANY

FABRICATORS OF *du Pont* TEFLON, *Kellogg* KEL-F AND OTHER PLASTICS

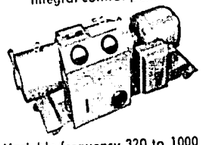
BOGUE



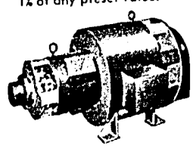


For precision Hi-Cycle power generating equipment to meet one of a myriad of special power requirements ranging from highest quality laboratory power to precision electronic testing, industry relies on Bogue Precision Power. Bogue as the recognized leader in the Hi-Cycle field offers these performance characteristics—

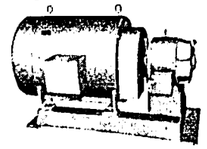
5 KW portable regulated 400 cycle motor-generator set with integral control panel.



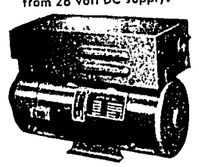
Variable frequency 320 to 1000 cycle M-G set. Bogue magnetic amplifier maintains voltage and frequency to within one-half of 1% of any preset value.



5 KW low harmonic set. 400 cycle regardless of input voltage, loading or heating.



400 cycle voltage & frequency regulated inverter. Operates from 28 volt DC supply.



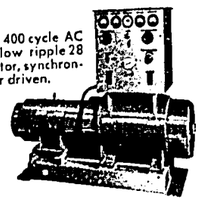
For example, Bogue special 400 cycle single shaft, two-bearing synchronous motor driven units eliminate belts, gears and other special speed changers, yet, faithfully deliver 400 cycles—exactly—no load to full load regardless of voltage variations.... truly the standard of 400 cycle power.... the reason so many prominent companies have been depending on equipment built by Bogue Electric Manufacturing Company...

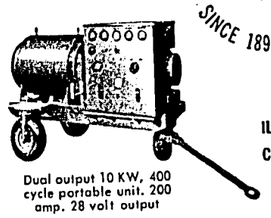
BOGUE

PRECISION ELECTRICAL EQUIPMENT SINCE 1892

50 IOWA AVENUE ● PATERSON 3, NEW JERSEY

Low harmonic 400 cycle AC generator and low ripple 28 volt DC generator, synchronous motor driven.





Dual output 10 KW, 400 cycle portable unit. 200 amp. 28 volt output

REQUEST ILLUSTRATED CATALOG 440

Hello Again!

Many of the advertisers in the 1954 IRE DIRECTORY have greeted you before as exhibitors in the 1954 Radio Engineering Show, or as advertisers in PROCEEDINGS OF THE I.R.E. during 1954. These advertisers are listed below, identified with an S for Show exhibitors, and a P for PROCEEDINGS advertisers.

(Continued from page 126)

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Stevens Mfg. Co., Inc. (S, P)	378
Stewart Stamping Co. (S, P)	499
Stoddart Aircraft Radio Co., Inc. (P)	472
Stupakoff Ceramic & Mfg. Co. (P)	4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Superior Electric Co. (S, P)	106-107
Superior Tube Co. (P)	88-89
Surprenant Mfg. Co. (S, P)	485
Switchcraft Inc. (S, P)	247
Sylvania Electric Products, Inc. (S, P)	9-14
Technology Inst. Corp. (S, P)	75-79
Telechrome, Inc. (S, P)	224
Telrex, Inc. (P)	489
Tenney Engineering, Inc. (P)	442
Tensolite Ins. Wire Co., Inc. (S, P)	483
Tetrad Co., Inc. (S)	251
Texas Instruments, Inc. (S, P)	226
Thomas & Skinner Steel Products Co. (S, P)	325
Thompson Products, Inc. (S, P)	235
Thor Seramics, Inc. (S, P)	487
Times Facsimile Corp. (P)	550
Trad Television Corp. (S, P)	451
Transformer & Electronic Specialty Co. (S)	390
Transicoil Corp. (P)	416
Triad Transformer Corp. (S, P)	232
Tung-Sol Electric, Inc. (S, P)	234
Ulanet Co., George (S, P)	379
U. S. Engineering Co. (S)	351
United States Gasket Co. (S, P)	126-127
United Transformer Co. (S, P)	582
Unitek Corporation (P)	534
Universal Aviation Equipment, Inc. (S, P)	516
Vari-L Co., Inc. (S)	392
Vectron, Inc. (S, P)	366, 462
Vibro-Ceramics Corp. (S, P)	451
Victory Engineering Corp. (S, P)	366
Vitramon, Inc. (S, P)	286
Ward Leonard Elec. Co. (S)	368
Waterman Products Co., Inc. (S, P)	112-113
Waveline, Inc. (S, P)	464
Weston Electcl. Inst. Corp. (S)	98-99
Wheeler Laboratories, Inc. (P)	490
Wiley & Sons, Inc., John (P)	557
Winchester Electronics Inc. (S, P)	73
Wind Turbine Co. (S, P)	256
Zophar Mills, Inc. (P)	527

How to Use Our Business and Product Sections

The Business and Product Sections of this Directory are included for the service of members so that this book will be complete as an index of an industry—listing Engineers, the Businesses they have founded, and the Products they have created for radio, television, communications, and electronics.

The following 4 Sections of the IRE DIRECTORY are:

Part		Page
1	Pink Section—Alphabetical List of Products & Group Arrangement	i-viii
2	Complete-Data-Spreads Section	2-128
3	Company List of Radio-Electronic Manufacturers	131-237
4	Product Index of Engineering Equipment and Parts —Advertisers Index—Facing Cover III	241-581

SECTION 2

Part 2 is one of the most informative and valuable sections of this Directory. Here manufacturers are supplying engineers with the maximum amount of detailed information possible through the use of multiple page spreads of their products (see page 2). The purpose of this section is to give the engineer a complete and ever available catalog file right in his IRE Directory where he can always see it easily and quickly. We believe that the services of this section will be of the utmost help to you.

SECTION 3

2760 firms have supplied us voluntarily with information about the components, equipment and services which they render the radio-electronic industry. The manufacturers are listed alphabetically in this section beginning on page 131 and ending on page 237. 1168 non-manufacturers such as distributors and representatives are listed under heading 10, a special directory. This index therefore gives the names of manufacturers of specific products available for purchase, with their addresses and code numbers indicating 104 types of products which they offer.

The completeness of this list depended on information voluntarily supplied us. Our most vigorous efforts may not have made it complete, but the excellent cooperation received from most of the industry is directly responsible for the up-to-dateness of our product data. We will welcome additions and suggestions for the 1955 edition.

SECTION 4

The Product sections start on page 241 and continue through 581. In both the alphabetical and the product indexes advertisers who have made it financially possible to provide a really comprehensive Directory to IRE members, have been listed in bold face type with a cross index to the page on which their display advertisement appears—giving complete information on their products and services. Non-advertisers have been listed in the product indexes giving firm name and state only. For full address the reader must turn to the alphabetical index for these companies.

To find the manufacturers of a given product, let us say "Amplifiers" look this product up in the Pink Section, preceding page 1. You will see that it is classification Number 1. A full listing of amplifier manufacturers starts on page 241. Turn to this classification in part 4.

As a service to engineers, both buyer and seller, we have included a list of 1168 firms and individuals who are distributors. Each name is further classified by number to indicate its place in the field—representative, distributor, exporter, etc. This is class #104, starting on page 559.

There are several other helpful indexes. Advertisers are given on pages 583-584 (inside back cover); and an index to 1954 Radio Engineering Show Exhibitors and Proceedings Advertisers who are in this Directory is on pages 116-128.

To get a comprehensive picture of what a given firm manufactures for engineers in our field, you will find in the alphabetical index of companies that all their products are listed by code number after the firm's name and address. These products are classified into ten separate Product Directories, serving basic sections of our industry. We have tried vigorously to make this truly a useful "Radio Engineers Directory."

Please submit all changes, corrections, additions and classification questions to Industry Research Div., Institute of Radio Engineers, 1475 Broadway, New York 36, N.Y.

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 583-584.

Key to Products, Pink Section.

Index to Spreads, 1.

Guide to Machol Thumb Indexes facing 240, 270, 400 & 476.

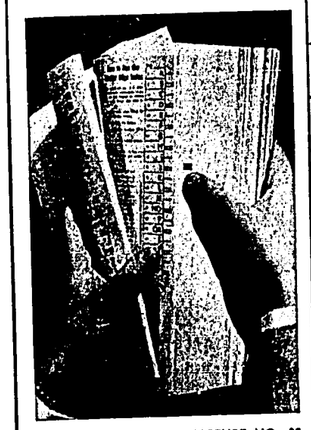
2	PART I COMPLETE DATA SPREADS
131	PART II ALPHABETICAL COMPANY LIST
241	PART III APPARATUS
271	PART IV COMPONENTS
401	PART V INSTRUMENTS & CONTROLS
477	PART VI SERVICES & MATERIALS

The Machol system will help you find both alphabetical and product sections swiftly.

131	A
139	B
147	C
157	D
161	E
169	F
173	G
177	H
181	I
185	JK
187	L
191	M
199	N
201	O
203	P
209	QR
217	S
225	T
231	U
233	VW
237	XYZ

INSTRUCTIONS

1. With the Directory open on the desk, bend the book almost double in your left hand, with your thumb just above this box.
2. From one-line or two-line symbol adjacent to the letter or subject you seek, run your eye across horizontally to a corresponding page-edge symbol.
3. Open there with right hand.



LICENSE NO. 25
MACHOL EDGE INDEX PATENT #2680630

1954 Edition prepared by The Advertising Department of The Institute of Radio Engineers, 1475 Broadway, New York 36, N.Y.
William C. Copp, Mgr.; Lillian Petranek, Asst.; Carl Maier, Production; Frank G. MacAloon, Research.

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. Audio Frequency Equipment (Products 1 to 11)
2. Broadcasting Equipment (Products 12 to 17)
3. Communications Equipment (Products 18 to 25)
4. Component Parts (Products 26 to 62)
5. Applications of Electronics (Products 63 to 70)
6. Radar, Microwave, UHF (Products 71 to 74)
7. Test & Measuring Equipment (Products 92 to 101)
8. Services and Materials (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.
9. Education & Publishing (Groups 102 & 103)
10. Distribution Functions (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

1954 I.R.E. DIRECTORY READER SERVICE REPLY CARD

Place a 2¢ stamp on one or more of the perforated cards below, and they will be promptly forwarded to the manufacturers listed on the back. If you prefer to send your specific requirements, a letter would be more advantageous, however be sure to enclose the reply card.

PLEASE PRINT IN INK OR TYPEWRITE

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

1954 I.R.E. DIRECTORY
READER SERVICE REPLY CARD

Below, for your convenience, are six perforated reply cards. Each one has enough space to list three advertisers' names and their page numbers. Forward as many cards as you have questions, and I.R.E. will promptly notify the manufacturer in question to send literature, specifications, and prices to you.

Name .....
Address .....
Company .....
Title .....

Please send further information regarding

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1954 IRE DIRECTORY

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1954 IRE DIRECTORY

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1954 IRE DIRECTORY

◀ The "KEL-F" polytrifluorochloroethylene molecule. How it would appear, greatly magnified. Dark grey indicates chlorine atoms that make this polymer unique.

KEL-F

Vital in Structural and Component Parts

for Severe CORROSIVE, ELECTRICAL, THERMAL Service

Check these Advantages of KEL-F® . . . TRI-FLUORO-CHLORO-ETHYLENE POLYMER

- CHEMICALLY INERT to *all* acids, alkalis, solvents . . . inert to metals
- HIGH DIELECTRIC properties
- WIDE TEMPERATURE UTILITY — minus 320°F to plus 390°F
- HIGH IMPACT strength — compressive strength up to 80,000 psi
- VARIABLE OPTICAL PROPERTIES . . . wide color range
- USED IN HARD, RIGID, SOFT, FLEXIBLE and dispersion forms to suit application
- DIMENSIONALLY STABLE — unaffected by moisture, age
- READILY MOLDED, FABRICATED, APPLIED — using standard equipment
- AVAILABLE FROM leading molders, extruders and fabricators . . . film . . . sheet . . . rod . . . tubing . . . extruded wire and cable coatings . . . dispersion coatings . . . oils, greases and waxes.

Non-flammable — non-porous — non-wetting — fungus-inert

TYPICAL PROVEN APPLICATIONS

CHEMICAL	– porous fillers – valve seats & discs – solid & core O rings – hose assemblies – gaskets & seals	– pump & valve discs – phragms – test tubes – gauges and gauge glasses	– drum plugs & sealed fittings – pipe, equipment & drum liners
ELECTRICAL	– switch parts – insulated wire & cable – insulators	– terminals – coil forms – molded components	– tube sockets – resistor sleeving
OTHER	– anti-hesive coatings – instrument parts	– bearings – medical goods	– low temp. valve seats

Chemical Manufacturing Division
THE M. W. KELLOGG COMPANY
P. O. Box 469 — Jersey City 3, N. J.

TECHNICAL SERVICE and DATA Available

The Technical Service Department and Molding Research Laboratory offer assistance to design and materials engineers in use of "KEL-F" polymers. Detailed data is available on properties, molding and application techniques for materials based on "KEL-F" polymer.

® Registered trade mark for The M. W. Kellogg Company's fluorocarbon polymers.

TRIFLUORO CHLORO ETHYLENE POLYMERS
MOLDING POWDERS
FLUORO CHLORO CARBON PLASTIC
DISPERSION COATINGS

Quality Components

by AMPHENOL

new

165 SERIES miniature connectors

These new miniature AN-type connectors are obtainable in two connector sizes and six contact configurations. 165 series connectors, besides their very small size, are pressure-proof and completely waterproof.

A N connectors

A complete selection of plugs, receptacles and fittings, a wide variety of insert contact arrangements. AMPHENOL AN connectors have many unique features, including gold-plated contacts and famous 1-501 blue dielectric material.

RF connectors

Made in strict accordance with government specifications, AMPHENOL RF connectors are the most efficient link between coaxial cables now available. Series include N, BN, HN, BNC, C, LC, Push-on, and splices, fittings and adapters.

RG cables

Ninety RG-/U coaxial cables are now being precision manufactured in AMPHENOL's up-to-date cable plant. In addition, AMPHENOL makes special cables, including aluminum jacketed ALJAK, miniature, triaxial, and low-noise.

new

26 SERIES miniature connectors

Miniature connectors with 5, 7 or 9 contacts, rack & panel or hex nut sizes. Hood and clamp hardware available for hex nut connectors. Fine materials, electrical efficiency, makes the 26 series ideal in miniaturized application.

Blue RIBBON connectors

FAMOUS AMPHENOL *blue* Ribbon connectors now available with pin or barrier polarization. Keyed shells and latch-lock cans are available for the barrier connectors. Both types have gold-plated contacts, AMPHENOL blue dielectric.

new

Qwik microphone connectors

Modern design makes the new QWIKs the most attractive, most efficient microphone connectors for every audio application. QWIKs are lightning-fast to use—plugs click-in to receptacles, disconnection is easily made with one hand.

AMPHENOL
AMERICAN PHENOLIC CORPORATION

Alphabetical Directory

A-1 Recording Corp., P.O. Box No. 1710, Hollywood 28, Calif., 77
Tel: HO 4-5729

AGA Div., Elastic Stop Nut Corp. of America, Dept. A12-5415, 1027 Newark Ave., Elizabeth, N.J., 50
For details see ad on page 355
Tel: Elizabeth 2-2900

A-K Manufacturing Co., Inc., 115 S. Northwest Hwy. Barrington, Ill., 75, 83, 89

A. P. W. Company, 72 W. Main St., Rockaway, N.J., 9, 34
Tel: RO 9-0643

A. R. F. Products, Inc., 7627 W. Lake St., River Forest, Ill., 1, 13, 50, 58, 64, 84, 92, 97, 100
Tel: ESterbrook 9-0345

A R & T Electronics, Inc., 1501 E. 6 St., N. Little Rock, Ark., 77, 79, 84
Tel: FR 5-6441

Abalon Precision Mfg. Corp., 540 Casanova St., New York 59, N.Y., 30, 33, 78, 79, 81
Tel: LU 9-5682

Accurate Electronics Corp., 1312 Ontario St., Cleveland 13, Ohio, 41, 79, 81, 83, 88, 89
Tel: SUperior 1-1113

Accurate Paper Tube Co., 807 N. Peoria St., Chicago 22, Ill., 81
Tel: CHesapeake 3-9646

Ace Coil & Electronics Co., 916 Lincoln Hwy., Metuchen, N.J., 34, 51, 57
Tel: ME 6-3580

Ace Electronics Associates, 125-129 Rogers Ave., Somerville 44, Mass., 51, 84
For details see ad on page 359
Tel: SO 6-5130

Ace Engineering & Machine Co., Inc., 3644 N. Lawrence St., Philadelphia 40, Pa., 93
Tel: REgent 9-1019

Acheson Colloids Co., Div. of Acheson Industries, 1555 Washington Ave., Port Huron, Mich., 85, 91
Tel: YUkon 4-4171

Acme Electric Corp., 44 Water St., Cuba, N.Y., 46, 57, 62
For details see ad on page 381
Tel: Cuba 4

Acme Electronics Div., Pasadena, Calif., See: Aerovox Corp.

Acme Telectronix Div., Nea Service, 1200 W. 3 St., Cleveland 13, Ohio, 1, 4, 22, 26, 30, 33, 46, 77, 79, 84, 95, 96, 103
Tel: MA 1-7300

Acme Wire Co., 1225 Dixwell Ave., New Haven 14, Conn., 34, 75, 83, 85
Tel: LOcust 2-2171

Acoustical Manufacturing Co., 30 St. Peters Rd., Huntingdon, Hunts., England, 1, 7, 8, 14
Tel: HUntingdon 361

Acro Products Co., 369 Shurs Lane, Philadelphia 28, Pa., 4, 34, 57
Tel: Ivy Ridge 3-5969

Acro Switch Div., Acro Mfg. Co., 2040 E. Main St., Columbus 16, Ohio, 54
Tel: FA 2143

Acro Tool & Die Works, 4554 Broadway, Chicago 40, Ill., 86
Tel: LO 1-1807

Acro Transformer & Mfg. Corp., 26-02 Fourth St., Long Island City 2, N.Y., 4, 34, 57
Tel: RAvenswood 6-2650

Acromark Company, Morrell St., Elizabeth 4, N.J., 79, 81, 86
Tel: ELizabeth 2-6500

Adams & Westlake Co., 1025 N. Michigan St., Elkhart Ind., 50
Tel: ELkhart 2-0550

Adair Engineering Co., George P., 1610 Eye St., N.W., Washington 6, D.C., 77, 84
Tel: EXecutive 3-1230

Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y., 6, 13, 16, 24, 42, 45, 68
Tel: New Rochelle 6-1620

Admiral Corp., 3800 Cortland St., Chicago 47, Ill., 9, 14, 18, 21, 68
Tel: SPaulding 2-0100

Advance Electric & Relay Co., 2435 N. Naomi St., Burbank, Calif., 50
Tel: ROckwell 9-1446

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 1, 26, 39, 43, 63, 68, 84, 92, 94, 100
For details see ad on page 401
Tel: PRescott 8-3687

Advance Insulated Wire & Cable Co., 25 Tingley Lane, Plainfield, N.J., 75
Tel: PLainfield 6-1552

Advance Recording Products Co., 36-12 34 St., Long Island City 6, N.Y., 10
Tel: ST 5-7837

Advanced Electronics, Inc., 94 Silas Deane Hwy., Rocky Hill, Conn., 50, 64, 79, 84, 92, 94

Advanced Vacuum Products, Inc., 22 Liberty St., Stamford, Conn., 76, 79, 82
Tel: Stamford 3-8934

Aero Electronics Co. 1512 N. Wells St., Chicago 10, Ill., 18, 26, 65, 69, 77, 79, 84

Aero Instrument Co., 11423 Vanowen St., North Hollywood, Calif., 15, 43, 50, 96, 97
Tel: STanley 7-5433

Aero Research Instrument Co., 1901 N. Hermitage Ave., Chicago 22, Ill., 63
Tel: BRunswick 8-5787

Aerocoil, Inc., 24 Cliff St., Jersey City, N.J., 27, 34, 39, 40
Tel: JOurnal Square 2-7446-7

Aeroflex Laboratories, Inc., 34-06 Skillman Ave., Long Island City 1, N.Y., 36, 63, 64, 69, 84
Tel: STillwell 4-7000

Aerohm Corp., 282 Moody St., Waltham 54, Mass., 51
Tel: WA 5-9021

Aerojet Engineering Div., General Tire & Rubber Co., P.O. Box 296, Azusa, Calif., 69

Aerolite Electronics Corp., 507-26 St., Union City, N.J., 6, 27, 32, 34, 35, 39, 41, 45, 54, 79, 81, 88, 89
For details see ad on page 500
Tel: UNion 3-2055

Aerolux Light Corp., 653 11 Ave., New York 36, N.Y., 45, 49, 60, 82, 84
Tel: CIrcle 6-5324

Aeronautical Communications Equipment, 3090 S.W., 37 Ave., Miami 33, Fla., 18, 25, 71
Tel: MIami 48-6503

Aeronautical Electric Co., 5656 Northwest Hwy., Chicago 30, Ill., 45, 79, 81
For details see ad on page 339
Tel: Spring 7-1616

Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y., 6, 8, 18, 26, 27, 36, 40, 44, 75, 79, 81, 84
Tel: Pioneer 6-6770

Aeroquip Corp., 300 S. East Ave., Jackson, Mich., 99
Tel: JAckson 2-0361

Aerovox Corp., 740 Belleville Ave., New Bedford Mass., 1, 2, 3, 4, 6, 11, 16, 26, 31, 33, 34, 39, 40, 46, 47, 51, 57
Tel: New Bedford 4-9661

Affiliated Products, Inc., 4802 N. Broad St., Philadelphia 41, Pa., 40

(Continued on page 131)

Code Numbers TELL YOU

what each company does or makes. The number after each address refers you to the 104 Product Listings, in which detailed product or service information on the firm will be found.

	Page
PINK SECTION gives a guide to the products and services listed in the Product Directories.	I-viii
COMPLETE DATA SPREADS	1
ALPHABETICAL LIST OF FIRMS	131
PRODUCTS AND SERVICES	
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3. Communications	263
II. Components	
4. Component Parts	271
III. Instruments & Controls	
5. Electronic Applications	401
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IV. Services and Materials	
8. Services, Materials and Consultants	477
9. Education & Publishing	551
10. Distribution	559
Index to Advertisers Facing Cover	3

BLILEY
Crystals....



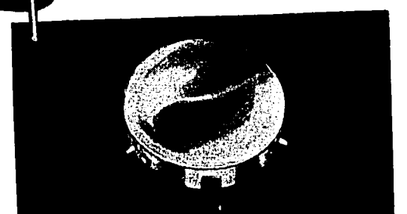
BLILEY BH8
Freq. 55-200 kc
550-2,000 kc

BLILEY BH9A
Freq. 90-200 kc

BLILEY BH6A
Freq. 200-500 kc
1,000 to 100,000 kc.

BLILEY
BANTAM BX
Freq. 10,000-100,000 kc

These hermetically sealed crystal units typify the precision and dependability that you expect from 23 years of Bliley research, craftsmanship and production experience.



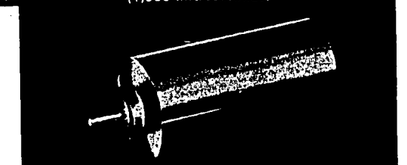
Typical Bliley Custom-built Delay Line
(1,000 microseconds)

BLILEY
SOLID ULTRASONIC DELAY LINES

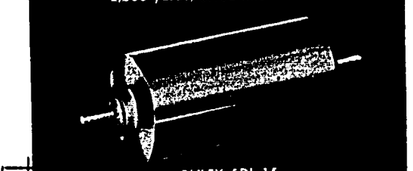
Bliley solid ultrasonic delay lines provide precise delay intervals for electronic equipment.

Standard models, SDL-15 and SDL-16, are available immediately from production. Each unit is in an hermetically sealed case. Carrier frequency is 30 mc. Attenuation is 26 db into 1,000 ohms. Bandwidth is 8 mc.

Custom delay lines are engineered to specific requirements. When requesting quotations, please send full specifications.



BLILEY SDL-16
(Single Ended Standard Type)
2,000 yards, 6.102 microseconds



BLILEY SDL-15
(Double Ended Standard Type)
1,000 yards, 3.051 microseconds



BLILEY CRYSTAL OVENS

Bliley ovens hold crystal temperatures within close limits for high stability. Designed especially for use with Bliley crystal units.

BLILEY TCO-1A

TECHNICAL LITERATURE AVAILABLE:
Bulletin No. 47—Crystals, Ovens, Frequency Standards, Mil-type Specification Index
Bulletin No. 45-A—Solid Ultrasonic Delay Lines
Bulletin No. 46-A—"Bantam BX" Crystals
Bulletin No. 44-A—Amateur, Standard Frequency, Ship-To-Shore, and TV Service Crystals

Bliley CRYSTALS

UNION STATION BUILDING

Alphabetical Directory

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Ahrendt Instrument Co., 4910 Calvert Road, College Park, Md., 26, 34, 46, 51, 63, 64, 69, 84
Tel: UN 4-5678

Air Associates, Inc., 511 Joyce St., Orange, N.J., 14, 18, 21, 25, 26, 44, 54, 63, 64, 69, 70, 79, 81, 84, 100
Tel: ORange 6-4200

Air Associates, Inc., Teterboro, N.J., 18, 21, 24, 25, 40, 57, 64, 65, 66, 70, 72, 73, 77

Airborne Accessories Corp., 1414 Chestnut Ave., Hillside 5, N.J., 69
Tel: WAverly 7-1700

Airborne Instruments Laboratory, 160 Old Country Rd., Mineola, L.I., N.Y., 47, 79, 84, 94, 95, 97, 100
Tel: Pioneer 2-0600

Aircom, Inc., 354 Main St., Winthrop 52, Mass., 97
Tel: OCean 3-4255

Aircraft Armaments, Inc., 4415 Reistertown Rd., Baltimore 3, Md., 84
Tel: HUnter 6-5980

Aircraft-Marine Products, Inc., Chemical & Dielectric Div., 155 Park St., Elizabethtown, Pa., 31, 46
For details see ad on page 281
Tel: ELizabethtown 420

Aircraft-Marine Products, Inc., 2100 Paxton St., Harrisburg, Pa., 6, 31, 35, 81
For details see ad on page 281
Tel: HArrisburg 4-0101

Aircraft Radio Corp., Boonton, N.J., 18, 24, 35, 81, 100
Tel: BOonton 8-1800

Aircraft Transformer Corp., West & Willow Aves., Long Branch, N.J., 26, 40, 57
For details see ad on page 379
Tel: Long Branch 6-6250

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 34, 35, 45, 48, 50, 51, 54, 79, 85
For details see ad on page 491
Tel: HEmlock 6-2230

Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, L.I., N.Y., 29, 44, 69
For details see ad on page 336
Tel: AMityville 4-6122

Airmec, Ltd., High Wycombe Bucks, England, 26, 46, 57, 62, 63, 64, 66, 68, 92, 94, 96, 99, 100
Tel: High Wycombe 2060

Airpax Products Co., Middle River, Baltimore 20, Md., 4, 24, 36, 46, 50, 57, 79, 84
Tel: MUrdock 6-9100

Airphone Co., Inc., 309 Calumet Bldg., Miami, Fla., 7, 84, 86, 88, 92, 93
Tel: Miami 9-2228

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 38, 40, 54, 58, 71, 73, 74, 77, 81, 84, 86, 87, 88
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Tel: LInden 3-1000

Airtronix Development Corp., 20-26 W. 22 St., New York 10, N.Y., 1, 9, 14, 26, 84
Tel: ORegon 5-2565

Ajax Condenser Co., Inc., 932 W. Wrightwood, Chicago 14, Ill., 31
Tel: GR 7-0660

Akron Rubber Co., 53 Warren St., New York 7, N.Y., 81, 88
Tel: DI 9-3636

Aladdin Radio Industries, Inc., 705 Murfreesboro Rd., Nashville, Tenn., 34, 37

Alcar Instruments, Inc., 20-21 Wagaraw Rd., Fair Lawn, N.J., 34, 69, 77, 84, 86
Tel: HA 7-6328

Alco Electronics Mfg. Co., 3 Wolcott Ave., Lawrence, Mass., 14, 46, 84, 94
Tel: LAwrence 3-0370

Alcor Electronics Corp., 180 Lafayette St., New York 13, N.Y., 18, 20, 26, 30, 33, 38, 46, 70, 84
Tel: WA 5-3111

Alden Electronics & Impulse Recording Equip. Co., Washington St., Westboro, Mass., 1, 22, 26, 46, 70, 84, 95
For details see ad on page 296
Tel: Westboro 467

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 6, 22, 27, 30, 31, 33, 34, 35, 37, 41, 45, 47, 53, 55, 75, 79, 81, 88, 95
For details see ad on page 296
Tel: Brockton 160

Alden Systems Co., 11 Alden Res. Center, Westboro, Mass., 22, 79, 84, 86
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Alfax Paper & Engineering Co., Washington St., Westboro, Mass., 22
Tel: WEstboro 467

Alford, Andrew, Consulting Engineers, 299 Atlantic Ave., Boston 10, Mass., 77, 84
Tel: HAncock 6-2338

Alford Manufacturing Co., Inc., 299 Atlantic Ave., Boston 10, Mass., 12, 27, 40, 97
Tel: HAncock 6-2338

All Channel Antenna Corp., 70-07 Queens Blvd., Woodside 77, N.Y., 27
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All Star Products, Inc., P.O. Box 187, Defiance, Ohio, 32, 34, 42
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All-Tronics, Inc., 2 Secatoag Ave., Pt. Washington, N.Y., 40, 77
Tel: PO 7-3634

Allard Instrument Corp., 30 Broad St., New York 4, N.Y., 26, 44, 50, 54, 64, 69, 79, 84
Tel: BO 9-0627

Allegany Instrument Co., Inc., 1000 Oldtown Road, Cumberland, Md., 1, 26, 94, 99
Tel: CUmberland 931

Allegheny Ludlum Steel Corp., 2000 Oliver Bldg., Pittsburgh 22, Pa., 78, 79, 82, 87
Tel: GRant 1-1085

Allegro Electronics Corp., 226 New York Ave., Huntington, L.I., N.Y., 1, 9
Tel: HUntington 4-7225

Allen-Bradley Co., 114 W. Greenfield Ave., Milwaukee 4, Wis., 31, 37, 50, 51, 54
Tel: ORchard 1-2000

Allen-Stevens Corp., 90-35 Van Wyck Exp., Jamaica 35, N.Y., 35, 79
Tel: OI 8-7910

Alliance Manufacturing Co., Lake Park Blvd., Alliance, Ohio, 9, 26, 27, 44, 71
Tel: ALliance 1-5361

Alliance Motors Div., Easy Washing Machine Co., Schell Ave., Toronto 10, Canada, 9, 29, 44
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Allied Allegri Co., Inc., 141 River Rd., Nutley, N.J., 34, 75, 81, 84, 86
Tel: NU 2-3910

Allied Chemical & Dye Corp., Barrett Div., 40 Rector St., New York 6, N.Y., 83, 89
Tel: HAnover 2-7300

Allied Chemical & Dye Corp., General Chemical Div., 40 Rector St., New York 6, N.Y., 80, 93
Tel: HAnover 2-7300

Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y., 34, 42, 50
Tel: BU 8-7403

Allied Industries, Inc., 2512 Woodland Ave., Louisville 10, Ky., 35
Tel: ARlington 4649

Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 104
For details see ad on page 568
Tel: Haymarket 1-6800

Allied Recording Products Co., 32-32 Greenpoint Ave., Long Island City 1, N.Y., 10, 11, 16
Tel: STillwell 4-2318

Allied Research & Engineering, Inc., 6916 Santa Monica Blvd., Los Angeles 38, Calif., 27, 71, 74, 79
Tel: HO 2-1251

Allies' Products Corp., 1028 Connecticut Ave., N.W., Washington 6, D.C., 51
For details see ad on page 359
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Allis Co., Louis, 427 E. Stewart St., Milwaukee 7, Wis., 44
Tel: SHeridan 4-2510

All-Metal Screw Products Co., Inc., Garden City, N.Y., 81
Tel: Pioneer 1-1200

Alloy Metal Wire Co., Div. of H. K. Porter Co., P.O. Box 316, Prospect Park, Pa., 75
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Tel: Wasburn 8-6500

Alloy Metalsmiths, Inc., 85 Commerce Rd., Cedar Grove, N.J., 33, 79
Tel: VErona 8-8807

Alonge Products, Inc., 163 W. 23 St., New York 11, N.Y., 10
Tel: WAtkins 4-2815

Alpha Metals, Inc., 61 Water St., Jersey City 4, N.J., 87, 90
For details see ad on page 544
Tel: HEnderson 4-6778

Alpha Wire Corp., 430 Broadway, New York 13, N.Y., 75
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Tel: CAnal 6-6800

Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif, 1, 4, 5, 7, 8, 9, 14, 16, 30, 33, 46, 57, 58, 67, 84, 92
Tel: CRestview 5-5101

Altec Lansing Corp., 161 Sixth Ave., New York 13, N.Y., 1, 4, 5, 7, 8, 14, 16, 30, 46, 57, 58
Tel: ALgonquin 5-3636

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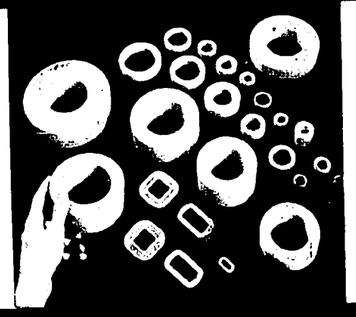
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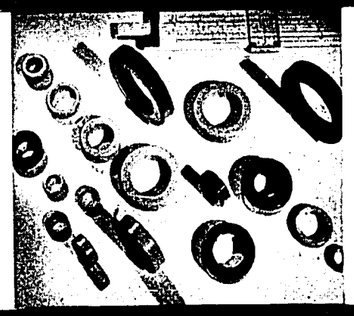
In 3-phase applications, the use of "E" Cores provides weight and size reduction, as well as higher efficiency and possible cost savings. Rigid standard tests are employed for both "C" and "E" types of cores, and special tests where required.



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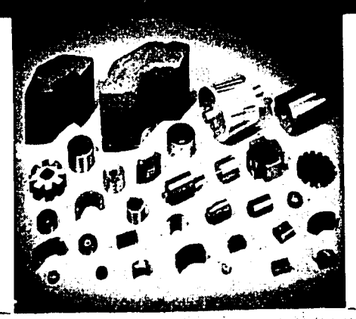
Used for magnetic amplifiers, pulse transformers, current transformers, wide-band transformers, non-linear retard coils, peaking strips, reactors, etc., this gapless type of core construction results in maximum effective working permeability with minimum flux leakage.



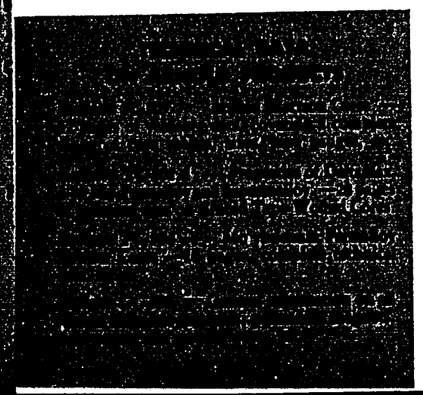
For use in loading coils, filters, broadband carrier systems and networks, for frequencies up to 200 kc, these Toroids provide high Q in a small volume. Characterized by low eddy current and hysteresis losses.

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These Moly Permalloy Powder Toroids are available in a wide range of sizes, to obtain nominal inductances as high as 281 mh/1000 turns. They are given various types of enamel and varnish finishes, some of which permit winding with heavy Formex insulated wire without supplementary insulation over the core.



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American Aluminum Co., 378 Jelliff Ave., Newark 8, N.J., 79, 81, 91
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American Brass Co., 414 Meadow St., Waterbury, Conn., 66, 75, 79, 81, 87, 91
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American Chronoscope Corp., 316 W. First St., Mt. Vernon, N.Y., 92, 94, 96
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American Condenser Co., 4410 N. Ravenswood Ave., Chicago 40, Ill., 31
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American Electric Cable Co., 181 Appleton St., Holyoke, Mass., 26, 75
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American Electric Motors, 4811 Telegraph Rd., Los Angeles, Calif., 29, 44

American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich., 75, 86
Tel: TRinity 5-2505

American Electronic Laboratories, 641 Arch St., Philadelphia 6, Pa., 12, 13, 26, 46, 63, 64, 65, 67, 69, 71, 72, 73, 77, 79, 84, 92, 93, 94, 97, 99
Tel: LOmbard 3-7882

American Electro Metal Corp., 320 Yonkers Ave., Yonkers 2, N.Y., 75, 86, 87, 91
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American Electronic Mfg., 4811 Telegraph Rd., Los Angeles, Calif., 44, 69

American Elite, Inc., 1775 Broadway, New York 19, N.Y., 8, 104
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American Encaustic Tiling Co., Inc., 9 St. and Kenilworth Ave., Lansdale, Pa., 64, 79, 97, 100
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American Gas Furnace Co., Spring St., Elizabeth, N.J., 79, 86
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American General Thermostat Corp., 2066 Bronx St., New York 60, N.Y., 54, 56
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American Hydromath Corp., 145 W. 57 St., New York 19, N.Y., 63, 64, 77

American Instrument Co., Inc., 8030 Georgia Ave., Silver Spring, Md., 50, 56, 57, 93, 99
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American Insulator Corp., New Freedom, Pa., 30, 79, 88
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American Laubscher Corp., 333 W. 52 St., New York 19, N.Y., 81
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American Lava Corp., Cherokee Blvd., and Mfrs. Rd., Chattanooga 5, Tenn., 31, 32, 37, 76, 81, 82, 83, 88, 91
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American Machine & Foundry Co., 261 Madison Ave., New York, N.Y., 28, 31, 62, 63, 64, 69, 71, 79, 81, 83, 85, 94
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American Machine & Foundry Co., Electronics Div., 1085 Commonwealth Ave., Boston 15, Mass., 84, 94
Tel: Algonquin 4-4234

American Machine & Foundry Co., Leland Electric Co., Div., 1501 Webster St., Dayton 4, Ohio, 36, 44
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American Machine & Foundry Co., Raleigh Eng. Div., 509 W. North St., Raleigh, N.C., 28, 64
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American Metal Co., Ltd., 61 Broadway, New York 6, N.Y., 87
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Tel: BO 9-1800

American Mica Insulation Co., 410 Frelinghuysen Ave., Newark 5, N.J., 31, 79, 83, 91
Tel: BI 3-1342

American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif., 8, 9
Tel: SYcamore 6-9008

American Molded Products Co., 2727 W. Chicago Ave., Chicago 22, Ill., 83, 88
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American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 19, 27, 35, 53, 71, 74, 75, 79, 83
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Tel: BIshop 2-1000

American Products Mfg. Co., Inc., 8127 Oleander St., New Orleans 18, La., 83, 85
Tel: GA 1501

American Quartz Labs., Route 9-D, Garrison, N.Y., 38
Tel: GArrison 4-3338

American Radio & Television, Inc., Fifth and Cornish Sts., N. Little Rock, Ark., 9, 30, 77, 84
Tel: LIttle Rock 5-6441

American Radio Hardware Co., 152 Macquesten Pkwy. S., Mt. Vernon, N.Y., 6, 39, 45, 53, 54, 55, 79, 81, 88, 89
Tel: FA 4-4200

American Radionic Co., Inc., 33 Flatbush Ave., Brooklyn 17, N.Y., 31
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American Relay & Controls, Inc., 3621 Howard St., Skokie, Ill., 50
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American Screen Products Co., 807 N.W. 20 St., Miami 37, Fla., 27, 71
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American Screw Co., 1670 W. Main St., Willimantic, Conn., 81
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American Silver Co., Inc., 36-07 Prince St., Flushing 54, N.Y., 87, 90
Tel: FL 3-8012

American Smelting & Refining Co., Federated Metals Div., 120 Broadway, New York 5, N.Y., 87, 90
Tel: REctor 2-9740

American Television Mfg. Corp., 5050 N. Broadway, Chicago 40, Ill., 14, 26, 39, 59, 60, 84, 97, 101, 102
Tel: UPtown 8-6300

American Television & Radio Co., 300 E. 4 St., St. Paul 1, Minn., 36
For details see ad on page 303
Tel: CE 3791

American Thermo-Electric Co., 198-11 Hollis Ave., Hollis 12, N.Y., 54
Tel: HO 8-2900

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Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y., 31, 48, 49, 52, 59, 60, 61
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Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 8, 50, 60
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Amplifier Corp. of America, 398 Broadway, New York 13, N.Y., 1, 11, 46, 62
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Ampro Corp., 2835 N. Western Ave., Chicago, Ill., 11

Amy, Aceves & King, Inc., 11 W. 42 St., New York 36, N.Y., 26, 27, 40
Tel: LO 5-6622

Anaconda Wire & Cable Co., 25 Broadway, New York 4, N.Y., 75
Tel: HAnover 2-6300

Analytical Measurements, Inc., 585 Main St., Chatham, N.J., 94
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Anchor Metal Co., 244 Boerum St., Brooklyn 6, N.Y., 66, 81, 87, 90
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Anchor Plastics Co., Inc., 36-36 36th St., Long Island City 6, N.Y., 83, 89
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Anchor Specialty Mfg. Co., 300 N. Industrial Ave., Teterboro, N.J., 30, 79, 81, 84, 86, 93, 94
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Apahouser Corp., 104 Brookline Ave., Boston 15, Mass., 47, 79, 81
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Apex Coated Fabrics Co., Inc., 12-16 E. 22 St., New York 10, N.Y., 81

Apple Frequency Measuring Service, H.L., 409 Union Ave., Burlington, N.C., 15, 96
Tel: BUrlington 6-0964

Applegate & Co., C. J., 1816 Grove St., Boulder, Colo., 1, 20, 46, 62, 64, 65, 67, 84
Tel: HI 28750

Appliance & Electronics Div., Avco Mfg. Corp., 1329 Arlington St., Cincinnati 25, Ohio, 1, 14
Tel: KI 6600

Applied Electronics Co., Inc., 1246 Folsom St., San Francisco 3, Calif., 14, 23, 24
Tel: MArket 1-2634

Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J., 54, 70
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Tel: Plainsboro 3-4141

Approved Electronic Instr. Corp., 928 Broadway, New York 10, N.Y., 1, 14, 58, 100, 101
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Arc Equipment Co., 85 Fifth Ave., Paterson 4, N.J., 13, 46, 84

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Arcturus Electronics, Inc., General Electronics Div., 101 Hazel St., Paterson, N.J., 49, 59, 60, 61
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Ardente Acoustic Laboratories, Ltd., 62 Horn Lane, Acton W3, London, England, 1, 35, 50, 57
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Aremac Associates, 329 W. Washington St., Pasadena 3, Calif., 70, 99
Tel: SY 71129

Arenberg Ultrasonic Laboratory, 94 Green St., Jamaica Plain, Mass., 39, 77, 84, 97
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Arey Machine Co., 38 Long Ave., Hillside 5, N.J., 6, 35, 75
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Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 15, 40, 64, 77, 84, 93, 103
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Armour Research Foundation of Ill. Inst. of Tech., 3201 S. Michigan, Chicago 16, Ill., 84, 102
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Armstrong Cork Co., Liberty St., Lancaster, Pa., 81, 85
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Arnhold Ceramics, Inc., 1 E. 57 St., New York 22, N.Y., 31, 32, 48, 51
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Arnold Engineering Co., Dept. P-81, P.O. Box G, Marengo, Ill., 37, 42
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Arro Expansion Bolt Co., North Boone Ave., Marion, Ohio, 27
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Arrow-Hart & Hegeman Electric Co., 103 Hawthorne St., Hartford 6, Conn., 54
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Arrow Radio Co., 1829 Davenport Rd., Toronto 9, Ont., Canada 31, 40
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Art Wire & Stamping Co., 3-B Boyden Pl., Newark 2, N.J., 79, 90, 91
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Tel: MItchell 5-6010

Asco Sound Corp., 115 W. 45 St., New York 36, N.Y., 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 14, 16
Tel: JU 2-1750

Asheville-Schoonmaker Mica Co., 900 Jefferson Ave., Newport News, Va., 31
Tel: Newport 7-1251

Askania Regulator Co., 240 E. Ontario, Chicago 11, Ill., 69
Tel: WH 4-3700

Assembly Products, Inc., Main at Bell St., Chagrin Falls, Ohio, 43, 50, 64
Tel: CH 7-7374

Associated Electronics Co., 132 Nassau St., New York 7, N.Y., 77, 102, 103
Tel: BE 3-3912

Associated Eng. Corp. of Boston, 65 Kent St., Brookline 46, Mass., 6, 46, 77, 84
Tel: ASpinwall 7-4664

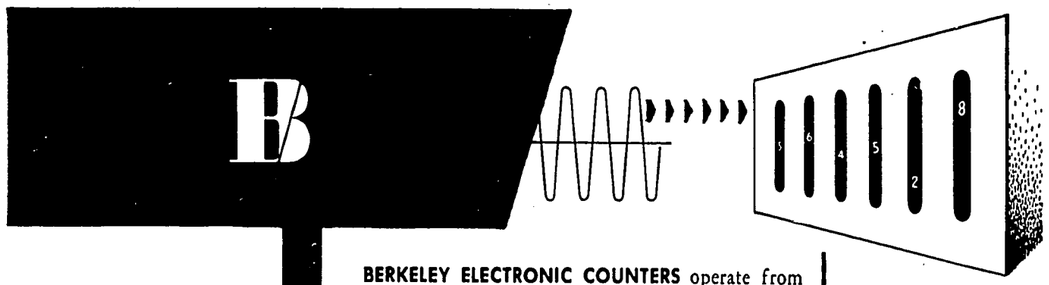
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill., 76, 77, 81, 86
Tel: RAndolph 6-1880

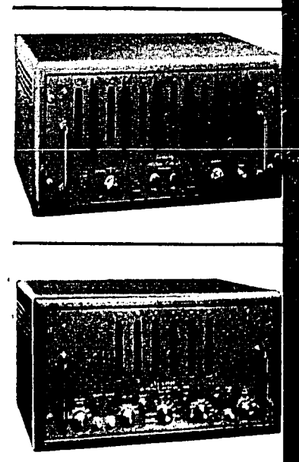
Associated Publishing Services, Inc., 14 S. Park St., Montclair, N.J., 103
Tel: MOntclair 2-9319

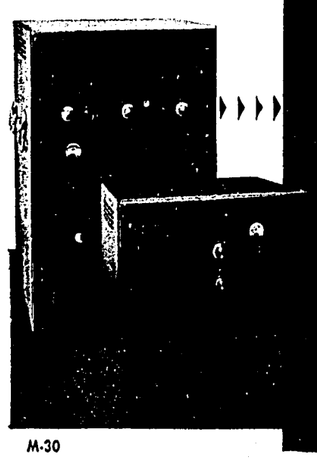
Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill., 65, 94
Tel: COrnelia 7-4040

Associated Specialties Co., 1751 Main St., Orefield, Pa., 46
For details see ad on page 339
Tel: EX 5-1275

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BERKELEY ELECTRONIC COUNTERS operate from closing contacts, photocells, magnetic or stylus pickups, or any means that will produce a positive potential of at least 1 v. Model 5001, in ruggedized industrial case with tamperproof transparent cover, handles up to 100 counts per second and lists at $148.00; Model 410, 10,000 counts per second, $330.00. Units with count rates to 1,000,000 per second available.

Applications:

Counting of manufactured objects, stacked sheets, motions; electrical, mechanical, physical or optical events.

BERKELEY PRESET COUNTERS produce an output signal when the desired number of counts have accumulated. Presetting is accomplished by depressing the desired pushbutton in each column of digits; manual or automatic reset. Maximum count rate is 40,000 per second. Standard models range from the 2-column Model 5422 at $375.00 to the 6-column Model 5426 at $795.00. Double pre-set models available.

Applications:

Counting and control of objects for packaging; coil winders; cutting stock to length; overspeed control; time delay generator; etc.

BERKELEY UNIVERSAL COUNTER AND TIMER multipurpose instruments provide direct reading of elapsed time with accuracy to ± 1 microsecond, frequency measurement to 1 megacycle with accuracy of ± 1 cycle, period measurement from 0 cycle upward with accuracy to ± 1 microsecond, and counting to 1 megacycle. Model 5510, $1,100.00.

Applications:

Precision tachometry, measurement of pressure, flow, frequency, velocity, viscosity, elasticity, time interval measurement, timer calibration, timing relay, shutter action, etc.

BERKELEY FREQUENCY MEASURING EQUIPMENT covers the full range of frequency measurement applications, and includes the first complete monitoring and recording system commercially available. This system indicates in digital form frequencies to 515 mc. having input levels of 100 millivolts or more. Accuracy is ±1 cycle ± crystal stability. Frequency meter prices range from $560.00 for the 20 cycle-100 KC Model 5556 to $1,785.00 for the 0-42 mc. Model 5570. Prices of complete systems, including converters to 515 mc., selective amplifier and printed readout, on request.

Applications:

Filter and crystal testing, oscillator calibration and testing, design and testing of telemetering, transmitter and receiver equipment, transmitter monitoring, etc.

M-30

Complete information and application data available on request; please address Dept. N13

Berkeley

Note: All prices f.o.b. factory.

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Tel: HUmboldt 2-7800

Atlantic Electronics Corp., 4 Manhasset Ave., Pt. Washington, N.Y., 1, 26, 34, 41, 63, 64, 69, 77
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Tel: POrt Washington 7-3703

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Atlas Engineering Co., Inc., 3 Edgewood St., Roxbury 19, Mass., 26, 34, 42, 46, 57, 69, 77, 94
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Atlas Resistor Co., 423 Broome St., New York 13, N.Y., 51
Tel: CA 6-1054

Atlas Sound Corp., 1449 39 St., Brooklyn 18, N.Y., 7, 8
Tel: GEdney 8-5500

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Audio Consultants, 1056 Sheridan Ave., New York 56, N.Y., 1, 77, 84
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Audio Devices, Inc., 444 Madison Ave., New York 22, N.Y., 9, 10

Audio Equipment Co., Inc., 805 Middle Neck Rd., Great Neck, N.Y., 7
Tel: GReat Neck 4-8480

Audio Industries, Inc., 532 W. Fourth St., Michigan City, Ind., 9, 10, 11, 14
Tel: MIchigan City 7-7251

Audio Instrument Co., 133 W. 14 St., New York 11, N.Y., 8, 63, 77, 92, 95
Tel: ON 5-7820

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Audio-Master Corp., 17 E. 45 St., New York 17, N.Y., 7, 9, 10, 11

Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif., 63, 70, 97
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Auricon Div., Berndt-Bach, Inc., 7377 Beverly Blvd., Los Angeles 36, Calif., 1, 9, 16, 44
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Automatic Electric Co., 1033 W. Van Buren, Chicago 7, Ill., 6, 8, 20, 25, 31, 45, 50, 51, 54, 73, 81
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Automatic Temperature Control Co., 5212 Pulaski Ave., Philadelphia 44, Pa., 50, 63, 64, 65, 69
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Auto-Test, Inc., 600 S. Michigan, Chicago 5, Ill., 33, 43, 46, 57, 77, 79, 84
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Avery Adhesive Label Corp., 1616 S. California St., Monrovia, Calif., 81
Tel: ELliott 8-2524

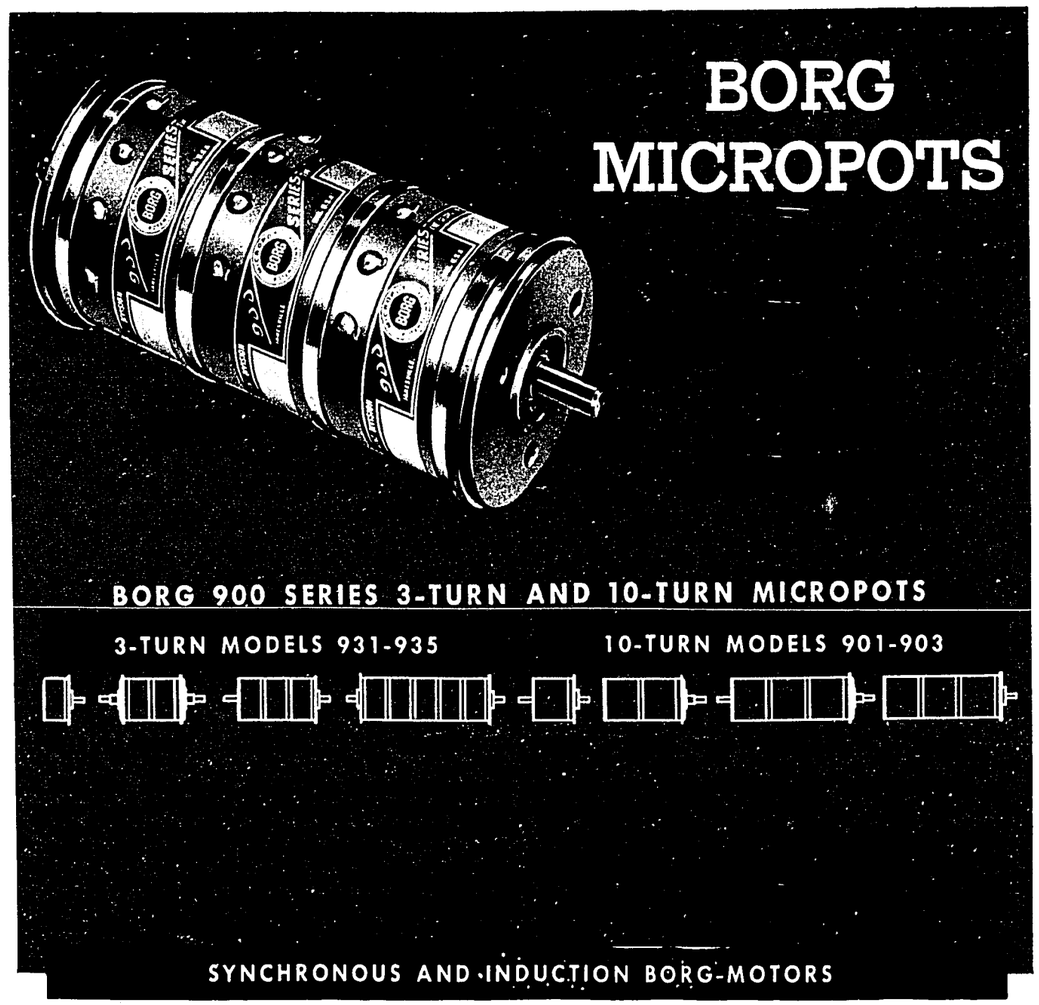
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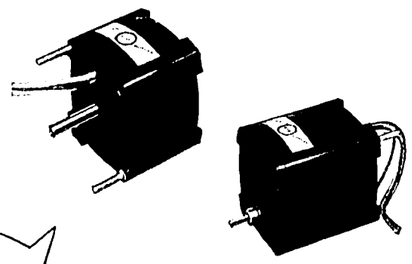
Babillus, John, 1381 Elmhurst Dr. N.E., Cedar Rapids, Iowa, 77
Tel: Cedar Rapids 2-4400

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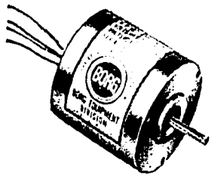


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Bache & Co., Semon, 636 Greenwich St., New York 14, N.Y., 93

Baer Company, N.S., 1-11 Montgomery St., Hillside 5, N.J., 79, 83, 89
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Bakelite Co., Div. Union Carbide & Carbon Corp., 30 E. 42 St., New York 17, N.Y., 83, 85, 89
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Barber & Howard, 120 East Ave., Westerly, R.I., 1, 14

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Bart Laboratories Co., Inc., Dept. IRE-54, 227 Main St., Belleville 9, N.J., 71, 74, 79, 97
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Baruch Laboratories, 1476 Broadway, New York 36, N.Y., 77
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Bassett Inc., Rex, 1314 N.E. 17 Court, Fort Lauderdale, Fla., 12, 13, 14, 15, 18, 19, 23, 24, 25, 27, 38, 43, 46, 96
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Bauman & Bluzat, 2753 W. North Ave., Chicago 47, Ill., 104
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Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N.Y., 38
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Bead Chain Mfg. Co., 60 Mountain Grove St., Bridgeport 5, Conn., 81, 91
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Becker Electronics Mfg. Corp., 1091 Rockaway Ave., Valley Stream, N.Y., 7
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Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio, 1, 5, 11, 46
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Bell Television, Inc., 254 W. 54 St., New York 19, N.Y., 14
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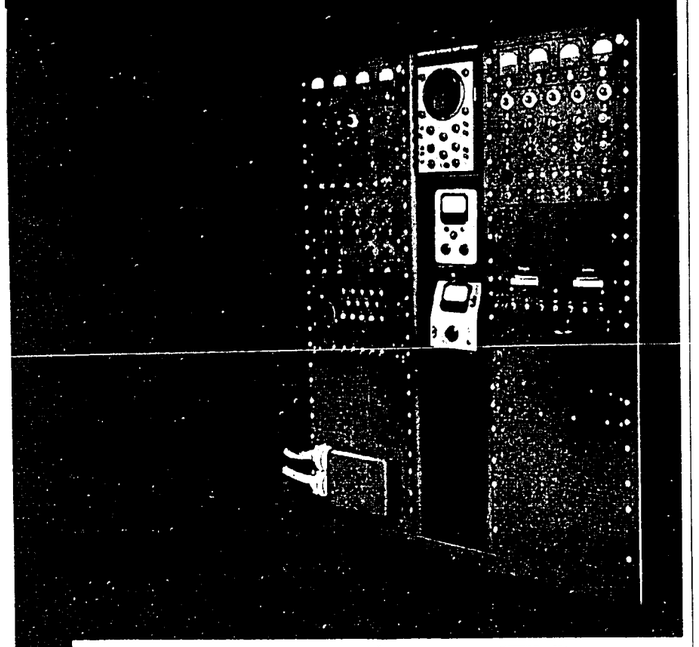
For further details see our advertisement on page 503

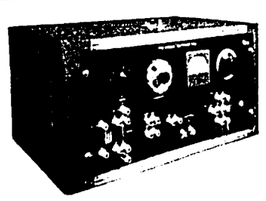
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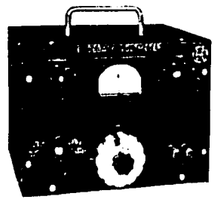
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Berndt-Bach, Inc., Auricon Div., 971 N. Mansfield Ave., Hollywood 38, Calif., 1, 8, 9, 16
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Bodnar Industries, Inc., 19 Railroad Ave., New Rochelle, N.Y., 81
For details see ad on page 505
Tel: NE 6-4664

Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y., 20, 50, 55, 79, 84, 95
Tel: SPring 7-2208

Boeing Airplane Co., Industrial Prod. Div., Seattle, Wash., 26, 46, 63, 64, 69, 71, 84
Tel: MOhawk 4444

Boesch Manufacturing Co., Inc., 45 River St., Danbury, Conn., 63, 86
For details see ad on page 531
Tel: Danbury 3-5571

Bogart Manufacturing Corp., 315 Seigel St., Brooklyn 6, N.Y., 27, 40, 54, 71, 74, 97
Tel: Hy 7-4972

Bogen Co., Inc., David, 29 Ninth Ave., New York 14, N.Y., 1, 5, 7, 9, 14, 26, 27, 30, 36, 57, 58, 71, 79, 84
Tel: ORegon 5-0565

Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 26, 44, 46, 48, 62, 64, 84
For details see ad on page 128
Tel: LA 5-2200

Bolt, Beranek and Newman, Inc., 16 Eliot St., Cambridge 38, Mass., 77
Tel: University 4-5870

Bolta Products Div., General Tire & Rubber Co., 70 Garden St., Lawrence, Mass., 88, 89
Tel: LA 3-7121

Bomac Laboratories, Inc., Salem Road, Beverly, Mass., 46, 48, 60, 61, 72, 73, 74
For details see ad on pages 92-93
Tel: Beverly 4670

Bond Electronics Corp., 60 Springfield Ave., Springfield, N.J., 51
Tel: UN 2-7220

Bone Engineering Corp., 701 W. Broadway, Glendale 4, Calif., 26, 46, 69, 71, 74, 79, 84
Tel: CH 5-2638

Boom Electric Corp., 5226 W. Grand Ave., Chicago 39, Ill., 5
Tel: National 2-5200

Boonton Electronics Corp., Box 171, Boonton, N.J., 135, 137
For details see ad on page 474
Tel: BO 3603

Boonton Radio Corp., Intervale Rd., Boonton, N.J., 100
Tel: Boonton 8-3200

Borden Co., Chemical Div., 350 Madison Ave., New York 17, N.Y., 85
Tel: VA 6-4100

Borden Engineering Co., 63 Clinton Ave., New Providence, N.J., 43, 65, 94
Tel: SU 6-9574

Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville Wis., 43, 44, 51, 63, 69, 96
For details see ad on page 140
Tel: Janesville 6910

Borthig Co., Inc., George C., Highway No. 20, E. Rutherford, N.J., 85
Tel: Webster 9-9260

Boston Insulated Wire & Cable Co., 65 Bay St., Boston 25, Mass., 75, 81
Tel: Co 5-2104

Bourns Laboratories, Dept. 72, 6135 Magnolia Ave., Riverside, Calif., 51
For details see ad on page 360
Tel: Riverside 7290

Bowman Instr. Corp., 2415 Pennsylvania St., Ft. Wayne 4, Ind., 63, 69
Tel: Ft. Wayne A2455

Bowser Technical Refrigeration, Div. of Bowser, Inc., Terryville, Conn., 93
Tel: Bristol 23140

Boyle Metalcraft Corp., 150 Sullivan St., Brooklyn 31, N.Y., 30, 33, 79
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Tel: TR 5-3603

Bozak Co., R. T., 114 Manhattan St., Stamford, Conn., 7
Tel: 48-4368

Brach Manufacturing Corp., 200 Central Ave., Newark 3, N.J., 26, 27, 64, 69, 71, 72
Tel: Humboldt 2-1500

Bradley Laboratories, Inc., 168 Columbus Ave., New Haven, Conn., 48, 60
Tel: Main 4-3123

Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 12, Wis., 81
Tel: EDgewood 2-8100

Brainin Co., C. S., 320 Washington St., Mt. Vernon, N.Y., 54, 87
For details see ad on page 371
Tel: Mount Vernon 8-5500

Brand & Co., Inc., William, North and Valley Sts., Willimantic, Conn., 75, 83, 89, 91
Tel: Harrison 3-1661

Branson Corp., 113 Cornelia St., Boonton, N.J., 50
Tel: BO 8-3097

Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn., 38, 94
Tel: Stamford 3-4907

Bremer Electronics, 43 Washington Ave., Lake Hiawatha, N.J., 1, 19, 24
Tel: Boonton 8-0982W

Brentanos Technical Department, 586 Fifth Ave., New York 36, N.Y., 103
Tel: PL 7-8600

Breon Laboratories, 1520 Evergreen Rd., Williamsport, Pa., 38
Tel: Williamsport 7426

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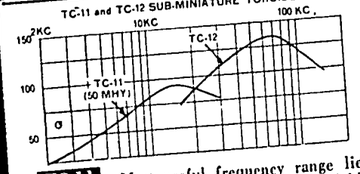
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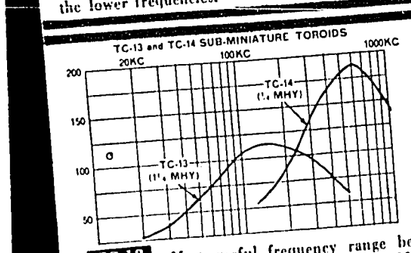
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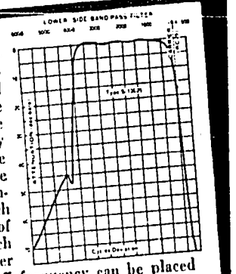
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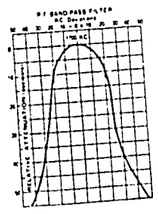
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MINIATURE TELEMETERING FILTERS

In view of the large number of filters that are employed in telemetering equipment, the size of the filters is a major contributing factor to the size of the equipment. As the approximate volume of a set of twenty standard telemetering band pass filters is 1500 cubic inches, even for ground based equipment this bulk can be objectionable. This is particularly true of mobile station. Our cognizance of this led to the development of a series of miniaturized filters that necessitates practically no sacrifice of desired attenuation characteristics.

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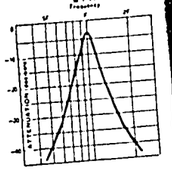
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These are economical band pass filters designed to operate either from a triode plate or cathode follower to the grid of a tube. A voltage gain of ten or more can be provided depending upon the desired band width. Range of center frequencies available lies between 60 cycles and 50,000 cycles.

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Brew & Co., Inc., Richard D., 106 Concord Ave., Belmont 78, Mass., 39, 82
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Tel: CLoster 5-0409

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Tel: EDison 4-1182

Bright Radio Laboratories, Inc., 24-28 45 St., Long Island City 3, N.Y., 1, 12, 18, 26, 27, 32, 34, 46, 54, 58, 72, 100, 101
Tel: AS 8-3901

Bright Star Battery Co., 600 Getty Ave., Clifton, N.J., 28
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Brilhart Plastics Corp., P.O. Box 31, Old Country Rd., Mineola, N.Y., 27, 30, 53, 79, 81, 83, 88, 91
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Tel: Pioneer 6-0425

Brilmayer Laboratories, Inc., E.W., 86 Fulton St., New York 38, N.Y., 64

Bristol Co., Waterbury 20, Conn., 20, 36, 43, 54, 56, 64, 69, 70, 81, 95
Tel: WAterbury 6-4451

Bristol Engineering Corp., Bristol, Pa., 13, 26, 36, 46, 49, 62, 79, 84, 92, 95, 96, 97, 100
Tel: BRistol 8-7894

British Industries Corp., 164 Duane St., New York 13, N.Y., 1, 7, 10, 30, 81, 86, 94
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Broadcast Equipment Specialties, 135-01 Liberty Ave., Richmond Hill 19, N.Y., 11
Tel: REgent 9020

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Tel: OR 9-5112

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Brook Electronics, Inc., 34 De Hart Pl., Elizabeth, N.J., 1
Tel: ELizabeth 2-7600

Brookhaven Electronics Corp., P.O. Box 931, Sanford, N.C., 35
Tel: SAnford 1122

Brooks & Perkins, Inc., 1950 W. Fort St., Detroit 16, Mich., 24, 30, 33, 71, 77, 79, 87
Tel: TAshmoo 5-5900

Brooks Radio & Television Corp., 84 Vesey St., New York 7, N.Y., 30, 91
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Brown-Brockmeyer Co., 1000 S. Smithville Rd., Dayton 1, Ohio, 44
Tel: MA 5661

Brown Electro-Measurement Corp. See: Electro-Measurements, Inc.

Brown, W. J., 71 Gurley Rd., Stamford, Conn., 77
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Brownell, H. Russell, 188 W. 4 St., New York 14, N.Y., 77, 84
Tel: CH 2-4208

Brownie Manufacturing Co., 55 Frankfort St., New York 38, N.Y., 14
Tel: WO 2-7745

Browning Laboratories, Inc., 750 Main St., Winchester, Mass., 1, 13, 15, 30, 46, 47, 58, 64, 84, 96, 97, 99, 100
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Bruel & Kjaer, Naerum, Denmark, 8, 13, 64, 68, 92, 94, 95, 98
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Pruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 1, 9, 26, 46, 47, 63, 86, 94, 97, 100
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Brunswick Instruments, P.O. Box 813, New Brunswick, N.J., 77, 84, 94, 100
Tel: Charter 7-5919

Brush Electronics Co., 3405 Perkins Ave., Cleveland 14, Ohio, 7, 8, 9, 10, 11, 13, 15, 26, 38, 43, 65, 67, 69, 70, 76, 79, 83, 84, 92, 94, 95
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Tel: GA 1321

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Tel: HE 1-7166

Budd-Stanley Co., Inc., 43-01 22 St., Long Island City 1, N.Y., 27, 40, 54, 58, 71, 74, 97
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Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn., 1, 8, 17, 20, 24, 25, 72, 73, 77, 84, 97, 100

Buffalo Instrument Corp., 1780 Elmwood Ave., Buffalo 7, N.Y., 18
Tel: RI 3640

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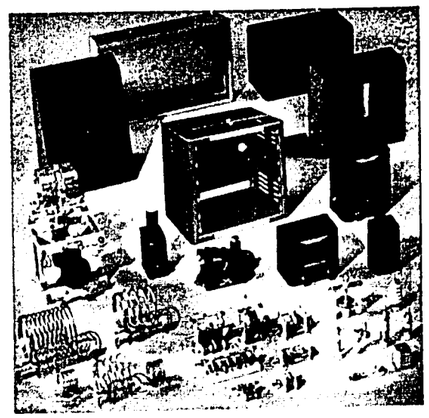
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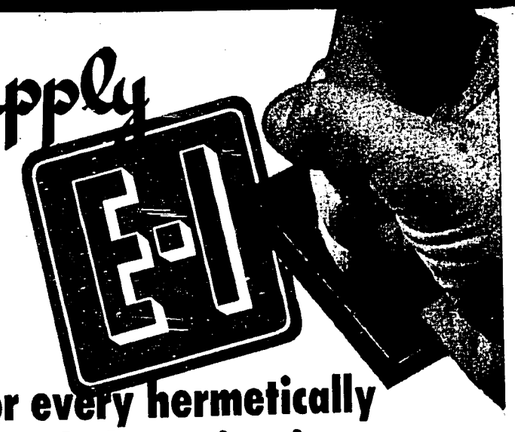


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Burgess Battery Co., Foot of Exchange St., Freeport, Ill., 28
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Tel: Main 3300

Burke & James, Inc., 321 S. Wabash, Chicago 4, Ill., 99
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Burlington Instrument Co., 143 N. Third St., Burlington, Iowa, 43, 62
For details see ad on page 327
Tel: Burlington 7241

Burndy Engineering Co., Inc., Norwalk, Conn., 35, 75
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Burnell & Co., Inc., 45 Warburton Ave., Yonkers 2, N.Y., 4, 34, 39
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Burnett Radio Lab., William W. L., 4814 Idaho St., San Diego 16, Calif., 15, 38, 77
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Burroughs Corp., Dept. P-1 Electronic Instrument Div., 1209 Vine St., Philadelphia 7, Pa., 37, 60, 63, 64, 84, 97
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Tel: LO 7-1401

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Tel: Garfield 1-1740

CBS-Hytron, Div. of Columbia Broadcasting System, Inc., 100 Endicott St., Danvers, Mass., 49, 51, 52, 59, 60, 61
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C & E Engineers, 3381 N. Kallin Ave., Long Beach 8, Calif., 31, 34, 51

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C & M Mfg. Co., Turnpike St., Eastondale, Mass., 27
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For details see ad on page 291
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Cadre Industries Corp., 19 Delaware Ave., Endicott, N.Y., 75, 79
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Calbest Engineering & Electronics, 828 N. Highland, Hollywood 38, Calif., 1, 14, 26, 34, 40, 57, 58, 64, 84
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Caledonia Electronics & Transformer Corp., P.O. Box 298, Caledonia, N.Y., 57
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Califone Corp., 1041 N. Sycamore Ave., Hollywood 38, Calif., 1, 5, 9, 16, 44
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Cal-Tronics Corp., 11307 Hindry Ave., Los Angeles 45, Calif., 94, 97
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Calvert Electronics, Inc., 59 Fourth Ave., New York 3, N.Y., 104
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Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 32, 34, 39, 76, 79, 81
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Cannon Electric Co., 3209 Humbolt St., Los Angeles 31, Calif., 6, 35, 79, 82
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Tel: EMerson 8-4846

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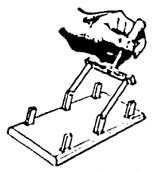


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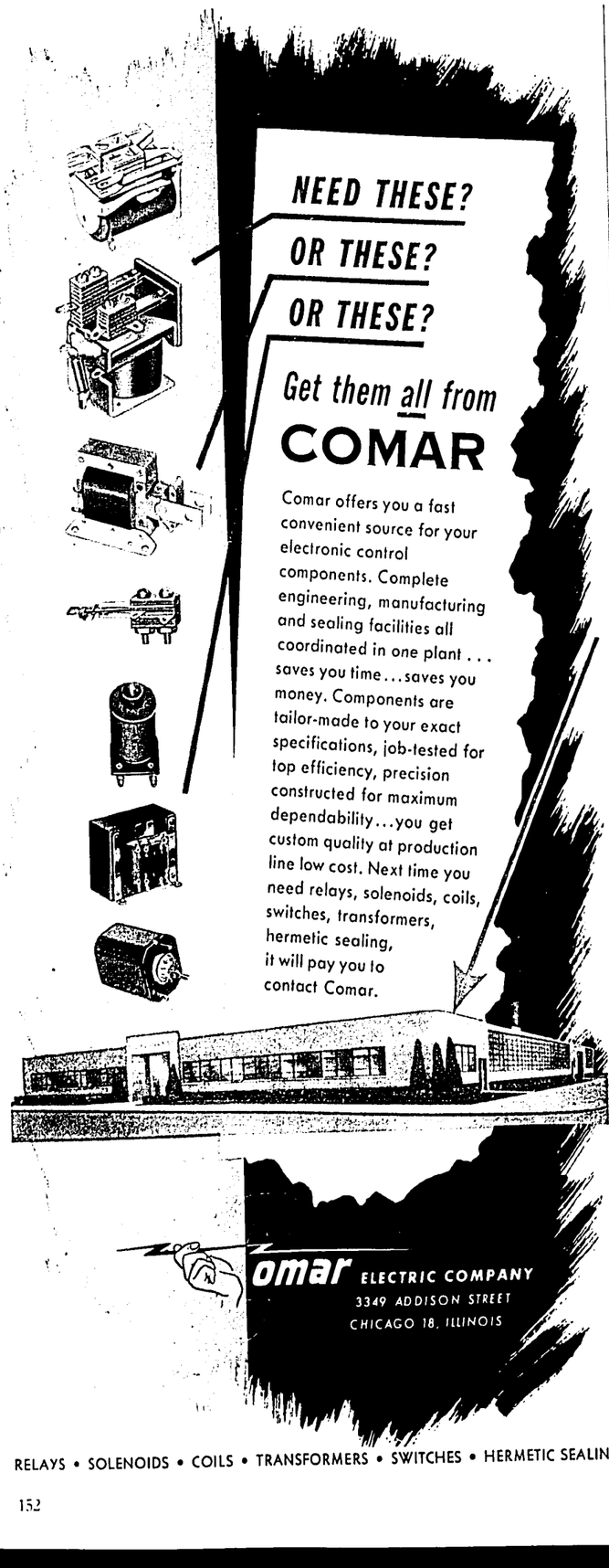
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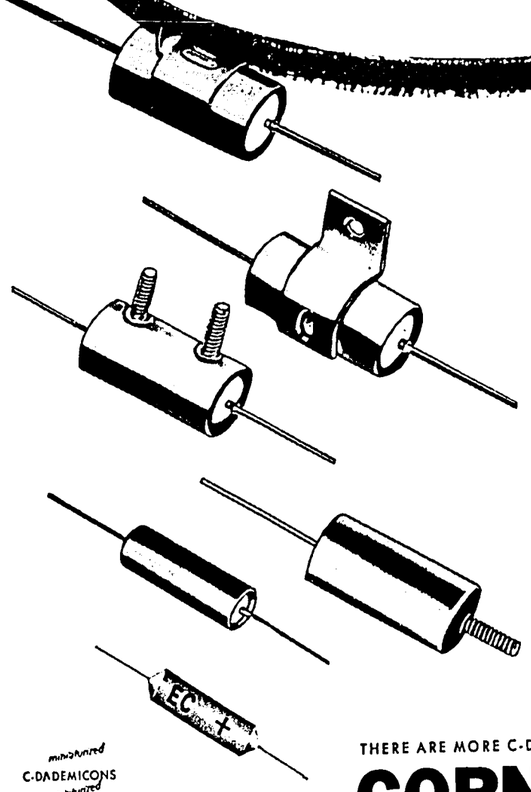
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Continental Electric Co., Inc., 325 Ferry St., Newark 5, N.J., 36, 44
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Continental Electronics Mfg. Co., 4212 S. Buckner Blvd., Dallas 17, Tex., 17, 58, 73
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Continental Radio & Elect. Eng., Ltd., 39 Sivewright Ave., New Doornfontein, Johannesburg, South Africa, 1, 12, 17, 18, 24, 26, 46, 48, 57, 69, 77, 78, 84, 86.
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Continental Screw Co., Mt. Pleasant St., New Bedford, Mass., 81
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Control Devices, Inc., 9918 Charlevoix Ave., Detroit 14, Mich., 26, 64, 84, 94
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Control Eng. Corp., 560 Providence Hwy., Norwood, Mass., 26, 63, 64, 65, 69, 70, 79, 94
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Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill., 50, 54, 77, 79, 84
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Cooper-Di Blasi, 259 W. 14th St., New York 11, N.Y., 104
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Copperweld Steel Co., Wire and Cable Div., 1000 Monongahela Ave., Glassport, Pa., 27, 75, 81, 87, 91
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Corbin Corp., 5419 56 Pl., Riverdale, Md., 18, 19, 22, 23, 24, 25, 36, 40, 46, 63, 64, 69, 70, 71, 77, 79, 84, 97, 100
Tel: APpleton 7-7676

Cornell Aeronautical Lab., Inc., 4455 Genessee St., Buffalo 21, N.Y., 84

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For details see ad on page 154
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Corning Glass Works, Corning, N.Y., 31, 32, 34, 39, 40, 47, 51, 58, 68, 74, 82, 83, 98
Tel: COrning 2-5011

Cornish Wire Co., Inc., 50 Church St., New York 7, N.Y., 75
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Corona Eng. Service, 94-52 Corona Ave., Elmhurst, N.Y., 34, 39, 50, 55, 77, 99

Corson Electric Mfg. Corp., 540 39 St., Union City, N.J., 31
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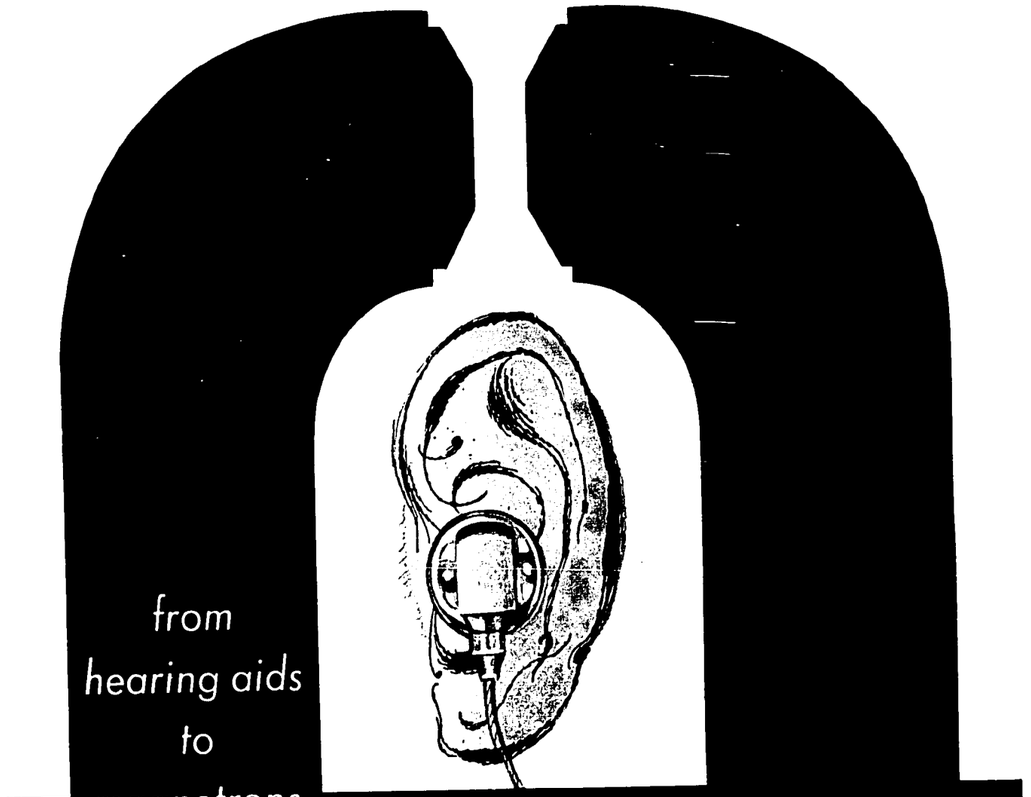
Cortland Industries, Inc., 4545 W. Cortland, Chicago 39, Ill., 30, 79, 81, 89, 91
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Cosa Corp., 405 Lexington Ave., New York 17, N.Y., 86
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Cosmic Condenser Corp., 853 Whittier St., New York 59, N.Y., 31
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Tel: Ludlow 9-3360

Cosmo Eng. Labs., Inc., Mountain Ave., Hackettstown, N.J., 64
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Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R.I., 34, 42
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Cox & Co., Inc., 115 E. 23 St., New York 10, N.Y., 86
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Craig Corp., 50 Eastern Ave., Boston 13, Mass., 29, 31, 44, 49, 61, 77
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Craig Machine, Inc., 90 Holten St., Danvers, Mass., 30
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Cramer Transformer Corp., 2734 N. Pulaski, Chicago 39, Ill., 34, 57, 62
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Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill., 79, 83, 88, 89
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Cratex Mfg. Co., 81 Natoma St., San Francisco 5, Calif., 81
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Craven, Lohnes & Culver, 1242 Munsey Bldg., Washington 4, D.C., 77
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Crest Labs., Inc., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y., 14, 34, 57, 67, 79, 84, 101
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Crosby Enterprises, Inc., Bing, Electronics Div., 9030 Sunset Blvd., Los Angeles 46, Calif., 77
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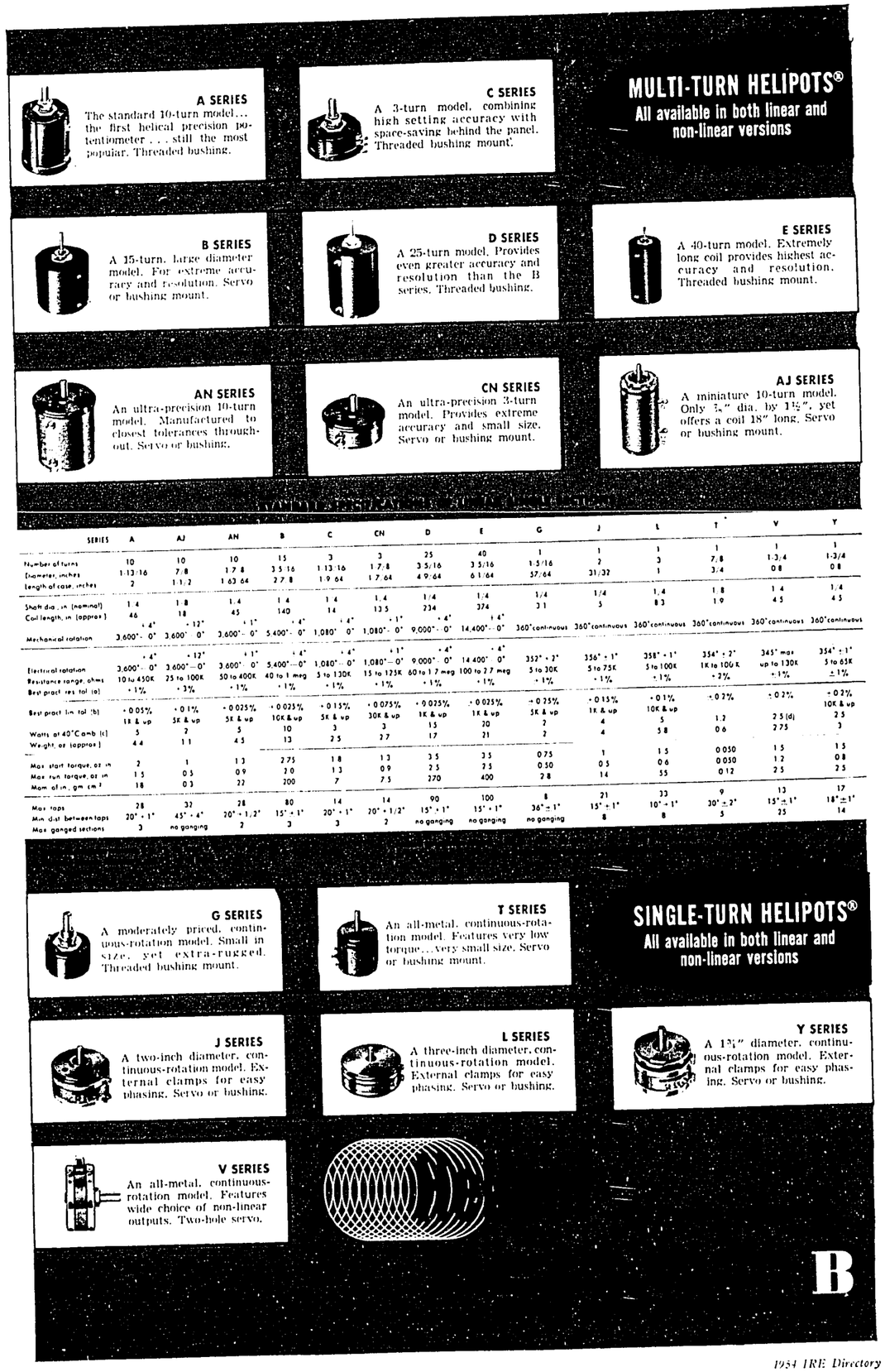
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Number of turns	10	10	10	15	3	3	25	40	1	1	1	1	1	1
Diameter, inches	1-13/16	7/8	1-7/8	3 5/16	1 13/16	1 7/8	3 5/16	3 5/16	1 5/16	2	3	7/8	1-3/4	1-3/4
Length of case, inches	2	1-1/2	1.63 64	2 7 8	1 9 64	1 7 64	4 9 64	6 1 64	57/64	31/32	1	3/4	0 8	0 8
Shaft dia., in (nominal)	1 4	1 8	1 4	1 4	1 4	1 4	1/4	1/4	1/4	1/4	1 4	1 8	1 4	1 4
Coil length, in (approx)	46	18	45	140	14	13 5	234	374	3 1	5	8 3	1 9	4 5	4 5
Mechanical rotation	3,600° − 0°	3.600° 0°	3.600° − 0°	5.400° − 0°	1,080° 0°	1,080° − 0°	9,000° − 0°	14,400° − 0°	360° continuous	360° continuous	360° continuous	360° continuous	360° continuous	360° continuous
Electrical rotation	3,600° − 0°	3.600° − 0°	3.600° 0°	5,400° − 0°	1,080° − 0°	1,080° − 0°	9,000° − 0°	14,400° 0°	352° ± 2°	356° ± 1°	358° ± 1°	354° ± 2°	345° min	354° ± 1°
Resistance range, ohms	10 to 450K	25 to 100K	50 to 400K	40 to 1 meg	5 to 130K	15 to 125K	60 to 1.7 meg	100 to 2.7 meg	5 to 30K	5 to 75K	5 to 100K	1K to 100 K	up to 130K	5 to 65K
Best pract res tol (a)	± 3%	± 3%	± 1%	± 1%	± 1%	± 1%	± 1%	± 1%	± 1%	± 1%	± 1%	± 2%	± 1%	± 1%
Best pract lin tol (b)	± 0.05% 1K & up	± 0.1% 5K & up	± 0.025% 5K & up	± 0.025% 10K & up	± 0.15% 5K & up	± 0.075% 30K & up	± 0.025% 1K & up	± 0.025% 1K & up	± 0.25% 5K & up	± 0.15% 1K & up	± 0.1% 10K & up	± 0.2%	± 0.2%	± 0.2% 10K & up
Watts at 40°C amb (c)	5	2	5	10	3	3	15	20	2	4	5	1.2	2 5 (d)	2 5
Weight, oz (approx)	4 4	1 1	4 5	13	2 5	2 7	17	21	2	4	5 8	0 6	2 75	3
Max start torque, oz in	2	1	1 3	2 75	1 8	1 3	3 5	3 5	0 75	1	1 5	0 050	1 5	1 5
Max run torque, oz in	1 5	0 5	0 9	2 0	1 3	0 9	2 5	2 5	0 50	0 5	0 6	0 050	1 2	0 8
Mom of in., gm cm²	18	0 3	22	200	7	7 5	270	400	2 8	14	55	0 12	2 5	2 5
Max taps	28	32	28	80	14	14	90	100	8	21	33	9	13	17
Min dist between taps	20° ± 1°	45° ± 4°	20° ± 1.2°	15° ± 1°	20° ± 1°	20° ± 1/2°	15° ± 1°	15° ± 1°	36° ± 1°	15° ± 1°	10° ± 1°	30° ± 2°	15° ± 1°	18° ± 1°
Max ganged sections	3	no ganging	2	3	3	2	no ganging	no ganging	no ganging	8	8	5	25	14

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Delta Electrical Instrument Co., 2700 S. Hill St., Los Angeles 7, Calif., 43, 50, 51
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Delta Radio Co., 115 Worth St., New York 13, N.Y., 34
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Deltron, Inc., P.O. Box 192, Glenside, Pa., 26, 64, 100
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Tel: SO 8-2200

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Douglas Radio Labs., 176 Norfolk Ave., Boston 19, Mass., 46, 68, 94
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Dow Corning Corp., P.O. Box 592, Midland, Mich., 83, 85
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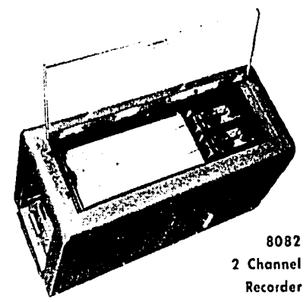
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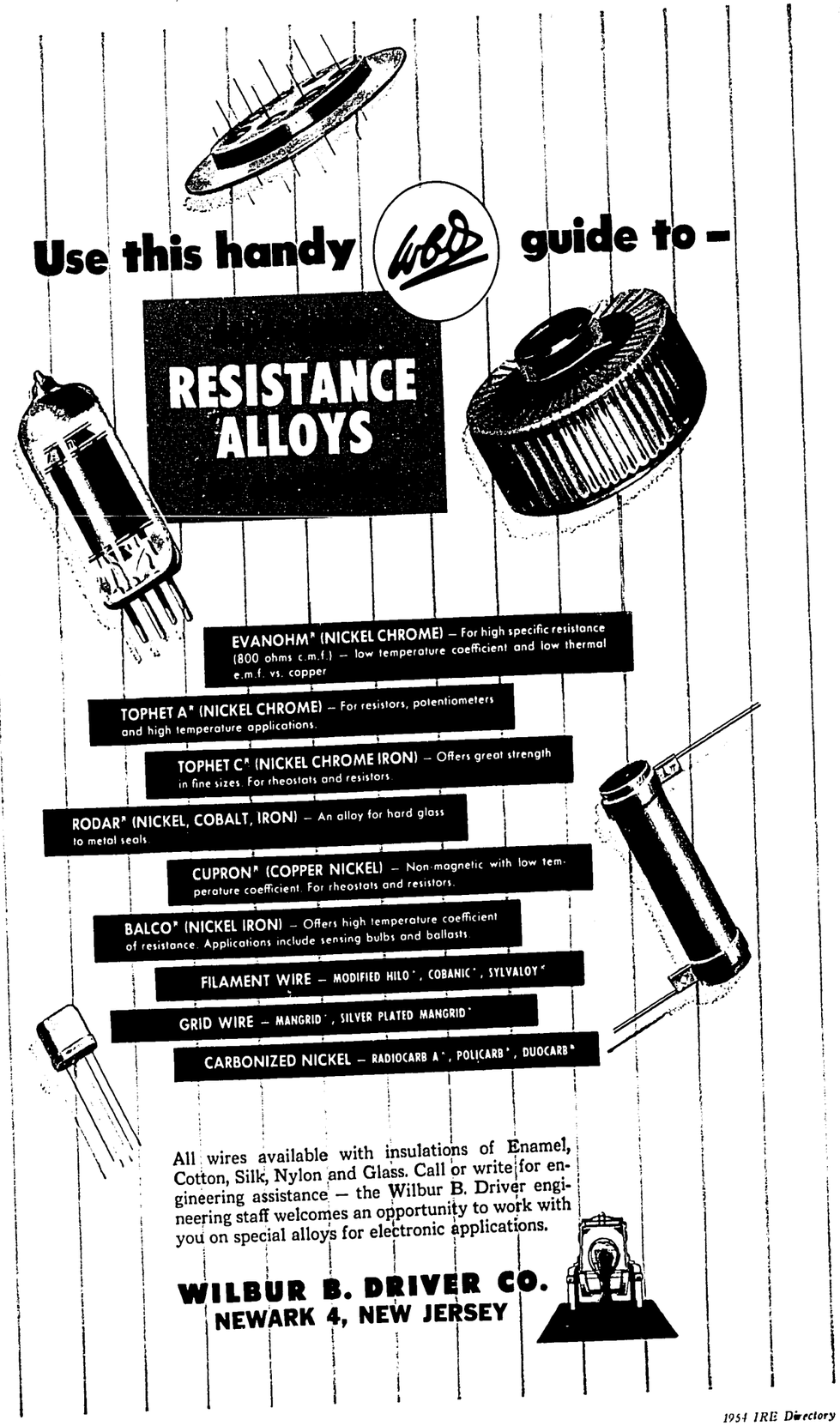
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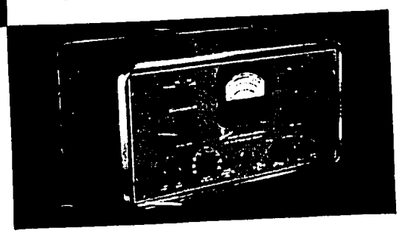


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Engineering Development, P.O. Box 37, Sta. C, Lincoln, Neb., 56, 63, 64, 77, 79, 84, 86
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Engineering Developments, Inc., P.O. Box 1046, Portsmouth, R.I., 93
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Engineering Research Associates, Div. of Remington Rand, 1902 W. Minnehaha Ave., St. Paul W4, Minn., 26, 57, 63, 64, 65, 70, 84
Tel: NEster 9601

Engineering Research Corp., P.O. Box 204, Englewood, Colo., 84
Tel: SU 1-7052

Engineering & Research Corp., P.O. Box 209, Hyattsville, Md., 26, 30, 33, 63, 69, 74, 79, 84, 86
Tel: WArfield 7-4444

Engineering Research & Dev. Co., Addison, Ill., 26, 64, 69
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English Electric Valve Co., Ltd., Waterhouse Lane, Chelmsford, Essex, Eng., 59, 60, 61
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Enthoven Solders, Ltd., 89 Upper Thames St., London EC4, England, 78, 87, 89, 90
Tel: MAnsion House 4533

Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I., 86, 94
Tel: ST 1-3500

Environmental Machinery Co., Inc., Pratt Oval, Glen Cove, N.Y., 93
Tel: GL 4-0270

Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y., 4, 34, 46, 57
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Tel: DI 5-7531

Eprad Co., Inc., 1206 Cherry St., Toledo 4, Ohio, 7
Tel: AD 8107

Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 10, 39, 57, 63, 70
For details see ad on page 318
Tel: CO 6-3228

Equipment and Service Co., 6815 Oriole Dr., Dallas 9, Tex., 16, 77, 84
Tel: DI 9918

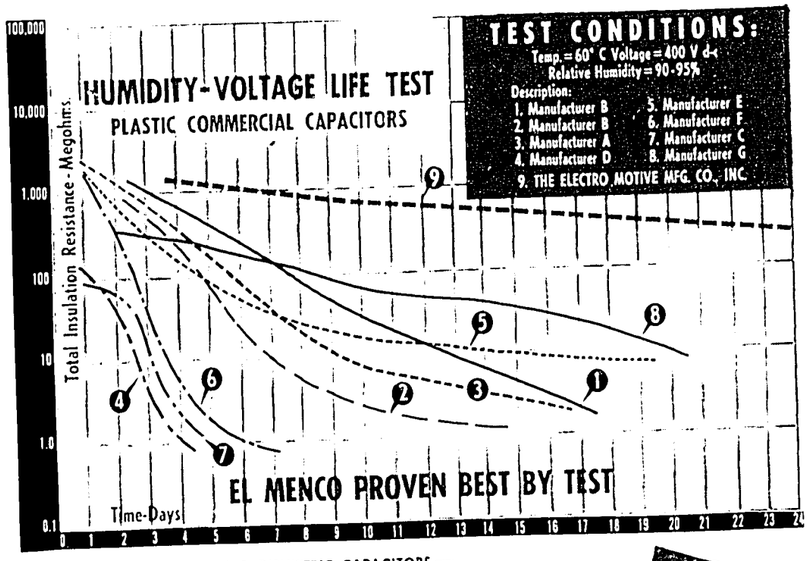
(Continued on page 169)



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Erco Radio Labs., Inc., Stewart Ave., Garden City, L.I., N.Y., 13, 14, 17, 18, 23, 24, 25, 71, 77, 79, 84
Tel: PIoneer 1-0300

Erdco Eng. Corp., Addison, Ill., 1, 4, 26, 40, 46, 64, 66, 67, 77, 79, 84, 86, 93, 94, 100
Tel: ELmhurst 1849

Erf Acoustical Co., H. A., 3868 Carnegie Ave., Cleveland 15, Ohio, 77
Tel: EXpress 1-1616

Erickson Specialties, c/o Paul B. Gebhardt, 306 Lincoln Ave., Lutherville, Md., 54
Tel: TOwson 7048

Erie Resistor Corp., 644 W. 12 St., Erie, Pa., 30, 31, 32, 38, 47, 51, 79, 81, 88
For details see ad on pages 82-83
Tel: ERie 2-1481

Erwood, Inc., 1770 W. Berteau Ave., Chicago 13, Ill., 38, 77, 79, 84
Tel: BIttersweet 8-0622

Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y., 1, 4, 22, 23, 27, 57, 94, 97, 100
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Esquire Radio Corp., 62-01 15 Ave., Brooklyn, N.Y., 9, 14
Tel: BEnsonhurst 6-2755

Essex Wire Corp., Magnetic Winding Div., Freemansburg Ave., Easton, Pa., 34, 57

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Etablissements, Elveco, 70 Rue De Strasbourg, Vincennes, Seine, France, 32
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Etched Products Corp., 39-01 Queens Blvd., Long Island City 4, N.Y., 47, 81
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F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y. 27, 38, 40, 43, 54, 58, 71, 74, 92, 97 100
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FSD Labs., 2660 North Ave., Bridgeport 4, Conn., 31, 40, 46, 64, 77
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Factory Enterprises, Inc., P.O. Box 4025, Pittsburgh 1, Pa., 75
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Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N.J., 14

Fairchild Camera & Instrument Corp., 225 Park Ave., Hicksville, L.I., N.Y., 51, 99
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Fairchild Industries, Div. of Fairchild Camera & Instrument, 110 Main St., Burlington, Vt., 29, 44
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Falls Metal Works, Ltd., 414 Main St., Little Falls, N.J., 30, 33, 79
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Farmer Electric Co., 21 Mossfield Rd., Waban 68, Mass., 50, 64, 84
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Fast & Co., John E., 3117 N. Pulaski Rd., Chicago 41, Ill., 31
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Federal Anti Capacity Switch Corp., 72 Kingsley St., Buffalo, N.Y., 54
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Federal Mfg. & Eng. Corp., 199-217 Steuben St., Brooklyn 5, N.Y., 11, 14, 25, 46, 72, 97, 100
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Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 35, 41, 45, 81, 88
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Federal Shock Mount Corp., 1077 Intervale Ave., New York 59, N.Y., 81
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Federal Telecommunication Labs., Div. I.T.&T., 500 Washington Ave., Nutley 10, N.J., 12, 13, 16, 17, 18, 20, 25, 26, 27, 39, 40, 46, 47, 52, 58, 61, 70, 71, 72, 73, 74, 75, 84, 85, 97, 101
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Federal Telephone & Radio Co., Div. of I.T.&T., 100 Kingsland Rd., Clifton, N.J., 18, 21, 24, 25, 26, 34, 36, 44, 46, 48, 49, 50, 52, 54, 57, 59, 61, 63, 64, 69, 71, 72, 73, 75, 79, 100
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Federal Tool & Mfg. Co., 3600 Alabama Ave., Minneapolis 16, Minn., 79
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Federated Semi-Conductor Co., 60 Dey St., New York 7, N.Y., 52
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Feedback Controls, Inc., 503 Rhode Island Ave. N.E., Washington 2, D.C., 63, 64, 69
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Feiler Eng. & Mfg. Co., 8026 N. Monticello, Skokie, Ill., 5, 20, 77, 79, 94, 99, 100

Feiner & Sons, Inc., P., 522 W. 45 St., New York 36, N.Y., 30, 33, 84
Tel: PL 7-6150

Feldman Co., Henry, 1244 S. Grand Ave., Los Angeles 15, Calif., 1, 4, 9, 14, 34, 57, 86, 94
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Ferrara, Inc., 8100 W. 9 Mile Rd., Oak Park 37, Mich., 64, 77, 84, 92
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Ferro-Co. Corp., 21-33 N. 11 St., Brooklyn 11, N.Y., 30, 33, 79
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Fidelitone, Inc., 1616 Devon Ave., Chicago 26, Ill., 10
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Fidelity Tube Corp., 900 Passaic Ave., E. Newark, N.J., 59
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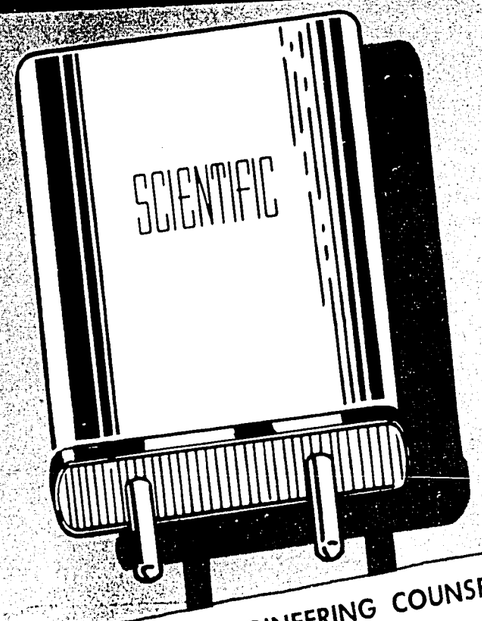
Fielden Instr. Div., Robertshaw-Fulton Contr. Co., 2920 N. 4 St., Philadelphia 33, Pa., 64, 95

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Flock Process Co., Inc., 375 Main Ave., Norwalk, Conn., 9, 81
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Fluke Mfg. Co., Inc., John, 1111 W. Nickerson St., Seattle 99, Wash., 1, 46, 57, 64, 92
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Foley, Andrew A., 640 Federal St., Camden 3, N.J., 104
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Foster Transformer Co., 3820 Colerain Ave., Cincinnati 23, Ohio, 57
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Franklin Electronics, Inc., 415 W. Pike St., Philadelphia 40, Pa., 1, 13, 26, 30, 33, 36, 44, 46, 63, 64, 68, 79, 81, 84, 92, 94, 96, 97, 99, 100, 101
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Tel: WOrth 4-0770

Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 3, 4, 26, 34, 46, 57, 92, 94, 96, 100
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Tel: Asbury Park 1718

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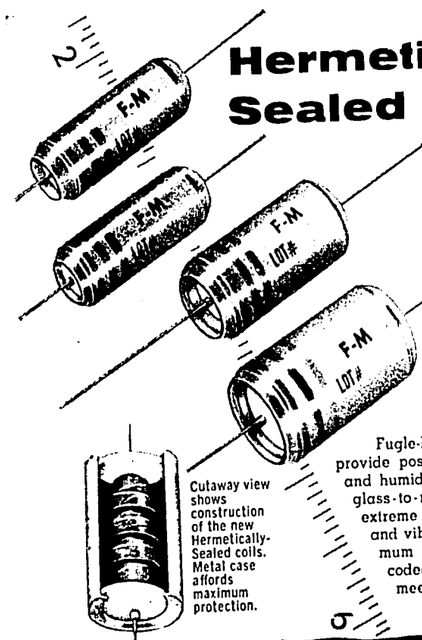
Frommer, Joseph C., 1525 Teakwood Ave., Cincinnati 24, Ohio, 77

Fryling Mfg. Co., 644 W. 12 St., Erie, Pa., 79
Tel: ERie 2-3707

Fugle-Miller Labs., Inc., 398 Main St., Metuchen, N.J., 34, 39, 46, 57
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Cutaway view shows construction of the new Hermetically-Sealed coils. Metal case affords maximum protection.

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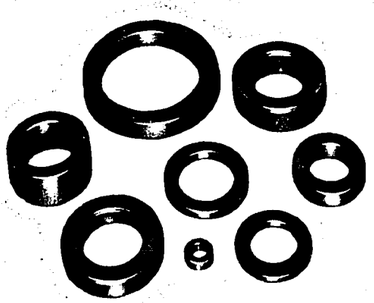
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PART NO.	FIG. NO.	A	B	C
F-394	1	.080	.050	.025
F-259	2	.230	.120	.060
F-262	2	.375	.1875	.125
F-109-1	2	.870	.540	.093
F-109-2	2	.870	.540	.156
F-109-3	2	.870	.540	.250
F-226-1	2	1.125	.750	.125
F-226-2	2	1.125	.750	.500
F-268-1	2	1.250	.750	.187
F-268-2	2	1.250	.750	.375
F-268-3	2	1.250	.750	.250
F108	1	1.875	1.375	.250

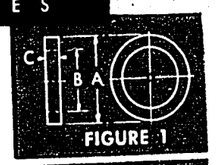


FIGURE 1

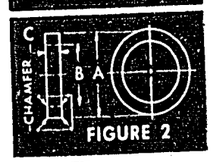


FIGURE 2

STANDARD CUP CORES

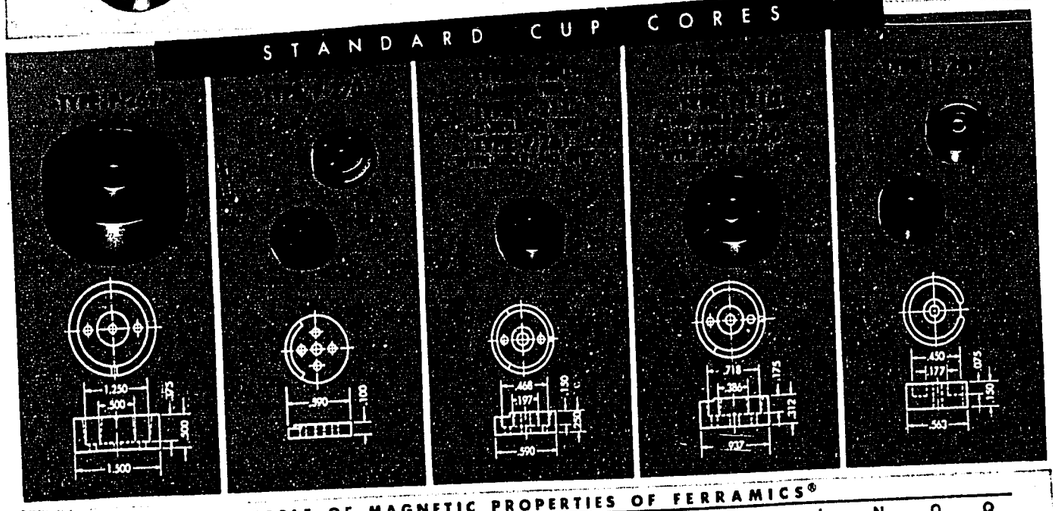


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PROPERTIES	UNIT	A	B	C	D	E	G	H	H-1	I	J	N	O	Q
Initial Perm. at 1 mc/sec.	–	20	95	250	410	750	410	850	550	900	330	200	1000	125
*Max. Perm.	–	100	183	1100	1030	1710	3300	4300	3800	3000	750	500	2000	400
*Sat. Flux Dens.	GAUSS	1500	1900	4200	3100	3800	3200	3400	2800	2000	2900	3000	3600	3300
*Residual Mag.	GAUSS	1000	830	2700	1320	1950	1050	1470	1560	700	1600	2300	1100	1050
*Coercive Force	OERSTED	5.0	3.0	2.1	1.0	.65	.25	.18	.35	.30	.80	.50	.35	2.0
Temp Coef. of Initial Perm.	%/°C	.15	.04	.40	.30	.25	1.3	.66	.80	.30	.22	.14	.48	.10 max
Curie Point	/°C	300	260	330	165	160	160	150	125	70	180	290	140	350
Vol. Resistivity		High	Med.	Med.	High	Med.	High	Med.	Med.	Med.	High	High	Med.	High
Loss Factor:	$\frac{1}{\mu_o Q}$													
At 1 mcs/sec.	–	.0005	.00016	.00007	.00005	.00008	.00008	.00030	.0004	.0003	.000055	.000035	.00025	.000024
At 5 mcs/sec.	–	.0007	.0011	.0008	.0012	.0020	.00075	.00155	.0010	.0050	.0004	.00012	.0030	.00004

*Measurements made on D.C. Ballistic Galvanometer with Hmax = 25 oersteds. Above data is based on nominal values.

The above standard items are available in all of the types of Ferramic material shown in the table of properties. Other shapes and sizes of cores can be made of the above materials to your design. For further details or quotations call, write or wire today.

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Furst Electronics, 3326A W. Lawrence Ave., Chicago 25, Ill., 1, 26, 46, 65, 84, 94, 100
Tel: KEystone 9-3368

Furzehill Labs., Ltd., Shenley Rd., Borehamwood, Herts., Eng., 1, 2, 13, 26, 43, 46, 62, 92, 94, 97 99, 100
Tel: ELStree 3940

Fusion Engineering, 4504 Superior Ave., Cleveland 3, Ohio, 66, 75, 77, 79, 86, 87, 90
Tel: EXpress 1-9343

Fusite Corp., 6000 Fernview Ave., Cincinnati 13, Ohio, 82
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G-M Laboratories, Inc., 4300 N. Knox Ave., Chicago 41, Ill., 43, 44, 69
Tel: PEnsacola 6-1800

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Gabriel Labs., Div. of Gabriel Co., 135 Crescent Rd., Needham Heights, Mass., 84
Tel: NEedham 3-0005

Gadgets, Inc., 3629 N. Dixie Dr., Dayton 4, Ohio, 27, 84, 88
Tel: RAndolph 2111

Gaertner Scientific Corp., 1244 Wrightwood Ave., Chicago 14, Ill., 95, 96
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Galbraith & Son Electric Corp., C. C., 450 Sixth Ave., New York 11, N.Y., 1, 5, 7, 21, 23, 26, 34, 46, 57, 79, 84
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Gallant Eng. Co., 261 Constitution Ave., Washington, D.C., 11, 84
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Gallay, Harris, Electronic Consultant, 60 Perry St., Belleville 9, N.J., 17, 84
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Gamewell Co., Newton Upper Falls, Mass., 51, 64
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For details see ad on page 506
Tel: UNion 1-0604

Garfield Wire Div. of the Overlakes Corp., 142 Monroe St., Garfield, N.J., 75
Tel: GRegory 2-3661

Garlock Packing Co., Main St., Palmyra, N.Y., 79, 81, 88, 89
Tel: PAlmyra 480

Garod Radio Corp., Brooklyn 1, N.Y., See Wilcox-Gay Corp.
Tel: UL 2-6000

Garrard Sales Corp., 164 Duane St., New York 13, N.Y., 9
Tel: WAlker 5-0900

Gasket Eng. Co., Inc., 2440 Charlotte St., Kansas City 8, Mo., 81

Gately Development Lab., Box 68, Barrington, N.J., 1, 30, 77
Tel: SUnset 9-7827

Gates Radio Co., 123 Hampshire, Quincy, Ill., 1, 5, 9, 11, 12, 13, 16, 17, 18, 19, 23, 24, 25, 26, 27, 30, 33, 34, 40, 46, 53, 54, 62, 65, 84
Tel: QUincy 8202

Gauthey, George E., 1052 Warner Bldg., Washington 4, D.C., 77
Tel: NAtional 8-7757

Gavco Corp., 540 E. 80 St., New York 21, N.Y., 50, 62
Tel: TR 9-8800

Gavitt Mfg. Co., Inc., Brookfield, Mass., 27, 75, 88
Tel: VOlunteer 7-3600

Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 6, 27, 35, 41, 54, 88
For details see ad on page 539
Tel: ROckford 5-9548

General Aniline & Film Corp., Antara Chemical Div., Dept. 89, 435 Hudson St., New York 14, N.Y., 87
For details see ad on page 182
Tel: WA 4-0600

General Cable Corp., 420 Lexington Ave., New York 17, N.Y., 75
Tel: LE 2-2920

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 6, 9, 10, 27, 41, 45, 53, 54, 81, 83, 85, 86, 89, 93
For details see ad on page 507
Tel: ROckford 2-6695

General Ceramics Corp., Crows Mill Rd., Keasbey, N.J., 37, 76, 82, 83
For details see ad on pages 172, 186
Tel: Valley 6-5100

General Chemical Div., Allied Chem. & Dye, 40 Rector St., New York 6, N.Y., 39, 74, 75, 80
Tel: WHitehall 4-2220

General Communication Co., 681 Beacon St., Boston 15, Mass., 50, 54, 97, 100
For details see ad on page 374
Tel. CO 7-6030

General Communications, Janesville Rd., Ft. Atkinson, Wis., 1, 5, 13, 16, 26, 27, 30, 33, 46, 48, 50, 62, 84
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General Devices, Inc., P.O. Box 253, Princeton, N.J., 54, 77, 84
For details see ad on page 376
Tel: PRinceton 1-5010

General Dry Batteries, Inc., 13000 Athens Ave., Cleveland 7, Ohio, 28
Tel: BOulevard 2-0030

General Dyestuff Corp., Antara Chemicals Div., 435 Hudson St., New York 14, N.Y., 78, 87
Tel: WAtkins 4-0600

General Electric Co., 570 Lexington Ave., New York, N.Y., 1, 7, 9, 12, 13, 14, 16, 17, 20, 21, 23, 24, 25, 30, 31, 35, 37, 38, 39, 46, 47, 48, 49, 51, 52, 53, 54, 59, 60, 61, 68, 69, 71, 72, 73, 91, 94, 99, 101
Tel: PLaza 1-1311

General Electric Co., Electronics Park, Syracuse, N.Y., 1, 3, 7, 9, 12, 13, 14, 16, 17, 21, 24, 25, 26, 27, 30, 31, 33, 38, 39, 40, 46, 47, 49, 51, 52, 58, 59, 60, 61, 63, 68, 69, 71, 72, 73, 94, 97, 99, 100, 101
Tel: 76-4411

General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N.Y., 20, 27, 29, 31, 36, 43, 44, 45, 46, 48, 50, 51, 52, 54, 56, 57, 62, 64, 66, 68, 69, 70, 82, 84, 86, 94, 95, 96, 97, 98
Tel: SChenectady 4-2211

General Electric Co., Capacitor Dept., John St., Hudson Falls, N.Y., 31
Tel: HUdson Falls 4-3341

General Electric Co., Carboloy Dept., 11177 E. 8 Mile Rd., Detroit 32, Mich., 42, 98
Tel: JEfferson 6-9100

General Electric Co., Chemical Div., 1 Plastics Ave., Pittsfield, Mass., 30, 79, 83, 85, 89
Tel: PIttsfield 8223

General Electric Co., Precision Parts Plant, Rt. 22, Springfield, N.J., 79
Tel: MIllburn 6-1031

General Electric Co., Specialty Transformer & Ballast, 1635 Broadway, Ft. Wayne 2, Ind., 26, 46, 57, 62
Tel: ANthony 2441

General Electric Co., Telechron Dept., Ashland, Mass., 43
Tel: FRamingham 4331

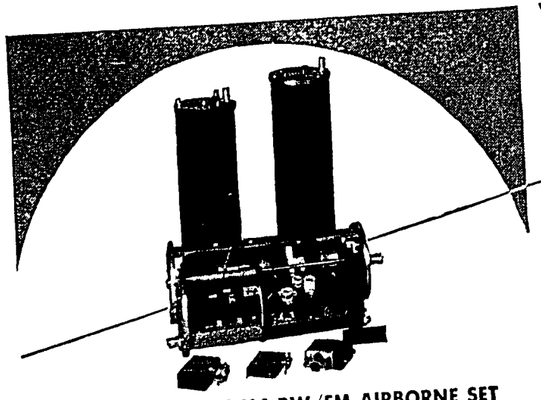
General Electric Co., Tube Dept., Bldg. 267, 1 River Rd., Schenectady 5, N.Y., 31, 49, 54, 59, 60, 61
Tel: SChenectady 4-2211

General Electric Co., Wiring Device Dept., 95 Hathaway St., Providence 9, R.I., 35, 82
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General Electric Co., X-Ray Dept., 4855 Electric Ave., Milwaukee 1, Wis., 67, 98
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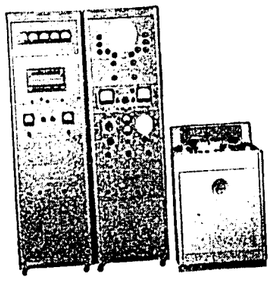
General Electric Co., Ltd. of England, Imtra Corp., U.S. Agent, Cambridge 58, Mass., 6, 50, 54, 63, 86
Tel: UN 4-4350

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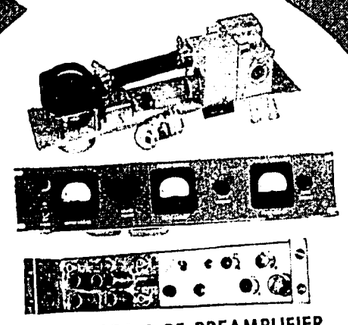
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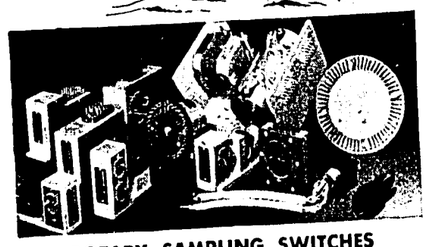
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General Fuse Co., 201 Main St., Matawan, N.J., 41
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General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 1, 50, 75, 79, 82, 84, 94
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General Instrument Corp., 829 Newark Ave., Elizabeth 3, N.J., 32, 34, 39, 40, 47, 58
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General Instrument Corp., F. W. Sickles Div., 165 Front St., Chicopee, Mass., 32, 34, 39, 40, 57, 58
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General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R.I., 75
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General Laminated Prods. Co., Inc., 2857 S. Halsted St., Chicago 8, Ill., 27, 41, 45, 53, 79, 81, 83, 85, 89, 91
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General Lead Batteries Co., Gould and W. Railway Ave., Paterson 3, N.J., 28
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General Metal Products Co., 1010-14 Centre St., Easton, Pa., 30, 33, 79
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General Plastics Corp., 1011 Main Ave., Clifton, N.J., 79, 83, 88
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General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass., 35, 74, 75, 87, 90
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General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 1, 12, 13, 16, 17, 26, 63, 69, 71, 72, 73, 74, 84, 97, 101
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General RF Fittings Co., 702 Beacon St., Boston 15, Mass., 35, 74, 79, 97
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General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 1, 2, 4, 6, 13, 26, 31, 32, 34, 35, 38, 43, 46, 51, 54, 57, 62, 65, 75, 92, 93, 94, 96, 97, 99, 100, 101
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General Winding Co., Inc., 420 W. 45 St., New York 36, N.Y., 34, 57
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Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif., 63, 70, 94
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Georator Corp., Box 210, Manassas, Va., 44, 46, 60, 65
Tel: MAnassas 565

Geotechnical Corp., 4712 Haggar Dr., Dallas 9, Tex., 4, 26, 63, 64, 65, 84, 95, 96
Tel: DIxon 3946

Gering Products, Inc., 7 St. and Monroe Ave., Kenilworth, N.J., 89
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Gertsch Products, Inc., 11846 Mississippi Ave., Los Angeles 25, Calif., 4, 94, 96, 97

Giannini & Co., Inc., G. M., 918 E. Green St., Pasadena 1, Calif., 44, 51, 63
Tel: SY 3-2101

Giannini & Co., Inc., G. M., 39 Main St., E. Orange, N.J., 44, 51, 63

Gibbs Mfg. & Research Corp., 450 N. Main St., Janesville, Wis., 1, 26, 69

Gibson Electric Co., 8350 Frankstown Ave., Pittsburgh 21, Pa., 54, 79, 81
Tel: FRemont 1-6500

Gillett & Associates, Glenn D., 982 Natl. Press Bldg., Washington 4, D.C., 77, 84
Tel: NAtional 8-3373

Girard-Hopkins, 1000 40 Ave., Oakland 1, Calif., 31, 51
Tel: KEllog 2-8477

Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn 37, N.Y., 87, 90

Glaser-Steers Corp., 2 Main St., Belleville 9, N.J., 7, 34, 42, 57
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Glass Products Co., 6911 S. South Chicago Ave., Chicago 37, Ill., 47, 51
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Tel: RYan 1-5111

Gleason-Avery, Inc., 45 Aurelius Ave., Auburn, N.Y., 9, 44, 69
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Glenco Corp., 212 Durham Ave., Metuchen, N.J., 4, 31, 38, 47, 51, 67, 76, 94
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Glens Falls Lab., Inc., 284 Glen St., Glens Falls, N.Y., 26, 64, 68, 84

Globe Industries, Inc., 1784 Stanley Ave., Dayton 4, Ohio, 44, 64, 69, 71
Tel: HEmlock 3741

Glyco Products Co., Inc., 26 Court St., New York 1, N.Y., 85
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Godfrey Mfg. Co., 2642 S. Michigan Ave., Chicago 16, Ill., 1
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Godley Co., Paul, P.O. Box J, Upper Montclair, N.J., 77
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Golden Corp., 1., 1054 38 St., Brooklyn 19, N.Y., 30, 33
Tel: GEdney 6-2476

Goldsmith Bros. Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill., 79, 87, 90
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Gombos Co., Inc., John 103 Montgomery Ave., Irvington, N.J., 79, 84
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Goodrich Chemical Co., B. F., 324 Rose Bldg., Cleveland 15, Ohio, 83, 89, 93
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Goodyear Aircraft Corp., 1210 Massillon Rd., Akron 15, Ohio, 63, 79
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Gordon Associates, Inc., 157 Broad St., Red Bank, N.J., 77, 103
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Gorham Mfg. Co., 333 Adelaide Ave., Providence 7, R.I., 27, 71, 73, 74, 79, 81
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Gorman Mfg. Corp., Subsid. of Interntl. Resistce. Co., 2242 S. Sepulveda Blvd., Los Angeles 64, Calif., 49
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Gotham Television Corp., 123 W. 64 St., New York 23, N.Y., 1, 14, 58
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Grady Instrument Co., 689 Belmont St., Belmont 78, Mass., 21, 24, 25
Tel: WAtertown 3-1100

Graham Mfg. Co., Inc., 47 Bridge St., E. Greenwich 5, R.I., 35, 74, 97
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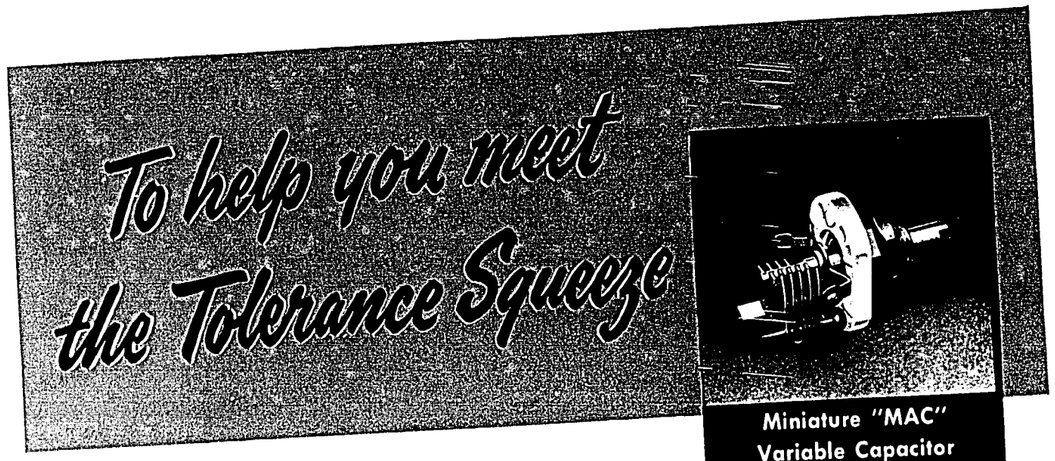
Graner, Inc., L. P., 40 E. 49 St., New York 17, N.Y., 77
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Grant Pulley & Hardware Corp., 31-85 Whitestone Pkwy., Flushing, N.Y., 33
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Graphite Metallizing Corp., 1054 Nepperhan Ave., Yonkers 3, N.Y., 35, 81
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Grason-Stadler Co., 106 Hampshire St., Cambridge 39, Mass., 1, 67, 77, 84
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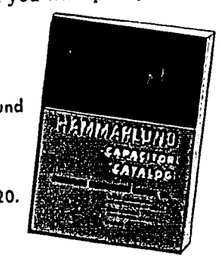
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Gray Radio Co., 501 Forest Hill Blvd., W. Palm Beach, Fla., 25
Tel: WEst Palm Beach 6211

Gray Research & Development Co., Inc., 658 Hilliard St., Manchester, Conn., 3, 9, 16
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Gray Stamping & Mfg. Co., Plano, Ill., 91

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Green Electronics, 8-03 149 St., Whitestone, L.I., N.Y., 26, 63
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Green Instrument Co., Inc., 385 Putnam Ave., Cambridge 39, Mass., 86
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Greenlee Tool Co., 2136 Twelfth St., Rockford, Ill., 86
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Gudeman Co. of Calif., Inc., The, 9200 Exposition Blvd., Los Angeles 34, Calif., 4, 34, 39, 40, 47, 57, 79
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Guild Electronics, Inc., 110 Duane St., New York 7, N.Y., 46, 53, 64, 66, 83
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Guthman & Co., Inc., Edwin L., 15 S. Throop St., Chicago 7, Ill., 34, 39, 57, 75, 81
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Haledy Electronics Co., 57 William St., New York 5, N.Y., 50, 63, 64, 94
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Haldorson Transformer Co., 4500 Ravenswood Ave., Chicago, Ill., 34, 57
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Hamlyn Electronics Corp., 32 Holman Blvd., Hicksville, N.Y., 1, 18, 19, 21, 23, 24, 25, 26, 46, 49, 63, 64, 99, 100
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Hammarlund Mfg. Co., Inc., The, 460 W. 34 St., New York 1, N.Y., 13, 14, 19, 24, 32, 64
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Harnett Electric Corp., 138 Haven Ave., Pt. Washington, L.I., N.Y., 34, 47, 57
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Tel: Southbridge 4-4361

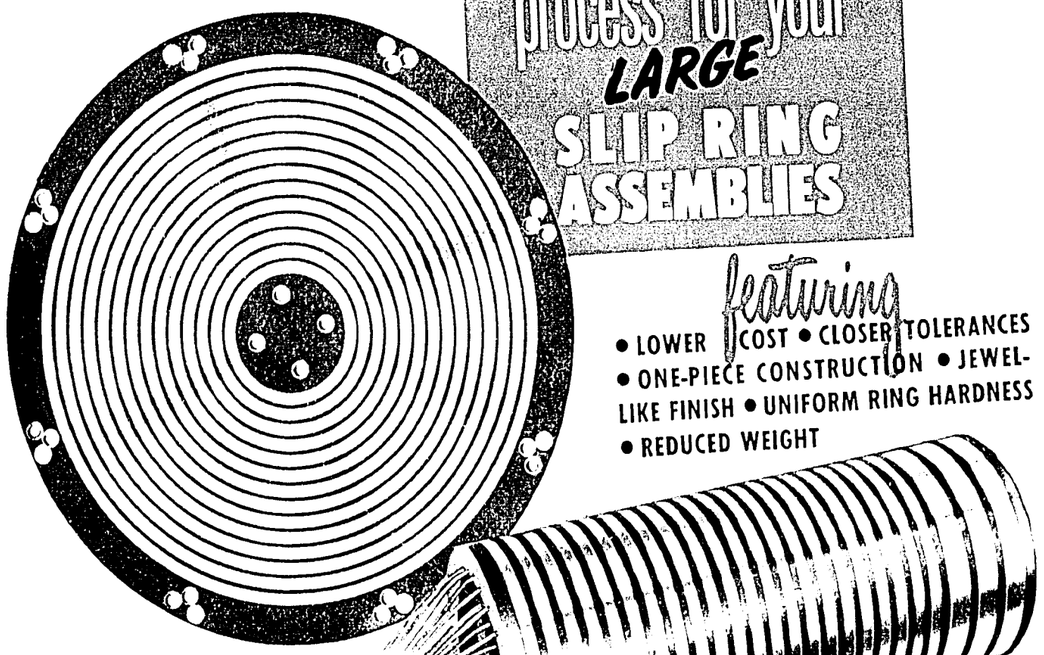
Harwood Mfg. Co., 466 W. Superior, Chicago 10, Ill., 16, 59
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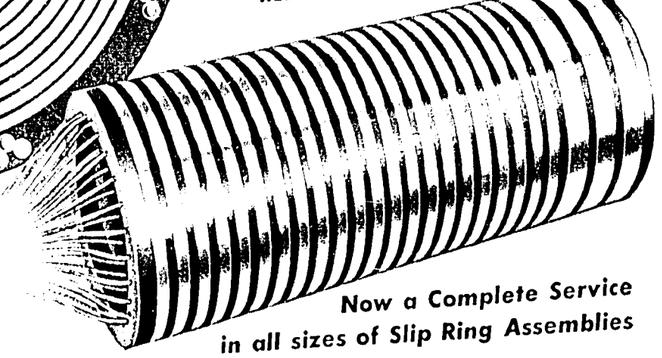
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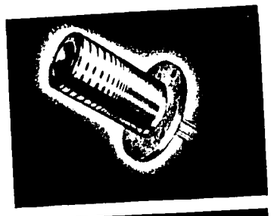
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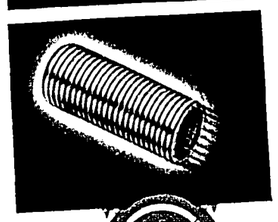
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Hawley Products Co., 333 N. 6 St., St. Charles, Ill., 7, 88
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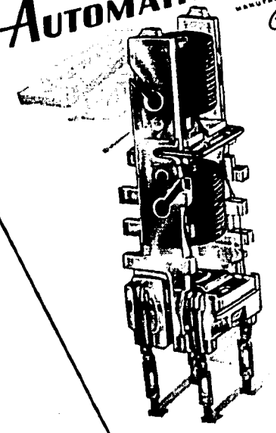
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Tel: WH 4-1000

International Pump & Machine Works, 11-13 Governor St., Newark 2, N.J., 86

International Radiant Corp., 40 Matinecock Ave., Pt. Washington, L.I., N.Y., 84, 94
For details see ad on page 440
Tel: Pt. Washington 7-3184

International Rectifier Corp., 1521 E. Grand Ave., El Segundo, Calif., 36, 48, 52, 64
For details see ad on page 352
Tel: Oregon 86281

International Resistance Co., 401 N. Broad St., Philadelphia, Pa., 2, 31, 34, 47, 48, 51, 52, 79
Tel: Walnut 2-2166

International Television Corp., 238 William St., New York 38, N.Y., 1, 14, 15, 100
Tel: Cort 7-5160

International Testing Service, 321 N. Hamilton St., Saginaw, Mich., 77, 79, 84, 89
Tel: Saginaw 5-4405

Ippolito & Co., Inc., James, 401 Concord Ave., New York 54, N.Y., 91
For details see ad on page 511
Tel: CY 2-5300

Iron Fireman Mfg. Co., Electronics Div., 2838 S.E. 9 Ave., Portland 2, Ore., 44, 50
Tel: FI 6551

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Institute of Radio Engineers

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IRE Directory

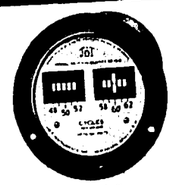
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New York 21, N.Y.

REED FREQUENCY METERS • ELAPSED TIME METERS
SWITCHES, Instrument and Test Equipment Quality: ROTARY, LEVER, TOGGLE
for THE ELECTRONIC INDUSTRY

J-B-T



Model 30-F
Dual Range, Double Window



Model 36-FX-21
21-Reed Meter in 3½" Case



Model 34-FHXX
9-Reed in 3½" Sealed Case



Model 41-FX
Dual Range in 4" Case



Model 15-FHAC
2-Reed in 1½" Sealed Case



Model 33-FP-9M
Portable, Metal Case
TS-328 A/U (400 cy. type) Shown

VIBRATING REED FREQUENCY METERS

Meters illustrated are typical panel mounting or portable—for use where constant or known frequency is important to efficient operation of equipment.

- *Permanently Accurate* within ±0.3% or better at reference temperature, depending on the model. This accuracy is not affected by poor wave form, external magnetic disturbances, or voltage fluctuations.
- *Size and Type for Every Service.* Made in a wide variety of portable and panel case styles, reed groupings and frequency ranges from 12 to 650 cycles and above; 100-130 volts furnished unless otherwise specified.
- *Rugged Construction* of simplified, patented design, with no moving parts to wear out or get out of calibration. Ideal for field and mobile applications.
- *Suitable for Electronic Circuits* because of relatively low power consumption and J-B-T reeds with high Q and sharp, immediate response.

3½" and 2½" SEALED Types

3½ inch FHXX Meters sealed, glass-to-metal construction with solder terminals, meet or exceed the sealing and electrical requirements of JAN-1-6 and MIL-M-6A including the 3000 volt breakdown, and use the front mounting dimensions specified. Max. barrel diameter, $2^{11}/_{16}$"; 2⅞" overall depth behind flange. While not regularly stocked, these meters are in volume production. New 2½" meters Model 21-FHXX available on special order.

1½" SEALED Types

Model 15-FHAC (illustrated half actual size). 60 and 400 cycles, 2 reeds, 8-10 volts, for cathode follower circuit. Widely used on audio oscillators to standardize output. Meets intent JAN-1-6 and amendments on sealed meters. Barrel, 1½" diameter; detachable flange, 2.094" diameter; solder terminals.

Model 15-FH Series (not illustrated)—Same case, sealed, 5 reeds, 58-62 cycles, 100-130 volts, or 390-410 cycles, 100-130 volts. Variations such as 6 reeds or 25 cycles available on special order.

ASK FOR CATALOG 354-R

ELAPSED TIME METERS

For Maintenance, Tube Life Data, and Operating Time Records—on Motor Generators, Transmitters, Receivers, Rectifiers, Test Set-ups, etc.



Model 31-EX (illustrated) also known as running-time or total time meter, registers in 1/10 hours to 9,999.9 hours, then automatically resets. Normally stocked for 60 cycles, 110-130 volts. 3½" standard meter mounting. Variations such as 50 cycles; 230 volts; 0-99,999 hours; 3" rectangular case; and readings in minutes available on special order.

SEALED TIME METERS

Model 31-EHXX—Completely sealed meter, reading 0-9,999.9 hours, same as Model 31-EX above. Glass-to-metal construction, solder terminals, and 3½" detachable flange, all match XX metal frequency meter case.

Model 33-EHXX — Operates on 400 cycles, 110-125 volts, to read 0-9,999.9 hours in 1/10 hour steps. It is presently made only in 3½" flange sealed metal case, 2¾" diameter, 4" deep behind panel.

Model 21-EHXX—New. 2½" flange, sealed, full size counter.

FREQUENCY — TIME METERS

Combination Reed-Type Frequency — Elapsed Time Meters—One Meter Does the Work of Two.

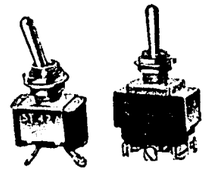


Model 31-FE (illustrated) pioneered by J-B-T, saves panel space and cost, and encourages periodic maintenance; 3¼" flange, metal case, $4^{11}/_{32}$" overall depth, standard. 3½" case known as 31-FEX-1 supplied on custom orders. 5 reeds, 60 cycle range, standard; 7, 9, 11 reeds or 50 cycle range on special order.

DISTRIBUTOR SERVICE

Standard J-B-T items are available through authorized electronics parts distributors.

TOGGLE SWITCHES FOR JAN-S-23



J-B-T now manufactures toggle switches of the quality required by Specifications JAN-S-23 and MIL-S-6745. The complete series ST-40 and ST-50 with screw terminals, and ST-42 and ST-52 (with solder lugs) are available. Solid silver contacts and rocker arms, rugged construction, and a tested combination of lubricant, plating and materials enable these switches to exceed many of the requirements. Ask for Bulletin TS-4. A convenient adhesive-backed list of Preferred Types (PPL-23-ST) also will be sent upon request. Smaller, lower capacity toggle switches, such as ST-12, -13, -22, -23, -26 and -27, also designed for JAN-S-23 will be released for sale in the third quarter of 1954. Your inquiries are invited.

MOLDED ROTARY SWITCHES

Shorting and Non-Shorting...14 or 20 Positions ...1 to 6 Decks.
All moving contacts enclosed — eliminates dirt and corrosion...contact lugs permanently integrated into switch assembly...sturdy construction with 3-post deck suspension, double-grip collector arms, and rectangular drive shaft through decks for precision indexing...interchangeable, electrically and mechanically with J-B-T Series SS-14 and 20 position Laminated Switches.
Carrying capacity (not make-and-break): 1 amp.; maximum momentary, normal 5 amp.; maximum voltage between contacts and ground, 1000 volts R.M.S.; between decks and ground, 2000 volts R.M.S. Average contact resistance 0.007 ohms or less. Also available in 6-pole per deck double throw construction.



Model MS-14-2

LAMINATED ROTARY SWITCHES

Used widely in quality test equipment, portable instruments, inspection setups and avionics where trouble-free, dependable performance counts. Two basic types —14 pos. (2" dia.) or 20 pos. ($2^{23}/_{32}$" dia.) give extra contacts in minimum space. One to six decks.



Model SS-14-2

LEVER ACTION SWITCHES

Excellent for test equipment and communications systems, these switches use the same high qaulity parts as the SS-14 series. Bracket mounting holes 1⅛" apart; single deck types may be mounted in groups ¾" between centers; two-deck types, $1^{5}/_{16}$" between centers.



Model SS-14-1L4

ASK FOR CATALOG 354-R

J-B-T INSTRUMENTS, INC. J-B-T NEW HAVEN 8, CONN.

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Irvington Varnish & Insulator Co., 6 Argyle Terr., Irvington 11, N.J., 78, 83, 85, 89
Tel: Essex 3-4200

Isolantite Mfg. Corp., Warren Ave., Stirling, N.J., 12, 23, 24, 27, 31, 34, 38, 47, 50, 51, 53, 54, 61, 76, 82, 83, 88, 91
Tel: Millington 7-0385

Ivanhoe Electronic Labs., 14238 S. La Salle St., Chicago 27, Ill., 15
Tel: Riverdale 0456

J-B-T Instruments, Inc., 441-R Chapel St., New Haven 8, Conn., 43, 54, 94
For details see ad on page 184
Tel: State 7-5825

JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 19, 24, 27, 32, 35, 41, 54, 57, 74, 81
For details see ad on page 286
Tel: BE 6-9200

Jablo Plastics Industries, Ltd., Mill Lane, Waddon, Croydon, Surrey, England, 83, 86, 91
Tel: Croyden 2201-3

Jackson Electrical Instr. Co., 18 S. Patterson Blvd., Dayton 2, Ohio, 92, 94, 99, 100, 101
Tel: Michigan 0367

Jacksonville Metal & Plastics Co., 575 Dora St., Jacksonville 4, Fla., 30, 33, 81
Tel: Jacksonville 64884

Jaco Products, 6408 Euclid Ave., Cleveland 3, Ohio, 79, 81 86
Tel: Express 1-6664

Jacobs, Charles F., P.O. Box 408, Church St. Sta., New York 8, N.Y., 27

Jacobs Instrument Co., 4718 Bethesda Ave., Bethesda 14, Md., 39, 57, 63, 64, 70, 72, 73, 79, 84, 96
Tel: Oliver 4-8100

James Vibrapowr Co., 4036 N. Rockwell St., Brooklyn 11, N.Y., 76, 81, 88, 91
Tel: CO 7-6333

Jan Hardware Mfg. Co., Inc., 75 N. 11 St., Brooklyn 11, N.Y., 76, 81, 88, 91
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Janette Electric Mfg. Co., Lehigh at Main, Morton Grove, Ill., 36, 44
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Jansky & Bailey, 1339 Wisconsin Ave., N.W., Washington 7, D.C., 77
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Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill., 18, 51, 77
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Jefferson Electric Co., 910 S. 25 Ave., Bellwood, Ill., 57
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Jefferson, Inc., Ray, 40 E. Merrick Rd., Freeport, L.I., N.Y., 23, 24
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Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose 8, Calif., 31, 32, 50, 54, 94
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Tel: Cyprus 2-4025

Jensen Industries, Inc., 329 S. Wood St., Chicago 12, Ill., 9, 10
Tel: Sel 3-7800

Jensen Mfg. Co., 6601 S. Laramie, Chicago 38, Ill., 7
Tel: PO 7-7600

Jerrold Electronics Corp., 26 and Dickinson Sts., Philadelphia 46, Pa., 26, 27, 35, 40, 57, 58, 75, 100
Tel: Howard 5-9200

Jersey City Technical Inst., 880 Bergen Ave., Jersey City 6, N.J., 102
Tel: Journal Square 3-2777

Jersey Specialty Co., Inc., Burgess Pl., Mountain View, N.J., 74, 75
Tel: Little Falls 4-0784

Jet Electronics, Inc., 93 Massachusetts Ave., Boston, Mass., 51

Jiffy Clip Mfg. Co., 128 Clinton, Huntington, N.Y., 81
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Johanson Mfg. Corp., P.O. Box 327, Boonton, N.J., 32
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Johns-Manville, 22 E. 40 St., New York 16, N.Y., 75, 77, 81, 83, 85
Tel: Lexington 2-7600

Johnson Co., E. F., 206 2nd Ave., Waseca, Minn., 6, 19, 32, 40, 53, 55, 76, 88, 91
Tel: Waseca 990

Johnson, J. Kelly, 511 5 Ave., New York 17, N.Y., 77
Tel: Murray Hill 7-5062

Johnson & Hoffman Mfg. Co., 31 E. Second St., Mineola, L.I., N.Y., 91
For details see ad on pages 55-58
Tel: Pioneer 2-3333

Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo., 87
Tel: Hu 1-7000

Johnson-Williams, Ltd., 2625 Park Blvd., Palo Alto, Calif., 64
Tel: DA 2-1531

Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 6, 35, 41, 53, 79, 91
For details see ad on pages 110-111
Tel: NE 2-2000

Jones Electronics Co., Inc., M. C., 185 N. Main St., Bristol, Conn., 27, 97, 100
Tel: Bristol 2-6388

Joy Mfg. Co., Pittsburgh 22, Pa., 35
Tel: Grant 1-2145

K-F Development Co., 2606 Spring St., Redwood City, Calif., 20, 51

K-G Electronics Corp., 3059 N. Sheffield, Chicago 14, Ill., 27
Tel: Wellington 5-8747

K. V. Transformer Corp., 20 E. Franklin St., Danbury, Conn., 34, 57, 79, 81
Tel: Danbury 3-5531

Kaar Eng. Corp., P.O. Box 1320, Palo Alto, Calif., 18, 21, 23, 24
Tel: DA 3-9001

Kabar Mfg. Corp., 1907 White Plains Rd., New York 62, N.Y., 66
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Kahle Engineering Co., 1310 7 St., N. Bergen, N.J., 86
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Kahn, Leonard R., 22 Pine St., Freeport, L.I., N.Y., 77
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Kahn & Co., 541 Windsor St., Hartford 1, Conn., 13, 21, 23, 24, 46, 64, 77, 79, 94
Tel: Hartford 46-7431

Kahn Research Labs., Elizabeth Bldg., 22 Pine St., Freeport, N.Y., 18, 24, 25, 77, 84
Tel: Freeport 9-8800

Kaiser Metal Products Co., Inc., Britol, Pa., 26, 46, 63, 64, 69, 79, 84, 96, 97
Tel: BRistol 8-8451

Kalbfell Labs., Inc., 1090 Morena Blvd., San Diego 10, Calif., 13, 16, 26, 46, 47, 62, 63, 65, 69, 70, 94
Tel: Woodcrest 8-6181

Kallmann, Ph.D., Heinz E., 417 Riverside Dr., New York 25, N.Y., 77
Tel: AC 2-1713

Karlson Associates, Inc., 1379 E. 15 St., Brooklyn 30, N.Y., 30
Tel: DE-9-1691

Karp Metal Products Co., 211 63 St., Brooklyn 20, N.Y., 16, 30, 33, 79
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Kartron, P.O. Box 472, Huntington Beach, Calif., 94
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Kaupp Co., C. B., 32 Newark Way, Maplewood, N.J., 79, 81
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Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 2, 57, 84, 94, 96, 97, 100, 101
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Tel: Caldwell 6-4000

Kaye-Halbert Television, 3623 Eastham, Culver City, Calif., 13, 14, 44, 47, 101
Tel: TE 0-4891

Kay Townes Antenna Co., 1511 Dean Ave., Rome, Ga., 27
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Kaywoff Products Co., Overton, Nebr., 79, 81, 83, 88, 89
Tel: Overton 2483

Kean, Walter F., 1 Riverside Rd., Riverside, Ill., 77
Tel: Riverside 7-2153

Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 26, 37, 44, 63, 64, 69, 76, 82, 83, 84
For details see ad on page 414
Tel: Little Falls 4-1600

Keim, Llewellen Bates, 74-12 35 Ave., Jackson Heights 72, N.Y., 77
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Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio, 1, 26, 94
For details see ad on page 446
Tel: Henderson 1-9809

Kelk & Co., G. F., North Park Post Office, Toronto, Can., 63, 77, 84
Tel: Re. 4896

Kellogg Co., The M. W., Chemical Mfg. Div., P.O. Box 469, Jersey City 3, N.J., 83, 89
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Tel: Worth 4-6775

Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 1, 2, 4, 6, 8, 20, 31, 33, 34, 50, 54, 63, 74
For details see ad on page 404
Tel: DEarborn 2-0750

Kelnor Mfg. Corp., 222 Kearny St., San Francisco 8, Calif., 86
Tel: DO 2-2996

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Standardized for your convenience!

General Ceramics ALUMINA CERAMIC*

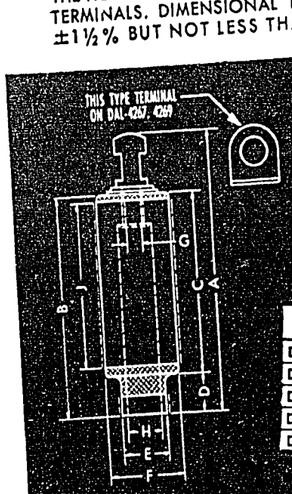
*Conforms to the requirements of Grade L-5A in accordance with JAN-1-10.

SOLDERSEAL HERMETIC TERMINALS

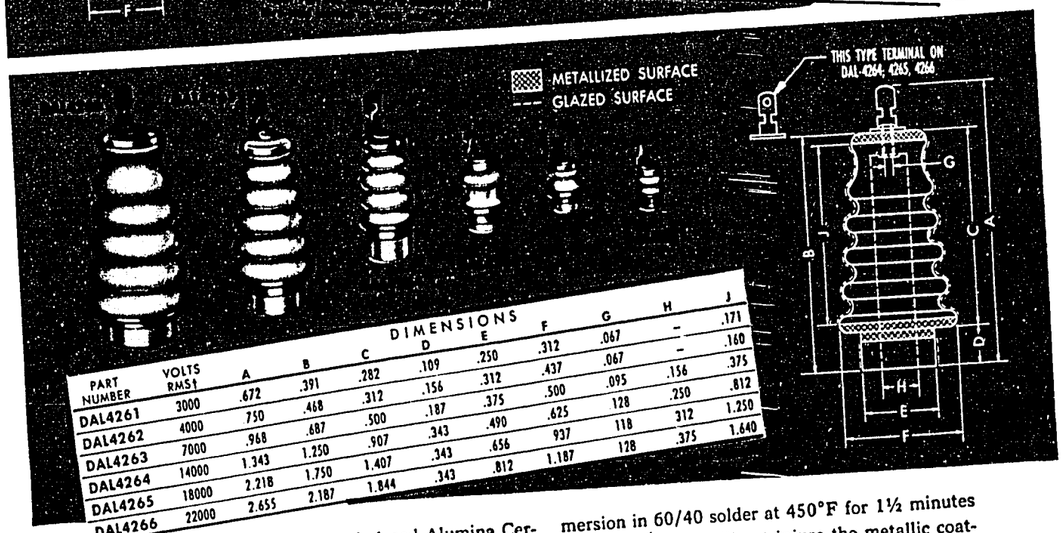
THE ITEMS SHOWN ARE STANDARD STOCK TERMINALS. DIMENSIONAL TOLERANCE, ±1½% BUT NOT LESS THAN ±.010"

Featuring

- High Mechanical Strength
- Resistance to Thermal Shock
- Fast, Easy Installation
- Permanent Hermetic Sealing



PART NUMBER	VOLTS RMS†	DIMENSIONS A	B	C	D	E	F	G	H	J
DAL4267	4000	.547	375	.281	093	125	.234	.046	.084	.250
DAL4268	5000	687	422	312	.109	250	359	069	.171	.281
DAL4269	8000	.875	.687	.562	.125	156	.250	.046	.093	.531
DAL4270*	10000	1.187	.937	437	500	.234	.312	–	–	.375
DAL4271	15000	1.531	1.250	.937	.312	281	.453	090	.187	.781



PART NUMBER	VOLTS RMS†	DIMENSIONS A	B	C	D	E	F	G	H	J
DAL4261	3000	.672	.391	.282	.109	.250	.312	.067	–	.171
DAL4262	4000	750	468	.312	.156	.312	.437	.067	–	.160
DAL4263	7000	.968	.687	.500	.187	.375	.500	.095	.156	.375
DAL4264	14000	1.343	1.250	.907	.343	.490	.625	128	.250	.812
DAL4265	18000	2.218	1.750	1.407	.343	.656	937	118	312	1.250
DAL4266	22000	2.655	2.187	1.844	.343	.812	1.187	128	.375	1.640

These terminals are made of glazed Alumina Ceramic. Lugs and eyelets are hot tinned brass and metallized areas are silver fired on ceramic, copper electroplated and tin fused for soft soldering. Immersion in 60/40 solder at 450°F for 1½ minutes for dip soldering will not injure the metallic coating. For complete information and quotations call, write or wire today.

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Tel: BOulevard 2-3330

Kemlite Labs., 1819 W. Grand Ave., Chicago 22, Ill., 60
Tel: TAylor 0-6050

Kemtron Electron Products, Inc., 14 Prince Pl., Newburyport, Mass., 38, 48
Tel: Newburyport 485

Kennedy Co., D. S., 432 S. Main St., Cohasset, Mass., 71, 79, 83
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Kent Co., F. C., 64 Howard St., Irvington 11, N.J., 74
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Kilpatrick Electronic Lab., 3527 Indian Queen Lane, Philadelphia 29, Pa., 1, 5, 26, 64, 67, 69, 79, 84
Tel: Victor 8-3885

Kimble Glass Co., A Subsid. of Owens-Illinois, P.O. Box 1035-36, Toledo 1, Ohio, 59, 83, 88, 91, 93
Tel: Fairfax 6543

King, Inc., Albert D., 65 King St., Northampton, Mass., 77, 84

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Kirchberger & Co., Inc., M., 1425 37 St., Brooklyn 18, N.Y., 76, 79, 91
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Kirk & Blum Mfg. Co., 3120 Forrer, Cincinnati 9, Ohio, 30, 79

Kliegl Bros., Universal Electric Stage Lighting Co., 321 W. 50 St., New York 19, N.Y., 16, 35
Tel: Columbus 5-0130

Kling Metals Spinning Co., 174 Centre St., New York 13, N.Y., 79, 91
Tel: Ca. 6-5580

Klipsch & Associates, P.O. Box 64, Hope, Ark., 4, 7
Tel: Prospect 7-3395

Knights Co., James, 101 E. Church St., Sandwich, Ill., 13, 38
For details see ad on page 313
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Tel: Marlboro 1000

Kollmorgen Optical Corp., 347 King St., Northampton, Mass., 26, 69, 71, 73, 74, 77, 79, 97
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Kolton Electric Mfg. Co., 123 N. J. Railroad Ave., Newark 5, N.J., 30, 41, 79
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Korb Eng. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich., 10, 11, 72, 73, 74, 77, 79, 84
Tel: Ardmore 0-2349

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Tel: Bigelow 8-1414

Kramer, Ambrose W., 422 Washington Bldg., Washington 5, D.C., 77, 84
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Tel: Wa. 4-6318

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Tel: University 4-4272

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Tel: AD 8161

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Tel: Chapman 5-2376

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Laboratory For Electronics, Inc., 75 Pitts St., Boston 14, Mass., 18, 39, 47, 63, 72, 73, 94, 96, 97, 99
Tel: Richmond 2-3200

Labscope, Inc., 50 Paterson Ave., E. Rutherford, N.J., 99
Tel: Ruth 2-9720

Lacey Brothers, 113 S. Lombard Ave., Oak Park, Ill., 47
For details see ad on page 496
Tel: ES 8-3232

Lafayette Labs., Inc., 236 Lafayette St., New York 12, N.Y., 79, 81, 84, 86
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(Continued on page 189)

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Tel: Twining 8-9400

Lambda-Pacific Eng., Inc., 14757 Keswick St., Van Nuys, Calif., 17, 26, 71, 72, 73
Tel: State 6-1801

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Tel: Ri 6378

La Moree, C. D., 2221 4 St., Berkeley, Calif., 79, 81, 83, 85, 89

Lampkin Labs., Inc., R.F.D. 1, Bradenton, Fla., 96, 97
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Landis & Gyr, Inc., 45 W. 45 St., New York 36, N.Y., 43, 63, 81
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Langevin Mfg. Corp., 37 W. 65 St., New York 23, N.Y., 1, 16, 26, 33, 34, 46, 57, 69, 79
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Tel: Endicott 2-7200

Landsdale Tube Co., Church St., Lansdale, Pa., 52, 59
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Lansing Sound, Inc., James B., 2439 Fletcher Dr., Los Angeles 39, Calif., 4, 7, 30
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La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn., 12, 26, 27, 47, 71
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Lapp Insulator Co., Inc., 16 Sumner St., La Roy, N.Y., 27, 31, 32, 76

La Rose & Assoc., Inc., W. T., 31 Ontario St., Cohoes, N.Y., 30, 31, 57, 66
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Laurehk Radio Mfg. Co., P.O. Box 430, Wayne, Mich, 1
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Lavin Associates, Henry, P.O. Box 196, Meriden, Conn., 104
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For details see ad on page 312
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Lawn Electronics Co., E. Freehold Rd., Freehold, N.J., 36, 46, 79
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Leach Corp., Inet Div., 4441 S. Santa Fe Ave., Los Angeles 58, Calif., 26, 36, 44, 46, 62
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Leach Relay Co., Div. of Leach Corp., 5915 Avalon Blvd., Los Angeles 3, Calif., 48, 50
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Leader Electronics, Inc., 5713 Euclid Ave., Cleveland 3, Ohio, 50, 54
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Lear, Inc., 3171 S. Bundy Dr., Santa Monica, Calif., 18, 24, 58, 64, 69, 70, 75, 77, 84
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Lectra, Inc., 153 W. Huron, Chicago 10, Ill., 34, 47
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Lee Chemical Corp., Walter, 567 Third Ave., New York 16, N.Y., 89
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Lee Electronic & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif., 26, 46, 48

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For details see ad on pages 349, 431
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Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa., 94
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Lepel High Frequency Labs, Inc., 54-18 37 Ave., Woodside 77, N.Y., 60
Tel: Havemeyer 6-4580

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Tel: ULster 8-7288

Lettine Radio Mfg. Co., 62 Berkley St., Valley Stream, N.Y., 17, 19, 24, 25, 27
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Leupold & Stevens Instr., Inc., 4445 N.E. Glisan St., Portland 13, Ore., 43, 63, 70, 95
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Levinthal Electronic Products, Inc., 2821 Fair Oaks Ave., Redwood City, Calif., 40, 57, 67, 73, 84
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Lewis & Kaufman, Ltd., 92 El Rancho Ave., Los Gatos, Calif., 49, 61
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Librascope, Inc., 1607 Flower St., Glendale 1, Calif., 26, 51, 54, 63, 68, 69, 95
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Tel: LYnbrook 9-6920

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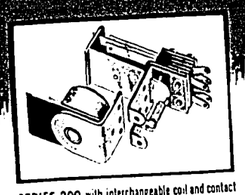
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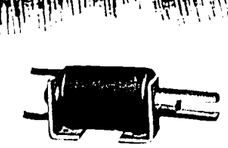
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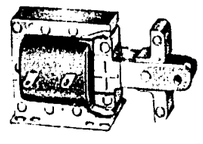
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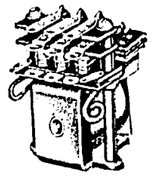
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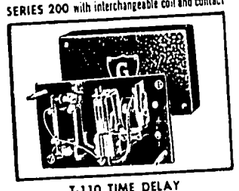
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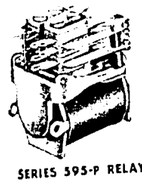
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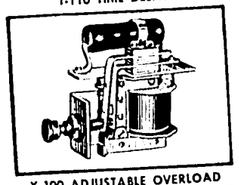
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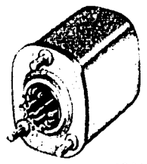
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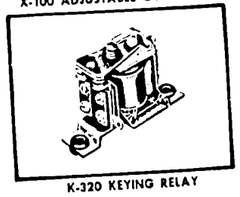
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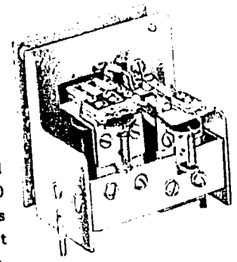


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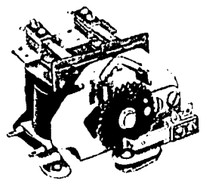
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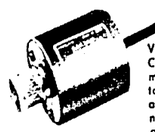
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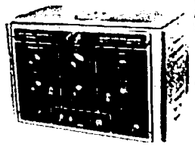
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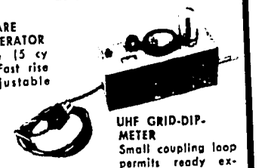
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Tel: Springfield 7-5361

Lynch Carrier Systems, Inc., 96 Jessie St., San Francisco 5, Calif., 20
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Lynmar Engineers, Inc., 1432 N. Carlisle St., Philadelphia 21, Pa., 26, 27, 77, 84, 100
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Lynn Electronic Research Co., 9 W. Mangolia Blvd., Burbank, Calif., 81, 88
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Lysco Mfg. Co., Inc., 1401 Clinton St., Hoboken, N.J., 19, 21, 23, 24, 50, 79, 84

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Machlett Labs., Inc., 1063 Hope St., Springdale, Conn., 49, 60, 61
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MacKay, Inc., A. D., 198 Broadway, New York 38, N.Y., 38, 48, 52, 78, 80, 87, 91, 93
Tel: Ba 7-8532

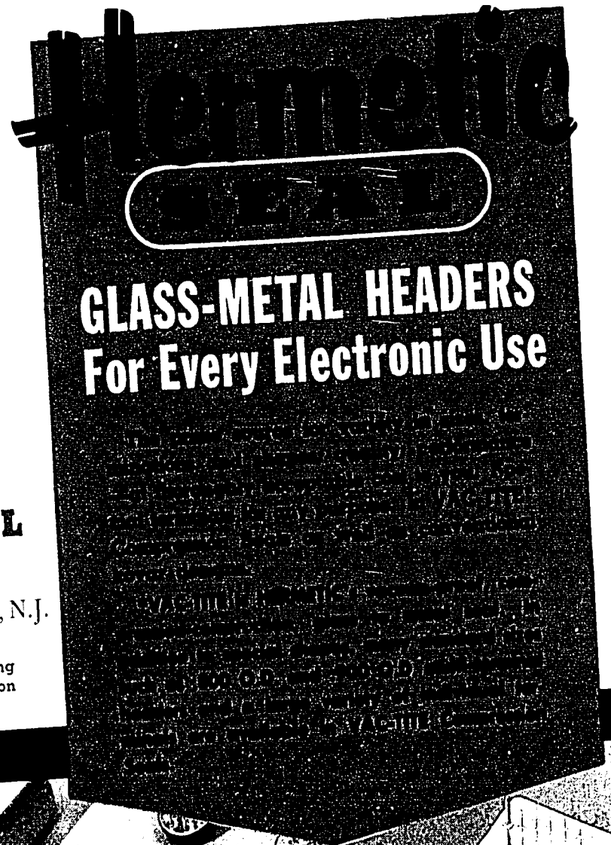
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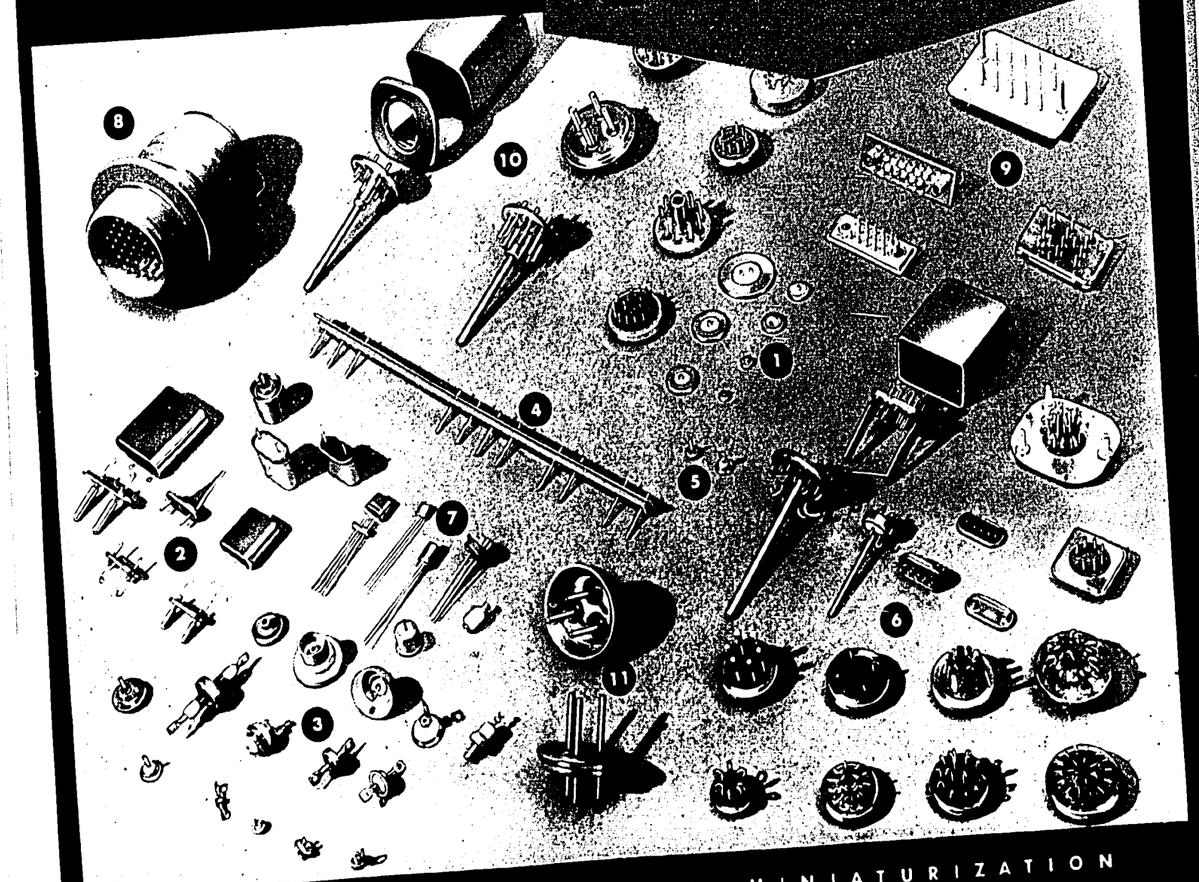
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MacKinnon, Keith A., P.O. Box 542, Ottawa, Canada, 77
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MacLeod & Hanopol, Inc., 10 Roland St., Charlestown 29, Mass., 46, 75, 84, 94
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Macmillan Co., 60 Fifth Ave., New York 11, N.Y., 102
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MacNabb Co., Inc., Vernon C., 909 E. Westfield Blvd., Indianapolis 20, Ind., 24
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Magnatran, Inc., 248 Schuyler Ave., Kearny, N.J., 49, 57
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Magnetic Metals Co., Hayes Ave., at 21 St., Camden 1, N.J., 37, 78
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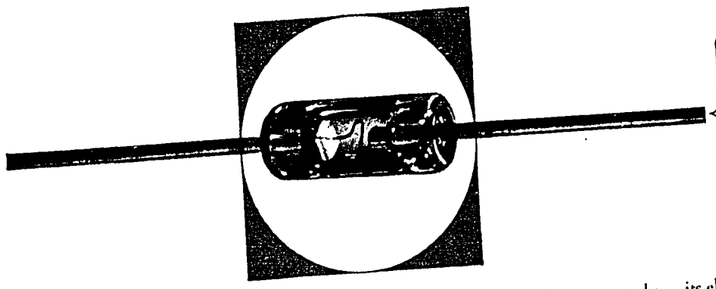
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Hughes *Fusion-Sealed* Germanium Diodes



ACTUAL DIMENSIONS DIODE BODY: *0.265 by 0.130 inches (maximum)*

SHUNT CAPACITANCE: *0.5 μμf (maximum)*

AMBIENT OPERATING TEMPERATURE RANGE: *−78°C to +90°C*

Hughes Point-Contact Germanium Diodes are fusion-sealed in a one-piece, gas-tight glass envelope . . . impervious to moisture, fumes or other external contaminating agents. The flexible dumet leads are especially suitable for spot-welding; or they can be iron- or dip-soldered as close as ¼ inch to the diode body—without special precautions.

The germanium crystal is permanently bonded to one lead, the cat whisker is welded to the other, and the point of the cat whisker is welded to the crystal. Hughes diodes are highly resistant to shock and vibration. *Positive* mechanical stability is achieved without risking contamination from fluxes, waxes or impregnants. And—*each diode is thoroughly tested* to ensure the stability of its electrical and physical characteristics. All this means: sturdy, highly reliable diodes.

TYPES—The Hughes line of diodes comprises standard RETMA, JAN, and many special types. Special types are produced according to customer specifications and are tested at high or low temperatures . . . for specific recovery time . . . for matching in pairs or quads.

ELECTRICAL SPECIFICATIONS AT 25° C *unless otherwise indicated*

DESCRIPTION	RETMA or Hughes Type	Clip-in Hughes Type	Peak Inverse Voltage† (volts)	Absolute Maximum Inverse Working Voltage (volts)	Minimum Forward Current @ +1V (mA)	Maximum Inverse Current @ −50V (mA)	Maximum Inverse Current Other (mA)	Other Characteristics
HIGH PEAK	1N55B	HD 2052	100	150	5.0		0.500 @ 150V	
	1N68A	HD 2053	130	100	3.0		0.625 @ 100V	
1 MEG TYPES	1N67A	HD 2054	100	80	4.0	0.050	0.005 @ 5V	
	1N99	HD 2055	100	80	10.0	0.050	0.005 @ 5V	
	1N100	HD 2056	100	80	20.0	0.050	0.005 @ 5V	
500K TYPES	1N89	HD 2057	100	80	3.5	0.100	0.008 @ 5V	
	1N97	HD 2058	100	80	10.0	0.100	0.008 @ 5V	
	1N98	HD 2059	100	80	20.0	0.100	0.008 @ 5V	
	1N116	HD 2060	75	60	5.0	0.100		
	1N117	HD 2061	75	60	10.0	0.100		
	1N118	HD 2062	75	60	20.0	0.100		
GENERAL PURPOSE	1N90	HD 2063	75	60	5.0	0.500		
	1N95	HD 2064	75	60	10.0	0.500		
	1N96	HD 2065	75	60	20.0	0.500		
JAN TYPES	1N126*		75	60	5.0	0.850	0.050 @ 10V	Non-JAN equivalent, HD2070; clip-in, HD2066
	1N127**		125	100	3.0	0.300	0.025 @ 10V	Non-JAN equivalent, HD2071; clip-in, HD2067
	1N128***		50	40	3.0		0.010 @ 10V	Non-JAN equivalent, HD2072; clip-in, HD2068
	1N198		100	80	5.0	0.250	0.075 @ 10V	
					These values tested 100% at 75°C			
COMPUTER TYPES	1N191	HD 2077		§	5.0	400K Ω min. between −10 and −50V @ 55°C§		Back resistance recovers to 50K Ω and 400K Ω (200K Ω for 1N192) in 0.5 μsec and 3.5 μsec max., respectively.‡
	1N192	HD 2078		§	5.0	200K Ω min. between −10 and −50V @ 55°C§		0.2 μsec recovery time.○
	HD2013				50 @ 1V & 1 @ 0.35V		0.120 @ −3V	0.2 μsec recovery time.○
	HD2014				50 @ 1V & 1 @ 0.35V		0.60 @ −6V	
UHF MISCELLANEOUS	HD2016A				UHF MIXER DIODE			
	HD2051		125	100	4.0	0.050		1N63 equivalent.

†That voltage at which dynamic resistance is zero when back voltage rises linearly at 90*v*/sec.

‡Back Recovery Time is measured with a forward pulse of 30mA, followed by a reverse pulse of 35 volts. Loop resistance of test circuit 2500 Ω max.

○Recovery time is that point at which the diode voltage reaches −1*V* after the initiation of a 6*V* back pulse through 20K Ω from an initial 3 mA forward bias. Total shunt capacitance is 20 μμf.

§Tested at 55°C. Test voltage is a continuous 60 cps sine wave. Peak Reverse Voltage across the diode is 70*V*. Peak Forward Voltage not less than +2*V* or Peak Forward Current not less than 20 m.*A*, whichever occurs first.

*Formerly 1N69A. **Formerly 1N70A. ***Formerly 1N81A.

Descriptive Bulletin SP2A is available on request.

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New York Chicago

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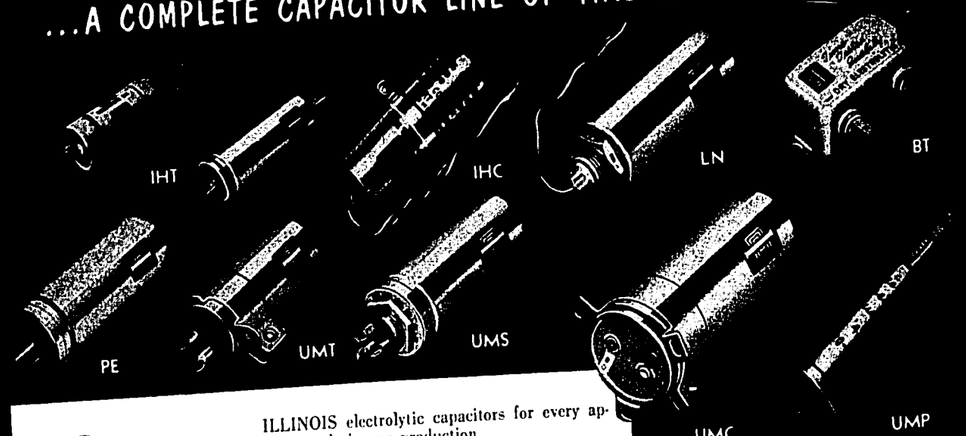
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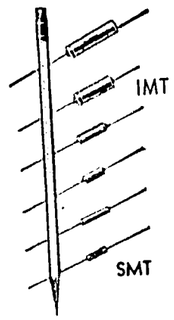
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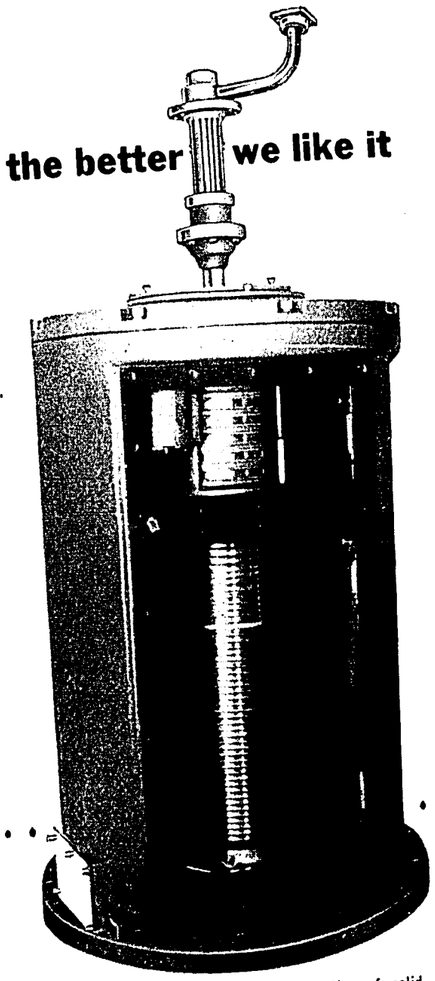
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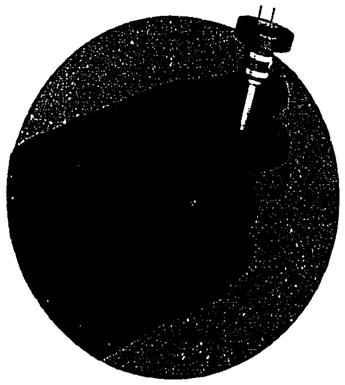
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Peirce Wire Recorder Corp., 5900 N. Northwest Hwy., Chicago 31, Ill., 9, 10, 11
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Penn East Engineering Corp., P.O. Box 240, Kutztown, Pa., 1, 26, 34, 57, 64, 69, 84
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Penntronics, 110 W. Hortter St., Philadelphia 19, Pa., 1, 46, 64, 67, 84, 92, 94, 99
Tel: GE 8-5576

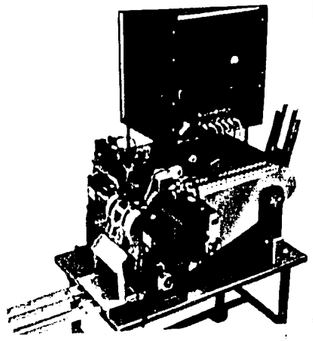
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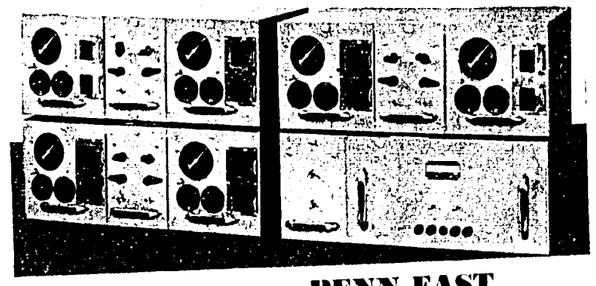
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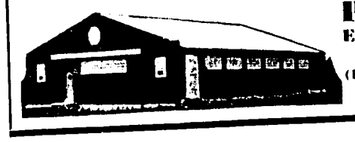
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Equipment like this *Radar Simulator* for training, simulation, control (below) built to your specifications.

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Crystals for color television are available to your specific calibration for either the ringing or oscillator circuit. This new design provides hermetic seal at an economical cost.

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Midland has developed, and is expanding, a new series of crystal units which will comprise the MIDLAND MINIATURE line. Their small glass enclosures insure true hermetic seal and long-term stability.

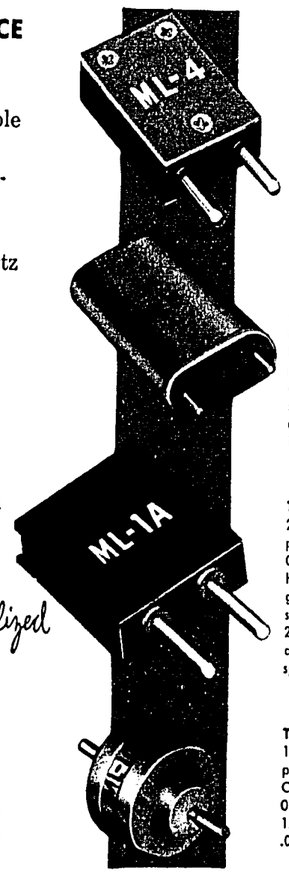
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The quality of Midland Crystals—which is another way of saying the completely dependable job they will do for you—is assured by exacting tests and controls through every step of processing. The finest precision equipment and most advanced techniques known to the industry are used by Midland from selection of raw quartz to final sealing of the crystal.

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Type ML-4 Range 1.0 - 10.0 mc. Supplied per mil Type CR-5, CR-6, CR-8, CR-10 when specified. Holder is phenolic, gasket sealed. Holder size is 1⅛ x 13/16 x 7/16 with .093" diameter pins ½" long spaced .486".

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Philco Corp., Government Industrial Div., 4700 Wissahickon Ave., Philadelphia 44, Pa., 16, 17, 71, 72, 73, 74, 97, 101
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"EVEREADY" RADIO BATTERIES
BRAND

TYPES	VOLTAGE	LENGTH	WIDTH	HEIGHT	TERMINALS	SUGGESTED CURRENT RANGE	WEIGHT BATTERY
"A" BATTERIES FOR PERSONAL RECEIVERS							
720	1.5	2 1/32"	1 3/4"	3 1/32"	Socket —, +1.5	0-300 m.a.	6 1/2 oz.
724	6	1 3/32"	1 3/32"	2 1/4"	Flat Contact —, +6	0-25 m.a.	2 1/2 oz.
950	1.5	1 21/64" D		2 27/64"	Flat Contact —, +1.5	0-150 m.a.	3 oz.
964	1.5	1 5/8" D		4 11/64"	Flat Contact —, +1.5	0-300 m.a.	5 9/10 oz.
"B" BATTERIES FOR PERSONAL RECEIVERS							
437	75	1 1/8"	1 1/8"	6 1/8"	Snap Type —, +75	0-10 m.a.	14 3/4 oz.
455	45	2 3/4"	1"	3 1/8"	Snap Type —, +45	0-10 m.a.	7 1/2 oz.
457	67.5	2 1/8"	1 5/8"	2 1/2"	Snap Type —, +67.5	0-6 m.a.	7 2/3 oz.
467	67.5	2 1/8"	1 3/4"	3 45/64"	Snap Type —, +67.5	0-10 m.a.	12 oz.
477	67.5	1 1/8"	63/64"	5 1/8"	Snap Type —, +67.5	0-8 m.a.	8 3/8 oz.
490	90	3 1/8"	1 3/4"	3 45/64"	Snap Type —, +90	0-10 m.a.	15 oz.
"A" BATTERIES FOR POCKET RECEIVERS							
635	1.5	1 1/64" D		1 1/4"	Flat Contact —, +1.5	0-80 m.a.	1 2/3 oz.
915	1.5	35/64" D		1 1/4"	Flat Contact —, +1.5	0-25 m.a.	5/8 oz.
"B" BATTERIES FOR POCKET RECEIVERS, RADIO PAGING AND SPECIAL EQUIPMENT							
411	15	1 3/32"	5/8"	1 29/64"	Flat Contact —, +15	0-2.5 m.a.	1/2 oz.
412	22.5	1 3/32"	5/8"	2"	Flat Contact —, +22.5	0-2.5 m.a.	1 1/8 oz.
413	30	1 3/32"	5/8"	2 1/8"	Flat Contact —, +30	0-2.5 m.a.	1 2/3 oz.
415	45	1 3/64"	5/8"	3 43/64"	Snap Type —, +45	0-4 m.a.	2 1/2 oz.
417	15	1 1/8"	3/4"	1 1/8"	Flat Contact —, +15	0-6 m.a.	1 1/8 oz.
420	22.5	1 1/8"	3/4"	2 1/8"	Flat Contact —, +22.5	0-6 m.a.	2 1/2 oz.
430	30	1 1/8"	1"	2 1/8"	Flat Contact —, +30	0-6 m.a.	3 1/8 oz.
491	240	2 19/32"	15/16"	4 1/16"	Flat Recessed —, +240	0-2.5 m.a.	13 oz.
493	300	2 11/16"	2 7/32"	3 29/32"	Pin Jacks —, +300	0-2.5 m.a.	14 1/2 oz.
497	510	3"	1 19/32"	5 5/8"	Flat Recessed —, +180, +510	0-2.5 m.a.	1 lb. 10 oz.
505	22.5	5/8"	19/32"	1 03/64"	Recessed —, +22 1/2	0-1.5 m.a.	3/5 oz.
506	30	1 13/64"	5/8"	1 27/64"	Flat Contact —, +30	0-1.5 m.a.	9/10 oz.
507	30	5/8"	19/32"	2.605"	Flat Contact —, +30	0-1.5 m.a.	9/10 oz.
"A" BATTERIES FOR PORTABLE RECEIVERS							
713	7.5	3 3/8"	53/64"	2 3/8"	Socket —, +7.5	0-50 m.a.	6 1/2 oz.
717	7.5	2 3/32"	1 1/8"	3 3/32"	Socket —, +7.5	0-75 m.a.	8 oz.
726	4.5	3 1/8"	1 1/16"	2 1/8"	Socket —, +4.5	0-150 m.a.	10 1/2 oz.
736	4.5	3 1/8"	1 1/16"	4 3/32"	Socket —, +4.5	0-250 m.a.	1 lb.
742	1.5	2 3/16"	2 3/16"	3 1/8"	Socket —, +1.5	0-1000 m.a.	1 lb. 5 oz.
744	6	2 3/8"	2 3/8"	3 1/8"	Socket —, +6	0-250 m.a.	1 lb. 5 oz.
746	4.5	3 1/8"	1 1/16"	4 3/8"	Socket —, +4.5	0-300 m.a.	1 lb. 3 2/3 oz.
"B" BATTERY FOR PORTABLE RECEIVERS							
482	45	3 3/8"	1 3/8"	5 1/2"	Socket —, +45	0-40 m.a.	1 lb. 15 oz.
"A-B" PACKS FOR PORTABLE RECEIVERS							
752	9 A	14 3/16"	2 1/4"	4 1/16"	Recessed Plug —, +9	A: 50 m.a.	6 lb. 2 oz.
	90 B				Recessed Plug —, +90	B: 12-15 m.a.	
753	7.5 & 9 A	9 3/32"	2 3/8"	4 1/16"	Socket —, +7.5 & 9	A: 50 m.a.	4 lb. 12 oz.
	90 B				Socket —, +90	B: 12-15 m.a.	
754	7.5 & 9 A	10 1/8"	3 1/4"	4"	Socket —, +7.5 & 9	A: 50 m.a.	6 lb. 1 oz.
	90 B				Socket —, +90	B: 12-15 m.a.	
755	6 & 7.5 A	8 5/16"	2 7/8"	3 3/4"	Socket —, +6 & 7.5	A: 50 m.a.	3 lb. 9 oz.
	75 B				Socket —, +75	B: 12 m.a.	
756	7.5 & 9 A	8 3/4"	2 1/8"	3 3/8"	Socket —, +7.5 & 9	A: 50 m.a.	2 lb. 14 oz.
	90 B				Socket —, +90	B: 8-12 m.a.	
757	9 A	9 3/32"	2 3/8"	4 3/8"	Recessed Plug —, +9	A: 50 m.a.	4 lb. 12 oz.
	90 B				Recessed Plug —, +90	B: 12-15 m.a.	
"A-B" PACK FOR HOME RECEIVERS							
776	7.5, 9.0 A	7 3/8"	4 1/8"	9 7/8"	Socket —, +7.5, +9	A: 50 m.a.	14 lb. 12 oz.
	90 "B"				Socket —, +90		
					Recessed Plug —, +9	B: 10-12 m.a.	
					Recessed Plug —, +90		

These Battery Engineering Bulletins are available on request: **1.** Batteries for Portable Electronic Equipment. **2.** "Mini-Max" "A-B" Packs for Portable and Home Receivers. **3.** Batteries for Hearing Aids. **4.** High Voltage Batteries. **5.** Photoflash Batteries.

EVEREADY
TRADE-MARK

The registered trade-marks "Eveready," and "Mini-Max," distinguish products of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

Alphabetical Directory

(Continued from page 207)

Pyramid Electric Co., 1445 Hudson Blvd., North Bergen, N.J., 31, 40
For details see ad on page 212
Tel: UN 51776
Pyramid Instr. Corp., 630 Merrick Rd., Lynbrook, N.Y., 43
Tel: Lynbrook 3-9634
Pyroferric Co., Inc., 621 E. 216 St., New York 67, N.Y., 37

Q Circuits Co., 132 El Camino Real, San Carlos, Calif., 47, 77
Tel: Lytell 3-7572
Q-Line Mfg. Corp., 1562 61 St., Brooklyn 19, N.Y., 4, 19, 24, 25, 27, 30, 33, 40, 79, 81
Tel: BEnsonhurst 6-9320
Q.L.C. Corp., 10 Aubrey St., Summit, N.J., 34, 57
Tel: Summit 6-6288
Q-O-S Corp., 39 W. 60 St., New York 23, N.Y., 46, 94
Tel: Columbus 5-6620
Quality Components, Inc., St. Marys, Pa., 37, 88
Quam-Nichols Co., 234 Marquette Rd., Chicago 37, Ill., 7
Tel: Wentworth 6-8150
Qutronic Transformer Corp., 2 E. Broadway, New York 2, N.Y., 4, 26, 34, 57, 58, 65
Tel: Worth 2-3639

R-B-M Div., Essex Wire Corp., 200 Godfrey St., Logansport, Ind., 50
For details see ad on page 214
Tel: LOgansport 5121
R-C Scientific Instr. Co., Inc., 307 Culver Blvd., Playa Del Rey, Calif., 68, 84, 98
Tel: EXbrook 8-5411
RCA Communications, Inc., 66 Broad St., New York 4, N.Y., 15
Tel: HA 2-1811
RCA Institutes, Inc., 350 W. 4 St., New York 14, N.Y., 102
Tel: WAtkins 4-7845
RCA Labs., 711 Fifth Ave., New York 22, N.Y., 84
Tel: EL 5-6549
RCA Review, RCA Labs., Princeton, N.J., 103
RCA Victor Co., Eng. Prod. Dept., Camden, N.J., 1, 2, 4, 5, 7, 8, 10, 11, 12, 13, 16, 17, 21, 24
Tel: WE 7551
RCA Victor Co., Ltd., 1001 Lenoir St., Montreal, Quebec, Canada, 1, 3, 5, 7, 8, 9, 10, 12, 15, 16, 17, 23, 24, 25, 27, 30, 34, 38, 52, 57, 71, 72, 73, 77
R. C. L. Manufacturing Co., P.O. Box 25, Riverside, N.J., 51
Tel: Riverside 4-1003
R.E.F. Mfg. Corp., 393 Jericho Tnpke., Mineola, N.Y., 30, 33, 77, 79
Tel: Pioneer 2-8400
R.F.I. Shielded Enclosures Corp., 3634 N. Lawrence St., Philadelphia 40, Pa., 93
Tel: RE 9-2537
R. J. Audio Products, 164 Duane St., New York 13, N.Y., 30
R. K. Mfg. Co., P.O. Box 112, Marion, Ill., 57
Tel: Ordill 251
R. M. S. Associates, Inc., 112 W. Boston Post Rd., Mamaroneck, N.Y., 26, 46, 77, 79, 84
Tel: Mamaroneck 9-4390
RS Electronics Corp., P.O. Box 368, Sta. A, Palo Alto, Calif., 47, 71, 72, 79, 84

(Continued on page 210)

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 named products. We have tried to avoid oversimplication, 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 used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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, preceding the product system in the pink pages introducing the "firms and products" section. You will note also that after each firm, its products are listed by number code in the alphabetical list, and that subclassifications 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.

The IRE DIRECTORY is 10 Indexes in one book.

Check list of RCA Tube Division Products and Services

ELECTRON TUBES

- **Receiving Tubes**
  - Detectors
  - Oscillators
  - Converters and Mixers
  - Power Amplifiers
  - Voltage Amplifiers
  - Electron-ray types
  - Rectifiers
- **Power Tubes**
  - High, Medium, Low Power AF, RF, VHF, UHF
- **Industrial Receiving Tubes**
  - "Special Reds"
  - "Premium" Types
  - "Pencil" Triodes
  - Computer Types
  - Voltage Reference and Regulator Types
- **Cathode-Ray Tubes**
  - Kinescopes (Black & White)
  - Kinescopes (Tricolor)
  - Oscillographs
  - Special-purpose
- **Microwave Tubes**
- **Thyratrons and Ignitrons**
- **Phototubes and Multiplier Phototubes**
- **Rectifiers**
  - Vacuum, Gas, Mercury-Vapor Types
- **TV Camera Tubes**
  - Image Orthicons
  - Vidicons
  - Monoscopes
  - Iconoscopes
- **Special Types**



SEMICONDUCTOR DEVICES

- **Transistors**
- **Crystal Diodes**

TEST EQUIPMENT

- **Cathode-Ray Oscilloscopes**
- **RF and AF Signal Generators**
- **TV Calibrator**
- **TV Sweep Generators**
- **Color-TV Test Equipment**
- **VoltOhmysts®**
- **Ultra Microammeter**

BATTERIES

- **Radio A and B Types**
- **Industrial and Special Types**

Which items can we put to work for you?

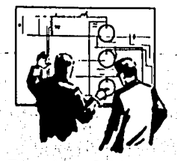
ELECTRONIC COMPONENTS

- **Radio and TV Components**
- **Loudspeakers**
- **Custom-Built Components**
- **Components for Military, Industrial, and Broadcasting Applications**

COLOR TV

RCA tricolor kinescopes; receiving, transmitting and camera tubes; components; and test equipment are ready for your color-TV designs.

SERVICES



- **RCA Application Engineering Service**—designed to assist equipment manufacturers in product development.
- **RCA Field Engineering Service**—provides "on the spot" technical assistance and liaison between RCA and customer.
- **RCA Sales and Customer Service**—seasoned representatives within convenient reach, ready to extend day-to-day personal service.
- **RCA District Offices**—located in Harrison, Chicago, and Los Angeles, to provide prompt service in your territory.
- **RCA Distribution**—bulk tube stocks are maintained in warehouses strategically located for quick service.
- **RCA Technical Literature**—the most authoritative in the field, covers characteristics and operating conditions of RCA tubes and components.

For information on any RCA Tube Division product, write RCA, Commercial Engineering, Section F35Q, Harrison, N. J., or contact your nearest RCA District Office:

(EAST) HUmboldt 5-3900, 415 S. Fifth Street, Harrison, N. J.
(CENTRAL) WHitehall 4-2900, 589 E. Illinois St., Chicago 11, Ill.
(WEST) MAdison 9-3671, 420 S. San Pedro St., Los Angeles 13, Cal.

RADIO CORPORATION of AMERICA
ELECTRON TUBES AND COMPONENTS — HARRISON, N. J.

Alphabetical Directory

(Continued from page 209)

Racker Co., Joseph, 140 Nassau St., New York 38, N.Y., 63, 77, 84, 103
Tel: WO 4-1463

Racon Electric Co., Inc., 1261 Broadway, New York 1, N.Y., 4, 7, 8
Tel: MU 4-6528, 9

Radar-Electronics, Inc., 229 W. 28 St., New York 1, N.Y., 1, 5, 14, 46, 72, 94
Tel: LOngacre 4-0666

Radelco Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio, 24, 27, 35
Tel: VUlcan 3-8080

Radell Corp., 7900 Pendleton Pike, Indianapolis 26, Ind., 51
Tel: CHerry 2466

Radex Corp., 2076 Elston Ave., Chicago 14, Ill., 29, 34, 44, 69, 92, 94
Tel: ARmitage 6-6900

Radiaphone Co., 600 E. Evergreen Ave., Monrovia, Calif., 1, 18, 23, 25, 84
Tel: ELliott 8-2586

Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 18, 26, 63, 69, 70, 72, 73, 84, 92, 95, 97
For details see ad on page 525
Tel: Melbourne 800

Radiation Counter Labs., Inc., 5122 W. Grove St., Skokie, Ill., 1, 26, 38, 54, 60, 65, 68, 82, 84, 98
Tel: Orchard 3-8700

Radiation Instrument Dev. Lab., 2337 W. 67 St., Chicago 36, Ill., 60, 68
Tel: GRovehill 6-4142

Radiation Research Corp., 526 Northwood Rd., W. Palm Beach, Fla., 28, 84, 98
Tel: W. Palm Beach 3-5127

Radio Apparatus Corp., 55 N. New Jersey, Indianapolis, Ind., 18, 24, 25, 75
Tel: Atlantic 1624

Radio City Products Co., Inc., Centre & Glendale St., Easton, Pa., 26, 30, 33, 43, 46, 79, 81, 84, 88, 92, 94, 97, 98, 99, 100, 101
Tel: Easton 9122

Radio Components, Ltd., 560 King St. W., Toronto, Ont., Canada, 11, 51, 54, 57, 74, 81, 85
Tel: Empire 8-4761

Radio Condenser Co., Davis & Copewood Sts., Camden 3, N.J., 32, 39, 58
Tel: EM 5-5500

Radio Cores, Inc., 9540 Tulley Ave., Oak Lawn, Ill., 37, 87
For details see ad on page 307
Tel: GA 2-3353

R.C.A. Tube Dept., Section F35Q, 415 S. Fifth St., Harrison, N.J., 9, 27, 28, 34, 43, 47, 49, 52, 57, 59, 60, 61, 86, 91, 94, 99, 100, 101
For details see ad on page 210
Tel: Humboldt 5-3900

Radio Corp. of America, Communications Marketing Dept., Camden, N.J., 24, 25, 71, 72, 73, 97
For details see ad on page 210
Tel: Woodlawn 3-8000

Radio Corp. of America, Eng. Prods. Dept., Camden, N.J., 1, 2, 4, 5, 7, 8, 10, 11, 12, 13, 16, 17, 21, 24, 67, 68, 69, 92, 94, 96, 97, 99, 100, 101
For details see ad on page 210
Tel: Woodlawn 3-8000

Radio Craftsmen, Inc., 4401 N. Ravenswood Ave., Chicago 40, Ill., 1, 14
Tel: UP 8-4000

Radio Dev. & Res. Corp., 26 Cornelison Ave., Jersey City 4, N.J., 52, 62, 87
Tel: HE 3-6900

Radio-Electronic Eng. Edition, Radio & TV News, 366 Madison Ave., New York 17, N.Y., 103
Tel: MU 7-8080, Ext. 131

Radio & Electr. Jobber News, Inc., 848 Leader Bldg., Cleveland 14, Ohio, 103
Tel: PRospect 1-1587, 8

Radio-Electronics Magazine, 25 W. Broadway, New York 7, N.Y., 103
Tel: RE 2-8630

Code Numbers TELL YOU

what each company does or makes. The number after each address refers you to the 104 Product Listings, in which detailed product or service information on the firm will be found.

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Tel: LE 9-3835

Radio Engineering Co., 8 State St., New York 4, N.Y., 1, 13, 15, 46, 64, 77, 79, 84
Tel: Wh 4-5266

Radio Eng. Labs., Inc., 36-40 37 St., Long Island City 1, N.Y., 14, 17, 25, 33, 58, 71, 72, 73
Tel: STillwell 6-2100

Radio Eng. & Maint., 208 W. Third St., Lexington, Ky., 77
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Radio Eng. Prods., Ltd., 4305 Iberville St., Montreal 34, Que., Canada, 2, 3, 4, 6, 17, 20, 25, 33, 34, 50, 77, 84
Tel: FAlkirk 3025

Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., 33, 81, 86, 94, 96
For details see ad on page 448
Tel: Boonton 8-3100

Radio Industries, Inc., 1307 Central Ave., Kansas City 2, Kan., 24
Tel: Finley 4590

Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill., 31, 32, 34, 39, 40, 47, 58, 85
Tel: UPtown 8-6500

Radio Instrument Labs., 12-05 Sumner Pl., Fair Lawn, N.J., 77, 84
Tel: FAir Lawn 4-5965

Radio Magazines, Inc., 204 Front St., Mineola, N.Y., 103
Tel: Pioneer 2-1950

Radio Mfg. Engineers, Inc., 300-306 First Ave., Peoria 6, Ill., 18, 19, 24, 25, 58
Tel: Peoria 6-6051

Radio Materials Corp., 3325 N. California Ave., Chicago 18, Ill., 31
For details see ad on pages 69-72
Tel: IRving 8-3600

Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 18, 25, 48, 52, 58, 66
For details see ad on pages 30-31
Tel: Watkins 4-3633

Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 46, 77, 79, 84, 86, 94
For details see ad on page 525
Tel: Oregon 50085

Radio Specialty Mfg. Co., 2023 S.E. 6, Portland 14, Ore., 21, 24, 38
Tel: EA 8123

Radio & Television News, 366 Madison Ave., New York 17, N.Y., 103
Tel: MU 7-8080

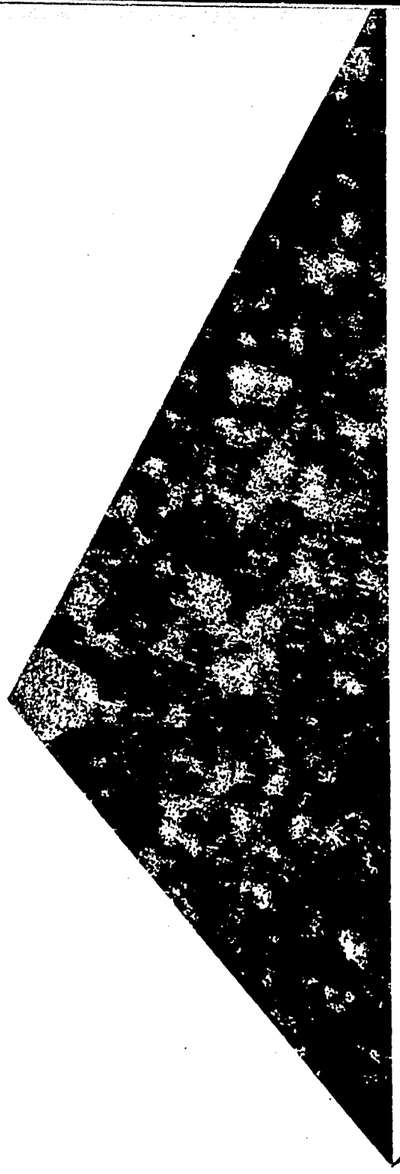
Radio Valve Co. of Canada, Ltd., 189 Dufferin St., Toronto 3, Ont., Canada, 59
Tel: OLiver 6311

Radio Wire Mfg. Co., New Augusta, Ind., 75

Radioactive Products, Inc., 540 W. Congress St., Detroit 26, Mich., 64, 68, 98
Tel: WO 3-9220

Radiocom, Inc., P.O. Box 600, Gt. Barrington, Mass., 103
Tel: GReat Barrington 1300

(Continued on page 213)



The security of experience. Pyramid has more experienced personnel in years of actual designing and manufacturing of capacitors than any other manufacturer.

The advantage of leadership. Pyramid supplies capacitors to all leading TV set manufacturers, and to ALL Branches of Government. Being so close to initial product developments, the design engineer, purchasing agent and production man benefit by new developments in the Pyramid line.

The control of specially designed facilities. Pyramid is the only manufacturer of capacitors whose plants were planned and built specifically for the entire manufacturing process of capacitors from drawing board conception through reception of raw materials, fabrication, packaging and shipment.

what is available from Pyramid

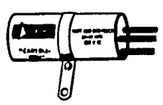
commercial
MIL-SPEC
capacitors

The guarantee of one standard. All Pyramid capacitors are one quality, made of the same quality materials demanded by rigid military specifications. Pyramid capacitors have a low leakage factor due to the non-hygroscopic insulating material used on all production. Pyramid delivers the best at no premium.

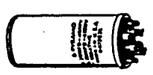
A complete line of capacitors—full ranges in all ratings and types.

ELECTROLYTICS


Type TD, TDL,


Type CDB

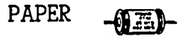

Type MC


Type TM

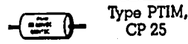

Type DO

PAPER

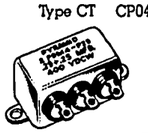

Type 85LPT


Type PTIM, CP 25


Type CT


Type PG "Glasseal," CP04, TOCP11

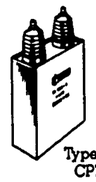

"IMP" Molded


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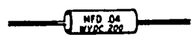

Type PEM, CP 67, CP 69

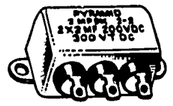

Type PKM, CP61 to CP65


Type PLMF, CP70


Type PJ, CP70

METALLIZED PAPER


Type MT


Type MPD


Type MPT


Type MPG

Burton browne advertising

PYRAMID ELECTRIC COMPANY 1445 HUDSON BOULEVARD • NORTH BERGEN, N. J., U. S. A.

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Radiomarine Corp. of America, 75 Varick St., New York 13, N.Y., 12, 14, 17, 23, 71, 72, 73, 84
Tel: WAlker 5-3716

Radionic Res. Div. of Technair, 848 William St., Montreal 3, Que., Canada, 84
Tel: UN 6-3324

Railway Communications, Inc., Smith Rd., & Glenwood, Raytown, Mo., 3, 4, 20, 24, 30, 33, 34, 37
Tel: Fleming 2100

Ram Electronics, Inc., S. Buckhout St., Irvington-on-Hudson, N.Y., 34, 57
Tel: Irvington 9-5700

Ramo-Wooldridge Corp., 6316 W. 92 St., Los Angeles 45, Calif., 84
For details see ad on page 232
Tel: ORegon 8-7161

Randall, Inc., Douglas, 102 High St., Westerly, R.I., 34

Rangertone, Inc., 73 Winthrop St., Newark 4, N.J., 1, 10, 11
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Rapid Electric Co., 2881 Middletown Rd., New York 61, N.Y., 43, 46, 48, 77

Rapid Electroplating Process, Inc., 1414 S. Wabash Ave., Chicago 5, Ill., 86
Tel: WAbash 2-0952

Rapid Specialties Co., 327 W. Huron St., Chicago 10, Ill., 81
For details see ad on page 515
Tel: DElaware 7-1440

Rattray & Co., Inc., George, 116-08 Myrtle Ave., Richmond Hill 18, N.Y., 51
For details see ad on page 367
Tel: VI 6-8250

Rauland Corp., 4245 N. Knox Ave., Chicago 18, Ill., 59, 60
Tel: MUlberry 5-5000

Rauland-Borg Corp., 3515 W. Addison, Chicago 18, Ill., 1, 5
Tel: Cornelia 7-1300

Rawson Electrical Instrument Co., 110 Potter St., Cambridge 42, Mass., 43, 92, 94, 100
Tel: KI 7-4041

Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N.J., 81, 83, 88
Tel: Gregory 3-2000

Raymond Eng. Lab., Inc., Smith St., Middletown, Conn., 84
Tel: DIamond 6-7745

Raymond Mfg. Co., 226 S. Center St., Corry, Pa., 79, 81
Tel: Corry 3-8201

Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis., 28, 44
Tel: Madison 5-7201

Raypar, Inc., 7810 W. Addison St., Chicago 34, Ill., 34, 39, 40, 46, 53, 57, 101
Tel: Tuxedo 9-3700

Raytheon Mfg. Co., 55 Chapel St., Newton 58, Mass., 38, 48, 49, 52, 59, 60
Tel: BIgelow 4-7500

Raytheon Mfg. Co., Foundry Ave., Waltham, Mass., 61
Tel: WAltham 5-5860

Razdow, Dr. Adolph, 593 Riverside Drive, New York 31, N.Y., 77
Tel: AU 3-7128

Rea Magnet Wire Co., Inc., East Pontiac St., Ft. Wayne 4, Ind., 75
Tel: Ft. Wayne A-5202

Institute of Radio Engineers

PUBLICATIONS

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A monthly collection of the latest data and theory in the electronic engineering field. Subscription to this invaluable engineering magazine is included as a part of I.R.E. membership dues.

Professional Group Transactions and Newsletters

Many I.R.E. Professional Groups publish periodical information on the latest developments in their respective fields. For further information on these groups and the fields they cover, see pages 238-239.

IRE Directory

Annually, the Institute publishes this directory, containing the names of all I.R.E. members, and the latest available information on the firms and products in the field.

To receive these publications, and other benefits of I.R.E. membership, write today for information to:

The Institute of Radio Engineers
1 East 79th St.
New York 21, N.Y.

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment -you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. The result is a more complete picture of each firm's full line, but you travel through fewer listings.

Alphabetical Directory

Reading Batteries, Inc., P.O. Box 916, Reading, Pa., 28

Recora Co., 56 W. 103 St., Chicago 28, Ill., 54
Tel: Pullman 5-6234

Recoton Corp., 147 W. 22 St., New York 11, N.Y., 9, 10
Tel: ORegon 5-7878

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Reeves-Hoffman Corp., 145 Cherry St., Carlisle 6, Pa., 23, 38
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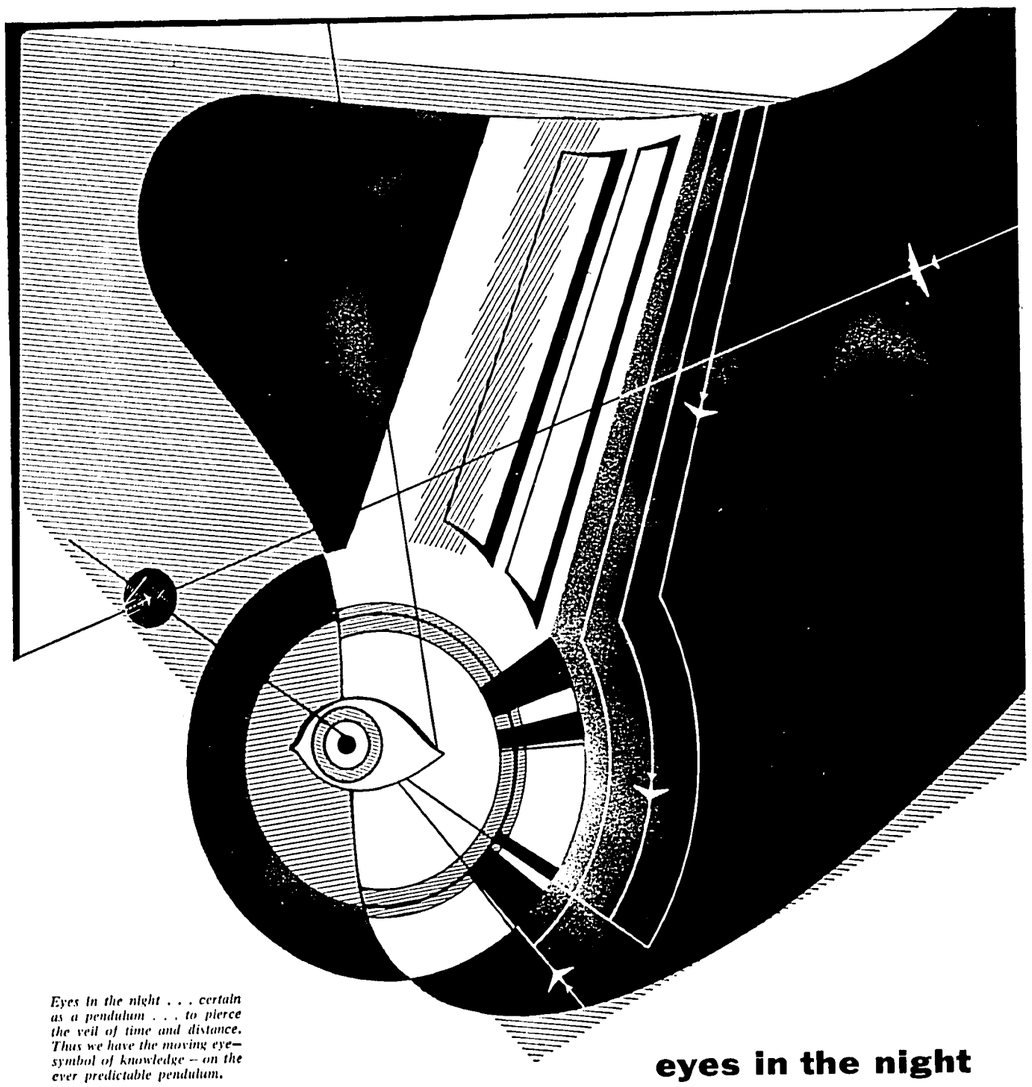
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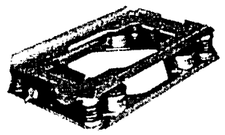
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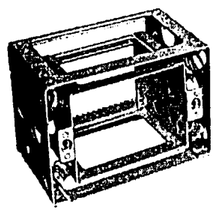
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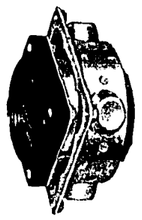


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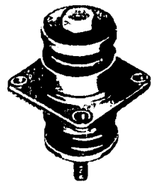


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Shevers Inc., Harold, 123 W. 64 St., New York, N.Y., 1, 14
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Shielding, Inc., 10 Reserve St., Riverside Pk., N.J., 40, 93
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Tel: RIverside 4-1202

Shores Lab., East Patchogue, L.I., N.Y., 84, 93
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Sigma Instruments, Inc., 170 Pearl St., S. Braintree 85, Mass., 50
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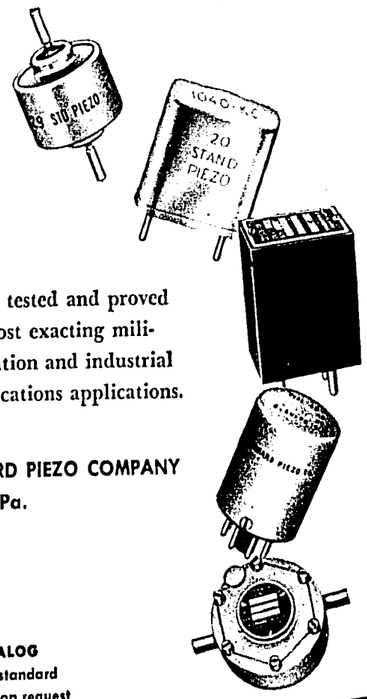
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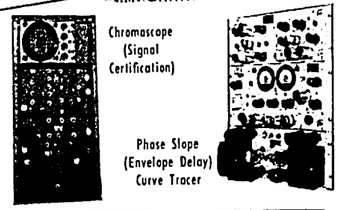
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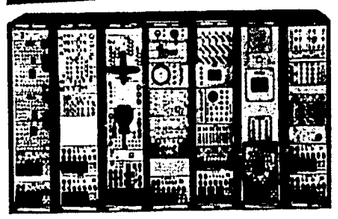
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Swiss Jewel Co., & Deltavis Co., Lafayette Bldg., Philadelphia 6, Pa., 6, 9, 35, 81, 91
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Switchcraft, Inc., 1340 N. Halsted St., Chicago 22, Ill., 6, 35, 54, 75
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Sylvania Electric Products Inc., Electronics Div., Woburn, Mass., 48, 52, 60, 61, 82
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Sylvania Electric Products Inc., 70 Forsyth St., Boston 15, Mass., 63, 72, 73, 84
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Synchromatic Productions, 995 Broadway, Bayonne, N.J., 10
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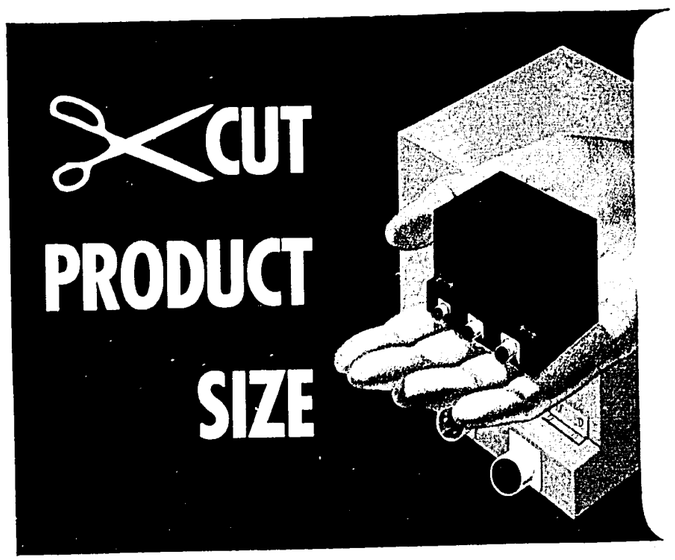
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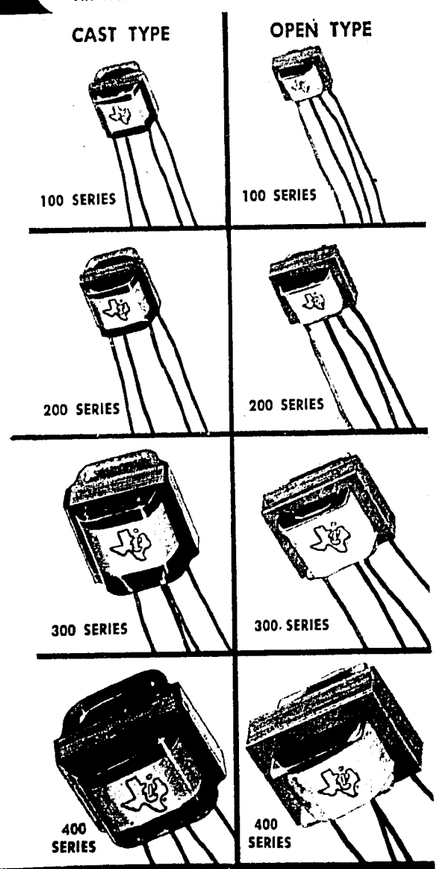
T. L. G. Electric Corp., 31 W. 27 St., New York 1, N.Y., 23, 24, 25, 26, 36, 46, 64, 69, 72, 73, 77, 84, 92, 94, 97, 99, 100
Tel: MU 6-4729

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WITH
TEXAS
INSTRUMENTS
SUBMINIATURE
TRANSFORMERS

All transformers shown ACTUAL SIZE



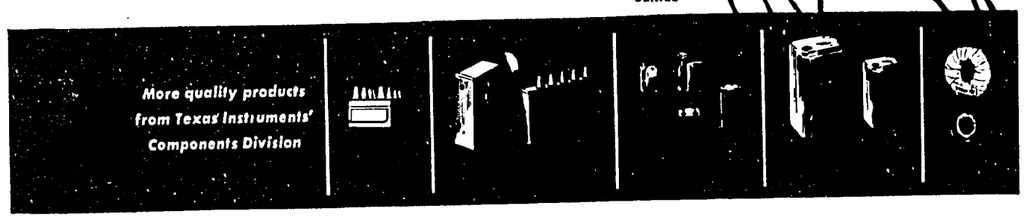
T/I announces 32 new subminiature transformers . . .

. . . for *transistor* and other miniaturization applications. Texas Instruments — also a leading transistor manufacturer — has applied its precise instrument standards in producing both transformers and transistors to bring you this first complete line of subminiature transformers. Behind every TI product are years of experience in meeting the exacting requirements of geophysical and military electronic equipment and components. This experience gives you added assurance of the reliable performance of these new transformers.

Input, interstage, choke, and output types are available in four size series ranging from less than 3/8 inch cubed (one milliwatt output) to slightly less than one inch cubed (over 100 milliwatts). Each series is manufactured in both open and cast construction, making a total of 16 basic types . . . 32 models. Designed for use in the audio and ultrasonic frequencies, these subminiatures will operate over a temperature range of —25° C to 100° C. with the cast units being particularly resistant to moisture and other environmental contamination. For your special applications, our engineers will design models to your detailed specifications.

Write for literature! Let our sales and design engineers help you with your specific transformer, magnetic amplifier or pulse network problems.

TEXAS INSTRUMENTS
INCORPORATED
6000 LEMMON AVENUE DALLAS 9, TEXAS



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Tel: Ludlow 4-3500

Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23, Ill., 1, 5
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Taylor, Archer S., P.O. Box 1479, Missoula, Mont., 77
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Technisonic Studios, 1201 Brentwood Blvd., St. Louis 17, Mo., 11, 15, 77
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Technograph Printed Electronics, 185 Valley St., N. Tarrytown, N.Y., 47, 84
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Code Numbers TELL YOU

what each company does or makes. The number after each address refers you to the 104 Product Listings, in which detailed product or service information on the firm will be found.

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Tel: Fairlawn 6-1500

Tele-Beam Industries, 6th and Soscol Ave., Napa, Calif., 18, 19, 24, 25, 27, 57, 71, 79
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Tele King Corp., 601 W. 26 St., New York 1, N.Y., 9, 14, 44
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Telephony Publishing Corp., 608 S. Dearborn St., Chicago 5, Ill., 103
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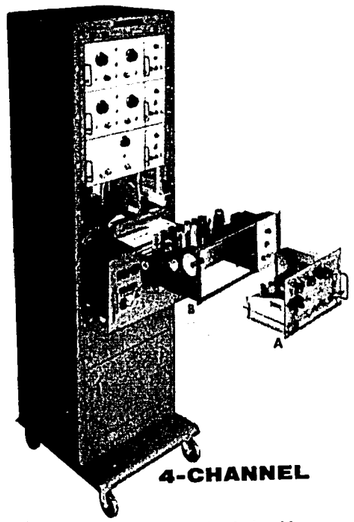
Teleradio Engineering Corp., 99 Wall St., New York 5, N.Y., 32, 34, 42, 57
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Telescreen Corp., 36 Grove St., New Canaan, Conn., 13, 14, 16, 18, 25, 57, 64, 72, 73, 79, 84
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4-CHANNEL

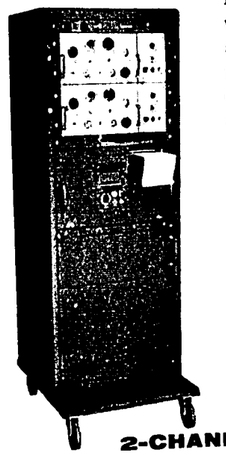
As a graphic example of the design idea that has brought new versatility to industrial recording, a Carrier Preamplifier (A) is shown above in position to plug into a Driver Amplifier in framework with Power Supply (B) which are normally already in place in the Basic Cabinet Assembly.

The identical design principles of the four-channel system are provided in the two-channel, the only difference being the number of channels.

fits your oscillographic recording need?

Sanborn "150" Recording Systems that put to use the original design concept of amplifier interchangeability (illustrated at the left) start with either a four-channel or two-channel standard Basic Assembly, to which the user adds whatever selection or combination of pre-amplifiers (A) are needed for his recording problem. The standard Basic Assemblies comprise a metal Cabinet, Recorder, and a built-in Driver Amplifier and Power Supply (B) for EACH channel. Presently available Preamplifiers are: AC-DC, Carrier, DC Coupling, Servo Monitor, Log-Audio, and Low Level Chopper.

Advantages common to ALL Sanborn Recorders are: inkless recording (by heated stylus) on plastic coated strip chart paper, and in true rectangular coordinates . . . high torque galvanometer movement . . . time and code markers . . . numerous paper travel speeds.



2-CHANNEL

"150"

COMPLETE FOUR-CHANNEL SYSTEM FOR USE WITH ANALOG COMPUTERS

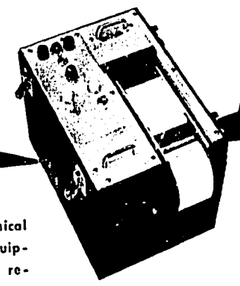
This "150" system consists of a Cabinet Assembly, a four-channel Recorder, and *two* dual channel DC Amplifiers. Each amplifier is complete with a common power supply. Each measures and records two separate single-ended signals, at sensitivities between one and one hundred volts per centimeter. The *two*-channel version of this system will comprise Cabinet, *two*-channel Recorder, and *one* dual channel amplifier.



"150"

SINGLE-CHANNEL RECORDER

A compact, lightweight unit for use when only one channel is required — provides permanent, inkless recording in *true* rectangular co-ordinates; *five* paper speeds (5, 10, 25, 50, 100 mm/sec.); *extra* stylus for either manual or remote timing and coding marks. Designed for simple, patch cord connection to *any* of the several "150" preamplifiers (plus driver amplifier and power supply), available soon in portable metal cases.



Ask, also, for a copy of the *Right Angle* — a Sanborn publication devoted to oscillographic recording in industry.

Catalog and technical data on all "150" equipment available on request.

SANBORN COMPANY

Industrial Division

CAMBRIDGE 39, MASS.

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Tempel Mfg. Co., 1939 Bryn Mawr Ave., Chicago 26, Ill., 78
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Tenney Engineering, Inc., Dept. N, 1090 Springfield Rd., Union, N.J., 93
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Trans Electro Products Corp., Bala-Cynwyd, Pa., 1, 77, 84
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Trans-Gel Products, P.O. Box 328, Pt. Washington, N.Y., 47, 81
Tel: Port Washington 7-3881

Trans-Lux Corp., 1270 Ave. of the Americas, New York 20, N.Y., 16
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Trans-Sonics, Inc., Bedford Airport, Bedford, Mass., 4, 69, 94
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Transformer Specialty Co., Inc., 328 Rockhill Rd., Bala-Cynwyd, Pa., 1, 34, 57
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Transmitter Equip. Mfg. Co., Inc., 345 Hudson St., New York 14, N.Y., 18, 19, 21, 23, 24, 25, 46, 63, 69, 72, 73
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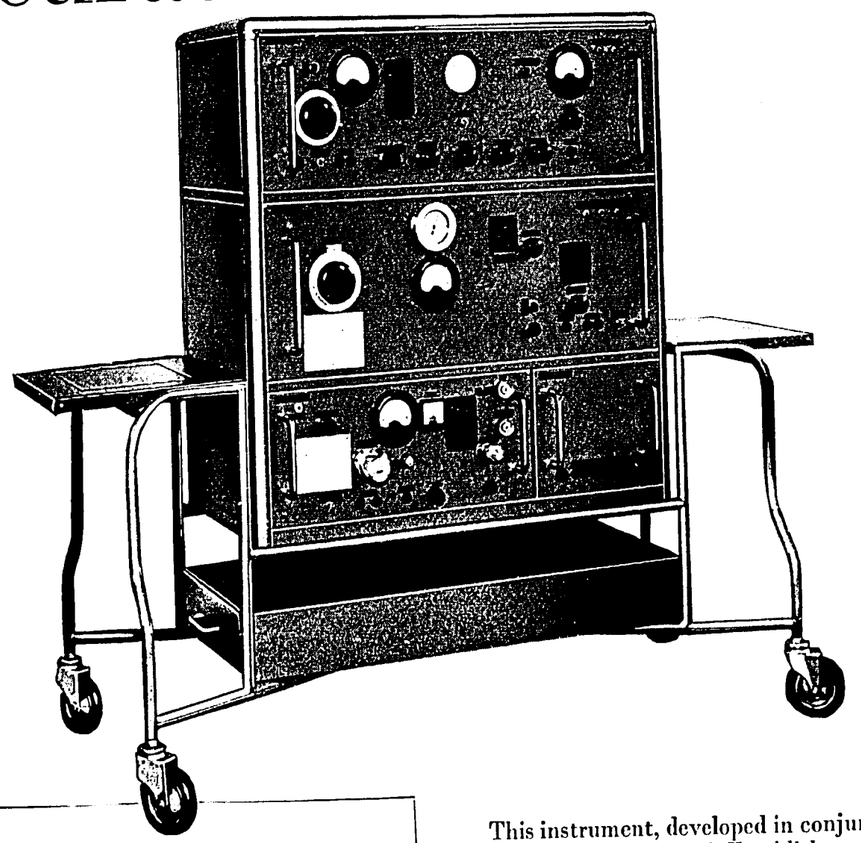
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Traveler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Ill., 9, 14, 30, 33, 46
Tel: Harrison 7-9151

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Attenuator Calibration accurate to ± 0·01 db!



PRECISION ATTENUATOR CALIBRATOR

Brief Specification

Frequency range: 2700 — 3800 Mc/s.

Range of measurement: — 90 db relative to 1 milliwatt.

Accuracy: ± 0·01 db.

Wavemeter accuracy: 0·1%.

Modulator output: 800 cps. sq. wave 100V. peak to peak.

Size (on trolley as illustrated) 65″ × 33″ × 56″ high.

This instrument, developed in conjunction with H.M. Radar Research Establishment, is a reference standard for the measurement of attenuation in 'S' band. Extension of the design to cover 'X' band is in progress. Piston attenuators, directional couplers, unidirectional lines, etc., can be calibrated to an accuracy of ± 0·01 db.

Another unique instrument in the Wayne Kerr microwave range is a ***Q Meter*** for measurements in 'S' and 'X' bands with an accuracy of better than 1%.

For details of Wayne Kerr Laboratory instruments, including the transformer ratio arm H.F. and V.H.F. Bridges, contact ***MARCONI INSTRUMENTS LIMITED*** *23-25 Beaver St., New York 4, N.Y., agents in the U.S.A. for*

WAYNE KERR LABORATORIES LIMITED

New Malden, Surrey, England

Wayne Kerr

Specialists in High Frequency measurement

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Tru-Ohm Products Div., Huntington, Ind., See: Model Engineering

Truelove & Maclean, Inc., Waterville St., Waterville, Conn., 79, 81, 91
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Truscon Steel Div., Republic Steel Corp., Albert St., Youngstown 1, Ohio, 12, 25, 75
Tel: RI 6-7211

Tube Service Corp., 2 Gaston Ave., Garfield, N.J., 59
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Tubergen Associates, 2232 W. 11th St., Los Angeles 6, Calif., 104
For details see ad on page 562
Tel: Dunkirk 9-3173

Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 45, 50, 52, 54, 59, 60
For details see ad on page 234
Tel: Humboldt 2-4200

Turner Co., 909 17 St. N.E., Cedar Rapids, Iowa, 8, 9
Tel: Cedar Rapids 3-8144

Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 6, 35, 45, 53, 54
For details see ad on page 103
Tel: LA 7-8400

Uglow, Kenneth M., 1507 M St. N.W., Washington 5, D.C., 77
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Ulanet Co., George, 413 Market St., Newark 5, N.J., 54, 56
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Tel: MA 2-4876

Ultra Electro Forming Co., 110 Cedar Ave., Pitman, N.J., 79, 86
Tel: Pitman 3 7666

Ultradyne Engineering Labs., Inc., Box 8007, Albuquerque, N.M., 77, 84, 102
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Ultrasonic Corp., 61 Rogers St., Cambridge 43, Mass., 1, 7, 26, 50, 54, 63, 65, 69, 70, 72, 79, 84
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Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J., 1, 18, 26, 34, 46, 57
Tel: Journal Square 4 1801

Union Switch & Signal Div. of Westinghouse Airbrake Corp., Pittsburgh 18, Pa., 48, 50, 64
Tel: PEnnhurst 10880

Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J., 1, 34, 46, 57
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United Condenser Corp., 337 E. 139 St., New York 54, N.Y., 31
Tel: CY 2 5180

United Control Corp., 4540 Union Bay Pl., Seattle 5, Wash., 54, 56, 64
Tel: Plaza 9200

United Electronics Co., 42 Spring St., Newark 4, N.J., 31, 49, 60, 61
Tel: Humboldt 2 0576

United Insulator Co., Ltd., Oakeroft Rd., Tolworth, Surbiton, Surrey, Eng., 37, 38, 41, 76, 81, 82, 83, 88, 91, 93
Tel: ELmbridge 5241 6

United Mfg. & Service Co., 405 S. 6 St., Milwaukee, Wis., 75

United Specialties Co., Mitchell Div., Edmund and Shelmire Sts., Philadelphia 36, Pa., 33, 79
Tel: De 3 5400

U. S. Components, Inc., 454 E. 148 St., New York 55, N.Y., 6, 35, 47, 82, 88
Tel: Cy 2 6525

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U. S. Recording Co., 1121 Vermont Ave. N.W., Washington 5, D.C., 1, 3, 4, 7, 8, 9, 10, 11, 15, 16, 46, 58
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Universal Circuit Controls Corp., 3201 Peoria St., Steger, Ill., 54
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Universal Electric Co., 300 E. Main St., Owosso, Mich., 44
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Universal Electronics Co., 2012 S. Sepulveda Blvd., Los Angeles 25, Calif., 46
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Universal Mfg. Co., Inc., 410 Hillside Ave., Hillside, N.J., 34, 74, 97
Tel: WA 6-4142

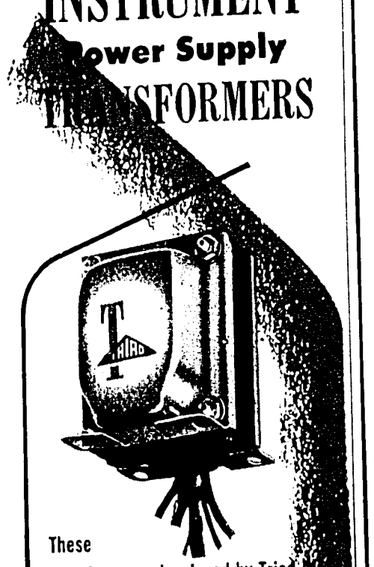
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University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N.Y., 1, 4, 7, 8, 23, 30, 57
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Vacuum-Electronic Engineering Co., 86 Denton Ave., New Hyde Park, N.Y., 64, 84, 86
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Vacuum Metals Corp., 70 Memorial Dr., Cambridge 42, Mass., 87
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Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif., 31, 49, 59, 60, 61, 66, 82, 84, 86
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Wakefield Industries, Inc., 5108 W. Grove St., Skokie, Ill., 38, 80, 82, 93
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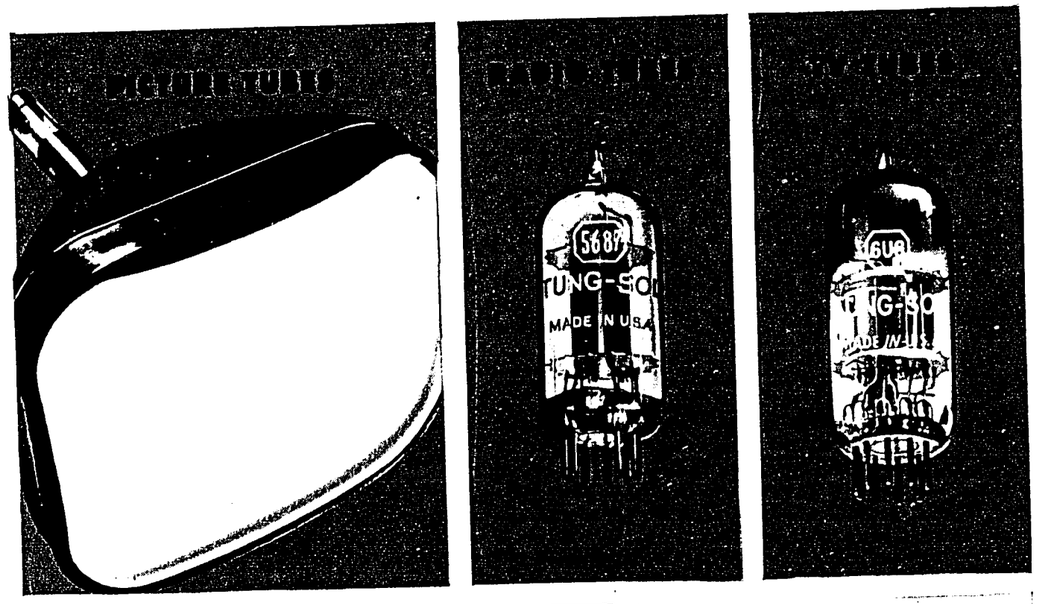
Waterbury Co., Inc., P.O. Box 1032, Waterbury 20, Conn., 30, 88
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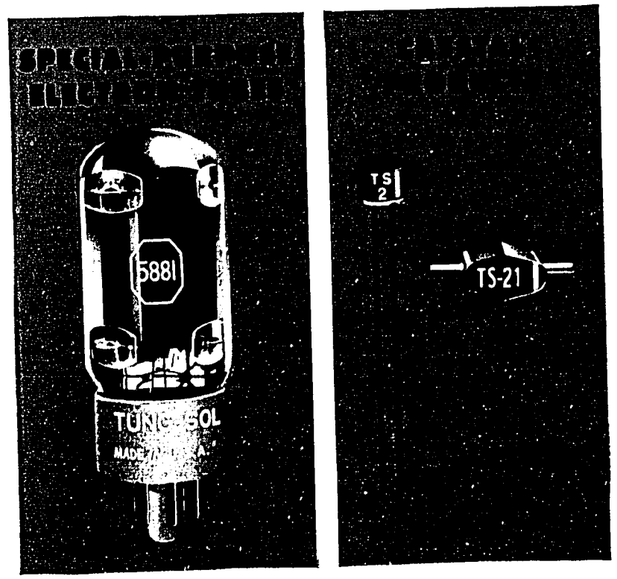
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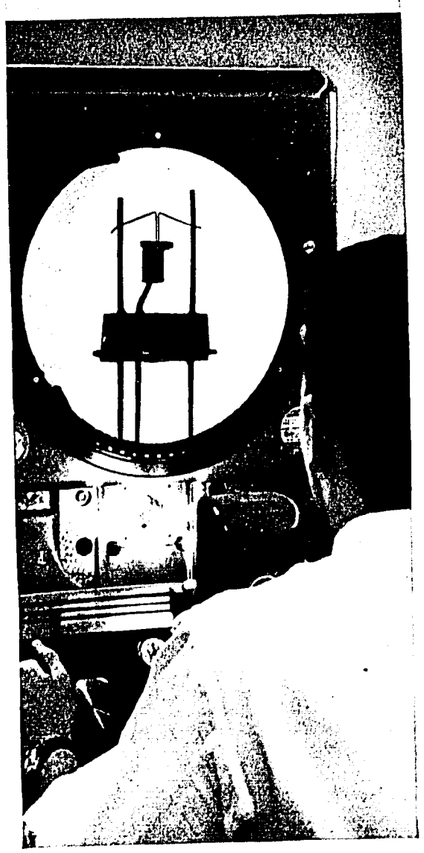
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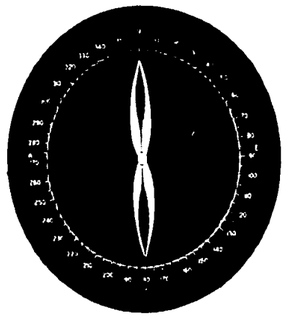
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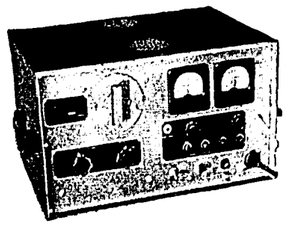
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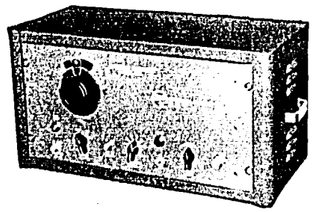


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DFG-2	0.54 – 30 Mc	4-Element spaced aerial	Automatic-Visual
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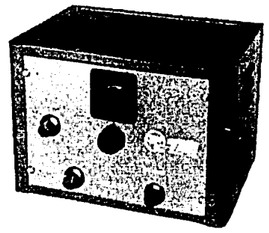
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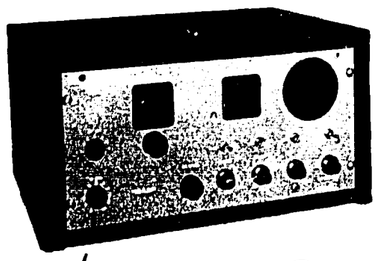
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Tel: Jefferson 7103

Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa., 14, 17, 20, 24, 25, 26, 34, 37, 43, 44, 45, 48, 49, 50, 54, 57, 59, 60, 63, 64, 72, 73, 78, 87, 88, 89
Tel: Court 1-5300

Westinghouse Electric Corp., Electronics Div., 2519 Wilkens Ave., Baltimore 3, Md., 1, 17, 20, 23, 25, 60, 72, 73
Tel: ED 6-2300

Westinghouse Electric Corp., P.O. Box 284, Elmira, N.Y., 49, 52, 59, 60, 61

Westlabs, Inc., P.O. Box 1111, Palo Alto, Calif., 26, 77, 84

Westline Products Div., 600 E. Second St., Los Angeles 59, Calif., 81
Tel: Trinity 2641

Weston Electrical Instr. Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 26, 36, 43, 46, 48, 50, 51, 57, 64, 68, 92, 94, 95, 96, 99, 100, 101
For details see ad on pages 98-99
Tel: BI 3-4700

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Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 71, 73, 74, 84, 97
For details see ad on page 490
Tel: HUnter 2-7876

White & Son, James L., 374 Verona Ave., Newark 4, N.J., 24, 71, 84, 86
Tel: HU 2-3727

White Electron Devices, Inc., Roger, Route 17 & Erie R.R., Ramsey, N.J., 61, 74, 84, 97, 100
For details see ad on page 399
Tel: Ramsey 9-1660

White Industrial Div., S. S., 10 East 40 St., New York 16, N.Y., 51, 79, 80, 81, 88, 89
Tel: MU 3-3015

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Tel: UL 1-2600

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Tel: Easton 8261

Williams, Everard M., 619 S. Linden Ave., Pittsburgh 8, Pa., 77, 84
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Williams, Brown & Earle, Inc., 904 Chestnut St., Philadelphia 7, Pa., 9, 11, 68, 93, 94
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For details see ad on page 73
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Yardney Electric Corp., 105 Chambers St., New York 7, N.Y., 28
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Yellow Springs Instr. Co., Inc., P.O. Box 100, Yellow Springs, Ohio, 84
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Yonkers Industries, Inc., 28-30 School St., Yonkers, N.Y., 14, 26, 40, 51, 94
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Zenith Optical Lab., 1940 Great Neck Rd., Copiague, L.I., N.Y., 51
Tel: AM 4-4616

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Zophar Mills, Inc., 112-130 26 St., Brooklyn 32, N.Y., 85
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Dr. K. Charlton Black, Chairman, Polytechnic Research & Development Co., 55 Johnson Street, Brooklyn 1, N.Y.

Fee $2. 12 Transactions. 4 Newsletters, *4, *5, *6, *8, & *9, and *Vol. ANE-1, No. 1.

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Mr. D. C. Ports, Chairman, Jansky & Bailey, 1339 Wisconsin Ave., N.W., Washington 7, D.C.

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Audio

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Dr. Vincent Salmon, Chairman, Stanford Research Institute, Stanford, California.

Fee $2. 19 Transactions, 4 Newsletters. *5, *7, *10. *Vol. AU-1, Nos. 1-6; *Vol. AU-2, Nos. 1-3.

Broadcast & Television Receivers

The design and manufacture of broadcast and television receivers and components and activities related thereto.

Mr. Earl I. Anderson, Chairman, Assistant Manager, Industry Service Lab., RCA Laboratory Div., 711-5th Ave., New York, N.Y.

Fee $2. 7 Transactions. *1, *2, *3, *5, *6, *7.

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Mr. Lewis Winner, Chairman, Editor, Television Engineering, 52 Vanderbilt Avenue, New York 17, N.Y.

Fee $2. Convention Report.

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Design and theory of operation of circuits for use in radio and electronic equipment.

Dr. Chester H. Page, Chairman, National Bureau of Standards, Connecticut Ave., Washington 25, D.C.

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IRE's 21 Professional Groups

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Radio and wire telephone, telegraph and facsimile in marine, aeronautical, radio-relay, coaxial cable and fixed station services.

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Electron Devices

Electron devices, including particularly electron tubes and solid state devices.

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Electronic Computers

Design and operation of electronic computers.

Mr. Harry T. Larson, Chairman, Ramo-Wooldridge Corp., 8820 Bellanca, Los Angeles 45, Calif.

Fee $2. 7 Transactions, 5 Newsletters. *Vol. EC-2, Nos. 2-4; *Vol. EC-3, Nos. 1-2.

Engineering Management

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Mr. Charles J. Breitwieser, Chairman, RCA Victor Division, Camden, N.J.

Fee $1. 1 Transaction, 8 Newsletters. *1.

Industrial Electronics

Electronics pertaining to control, treatment and measurement, specifically in industrial processes.

George P. Bosomworth, Chairman, Firestone Tire & Rubber Co., Akron 17, Ohio

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Information theory and its application in radio circuitry and systems.

Dr. William G. Tuller, Chairman, Melpar, Inc., 452 Swann Ave., Alexandria, Va.

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Instrumentation

Measurements and instrumentation utilizing electronic techniques.

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Application of electronic techniques and devices to the nuclear field.

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Techniques of determining and controlling the quality of electronic parts and equipment during their manufacture.

Mr. Leon Bass, Chairman, Manager, Quality Eng., Jet Eng. Dept., General Electric Co., Cincinnati 15, Ohio.

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The control of devices and the measurement and recording of data from a remote point by radio.

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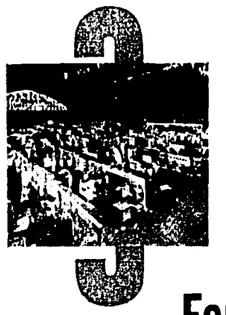
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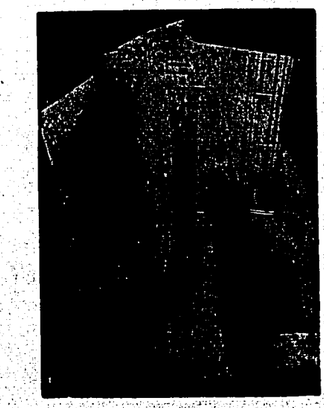
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For complete list of products and services, arranged alphabetically for fast reference, see the eight-page pink section preceding page 1.

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Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. **Audio Frequency Equipment** (Products 1 to 11)
2. **Broadcasting Equipment** (Products 12 to 17)
3. **Communications Equipment** (Products 18 to 25)
4. **Component Parts** (Products 26 to 62)
5. **Applications of Electronics** (Products 63 to 70)
6. **Radar, Microwave, UHF** (Products 71 to 74)
7. **Test & Measuring Equipment** (Products 92 to 101)
8. **Services and Materials** (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.
9. **Education & Publishing** (Groups 102 & 103)
10. **Distribution Functions** (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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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03 Equalizers.
04 Filters.
05 Industrial Sound Systems.
06 Jacks, Jack Fields & Plugs.
07 Loudspeakers & Headphones.
08 Microphones & Stands.
09 Phonographs, Pick-ups, Record Changers, etc.
10 Recording Accessories & Supplies.
11 Recording Equipment.

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

01. Amplifiers.

5. Decade amplifiers
10. Dynamic noise suppressors
15. Hearing aid
20. High fidelity
25. Inter-coms
30. Phonograph pre-amplifiers
35. Power amplifiers—recording
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Champion Electric Corp., England, 30
Cleveland Electronics, Inc., Ohio, 25
Cole Instrument Co., Calif., 5, 10
Collins Radio Co., 855 35 Street, N.E., Cedar Rapids, Iowa, 20
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Colortone Electronics, Inc., N.Y., 25
Commercial Radio-Sound Corp., N.Y., 25, 40
Communicating Systems, Inc., N.J., 20, 25, 40

(Continued on page 242)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

1. Audio Frequency Equipment

01. Amplifiers.

(Continued from page 241)

Communication Equip. & Engr. Co., Ill., 25, 40
Components Supply Co., N.Y., 30
Continental Radio & Elec. Eng., S. Africa, 20, 30
Cook Labs., Conn., 30
Cooper Electronic Prods. Co., Pa., 25
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 40
For details see ad on page 157
Tel: HAlifax 4-6487
Crown Eng., N.M., 25
D & R Ltd., Calif., 20, 30, 35
Danby Radio Corp., Pa., 20, 35
Daystrom Electric Corp., N.Y., 20, 35
Demco Products, Pa., 15, 20
Denrad Mfg. Co., Inc., Texas, 20, 25, 30, 35, 40
DeWald Radio & TV Corp., N.Y., 20
Dictograph Prods., Inc., N.Y., 15, 20, 25, 30, 35, 40
Dominion Electrohome Inds., Ltd., Canada, 20
Douglas Labs., Inc. N.Y., 35
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 15, 20, 25, 30, 35, 40
For details see ad on page 445
Tel: Burlington 3-0446
Dyna Labs., Inc., N.Y., 15
El-Tronics, Inc., Pa., 5, 20, 35
Electro-Voice, Inc., Mich., 20, 40
Electronic Measurements Co., Maple Ave. & Lewis St., Eatontown, N.J., 20, 25
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Specialty Co., Calif., 25
Electron-Radar Products, Ill., 20, 30
Electronica Industrial, Ltda., Brasil, 20, 30
Elk Elect. Labs., Inc., N.Y., 5, 20, 25, 35
Endevco Corp., Calif., 5
Erdco Eng. Corp., Ill., 35
Espey Mfg. Co., Inc., N.Y., 20
Fairchild Recording Equip. Co., N.Y., 30, 35
Feldman Co., Henry, Calif., 5, 10, 20
Fidelity Hearing Aid Co., N.J., 15
Fisher Radio Corp., N.Y., 20, 30, 35, 40
Fluke Mfg. Co., Inc., John, Wash., Power Amp-Audio Testing
Fog-O-Scope, Inc., Ill., 20
Forbes Wagner, Inc., N.Y., 20
Franklin Electronics, Inc., Pa., 5
Freed Electr. & Controls Corp., N.Y., 20, 35
Furst Electronics, Ill., 5
Furzehill Labs., Ltd., England, 20
Galbraith & Son Elec. Corp., C. C., N.Y., 40
Gately Dev. Lab., N.J., 20, 30
Gates Radio Co., Ill., 20, 30, 35, 40
General Communications, Wisc., Broadcast Plug in Preline & Monitor
General Electric Co., N.Y.C., N.Y., 20, 30
General Electric Co., N.Y., 20, 30, 35
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 25
For details see ad on page 496
Tel: Valley Stream 5-6363
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 20
For details see ad on page 188
Tel: Pleasantville 2-2000
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Gibbs Mfg. & Research Corp., Wis., 20, 30
Godfrey Mfg. Co., Ill., 25
Gotham Television Corp., N.Y., 20, 30
Grason-Stadler Co., Mass., 15
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 177
Tel: Metuchen 6-2800
Hallicrafters Co., Ill., 20
Hamlyn Electronics Corp., N.Y., 25, 40
Harman-Kardon, Inc., N.Y., 20, 35, 40
Hartley Co., Inc., H. A., N.Y., 10, 20, 30
Hathaway Instrument Co., Colo., 35
Heath Co., 305 Territorial Rd., Benton Harbor 27, Mich., 20, 30
For details see ad on page 447
Tel: WA 5-1175
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 5
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hi-Video, Inc., N.Y., 20, 25, 30, 40
Holl Audio, Inc., Calif., 20
Industrial Assembly Corp., N.Y., 20, 25, 40
Industrial Control Co., N.Y., 5
Insuline Corp. of America, N.H., 20, 25, 30, 40
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 5, 10, 15, 20, 30, 35, 40
For details see ad on page 277
Tel: LUdlow 4-6200
International Television Corp., N.Y., 25
Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio, 5
For details see ad on page 446
Tel: HEnderson 1-9809
Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 25
For details see ad on page 404
Tel: DEarborn 2-0750
Kilpatrick Electr. Lab., Pa., 15, 20, 25, 30
Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 20, 30, 35, 40
For details see ad on page 2-3
Tel: UNiversity 4-4272
Kuss Mach. Tool & Die Co., Inc., Pa., 5, 20, 25, 30, 35
Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 20, 25, 30, 35, 40
For details see ad on pages 116-17
Tel: ENdicott 2-7200
Laurehk Radio Mfg. Co., Mich., 15
Lee Labs., Inc., P.O. Box 200, Genessee, Pa., 20
For details see ad on pages 349, 431
Tel: Genessee 2567
Leonard Elec. Prods. Co., Inc., N.Y., 30, 35
Livingston Elec. Corp., N.J., 20, 30
Loge Sound Engineers, J. M., Calif., 25, 30, 40
MP Engineering Co., Conn., 15, 20, 30, 35, 40
Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 4, Ind., 20, 25, 30
For details see ad on page 248
Tel: E 5471
Magnecord, Inc., Ill., 20
Maico Co., Inc., The, 21 N. 3rd St., Minneapolis 1, Minn., 20
For details see ad on page 439
Tel: AT 8255
Marconi's Wireless Telegraph Co., Ltd., England, 40
Marshall Eng., Electr. Div., Calif., 20
Martin & Co., H. S., Ill., 20, 30
Massa Labs., Inc., Mass., 5
Mc Intosh Lab., Inc., N.Y., 20, 30, 35, 40
Melody Master Mfg. Co., Ill., 15, 20, 40
Metrotype Corp., Ill., 30
Meyers, James G., N.Y., 20, 30
Michel Mfg. Co., Wis., 20, 30, 40
Mid-West Coil & Transformer Co., Ill., 20
Morecroft Design Engineer, John H., Calif., 25
National Inter-Comm. Systems, Inc., Ill., 25, 30, 35, 40
National Radio Res. Labs., N.Y., 20, 30, 35
Neptune Electr. Co., N.Y., 20, 25, 30, 35, 40
Newcomb Audio Products Co., Calif., 20, 30, 35, 40
Newton Scientific Co., Mass., 20, 30
Norrman Labs., Ernst, Wis., 35
Northern Elec. Co., Ltd., Canada, 20, 25, 30, 40
Northern Radio Co., Inc., Dept. D54, 147 W. 22nd St., N.Y. 11, N.Y., Line
For details see ad on pages 6-8
Tel: Watkins 9-9117
Oakton Eng. Corp., Ill., 20, 30
Ossian Mfg. Co., Ind., 25
Paravox, Inc., Ohio, 15
Pedersen Electronics, Calif., 20, 30
Penn East Eng. Corp., Box 240, Kutztown, Pa., 20
For details see ad on pages 203, 293
Penntronics, Pa., 20
Perry-Briggs Co., Ohio, 25
Pfanstiehl Chem. Co., Ill., 30
Phebco, Inc., Md., 10, 20, 25
Philmore Mfg. Co., Inc., N.Y., 20
Photron Instr. Co., Ohio, 10
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 20
For details see ad on pages 463, 489
Tel: NEedham 3-3345
Pickering & Co., Inc., Dept. T, 308 Woods Ave., Oceanside, L.I., N.Y., 30
For details see ad on page 376
Tel: RO 4-3200

1. Audio Frequency Equipment

01. Amplifiers.

Pilot Radio Corp., N.Y., 20, 30
Plastics & Electr. Corp., N.Y., 15, 25, 30
Precise Dev. Corp., N.Y., 20, 30
Precision Associates, Inc., N.Y., 15, 25, 30
Precision Electr. Inc., Ill., 20, 30, 35, 40
Press Wireless Labs., Inc., Mass., 35
Presto Recording Corp., P.O. Box 500, Paramus, N.J., 20, 35
For details see ad on page 252
Tel: DIamond 3-5700
Radio Corp. of America, Eng. Prod. Dept., Camden, N.J., 20, 25, 30, 35, 40
For details see ad on page 210
Tel: Woodlawn 3-8000
RCA Victor Co., Ltd., Canada, 20, 25, 30, 35, 40
Radar-Electr., Inc., N.Y., 20, 25, 30, 40
Radiaphone Co., Calif., 20
Radiation Counter Labs., Inc., Ill., 20
Radio Craftsmen, Inc., Ill., 20, 30
Radio Eng. Co., N.Y., 20, 35
Rangertone, Inc., N.J., 20
Rauland-Borg Corp., Ill., 20, 25, 40
Redifon, Ltd., England, 40
Reeves Equipment Corp., N.Y., 35
Reevesound Co., Inc., N.Y., 40
Reid Co., Henry L., Ga., 20, 25, 30
Rek-O-Kut Co., N.Y., 40
Remler Co., Ltd., Calif., 40
Rese Eng., Inc., Pa., 5
Ribet, Desjardin, France, 30
Ripley Co., Inc., Factory St., Middletown, Conn., 20, 25, 30, 35, 40
For details see ad on page 277
Tel: Middletown 6-6679
Ronar, Inc., Ill., 15
Royalcall, Inc., Ohio, 25
Sargent-Rayment Co., The, Calif., 20, 30, 35
Scott, Inc., H. H., Mass., 5, 10, 15, 20, 25, 30, 35, 40
Selectronics, Inc., Calif., 40
Shevers, Harold, N.Y., 20
Shrader Mfg. Co., Inc., D.C., 20
Shura-Tone Prods., Inc., N.Y., 30
Simpson Mfg. Co., Mark, N.Y., 20, 25, 30, 35, 40
Sonex, Inc., Pa., 20, 30, 40
Sonotone Corp., N.Y., 15
Sound Projects Co., Ill., 20, 35
Special Prods. Co., Md., 10, 20, 30
Specialty Eng. Div., Spec. Assem. & Pack., N.Y., 40
Square Root Mfg. Corp., N.Y., 20
Stephens Mfg. Corp., Calif., 20
Stromberg-Carlson Co., N.Y., 20, 25, 30, 40
Stuedeman, W., N.J., 20, 40
Summit Electr., Inc., N.J., 10, 20, 30, 35, 40
Superex Electr. Corp., N.Y., 20, 25, 40
Taffet Radio & TV Co., N.Y., 5, 25, 30, 35, 40
Talk-A-Phone Co., Ill., 25
Tech-Master Corp., N.Y., 20, 30
Technology Instrument Corp., 535-A Main St., Acton, Mass., 5
For details see ad on pages 75-79
Tel: COlonial 3-7711
Telectro Industries Corp., N.Y., 20, 25, 30, 35, 40
Telephonics Corp., N.Y., 5, 10, 25, 30, 40
Telex, Inc., Minn., 15
Thordarson-Meissner Mfg. Div., Ill., 20, 30
Trans-Electro Prods. Corp., Pa., 20, 35, 40
Transelectric Mfg. Co., Pa., 25
Transformer Specialty Co., Inc., 328 Rockhill Rd., Bala-Cynwyd, Pa., 20, 35, 40
For details see ad on page 391
Tel: Welch Valley 4-5770
Transformer Technicians, Inc., Ill., 35
Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 20, 30, Kits Only
For details see ad on pages 232
Tel: TExas 0-5381
Triumph Mfg. Co., Ill., 20, 30, 35
Ultrasonic Corp., Mass., 20
Union Elec. & Mfg. Co., N.J., 35, 40
Union Spring & Mfg. Co., N.J., 20, 25, 30, 35, 40
U. S. Recording Co., D.C., 20, 30, 35
University Loudspeakers, Inc., N.Y., 40
Vidaire Electr. Mfg. Co., N.Y., 20
Vocaline Co. of America, Inc., Conn., 25, 40
Waters Conley Co., Minn., 20
Waveforms, Inc., N.Y., 5, 20
Weathers Industries, Inc., N.J., 30
Webster Elec. Co., Wis., 20, 25, 40
Westinghouse Elec. Corp., Electr. Div., Md., 35

02. Attenuators.

5. Decade
10. Impedance matching
15. Volume controlling

Aerovox Corp., Mass., 5, 10, 15
Asco Sound Corp., N.Y., 10, 15
Canadian Aviation Electr., Ltd., Canada, 15
Canadian Research Institute, Canada, 10
Centralab Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 15
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 10, 15
For details see ad on pages 100-101
Tel: Dover 975
Cole Instrument Co., Calif., 5
Cubic Corp., Calif., 10
Daven Co., N.J., 5, 10, 15
Dyna-Labs., Inc., N.Y., 15
Electron-Radar Products, Ill., 5, 10, 15
Elk Electr. Labs., Inc., N.Y., 5
Emerson & Cuming, Inc., Mass., 10
Furzehill Labs., Ltd., England, 5, 15
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 5
For details see ad on pages 15-22
Tel: DAvenport 5-4451
International Resistance Co., Pa., 15

02. Attenuators.

Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 5
For details see ad on page 436
Tel: CAldwell 6-4000
Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 15
For details see ad on page 404
Tel: DEarborn 2-0750
Kings Electr. Co., N.Y., 5, 10, 15
Kollsman Instrument Corp., Div. Standard Coil Products Co., 80-08 45th Ave., Elmhurst 73, L.I., N.Y., 5
For details see ad on page 216
Tel: NEwtown 9-2900
Lynmar Engineers, Inc., Pa., 10
Marconi Instruments, Ltd., N.Y., 5
Maspeth Telephone & Radio Corp., N.Y., 5, 10, 15
Measurements Corp., Intervale Rd., Boonton, N.J., 10
For details see ad on pages 470, 524
Tel: Boonton 8-2131
Microlab, 71 Okner Pkwy., Livingston, N.J., 10, 15
For details see ad on pages 319
Tel: Livingston 6-0692
Muirhead & Co., Ltd., England, 5
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 5
For details see ad on page 344
Tel: I 7-0469
Painton and Co., Ltd., England, 5, 10, 15
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 15
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Eng. Products, Ltd., Canada, 10, 15
Shallcross Mfg. Co., Pa., 5, 10, 15
Southwestern Indust. Electr. Co., Tex., 5, 10
Stackpole Carbon Co., Electronics Div., Tannery St., St. Marys, Pa., 15
For details see ad on pages 84-85
Tel: 41-521
Stoddart Aircraft Radio Co., Inc., 6644-C Santa Monica Blvd., Hollywood 38 Calif., Coaxial
For details see ad on page 472
Tel: Hollywood 4-9294
Superex Electr. Corp., N.Y., 10
Tech Labs., Inc., N.J., 5, 10, 15
White Industries, Inc., N.Y., 10
Wunderlich Radio Co., N.Y., 5, 10

03. Equalizers.

5. Dialogue equalizers
10. Line equalizers
15. Magnetic recording
20. Recording diameter equalizers
25. Sound effect equalizers

Aerovox Corp., Mass., 5, 10, 15, 20, 25
Asco Sound Corp., N.Y., 15
Audio Development Co., Minn., 10, 25
Central Transformer Co., Ill., 10, 25
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 10
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Daven Co., N.J., 10, 25

(Continued on page 244)

1. Audio Frequency Equipment

03. Equalizers.

(Continued from page 243)

De Coursey Eng. Lab., P.O. Box 235, Los Angeles 25, Calif., 5, 10, 15, 25
For details see ad on page 291
Tel: ARiz. 3-2530

Dubrow Development Co., 235 Penn St., Burlington, N.J., 10, 25
For details see ad on page 445
Tel: Burlington 3-0446

Fairchild Recording Equip. Co., N.Y., 15, 20

Fisher Radio Corp., N.Y., Phono Playback

Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 5, 10, 15, 20, 25
For details see ad on page 180
Tel: Evergreen 6-1300

General Electric Co., N.Y., 10, 25

Gray Research & Development Co., Inc., 658 Hilliard St., Manchester, Conn., 10
For details see ad on page 260
Tel: Mitchell 9-4506

Insuline Corp. of America, N.H., 15

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 10, 15, 25
For details see ad on page 277
Tel: LUdlow 4-6200

Krohn-Hite Instrument Co., Dept B, 580 Massachusetts Ave., Cambridge 39, Mass., 25
For details see ad on pages 2-3
Tel: UNiversity 4-4272

Lenkurt Electric Co., Inc., Calif., 10

Livingston Elec. Corp., N.J., 15

Northern Elec. Co., Ltd., Canada, 5, 10, 25

Pacific Transducer Re Corp., Calif., 10

Presto Recording Corp., P.O. Box 500, Paramus, N.J., 15, 20
For details see ad on page 252
Tel: DIamond 3-5700

Pulse Techniques, Inc., N.J., 5

RCA Victor Co., Ltd., Canada, 10, 25

Radio Eng. Products, Ltd., Canada, 5, 10

Railway Communications, Inc., Mo., 10

Reevesound Co., Inc., N.Y., 15

Spencer-Kennedy Labs., Inc., Mass., 10

Technical Material Corp., N.Y., 10

Thordarson Meissner Mfg. Div., Ill., 10

U. S. Recording Co., D.C., 10, 15, 20

United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 10, 15, 20, 25
For details see ad on page 582
Tel: Algonquin 5-3500

04. Filters.

5. Band pass and band rejection
10. Loudspeaker dividing networks
15. Variable band pass

Acme Telectronix Div., Nea Service, Ohio, 5

Acro Products Co., Pa., 5

Acro Transformer & Mfg. Corp., N.Y., 5

Aerovox Corp., Mass., 5, 10, 15

Airpax Products Co., Md., 5

Altec Lansing Corp., Calif., 10

Altec Lansing Corp., N.Y., 10

Asco Sound Corp., N.Y., 10

Astron Corp., 255 Grant Ave., E. Newark, N.J., 5
For details see ad on page 282
Tel: HUmboldt 2-7800

04. Filters.

Audio Development Co., Minn., 5

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 5, 10, 15
For details see ad on pages 96-97
Tel: FI 2-1821

Beam Instruments Corp., N.Y., 10

Blackstone Electric Co., Ill., 5

Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 5
For details see ad on page 145
Tel: HE 1-7166

Burnell & Co., Inc., 45 Warburton Ave., Yonkers 2, N.Y., 5
For details see ad on page 144
Tel: Yonkers 5-6800

CGS Labs., Inc., Conn., 5, 15

Cohn, Campbell Co., Inc., Conn., 5, 10, 15

Carad Corp., Calif., 5

Carol Electronics Corp., N.Y., 5

Central Transformer Co., Ill., 5

Centralab Div. Globe-Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 5
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Chicago Electr. Eng. Co., Ill., 5, 15

Coil Winders, Inc., N.Y., 5, 15

Communication Accessories Co., 110th St. & Hillcrest Rd., Hickman Mills, Mo., 5
For details see ad on pages 80-81
Tel: South 5528

Communication Equip. & Engr. Co., Ill., 5

Communication Parts, Ill., 5

Constantine Eng. Labs. Co., P.O. Box 471B, Mahwah, N.J., 5
For details see ad on pages 288, 380
Tel: Ramsey 9-1123

Cornell-Dubilier Electric Co., Dept MB4, 333 Hamilton Blvd., S. Plainfield, N.J., 5
For details see ad on page 154
Tel: Plainfield 6-9000

Crown Eng., N.M., 5

D & R. Ltd., Calif., 5

De Coursey Eng. Lab., P.O. Box 235, Los Angeles, Calif., 5, 10
For details see ad on page 291
Tel: ARiz. 3-2530

Deutschmann Corp., Tobe, Mass., 5

Dietz Design & Mfg. Co., Grandview 7, Mo., 5
For details see ad on page 290
Tel: South 7216

Dubrow Development Co., 235 Penn St., Burlington, N.J., 5
For details see ad on page 445
Tel: Burlington 3-0446

El-Rad Mfg. Co., Ill., 10

Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 15
For details see ad on page 487
Tel: Pioneer 6-5212

Electrical Windings, Inc., Ill., 5

Electro-Voice, Inc., Mich., 10

Elk Electr. Labs., Inc., N.Y., 5

Elm Labs., N.Y., 5

Empire State Labs., Inc., N.Y., 5

Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y., 5
For details see ad on page 383
Tel: Dickens 5-7531

Erdco Eng. Corp., Ill., 5

Espey Mfg. Co., Inc., N.Y., 5, 15

Feldman Co., Henry, Calif., 5, 15

Ferranti Electric, Inc., N.Y., 5

Fisher Radio Corp., N.Y., Sharp Cut Off

Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 5, 10, 15
For details see ad on page 180
Tel: Evergreen 6-1300

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 15
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Geotechnical Corp., Tex., 5

Gertsch Prods., Inc., Calif., 5

Glenco Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 284
Tel: Metuchen 6-2800

Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 5, 10
For details see ad on Cover III
Tel: Everglade 4-4400

Gudeman Co., 340 W. Huron St., Chicago 10, Ill., 5
For details see ad on page 29
Tel: Delaware 7-7400

Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 5
For details see ad on pages 318, 385
Tel: Texas 0-7317

Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 177

Hammond Mfg. Co., Ltd., Canada, 5

Hartley Co., Inc., H. A., N.Y., 5

Hill Electronic Eng. & Mfg. Co., New Kingston, Pa., 5
For details see ad on page 310
Tel: Mechanicsburg 5578

Hogan Labs., Inc., 155 Perry St., New York 14, N.Y., 5
For details see ad on page 488
Tel: CHelsea 2-7855

Holl Audio, Inc., Calif., 10

Hopkins, Eng. Co., Calif., 5

Hycor, Inc., Calif., 5, 15

Insuline Corp. of America, N.H., 5, 10, 15

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 10
For details see ad on page 277
Tel: LUdlow 4-6200

Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 5
For details see ad on page 404
Tel: DEarborn 2-0750

Kenyon Transformer Co., Inc., 840 Barry St., New York 59, N.Y., 5
For details see ad on page 386
Tel: Kirkpatrick 2-4500

Kings Electr. Co., N.Y., 15

Klipsch & Assoc., Ark., 10

Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 5, 15
For details see ad on page 2-3
Tel: UNiversity 4-4272

Lansing Sound, Inc., James B., Calif., 10

Lenkurt Electric Co., Inc., Calif., 5

1. Audio Frequency Equipment

04. Filters.

Leonard Elec. Prods. Co., Inc., N.Y., 5, 15

Lepace Mfg. Co., N.Y., 5

Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 4, Ind., 5
For details see ad on page 248
Tel: E 5471

Magnex Corp., N.Y., 5

Marine Elec. Corp., N.Y., 5

Melco Prods., Inc., Minn., 5

Micamold Radio Corp., N.Y., 5

Microlab, 71 Okner Pkwy., Livingston, N.J., 5
For details see ad on page 319
Tel: Livingston 6-0692

Microtan Co., N.Y., 10

Mid-West Coil & Transformer Co., Ill., 5, 10

Miller Co., J. W., Calif., 5

Neptune Electr. Co., N.Y., 5

Networks Electronics Corp., Calif., 5

Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 5, 10, 15
For details see ad on page 321
Tel: MUlberry 4-5858

Partridge Transformers, Ltd., England, 10

Permoflux Corp., Ill., 10

Phebco, Inc., Md., 5

Pittsburgh Coil Co., Pa., 5

Plastic Capacitors, Inc., Ill., 5

Pulse Techniques, Inc., N.J., 15

Putronic Transformer Corp., N.Y., 5

Q-Line Mfg. Corp., N.Y., 5

Racon Elec. Co., Inc., N.Y., 10

Radio Corp. of America, Engineering Prod. Dept., Camden, N.J., 10
For details see ad on page 210
Tel: Woodlawn 3-800

Radio Eng. Products, Ltd., Canada, 5

Railway Communications, Inc., Mo., 5

Richardson Labs., Kenneth, N.Y., 5

Rollins Corp., Del., 5

Ross Mfg. Co., Iowa, 5

Saratoga Industries, N.Y., 5

Scientific Specialties Corp., Mass., 5

Scott, Inc., H. H., Mass., 5, 15

Southwestern Industrial Electronics Co., Tex., 5

Southern Electronics Co., Dept. IC, 239 W. Orange Grove Ave., Burbank, Calif., 5
For details see ad on page 285
Tel: RO 9-3193

Southern Elec. & Transmission Co., Tex., 5

Spencer-Kennedy Labs., Inc., Mass., 5, 15

Square Root Mfg. Corp., N.Y., 5

Standard Coil Prods. Co., Inc., Calif., 5

Standard Transformer Corp., Ill., 5

Stephens Mfg. Corp., Calif., 10

Summit Electronics, Inc., N.J., 10

Superex Electronic Corp., N.Y., 5

Technical Material Corp., N.Y., 5

Television Labs., Inc., Ill., 5

Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex., 5
For details see ad on page 226
Tel: DI 1781

Thordarson-Meissner Mfg. Div., Ill., 5

Torwico Electronics, Inc., 965 Frelinghuysen Ave., Newark 5, N.J., 5
For details see ad on page 295
Tel: BIgelow 8-0426

Trans-Sonics, Inc., Mass., 5

Transformer Engineers, Calif., 5

Transformer Technicians, Inc., Ill., 5, 10

Transformers, Inc., N.Y., 5

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 5, 10
For details see ad on page 232
Tel: TExas 0-5381

U. S. Electronic Corp., N.J., 5, 15

U. S. Recording Co., D.C., 10

United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 10, 15
For details see ad on page 582
Tel: Algonquin 5-3500

University Loudspeakers, Inc., N.Y., 10

Vectron, Inc., 402 Main St., Waltham 54, Mass., 5
For details see ad on page 366, 462
Tel: WAltham 5-8700

Vitavox, Ltd., England, 10

Volkar Corp., Mich., 5, 10, 15

White Industries, Inc., N.Y., 5

Wickes Eng. & Construction Co., N.J., 5

05. Industrial Sound Systems.

5. Complete systems **10. Installation & rental contractors**

Altec Lansing Corp., Calif., 5

Altec Lansing Corp., N.Y., 5, 10

Asco Sound Corp., N.Y., 5

Bell Sound Systems, Inc., Ohio, 5

Berlant Associates, Calif., Multi Channel Mixer

Bliss Electronic Corp., N.J., 5

Bogen Co., Inc., David, N.Y., 5

Boom Electric Corp., Ill., 5, 10

Califone Corp., Calif., 5

Canadian Aviation Electronics, Ltd., Canada, 10

Canadian Marconi Co., Canada, 5

Canadian Radio Mfg. Corp., Ltd., Canada, 5

Central Rediffusion Services, Ltd., England, 5, 10

Colortone Electronics, Inc., N.Y., 5

Communicating Systems, Inc., N.J., 5

Communication Equip. & Engineering Co., Ill., 5

Connecticut Telephone & Elec. Corp., Conn., 5

Dictograph Prods., Inc., N.Y., 5

Dormitzer Electric & Mfg. Co., Inc., Mass., 5

Edmar Communication Co., Pa., 5, 10

Executone, Inc., N.Y., 5

Feiler Engineering & Mfg. Co., Ill., 5

Galbraith & Son Elec. Corp., C. C., N.Y., 5

Gates Radio Co., Ill., 5

General Communications, Wis., 5

Hi-Video, Inc., N.Y., 10

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Insuline Corp. of America, N.H., 5

Kilpatrick Electronic Lab., Pa., 5

Loge Sound Engineers, J. M., Calif., 5

MP Engineering Co., Conn., 5

Marconi's Wireless Telegraph Co., Ltd., England, 5

National Inter-Comm. Systems, Inc., Ill., 5

Newcomb Audio Products Co., Calif., 5

Northern Elec. Co., Ltd., Canada, 5

Perry-Briggs Co., Ohio, 5

Precision Electronics Inc., Ill., 5

RCA Victor Co., Ltd., Canada, 5

Radio Corp. of America, Engineering Prod. Dept., Camden, N.J., 5, 10
For details see ad on page 210
Tel: Woodlawn 3-8000

Radio Corp. of America, Tube Dept., 415 S. 5th St., Harrison, N.J., 5
For details see ad on page 210
Tel: HUmboldt 5-3900

Radar-Electr., Inc., N.Y., 5

Rauland-Borg Corp., Ill., 5

Redifon, Ltd., England, 5, 10

Remler Co., Ltd., Calif., 5

Shrader Mfg. Co., Inc., D.C., 5, 10

Signal Eng. & Mfg. Co., N.J., 5

Simpson Mfg. Co., Mark, N.Y., 5

Smith-Meeker Eng. Co., N.Y., 5

Stromberg-Carlson Co., N.Y., 5

Stuedeman, W., N.J., 5, 10

Talk-A-Phone Co., Ill., 5

Transelectric Mfg. Co., Pa., 5

Webster Elec. Co., Wis., 5

06. Jacks, Jack Fields & Plugs.

5. Jacks **15. Patch cords**
10. Jack fields **20. Plugs**

Adler Communications Labs., N.Y., 10, 15

Aerolite Electronics Corp., 507 26th St., Union City, N.J., 5, 10, 15, 20
For details see ad on page 500
Tel: Union 3-2955

Aeronautical Radio Mfg. Co., N.Y., 15, 20

Aerovox Corp., Mass., 5, 10, 20

Aircraft-Marine Products, Inc., 2100 Paxton St., Harrisburg, Pa., 15
For details see ad on page 281
Tel: Harrisburg 4-0101

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 15, 20
For details see ad on page 296
Tel: Brockton 160

American Radio Hardware Co., N.Y., 5, 10, 20

Arey Machine Co., N.J., 5, 10, 15, 20

Associated Eng. Corp. of Boston, Mass., 15, 20

Audio Development Co., Minn., 5, 10, 15, 20

Automatic & Precision Mfg. Co., N.Y., 20

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1. Audio Frequency Equipment

06. Jacks, Jack Fields & Plugs.

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Automatic Mfg. Corp., N.J., 20
Birnbach Radio Co., Inc., N.Y., 5, 20
Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 5, 20
For details see ad on page 145
Tel: HE 1-7166
Buggie, Inc., H. H., 726 Stanton St., Toledo 4, Ohio, 5, 15, 20
For details see ad on page 298
Tel: Adams 8216
Canadian General Elec. Co., Canada, 5, 10, 15, 20
Canadian Marconi Co., Canada, 5, 10, 15, 20
Cannon Electric Co., Calif., 20
Carter Parts Co., Ill., 5, 20
Cannon Electric Co., Calif., 15, 20
Citation Products Co., 233 E. 146th St., New York 51, N.Y., 5, 20
For details see ad on page 504
Tel: MO 5-0740
Clark Cable, Inc., 3184-88 W. 32 St., Cleveland, Ohio, 15
For details see ad on page 481
Tel: MElrose 1-8080
Clarke Instruments Div. of N.E.M.S., Md., 5, 10, 15, 20
Coaxial Connector Co., 37 N. 2nd Ave., Mt. Vernon, N.Y., 15, 20
For details see ad on page 297
Tel: MO 8-6416
Coles Electronic Corp., Pa., 5, 20
Connecticut Telephone & Electric Corp., Conn., 5, 10, 15, 20
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Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 5, 20
For details see ad on page 370
Tel: Davenport 4-7000
Flexilab Products Co., Ind., 5, 20
Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 5, 15, 20
For details see ad on page 539
Tel: Rockford 5-9548
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 5, 15, 20
For details see ad on page 507
Tel: Rockford 2-6695
General Elec. Co., Ltd., of England, Mass., 5, 20
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 20
For details see ad on page 59-62, Cover IV
Tel: Trowbridge 6-4400
Industrial Assembly Corp., N.Y., 5, 15, 20
Industrial Devices, Inc., N.J., 5
Instrument Corp. of America, P.O. Box 219, Blacksburg, Va., 5, 20
For details see ad on page 220
Tel: Blacksburg 8208
Insuline Corp. of America, N.H., 5, 15, 20
Johnson Co., E. F., Minn., 5, 20
Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 5, 20
For details see ad on pages 110-111
Tel: Nevada 2-2000
Kellogg Switchboard & Supply Co., 79 West Monroe St., Chicago 3, Ill., 5, 10, 15, 20
For details see ad on page 404
Tel: DEarborn 2-0750
Keystone Electr. Corp., N.Y., 5, 15, 20
Kings Electronics Co., N.Y., 5, 10, 15, 20
Lenkurt Electric Co., Inc., Calif., 10, 15, 20
Makepeace Co., D.E., Div. Union Plate & Wire, Dunham & Pine Sts., Attleboro, Mass., 5, 10, 15, 20
For details see ad on page 200
Tel: ATtleboro 1-0089
Maspeth Telephone & Radio Corp., N.Y., 5, 10, 15, 20
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 5, 20
For details see ad on page 301
Tel: Terhune 5-3224
Microdot Div., Felts Corp., Calif., 5, 20, Microminiature
National Tel-tronics Corp., N.Y., 5, 20
Neptune Electronics Co., N.Y., 5, 10, 15, 20
Painton and Co., Ltd., England, 20

(Continued on page 247)

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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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into 608 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 used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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, preceding the product system in the pink pages introducing the company index. 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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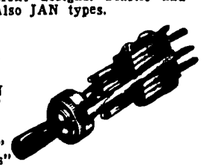
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1. Audio Frequency Equipment

06. Jacks, Jack Fields & Plugs.

(Continued from page 246)

Pentron Corp., Dept. IRE 54, 777 South Tripp Ave., Chicago 24, Ill., 15
For details see ad on page 253
Tel: SAcramento 2-3201
Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 5, 15, 20
For details see ad on page 333
Tel: CL 5-1471
Philbrick Researches, Inc., G. A., Mass., 15
Philmore Mfg. Co., Inc., N.Y., 5, 20
Precision Associates, Inc., N.Y., 15
Pyle-National Co., Ill., 20
Radio Eng. Products, Ltd., Canada, 5, 10, 15, 20
Ramsey Reese, Inc., J., N.Y., 5
Runzel Cord & Wire Co., Ill., 15
Schott Co., Walter, Calif., 5, 20
Sears Co., M. J., N.Y., 15
Smith, Inc., Herman, H., N.Y., 5, 15, 20
Standard Elec. Time Co., 73 Logan St., Springfield 2, Mass., 5, 15, 20
For details see ad on page 457
Tel: 6-7237
Standard Electr. Corp., N.J., 10
Stromberg-Carlson Co., N.Y., 5, 20
Swiss Jewel Co., Pa., 5, 20
Switchcraft, Inc., 1340 N. Halsted St., Chicago 22, Ill., 5, 20
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Tel: MI 2-7136
Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5, 20
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Tel: Judson 6-2424
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Telephonics Corp., N.Y., 5, 10, 15, 20
Telex, Inc., Minn., 5, 15, 20
Trimm, Inc., 400 West Lake St., Libertyville, Ill., 5, 10, 15, 20
For details see ad on page 247
Tel: LI 2-3700
Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 5, 20
For details see ad on page 103
Tel: LA 7-8400
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 5, 20
For details see ad on page 102
Tel: Kirkland 7-4900
U. S. Components, Inc., N.Y., 5, 15, 20
Virginia Electronics Co., D.C., 10
Whitso, Inc., Ill., 5

07. Loudspeakers & Headphones.

5. Commercial grade loudspeakers
10. Headphones
15. High-frequency loudspeakers
20. Low-frequency loudspeakers
25. Wide-range, 2 & 3 way systems

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Airphone Co., Inc., Fla., 10
Altec Lansing Corp., Calif., 15, 20, 25
Ampex Corp., 934 Charter St., Redwood City, Calif., 25
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07. Loudspeakers & Headphones.

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Atlas Sound Corp., N.Y., 5, 15
Audio Equipment Co., Inc., N.Y., Electronic Megaphone
Audio-Master Corp., N.Y., 10
Barker Sound Reproducers, England, 15, 20, 25
Beam Instruments Corp., N.Y., 5, 15, 20, 25
Becker Electronics Mfg. Corp., N.Y., 5
Bell & Howell Co., Ill., 10
Best Mfg. Co., Inc., N.J., 5
Bogen Co., Inc., David, N.Y., 25
Bozak Co., R. T., Conn., 15, 20, 25
British Industries Corp., N.Y., 10, 15, 20
Brociner Electronics Lab., N.Y., 25
Brush Electronics Co., Ohio, 10
Campbell Mfg. Co., Ltd., Canada, 5, 10, 25
Canadian Gen. Elec. Co., Electr. Equip., Canada, 5, 15, 20
Cannon, Co., C. F., N.Y., 10
Carbonneau Industries, Inc., Mich., 5
Cinaudagraph Corp., Ill., 5, 10, 15, 20, 25
Cleveland Electronics, Inc., Ohio, 5, 15, 20, Auto-Drive-In Theatre
Components Corp., N.J., 15, 25
Connecticut Telephone & Elec. Corp., Conn., 10
Consolidated Radio Prods. Co., Ill., 5, 10, 15, 20, 25

(Continued on page 249)

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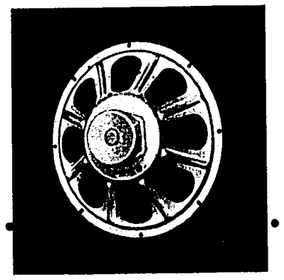
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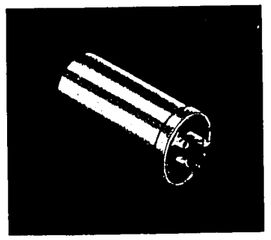
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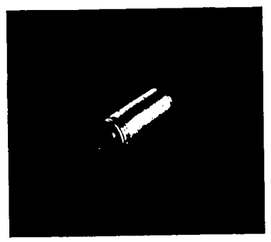
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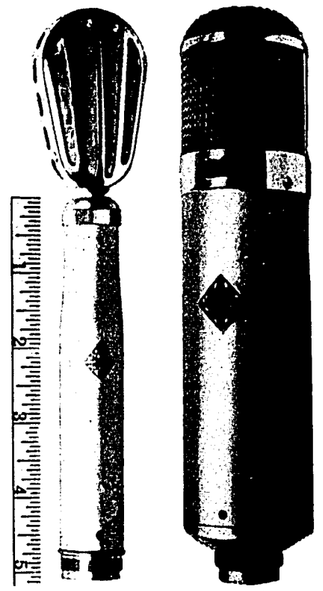
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1. Audio Frequency Equipment

Products 07-08

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(Continued from page 247)

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Dictograph Prods., Inc., N.Y., 10
Duotone Co., Inc., N.J.
Electro-Voice, Inc., Mich., 5, 15, 20, 25
Fidelity Amplifier Co., Ill., Drive-in-theatre
Galbraith & Son Elec. Corp., N.Y., 5
General Electric Co., N.Y.C., N.Y., 5, 15, 20, 25
General Electric Co., N.Y., 5, 15, 20, 25
Glaser-Steers Corp., N.J., 5
Hartley Co., Inc., H. A., N.Y., 15, 20, 25
Hawley Products Co., 333 N. 6th St., St. Charles, Ill., 5
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Tel: St. Charles 3130
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Holl Audio, Inc., Calif., 15, 20, 25
Insuline Corp. of America, N.H., 10
Jensen Mfg. Co., Ill., 5, 15, 20, 25
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Flipsch & Assoc., Ark., 15, 20, 25
Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 25
For details see ad on pages 2-3
Tel: UNiversity 4-4272
Lansing Sound, Inc., Calif., 15, 20, 25
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Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne, Ind., 5, 15, 20
For details see ad on page 248
Tel: E 5471
Magnecord, Inc., Ill., 15, 20, 25
Northern Elec. Co., Ltd., Canada, 10
Oxford Elec. Corp., Ill., 5, 15, 20, 25
Permoflux Corp., Ill., 5, 10, 15, 20, 25
Philmore Mfg. Co., Inc., N.Y., 10
Quam-Nichols Co., Ill., 5, 15, 20
RCA Victor Co., Ltd., Canada, 5, 25
Radio Corp. of America, Engr. Prod. Dept., Camden, N.J., 5, 15, 20
For details see ad on page 210
Tel: Woodlawn 3-8000
Racon Elec. Co., Inc., N.Y., 5, 15, 20, 25
Reeves Equipment Corp., N.Y., 25
Roanwell Corp., N.Y.
Rola Co., Inc., The, Ohio, 5
Sears Co., M. J., N.Y., 10
Setchell-Carlson, Inc., Minn., 5
Sonotone Corp., N.Y. 10
Sound Projects Co., Ill., 20
Stephens Mfg. Corp., Calif., 15, 20, 25
Stevens Prod., Inc., N.J., Diaphragms, Cones, Suspensions
Stromberg-Carlson Co., N.Y., 5, 10, 15, 20, 25
Telephonics Corp., N.Y., 10
Telex, Inc., Minn., 5, 10, 20
Trimm, Inc., 400 W. Lake St., Libertyville, Ill., 10
For details see ad on page 247
Tel: LI 2-3700
Ultrasonic Corp., Mass., 25
U. S. Recording, D.C., 5, 10, 15, 20, 25
University Loudspeakers, Inc., N.Y., 5, 15, 20, 25
Utah Radio Products Co., Inc., 1225 Roosevelt Ave., Huntington, Ind., 5, 15, 20, 25
For details see ad on page 390
Tel: HUntington 3100
Vitavox, Ltd., England, 15, 20, 25
Wright, Inc., Minn., 5
Wright Zimmerman, Inc., Minn., 5, Hospital Speakers

08. Microphones & Stands.

5. Carbon
10. Ceramic
15. Condenser
20. Crystal
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30. Velocity
35. Microphone stands

Acoustical Manufacturing Co., Ltd., England, 5, 35
Aeronautical Radio Mfg. Co., N.Y., 5
American Elite, Inc., 1775 Broadway, New York 19, N.Y., 15
For details see ad on page 249
Tel: Plaza 7-7491
Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 25, 30
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Tel: Canal 6-1446
Altec Lansing Corp., Calif., 15, 25, 30, 35
American Microphone Co., Calif., 5, 10, 20, 25, 30, 35
Asco Sound Corp., N.Y., 5, 10, 15, 20, 25, 30, 35
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Atlas Sound Corp., N.Y., 35

(Continued on page 250)

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1. Audio Frequency Equipment

08. Microphones & Stands.

(Continued from page 249)

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Automatic Electric Co., Ill., 5
Barco, Inc., Wis., 20, 25
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 15
For details see ad on pages 96-97
Tel: FI 2-1821
Beam Instruments Corp., N.Y., 25
Berndt-Bach, Inc., Auricon Div., 971 N. Mansfield Ave., Hollywood 38, Calif., 25, 35
For details see ad on page 259
Tel: Hollywood 2-0931
Bruel & Kjaer, Denmark, 15, 35
Brush Electronics Co., Ohio, 20
Budelman Radio Corp., Conn., 15
Canadian Gen. Elec. Co. Electr. Equip., Canada, 25, 30, 35
Capps Co., Inc., Frank L., N.Y., 15
Connecticut Telephone & Elec. Corp., Conn., 5, 25
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Eastern Mike-Stand Co., N.Y., 35
Ectro, Inc., Ohio, 5, 20, 25
Electro-Voice, Inc., Mich., 5, 10, 15, 20, 25, 30, 35
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For details see ad on page 177
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Remler Co., Ltd., Calif., Variable Reluctance
Roanwell Corp., N.Y., 5, 35
Ronar, Inc., Ill., 20
Sears Co., M. J., N.Y., 5, 25
Shure Brothers, Inc., Ill., 5, 10, 20, 25, 30, 35, Wireless
Snyder Mfg. Co., Pa., 35
Sonotone Corp., N.Y., 20
Stephens Mfg. Corp., Calif., 15
Stromberg-Carlson Co., N.Y., 5, 10, 15, 20, 25, 30, 35
Telephonics Corp., N.Y., 5, 10, 25
Telex, Inc., Minn., 25
Tibbetts Industries, Inc., Maine, 20
Turner Co., Iowa, 5, 10, 20, 25, 30, 35
U. S. Recording Co., D.C., 5, 10, 15, 20, 25, 30, 35
University Loudspeakers, Inc., N.Y., 5
Vitavox, Ltd., England, 25, 35
Western Insulated Wire Co., Calif., Microphone Cords

09. Phonograph, Pick-ups, Record Changers, etc.

5. Phonograph motors
10. Pick-ups—crystal
15. Pick-ups—dynamic
20. Pick-ups—magnetic
25. Pick-ups—reluctance
30. Playback arms
35. Record changers
40. Record players
45. Styli-diamond
50. Styli-metallic
55. Styli-sapphire
60. Taps phonographs & playback equipment

A. P. W. Co., N.J., 20
Admiral Corp., Ill., 35
Airtronix Development Corp., N.Y., 40
Allegro Electronics Corp., N.Y., 40
Alliance Mfg. Co., Ohio, 5
Alliance Motors, Canada, 5
Altec Lansing Corp., Calif., 20, 30
American Microphone Co., Calif., 10
American Radio & Television, Inc., Ark., 40
Ampex Corp., 934 Charter St., Redwood City, Calif., 60
For details see ad on pages 108-109
Tel: Emerson 8-1471
Ansley Mfg. Co., Arthur, Pa., 40
Asco Sound Corp., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60
Astatic Corp., Ohio, 10, 50, 55
Audio Devices, Inc., N.Y., 50, 55
Audio Industries, Inc., Ind., 35, 40
Audio-Master Corp., N.Y., 35, 40, 60
Barber-Colman Co., Ill., 5
Beam Instruments Corp., N.Y., 60
Bell & Howell Co., Ill., 40
Berndt-Bach, Inc., Auricon Div., 971 Mansfield Ave., Hollywood 38, Calif., 40
For details see ad on page 259
Tel: Hollywood 2-0931
Bird & Co., Richard H., Mass., 55
Birmingham Sound Reproducers, Ltd., England, 5, 35, 40
Bogen Co., Inc., David, N.Y., 40
Bruno-N.Y. Industries Corp., 460 W. 34 St., New York 1, N.Y., 40
For details see ad on page 444
Tel: Longacre 4-5930
Brush Electronics Co., Ohio, 20, 60
Califone Corp., Calif., 5, 10, 25, 30, 40
Campbell Mfg. Co., Ltd., Canada, 60
Canadian Gen. Elec. Co. Electr. Equip., Canada, 25, 30, 45, 55
Canadian Radio Mfg. Corp., Ltd., Canada, 35, 40
Capps Co., Inc., Frank L., N.Y., 50, 55
Components Corp., N.J., 15, 40
Consolidated Radio Prods. Co., Ill., 35
Crescent Industries, Inc., Ill., 35, 40, 60
Culbertson Co., George K., Calif., 40
D & R, Ltd., Calif., 40
De Wald Radio & TV Corp., N.Y., 40, 60
Diamond Tool Eng. Co., Mass., 45, 55
Duotone Co., Inc., N.J., 35, 45, 50, 55
Eastern Air Devices, Inc., N.H., 5
Eicor, Inc., Ill., 60
Electro Engineering Products Co., 609 W. Lake St., Chicago 6, Ill., 5
For details see ad on page 337
Tel: Central 6-2670
Electro-Voice, Inc., Mich., 10, 15, 20, 25, 30
Electron-Radar Products, Ill., Pick-ups-Photoelectric
Electrovox Co., Inc., N.J., 45, 50, 55
Elso Mfg. Co., Inc., Pa., 35, 40, 60
Esquire Radio Corp., N.Y., 40
Fairchild Recording Equipment Co., N.Y., 20, 30
Feldman Co., Henry, Calif., 30, 45, 50
Ferranti Electric, Inc., N.Y., 15
Fidelity Amplifier Co., Ill., 40
Fisher Radio Corp., N.Y., 20
Flock Process Co., Inc., Conn., 35, 40
Garod Radio Corp., N.Y., 40, 60
Garrard Sales Corp., N.Y., 35, 40
Gates Radio Co., Ill., 40
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 60
For details see ad on page 507
Tel: Rockford 2-6695
General Electric Co., N.Y.C., N.Y., 25, 30, 45, 55
General Electric Co., N.Y., 25, 30, 45, 55
Gleason-Avery, Inc., N.Y., 5
Gray Research & Development Co., Inc., 658 Hilliard St., Manchester, Conn., 30
For details see ad on page 260
Tel: Mitchell 9-4506
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 10
For details see ad on page 177
Hartley Co., Inc., H. A., N.Y., 5, 10, 15, 20, 35, 40, FM
Insuline Corp., of America, N.H., 15, 20, 45, 55
Jensen Indust., Inc., Ill., 45, 50, 55
Lindberg Instrument Co., Inc., Tex., Resistance Pick-Up
Lincoln Eng. Co., Mo., 35, 40
Lipps Eng., Edwin A., Calif., 45, 55
Livingston Elec. Corp., N.J., 30, 60
Loral Electronics Corp., Dept. ID 54, 794 E. 140 St., New York 54, N.Y., 5
For details see ad on page 198
Tel: CY 2-1800
MP Eng. Co., Conn., 40, 60
Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 10, 30 35
For details see ad on page 248
Tel: E 5471
Magnecord, Inc., Ill., 35, 60
Markel Elec. Prods., Inc., N.Y., 35
Melody Master Mfg. Co., Ill., 40
Micro Eng. Lab., Canada, 5, 30
Microlab Devices, Ltd., Canada, 5, 30
Miller Mfg. Co., M. A., Ill., 45, 50, 55
Motorola Comm. & Elec., Ill., 35, 40
Newcomb Audio Products Co., Calif., 40
Omega Mfg., Inc., N.Y., 35
Pacific Transducer RE Corp., Calif., 20, 25, 30, 45, 55
Peirce Wire Recorder Corp., Ill., 60
Pentron Corp., Dept. IRE 54, 777 S. Tripp Ave., Chicago 24, Ill., 60
For details see ad on page 253
Tel: SAcramento 2-3201
Permo, Inc., Ill., 45, 50, 55
Pfanstiehl Chem. Co., Ill., 25, 30, 45, 50, 55
Pickering & Co., Inc., Dept. T, 308 Woods Ave., Oceanside, L.I., N.Y., 20, 30
For details see ad on page 376
Tel: RO 4-3200
Presto Recording Corp., P.O. Box 500, Paramus, N.J., 30
For details see ad on page 252
Tel: DIamond 3-5700
RCA Victor Co., Ltd., Canada, 20, 60

1. Audio Frequency Equipment

09. Phonograph, Pick-ups, Record Changers, etc.

Radio Corp. of America, Tube Department, Section F35Q, 415 S. 5 St., Harrison, N.J., 55
For details see ad on page 210
Tel: HUmboldt 5-3900
Recoton Corp., N.Y., 20, 45, 50, 55, 60
Reeves Soundcraft Corp., N.Y., 45, 50, 55
Reid Co., Henry L., Ga., 5, 10, 15, 20, 25, 30, 35, 40, 60
Rek-O-Kut Co., N.Y., 40, 60
Rockbar Corp., N.Y., 10, 25, 35, 40
Shure Brothers, Inc., Ill., 10, 30, 50, 55
Shura-Tone Prods., Inc., N.Y., 60
Simpson Mfg. Co., Mark, N.Y., 60
Sonotone Corp., N.Y., Pick-Ups Ceramic
Sound Projects Co., Ill., 15, 20, 40
Square Root Mfg. Corp., N.Y., 40, 60
Steelman Phonograph & Radio Co., Inc., N.Y., 40
Stromberg-Carlson Co., N.Y., 5, 35, 40
Superex Electr. Corp., N.Y., 45
Swiss Jewel Co. & Deltavis Co., Pa., 55
Tele King Corp., N.Y., 35, 40
Televex Co., N.Y., 15, 45, 55
Tetrad Co., Inc., 62 St. Mary St., Yonkers 2, N.Y., 45
For details see ad on page 251
Tel: YO 3-1474

"Diamond needles prove best by actual scientific test and measurement"
—Harold D. Weiler

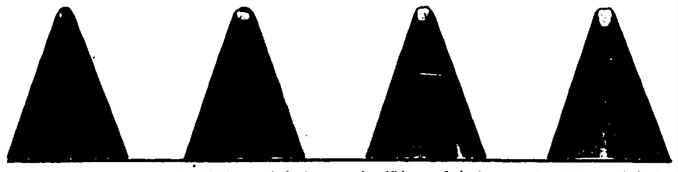
DIAMOND NEEDLES



new — after 38 hours of playing — after 87 hours of playing — after 1538 hours of playing

Note: This needle shows less wear than the sapphire after 38 hours of playing shown below.

SAPPHIRE NEEDLES



new — after 3½ hours of playing — after 17 hours of playing — after 38 hours of playing

Tests, statements, and photographs reprinted from "The Wear and Care of Records and Styli" by Harold D. Weiler. Published by Climax Publishing Co., 17 East 48th Street, New York 17, N. Y. We recommend this authoritative book on proper record care written in understandable, non-technical language. It contains information vital for the protection of your valuable records. Available at your local dealer.

"The preceding tests have proved conclusively the superiority of the diamond tipped stylus from the standpoint of economy, preservation of records, and the quality of reproduction over a given period of time."

Published as a public service by

TETRAD

World's Largest Producer of Diamond Styli
Supplier to Manufacturers of Pick-Up Cartridges and Phonographs

62 St. Mary Street, Yonkers 2, New York

Transformer Metal Prods. Corp., N.Y., 30
Trav-Ler Radio Corp., Ill., 40
Turner Co., Iowa, 10
U. S. Recording Co., D.C., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60
V-M Corp., Mich., 35, 40
Vallorbs Jewel Co., Pa., 55
Waters Conley Co., Minn., 40
Weathers Industries, Inc., N.J., 10, 30, 35, 40, 45, 55, Capacitance Type
Webster Elec. Co., Wis., 10, 30
Williams Brown & Earle, Inc., Pa., 40, 60

10. Recording Accessories & Supplies.

5. Blank disks
10. Cutting heads
15. Cutting styli
20. Magnetic recording, playback & erase heads
25. Magnetic recording tape-acetate base
30. Magnetic recording tape-paper base
35. Magnetic recording wire
40. Stylus resharpening
45. Suction pumps & equipment
50. Tape splicing equipment

Advance Recording Products Co., N.Y., 5
Allied Recording Products Co., N.Y., 5
Alonge Products, Inc., N.Y., 50
Asco Sound Corp., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
Audio Devices, Inc., N.Y., 5, 15, 25, 30, 40
Audio Industries, Inc., Ind., 15
Audio-Master Corp., N.Y., 25
Bell & Howell Co., Ill., 20
Berlant Assoc., Calif., 20
British Industries Corp., N.Y., 20
Brush Electronics Co., Ohio, 10, 20
Caltron Prods. Co., Calif., 5
Capps Co., Inc., Frank L., N.Y., 15, 40
Devol Research Co., Conn., 20
Duotone Co., Inc., N.J., 5, 10, 15, 25, 40, 45
Eicor, Inc., Ill., 20
Electro-Mechanical Instr. Co., Pa., 20
Electrovox Co., Inc., N.J., 15, 40
Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 20
For details see ad on page 318
Tel: CO 6-3228
Fairchild Recording Equip. Co., N.Y., 10, 40, 45
Fidelitone, Inc., Ill., 25, 30, 35
Garod Radio Corp., N.Y., 5
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 30, 35
For details see ad on page 507
Tel: Rockford 2-6695
Home Recording Prod. Corp., N.Y., 5
Insuline Corp. of America, N.H., 25
Jensen Indust., Inc., Ill., 15, 25, 30

(Continued on page 253)

Have you seen and tried the newest

PRESTO

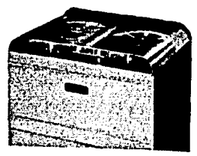
EQUIPMENT?

Here is a sampling of the complete Presto line of precision disc and tape recording and reproducing equipment specifically designed for ease of operation and professional results.



PRESTO SR-11 COMPLETE STUDIO CONSOLE TAPE RECORDER

Never so much quality, operational ease and value offered at modest price. Embodies the famous Presto R-11 tape mechanism, matching amplifier-power supply in a sturdy, well designed console cabinet. Three motors for accurate drive; 15" and 7½" per sec. speeds. Price: under $1000.



PRESTO RELIABLE LONG-PLAYING TAPE REPRODUCER PB-17

Automatically reversible for continuous playback of background music. Frequency response uniform from 50 to 8,000 cps (±2 db). Tape speed: 3¾" per sec. Reels up to 14" dia. (4,800' of tape) with dual track. Mechanism will re-cycle or stop after 8-hours of play.



PRESTO HIGH-QUALITY TURNTABLE-DRIVEN TAPE PLAYBACK UNIT TL-10

Powered by mounting on any standard 16" turntable. Equalized output of playback head can be fed directly into high-quality preamplifier, such as standard broadcast speech input equipment. Capstan for 7½" and 15" per sec. when table turns at 78 rpm. Ideal for low-cost, high-fidelity tape playback.



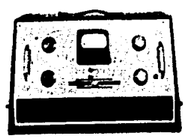
PRESTO PRECISION FIELD TAPE AMPLIFIER 900 A-3

Here is the proper high quality, wide range amplifier to match Presto Tape Transport mechanisms RC-7 and RC-11. Separate power supply eliminates noise. Three microphone input, low distortion. 900-A-1 amplifier identical except for single input transformer.



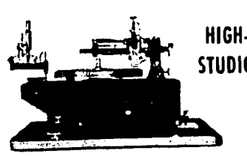
PRESTO 92-B RECORDING AMPLIFIER FOR VERTICAL RACK MOUNTING

Has low internal output impedance, high degree of feed-back and its response is virtually unaffected by changes in load. Holds distortion to minimum. 60-watt output ample for transient peaks. Push-button selector for recording characteristics. Vertical chassis with removable front panel for instant inspection or servicing.



PRESTO 90-B RECORDING CONSOLE FOR PORTABLE OR FIXED USE

The widely used 90-B features a 3-microphone mixer, input and output controls, has several fixed characteristics as well as variable high and low frequency controls, and V.U. meter. Switching and connectors for double turntable. Highest professional standard materials and workmanship . . . over-all performance equal to finest high-fidelity studio equipment.



PRESTO HIGH-PRECISION STUDIO CONSOLE RECORDER 8-D-G

Unusually flexible in operation and easy to control. Cuts finest instantaneous and master recordings, with choice of seven different feed pitches, plus 250 lpi microgroove in each direction. Direct gear drive at 33⅓ and 76.26 rpm, either speed selected by double-throw switch. Transmission unit is simple, very rugged, and extremely accurate.



PRESTO 16" TURNTABLE 10-B FOR RADIO STATIONS AND RECORDING STUDIOS

An improvement on the long popular model 10-A. Capable of continuous operation by non-technical personnel. Inexpensive and simple to service. Operates at 33⅓, 78 and 45 rpm. With its 3-speed mechanism, the Presto 10-B is an extremely accurate rim-driven table. Available as chassis only or in console cabinet.



PRESTO PORTABLE, HIGHLY ACCURATE PROFESSIONAL-TYPE RECORDER 6-N

A fine, high-quality recorder for portable or stationary operation, whose dependability has made it a 15-year favorite here and abroad. Especially designed for professional users. Presto 1-D cutting head supplied. Equipped with precision overhead mechanism including spiraling feedscrew. May be equipped for microgroove recording at extra cost.

PRESTO RECORDING CORPORATION

PARAMUS, NEW JERSEY

Export Division: 25 Warren Street, New York 7, N. Y.

Canadian Division: Walter P. Downs, Ltd., Dominion Square Bldg., Montreal

WORLD'S LARGEST MANUFACTURER OF PRECISION RECORDING EQUIPMENT AND DISCS

1. Audio Frequency Equipment

10. Recording Accessories & Supplies.

(Continued from page 251)

Kollsman Instrument Corp., Div. of Standard Coil Products Co., 80-08 45 Ave., Elmhurst 73, L.I., N.Y., 20
For details see ad on page 216
Tel: NEwtown 9-2900

Korb Eng. & Mfg. Co., Mich., 35

Lipps Eng., Edwin A., Calif., 10, 15, 20, 40

Logistics Research, Inc., 141 S. Pacific Ave., Redondo Beach, Calif., 20
For details see ad on page 405
Tel: ORegon 8-7108

Magnecessories, D.C., 50

Magnecord, Inc., Ill., 20

Maico Co., Inc., The, 21 N. 3 St., Minneapolis 1, Minn., 20
For details see ad on page 439
Tel: AT 8255

Miller Mfg. Co., M. A., Ill., 15

Mirror Record Corp., N.Y., 5, 15

National Hollywood, Calif., 5, 15, 25, 40

Orradio Industries, Ala., 25, 30

Peirce Wire Recorder Corp., Ill., 10, 20, 35

Pentron Corp., Dept. IRE 54, 777 S. Tripp Ave., Chicago 24, Ill., 20, 25
For details see ad on page 253
Tel: SAcramento 2-2301

Permo, Inc., Ill., 25, 30, 35

Presto Recording Corp., P.O. Box 500, Paramus, N.J., 5, 10, 15, 20, 40
For details see ad on page 252
Tel: DIamond 3-5700

RCA Victor Co., Ltd., Canada, 5, 15, 25, 30, 40

Radio Corp. of America, Engineering Products Dept., Camden, N.J., 20, 25, 30
For details see ad on page 210
Tel: Woodlawn 3-8000

Rangertone, Inc., N.J., 20

Recoton Corp., N.Y., 5, 15, 25, 40

Reeves Equipment Corp., N.Y., 5, 10, 25, 45

Reeves Soundcraft Corp., N.Y., 5, 15, 25, 30, 40

Shure Brothers, Inc., Ill., 20

Sonic Recording Prods., Inc., N.Y., 5, 15, 40

Soroban Eng., Inc., Fla., 20

Sound Devices, Inc., N.Y., 5, 25, 30

Soundscriber Corp., Conn., 5

Stancil-Hoffman Corp., Calif., 20

Synchromatic Productions, N.J., Audio-Visual Photoelectric Cell and Amplifier

U. S. Recording Co., D.C., 5, 10, 15, 20, 25, 30, 40, 50

V-M Corp., Mich., 25

Webster Elec. Co., Wis., 20

11. Recording Equipment.

5. Disk recorders
10. Embossing types of recorders
15. Magnetic tape recorders
20. Magnetic wire recorders

Aerovox Corp., Mass., 15

Allied Recording Products Co., N.Y., 5

Ampex Corp., 934 Charter St., Redwood City, Calif., 15
For details see ad on pages 108-109
Tel: Emerson 8-1471

Amplifier Corp. of America, N.Y., 15

Ampro Corp., Ill., 15

Asco Sound Corp., N.Y., 5, 15, 20

Audio Corp. of America, N.J., 15

Audio Industries, Inc., Ind., 5

Audio-Master Corp., N.Y., 15

Beam Instruments Corp., N.Y., 15

11. Recording Equipment.

Bell & Howell Co., Ill., 15, Sound on Film

Bell Sound Systems, Inc., Ohio, 5, 15

Berlant Assoc., Calif., 15

Broadcasting Equipment Specialties, N.Y., 15

Brush Electronics Co., Ohio, 15

Campbell Mfg. Co., Ltd., Canada, 15

Canadian Gen. Elec. Co. Electr. Equip., Canada, 15

Canadian Radio Mfg. Corp., Ltd., Canada, 15

Components Corp., N.J., 5

Cook Laboratories, Conn., 5

Crescent Industries, Inc., Ill., 15, 20

Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., 15
For details see ad on page 254
Tel: APpleton 7-1133

Daystrom Electric Corp., N.Y., 10, 15

Dictaphone Corp., Conn., Dictation Equipment

Dubbings Co., Inc., N.Y., 5, 15

Dubrow Development Co., 235 Penn St., Burlington, N.J., 15
For details see ad on page 445
Tel: Burlington 3-0446

Ectro, Inc., Ohio, 15

Eicor, Inc., Ill., 15

Electro Craft Industries, Inc., Conn., 15

Elso Mfg. Co., Inc., Pa., 15

(Continued on page 254)

3 WAYS TO MARKET

The IRE Balanced Promotion Package is composed of a monthly magazine, a directory and a show, to do these three marketing jobs:

Product Promotion is the function of advertising in "Proceedings of the I.R.E." which reaches 38,945 net paid, ABC readers of which 35,110 are member engineers (including 3,836 student engineers). The publication is a month-by-month textbook of engineering and radio science, and its advertising keeps the engineer up-to-the-minute with product development. Thus its ads promote products to the "thinking and reading" engineers who design and set the specs for tomorrow's production.

Product Reference is the job of the IRE DIRECTORY. Engineers are highly literate, and what they do not know or remember themselves, they do know where and how to look up. The IRE DIRECTORY is their own reference book for men, firms and products—supplying an accurate source of information—in which advertising is an "insurance" that your facts will be found.

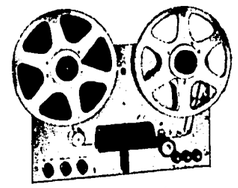
Product Presentation is accomplished economically through the Radio Engineering Show, which attracted 39,302 registered visitors, and served 605 exhibitors in 1954.

New standard of professional recording

Dynacord

PROFESSIONAL TAPE RECORDER

by PENTRON



engineered throughout to NARTB standards

- Portable, may be rack mounted or installed in console.
- High inertia direct capstan drive for minimum flutter.
- New type slow speed "inside-out" hysteresis motor.
- Dynamic braking.
- Interlocked push-button control.
- 3-Head construction facilitates monitoring.
- Accommodates 10½" reels.
- Instantaneous emergency stop.
- Many more superior features.

WRITE for new bulletin today!

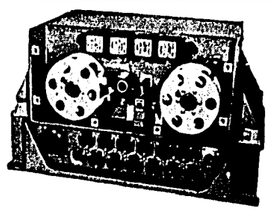
THE PENTRON CORP. Dept. IRE-54
777 S. Tripp Ave., Chicago 24, Ill.

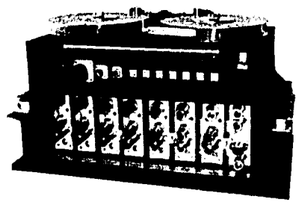
PENTRON — Canada: Atlas Radio Corp., Ltd., Toronto

RECORD ON MAGNETIC TAPE
And Realize These Advantages . . .

1. Data stored in "live" electrical form . . . ideal input to data reduction equipment.
2. High frequency data reproducible on direct writing recorders by playing back at reduced tape speeds.
3. Data accessible for immediate playback.

RECORD
AT THE SOURCE





Portable Recorders

Data recorders for airborne, mobile, and extreme environmental conditions. Meet vibration Specif. MIL-E-5272A Proc. I. Operate from 28 volts DC and/or 115 volts, 400 C. Self-contained units incorporate all electronic circuitry. Available with up to 13 tracks for data recording DC to 30 KC. Frequency multiplexing on single tape track permits recording up to 196 channels on one multichannel recorder. Any single tape speed 7.5 to 30 ips. *Small Portable Recorder* (above, left) records for 3 minutes at 30 ips, measures 20⅝ x 12 x 12 inches including shock mounting, and weighs 55 lbs. *Long Playing Portable Recorder* (above, right) records for 16 minutes at 30 ips, measures 27⅜ x 15 x 15 inches including shock mounting, and weighs 70 lbs.

PLAYBACK
OR RECORD IN THE LABORATORY



Reproducers

For playback of data obtained on recorders described above or laboratory recording and playback. Designed specifically for data recording and reproduction—*not audio*. Tape speeds, 1.5 to 60 ips. Hi/Lo speed combinations available covering frequency range from DC to 60 KC using FM carrier and direct recording techniques. Operates from 115 volts 60 C with or without Frequency Lock which assures reproduction of original frequencies within ½%. Precision frequency drive also available. Improved and simplified wow and flutter compensation used with FM carrier recording permits high signal-to-noise ratio at even low tape speeds. FM carrier discriminator self-contained and operates without regulator from 115-volt, 60 C line—one-hour overall stability better than 1% of maximum output (10 ma. peak at 14 volts) which will drive galvanometers and direct writing recorders—plug-in assemblies allow use at tape speeds between 1½ and 60 ips. Equipment available completely assembled and wired in standard relay racks.

ANALYZE
IN THE LABORATORY



Automatic Wave Analyzer

Heterodyne type analyzer provides completely automatic fourier analysis (amplitude versus frequency) of vibration, seismic, power line, transient, noise, shock, and similar data. In some instances, an amplitude versus time plot for a given frequency can be obtained. Suited for operation from any source supplying a repetitive signal such as a magnetic tape loop. Frequency range 3 to 2000 cps, variable bandwidth ½ to 45 cps, amplitude accuracy ±5% of reading on logarithmic scale, frequency accuracy ½% of reading, output voltage range 60 db, input impedance 2½ megohms. Analysis recorded and up to 14 inputs can be handled and selected automatically.

Special Data Reduction Equipment

Equipment meeting the needs of a particular application can be designed and manufactured to order. Inquiries are invited.

THE *Davies* LABORATORIES INCORPORATED
MANUFACTURERS OF
MAGNETIC TAPE DATA RECORDING EQUIPMENT AND SYSTEMS
4705 QUEENSBURY ROAD • RIVERDALE, MARYLAND
TELEPHONE: WASHINGTON, D.C., APPLETON 7-1133

1. Audio Frequency Equipment

11. Recording Equipment.

(Continued from page 253)

Fairchild Recording Equipment Co., N.Y., 5, 15
Federal Mfg. & Eng. Corp., N.Y., 15
Fisher-Smith, N.J., 15
Gallant Eng. Co., D.C., 5, 15, 20
Garod Radio Corp., N.Y., 15
Gates Radio Co., Ill., 5
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 15
For details see ad on page 177
Tel: Metuchen 6-2800
Insuline Corp. of America, N.H., 5
Korb Eng. & Mfg. Co., Mich., 15
Magnecord, Inc., Ill., 15
McElroy Mfg. Corp., Mass., Ink Tape
Micro Engineering Lab., Canada, 5, 15
Microlab Devices, Ltd., Canada, 5
Miller Instr., Inc., William, Calif., 15
Mirror Record Corp., N.Y., 5
Oakton Eng. Corp., Ill., 15
Peirce Wire Recorder Corp., Ill., 15, 20
Pentron Corp., 777 S. Tripp Ave., Chicago 24, Ill., 15
For details see ad on page 253
Tel: SAcramento 2-3201
Permoflux Corp., Ill., 15
Potter Instr. Co., Inc., N.Y., 15
Press Wireless Labs., Inc., Mass., 15
Presto Recording Corp., P.O. Box 500, Paramus, N.J., 5, 15
For details see ad on page 252
Tel: DIamond 3-5700
Radio Components, Ltd., Canada, 15
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 15
For details see ad on page 210
Tel: Woodlawn 3-8000
Rangertone, Inc., N.J., 15
Reevesound Co., Inc., N.Y., 15, Film
Rek-O-Kut Co., N.Y., 5
Robinson Recording Labs., Pa., 5
Simpson Mfg. Co., Mark, N.Y., 5, 15
Skiatron Electr. & TV Corp., N.Y., 15
Soundscriber Corp., Conn., 5, 10, 15
Southwestern Indust. Electr. Co., Texas, 15
Stancil-Hoffman Corp., Calif., 15
Technisonic Studios, Mo., 5
Telectro Industries Corp., N.Y., 15, 20
U. S. Recording Co., D.C., 5, 15
V-M Corp., Mich., 15
Wagner Research, N.J., 5, 10
Webster Elec. Co., Wis., 15
Williams, Brown & Earle, Inc., Pa., 15
Wireway Corp. of America, Ill., 15, 20
Wright Eng. Co., Calif., 15

See complete list of IRE professional groups on pages 238-239

2. Broadcasting Equipment

Both Aural & Visual; Receivers, Transmitters & Associated Equipment

A Directory of



6 Major Groups
28 Products
Organized by functions for Engineers.

12 Antennas & Accessories.
- 05 AM broadcast transmitting
- 10 FM broadcast transmitting
- 15 TV broadcast transmitting
- 20 Supporting towers
- 25 Tower lighting equipment
- 30 Tower erection & maintenance service

13 Monitor Equipment.
- 05 Frequency
- 10 Modulation
- 15 Remote control monitors
- 20 Video monitors

14 Receivers.
- 05 AM Broadcast
- 10 AM Shortwave
- 15 FM Broadcast
- 20 TV Broadcast B & W
- 25 TV Broadcast—Color

15 Services for the Broadcaster.
- 05 Frequency measurement
- 10 Packaged program services
- 15 Transcription libraries

16 Studio Equipment.
- 05 Consoles & speech input equipment
- 10 TV Cameras
- 15 TV Camera control equipment
- 20 TV Film projectors
- 25 TV Studio lighting equipment
- 30 Turntables

17 Transmitters.
- 05 AM Broadcast
- 10 FM Broadcast
- 15 TV Broadcast
- 20 Relay broadcast & STL equipment

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

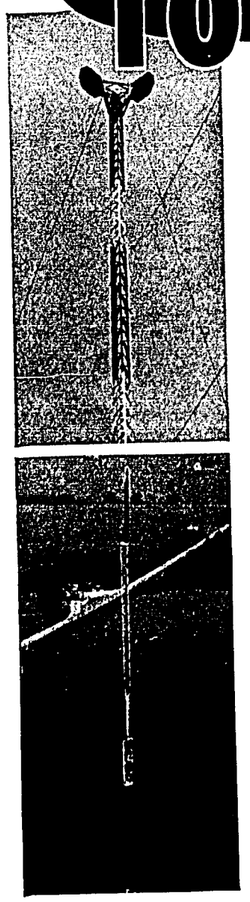
12. Antennas & Accessories.

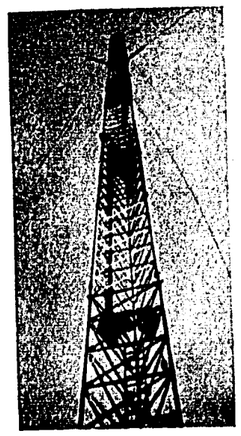
5. AM broadcast transmitting
10. FM broadcast transmitting
15. TV broadcast transmitting
20. Supporting towers
25. Tower lighting equipment
30. Tower erection & maintenance service

Alford Mfg. Co., Inc., Mass., 10, 15
American Electronic Labs., Inc., Pa., 5, 15
Andrew Corp., 363 E. 75 St., Chicago 19, Ill., 5, 10, 15, 25
For details see ad on page 420
Tel: TR 4-4400
Bassett, Inc., Rex, Fla., 20
Beam Instruments Corp., N.Y., 20
Blaw-Knox Equipment Div., Pa., 20
Bright Radio Labs., Inc., N.Y., 15
Bud Radio, Inc., Dept. RE, 2118 E. 55 St., Cleveland 3, Ohio, 20
For details see ad on page 145
Tel: HE 1-7166
Burton-Rogers Co., Mass., 5
Canadian Gen. Elec. Co. Electr. Equip., Canada, 5, 10, 15, 20, 25
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 5
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Connecticut Telephone & Elec. Corp., Conn., 10
Continental Radio & Electrical Eng., S. Africa, 5, 15, 25
Dresser-Stacey Co., Ideco Div., Ohio, 20, 30
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 15, 20, 30
For details see ad on page 161
Tel: Mulberry 4-7400
Eichwald & Co., Inc., B., N.Y., 30
Electrical Tower Service, Inc., Ill., 30
Electron-Radar Products, Ill., Test-Microware
Federal Telecommun. Labs., Div. I T & T, N.J., 15
Gabriel Electronics Div., The Gabriel Co., Endicott St., Norwood, Mass., 10, 15
For details see ad on page 422
Tel: Norwood 7-3300
Gates Radio Co., Ill., 10
General Electric Co., N.Y.C., 5, 10, 15
General Electric Co., N.Y., 5, 10, 15
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 15
For details see ad on page 188
Tel: Pleasantville 2-2000
Hose-McCann Tel. Co., N.Y., 5, 30
Hughey & Phillips, Inc., Calif., 25
Isolantite Mfg. Corp., N.J., Insulators
Johnson Co., E. F., Minn., 5, 25
Lapointe Electronics, Inc., Conn., 10, 15
Lehigh Structural Steel Co., 17 Battery Pl., New York 4, N.Y., 20, 25, 30
For details see ad on page 268
Tel: Whitehall 4-1424
Lingo & Son, Inc., John E., N.J., 5, 10, 15
Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20, 25, 30
National Elec. Prods. Corp., Pa., 15,
Pfaff & Kendall, N.J., 20, 25, 30
Philson Mfg. Co., Inc., N.Y., 5, 10, 15
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 15
For details see ad on page 424, 489
Tel: NEedham 3-3345
Prodelin, Inc., 307 Bergen Ave., Kearny, N.J., 15
For details see ad on page 424
Tel: KEarny 2-8600
RCA Victor Co., Canada, 5, 10, 15
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 10, 15, 20, 25
For details see ad on page 210
Tel: Woodlawn 3-8000
Radiomarine Corp. of America, N.Y., 10
Redifon, Ltd., England, 5, 20
Rich Electronic, Inc., Fla., 10
Rohn Mfg. Co., Ill., 20
Rostan Corp., N.Y., 20
Societe Francaise Radio Electrique, France, 5, 10, 15, 20, 25, 30
Southern Indust. of Maryland, Inc., Md., 5, 10, 15, 20, 30
Stainless, Inc., Pa., 5, 10, 20, 25, 30
Tarzian, Inc., Brdcstg. Equip. Div., Ind., 15
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 15
For details see ad on page 224
Tel: AMityville 4-4446
Transvision, Inc., N.Y., 30
Truscon Steel Div., Ohio, 20, 25

(Continued on page 256)

TRYLON® T TOWERS





...For Rigid Sway and Twist Limits

From standard broadcast to extended microwave installations, Trylon towers have extreme rigidity to withstand difficult loading conditions with a wide safety margin to spare. Each unit is "tailored" to fit the specific requirements of its application.

Type 3500H—heights to 320 feet
Note the *balanced diagonal bracing* which increases the compression strength and greatly increases resistance to twist.

Type 3600—heights to 520 feet
As shown here, a Trylon 3600 tower is supporting an FM antenna at 270 feet. All Trylon towers are hot-dip galvanized *after* fabrication.

Type 6000—heights to 800 feet
This heavy-duty tower is specifically designed for minimum deflection with VHF-UHF television antennae.

PLUS . . . over 20 years' experience in designing, manufacturing, and installing many types of towers, rotators, antennae shorting and changeover switches, and other antenna specialties.

Trylon Towers are made only by

WIND TURBINE COMPANY
WEST CHESTER, PA.

Broadcasting Equipment

12. Antennas & Accessories.

(Continued from page 255)

Wincharger Corp., Iowa, 5, 10, 15, 20
Wind Turbine Co., 238 E. Market St., West Chester, Pa., 20, 25, 30
For details see ad on page 256
Tel: West Chester 3110
Worner Electronic Devices, Ill., 25
Wunderlich Radio Co., N.Y., 5, 10, 20, 25, 30

13. Monitor Equipment.

5. Frequency
10. Modulation
15. Remote control monitors
20. Video monitors

A. R. F. Products, Inc., Ill., 5, 10
Adler Communications Lab., N.Y., 20
American Electronic Labs., Inc., Pa., 20
Andrew Corp., 363 E. 75 St., Chicago 19, Ill., Phase Monitor, AM, B/C
For details see ad on page 420
Tel: TR 4-4400
Arc Equipment Co., N.J., 20
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on page 402
Tel: Eliot 4-4321
Bace Television Corp., N.J., 20
Bassett, Inc., Rex, Fla., 5
Beam Instruments Corp., N.Y., Audio Monitor Ampls.
Berkeley Div. Beckman Instruments, Inc., Dept. N-13, 2200 Wright Ave., Richmond 3, Calif., 5, 15
For details see ad on page 138
Tel: Landscape 6-7730
Bristol Engineering Corp., Pa., 10
Browning Laboratories, Inc., Mass., 5, 10
Bruel & Kjaer, Denmark, 10
Brush Electronics Co., Ohio, 5, 10
Bud Radio, Inc., Dept. RE, 2118 E. 55 St., Cleveland 3, Ohio, 5
For details see ad on page 145
Tel: HE 1-7166
Canadian General Elec. Co., Canada, 5, 10, 15, 20
Canadian Radio Mfg. Corp., Ltd., Canada, 5
Capehart-Farnsworth Co., Ind., 20
Cardwell Mfg. Corp., Allen D., Conn., 5, 10, 15, 20
Colortone Electronics, Inc., N.Y., 5
Communicating Systems, Inc., N.J., 20
Conrac, Inc., Calif., 20
Doelcam Corp., Mass., 15
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 10, 15
For details see ad on page 445
Tel: Burlington 3-0446
Du Mont Labs., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 20
For details see ad on page 161
Tel: Mulberry 4-7400

2. Broadcasting Equipment

13. Monitor.

Erco Radio Labs., Inc., N.Y., 15
Federal Telecommun. Labs., Div. I T & T, N.J., 5, 10, 15, 20
Franklin Electronic, Inc., Pa., 10
Furzehill Labs., Ltd., England, 5, 10
Gates Radio Co., Ill., 5, 10, 15
General Communications, Wis., 20
General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20
General Electric Co., N.Y., 5, 10, 20
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 20
For details see ad on page 188
Tel: Pleasantville 2-2000
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15, 20
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Gonset Co., Calif., 10
Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 5
For details see ad on page 176
Tel: Longacre 5-1300
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 5, 10, 15, 20
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hycon Mfg. Co., Calif., 15, 20
Industrial Assembly Corp., N.Y., 15
Industrial Television, Inc., N.J., 20
Insuline Corp. of America, N.H., 15
Kahn & Co., Inc., Conn., 10
Kalbfell Labs., Inc., Calif., 20
Kaye-Halbert Television, Calif., 15
Knights Co., The James, 101 E. Church St., Sandwich, Ill., 5, 10
For details see ad on page 313
Tel: SAndwich 2141
Marconi Instruments, Ltd., N.Y., 5
Marconi's Wireless Telegraph Co., Ltd., England, 5, 20
Monitor Products Co., Calif., 5
Neptune Electronic Co., N.Y., 15
New London Instrument Co., P.O. Box 189P, New London, Conn., 10
For details see ad on page 438
Tel: Gibson 3-8451
Northern Radio Co., Inc., Dept. D54, 147 W. 22 St., New York 11, N.Y., 5, Shift
For details see ad on pages 6-8
Tel: Watkins 9-9117
Panoramic Radio Products Inc., 20 South 2 Ave., Mt. Vernon, N.Y., 10
For details see ad on page 437
Tel: MOunt Vernon 4-3970
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 20
For details see ad on pages 39-42
Tel: STagg 2-3464
Press Wireless Labs., Inc., Mass., 5
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 10, 20
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Eng. Co., N.Y., 5
Schafer Custom Eng., Calif., 15
Setchell-Carlson, Inc., Minn., 20
Skiatron Electronics & TV Corp., N.Y., 15
Stelma, Inc., 389 Ludlow St., Stamford, Conn., Telegraph Signal Monitors
For details see ad on page 439
Tel: 48-2579
Superex Electronic Corp., N.Y., 20
Tarzian, Inc., Brdcstg. Equip. Div., Ind., 20
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 20
For details see ad on page 474
Tel: Webster 9-9520
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 10, 15, 20
For details see ad on page 224
Tel: AMityville 4-4446
Telescreen Corp., Conn., 15, 20
Television Utilities Corp., N.Y., 15, 20
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 20
For details see ad on page 230
Tel: Malden 2202
West Coast Electronics Co., Calif., 5
Wickes Eng. & Const. Co., N.J., 20
Willys Motors, Electr. Div., Ohio, 20

14. Receivers.

5. A.M. broadcast
10. AM shortwave
15. FM broadcast
20. TV broadcast—B & W
25. TV broadcast—Color

Acoustical Mfg. Co., Ltd., England, 5
Admiral Corp., Ill., 5, 20, 25
Air Associates, Inc., N.J., 10
Airtronix Dev. Corp., N.Y., 5
Alco Electronics Mfg. Co., Mass., 15
Altec Lansing Corp., Calif., 5, 15
Altec Lansing Corp., N.Y., 5, 15
American Television Mfg. Corp., Ill., 20
Ansley Mfg. Co., Arthur, Pa., 5, 15
Appliance & Electronic Div., Avco Mfg., Ohio, 5, 15, 20
Approved Electronic Instr. Corp., N.Y., 5, 15
Asco Sound Corp., N.Y., 5, 15
Audio Industries, Inc., Ind., 5
Barber & Howard, R.I., 15
Bassett, Inc., Rex, Fla., 10
Bell Television, Inc., N.Y., 20
Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 5, 20
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bogen Co., Inc., David, N.Y., 5, 15
Brownie Mfg. Co., N.Y., 20, Miniature
Calbest Eng. & Electronics Co., Calif., 5, 15, 20
Canadian Aviation Electronics, Ltd., Canada, 20
Canadian Radio Mfg. Corp., Ltd., Canada, 5, 10, 15, 20, 25
Canadian Westinghouse Co., Ltd., Canada, 5, 10, 15, 20
Capehart-Farnsworth Co., Ind., 5, 10, 15, 20, 25
Certified Radio Laboratories, N.Y., 20
Champion Electric Corp., England, 5, 10, 15, 20
Chisholm Industries, Ltd., Canada, 5, 20
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 10
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Conrac, Inc., Calif., 20
Crest Laboratories, Inc., N.Y., 25
De Wald Radio & TV Corp., N.Y., 5, 10, 15, 20, 25
Dominion Electrohome Industries, Ltd., Canada, 5, 10, 15, 20
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 15
For details see ad on page 445
Tel: Burlington 3-0446
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 20, 25
For details see ad on page 161
Tel: Mulberry 4-7400
Du Mont Labs., Inc., A. B., Receiver Div., 35 Market St., E. Paterson, N.J., 5, 20, 25
For details see ad on page 161
Tel: Mulberry 4-7400
Eckstein Radio & TV Co., Minn., 5, 10
Elm Laboratories, N.Y., 5
Erco Radio Labs., Inc., N.Y., 10
Esquire Radio Corp., N.Y., 5, 10, 15
Fada Radio & Elec. Co., Inc., N.J., 5, 10, 15, 20
Federal Mfg. & Eng. Corp., N.Y., 10
Feldman Co., Henry, Calif., 5, 15
Fisher Radio Corp., N.Y., 5, 15
Fisher Research Laboratory, Inc., Calif., 5, 10
Flush Wall Radio Co., Fla., 5
Fog-O-Scope, Inc., Ill., 5, 10, 15, 20, 25
Freed Electronics & Controls Corp., N.Y., 5, 10, 15
Garod Radio Corp., N.Y., 5, 10, 15, 20, 25
General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20, 25
General Electric Co., N.Y., 5, 15, 20, 25
Gonset Co., Calif., 10, 15
Gotham Television Corp., N.Y., 5, 10, 20
Hallicrafters Co., Ill., 5, 10, 15
Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 10
For details see ad on page 176
Tel: Longacre 5-1300
Hartley Co., Inc., H. A., N.Y., 5, 15
Hoffman Radio Corp., Calif., 5, 15, 20
Hose-McCann Telephone Co., N.Y., 5
International Television Corp., N.Y., 20
Kaye-Halbert Television, Calif., 5, 20, 25
Kingston Prod. Corp., Ind., 5
Kuss Machine Tool & Die Co., Inc., Pa., 5
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 5
For details see ad on page 312
Tel: MAtawan 1-2600
Lehigh Valley Electronic Eng. & Mfg. Co., Pa., 10
Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 4, Ind., 5, 10, 15, 20
For details see ad on page 248
Tel: E 5471

(Continued on page 259)



At least one of your interests is now served by one of IRE's 21 Professional Groups

Each group publishes its own specialized papers in its *Transactions*, some annually, and some bi-monthly. The larger groups have organized local Chapters, and they also sponsor technical sessions at IRE Conventions.

Aeronautical and Navigational Electronics (G 11)	Fee $2
Antennas and Propagation (G 3)	Fee $4
Audio (G 1)	Fee $2
Broadcast & Television Receivers (G 8)	Fee $2
Broadcast Transmission Systems (G 2)	Fee $2
Circuit Theory (G 4)	Fee $2
Communication Systems (G 19)	Fee $2
Component Parts (G 21)	Fee $2
Electron Devices (G 15)	Fee $2
Electronic Computers (G 16)	Fee $1
Engineering Management (G 14)	Fee $2
Industrial Electronics (G 13)	Fee $2
Information Theory (G 12)	Fee $1
Instrumentation (G 9)	Fee $1
Medical Electronics (G 18)	Fee $2
Microwave Theory and Techniques (G 17)	Fee $2
Nuclear Science (G 5)	Fee $2
Quality Control (G 7)	Fee $1
Radio Telemetry & Remote Control (G 10)	Fee $2
Ultrasonics Engineering (G 20)	Fee $2
Vehicular Communications (G 6)	

IRE Professional Groups are only open to those who are already members of the IRE. Copies of Professional Group Transactions are available to non-members at three times the cost-price to group members.

The Institute of Radio Engineers
1 East 79th Street, New York 21, N.Y.

USE THIS COUPON DIR 54

Miss Emily Sirjane
IRE—1 East 79th St.
New York 21, N.Y.

Please enroll me for these IRE Professional Groups

..... $.....
..... $.....
.....
Name .....
Address .....
Place .....

Please enclose remittance with this order.

Professional Group on Broadcast and Television Receivers

The field of broadcast receivers is one which is closely associated with the general public, perhaps more so than any other branch of the radio engineering field. In fact, to the layman the term "radio" is synonymous with "broadcast receiver."

As a result, the receiver engineer has been concerned with an additional factor not generally common to other fields, namely, that of responding to—or endeavoring to create—public demand for a product. This factor has played a prominent role in such developments as FM, car radios, portable receivers, and black-and-white television sets. It is now conspicuously evident in connection with current efforts to produce and market color television receivers.

The IRE Professional Group on Broadcast and Television Receivers is playing a major role in making available vitally needed technical information, not only on color television, but on all aspects of the receiver field. Through this exchange of information, the radio and television industry is gaining important data which will be helpful in solving the engineering problems it faces and in successfully meeting the "public demand" factor mentioned above.

The Group has been particularly active in sponsoring technical sessions at most of the national meetings held throughout the country during the year; the Radio Fall Meeting, the Spring Television Conference in Cincinnati, and the IRE National Convention, to mention but a few.

The Group also publishes its own technical publication, called *Transactions*, which is distributed to some 1200 members as a part of their $2.00 assessment fee. The *Transactions*, which is published on a quarterly basis, has become a chief source of information on the latest technical developments in the field of broadcast and television receivers.

W. R. G. Baker

Chairman, Professional Groups Committee

2. Broadcasting Equipment

14. Receivers.

(Continued from page 257)

Magnecord, Inc., Ill., 5, 15
Martin & Co., H. S., Ill., 5, 15
Measurement Eng., Ltd., Canada, 10
Midwest Radio & Television Corp., Ohio, 5, 10, 15, 20
Motorola Communic. & Elec., Inc., Ill., 5, 10, 15, 20, 25
Muntz TV, Inc., Ill., 20
National Co., Inc., Mass., 5, 10
Newton Scientific Co., Mass., 5, 15
Northern Elec. Co., Ltd., Canada, 5
Orthon Corp., 196 Albion Ave., Paterson 2, N.J., 5, 10, 15
For details see ad on page 273
Tel: MUlberry 4-5858
Pedersen Electronics, Calif., 5, 15
Pentron Corp., Dept. IRE 54, 777 South Tripp Ave., Chicago 24, Ill., 5, 15
For details see ad on page 253
Tel: SAcramento 2-3201
Philips Indust., Ltd., Canada, 5, 10, 15, 20
Pilot Radio Corp., N.Y., 5, 15, 20
Polarad Electronic Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 10, 15
For details see ad on pages 39-42
Tel: Stagg 2-3464
Radar-Electr., Inc., N.Y., 5, 10, 15, 20
Radio Craftsmen, Inc., Ill., 5, 15, 20
Radio Eng. Labs., Inc., N.Y., 15
Radiomarine Corp. of America, N.Y., 10
Reid Co., Henry L., Ga., 5, 10, 15, 20, 25
Ribet Desjardin, France, 5, 20
Setchell-Carlson, Inc., Minn., 5, 15, 20, 25
Shaw Television Corp., N.Y., 5, 15, 20, 30
Shevers, Harold, N.Y., 5, 15, 20
Societe Francaise Radio Electrique, France, 10
Sonar Radio Corp., N.Y., 10
Sondyna, A. G., Switz., 5, 10, 15, 20
Specialty Eng., Div. Spec. Assem. & Pack., N.Y., 10
Spera Electronic Labs., N.Y., 10
Steelman Phonograph & Radio Co., Inc., N.Y., 5, 15
Stromberg-Carlson Co., N.Y., 5, 15, 20, 25
Superex Electronic Corp., N.Y., 5, 15
Superior Marine Radio Co., Fla., 10
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 5, 15, 20, 25
For details see ad on pages 9-14
Tel: JU 6-2424
Sylvania Electric Products Inc., Radio & TV Div., 254 Rano St., Buffalo 7, N.Y., 5, 15, 20
For details see ad on pages 9-14
Tel: Victoria 2450
Taffet Radio & TV Co., N.Y., 5, 10, 15
Tech-Master Corp., N.Y., 5, 15, 20, 25
Technical Material Corp., N.Y., 10
Tele King Corp., N.Y., 5, 20
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 25
For details see ad on page 224
Tel: AMityville 4-4446
Telephonics, Corp., N.Y., 10
Telescreen Corp., Conn., 25, Industrial
Telex, Inc., Minn., 10
Thordarson-Meissner Mfg. Div., Ill., 5, 10, 15
Transvision, Inc., N.Y., 20
Trav-Ler Radio Corp., Ill., 5, 20
Vocaline Co. of America, Inc., Conn., 5
Warwick Mfg. Corp., Ill., 5, 10, 15, 20, 25
Wells-Gardner & Co., Ill., 5, 10, 15, 20
Westinghouse Elec. Corp., Pa., 5, 15, 20
Yonkers Industries, Inc., N.Y., U H F Converters

15. Services for the Broadcaster.

5. Frequency measurement
10. Packaged program
15. Transcription services
Libraries

Aero Instrument Co., Calif., 5
Apple Frequency Measuring Service, H. L., N.C., 5
Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 5
For details see ad on page 487
Tel: LIvingston 8-1545
Bassett, Inc., Rex, Fla., 5
Browning Laboratories, Inc., Mass., 5
Brush Electronics Co., Ohio, 5
Burnett Radio Lab., William, W. L., Calif., 5
Central Rediffusion Services, Ltd., England, 10, 15
De Wald Radio & TV Corp., N.Y., 5
Dubbings Co., Inc., N.Y., 15
Eidson Electronic Co., Texas, 5
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5
For details see ad on page 487
Tel: Pioneer 6-5212
Electronic Research Mfg. Corp., Ohio, 5
Frequency Standards, P.O. Box 504, Asbury Park, N.J., 5
For details see ad on page 460
Tel: 1718
International Television Corp., N.Y., 5, 85 to 1000 mc
Ivanhoe Electronic Labs., Ill., 5

15. Services for the Broadcaster.

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 5
For details see ad on page 312
Tel: MAtawan 1-2600
Marconi Instruments, Ltd., N.Y., 5
Monitor Products Co., Calif., 5
Northern Elec. Co., Ltd., Canada, 5
Phelps Precision Lab., Minn., 5
Precision Film Labs., Inc., N.Y., Film Processing
RCA Victor Co., Ltd., Canada, 10, 15
Radio Engineering Co., N.Y., 5
Sellers Co., Tex., Recording Studio
Standard Electronic Research Corp., N.Y., 5
Strain Eng. Service, Ga., 5
Technisonic Studios, Mo., 15
U. S. Recording Co., D.C., 10, 15

16. Studio Equipment.

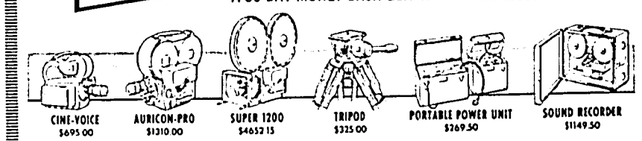
5. Consoles & speech input equip.
10. TV cameras
15. TV camera control equipment
20. TV film projectors
25. TV studio lighting equipment
30. Turntables

Adler Communications Labs., N.Y., 5
Aerovox Corp., Mass., 5
Allied Recording Products Co., N.Y., 30
Altec Lansing Corp., Calif., 5
Altec Lansing Corp., N.Y., 5
Asco Sound Corp., N.Y., 5, 30
Bace Television Corp., N.J., 10
Bardwell & McAlister, Inc., Calif., 25
Berndt-Bach, Inc., Auricon Div., 971 North Mansfield Ave., Hollywood 38, Calif., 10 Sound on Films, 30
For details see ad on page 259
Tel: Hollywood 2-0931
Bliss Electronic Corp., N.J., 5
Califone Corp., Calif., 30
Camera Equipment Co., N.Y., 15, Tripods
Canadian General Elec. Co., Canada, 5, 10, 15, 20, 25, 30
Canadian Research Institute, Canada, 5

(Continued on page 261)

Auricon Hollywood

16mm SOUND-ON-FILM EQUIPMENT FOR TELEVISION NEWSREELS, TV FILM INSERTS AND KINESCOPE RECORDINGS...SOLD WITH A 30-DAY MONEY-BACK GUARANTEE. YOU MUST BE SATISFIED!



WRITE FOR FREE ILLUSTRATED INFORMATION

BERNDT-BACH, Inc.
971 No. Mansfield Avenue, Hollywood 38, Calif.

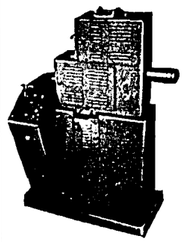
MANUFACTURERS OF SOUND-ON-FILM RECORDING EQUIPMENT SINCE 1931

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Gray RESEARCH

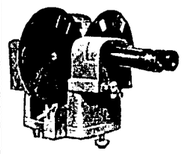
Precision Professional Equipment

FOR TELEVISION and BROADCAST STATIONS
ACCEPTED and USED by ALL MAJOR NETWORKS
FOR RELIABILITY • VERSATILITY • PERFORMANCE



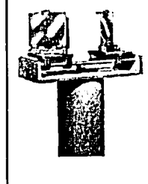
TELOP I . . . TELEVISION OPTICAL PROJECTOR

Telop I is one-man operated, economical and reliable. It projects low-cost, easily produced "commercials" for increased profits. The Telop completely eliminates keystoning; any two photographs, glass lantern slides, or opaque cards can be projected, also small objects, with superposition, lap dissolves or fadeout. Metal slides holding either five or eight 4"x5" cards may be used for projection.



3A . . . TELOJECTOR

Compact, portable unit for automatic, remote control of standard 2" x 2" transparencies. Provides uninterrupted continuity with studio effects of fading, lapping and superposition. Slide turrets can be changed instantly.



60A FOUR-WAY FILM MULTIPLEXER

A precision arrangement of mirrors for operation of pairs of projectors simultaneously in a single TV camera or individually into two separate cameras. Also available as a 62A two-way moving mirror multiplexer (illustrated) or a 61A two-way fixed mirror multiplexer.

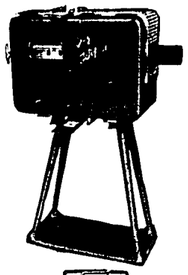


35A MANUAL CONTROL BOX

Gray's Control Box is especially designed for use with the Telojector. Control Box laps, fades, superpositions and permits remote changing of slides.

TELOP II . . . PROJECTOR

For smaller TV stations . . . one man operated . . . will project any combination of slides, transparencies, opaque cards or photographs. Eliminates costly film strips and live talent, yet achieves clear sharp pictures with superposition, lap dissolves and fade-out effects. Small initial investment assures greater profits because of low production and operating cost.



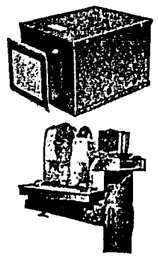
55A FILM CAMERA TURRET

One camera can serve up to 8 projectors with Gray camera turret. Mounted on heavy, welded steel frame, the turret revolves 360 degrees on heavy duty ball bearings with positive placement. Requires minimum space.



13A LIGHT BOX

This attachment will back-light 3¼" x 4" transparencies and make them part of a "commercial" along with opaque cards or other copy. The box mounts directly behind the slide holder groove in the optical channel opening of the Telop.



63A TELOJECTOR SHELF

The Gray Telojector shelf is of steel construction. Strong, sturdy, it is easy to attach to Multiplexer stand. Telojector mounts on shelf.

11B VERTICAL SCROLL DRIVE

The Vertical Scroll Drive will televise rollstock and broadcast running commentary or "commercials"—with or without sound accompaniment. Attaches to the optical openings of the Telop.

12A HORIZONTAL TAPE DRIVE

Horizontal Tape permits televising of 8 mm. news ticker tape. Tape can be projected on any part of screen—top, bottom or middle and superposed on copy televised from another Telop optical opening.

15R REVERSE CLOCK

Designed for time spots and announcements. Clock face is small enough to permit superposition of commercial or other copy. Also available in 15A direct reading model.

106SP TRANSCRIPTION ARM

106SP Transcription Arm meets the strict requirements of modern, highly compliant pick-up cartridges. 3 Cartridge slides furnished, enable GE 1-mil, 2½ mil, or 3 mil cartridges or Pickering cartridges to be instantly installed. Fairchild cartridge slides also available.

108B VISCOUS-DAMPED TONE ARM

Radically new suspension development on the viscous damping principle for perfect tracking of records and elimination of tone arm resonances. For all records—33⅓, 45, and 78 RPM. Solves all record reproducing problems.

602B EQUALIZER

The new 602B Equalizer provides balanced output, permitting operation of the Equalizer into either a balanced or unbalanced line. A convenient control allows instant switching from conventional records to micro-groove.

GRAY RESEARCH

and Development Co., Inc., Hilliard St., Manchester, Conn.

Division of the GRAY Mfg. Co. Originators of the Gray Telephone Pay Station, Gray Audograph and the Gray PhonAudograph.

Gray, as a special service to its many TV customers, now has available a custom-made test pattern with individual call letters for TV stations.



2. Broadcasting Equipment

16. Studio Equipment.

(Continued from page 259)

Carrier Corp., N.Y., Air Conditioning
Century Lighting, Inc., N.Y., 25
Cinematic Developments Co., Calif., 10, Custom
Collins Radio Co., 855 35th Street, N.E., Cedar Rapids, Iowa, 5
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
D & R, Ltd., Calif., 30
Danby Radio Corp., Pa., 30
Daven Company, N.J., 5
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 30
For details see ad on page 445
Tel: Burlington 3-0446
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N. J., 5, 10, 15, 20, 25, 30
For details see ad on page 161
Tel: Mulberry 4-7400
Eastern Precision Resistor Corp., N.Y., 25
Eastman Kodak Co., N.Y., 20
Edmar Communication Co., Pa., 5
Eichwald & Co., Inc., B, N.Y., 25
Electro Eng. & Mfg. Co., Mich., Sound Slide Film
Elgin Metalformers Corp., 902 N. Liberty St., Elgin, Ill., 5
For details see ad on pages 122-123
Tel: Elgin 7225
Equipment and Service Co., Texas, 25
Federal Telecommunication Labs., Div. I T & T, N.J., 5, 10, 15, 20
Gates Radio Co., Ill., 5, 30
General Communications, Wis., 5, 15, 25
General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20, 30
General Electric Co., N.Y., 5, 10, 15, 20, 25, 30
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 10, 15, 20
For details see ad on page 183
Tel: Pleasantville, 2-2000
Gray Research & Dev. Co., Inc., 658 Hilliard St., Manchester, Conn., 5, 20
For details see ad on page 260
Tel: Mitchell 9-4506
Harwood Mfg. Co., Ill., 25
Kalbfell Labs., Inc., Calif., 10, 15
Karp Metal Products Co., N.Y., 5
Kliegl Bros., Universal Elec. Stage Lighting Co., N.Y., 25
Kuss Mach. Tool & Die Co., Inc., Pa., 5
Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 5
For details see ad on pages 116-117
Tel: ENdicott 2-7200
Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20, 25, 30
Marine Elec. Corp., N.Y., 5
Measurement Eng., Ltd., Canada, 5
Microlab Devices, Ltd., Canada, 30
Mole-Richardson Co., Calif., 25
Morecroft Design Engineer, John H., Calif., 5
National Cine Equip., Inc., N.Y., 15, 25
National Radio Res. Labs., N.Y., 5
Northern Elec. Co., Ltd., Canada, 5
Par-Metal Products Corp., 32-62 49th St., Long Island City 3, N.Y., 5
For details see ad on page 289
Tel: AStoria 8-8905
Philco Corp., Govt. & Industrial Div., Pa., 20
Ponder & Best, Calif., TV Camera Lenses
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 10, 15, 20, 30
For details see ad on page 210
Tel: Woodlawn -800
RCA Victor Co., Ltd., Canada, 5, 10, 15, 20, 25, 30
Redifon, Ltd., England, 5
Reevesound Co., Inc., N.Y., 5, 15
Rek-O-Kut Co., N.Y., 30
Robinson Recording Labs., Pa., 30
Societe Francaise Radio Electrique, France, 5
Standard Electronic Corp., N.J., 5, 10, 15
Strong Elec. Corp., Ohio, 25
Superior Elec. Co., 9000 Clarke Ave., Bristol, Conn., 25
For details see ad on pages 106-107
Tel: Bristol 2-9561
Tarzian, Inc., Brdcstg. Equip. Div., Ind., 5, 10, 15, 20
Tech Labs., Inc., N.J., 5
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 10
For details see ad on page 474
Tel: WEbster 9-9520
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 10, 15
For details see ad on page 224
Tel: AMityville 4-4446
Telescreen Corp., Conn., 10, 15
Trans-Lux Corp., N.Y., 20, Rear Projection Screens
U. S. Recording Co., D.C., 5, 30
Willys Motors, Eelectronics Div., Ohio, 5, 10, 15

17. Transmitters.

5. AM broadcast
10. FM broadcast
15. TV broadcast
20. Relay broadcast & STL equip.

Beam Instruments Corp., N.Y., 5
Budelman Radio Corp., Conn., 20
Canadian General Elec. Co., Canada, 5, 10, 15, 20
Canadian Marconi Co., Canada, 5, 10, 15, 20
Canadian Westinghouse Co., Ltd., Canada, 5, 10
Cardwell Mfg. Corp., Allen D., Conn., 15
Central Rediffusion Services, Ltd., England, 5
Century Electronics Div., Century Metalcraft, Calif., 20
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5, 10, 20
For details see ad on pages 86-87
Tel: Livingston 6-1100

17. Transmitters.

Chisholm Industries, Ltd., Canada, 5, 10, 20
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 5
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Connecticut Electr. Alarm Sys., Conn., 20
Connecticut Tel. & Elec. Corp., Conn., 10, 20
Continental Electr. Mfg. Co., Tex., 5, 15
Continental Radio & Electrical Eng., South Africa, 5, 10, 15
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 15
For details see ad on page 161
Tel: Mulberry 4-7400
Electro Craft Industries, Inc., Conn., 20
Erco Radio Labs., Inc., N.Y., 5
Federal Telecommunication Labs., Div. I T & T, N.J., 15, 20
Fisher Research Laboratory, Calif., 5
Fog-O-Scope, Inc., Ill., 20
Gallay, Harris, N.J., 20
Gates Radio Co., Ill., 5, 10, 15, 20
General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20
General Electric Co., N.Y., 5, 10, 15
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 15
For details see ad on page 188
Tel: Pleasantville 2-2000
Hose-McCann Telephone Co., N.Y., 5
Kraus Fratelli, Italy, 5, 10
Lambda-Pacific Engr., Inc., Calif., 20
Lettine Radio Mfg. Co., N.Y., 20
Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20
Motorola Communication & Electronics, Inc., Ill., Microwave
Parisier & Co., Maurice I., N.Y., 5
Philco Corp., Govt. & Ind. Div., Pa., 20
RCA Victor Co., Ltd., Canada, 5, 10, 15, 20
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 10, 15, 20
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Eng. Labs., Inc., N.Y., 10
Radio Eng. Products, Ltd., Canada, 20
Radiomarine Corp. of America, N.Y., 10
Redifon, Ltd., England, 5
Societe Francaise Radio Electrique, France, 5, 10, 15, 20
Standard Electronic Corp., N.J., 5, 10, 15
Taffet Radio & TV Co., N.Y., 5, 10
Tarzian, Inc., Brdcstg. Equip. Div., Ind., 15, 20
Telechrome, Inc. 88 Merrick Rd., Amityville, L.I., N.Y., 15, 20
For details see ad on page 224
Tel: AMityville 4-4446
Vocaline Co. of America, Inc., Conn., 5
Westinghouse Elec. Corp., Pa., 5, 10
Westinghouse Elec. Corp., Electronic Div., Md., 5, 10
Willys Motors, Electronics Div., Ohio, 15
Wunderlich Radio Co., N.Y., 5, 10, 20

"Radio" is a way of Thinking!

Just as "communication" needed to break its earthbound bonds of wire and take to the air, so industry is seeking and finding in radio controls new "tools" ranging from servo-mechanisms to electronic computers.

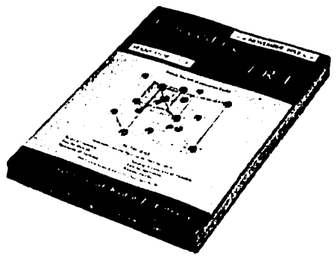
THIS IS NO DREAM

Radio engineers are making the "bright new world" which was the dream of men in World War II. Just as radio engineers bridged the lost silence of the sea by ship radio communications in the 1900s, so these same thinkers, as radio physicists unleashed the "radiation" power of the atom, and will harness it to industry. They have brought the picture of the world under your control by a knob in your home television — and have beaten the monotony of endless counting by the electronic computer.

TAKING THE GUESSWORK OUT

Such progress is no "happy accident." Men do not "discover" television — they "engineer" it. A good example is the achievement of color television. From "fission" to "computation" the job is done by an enormous process of information exchange — the methodical and brilliant teaming together of engineering thinking to solve a problem. In radio this work has been done deliberately by a growing engineering society, through its meetings and published proceedings, which unleash the minds of men.

In 1953 "Proceedings of the I·R·E" published 1,818 text pages, exclusive of product news and departmental features. This is the word-count equivalent of seven 500 page textbooks on radio-electronics for engineers, and exceeds the contents of the next two contemporary publications put together. This "high" in genuine reader service was logically matched by advertising worth half a million dollars, by firms investing in the engineers' reading interest.



"Proceedings of the I·R·E"

Published by the

INSTITUTE OF RADIO ENGINEERS

Advertising Dept. 1475 Broadway

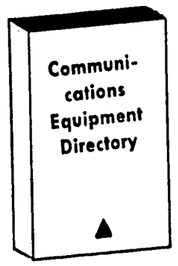
New York 36, N.Y., BRyant 9-7550

Radio • Communications • Television • Electronics

A Directory of

3. Communications Equipment

All non-broadcast forms of communication; Amateur, Emergency, Facsimile, Mobile, Etc.



8 Major Groups
29 Products
Organized by functions for Engineers

18 Aircraft & Airport Equipment.
- 05 Airborne receivers
- 10 Airborne transmitters
- 15 Airport receivers
- 20 Airport transmitters
- 25 GCA Equipment, etc.

19 Amateur Equipment.
- 05 Antennas & antenna accessories, rotators, etc.
- 10 Receiving equipment
- 15 Transmitters

20 Carrier Current Equipment.
- 20 Complete terminal equipment
- 10 Installation & maintenance
- 15 Repeat & relay equipment

21 Emergency Communications Equipment.
- 05 Despatching equipment
- 10 Walkie-talkies

22 Facsimile Equipment.
- 05 Receiving equipment
- 10 Sensitized paper
- 15 Transmitting equipment

23 Marine Equipment.
- 05 Contract installers
- 10 Pleasure craft radiotelephones
- 15 Shipborne communications equipment

24 Mobile Equipment.
- 05 Antennas
- 10 Central Station receivers
- 15 Central Station transmitters
- 20 Citizen Radio
- 25 Mobile receivers
- 30 Mobile transmitters
- 35 Selective Calling equipment

25 Point-to-Point Equipment.
- 05 Antennas & towers
- 10 Receivers
- 15 Transmitters

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

18. Aircraft & Airport Equipment.

5. Airborne receivers
10. Airborne transmitters
15. Airport receivers
20. Airport transmitters
25. GCA equipment, etc.

Admiral Corp., Ill., 5, 10
Aero Electronics Co., Ill., 25
Aeronautical Communications Equip., Fla., 5, 10, 20
Aeronautical Radio Mfg. Co., N.Y., 5, 10
Air Associates, Inc., N.J., 5, 10, 15, 20
Air Associates, Inc., N.J., 15, 20
Aircraft Radio Corp., Boonton, N.J., 5, 10
For details see ad on page 469
Tel: BOonton 8-1800
Alcor Electronics Corp., N.Y., 25
Andersen Labs. Inc., 37 Talcott Rd., West Hartford 10, Conn., 25
For details see ad on page 318
Tel: ADams 3-4491
Bassett, Inc., Rex, Fla., 15, 20
Bendix Aviation Corp., 1400 Fisher Bldg., Detroit 9, Mich., 5, 10, 25
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 5, 10, 15, 20, 25
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411
Bright Radio Labs., Inc., N.Y., Direction Finders
Buffalo Instrument Corp., N.Y., 10
Bunnell & Co., J. H., N.Y., 5, 10
Canadian General Elec. Co., Electronic Equipment Div., Canada, 5, 10
Canadian Westinghouse Co., Ltd., Canada, 5, 10, 15, 20
Canoga Corp., Calif., 25
Cardwell Mfg. Corp., Allen D., Conn., 5, 10
Central Rediffusion Services, Ltd., England, 15, 20
Champion Electric Corp., England, 5
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 20
For details see ad on pages 86-87
Tel: Livingston 6-1100
Codetyper Labs., N.Y., 10
Coles Electronic Corp., Pa., 10
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5, 10, 15, 20
For details see ad on pages 43-46
Tel: Cedar Rapids 4-0281
Communications Co., Inc., Fla., 5, 10, 15, 20, FM only
Continental Radio & Electrical Eng., S. Africa, 5, 10, 15, 20, 25
Corbin Corp., Md., 5, 10, 15, 20
Crown Engineering, N.M., 5, 10
Cubic Corp., Calif., 5, 10
Dayton Aircraft Prods., Inc., Ohio, Antennas
El-Tronics Inc., Pa., 15, 20
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L. I., N.Y., 5, 10, 15, 20
For details see ad on page 487
Tel: Pioneer 6-5212
Electro-Mechanical Research, Inc., Conn., 10
Electronic Specialty Co., Calif., 5, 10
Engineering Associates, Ohio, 5, 10
Erco Radio Labs., Inc., N.Y., 15, 20
Federal Telecommun. Labs., Div. I T & T, N.J., 5, 10, 15, 20, 25, Ils
Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 5, 10, 15, 20
For details see ad on pages 32-37
Tel: Nutley 2-3600
Fog-O-Scope, Inc., Ill., 5, 10
Gates Radio Co., Ill., 20
Gonset Co., Calif., 5, 10, 15, 20, 25
Hamlyn Electronics Corp., N.Y., 5, 10, 15, 20, 25
Industrial Research Labs., Md., 10
Insuline Corp. of America, N.H., 25
Jarvis Electronic Corp., Ill., 5, 10, 25
Kaar Eng. Corp., Calif., 15, 20
Kahn Research Labs, N.Y., 20
Ketay Mfg. Corp., N.Y., 25
Kingston Prod. Corp., Ind., 10
Kraus Fratelli, Italy, 10, 20
Laboratory for Electronics, Inc., Mass., 25
Lavoie Labs, Inc., Matawan & Freehold Rd., Morganville, N.J., 15, 20, 25
For details see ad on page 312
Tel: MAtawan 1-2600
Lear, Inc., Learcal Div., Calif., 5, 10, 15, 20
Lear, Inc., Calif., 5, 10, 15, 20
Lewyt Corp., N.Y., 5, 10

(Continued on page 264)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

3. Communications Equipment

18. Aircraft & Airport Equipment.

(Continued from page 263)

Loral Electronic Corp., 794 E. 140th St., New York 54, N.Y., 5, 10
For details see ad on page 198
Tel: CY 2-1800
Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 4, Ind., 5
For details see ad on page 248
Tel: E 5471
Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20, 25
Maryland Electronic Mfg. Corp., Md., 15, 20, 25
Measurement Eng., Ltd., Canada, 15, 20
Melstrom Mfg. Corp., N.J., 5, 10, 15, 20
Mitchell Industries, Texas, 5, 10, 15, 20
Morecroft Design Engineer, John H., Calif., 5, 10
Motorola Reesarch Lab., Ariz., 5, 10
Munston Mfg. & Service, Inc., N.Y., 15, 20
National Aeronautical Corp., Pa., 5, 10, 15, 20
National Co., Inc., Mass., 15
National Electronic Labs., Inc., D.C., 15, 20
Northern Electric Co., Ltd., Canada, 15
Otis Elevator Co., Electronic Div., N.Y., 5, 10, 15, 20
Phebco, Inc., Md., 5, 10
Platt Mfg. Corp., N.Y., 5, 10, 15, 20
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5
For details see ad on pages 39-42
Tel: Stagg 2-3464
Radiaphone Co., Calif., 5, 10
Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 5, 10
For details see ad on page 525
Tel: MElbourne 800
Radio Apparatus Corp., Ind., 15
Radio Mfg. Engineers, Inc., Ill., 15
Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 15, 20, 25
For details see ad on pages 30-31
Tel: Watkins 4-3633
Redifon, Ltd., England, 15, 20
Remler Co., Ltd., Calif., 5, 20
Robet Desjardins, France, 25
Schuttig & Co., Inc., D.C., 15, 20
Servo Corp. of America, Dept. 14, 20-20 Jericho Tnpke., New Hyde Park, N.Y., 5, 10, 15, 20
For details see ad on page 236
Tel: FI 7-2810
Societe Francaise Radio Electrique, France, 5, 10, 15, 20
Sonar Radio Corp., N.Y., 5, 10
Specialty Eng. Div., Specialty Assembling & Packing Co., N.Y., 5
Superex Electronic Corp., N.Y., 5, 10
Taffet Radio & TV Co., N.Y., 5, 10, 15
Technical Material Corp., N.Y., 15
Tele-Beam Industries, Calif., 5, 10, 15, 20
Telephonics Corp., N.Y., 5, 10, 15, 20
Telescreen Corp., Conn., 5, 10
Transmitter Equip. Mfg. Co., Inc., N.Y., 5, 10, 15, 20
Triumph Mfg. Co., Ill., 5, 10
Union Electric & Mfg. Co., N.J., 5, 10
White Industries, Inc., N.Y., 5, 10
Wilcox Electric Co., Inc., Mo., 5, 10, 15, 20
Wunderlich Radio Co., N.Y., 5, 10, 15, 20

19. Amateur Equipment.

5. Antennas & antenna accessories, rotators, etc. **10. Receiving equipment** **15. Transmitters**

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 5
For details see ad on page 130
Tel: Bishop 2-1000
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 5, 15
For details see ad on pages 96-97
Tel: FI 2-1821
Bassett, Inc., Rex, Fla., 5, 10, 15
Birnbach Radio Co., Inc., N.Y., 5
Bremer Electronics, N.J., 5, 10, 15
C and H Sales Co., Calif., 10, 15
Cardwell Mfg. Corp., Allen D., Conn., 10
Champion Electric Corp., England, 10
Codetyper Labs., N.Y., 15
Coles Electronic Corp., Pa., 15
Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 10, 15
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 15, Single Side Band
For details see ad on page 152
Tel: PL 4-5502
Connecticut Telephone & Electric Corp., Conn., 5, 10, 15
Consolidated Wire & Assoc. Co., Ill., 5
Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 10
For details see ad on page 317
Tel: Hunt. 4-7961
Corbin Corp., Md., 5
Crowley & Co., Inc., Henry L., N.J., 5
Drake Co., R. L., Ohio, 5
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15
For details see ad on page 487
Tel: Pioneer 6-5212
Electro-Voice, Inc., Mich., 10
Fidelity Instrument Corp., Pa., Amateur Mobile Equipment

For Fast Product Reference

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

19. Amateur Equipment.

Fog-O-Scope, Inc., Ill., 10, 15
Fretco, Inc., Pa., 5
Gabriel Electronics Div., The Gabriel Co., Endicott St., Norwood, Mass., 5
For details see ad on page 422
Tel: Norwood 7-3300
Gates Radio Co., Ill., 15
Gonset Co., Calif., 5, 10, 15
Guardian Electric Mfg. Co., 1621-IRE W. Walnut St., Chicago 12, Ill., 5
For details see ad on page 190
Tel: CHesapeake 3-1100
Hamlyn Electronics Corp., N.Y., 10, 15
Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 10
For details see ad on page 176
Tel: LOangre 5-1300
Harvey-Wells Electronics, Inc., Mass., 5, 10, 15
Heath Co., The, 305 Territorial Rd., Benton Harbor 27, Mich., 10, 15
For details see ad on page 447
Tel: WA 5-1175
Heinze Electric Co., 685 Lawrence St., Lowell, Mass., 5
For details see ad on page 276
Tel: BE 6-9200
Hy-Lite Antennae, Inc., N.Y., 5
Insuline Corp. of America, N.H., 5
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 5
For details see ad on page 286
Tel: BE 6-9200
Johnson Co., E. F., Minn., 5, 15
Kraus Fratelli, Italy, 15
Lettine Radio Mfg. Co., N.Y., 15
Lund-Hansen Co., Ill., 5
Lysco Mfg. Co., Inc., N.J., 5, 15
Mark Prods. Co., Ill., 5
McCarter Radio & Television, Ltd., Canada, 5
Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 5
For details see ad on page 287
Tel: WA 5-6880
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 15
For details see ad on page 548
Tel: MA 4-4108
Morecroft Design Engineer, John H., Calif., 10, 15
National Co., Inc., Mass., 10
Panoramic Radio Prods., Inc., 20 S. 2nd Ave., Mt. Vernon, N.Y., 10
For details see ad on page 437
Tel: MOunt Vernon 4-3970
Philmore Mfg. Co., Inc., N.Y., 5, 15
Premax Prods. Div., Chisholm-Ryder, N.Y., 5
Q-Line Mfg. Corp., N.Y., 5
Radio Mfg. Engineers, Inc., Ill., 10, 15
Rich Electronic, Inc., Fla., 15
Semco Electronic Corp., N.Y., 10, 15
Snyder Mfg. Co., Pa., 5
Sonar Radio Corp., N.Y., 10, 15
Southern Indust. of Maryland, Inc., Md., 5
Standard Transformer Corp., Ill., 15
Suburban Radio Co., N.J., 15
Superior Marine Radio Co., Fla., 10, 15
Tech Labs., Inc., N.J., 15
Tele-Beam Industries, Calif., 5

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

3. Communications Equipment

19. Amateur Equipment.

Telrex, Inc., 26 Neptune Hwy., Asbury Park, N.J., 5
For details see ad on page 489
Tel: ASbury Park 2-7252
Transmitter Equip. Mfg. Co., Inc., N.Y., 15
Video Industries Co., N.Y., 5
Western Gear Works, Box 182, Lynwood (Los Angeles), Calif., 5
For details see ad on page 74
Tel: Nevada 6-2161
Wind Turbine Co., 238 E. Market St., West Chester, Pa., 5
For details see ad on page 256
Tel: West Chester 3110
World Radio Labs., Iowa, 15

20. Carrier Current Equipment.

5. Complete terminal equipment **10. Installation & maintenance** **15. Repeat & relay equipment**

Alcor Electronics Corp., N.Y., 5, 15
Automatic Electric Co., Ill., 5, 15
Boehme, Inc., H. O., N.Y., 5
Bristol Co., Conn., 15
Budelman Radio Corp., Conn., 5
Bunnell & Co., J. H., N.Y., 5, 15
Canadian General Electric Co., Electric Equip. Div., Canada, 5, 10, 15
Canadian Radio Mfg. Corp., Ltd., Canada, 5, 15
Communication Accessories Co., 110th St. & Hillcrest Rd., Hickman Mills, Mo., 5
For details see ad on pages 80-81
Tel: South 5528
Communication Equip. & Engr. Co., Ill., 5, 15
Connecticut Telephone & Electric Corp., Conn., 5, 15
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 15
For details see ad on page 487
Tel: PIoneer 6-5212
Federal Telecommun. Labs., Div. I T & T, N.J., 5, 15
Feiler Engineering & Mfg. Co., Ill., Intercom
General Electric Co., N.Y., 5, 15
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15
Harmon Electronics Co., Mo., 5, 15
Industrial Electronics of Canada, Ltd., Canada, 15
Insuline Corp. of America, N.H., 5
K-F Dev. Co., Calif., 5, 10
Kellogg Switchboard & Supply Co., 79 West Monroe St., Chicago 3, Ill. Telephone Carrier
For details see ad on page 404
Tel: DEarborn 2-0750
Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N.Y., 5
For details see ad on page 511
Tel: MOunt Vernon 4-4024
Lenkurt Electric Co., Inc., Calif., 5, 10, 15
Lynch Carrier Systems, Inc., Calif., 5, 15
Maspeth Telephone & Radio Corp., N.Y., 5, 10, 15
Melstrom Mfg. Corp., N.J., 5, 15
Morecroft Design Engineer, John H., Calif., 5, 10, 15
Motorola Communication & Electriic Inc., Ill., 5, 10, 15
Northern Electric Co., Ltd., Canada, 5, 15
Radio Eng. Products, Ltd., Canada, 5, 15
Railway Communications, Inc., Mo., 5, 10, 15
Societe Francaise Radio Electrique, France, 10, 15
Southern Electric & Transmission Co., Texas, 5, 15
Stelma, Inc., 389 Ludlow St., Stamford, Conn., 5, 10, 15
For details see ad on page 439
Tel: 48-2579
Stromberg-Carlson Co., N.Y., 5, 10, 15
Summit Electronics, Inc., N.J., 5
Technical Material Corp., N.Y., 5, 15
Vocaline Co. of America, Inc., Conn., 10, 15
Westinghouse Electric Corp., Pa., 5, 15
Westinghouse Electric Corp., Electronic Div., Md., 5

21. Emergency Communications Equipment.

5. Despatching equipment **10. Walkie-talkies**

Admiral Corp., Ill., 10
Air Associates, Inc., N.J., 10
Air Associates, N.J., 5, 10
Authorized Manufacturers Service, N.Y., 10
Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 5, 10
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411
Bliss Electronic Corp., N.J., 5
Canadian General Electric Co., Electronic Equip. Div., Canada, 5, 10
Canadian Marconi Co., Canada, 5, 10
Canadian Radio Mfg. Corp., Ltd., Canada, 5, 10
Champion Electric Corp., England, 10
Codetyper Labs., N.Y., 5
Communication Equip. & Engr. Co., Ill., 10
Communications Co., Inc., Fla., 5
Condor Radio Mfg. Co., Ariz., 10
Connecticut Electronic Alarm Systems, Conn., 5
Connecticut Telephone & Electric Corp., Conn., 5
Dictograph Prods., Inc., N.Y., 5
Du Mont Labs., Inc., A. B., Communications Products Div., 1500 Main Ave., Cilfton, N.J., 5, 10
For details see ad on page 161
Tel: Mulberry 4-7400
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10
For details see ad on page 487
Tel: Pioneer 6-5212
Electro Craft Industries, Inc., Conn., 10
Electronic Research Mfg. Corp., Ohio, 5
Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 5
For details see ad on pages 32-37
Tel: Nutley 2-3600
Freed Electronics & Controls Corp., N.Y., 5, 10
Galbraith & Son, Electric Corp., C. C., N.Y., 5
General Eelectric Co., N.Y.C. N.Y., 5, 10
General Electric Co., N.Y., 5
Grady Instrument Co., Mass., 5, 10
Hallicrafters Co., Ill., 10
Hamlyn Electronics Corp., N.Y., 5, 10
Harmon Electronics Co., Mo., 5
Harvey-Wells Electronics, Inc., Mass., 5, 10
Hoffman Radio Corp., Calif., 10
Industrial Radio Corp., Ill., 10
Insuline Corp. of America, N.H., 10
Kaar Eng. Corp., Calif., 5
Kahn & Co., Inc., Conn., 10
Lehigh Valley Electronic Engr. & Mfg. Co., Pa., 10
Lorain County Radio Corp., Ohio, 5
Lysco Mfg. Co., Inc., N.J., 5, 10
Magnex Corp., N.Y., 10
Marconi's Wireless Telegraph Co., Ltd., England, 10
Marsh-Theiss, Inc., N.Y., 5, 10
Maspeth Telephone & Radio Corp., N.Y., 10
McElroy Mfg. Corp., Mass., Radio Telegraph
Measurement Eng., Ltd., Canada, 10
Motorola Communication & Electrics, Inc., Ill., 5, 10
Northern Electric Co., Ltd., Canada, 5
Parts Producing Corp., Mfg. Div., N.Y., 5
Phebco, Inc., Md., 5, 10
Radio Corp. of America, Eng. Prod. Dept., Camden, N.J., 5, 10
For details see ad on page 210
Tel. WOodlawn 3-8000
Radio Specialty Mfg. Co., Orc., 10
Royalcall, Inc., Ohio, UHF Paging or One Way Signaling
Royalcall, Inc., Ohio, Hospital & Industrial
Semco Electronic Corp., N.Y., 10
Societe Francaise Radio Electrique, France, 5, 10
Sonar Radio Corp., N.Y., 10
Superior Marine Radio Co., Fla., 5, 10
Taffet Radio & TV Co., N.Y., 10

(Continued on page 266)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

3. Communications Equipment

21. Emergency Communications Equipment.

(Continued from page 265)

Tech. Labs, Inc., N.J., 5
Telephonics Corp., N.Y., 10
Transmitter Equip. Mfg. Co., Inc., N.Y., 5
West Coast Electronic Co., Calif., 5
Wunderlich Radio Co., N.Y., 5, 10

22. Facsimile Equipment.

5. Receiving equipment
10. Sensitized paper
15. Transmitting equipment

Acme Telectronix Div., NEA Service, Ohio, 5, 15
Alden Electronic & Impulse Rec. Equip. Co., Washington St., Westboro, Mass., 5, 15
For details see ad on page 296
Tel: Westboro 467
Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 10, 15
For details see ad on page 296
Tel: Brockton 160
Alden Systems Co., 11 Alden Research Center, Westboro, Mass., 5, 15
For details see ad on page 296
Tel: Westboro 377
Alfax Paper & Eng. Co., Mass., 10
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 15
For details see ad on pages 96-97
Tel: FI 2-1821
Brick Electronic Co., N.J., 5, 10, 15
Bunnell & Co., J. H., N.Y., 5, 15
Cardwell Mfg. Corp., Allen D., Conn., 5, 15
Communicating Systems Inc., N.J., 5, 10, 15
Corbin Corp., Md., 5
Espey Mfg. Co., Inc., N.Y., 15

22. Facsimile Equipment.

Freed Electronics & Controls Corp., N.Y., 5, 15
Garod Radio Corp., N.Y., 5
Hogan Labs., Inc., 155 Perry St., New York 14, N.Y., 5, 10, 15
For details see ad on page 488
Tel: CHelsea 2-7855
Muirhead & Co., Ltd., England, 5, 10, 15
Northern Radio Co., Inc., Dept. D54, 147 W. 22nd St., New York 11, N.Y., 5, 15
For details see ad on pages 6-8
Tel: Watkins 9-9117
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 10
For details see ad on page 345
Tel: ES 5-9435
Press Wireless Labs., Inc., Mass., 5, 15
Skiatron Electronic & TV Corp., N.Y., 15
Sonar Radio Corp., N.Y., 15
Taffet Radio & TV Co., N.Y., 5
Technical Material Corp., N.Y., 5
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 15
For details see ad on page 224
Tel: AMityville 4-4446
Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 5, 10, 15
For details see ad on page 550
Tel: JU 2-3030
Western Union Telegraph Co., N.Y., 10
Winchester Industries, Inc., N.J., 5, 10, 15

23. Marine Equipment.

5. Contract installers
10. Pleasure craft radiotelephones
15. Shipborne communications equip.

Applied Electronics Co., Inc., Calif., 10
Bassett, Inc., Rex, Fla., 10
Beam Instruments Corp., N.Y., 15
Bliss Electronic Corp., N.J., 15

23. Marine Equipment.

Bludworth Marine Div., N.Y., 10, 15
Burke Electric & X-Ray Co., Ltd., Canada, 5, 10, 15
Canadian General Electric Co., Electronic Equip. Div., Canada, 10, 15
Canadian Westinghouse Co., Ltd., Canada, 10, 15
Central Rediffusion Services, Ltd., England 15
Chisholm Industries, Ltd., Canada, 15
Codetyper Labs., N.Y., 15
Communicating Systems, Inc., N.J., 15
Connecticut Marine Instr. Co., Conn., 10
Connecticut Telephone & Electric Corp., Conn., 10, 15
Corbin Corp., Md., 5
Eldico of N.Y., Inc., 72 E. Second St., Mineola, L.I., N.Y., 10, 15
For details see ad on page 487
Tel: Pioneer 6-5212
Electro Craft Industries, Inc., Conn., 15
Electro Switch Corp., Mass., 15
Erco Radio Labs., Inc., N.Y., 5, 15
Espey Mfg. Co., Inc., N.Y., 15
Fisher Research Laboratory, Inc., Calif., 10, 15
Freed Electronics & Controls Corp., N.Y., 15
Galbraith & Son Electric Corp., C. C., N.Y., 15
Gates Radio Co., Ill., 15
General Electric Co., N.Y., 10, 15
General Electrosonics, Inc., N.Y., 5
Gray Radio Co., Fla., 10
Hamlyn Electronics Corp., N.Y., 10, 15
Harvey-Wells Electronics, Inc., Mass., 10
Hose-McCann Telephone Co., N.Y., 5, 10, 15
Isolantite Mfg. Corp., N.J., Insulators-Lead In
Jefferson, Inc., Ray, N.Y., 10, 15, Direction Finders
Kaar Eng. Corp., Calif., 10, 15
Kahn & Co., Inc., Conn., 10, 15
Lorain County Radio Corp., Ohio, 15
Lysco Mfg. Co., Inc., N.J., 10
Mackay Radio & Telegraph Co., N.Y., 5, 10, 15
Magnex Corp., N.Y., 15
Marconi's Wireless Telegraph Co., Ltd., England, 15
Marine Electric Corp., N.Y., 5
Measurement Eng., Ltd., Canada, 5, 10, 15
Morecroft Design Engineer, John H., Calif., 5, 10, 15
Munston Mfg. & Service, Inc., N.Y., 10
RCA Victor Co., Ltd., Canada, 5, 10, 15
Radiaphone Co., Calif., 10
Radiomarine Corp. of America, N.Y., 15
Redifon, Ltd., England, 15
Reeves-Hoffman Corp., 145 Cherry St., Carlisle, Pa., 10
For details see ad on page 314
Tel: Carlisle 2480
Remler Co., Ltd., Calif., 15
Rich Electronic Inc., Fla., 10, 15
Smith Mfg. Co., Nathan R., Calif., 5, 10
Societe Francaise Radio Electrique, France, 10, 15
Sonar Radio Corp., N.Y., 10, 15
Standard Electronic Corp., N.J., 10

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RADIO ENGINEERING SHOW

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Kingsbridge Armory
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3. Communications Equipment

23. Marine Equipment.

Superior Marine Radio Co., Fla., 5, 10, 15
T. L. G. Electric Corp., N.Y., 10, 15
Taffet Radio & TV Co., N.Y., 15
Tech Labs., Inc., N.J., 15
Transmitter Equip. Mfg. Co., Inc., N.Y., 15
University Loudspeakers, Inc., N.Y., 15
Virginia Electronic Co., D.C., 15
Westinghouse Electric Corp., Electronic Div., Md., 15
Winters, Engineer, T. Starling, N.J., Automatic Pilots
Wunderlich Radio Co., N.Y., 15

24. Mobile Equipment.

5. Antennas
10. Central station receivers
15. Central station transmitters
20. Citizen radio
25. Mobile receivers
30. Mobile transmitters
35. Selective calling equipment

Adler Communications Labs., N.Y., 25, 30
Air Associates, Inc., N.J., 25, 30
Aircraft Radio Corp., Boonton, N.J., 25, 30
For details see ad on page 469
Tel: BOonton 8-1800
Airpax Products Co., Md., Marine Converters
Andrew Corp., 363 E. 75th St., Chicago 19, Ill., 5
For details see ad on page 420
Tel: TR 4-4400
Applied Electronics Co., Inc., Calif., 5, 25, 30
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 10, 15, 25, 30
For details see ad on pages 96-97
Tel: FI 2-1821
Bassett, Inc., Rex, Fla., 5, 10, 15, 25, 30

24. Mobile Equipment.

Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 25, 30
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 10, 15, 25, 30, 35
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411
Bludworth Marine Div., N.Y., 25, 30
Bremer Electronics, N.J., 20, 25, 30
Brooks & Perkins, Inc., Mich., 5
Budelman Radio Corp., Conn., 5, 35
Buggie, Inc., H. H., 726 Stanton St., Toledo 4, Ohio, 5
For details see ad on pages 298
Tel: Adams 8216
Campbell Mfg. Co. Ltd., Canada, 5
Canadian General Electric Co., Electronic Equip. Div., Canada, 5, 10, 15, 20, 25, 30, 35
Canadian Marconi Co., Canada, 5, 10, 15, 20, 25, 30, 35
Canadian Radio Mfg. Corp., Ltd., Canada, 5, 10, 15, 25, 30, 35
Cardwell Mfg. Corp., Allen D., Conn., 10, 15, 20, 25, 30, 35
Chisholm Industries, Ltd., Canada, 5, 10, 15, 25, 30
Codetyper Labs., N.Y., 35
Communication Equip. & Engr. Co., Ill., 25, 30
Communication Prods. Co., Inc., State Hwy., Marlboro, N.J., 5
For details see ad on pages 104-105
Tel: Freehold 8-1880
Communications Co., Inc., Fla., 5, 10, 15, 20, 25, 30
Condor Radio Mfg. Co., Ariz., 25, 30
Connecticut Electronic Alarm Systems, Conn., 10, 15, 20, 25, 30
Connecticut Marine Instr. Co., Conn., 25, 30
Connecticut Telephone & Electric Corp., Conn., 5, 10, 15, 20, 25, 30, 35
Continental Radio & Electrical Eng., S. Africa, 5, 10, 15, 20, 25, 30
Corbin Corp., Md., 5, 25, 30
Crowley & Co., Inc., Henry L., N.J., 5
Dictograph Prods., Inc., N.Y., 25
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 25, 30, 35
For details see ad on page 161
Tel: Mulberry 4-7400
El-Tronics, Inc., Pa., 25, 30
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15, 20, 25, 30, 35
For details see ad on page 487
Tel: Pioneer 6-5212
Electro Craft Industries, Inc., Conn., 5
Electro-Voice, Inc., Mich., 25
Electronic Research Mfg. Corp., Ohio, 5, 10, 15, 20, 25, 30, 35
Erco Radio Labs, Inc., N.Y., 10, 15
Federal Telephone & Radio Co., Div., of I T & T, 100 Kingsland Rd., Clifton, N.J., 10, 15, 25, 30, 35
For details see ad on pages 32-37
Tel: Nutley 2-3600
Fisher Research Laboratory, Inc., Calif., 25, 30
Fog-O-Scope, Inc., Ill., 10, 15, 20
Freed Electronics & Controls Corp., N.Y., 5, 10, 25, 30
Gabriel Electronic Div., The Gabriel Co., Endicott St., Norwood, Mass., 5
For details see ad on page 422
Tel: Norwood 7-3300
Gates Radio Co., Ill., 15, 30
General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20, 25, 30, 35
General Electric Co., N.Y., 35
Gonset Co., Calif., 25, 30
Grady Instrument Co., Mass., 5, 10, 15, 20, 25, 30, 35
Hallicrafters Co., Ill., 10, 15, 25, 30
Hamlyn Electronics Corp., N.Y., 10, 15, 20, 25, 30, 35
Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 35
For details see ad on page 176
Tel: LOngacre 5-1300
Harmon Electronics Co., Mo., 35

(Continued on page 268)

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

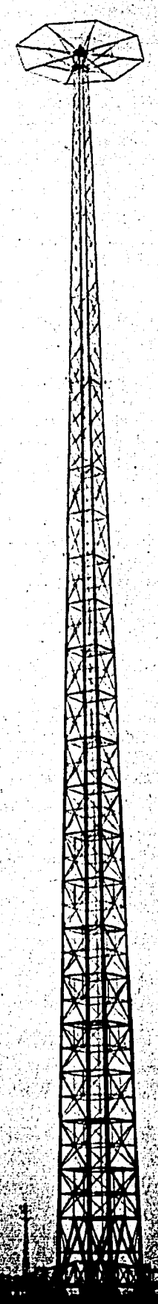
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Tel: WHitehall 4-1424

Offices in Principal Cities — PLANT AT ALLENTOWN, PA

3. Communications Equipment

24. Mobile Equipment.

(Continued from page 267)

Harvey-Wells Electronics, Inc., Mass., 25, 30

Honeycomb Co. of America, Inc., Conn., 5

Insuline Corp. of America, N.H., 5

Isolantite Mfg. Corp., N.J., Insulators-Lead In

JFD Mfg. Co., Inc., 1462 62 Ave., Brooklyn 19, N.Y., 5
For details see ad on page 286
Tel: BE 6-9200

Jefferson Inc., Ray, N.Y., 5

Johnson Co., E. F., Minn., 5, 30

Kaar Eng. Corp., Calif., 10, 15, 25, 30

Kahn & Co., Inc., Conn., 5, 10, 15, 25, 30

Kahn Research Labs, N.Y., 15

Kilchel Communications Service, Pa., Installation & Service

Kings Electronic Co., N.Y., 5, 25, 30

Kraus Fratelli, Italy, 15, 30

Lear, Inc., Learcal Div., Calif., 5, 10, 15, 25, 30

Lear, Inc., Calif., 25, 30, VHF, OLF, VHF

Lehigh Valley Electronic Engr. & Mfg. Co., Pa., 25

Lettine Radio Mfg. Co., N.Y., 30

Lingo & Son, Inc., John E., N.J., 5

Lysco Mfg. Co., Inc., N.J., 5, 10, 15, 25, 30

MacNabb Co., Inc., Vernon C., Ind., 20

Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 25, 30
For details see ad on page 248
Tel: E 5471

Magnex Corp., N.Y., 20, 25, 30

Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20, 25, 30

Mark Prods. Co., Ill., 5

Marsh-Theiss, Inc., N.Y., 5, 10, 15, 25, 30, 35

Melstrom Mfg. Corp., N.J., 5

Morecroft Design Engineer, John H., Calif., 20, 25, 30

Motorola Communic. & Electric, Inc., Ill., 5, 10, 15, 20, 25, 30, 35

Motorola Research Lab., Ariz., 25, 30, 35

National Electronic Labs., Inc., D.C., 25, 30

Northern Electric Co., Ltd., Canada, 10, 25, 30, 35

Phebco, Inc., Md., 25, 30, 35

Philmore Mfg. Co., Inc., N.Y., 20

Plastics & Electronic Corp., N.Y., 35

Platt-Mfg. Corp., N.Y., 5, 10, 15, 20, 25, 30, 35

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

3. Communications Equipment

24. Mobile Equipment.

Premax Prods. Div., Chisholm-Ryder, N.Y., 5

Q-Line Mfg. Corp., N.Y., 5

Radio Corp. of American, Communications Marketing Dept., Camden, N.J., 5, 10, 15, 20, 23, 30, 35
For details see ad on page 210
Tel: WOodlawn 3-8000

Radio Corp. of America, Eng. Prod. Dept., Camden, N.J., 5, 10, 15, 25, 30, 35
For details see ad on page 210
Tel: WOodlawn 3-8000

RCA Victor Co., Ltd., Canada, 5, 10, 15, 25, 30

Radelco Mfg. Co., Ohio, 5

Radio Apparatus Corp., Ind., 5, 10, 25

Radio Industries, Inc., Kan., 5, 10, 15, 25, 30

Radio Mfg. Engineers, Inc., Ill., 10, 25, 30

Radio Specialty Mfg. Co., Ore., 25, 30

Railway Communications, Inc., Mo., 25, 30, 35

Redifon, Ltd., England, 10, 15, 25, 30

Rich Electr., Inc., Fla., 25, 30

Rosen Eng. Prods., Inc., Raymond, Pa., 10, 15, 25, 30, 35

Schutter Mfg. Co., Carl W., N.Y., 5

Schuttig & Co., Inc., D.C., 25

Snyder Mfg. Co., Pa., 5

Societe Francaise Radio Electrique, France, 5, 10, 15, 25, 30, 35

Sonar Radio Corp., N.Y., 25, 30

Southern Indust. of Maryland, Inc., Md., 5

Standard Transformer Corp., Ill., 30

Stevens-Arnold, Inc., 22 Elkins St., South Boston, Mass., 35
For details see ad on page 304
Tel: SO 8-1170

Suburban Radio Co., N.J., 30

Superior Marine Radio Co., Fla., 25, 30

T. L. G. Electric Corp., N.Y., 10, 15, 20, 25, 30

Taffet Radio & TV Co., N.Y., 20, 25, 30

Tech Labs., Inc., N.J., 30

Technical Appliance Corp., N.Y., 5

Tele-Beam Industries, Calif., 5

Telephonics Corp., N.Y., 25, 30, 35

Telrex, Inc., 26 Neptune Hwy., Asbury Park, N.J., 5
For details see ad on page 489
Tel: PRospect 5-7252

Texas Instruments, Inc., 6000 Lemmon Ave., Texas, Transreceivers Comm. & Seismic
For details see ad on page 226
Tel: DI 1781

Transmitter Equip. Mfg. Co., Inc., N.Y., 10, 15, 25, 30, 35

Ward Prods. Corp., Ohio, 5

West Coast Electronic Co., Calif., 5, 10, 15, 25, 30

Westinghouse Electric Corp., Pa., 25, 30

White & Son, James L., N.J., 5

Wind Turbine Co., 238 E. Market St., West Chester, Pa., 5
For details see ad on page 256
Tel: West Chester 3110

Wunderlich Radio Co., N.Y., 5, 10, 15, 20, 25, 30, 35

25. Point-to-Point Equipment.

5. Antennas & towers — 10. Receivers — 15. Transmitters

Aeronautical Communications Equip., Fla., 15

Air Associates, Inc., N.J., 10, 15

Andrew Corp., 363 E. 75th St., Chicago 19, Ill., 5
For details see ad on page 420
Tel: TR4-4400

Automatic Electric Co., Ill., 10, 15

Barber Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing 58, N.Y., Frequency Shift, Single Side Band
For details see ad on page 522
Tel: IN3-3306

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 10, 15
For details see ad on pages 96-97
Tel: FI 2-1821

Bassett, Inc., Rex, Fla., 5, 10, 15

Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 10, 15
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411

Blaw-Knox Equipment Div., Pa., 5

Bludworth Marine Div., N.Y., 15

Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 5
For details see ad on page 145
Tel: HE 1-7166

Budelman Radio Corp., Conn., 10, 15, Microwave

Canadian General Electric Co., Electronic Equip. Div., Canada, 5, 10, 15

Canadian Marconi Co., Canada, 5, 10, 15

Canadian Radio Mfg. Corp., Ltd., Canada, 10, 15

Canadian Westinghouse Co., Ltd., Canada, 10, 15

Canoga Corp., Calif., 5, 10, 15

Cardwell Mfg., Corp., Allen D., Conn., 10, 15

Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 15
For details see ad on pages 86-87
Tel: Livingston 6-1100

Chisholm Industries, Ltd., Canada, 10, 15

Codetyper Labs, N.Y., 15

Communications Co., Inc., Fla., 5, 10, 15

Connecticut Electronic Alarm Systems, Conn., 10, 15

Connecticut Telephone & Electric Corp., Conn., 10, 15

Corbin Corp., Md., 5, 10, 15

Crosby Laboratories, Inc., Robbins Lane, Hicksville, N.Y., 10, 15, Frequency Shift and Single Side-band
For details see ad on page 523
Tel: Hicksville 3-3191

Du Mont Labs., Inc., A. B., Communications Products Div., 1500 Main Ave., Clifton, N.J., 5, 10, 15
For details see ad on page 161
Tel: Mulberry 4-7400

Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15
For details see ad on page 487
Tel: Pioneer 6-5212

Electro Craft Industries, Inc., Conn., 10, 15

Electronic Research Mfg. Corp., Ohio, 10, 15

Erco Radio Labs., Inc., N.Y., 10, 15

Federal Mfg. & Eng. Corp., N.Y., 10

Federal Telecommun. Labs, Div. I T & T, N.J., 5, 10, 15

Federal Telephone Radio Co., Div., of I T & T, 100 Kingsland Rd., Clifton, N.J., 10, 15
For details see ad on pages 32-37
Tel: Nutley 2-3600

Fisher Research Laboratory, Inc., Calif., 10, 15

Fretco, Inc., Pa., 5

Gabriel Electronic Div., The Gabriel Co., Endicott St., Norwood, Mass., 5
For details see ad on page 422
Tel: Norwood 7-3300

Gates Radio Co., Ill., 15

General Electric Co., N.Y.C., N.Y., 5, 10, 15

General Electric Co., N.Y.C., 5, 10, 15

Grady Instrument Co., Mass., 10, 15

Hamlyn Electronics Corp., N.Y., 10, 15

Kahn Research Labs., N.Y., 15

Kraus Fratelli, Italy, 15

Lehigh Valley Electronic Engr. & Mfg. Co., Pa., 10

Lehigh Structural Steel Co., 17 Battery Pl., New York 4, N.Y., 5
For details see ad on page 268
Tel: WHitehall 4-1424

Lenkurt Electric Co., Inc., Calif., 10, 15

Lettine Radio Mfg. Co., N.Y., 15

Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15

Mark Prods. Co., Ill., 5

McCarter Radio & Television, Ltd., Canada, 5

Measurement Eng., Ltd., Canada, 10, 15

Melstrom Mfg. Corp., N.J., 10, 15

Motorola Communic. & Electric, Inc., Ill., 5, 10, 15

Munston Mfg. & Service, Inc., N.Y., 10, 15

Northern Electric Co., Ltd., Canada, 10, 15

Northern Radio Co., Inc., Dept. PD 54, 147 W. 22nd St., New York 11, N.Y., 10, Multi-Plex Frequency Shift
For details see ad on pages 6-8
Tel: Watkins 9-9117

Otis Elevator Co., Electronic Div., N.Y., 15

Parisier & Co., Maurice I., N.Y., 15

Plastics & Electronic Corp., N.Y., 10

Premax Prods. Div., Chisholm-Ryder, N.Y., 5

Press Wireless Labs., Inc., Mass., 10, 15

(Continued on page 270)

New Towers in the Sky!

Research information readily exchanged between engineers and scientists has been the forerunner of every radio-electronic advance. This is the priceless service to all of "Proceedings of the I.R.E."

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

35,000

Radio-Electronic Engineers will receive and use the 1954 IRE DIRECTORY

Better and Better and Better!

Up-to-dateness is almost a mania with IRE DIRECTORY compilers! Membership lists are corrected up to May 30th. Industry lists, compiled and classified by high speed IBM sorting methods are accurate to June 15th. No firm's report is older than 18 months.

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfuly eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information —fast.

Machol Edge Index is just one more modern service to help the user find information fast.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

THE INSTITUTE OF RADIO ENGINEERS

BRyant 9-7550 • ADVERTISING DEPT., 1475 BROADWAY, NEW YORK 36, N.Y.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

3. Communications Equipment

25. Point-to-Point Equipment.

(Continued from page 269)

Prodelin, Inc., 307 Bergen Ave., Kearney, N.J., 5
For details see ad on page 424
Tel: KEarny 2-8600
Q-Line Mfg. Corp., N.Y., 5
RCA Victor Co., Ltd., Canada, 5, 10, 15
Radiaphone Co., Calif., 10, 15
Radio Apparatus Corp., Ind., 10
Radio Corp. of America, Communications Marketing Dept., Camden, N.J., 10, 15
For details see ad on page 210
Tel: WOodlawn 3-8000
Radio Eng. Labs., Inc., N.Y., 5, 10, 15
Radio Eng. Products, Ltd., Canada, 5, 10, 15
Radio Mfg. Engineers, Inc., Ill., 10
Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 10, 15
For details see ad on pages 30-31
Tel: Watkins 4-3633
Redifon, Ltd., England, 5, 10, 15
Rohn Mfg. Co., Ill., 5
Rosen Eng. Prods., Inc., Raymond, Pa., 5, 10, 15
Scala Radio Co., Calif., 5
Schutter Mfg. Co., Carl W., N.Y., 5
Schuttig & Co., Inc., D.C., 15
Servo Corp. of America, Dept. 1Y, 20-20 Jericho Tnpke., New Hyde Park, N.Y., 10, 15
For details see ad on page 236
Tel: FI 7-2810
Societe Francaise Radio Electrique, France, 5, 10, 15
Southern Indust. of Maryland, Inc., Md., 5
Specific Prods. Co., Calif., 10
Stelma, Inc., 389 Ludlow St., Stamford, Conn., 10, 15
For details see ad on page 439
Tel: 48-2579
Superior Marine Radio Co., Fla., 10, 15
T. L. G. Electric Corp., N.Y., 10, 15
Taffet Radio & TV Co., N.Y., 10, 15
Tech Labs., Inc., N.J., 15
Technical Appliance Corp., N.Y., 5
Technical Material Corp., N.Y., 5, 10, 15
Tele-Beam Industries, Calif., 5
Telescreen Corp., Conn., 10, 15
Telex, Inc., Minn., 10
Telrex, Inc., Neptune Hwy., Asbury Park, N.J., 5
For details see ad on page 489
Tel: Prospect 5-7252
Transmitter Equip. Mfg. Co., Inc., N.Y., 10, 15
Truscon Steel Div., Republic Steel Corp., Ohio, 5
Westinghouse Electric Corp., Pa., 10, 15
Westinghouse Electric Corp., Electronic Div., Md., 15
Wilcox Elec. Co., Inc., Mo., 10, 15
Wincharger Corp., Iowa, 5
Wind Turbine Co., 238 E. Market St., West Chester, Pa., 5
For details see ad on page 256
Tel: West Chester 3110
Wunderlich Radio Co., N.Y., 5, 10, 15

Part IV COMPONENTS

4. Component Parts

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 or letter that you seek.

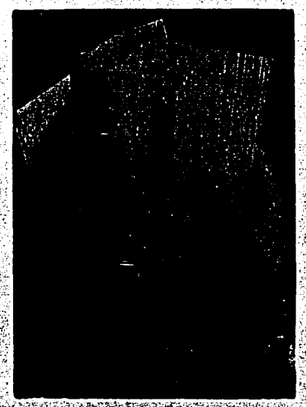
HOW TO USE

1. **With the directory open on the desk, bend the book almost double in your left hand, with your thumb just below this line.**

2. **From one-line or two-line symbol adjacent to the letter or subject you seek, run your eye across horizontally to a corresponding page-edge symbol.**

3. **Open there with your right hand.**

IT IS EASIER IF YOU "FAN" OR "RIFFLE" THE LAST FEW PAGES WITH YOUR RIGHT THUMB. THE EDGE INDEX COVERING THE OTHER 7 DIRECTORIES WILL BE FOUND OPPOSITE PAGES 240, 400 and 476.



For complete list of products and services, arranged alphabetically for fast reference, see the eight-page pink section preceding page 1.

2	PART I COMPLETE DATA SPREADS
131	PART II ALPHABETICAL COMPANY LIST
241	PART III APPARATUS
271	PART IV COMPONENTS
401	PART V INSTRUMENTS & CONTROLS
477	PART VI SERVICES & MATERIALS

Product	Page
26 Amplifiers	271
27 Antennas & Access.	274
28 Batteries	276
29 Blowers & Fans	277
30 Cabinets and Consoles	277
31 Capacitors: Fixed	281
32 Capacitors: Variable	286
33 Chassis & Racks	287
34 Coils	289
35 Connectors	295
36 Converters	303
37 Cores	307
38 Crystals	311
39 Delay Lines	317
40 Filters	319
41 Fuses & Fuse Holders	323
42 Magnets	325
43 Meters (Indicating Instruments)	327
44 Motors & Motor Generators	335
45 Pilot Lights & Assemblies	339
46 Power Supplies	339
47 Printed Circuits	347
48 Rectifiers, Metallic	351
49 Rectifiers, Vacuum Tube	353
50 Relays	354
51 Resistors	359
52 Semi-Conductors	369
53 Sockets	370
54 Switches	371
55 Telegraph Keys	378
56 Thermostats	378
57 Transformers	379
58 Tuners	382
59 Vacuum Tubes, Receiving	393
60 Vacuum Tubes, Special Purpose	394
61 Vacuum Tubes, Transmitting	395
62 Voltage Regulators	399

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. **Audio Frequency Equipment** (Products 1 to 11)
2. **Broadcasting Equipment** (Products 12 to 17)
3. **Communications Equipment** (Products 18 to 25)
4. **Component Parts** (Products 26 to 62)
5. **Applications of Electronics** (Products 63 to 70)
6. **Radar, Microwave, UHF** (Products 71 to 74)
7. **Test & Measuring Equipment** (Products 92 to 101)
8. **Services and Materials** (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.
9. **Education & Publishing** (Groups 102 & 103)
10. **Distribution Functions** (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

1954 I.R.E. DIRECTORY READER SERVICE REPLY CARD

Place a 2¢ stamp on one or more of the perforated cards below, and they will be promptly forwarded to the manufacturers listed on the back. If you prefer to send your specific requirements, a letter would be more advantageous, however be sure to enclose the reply card.

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Below, for your convenience, are six perforated reply cards. Each one has enough space to list three advertisers' names and their page numbers. Forward as many cards as you have questions, and I.R.E. will promptly notify the manufacturer in question to send literature, specifications, and prices to you.

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Address .....
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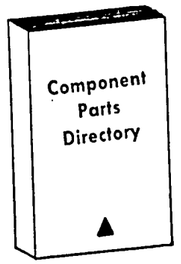
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1954 IRE DIRECTORY

A Directory of

4. Component Parts



36 Major Groups

228 Products in these groups

Organized by function for Engineers

26 Amplifiers.
27 Antennas & Accessories.
28 Batteries.
29 Blowers & Cooling Fans.
30 Cabinets, Consoles, & Enclosures.
31 Capacitors, Fixed.
32 Capacitors, Variable.
33 Chassis & Racks.
34 Coils.
35 Connectors.
36 Converters.
37 Cores.
38 Crystals & Accessories.
39 Delay Lines.
40 Filters.
41 Fuses & Fuse Holders.
42 Magnets.
43 Meters (Indicating Instruments)
44 Motors & Motor Generators.
45 Pilot Lights & Assemblies.
46 Power Supplies.
47 Printed Circuits.
48 Rectifiers, Metallic.
49 Rectifiers, Vacuum Tube.
50 Relays.
51 Resistors.
52 Semi-Conductors (Diodes & Transistors)
53 Sockets.
54 Switches.
55 Telegraph Keys.
56 Thermostats.
57 Transformers.
58 Tuners.
59 Vacuum Tubes, Receiving.
60 Vacuum Tubes, Special Purpose.
61 Vacuum Tubes, Transmitting.
62 Voltage Regulators

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

26. Amplifiers.

5. DC amplifiers
10. IF amplifiers
15. Magnetic amplifiers
20. Microwave amplifiers
25. RF amplifiers
30. Servo-types
35. TV amplifiers
40. TV boosters
45. Wideband amplifiers

Acme Teletronix Div., NEA Service, Ohio, 5

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 45
For details see ad on page 401
Tel: PRescott 8-3687

Aero Electronics Co., Ill., 5, 30
Aeronautical Radio Mfg. Co., N.Y., 5
Aerovox Corp., Mass., 15
Ahrendt Instrument Co., M.D., 5, 15, 30
Air Associates, Inc., N.J., 5, 10, 25, 30

Aircraft Transformer Corp., West & Willow Aves., Long Branch, N.J., 15
For details see ad on page 379
Tel: Long Branch 6-6250

Airmec, Ltd., England, 45
Airtronix Development Corp., N.Y., 40
Alcor Electronics Corp., N.Y., 5

Alden Electronic & Impulse Recording Equip. Co., Washington St., Westboro, Mass., 5
For details see ad on page 296
Tel: Westboro 467

Allard Instrument Corp., N.Y., 15
Allegany Instrument Co., Inc., M.D., 5
Alliance Mfg. Co., Ohio, 40
American Electronic Labs., Inc., Pa., 5, 30, 45
American Television Mfg. Corp., Ill., 35, 45
Amy, Aceves, & King, Inc., N.Y., 35, 40, 45
Applegate & Co., C. J., Colo., 45
Astatic Corp., Ohio, 40

Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 15
For details see ad on pages 203, 293
Tel: POrt Washington 7-3703

Atlas Coil, Inc., Conn., 5, 10
Atlas Eng. Co., Inc., Mass., 15

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 45
For details see ad on page 402
Tel: Eliot 4-4321

Audio Corp. of America, N.J., 5, 10, 25, 30
Automatic Mfg. Corp., N.J., 10, 20, 25, 35
Avion Instrument Corp., N.J., 5, 30

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 5, 15
For details see ad on pages 96-97
Tel: FI 2-1821

Beam Instruments Corp., N.Y., 5

Bendix Aviation Corp., Bendix Computer Div., 5630 Arbor Vitae St., Los Angeles 45, Calif., 5, 30
For details see ad on pages 51-54, 302
Tel: Oregon 8-2128

Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 30
For details see ad on pages 51-54
Tel: Hasbrouck Heights 8-3698

Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 25
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651

Berkshire Labs., Mass., 5
Beva Lab., N.J., Linear Pulse

Blonder-Tongue Labs., Inc., N.J., 25, 35, 40, 45

Boeing Airplane Co., Wash., 5, 30
Bogen Co., Inc., David, N.Y., 40

Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 15
For details see ad on page 128
Tel: LAmbert 5-2200

Bone Eng. Corp., Calif., 15, 30
Brach Mfg. Corp., N.J., 30, 40
Bright Radio Labs., Inc., N.Y., 10, 25
Bristol Eng. Corp., Pa., 15, 25

Bruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 5, 10, 25, 40
For details see ad on page 444
Tel: LOngacre 4-5930

Brush Electronics Co., Ohio, 5
Bunnell & Co., J. H., N.Y., 5, 10, 25
CGS Labs., Inc., Conn., 10, 15, 20, 25, 45
Calbest Eng. & Electr. Co., Calif., 40
Campbell Co., Inc., Conn., Conn., 15

(Continued on page 272)

4. Component Parts

26. Amplifiers.

(Continued from page 271)

Canadian General Electric Co., Electronic Equip., Canada, 10
Canadian Research Institute, Canada, 5
Canadian Westinghouse Co., Ltd., Canada, 15
Canoga Corp., Calif., 5, 10, 15, 20, 25, 30, 45
Cardwell Mfg. Corp., Allen D., Conn., 5, 10, 15, 20, 25, 30, 35, 40, 45
Central Sales & Mfg. Corp., N.J., 5
Central Transformer Co., Ill., 15
Centralab Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 10, 45
For details see ads on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5
For details see ad on pages 86-87
Tel: Livingston 6-1100
Clifford Mfg. Co., Mass., 5, 30
Cole Instrument Co., Calif., 5, 26
Communication Accessories Co., 110th St. & Hillcrest Rd., Hickman Mills, Mo., 15, 30
For details see ad on pages 80-81
Tel: South 5528
Computer Co. of America, 460 W. 34 St., New York 1, N.Y., 5
For details see ad on page 444
Tel: LOngacre 4-5930
Computing Devices of Canada, Ltd., Canada, 30
Constantine Eng. Labs. Co., P.O. Box 471B, Mahwah, N.J., 15
For details see ad on pages 288, 380
Tel: Ramsey 9-1123
Continental Radio & Electrical Eng., South Africa, 5, 15, 30
Control Components Co., Mass., 15, 30
Control Devices, Inc., Mich., 5
Control Electronics Co., Inc., 1927 New York Ave., Huntington L.I., N.Y., 30, 35, 45
For details see ad on page 317
Tel: Huntington 4-7961
Control Eng. Corp., Mass., 15, 30
Crown Eng., N.M., 10, 25
DX Radio Prods. Co., Ill., 15
Danby Radio Corp., Pa., 45
Daystrom Instrument Div., Daystrom, Inc., Pa., 5, 10, 15, 30, 45
De Coursey Eng. Labs., P.O. Box 235, Los Angeles 25, Calif., 15, 30
For details see ad on page 291
Tel: ARizona 4-2530
Deltron, Inc., Pa., 45
De Mornay-Bonardi, Calif., 10
Doelcam Corp., Mass., 5, 15, 30
Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 20
For details see ad on page 430
Tel: NE 6-6900
Dressen-Barnes Corp., Calif., 5, 15, 30
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 45
For details see ad on page 445
Tel: Burlington 3-0446
Duncan & Bayley Div., N.Y., 30
Dynamic Analysis, Inc., Calif., 5
Eastern Precision Resistor, N.Y., 5, 35
Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 5
For details see ad on page 163
Tel: WOrcester 7-8394
El Mec Labs., Inc., N.J., 5, 15
El-Tronics, Inc., Pa., 5, 30
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 25
For details see ad on page 487
Tel: Pioneer 6-5212
Electrical & Physical Instr. Corp., 42-19 27th St., Long Island City, N.Y., 45
For details see ad on page 412
Tel: Stilwell 4-6389
Electro-Mechanical Research, Inc., Conn., 5, 25, 45
Electro-Voice, Inc., Mich., 40
Electronic Associates, Inc., N.J., 5
Electronic Designs, Inc., N.Y., 40
Electronic Measurement Co., Maple Ave. & Lewis St., Eatontown, N.J., 5, 15
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Eng. Co. of Calif., Calif., 5
Electronic Research Associates, Inc., P.O. Box 29, Caldwell, N.J., 45
For details, see ad on page 369
Tel: CO 6-6729
Electronic Specialty Co., Calif., 25
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 5, 45
For details see ad on page 467
Tel: Chestnut Hill 7-6800
Electronics for Medicine, Inc., N.Y., 5
Empire State Labs., N.Y., 10, 30, 45
Engineering Research Associates, Inc., Div. Remington Rand, Inc., Minn., 10, 30, 45
Engineering & Research Corp., Md., 30
Engineering Research Dev. Co., Ill., 5
Erdco Eng. Corp., Ill., 5, 25, 45
Federal Telecommun. Labs., Div. I. T. & T., N.J., 20, 45
Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 15, 30
For details see ad on pages 32-37
Tel: Nutley 2-3600
Fidelity Instrument Corp., Pa., 15, 30
Fisher Enginering, Inc., P.O. Box 327, Huntington, Ind., 15
For details see ad on page 385
Fog-O-Scope, Inc., Ill., 5, 20
Ford Instrument Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 15, 30
For details see ad on page 415
Tel: ST 4-9000
Franklin Electronics, Pa., 5, 10, 25, 45
Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 15
For details see ad on page 180
Tel: Evergreen 6-1300
Furst Electronics, Ill., 5, 45
Furzehill Labs., Ltd., England, 5
Galbraith & Son Electric Corp., C. C., N.Y., Power Amplifiers, 50W-5KW
Gates Radio Co., Ill., 5, 10, 20, 25, 35, 40
General Communications, Wis., 35, Video Amplifiers
General Electric Co., N.Y., 20, 25, 35, 45
Gen. Electric Co., Specialty, Transformer, & Ballast, Ind., 15
General Magnetics, Inc., N.J., 15, 30
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 15, 30, 35, 45
For details see ad on page 188
Tel: Pleasantville 2-2000
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 25, 45
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Geotechnical Corp., Texas, 5
Gibbs Mfg. & Research Corp., Wis., 30
Glens Falls Lab., Inc., N.Y., 5
Gonset Co., Calif., 10, 25
Green Electronics, N.Y., 10
Gyromechanisms, Inc., N.Y., 15
Hamlyn Electronics, N.Y., 10, 25, 45
Hanson-Gorrill-Brian, Inc., N.Y., 15, 30
Harmon Electronics Co., Mo., 5
Hathaway Instrument Co., Colo., 5
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 20, 45
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hufford Machine Works, Inc., Elec. Div., Calif., 15, 30
Hycon Mfg. Co., Calif., 5, 10, 20, 25, 30, 45
I. D. E. A., Inc., Ind., 40
Industrial Control Co., N.Y., 5, 15, 30
Industrial Research Labs., Md., 15, 30

• 0.1% MAGNETIC VOLTAGE REFERENCES
60 and 400 cycles
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• MAGNETIC AMPLIFIERS
Designed to Specifications



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142 KING ST., CHAPPAQUA, N.Y.

4. Component Parts

26. Amplifiers.

Industrial Television, Inc., N.J., 35, 40, 45
Insuline Corp. of America, N.H., 5, 10, 15, 20, 25, 35, 45
Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 45
For details see ad on page 277
Tel: LUdlow 4-6200
James Vibrapowr Co., Ill., 5
Jerrold Electronics Corp., Pa., 35
Kaiser Metal Prods. Co., Inc., Pa., 5, 30
Kalbfell Labs., Inc., Calif., 5, 30, 35, 45
Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 30
For details see ad on page 414
Tel: Little Falls 4-1600
Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio, 5
For details see ad on page 446
Tel: HEnderson 1-9809
Ketay Mfg. Corp., N.Y., 15, 30
Keystone Products Co., 904 23rd St., Union City, N.J., 15
For details see ad on page 38
Tel: Union 6-5400
Kilpatrick Electr. Lab., Pa., 30
Kings Electr. Co., N.Y., 20, 25
Kollmorgen Optical Corp., Mass., 30
Kollsman Instrument Corp., Div. Standard Coil Products Co., 80-08 45th Ave., Elmhurst 73, L.I., N.Y., 10, 25, 45
For details see ad on page 216
Tel: NEwtown 9-2900
Kraus, Fratelli, Italy, 25
Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 45
For details see ad on pages 243
Tel: UNiversity 4-4272
Kuss Mach. Tool & Die Co., Inc., Pa., 5, 10, 30
Lambda-Pacific Eng., Inc., Calif., 20, 40
Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 30
For details see ad on pages 116-117
Tel: ENdicott 2-7200
Lapointe Electronics, Inc., Conn., 40
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 20, 25
For details see ad on page 312
Tel: MAtawan 1-2600
Leach Corp., Inet Div., Calif., 15
Lee Electric & Mfg. Co., Calif., 15
Lee Labs., Inc., P.O. Box 200, Genessee, Pa., 5, 10, 25, 30, 45
For details see ad on pages 349, 431
Tel: Genessee 2567
Leonard Elec. Prods. Co., Inc., N.Y., 10, 25, 45
Librascope, Inc., Calif., 15, 30
Liston-Becker Instr. Co., Inc., Conn., 5
Loral Electronics Corp., Dept. ID 54, 794 E. 140th St., New York 54, N.Y., 10, 15, 20, 25, 30, 45
For details see ad on page 198
Tel: CY 2-1800
Lynmar Engineers, Inc., Pa., 10, 25, 35, 40, 45
Mackenzie Prods. Co., The, Conn., 35
Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 10, 25
For details see ad on page 248
Tel: E 5471
Magnetic Amplifiers, Inc., N.Y., 5, 15, 30
Magnetic Research Corp., Calif., 5, 15, 30
Magnetics, Inc., Dept. I-11, Box 230, Butler, Pa., 15, 30
For details see ad on page 306
Tel: Butler 71745
Magnetics Research Co., 142 King St., Chappaqua, L.I., N.Y., 15
For details see ad on pages 272, 387
Tel: CH 1-0052
Magnex Corp., N.Y., 5
Marconi Instruments, Ltd., N.Y., 45
Marshall Eng., Electr. Div., Calif., 30
Measurement Eng., Ltd., Canada, 5
Metal Prods. Co., Tenn., 35, 45
Metrotype Corp., Ill., 5, 30
Midwestern Geophysical Lab., Okla., 30
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 25
For details see ad on page 548
Tel: Ma 4-4108
Miller Instr., Inc., William, Calif., 5, 15, 45
Millivac Instr. Corp., N.Y., 5
Minneapolis-Honeywell Regulator Co., Minn., 30
Muirhead & Co., Ltd., England, 30
Networks Electr. Corp., Calif., 15
New London Instrument Co., P.O. Box 189P, New ondon, Conn., 45
For details see ad on page 438
Tel: Gibson 3-8451
Newton Co., The, Conn., 15, 30
Norden Labs., Corp., Conn., 30
Offner Electr., Inc., Ill., 5, 30
Ohmart Corp., The, Ohio, 5
Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 15, 30
For details see ad on page 321
Tel: MUlberry 4-5858
Orthon Corp., 196 Albion Ave., Paterson 2, N.J., 45
For details see ad on page 273
Tel: MUlberry 4-5858
Parsons Co., Ralph M., Calif., 5, 30
Partridge Transformers, Ltd., England, 15
Penn East Eng. Corp., Box 240, Kutztown, Pa., 15, 30
For details see ad on pages 203, 293
Perkin Eng. Corp., Calif., 15
Phebco, Inc., Md., 5, 10, 15, 25, 45
Philbrick Researches, Inc., G. A., Mass., 5
Plastics & Electr. Corp., 5, 10, 30, 45
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 15, 30
For details see ad on page 166
Tel: ULster 2-6800
Power Transformer Co., Inc., N.J., 15
Precise Dev. Corp., N.Y., 45
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 15
For details see ad on page 345
Tel: ES 5-9435
Precision Associates, Inc., N.Y., 5, 10, 25
Press Wireless Labs., Inc., Mass., 5, 25
Process & Instruments, N.Y., 5
Qutronic Transformer Corp., N.Y., 15
R. M. S. Assoc., Inc., N.Y., 5
Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 20
For details see ad on page 525
Tel: MElbourne 800
Radiation Counter Labs., Inc., Ill., 5, 30, 45
Radio City Products Co., Inc., Pa., 45
Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., 5, 30
For details see ad on page 406
Tel: TRafalgar 6-6000
Reflectone Corp., The, Conn., 15, 30
Regulator Equip. Corp., N.J., 15
Rek-O-Kut Co., N.Y., 45
Rese Eng., Inc., Pa., 45
Research Electronics, Pa., 5
Ripley Co., Inc., Factory St., Middletown, Conn., 5
For details see ad on page 277
Tel: Middletown 6-6679
Rockwell Eng. Co., Ind., 30

(Continued on page 274)

•MIL-SPEC
•SUB-CONTRACT
•COMMERCIAL

Amplifiers
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SPECIALISTS IN ELECTRO-MECHANICAL ASSEMBLIES
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196 ALBION AVENUE PATERSON, N. J.
MUlberry 4-5858

4. Component Parts

26. Amplifiers.

(Continued from page 273)

Rollins Corp., Del., 15, 30
Rutishauser Corp., Calif., 5
Sanborn Co., 39 Osborn St., Cambridge 39, Mass., 5
For details see ad on page 228
Tel: KI 7-8460
Sangamo Weston, Ltd., England, 5, 30
Schutter Mfg. Co., Carl W., N.Y., 20
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 30
For details see ad on page 236
Tel: FI 7-2810
Servomechanisms, Inc., Post and Stewart Aves., Westbury, L.I., N.Y., 15, 30
For details see ad on page 417
Tel: Pioneer 6-0481
Servo-Tek Prods. Co., N.J., 5, 30
Sheldon Elec. Co., Div. Allied Elec., N.J., 40
Sierra Electr. Corp., Calif., 20
Simpson Mfg. Co., Mark, N.Y., 40
Societe Francaise Radio Electrique, France, 20, 25, 45
Southwestern Indust. Electr. Co., Texas, 5, 45
Specialties, Inc., N.Y., 5, 15, 30
Spencer-Kennedy Labs., Inc., Mass., 25, 35, 40, 45
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 20
For details see ad on pages 23-24
Tel: FIeldstone 7-3600
Square Root Mfg. Corp., N.Y., 10, 15
Standard Coil Prods. Co., Inc., Calif., 10, 15, 25, 35, 40
Standard Electrical Prods. Co., Ohio, 15
Standard Electr. Corp., N.J., 35
Standard Electr. Res. Corp., N.Y., 5, 15
Sterling Transformer Corp., N.Y., 15
Stromberg-Carlson Co., N.Y., 30, 45
Summit Electronics, Inc., N.J., 5, 10
Superex Electronics Corp., N.Y., 5, 15, 40
Szekely & Assoc., Inc., O. E., Pa., 30
T. L. G. Electric Corp., N.Y., 5, 10, 30, 45
Taffet Radio & TV Co., N.Y., 5, 10, 25
Tech-Master Corp., N.Y., 10, 40
Technical Appliance Corp., N.Y., 35, 40, 45
Technical Material Corp., N.Y., 45
Technology Instrument Corp., 535A Main St., Acton, Mass., 45
For details see ad on pages 75-79
Tel: COlonial 3-7711
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 35, 45
For details see ad on page 474
Tel: WEbster 9-9520
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 35, 45
For details see ad on page 224
Tel: AMityville 4-4446
Telephonics Corp., N.Y., 5, 25
Television Utilities Corp., N.Y., 35, 45
Torwico Electronics Inc., 965 Frelinghuysen Ave., Newark 5, N.J., 15
For details see ad on page 295
Tel: BIgelow 8-0426
Transformer Engineers, Calif., 15
Transformer Technicians, Inc., Ill., 5, 15
Transformers, Inc., N.Y., 15
Transicoil Corp., 107 Grand St., New York 13, N.Y., 30
For details see ad on page 416
Tel: WOrth 2-2347
Transvision, Inc., N.Y., 40
Triumph Mfg. Co., Ill., 5, 10, 20, 25, 35, 40, 45
Ultrasonic Corp., Mass., 5
Union Elec. & Mfg. Co., N.J., 5, 10, 25
U.S. Electronics Corp., N.J., 10, 25, 45
United Transformer Co., 150 Varick St., New York 16, N.Y., 15
For details see ad on page 582
Tel: ALGonquin 5-3500
Vari-L Co., Inc., 434 Fairfield Ave., Stamford, Conn., 15
For details see ad on page 392
Tel: 48-0091
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 30
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vickers Elec. Div., Vickers, Inc., Mo., 5, 15, 30
Vocaline Co. of America, Inc., Conn., 25, 45
Walker Consulting Eng., J. R., Mich., 15, 30
Walkirt Co., Calif., 5
Wallind-Pierce Corp., Calif., 15
Waveforms, Inc., N.Y., 45
Westinghouse Electric Corp., Pa., 15
Westlabs, Inc., Calif., 20, 45
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 5
For details see ad on pages 98-99
Tel: BIgelow 3-4700
White Industries, Inc., N.Y., 10, 25, 45
Wickes Eng. & Const. Co., N.J., 35
Yonkers, Industries, Inc., N.Y., 40

See also listings for Audio Amplifiers page 241

27. Antennas & Accessories.

5. All-wave receiving
10. Dummy
15. Feeder line
20. Indoor types
25. Insulators
30. Lightning arresters
35. Mounting hardware
40. Small towers
45. TV multiple systems

All Channel Antenna Corp., N.Y., 5
Alliance Mfg. Co., Ohio, 37
Allied Research & Eng., Inc., Calif., 5
American Electric Cable Co., Mass., 15
American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 20, 25, 30, 35
For details see ad on page 130
Tel: Bishop 2-1000
American Screen Prods. Co., Fla., 5, 20, 37
Amy, Aceves, & King, Inc., N.Y., 5, 45
Arro Expansion Bolt Co., Ohio, 35
Bassett, Inc., Rex, Fla., 40
Bird Electronic Corp., 1797 E. 38th St., Cleveland 14, Ohio, 10
For details see ad on page 328
Tel: EX 1-3535
Birnbach Radio Co., Inc., N.Y., 25, 30, 35
Blonder-Tongue Labs., Inc., N.J., 45
Bogart Mfg. Corp., N.Y., 10
Bogen Co., Inc., David, N.Y., 15
Brach Mfg. Corp., N.J., 5, 20, 30, 45
Bright Radio Labs., Inc., N.Y., 20
Brilhart Plastics Corp., Old Country Rd. (P.O. Box 31), Mineola, N.Y., 25
For details see ad on page 539
Tel: Pioneer 6-0425
Bud Radio, Inc., Dept. RE, 2118 East 55th St., Ceveland 3, Ohio, 35, 40
For details see ad on page 145
Tel: HE 1-7166
Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 10
For details see ad on page 428
Tel: STillwell 6-1706
Burke Electric & X-Ray Co., Ltd., Canada, 25, 35, Marine
C & M Mfg. Co., Mass., 5, 20, 35
Canoga Corp., Calif., 10
Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 25
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Channel Master Corp., N.Y., 5, 35, 40
Citation Products Co., 233 E. 146th St., New York 51, N.Y., 25
For details see ad on page 504
Tel: MO 5-0740
Cleveland Electronics, Inc., Ohio, 20, 30
Columbia Wire & Supply Co., Ill., 30
Communication Equip. & Eng. Co., Ill., Aircraft
Communication Products Co., Inc., State Hwy. 79, Marlboro, N.J., 5
For details see ad on pages 104-105
Tel: Freehold 8-1880
Consolidated Wire & Associated Cos., Ill., 5, 25, 30
Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 10, 20
For details see ad on page 317
Tel: Huntington 4-7961
Copperweld Steel Co., Pa., 15, Solid Antenna Wire
Cornell-Dubilier Electric Co., Dept. MB4, 333 Hamilton Blvd., S. Plainfield, N.J., 5, 20, 30, 35
For details see ad on page 154
Tel: Plainfield 6-9000

27. Antennas & Accessories.

Crowley & Co., Inc., Henry L., N.J., 5
Crown Eng., N.M., 10
Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 10
For details see ad on page 430
Tel: NE 6-6900
Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 35
For details see ad on page 370
Tel: Davenport 4-7000
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 10
For details see ad on page 487
Tel: Pioneer 6-5212
Electro Impulse Lab., Inc., 62 White St., Red Bank, N.J., 10
For details see ad on page 330
Tel: Red Bank 6-0404
Electronic Labs. of Canada, Ltd., Canada, 20
Electron-Radar Products, Ill., 10
Espey Mfg. Co., Inc., N.Y., 10
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 10
For details see ad on pages 47-50
Tel: Astoria 8-2800
Federal Telecommun. Labs., Div. I. T. & T., N.J., 10
Fluorocarbon Prods., Div., U.S. Gasket, N.J., 10, 15, 25
Fretco, Inc., Pa., 5, 15, 25
Gabriel Electronic Div., The Gabriel Co., Endicott St., Norwood, Mass., 30
For details see ad on page 422
Tel: Norwood 7-3300
Gadgets, Inc., Ohio, 5, 10
Garde Mfg. Co., R.I., 25
Gates Radio Co., Ill., 10
Gavitt Mfg. Co., Inc., Mass., 20
Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 20, 25, 30, 35, 40, 45
For details see ad on page 539
Tel: Rockford 5-9248
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 20, 25, 30, 35
For details se ad on page 507
Tel: Rockford 2-6695
General Communications, Wis., Clamp Amplifiers, Video Mixing Amp.
General Electric Co., N.Y., 10, 15
General Electric Co., Apparatus Sales Div., N.Y., 30
General Laminated Prods. Co., Inc., Ill., 25, 35
Gonset Co., Calif., 15
Gorham Mfg. Co., R.I., 10
Gries Reproducer Corp., N.Y., 35
Hansen Co., W., Mich., 40
Hi-Lo TV Antenna Corp., Ill., 5, 20
Hycon Mfg. Co., Calif., 10
Hy-Lite Antennae, Inc., N.Y., 5, 30
Industrial Television, Inc., N.J., 45
Insuline Corp. of America, N.H., 5, 20, 25, 30, 35
Isolantite Mfg. Corp., N.J., 25, Ceramic
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 5, 20, 30, 35
For details see ad on page 286
Tel: BE 6-9200
Jacobs, Charles F., N.Y., 15
Jerrold Electronics Corp., Pa., 45
Johnson Co., E. F. Minn., 25, Amateur Transmitting
Jones Electr. Co., Inc., M. C., Conn., 10
K-G Electr. Corp., Ill., 20
Kay Townes Antenna Co., Ga., 5
Kings Electr. Co., N.Y., 10
Lapointe Electronics, Inc., Conn., 30
Lapp Insolator Co., Inc., N.Y., 10, 25
Lehigh Structural Steel Co., 17 Battery Place, New York 4, N.Y., 40
For details se ad on page 268
Tel: Whitehall 4-1424
Lerner Instr. & Electr. Mfg. Corp., N.Y., 10
Lettine Radio Mfg. Co., N.Y., 37
Lund-Hansen Co., Ill., 15
Lynmar Engineers, Inc., Pa., 45
Marconi's Wireless Telegraph Co., Ltd., England, 5, 40, 45
Mark Prods. Co., Ill., 10, 15
McMillan Lab., Inc., Mass., 25
Metalace Corp., Electr. Div., N.Y., 25, 35, 40
Michel Mfg. Co., Wis., 5
Microlab, 71 Okner Pkwy., Livingston, N.J., 10
For details use ad on page 319
Tel: Livingston 6-0692
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 25
For details see ad on page 548
Tel: MAlden 4-4108
National Ceramic Co., 500 Southard St., Trenton 2, N.J., 25
For details see ad on page 486
Tel: EXport 4-5373
National Co., Inc., Mass., 25
National Elec. Prods. Corps., Pa., 5, 35, 40
Neo-Sil Corp., N.J., 25
Newton Co., The, Conn., 35
Nibur Sales Corp., N.J., 10
Ohmite Mfg. Co., Ill., 10
Peerless Prods. Industries, Ill., 20
Pfaff & Kendall, N.J., 40
Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 15
For details see ad on page 484
Tel: WHitehall 4-3570
Phoenix Electr., Inc., Mass., 5, 30, 35
Polydoroff & Assoc., W. J., D.C., 5, Ferromagnetic
Polymer Corp. of Pennsylvania, 126 N. 5th St., Reading, Pa., 25
For details see ad on page 540
Tel: REading 6-7241
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 10
For details see ad on page 166
Tel: ULster 2-6800

See also listings for:
Broadcasting Antennas, page 255
Mobile Equipment Antennas, page 267
Point-to-Point Equipment Antennas, page 269
Radar & Microwave Antennas, page 421

Polytron Corp., N.Y., 20, Loop Antenna, Ferrite Core Ant.
Premax Prods. Div., Chisholm-Ryder, N.Y., 25
Press Wireless Labs., Inc., Mass., 10
Prodelin, Inc., 307 Bergen Ave., Kearny, N.J., 40
For details see ad on page 424
Tel: KEarny 2-8600
Q-Line Mfg. Corp., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45
RCA Victor Co., Ltd., Canada, 45
Radelco Mfg. Co., Ohio, 30
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 30, 35
For details see ad on page 210
Tel: HUmboldt 5-3900
Rohn Mfg. Co., Ill., 40
Rostan Corp., N.Y., 40
Saxton Products, Inc., N.Y., 20, 25, 30, 35
Scala Radio Co., Calif., 45
Schott Co., Walter, Calif., 35
Schutter Mfg. Co., Carl W., N.Y., 10, 15
Sheldon Elec. Co., Div. Allied Elec., N.J., 30
Sierra Electr. Corp., Calif., 10
Smith & Stone, Ltd., Canada, 25, 30
Snyder Mfg. Co., Pa., 5, 20
Societe Francaise Radio Electrique, France, 10, 15, 40, 45
South River Metal Prods. Co., Inc., N.J., 25, 35
Southern Industries of Maryland, Inc., Md., 40
Spencer-Kennedy Labs., Inc., Mass., 45
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 10
For details see ad on pages 23-24
Tel: FIeldstone 7-3600
Square Root Mfg. Corp., N.Y., 10
Stainless, Inc., Pa., 30, 40
Standard Electr. Corp., N.J., 10
States Co., Conn., 10
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 25
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Summit Electr., Inc., N.J., 10
Superior Porcelain Co., W.Va., 25, 30
Swan Television Co., Ltd., Ernie, Canada, Community Types
Syncor Products Co., 26 Irving Court, P.O. Box 51, Malden 48, Mass., 25
For details see ad on page 499
Tel: Malden 2-1364
Taffet Radio & TV Co., N.Y., 10
Taylor Fibre Co., Pa., 25
Technical Appliance Corp., N.Y., 5, 25, 30, 35, 45
Tele-Beam Industries, Calif., 45
Telephonics Corp., N.Y., 30
Telrex, Inc., Neptune Hwy., Asbury Park, N.J., 5, 20
For details see ad on page 489
Tel: Prospect 5-7252
Television Labs., Inc., Ill., 20

(Continued on page 276)

27. Antennas & Accessories.

(Continued from page 275)

Thompson Prods., Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 10
For details see ad on page 235
Tel: HE 1-6765

Thor Ceramics Inc., 225 Bellville Ave., Bloomfield, N.J., 25
For details see ad on page 487
Tel: Bloomfield 2-4711

Transvision, Inc., N.Y., Master TV Systems

Tricraft Prods. Co., Ill., 5, 20, 25, 30, 35

Triumph Mfg. Co., Ill., 10

U. S. Electronics Corp., N.J., 10

United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 10, 15, 25
For details see ad on pages 126-127
Tel: WOodlawn 4-0370

Vesto Co., Inc., Mo., 40

Video Industries Co., N.Y., 5, 10, 35

Ward Prods. Corp., Ohio, 5, 20, 30, 35, 40

Waveguide, Inc., Calif., 10, 15

Weckesser Co., Ill., 35

Wincharger Corp., Iowa, 40

Wind Turbine Co., 238 E. Market St., West Chester, Pa., 5, 25, 35, 40
For details see ad on page 256
Tel: West Chester 3110

Wisconsin Porcelain Co., 25

28. Batteries.

5. Dry batteries
10. Mercury batteries
15. Storage batteries—lead-acid
20. Storage batteries—nickel-alkali
25. Storage batteries—silver-zinc

American Machine & Foundry Co., N.Y., 25

American Machine & Foundry, Raleigh Eng. Div., N.C., 25

Bright Star Battery Co., N.J., 5

Burgess Battery Co., Foot of Exchange St., Freeport, Ill., 5
For details see ad on page 276
Tel: Main 3300

Burke Electric & X-Ray Co., Ltd., Canada, 20

Canadian Aviation Electronics, Ltd., Canada, 20

Electronic Batteries, Inc., N.Y., 15

General Dry Batteries, Inc., Ohio, 5, 10

General Lead Batteries Co., N.J., 15

Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y., 5, 25, Miniature Batteries
For details see ad on page 277
Tel: LUdlow 4-6200

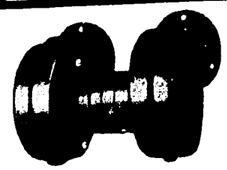
Koehler Mfg. Co., Mass., 15

Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 10
For details see ad on page 248
Tel: E 5471

Mallory & Co., Inc., P. R., Ind., 10

Marathon Battery Co., Wis., 5

HEINZE BLOWERS

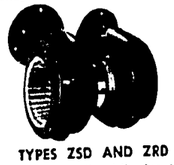


TYPE DD

Double blowers for applications requiring 100 CFM of air. Powered by Type D shaded pole induction motor. Requires infrequent oiling. Non-radio interfering. For 115 volts, AC, 60 cycles, 35 watts, 3150 RPM (free air). Other voltages and frequencies on request.

TYPE DS

Single blower, with all the advantages of Type DD, but approximately half the air delivery. 115 volts, AC, 60 cycles. For CW and CCW operation. 35 watts. 3100 RPM (free air). Other voltages and frequencies on request.



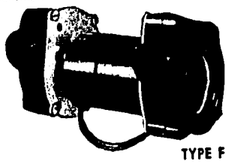
TYPES ZSD AND ZRD

Quiet, dependable units, delivering 100 CFM. 4 pole motor and large balanced air rotor. ZRD has absolute minimum of vibration. 115 volts, AC, 60 cycles, 1650 RPM (free air), 45 watts. Available for 230 volts or 50 cycle operation.



TYPES ZSS and ZRS

Most compact 50 CFM blowers available. Sturdy low speed 2 shaped pole induction motor. 3⅝" balanced air rotor. 115 volts, AC, 60 cycles, 1650 RPM (free air) 40 watts. Can be supplied for 230 volt operation. Various mountings.



TYPE F

For cooling electronic tubes in transmitters, induction heaters and diathermy equipment. 115 volts, AC, 60 cycles, 3000 RPM (free air). F2B, single blower, 10 CFM. F2D, double blower, 20 CFM.

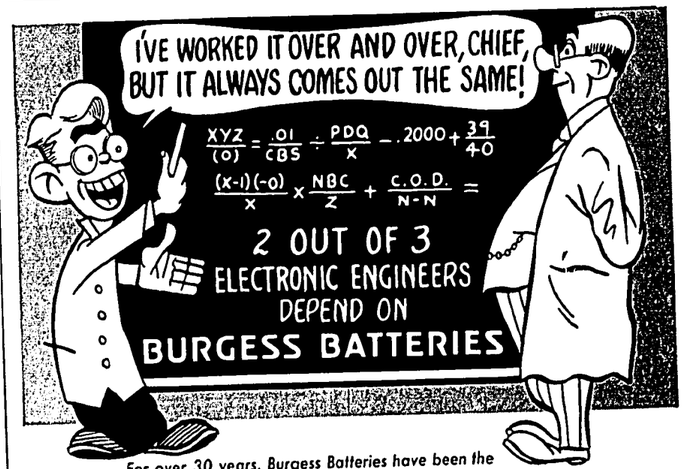
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AR AM

Low-voltage AC reversible capacitor-type motors. 24v, 60 cycle AC operation, reversible with a switch. Free load, 3300 rpm, using a 100 mf condenser. For television antenna rotator service.

Heinze Electric Co
685 Lawrence Street
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For over 30 years, Burgess Batteries have been the popular favorite of electronic engineers, due to their uniform operation and consistently high quality. You'll find a Burgess Battery to fit every need... including the all-new transistor types.



No. 4FH

No. Z30NX



Write for FREE engineering manual listing the complete line of BURGESS BATTERIES and specifications, the FREE check sheet to enter new battery specifications, and the new transistor battery sheet.

BURGESS BATTERIES
BURGESS BATTERY COMPANY
FREEPORT, ILLINOIS

4. Component Parts

28. Batteries.

National Carbon Co., Div. Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y., 5
For details see ad on page 208
Tel: Murray Hill 7-8000

National Carbon Co., Div. Union Carbide, Ltd., Canada, 5

Northern Elec. Co., Ltd., Canada, 5, 15, 20

Olin Industries, Inc., Elec. Div., Conn., 5

Radiation Research Corp., Fla., Radioactive

Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 5
For details see ad on page 210
Tel: HUmboldt 5-3900

Ray-O-Vac Co., Special Prods. Div., Wis., 5

Reading Batteries, Inc., Pa., 15

Sonar Radio Corp., N.Y., 5

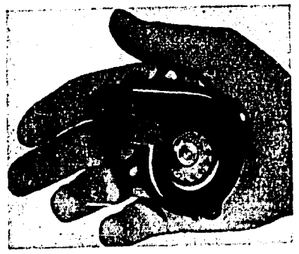
Sonotone Corp., N.Y., 20

Stromberg-Carlson Co., N.Y., 5, 15

United States Rubber Co., N.Y., Plastic & Rubber Separators

Willard Storage Battery Co., Ohio, 5, 15

Yardney Elec. Corp., N.Y., 25



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L-R BLOWER .... moves AIR
5 to 170 cubic feet a minute

There is a light, compact highly efficient L-R Blower to give you maximum heat dispersion under all climatic or temperature conditions. Each of these blowers requires minimum space and produces maximum C.F.M. Specifications are listed below so that you may choose the size best suited to your needs.

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MODEL 1½, Wgt. (less motor) .....2½ oz.
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MODEL 2, Wgt. (less motor) .....5 oz.
Output: 10 to 30 C.F.M. Hgt. 3¾"
MODEL 2½, Wgt. (less motor) .....5½ oz.
Output: 20 to 65 C.F.M. Hgt. 4⅞"
MODEL 3, Wgt. (less motor) .....12½ oz.
Output: 40 to 170 C.F.M. Hgt. 6½"

All models have light-wight, high-impact plastic housings, turbo-type wheels and are made for either clockwise or counter-clockwise rotation. Available with or without motor.

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Factory & Engineering Office: Middletown, Conn.

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5. Air wheels & housings
10. Complete blower assemblies
15. Fan blades

Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, L.I., N.Y., 5, 10, 15
For details see ad on page 336
Tel: AMityville, 4-6122

Alliance Motors, Canada, 5, 10, 15

American Electric Motors, Inc., Calif., 5, 10

Barber-Colman Co., Ill., 15

C and H Sales Co., Calif., 10

Cole Instrument Co., Calif., 10

Craig Corp., Mass., 10

Dominion Electrohome Industries, Ltd., Canada, 5, 10, 15

Eastern Air Devices, Inc., N.H., 10

Eicor, Inc., Ill., 10

Electro-Engineering Products Co., Inc., 609 W. Lake St., Chicago 10, Ill., 10
For details see ad on page 337
Tel: Central 6-2670

Fairchild Industries Div., Vt., 10

General Electric Co., Apparatus Sales Div., N.Y., 10

Heinze Electric Co., 685 Lawrence St., Lowell, Mass., 5, 10
For details see ad on page 276
Tel: LOwell 7557

Hertner Electric Co., Ohio, 10

Howard Industries, Inc., Wis., 10

Induction Motors Corp., N.Y., 5, 10, 15

Mission-Western Engineers, Inc., Calif., 5, 10, 15

Oster Mfg. Co., John, 1 Main St., Racine, Wis., 10
For details see ad on page 337
Tel: RAcine 3-6331

Pioneer Elec. & Res. Corp., Ill., 10, 15

Radex Corp., Ill., 10

Ripley Co., Inc., Factory St., Middletown, Conn., 5, 10
For details see ad on page 277
Tel: Middletown 6-6679

Rotron Mfg. Co., Inc., N.Y., 10

Sanders Assoc., Inc., N.H., 10

Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y., 10
For details see ad on page 417
Tel: Pioneer 6-0481

Servo-Tek Prods. Co., N.J., 10

Small Motors, Inc., Ill., 10

Suckle Electr. Co., N.J., 5

See also
listings for
Blower & Fan Motors
Product 44
Subclassification 05
page 335

30. Cabinets, Consoles, & Enclosures.

5. Metal cabinets
10. Metal relay rack panels
15. Moulded plastic cabinets
20. Wood cabinets

Abalon Precision Mfg. Corp., N.Y., 5, 10

Acme Telectronix Div., NEA Service, Ohio, 5

Alcor Electronics Corp., N.Y., 10

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 10
For details see ad on page 296
Tel: Brockton 160

Altec Lansing Corp., Calif., 10, 20

Altec Lansing Corp., N.Y., 20

American Insulator Corp., Pa., 15

American Radio & Television, Inc., Ark., 20

Anchor Specialty Mfg. Co., N.J., 5, 10, 20

Anetsberger Brothers, Inc., Ill., 5, 10

Artisan Metal Works Co., Ohio, 5, 10

Baltic Metal Prods. Co., N.Y., 5, 10

Beam Instruments Corp., N.Y., 20

(Continued on page 278)

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2432 Grand Concourse
New York 58, New York

4. Component Parts

30. Cabinets, Consoles & Enclosures.

(Continued from page 277)

Beckman Instruments, Inc., Shasta Div., P.O. Box 296, Station A, Richmond, Calif., 5
For details see ad on page 138
Tel: Beacon 5-7196

Bennett Mfg. Co., 38 Railroad St., Alden, N.Y., 5, 10
For details see ad on page 278
Tel: ALden 3711

Berkeley Div. Beckman Instr., Inc., 2200 Wright Ave., Richmond 3, Calif., 5
For details see ad on page 138
Tel: Landscape 6-7730

Blonder-Tongue Labs., Inc., N.J., 5

Bogen Co., Inc., David, N.Y., 20

Boyle Metalcraft Corp., 150 Sullivan St., Brooklyn 31, N.Y., 5, 10
For details see ad on page 278
Tel: TR 5-3603

Brilhart Plastics Corp., Old Country Rd. (P.O. Box 31), Mineola, L.I., N.Y., 15
For details see ad on page 539
Tel: PIoneer 6-0425

British Industries Corp., N.Y., 5

Brooks & Perkins, Inc., Mich., 5, 10

Brooks Radio & Television Corp., N.Y., 20

Browning Labs., Inc., Mass., 20

Buck Eng. Co., Inc., N.J., 5, 10

Bud Radio, Inc., Dept. RE, 2118 E. 55th St., Cleveland 3, Ohio, 5, 10
For details see ad on page 145
Tel: HE 1-7166

Canadian Aviation Electronics, Ltd., Canada, 5, 10, 20

Chisholm Industries, Ltd., Canada, 5, 10, 20

Churchill Cabinet Co., Ill., 20

Churchill Lighting Corp., Mass., 5, 10

Cole Instrument Co., Calif., 10

Coles Electronic Corp., Pa., 5

Communication Equip. & Eng. Co., Ill., 5, 10

Conrad & Moser, N.Y., 5, 10

Consolidated Molded Prods. Corp., Pa., 15

Cortland Industries, Inc., Ill., 15

Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 10, 20
For details see ad on page 157
Tel: HAlifax 4-6487

Craig Machine, Inc., Mass., 5, Carrying Types

Crescent Industries, Inc., Ill., 5

Dahlstrom Metallic Door Co., N.Y., 5, 10

Daystrom Instrument Div., Daystrom, Inc., Pa., 5

De Wald Radio & TV Corp., N.Y., 5, 10

Dolin Metal Prods., Inc., N.Y., 5

Dominion Electrohome Industries, Ltd., Canada, 20

Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 5, 10
For details see ad on page 161
Tel: Mulberry 4-7400

Edo Corp., N.Y., 5

Elgin Metalformers Corp., 902 N. Liberty St., Elgin, Ill., 5, 10
For details see ad on pages 122-123
Tel: ELgin 7225

Engineered Instruments, Calif., 5

Engineering & Research Corp., Md., 5

Erie Resistor Corp., 644 W. 12th St., Erie, Pa., 15
For details see ad on pages 82-83
Tel: Erie 2-1481

Falls Metal Works, Ltd., 414 Main St., Little Falls, N.J., 5, 10
For details see ad on page 279
Tel: Little Falls 4-1300

Falstrom Co., N.J., 5, 10

Federal Electric Products Co., N.J., 5

Feiner & Sons, Inc., P., N.Y., 5, 10

Ferro-Co., Corp., N.Y., 5, 10

Finn & Co., Inc., T. R., N.Y., 5, 10

Fisher Radio Corp., N.Y., Speaker Enclosures

Franklin Electronics, Inc., Pa., 5, 10

Gately Dev. Lab., N.J., 20

Gates Radio Co., Ill., 5, 10, 20

General Communications, Wis., 5, 10

General Electric Co., N.Y.C., N.Y., 20

General Electric Co., N.Y., 5, 10

General Electric Co., Chemical Div., Mass., 15

General Metal Prods. Co., Pa., 5, 10

Golden Corp., N.Y., 5, 10

Gonset Co., Calif., 5

Hammond Mfg. Co., Ltd., Canada, 5, 10

Heller Co., Gerald K., Md., 5

Heller & Co., W. C., Ohio, 5 Parts

Henry & Miller Industries, N.Y., 5

Insuline Corp. of America, N.H., 5, 10

Jacksonville Metal & Plastics Co., Fla., 5, 10

Karlson Assoc., Inc., N.Y., 20

Karp Metal Prods., Co., N.Y., 5, 10

Kirk & Blum Mfg. Co., Ohio, 5, 10

Kolton Elec. Mfg. Co., N.J., 5

Kuss Mach. Tool & Die Co., Inc., Pa., 5, 10

Lansing Sound, Inc., James B., Calif., 20

Larose & Associates, Inc., W. T., N.Y., 5

Lowell Mfg. Co., Mo., 5, 10

Manfredi Wood Prods. Corp., N.Y., 20

Marine Elec. Corp., N.Y., 5, 10

Measurement Eng., Ltd., Canada, 5, 10

Metalcraft, Inc., N.Y., 5, 10

Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 5, 10
For details see ad on page 287
Tel: WA LTAAM 5-6800

Metal Prods. Co., Tenn., 5, 10

Metallic Arts of New England, Inc., Mass., 5, 10

Mississippi Products, Inc., Miss., 20

Muckle Mfg. Co., Minn., 5

Multi-Metal Wire Cloth Co., Inc., N.Y., 5, 10

Newcomb Audio Prods. Co., Calif., 5, 10

Northern Elec. Co., Ltd., Canada, 5, 10

Otis Elevator Co., Electr. Div., N.Y., 5, 10

Par-Metal Products Corp., 32-62 49th St., Long Island City 3, N.Y., 5
For details see ad on page 289
Tel: AStoria 8-8905

Permoflux Corp., Ill., 20

Pioneer Elec. & Res. Corp., Ill., 5

Premier Metal Products Co., 3160 Webster Ave., New York 67, N.Y., 5, 10
For details see ad on page 279
Tel: OLinville 4-4841

Product Eng. Labs. Co., Inc., N.J., 15

Protectoseal Co., The, Ill., Tanks, cans

Q-Line Mfg. Corp., N.Y., 5, 10

RCA Victor Co., Ltd., Canada, 20

REF Mfg. Corp., N.Y., 5, 10

RJ Audio Prods., N.Y., 20, for Speakers

Radio City Products Co., Inc., Pa., 5, 20

Railway Communications, Inc., Mo., 5

Reflectone Corp., The, Conn., 5, 10

(Continued on page 281)

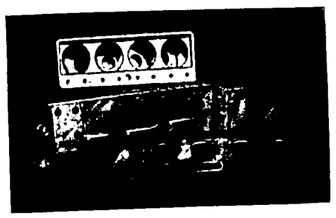
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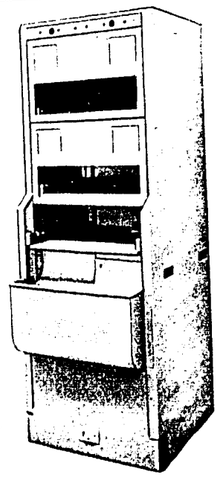


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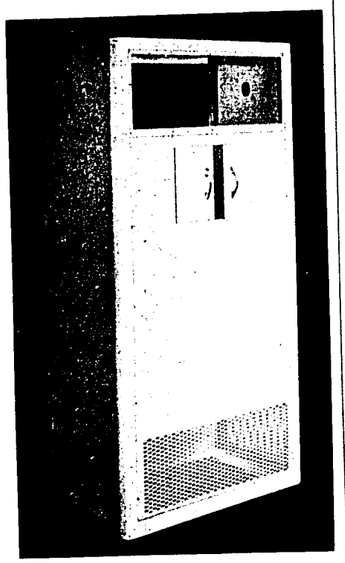
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Paul R. Sturgeon
25 Huntington Ave., Boston 16, Mass.

Samuel K. Macdonald, Inc.
1531 Spruce St., Philadelphia 2, Pa.

Kenneth E. Hughes Co.
4808 Bergenline Ave., Union City, N.J.

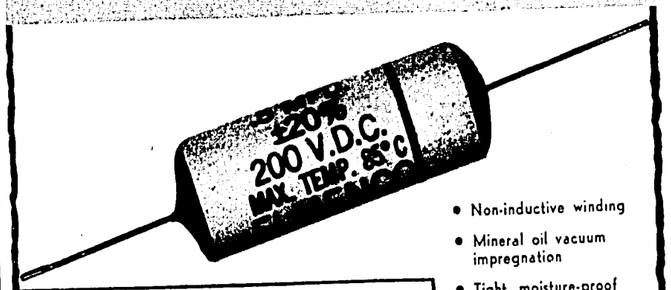
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4. Component Parts

30. Cabinets, Consoles & Enclosures.

(Continued from page 279)

Reiner Electr. Co., Inc., N.Y., 5
Rek-O-Kut Co., N.Y., 20
Research Instrument Co., Inc., N.Y., 5, 10, 15
Richardson Co., The, Ill., 15
Riester & Thesmacher Co., The, 1526 W. 25 St., Cleveland 13, Ohio, 5
For details see ad on page 280
Tel: Cherry 1-0154
River Edge Industries, N.J., 20
Rogan Bros., Ill., 15
Romar Plastics, Inc., 1313 E. Main St., St. Charles, Ill. 15
For details see ad on page 538
Tel: St. Charles 6571
Scheidl Mfg. Co., N.Y., 15
Scientific Wood Cabinet Co., N.J., 20
Setchell-Carlson, Inc., Minn., 20
Shaw Television Corp., N.Y., 20
Shura-Tone Prods., Inc., N.Y., 20, and Leatherette
Specific Prods. Co., Calif., 10
Spencer-Kennedy Labs., Inc., Mass., 5
Stephens Mfg. Corp., Calif., 20
Stokes Molded Prods., N.J., 15
Stromberg-Carlson Co., N.Y., 5, 10, 20
Suckle Electr. Co., N.J., 5, 10
Suffolk Prods. Corp., N.Y., 5, 10
Summit Electr., Inc., N.J., 5
Taffet Radio & TV Co., N.Y., 5, 10
Transformer Metal Prods. Corp., N.Y., 5, 10
Trav-Ler Radio Corp., Ill., 20
Triad Portable Case Corp., N.Y., 20
Triumph Mfg. Co., Ill., 15
United Wood Specialty Mfg. Co., Mass., 20
University Loudspeakers, Inc., N.Y., 20
Utah Radio Prods. Co., Inc., 1125 Roosevelt St., Huntington, Ind., 20
For details see ad on page 390
Tel: HUntington 3100
Utility Metal Prods. Co., Inc., Mass., 5, 10
Vector Electr. Co., Calif., 5
Walter Co., Inc., S., N.Y., 5, 10
Waterbury Companies, Inc., Conn., 15
Wells-Gardner & Co., Ill., 20
Weltronic Co., Mich., 5, 10
White Industries, Inc., N.Y., 5
Wickes Eng., & Const. Co., N.J., 5
Worcester Pressed Steel Co., Mass., 5, 10
Wright-Hepp Assoc., Inc., N.J., 5, 10
Wright, Inc., Minn., 5

See also listings for Chassis & Racks Product 33

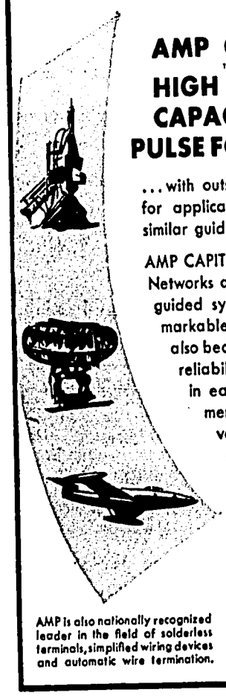
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70. Tantalum
75. Vacuum

Aerovox Corp., Mass., 5, 10, 15, 20, 25, 30, 35, 40, 45, 55, 60, 65
Aircraft-Marine Products, Inc., Chemical & Dielectric Div., 155 Park St., Elizabethtown, Pa., 15, 25, 60
For details see ad on page 281
Tel: Elizabethtown 420
Aircraft-Marine Prods., Inc., 2100 Paxton St., Harrisburg, Pa., 15, 60
For details see ad on page 281
Tel: Harrisburg 4-0101
Ajax Condenser Co., Inc., Ill., 10, 15, 30, 35
Alden Products Co., 113 No. Main St., Brockton 64, Mass., 55
For details see ad on page 296
Tel: Brockton 160
Allen-Bradley Co., Wis., 5
American Condenser Co., Ill., 10, 15, 30, 35, 45
American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 5, 15
For details see ad on page 136
Tel: Chattanooga 5-3411
American Machine & Foundry Co., N.Y., 40
American Mica Insulation Co., N.J., 25
American Radionic Co., Inc., N.Y., 30, 35
Amperex Electronic Corp., N.Y., 75
Arco Electronics, Inc., 103 Lafayette St., New York 13, N.Y., 5, 15, 25, 35, 65
For details see ad on page 280
Tel: WOrth 6-0530
Arnhold Ceramics, Inc., N.Y., 5, 15, 65
Arrow Radio Co., Canada, 30, 35, 40
Asheville-Schoonmaker Mica Co., Va., 5
Astron Corp., 255 Grant Ave., E. Newark, N.J., 10, 15, 20, 30, 35, 40, 45
For details see ad on page 282
Tel: HUmboldt 2-7800
Automatic Electric Co., Ill., 35
Automatic Mfg. Corp., N.J., 5, 25, 50, 55, 65
Balco Research Labs., N.J., 40
Barco, Inc., Wis., 10, 30, 70
Beam Instruments Corp., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 65
Bendix Aviation Corp., Cincinnati Div., 203 W. Third St., Cincinnati 2, Ohio, 40
For details see ad on pages 51-54, 302
Tel: Dunbar 5885
C & E Engineers, Calif., 5, 55
Canadian Gen. Elec. Co. Electr. Equip., Canada, 75
Cardwell Mfg. Corp., Allen D., Conn., 15, 50, 55

(Continued on page 283)

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Leading electronic equipment manufacturers favor Safety Margin Electrolytic capacitors for their reliability and quality.

Safety Margin types fill your requirements whether they are for metal cased, cardboard cased or twist prong capacitors.

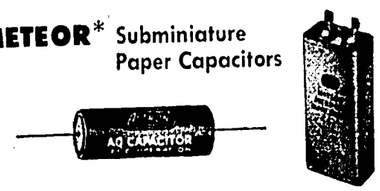
*Trademark

BLUE-POINT® Molded Plastic Tubulars



BLUE POINT'S tough new bonded plastic shell and unique bonded seal answer all heat and moisture problems. Exclusive new material treatments and design with solid thermosetting vacuum impregnant insure absolutely dependable operation at 85°C without derating. Extremely high heat resistant qualities of the shell and BLUE POINT seal prevent leads from pulling or melting out.

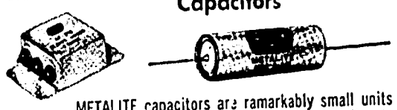
METEOR* Subminiature Paper Capacitors



Operate up to 125°C without derating,
METEORS* use ASTRON'S exclusive new high temperature impregnant X-250*. Over the entire operating range −65°C to +125°C, these miniaturized capacitors have high insulation resistance, low power factor plus a built-in voltage safety factor. METEORS* surpass the most exacting military specifications and are available in a variety of designs for all types of installation.

*Trademark

METALITE® Metallized Paper Capacitors



METALITE capacitors are ramarkably small units designed to meet current needs for subminiature capacitors to fit into ultra compact electronic equipment. Extremely small and lightweight METALITE'S self-healing characteristics prevent failures from momentary over-voltages and surges.

For operating temperatures up to +125°C HY-MET METALITE capacitors with solid thermosetting impregnant offer the desired operating qualities ... stability, vastly improved insulation resistance, low RF impedance and self-healing properties.

METALITE and HY-MET in a wide variety of case styles and operating characteristics meet the requirements for all types of equipment.

OIL FILLED Capacitors



ASTRON-developed, oil filled, hermetically sealed paper capacitors are designed to meet the severe operating requirements and test conditions of specification MIL-C-25A. Designed for military as well as commercial use, they are made to the most exacting quality standards for reliable performance and maximum dependability.

RF NOISE SUPPPRESSION FILTERS



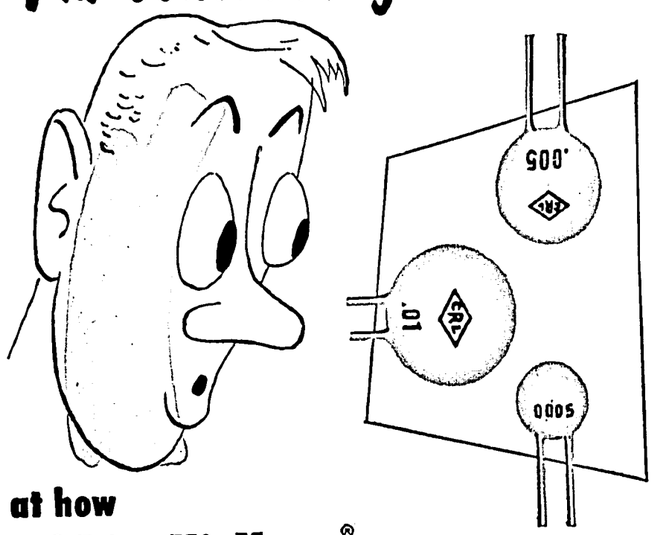
Pioneers in the development and mass production of high efficiency subminiaturized filters, ASTRON engineers have solved the most difficult and diversified noise suppression problems. Latest concepts of filter design plus the newest quality components and production techniques assure unequaled guaranteed performance plus reduced size and weight. Let ASTRON'S filter engineers solve your noise suppression problems.

ASTRON'S extensive experience and modern large scale production can solve all your capacitor and filter problems. ASTRON products are now in use in millions of leading TV sets and other electronic equipment. Start using ASTRON brand today to increase your brand acceptance. Write today outlining your requirements.

ASTRON CORPORATION
255 GRANT AVENUE
E. NEWARK, N. J.

Export Division: Rocke Internation Corp., 13 E. 40th St., N. Y. C.
In Canada: Charles W. Pointon, 6 Alcina Ave., Toronto 10.

I'm continually amazed



at how BC Disc Hi-Kaps® solve space and design problems

Centralab BC Disc Hi-Kaps can amaze you too — Here's why —

- BC Discs are small in size, cut the third dimension (thickness) to a minimum. (5/32" thin.)
- Stable power factor — Initial, 1.5% at 1 KC.
- High Insulation Resistance—10,000 Megohms.
- Safe Rated Voltages — Rated at 500 VDCW, but tested continuously at 1,250 VDCW. High voltage types to 6000 VDCW available.
- Wide range of capacities — 10mmf to 20,000-mmf.
- No "intermittents" — Positive high temperature bond between ceramic and silver guarantees no movements, plus sure electrical contact.



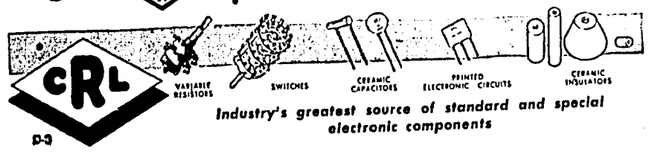
CENTRALAB BC Discs are so small that 25 of them occupy the space of one cigarette.

CENTRALAB knows the ceramic capacitor field better than any other supplier...

- CRL introduced ceramic capacitors in the U.S. many years before any other supplier entered the field.
- Centralab manufactures from basic powders to finished product right in its own plant ... complete laboratory control over every step in the process.
- CRL has the largest staff of development engineers of any comparable company ... over 150 men available for consultation on your capacitor problems.
- CRL's many plants are highly mechanized for efficient, quality manufacture, and located strategically for best delivery.

Write now for Bulletin 42-4.

Centralab
A Division of Globe-Union Inc.
9201 E. Keefe Avenue • Milwaukee 1, Wisconsin
In Canada: 804 Mt. Pleasant Road, Toronto, Ontario



Industry's greatest source of standard and special electronic components

D-9

4. Component Parts

31. Capacitors: Fixed.

(Continued from page 281)

Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 5, 15, 55
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Chicago Condenser Corp., Ill., 15, 30, 35

Church Co., George H., Minn., 5, 15, 20, 30, 35, 40, 45, 55, 60

Communication Accessories Co., 110th St. & Hillcrest Rd., Hickman Mills, Mo., 60
For details see ad on pages 80-81
Tel: South 5528

Condenser Products Co., Conn., 15, 30, 40, 60

Condenser Manufacturers, Inc., Tenn., 10, 20, 35, 40, 45, 55, 70

Condenser Prods. Co., Ill., 5, 30, 40

Control Electronics Co., Inc., 1927 New York Ave., Huntington L.I., N.Y., 60
For details see ad on page 317
Tel: Huntington 4-9961

Cornell-Dubilier Electric Co., Dept. MB 4, 333 Hamilton Blvd., S. Plainfield, N.J., 5, 10, 15, 20, 25, 30, 35, 40, 45, 55, 60, 65, 70
For details see ad on page 154
Tel: Plainfield 6-9000

Corning Glass Works, N.Y., Glass

Corson Elec. Mfg. Corp., N.J., 15, 30, 35, 40, 60 Styrene

Cosmic Condenser Co., 853 Whittier St., New York 59, N.Y., 10, 35
For details see ad on page 285
Tel: LU 9-3360

Craig Corp., Mass., 30, 35, 45

Deutschmann Corp., Tobe, Mass., 10, 15, 20, 30, 35, 40, 45, 60

Delinko & Wilkens, Inc., N.J., 75

Dumont Airplane & Marine Instruments, Inc., 10, 30 ,35, 40

Dwyer Engineering Co., Inc., P.O. Box 483, Nashua, N.H., 5, 55
For details see ad on page 347
Tel: Nashua 4057

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 60
For details see ad on page 316
Tel: Windsor 7-0400

Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 75
For details see ad on pages 90-91
Tel: JUno 8-1212

Electralab, Inc., 74 Atherton St., Boston 20, Mass., 55
For details see ad on page 348
Tel: JA 4-3230

Electro Motive Mfg. Co., Inc., South Park and John Sts., Willimantic, Conn., 5, 25, 35, 65
For details see ad on page 168
Tel: HA 3-4551

Electronic Fabricators, Inc., N.Y., 30, 65, Plastic Film Dielectric

Emerald Mfg. Co., Ill., 65

Erie Resistor Corp., 644 West 12th St., Erie, Pa., 5, 15, 25, Button Silver, 40, 55, 65
For details see ad on pages 82-83
Tel: Erie 2-1481

(Continued on page 284)

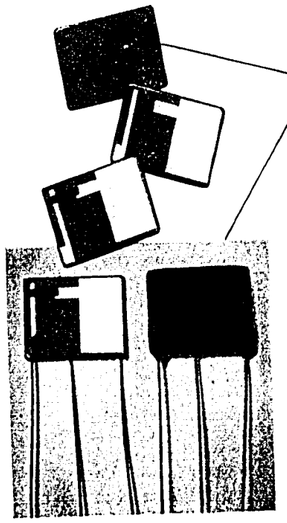
31. Capacitors: Fixed.

(Continued from page 283)

FSD Laboratories, Conn., 10
Fansteel Metallurgical Corp., Ill., 70
Fast & Co., John E., Ill., 15, 30, 35, 40, 45
Film Capacitors, Inc., N.Y., 40
Fisher Engineering, Inc., P.O. Box 327, Huntington. Ind., 60
For details see ad on page 385
General Electric Co., N.Y.C., 5, 55, 75
General Electric Co., N.Y., 5
General Electric Co., Apparatus Sales Div., N.Y., 10, 30, 35, 45, 60, 70
General Electric Co., Capacitor Dept., N.Y., 10, 15, 30, 35, 40, 45, 60, 70
General Electric Co., Tube Dept., N.Y., 75
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 25, 50
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Girard-Hopkins, Calif., 30, 35, 45
Glenco Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 284
Tel: Metuchen 6-2800
Good-All Elec. Mfg. Co., Neb., 30, 35, 40, 55

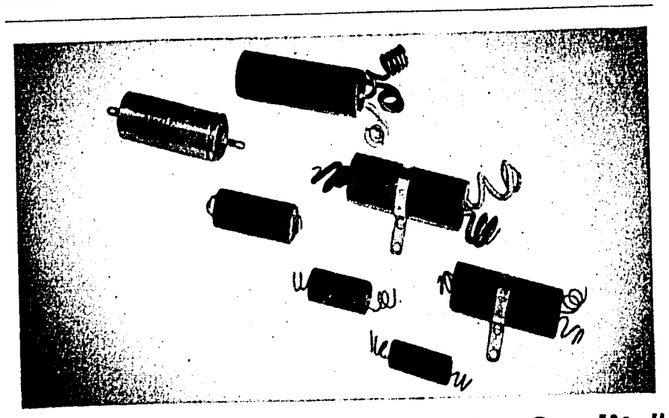
ONONDAGA POTTERY COMPANY

Electronics OPCO *Division*



From the basic raw material to the finished product — Onondaga Pottery Company controls every step in manufacturing to insure top quality and complete dependability. Our facilities are ample to fulfill any or all of your requirements for multiple capacitor and resistor-capacitor combinations. We solicit your inquiry.

ONONDAGA POTTERY COMPANY
Syracuse 1, New York



Planet Capacitors "*Engineered for Quality*"

1 year service guarantee

Custom engineered to your specifications or supplied from stock, Planet capacitors meet the highest standards of the industry. Every capacitor is tested mechanically and electrically throughout its manufacture.

This rigid system of quality control makes our unconditional one-year guarantee possible. But making Planet capacitors right from the start means reasonable prices too!

WRITE for Catalog I, listing specifications on stock items.

PLANET MANUFACTURING CORPORATION
225 BELLEVILLE AVENUE
BLOOMFIELD, N.J.

PLANET

GLENNITE® *High Reliability* **SUBMINIATURE COMPONENTS**

- Subminiature Capacitors
- TC Capacitors (temperature coefficients controlled to ±10 PPM/°C
- Subminiature Resistors
- Miniature RC Networks
- Non Linear Dielectrics
- Memory Cells
- Thermistors and Thermistor Networks
- Units Engineered to Your Specifications
- Small as well as Large Quantity Inquiries Invited
- Materials Research
- Circuit Development

GLENCO CORPORATION
METUCHEN, NEW JERSEY • MEtuchen 6-2800

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

4. Component Parts

31. Capacitors: Fixed.

Gudeman Co., 340 W. Huron St., Chicago 10, Ill., 10, 15, 20, 30, 35, 40, 45
For details see ad on page 29
Tel: Delaware 7-7400
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 55
For details see ad on page 177
Tel: Metuchen 6-2800
Hamlin, Inc., Ill., 75
Herlec Corp., Wis., 5, 55
Hopkins Engineering Co., Calif., 20, 30, 35
Illinois Condenser Co., 1616 N. Throop St., Chicago 20, Illinois, 10, 15, 35, 55
For details see ad on page 196
Tel: EV 4-1300
Industrial Assembly Corp., N.Y., 10, 15, 30, 35
Industrial Condenser Corp., Ill., 10, 15, 30, 35, 40, 45, 60
Insulated Circuits, Inc., N.J., 55
International Resistance Co., Pa., 5
Isolantite Mfg. Corp., N.J., Ceramic Cases
Jeffers Electr. Div., Pa., 5, Fixed Composition High Voltage
Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose 8, Calif., 15 Vacuum, 75
For details see ad on pages 25-28
Tel: CYpress 2-4025
Kellogg Switchboard & Supply Co., 79 West Monroe St., Chicago 3, Ill., 35
For details see ad on page 404
Tel: DEarborn 2-0750
Lapp Insulator Co., Inc., N.Y., 15
Larose, W. T. & Associates, Inc., N.Y., 15
Lurex Mfg. Co., N.J., 5, 25, 50, 55, 65, 75
Magnavox Co., Dept. 82, 2131 Bueter Ave., Fort Wayne 4, Ind., 10
For details see ad on page 248
Tel: E 5471
Maida Dev. Co., Va., 5, 15, 55
Mallory & Co., Inc., P. R., Ind., 5, 10, 15, 30, 35, 40, 45, 55, 70
Mica Fabricating Co., N.J., 25
Micamold Radio Corp., N.Y., 10, 25, 30, 35, 65
Mucon Corp., N.J., 5, 15, 55
Muirhead & Co., Ltd., England, 50
Muter Co., The, Ill., 5
National Capacitor Co., Mass., 15, 20, 30, 35, 40, 45, 60
Neptune Electr. Co., N.Y., 25, 30, 35, 65
Networks Electr. Corp., Calif., 60
Northern Elec. Co., Ltd., Canada, 5, 20, 25, 35
Onondaga Pottery Co., Electr. Div., 1858 W. Fayette St., Syracuse 1, N.Y., 5, 55
For details see ad on page 284
Tel: SYracuse 8-1681
Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 60
For details see ad on page 321
Tel: MUlberry 4-5858
Photo Chemical Prods., 479 Walton Ave., New York 51, N.Y., 55
For details see ad on page 498
Tel: LUdlow 5-0200
Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J., 10
For details see ad on page 284
Tel: BLoomfield 2-2874
Plastic Capacitors, Inc., Ill., 15, 30, 40, 45, 60
Potter Co., The, Ill., 30, 35, 40
Powell Co., Harold H., Pa., 25
Pyramid Elec. Co., 1445 Hudson Blvd., No. Bergen, N.J., 10, 15, 20, 30, 35, 40
For details see ad on page 212
Tel: UN 5-1776
Radio Industries, Inc., Ill., 5, 55, 65
Radio Materials Corp., 3325 N. California Ave., Chicago 18, Ill., 5
For details see ad on pages 69-72
Tel: IRving 8-3600
Research Instrument Co., Inc., N.Y., 30, 75
Rockbar Corp., N.Y., 5, 65
Sanders Assoc., Inc., N.H., 5, 55

(Continued on page 286)

HIGHEST STANDARDS TOP QUALITY!

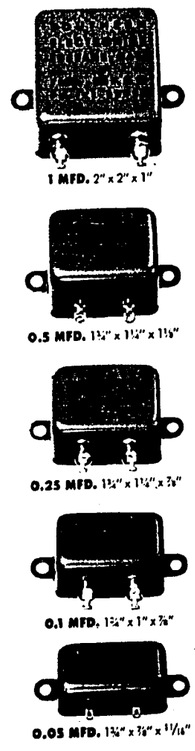
COSMIC

"CONDENSER SPECIALISTS SINCE 1923"

ELECTROLYTIC AND PAPER TUBULAR **CONDENSERS**

For A.C., D.C. Sets-Phonographs etc.

COSMIC CONDENSER CO. 853 Whittier St., Bronx, N. Y.-Phone LU 9-3360



ULTRA-HIGH PRECISION POLYSTYRENE CAPACITORS

as low as 0.1% tolerance in most values

CAPACITANCE AVAILABLE—0.05 to 10.0 MFD.
VOLTAGE AVAILABLE—100 to 400 VDC
INSULATION RESISTANCE—10^6 MEG./MFD.
TEMP. COEFF.—100 P.P.M. per °C (—20° to 140°F)
DIELECTRIC ABSORB.—.015%
DISSIPATION—.0002

Special Values to Close Tolerances—Our Specialty

WRITE FOR NEW, COMPLETE CATALOG TO DEPT. IC

SOUTHERN ELECTRONICS CORP.

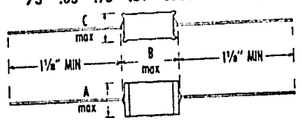
239 W. Orange Grove Avenue, Burbank, California

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Vitramon
CAPACITORS

The tiny, tough, porcelain Capacitors — with Low Loss and Long Life

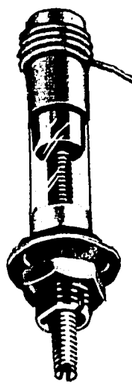
TYPE	Inches A	B	C	Capacities 500-vdcw Rating
70	.24	.40	.25	0.5 - 200 μμf
71	.30	.57	.25	220 - 470 μμf
29	.47	.93	.25	510 - 1000 μμf
73	.83	.93	.31	1100 - 3300 μμf
				250-vdcw Rating
70	.24	.30	.25	220 - 300 μμf
72	.30	.57	.30	430 - 1000 μμf
29	.47	.93	.25	1100 - 2000 μμf
73	.83	.93	.31	3300 - 5600 μμf



5% -tolerance series stocked in all sizes. Full Technical Details in Bulletin.

Vitramon
INCORPORATED

BOX 544 P • BRIDGEPORT 1 • CONN.



NEW DEVELOPMENTS
in JFD Piston type Variable Trimmer Capacitors

- Capacitance ranges in miniature size units from 1.0 to 200.0 mmf
- Dust-proof metal caps with extruded lead-in
- Baked-in Water repellant plating
- Silver plating available on every model for performance on UHF and microwave frequencies.



actual size (one inch).

STANDARD MODELS Available from stock

MODEL	CAP. RANGE MMF.	COEF. OF CAP.	DIELECTRIC	ROTOR
VC-1G	0.7 to 7.0	±50 PPM/°C. ±3.5 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Invar
VC-3G	0.7 to 8.0	±250 PPM/°C. ±2 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Brass
VC-4G	1.0 to 18.0	±250 PPM/°C. ±4.5 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Brass
VC-11G	0.7 to 12.0	±50 PPM/°C. ±6 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Invar
VC-11GRB	0.7 to 10.0	±250 PPM/°C. ±2.5 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Brass
VC-11GRC	0.7 to 10.0	±100 PPM/°C. ±1.0 x 10⁻⁴MMF./°C. At Max. Capacity	Glass	Brass Invar
VC-5	0.5 to 5.0	Approx. Zero/°C.	Fused Quartz	Invar
VC-5F	0.7 to 5.0	Approx. Zero/°C.	Fused Quartz	Invar
VC-11	1.0 to 10.0	Approx. Zero/°C.	Fused Quartz	Invar

Write for form 252 listing standard

JFD PISTON TYPE VARIABLE TRIMMER CAPACITORS

Call on JFD engineers for your Piston type Trimmer Capacitor requirements. Send blueprints, specifications or details of application to Piston Capacitor Department, JFD Electronics Division,

JFD MANUFACTURING COMPANY, INC., 1462 62ND STREET, BROOKLYN 19, N. Y.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

4. Component Parts

31. Capacitors: Fixed

(Continued from page 285)

San Fernando Elec. Mfg. Co., Calif., 20, 30, 35

Sangamo Elec. Co., Ill., 10, 15, 25, 30, 35, 40, 65, 70

Saxonburg Ceramics, Pa., 5

Skottie Electr., Inc., Pa., 5, 15, 55

Solar Mfg. Corp., Calif., 5, 15, 55

Southern Electronics Co., Dept. IC, 239 W. Orange Grove Ave., Burbank, Calif., 15, 30, 40, 50, Polystyrene
For details see ad on page 285
Tel: RO 9-3193

Speer Carbon Co., Pa., 5, 15

Sprague Elec. Co., Mass., 5, 10, 15, 20, 25, 30, 35, 40, 55, 60, 65, 70

Stackpole Carbon Co., Electr. Div., Tannery St., St. Marys, Pa., 55
For details see ad on pages 84-85
Tel: 41-521

Standard Condenser Co., Ill., 20, 25, 30, 35, 40, Plastic Film and Hi-Temp

Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 5, 55
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400

Telegraph Condenser Co., Ltd., England, 5, 10, 15, 25, 30, 35, 40, 45, 50, 60, 65, 70

Telex, Inc., Minn., 5

Texas Instruments, Inc., 6000 Lemmon Ave., Texas, 15, 60
For details see ad on page 226
Tel: DI 1781

Triumph Mfg. Co., Ill., 50

United Condenser Corp., N.Y., 30, 35, 40

United Electr. Co., N.J., 75

Vacuum Tube Products, Calif., 75

Vitramon, Inc., Box 544 P, Bridgeport 1, Conn., 25, Vitramon
For details see ad on page 286
Tel: Bridgeport 8-1683

Winters, Engineer, T. Starling, N.J., 15, 30, 45, 60

32. Capacitors: Variable.

5. Neutralizing
10. Precision variable
15. Temperature compensating
20. Trimmers, air
25. Trimmers, ceramic
30. Trimmers, glass
35. Trimmers, vacuum
40. Tuning

Aerolite Electronics, 507 26th St., Union City, N.J., 40
For details see ad on page 500
Tel: UNion 3-2955

Aerovox Corp., Mass., 25

All Star Products, Inc., Ohio, 20, 40

American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 15
For details see ad on page 136
Tel: Chattanooga 5-3411

Arco Electronics, Inc., 103 Lafayette St., New York 13, N|Y., 25, 40, Trimmers, Mica
For details see ad on page 280
Tel: WOrth 6-0530

Arnhold Ceramics, Inc., N.Y., 25

Automatic Mfg. Corp., N.J., 5, 20

Barker & Williamson, Inc., Pa., 237 Fairfield Ave., Upper Darby, Pa., 5, 40
For details see ad on pages 96-97
Tel: FI 2-1821

Beam Instruments Corp., N.Y., 5, 15, 25

Bright Radio Labs., Inc., N.Y., 10, 40

Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 5, 10, 40
For details see ad on page 145
Tel: HE 1-7166

Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 25
For details see ad on page 502
Tel: Trowbridge 6-2800

Canadian Radio Mfg. Corp., Ltd., Canada, 20

Cardwell Mfg. Corp., Allen D., Conn., 5, 10, 15, 20, 40

Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 15, 25
For details see ad on pages 283, 346, 358, 372, 518.
Tel: Woodruff 2-9200

Condenser Prods. Co., Ill., 15

Corning Glass Works, N.Y., 5, 10, 30

4. Component Parts

32. Capacitors: Variable.

De Wald Radio & TV Corp., N.Y., 20

Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 35
For details see ad on pages 90-91
Tel: JUno 8-1212

Electro Motive Mfg. Co., Inc., South Park & Joan Sts., Willimantic, Conn., 20
For details see ad on page 168
Tel: HA 3-4551

Emerald Mfg. Co., Ill., 20

Erie Resistor Corp., 644 West 12th St., Erie, Pa., 15, 25
For details see ad on pages 82-83
Tel: Erie 2-1481

Establissements Elveco, France, 10, 20

Fluorocarbon Prods., Div. U.S. Gasket, N.J., 20

General Instrument Corp., N.J., 10, 20, 40

General Instr. Corp., F. W. Sickles Div., Mass., 20

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10, 40
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 5, 10, 20, 40
For details see ad on page 176
Tel: LOngacre 5-1300

Herlec Corp., Wis., 25

Hermaseal Co., Inc., Ind., 30

JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 10, 30
For details see ad on page 286
Tel: BE 6-9200

Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose 8, Calif., 5, 35, 40, Vacuum
For details see ad on pages 25-28
Tel: CYpress 2-4025

Johanson Mfg. Corp., N.J., 5, 10, 20, 40

Johnson Co., E. F., Minn., 10, 20, 40

Lapp Insulator Co., Inc., N.Y., 40

Leonard Elec. Prods. Co., Inc., N.Y., 25, 40

Lurex Mfg. Co., N.J., 5, 10, 20, 25, 30, 35, 40

Maida Dev. Co., Va., 25

McCoy Electronics Co., Chestnut & Watt St., Mt. Holly Springs, Pa., 10, 40
For details see ad on page 315
Tel: 376

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 20, 40
For details see ad on page 548
Tel: MAlden 4-4108

Mucon Corp., N.J., 25

Muirhead & Co., Ltd., England, 10

Mullard, Ltd., England, 20

Muter Co., The, Ill., 20

National Co., Inc., Mass., 5, 10

Nilsen Mfg. Co., Ill., 10

Northern Elec. Co., Ltd., Canada, 10, 15, 40

Oxley Dev. Co., Ltd., England, 5, 10, 15, 20, 40

Parts Producing Corp., Mfg. Div., N.Y., 10, 40

Radio Condenser Co., N.J., 10, 40

Radio Industries, Inc., Ill., 25

Research Instrument Co., Inc., N.Y., 5, 10, 15, 35, 40

Ronar, Inc., Ill., 10

Skottie Electr., Inc., Pa., 15, 25

Société Francaise Radio Electrique, France, 40

Solar Mfg. Corp., Calif., 25

Southern Electronics Co., Dept. IC, 239 W. Orange Grove Ave., Burbank, Calif., 10
For details see ad on page 285
Tel: RO 9-3193

Sprague Elec. Co., Mass., 25

Standard Coil Prods. Co., Inc., Calif., 25

Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 15, 25
For details see ad on pages 4-5, 225, 351, 367, 486, 489, 517, 537, 541, 550
Tel: Latrobe 1400

Taffet Radio & TV Co., N.Y., 40

Tarzian, Inc., Airtrimmer Div., Ind., 20

Telegraph Condenser Co., Ltd., England, 25

Teleradio Eng. Corp., N.Y., 5, 10, 20

United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 20
For details see ad on pages 126-127
Tel: WOodlawn 4-0370

Wheaton Co., T. C., N.J., 20

White Industries, Inc., N.Y., 10

Wilmad Glass Co., Inc., N.J., 30, Glass Parts

33. Chassis & Racks.

5. Aluminum chassis
10. Chassis slides
15. Relays racks & cabinets
20. Steel chassis

Abalon Precision Mfg. Corp., N.Y., 5, 15, 20

Acme Telectronix, Div. NEA Service, Ohio, 5, 15, 20

Aerovox Corp., Mass., 10

Alcor Electronics Corp., N.Y., 5

Alden Products Co., 113 No. Main St., Brockton, Mass., 10, 15, 20
For details see ad on page 296
Tel: Brockton 160

Alloy Metal Smiths, Inc., N.J., 5, 15, 20

Altec Lansing Corp., Calif., 15

Artisan Metal Works Co., Ohio, 5, 10, 15, 20

Auto-Test, Inc., Ill., 20

Baltic Metal Prods. Co., N.Y., 5, 10, 15, 20

Beckman Instr., Inc., Shasta Div., P.O. Box 296, Station A, Richmond, Calif., 15
For details see ad on page 138
Tel: Beacon 5-7196

Bennett Mfg. Co., 38 Railroad St., Alden, N.Y., 5, 10, 15, 20
For details see ad on page 278
Tel: ALden 3711

Boyle Metacraft Corp., 150 Sullivan St., Brooklyn 31, N.Y., 5, 10, 20
For details see ad on page 278
Tel: TR 5-3603

Brooks & Perkins, Inc., Mich., Magnesium Chassis

Buck Engineering Co., Inc., N.J., 5, 15, 20

Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 5, 15, 20
For details see ad on page 145
Tel: HE 1-7166

Churchill Lighting Corp., Mass., 5, 15, 20

Cole Instrument Co., Calif., 15

Coles Electronic Corp., Pa., 5, 20

Communication Equip. & Engr. Co., Ill., 15

Conrad & Moser, N.Y., 5, 15, 20

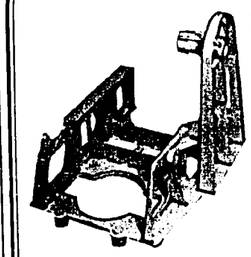
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 10, 15, 20
For details see ad on page 157
Tel: HAlifax 4-6487

Crescent Industries, Inc., Ill., 5, 20

Dahlstrom Metallic Door Co., N.Y., 5, 10, 15, 20

Daystrom Instrument, Pa., 5, 15, 20

(Continued on page 288)



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Consoles; Racks & Cabinets

Specialists in Aluminum, Stainless & Magnesium

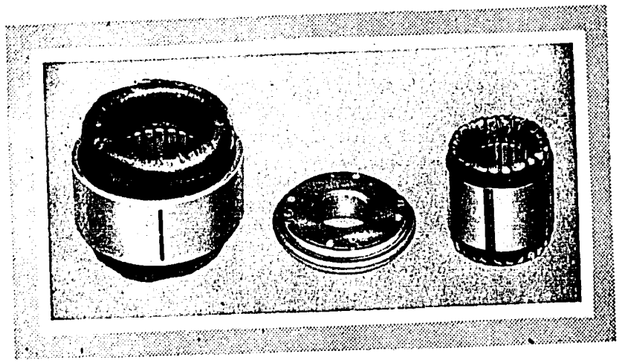


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Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

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Celco

Constantine Engineering Laboratories Co.

ISLAND AVENUE, MAHWAH, NEW JERSEY

33. Chassis & Racks.

(Continued from page 287)

De Wald Radio & TV Corp., N.Y., 5, 10, 15, 20
Dominion Electrohome Industries, Ltd., Canada, 15, 20
Engineered Instruments, Calif., 5, 20
Engineer & Research Corp., Md., 5, 10
Fall Metal Works, Ltd., 414 Main St., Little Falls, N.J., 5, 15, 20
For details see ad on page 279
Tel: Little Falls 4-1300
Falstrom Co., N.J., 5, 20
Feiner & Sons, Inc., P., N.Y., 5, 15, 20
Ferro Co., Corp., N.Y., 5, 15, 20
Finn & Co., Inc., T. R., N.Y., 5, 20
Franklin Electronics, Inc., Pa., 5, 15, 20
Gates Radio Co., Ill., 5, 10, 15, 20
General Communications, Wis., 15, 20
General Electric Co., N.Y., 5, 15
General Metal Prods. Co., Pa., 5, 15, 20
Golden Corp., I., N.Y., 5, 15, 20
Gonset Co., Calif., 5, 10, 20
Grant Pulley & Hardware Corp., N.Y., 10
Hammond Mfg. Co., Ltd., Canada, 5, 10, 15, 20
Heldor Mfg. Corp., 238 Lewis St., Paterson, N.J., 15
For details see ad on page 508
Tel: MUlberry 3-7953
Insuline Corp. of America, N.H., 5, 15, 20
Jacksonville Metal & Plastics Co., Fla., 5, 15, 20
Karp Metal Prods. Co., N.Y., 5, 15, 20
Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 15
For details see ad on page 404
Tel: DEarborn 2-0750
Kuss Mach. Tool & Die Co., Inc., Pa., 5, 10, 15, 20
Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 20
For details see ad on pages 116-117
Tel: ENdicott 2-7200
Lehigh Valley Electr. Engr. & Mfg. Co., Pa., 5, 20
Lewyt Corp., N.Y., 5
Lowell Mfg. Co., Mo., 5, 10, 15, 20
Mackenzie Prods. Co., The, Conn., 5
Marine Elec. Corp., N.Y., 5, 15, 20
Metalcraft, Inc., N.Y., 5, 15, 20
Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 5, 10, 15, 20
For details see ad on page 287
Tel: WA 5-6800
Metal Prods. Co., Tenn., 5, 15, 20
Metallic Arts of New England, Inc., Mass., 5, 15, 20
Multi-Metal Wire Cloth Co., Inc., N.Y., 5, 10, 15, 20
Northern Elec. Co., Ltd., Canada, 5, 20
Otis Elevator Co., Electr. Div., N.Y., 5, 15, 20
Par-Metal Prods. Corp., 32-62 49th St., Long Island City 3, N.Y., 5, 10, 15, 20
For details see ad on page 289
Tel: AStoria 8-8905
Powell Co., Harold H., Pa., 5, 10

33. Chassis & Racks.

Premier Metal Prods. Co., 3160 Webster Ave., New York 67, N.Y., 5, 10, 15, 20
For details see ad on page 279
Tel: OLinville 4-4841
Q-Line Mfg. Corp., N.Y., 5, 10, 15, 20
Ref Mfg. Corp., N.Y., 5, 15
Radio City Products Co., Inc., Pa., 5, 20
Radio Eng. Labs., Inc., N.Y., 5, 15
Radio Eng. Products, Ltd., Canada, 15
Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., 10
For details see ad on page 448
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Repath Co., Paul R., Calif., 5, 20
Research Instrument Co., Inc., N.Y., 5, 15, 20
Riester & Thesmacher Co., The, 1526 W. 25 St., Cleveland 13, Ohio, 5, 20
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Robinson Aviation, Inc., Airborne Div., Dept. IRE 8, Teterboro Air Term., Teterboro, N.J., 5, 15, 20
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Tel: HA 8-2500
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Stromberg-Carlson Co., N.Y., 15
Suckle Electr. Co., N.J., 5, 10, 15, 20
Suffolk Prods. Corp., N.Y., 5, 15, 20
Summit Electr., Inc., N.J., 5, 15, 20
Taffet Radio & TV Co., N.Y., 5, 15, 20
Todd Elec. Co., Inc., N.Y., 5, 20
Transformer Metal Prods. Corp., N.Y., 5, 15, 20
Trav-Ler Radio Corp., Ill., 20
United Specialties Co., Mitchell Div., Pa., 5, 20
Utility Metal Prods. Co., Inc., Mass., 5, 10, 15, 20
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Walter Co., Inc., S., N.Y., 5, 10, 15, 20
Weltronic Co., Mich., 15, 20 Custom
Wickes Eng. & Const. Co., N.J., 15
Worcester Pressed Steel Co., Mass., 15, 20
Wright-Hepp Assoc., Inc., N.J., 5, 10, 15, 20

34. Coils.

5. Audio frequency chokes
10. Deflection yokes
15. Filter
20. Flyback
25. Focusing coils
30. RF & IF chokes
35. Toroids
40. Tuning

A. P. W. Co., N.J., 15, 25, 35
Ace Coil & Electronics Co., N.J., 25, 30, 40
Acme Wire Co., Conn., Custom
Acro Products Co., Pa., 5, 15

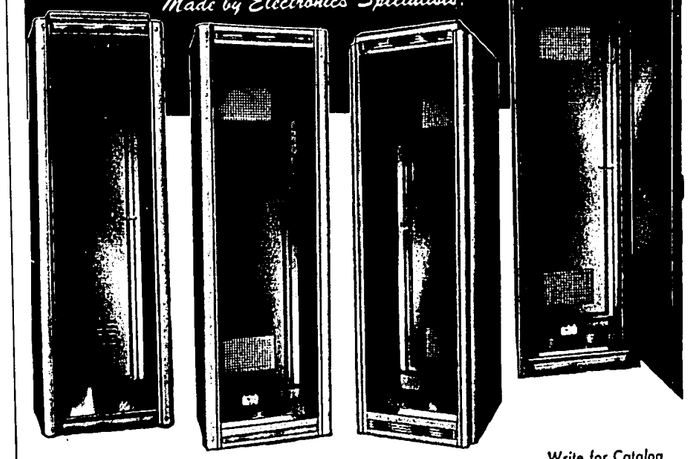
34. Coils.

Acro Transformer & Mfg. Corp., N.Y., 5, 15
Aerocoil, Inc., N.J., 15, 25, 30
Aerolite Electronics Corp., 507 26th St., Union City, N.J., 5, 10, 15, 25, 30, 35, 40
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Tel: UNion 3-2955
Aerovox Corp., Mass., 5, 15, 35
Ahrendt Instrument Co., Md., 35
Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., Potted
For details see ad on page 491
Tel: Hemlock 6-2230
Aladdin Radio Industries, Inc., Tenn., 30, 40
Alcar Instruments, Inc., N.J., 5, 10, 15, 20, 25, 30, 35, 40
Alden Products Co., 113 No. Main St., Brockton 64, Mass., 35
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All Star Products, Inc., Ohio, 25
Allied Allegri Co., Inc., N.J., 30
Allied Control Co., Inc., N.Y., 5, Rotary & Solenoid
Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 30, 35
For details see ad on pages 203, 293
Tel: POrt Washington 7-3703
Atlantic Transformer Corp., 30 Hynes Ave., Groton, Conn., 5, 15, 35
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Tel: Hilltop 5-0353
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Atlas Engineering Co., Inc., Mass., 5, 15, 30, 35
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Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 5, 30, 35, 40
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Berkshire Labs., Mass., 35
Best Mfg. Co., Inc., N.J., 5, 25
Bittermann Electric Co., Conn., 15, 35
Blackstone Electric Co., Ill., 35, 40
Bright Radio Labs., Inc., N.Y., 30, 40
Bud Radio, Inc., Dept. RE, 2118 East 55th St., Cleveland 3, Ohio, 30, 40
For details see ad on page 145
Tel: HE 1-7166
Bunnell & Co., J. H., N.Y., 30, 40
Burnell & Co., Inc., 45 Warburton Ave., Yonkers 2, N.Y., 15, 35
For details see ad on page 144
Tel: Yonkers 5-6800

(Continued on page 290)

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STANDARDIZED for
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Export Dept. Rocke International Corp.
13 East 40 Street New York 16, N.Y.

(Continued from page 289)

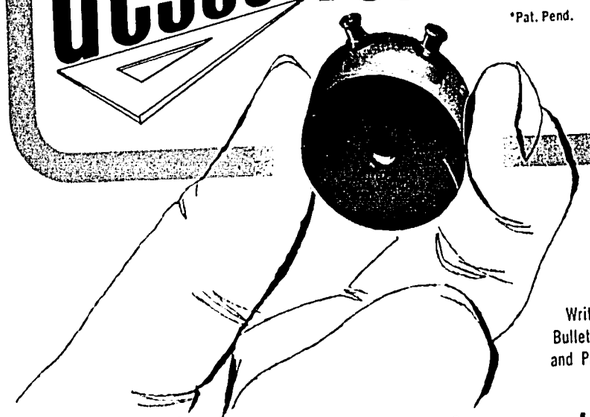
C & E Engineers, Calif., Coils High Temp
CGS Laboratories, Inc., Conn., 15, 40
Caddell-Burns Mfg. Co., Inc., 40 East 2nd St., Mineola, L.I., N.Y., 30, 40
For details see ad on page 291
Tel: Pioneer 6-2310
Calbest Eng. & Electronics Co., Calif., 30, 40
Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 30, 40
For details see ad on page 502
Tel: Trowbridge 6-2800
Canadian Marconi Co., Canada, 5, 15, 20, 25, 30
Canadian Westinghouse Co., Ltd., Canada, 5
Carad Corp., Calif., 5, 15, 30, 35, 40
Cardwell Mfg. Corp., Allen D., Conn., 30

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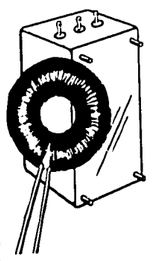
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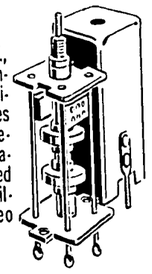
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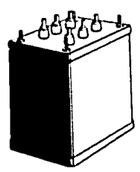
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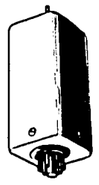
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All types I. F., R. F., B. F. O. coils, etc. conforming to latest military design • All sizes Cup Core coils • Special coils—Permeability Tuned—Shielded—Unshielded • Oscillator coils—Video coils—Chokes.



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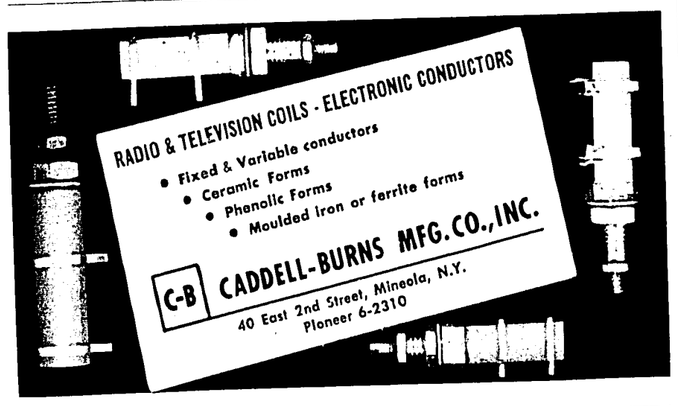
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A Complete Alphabetical Index of all Products listed in this Directory will be found in the eight-page pink insert immediately preceding page 1 of the products and firms section.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Central Transformer Co., Ill., 5, 15
Chicago Standard Transformer Corp., Ill., 5, 10, 15, 20, 25, 35
Clippard Instrument Lab., Inc., Ohio, 30
Cohn, Campbell Co., Inc., Conn., 5, 15, 35
Coil Winders, Inc., N.Y., 10, 15, 25, 30, 40
Coilcraft, Inc., Ill., 5, 15, 20, 30, 40
Cole Instrument Co., Calif., 30, 35
Coles Electronic Corp., Pa., 30
Columbus Process Co., Inc., Ind., 5
Communication Accessories Co., 110th St. and Hillcrest Rd., Hickman Mills, Mo., 5, 15, 35
For details see ad on pages 80-81
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Connecticut Telephone & Elec. Corp., Conn., 5, 35
Constantine Eng. Labs. Co., P.O. Box 471 B, Mahwah, N.J., 5, 10, 15, 20, 25, 30, 35 40
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Tel: Ramsey 9-1123
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Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 15
For details see ad on page 317
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Corning Glass Works, N.Y., 40
Corona Engineering Service, N.Y., 35
Coto-Coil Co., Inc., R.I., 15, 25, 30 Relay & Solenoid
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Crest Laboratories, Inc., N.Y., 5
Crown Engineering, N.M., 15, 30
D & R, Ltd., Calif., 35
Davis Electric Co., Mo., 10, 25, 35
Daystrom Instrument, Pa., 10
De Coursey Engineering Lab., P.O. Box 235, Los Angeles 25, Calif., 35
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Dietz Design & Mfg. Co., Grandview 7, Mo., 5, 15, 30, 35, 40
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Dinion Coil Co., Inc., N.Y., 5
Dubrow Development Co., 235 Penn St., Burlington, N.J., 15
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Tel: Burlington 3-0446
Du Mont Labs., Inc., A. B., Receiver Div., 35 Market St., E. Paterson, N.J., 10, 20
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Electrical Windings, Inc., Ill., 5, 15
Electro Eng. & Mfg. Co., Mich., 10
Electrometric, Inc., Ill., 30, 35, 40
Electronic Coils, Inc., Mass., 15, 30, 35
Electronic Components Corp., Ill., 5, Filter Choke
Electronic Transformer Co., N.Y., 5, 15
Emerald Mfg. Co., Ill., 30, 35, 40
Epco Products, Inc., N.Y., 2500 Atlantic Ave., Brooklyn 7, N.Y., 5, 15, 35
For details see ad on page 383
Tel: Dickens 5-7531
Essex Wire Corp., Mag. Windings Div., Pa., 5
Farley, Ltd., T. S., Canada, 10, 20, 30, 35, 40
Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 35
For details see ad on pages 32-37
Tel: Nutley 2-3600
Feldman Co., Henry, Calif., 10
Ferranti Electric, Inc., N.Y., 5

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Toroidal Inductances wound on Molybdenum Permalloy compressed powdered dust cores are available in all practical inductance values. Several core sizes and types are stocked making it possible to supply high Q inductances, especially suitable for *your* frequency and load ranges. We supply Inductoroids either cased or uncased.

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Manufacturing Division

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★

4. Component Parts

34. Coils.

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Fisher Engineering, Inc., P.O. Box 327, P.O. Box 327, Huntington, Ind., 5
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Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 5, 15, 35
For details see ad on page 180
Tel: Evergreen 6-1300

Fugle-Miller Labs., Inc., Dept. Y-6, 398 Main St., Metuchen, N.J., 30
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Tel: ME 6-2245

Galbraith & Son Elec. Corp., C. C., N.Y., 5

Gates Radio Co., Ill., 40

General Instrument Corp., N.J., 5, 10, 15, 20, 30, 35, 40

General Instr. Corp., F. W. Sickles Div., Mass., 20, 30, 35

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 15, 30, 35
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

General Winding Co., Inc., N.Y., 10, 25, 35

Glaser-Steers Corp., N.J., 25

Goslin Elec. & Mfg. Co., Calif., 5, 30, 35

Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 5
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Grayburne Corp., N.Y., 30

Guardian Electric Mfg. Co., 1621-IRE W. Walnut St., Chicago 12, Ill., 10, 25
For details see ad on page 190
Tel: CHesapeake 3-1100

Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 15, 30
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Tel: Texas 0-7317

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Hadley Co., Inc., Robert M., Calif., 5, 15, 35

Halldorson Transformer Co., Ill., 5, 10, 15

Hammond Mfg. Co., Ltd., Canada, 5

Harnett Electric Corp., 138 Haven Ave., Port Washington, L.I., N.Y.. 5, 15, 20,
Tel: Port Washington 7-3344

Heppner Mfg. Co., Box 1207, Round Lake, Ill., 20, 25
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Tel: ROund Lake 6-2161

Hillburn Electronic Prods., N.Y., 15, 20, 30, 40

Hindle Transformer Co., Inc., N.J., 5, 15

Hopkins Engineering Co., Calif., 5, 35

Houlihan, T. J., Co., Ill., 15, 20, 30, 35, 40

4. Component Parts

34. Coils.

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Hycor, Inc., Calif., 35

I-T-E Circuit Breaker Co., Pa., 10, 25, 30, 35

Insuline Corp. of America, N.H., 30

International Resistance Co., Pa., 30

Isolantite Mfg. Corp., N.J., Ceramic Insulators

Jeffers Electr. Div., Pa., 30

Johnson Co., E. F., Minn., 30

K. V. Transformer Corp., Conn., 5, 15, 35

Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 35
For details see ad on page 404
Tel: Dearborn 2-0750

Kenyon Transformer Co., Inc., 840 Barry St., New York 59, N.Y., 5, 15, 25, 35
For details see ad on page 386
Tel: Kirkpatrick 2-4500

Ketay Mfg. Corp., N.Y., 10, 25, 35

Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 5
For details see ad on pages 116-117
Tel: ENdicott 2-7200

Lectra, Inc., Ill., Printed

Lectrohm, Inc., Ill., 30

Lee Spring Co., Inc., N.Y., 30

Lehigh Valley Electr. Engr. & Mfg. Co., Pa., 30, 40

Lenkurt Electric Co., Inc., Calif., 35

Leonard Elec. Prods. Co., Inc., N.Y., 5, 10, 15, 20, 25, 30, 35, 40

Lepace Mfg. Co., N.Y., 5, 15

Lewyt Corp., N.Y., 30

Linell Eng. Corp., Charles S., Ill., 30

Lurex Mfg. Co., N.J., 40

Magnetics, Inc., Dept. I-11, Box 230, Butler, Pa., 35
For details see ad on page 306
Tel: Butler 7-1745

Magnex Corp., N.Y., 5, 10, 15, 30, 35, 40

Mark Electr., Inc., N.J., 20

Measurement Eng., Ltd., Canada, 35

Melco Prods., Inc., Minn., 5, 15, 35

Merit Coil & Transformer Corp., Ill., 25, 30

Michel Mfg. Co., Wis., 30, 40

Mico Instrument Co., 79 Trowbridge St., Cambridge 38, Mass., 35
For details see ad on page 533
Tel: KIrkland 7-8660

Microtran Co., N.Y., 5, 15, 25

Mid-West Coil & Transformer Co., Ill., 5

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 30
For details see ad on page 548
Tel: MAlden 4-4108

Miller Co., J. W., Calif., 15, 30, 40

Miller Co., J. W., 15, 30, 40

Miller Instr., Inc., William, Calif., 5, 15, 30, 35, 40

Modelectric Prod. Corp., N.J., Miniature

Moran Electronic Components, Inc., 10515 Metropolitan Ave., Kensington, Md., 15, 30, 40
For details see ad on page 293
Tel: LO 4-8470

Muter Co., The, Ill., 30

National Co., Inc., Mass., 30

Networks Electr. Corp., Calif., 15, 35

North Hills Elec. Co., Inc., N.Y., 15, 30, 40

Northern Elec. Co., Ltd., Canada, 15, 25, 35

Ohmite Mfg. Co., Ill., 30

Omega Mfg., Inc., N.Y., Magnet

Orenco, (Ortho Engineering Corp.), 245 Wallace St., Orange, N.J., 35
For details see ad on page 389
Tel: ORange 4-7193

Osborne Transformer Corp., Mich., 5, 15

Oxford Elec. Corp., Ill., 5

Painton and Co., Ltd., England, 30

Partridge Transformers, Ltd., England, 5, 30

Peerless Electrical Prods., Div. Altec Lansing, Calif., 5, 35

Penn East Eng. Corp., Box 240, Kutztownn, Pa., 15, 30, 40
For details see ad on pages 203, 293

Permoflux Corp., Ill., 5, 15

Pittsburgh Coil Co., Pa., 30

Polydoroff & Assoc., W. J., D.C., 35, 40

Potter Co., The, Ill., 15

Power Industries, Inc., 2611 Indiana Ave., Chicago 16, Ill., 5, 10, 15, 20, 25, 30, 35, 40
For details see ad on page 292
Tel: CAlumet 5-1125

Power Transformer Co., Inc., N.J., 15, 35

Precision, Inc., Dept. R, 730 Lyndale Ave. N., Minneapolis 11. Minn., 35,
For details see ad on page 365
Tel: HY 7726

Q.L.C. Corp., N.J., 30, 40

Qutronic Transformer Corp., N.Y., 5, 35

RCA Victor Co., Ltd., Canada, 5, 10, 15, 20, 25, 30

Radex Corp., Ill., 30

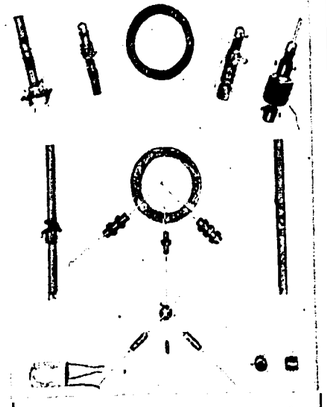
Radio Corp. of America, Tube Department, Section F35Q, 415 S. 5th St., Harrison, N.J., 5, 10, 15, 30
For details see ad on page 210
Tel: HUmboldt 5-3900

Radio Eng. Prods., Ltd., Canada, 5, 15, 35

Radio Industries, Inc., Ill., 15, 30, 40

Railway Communications, Inc., Mo., 15, 35

(Continued on page 294)



Coils of Special Order to the Customer's prints are wound at Moran Electronic Components Inc. to a high quality at reasonable cost—with best possible delivery.

Moran Electronic Components Inc. offers a standard line of most used Chokes of the Solenoid and Universal Pie types, ranging in Inductance from .47 Micro-Henry to 25 Milli-Henry.

Complete Data available on request.

MORAN ELECTRONIC COMPONENTS INC
10515 Metropolitan Ave., Kensington, Md.

***Designed and Manufactured to* YOUR SPECIFICATIONS**



Backed by 18 Years Experience.

COILS
INDUCTORS
MAGNETIC AMPLIFIERS

All Types, Any Quantities

PENN-EAST
Engineering Corporation
Kutztown, Pennsylvania
(Formerly—Atlantic Electronics Corp. of Port Washington, N.Y.)
P.O. Box 240; Telephone Kutztown 2675

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfully eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information—fast.

3000 Firms listed. The alphabetical directory gives a clear definition of these firms by showing any or all of the ten fundamental groups in which these firms belong after every name.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

4. Component Parts

34. Coils.

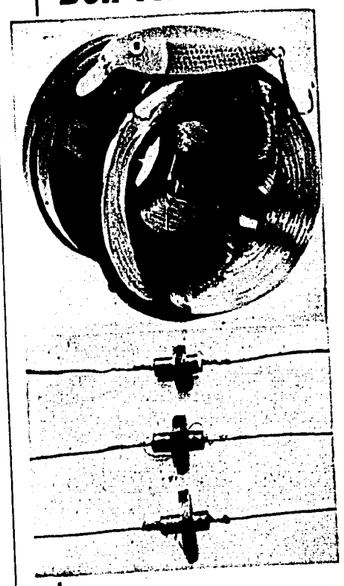
(Continued from page 293)

Ram Electronics, Inc., N.Y., 10, 15
Randall, Inc., Douglas, R.I., Fractional H-P Motor Relay
Raypar, Inc., Ill., 5, 15, 20, 25, 30, 35, 40
Redman Electr. Corp., Conn., 30, 40
Reliable Spring & Wire Forms, The, Ohio, 40
Research Instrument Co., Inc., N.Y., 35, 40
Richardson Labs., Kenneth, N.Y., 5
Richmond Eng. Co., Inc., Conn., 5
Rola Co., Inc., The, Ohio, 10, 20
Rollins Corp., Dela., 5, 15
Ross Mfg. Co., Iowa, 5, 10, 15, 20, 25, 30, 40
SNC Mfg. Co., Inc., Wis., 5
Sag Harbor Industries, Inc., N.Y., 5, 15, 20, 30, 35
Saratoga Industries, N.Y., 15, 35
Savage Transformers, Ltd., England, 5, 15
Smallwood, Ltd., S. G., Canada, 20, 30, 40
Smith Mfg. Co., Nathan R., 5
Southwestern Indust. Electr. Co., Texas, 5, 15, 35
Southern Elec. & Transmission Co., Texas, 35

Spellman Television Co., Inc., 3029 Webster Ave., New York 67, N.Y., High Voltage
For details see ad on page 344
Tel: KI 7-0306

Speer Carbon Co., Pa., 30
Square Root Mfg. Corp., N.Y., 5, 15, 20, 30, 35, 40
Standard Coil Prods. Co., Inc., Calif., 10, 15, 20, 30, 35, 40
Standard Electrical Prods. Co., Ohio, 35
Standard Electr. Res. Corp., N.Y., 15
Standard Transformer Corp., Ill., 5
Standard Winding Co., Inc., N.Y., 20, 30, 40
Stanwyck Winding Co., Inc., N.Y., 5, 30, 35, 40
Sterling Transformer Corp., N.Y., 5, 15, 30
Summit Coil Co., N.J., 30, 40
Summit Electr., Inc., N.J., 5
Superex Electr. Corp., N.Y., 30, 40
Syntronic Instr., Inc., Ill., 10, 25
Tartak Electr., Inc., Calif., 5
Technical Material Corp., N.Y., 35

Don't ANGLE for a reliable source • • •



LINE UP with TEL-RAD

Quality manufacturer of Deflection Components and Coils. NEW! 90° high efficiency yokes. Let us *TACKLE* your parts problem. We are always ready to promptly send sample to your specifications. Our prices always reflect our favorable labor market and low overhead.

TEL-RAD MFG. CO., INC.
Radio and Television Components
7th and Madison Street Phone: Green 270 Fennimore, Wisconsin

4. Component Parts

34. Coils.

Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 10, 15, 20, 25, 30
For details see ad on page 224
Tel: AMityville 4-4446

Telectron Co., Ohio, 10, 25
Teleradio Eng. Corp., N.Y., 10, 20, 25, 30, 40
Television Labs., Inc., Ill., 10, 15, 25, 35

Tel-Rad Mfg. Co., Inc., 7th & Madison St., Fennimore, Wisconsin, 10
For details see ad on page 294
Tel: Green 270

Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 5, 10, 15, 25, 30, 35, 40
For details see ad on page 226
Tel: DI 1781

Thompson, Harris A., Colo., 25, Lightweight
Thordarson Meissner Mfg. Div., Ill., 5, 15, 30
Torocoil Co., Mo., 5, 15, 35

Torwico Electronics, Inc., 965 Frelinghuysen Ave., Newark 5, N.J., 5, 35
For details see ad on page 295
Tel: BIgelow 8-0426

Transformer & Electronic Specialty Co., 3824-28 Terrace St., Philadelphia 28, Pa., 5, 15
For details see ad on page 390
Tel: IVyridge 3-1383

Transformer Engineers, Calif., 5, 10, 15, 30, 35

Transformer Specialty Co., Inc., 328 Rockhill Rd., Bala Cynwyd, Pa., 5
For details see ad on page 391
Tel: WElsh Valley 4-5770

Transformer Technicians, Inc., Ill., 5, 15, 35
Transformers, Inc., N.Y., 15, 35
Transvision, Inc., N.Y., 5, 30, 40
Tri-Dex Co., Calif., 15, 30

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 5, 10, 15, 20, 25, 35
For details see ad on page 232
Tel: TExas 0-5381

Triumph Mfg. Co., Ill., 5, 10, 15, 20, 25, 35
Union Elec. & Mfg. Co., N.J., 5, 10, 15, 20, 25, 30, 35, 40
Union Spring & Mfg. Co., N.J., 5, 10, 15, 30, 35, 40
U. S. Electr. Corp., N.J., 5, 15, 20, 25, 30, 35, 40

United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 15, 35
For details see ad on page 582
Tel: ALgonquin 5-3500

Universal Mfg. Co., Inc., N.J., 35
Vanguard Electr. Co., Calif., 20, 30, 40
Vari-L Co., Inc., 434 Fairfield Ave., Stamford, Conn., 15, 35, 40
For details see ad on page 392
Tel: 48-0091
Vectron, Inc., 402 Main St., Waltham 54, Mass., 35
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vidaire Electr. Mfg. Co., N.Y., 30, 40
Vokar Corp., Mich., 5, 30, 40
Western Coil Prods. Co., Inc., Calif., 5, 30, 40
Westinghouse Elec. Corp., Pa., 35
Wheeler Insulated Wire Co., Inc., Conn., 5, 25
White Industries, Inc., N.Y., 15, 30
Wirt Co., Pa., 30, 40

See also listings for:
Ceramic coil forms
Product 76. 05: page 485
Paper preforms for coil foundations
Product 81. 55: page 500
Coil dope
Product 85. 05: page 527
Coil winding machines
Product 86. 05: page 529



35. Connectors.

5. AN & MIL standard types
10. Co-axial
15. Microphone
20. Multiple circuit connectors
25. Power
30. Slip ring and commutating connectors
35. Sub-miniature

Aerolite Electronics, 507 26th St., Union City, N.J., 15, 20
For details see ad on page 500
Tel: UNion 3-2955
Aircraft-Marine Prods., Inc., 2100 Paxton St., Harrisburg, Pa., 20
For details see ad on page 281
Tel: Harrisburg 4-0101
Aircraft Radio Corp., Boonton, N.J., 20
For details see ad on page 469
Tel: BOonton 8-1800
Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 30
For details see ad on page 491
Tel: Hemlock 6-2230
Alden Products Co., 113 N. Main St., Brockton 64, Mass., 15, 20, 25, 30, 35
For details see ad on page 296
Tel: Brockton 160
Allen-Stevens, N.Y., 25
Allied Industries, Inc., Ky., 5, 10
American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 5, 10, 15, 20, 25
For details see ad on page 130
Tel: Bishop 2-1000
Ardente Acoustic Labs., Ltd., England, 20, 35
Arey Machine Co., N.J., 15, 20, 25
Automatic & Precision Mfg. Co., N.Y., 5, 25, 35
Automatic Mfg. Corp., N.J., 5
Automatic Metal Prods. Corp., N.Y., 10, 20, 35

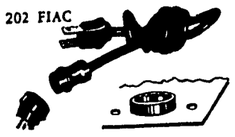
(Continued on page 297)

Simplify planning and production of Electronic Gear with ALDEN STANDARD COMPONENTS

❶ You have to provide for IN-OUT CIRCUITS

Alden Detachable Line Cord to bring the power in.

202 FIAC



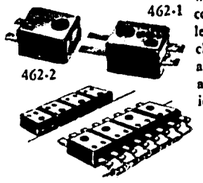
Reduce all problems to just a simple plug mounted in your equipment. Give customer choice of desired length.

Alden Slide-In Back Connectors centrally organize all in-out leads.

Unique Alden Back Connectors avoid rat's nest, blind wiring of conventional connectors — organize leads in spread out single check point, instantly accessible, color coded and symboled for quick identification.

462-1

462-2



Tiny Alden Sensing Elements act as "tell tales" to protect equipment, monitor operation, permit front-panel checks

Check Voltages with Alden Mini-Test Jacks

Monitor Operations with Alden Pan-i-Lite

Spot Blown Fuse — Alden Fusette



Alden Miniature AC outlets provide power take-outs wherever needed.



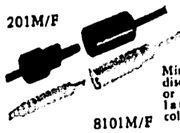
402ACE 402ACFL

World's smallest, most rugged AC outlets, with tabs or leads tailored to your specs.

❷ You have to provide INTERNAL CONNECTORS

Alden Connectors, from 1 to 20 contacts, employ standard mass-produced components to fit every need with minimum assembly costs and space requirements: "Top connected contacts" and other unique Alden features provide extra quality and dependability.

201M/F



8101M/F

SINGLE LEAD DISCONNECTS
Miniature hi-voltage disconnects. Phenolic or polyethylene insulation. UL safety collar.

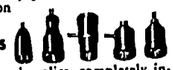
Speaker Connector Series



TWO TO SEVEN LEAD
Beautiful detachable terminal connectors that do away with terminal strips, save soldering and cabling.

TUBE CAPS for every purpose
Completely prewired—Phenolic, Injection

90 SERIES



Quality phenolics, completely insulated for radio receiver, transmitter or TV tubes.

DIAL LIGHT SOCKETS
Designed for low-cost high-volume production, with tailored leads ready to drop aboard your equipment. 4 basic designs you can standardize on for almost all needs.





HA Series

TWO AND THREE LEAD
Excellent miniature antenna lead-ins or signal connectors.

Non-interchangeable Series



TWO TO ELEVEN LEAD
For cables having several connectors, prevent misconnects by specifying Alden Non-Interchangeable Connectors.

ISL SERIES



Integrally molded with insulation, lead and grid in one piece to meet any environmental and electrical conditions.

500 Series



Metal Seal Series

ONE TO FOUR LEAD
Compact inexpensive connector with UL safety collar for carrying AC power or signal.

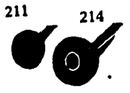
MINI DUO-DECALS
Have only 3 parts: "Top Connected" contacts, leads, molding. Voltage breakdown exceeds that of tube base.

212/5 212



C-R TUBE CONNECTORS
Quality equipment for instruments, TV, radar. Magnal, duodecal, diheptal. 100% insulation each clip and lead.

211 214



Shielded Series



ONE TO FIVE LEAD
Plugs, Connectors and Sockets that answer most needs for 1 to 5 shielded leads.

COMPLETELY MOLDED CABLES

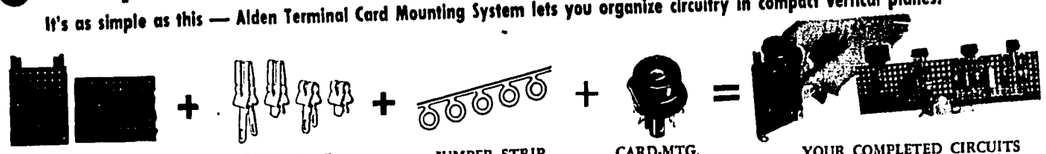
New Alden Technique Solves hi-voltage and corona problems



This 20,000 volt Anode Cable for Color TV comprises nylon Tube Cap, High-voltage Disconnect and Anode Clip, molded by new Alden technique to form integral unit with joints sealed against leakage and corona discharge. We mold cables to your requirements including any number of components.

❸ You probably want PLUG-IN CONSTRUCTION

It's as simple as this — Alden Terminal Card Mounting System lets you organize circuitry in compact vertical planes.



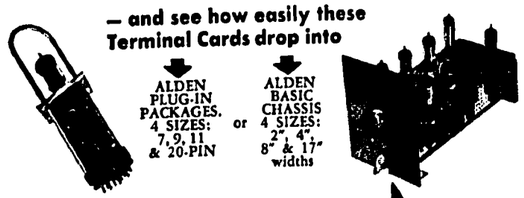
PREPUNCHED TERMINAL MTG. CARD + MINIATURE TERMINALS + JUMPER STRIP Eliminates wiring for common circuits + CARD-MTG. SOCKETS = YOUR COMPLETED CIRCUITS FOR PLUG-IN PACKAGE OR CHASSIS

— and see how easily these Terminal Cards drop into

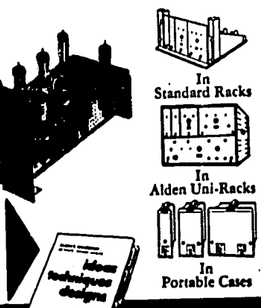
ALDEN PLUG-IN PACKAGES. 4 SIZES: 7, 9, 11 & 20-PIN

or

ALDEN BASIC CHASSIS 4 SIZES: 2", 4", 8" & 17" widths



REQUEST CATALOG describing Alden's complete line of standard components to mount, house, fasten, connect, monitor your electronic circuitry. State your area of interest and we will send samples.

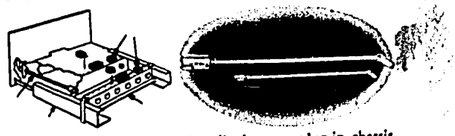


In Standard Racks

In Alden Uni-Racks

In Portable Cases

GET QUICK CHASSIS PILOTING, LOCKING AND EJECTING WITH ALDEN SERVE-A-UNITS



Alden Serve-A-Units install easily in your plug-in chassis so that ½ twist of front handles operate powerful bullet nose cam to pilot, lock or eject your Side Rail guided units into simple "L" Lock Frame.

Alden Slide-in Back Connectors make and break all in-out leads as Serve-A-Units draw in or eject.

ALDEN PRODUCTS CO. 113 N. Main St., Brockton 64, Mass.



This is why COAXIAL CONNECTOR CO. makes a line of connectors that is top-rated throughout the industry:

if "know-how" means precision-engineered JAN Connectors;

if "know-how" means the superior product of the knowledge of engineering specialists;

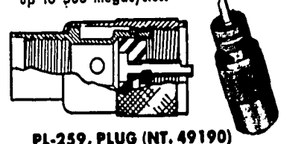
if "know-how" means economy, workmanship, and a short production cycle:

then Coaxial Connector Co. has the kind of know-how that will help you keep your manufacturing operation smooth, superior, and trouble-free!

Rugged service in field and laboratory give our Connectors a *proven dependability*. Quality-controlled to give insurance-plus when you use a Coaxial Connector Co. precision-made Connector.

UHF SERIES CONNECTORS

For dependable low-cost, general purpose use. Satisfactory up to 200 megacycles and may be used with caution up to 500 megacycles.



PL-259, PLUG (NT. 49190)
Non-weatherproof type. Mates with UHF female. Two-piece construction. For use with Cable RG-/U: 8, 9, 10, 11, 12, 13, 63, 65.

PL-259A, PLUG (NT. 49195)
Similar to PL-259. It is a 3-piece unit for ease of handling. Non-weatherproof. Mates with UHF female. SO239.



SO-239, NT. 49194 Receptacle
Mates with male plugs PL-259, PL-259A, UG-203/U. Non-weatherproof, single piece construction. For use with Cable RG-/U8, 9, 10, 11, 12, 13, 63, 65.

Also available special Adapter for the above Plugs (UG-175/U, UG-176/U) used with RG-58/U, RG-59/U, RG-62/U and other small cables.

Design Problems? Engineering information? Special requirements? Our engineering specialists will help you solve your problems.

FREE! Cross Reference Chart! Just ask for it or for more information.

COAXIAL CONNECTOR COMPANY
37 No. 2nd Ave. Mt. Vernon, N. Y.
MOunt Vernon 8-6416
Government Designation: C B W U

4. Component Parts

35. Connectors.

(Continued from page 295)

Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 5
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000

Bendix Aviation Corp., Scintilla Div., Sidney, New York, 5, 20, 25
For details see ad on pages 51-54, 302
Tel: Sidney 9511

Birnbach Radio Co., Inc., N.Y., 10, 15, 25

Brookhaven Electronics Corp., N.C., 10

Buggie, Inc., H. H., 726 Stanton St., Toledo 4, Ohio, 5, 10, 20, 25, 35
For details see ad on page 298
Tel: Adams 8216

Burndy Engineering Co., Inc., Conn., 10, 20, 25

For fast product reference

Use the alphabetical index to products in the eight-page pink section preceding page 1, and the Machol-Edge Indexes on the pink cards throughout the book.

Cannon Electric Co., Calif., 5, 10, 15, 20, 25, 35

Carter Parts Co., Ill., 15

Cinch Manufacturing Corp., 1026 S. Homan Ave., Chicago 24, Ill., 20, 25, 35
For details see ad on pages 110-111
Tel: Nevada 2-2000

Circle Mfg. Co., Inc., N.J., 10

Circon Component Co., Calif., 20, 30, 35, Printed Circuit Connector

Coaxial Connector Co., 37 N. 2nd Ave., Mt. Vernon, N.Y., 10, 20, 25, 35
For details see ad on page 297
Tel: MO 8-6416

Collectron Corp., 216 E. 45th St., New York 17, N.Y., 30
For details see ad on page 297
Tel: MUrray Hill 2-8473

Commercial Radio-Sound Corp., N.Y., 10

Communication Products Co., Inc., State Hwy. 79, Marlboro, N.J., 10
For details see ad on pages 104-105
Tel: Freehold 8-1880

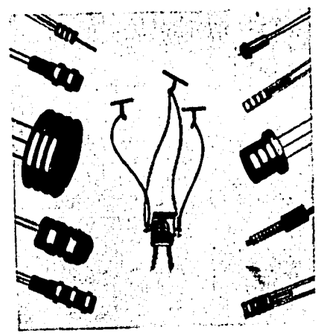
Constantin & Co., Inc., L.L., Route 46, Lodi, N.J., 5
For details see ad on page 667
Tel: Prescott 7-0223

Dage Electric Co., Inc., Ind., 5, 10, 35

Dante Electric Mfg. Co., Conn., 25

Davis Electric Co., Mo., Special-AEC

(Continued on page 299)



Miniature and Sub-Miniature

SLIP RING ASSEMBLIES
BRUSH BLOCK ASSEMBLIES
COMMUTATORS

and other
Electro-Mechanical Components

PRECISION MADE TO YOUR OWN SPECIFICATIONS

Precision molded products with exacting tolerances in precious and non-precious solid metals of all alloys. All types of Thermo-Plastic and Thermo-Setting materials.

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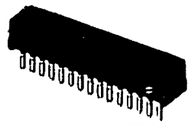
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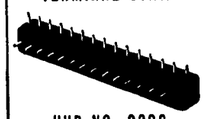
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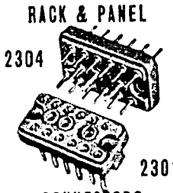
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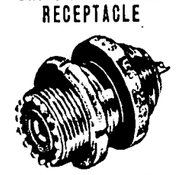
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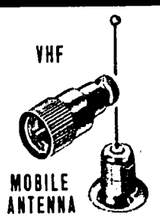


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4. Component Parts

35. Connectors.

(Continued from page 297)

De Jur-Amsco Corp., Dept. IRE DC, 45-01 Northern Blvd., Long Island City 1, N.Y., 20, 25, 30, 35
For details see ad on pages 300, 362
Tel: AStoria 8-1040

Dialight Corp., 60 Stewart Ave., Brooklyn 37, N.Y., 15
For details see ad on page 338
Tel: HY 7-7600

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 5, 20, 35
For details see ad on page 370
Tel: DAvenport 4-7000

Elco Corp., Pa., 20, 25, 35

Electro Precision Products, Inc., N.Y., 10

Electro Tec Corp., 4 Romanelli Ave., South Hackensack, N.J., 30
For details see ad on page 178
Tel: HUbbard 7-4940

Endevco Corp., Calif., 10

Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 15
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Tel: Delaware 7-5776

Fluorocarbon Prods., Div. U.S. Gasket, N.J., 20, 35

Fog-O-Scope, Inc., Ill., 5

Garde Mfg. Co., 588 Eddy St., Providence 3, R.I., 5, 20, 30, 35
For details see ad on page 506
Tel: UNion 1-0604

Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 10
For details see ad on page 539
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General Plate, Div. Metals & Controls, Mass., 30

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

General RF Fittings Co., Inc., Mass., 10

Graham Mfg. Co., Inc., R.I., 5, 10

Graphite Metallizing Corp., 1054 Nepperhan Ave., Yonkers, N.Y., 30
For details see ad on page 299
Tel: YOnkers 8-8400

Gulton Mfg. Corp., Durham Ave., Metuchen, N.J., 10
For details see ad on page 177
Tel: Metuchen 6-2800

Hermetic Seal Products Co., 29 South 6th St., Newark 7, N.J., 5
For details see ad on page 192
Tel: MArket 3-9400

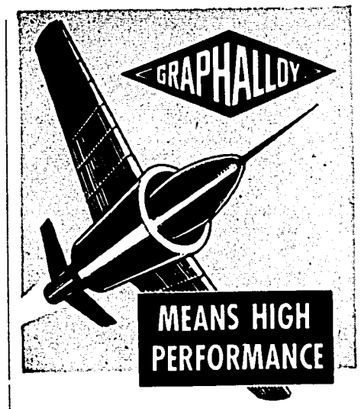
Hubbell, Inc., Harvey, Conn., 35, and miniature

Ilsco Copper Tube & Prods., Inc., Ohio, 20, 25

Industrial Assembly Corp., N.Y., 5, 10, 15

Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 5
For details see ad on page 371
Tel: ORegon 7-1881

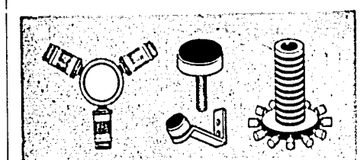
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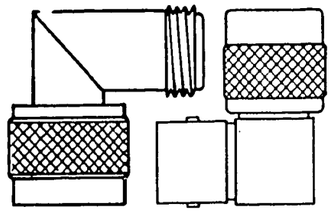
4. Component Parts

35. Connectors.

(Continued from page 299)

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For details see ad on page 220
Tel: Blacksburg 8208
Instrument Specialties Co., Inc., 160 Bergen Blvd., Little Falls, N.J., 35
For details see ad on page 510
Tel: Little Falls 4-0280
Insuline Corp. of America, N.H., 15
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 5
For details see ad on page 286
Tel: Be 6-9200
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Johnson Co., E. F., Minn., 35, Tip Jacks
Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 5, 20, 35
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Joy Mfg. Co., Pa., 5, 25
Keystone Electr. Corp., N.Y., 15
Kings Electr. Co., N.Y., 5, 10, 15, 20, 35
Kliegl Bros., Univ. Elec. Stage Lght. Co , N.Y., 25
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Microwave Consultants, N.Y., 5, 10
Minneapolis-Honeywell Regulator, Minn., 35
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For details see ad on pages 94-95
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Neo-Sil Corp., N.J., 20, 25
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Painton and Co., Ltd., England, 10, 20
Poly-Scientific Corp., Va., 20, 25, 30, 35
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Switchcraft, Inc., 1340 N. Halsted St., Chicago 22, Ill,, 15
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Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 5, 20, 25. 35
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Taffet Radio & TV Co., N.Y., 25
Teletronic Labs., Inc., Calif., 5, 10
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For details see ad on page 103
Tel: LAS 7-8400
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 10, 20
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United States Gasket Co., 611 N. 10 St., Camden 1, N.J., 5, 20, 25, 35
For details see ad on page 126-127
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Vector Electr. Co., Calif., 35

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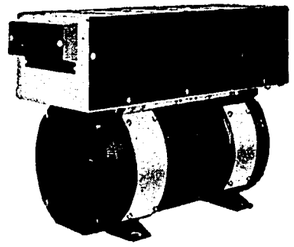
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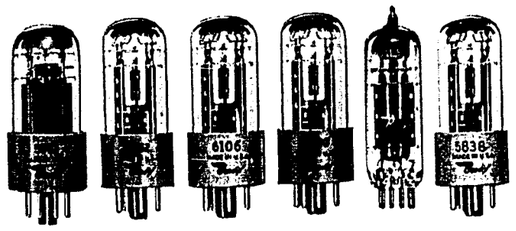
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4. Component Parts

35. Connectors.

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36. Converters.

5. AC to DC
10. DC to AC
15. Inverters
20. Rotary
25. Vibrators

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(Continued on page 304)

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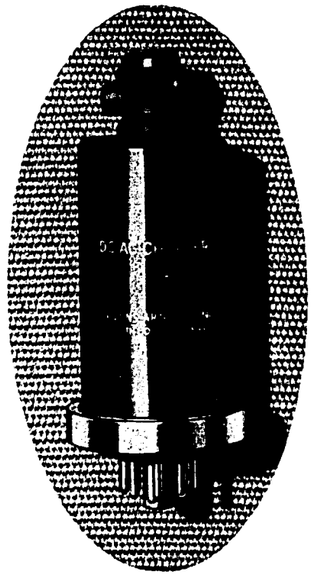


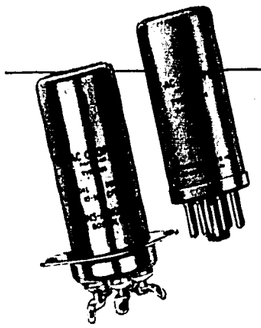
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4. Component Parts

36. Converters.

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Beckman Instruments, Inc., Shasta Div., P.O. Box 296, Station A, Richmond, Calif., 10
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Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 5, 10, 15, 20
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Franklin Electronics, Inc., Pa., 20
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General Magnetics, Inc., N.J., 10, Magnetic Thermocouple
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4. Component Parts

36. Converters.

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International Rectifier Corp., 1521 E. Grand Ave., El Segundo, Calif., 5
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Janette Elec. Mfg. Co., Ill., 15, 20
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Magnetic Research Corp., Calif., 10
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McColpin-Christie Corp., 3400 W. 67th St., Los Angeles 43, Calif., 5
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Meyer & Co., Hugo, N.Y., 25
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Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 10
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Perma-Power Co., Ill., 5
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 10
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Power Transformer Co., Inc., N.J., 5
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Stelma, Inc., 389 Ludlow St., Stamford, Conn., Frequency Shift
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Terado Co., 1062 Raymond Ave., St. Paul 14, Minn., 10
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Weston Electrical Instrument Co., 614 Frelinghuysen Ave., Newark 5, N.J., 5
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Wincharger Corp., Iowa, 15, 20

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into 608 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!

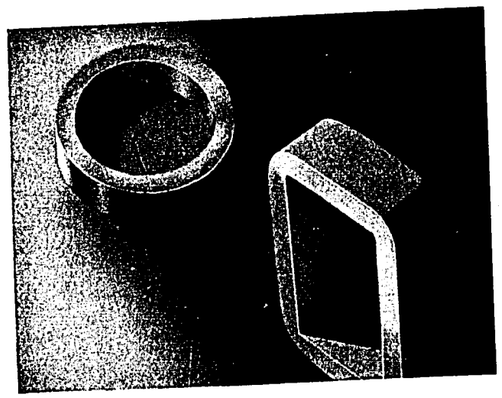
YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product may also appear in the "Component 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, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

ALL *Performance-Guaranteed* PRODUCTS

MAGNETICS inc. TAPE WOUND CORES

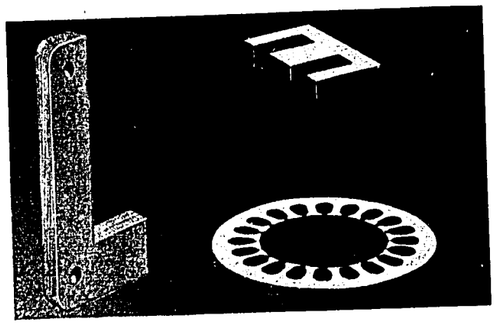


Only Magnetics, Inc. offers Tape Wound Cores, *guaranteed* to meet your performance specifications. The industry's widest selection of standard cores, over 120 standard sizes, gives you a size choice:

Inside Diameter . . . from 0.375-in. to 4.500-in.
Outside Diameter . . . from 0.500-in. to 6.500-in.
Height . . . from 0.125-in. to 4.500-in.
Gauge of Tape . . .001, .002, .003, .004, .006-in.
Materials . . . Hy-Mu 80, 48 Alloy, Orthonol, Magnesil and all other commercially available high permeability materials.

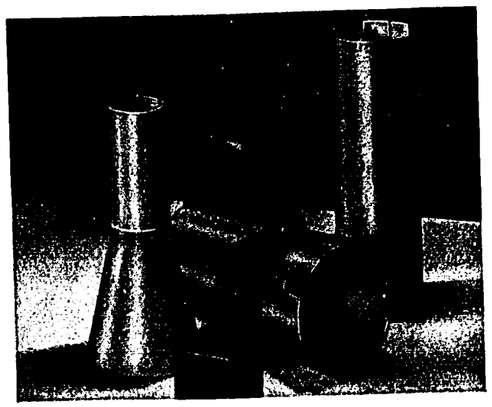
Cores are normally furnished encased in protective plastic boxes, cushioned in special wide temperature compound. Tape is hydrogen annealed to provide exact characteristics to meet your performance specifications.

MAGNETICS inc. LAMINATIONS



Magnetics Inc. Magnetic Laminations are performance guaranteed to meet all production requirements of the electrical and electronic industries. Substantially burr-free, flat laminations in both nickel-iron and all grades of silicon steels are available in standard shapes, such as Rings, EE 24-25, EE 26-27, EI 11, EI 21, EI 75 and EI 375, and in standard gauges from .025 through .006. Laminations are hydrogen annealed when necessary for guaranteed performance. Complete core assemblies can be provided and dies of both tungsten-carbide and hi-carbon, hi-chrome are provided to meet any requirement.

MAGNETICS inc. MAGNETIC SHIELDS



Performance Guaranteed Shields, usually made from Mumetal or A.E.M. 4750, can be made from any other commercially available magnetic or non-magnetic material. Shields are dry-hydrogen annealed, as necessary, and fabricated or drawn to meet production requirements. These shields can be furnished painted or lacquered in any color to your specification.

Write for literature on company letterhead

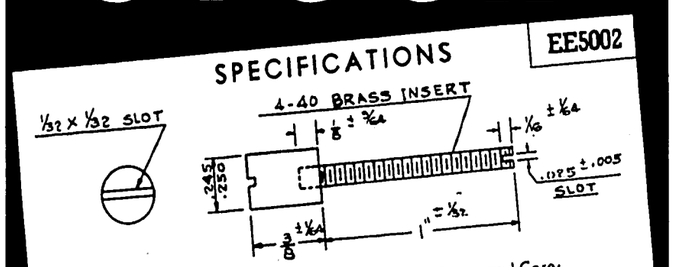
MAGNETICS inc.

DEPT. I-11, BUTLER, PENNSYLVANIA

Engineered Economy Iron

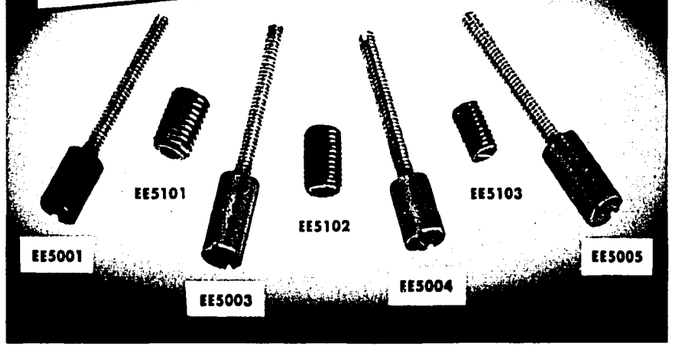
CORES *from* STOCK

SPECIFICATIONS — EE5002



Material: Radio Cores No. 10
Test Frequency: 1 MC
Q Tolerance: ± 7½%
Perm Tolerance: ± 2%

Concentricity of Screw and Core:
.015 Maximum at ¾" from end of core
.007 Maximum at end of core



Engineered Economy means:

- **HIGHEST PERFORMANCE**
- **HIGHEST QUALITY MATERIALS**
- **UNIFORM HIGH QUALITY**
- **LOWEST COST**
- **STANDARDIZATION**

DELIVERY FROM STOCK: We maintain an inventory of EE Cores, thus increasing speed of delivery, increasing your inventory turnover, cutting your investment, and eliminating expensive down-time on lines because of inventory "outs."

ENGINEERED ECONOMY IRON CORES . . . AT MONEY SAVING VOLUME PRICES . . . ARE NOW AVAILABLE FROM STOCK. Two years of research and planning have produced the first concrete approach toward mass production in the iron core field. The EE cores illustrated are based on the most commonly used electrical and mechanical standard specifications, therefore design engineers may adapt them easily to a wide variety of uses.

Literature is available upon request . . . please write for our EE specification sheets.

If your needs are not covered in the above group, ask about our "Custom Engineered Cores", made to your exact specifications.

Radio Cores, Inc.

MEMBER mpa METAL POWDER ASSOCIATION

9540 Tulley Avenue Oak Lawn, Illinois

4. Component Parts

37. Cores.

5. Ceramic
10. Ferrites
15. Pre-formed, spirally wound
20. Powdered metal
25. Toroids

Aladdin Radio Industries, Inc., Tenn., 20

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 25
For details see ad on page 296
Tel: Brockton 160

Allen-Bradley Co., Wis., 10

American Lava Corp., Cherokee Blvd. & Mfrs. Rd., Chattanooga 5, Tenn., 5
For details see ad on page 136
Tel: Chattanooga 5-3411

Arnold Engineering Co., P-81, P.O. Box G, Marengo, Ill., 15, 20, 25
For details see ad on page 134
Tel: Marengo 38

Automatic Mfg. Corp., N.J., 5, 10, 20

Burroughs Corp., Dept. P-1, Electronic Instr. Div., 1209 Vine St., Philadelphia 7, Pa., 25
For details see ad on page 458
Tel: LO 7-1401

Canadian Westinghouse Co., Ltd., Canada, 15

Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 5
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Chrysler Corp., Amplex Div., Mich., 20

Crowley & Co., Inc., Henry L., N.J., 5, 10, 20, 25

Ferricore, Inc., N.Y., 10, 20

General Ceramics Corp., Crows Mill Rd., Keasbey, N.J., 5, 10, 25
For details see ad on pages 172, 186
Tel: Valley 6-5100

General Electric Co., N.Y., 5, 10, 25

Grayburne Corp., N.Y., 10

Gries Reproducer Corp., N.Y., Bobbins, Nylon Coil Winding

I-T-E Circuit Breaker Co., Pa., 15, 25

Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 5
For details see ad on page 414
Tel: Little Falls 4-1600

Lenkurt Electric Co., Inc., Calif., 20, 25

Leonard Elec. Prods. Co., Inc., N.Y., 10, 20, 25

Magnetics, Inc., Dept. I-11, Box 230, Butler, Pa., 15, 20, 25
For details see ad on page 306
Tel: Butler 7-1745

Magnetic Core Corp., N.Y., 20, 25

Magnetic Metals Co., N.J., 15

Metal Powder Association, N.Y., 20, 25

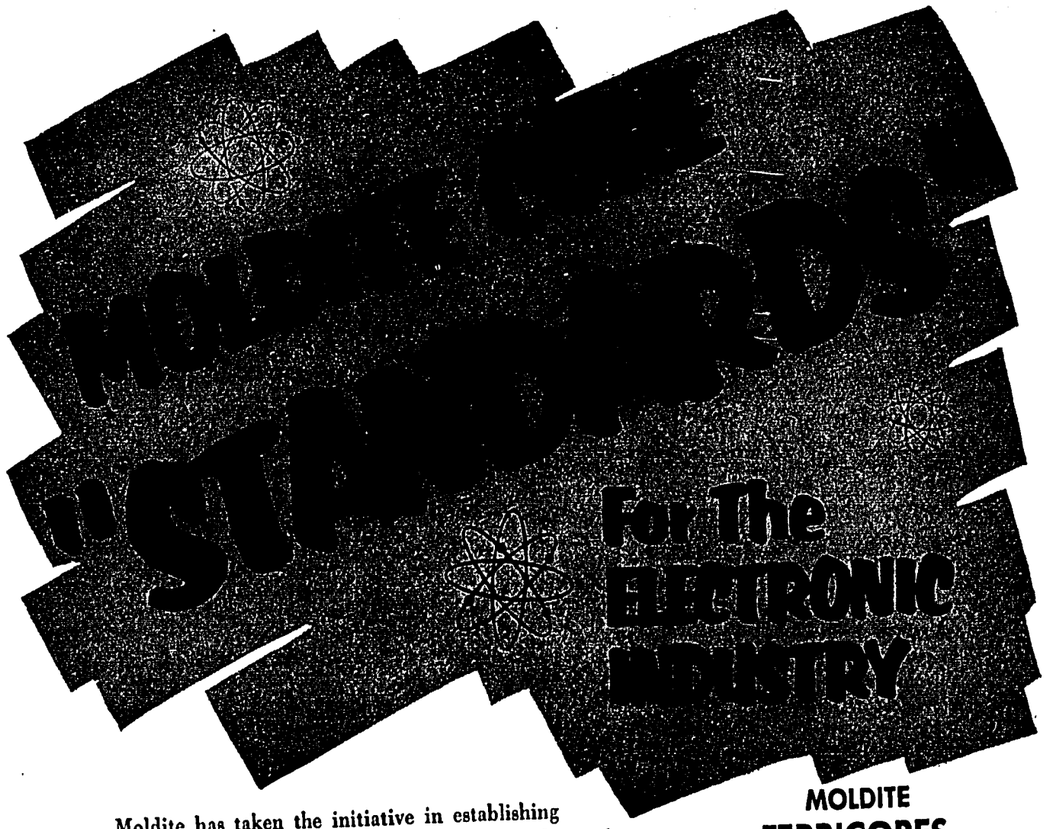
Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo., 15
For details see ad on page 388
Tel: Evergreen 3-3300

Mullard, Ltd., England, 10

National Ceramic Co., 500 Southard St., Trenton 2, N.J., 5
For details see ad on page 486
Tel: Export 4-5373

(Continued on page 309)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.



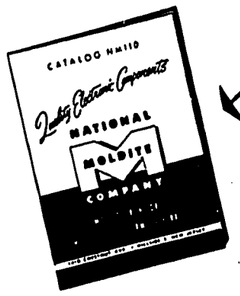
Moldite has taken the initiative in establishing accepted electrical standards long required by the electronic industry. Every coil and set manufacturer, every engineer has designed coils to utilize Moldite "standards".

The reasons are obvious. *Moldite Core Standards Offer . . .*

ECONOMY	HIGH QUALITY	UNIFORMITY
AVAILABILITY	INTERCHANGEABILITY	FLEXIBILITY

This means a better product backed by years of Moldite leadership in engineering and research. No one has done more than Moldite to give the industry a superlative core or coil form for every electronic application.

So Design with Moldite Core Standards.



. . . Send for our new Catalog No. 110 — THE MOST COMPLETE LINE OF CORES IN THE INDUSTRY!

MOLDITE FERRICORES

MOLDITE MOLDED COIL FORMS

MOLDITE MAGNETIC IRON CORES

FERRITE CORES
MOLDED COIL FORMS
(iron and phenolic)
MAGNETIC IRON CORES
FILTER CORES
THREADED CORES
SLEEVE CORES
CUP CORES

Samples promptly submitted upon request for design, pre-production, and test purposes

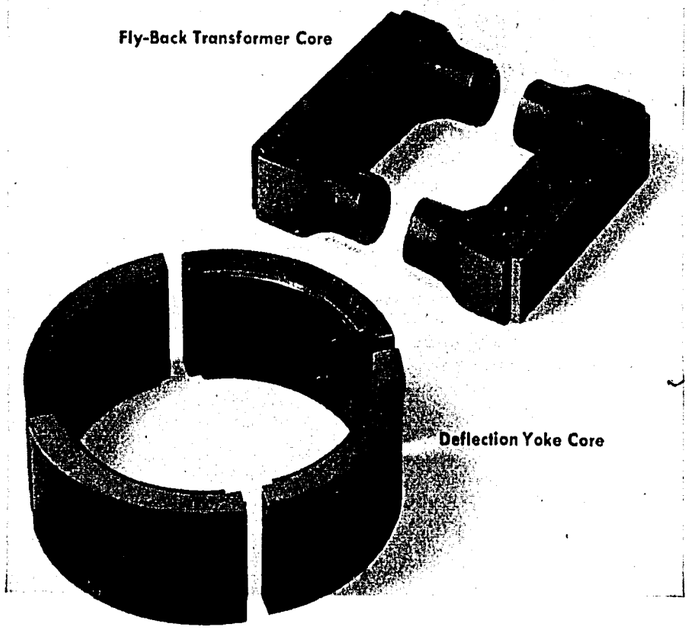
NATIONAL MOLDITE COMPANY

1410 CHESTNUT AVE., HILLSIDE 5, N. J.

Robert T. Murray Co., 604 Central Ave., East Orange, N.J.
Jerry Golten Co., 2750 W. North Ave., Chicago 22, Ill.
Arnold Andrews, 521 Cumberland Ave., Syracuse, N.Y.
Perlmuth, Colman & Assoc., 2419 S. Grand Avenue, Los Angeles, Calif.
Jose Luis Ponte, Cardoba 1472, Buenos Aires

1954 IRE Directory

PRECISION-FORMED *Ferrite* PARTS

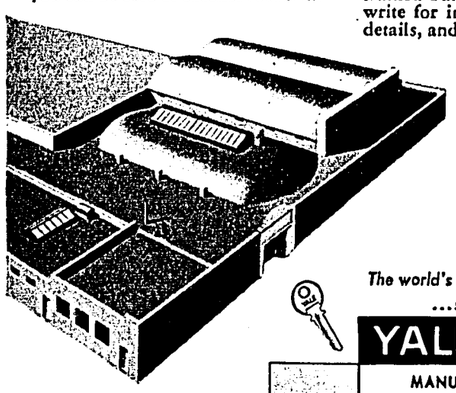


YALE & TOWNE'S *better Engineering means better Components...* **cores and rods for transformers—yokes—antennae**

Superior engineering know-how and precision production have given YALE & TOWNE its position of leadership in powder metallurgy. And these same factors are your assurance of the *best* in ferro-magnetic parts for TV, radio, and electronics.

With Yale & Towne ferro-magnetic cores and extruded antennae rods, you can be sure of excellent electrical characteristics, maintained with unvarying uniformity and quality regardless of shape, size, or production requirements. As with all of the fine powdered metal products Yale & Towne has produced successfully through the years...you will find your specifications fully satisfied.

Arrange for a visit from a specially-trained Yale & Towne consultant, or write for informative literature, full details, and quotations—today!



Our recently completed addition has greatly expanded our plant facilities—permits us to offer the most extensive and modern facilities available for producing ferrites.

The world's most famous key ...symbol of industrial leadership!

YALE & TOWNE MANUFACTURING COMPANY

PMP *Powdered Metal Products Division*

9333 Belmont Avenue • Franklin Park, Illinois

4. Component Parts

37. Cores.

(Continued from page 307)

National Moldite Co., 1410 Chestnut Ave., Hillside 5, N.J., 10, 20, 25
For details see ad on page 308
Tel: Waverly 6-2123

Northern Elec. Co., Ltd., Canada, 20, 25

Pacent Eng. Corp., N.Y., 10

Paramount Paper Tube Corp., 617 S. Lafayette St., Fort Wayne 2, Ind., 15
For details see ad on page 514
Tel: A-4197

Permoflux Corp., Ill., 15, 25

Polydoroff & Assoc., W. J., D.C., 10, 20, 25

Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 15
For details see ad on page 512
Tel: ARmitage 6-5200

Pyroferric Co., Inc., N.Y., 15, 20, 25

Quality Components, Inc., Pa., 20

Radio Cores, Inc., 9540 Tulley Ave., Oak Lawn, Ill., 20, 25
For details see ad on page 307
Tel: GA 2-3353

Railway Communications, Inc., Mo., 20, 25

Research Dev. Manufacture, Inc., Pa., 10

Resinite Corp., Ill., 15

Solar Mfg. Corp., Calif., 5

Speer Carbon Co., Pa., 5, 20, Phenolic

Sprague Electric Co., Mass., 10

Stackpole Carbon Co., Electronics Div., Tannery St., St. Marys, Pa., 10, 20, 25
For details see ad on pages 84-85
Tel: 41-521

Standard Electrical Prods. Co., Ohio, Strip Wound

Steward Mfg. Co., D. M., Tenn., 5, 10

Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 5
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400

Superior Steatite & Ceramic Corp., 85 West Forest Ave., Englewood, N.J., 5
For details see ad on page 521
Tel: ENglewood 3-4555

Thomas & Skinner Steel Prod. Co., Inc., 1125 E. 23rd St., Indianapolis 5, Ind., 15, 25
For details see ad on page 325
Tel: WAbash 2448

Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 5
For details see ad on page 387
Tel: Bloomfield 2-4711

Torocoil Co., Mo., 25

United Insulator Co., Ltd., England, 5

Western Gold & Platinum Works, Calif., 5, 20

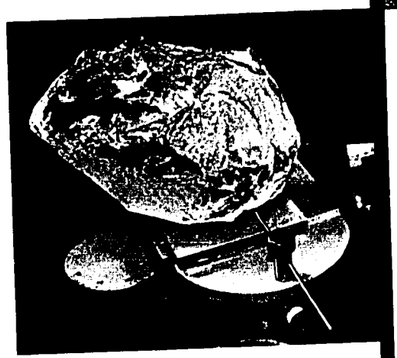
Westinghouse Elec. Corp., Pa., 15

Yale & Towne Mfg. Co., Powdered Metal Prods. Div., 9333 W. Belmont Ave., Franklin Park, Ill., 10, 20
For details see ad on page 309
Tel: Esterbrook 8-1933

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

TWO DOZEN . . .
or two thousand

Heemco



How many crystal blanks this piece of quartz may yield is unknown . . . a dozen, two dozen, or perhaps even as many as two thousand. Just how many depends on several factors, foremost of which are the pieces of quartz itself and the skill with which it is cut. What we are sure of though is that every crystal leaving the Heemco plant is designed, manufactured and tested for long-life and accuracy.

Heemco manufactures a complete line of high quality, low frequency crystals from 800 cycles to 500 KC.

HILL ELECTRONIC
ENGINEERING AND MANUFACTURING
COMPANY, INC.

NEW KINGSTOWN, PA.

They Go Together

Precision
Research
Highest quality

in

QUARTZ CRYSTAL UNITS
CRYSTAL BLANKS
LAPPING MACHINES
WORKHOLDERS or NESTS
ELECTRODES
QUARTZ CUTTING SAWS

•

Our Machine Shop and Electronic Engineering facilities are always available upon request.

•

Our completely new illustrated brochure is now available your inquiry answered immediately.

P R Hoffman Co.
321A Cherry St.
Carlisle, Penna.

now available **MINIATURE**
GLASS-ENCLOSED



from 15 to 100 Mc.

- Evacuated glass-enclosed envelope for minimized ageing effects and long term frequency stability.

Also available in hermetically sealed metal holder.



ACTUAL SIZE

Keystone Quartz Crystals, of every type, now serving the world over in military and commercial frequency control applications.

Consult with us on your miniaturization or other design problems — at either your plant or ours. Crystal brochure on request to Dept. P-7.



LICENSED UNDER WESTERN ELECTRIC PATENTS

KEYSTONE ELECTRONICS COMPANY
114 Manhattan Street / Stamford, Connecticut

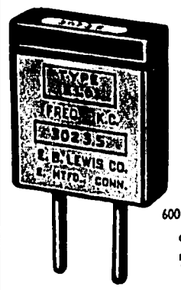
Precision
CRYSTALS
ALL TYPES



New Equipment
GOV'T TYPE
CR-18/U
1,000 KC to 15,000 KC on Fundamental.
.486" pin spacing
.050" diameter.
Hermetically sealed unit.

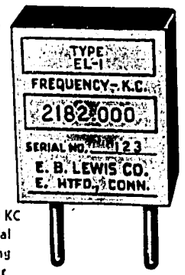
General Usage
GOV'T TYPE
FT. 243
450 KC to 15,000 KC on Fundamental
½" pin spacing
.093" diameter.





Aircraft
GOV'T
TYPE
CR-1A/AR
600 KC to 15,000 KC on Fundamental
½" Pin Spacing
.125 diameter.

Mobile and Marine
GOV'T
TYPE
CM-1
450 KC to 15,000 KC on Fundamental
¾" pin spacing
.125" diameter



Our complete line of specialized crystals includes, besides those shown: Ultrasonic, Amateur, and Professional use. They include advances in precision acquired producing thousands of units for Equipment Manufacturers, the Armed Forces, American Airlines, Civil Air Patrol, major Colleges and Universities, etc. Your requirements will be closely analyzed and your orders expertly handled.

E. B. LEWIS CO.
11 BRAGG STREET
EAST HARTFORD 8, CONN.

4. Component Parts

38. Crystals & Accessories.

5. Crystal holders
10. Crystal ovens
15. Germanium
20. Oscillating quartz crystals
25. Piezo electric

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5
For details see ad on page 429
Tel: Linden 3-1000

Alcor Electronics Corp., N.Y., 10

American Quartz Labs., N.Y., 20, 25

Augat Bros., Inc., Mass., 5

Bassett Inc., Rex, Fla., 5, 10, 20, 25

Bausch & Lomb Optical Co., N.Y., 25

Berkshire Labs., Mass., 15

Bliley Electric Co., 227 Union Station Bldg., Erie, Pa., 5, 10, 20, 25
For details see ad on page 132
Tel: 22-287

Branson Instruments, Inc., Conn., 25

Breon Labs., Pa., 5, 10, 15, 20

Brush Electronics Co., Ohio, 20, 25

Burnett Radio Lab., William W. L., Calif., 5, 10, 20

C and H Sales Co., Calif., 15

Canadian General Elec. Co., Electr. Equip., Canada, 15, 20

Canadian Radio Mfg. Corp., Ltd., Canada, 15, 20

Caribe Aircraft Radio Corp., Puerto Rico, 10

Cathodeon, Ltd., England, 5

Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 5, 25
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Clark Crystal Co., Mass., 10, 20, 25

Constantin & Co., Inc., L. L., Route 46, Lodi, N.J., 5
For details see ad on page 67
Tel: Prescott 7-0223

DX Radio Prods. Co., Ill., 5, 10, 15, 20

Dage Electric Co., Inc., Ind., 5

Dallons Labs., Inc., Calif., 20, 25

Diamond Drill Carbon Co., N.Y., Raw Quartz

Diamond Microwave Corp., Mass., 5

Eby Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 5
For details see ad on page 370
Tel: DAvenport 4-7000

Eidson Electronic Co., Texas, 20

Electrical Industries, Div. Amperex Electronic Corp., 44 Summer Ave., Newark 4, N.J., 5
For details see ad on page 146
Tel: HU 3-7112

Erie Resistor Corp., 644 West 12th St., Erie, Pa., 25
For details see ad on pages 82-83
Tel: Erie 2-1481

Erwood, Inc., Ill., 10

F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 5
For details see ad on pages 47-50
Tel: AStoria 8-2800

Freed Electronics & Controls Corp., N.Y., 5, 25

General Electric Co., N.Y.C., N.Y., 15, 20

General Electric Co., N.Y., 5, 15, 20, 25

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 20, 25
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Germanium Prods. Corp., N.J., 15

Glenco Corp., 212 Durham Ave., Metuchen, N.J., 20
For details see ad on page 284
Tel: MEtuchen 6-2800

Grayhill Inc., 505 Hillgrove Ave., LaGrange, Ill., 15, Diode Holders
For details see ad on page 375
Tel: FLeetwood 4-1040

Guideline Associates, N.J., 5

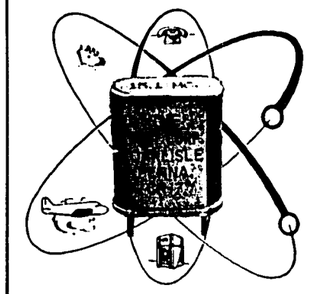
Gulton Mfg. Corp., Durham Ave., Metuchen, N.J., 25
For details see ad on page 177
Tel: Metuchen 6-2800

Hermetic Seal Products Co., 29 South 6 St., Newark 7, N.J., 5
For details see ad on page 192
Tel: MArket 3-9400

Hill Electronic Engr. & Mfg. Co., New Kingstown, Pa., 5, 10, 20, 25
For details see ad on page 310
Tel: MEchanicsburg 5578

(Continued on page 313)

STABILITY
HUNT CR-7 CRYSTAL



Miniature Type CR-7
Crystal Unit

(Illustration is actual size)

THE Hunt CORPORATION
CARLISLE 2, PENNSYLVANIA

Keep Crystal Frequency
Where You Want It With The

New LAVOIE PRECISION CRYSTAL OSCILLATOR OVEN!



The Ultimate in
Compactness...
Speed...
Accuracy

The new Lavoie Precision Crystal Oscillator oven is designed to serve as a plug-in expendable circuit element. It supplies a precise output frequency determined by the interior mounted temperature-controlled crystal. The unit is unusually compact with the vacuum tube and all circuit elements mounted inside the oven case. This design insures a degree of accuracy not normally obtained in a unit of comparable size. If you are designing and building airborne or transportable communications equipment, you will want to know more about this newest Lavoie development. Write for details.

PERFORMANCE CHART

Oscillators	#1	#2	#3	#4	#5
Frequency deviation when first turned on at room temp.	110 cycles	90 cycles	140 cycles	100 cycles	120 cycles
Warm-up time to 50 cycles deviation from room temp.	15 seconds	70 seconds	75 seconds	60 seconds	60 seconds
Frequency deviation at room temp. after warm-up	2.8 cycles	0.67 cycles	3.10 cycles	3.1 cycles	2.8 cycles
Frequency change at room temp. when output is loaded with 10 mmf capacitor	-2.5 cycles	-1.0 cycles	-0.5 cycles	-0.6 cycles	-0.8 cycles
Frequency change at + 55°C ambient	0.02 cycles	0.5 cycles	0.9 cycles	0.35 cycles	0.03 cycles
Frequency deviation when first turned on at + 55°C ambient	450 cycles	300 cycles	300 cycles	480 cycles	520 cycles
Warm-up time to 50 cycles deviation from + 55°C ambient	4 minutes	4 minutes	4½ minutes	4½ minutes	5 minutes

SPECIFICATIONS:

Frequency 500 kilocycles
Max. Deviation after 15 min. warm-up ±0.0012% (6 cycles at 500 kc)
Operating Temp. —55 to +80°C
Pressure 3 to 30 inches mercury
Vibration 10 to 55 cps (0.015 inches amplitude)
Shock 10 G
Humidity 30 days cycling at 100% RH at 50°C
Orientation Any position
Warmup ±0.01% (50 cps) after 3 minutes under any condition; after 1 minute at room temp.
Weight 9 ounces maximum
Connections Miniature 7 pin base
Supply voltages Heater: 6-12-28-110 volts, 30 watts Filament: 6.3 volts Plate: 75 volts, 3 ma max.
Load 100,000 ohm grid circuit, variation of 10 mmf shall not produce frequency charge in excess of allowable stability.
Life Not less than 500 hours without servicing; 2000 hours with reasonable servicing.

Lavoie Laboratories, Inc.
MORGANVILLE, NEW JERSEY

4. Component Parts

38. Crystals & Accessories

(Continued from page 311)

Hoffman Co., P. R., 321A Cherry St., Carlisle, Pa., 20, 25
For details see ad on page 310
Tel: CArlisle 1090

Howard Moldings, Inc., Mo., 5

Hunt Corp., 453 Lincoln St., Carlisle, Pa., 10, 20, 25
For details see ad on page 311
Tel: CArlisle 1486

Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 5
For details see ad on page 371
Tel: ORegon 7-1881

Insuline Corp. of America, N.H., 5

International Crystal Mfg. Co., Inc., Okla., 20, 25

Isolantite Mfg. Corp., N.J., Ceramic Insulating Cases

Johnson Co., E. F., Minn., 5

Kemtron Electron Prods., Inc., Mass., 15

Keystone Electronics Co., Dept. P-7, 114 Manhattan St., Stamford, Conn., 20
For details see ad on page 310
Tel: STamford 4-9504

Knights Co., The James, 101 E. Church St., Sandwich, Ill., 5, 10, 15, 20, 25
For details see ad on page 313
Tel: Sandwich 2141

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10
For details see ad on page 312
Tel: MAtawan 1-2600

Lehigh Valley Electr. Engr. & Mfg. Co., Pa., 20, Quartz Crystals

Lewis Co., E. B., East Hartford 8, Conn., 20, 25
For details see ad on page 311
Tel: JA 8-0830

Mackay, Inc., A. D., N.Y., 15

Marconi's Wireless Telegraph Co., Ltd., England, 20

McCoy Electronics Co., Chestnut and Watt St., Mt. Holly Springs, Pa., 5, 10, 20, 25
For details see ad on page 315
Tel: 376

Microlab, 71 Okner Pkwy., Livingston, N.J., 5
For details see ad on page 319
Tel: Livingston 6-0692

Midland Mfg. Co., Inc., 3155 Fiberglas Rd., Kansas City 15, Kan., 5, 20, 25
For details see ad on page 204
Tel: Finley 7950

Monitor Products Co., Calif., 5, 10, 20, 25

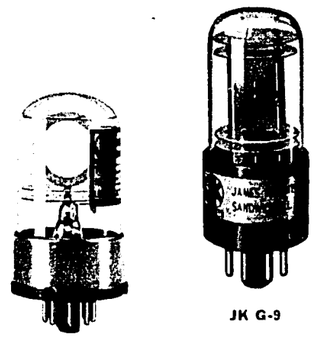
Nebel Lab., R. E., N.Y., 20, 25

Northern Elec. Co., Ltd., Canada, 15, 20

Northern Electr. & Vacuum Industries, Canada, Scintillating

(Continued on page 315)

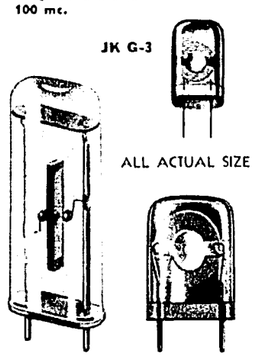
PRECISION GLASS ENCLOSED CRYSTALS over a complete range of 800 cycles to 5 mc.



JK G-9

JK G-12A—with a proven stability potential of one part in 100 million at 1000 kc.

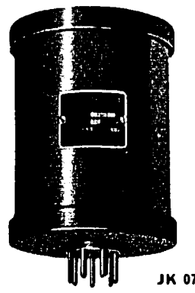
MINIATURE PRECISION GLASS ENCLOSED CRYSTALS over a complete range of 2 mc to 100 mc.



JK G-3

ALL ACTUAL SIZE

JK G-17T JK G-17



JK 07E

A Wide Range of **TEMPERATURE CONTROL OVENS**

JK 09T



JK 09



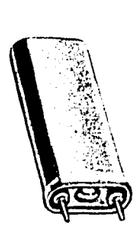
- Custom Oscillators, Crystal Filter Networks.
- Suppliers of Quartz for Ultra Sonic Transducers.
- Complete customer engineering service provided for quartz crystal applications.



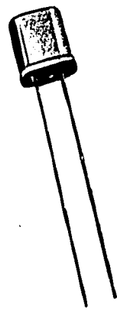
Write for technical catalog

PRODUCTS
FREQUENCY MANAGEMENT SPECIALISTS

MILITARY TYPES
Hermetic sealed, metal cased, in frequency ranges from 16 kc to 100 mc.



JK H-17T

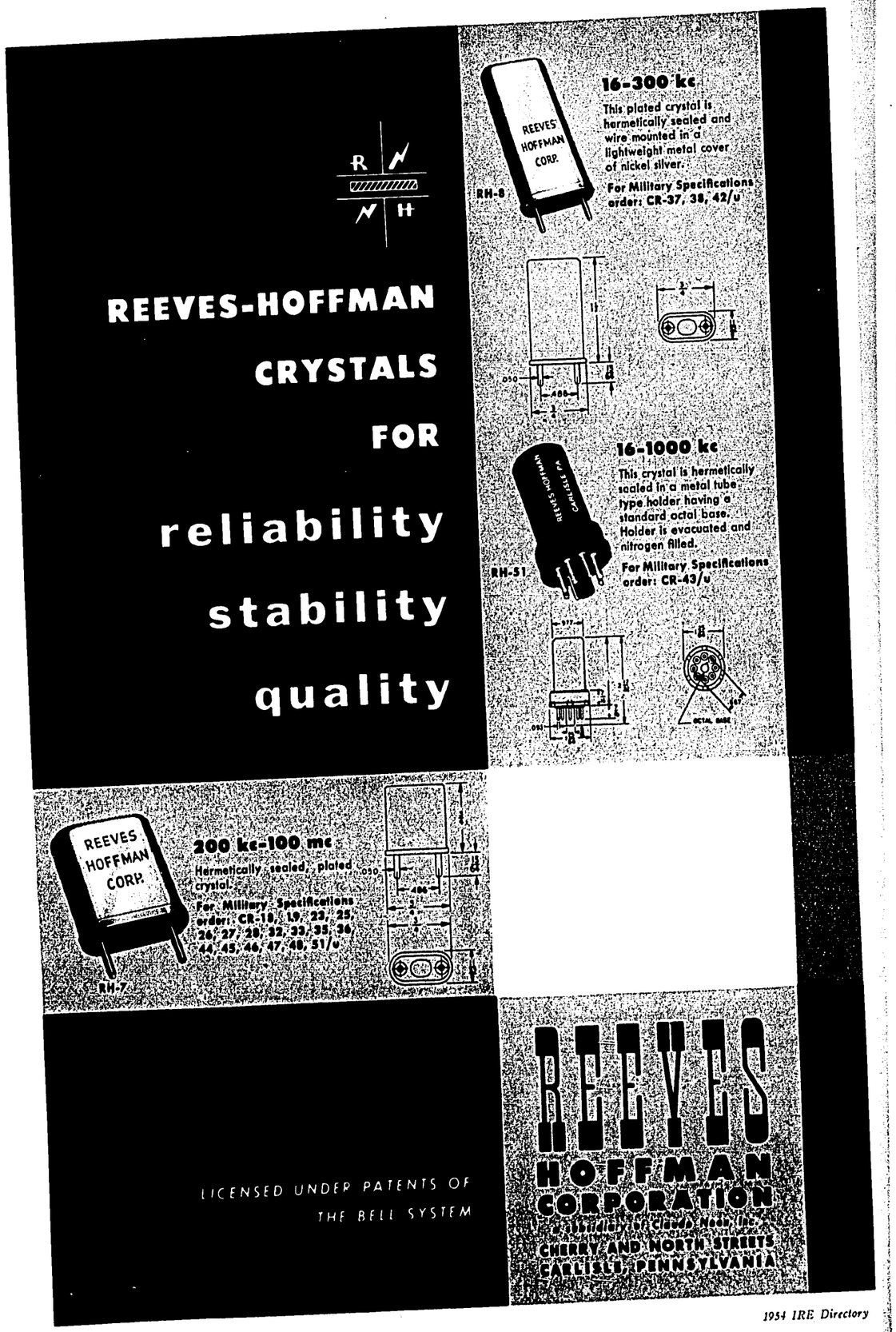


JK H-3



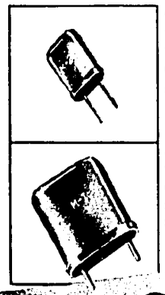
JK H-17

THE JAMES KNIGHTS COMPANY
SANDWICH, ILLINOIS





You can expect the same precision performance from both the McCoy M-1 and the M-20 "McMite," although the "McMite" is only 1/5th as big. Both crystals are produced up to 110 mc on the 5th overtone. The fact that these two crystals perform equally well in meeting widely varied job specs illustrates the versatility of McCoy design and production facilities. Whatever you need in quartz crystals, McCoy either makes them or can develop them for you. Send for free catalog today on the McCoy line of high quality, precision-made quartz crystals.



M-20 "McMite" is a sub-miniature hermetically sealed unit, adaptable to multi-channel design for communications and frequency control equipment. Can be wired into a sub-miniature selector switch assembly or soldered to a printed circuit terminal board.

M-1 is an hermetically sealed, plated crystal preferred when fundamentals below 5 mc are desired. Easily interchangeable, it plugs into a standard socket. Meets government specification MIL-C-3098A and CAA-R-916; also ARINC No. 401.

mcCoy ELECTRONICS COMPANY
MT. HOLLY SPRINGS, PENNA.
Phone 376 and 377

Licencee under patents of Western Electric Company

4. Component Parts

38. Crystals & Accessories

(Continued from page 313)

Onondaga Pottery Co., Electronics Div., 1858 W. Fayette St., Syracuse, N.Y., 25
For details see ad on page 284
Tel: SYracuse 8-1681

Petersen Radio Co., Inc., Iowa, 20

Philmore Mfg. Co., Inc., N.Y., 5

Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5
For details see ad on page 166
Tel: ULster 2-6800

Premier Res. Labs., N.Y., 5, 10, 20, 25

Press Wireless Labs., Inc., Mass., 10

RCA Victor Co., Ltd., Canada, 20

Radiation Counter Labs., Inc., Ill., 10

Radio Specialty Mfg. Co., Ore., 20

Raytheon Mfg. Co., Mass., 15

Redifon, Ltd., England, 15

Reeves-Hoffman Corp., 145 Cherry St., Carlisle 6, Pa., 5, 10, 20, 25
For details see ad on page 314
Tel: Carlisle 2480

Scientific Radio Products, Inc., 215 S. 11 St., Omaha 8, Neb., 10, 20, 25
For details see ad on page 170
Tel: ATlantic 9787

Scientific Radio Service, Md., 20

Societe Francaise Radio Electrique, France, 5, 15, 20, 25

Specialty Eng. Div., Specialty Assembly & Packing, N.Y., 5

Standard Crystal Co., Mo., 10, 15, 20

Standard Piezo Co., 265 E. Pomfret St., Carlisle, Pa., 5, 10, 20
For details see ad on page 222
Tel: Carlisle 1495

Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 25
For details see ad on pages 4-5, 325, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400

Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 5, 15
For details see ad on pages 9-14
Tel: JUdson 6-2424

Tadir, Ltd., Israel, 20, 25

Teletronics Lab., Inc., N.Y., 10

Transistor Products, Inc., Mass., 15

Transitron Electr. Corp., Mass., 15

United Insulator Co., Ltd., England, 25

United States Gasket Co., 611 N. 10 St., Camden 1, N.J., 5
For details see ad on pages 126-127
Tel: WOodlawn 4-0370

Valpey Crystal Corp., Mass., 5, 10, 20, 25

Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 20
For details see ad on pages 366, 462
Tel: WAltham 5-8700

Wakefield Industries, Inc., Ill., 10

Waveguide, Inc., Calif., 5

Wright Electronics, Mo., 10, 20, 25

Wright Eng. Co., Calif., 25

Now In Our Newly Constructed Plant Devoted Completely To

DELAY LINES*

Lumped Constant

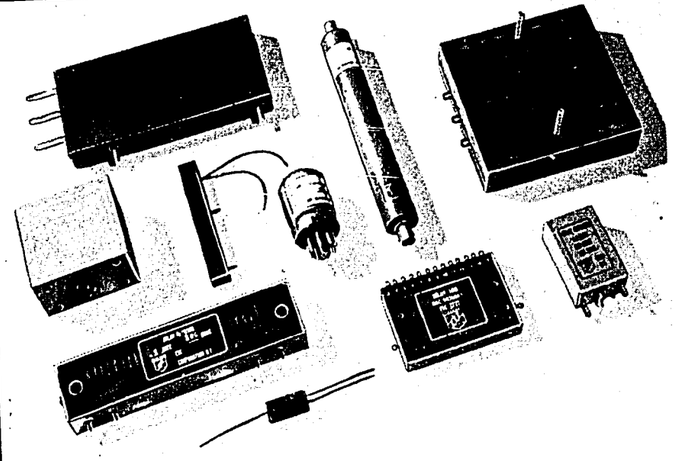
Distributed Constant

FILTER NETWORKS

PULSE TRANSFORMERS

and

DECADE DELAY LINES



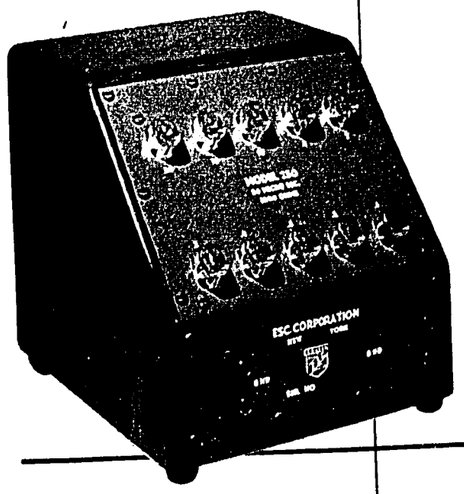
Years of research and production experience have made possible this new plant with its specialized personnel and complete facilities for the production of all types of video delay lines.

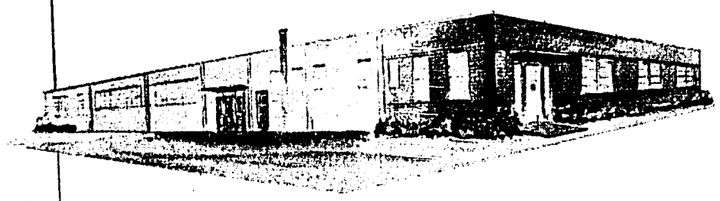
Custom-made to meet your most precise specifications, ESC Delay Lines assure you maximum engineering efficiency in a minimum of space.

* or perhaps our Delay Lines, available from stock, can meet your specifications, with early delivery dates!

Our brochure is available upon request.

For all pulse systems, ESC Decade Delay Lines meet the most rigorous specifications.

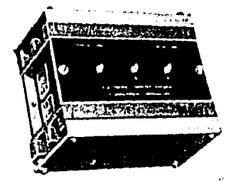


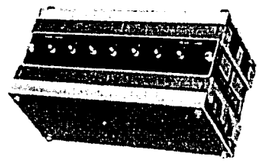


ESC CORPORATION

534 BERGEN BLVD., PALISADES PARK, NEW JERSEY

DELAY LINES by ELECOM





low attenuation...

small size...

fast rise time...

accurate delay...

Available in a wide range of delays and impedances. Can be custom-built to withstand environmental conditions specified by the armed services.

Underwood Delay Lines are a co-product of Underwood's pioneering work in the electronic computer field. Call or write Underwood for literature and full details.

ELECTRONIC COMPUTER DIVISION

UNDERWOOD CORPORATION

35-10 36th Ave., Long Island City 6, N.Y.
Phone EX 2-3400

4. Component Parts

Product 39

39. Delay Lines.

5. Distributed constant
10. Distributed perameter
15. Lumped constant
20. Sonic

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 5, 10, 15
For details see ad on page 401
Tel: Prescott 8-3687

Aerocoil, Inc., N.J., 5, 10, 15

Aerolite Electronics Corp., 507 26 St., Union City, N.J., 5, 10, 15, 20
For details see ad on page 500
Tel: UNion 3-2955

Aerovox Corp., Mass., 5, 10, 15

American Television Mfg. Corp., Ill., 15

Andersen Labs., Inc., 37 Talcott Rd., West Hartford 10, Conn., 20, Ultra Sonic
For details see ad on page 318
Tel: ADams 3-4491

Arenberg Ultrasonic Lab., Mass., 20

Bliley Electric Co., 227 Union Station Bldg., Erie, Pa., Ultrasonic
For details see ad on page 132
Tel: 22-287

Brew & Co., Inc., Richard D., Mass., 5, 10, 15, 20

Brubaker Mfg. Co., Inc., Calif., 5, 10, 15

Burnell & Co., 45 Warburton Ave., Yonkers 2, N.Y., 15
For details see ad on page 144
Tel: Yonkers 5-6800

Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 5, 15
For details see ad on page 502
Tel: Trowbridge 6-2800

Canadian General Elec. Co., Canada, 5

Canoga Corp., Calif., 15

Carad Corp., Calif., 15

Coil Winders, Inc., N.Y., 15

Columbia Technical Corp., N.Y., 5, 10

Communication Accessories Co., 110 St., & Hillcrest Rd., Hickman Mills, Mo., 15, 20
For details see ad on pages 80-81
Tel: South 5528

Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 5
For details see ad on page 152
Tel: PL 4-5502

Computer Control Co., Inc., 92 Broad St., Babson Park 57, Mass., Solid Acoustic
For details see ad on page 403
Tel: Belmont 5-6161

Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 5, 15
For details see ad on page 317
Tel: Huntington 4-7961

Corning Glass Works, N.Y., 10, 20

Corona Engineering Service, N.Y., 15

Dallons Labs., Inc., Calif., 20

Demco Products, Pa., 5, 10, 15, 20

Deutschmann Corp., Tobe, Mass., 15

Developmental Electronics Corp., Calif., 5, 10, 15

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 5, 10, 15
For details see ad on page 316
Tel: Windsor 7-0400

El-Rad Mfg. Co., Ill., 5

Electronic Computer Div., Underwood Corp., 35-10 36 Ave., Long Island City 6, N.Y., 15
For details see ad on page 317
Tel: Exeter 2-3400

Electrometric, Inc., Ill., 5, 10, 15

Empire State Laboratories, Inc., N.Y., 5, 15

Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 5, 10, 15, 20
For details see ad on page 318
Tel: CO 6-3228

Federal Telecommunication Labs., Div. I T & T, N.J., 10

Forbes Wagner, Inc., N.Y., 5, 15

Freed Electronics & Controls Corp., N.Y., 20

Fugle-Miller Labs., Inc., 398 Main St., Metuchen, N.J., 15
For details see ad on pages 171, 292
Tel: ME 6-2245

General Chem. Div., Allied Chem. & Dye Corp., N.Y., 15

General Electric Co., N.Y.C., N.Y., 5

General Electric Co., N.Y., 5, 10

(Continued on page 318)

DELAY LINES

FIXED & VARIABLE

For: LABORATORY — COLOR TELEVISION COMPUTERS — RADAR — etc.

- 0.6 μsec, 0.8 μsec, 1.0 μsec fixed, for Color T.V.
- Variable for permanent installation in equipment.
- Equalize delays in T.V. studios.
- Miniaturized and special types, wide band, precise.

CONTROL ELECTRONICS CO., INC.
1927 New York Ave., Huntington Station, Long Island, N. Y.
Tel. HU. 4-7961

DATA-HANDLING COMPONENTS BY EPSCO

Epsco components are units having unusual characteristics intended for application in systems where reliability is of primary importance. Every effort is taken in the manufacturing process to insure that each unit more than meets its electrical and mechanical specifications.

MAGNETIC CORE STORAGE ELEMENTS

Units capable of operating at exceptional high rates of data transmission with unusually low power requirements. May be used as shift registers control elements and storage elements at megacycle pulse rates.

MAGNETIC RECORDING HEADS

Particularly designed for magnetic drum recording systems Epsco recording heads are low cost units which may be advantageously applied wherever gaps of 1 mil or greater are desired.

PULSE & VIDEO TRANSFORMERS

Complete line of miniature encapsulated and hermetically sealed pulse transformers in a wide variety of turns ratios characteristic-impedance levels, etc. Standard units are available from stock—Rapid delivery can be made on both sample orders for special units and subsequent production. Unusual uniformity and temperature stability. Extremely large ratios of droop time to rise time (i.e. extremely wide band widths; on the order of 3000:1).

LUMPED-CONSTANT DELAY LINES

Exceptionally high delay to rise time ratios and exceptionally low attenuation—packaged to customer specification. Units exhibit less than 0.3% change in total delay over the temperature range −65°C to +150°C.

DISTRIBUTED CONSTANT DELAY LINES

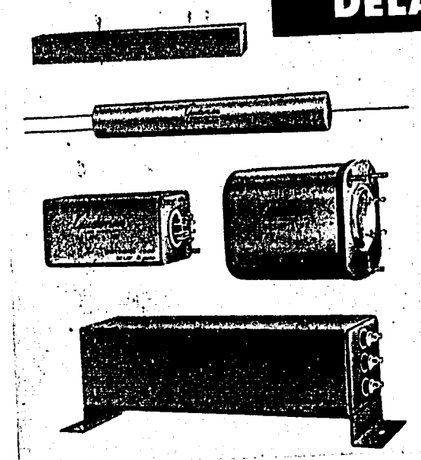
Ultra-stable miniature units having exceptional delay to rise time ratios and uniformity from unit to unit.

EPSCO, INCORPORATED

126 Massachusetts Avenue — Boston, Mass.

Precision

MINIATURE DISTRIBUTED PARAMETER DELAY LINES



to your specifications

SPECIFICATION RANGE

Delay: .01 to 20 microseconds

Rise Time: .07 √ delay to .8 √ delay

Characteristic Impedance: 50 to 3300 ohms

Ripple Content: 10, 5 or 2%

Operating Temperature Range: −65° to 125° C (to 200° C on special order)

All models are Epoxy impregnated and encapsulated or hermetically sealed to meet military environmental requirements.

- Also available to your specifications: Continuously Variable, Decade Variable, and Lumped Parameter delay lines.
- Your inquiries regarding specific applications are invited. Quotations will be made without obligation.

THE Gudeman COMPANY OF CALIFORNIA INC

9200 Exposition Boulevard
Los Angeles 34, California
Telephone: TExas 0-7317

4. Component Parts

39. Delay Lines.

(Continued from page 317)

General Instrument Corp., N.J., 5, 10, 15
General Instrument Corp., F. W. Sickles Div., Mass., 5, 10, 15
Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 5, 10, 15
For details see ad on pages 318, 385
Tel: Texas 0-7317
Gulton Mfg. Corp., Durham Ave., Metuchen, N.J., 15
For details see ad on page 177
Tel: Metuchen 6-2800
Guthman & Co., Inc., Edwin I., Ill., 5, 10, 15
Helipot Corp., Div. Beckman Instruments, Inc., 916 S. Meridian Ave., S. Pasadena, Calif., 10
For details see ad on page 158
Tel: PYramid 1-2164
Ideal Industries, Ill., 10
Jacobs Instrument Co., Md., 5, 15
Laboratory For Electronics, Inc., Mass., 20
Leonard Elec. Prods. Co., Inc., N.Y., 5, 10, 15, 20
Linear Equipment Labs., Inc., 1 Brightwater Place, Massapequa, L.I., N.Y., 5
For details see ad on page 191
Tel: MA 6-3023

SOLID ultra-sonic DELAY LINES

for compactness and stability over wide temperature ranges.

andersen Laboratories INCORPORATED

37 Talcott Road
West Hartford 10, Conn.

4. Component Parts

39. Delay Lines.

Mahoney Teletronic Labs., Inc., N.J., 15
May Engineering Co., Calif., 5, 10, 15
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 15
For details see ad on page 548
Tel: MA 4-4108
Networks Electronic Corp., Calif., 5, 10, 15
Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 15
For details see ad on page 321
Tel: Mulberry 4-5858
Ossian Mfg., Co., Ind., 5, 10, 15, 20
P.C.A. Electronics, Inc., Calif., 5, 10, 15
Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 5
For details see ad on page 484
Tel: WHitehall 4-3570
Radio Condenser Co., N.J., 15
Radio Industries, Inc., Ill., 5, 15
Raypar, Inc., Ill., 5, 10, 15
Redman Electronics Corp., Conn., 5, 10, 15
Ross Mfg. Co., Iowa, 5, 15
Royal Electronics Co., D.C., 5, 10, 15
Shallcross Mfg. Co., Pa., 5, 10, 15
Sightmaster Corp., N.Y., 15
Sprague Electric Co., Mass., 5
Standard Coil Prods. Co., Inc., Calif., 5, 10, 15
Technitrol Eng. Co., Pa., 5, 10
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 15
For details see ad on page 474
Tel: WEbster 9-9520
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 10, 15
For details see ad on page 224
Tel: AMityville 4-4446
Titeflex, Inc., N.J., 15
U. S. Electronics Corp., N.J., 5, 10, 15
United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 15, 20
For details see ad on page 582
Tel: ALgonquin 5-3500
Vanguard Electronics Co., Calif., 5, 15
West Coast Electronics Co., Calif., 5, 10, 15
White Industries, Inc., N.Y., 5, 10, 15
Winters Engineer, T. Starling, N.J., 15, High Voltage

40. Filters.

5. Mechanical
10. Microwave
15. RF noise reduction
20. TV noise reduction
25. UHF & VHF

Aerocoil, Inc., N.J., 15, 20, 25
Aeronautical Radio Mfg. Co., N.Y., 15
Aerovox Corp., Mass., 15, 20, 25

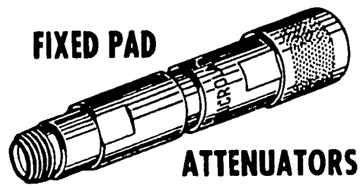
See also listings for Audio Filters Page 244

40. Filters.

Affiliated Products, Inc., Pa., 15, Power Line
Air Associates, Inc., N.J., 15
Aircraft Transformer Corp., West and Willow Aves., Long Branch, N.J., 15
For details see ad on page 379
Tel: Long Branch 6-6250
Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 10
For details see ad on page 429
Tel: Linden 3-1000
Alford Manufacturing Co., Inc., Mass., 25
All-Tronics, Inc., N.Y., 15
Allied Industries, Inc., Ky., 10, 25
Amy, Aceves & King, Inc., N.Y., 25
Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 15
For details see ad on page 487
Tel: LIvingston 8-1545
Arrow Radio Co., Canada, 15
Astron Corp., 255 Grant Ave., East Newark, N.J., 15, 20, 25
For details see ad on page 282
Tel: Humboldt 2-7800
Automatic Mfg. Corp., N.J., 15, 20, 25
Balco Research Labs., N.J., 15, 20
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 15
For details see ad on pages 96-97
Tel: FI 2-1821
Bird Electronic Corp., 1797 E. 38 St., Cleveland 14, Ohio, 15
For details see ad on page 328
Tel: EX 1-3535
Blackstone Electronic Co., Ill., 5
Bogart Mfg. Corp., N.Y., 10
Bud Radio, Inc., Dept. RE, 2118 East 55 St., Cleveland 3, Ohio, 15, 20
For details see ad on page 145
Tel: HE 1-7166
Budd-Stanley Co., Inc., 43-01 22 St., Long Island City 1, N.Y., 10
For details see ad on page 428
Tel: STillwell 6-1706
Caddell-Burns Mfg. Co., Inc., 40 East 2nd St., Mineola, L.I., N.Y., 15
For details see ad on page 291
Tel: Pioneer 6-2310
Calbest Eng. & Electronics Co., Calif., 25
Carad Corp., Calif., 15
Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 15, 20
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Chicago Standard Transformer Corp., Ill., 10, 25
Chrysler Corp., Amplex Div., Mich., 5

(Continued on page 320)

COAXIAL COMPONENTS by μ LAB

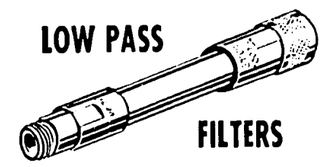


FIXED PAD ATTENUATORS

- D.C. TO 3000 Mc.
- 1 TO 60 db.
- LOW VSWR
- LOW COST

- 100 TO 4000 Mc.
- LOW PASS BAND VSWR AND ATTENUATION
- SHARP CUT-OFF
- BROAD STOP BAND

LOW PASS FILTERS



Write for complete catalog

- coaxial terminations
- frequency multipliers
- high pass filters
- stub tuners
- xtal/bolo mounts
- power line filters
- power dividers
- baluns

MICROLAB

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35,000

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Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfuly eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information —fast.

Machol Edge Index is just one more modern service to help the user find information fast.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

THE INSTITUTE OF RADIO ENGINEERS

BRyant 9-7550 • ADVERTISING DEPT., 1475 BROADWAY, NEW YORK 36, N.Y.

4. Component Parts

40. Filters.

(Continued from page 319)

Church Co., George H., Minn., 15, 20
Coil Winders, Inc., N.Y., 15, 20
Cole Instrument Co., Calif., 15
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 5, 10
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281
Communication Accessories Co., 110 St. and Hillcrest Rd., Hickman Mills, Mo., 5, 15, Audio and Carrier Frequency
For details see ad on pages 80-81
Tel: South 5528
Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio, 15
For details see ad on page 360
Tel: Clearwater 1-6500
Corbin Corp., Md., 15, 25
Cornell-Dubilier Electric Corp., Dept. MB4, 333 Hamilton Blvd., S. Plainfield, N.J., 15, 20, 25
For details see ad on page 154
Tel: Plainfield 6-9000
Corning Glass Works, N.Y., 25
Crowley & Co., Inc., Henry L., N.J., 10
De Mornay-Bonardi, Calif., 10
Deutschmann Corp., Tobe, Mass., 10, 15, 20, 25
Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 10
For details see ad on page 430
Tel: NE 6-6900
Drake Co., R. L., Ohio, 15, High and Low Pass
ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 15, 25
For details see ad on page 316
Tel: Windsor 7-0400
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15, 20, 25
For details see ad on page 487
Tel: Pioneer 6-5212
Electralab, Inc., 74 Atherton St., Boston 30, Mass., 10, 25
For details see ad on page 348
Tel: JO 4-3230
Electro-Search, 4337 N. 5 St., Philadelphia 40, Pa., 10
For details see ad on page 488
Tel: GL 5-5353
Electronic Designs, Inc., N.Y., 15
Emerald Mfg. Co., Ill., 15
Erdco Engineering Corp., Ill., 15
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 10
For details see ad on pages 47-50
Tel: Astoria 8-2800
FSD Laboratories, Conn., 15
Federal Telecommunication Labs., Div. I T & T, N.J., 10
Filtron Co., Inc., N.Y., 15, 20, 25
Forbes Wagner, Inc., N.Y., 15, 20
Freteo, Inc., Pa., 25
Gates Radio Co., Ill., 25
General Electric Co., N.Y., 15, 25
General Instrument Corp., N.J., 20, 25

4. Component Parts

40. Filters.

General Instr. Corp., F. W. Sickles Div., Mass., 25
Gudeman Co., 340 W. Huron St., Chicago 10, Ill., 15, 20, 25
For details see ad on page 29
Tel: Delaware 7-7400
Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 15, 25
For details see ad on pages 318, 385
Tel: Texas 0-7317
Gulton Mfg. Corp., Durham Ave., Metuchen, N.J., 5
For details see ad on page 177
Tel: Metuchen 6-2800
Hopkins Engineering Co., Calif., 15, 25
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 10
For details see ad on page 431
Tel: FArmingdale 2-3606
Industrial Condenser Corp., Ill., 15, 20
Insuline Corp. of America, N.H., 20
Jerrold Electronics Corp., Pa., 20
Johnson Co., E. F., Minn., 15
Kings Electronics Co., N.Y., 10, 15, 25
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 25
For details see ad on page 312
Tel: MAtawan 1-2600
Lenkurt Electric Co., Inc., Calif., 25
Levinthal Electr. Prods., Inc., Calif., 10
Lieco, Inc., N.Y., 10
Mackenzie Prods. Co., The, Conn., 10, 25
Mallory & Co., Inc., P. R., Ind., 15
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 10
For details see ad on page 432
Tel: Raymond 3-1508
Micamold Radio Corp., N.Y., 15
Microlab, 71 Okner Pkwy., Livingston, N.J., 10, 15, 20, 25
For details see ad on page 319
Tel: Livingston 6-0692
Microwave Consultants, N.Y., 10, 25
Miller Co., J. W., Calif., 15, 20
Miller Instruments, Inc., William, Calif., 15, 25
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 10
For details see ad on page 461
Tel: Pioneer 6-4560
National Capacitor Co., Mass., 15, 20
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 10, 25
For details see ad on page 344
Tel: KI 7-0469
Northern Elec. Co., Ltd., Canada, 10, 20
Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 15, 20, 25
For details see ad on page 321
Tel: MUlberry 4-5858
P C A Electronics, Inc., Calif., 15
Pittsburgh Coil Co., Pa., 20
Plastic Capacitors, Inc., Ill., 15
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 10
For details see ad on page 166
Tel: ULster 2-6800
Potter Co., The, Ill., 15, 20
Precision Electronics, Inc., Ill., 15, 20
Premier Instrument Corp., 52 W. Houston St., New York 12, N.Y., 10
For details see ad on page 433
Tel: GRamercy 5-3520
Pyramid Electric Co., 1445 Hudson Blvd., N. Bergen, N.J., 15
For details see ad on page 212
Tel: UN 5-1776
Q-Line Mfg. Corp., N.Y., 25
Radio Industries, Inc., Ill., 15, 20, 25
Raypar, Inc., Ill., 20
Ross Mfg. Co., Iowa, 15, 20
Schutter Mfg. Co., Carl W., N.Y., 5, 10
Sel-Rex Precious Metals, Inc., Dept. IRE-54, 229 Main St., Belleville 9, N.J. 5, for liquids
For details see ad on page 536
Tel: Plymouth 9-0200
Shielding, Inc., 10 Reserve St., Riverside Park, N.J., 15
For details see ad on page 442
Tel: RIverside 4-1202
Sonar Radio Corp., N.Y., 20
Spencer-Kennedy Labs, Inc., Mass., 25
Speer Carbon Co., Pa., 25
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 10
For details see ad on pages 23-24
Tel: FIeldstone 7-3600
Sprague Electric Co., Mass., 15
Standard Coil Prods. Co., Inc., Calif., 15, 20, 25
Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass., 5
For details see ad on page 304
Tel: SOuth 8-1170
Summit Electronics, Inc., N.J., 15
Superex Electronics Corp., N.Y., 15
Technical Appliance Corp., N.Y., 25
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas 15
For details see ad on page 226
Tel: DI 1781
Thordarson-Meissner Mfg. Div., Ill., 15, 20
U. S. Electronics Corp., N.J., 15, 20, 25
United Technical Labs., N.J., 15
United Transformer Co., 150 Varick St., New York 16, N.Y., 15
For details see ad on page 582
Tel: Algonquin 5-3500
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10
For details see ad on pages 366, 462
Tel: Waltham 5-8700
Vidaire Electronics Mfg. Co., N.Y., 15, 20, 25
Vocaline Co. of America, Inc., Conn., 15, 20
Vokar Corp., Mich., 15
Western Coil Prods. Co., Inc., Calif., 15
White Industries, Inc., N.Y., 15
White Instrument Labs., Texas, R. C., Twin-T, Low Pass, Servo Rate
Yonkers Industries, Inc., N.Y., 15, Wave Traps

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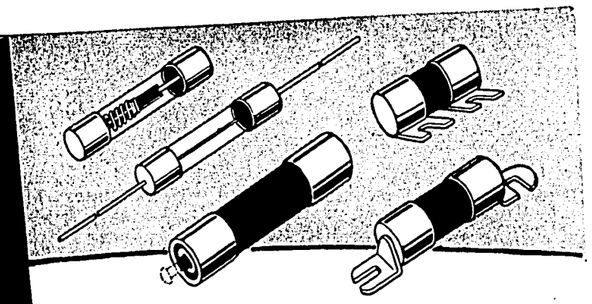
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University at Jefferson, St. Louis 7, Mo.

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Company_____

Address_____

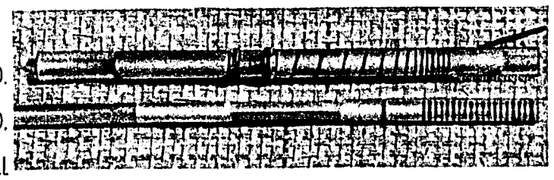
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± .0003 I.D.
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PRECISION FORM GLASS PARTS

Equipment Manufacturers have long been seeking lower drift components to further stabilize the performance of equipment in the higher frequency ranges. When metallized glass forms were first introduced, great improvements were experienced, but constructional methods limited the shapes and electrical qualities for electronic applications. Now, another great improvement is available. BEL Fuse Inc. is now offering a wide variety of features heretofore unavailable, such as;

GLASS TUBE TRIMMERS



BEL trimmer forms and complete assemblies are available in a wide variety of ranges. Let us quote on your present parts and help design stable glass into your product.

- EXTREMELY HIGH TOLERANCES TO GUARANTEE UNIFORMITY IN PRODUCTION—Coil forms are held to ± .0003 I.D., ± .0005 O.D. with wall thickness down to .020.
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- BEL PRECISION INDUCTANCES CAN BE HELD TO ± 0.5 MEG. OVER 900 MEG. BAND SPREAD IN PRODUCTION QUANTITIES.
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- MOUNTING BRACKETS AND COMPLETE ASSEMBLIES.
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FUSE INC.
311 MOUNTAIN RD • UNION CITY, N. J.

4. Component Parts

41. Fuses & Fuse Holders.

5. Fuses 10. Fuse holders

Accurate Electronics Corp., Ohio, 10

Aerolite Electronics Corp., 507 26 St., Union City, N.J., 10
For details see ad on page 500
Tel: UNion 3-2955

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 10
For details see ad on page 296
Tel: Brockton 160

American Radio Hardware Co., N.Y., 10

Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 5
For details see ad on pages 203, 293
Tel: POrt Washington 7-3703

Atlas E-E Corp., Bedford Airport, Bedford, Mass., 10
For details see ad on page 501
Tel: LExington 9-3911

Bel Fuse, Inc., 311 Mountain Rd., Union City, N.J., 5, 10
For details see ad on page 323
Tel: Union 6-5416

Bussman Mfg. Co., Dept. IRE-D54, University at Jefferson, St. Louis 7, Mo., 5, 10
For details see ad on page 322
Tel: Garfield 1-1740

Chatham Electronic Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5, Vacuum
For details see ad on pages 86-87
Tel: Livingston 6-1100

Cinch Manufacturing Corp., 1026 S. Homan Ave., Chicago 24, Ill., 10
For details see ad on pages 110-111
Tel: Nevada 2-2000

Dante Electric Mfg. Co., Conn., 10

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 10
For details see ad on page 370
Tel: Davenport 4-7000

Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 10
For details see ad on page 505
Tel: Delaware 7-5776

Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 5, 10
For details see ad on page 539
Tel: ROckford 5-9548

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 10
For details see ad on page 507
Tel: Rockford 5-9548

General Fuse Co., N.J., 5, 10

General Laminated Prods. Co., Inc., Ill., 10

Ilsco Copper Tube & Prods, Inc., Ohio, 10

Insuline Corp. of America, N.H., 10

JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 10
For details see ad on page 286
Tel: BE 6-9200

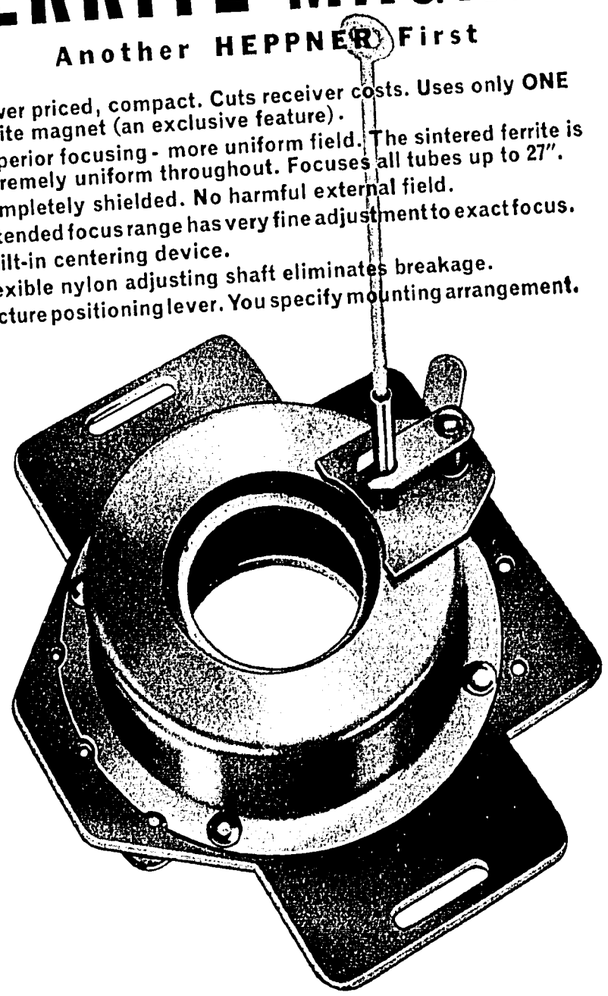
Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 624, Ill., 10, Fuse Holders
For details see ad on page 110-111
Tel: NE 2-2000

(Continued on page 325)

NEW lower priced FOCOMAG USES SINGLE FERRITE MAGNET

Another HEPPNER First

- Lower priced, compact. Cuts receiver costs. Uses only ONE ferrite magnet (an exclusive feature).
- Superior focusing - more uniform field. The sintered ferrite is extremely uniform throughout. Focuses all tubes up to 27".
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THOMAS & SKINNER Steel Products Company, Inc.

1125 EAST 23RD STREET, INDIANAPOLIS 7, INDIANA

4. Component Parts

41. Fuses & Fuse Holders.

(Continued from page 323)

Kolton Elec. Mfg. Co., N.J., 10
Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill., 5, 10
For details see ad on page 68
Tel: Vanderbilt 4-1188
Neo-Sil Corp., N.J., 10
Northern Elec. Co., Ltd., Canada, 5, 10
Rodale Mfg. Co., Inc., Pa., 5
Smith, Inc., Herman H., N.Y., 10
Smith & Stone, Ltd., Canada, 5, 10
Star Fuse Co., Inc., N.Y., 5, 10
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 10
For details see ad on pages 9-14
Tel: Judson 6-2424
United Insulator Co., Ltd., England, 5

42. Magnets.

5. Electro 10. Permanent

All Star Products, Inc., Ohio, Ion Traps
Allied Control Co., Inc., N.Y., 5
Arnold Engineering Co., Dept. P-81, P.O. Box G, Marengo, Ill., 10
For details see ad on page 134
Tel: Marengo 38
Atlas Engineering Co., Inc., Mass., 5
Automatic Elec. Mfg. Co., Minn., 10
Beam Instruments Corp., N.Y., 10
Carboloy Dept. General Elec. Co., Mich., 10
Cole Instrument Co., Calif., 5
Comar Electric Co., 3349 W. Addison St., Chicago 18, Ill., 5
For details see ad on page 152
Tel: Juniper 8-2410
C-T-O Coil Co., Inc., R.I., 5
Crowley & Co., Inc., Henry L., N.J., 10
Crucible Steel Co. of America, 405 Lexington Ave., N.Y., N.Y. and Henry W. Oliver Bldg. Box 88, Pittsburgh 30, Pa., 10
For details see ad on page 156
Tel: Atlantic 1-3800 (Pa.)
Cutler-Hammer, Inc., Wis., 5
Deluxe Coils, Inc., Ind., 5
Dormeyer Industries, Ill., 5
General Elec. Co., Carboloy Dept., Mich., 10
Glaser-Steers Corp., N.J., 5
Guardian Electric Mfg. Co., 1621-IRE W. Walnut St., Chicago 12, Ill., 5
For details see ad on page 190
Tel: CHesapeake 3-1100
Hasler-Tel Co., N.Y., Tachometer
Heppner Mfg. Co., Box 1207, Round Lake, Ill., Ion Traps
For details see ad on page 324
Tel: ROund Lake 6-2161
High Voltage Engineering Corp., Mass., 5
Indiana Steel Products Co., Ind., 10
Ketay Mfg. Corp., N.Y., 5
Kurman Elec. Co., Inc., N.Y., 5

(Continued on page 327)

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Electronic Computers	Fee $1
Engineering Management	Fee $2
Industrial Electronics	Fee $2
Information Theory	Fee $1
Instrumentation	Fee $1
Medical Electronics	Fee $2
Microwave Theory and Techniques	Fee $2
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Name .....
Address .....
Place .....
Please enclose remittance with this order.

4. Component Parts

42. Magnets.

(Continued from page 325)

Little, Inc., Arthur D., Mass., 5
Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 10
For details see ad on page 248
Tel: E 5471
Master Appliances, Inc., Ind., 5
Mullard, Ltd., England, 10
Northern Elec. Co., Ltd., Canada, 10
Permag Corp., 210 Taaffe Pl., Brooklyn 5, N.Y., 10
For details see ad on page 327
Tel: MAin 2-0114
Plamondon Magnetics Co., Ill., 10
Process & Instr., N.Y., 5
Richardson Labs., Kenneth, N.Y., 5
Simonds Saw & Steel Co., N.Y., 10
Smith Mfg. Co., Nathan R., Calif., 5
Stackpole Carbon Co., Electr Div., Tannery St., St. Marys, Pa., 10
For details see ad on pages 84-85
Tel: 41-521
Standard Electrical Prods. Co., Ohio, 5
Struthers-Dunn, Inc., N.J., 5
Teleradio Eng. Corp., N.Y., 5, 10
Thomas & Skinner Steel Prod. Co., Inc., 1125 E. 23 St., Indianapolis 7, Ind., 10
For details see ad on page 325
Tel: WAbash 2448
Thompson, Harris A., Colo., 5, Lightweight
Triumph Mfg. Co., Ill., 5
Varian Associates, 611 Hansen Way, Palo Alto 2, Calif., 5, 10
For details see ad on page 398
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OF GENERAL ELECTRIC CO.

PERMAG CORP., 210 TAAFFE PL., BROOKLYN 5, N. Y. - Phone: MAin 2-0114

43. Meters (Indicating Instruments).

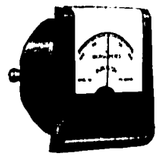
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15. Frequency indicating
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30. Milli-ammeters
35. Voltmeters
40. Volume level, (D)B & VU)
45. Wattmeters & watt hour meters

Adler Communications Labs., N.Y., 40
Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 15, 35
For details see ad on page 401
Tel: PRescott 8-3687
Aero Instrument Co., Calif., 10, 15
Assembly Products, Inc., Ohio, 5, 25, 30, 35
Auto-Test, Inc., Ill., 5
Aviation Eng. Div. Avien Knickerbocker, N.Y., Aircraft
Bassett, Inc., Rex, Fla., 15
Beckman Div. Beckman Instr., Inc., 820 Mission St., S. Pasadena, Calif., 25
For details see ad on page 138
Tel: PYramid 1-2141
Beede Electrical Instr. Co., Inc., N.H., 5, 20, 25, 30, 35, 40
Berkeley, Div. Beckman Instruments, Inc., 2200 Wright Ave., Richmond 3, Calif., 10, 15
For details see ad on page 138
Tel: Landscape 6-7730
Borden Engineering Co., N.J., 20, 25, 35
Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., Counting Dials
For details see ad on page 140
Tel: Janesville 6616
Bristol Co., Conn., 5, 10, 20, 25, 30, 35, 45
Brush Electronics Co., Ohio, 5, 15, 35, 40
Burlington Instrument Co., 143 N. 3d St., Burlington, Iowa, 5, 10, 15, 20, 25, 30, 35, 40
For details see ad on page 327
Tel: BUrlington 7241

(Continued on page 329)

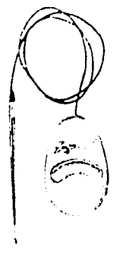
Burlington PANEL INSTRUMENTS


Square Front Board


2½" Sq. Flush Plexiglas Front


Fan Shaped

SWIFTEM TEMPERATURE INDICATORS
Pocket carrying or panel instruments for temperature applications using the "Swiftem" principle. Ranges: minus 50°C to plus 300°C. A handy six ounce tool for the refrigeration serviceman, laboratory or photographic technician.




Round Flush


Square Semi-Flush

Burlington offers a wide selection of dependable, tested panel meters in metal and bakelite cases, in ranges to fit just about every situation—hermetically sealed or sealed ruggedized. Illuminated, Rectifier and R.F. Thermocouple types available in wide range. VU and DB meters in all case styles. *Write for Catalog N1. Burlington custom builds instruments to your specifications.*

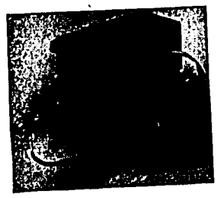

Shock resistant D'arsonval movement, long scale arc.
Edgewise

Burlington Instrument Company, 143 N. Third St., Burlington, Iowa

TERMALINE-THRULINE Coaxial Line Instruments



MODEL 67



TERMALINE Direct-Reading RF Wattmeters 30 mc-500 mc; 50 ohms; ½ W-5 KW — Load Type
THRULINE Direct-Reading RF Wattmeters 25-1000 mc; 10-500 watts — "Thru" Type

TERMALINE Wattmeters

The TERMALINE wattmeter is a direct-reading, absorption type instrument for simple, fast and accurate power measurement of transmitters operating between 30 mc and 500 mc. With the TERMALINE coaxial load resistor dissipating all power applied, a crystal voltmeter circuit built into the input connector of the wattmeter feeds a dc meter which is calibrated directly in RF watts. Accuracy of 5% of full scale or better is assured. Model 611 is the commercial version of the Army-Navy ME-11/U RF wattmeter, widely used by all government services. Most transmitter manufacturers use the TERMALINE wattmeter for production and field test work and recommend it to maintain performance.

Frequency Range .. 30 to 500 mc. (See Table)
Power Range ..... ½ watt to 5000 watts
Impedance ..... 50 ohms
Accuracy ..... 5% of full scale. VSWR less than 1.1

Model	Freq. Range	Max. Power	Ranges	Scales	Input Connector
611	30-500 mc	60 W	2	0-15 0-60	Female N. Takes UG-21/U plug
612	30-500 mc	80 W	2	0-20 0-80	Female N. Takes UG-21/U plug
67	30-500 mc	500 W	3	0-25 0-100 0-500	Coplanar. Adapter to UG-21/U supplied. Available accessories: RG-17 and RG-19 Cable assemblies, adapters to rigid lines.
67C	30-500 mc	2500 W (Water cooled)	3	0-100 0-500 0-2500	
824	30-220 mc	5000 W (Water cooled)	1	0-5000W	

Special scale Model 61 for low powers such as 0-1, 0-5 watts also available.



MODEL 81

TERMALINE-Coaxial Terminations

The Termaline coaxial load resistor is designed to have a constant 50 ohm impedance over a wide frequency range. Its unique design puts reactance to work and produces an almost purely resistive load, with little or no sensitivity to frequency change. The active power dissipating portion is the outer surface of a cylindrical film-type resistor, which forms the center conductor of a special self-terminated coaxial structure.

Major use is as a dummy load for high frequency transmitters. Being non-radiating, adjustment of transmitters can be made without violation of FCC rules. Thousands are now being used in military equipment. It is incorporated as standby in many commercial transmitters and as a test load.

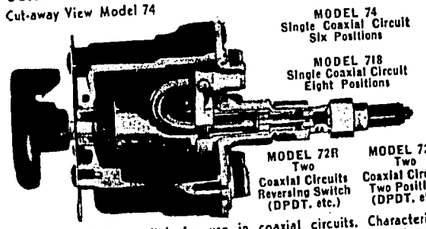
50 ohms 5w.-2500w.

Model	Max. Power	Useful Freq. Range	Max. VSWR	Input Connector
80-F	5 W	0-4 KMC	1.2	Type N Female
80-M	5 W	0-4 KMC	1.2	Type N Male
80A	20 W	0-500 MC	1.1	Type N Female
81	50 W	0-4 KMC	1.2	Type N Female
81B	80 W	0-4 KMC	1.2	Type N Female
82	500 W*	0-3 KMC	1.2	Coplanar. Adapter to UG-21/U supplied. Available accessories: RG-17 and RG-19 Cable assemblies, adapters to rigid lines.
82A	500 W	0-3 KMC	1.2	
82C	2500 W**	0-3 KMC	1.2	

* At max rating fan necessary ** Water cooled

COAXWITCH—Coaxial Selector Switch

Cut-away View Model 74



MODEL 74
Single Coaxial Circuit
Six Positions

MODEL 718
Single Coaxial Circuit
Eight Positions

MODEL 72R
Two
Coaxial Circuits
Reversing Switch
(DPDT. etc.)

MODEL 72-2
Two
Coaxial Circuits
Two Positions
(DPDT. etc.)

This is a 50 ohm switch for use in coaxial circuits. Characteristic impedance is maintained through all switch details and low standing wave ratios result. In V.S.W.R., switch is comparable and as good as the connectors and cable with which it is used. Type N female connectors are standard on all models to receive UG-21/U series plugs. Adaptors may be used to enable switch to be used with other cable and connectors.

Model 43 Thruline DIRECTIONAL WATTMETER



Reads Directly . . .
→ WATTS FORWARD
WATTS REFLECTED ←
. . . In 50 Ohm Coaxial Lines

FREQUENCY RANGE, MEGACYCLES				
25-60 mc	50-125 mc	100-250 mc	200-500 mc	400-1000 mc
10 W 25 W 50 W 100 W	10 W 25 W 100 W	10 W 25 W 50 W 100 W	10 W 25 W 50 W 100 W 250 W	10 W 25 W 50 W 100 W
500 W	500 W	500 W		

Note: ELEMENTS must be specified for both power and frequency range.
Thus: Element, 100 watt, 100-250 mc, is correct ordering information.

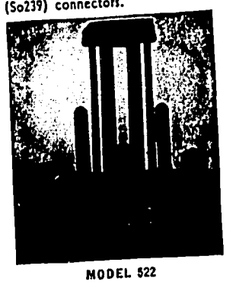
The Thruline Wattmeter is a direct reading wattmeter designed for insertion between transmitter and antenna or load resistor. It provides a simple, accurate means for measuring power into the load or power reflected by this load. Full scale power range and frequency range are determined by the selection of plug-in elements as shown in the table.

The entire instrument is housed in a rugged cast aluminum case equipped with sockets for extra elements and with a carrying strap. Available with female "N", male "N" or female UHF (So239) connectors.

LOW PASS RF FILTER

Suppression of low order harmonics in VHF and UHF transmitters may be handled thru use of these filters. Insertion loss and VSWR are very low thru pass band. Rugged construction thruout assures reliability. All are of 50 ohms impedance and are reversible with equal results. Attenuation in pass band is less than ½ db and in stop band 40 db or better is realized.

MODEL	PASS BAND	STOP BAND	MAX. POWER	VSWR	CONNECTORS
522	0-400 MC	500-2000 MC	150 W	1.35	One male and one female N
819-1200	0-1200 MC	1900-4000 MC	100 W	2 to 1	One male and one female N
819-7	0-1200 MC	1800-4000 MC	3.5 KW	2 to 1	Coplanar. For use with Models 67 and 67C



MODEL 522



BIRD ELECTRONIC CORPORATION

1797 East 38th Street Cleveland 14, Ohio Express 1-3535

NEELY ENTERPRISES — Sacramento — Hollywood — San Francisco — Albuquerque

RON MERRITT CO., Seattle, Wash., & EARL LIPSCOMB ASSOC., Dallas-Houston

4. Component Parts

43. Meters.

(Continued from page 327)

Burton-Rogers Co., Mass., 5, 20, 25, 30, 35
C and H Sales Co., Calif., 5, 10, 15, 20, 25, 30, 35
Canadian Research Institute, Canada, 5, 20, 25, 30, 35, 40, 45
Clough-Brengle Co., Ill., 40
Cole Instrument Co., Calif., 5, 10, 15, 20, 25, 30, 35, 40, 45
Colortone Electronics, Inc., N.Y., 15
Columbia Electric Mfg. Co., Ohio, 5, 35
Campagnie Générale de Métrologie, Chemin De La Croix-Rouge, Annecy, France, 25, 30, 35
For details see ad on page 445
Tel: Annecy 8160
Consolidated Engineering Corp., Calif., 20
Cramer Co., Inc., The R. W., Conn., 10
Cubic Corp., Calif., 45
Dawe Instruments, Ltd., England, 40
De Jur-Amsco Corp., Dept IRE DPM, 45-01 Northern Blvd., Long Island City 1, N.Y., 5, 30, 35
For details see ad on pages 300, 362
Tel: Astoria 8-1040
Delta Electrical Instrument Co., Calif., 5, 20, 25, 30, 35, 40, 45
Doelcam Corp., Mass., 20, 35
Dubbings Co., Inc., N.Y., 40
Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 20
For details see ad on page 163
Tel: Worcester 7-8394
Electric Design & Mfg. Co., Iowa, 5, 25, 30, 35
Electric Indicator Co., Conn., 5, 15, 20, 25, 30
Electro Impulse Laboratory, 62 White St., Red Bank, N.J., 15, 40, 45
For details see ad on page 330
Tel: Red Bank 6-0404
Electro-Mechanical Instrument Co., Pa., 5, 30, 35
Electro-Tech. Equipment Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45
Electronic Instruments, Ltd., England, 10
Elm Laboratories, N.Y., 15
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 15
For details see ad on pages 47-50
Tel: Astoria 8-2800
Ferranti Electric, Inc., N.Y., 35
Furzehill Labs, Ltd., England, 10
G-M Labs., Inc., Ill., 20
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15, 20, 25, 30, 35, 45
General Electric Co., Telechron Dept., Mass., 10
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 15, 20, 35, 40
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Greibach Instruments Corp., 212 Durham Ave., Metuchen, N.J., 5, 20, 25, 30, 35, 40, 45
For details see ad on page 329
Tel: Metuchen 6-2800
Greibach Res. & Dev. Labs., N.Y., 5, 20, 25, 30, 35
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 25, 30, 35
For details see ad on page 177
Tel: Metuchen 6-2800
Haydon Mfg. Co., Inc., Conn., 10
Heath Co., 305 Territorial Rd., Benton Harbor 27, Mich., 45
For details see ad on page 447
Tel: WA 5-1175
Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 20
For details see ad on page 466
Tel: PEarl 3-4691
Helipot Corp., Div. Beckman Instr., Inc., 916 S. Meridian Ave., S. Pasadena, Calif. Turns Counting Duodials
For details see ad on page 158
Tel: PYramid 1-2164

(Continued on page 331)

For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

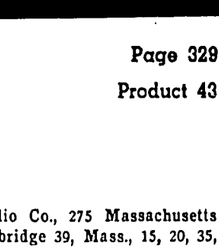
If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.

GREIBACH METERS

—the revolutionary new meter WITHOUT bearings



- 1,000,000 ohms per volt
- Ultrasensitive—1 microamp full scale with 4500 ohms internal resistance
- Multirange WITHOUT shunts or resistor dividers
- Shockproof—withstands up to 600 g shock
- High precision—¼ of 1% accuracy
- Rugged—will withstand 100,000% overload
- No parallax—light pointer movement

GREIBACH INSTRUMENTS CORPORATION
METUCHEN, NEW JERSEY • MEtuchen 6-2800

RF WATTMETER and DUMMY LOAD, PM-11

GENERAL DESCRIPTION: The RF Wattmeter PM-11 is an absorption type wattmeter consisting of an oil filled, air cooled, coaxial load resistor and a voltmeter calibrated to read watts. The Wattmeter 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 detached, 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.

POWER RANGES: 0-25 watts or 0-100 watts, selected by switch on front of meter box.

DUMMY LOAD: 50 ohms impedance capable of 100 watts dissipation, in still air, continuously.

VOLTMETER CIRCUIT: Uses 1N82 silicone diode crystal, and sensitive 200 micro ampere sealed meter. May be calibrated for any scale range from 0-7.5 w to 0-100 watts. Spare crystal included.

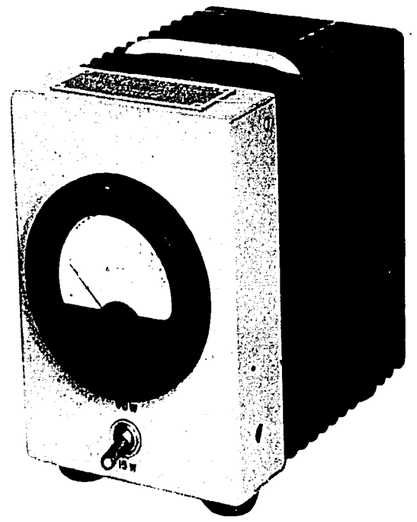
RECALIBRATION: May be recalibrated using 60 cycle A.C.

INPUT: Coaxial Type N, using modified UG58-A/U connector.

VOLTAGE STANDING WAVE RATIO: Less than 1.15 from D.C. to 800 MC.

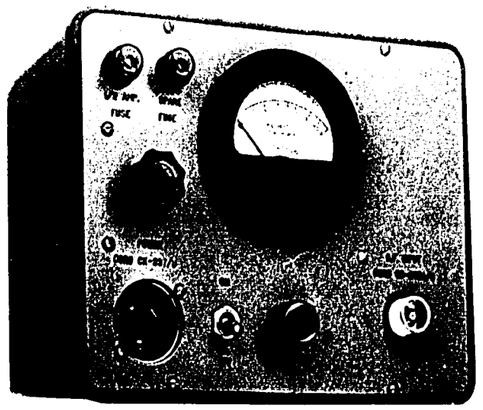
ACCURACY: ±5% from 0-100 Watts.

FREQUENCY RESPONSE: ±5% from 30 to 700 MC.



RF WATTMETER & DUMMY LOAD, PM-10
Power Ranges: 0-15 watts or 0-60 watts, selected by switch on front of meter box.

RF WATTMETER & DUMMY LOAD, PM-15
Power Ranges: 0-125 watts or 0-500 watts, selected by switch on front of meter box.



★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★
★ ADDITIONAL NEW PRODUCTS ★
★ X-BAND & S-BAND WATER LOADS—all waveguide sizes. ★
★ X-BAND TERMINATIONS—3" LONG—dissipates 50 watts average power. ★
★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

50 KW PEAK READING RF POWER METER PM-12

The P. M. 12 Peak Reading Power Meter is designed to accurately measure the peak power of pulsed RF signals in the range of 2 to 700 MC with PRF of 800 to 10,000 pps and pulse duration of .5 micro-seconds or more.

It is capable of dissipating 50 KW peak power with an RF duty cycle of .002.

This test set may also be used as a dummy antenna, rated for 100 watts maximum average power for any frequency within its range.

The 52 ohm coaxial input circuit is fitted with a type N or UG61A/U receptacle to mate with a UG59/U connector.

This test set is 110V, 60 cycles powered and is completely self contained in a cabinet 7 in. x 9 in. x 9 in.

SPECIFICATIONS

USE	Peak reading power meter. Dummy Antenna.
POWER DISSIPATION	100 Watts average, 50 KW Peak.
FREQUENCY RANGE	2 to 700 Megacycles.
pulse rate	200 to 20,000 pulses per second.
pulse width	.5 microseconds to DC.
VSWR	Will not exceed 1.15 at any frequency in its range.
ACCURACY	Absolute 10% Relative 1%
INPUT	51.5 ohm coaxial, type N or UG 61 A/U receptacle.
CALIBRATION	May be recalibrated using 60 cycle ac.
CONSTRUCTION	Meets Jan specifications for moisture, humidity, shock, and vibration. Meter is sealed and ruggedized, Jan approved components used throughout.
SIZE	7 in. high, 9 in. wide, 9 in. deep.
POWER	105 to 120 volts, 60 cycle, 10 watts.

ELECTRO IMPULSE Laboratory 62 WHITE STREET • RED BANK, N. J.
RED BANK 6-0404

4. Component Parts

43. Meters.

(Continued from page 329)

Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 5, 15, 20, 25, 30, 35, 40, 45
For details see ad on page 434
Tel: LIberty 1-8060

Hoyt Elec. Instrument Works, Inc., Mass., 5, 25, 30, 35

Industrial Assembly Corp., N.Y., 5, 35

Industrial Control Co., N.Y., 20, 25

Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 35, 45
For details see ad on page 471
Tel: GRamercy 3-4684

Industrial Timer Corp., N.J., 10

Instrument Electrs. Corp., N.Y., 35

In'ernational Instruments, Inc., P.O. Box 2954, New Haven, 15, Conn., 5, 25, 30, 35, 40
For details see ad on page 331
Tel: FUlton 7-2515

J-B-T Instruments, Inc., 441 Chapel St., New Haven 8, Conn., 10, 15, 20
For details see ad on page 184
Tel: State 7-5825

Landis & Gyr, Inc., N.Y., 45

Leupold & Stevens Instruments, Inc., Ore., Remote Register

Loral Electronics Corp., Dept. ID-54, 794 E. 140 St., New York 54, N.Y, 15
For details see ad on page 198
Tel: CY 2-1800

Marconi's Wireless Telegraph Co., Ltd., England, 40

Marion Electrical Instr. Co., 408 Canal St., Manchester, N.H., 5, 10, 20, 25, 30, 35, 40
For details see ad on page 332
Tel: Manchester 5-6971

Measurements Corp., Intervale Rd., Boonton, N.J., 15, 35
For details see ad on pages 470, 524
Tel: BOonton 8-2131

Meters, Inc., Ind., 5, 20, 25, 30, 35, 40

Midwestern Geophysical Lab., Okla., 20

Modelectric Prod., Inc., N.J., 10

Nilsson Elec. Lab., Inc., N.Y., 5, 20, 25, 30, 35, 45

Pacent Eng. Corp., N.Y., 5, 20, 25, 30, 35, 40, 45

Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 5, 10, 15, 20, 25, 30, 35, 40, 45
For details see ad on page 333
Tel: CL 5-1471

Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 15
For details see ad on page 166
Tel: ULster 2-6800

Polytronics Co., Canada, 20

Potter Instrument Co., Inc., N.Y., 10, 15

Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, L.I., NY., 5, 25, 30, 35
For details see ad on page 468
Tel: Havermeyer 9-6262

(Continued on page 333)

international instruments
INCORPORATED
P.O. BOX 2954, NEW HAVEN 15, CONN.

1" and 1½" miniature panel meters

international instruments, specialists in the design and manufacture of miniature panel meters, FIRST in this country to design and manufacture a 1" barrel diameter meter, FIRST to produce 1" and 1½" illuminated meters, FIRST to produce 1½" DB and VU meters and FIRST to develop 1" long scale meters. This record of past achievement plus modern plant and test facilities, extensive experience and skilled personnel combine to make ***international*** the logical source for your miniature meter needs.

international panel meters are miniature D'Arsonval instruments housed in metal cases. Models for government or commercial applications are available. Accuracy is within ± 3% of full scale deflection for DC readings, and ± 5% for AC. Model 100 and 150 Meters are easily mounted by means of threaded barrel ring. Model 153 Meters supplied with mounting screws. A wide variety of ranges are available starting from 0-100 microamperes. Special scales, sensitivities, ranges, and other modifications can be produced. Consult our Engineering Department giving details of special requirements.



MODEL 150
1½" barrel diameter Full 90° scale arc, scale length 1.322".



MODEL 100
1" barrel diameter Full 90° scale arc, scale length .770". Self-contained, ready for use.

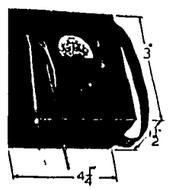


MODEL 153
1½" barrel diameter Designed to meet MIL-M-3823 requirements.



VU METER
DB METER
Self-contained and ready for use. Available in Model 150 and 153. Also available in Model 100 with external accessory.

MINIATURE MULTITESTER



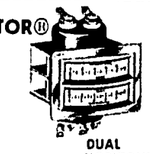
Compact combination voltohmeter for testing resistances and AC or DC voltages. Meter has sensitivity of 8,000 ohms per volt on AC ranges, 10,000 ohms per volt on DC ranges. Accuracy ± 2% of full scale deflection.



ILLUMINATED METER
Sealed meter has own external source of illumination. Lamps for 6, 14 and 28 volts. Easy bulb replacement. Available in Model 100, 150 and 153.



NEW MODEL 1120 SIDE INDICATOR® Pat. Pend.
Single instrument panel opening only .516" x 1.605", scale 1.3" long. Horizontal or vertical mounting singly or with scales together. Dust-proof anodized aluminum case with clear plastic cover.
VERTICAL MOUNTING



DUAL HORIZONTAL MOUNTING

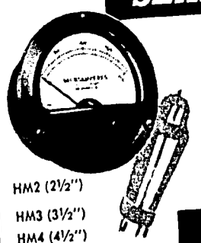
ENGINEERING DATA SHEETS COMPLETELY DESCRIBING THESE INSTRUMENTS ARE AVAILABLE. WRITE FOR YOUR COPIES TODAY.

international instruments
INCORPORATED
P.O. BOX 2954, NEW HAVEN 15, CONN.

marion

ELECTRICAL INDICATING INSTRUMENTS

HERMETICALLY SEALED METERS



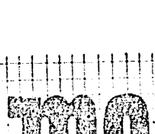
HM2 (2½")
HM3 (3½")
HM4 (4½")

HM Series

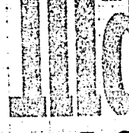
Marion true glass-to-metal hermetic sealing . . long accurate life under adverse conditions of humidity, dust and hazardous atmospheres. Magnetically shielded.

MARION "REGULARS"

phenolic and metal cases — designed for commercial application where hermetic sealing or ruggedization is not required. All Alnico construction. Reliable high torque performance in moderate price range.



MODEL 52N Series 52
Accurate dependable service in smallest practical form. Model 52N (JAN MR24, MR25) 2½" round phenolic case. 52S, 2½" rectangular phenolic case. Model 52 RM, narrow flange brass case. Also available in brass case without flange, 52RMS.



MODEL 53SN Series 53
Standard 3" commercial rectangular type (Model 53SN). Also available in 3½" round phenolic case (Model 53RN) (JAN MR34, MR35).



MODEL 55
Large 4⅜" x 4⅛". Critical readability on 100° scale. Extremely accurate. Most popular case style in test equipment field.



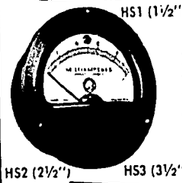
MODEL 56
6½" x 5¼" phenolic case. Large open face with 100° scale in 5½" arc.

MODEL 57
8½" x 7" open face, extra long scale. More than a mere overgrown 3" meter. Enlarged pole shoes — higher torque movement — higher damping factor. Accurate within 1%.

RUGGEDIZED METERS



HS1 (1½")

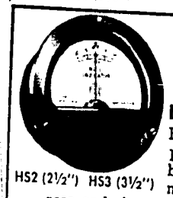


HS2 (2½") HS3 (3½")

HS Series
HERMETICALLY SEALED

Exceptionally accurate and sensitive even under extreme conditions of shock, vibration, mechanical stress or strain, weather and climate. Outstanding performance in *any* application. 2½" and 3½" types have standard A.S.A. dimensions.

RELATED PRODUCTS



HS2 (2½") HS3 (3½")

NULL INDICATORS
Ruggedized, Hermetically Sealed. Used primarily as bridge and potentiometer balance indicators and where an instrument with very high sensitivity about the zero or balance point is desired. Sensitivity at this point is 1 ua per mm. or higher; the meter's shaded pole face and shielded core construction give sharply logarithmic attenuation as it departs from null point and provides ample overload protection.



HM2ET (2½") HM3ET (3½")

ELAPSED TIME INDICATORS
Two sizes, 2½" and 3½", standard JAN dimensions for panel mounting. Operating range −55°C to +85°C. Hermetically sealed. Magnetically shielded. Registers in 1/10 hour steps to 9999.9 or hour steps to 99999. Durable, self-starting synchronous motor. Available for 110-125, 220-250 volts, 50 or 60 cycles A.C.

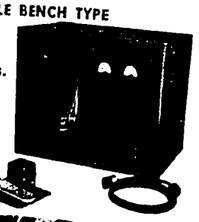


M-2

MULTI-RANGE METER TESTER
The only instrument of its type available today. Used for production inspection and calibration of electrical indicating instruments and to maintain high measuring standards in the laboratory. It is also used as a precise production limit bridge permitting acceptance tolerances to be set for any value from ±½% to ±20%. Overall accuracy for current measurements better than ¼ of 1%. Resistance range 0-5000 ohms. Power source 115V AC 60 cycles. Complete, no accessories required.

MARION MODEL PM1 PORTABLE BENCH TYPE INDUCTION SOLDERING UNIT

Improves and speeds up production of small components. Low cost, low powered and portable. Size: 15¾" x 21½" x 15". 150 lbs. Power supply: 115 volts 60 cycles. Draws 775 watts full load, 100 watts standby.





marion
ELECTRICAL INSTRUMENT COMPANY
408 Canal Street, Manchester, New Hampshire, U. S. A.

4. Component Parts

43. Meters.

(Continued from page 331)

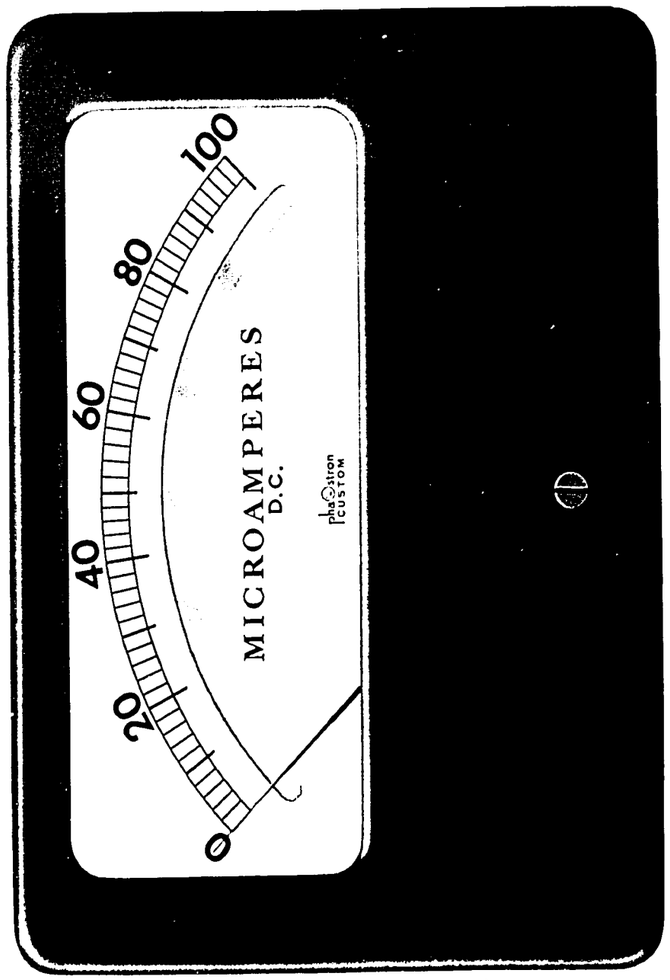
Pyramid Instrument Corp., N.Y., 5, 35
Radio City Products Co., Inc., Pa., 5, 25, 30, 35
Radio Corp. of America, RCA Tube Dept., Section F35, 415 S. 5 St., Harrison, N.J., 25
For details see ad on page 210
Tel: HUmboldt 5-3900
Rapid Elec. Co., N.Y., 5, 35
Rawson Electr. Instrument Co., Mass., 5, 20, 25, 30, 35, 45
Reiner Electr. Co., Inc., N.Y., 35
Research Electronics, Pa., 25, 35
Roller-Smith Corp., Pa., 5, 15, 20, 25, 30, 35, 40, 45
Scott, H. H., Inc., Mass., 40
Sangamo Weston, Ltd., England, 5, 10, 15, 20, 25, 30, 35, 40, 45
Scientific Specialties Corp., Mass., 5, 20, 25, 30, 35, 45
Sensitive Research Instrument Corp., Dept. 156-D, 9 Elm Ave., Mt. Vernon, N.Y., AC & DC, 5, 20-Differential, 25, 30, 35-Flux for magnetic measuring, 45, Ratio Meters, Current Product Meters
For details see ad on page 449
Tel: Fairbanks 4-3358
Shalleross Mfg. Co., Pa., 20

(Continued on page 335)

the KEY to your problems

phaostron 6" CUSTOM panel instruments

METAL-CASED TO INSURE THEIR CONTINUED INTEGRITY



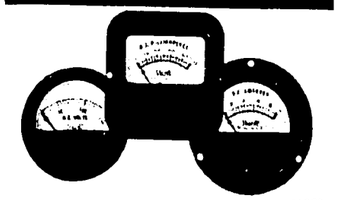
We don't recommend mounting the instrument in this position
this FULL SIZE ILLUSTRATION
will be better appreciated by turning the magazine

phaostron TIME PROVEN MOVEMENTS
phaostron ANTI-MAGNETIC SHIELDING
phaostron LARGE, EASY-TO-SEE SCALES
phaostron 1% ACCURACY
phaostron MIRROR SCALES
phaostron PRICE — YOU CANNOT BUY BETTER

Inquiries are invited and catalogue sheets are available on this *NEW LINE* of CUSTOM INSTRUMENTS which also include 2½" & 3½" sizes.

PHAOSTRON CO. • 151 PASADENA AVE. • SO. PASADENA, CALIF.

Shurite
TRADE MARK
ELECTRICAL MEASURING INSTRUMENTS



RUGGED • ATTRACTIVE • MODERATELY PRICED

TYPES—ammeters, milliammeters, voltmeters, AC and DC; resistance meters; many with zero adjusters; also pocket types.

ACCURACY—well within 5%. AC meters are double-vane, repulsion type with jeweled bearing; DC meters are polarized-vane solenoid type or moving magnet sensitive type.

METAL CASES—three basic styles, round or rectangular, all requiring 2-5/32" hole. Also pocket types.

DIALS—all metal—age and moisture resistant. Special calibrations, one to five colors.

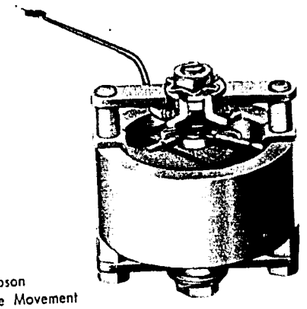
USES—plate current and voltage readings; battery charging, emergency lighting, fire or burglar alarm units; TV antenna rotator indicators; voltage regulators, transmitters, receivers, plating equipment, AC line testers, field indicators, etc.

STOCKED—by leading electronics parts distributors. Ask for Bulletin G-56(SH) showing 219 models.

SHURITE METERS
33 Hamilton St. • New Haven 8, Conn.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

NEW Simpson Core Movement

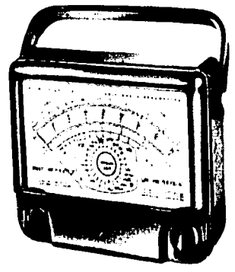


Simpson Core Movement

brings you the

finest in PANEL INSTRUMENTS and TEST EQUIPMENT

Simpson, world's largest manufacturer of electronic test equipment, brings you its new core movement. It's a more compact, more sensitive, *self-shielding* movement that gives electrical measurements with laboratory accuracy, yet has the ruggedness to withstand severe shocks. Its accuracy specifications are so rigid that Simpson engineers had to devise unusual production techniques. Now, let Simpson engineers design panel meters using this new core movement to your special instrument requirements.



100,000 Ohms per volt, volt-ohm-microammeter with Simpson Core Movement, Model 269 . . . $88.00 at electronics parts jobbers. Also available in 20,000 ohms per volt, same size, case, and meter, Model 262 .....$59.50

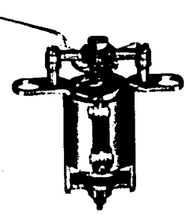
RUGGEDIZED METERS

Simpson's 2½" and 3½" Panel Meters are available in *SEALED, RUGGEDIZED* models to meet specification MIL-M-10304-(SIG C). Movements are sealed against moisture and other adverse atmospheres, and are spring-mounted to absorb excessive vibration.



Sealed, Ruggedized with new Simpson Core Meter Movement

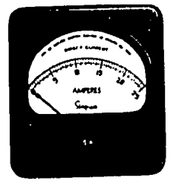
STANDARD MOVEMENT



Simpson Standard Movement

Simpson continues to make available its fine standard movement. This movement is used in many Simpson test instruments, including the now world-famous Model 260 Volt-Ohm-Milliammeter. Standard Simpson movements are available for prototype design or small production runs in over 700 different sizes and ranges of panel meters and they may be procured locally through distributors.

Write for catalog 17 (available October 1, 1954) . . . *PANEL METERS* . . . one inch to nine inch diameters . . . many styles including round, square, modernistic, flange, duplex, flush types . . . same catalog shows *test equipment* . . . VOM's, VTVM's, AM-FM signal generators, oscilloscopes, tube testers, field strength meters, white dot and color bar generators, and many others, suited to color TV and full range of industrial applications.



Model 27—3½" rectangular case at electronics parts jobbers, or direct from factory in production quantities.



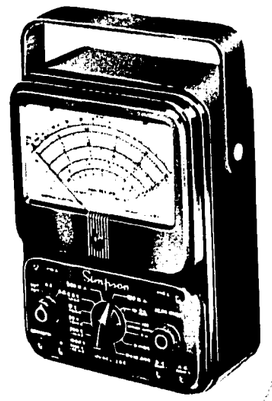
Model 127—2½" rectangular case at electronics parts jobbers, or direct from factory in production quantities.



Model 125—2½" round case at electronics parts jobbers, or direct from factory in production quantities.



Modernistic meter with one-piece clear plastic front cover. Can be furnished with your brand name. Write us for details.



World Famous 260

with Simpson Standard Movement

Now . . . over a half million 260's are in use . . . 20,000 ohms per volt . . . $38.95 at electronics parts jobbers.

SIMPSON ELECTRIC CO., 5211 W. Kinzie St., Chicago 44, Ill.

In Canada: Bach-Simpson, Ltd., London, Ontario

Telephone EStebrook 9-1121



NEW additions to Servo Motor line

by INFRA

part of

a steadily growing series in the most popular sizes . . . feature new lamination designs giving high performance at lower cost.

WRITE NOW FOR DETAILED SPECIFICATION SHEETS.

INFRA ELECTRONIC CORP.
555 Eagle Rock Ave.
Roseland, N. J.

Gentlemen:

Please send specification sheets on Servo Motors.

Name & Title

Company

Address

4. Component Parts

Products 43-44

43. Meters.

Continued from page 333)

Sierra Electr. Corp., Calif., 45

Shurite Meters, 33 Hamilton St, New Haven 8, Conn., 5, 30, 35
For details see ad on page 333
Tel: State 7-5826

Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 5, 20, 25, 30, 35, 40, 45
For details see ad on page 334
Tel: EStebrook 9-1121

Statham Labs., Calif., Accelerators, Transducers

Sterling Mfg. Co., Ohio, 5, 30, 35

Supreme, Inc., Miss., 5, 25, 30, 35, 40

Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 35
For details see ad on pages 9-14
Tel: Judson 6-2424

Taylor Elec. Instruments, Ltd., England, 5, 20, 25, 30, 35, 40

Technology Instrument Corp., 535A Main St., Acton, Mass., 20
For details see ad on pages 75-79
Tel: COlonial 3-7711

Telecomputing Corp., Calif., 30, 35

Thwing-Albert Instrument Co., Pa., 20, 35

Tork Clock Co., Inc., N.Y., 10

Triplett Electrical Instrument Co., Ohio, 5, 20, 25, 30, 35, 40, 45

U. S. Gauge Div. American Machine Metals Co., Pa., 5, 35

Vibro-Ceramics Corp., 212 Durham Ave., Metuchen, N.J., 45
For details see ad on page 451
Tel: Metuchen 6-2800

Vocaline Co. of America, Inc., Conn., 10

Walkirt Co., Calif., 15

Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 45
For details see ad on page 230
Tel: Malden 2202

Welch Mfg. Co., W. M., Ill., 5, 20, 25, 30, 35, 45

Westinghouse Electric Corp., Pa., 5, 10, 15, 30, 35, 40, 45

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 5, 10, 15, 20, 25, 30, 35, 40, 45, Thermo Ammeters and Volt Meters
For details see ad on pages 98-99
Tel: BI 3-4700

Wright Engineering Co., Calif., 15, 20

44. Motors & Motor-Generators.

5. Blower & fan motors
10. Dynamotors
15. Frequency changers
20. Motor-generators
25. Phonograph
30. Servo
35. Synchronous motors
40. Timing motors

Aeronautical Radio Mfg. Co., N.Y., 10

Air Associates, Inc., N.J., 5, 30, 35

Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, L.I., N.Y., 5, 20, 30, 35
For details see ad on pages 336
Tel: AMityville 4-6122

44. Motors & Motor-Generators.

Allard Instrument Corp., N.Y., 5, 10, 15, 30, 35, 40

Alliance Mfg. Co., Ohio, 5, 25, 40

Alliance Motors, Canada, 5, 25

Allis Co., The Louis, Wis., 5, 15, 20

American Electric Motors, Inc., Calif., 5, 15, 20, 30, 35, 40

American Electronic Mfg., Calif., 30, 35

American Machine & Foundry, Leland Electric Co., Ohio, 20

Amglo Corp., Ill., 35, 40

Barber-Colman Co., Ill., 5, 25, 35

Bendix Aviation Corp., 1104 Fisher Bldg., Detroit 2, Mich., 10, 35
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000

Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 20, 30
For details see ad on pages 51-54
Tel: Hasbrouck Heights 8-3698

Bendix Aviation Corp., Red Bank Div., Eatontown, N.J., 5, 10, 25, 30
For details see ad on page 302
Tel: Eatontown 3-1340

Berndt-Bach, Inc., Auricon Div., Calif., 20

Bludworth Marine Div., N.Y., 20

Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 20
For details see ad on page 128
Tel: LAmbert 5-2200

Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., 30, 35, 40
For details see ad on page 140
Tel: Janesville 6616

Brown-Brockmeyer Co., Ohio, 20

Burke Electric & X-Ray Co., Ltd., Canada, 15

C and H Sales Co., Calif., 5, 10, 15, 20, 25, 40

Califone Corp., Calif., 25

Carter Motor Co., 2645 N. Maplewood Ave., Chicago 47, Ill., 10
For details see ad on page 148
Tel: HU 6-4700

Champion Electric Corp., England, 5

Clifton Precision Products Co., Inc., Pa., 30-Resolvers

Columbia Electric Mfg. Co., Ohio, 20

Comar Electric Co., 3349 W. Addison St., Chicago 18, Ill., 5
For details see ad on page 152
Tel: Juniper 8-2410

Constantine Eng. Labs. Co., P.O. Box 471 B, Mahwah, N.J., Stator Windings, Rotor and Armatures
For details see ad on pages 288, 380
Tel: Ramsey 9-1123

Continental Electric Co., Inc., N.J., 5, 10, 15, 20

Craig Corp., Mass., 20

Cramer Co., Inc., The R. W., Conn., 35, 40

Dalmotor Co., Calif., 5, 30, 35

Diehl Mfg. Co., N.J., 5, 30

Doelcam Corp., Mass., 30

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4. Component Parts

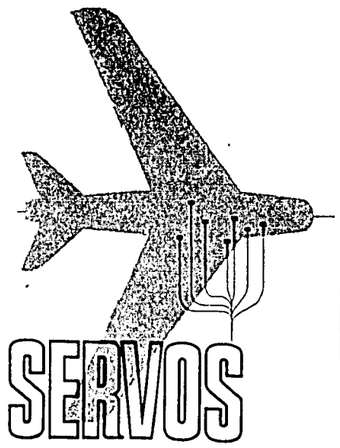
Product 44

44. Motors & Motor-Generators.

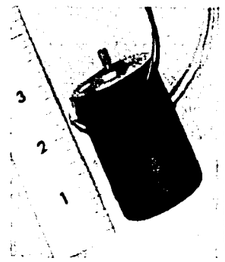
(Continued from page 335)

Dominion Electrohome Industries, Ltd., Canada, 5, 25
Eastern Air Devices, Inc., N.H., 5, 20, 25, 30, 35
Eicor, Inc., Ill., 5, 10, 20
Electric Products Co., Ohio, 15, 20
Electric Specialty Co., Conn., 10, 15, 20, 25
Electro Craft Industries, Inc., Conn., 5, 20
Electro-Engineering Products Co., Inc., 609 W. Lake St., Chicago 10, Ill., 5, 10, 20, 25, 40
For details see ad on page 337
Tel: Central 6-2670
Electro-Tech Equipment Co., N.Y., 40
Fairchild Industries Div., Vt., 5, 35
Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 30
For details see ad on pages 32-37
Tel: Nutley 2-3600
Fidelity Instrument Corp., Pa., 15
Ford Instrument Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 30, 35
For details see ad on page 415
Tel: ST 4-9000
Franklin Electronics, Inc., Pa., 15
G-M Labs., Inc., Ill., 30
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15, 20, 25, 30, 35
Gerator Corp., Va., 15, 20
Giannini & Co., Inc., G. M., N.J., 30, 35
Gleason-Avery, Inc., N.Y., 5, 40
Globe Industries, Inc., Ohio, 5, 20, 35, 40
Haydon Co., A. W., 240 North Elm St., Waterbury 20, Conn., 20, 40
For details see ad on page 456
Tel: WAterbury 6-4481
Haydon Mfg. Co., Inc., Conn., 40
Heller Co., Gerald K., Md., 30
Hertner Electric Co., Ohio, 5, 15, 20, 30, 35, 40
Howard Industries, Inc., Wis., 5, 10, 20, 25, 30, 35
I. D. Mfg. Corp., N.Y., 40
Imperial Electric Co., N.Y., 5, 15, 20
Induction Heating Corp., N.Y., 15
Induction Motors Corp., N.Y., 5, 20, 25, 40
Infra Electronic Corp., 555 Eagle Rock Ave., Roseland, N.J., 5, 20, 30, 35
For details see ad on page 335
Tel: CAldwell 6-4300
Instrument Motors, Conn., 5, 20, 30, 35
Iron Fireman Mfg. Co., Electronic Div., Ore., Miniature
Janette Electric Mfg. Co., Ill., 15, 20
Kaye-Halbert Television, Calif., 5, 30
Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 20, 30, 35
For details see ad on page 414
Tel: Little Falls 4-1600
Ketay Mfg. Corp., N.Y., 20, 30

(Continued on page 338)



SERVOS make flight safe!



Lightweight Oster Motor type 2W-2084

Delivers 1/500 H.P. @ 6500 RPM on 24 to 29 volts DC. Suitable for pushpull, plate to plate operation. This motor will fill your needs in computer, fire control, and autopilot systems.

Miniaturized muscle men perform exacting control tasks on signal from electronic amplifiers!

Another example of Oster precision quality motors for avionics and for other closed-loop control systems.

Oster Avionic Products conform to military specifications for altitude, high and low temperature, life, shock, vibration, humidity, fungicidal treatment and salt spray.

You can depend on Oster quality in rotating components for automatic control.

Other OSTER Avionic Products include:

- Special motors: Servos, Synchros, Drive Motors, Blowers and Fans.
- Synchro generators, control transformers, transmitters, differentials, receivers and resolvers. Two-speed synchros and reference generators.
- Tachometer generators.
- Aircraft actuators, both linear and rotary.

Insure dependability... specify Oster®

JOHN OSTER MANUFACTURING COMPANY AVIONIC DIVISION RACINE, WISCONSIN

EEPCO



DC MOTOR OR GENERATOR This small permanent magnet, ball-bearing unit—As a motor: 1/125 H.P. at 6000 RPM continuous duty. As a generator: output 4 watts at 6000 RPM—5 volts per 1000 RPM. Dimensions: 1-29/32" x 1-1/2" x 1-15/100".

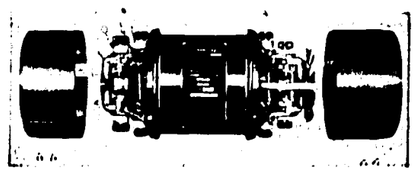


SHADED POLE MOTOR — for sound recorders, air circulators, many other applications. 4-pole, 2 or 4 coil construction. Will operate from 115 volts, 60 cycle a.c.

The RIGHT power supply for mobile equipment is an EEPCO specialty

Outstanding experience in producing rotary electrical equipment to meet rigid specifications is an integral part of every EEPCO product.

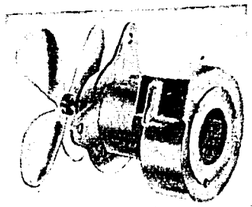
Whether your problem involves an industrial or highly developed military unit, EEPCO's complete research and engineering facilities are at your disposal. Contact EEPCO today for special design assistance that can provide you with the best solution.



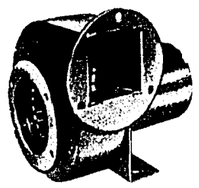
DYNAMOTOR OPERATES FROM 12-24-32 VOLTS Output of this remarkably compact unit is 500 volts at .100 amperes. Dynamically balanced armature has 4 windings.

ELECTRO ENGINEERING PRODUCTS CO.
609 W. LAKE STREET, CHICAGO 6, ILLINOIS

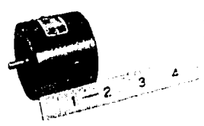
• P M DC MOTORS & GENERATORS • CAPACITOR TYPE MOTORS • UNIVERSAL MOTORS
• DC MOTORS & GENERATORS • SHADED POLE MOTORS 2 4 6 Pole • P M AC GENERATORS



A15ABF-1 115 Volt — 400 cycle. Blower delivering 50 CFM at 8500 RPM. Propeller fan delivering approx. 300 CFM at 8500 RPM.



B20B3—115 Volt 400 cycle single phase centrifugal blower. Delivering 140 CFM of air against 2" of water operating at 6500 RPM minimum.



A08C1—2 phase control motor for operation on 60 cycle supply 115 Volt on one phase and 40 Volt on control phase. 3.0 oz/in starting torque on above voltages. 1500 RPM. No load speed.



A15AD3—Axial blower unit for operation on 115 Volt 60 cycle single phase supply at 3300 RPM delivering 35 CFM at 0.2 S.P. This unit has special mounting bracket.

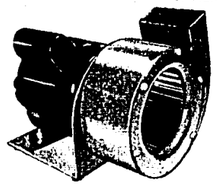
Manufacturers of Specialty Rotating Equipment Including Motors, Fans & Blowers

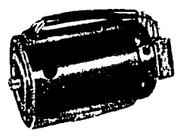
The features of all AIR MARINE motors include Stainless steel thru-bolts, Rigid die-cast aluminum housings, and Riveted stator to insure Extra-Rigid Construction assuring positive bearing alignment and uniform air gap. Motors are protected against humidity and fungus growth—can be mounted in any position—are equipped with ball bearings using lubricants for high and low temperatures—meet all AN specifications.



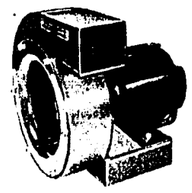
A11A-2—115 Volt 400 cycle single phase axial vane blower delivering 70 CFM at 1" static pressure at 11,000 RPM.

631 x 35 115 Volt, 60 cycle or 220 Volt, 60 cycle, 1 or 3 phase. 3450 RPM continuous duty. 250 CFM at 2½" water gauge. Used in microwave generators, unattended repeater stations. Fits in space 13½" long, 8¾" wide, 7¾" high.



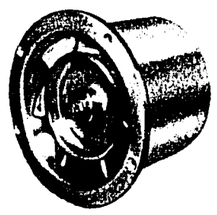


A15HF—115 Volt 60 cycle single phase capacity start & run sychronous motor running at 3600 RPM. This unit has special terminal block mounted on end of motor.



631 x 1—115 Volt, 60 cycle, 3450 RPM 100 CFM @ 2½" water gauge. Fits in space 9½" long, 8¾" wide, 7¾" high.

450C-1—115 Volt 400 cycle phase axial—vane type blower delivering 200 CFM at 6 S.P. Weight approx. 5 lb.



Variable frequency blower for operation on 115 Volt single phase. Available with axial fan or centrifugal blower.

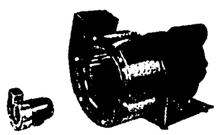
A15BF-15—50 to 800 cycles—single winding available with axial fan or centrifugal blower.

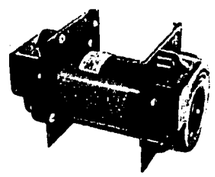
A15AB-2—50-60 cycle and 400 cycle operation single winding.

A15CF10—50-60 and 320-1000 cycle operation dual winding.



Showing comparison between our large and small blowers





A15BD—115 Volt 400 cycle single phase double blower delivering 26 CFM total at 0 static. This unit has special mounting brackets.

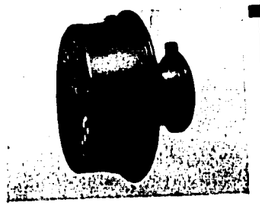
The motors and blowers on this page are representative of the many varied models available. Detailed information specifications and performance data on all the above units available on request.

Constantly developing to meet your exacting needs . . .

air-marine motors Inc.

369 Bayview Avenue
Amityville, L. I., N. Y.
AMityville 4-6122

West Coast Factory
2055 Pontius Avenue
Los Angeles 25, Calif.



A11A-1—115 Volt 400 cycle single phase propeller type blower using 4" 4 blade fan.

For PILOT LIGHTS
CONSULT
DIALCO


A

Your product benefits 3 ways from the use of a DIALCO Pilot Light:

Enhanced appearance: The glow of light and sparkle of a lens add colorful visual attraction.

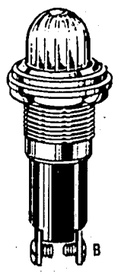
Greater safety: A timely warning flashed by a pilot light can prevent damage to equipment.

Added service: Discs inserted behind lenses can be used to deliver specific messages, such as "FUEL LOW", "ON", "OFF", etc.

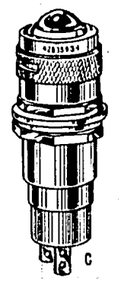
Let the Dialco engineering department assist you in selecting the *right* lamp and the *most suitable* pilot light for your needs.

Dialco offers the *complete* line of pilot lights, from sub-miniature types to giant units with 1½" lenses.

Every assembly is available complete with lamp.

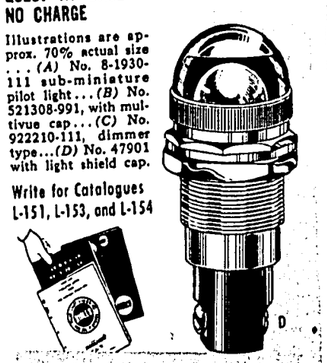

B

SAMPLES ON REQUEST AT ONCE — NO CHARGE


C

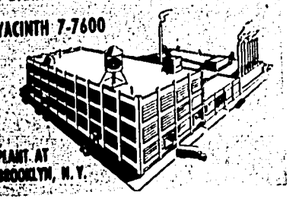
Illustrations are approx. 70% actual size . . . *(A)* No. 8-1930-111 sub-miniature pilot light . . . *(B)* No. 521308-991, with multivue cap . . . *(C)* No. 922210-111, dimmer type . . . *(D)* No. 47901 with light shield cap.

Write for Catalogues L-151, L-153, and L-154


D

Foremost Manufacturer of Pilot Lights

DIALIGHT
CORPORATION
60 STEWART AVE. • BROOKLYN 37, N. Y.
HYACINTH 7-7600


PLANT AT BROOKLYN, N. Y.

44. Motor & Motor-Generators.

(Continued from page 337)

Kollsman Instrument Corp., Div. Standard Coil Prods. Co., 80-08 45 Ave., Elmhurst 73, L.I., N.Y., 30
For details see ad on page 216
Tel: NEwtown 9-2900

Leach Corp., Inet Div., Calif., 20

Loral Electronics Corp., Dept. ID 54, 794 E. 140 St., New York 54, N.Y., 25
For details see ad on page 198
Tel: CY 2-1800

Minneapolis-Honeywell Regulator Co., Minn., 30

Mission-Western Engineers, Inc., Calif., 5, 10, 15, 20, 30, 35, 40

Motordyne, Inc., Calif., 5, 10, 20, 30

Oster Mfg. Co., John, 1 Main St., Racine, Wis., 5, 25, Fixed and Variable A C
For details see ad on page 337
Tel: RAcine 3-6331

Pioneer Electric & Res. Corp., Ill., 5, 20

Radex Corp., Ill., 5, 10, 30, 35

Ray-O-Vac Co., Special Prods. Div., Wis., Miniature Electric Motors

Rotron Mfg. Co., Inc., N.Y., 5

Servomechanisms, Inc., Post & Stewart Ave., Westbury, L.I., N.Y., 5, 30, 35
For details see ad on page 417
Tel: Pioneer 6-0481

Servo-Tek Prods. Co., N.J., 5, 30

Sessions Clock Co., Conn., 35, 40

Sherman Industrial Electronic Co., N.J., 40

Small Motors, Inc., Ill., 5, 10, 20, 30, 35

Sorensen & Co., Inc., Conn., 15

Stancil-Hoffman Corp., Calif., 35

Standard Coil Prods. Co., Inc., Calif., 5, 20, 30, 35

Star-Kimble Motor Div., N.J., 15, 20, 25

Struthers-Dunn, Inc., N.J., 40

Szekely & Assoc., Inc., O. E., Pa., 15, 20

Tele King Corp., N.Y., 10

Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y., 35
For details see ad on page 550
Tel: JU 2-3030

Transicoil Corp., 107 Grand St., New York 13, N.Y., 30
For details see ad on page 416
Tel: WOrth 2-2347

United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 5
For details see ad on page 102
Tel: Kirkland 7-4900

Universal Electric Co., Mich., 5

Vocaline Co. of America, Inc., Conn., 35, 40

Westinghouse Electric Corp., Pa., 5, 15, 20, 35

Wincharger Corp., Iowa, 5, 10

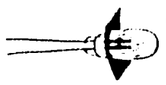
Eldema COMPUTER COMPONENTS

all materials and finishes per military specifications

E-LITE MINIATURE INDICATOR LIGHTS

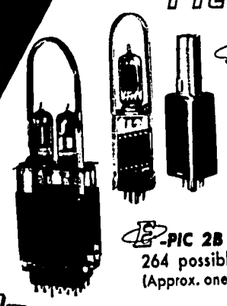


E-LITE 1A-1025
Neon indicator for data display. (Approx. Half size)



E-LITE, 1B-1024
Integral panel mounted version. (Approx. Half size)

E-PIC PLUG-IN CIRCUIT CONTAINERS



E-PIC 2A Type
32 possible case, socket, base, shield, and handle combinations. (Approx. one-fifth size)

E-PIC 2B Type
264 possible variations. (Approx. one-fifth size)

write for brochures

Eldema Corporation
5827 East Beverly Blvd
Los Angeles 22 California

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

45. Pilot Lights & Assemblies.

5. Brackets, jewels, mounts, sockets
10. Incandescent
15. Neon lights

Aerolite Electronics Corp., 507 26 St., Union City, N.J., 5
For details see ad on page 500
Tel: UNion 3-2955

Aerolux Light Corp., N.Y., 15

Aeronautical Electric Co., 5656 Northwest Hwy., Chicago 30, Ill., 5
For details see ad on page 339
Tel: SPring 7-1616

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 15, Potted
For details see ad on page 491
Tel: Hemlock 6-2230

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 10, 15
For details see ad on page 296
Tel: Brockton 160

American Radio Hardware Co., N.Y., 5

Automatic Electric Co., Ill., 5, 10

Bardwell & McAlister, Inc., Calif., 5

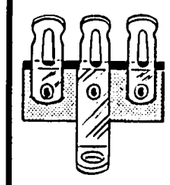
Bird & Co., Richard H., Mass., 5

Bud Radio, Inc., Dept RE, 2118 E. 55 St., Cleveland 3, Ohio, 5
For details see ad on page 145
Tel: HE 1-7166

Circuit Craft Associates, Calif., 15

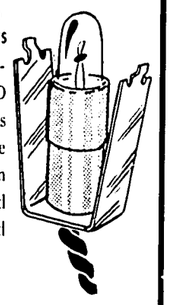
Dialight Corp., 60 Stewart Ave., Brooklyn 37, N.Y., 5, 10, 15
For details see ad on page 338
Tel: HY 7-7600

TERMINAL STRIPS
PILOT LIGHT SOCKETS



TERMINAL STRIPS
FAST DELIVERY of a wide variety of standard and special types of terminal strips

NYLON INSULATED PILOT LIGHT SOCKETS
UNDERWRITERS APPROVED Dial Light Sockets with unbreakable molded Nylon sleeves. Supplied with standard and special brackets. Also other types.



WRITE FOR CATALOG

Aeronautical ELECTRIC COMPANY
5656 Northwest Highway, Chicago 30, Ill.

Drake Mfg. Co., Dept IR, 1713 W. Hubbard St., Chicago 22, Ill., 5, 15
For details see ad on page 160
Tel: Chesapeake 3-4462

Eldema Corp., 5827 E. Beverly Blvd., Los Angeles 22, Calif., 5, 15
For details see ad on page 338
Tel: PA 8-5452

Electro-Tech Equipment Co., N.Y., 5

Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 5
For details see ad on page 505
Tel: Delaware 7-5776

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 5, 10
For details see ad on page 507
Tel: Rockford 2-6695

General Electric Co., N.Y., 5

General Laminated Prods. Co., Ill., 5

Hart Mfg. Co., Conn., 10, 15

Hetherington, Inc., Pa., 5

Industrial Devices, Inc., N.J., 15

Ketay Mfg. Corp., N.Y., 5

Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N.Y., 5, 10
For details see ad on page 511
Tel: MOunt Vernon 4-4024

National Carbon Co., Div. Union Carbide & Carbon Corp., 30 E. 42 St., New York 17, N.Y., 10
For details see ad on page 208
Tel: Murray Hill 7-8000

Oxford Electric Corp., Ill., 10

Rodale Mfg. Co., Inc., Pa., 5

Signalite, Inc., N.J., 15

Smith, Inc., Herman H., N.Y., 5

Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 10
For details see ad on page 234
Tel: HUmboldt 2-4200

Ucinite Co., 459 Watertown St., Newtonville 60, Mass., 5
For details see ad on page 103
Tel: LA 7-8400

United-Carr Fastener Corp. 31 Ames St., Cambridge 42, Mass., 5
For details see ad on page 102
Tel: KIrkland 7-4900

Universal Aviation Equip., Inc., 362 Fifth Ave., New York 1, N.Y., 10
For details see ad on page 516
Tel: WIsconsin 7-3574

Westinghouse Electric Corp., Pa., 5

46. Power Supplies.

5. High voltage, (kilovolt)
10. Low voltage
15. Medium voltage
20. Primary power
sources, fuel-engine driven
25. Voltage regulated power sources

Acme Electric Corp., 44 Water St., Cuba, N.Y., 5, 10, 15, 25
For details see ad on page 381
Tel: Cuba 4

Acme Telectronix Div., Nea Service, Ohio, 10, 15, 25

Adler Communications Labs., N.Y., 25

Aerovox Corp., Mass., 25

Ahrendt Instrument Co., Md., 10, 15, 25

Aircraft-Marine Prods., Inc., Chemical and Dielectric Div., 155 Park St., Elizabethtown, Pa., 5
For details see ad on page 281
Tel: Elizabethtown 420

Airmec., Ltd., England, 25

Airpax Products Co., Md., 5, 10, 15

Alco Electronics Mfg. Co., Mass., 15, 25

Alcor Electronics Corp., N.Y., 10, 15, 25

Alden Electronic & Impulse Recording Equip., Washington St., Westboro, Mass., 10, 15
For details see ad on page 296
Tel: Westboro 467

Altec Lansing Corp., Calif., 5, 10, 15

Altec Lansing Corp., N.Y., 25

American Electronic Labs., Inc., Pa., 10, 15, 25

Amplifier Corp. of America, N.Y., 10, 25

Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 25
For details see ad on page 394
Tel: EV 6-5715

Applegate & Co., C. J., Colo., 5, 10, 15

Arc Equipment Co., N.J., 5, 10, 15

Associated Eng. Corp. of Boston, Mass., 5, 10, 15, 25

Associated Specialties Co., Dept. 101 1751 Main St., Orefield, Pa., 25
For details see ad on page 339
Tel: EX 5-1275

Atlantic Industrial Co., N.Y., 5, 10, 15, 25

Atlas Eng. Co., Inc., Mass., 25

(Continued on page 341)



RACK MOUNTING MODELS
105-125 V. 60C INPUT
OUTPUT CURRENT MAY BE SET AT ANY VALUE FROM 0.2 TO 50 M.A. D.C.
AS LOAD VOLTAGE VARIES BETWEEN 0-150 V. MODEL 1A-R IS CONSTANT WITHIN 1%, MODEL 1B-R WITHIN 0.1%.
IMMEDIATE DELIVERY
MODEL 1A-R $112—MODEL 1B-R $245
0.2-100 M.A. RANGE $13 MORE
Other models to specifications

ELECTRONICALLY REGULATED
D.C. CONSTANT CURRENT POWER SUPPLIES
OUTPUT CURRENT IS HELD CONSTANT AS LOAD VARIES

OTHER MODELS AVAILABLE

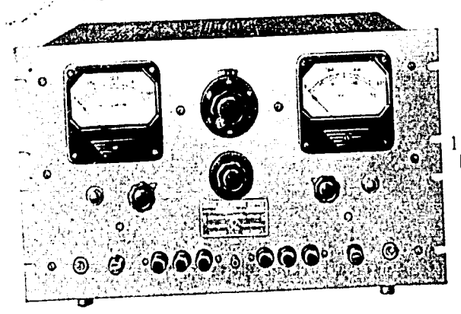
ASSOCIATED SPECIALTIES CO
1751 MAIN STREET
OREFIELD, PENNSYLVANIA

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Precisely Controlled Power
for Research, Production
and Equipment Applications...

VOLTAGE STANDARD POWER SOURCES

Whether your requirement is simple bench power, precision voltages for meter calibration or stable high power for computers, ELECTRONIC MEASUREMENTS is a dependable source for stable D.C. power. Long experience in this field, including the solution of many airborne problems, means ELECTRONIC MEASUREMENTS can meet your routine or special power needs competently and economically.



0-600 V
600MA
or
1 AMP UNIT
Illustrated



● REGATRON SERIES

VARIABLE D.C. VOLTAGE STANDARD
SUPER REGULATED POWER SOURCE
SMALL SIGNAL MODULATION
MECHANICAL AND ELECTRICAL VERNIERS
ESPECIALLY SUITED FOR TRANSISTOR APPLICATIONS
HIGH STABILITY OVER EXTENDED PERIODS
COMPACT SIZE FOR DELIVERED POWER

● REGATRON FOR COMPUTERS

MODULAR SYSTEM PERMITS CURRENTS UP TO 20 AMPS., VOLTAGE TO 350 V. AT HIGH EFFICIENCIES
HIGH STABILITY OVER EXTENDED OPERATING PERIODS
FAST CORRECTION SPEED AND LOW OUTPUT IMPEDANCE
VERY CLOSE REGULATION
EXTREMELY LOW RIPPLE
CONTINUOUS MONITORING OF TUBE PERFORMANCE
ABSOLUTE CALIBRATION AVAILABLE

FURTHER INFORMATION AND COMPLETE SPECIFICATIONS UPON REQUEST

● GENERAL PURPOSE POWER SUPPLIES

Electronic Measurements Company Regulated Power Supplies have been in production for almost a decade and have established a standard of performance recognized throughout the industry. A complete line is offered, capable of meeting most requirements.

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COMMUNICATIONS EQUIPMENT, INDUSTRIAL TEST EQUIPMENT, AIRCRAFT POWER EQUIPMENT

4. Component Parts

46. Power Supplies.

(Continued from page 340)

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on page 402
Tel: Eliot 4-4321
Audio Corp. of America, N.J., 5, 10, 15, 25
Authorized Manufacturers Service, N.Y., 15, 25
Auto-Test, Inc., Ill., 15, 25
Avion Instrument Corp., N.J., 25
Bassett, Inc., Rex, Fla., 5
Beckman Instruments, Inc., Shasta Div., P.O. Box 296, Station A, Richmond, Calif., 5, 10, 15, 25
For details see ad on page 138
Tel: Beacon 5-7196
Bell Sound Systems, Inc., Ohio, 10, 15
Beta Electric Corp., N.Y., 5
Beva Lab., N.J., 5, 25
Boeing Airplane Co., Indust. Prods. Div., Wash., 15, 25
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 25
For details see ad on page 128
Tel: LAmbert 5-2200
Bomac Labs., Inc., Salem Rd., Beverly, Mass., 5, 10, 15
For details see ad on pages 92-93
Tel: Beverly 4670
Bone Eng. Corp., Calif., 25
Bright Radio Labs., Inc., N.Y., 5, 10, 15, 25
Bristol Eng. Corp., Pa., 10, 15, 25
Browning Labs., Inc., Mass., 25
Brownthorn Electronics, Inc., N.Y., 10, 15, 25
Bruno N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 25
For details see ad on page 444
Tel: LOngacre 45930
Bunnell & Co., J. H., N.Y., 10
Burke Electric & X Ray Co., Ltd., Canada, 5
Canadian Aviation Electronics, Ltd., Canada, 5, 10, 15
Canadian Research Institute, Canada, 5, 10, 15, 25
Canoga Corp., Calif., 5, 10, 15
Carter Motor Co., 2645 N. Maplewood Ave., Chicago 47, Ill., 10
For details see ad on page 148
Tel: HU 6-4700
Caterpillar Tractor Co., Ill., 20, 25
Central Transformer Co., Ill., 5, 10, 15
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5, 10, 15, 20
For details see ad on pages 86-87
Tel: Livingston 6-1100
Cole Instrument Co., Calif., 5, 10, 15
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 10, 15, 25
For details see ad on page 152
Tel: PL 4-5502
Components Supply Co., N.Y., 10
Computer Co. of America, Div. Bruno-N.Y., 460 W. 34 St., New York 1, N.Y., 10, 15, 25
For details see ad on page 444
Tel: LOngacre 4-5930
Condenser Products Co., Conn., 5
Condenser Prods. Co., Ill., 5, 10, 15
Continental Radio & Electrical Eng., South Africa, 10, 15, 25
Corbin Corp., Md., 20
Cornell-Dubilier Electric Co., Dept. MB4, 333 Hamilton Blvd., S. Plainfield, N.J., 10, 15
For details see ad on page 154
Tel: Plainfield 6-9000
Crown Eng., N.M., 5, 25
Cubic Corp., Calif., 10, 15, 25
Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., Precision Frequency Power Supply
For details see ad on page 254
Tel: APpleton 7-1133
Demco Products, Pa., 10, 15
De Mornay-Bonardi, Calif., 5
Devtronics, Inc., N.J., 5, 10, 15, 25
De Wald Radio & TV Corp., N.Y., 5, 10, 15
Dictograph Prods., Inc., N.Y., 10, 15
Douglas Labs., Inc., N.Y., 5, 10, 15, 25
Douglas Radio Labs., Mass., 25
Dressen-Barnes, Calif., 5, 10, 15, 25
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 10, 15, 25
For details see ad on page 445
Tel: Burlington 3-0446
Du Mont Labs. Inc., A. B., Communication Prods. Div., 1500 Main Ave., Clifton, N.J., 25
For details see ad on page 161
Tel: Mulberry 4-7400
Du Mont Labs., Inc, A. B., Instrument & Tube Div., 1500 Main Ave., Clifton, N.J., 5
For details see ad on page 161
Tel: Gregory 2-2000
Eastern Precision Resistor, N.Y., 5, 25
Eastern Specialty Co., Pa., 25
Eder Eng. Co., Wis., 5, 10, 15, 25
Edmar Communication Co., Pa., 10
El Mec Labs., Inc., N.J., 5, 10, 15, 25
El-Tronics, Inc., Pa., 5, 10, 15, 25
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15, 20, 25
For details see ad on page 487
Tel: Pioneer 6-5212
Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill., 5
For details see ad on page 383
Tel: BI 8-4596
Electrical Device Mfg. Co., N.J., 5, 10, 15, 25
Electro Craft Industries, Inc., Conn., 5
Electro Eng. Works, Calif., 5, 10, 15, 25
Electro Products Labs., Inc., 4501-RC N. Ravenswood Ave., Chicago 40, Ill., 10
For details see ad on page 408
Tel: UPtown 8-1141

The industry's most effective power supply

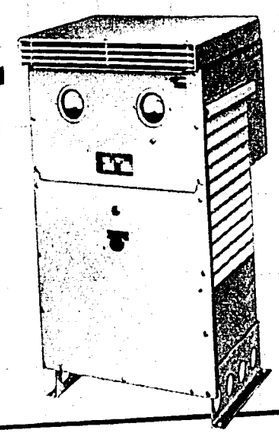
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Electronic Eng. Co. of Calif., Calif., 25
Electronic Instrument Co., Inc., N.Y., Battery Eliminator
Electronic Measurements Co., Inc., Maple Ave. & Lewis St., Eatontown, N.J., 5, 10, 15, 25, DC Supplies & Computer Power Supplies
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Research Associates, Inc., P.O. Box 29, Caldwell, N.J., 10, 15, 25
For details see ad on page 369
Tel: CAldwell 6-6729
Elm Labs., N.Y., 10
Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y., 10, 15
For details see ad on page 383
Tel: Dickens 5-7531
Erdco Eng. Corp., Ill., 5, 10, 15, 25
ESD Labs., Conn., 10
Fairchild Recording Equipment Co., N.Y., 15
Federal Mfg. & Eng. Corp., N.Y., 10
Federal Telecommunication Labs., Div. I. T. & T., N.J., 10
Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 5, 10, 15, 25
For details see ad on pages 32-37
Tel: Nutley 2-3600
Fluke Mfg. Co., Inc., John, Wash., 5, 10, 15, 25
Franklin Electronics, Inc., Pa., 5, 10, 15
Freed Electronics & Controls Corp., N.Y., 10, 15, 25
Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 10, 15, 25
For details see ad on page 180
Tel: Evergreen 6-1300
Fugle-Miller Labs., Inc., 398 Main St., Metuchen, N.J., 5
For details see ad on pages 171, 292
Tel: ME 6-2245
Furst Electronics, Ill., 5, 10, 15, 25
Furzehill Labs., Ltd., England, 15, 25
Galbraith & Son Electric Corp., C. C., N.Y., 10, 15
Gates Radio Co., Ill., 5, 10, 15, 25
General Communications, Wis., 5, 10, 15, 25
General Electric Co., N Y C, N.Y., 5, 10, 15, 25
General Electric Co., N.Y., 10, 20, 25
General Electric Co., Apparatus Sales Div., N.Y., 5
General Electric Co., Specialty, Transformer, & Ballast, Ind., 10, 15
General Electrosonics, Inc., N.Y., 5, 10, 15, 25
General Magnetics, Inc., N.J., 10, 15, 25
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10, 25
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Georator Corp., Va., 20
Gonset Co., Calif., 15
Goslin Electric & Mfg. Co., Calif., 5, 10, 15, 25

(Continued on page 342)

A New Type of D-C Power Source



C&C

STAVOLT®

POWER RECTIFIERS

Closely Regulated by Magnetic Amplifier Control of unique and stable qualities.

Low Ripple

Fast Response

- Ten standard 28 Volt production models up to 1000 amperes, many others, mobile or stationary.
- Amazing size and weight reduction made possible by use of latest core and insulation materials and aluminum construction.
- Encapsulated components—shock mounted meters recessed behind plastic windows.
- No tubes—lamps—carbon piles—commutators or moving contacts and no radio interference.
- STAVOLT Rectifiers are rugged and can take heavy intermittent overloads. They meet MIL-E-7894 with both range and characteristics.

Engineers will be interested in learning more about the fine qualities of STAVOLT Rectifiers. Write for catalog with detail specifications.

McCOLPIN-CHRISTIE CORP.

3400 West 67th Street, Los Angeles 43, Calif.

25th Year of Rectifier Manufacturing

NEUTRONIC

REGULATED

HIGH VOLTAGE POWER SUPPLIES



Model R-22 Series
Reversible illustrated

REVERSIBLE OUTPUT POLARITY

Model	Output				Reg.
R-22*	3-26 KV	2 ma. or	18 KV		0.5%
R-22CR	5-26 KV	2 ma. or	18 KV		
R-22M	5-30 KV	2 ma. or	20 KV		0.5%
R-22MR	5-30 KV	2 ma. or	20 KV		0.5%
R-22SR	5-30 KV	2 ma. or	30 KV		

*SINGLE POLARITY

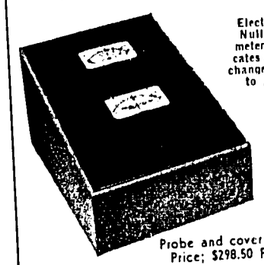
21K	1-10 KV	10 ma. or	5 KV	
21KR	1-10 KV	10 ma. or	5 KV	0.5%
21M	1-12 KV	6 ma. or	10 KV	0.5%
21MR	1-12 KV	6 ma. or	10 KV	
22K	3-26 KV	2 ma. or	18 KV	
22KR	3-26 KV	2 ma. or	18 KV	0.5%
22M	5-30 KV	2 ma. or	20 KV	
22MR	5-30 KV	2 ma. or	20 KV	0.5%
22C	5-40 KV	1.5 ma. or	25 KV	
22CR	5-40 KV	1.5 ma. or	25 KV	0.5%
22M	5-45 KV	1.5 ma. or	30 KV	
22MR	5-45 KV	1.5 ma. or	30 KV	0.5%
22C	5-50 KV	1 ma. or	35 KV	
22CR	5-50 KV	1 ma. or	35 KV	0.5%
22M	5-55 KV	2 ma. or	50 KV	
22MR	5-55 KV	2 ma. or	50 KV	0.5%
22S	5-75 KV	2 ma. or	70 KV	
22SR	5-75 KV	2 ma. or	70 KV	0.5%

*Either positive or negative

ALL TYPES CAN BE MODIFIED TO INDIVIDUAL ORDER

VOLTMETER, KILOVOLTMETER, and VARIATION PERCENTAGE INDICATOR

25 microampere movement. Measures DC voltages 0-1200v, 0-3000v, 0-30 KV, 0-60 KV



Electronic Null type meter indicates voltage changes down to .05%

Probe and cover not shown
Price; $298.50 FOB N.Y.

NEUTRONIC ASSOCIATES

87-16 116th St., Richmond Hill, L.I., N.Y.
Virginia 7-7703

4. Component Parts

46. Power Supplies.

(Continued from page 341)

Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 25
For details see ad on Cover III
Tel: Everglade 4-4400

Guild Electronics, Inc., N.Y., 5

Hamlyn Electronics Corp., N.Y., 5, 10, 15, 25

Hanson-Gorrill-Brian, Inc., N.Y., 5, 25

Harvey-Wells Electronics, Inc., Mass., 10, 15

Hathaway Instrument Co., Colo., 25

Heath Co., 305 Territorial Rd., Benton Harbor, Mich., 25
For details see ad on page 447
Tel: WA 5-1175

Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 25
For details see ad on pages 15-22
Tel: DAvenport 5-4451

Howard Industries, Inc., Wis., 20

Hufford Machine Works Inc., Electric Div., Calif., 10, 15, 25

Hycon Mfg. Co., Calif., 5, 10, 15

Industrial Electronics of Canada, Ltd., Canada, 5, 10, 15, 25

Industrial Research Labs., Md., 25

Industrial Television, Inc., N.J., 5

Industrial Test Equip. Co., 55 E. 11 St., New York 3, N.Y., 25, DC
For details see ad on page 471
Tel: GRamercy 3-4684

Insuline Corp. of America, N.H., 10, 15, 25

Kahn & Co., Inc., Conn., 10

Kaiser Metal Prods. Co., Inc., Pa., 10, 15

Kalbfell Labs., Inc., Calif., 5, 10, 15, 25

Kepco Labs., N.Y., 5, 10, 15, 25

Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 10, 15, 25
For details see ad on pages 2-3
Tel: UNiversity 4-4272

Kuss Mach. Tool & Die Co., Inc., Pa., 10, 15

Lambda Electronics Corp., N.Y., 5, 10, 15, 25

Langevin Mfg. Corp., 37 W. 65th St., New York 23, N.Y., 10, 15
For details see ad on pages 116-117
Tel: ENdicott 2-7200

Lawn Electronics Co., N.J., 10, 15, 25

Leach Corp., Inct Div., Calif., 10, 15, 20, 25

Lee Electric & Mfg. Co., Calif., 5, 10, 25

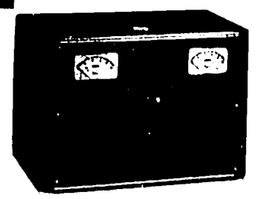
Link Aviation, Inc., N.Y., 15

MB Mfg. Co., Inc., Conn., Electronic

MacLeod & Hanopol, Inc., Mass., 25

Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 10, 15
For details see ad on page 248
Tel: E 5471

Selenium Rectifier Power Units



D. C. POWER SUPPLIES

MODEL CV-30-24

INPUT: 117V 60 cycle single phase.
OUTPUT: 0-30 volts at 0-24 amperes D.C.
CONTROLS: Powerstat. Henry-ons magnetic circuit breaker. Klixon thermal circuit breaker. 4" rectangular voltmeter and ammeter accurate to 2%. neon pilot light. 5 way binding posts for output.

CV-30-24 full wave rectified D.C. $260.00
CF-30-24 2.5% ripple $300.00
CA-30-24 0.35% ripple $345.00

D. C. LABPACK

INPUT: 117 volts 60 cycle single phase.
OUTPUT: 0-28 volts at listed current, continuously variable.
CONTROLS: Powerstat, circuit breaker, neon pilot lamp, on-off switch, voltmeter and ammeter accurate to 3%, 5 way binding posts for output.

Model L 28-5, 5 Amperes full wave rectified D.C. $87.50
Model LF28-4 4 Amperes D.C. 2% ripple 107.50
Model L 28-10, 10 Amperes full wave rectified D.C. 155.00
Model LF28-8, 8 Amperes D.C. 2% ripple 170.00



The illustrated standard units represent the power supplies we manufacture. Many power supplies are designed to the exact requirements of the user, giving maximum utility together with economy. Prompt quotation and delivery. Request catalog describing these and other power supplies.

POWER CONVERSION FOR—

Production and laboratory testing of D.C. apparatus from A.C. power lines, allowing continuous variation of D.C. voltage and current to simulate changing battery or line voltage conditions.
Commercial operation of vibrator power packs, dynamotors, D.C. motors, relays and other devices which require D.C.

- Replacing storage or primary batteries.
- Battery charging.
- Life testing of battery operated equipment.
- High current selenium rectifier plate power supplies.

MODEL RECTIFIER CORPORATION

557 Rogers Ave., B'klyn 25, N. Y.

Magnetic Amplifiers, Inc., N.Y., 10, 15, 25

Magnetic Research Corp., Calif., 10, 15, 25

Magnetics, Inc., Dept. I-11, P.O. Box 230, Butler, Pa., 25
For details see ad on page 306
Tel: Butler 7-1745

Magnetics Research Co., 142 King St., Chappaqua, L.I., N.Y., 25
For details see ad on pages 272, 387
Tel: CH 1-0052

Magnex Corp., N.Y., 5, 10, 15

Manson Labs., Conn., 5, 10, 15, 25

Marine Electric Corp., N.Y., 25

Marshall Eng., Electronic Div., Calif., 10, 15, 25

McColpin-Christie Corp., 3400 W. 67th St., Los Angeles 43, Calif., 10, 25
For details see ad on page 342
Tel: Pleasant 3-2607

McNeal, J. D., Conn., 5, 10, 15, 25

Measurement Eng., Ltd., Canada, 10, 15, 25

Melstrom Mfg. Corp., N.J., 10, 15

Metal Prods. Co., Tenn., 25

Meyer & Co., Hugo, N.Y., 5, 15

Mid-West Coil & Transformer Co., Ill., 10, 15

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 15, 25
For details see ad on page 548
Tel: Malden 4-4108

Millivac Instrument Corp., N.Y., 15, 25

Model Rectifier Corp., 557 Rogers Ave., Brooklyn 25, N.Y., 10, 25
For details see ad on page
Tel: BU 7-0029

Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo., 5
For details see ad on page 388
Tel: Evergreen 3-3300

Moulic Specialties Co., Ill., 5, 15, 25

Multi-Tron Lab., Ill., 5, 25

Neutronic Associates, 87-16 116 St., Richmond Hill, L.I., N.Y., 5, 10, 15, 25
For details see ad on page 342
Tel: Virginia 7-7703

New Rochelle Tool Corp., N.Y., 5

Newton Co., The, Conn., 25

Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 5, 10, 15, 25
For details see ad on page 344
Tel: KI 7-0469

Northern Electric Co., Ltd., Canada, 10, 15, 25

Nuclear Instrument & Chemical Corp., Ill., 5

Nuclear Research Corp., Pa., 5

Nuclear Specialty Co., N.Y., 15

Omega Mfg., Inc., N.Y., 25

Onan & Sons, Inc., D. W., Minn., 20

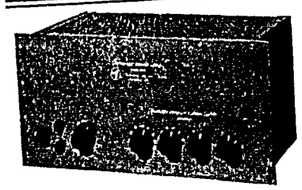
Ontario Industries, Inc., N.Y., 10

Opad-Green Co., N.Y., 10, 15, 25, Battery Eliminators

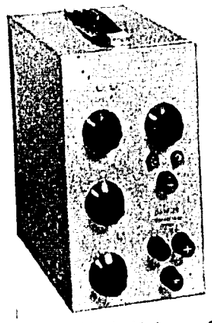
Oregon Electronic Mfg. Co., Ore., 15, 25

(Continued on page 345)

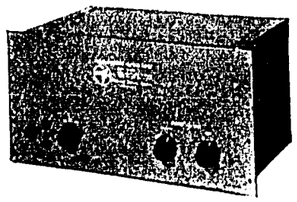
PRECISION SUPPLIES



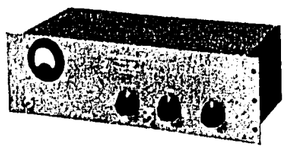
Constant Current Supply
Model RI-221
1-225 Ma. 0-300 V.
10 uA. ripple 100 Megohm Imped.



Regulated High Voltage Supply
Model RE-1601
300-1600 V. 0.5 Mv. ripple
0-7 Ma. 0.5 Ohm Imped.



Regulated High Voltage Supply
Model RE-2002
700-2020 V. 1 Mv. ripple
0-25 Ma. 0.5 Ohm Imped.



Klystron Modulator
Model ME-331
Square-wave frequency: 50-10,000 cps.
Used with RE-2002 Supply

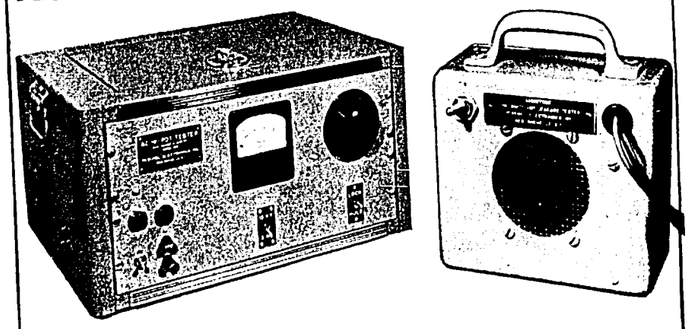
Either positive or negative of any supply can be grounded.

Any of these supplies can be modified to meet specialized requirements.

Regulated HV supplies to 10 Kv. and Constant Current supplies to 1 Amp. can be designed and built. Inquires invited.

NORTHEAST SCIENTIFIC CO.
ONE GRAY STREET
CAMBRIDGE 38, MASS.

PESCHEL INSTRUMENTS AND POWER SUPPLIES



- Sensitive Hipot Testers, AC/DC, non-destructive, 5 microamp circuit breaker.
- Corona Ionization Test Sets.
- HV Test Sets, AC/DC, high capacity.
- DC Power Supplies, up to 100 KV.
- DC High Potential Test and Cable Fault Locators.
- Potential Indicators, wide range, 200 V to 50 KV.
- Dielectric Breakdown Testers, AC or DC.
- Audiotone Continuity and Leakage Testers, 0-100 megohms.
- Continuous Insulation Testers, production type.
- Electronic Heating.

CONTRACT WORK DIVISION: INSTRUMENTS, POWER UNITS SUB-ASSEMBLIES, CABLE AND WIRE HARNESS ASSEMBLIES

INQUIRIES INVITED

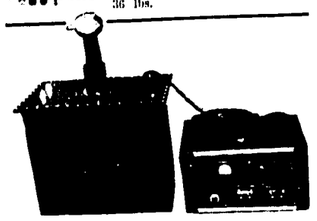
PESCHEL ELECTRONICS, INC.
13 GARDEN STREET, NEW ROCHELLE, N. Y., NEW ROCHELLE 6-3342

SPELLMAN HIGH VOLTAGE POWER SUPPLIES



MODEL MIL-30
POSITIVE POLARITY POWER SUPPLY

A positive polarity high voltage DC supply with an output voltage range of 15 to 30 KV DC at 1 ma. with regulation of .5%. The MIL-30 also has a negative 1000 Volt tap at 1 ma. regulated. Also included—a positive 300 Volt tap at 1 ma. regulated. This unit, shown less housing, is built in accordance with military specifications. Dimensions: Length 15", Width 8½", Depth 9". Weight 36 lbs.



0-100 KV AC 2 ma.
0-100 KV DC 2 ma.
OIL-FILLED 60 CYCLE POWER SUPPLIES

Suitable for use in paint spraying, flocking, electrostatic precipitation.

SPELLMAN TV is uniquely adapted for the construction of special power supply units of all types. Please write concerning your needs.

Model LAB-60 CONTINUOUSLY VARIABLE REGULATED 0 to 60 KV DC SUPPLY.

Model LAB-60PN—Same as above with POLARITY REVERSIBLE From front panel.

Model LAB-40 CONTINUOUSLY VARIABLE REGULATED 25 to 40 KV DC SUPPLY.

Model LAB-30PN REVERSIBLE POLARITY From Front Panel—CONTINUOUSLY VARIABLE 1 to 30 KV DC SUPPLY.

Model RG-30 CONTINUOUSLY VARIABLE 15-30 KV REGULATED DC POWER SUPPLY.

Model PN-30R REVERSIBLE POLARITY CONTINUOUSLY VARIABLE 1-30 KV UNREGULATED POWER SUPPLY.

Model PN-60 REVERSIBLE POLARITY 60 KV DC POWER SUPPLY.

Model 2040 40 KV DC POWER SUPPLY.

Model 1575 1½ KV POWER SUPPLY.

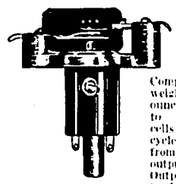
HIGH VOLTAGE RF STEP-UP COILS

5 KV	$ 4.80 Net
10-15 KV	12.00 Net
25 KV	36.00 Net
35 KV	42.00 Net

SEND FOR COMPLETE INFORMATION

SPELLMAN TELEVISION CO., INC 3029 WEBSTER AVENUE BRONX, N. Y.

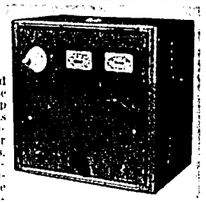
HIGH VOLTAGE
from Milliwatts to Kilowatts



MINIATURE HIGH VOLTAGE CONVERTER

Compact, powerful unit, weighs less than 3 ounces. Simply connect to standard flashlight cells or low voltage 60 cycles and any voltage from zero to 7000 volts output can be obtained. Output can be stabilized to 1% by means of circuits supplied. Delivery from stock. Perfect for Photoflash applications, breakdown testers, portable power supplies, megohmmeters, Geiger counters. Full details on request.

STABILIZED POWER SUPPLIES



Many standard models to choose from. Ranges up to 100,000 Volts DC. May be obtained with or without meters. Regulated or unregulated. Regulated types use amplifier circuits, highly accurate chopper type circuits or tubeless magnetic amplifier control. Full details on request.

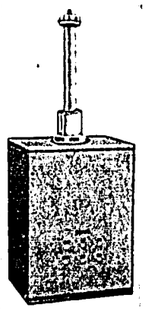


HIGH CURRENT HIGH VOLTAGE

For applications requiring high power. Output available up to several amperes at high voltages. These are industrial type units intended for long continuous service under adverse conditions. Reversible polarity model illustrated. Write us giving details of your needs.

BREAKDOWN TESTERS

Basic transformer. Provides output of 0 to 100,000 Volts RMS. Up to 20 Ma may be drawn from the secondary. A special metering winding accurately shows the exact output voltage. The best all around tester obtainable for those odd breakdown and insulation measurements. Write for full details.



MAGNETIC AMPLIFIERS

Convert millivolts to volts or microamperes to milliamperes. Rugged units, simply plug in. No warm-up time—no delicate tubes. What are your needs?

Other PRECISE Products . . .
KILOVOLTMETERS to 100,000 Volts
TRANSPARENT CIRCUIT STAMPS saves hours of drafting time.
MICRO CIRCLE CUTTERS for cutting holes in meter panels.
PRECISION MEGOHM BRIDGES
SATURABLE REACTORS
INFRA RED SUPPLIES complete selection in stock.
METER SCALE PRINTING MACHINES

We will gladly send additional information on any of our products.

PRECISE MEASUREMENTS COMPANY
940 Kings Highway Brooklyn 23, New York
Telephone ESplanade 5-9435

4. Component Parts

46. Power Supplies.

(Continued from page 343)

Orenco, (Ortho Eng. Corp.), 245 Wallace St., Orange, N.J., 25, D.C.
For details see ad on page 389
Tel: Orange 4-9913

Otis Elevator Co., Electronic Div., N.Y., 5, 10, 15, 25

Owen Labs., Calif., 10

Partridge Transformers, Ltd., England, 5, 10

Pedersen Electronics, Calif., 15, 25

Penntronics, Pa., 15, 25

Perkin Eng. Corp., Calif., 5, 10, 15, 25, Magnetic Amplifier, Regulated

Perma-Power Co., Ill., 10

Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y., 5, 10, 15, 25
For details see ad on page 344
Tel: NE 6-3342

Phebco, Inc., Md., 5, 10, 15

Philbrick Researches, Inc., G. A., Mass., 15, 25

Photogenic Machine Co., Ohio, 5

Plastic Capacitors, Inc., Ill., 5, 10, 15

Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 10, 15, 25
For details see ad on pages 39-42
Tel: STagg 2-3464

Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 10, 15, 25
For details see ad on page 165
Tel: ULster 2-6800

Polytronics Co., Canada, 25

Power Equipment Company, Mich., 10 15, 25

Power Designs, Inc., N.Y., 5, 10, 15, 25

Power Transformer Co., Inc., N.J., 5, 10, 15, 25

Precise Development Corp., N.Y., 15, 25

Precise Measurements Company, 940 Kings Highway, Brooklyn 23, N.Y., 5, 15, 25
For detail see ad on page 345
Tel: ES 5-9435

Precision Associates, Inc., N.Y., 10, 15

Press Wireless Labs., Inc., Mass., 5

Process & Instruments, N.Y., 25

Production Research Corp., Claremont Ave., Thornwood, N.Y., 5, 25
For details see ad on page 524
Tel: PLeasantville 2-2767

Pulse Techniques, Inc., N.J., 10

Q-O-S Corp., N.Y., 5

R. M. S. Assoc., Inc., N.Y., 15, 25

Radar-Electronics, Inc., N.Y., 5, 10, 15, 25

Radio City Products Company, Inc., Pa., 10, 15

Radio Engineering Co., N.Y., 5, 10, 15

Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 5, 10, 15, 25
For details see ad on page 525
Tel: Oregon 5-0085

Rapid Electric Co., N.Y., 10, 15, 25

Raypar, Inc., Ill., 5

Regulator Equip. Corp., N.J., 10, 15, 25

Research Electronics, Pa., 5, 25

Rich Electronics, Inc., Fla., 5

Richardson-Allen Corp., N.Y., 5, 10, 15, 25

Ross Mfg. Co., Iowa, 10, 15

Sargent-Rayment Co., The, Calif., 10, 15

Schauer Manufacturing Corp., Ohio, 10, 15, 25

Scientific Instrument Labs., N.Y., 15

Scientific Specialties Corp., Mass., 5, 15

Scott, Inc., H. H., Mass., 10, 15, 25

Senn Corp., Ind., 5, 10, 15

Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 5
For details see ad on page 236
Tel: FI 7-2810

Servomechanisms, Inc., Post & Stewart Ave., Westbury, L.I., Ne.Y., 25
For details see ad on page 417
Tel: Pioneer 6-0481

Servo-Tek Prods. Co., N.J., 25

Sierra Electronics Corp., Calif., 25

Smith-Meeker Engineering Co., N.Y., 10

Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., 25
For details see ad on page 391
Tel: BI 2-1414

Sonar Radio Corp., N.Y., 25

Sorensen & Co., Inc., Conn., 10, 15, 25

Specialized Instruments Corp., Calif., 25

Spellman Television Co., Inc., 3029 Webster Ave., New York 67, N.Y., 5, 15
For details see ad on page 344
Tel: KI 7-0306

Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 25
For details see ad on pages 23-24
Tel: FIeldstone 7-3600

Standard Coil Prods. Co., Inc., Calif., 25

Standard Electric Time Co., 73 Logan St., Springfield 2, Mass., 25
For details see ad on page 457
Tel: SPringfield 6-7237

Standard Electrical Prods. Co., Ohio, 25

Standard Electronic Research Corp., N.Y., 25

Statham Labs., Calif., 25

Strong Electric Corp., Ohio, 10

Suffolk Prods. Corp., N.Y., 5

Summit Electronics, Inc., N.J., 15, 25

Superex Electronic Corp., N.Y., 5, 10, 15, 25

Superior Electric Co., 9000 Clarke Ave., Bristol, Conn., 10, 15, 25
For details see ad on pages 106-107
Tel: Bristol 2-9561

Syntronic Instruments, Inc., Ill., 5

T. L. G. Electric Corp., N.Y., 5, 10, 15, 25

Taffet Radio & Television Co., N.Y., 10, 25

Tech Labs., Inc., N.J., 15

Technical Apparatus Builders, N.Y., 10, 15, 25

Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 15, 25
For details see ad on page 474
Tel: WEbster 9-9520

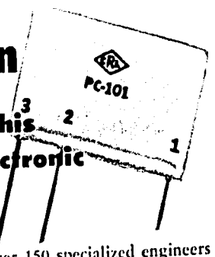
(Continued on page 346)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Clean Sweep
on soldered connections



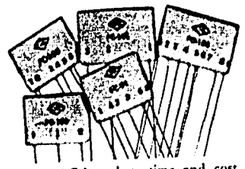
82% **labor reduction in wiring—with this Centralab Printed Electronic Circuit Couplate†**



- CRL PC-101 Vertical Integrator reduces wiring connections from 16 to 3.
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- PC-101 is in CRL stock for *IMMEDIATE DELIVERY* — as are 30 standard circuit couplates.

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- CRL has over 150 specialized engineers for the design and development of P.E.C.'s. They can help *you* with your circuit problem.
- Hundreds of experienced production personnel and extensive, mechanized facilities produce your requirements whether hundreds or millions of couplates.
- Up to 29 different quality tests are made on each CRL Couplate before shipment.
- Centralab's experience in resistor, capacitor and ceramic materials goes back to 1923 — all these have contributed to the quality of Centralab P.E.C.'s.



Centralab P.E.C.'s reduce time and cost of installation, stocking and paper work — give you consistent, accurate performance for 100 or 1,000,000 plates.

†Trademark



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In Canada: 804 Mt. Pleasant Road, Toronto, Ontario



Industry's greatest source of standard and special electronic components

Y-2

46. Power Supplies.

(Continued from page 345)

Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 10, 15
For details see ad on page 224
Tel: AMityville 4-4446
Teletronics Lab., Inc., N.Y., 10, 15, 25
Transformer & Eelectronic Specialty Co., 3824-28 Terrace St., Philadelphia 28, Pa., 5
For details see ad on page 390
Tel: IVyridge 3-1383
Transformer Engineers, Calif., 10, 25
Transformer Technicians, Inc., Ill., 5, 10, 15, 25
Transmitter Equipment Mfg. Co., Inc., N.Y., 5, 10, 15, 25
Tray-Ler Radio Corp., Ill., 5
Triumph Mfg. Co., Ill., 10, 15
Union Electric & Mfg. Co., N.J., 5, 10, 15
Union Spring & Mfg. Co., N.J., 5, 10, 15, 25
United States Motors Corp., Wis., 20
U.S. Recording Co., D.C., 25
Universal Electronics Co., Calif., 5, 10, 15, 25
Varian Associates, 661 Hanson Way, Palo Alto 2, Calif., 25
For details see ad on page 398
Tel: DAvenport 5-5631
Varo Mfg. Co., Inc., Tex., 10, 15, 25
Vectron, Inc., 402 Main St., Waltham 54, Mass., 5, 10, 15, 25
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vickers Electric Div., Vickers, Inc., Mo., 5, 10, 15, 25
Victoreen Instrument Co., Ohio, 5, 15, 25
Virginia Electronics Co., D.C., 25
Vokar Corp., Mich., 5, 10, 15, Power Packs
Walker Consulting Engineer, J. R., Mich., 25
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 25
For details see ad on page 230
Tel: Malden 2202
Welch Mfg. Co., W. M., Ill., 10
Weltronic Co., Mich., 10, 15
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 25
For details see ad on pages 98-99
Tel: BI 3-4700
White Industries, Inc., N.Y., 5
Wickes Eng. & Construction Co., N.J., 10
Wincharger Corp., Iowa, 20
Wright Eng. Co., Calif., 10, 15, 25

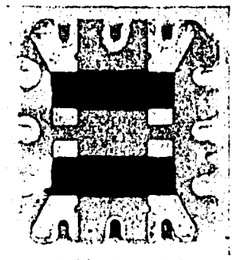
IRE Professional Groups
cover every field in Radio-Electronics
For information on the group most closely allied to your interests, see pages 238-239.

47. Printed Circuits.

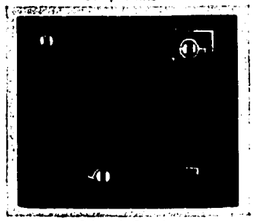
5. Etched or screened prewired chassis
10. Printed electronic assemblies
15. Solder dipped prewired chassis.

Aerovox Corp., Mass., 5, 10, 15
Airborne Instruments Lab., N.Y., 10
Alden Products Co., 113 No. Main St., Brockton 64, Mass., 10, 15
For details see ad on page 296
Tel: Brockton 160
Apahouser Corp., Mass., 5
Audio Corp. of America, N.J., 5, 10
Bendix Aviation Corp., Bendix Computer Div., 5630 Arbor Vitae St., Los Angeles 45, Calif., 5, 15
For details see ad on pages 51-54, 302
Tel: Oregon 8-2128
Browning Labs., Inc., Mass., 15
Bruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 5, 10, 15
For details see ad on page 444
Tel: LOngacre 4-9530
C & L Screenprints, Ohio, 5, 10
Cardwell Mfg. Corp., Allen D., Conn., 5, 10, 15
Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 10
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

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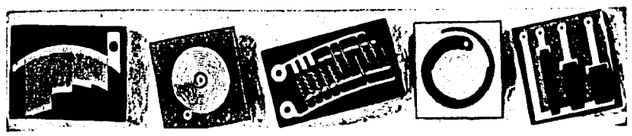
Dwyer Engineering Co Inc
P. O. BOX 483, NASHUA, N.H.
Telephone 4057

DECI PAC DECI

Centronics Co., N.Y., 5, 10, 15
Church Co., George H., Minn., 5, 10
Circon Component Co., Calif., Connectors for Printed Circuits
Citation Products Co., 233 E. 146th St., New York 51, N.Y., 5
For details see ad on page 504
Tel: MO 5-0740
Codetyper Labs., N.Y., 10
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 10
For details see ad on page 152
Tel: PL 4-5502
Corning Glass Works, N.Y., 5, 15
Davelle Labs., Inc., N.Y., 5, 10, 15
Digital Prods., Inc., Calif., 5, 10, 15
Dwyer Engineering Co., Inc., P.O. Box 483, Nashua, N.H., 5, 10, 15
For details see ad on page 347
Tel: Nashua 4057
Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 5, 10
For details see ad on page 370
Tel: DAvenport 4-700
El Mec Labs., Inc., N.J., 5, 10
Electralab, Inc., 74 Atherton St., Boston 3I, Mass., 5, 10, 15
For details see ad on page 348
Tel: JA 4-3230
Electronic Eng. Co. of Calif., Calif., 5
Electronic Mechanics, Inc., N.J., 5
Electron-Radar Products, Ill., 25
Elm Labs., N.Y., 5
Emerald Mfg. Co., Ill., 10
Erie Resistor Corp., 644 West 12th St., Erie, Pa., 5
For details see ad on pages 82-83
Tel: Erie 2-1481
Etched Products Corp., N.Y., 5, 15
Federal Telecommunication Labs., Div. I. T. & T., N.J., 10
The Formica Co., Ohio, 5
Fretco, Inc., Pa., 5, 10
General Electric Co., N.Y.C., N.Y., 5, 10, 15
General Electric Co., N.Y., 5, 15
General Instrument Corp., N.J., 10
Glass Products Co., 6911 S. So. Chicago Ave., Chicago 37, Ill., 5, 10, 15
For details see ad on page 347
Tel: Fairfax 4-1050
Glenco Corp., 212 Durham Ave., Metuchen, N.J., 5, 10, 15
For details see ad on page 284
Tel: Metuchen 6-2800
Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 10
For details see ad on pages 318, 385
Tel: Texas 0-7317
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 10
For details see ad on page 177
Tel: Metuchen 6-2800
Harman-Kardon, Inc., N.Y., 5, 10
Harnett Electric Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 5, 10, 15
For details see ad on page 150
Tel: Port Washington 7-3344
Herlee Corp., Wis., 10
Insulated Circuits, Inc., N.J., 5, 10, 15
International Resistance Co., Pa., 10
Isolantite Mfg. Corp., N.J., 10
Kalbfell Labs., Inc., Calif., 5, 10
Kaye-Halbert Television, Calif., 5, 10, 15
Laboratory for Electronics, Inc., Mass., 5, 10, 15
Lacey Brothers, 113 S. Lombard Ave., Oak Park, Ill., 5, 10, 15
For details see ad on page 496
Tel: ES 8-3232
Lapointe Electronics, Inc., Conn., 10
Lectra, Inc., Ill., 5
Loral Electronics Corp., Dept. ID 54, 794 E. 140th St., New York 54, N.Y., 5
For details see ad on page 198
Tel: CY 2-1800
Lurex Manufacturing Co., N.J., 5, 10, 15
Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 5
For details see ad on page 248
Tel: E 5471
Magnex Corp., N.Y., 5, 10
Mahoney Teletronic Labs., Inc., N.J., 10
Maida Dev. Co., Va., 5
Mallory & Co., Inc., P. R., Ind., 10, 15
Marshall Eng., Electronics Div., Calif., 5, 10

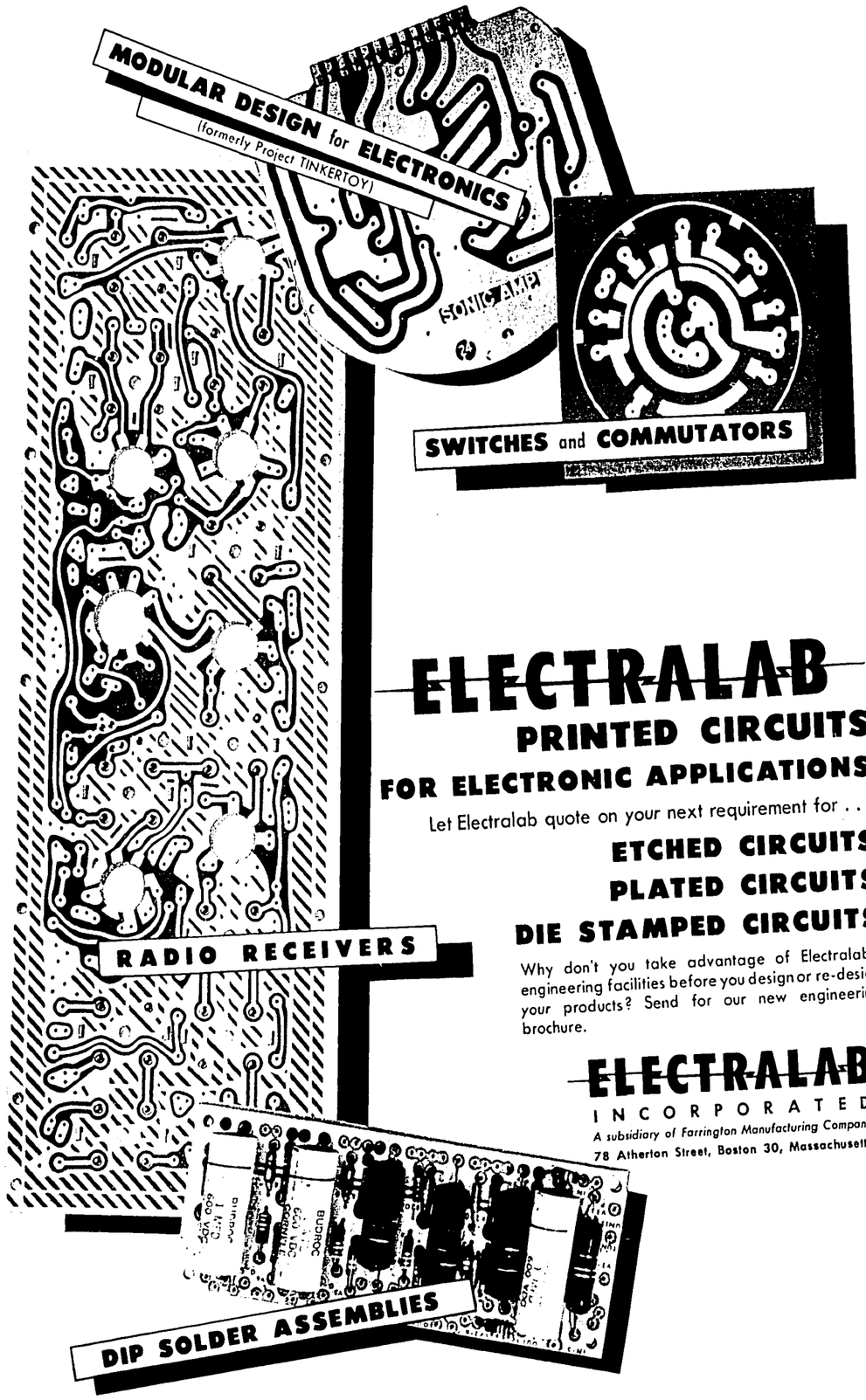
(Continued on page 349)

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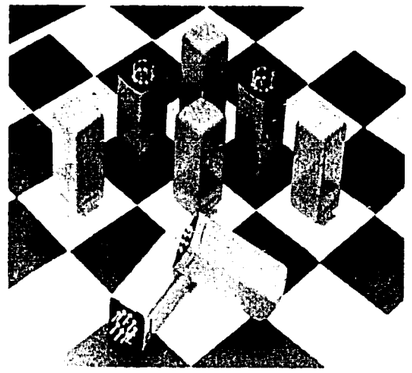
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Genesee, Pennsylvania

4. Component Parts

47. Printed Circuits.

(Continued from page 347)

Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill., 5, 10, 15
For details see ad on pages 350
Tel: Brunswick 8-0334

Michel Mfg. Co., Wis., 5

Micro-Circuits Co., New Buffalo 3, Mich., 5, 10
For details see ad on pages 365, 526
Tel: 272W1

Miller Dial & Name Plate Co., Calif., 5

Mini-Circuits, N.Y., 5, 10, 15

Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 5
For details see ad on pages 94-95
Tel: Prescott 9-8866

Nameplates, Inc., N. Y., 10

Onondaga Pottery Co., Electronics Div., 1858 W. Fayette St., Syracuse 1, N.Y., 10
For details see ad on page 284
Tel: SYracuse 8-1681

P. C. V. Electronics, Inc., Calif., 10

Photo Chemical Products, Inc., 479 Walton Ave., New York 51, N.Y., 5
For details see ad on page 498
Tel: LUdlow 5-8200

Photocircuits Corp., N.Y., 5, 10, 15

(Continued on page 351)

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into 608 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!

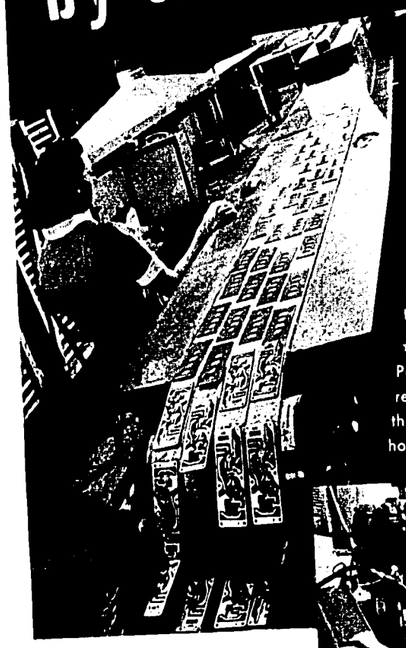
You will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product may also appear in the "Component 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, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

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Select METHODE for Quality in Quantity on these circuit types:

★ Single Side Conductor Panels — for Economy and Simplicity in Auto-sembly and dip soldering . . .

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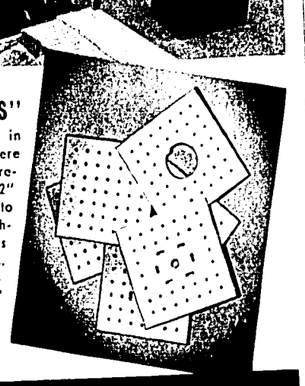
★ "Plated Through" Conductor Panels — For the complex circuit requiring a large number of feed thru connections with conductive holes to permit circuit cross-overs.



Well integrated facilities and a department specialized and experienced on custom tooled volume applications assures performance and satisfaction consistent with Methode's record in serving high production users.

Or by the Hundreds with "QUAD-KARDS"

Where the designer wishes uniformity and simplicity in assemblies which will be used in small quantities where custom printed circuit tooling would be uneconomical, pre-tooled QUAD-KARDS can be furnished in standard 2" square segments with (or without) conductors printed to specifications. Quad-Kards have standard hole punchings for tube sockets, transformers and condensers *plus* a grid pattern of .050" diameter holes on ¼" centers. Undesired holes are omitted and the conductor pattern printed to the customer's layout. "Quad-Kards" may be abutted, angled or stacked during incorporation into finished assemblies. Details on request.



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4. Component Parts

47. Printed Circuits.

(Continued from page 349)

Plastic Accessories, Inc., N.Y., 5
Plastics & Electronics Corp., N.Y., 10, 15
Premier Metal Etching Co., N.Y., 5
Printloid, Inc., N.Y., 5
Q Circuits Co., Calif., 5, 10, 15
RS Electronics Corp., Calif., 5, 10, 15
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 10
For details see ad on page 210
Tel: HUmboldt 5-3900
Radio Industries, Inc., Ill., 5
Remler Co., Ltd., Calif., 5
Research Instrument Co., Inc., N.Y., 5
Richradson Co., Ill. 5
Sampson Chemical & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill., 5, 10
For details see ad on page 540
Tel: Sacramento 2-6346
Sanders Assoc., Inc., N.H., 5, 10, 15
Sequoia Process Corp., Calif., 5, 10, 15
Sound Devices, Inc., N.Y., 10
Sprague Electric Co., Mass., 10
Square Root Mfg. Corp., N.Y., 10
Stackpole Carbon Co., Electronic Div., Tannery St., St. Marys, Pa., 10
For details see ad on pages 84-85
Tel: 41-521
Standard Coil Prods. Co., Inc., Calif., 5, 10, 15
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 10
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Suffolk Prods. Corp., N.Y., 5, 10, 15
Summit Electronics, Inc., N.J., 5, 10, 15
Superex Electronics Corp., N.Y., 5, 10, 15
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 5, 10, 15
For details see ad on pages 9-14
Tel: Judson 6-2424
Technograph Printed Electronics, Inc., N.Y., 5, 10, 15
Trans-Gel Products, N.Y., 5
Tri-Dex Co., Calif., 5, 10, 15
U. S. Components, Inc., N.Y., 5, 10, 15
United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 5, 10, 15
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
U. S. Radium Corp., N.Y., 5
Vi ar Corp., Mich., 5, 10
Wheaton Co., T. C., N.J., 5
Willys Motors, Electronics Div., Ohio, 10

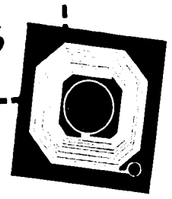
48. Rectifiers, Metallic.

5. Copper oxide
10. Germanium
15. Selenium diodes
20. Selenium stacks
25. Silicon

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., Potted
For details see ad on page 491
Tel: Hemlock 6-2230
Amperex Electronic Corp., N.Y., 10
Arnhold Ceramics, Inc., N.Y., 5, 20
Barco, Inc., Wis., 20
Berkshire Labs., Mass., 10
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 2, N.J., 20
For details see ad on page 128
Tel: LAmbert 5-2200
Bomac Labs., Inc., Salem Rd., Beverly, Mass., 25
For details see ad on pages 92-93
Tel: Beverly 4670
Bradley Labs., Inc., Conn., 5, 15, 20
Burke Electric & X-Ray Co., Ltd., Canada, 20
Canadian General Electric Co., Electronic Equip., Canada, 10
Conant Labs., Neb., 5, 10
Continental Radio & Electrical Eng., South Africa, 15

(Continued on page 553)

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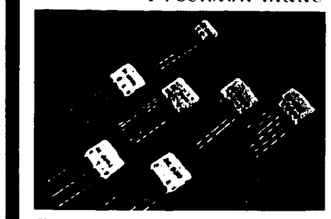
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★ *Compact*

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Selenium Rectifiers



HIGH VOLTAGE CARTRIDGE RECTIFIERS
Made to your specifications. DC output from 20 volts to 200,000 volts.



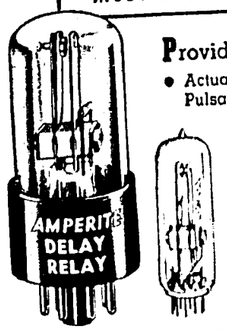
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Specify SIMPLEST, MOST COMPACT

AMPERITE THERMOSTATIC DELAY RELAYS

MOST ECONOMICAL, HERMETICALLY SEALED



STANDARD MINIATURE

Provide delays ranging from 2 to 120 seconds.

- Actuated by a heater, they operate on A.C., D.C., or Pulsating Current.
- *Hermetically sealed.* Not affected by altitude, moisture, or other climate changes.
- Circuits: *SPST only*—normally open or normally closed.

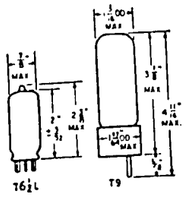
Amperite Thermostatic Delay Relays are compensated for ambient temperature changes from —55° to +70°C. Heaters consume approximately 2 W. and may be operated continuously. The units are *most compact, rugged, explosion-proof, long-lived,* and — *inexpensive!*

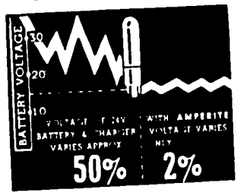
TYPES: Standard Radio Octal, and 9-Pin Miniature.

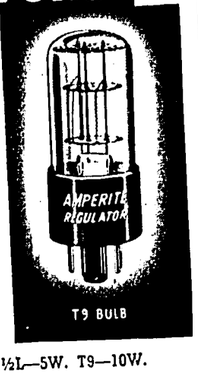
PROBLEM? Send for Bulletin No. TR-81

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AMPERITE CO. Inc., 561 Broadway, New York 12, N. Y.

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4. Component Parts

49. Rectifiers, Vacuum Tube.

(Continued from page 353)

Otis Elevator Co., Electronic Div., N.Y., 5, 10

Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5 St., Harrison, N.J., 10, 15, 20
For details see ad on page 210
Tel: HUmboldt 5-3900

Raytheon Mfg. Co., Mass., 15

Richardson-Allen Corp., N.Y., 5, 10

Sheldon Electric Co., Div. Allied Electric, N.J., 10, 15

Societe Francaise Radio Electrique, France, 5, 10, 15, 20

State Labs., Inc., N.Y., 5, 10, 15, 20

Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 15
For details see ad on pages 9-14
Tel: JUdson 6-2424

Taylor Tubes, Inc., Ill., 5, 10, 20

United Electronic Co., N.J., 5, 10, 20

Vacuum Tube Products, Calif., 5, 10, 15, 20

Weltronic Co., Mich., 5, 10

Westinghouse Electric Corp., Pa., 5, 10

Westinghouse Electric Corp., N.Y., 5, 10, 15, 20

50. Relays.

5. Co-axial
10. D'Arsonval
15. Frequency selective
20. Hermetically sealed
25. Keying
30. Latching
35. Mercury contact
40. Polarized
45. Power control & overload
50. Stepping
55. Sub-miniature
60. Telephone
65. Time delay

AGA Div. Elastic Stop Nut Corp. of America, Dept. A13-5415, 1027 Newark Ave., Elizabeth 3, N.J., 65
For details see ad on page 355
Tel: ELizabeth 2-2900

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 20
For details see ad on page 491
Tel: Hemlock 6-2230

A.R.F. Products, Inc., Ill., 15, 25

Adams & Westlake Co., Ind., 20, 35, 45, 65

Advance Electric & Relay Co., Calif., 5, 20, 25, 30, 40, 45, 50, 55, 60, 65

Advanced Electronics, Inc., Conn., 45

Aero Instrument Co., Calif., 20

Airpax Products Co., Md., 20, 40, 45, 55

Allard Instrument Corp., N.Y., 15, 50

Allen-Bradley Co., Wis., 30, 45, 65

Allied Control Co., Inc., N.Y., 5, 20, 25, 30, 40, 45, 55, 65

American Instrument Co., Inc., Md., 35, 65

4. Component Parts

50. Relays.

American Relay & Controls, Inc., Ill., 20, 30, 45, 60, 65

Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 65
For details see ad on page 354
Tel: Canal 6-1446

Ardente Acoustic Labs., Ltd., England, 55

Assembly Products, Inc., Ohio, 10, 20, 65

Automatic Electric Co., Ill., 20, 25, 35, 40, 50, 60, 65

Automatic Electric Mfg. Co., Minn., 5, 20, 25, 45, 60

Automatic Switch Co., N.J., 15, 40, 45, 50, 65

Automatic Temperature Control Co., Pa., 65

Barber-Colman Co., Ill., 40

Biddle Co., James G., Pa., 15

Blonder-Tongue Labs., Inc., N.J., 65

Boehme, Inc., H. O., N.Y., 25

Branson Corp., N.J., 20, 55, 60, 65

Brubaker Mfg. Co., Inc., Calif., 55

Bunnell & Co., J. H., N.Y., 25, 40

Canadian Research Institute, Canada, 65

Clare & Co., C. P., Ill., 20, 25, 30, 35, 40, 50, 55, 60, 65

Cole Instrument Co., Calif., 10, 15, 20, 40, 45, 50, 60, 65

Comar Electric Co., 3349 W. Addison St., Chicago 18, Ill., 5, 20, 30, 45, 55, 60, 65
For details see ad on page 152
Tel: Juniper 8-2410

Connecticut Valley Enterprises, Inc., Conn., 20

Cook Electric Co., Ill., 5, 20, 45, 50, 60, 65

Corona Engineering Service, N.Y., 35

Cramer Co., Inc., The R. W., Conn., 20, 65

Cutler-Hammer, Inc., Wis., 20, 30, 45, 65

Davis Electric Co., Mo., 5, 20, 60

De Coursey Engineering Lab., P.O. Box 235, Los Angeles 25, Calif., 45
For details see ad on page 291
Tel: Arizona 3-2530

Delta Electrical Instrument Co., Calif., 10

Dictograph Prods., Inc., N.Y., 60, Thermal

Ebert Electronics Corp., N.Y., 30, 35, 45

Edison, Inc., Thomas A., Instr. Div., N.J., 10, 20, 40, 45, 65

Electrical & Physical Instr. Corp., 42-19 27th St., Long Island City, N.Y., 20
For details see ad on page 412
Tel: STillwell 4-6389



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Electro-Seal Corp., 946 North Ave., Des Plaines, Ill., 20
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Tel: Rodney 3-0047

Electro-Tech Equipment Co., N.Y., 10, 20, 30, 35, 45, 50, 55, 60, 65

Electronic Control Corp., Mich., 45, 65, Electronic

Electronic Specialty Co., Calif., 65

Elly Electronics Corp., N.J., 20, 65

Emerald Mfg. Co., Ill., 65

Essex Wire Corp., REM Div., Ind., 20, 30, 45, 55, 60, 65

Eureka Television & Tube Corp., N.J., 65

Farmer Electric Co., Mass., 65

Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Road, Clifton, N.J., 50, 60
For details see ad on pages 32-37
Tel: Nutley 2-3600

Filtors, Inc., N.Y., 55

Furnas Electric Co., Ill., 45

GAV Controls, Inc., N.J., 15, 45, 65

Gavco Corp., N.Y., Directional Power

General Communications, Wisc., 50, 60, Video

General Communication Co., 681 Beacon St., Boston 15, Mass.
For details see ad on page 374
Tel: CO 7-6030

General Control Co., Mass., 65

General Electric Co., Apparatus Sales Div., N.Y., 20, 40, 45, 55, 65

General Electric Co., Ltd., of England, Mass., 50, 60

General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 20
For details see ad on page 495
Tel: Valley Stream 5-6363

Greibach Research & Development Labs., N.Y., 10

Guardian Electric Mfg. Co., 1621-IRE W. Walnut St., Chicago 12, Ill., 20, 25, 30, 45, 50, 60, 65
For details see ad on page 190
Tel: CHesapeake 3-1100

Haledy Electronics Co., N.Y., 20, 35, 45

Hart Mfg. Co., Conn., 20, 55

Haydon Co., A. W., 240 North Elm St., Waterbury 20, Conn., 65
For details see ad on page 456
Tel: WAterbury 6-4481

Haydon Mfg. Co., Inc., Conn., 65

Heinemann Electric Co., N.J., 45, 65

Hetherington, Inc., Pa., 20, 30

Industrial Prods. Co., Div. Danbury-Knudsen, Conn., 5

Industrial Timer Corp., N.J., 65

Iron Fireman Mfg. Co., Electronic Div., Ore., 20, Sensitive

Isolantite Mfg. Corp., N.J., Ceramic Insulators

Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose 8, Calif., 5, 25, 30, 45, Vacuum Relay Equip.
For details see ad on pages 25-28
Tel: CYpress 2-4025

(Continued on page 357)



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Boston 22, Mass.

4. Component Parts

50. Relays.

(Continued from page 355)

Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 40, 50, 60
For details see ad on page 404
Tel: DEArborn 2-0750

Ketay Mfg. Corp., N.Y., 45

Kings Electronic Co., N.Y., 5

Kurman Electric Co., Inc., N.Y., 20, 25, 30, 40, 45, 55, 60, 65

Leach Relay Co., Div. Leach Corp., Calif., 20, 25, 30, 45, 60, 65

Leader Electronics, Inc., Ohio, 40, 50

Leland, Inc., G. H., Ohio, 30, 50

Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill., 45
For details see ad on page 68
Tel: VAnderbilt 4-1188

Livingston Electric Corp., N.J., 5

Lumenite Electronic Co., Ill., 65

Lysco Mfg. Co., Inc., N.J., 5

Magnecraft Electric Co., Ill., 20, 25, 30, 45, 55, 60, 65

Magnetic Amplifiers, Inc., N.Y., Magnetic

Mcspeth Telephone & Radio Corp., N.Y., 40, 60

Maxson Corp., W. L., N.Y., 40

McNeal, J. D., Conn., 65

Milwaukee Gas Specialty Co., Dept. DR, 730 N. Jackson St., Milwaukee 1, Wis., 20
For details see ad on page 357
Tel: Broadway 2-5388

Minneapolis-Honeywell Regulator Co., Minn., 55

Motordyne, Inc., Calif., 65

Mullenbach Electric Mfg. Co., Calif., Sensitive

Neomatic, Inc., Calif., 15, 20, 30, 40, 55, 65

Networks Electronic Corp., Calif., 20

Northern Electric Co., Ltd., Canada, 40, 60

Omega Mfg., Inc. N.Y., 45, 65

Pacent Eng. Corp., N.Y., 10, 45, 65

Parts Producing Corp., Mfg. Div., N.Y., 20, 25, 40

Penta Labs., Inc., Calif., 20

Phaostron Co., 151 Pasadena Ave., So. Pasadena, Calif., 10, 15, 20, 25, 30, 40, 45, 55, 65
For details see ad on page 333
Tel: CL 5-1471

Phillips Control Corp., Ill., 20, 25, 30, 45, 55, 60, 65

Pollak Corp., Joseph, Dept. D, 75-95 Freeport St., Boston 22, Mass., 5, 15, 20, 30, 40, 50, 55, 60, 65
For details see ad on page 357
Tel: AV 2-9550

Potter & Brumfield, Princeton, Ind., 20, 25, 30, 45, 55, 60, 65
For details see ad on page 356
Tel: PRinceton 1596

Price Electric Corp., Md., 5, 20, 30, 45, 50, 55, 60, 65, Rotary Relays

RBM Div., Essex Wire Corp., 200 Godfrey St., Logansport, Ind., 20, 60
For details see ad on page 214
Tel: LOgansport 5121

Radio Eng. Products, Ltd., Canada, 25, 55, 60

Relays, Inc., N.Y., 20, 25, 45, 60

Rich Electronic, Inc., Fla., 25

Ripley Co., Inc., Factory St., Middletown, Conn., 65
For details see ad on page 277
Tel: Middletown 6-6679

Roller-Smith Corp., Pa., 10

Sangamo Weston, Ltd., England, 15, 20, 55

Saratoga Industries, N.Y., 55

Sheldon Electric Co., Div. Allied Electric, N.J., 65

Sightmaster Corp., N.Y., 20, 40

Sigma Instr. Inc., Mass., 20, 25, 30, 40, 55, 65

Signal Eng. & Mfg. Co., N.J., 5, 20, 25, 30, 40, 55, 60, 65

Societe Francaise Radio Electrique, France, 65

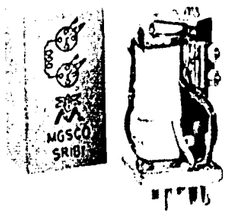
Standard Electrical Prods Co., Ohio, 20, 25, 35, 45, 65

Staver Co., Inc., N.Y., High Voltage

Sterling Eng. Co., Inc., N.H., 20, 30, 45, 60

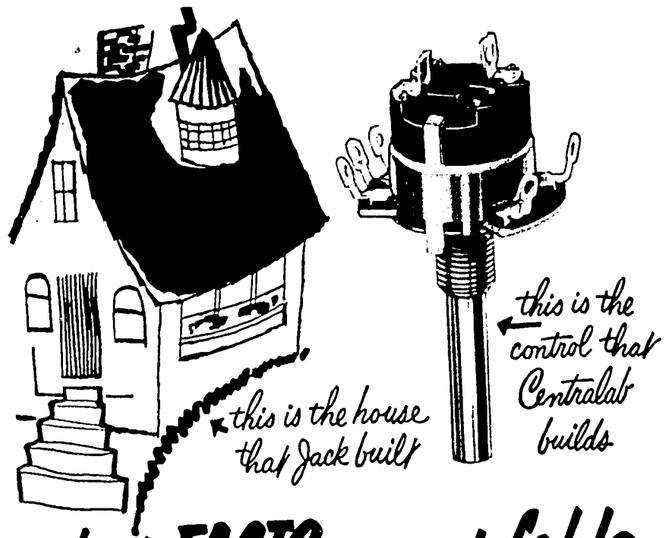
(Continued on page 358)

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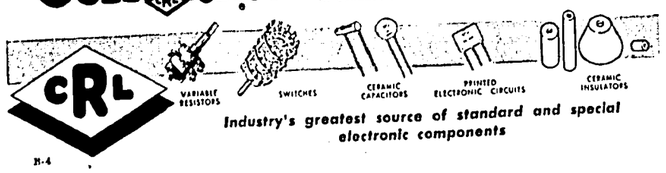
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UNITED STATES OF AMERICA

4. Component Parts

50. Relays.

(Continued from page 357)

Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass., 15, 20, 25, 40
For details see ad on page 304
Tel: SO 8-1170

Stromberg-Carlson Co., N.Y., 25, 30, 45, 60, 65

Struthers-Dunn, Inc., N.J., 5, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Sunvic Controls, Ltd., England, 20, 65

Terado Co., 1062 Raymond Ave., St. Paul 14, Minn., 20, 55
For details see ad on page 358
Tel: Nestor 2514

Thermo Instruments Co., Calif., Power Relays

Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 20, 45, 65
For details see ad on page 234
Tel: HUmboldt 2-4200

Ultrasonic Corp., Mass., 45

Union Switch Sig. Div. Westinghouse, Pa., 20, 25, 40, 55

Varo Mfg. Co., Inc., Tex., 15

Ward-Leonard Electric Co., 90 South St., Mount Vernon, N.Y., 25, 30, 45, 65
For details see ad on page 368
Tel: MO 4-1000

Westinghouse Electric Corp., Pa., 45

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark, N.J., 10, 20, 35, 55
For details see ad on pages 98-99
Tel: BI 3-4700

Wheaton Co., T. C., N.J., 20

Wilson & Co., G. C., W.Va., 20, 65

Worner Electronic Devices, Ill., 65

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Ace Coil & Electronics Co., N.J., 45, 55

Ace Electronics Associates, 125-129 Rogers Ave., Somerville 44, Mass., 20, 45, 50, 55, Wire Wound Resistance Strips
For details see ad on page 359
Tel: Somerset 6-5130

Aerohm Corp., Mass., 20, 50, 55

Aerovox Corp., Mass., 15, 40, 45, 50, 55

Ahrendt Instrument Co., Md., 20

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 35
For details see ad on page 491
Tel: Hemlock 6-2330

Allen-Bradley Co., Wis., 5, 10, 20, 30

Allies' Products Corp., 1028 Connecticut Ave., N.W., Washington 6, D.C., 15
For details see ad on page 359
Tel: RE 7-0504

Amalgamated Electronics, N.Y., 20, 55, Strips

Arma Corp., Roosevelt Field, Garden City, L.I., N.Y., 20
For details see ad on page 407
Tel: Pioneer 2-2000

Arnhold Ceramics, Inc., N.Y., 5, 15, 35, 40

Atlas Electric Prods. Co., Pa., 45, 55

Atlas Resistor Co., N.Y., 45, 50

Automatic Electric Co., Ill., 45

Balco Research Labs., N.J., Metal Film

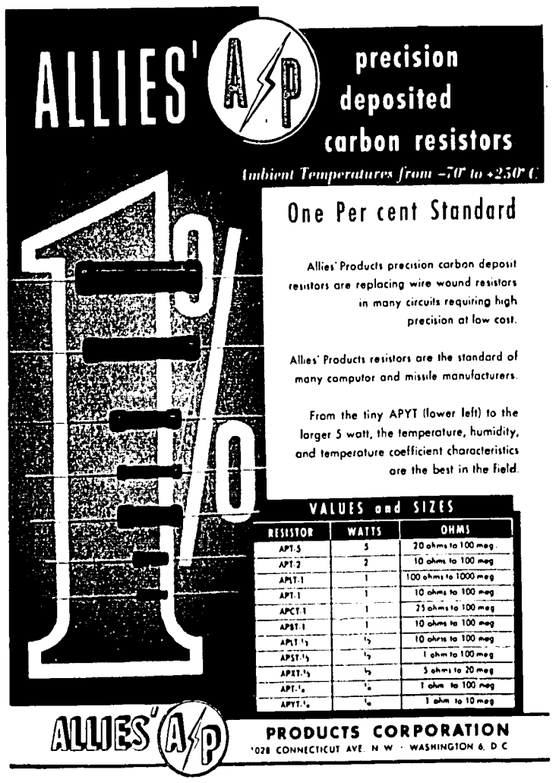
Biddle Co., James G., Pa., 30

Birklan Corp., N.Y., 55

Bond Electronics Corp., N.J., 45, 55

Borg Equip. Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., 50, 55
For details see ad on page 140
Tel: Janesville 6616

(Continued on page 361)



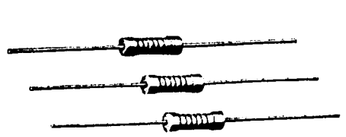
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Our research and development efforts continually aimed at resistor improvement and specialized in the range of 1/2 watt to 5 watt, makes available to you resistors of economical manufacture and high stability performance.

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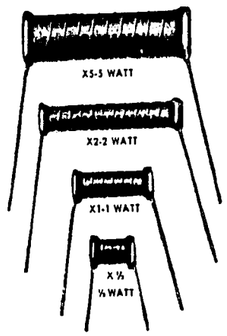


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½, 1, 2, & 5 WATT



WM wire wound (low power) resistors, color coded—RETMA standard are also available in 1/3, 1/2 and 1 watt. Write for technical data and catalog on all Continental products.

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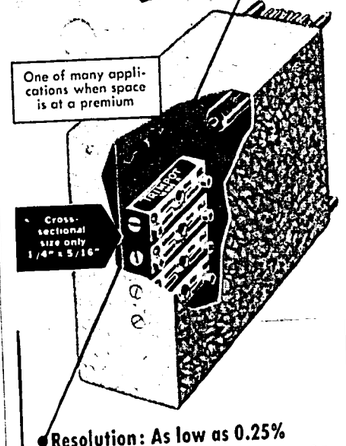
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- **Weight: Only 0.1 oz.**

BOURNS *TRIMPOT* is a 25 turn, fully adjustable wire-wound potentiometer, designed and manufactured exclusively by BOURNS LABORATORIES. This rugged, precision instrument, developed expressly for trimming or balancing electrical circuits in miniaturized equipment, is accepted as a standard component by aircraft and missile manufacturers and major industrial organizations.

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BOURNS *also manufactures precision potentiometers to measure Linear Motion; Gage, Absolute, and Differential Pressure and Acceleration.*

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Technical Bulletin On Request, Dept. 72

4. Component Parts

51. Resistors.

(Continued from page 359)

Bourns Labs., Dept. 72, 6135 Magnolia Ave., Riverside, Calif., 20, 30, 50, 55
For details see ad on page 360
Tel: RIverside 7290

C. & E. Engineers, Calif., 45

Campbell Industries, Inc., Tenn., 15

Carborundum Co., Globar Div., N.Y., 5

Carol Electronics Corp., N.Y., 55

Carter Parts Co., Ill., 20, 30, 50

Central Scientific Co., Ill., 10, 30, 40

Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 10, 20, 25, 30, 50
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Chase Resistor Co., N.J., 15, 35

Chicago Telephone Supply Corp., 1142 W. Beardsley Ave., Elkhart, Ind., 10, 20, 25, 30, 50, 55
For details see ad on pages 114-115
Tel: Elkhart 3-0310

Cima Corp., Mass., 45, 50, 55

Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 10, 20, 30, 45, 50, 55
For details see ad on pages 100-101
Tel: Dover 975

Coilcraft, Inc., Ill., 45, 55

Cole Instrument Co., Calif., 20, 50, 55

Columbia Electric Mfg. Co., Ohio, 30

Columbia Resistors, Inc., N.Y., 45, 50

Consolidated Resistance Co. of America, N.Y., 45, 55

Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio, 45, Deposited Metal Film
For details see ad on page 360
Tel: Clearwater 1-6500

Corning Glass Works, N.Y., Glass Metal Film Accurate-High, Temp. H. F. and Power Types

Cutler-Hammer, Inc., Wis., 30, 45

Dale Prods., Inc., 1318-28 Ave., Columbus, Neb., 15, 35, 40, 45, 55
For details see ad on pages 118-119
Tel: Columbus 2139

Daven Co., N.J., 10, 20, 30, 40, 45, 50, 55

De Jur-Amsco Corp., Dept. IRE DPM, 45-01 Northern Blvd., Long Island City 1, N.Y., 20, 50, 55
For details see ad on pages 300, 362
Tel: AStoria 8-1040

Delta Electrical Instrument Co., Calif., 55

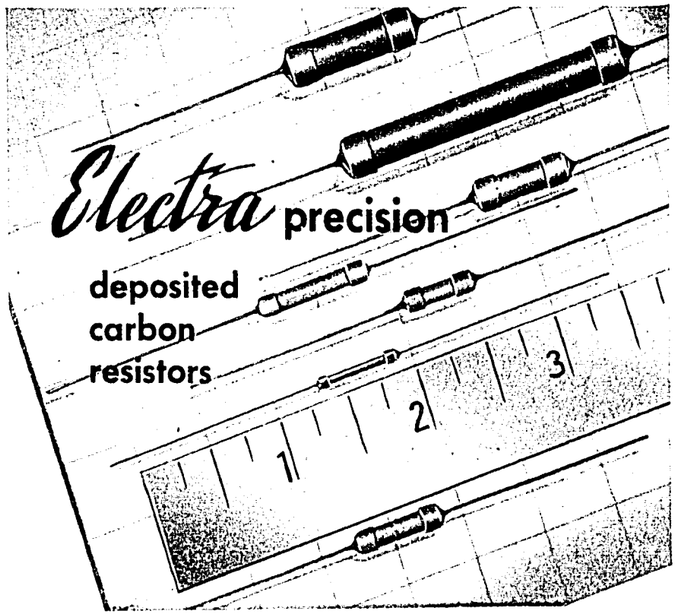
Dietz Design & Mfg. Co., Grandview 7, Mo., 35, 45, 55
For details see ad on page 290
Tel: South 7216

Dwyer Engineering Co., Inc., P.O. Box 483, Nashua, N.H., 5, 25
For details see ad on page 347
Tel: Nashua 4057

Eastern Precision Resistor Corp., 45, 55

Electra Mfg. Co., 2537 Madison Ave., Kansas City 8, Mo., 15, Hermetically Sealed
For details see ad on page 361
Tel: GR 1216

(Continued on page 363)



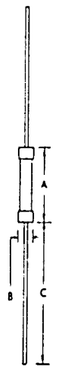
8 sizes to meet circuit requirements of high stability, accuracy & low cost

Electra carbon coat resistors provide the precision, stability and accuracy to meet a variety of applications and requirements in advanced electronic circuits. Electra offers the benefits of low voltage coefficient, low capacitive and inductive characteristics in high frequency applications, in addition to small physical size and economy.

STABILITY — regardless of resistance tolerance all Electra deposited carbon resistors are equally high in stability.

ACCURACY — ±1% is standard but resistance value tolerances of ±2%, ±5% and ±10% are available.

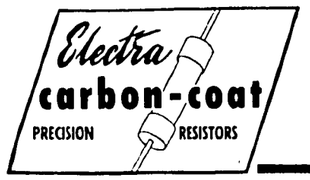
ECONOMY — When the advantages of stability, accuracy and small physical size are considered, Electra resistors are your most economical buy.



PART NUMBER	Wattage	Maximum Rated Voltage	Resist. Range	* DIMENSIONS Length A	Dia. B
DC-⅛	.125	250	4 Ω 250 K Ω	9/32"	5/64"
DC-¼	.25	300	5 Ω 1 Megs	17 32"	3/32"
DC-½	.5	500	6 Ω 5 Megs	13/16"	11/64"
DC-½A	.5	350	3 Ω 2.2 Megs	19/32"	11/64"
DC-½B	.5	500	3 Ω 5 Megs	11/16"	15/64"
DC-½C	.5	350	2 Ω 1.1 Megs	15/32"	11/64"
DC-1	1	500	3 Ω 10 Megs	15 16"	9/32"
DC-2	2	1000	10 Ω 50 Megs	2 1/16"	9/32"

* Lead Length C—Lengths of leads for all resistors shown above are 1½ inches.

Hermetically Sealed Resistors Are Available in 6 Sizes From ¼ Watt to 2 Watts.



Write for complete information—address

Electra Manufacturing Co.

Resistor Division

2537 Madison Kansas City, Mo.

precision electronic instruments by DeJUR



PANEL INSTRUMENTS

1. 2½" Ruggedized Meter. Meets MIL-M-10304. Model R210
2. 3½" A.S.A. Meter meets MIL-M-6A. Model S312
3. 1½" Meter. Conserves space. Built to SC-73-3. Model 112
4. 1½" Meter. Metal Case. Single Hole Mounting. Model 120
5. 1½" Ruggedized Meter. Meets MIL-10304. Model R112

PRECISION POTENTIOMETERS

6. Multiple ganging and external phasing 2" Diameter Model C200
7. Single hole mounting Model C200
8. Single Sine-Cosine Model C200
9. Dual Unit Model L402
10. 1-11/16" Diameter Center tapped Model L400
11. 3" Diameter 11 watt JAN-R-19 Const. Model 275
12. Dual Concentric Model 282
13. 3" Diameter 8 watt JAN-R-19 Const. Model 260
14. Non-Linear Card C200
15. Sine-Cosine Card C200

Actual performance records prove that these DeJUR components withstand adverse conditions of vibration, heat and moisture. Each is engineered and manufactured to meet rigid government requirements. In addition to its wide variety of stock instruments, DeJUR offers top-flight laboratory, engineering and manufacturing facilities for production of these precision units adapted to your specifications. Inquiries are invited.

Write for more detailed information on any of the products shown on this page to Dept. IREDPM.

DeJUR-AMSCO CORPORATION

45-01 NORTHERN BOULEVARD, LONG ISLAND CITY 1, N. Y.

MANUFACTURERS OF SCIENTIFIC PRECISION EQUIPMENT FOR OVER 30 YEARS

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfully eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information—fast.

3000 Firms listed. The alphabetical directory gives a clear definition of these firms by showing any or all of the ten fundamental groups in which these firms belong after every name.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

4. Component Parts

Product 51

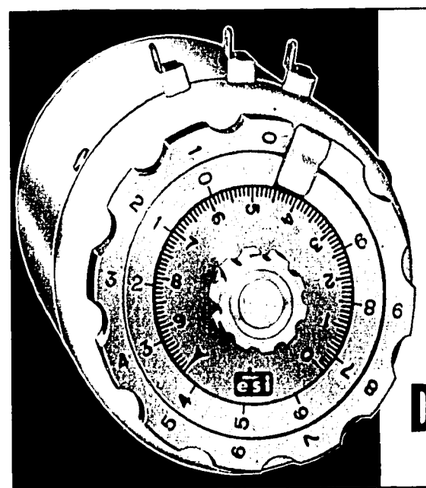
51. Resistors.

(Continued from page 361)

Electralab, Inc., 74 Atherton St., Boston 30, Mass., 25
For details see ad on page 348
Tel: JA 4-3230
Electromath Corp., N.Y., 20, Precision
Electro-Measurements, Inc., 4312 S.E. Stark St., Portland 15, Ore., 20, 30
For details see ad on page 363
Tel: FI 9235
Electro-Mec Lab., Inc., N.Y., 20, 50, 55
Electro-Tech Equip. Co., N.Y., 30, 45, 50
Electronic Designs, Inc., N.Y., 45, 55
Electronics of Colorado, Inc., Colo., Metal Film
Electron-Radar Products, Ill., 25, Thermistor
Erie Resistor Corp., 644 West 12th St., Erie, Pa., 5, 15
For details see ad on pages 82-83
Tel: Erie 2-1481
Fairchild Camera & Instrument Corp., N.Y., 20
Ford Engineering Co., Calif., 20
Gamewell Co., Mass., 55
General Electric Co., N.Y., 45
General Electric Co., N.Y.C., N.Y., 45
General Electric Co., Apparatus Sales Div., N.Y., 30, 45
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 50, 55
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Giannini & Co., Inc., G. M., N.J., 20, 55
Girard-Hopkins, Calif., 5
Glass Products Co., 6911 S. So. Chicago Ave., Chicago 37, Ill., 25
For details see ad on page 347
Tel: Fairfax 4-1050
Glenco Corp., 212 Durham Ave., Metuchen, N.J., 15
For details see ad on page 284
Tel: Metuchen 6-2800
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 25
For details see ad on page 177
Tel: Metuchen 6-2800
Gyromechanisms, Inc., N.Y., 20
Hardwick Hindle, Inc., N.J., 20, 30, 45, 50
Helipot Corp., Div. Beckman Instruments Inc., 916 S. Meridian Ave., So. Pasadena, Calif., 20, 50, 55
For details see ad on page 158
Tel: PYramid 1-2164
Herlee Corp., Wis., 25
Hycor, Inc., Calif., 55
I. T. E. Circuit Breaker Co., Pa., 35, 40, 45, 50, 55, Subminiature Precision

(Continued on page 365)

1955 Radio Engineering Show
March 21-24, 1955
Kingsbridge Armory,
New York



Linearity Beyond 0.01% with esi Precision DEKAPOTS

Shown: MODEL DP-211

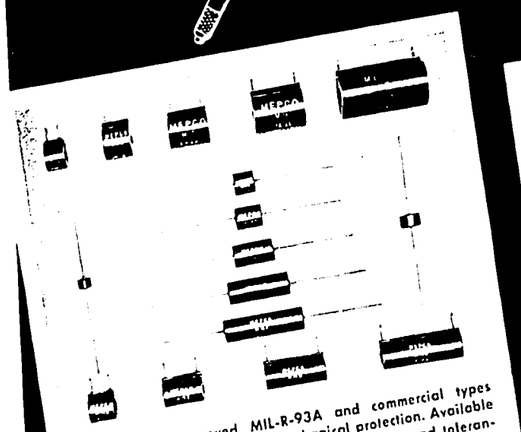
Additional Features

Resolution: to better than 0.002%.
Frequency Response: less than 1° phase shift at 10 kc.
Easy-Reading Dekadial: all figures in horizontal line; read directly to four places.
Exceptional Scale Length: equals 100-turn potentiometer.
Rapid Settings: any reading within three turns.
Convenient Installation: mounts in single panel hole.
Small Size: 3" diameter; 3⅛" to 6" deep.

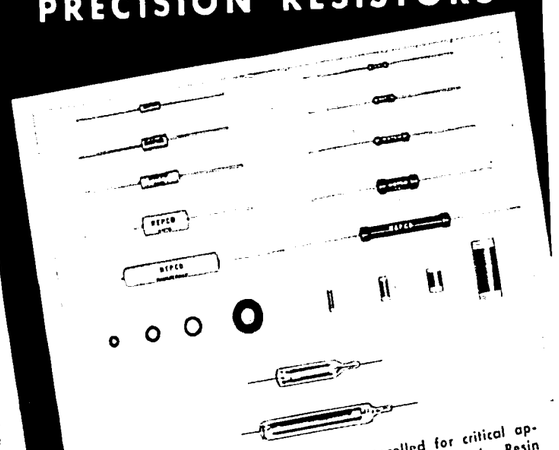
esi
ELECTRO-MEASUREMENTS, INC.
4312 S. E. STARK STREET
PORTLAND 15, OREGON
Nationwide Representation

MEPCO

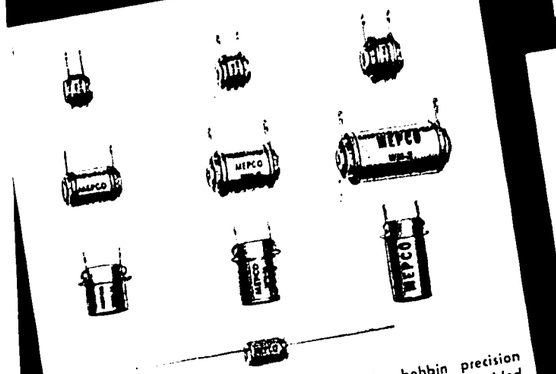
Time Proven
PRECISION RESISTORS



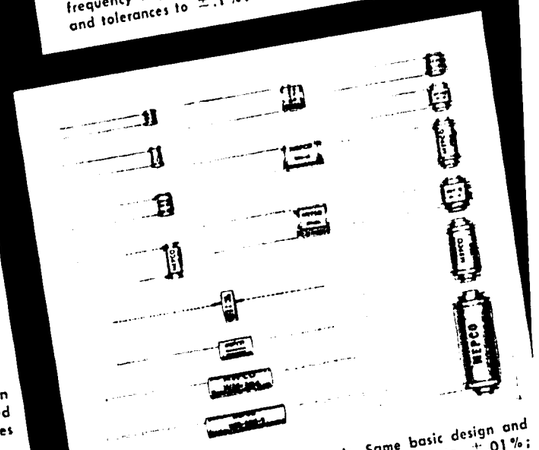
Encapsulated, approved MIL-R-93A and commercial types provide positive moisture and mechanical protection. Available in all resistance values, temperature coefficients and tolerances down to ±.01%. Also, matched sets.



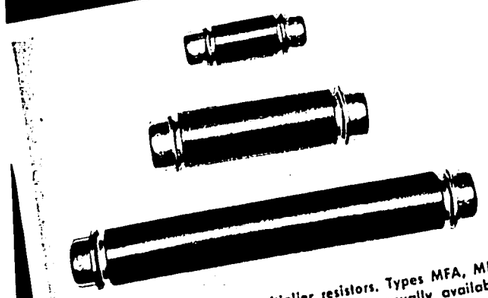
Hermetic sealed carbon film types unexcelled for critical applications where wire wounds are too large or costly. Resin coated units to MIL-R-10509A. Disc and rod types for high frequency requirements. Glass sealed types for high stability and tolerances to ±.1%.



Standard JAN-R-93 and commercial steatite bobbin precision resistors. Basic lug terminal types include exclusive metal molded termination and patented internal insulation features. All types manufactured to your exact requirements.



Lead terminal precision wire wounds. Same basic design and reliability as standard JAN types. Tolerances to ±.01%; matched sets, etc.



JAN-R-29 external meter multiplier resistors. Types MFA, MFB and MFC in all standard resistance values usually available from stock.

Shown on this page

are but a few of the many types available either as standard items or custom manufactured to your exact specifications. Complete technical data will be furnished on request.

MEPCO, INC. MORRISTOWN, N. J.

MICRO-CIRCUITS CO. PRODUCTS

Please request data sheets for your files. We shall be pleased to discuss the application to your equipment of any of the materials described below.

PRINTED CIRCUITS

We can produce, to order, a wide range of low-cost conductor and resistor networks, moisture and rain-detecting grids, commutators and switches capable of over 100 million revolutions, resistor and tuning networks on flat or tubular bases for TV and radio circuits, etc.

RESISTORS

TEMPERATURE SENSITIVE—for protection of TV and radio receiver filaments. For temperature measuring and control.

VOLTAGE SENSITIVE—for circuit stabilization and voltage regulation at low cost. Medium to high resistance.

HIGH MEGOHM—for instruments and photocell circuits. One megohm to ten million megohms. Single resistors ½" to 8" long. Low-cost, printed resistor networks. An extremely versatile and time-saving series of low-cost decade units covering the above resistance range for laboratory and small production.

HIGH VOLTAGE—for high voltage power supplies in color TV receivers, etc. Single value resistors. Low-cost, printed-circuit bleeder-resistor strips containing all necessary fixed resistors. Printed on bases 1" to 8" long.

FLAT STRIP RESISTORS (tape resistors), resistor stock, and conductive sheets. With or without silver terminals, adhesives, etc. Makers of lightning arrestors, neon pilot lights, etc.; are buying strips which they shear into resistors at a fraction of a cent each.

CONDUCTIVE PAINT

OVER 100 TYPES for printed-circuit and shielding uses including extremely durable baking types.

SHIELDING MICROPAINTS—for meter, circuit, and instrument cases; cathode-ray tubes; etc. Silver types priced as low as 45¢/oz. Carbon types with resistances as low as 25 ohms/inch.

NEW, LOW COST, general purpose, air drying Silver Micropaint SC14. A few current prices for comparison are: 1 to 4 tr. oz.—$5.00/oz., 25 to 99 tr. oz.—$1.29/oz., 500 to 999 tr. oz.—$1.21/oz., 5000 tr. oz. and up—$0.98/oz.

MICRO-CIRCUITS CO.
New Buffalo 3, Michigan

4. Component Parts

51. Resistors.

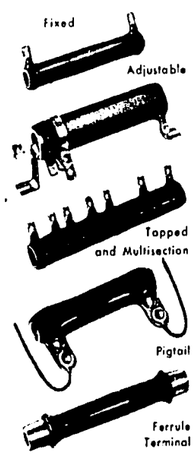
(Continued from page 363)

Industrial Assembly Corp., N.Y., 5, 10, 20, 30, 45, 50
Instrument Resistors Co., N.J., 45, 55, Wire Wound Subminiature Fixed
Insulated Circuits, Inc., N.J., 25
International Resistance Co., Pa., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55
Isolantite Mfg. Corp., N.J., Low Loss Ceramic Insulators
Jarvis Electronic Corp., Ill., 20, 50, 55
Jet Electronics Inc., Mass., 20, Precision Linear & Non-Linear
K-F Dev. Co., Calif., 20, 30, 45, 50, 55
Keystone Carbon Co., Pa., N. T. C. Resistors
Lectrohm, Inc., Ill., 45, 50
Leonard Electric Prods. Co., Inc., N.Y., 20, 55
Librascope, Inc., Calif., 20
Lurex Mfg. Co., N.J., 15, 25, 35
Mallory & Co., Inc., P. R., Ind., 5, 10, 15, 30, 40, 45, 50, 55
Markite Corp., N.Y., 20
Mepco, Inc., 35 Abbett Ave., Morristown, N.J., 15, 35, 40, 45, 55
For details see ad on page 364
Tel: MO 4-5777
Meredith & Co., Ltd., C. C., Canada, 10, 20, 25, 30, 50
Micamold Radio Corp., N.Y., 45
Micro-Circuits Co., New Buffalo 3, Mich., 25, 40
For details see ad on pages 365, 526
Tel: 272W1
Micromax Co., N.Y., 10, 20, Sine-Cosine
Milwaukee Resistor Co., Inc., Wis., 45, 50
Model Engineering & Mfg. Co., Tru-Ohm Prods. Div., 2800 N. Milwaukee Ave., Chicago 18, Ill., 30, 45, 50
For details see ad on page 206
Tel: EV 4-2646
Monson Mfg. Corp., Ill., 15, 40, 45, 50, 55
Muirhead & Co., Ltd., England, 45, 55
Mullenbach Electronic Mfg. Co., Calif., 45
Muter Co., The, Ill., 20, 30, 45, 50
National Electric Controller Co., Ill., 30
Neptune Electronic Co., N.Y., 5, 10, 20, 30, 50
Northern Electric Co., Ltd., Canada, 5, 15
Ohio Carbon Co., The, Ohio, 5, 10, 45, 50
Ohmite Mfg. Co., Ill., 5, 10, 20, 30, 35, 45, 50, 55
Ohmweve Co., The, Conn., Woven Non Inductive

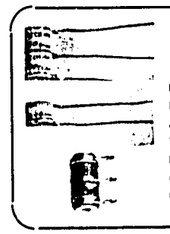
(Continued on page 365)

PRECISE-OHM RESISTORS

The very highest quality ceramic tubes, alloy wire and specially compounded vitreous enamel go into the manufacture of Precise-Ohm Resistors. A new, continuous, high-temperature, high production furnace is among our modern equipment; adaptable to manufacture of various size resistors, any size order, with closest possible control of critical fusing process in the application of vitreous enamel. If your product design requires wire wound resistors, insist on PRECISE-OHM.



FIXED: Wire wound vitreous enamel type; alloy wire, ceramic cores.
ADJUSTABLE: Fixed types, but with narrow longitudinal tract on side, bare of enamel.
TAPPED AND MULTISECTION: Like fixed type except that any number of taps may be incorporated.
PIGTAIL: 10 watt and smaller are space wound on low-loss ceramic cores with low temperature coefficient wire.
FERRULE TERMINAL: Ferrules are monel metal, oxidation and corrosion proof.
APPROX. WATTAGE RATING: 5 to 190 Watts
TUBE DIMENSIONS: (Outside diameter) $\frac{5}{16}$ to 1¾" (length) 1 to 11½.
RESISTANCE: (Min.) .03 to .78 (Max.) 10,000 to 125,000.



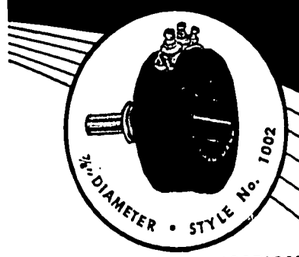
PRECISION RESISTORS

Precision, Price, and Promptness our bywords on precision resistors. Tolerance to 1/50% available on order. Price as always very competitive. Promptness unequaled in the field. **For further information on our many types, write Dept. R.**

precision inc. / 730 LYNDALE AVENUE NORTH MINNEAPOLIS, MINNESOTA.

VECTRON

PRECISION LINEAR WIRE-WOUND POTENTIOMETERS



GENERAL SPECIFICATIONS

Over-all Resistance: 50 ohms to 50,000 ohms
Resistance Tolerance: ± 5% standard (±2% or ±1% if specified)
Independent Linearity: ± 1% standard (±0.5% or ±0.25% if specified)
Temperature Coefficient of Resistance Wire: 0.00002 parts per °C, above 250 ohms 0.0007 parts per °C, 250 ohms or less
Power Dissipation: Nominal dissipation rating, 2 watts at 25°C. Rated 5 watts to 5°C under specific conditions
Electrical Rotation: 320° ± 5° standard to 357 ± 1° if specified
Resolution: Optimum—based on resistance
Terminal Assembly: Treated, electrical grade, laminated phenolic with gold-plated terminals.

Always to Your Specifications

From Vectron's three basic Potentiometer styles, ⅞" diameter, 1 1/16" diameter and 2" diameter, units can be made to suit your individual requirements. Multiple ganged units with individual phasing, special stops and even specially tapped units supplied to order, individually or in quantity. Additional new sizes and new types are being prepared as this publication goes to press. Standard shafts supplied in any length or detail; special bushings and shaft locks to order.

High Linearity — Superior Performance

Vectron Potentiometers provide superior performance. Uniformity and linearity far beyond normal specification requirements are the result of long experience. Close tolerances and special processing insure minimum run-out and bearing angularity.



FOR FULL INFORMATION
Write for Vectron's Potentiometer Bulletin

Precision Components Section
VECTRON, inc.
Electronic and Electro-Mechanical Equipment
402 MAIN STREET, WALTHAM 54, MASS.

IRE provides all THREE

"Proceedings of the I.R.E."

puts your product promotion monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 38,945 (ABC).

Founded in 1913, "Proceedings of the I.R.E." is the authoritative work-book of America's fastest expanding industry. In it, electronic advances, years ahead of the times, are published every month, thus keeping engineers up to the moment on all that is new in engineering research and application. Its advertising is a constant product parade of the best this industry manufactures. A vital service to all men who specify and buy, it is a proved vehicle for your consistent product promotion—*with prestige!*

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provides 35,000 IRE members educated to buy and specify with your detailed product data for ready reference all year long.

The IRE DIRECTORY is their working encyclopedia . . . it organizes, codes, simplifies and "indexes for use" a vast and complex industry. They look to its listing of men, firms and products as vital working information. Wherever you find IRE members, you'll find IRE DIRECTORIES close at hand for ready reference. The cost of keeping your product story before 35,000 engineers is less than you'd expect. The price of one page is less than one-half the three cents postage required to mail 35,000 letters.

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. . . the eye-opening event of each radio-electronic year . . . where over 40,000 engineers come to you for all that's new.

Bringing buyers and sellers face to face to discuss engineering needs and product performance is one of IRE's great services to an industry where understanding is the key to progress. The Radio Engineering Show completes with actual product presentation the balanced promotion package of "Proceedings of the I.R.E." for product promotion and the Radio Engineers Directory for product reference.

VECO Stands for



ADVANCED DESIGN . .

A recent development in sensing elements provides the basis for a new and better approach to problems in measurement and control. VECO THERMISTORS have an extremely high negative temperature coefficient of electrical resistance. Their small size and extreme sensitivity to thermal changes offer engineers a circuit element to utilize in new applications, and for the improvement of older methods.

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SOME PRACTICAL USES:

Time delay • Gas analysis • Volume limiting • Surge protection • Vacuum manometry • Flow measurement • Temperature control • Temperature measurement • Radar power measurement • Temperature compensation Oscillator stabilization • and many new applications being developed.

SEND FOR . . .
VECO THERMISTOR DATA BOOK

VECO VARISTORS react instantaneously to current or voltage changes, and have innumerable uses such as arc suppressing and regulating source voltages.

VECO GAS ANALYSIS CELLS

employ Veco glass-coated Thermistors as sensing and reference elements (no open wires, therefore no corrosion).

$5.00 cash or money order will bring you the VECO Experimentors' THERMISTOR-VARISTOR package, No. 168—7 items and application circuitry—over a $15.00 value!

Victory ENGINEERING CORPORATION
MANUFACTURERS OF:
Electronic & Thermal Control Instruments
Temperature Sensing Devices
Combustion Analyzers

Springfield Road, Union, N.J. Tel. UNionville 2-7150

4. Component Parts

51. Resistors.

(Continued from page 365)

Onondaga Pottery Co., Electronic Div., 1858 W. Fayette St., Syracuse 1, N.Y., 25
For details see ad on page 284
Tel: SYracuse 8-1681
Pacent Eng. Corp., N.Y., 20, 50, 55
Painton and Co., Ltd., England, 15, 20, 30, 45, 50, 55
Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 15, 35, 55
For details see ad on page 333
Tel: Cleveland 5-1471
Plastics & Electronic Corp., N.Y., 25
Polytronics Co., Canada, 25
Potentiometer Div., Fairchild Camera, N.Y., 20, 50, 55
Powell Co., Harold H., Pa., 15, 30
Precision Electronic Components, Ltd., Canada, 10, 20
Precision, Inc., Dept. R, 730 Lyndale Ave. North, Minneapolis 11, Minn., 45, 50, 55
For details see ad on page 365
Tel: Hy 7726
Precision Resistance Co., N.Y., 20, 45, 50, 55
R.C.L. Mfg. Co., N.J., 10
Radell Corp., Ind., 15
Radio Components Ltd., Canada, 10, 20
Rattray & Co., Inc., George, 116-08 Myrtle Ave., Richmond Hill 18, N.Y., 20, Precision
For details see ad on page 367
Tel: Virginia 6-8250
Reon Resistor Corp., N.Y., 45, 50, 55
Resistance Products Co., 714 Race St., Harrisburg, Pa., 40, 55
For details see ad on pages 124-125
Tel: Harrisburg 2-4245
Resistors, Inc., Ill., 45, 50, 55
Rex Rheostat Co., N.Y., 30, 45, 50, 55
Ruckelshaus Labs., Inc., John G., N.J., 15, Metal Films, 25
Sanders Assoc., Inc., N.H., 15, 25
Sensitive Research Instr. Corp., Dept. 156-D, 9 Elm Ave., Mt. Vernon, N.Y., 45, 55
For details see ad on page 449
Tel: Fairbanks 4-3358
Servotrol Co., Mass., 20
Shallcross Mfg. Co., Pa., 15, 35, 40, 45, 55
Speer Carbon Co., Pa., 5
Sprague Electric Co., Mass., 5, 15, 25, 40, 45, 55
Stackpole Carbon Co., Electronic Div., Tannery St., St. Marys, Pa., 5, 10, 20, 25, 30
For details see ad on pages 84-85
Tel: 41-521
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 25
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Supreme, Inc., Miss., 45, 55
Tech Labs., Inc., N.J., 30, 50
Technology Instrument Corp., 535A Main St., Acton, Mass., 20, 50
For details see ad on pages 75-79
Tel: COlonial 3-7711
Techtronic Dev. & Mfg., Calif., 20, 55
Telewave Corp., N.Y., Microwave
Telex, Inc., Minn., 20, 45, 55
Thwing-Albert Instrument Co., Pa., 20
U.S. Electronic Corp., N.J., 45, 55
Vectron, Inc., 402 Main St., Waltham 54, Mass., 20, 30, 50, 55
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Victoreen Instrument Co., Ohio, 15, 35, 40
Victory Engineering Corp., Springfield Rd., Union, N.J., Thermistors
For details see ad on page 366
Tel: UN 2-7150
Vokar Corp., Mich., 45, 55

(Continued on page 369)

PRECISION *Potentiometers*



Rattray precision potentiometers have a wide scope and cover many types and sizes, in the field of wire-wound units of high accuracy, long life and stability. Rattray's designs are compact, having mechanical and electrical capabilities of the highest quality. The two basic lines include: single and multiple turn linear and nonlinear models. Rattray has the facilities for quantity production orders; fast deliveries made on sample and special requirement quantities.

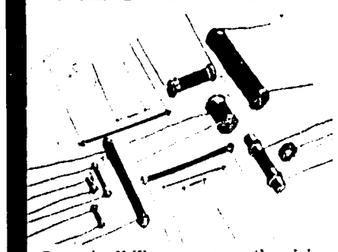
Models	106	162	200	300	181-3	181-10
Dimensions:						
Diameter, in.	1.060	1.620	1.985	2.985	1.820	1.820
Length, single unit, in.	0.656	0.838	0.838	0.838	1.200	2.080
Add per section, in.	0.500	0.615	0.615	0.615	0.880	1.560
Resistance Range, ohms:						
Linear, max.	50,000	140,000	178,000	283,000	100,000	350,000
Non-linear	Depends on function involved.					
Electrical Contact Angle	350°	350°	350°	350°	1080°	3600°
Functional Tolerances:						
Linear	±0.35%	±0.15%	±0.10%	±0.075%	±0.1%	±0.075%
Non-linear	to ±0.5%	±0.5%	±0.4%	±0.3%	±0.5%	±0.3%
Torque Per Section, oz. in.	0.5	0.5	0.5	0.5	1.0	1.0
Wattage Rating at 40°C	1	2.5	4.0	5.0	3	5
Operating Temperature Range	−55°C to +75°C standard.					
Resolution, Max.	1/1500	1/2500	1/3300	1/5300	1/6000	1/20,000

Function tolerances indicated are typical and vary with resolution.
In all cases, extra taps can be provided as required.
Ball bearings available if required, and will increase length slightly.

Manufacturers Representatives:
Many choice territories open.

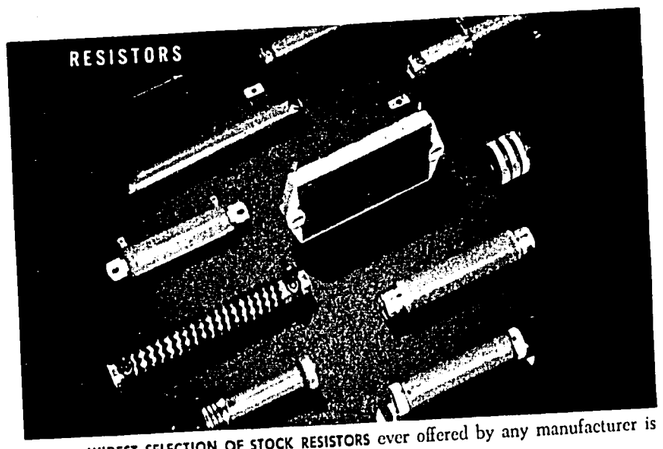
GEORGE RATTRAY & CO., INC.
116-08 Myrtle Avenue — Richmond Hill, 18, N. Y.

Stupakoff
CERAMIC RESISTORS

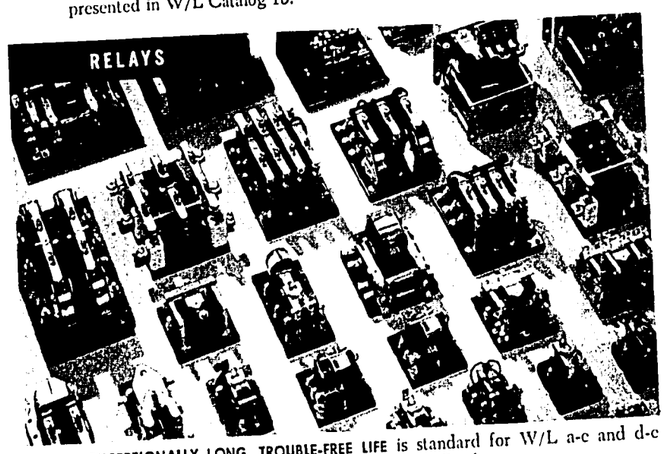


Stupakoff Temperature Sensitive Resistors are used for the control of voltage, current, pressure, temperature, humidity, radio oscillation, resistance and resistance compensation. Stupakoff Insulcon units are used as an infra-red light source and as heating elements. Both are supplied in the form of rods, tubes, discs, bars, rings, etc., and complete with terminals.

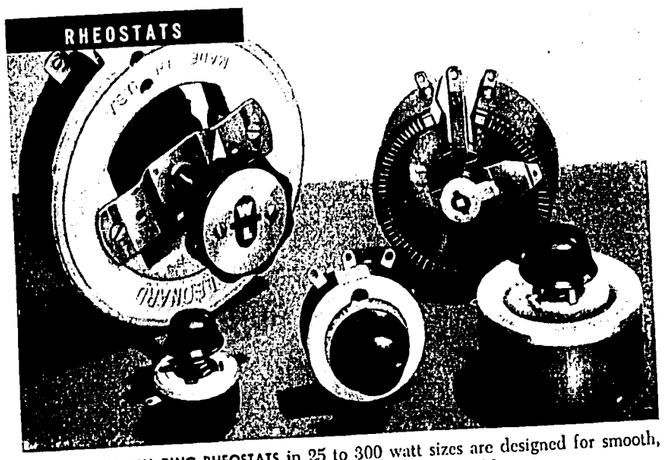
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4. Component Parts

51. Resistors.

Continued from page 367)

Ward Leonard Electric Co., 90 South St., Mount Vernon, N.Y., 20, 30, 45, 50
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Tel: MO 4-1000
Waters Mfg. Inc., Mass., 20, 50, 55
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 20, 55
For details see ad on page 230
Tel: Malden 2202
Welch Mfg. Co., W. M., Ill., 30
Welwyn Canada, Ltd., Canada, 15, 20, 25, 40, 45, 55
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 45, 55
For details see ad on pages 98-99
Tel: BI 3-4700
White Industrial Div., S. S., N.Y., 5, 40
Wirt Co., Pa., 20, 30, 45, 50
Yonkers Industries, Inc., N.Y., 45, 55
Zenith Optical Lab., N.Y., 40

52. Semi-Conductors.

5. Germanium diodes
10. Transistors, junction
15. Transistors, point contact

Amperex Electronic Corp., N.Y., 10
Berkshire Labs., Mass., 5

For Further Information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.

52. Semi-Conductors.

CBS-Hytron, Div. Columbia Brdcstng. Syst., Mass., 5, 10, 15
Canadian General Electric Co., Electronic Equip. Div., Canada, 5, 10, 15
Electro-Tech Equip. Co., N.Y., 5, 10
Electron-Radar Products, Ill., 10, 15
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For details see ad on pages 32-37
Tel: Nutley 2-3600
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General Electric Co., Apparatus Sales Div., N.Y., 5
Germanium Prods. Corp., N.J., 5, 10
Hughes Aircraft Co., Semiconductor Div., Florence and Teale Sts., Culver City, Calif., 5
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Hytro-Aire, Inc., Calif., 10, 15
International Rectifier Corp., 1521 E. Grand Ave., El Segundo, Calif., 5
For details see ad on page 352
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Lansdale Tube Co., Pa., 5
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Mallory & Co., Inc., P. R., Ind., 10, 15
Microwave Assoc., Inc., Mass., Silicone Diodes
Mullard, Ltd., England, 5, 10, 15
National Union Radio Corp., Pa., 5, 10
Northern Electric Co., Ltd., Canada, 5, 10, 15
Pacent Eng. Corp., N.Y., 5, 10, 15
Pacific Semiconductors, Inc., Sub. Ramo-Wooldridge Corp., 6316 W. 92 St., Los Angeles 45, Calif., 5, 10, 15
For details see ad on page 232
Tel: Oregon 8-7161
RCA Victor Co., Ltd., Canada, 10, 15
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 5, 10
For details see ad on page 210
Tel: HUmboldt 5-3900
Radio Dev. & Res. Corp., N.J., 5, 10
Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 5, 10, 15
For details see ad on pages 30-31
Tel: WAtkins 4-3633
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Sealtron Corp., Ohio, 10
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Societe Francaise Radio Electrique, France, 5, 10, 15
Sylvania Electric Prods. Inc., Electronics Div., Woburn, Mass., 5, 10, 15, Photo Diodes
For details see ad on pages 9-14
Tel: Woburn 2-3500
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 5, 10, 15
For details see ad on pages 9-14
Tel: JUdson 6-2424
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, Silicon Junction Diodes, 10-Triodes & Tetrodes, 15, Transistors, Silicon Grown Junction
For details see ad on page 226
Tel: DI-1781
Transistor Prods., Inc., Mass., 5, 10, 15
Transitron Electronic Corp., Mass., 5, 10
Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 5, 10, 15
For details see ad on page 234
Tel: HUmboldt 2-4200
Westinghouse Electric Corp., N.Y., 5, 10, 15

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For details see ad on page 296
Tel: Brockton 160

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 10, 15, 20
For details see ad on page 130
Tel: Bishop 2-1000

American Radio Hardware Co., N.Y., 10, 15

Brilhart Plastics Corp., Old Country Rd., (P.O. Box 31) Mineola, L.I., N.Y., 5, 10, 15, 20
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Tel: Pioneer 6-0425

Canadian General Electric Co., Electronic Equip. Div., Canada, 15

Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 5, 10, 15
For details see ad on pages 110-111
Tel: Nevada 2-2000

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 10, 15
For details see ad on page 370
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Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 15
For details see ad on pages 90-91
Tel: JUno 8-1212

Elco Corp., Pa., 10, 15

Electronic Mechanics, Inc., N.J., 10

Fluorocarbon Prods., Div. U.S. Gasket Co., N.J., 10, 15

Gates Radio Co., Ill., 15

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 10
For details see ad on page 507
Tel: Rockford 2-6695

General Electric Co., N.Y.C., N.Y., 15, 20

General Laminated Prods. Co., Inc., Ill., 20

Guild Electronics, Inc., N.Y., 15

Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 10, 20
For details see ad on page 371
Tel: ORegon 7-1881

Insuline Corp. of America, N.H., 10

Isolantite Mfg. Corp., N.J., Low Loss Ceramic Insulators

Johnson Co., E. F., Minn., 15, 20

Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 5, 10
For details see ad on pages 110-111
Tel: Nevada 2-2000

Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N.Y., 20
For details see ad on page 511
Tel: MOunt Vernon 4-4024

4. Component Parts

53. Sockets.

Livingston Electric Corp., N.J., 10, Hermetically Sealed

Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill., 10, 15
For details see ad on page 350
Tel: Brunswick 8-0334

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 10, 15
For details see ad on page 548
Tel: Malden 4-4108

Mycalex Corp. of America, 111-A Clifton Blvd., Clifton, N.J., 10
For details see ad on pages 94-95
Tel: Prescott 9-8866

National Co., Inc., Mass., 10, 15

Neptune Electronic Co., N.Y., 10, 15

Philmore Mfg. Co., Inc., N.Y., 10

Plastic Mold. & Eng., R.I., 10

Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, L.I., N.Y., Pin Straightener
For details see ad on page 533
Tel: OYster Bay 6-0009

Raypar, Inc., Ill., 10, 20

Remler Co., Ltd., Calif., 5, 10, 15

Rodale Mfg. Co., Inc., Pa., 20

Societe Francaise Radio Electrique, France, 15

Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 10, 15
For details see ad on pages 9-14
Tel: Judson 6-2424

Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 10
For details see ad on page 103
Tel: LA 7-8400

United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 10, 15
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Tel: Kirkland 7-4900

United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 5, 10, 15
For details see ad on pages 126-127
Tel: WOodlawn 4-0370

Vector Electronic Co., Calif., 10

54. Switches.

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15. Foot
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Acro Switch, Div. Acro Mfg. Co., Ohio, 40, 70

Aerolite Electronics, 507 26th St., Union City, N.J., 70
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Tel: UNion 3-2955

Air Associates, Inc., N.J., 40

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 45
For details see ad on page 491
Tel: Hemlock 6-2230

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 60
For details see ad on page 429
Tel: Linden 3-1000

Allard Instrument Corp., N.Y., 45, 55, 65

Allen-Bradley Co., Wis., 15, 35, 45, 55

American Radio Hardware Co., N.Y., 20, 50, 70

American Thermo-Electric Co., N.Y., Thermocouple

Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J., High Speed Sampling
For details see ad on page 174
Tel: Plainsboro 3-4141

Arrow-Hart & Hegeman Electric Co., Conn., 30, 35, 40, 45, 50, 60, 70

Automatic Electric Co., Ill., 15, 20, 25, 40, 45, 50, 55, 70

Automatic Electric Mfg. Co., Minn., Time

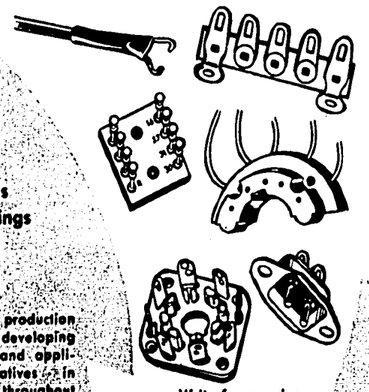
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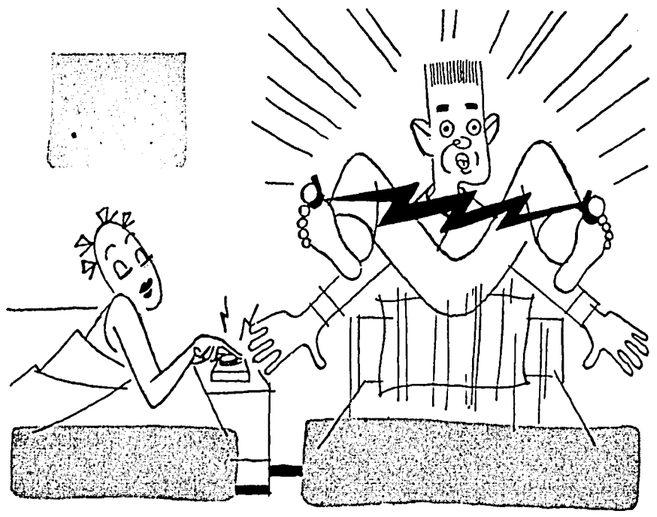
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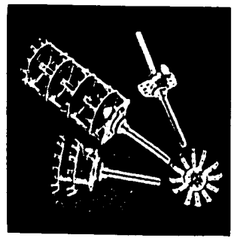
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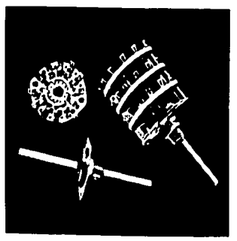


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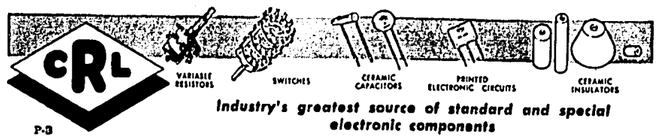
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54. Switches.

(Continued from page 371)

Baker & Co., Inc., 113 Astor St., Newark 5, N.J., Contacts
For details see ad on page 374
Tel: BI 3-0030

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 5
For details see ad on pages 96-97
Tel: FI 2-1821

Bird Electronic Corp., 1797 E. 38 St., Cleveland 14, Ohio, 10
For details see ad on page 328
Tel: EX 1-3535

Birnbach Radio Co., Inc., N.Y., 30, 35, 45, 50, 70

Blonder-Tongue Labs, Inc., N.J., 65

Bogart Mfg. Corp., N.Y., 5, 10, 35, 45, 55

Brainin Co., C. S., 320 Washington St., Mount Vernon, N.Y., Contacts
For details see ad on page 371
Tel: Mount Vernon 8-5500

Bright Radio Labs., Inc., N.Y., 45

Bristol Co., Conn., 45

Bud Radio, Inc., 2118 E. 55 St., Cleveland 3, Ohio, 70
For details see ad on page 145
Tel: HE 1-7166

Budd-Stanley Co., Inc., 43-01 22 St., Long Island City 1, N.Y., 10
For details see ad on page 428
Tel: STillwell 6-1706

C. and H. Sales Co., Calif., 70

Caltron Prods. Co., Calif., 55, Solenoid

Carling Electric, Inc., Conn., 45, 50, 60, 70

Carter Parts Co., Ill., 20, 30, 45, 50, 70

Cannon Electric Co., Calif., 55

Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 5, 35, 45, 50, 60, Lever
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 25, Vacuum
For details see ad on pages 86-87
Tel: Livingston 6-1100

Cherry Electrical Prods. Corp., Ill., 40

Chicago Telephone Supply Corp., 1142 W. Beardsley Ave., Elkhart, Ind., 5, 40, 45
For details see ad on pages 114-115
Tel: Elkhart 3-0310

Clare & Co., C. P., Ill., 20

Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 5, 35, 45
For details see ad on pages 100-101
Tel: Dover 975

Cole Instrument Co., Calif., 5, 35, 45, 60

Comar Electric Co., 3349 W. Addison St., Chicago 18, Ill., 40, 55
For details see ad on page 152
Tel: Juniper 8-2410

Communication Products Co., Inc., State Hwy. 79, Marlboro, N.J., 5, 45
For details see ad on pages 104-105
Tel: Freehold 8-1880

Connecticut Telephone & Electric Corp., Conn., 55, 70

Cook Electric Co., Ill., 65

Cunningham, Son & Co., Inc., James, Dept. 1D, 13 Canal St., Rochester 8, N.Y., Crossbar
For details see ad on page 373
Tel: Baker 7240

Cutler-Hammer, Inc., Wis., 35, 45, 55, 70

Dalmotor Co., Calif., 55

Daven Co., N.J., 5, 40, 45

Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 10
For details see ad on page 430
Tel: NE 6-6900

Eastern Specialty Co., Pa., 45

Ebert Electronics Corp., N.Y., 25, 35

Edison Inc., Thomas A., Instr. Div., N.J., 65

Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., Vacuum
For details see ad on pages 90-91
Tel: JUno 8-1212

Electro-Snap Switch & Mfg. Co., Ill., 40, 45, 70

Electro Switch Corp., Mass., 30, 35, 40, 45, 60

Electro-Tech Equipment Co., N.Y., 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70

Erickson Specialties of P. G. Gebhart Co., Md., Custom Barometric

F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 45
For details see ad on pages 47-50
Tel: AStoria 8-2800

Federal Anti Capacity Switch Corp., N.Y., 20, Anti-Capacity

Federal Electric Products Co., N.J., 35, 65, 70

Federal Telephone & Radio Co., Div. of I.T.&.T., 100 Kingsland Rd., Clifton, N.J., 20, 45
For details see ad on pages 32-37
Tel: Nutley 2-3600

Fenwal, Inc., Mass., 65

Fog-O-Scope, Inc., Ill., 70

Franklin Television Labs., Inc., N.Y., 15

Furnas Electric Co., Ill., 15, 55

G-V Controls, Inc., N.J., 65

Gabriel Electronics Div., The Gabriel Co., Endicott St., Norwood, Mass., 10
For details see ad on page 422
Tel: Norwood 7-3300

Gates Radio Co., Ill., 35, 55

Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 30, 35, 40, 45, 50, 70
For details see ad on page 539
Tel: Rockford 5-9548

(Continued on page 375)

Cunningham
ESTABLISHED 1818
CROSSBAR

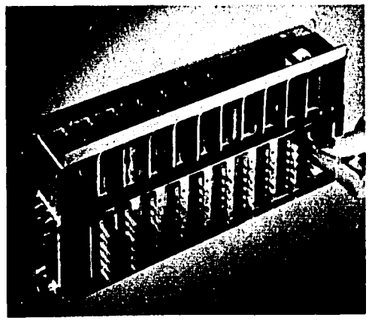
Presenting
A NEW HF CROSSBAR SWITCH

A truly superior switch for MASTER CONTROL AND MONITOR SWITCHING OF AUDIO & VIDEO CIRCUITS

Also COMPUTERS • TELEMETERING TELEPHONY • DELAY LINES ETC.

Advantages

- Switches up to 70 megacycles
- Extreme flexibility
- Fast quiet switching
- Crosstalk down 60 Db at 10 MC
- Any group of setups may be held intact while setting up others
- Individual magnets at each cross-over
- Maximum, six conductors per circuit
- Life-tested to 100 million operations
- Provision for spot or remote control
- Designed to permit easy modification
- Strapwiring eliminated
- Palladium contacts
- Reduced cost
- Compact design, small size
- Low operating power—2.5 watts
- Simple "package" installation



If you have a special switching problem, let us point out where our switches can be used to advantage. Write for further information on switch and Application Data sheets.

JAMES CUNNINGHAM, SON & CO., INC.
Dept. ID, Rochester, New York Tel: BAker 7240

CO-AXIAL SWITCHES and MICROWAVE *Test Equipment*





REMOTE CONTROL SWITCHES

28 V. DC., 110 V. DC.—Compact, lightweight—available in Radial, spring return; Radial, transfer; parallel connector configuration.

115 V. AC., 60 cycle.—Compact, lightweight—available in Radial, spring return; parallel connector configuration.

MANUAL CONTROL SWITCHES

Compact, lightweight—available in Radial; parallel connector configuration.

GENERAL CHARACTERISTICS

(all switches)

Frequency range .....0 to 10,500 MC
VSWR .....1.2:1 max. at 3000 MC
Insertion loss .....0.3 db max.
Crosstalk .....greater than 60 db at 3000 MC
greater than 40 db at 10,500 MC
Operation Life .....10,000 cycles, min.
Construction .....weatherproof
Connectors .....N, BNC, C, HN, BN, LN
Positions ..2, 3, 4 and 6: single and double pole
Easily adaptable for specialized usage.

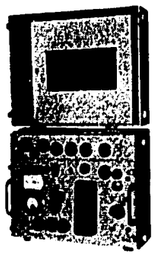


"S" BAND BEACON

A highly miniaturized receiver-transmitter for missile applications to facilitate radar tracking. Supplied with power supply, cable and antenna (not shown).

"X" BAND TEST EQUIPMENT

Test set BHS (AN/UPM-10A) is a portable microwave signal generator for testing and adjusting beacon equipment and radar systems operating in the range of 8500 to 9600 MC. Measures power and frequency of external signals. Supplies pulse-modulated, square wave-modulated or unmodulated signals of known power and frequency. Also supplies frequency-modulated signals.



GENERAL COMMUNICATION COMPANY
681 Beacon Street, Boston 15, Massachusetts

The widest variety of



precious metal contacts



& contact materials

Types available include rivets, studs, screws, steel-back and solder-back buttons, washers, discs, rods, rings and special shapes and stampings . . . Supplied in practically any specified dimensions to suit special requirements and designed for assembly or attachment by any standard method. A wide selection of contact materials is available. Platinum, palladium, gold and silver—both pure and in their many alloys—give you exactly the metal you need for your own particular electrical contact application.

Your inquiries will receive our prompt courteous attention

BAKER & COMPANY INC PRECIOUS METALS
113 ASTOR ST NEWARK 5, N. J.

4. Component Parts

54. Switches.

(Continued from page 373)

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 30, 45, 50, 60, 70
For details see ad on page 507
Tel: Rockford 2-6695

General Communication Co., 681 Beacon St., Boston 15, Mass., 10
For details see ad on page 374
Tel: CO 7-6030

General Control Co., Mass., 30, 45, 60, 70

General Devices, Inc., P.O. Box 253, Princeton, N.J., 45
For details see ad on page 376
Tel: Princeton 1-5010

General Electric Co., N.Y.C., N.Y., 25

General Electric Co., Apparatus Sales Div., N.Y., 15, 35, 55, 70

General Electric Co., Tube Dept., N.Y., 25, Vacuum

General Electric Co., Ltd., of England, Mass., 45

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 45
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Gibson Electric Co., Pa., Contacts only

Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 30, 45, 70
For details see ad on page 375
Tel: Fleetwood 4-1040

Grigsby-Allison Co., Inc., Ill., 5, 10, 30, 35, 40, 45, 50, 60, 70

Guardian Electric Mfg. Co., 1621-IRE W. Walnut St., Chicago 12, Ill., 55
For details see ad on page 190
Tel: CHesapeake 3-1100

Hamlin, Inc., Ill., 25

Hart Mfg. Co., Conn., 30, 45, 70

Heinemann Electric Co., N.J., 55

Hetherington, Inc., Pa., 15, 30, 40, 45, 60, 70

Industrial Assembly Corp., N.Y., 65, 70

Industrial Instruments, Inc., N.J., 45

Industrial Prods. Co., Div. Danbury-Knudsen, Conn., 10

Industrial Timer Corp., N.J., Time

Instrument Corp. of America, P. O. Box 219, Blacksburg, Va., 45
For details see ad on page 220
Tel: Blacksburg 8208

Insulated Circuits, Inc., N.J., Printed Circuit Flush and Raised

Insuline Corp. of America, N.H., 50, 70

Isolantite Mfg. Corp., N.J., Low Loss Ceramic Insulators

J-B-T Instruments, Inc., 441 Chapel St., New Haven 8, Conn., 30, 45, 60, 70
For details see ad on page 184
Tel: State 7-5825

JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 20, 50, 70
For details see ad on page 286
Tel: BE 6-9200

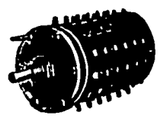
(Continued on page 376)

GRAYHILL Switches · Test Clips · Molded Plastic Parts

Grayhill Rotary Tap Switch
SERIES 3000

For Special Circuit Combination Applications

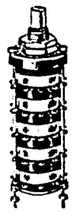
Available 1 to 12 decks, 2 to 11 contacts per deck.
A rugged index action assures rotor contact coming to rest at next position once thrown past center.
Diameter of switch 3-½"
Rated—20 amps., 115 v., A.C., non-inductive



Grayhill Miniature Tap Switches
SERIES 5000

For Commercial Applications

Available 1 to 6 decks—2 to 10 contacts per deck.
Shorting (make before break) or Non-shorting (break before make).
Switch rotates 360° with 10 positions—stops provided with 9 or less positions.
Bushings, ¼" long—⅜" —32 thread
Diameter of switch 1-1/32"
Rated to break—1 amp., 115 v., A.C., non-inductive.
To carry—5 amps., 115 v., A.C.



SERIES 12

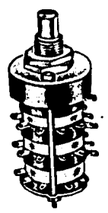
For Military Applications

Available 1 to 6 decks—2 to 10 contacts per deck.
Shorting (make before break) or Non-shorting (break before make).
360° rotation with 10 positions—stops provided with 9 or less positions.
Bushings, ¼" long—⅜"—32 thread
Diameter of switch 1-1/32".
Rated to break—1 amp., 115 v., A.C., non-inductive
To carry—5 amps., 115 v., A.C.



SERIES 24

Positive Detent Action and better feel for precision requirements.
Available 1 to 6 decks—2 to 10 contacts per deck.
Shorting (make before break) or Non-shorting (break before make).
360° rotation with 10 positions—stops provided for less than 10 positions.
Bushings, ¼" long—⅜"—32 thread
Diameter of switch 1—1/32"
Rated to break—1 amp., 115 v., A.C., non-inductive
To carry—5 amps., 115 v., A.C.



Grayhill Push Button Switch
SERIES 2000—Snap Action

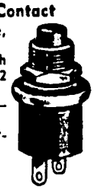
For Manual Operation

Audible click when actuated
Momentary contact, single pole, single throw type.
O.D.—7/8" dia. x 1-59/64" high
Bushings, 7/16" long—15/32"—32 thread
Rated—10 amps., 115 v., A.C., non-inductive
1 amp., 115 v., D.C.
Rated Life—Approx. 50,000 operations
No. 2201—Normally open
No. 2202—Normally closed



SERIES 4000—Momentary Contact

Momentary contact, single pole, single throw type.
O.D.—51/64" dia. x 1-17/32" high
Bushings, ⅜" long—15/32"—32 thread
Rated—½ amp., 115 v., A.C.—non-inductive
Rated Life—Approx. 800,000 operations
No. 4001—Normally open
No. 4002—Normally closed



SERIES 23 — Miniature, Momentary Contact

Momentary contact, single pole, single throw
O.D. ½" dia. x 1-3/64" high
Bushings, ¼" long — 5/16" — 32 thread
Rated—¼ amp., 115 v., A.C., non-inductive
Rated Life—Approx. 500,000 operations
No. 23-1—Normally open



Grayhill Test Clips
SERIES 16—Completely insulated, alligator type

Even hinge pin is insulated.
Low contact resistance (approx. .0015 ohm)—.008" silver overlay on contact surfaces
Terminals—silver plated
Finger grips—molded phenolic



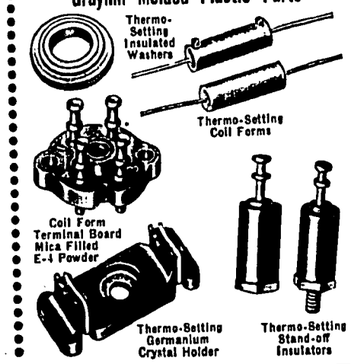
SERIES 2



No. 2-2—Plug-in Adapter for equipment employing ¾" jack centers.
No. 2-0—Threaded Stud
No. 2-1—Banana Plug

Clips—Cadmium plated
Plugs—Nickel plated
Base—General purpose phenolic electrical grade, per Mil-P-14 type CFG.

Grayhill Molded Plastic Parts



Grayhill

505 Hillgrove Avenue, La Grange, Illinois
Phone: Fleetwood 4-1040

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

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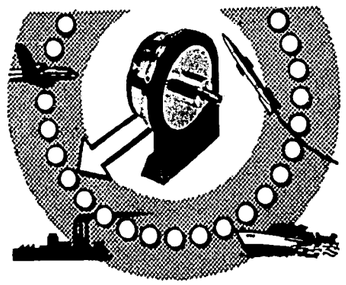
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New York 21, N.Y.



Precision HIGH SPEED Rotary

MULTICONTACT SWITCHES
and
SAMPLING DEVICES
for
Military or Industrial Low Current Applications

Check this representative list

Used in:
- ☐ CHOPPER DEVICES
- ☐ COMPUTING DEVICES
- ☐ DATA CORRELATORS
- ☐ DATA HANDLING SYSTEMS
- ☐ FM-FM TELEMETERING SYSTEMS
- ☐ MARKER GENERATORS
- ☐ MULTICHANNEL TEMPERATURE ALARMS
- ☐ PAM TELEMETERING SYSTEMS
- ☐ PWM TELEMETERING SYSTEMS
- ☐ RADAR DISPLAY SYSTEMS
- ☐ SYNCHRONOUS DEMODULATORS
- ☐ TRANSISTOR ANALYZERS

Used For:
- ☐ AUTOMATIC CALIBRATION
- ☐ COMMUTATION AND SUBCOMMUTATION
- ☐ DATA CONVERSION
- ☐ MULTIPLE FAULT INDICATION
- ☐ MULTICHANNEL LOW LEVEL AMPLIFICATION
- ☐ MULTIPLE AMPLIFIER STABILIZATION
- ☐ MULTIPLEXING RECORDER CHANNELS
- ☐ MULTICHANNEL REMOTE CONTROL
- ☐ MULTISIGNAL COMPARISON
- ☐ PARAMETER DISPLAY ON CRO
- ☐ STRAIN GAUGE SAMPLING
- ☐ SYNCHRONIZED SAMPLING
- ☐ SPECIAL WAVEFORM GENERATION
- ☐ THERMOCOUPLE SAMPLING

Related Specialties:
- ☐ CODED SHAFT ROTATION
- ☐ LOW SPEED PRECISION SWITCHES
- ☐ MANY CONTACTS OR POLES
- ☐ MULTICHANNEL CAPACITATIVE DEVICES
- ☐ MULTICHANNEL MAGNETIC PICKUP DEVICES
- ☐ PHOTO-ETCHED SWITCHES
- ☐ SERVO-POSITIONED SWITCHES
- ☐ SPECIAL MOLDED CONTACT PLATES
- ☐ SPECIAL SWEEP DEVICES
- ☐ SUBMINIATURE PRECISION SWITCHES
- ☐ VERY HIGH SPEED SWITCHES

Send for convenient spec sheet

GENERAL DEVICES, Inc.
Box 253, Princeton, New Jersey

Associated with:
McLean Engineering Laboratories
Princeton, N.J.

Manufacturers of:
Electronic Cabinet Cooling Fans

4. Component Parts

54. Switches.

(Continued from page 375)

Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose, Calif., 10, 35, Vacuum
For details see ad on pages 25-28
Tel: Cypress 2-4025

Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., 20
For details see ad on page 404
Tel: DEarborn 2-0750

Kings Electronic Co., N.Y., 10, 45

Kriser Corp., N.Y., Foot

Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N.Y., 30, 70
For details see ad on page 511
Tel: MOunt Vernon 4-4024

Leader Electronics, Inc., Ohio, 45

Leland, Inc., G. H., Ohio, 40, 45, 55

Librascope, Inc., Calif., 45

Linemaster Switch Corp., Conn., 15

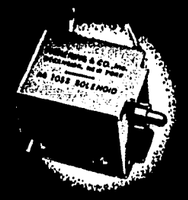
Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill., 25
For details see ad on page 68
Tel: VAnderbilt 4-1188

Livingston Electric Corp., N.J., 15

PICKERING *solenoids*



for DC Circuits



Pickering engineering service is available for special applications where Pickering standard Solenoids do not apply

PICKERING & CO., Inc.

For details and literature address Dept. T.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

4. Component Parts

54. Switches.

Loral Electronics Corp., Dept. ID 54, 794 E. 140 St., New York 54, N.Y., 10, 40
For details see ad on page 198
Tel: CY 2-1800

Mallory & Co., P. R., Ind., 5, 30, 40, 45

Marco Industries Co., Calif., 70

Maxson Corp., W. L., N.Y., 40

Mercoid Corp., Ill., 25

Microwave Consultants, N.Y., 10

Minneapolis-Honeywell Reg. Co., Micro Switch, Ill., 15, 25, 30, 40, 45, 60, 70

Mossman, Inc., Donald P., Ill., 20, 30, 35, 45, 60, 70

Muirhead & Co., Ltd., England, 20, 45

Muter Co., The, Ill., 50

Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 45
For details see ad on pages 94-95
Tel: Prescott 9-8866

Mycalex Electronic Corp., 30 Rockefeller Plaza, N.Y. 20, N.Y., Telemeter
For details see ad on pages 94-95
Tel: Columbus 5-5989

Neptune Electronic Co., N.Y., 15, 30, 70

Network Mfg. Corp., N.J., 70

Ney Co., J. M., 171 Elm St., Hartford 1, Conn., Contacts
For details see ad on page 377
Tel: Hartford 2-4271

Ohmite Mfg. Co., Ill., 35, 45

P. M. Industries, Conn., 45

Pacent Eng. Corp., N.Y., 35, 45

Painton and Co., Ltd., England, 45, 70

Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 40, 55, 60, 70
For details see ad on page 333
Tel: CL 5-1471

Phillips Control Corp., Ill., 55

Philmore Mfg. Co., Inc., N.Y., 70

Pollak Corp., Joseph, Dept. D, 75-95 Freeport St., Boston 22, Mass., 30, 35, 45, 50, 55, 60, 70
For details see ad on page 357
Tel: AV 2-9550

Poly-Scientific Corp., Va., 45, 50

Powell Co., Harold H., Pa., 45, 70

Radiation Counter Labs., Inc., Ill., 25

Radio Components, Ltd., Canada, 5, 30, 45, 50, 60, 70

Recora Co., The, Ill., 15

Ripley Co., Inc., Factory St., Middletown, Conn., Electronic
For details see ad on page 277
Tel: 6-6679

Roanwell Corp., N.Y., 40, 60

Rodale Mfg. Co., Inc., Pa., 50, 70

Roller-Smith Corp., Pa., 35, 45

Sangamo Weston, Ltd., England, 40, 45

Schott Co., Walter, Calif., 30, 50, 70

Sensitive Res. Instr. Corp., N.Y., 45

Ses..ions Clock Co., Conn., 40

Shallcross Mfg. Co., Pa., 5, 35, 45, 60

Sheldon Electric Co., Div. Allied Electric, N.J., Starters

Shure Brothers, Inc., Ill., 45, 50, 70

Smith, Inc., Herman H., N.Y., 45, 50, 60,

Smith Mfg. Co., Nathan, Calif., 60, 70

Smith & Stone, Ltd., Canada, 25, 70

Stackpole Carbon Co., Electronic Div., Tannery St., St. Marys, Pa., 30, 40, 50, 60, 70
For details see ad on pages 84-85
Tel: 41-521

Sunvic Controls, Ltd., England, 65

Switchcraft, Inc., 1340 N. Halsted St., Chicago 22, Ill., 20, 30, 45, 60, 70
For details see ad on page 247
Tel: MI 2-7136

Tech Labs., N.J., 30, 35, 45, 55, 65, 70

Telephonics Corp., N.Y., 5

Thompson Prods., Inc., Electronics Div., Dept. PI, 2196 Clarkwood Rd., Cleveland, Ohio, 10
For details see ad on page 235
Tel: HE 1-6765

Todd Electric Co., Inc., N.Y., 5, 10, 20, 30

Tork Clock Co., Inc., N.Y., Time

Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 65
For details see ad on page 234
Tel: HUmboldt 2-4200

Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville 60, Mass., 5, 40, 45, 70
For details see ad on page 103
Tel: LA 7-8400

United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 5, 30, 40, 45, 70
For details see ad on page 102
Tel: Kirkland 7-4900

Ulanet Co., George, 413 Market St., Newark 5, N.J., 65
For details see ad on page 379
Tel: Market 2-4876

Ultrasonic Corp., Mass., 35

Unimax Switch Corp., Div. Maxson Corp., N.Y., 40

United Control Corp., Wash., 65

Universal Circuit Controls Corp., Ill., 20, 50, 70

Valverde Labs., N.Y., 65

Vokar Corp., Mich., 5, 40, 45, 65

Ward-Leonard Electric Co., 90 South St., Mount Vernon, N.Y., 30, 35, 55, 70
For details see ad on page 368
Tel: MO 4-1000

Westinghouse Electric Corp., Pa., 65

Wind Turbine Co., 238 E. Market St., West Chester, Pa., 5
For details see ad on page 256
Tel: West Chester 3110

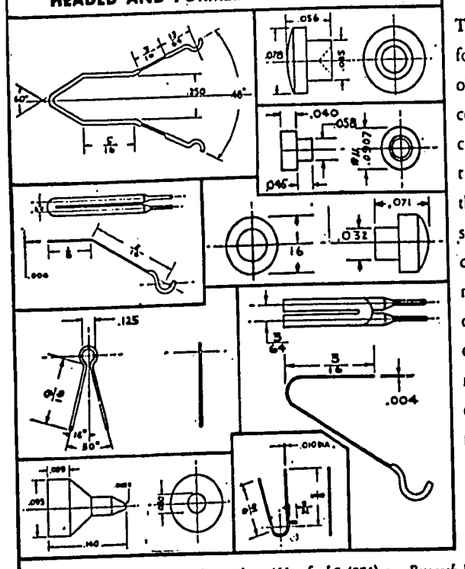
Wirt Co., Pa., 50

Wright Eng. Co., Calif., 50

NEY Precious Metals in Industry

YOUR DESIGN PROBLEM SIMPLIFIED WITH THE USE OF ONE OF OUR STANDARD CONTACTS

HEADED AND FORMED WIRE CONTACTS



This simplified chart shows the form and overall dimensions of a few of the many types of contacts made from Ney Precious Metal Alloys with electrical and physical properties that have proved exceptionally satisfactory for brush or wiping contact applications. Full technical and test data are available on request. Other Ney Precious Metal Alloys have solved many special industrial application problems. Consult us freely without obligation.

NEY GOLD

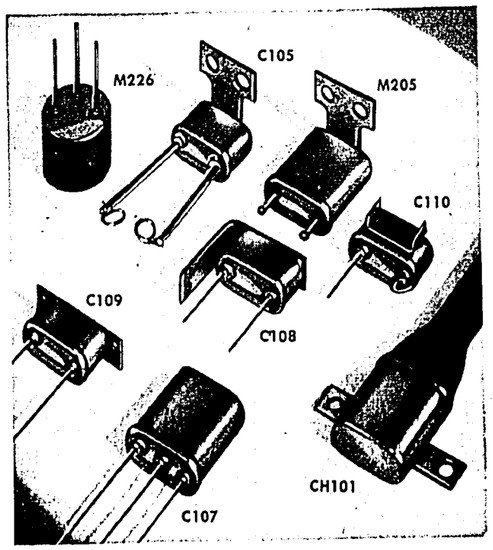
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SPECIALISTS IN PRECIOUS METAL METALLURGY SINCE 1812

See also listings for Thermostats on page 378

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

STEVENS* hermetically sealed THERMOSTATS



Bright plated or dull black finish. Terminals to customer specification. Thermostats shown approximately ¾ size.

Stevens Hermetically Sealed Thermostats—specially engineered for precision control of devices or equipment subjected to dust, moisture or corrosive atmospheres—are tightly, permanently sealed in corrosion-resistant metal cans. Some models have neoprene covered terminals. Virtually any type mounting bracket available.

Stevens Hermetically Sealed Thermostats are available in two basic styles: Type M bimetal disc for high-current circuits; Type C bimetal strip for low-current circuits, or for use in conjunction with disc types. *Both models feature a bimetal thermal element that eliminates artificial cycling or life-shortening "jitters."*

If your problem involves fast, accurate control of temperature under rugged atmospheric conditions, specify Stevens Hermetically Sealed Thermostats—they add to the life and sales of your product.

***Stevens also makes a complete line of standard bimetal disc and strip thermostats. Write for data.** A-6669

Type M thermostat patented; Type C, patent applied for

STEVENS

manufacturing company, inc.

MANSFIELD, OHIO

55. Telegraph Keys.

5. Manual
10. Mechanical high speed
15. Semi-automatic

Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5
For details see ad on page 296
Tel: Brockton 160
American Radio Hardware Co., N.Y., 5
Boehme, Inc., H. O., N.Y., 10
Bunnell & Co., J. H., N.Y., 5, 10, 15
Codetyper Labs., N.Y., 10
Corona Eng. Service, N.Y., 5
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 10, 15
For details see ad on page 487
Tel: Pioneer 6-5212
Electro-Medical Lab., Inc., Vt., 15
Johnson Co., E. F., Minn., 5, 15
Marconi's Wireless Telegraph Co., Ltd., England, 5
Northern Electric Co., Ltd., Canada, 5
Stromberg-Carlson Co., N.Y., 5
Taffet Radio & TV Co., N.Y., 5
Technical Material Corp., N.Y., 10
Vibroflex Co., Inc., N.Y., 15

56. Thermostats.

5. Bellows
10. Bimetal
15. Hermetically sealed

American General Thermostat Corp., N.Y., 5
American Instrument Co., Inc., Md., 10
Baker & Co., Inc., 113 Astor St., Newark 5, N.J., Bi-Metals
For details see ad on page 374
Tel: BI 3-0030
Barber-Colman Co., Ill., 5, 10
Bristol Co., Conn., 5, 10, 15
Clifford Manufacturing Co., Mass., 5
Curtis Development & Mfg. Co., Wis., 10
Detroit Controls Corp., Res. Div., Calif., 5, 10
Edison, Inc., Thomas A., Instr. Div., N.J., 10, 15
Electro-Tech Equipment Co., N.Y., 10
Engineering Development, Neb., Differential Electronic
Fenwal, Inc., Mass., 10, 15
Fog-O-Scope, Inc., Ill., 10
G-V Controls, Inc., N.J., 15
General Electric Co., Apparatus Sales Div., N.Y., 5
Hart Mfg. Co., Conn., 5
Mercoid Corp., Ill., 5, 10
Monitor Products Co., Calif., 15
Stevens Mfg. Co., Inc., 69 S. Walnut St., Mansfield, Ohio, 10, 15
For details see ad on page 378
Tel: 1547-6
Sunvic Controls, Ltd., England, 5
Ulanet Co., George, 413 Market St., Newark 5, N.J., 10, 15
For details see ad on page 379
Tel: Market 2-4876
United Control Corp., Wash., 10, 15
Valverde Labs., N.Y., 10, 15

57. Transformers.

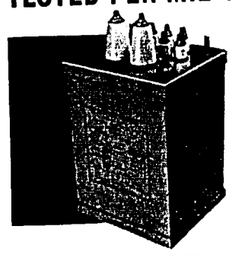
Transducers
See Page 407, Product 64, Electronic Control Equipment, Subhead 20, Production control, counting and sorting equipment

5. Audio
10. Geophysical
15. Hermetically sealed
20. Horizontal output & flyback
22. I. F.
25. Isolation
30. Power components
35. Precision matched
40. Pulse
45. Radio Frequency
50. Saturable
55. TV deflection
60. TV impedance matching
65. Variable
70. Voltage regulating

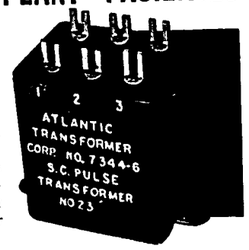
Ace Coil & Electronics Co., N.J., 45
Acme Electric Corp., 44 Water St., Cuba, N.Y., 5, 15, 25, 30, 40, 50, 65, 70
For details see ad on page 381
Tel: Cuba 4
Acro Products Co., Pa., 5, 15, 30, 40, 50
Acro Transformer & Mfg. Corp., N.Y., 5, 15, 25, 30, 70
Aerovox Corp., Mass., 5, 15
Air Associates, Inc., N.J., 45
Aircraft Transformer Corp., West and Willow Aves., Long Beach, N.J., 5, 15, 25, 30, 35, 40, 45, 50, 60, 65, 70
For details see ad on page 379
Tel: Long Branch 6-6250
Airmec, Ltd., England, 15, 70
Airpax Products Co., Md., 5, 15, 30, 35, 40, 50, 65
Altec Lansing Corp., Calif., 5, 15, 25, 30, 35, 40, 50, 70
Altec Lansing Corp., N.Y., 5, 10, 15, 30
American Instrument Co., Inc., Md., 65
Annis Co., R. B., Ind., Split Core
Ardente Acoustic Labs., England, 5, 40
Atlantic Transformer Corp., 30 Hynes St., Groton, Conn., 5, 15, 25, 30, 35, 40, 50, 65
For details see ad on page 379
Tel: Hilltop 5-0353
Atlas Coil, Inc., Conn., 5, 10, 15, 25, 30, 35, 40, 45, 50, 65, 70
Atlas Engineering Co., Inc., Mass., 5, 10, 15, 25, 30, 35, 40, 45, 50, 65
Audio Dev. Co., Minn., 5, 10, 15, 25, 30, **35, 40**
Automatic Mfg. Corp., N.J., 20, 22, 45, 55, 60
Auto-Test, Inc., Ill., 30

(Continued on page 381)

TESTED PER MIL-T-27 IN OUR "IN-PLANT" FACILITIES



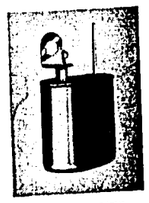
We are now producing government and commercial transformers in quantity. Our top flight engineering staff and complete electrical test facilities can help solve your toughest transformer problems.
"In-plant" testing means a minimum of waiting before passing Government tests. *Write or phone for detailed information.*



HIGH VOLTAGE PLATE TRANSFORMER — Class A, B, C, H — MOLDED MINIATURE BLOCKING OSCILLATOR TRANSFORMER

ATLANTIC TRANSFORMER CORP. 30 Hynes Ave., Groton, Conn.

NEW Hermetically Sealed MINIATURE THERMOSTAT



ACTUAL SIZE

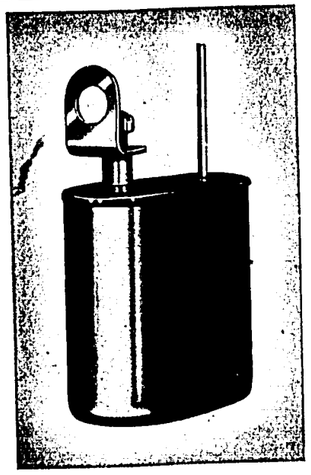
★ Illustrated unit is Model 21. Designed for use in critical electronic, thermal sensing and thermal control applications.

Will control non-inductive loads up to 5 amperes at 27.5 volts D.C. The inherent features of Model 21 are its rapid response and extreme stability. Temperatures varying between —100°F. and +300°F. do not effect the original calibration.

OVERALL SIZE 11/16" x 5/16" WIDE, ⅞" HIGH

Terminals and mounting arrangements can be furnished to meet particular requirements.

Write for catalog illustrating largest thermostat and thermal timer line available to industry.



SINCE 1931 ULANET **GEORGE ULANET COMPANY**

416 Market Street • Newark 5, New Jersey

It's a safe bet to rely on Ulanet!



TYPE 01-1529

YES-Hermetically Sealed CLASS H

Open Type Transformer

POSSIBLE ONLY WITH

FORMFLEX

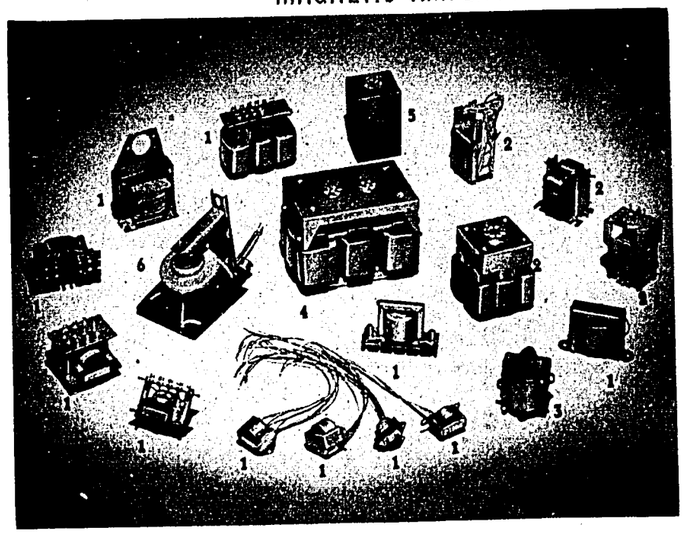
Designed for long life at "Hot Spot" temperatures of 200°C, permitting weight and size reductions over class A designs. Hermetically sealed (MIL-T-27) Grade 1, using exclusive FormFlex process.

Manufacturers of Inductive Equipment

AIRCRAFT TRANSFORMER CORPORATION

Long Branch, N.J.

Celco **Manufacturers of:**
TRANSFORMERS VARIABLE REACTORS
MAGNETIC AMPLIFIERS



1. OUTPUT, MATCHING, COUPLING, AND POWER SIGNAL 400 CYCLE TRANSFORMERS: used where reliability and miniature size is required, such as control amplifying systems. Supplied with any special lead wires or terminations.

2. DUAL MAGNETIC AMPLIFIERS: all types used in latest 400 cycle aircraft control amplifiers for Servo Systems.

3. VARIABLE REACTOR: used today in tuned resonant circuits for vacuum tube voltage regulating systems. Suitable for experimental laboratory work where a Hi-Q and wide range of inductance is required.

4. TRIPLE MAGNETIC AMPLIFIER: used in aircraft automatic pilots, by both the Army Air Force and Navy.

5. HERMETICALLY SEALED TRANSFORMERS: designed to conform to military specifications for hermetically sealed transformers, magnetic amplifiers and reactors.

6. FLY BACK: HORIZONTAL OUTPUT AND HIGH VOLTAGE TELEVISION TRANSFORMER: manufactured for extra quality performance, of very low costs.

COMMERCIAL USE

Omni-Range; Dme; Line Course Computers; Automatic Pilots Navigation; Transmitters and Receivers; Oil Burner Ignition; Fly Back; Vertical Output, Linearity Controls.

MILITARY USE

Servo Amplifiers; Adjustable Reactors; Transistor Magnetic Amplifier; Class H. Transformers; Drone Control; Guided Missile; Voltage Control; Marine Control; Sonar Celco Research.

Celco Gives Prompt Service—send us your requirements for our immediate attention.

Celco *Constantine Engineering Laboratories Co.*
ISLAND AVENUE MAHWAH, NEW JERSEY

IRE provides all THREE

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puts your product promotion monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 38,945 (ABC).

Founded in 1913, "Proceedings of the I.R.E." is the authoritative work-book of America's fastest expanding industry. In it, electronic advances, years ahead of the times, are published every month, thus keeping engineers up to the moment on all that is new in engineering research and application. Its advertising is a constant product parade of the best this industry manufactures. A vital service to all men who specify and buy, it is a proved vehicle for your consistent product promotion—*with prestige!*

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provides 35,000 IRE members educated to buy and specify with your detailed product data for ready reference all year long.

The IRE DIRECTORY is their working encyclopedia . . . it organizes, codes, simplifies and "indexes for use" a vast and complex industry. They look to its listing of men, firms and products as vital working information. Wherever you find IRE members, you'll find IRE DIRECTORIES close at hand for ready reference. The cost of keeping your product story before 35,000 engineers is less than you'd expect. The price of one page is less than one-half the three cents postage required to mail 35,000 letters.

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. . . the eye-opening event of each radio-electronic year . . . where over 40,000 engineers come to you for all that's new.

Bringing buyers and sellers face to face to discuss engineering needs and product performance is one of IRE's great services to an industry where understanding is the key to progress. The Radio Engineering Show completes with actual product presentation the balanced promotion package of "Proceedings of the I.R.E." for product promotion and the Radio Engineers Directory for product reference.

4. Component Parts

57. Transformers.

(Continued from page 379)

Ballastran Corp., Ind., 5, 10, 15, 25, 30

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 15, 40, 45
For details see ad on pages 96-97
Tel: FI 2-1821

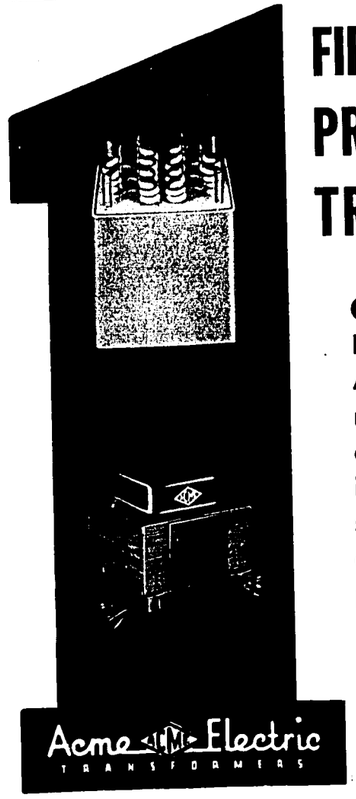
Beam Instruments Corp., N.Y., 5, 15, 30
Bellaire Electronics, Inc., N.Y., 45
Berkshire Labs., Mass., 40
Berkshire Transformer Corp., Conn., 5, 15, 30
Best Mfg. Co., Inc., N.J., 5
Blackstone Electric Co., Ill., 5, 15
Blonder-Tongue Labs., Inc., N.J., 60
Bogen Co., Inc., David, N.Y., 65
CGS Laboratories, Inc., Conn., 50
Calbest Eng. & Electronics Co., Calif., 45, 60

Caledonia Electronics & Transformer Corp., P.O. Box 298, Caledonia, N.Y., 15, 30, 40
For details see ad on page 381
Tel: Caledonia 271

Tough Transformer Design Problems?

For special design requirements or unusually severe operating conditions, call on specialists in custom-designed audio, power and pulse transformers and saturable reactors as well as transformers for defense applications.

CALEDONIA ELECTRONICS & TRANSFORMER CORPORATION
CALEDONIA, N.Y.



FIRST CHOICE FOR PRECISION MADE TRANSFORMERS

Precision is two-fold in Acme Electric transformers. Exact mechanical dimensions facilitate installation in limited space. Unvarying electrical characteristics provide for dependable performance.

ACME ELECTRIC CORPORATION
44D WATER ST. • CUBA, N. Y.
West Coast Engineering Laboratories:
1375 W. Jefferson Blvd., Los Angeles, California
In Canada: Acme Electric Corp. Ltd.
50 Northline Road, Toronto, Ontario

Campbell Co., Inc., John, Conn., 5, 15, 25, 30, 35, 40, 50
Canadian Marconi Co., Canada, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70
Canadian Westinghouse Co., Ltd., Canada, 5, 15, 20, 30, 40, 70
Carad Corp., Calif., 40
Carol Electronics Corp., N.Y., 5, 10, 15, 25, 30, 50, 60
Central Transformer Co., Ill., 5, 10, 15, 25, 30, 35, 50, 65, High Voltage
Century Geophysical Corp., Okla., 10
Chicago Magnetic Control, Ill., 15, 45, 65, 70
Chicago Electronic Eng. Co., Ill., 5, 10, 15, 25, 35, 40, 50
Chicago Standard Transformer Corp., Ill., 5, 15, 20, 25, 30, 40, 50, 65
Church Co., George H., Minn., 40
Cinaudagraph Corp., Ill., 5, 20, 30, 55, 65
Coil Eng. & Mfg. Co., Inc., Ind., 5, 25, 30
Coil Winders, Inc., N.Y., 45, 55
Coilcraft, Inc., Ill., 20, 22, 45, 60
Cole Instrument Co., Calif., Instrument
Columbus Process Co., Inc., Ind., 5, 15, 25, 50, 55

Comar Electric Co., 3349 W. Addison St., Chicago 18, Ill., 30
For details see ad on page 152
Tel: Juniper 8-2410

Communication Accessories Co., 110 St. & Hillcrest Rd., Hickman Mills, Mo., 5, 35, 40, 50
For details see ad on pages 80-81
Tel: South 5528

Communication Equip. & Engr. Co., Ill., 25
Communication Parts, Ill., 15, 45
Component Manufacturers, Inc., N.Y., 15, 20, 45, 55
Consolidated Radio Prods. Co., Ill., 5, 15, 20, 30

Constantine Eng. Labs. Co., Island Avenue, Mahwah, N.J., 5, 15, 20, 25, 35, 40, 45, 50, 55
For details see ad on pages 288, 380
Tel: Ramsey 9-1123

Continental Radio & Electrical Eng., S. Africa, 70
Control Components Co., Mass., Differential
Cramer Transformer Corp., Ill., 5, 15, 20, 25, 30, 35, 40, 45, 55, 60, 65, 70
Crest Laboratories, Inc., N.Y., 5, 10, 15, 30, 40
Crown Engineering, N.M., 45
Cycle Transformer Corp., N.J., 5, 15, 25, 30
Demco Products, Pa., 40
Developmental Electronics Corp., Calif., 40

Dietz Design & Mfg. Co., Grandview 7, Mo., 5, 15, 30, 45
For details see ad on page 290
Tel: South 7216

(Continued on page 383)

TRANSFORMERS.....

★ ENCAPSULATED
★ EMBEDDED

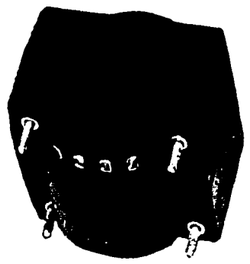
Years of Transformer Engineering

When designing your electronic equipment, consider the advantages of our facilities to properly engineer your transformer components. FELCO designed transformers are in great demand where size and weight are important factors.

FROM STANDARD UNITS . . . .

POWER • AUDIO • CHOKES • ETC.

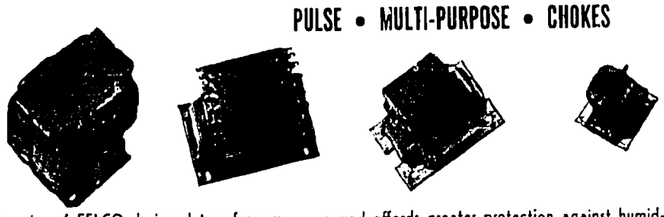
From the simplest choke to the most complex power transformer, available embedded or encapsulated as shown here.





TO COMPLETELY ENGINEERED SERIES . . . .

PULSE • MULTI-PURPOSE • CHOKES



A series of FELCO designed transformers which have been treated with Westinghouse Fosterite, eliminating the need for expensive hermetic sealing. Impregnating the transformers with this special compound affords greater protection against humidity and reduces corona.

OR SPECIALS . . . .

Cast transformers are available for applications where size, weight and moisture resistance are important factors.



This type embedment is particularly adeptable to airborne, portable and specially designed apparatus and equipment.

The Forest Electric Company

7216 CIRCLE AVENUE — FOREST PARK, ILLINOIS

THE FOREST ELECTRIC COMPANY — F E FELCO C O

Chicago Phone: MAnsfield 6-0766

FOrest 6-4100

MANUFACTURERS OF SPECIALIZED TRANSFORMERS

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfully eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information---fast.

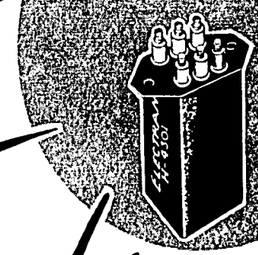
3000 Firms listed. The alphabetical directory gives a clear definition of these firms by showing any or all of the ten fundamental groups in which these firms belong after every name.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

ELECTRAN

★ Transformers
★ Saturable Reactors
★ Electronic Devices



Transformers

Designers and Custom Builders—small and medium quantities—from milliwatts to 50 KVA, single or polyphase.

May We Bid On Your Requirements?

ELECTRAN MFG. CO.

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EPCO

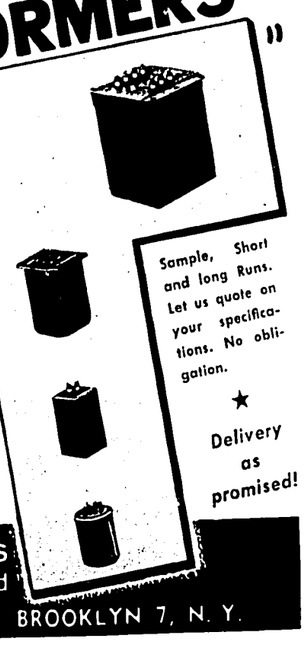
TRANSFORMERS"

"fill your Needs to a . . .

For Industrial and Electronic Equipment

DESIGNED TO COMMERCIAL & MILITARY SPECIFICATIONS (MIL-T-27 and AN-E-19). ALSO CLASS A, B, H, AND MINIATURES.

★



Sample, Short and long Runs. Let us quote on your specifications. No obligation.

★

Delivery as promised!

EPCO Products Incorporated

2500 ATLANTIC AVE. • BROOKLYN 7, N. Y.

4. Component Parts

57. Transformers.

(Continued from page 381)

Dinion Coil Co., Inc., N.Y., 5, 10, 15, 25, 30, 40, 50

Dit-Mco, Inc., Electronic Div., Mo., 5, 15, 25, 30

Dormeyer Industries, Ill., 5, 25, 30

Dormitzer Electric & Mfg. Co., Inc., Mass., 5, 15, 30, 40

Dressen-Barnes Corp., Calif., 50, 70

ESC Corp., 534 Bergen Blvd., Palisades Park, N.J., 40
For details see ad on page 316
Tel: Windsor 7-0400

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 60
For details see ad on page 370
Tel: DAvenport 4-7000

El-Rad Mfg. Co., Ill., 20, 40, 45, 55, 60

Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill., 15, 25, 30, 50
For details see ad on page 383
Tel: BI 8-4596

Electricoil Transformer Corp., N.Y., 5, 15, 30, 40

Electrical Windings, Inc., Ill., 5, 15, 25, 30, 50

Electro Engineering Works, Calif., 5, 15, 25, 30, 40, 50, 70

Electro-Search, 4337 N. 5 St., Philadelphia 40, Pa., 25
For details see ad on page 488
Tel: GL 5-5353

Electro-Tech Equipment Co., N.Y., 25, 30, 65, 70

Electrometric, Inc., Ill., 20, 40, 45

Electronic Components Corp., Ill., 5, 30

Electronic Computer Div., Underwood Corp., 35-10 36 Ave., Long Island City 6, N.Y., 40
For details see ad on page 317
Tel: Exeter 2-3400

Electronic Heating Corp., Mass., 30

Electronic Transformer Co., N.Y., 5, 15, 25, 30, 35, 40

Emerald Mfg. Co., Ill., 40, 45

Engineering Research Asso., Div. Rem. Rand., Inc., Minn., 40

Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y., 5, 10, 15, 25, 30, 35, 40, 50
For details see ad on page 383
Tel: Dickens 5-7531

Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 40
For details see ad on page 318
Tel: CO 6-3228

Espey Mfg. Co., Inc., N.Y., 15, 20, 30, 40, 45, 70

Essex Wire Corp., Mag. Windings Div., Pa., 5, 10, 15, 25, 30, 35, 40, 50, 55, 60

Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 5, 45
For details see ad on pages 32-37
Tel: Nutley 2-3600

Feldman Co., Henry, Calif., 20

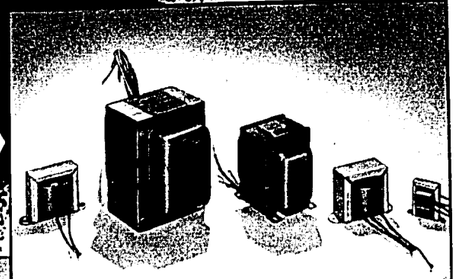
(Continued on page 385)

GTC

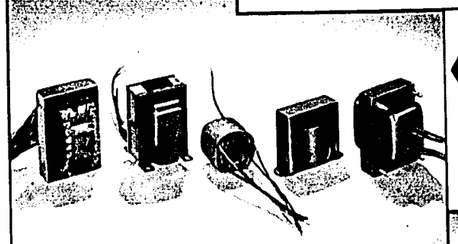
TRANSFORMERS . . .

. . . specified for the usual

. . . demanded for the unusual

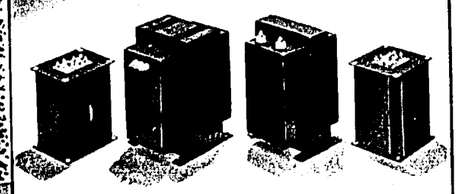


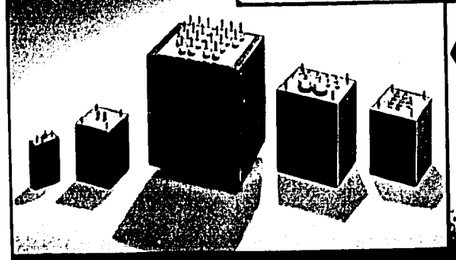
"GTC" Transformers for television receiver applications . . . custom-designed for high quality at minimum cost.



"GTC" Transformers for industrial and commercial applications . . . accurately engineered and fully recognized for finest quality.

Manufacturers specify "GTC" . . . for audio uses, communication, radar devices, test equipment, transmitters, and various other electronic-controlled devices.





"GTC" Military Transformers . . . designed to meet rigid government specifications and to perform under the most severe and continuous operating conditions. MIL-T-27 and JAN-T-27.

Skilled engineering techniques make GTC a source for transformers in highly specialized and extremely unusual applications. Utilization of these techniques results in greater dependability, quality and better construction.

Our completely self-contained plant's modern equipment guarantees transformer production in any quantity, to meet your requirements. We welcome your inquiry and will supply production samples where desired.

GTC

GENERAL TRANSFORMER COMPANY

serving industry since 1928

18240 Harwood Avenue, Homewood, Illinois

(Suburb of Chicago)

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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 IRE 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 Institute 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
1475 Broadway
New York 36, N.Y.

4. Component Parts

57. Transformers.

(Continued from page 383)

Ferranti Electric, Inc., N.Y., 5, 10, 15, 30, 40, 70

Fisher Engineering, Inc., P.O. Box 327, Huntington, Ind., 5, 15, 35, 40, 50
For details see ad on page 385

Fluke Mfg. Co., Inc., John, Wash., 30

Forbes Wagner, Inc., N.Y., 15, 20, 40, 45

Forest Electric Co., 7216 Circle Ave., Forest Park, Ill., 5, 15, 20, 25, 30, 35, 50
For details see ad on page 382
Tel: MA 6-0766

Foster Transformer Co., Ohio, 5, 15, 30, 40

Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 5, 10, 15, 25, 30, 35, 40, 50
For details see ad on page 180'
Tel: Evergreen 6-1300

Fugle-Miller Labs., Inc., 398 Main St., Metuchen, N.J., 22, 45
For details see ad on pages 171, 292
Tel: ME 6-2245

Galbraith & Son Elec. Corp., C. C., N.Y., 5, 15, 25, 30

General Elec. Co., Apparatus Sales Div., N.Y., 5, 15, 30, 40, 45, 70

General Elec. Co., Spec. Transf. and Ballast, Ind., 5, 15, 20, 30, 40, 70

General Instr. Corp., F. W. Sickles Div., Mass., 20, 55, 60

General Magnetics, Inc., N.J., 50

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 35, 65, 70
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

General Transformer Co., 18240 Harwood Ave., Homewood, Ill., 5, 15, 25, 30, 35, 50, 60
For details see ad on page 384
Tel: Homewood 124

General Winding Co., Inc., N.Y., 10, 55, 60

Glaser-Steers Corp., N.J., 15

Goslin Electric & Mfg. Co., Calif., 5, 10, 15, 25, 30, 35, 40, 45, 50, 70

Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 5, 15, 20, 30, 40, 70, Hearing Aid
For details see ad on Cover III
Tel: Everglade 4-4400

Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 40
For details see ad on pages 318, 385
Tel: Texas 0-7317

Guthman & Co., Inc., Edwin L., Ill., 15, 20, 45, 55, 60

Gyromechanisms, Inc., N.Y., 50

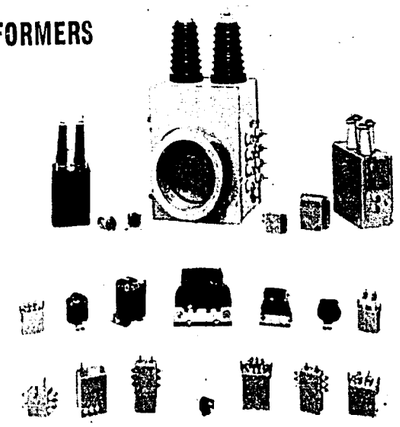
Hadley Co., Inc., Robert M., Calif., 5, 10, 15, 25, 30, 35, 40, 50

Halldorson Transformer Co., Ill., 5, 10, 20, 30, 70

(Continued on page 387)

QUALITY *If it's SPECIAL . . . See us*

TRANSFORMERS



Radar Components
Delay Lines
Pulse Forming Networks
Modulators-Converters

Magnetic Amplifiers
Reactors Charging-Filter

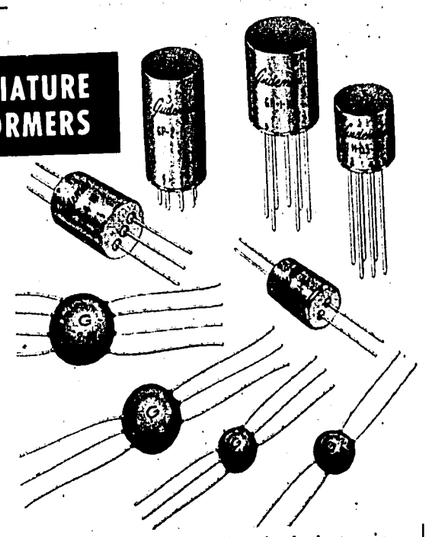
Transformers:
Modulation
Blocking Oscillator
Pulse—all types
Power-Filament-Plate

Fisher Engineering, Inc.

P.O. Box 327

Huntington, Indiana

IMPROVED MINIATURE PULSE TRANSFORMERS



SURPASSES MIL-T-27 TEST SPECIFICATIONS

PULSE WIDTHS: from .05 to 20 μsec.

RISE TIMES: from .005 to .025 μsec.

2, 3 or 4 WINDINGS (with or without taps)

TYPICAL SPECIFICATIONS:

Model No.	G.1-11
Pulse Width	.1 microsecond
Rise Time	.005 microsecond
Test Voltage	2000 V RMS
Operating Temp. Range	−70°C to 135°C
Weight	less than .03 ounce
Size	11/32" diameter

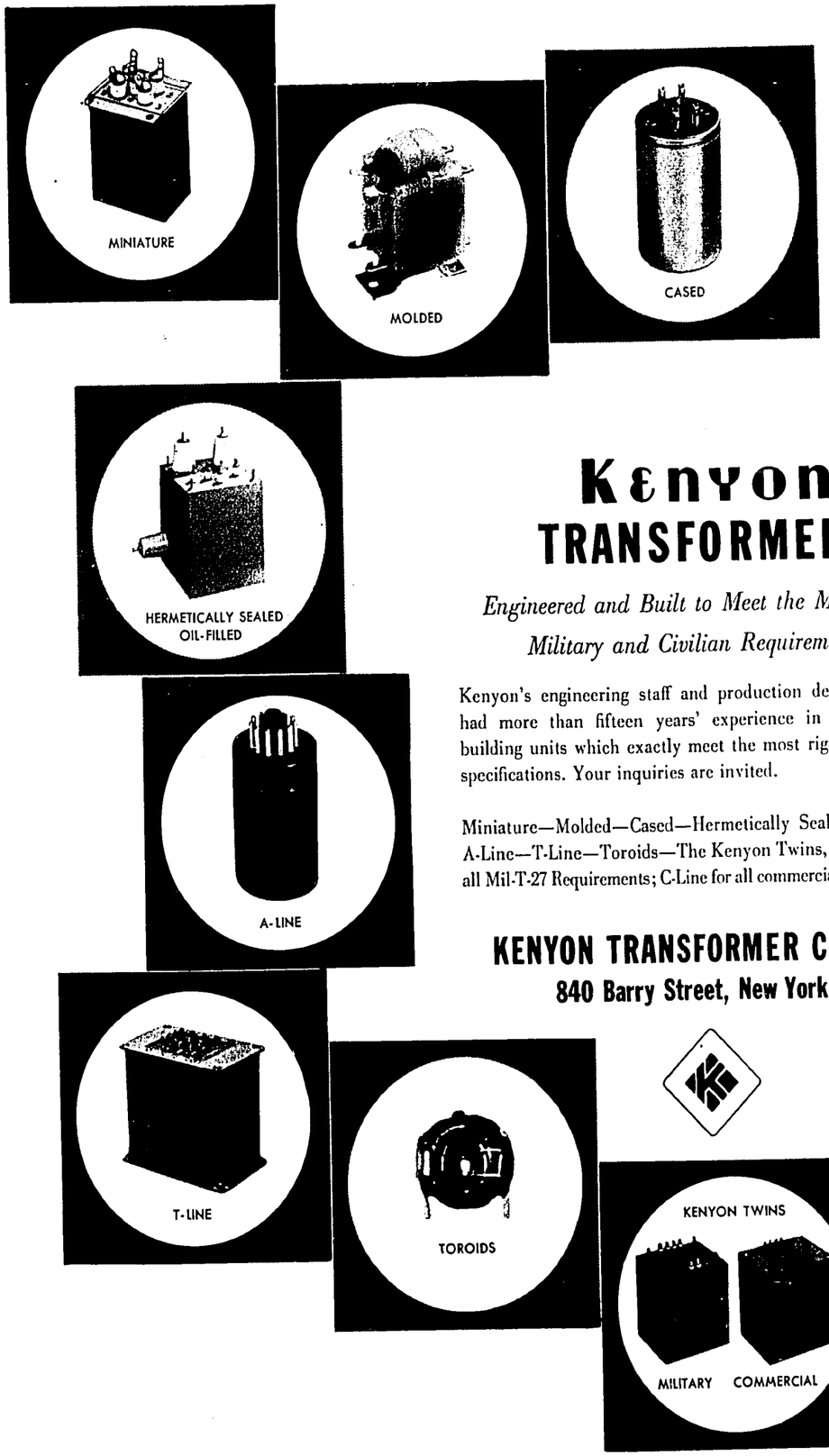
Write for complete data: our Data Sheet Series G-1

- Developed for miniaturized electronic equipment.
- Impregnated and imbedded in a special Epoxy resin which will not support combustion.
- Insulation resistance in excess of 1,000 megohms from −70°C to 135°C.
- Highly stable grain-oriented, annealed, silicon steel toroidal cores.
- All leads clearly identified.

All types available on special order for operation to 210°C.

THE Gudeman COMPANY OF CALIFORNIA INC

9200 Exposition Boulevard
Los Angeles 34, California
Telephone: TExas 0-7317



Kenyon TRANSFORMERS

Engineered and Built to Meet the Most Rigid Military and Civilian Requirements

Kenyon's engineering staff and production department have had more than fifteen years' experience in designing and building units which exactly meet the most rigid and unusual specifications. Your inquiries are invited.

Miniature—Molded—Cased—Hermetically Sealed Oil-Filled—A-Line—T-Line—Toroids—The Kenyon Twins, M-Line to meet all Mil-T-27 Requirements; C-Line for all commercial requirements.

KENYON TRANSFORMER CO., INC.
840 Barry Street, New York 59

4. Component Parts

57. Transformers.

(Continued from page 385)

Hammond Mfg. Co., Ltd., Canada, 5, 15, 25, 30, 35, 40, 70
Harnett Electric Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 5, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70
For details see ad on page 150
Tel: Port Washington 7-3334
Hartley Co., Inc., H. A., N.Y., 5, 30
Heppner Mfg. Co., Box 1207, Round Lake, Ill., 20, 40, 55
For details see ad on page 324
Tel: ROund Lake 6-2161
Highland Engineering Co., Main and Urban Sts., Westbury, L.I., N.Y., 5, 15, 25, 70
For details see ad on page 387
Tel: WE 7-2933
Hillburn Electronic Prods., N.Y., 20, 45
Hindle Transformer Co., Inc., N.J., 5, 15, 25, 30, 40, 50
Houlihan Co., T. R., Ill., 45
Hufford Machine Works, Inc., Elec. Div., Calif., 50
Hycor, Inc., Calif., 5, 10, 15
I-T-E Circuit Breaker Co., Pa., 45, 55
Industrial Television, Inc., N.J., 60
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 30
For details see ad on page 286
Tel: BE 6-9200
Jacobs Instr. Co., Md., 40, 50
Jefferson Electric Co., Ill., 5, 10, 15, 25, 30, 40, 50
Jerrold Electronics Corp., Pa., 60
K. V. Transformer Corp., Conn., 5, 15, 25, 30, 35, 40, 50, 65
Kay Electric Co., 14 Maple St., Pine Brook, N.J., 45, 60
For details see ad on page 436
Tel: CAldwell 6-4000
Kenyon Transformer Co., Inc., 840 Barry St., New York 59, N.Y., 5, 10, 15, 25, 30, 35, 40, 50
For details see ad on page 386
Tel: Kirkpatrick 2-4500
Ketay Mfg. Corp., N.Y., 70
Keystone Products Co., 904 23 St., Union City, N.J., 15, 30
For details see ad on page 38
Tel: Union 6-5400
Lako Co., Wis., 30
Langevin Mfg. Corp., 37 W. 65 St., New York 23, N.Y., 5, 10, 15, 25, 30, 35, 40, 50
For details see ad on pages 116-117
Tel: ENdicott 2-7200
Larose & Associates, Inc., W. T., N.Y., 30
Lectroman, Inc., N.Y., 30
Lehigh Valley Electronic Engr. & Mfg. Co., Pa., 45
Leonard Electric Prods. Co., Inc., N.Y., 5, 15, 20, 45, 55, 60
LePace Mfg. Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 60
Levinthal Electronic Prods., Inc., Calif., 40
Lewyt Corp., N.Y., 5, 15, 45
Lindberg Engr. Co., Ill., 30, Plate & Filament
Linell Eng. Corp., Charles S., Ill., 45, 65
Magnatran, Inc., N.J., 30, 35, 40, 45, 70
Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 4, Ind., 5, 15, 30, 40, 50
For details see ad on page 248
Tel: E 5471
Magnetic Amplifiers, Inc., N.Y., 15, 25, 30, 50, 70
Magnetic Research Corp., Calif., 40
Magnetic Windings, Div. Essex Wire, Pa., 5, 15, 30, 40
Magnetics Research Co., 142 King St., Chappaqua, L.I., N.Y., 40
For details see ad on pages 272, 387
Tel: CH 1-0052
Magnex Corp., N.Y., 5, 10, 15, 20, 30, 40
Mark Electronic, Inc., N.J., 20, 55
Melco Prods., Inc., Minn., 5, 15, 20, 25, 30, 40, 50, 65, 70
Merit Coil & Transformer Corp., Ill., 5, 15, 20, 25, 30, 45, 55, 65
Michel Mfg. Co., Wis., 45

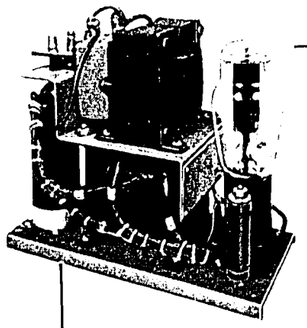
(Continued on page 389)

COMPUTER COMPONENTS

- 100 KC MAGNETIC SHIFT REGISTERS
- 200 KC MAGNETIC LOGICAL ELEMENTS
- PULSE TRANSFORMERS
- SYSTEM DESIGN



MAGNETICS RESEARCH COMPANY
142 KING ST., CHAPPAQUA, N.Y.



HIGHLAND ENGINEERING

TRANSFORMERS—CHOKES

for all industrial and Electronic Applications. Open or cased. Capacities 5VA-50 KVA. Specializing in quality, service and delivery on Transformers and Inductors to suit your particular requirements. Special units built from standard parts at competitive prices and deliveries. MIL-T specifications.

Send us details of your specifications or requirements which will have our prompt attention.

W. R. SPITTAL

HIGHLAND ENGINEERING CO.
WESTBURY, LONG ISLAND, N.Y.
Telephone: WE-7-2933

TRANSFORMERS for . . .

RADIO • TELEVISION • MILITARY • SPECIAL APPLICATIONS

RADIO & TV

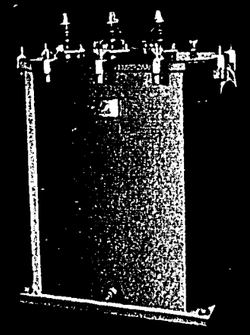
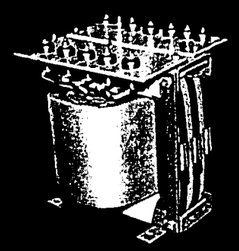
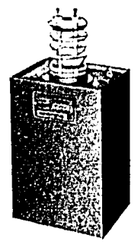


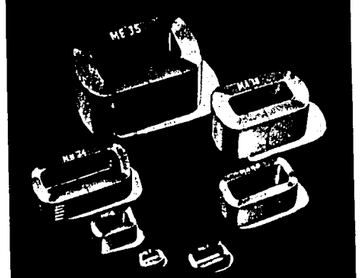
PLATE TRANSFORMERS
MODULATION TRANSFORMERS
REACTORS
FILAMENT TRANSFORMERS
UNITIZED RECTIFIERS
PULSE TRANSFORMERS
CHARGING REACTORS
OIL, ASKAREL
DRY TYPE, (CLASS A, B & H)
PER { MIL-T-27 / RETMA } SPEC.

RADIO & TV



MILITARY

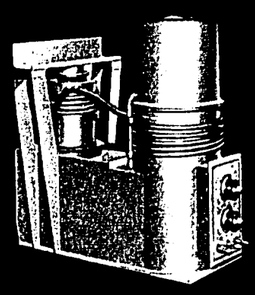




HIPERCORE CORES

for smaller, lighter, low loss transformers. Write for Bulletin SR 205 listing standard cores, weights, dimensions, performance and prices.

MILITARY

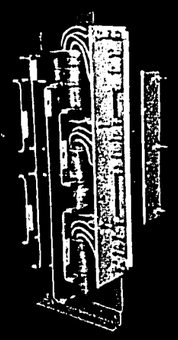


Moloney quality, backed by 58 years of transformer experience, is designed and built into each unit.

This engineering background and experience enables Moloney to produce transformers that offer the maximum in reliability, endurance and efficiency at a minimum of size and weight.

Write for Specialty Transformer Bulletin ST 3505.

SPECIAL APPLICATIONS



MOLONEY ELECTRIC COMPANY

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES: ST. LOUIS, MO.; TORONTO, ONT., CANADA



MORE FOR YOUR POWER SUPPLY DOLLAR





N. J. ELECTRONICS CORP.
REGULATED POWER SUPPLIES



— meet every need
— fit every budget

STANDARD GRADE

Simple, conservative designs, constructed of high-quality standard components for general shop, bench, experimental use. No frills, no unwanted extras. Eighteen models *start at $48.50!!**

*Model 100R: 200-325 V, 100 ma, reg. 1% 6.3 V, 3 A unreg. Rack mtg.

LABORATORY GRADE

Entirely new standards of performance and service life. All components derated *at least* 30%. All units blower-cooled. *No electrolytics! No carbon resistors! No carbon potentiometers! 10,000 hour tubes!* Unusually high stability, close regulation, low ripple. Built to last a lifetime, intended for research labs, permanent equipment. The ultimate in convenience and flexibility, yet prices *start under $100.00!*

Write for our complete catalog No. 1-5455

N. J. ELECTRONICS CORP.
345 CARNEGIE AVENUE KENILWORTH N. J.
CHestnut 5-8038

4. Component Parts

57. Transformers.

(Continued from page 387)

Microlab, 71 Okner Pkwy., Livingston, N.J., 60
For details see ad on page 319
Tel: Livingston 6-0692
Micro-tran Co., N.Y., 5, 10, 15, 25, 35, 40
Mid-West Coil & Transformer Co., Ill., 5, 15, 25, 35, 40, 50
Miller Co., J. W., Calif., 45
Miller Instr., Inc., William, Calif., 5, 10, 15, 40, 45, 50, 55, 60, 65, 70
Milwaukee Transformer Co., Wis., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70
Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo., 15, 30, 40, 50
For details see ad on page 388
Tel: Evergreen 3-3300
Muirhead & Co., Ltd., England, 5
Munston Mfg. & Service, Inc., N.Y., 5, 15, 30
Muter Co., The, Ill., 45
Networks Electronic Corp., Calif., 5, 15, 40, 50
New Jersey Electronics Corp., 345 Carnegie Ave., Kenilworth, N.J., 5, 15, 30, 40, 65, 70, Class "C"
For details see ad on page 389
Tel: Chestnut 5-8038
New York Transformer Co., Inc., N.J., 5, 15, 25, 30, 40, 50, 55, 70
Newton Co., The, Conn., 65
Northern Electric Co., Ltd., Canada., 5, 15, 25, 40, 45
Nothelfer Winding Labs., N.J., 25, 30, 50, 65
Omega Mfg., Inc., N.Y., 30, 70
Ontario Industries, Inc., N.Y., 5, 15, 25, 30, 50, 70
Orenco (Ortho Engineering Corp.), 245 Wallace St., Orange, N.J., 5, 15, 20, 25, 30, 35, 40, 50, 60
For details see ad on page 389
Tel: Orange 4-7319
Osborne Transformer Corp., Mich., 30, 50
Oxford Electric Corp., Ill., 5
P. C. A. Electronic, Inc., Calif., 40
Pacent Eng. Corp., N.Y., 5, 15, 30, 40, 50, 70
Partridge Transformers, Ltd., England, 5, 15, 20, 30, 40, 45, 70
Peerless Electrical Prods., Div. Altec Lansing, Calif., 5, 15, 30, 40
Penn East Eng. Corp., P.O. Box 240, Kutztown, Pa., 5
For details see ad on pages 203, 293
Tel: Kutztown 2675
Permoflux Corp., Ill., 5, 10, 15, 25, 40
Plastic Capacitors, Inc., Ill., 40
Polydoroff & Assoc., W. J., D.C., 45, 50
Polyphase Instr. Co., Pa., 15, 40
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 50, 70
For details see ad on page 166
Tel: ULster 2-6800
Powell Co., Harold H., Pa., 10
Power Industries, Inc., 2611 Indiana Ave., Chicago 16, Ill., 5, 20, 30, 35, 40, 45, 60, 70
For details see ad on page 292
Tel: Calumet 5-1125
Power Transformer Co., Inc., N.J., 5, 15, 30, 40, 50, 65, 70
Presto Electric Co., Inc., N.J., 70
Q. L. C. Corp., N.J., 45
Qutronic Transformer Corp., N.Y., 5, 10, 15, 30, 70
RCA Victor Co., Ltd., Canada, 5, 20, 30, 55, 60, 65, 70
R. K. Mfg. Co., Ill., 5, 10, 15, 25, 30, 40, 50
Radio Components, Ltd., Canada, 45
Radio Corp. of America Tube Dept., Section F35Q, 415 S. 5 St., Harrison, N.J., 5, 15, 20, 30, 40, 45
For details see ad on page 210
Tel: HUmboldt 5-3900
Ram Electronics, Inc., N.Y., 20
Raypar, Inc., Ill., 5, 20, 30, 40, 45, 55
Redman Electronic Corp., Conn., 35, 40, 45
Reflectone Corp., The, Conn., 5, 25, 30, 40, 50
Rich Electronic, Inc., Fla., 45
Richardson-Allen Corp., N.Y., 30, 50, 70
Richmond Eng. Co., Inc., Conn., 5, 15, 25, 30
Rola Co., Inc., Ohio, 5, 15, 20, 55, 60

(Continued on page 391)

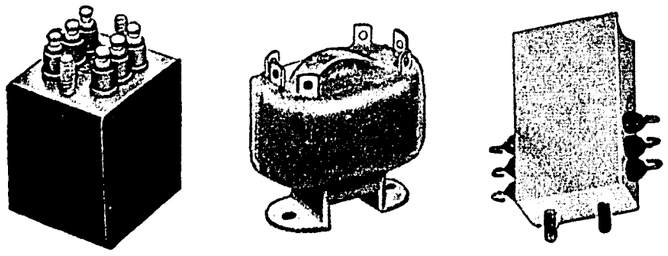
• transformers
MIL—T—27 OR COMMERCIAL
• toroids

SAMPLES AND SHORT RUN PRODUCTION
1 TO 3 WEEK DELIVERY ON PROTOTYPES

AUDIO
POWER
FILAMENT
PLATE
REACTORS
PULSE
400 CYCLES
ISOLATION
STEP-DOWN
VIBRATOR
•
CUSTOM BUILT TO YOUR SPECIFICATIONS

ORENCO
YOUR INQUIRIES INVITED
ortho engineering corporation
245 WALLACE ST. • ORANGE, N. J. • ORange 4-7193

PULSE TRANSFORMERS...



A FIELD PIONEERED and DEVELOPED BY....UTAH

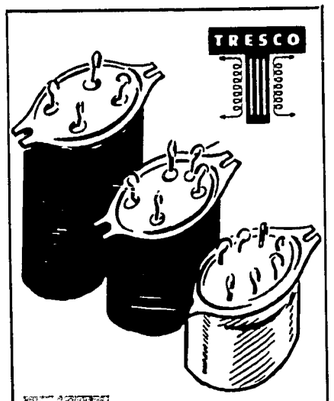
Catalogue Number	Pulse Voltage(KV)	Pulse Duration Microseconds	Max. Duty Ratio	Test Voltage (60 cps. RMS)	Induced Voltage @ 0.5 u sec.	Load Impedance (ohms)	D. C. Resistance 1	2	3
X124F X124H	0.3/0.3/0.3	.6 to 5	0.002	1000	400	150	4.1	4.6	5.0
X143F X143H	0.1/0.1/0.1	.3 to 1.5	0.002	1000	400	200	2.05	2.3	2.5
X140F X140H	0.1/0.4/0.1	.3 to 5	0.002	1000	800	200	2.05	9.2	2.5
X139F X139H	0.1/0.1	.3 to 1.5	0.002	1000	400	175	2.05	2.3	
X146F X146H	0.3/0.3	.6 to 5	0.002	1000	800	250	4.1	4.6	
X148F X148H	0.5/0.5	1 to 10	0.002	1500	1000	250	6.9	6.9	
X138F X138H	0.3/0.6	.6 to 5	0.002	1000	800	250	4.6	9.2	
X171H	0.1/0.1/0.1 01./0.1/0.1	.3 to 1.5	0.002	500	200	200	2.05 2.05	2.3 2.3	2.5 2.5
X154H	2.0/1.0/1.0	4 to 12	0.002	1500	2000	1300	27.5	13 5	14
X166H	1.0/1.0/1.0/1.0	4 to 12	0.002	1500	2000	1000	13.5 14.0	13.5 14.0	
X141H	2.0/2.0	4 to 12	0.002	1500	4000	400	27.5	27.5	
X91F X91H	0.75/1.5/3.0	1 to 5	0.002	1500	3000	1500	1.72 13.8	12.2	25
X92F X92H	0.5/1.5	1 to 5	0.002	1500	3000	500	.5	3.26	
X93F X93H	0.1/0.3/0.3/0.1	.6 to 5	0.002	1000	400	200	4.1 2.5	4.1 2.5	
X94F X94H	2.5/2.5; 2.5/1.25 1.5/1.5; 1.5/0.75	1 to 2.5 1 to 5	0.002	1500	3000	1500	12.12 13.8	12.2	1.72
X95F	0.1/0.1/01./0.1	.6 to 5	0.002	1000	400	200	2.05	2.13	
X96F X96H	1.0/0.67/0.67	1 to 5	0.002	1000	2000	800	2.32	2.46	12.4
X97F X97H	0.3/0.45	.6 to 5	0.002	1000	800	250	4.1	7.1	
X98F X98H	.5/.5/.5	.1 to .5	0.002	1000	2000	300	.254	.282	.303

The suffix letter "F" indicates Fosterite and the letter "H" indicates Hermetically sealed units.

33 MODELS AVAILABLE
Immediate Delivery from Stock

Write For Complete Transformer Catalog TS-201

UTAH RADIO PRODUCTS CO., INC.
1225 ROOSEVELT STREET
HUNTINGTON, INDIANA



MINIATURIZING?

MAGNETIC AMPLIFIERS

PULSE TRANSFORMERS

HIGH VOLTAGE POWER PACK
Hermetically Sealed

HIGH GRADE COMMERCIAL TRANSFORMERS

ENCAPSULATED AND HERMETICALLY SEALED TO MIL-T-27

Turn to TRESCO if your program calls for the miniaturizing of components. Here's why—TRESCO'S engineering, quality control and long-established miniaturization program give you

SAVINGS IN WEIGHT
SAVINGS IN SPACE

without sacrifice of quality or performance at low power levels. Prompt quotes on any quantity, large or small. Engineering assistance that's intelligent and *really* helpfull

TRESCO
Transformer and Electronic Specialty Company
3824-28 Terrace Street, Philadelphia 28, Pa.
Phone—IVy Ridge 3-1383

4. Component Parts

57. Transformers.

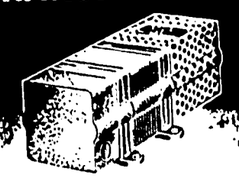
(Continued from page 389)

Rollins Corp., Dela., 5, 10, 15, 25, 30, 35, 40, 50, 60, 70
Ross Mfg. Co., Iowa, 5, 20, 25, 30, 35, 45, 55, 60
SNC Mfg. Co., Inc., Wis., 5, 15, 25, 30, 50
Saratoga Industries, N.Y., 5, 15, 25, 30, 35, 40, 50
Savage Transformers, Ltd., England, 5, 25, 30
Schauer Mfg. Corp., Ohio, 30
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 15
For details see ad on page 236
Tel: FI 7-2810
Sierra Electronic Corp., Calif., 40, 45
Smallwood, Ltd., S. G., Canada, 20, 45
Smith Mfg. Co., Nathan R., Calif., 5, 30, 40
Societe Francaise Radio Electrique, France, 5, 15, 40, 45
Sola Electric Co., 4633 W. 16 St., Chicago 50, Ill., 70
For details see ad on page 391
Tel: BI 2-1414
Sorensen & Co., Inc., Conn., 65
Southwestern Indust. Electronic Co., Texas, 5, 10, 15, 25, 30, 35
Specialties, Inc., N.Y., 5, 15, 25, 30, 35, 40, 45, 50, 65, 70
Sprague Electric Co., Mass., 40
Square Root Mfg. Corp., N.Y., 5, 15, 20, 25, 40, 50, 55
Standard Coil Prods. Co., Inc., Calif., 45, 55
Standard Electrical Prods. Co., Ohio, 5, 15, 30, 70
Standard Electronic Corp., N.J., 5, 15, 25, 30, 50, 65, 70
Standard Transformer Corp., Ill., 5, 10, 20, 25, 30, 35
Standard Winding Co., Inc., N.Y., 45
Stanwyck Winding Co., Inc., N.Y., 20, 45
Sterling Transformer Corp., N.Y., 5, 15, 25, 30, 35, 40, 50, 60
Strong Electric Corp., Ohio, 30
Summit Coil Co., N.J., 45
Summit Electronic, Inc., N.J., 5, 30, 70
Superex Electronic Corp., N.Y., 5, 15, 45
Superior Electric Co., 9000 Clarke Ave., Bristol, Conn., 65, 70
For details see ad on pages 106-107
Tel: Bristol 2-9561
Sylvania Electric Products Inc., Estes St., Ipswich, Mass., 5, 15, 25, 30, 35, 40, 50
For details see ad on pages 9-14
Tel: Ipswich 0-260
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 15, 35
For details see ad on pages 9-14
Tel: Judson 6-2424
Syntronic Instr., Inc., Ill., 20
Tatrak Electronic, Inc., Calif., 5, 15, 25, 30, 35, 40, 50, 70
Tech-Master Corp., N.Y., 5
Technical Material Corp., N.Y., 45
Technitrol Eng. Co., Pa., 40
Tele-Beam Industries, Calif., 60
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 40
For details see ad on page 224
Tel: AMityville 4-4446
Telectro Industries Corp., N.Y., 5, 15, 25, 30, 35
Telephonics Corp., N.Y., 5
Teleradio Eng. Corp., N.Y., 20, 45, 55
Telescreen Corp., Conn., 70
Telex, Inc., Minn., 5, 15, 40
Television Labs., Inc., Ill., 5, 45, 55
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 5, 10, 15, 25, 30, 40, 45, 50, 65, 70, Miniaturized for Transistors
Thordarson Meissner Mfg. Div., Ill., 5, 10, 15, 25, 30, 35, 45, 50, 60, 65, 70

(Continued on page 392)



VOLTAGE REGULATING TRANSFORMERS



Patented SOLA Constant Voltage Transformers provide the following advantages: Automatic, instantaneous regulation within ±1% regardless of primary variations of 30%. No moving or expendable parts . . . no manual adjustments or maintenance . . . self-protecting against short circuit . . . available in a complete range of capacities and special types.

Write for Bulletin 1M-CV-200. We welcome any inquiries regarding specific applications to your requirements.

SOLA *Constant Voltage* **TRANSFORMERS**

SOLA ELECTRIC CO.
4633 W. 16th Street, Chicago 50, Illinois

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

4. Component Parts

57. Transformers.

(Continued from page 391)

Todd Prods. Co., Inc., N.Y., 5, 10, 15, 20, 25, 30, 35, 55, 60

Torwico Electronics, Inc., 965 Frelinghuysen Ave., Newark 5, N.J., 5, 15
For details see ad on page 295
Tel: BIgelow 8-0426

Transformer & Electronic Specialty Co., 3824-28 Terrace St., Philadelphia 28, Pa., 5, 15, 25, 30, 40, 50, 60
For details see ad on page 390
Tel: IVyridge 3-1383

Transformer Engineers, Calif., 5, 15, 30, 40, 70

Transformer Specialty Co., Inc., 328 Rockhill Road, Bala Cynwyd, Pa., 5, 15, 25, 30, 40
For details see ad on page 391
Tel: Welsh Valley 4-5770

Transformer Technicians, Inc., Ill., 5, 10, 15, 25, 30, 35, 40, 50, 65, 70

Transformers, Inc., N.Y., 5, 15, 25, 30, 35, 40, 50

Transvision, Inc., N.Y., 5, 15, 30, 40, 45

Trenton Transformer Corp., N.J., 5, 10, 15, 25, 30, 50, 65, 70

Tri-Dex Co., Calif., 45

Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 5, 10, 15, 20, 25, 30, 35, 40, 50, 55
For details see ad on page 232
Tel: TExas 0-5381

Triumph Mfg. Co., Ill., 5, 20, 55

Union Electric & Mfg. Co., N.J., 5, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Union Spring & Mfg. Co., N.J., 5, 15, 20, 30, 40, 45, 70

U. S. Electronic Corp., N.J., 5, 10, 15, 20, 25, 30, 40, 45, 50, 65

United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 10, 15, 25, 30, 35, 40, 50, 65, 70
For details see ad on page 582
Tel: Algonquin 5-3500

University Loudspeakers, Inc., N.Y., 5

Utah Radio Prods. Co., Inc., 1225 Roosevelt St., Huntington, Ind., 5, 15, 25, 30, 35, 40
For details see ad on page 390
Tel: HUntington 3100

Vanguard Electronic Co., Calif., 20, 45

Vari-L Co., Inc., 434 Fairfield Ave., Stamford, Conn., 50
For details see ad on page 392
Tel: 48-0091

Varo Mfg. Co., Inc., Texas, 5, 15, 30, 50, 70

Vickers Electric, Div. Vickers, Inc., Mo., 50

Walker Consulting Eng., J. R., Mich., 30, 70

Weltronic Co., Mich., 30

Western Coil Prods. Co., Inc., Calif., 40

Westinghouse Electric Corp., Pa., 40

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 35, Instrument
For details see ad on pages 98-99
Tel: BI 3-4700

Wheeler Insulated Wire Co., Inc., Conn., 5, 15, 25, 30, 40, 60

White Industries, Inc., N.Y., 45

Wirt Co., Pa., 45, 65

Transistors
See Product 52
Semi-Conductors page 369

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58. Tuners.

5. AM tuners
10. FM tuners
15. Microwave
20. TV tuners
25. UHF & VHF

A. R. F. Products, Inc., Ill., 10, 15

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 15
For details see ad on page 429
Tel: Linden 3-1000

Altec Lansing Corp., Calif., 5, 10

Altec Lansing Corp., N.Y., 5, 10

Anchor Radio Corp., Ill., 20, 25

Approved Electr. Instr., Corp., N.Y., 5, 10

Atlas Coil, Inc., Conn., 10

Automatic Mfg. Corp., N.J., 20, 25

Blonder-Tongue Labs., Inc., N.J., 25

Bogen Co., Inc., David, N.Y., 5, 10

Bright Radio Labs., N.Y., 10, 20, 25

Browning Laboratories, Inc., Mass., 5, 10

Budd-Stanley Co., Inc., 43-01 22 St., Long Island City 1, N.Y., 15
For details see ad on page 428
Tel: STillwell 6-1706

CGS Laboratories, Inc., Conn., 5, 10

Calbest Eng. & Electr. Co., Calif., 5, 10

Cardwell Mfg. Corp., Conn., 20, 25

Conrac, Inc., Calif., 20

Continental Electr. Mfg. Co., Texas, 5

Corning Glass Works, N.Y., 10, 20, 25

DX Radio Prods. Co., Ill., 20

De Mornay-Bonardi, Calif., 15

De Wald Radio & TV Corp., N.Y., 25

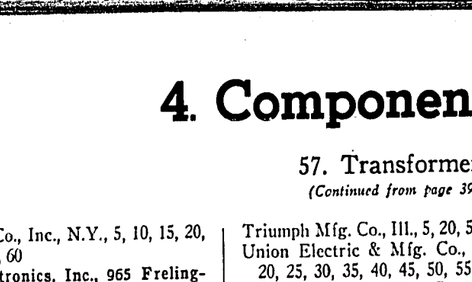
Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 15
For details see ad on page 430
Tel: NE 6-6900

DuMont Labs., Inc., A. B., Receiver Div., 35 Market St., E. Paterson, N.J., 20
For details see ad on page 161
Tel: Mulberry 4-7400

Dunn Engineering Assoc., Inc., Mass., 15

Elk Electronic Laboratories, Inc., N.Y., 5, 10, 25

F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 15
For details see ad on pages 47-50
Tel: Astoria 8-2800



ELECTRICALLY

VARI-L VARIABLE INDUCTORS

This line of A-F, R-F, V-H-F Saturable-Core Reactors for Sweep Tuning is growing in all directions:

HIGHER in Power, Frequency, Stability, Efficiency
LOWER in Cost and Space Requirements
WIDER in Range of Usefulness

as the result of continuing emphasis on production engineering and product reliability.

Chances are that, in designing to many special requirements, we have touched on problems similar to yours — and that there may be a Vari-L Inductor to suit your needs. Even if you need something "special," our policy of "Design for Adaptability" has possibly created a Vari-L Inductor that will require only slight modification, at slight cost, to do your job, too. And it costs you nothing to ask. Be sure to give full details.

Vari-L Company, Inc.

434 Fairfield Avenue • Stamford • Conn. • Phone 48-0091

4. Component Parts

58. Tuners.

Federal Telecommun. Labs., Div. I T & T, N.J., 15

Fisher Radio Corp., N.Y., 5, 10

Forbes Wagner, Inc., N.Y., 5, 25

Freed Electronics & Controls Corp., N.Y., 5, 10

Garod Radio Corp., Wilcox-Gay Corp., N.Y., 5, 10

General Electric Co., N.Y., 25

General Instrument Corp., N.J., 5, 10, 20, 25

General Instr. Corp., F. W. Sickles Div., Mass., 5, 20, 25

Gonset Co., Calif., 5, 10, 20, 25

Gotham Television Corp., N.Y., 5, 10

Granco Prods., Inc., N.Y., 20

Grigsby-Allison Co., Inc., Ill., Mechanical

Guideline Assoc., N.J., 15

Hallicrafters Co., Ill., 5, 10

Heath Co., The, 305 Territorial Rd., Benton Harbor 27, Mich., 5, 10
For details see ad on page 447
Tel: WA 5-1175

Hycon Mfg. Co., Calif., 15

Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 15
For details see ad on page 431
Tel: FArmingdale 2-3606

Industrial Television, Inc., N.J., Converter OHF

Jerrold Electronics Corp., Pa., UHF Converters

Kings Electronic Co., N.Y., 15, 25

Kingston Prod. Corp., Ind., 20

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 15, 25
For details see ad on page 312
Tel: MAtawan 1-2600

Lear, Inc., Calif., 5, 25

Leonard Electric Prods. Co., Inc., N.Y., 10, 20, 25

Loral Electronic Corp., Dept. 1D54, 794 E. 140 St., New York 54, N.Y., 15, 25
For details see ad on page 198
Tel: CY 2-1800

Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 5, 10, 20, 25
For details see ad on page 248
Tel: E 5471

Mallory & Co., Inc., P. R., Ind., 20, 25

Meridian Metalcraft Inc., 213 W. Whittier Blvd., Whittier, Calif., 15
For details see ad on page 432
Tel: Raymond 3-1308

Microlab, 71 Okner Pkwy., Livingston, N.J., 15, 25
For details see ad on page 319
Tel: Livingston 6-0692

Miller Co., J. W., Calif., 5

Narda Corp., 66 Main St., Mineola, L.I., N.Y., 15
For details see ad on page 461
Tel: PIoneer 6-4650

Newcomb Audio Products Co., Calif., 5, 10

Pedersen Electronics, Calif., 5, 10

Pilot Radio Corp., N.Y., 5, 10, 20, 25

Polydoroff & Assoc., W. J., D.C., 5, 10, 20

Premier Instr. Corp., 52 W. Houston St., New York 12, N.Y., 15
For details see ad on page 433
Tel: GRamercy 5-3520

Radio Condenser Co., N.J., 5, 20, 25

Radio Eng. Labs., Inc., N.Y., 10

Radio Industries, Inc., Ill., 5

Radio Mfg. Engineers, Inc., Ill., 25

Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 25
For details see ad on pages 30-31
Tel: WAtkins 4-3633

Sargent-Rayment Co., The, Calif., 5, 10

Sierra Electronic Corp., Calif., 15, 25

Specialty Eng., Div. Spec. Assembly and Pack., N.Y., 5

Standard Coil Prods. Co., Inc., Calif., 5, 10, 20, 25

Stromberg-Carlson Co., N.Y., 5, 10, 20

Suffolk Prods. Corp., N.Y., 15

Taffet Radio & TV Co., N.Y., 5, 10, 15, 20, 25

Tarzian, Inc., Sarkes Tuner Div., Ind., 20, 25

Tech-Master Corp., N.Y., 5, 10, 20, 25

Technicraft Labs., Inc., Conn., 15

Thompson Prods., Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 20, UHF
For details see ad on page 235
Tel: HE 1-6765

Thordarson Meissner Mfg. Div., Ill., 5, 10

Triumph Mfg. Co., Ill., 5

U. S. Recording Co., D.C., 5, 10

Universal Microwave Corp., N.J., 15

Vectron, Inc., 402 Main St., Waltham 54, Mass., 15
For details see ad on pages 366, 462
Tel: WAltham 5-8700

Victoreen Instrument Co., Ohio, 20

Vidaire Electronic Mfg. Co., N.Y., 10

Waveguide, Inc., Calif., 15

Wilmad Glass Co., Inc., N.J., Glass Devices

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59. Vacuum Tubes, Receiving.

5. Cathode-ray & TV picture
10. Miniature
15. Standard types, glass & metal
20. Sub-miniature

American Television Mfg. Corp., Ill., 5

Amperex Electronic Corp., N.Y., 20

Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 20
For details see ad on page 394
Tel: EV 6-5715

Arcturus Electronic, Inc., Gen. Electronic Div., N.J., 5

Baker Co., George W., Conn., 5, 20

Beam Instruments Corp., N.Y., 5, 10, CR Tubes

Bendix Aviation Corp., Red Bank Div., Eatontown, N.J., 10, 15, 20
For details see ad on page 302
Tel: Eatontown 3-1340

59. Vacuum Tubes, Receiving.

CBS-Hytron Div., Mass., 5, 10, 15

Canadian Gen. Elec. Co., Electronic Equip., Canada, 5, 10, 15, 20

Canadian Radio Mfg. Corp., Ltd., Canada, 5, 10, 15, 20

Canadian Westinghouse Co., Ltd., Canada, 5, 10, 15, 20

Cathodeon, Ltd., England, 5

Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 10, 15, 20
For details see ad on pages 86-87
Tel: LIvingston 6-1100

Chromatic Television Labs., Calif., 5, Tri-Color

Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5
For details see ad on page 157
Tel: HAlifax 4-6487

DuMont Labs., Inc., A. B., Instr. Div., 1500 Main Ave., Clifton, N.J., 5
For details see ad on page 161
Tel: GR 2-2000

DuMont Labs., A. B., Cathode-Ray Tube Div., 750-760 Bloomfield Ave., Clifton, N.J., 5
For details see ad on page 161
Tel: Mulberry 7-4700

Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 5
For details see ad on pages 90-91
Tel: JUno 8-1212

Electrical Device Mfg. Co., N.J., 5

Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 5, Multi Channel
For details see ad on page 467
Tel: Chestnut Hill 7-6800

Emeltone Electronics Co., N.Y., 5, 10, 15, 20

English Electric Valve Co., Ltd., England, 5

Eureka Television & Tube Corp., N.J., 5

Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 15
For details see ad on pages 32-37
Tel: Nutley 2-3600

Fidelity Tube Corp., N.J., 5

Freed Electronics & Controls Corp., N.Y., 5

Freeland Products Co., La., 5

General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20

General Electric Co., N.Y., 5, 10, 15, 20

General Electric Co., Tube Dept., N.Y., 5, 10, 15, 20

Harwood Mfg. Co., Ill., 15

Haydu Brothers, N.J., 5, 10

International Electronics Corp., N.Y., 5, 10, 15, 20

Kimble Glass Co., Subsidiary Owens-Ill., Ohio, 5, Bulb Only

Lansdale Tube Co., Pa., 5, 10, 20

Marconi Instruments, Ltd., N.Y., 15

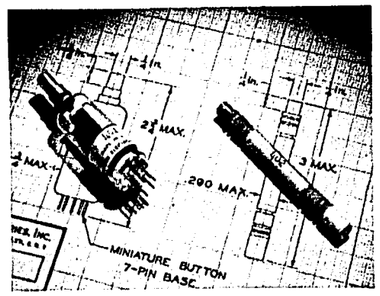
Marconi's Wireless Telegraph Co., Ltd., England, 10, 15, 20

Martin & Co., H. S., Ill., 5

(Continued on page 394)

Your Regulated High Voltage Problems can be Economically Solved, Now, by the Originators of the Corona Discharge V-R Tube

ANTON



Typical Rugged AEL Corona Discharge V-R Tubes

FIXED REGULATION

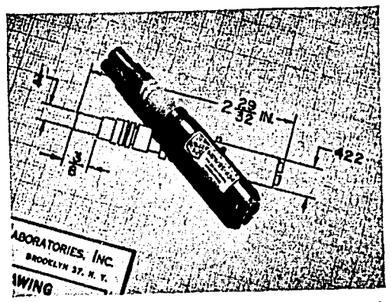
300V to 10,000V

- stabilized voltages
- currents up to 2 milliamperes
- low dynamic resistance
- unlimited life
- size—ranging from sub-miniature T3 bulb to larger volume stainless steel shells

VARIABLE REGULATION

550V to 750V

- Just a turn of a screwdriver makes ±50V adjustment possible
- Stabilized voltage at every point
- Currents up to 50 micro-amperes
- no hot cathodes
- unlimited life



Variable Corona Discharge V-R Tube conceived and developed in its entirety by AEL

ANTON Corona Discharge V-R Tubes
New Freedom for Circuit Designers

TYPICAL APPLICATIONS

- Color TV Receivers and Monitors
- Airborne Radar Power Supplies
- Voltage Reference Tubes
- Cathode Ray Oscilloscopes
- Radiac Power Supplies
- All high voltage low current power supplies

Also available at AEL is a complete line of nucleonic tubes and instruments. We welcome the specifications of your individual requirements.

CATALOG — free upon request on your letter-head.

ANTON ELECTRONIC LABORATORIES, INC.

1226 Flushing Avenue, Brooklyn 37, N. Y.

59. Vacuum Tubes, Receiving.

(Continued from page 393)

Midland Mfg. Co., Inc., 3155 Fiberglas Rd., Kansas City 15, Kan., 5
For details see ad on page 204
Tel: Finley 7950
Mullard, Ltd., England, 5, 10, 15, 20
Multi-Tron Lab., Ill., 5, 20
National Union Radio Corp., Pa., 5, 10, 15, 20
National Video Corp., Ill., 5
Pittsburgh Plate Glass Co., Pa., 5
Practical Electronic Mfg. Co., Ill., 5
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5 St., Harrison, N.J., 5, 10, 15, 20
For details see ad on page 210
Tel: HUmboldt 5-3900
Radio Valve Co. of Canada, Ltd., Canada, 5, 10, 15, 20
Rauland Corp., The, Ill., 5
Raytheon Mfg. Co., Mass., 5, 10, 15, 20
Sheldon Electric Co., Div., Allied Elec., N.J., 5, 15
Societe Francaise Radio Electrique, France, 5, 10, 15, 20
Sonotone Corp., N.Y., 10, 20
State Labs., Inc., N.Y., 10, 15, 20
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 5, 10, 15, 20
For details see ad on pages 9-14
Tel: JUdson 6-2424
Tel-O-Tube Corp. of America, N.J., 5
Thomas Electronic, Inc., N.J., 5
Transvision, Inc., N.Y., 5
Tube Service Corp., N.J., 5
Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 5, 10, 15, 20
For details see ad on page 234
Tel: HUmboldt 2-4200
Vacuum Tube Products, Calif., 5
Victoreen Instrument Co., Ohio, 10, 20
Waterman Prods. Co., Inc., 2445-63 Emerald St., Philadelphia 25, Pa., 5
For details see ad on pages 112-113
Tel: GA 6-8600
Westinghouse Electric Corp., Pa., 5, 10, 15, 20
Westinghouse Electric Corp., N.Y., 5, 10, 15, 20

60. Vacuum Tubes, Special Purpose.

5. Electrometer tubes
10. Geiger-Mueller
15. Phototubes
20. Pirani tubes
25. Thyratrons
30. Voltage regulators & ballasts

Aerolux Light Corp., N.Y., 10, 15, 20, 25, 30
American Television Mfg. Corp., Ill., 25
Amglo Corp., Ill., Strobe
Amperex Electronic Corp., N.Y., 10, 25, 30

60. Vacuum Tubes, Special Purpose.

Amperite Co., Inc., 561 Broadway, New York 12, N.Y., 30
For details see ad on page 354
Tel: Canal 6-1446
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 10, 15, 25, 30
For details see ad on page 394
Tel: EV 6-5715
Arcturus Electronic, Inc., Gen. Electr. Div., N.J., 10, 25, 30
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 10, 15
For details see ad on page 402
Tel: Eliot 4-4321
Baker Co., George W., Conn., 25
Bendix Aviation Corp., Red Bank Div., Eatontown, N.J., 10, 15, 20, 25, 30
For details see ad on page 302
Tel: Eatontown 3-1340
Bomac Labs., Inc., Salem Rd., Beverly, Mass., 25
For details see ad on pages 92-93
Tel: Beverly 4670
Bradley Labs., Inc., Conn., 15
Burroughs Corp., Electronic Instr. Div., Dept. P-1, 1209 Vine St., Philadelphia 7, Pa., 60, Beam Switching
For details see ad on page 458
Tel. LO7-1401
CBS-Hytron Div., Mass., 30, Gaseous
Canadian General Electric Co., Electronic Equip. Div., Canada, 5, 10, 15, 20, 25, 30
Canadian Radio Mfg. Corp., Ltd., Canada, 25, 30
Canadian Westinghouse Co., Ltd., Canada, 15, 25, 30
Cathodeon, Ltd., England, 20
Central Sales & Mfg. Corp., N.J., 15, Ion Gauge
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 25, 30
For details see ad on pages 86-87
Tel: Livingston 6-1100
Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 30
For details see ad on pages 100-101
Tel: Dover 975
Consolidated Vacuum Corp., N.Y., 20
Cycloytron Specialties Co., Calif., 10
Du Mont Labs., Inc., A. B., Instrument Div., 1500 Main Ave., Clifton, N.J., 15
For details see ad on page 161
Tel: GR 2-2000
Edgerton, Germenshausen, & Grier, Mass., 25
Electric Indicator Co., Conn., 20
Electronic Components Corp., Ill., 30
Electronic Products Co., N.Y., 10, 30
Electron-Radar Products, Ill., 15, 20, 25
Electrons, Inc., 127 Sussex Ave., Newark 3, N.J., 25
For details see ad on page 353
Tel: Humboldt 2-5977
Emeltone Electronics Co., N.Y., 5, 15, 25, 30
English Electric Valve Co., Ltd., England, 25, 30
General Electric Co., N.Y.C., N.Y., 5, 15, 20, 25, 30
General Electric Co., N.Y., 5, 25, 30
General Electric Co., Tube Dept., N.Y., 5, 15, 20, 25, 30
Georator Corp., Va., 10
Industrial Tubes, Inc., Ill., 25
International Electronics Corp., N.Y., 15, 25, 30
Kemlite Labs., Ill., Strobe Condenser Discharge
Kuthe Labs., Inc., N.J., 25
Lurex Mfg. Co., N.J., 10
Machlett Labs., Inc., 1063 Hope St., Springdale, Conn., 25, 35, X-Ray
For details see ad on page 396
Tel: Stamford 4-5781
Marconi Instruments, Ltd., N.Y., 10, 15, 30
Marconi's Wireless Telegraph Co., Ltd., England, 25, 30
Martin & Co., H. S., Ill., 10, 15, 20, 25
McMillan Lab., Inc., Mass., 25
Mullard, Ltd., England, 5, 10, 15, 25, 30
Multi-Tron Lab., Ill., 10, 20, 30
National Electronics, Inc., 628 North St., Geneva, Ill., 25
For details see ad on page 395
Tel: Geneva 702
National Union Radio Corp., Pa., 30
Northern Electric Co., Ltd., Canada, 5, 10, 15, 20
Northern Electronic & Vacuum Indust., Canada, 15
Nuclear Development Laboratory, Mo., 10
Penta Labs., Inc., Calif., 25
Power Equipment Co., Mich., 30
Practical Electronic Manufacturing Co., Ill., 15
Radiation Counter Labs., Inc., Ill., 10
Radiation Instrument Development Lab., Ill., 10
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 15, 20, 25
For details see ad on page 210
Tel: HUmboldt 5-3900
Rauland Corp., The, Ill., 25
Raytheon Manufacturing Co., Mass., 5, 10, 25, 30
Signalite, Inc., N.J., 30
Societe Francaise Radio Electrique, France, 25, 30
State Labs., Inc., N.Y., 5, 10, 15, 25, 30
Sunvic Controls, Ltd., England, 20
Sylvania Electric Prods. Inc., Electronics Div., Woburn, Mass., 15, 20, 25
For details see ad on pages 9-14
Tel: WOburn 2-3500
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 15, 20, 25, 30
For details see ad on pages 9-14
Tel: JUdson 6-2424
Taylor Tubes, Inc., Ill., 25
Tracerlab, Inc., Mass., 10
Tung-Sol Electric, Inc., 95 Eighth Ave., Newark 4, N.J., 15, 30
For details see ad on page 234
Tel: HUmboldt 2-4200
United Electronic Co., N.J., 25
Vacuum Tube Products, Calif., 20, 25
Victoreen Instrument Co., Ohio, 5, 10, 30
Westinghouse Electric Corp., Pa., 25
Westinghouse Electric Corp., N.Y., 5, 15, 20, 25, 30

NATIONAL INDUSTRIAL TUBES
IGNITRONS—THYRATRONS—
RECTIFIERS

Write for your National Industrial Tube Catalogue

NATIONAL ELECTRONICS, INC.
GENEVA, ILL.

61. Vacuum Tubes, Transmitting.

5. ATR & TR types
10. Air-cooled power tubes
15. Iconscopes
20. Image orthicons
25. Klystrons
30. Magnetrons
35. Monoscope tubes
40. Traveling wave
45. Water-cooled power tubes

Amperex Electronic Corp., N.Y., 10, 30, 45
Arcturus Electric, Inc., General Electric Div., N.J., 5, 10
Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 25
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Red Bank Div., Eatontown, N.J., 5, 25
For details see ad on page 302
Tel: Eatontown 3-1340

(Continued on page 397)

MACHLETT ELECTRON TUBES *for* Broadcasting and Industry

TRANSMITTING TUBES

TYPE	CATHODE VOLTS	CATHODE AMPS	MU	MAXIMUM ANODE RATING VOLTS	MAXIMUM ANODE RATING AMPS	INPUT WATTS	DISS. WATTS	FULL INPUT FREQ. MCS.	COOLING
ML-2C39A	6.3	1.0	100	1000	0.125	125	100	2500	Forced-Air
ML-207	22.0	51.0	20	15000	2.0	30000	10000	1.6	Water
ML-212E	14.0	6.0	16	3000	.350	—	275	1.5	Convection
ML-220C	21.5	41.0	40	15000	1.5	—	10000	4	Water
ML-220CA	21.5	41.0	40	15000	1.5	—	5000	4	Forced-Air
ML-228A	21.5	41.0	16	6000	1.5	—	5000	3	Water
ML-232B	20.0	60.0	40	20000	3.0	—	25000	3	Water
ML-240B	21.5	41.0	40	12000	1.7	—	10000	20	Water
ML-241B	14.0	6.0	16	3000	.350	—	275	7.5	Convection
ML-242C	10.0	3.25	12.5	1250	.150	188	100	6	Convection
ML-279A	10.0	21.0	10	3000	.800	—	1200	20	Convection
ML-298A	27	225	32	20000	11.0	—	100000	4	Water
ML-298B	27	225	57.5	20000	11.0	—	100000	4	Water
ML-342A	20.0	67	40	20000	2.5	—	25000	4	Water
ML-343A	21.5	57.5	40	18000	2.0	—	10000	4	Water
ML-343AA	21.5	57.5	40	18000	1.5	—	5000	4	Forced-Air
ML-356	7.5	170	20	12500	6.0	60000	22500	25	Water
ML-357B	10.0	10	30	4000	0.5	1800	400	110	Convection
ML-379A	10.0	21.0	10	3000	.800	—	1200	20	Convection
ML-381	6.3	1.0	100	3500	0.01*	35*	35*	3000	Forced-Air
ML-450TH	7.5	12.0	38	6000	0.6	—	450	40	Convection
ML-833A	10.0	10.0	35	4000	0.50	1800	400	20	Forced-Air
ML-880	12.6	315	20	10500	6.0	60000	20000	25	Water
ML-889A	11.0	120	21	8500	2.0	16000	5000	50	Water
ML-889RA	11.0	120	21	8500	2.0	16000	5000	40	Forced-Air
ML-891	22.0	60	8.5	12000	2.0	18000	6000	1.6	Water
ML-891R	22.0	60	8.5	10000	2.0	15000	4000	1.6	Forced-Air
ML-892	22.0	60	50	15000	2.0	30000	10000	1.6	Water
ML-892R	22.0	60	50	12500	2.0	18000	4000	1.6	Forced-Air
ML-893A	20.0	183	34.5	20000	4.0	70000	20000	5	Water
ML-893AR	20.0	183	34.5	20000	4.0	70000	20000	5	Forced-Air
ML-5530	5.0	55	26	5000	1.75	8750	3000	110	Forced-Air
ML-5531	6.3	92	22	10500	3.75	30000	10000	30	Forced-Air
ML-5541	7.5	57	26	8500	2.75	23000	10000	110	Forced-Air
ML-5604	11.0	176	19.5	12500	3.0	32500	10000	22.5	Forced-Air
ML-5606	22.0	60	50	14000	2.0	25000	10000	1.6	Water
ML-5619	11.0	176	19.5	12500	3.0	32500	20000	22.5	Water
ML-5658	12.0	290	20	12500	5.0	60000	20000	20	Water
ML-5666	11.0	120	21	10000	2.0	20000	12500	22.5	Water
ML-5667	11.0	120	21	10000	2.0	20000	7500	22.5	Forced-Air
ML-5668	22.0	60	50	14000	2.0	28000	20000	5	Water
ML-5669	22.0	60	50	14000	2.0	28000	10000	5	Forced-Air
ML-5681	12.0	220	25	15000	12.0	150000	75000	30	Water
ML-5682	16.5	325	32	16000	20.0	300000	100000	30	Water
ML-6256	12.6	27	21	5500	1.5	7000	5000	110	Water
ML-6257	12.6	27	21	5500	1.5	7000	5000	110	Water
ML-6258	12.6	27	21	5500	1.5	7000	3000	110	Forced-Air

*Duty cycle: 0.0033

HIGH-VOLTAGE RECTIFIERS

TYPE	CATHODE VOLTS	CATHODE AMPS	ANODE RATINGS INV. PKV	ANODE RATINGS PEAK MA	INSULATION	COOLING
ML-102A	20	19.0	75	750	Air	Convection
ML-103	10	11.5	125	78	Oil	Convection
ML-108	13	12.5	140	200	Oil	Convection
ML-110	10	11.5	140	78	Air	Convection
ML-115	10	11.5	125	100	Air	Convection
ML-120	13	12.5	140	200	Air	Convection
ML-121	10	11.5	140	100	Oil	Convection
ML-126	13	12.5	150	200	Air	Convection
ML-170	13	12.5	200	200	Air	Convection
ML-180	13	12.5	200	200	Oil	Convection
ML-199	12	23	110	10000	Air	Convection
ML-222A	21.5	41	25	5000	Air	Water
ML-5575/100	20	24	150	1000	Air	Convection
ML-5576/200	20	32	150	2500	Air	Convection

MERCURY VAPOR RECTIFIERS

TYPE	CATHODE VOLTS	CATHODE AMPS	TUBE VOLT. DROP	FIL. EXCIT.	COOLING	ANODE RATINGS INV. PKV	ANODE RATINGS PEAK AMPS	ANODE RATINGS AV. AMPS
ML-575A	5.0	10	10	In-Ph.	Convection	15	6.0	1.5
ML-673A	5.0	10	10	In-Ph.	Convection	15	6.0	1.5
ML-857B	5.0	30	15	Quad.	Forced-Air	22	40.0	10.0
ML-866A	2.5	5.0	15	In-Ph.	Convection	10	1.0	0.25
ML-869B	5.0	19	15	Quad.	Forced-Air	15	20.0	5.0
ML-872A	5.0	7.5	10	In-Ph.	Convection	10	5.0	1.25
ML-8008	5.0	7.5	10	In-Ph.	Convection	10	5.0	1.25

HYDROGEN THYRATRON TUBES

TYPE	CATHODE VOLTS	CATHODE AMPS	RESERVOIR VOLTS	RESERVOIR AMPS	ANODE RATINGS PEAK VOLTS	ANODE RATINGS AMPS AV.	ANODE RATINGS AMPS PEAK
ML-5948/1754	6.3	30	4.5	4.5	25000	1.0	1000
ML-5949/1907	6.3	20	4.0	3.0	25000	0.5	500

DISTRIBUTORS

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Canada.....Dominion Sound Equipments, Ltd.
Europe, South America, Africa, Asia.....Westrex Corp.

Note: For complete technical data or prices, write to Machlett Laboratories, Inc., Springdale, Conn., or nearest Graybar, Westrex, or Dominion Sound Equipment office.

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4. Component Parts

61. Vacuum Tubes, Transmitting.

(Continued from page 395)

Bomac Labs. Inc., Salem Road, Beverly, Mass., 5, 25, 30, 40
For details see ad on pages 92-93
Tel: Beverly 4670

CBS-Hytron Div., Columbia Broadcasting System, Mass., 10

Canadian General Elec. Co., Electr. Equip., Canada, 5, 10, 15, 20, 25, 30, 35, 40, 45

Capehart-Farnsworth Co., Ind., 15

Cathodeon, Ltd., England, 15, 35

Central Sales & Mfg. Corp., N.J., 10, 45

Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 10
For details see ad on pages 86-87
Tel: Livingston 6-1100

Craig Corp., Mass., 5, 10, 15, 20, 25, 30, 35, 40, 45

Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 10, 25, 45
For details see ad on pages 90-91
Tel: JUno 8-1212

Emeltone Electronics Co., N.Y., 5, 10, 25, 30, 40

English Elec. Valve Co., Ltd., England, 5, 10, 20, 25, 30, 40, 45

Federal Telecommun. Labs. Div., I T & T, N.J., 5, 40

Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Road, Clifton, N.J., 10, 30, 40, 45
For details see ad on pages 32-37
Tel: Nutley 2-3600

Freeland Products Co., La., 10, 45

General Electric Co., N.Y.C., N.Y., 5, 10, 20, 25, 30, 45

General Electric Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45

General Electric Co. Tube Dept., N.Y., 5, 10, 15, 20, 25, 30, 45

Haydu Brothers, N.J., 10

Huggins Labs., Inc., 711 Hamilton Ave., Menlo Park 2, Calif., 40
For details see ad on page 397
Tel: DA 2-0346

International Electronics Corp., N.Y., 10, 20

Isolantite Mfg. Corp., N.J., Low Loss Ceramic Insulators

Lewis and Kaufman, Ltd., Calif., 10

Litton Industries, Calif., 25, 30

Machlett Labs., Inc., 1063 Hope St., Springdale, Conn., 10, 45
For details see ad on page 396
Tel: Stamford 4-5781

Marconi Instruments, Ltd., N.Y., 25

Marconi's Wireless Telegraph Co., Ltd., England, 10, 20, 25, 30, 40, 45

Martin & Co., H. S., Ill., 40

Microwave Associates, Inc., Mass., 5, 30

Mullard, Ltd., England, 5, 10, 25, 30, 40

Multi-Tron Lab., Ill., 20, 25, 30

Penta Labs, Inc., Calif., 10, 40

Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5 St., Harrison, N.J., 10, 15, 20, 30, 35, 45
For details see ad on page 210
Tel: HUmboldt 5-3900

Raytheon Mfg. Co., Mass., 10, 25, 30, 35, 40

Societe Francaise Radio Electrique, France, 5, 10, 25, 30, 40, 45

Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 25, 40
For details see ad on pages 23-24
Tel: FIeldstone 7-3600

State Labs, Inc., N.Y., 10, 15, 20, 25, 30, 35, 45

Sylvania Electric Prods. Inc., Electronics Division, Woburn, Mass., 5, 20, 25, 30, 40
For details see ad on pages 9-14
Tel: WO 2-3500

Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 5, 20, 25, 30, 40
For details see ad on pages 9-14
Tel: JUdson 6-2424

(Continued on page 399)

For Further Information

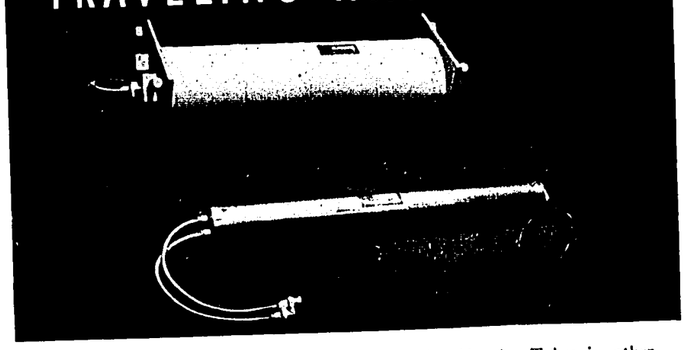
about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

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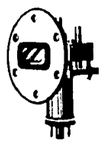
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- UHF television transmitters
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- Coherent and pulsed radar transmitters
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- Particle accelerators—power tubes

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Radar Transmitters	8500 — 11,000	100 W — 9 KW	V-23, V-63, V-27, V-82, V-45
Beacon Transmitters	9100 — 12,200	450 mw — 9 KW	V-54, V-63, V-27, V-82, V-45
Relay Local Oscillators & Transmitters	5100 — 7500	30 mw — 1 W	X-26B, X-26D, X-26E, X-26F
UHF Television	470 — 890	15 KW	VA-6237, 38, 39, 40, 41 and 42
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Neely Enterprises, 1029 Rosecrans Street
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MARYLAND
Baltimore 10
Horman Associates, 635, St. Johns Rd.

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Boston
Yewell Associates, 751 Main St.,Waltham 54

MICHIGAN
Detroit 35
S. Sterling Company, 15310 W. McNichols Rd.

MINNESOTA
St. Paul 14
Alfred Crossley & Associates, 2388 University Avenue

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Kansas City 30
Harris-Hanson Company, 7916 Paseo Avenue
St. Louis 9
Harris-Hanson Company, 5506 So. Kingshighway

NEW JERSEY
Asbury Park
I. E. Robinson Co., 702 Mattison Avenue
Bogota
R. M. C. Associates, 114 E. Main Street

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Albuquerque
Neely Enterprises, 107 Washington Street, S.E.

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New York 21
R. M. C. Associates, 170-E 80th St.
Syracuse
J. D. Ryerson, 412 E. Genesee St.

NORTH CAROLINA
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Cleveland 15
M. P. Odell Company, 2536 Euclid Avenue
Dayton 9
Alfred Crossley & Associates, 53 Park Ave.

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I. E. Robinson Co., 37A Thomas St.
Upper Darby
I. E. Robinson Co., 7217 Marshall Road

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Dallas
Earl Lipscomb Associates, P. O. Box 8042
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4. Component Parts

61. Vacuum Tubes Transmitting.

(Continued from page 397)

Taylor Tubes, Inc., Ill., 10, 45
United Electronic Co., N.J., 10
Vacuum Tube Products, Calif., 5, 10, 35
Varian Associates, 661 Hanson Way, Palo Alto 2, Calif., 25
For details see ad on page 398
Tel: DAvenport 5-5631
Westinghouse Electric Corp., N.Y., 5, 10, 45
White Electron Devices, Inc., Roger, Route 17 & Erie Railroad, Ramsey, N.J., 40
For details see ad on page 399
Tel: Ramsey 9-1660

62. Voltage Regulators.

5. Automatic
10. Manually operated
15. Varistors

Acme Electric Corp., 44 Water St., Cuba, N.Y., 5
For details see ad on page 381
Tel: Cuba 4
Airmec, Ltd., England, 5, 10
American Machine & Foundry Co., N.Y., 5
Amplifier Corp. of America, N.Y., 5
Applegate & Co., C. J., Colo., 5
Avimo, Ltd., England, 5
Avion Instrument Corp., N.J., 5
Bendix Aviation Corp., Red Bank Div., Eatontown, N.J., 5
For details see ad on page 302
Tel: Eatontown 3-1340
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 5
For details see ad on page 128
Tel: Lambert 5-2200
Bristol Engineering Corp., Pa., 5
Brownthorn Electronics, Inc., N.Y., 5
Burlington Instrument Co., 213 N. Third St., Burlington, Iowa, 5
For details see ad on page 327
Tel: BUrlington 7241
Canadian Research Institute, Canada, 5, 10
Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 5
For details see ad on pages 100-101
Tel: Dover 975
Cole Instrument Co., Calif., 5
Computer Co. of America, Div. Bruno-N.Y. Industries Corp., 460 W. 34 St., New York 1, N.Y., 5
For details see ad on page 444
Tel: Longacre 4-5930
Cramer Transformer Corp., Ill., 10
Dressen-Barnes Corp., Calif., 5, 10
Electric Regulator Corp., Conn., 5
Electro Engineering Works, Calif., 5, 10
Fidelity Instrument Corp., Pa., 5
Furzehill Labs., Ltd., England, 5
Gates Radio Co., Ill., 5
Gavco Corp., N.Y., 5
General Communications, Wis., 5
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15

62. Voltage Regulators.

General Electric Co., Spec. Transf. & Ballast., Ind., 5
General Magnetics, Inc., N.J., 5
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 10
For details see ad on Cover III
Tel: Everglade 4-4400
Gyromechanisms, Inc., N.Y., 5
Hanson-Gorrill-Brian, Inc., N.Y., 5
Hufford Machine Works Inc., Elec. Div., Calif., 5
Industrial Electr. of Canada, Ltd., Canada, 5
Kalbfell Labs., Inc., Calif., 5
Kepco Labs., N.Y., 5, 10
Lambda Electronics Corp., N.Y., 5
Leach Corp., Inet Div., Calif., 5, 10.
Magnetic Amplifiers, Inc., N.Y., 5, 10
Magnetics Research Co., 142 King St., Chappaqua, L.I., N.Y., 5
For details see ad on pages 272, 387
Tel: CH 1-0052
Marconi's Wireless Telegraph Co., Ltd., England, 5
Marshall Eng. Electr. Div., Calif., 5
Melco Prods., Inc., Minn., 10
Micro-Circuits Co., New Buffalo 3, Mich., 15
For details see ad on pages 365, 526
Tel: 272W1
Northern Electric Co., Ltd., Canada, 15
Omega Mfg., Inc., N.Y., 5, 10
Partridge Transformers, Ltd., England, 10
Perma-Power Co., Ill., 10
Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y., 5
For details see ad on page 344
Tel: NE 6-3342
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 10
For details see ad on page 166
Tel: ULster 2-6800
Polytronics Co., Canada, 5
Power Transformer Co., Inc., N.J., 5, 10
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 5
For details see ad on page 345
Tel: ES 5-9435
Qutronic Transformer Corp., N.Y., 5
Radio Dev. & Res. Corp., N.J., 15
Regulator Equip. Corp., N.J., 5
Schauer Mfg. Corp., Ohio, 5, 10
Servo-Tek Prods. Co., N.J., 5
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., 5
For details see ad on page 391
Tel: BI 2-1414
Sorensen & Co., Inc., Conn., 5
Standard Electrical Prods. Co., Ohio, 5, 10
Summit Electronic, Inc., N.J., 5
Superior Electric Co., 9000 Clarke Ave., Bristol, Conn., 5, 10
For details see ad on pages 106-107
Tel: Bristol 2-9561

(Continued on page 400)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

4. Component Parts

62. Voltage Regulators.

(Continued from page 399)

Sylvania Electric Prods. Inc., Electronics Div., Woburn, Mass., 15
For details see ad on pages 9-14
Tel: WO 2-3500
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 15
For details see ad on pages 9-14
Tel: JUdson 6-2424
Thermistor Corp. of America, N.J., 15
Thordarson Meissner Mfg. Div., Ill., 5
Transformer Technicians, Inc., Ill., 5, 10
United Transformer Co., 150 Varick St., New York 16, N.Y., 5, 10
For details see ad on page 582
Tel: AL 5-3500
Varo Mfg. Co., Inc., Tex., 5
Vickers Electric Div., Vickers, Inc., Mo., 5
Weltronic Co., Mich., 5, 10
White Industries, Inc., N.Y., 5

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Aeronautical & Navigational Electronics	Fee $2
Antennas and Propagation	Fee $4
Audio	Fee $2
Broadcast & Television Receivers	Fee $2
Broadcast Transmission Systems	Fee $2
Circuit Theory	Fee $2
Communications Systems	Fee $2
Component Parts	Fee $2
Electron Devices	Fee $2
Electronic Computers	Fee $1
Engineering Management	Fee $2
Industrial Electronics	Fee $2
Information Theory	Fee $1
Instrumentation	Fee $1
Medical Electronics	Fee $2
Microwave Theory and Techniques	Fee $2
Nuclear Science	Fee $2
Quality Control	Fee $1
Radio Telemetry & Remote Control	Fee $2
Ultrasonics Engineering	Fee $2
Vehicular Communications	

IRE Professional Groups are only open to those who are already members of the IRE. Copies of Professional Group Transactions are available to non-members at three times the cost-price to group members.

The Institute of Radio Engineers
1 East 79th Street, New York 21, N.Y.

USE THIS COUPON

DIR 54

Miss Emily Sirjane
IRE—1 East 79th St.
New York 21, N.Y.

Please enroll me for these IRE Professional Groups
..... $ .....
..... $ .....
..... $ .....
Name .....
Address .....
Place .....
Please enclose remittance with this order.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Part V INSTRUMENTS & CONTROLS

5. Applications of Electronics
6. Radar, Microwave, UHF Equip.
7. Test & Measuring Equip.

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 or letter that you seek.

HOW TO USE

1. **With the directory open on the desk, bend the book almost double in your left hand, with your thumb just below this line.**
2. **From one-line or two-line symbol adjacent to the letter or subject you seek, run your eye across horizontally to a corresponding page-edge symbol.**
3. **Open there with your right hand.**

IT IS EASIER IF YOU "FAN" OR "RIFFLE" THE LAST FEW PAGES WITH YOUR RIGHT THUMB. THE EDGE INDEXES COVERING THE OTHER DIRECTORIES WILL BE FOUND OPPOSITE PAGES 240, 270, & 476.



For complete list of products and services, arranged alphabetically for fast reference, see the eight-page pink section preceding page 1.

2	PART I COMPLETE DATA SPREADS
131	PART II ALPHABETICAL COMPANY LIST
241	PART III APPARATUS
271	PART IV COMPONENTS
401	PART V INSTRUMENTS & CONTROLS
477	PART VI SERVICES & MATERIALS

APPLICATIONS

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RADAR, MICROWAVE

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73 Transmitters	426
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TEST & MEASURING EQUIPMENT

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93 General Laboratory Equipment	441
94 General Test Equipment	443
95 Graphic Recorders	453
96 Lab. Standards of Frequency & Time	455
97 Microwave & Radar Test	457
98 Nuclear Test	465
99 Oscilloscopes, Cathode-Ray	465
100 Radio-Frequency Test	469
101 Television Test Equip.	475

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. **Audio Frequency Equipment** (Products 1 to 11)
2. **Broadcasting Equipment** (Products 12 to 17)
3. **Communications Equipment** (Products 18 to 25)
4. **Component Parts** (Products 26 to 62)
5. **Applications of Electronics** (Products 63 to 70)
6. **Radar, Microwave, UHF** (Products 71 to 74)
7. **Test & Measuring Equipment** (Products 92 to 101)
8. **Services and Materials** (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.
9. **Education & Publishing** (Groups 102 & 103)
10. **Distribution Functions** (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

1954 I.R.E. DIRECTORY READER SERVICE REPLY CARD

Place a 2¢ stamp on one or more of the perforated cards below, and they will be promptly forwarded to the manufacturers listed on the back. If you prefer to send your specific requirements, a letter would be more advantageous, however be sure to enclose the reply card.

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Below, for your convenience, are six perforated reply cards. Each one has enough space to list three advertisers' names and their page numbers. Forward as many cards as you have questions, and I.R.E. will promptly notify the manufacturer in question to send literature, specifications, and prices to you.

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1954 IRE DIRECTORY

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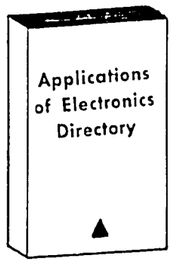
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1954 IRE DIRECTORY

A Directory of

5. Applications of Electronics

Industrial, Medical & Military



8 Major Groups

33 Products

Organized by functions for Engineers

63 Computers & Counters.
- 05 Analog to digital converters
- 10 Computers, analog
- 15 Computers, digital
- 20 Counters, continuous
- 25 Counters, pre-set

64 Electronic Control Equipment.
- 05 Burglar-alarm & protective systems
- 10 Combustion & smoke-nuisance controls
- 15 Electronic controls
- 20 Production control, counting & sorting equipment
- 25 Variable speed controls

65 Geophysical Apparatus.
- 05 Amplifiers
- 10 Complete exploration equipment
- 15 Control equipment
- 20 Microphones
- 25 Recording galvanometers

66 Induction Heating Equipment.
- 05 Brazing, soldering & welding
- 10 Di-electric heating
- 15 Induction heating

67 Medical Equipment.
- 05 Cardiographs
- 10 Diathermy
- 15 Electronic cauterizing
- 20 Electro-encephalographs
- 25 Stimulators

68 Nuclear Equipment.
- 05 Pulse count integrators
- 10 Radiation detectors
- 15 Scalers

69 Servo-Mechanisms.
- 05 Controls
- 10 Gears, gear-trains, etc.
- 15 Servo amplifiers
- 20 Servo motors & generators

70 Telemetering Equipment.
- 05 Data Recorders
- 10 Data storage mechanisms
- 15 FM/FM Modulators

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

ELECTRONIC COUNTERS with PLUG-IN UNITS



TYPE 1011-3

INSTRUMENT	RANGE	ACCURACY
Frequency Counter	0 cps to 100 kc max	1 count per 100,000
Phase Angle Counter	0 second cps to 1000 cps	1 count per 1000 cons
Time Interval Counter	10 us to 100,000 secs	1% microseconds
Universal Time Interval and Frequency Counter	Same as individual Frequency and time counters above. In addition, will count time ratio up to 1 to 1000	

PRICES	
Type 1011	$1295.00
Type 1102	$242.00
Type 1103	$148.00
Type 1104	$198.00
Type 1105	$148.00
Type 1106	$388.00

PHASE MEASURING INSTRUMENTS · 0 CPS TO 500 MC

TYPE	NAME	RANGE	ACCURACY	PRICE
205	Precision Phase Detector	10 kc to 10 mc	0.1 degree	$445.00
105	Phase Meter	10 kc to 5 mcs	0.5 degree	$345.00
213	H.F. Phase Meter	10 kc to 500 mc	5%	$225.00
1011-3	Phase Angle Counter	0 cps to 1 kc	0.5 degree	$850.00

CONTINUOUSLY VARIABLE DELAY LINES with



Resolution Time LESS THAN 5×10^{-10} seconds

Priced at $59.00 Each

TYPE 506

TYPE	TIME DELAY	TYPE	TIME DELAY
505	0 to 0.05 us	506b	0 to 0.25 us
505a	0 to 0.1 us	506c	0 to 0.32 us
506	0 to 0.25 us	506d	0 to 0.38 us
506a	0 to 0.17 us	508	0 to 0.1 us

STEP VARIABLE DELAY LINES with

EQUAL INPUT AND OUTPUT IMPEDANCE



TYPE 601

TYPE	MAXIMUM DELAY	PRICE
601	2.2 us	$ 95.00
602	2.5 us	$111.00
603	25.5 us	$150.00
702	10 us	$ 75.00

WRITE FOR DATA!

ADVANCE ELECTRONICS CO., INC.

451 HIGHLAND AVE. PASSAIC, N.J.

63. Computers & Counters.

5. Analog to digital converters
10. Computers, analog
15. Computers, digital
20. Counters, continuous
25. Counters, pre-set

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 20
For details see ad on page 401
Tel: PRescott 8-3687

Aero Research Instr. Co., Ill., 10

Aerodex Laboratories, Inc., N.Y., 10

Ahrendt Instrument Co., Md., 20

Air Associates, Inc., N.J., 5, 10, 15

Airmec, Ltd., England, 20, 25

American Electronic Labs., Inc., Pa., 10, 15

American Hydromath Corp., N.Y., 10

American Machine & Foundry Co., N.Y., 15

Anelex Corp., N.H., 5, 10, 15

Arma Corp., N.Y., Roosevelt Field, Garden City, L.I., N.Y., 10, 15
For details see ad on page 407
Tel: Pioneer 2-2000

Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 10
For details see ad on pages 203, 293
Tel: POrt Washington 7-3703

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5, 15, 20, 25
For details see ad on page 402
Tel: Eliot 4-4321

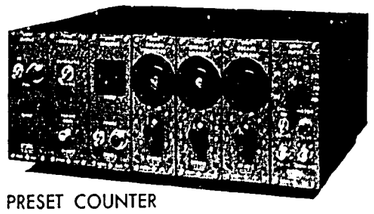
Audio Instrument Co., Inc., N.Y., 10

(Continued on page 1921)

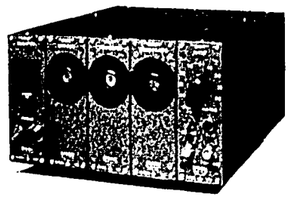
ATOMIC INSTRUMENT CO.

electronic counting and control with unitized construction for versatility

Select the instrument exactly suited to your specific counting and control application. Without high "custom design" costs, without time-consuming modifications, you can choose the right instrument for your operation from the wide variety of plug-in units available. A typical unitized instrument is the Preset Counter (right). Tell us your counting problem! Atomic has over ten "standard" counters, registers, etc. with unitized modifications to suit your needs. Ask for Bulletin G-8 for descriptions.



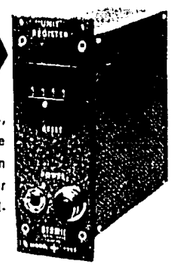
PRESET COUNTER



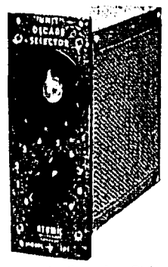
"DUZZENER" for counting in dozen and gross lots

Plug-in units are functional, compact and reliable.

A large variety of counting and control units, each performing a specific function, may be combined into a single instrument or used in units of your own manufacture. Write for details of available strips contained in Bulletin G-8.



Register Strip



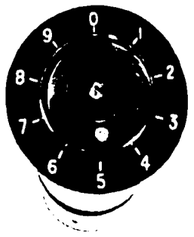
Decade Counting Strip

Over 5 years dependable operation

DEKATRON counting tubes for counting, timing and computer circuitry

distributed by Atomic Instrument Co.





Many thousands of Dekatron Counting Tubes have been providing tens of thousands of hours of reliable operation since their introduction over 5 years ago. Type GC10D, 20,000 cps, is the seventh and latest model available.

*Dekatron counting tubes are manufactured by Ericsson Telephones, Ltd., G. B. and distributed exclusively in U.S.A. and Canada by Atomic Instrument Co. Complete stocks are maintained in the U.S. for fast delivery.

Atomic also manufactures a complete line of laboratory instruments for radioactivity detection and measurement. Write for catalog and new supplements.

ATOMIC INSTRUMENT COMPANY

84 MASSACHUSETTS AVE. CAMBRIDGE 39, MASS.

Linear Amplifiers, Scalers, High Voltage Supplies, Scintillation Counters, Count Rate Meters, Coincidence and Anticoincidence Instruments, Differential Pulse Height Analyzers, Data-printing Systems, Accessories, Electronic Counting and Control Instrumentation.

Write for name of Sales Representatives in your area.

5. Applications of Electronics

63. Computers & Counters.

(Continued from page 401)

Audio Prods. Corp., 2265 Westwood Blvd., Los Angeles 64, Calif., 15, 20
For details see ad on page 139
Tel: BRadshaw 2-4266

Austin Co., N.Y., 5, 10, 15, 20, 25

Automatic Temperature Control Co., Pa., 25

Avion Instrument Corp., N.J., 10, 15

Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 10, 15, 20, 25
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000

Bendix Aviation Corp., Cincinnati Div., 203 West Third St., Cincinnati 2, Ohio, 20, 25
For details see ad on pages 51-54, 302
Tel: Dunbar 5885

Bendix Aviation Corp., Bendix Computer Div., 5630 Arbor Vitae St., Los Angeles 45, Calif., 5, 10, 15
For details see ad on pages 51-54, 302
Tel: Oregon 8-2128

Benson-Lehner Corp., Calif. 5

Berkeley & Assoc., Edmund C., 815 Washington St., R98, Newtonville 60, Mass., 10, 15
For details see ad on page 555
Tel: Decatur 2-5453

Berkeley, Div. Beckman Instruments, Inc., Dept. N-13, 2200 Wright Ave., Richmond 3, Calif., 10, 20, 25
For details see ad on page 138
Tel: Landscape 6-7730

Boeing Airplane Co., Indust. Prods Div., Wash., 5, 10

Boesch Mfg. Co., Inc., 45 River St., Danbury, Conn., 25
For details see ad on page 531
Tel: Danbury 3-5571

Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., 20
For details see ad on page 140
Tel: Janesville 6616

Bruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 10
For details see ad on page 444
Tel: Longacre 4-9530

Burroughs Corp., Electronic Instr. Div., Dept. P-1, 1209 Vine St., Philadelphia 7, Pa., 15, 20, 25
For details see ad on page 458
Tel: LO 7-1401

Canadian Westinghouse Co., Ltd., Canada, 10

Capehart-Farnsworth Co., Ind., 10

Clary Multiplier Corp., Calif., 20

Clifton Precision Products Co., Inc., Pa., 10

Codetyper Laboratories, N.Y., 15

Cole Instrument Co., Calif., 20, 25

Computer Co. of America, Div. Bruno-N.Y., 460 W. 34 St., New York 1, N.Y., 10
For details see ad on page 444
Tel: Longacre 4-9530

5. Applications of Electronics

63. Computers & Counters.

Computer Control Co., Inc., 92 Broad St., Babson Park 57, Mass., 5, 15
For details see ad on page 403
Tel: Belmont 5-6161

Computer Res. Corp. of Calif., Calif., 15

Computing Devices of Canada, Ltd., Canada, 5, 10, 15

Consolidated Eng. Corp., Calif., 5, 10, 15

Control Eng. Corp., Mass., 10

Corbin Corp., Md., 5, 10, 15

Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., 10
For details see ad on page 254
Tel: APpleton 7-1133

Daystrom Instrument, Pa., 5, 10, 15, 20, 25

Decade Instrument Corp., P.O. Box 153, Caldwell, N.J., 20
For details see ad on page 403
Tel: Caldwell 6-4258

Detecto Lab., Inc., Ill., 20, 25

Detectron Corp., Calif., 15, 20, 25

Digital Instrument Co., Fla., 15, 20, 25

Digital Prods. Inc., Calif., 15, Magnetic Memory Drums

Donner Scientific Co., Calif., 10

Dubrow Development Co., 235 Penn St., Burlington, N.J., 10, 15, 20, 25
For details see ad on page 445
Tel: Burlington 3-0446

Dynamic Analysis Inc., Calif., 10

Eder Engineering Co., Wis., 10

El-Tronics, Inc., Pa., 20, 25

Eldema Corp., 5827 E. Beverly Blvd., Los Angeles 22, Calif., 20, 25
For details see ad on page 338
Tel: PA 8-5452

Electro Data Corp., Calif., 15

Electro-Mechanical Research, Inc., Conn., 15

Electro-Tech Equipment Co., N.Y., 20, 25

Electronic Associates, Inc., N.J., 10

Electronic Computer Div., Underwood Corp., 35-10 36th Ave., Long Island City 6, N.Y., 15
For details see ad on page 317
Tel: Exeter 2-3400

Electronic Eng. Co. of California, Calif., 5, 25

Engineering Development, Neb., 20

Engineering Research Asso., Div. Remington Rand, Inc., Minn., 5, 15, Magnetic Storage Drums

Engineering & Research Corp., Md., 10

Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 5, 15, 20, 25, Storage Drums, Shift Registers
For details see ad on page 318
Tel: CO 6-3228

Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Road, Clifton, N.J., 20, 25
For details see ad on pages 32-37
Tel: Nutley 2-3600

Feedback Controls, Inc., D.C., 5, 10, 15, 20, 25

Ferranti Electric, Inc., N.Y., 15

Ferranti Electric, Ltd., Res. Dept., Canada, 5, 10, 15, Magnetic Storage Drums

Fischer & Porter Co., 5, 10, 15, 20, 25

Ford Instrument Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 5, 10, 15
For details see ad on page 415
Tel: ST 4-9000

Franklin Electronics, Inc., Pa., 5

Freed Electronics & Controls Corp., N.Y., 5, 10, 15

General Electric Co., N.Y., 5, 10, 15, 20

General Electric Co., Ltd. of England, Mass., Magnetic Storage Drums

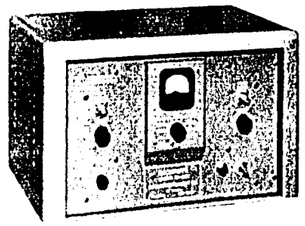
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 5, 10, 15
For details see ad on page 188
Tel: Pleasantville 2-2000

Genisco, Inc., Calif., 5

Geotechnical Corp., Tex., 10, 15

(Continued on page 404)

NEW PRECISION COUNTING SYSTEM FOR HIGH FREQUENCY



DECAVIDER* 10-100

Newly modified DECAVIDER* 10-100 extends to 100 megacycles the counting range of 10MC standard counting equipment. Single knob Decade selector switch and output meter permit instant location of unknown frequency, no auxiliary tuning required. No loss of accuracy, merely add number indicated by DECAVIDER* to number on counter.

Specifications:

Range: 10-100 megacycles.
Used with: Any standard 10MC counter or EPUT meter.
Input: 0.05 to 4.0 volts rms.
Output: 1.0 to 20 volts rms.
Average Gain: 25 db.
Price: $495.00 FOB Caldwell, N.J.
Other DECAVIDERS* for other ranges with 100KC and 1MC counters.
Also available:—
DECALATORS* (Decade-switched crystal-controlled signal generators)
DECASWEEPS* (Decade-switched sweeping oscillators).

WRITE FOR DETAILS

DECADE INSTRUMENT CO.

P.O. BOX 153, CALDWELL, N.J.

ELECTRONIC COMPUTERS and COMPONENTS

Digital Data Handling Systems

3C ENGINEERS will provide . . .

Evaluation . . . Consultation
Design . . . Development

of
- DIGITAL DATA HANDLING SYSTEMS
- DATA CONVERSION SYSTEMS
- MAGNETIC TAPE HANDLING EQUIPMENT
- MAGNETIC READING AND RECORDING CIRCUITS
- ACOUSTIC AND MAGNETIC MEMORIES
- LOGICAL COMPUTER PACKAGES
- COMPUTER TEST EQUIPMENT

3C Engineers now operate and maintain a large-scale digital computer for the U.S. Navy.

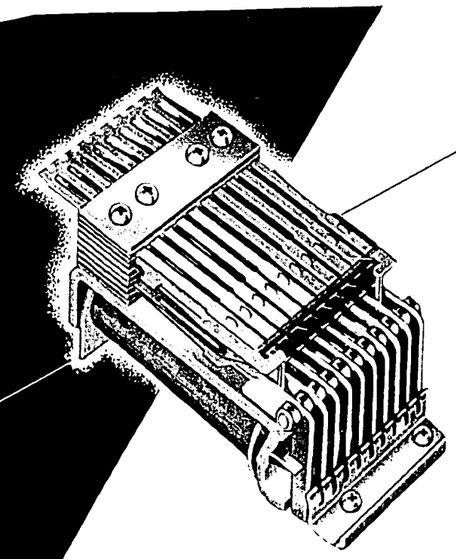
Send inquiries to Department L4 . . .

3C COMPUTER CONTROL CO. INC.

92 BROAD STREET, BABSON PARK 57, MASSACHUSETTS

KELLOGG

Magnetic Impulse Counter



Check these features

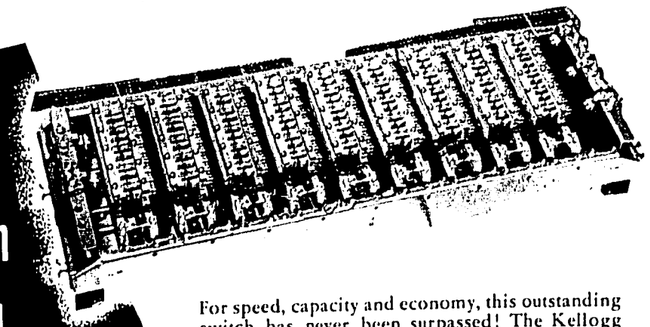
- ☐ The long life and dependability characteristic of relay equipment.
- ☐ Occupies space of only two telephone relays.
- ☐ Operates over a wide range of pulse ratio and frequency.
- ☐ Replaces a chain of well designed relays at small fraction of cost.

It's new — but already Industry is pouring in orders for Kellogg's unique *Magnetic Impulse Counter!* . . . Why? Because it is simple, it saves space and it has a wide application in many fields. Actuated by electrical impulses, the Kellogg Magnetic Impulse Counter performs the counting and marking function of a chain of from 10 to 20 relays — or of a two-magnet ten-point stepping switch. It does this in less space and with assured reliability! It has many uses — from industrial control, to any system where trains of impulses, such as generated by a telephone dial, are to be counted. Get the facts. Get them now! Find out how the Kellogg Magnetic Impulse Counter can save you money. A request on your letterhead will bring particulars.

KELLOGG

Crossbar Switch

for Automatic Control Systems and Computers



For speed, capacity and economy, this outstanding switch has never been surpassed! The Kellogg *Crossbar Switch* operates completely in one movement—provides the fast, low-cost means of interconnecting or selecting many different circuits. Connects any 3 of 60 circuits to any of 75—or chooses 1 circuit from as many as 936. Palladium contact points insure utmost signal fidelity and prevent corrosion. Mounted for drawer-like removal from its rack.

- Exceptionally Fast Operation!
- Many Circuit Applications!
- Thoroughly Proved Performance!
- Built To Last, Designed To Grow!

KELLOGG — DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A Division of International Telephone and Telegraph Corporation
Sales Offices: 79 W. Monroe Street, Chicago 3, Illinois

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in which "Proceedings of the I.R.E." serves the advertiser differently and more effectively than other publications.

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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.

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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 leader 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 IRE 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.

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It is a specific purpose of the Institute 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
1475 Broadway
New York 36, N.Y.

5. Applications of Electronics

63. Computers & Counters.

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Tel: MElbourne 800

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- LOGRINC plotter-follower
- magnetic library system
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- ALWAC digital computer



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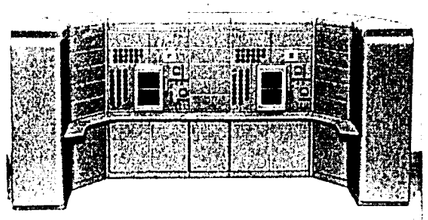
LOGISTICS RESEARCH, INC.
141 S. Pacific Avenue
Redondo Beach, Calif.

SYSTEMS
COMPUTERS
COMPONENTS

REEVES NE

REEVES INSTRUMENT CORPORATION • 215 EAST 91st ST., NEW YORK 28, N.Y.

NEW ANALOG COMPUTER PACKAGING CONCEPT PERMITS MAXIMUM COMPONENT SELECTION



400 Series REAC Expansion Consoles Combine Adaptability with Economy

Diode Function Generator, Diode Multiplier Recorder, Servo Voltmeter added to REAC Line

The Reeves Instrument Corporation assures its position of leadership in the field of analog computing equipment with the introduction of a new packaging concept, the Expansion Console of the Series 400 REAC. This year, Reeves also announces the addition of an all-electronic diode function generator, a square-law diode multiplier, a desk-mounted recorder and a servo voltmeter to its line of quality computing equipment. These units exemplify the high standards of accuracy, flexibility and adaptability which have already earned REAC equipment such a fine reputation.

The modular construction of the 400 Series REAC allows the types and quantities of components to be chosen so as to satisfy individual requirements. Not only is the initial size of the console variable but later expansion may be effected with great economy.

The new 400 Series REAC, shown above, represents an entirely new analog computer packaging concept which allows greater freedom in the choice of components and makes expansion more economical.

MINIATURE FLOATED GYROS CONTROL, MEASURE MOTION

Reeves Instrument Corporation, long a quantity manufacturer of quality HIGG floated gyros, is now offering three miniature floated sensing devices of great accuracy, the 20 IG Integrating Gyro, the 20 RG Rate Gyro and the 20 A Pendulous Accelerometer. Because the output gimbal of each of these devices is supported by the buoyancy of a fluid of its own density, friction is negligible. Thus accuracy is comparable to that of much larger units.

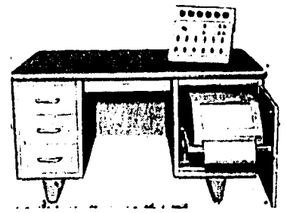
Although rugged enough to withstand government high-impact shock and vibration tests, each of the units weighs only about one pound and is only two inches in diameter.

The integrating gyro is used to cause a structure to move at any commanded rate with respect to inertial space or in any system in which varying rates of rotation about a given axis must be mechanically integrated. It may also be used to stabilize the structure on which it is mounted with respect to inertial space and about a given input axis.

The rate gyro may be used in any system where the rate of rotation about a given axis must be measured.

The accelerometer may be used in any system where the linear acceleration in inertial space along a given axis must be measured.

Reeves also produces a variety of precision floated gyros of other sizes.



Six Channel Recorder

PRECISION INDUCTION RESOLVERS USEFUL FOR MANY APPLICATIONS

Reeves precision induction resolvers are employed as basic elements in analog computers, automatic control systems, angle data transmission systems and plan position indicating radars.

Miniature resolvers (equivalent to Navy frame size 15) are available for applications where compactness is essential. Standard resolvers (equivalent to Navy frame size 23) may also be ordered.

Standard production models of Reeves resolvers compute the sine of an angle with an accuracy of better than five parts in ten thousand and with an angular error of less than two minutes.

Reeves resolvers are described in detail in RICO Bulletin #57.

DIODE AUXILIARY UNITS

Among the nonlinear computing components which may be housed in the 400 Series REAC are the new diode function generator and diode multiplier. Both of these units are capable of high speed real time operation and neither employs any complicated circuit configurations requiring servicing by specialized personnel or involving high replacement costs. The function generator is capable of generating a function of two variables.

Both the multiplier and the function generator are available as separate four channel units with built-in power supplies.

SERVO VOLTMETER

A convenient accurate readout device which may be ordered either as a part of a 400 Series Console or as a separate unit is the Servo Voltmeter. The standard unit is provided with 100-volt and 200-volt scales. Accuracy is 0.025%, while the dial reads directly to 0.01 volt.

SIX CHANNEL RECORDER

A new six channel recorder featuring automatic cycling may be ordered desk mounted, caster mounted or installed in a 400 Series Console. The automatic cycling provides sensitivity and offset traces prior to a run. From them, personnel studying the recording later will know immediately at what deflection sensitivity each of the channels was operated and what offset voltage, if any, was introduced to each channel.

OTHER REAC MODELS

In addition to the 400 Series, Reeves offers a wide variety of computer models. The desk-top 300 Series is ideal for small laboratories and for "on location" work. The 200 Series features single cabinets housing built-in power supplies, computing amplifiers and servos.

PROJECT CYCLONE

The REAC line of commercial computing equipment is the outgrowth of simulator development work done under contract to the Navy. Reeves is currently operating Project Cyclone, under the cognizance of the Bureau of Aeronautics. This activity, which is one of the largest analog computer installations in the world, uses essentially commercial REAC

STANDARD, MINIATURE BREADBOARD INSTRUMENTATION PARTS ECONOMICAL FOR BUILDING EXPERIMENTAL SERVOS, COMPUTERS

Reeves manufactures a complete line of precision breadboard parts for economical construction of experimental servos and computers. The line includes precision gears, component hangars, slotted mounting plates, etc. The use of these unique precision mechanical systems for building experimental models completely eliminates drafting and machine shop time and permits models to be modified quickly and inexpensively. Catalog RICO #10 gives a complete listing of standard (¼" shaft) and miniature (⅛" shaft) sizes. The latter are ideal for applications where small size and light weight are important factors.

REEVES INSTRUMENT CORPORATION a subsidiary of CLAUDE NEON, Inc.

Research, Development and Manufacture of RADAR, FIRE CONTROL AND GUIDANCE SYSTEMS FOR GOVERNMENT

ARMA

inertial guidance systems

A four-pound gyro—rugged, reliable and accurate—is the key to Arma's self-contained Inertial Guidance System for tactical missiles. Call or write today to Arma, Brooklyn, N.Y.; Garden City, N.Y., a division of American Bosch Arma Corporation.

ARMA

advanced electronics for control

ARMA INSTRUMENT

5. Applications of Electronics

63. Computers & Counters.

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STATIC MAGNETIC DEVICES
serve you in your electronic system as:

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- Pulse count converter
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- Data manipulator
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- Precision timer
- Number storage
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- Synchronizer
- Rate meter

WANG LABORATORIES
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KEnmore 6-0624

64. Electronic Control Equip.

5. Burglar-alarm & protective systems
10. Combustion & smoke-nuisance controls
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A. R. F. Products, Inc., Ill., 15
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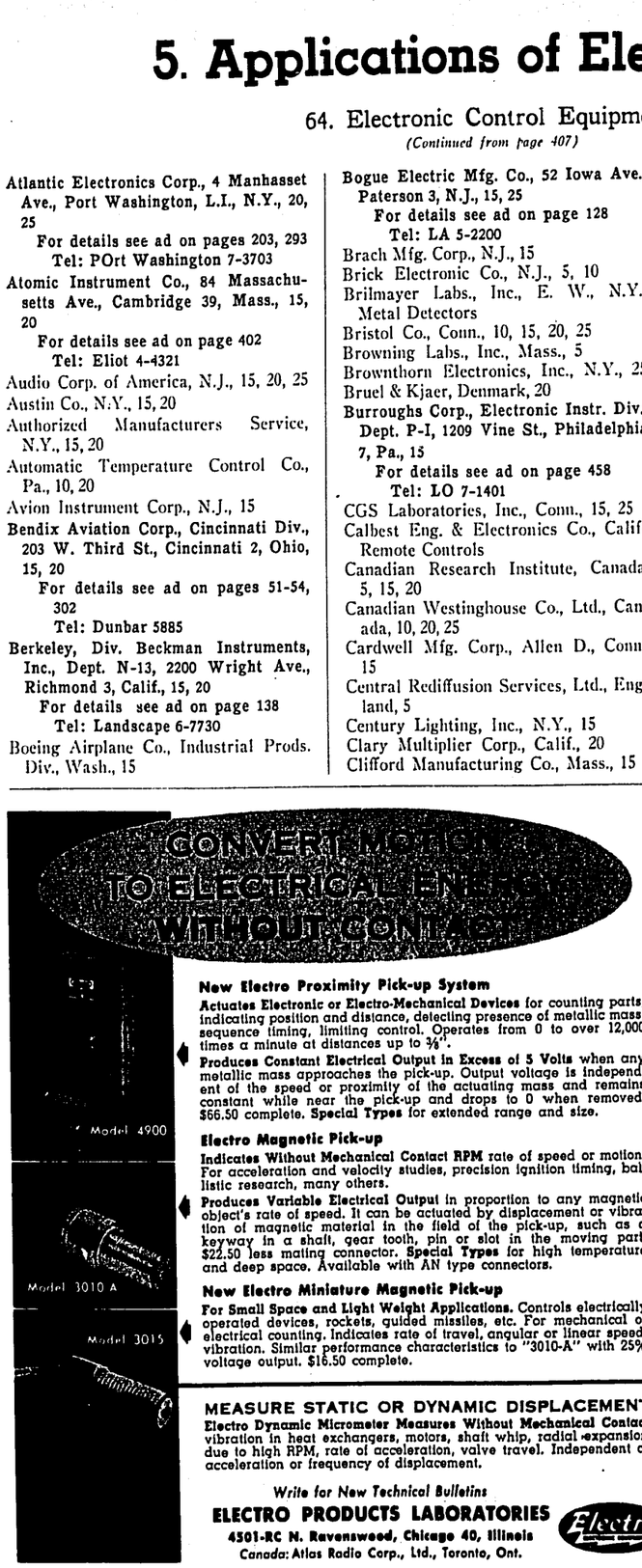
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Actuates Electronic or Electro-Mechanical Devices for counting parts, indicating position and distance, detecting presence of metallic mass, sequence timing, limiting control. Operates from 0 to over 12,000 times a minute at distances up to ¾".

Produces Constant Electrical Output in Excess of 5 Volts when any metallic mass approaches the pick-up. Output voltage is independent of the speed or proximity of the actuating mass and remains constant while near the pick-up and drops to 0 when removed. $66.50 complete. **Special Types** for extended range and size.

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Indicates Without Mechanical Contact RPM rate of speed or motion. For acceleration and velocity studies, precision ignition timing, ballistic research, many others.

Produces Variable Electrical Output in proportion to any magnetic object's rate of speed. It can be actuated by displacement or vibration of magnetic material in the field of the pick-up, such as a keyway in a shaft, gear tooth, pin or slot in the moving part. $22.50 less mating connector. **Special Types** for high temperature and deep space. Available with AN type connectors.

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For Small Space and Light Weight Applications. Controls electrically operated devices, rockets, guided missiles, etc. For mechanical or electrical counting. Indicates rate of travel, angular or linear speed, vibration. Similar performance characteristics to "3010-A" with 25% voltage output. $16.50 complete.

MEASURE STATIC OR DYNAMIC DISPLACEMENT

Electro Dynamic Micrometer Measures Without Mechanical Contact vibration in heat exchangers, motors, shaft whip, radial expansion due to high RPM, rate of acceleration, valve travel. Independent of acceleration or frequency of displacement.

Write for New Technical Bulletins

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Electro

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Pantek Co., Calif., 20
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For details see ad on page 357
Tel: AV 2-9550
Poly-Scientific Corp., Va., 15
Polyphase Instr. Co., Pa., 15
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 15, 25
For details see ad on page 166
Tel: ULster 2-6800
Potter Instrument Co., Inc., N.Y., 15, 20
Power Industries, Inc., 2611 Indiana Ave., Chicago 16, Ill., 15
For details see ad on 292
Tel: Calumet 5-1125
Power Transformer Co., Inc., N.J., 15
Presto Electric Co., Inc., N.J., 5
Process & Instruments, N.Y., 15
Radio Eng. Co., N.Y., 15
Radioactive Products, Inc., Mich., 20
Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., 15
For details see ad on page 406
Tel: TR 6-6000
Reliance Elec. & Eng. Co., Ohio, 25
Rese Engineering, Inc., Pa., 20
Research Electronics, Pa., 15, 20
Rich Electronics, Inc., Fla., 20, 25
Rich-Roth Labs., Conn., 15, 20, 25
Ripley Co., Inc., Factory St., Middletown, Conn., 5, 10, 20
For details see ad on page 277
Tel: 6-6679
Robinette Co., W. C., Calif., 25
Rockwell Eng. Co., Ind., 15, 25
Renar, Inc., Ill., 15
Scott, Inc., H. H., Mass., 15
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 15
For details see ad on page 236
Tel: FI 7-2810
Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y., 15, 25
For details see ad on page 417
Tel: Pioneer 6-0481
Servo-Tek Products Co., N.J., 15, 25
Signal Eng. & Mfg. Co., N.J., 10
Specialties, Inc., N.Y., 25
Square Root Mfg. Corp., N.Y., 15, 25
Standard Electronic Res. Corp., N.Y., 15, 20
Strandberg Eng. Labs., N.C., 15, Moisture
Streeter-Amet Co., 15, 20
Summit Electronics, Inc., N.J., 15
Sunvic Controls Ltd., England, 20
Synchro-Start Prods., Inc., Ill., Motor Controls
T. L. G. Electric Corp., N.Y., 15, 20, 25
Taller & Cooper, N.Y., 10
Telecomputing Corp., Calif., 15, 20
Telephonics Corp., N.Y., 5, 10, 15

(Continued on page 410)

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puts your product promotion monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 38,945 (ABC).

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5. Applications of Electronics

64. Electronic Control Equipment.

(Continued from page 409)

Teleregister Corp., Conn., 20
Telescreen Corp., Conn., 10
Teletronics Lab., Inc., N.Y., 15, 20
Thermistor Corp. of America, N.J., 10, 15
Thermo Instruments Co., Calif., 15
Transelectric Mfg. Co., Pa., 5
Transformer Technicians, Inc., Ill., 15
Triumph Mfg. Co., Ill., 15
Union Switch & Electric Corp., Sig. Div., Westinghouse, Pa., 15
United Control Corp., Wash., 15
U. S. Radium Corp., N.Y., 15
Vacuum-Electr. Eng. Co., N.Y., 20
Vectron, Inc., 402 Main St., Waltham, 54, Mass., 15, 25
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vickers Elec. Div., Vickers, Inc., Mo., 15
Victoreen Instrument Co., Ohio, 15
Virginia Electronics Co., D.C., 20
Vocaline Co. of America, Inc., Conn., 15
Walkirt Co., Calif., 15
Wang Laboratories, 296 Columbus Ave., Boston 16, Mass., 15
For details see ad on page 407
Tel: KE 6-0624
Weltronic Co., Mich., 15, 25
Western Gear Works, P.O. Box 182, Lynwood, Calif., 25
For details see ad on page 74
Tel: Nevada 6-2161
Westinghouse Electric Corp., Pa., 15
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 10
For details see ad on pages 98-99
Tel: BI 3-4700
Wilson & Co., G. C., W.Va., 15
Winter Engineer, T. Starling, N.J., 25
Worner Electr. Devices, Ill., 5, 10, 15, 20, 25
Wright Engineering Co., Calif., 20

65. Geophysical Apparatus.

5. Amplifiers
10. Complete exploration equipment
15. Control equipment
20. Microphones
25. Recording galvanometers

Aero Electronics Co., Ill., 5, 15
Air Associates, Inc., N.J., 15
American Electronic Labs., Inc., Pa., 5
Ampex Corp., 934 Charter St., Redwood City, Calif., Recording Equip.-Magnetic Tape Drum
For details see ad on pages 108-109
Tel: EMerson 8-1471
Applegate & Co., C. J., Colo., 5
Associated Research, Inc., Ill., Ground Resistance Meter
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on page 402
Tel: Eliot 4-4321

65. Geophysical Apparatus.

Automatic Temperature Control Co., Pa., 15
Borden Engineering Co., N.J., 10
Brush Electronics Co., Ohio, 5, 10, 15, 25
Canadian Research Institute, Canada, 5, 10, 15
Century Geophysical Corp., Okla., 5, 10, 15, 20, 25
Consolidated Engineering Corp., Calif., 25
Control Engineering Corp., Mass., 5, 15
Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., Recording Equipment
For details see ad on page 254
Tel: APpleton 7-1133
Daystrom Instrument, Pa., 5
Dressen-Barnes Corp., Calif., 10
Eastern Precision Resistor Corp., N.Y., 5
Edin Co., Inc., Dept. L., 207 Main St., Worcester 8, Mass., 5, 25
For details see ad on page 163
Tel: Worcester 7-8394
Electro-Voice, Inc., Mich., 20
Engineering Research Associates Div. Remington Rand, Inc., Minn., 5
Fisher Research Laboratory, Inc., Calif., 10
Furst Electronics, Ill., 5
Gates Radio Co., Ill., 5
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Georator Corp., Va., 10
Geotechnical Corp., Texas, 5, 15, 25, Seismographs
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 20
For details see ad on page 170
Tel: Metuchen 6-2800
Hathaway Instrument Co., Colo., 5, 10, 25
Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 25
For details see ad on page 466
Tel: PEarl 3-4691
Industrial Control Co., N.Y., 5, 15
Kalbfell Labs., Inc., Calif., 5
Ketay Mfg. Corp., N.Y., 15
Krohn-Hite Instrument Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on pages 2-3
Tel: University 4-4272
Magnex Corp., N.Y., 5
Measurement Engineering, Ltd., Canada, Aerial Scintillation Monitor & Detector
Menlo Research Lab., Calif., 10
Midwestern Geophysical Lab., Okla., 5, 10, 25
Miller Instruments, Inc., William, Calif., 5, 25
Millivac Instruments Corp., N.Y., 5
Morecroft Design Engineer, John H., Calif., 10, 15
National Geophysical Co., Inc., Texas, 5, 10

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

5. Applications of Electronics

65. Geophysical Apparatus.

Northern Elec. Co., Ltd., Canada, 5
Nuclear Res. Corp., Pa., 10
Offner Electr., Inc., Ill., 25
Petty Labs. Inc., Texas, 5, 10, 15, 20, 25
Plastics & Electr. Corp., N.Y., 5
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5
For details see ad on page 166
Tel: ULster 2-6800
Precision Radiation Instr., Inc., Calif., 10
Qutronic Transformer Corp., N.Y., 15
Radiation Counter Labs., Inc., Ill., 10
Rich Electr., Inc., Fla., 5, 15
Sanborn Co., 39 Osborn St., Cambridge 39, Mass., 25
For details see ad on page 228
Tel: KI 7-8460
Seismograph Service Corp., Okla., 5, 10, 25
Southwestern Indust. Electr. Co., Texas, 5, 10, 15, 20, 25
Statistical Instr. Co., N.Y., 5, 15
Taffet Radio & TV Co., N.Y., 5, 15
Telephonics Corp., N.Y., 20
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 5, 10, 15, 20, 25
For details see ad on page 226
Tel: DI 1781
Ultrasonic Corp., Mass., 15
Wright Engineering Co., Calif., 5, 10, 25

66. Induction Heating Equipment.

5. Brazing, soldering & welding
10. Dielectric heating
15. Induction heating

Air Associates, Inc., N.J., 10, 15
Airmec, Ltd., England, 5, 15
American Brass Co., Conn., 5
Anchor Metal Co., N.Y., 5
Canadian Research Institute, Canada, 5, 10, 15
Canadian Westinghouse Co., Ltd., Canada, 5, 10, 15
Central Rediffusion Services, Ltd., England, 10, 15
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5, 10, 15
For details see ad on pages 86-87
Tel: Livingston 6-1100
Eder Eng. Co., Wis., 10
Electrical Device Mfg. Co., N.J., 5, 10, 15
Electronic Heating Corp., Mass., 10, 15
Electronic Processes Corp., Calif., 10, 15
Electronic Research Mfg. Corp., Ohio, 5, 10

See also listings for
Soldering irons & guns 529
Welders and brazers 529
Solder 545

66. Induction Heating Equipment.

Electronica Industrial, Ltda., Brasil, 5, 10, 15
Engineering Research Dev. Co., Ill., 5, 10, 15
Erdco Eng. Corp., Ill., 10
Flamboro Instrument Co., Canada, 10
Fusion Eng., Ohio, 5, 10, 15
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15
Guild Electronics, Inc., N.Y., 10
Haydu Brothers, N.J., 5, 10, 15
Kabar Mfg. Corp., N.Y., 10, 15
Larose & Associates, Inc., W. T., N.Y., 10
Lepel High Frequency Labs., Inc., N.Y., 5, 15
Lund-Hansen Co., Ill., 15
Mahoney Teletronic Labs., Inc., N.J., 5, 10, 15
Marion Electrical Instr. Co., 408 Canal St., Manchester, N.H., 15
For details see ad on page 332
Tel: Manchester 5-6971
Miskella Infra-Red Co., Ohio, 5, 10, 15
New Rochelle Tool Corp., N.Y., 5, 10, 15
Olympic Metal Prods. Co., Inc., Third Ave., Alpha, N.J., 5
For details see ad on page 167
Tel: Phillipsburg 5-1193
Parker, Inc., G. I., R.I., 5, 10, 15
Peeco Corp., Calif., 10
Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 10, 15
For details see ad on pages 30-31
Tel: WAtkins 4-3633
Redifon, Ltd., England, 5, 10, 15
Reeve Electronics, Inc., Ill., 5, 10, 15
Resdel Eng. Corp., Calif., 10, 15
Rich Electronics, Inc., Fla., 10
Richardson Labs., Kenneth, N.Y., 10
Ronar, Inc., Ill., 10
Sherman Industrial Electronics Co., N.J., 5, 10, 15
Unitek Corp., 274 N. Halstead Ave., Pasadena 8, Calif., 5 Stored Energy Welders
For details see ad on page 534
Tel: SY 5-2377
Vacuum Tube Products, Calif., 5, Welding
Wall Mfg. Co., P., Pa., 5
Weltronic Co., Mich., 5, 10, 15
Westinghouse Electric Corp., Pa., 5, 10, 15
Westinghouse Electric Corp., Electronic Div., Md., 5, 10, 15

67. Medical Equipment.

5. Cardiographs
10. Diathermy
15. Electronic cauterizing
20. Electro-encephalographs
25. Stimulators

Altec Lansing Corp., Calif., Heart Microphone
American Electronic Labs., Inc., Pa., 25
Applegate & Co., C. J., Colo., 15, 25
Biophysical Instruments, Inc., Pa., 5

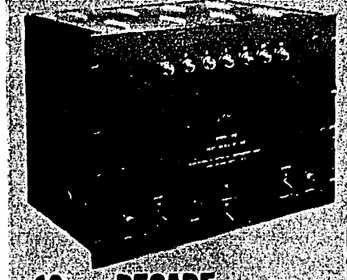
67. Medical Equipment.

Birtcher Corp., Calif., 10, 25
Brush Electronics Co., Ohio, 20
Canadian Research Institute, Canada, 10, 25
Coles Electronic Corp., Pa., 10, 15
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5
For details see ad on page 157
Tel: HAlifax 4-6487
Crest Labs., Inc., N.Y., 25
Dallons Labs., Inc., Calif., 10, 15, 25
Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 5, 20, 25
For details see ad on page 163
Tel: Worcester 7-8394
Egan Lab., N.Y., 20
Electrical & Physical Instrument Corp., 42-19 27th St., Long Island City, N.Y., 25
For details see ad on page 412
Tel: Stilwell 4-6389
Electrodyne Co., Mass., 25
Electro-Medical Lab., Inc., Vt., 20, 25
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 20
For details see ad on page 467
Tel: Chestnut Hill 7-6800
Electronics for Medicine, Inc., N.Y., Special
Erdco Eng. Corp., Ill., 10
General Electric Co., X-Ray Dept., Wis., 5, 10, X-Ray Equipment
Glenco Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 284
Tel: Metuchen 6-2800
Gorrell & Gorrell, N.J., 25
Grason-Stadler Co., Mass., 25
Grass Instrument Co., Mass., 20, 25
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 177
Tel: Metuchen 6-2800
Hathaway Instrument Co., Colo., 5
High Voltage Eng. Corp., Mass., X-Ray Generators
Holland Electronics, N.Y., 5, 25
Industrial Control Co., N.Y., 25
Industrial Development Labs., Inc., N.J., 5
Kilpatrick Electronics Lab., Pa., 5, 25
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 20, Myographs
For details see ad on page 312
Tel: MAtawan 1-2600
Levinthal Electronic Prods., Inc., Calif., 5, 20, 25
Liebel-Flarsheim Co., Ohio, 10, 15
Luckenbach & Co., Inc., Paul, N.Y., 10, 15, 25
Master Appliances, Inc., Ind., 10, Longwave
Medcraft Electronics Corp., N.Y., 20, 25
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 5, Ballistics
For details see ad on page 301
Tel: Terhune 5-3224
Metal Prods. Co., Tenn., 25
Meyer & Co., Hugo, N.Y., 10
Microtran Co., N.Y., 25
Naber Aviation Electronic Service, J. S., Ill., 25

(Continued on page 412)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10mc EPIC SCALERS
0.1 MICROSECOND RESOLUTION



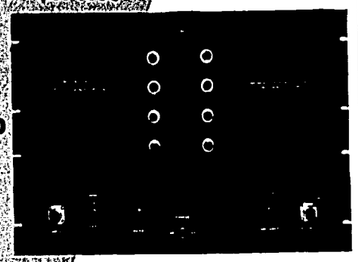
Other EPIC products available are—

- DECADE AND BINARY SCALING STRIPS (100 KC - 10MC)
- COUNTING AND TIMING EQUIPMENT
- CUSTOM DESIGN OF COUNTING SYSTEMS

Write for Details

10mc BINARY SCALER MODEL 410 $575.00

10mc DECADE SCALER MODEL 412 $695.00



FEATURES:

Resolving Time: 0.1 usec
Maximum Acceptable Uniform Rate: 10 mc or 10⁷ counts/sec.

POWER SUPPLY: Electronically regulated.

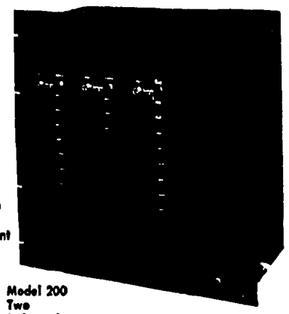
SCALE FACTOR: Model 410: BINARY Scale of 128. Model 412: Decade Scale of 100. Others: Upon request.

SIZE: Standard 19" rack mount. Modifications available to your specifications.

We will add any number of slow scaling stages and a register timer, etc., to suit your requirements.

APPLICATIONS:
Fast Nuclear Counting
High Frequency Measurements
Time Interval Measurements
Computer and pulse control work.
Extending other counter ranges.

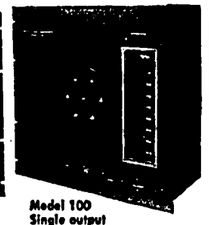
SQUARE PULSE GENERATORS
MILLIMICROSECOND TO MICROSECOND RANGE



Model 300 Three Independent outputs $575.00

Model 200 Two Independent outputs $495.00





Model 100 Single output $395.00

New Basic Test instruments for NUCLEAR, RADAR, TV, UHF and other fields employing FAST PULSE CIRCUITS

FEATURES:

Pulse Shape: Square.

Rise Time: One millimicrosecond 10% to 90% Amplitude.

Pulse Width: One millimicrosecond to several microseconds.

Pulse Amplitudes: 100 volts to 0.006 volts in one db fixed steps using precision RF attenuators. Higher and lower voltages also available.

Output Impedance: Matched to any impedance for standard coaxial lines. Multi-impedance outputs also available.

Push-to-push button for single pulse operation. Internal regulated power supply, and standard 19" rack mount or portable cases as desired. Also available modified to your specifications.

Write For Bulletin RD-4

EPIC ELECTRICAL and PHYSICAL INSTRUMENT CORPORATION
Engineering Division
42-19 27th STREET
L.I.C. 1, N.Y.
Tel.: Stillwell 4-6389

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

5. Applications of Electronics

67. Medical Equipment.

(Continued from page 411)

Offner Electronics, Inc., Ill., 20
Optionic Research, Inc., Mass., Blood Cell Counter Machine
Parker, Inc., G. I., R.I., 10
Penntronics, Pa., 20, 25
Petty Labs., Inc., Texas, 25 Oxymeters
Process & Instruments, N.Y., 25
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 10, 15, 25
For details see ad on page 210
Tel: Woodlawn 3-8000
Rich-Roth Labs., Conn., 30, Ultrasonic Therapy
Richardson Labs., Kenneth, N.Y., 25
Sanborn Co., 39 Osborn St., Cambridge 39, Mass., 5
For details see ad on page 228
Tel: KI 7-8460
Smith & Stone, Ltd., Canada, 5, 25
Standard Electronics Research Corp., N.Y., 25
Summit Electronics, Inc., N.J., 10
Teca Corp., N.Y., 25
Triumph Mfg. Co., Ill., 25
Vibro-Ceramics Corp., 212 Durham Ave., Metuchen, N.J., 5
For details see ad on page 451
Tel: Metuchen 6-2800
Waters Conley Co., Minn., 5
Wright Eng. Co., Calif., 5

68. Nuclear Equipment.

5. Pulse count integrators
10. Radiation detectors
15. Scalers

Admiral Corp., Ill., 10
Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 15
For details see ad on page 401
Tel: PRescott 8-3687
Airmec, Ltd., England, 10
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 10, 15
For details see ad on page 394
Tel: EV 6-5715
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15
For details see ad on page 402
Tel: Eliot 4-4321
Austin Co., N.Y., 5, 10, 15
Beckman Instruments, Inc., Beckman Div., 820 Mission St., S. Pasadena, Calif., 10
For details see ad on page 138
Tel: PYramid 1-2141
Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 10
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000

5. Applications of Electronics

68. Nuclear Equipment.

Bendix Aviation Corp., Cincinnati Div., 203 West Third St., Cincinnati 2, Ohio, 10
For details see ad on pages 51-54, 302
Tel: Dunbar 5885
Berkeley Div., Beckman Instruments, Inc., Dept. N-13, 2200 Wright Ave., Richmond 3, Calif., 10, 15
For details see ad on page 138
Tel: Landscape 6-7730
Biophysical Instruments, Inc., Pa., 10
Bruel & Kjaer, Denmark, 10, 15
Canadian Aviation Electronics, Ltd., Canada, 10
Canadian General Electric Co., Electronic Equip., Canada, 10, 15
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 10
For details see ad on pages 86-87
Tel: Livingston 6-1100
Cole Instrument Co., Calif., 5, 10
Consolidated Engineering Corp., Calif., 10
Corning Glass Works, N.Y., 10
Daystrom Instrument Div., Daystrom, Inc., Pa., 5, 15
Detecto Laboratory, Inc., Ill., 5, 10, 15
Detectron Corp., Calif., 10, 15
Digital Instrument Co., Inc., Fla., 15
Douglas Radio Laboratories, Mass., 5, 15
El-Tronics, Inc., Pa., 5, 10, 15
Electrical & Physical Instrument Corp., 42-19 27th St., Long Island City, N.Y., 15
For details see ad on page 412
Tel: Stillwell 4-6389
Electronic Products Co., N.Y., 10
Fisher Research Laboratory, Inc., Calif., 10
Franklin Electronics, Inc., Pa., 5, 15
Freed Electronics & Controls Corp., N.Y., 10
General Electric Co., N.Y.C., N.Y., 10
General Electric Co., N.Y., 10, 15
General Electric Co., Apparatus Sales Div., N.Y., 10
Glens Falls Lab., Inc., N.Y., 10
Hansen Co., W. M. Mich., 10
Harris Electronic Laboratories, N.Y., 10
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 15
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Librascope, Inc., Calif., 10
Magnex Corp., N.Y., 5, 10
Manufacturers Engineering and Equipment Corp., 5 Sunset Lane, Hatboro, Pa., 10
For details see ad on page 473
Tel: HAtboro 2643-4
Marconi Instruments, Ltd., N.Y., 10
Measurement Eng., Ltd., Canada, 10
Menlo Research Lab., Calif., 10
Metrotype Corp., Ill., 5
Multi-Tron Lab., Ill., 10
North American Philips Co., Inc., N.Y., 5, 10, 15
Nuclear Development Laboratory, Mo., 10
Nuclear Instr. & Chemical Corp., Ill., 10, 15
Nuclear Research Corp., Pa., 5, 10
Nuclear Research & Dev. Co., Mo., 5, 10, 15
Nuclear Specialty Co., N.Y., 15
Ohmart Corp., The, Ohio, 10
Pacific Transducer Re Corp., Calif., 10
Potter Instr. Co., Inc., N.Y., 15
Precision Radiation Instr., Inc., Calif., 10
R-C Scientific Instr. Co., Inc., Calif., 5, 10, 15
Radiation Counter Labs., Inc., Ill., 5, 10, 15
Radiation Instrument Dev. Lab., Ill., 5, 10, 15
Radioactive Products, Inc., Mich., 5, 10, 15
Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 15
For details see ad on page 210
Tel: Woodlawn 3-8000
Resdel Eng. Corp., Calif., 10
Special Instrument Laboratory, Inc., Tenn., 10
Specialty Eng. Div., Specialty Assembling and Pack., N.Y., 10
Standard Electronics Research Corp., N.Y., 10
Statistical Instr. Co., N.Y., 5
Technical Associates, Calif., 5, 10, 15
Tracerlab, Inc., Mass., 5, 10, 15
U. S. Radium Corp., N.Y., Radiation Sources
Victoreen Instrument Co., Ohio, 10
Walkirt Co., Calif., 15
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 10
For details see ad on page 230
Tel: Malden 2202
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 10
For details see ad on pages 98-99
Tel: BI 3-4700
Williams, Brown & Earle, Inc., Pa., 10
Wood Counter Lab., N., Ill., 10
Wright Eng. Co., Calif., 5, 10, 15

69. Servo-Mechanisms.

5. Controls
10. Gears, gear-trains, etc.
15. Servo amplifiers
20. Servo motors & generators

Aero Electronics Co., Ill., 15
Aeroflex Laboratories, Inc., N.Y., 5, 15
Aerojet Engineering, Calif., 5, 10, 20
Ahrendt Instrument Co., Md., 5, 10, 15
Air Associates, Inc., N.J., 5, 15
Airborne Accessories Corp., N.J., 5, 15, 20
Air-Marine Motors, Inc., 369 Bayview Ave., Amityville, L.I., N.Y., 20
For details see ad on page 336
Tel: AMityville 4-6122
Alcar Instruments, Inc., N.J., 5, 10
Allard Instrument Corp., N.Y., 20
American Electronic Laboratories, Inc., Pa., 15
American Electronic Manufacturing, Calif., 15
American Machine & Foundry Co., N.Y., 10
Arma Corp., Roosevelt Field, Garden City, L.I., N.Y., 5, 15, 20
For details see ad on page 407
Tel: Pioneer 2-2000
Askania Regulator Co., Ill., 5
Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 15
For details see ad on pages 203, 293
Tel: POrt Washington 7-3703
Atlas Engineering Co., Inc., Mass., 15
Austin Co., N.Y., 5
Automatic Temperature Control Co., Pa., 15
Avion Instrument Corp., N.J., 5.
Beckman Instruments, Inc., Beckman Div., 820 Mission St., S. Pasadena, Calif., 15
For details see ad on page 138
Tel: PYramid 1-2141
Bendix Aviation Corp., Computer Div., 5630 Arbor Vitae St., Los Angeles 45, Calif., 15
For details see ad on pages 51-54, 302
Tel: Oregon 8-2128
Bendix Aviation, Eclipse-Pioneer Div., Teterboro, N.J., 5, 15, 20
For details see ad on pages 51-54
Tel: Hasbrouck Heights 8-3698
Bendix Aviation, Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 15, 20
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651
Boeing Airplane Co., Indust. Prods. Div., Wash., 15
Bone Engineering Corp., Calif., 10, 15
Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., 5, 10, 15, 20
For details see ad on page 140
Tel: Janesville 6616
Bowman Instrument Corp., Ind., 10
Brach Mfg. Corp., N.J., 5, 15
Brevel Prods. Corp., N.Y., 10, 20
Bristol Co., Conn., 5, 15
Brush Electronics Co., Ohio, 15
Bunnell & Co., J. H., N.Y., 10
C and H Sales Co., Calif., 15, 20
Capehart-Farnsworth Co., Ind., 5, 15
Cardwell Mfg. Corp., Allen D., Conn., 5, 10, 15
Century Lighting, Inc., N.Y., 5, 15
Clarostat Mfg. Co., Inc., 975 Washington St., Dover, N.H., 5
For details see ad on pages 100-101
Tel: Dover 975
Clifford Manufacturing Co., Mass., 5, 15
Clifton Precision Products Co., Inc., Pa., 20
Communication Accessories Co., 110 St. and Hillcrest Rd., Hickman Mills, Mo., 15
For details see ad on pages 80-81
Tel: South 5528

(Continued on page 415)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

Kearfott

SINCE 1917

PRECISION COMPONENTS IN PRODUCTION



(shown ⅛ size)

GYROS

3 Gyro Platforms, Floated Rate Integrating Gyros, Vertical, Free, Directional, Rate Gyros and Gyro operated Rate Switches—compact, lightweight, hermetically sealed.



(shown ¼ size)

SYNCHROS

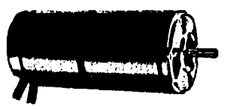
Transmitters, Control Transformers, Resolvers, Repeaters, and Differentials in Bu Ord Sizes 15, 11 and 8. High accuracy and environmental resistance.



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ELECTRONICS

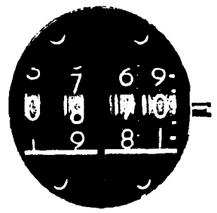
Miniature and subminiature Servo Amplifiers and Magnetic Amplifiers "potted" for convenience of installation and long life.



(shown ½ size)

SERVO MOTORS

High torque, low inertia Servo Motors, Servo Motor-Generators, Inertial and Viscous damped Servo Motors 31-32" to 1¾" Diameter.



(shown full size)

MECHANICAL DEVICES

Counters, Electro-Mechanical Computers, Hermetic Rotary Seals, Aircraft Instruments and High Temperature Resistant, Chemically Inert, Machinable Ceramics.

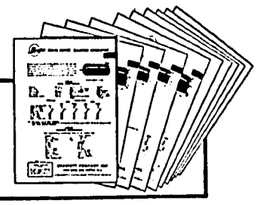
SYSTEMS

Aircraft Navigational Systems

Industrial Servo Systems

Servo Analog-to-Digital, Digital-to-Analog Converters

Electro-Hydraulic Servo Systems



Bulletin giving physical and technical data on the various Kearfott Products will be sent on request. The Kearfott organization is available to assist in the development and manufacture of other precision components you may require.

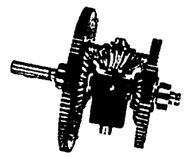
KEARFOTT COMPANY, INC., LITTLE FALLS, N. J.

Sales and Engineering Offices: 1378 Main Avenue, Clifton, N. J. West Coast Office: 253 N. Vinedo Avenue, Pasadena, Calif.
South Central Office: 6115 Denton Drive, Dallas, Texas Mid West Office: 188 W. Randolph Street, Chicago, Ill.

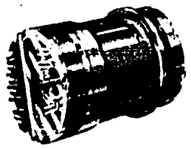
A GENERAL PRECISION EQUIPMENT CORPORATION SUBSIDIARY

FORD INSTRUMENT COMPONENTS

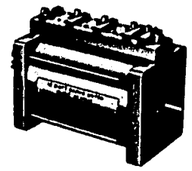
Ford Instrument Company makes the finest precision instruments and mechanisms for industry and the armed forces.



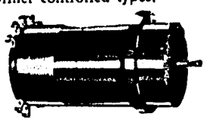
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FORD SERVO MOTORS (60 and 400 cycles) for extremely low inertia and high frequency response. 1/5; ½; 1½; 2½; 5; 10-watt models in both low and high voltage, including magnetic amplifier controlled types.



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Mechanical Integrators
Magnetic Clutches and Brakes
Precision Cams • Rate Generators

30

FORD INSTRUMENT COMPANY
Division of The Sperry Corporation
31-10 Thomson Ave.
Long Island City 1, N. Y.

5. Applications of Electronics

69. Servo-Mechanisms.

(Continued from page 413)

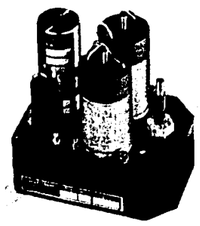
Computing Devices of Canada, Ltd., Canada, 15
Continental Radio & Electrical Eng., S. Africa, 15
Control Components Co., Mass., 15
Control Electronics Co., Inc., 1925 New York Ave., Huntington, L.I., N.Y., 5, 15
For details see ad on page 317
Tel: Hunt. 4-7961
Control Engineering Corp., Mass., 5, 10, 15, 20
Controlectric, N.Y., 5, 15
Corbin Corp., Md., 5, 15
Custom Gear Co., Ind., 10
Daystrom Instrument, Pa., 5, 10, 15
Deen Associates, Inc., 2 John St., New York 38, N.Y., 5
For details see ad on page 487
Tel: RE 2-1464
De Coursey Engineering Lab., P.O. Box 235, Los Angeles 25, Calif., 15
For details see ad on page 291
Tel: Arizona 3-2530
Detroit Controls Corp. Res. Div., Calif., 5
Doelcam Corp., Mass., 5, 15, 20
Donner Scientific Co., Calif., 15
Duncan & Bayley Div., N.Y., 15, Actuators
Eastern Air Devices, Inc., N.H., 20
Eby Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 15
For details see ad on page 370
Tel: Davenport 4-7000
Eder Engineering Co., Wis., 10
El-Tronics, Inc., Pa., 15
Electromec, Inc., Calif., 10
Electronic Associates, Inc., N.J., 5, 15
Empire State Laboratories, Inc, N.Y., 10, 15
Engineering & Research Corp., Md., 15
Federal Telephone & Radio Co., Div., of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 5, 15, 20
For details see ad on pages 32-37
Tel: Nutley 2-3600
Feedback Controls, Inc., D.C., 5, 10, 15
Fidelity Instrument Corp., Pa., 5, 10, 15
Fog-O-Scope, Inc., Ill., 15
Ford Instr. Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 5, 10, 15, 20
For details see ad on page 415
Tel: ST 4-9000
Freed Electronics & Controls Corp., N.Y., 5, 10, 15
G-M Labs., Inc., Ill., 20
General Electric Co., N.Y.C., N.Y., 5, 15
General Electric Co., N.Y., 5, 15
General Electric Co., Apparatus Sales Div., N.Y., 15, 20
General Magnetics, Inc., N.J., 15
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 5, 15, 20
For details see ad on page 188
Tel: Pleasantville 2-2000
Gibbs Mfg. & Research Corp., Wis., 15
Gleason-Avery, Inc., N.Y., 20
Globe Indust., Inc., Ohio, 5, 10, 20
Gorrell & Gorrell, N.J., 10
Gries Reproducer Corp., N.Y., 10
Hanson-Gorrill-Brian, Inc., N.Y., 5, 10, 15
Heller Co., Gerald K., Md., 20
Hertner Electric Co., Ohio, 20
Howard Industries, Inc., Wis., 20
Hufford Machine Works, Inc., Elec. Div., Calif., 15
Hycon Mfg. Co., Calif., 5, 15
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I-T-E Circuit Breaker Co., Pa., 10
Induction Motors Corp., N.Y., 10, 20
Industrial Control Co., N.Y., 5, 10, 15
Industrial Research Labs., Md., 15
Industrial Test Equipment Co.,.55 E. 11 St., New York 3, N.Y., 15
For details see ad on page 471
Tel: GRamercy 3-4684
Infra Electronic Corp., 555 Eagle Rock Ave., Roseland, N.J., 5, 10, 15, 20
For details see ad on page 335
Tel: Caldwell 6-4300
Instrument Motors, Conn., 20
Iron Fireman Mfg. Co., Electronic Div., Ore., 20
Kaiser Metal Prods. Co., Inc., Pa., 5, 15
Kalbfell Labs., Inc., Calif., 5, 15
Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 5, 10, 15, 20
For details see ad on page 414
Tel: Little Falls 4-1600
Ketay Mfg. Corp., N.Y., 5, 10, 15, 20
Kilpatrick Electronic Lab., Pa., 5, 15
Kollmorgen Optical Corp., Mass., 5, 10, 15, 20
Kollsman Instrument Corp., Div. Standard Coil Products Co., 80-08 45 Ave., Elmhurst 73, N.Y., 20
For details see ad on page 216
Tel: NEwtown 9-2900
Krohn-Hite Instruments Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 15, Servo Design Filters
For details see ad on pages 2-3
Tel: UNiversity 4-4272
Langevin Mfg. Corp., 37 W. 65 St., New York 23, N.Y., 15
For details see ad on pages 116-117
Tel: ENdicott 2-7200
Lear, Inc., Learcal Div., Calif., 5, 15, 20
Lear, Inc., Calif., 10, 15, 20
Lewyt Corp., N.Y., 15
Librascope, Inc., Calif., 5, 10, 15
Link Aviation, Inc., N.Y., 5, 10, 15
Loral Electronics Corp., Dept. ID 54, 794 E. 140 St., New York 54, N.Y., 10, 15
For details see ad on page 198
Tel: CY 2-1800
Magnavox Co., Dept. 82, 2131 Bueter Rd., Fort Wayne 4, Ind., 15
For details see ad on page 248
Tel: E 5471
Magnetics, Inc., Dept. I-11, Box 230, Butler, Pa., 15
For details see ad on page 306
Tel: Butler 7-1745

(Continued on page 417)

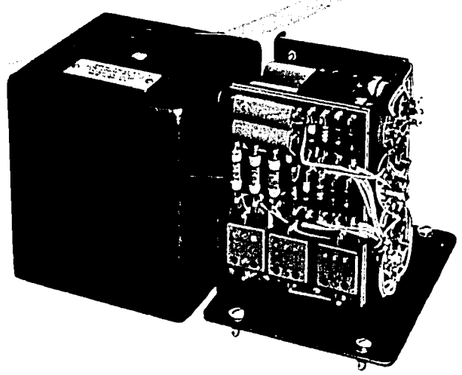
PRECISION

Servo Systems

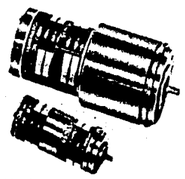
AND COMPONENTS



MOTOR-DRIVEN
INDUCTION GENERATOR,
GEAR TRAIN & SYNCHRO
COMBINATIONS



SERVO AMPLIFIERS

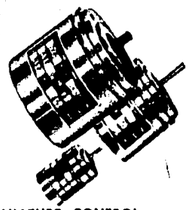


MOTOR-DRIVEN
INDUCTION GENERATORS

Transicoil servo systems feature integrated design—every component is made to match all the others . . . coordinated to insure maximum efficiency and top performance.

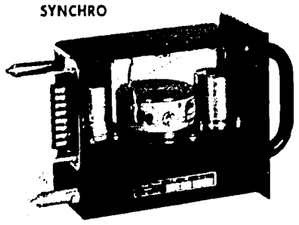
For systems of your own design, Transicoil can supply precision components designed to meet your requirements . . . their effectiveness limited only by the restrictions you impose.

Complete data will be sent on request.



MINIATURE CONTROL
MOTORS

PLUG-IN ASSEMBLIES OF
CONTROL MOTOR, GEAR
TRAIN, POTENTIOMETER &
SYNCHRO



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CORPORATION 107 Grand Street
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PACKAGED ELECTRONIC COMPONENTS

for design and production

ECONOMY

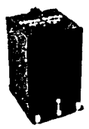
Servomechanisms, Inc., pioneers in the "packaged function" technique, offers the economy-minded designer and manufacturer of electronic and electromechanical control systems, outstanding savings in development and production costs through the use of plug-in electronic components. These standard plug-in components may be used immediately in the laboratory breadboard stage or in quantity production, thus relieving the user of design and production problems and reducing the electronic plug-in components to a purchased parts status. This advanced design philosophy provides a new standard of ***reliability, interchangeability,*** and ***ease of maintenance.*** Servomechanisms, Inc., facilities are available for the development and production of special "packaged electronic functions" and complete systems.



SERVO AMPLIFIERS



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POWER SUPPLIES



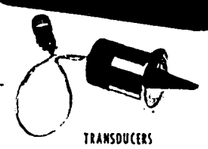
MODULATORS



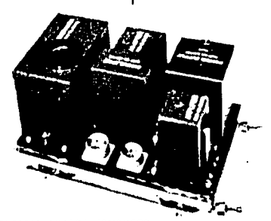
POSITIONING MECHANISMS



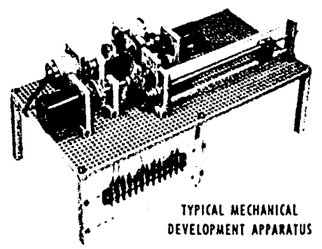
MINIATURE
SERVO MOTORS



TRANSDUCERS



A TYPICAL ANALOG COMPUTER



TYPICAL MECHANICAL
DEVELOPMENT APPARATUS

SERVOmechaNISMS INC.
PACKAGED FUNCTIONAL COMPONENTS

PLUG-IN COMPONENTS
ARE AVAILABLE FOR 60 CYCLE
AND 400 CYCLE APPLICATIONS.

FOR FURTHER INFORMATION
ON SPECIFIC APPLICATIONS,
WRITE TO DEPT. CLO.

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EL SEGUNDO DIVISION.....316 WASHINGTON ST., EL SEGUNDO, CALIF.
COMPONENTS DIVISION .....625 MAIN ST., WESTBURY, N.Y.

5. Applications of Electronics

69. Servo-Mechanisms.

(Continued from page 415)

Magnetic Amplifiers, Inc., N.Y., 5, 15
Mark Electronic, Inc., N.J., 15
Marshall Eng., Electronic Div., Calif., 15
Maxson Corp., W. L., N.Y., 5, 10, 15, 20
McKenna Labs., Calif., 5
McNeal, J. D., Conn., 5, 15
Metrotype Corp., Ill., 5
Midwestern Geophysical Lab., Okla., 15, Servovalve
Minneapolis-Honeywell Regulator Co., Minn., 5, 15, 20
Minneapolis-Honeywell Reg., Ind. Div., Pa., 15, 20
Mission-Western Engineers, Inc., Calif., 5, 10, 15, 20
Moseley Co., F. L., 409 N. Fair Oaks Ave., Pasadena 3, Calif., 10, 15
For details see ad on page 452
Tel: Sycamore 5-4606
Motordyne, Inc., Calif., 20
Muirhead & Co., Ltd., England, 5, 15, 20
Newton Co., The, Conn., 5, 10, 15
Norden Labs. Corp., Conn., 5, 10, 15
Offner Electronic, Inc., Ill., 5, 15
Ortho Filter Corp., 196 Albion Ave., Paterson 2, N.J., 15
For details see ad on page 321
Tel: MUlberry 4-5858
Oster Mfg. Co., John, 1 Main St., Racine, Wis., 20
For details see ad on page 337
Tel: RAcine 3-6331
Otis Elevator Co., N.Y., 5, 10, 15
P. M. Industries, Conn., 5, 10
PSC Applied Res., Ltd., Canada, 15
Parsons Co., Ralph M., Calif., 15
Penn East Eng. Corp., P.O. Box 240, Kutztown, Pa., 5, 15
For details see ad on pages 203, 293
Tel: Kutztown 2675
Phebco, Inc., Md., 15
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 15
For details see ad on page 166
Tel: ULster 2-6800
Radex Corp., Ill., 20
Radiation, Inc., PO Drawer Q, Melbourne, Fla., 15
For details see ad on page 525
Tel: MElbourne 800
Radio Corp. of America, Eng. Prod. Dept., Camden, N.J., 5, 10, 15
For details see ad on page 210
Tel: WOodlawn 3-8000
Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., N.Y., 5, 10, 15
For details see ad on page 406
Tel: TR 6-6000
Reflectone Corp., The, Conn., 15
Regulator Equip. Corp., N.J., 15
Renbrandt, Inc., Mass., 10
Resdel Eng. Corp., Calif., 15
Research Dev. Manufacture, Inc., Pa., 10
Research Instrument Co., Inc., N.Y., 10
Rich-Roth Labs., Conn., 5

(Continued on page 418)

5. Applications of Electronics

69. Servo-Mechanisms.

(Continued from page 417)

Robinette Co., W. C., Calif., 15, Complete Systems
Rockwell Eng. Co., Ind., 5, 15
Rynel Corp., Ill., 10
Sanders Assoc., Inc., N.H., 5, 15
Self Winding Clock Co., Inc., N.Y., 10
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 5, 10, 15
For details see ad on page 236
Tel: FI 7-2810
Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y., 5, 10, 15, 20
For details see ad on page 417
Tel: Pioneer 6-0481
Servo-Tek Prods. Co., N.J., 5, 15, 20
Simmonds Aerocessories, Inc., N.Y., 5
Specialties, Inc., N.Y., 5, 15
Standard Coil Prods. Co., Inc., Calif., 15, 20
Statistical Instr. Co., N.Y., 5
Strandberg Eng. Labs., N.C., 5
Streeter Amet Co., Ill., 5
Suffolk Prods. Corp., N.Y., 10
Superex Electronic Corp., N.Y., 15
Szekely & Assoc., Inc., O. E., Pa., 10
T. L. G. Electric Corp., N.Y., 15
Taffet Radio & TV Co, N.Y., 5, 15
Taller & Cooper, N.Y., Custom
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 5, 15
For details see ad on page 226
Tel: DI 1781
Trans-Sonics, Inc., Mass., 5
Transicoil Corp., 107 Grand St., New York 13, N.Y., 10, 15, 20
For details see ad on page 416
Tel: WOrth 2-2347
Transmitter Equip. Mfg. Co., Inc., N.Y., 15
Ultrasonic Corp., Mass., 10, 15
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 15, 20
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vickers Electric, Div. Vickers, Inc., Mo., 15
Viking Electric Co., Calif., 20
Walker Consulting Eng., J. R., Mich., 15
Western Gear Works, P.O. Box 182 Lynwood, Calif., 10
For details see ad on page 74
Tel: Nevada 6-2161
White Industries, Inc., N.Y., 10
White-Rodgers Electric Co., Mo., 5, 15
Winters, T. Starling, Engineer, N.J., 5, 10, 15
Wright Eng. Co., Calif., 15

70. Telemetering Equip.

5. Data recorders
10. Data storage mechanisms
15. FM/FM modulators

Air Associates, Inc., N.J., 5, 10
Alcor Electronics Corp., N.Y., 15
Alden Electronic & Impulse Recording Equip., Washington St., Westboro, Mass., 5
For details see ad on page 296
Tel: Westboro 467
Altec Lansing Corp., N.Y., 5, 15, 20, 25
Ampex Corp., 934 Charter St., Redwood City, Calif., 5
For details see ad on page 108
Tel: EMerson 8-1471
Anelex Corp., N.H., 5
Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J., 5
For details see ad on page 174
Tel: Plainsboro 3-4141
Asco Sound Corp., N.Y., 5, 10, 15, 20, 25
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5, 10
For details see ad on page 402
Tel: Eliot 4-4321
Audio Prods. Corp., 2265 Westwood Blvd., Los Angeles 64, Calif., 15
For details see ad on page 139
Tel: BRadshaw 2-4266
Austin Co., N.Y., 5

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into 608 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 used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

5. Applications of Electronics

70. Telemetering Equipment.

Authorized Manufacturers Service, N.Y., 5, 10
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For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 15
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651
Bristol Co., Conn., 5
Brush Electronics Co., Ohio, 5, 10
CGS Laboratories, Inc., Conn., 15
Canadian Gen. Elec. Co., Electr. Equip., Canada, 5
Cardwell Mfg. Corp., Allen D., Conn., 15
Century Geophysical Corp., Okla., 5
Clary Multiplier Corp., Calif., 5, 10
Consolidated Engineering Corp., Calif., 5, 10
Control Engineering Corp., Mass., 5
Corbin Corp., Md., 15
Crown Engineering, N.M., 15
DX Radio Prods. Co., Ill., 10
Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., 5, 10, 15
For details see ad on page 256
Tel: Appleton 7-1133
Daystrom Instrument, Pa., 5, 10
Digital Instrument Co., Inc., Fla., 5
Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 5
For details see ad on page 163
Tel: Worcester 7-8394
Electro Data Corp., Calif., 10
Electro-Mechanical Res., Inc., Conn., 15, and Discriminators
Electronic Engr. Co. of California, Calif., 5, 15
Endevco Corp., Calif., 5
Engineering Research Asso., Div. Rem. Rand, Inc., Minn., 5, 10
Eprad Co., Inc., Ohio, 5, Drive-In Theatre
Epsco, Inc., 126 Massachusetts Ave., Boston 15, Mass., 5, 10
For details see ad on page 318
Tel: CO 6-3228
Federal Telecommun. Labs., Div. I T & T, N.J., 5, 10
Fischer & Porter Co., Pa., 5
Freed Electronics & Controls Corp., N.Y., 5, 10, 15
General Electric Co., Apparatus Sales Div., N.Y., 5, 10, 15
Genisco, Inc., Calif., 5
Harmon Electronics Co., Mo., 15
Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 5
For details see ad on page 466
Tel: PEarl 3-4691
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 5
For details see ad on page 488
Tel: CHelsea 2-7855
Hollander, Gerhard Ludwig, Mass., 5, 10
Hycon Mfg. Co., Calif., 15
Industrial Electronic of Canada, Ltd., Canada, 5, 10
Insuline Corp. of America, N.H., 15
Jacobs Instr. Co., Md., 5, 10
Kalbfell Labs., Inc., Calif., 5
Kollsman Instrument Corp., Div. Standard Coil Products Co., 80-08 45 Ave., Elmhurst 73, N.Y., 5, 10
For details see ad on page 216
Tel: NEwtown 9-2900
Lear, Inc., Calif., 5
Lenkurt Electric Co., Inc., Calif., 15
Leupold & Stevens Instruments, Inc., Ore., 5
Lewyt Corp., N.Y., 15
Loral Electronic Corp., Dept. ID54, 794 E. 140 St., New York 54, N.Y., 5
For details see ad on page 198
Tel: CY 2-1800
Magnecord, Inc., Ill., 5, 10, 15
Maxson Corp., W. L., N.Y., 5
Metrotype Corp., Ill., 5, 10
Midwestern Geophysical Lab., Okla., 5
Miller Instr., Inc., William, Calif., 5, 10, 15
Motorola Communication & Electric, Inc., Ill., 5
Otis Elevator Co., Electronic Div., N.Y., 5, 10
Parsons Co., Ralph M., Calif., 15
Phebco, Inc., Md., 15
Potter Instrument Co., Inc., N.Y., 5, 10
Presto Recording Corp., P.O., Box 500, Paramus, N.J., 5
For details see ad on page 252
Tel: DIamond 3-5700
Radiation, Inc., PO Drawer Q, Melbourne, Fla., 5
For details see ad on page 525
Tel: MElbourne 800
Resdel Eng. Corp., Calif., 15
Ribet Dejardin, France, 15
Rosen Eng. Prods., Inc., Raymond, Pa., 10, 15
Sanders Assoc., Inc., N.H., 15
Scientific Specialties Corp., Mass., 5
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 5, 10
For details see ad on page 246
Tel: FI 7-2810
Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y., 5
For details see ad on page 417
Tel: Pioneer 6-0481
Shepard Labs., N.J., Decoder and Printer
Stancil-Hoffman Corp., Calif., 5
Streeter Amet Co., Ill., 5
Taller & Cooper, N.Y., 5
Teleregister Corp., Conn., 5, 10
Ultrasonic Corp., Mass., 5
Vari-L Co., Inc., 434 Fairfield Ave., Stamford, Conn., 15
For details see ad on page 392
Tel: 48-0091
Wright Eng. Co., Calif., 5, 10

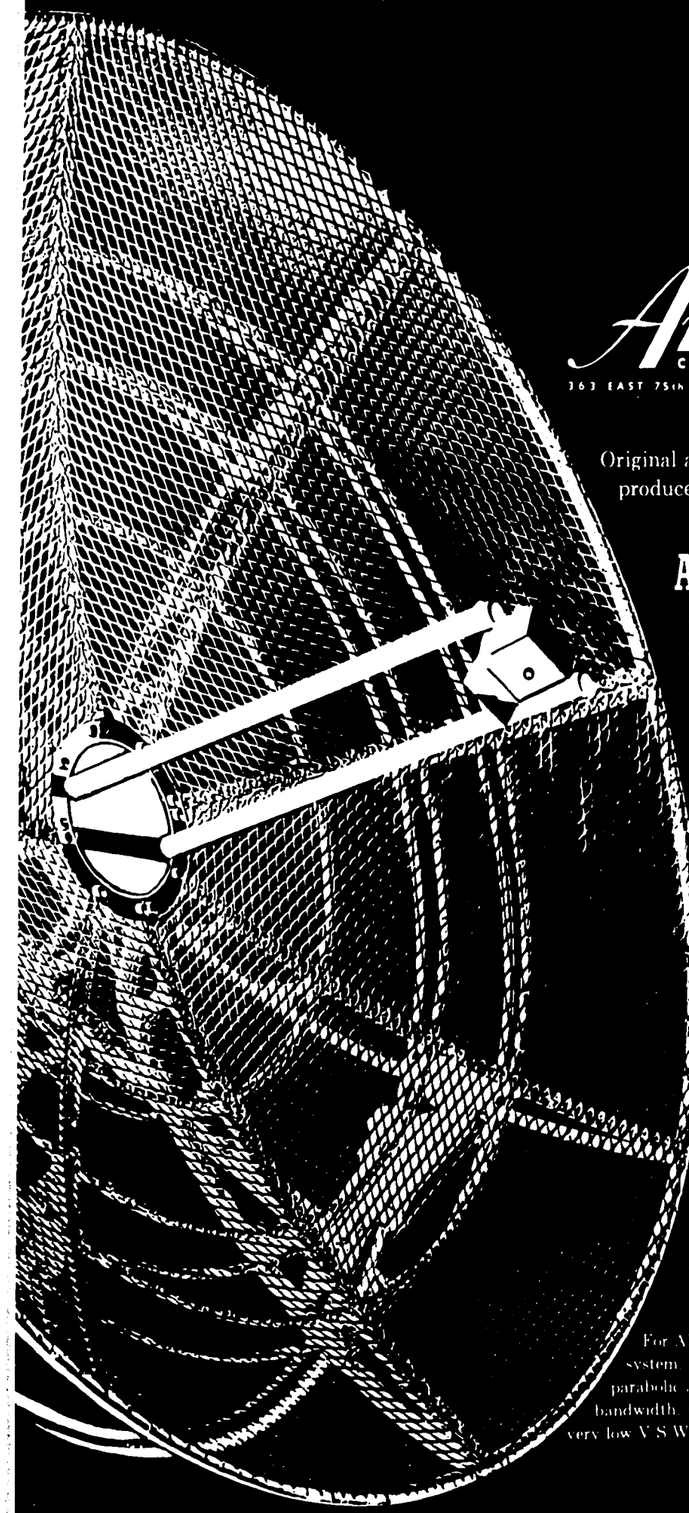
For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.



Andrew
CORPORATION
363 EAST 75th STREET · CHICAGO 19

Original antenna system specially produced for the Military

A MAJOR ANDREW ENGINEERING-PRODUCTION ACHIEVEMENT.

Only one of many proofs-in-use that Andrew is thoroughly qualified to take on your major *antenna* design-production projects.

Only Andrew offers you such extensive facilities exclusively devoted to the design and manufacture of complete antenna systems for communications including Andrew designed and produced flexible and semi-flexible coaxial cables and rigid transmission lines.

For AN/TRC-29 Military Microwave system: an 8' aluminum mesh parabolic antenna unique for its bandwidth, 1700-2400 MC. Very low V.S.W.R.

A Directory of

6. Radar, Microwave, UHF Equipment



4 Major Groups

19 Products

Organized by functions for Engineers

The Ultra-Highs have brought into being a set of equipment, mostly used for military purposes. In this particular directory we list both equipment and components which belong specially to this area of the spectrum.

Of all our groups, this one promises to expand the most in the future. The reader is also referred to basic groups 2, 3, & 5.

71 Antennas.
- 05 Feed systems
- 10 Receiving
- 15 Reflectors
- 20 Rotating mechanisms
- 25 Transmitting

72 Receivers.
- 05 Microwave relay
- 10 Position indicators
- 15 Radar

73 Transmitters.
- 05 Microwave
- 10 Microwave relay
- 15 Radar

74 Waveguides & Accessories.
- 05 Couplings
- 10 Flexible waveguides
- 15 Hybrid junctions
- 20 Microwave attenuators
- 25 Rigid waveguides
- 30 Sampling lines, reflectors, etc.
- 35 Switches
- 40 Transmission lines

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

71. Antennas.

5. Feed systems
10. Receiving
15. Reflectors
20. Rotating mechanisms
25. Transmitting

Aeronautical Communications Equip., Fla., 20

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5
For details see ad on page 429
Tel: Linden 3-1000

Alliance Manufacturing Co., Ohio, 20

Allied Research & Eng., Inc., Calif., 5, 10, 25

Amerac Inc., Mass., 5, 15, 20

American Electronic Labs., Inc., Pa., 10, 25

American Machine & Foundry Co., N.Y., 5, 10, 15, 20, 25

American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 5
For details see ad on page 130
Tel: Bishop 2-1000

American Screen Prods. Co., Fla., 10, 15, 20

Andrew Corp., 363 E. 75 St., Chicago 19, Ill., 5, 10, 15, 25
For details see ad on page 420
Tel: TR 4-4400

Bart Labs. Co., Inc., Dept. IRE-54, 227 Main St., Belleville 9, N.J., 10
For details see ad on page 492
Tel: PLymouth 9-0200

Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 20, 25
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651

Bludworth Marine Division, N.Y., 25

Boeing Airplane Co., Indust. Prods. Div., Wash., 5, 10, 15, 25

Bogart Mfg. Corp., N.Y., 5, 10, 15, 20, 25

Bogen Co., Inc., David, N.Y., 5, UHF

Bone Engineering Corp., Calif., 5, 20

Brach Mfg. Corp., N.J., 10, 15, 20, 25

Brooks & Perkins, Inc., Mich., 15

Budd-Stanley Co., Inc., 43-01 22 St., Long Island City 1, N.Y., 5, 10, 25
For details see ad on page 428
Tel: STillwell 6-1706

C and H Sales Co., Calif., 20

Camera Equipment Co., N.Y., 20

Canadian General Electric Co., Electr. Equip., Canada, 5, 10, 15, 20, 25

Canoga Corp., Calif., 5, 10, 15, 20, 25

Capehart-Farnsworth Co., Ind., 10, 25

Century Electr. Div., Century Metalcraft, Calif., 5, 10, 15, 20, 25

Channel Master Corp., N.Y., 10, 15

Cleveland Electronics, Inc., Ohio, 10

Communication Prods. Co., Inc., State Hwy. 79, Marlboro, N.J., 5
For details see ad on pages 104-105
Tel: Freehold 8-1880

Corbin Corp., Md., 5, 10, 15, 20, 25

Cubic Corp., Calif., 5, 10, 25

Dalmo Victor Co., Calif., 5, 10, 15, 20, 25

Daystrom Instrument, Pa., 15, 20

DeMornay-Bonardi, Calif., 5, 20

Digital Prods. Inc., Calif., Antenna Couplers

Doelcam Corp., Mass., 20

Dorne & Margolin, Inc., N.Y., 5, 10, 25

Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 5, 10, 20, 25
For details see ad on page 430
Tel: NE 6-6900

DuMont Labs., Inc., A. B., Commun. Prods. Div., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 25
For details see ad on page 161
Tel: Mulberry 4-7400

Duncan & Bayley Div., N.Y., 20

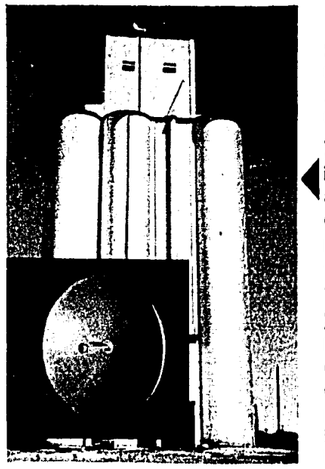
(Continued on page 423)

GABRIEL

integrated research through production 33,000 mc 25 mc = ADVANCED ANTENNA PERFORMANCE

From Gabriel's *integrated* facilities for development and production came the unsurpassed antenna performance shown here . . .

Gabriel *integrates* its antenna specifications with your system requirements. Ask a Gabriel Field Consultant for recommendations.



GABRIEL MICROWAVE ANTENNA

Field proved the world over, Gabriel Parabolics are produced for commercial, industrial, and military frequencies.

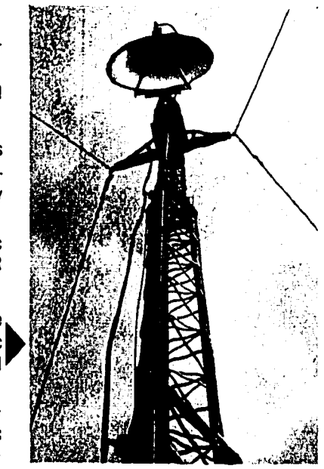
Request Catalog EMP for complete specifications in these and other frequencies.

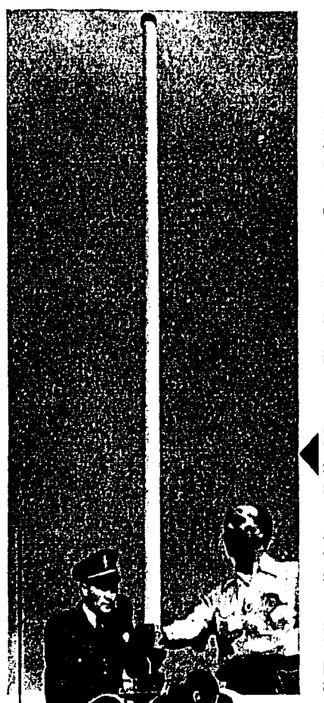
7000 mc. — 7000 mc. Railroad Microwave System Operates in mid-west weather conditions ranging from —27° to 110°F — and often mounted where difficult access makes reliability critical. Photo courtesy of Philco.

Important features are COMPLETE COVERAGE — 5925-7425 mc · HIGH GAIN — to 42.5 db over isotropic source · LOW VSWR — 1.13 max. · LOW SIDELOBES — better than 22 db down.

2000 mc. — 2000 mc. NATO Mobile Military Microwave Relay 24-channel communication relay using Gabriel 2000 mc offset feed antenna. Broadband characteristics of Horn Feed cover entire 2000 mc band.

Important specifications are HIGH GAIN — better than 30 db over isotropic source · LOW VSWR — 1.2 max. over 1750-1990 mc band · BEAMWIDTH — H plane 6°, E plane 5.7° · LOW SIDELOBES — better than 23 db down.



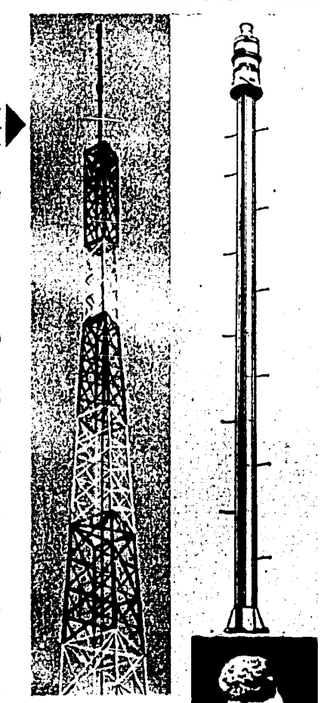


GABRIEL HIGH GAIN UHF-TV BROADCAST ANTENNA

From station after station, in metropolitan and smaller communities, come verified reports of increased signal coverage — at relatively low cost — with Gabriel's radically new transmitting antenna.

Request 24-page Report ETV for complete performance characteristics.

Important features are: HIGH GAIN — 25 and 14 power gain models available · IDEAL VERTICAL PATTERN — Cosecant squared radiation pattern for uniform field strength · SHAPED HORIZONTAL PATTERN — Omni-directional or cardioid as site requires · NULL FILL-IN — standard on all models · TROUBLE-FREE — mechanical design with greater strength, no de-icing, no insulator except as seal · ELECTRICAL BEAM TILT .7° if desired.



GABRIEL COMMUNICATIONS ANTENNAS

A complete line for wide-range dependable mobile communications for increased signal power with wider coverage at great savings over cost of high power station and mobile transmitters. Request 24-page Catalog EMC.

HIGH GAIN BEACON ANTENNAS — Gabriel HW series covers 450-470, 144-174, 108-144 mc bands. Gain up to 6.5 db over ½ wave dipole, with equal power radiation in all horizontal directions and low VSWR.

MOBILE ANTENNAS — Gabriel's complete line with bases, springs, and rods, meets every mobile communications need. Typical models are famous "disguise" Model SPPB-71 for all police frequencies; Model SPP-3 series of swivel-base, spring, and whip antennas; Model SPP-18 roof-top model for 140-165 mc.

GABRIEL ELECTRONICS DIVISION

THE GABRIEL COMPANY ENDICOTT STREET, NORWOOD, MASS.

6. Radar, Microwave, UHF

71. Antennas.

(Continued from page 421)

Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 25
For details see ad on page 487
Tel: PIoneer 6-5212

Electro Craft Industries, Inc., Conn., 10

Electro Impulse Laboratory, Inc., 62 White St., Red Bank, N.J., 25
For details see ad on page 330
Tel: Red Bank 6-0404

Electromec, Inc., Calif., 20

Electron-Radar Products, Ill., Test

Erco Radio Labs, Inc., N.Y., 10, 15, 25

F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 5, 20
For details see ad on pages 47-50
Tel: Astoria 8-2800

Federal Telecommun. Labs. Div., I T & T, N.J., 25

Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 25
For details see ad on pages 32-37
Tel: Nutley 2-3600

Freed Electronics & Controls Corp., N.Y., 5, 10, 15, 20, 25

Fretco, Inc., Pa., 5, 10, 15

Gabriel Electronic Div., The Gabriel Co., Endicott St., Norwood, Mass., 5, 10, 15, 20, 25
For details see ad on page 422
Tel: Norwood 7-3300

General Electric Co., N.Y.C., N.Y., 5, 10, 15, 20, 25

General Electric Co., N.Y., 5, 10, 15, 20, 25

General Electrosonics, Inc., N.Y., 5, 10, 15, 25

General Precision Lab. Inc., 63 Bedford Rd., Pleasantville, N.Y., 5
For details see ad on page 188
Tel: Pleasantville 2-2000

Globe Indust., Inc., Ohio, 20

Gorham Mfg. Co., R.I., 5, 15

Heinze Electric Co., 685 Lawrence St., Lowell, Mass., 20
For details see ad on page 276
Tel: 7557

Honeycomb Co. of America, Inc., Conn., 15

Hycon Mfg. Co., Calif., 5, 10, 20, 25

I-T-E Circuit Breaker Co., Pa., 5, 10, 15, 20, 25

Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 5, 10, 15, 25
For details see ad on page 431
Tel: FArmingdale 2-3606

Industrial Prods. Co., Div. Danbury, Conn., 10

Insuline Corp. of America, N.H., 10, 15, 25

Kennedy & Co., D. S., 432 S. Main St., Cohasset, Mass., 10, 15, 25
For details see ad on page 423
Tel: CO 4-0699

Ketay Mfg. Corp., N.Y., 20

Kings Electr. Co., N.Y., 10, 20

Kollmorgen Optical Corp., Mass., 5, 10

Lambda-Pacific Engr. Inc., Calif., 15

Lapointe Electronics, Inc., Conn., 20

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 5, 10, 15, 20, 25
For details see ad on page 312
Tel: MAtawan 1-2600

Lee Labs. Inc., P.O. Box 200, Genessee, Pa., 5
For details see ad on pages 339-431
Tel: 2567

Lerner Instr. & Electr. Mfg. Corp., N.Y., 5, 15, 20

Lieco, Inc., N.Y., 5

Lingo & Son, Inc., John E., N.J., 25

Magnex Corp., N.Y., 10

Makepeace Co., D. E., Div. Union Plate & Wire, Dunham & Pine Sts., Attleboro, Mass., 20
For details see ad on page 200
Tel: Attleboro 1-0089

Marconi's Wireless Telegraph Co., Ltd., England, 5, 10, 15, 20, 25

Maxson Corp., W. L., N.Y., 5, 10, 20, 25

McMillan Lab., Inc., Mass., 15

Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 5, 10, 15, 20, 25

(Continued on page 424)

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfully eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

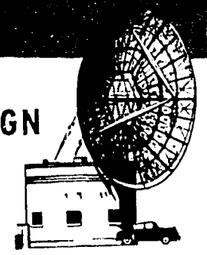
Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information—fast.

3000 Firms listed. The alphabetical directory gives a clear definition of these firms by showing any or all of the ten fundamental groups in which these firms belong after every name.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

ANTENNAS



DESIGN

DEVELOPMENT



PRODUCTION

D. S. Kennedy & CO.

ANTENNA EQUIPMENT

COHASSET • MASSACHUSETTS

Telephone CO 4-0699

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

for MICROWAVE...
for TV...
it's— pdc

MICROWAVE

COAXIAL TRANSMISSION LINES

⅞" 50 OHM—1⅝" 50 OHM

Ideal for applications to 3000 mc, without regard to frequency. Furnished with RETMA flanges, which feature locating pins and anchor insulator connectors for positive concentricity between sections. Can be supplied with PDC "Air-lite" couplings for rapid, leak proof assembly in the field. Proved in use in many critical applications. More in use than all other types combined.

TOWERS

Prodelin all-aluminum guyed towers are available, in 10-foot increments, to a height of 200 feet. They can be raised or dismantled by 3 men in a half day, without special tools or footings. No wrenches, nuts or bolts required to erect towers.



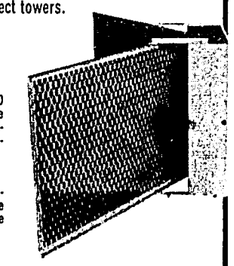
ANTENNAS

Cavity-Fed Corner Reflector →

All-aluminum, high gain, from 890 to 2700 mcs. Ideal for short distances, as in local "side hops." Lightweight. Low wind resistance, facilitating pole mounting. Inexpensive. (See illustration right.)

← 2000 MC. Horn

All-aluminum, 20 db antenna for 2000 mc microwave communication. Low cost. Replaces more expensive parabolic antennas for short-distance transmission. (See illustration left.)



Parabolic. High gain, center and offset fed, from 890 to 2700 mcs. Spun or mesh aluminum. Superior electrical and mechanical performance. Many features incorporated as a result of years of actual experience and user case histories.

TV BROADCAST



COAXIAL TRANSMISSION LINES

51.5 and 50 ohm teflon and steatite insulated transmission lines and components provide very low attenuation, low VSWR, and flat impedance systems. Nominal 51.5 ohm lines are currently supplied in both teflon and steatite. Teflon lines are available with either RETMA flanges or PDC "Air-lite" couplings at no additional cost. 6⅛" teflon lines are supplied only with RETMA flanges; steatite insulated lines with RMA.

UHF-TV WAVEGUIDE

Prodelin is first choice in UHF-TV installations using waveguide. Prodelin pioneered in commercial TV waveguide proving exceedingly efficient over a long term of service in many installations. Special sexed flanges, which allow for expansion, permit rigid hanging direct to the tower members. This also eliminates the 24 bolts previously required and reduces installation time more than 50%.



UHF "TELEPLEXER"

The Prodelin "teleplexer" consists of a vestigial sideband filter and a diplexer. It combines the output of the aural and visual transmitters, rejecting and absorbing the unwanted portions of the signal. The resultant signal is fed to a single transmission line. The "teleplexer" is designed for inexpensive conversion to 50 KW operation.

Write for Fully Descriptive Catalog on all these Prodelin Products

Prodelin Inc — pdc

World's Finest Transmission Lines

307 BERGEN AVE. • KEARNY, N. J.

6. Radar, Microwave, UHF

71. Antennas.

(Continued from page 423)

Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 20
For details see ad on page 287
Tel: WAlt 5-6800

Mission-Western Engineers, Inc., Calif., 20

Motorola Research Lab., Ariz., 5, 10, 15, 25

N. R. K. Mfg. & Eng. Co., 4601 W. Addison St., Chicago 41, Ill., 20
For details see ad on page 432
Tel: Spring 7-2970

Narda Corp., 66 Main St., Mineola, L.I., N.Y., 5, 10, 15, 20, 25
For details see ad on page 461
Tel: PIoneer 6-4650

National Elec. Prods. Corp., Pa., 10

Nibur Sales Corp., N.J., 25

Norden Labs. Corp., Conn., 15, 20, 25

Northern Elec. Co., Ltd., Canada, 10, 25

P M Industries, Conn., 20

Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 5
For details see ad on page 484
Tel: WHitehall 4-3570

Philco Corp., Govt. & Indust. Div., Pa., 5, 10, 15, 25

Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 5, 10, 25
For details see ad on pages 463, 489
Tel: NEedham 3-3345

Precision Associates, Inc., N.Y., 10, 25

Prodelin, Inc., 307 Bergen Ave., Kearny, N.J., 5, 15, 25
For details see ad on page 424
Tel: KEarny 2-8600

Production Research Corp., Claremont Ave., Thornwood, N.Y., 10, 25
For details see ad on page 524
Tel: PLeasantville 2-2767

RCA Victor Co., Ltd., Canada, 10, 25

RS Electr. Corp., Calif., 20

Radio Corp. of America, Communications Marketing Dept., Camden, N.J., 10, 15, 25
For details see ad on page 210
Tel: Woodlawn 3-8000

Radio Eng. Labs., Inc., N.Y., 10, 25

Radiomarine Corp. of America, N.Y., 10, 15

Robinette Co., W. C., Calif., 20

Ruckelshaus Labs. Inc., John G., N.J., 20

Sanders Assoc., Inc., N.H., 5, 10, 15, 20, 25

Schott Co., Walter, Calif., 10

Schutter Mfg. Co., Carl W., N.Y., 5, 10, 15, 20, 25

Snyder Mfg. Co., Pa., 10

Societe Francaise Radio-Electrique, France, 5, 10, 15, 20, 25

Southwest Technical Lab., N.Mex., 5, 15

Spincraft, Inc., Wis., 15

Square Root Mfg. Corp., N.Y., 10, 25

Swift Indust. Inc., Conn., 15

6. Radar, Microwave, UHF

71. Antennas.

Szekely & Assoc. Inc., O. E., Pa., 10, 20

Technical Appliance Corp., N.Y., 5, 10, 15, 25

Tele-Beam Industries, Calif., 10

Telrex, Inc., 26 Neptune Hwy., Asbury Park, N.J., 25
For details see ad on page 489
Tel: Prospect 5-7252

Terpening Co., L. H., N.Y., 5

Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 10, 15, 20, 25
For details see ad on page 226
Tel: DI-1781

Thompson Prods., Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 10, 25
For details see ad on page 235
Tel: HE 1-6765

Titeflex, Inc., N.J., 5, 20

Torngren Co., Inc., C. W., 236 Pearl St., Somerville, Mass., 15
For details see ad on page 425
Tel: Monument 6-3250

Tricraft Prods. Co., Ill., 10

Virginia Electr. Co., D.C., 25

Ward Prods. Corp., Ohio, 10

Waveguide, Inc., Calif., 5, 20

Waveline, Inc., Passaic Ave., Caldwell 1, N.J., 5, 10, 25
For details see ad on page 464
Tel: CAldwell 6-5785

Wheeler Labs. Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 5, 10, 25
For details see ad on page 490
Tel: HUnter 2-7876

White & Son, James L., N.J., 10

Wilcox Elec. Co., Inc., Mo., 10, 25

Wind Turbine Co., 238 E. Market St., West Chester, Pa., 20
For details see ad on page 256
Tel: WEst Chester 3110

Wunderlich Radio Co., N.Y., 5, 10, 25

72. Receivers.

5. Microwave relay
10. Position Indicators
15. Radar

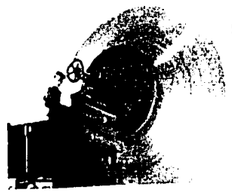
Adler Communications Labs., N.Y., 15, Systems Mobile

Air Associates, Inc., N.J., 5

Amerac, Inc., Mass., 5

American Electronic Labs., Inc., Pa., 15

Arma Corp., Roosevelt Field, Garden City, L.I., N.Y., 15
For details see ad on page 407
Tel: Pioneer 2-2000



STRENGTH

Mecatorn yields almost perfectly uniform wall thickness with a minimum of stock reduction. Current bead-design developments may even increase rigidity against wind and ice loads.

SIZE

We fabricate 2' — 8' reflectors in production and 10' diameters regularly with a maximum,— currently—of 12'. Our drawing boards are now occupied with plans to manufacture up to 16' diameters.

WAVE INTENSITY

Uniform hydraulic pressures exerted by Mecatorn yield minimum surface irregularity. Higher reflectivity becomes more important as frequencies increase.

what do you require from a parabolic reflector?

PARALLEL WAVE PROPAGATION

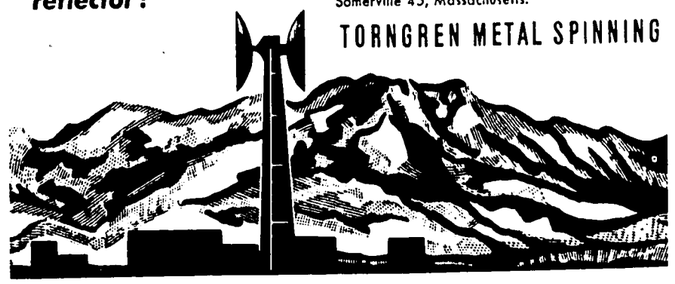
The parabolic equation, $Z^2 + Y^2 = 4ax$, can be held to ±.030" by Mecatorn in the largest diameters, even closer as size decreases.

COST

Hydraulic Mecatorns, being semi-automatic, spin more accurately, faster than the usual hand methods—and novel, low-cost tooling methods make it the least expensive process. Torngren backs this up with the East's most complete spinning facilities and engineering service.

New data sheets C7, C8 cover radome, shield and other information, free on request to C. W. Torngren Co., Inc., 236 Pearl Street, Somerville 45, Massachusetts.

TORNGREN METAL SPINNING



72. Receivers.

Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 15
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651

Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 15, Airborne
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411

Bludworth Marine Division, N.Y., 15

Bomac Labs., Inc., Salem Road, Beverly, Mass., 15
For details see ad on pages 92-93
Tel: Beverly 4670

Brach Mfg. Corp., N.J., 10

Bright Radio Labs., Inc., N.Y., 10

Brubaker Mfg. Co., Inc., Calif., 15

Budelman Radio Corp., Conn., 5

CGS Labs., Inc., Conn., 5

Canadian Gen. Elec. Co., Electronic Equip., Canada, 5, 10, 15

Canadian Westinghouse Co., Ltd., Canada, 5, 15

Canoga Corp., Calif., 5, 10, 15

Capehart-Farnsworth Co., Ind., 15

Cardwell Mfg. Corp., Allen D., Conn., 5, 15

Century Electronic Div., Century Metalcraft, Calif., 5

Collins Radio Co., 855 35th St., N.E., Cedar Rapids, Iowa, 5
For details see ad on pages 43-46
Tel: Cedar Rapids 3-0281

Color Television, Inc., Calif., 15, Air Borne

Connecticut Telephone & Electric Corp., Conn., 5

Corbin Corp., Md., 5, 10, 15

Cossor (Canada) Ltd., 301 Windsor St., Halifax, N. S., Canada, 15
For details see ad on page 157
Tel: HAlifax 4-6487

Cubic Corp., Calif., 15

Daystrom Instrument, Pa., 15

De Wald Radio & TV Corp., N.Y., 15

Dockcam Corp., Mass., 10

Du Mont Labs., Inc., A. B., Commun. Prods. Div., 1500 Main Ave., Clifton, N.J., 5
For details see ad on page 161
Tel: Mulberry 4-7400

Edo Corp., N.Y., Sonar

Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 15
For details see ad on page 487
Tel: Pioneer 6-5212

Engineering Associates, Ohio, 15

Federal Mfg. & Eng. Corp., N.Y., 15

Federal Telecommunation Labs., Div. I T & T, N.J., 5, 15

Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 5
For details see ad on pages 32-37
Tel: Nutley 2-3600

Freed Electronics & Controls Corp., N.Y., 5, 10, 15

(Continued on page 426)

IRE provides all THREE

"Proceedings of the I.R.E."

puts your product promotion monthly before the "thinking and doing" engineers in the fabulous, fast-moving radio-electronic industry. Circulation 38,945 (ABC).

Founded in 1913, "Proceedings of the I.R.E." is the authoritative work-book of America's fastest expanding industry. In it, electronic advances, years ahead of the times, are published every month, thus keeping engineers up to the moment on all that is new in engineering research and application. Its advertising is a constant product parade of the best this industry manufactures. A vital service to all men who specify and buy, it is a proved vehicle for your consistent product promotion—*with prestige!*

IRE DIRECTORY

provides 35,000 IRE members educated to buy and specify with your detailed product data for ready reference all year long.

The IRE DIRECTORY is their working encyclopedia . . . it organizes, codes, simplifies and "indexes for use" a vast and complex industry. They look to its listing of men, firms and products as vital working information. Wherever you find IRE members, you'll find IRE DIRECTORIES close at hand for ready reference. The cost of keeping your product story before 35,000 engineers is less than you'd expect. The price of one page is less than one-half the three cents postage required to mail 35,000 letters.

RADIO ENGINEERING SHOW

. . . the eye-opening event of each radio-electronic year . . . where over 40,000 engineers come to you for all that's new.

Bringing buyers and sellers face to face to discuss engineering needs and product performance is one of IRE's great services to an industry where understanding is the key to progress. The Radio Engineering Show completes with actual product presentation the balanced promotion package of "Proceedings of the I.R.E." for product promotion and the Radio Engineers Directory for product reference.

6. Radar, Microwave, UHF

72. Receivers.

(Continued from page 425)

Garod Radio Corp., Wilcox-Gay Corp., N.Y., 15
General Electric Co., N.Y.C., N.Y., 5, 10, 15
General Electric Co., N.Y., 5, 10, 15
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 15
For details see ad on page 188
Tel: Pleasantville 2-2000
Haller, Raymond, & Brown, Inc., Pa., Radar Relay
Harman-Kardon, Inc., N.Y., 15
Hastings Instrument Co., Inc., Va., Raycist
Henry & Miller Industries, N.Y., 15, Pressurized Modulator Cases
Hoffman Radio Corp., Calif., 15
Hycon Mfg. Co., Calif., 5, 15
Insuline Corp. of America, N.H., 5, 10, 15
Jacobs Instrument Co., Md., 15
Ketay Mfg. Corp., N.Y., 10
Kings Electronic Co., N.Y., 5, 15
Korb Eng. & Mfg. Co., Mich., 15
Laboratory for Electronics, Inc., Mass., 10, 15
Lambda-Pacific Engr., Inc., Calif., 5
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 15
For details see ad on page 312
Tel: MAtawan 1-2600
Lenkurt Electric Co., Inc., Calif., 5
Leonard Electric Prods. Co., Inc., N.Y., 5
Lewyt Corp., N.Y., 5, 15
Loral Electronic Corp., Dept. ID54, 794 E. 140 St., New York 54, N.Y., 5, 15
For details see ad on page 198
Tel: CY 2-1800
Magnex Corp., N.Y., 10, 15
Marconi's Wireless Telegraph Co., Ltd., England, 10, 15
Maxson Corp., W. L., N.Y., 5, 10, 15
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 5, 15
For details see ad on page 432
Tel: Raymond 3-1508
Motorola Communication & Electric Inc., Ill., 5
Motorola Research Lab., Ariz., 5, 10, 15
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 5, 15
For details see ad on page 461
Tel: PIoneer 6-4560
Norden Labs. Corp., Conn., 15
Northern Electric Co., Ltd., Canada, 5, 15
Otis Elevator Co., Electronic Div., N.Y., 10, 15
Phebco, Inc., Md., 10, 15
Philco Corp., Gov't. & Indust. Div., Pa., 5
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 15
For details see ad on pages 463, 489
Tel: NEedham 3-3345
Polarad Electronic Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5, 10, 15
For details see ad on pages 39-42
Tel: STagg 2-3464
RCA Victor Co., Ltd., Canada, 5, 15
RS Electronic Corp., Calif., 15
Radar-Electronic, Inc., N.Y., 15
Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 15
For details see ad on page 525
Tel: MElbourne 800
Radio Eng. Labs., Inc., N.Y., 5
Radiomarine Corp. of America, N.Y., 15
Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., 15
For details see ad on page 406
Tel: TR 6-6000
Resdel Eng. Corp., Calif., 15
Rosen Eng. Prods., Inc., Raymond, Pa., 5
Sanders Associates, Inc., N.H., 15
Schutter Mfg. Co., Carl W., N.Y., 15
Societe Francaise Radio Electrique, France, 5, 10, 15
Specialty Eng., Div. Special Assembling & Packaging, N.Y., 15
Superex Electronic Corp., N.Y., 15
Sylvania Electric Prods. Inc., Boston Eng., 70 Forsyth St., Boston 15, Mass., 15
For details see ad on pages 9-14
Tel: KEnmore 6-8900
Syntronic Instrument, Inc., Ill., 10
T. L. G. Electric Corp., N.Y., 5, 15
Tarzian, Inc., Broadcasting Equipment Div., Ind., 5
Telescreen Corp., Conn., 15
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas, 10, 15
For details see ad on page 226
Tel: DI-1781
Transmitter Equipment Mfg. Co., Inc., N.Y., 5, 10, 15
Ultrasonic Corp., Mass., 10
Vectron, Inc., 402 Main St., Waltham 54, Mass., 15
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Westinghouse Electric Corp., Pa., 5, 15
Westinghouse Electric Corp., Electronic Div., Md., 5
Wilcox Electric Co., Inc., Mo., 15
Wunderlich Radio Co., N.Y., 5

73. Transmitters.

5. Microwave
10. Microwave relay
15. Radar

Air Associates, Inc., N.J., 5
Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5, 10, 15, Components
For details see ad on page 429
Tel: Linden, 3-1000
Amerac Inc., Mass., 5, 15
American Electronic Labs., Inc., Pa., 15
Arma Corp., Roosevelt Field, Garden City, L.I., N.Y., 15
For details see ad on page 407
Tel: Pioneer 2-2000

6. Radar, Microwave, UHF

73. Transmitters.

Automatic Electric Co., Ill., 5, 10
Baldwin Eng. Service, Calif., 10
Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 15
For details see ad on pages 51-54, 302
Tel: Stanley 7-2651
Bendix Aviation Corp., Bendix Radio Div., Baltimore 4, Md., 15, Airborne
For details see ad on pages 51-54, 302
Tel: Hopkins 7-3411
Bludworth Marine Division, N.Y., 15
Bomac Labs., Inc., Salem Rd., Beverly, Mass., 15
For details see ad on pages 92-93
Tel: Beverly 4670
Brubaker Mfg. Co., Inc., Calif., 15
Budelman Radio Corp., Conn., 5, 10
CGS Labs., Inc., Conn., 5
Canadian Gen. Elec. Co., Electronic Equipment, Canada, 5, 10, 15
Canadian Westinghouse Co., Ltd., Canada, 5, 10, 15
Canoga Corp., Calif., 5, 10, 15
Capehart-Farnsworth Co., Ind., 15
Cardwell Mfg. Corp., Allen D., Conn., 5, 15
Century Electronic Div., Century Metalcraft, Calif., 5, 10, 15
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 5, 10
For details see ad on pages 43-46
Tel: 3-0281
Color Television, Inc., Calif., 15, Air Borne
Connecticut Telephone & Electric Corp., Conn., 10
Continental Electronics Mfg. Co., Texas, 5
Corbin Corp., Md., 5, 10, 15
Cossor (Canada) Ltd., 301 Windsor St., Halifax, N.S., Canada, 15
For details see ad on page 157
Tel: HAlifax 4-6487
Cubic Corp., Calif., 5, 15
Daystrom Instrument, Pa., 15
Deen Associates, Inc., 2 John St., New York 38, N.Y., 5
For details see ad on page 487
Tel: RE 2-1464
Du Mont Labs., Inc., A. B., Communication Prods. Div., 1500 Main Ave., Clifton, N.J., 5, 10
For details see ad on page 161
Tel: Mulberry 4-7400
Edo Corp., N.Y., Sonar
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10
For details see ad on page 487
Tel: Pioneer 6-5212
Federal Telecommunication Labs., Div. I T & T, N.J., 5, 10, 15
Federal Telephone & Radio Co., Div. of I T & T, 100 Kingsland Rd., Clifton, N.J., 5, 10
For details see ad on pages 32-37
Tel: Nutley 2-3600
Freed Electronics & Controls Corp., N.Y., 5, 10, 15
General Electric Co., N.Y.C., N.Y., 5, 10, 15
General Electric Co., N.Y., 5, 10
General Precision Lab., Inc., 63 Beford Rd., Pleasantville, N.Y., 15
For details see ad on page 188
Tel: Pleasantville 2-2000
Gorham Mfg. Co., R.I., 5, 10
Henry & Miller Industries, N.Y., Pressurized Modulator Cases
Hoffman Radio Corp., Calif., 15
Hycon Mfg. Co., Calif., 5, 10, 15
Insuline Corp. of America, N.H., 5, 10, 15
Jacobs Instrument Co., Md., 15
Kings Electronic Co., N.Y., 5, 10, 15
Kollmorgen Optical Corp., Mass., 15
Korb Eng. & Mfg. Co., Mich., 15
Kraus, Fratelli, Italy, 5, 10
Laboratory for Electronics, Inc., Mass., 5, 15
Lambda-Pacific Engr., Inc., Calif., 10
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 15
For details see ad on page 312
Tel: MAtawan 1-2600
Lenkurt Electric Co., Inc., Calif., 10
Leonard Electric Prods. Co., Inc., N.Y., 5, 10
Levinthal Electronic Prods., Inc., Calif., 5, 15
Lewyt Corp., N.Y., 5, 10, 15
Manson Labs., Conn., 15
Marconi's Wireless Telegraph Co., Ltd., England, 10, 15
Maxson Corp., W. L., N.Y., 5, 10, 15
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 5, 10, 15
For details see ad on page 432
Tel: Raymond 3-1508
Motorola Communication & Electric, Inc., Ill., 5, 10
Motorola Research Lab., Ariz., 5, 10, 15
Narda Corp., 66 Main St., Mineola, N.Y., 5, 10, 15
For details see ad on page 461
Tel: PIoneer 6-4560
Norden Labs. Corp., Conn., 15

Telephone Numbers and complete addresses for all firms listed in this Directory are given for your convenience in the Alphabetical Index to Radio-Electronic Manufacturers starting on page 131.

Northern Electric Co., Ltd., Canada, 5, 10, 15
Otis Elevator Co., Electronic Div., N.Y., 5, 15
Philco Corp., Gov't. & Indust. Div., Pa., 5
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 5, 15
For details see ad on pages 463, 489
Tel: NEedham 3-3345
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5
For details see ad on pages 39-42
Tel: Stagg 2-3464
RCA Victor Co., Ltd., Canada, 5, 10, 15
Radiation, Inc., PO Drawer Q, Melbourne, Fla., 5
For details see ad on page 525
Tel: MElbourne 800
Radio Corp. of America, Communications Marketing Dept., Camden, N.J., 5, 10
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Eng. Labs., Inc., N.Y., 5, 10
Radiomarine Corp. of America, N.Y., 15
Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., 15
For details see ad on page 406
Tel: Tr 6-6000
Remler Co., Ltd., Calif., 15
Resdel Eng. Corp., Calif., 15
Rosen Eng. Prods., Inc., Raymond, Pa., 10
Sanders Assoc., Inc., N.H., 5, 15
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 5
For details see ad on page 236
Tel: FI 7-2810
Sierra Electronic Corp., Calif., 5
Societe Francaise Radio Electrique, France, 5, 10, 15
Sylvania Electric Prods. Inc., Boston Engineering Lab., 70 Forsyth St., Boston 15, Mass., 15
For details see ad on pages 9-14
Tel: KEnmore 6-8900
T. L. G. Electric Corp., N.Y., 5, 15
Tarzian, Inc., Broadcasting Equipment Div., Ind., 10
Telescreen Corp., Conn., 15
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Texas 15
For details see ad on page 226
Tel: DI 1781
Transmitter Equipment Mfg. Co., Inc., N.Y., 5, 10, 15
Westinghouse Electric Corp., Pa., 10, 15
Westinghouse Electric Corp., Electronic Div., Md., 10
Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 15
For details see ad on page 490
Tel: HUnter 2-7876
Wilcox Electric Co., Inc., Mo., 15
Wunderlich Radio Co., N.Y., 5, 10

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 SPECIFIC microwave information on "new" components or "standard" plumbing



If you use microwave components ... you can benefit from Airtron's broad range of engineering experience in designing and producing both advanced and so-called "standard" plumbing. For specific, helpful information ... prepared *by* and *for* engineers ... merely fill in the obligation free coupon below and send it to us.

BRANCHING AND BALANCED DUPLEXERS
Standard and special duplexers from 6.66 x 3.41 to 360 x 220 O. D. Power performance and packaging to meet your applications. *Bulletin T-2200*

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BALANCED MIXERS
Mixers with waveguide crystal mounts or coaxial crystal mounts covering a frequency range from 400 to 40,000 megacycles. Standardized and special types. *Bulletin T-2600*

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Precision castings, holding tolerances of ±.002" per inch of dimension, economically made to your own specifications. *Bulletin 6002.*

FLEXIBLE WAVEGUIDE
Available in all sizes for high power pressurized applications over wide temperature ranges. Seamless, twistable, preformed and circular. Special waveguides to meet specific problems. *Cat. 1011*

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For rapid and/or cyclic switching to or from noise sources, signal generators, dummy loads, etc. Low VSWR, excellent crosstalk and high peak power performance. *Cat. 2331.*

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Precision cast one piece hybrids. Low VSWR, excellent isolation and low attenuation over broad bandwidths. Used in balanced mixers, duplexers, power splitters. *Cat. 2361*

K-BAND TEST HORNS
For test purposes over the frequency range from 12,400 to 40,000 mc. One piece aluminum castings to close tolerances. Low VSWR. Low secondary lobes. *Cat. 3291.*

WAVEGUIDE MAGIC TEES
Hybrid junctions for power splitting with minimum energy loss. From 1.00 x 1.50 to all smaller standard and military sizes. Low VSWR and excellent broad band isolation. *Cat. 3330*

OTHER AIRTRON PRODUCTS

Folded Hybrids • Quick Disconnects • VSWR Standards • High Power Dummy Loads • Antenna Horns • Waveguide Bends, Twists, Elbows and Transitions • Rotating Joints • RF and Pressure Gaskets • Aircraft Junction Boxes and Cable Assemblies

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Linden, New Jersey

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DALLAS
DAYTON
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1107 West Elizabeth Ave.
Linden, N.J.

Please send me without obligation information on.....
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NAME.....TITLE.....
COMPANY.....
STREET.....
CITY.....ZONE.....STATE.....
☐ Check here if you want Airtron representative to call.

6. Radar, Microwave, UHF

74. Waveguides & Accessories.

5. Couplings
10. Flexible waveguides
15. Hybrid junctions
20. Microwave attenuators
25. Rigid waveguides
30. Sampling lines, reflectors, etc.
35. Switches
40. Transmission lines

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5, 10, 15, 20, 25, 30, 35, 40
For details see ad on page 429
Tel: Linden 3-1000

Allied Research & Eng., Inc., Calif., 5, 15, 20, 25

Amerac, Inc., Mass., 5, 15, 20, 25, 30, 35, 40

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 40
For details see ad on page 130
Tel: Bishop 2-1000

Andrew Corp., 363 E. 75th St., Chicago 19, Ill., 25, 40, UHF TV
For details see ad on page 420
Tel: TR 4-4400

Bart Labs. Co., Dept. IRE54, 227 Main St., Belleville 9, N.J., 5, 25
For details see ad on page 492
Tel: PLymouth 9-0200

Bogart Mfg. Corp., N.Y., 5, 15, 20, 25, 30, 35, 40

Bomac Labs., Inc., Salem Rd., Beverly, Mass., 15, 20, 35
For details see ad on pages 92-93
Tel: Beverly 4670

Bone Eng. Corp., Calif., 5, 15, 25, 30

Bomac Labs., Inc., Mass., 45

Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 5, 15, 20, 25, 30, 35 40
For details see ad on page 428
Tel: STillwell 6-1706

Capehart-Farnsworth Co., Ind., 15, 20

Cascade Research Corp., Calif., 20, 35, 40

Century Electronic, Div. Century Metalcraft, Calif., 5, 25, 30, 35

Communication Prods. Co., Inc., State Hwy. 79, Marlboro, N.J., 25, 30, 40
For details see ad on pages 104-105
Tel: Freehold 8-1880

Co-operative Industries, Inc., N.J., 5, 10, 25

Corning Glass Works, N.Y., 20, Micro Strip

Cubic Corp., Calif., 5, 15, 20, 25

Dahlstrom Metallic Door Co., N.Y., 25

Dalmo Victor Co., Calif., 5, 25, 35

Daven Co., N.J., 35

Deen Associates, Inc., 2 John St., New York 38, N.Y., 20
For details see ad on page 487
Tel: RE 2-1464

De Mornay-Bonardi, Calif., 5, 15, 20, 25, 35, 40

(Continued on page 431)

DOUGLAS

MICROWAVE SPECIALISTS

Do you need a specialist for your MICRO-WAVE-RADAR "Plumbing" problems; or is your need for standard or special test equipment? Design, Development and Production of component parts and test equipment in the frequency range of 1000-40,000 mcs. (and higher) is our specialty.

Our production facilities are available for "model shop" quantities or for large runs. We work to your pencil sketches or to your completely detailed drawings.

Our design facilities enable us to supply you with a completely engineered unit for those cases where an outline drawing and specification list only are sent us.

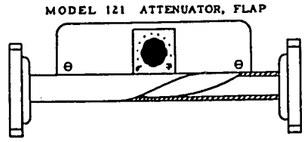
Your requirements are engineered and manufactured to the highest quality standards, whether the unit required is a simple transmission line or a complex balanced duplexer.

WE INVITE YOUR INQUIRIES.

Our catalog, the most complete and comprehensive in our field, is available upon request.

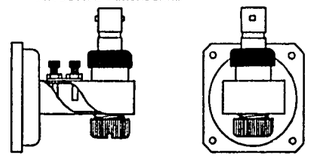
SOME SPECIAL FEATURES OF A FEW OF OUR CATALOG ITEMS

MODEL 121 ATTENUATOR, FLAP



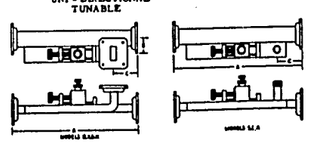
Features 270° knob rotation; may be easily calibrated

CRYSTAL DETECTOR MOUNT WAVEGUIDE - BROADBAND MODEL 160



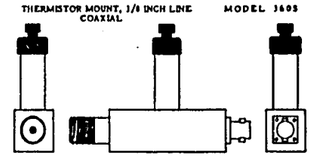
Features double probe tuner to lower VSWR

DIRECTIONAL COUPLER UNI - DIRECTIONAL TUNABLE MODEL 172



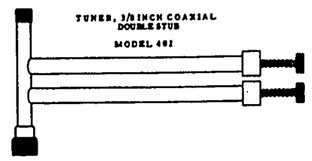
Features sliding probe on sidearm for higher directivity

THERMISTOR MOUNT, 1/8 INCH LINE COAXIAL MODEL 3605



Features adjustable short for better match

TUNER, 1/8 INCH COAXIAL DOUBLE STUB MODEL 401



Features rotating knobs for finer tuning, once adjusted does not shift under vibration

DOUGLAS MICROWAVE Co., Inc.

11 BEECHWOOD AVENUE • NEW ROCHELLE, N. Y. • New Rochelle 6-6900

6. Radar, Microwave, UHF

74. Waveguides & Accessories.

(Continued from page 429)

Diamond Microwave Corp., Mass., 15, 20, 40

Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 5, 15, 20, 25, 30, 35, 40
For details see ad on page 430
Tel: NE 6-6900

Du Mont Labs., Inc., A. B., Communications Prods. Div., 1500 Main Ave., Clifton, N.J., 40
For details see ad on page 161
Tel: Mulberry 4-7400

Electro Impulse Lab., Inc., 62 White St., Red Bank, N.J., 20
For details see ad on page 330
Tel: Red Bank 6-0404

Electro Precision Products, Inc., N.Y., 5, 15, 20, 25, 30, 35, 40

Electron-Radar Products, Ill., 20, 25

Emerson & Cuming, Inc., Mass., 20

Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, L.I., N.Y., 20
For details see ad on page 459
Tel: BA 4-8500

Engineering & Research Corp., Md., 5, 15, 25

F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 5, 15, 20, 25, 30, 35, 40
For details see ad on pages 47-50
Tel: AStoria 8-2800

Federal Telecommunication Labs., Div. I. T. & T., N.J., 20, 40

General Chem., Div. Allied Chem. & Dye Corp., N.Y., 5, 10, 25, 30, 35

General Plate, Div. Metals & Controls, Mass., Tubing

General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 5, 10, 15, 20, 25, 30, 35
For details see ad on page 188
Tel: Pleasantville 2-2000

General RF Fittings Co., Inc., Mass., 5, 15, 20

Gorham Mfg. Co., R.I., 5, 15, 25, 35

Graham Mfg. Co., Inc., R.I., 5, 20, 25

Grigsby-Allison Co., Inc., Ill., 35

Hastings Instrument Co., Inc., Va., Radist

Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 15, 20, 30
For details see ad on pages 15-22
Tel: DAvenport 5-4451

Honeycomb Co. of America, Inc., Conn., 45, Windows

Hycon Mfg. Co., Calif., 15, 20

Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 20, 25, 40
For details see ad on page 431
Tel: FArmingdale 2-3606

Imperial Radar & Wire Corp., N.Y., 10, 30, 40

(Continued on page 433)

GLAS-GUIDE

R. F. COMPONENTS MADE OF LAMINATED GLASS CLOTH

Microwave Transmission Lines Fabricated in This Manner Offer the Following Superior Properties:

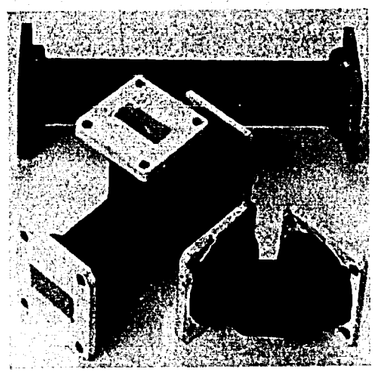
NON CORROSIVE

NON HEAT CONDUCTING

HIGH STRENGTH TO WEIGHT RATIO

CLOSE MECHANICAL TOLERANCES

FINE SILVERED CONDUCTING SURFACE



Straight sections, tees and mitered elbows are among the many components available as standard items. GLAS-GUIDE can also be made to your print.

"Don't say waveguide, say Glas-Guide"

Write today for complete data.

LEE LABORATORIES, Inc.
Genesee, Pennsylvania

QUALITY DEVELOPMENT AND PRODUCTION OF . . .

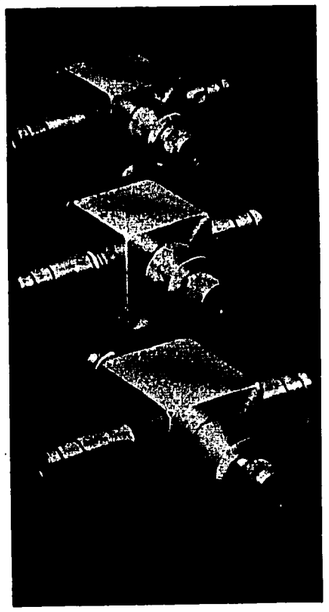
MICROWAVE COMPONENTS INSTRUMENTS ASSEMBLIES AND SYSTEMS

50 TO 3300 MC *Precision* DIRECTIONAL COUPLERS

FOR LAB. & INCORPORATION APPLICATIONS

Model No.	Frequency Range (Mc)
500-0Y	50 - 200
500-1Y	200 - 500
500-2Y	500 - 1000
500-3Y	1000 - 2000
500-4Y	1500 - 2500
500-5Y	2500 - 3300

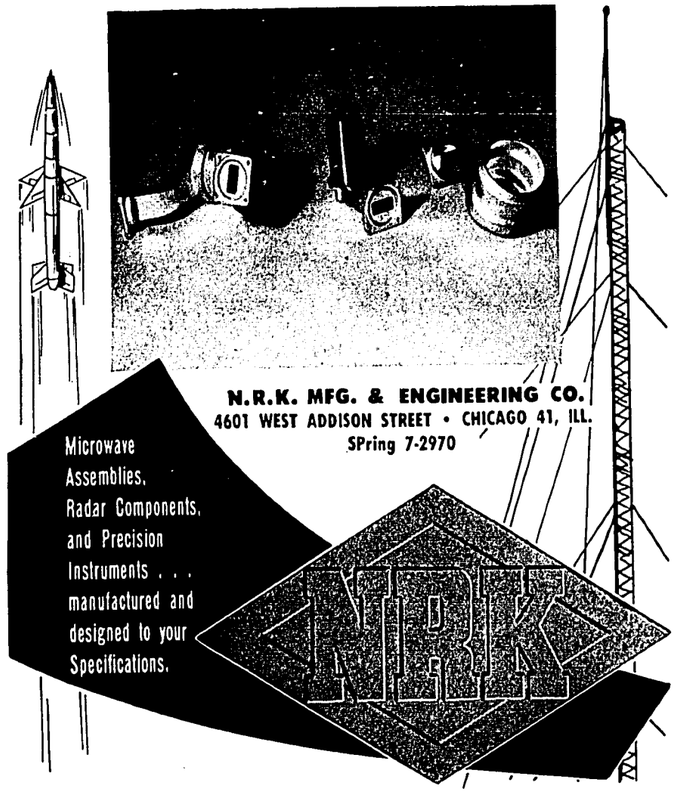
Specifications:
Coupling (C) 30 db or as specified
Directivity: C + 10 db minimum
Arm balance: within .04 db
Arms matched to 1.25 on 50 ohms
VSWR: below 1.05:1
Price: $160.00 Delivery from stock



CATALOG RD-7 On Request

ii IMPEDANCE INCORPORATED

9 Alan Court • Farmingdale, L. I.



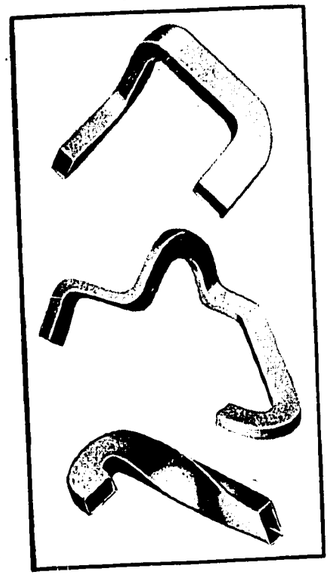




The F. C. Kent Company

has long been recognized as the outstanding source for formed waveguides in the country. If you have requirements for bent and formed waveguide sections — waveguides with as many as seven or eight different bends in one continuous section of tubing—in different planes and with sharp radii; if your assemblies call for waveguide tubing to be twisted, offset, tapered, expanded or call for a transition from rectangular to round; then we wish to bring to your attention our exceptional ability as specialists in bending and forming waveguide tubing in all sizes.

Specialists in Forming Waveguide Tubes



PRECISION TUBE FORMING

KENT

F.C. KENT COMPANY

6. Radar, Microwave, UHF

74. Waveguides & Accessories.

(Continued from page 431)

Industrial Prods. Co., Conn., 15, 25
Insulated Circuits, Inc., N.J., Printed Circuit Components
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 40
For details see ad on page 286
Tel: Be 6-9200
Jersey Specialty Co., Inc., N.J., 40
Kellogg Switchboard & Supply Co., 79 W. Monroe St., Chicago 3, Ill., Telephone Terminating Equipment
For details see ad on page 404
Tel: DEarborn 2-0750
Kent Co., F. C., 64 Howard St., Irvington 11, N.J., 25
For details see ad on page 432
Tel: ESsex 3-5500
Kings Electronic Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 40
Kinney Co., Inc., Joseph, Pa., 5, 25
Kollmorgen Optical Corp., Mass., 40
Korb Eng. & Mfg. Co., Mich., 30
Lee Labs., Inc., P.O. Box 200, Genessee, Pa., 15, 20, 25, 40
For details see ad on pages 349, 431
Tel: Genessee 2567
Lerner Inst. & Electr. Mfg. Corp., N.Y., 5, 25, 30
Lieco, Inc., N.Y., 5, 15, 20, 25, 40, Flanges, Adapters, Tees
Luhrs & Co., C. H., N.J., 35, Coupling Devices, Phase Shifters
Mackenzie Prods. Co., The, Conn., 5, 15, 20, 25, 30, 35, 40
Makepeace Co., D.E., Div. Union Plate & Wire, Dunham & Pine Sts., Attleboro, Mass., 25
For details see ad on page 200
Tel: Attle. 1-0089
Mallory & Co., Inc., P. R., Ind., 35
McMillan Lab., Inc., Mass., 20
Mendelsohn Speedgun Co., Inc., 4th Ave., Haskell, N.J., 5, 10, 20, 25
For details see ad on page 301
Tel: Terhune 5-3224
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 5, 15, 20, 25, 30, 40
For details see ad on page 432
Tel: Raymond 3-1508
Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 25
For details see ad on page 287
Tel: WA 5-6800
Metals & Controls Corp., Mass., 25
Metavac, Inc., N.Y., 20
Microlab, 71 Okner Pkwy., Livingston, N.J., 15, 20, 30, 40
For details see ad on page 319
Tel: Livingston 6-0692
Microwave Consultants, N.Y., 5, 15, 20, 25, 30, 40
Microwave Dev. Labs., Inc., Mass., 5, 15, 25
N. R. K. Mfg. & Eng. Co., 4601 W. Addison St., Chicago 41, Ill., 5, 15, 20, 25, 35, 40
For details see ad on page 432
Tel: Spring 7-2970
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 15, 20, 25, 30, 35, 40
For details see ad on page 461
Tel: PIoneer 6-4560
Nibur Sales Corp., N.J., 20
Northern Electric Co., Ltd., Canada, 5, 15, 20, 25
Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 40
For details see ad on page 484
Tel: WHitehall 4-3570
Philco Corp., Pa., 5, 10, 15, 20, 25, 30, 35
Poinsettia, Inc., N.J., 25
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 20
For details see ad on pages 39-42
Tel: STagg 2-3464
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 20
For details see ad on page 166
Tel: ULster 2-6800
Premier Instrument Corp., 52 West Houston St., New York 12, N.Y., 5, 15, 20, 25, 35
For details see ad on page 433
Tel: GRamercy 5-3520
Radio Components, Ltd., Canada, 35
Radio Corp. of America, Commun. Marketing Dept., Camden, N.J., 20, 40
For details see ad on page 210
Tel: Woodlawn 3-8000
Sanders Assoc., Inc., N.H., 40
Schutter Mfg. Co., Carl W., N.Y., 5, 10, 15, 20, 25, 30, 35, 40
Sightmaster Corp., N.Y., 5, 10, 25, 30, 35
Sivers Lab., Sweden, 15, 20, 30, 35
Societe Francaise Radio Electrique, France, 5, 10, 15, 25, 35
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 15, 20, 30
For details see ad on pages 23-24
Tel: FIeldstone 7-3600
Sponge Rubber Prods. Co., 64 Derby Pl., Shelton, Conn., Absorption Material
For details see ad on page 520
Tel: Ansonia-Derby 4-2581
Suffolk Prods. Corp., N.Y., 5, 20, 25
Summit Electronic, Inc., N.J., 15, 25
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 35
For details see ad on pages 9-14
Tel: JU 6-2424
Technicraft Labs., Inc., Conn., 5, 10, 15, 20, 25, 30, 40
Telephonics Corp., N.Y., 15, 35
Terpening Co., L. H., N.Y., 40
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 29, Texas, 5, 15, 20, 25
For details see ad on page 226
Tel: DI-1781
Thompson Prods., Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 20, 35
For details see ad on page 235
Tel: HE 1-6765

(Continued on page 435)



THE STANDARD OF QUALITY — HICKOK INSTRUMENTS — FOR OVER FORTY-THREE YEARS



MODEL 7001 MODEL 700

LABORATORY TUBE TESTER
All Voltages Variable and Metered

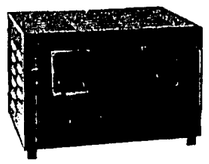
Model 700: Most complete and accurate Tube Tester. Covers wide ranges of values to duplicate the results in tube manuals. This instrument is invaluable for electronic developmental and research work. Model 7001: Null Reading Apparatus, for use with the Model 700 to obtain bridge type Null readings with an accuracy of 1%. Most complete and accurate tube Tester available. 7 other HICKOK tube testers are available to fill all your requirements.



MODEL 209A

TRUE VACUUM TUBE VOLTMETER
Laboratory Size and Accuracy

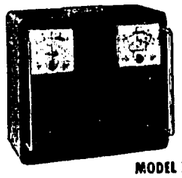
Model 209A: Contains large 9" meter with zero-center scale. Highly accurate for servicing industrial electronic equipment. DC Volts: 0-1200 in 6 ranges. AC RMS Voltage: 0-1200 V. in 6 ranges. AC Peak-to-Peak Voltage: 0-1200 V. in 6 ranges. Capacitance 0.1 to 10,000 MMF in 2 ranges, 0-1000 MF in 5 ranges. 50 MH to 100 henries. 0.1 ohm to 10,000 megohms in 7 ranges.



MODEL 710

SINE-SQUARE WAVE GENERATOR
For Laboratory & Industrial Use

Model 710: Provides an accurately calibrated source of sine wave and square wave functions over a wide frequency range. Sine wave total harmonic distortion below 1%. Hum level better than 90 db down. Square wave rise time less than .1 Micro second. 20 cycles to 1 MC in five ranges on both sine and square waves.



MODEL 755

NOISE GENERATOR
Industrial & Technician Model

Model 755: The first noise generator to be completely self-contained. Has two indicating meters. This instrument is divided into two parts—VTVM side and Generator Noise side. Permits noise level adjustments to improve sound and video in TV receivers. Ranges: 0-0.1, 0.5, 1.0 and 5.0 Volts, zero-center DC scale. Frequency rangeflat from 10 to 250 MC. Noise level: 0-20 db.



MODEL 1800

LABORATORY CATHODE RAY OSCILLOSCOPE
Wide Range . . . Versatile

Model 1800: Provides the ultimate in Oscilloscope function for the industrial electronic laboratory. Exceptional range, sensitivity and stability make the 1800 most desirable for the professional electronic engineer in his detailed visual study of any one electrical quantity as a function of another electrical quantity. 5 other models of HICKOK oscilloscopes are available. Write for catalog today.

ELECTRICAL

INDICATING METERS

HICKOK is a manufacturing pioneer and constant developer of the finest electrical indicating instruments. Today HICKOK manufactures the most accurate laboratory types with accuracies of 0.2% of full scale deflection down to small pocket portable types with accuracies of 1½%. HICKOK introduced the internal pivot design to provide the high standards of accuracy and dependability in modern instrumentation.



MODEL 46

The high HICKOK standard of quality is available in Ruggedized DC or Rectifier Type AC meters. This latest design provides the practical answer to requirements for shock-proof meters with dependable accuracy. These instruments are thoroughly engineered and tested and meet MIL-M-6A, MIL-M 10304 (Sig. C) and New Military Specification for Round Panel Instruments. Available in 2½", 3½" and 4½" Ruggedized.



MODEL 46-250

Space on an instrument panel is valuable. The need for obtaining as long a panel as possible is neatly filled with a 250 Degree Arc-Angle long scale instrument pioneered and perfected in the smaller size by HICKOK. These meters have a scale 2½ times as long as the conventional panel instruments. 250° Meters, in sealed as well as standard molded cases, are available in many sizes and ranges.



MODEL 14

HICKOK DC and AC Portable Instruments—Ammeters, Milliammeters, Microammeters, Voltmeters, Millivoltmeters, Volt-Ammeters Thermo-Meters are contained in a phenolic case lined with heavy steel shell which shields from the effects of stray magnetic fields. Scale divisions are spaced equal distances apart. Accuracy within ½ of 1%. On special order, Model 14 can be supplied with a calibration chart to provide accuracy to 0.2%. Also available is a complete line of pocket portables with accuracies to 0.5%.

The many special movements developed by HICKOK are: electrodynamometers, self-contained frequency meters, galvanometers, true logarithmic deflections, special curves for special purposes and ruggedized designs for highest shock tests. Full technical information on the complete line of HICKOK instruments and test equipment is available on request. Kindly list details of your requirements and ask for Catalog No. 28.

THE HICKOK ELECTRICAL INSTRUMENT COMPANY

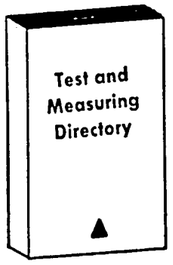
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Manufacturers of the World's Most Complete Line of Electrical-Electronic Test Equipment

A Directory of

7. Test and Measuring Equipment

Laboratory Standards & Supplies



10 Major Groups

70 Products

Organized by functions for Engineers

In order to include Test Equipment with other instruments and controls in Part V, the Directory of Materials and Services, (Products 75-81), has been included in Part VI, beginning on page 477.

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

92 Audio Frequency Test Equipment.
93 General Laboratory Equipment & Supplies.
94 General Test Equipment.
95 Graphic Recorders.
96 Laboratory Standards of Frequency & Time.
97 Microwave & Radar Test Equipment.
98 Nuclear.
99 Oscilloscopes—Cathode-Ray.
100 Radio Frequency Test Equipment.
101 Television Test Equipment.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

74. Waveguides & Accessories.

(Continued from page 433)

Titeflex, Inc., N.J., 5, 10, 25, 30, 35

Transline Assoc., N.J., 15, 20, 40

Triumph Mfg. Co., Ill., 5, 10, 15, 20, 25, 30, 35, 40

Universal Mfg. Co., Inc., N.J., 5, 25

Universal Microwave Corp., N.J., 5, 15, 20, 25, 30, 35

Vectron, Inc., 402 Main St., Waltham 54, Mass., 20
For details see ad on pages 366, 462
Tel: WAltham 5-8700

Waveguide, Inc., Calif., 5, 15, 20, 25, 30, 35, 40

Waveline, Inc., Passaic Ave., Caldwell, N.J., 5, 15, 20, 25, 30, 35, 40
For details see ad on page 464
Tel: CAldwell 6-5785

Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden Surrey, England, 5, 10, 25
For details see ad on page 230
Tel: Malden 2202

Weinschel Eng. Co., Inc., Md., 20

Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 15, 20, 30, 40, Directional Couplers
For details see ad on page 490
Tel: HUnter 2-7876

92. Audio Frequency Test Equipment.

5. Beat frequency oscillators
10. Distortion & noise analyzers
15. Intermodulation meters
20. Output power meters
25. RC oscillators
30. Spectrum analyzers
35. Square wave generators
40. Voltmeters-audio frequency

A. R. F. Products, Inc., Ill., 10

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 40
For details see ad on page 401
Tel: Prescott 8-3687

Advanced Electronics, Inc., Conn., 10

Airmec, Limited, England, 20, 25

Altec Lansing Corp., Calif., 15

American Chronoscope Corp., N.Y., 40

American Electronic Labs., Inc., Pa., 35

Amplitronix, Inc., N.Y., 35

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 35
For details see ad on page 402
Tel: Eliot 4-4321

Audio Instrument Co., Inc., N.Y., 15

Authorized Manufacturers Service, N.Y., 40

Ballantine Labs., Inc., 102 Fanny Rd., Boonton, N.J., 40
For details see ad on page 450
Tel: Boonton 8-1432

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 10, 15, 25, 35
For details see ad on pages 96-97
Tel: FI 2-1821

Beckman Instr., Inc., Shasta Div., P. O. Box 296, Station A, Richmond, Calif., 15, 25, 35, 40
For details see ad on page 138
Tel: Beacon 5-7196

Bristol Engineering Corp., Pa., 25, 35

Bruel & Kjaer, Denmark, 5, 10, 30, 40

Brush Electronics Co., Ohio, 5, 10, 25, 30, 40

C.G.S. Laboratories, Inc., Conn., 30

Canadian Research Institute, Canada, 5, 20, 25, 35, 40

Clough-Brengle Co., Ill., 5, 25, Sweep Generator

Cole Instrument Co., Calif., 20, 40

Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 20, 40
For details see ad on page 152
Tel: PL 4-5502

Compagnie Generale de Metrologie, Chemin de la Croix-Rouge, Annecy, France, 20, 25, 40
For details see ad on page 445
Tel: Annecy 8.60

Crown Engineering, N.M., 5

Cubic Corp., Calif., 20, 35

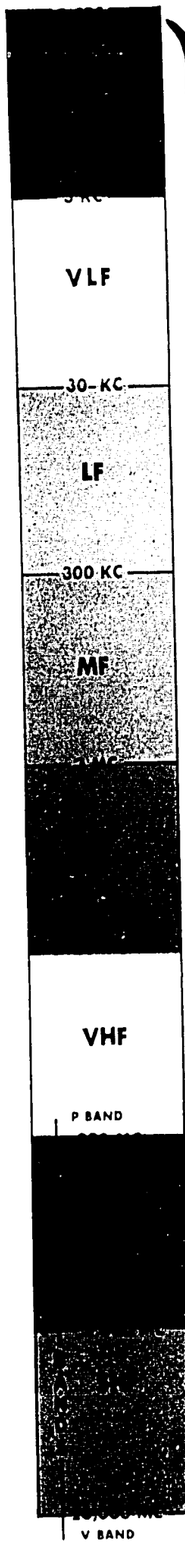
D & R Ltd., Calif., 10, 15

Daven Company, N.J., 10, 20, 25, 40

Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., 10, 30
For details see ad on page 254
Tel: APpleton 7-1133

Dawe Instruments, Ltd., England, 10, 20, 25, 40

(Continued on page 437)



THERE IS A

KAY ALL-ELECTRONIC INSTRUMENT for

HIGH FREQUENCY MEASUREMENTS

AUDIO ANALYSIS

LABORATORY, ENGINEERING & PRODUCTION

HIGH FREQUENCY EQUIPMENT

RANGE	INSTRUMENT	DESCRIPTION	PRICE
50 KC—1000 MC	Mega-Sweep	Sweeping Oscillator	$465
50 KC— 950 MC	Calibrated Mega-Sweep	Sweeping Oscillator	$495
10 MC— 950 MC	111A Calibrated Mega-Sweep	Sweeping Oscillator	$575
1245 MC—9660 MC	Centilators	Sweeping Oscillator	$395 to 595
50 KC— 2 MC	Kilo-Sweep	Sweeping Oscillator with Crystal Markers	$525
5 KC— 200 KC	Sona-Sweep	Sweeping Oscillator with Crystal Markers	$525
50 KC— 20 MC	Model Video Marka-Sweep	Sweeping Oscillator with Crystal Markers	$495
50 KC— 8 MC	Model Video TTV Marka-Sweep	Sweeping Oscillator with Variable and Crystal Markers	$695
450 MC— 900 MC	Ultra-Sweep	Sweeping Oscillator	$895
450 MC— 900 MC	Ultra-Marker	Marker Generator	$395
450 MC— 900 MC	Model UHF Marka-Sweep	Combines Ultra Sweep and Ultra Marker in Single Cabinet	$1190
10 MC—1000 MC	Mega-Match	Impedance Match Indicator	$895
8500 MC—9700 MC	Microwave Mega-Match	Impedance Match Indicator	$895
10 MC—3000 MC	Megalyzer	Spectrum Analyzer	$895
5 MC— 220 MC	Mega-Node	Random Noise Generator	$295
100 MC—3000 MC	Mega-Node Sr.	Random Noise Generator	$995
1200 MC—26500 MC	Microwave Mega-Nodes	Random Noise Generator	$195 to 445
5 MC—26500 MC	Rada-Node	Radar Noise Figure Measuring Set	$1395
30 MC & 60 MC	Rada-Pulser	Pulsed-Carrier Generator	$595
12 MC to 80 MC	Rada-Pulser Sr.	Pulsed-Carrier Generator	$745
½, 1, 2 and 5 microseconds	Micro Pulser	Pulse Generator	$225
.025, 0.05, 0.1 and 0.25 microseconds	Mega-Pulser	Pulse Generator	$225
40 MC—10,000 MC	Radalyzer	Gain Measuring Set	$995

PRODUCTION AND SERVICE TEST EQUIPMENT

RANGE	INSTRUMENT	DESCRIPTION	PRICE
VHF TV All 12 channels	Model RF-P Marka-Sweep	All-Electronic Switchable RF TV Sweeping Oscillator for production test with narrow pulse markers	$795
20-50 MC	Model IF Marka-Sweep	All Electronic IF TV Sweeping Oscillator for production test with narrow pulse type markers.	$325
30 & 60 MC Others, Special	Rada-Sweep	Combined Sweeping Oscillator and Crystal Marker Generator for rapid alignment	$395
All 12 TV Channels	Mega-Pix Sr.	A Crystal Controlled Picture and Sound RF Signal Source for color, black and white	$990
Any Single Channel	Mega-Pix Sr.		$495
TV Channels 14,15,16,34, 35,36,37,38, 39, 40,47,48, 49,81,82,83	Mega-Pix UHF Converter	For use with Mega-Pix Sr.	$450
TV Channels 3, 15, 48, 82	Ultra-Pix	UHF Crystal Controlled Picture and Sound RF Signal Source	$795
Video	Model Uni-Chrome Chromabar	Color Generator— each NTSC color and black and white presented simultaneously	$425
Video	Model Multi-Chrome Chromabar	Multiple Color Bar Generator, all NTSC colors and black and white presented simultaneously.	$990
Video	Model Tri-Chrome Chromabar	All 6 NTSC colors displayed 3 at a time with black & white	$525
Video	Model Anychrome Chromabar	A laboratory Color Signal Generator	$495
All 12 TV Channels	Mega-Marker Sr.	A Crystal Controlled TV RF Sound Carrier Marker Generator	$250
All 12 TV Channels	Dual Mega-Marker Sr.	A Crystal Controlled High Output Picture and Sound RF Marker Generator	$350
19 to 49 MC	Megaliner	IF Marker Generator	$150

ELECTRONIC SOUND ANALYSIS EQUIPMENT

AUDIO FREQUENCY RANGE C.P.S.	INSTRUMENT	DESCRIPTION	PRICE
5—4400	Vibralyzer	Vibration Frequency Analyzer	$2500
85—8000	Sonagraph	Sound Spectrograph for Analysis of Audio Energy	$1995
100—5000	Sona-Stretcher	Speech Stretcher—slows speech to one-half of normal tempo	$950
100—4000	Sonalator	Dynamic Translator for Visible Speech Display	$1495 & 1695
40—12,000	Echo-Vox	A Wide and Continuously Variable Time Delay	$650

ACCESSORIES

RANGE	INSTRUMENT	DESCRIPTION	PRICE
8500 to 9700 MC	X Band Wavemeter	A High Q Micrometer—Controlled Co-axial Wavemeter	$50 & $75
DC to 500 MC	Attenuators	Switchable in 1 db steps	$50
450 to 900 MC	Ultra-former	An Unbalanced to Balanced Matching Transformer	$30
Any single VHF-TV channel	Telefilter	A single side band TV filter	$195

ALL PRICES F.O.B. FACTORY

Write for Catalog

KAY ELECTRIC COMPANY

14 MAPLE AVENUE, PINE BROOK, N. J.

PRECISION TEST AND MEASURING INSTRUMENTS FOR LABORATORY, PRODUCTION AND FIELD

7. Test and Measuring Equipment

92. Audio Frequency Test Equipment.

(Continued from page 435)

Daystrom Instrument, Pa., 25, 35
Donner Scientific Co., Calif., 10, 25, 30
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 10, 15, 20, 25, 35, 40
For details see ad on page 445
Tel: Burlington 3-0446
Dyna-Labs., Inc., N.Y., 10, 30
El Mec Labs., Inc., N.J., 40
El-Tronics, Inc., Pa., 25, 35
Electrical & Physical Instr. Corp., 42-19 27th St., Long Island City, N.Y., 35
For details see ad on page 412
Tel: Stilwell 4-6389
Electro Impulse Lab., Inc., 62 White St., Red Bank, N.J., 30, 40
For details see ad on page 330
Tel: Red Bank 6-0404
Electro-Mechanical Research, Inc., Conn., 35
Electronic Instrument Co., Inc., N.Y., 35
Electronic Instruments, Ltd., England, 40
Electronic Measurements Corp., Lewis Ave. & Maple St., Eatontown, N.J. 5, 25, 40
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Measurements Corp., N.Y., 25
Elk Electr. Laboratories, Inc., N.Y., 5, 10, 15, 25, 35, 40
Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, N.Y., 10
For details see ad on page 459
Tel: BA 4-8500
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 30, 40
For details see ad on pages 47-50
Tel: Astoria 2-800
Ferrara, Inc., Mich., 35
Fluke Mfg. Co., Inc., John, Wash., Electronic Wattmeters
Franklin Electronics, Inc., Pa., 5, 10, 30, 35
Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 10, 25, 40
For details see ad on page 180
Tel: Evergreen 6-1300
Furzehill Labs., Ltd., England, 5, 20, 25, 30, 35, 40
General Electrosonics, Inc., N.Y., 5, 30
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15, 20, 25, 30, 35, 40
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Heath Co., 305 Territorial Rd., Benton Harbor 37, Mich., 15, 20, 25, 35, 40
For details see ad on page 447
Tel: WA 5-1175
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 5, 10, 25, 35, 40
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 40
For details see ad on page 434
Tel: LIberty 1-8060
Hycon Mfg. Co., Calif., 5, 10, 15, 20, 25, 30, 35, 40
Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 10, 25, 40
For details see ad on page 471
Tel: GR 3-4684
Instrument Electrs. Corp., N.Y., 40
Instrument Labs., Ill., 40
Insuline Corp. of America, N.H., 5, 10, 15, 20, 25, 30, 35, 40
Jackson Electrical Instr. Co., Ohio, 25
Krohn-Hite Instr. Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 25, 35
For details see ad on pages 2-3
Tel: UNiversity 4-4272
Linear Equip. Labs., Inc., Dept. RD-7, 295 W. Shore Dr., Massapequa, L.I., N.Y., 35
For details see ad on page 191
Tel: MA 6-3023
Maico Co. Inc., 21 N. 3rd St., Minneapolis 1, Minn., Audiometers
For details see ad on page 439
Tel: AT 8255
Marconi Instruments, Ltd., N.Y., 5, 10, 20, 30, 35, 40
Measurements Corp., Intervale Rd., Boonton, N.J., 15, 25, 35, 40
For details see ad on pages 470, 524
Tel: BOonton 8-2131
Measurements Eng., Ltd., Canada, 25, 35
Millivac Instr. Corp., N.Y., 20, 40
Muirhead & Co., Ltd., England, 25
New London Instrument Co., P.O. Box 189P, New London, Conn., 35
For details see ad on page 438
Tel: Gibson 3-8451
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 35
For details see ad on page 344
Tel: KI 7-0469
Northern Radio Co., Inc., Dept. PD54, 147 W. 22nd St., New York 11, N.Y., 35
For details see ad on pages 6-8
Tel: Watkins 9-9117
Osterland Co., Edmund, N.J., 40
Panoramic Radio Prods., Inc., 20 South 2nd Ave., Mt. Vernon, N.Y., 10, 15, 30
For details see ad on page 437
Tel: MOunt Vernon 4-3970
Penntronics, Pa., 25, 35
Phebco, Inc., Md., 20, 25
Philbrick Researches, Inc., G. A., Mass., 35

(Continued on page 439)

PROBLEM: *Analyzing or Monitoring Spectral Content*

FAST SOLUTION: *A General Purpose or Special Panoramic Instrument Designed for Your Needs*

Which Is Your Problem?

Analysis of Sounds, Vibrations, Waveform or Distortion

Ultra-audible sounds and vibrations, bandwidth of ultrasonic transmissions

Analysis of FM, AM and pulsed RF signals, interference, spurious oscillations or monitoring communications channels

Solution

PANORAMIC SONIC ANALYZER Models AP-1 and LP-1 Visually displays spectral components between 40 20,000 cps in one second. Direct Reading.

PANORAMIC ULTRASONIC ANALYZER Model SB-7 2 KC-300 KC. Direct Reading. Continuously variable presentation width 200 KC to zero.

PANORAMIC SPECTRUM ANALYZER Model SPA-1
PANADAPTOR Models PR-1, SA-3, and SA-8a
PANALYZER Models SB-3 and SB-8a.
available in a variety of types having different sweep-widths and resolution capabilities.

Also Sweep Generators for accurate frequency response analysis covering sonic and ultrasonic frequencies, Models SG-1, G-2 and G-3

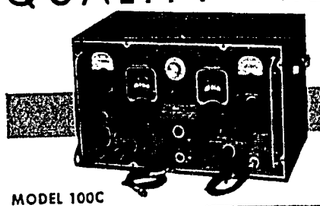
Write for complete details, prices and delivery today.

PANORAMIC RADIO PRODUCTS, INC.

20 South Second Ave. Mount Vernon, N.Y.

Phone MOunt Vernon 4-3970

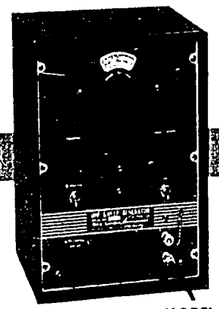
QUALITY PRECISION INSTRUMENTATION



MODEL 100C

FM SIGNAL GENERATOR

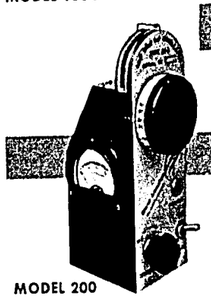
A precision FM signal source for testing FM equipment. 27-230 mc.



MODEL 130A

UHF TV SWEEP FREQUENCY GENERATOR

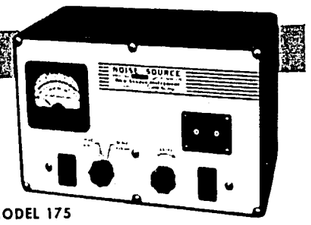
A laboratory instrument also suitable for production and service testing of UHF television tuners and receivers. 450-900 mc.



MODEL 200

UHF GRID DIP OSCILLATOR

This versatile, compact instrument combines the power supply and oscillator in one lightweight unit. 400-900 mc.



MODEL 175

VHF-UHF NOISE SOURCE

Features simple operation, long life noise diodes, and no balun requirements. 50-900 mc.



MODEL 155

SIGNAL GENERATOR

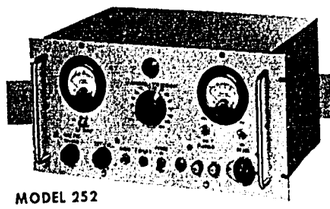
Tests receivers and transmitters operating between 2700 and 3400 mc.



MODEL 160

BROADBAND AMPLIFIER

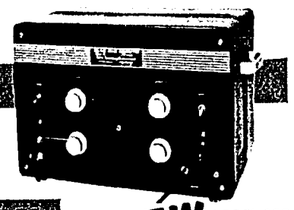
Increases the sensitivity of oscilloscopes and voltmeters; amplifies short pulses without objectionable distortion. 15 kc — 50 mc. 60 db gain.



MODEL 252

MODULATION MONITOR

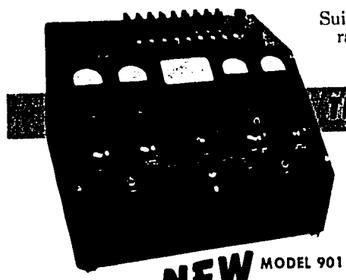
Measures the percentage of modulation of AM transmitters operating from 100-225 mc or 225-400 mc.



NEW MODEL 183

SQUARE WAVE GENERATOR

Suitable for testing the transient and frequency range of wide band amplifiers, and accurately measuring their amplitude. 10 cps to 1 mc.



NEW MODEL 901

TRANSCONDUCTANCE ANALYZER AND CIRCUIT SIMULATOR

Measures transconductance under all operating conditions; reproduces any type of static or dynamic tube characteristic. Range: 0-100; 0-500; 0-1,000; 0-5,000; 0-10,000; 0-50,000 micromhos.

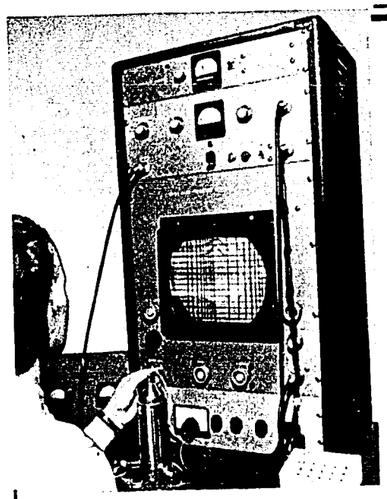
NEW FREQUENCY STANDARD MODEL 701

A source of highly stabilized frequencies covering the range from 10 kc to 50 mc at intervals of 10 kc, 100 kc or 1 mc.

Write for catalog and detailed specifications

NEW LONDON INSTRUMENT Company

P. O. BOX 189P, NEW LONDON, CONN.



Engineering and Manufacturing Facilities for:

Audio Equipment
Acoustical Devices
Magnetic Recording
Industrial Electronics

Manufacturers of:

Audiometers
Hearing Aids
Equipment for the Deaf
Recording Heads
(Dynamu Division)
Curve Tracers
Headlight Dimmers

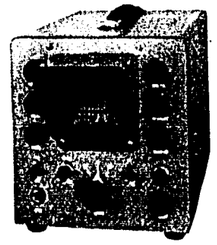
The Maico Audio Frequency Curve Tracer provides a fast, accurate means of obtaining a visual presentation of the frequency response of a wide variety of audio components and audio systems. Makes for more accurate inspection at lower cost.

Maico Company, Inc.

21 North Third St. **Minneapolis 1, Minn.**

TELEGRAPH DISTORTION ANALYZER

A VERSATILE NEW INSTRUMENT THAT SIMPLIFIES THE MEASUREMENT OF BIAS AND DISTORTION . . .



The Stelma Telegraph Distortion Analyzer Model TDA-1 is a self-contained, portable unit designed to measure the bias and distortion of telegraph signals rapidly and accurately. The percent distortion is read directly on a calibrated scale mounted in front of a cathode-ray tube. The various components of distortion making up the total distortion are clearly indicated.



No test signals required.
Measurements are made on regular teleprinter traffic.

An Ideal Instrument For Telegraph Terminal Centers and Field Stations

SIMPLE TO CONNECT

The Telegraph Distortion Analyzer is patched in series into a telegraph loop or local telegraph circuit. It can be conveniently carried into the field and readily plugged into working circuits at various repeater or terminal points in order to check the distortion characteristics of circuits and equipment.

QUICK TO ADJUST • EASY TO OPERATE

No special skill or technical knowledge is required to operate the TDA.

CONVENIENTLY PORTABLE

The Telegraph Distortion Analyzer weighs only 17 lbs. and measures 7½ x 8 x 12 inches.

STELMA PRODUCTS

Regenerative Repeaters, Electronic
Bias Test Sets
Telegraph Repeater—4-wire to 2-wire
Automatic Telegraph Distortion Warning Systems
Receivers, Carrier Telegraph
Transmitters, Carrier Telegraph

STELMA INCORPORATED
389 Ludlow St. **Stamford, Conn.**

7. Test and Measuring Equipment

92. Audio Frequency Test Equipment.

(Continued from page 437)

Polarad Electronic Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 30
For details see ad on pages 39-42
Tel: Stagg 2-3464

Precise Dev. Corp., N.Y., 25, 35, 40

Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y., 25, 35
For details see ad on page 468
Tel: HA 9-6262

Radex Corp., Ill., 25

Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 30
For details see ad on page 525
Tel: MElbourne 800

Radio City Products Co., Inc., Pa., 5, 20, 25, 35, 40

Radio Corp. of America, Eng. Prods. Dept., Camden, N.J., 5, 10, 15, 20, 25, 30, 35, 40
For details see ad on page 210
Tel: Woodlawn 3-8000

Rawson Electr. Instrument Co., Mass., 40

Reiner Electr. Co., Inc., N.Y., 20, 35, 40

Ribet Desjardin, France, 25, 35

Rutherford Electr. Co., Calif., 35

Scott, Inc., H. H., Mass., 10, 25

Sensitive Res. Instr. Corp., N.Y., 20, 40

Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 35
For details see ad on page 236
Tel: FI 7-2810

Sonotone Corp., N.Y., Audiometer

Southwestern Indust. Electr. Co., Tex., 25, 40

Specialty Eng. Div. Spec. Assem. & Pack., N.Y., 25, 40

Spencer-Kennedy Labs., Inc., Mass., 35

Statistical Instr. Co., N.Y., 10, 20, 30, 35, 40

Stelma, Inc., 389 Ludlow St., Stamford, Conn., Telegraph Distortion Analyzer
For details see ad on page 439
Tel: Stanford 48-2579

Summit Electr. Inc., N.J., 5, 10, 15, 20, 25, 35, 40

Sylvania Elec. Products Inc., Radio and Television Div., 254 Rano St., Buffalo 7, N.Y., 30
For details see ad on pages 9-14
Tel: Victoria 2450

T. L. G. Elec. Corp., N.Y., 35

Taffet Radio & TV Co., N.Y., 5, 25

Taylor Elec. Instruments, Ltd., England, 20, 25, 35, 40

Tektronix, Inc., Ore., 35

Teletronics Lab., Inc., N.Y., 25, 35

Triumph Mfg. Co., Ill., 5, 35, 40

(Continued on page 441)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

We're Glad we Bought a HIGHER ATTENUATION

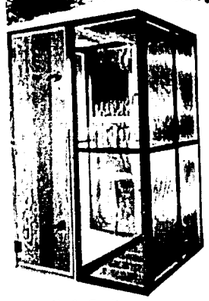
NEW SCREEN ROOM



Lindgren "AMERICAN 40"

LONGER LIFE . . . GREATER EFFICIENCY . . .
IMPROVED COMFORT . . . LOWER COST!

When you buy screen rooms it pays to get HIGHEST GUARANTEED ATTENUATION to take care of future as well as present needs. Due to exclusive construction features, Lindgren true-isolated, double shielded BRONZE Screen rooms offer high attenuation (128 DB) at lower cost than cell type rooms rated below 100 D.B. Bronze lasts longer, costs less, is self-ventilating through open mesh. Also available in Copper up to 146 D.B.



Meets U. S. Gov't performance specifications

CONSISTENTLY HIGHEST ATTENUATION
"In our experience, your screen rooms consistently showed highest attenuation."
—(Engineering Report.)

Get this FREE BOOK
Gives construction diagrams, complete specifications, photos, sizes, prices, performance charts, engineering reports . . . Everything you need to know to buy Screen Rooms intelligently. Send for "Screen Rooms" of Quality, before you decide your screen room purchase.



ON DISPLAY West Coast Electronic Conference Los Angeles, August 25-27.

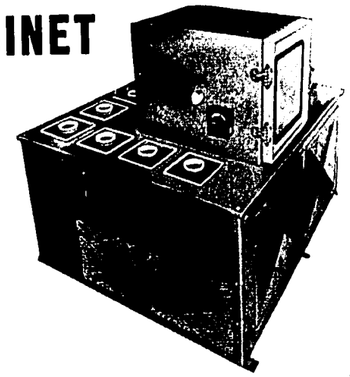
ERIK A. Lindgren & ASSOCIATES
Established 1939 Phone SUnnyside 4-0710
4515-17 N. RAVENSWOOD AVE. CHICAGO 40, ILL.

ANOTHER INTERNATIONAL RADIANT FIRST!!

A TEMPERATURE CALIBRATION CABINET

Featuring:

SEVEN TANKS and ONE CHAMBER



- Permits closely controlled calibration and testing of remote temperature sensing devices.
- Temperature in each tank controlled to ±¼° F.
- Separate cooling or heating systems for each tank.
- Altitude conditions also available in chamber.
- Separate control of temperature and humidity in the chamber to tolerances ±2° F. closer tolerance possible.
- Illustrated unit has 7 tanks (—60° c. to +60° c.)
- Chamber temperature range — 70° c. to +60° c.

The illustrated unit was specially designed and built "to solve a clients' problem in environmental testing" a specialty of I. R. C. Our engineers are ready to solve your needs—call on us for quotations.

MANUFACTURERS OF: Vacuum Ovens, Brine Chillers, Diaphragm Exercisers, Rain Makers, Special Air Conditioning Equipment, Super Vacuum Systems, Explosion Chambers, Sunshine Chambers, Plastic Bell Jar Systems, Immersion Test Equipment, Low Temperature Test Equipment—Humidity Controlled Test Equipment, Altitude and Vacuum, Sand and Dust, Walk-In Rooms, Salt Spray, Fungus, Sublimators, Liquid Hot and Cold Baths, Mobile Refrigeration.

SEND FOR OUR NEW 1954 CATALOG RD

INTERNATIONAL RADIANT CORP.
MEMBERS INSTITUTE OF ENVIRONMENTAL EQUIPMENT MANUFACTURERS
40 MATINECOCK AVE. • PORT WASHINGTON, N. Y.

CONRAD ENVIRONMENTAL TEST CHAMBERS

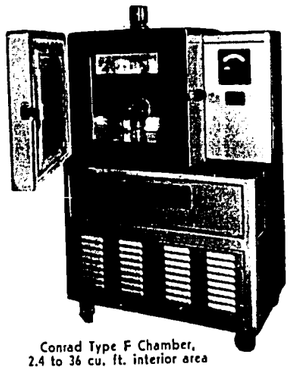
★★★ *Full range of sizes, temperature and instrumentation.*

★★★ *Remote and portable liquid chilling units to 900,000 Btu per hr. at —100° F.*

★★★ *Self contained fully portable temperature test chambers.*

FULL SELECTIVITY OF EQUIPMENT TO MEET YOUR SPECIFIC NEEDS

Cold only—cold and heat—Cold, heat, and humidity—Heat and humidity—cold and altitude—Cold, heat and altitude—Cold, heat, altitude and humidity—Heat and altitude—Altitude only—Remote or portable liquid chillers—Portable test chambers.



Conrad Type F Chamber, 2.4 to 36 cu. ft. interior area

CONRAD DESIGN AND CONSTRUCTION ASSURES HIGH LEVEL PERFORMANCE AND RELIABILITY

Quicker draw down with patented Conrad double cascade system. Uses safe Freon 13 and 22.

Rigid insulation provides uniform heat barrier.

Stainless steel interiors permit test of any materials.

All welded cabinet construction—no wood used.

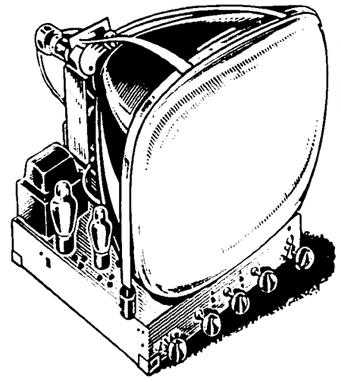
Full selection of instrumentation and controls.

Write for Data Sheets, or information on environmental chambers to meet your needs.

CONRAD INC.
HOLLAND, MICHIGAN

High Purity

Baker ELECTRONIC CHEMICALS



New standards of precision have marked the rapid growth of the booming electronics industry. To help attain those standards, chemical purity is highly essential for phosphors, emission coatings, activating agents, etc.

Some of the Baker Chemicals popular with the electronics industry are shown on this page. As your electronics development work requires these or other chemicals to precise standards, Baker is your logical source of dependable supply.

J. T. Baker Chemical Co., Executive Offices and Plant, Phillipsburg, N. J.

Aluminum Nitrate	Chemical R-500
Aluminum Sulfate	Magnesium Chloride
Ammonium Hydroxide	Magnesium Oxide
Ammonium Phosphate	Manganous Carbonate
Antimony Trioxide	Phosphoric Acid
Barium Acetate	Potassium Hydroxide
Barium Aluminate	Radio Mixtures
Barium Carbonate	Reagent Grade Acids
Barium Nitrate	Silicic Acid
Barium Tungstate	Sodium Hydroxide
Cadmium Chloride	Sodium Phosphate Dibasic
Cadmium Sulfate	Strontium Carbonate
Cadmium Sulfide	Strontium Nitrate
Calcium Carbonate	Triple Carbonates
Calcium Chloride	Zinc Nitrate
Calcium Fluoride	Zinc Oxide
Calcium Nitrate	Zinc Sulfide

Baker Industrial Chemicals
"Purity by the ton"

7. Test and Measuring Equipment

Products 92-93

92. Audio Frequency Test Equipment.

(Continued from page 439)

Vectron, Inc., 402 Main St., Waltham 54, Mass., 30
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vocaline Co. of America, Inc., Conn., 5, 10
Walkirt Co., Calif., 35
Wang Labs., 296 Columbus Ave., Boston 16, Mass., 25
For details see ad on page 407
Tel: KE 6-0624
Waveforms, Inc., N.Y., 25, 40
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 10, 25, 35
For details see ad on page 230
Tel: MAlden 2202
Weinschel Eng. Co., Inc., Md., 25, Signal Generators
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 20, 40
For details see ad on pages 98-99
Tel: BI 3-4700
White Industries, Inc., N.Y., 40
Winston Electr., Inc., Pa., 10, 15, 20, 25, 30, 35, 40
Wright Eng. Co., Calif., 10, 30, 40
Wunderlich Radio Co., N.Y., 5

93. General Laboratory Equipment & Supplies.

5. Chemicals
10. General laboratory equipment
15. RF shielding materials
20. Shielded enclosures

Ace Engineering & Machine Co., Inc., Pa., 20
Allied Chem. & Dye, Gen. Chem. Div., N.Y., 5
American Electronic Labs., Inc., Pa., 10
American Instrument Co., Inc., Md., 10
Anchor Specialty Mfg. Co., N.J., 10
Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 15, 20
For details see ad on page 487
Tel: LIvingston 8-1545
Bache & Co. Semon, N.Y., Optical Systems
Baker Chemical Co., J. T., No. Broad St., Phillipsburg, N.J., 5, TV
For details see ad on page 441
Tel: Phillipsburg 5-2151
Barnstead Still & Sterilizer Co., Mass., 10
Beckman & Whitley, Inc., Calif., Framing & Streak Cameras
Bethlehem Apparatus Co., Inc., Pa., 10
Blue M. Electric Co., Ill., 10
Bowser Tech. Refrig. Div. of Bowser., Conn., 25
Canadian Radium & Uranium Corp., N.Y., 20
Canadian Research Institute, Canada, 10

93. General Laboratory Equipment & Supplies.

Central Scientific Co., Ill., 5, 10
Coleman Instruments, Inc., Ill., 10
Conrad, Inc., 52 W. 4 St., Holland, Mich., Test Chambers
For details see ad on page 440
Tel: Holland 7447
Co-operative Industries, Inc., N.J., 15
Demuth Glass Works, Inc., W.Va., Glass
Devtronics, Inc., N.J., 5, 10
Eastman Kodak Co., N.Y., 5
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 15, 20
For details see ad on page 487
Tel: Pioneer 6-5212
Electronic Instruments, Ltd., England, 10
Electrovox Co., Inc., N.J., 5, Anti-Static
Engineering Associates, Ohio, 10
Engineering Dev., Inc., R.I., Optical Inspect. Devices
Environmental Machinery Co., Inc., N.Y., Test Chambers
Erdco Engineering Corp., Ill., 20
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 5
For details see ad on page 507
Tel: Rockford 2-6695
General Electrosonics, Inc., N.Y., 10
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Goodrich Chemical Co., B. F., Ohio, 5
High Voltage Engineering Corp., Mass., Neutron Sources
Kimble Glass Co., Subsid. Owens-Ill., Ohio, 10
Lindgren & Assoc. Erik A., 4515 N. Ravenswood Ave., Chicago 40, Ill., 15, 20
For details see ad on page 440
Tel: SUnnyside 4-0710
Mackay, Inc., A. D., N.Y., 5
McMillan Lab., Inc., Mass., 20
Metal Textile Corp., 647 E. First Ave., Roselle, N.J., 15
For details see ad on page 480
Tel: CHestnut 5-3000
Meyer & Co., Hugo, N.Y., 10

(Continued on page 443)

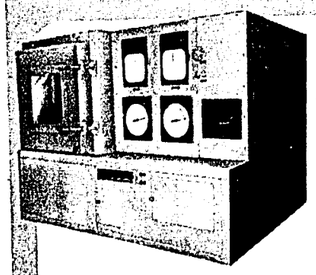
Telephone Numbers and complete addresses for all firms listed in this Directory are given for your convenience in the Alphabetical Index to Radio-Electronic Manufacturers starting on page 131.

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

FOR
ENVIRONMENTAL
TESTING

Tenney

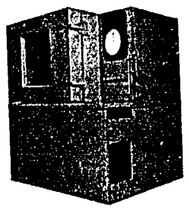
. . . for Tenney Test Chambers are precision-engineered for maximum efficiency and can be designed to simulate the complete range of temperature, atmospheric or pressure conditions found anywhere on earth — or above it to altitudes of 120,000 ft. plus! They attain sub-zero temperatures quickly, maintain them efficiently and provide full instrumentation for accurate evaluation of complete test data.



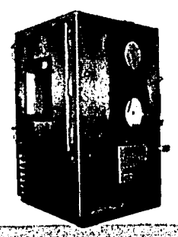
TENNEYZPHERE ALTITUDE CHAMBERS

Designed to withstand atmospheric pressure and to simulate global conditions of pressures, temperatures and humidities. Altitudes from sea level to approx. 80,000 ft. Temperature range from plus 200° F. to minus 100° F. Also simulates desired (20% to 95%) relative humidity.

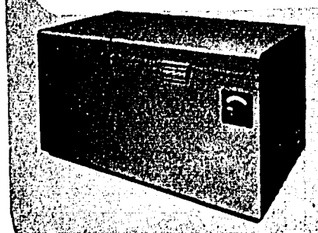
TEMPERATURE AND HUMIDITY CHAMBERS



Model TR — Precision recorder controllers permit accurate simulation and check of temperatures to +200° F. Meets all Mil and JAN specs for low- and high-temperature requirements by incorporation of temperatures down to −100° F. Humidities within 20%-95% range. Variety of standard sizes.



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Designed for low-temperature testing of metals, radios, instruments, plastics, liquids, chemicals and pharmaceuticals. Temperature ranges of −40° F., −80° F., −100° F., −120° F., −150° F., −170° F., are standard for each size.

For further information write Dept. N

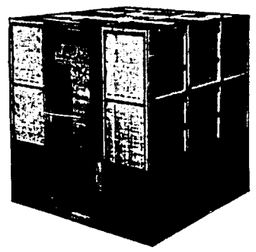
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Los Angeles 46, Calif.

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Tenney
ENGINEERING, INC.
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SHIELDING ROOMS



MULTI-CELL® Shielding Rooms meet all specifications for electrical and electronic performance in research, development and production including

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MIN 100DB from .10 to 10,000 MC and HIGHER

**Military specifications for shielded enclosures.*

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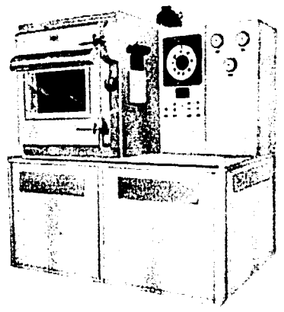
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7. Test and Measuring Equipment

TEST
CHAMBERS



HIGH & LOW TEMPERATURES
CONTROLLED HUMIDITY

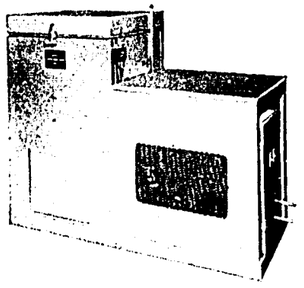
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Equipment available to meet Government specifications for environmental testing



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93. General Laboratory Equipment & Supplies.

(Continued from page 441)

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Tel: Livingston 6-0692
Mission-Western Engineers, Inc., Calif., 10
Multi-Tron Lab., Ill., 10
Nuclear Instr. & Chemical Corp., Ill., 5, 10, Radioactive
Perfection Mica Co., Ill., 15, 20
Precise Measurements Co., 940 Kings Hwy., Brooklyn 23, N.Y., 5
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R.F.I. Shielded Enclosures Corp., Pa., 20
Scientific Specialties Corp., Mass., 10
Semon Bache & Co., N.Y., Optical Systems
Shielding, Inc., 10 Reserve St., Riverside Park, N.J., 20
For details see ad on page 442
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For details see ad on pages 9-14
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Tenney Eng. Inc., Dept. N, 1090 Springfield Rd., Union, N.J., Test Chambers
For details see ad on page 442
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Wakefield Industries, Inc., Ill., Scientific Glass
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Welch Mfg. Co., W. M., Ill., 5, 10
Williams, Brown & Earle, Inc., Pa., 10
Zenith Optical Lab., N.Y., Optics

94. General Test Equipment.

5. Bridges, capacitance
10. Bridges, impedance
15. Bridges, inductance
20. Bridges, resistance
25. Decades, capacitance
30. Decades, resistance
32. Diode testers
35. Insulation testers
40. Multimeters
45. Ohm & megohm meters
50. Strain gauges
55. Stroboscopes
60. Transistor testers
62. Ultrasonic generators
64. Ultrasonic testers
65. Vacuum tube testers
70. Vacuum tube voltmeters
75. Vibration analyzers

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 70
For details see ad on page 401
Tel: Prescott 8-3687
Advanced Electronics, Inc., Conn., 75
Airborne Instruments Lab., N.Y., 60
Airmec, Limited, England, 35, 45, 70
Alco Electronics Mfg. Co., Mass., 35

94. General Test Equipment.

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American Chronoscope Corp., N.Y., 70
American Electronic Labs., Inc., Pa., 60
American Machine & Foundry Co., N.Y., 65
American Mach. & Found. Electronics Div., Mass., 65
Analytical Measurements, Inc., N.J., Ph Meters
Anchor Specialty Mfg. Co., N.J., 60, 65
Associated Research, Inc., Ill., 35, 45
Atlas Engineering Co., Inc., Mass., 15
Authorized Manufacturers Service, N.Y., 65, 75
Ballantine Labs., Inc., 102 Fanny Rd., Boonton, N.J., 70
For details see ad on page 450
Tel: Boonton 8-1432
Beckman Instr., Inc., Beckman Div., 820 Mission St., So. Pasadena, Calif., 70
For details see ad on page 138
Tel: PYramid 1-2141
Beckman Instr. Inc., Shasta Div., P.O. Box 296, Station A, Richmond, Calif., 5, 10, 15, 20, 45
For details see ad on page 138
Tel: Beacon 5-7196
Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 20
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Cincinnati Div., 203 West Third St., Cincinnati 2, Ohio, 45, 65
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Tel: Dunbar 5885
Bendix Aviation Corp., Computer Div., 5630 Arbor Vitae St., Los Angeles 45, Calif., 60
For details see ad on pages 51-54, 302
Tel: Oregon 8-2128
Berkshire Labs., Mass., 55
Beta Electric Corp., N.Y., 35
Biddle Co. James G., Pa., 20, 35, 45
Bliss Electronic Corp., N.J., 35
Borden Engineering Co., N.J., 20, 45
Branson Instruments, Inc., Conn., 62, 64
British Industries Corp., N.Y., 40
Bruel & Kjaer, Denmark, 10, 45, 70, 75
Bruno-N.Y. Industries Corp., Dept ID, 460 W. 34 St., New York 1, N.Y., 40, 55
For details see ad on page 444
Tel: LOngacre 4-5930
Brunswick Instruments, N.J., 70
Brush Electronics Co., Ohio, 5, 10, 15, 20, 35, 45, 75
Buck Engineering Co., Inc., N.J., 65
C.G.S. Laboratories, Inc., Conn., 10, 75
Calidyne Co., Mass., 75
Cal-Tronics Corp., 11307 Hindry Ave., Los Angeles 45, Calif., 10, Computer Test
For details see ad on page 142
Tel: Oregon 8-7141

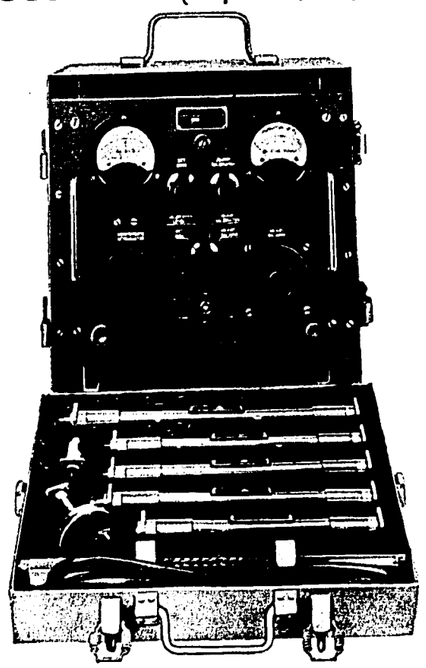
(Continued on page 445)

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BROADBAND POWER METERS
THE CHOICE OF ALL ARMED SERVICES FOR MICROWAVE POWER MEASUREMENTS

POWER { PULSE and CW
5μW to 5W average

FREQUENCY { 20MC — 10,000MC

ACCURACY { 5% Absolute at all ranges, frequencies, temperatures



. . . **INDICATIONS:** Direct Reading
. . . **CALIBRATION:** Compensates for All Variables
. . . **R-F COMPONENTS:** Included, 3, 6, 10 and 20db Attenuators, Bolometer Mount and Elements, R-F Cable
. . . **BOLOMETER:** Broadband, High Overload Capacity
. . . **PLUMBING:** 3/8" and 7/8" 50-ohm Coaxial
. . . **POWER SOURCE:** 115VAC ±15%, 50-1000 cps
. . . **CONSTRUCTION:** Rugged, meets all JAN, MIL requirements

The Standard Item of Test Equipment for All Broadband R-F Power Measurements . . .

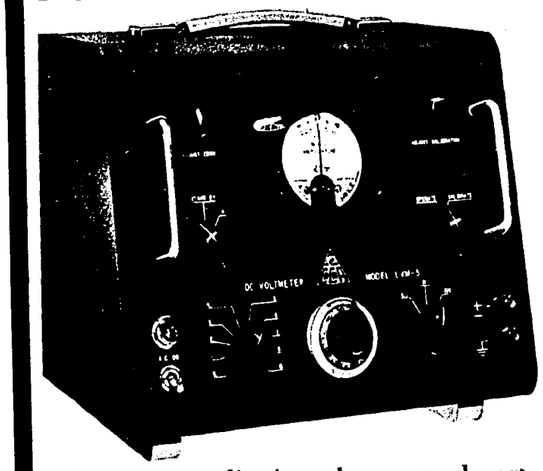
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Microwave Links . . . Television . . . Communications . . . Radar . . . Telemetering . . . Signal Generators . . Laboratory Standards.

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Bruno-New York Industries Corporation
DESIGNERS AND MANUFACTURERS OF ELECTRONIC EQUIPMENT
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High Resolution-Laboratory Standard DC Voltmeters



For most applications these rugged portable, self-contained nulling voltmeters replace a potentiometer, voltbox, galvanometer and standard cell combination. They are suitable for laboratory use, production line testing and field service.

Model LVM-5

Voltage Range: 0-100 Volts DC
Resolution: At least 50 microvolts between 0 and 1 volt
500 microvolts between 1 and 10 volts
5 millivolts between 10 and 100 volts
Absolute Accuracy: ± 0.1% of reading
Input Impedance: Infinite at null

Model PVM-4

Voltage Range: 0-600 Volts DC
Resolution: At least 5 millivolts between 0 and 10 volts
50 millivolts between 10 and 600 volts
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Catalog PL-2 describes these instruments completely, including their use as deflection potentiometers, null indicators and millimicroammeters. Copy on request.

IDA analog computers and accessories are manufactured by Computer Company of America, Division of Bruno-New York Industries Corp. Their usefulness in the field of dynamics has been proven over the years.

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A complete line of standard computers, instruments and regulated power supplies is supplemented by the ability to design and manufacture specialized equipment for your particular applications. Your inquiries are invited.

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7. Test and Measuring Equipment

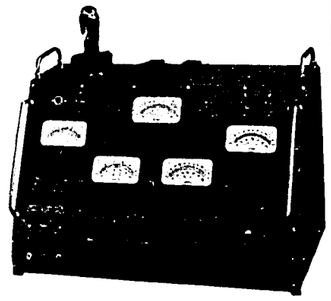
94. General Test Equipment.

(Continued from page 443)

Canadian Aviation Electronics, Ltd., Canada, 55, Moisture Meter
Canadian Research Institute, Canada, 5, 20, 25, 30, 35, 40, 45, 65, 70, 75
Carborundum Co., Globar Div., N.Y., Voltage Sensitive Bridge
Carol Electronics Corp., N.Y., 40
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Tel: Dover 975
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Cole Instrument Co., Calif., 5, 10, 15, 20, 25, 30, 35, 40, 60, 70
Compagnie Generale de Metrologie, Chemin de la Croix-Rouge, Annecy, France, 10, 20, 40, 65, 70
For details see ad on page 445
Tel: Annecy 8.60
Computer Co., of Amer., Div. Bruno-N.Y., 460 W. 34 St., New York 1, N.Y., 70
For details see ad on page 444
Tel: LOngacre
Computer Control Co., Inc., 92 Broad St., Babson Park 57, Mass., Time Marker Generator
For details see ad on page 403
Tel: Belmont 5-6161
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Conn., Ltd., C. G., Electr. Equip. Div., Ind., 55
Consolidated Engineering Corp., Calif., 20, 75
Control Devices, Inc., Mich., 45, 70
Control Engineering Corp., Mass., 50
Cornell-Dubilier Electric Co., Dept. MB4, 333 Hamilton Blvd., S. Plainfield, N.J., 5, 25
For details see ad on page 154
Tel: Plainfield 6-9000
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 10, 15, 20, 40, 45, 65
For details see ad on page 157
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Daven Company, N.J., 30, 70
Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md., 75
For details see ad on page 254
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Dice Co., J. W., N.J., 35, 45, 64
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Douglas Labs., Inc., N.Y., 5, 65
Douglas Radio Labs., Mass., 40
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For details see ad on page 445
Tel: Burlington 3-0446

(Continued on page 446)

LABORATORY TUBE ANALYSER U-61 B



The sources of supply and the many switching combinations possible with this instrument make all the standard measurements on electronic tubes in their working conditions: insulation, electrode continuity, current passed by each electrode, slope, etc. . . . Each voltage (one for the anode, two for the screens, one for the grid) is continuously variable from zero to its maximum value and is indicated by a separate meter. The currents passed by each electrode are also measured separately. Its easy use and the certainty of exact measurements are due to a stabilized power supply, correcting against changes in input voltage and output current, the voltage applied to each electrode being practically independent of the load current. The various voltages are also available at sockets so that the instrument may be used as a stabilized power supply for laboratory work. Overload cut-out gives protection against faulty connections. The possible combinations of switching and jumpers allow complete tube circuits to be examined.

TECHNICAL CHARACTERISTICS: Filament volts: 19 values from 1.1 to 117 V. Anode volts: variable from 0 to 300 V. max. current 100 mA. Auxiliary Grid volts: Two identical sources. Variable from 0 to 300 V. max. current 15 mA. Control Grid volts: Variable from 0 to 50 V. Power supply stabilisation: less than ± 1% variation of all sources for ± 10% power supply variation. Power supply: 110-130 - 220 - 250 V, 50 - 60 c/s. Tubes used: 3 × 5Y3 GB, 2 × 6 V6, 2 × 6L6, 3 × 6AU6, 2 × OB2. Dimensions: 24 × 13⅜ × 15¾ ins. (610 × 340 × 400 mm.) Weight: 66 lbs. (30 kg).

MANUFACTURERS OF:

A.F.-H.F.-V.H.F. Signal Generators

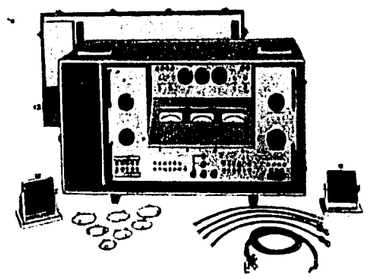
Multimeters

Impedance Bridges

T.V.-Sweep Generators

WORLD-WIDE REFERENCES

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METER CALIBRATION
METER INSPECTION
(quality control)
METER CHECKING
INSTRUMENT CALIBRATION
VOLTAGE and/or CURRENT SOURCE

All in One Versatile Compact Self Contained Unit

MODEL 336
METER TEST SET AND LABORATORY STANDARD
Containing Accurately Metered Power Supply
48 RANGES

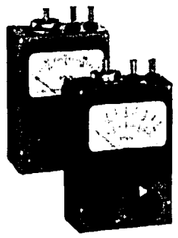
Accuracy of ¼% all ranges using supplied calibration charts
DC VOLTS—100 MILLIVOLTS THROUGH 2000 VOLTS
AC VOLTS—1 VOLT THROUGH 2000 VOLTS
DIRECT CURRENT—100 MICROAMPERES THROUGH 100 AMPERES
ALTERNATING CURRENT—100 MILLIAMPERES THROUGH 100 AMPERES
Complete specifications on request

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BURLINGTON NEW JERSEY
Electronic DEVELOPMENT DESIGN MANUFACTURE

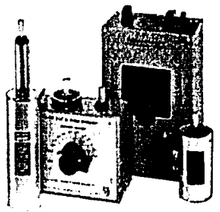
Keithley Instruments



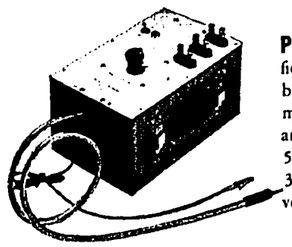
Vacuum Tube Electrometer (Model 210) is a line-operated dc voltmeter, has ranges of 0.8, 2, 8, 20, and 80 volts, a 10^{14} ohm input, grid current within 10^{-13} ampere, accuracy within 2% of full scale, output amplifier with 0-5kc response and 10-volt output full scale on all ranges, output terminals for balanced or unbalanced recorders and amplifiers. Can be used with accessories below and as a preamplifier which has an ultra-high input impedance.



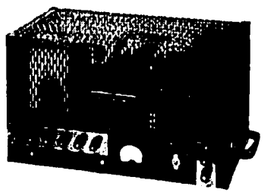
Vacuum Tube Electrometers (Models 200, 200A) are battery-operated dc voltmeters, have ranges of 2 and 20 or 2 and 8 volts, inputs of 10^{14} ohms, grid currents below 5×10^{-13} ampere, accuracy within 2% of full scale. Accessories described below permit use as polarity-sensitive kilovoltmeters, micromicroammeters of extreme range, and meg-megohmmeters.



Electrometer Accessories multiply uses of Keithley Electrometers. Decade Shunt clips over input terminals, converts instrument to direct reading micromicroammeter with full-scale sensitivity of 8×10^{-13} ampere. Voltage dividers provide numerous ranges up to 20 kv. The Test Voltage Supply is useful in measuring resistances as high as 10^{16} ohms.



Phantom Repeater is an instrument amplifier which greatly reduces measuring errors caused by circuit loading. Input impedance is over 200 megohms shunted by 6 mmf. Gains of 1.0, 10, and 100 accurate within 2%, frequency response 5 to over 150,000 cps, output impedance less than 350 ohms, noise equivalent to less than 70 microvolts at the input.



Meter Matcher is a power frequency amplifier. Eliminates meter current errors when using a voltmeter or wattmeter. Gives 150-volt voltmeter or wattmeter effective full-scale ranges of 15 to 600 volts. Input impedance 100,000 ohms to 4.0 megohms on five input voltage ranges, max signal 150 volts rms into resistive meter loads of over 2000 ohms; response 5 to 20,000 cps. Adds less than 0.15% error to measurements.

Write for descriptive literature, or phone our nearest representative . . .

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KEITHLEY INSTRUMENTS
3868 Carnegie Ave. Cleveland 15, Ohio

94. General Test Equipment.

(Continued from page 445)

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Eastern Specialty Co., Pa., 35
Eder Engineering Co., Wis., 50
Edgerton Germeshausen & Grier, Mass., 55
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El-Tronics Inc., Pa., 45
Electrical Device Mfg. Co., N.J., 40, 65
Electro-Measurements, Inc., 4312 S.E. Stark, Portland 15, Ore., 5, 10, 15, 20, 30
For details see ad on page 363
Tel: FI-9235
Electro-Mechanical Research, Inc., Conn., 50
Electro-Metric Instrument Co., 241 Centre St., New York 13, N.Y., 10, Power
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Tel: Canal 6-1337
Electro Products Labs., Inc., 4501-RC N. Ravenswood Ave., Chicago 40, Ill., 75
For details see ad on page 408
Tel: UPtown 8-1141
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Electronic Designs, Inc., N.Y., 70
Electronic Instrument Co., Inc., N.Y., 5, 20, 25, 30, 40, 45, 65, 70
Electronic Instruments, Ltd., England, 35, 40, 45
Electronic Measurements Co., Inc., Lewis Ave. & Maple St., Eatontown, N.J., 45, 55, 65, 70
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Measurements Corp., N.Y., 40, 45, 65, 70
Electronic Research Associates, Inc., P.O. Box 29, Caldwell, N.J., 60
For details see ad on page 369
Tel: CAldwell 6-6729
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Elk Electr. Laboratories, Inc., N.Y., 45, 65, 70
Elm Laboratories, N.Y., 5, 20
Empire State Laboratories, Inc., N.Y., 32, 60
Endevco Corp., Calif., 55, 70, 75
Entwistle Co., James L., R.I., 65
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For details see ad on page 180
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Furzehill Labs., Ltd., England, 15, 30, 70
General Electric Co., N.Y.C., N.Y., 60
General Electric Co., N.Y., 60
General Elec. Co., Apparatus Sales Div., N.Y., 5, 10, 15, 35, 45, 50, 70, 75
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 35, 45
For details see ad on page 495
Tel: Valley Stream 5-6363
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15, 20, 25, 30, 35, 40, 45, 55, 60, 65, 70, 75
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Genisco, Inc., Calif., G-Accelerator
Germanium Prods. Corp., N.J., 60
Gertsch Prods., Inc., Calif., 32, 70
Glenco Corp. 212 Durham Ave., Metuchen, N.J., 5, 50, 75
For details see ad on page 284
Tel: Metuchen 6-2800
Greibach Instruments Corp., 212 Durham Ave., Metuchen, N.J., 40, 45
For details see ad on page 329
Tel: Metuchen 6-2800
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 50, 75
For details see ad on page 177
Tel: Metuchen 6-2800
Haledy Electronics Co., N.Y., 35
Hastings Instrument Co., Inc., Va., 65, Vacuum Indicators
Hathaway Instrument Co., Colo., 50, 75
Heath Co., 305 Territorial Rd., Benton Harbor 27, Mich., 5, 10, 15, 25, 30, 40, 45, 65, 70
For details see ad on page 447
Tel: WA 5-1175
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 70
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hewson Co., Inc., N.J., 35
Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 40, 45, 65, 70
For details see ad on page 434
Tel: LIberty 1-8060
High Vacuum Equip. Corp., Mass., 65
Hycon Mfg. Co., Calif., 40, 65, 70
Hycor, Inc., Calif., Inductance Decades
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 10, 35
For details see ad on page 431
Tel: FArmingdale 2-3606
Industrial Control Co., N.Y., 70
Industrial Development Labs., Inc., N.J., 5, 10, 20
Industrial Electronics, Inc., Mich., 20, 75
Industrial Instruments, Inc., N.J., 5, 10, 15, 20, 25, 30, 35, 45
Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 5, 10, 15, 20, 70, Null Meter
For details see ad on page 471
Tel: GR 3-4684
Instrument Electrs. Corp., N.Y., 70
Instrument Labs., Ill., 40
International Electronics Corp., N.Y., 62
International Instruments, Inc., P.O. Box 2954, New Haven, Conn., 40
For details see ad on page 331
Tel: FUlton 7-2515
International Radiant Corp., 40 Matinecock Ave., Port Washington, L.I., N.Y., Test Chambers; Low Temp., Humidity, Altitude & Vacuum, Sand & Dust, Salt Spray, Fungus, Vacuum Ovens, etc.
For details see ad on page 440
Tel: Port Washington 7-3184
J.B.T. Instruments, Inc., 441 Chapel St., New Haven, Conn., Pyrometers
For details see ad on page 184
Tel: State 7-5825
Jackson Electrical Instr. Co., Ohio, 65, 70
Jennings Radio Mfg. Corp., 970 McLaughlin Ave., San Jose 8, Calif., 70 High Voltage
For details see ad on pages 25-28
Tel: Cypress 2-4025
Kahn & Co., Inc., Conn., 20
Kalbfell Labs., Inc., Calif., 5, 15
Kartron, Calif., Shorted Turn Indicator
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 60, 75
For details see ad on page 436
Tel: CAldwell 6-4000
Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio, 35, 45, 70, Vacuum Tube Electrometer
For details see ad on page 446
Tel: HEnderson 1-9809
L. A. B. Corp., N.Y., 50, 75
Leeds & Northrup Co., Pa., 5, 10, 20, 25, 30, 45
Lehigh Valley Electr. Engr. & Mfg. Co., Pa., Quartz Crystal Test
Lund-Hansen Co., Ill., 45, 65, 70
MB Mfg. Co., Inc., Conn., 75
MacLeod & Hanopol, Inc., Mass., 5, 45, 65
Manson Labs., Conn., 65
Marconi Instruments, Ltd., N.Y., 5, 10, 15, 20, 70

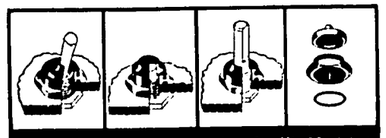
(Continued on page 449)



SPECIAL HARDWARE — RFL — TEST AND SERVICE EQUIPMENT

Est. 1922

SEALNUTS



Type H-1267 for toggle switches fits 13/32-32 thd. is equal to Boot AN 3223 I. Also types for 1/2-20, 1/4-32 and 1/4-40 thds.

Type H-2475 for push switches fits 13/32-32 thd. Other types for various pushbutton diam. and lengths.

Type H-1268 for rotary shafts fits 3/8-32 thd. Also types for 1/2-20 and 13/32-32 thd w/large shafts.

Each *Sealnut** has three parts: black Silicone cap, nickel-plated brass nut, and Silicone O-ring. The nut tightens against the control panel for mechanical rigidity and is pressure sealed by the O-ring. The cap seals the switch handle or shaft. *Sealnuts* have operated without leaking at external hydraulic pressures of 200 lbs./sq. in. They remain flexible to —65°C, meet operating and service life requirements of Spec. MIL-B-5423 and are approved by U. S. Air Force, Navy and Signal Corps.

Write for illustrated data sheet and samples.

*U. S. Patent 2462023

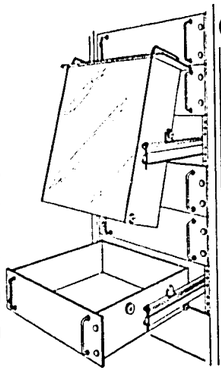
HANDLE



Type HA-5371 Handle with mounting plate is designed particularly for portable electronic equipment and conforms to MIL-T-945A. Hinged grip of black anodized aluminum is coated with black vinyl and swings 180°—lies flat when not in use. Will lift 125 lbs. without distortion. Insulated grip is comfortable to carry.

SLIDE ASSEMBLIES

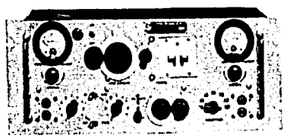
New inexpensive Chassis Slides designed for standard relay rack mounting on Navy and Signal Corps equipment are now available as stock item. Materials and finishes comply with MIL-E-16400 (Ships). Slides carry chassis to 100 lbs., tilt for easy access to bottom of chassis, and are easily removed. Rugged, cadmium plated, iridited steel rails with bronze rollers, stainless steel pins and nylon bushings. Write for detailed data sheet.



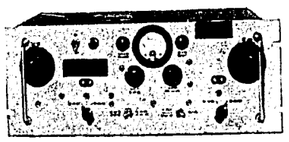
CRYSTAL TESTING EQUIPMENT

These three crystal impedance meters were specifically designed to test quartz crystals per MIL-C-3098. They are used to determine equivalent electrical parameters, such as resonance and anti-resonance resistance, series capacitance and inductance. From these parameters the crystal's performance index can be calculated. All units operate from 115 volt, 50/1000 cycle source and fit a standard relay rack. Front panels measure 7 x 19.

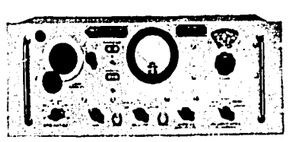
MODEL 459 (TS-330/TSM) C. I. Meter tests crystals in the frequency range of 1 to 15 mc. Three resistance ranges are available: 0-99, 0-990 and 0-9,900 ohms. Load capacitance is calibrated from 12 to 110 mmf., using calibration chart. Net $560.



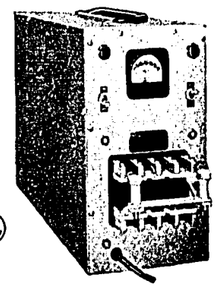
MODEL 531 (TS-683/TSM) C. I. Meter is used for crystals in the frequency range of 10 to 140 mc. Twelve calibrating resistors of 10, 22, 30, 40, 51, 60, 68, 82, 91, 100, 120 and 150 ohms, plus a 100-ohm variable resistor are used for resistance calibration. An adapter for measurement of anti-resonance resistance is provided. Net $550.



MODEL 541 (TS-710/TSM) C. I. Meter tests crystals from 10 to 1100 kcs. Resonance and anti-resonance resistances from 10 ohms to 0.5 megohms are calibrated. Load capacitance calibrated from 15 to 105 mmf. Built-in voltmeter measures power dissipated in crystal. Internal ohmmeter measures crystal resistance using one of three variable resistance adapters supplied. Also supplied are two adapters for octal base and HC-5/U crystal holders, fourteen fixed calibrating resistors, and one RF cable. Net $650.



HOW TO CHARGE MAGNETS *Safely and Quickly—*



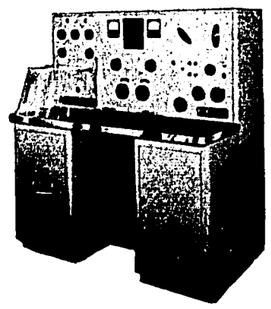
New MODEL 107-A Magnet Charger has dual range charging current output—12,000 amperes for small magnets and 22,000 amperes for larger, Alnico V magnets. Any shape or kind of magnet can be charged, including core type mechanisms, using charging bar or special adapters. Booster Unit available for increasing output to 28,000 amperes. Carrying handle added for easier portability.

Unit is self-contained, simple to operate, all exterior parts can be handled during complete charging cycle without danger to operator. Rugged and designed for production charging, its average magnetizing cycle is under 5 sec. Net price $490.

Weight: 75 lbs.-Size: 12 x 7 x 17-Operates on 110 volts, 15 watts.

INSTRUMENT CALIBRATION STANDARDS

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. 4 standard cells. Voltage and current ranges separate for calibration of watt meters. Operates on 105/125 volts, 50/1600 cycles, 350 watts, with internal voltage regulator. Interlocks and hood protect instrument under test and operator from accidental overloads. Price $14,300.



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 260B Standards for DC meters to 0.5% over ranges of 1 millivolt to 1500 volts and 1 microampere to 150 amperes. Detailed data and prices on request.

All prices are FOB Boonton, N. J. and subject to change without notice.

RADIO FREQUENCY LABORATORIES, INC.
Boonton 7, New Jersey

7. Test and Measuring Equipment

94. General Test Equipment.

(Continued from page 447)

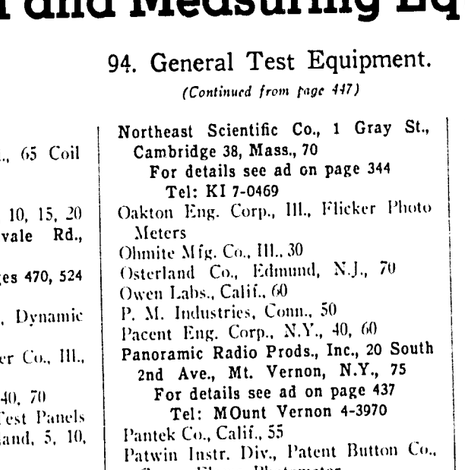
Marma Electr. Co., Ill., 20
Master Appliances, Inc., Ind., 65 Coil Test
McNeal, J. D., Conn., 35, 45
McShan Dev. Corp., N.Y., 5, 10, 15, 20
Measurements Corp., Intervale Rd., Boonton, N.J., 70
For details see ad on pages 470, 524
Tel: BOonton 8-2131
Micro Balancing, Inc., N.Y., Dynamic Balance
Mid-West Coil & Transformer Co., Ill., 10, 15
Millivac Instr. Corp., N.Y., 40, 70
Moulic Specialties Co., Ill., Test Panels
Muirhead & Co., Ltd., England, 5, 10, 20, 25, 30, 75
Mullard, Ltd., England, 65
Multi-Tron Labs., Ill., 65
Munston Mfg. & Service, Inc., N.Y., 40
Murphy & Miller, Inc., Ill., Thermal Test Equip.
National Capacitor Co., Mass., 5, 25, 35
New London Instrument Co., P.O. Box 189P, New London, Conn., 65
For details see ad on page 438
Tel: Gibson 3-8451
Newton Scientific Co., Mass., 40, 70
Nilsson Elec. Lab., Inc., N.Y., 40, 45
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 70
For details see ad on page 344
Tel: KI 7-0469
Oakton Eng. Corp., Ill., Flicker Photo Meters
Ohmite Mfg. Co., Ill., 30
Osterland Co., Edmund, N.J., 70
Owen Labs., Calif., 60
P. M. Industries, Conn., 50
Pacent Eng. Corp., N.Y., 40, 60
Panoramic Radio Prods., Inc., 20 South 2nd Ave., Mt. Vernon, N.Y., 75
For details see ad on page 437
Tel: MOunt Vernon 4-3970
Pantek Co., Calif., 55
Patwin Instr. Div., Patent Button Co., Conn., Flame Photometer
Penntronics, Pa., 50
Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y., 35
For details see ad on page 344
Tel: NE 6-3342
Phaostron Co., 151 Pasadena Ave., So. Pasadena, Calif., 20, 30, 35, 40, 45, 65, 70
For details see ad on page 333
Tel: CL 5-1471
Philco Corp., Accessory Div., Pa., 65, 70
Pioneer Elec. & Res. Corp., Ill., 10
Polyphase Instr. Co., Pa., 50, 60
Polytronics Co., Canada, 20, 30
Precise Dev. Corp., N.Y., 25, 30, 40, 45, 65, 70
Precise Measurements Co., 940 Kings Hwy., Brooklyn 23, N.Y., 20, 35, 45
For details see ad on page 345
Tel: ES 5-9435
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y., 40, 45, 65, 70
For details see ad on page 468
Tel: HA 9-6262
Q-O-S Corp., N.Y., 20
Radar-Electr., Inc., N.Y., 40
Radex Corp., Ill., 10
Radio City Products Co., Inc., Pa., 5, 20, 35, 40, 45, 60, 65, 70
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 70
For details see ad on page 210
Tel: HUmboldt 5-3900
Radio Corp. of America Eng. Prods. Dept., Camden, N.J., 40, 70
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., Crystal Test
For details see ad on page 448
Tel: BOonton 8-3100
Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 60, 65, 75
For details see ad on page 525
Tel: ORegon 5-0085
Rawson Electr. Instrument Co., Mass., 40, 45, Gaussmeters
Reiner Electr. Co., Inc., N.Y., 20, 40, 65, 70
Republic Eng. Co., Inc., Md., 10
Research Electronics, Pa., 60, 65, 70
Ribet Desjardin, France, 45, 50, 75
Rochester Electr. Co., Inc., N.Y., 30
Ronar, Inc., Ill., 45
Saratoga Industries, N.Y., 15, 35
Scientific Specialties Corp., Mass., 5, 20, 45, 70
Scott, Inc., H. H., Mass., 60
Sensitive Research Instrument Corp., Dept. 156D, 9 Elm Ave., Mount Vernon, N.Y., 45, Magnetic Test Sets, Mutual Conductance Meter, Electro-Static Instr.
For details see ad on page 449
Tel: Fairbanks 4-3358
Shallcross Mfg. Co., Pa., 5, 20, 30, 45
Shepard Labs., N.J., 50, Pulse Voltmeter
Shurite Meters, 33 Hamilton St., New Haven, Conn., Battery Testers
For details see ad on page 333
Tel: State 7-5826
Sierra Electr. Corp., Calif., 70
Simmonds Aerocessories, Inc., N.Y., 5
Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 5, 40, 45, 65, 70
For details see ad on page 334
Tel: EStebrook 9-1121

(Continued on page 451)

ELECTRICAL INSTRUMENTS OF PRECISION!

LABORATORY STANDARDS
MICROAMMETERS
MILLIAMMETERS
MILLIVOLTMETERS
VOLTMETERS
FLUXMETERS
WATTMETERS
ELECTROSTATIC VOLTMETERS
AC, DC and MAGNETIC TEST SETS
A COMPLETE LINE OF STANDARD AND SPECIAL INSTRUMENTS

FOR ALTERNATING AND DIRECT CURRENT MEASUREMENTS



88 Range A.C.-D.C. Polyranger

Write Dept. 156-D for our new catalog #A-62 which is just off the press!

SENSITIVE RESEARCH INSTRUMENT CORPORATION
MOUNT VERNON, N.Y.

Symbol of Quality

ELECTRICAL INSTRUMENTS OF PRECISION SINCE 1927

BALLANTINE

World's Leading Electronic Voltmeters

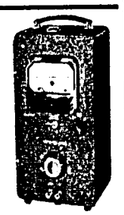
AUDIO to 150 kc — MODEL 300



Voltage Range..... 1mv—100v
Frequency Range..... 10cps—150kc
Accuracy..... 2% ENTIRE RANGE
Input Impedance..... ½ meg shunted by 30μμf

SUB-AUDIO to 150 kc — MODEL 302B

Battery Operated



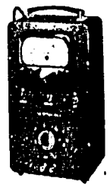
Voltage Range..... 100μv—100v
Frequency Range..... 2cps—150kc
Accuracy..... 3% 5cps—100kc
5% elsewhere
Input Impedance..... 2 meg shunted by 15 μμf*

PEAK-to-PEAK — MODEL 305



Voltage Range..... 1mv—1000v pk-to-pk
Frequency Range..... 10cps—100kc (sine wave)
Pulse width..... 3μsec—250μsec
Min Rep Rate..... 20 pulses per sec
Accuracy..... 5% for pulses
Input Impedance..... 2 meg shunted by 15 μμf*

AUDIO to 2 mc — MODEL 310A



Voltage Range..... 100μv—100v
Down to 40 uv at reduced accuracy
Frequency Range..... 10cps—2mc
As null detector 5cps—4mc
Accuracy..... 3% 10cps—1mc
5% elsewhere
Input Impedance..... 2 meg shunted by 15μμf*

AUDIO to 6 mc — MODEL 314



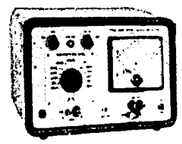
Voltage Range..... 1mv—1000v
(100μv—1mv without probe)
Frequency Range..... 15cps—6mc
Accuracy..... 3% 15cps—3mc
5% elsewhere
Input Impedance..... 11 meg shunted by 7.5 μμf
(1 meg shunted by 25μμf without probe)

INFRASONIC to 30 kc — MODEL 316



Voltage Range..... 20 mv—200 v pk-to-pk
Frequency Range..... 0.05 cps—30 kc
(Down to .01 cps with corrections)
Accuracy..... 3% ENTIRE RANGE
Input Impedance..... 4.4 meg shunted by 50 μμf

TRUE RMS INDICATION — MODEL 320



Voltage Range..... 100 μv—320 v
Frequency Range..... 5 cps—500 kc
Accuracy..... 3% 15 cps—150 kc
5% elsewhere
Stability of Internal Calibrator..... 0.5%
Input Impedance...
10 megs shunted by 25 μμf below 10 mv
10 megs shunted by 8 μμf above 10 mv

DC & AC PRECISION CALIBRATOR — MODEL 420



Voltage Range..... 0-10 v RMS; Pk-to-Pk; or DC
Frequency (Std Model)..... 1 kc
(other values on special order)
Accuracy (long term)...Better than 0.5% above 1 mv
Distortion and Hum..... Less than 0.5%
Setting Resolution...Approaches 0.01% above 10 mv
Output Impedance (AC)..... 2-20 ohms depending on range setting

SENSITIVE INVERTER — MODEL 700

For Measuring DC Voltages when combined with any AC Voltmeter



Voltage Range..... 1μv—100v DC
Ratios DC Input to RMS Output..... 1:100 & 10:1
Accuracy..... 1% 100μv—100v
Input Resistance..... >10 meg for 1:100
50 meg for 10:1

DECADE AMPLIFIER — MODEL 220A

For Increasing the Sensitivity of any AC Voltmeter by 10 or 100 times



Voltage Range..... 10μv—50mv
Frequency Range..... 10cps—150kc
Accuracy..... 2% ENTIRE RANGE
Input Impedance..... 5 meg shunted by 15μμf

ACCESSORIES are available for all voltmeters to extend voltage measurements down to 20 uv and up to 10 kv, and to measure alternating currents from 0.1 uamp to 10 amp, and to provide DC from the Model 300 Voltmeter to drive external recorders or remotely located meters.

Famous for SENSITIVITY • ACCURACY • STABILITY

Each Ballantine Voltmeter

- Has only ONE voltage scale with decade range switching.
- Provides the same accuracy of reading at ALL points on the logarithmic voltage scale.
- Has a linear decibel scale.
- May be used as a high gain wide band amplifier.
- Responds to the average value of the input voltage wave, thus avoiding "turn-over" discrepancy.

WRITE FOR MORE DETAILED INFORMATION TO—

BALLANTINE LABORATORIES, INC.
102 Fanny Road, Boonton, N.J.

**Shunt capacitance is 8μμf on all ranges except two most sensitive ranges.*

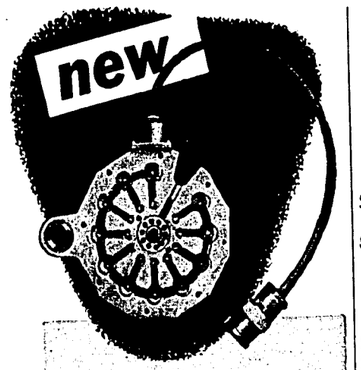
7. Test and Measuring Equipment

94. General Test Equipment.

(Continued from page 449)

Southwestern Indust. Electr. Co., Tex., 5, 10, 15, 20, 35, 45, 70, 75
Southern Electronics Co., Dept. IC, 239 W. Orange Grove Ave., Burbank, Calif., 25
For details see ad on page 285
Tel: RO 9-3193
Special Instr. Lab., Inc., Tenn., 20
Specialty Eng. Div., Spec. Assem. & Pack., N.Y., 40, 70
Spellman Television Co., Inc., 3029 Webster Ave., New York 67, N.Y., Kilovolt Meters
For details see ad on page 344
Tel: KI 7-0306
Sprague Elec. Co., Mass., 5
Standard Cabinet Co., 53 Washington Ave., Carlstadt, N.J., Temperature & Humidity Test Cabinets
For details see ad on page 443
Tel: GEneva 8-1500
States Co., Conn., 35
Statham Labs., Calif., 50, Gas Analyzers
Statistical Instr. Co., N.Y., 75
Stelma, Inc., 389 Ludlow St., Stamford, Conn., Distortion Analyzer and Bias Test Sets
For details see ad on page 439
Tel: 48-2579
Sticht Co., Inc., Herman, H., N.Y., 20, 35, 40, 45
Stromberg-Carlson Co., N.Y., 45
Summit Electr., Inc., N.J., 5, 10, 60
Supreme, Inc., Miss., 40, 45, 65
Sylvania Elec. Products Inc., 1740 Broadway, New York 19, N.Y., 5, 40, 45, 65, 70
For details see ad on pages 9-14
Tel: JUdson 6-2424
Sylvania Elec. Products Inc., Radio and Television Div., 254 Rano St., Buffalo 7, N.Y., 5, 65
For details see ad on pages 9-14
Tel: Victoria 2450
T L. G. Elec. Corp., N.Y., 5, 40, 60, 65
Taylor Elec. Instruments, Ltd., England, 5, 20, 40, 45, 65, 70
Tech Labs., Inc., N.J., 5, 20, 30
Technology Instrument Corp., 535A Main St., Acton, Mass., 10
For details see ad on pages 75-79
Tel: COlonial 3-7711
Telecomputing Corp., Calif., 40, 45
Teletronics Lab., Inc., N.Y., 60
Tensitron, Inc., Mass., Tension Meters
Torocoil Co., Mo., Decades Inductance
Trad Television Corp., 1001 First Ave., Asbury Park, N.J., 70
For details see ad on page 451
Tel: PR 6-7445
Trans-Sonics, Inc., Mass., 50
Transistor Prods., Inc., Mass., 60
Trenton Transformer Corp., N.J., 35
Triplett Electrical Instrument Co., Ohio, 40, 45, 70
Triumph Mfg. Co., Ill., 5, 10, 15, 20, 25, 30, 40, 45, 65, 70
U. S. Time Corp., N.Y., Rate Gyroscopes
United Transformer Co., 150 Varick St., New York 16, N.Y., Decade Inductance
For details see ad on page 582
Tel: AL 5-3500
Vibro-Ceramics Corp., 212 Durham Ave., Metuchen, N.J., 62, Detector and Probes
For details see ad on page 451
Tel: Metuchen 6-2800
Victory Eng. Corp., Springfield Rd., Union N.J., Combustion Analyzers, Temperature Sensing Devices, Thermal Control Instruments
For details see ad on page 366
Tel: UN 2-7150
Waters Mfg., Inc., Mass., 10, 15, 32
Waveforms, Inc., N.Y., 70
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 5, 10, 20
For details see ad on page 326
Tel: Malden 2202
Webber Mfg. Co., Inc., Ind., Temperature Test Equipment
Welch Mfg. Co., W. M., Ill., 5, 10, 15, 20, 25, 30, 40, 45, 65

(Continued on page 453)



PRECISION RF STEP ATTENUATOR*

Model AT-120 0 to 1000 MC

Small, rugged ladder attenuator achieves attenuation accuracy and low vswr from dc to uhf. Suitable for all signal and sweep generators in this frequency range.

Care in design assures maximum flexibility in mounting, drive, and types of input and output connections.

Easily adaptable for inclusion in different types of test equipment and in laboratory and production test applications.

MAXIMUM STEPS
Ten (eleven contact positions)

ATTENUATION RANGE
Up to 120 db total

OUTPUT IMPEDANCE
50 or 75 ohms nominal

INPUT IMPEDANCE
100 or 150 ohms nominal
50 or 75 ohms optional

INPUT AND OUTPUT VSWR
1.1 to 1000 mc at 50 ohms

Quick delivery on Standard Models. Prompt attention given to special requirements.

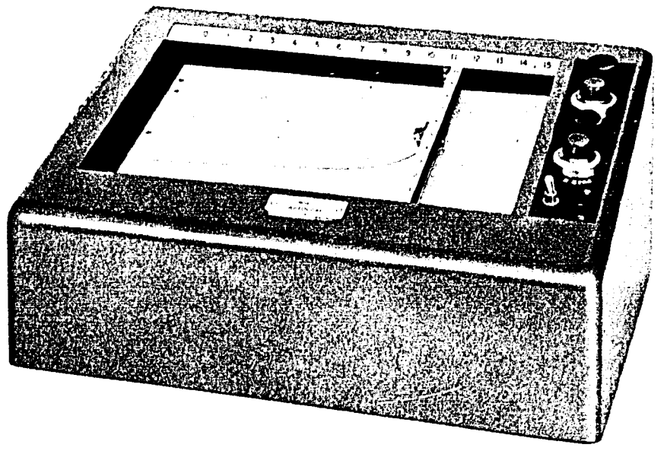
*PAT. PENDING

TRAD TELEVISION CORPORATION
1001 FIRST AVENUE,
ASBURY PARK, N. J.

GLENNITE® ULTRASONIC EQUIPMENT

- Ultrasonic Transducers
- Complete Ultrasonic Generators
- Ultrasonic Probes and Detectors
- Ultrasonic Attenuation and Velocity Measuring Equipment from 5 mc to 75 mc
- Medical Instruments
- Complete Engineering and Consultant Service in Electro-acoustics
- Environmental Testing Service

VIBRO-CERAMICS CORPORATION
METUCHEN, NEW JERSEY • MEtuchen 6-2800

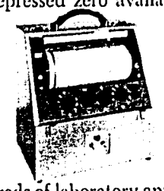


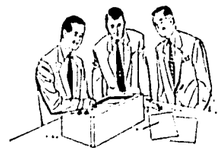
A new, large size, flat bed, versatile 2-axis recorder...

AUTOGRAF *trademark*

MODEL 2

The versatility and labor-saving convenience of the original portable Autograf have now been built into an instrument which handles standard 11" x 16½" graph papers. Model 2 has the same scales and ranges as Model 1 (0-5 millivolts to 0-100 volts each axis); same speed (full scale X and Y in one second); same input impedance (200,000 ohms per volt). In addition, depressed zero available each axis, larger recording area (twice as big), flat bed, easy-reading design.

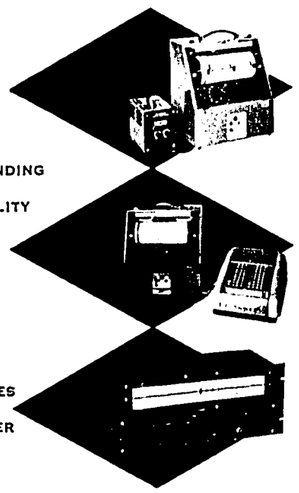




Curves are available for observation and labeling while they are being drawn.

THE AUTOGRAF MODEL 1

general purpose 8½" x 11" X-Y recorder—is doing duty in hundreds of laboratory applications: chemical, electrical, electronic, wind tunnel, computer... And on production lines: measuring motors, filters, tubes, transistors, airfoils, amplifiers, rectifiers, magnetic circuits and materials, nuclear devices, etc....



BOTH AUTOGRAF MODELS ARE OUTSTANDING FOR THEIR VERSATILITY

NEW MODEL 20 SERIES DC VOLTMETER

AUTOGRAF CURVE FOLLOWER plots or reads out Y vs. X. Either Model 1 or Model 2 can be furnished as a recorder/curve follower.

AUTOGRAF POINT PLOTTER Models 1 and 2 may be fitted for point plotting from keyboard or other digital sources.

A new high accuracy, easy-to-read, multi-range servo-voltmeter with fast response. Scales 0-3 millivolts to 0-300 volts. Zero left or zero center. Designed for indication, control, or analog to digital conversion.

Bulletins describing these instruments are available, and we will be glad to send you the ones you want. Write...

F. L. MOSELEY CO., 409 NORTH FAIR OAKS AVENUE, PASADENA 3, CALIFORNIA

There are

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.

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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 IRE 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 Institute 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
1475 Broadway
New York 36, N.Y.

7. Test and Measuring Equipment

94. General Test Equipment.

(Continued from page 451)

West Instrument Corp., Ill., Pyrometers Thermo Couples

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark, N.J., 35, 40, 45, 65, 70, Temperature Measuring Equipment
For details see ad on pages 98-99
Tel: BI 3-4700

Williams, Brown & Earle, Inc., Pa., 55
Winston Electr., Inc., Pa., 40, 60, 65, 70
Wright Engineering Co., Calif., 25, 55, 70, 75
Yonkers Industries, Inc., N.Y., 70

95. Graphic Recorders.

5. Charts & papers
10. Ink writing
15. Inkless types
20. Fixed speed types
25. Variable speed types

Acme Telectronix Div. NEA. Service, Ohio, 15, 20, 25
Airborne Instruments Laboratory, N.Y., 25

Alden Electronic & Impulse Recording Equip. Co., Washington St., Westboro, Mass., 15, 20, 25
For details see ad on page 296
Tel: Westboro 467

Alden Products Co., 113 No. Main St., Brockton 64, Mass., 5, 15
For details see ad on page 296
Tel: Brockton 160

Audio Instrument Co., Inc., N.Y., Magnetic Tape Type
Boehme, Inc., H. O., N.Y., 10
Bristol Co., Conn., 5, 10, 15, 20, 25
Bristol Engineering Corp., Pa., 15
Bruel & Kjaer, Denmark, 5, 10, 15, 25
Brush Electronics Co., Ohio, 5, 10, 25
Century Geophysical Corp., Okla., 5, 20, 25
Consolidated Engineering Corp., Calif., 15, 25

Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 5, 10, 15, 20, 25
For details see ad on page 163
Tel: Worcester 7-8394

Electro-Medical Laboratory, Inc., Vt., 10, 15
Electro-Tech Equipment Co., N.Y., 5, 10, 15, 20
Electronic Associates, Inc., N.J., 10
Fielden Instr. Div.-Controls Co., Pa., 10, 20, 25
Foxboro Co., Mass., 10, 25
Gaertner Scientific Corp., Ill., 5, 10, 15, 20
General Elec. Co., Apparatus Sales Div., N.Y., 10
Geotechnical Corp., Tex., 15, 20
Gorrell & Gorrell, N.J., 10, 15, 20, 25
Grass Instrument Co., Mass., 10
Hillyer Instrument Co., N.Y., 15

Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 5, 15, 20, 25
For details see ad on page 488
Tel: CHelsea 2-7855

Ketay Mfg. Corp., N.Y., 20
Leupold & Stevens Instruments, Inc., Ore., 5, 10
Librascope, Inc., Calif., X-Y Recorder
Link Aviation, Inc., N.Y., 25

Loral Electronics Corp., Dept. ID 54, 794 E. 140th St., New York 54, N.Y., 15, 25
For details see ad on page 198
Tel: CY 2-1800

Magne-Pulse Corp., N.Y., 20, 25
Miller Instr., Inc., William, Calif., 15, 25
Millivac Instr. Corp., N.Y., 15

Moseley Co., F. L., 409 N. Fair Oaks Ave., Pasadena 3, Calif., 10, 20, 25
For details see ad on page 452
Tel: Sycamor 5-4606

Offner Electronics, Inc., Ill., 10, 15, 25

Precise Measurements Co., 940 Kings Hwy., Brooklyn 23, N.Y., 5, 10, 15, 20, 25
For details see ad on page 345
Tel: ES 5-9435

Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 15, 25
For details see ad on page 525
Tel: MElbourne 800

Reeves Instrument Corp., 215 E. 91 St., New York 28, N.Y., 10, 15, 20, 25
For details see ad on page 406
Tel: TR 6-6000

Sanborn Co., 39 Osborn St., Cambridge 39, Mass., 5, 15, 20, 25
For details see ad on page 228
Tel: KI 7-8460

Servo Corp., of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 25
For details see ad on page 236
Tel: FI 7-2810

Sound Apparatus Co., Main St., Stirling, N.J., 5, 10, 20, 25, Graphic Sound Recorder
For details see ad on page 453
Tel: Millington 7-0600

Sticht Co., Inc., Herman, H., N.Y., 10, 15
Strandberg Engineering Laboratories, N.C., 10
Streeter Amet Co., Ill., 10
Sunvic Controls, Ltd., England, 20, 25
Taller & Cooper, N.Y., 5, 10, 15, 20, 25, Digital

Texas Instruments, Inc., 6000 Lemmon Ave., Dallas 9, Tex., 10, 15, 20, 25
For details see ad on page 226
Tel: DI-1781

(Continued on page 455)



INK RECORDED

by ruggedly built, portable self-contained instruments

Polar Recorder
and POLINEAR RECORDER

MODEL PFR and PR

for BEAM PATTERN PLOTTING of antennas, microphones, loudspeakers, ultrasonic devices;

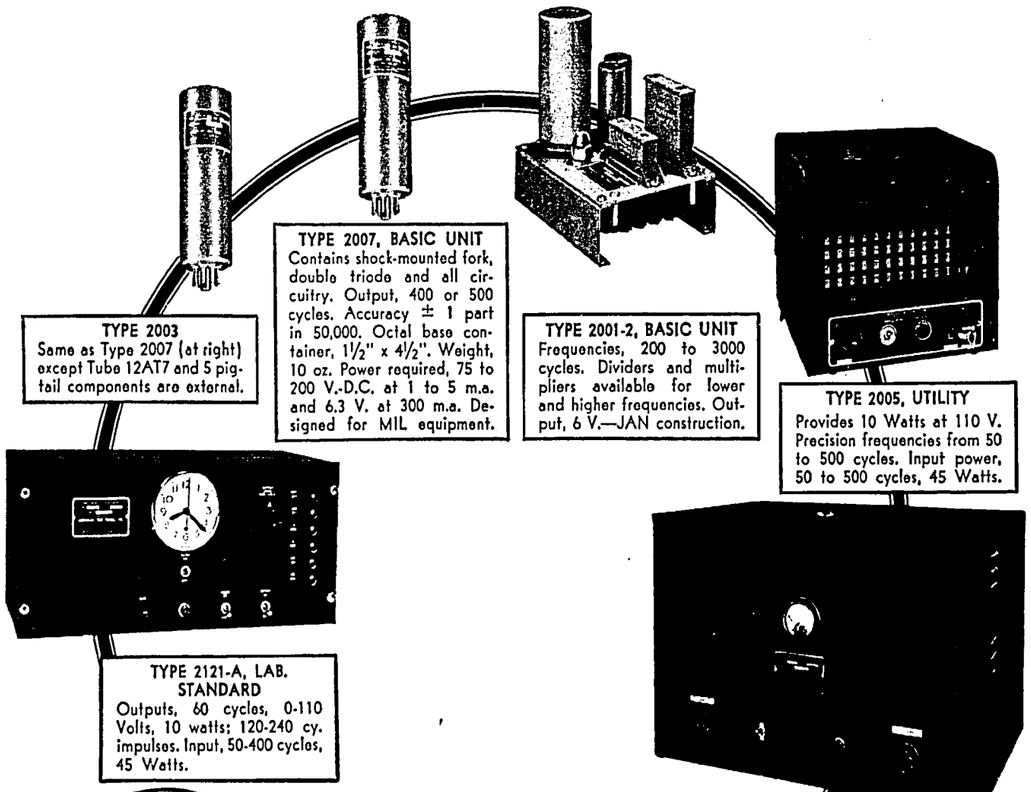
for FREQUENCY RESPONSE RECORDS of microphones, loudspeakers, amplifiers, filters, radio and television circuits.

Both recorders can be furnished with circuits for ac or ac-dc signal recording. Chart size 8½" x 11". Convenient linkage to oscillators, analyzers, rotational devices, test-turntables.

The POLAR RECORDER PR has selsyn-driven rotary movement; the POLINEAR RECORDER PFR has polar and linear synchronous-driven turntable.

Inquire about our RECORDER Models FR · FRA · TFR · HPL
Literature will be mailed upon request

SOUND *Designers and Manufacturers of Graphic Recorders*
Instruments Engineered for Individual Requirements
APPARATUS COMPANY STIRLING, N. J.



Precision
FREQUENCIES

GUARANTEED ACCURACY
1 PART IN 100,000 (.001%)
except where otherwise noted

The basis of these frequency standards is an electronically actuated high-precision fork, temperature-compensated and hermetically sealed against barometric changes. The partial list of uses at the right not only suggests the broad range of applications but also proven dependability where there can be no compromise with accuracy. Please request details by Type No. Our engineers are available for advice or cooperation on related problems.

WIDELY USED IN SUCH FIELDS AS
Aviation, Navigation
Ordnance, Ballistics
High Speed Photography
Viscosity Measurement
Fluid Flow
Nuclear Physics, Telemetering
Chemical Reaction
Radiation Counting
Computers
Facsimile
Fire Control
School and Indl. Research Labs.
Accurate Speed Control

American Time Products, Inc.
580 Fifth Avenue ***New York 36, N.Y.***

OPERATING UNDER PATENTS OF WESTERN ELECTRIC COMPANY

7. Test and Measuring Equipment

95. Graphic Recorders.

(Continued from page 453)

Thompson Prods., Inc., Dept. PI, Electronic Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 10
For details see ad on page 235
Tel: HE 1-6765

Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 15, 20
For details see ad on page 550
Tel: JU 2-3030

Western Union Telegraph Co., N.Y., 5

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 5, 10, 20, 25
For details see ad on pages 98-99
Tel: BI 3-4700

Willys Motors Electr. Div., Ohio, 5

Wright Eng. Co., Calif., 5, 10, 15, 20, 25

96. Laboratory Standards of Frequency & Time.

5. Elapsed time measuring equip.
10. rimary standards of frequency
15. Primary standards of time
20. Secondary standards of frequency
25. Secondary standards of time
30. Tuning forks

Acme Telectronix Div. NEA Service, Ohio, 10, 20, 30

96. Laboratory Standards of Frequency & Time.

Aero Instrument Co., Calif., 5, 20

Airmec, Limited, England, 10, 15

American Chronoscope Corp., N.Y., 05

American Time Prods., Inc., 580 Fifth Ave., New York 36, N.Y., 10, 15, 20, 25, 30
For details see ad on page 454
Tel: Plaza 7-1430

Apple Frequency Measuring Service, H. L., N.C., 10

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5, 20, 25
For details see ad on page 402
Tel: Eliot 4-4321

Bassett, Inc., Rex, Fla., 20

Beckman Instr., Inc., Shasta Div., P.O. Box 296, Station A, Richmond 3, Calif., 20, 25
For details see ad on page 138
Tel: Beacon 5-7196

Berkeley, Div. Beckman Instruments, Inc., Dept. N-13, 2200 Wright Ave., Richmond, Calif., 5
For details see ad on page 138
Tel: Landscape 6-7730

Bliley Electric Co., 227 Union Station Bldg., Erie, Pa., 20
For details see ad on page 132
Tel: 22-287

For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.

Borg Equipment Div., Geo. W. Borg Corp., 120 S. Main St., Janesville, Wis., 10, 15, 20, 25
For details see ad on page 140
Tel: 6616

Bristol Engineering Corp., Pa., 20

Browning Laboratories, Inc., Mass., 20, 25

Bunnell & Co., J. H., N.Y., 30

Central Scientific Co., Ill., 10

Century Electr., Div. Century Metalcraft, Calif., 20

Clark Crystal Co., Mass., 20

Colortone Electronics, Inc., N.Y., 10

Cramer Co., Inc., The R. W., Conn., 5

Daystrom Instrument, Pa., 30

DeMornay-Bonardi, Calif., 20

Digital Instrument Co., Inc., Fla., 5, 20, 25

Dubrow Development Co., 235 Penn St., Burlington, N.J., 20
For details see ad on page 445
Tel: Burlington 3-0446

El Mec Labs., Inc., N.J., 20

El-Tronics, Inc., Pa., 5, 20

Electrical & Physical Instr. Corp., 42-19 27th St., Long Island City, N.Y., 5
For details see ad on page 412
Tel: Stilwell 4-6389

Electro-Pulse, Inc., Calif., 5

Electronic Engr. Co. of California, Calif., 5, 10, 15, 20, 25

Electronic Instruments, Ltd., England, 5

Electronic Research Mfg. Corp., Ohio, 20

Elk Electr. Laboratories, Inc., N.Y., 20

Ferris Instrument Co., N.J., 20

Franklin Electronics, Inc., Pa., 5, 20, 25

Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 20
For details see ad on page 180
Tel: Evergreen 6-1300

Furzehill Labs., Ltd., England, 20

Gaertner Scientific Corp., Ill., 5, 25, 30

General Elec. Co., Apparatus Sales Div., N.Y., 5

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10, 15, 20, 25, 30
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Geotechnical Corp., Tex., 5, 25

Gertsch Prods., Inc., Calif., 20

Hathaway Instrument Co., Colo., 15, 20, 25, 30

Haydon Co., A. W., 240 N. Elm St., Waterbury 20, Conn., 5
For details see ad on page 456
Tel: Waterbury 6-4481

Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 20, 25
For details see ad on pages 15-22
Tel: DAvenport 5-4451

Hill Electronic Engr. & Mfg. Co., New Kingston, Pa., 10, 15, 20, 25, 30
For details see ad on page 310
Tel: MEchanicsburg 5578

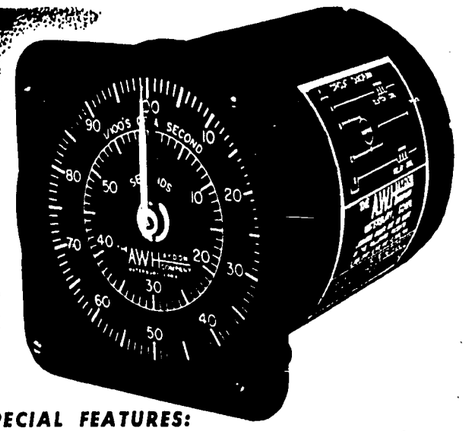
Hoffman Radio Corp., Calif., 20

(Continued on page 457)

New A. W. HAYDON COMPANY

STOP CLOCK

STOPS TIME IN ITS FLIGHT



High Speed Stop Clock Accrued Seconds Indicator With Fluorescent Dial and Hands . . Also Available for Other Intervals.

This new, hermetically-sealed *Stop Clock* further enlarges the complete line of A. W. HAYDON COMPANY A.C. and D.C. Timers, time delay relays and timing motors. This accurate, panel-mounted timer totalizes hundredths of a second up to a minute. Hermetically-sealed, it weighs approximately 2 lbs. Comes with automatic reset.

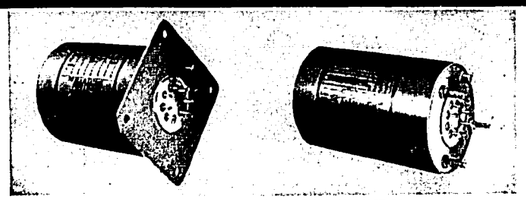
SPECIAL FEATURES:

- Precision timing measuring hundredths of seconds to one minute.
- Automatic reset · Hermetically sealed · For operation on 50, 60 or 400 cycles A.C. or 20-30V D.C. 400 cycle unit has D.C. clutch.

A. W. HAYDON COMPANY TIMING DEVICES HAVE *PROVEN SUPERIORITY*

MINIATURE — HERMETICALLY SEALED TIME DELAY RELAY 6400, 11400, 24300 SERIES

- Single or multiple switching.
- Delay periods from 2 seconds to 3 hours.
- AC-DC or 400 Cycle Power.



MINIATURE — HERMETICALLY SEALED REPEAT CYCLE TIMER 3600, 13600, 24400 SERIES

- 1 to 10 Switches.
- Wide choice of Cycling Time.
- AC-DC or 400 Cycle Power.

GENERAL SPECS. FOR MINIATURE HERMETICS
2½" Diameter Round Aluminum Housing — Flange or 3 Stud Mounting.
Glass seal terminals or header or AN connector

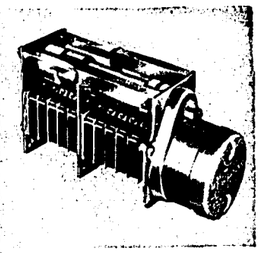


A. W. HAYDON CO. 400 CYCLE MOTOR 24100 SERIES has improved performance for aircraft use.

- Light in Weight — Small Compact Size.
- Now . . . you can run timing systems directly from 400 cycle power.
- Features fast start and stop, as well as high torque and reversibility.
- Get all the facts in the new A. W. Haydon Co. catalog, described below.

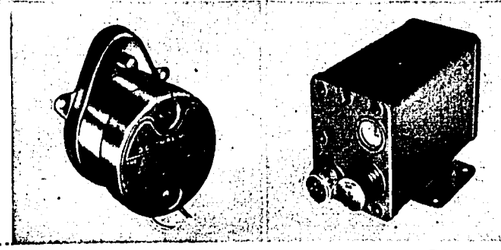
REPEAT CYCLE TIMER A. C. SERIES 13600 OR D. C. SERIES 3600

- Durable . . . Long life.
- Wide range of time cycles.
- Multiple control circuits.
- Easily adaptable to meet specific requirements.



SERIES 5300 D. C. TIMING MOTOR

- Rugged, Accurate, Reliable.
- Compact . . . Reversible, variable speed.
- Special windings available for operation from vacuum tubes or as tachometer generator.



NEW HERMETICALLY SEALED TIME DELAY RELAY

New Hermetically Sealed Time Delay Relay is Adjustable. Lightweight hermetically sealed enclosure is provided with adjustment knob and glass window to view calibrated dial. Provides complete protection from environmental condition, but allows variation of time delay period. Many ranges available. Standard hermetic housing available for all timers.

PREFERRED WHERE

PERFORMANCE IS PARAMOUNT

SEND FOR CATALOG
IRED

The A. W. HAYDON COMPANY
240 NORTH ELM STREET
WATERBURY 20, CONNECTICUT

Design and Manufacture of Electro-Mechanical Timing Devices

7. Test and Measuring Equipment

96. Laboratory Standards of Frequency & Time.

(Continued from page 455)

Hycon Mfg. Co., Calif., 5
I. D. Mfg. Corp., N.Y., 5
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 20
For details see ad on page 431
Tel: FArmingdale 2-3606
Jacobs Instr. Co., Md., 10, 15, 20, 25
Kaiser Metal Prods. Co., Inc., Pa., 5, 20, 25
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 20
For details see ad on page 436
Tel: CAldwell 6-4000
Krohn-Hite Instr. Co., Dept. B, 580 Massachusetts Ave., Cambridge 39, Mass., 20
For details see ad on pages 2-3
Tel: UNiversity 4-4272
Laboratory for Electronics, Inc., Mass., 5
Lampkin Labs., Inc., Fla., 20
Lewis Co., E. B., 11 Bragg St., East Hartford 8, Conn., 20
For details see ad on page 311
Tel: JA 8-0830
Marconi Instruments, Ltd., N.Y., 5, 10, 15, 20
Measurement Eng., Ltd., Canada, 20
Muirhead & Co., Ltd., England, 30
Narda Corp., 66 Main St., Mineola, N.Y., 10, 20
For details see ad on page 461
Tel: PIoneer 6-4560
New London Instrument Co., P.O. Box 189P, New London, Conn., 20
For details see ad on page 438
Tel: Gibson 3-8451
Norrman Labs., Ernst, Wis., 10, 15, 20, 25
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 5, 20
For details see ad on page 344
Tel: KI 7-0469
Philamon Lab., Inc., N.Y., 20, 30
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 10, 20
For details see ad on pages 39-42
Tel: STagg 2-3464
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 20
For details see ad on page 166
Tel: ULster 2-6800
Potter Instr. Co., Inc., N.Y., 5, 20
Precision Associates Inc., N.Y., 20
Radio Corp. of America, Eng. Prods. Dept., Camden, N.J., 5
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., Instrument Calibration Standards
For details see ad on page 448
Tel: BOonton 8-3100
Rutherford Electr. Co., Calif., 5, 25
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 20
For details see ad on page 236
Tel: FI 7-2810
Societe Francaise Radio-Electrique, France, 10, 20
Sorensen & Co., Inc., Conn., 10, 20
Special Instr. Lab., Inc., Tenn., 5
Specific Prods. Co., Calif., Receiver for WWV
Standard Electric Time Co., 73 Logan St., Springfield 2, Mass., 5, 10, 15, 20, 25
For details see ad on page 457
Tel: SPringfield 6-7237
Standard Electr. Res. Corp., N.Y., 5, 10, 20, 25
Stieht Co., Inc., Herman H., N.Y., 5, Chronoscopes
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 25
For details see ad on page 224
Tel: AMityville 4-4446
Teletronics Lab., Inc., N.Y., 5, 10, 15, 20, 25
Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 30
For details see ad on page 550
Tel: JU 2-3030
Varo Mfg. Co., Inc., Tex., 20, 30
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 20
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vocaline Co. of America, Inc., Conn., 5
Walkirt Co., Calif., 5
Welch Mfg. Co., W. M., Ill., 30
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 5
For details see ad on pages 98-99
Tel: BI 3-4700
Wright Eng. Co., Calif., 5, 20, 25

STANDARD TIMERS

AN ECONOMICAL INVESTMENT IN LONG-LIFE PERFORMANCE AND EXTREME ACCURACY. RUGGED, FOR HEAVY-DUTY SERVICE; FLEXIBLE IN APPLICATION.

Model	Scale Divisions	Totalizes	Accuracy
S-100	1/5 sec.	6000 sec.	±.1 sec.
S-60	1/5 sec.	60 mjn.	±.1 sec.
SM-60	1/100 min.	60 min.	±.002 min.
S-10	1/10 sec.	1000 sec.	±.02 sec.
S-6	1/1000 min.	10 min.	±.0002 min.
S-1	1/100 sec.	60 sec.	±.01 sec.
MST	1/1000 sec.	.360 sec.	±.001 sec.
MST-500	1/1000 sec.	30 sec.	±.002 sec.



The clutch coil can be connected directly in the plate circuit of electronic tubes. For this use the coil has a resistance of 2000 ohms and requires 50 to 60 milliamperes. When ordering for this purpose, always specify 120V DC clutch coil.

WRITE FOR BULLETIN 198.

STANDARD
Since 1884

The STANDARD ELECTRIC TIME CO.

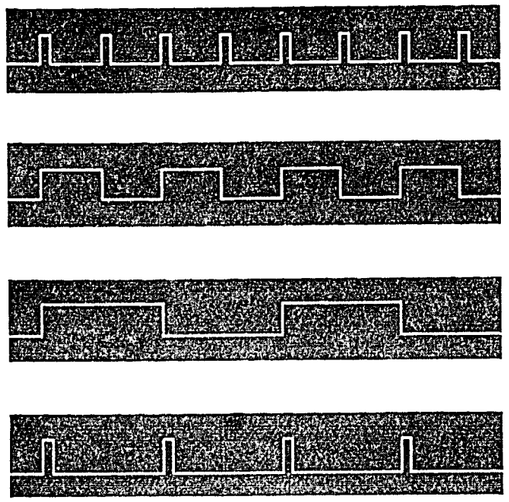
73 LOGAN STREET · SPRINGFIELD 2, MASS.

97. Microwave & Radar Test Equipment.

5. Bolometers
10. Frequency meters
15. Marker generators
20. Oscillators
25. Pulse generators
30. Slotted lines & measuring accessories
35. SWR meters
40. Time delay generators
45. Wavemeters

A. R. F. Products, Inc., Ill., 15
Aero Instrument Co., Calif., 10
Airborne Instruments Lab., N.Y., 20, 35
Aircom Incorporated, Mass., 10, 20
Alford Manufacturing Co., Inc., Mass., 30
Amerac Incorporated, Mass., 10, 15, 20, 25, 30, 35, 45
American Electronic Labs., Inc., Pa., 25
American Encaustic Tiling Co., Inc., Pa., 45

(Continued on page 459)



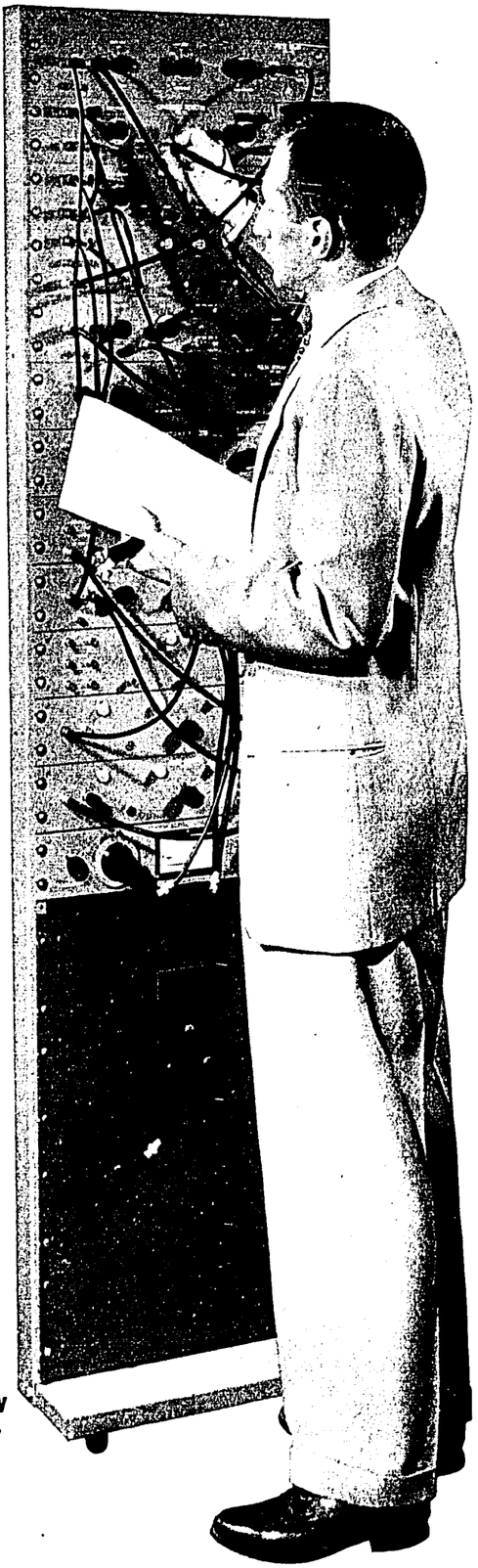
Burroughs **PULSE** equipment lets you assemble your own system—**IN MINUTES**

Just by connecting standard cables between Burroughs Pulse Control units, you can assemble virtually any pulse system you want. It's that easy.

Suppose you need a complex pulse sequence for testing. The basic units required to make up the system can be ordered from Burroughs—and delivered from stock. Connect them together, and there's your system. You've saved time-consuming "breadboard" engineering, equipment cost, and delay on your primary project. What's more, your Burroughs Pulse Equipment can be used over and over again on different, future projects.

To meet the growing need for versatile pulse control systems, Burroughs offers a whole family of matched pulse handling units: pulse generators, coincidence detectors, flip-flops, gating circuits, etc. During the past four years, this equipment has been in use by such prominent organizations as MIT, Consolidated Engineering Corp., Wayne University, Stanford Research Institute, and many others.

Let us help you get started quicker on pending engineering work. Write us a letter outlining briefly your pulse system requirements. Dept. P-1, Electronic Instruments Division, Burroughs Corp., 1209 Vine St., Philadelphia 7, Pa.



ELECTRONIC INSTRUMENTS DIVISION

Burroughs

FIRST IN PULSE HANDLING EQUIPMENT

7. Test and Measuring Equipment

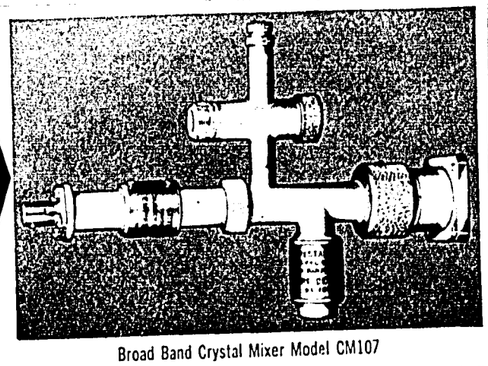
97. Microwave & Radar Test Equipment.

(Continued from page 457)

American Television Mfg. Corp., Ill., 20, 25
Amertronic, Inc., D.C., 25
Andrew Corp., 363 E. 75th St., Chicago 19, Ill., 30
For details see ad on page 420
Tel: TR 4-4400
Arenberg Ultrasonic Lab., Mass., 40
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 10, 40
For details see ad on page 402
Tel: Eliot 4-4321
Audio Prods. Corp., 2265 Westwood Blvd., Los Angeles 64, Calif., 25
For details see ad on page 139
Tel: BRadshaw 2-4266
Avion Instrument Corp., N.J., 20
Bart Labs. Co., Inc., Dept. IRE 54, 227 Main St., Belleville 9, N.J., 30
For details see ad on page 492
Tel: PLymouth 9-0200
Berkeley, Div. Beckman Instr., Inc., 2200 Wright Ave., Richmond 3, Calif., 10, 25
For details see ad on page 138
Tel: Landscape 6-7730
Berkshire Labs., Mass., 15, 25
Biddle Co., James G., Pa., 10, 20
Bird Electronic Corp., 1797 E. 38 St., Cleveland 14, Ohio, 35
For details see ad on page 328
Tel: Ex 1-3535
Bogart Mfg. Corp., N.Y., 10, 30, 45
Bristol Engineering Corp., Pa., 25, 40, Calibrators
Browning Laboratories, Inc., Mass., 15, 35, 40
Brubaker Mfg. Co., Inc., Calif., 15, 25, 40
Bruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 5, 30
For details see ad on page 444
Tel: Longacre 4-5930
Budd-Stanley Co., Inc., 43-01 22nd St., Long Island City 1, N.Y., 10, 30, 35, 45
For details see ad on page 428
Tel: STillwell 6-1706
Budelman Radio Corp., Conn., 10
Burroughs Corp., Electronic Instr. Div., Dept. P-1, 1209 Vine St., Philadelphia 7, Pa., 25, Mixers
For details see ad on page 458
Tel: LO 7-1401
CGS Laboratories, Inc., Conn., 20, 25
Cal-Tronics Corp., 11307 Hindry Ave., Los Angeles, 45, Calif., 35, Fire-Control Test
For details see ad on page 142
Tel: Oregon 8-7141
Canadian Gen. Elec. Co., Electr. Equip., Canada, 15, 20, 25, 40
Canadian Marconi Co., Canada, 20, 45
Cascade Research Corp., Calif., Amplitude & Phase Modulators
Central Rediffusion Services, Ltd., England, 45
Century Electr., Div. Century Metalcraft, Calif., 25, 30, 40, 45
Color Television, Inc., Calif., 20, 35
Connecticut Telephone & Elec. Corp., Conn., 15
Corbin Corp., Md., 35
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 20
For details see ad on page 157
Tel: HAlifax 4-6487
Cubic Corp., Calif., 25, 30, 35, 40
Dalmo Victor Co., Calif., 30, 35
Dawe Instruments, Ltd., England, 25
Daystrom Instrument, Pa., 15, 20, 25
De Mornay-Bonardi, Calif., 10, 30, 35, 45
Diamond Microwave Corp., Mass., 10, 30, 45
Douglas Labs., Inc., N.Y., 25
Douglas Microwave Co., Inc., 11 Beechwood Ave., New Rochelle, N.Y., 10, 20, 30, 45
For details see ad on page 430
Tel: NE 6-6900
Eder Engineering Co., Wis., 25
Electrical & Physical Instr. Corp., 42-19 27th St., Long Island City, N.Y., 25
For details see ad on page 412
Tel: Stilwell 4-6389
Electro Impulse Laboratory, Inc., 62 White St., Red Bank, N.J., 10, 35, 45
For details see ad on page 330
Tel: Red Bank 6-0404
Electro-Metric Instrument Co., 241 Centre St., New York 13, N.Y., 5, 20, 30, 35, 45
For details see ad on page 523
Tel: Canal 6-1337
Electro-Pulse, Inc., Calif., 20, 25, 40
Electron-Radar Products, Ill., 25, 30
Elk Electr. Laboratories, Inc., N.Y., 10, 20
Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, L.I., N.Y., 25
For details see ad on page 459
Tel: BA 4-8500
Engineering Associates, Ohio, 30
Espey Mfg. Co., Inc., N.Y., 5
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 5, 10, 20, 30, 35, 45
For details see ad on pages 47-50
Tel: Astoria 8-2800
Federal Mfg. & Eng. Corp., N.Y., 25, 45
Federal Telecommun. Labs., Div. I T & T., N.J., 30
Ferris Instrument Co., N.J., 30
Franklin Electronics, Inc., Pa., 40
Frequency Standards, Post Office Box 504, Asbury Park, N.J., 10
For details see ad on page 460
Tel: 1718
Furzehill Labs., Ltd., England, 15
Garod Radio Corp., Wilcox-Gay Corp., N.Y., 10, 15, 20, 25
General Communication Co., 681 Beacon St., Boston 15, Mass., 10, 25
For details see ad on page 374
Tel: CO 7-6030

(Continued on page 461)

COAXIAL CRYSTAL MIXER
BROAD BAND FIXED TUNED



Broad Band Crystal Mixer Model CM107

INPUT VSWR: Better than 2 to 1, without adjustments, for all frequencies within the nominal frequency range.

LOCAL OSCILLATOR POWER REQUIREMENT: 10 Milliwatts. Oscillator injector is adjustable to accommodate large variations in oscillator power.

LOCAL OSCILLATOR VSWR: Better than 2 to 1 with any L. O. injector adjustment.

LOCAL OSCILLATOR REJECTION AT I. F. OUTPUT: Better than 30 DB.

MODEL	FREQ. RANGE IN MC
CM-107A	225 to 400
CM-107A1	300 to 530
CM-107A2	510 to 760
CM-107B	750 to 1210
CM-107C	1120 to 1700
CM-107D	1700 to 2600
CM-107E	2600 to 4000
CM-107F	4000 to 5600

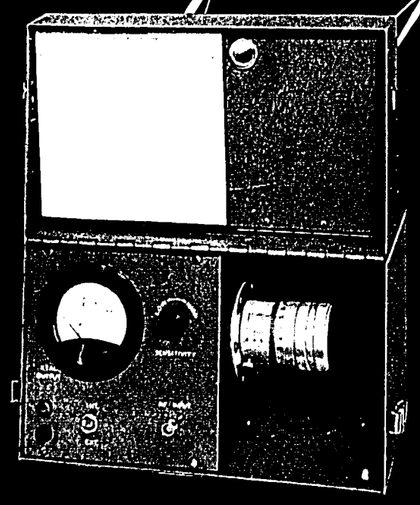
Specify Input Connector: Type "N" or UG-46/U.

EMPIRE DEVICES' expert engineering staff is available to give careful attention to your inquiries.

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38-15 BELL BOULEVARD • BAYSIDE 61 NEW YORK

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Frequency Meters



COMPLETELY — SELF-CONTAINED FIELD TEST INSTRUMENTS — by

FREQUENCY STANDARDS

These precision-built field test instruments were designed by Frequency Standards to provide rapid and accurate means of frequency measurement in the field. Frequency is determined by means of a micrometer dial. This reading is translated to frequency by accurate individual calibration charts or curves. Transducers, fittings, and cables can be supplied to meet the requirements of customers and convenient storage space for these items is provided in the lid of the instruments.



MODEL	FREQUENCY RANGE	ACCURACY
912-4	900-1200 MC	.01%
1217-4	1200-1700 MC	.02%
1723-4	1700-2300 MC	.02%
2335-4	2300-3500 MC	.02%
3545-4	3500-4500 MC	.01%
4458-4	4400-5800 MC	.01%
5882-4	5800-8200 MC	.01%

ILLUSTRATED BULLETINS SENT ON REQUEST

Frequency Standards
ASBURY PARK, NEW JERSEY
Address inquiries to BOX 504

7. Test and Measuring Equipment

97. Microwave & Radar Test Equipment.

(Continued from page 459)

General Electric Co., N.Y., 10, 15, 20, 45
General Elec. Co., Apparatus Sales Div., N.Y., 10, 25
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 25, 45
For details see ad on page 188
Tel: Pleasantville 2-2000
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 20, 25, 30, 35, 40, 45
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
General RF Fittings Co., Inc., Mass., 10, 30
Gertsch Prods., Inc., Calif., 10
Graham Mfg. Co., Inc., R.I., 5, 30
Harman-Kardon, Inc., N.Y., 35
Harvey-Wells Electronics, Inc., Mass., 25, 45
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 5, 10, 20, 25, 30, 35, 45
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hillyer Instrument Co., N.Y., 25, 40
Hycon Mfg. Co., Calif., 10, 15, 20, 25, 30, 35, 40, 45
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 10, 20, 30, 35, 45
For details see ad on page 431
Tel: FArmingdale 2-3606
Jones Electr. Co., Inc., M. C., Conn., 35
Kaiser Metal Prods. Co., Inc., Pa., 15, 25, 40
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 15, 20, 25, 35, 45
For details see ad on page 436
Tel: CAldwell 6-4000
Kings Electronic Co., N.Y., 5, 10, 15, 20, 25, 30, 35, 40, 45
Kollmorgen Optical Corp., Mass., 25
Kollsman Instr. Corp., Div. Standard Coil Products Corp., 80-08 45th Ave., Elmhurst 73, N.Y., 10, 20
For details see ad on page 216
Tel: NEwtown 9-2900
Laboratory for Electronics, Inc., Mass., 15, 20
Lampkin Labs., Inc., Fla., 10
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 25, 45
For details see ad on page 312
Tel: MAtawan 1-2600
Lerner Instr. & Electr. Mfg. Corp., N.Y., 30
Leeco, Inc., N.Y., 30
Linear Equip. Labs., Inc., Dept. RD-7, 295 W. Shore Dr., Massapequa, L.I., N.Y., 45
For details see ad on page 191
Tel: MA 6-3023
Litton Eng. Labs., Calif., 30
Loral Electronics Corp., Dept. ID54, 794 E. 140th St., New York 54, N.Y., 10, 15, 20, 25
For details see ad on page 198
Tel: CY 2-1800
Lund Hansen Co., Ill., 15, 20
Magnex Corp., N.Y., 25
Manson Labs., Conn., 25
Marconi Instruments, Ltd., N.Y., 5, 10, 20, 25, 45
Mc Millan Lab., Inc., Mass., 30
Measurements Corp., Intervale Rd., Boonton, N.J., 25
For details see ad on pages 470, 524
Tel: Boonton 8-2131
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 20
For details see ad on page 301
Tel: Terhune 5-3224
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 30, Measuring Accessories, 45, Special
For details see ad on page 432
Tel: Raymond 3-1508
Mico Instr. Co., 79 Trowbridge St., Cambridge 38, Mass., 45, Coaxial
For details see ad on page 533
Tel: Kirkland 7-8660
Microlab, 71 Okner Pkwy., Livingston, N.J., 30
For details see ad on page 319
Tel: Livingston 6-0692
Microwave Associates, Inc., Mass., 5, 10, 30, 35, 45
Microwave Consultants, N.Y., 10, 30
Microwave Dev. Labs., Inc., Mass., 45
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 5, 10, 30, 35, 45
For details see ad on page 461
Tel: PIoneer 6-4560
New London Instrument Co., P. O. Box 189P, New London, Conn., VHF & UHF Noise Source
For details see ad on page 438
Tel: Gibson 3-8451
Newton, Arnold, N.Y., 30, 35, 45
Nibur Sales Corp., N.J., 10, 35, 45
Northern Elec. Co., Canada, 10, 20, 25
(Continued on page 463)

1955
RADIO ENGINEERING SHOW
March 21-24, 1955
Kingsbridge Armory
New York City

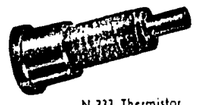
MICROWAVE TEST EQUIPMENT

A complete line of Test Equipment for the microwave frequency range including

- ADAPTORS
- ATTENUATORS
- BENDS
- DETECTOR MOUNTS
- DIRECTIONAL COUPLERS
- FREQUENCY METERS
- IMPEDANCE METERS
- MIXERS
- PROBES
- TEES
- TERMINATIONS
- TUNABLE SHORTS
- TUNERS
- WAVEGUIDE STANDS

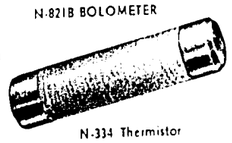
BOLOMETERS & Thermistors

N-610B BOLOMETER



N-333 Thermistor

N-821B BOLOMETER



N-334 Thermistor

Features:

BOLOMETERS

N-610B—Interchangeable with IN21 and IN23 crystals
- 200 ohms at 8.75 ma bias
- Sensitivity 4.5 ohms/mw
- Frequency Range DC—12.4 kmc
- Total Power 32 mw

N-821B—For use in bolometer or barretter mounts
- Electrical specifications same as N-610B.

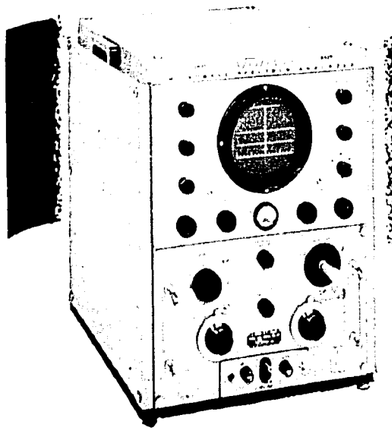
THERMISTORS

N-333 • MOUNTS in all crystal Detector mounts
- Operates with all power meters and bridges
- Resistance: 100 to 200 ohms depending on bias
- Detecting Element: Veco 32A5/32A26 Thermistor
- Frequency Range: DC to 12.4 K mc

N-334 • MOUNTS in bolometer or barretter mounts
- Electrical specification same as N-333

Send for complete catalog R-D-4

NARDA MICROWAVE TEST EQUIPMENT & BOLOMETERS
66 MAIN ST. • MINEOLA, N.Y. • Ploneer 6-4650



New VECTRON MICROWAVE SPECTRUM ANALYZER SA25

A Sensitive Test Instrument for Design, Manufacture, Installation and Maintenance of Microwave Radar, Altimeter, Guided Missile, Television Relay, Communication and Control Equipment.

Accurate Microwave Measurements including:

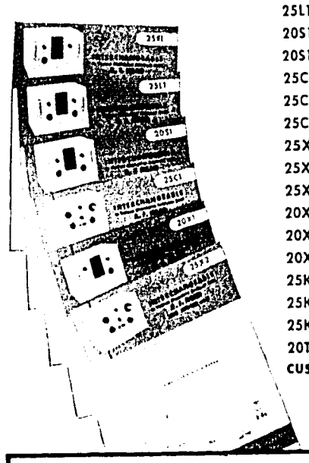
1. Basic frequency of the carrier and all side bands
2. Undesired microwave frequencies being generated
3. Relative intensity of signals, wanted and unwanted
4. Instability in terms of frequency and power output.

Engineered to meet present and future requirements

Vectron's SA25 Microwave Spectrum Analyzer has been engineered to serve present needs while it anticipates future trends in electronic and communication equipment. As this yearbook goes to press, the Bulletins listed below are only a few weeks old. They present a complete description of and detailed specifications for the SA25 and its Interchangeable RF Heads. Improvements and new features will be covered in the literature you receive.

ENGINEERS LIKE THESE FEATURES

- Interchangeable R. F. Heads for specific frequency (or band) coverage — 300 mc/s to 40 kmc/s.
- 5" medium persistence C R T display.
- 20 kilocycle bandwidth I. F. amplifier. Stable low noise circuit with higher usable gain.
- Dual range sweep — 2 to 20 C P S in two overlapping ranges. Single control — ready to use on either range without modification.
- Standard C R T bezel for camera or hood.
- Fully regulated DC supplies and stabilized "safety" high voltage supply.
- Minimum controls for maximum convenience.
- Amplified indication for transmission wavemeters.
- Extended low frequency response — New high-speed sweep and retrace.
- Improved power response linearity.



25L1	800-2400 mc/s
20S1	2400-3650 mc/s
20S1a	2400-4040 mc/s
25C1b	4240-4910 mc/s
25C1a	4240-5900 mc/s
25C1	5100-5900 mc/s
25X2b	5700-6600 mc/s
25X2a	5700-7425 mc/s
25X2	6250-7425 mc/s
20X1b	9500-10,250 mc/s
20X1a	8500-10,250 mc/s
20X1	8500-9660 mc/s
25K1	15,300-17,700 mc/s
25K2	22,800-26,400 mc/s
25KQ1	34,000-38,500 mc/s
20TV1	300-900 mc/s

CUSTOM HEADS



Complete Description and Detailed Specifications for the Basic Unit

If your frequency coverage requirements are not met by any of the RF Heads listed, please write and tell us your specific needs. These will be met in any one of three ways:

1. A custom RF Head.
2. An adaptation of an existing RF Head.
3. A new Vectron RF Head, completed too late to appear in this yearbook.

FOR COPIES OF ANY OF THESE BULLETINS, SEE YOUR VECTRON COMMERCIAL TEST EQUIPMENT REPRESENTATIVE OR WRITE:

VECTRON, inc. *Electronic and Electro-Mechanical Equipment*

402 MAIN STREET, WALTHAM 54, MASS.

Vectron invites your inquiries regarding the development and manufacture of:

Gyro mechanisms; Gyro stabilized Platforms; Gyros and Gyro Systems; Aircraft Instruments; Synchros and Servomechanisms; Electronic Systems; Precision Mechanical Devices; Computers and Calculators; Gear Assemblies; Microwave Equipment; Microwave Test Equipment; Radar Units and Systems; Communication Networks and Filters; Precision Electronic Components; Test Instruments

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment —you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. The result is a more complete picture of each firm's full line, but you travel through fewer listings.

7. Test and Measuring Equipment

97. Microwave & Radar Test Equipment.

(Continued from page 461)

Philco Corp., Pa., 10
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 5, 35
For details see ad on pages 463, 489
Tel: Needham 3-3345
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 10, 15, 20, 25, 45
For details see ad on pages 39-42
Tel: STagg 2-3464
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 10, 15, 20, 30, 35, 45
For details see ad on page 166
Tel: ULster 2-6800
Precision Associates, Inc., N.Y., 10
Press Wireless Labs., Inc., Mass., 30
Presto Recording Corp., P. O. Box 500, Paramus, N.J., 45
For details see ad on page 252
Tel: DIamond 3-5700
Production Res. Corp., Claremont Ave., Thornwood, N.Y., 20
For details see ad on page 524
Tel: Pleasantville 2-2767
Radiation, Inc., P. O. Box Q, Melbourne, Fla., 45
For details see ad on page 525
Tel: 800
Radio City Products Co., Inc., Pa., 15, 25
Radio Corp. of America, Communications Marketing Dept., Camden, N.J., 10, 45
For details see ad on page 210
Tel: Woodlawn 3-8000
Radio Corp. of America Eng. Prods. Dept., Camden, N.J., 25
For details see ad on page 210
Tel: Woodlawn 3-8000
Rese Eng., Inc., Pa., 15, 25
Rollin Co., Calif., 25, 30, 35
Rutherford Electr. Co., Calif., 15, 25, 40
Sierra Electr. Corp., Calif., 5, 20, 35
Sightmaster Corp., N.Y., Calorimeters
Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 15
For details see ad on page 334
Tel: Estebrook 9-1121
Sivers Lab., Sweden, 10, 20, 30, 35, 45
Societe Francaise Radio-Electrique, France, 45
Southern Elec. & Transmission Co., Tex., Multiplexing
Specialty Eng. Div. Spec. Assem. & Pack., N.Y., 20, 25
Spencer-Kennedy Labs., Inc., Mass., 25
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 5, 10, 20, 25, 30, 35, 45
For details see ad on pages 23-24
Tel: Fieldstone 7-3600
Statistical Instr. Co., N.Y., 20, 25
Sticht Co., Inc., Herman H., N.Y., 10
Summit Electr., Inc., N.J., 45
Sylvania Elec. Prods. Inc., 1740 Broadway, New York 19, N.Y., 15
For details see ad on pages 9-14
Tel: JUdson 6-2424
Szekely & Assoc., Inc., O. E., Pa., 10
T. L. G. Elec. Corp., N.Y., 10, 20, 25, 45
Taffet Radio & TV Co., N.Y., 10
Taylor Elec. Instruments, Ltd., England, 25
Technicraft Labs., Inc., Conn., 30
Technitrol Eng. Co., Pa., 25
Technology Instrument Corp., 535A Main St., Acton, Mass., 20
For details see ad on pages 75-79
Tel: COlonial 3-7711
Tektronix, Inc., Ore., 15, 25
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 15
For details see ad on page 474
Tel: WEbster 9-9520
Teletronics Lab., Inc., N.Y., 15, 25, 40
Tensitron, Inc., Mass., 25
Thompson Prods. Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 45
For details see ad on page 235
Tel: HE 1-6765
Titeflex, Inc., N.J., 30
Triplett Electrical Instr. Co., Ohio, 10, 15
Universal Mfg. Co., Inc., N.J., 30
Universal Microwave Corp., N.J., 10, 30, 45
Vectron Inc., 402 Main St., Waltham 54, Mass., 10, 15, 45
For details see ad on pages 366, 462
Tel: WAltham 5-8700

(Continued on page 465)

ELECTRONICS *unlimited?*

Well — almost. After you have discussed your problem with us we think you will agree that the solution of problems by electronics is almost *unlimited*. Pickard and Burns offers a completely integrated service for consultation, research, development, instrumentation, and custom manufacturing, in the various phases of electronics and radio.

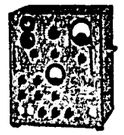
The staff includes experienced specialists in electronics, physics, mathematics, navigation, geophysics, statistics and technical economics.

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- Antennas
- Radar Systems
- Loran
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- Automatic Recorders

MEASUREMENT AND TEST EQUIPMENT



BOLOMETER AMPLIFIER, Model 100. A high-precision instrument to aid in measuring RF field strengths of antenna systems and RF networks.

BOLOMETER AMPLIFIER, Model 60. A highly accurate instrument not requiring the special features of Model 100.

LOG-LINEAR CONVERTER, Model 86. Will convert any 50 kc. signal to logarithmic form up to 100 db. for direct meter reading or to operate any conventional linear recorders.

PICKARD & BURNS
INCORPORATED
240 Highland Avenue,
Needham 94, Mass.

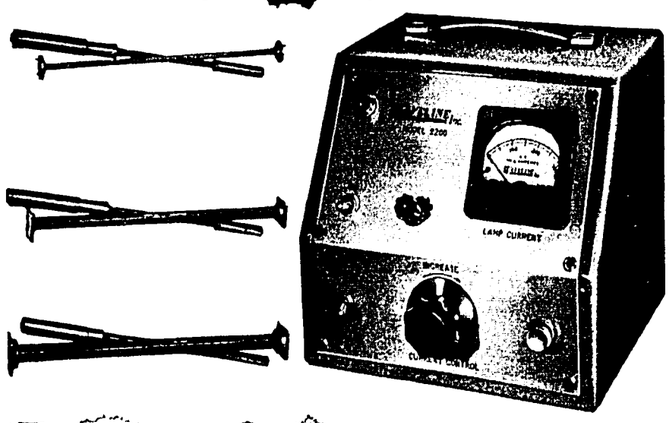
WAVELINE

MICROWAVE NOISE SOURCE

model 2200.....2600 to 26,000 mcs.

level 16.0 db above KTB at 290°K

independent of operating temperature



The WAVELINE Model 2200 microwave noise source—gas noise tube in combination with its Waveguide mount and power unit—provides a random noise squrce of known output level in the frequency range from 2,600 to 26.000 MCS. Throughout this range it also functions as an untuned termination.

The noise power of 16.0 db ±0.5 db above KTB at 290°K is available without warm-up time—and is *completely independent of operating temperature.*

The gas noise tube provides an average VSWR over the frequency range of the tube of approximately 1.07; maximum is approximately 1.13. Insertion loss of the unlighted tube is negligible; maximum inserted VSWR is 1.17. Full VSWR plots for active and inactive tube conditions are supplied with the unit.

MODEL 2200 POWER SUPPLY AND CABLES.....$150.00

Other Microwave test equipment available including complete line of Waveguide instruments. Write for general catalog of microwave instruments today!

CONTI

WAVELINE INC CALDWELL NEW JERSEY

IRE provides all THREE

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Bringing buyers and sellers face to face to discuss engineering needs and product performance is one of IRE's great services to an industry where understanding is the key to progress. The Radio Engineering Show completes with actual product presentation the balanced promotion package of "Proceedings of the I.R.E." for product promotion and the Radio Engineers Directory for product reference.

7. Test and Measuring Equipment

97. Microwave & Radar Test Equipment.

(Continued from page 463)

Walkirt Co., Calif., 25
Waveguide, Inc., Calif., 10, 45
Waveline, Inc., Passaic Ave., Caldwell, N.J., 5, 10, 20, 25, 30, 35, 45
For details see ad on page 464
Tel: CAldwell 6-5785
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 25, 30, 45
For details see ad on page 235
Tel: Malden 2202
Weinschel Eng. Co., Inc., Md., Power Measuring Bridge
Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 10, 20, 45, Signal Generator
For details see ad on page 490
Tel: HUnter 2-7876
White Electron Devices, Inc., Roger, Route 17 & Erie Railroad, Ramsey, N.J., 5, 20
For details see ad on page 399
Tel: Ramsey 9-1660
Wright Eng. Co., Calif., 20, 35

98. Nuclear.

5. Dosimeters
10. Ionization chambers
15. Survey meters

Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 10, 15
For details see ad on page 394
Tel: EV 6-5715
Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass., 5, 10, 15
For details see ad on page 402
Tel: Eliot 4-4321
Beckman Instr., Inc., Beckman Div., 820 Mission St., S. Pasadena, Calif., 10
For details see ad on page 138
Tel: PYramid 1-2141
Bendix Aviation Corp., 1104 Fisher Building, Detroit 2, Mich., 5
For details see ad on pages 51-54, 302
Tel: Trinity 5-5000
Bendix Aviation Corp., Cincinnati Div., 203 West Third St., Cincinnati 2, Ohio, 5, 10, 15
For details see ad on pages 51-54, 302
Tel: Dunbar 5885
Berkeley, Div. Beckman Instr., Inc., Dept. N-13, 2200 Wright Ave., Richmond 3, Calif., 15
For details see ad on page 138
Tel: Landscape 6-7730
Bruel & Kjaer, Denmark, 10, 15
Canadian Aviation Electronics, Ltd., Canada, 15
Canadian Gen. Elec. Co., Electr. Equip., Canada, 15
Chatham Electronics Corp., 630 W. Mt. Pleasant Ave., Livingston, N.J., 5, 10
For details see ad on pages 86-87
Tel: Livingston 6-1100

98. Nuclear.

Consolidated Engineering Corp., Calif., 5
Corning Glass Works, N.Y., 5
Cyclotron Specialties Co., Calif., 15
Egan Lab., N.Y., 15
Electronic Products Co., N.Y., 15
Freed Electronics & Controls Corp., N.Y., 10
Gen. Elec. Co., Apparatus Sales Div., N.Y., 10
Gen. Elec. Co., Carboloy Dept., Mich., Shielding
Gen. Elec. Co., X-Ray Dept., Wis., 5
Greibach Res. & Dev. Labs., N.Y., 5
Hansen, C. W., Mich., 5, 15
High Vacuum Equip. Corp., Mass., 10
Magnex Corp., N.Y., 5, 10, 15
Marconi Instruments, Ltd., N.Y., 5
Measurement Eng., Ltd., Canada, 15
Network Mfg. Corp., N.J., 10
North American Philips Co., Inc., N.Y., 5, 10, 15
Nuclear Instr. & Chemical Corp., Ill., 15
Nuclear Res. Corp., Pa., 15
Nuclear Res. & Dev. Co., Mo., 15
Ohmart Corp., The, Ohio, 10, 15
Precision Radiation Instr., Inc., Calif., 15
R-C Scientific Instr. Co., Inc., Calif., 5, 10, 15
Radiation Counter Labs., Inc., Ill., 5, 10, 15
Radiation Res. Corp., Fla., 5, 15
Radio City Products Co., Inc., Pa., 5, 15
Radioactive Products, Inc., Mich., 15
Sangamo Weston, Ltd., England, 5, 15
Special Instr. Lab., Inc., Tenn., 15
Specialty Eng. Div., Spec. Assem. & Pack., N.Y., 5
Technical Associates, Calif., 5, 10, 15
Tracerlab, Inc., Mass., 5, 10, 15
Victoreen Instrument Co., Ohio, 5, 10, 15
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 10
For details see ad on page 235
Tel: Malden 2202
Wood Counter Lab., Ill., Counters

Telephone Numbers and complete addresses for all firms listed in this Directory are given for your convenience in the Alphabetical Index to Radio-Electronic Manufacturers starting on page 131.

99. Oscilloscopes—Cathode-Ray.

5. General purpose
10. Oscilloscope cameras
15. Oscillosynchroscopes
20. Recording oscillographs
25. Special UHF & pulse analysis equipment

Aeroquip Corp., Mich., 5, 10
Airmec, Limited, England, 5, 10
Allegany Instr. Co., Inc., Md., 5, 10, 20
American Electronic Labs., Inc., Pa., 5
American Instr. Co., Inc., Md., 10, 20
Amplitronix, Inc., N.Y., Projection
Aremac Associates, Calif., 10
Beam Instruments Corp., N.Y., 5, 10, 25
Benson-Lehner Corp., Calif., Trace Analyzers & Readers
Beva Laboratory, N.J., 25
Browning Labs., Inc., Mass., 5, 15, 25
Burke & James, Inc., Ill., 10
Canadian Aviation Electronics, Ltd., Canada, 5
Canadian Gen. Elec. Co., Electr. Equip., Canada, 5
Canoga Corp., Calif., 25
Central Scientific Co., Ill., 5
Century Geophysical Corp., Okla., 20
Chicago Electr. Laboratories, Ill., 25
Colortone Electronics, Inc., N.Y., 5
Compagnie Générale de Métrologie, Chemin de la Croix-Rouge, Annecy, France, 5
For details see ad on page 445
Tel: Annecy 8.60.
Computer Control Co., Inc., 92 Broad St., Babson Park 57, Mass., Dual Beam Converters
For details see ad on page 403
Tel: Belmont 5-6161
Consolidated Eng. Corp., Calif., 20
Corona Engineering Service, N.Y., 5
Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 10
For details see ad on page 157
Tel: HAlifax 4-6487
Crosby Laboratories, Inc., Robbins Lane Box 233, Hicksville, L.I., N.Y., 5
For details see ad on page 523
Tel: Hicksville 3-3191
Daystrom Instrument, Pa., 25
Douglas Labs., Inc., N.Y., 15
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5
For details see ad on page 445
Tel: Burlington 3-0446
Du Mont Labs., A. B., Inc., Commun. Prods. Div., 1500 Main Ave., Clifton, N.J., 5, 25
For details see ad on page 161
Tel: Mulberry 4-7400
Du Mont Labs., Inc., Instr. Div., 1500 Main Ave., Clifton, N.J., 5, 10, 15, 25
For details see ad on page 161
Tel: GR 2-2000
Eastman Kodak Co., N.Y., 10
Edgerton, Germeshausen & Grier, Mass., 10, 25
Edin Co., Inc., Dept. L, 207 Main St., Worcester 8, Mass., 20
For details see ad on page 163
Tel: Worcester 7-8394
El-Tronics, Inc., Pa., 5
Electro-Medical Laboratory, Inc., Vt., 10
Electro-Tech Equipment Co., N.Y., 5

(Continued on page 467)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

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INSTRUMENTS

[illegible] today by [illegible] anticipating the future needs of scientists and testing engineers for more accurate, more versatile and more dependable instruments. This unceasing effort to foresee the demands of the future, results in the design and development of ultra-modern instruments that meet every requirement of science and industry.

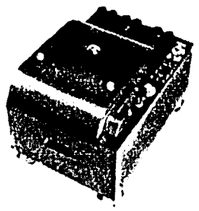
Heiland
20TH ANNIVERSARY

Heiland Research Corporation
130 East Fifth Ave Denver Colorado

Heiland

700 SERIES MULTICHANNEL RECORDING OSCILLOGRAPH—*For recording of static and dynamic current phenomena*—Simultaneous recording of as many as 60 separate channels on either 8 or 12 inch record widths and with record speeds as high as 144 inches per second assures accurate measurement of events occurring in the 0 to 5000 cps range.

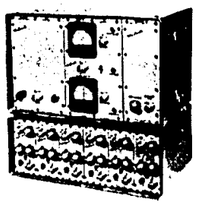
Features include relay rack, table or aircraft mounting; convenient one surface operation; daylight loading; selective record speeds; trace identifier; scanning system; precision timing lines; AC or DC models available.



Heiland

MODEL 119 – SIX CHANNEL AMPLIFIER SYSTEM – Carrier linear and integrating type amplification of static and dynamic phenomena for oscillographic recording is simple and accurate when using the Heiland Amplifier System in conjunction with the Heiland Recording Oscillograph.

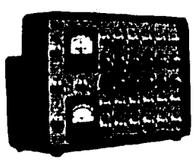
Among its many features are: One surface operation; high sensitivity; high power output; local and remote calibration; carrier amplification 0 to 1000 cps; linear and integrating amplification 5 to 3000 cps; relay rack, table or aircraft mountings; plug-in units.



Heiland

MODEL 82-6 – SIX CHANNEL BRIDGE BALANCE & STRAIN INDICATOR UNIT—Provides a simple and accurate means of calibrating, measuring and controlling static and dynamic phenomena from resistive type transducers before applying such phenomena to the galvanometer circuits of the recording oscillograph.

Designed for relay rack, table or aircraft mounting. Each of the six separate channels may be individually calibrated to gages of different resistances and having two, three or four external arms. A micro-ammeter is provided to aid in calibration and also serves as a static strain indicator.



Heiland

MODEL 500B – PORTABLE RECORDING OSCILLOGRAPH—Provides maximum portability when it is desired to record up to 12 separate phenomena and with small size and economy as controlling factors.

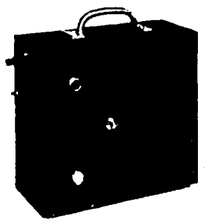
Record width–4 inches; record length–100 feet; highly accurate timing system; daylight loading; easy access; shock mount base; wide range of record speeds.



Heiland

MODEL 401 – PORTABLE SIX CHANNEL RECORDING OSCILLOGRAPH – The Heiland 401 recording oscillograph has its own self contained storage battery power source. Its low cost, small size and ability to record up to six separate phenomena on two inch recording media have made this instrument popular for laboratory and industrial testing as well as in schools and universities.

Included in its features are: Accurate timing system; choice of record speeds; local or remote operation; direct monitoring; daylight loading.



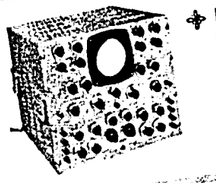
Heiland

GALVANOMETERS– Heiland Galvanometers are employed in recording oscillographs to transfer minute voltage and current variations to the photographically processed record where they can be measured and studied. Heiland galvanometers are available having natural frequencies up to 5000 cps and sensitivities such that only a few micro-amperes are required for each inch of deflection on the record.
Their small size permits as many as sixty elements to be placed adjacently in a 12 inch space. One common magnet assembly provides the necessary magnetic field for each group of 12 galvanometers. Each magnet assembly is individually heated and thermostatically controlled.

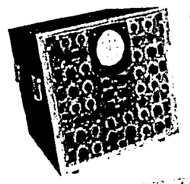
Its features are: high sensitivity; broad range of frequencies; hermetically sealed; plug-in connection; precision balance; low zero drift; high amplitude recordings.



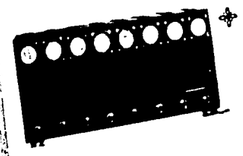
MULTI-CHANNEL SCOPES & MULTI-GUN TUBES THAT Tackle the TOUGH Jobs!



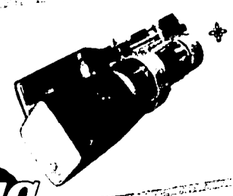
Dual Channel Scopes—Wide band, high gain. Separate intensity, focus, & axes controls on each channel. #H-21A:DC to 200kc, #H-23:DC to 1mc, #H-25:DC to 10mc.



Four Channel Scopes—Same separate controls. #H-43, DC-200kc range, for use with continuous film strip camera. #H-45, DC to 300kc range, sensitivity over .028 Vdc/in.



Multi-Tube, 8 Channel Scopes—For film strip seismography recording, etc. #H-81, AC amp. #H-82, DC amp., greater sensitivity.



Multi-Gun C.R. Tubes—Complete line from 1-gun to 10-gun types, special purpose tubes—virtually every type capable of commercial manufacture.

ETC
electronic tube corporation
1200 E. MERMAID LANE, PHILADELPHIA 18, PA.

Representative types only—write for catalog covering the complete line.

7. Test and Measuring Equipment

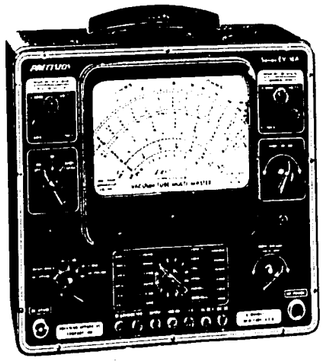
99. Oscilloscopes—Cathode-Ray.

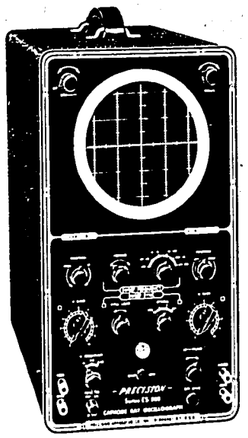
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Electronic Instrument Co., Inc., N.Y., 5
Electronic Measurements Corp., N.Y., 5
Electronic Tube Corp., 1200 East Mermaid Lane, Philadelphia 18, Pa., 10, 15
For details see ad on page 467
Tel: Chestnut Hill 7-6800
Electronics for Medicine, Inc., N.Y., 20
Fairchild Camera & Instrument Corp., N.Y., 10
Feiler Engineering & Mfg. Co., Ill., 5, 15
Franklin Electronics, Inc., Pa., 10, 15, 20
Furzehill Labs., Ltd., England, 5, 10
General Electric Co., N.Y.C., N.Y., 5
General Electric Co., N.Y., 5, 25
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Grass Instrument Co., Mass., 10
Hamlyn Electronics Corp., N.Y., 5
Hathaway Instrument Co., Colo., 20
Heath Co., 305 Territorial Rd., Benton Harbor 27, Mich., 5
For details see ad on page 447
Tel: WA 5-1175
Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo., 20
For details see ad on page 466
Tel: Pearl 3-4691
Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 5
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Tel: LIberty 1-8060
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Instrument Labs., N.Y., 20
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Jackson Electrical Instr. Co., Ohio, 5
Laboratory for Electronics, Inc., Mass., 5
Labscope, Inc., N.J., 5
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 25
For details see ad on page 312
Tel: MAtawan 1-2600
Loral Electronics Corp., Dept. ID54, 794 E. 140th St., New York 54, N.Y., 25
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Tel: CY 2-1800
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For details see ad on page 548
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Penntronics, Pa., 5
Philco Corp., Accessory Div., Pa., 5
Photoron Instr. Co., Ohio, Oscillographs

(Continued on page 469)

SERIES ES-520
General Purpose, Push-Pull
5" Oscilloscope

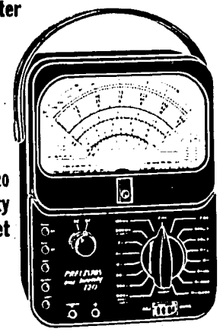




SERIES E-300
Sine-Square Wave
Signal Generator



SERIES EV-10A
Wide-Range, Zero-Center
VTVM and Megohmmeter



SERIES 120
High Sensitivity
Multi-Range Test Set

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ELECTRONIC TEST INSTRUMENTS

because:

. . . ***they recognize*** that there is no compromise, no guesswork, behind the design and workmanship of a "*PRECISION*"-built instrument;

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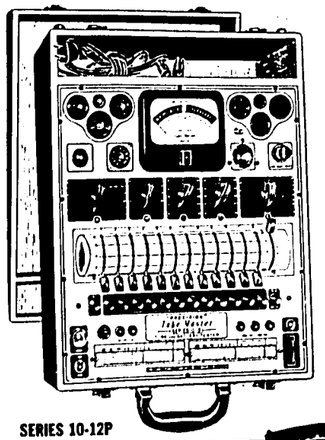
. . . ***they have learned,*** over the past twenty years – in the laboratory, on the production line, in the maintenance department, that they can always look to *PRECISION* as the standard of performance, accuracy and value!

Complete, Illustrated Catalog, Describing the Entire Line of PRECISION Test Instruments, Available on Request

PRECISION **Apparatus Company, Inc.**

70-31 84th STREET, GLENDALE 27, L. I., N. Y.

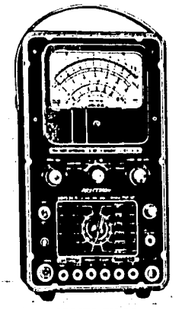
Export Division: 458 Broadway, New York 13, U.S.A. Cables: Morhanex
Canada: Atlas Radio Corp., Ltd., 560 King Street W., Toronto 2B



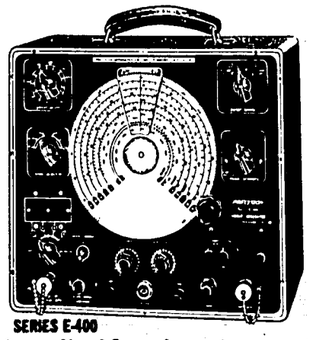
SERIES 10-12P
Electronamic
Tube Performance
Tester



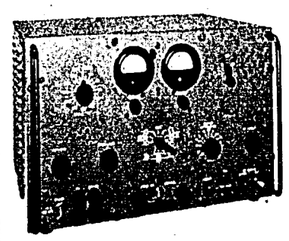
SERIES E-200C
Signal and Marking
Generator



SERIES EV-20
VTVM and Multi-Range
Test Set



SERIES E-400
Sweep Signal Generator



Complete Testing Equipment for

OMNI and

LOCALIZER RECEIVERS

A.R.C. Type H-14 Signal Generator



For a quick and accurate check by pilot before take-off, or for maintenance on the bench, this is the favored and dependable instrument. Checks up to 24 omni courses, omni course sensitivity, to-from and flag-alarm operation, and left-center-right on localizer. For ramp check, RF output 1 volt into 52 ohm line; for bench checks, 0-10,000 microvolts.

The H-16 Standard Course Checker is a companion instrument to the H-14. It makes possible a precise check on the course-accuracy of the H-14 or of any other omni signal generator. Just as a frequency meter is necessary in connection with a variable frequency signal generator, the H-16 Standard Course Checker is required in connection with a VOR signal generator for a precise measurement of phase accuracy.



These instruments sold only direct from factory.

Write for detailed literature

ARC

Dependable Airborne Electronic Equipment Since 1928

Aircraft Radio Corporation

BOONTON NEW JERSEY

7. Test and Measuring Equipment

99. Oscilloscopes—Cathode-Ray.

(Continued from page 467)

Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5
For details see ad on pages 39-42
Tel: STagg 2-3464

Precise Dev. Corp., N.Y., 5

Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y., 5
For details see ad on page 468
Tel: HA 9-6262

Radio City Products Co., Inc., Pa., 5

Radio Corp. of America, Tube Department, Section F35Q, 415 S. Fifth St., Harrison, N.J., 5
For details see ad on page 210
Tel: Humboldt 5-3900

Radio Corp. of America, Eng. Prods. Dept., Camden, N.J., 5, 25
For details see ad on page 210
Tel: Woodlawn 3-8000

Reiner Electr. Co., Inc., N.Y., 5

Ribet Desjardin, France, 5, 15

Rollin Co., Calif., 25

Rutherford Electr. Co., Calif., 25

Sanborn Co., 39 Osborn St., Cambridge 39, Mass., 20
For details see ad on page 228
Tel: KI 7-8460

Saratoga Industries, N.Y., 5

Scientific Specialties Corp., Mass., 20

Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 20
For details see ad on page 236
Tel: FI 7-2810

Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 5
For details see ad on page 334
Tel: EStebrook 9-1121

Smith & Stone, Ltd., Canada, 20

Societe Francaise Radio Electrique, France, 25

Southwestern Indust. Electr. Co., Tex., 20

Spencer-Kennedy Labs., Inc., Mass., 15

Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 25
For details see ad on pages 23-24
Tel: Fieldstone 7-3600

Supreme, Inc., Miss., 5

Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 5, 15
For details see ad on pages 9-14
Tel: JUdson 6-2424

Sylvania Electric Prods. Inc., Radio and Television Div., 254 Rano St., Buffalo 7, N.Y., 5
For details see ad on pages 9-14
Tel: Victoria 2450

Syntronic Instr., Inc., Ill., 15

T. L. G. Elec. Corp., N.Y., 15, 25

Taffet Radio & TV Co., N.Y., 5

Taylor Elec. Instruments, Ltd., England, 5

Tektronix, Inc., Ore., 5, 15

Teletronic Labs., Inc., Calif., 5

Trad TV Corp., 1001 First Ave., Asbury Park, N.J., 5
For details see ad on page 451
Tel: PR 6-7445

Triumph Mfg. Co., Ill., 5, 15, 25

Waterman Prods. Co., Inc., 2445-63 Emerald St., Philadelphia 25, Pa., 5, 15, 25
For details see ad on pages 112-113
Tel: GA 6-8600

Waters Mfg., Inc., Mass., 25

Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 25
For details see ad on page 230
Tel: Malden 2202

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 5
For details see ad on pages 98-99
Tel: BI 3-4700

Winston Electr., Inc., Pa., 5, 15

Wright Eng. Co., Calif., 10, 20

100. Radio Frequency Test Equipment.

5. Field strength meters
10. Impedance & admittance meters
15. Marker generators
20. Multi-vibrators
25. Phase meters
30. "Q" meters
35. RF power output meters
40. Signal generators, AM
45. Signal generators, FM
50. Sweep generators

A. R. F. Products, Inc., Ill., 15, 40, 45, 50

Advance Electronics Co., Inc., 451 Highland Ave., Passaic, N.J., 10, 25
For details see ad on page 401
Tel: Prescott 8-3687

Air Associates, Inc., N.J., 20

Airborne Instruments Lab., N.Y., 50

Aircraft Radio Corp., Boonton, N.J., 40
For details see ad on page 469
Tel: Boonton 8-1800

Airmec, Limited, England, 5, 25, 40

American Encaustic Tiling Co., Inc., Pa., 5

Approved Electr. Instr. Corp., N.Y., 5, 40, 45, 50

Authorized Manufacturers Service, N.Y., 5

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa., 35
For details see ad on pages 96-97
Tel: FI 2-1821

Beckman Instruments, Inc., Shasta Div., P. O. Box 296, Station A, Richmond, Calif., 15, 30
For details see ad on page 138
Tel: Beacon 5-7196

Bellaire Electronics, Inc., N.Y., 40, 45

Berkshire Labs., Mass., 15

Bird Electronic Corp., 1797 E. 38th St., Cleveland, Ohio, 35
For details see ad on page 328
Tel: EX 1-3535

Boonton Electronics Corp., Box 171, Boonton, N.J., 5, 15, 40
For details see ad on page 474
Tel: Boonton 8-3603

Boonton Radio Corp., N.J., 10, 30, 40, 45, OMNI Range Signal Gen.

(Continued on page 471)

MEASUREMENTS CORPORATION

Laboratory Standards

Throughout the world, Measurements' reputation for accuracy and reliability is your guarantee of satisfactory service.

STANDARD SIGNAL GENERATOR MODEL 65-B

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
75 Kc.—30 Mc.	0.1 microvolt to 2.2 volts	AM. 0 to 100% 400 cycles or 1000 cycles External mod., 50-10,000 cycles

STANDARD SIGNAL GENERATOR MODEL 78

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
15-25 Mc.; 195-225 Mc. 15-25 Mc.; 90-125 Mc. Other ranges on order	1 to 100,000 microvolts	AM. 8200-400 cycles 625—400 cycles Fixed at approximately 30%

STANDARD SIGNAL GENERATOR MODEL 78-FM

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
86 Mc.—108 Mc.	1 to 100,000 microvolts	Deviation 0-300 Kc. 2 ranges FM. 400 and 8200 cycles External mod. to 15 Kc.

STANDARD SIGNAL GENERATOR MODEL 80

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
2 Mc.—400 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30% 400 cycles or 1000 cycles External mod., 50-10,000 cycles

STANDARD SIGNAL GENERATOR MODEL 82

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
20 cycles to 200 Kc. 80 Kc. to 50 Mc.	0-50 volts 0.1 microvolt to 1 volt	Continuously variable 0-50% from 20 cycles to 20 Kc.

STANDARD SIGNAL GENERATOR MODEL 84

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
300 Mc.—1000 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30%, 400, 1000, or 2500 cycles. Internal pulse modulator External mod., 50-30,000 cycles.

STANDARD SIGNAL GENERATOR MODEL 84-TV

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
300 Mc. to 1000 Mc.	Continuously variable from 0.1 microvolt to 1.0 volt	Continuously variable 0 to 30% External modulation 20 to 20,000 cycles.

STANDARD SIGNAL GENERATOR MODEL 90

FREQUENCY RANGE	OUTPUT RANGE	MODULATION
20 Mc.—250 Mc.	0.3 microvolt to 0.1 volt	Continuously variable, 0 to 100% Sinusoidal modulation 30 cycles 5 mc Composite TV modulation.

PULSE GENERATOR MODEL 79-B

FREQUENCY RANGE	PULSE WIDTH	OUTPUT
60 to 100,000 cycles	Continuously variable from 0.5 to 40 microseconds	Approx. 150 v. positive with respect to ground. "Sync Output" 35 v. positive with respect to ground.

SQUARE WAVE GENERATOR MODEL 71

FREQUENCY RANGE	WAVE SHAPE	OUTPUT
Continuously variable 6 to 100,000 cycles	Rise time less than 0.2 microseconds with negligible overshoot	Step attenuator 75, 50, 25, 15, 10, 5 peak volts fixed and 0 to 2.5 volts continuously variable

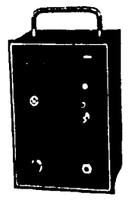
VACUUM TUBE VOLTMETERS

MODEL 62

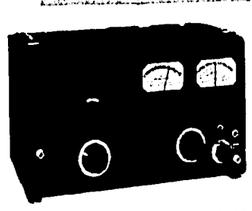
VOLTAGE RANGE	FREQUENCY RANGE	INPUT IMPEDANCE
0-1, 0-3, 0-30 and 0-100 volts AC or DC	30 cycles to over 150 Mc.	Approximately 7 mmfd

MODEL 67

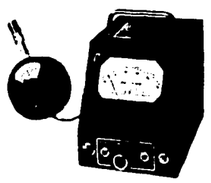
VOLTAGE RANGE	FREQUENCY RANGE	INPUT IMPEDANCE
.0005 to 300 volts peak-to-peak	5 to 100,000 sine-wave cycles per second	1 megohm shunted by 30 mmfd.



CRYSTAL CALIBRATOR MODEL 111



STANDARD SIGNAL GENERATOR MODEL 80



MEGACYCLE METER MODEL 59

U.H.F. FIELD STRENGTH METER MODEL 58

FREQUENCY RANGE	INPUT VOLTAGE RANGE
15 Mc to 150 Mc.	1 to 100,000 microvolts in antenna. 1 to 100 microvolts on semi-logarithmic output meter, balanced resistance attenuator with ratios of 10, 100 and 1000 ahead of all tubes.

INTERMODULATION METER MODEL 31

INTERMODULATION RANGE	FREQUENCIES (CYCLES)	ANALYZER INPUT VOLTAGES
3%, 10% and 30% Full scale	LF 60 cps HF 3000 cps	Full scale ranges of 3, 10, 30 volts RMS

MEGACYCLE METERS MODELS 59 LF—59—59 UHF

FREQUENCY RANGE	FREQUENCY ACCURACY	MODULATION
0.1 Mc to 4.5 Mc 7.2 Mc to 400 Mc 430 Mc to 940 Mc	Within ± 2%	CW or 120 cycles fixed at approximately 30%. Provision for external modulation

CRYSTAL CALIBRATORS

MODEL 111

FREQUENCY RANGE	FREQUENCY ACCURACY	HARMONIC RANGE
250 Kc.—1000 Mc	0.002%	.25 Mc Oscillator .25-450 Mc. 1 Mc Oscillator 1-600 Mc. 10 Mc. Oscillator 10-1000 Mc.

MODEL 111-B

FREQUENCY RANGE	FREQUENCY ACCURACY	HARMONIC RANGE
100 Kc.—1000 Mc.	0.002%	1 Mc. Oscillator .1 — 450 Mc. 1 Mc. Oscillator 1 — 600 Mc. 10 Mc. Oscillator 10—1000 Mc.

MEASUREMENTS CORPORATION

BOONTON NEW JERSEY

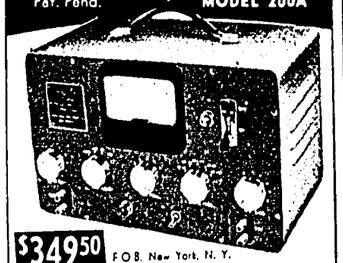
7. Test and Measuring Equipment

100. Radio Frequency Test Equipment.

(Continued from page 469)

Bright Radio Labs., Inc., N.Y., 40, 45
Bristol Engineering Corp., Pa., 15
Browning Laboratories, Inc., Mass., 15
Bruno-N.Y. Industries Corp., Dept. ID, 460 W. 34 St., New York 1, N.Y., 15, 35, 40
For details see ad on page 444
Tel: Longacre 4-5930
Brunswick Instruments, N.J., 35
Buck Engineering Co., Inc., N.J., 35
Budelman Radio Corp., Conn., 35
Bulova Watch Co., Inc., N.Y., 45
C.G.S. Laboratories, Inc., Conn., 50
Canadian Gen. Elec. Co., Canada, 15, 50
Canadian Research Institute, Canada, 40
Canoga Corp., Calif., 15, 50
Clarke Instruments, Md., 5, 25
Clough-Brengle Co., Ill., 15, 40, 50
Cole Instrument Co., Calif., 30, 40
Compagnie Générale de Métrologie, Chemin de la Croix-Rouge, Annecy, France, 40, 50
For details see ad on page 445
Tel: Annecy 8.60
Connecticut Telephone & Elec. Corp., Conn., 15, 45
Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 35
For details see ad on page 317
Tel: Huntington 4-7961
Corbin Corp., Md., 5
Crown Engineering, N.M., 5, Noise Measurement
Cubic Corp., Calif., 25, 35, 45, 50
Daven Company, N.J., 45
Dawe Instruments, Ltd., England, 30
Daystrom Instrument, Pa., 15, 20
Decade Instrument Corp., Box 153, Caldwell, N.J., 50, Extended Range
For details see ad on page 403
Tel: Caldwell 6-4258
Deltron, Inc., Pa., 25
El-Tronics, Inc., Pa., 50
Electro Impulse Laboratory, Inc., 62 White St., Red Bank, N.J., 35, 40, 45
For details see ad on page 330
Tel: Red Bank 6-0404
Electro Metric Instrument Co., 241 Centre St., New York 13, N.Y., 10, 35, 50
For details see ad on page 523
Tel: Canal 6-1337
Electronic Instrument Co., Inc., N.Y., 15, 40, 45, 50
Electronic Measurements Corp., Lewis Ave. & Maple St., Eatontown, N.J., 30, 40, 45, 50
For details see ad on page 363
Tel: Eatontown 3-0300
Electron-Radar Products, Ill., 35
Elk Electr. Laboratories, Inc., N.Y., 5, 10, 20, 30, 35, 40, 45, 50
Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, N.Y., 5
For details see ad on page 459
Tel: BA 4-8500
Erdco Engineering Corp., Ill., 5
Espey Mfg. Co., Inc., N.Y., 5, 40
F-R Machine Works, Inc., 26-12 Borough Pl., Woodside 77, N.Y., 5
For details see ad on pages 47-50
Tel: Astoria 8-2800
Federal Manufacturing & Eng. Corp., N.Y., 40, 45
Federal Telephone & Radio Co., Div. of I T & T., 100 Kingsland Rd., Clifton, N.J., 5
For details see ad on pages 32-37
Tel: Nutley 2-3600
Feiler Engineering & Mfg. Co., Ill., 40
Ferris Instrument Co., N.J., 5, 40, 45
Franklin Electronics, Inc., Pa., 50
Freed Electronics & Controls Corp., N.Y., 40, 45
Freed Transformer Co., Inc., 1720 Weirfield St., Brooklyn 27, N.Y., 30, Low Frequency
For details see ad on page 180
Tel: Evergreen 6-1300
Furst Electronics, Ill., WOW & Flutter Meters
Furzehill Labs., Ltd., England, 15
General Communication Co., 681 Beacon St., Boston 15, Mass., 40, 45
For details see ad on page 374
Tel: CO 7-6030
General Electric Co., N.Y., 15, 45, 50

PHAZOR Pat. Pend. **PHASE METER MODEL 200A**



$349.50 F.O.B. New York, N. Y.

Measures phase shift in transformers, amplifiers, filters, and phase displacement networks.
- Measures from 0 to 360 degrees.
- Readings not affected by noise and harmonics.
- Phase shifts of the order of .01 degree can be measured employing special circuit techniques.
- Measures in-phase and quadrature components separately.

SPECIFICATIONS

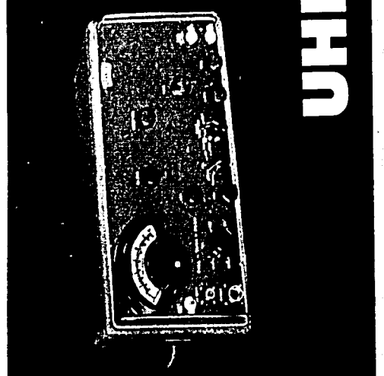
Accuracy—Basic accuracy plus or minus 2 degrees. Plus or minus 1 degree due to meter error.
Noise and Harmonic Rejection—40 db. down
Sensitivity—6 millivolts full scale
Maximum Input Voltage—125 volts RMS
Peak Input Signal—400 volts
Frequency Range—20 to 20,000 cps.
Input Impedance
High Gain—2.0 megohm shunted by 25 mmfd.
Low Gain—2.5 megohm shunted by 10 mmfd.
Reference Input Impedance—4000 ohms
Power Supply—105 to 125 volts, 60 cps., 25 watts
Dimensions—Length 15 in., Hgt. 9 in., Depth 8 in.
Weight—25 pounds

INDUSTRIAL TEST EQUIPMENT CO.
55 EAST 11th ST., N. Y. 3 - Tel: GR. 3-4684

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10, 15, 20, 25, 35, 40, 45, 50
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Germanium Prods. Corp., N.J., 50, Transistor
Hamlyn Electronics Corp., N.Y., 15, 40, 45
Harvey-Wells Electronics, Inc., Mass., 15
Heath Co., 305 Territorial Rd., Benton Harbor 27, Mich., 30, 40, 45, 50
For details see ad on page 447
Tel: WA 5-1175
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 40
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 15, 40, 45, 50
For details see ad on page 434
Tel: LIberty 1-8060
Hycon Mfg. Co., Calif., 10, 15, 25, 35, 40, 45, 50
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 10
For details see ad on page 431
Tel: FArmingdale 2-3606
Industrial Television, Inc., N.J., 5
Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 25
For details see ad on page 471
Tel: GR 3-4684
International Television Corp., N.Y., 15
Jackson Electrical Instr. Co., Ohio, 15, 45, 50
Jerrold Electronics Corp., Pa., 5
Jones Electr. Co., Inc., M. C., Conn., 35
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 15, 50
For details see ad on page 436
Tel: CAldwell 6-4000
Kings Electr. Co., N.Y., 5, 25, 30, 35, 50
Kollsman Instrument Corp., Div. Standard Coil Products Co., 80-08 45th Ave., Elmhurst 73, New York, 15, 50
For details see ad on page 216
Tel: NEwtown 9-2900
Lako Co., Wis., 10, 30
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 40
For details see ad on page 312
Tel: MAtawan 1-2600
Loral Electr. Corp., Dept. ID54, 794 E. 140th St., New York 54, N.Y., 15, 40
For details see ad on page 198
Tel: CY 2-1800
Lund-Hansen Co., Ill., 40, 45, 50

(Continued on page 473)

Consult the advertisements in this book for the detailed information you need in specifying and buying.



UHF

NM-50A 375mc to 1000mc

Commercial Equivalent of AN/URM-17.
Frequency range includes Citizens Band and UHF color TV Band.



VHF

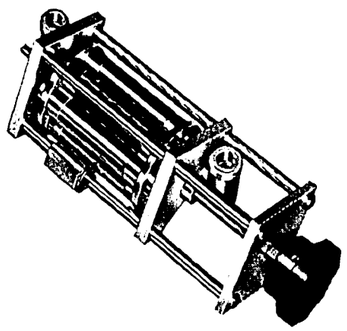
NM-30A 20mc to 400mc

Commercial Equivalent of AN/URM-47. Frequency range includes FM and TV bands.

PRECISION ATTENUATION TO 3000mc!

TURRET ATTENUATOR featuring "PULL-TURN-PUSH" action

FREQUENCY RANGE: dc to 3000 mc.
CHARACTERISTIC IMPEDANCE: 50 ohms
CONNECTORS: Type "N" Coaxial female fittings each end
AVAILABLE ATTENUATION: Any value from .1 db to 60 db
VSWR: ≤1.2, dc to 3000 mc., for all values from 10 to 60 db
≤1.5, dc to 3000 mc., for values from .1 to 9 db
ACCURACY: ±0.5 db
POWER RATING: One watt sine wave power dissipation



Send for free bulletin entitled "Measurement of RF Attenuation"
Inquiries invited concerning pads or turrets with different connector styles



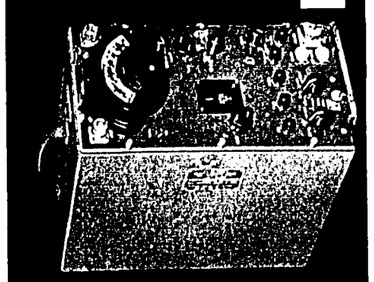
Single "IN-THE-LINE" ATTENUATOR PADS and 50 ohm COAXIAL TERMINATION

Stoddart Aircraft Radio Co., Inc.

6644-C SANTA MONICA BOULEVARD, HOLLYWOOD 38, CALIFORNIA • HOLLYWOOD 4-9294

RADIO INTERFERENCE and FIELD INTENSITY Measuring Equipment

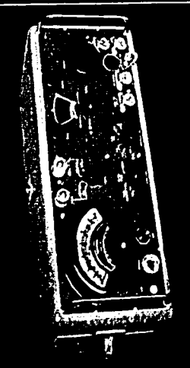
COMPLETE FREQUENCY COVERAGE—14kc to 1000mc!



VHF

NM-20B 150kc to 25mc

Commercial Equivalent of AN/PRM-1A
Self-contained batteries. A. C. supply optional. Includes standard broadcast band, radio range, WWV, and communications frequencies. Has BFO.



VLF

NM-10A 14kc to 250kc

Commercial Equivalent of AN/URM-6B
Very low frequencies

7. Test and Measuring Equipment

100. Radio Frequency Test Equipment.

(Continued from page 471)

Lynmar Engineers, Inc., Pa., 5

Manufacturers Engineering & Equipment Corp., 5 Sunset Lane, Hatboro, Pa., 50
For details see ad on page 473
Tel: HAtboro 2643-4

Marconi Instruments, Ltd., N.Y., 10, 25, 30, 35, 40, 45

Maxson Corp., W. L., N.Y., 25

Measurements Corp., Intervale Rd., Boonton, N.J., 5, 40, 45
For details see ad on pages 470, 524
Tel: Boonton 8-2131

Munston Mfg. & Service, Inc., N.Y., 40

New London Instrument Co., P. O. Box 189P, New London, Conn., 40, 45, 50
For details see ad on page 438
Tel: Gibson 3-8451

Newton, Arnold, N.Y., 40, 45, 50

Nilsur Sales Corp., N.J., 35, 40, 45

Norrman Labs., Ernst, Wis., 20

Northern Radio Co., Inc., Dept. D54, 147 W. 22nd St., New York 11, N.Y., Oscillator-Master Variable Crystal
For details see ad on pages 6-8
Tel: Watkins 9-9117

Oregon Electr. Mfg. Co., Ore., 35, Grid Dip & Resonance

Pacific Transducer Res. Corp., Calif., 50

Panoramic Radio Products, Inc., 20 South 2nd Ave., Mt. Vernon, N.Y., 50
For details see ad on page 437
Tel: MOunt Vernon 4-3970

Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 5, 25, 35
For details see ad on page 333
Tel: CL 5-1471

Philco Corp., Accessory Div., Pa., 5, 15, 45, 50

Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 5, 10, 35
For details see ad on pages 463, 489
Tel: NEedham 3-3345

Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5, 50
For details see ad on pages 39-42
Tel: STagg 2-3464

Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 10, 35, 40, 45
For details see ad on page 166
Tel: ULster 2-6800

Potter Instr. Co., Inc., N.Y., 20

Precise Dev. Corp., N.Y., 15, 40, 45, 50

Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y., 15, 40, 45, 50
For details see ad on page 468
Tel: NA 9-6262

Radio City Products Co., Inc., Pa., 15, 40, 45, 50

Radio Corp. of America, Tube Dept., Section F35Q, 415 S. Fifth St., Harrison, N.J., 15, 40, 45, 50
For details see ad on page 210
Tel: Humboldt 5-3900

Radio Corp. of America, Engineering Products Dept., Camden, N.J., 5, 15, 35, 40, 45, 50
For details see ad on page 210
Tel: Woodlawn 3-8000

Rawson Electrical Instrument Co., Mass., 35

Reiner Electr. Co., Inc., N.Y., 15, 20, 30, 40, 45, 50

Resdel Eng. Corp., Calif., 5

Rollin Co., Calif., 35, 40, 45, Watt Meter, RF

Sensitive Res. Instr. Corp., N.Y., 5*

Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 15, 40
For details see ad on page 236
Tel: FI 7-2810

Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 5, 15, 40, 45
For details see ad on page 334
Tel: EStebrook 9-1121

Specialty Eng. Div., Spec. Assem. & Pack., N.Y., 40

Standard Coil Prods. Co., Inc., Calif., 50

Standard Electr. Res. Corp., N.Y., 5, 20

Stoddart Aircraft Radio Co., Inc., 6644-C Santa Monica Blvd., Hollywood 38, Calif., 5
For details see ad on page 472
Tel: Hollywood 4-9294

Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 40, 45, 50
For details see ad on pages 9-14
Tel: JUdson 6-2424

Sylvania Electric Products, Inc., Radio & TV Div., 254 Rano St., Buffalo 7, N.Y., 15, 50
For details see ad on pages 9-14
Tel: Victoria 2450

Szekely & Assoc., Inc., O. E., Pa., 40

T. L. G. Elec. Corp., N.Y., 35, 40

Taylor Elec. Instruments, Ltd., England, 35, 40

Technology Instrument Corp., 535A Main St., Acton, Mass., 10, 25, 30, 40
For details see ad on pages 75-79
Tel: COlonial 3-7711

Tektronix, Inc., Ore., 15

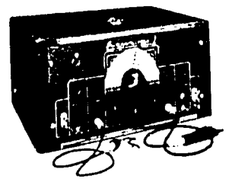
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 50
For details see ad on page 474
Tel: WEbster 9-9520

Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 15, 20, 25
For details see ad on page 224
Tel: AMityville 4-4446

Trad Television Corp., 1001 First Ave., Asbury Park, N.J., 40
For details see ad on page 451
Tel: PR 6-7445

(Continued on page 475)

SWEEPMASTER



Sweep Frequency Generators give you these outstanding advantages

- A frequency Marker with an accuracy of ± 2%, independent of Sweepwidth, is inserted after external detection, eliminating undesirable transient distortion or limiting. This unique marker is independently adjustable in amplitude.
- An attenuator whose performance is free of frequency distortion, providing an output Envelope flat to within ± 1 db over the maximum sweep range.
- Separate examination of either the positive or negative envelope by front panel control.
- Durable, compact, lightweight Output and Detector Probes.

Descriptive Specifications

MODEL	FREQUENCY MARKER RANGE	SWEEPWIDTH CONTINUOUS ADJUSTMENT	RF OUTPUT 50 OHM* TERMINATION
SM I	100 KC to 11 MC	150 KC to 14 MC	1 Volt RMS
SM II	500 KC to 50 MC	150 KC to 20 MC	0.1 Volt RMS
SM III	500 KC to 75 MC	150 KC to 20 MC	0.1 Volt RMS

*75 ohm available when specified

Write for complete information

MANUFACTURERS ENGINEERING & EQUIPMENT CORP.
5 Sunset Lane Hatboro, Pa.

Code number at end of each address refers to product or service sub classifications listed at the head of the major classification.

NEW!

UHF GRID DIP METER

300 TO 1000 MEGACYCLES



FEATURES:

★ Exceptionally wide frequency range.

★ High sensitivity for *both* capacitive and inductive coupling.

★ No wiping contacts.

★ May also be used as a sensitive high Q absorbtion frequency meter.

★ Frequency accuracy: ±2% *(individually calibrated dial.)*

★ 18 inches total dial scale readable to ¼% anywhere on dial.

★ High stability RF circuit. Short term stability approximately .01% after initial warm up.

★ Provision for internal or external modulation.

PRICE $275
F.O.B. Boonton, N. J.

BOONTON
ELECTRONICS CORP.
BOONTON, NEW JERSEY
BOONTON 8-3603

For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.

A Complete Line of

TV STUDIO and PRODUCTION TEST EQUIPMENT

- Monochrome and Color Sync Generators
- Monochrome and Color Monoscope Cameras
- Color Monitors
- Monochrome and Color R.F. Generators
- I.F. and Video Distribution Amplifiers
- R.F., I.F. and Video Sweep Generators
- Color Test Equipment
- Phase Equalizing Filters

WRITE FOR COMPLETE CATALOG

Tel-Instrument Co., Inc.
728 GARDEN STREET
CARLSTADT, N.J.

7. Test and Measuring Equipment

100. Radio Frequency Test Equipment.

(Continued from page 473)

Triplett Electrical Instrument Co., Ohio, 15, 40, 45, 50
Triumph Mfg. Co., Ill., 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
United Technical Labs., N.J., Pattern Generator for TV
Walkirt Co., Calif., 20
Waveforms, Inc., N.Y., 40, 45
Wayne-Kerr Labs., Ltd., Sycamore Grove, New Malden, Surrey, England, 40
For details see ad on page 230
Tel: Malden 2202
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 15, 50
For details see ad on pages 98-99
Tel: BI 3-4700
White Electron Devices, Inc., Roger, Rt. 17 & Erie R.R., Ramsey, N.J., 50
For details see ad on page 399
Tel: Ramsey 9-1660
White Industries, Inc., N.Y., 35
Winston Electr., Inc., Pa., 5, 15, 25, 40, 45, 50

101. Television Test Equipment.

5. Synchronizing generators
10. TV calibrators
15. TV marker generators
20. TV signal generators
25. TV sweep generators

American Television Mfg. Corp., Ill., 5
Approved Electr. Instr. Corp., N.Y., 15, 25
Boonton Electronics Corp., P.O. Box 171, Boonton, N.J., 15
For details see ad on page 474
Tel: Boonton 8-3603
Bright Radio Labs., Inc., N.Y., 20
C.G.S. Laboratories, Inc., Conn., 25
Canadian Gen. Elec. Co., Electr. Equip., Canada, 5, 10, 15, 20, 25
Canoga Corp, Calif., 25
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., Color Test
For details see ad on page 152
Tel: PL 4-5502
Compagnie Générale de Métrologie, Chemin de la Croix-Rouge, Annecy, France, 20, 25
For details see ad on page 445
Tel: Annecy 8.60
Connecticut Telephone & Elec. Corp., Conn., 15, 20
Crest Laboratories, Inc., N.Y., 20
Decade Instrument Corp., P.O. Box 153, Caldwell, N.J., 25
For details see ad on page 403
Tel: CA 6-4258
Du Mont Labs., Inc., A. B., Communication Products Div., 1500 Main Ave., Clifton, N.J., 5, 20, 25
For details see ad on page 161
Tel: Mulberry 4-7400
El-Tronics, Inc., Pa., 20
Electro Metric Instrument Co., 241 Centre St., New York 13, N.Y., 20, 25
For details see ad on page 523
Tel: Canal 6-1337
Electronic Instrument Co., Inc., N.Y., 15, 20, 25
Electronic Measurements Co., Inc., Maple Ave. & Lewis St., Eatontown, N.J.
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Measurements Corp., N.Y., 20
Federal Telecommunication Labs., Div. I. T. & T., N.J., 5
Franklin Electronics, Inc., Pa., 10, 15, 20, 25
Franklin Television Labs., Inc., N.Y., Linearity & Width
General Electric Co., N.Y.C., N.Y., 5, 15, 20, 25
General Electric Co., N.Y., 10, 15, 20, 25
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 5, 20, 25
For details see ad on page 188
Tel: Pleasantville 2-2000
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 20, 25
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400
Granco Prods., Inc., N.Y., 20
Hewlett-Packard Co., 3000 Page Mill Rd., Palo Alto, Calif., 20
For details see ad on pages 15-22
Tel: DAvenport 5-4451
Hickok Electrical Instrument Co., 10551 Dupont Ave., Cleveland 8, Ohio, 5, 10, 15, 20, 25
For details see ad on page 434
Tel: LIberty 1-8060
Hycon Mfg. Co., Calif., 10, 20, 25
Hy-Lite Antennae, Inc., N. Y., Pattern Testers
Jackson Electrical Instr. Co., Ohio, 20, 25
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 10, 15, 20, 25
For details see ad on page 436
Tel: CAldwell 6-4000
Kaye-Halbert Television, Calif., 15
Kollsman Instr. Corp., Div. of Standard Coil Prods. Corp., 80-08 45 Ave., Elmhurst 13, N.Y., 25
For details see ad on page 216
Tel: Newtown 9-2900
Linear Equipment Labs., Inc., Dept. RD-7,295 West Shore Dr., Massapequa, L.I., N.Y., 15, 25
For details see ad on page 191
Tel: MA 6-3023
Lund-Hansen Co., Ill., 25
Marconi Instruments, Ltd., N.Y., 20
Marconi's Wireless Telegraph Co., Ltd., England, 5
Measurements Corp., Intervale Rd., Boonton, N.J., 20
For details see ad on pages 470, 524
Tel: Boonton 8-2131
Microtran Co., N.Y., 15
Newton, Arnold, N.Y., 20
Philco Corp., Accessory Div., Pa., 15, 20, 25
Philco Corp., Govt. & Indust. Div., Pa., 15, 20, 25
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N.Y., 5, 10, 20
For details see ad on pages 39-42
Tel: STagg 2-3464
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 15, 20, 25
For details see ad on page 166
Tel: ULster 2-6800
Precise Dev. Corp., N.Y., 15, 20
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y., 15, 20, 25
For details see ad on page 468
Tel: MA 9-6262
Radio City Products Co., Inc., Pa., 5, 10, 15, 20, 25
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. Fifth St., Harrison, N.J., 20
For details see ad on page 210
Tel: Humboldt 5-3900
Radio Corp. of America, Engineering Products Div., Camden, N.J., 20
For details see ad on page 210
Tel: Woodlawn 3-8000
Raypar, Inc., Ill., 15
Reiner Electronics Co., Inc., N.Y., 20
Research Electronics, Pa., 20
Rollin Co., Calif., 20
Scala Radio Co., Calif., 10
Simpson Electric Co., 5211 W. Kinzie St., Chicago 44, Ill., 15, 20
For details see ad on page 334
Tel: EStebrook 9-1121
Societe Francaise Radio Electrique, France, 10, 20
Standard Coil Prods. Co., Inc., Calif., 25
Supreme, Inc., Miss., 5
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 15, 25
For details see ad on pages 9-14
Tel: JUdson 6-2424
Taylor Elec. Instruments, Ltd., England, 20
Tel-Instrument Co., Inc., 728 Garden St., Carlstadt, N.J., 5, 10, 15, 20, 25
For details see ad on page 474
Tel: WEbster 9-9520
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 10, 15, 20
For details see ad on page 224
Tel: Amityville 4-4446
Triplett Electrical Instrument Co., Ohio, 15, 20, 25
Triumph Mfg. Co., Ill., 5, 10, 15, 20, 25
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J., 10, 15, 25
For details see ad on pages 98-99
Tel: BI 3-4700
Wickes Engineering & Construction Co., N.J., Color Test
Willys Motors, Electronics Div., Ohio, 5
Winston Electr., Inc., Pa., 10, 15, 20, 25

Current IRE Standards

In addition to the technical papers published in the *PROCEEDINGS OF THE I-R-E*, Standards on various subjects have been printed. These are available at the prices listed below. A 20% discount will be allowed on order for 100 or more copies mailed to one address. PLEASE ORDER BY NUMBER.

	PRICE
48 IRE 2., 11., 15. S1 Standards on Antennas, Modulation Systems, and Transmitters: Definitions of Terms, 1948	$0.75
53 IRE 2. S1 Standards on Antennas and Waveguides: Definitions of Terms, 1953. Reprinted from the December, 1953, PROCEEDINGS	$0.75
48 IRE 2. S2 Standards on Antennas: Methods of Testing, 1948. Adopted by ASA. (ASA C16.11-1949)	$0.75
42 IRE 3. S1 American Recommended Practice for Volume Measurements of Electrical Speech and Program Waves. Adopted by ASA. (ASA C16.5-1942)	$0.30
50 IRE 4. S1 Standards on Circuits: Definitions of Terms in Network Topology, 1950. Reprinted from the January, 1951, PROCEEDINGS	$0.50
42 IRE 6. S1 American Recommended Practice for Loudspeaker Testing. Adopted by ASA. (ASA C16.4-1942)	$0.40
51 IRE 6. S1 Standards on Electroacoustics: Definitions of Terms, 1951. Reprinted from the May, 1951, PROCEEDINGS	$1.00
50 IRE 7. S1 Standards on Electron Tubes: Definitions of Terms, 1950. Reprinted from the April, 1950, PROCEEDINGS	$0.75
52 IRE 7. S1 Standards on Magnetrons: Definitions of Terms, 1952. Reprinted from the May, 1952, PROCEEDINGS	$0.25
53 IRE 7. S1 Standards on Electron Devices: Methods of Measuring Noise, 1953 Reprinted from the July, 1953, PROCEEDINGS	$0.75
50 IRE 7. S2 Standards on Electron Tubes: Methods of Testing, 1950. Part I reprinted from August, 1950, PROCEEDINGS; Part II reprinted from September, 1950, PROCEEDINGS	$1.25
52 IRE 7. S2 Standards on Gas-Filled Radiation Counter Tubes: Methods of Testing, 1952. Reprinted from the August, 1952, PROCEEDINGS	$0.75
52 IRE 7. S3 Standards on Gas-Filled Radiation Counter Tubes: Definitions of Terms, 1952. Reprinted from the August, 1952, PROCEEDINGS	$0.50
50 IRE 8. S1 Standards on Electronic Computers: Definitions of Terms, 1950. Reprinted from the March, 1951, PROCEEDINGS	$0.75
42 IRE 9. S1 Standards on Facsimile: Definitions of Terms, 1942	$0.20
43 IRE 9. S1 Standards on Facsimile: Temporary Test Standards, 1943	$0.20
53 IRE 11. S1 Standards on Modulation Systems: Definitions of Terms, 1953. Reprinted from the May, 1953, PROCEEDINGS	$0.50
49 IRE 12. S1 Standards on Radio Aids to Navigation: Definitions of Terms, 1949. Reprinted from the December, 1949, PROCEEDINGS	$0.60
45 IRE 14. S1 Standards on Piezoelectric Crystals: Recommended Terminology, 1945	$0.20
49 IRE 14. S1 Standards on Piezoelectric Crystals, 1949. Reprinted from the December, 1949, PROCEEDINGS	$0.80
49 IRE 16. S1 Standards on Railroad and Vehicular Communications: Methods of Testing, 1949. Reprinted from the December, 1949, PROCEEDINGS	$0.50
47 IRE 17. S1 Standards on Radio Receivers: Methods of Testing Frequency-Modulation Broadcast Receivers, 1947. Adopted by ASA. (ASA C16.12-1949)	$0.50
48 IRE 17. S1 Standards on Radio Receivers: Methods of Testing Amplitude-Modulation Broadcast Receivers, 1948	$1.00
49 IRE 17. S1 Tests for Effects of Mistuning and for Downward Modulation. 1949 Supplement to 47 IRE 17. S1 Reprinted from the December, 1949, PROCEEDINGS	$0.25
51 IRE 17. S1 Standards on Radio Receivers: Open Field Method of Measurement of Spurious Radiation from Frequency Modulation and Television Broadcast Receivers, 1951. Reprinted from the July, 1951, PROCEEDINGS	$0.50
52 IRE 17. S1 Standards on Receivers: Definitions of Terms, 1952. Reprinted from the December, 1952, PROCEEDINGS	$0.60
53 IRE 19. S1 Standards on Sound Recording and Reproducing: Methods of Measurement of Noise, 1953. Reprinted from the April, 1953, PROCEEDINGS	$0.50
51 IRE 20. S1 Standards on Pulses: Definitions of Terms—Part 1, 1951. Reprinted from the June, 1951, PROCEEDINGS	$0.50
51 IRE 20. S2 Standards on Transducers: Definitions of Terms, 1951. Reprinted from the August, 1951, PROCEEDINGS	$0.50
52 IRE 20. S1 Standards on Pulses: Definitions of Terms—Part II, 1952. Reprinted from the May, 1952, PROCEEDINGS	$0.50
48 IRE 21. S1 Standards on Abbreviations, Graphical Symbols, Letter Symbols, and Mathematical Signs, 1948	$0.75
49 IRE 21. S1 Standards on Designations for Electrical, Electronic and Mechanical Parts and their Symbols, 1949. Reprinted from February, 1950, PROCEEDINGS	$0.60
51 IRE 21. S1 Standards on Abbreviations of Radio-Electronic Terms, 1951. Reprinted from the April, 1951, PROCEEDINGS	$0.50
47 IRE 22. S1 Standards on Television: Methods of Testing Television Transmitters, 1947	$0.75
48 IRE 22. S1 Standards on Television: Methods of Testing Television Receivers, 1948. Adopted by ASA. (ASA C16.13-1949)	$1.00
53 IRE 22. S1 Standards on Television: Definitions of Color Terms, Part 1, 1953. Reprinted from the March, 1953, PROCEEDINGS	$0.50
48 IRE 22. S2 Standards on Television: Definitions of Terms, 1948	$0.50
50 IRE 23. S1 Standards on Television: Methods of Measurement of Television Signal Levels, Resolution, and Timing of Video Switching Systems, 1950. Reprinted from the May, 1950, PROCEEDINGS	$0.70
50 IRE 23. S2 Standards on Television: Methods of Measurement of Time of Rise, Pulse Width, and Pulse Timing of Video Pulses in Television, 1950 Reprinted from the November, 1950, PROCEEDINGS	$0.75
50 IRE 23. S3 Standards on Television: Methods of Measurement of Electronically Regulated Power Supplies, 1950. Reprinted from the January, 1951, PROCEEDINGS	$0.75
45 IRE 24. S1 Standards on Radio Wave Propagation: Definitions of Terms Relating to Guided Waves, 1945	$0.20
50 IRE 24. S1 Standards on Wave Propagation: Definitions of Terms, 1950 Reprinted from the November, 1950, PROCEEDINGS	$0.60

Prices are net and include postage to any country. Include remittance with order and address.

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

Part VI SERVICES & MATERIALS

8. Raw Materials and Services
9. Education & Publishing
10. Distribution

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 or letter that you seek.

HOW TO USE

1. With the directory open on the desk, bend the book almost double in your left hand, with your thumb just below this line.
2. From one-line or two-line symbol adjacent to the letter or subject you seek, run your eye across horizontally to a corresponding page-edge symbol.
3. Open there with your right hand.

IT IS EASIER IF YOU "FAN" OR "RIFFLE" THE LAST FEW PAGES WITH YOUR RIGHT THUMB. THE EDGE INDEXES COVERING THE OTHER DIRECTORIES WILL BE FOUND OPPOSITE PAGES 240, 270, & 400.



For complete list of products and services, arranged alphabetically for fast reference, see the eight-page pink section preceding page 1.

2	PART I COMPLETE DATA SPREADS
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241	PART III APPARATUS
271	PART IV COMPONENTS
401	PART V INSTRUMENTS & CONTROLS
477	PART VI SERVICES & MATERIALS

RAW MATERIALS AND SERVICES

Product No.	Page No.
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76 Ceramics	485
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84 Laboratories & Custom Builders	521
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86 Machnery & Tools	529
87 Metals	535
88 Moulded Products	537
89 Plastics	541
90 Solder	545
91 Vacuum Tube Parts	547
102 Education	551
103 Publishing	555
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Ad. Index Page 583-584

Complete-Data Spreads Part I 2

Classifications with a System!

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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

YOU will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. **Audio Frequency Equipment** (Products 1 to 11)
2. **Broadcasting Equipment** (Products 12 to 17)
3. **Communications Equipment** (Products 18 to 25)
4. **Component Parts** (Products 26 to 62)
5. **Applications of Electronics** (Products 63 to 70)
6. **Radar, Microwave, UHF** (Products 71 to 74)
7. **Test & Measuring Equipment** (Products 92 to 101)
8. **Services and Materials** (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.
9. **Education & Publishing** (Groups 102 & 103)
10. **Distribution Functions** (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

1954 I.R.E. DIRECTORY READER SERVICE REPLY CARD

Place a 2¢ stamp on one or more of the perforated cards below, and they will be promptly forwarded to the manufacturers listed on the back. If you prefer to send your specific requirements, a letter would be more advantageous, however be sure to enclose the reply card.

PLEASE PRINT IN INK OR TYPEWRITE

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

Place Stamp Here

To: IRE DIRECTORY
1475 Broadway
New York 36, N. Y.

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New York 36, N. Y.

1954 I.R.E. DIRECTORY READER SERVICE REPLY CARD

Below, for your convenience, are six perforated reply cards. Each one has enough space to list three advertisers' names and their page numbers. Forward as many cards as you have questions, and I.R.E. will promptly notify the manufacturer in question to send literature, specifications, and prices to you.

Name .....
Company .....
Address .....
Title .....

Please send further information regarding

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1954 IRE DIRECTORY

A Directory of 8. Services and Raw Materials



To the engineer with a manufacturing problem, this section provides a special listing of the services and products which are basic to production. Separate from actual components, these are the base sources of manufacture, ranging from the research functions of Consulting Engineers, to subcontracting assemblers, and from basic raw materials such as ceramics, metals and staples, like wire, to such specialties as the parts for vacuum tubes. Here is a useful section, well illumined by informative advertising, which will serve you well, and often.

17 Product and Service groups give detail on 102 items the production engineer and designer may need.

The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 104 major product groups are numbered throughout.

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

75 Cable & Wire.
76 Ceramics.
77 Consulting Engineers.
78 Core Materials.
79 Fabricators & Services.
80 Gasses & Vapors.
81 Hardware & Findings.
82 Hermetic Seals.
83 Insulating Materials.
84 Laboratories & Custom Builders.
85 Lacquers, Paints, Compounds & Waxes.
86 Machinery & Tools.
87 Metals.
88 Moulded Products.
89 Plastics.
90 Solder.
91 Vacuum Tube Parts.

Key Man Coverage!

ENGINEERS are the most "literate" men in the world! Engineers do not know everything, but they do know where to look it up. "Engineers set the specs!" "Engineers are educated to buy!" You can only sell a technical industry through its technical men.

That is why reference advertising in the DIRECTORY every IRE Member gets and uses, covers the key men you need to sell! They know how to use IRE DIRECTORY information, and do use it. Have you told them your story?

In order to improve the grouping of products in the 1954 IRE Directory one of the 10 basic directories has been moved out of order. The directory of test equipment begins on page 435.

75. Cable & Wire.

5. Aluminum
10. Co-axial cables
15. Copper, bare
20. Low-loss, high-frequency types
25. Magnet wire
30. Precious & rare metals wire
35. Pre-formed wire harnesses
40. Rubber insulated
45. Shielded
50. Synthetic insulated
55. Wire mesh
60. Woven wire braid

A-K Mfg. Co., Inc., Ill., 10, 20, 35, 40, 45, 50, 60
Acme Wire Co., Conn., 25, 50
Advance Insulated Wire & Cable Co., N.J., 10, 20, 45, 50
Aeronautical Radio Mfg. Co., N.Y., 10, 35
Alden Products Co., 113 No. Main St., Brockton 64, Mass., 45
For details see ad on page 296
Tel: Brockton 160
Allied Allegri Co., Inc., N.J., 35

(Continued on page 479)



Serving the Electronic Industry . . .

ALLOY METAL

WIRE • ROD • STRIP

- **Nickel Alloys**
- **Stainless Steels**
- **Electrical Resistance Alloys**

Alloy Metal Wire Company offers the electronic industry a wide selection of alloys in a full range of sizes—and backed by 35 years experience in the metal alloy field. Wire, rod and strip are available with outstanding electrical properties, special magnetic properties, high temperature resistance, corrosion resistance, excellent spring characteristics and good mechanical properties.

Nickel alloy and stainless steel wire are also available in a variety of special cross-sectional shapes, including oval, square, hexagon, teardrop, half oval, half round, wedge, D-shape and keystone.

Alloy Metal Wire Company engineers will be happy to help you select the right material for your application. Write today for our technical handbooks.

Alloy Metal Wire Company Materials

NICKEL ALLOYS	STAINLESS STEELS		ELECTRICAL RESISTANCE ALLOYS
	Chromium Nickel Grades	Straight Chromium Grades	
Nickel—Grade A	Almet 302	Almet 405	Alray A (80 Ni—20 Cr)
Grade D	Almet 304	Almet 410	
Grade E	Almet 17-7PH	Almet 420	Alray C (62 Ni—15 Cr—Bal Fe)
Duranickel ("Z" Nickel)	Almet 305	Almet 430	
Monel	Almet 308	Almet 434	Alray D (35 Ni—18 Cr—Bal Fe)
"R" Monel (Free Machining)	Almet 309	Almet 442	
"K" Monel	Almet 310	Almet 446	Excelsior (55 Cu—45 Ni)
"KR" Monel (Free Machining)	Almet 314		
Inconel	Almet 316		
Inconel X	Almet 317		
Inconel W	Almet 330		
	Almet 347		
	Almet C-20		

Other Alloy Metal Wire Co. products: *36%, 42%, 49% and 52% Nickel Irons; Nickel Clad Copper; Titanium; Special Alloys for high temperature springs.*

ALLOY METAL WIRE COMPANY

DIVISION OF H. K. PORTER COMPANY, INC. PROSPECT PARK, PENNSYLVANIA

8. Services and Raw Materials

75. Cable & Wire.

(Continued from page 477)

Alloy Metal Wire Div., H. K. Porter Co., Inc., Prospect Park, Pa., Nickel Alloys-Stainless Steel Wire, Rod and Strip
For details see ad on page 478
Tel: Washburn 8-6500

Alpha Wire Corp., 430 Broadway, New York 13, N.Y., 10, 15, 20, 40, 45, 50, 60
For details see ad on page 479
Tel: CAnal 6-6800

American Brass Co., Conn., 15

American Electric Cable Co., Mass., 10, 15, 35, 45

American Electrical Heater Co., Mich., Cords

American Electro Metal Corp., N.Y., 30, Tungsten & Molybdenum

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 10, 15, 20, 35, 45, 50, 60
For details see ad on page 130
Tel: Bishop 2-1000

Anaconda Wire & Cable Co., N.Y., 5, 10, 15, 20, 25, 40, 45, 50

Andrew Corp., 363 E. 75th St., Chicago 19, Ill., 10
For details see ad on page 420
Tel: TR 4-4400

Ansonia Wire & Cable Co., Conn., 10, 45, 50

Arey Machine Co., N.J., 35

Bardwell & McAlister, Inc., Calif., 35

Beam Instruments Corp., N.Y., 5, 10, 20, 40, 45, 50

Belden Mfg. Co., Ill., 4641 W. Van Buren St., Chicago 44, Ill., 5, 10, 15, 20, 35, 40, 45, 50, 60
For details see ad on Cover II

Birnbach Radio Co., Inc., N.Y., 5, 10, 15, 20, 25, 40, 45, 50, 60

Bliss Electronic Corp., N.J., 35

Boston Insulated Wire & Cable Co., Mass., 10, 20, 40, 45, 50, 60

Brand & Co., Inc., William, Conn., 10, 20, 35, 45, 50

Bridgeport Brass Co., Conn., 15

Buggie, Inc., H. H., 726 Stanton St., Toledo 4, Ohio, 35
For details see ad on page 298
Tel: Adams 8216

Burndy Eng. Co., Inc., Conn., Connectors

Cadre Industries Corp., N.Y., 35

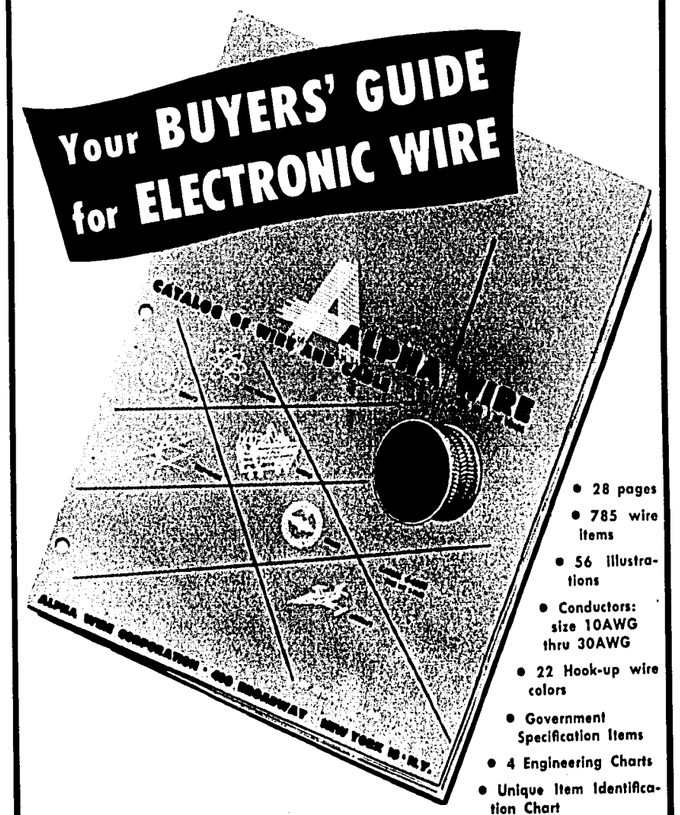
Canada Wire & Cable Co., Ltd., Canada, 5, 10, 15, 20, 25, 40, 45, 50, 60

Chase Brass & Copper Co., Conn., 10, 15, 40, 45, 50, 60

Channer Corp., Ill., 35

(Continued on page 480)

the greatest number of **IN STOCK** Wire Items in the industry!



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- 22 Hook-up wire colors
- Government Specification Items
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First in Quality Wire for over 30 years.

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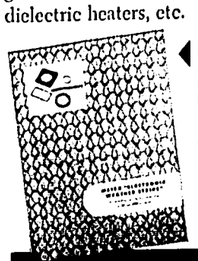
STOP RF LEAKAGE ON THE DRAWING BOARD

. . . WHEN YOU DESIGN METEX ELECTRONIC WEATHERSTRIPPING INTO YOUR EQUIPMENT YOU GET ITS POSITIVE SHIELDING EFFECTIVENESS — AT MAXIMUM OVERALL ECONOMY

Plan *now* to take full advantage of *Metex Electronic Weatherstripping's* unusual effectiveness in shielding all types of electronic equipment. Because it is made of *knitted* wire mesh, *Metex Electronic Weatherstripping* is both conductive and resilient. It assures positive metal-to-metal contact between all mating surfaces. And being resilient it accommodates itself positively to surface inequalities.

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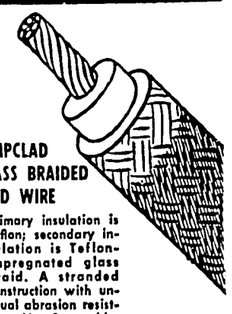
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For detailed information on METEX ELECTRONIC PRODUCTS, write for FREE copy of "Metex Electronic Weatherstrips" or outline your SPECIFIC shielding problem — it will receive our immediate attention.

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ROSELLE, NEW JERSEY



TEMPCLAD GLASS BRAIDED LEAD WIRE

Primary insulation is Teflon; secondary insulation is Teflon-impregnated glass braid. A stranded construction with unusual abrasion resistance. Non-flammable.

see #7 below

From the list below select the wire which meets your needs:

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2 TEMPRITE-X SPECIAL TEFLON MAGNET WIRE — Same characteristics and sizes as regular Temprite magnet wire, but specially processed for severe applications.

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6 TEMPREX TEFLON EXTRUDED HOOK-UP WIRE — Sizes from 30—10 AWG incl. Types E and EE of MIL-W-16878A in 14 solid colors. Same characteristics as Temprene.

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For complete engineering particulars write

ITEMP WIRES

26 WINDSOR AVENUE

MINEOLA LONG ISLAND

SPECIALISTS IN HIGH TEMPERATURE INSULATION

8. Services and Raw Materials

75. Cable & Wire.

(Continued from page 479)

Chester Cable Corp., P.O. Box 316, Chester, N.Y., 10, 20, 45, 50, Multi-Conductor
For details see ad on pages 120-121
Tel: Chester 2221

Clark Cable Corp., 3184-88 W. 32 St., Cleveland 9, Ohio, 35
For details see ad on page 481
Tel: MElrose 1-8080

Cohn Corp., Sigmund, N.Y., 121 So. Columbus Ave., Mt. Vernon, N.Y., 5, 30
For details see ad on page 481
Tel: MO 4-5300

Columbia Technical Corp., N.Y., 10, 20

Columbia Wire & Supply Co., Ill., 5, 10, 15, 20, 25, 35, 40, 45, 50, 60

Commercial Radio-Sound Corp., N.Y., 10, 45

Communication Prods. Co., Inc., State Hwy. 79, Marlboro, N.J., 10, 20, 45
For details see ad on pages 104-105
Tel: Freehold 8-1880

Consolidated Wire & Assoc. Co., Ill., 10, 15, 20, 40, 45, 50, 60

Co-operative Industries, Inc., N.J., 35, 40, 45, 50, 60

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8. Services and Raw Materials

75. Cable & Wire.

Copperweld Steel Co., Pa., 10, 15, 20, 40, 50, 60

Cornish Wire Co., Inc., N.Y., 35, 40, 45, 50

Cossor (Canada), Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 10, 15, 20, 40, 45, 50
For details see ad on page 157
Tel: HAlifax 4-6487

Crescent Co., Inc., R.I., 35, 40, 45, 50

Daystrom Electric Corp., N.Y., 35

Dayton Aircraft Prods., Inc., Ohio, 50, Aircraft Antenna

Diamond Wire & Cable Co., Ill., 15, 40, 45, 50

Driver Co., Wilbur B., 1875 McCarter Hwy., Newark 4, N.J., 30
For details see ad on page 164
Tel: HU 2-5550

Du Mont Labs., Inc., A. B., Communication Prods. Div., 1500 Main Ave., Clifton, N.J., 10
For details see ad on page 161
Tel: Mulberry 4-7400

Electro Eng. & Mfg. Co., Mich., 35

Essex Wire Corp., Fort Wayne, Ind., 5, 15, 20, 25, 35, 40, 45, 50, 60

Clark Cable Corporation

PRECISION DEVELOPMENT & FABRICATION OF PREFORMED CABLE ASSEMBLIES AND WIRE HARNESSES FOR —

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CLARK CABLE CORPORATION, 3184-88 WEST 32nd ST., CLEVELAND 9, OHIO



Essex Wire Corp., Logansport, Ind., 15, 25, 35, 40, 45, 50

Factory Enterprises, Inc., P.O. Box 4025, Pittsburgh 1, Pa., 55
For details see ad on page 480
Tel: MU 1-1199

Federal Telecommunications Labs., Div. I.T.&T., N.J., 50

Federal Telephone & Radio Co., Div. of I.T.&T., 100 Kingsland Road, Clifton, N.J., 10, 20, 45, 60
For details see ad on pages 32-37
Tel: Nutley 2-3600

Flexo Wire, Div. Copperweld Steel Co., N.Y., 15, Alloy

Flexonics Corp., Ill., Conduit Armor

Franklin Television Labs., Inc., N.Y., Cable Assemblies

Fusion Eng., Ohio, 30

Garfield Wire, Div. of Overlakes Corp., N.J., 15, 25

Gavitt Mfg. Co., Inc., Mass., 35, 40, 45, 50

General Cable Corp., N.Y., 5, 10, 15, 20, 40, 45, 50

General Chem., Div. Allied Chem. & Dye Corp., N.Y., 10

General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 35
For details see ad on page 495
Tel: Valley Stream 5-6363

General Insulated Wire Works, Inc., R.I., 10, 40, 45, 50

General Plate, Div. Metals & Controls, Mass., 30

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 10
For details see ad on pages 59-62, Cover IV
Tel: Trowbridge 6-4400

Guthman & Co., Inc., Edwin L., Ill., 50

Handy & Harman, N.Y., 30

Hitemp Wires, Inc., 26 Windsor Ave., Mineola, L.I., N.Y., 25, 50, 60
For details see ad on page 480
Tel: PIoneer 2-5540

Hudson Wire Co., Winsted Div., Conn., 15, 20, 25

Ilsco Copper Tube & Prods., Inc., Ohio, Copper Tubing

Imperial Radar & Wire Corp., N.Y., 5, 10, 15, 20, 25, 55, 60

Insuline Corp. of America, N.H., 5

Jerrold Electronics Corp., Pa., 10

Jersey Specialty Co., Inc., N.J., 20

Johns-Manville, N.Y., Asbestos Tubing

Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 35
For details see ad on page 312
Tel: MAtawan 1-2600

Lear, Inc., Calif., 35

Lenz Electric Mfg. Co., Ill., 20, 35, 45, 50, 60

Little Falls Alloys, Inc., N.J., 5, 15, 20, 30

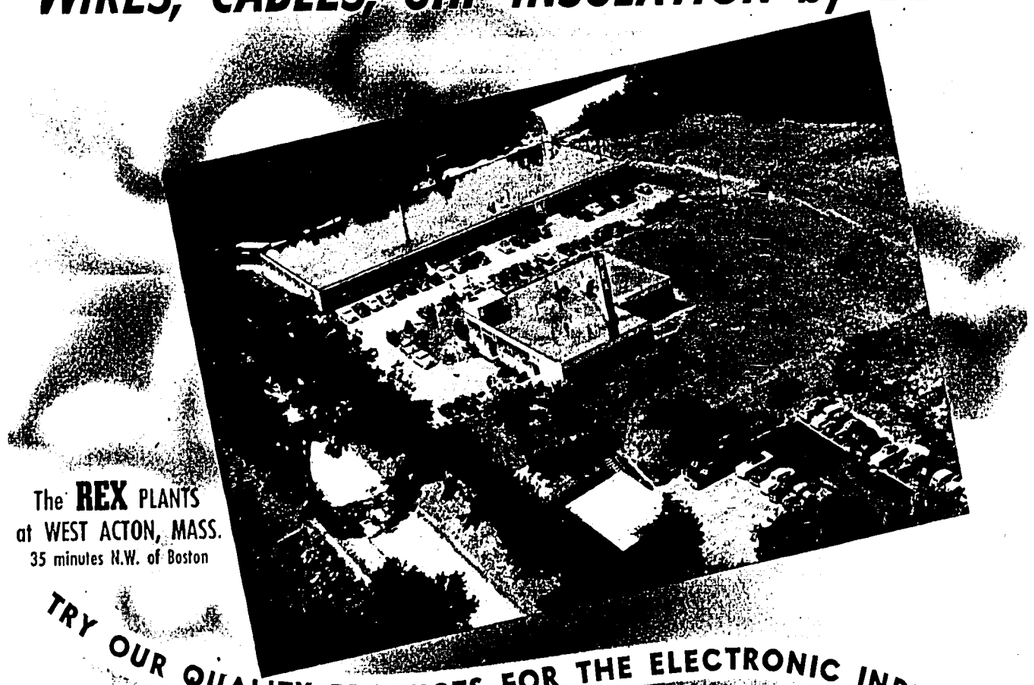
Macleod & Hanopol, Inc., Mass., 35

Makepeace Co., D.E., Div. Union Plate Wire Co., Pine & Dunham Sts., Attleboro, Mass., 35
For details see ad on page 200
Tel: Attleboro 1-0089

(Continued on page 483)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

WIRES, CABLES, UHF INSULATION by REX



The REX PLANTS at WEST ACTON, MASS. 35 minutes N.W. of Boston

TRY OUR QUALITY PRODUCTS FOR THE ELECTRONIC INDUSTRY

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REXOLITE 1422

Sheets and rods with the electrical properties of polystyrene and the machinability of free-turning brass. Rexolite 1422 is a thermosetting cross linked styrene copolymer. Dielectric constant 2.5. Dissipation factor .00015 — .0003 at one megacycle.

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A glass reinforced laminate with fine UHF electrical properties in the same general range as Rexolite 1422 (see left) but with the added properties of good punchability, high impact strength and surprisingly low price.

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SPECIALTY CABLES

Communication and control cables of all types. Excellent cable engineering. Fine cabling, shielding and jacketing work.

COAXIAL CABLES

Quotations on request for both special and standard coaxial cables.

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REX K-F WIRE insulated with trifluoro monochloroethylene (per Mil-W 12349) sets new high standards for hook-up wire. Write for full information.

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Write for full information on Rex Teflon insulated wire.

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High precision miniature wire for up to 120° C. Continuous operation. Write for full informaton.

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Quotations on request for all plastic types.

REX VJN MINIATURE WIRE

Vinyl with Nylon jacket for −55°C. to 110°C. and 300 V to 2500 V. Write for full information.

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We make practically all of the plastic insulated military specification wires.

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Telephone: ELiot 4-1751

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MASSEY ASSOCIATES
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Telephone: NAtional 8-1957
529 Brookhurst Ave., Narberth, Pennsylvania
Telephone: MOhawk 4-4200

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MINIATURE SUPER-FLEXIBLE

PLASTIC INSULATED WIRE and CABLE

TENSOLON HOOK-UP WIRE

Teflon insulated for continuous use up to 250°C, "Tensolon" is available in 14 solid colors plus 819 stripe combinations and features a free-stripping, thin wall covering to MIL-W-16878A.

TENSOLEX MIL-W-76A HOOK-UP WIRE

Types LW, MW, and HW available in small wire sizes in all standard colors including spiral striping. Nylon jackets can also be supplied for greater resistance to abrasion.

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Thin wall vinyl insulation over flexible stranded conductors (AWG sizes down to #40) meets many requirements for small space factor. Available in all standard colors with or without wire braid shields.

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Tensolite super-flexible cables, featuring the patented tensulation process, solve many problems calling for limpness and long flex life. Phonograph pick-up cables, hearing aid cordage, and telephone tinsels are regularly being supplied.

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For laboratory and prototype requirements, the following convenient desk size wire kits are now available from stock: Teflon Kit, SRIR Kit, Sub-miniature "1482" Kit, Flexible Cable Assortment.

SPECIAL CONSTRUCTIONS

Tensolite's engineering and development facilities are also available for collaboration in the solution of many special cable problems. Simple or complex, Tensolite will welcome an opportunity to estimate on your requirements.

WRITE FOR OUR COMPLETE CATALOG

TENSOLITE INSULATED WIRE COMPANY · INC
TARRYTOWN · NEW YORK

8. Services and Raw Materials

75. Cable & Wire.

(Continued from page 481)

Mallory & Co., Inc., P.R., Ind., 30

Marco Industries Co., Calif., Flexible Conduits

Metal Textile Corp., 647 E. First Ave., Roselle, N.J., 55, 60
For details see ad on page 480
Tel: CHestnut 5-3000

Metals & Controls Corp., Mass., 30

Microdot, Div. Felts Corp., Calif., 10, 45, 50, Micro Miniature

Modelectric Prod. Corp., N.J., 35

National Electric Prods. Corp., Pa., 20, 40

National Tel-Tronics Corp., N.Y., Cable Assemblies

Neptune Electronic Co., N.Y., 35

Nesor Alloy Prods. Co., N.J., 5, 15, 30, 45, 60

Ney Co., J. M., 171 Elm St., Hartford 1, Conn., 30
For details see ad on page 377
Tel: Hartford 2-4271

North American Res. Labs., Inc., N.J., 30

Northern Electric Co., Ltd., Canada, 5, 10, 15, 20, 25, 40, 45, 50, 60

Parkside Wire Co., Ill., 5, 15, 25, 40, 45, 50, 60

Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y., 35
For details see ad on page 344
Tel: NE 6-3342

Phalo Plastics Corp., Mass., 10, 20, 35 45, 50

Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 10, 15, 20, 25, 40, 45, 50
For details see ad on page 484
Tel: WHitehall 4-3570

Plastic Wire & Cable Corp., Conn., 10, 45, 50

Plastoid Corp., N.Y., 10, 45, 50, 60

Powell Co., Harold H., Pa., 10

Precision Tube Co., Inc., Pa., 10, 45

Prodelin, Inc., 307 Bergen Ave., Kearny, N.J., 10
For details see ad on page 424
Tel: KEarny 2-8600

Radio Apparatus Corp., Ind., 35, Cable Assemblies

Radio Wire Mfg. Co., Ind., 20, 25, 50, 60

Rea Magnet Wire Co., Inc., Ind., 5, 15, 25

Rex Corp., Hayward Rd., West Acton, Mass., 10, 45, 50
For details see ad on page 482
Tel: Acton 3-7721

(Continued on page 484)

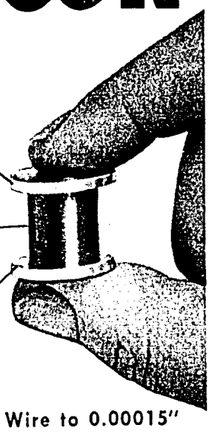
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precision small wire

bare •
insulated
plated ⊙

for highly engineered applications



all metals
all alloys

Round Wire to 0.00015" diameter. Ribbon rolled to 0.0001" in thickness. Close tolerances held on all specifications.

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WHite Plains 9-4757

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8. Services and Raw Materials

75. Cable & Wire.

(Continued from page 483)

Rhode Island Insulated Wire Co., Inc., R.I., 40, 45, 50

Rockbestos Prods. Corp., Conn., 10, 25

Rollins Corp., Dela., 35

Runzel Cord & Wire Co., Ill., 35, 45, 50, 60

Saxton Products, Inc., N.Y., 5, 10, 15

Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 25
For details see ad on page 484
Tel: White Plains 9-4757

Sequoia Process Corp., Calif., 10, 20, 45, 50, 60

Sheffco Mfg. Co., N.J., Pigtails & Leads

Slepian & Co., Arthur, Conn., 15, 50 Magnet & Litz

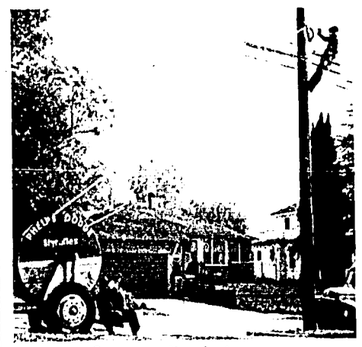
Stromberg-Carlson Co., N.Y., 40, 45, 50, 55, 60

Suburban Radio Co., N.J., 35

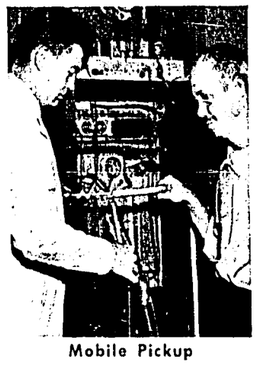
Suprenant Mfg. Co., 199 Washington St., Boston 8, Mass., 5, 10, 20, 45, 50, 60
For details see ad on page 485
Tel: Clinton 2180

Switchcraft, Inc., 1340 N. Halsted, Chicago 22, Ill., Cable Assemblies
For details see ad on page 247
Tel: MI 2-7136

Styroflex Coaxial Cable
has many applications
in the communication field!



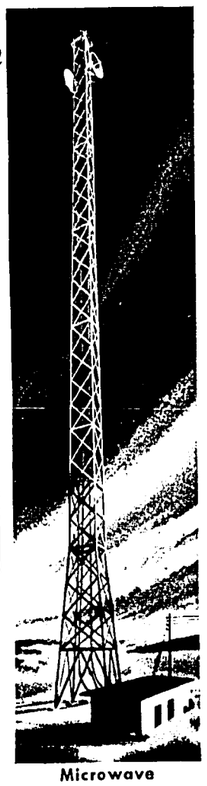
Community Antenna



Mobile Pickup



Television Broadcast



Microwave

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CORPORATION
General Offices: 40 WALL STREET, NEW YORK 5, N. Y.

8. Services and Raw Materials

75. Cable & Wire.

Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 20, 30, 35
For details see ad on pages 9-14
Tel: JUdson 6-2424

Telectron Co., Ohio, 35

Teletronic Labs., Inc., Calif., 35

Tensolite Insulated Wire Co., Inc., 198 Main St., Tarrytown, N.Y., 45, 50
For details see ad on page 483
Tel: TA 4-2300

Thomas Electronics, Inc., N.J., 10, 35, 40

Transradio, Ltd., England, 10, 20, 45, 50, 60

Tri-Dex Co., Calif., 35

Truscon Steel Div., Ohio, Expanded Copper Mesh

United Mfg. & Service Co., Wis., 35

United States Rubber Co., N.Y., 5, 10, 20, 40, 45, 50

U. S. Wire & Cable Corp., N.J., 10, 15, 45, 50, 60

Virginia Electronic Co., D.C., 35

Vokar Corp., Mich., 35

Warren Wire Co., Vt., 10, 15, 25, 45

Western Gold & Platinum Works, Calif., 30

Western Insulated Wire Co., Calif., 40, 45, 60

Wheeler Insulated Wire Co., Inc., Conn., 25, 35

Whitney Blake Co., Conn., 20, 40, 45, 50

Wright Eng. Co., Calif., 10

76. Ceramics.

5. Coil forms
10. Custom fabrication
15. Insulators
20. Proprietary forms

Advanced Vacuum Prod., Inc., Conn., 15

American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 5, 10, 15
For details see ad on page 136
Tel: Chattanooga 5-3411

American Molded Prods., Ill., 5

Associated Production Co., Ill., 5

Automatic Mfg. Corp., N.J., 5

Birnbach Radio Co., Inc., N.Y., 15

Blackstone Electric Co., Ill., 5

Brush Electronics Co., Ohio, 10

Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 5, 15
For details see ad on page 502
Tel: Trowbridge 6-2800

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in ENGINEERED Wire and Cable for the Electronic and Aircraft Industries

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a speedy small order service for development and prototype engineers—write for details.

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199 Washington St. Boston 8, Mass. Plant—Clinton, Mass.

76. Ceramics.

Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 5, 10, 15
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200

Cleveland Container Co., Ohio, 5

Collectron Corp., 216 E. 45 St., New York 17, N.Y., 5, Nylon
For details see ad on page 297
Tel: MU 2-8473

Continental-Diamond Fibre Co., 16 Chapel St., Newark 111, Del., 5, 15
For details see ad on pages 63-66
Tel: NEwark 531

Crowley & Co., Inc., Henry L., N.J., 5, 10, 15, 20

Electronic Mechanics, Inc., N.J., 5, 15, 20

Frenchtown Porcelain Co., N.J., 10, 15

Fretco, Inc., Pa., 15

General Ceramics Corp., Crows Mill Rd., Keasbey, N.J., 5, 10, 15, 20
For details see ad on pages 172, 186
Tel: Valley 6-5100

Glenco Corp., 212 Durham Ave., Metuchen, N.J., 10
For details see ad on page 284
Tel: Metuchen 6-2800

Insuline Corp. of America, N.H., 5, 15

Isolantite Mfg. Corp., N.J., 5, 10, 15, 20

Jan Hardware Mfg. Co., Inc., N.Y., 15

Johnson Co., E. F., Minn., 15

Kearfott Co., Inc., 1378 Main St., Clifton, N.J., 5, 10
For details see ad on page 414
Tel: Little Falls 4-1600

Kirchberger & Co., Inc., M., N.Y., 5, 10, 15, 20

Lapp Insulator Co., Inc., N.Y., 10, 15

Louthan Mfg. Co., The, Ohio, 10

Lurex Mfg. Co., N.J., 5, 10, 15, 20

Mansol Ceramics Co., N.J., 10, 15

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 15
For details see ad on page 548
Tel: Malden 4-4108

National Ceramic Co., 500 Southard St., Trenton 2, N.J., 5, 10, 15
For details see ad on page 486
Tel: Export 4-5373

National Co., Inc., Mass., 5, 15

National Moldite Co., 1410 Chestnut Ave., Hillside 5, N.J., 5
For details see ad on page 308
Tel: Waverly 6-2123

North Hills Electric Co., Inc., N.Y., 5

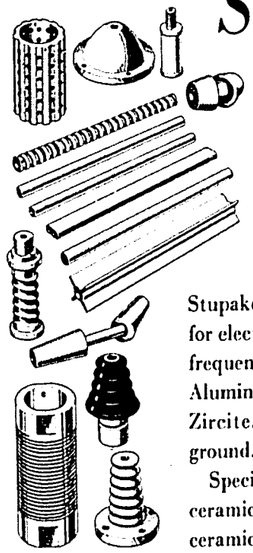
Onondaga Pottery Co., Electronic Div., 1858 W. Fayette St., Syracuse 1, N.Y., 20
For details see ad on page 284
Tel: SYracuse 8-1681

Porcelain Prods., Inc., Ohio, 10, 15

Premax Prods. Div., Chisholm-Ryder, N.Y., 15

Sanders Assoc., Inc., N.H., 10, 15, 20

(Continued on page 486)



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8. Services and Raw Materials

76. Ceramics.

(Continued from page 485)

Saxonburg Ceramics, Pa., 5, 10, 15, 20
Smith & Stone, Ltd., Canada, 10, 15, 20
Societe Francaise Radio Electrique, France, 5, 15
Solar Mfg. Corp., Calif., 5, 15
Sound Devices, Inc., N.Y., 5
Steward Mfg. Co., D. M., Tenn., 5, 10, 15
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 5, 10, 15, 20
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Superior Porcelain Co., W.Va., 15
Superior Steatite & Ceramic Corp., 85 W. Forest Ave., Englewood, N.J., 10, 15
For details see ad on page 521
Tel: EN 3-4555
Syncor Prods. Co., 26 Irving Court, P.O. Box 51, Malden 48, Mass., 5, 10
For details see ad on page 499
Tel: Malden 2-1364
Telex, Inc., Minn., 10, 20
Thomas & Sons Co., The, Ohio, 15
Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 5, 10, 15, 20
For details see ad on page 487
Tel: BL 2-4711
United Insulator Co., Ltd., England, 5, 10, 15, 20
U. S. Electronics Corp., N.J., 5
Vibro-Ceramics Corp., 212 Durham Ave., Metuchen, N.J., 10
For details see ad on page 451
Tel: Metuchen 6-2800
Western Gold & Platinum Works, Calif., 10, 15, 20
Wind Turbine Co., 238 E. Market St., West Chester, Pa., 15
For details see ad on page 256
Tel: West Chester 3110
Wisconsin Porcelain Co., Wis., 5, 10, 15, 20

77. Consulting Engineers.

5. Acoustical
10. Electrical
15. Mechanical
20. Radio

A-1 Recording Corp., Calif., 10, Sound Recording
A. R. & T. Electronics, Inc., Ark., 20
Acme Telectronix Div., NEA Service, Ohio, 10, 15, 20
Adair Eng. Co., George P., D.C., 5, 10, 20
Aero Electronics Co., Ill., 10, 15
Air Associates, Inc., N.J., 20
Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 10, 15
For details see ad on page 429
Tel: Linden, 3-1000
Alcar Instruments, Inc., N.J., 10, 15
Alford, Andrew, Mass., 20

8. Services and Raw Materials

77. Consulting Engineers.

All-Tronics, Inc., N.Y., 20, Noise Suppression
American Electronic Labs., Inc., Pa., 20
American Hydromath Corp., N.Y., 15
American Radio & Television, Inc., Ark., 20
Arenberg Ultrasonic Lab., Mass., 5, Ultrasonic

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ALBERT R. KALL, Consultant
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Philadelphia 20, Pa.

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For details see ad on page 487
Tel: LIvingston 8-1545
Associated Electronics Co., N.Y., 10, 15, 20
Associated Eng. Corp. of Boston, Mass., 10
Associated Production Co., Ill., 15
Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, L.I., N.Y., 10
For details see ad on pages 203, 293
Tel: Port Washington 7-3703
Atlas Eng. Co., Inc., Mass., 10
Audio Consultants, N.Y., 20
Audio Corp. of America, N.J., 10, 15
Audio Instrument Co., Inc., N.Y., 10
Austin Co., N.Y., 10, 15
Auto-Test, Inc., Ill., 10
Automatic Production Research, 10 Choate Ave., Pleasantville, N.Y., 10, 15, 20
For details see ad on page 522
Tel: Pleasantville 2-3587
Babillus, John, Iowa, 10, 15, 20
Baruch Labs., N.Y., 20
Berkshire Labs., Mass., 10
Bernstein, Robert, N.Y., 10, 20, Electronics
Bibbero, Robert J., N.Y., 10, 15, 20
Biophysical Instruments, Inc., Pa., Medical Application
Bolt, Beranek, & Newman, Inc., Mass., 5
Brick Electronic Co., N.J., 10, 15, 20
Brooks & Perkins, Inc., Mich., 15
Brown, W. J., Conn., 10, 20
Brownell, H. Russell, N.Y., 10
Brownthorn Electronics, Inc., N.Y., 10, 20
Brunswick Instruments, N.J., 10
Budelman Radio Corp., Conn., 20
Burnett Radio Lab., William W. L., Calif., 10, 20
C.G.S. Labs., Inc., Conn., 10, 20
Canadian General Electric Co., Electronic Equip., Canada, 20
Capitol Radio Eng. Institute, D.C., 10, 20
Cargo Packers, Inc., N.Y., Packagings
Central Research Labs., Inc., Minn., 10
Charp, S., Pa., 10, 20
Chicago Electronic Eng. Co., Ill., 10
Clegg Labs., Inc., N.J., 10
Cleveland Electronics, Inc., Ohio, 5
Codetyper Labs., N.Y., 20
Cole Instrument Co., Calif., 10, 20
Coles Electronic Corp., Pa., 15
Computing Devices of Canada, Ltd., Canada, 5, 10, 15
Content, Ed. J., Morocco, 20
Continental Electronics, Ltd., N.Y., 5, 10, 20
Continental Radio & Electrical Eng., S. Africa, 10, 20
Cook Electric Co., Ill., 10, 15
Corbin Corp., Md., 10, 15, 20
Corona Eng. Service, N.Y., 10, 15, 20
Craig Corp., Mass., 10, 20
Craven, Lohnes, & Culver, D.C., 20, Television
Crosby Enterprises, Inc., Bing, Calif., 10, 20
Cullum Jr., A. Earl., Texas, 20
Cumeralto, Quinten G., Mich., 20
Dade Brothers, Inc., Eng. & Mfg. Div., N.Y., 15, 20
Davis, George C., D.C., 20, Television

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Deen Associates, Inc., 2 John St., New York 38, N.Y., 10, 15, 20
For details see ad on page 487
Tel: RE 2-1464
Designers for Industry, Inc., Ohio, 10, 15, 20
Deutschmann Corp., Tobe, Mass., 10, 20
Devenco, Inc., N.Y., 10, 20
Devol Research Co., Conn., 10, 15
Dyna-Labs., Inc., N.Y., 5, 10
Edgerton, Germeshausen, & Grier, Mass., 10, 20
Ehrlich, Charles N., N.Y., 10, 15
Egan Lab., N.Y., 10, 15, 20
Eichwald & Co., Inc., B., N.Y., 10, 20
Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 20
For details see ad on pages 90-91
Tel: JUno 8-1212
El Mec Labs., Inc., N.J., 10, 15

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For details see ad on page 487
Tel: Pioneer 6-0383
Electromec, Inc., Calif., 10, 15
(Continued on page 488)



8. Services and Raw Materials

77. Consulting Engineers.

(Continued from page 487)

Electro-Metric Instrument Co., 241 Centre St., New York 13, N.Y.
For details see ad on page 523
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GLadstone 5-5353

Electro-Search, 4337 N. 5 St., Philadelphia 40, Pa., 20
For details see ad on page 488
Tel: GL 5-5353
Electronic Research Associates, Inc., P.O. Box 29, Caldwell, N.J., 20
For details see ad on page 369
Tel: Caldwell 6-6729
Electronics Research, Inc., Ind., 10, 20
Electronics Research, N.J., 10, 15, 20
Elm Labs., N.Y., 10, 15, 20
Emerson & Cuming, Inc., Mass., 15
Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, L.I., N.Y., 20
For details see ad on page 459
Tel: BA 4-8500
Empire State Labs., Inc., N.Y., 10
Engineering Development, Neb., 5, 10, 15, 20
Equipment and Service Co., Tex., 10, 20
Erco Radio Labs., Inc., N.Y., 20
Erdco Eng. Corp., Ill., 10, 15
Erf Acoustical Co., H. A., Ohio, 5
Erwood, Inc., Ill., 10, 15, 20
FSD Labs., Conn., 10, 20
Feiler Eng. & Mfg. Co., Ill., 20
Ferranti Electric, Ltd., Res. Dept., Canada, 5, 10, 15, 20
Ferrara, Inc., Mich., 10
Fidelity Instrument Corp., Pa., 10, 15
Fisher Engineering, Inc., P.O. Box 327, Huntington, Ind., 10
For details see ad on page 385
Fisher Radio Corp., N.Y., 5
Fog-O-Scope, Inc., Ill., 10, 15
Forbes, Wagner, Inc., N.Y., 10, 15
Foss, Inc., William L., D.C., 20
Frederick Research Corp., P.O. Box 5853, Bethesda 14, Md., 5, 10, 15, 20
For details see ad on page 523
Tel: OL 4-3229
Frommer, Joseph C., Ohio, 10, 20
Fusion Engineering, Ohio, 15
Gabriel Electronics Div., The Gabriel Co., Endicott St., Norwood, Mass., 20
For details see ad on page 422
Tel: Norwood 7-3300
Gallay, Harris, N.J., 20
Gamma Labs., N.Y., 10, 15, 20
Gately Dev. Lab., N.J., 5, 10
Gautney, George E., D.C., 20
General Cybernetics Assoc., Inc., Calif., 10, 15
General Devices, Inc., P.O. Box 253, Princeton, N.J., 10, 20
For details see ad on page 376
Tel: Princeton 1-5010
General Electrosonics, Inc., N.Y., 20
Gillett & Assoc., Glenn D., D.C., 10, 20

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Gordon, Herman Q., D.C., 20
Graner, Inc., L. P., N.Y., 10, 20
Grason-Stadler Co., Mass., 5
Greibach Res. & Dev. Labs., N.Y., 5, 10, 15, 20
Grimwood & Co., Inc., Fred O., Mo., 20, Television
Gulton Mfg. Corp., 212 Durham Ave., Metuchen, N.J., 5, 10
For details see ad on page 177
Tel: Metuchen 6-2800
Hanson-Gorrill-Brian, Inc., N.Y., 10, 15
Harman-Kardon, Inc., N.Y., 5
Harries, Owen, Bermuda, 5, 10, 20
Hastings Instrument Co., Va., 10, 20
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Hollander, Gerhard Ludwig, Mass., 10
Hutcheson, Guy C., Texas, 20
Impedance, Inc., 9 Alan Court, Farmingdale, L.I., N.Y., 20
For details see ad on page 431
Tel: FArmingdale 2-3606
Indianapolis Electronic School, Ind., 10, 20
Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 10, 15
For details see ad on page 371
Tel: ORegon 7-1881
Industrial Resch. Labs., Md., 10, 15, 20
Industrial Tubes, Inc., Ill., 10
International Testing Service, Mich., 10, 15, 20
Jarvis Electronic Corp., Ill., 10, 15, 20
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For details see ad on page 488
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Kahn & Co., Inc., Conn., 10
Kahn Res. Labs., N.Y., 20
Kallman, Heinz E., N.Y., Electronics
Kean, Walter F., Ill., 20
Keim, Llewellyn Bates, N.Y., 10, 20
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Kinn, Theodore P., 7007 Lancaster Rd., Baltimore 7, Md., 10, 20, Industrial
For details see ad on page 488
Tel: WIlkens 5-2996
Kollmorgen Optical Corp., Mass., 10, 15
Korb Eng. & Mfg. Co., Mich., 10
Kramer, Ambrose W., D.C., 10, 20
Lear, Inc., Calif., 20
Lehigh Valley Electronic Eng. & Mfg. Co., Pa., 10, 20
Leonard Electric Prods. Co., Inc., N.Y., 20
Little, Inc., Arthur D., Mass., 5, 10, 15
Lubcke Consulting TV Engineer H. R., Calif., 5, 10, 20
Lurex Mfg. Co., N.J., Glass Consulting Engineers
Lynmar Engineers, Inc., Pa., 10, 20
Mackenzie Prods. Co., The, Conn., 10, 15, 20, UHF-Microwave
Mackinnon Consulting Radio Eng., Canada, 20
Magnetic Amplifiers, Inc., N.Y., 10
Magnex Corp., N.Y., 5, 10, 15, 20
Marine Electric Corp., N.Y., 10, 20
Marsh-Theiss, Inc., N.Y., 10, 15, 20, Optical
Maxson Corp., W. L., N.Y., 10, 15

8. Services and Raw Materials

77. Consulting Engineers.

McKenna Labs., Calif., 10, 20
McMillan Lab., Inc., Mass., 10, 20
McNary, James C., D.C., 20
McNeal, J. D., Conn., 10
Measurements Corp., Intervale Rd., Boonton, N.J., 10, 15, 20
For details see ad on pages 470, 524
Tel: Boonton 8-2131
Medical-Electronic Dev. Co., N.Y., 10
Medico-Physical Labs., Canada, 10
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif.. Microwave
For details see ad on page 432
Tel: Raymond 3-1508
Mesa Plastics Co., Calif., Plastic
Metal Prods. Co., Tenn., 20
Meyers, James G., N.Y., 5, 20
Micronics, Inc., 1603 W. 135 St., Gardena, Calif., 10, 20
For details see ad on page 202
Tel: Plymouth 4-2881
Microwave Consultants, N.Y., 5
Microwave Services, Inc., N.Y., 5, 10, 15, 20
Millivac Instrument Corp., N.Y., 10
Morecroft, Design Engineer, John H., Calif., 5, 10, 15, 20
Multi-Tron Lab., Ill., 20
Murray, Albert F., D.C., 20, Television
Naber Aviation Electronic Service, J. S., Ill., 10, Electronics
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 20
For details see ad on page 461
Tel: PIoneer 6-4560
National Electronic Labs., Inc., D.C., 20
National Radio Res. Labs., N.Y., 15, 20
Naybor Labs., E. V., N.Y., 10, 15
Newton, Arnold, N.Y., 10, 20
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For details see ad on page 489
Tel: Concord 827
Parsons Co., Ralph M., Calif., 10, 15, 20
Peay & Assoc., L. W., Texas, 20
Penn, William Donaldson, Texas, 5, 20
Phebco, Inc., Md., 20

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Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 10, 20
For details see ad on pages 463, 489
Tel: NEedham 3-3345
Pierce, F. W., Ill., 20
Pioneer Electric & Res. Corp., Ill., 10, 20
Potter Co., The, Ill., 20
Product Dev. Corp., Mass., 20
Publication Engineering Consultants, Affiliate Roger M. Stern Co., 93 Nassau St., New York 38, N.Y., 10, 15, 20
For details see ad on page 223
Tel: Worth 2-6835
Pulse Techniques, Inc., N.J., 20
Q Circuits Co., Calif., 10, 15, 20
RCA Victor Co., Ltd., Canada, 20
REF Mfg. Corp., N.Y., 15
R. M. S. Assoc., Inc., N.Y., 10, 15, 20
Racker Co., Joseph, N.Y, 20
Radiaphone Co., Calif., 10, 15
Radio Eng. Co., N.Y., 5, 10, 15, 20
Radio Eng. & Maintenance Corp., Ky., 20
Radio Eng. Products, Ltd., Canada, 20
Radio Instrument Labs., N.J., 20
Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 20
For details see ad on page 525
Tel: Oregon 5-0085
Rapid Electric Co., N.Y., 10
Razdow, Dr. Adolph, N.Y., 10, 15
Reevesound Co., Inc., N.Y., Sound Recording
Remington Rand, Inc., Engineering Res. Assoc., Minn., 10, 15
Rese Eng., Inc., Pa., 10, 20
Research Electronics, Pa., 10, 15
Research Instrument Co., Inc., N.Y., 10, 15
Rich Electronics, Inc., Fla., 10, 15, 20
Rich-Roth Labs., Conn., 5, 10, 20
Ring & Assoc., A. D., D.C., 20
Robinette Co., W. C., Calif., 10, 15
Robinson Aviation, Inc., Airborne Div., Dept. IRE 8, Teterboro Air Terminal, Teterboro, N.J., 15, Vibration Control
For details see ad on page 218
Tel: HA 8-2500
Rolab Photo-Science Labs. & Studios, Conn., 10, 15
Ronar, Inc., Ill., 10
Rosenberg Associates, Paul, 100 Stevens Ave., Mt. Vernon, N.Y., Physicist
For details see ad on page 489
Tel: Mount Vernon 7-8040

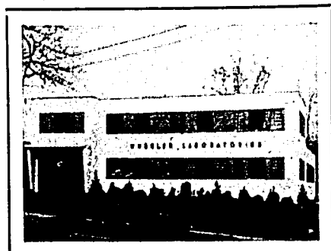
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Saville RaTeleNics Labs., Ky., 20
Scientific Instrument Labs., N.Y., 20
Sears Co., M. J., N.Y., 5
Sepmeyer, L. W., Calif., 5
Shepard Labs., N.J., 10
Sherwood Co., Robert H., N.Y., 5, 10, 15, 20
Sierra Electronics Corp., Calif., 20
Sivers Lab., Sweden, 20
Smeby, Lynne C., D.C., 20, FCC & Top-loading Antennas
Smith-Meeker Eng. Co., N.Y., 10, 20
Southwest Prods., Inc., Texas, 10, 15, 20
Square Root Mfg. Corp., N.Y., 10, 15
Standard Electronic Res. Corp., N.Y., 10, 20
Star Fuse Co., Inc., N.Y.
Statistical Instrument Co., N.Y., 10
Stern Co., Roger M., 93 Nassau St., New York 38, N.Y., 10, 15, 20
For details see ad on page 223
Tel: Worth 2-6835
Stibitz, George R., Vt., 10, 20
Stockman Electronic Res. Co., Mass., 5, 20
Strain Eng. Service, Ga., 20
Stromberg-Carlson Co., N.Y., 5, 10, 15, 20
Suffolk Prods. Corp., N.Y., 15
Summit Electronics, Inc., N.J., 5, 20
Superex Electronics Corp., N.Y., 10, 20
Swan Television Co., Ltd., Ernie, Canada, 20
Szekely & Assoc., Inc., O. E., Pa., 15
T. L. G. Electric Corp., N.Y., 10
Taller & Cooper, N.Y., 10, 15
Taylor, Archer S., Mont., 20
Technical Advisory Assoc., N.Y., 10, 15, 20
Technical Material Corp., N.Y., 20
Technisonic Studios, Mo., 5
Tecon, Inc., N.Y., 10, 15, 20
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., Television
For details see ad on page 224
Tel: AMityville 4-4446
Telex, Inc., Minn., 5

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(Continued on page 490)



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8. Services and Raw Materials

77. Consulting Engineers.

(Continued from page 489)

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Thompson, Harris A., Colo., 10, 20
Toth, Albert F., N.Y., 10
Trans Electro Prods. Corp., Pa., 10, 20
Transformer Technicians, Inc., Ill., 10
Transvision, Inc., N.Y., 20
Uglow, Consulting Engr., Kenneth M., D.C., 20
Ultradyne Eng. Labs., Inc., N.M., 10
United States Testing Co., Inc., N.J., 5, 10, 15, 20
Vanby Corp., N.Y., 5, 10, 15, 20
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 15
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Vibro-Ceramics Corp., 212 Durham Ave., Metuchen, N.J., 5, 10, 15
For details see ad on page 451
Tel: Metuchen 6-2800
Virginia Electronics Co., D.C., 20
Vocaline Co. of America, Inc., Conn., 5, 10, 15, 20
Waler Electric Co., N.Y., 20
Walker, Consulting Engr., J. R., Mich., 20
Wallind-Pierce Corp., Calif., 10, 20
Wallson Assoc., N.J., 10
Walsh Eng. Co., N.J., 5, 10, 15, 20
Washington Technological Assoc., Inc., D.C., 10, 15, 20
Waveguide, Inc., Calif., 10, 15
Weathers Industries, Inc., N.J., 5, 10
Western Coil Prods. Co., Inc., Calif., 20
Western Gear Works, Mission Western Div., Box 182, Lynwood, Calif., 10, 15
For details see ad on page 74
Tel: Nevada 6-2161
West Labs., Inc., Calif., 20
Wheeler Laboratories, Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 20
For details see ad on page 490
Tel: Hunter 2-7876
Williams, Consulting Engr., E. M., Pa., 10, 20
Winter, Engineer, T. Starling, N.J., 10
Workshop for Electronics, Okla., 10
Wunderlich Radio Co., N.Y., 20

78. Core Materials.

5. Laminations **10. Metallic powders**

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Allegheny Ludlum Steel Corp., Pa., 5
Chrysler Corp., Amplex Div., Mich., 10
Continental Radio & Electrical Eng., S. Africa, 5
Du Pont de Nemours & Co., Inc., E. I., Del., 5
Enthoven Solders, Ltd., England, 10
General Aniline & Film Corp., Antara Chem. Div., Dept. 89, 435 Hudson St., New York 14, N.Y., 10
For details see ad on page 182
Tel: Watkins 4-0600

8. Services and Raw Materials

78. Core Materials.

Gries Reproducer Corp., N.Y., Thermoplastic Moldings
Handy & Harman, N.Y., 10
I-T-E Circuit Breaker Co., Pa., Ribbon
Irvington Varnish & Insulator Co., N.J., 5
Mackay, Inc., A. D., N.Y., 10
Magnetics, Inc., Dept. I-11, Box 230, Butler, Pa., 5
For details see ad on page 306
Tel: Butler 7-1745
Magnetic Core Corp., N.Y., 10
Magnetic Metals Co., N.J., 5
Mullard, Ltd., England, 5
National Moldite Co., 1410 Chestnut Ave., Hillside 5, N.J., 10
For details see ad on page 308
Tel: Waverly 6-2123
National Radiator Co., Plastic Div., Pa., 10
Permoflux Corp., Ill., 5
Plastic Metals Div., Natl. Radiator Co., Pa., 10
Polydoroff & Assoc., W. J., D.C., 10
Repath Co., Paul R., Calif., 5
Research Instrument Co., Inc., N.Y., 5
Saratoga Industries, N.Y., 5
Telex, Inc., Minn., 5
Tempel Mfg. Co., 1939 Bryn Mawr Ave., Chicago 26, Ill., 5
For details see ad on page 490
Tel: Ardmor 1-8100
Thomas & Skinner Steel Prods. Co., Inc., 1125 E. 23 St., Indianapolis 5, Ind., 5
For details see ad on page 325
Tel: WAbash 2448
Universal Aviation Equip., Inc., 362 Fifth Ave., New York 1, N.Y., 5
For details see ad on page 516
Tel: Wisconsin 7-3574
Westinghouse Electric Corp., Pa., 5
Williams & Co., C. K., Pa., 10
Yale & Towne Mfg. Co., Powdered Metal Prod. Div., 9333 W. Belmont Ave., Franklin Park, Ill., 10
For details see ad on page 309
Tel: Esterbrook 8-1933

79. Fabricators & Services.

5. Contract fabrication & assembly
10. Electro-plating
15. Embedment
20. Hardening & heat-treating
25. Hermetic sealing service
30. Metal stamping & spinning
35. Packaging
40. Plastic fabricators
45. Plastic moulders

A. R. & T. Electronics, Inc., Ark., 5
Abalon Precision Mfg. Corp., N.Y., 5, 30
Accurate Electronics Corp., Ohio, 5, 30, 40, 45
Acme Telectronix, Div. NEA Service, Ohio, 5



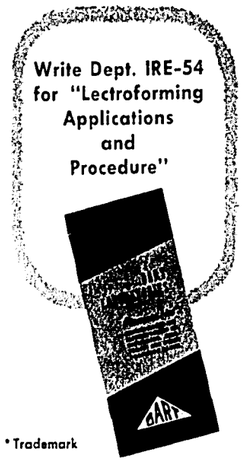
79. Fabricators & Services.

Acromark Co., N.J., 5, 20, 30
Advanced Electronics, Inc., Conn., 5
Advanced Vacuum Products, Inc., Conn., 25
Aero Electronics Co., Ill., 5
Aerolite Electronics, 507 26 St., Union City, N.J., 5, 30, 45
For details see ad on page 500
Tel: UNion 3-2955
Aeronautical Electric Co., 5656 Northwest Hwy., Chicago 30, Ill., 40
For details see ad on page 339
Tel: SPring 7-1616
Aeronautical Radio Mfg. Co., N.Y., 5
Air Associates, Inc., N.J., 5
Airborne Instruments Lab., N.Y., 5
Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 10, 15, 25, 45
For details see ad on page 491
Tel: Hemlock 6-2230
Airpax Products Co., Md., 5
Alden Products Co., 113 No. Main St., Brockton 64, Mass., 5, 10, 30, 35, 40, 45
For details see ad on page 296
Tel: Brockton 160
Alden Systems Co., 11 Alden Research Center, Westboro, Mass., 5
For details see ad on page 296
Tel: Westboro 377
Allard Instrument Corp., N.Y., 5
Allegheny Ludlum Steel Corp., Pa., 30
Allen-Stevens, N.Y., Die Castings
Allied Research & Eng., Inc., Calif., 10
Alloy Metal Smiths, Inc., N.J., 5
American Aluminum Co., 378 Jelliff Ave., Newark 8, N.J., 5, 30
For details see ad on page 492
Tel: BI 3-3018
American Brass Co., Conn., 30
American Electronic Labs., Inc., Pa., 5, 35
American Encaustic Tiling Co., Inc., Pa., 5
American Gas Furnace Co., N.J., 20
American Insulator Corp., Pa., 45
American Machine & Foundry Co., N.Y., 5
American Mica Insulation Co., N.J., 5, 40
American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 45
For details see ad on page 130
Tel: Bishop 2-1000
American Radio Hardware Co., N.Y., 5
Amertronic, Inc., D.C., 5
Anchor Specialty Mfg. Co., N.J., 5, 40
Anderson Assoc., H. V., 239 Park Ave., Berkeley Heights, N.J., 25
For details see ad on page 492
Tel: Summit 6-1840
Anetsberger Brothers, Inc., Ill., 5
Apahouser Corp., Mass., 5, 40, Marking
Arma Corp., Roosevelt Field, Garden City, L.I., N.Y., 5
For details see ad on page 407
Tel: Pioneer 2-2000
Art Wire & Stamping Co., 3-B Boyden Pl., Newark 2, N.J., 30
For details see ad on page 547
Tel: HU 2-7492

(Continued on page 492)

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8. Services and Raw Materials

79. Fabricators & Services.

(Continued from page 491)

Artisan Metal Works Co., Ohio, 5
Auburn Button Works, Inc., N.Y., 45
Audio Corp. of America, N.J., 5
Augat Bros., Inc., Mass., 5, 30
Austin Co., N.Y., 5
Authorized Manufacturers Service, N.Y., 5
Automatic Mfg. Corp., N.J., 5, 45
Auto-Test, Inc., Ill., 5
Baer Co., N. S., N.J., 5, 40
Bardwell & McAlister, Inc., Calif., 5, 30
Bart Laboratories Co., Inc., Dept. IRE-54, 227 Main St., Belleville 9, N.J., 10
For details see ad on page 492
Tel: PLymouth 9-0200
Bennett Mfg. Co., 38 Railroad St., Alden, N.Y., 5, 10, 30
For details see ad on page 278
Tel: Alden 3711
Berkshire Labs., Mass., 5, 15
Blackstone Electric Co., Ill., 5
Boehme, Inc., H. O., N.Y., 5
Bogen Co., Inc., David, N.Y., 5
Bone Engineering Corp., Calif., 5, 10
Boyle Metalcraft Corp., 150 Sullivan St., Brooklyn 31, N.Y., 30
For details see ad on page 273
Tel: TR 5-3603

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8. Services and Raw Materials

79. Fabricators & Services.

Brilhart Plastics Corp., P.O. Box 31, Old Country Rd., Mineola, L.I., N.Y., 45
For details see ad on page 539
Tel: Pioneer 6-0425
Bristol Engineering Corp., Pa., 5
Brofman Machine Corp., N.Y., 5
Brooks & Perkins, Inc., Mich., 5, 10, 30
Brubaker Mfg. Co., Inc., Calif., 5
Brush Electronics Co., Ohio, 5
Buck Engineering Co., Inc., N.J., 5
Buckbee-Mears Co., Minn., Electro Forming
Buggie, Inc., H. H., 726 Stanton St., Toledo 4, Ohio, 45
For details see ad on page 298
Tel: Adams 8216
Bunnell & Co., J. H., N.Y., 5
Cadre Industries Corp., N.Y., 5
Cambridge Thermionic Corp., 440 Concord Ave., Cambridge 38, Mass., 40
For details see ad on page 502
Tel: Trowbridge 6-2800
Cannon Electric Co., Calif., 25
Canoga Corp., Calif., 5
Cardwell Mfg. Corp., Allen D., Conn., 5
Cargo Packers, Inc., N.Y., 35, Contract Packing
Cast Optics Corp., Conn., 40
Central Rediffusion Services, Ltd., England, 40
Churchill Lighting Corp., Mass., 5, 30
Citation Products Co., 233 E. 146 St., New York 51, N.Y., 30, 40
For details see ad on page 504
Tel: MO 5-0740
Clark Cable Corp., 3184-88 W. 32 St., Cleveland 9, Ohio, 5, 35
For details see ad on page 481
Tel: MElrose 1-8080
Codetyper Laboratories, N.Y., 15
Cohan-Epner, Inc., Dept. IR, 142 W. 14 St., New York 11, N.Y., 10
For details see ad on page 493
Tel: Chelsea 3-3411
Cole Instrument Co., Calif., 5, 20
Coles Electronic Corp., Pa., 5
Collectron Corp., 216 E. 45 St., New York 17, N.Y., 5, 15, 40, 45
For details see ad on page 297
Tel: MU 2-8473
Color Television, Inc., Calif., 5
Commercial Plastics Co., Dept. R, 2812 W. North Ave., Chicago 47, Ill., 40, 45
For details see ad on page 504
Tel: Belmont 5-1030
Commercial Radio-Sound Corp., N.Y., 5
Communication Accessories Co., 110 St. & Hillcrest Rd., Hickman Mills, Mo., 15
For details see ad on pages 80-81
Tel: South 5528
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 5
For details see ad on page 152
Tel: PL 4-5502
Components Corp., N.J., 30
Conrad & Moser, N.Y., 5
Consolidated Molded Prods. Corp., Pa., 45
Constantin & Co., Inc., L. L., Route 46, Lodi, N.J., 25
For details see ad on page 67
Tel: Prescott 7-0223
Continental-Diamond Fibre Co., 16 Chapel St., Newark 111, Del., 40, 45
For details see ad on pages 63-66
Tel: NEwark 531
Contracters Production Corp., N.Y., 35
Control Engineering Corp., Mass., 5
Cook Electric Co., Ill., 20
Corbin Corp., Md., 5
Cortland Industries, Inc., Ill., 40
Crane Packing Co., Ill., 40, 45
Crescent Industries, Inc., Ill., 30
Crest Laboratories, Inc., N.Y., 25
Crown Engineering & Sales Co., N.J., 5, 10, 20, 30, 40, 45
Crystal Research Prods., N.J., 5
Cubic Corp., Calif., 5
Dale Products, Inc., 1318 28 Ave., Columbus, Neb., 5, 15
For details see ad on pages 118-119
Tel: Columbus 2139
Daven Co., N.J., 5
Davies Molding Co., Harry, Ill., 45
Daystrom Electric Corp., N.Y., 5, 10, 20
Daystrom Instrument., Pa., 5, 10, 20, 35
Demco Products, Pa., 5, 15, 35, 40, 45
Denrad Mfg. Co., Inc., Texas, 5
Designers for Industry, Inc., Ohio, 5
Digital Products, Inc., Calif., 5
Dolin Metal Prods., Inc., N.Y., 30
Eastern Specialty Co., Pa., 5
Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 10, 30, 40, 45
For details see ad on page 370
Tel: Davenport 4-7000
Eder Engineering Co., Wis., 5
Eichwald & Co., Inc., B., N.Y., 5
El Mec Labs., Inc., N.J., 5
El-Rad Mfg. Co., Ill., 5
Electralab, Inc., 76 Atherton St., Boston 30, Mass., 5, 15, 40
For details see ad on page 348
Tel: JA 4-3230
Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill., 5, 15
For details see ad on page 383
Tel: BI 8-4596
Electrical & Physical Instr. Corp., N.Y., 5
Electri-Wire Assemblies Co., Wis., 5
Electrochemical Industries, Inc., Mass., 10
Electro Craft Industries, Inc., Conn., 5, 25
Electro Eng. & Mfg. Co., Mich., 5
Electro-Physics Co., N.Y., 5

(Continued on page 495)

For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

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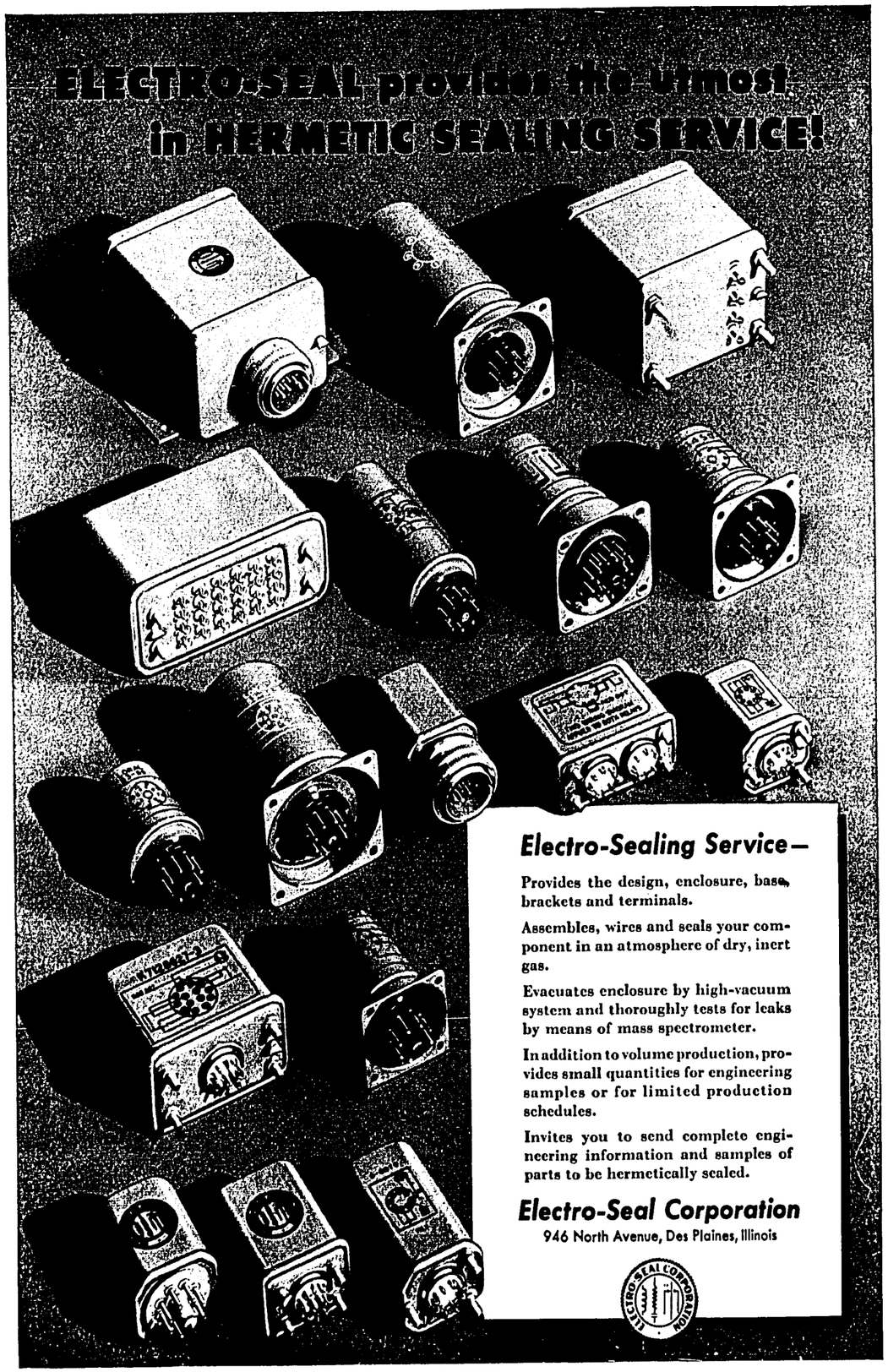
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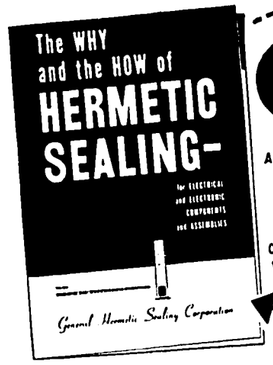


8. Services and Raw Materials

79. Fabricators & Services.

(Continued from page 493)

Electro-Seal Corp., 946 North Ave., Des Plaines, Ill., 25
For details see ad on page 494
Tel: Rodney 3-0047
Electronic Engr. Co. of California, Calif., 5
Electronic Mechanics, Inc., N.J., 40, 45
Electronic Service Corp., 221 Lake St., Oak Park, Ill., 25
For details see ad on page 495
Tel: Village 8-4500
Electronic Specialty Co., Calif., 5
Elm Laboratories, N.Y., 5
Emerson & Cuming, Inc., Mass., 15, 35, 40, 45



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Emerson Plastics Corp., N.Y., 5, 40
Empire State Laboratories, Inc., N.Y., 5
Engineered Instruments, Calif., 5, 30
Engineering Co., The, 27 Wright St., Newark 5, N.J., 5, 10, 30
For details see ad on page 549
Tel: BI 3-0800
Engineering Development, Neb., 10, Electro Forming
Engineering & Research Corp., Md., 5, 10, 20, 30, 35
Erco Radio Labs., Inc., N.Y., 5
Erdco Engineering Corp., Ill., 5, 30
Erie Resistor Corp., 644 W. 12 St., Erie, Pa., 5, 30, 45
For details see ad on pages 82-83
Tel: Erie 2-1481
Erwood, Inc., Ill., 5
Falls Metal Works, Ltd., 414 Main St., Little Falls, N.J., 5
For details see ad on page 279
Tel: LI 4-1300
Falstrom Co., N.J., 5
Federal Telephone & Radio Co., Div. of I. T. & T., 100 Kingsland Rd., Clifton, N.J., 15
For details see ad on pages 32-37
Tel: Nutley 2-3600
Federal Tool & Mfg. Co., Minn., 30
Feiler Engineering & Mfg. Co., Ill., 5
Felt Products Mfg. Co., Ill., 30
Ferranti Electric, Inc., N.Y., 25
Ferranti Electric, Ltd., Canada, 5
Ferro Co. Corp., N.Y., 5, 30
Fidelity Amplifier Co., Ill., 5
Flamboro Instrument Co., Canada, 5
Fisher-Smith, N.J., 5
Flexrock Co., Pa., 40
Fog-O-Scope, Inc., Ill., 5
Forbes Wagner, Inc., N.Y., 5
Ford Instrument Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 5
For details see ad on page 415
Tel: ST 4-9000
Franklin Electronics, Inc., Pa., 5, 35
Fryling Mfg. Co., Pa., 30
Fusion Engineering, Ohio, 25
Gabriel Electronics Div., The Gabriel Co., Endicott St., Norwood, Mass., 5
For details see ad on page 422
Tel: Norwood 7-3300
Galbraith & Son Electric Corp., C. C., N.Y., 5
Garde Mfg. Co., 588 Eddy St., Providence 3, R.I., 45
For details see ad on page 506
Tel: Union 1-0604
Garlock Packing Co., N.Y., 40, 45
General Electric Co., Chemical Div., Mass., 45
General Electric Co., Precision Parts Plant, N.J., 5, 30
General Electrosonics, Inc., N.Y., 5
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 25
For details see ad on page 495
Tel: Valley Stream 5-6363
General Laminated Prods., Co., Inc., Ill., 5, 10, 40

(Continued on page 496)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

8. Services and Raw Materials

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General Plastics Corp., N.J., 40
General RF Fittings Co., Inc., Mass., 5
General Tire & Rubber Indust., Prods. Div., Ind., 40
Gibson Electric Co., Pa., 30
Goldsmith Bros. Smelting & Ref. Co., Ill., 10, Salts
Gombos Co., Inc., John, N.J., 5
Goodyear Aircraft Corp., Ohio, 40
Gorham Mfg. Co., R.I., 5, 10, 20, 30
Gries Reproducer Corp., N.Y., Die Castings, Small Zinc Alloy
Gudeman Co. of Calif., Inc., 9200 Exposition Blvd., Los Angeles 34, Calif., 5, 15
For details see ad on pages 318, 385
Tel: Texas 0-7317
Hamlin, Inc., Ill., 5, 25
Harmon Electronics Co., Mo., 5
Heldor Mfg. Corp., 238 Lewis St., Paterson, N.J., 5, 25
For details see ad on page 508
Tel: MUlberry 3-7953
Helko Products Co., Inc., N.Y., Engraving
Heller, Co., Gerald K., Md., 5
Henry & Miller Industries, N.Y., 5, 10, & Anodizing, 30
Hermaseal Co., Inc., Ind., 25
Hermetic Seal Products Co., 29 S. 6 St., Newark 7, N.J., 25
For details see ad on page 192
Tel: MArket 3-9400
Houghton Laboratories, Inc., N.Y., 15, 25, 40, 45
Hudson Tool & Die Co., 118 S. 14 St., Newark 7, N.J., 30
For details see ad on page 162
Tel: HUmboldt 2-8561
I-T-E Circuit Breaker Co., Pa., 5, 30
Illinois Tool Works, Shake Proof Div., Ill., 30, 45
Impedance, Inc., 9 Alan Ct., Farmingdale, L.I., N.Y., 5, 30
For details see ad on page 431
Tel: FArmingdale 2-3606
Induction Heating Corp., N.Y., 20, 45
Industrial Electronics of Canada, Ltd., Canada, 5
Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 5, 30, 40
For details see ad on page 371
Tel: ORegon 7-1881
Instrument Corp. of America, P.O. Box 219, Blacksburg, Va., 10
For details see ad on page 220
Tel: Blacksburg 8208
Instruments for Industries, N.Y., 5
Insulated Circuits, Inc., N.J., 15
Insuline Corp. of America, N.H., 5, 20, 30
International Resistance Co., Pa., 5
International Testing Service, Mich., 5, 15, 35, 40
Jaco Products, Ohio, 40, 45
Jacobs Instrument Co., Md., 5, 15, 25, 35
Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 30
For details see ad on pages 110-111
Tel: NE 2-2000
K. V. Transformer Corp., Conn., 30
Kahn & Co., Inc., Conn., 5
Kaiser Metal Prods. Co., Inc., Pa., 5, 30, 35
Karp Metal Prods. Co., N.Y., 5
Kaupp Co., C. B., N.J., 30
Kaywoff Prods. Co., Neb., 40, 45
Kennedy & Co., D. S., 432 Main St., Cohasset, Mass., 40, Reinf.
For details see ad on page 423
Tel: CO 4-0699
Kenwood Mfg. Co., N.J., 5, 40, Kel-F
Keystone Carbon Co., Pa., Powdered Metal Parts
Kilpatrick Electr. Lab., Pa., 5
Kirchberger & Co., Inc., M., N.Y., 40
Kirk & Blum Mfg. Co., Ohio, 5
Kling Metals Spinning Co., N.Y., 30
Koehler Mfg. Co., Mass., 5, 30
Kollmorgen Optical Corp., Mass., 5, 35
Kolton Elec. Mfg. Co., N.J., 5, 30
Korb Eng. & Mfg. Co., Mich., 5, 10, 30
Kriser Corp., N.Y., 5, 40
Kurz-Kasch, Inc., Ohio, 45
Kuss Mach. Tool & Die Co., Inc., Pa., 5, 30
Lafayette Labs., Inc., N.Y., 5
Lako Co., Wis., 5
La Moree, C. D., Calif., 40
Langevin Mfg. Corp., 37 W. 65 St., New York 23, N.Y., 25
For details see ad on pages 116-117
Tel: Endicott 2-7200
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 5
For details see ad on page 312
Tel: MAtawan 1-2600
Lawn Electronics Co., N.J., 5
Leonard Elec. Prods. Co., Inc., N.Y., 5
Lewis Co., E. B., 11 Bragg St., East Hartford 8, Conn., 10, 40
For details see ad on page 311
Tel: JA 8-0830
Lewyt Corp., N.Y., 5, 30
Little, Inc., Arthur D., Mass., 5
Livingston Elec. Corp., N.J., 5, 25
Lowell Mfg. Co., Mo., 30
Lurex Mfg. Co., N.J., 25
Lyman Electr. Corp., Mass., 5
Lysco Mfg. Co., Inc., N.J., 5
Mackenzie Prods. Co., The, Conn., 5
Magnex Corp., N.Y., 5
Mahoney Teletronic Labs., Inc., N.J., 25
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8. Services and Raw Materials

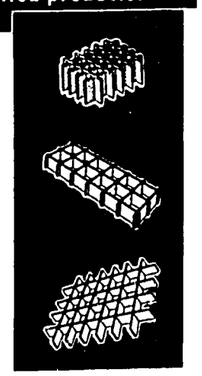
79. Fabricators & Services.

Mallory & Co., Inc., P. R., Ind., 5, 10, 30, 45
Mansol Ceramics Co., N.J., 25, 45
Markwik Mfg. Co., Dept. IR-9, 147-39 18 Ave., Whitestone, L.I., N.Y., 25, Marking Service
For details see ad on page 530
Tel: IN 3-4439
Marshall Eng., Electr. Div., Calif., 5, 10, 40, 45
Martin & Co., H. S., Ill., 5
McMillan Lab., Inc., Mass., 40, 45
McNeal, J. D., Conn., 5
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 5, 30, 40
For details see ad on page 301
Tel: Terhune 5-3224
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 5
For details see ad on page 432
Tel: Raymond 3-1508
Merit Plating Co., 218 141 St., New York 51, N.Y., 10
For details see ad on page 496
Tel: Cypress 2-6380
Metal Fabricators Corp., 73 Pond St., Waltham 54, Mass., 5
For details see ad on page 287
Tel: WA 5-6800
Metal Prods Co., Tenn., 5
Metalace Corp., Electr. Div., N.Y., 30
Metallic Arts of New England, Inc., Mass., 5, 30
Meyer & Co., Hugo, N.Y., 5, 15
Mica Insulator Co., N.Y., 40
Mica & Minerals Co., N.C., Mica
Michel Mfg. Co., Wis., 5
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Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 5
For details see ad on pages 94-95
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For details see ad on page 377
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Polymer Corp. of Pa., 126 N. 5 St., Reading, Pa., 5, 40, 45
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Protectoseal Co., The, Ill., 30
Q-Line Mfg. Corp., N.Y., 5, 30
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Radiaphone Co., Calif., 5
Radio City Products Co., Inc., Pa., 5

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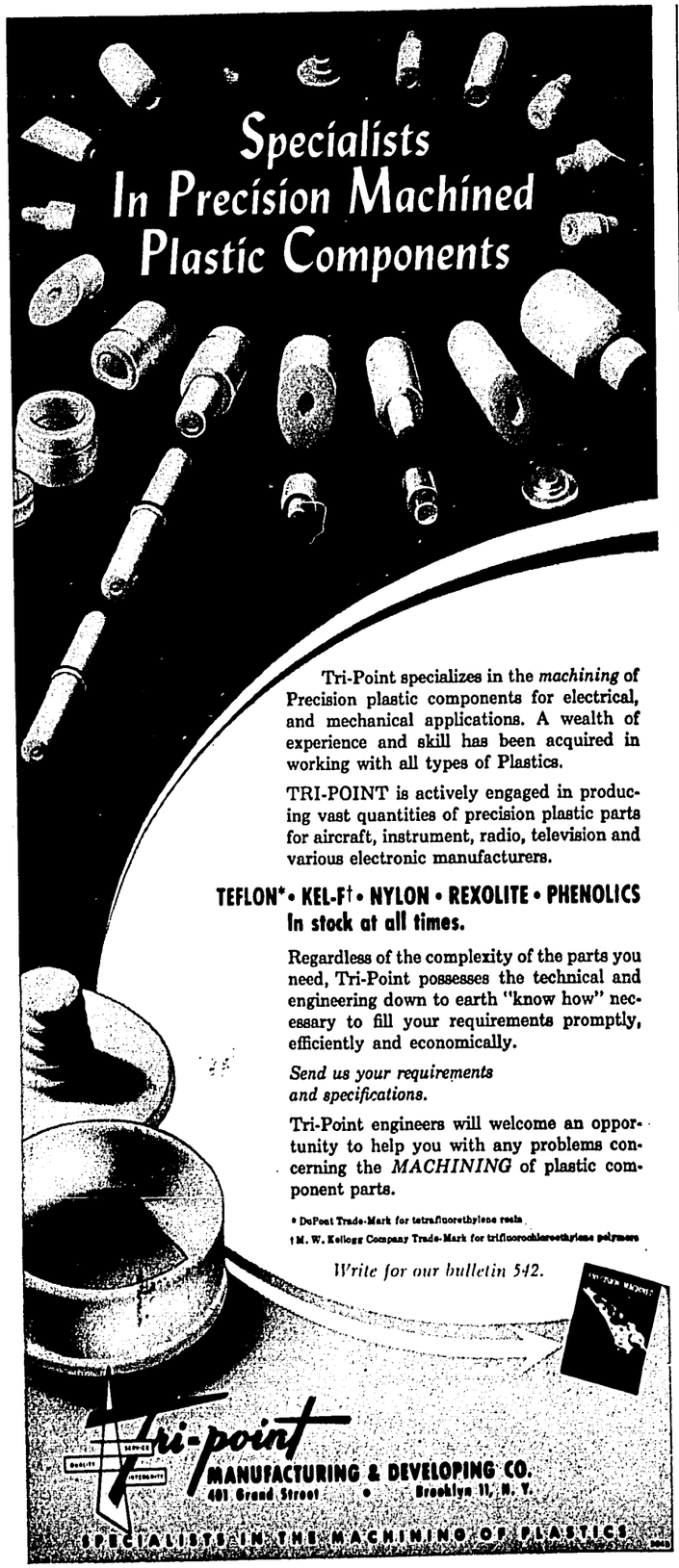
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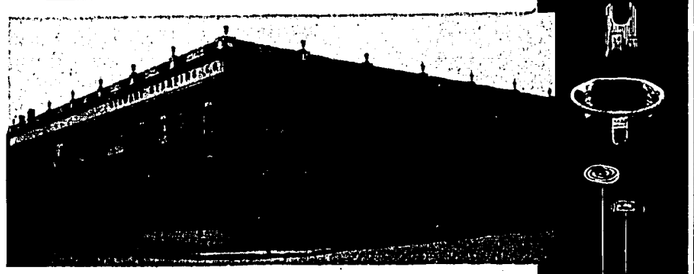
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8. Services and Raw Materials

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Stainless, Inc., Pa., 5
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8. Services and Raw Materials

79. Fabricators & Services.

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15. Hydrogen
20. Krypton
25. Neon
30. Oxygen
35. Xenon

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81. Hardware & Findings.

5. Adhesive labels & tapes
10. Bushings & bearings
15. Cans
20. Dials & dial assemblies
22. Fasteners
25. Flexible shafts
30. Gaskets
32. Grilles
35. Grommets
40. Lacing cord & tape
45. Machine screw products
47. Markers & tags
50. Nameplates
55. Paper preforms, for coil foundations
60. Retaining rings
65. Rivets
70. Screws, nuts & washers
75. Shock mounts
80. Springs
85. Strain reliefs
90. Terminal boards
95. Terminals, rivet or stud
97. Terminals, wire end
98. Test clips
99. Vibration mounts & isolating pads

Abalon Precision Mfg. Corp., N.Y., 10, 15, 45

8. Services and Raw Materials

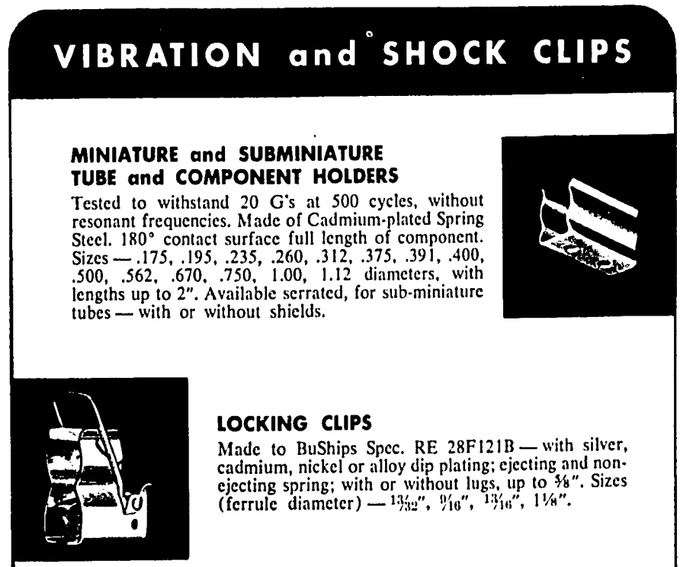
81. Hardware & Findings.

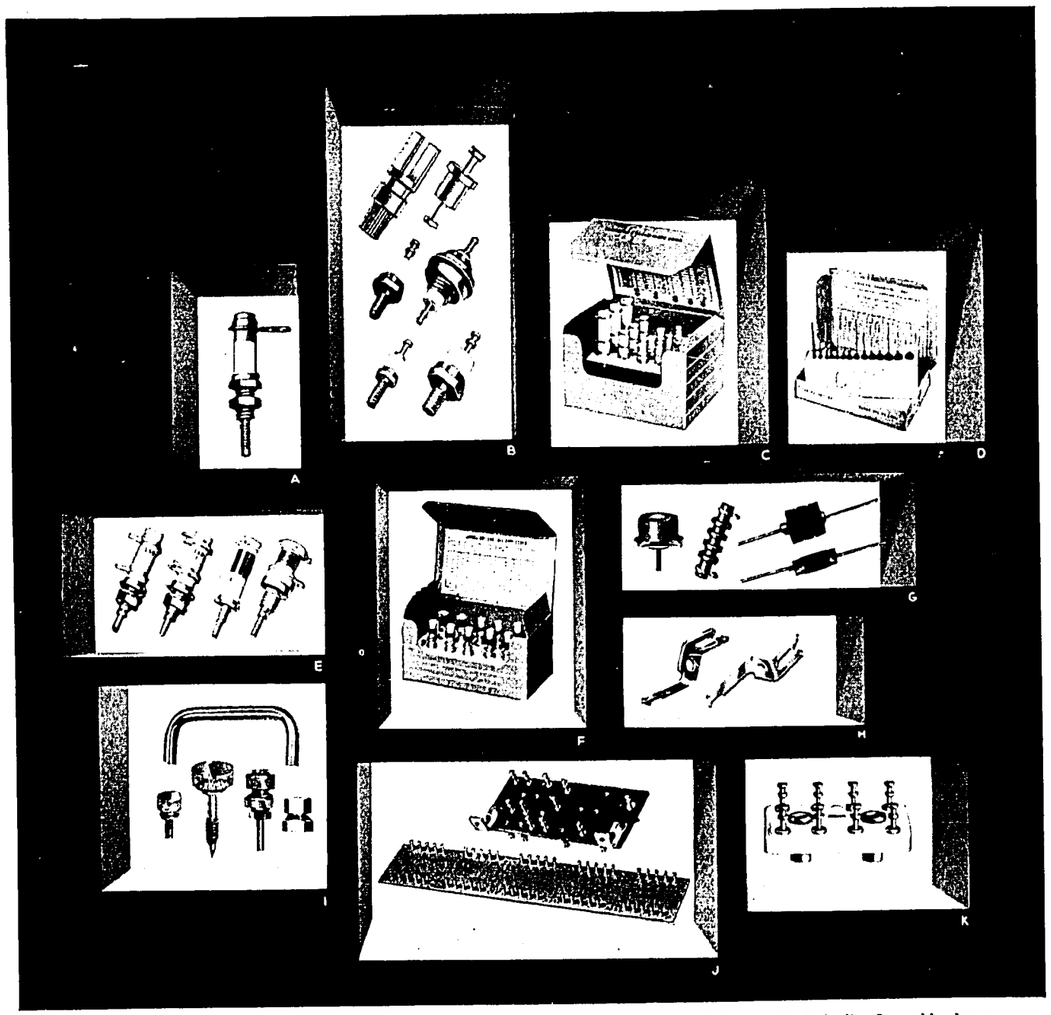
Accurate Electronics Corp., Ohio, 45, 90
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Armstrong Cork Co., Pa., 30
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Atlas E-E Corp., Bedford Airport, Bedford, Mass., Component Holders
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A Complete Alphabetical Index of all Products

Listed in this Directory will be found in the eight-page pink insert immediately preceding page 1 of the products and firms section.





CTC Components shown include: A. capacitor; B. standard and insulated terminals; C. coil form kit; D. RF choke kit; E. coil forms and coils; F. coil kit; G. RF chokes; H. diode clips; I. panel hardware; J. standard and custom terminal boards; K. ceramic board.

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CAMBRIDGE THERMIONIC CORPORATION

makers of guaranteed electronic components, custom or standard



8. Services and Raw Materials

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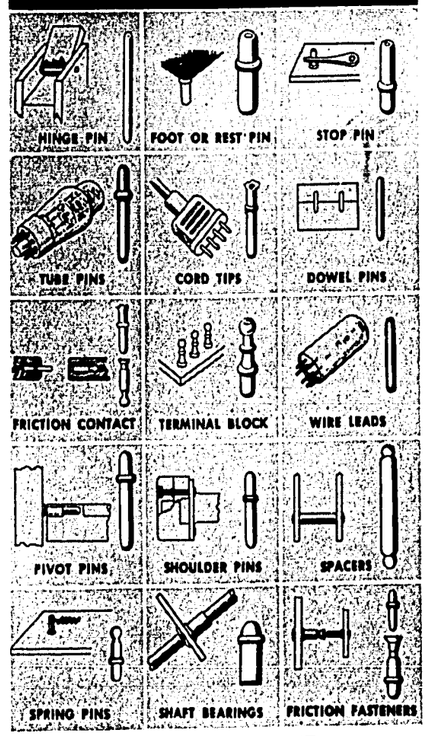
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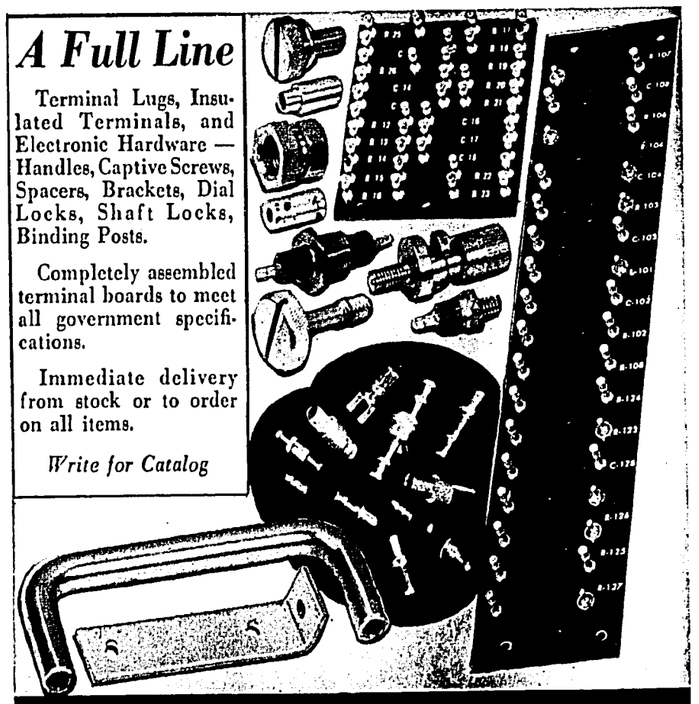
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Completely assembled terminal boards to meet all government specifications.

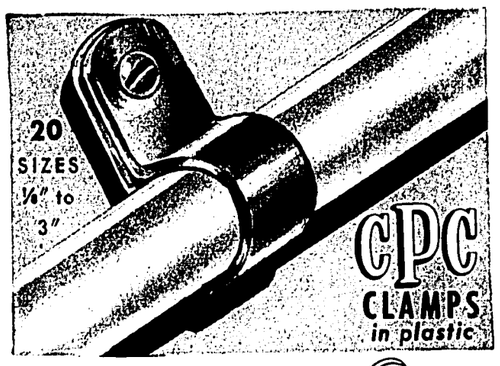
Immediate delivery from stock or to order on all items.

Write for Catalog

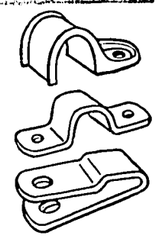


CITATION PRODUCTS CO.

233 EAST 146th ST., NEW YORK 51, N.Y.



Many Styles - All Sizes
All Materials and Colors



Original designers and manufacturers . . . Commercial can offer you in CPC Clamps the very best know-how, production and delivery. There is a CPC Plastic Clamp . . . or one can be designed . . . for every application. Durable, no corrosion. Ideal for cable, tubing, wiring, conduit. Save on cost, too! Send for sample. H 100

Dept. R., 2812 W. NORTH AVE. · CHICAGO 47, ILL.

COMMERCIAL PLASTICS CO.

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment—you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfully eliminated. Simplicity makes this book easy to work with—insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information—fast.

3000 Firms listed. The alphabetical directory gives a clear definition of these firms by showing any or all of the ten fundamental groups in which these firms belong after every name.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 503)

Citation Products Co., 233 E. 146th St., New York 51, N.Y., 10, 20, 45, 90, 95
For details see ad on page 504
Tel: MO 5-0740

Cleveland Container Co., Ohio, 55

Colortone Electronics, Inc., N.Y., 45

Components Corp., N.J., 45

Condor Radio Mfg. Co., Ariz., Coolers

Continental Screw Co., Mass., 70

Co-operative Industries, Inc., N.J., 45, 95, 97

Copperweld Steel Co., Pa., 80

Cortland Industries, Inc., Ill., 55, 90

Cratex Mfg. Co., Calif., Abrasives

Curtis Development & Mfg. Co., Wis., 90

Davies Molding Co., Harry, Ill., 20

Dietz Design & Mfg. Co., Grandview 7, Mo., 15, Housings, Plug-In
For details see ad on page 290
Tel: South 7216

Dietz Co., Henry G., Coral Des. Div., N.Y., 20, 50

Dominion Electrohome Ind., Ltd., Canada, 45

Duralith Corp., Pa., 50

Duramark, Inc., Dept. R-54, 2 Secatoag Ave., Pt. Washington, N.Y., 47, 50, Laminated
For details see ad on page 505
Tel: PO 7-3232

Dzus Fastener Co., Inc., N.Y., 22

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 45, 90
For details see ad on page 370
Tel: Davenport 4-7000

Electronic Mechanics, Inc., N.J., 30, 35, 90

Emerson Plastics Corp., N.Y., 10, 20, 30, 35, 50, 60, 90

Erie Resistor Corp., 644 West 12th St., Erie, Pa., 20, 50
For details see ad on pages 82-83
Tel: Erie 2-1481

Etched Products Corp., N.Y., 20, Panels

Federal Screw Prods., Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 35, 45, 65, 70, 90, 97
For details see ad on page 505
Tel: Delaware 7-5776

Federal Shock Mount Corp., N.Y., 75, 99

Felt Products Mfg. Co., Ill., 30, 35

Finn & Co., Inc., T. R., N.Y., 75

Fisher Radio Corp., N.Y., 90

Flexilab Products Co., Ind., 95

Flock Process Co., Inc., Conn., 32

Fluorocarbon Prods. Div., U. S. Gasket Co., 6911 N. 10 St., Camden 1, N.J., 10, 25, 30, 35, 45, 90, 95
For details see ad on pages 126-127

((Continued on page 507)

There is Always One Leader in Every Field

BODNAR INDUSTRIES, Inc.

leads in the field of

PLASTIC LIGHTING PANELS AND DIALS

BECAUSE OF *Quality* • *Uniformity* • *Performance*
Design & Layout "Know-How Service"
Quantity Production Promptly

NEW YORK —19 Railroad Ave., New Rochelle (Home Office)
CALIFORNIA—4440 Lankershim Blvd., P.O. Box 264, North Hollywood
CANADA —44 Wellington St. E., Toronto

SPECIMEN PANEL MIL-P-7788 (AN-P-89) SENT ON LETTERHEAD REQUEST



FEDLOCK FASTENINGS

HARDWARE FOR ELECTRONICS

ONE SOURCE OF SUPPLY FOR FASTENINGS

We carry in stock thousands of STANDARD and SPECIAL items used in the ELECTRONIC INDUSTRY. SCREWS—NUTS —WASHERS—TERMINALS—GROMMETS—RIVETS— EYELETS—ACCESSORIES.
SPECIAL Cold Headed Products—Stampings—Screw Machine Parts—Made to order in all metals.
WRITE FOR CATALOG 54

FEDERAL SCREW PRODUCTS INC.
3917 N. KEDZIE AVE. CHICAGO 18, ILL.

J-10 AL-42



Flash!

. . . now on press

is a new

brochure

illustrating new

applications

and industrial

uses for

"Duramark."

Write today

to Dept. R-54

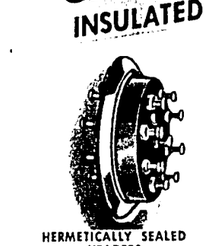
to reserve

your copy.

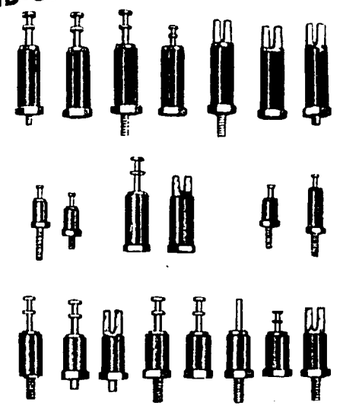
For { HIGH FREQUENCY / HIGH VOLTAGE } Space Saving Applications

GARDE Miniature & Sub-Miniature

INSULATED STAND-OFFS & FEED THROUGHS



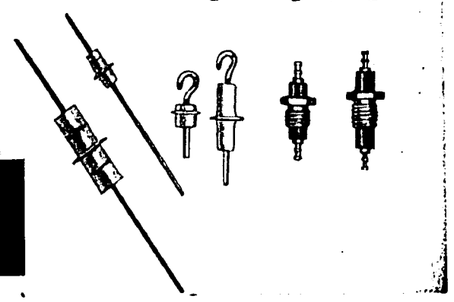
HERMETICALLY SEALED HEADERS

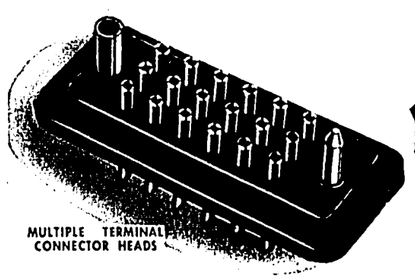




COIL FORMS

CHOICE OF INSULATION CHARACTERISTICS IN ACCORDANCE WITH LATEST Mil-P-14 SPECIFICATIONS.





MULTIPLE TERMINAL CONNECTOR HEADS



BARRIER STRIPS

For users to properly assess the outstanding features and advantages of Garde Components, samples will be sent on request. A detailed technical catalog is now in preparation. Be sure your name is on our mailing list.

We have complete facilities to accommodate your special requirements, ranging from Engineering Consulting Service to Precision Design and Production.

GARDE MANUFACTURING COMPANY

MOLDERS OF THERMOPLASTIC AND THERMOSETTING MATERIALS

588 Eddy Street Providence 3, Rhode Island Sales Representatives in Principal Cities

There are

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 IRE 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

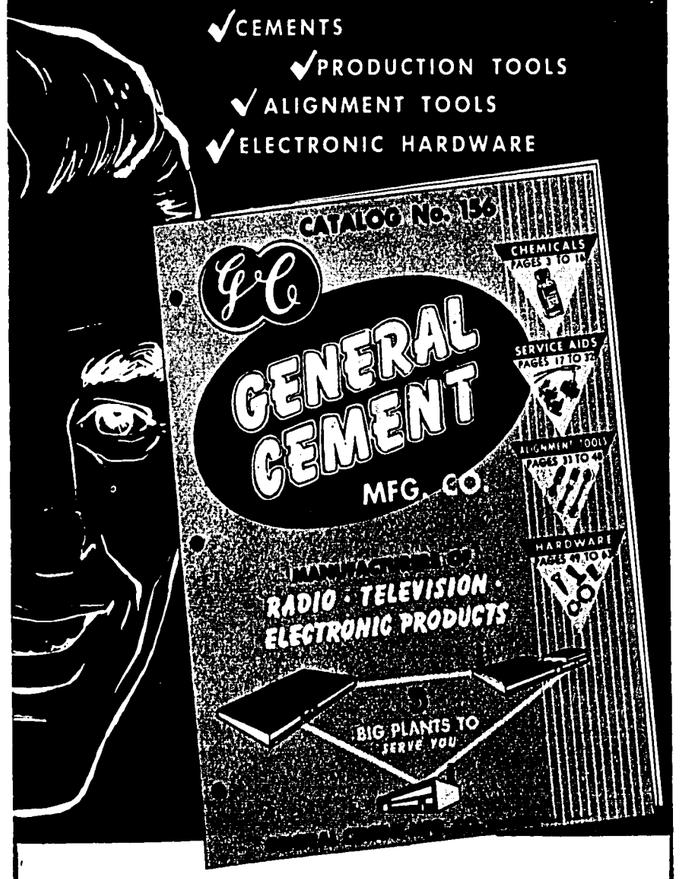
It is a specific purpose of the Institute of Radio Engineers that its advertising rates should benefit and help the industry grow, by being economical. Part of the economy of a tax-free organization is thus passed on to advertisers in the form of low-cost advertising to a high-quality audience. The page 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
1475 Broadway
New York 36, N.Y.

LOOK HERE!

FOR PRODUCTS ESPECIALLY DESIGNED FOR THE ELECTRONIC INDUSTRY

✓CEMENTS
✓PRODUCTION TOOLS
✓ALIGNMENT TOOLS
✓ELECTRONIC HARDWARE



Be sure you have this fully illustrated catalog. Send for your FREE copy today!

GENERAL G-C CEMENT MANUFACTURING COMPANY

926 TAYLOR AVENUE • ROCKFORD, ILLINOIS

8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 505)

Fog-O-Scope, Inc., Ill., Hose Clamps
Franklin Electronics, Inc., Pa., 50, 80
Franklin Electronics, Inc., Pa., 50, 80
Garde Mfg. Co., 588 Eddy St., Providence 3, R.I., 90, 95
For details see ad on page 506
Tel: Union 1-0604
Garlock Packing Co., N.Y., 30
Gasket Engineering Co., Inc., Mo., 30
General Cement Mfg. Co., 916 Taylor Ave., Rockford, Ill., 35, 40, 45, 60, 65, 70, 75, 80, 85, 90, 95, 99
For details see ad on page 507
Tel: Rockford 2-6695
General Laminated Prods. Co., Inc., Ill., 30, 35, 45, 65, 70, 75
General Tire & Rubber Indust. Prods. Div., Ind., 30, 35, 75, 99
Gibson Electric Co., Pa., 65
Gorham Mfg. Co., R.I., 45
Graphite Metallizing Corp., 1054 Nepperhan Ave., Yonkers 3, N.Y., 10, Brushes-Metal Graphite
For details see ad on page 299
Tel: YO 8-4400

(Continued on page 509)

For Further Information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

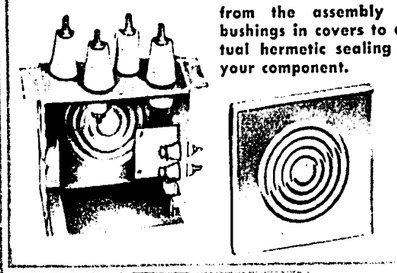
Post Card Inserts

to write for literature without cost.

it will pay you to Specify Heldor's

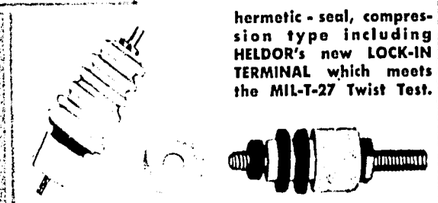
A ASSEMBLY SERVICE

from the assembly of bushings in covers to actual hermetic sealing of your component.



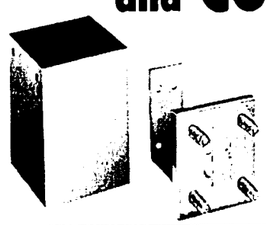
B BUSHINGS

hermetic - seal, compression type including HELDOR's new LOCK-IN TERMINAL which meets the MIL-T-27 Twist Test.



C CANS and COVERS

built to meet MIL-T-27 and Commercial Specifications.



because Heldor gives

● ***FAST DELIVERY***
on Cans, Covers and Assemblies. Prototypes and special size cans and covers. Bushings immediately from stock.

● ***CONSISTENT QUALITY***
Advanced quality-control procedures result in new *lows* for rejects, etc.

● ***LOWER COSTS***
No tool or die costs on Standard cans, covers. "Know-how" makes possible substantial economies on Bushings and Assembly Service.

WRITE for NEW "Lower Cost" PRICE LIST and for DATA SHEET on New LOCK-IN TERMINAL!

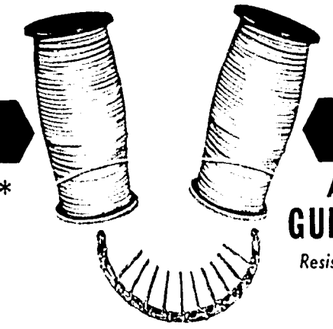
HELDOR MANUFACTURING CORPORATION

HELDOR BUSHING & TERMINAL CO., INC.

238 Lewis Street • Paterson, N. J.

Midwestern Branch: 3821 Montrose Ave., Chicago 18, Ill.

2 *Fungus Resistant* NYLON FLAT-BRAIDED LACING TAPES



WAX FINISH

GUDELACE*

Easy on Hands
Easy to tie

WAX FREE

All-Nylon GUDE-NYLACE*

Resists High Temperature

Both tapes save time and money—and cut down rejects. Neither will bite through insulation. Gudelace ties easier, tighter and cuts down knot slippage. Gude-Nylace is the perfect product where the use of wax is not indicated.

**Patent Applied For*

WRITE FOR COMPLETE INFORMATION AND A FREE TRIAL SUPPLY TODAY!

GUDEBROD BROS. SILK CO., INC.

ELECTRONICS DIVISION
225 W. 34th Street, New York 1, N.Y.

EXECUTIVE OFFICES
12 S. 12th Street, Philadelphia 7, Pa.

HEYCO NYLON STRAIN RELIEF BUSHINGS

anchor power cords to the housing & eliminate strain on terminals



1. *Slip over wire*
2. *Snap into hole*

CHASSIS →

HEYCO

CUT PRODUCTION COSTS IMPROVE PRODUCT QUALITY

● Heycos absorb all cord pull, push and torque and insulate wire from housing. Product life is increased and product appearance is improved. Samples available on receipt of wire sizes.

HEYMAN MANUFACTURING COMPANY
KENILWORTH 7, NEW JERSEY

8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 507)

Grayhill, Inc., 505 Hillgrove Ave., La Grange, Ill., 98
For details see ad on page 375
Tel: FLeetwood 4-1040
Great American Indust., Inc., Rubatex Div., Va., 30, 35, 99, Rubber
Gries Reproducer Corp., N.Y., 55, 65, 70
Griffin Co., John, Minn., Drafting Supplies
Groov-Pin Corp., N.J., 22, Lock Inserts
Gudebrod Bros. Silk Co., Inc., 225 W. 34 St., New York 1, N.Y., 40
For details see ad on page 509
Tel: Lackawanna 4-5858
Guthman & Co., Inc., Edwin I., Ill., 15
Harper Co., H. M., The, Ill., 45, 65, 70
Heldor Mfg. Corp., 238 Lewis St., Paterson, N.J., 15, 90
For details see ad on page 508
Tel: MUlberry 3-7953
Heminway & Bartlett Mfg. Co., 500 Fifth Ave., New York 36, N.Y., 40
For details see ad on page 510
Tel: LOngacre 4-0880
Henry & Miller Ind., 15, 45, 75, 97
Heppner Mfg. Co., Box 1207, Round Lake, Ill., 75
For details see ad on page 324
Tel: ROund Lake 6-2161
Heyman Mfg. Co., 300 Michigan Ave., Kenilworth 7, N.J., 85
For details see ad on page 509
Tel: CHestnut 5-2345

(Continued on page 511)

A Complete Alphabetical Index of all Products

Listed in this Directory will be found in the eight-page pink insert immediately preceding page 1 of the products and firms section.

For easier-to-tie knots *that will not slip!*



HEMINWAY & BARTLETT

Fungus-Proof

NYLON LACING CORDS and FLAT BRAIDED TAPES

- Revolutionary synthetic resin coating prevents knots from slipping.
- Laces faster and tighter with less effort. Unique "plastic memory" actually causes lacing to tighten *itself* after knot is made!
- Its greater strength means minimum breakage – minimum rejects.
- The synthetic resin coating retains the desirable malleability of wax and yet has a melting point of over 190°F. It is non-toxic to humans.
- Complies with *ALL* construction and fungus-proof requirements of Govt. Spec Jan-T-713 and Jan-T-152.

Cords and tapes are also available with wax finish.

For FREE SAMPLES and prices write:

The Heminway & Bartlett Mfg. Co., ELECTRONICS DIVISION, 500 Fifth Ave., New York 36, New York

Sales Offices: Chicago, Philadelphia, Boston, St. Louis, Cincinnati, San Francisco, Los Angeles, Charlotte, N.C., Gloversville, N.Y. Foreign Agent: Turner, Halsey Co., Inc., 40 Worth St., New York. Cable Address: THECOTEX

Why 38,799 Engineers have joined The Institute of Radio Engineers

BENEFITS

Get to know your fellow engineers—attend section and professional group meetings—keep up with engineering progress.

o o o

Get 12 great issues of Proceedings of the IRE. . . . A working textbook up-to-the-month on practical radio-electronic engineering.

o o o

Get the annual IRE DIRECTORY . . . an industry between covers . . . men, products, firms.

o o o

For membership information, write to:

Institute of Radio Engineers
1 East 79th Street
New York 21, N.Y.

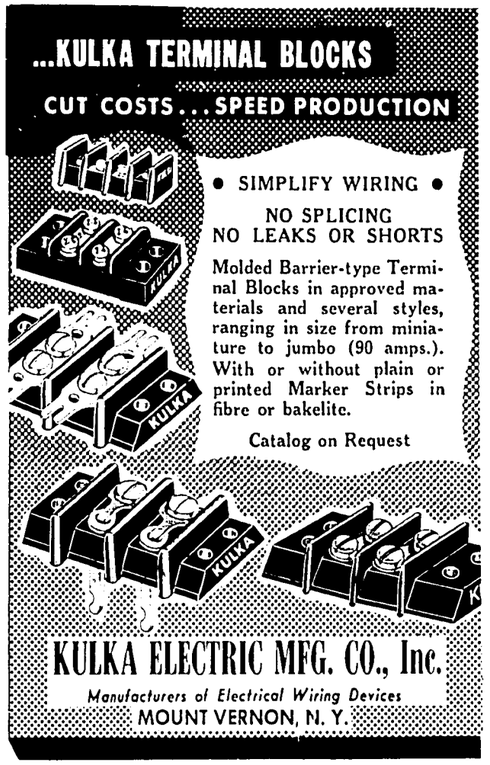


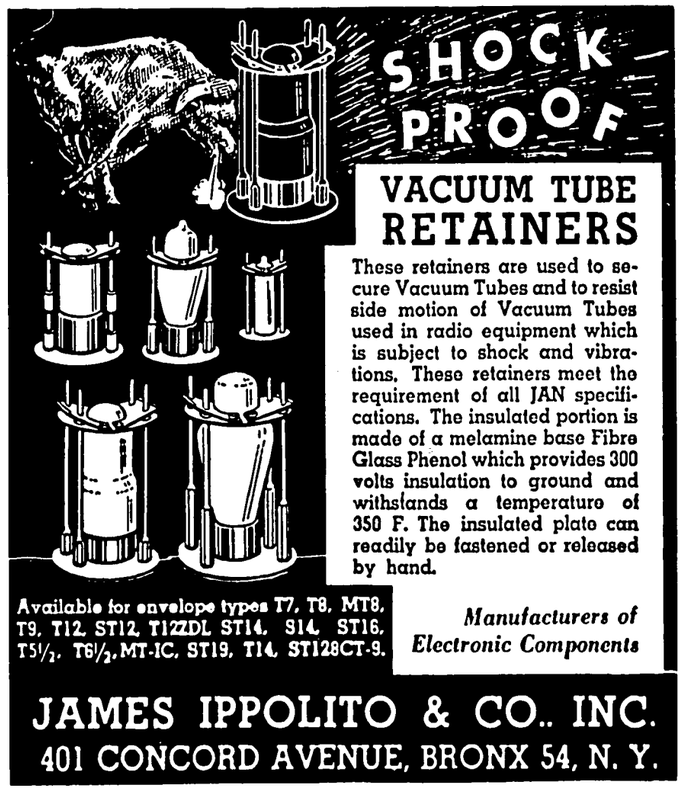
I-S Beryllium copper finger contact strips and contact rings combine higher elastic performance, accuracy of contour and choice of three finishes. Precision methods extended into mass production, eliminate hand adjustment of assembly . . . reducing final costs.

For full information on I-S Micro-processed Springs, write today for your free copy of Catalog 8; for Electronic Components, ask for Catalog No. 8-A.

To assist in developing the most effective and economical design, our experienced engineering staff is at your disposal.

INSTRUMENT SPECIALTIES CO., INC.
160 Bergen Blvd., Little Falls, New Jersey
Tel. Little Falls 4-0280





8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 502)

Hitemp Wires, Inc., 26 Windsor Ave., Mineola, L.I., N.Y., 40
For details see ad on page 480
Tel: Pioneer 2-5540
Hobson Bros., Ill., 90
Hopkins Engineering Co., Calif., 45
Hudson Tool & Die Co., 118 S. 14 St., Newark 7, N.J., 15
For details see ad on page 162
Tel: Humboldt 2-8561
Ideal Industries, Inc., Ill., 5
Ilsco Copper Tube & Prods., Inc., Ohio, 97
Illinois Tool Works, Shake Proof Div., Ill., 35, 65, 70, 85, 95, 97
Imperial Bolt & Screw Co., Inc., N.Y., 70
Industrial Assembly Corp., N.Y., 75
Industrial Devices, Inc., N.J., 98
Industrial Hardware Mfg. Co., Inc., Dept. I-54, 109 Prince St., New York 12, N.Y., 90, 95, 97
For details see ad on page 371
Tel: ORegon 7-1881
Industrial Tape Corp., N.J., 5
Instrument Specialties Co., Inc., 160 Bergen Blvd., Little Falls, N.J., 80
For details see ad on page 220
Tel: LIttle Falls 4-0280
Insuline Corp. of America, N.H., 10, 20, 30, 35, 45, 50, 65, 70, 75, 90, 99
JFD Mfg. Co., Inc., 1462 62 St., Brooklyn 19, N.Y., 25, 35, 75
For details see ad on page 286
Tel: BE 6-9200
Jacksonville Metal & Plastics Co., Fla., 50
Jaco Products., Ohio, 30, 45
Jan Harware Mfg. Co., Inc., N.Y., 10, 20, 25, 30, 45, 75, 80, 99
Jiffy Clip Mfg. Co., N.Y., Test Probes
Johns-Manville, N.Y., 5, 30, 40, 90, 99
K. V. Transformer Corp., Conn., 15
Kaupp Co., C. B., N.J., 15
Kaywoff Prods. Co., Neb., 30, 35, 75
Kenwood Mfg. Co., N.J., 10, 45
Ketay Mfg. Corp., N.Y., 20
Keystone Carbon Co., Pa., 10, Graphite & Carbon Brushes
Keystone Electronic Corp., N.Y., 10, 45, 90, 95
Kings Electronic Co., N.Y., 75, 90, 99
Koehler Mfg. Co., Mass., Spotlights & Lamps
Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N.Y., 85, 90, 95, 97
For details see ad on page 511
Tel: MOunt Vernon 4-4024
Kupfrian Mfg. Co., N.Y., 25
Kuss Mach. Tool & Die Co. Inc., Pa., 99

(Continued on page 512)

Only
Precision OFFERS YOU
HIGHEST QUALITY, LOW COST PAPER TUBING
in
any shape
every size
any length
plus
any ID
every OD
any quantity



DIELECTRIC KRAFT • FISH PAPER • CELLULOSE ACETATE
COMBINATIONS • PHENOL IMPREGNATED

Round, square, rectangular, triangular, any shape, any size — Precision Paper Tube Co. can provide *all* your paper tubing needs. Your specifications are met to the most exacting tolerances. Precision Paper Tubes are sturdy, crush resistant, have high tensile strength and excellent dimensional stability.

Send in your specifications for samples. Request Arbor List of over 2000 sizes.

HIGH DIELECTRIC BOBBINS FOR BETTER COILS

Precision-made on specially designed equipment, using the finest materials, to provide maximum tensile strength, light weight, more winding space and other essential electrical and mechanical characteristics.

Furnished in any size or shape. Supplied plain or fitted with leads, slots or holes. Flanges cut to specification, plain or embossed. Tube ends swaged to lock flanges.

Send Specifications for samples. Ask for illustrated folder.

Sales Representatives in:

New England:
Framingham, Massachusetts, Framingham 7091

Metropolitan New York, New Jersey:
Jersey City, New Jersey, Journal Square 4-3574

Upstate New York:
Syracuse, New York, Syracuse 76-8056

Northern Ohio, Western Pennsylvania:
Cleveland, Ohio, Atlantic 1-1060

Indiana, Southern Ohio:
Logansport, Indiana, Logansport 2555

Missouri, Southern Illinois, Iowa:
St. Louis, Missouri, Sterling 2318

Maryland:
Baltimore, Maryland, Plaza 2-3211

Philadelphia, Camden:
Philadelphia, Pa., Chestnut Hill 8-0282

California:
Pasadena, California, Sycamore 8-3919

Canada:
Montreal, Quebec, Canada, Walnut 2715

PRECISION
PRECISION PAPER TUBE CO.
2062 W. CHARLESTON ST. CHICAGO 47, ILL.
Plant No. 2: 79 Chapel St., Hartford, Conn.

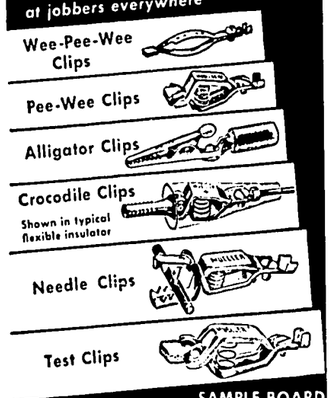
8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 511)

Lafayette Labs., Inc., N.Y., 45, 65, 70
La Moree, C. D., Calif., 35, 50, 90
Lamson & Sessions Co., Ohio, 45, 65, 70, 95
Landis & Gyr, Inc., N.Y., 10
Lee Spring Co., Inc., N.Y., 80
Lion Fastener, Inc., N.Y., 22
Lord Mfg. Co., Pa., 75, 99
Lowell Mfg. Co., Mo., 35
Lynn Electronic Research Co., 9 W. Magnolia Blvd., Burbank, Calif., 45, 90, 95, 97
For details see ad on page 513
Tel: Victoria 9-2864
Maigne Co., O. J., N.Y., 30, 35
Malco Tool & Mfg. Co., Ill., 95, 97
Mallory & Co., Inc., P. R., Ind., 15, 35, 45, 60, 65, 70
Maryland Etching Co., Md., 50
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 45
For details see ad on page 301
Tel: Terhune 5-3224
Metal Prods. Co., Tenn., 50
Metal Textile Corp., 647 E. First Ave., Roselle, N.J., 30, 75, 99
For details see ad on page 480
Tel: Chestnut 5-3000
Micromech Mfg. Corp., N.J., 10, 30, 45, Teflon

Mueller
MAKES THE CLIPS!
ALL TYPES—ALL SIZES
at jobbers everywhere



SAMPLE BOARD

SEND FOR FREE CLIP & INSULATOR SAMPLES!
Pick from illustrations above.

5 INSULATOR COLORS now available for easy lead identification. Black, Red, White, Blue and Yellow. Samples furnished on request.

NEW CATALOG No. Y563 ON REQUEST



Ask about handy, low cost display and selection board, for department heads, jobbers, etc.

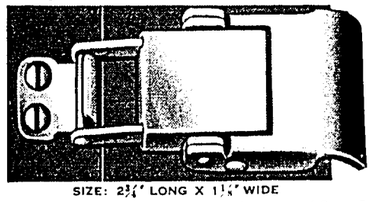
Mueller Electric Co
1563Y EAST 31st STREET • CLEVELAND 14, OHIO

8. Services and Raw Materials

81. Hardware & Findings.

Milford Rivet & Machine Co., Conn., 22, 65, 95
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 10, 15, 20, 90
For details see ad on page 548
Tel: MAlden 4-4108
Miller Dial & Name Plate Co., Calif., 50
Miniature Precision Bearings, Inc., N.H., 10
Minnesota Rubber & Gasket Co., Minn., 30, 35
Moran Electronic Components, Inc., 10515 Metropolitan Ave., Kensington, Md., 90
For details see ad on page 293
Tel: LO 4-8470
Mueller Electric Co., 1563Y E. 31 St., Cleveland 14, Ohio, 98
For details see ad on page 512
Tel: PR 1-5225

"Nielsen" COMPRESSION SPRING DRAW PULL CATCHES
WITH SPRINGS CONCEALED
SIGNAL CORPS NO. SC-B-83314



SIZE: 2¾" LONG X 1¼" WIDE

70-Pound Tension at ⅛" Deflection, the established application dimension.
Withstands 600-Pound Pull Test.
Nielsen Catches Carry "Certification of Compliance".

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AFFILIATED WITH NIELSEN TOOL & DIE CO.
FOR QUALITY HARDWARE — GOOD SERVICE TO YOUR SPECIFICATION

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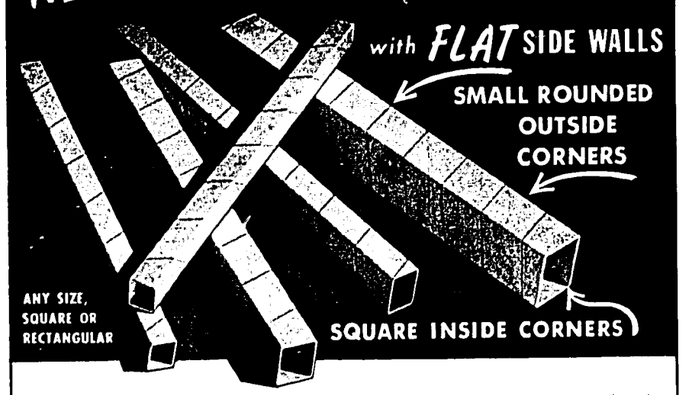
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Lynn Electronic Research Co. has set up an associate company with a new plant to provide increased production facilities and improved delivery service.
STANDARD BOARDS NOW AVAILABLE FROM STOCK
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STANDARD, MINIATURE, & SPECIAL TERMINALS
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CONNECTORS, RECEPTACLES, PLUG ASSEMBLIES
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COMPLETE PRINTED CIRCUIT HARDWARE
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9 WEST MAGNOLIA BLVD. BURBANK, CALIF.

Nagel-Chase Mfg. Co., Ill., Bracket & Caster Assemblies
Nameplates, Inc., N.Y., 50
National Co., Inc., Mass., 10, 15, 20, 25
National Hollywood Co., Calif., Aluminum Reels
National Tel-Tronics Corp., N.Y., 90, 95, 97
Neptune Electronic Co., N.Y., 75, 90, 99
Neo-Sil Corp., N.J., 30, 35, 95
New England Etching & Plating Co., Mass., 50
Newton Co., The, Conn., 90
Ney Co., J. M., 171 Elm St., Hartford 1, Conn., 45
For details see ad on page 377
Tel: Hartford 2-4271
Nielsen Hardware Corp., 770 Wethersfield Ave., Hartford 14, Conn., Catches & Fastening Devices
For details see ad on page 513
Tel: JAckson 2-8145
Noesting Pin Ticket Co., Inc., N.Y., 97
North Shore Nameplate, Inc., N.Y., 5, 50
Ohio Carbon Co., The, Ohio, Carbon Graphite Brushes
Olympic Metal Prods. Co., Inc., Third Ave., Alpha, N.J., 15, 90
For details see ad on page 167
Tel: Phillipsburg 5-1193
Painton and Co., Ltd., England, 20
Palnut Co., The, N.J., 22, 70
Paramount Paper Tube Corp., 617 Lafayette St., Fort Wayne 2, Ind., 55
For details see ad on page 514
Tel: A-4197
Patton-MacGuyer Co., R.I., 97
Peerless Prods. Indust., Ill., 20, 45, 50, 90, 95
Permacel Tape Corp., N.J., 5, Pressure Sensitive Tape
Phaostron Co., 151 Pasadena Ave., S. Pasadena, Calif., 35
For details see ad on page 333
Tel: CL 5-1471
Pheoll Mfg. Co., Ill., 70
Photo Chemical Prods., 479 Walton Ave., New York 51, N.Y., 20, 50, 90
For details see ad on page 498
Tel: LU 5-0200
Pix Mfg. Co., Inc., N.J., 10, 30, 35, 65, 95, 97
Polymer Corp. of Pennsylvania, 126 N. 5th St., Reading, Pa., 10, 30, 70
For details see ad on page 540
Tel: REading 6-7241
Penn Machine Cutting Co., Mass., 30
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 20
For details see ad on page 345
Tel. ES 5-9435
Precision Marking Co., N.J., 20, 50
Precision Metal Prods. Co., Inc., Mass., 90, 95
Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 55
For details see ad on page 512
Tel: Armitage 6-5200
Premier Metal Etching Co., N.Y., 20, 50, Etched Panels

(Continued on page 515)

NEW "PARAFORMED" SPIRAL WOUND PAPER TUBES



DO YOU HAVE A SPACE PROBLEM?

Eliminates squeezing operation of finished coil and possibility of shorts due to fractured enamel insulation.

For the first time, a paper tube like this—developed and perfected by PARAMOUNT after years of research! No artificial heat or pressure is used in its manufacture—*"PARAFORMING" takes place at the time of actual winding.* No sharp outside edges to cut the wire during winding of coils. Has great rigidity and physical strength. Permits coil manufacturers to hold *much closer tolerances.* No need for wedges to tighten the winding on the laminated core. Coils can be automatically stacked much faster, too. The new "PARAFORMED" tubes are approved and used by leading manufacturers. *And they cost no more!*

WRITE ON COMPANY LETTERHEAD FOR STOCK ARBOR LIST OF OVER 2000 SIZES

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617 LAFAYETTE ST., FORT WAYNE 2, IND.
Standard of the Coil Winding Industry for Over 20 Years

Plan with FLEXIBLE SHAFTS



FLEXIBLE SHAFTS

Make for simple grouping of working units and insure quiet, smooth trouble-free operation.

Flexible shafts offer a more economical construction and lower maintenance cost.

Direct alignment in remote control or power transmission around corners is a saving in space and operation.

Write on your letterhead for our Flexible Shaft Manual

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CIRCLE TESS
4311-13 RAVENSWOOD AVENUE · CHICAGO 13, ILL.
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8. Services and Raw Materials

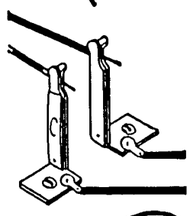
81. Hardware & Findings.

(Continued from page 513)

Protectoseal Co., The, Ill., 15
Q-Line Mfg. Corp., N.Y., 70
Radio City Products Co., Inc., Pa., 45
Radio Components, Ltd., Canada, 10, 20, 45, 90
Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., Switch Seals & Handles
For details see ad on page 448
Tel: BOonton 8-3100
Rapid Specialties Co., 327 W. Huron St., Chicago 10, Ill., 98
For details see ad on page 515
Tel: Delaware 7-1440
Raybestos-Manhattan, N.J., 30, 35, 75
Raymond Mfg. Co., Pa., 80
Reed & Prince Mfg. Co., Mass., 65, 70
Reese, Inc., J., Ramsey, N.Y., 20, 30, 45, 60, 70, 80
Reliable Spring & Wire Forms, The, Ohio, 80
Repath Co., Paul R., Calif., 15
Research Instrument Co., Inc., N.Y., 10, 15, 20, 45, 75
Resin Industries, Inc., Calif., 40
Robco Mfg. Div., Pilot Int'l., N.Y., 97
Robinson Aviation, Inc., Airborne Div., Dept. IRE 8, Teterboro Air Terminal, Teterboro, N.J., 75, 99
For details see ad on page 218
Tel: HA 8-2500
Rodale Mfg. Co., Inc., Pa., 10
Rogers Corp., Conn., 30, 35, 55, 90
Rollins Corp., Del., 90
S&S Mfg. Co., N.J., 10, 45, 70
St. Mary's Carbon Co., Pa., 10, Powdered Metal Oilless Carbon Brushes
Sampson Chem. & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill., 20
For details see ad on page 540
Tel: Sacramento 2-6346
Sayers, John F., N.J., Catalog Binders
Scheidl Mfg. Co., N.Y., 20
Schott Co., Calif., 35, 45, 65, 70, 80, 97
Scovill Mfg. Co., Conn., 35, 45, 60, 65, 70
Seager Standard Carbon Co., N.Y., Brushes, Motor & Generator
Sealectro Corp., N.Y., 95, 97
Semrow Prod. Co., Inc., Ill., 32
Set Screw & Mfg. Co., Ill., 70
Sexton Can Co., Inc., Mass., 15
Sheffco Mfg. Co., N.J., 90, 97
Sherman Mfg. Co., H. B., Mich., 97
Sierra Electronic Corp., Calif., 20
Simmons Fastener Corp., N.Y., 22, 45, 70
Smith, Inc., Herman H., N.Y., 10, 20, 35, 45, 50, 70, 75, 90, 95, 99
South Chester Corp., Pa., 22, 65
Standard Pressed Steel Co., Pa., 45, 70, Shop Equipment
Star Expansion Prods. Co., N.Y., 45
States Co., Conn., 90
Staver Co., Inc., N.Y., 60
Stewart Mfg. Corp., F. W., 4311-13 Ravenswood Ave., Chicago 13, Ill., 25
For details see ad on page 514
Tel: Graceland 2-6600
Stewart Stamping Co., 630 Central Park Ave., Yonkers 4, N.Y., 95, 97
For details see ad on page 499
Tel: Yonkers 5-0816
Suckle Electronic Co., N.J., 15, 75
Sun Dial Corp., P.O. Box 326, Caldwell, N.J., 20
For details see ad on page 515
Tel: Caldwell 6-4334
Surprenant Mfg. Co., 199 Washington St., Boston 8, Mass., 40
For details see ad on page 485
Tel: Boston 2180
Swiss Jewel Co., & Deltavis Co., Pa. 10, 45, 60, 65, 70, 95
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 45, 50, 90
For details see ad on pages 9-14
Tel: JUdson 6-2424
Tablet & Ticket Co., Ill., 20, 50
Taylor Fibre Co., 10, 35, 45, 90

(Continued on page 516)

Rapid **TEST CLIPS**



for MOTORS, COILS, ELECTRICAL UNITS

• Positive Connection • Long Life
For Any Size Lead, Solid or Braided Wire.
Tension Spring for Quick, Easy Setting.
40 amp. Polished brass • Angle or straight

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SPECIFY *Lackon* Trade Mark

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Equip your instruments with sharp, easy to read Lackon dials, panels, etc. . . . made to any size . . . any shape . . . any quantity . . . accurate to your most critical tolerances . . . uniform and highly durable. Printed on metal, plastic, glass, etc., in black and white or multi-color. Passes all government tests. Send for illustrated brochure or contact:

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by **NIGHT**

by **DAY**

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- DIALS

Because of a unique technique, characteristics never before achieved are available in panels, knobs, switches, flat and drum dials. The lettering is *flush*, on a non-reflecting black background, providing maximum angle visibility with no eye fatigue. When lighted from behind, there is no after-image.

An illustrated booklet showing some of the present applications of this new technique (and perhaps provoking some new ideas) is available.

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362 Fifth Ave., New York 1, N. Y.
Wisconsin 7-3574-5

8. Services and Raw Materials

81. Hardware & Findings.

(Continued from page 515)

Thompson-Bremer Co., AMF, Ill., 70
Thompson Fiber Glass Co., H. I., Calif., 40, 99
Tinnerman Prods., Inc., Ohio, 22, 70, 98
Topflight Tape Co., Pa., 5
Torwico Electronics Inc., 965 Frelinghuysen Ave., Newark, N.J., 90
For details see ad on page 295
Tel: Bigelow 8-0426
Trans-Gel Products, N.Y., 20, Panels
Transformer Metal Prods. Corp., N.Y., 15
Transradio, Ltd., England, 20
Tri-Dex Co., Calif., 90
Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 15
For details see ad on page 232
Tel: TExas 0-5381
Triumph Mfg. Co., Ill., 90
Truelove & MacLean, Inc., Conn., 15, 35
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 75
For details see ad on page 102
Tel: Kirkland 7-4100
United Insulator Co., Ltd., England, 90, 95, 97
U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif., 90, 95
For details see ad on page 351
Tel: CHapman 5-4438
United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 10, 25, 30, 35, 45, 90, 95
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
U. S. Radium Corp., N.Y., 20, 50
United Technical Labs., N.J., 98, Probes
Universal Aviation Equip., Inc., 362 Fifth Ave., New York 1, N.Y., 20
For details see ad on page 516
Tel: WIsconsin 7-3574
Vaco Prods. Co., Ill., 97
Vallorbs Jewel Co., Pa., 45, 95
Varflex Corp., N.Y., 40
Vector Electronic Co., Calif., 15, 90
Video Industries Co., N.Y., 10
Viking Electric Co., Calif., 45
Virginia Electronic Co., D.C., 45, 90, 97, Teflon
Waldes Kohinoor, Inc., N.Y., 60
Walker Co., George, 118 Amsterdam Ave., Passaic, N.J., 85, Grip-Masters
For details see ad on page 516
Tel: Prescott 7-3337
Walker Turner Div. of Kearney Corp N.J., 25

4 WAYS TO END ALL CORD AND CABLE SERVICE FAILURES *Economically*

PROTECT YOUR PRODUCT

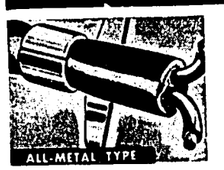
at point of strain

Protect product saleability too — by insuring long life for cords, cables and conductors. Genuine "GRIPMASTER" Strain Reliefs provide these vital features—

- ★ Anchor cords to housings
- ★ Eliminate taping or threading
- ★ Prevent unraveling
- ★ Prevent cord pull damage
- ★ All sizes and styles
- ★ Easy to apply
- ★ Inexpensive

Gripmaster Strain Reliefs are "tremendous trifles" that make good products better!

Ask for samples.







GRIPMASTER STRAIN RELIEFS

Interruptions due to cable and cord connection failures are eliminated because they anchor the cord to the product at the point of strain. GRIPMASTER Strain Reliefs can withstand pulls up to 100 lbs., and are acceptable to Underwriters Laboratories. All types Reg. U. S. Pat. Off.

WIRE BINDING SLEEVES—Preventing fraying of cord ends, these specially-treated rubber tubes are available in five sizes to fit wires to .790



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8. Services and Raw Materials

81. Hardware & Findings.

Wall Mfg. Co., P., Pa., 45
Waveguide, Inc., Calif., 45, 70
Weckesser Co., Ill., 98, Clips, Clamps
Western Lithograph Co., Calif., 5
Westline Prods. Div., Calif., 5, 50
White Industrial Div., S. S., N.Y., 25
Wilmad Glass Co., Inc., N.J., 10
Wilmington Fibre Specialty Co., Del., 10, 30, 35
Woodruff & Stokes Co., Inc., Mass., 45
Worcester Pressed Steel Co., Mass., 15
Wright-Hepp Assoc., Inc., N.J., 15, 95
Zierick Mfg. Corp., N.Y., 95, 97

82. Hermetic Seals.

5. Ceramic to metal seals
10. Complete headers
15. Glass to metal seals

Advanced Vacuum Prod., Inc., Conn., 5
Aerolux Light Corp., N.Y., 15
Allegheny Ludlum Steel Corp., Pa., 15
American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 5
For details see ad on page 136
Tel: Chattanooga 5-3411
Anderson Assoc., H. V., 239 Park Ave., Berkeley Heights, N.J., 5, 15
For details see ad on page 492
Tel: Summit 6-1840

82. Hermetic Seals.

Annis Co., R. B., Ind., 15
Automatic & Precision Mfg. Co., N.Y., Hexseals
Blackstone Electric Co., Ill., 5
Brew & Co., Inc., Richard D., Mass., 15
Cannon Electric Co., Calif., 15
Cathodeon, Ltd., England, 10, 15
Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 5
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Centronics Co., N.Y., 15
Ceramaseal Co., N.Y., 5
Constantin & Co., Inc., L. L., Route 46, Lodi, N.J., 10, 15
For details see ad on page 67
Tel: Prescott 7-0223
Corning Glass Works, N.Y., 15
Dolinko & Wilkens, Inc., N.J., 15
Edgerton, Germeshausen & Grier, Mass., 5
Electrical Industries, Div. Amperex Electronic Co., 44 Summer Ave., Newark 4, N.J., 10, 15
For details see ad on page 146
Tel: Hu 3-7112
Electro-Seal Corp., 946 North Ave., Des Plaines, Ill., 10
For details see ad on page 494
Tel: Rodney 3-0047
Electronic Mechanics, Inc., N.J., 5
Electronic Products Co., N.Y., 15
Electronic Service Corp., 221 Lake St., Oak Park, Ill., 5, 15
For details see ad on page 495
Tel: Village 8-4500
Electron-Radar Products, Ill., 5, 15
Fish-Schurman Corp., N.Y., 5, 15
Fusite Corp., Ohio, 10, 15
Garde Mfg. Co., 588 Eddy St., Providence 3, R.I., 10
For details see ad on page 506
Tel: Union 1-0604
General Ceramics Corp., Crows Mill Rd., Keasbey, N.J., 5
For details see ad on pages 172, 186
Tel: Valley 6-5100
General Electric Co., Apparatus Sales Div., N.Y., 15
General Electric Co., Wiring Device Dept., R.I., 15
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 5, 10, 15
For details see ad on page 495
Tel: Valley Stream 5-6363
Glass-Solder Eng., Calif., 5, 10, 15
Grieve-Hendry Co., Inc., Ill., Electric Ovens
Hamlin, Inc., Ill., 15
Heldor Bushing & Terminal Co., Inc., N.J., 10
Heldor Mfg. Corp., 238 Lewis St., Paterson, N.J., 5, 10, Neoprene & Silicone
For details see ad on page 508
Tel: MUlberry 3-7953
Hermaseal Co., Inc., Ind., 10, 15
Hermetic Seal Products Co., 29 South 6th St., Newark 7, N.J., 5, 10, 15
For details see ad on page 192
Tel: Market 3-9400
Hermetite Corp., Mass., 5, 10, 15
Houghton Labs., Inc., N.Y., 5, 15
Isolantite Mfg. Corp., N.J., 5
Kearfott Co., Inc., 1378 Main St., Clifton, N.J., Metal-Metal Rotary
For details see ad on page 414
Tel: LIttle Falls 4-1600
Livingston Electric Corp., N.J., 10
Lundey Assoc., Mass., 5, Ceramic-Gasket Type
Lurex Mfg. Co., N.J., 5, 10, 15
Mahoney Teletronic Labs., Inc., N.J., 5, 15
Martin & Co., H. S., Ill., 15
Metavac, Inc., N.Y., 15
Multi-Tron Lab., Ill., 5
Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 5
For details see ad on pages 94-95
Tel: Prescott 9-8866
Neo-Sil Corp., N.J., 10
Powell Co., Harold H., Pa., 15
Radiation Counter Labs., Inc., Ill., 15
Robco Mfg. Div., Pilot Int'l. Corp., N.Y., 10
Scientific Electronic Lab., N.J., 5, 15

(Continued on page 519)

Stupakoff

GLASS to METAL SEALS

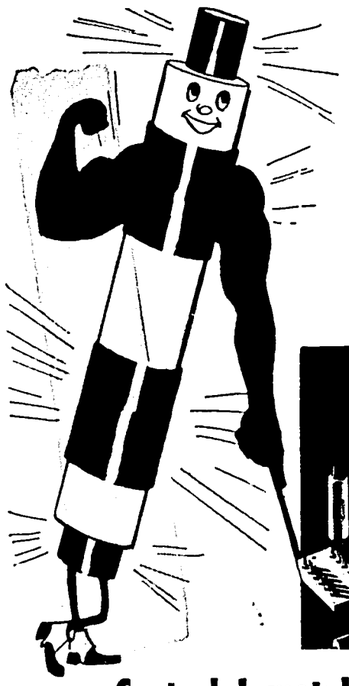
Stupakoff Kovar-Glass Seals are made with hard glass, assuring the highest degree of protection against thermal shock and weathering.

Stupakoff Kovar-Glass Seals are *not* mechanical compression seals, but develop a permanent and impervious bond through chemical interaction of the oxide of Kovar fused with hard boro-silicate glass.

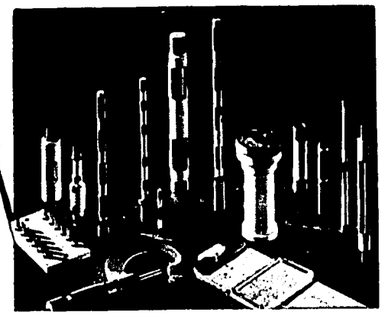
Kovar is the ideal metal for such seals because its expansion characteristics closely match those of hard glass.

Available in a wide variety of standard sizes and designs, and can be made in many special forms. We will gladly submit samples and quotations.

STUPAKOFF CERAMIC & MANUFACTURING CO.
LATROBE, PENNSYLVANIA
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Strength like beauty must be more than skin deep



Centralab metallized ceramics have a bond of 2000 psi

- Centralab's bond of non-ferrous metals to ceramic bodies is almost as strong as the material itself.
- Your precision requirements met by combining most desirable properties of metals and ceramic materials with JAN-specified characteristics, including:
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- Low loss at high frequency — loss factor at 1 MC — .007.
- High mechanical strength—18,000 psi, modulus of rupture.
- Harder than quartz — 7.5 Mohs' scale.
- Impervious to moisture or acids (.005%).

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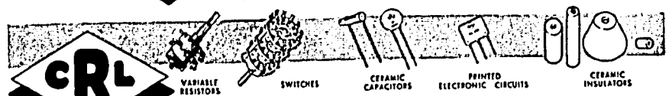
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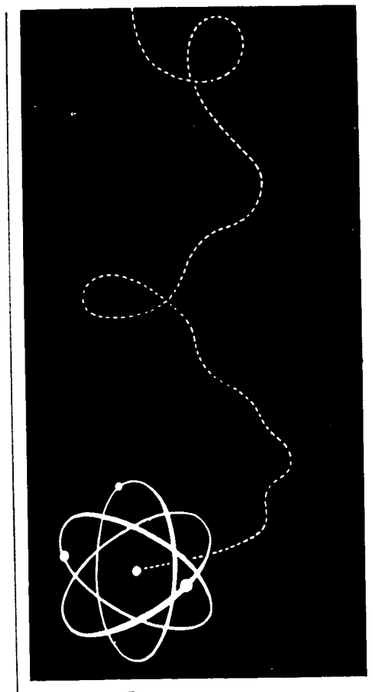
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New York 38, New York

8. Services and Raw Materials

82. Hermetic Seals.

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Sealtron Corp., Ohio, 5, 10, 15
Societe Francaise Radio Electrique, France, 5, 10, 15
Solar Mfg. Corp., Calif., 5
Sound Devices, Inc., N.Y., 5
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 5, 10, 15
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Sylvania Electric Prods. Inc., Electronics Div., Woburn, Mass., 5, 15
For details see ad on pages 9-14
Tel: Woburn 2-3500
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 5, 15
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Tel: JUdson 6-2424
Torwico Electronics, Inc., 965 Frelinghuysen Ave., Newark, N.J., 10, Silicone
For details see ad on page 295
Tel: Bigelow 8-0426
Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif., 10
For details see ad on page 232
Tel: TExas 0-5381
United Insulator Co., Ltd., England, 5, 10
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U. S. Electronic Corp., N.J., 15
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For details see ad on pages 126-127
Tel: WOodlawn 4-0370
Vacuum Tube Products, Calif., 15
Virginia Electronic Co., D.C., 10
Wakefield Industries, Inc., Ill., 15
Wheaton Co., T. C., N.J., 5, 10, 15

83. Insulating Materials.

5. Cambric sheeting **35. Glass bonded mica**
10. Cambric tubing **40. Plastic**
15. Ceramic **45. RF shielding materials**
20. Cotton tapes **50. Rubber**
25. Fiberglass tapes **55. Synthetics**
30. Fiberglass tubing

A-K Mfg. Co., Inc., Ill., 55, Tubing & Extruded Shapes
Accurate Electronics Corp., Ohio, 40
Acme Wire Co., Conn., 5, 20, 25, 55, Varnished
Allied Chem. & Dye Corp., Barrett Div., N.Y., 40
American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 15
For details see ad on page 136
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American Machine & Foundry Co., N.Y., 40
American Mica Insulation Co., N.J., Mica
American Molded Products Co., 2727 W. Chicago Ave., Chicago 22, Ill., Reel Plastic for Magnetic Tape
For details see ad on page 538
Tel: AR 6-3235

83. Insulating Materials.

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill., 40
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Tel: Bishop 2-1000
American Prods. Mfg. Co., Inc., La., 40
Anchor Plastics Co., Inc., N.Y., 40
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Baer Co., N. S., N.J., 40
Bakelite Co., Div. Union Carbide & Carbon Co., N.Y., 55
Bentley-Harris Mfg. Co., Pa., 10, 30, 40
Birnbach Radio Co., Inc., N.Y., 15, 40
Brand & Co., Inc., William, Conn., 5, 10, 20, 25, 30, 55
Brilhart Plastics Corp., P.O. Box 31, Old Country Rd., Mineola, L.I., N.Y., 40
For details see ad on page 539
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Cast Optics Corp., Conn., 55
Celanese Corp. of America, N.Y., Coil Film
Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 15
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Tel: Woodruff 2-9200
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Chicago Die Mold, Div. U. S. Rubber Co., Ill., 40, 55
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Cleveland Container Co., Ohio, 40
Collectron Corp., 216 E. 45 St., New York 17, N.Y., 40
For details see ad on page 297
Tel: MU 2-8473
Condor Radio Mfg. Co., Ariz., Coolers
Continental-Diamond Fibre Co., 16 Chapel St., Newark 111, Del., 25, 30, 35, 40
For details see ad on pages 63-66
Tel: Newark 531
Co-operative Industries, Inc., N.J., 45
Corning Glass Works, N.Y., 15, Glass
Crane Packing Co., Ill., 40
Dielect, Inc., N.J., 55, Film
Dow Chemical Co., Mich., 40
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Du Pont De Nemours & Co., Inc., E. I., Del., 55
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Electronic Mechanics, Inc., N.J., 15, 35, 40, 55
Emerson & Cuming, Inc., Mass., 40
Emerson Plastics Corp., N.Y., 40
Flexrock Co., Pa., 55
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Formica Co., The, Ohio, 40
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Fretco, Inc., Pa., 40
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For details see ad on page 507
Tel: Rockford 2-6695
General Ceramics Corp., Crows Mill Rd., Keasbey, N.J., 15
For details see ad on pages 172, 186
Tel: Valley 6-5100
General Electric Co., Chemical Div., Mass., 5, 35, 40, 50, 55
General Laminated Prods. Co., Inc., Ill., 5, 10, 20, 25, 30, 55
General Plastics Corp., N.J., 55
General Tire & Rubber Co., Indust. Prods. Div., Ind., 40, 50, 55
Germanium Prods. Corp., N.J., 55
Goodrich Chemical Co., B. F., Ohio, 40, 55
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Guild Electronics, Inc., N.Y., 40, 45
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Jablo Plastics Indust., Ltd., England, 40
Johns-Manville, N.Y., 55, Glass-Reinforced Asbestos, Sheet & Board Composites, Asbestos, and Glass
Kaywoff Prods. Co., Neb., 40, 55
Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 15
For details see ad on page 414
Tel: LIttle Falls 4-1600
Kellogg Co., M. W., Chem. Mfg. Div., P.O. Box 469, Danforth Ave., Jersey City 3, N.J., 40, 55
For details see ad on page 129
Tel: WOrth 4-6775
Kennedy & Co., D. S., 432 Main St., Cohasset, Mass., 30
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Kinney Co., Inc., Joseph, Pa., 45
La Moree, C. D., Calif., 5, 10, 20, 25, 30, 35, 40, 45
Lee Labs., Inc., P.O. Box 200, Genessee, Pa., 30
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Tel: Genessee 2567
Lurex Mfg. Co., N.J., 15, Glass
Maigne Co., O. J., N.Y., 40, 50
Mallory & Co., Inc., P. R., Ind., 15
Manning Paper Co., Inc., John A., N.Y., Paper
Mansol Ceramics Co., N.J., 15, 40
Markel & Sons, L. Frank, Box 267, Norristown, Pa., 10, 30, 40, 55
For details see ad on page 543
Tel: NO 5-2121

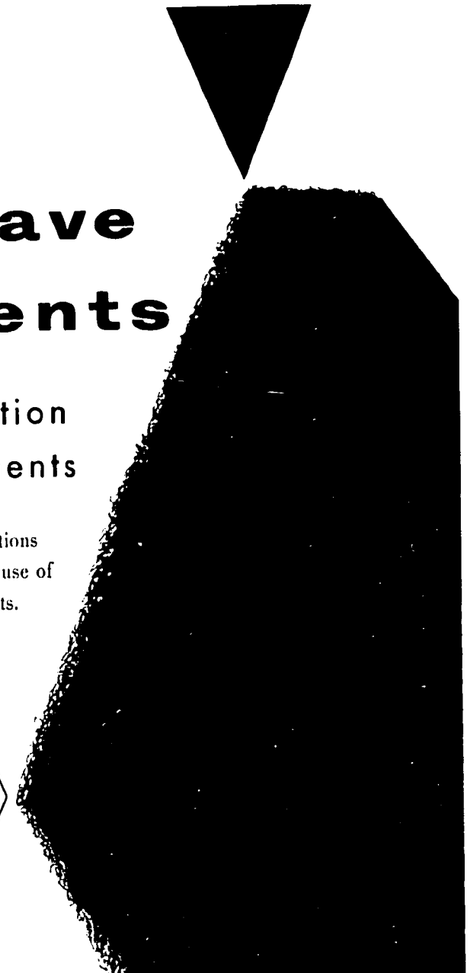
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	for 12 CM. Broadband Absorber	for 30 CM. Broadband Absorber	for 60 CM. Broadband Absorber

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8. Services and Raw Materials

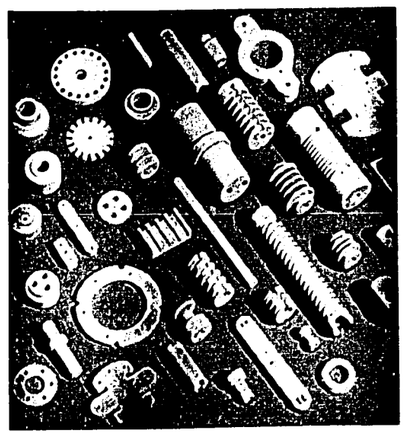
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McMillan Lab., Inc., Mass., 25, 40, 55
Mesa Plastics Co., Calif., 40
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Mica Fabricating Co., N.J., 5, 10, 15, 20, 25, 30, 35, 40, Mica
Mica Fabricators Assoc., N.Y., Raw Mica
Mica Insulator Co., N.Y., 5, 25, 40
Mica & Minerals Co., N.C., Mica
Minnesota Mining & Mfg. Co., N.J., 5, 10, 20, 25, 30, 35, 40, 50, 55
Mitchell-Rawd Insulation Co., N.Y., 5, 10, 20, 25, 30, 55
Molded Insulation Co., Pa., 30
Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 35, 55
For details see ad on pages 94-95
Tel: Prescott 9-8866
National Ceramic Co., 500 Southard St., Trenton 2, N.J., 15
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Tel: Export 4-5373
National Vulcanized Fibre Co., Del., 40
Natvar Corp., N.J., 5, 10, 25, 30, 40, Tubing & Styroflex
Neo-Sil Corp., N.J., Rubber
Oppenheimer Corp., N.Y., 55
Panelyte Div., St. Regis Paper Co., N.Y., 30, 40
Perfection Mica Co., Ill., 35, 45
Plastilight, Inc., Conn., 40, 55
Poly-Scientific Corp., Va., 15, 40, 55
Polymer Corp. of Pa., 126 N. 5 St., Reading, Pa., 40, 55
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Raybestos-Manhattan, Inc., N.J., 50, 55
Resin Industries, Inc., Calif., 40, 55
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Tel: Acton 3-7721
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Rogers Corp., Conn., 40
Romar Plastics, Inc., 1313 E. Main St., St. Charles, Ill., 40
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Tel: St. Charles 6571
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Silicone Insulation, Inc., N.Y., 55, Silicone Glass
Solar Mfg. Corp., Calif., 15
Spruce Pine Mica Co., N.C., 35, 40, Mica
Stackpole Carbon Co., Electronic Div., Tannery St., St. Marys, Pa., 45
For details see ad on pages 84-85
Tel: 41-521
Steward Mfg. Co., D. M., Tenn., 15
Stokes Molded Prods., N.J., 50
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 15
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Tel: Latrobe 1400
Sun Chem. Corp., Electro Tech Prods. Div., N.J., 5, 25, 35, 55, Silicone
Superior Porcelain Co., W.Va., 15
Superior Steatite & Ceramic Corp., 85 West Forest Ave., Englewood, N.J., 15
For details see ad on page 521.
Tel: Englewood 3-4555
Surprenant Mfg. Co., 199 Washington St., Boston 8, Mass., 40
For details see ad on page 485
Tel: 2180
Syncor Products Co., 26 Irving Court, P.O. Box 51, Malden 48, Mass., Fused Quartz
For details see ad on page 499
Tel: MAlden 2-1364
Taylor Fibre Co., Pa., 30, 40
Technical Material Corp., N.Y., 40
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Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 15
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United States Gasket Co., 611 N. 10 St., Camden 1, N.J., 40, 55
For details see ad on pages 126-127
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Varflex Corp., N.Y., 10, 30, 40
Warren Wire Co., Vt., 55
Wilson & Co., G. C., W.Va., 40
Wisconsin Porcelain Co., Wis., 15

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for electrical and electronic applications



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84. Laboratories & Custom Builders.

5. Individual item builders
10. Pilot run plants
15. Research & development labs.
20. Testing & certifying organizations

A. R. F. Products, Inc., Ill., 5, 10, 15
A. R. & T. Electronics, Inc., Ark., 15
Ace Electronics Associates, 125-129 Rogers Ave., Somerville 44, Mass., 5, 15
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Tel: SO 6-5130
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Tel: Prescott 8-3687

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Ahrendt Instrument Co., Md., 15
Air Associates, Inc., N.J., 5, 15
Airborne Instruments Lab., N.Y., 5, 10, 15
Aircraft Armaments, Inc., Md., 5, 10, 15
Airpax Products Co., Md., 5, 15, 20
Airphone Co., Inc., Fla., 5, 15
Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5, 15
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Tel: Linden 3-1000
Airtronix Development Corp., N.Y., 5
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Alco Electronics Mfg. Co., Mass., 5
Alcor Electronics Corp., N.Y., 5
Alden Electronic & Impulse Recording Equip. Co., Washington St., Westboro, Mass., 15
For details see ad on page 296
Tel: Westboro 467
Alden Systems Co., 11 Alden Research Center, Westboro, Mass., 10
For details see ad on page 296
Tel: Westboro 377
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Allard Instrument Corp., N.Y., 5, 10, 15
Allied Allegri Co., Inc., N.J., 5, 15
Altec Lansing Corp., Calif., 5, 15
American Electronic Labs., Inc., Pa., 5, 10, 15
Amer. Mach. & Found., Electronics Div., Mass., 5
American Radio & Television, Inc., Ark., 15
American Television Mfg. Corp., Ill., 5, 15
Anchor Specialty Mfg. Co., N.J., 5, 15
Anetsberger Brothers, Inc., Ill., 15
Anton Electronic Labs., Inc., 1226 Flushing Ave., Brooklyn 37, N.Y., 5, 10, 15
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Tel: EV 6-5715
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Arc Equipment Co., N.J., 5, 10, 15
Arenberg Ultrasonic Lab., Mass., 15
Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 20
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Associated Eng. Corp. of Boston, Mass., 5, 15
Audio Consultants, N.Y., 5
Audio Corp. of America, N.J., 5, 10
Austin Co., N.Y., 5, 15
Authorized Manufacturers Service, N.Y., 5
Automatic Mfg. Corp., N.J., 15

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Automatic Production Research, 10 Choate Ave., Pleasantville, N.Y., 15
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Tel: PL 2-3587
Auto-Test, Inc., Ill., 5, 10, 15
Avimo, Ltd., England, 15
Baker Co., George W., Conn., 5, 10

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For details see ad on page 522
Tel: Independence 3-3306
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Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif., 15
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Tel: 5521
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Bibbero, Robert J., N.Y., 15, Automation
Biophysical Instruments, Inc., Pa., 15
Bjorksten Research Labs., Inc., Wis., 15
Blackstone Electric Co., Ill., 15
Bliss Electronic Corp., N.J., 5, 10
Blue M. Electric Co., Ill., 15
Boehme, Inc., H. O., N.Y., 5, 10, 15
Boeing Airplane Co. Indust. Prods. Div., Wash., 15
Bogen Co., Inc., David, N.Y., 5
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J., 15
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Tel: Lambert 5-2200
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Brownell, H. Russell, N.Y., 15
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Brunswik Instruments, N.J., 5, 15
Brush Electronics Co., Ohio, 15
Buck Engineering Co., Inc., N.J., 5
Budelman Radio Corp., Conn., 5
Bunnell & Co., J. H., N.Y., 5
Burroughs Corp., Electronic Instr. Div., Dept. P-1, 1209 Vine St., Philadelphia 7, Pa., 5, 15
For details see ad on page 458
Tel: LO 7-1401
C.G.S. Laboratories, Inc., Conn., 15
Calbest Eng. & Electronics Co., Calif., 5, 10
Caltron Prods. Co., Calif., 5
Canadian Aviation Electronics, Ltd., Canada, 5, 10, 15, 20
Canadian Radium & Uranium Corp., N.Y., 15
Canadian Research Institute, Canada, 5, 10, 15, 20
Canoga Corp., Calif., 5, 15
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Cinematic Developments Co., Calif., 15
Clegg Laboratories, Inc., N.J., 5, 10, 15, 20
Codetyper Laboratories, N.Y., 5, 15
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Communication Equip. & Engr. Co., Ill., 5
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., 5, 10
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Tel: PL 4-5502
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For details see ad on page 403
Tel: Belmont 5-6161
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Connecticut Electr. Alarm Systems, Conn., 5, 10
Constantine Eng. Labs. Co., Island Ave., Mahwah, N.J., 15
For details see ad on pages 288, 380
Tel: Ramsey 9-1123
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Control Electronics Co., Inc., 1927 New York Ave., Huntington, L.I., N.Y., 15
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Corbin Corp., Md., 5, 10, 15, 20
Cornell Aeronautical Lab., Inc., N.Y., 15
Cossor (Canada) Ltd., 301 Windsor St., Halifax, N.S., Canada, 5, 15
For details see ad on page 157
Tel: HAlifax 4-6487
Crest Laboratories, Inc., N.Y., 10, 15
Crosby Laboratories, Inc., Robbins Lane, Hicksville, L.I., N.Y., 15
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Tel: HIcksville 3-3191

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

8. Services and Raw Materials

84. Laboratories & Custom Builders.

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RADIO-ELECTRONIC RESEARCH
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HICKSVILLE 3-3191

Crown Engineering, N.M., 5, 10, 15
Crystal Research Prods., N.J., 5
Cubic Corp., Calif., 5, 10, 15
Dade Brothers, Inc., Eng. & Mfg. Div., N.Y., 5, 10, 15
Dale Products, Inc., 1318 28 Ave., Columbus, Neb., 5, 15
For details see ad on pages 118-119
Tel: Columbus 2139
Danby Radio Corp., Pa., 5
Daven Company, N.J., 5, 15

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Davidoff, Charles, 198 Broadway, New York 38, N.Y., 15, 20
For details see ad on page 523
Tel: DI 9-3917
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Deen Associates, Inc., 2 John St., New York 38, N.Y., 15
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De Ment Labs., Ore., 15, 20
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Designers for Industry, Inc., Ohio, 5, 10, 15
Devol Research Co., Conn., 15
Devtronics, Inc., N.J., 5, 15
Diamond Microwave Corp., Mass., 5, 15
Dietz Co., Henry G., Coral Design Div., N.Y., 5
Donner Scientific Co., Calif., 15
Dorne & Margolin, Inc., N.Y., 15
Douglas Labs., Inc., N.Y., 5, 10, 15
Dubrow Development Co., 235 Penn St., Burlington, N.J., 5, 15, 20
For details see ad on page 445
Tel: Burlington 3-0446
Dunn Engineering Assoc. Inc., Mass., 5, 15
Eder Engineering Co., Wis., 5, 10, 15, 20
Edgerton, Germeshausen, & Grier, Mass., 5, 15
Edmar Communication Co., Pa., 5
Egan Lab., N.Y., 5, 15
Eichwald & Co., Inc., B, N.Y., 5
El Mec Labs., Inc., N.J., 5, 10, 15
El-Tronics, Inc., Pa., 5, 15
Eldico of N.Y., Inc., 72 E. 2nd St., Mineola, L.I., N.Y., 5, 10, 15, 20
For details see ad on page 487
Tel: Pioneer 6-5212
Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill., 5
For details see ad on page 383
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Electrical Device Mfg. Co., N.J., 5, 10, 15
Electro Craft Industries, Inc., Conn., 5, 10, 15
Electromec, Inc., Calif., 5, 10, 15
Electro-Mechanical Research, Inc., Conn., 15

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Canal 6-1337

Electro-Metric Instrument Co., 241 Centre St., New York 13, N.Y., 5, 15
For details see ad on page 523
Tel: Canal 6-1337
Electro-Physics Co., N.Y., 5, 15
Electro-Seal Corp., 946 North Ave., Des Plaines, Ill., 5
For details see ad on page 494
Tel: Rodney 3-0047
Electro-Search, 4337 N. 5th St., Philadelphia 40, Pa., 15, 20
For details see ad on page 488
Tel: GL 5-5353
Electro Switch Corp., Mass., 5, 15
Electrona Corp., N.J., 5, 15
Electronic Eng. Co. of California, Calif., 5, 10, 15
Electronic Measurements Co., Inc., Lewis St. & Maple Ave., Eatontown, N.J., 5
For details see ad on page 340
Tel: Eatontown 3-0300
Electronic Products Co., N.Y., 15
Electronic Research Mfg. Corp., Ohio, 5, 10, 15
Electronic Specialty Co., Calif., 15
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 5, 10, 15
For details see ad on page 467
Tel: Chestnut Hill 7-6800
Electronics for Medicine, Inc., N.Y., 5
Electronics Research, Inc., Ind., 15
Electronics Research, N.J., 15
Electron-Radar Products, Ill., 15
Elk Electr. Laboratories Inc., N.Y., 10, 15
Elm Laboratories, N.Y., 5, 15
Emerson & Cuming Inc., Mass., 15
Empire Devices Products Corp., 38-15 Bell Blvd., Bayside 61, L.I., N.Y., 15
For details see ad on page 459
Tel: BA 4-8500
Empire State Laboratories, Inc., N.Y., 5, 15
Engineered Instruments, Calif., 10, 15
Engineering Development, Neb., 5, 10, 15
Engineering Research Assoc., Div. Remington Rand, Inc., Minn., 5, 15
Engineering Research Corp., Colo., 5
Engineering & Research Corp., Md., 5, 15
Equipment and Service Co., Tex., 5
Erco Radio Labs., Inc., N.Y., 5, 10, 15
Erdco Engineering Corp., Ill., 5, 15, 20
Erwood, Inc., Ill., 5, 10, 15
Falstrom Co., N.J., 5
Farmer Electric Co., Mass., 10
Federal Telecom. Labs., Div. I.T.&.T., N.J., 10, 15
Feiner & Sons, Inc., P, N.Y., 10
Ferranti Electric, Ltd., Res. Dept., Canada, 5, 15
Ferrara, Inc., Mich., 15
Flamboro Instrument Co., Canada, 5
Fog-O-Scope, Inc., Ill., 5
Ford Instr. Co., Div. of Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y., 15
For details see ad on page 415
Tel: ST 4-9000
Franklin Electronics, Inc., Pa., 5, 15
Franklin Institute Labs. for Res. & Dev., Pa., 5, 15

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Frederick Research Corp., Bethesda 14, Md., 15
For details see ad on page 523
Tel: OLiver 4-5897
Freed Electronics & Controls Corp., N.Y., 5, 10, 15
Furst Electronics, Ill., 5, 10
Gabriel Labs., Div. the Gabriel Co., Mass., 15
Gadgets, Inc., Ohio, 5, 10
Galbraith & Son Elec. Corp., C. C., N.Y., 5
Gallant Engineering Co., D.C., 5
Gallay, Harris, N.J., 5, 15
Gates Radio Co., Ill., 5, 15
General Communications, Wis., 5, 15
General Devices, Inc., P.O. Box 253, Princeton, N.J., 5, 15
For details see ad on page 376
Tel: Princeton 1-5010
General Elec. Co., Apparatus Sales Div., N.Y., 15
General Electrosonics, Inc., N.Y., 5, 10, 15
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y., 20
For details see ad on page 495
Tel: Valley Stream 5-6363
General Precision Lab., Inc., 63 Bedford Rd., Pleasantville, N.Y., 5, 10, 15
For details see ad on page 188
Tel: Pleasantville 2-2000
Geotechnical Corp., Tex., 5, 10, 15
Gillett & Assoc., Glenn D., D.C., 15
Glens Falls Lab., Inc., N.Y., 5, 15
Gombos Co., Inc., John, N.J., 5
Gorrell & Gorrell, N.J., 5, 15
Grason-Stadler Co., Mass., 5, 15
Haller, Raymond & Brown, Inc., Pa., 5, 15
Hamlin, Inc., Ill., 15

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Hanson-Gorrill-Brian, Inc., N.Y., 5, 10, 15
Harmon Electronics Co., Mo., 5, 10, 15
Heller Co., Gerald K., Md., 5
Hillyer Instrument Co., N.Y., 5, 15
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 15
For details see ad on page 488
Tel: CHelsea 2-7855
Hoisington, David B., Calif., 5, 15
Holland Electronics, N.Y., 5, 15
Honeycomb Co. of America, Inc., Conn., 5
Hopkins Engineering Co., Calif., 15
Huggins Labs., Inc., 711 Hamilton Ave., Menlo Park 2, Calif., 15
For details see ad on page 397
Tel: DA 2-0346
Hughes Res. & Dev. Labs., Calif., 15
I-T-E Circuit Breaker Co., Pa., 5, 15
Impedance, Inc., 9 Alan Ct., Farmingdale, L.I., N.Y., 5, 15
For details see ad on page 431
Tel: FArmingdale 2-3606
Indianapolis Electronic School, Ind., 5, 15, 20
Industrial Dev. Labs., Inc., N.J., 10, 15
Industrial Electr. of Canada, Ltd., Canada, 5
Industrial Research Labs., Md., 15, 20
Industrial Television, Inc., N.J., 15
Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y., 5, 10, 15
For details see ad on page 471
Tel: GR 3-4684
Infra Electronic Corp., 555 Eagle Rock Ave., Roseland, N.J., 5, 10, 15
For details see ad on page 335
Tel: Caldwell 6-4300
Instrument Development Labs., Inc., Mass., 15
Instruments For Industries, N.Y., 5, 15
Instrument Labs., Ill., 5, 15, 20
Instrument Labs., N.Y., 5, 15
International Radiant Corp., 40 Matinecock Ave., Port Washington, L.I., N.Y., 5, Environmental Test Equip.
For details see ad on page 440
Tel: Port Washington 7-3184
International Testing Service, Mich., 5, 10, 15, 20
Jacobs Instr. Co., Md., 5, 10, 15
Kahn Res. Labs., N.Y., 15
Kaiser Metal Prods. Co., Pa., 5, 15
Kay Electric Co., 14 Maple Ave., Pine Brook, N.J., 5, 15
For details see ad on page 436
Tel: CAldwell 6-4000
Kearfott Co., Inc., 1378 Main Ave., Clifton, N.J., 15
For details see ad on page 414
Tel: LIttle Falls 4-1606
Kelk & Co., G. F., Canada, 5, 15
Kepco Labs., N.Y., 5, 15
Ketay Mfg. Corp., N.Y., 15, 20
Keystone Electronics Co., Dept. P-7, 114 Manhattan St., Stamford, Conn., 15
For details see ad on page 310
Tel: STamford 4-9504
Kihchel Communications Service, Pa., 5, 20
Kilpatrick Electr. Lab., Pa., 5, 15
King, Inc., Albert D., Mass., 5, 15, 20
Kip Electr. Corp., Conn., 15
Korb Eng. & Mfg. Co., Mich., 5, 10, 15
Kramer, Ambrose W., D.C., 15
Kuss Mach. Tool & Die Co., Pa., 5
Laboratory For Electronics, Inc., Mass., 15, 20
Lafayette Labs., Inc., N.Y., 5
Lambda Electronics Corp., N.Y., 10
Lavoie Labs., Inc., Matawan-Freehold Rd., Morganville, N.J., 10, 15
For details see ad on page 312
Tel: MAtawan 1-2600
Lear, Inc., Calif., 5, 15
Lectroman, Inc., N.Y., 5, 15
Lee Labs, Inc., P.O. Box 200, Genessee, Pa., 15
For details see ad on pages 349, 431
Tel: Genessee 2367
Lehigh Valley Electr. Engr. & Mfg. Co., Pa., 5, 10, 15
Leonard Elec. Prods. Co., Inc., N.Y., 15
Levinthal Electr. Prods., Inc., Calif., 15
Little, Inc., Arthur D., Mass., 5, 10, 15, 20
Livingston Elec. Corp., N.J., 15
Long Eng. Co., Inc., N.C., 5
Lorain County Radio Corp., Ohio, 5
Loral Electronics Corp., Dept. ID54, 794 E. 140 St., New York 54, N.Y., 10, 15, 20
For details see ad on page 198
Tel: CY 2-1800
Lubcke, Consulting TV Eng., H. R., Calif., 15
Lurex Mfg. Co., N.J., 5, 15
Lyman Electr. Corp., Mass., 5, 10
Lynmar Engineers, Inc., Pa., 5, 15
Lysco Mfg. Co., Inc., N.J., 5
Mackenzie Prods. Co., Conn., 5, 10, 15
MacLeod & Hanopol, Inc., Mass., 10
Magnetics Research Co., 142 King St., Chappaqua, L.I., N.Y., 5, 10, 15
For details see ad on pages 272, 387
Tel: CH 1-0052
Magnex Corp., N.Y., 5, 10, 15
Manson Labs., Conn., 5, 15
Marchand Electr. Labs., Conn., 15
Marconi's Wireless Telegraph Co., Ltd., England, 15
Marine Elec. Corp., N.Y., 5, 15
Marsh-Theiss, Inc., N.Y., 5, 10, 15
Marshall Eng., Electr. Div., Calif., 5
Martin & Co., H. S., Ill., 5
McKenna Labs., Calif., 5, 15
McMillan Lab., Inc., Mass., 10, 15
McNeal, J. D., Conn., 5, 10
Measurement Eng., Ltd., Canada, 5, 10, 15

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Medico-Physical Labs., Canada, 15
Melpar, Inc., Va., 5, 10, 15, 20
Melstrom Mfg. Corp., N.J., 5, 10, 15
Mendelsohn Speedgun Co., Inc., Fourth Ave., Haskell, N.J., 5, 10, 15
For details see ad on page 301
Tel: Terhune 5-3224
Menlo Res. Lab., Calif., 5, 15
Meridian Metalcraft, Inc., 213 W. Whittier Blvd., Whittier, Calif., 15
For details see ad on page 432
Tel: Raymond 3-1508
Metal Prods. Co., Tenn., 5, 10, 15
Meyer & Co., Hugo, N.Y., 5, 15
Meyers, James G., N.Y., 5, 15
Michel Mfg. Co., Wis., 5, 10, 15
Microdot Div., Felts Corp., Calif., 15
Micromech Mfg. Corp., N.J., 5
Micronics, Inc., 1603 W. 135 St., Gardena, Calif., 15, 20
For details see ad on page 202
Tel: Plymouth 4-2881
Midwest Res. Institute, Mo., 15
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5
For details see ad on page 548
Tel: MAlden 4-4108
Minnesota Electronics, Minn., 15
Mission-Western Engineers, Inc., Calif., 5, 15

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8. Services and Raw Materials

84. Laboratories & Custom Builders.

Molded Insulation Co., Pa., 5, 15
Morecroft, Design Engineer, John H., Calif., 5, 10, 15
Multi-Tron Lab., Ill., 10, 15
Naber Aviation Electr. Service, J. S., Ill., 5, 15
Narda Corp., 66 Main St., Mineola, L.I., N.Y., 15
For details see ad on page 461
Tel: Pioneer 6-4560
National Electr. Labs., Inc., D.C., 15, 20
National Radio Res. Labs., N.Y., 5, 15
Naybor Labs., E. V., N.Y., 5, 10, 15, 20
New Jersey Electronics Corp., 345 Carnegie Ave., Kenilworth, N.J., 5
For details see ad on page 389
Tel: Chestnut 5-8038
New Rochelle Tool Corp., N.Y., 15, 20
New York Testing Labs., N.Y., 15, 20
Newton Co., The, Conn., 5, 10, 15
Newton Scientific Co., Mass., 5
Nilsson Elec. Lab., Inc., N.Y., 5, 20
Northeast Scientific Co., 1 Gray St., Cambridge 38, Mass., 5, 15
For details see ad on page 344
Tel: KI 7-0469
Optionic Res., Inc., Mass., 15
Oregon Electr. Mfg. Co., Ore., 5
Orthon Corp., 196 Albion Ave., Paterson 2, N.J., 5, 10
For details see ad on page 273
Tel: MUlberry 4-5858
Ostlund, Consulting Radio Eng., E. M., Andover, N.J., 5, 15
For details see ad on page 489
Tel: LAke Mohawk 8635
Ossian Mfg. Co., Ind., 5, 15, 20
Otis Elevator Co., Electr. Div., N.Y., 15
P. C. A. Electr., Inc., Calif., 15
P. M. Industries, Conn., 5
P.S.C. Applied Res., Ltd., Canada, 15
Parsons Co., Ralph M., Calif., 5, 10, 15
Patricks Industries, Mich., 5, 15
Peay & Assoc., Texas, 5, 10, 15, 20

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Penn East Eng. Corp., Box 240, Kutztown, Pa., 10, 15
For details see ad on pages 203, 293
Pennsylvania Testing Lab., Pa., 20
Penntronics, Pa., 5
Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y., 5, 10, 15
For details see ad on page 344
Tel: NE 6-3342
Phebco, Inc., Md., 5, 10, 15
Philbrick Researches, G. A., Mass., 15
Photogenic Machine Co., Ohio, 5
Pickard & Burns, Inc., 240 Highland Ave., Needham 94, Mass., 5, 10, 15, 20
For details see ad on pages 463, 489
Tel: NEedham 3-3345
Pioneer Elec. & Res. Corp., Ill., 5, 10, 15
Plastics & Electr. Corp., N.Y., 5, 15
Poly-Scientific Corp., Va., 5, 10, 15
Polytechnic Res. & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 5, 15
For details see ad on page 166
Tel: ULster 2-6800
Polytronics Co., Canada, 5, 15
Potter Instr. Co., Inc., N.Y., 5, 15
Power Designs, Inc., N.Y., 5
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 5, 10, 15
For details see ad on page 345
Tel: ES 5-9435
Precision Associates, Inc., N.Y., 10
Process & Instr., N.Y., 5, 10, 15
Production Research Corp., Claremont Ave., Thornwood, N.Y., 5, 10, 15
For details see ad on page 524
Tel: PLeasantville 2-2767
Pulse Techniques, Inc., N.J., 5, 15
R-C Scientific Instr. Co., Inc., Calif., 15
RCA Labs, N.Y., 15
R. M. S. Assoc., Inc., N.Y., 5, 10, 15
R.S. Electr. Corp., Calif, 5, 15
Racker Co, Joseph, N.Y., 15
Radiaphone Co., Calif., 5, 15
Radiation, Inc., P.O. Drawer Q, Melbourne, Fla., 10, 15
For details see ad on page 525
Tel: MElbourne 800
Radiation Counter Labs., Inc., Ill., 15
Radiation Res. Corp., Fla., 5, 15
Radio City Products Co., Inc., Pa., 5
Radio Eng. Co., N.Y., 5, 10, 15
Radio Eng. Products, Ltd., Canada, 15
Radio Instrument Labs., N.J., 5, 15

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Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 5, 10, 15, 20
For details see ad on page 525
Tel: Oregon 5-0085
Radiomarine Corp. of America, N.Y., 5
Radionic Res. Div. of Techmair, Ltd., Canada, 5
Ramo-Wooldridge Corp., 6316 W. 92 St., Los Angeles 45, Calif., 15
For details see ad on page 232
Tel: Oregon 8-7161
Raymond Eng. Lab., Inc., Conn., 10, 15
Reflectone Corp., The, Conn., 15
Remington Rand, Inc., Eng. Res. Assoc., Minn., 5, 15
Resdel Eng. Corp., Calif., 5
Rese Eng., Inc., Pa., 5, 15
Research, Inc., Minn., 5, 10, 15
Research Electronics, Pa., 5, 15
Research Instrument Co., Inc., N.Y., 5, 10, 15
Rich Electr., Inc., Fla., 5, 10, 15, 20
Rich-Roth Labs., Conn., 5, 15
Ring & Assoc., A. D., D.C., 5, 15, 20
Robinette Co., W. C., Calif., 15
Rolab Photo Science Labs Studios, Conn., 5, 15, 20
Ronar, Inc., Ill., 5, 10, 15
Rosenberg Associates, Paul, 100 Stevens Ave., Mount Vernon, N.Y., 15
For details see ad on page 489
Tel: Mount Vernon 7-8040
Ross Consulting Engineer, D. K., Mo., 15
Royal Electr. Co., D.C., 5, 15
Rutishauser Corp., Calif., 15
Sanders Assoc., Inc., N.H., 15
Saratoga Industries, N.Y., 15, 20
Saville Ra Tele Nics Labs., Ky., 15
Scala Radio Co., Calif., 5
Schutter Mfg. Co., Carl W., N.Y., 5, 15
Scientific Instrument Labs., N.Y., 5, 10, 15
Self-Winding Clock Co., Inc., N.Y., 15
Servo Corp. of America, Dept. IY, 20-20 Jericho Tpke., New Hyde Park, L.I., N.Y., 5, 15
For details see ad on page 236
Tel: FI 7-2810
Sherwood Co., Robert H., N.Y., 5, 15
Shores Lab., N.Y., 15
Sierra Electr. Corp., Calif., 5, 15
Sivers Lab., Sweden, 5, 15
Skiatron Electr. & TV Corp., N.Y., 5, 15

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8. Services and Raw Materials

84. Laboratories & Custom Builders.

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Smith Mfg. Co., Nathan R., Calif., 5
Smith-Meeker Eng. Co., N.Y., 5, 15
Sonex, Inc., Pa., 5, 15
Southwest Prods., Inc., Texas, 5, 10, 15
Southwest Res. Institute, Texas, 15
Southwestern Indust. Electr. Co., Texas, 5, 15
Spellman Television Co., Inc., 3029 Webster Ave., New York 67, N.Y., 5
For details see ad on page 344
Tel: KI 7-0306
Spencer-Kennedy Labs., Inc., Mass., 15
Spera Electr. Labs., N.Y., 5, 10, 15
Square Root Mfg. Corp., N.Y., 5, 10, 15
Standard Coil Prods. Co., Inc., Calif., 5, 15
Standard Electr. Res. Corp., N.Y., 5, 15, 20
Statistical Instr. Co., N.Y., 5, 15
Stavid Eng., Inc., N.J., 5, 10, 15
Sterling Transformer Corp., N.Y., 5, 10, 15
Stockman Electr. Res. Co., Mass., 5, 15
Strandberg Eng. Labs., N.C., 5, 15
Stuedeman, W., N.J, 5
Suckle Electr. Co., N.J., 5
Summit Electr., Inc., N.J., 5, 10, 15
Superex Electr. Corp., N.Y., 5, 10
Sylvania Electric Prods. Inc., Boston Eng. Lab., 70 Forsyth St., Boston 15, Mass., 15
For details see ad on pages 9-14
Tel: KEnmore 6-8900
Szekely & Assoc., Inc., O. E., Pa., 5, 15
T. L. G. Elec. Corp., N.Y., 5, 15
Taller & Cooper, N.Y., 5
Tarzian, Inc., Sarkes, Tuner Div., Ind., 5
Technical Dev. Corp., Calif., Package Circuitry
Technical Material Corp., N.Y., 5, 15
Technicraft Labs., Inc., Conn., 5, 15
Technograph Printed Electr., Inc., N.Y., 15
Tecon, Inc., N.Y., 5, 15
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 5, 15
For details see ad on page 224
Tel: AMityville 4-4446
Telectron Co., Ohio, 5, 15
Telephonics Corp., N.Y., 15
Teleregister Corp., Conn., 5, 15
Telescreen Corp., Conn., 5, 15
Teletronic Labs., Inc., Calif., 5
Teletronics Labs., Inc., N.Y., 5, 10, 15
Tensitron, Inc., Mass., 5, 10, 15, 20
Thermistor Corp. of America, N.J., 5, 15
Thompson Products, Inc., Dept. PI, Electronics Div., 2196 Clarkwood Rd., Cleveland 3, Ohio, 15
For details see ad on page 235
Tel: HE. 1-6765
Torngren Co., Inc., C. W., 236 Pearl St., Somerville 45, Mass., 5
For details see ad on page 425
Tel: Monument 6-3250
Toth, Albert F., N.Y., 5, 15
Trans Electro Prods. Corp., Pa., 5, 10, 15, 20
Transformer Technicians, Inc., Ill., 5
Transistor Prods., Inc., Mass., 15
Transvision, Inc., N.Y., 5, 10, 15
Tri-Dex Co., Calif., 5, 10
Triumph Mfg. Co., Ill., 5, 10, 15
Ultradyne Eng. Labs., Inc., N.M., 5, 15
Ultrasonic Corp., Mass., 5, 10, 15
United States Gasket Co., 611 N. 10 St., Camden 1, N.J., 5, 15
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
United States Testing Co., Inc., N.J., 5, 15, 20
United Technical Labs., N.J., 5
Vacuum-Electr. Eng. Co., N.Y., 5
Vacuum Tube Products, Calif., 15
Van Deventer, Inc., H. R., N.Y., 15
Varian Assoc., 661 Hanson Way, Palo Alto 2, Calif., 15
For details see ad on page 398
Tel: DAvenport 5-5631
Varo Mfg. Co., Inc., Tex., 15
Vectron, Inc., 402 Main St., Waltham 54, Mass., 10, 15
For details see ad on pages 366, 462
Tel: WAltham 5-8700
Virginia Electr. Co., D.C., 5, 15
Vocaline Co. of America, Inc., Conn., 5, 10, 15
Waler Elec. Co., N.Y., 5, 15
Walkirt Co., Calif., 5, 15
Wallind-Pierce Corp., Calif., 5, 15
Walsh Eng. Co., N.J., 15

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Wang Labs., 296 Columbus Ave., Boston 16, Mass., 15
For details see ad on page 407
Tel: KE 6-0624
Washington Technological Assoc., Inc., D.C., 15
Waveforms, Inc., N.Y., 5, 15
Waveguide, Inc., Calif., 5, 10
Weathers Industries, Inc., N.J., 15
Weldon & Carr Dev. Eng. Corp., D.C., 15
West Coast Electr. Co., Calif., 15
Western Coil Prods. Co., Inc., Calif., 5, 15
Western Gear Works, P.O. Box 182, Lynwood, Calif., 5
For details see ad on page 74
Westlabs, Inc., Calif., 5, 15
Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y., 5, 15
For details see ad on page 490
Tel: HUnter 2-7876
White & Son, James L., N.J., 5
White Industries, Inc., N.Y., 5
White Electron Devices, Inc., Roger, Route 17 & Erie R.R., Ramsey, N.J., 5, 10, 15
For details see ad on page 399
Tel: Ramsey 9-1660
White Ridgers Elec. Co., Mo., 15
Williams, Consulting Eng., E. M., Pa., 15, 20
Workshop For Electr., Okla., 5, 10, 15
Wunderlich Radio Co., N.Y., 5, 10, 15
Yellow Springs Instrument Co., Inc., Ohio, 15

85. Lacquers, Paints, Compounds & Waxes.

3. Aluminizers
5. Coil dope
10. Conducting paint
15. Finishing & protecting lacquer
20. Fungus preventatives
25. Moisture proofing
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35. Silicones

Acheson Colloids Co., Div. Acheson Ind., Mich., 10
Acme Wire Co., Conn., 15, 20, 25, 30
Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J., 30
For details see ad on page 491
Tel: Hemlock 6-2230
American Machine & Foundry Co., N.Y., 35
American Prods. Mfg. Co., Inc., La., 5, 15, 25, 30
Armstrong Cork Co., Pa., 30
Bakelite Co., Div. Union Carbide & Carbon Co., N.Y., 25
Barrett Div., Allied Chem. & Dye Corp., N.Y., 35
Biwax Corp., 3445 Howard St., Skokie, Ill., 25, 30
For details see ad on page 526
Tel: OR 3-1050
Borden Co., Chemical Div., N.Y., 30, Bonding Compounds
Borthig Co., Inc., George C., N.J., 5, 10, 15, 20, 25, 30, Masking Compound
Canadian Industries, Ltd., Canada, 5, 10, 15, 25
Canadian Radium & Uranium Corp., N.Y., Luminous
Chemical Dev. Corp., Mass., 10, 25, 30, 35
Ciba Co., Inc., N.Y., 30
Communication Prods. Co., Inc., State Hwy. 79, Marlboro, N.J., 5, 15, 20, 25, 30
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Dow Corning Corp., Mich., 35
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Emerson & Cuming, Inc., Mass., 10, 30
Federal Telecomm. Labs., Div. I.T.&T., N.J., 30
Fidelity Chemical Products Co., N.J., Chemical Wire Stripper
Forman Co., Inc., B. G., N.Y., 30
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 5, 10, 15, 20, 25, 35
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Glyco Prods. Co., Inc., N.Y., 25, 30
Handy & Harman, N.Y., 10

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---COMPOUNDS

Zophar Waxes, resins and compounds to impregnate, dip, seal, embed, or pot electronic and electrical equipment or components of all types; radio, television, etc. Cold flows from 100°F. to 285°F. Special waxes non-cracking at —76°F. Compounds meeting Government specifications plain or fungus resistant. Let us help you with your engineering problems.

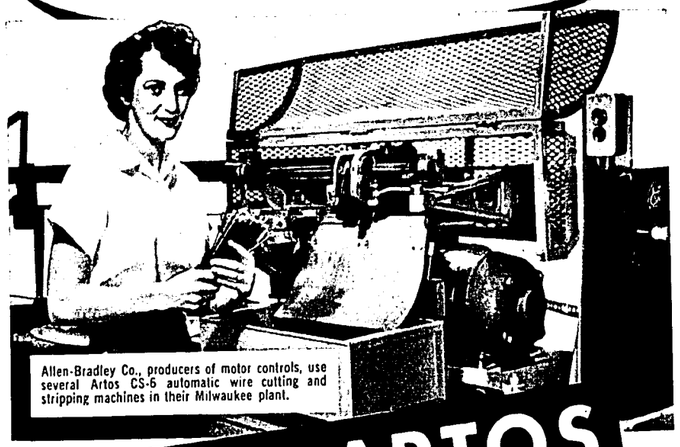
108 YEARS
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Brooklyn 32, N. Y.

Hardman Co., Inc., H. V., N.J., 5, 25, 30
Haynes Labs., Inc., C. W., Mass., 5, 10, 15, Plastic Cements
Hi-Test Chemical Corp, N.Y., 30
Honeycomb Co. of America, Inc., Conn., Adhesives
Horn Co., Inc., A. C., N.Y., 10, 15, 25, 35
Houghton Labs., Inc., N.Y., 30, Adhesives Varnishes
Insulation Mfrs. Corp., Ill., 15, 30, 35
Irvington Varnish & Insulator Co., N.J., 15, 30, 35
Johns-Manville, N.Y., 30
Lake Chemical Co., Ill., 10, 30
LaMoree, C. D., Calif., 30, 35
Lurex Mfg. Co., N.J., 10, 35, Coatings
Mahoney Teletronic Labs., Inc., N.J., 10
Mansol Ceramics Co., N.J., Resin Compounds
McMillan Lab., Inc., Mass., 30
Metallic Arts of New England, Inc., Mass., 15
Micro-Circuits Co., New Buffalo 3, Mich., 10, 15, 25
For details see ad on pages 365, 526
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Minnesota Mining & Mfg. Co., N.J., 15, 25, 30
Minnesota Rubber & Gasket Co., Minn., 35
Mitchell-Rand Insulation Co., N.Y., 25, 30, 35
Molding Specialists, Inc., N.Y., 30
Monsanto Chemical Co., Mass., 20, 25, 30, Resins
Neo-Sil Corp., N.J., 25
Perfection Mica Co., Ill., 10, 20, 25, 30
Pittsburgh Plate Glass Co., Pa., 10, 15
Radio Components, Ltd., Canada, 10
Radio Industries, Inc., Ill., Chemical Metal Coating
Robinson, Inc., Edward E., N.J., 30
Sauereisen Cements Co., Pa., 5, 10, 30
Schott Co., Walter, Calif., 5, 10, 15, 20, 25
Sherwin-Williams Co., Ohio, 5, 15, 25, 30
Stevenson Bros. & Co., Pa., 20, 25, 30, Resin Compounds
United Technical Labs., N.J., 15, 20, 25
Westfield Chemical Corp., Mass., 5, 15
Zophar Mills, Inc., 112-130 26 St., Brooklyn 32, N.Y., 20, 25, 30, Waxes, Impregnating, & Coating
For details see ad on page 527
Tel: SOuth 8-0907

FOR
FAST PRODUCT REFERENCE

Consult the alphabetical index of products in the Pink Section preceding the "Products & Firms" section.

Here's the fastest way to produce finished wire leads!



Allen-Bradley Co., producers of motor controls, use several Artos CS-6 automatic wire cutting and stripping machines in their Milwaukee plant.

high speed ARTOS AUTOMATIC MODEL CS-6

MEASURES, CUTS and STRIPS wire, cord and cable at speeds up to 3000 pieces per hour

2-Conductor Twisted Wire

Single Conductor Solid Wire

2-Conductor Parallel Stranded Wire

300 Ohm Television Wire

SJ Cord

Heater Cord

Braided Cord With Rubber Jacket

3000 STRIPPED WIRE LEADS in one hour ...each precision-cut with both ends perfectly stripped. That's the speedy pace set by the Artos CS-6 in producing wire leads up to 15 inches in length! Production rates vary in proportion to the length cut.

Highly accurate machine operation reduces work spoilage to an absolute minimum. Errors due to the human element are eliminated. There is no cutting of strands or nicking of solid wire.

PROVED PERFORMANCE

Time-consuming hand stripping jobs which once were a bottleneck in many plants are gone forever. As a result, Artos automatic wire strippers are paying their way in the mass production of television and radio sets, electrical appliances, motor controls and instruments of all kinds.

Plan now to cut wire stripping costs in your plant... with the high speed, automatic Artos CS-6.

CS-6 CAPACITY

Finished Wire Leads Per Hour: lengths to 15", 3000; 6-4"-97" lengths, 500.

Stripping Length: 1½" max. both ends.

Cutting Length: max., 97"; min., 2"; special, ⅞".



WRITE FOR BULLETIN ▶ Descriptive technical sheet tells how the Artos CS-6 can save you money, manpower and time.

Automatic Wire Cutting and Stripping

ARTOS ENGINEERING CO.

2735 South 28th Street • Milwaukee 46, Wisconsin

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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.

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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 IRE 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.

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It is a specific purpose of the Institute 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
1475 Broadway
New York 36, N.Y.

8. Services and Raw Materials

86. Machinery & Tools.

5. Coil winding machines
10. Dehydrators
15. General production machinery & tools
20. Marking & engraving machines
25. Soldering irons & guns
30. Vacuum tube machinery
35. Vacuum pumps
40. Vibration exciters
45. Welders & brazers

Acro Tool & Die Works, Ill., Chassis Cradle

Acromark Co., N.J., 20

Airphone Co., Inc., Fla., 15

Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 15, 20, 25, 40, 45
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Tel: Linden 3-1000

Alcar Instruments, Inc., N.J., 5, 25, Ultra Sonic

Alden Systems Co., 11 Alden Research Center, Westboro, Mass., 15
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American Electro Metal Corp., N.Y., 35

American Gas Furnace Co., N.J., Gas-Air, Gas Oxygen Burners

Anchor Specialty Mfg. Co., N.J., 5, 15, 40

Andrew Corp., 363 E. 75 St., Chicago 19, Ill., 10
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Barber-Colman Co., Ill., 15

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Boesch Mfg. Co., Inc., 45 River St., Danbury, Conn., 5, 15
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Calidyne Co., Mass., 40

Canadian Research Institute, Canada, 20

Central Scientific Co., Ill., 35

Chicago Rivet & Machine Co., 9625 W. Jackson Blvd., Bellwood, Ill., Rivet Setters
For details see ad on page 149
Tel: Columbus 1-1333

Clark Crystal Co., Mass., Lapping Machines

Coil Winding Equip. Co., 19 Maxwell Ave., Oyster Bay 9, L.I., N.Y., 5, Wire Tension Devices
For details see ad on page 529
Tel: Oyster Bay 6-1285

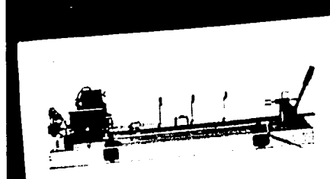
(Continued on page 531)

COIL WINDING EQUIPMENT?...

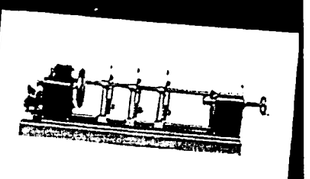
for production & development

We have them all!

TRANSFORMER WINDERS

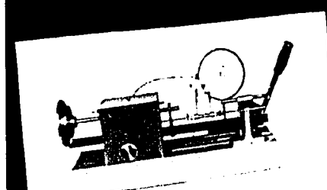


MODEL AL

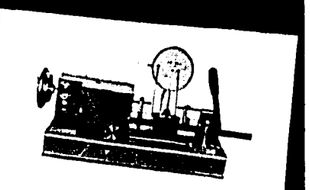


MODEL BM

LATTICE & PI WINDERS

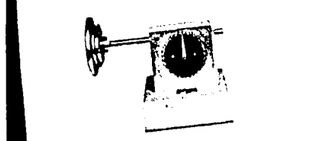


MODEL W

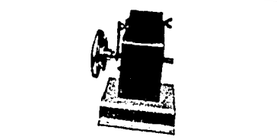


MODEL WX

HAND WINDERS

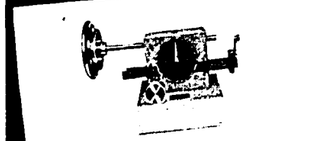


MODEL A

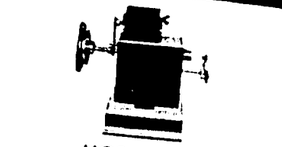


MODEL L

SPACE AND BOBBIN WINDERS



MODEL B



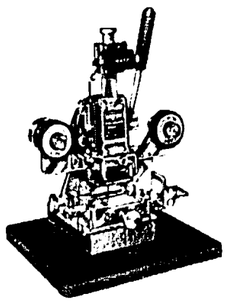
MODEL CS

. . . Write today for complete catalog.

Coil Winding Equipment Co.

OYSTER BAY, NEW YORK • Telephone OYster Bay 6-1285

Stop your vinyl spaghetti marking problems COLD! with New heatless Kodifier® marking machine



Markings Can't Rub Off! The new KODIFIER heatless marking produces absolutely permanent code markings on vinyl sleeving. *Nothing* removes them: rough use, solvents or abrasion.

Ribbon Delivers Cold Printing! Specially-formulated INDELIDENT® process ribbon penetrates and permanently adheres to and unites with vinyl plastic materials: poly-vinyl-chloride and poly-ethylene.

Quick-Change Rotary Type! With one spin of type wheel . . . you change your code. Thus, KODIFIER is ideal for ***short runs*** where codes must be changed ***frequently*** . . . and serves equally well in ***production*** work where code remains ***constant.***

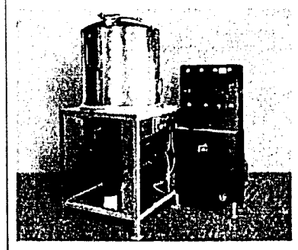
Write Dep't IR-9 today for sample processed markings and colorful brochure.

WE ALSO MAINTAIN A COMPLETE MARKING SERVICE FOR YOUR RUSH NEEDS.

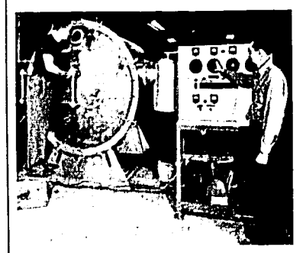
MARKWIK

MANUFACTURING CO., INC.
147-39 18th Ave.
WHITESTONE, N. Y.
INdependence 3-4439

TV COLOR PLATE ALUMINIZERS



Model—P-5



Model—P-6

Large scale high vacuum production evaporator with a 36" diameter stainless steel bell jar. Will handle four times the volume of an 18" bell jar model. The standard P-5 unit with the OFEC #1000 diffusion pump will produce a vacuum of 10^{-6} mm Hg within 8 minutes. Ultimate pressure is about 10^{-7} mm of mercury. The machine is fully equipped with thermocouple and Phillips type gauges for reading pressures from 0.5 to 10^{-5} mm of mercury.

A large industrial metallizer with a vacuum chamber capacity of 100 cubic feet. Its horizontal 5' diameter by 5' long welded stainless steel tank can handle almost any metallizing job in which high vacuum is used. Ideal for color plate aluminizing. The P-6 with its four OFEC #1000 high speed oil diffusion pumps and OFEC #600 booster pump backed by a Kinney 217 CFM mechanical pump will reach a pressure of 10^{-6} mm of Hg in less than 10 minutes. Ultimate vacuum is approximately 10^{-7} mm of mercury.

We can supply all types of high vacuum equipment and accessories including television tube aluminizers, oil diffusion pumps, laboratory and industrial high vacuum evaporators and vacuum furnaces. Also evaporated filming services such as: low reflection coatings, mirrors, radio frequency shielding coatings, dichroic filters, etc.

OPTICAL FILM ENGINEERING COMPANY
2731-37 North Sixth Street, Philadelphia 33, Penna.

DURO

MINIATURE ELECTRON TUBE
Pin Straightening Tools

Dual Types for Straightening 7-Pin and 9-Pin Tubes — For use in Test Equipment, Radio and Radar



U. S. Patent No. 2,573,198

TYPE No. D-279-S
For chassis and bench mounting. Ruggedly constructed. Stainless steel straightening dies of precision accuracy. Knurled and threaded aluminum guides screw into aluminum base plate. Broken pins easily removed without disturbing base plate mounting. Tested and approved by U. S. Army Signal Corps for use by the Armed Services.

TYPE No. D-200
Precision double-ended hand tool



DURO SPECIALTY CO., INC.
8 BENNETT STREET, LYNN, MASS
Tel LYnn 8-3479

WIRE STRIPPING: Your jobs are peculiar to your own business and may be governed by such variables as kind and size of wire, what you use it for, your production requirements, and other similar factors.

So we may serve you promptly and efficiently, tell us what you are now doing and your hopes in the way of improved quality, increased production and lower costs.

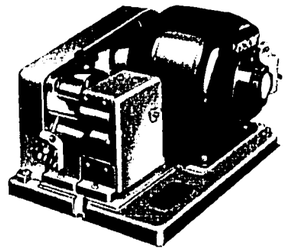


Illustration shows a MODEL "D-1" Two-Wheel Stripper, which is but one of the many different types of machines made. This one uses 1¼" diameter stripping wheels and is ordinarily used to strip any type of Film Insulation from wires in the range of AWG #25 to AWG #44. A wide variety of stripping wheels are available, made from FybRglass and Brush Wire, all designed to provide economical service.

This particular machine is only $156.25, f.o.b. Syracuse, exclusive of stripping wheels. It is available on a Test-Rental Plan or may be purchased out of savings over a ten month period.

For a confidential report containing our recommendations, send samples and complete information to

Rush Wire Stripping Division
The Eraser Company, Inc.
1060 South Clinton Street
Syracuse 4, New York

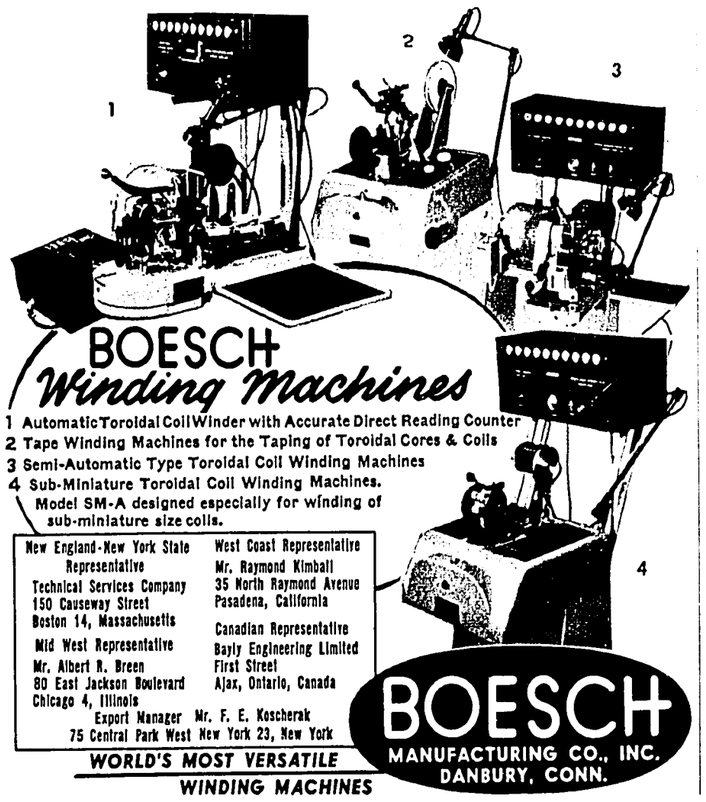
8. Services and Raw Materials

86. Machinery & Tools.

(Continued from page 529)

Coles Electronic Corp., Pa., 15
Columbia Resistors, Inc., N.Y., Heating Elements
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J., Tinkertoy Hand Tools
For details see ad on page 152
Tel: PL 4-5502
Communication Prods. Co., Inc., State Hwy. 79, Marlboro, N.J., 10
For details see ad on pages 104-105
Tel: Freehold 8-1880
Component Mfrs., Inc., N.Y., Coil Turns Counter
Consolidated Vacuum Corp., N.Y., 3, 30, 35, Vacuum Coaters
Constantin & Co., L. L., Route 46, Lodi, N.J., Vacuum Coaters
For details see ad on page 67
Tel: Prescott 7-0223
Continental Radio & Electrical Eng., S. Africa, Battery Chargers
Cosa Corp., N.Y., 5, Toroidal
Cox & Co., Inc., N.Y., Heating Elements
Crescent Ind., Inc., Ill., Dies
Dee Electric Co., Ill., Solder Pots
Drake Electric Works, Inc., Ill., 25
Dubrow Development Co., 235 Penn St., Burlington, N.J., 40
For details see ad on page 445
Tel: Burlington 3-0446
Duro Specialty Co., Inc., 811 Boston St., West Lynn, Mass., 30, Pin Straighteners
For details see ad on page 530
Tel: Lynn 8-3479
Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 35
For details see ad on pages 90-91
Tel: JUno 8-1212
Electrical Device Mfg. Co., N.J., 30, 45
Electro Switch Corp., Mass., 15
Electronic Instrument Co., Inc., N.Y., Battery Chargers
Engineering Co., The, 27 Wright St., Newark 5, N.J., 15, 45
For details see ad on page 549
Tel: BI 3-0800
Engineering Development, Neb., Inirared Heaters
Eng. & Research Corp., Md., 15
Entwistle Co., James L., R.I., 15, 20, 30
Eraser Co., Inc., Rush Wire Strip. Div., 1060 S. Clinton St., Syracuse 4, N.Y., Wire Strippers
For details see ad on page 530
Tel: 76-7441
Erdco Eng. Corp., Ill., 15
F & M Sales, Inc., Calif., 15
Feldman Co., Henry, Calif., 25
Fusion Engineering, Ohio, 25, 45
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., Aligning Tools
For details see ad on page 507
Tel: Rockford 2-6695
General Electric Co., N.Y., 25, 45
General Electric Co., Ltd. of England, Mass., Tension Gauges
Graham Transmissions, Inc., Wis., 35
Green Instrument Co., Inc., Mass., 20
Greenlee Tool Co., Ill., Punches
Gries Reproducer Corp., N.Y., 15
Haydu Bros., N.J., Glass Working Equip.
Hexagon Electric Co., N.J., 25
High Speed Hammer Co., Inc., N.Y., 15
High Vacuum Equip. Corp., Mass., 10, 30, 35, Vacuum Furnaces
Hoffman, Co., P. R., 321A Cherry St., Carlisle, Pa., 15, 20
For details see ad on page 310
Tel: CARlisle 1090
Huppert Co., K. H., Ill., Electrical Furnaces, Ovens, Kilns
Ideal Industries, Inc., Ill., 25, Wire Strippers
Ilsco Copper Tube & Prods., Inc., Ohio, 25
Illinois Tool Works, Shakeproof Div., Ill., Precision Stamped Gears
Induction Heating Corp., N.Y., 30, 45
Industrial Electrical Works, Neb., Portable Cable Reel
Intl. Electr. Corp., N.Y., 25, Ultra Sonic
Intl. Pump & Mach. Works, N.J., 30, 35, 45
Jablo Plastics Indust., England, 15
Jaco Products, Ohio, Alignment Tools, Wire Strippers
Kahle Eng. Co., 1310 N. 7th St., North Bergen, N.J., 5, 10, 30, 45, Lead Wire Welders Only
For details see ad on page 532
Tel: ON 7-6500
Kelnor Mfg. Corp., Calif., 25
Keystone Electronic Corp., N.Y., Alignment Tools
Kinney Mfg. Co., Mass., 35, 40
Kwikheat Mfg. Co., Calif., 25
L. A. B. Corp., N.Y., 40
Lafayette Labs., Inc., N.Y., 15
Lake Chemical Co., Ill., 20
Lectrohm, Inc., Ill., Solder Pots
Lenk Mfg. Co., The, Mass., 25
Litton Eng. Labs., Calif., 30, 35
Livingston Electric Corp., N.J., 30, 45
Luma Electric Equip. Co., Ohio, 25
MB Mfg. Co., Inc., Conn., 40
Markem Machine Co., N.H., 20
Markwik Mfg. Co., Dept. IR-9, 147-39 18 Ave., Whitestone, L.I., N.Y., 20
For details see ad on page 530
Tel: IN 3-4439
Massa Labs., Inc., Mass., 40
Mico Instr. Co., 79 Trowbridge St., Cambridge 38, Mass., 5, 20, Toroid
For details see ad on page 533
Tel: Kirkland 7-8660
Micromech Mfg. Corp., N.J., 15
Mitchell Industries, Tex., 25
Multi-Tron Lab., Ill., 30

(Continued on page 533)



BOESCH Winding Machines

1 Automatic Toroidal Coil Winder with Accurate Direct Reading Counter
2 Tape Winding Machines for the Taping of Toroidal Cores & Coils
3 Semi-Automatic Type Toroidal Coil Winding Machines
4 Sub-Miniature Toroidal Coil Winding Machines.
Model SM-A designed especially for winding of sub-miniature size coils.

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80 East Jackson Boulevard
Chicago 4, Illinois

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DANBURY, CONN.

sealing glass
or sealing
glass-to-metal?

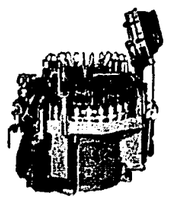
then KAHLE machinery is best for you...

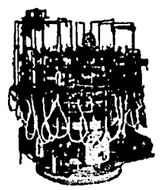
largest manufacturer
of sealing machines
for the electronics
and allied industries

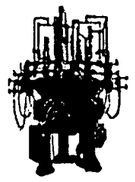
Experience with the widest range of products to be sealed—whether all glass seals or glass-to-metal seals—makes Kahle your logical source for sealing machines—stationary, automatic or combination. Kahle automatic combination machines seal and exhaust in one operation—produce up to 2000 units each hour! Regardless of your product or production requirement, write **KAHLE.**

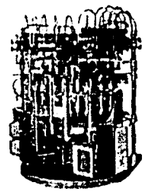
SPECIAL EXPERIMENTAL AND RESEARCH SERVICES OFFERED BY KAHLE INCLUDE:

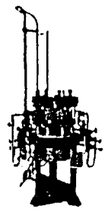
- Special glass parts and accessories
- Special tools for research
- Special models
- Small-lot manufacture of special items for research or development
- Regular industrial engineering at regular fee or contract rates
- Special tubes, lamps, etc. for research purposes including elements and parts
- Any special equipment for manufacture or research for tubes or lamps

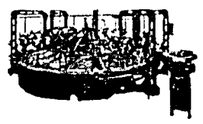

SUB-MINIATURE TUBES 24 HEAD

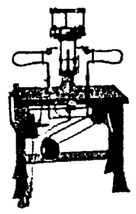

MERCURY LAMPS


HERMETIC SEAL 8 HEAD

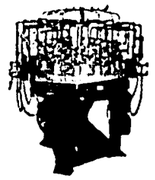

RADIO RECEIVING TUBES SEAL EXHAUST MACHINE


FLUORESCENT LAMPS 8 HEAD

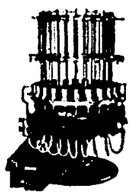

CR TUBES 16 HEAD

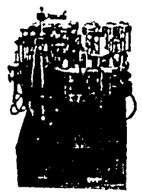

CR TUBES SINGLE HEAD

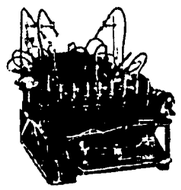

LIGHTHOUSE TUBES HIGH FREQUENCY SEALING

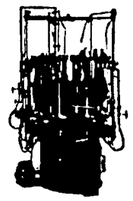

SUB-MINIATURE 12 HEAD

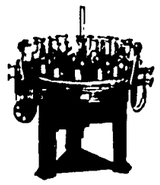

BI-POST LAMPS SINGLE HEAD

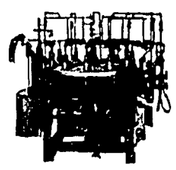

FLUORESCENT LAMPS 24 HEAD


MOULDED NECK LAMPS

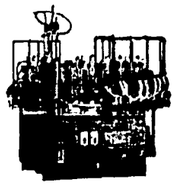

CR TUBE FACE PLATE SEALING SINGLE HEAD FOR COLOR TV TUBES


POWER TUBES 8 HEAD


MINIATURE TUBES 12 HEAD


HERMETIC SEAL 12 HEAD


POWER TUBES SINGLE HEAD


VACUUM BOTTLES

Kahle
ENGINEERING COMPANY
1310 SEVENTH STREET
NORTH BERGEN, N. J.

CONTI

8. Services and Raw Materials

86. Machinery & Tools.

(Continued from page 531)

National Res. Corp., Mass., 3, 30, 35
Nelson Vacuum Pump Co., George F., Calif., 35
New Hermes Engraving Mach. Co., N.Y., 20
Newton Co., The, Conn., 15
Numberall Stamp & Tool Co., N.Y., 20
O'Neil-Irwin Mfg. Co., Minn., 15, Rollers, Power Shears
Opad-Green Co., N.Y., Battery Chargers
Optical Film Eng. Co., 2731-37 N. 6 St., Philadelphia 33, Pa., 3, 30, 35
For details see ad on page 530
Tel: GA 3-9007
Paragon-Revolute Corp., N.Y., Blueprint & Allied Photo Equipment
Perkin Eng. Corp., Calif., Plating Units
Pioneer Machine Works, 6136 Adam St., West New York, N.J., 30
For details see ad on page 533
Tel: UNion 3-3838
Popper & Sons, Inc., N.Y., 20
Precise Measurements Co., 940 Kings Highway, Brooklyn 23, N.Y., 20
For details see ad on page 345
Tel: ES 5-9435
Preis Engraving Mach. Co., H. P., N.J., 20
Production Control Units, Inc., Ohio, 15
Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, L.I., N.Y., 15
For details see ad on page 533
Tel: OYster Bay 6-0009
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 25
For details see ad on page 210
Tel: HUmboldt 5-3900
Radio Frequency Labs., Inc., Powerville Rd., Boonton 7, N.J., Magnet Chargers
For details see ad on page 448
Tel: BOonton 8-3100
Radio Sonic Corp., 32 W. 22 St., New York 10, N.Y., 40
For details see ad on page 525
Tel: ORegon 5-0085
Rapid Electroplating Process, Inc., Ill., Portable Silver Platers
Remington Rand, Inc., Eng. Res. Assoc., Minn., 5
Research Dev. Manufacture, Inc., Pa., 15

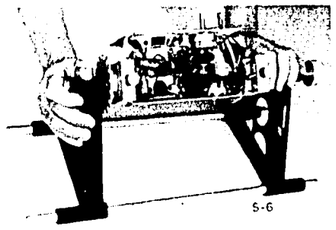
(Continued on page 535)

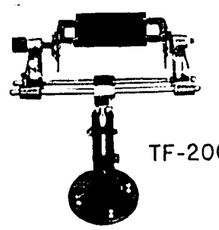
MACHINERY FOR RADIO TUBES, CATHODE RAY TUBES
NEON TUBES, INCANDESCENT LAMPS, FLUORESCENT LAMPS

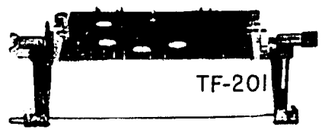
CATHODE RAY TUBE MACHINES
- Vertical Lathe
- Sealing Machines
- Dag Machines
- Tilt Tables
- Bulb Washers
- Sealing Heads

COAXIAL SEAL-IN HEADS
STRAIGHT LINE
ANNEALERS
and
HOT CUT
FLARE MACHINES

PIONEER MACHINE WORKS
6136 Adam Street — West New York, N.J.


S-6


TF-200


TF-201


TF-212


PT-7-9B

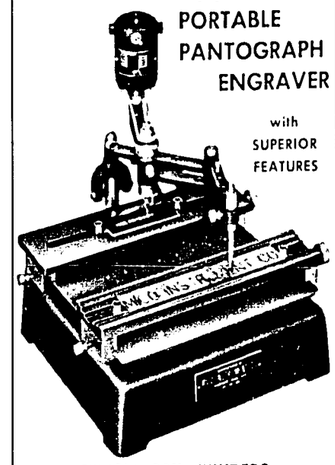
Attention Methods Engineers!

Need a "Third Hand" for wiring assemblies?

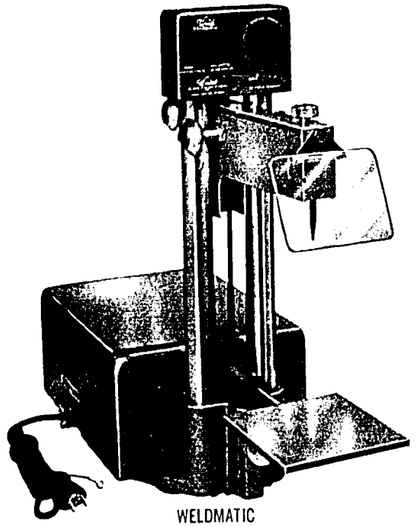
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OYSTER BAY, N. Y.
Phone: OYster Bay 6-0009

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MICO INSTRUMENT CO.
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Model 1015



ACCESSORY PLUG-IN



TWEEZER-TYPE
HAND-PIECE

A major advance in precision metal joining

STORED-ENERGY WELDING SPEEDS ELECTRONIC ASSEMBLY

NEW METHOD

Welded electronic components and precision instruments (resistors, potentiometers, capacitors, transducers, etc.) show superior performance with lower production costs. All metals and most combinations joined in many shapes and thickness ratios. Milli-second weld-time permits precision welding of copper, silver, and other "difficult" materials.

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Unitek Weldmatic equipment utilizes capacitor-discharge to make precision resistance welds. Energy stored is instantly adjustable over a very wide range to accommodate wires 0.0003 through 0.040 inch diameter and sheet metal 0.00005 to 0.020.

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Simple installation, rapid setup, versatility, easy operation, and low maintenance make the Model 1015 best for electronics assembly. Untrained operators make uniform, high-strength welds with no discoloration or deformation. Other models available for special jobs.

Write for descriptive brochure.

Unitek WELDMATIC

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8. Services and Raw Materials

86. Machinery & Tools.

(Continued from page 533)

Research Instrument Co., Inc., N.Y., 45
Rex Rheostat Co., N.Y., 5
Robinson, Inc., Edward E., N.J., 15
Rynel Corp., Ill., Precision Gears
Sanders Assoc., Inc., N.H., 15
Sargent & Co., Conn., 15, Tools
Schauer Mfg. Corp., Ohio, 15
Schott Co., Walter, Calif., Alignment Tools
Sound Projects Co., Ill., 5, 45
Star Expansion Prods. Co., N.Y., Pin Aligner
Stark Mfg. Co., Ala., 25
Steiner-Ives Co., N.J., 15, 30, Industrial Ovens
Stevens Mfg. Co., George, Ill., 5
Stromberg-Carlson Co., N.Y., 25
Sturtevant Co., P. A., Ill., Torque Wrenches
Suffolk Prods. Corp., N.Y., 15
Sylvania Electric Prods. Inc., 1740 Broadway, New York 19, N.Y., 30
For details see ad on pages 9-14
Tel: JUdson 6-2424
Szekely & Assoc., Inc., O. E., Pa., 15
Ultra Electro Forming Co., N.J., Electro Formed Plastic Molds
Ungar Electric Tools, Inc., Calif., 25
U.S. Tool Co., Inc., N.J., Multi-Slide Machines
Unitek Corp., 274 N. Halstead Ave., Pasadena 8, Calif., 45
For details see ad on page 534
Tel: SY 5-2377
Universal Winding Co., R.I., 5
Vaco Prods. Co., Ill., Hand Tools
Vacuum-Electronic Eng. Co., N.Y., 30
Vacuum Tube Products, Calif., 45
Vulcan Electric Co., Mass., 25, Elec. Heating Units, Melting Pots
Wall Mfg. Co., P., Pa., 25
Wassco Electric Products Corp., Dept. 2, 126 W. Cass St., Joliet, Ill., 25
For details see ad on page 535
Tel: JOliet 2-4714
Welch Mfg. Co., W. M., Ill., 35
Weller Electric Corp., Pa., 25
Western Gear Works, P.O. Box 182, Lynwood, Calif., 15
For details see ad on page 74
Tel: Nevada 6-2161
White & Son, James L., N.J., 15
White Indust. Inc., N.Y., 5, 15
Wilder Mfg. Co., Inc., N.Y., Production Handling Equip.
Wilder Mfg. Co., Inc., N.Y., Soldering Iron Holders
Wright Eng Co., Calif., 40
Xcelite, Inc., N.Y., 15, Hand Tools

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THE COPPER THAT MADE LARGE SCALE DEVELOPMENT OF ELECTRONICS POSSIBLE

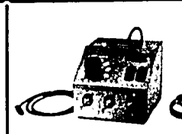
REGULAR OFHC. ASTM B-170-47
CERTIFIED OFHC, FOR ELECTRONICS
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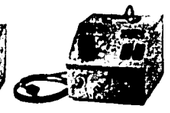
THE AMERICAN METAL COMPANY, LTD.
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#10535 SOLDERING UNIT



#105-B2 500 WATTS



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STANDARD HANDPIECE



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RESISTANCE SOLDERING DEVICES

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- faster—production increased 3 to 5 times
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- safe—no burn, shock or visual arc hazard
- efficient—instantaneous, controlled heat for all types of soldered joints

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DEPT. 2 • 126 W. CASS ST. • JOLIET, ILLINOIS

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10. Copper
15. Ferrous
20. Non-ferrous, excluding copper
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30. Precious & rare

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For details see ad on page 429
Tel: Linden 3-1000
Allegheny Ludlum Steel Corp., Pa., 15
Alpha Metals, Inc., 61 Water St., Jersey City 4, N.J., 5, 20
For details see ad on page 544
Tel: HEnderson 4-6778
American Brass Co., Conn., 5, 10
American Electro Metal Corp., N.Y., 25, 30, Brazing Compound
American Metal Co., Ltd., 61 Broadway, New York 6, N.Y., 10, OFHC, 25
For details see ad on page 535
Tel: Bo 9-1800
American Silver Co., Inc., N.Y., 5, 10, 15, 20, 25, 30
American Smelt. & Ref., Federated Metals, N.Y., 5, 10, 20
Anchor Metal Co., N.Y., 5, 10, 20

(Continued on page 536)

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Pioneers in the Development of Modern Precious Metal Plating Processes

Outstanding developments by Sel-Rex in precious metals for plating have resulted in better quality at less cost for both decorative and industrial platers. Superior engineering skill and long experience in the plating field make Sel-Rex your best choice for all precious metal plating needs.

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Sel-Rex SILVER SOL-U-SALT (Potassium Silver Cyanide) in pure crystalline form is completely soluble in water. Eliminates old fashioned mixing, calculating or filtering. Eliminates hazard of airborne dust—no insoluble particles in the bath to cause rough deposits.

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Pioneers and developers of better gold, silver, nickel, copper, cadmium and rhodium salts and solutions.

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RIBBONS—STRIPS

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★ MOLYBDENUM ★ SPECIAL ALLOYS

and OTHER METALS

IN

ULTRA THIN GAUGES OR FOIL

(Ribbons may be supplied in Mg. weights if required)
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Telephone WOrth 2-2044 COrtland 7-0470

8. Services and Raw Materials

87. Metals.

(Continued from page 535)

Armco Steel Corp., Ohio, 5, 15
Baker Chemical Co., J. T., No. Broad St., Phillipsburg, N.J., 10, 20, 25
For details see ad on page 441
Tel: Phillipsburg 5-2151
Baker & Co., Inc., 113 Astor St., Newark 5, N.J., 30
For details see ad on page 374
Tel: Bi 3-0030
Brainin Co., C. S., 320 Washington St., Mt. Vernon, N.Y., 30, Contact Points
For details see ad on page 371
Tel: Mount Vernon 8-5500
Bridgeport Brass Co., Conn., 5, 10, 20
Brooks & Perkins, Inc., Mich., 5, Magnesium
Canadian Radium & Uranium Corp., N.Y., 30
Carboloy Dept., General Electric Co., Mich., 25
Carpenter Steel Co., Pa., 5
Chrysler Corp., Amplex Div., Mich., 15, 20, 25
Cohn Corp., Sigmund, 121 So. Columbus Ave., Mt. Vernon, N.Y., 30
For details see ad on page 481
Tel: MO 4-5300
Collectron Corp., 216 E. 45 St., New York 17, N.Y., 30
For details see ad on page 297
Tel: MU 2-8473
Copperweld Steel Co., Pa., 5, 10, 15, 20
Cross Co., H., 15 Beekman St., New York 38, N.Y., 5, 20, TU & MO Strips
For details see ad on page 536
Tel: WOrth 2-2044
Crucible Steel Co. of America, Henry W. Oliver Bldg., Box 88, Pittsburgh 30, Pa., 5, 15
For details see ad on page 156
Tel: Atlantic 1-3800
Division Lead Co., Ill., 5, 20
Dow Chemical Co., Mich., 5, 20, Magnesium
Drakenfeld & Co., Inc., B. F., Pa., 25
Driver Co., Wilbur B., 1875 McCarter Highway, Newark 4, N.J., 5, 15, 20, 30
For details see ad on page 164
Tel: HU 2-5550
Driver-Harris Co., N.J., 5, 20
Eastern Brass & Copper Co., Inc., N.Y., 5, 10, 15, 20
Enthoven Solders, Ltd., England, 20, 25
Fansteel Metallurgical Corp., Ill., 20, 25, TA, MO, WO
Federated Metals Div., N.Y., 5, 10, 20
Flexo Wire Div., Copperweld Steel Co., N.Y., 5
Fusion Engineering, Ohio, 5, 10, 20, 25
General Aniline & Film Corp., Antara Chem. Div., Dept. 89, 435 Hudson St., New York 14, N.Y., 15, 25
For details see ad on page 182
Tel: WA 4-0600
General Plate Div., Metals & Controls, Mass., 5, 10, 20, 30
Glaser Lead Co., Inc., N.Y., 20, 25
Goldsmith Bros. Smelting & Refng. Co., Ill., 30
Handy & Harman, N.Y., 5, 20, 25, 30

8. Services and Raw Materials

87. Metals.

Int'l. Nickel Co., Inc., N.Y., 5, 20
Johnston Foil Mfg. Co., Mo., 20, Aluminum, Tin, & Lead Foil
Keystone Carbon Co., Pa., 25
King Labs., Inc., N.Y., 5, 25, 30
Kinney Co., Inc., Joseph, Pa., Copper Clad Steel, Copper Clad Vanadium
Mackay, Inc., A. D., N.Y., 5, 10, 15, 20, 25, 30, Cesium, Rubidium
Magnetic Powders, Inc., Pa., 5, 25
Makepeace Co., D. E., Div. Union Plate Wire, Pine & Dunham Sts., Attleboro, Mass., 20, 30
For details see ad on page 200
Tel: Attleboro 1-0089
Mallory & Co., Inc., P. R., Ind., 5, 10, 20, 25, 30
Mansol Ceramics Co., N.J., 25
Metal Hydrides, Inc., Mass., 25
Metal Powder Assoc., N.Y., 25
Metals & Controls Corp., Mass., 30
National Radiator Co., Plastic Div., Pa., 25
Nesor Alloy Prods. Co., N.J., 5, 15, 30
Ney Co., J. M., 171 Elm St., Hartford 1, Conn., 30
For details see ad on page 377
Tel: Hartford 2-4271
Olin Indust., Inc., Electric Div., Conn., 10, 20
Phelps Dodge Copper Prods. Corp., 40 Wall St., New York 5, N.Y., 5, 10
For details see ad on page 484
Tel: Whitehall 4-3570
Plamondon Magnetics Co., Ill., 5, 15
Plastic Metals Div., Nat'l. Radiator Co., Pa., 15, 25
Precision Tube Co., Inc., Pa., 5, 10, 20
Production Metals, Inc., N.Y., 10, 20
Radio Cores, Inc., 9540 Tulley Ave., Oak Lawn, Ill., 15, 25
For details see ad on page 307
Tel: GA 2-3353
Radio Dev. & Res. Corp., N.J., 30
Republic Foil & Metal Mills, Inc., Conn., Metals, Foil, Aluminum
Revere Copper Brass, Inc., N.Y., 5, 10, 20
Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 5, 15, 30
For details see ad on page 484
Tel: White Plains 9-4757
Sel-Rex Precious Metals, Inc., Dept. IRE-54, 229 Main St., Belleville 9, N.J., Gold, Silver, Platinum, Rhodium, & Paladium
For details see ad on page 536
Tel: PLymouth 9-0200
Simonds Saw & Steel Co., N.Y., 5
Somers Brass Co., Inc., Conn., 5, 10, 20, Rolled Strip
Southwest Prods. Inc., Tex., 5, 25, 30
Stackpole Carbon Co., Electronic Div., Tannery St., St. Marys, Pa., 25
For details see ad on pages 84-85
Tel: 41-521
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 5, Kovar
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N.Y., 25, 30
For details see ad on pages 9-14
Tel: JUdson 6-2424
Taylor Electric Instruments, Ltd., England, 5, 15
Technic, Inc., R.I., 30
Uniform Tubes, Inc., Pa., Aluminum & Copper Tubes
United States Steel Corp., Pa., 15
Vacuum Metals Corp., Mass., 5, 10, 15, 20
Western Gold & Platinum Works, Calif., 20, 25, 30
Westinghouse Electric Corp., Pa., 5
Williams & Co., C. K., Pa., 15, 25
Yale & Towne Mfg. Co., Powdered Metals Div., 9333 W. Belmont Ave., Franklin Park, Ill., 25
For details see ad on page 309
Tel: Estebrook 8-1933

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STUPAKOFF CERAMIC & MANUFACTURING CO.
LATROBE, PENNSYLVANIA
DIVISION OF THE CARBORUNDUM COMPANY

88. Moulded Products.

5. Insulators
10. Knobs & parts
15. Proprietary mouldings

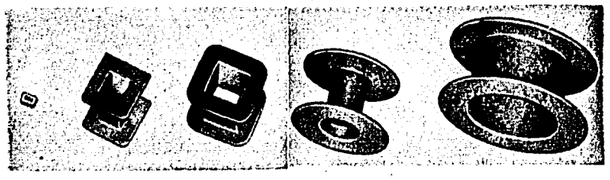
Accurate Electronics Corp., Ohio, 5, 10
Aerolite Electronics Corp., 507 26th St., Union City, N.J., 15
For details see ad on page 500
Tel: UNion 3-2955
Airphone Co., Inc., Fla., 15
Airtron, Inc., 1107 W. Elizabeth Ave., Linden, N.J., 5
For details see ad on page 429
Tel: Linden 3-1000
Akron Rubber Co., N.Y., Rubber
Alden Products Co., 113 N. Main St., Brockton 64, Mass., 5, 10, 15
For details see ad on page 296
Tel: Brockton 160
American Insulator Corp., Pa., 10
American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga 5, Tenn., 5
For details see ad on page 136
Tel: Chattanooga 5-3411
American Molded Products Co., 2727 W. Chicago Ave., Chicago 22, Ill., 10, 15
For details see ad on page 538
Tel: AR 6-3235
American Radio Hardware Co., N.Y., 10
Auburn Button Works, Inc., N.Y., 5
Biwax Corp., 3445 Howard St., Skokie, Ill., 5
For details see ad on page 526
Tel: OR 3-1050
Bolta Prods. Div., General Tire & Rubber, Mass., 10, 15

(Continued on page 539)

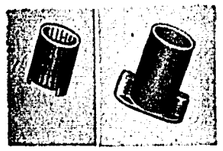
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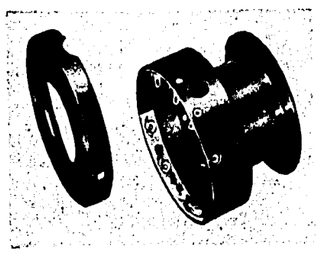


FLYBACK FORMS

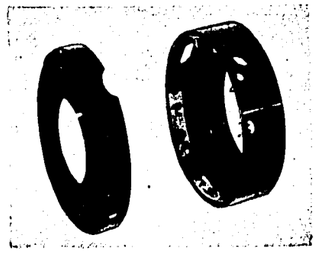
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Insulating shells between vertical and horizontal Coils

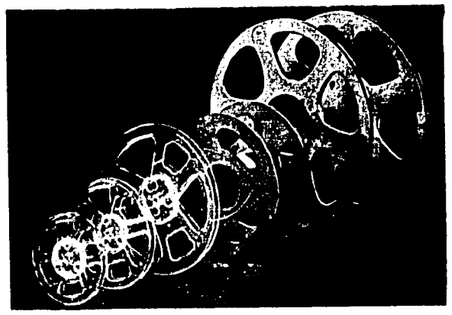




70° YOKE CASE AND CAP



90° YOKE CASE AND CAP

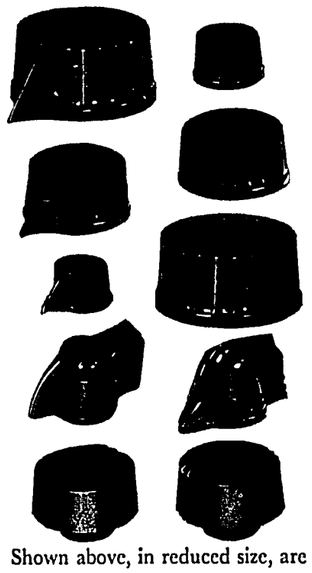


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- Experienced design and production engineering.
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- Pre-forming equipment to save time and materials.
- Newest type thermo-setting and thermo-plastic equipment.
- Finishing facilities for buffing, grinding, polishing, drilling, hot stamping, and painting.

Send your prints or specifications on custom items for prompt advice and quotation.

ROMAR PLASTICS, INC.
Molders of Plastics
1313 E. Main Street St. Charles, Illinois

8. Services and Raw Materials

88. Moulded Products.

(Continued from page 537)

Brilhart Plastics Corp., P.O. Box 31, Old Country Rd., Mineola, L.I., N.Y., 5, 10
For details see ad on page 539
Tel: Pioneer 6-0425

Campbell Mfg. Co., Ltd., Canada, Rubber

Centralab, Div. of Globe Union, Inc., 920I E. Keefe Ave., Milwaukee 1, Wis., 5
For details see ad on pages 283, 345, 358, 372, 518
Tel: Woodruff 2-9200

Chicago Die Mold Div., U.S. Rubber Co., Ill., 10

Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 15
For details see ad on pages 110-111
Tel: Nevada 2-2000

Cincinnati Molding Co., Ohio, 5

Collectron Corp., 216 E. 45 St., New York 17, N.Y., 5, 10, 15
For details see ad on page 297
Tel: MU 2-8473

CUSTOM MOLDED KEL-F, NYLON and all other materials

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Terminals
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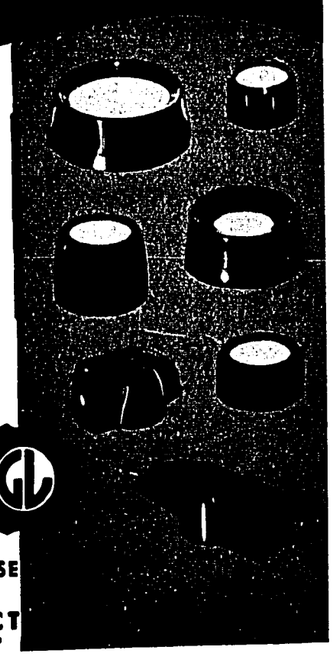
MINEOLA, L.I., N.Y. • Pioneer 6-0425 FLushing 7-7866

Injection *Compression* *A Complete Service*

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826 Elm Street

Chemical Products Corp., 10

Consolidated Molded Prods. Corp., Pa., 5, 10

Continental-Diamond Fibre Co., 16 Chapel St., Newark 48, Dela., 5
For details see ad on pages 63-66
Tel: NEwark 531

Crane Packing Co., Ill., 5, 15

Davies Molding Co., Harry, Ill., 10

Demco Products, Pa., 15

Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 10, 15
For details see ad on page 370
Tel: DAvenport 4-7000

Elco Corp., Pa., 15

Electronic Mechanics, Inc., N.J., 5, 15

Emerson & Cuming, Inc., Mass., 15

Erie Resistor Corp., 644 West 12th St., Erie, Pa., 10
For details see ad on pages 82-83
Tel: Erie 2-1481

Federal Screw Products, Inc., 3917 N. Kedzie Ave., Chicago 18, Ill., 10
For details see ad on page 505
Tel: Delaware 7-5776

Fluorocarbon Prods. Div., U.S. Gasket, N.J., 5, 15

Fretco, Inc., Pa., 5

Gadgets, Inc., Ohio, 15

Garde Mfg. Co., 588 Eddy St., Providence 3, R.I., 5, 15
For details see ad on page 506
Tel: Union 1-0604

Garlock Packing Co., N.Y., 5, 15

Gavitt Mfg. Co., Inc., Mass., 15

Gee-Lar Mfg. Co., 826 Elm St., Rockford, Ill., 5
For details see ad on page 539
Tel: ROckford 5-9548

General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 10
For details see ad on page 507
Tel: ROckford 2-6695

General Plastics Corp., N.J., 5, 10, 15

Gries Reproducer Corp., N.Y., 5, 10

Hobson Bros., Ill., 5

Howard Moldings, Inc., Mo., 15

Induction Heating Corp., N.Y., 5

Industrial Devices, Inc., N.J., 5, 10, 15

Insuline Corp. of America, N.H., 5, 10

Isolantite Mfg. Corp., N.J., 5

Jan Hardware Mfg. Co., Inc., N.Y., 5, 10

Johnson Co., E. F., Minn., 5, 10

Kaywoff Prods. Co., Neb., 5, 10, 15

Keystone Carbon Co., Pa., 10

Kimble Glass Co., Subsid. Owens-Ill. Glass Co., Ohio, 10

Kurz-Kasch, Inc., Ohio, 10, 15

Lee Chemical Corp., Walter, N.Y., 5, Teflon

Lynn Electronic Research Co., 9 West Magnolia Blvd., Burbank, Calif., 5
For details see ad on page 513
Tel: VIctoria 9-2864

Maigne Co., O. J., N.Y., 5

Mallory & Co., Inc., P. R., Ind., 5, 10, 15

(Continued on page 541)

POLYPENCO® NON-METALLIC SHAPES

Use stock shapes for low cost fabrication

With POLYPENCO shapes, you can economically obtain the advantages of nylon, Teflon*, and Q-200.5 for a wide variety of components by fabricating them on standard metalworking tools. You also receive uniform high quality in every piece of stock. Most standard sizes are stocked now for immediate delivery.

NYLON



ROD: Diameters from 1/8" to 6 1/2" in lengths from 8' to 6'.

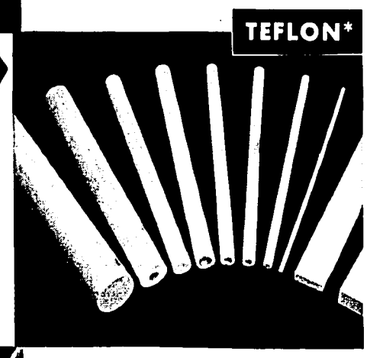
STRIP: .010" to .125" thick, 1/4" to 4" wide.

TUBING: .035" to .500" O.D., .020" to .410" I.D.

TUBULAR BAR: O.D.'s from 2" to 10" with wall thicknesses of 3/8" to 1 1/2".

SLAB: 1/4" to 1" thick, standard 10" width, discs from 1/4" to 2" thick in 6" to 12" diameters.

TEFLON*



ROD: Diameters from .030" to 4" in lengths ranging from continuous coils down to 6".

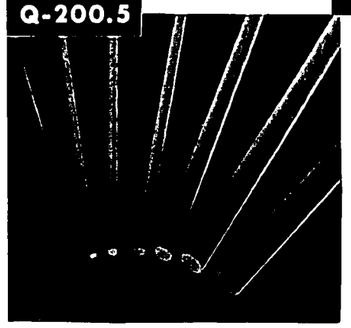
TUBING: 1/4" to 4 7/8" I.D. with walls from 1/8" to 2" thick.

SPAGHETTI TUBING: I.D.'s corresponding to American Wire Gauges 22 through 8, in lengths up to 1,000'.

TAPE: .002" to .125" thick, 1/4" to 12" wide.

SLAB: 24" or 48" squares from .125" to 1.50" thick.

Q-200.5



ROD: Diameters from 1/8" to 3 7/8" in lengths from 4' to 8'.

Other shapes and sizes can be supplied on special order.

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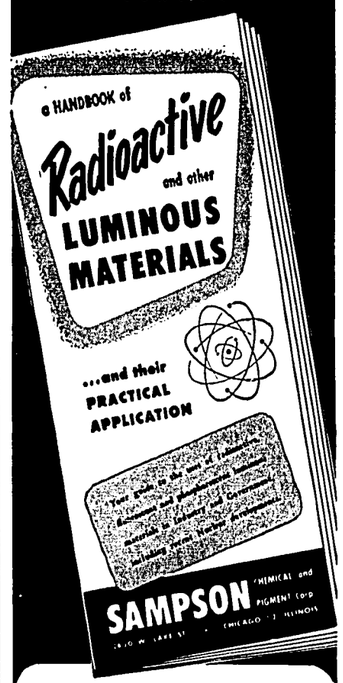
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nylon . . . Teflon* . . . Q-200.5

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*trademark for Du Pont tetrafluoroethylene resin

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ADDRESS.....
CITY.....STATE.....
BY.....
TITLE.....

8. Services and Raw Materials

88. Moulded Products.

(Continued from page 539)

Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 5, 10
For details see ad on page 548
Tel: Ma 4-4108
Minnesota Rubber & Gasket Co., Minn., 10
Molded Insulation Co., Pa., 5, 10, 15
Molding Specialists, Inc., N.Y., 15
Mycalex Corp. of America, 111A Clifton Blvd., Clifton, N.J., 5, 15
For details see ad on pages 94-95
Tel: Prescott 9-8866
Neo-Sil Corp., N.J., 5, Rubber
P. M. Industries, Conn., 15
Painton and Co., Ltd., England, 10
Panelyte Div., St. Regis Paper Co., N.Y., 15
Poly-Scientific Corp., Va., 5
Polymer Corp. of Pennsylvania, 126 N. 5th St., Reading, Pa., 5
For details see ad on page 540
Tel: REading 6-7241
Quality Components, Inc., Pa., 15
Radio City Products Co., Inc., Pa., 10
Raybestor-Manhattan, Inc., N.J., 15
Remler Co., Ltd., Calif., 5, 10, 15
Research Instrument Co., Inc., N.Y., 5, 10
Richardson Co., The, Ill., 5, 15
Rogan Bros., Ill., 5, 10, 15
Rohden Mfg. Co., Ill., 10
Romar Plastics, Inc., 1313 E. Main St., St. Charles, Ill., 5, 10, 15
For details see ad on page 538
Tel: St. Charles 6571
Semrow Prod. Co., Inc., Ill., 10
Silicone Insulation, Inc., N.Y., 5, 10, 15
Smith & Stone, Ltd., Canada, Custom
Stevens Prod., Inc., N.J., 5
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 10
For details see ad on pages 9-11
Tel: JUdson 6-2424
Synthane Corp., Pa., 15, 20, 25, Laminated Plastic
Syracuse Ornamental Co., Inc., N.Y., 15
Technology Instrument Corp., 535A Main St., Acton, Mass., 10
For details see ad on pages 75-79
Tel: COlonial 3-7711
Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J., 5, 10, 15
For details see ad on page 487
Tel: BL 2-4711
Triumph Mfg. Co., Ill., 5, 10
United Insulator Co., Ltd., England, 5, 15
U. S. Components, Inc., N.Y., 10
United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 5, 15
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
United States Rubber Co., N.Y., Rubber Wiring Devices
Waterbury Companies, Inc., Conn., 10, 15, Reinforced
Western Gold & Platinum Works, Calif., 5
White Industrial Div., S. S., N.Y., 15
Whitso, Inc., Ill., 5, 10, 15

89. Plastics.

5. Extrusions
10. Raw powders
15. Rods
20. Sheets
25. Tubes

A-K Mfg. Co., Inc., Ill., 5, 15, 25
Accurate Electronics Corp., Ohio, 20
Aerolite Electronics Corp., 507 26th St., Union City, N.J., 5
For details see ad on page 500
Tel: UNion 3-2955
Allied Chemical & Dye, Barrett Div., N.Y., 10
American Radio Hardware Co., N.Y., 5
Anchor Plastics Co., Inc., N.Y., 5, 15, 25
Auburn Button Works, Inc., N.Y., 5, 15, 20, 25
Baer Co., N. S., N.J., 15, 20, 25
Bakelite Co., Div. Union Carbon & Carbide, N.Y., 10, 20
Bolta Prods. Div., General Tire & Rubber, Mass., 5, 10, 15, 20, 25, Formable Sheets
Brand & Co., Inc., William, Conn., 5
Canadian Industries, Ltd., Canada, 5, 10, 15, 20, 25

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LATROBE, PENNSYLVANIA
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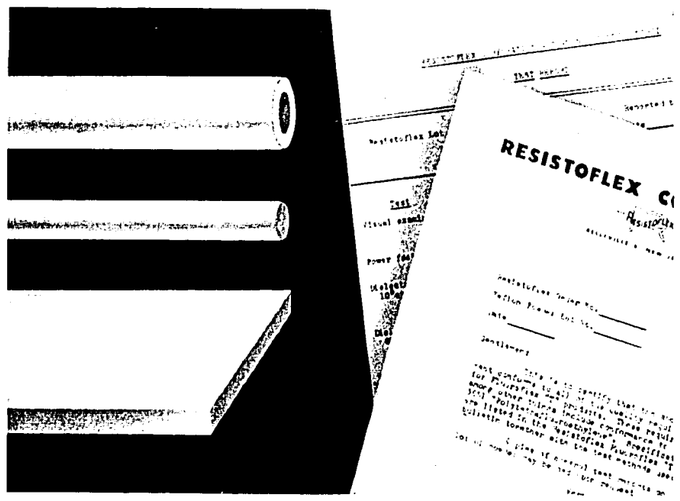
89. Plastics.

Carmer Industries, N.J., 5, 15, 20, 25
Cast Optics Corp., Conn., 15, 20, 25
Celanese Corp. of America, N.Y., 10, 20
Chicago Die Mold Div., U. S. Rubber Co., Ill., 5, 15, 20, 25
Ciba Co., Inc., N.Y., 10
Citation Products Co., 233 E. 146 St., New York 51, N.Y., 20, 25
For details see ad on page 504
Tel: MO 5-0740
Cleveland Container Co., Ohio, 25
Commercial Plastics Co., Dept. R, 2812 W. North Ave., Chicago 47, Ill., 5, 25
For details see ad on page 504
Tel: Belmont 5-1030
Continental-Diamond Fibre Co., Newark 48, Del., 15, 20, 25
For details see ad on pages 63-66
Tel: NEwark 531
Cortland Industries, Inc., Ill., 15, 20, 25
Crane Packing Co., Ill., 5, 15, 20, 25
Dow Chemical Co., Mich., 10
Durez Plastics & Chemicals, Inc., N.Y., 10
Eastern Precision Resistor Corp., N.Y., 15
Electronic Mechanics, Inc., N.J., 5, 15, 20, 25
Emerson & Cuming, Inc., Mass., 15, 20
Enthoven Solders, Ltd., England, 15, 25
Flexrock Co., Pa., 5, 15, 20, 25
Fluorocarbon Prods. Div., U. S. Gasket, N.J., 5, 15, 20, 25
Formica Co., Ohio, 15, 20, 25
Garlock Packing Co., N.Y., 5, 15, 20, 25
General Cement Mfg. Co., 926 Taylor Ave., Rockford, Ill., 15, 20, 25
For details see ad on page 507
Tel: ROckford 2-6695
General Electric Co., Chemical Div., Mass., 10, 15, 20, 25
General Laminated Prods. Co., Inc., Ill., 5, 15, 20, 25
General Tire & Rubber, Indust. Prods. Div., Ind., 5, 10, 15, 20, 25
Gering Prods., Inc., N.J., 5, 10, 15, 20, 25
Goodrich Chemical Co., B. F., Ohio, 10
Houghton Labs., Inc., N.Y., 15, 20, 25
Insulating Fabricators, Inc., N.J., 15, 20, 25
Insulation Manufacturers Corp., Ill., 15, 20, 25
International Testing Service, Mich., 5
Irvington Varnish & Insulator Co., N.J., 5, 15, 20, 25
Kaywoff Prods. Co., Neb., 5
Kellogg Co., M. W., Chemical Mfg. Div., P. O. Box 469, Jersey City 3, N.J., 10
For details see ad on page 129
Tel: WOrth 4-6775
Kenwood Mfg. Co., N.J., 5, 15, 25, Kel-F
Kings Electronics Co., N.Y., 5, 15, Teflon
La Moree, C. D., Calif. 5, 15, 20, 25
Lee Chemical Corp., Walter, N.Y., 5, Teflon
Maigne Co., O. J., N.Y., 5, 15, 20, 25

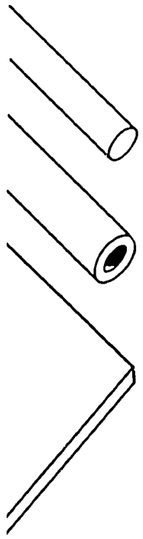
(Continued on page 543)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

now...TEFLON* with Certified performance



Conformance to specifications assured in **FLUOROFLEX®-T** *rod, sheet, tube*



Resistoflex will certify each shipment of "electrical grade" Fluoroflex-T products on six vital physical and electrical properties. Qualification tests are performed on all incoming Teflon powder to determine whether it will yield rods, tubes and sheets which are in conformance with specification AMS-3651 "Polytetrafluoroethylene." Processing under a quality control and inspection system approved by the USAF under MIL-Q-5923 specification maintains the identity of each lot of material through all stages of manufacture – from virgin powder to finished product.

An affidavit accompanies each shipment attesting to its conformance with AMS-3651. Certified test reports of the actual properties of any shipment will be furnished whenever they are requested.

Be *sure* of optimum performance in Teflon by specifying electrical grade Fluoroflex-T. Remember, too–Fluoroflex-T products are non-porous and stress-relieved. This means better dimensional stability, less costly machining and fewer rejects. For more details, write or phone...

**DuPont trade mark for its tetrafluoroethylene resin.*
®Resistoflex trade mark for products from fluorocarbon resins.

RESISTOFLEX
corporation
Belleville 9, N. J.

There are

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 IRE 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 Institute 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.

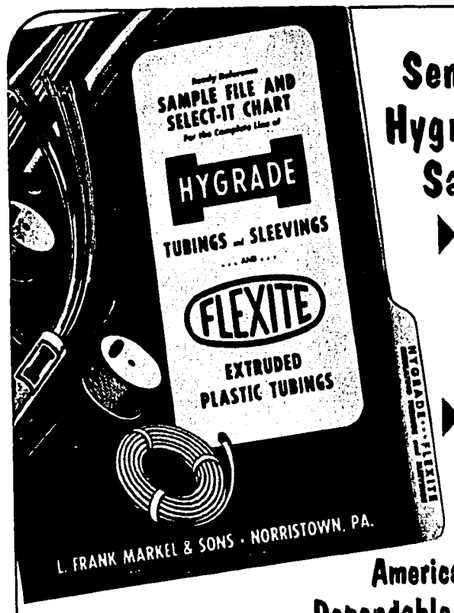
THE INSTITUTE OF RADIO ENGINEERS
ADVERTISING DEPARTMENT
1475 Broadway
New York 36, N.Y.

8. Services and Raw Materials

89. Plastics.

(Continued from page 541)

Mallory & Co., Inc., P. R., Ind., 5
Markel & Sons, L. Frank, P.O. Box 267, Norristown, Pa., 5, 25
For details see ad on page 543
Tel: NO 5-2121
Markite Corp., N.Y., Conductive
Mesa Plastics Co., Calif., 10
Mica Insulator Co., N.Y., 15, 20, 25
Midwest Plastic Prods. Co., Ill., 5, 15, 20, 25
Minnesota Mining & Mfg. Co., N.J., 5, 15, 20, 25
Monsanto Chemical Co., Mass., 10, 20
National Tel-Tronics Corp., N.Y., 15, 20, 25
National Vulcanized Fibre Co., Del.,,15, 20, 25
Natvar Corp., N.J., 5, 20, 25, Styroflex Film
Olin Industries, Inc., Electric Div., Conn., 20
Oppenheimer Corp., N.Y., 10
Panelyte Div., St. Regis Paper Co., N.Y., 15, 20, 25
Perfection Mica Co., Ill., 20, 25
Peters Chemical Mfg. Co., Ill., 10
Plastilight, Inc., Conn., 20
Polymer Corp. of Pennsylvania, 126 N. 5 St., Reading, Pa., 5, 10, 15, 20, 25
For details see ad on page 540
Tel: Reading 6-7241
Porcelain Prods., Inc., Ohio, 5
Resin Industries, Inc., Calif., 5, 15, 20, 25
Resistoflex Corp., Belleville 9, N.J., 5, 15, 20, 25
For details see ad on page 542
Tel: Plymouth 9-7000
Rex Corp., The, Hayward Rd., West Acton, Mass., 5, 15, 20
For details see ad on page 482
Tel: Acton 3-7721
Richardson Co., The, Ill., 15, 20, 25
Scheidl Mfg. Co., N.Y., Laminations
Semimetals Co. of America, Pa., 15, 20, 25
Shawinigan Prods. Corp., N.Y., 10
Sheffco Mfg. Co., N.J., 15, 20, 25
Smith & Stone, Ltd., Canada, 5
Stokes Molded Prods., N.J., 5, 15, 20, 25
Surprenant Mfg. Co., 199 Washington St., Boston 8, Mass., 5, 25
For details see ad on page 485
Tel: Clinton 2180
Taylor Fibre Co., Pa., 20, 25
United States Gasket Co., 611 N. 10th St., Camden 1, N.J., 5, 15, 20, 25
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
U. S. Wire & Cable Corp., N.J., 25
Varflex Corp., N.Y., 25
Vergon Specialties, N.J., 25
Westinghouse Electric Corp., Pa., 15, 20, 25
White Industrial Div., S. S., N.Y., 15
Wilson & Co., G. C., W.Va., 15, 20, 25



Send for Your Hygrade-Flexite Sample File

▶ *HYGRADE VARNISHED TUBING AND SLEEVING*

CLASS H—Silicone Treated Fiberglas
CLASS B—Fiberglas Base
CLASS A—Organic Base

▶ *FLEXITE EXTRUDED PLASTIC TUBING*

America's Oldest and Most Dependable Manufacturer of Insulating Tubing and Sleeving

L. FRANK MARKEL & SONS
Manufacturers of Electrical Insulations Since 1922
NORRISTOWN—PENNSYLVANIA

For further information

about any of the products listed, consult advertisements on pages shown at the end of the listing.

If the facts you want are not given in the advertisements, use the

Post Card Inserts

to write for literature without cost.

PRODUCTION MEN PREFER ALPHA





CEN-TRI-CORE

"ENERGIZED or PLASTIC"

ROSIN-FILLED SOLDER

Standard for Television, Radio and fine Electronic and Electrical work. Non-corrosive, melts faster, more joints per pound, insured continuity of flux. Available in 6 different flux percentages. Meets Federal Specifications.

foremost in Quality

the mighty midgets

SOFT-SOLDER PREFORMS

Designed for YOUR application. For Flame, oven or induction heating. Solid Wire, Acid or Rosin Core. ALL SIZES, SHAPES and ALLOYS... rings, washers, pellets, springs, discs and other shapes.

SPECIALISTS IN
SOLDERS AND FLUXES
FOR OVER 50 YEARS

SOLDERS FOR PRINTED CIRCUITRY

For dip soldering copper, solder plated and gold systems a 60% tin or a 63% tin alloy is recommended. For silver containing systems a silver bearing alloy is recommended to prevent silver take-up by the solder bath.



EXTERNAL FLUXES

for all soldering applications

ROSIN, ACTIVATED ROSIN,
GENERAL PURPOSE AND
STAINLESS STEEL FLUXES

SOLDERS FOR LOW TEMPERATURES — INDIUM

INDIUM pellets in all sizes. Made of pure indium and tolerances can be closely held. Indium pellets are most useful in Transistors, Resistors and Junction Resistors of all types, where very low temperatures are required. Alpha also makes solder pellets of all alloys for the soldering of GERMANIUM and SILICON DIODES.

OTHER ALPHA PRODUCTS

LAMP FLUX CORE • SOLID WIRE
BAR • RADIATOR and BODY
FOIL • RIBBON • PASTE SOLDER
PRINTED CIRCUIT SOLDERS
INDIUM PELLETS & ALLOYS AVAILABLE
UNI-CORE LEAK-PRUF ACID FLUX

Consult us on YOUR Soldering Problems!

Trained Field Engineers are always available to assist YOU.

ALPHA

ALPHA METALS, INC.

61 WATER STREET, JERSEY CITY 4, N.J.

35,000

Radio-Electronic Engineers will receive and use the 1954 IRE DIRECTORY

Better and Better and Better!

Up-to-dateness is almost a mania with IRE DIRECTORY compilers! Membership lists are corrected up to May 30th. Industry lists, compiled and classified by high speed IBM sorting methods are accurate to June 15th. No firm's report is older than 18 months.

Information at high speed! "Data the way an engineer thinks" is the key to IRE DIRECTORY classifications. All products are divided into 10 fundamental groups, many of which parallel professional group organization. The grouping plan makes this the fastest working directory you ever used! No components are mixed with test equipment -you turn right to a section where each item belongs.

Yet good engineering detail is maintained. 104 basic classes of products under these ten sectional product directories keep listings from becoming cumbersome, but clearly define products. Overlapping listings are skillfuly eliminated. Simplicity makes this book easy to work with--insures faster finding of facts when forgotten. Thus the faults of terminology listings are avoided.

Completeness is insured! Most firms make many products in a single classification. Wasteful, eye-confusing relisting of the same firms over and over is quite sensibly solved by using a system of codes under the 104 basic headings which actually provide 608 separate classifications. A more complete picture of what each firm's full line is results, but you travel through fewer listings. The "Copp Principle" of Directory indexing makes these lists wide, well marked highways to information —fast.

Machol Edge Index is just one more modern service to help the user find information fast.

Ads positioned with reason! In a DIRECTORY where ads play an important part in supplying information the user wants and needs, it makes good sense to cross-reference every advertiser in each listing so that the user can quickly find more detail. Ads are also placed facing company alphabetical listings, or in the product section in which they properly belong. No effort is spared to "organize" ad information.

More advertisers—more information! Never before have so many advertisers served IRE readers with so much information! The advertisers' list this year is truly a "social register" of this great industry.

THE INSTITUTE OF RADIO ENGINEERS

BRyant 9-7550 • ADVERTISING DEPT., 1475 BROADWAY, NEW YORK 36, N.Y.

8. Services and Raw Materials

90. Solder.

5. Acid core
10. Fluxes
15. Plain
20. Precious metal
25. Pre-forms
30. Rosin core

Alpha Metals, Inc., 61 Water St., Jersey City 4, N.J., 5, 10, 15, 20, 25, 30
For details see ad on page 544
Tel: HEnderson 4-6778

American Silver Co., Inc., N.Y., 10, 20, 25

American Smelting & Refining Federated Metals, N.Y., 5, 15, 25, 30

Anchor Metal Co., N.Y., 5, 10, 15, 20, 25, 30

Anderson Associates, H. V., 239 Park Ave., Berkeley Heights, N.J., 10
For details see ad on page 492
Tel: Summit 6-1840

Art Wire & Stamping Co., 3-B Boyden Pl., Newark 2, N.J., 25
For details see ad on page 547
Tel: HU 2-7492

Chase Brass & Copper Co., Conn., 10

Division Lead Co., Ill., 5, 10, 15, 20, 25, 30

Eastern Brass & Copper Co., Inc., N.Y., 20

Enthoven Solders, Ltd., England, 5, 10, 15, 20, 25, 30

Federated Metals Div., N.Y., 5, 15, 25, 30

Fusion Eng., Ohio, 5, 10, 15, 20, 25, 30, Solder Paste

General Plate, Div. Metals & Controls, Mass., 20, 25

Glaser Lead Co., Inc., N.Y., 5, 10, 15, 25, 30

Goldsmith Bros. Smelting & Refining Co., Ill., 10, 20

Handy & Harman, N.Y., 10, 20, 25

Kester Solder Co., 4219 Wrightwood Ave., Chicago 39, Ill., 5, 10, 15, 25, 30
For details see ad on page 546
Tel: BElmont 5-1601

Lake Chemical Co., Ill., 10

Lenk Mfg. Co., The, Mass., 5, 10, 15, 25, 30

Makepeace Co., D. E., Div. Union Plate Wire, Pine & Dunham Sts., Attleboro, Mass., 20
For details see ad on page 200
Tel: Attleboro 1-0089

Metals & Controls Corp., Mass., 20

Mico Instrument Co., 79 Trowbridge St., Cambridge 38, Mass., 10
For details see ad on page 533
Tel: KIrkland 7-8660

Mitchell-Rand Insulation Co., N.Y., 15

Multicore Solders, Ltd., England, 5, 10, 15, 25, 30

National Lead Co., N.Y., 5, 10, 15, 25, 30

(Continued on page 547)

in solder flux cores, too...

the right size is important!



AND ONLY

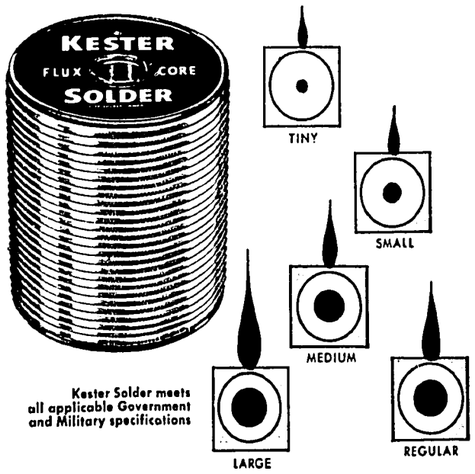
KESTER SOLDER

GIVES YOU

5

ENGINEERED CORE SIZES!

Just as in selecting the right hat size, it's important to select the correct core size in Flux-Core Solder to give you the proper predetermined amount of Flux needed to do the job right. Core size, which controls the ratio of flux to solder regardless of strand size, is always uniform with Kester.



Kester Solder meets all applicable Government and Military specifications

With five different core sizes, available only in Kester Solder, you're sure of the desired solder-spread and absolute control of flux residue. This is a "job-insurance" feature, only to be had with Kester, that will see you through satisfactorily in your production on those exacting government contracts, and all other soldering.

KESTER SOLDER COMPANY

4219 Wrightwood Ave., Chicago 39
Newark 5, New Jersey • Brantford, Canada

Priced Right! WIRE FORMS

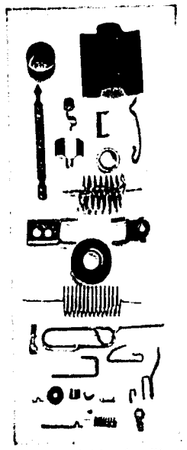
& Metal Stampings

STRAIGHTENING & CUTTING
Perfect straight lengths to 12 ft.
.0015 to .125 diameter

WIRE FORMS
.0015 to .125 diameter

SMALL METAL STAMPINGS
.0025 to .035 thickness
.062 to 3 inches wide

SMALL METAL STAMPINGS
.0025 to .035 thickness
.062 to 3 inches wide



High-speed quality production with custom-made precision. Wire formed to any shape for every need.

Specializing in Production of Parts for Electronic and Cathode Ray Tubes, and Transistors.

Write for illustrated folder.
Send Blueprints or Samples for Estimate.

ART WIRE & STAMPING CO.
3-B BOYDEN PLACE NEWARK 2, N.J.

8. Services and Raw Materials

Products 90-91

90. Solder.

(Continued from page 545)

Ney Co., J. M., 171 Elm St., Hartford 1, Conn., 20
For details see ad on page 377
Tel: Hartford 2-4271
Ruby Chemical Co., The, Ohio, 5, 10, 30
Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 20
For details see ad on page 484
Tel: White Plains 9-4757
Sightmaster Corp., N.Y., Aluminum Soldering Specialties, N.J., 5, 10, 15, 20, 25, 30
Southwest Prods., Inc., Tex., 20
Stromberg-Carlson Co., N.Y., 5, 30
Superior Flux & Mfg. Co., Ohio, 10, Welding, Soldering & Brazing
Wall Mfg. Co., P., Pa., 5, 30
Western Gold & Platinum Works, Calif., 20

91. Vacuum Tube Parts.

5. Anodes
10. Envelopes, glass
15. Envelopes, metal
20. Getters
25. Grids & grid wire
30. Guns & gun parts
35. Phospors
40. Pins & prongs
45. Spacers & insulators
50. Stampings
55. Tube caps
60. Tube clamps
65. Tube shields
70. Tubing-cathode

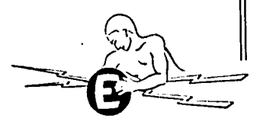
Acheson Colloids Co., Div. Acheson, Ind., Mich., Coatings

TUBE COMPONENTS

- Tungsten Lead wires (hard glass)
- Transmitter Tube Bases
  Top Caps all types
- Heater Elements

Stampings and spinnings for all inside parts of transmitter tubes.

ELECTRONIC MFG. CO.
20 ORANGE STREET
NEWARK 2, N.J.
MITCHELL 2-3034



CONTACTS • PINS • TERMINALS • JACKS
PLUGS • WIRE LEADS • PLASTIC INSERTS

made by the cost-saving

BEAD CHAIN

Multi-Swage Process

For Small Metal Parts

TRADE MARK

The advanced method for producing small metal parts — hollow or solid — beaded, grooved, shouldered, etc., — dimensions about ¼" or less diameter and up to 1½" length. This high speed process usually requires runs of 100,000 pieces, other than stock items, to justify job set-up costs.
Contact Pins have a tightly swaged seam with hole through entire length for easy threading of lead wires. Ideal for plastic, ceramic, metal and other bases or panels.
Male & Female Friction Contacts are available to close tolerances, maintain "holding power" with ease of engagement and release.
Terminals in many special and standard types, including turret-type — for flared, rolled, split, spun and other assemblies.



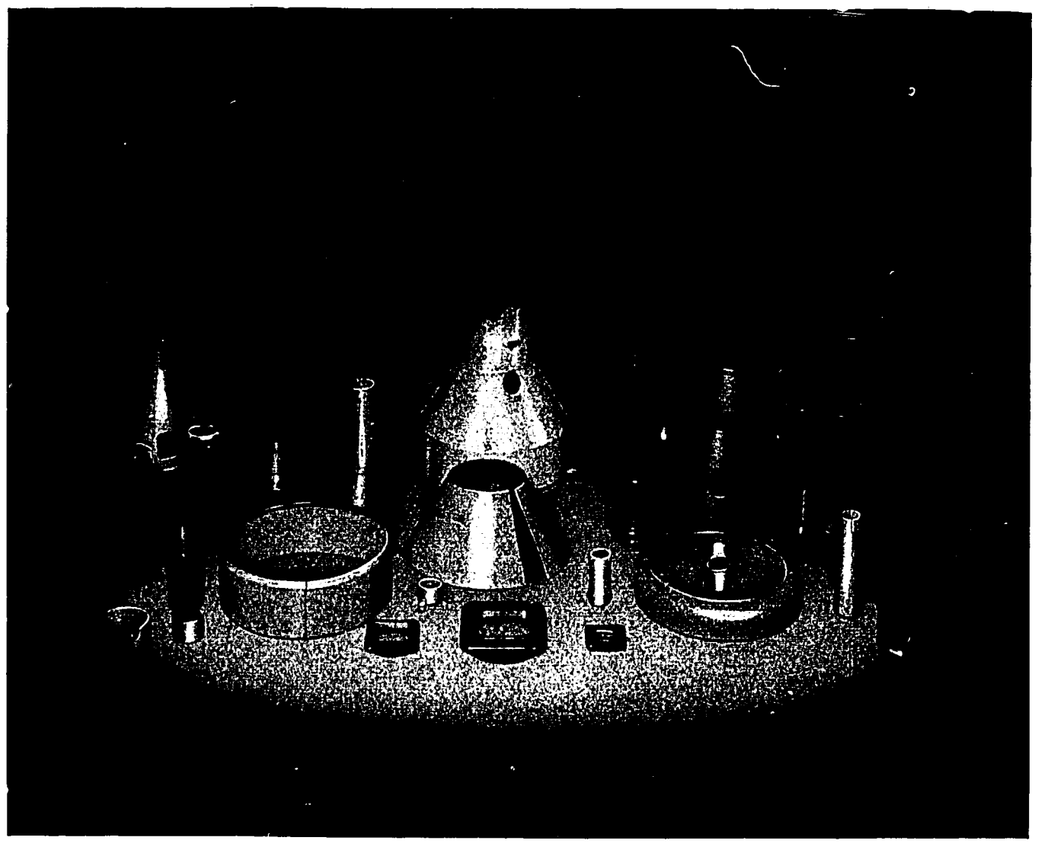
For further details see our advertisement on page 503.

THE BEAD CHAIN MFG. CO. 60 Mountain Grove St., Bridgeport, Conn.

91. Vacuum Tube Parts.

American Aluminum Co., 378 Jelliff Ave., Newark 8, N.J., 60, 65
For details see ad on page 492
Tel: BIgelow 3-3018
American Brass Co., Conn., 5, 40
American Electro Metal Corp., N.Y., 5, 25, 70
American Lava Corp., Cherokee Blvd. & Mfgrs. Rd., Chattanooga, Tenn., 45, 70
For details see ad on page 136
Tel: CHattanooga 5-3411
American Mica Insulation Co., N.J., 45
Art Wire & Stamping Co., 3-B Boyden Pl., Newark, N.J., 5, 20, 30, 40, 45, 50
For details see ad on page 547
Tel: HU 2-7492
Augat Bros., Inc., Mass., 60
Bead Chain Mfg. Co., 60 Mountain Grove St., Bridgeport 5, Conn., 40
For details see ad on pages 141, 503, 547
Tel: EDison 4-4124
Bigelow Mfg. Corp., N.J., Lead Wires
Birtcher Corp., Calif., 60
Brand & Co., Inc., William, Conn., 45
Brilhart Plastics Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y., 45
For details see ad on page 539
Tel: Pioneer 6-0425
Brooks Radio & Television Corp., N.Y., CRT Mounts
Buckbee Mears Co., Minn., 25
Cardwell Mfg. Corp., Allen D., Conn., 25
Centralab, Div. of Globe Union, Inc., 9201 E. Keefe Ave., Milwaukee 1, Wis., 45
For details see ad on pages 283, 346, 358, 372, 518
Tel: Woodruff 2-9200
Chicago Dial Co., Ill., Implosion Plates
Commercial Plastics Co., Dept. R, 2812 W. North Ave., Chicago 47, Ill., 60
For details see ad on page 504
Tel: Belmont 5-1030
Copperweld Steel Co., Pa., 25, Lead Wires
Cortland Industries, Inc., Ill., TV Tube Masks & Shield Covers
Dale Products, Inc., 1318 28 Ave., Columbus, Neb., 5, 20, 30
For details see ad on pages 118-119
Tel: Columbus 2139
Driver Co., Wilbur B., 1875 McCarter Highway, Newark 4, N.J., 25
For details see ad on page 164
Tel: HU 2-5550
Driver-Harris Co., N.J., 25
Eby, Inc., Hugh H., 4703 Stenton Ave., Philadelphia 44, Pa., 50, 65
For details see ad on page 370
Tel: Davenport 4-7000
Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif., 25
For details see ad on pages 90-91
Tel: Juneau 8-1212
Elco Corp., Pa., 65
Electronic Mfg. Co., 20 Orange St., Newark 2, N.J., 5, 25, 50, 55
For details see ad on page 547
Tel: MI 2-3034

(Continued on page 549)



Designed for Application

Mu Metal Shields

The James Millen Mfg. Co. Inc. has for many years specialized in the production of magnetic metal cathode ray tube shields for the entire electronics industry, supplying magnetic metal shields to manufacturing companies, laboratories and research organizations. Stock shields are immediately available for all of the more popular sizes and types of cathode ray tubes as well as bezels for 2″, 3″ and 5″ size tubes.

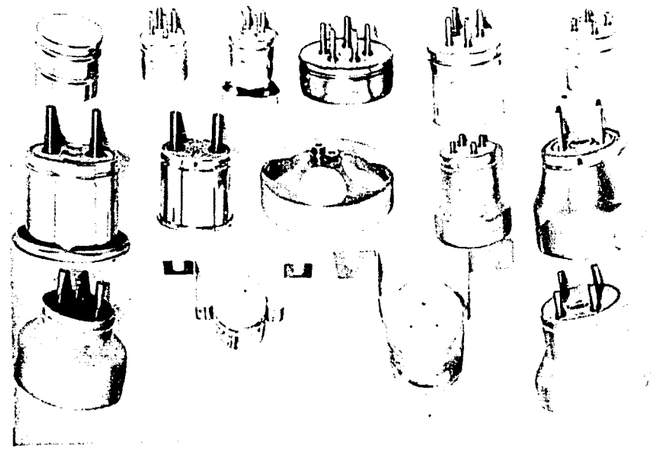
Many production problems, however, make desirable special shields designed in conjunction with the specialized requirement of the basic apparatus. Herewith, are illustrated a number of such custom built shields. Our custom design and fabrication department is at the service of our customers for the development and manufacture of magnetic metal shields of either nicoloi or mumetal for such specialized applications.

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN, MASSACHUSETTS, U.S.A.

DANIEL KONDAKJIAN TUNGSTEN LEADS—TUBE BASES

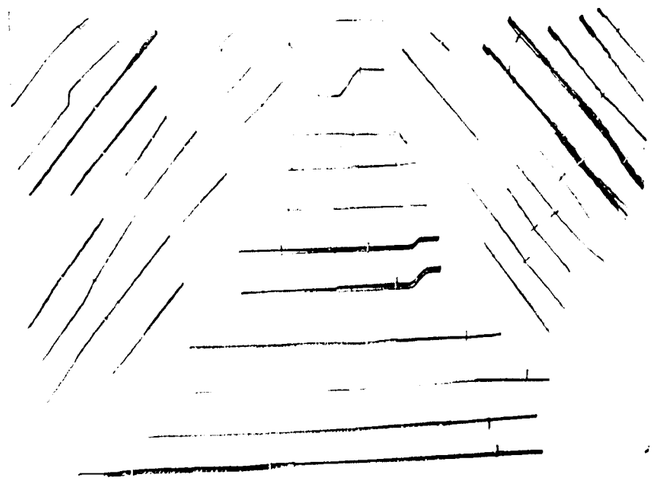


The Engineering Co. now specializing in the manufacture of Hydrogen Thyratron bases up to 6.25 in diameter. Also larger diameter bases.

Some of the popular bases which we manufacture are 50 watt, 3303B, 412 Industrial Base, Giant 7 Pin Bayonet, 4310-four pin jumbo base, Tetrode and many others.

All bases manufactured to JAN-1A/MIL-E-1B.

Bases are all given weight and strength tests.



Tungsten leads are made using General Electric Timing control. Each rod of tungsten is examined under magnifying glass to discover any flaws. Tube makers realize great loss in leakage if tungsten is not 100% pure.

Quality and low prices now available.

Send us your drawings for quotations and let us prove to you that Engineering Co. prices are OK.

THE ENGINEERING CO.

27 WRIGHT STREET, NEWARK, 5, NEW JERSEY

DKE

8. Services and Raw Materials

91. Vacuum Tube Parts.

Electronic Parts Mfg. Co., Inc., 5-8 58th St., Union City, N.J., Lead Wires
For details see ad on page 550
Tel: Union 5-4[illegible]

Engineering Co., 27 Wright St., Newark 5, N.J., 35, 50, 55, [illegible], 65, 70
For details see ad on page 549
Tel: BI[illegible]

Hoffman, Co., I. R., 321A Cherry St., Carlisle, Pa., 5
For details see ad on page 550
Tel: CArlisle 2-[illegible]

Ippolito & Co., Inc., James, 401 Concord Ave., New York 54, N.Y., 60, Shaft Locks & Terminals, Tube Retainers
For details see ad on page 511
Tel: CY 2-5[illegible]

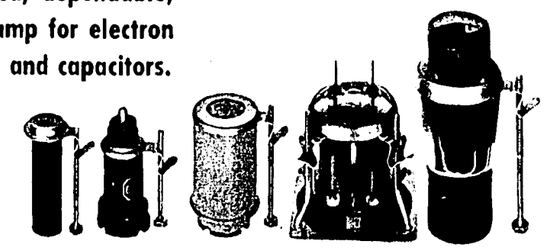
Johnson & Hoffman Mfg. Co., 31 East Second St., Mineola, L.I., N.Y., 5, 35, 40, 45, 50, 55, 60, 65
For details see ad on page 55[illegible]
Tel: Pioneer 2-3[illegible]

Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill., 60
For details see ad on page [illegible] 511
Tel: NE 2-[illegible]

Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mount Vernon, N.Y., 55
For details see ad on page 511
Tel: MOunt Vernon 4-4[illegible]

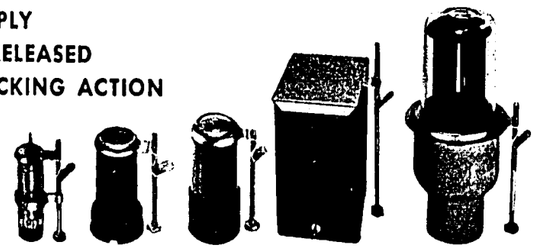
TOP HAT RETAINERS

A widely used, dependable, improved clamp for electron tubes, relays and capacitors.



WRITE FOR FREE CATALOG

EASY TO APPLY
INSTANTLY RELEASED
POSITIVE LOCKING ACTION



TIMES FACSIMILE CORPORATION
540 West 58 St., New York 19, N. Y.
1523 L St., N.W. Washington 5, D. C.



ELECTRONIC PARTS MANUFACTURING CO., Inc.
508 25th St., Union City, N. J.

8. Services and Raw Materials

91. Vacuum Tube Parts.

(Continued from page 549)

Metal Hydrides, Inc., Mass., 20
Metal Textile Corp., 647 E. First Ave., Roselle, N.J., 25
For details see ad on page 480
Tel: CHestnut 5-3000
Metallic Arts of New England, Inc., Mass., 65
Mica Insulator Co., N.Y., 45
Millen Mfg. Co., Inc., James, 150 Exchange St., Malden 48, Mass., 55, 60, 65
For details see ad on page 548
Tel: MAlden 4-4108
Multi-Tron Lab., Ill., 5, 30
Perfection Mica Co., Ill., 65
Pix Mfg. Co., Inc., N.J., 30, 40, 45, 50, 60
Radio Corp. of America, Tube Dept., Section F35Q, 415 S. 5th St., Harrison, N.J., 5, 15, 20, 25, 30, 40, 45
For details see ad on page 210
Tel: HUmboldt 5-3900
Sampson Chemical & Pigment Corp., Dept. ID, 2830 W. Lake St., Chicago 12, Ill., 35
For details see ad on page 540
Tel: Sacramento 2-6346

(Continued on page 551)

Stupakoff

VACUUM TUBE PARTS

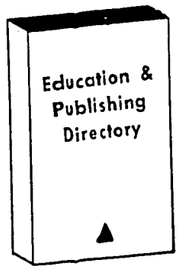
Kovar Alloy · Ceramics
Glass to Metal Seals

Stupakoff has long been a leading manufacturer of parts for vacuum tubes. Extensive experience has given Stupakoff engineers a thorough understanding and appreciation of the requirements plus the importance of quality, price and service.

STUPAKOFF CERAMIC & MFG. CO.
LATROBE, PENNSYLVANIA
DIVISION OF THE CARBORUNDUM COMPANY

A Directory of

9. Education and Publishing



The products and services of the Radio-Electronics industry have been organized into ten basic directories following closely the organization of the IRE Professional Groups. But 100 major product groups are numbered consecutively throughout.

Companies, associations, schools and publishers are contributing both training and printed education to the advancement of radio-electronics. A condensed list of those active in this field is included under the two headings,

Education
Publishing

in this special section. Note particularly the sub-classification codes at the end of each firm address.

102. Education.
- 05 Technical instruction—home study
- 10 Technical instruction—resident

103. Publishing.
- 05 Book publishers
- 10 Data sheet & manual preparation
- 15 Magazines

Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list more than 500 products by name, as well as under the product groups. Page numbers are given for speed.

91. Vacuum Tube Parts.

(Continued from page 550)

Scientific Electronic Lab., N.J., Button Stems
Secon Metals Corp., 7 Intervale St., White Plains, N.Y., 25
For details see ad on page 484
Tel: White Plains 9-4757
Sheldon Electric Co., Div. Allied Electric, N.J., 30
Smith, Inc., Herman H., N.Y., 60, 65
Sonotone Corp., N.Y., 30
Spincraft, Inc., Wis., 15, 65
Staver Co., Inc., N.Y., 5, 25, 50, 60, 65
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 45
For details see ad on pages 4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Tel: Latrobe 1400
Suckle Electronic Co., N.J., 65
Superior Tube Co., 2512 Germantown Ave., Norristown, Pa., 5, 30, 70
For details see ad on pages 88-89
Tel: Norristown 5-2070
Swiss Jewel Co. & Deltavis Co., Pa., 40
Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y., 5, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65
For details see ad on pages 9-14
Tel: JU 6-2424
Syncor Products Co., 26 Irving Ct., P.O. Box 51, Malden 48, Mass., 45
For details see ad on page 499
Tel: MAlden 2-1364
Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y., 60
For details see ad on page 550
Tel: JU 2-3030
Truelove & Maclean, Inc., Conn., 5, 15, 50, 65
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass., 55, 65
For details see ad on page 102
Tel: KIrkland 7-4900
United Insulator Co., Ltd., England, 45
United States Gasket Co., 611 N. Tenth St., Camden 1, N.J., 45, 65
For details see ad on pages 126-127
Tel: WOodlawn 4-0370
U. S. Radium Corp., N.Y., 35
Varian Assoc., 611 Hansen Way, Palo Alto 2, Calif., 25
For details see ad on page 398
Tel: DAvenport 5-5631
Volkert Metal Stampings, Inc., John, N.Y., 5, 30, 50, 65

In order to improve the grouping of products in the 1954 IRE Directory one of the 10 basic directories has been moved out of order. The directory of Test Equipment begins on page 435.

102. Education.

5. Technical instruction—home study
10. Technical instruction—resident

American Television Mfg. Corp., Ill., 5, 10
Armour Res. Found of Ill. Inst. Tech., Ill., 10
Associated Electronics Co., N.Y., 5, 10
Berkeley & Assoc., Edmund C., N.Y., 5
Capitol Radio Eng. Inst., D.C., 5, 10
Coastal Publications Corp., N.Y., 5
De Forests Training, Inc., Ill., 5, 10
Hollywood Radio Television Inst., Calif., 5
Illinois Institute of Technology, Ill., 10
Indiana University, Ind., 5, 10
Indianapolis Electronic School, Ind., 10
Jersey City Technical Inst., N.J., 10
Macmillan Co., The, N.Y., 5
Marconi's Wireless Telegraph Co., Ltd., England, 10
National Radio Institute, D.C., 5
Portland Television School, Ore., 10
RCA Institutes, Inc., N.Y., 5, 10
Ultradyne Eng. Labs., Inc., N.M., 5

Schools From Which IRE Student Applications are Accepted

Adelaide, University of, Adelaide, Australia
Akron, University of, Akron, Ohio
Alabama Polytechnic Institute, Auburn, Ala.

(Continued on page 552)

9. Education and Publishing

102. Education.

(Continued from page 551)

Alabama, University of, University, Ala.
Alaska, University of, College, Alaska
Alberta, University of, Edmonton, Alberta, Canada
Arizona, University of, Tucson, Ariz.
Arkansas, University of, Fayetteville, Ark.
Bradley University, Peoria, Ill.
British Columbia, University of, Vancouver, British Columbia, Canada
Brooklyn, Polytechnic Institute of, Brooklyn, N.Y.
Brown University, Providence, R.I.
Bucknell University, Lewisburg, Pa.
California Institute of Technology, Pasadena, Calif.
California State Polytechnic College, San Luis Obispo, Calif.
California, University of, Berkeley, Calif.
California, University of, Los Angeles, Calif.
Cambridge, University of, Cambridge, England
Capitol Radio Engineering Institute, Washington, D.C.
Carleton College, Canada
Carnegie Institute of Technology, Pittsburgh, Pa.
Case Institute of Technology, Cleveland, Ohio
Catholic University of America, Washington, D.C.
Central Radio & Television Schools, Kansas City, Mo.
Cincinnati, University of, Cincinnati, Ohio
Citadel, The, Charleston, S.C.
City & Guilds College of the University of London, London, England
Clarkson College of Technology, Potsdam, N.Y.
Clemson Agricultural College, Clemson, S.C.
Colorado A. and M. College, Fort Collins, Colo.
Colorado School of Mines, Golden, Colo.
Colorado, University of, Boulder, Colo.
Columbia University, New York, N.Y.
Connecticut, University of, Storrs, Conn.
Cooper Union School of Engineering, New York, N.Y.
Cornell University, Ithaca, N.Y.
Dartmouth College, Hanover, N.H.
Dayton, University of, Dayton, Ohio
Delaware, University of, Newark, Dela.
Denver, University of, Denver, Colo.
Detroit, University of, Detroit, Mich.
Drexel Institute of Technology, Philadelphia, Pa.
Duke University, Durham, N.C.
Escuela Oficial de Telecommunicacion, Spain
Escuela Superior de Ingenieria Mechanica y Electrica, Mexico
Facultad de Ciencias Exactas, Fisicas y Naturales de la Universidad Nacional de Buenos Aires, Buenos Aires, Argentina
Facultad de Ciencias Fisco-Mathematicas de la Universidad Nacional de la Plata, La Plata, Argentina
Fenn College, Cleveland, Ohio
Florida, University of, Gainesville, Fla.
Franklin University, Columbus, Ohio
George Washington University, Washington, D.C.
Georgia Institute of Technology, Atlanta, Ga.
Harvard University, Cambridge, Mass.
Hawaii, University of, Honolulu, Hawaii
Houston, University of, Houston, Tex.
Howard University, Washington, D.C.
Idaho, University of, Moscow, Idaho
Illinois Institute of Technology, Chicago, Ill.
Illinois, University of, Urbana, Ill.
Instituto Technologico de Aeronautica, Sao Jose dos Compas, S.P., Brazil
Iowa State College, Ames, Iowa
Iowa, State University of, Iowa City, Iowa
John Carroll University, Cleveland, Ohio
Johns Hopkins University, Baltimore, Md.
Kansas State College, Manhattan, Kan.
Kansas, University of, Lawrence, Kan.
Kentucky, University of, Lexington, Ky.
Kings College, Durham University, Durham, England
Lafayette College, Easton, Pa.
Laval University, Quebec, P.Q., Canada
Lawrence Institute of Technology, Detroit, Mich.
Lehigh University, Bethlehem, Pa.
Louisiana Polytechnic Institute, Ruston, La.
Louisiana State University, University, La.
Louisville, University of, Louisville, Ky.
Lowell Technological Institute of Massachusetts, Lowell, Mass.
Maine, University of, Orono, Me.
Manhattan College, New York, N.Y.
Manitoba, University of, Winnipeg, Manitoba, Canada
Marquette University, Milwaukee, Wis.
Maryland, University of, College Park, Md.
Massachusetts Institute of Technology, Cambridge, Mass.
Massachusetts, University of, Amherst, Mass.
McGill University, Montreal, P.Q., Canada
McMaster University, Hamilton, Ontario, Canada
Miami, University of, Coral Gables, Fla.
Michigan College of Mining and Technology, Houghton, Mich.
Michigan State College, East Lansing, Mich.
Michigan, University of, Ann Arbor, Mich.
Milwaukee School of Engineering, Milwaukee, Wis.
Minnesota, University of, Minneapolis, Minn.
Mississippi State College, State College, Miss.
Mississippi, University of, University, Miss.
Missouri School of Mines and Metallurgy, Rolla, Mo.
Missouri, University of, Columbia, Mo.
Montana School of Mines, Butte, Mont.
Montana State College, Bozeman, Mont.
Montreal, University of, Montreal, P.Q., Canada
National University of Tucuman, Tucuman, Argentina
Nebraska, University of, Lincoln, Neb.
Nevada, University of, Reno, Nev.
New Brunswick, University of, Fredericton, New Brunswick, Canada
New Hampshire, University of, Durham, N.H.
New Mexico College of A. and M. Arts, State College, N.M.
New Mexico, University of, Albuquerque, N.M.
New York, City College of, New York, N.Y.
New York State College of Ceramics (at Alfred University), Alfred, N.Y.
New York University, New York, N.Y.
Newark College of Engineering, Newark, N.J.
North Carolina State College, Raleigh, N.C.
North Dakota Agricultural College, Fargo, N.D.
North Dakota, University of, Grand Forks, N.D.
North Texas State College, Denton, Tex.
Northeastern University, Boston, Mass.
Northwestern University, Evanston, Ill.
Norwich University, Northfield, Vt.
Notre Dame, University of, Notre Dame, Ind.
Nova Scotia Technical College, Halifax, Nova Scotia, Canada
Ohio State University, Columbus, Ohio
Ohio University, Athens, Ohio
Oklahoma A. and M. College, Stillwater, Okla.
Oklahoma Institute of Technology, Stillwater, Okla.
Oklahoma, University of, Norman, Okla.
Oregon State College, Corvallis, Ore.
Pennsylvania State College, State College, Pa.
Pennsylvania, University of, Philadelphia, Pa.
Pittsburgh, University of, Pittsburgh, Pa.
Pratt Institute, Brooklyn, N.Y.

Keep your education up to date with articles on current developments in the electronic field in Proceedings of the I.R.E.

9. Education and Publishing

102. Education.

Princeton University, Princeton, N.J.
Purdue University, Lafayette, Ind.
Queens University, Kingston, Ontario, Canada
RCA Institutes, New York, N.Y.
Rensselaer Polytechnic Institute, Troy, N.Y.
Rhode Island, University of, Kingston, R.I.
Rice Institute, Houston, Tex.
Rochester, University of, Rochester, N.Y.
Rose Polytechnic Institute, Terre Haute, Ind.
Rutgers University, New Brunswick, N.J.
Saint Louis University, St. Louis, Mo.
San Diego State College, San Diego, Calif.
San Jose State College, San Jose, Calif.
Santa Clara, University of, Santa Clara, Calif.
Saskatchewan, University of, Saskatoon, Saskatchewan, Canada
Seattle University, Seattle, Wash.
Sir George Williams College, Montreal, P.Q., Canada
South Carolina, University of, Columbia, S.C.
South Dakota State College, Brookings, S.D.
South Dakota School of Mines, Rapid City, S.D.
Southern California, University of, Los Angeles, Calif.
Southern Methodist University, Dallas, Tex.
Southern Technical Institute, Chamblee, Ga.
Stanford University, Stanford, Calif.
Stevens Institute of Technology, Hoboken, N.J.
Swarthmore College, Swarthmore, Pa.
Syracuse University, Syracuse, N.Y.
Tennessee, University of, Knoxville, Tenn.
Texas, A. and M. College of, College Station, Tex.
Texas College of Arts and Industries, Kingsville, Tex.
Texas Technological College, Lubbock, Tex.
Texas Western College, El Paso, Tex.
Texas, University of, Austin, Tex.
Toledo, University of, Toledo, Ohio
Toronto, University of, Toronto, Ontario, Canada
Tufts College, Medford, Mass.
Tulane University of Louisiana, New Orleans, La.
Tulsa, University of, Tulsa, Okla.
Union College, Schenectady, N.Y.
United States Coast Guard Academy, New London, Conn.
United States Naval Post-graduate School, Monterey, Calif.
Universidad de La Plata, La Plata, Argentina
Utah State Agricultural College, Logan, Utah
Utah, University of, Salt Lake City, Utah
Valparaiso Technical Institute, Valparaiso, Ind.
Vanderbilt University, Nashville, Tenn.
Vermont, University of, Burlington, Vt.
Villanova College, Villanova, Pa.
Virginia Military Institute, Lexington, Va.
Virginia Polytechnic Institute, Blacksburg, Va.
Virginia, University of, Charlottesville, Va.
Washington, State College of, Pullman, Wash.
Washington University, St. Louis, Mo.
Washington, University of, Seattle, Wash.
Wayne University, Detroit, Mich.
Webb Institute of Naval Architecture, Glen Cove, N.Y.
Wentworth Institute, Auston, Mass.
West Virginia University, Morgantown, W.Va.
Western Ontario, University of, London, Ontario, Canada
Wichita, Municipal University of, Wichita, Kan.
Wisconsin, University of, Madison, Wis.
Witwatersrand, University of, Johannesburg, South Africa
Worcester Polytechnic Institute, Worcester, Mass.
Wyoming, University of, Laramie, Wyo.
Yale University, New Haven, Conn.

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1913-1915 Volumes 1-3 Quarterly

1913 Vol. 1 January (A Reprint)

1916-1926 Volumes 4-14 Bimonthly

1922 Vol. 10 June, August, October
1923 Vol. 11 April
1925 Vol. 13 April, June, December
1926 Vol. 14 February, April, August, October

1927-1938 Volumes 15-26 Monthly

1927 Vol. 15 May, October, December
1928 Vol. 16 February to December, Inc.
1929 Vol. 17 April, May, June, November
1930 Vol. 18 April to December, Inc.
1931 Vol. 19 January to November, Inc.
1932 Vol. 20 January, March to December, Inc.
1933 Vol. 21 All 12 issues
1934 Vol. 22 All 12 issues
1935 Vol. 23 All 12 issues
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1945 Vol. 33 March, May, June, November, December
1946 Vol. 34 February, April to December, Inc.
1947 Vol. 35 January to May, Inc., November, December
1948 Vol. 36 All 12 issues
1949 Vol. 37 February, March, July to December, Inc.
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1953 Vol. 41 January to September, Inc., November, December
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PGAE-4;	The Selectivity and Intermodulation Problem in UHF and Communication Equipment	$ .45	$ .65	$1.35
PGAE-5;	A Dynamic Aircraft Simulator for Study of Human Response Characteristics	.30	.45	.90
PGAE-6;	Ground-to-Air Cochannel Interference at 2900 MC	.30	.45	.90
PGAE-8;	June 1953 Issue	.65	.95	1.95
PGAE-9;	September 1953 Issue	.70	1.05	2.10
Vol. ANE-1,	No. 1; March 1954 Issue	1.00	1.50	3.00
	ANTENNAS AND PROPAGATION G-3			
PGAP-4;	IRE Western Convention, August 1952	2.20	3.30	6.60
Vol. AP-1,	No. 1; July 1953 Issue	1.20	1.80	3.60
Vol. AP-1,	No. 2; October 1953 Issue	1.20	1.80	3.60
Vol. AP-2,	No. 1; January 1954 Issue	1.35	2.00	4.05
Vol. AP-2,	No. 2; April 1954 Issue	2.00	3.00	6.00
Vol. AP-2,	No. 3; July 1954 Issue	1.50	2.25	4.50
	AUDIO G-1			
PGA-5;	Design Interrelations of Records and Reproducers	.30	.45	.90
PGA-7;	Editorials, Technical Papers and News	.90	1.35	2.70
PGA-10;	November-December 1952 Issue	.70	1.05	2.10
Vol. AU-1,	No. 1; January-February 1953 Issue	.60	.90	1.80
Vol. AU-1,	No. 2; March-April 1953 Issue	.80	1.20	2.40
Vol. AU-1,	No. 3; May-June 1953 Issue	.80	1.20	2.40
Vol. AU-1,	No. 4; July-August 1953 Issue	.70	1.05	2.10
Vol. AU-1,	No. 5; September-October 1953 Issue	.50	.75	1.50
Vol. AU-1,	No. 6; November-December 1953 Issue	.90	1.35	2.70
Vol. AU-2,	No. 1; January-February 1954 Issue	1.20	1.80	3.60
Vol. AU-2,	No. 2; March-April 1954 Issue	.95	1.40	2.85
Vol. AU-2,	No. 3; May-June 1954 Issue	.95	1.40	2.85
	BROADCAST AND TELEVISION RECEIVERS G-8			
PGBTR-1;	Round-table Discussion on UHF Television Receiver Considerations, 1952 IRE National Convention	.50	.75	1.50
PGBTR-2;	Papers Presented at IRE-RTMA Radio Fall Meeting, Syracuse, New York, October 20-22, 1952	.60	.90	1.80
PGBTR-3;	June 1953 Issue	1.40	2.10	4.20
PGBTR-5;	January 1954 Issue	1.80	2.70	5.40
PGBTR-6;	April 1954 Issue	2.35	3.50	7.00
	CIRCUIT THEORY G-4			
PGCT-1;	IRE Western Convention, August 1952	1.60	2.40	4.80
PGCT-2;	Papers Presented at Circuit Theory Sessions, Western Electronic Show & Convention, August 19-21, 1953, San Francisco, California	1.95	2.90	5.85
Vol. CT-1,	No. 1: Servomechanism Papers Presented at the Western Electronic Show & Convention, August 19-21, 1953, San Francisco, California	1.30	1.95	3.90
	COMMUNICATIONS SYSTEMS G-19			
Vol. CS-2,	No. 1; January 1954 Issue	1.65	2.50	4.95
	COMPONENT PARTS G-21			
PGCP-1;	March 1954 Issue	1.20	1.80	3.60

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Vol. EC-2,	No. 2; June 1953 Issue	$ .90	$1.35	$2.70
Vol. EC-2,	No. 3; September 1953 Issue	.75	1.10	2.25
Vol. EC-2,	No. 4; December 1953 Issue	1.25	1.85	3.75
Vol. EC-3,	No. 1; March 1954 Issue	1.10	1.65	3.30
Vol. EC-3,	No. 2; June 1954 Issue	1.65	2.45	4.95
	ELECTRON DEVICES G-15			
PGED-1;	IRE Conference on Electron Tube Research and IRE-AIEE Conference on Semi-Conductor Research, June 1952	.80	1.20	2.40
PGED-2;	IRE Conference on Electron Tube Research, Ottawa, Canada, June 1952 and IRE Western Convention, August 1952	1.60	2.40	4.80
PGED-4;	December 1953 Issue	1.30	1.95	3.90
Vol. ED-1,	No. 1; February 1954 Issue	1.40	2.10	4.20
Vol. ED-1,	No. 2; April 1954 Issue	1.40	2.10	4.20
	ENGINEERING MANAGEMENT G-14			
PGEM-1;	February 1954 Issue	1.15	1.70	3.45
	INDUSTRIAL ELECTRONICS G-13			
PGIE-1;	August 1953 Issue	1.00	1.50	3.00
	INFORMATION THEORY G-12			
PGIT-2;	A Bibliography of Information Theory (Communication Theory—Cybernetics)	1.25	1.85	3.75
PGIT-3;	Symposium on Statistical Methods in Communication Engineering, August 17-18, 1953, Berkeley, California	2.60	3.90	7.80
	INSTRUMENTATION G-9			
PGI-2;	Data Handling Systems Symposium; IRE Western Electronic Show & Convention, Long Beach, California, August 1952	1.65	2.45	4.95
PGI-3;	April 1954 Issue	1.05	1.55	3.15
	MEDICAL ELECTRONICS G-18			
PGME-1;	November 1953 Issue	1.05	1.55	3.15
	MICROWAVE THEORY AND TECHNIQUES G-17			
Vol. MTT-1,	No. 2; November 1953 Issue	.90	1.35	2.70
Vol. MTT-2,	No. 1; April 1954 Issue; Papers presented at the Microwave Radio Relay Systems Symposium, New York, N.Y., November 5-6, 1953	2.20	3.30	6.60
	QUALITY CONTROL G-7			
PGQC-1;	Papers presented at Radio Fall Meeting, and 1952 IRE National Convention	1.20	1.80	3.60
PGQC-2;	March 1953 Issue	1.30	1.95	3.90
PGQC-3;	February 1954 Issue	1.15	1.70	3.45
	ULTRASONICS ENGINEERING G-20			
PGUE-1;	June 1954 Issue	1.55	2.30	4.65
	VEHICULAR COMMUNICATIONS G-6			
PGVC-2;	Symposium on What's New in Mobile Radio	1.20	1.80	3.60
PGVC-3;	Papers presented at Third Annual Meeting, Professional Group on Vehicular Communications, Washington, D.C. December 3-5, 1952, (Theme: Spectrum Conservation)	3.00	4.50	9.00
PGVC-4;	June 1954 Issue Theme: Design, Planning and Operation of Mobile Communications Systems	2.40	3.60	7.20

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9. Education and Publishing

103. Publishing.

5. Book publishers 10. Data sheet & manual preparation 15. Magazines

Acme Teletronix Div., NEA Service Ohio, 10

Ark Engineering Co., 431 W. Tabor Rd., Philadelphia 20, Pa., 10
For details see ad on page 487
Tel: Livingston 8-1545

Associated Electronics Co., N.Y., 5, 10

Associated Publishing Services, Inc., N.J., 10

Berkeley & Assoc., Edmund C., 815 Washington St., R 98, Newtonville 60, Mass., 5, 15
For details see ad on page 555
Tel: Decatur 2-5453

Berkshire Labs., Mass., 5

Bibbero, Robert J., N.Y., 10

Brentanos Technical Dept., N.Y., 15

Coastal Publications Corp., N.Y., 5, 10

Drake & Co., Frederick J., Ill., 5

Electronic Design, N.Y., 15

Electronics Research, N.J., 10

Elsevier Press, Tex., 5

(Continued on page 557)

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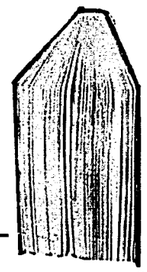
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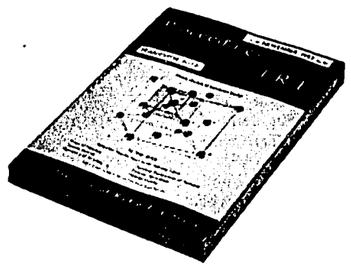
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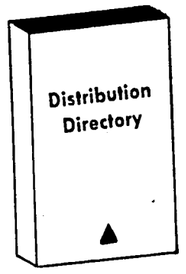
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The final section of our "10 in 1" directory is the complement to manufacturing, which is distribution. It has proved to be a real service to IRE member engineers and executives to put into this book a list of annually checked jobbers, wholesalers and distributors. Many of these firms are identified further by the initials REP, as member of "The Representatives," or NEDA, as member of the National Electronic Dealers Association. The number after the address codes each firm as shown at start of listing, top left.

104 Distribution.
- 05 Export & Import
- 10 Jobbers & Wholesalers
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Always consult the pink pages at the start of the Directory of firms, for a terminology cross-index, or to find products by name. The pink pages list 608 products by name, as well as under the product groups. Page numbers are given for speed.

104. Distribution.

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(Continued on page 561)

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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. To this end, the product grouping follows the pattern of the IRE Professional Groups, broadly. The result is a division of all products and services into ten fundamental indexes into which 104 basic classifications have been organized.

You will note that we here differ from most directory compilers, for we do not mix meters with motors simply for alphabetical reasons. Products used in "Audio" whether components or complete apparatus form the first fundamental group. Yet, the same manufacturer and product 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*.

1. **Audio Frequency Equipment** (Products 1 to 11)
2. **Broadcasting Equipment** (Products 12 to 17)
3. **Communications Equipment** (Products 18 to 25)
4. **Component Parts** (Products 26 to 62)
5. **Applications of Electronics** (Products 63 to 70)
6. **Radar, Microwave, UHF** (Products 71 to 74)
7. **Test & Measuring Equipment** (Products 92 to 101)
8. **Services and Materials** (Groups 75 to 91)

   Here we separate the consultant, the fabricating firm, the machine for radio manufacturing, and basic materials from being lost in an alphabetical maze of component and test equipment names.

9. **Education & Publishing** (Groups 102 & 103)
10. **Distribution Functions** (Service 104)

For detailed identification, these 104 products and services, grouped in the 10 indexes, are further defined into over 600 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!

For safety, an alphabetical "terminology" index is given, preceding the product system in the pink pages introducing the company index. 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.

The IRE DIRECTORY is 10 Indexes in one book.

10. Distributional Functions

104. Distribution.

(Continued from page 559)

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Inland Electr. Supply, 843 Colten Ave., San Bernardino, Calif., 10 (NEDA)

Ireland, Frederick, 1000 N. Seward St., Los Angeles 38, Calif., 15 (REP)

Kemp Co., E. M., 1115 R St., Sacramento 14, Calif., 10 (NEDA)

Kittleson, H. A., 7614 Melrose Ave., Los Angeles 46, Calif., 15 (REP)
Tel: WH 1167

Knight, W. Bert, 10373 W. Pico Blvd., Los Angeles 64, Calif., 15 (REP)
Tel: Bradshaw 2-5647

Koessler, Frank B., 6907 Melrose Ave., Los Angeles 38, Calif., 15 (REP)

Lasure, Harry A., 9041 W. Pico Blvd., Los Angeles 35, Calif., 15 (REP)
Tel: Bradshaw 2-7805

Lebell, Frank, 988 Market St., San Francisco 2, Calif., 15 (REP)

Lewis, Dean A., 219-21 Ninth St., San Francisco 3, Calif., 15 (REP)
Tel: Underhill 3-1414

Logan, Les, 530 Gough St., San Francisco 3, Calif., 15 (REP)
Tel: Hemlock 1-5127

Loukota, Joseph W., 6010½ Franklin Ave., Los Angeles 28, Calif., 15 (REP)
Tel: Hollywood 4-8157

Marsh, Joseph W., 4216 W. Jefferson Blvd., Los Angeles 16, Calif., 15 (REP)
Tel: Republic 2-0145

Marshall, G. S., 40 S. Los Robles, Pasadena 1, Calif., 15 (REP)
Tel: Ryan 1-9663

Marshank, David N., 672 S. Lafayette Pk., Los Angeles 5, Calif., 15 (REP)
Tel: Dunkirk 7-8235

Marshank, Norman J., 672 S. Lafayette Pk., Los Angeles 5, Calif., 15 (REP)
Tel: Dunkirk 7-8235

Meyer, Charles N., 113 10th St., San Francisco 3, Calif., 15 (REP)
Tel: Hemlock 1-0480

Miller, Gerald B., 1550 N. Highland Ave., Los Angeles 28, Calif., 15 (REP)
Tel: Hollywood 9-6305

Moulthrop, Richard W., 160 Tenth St., San Francisco 3, Calif., 15 (REP)
Tel: Hemlock 1-2624

Murgerl, R. R., c/o J. W. Marsh Co., 4216 W. Jefferson Blvd., Los Angeles 16, Calif., 15 (REP)
Tel: Republic 2-0145

Nace, Charles J., 10373 W. Pico Blvd., Los Angeles 64, Calif., 15 (REP)
Tel: Bradshaw 2-5647

Neely, Norman B., 7422 Melrose Ave., Los Angeles 46, Calif., 15 (REP)
Tel: Webster 3-9201

Newman, Harold L., 420 Market St., San Francisco 11, Calif., 15 (REP)
Tel: Yukon 6-3897

Nickerson & Rudat, 381 Brannan St., San Francisco 7, Calif., 10
Tel: Yukon 2-2982

Nott, L. A., 1061 Howard St., San Francisco 3, Calif., 15 (REP)
Tel: Hemlock 1-4738

Nott, Willard M., 1061 Howard St., San Francisco 3, Calif., 15, (REP)
Tel: Hemlock 1-4738

Owens, Lee H., 2331 W. Washington Blvd., Los Angeles 18, Calif., 15 (REP)
Tel: Republic 0203

Patterson, Wm. G., 2936 E. 46th St., Los Angeles 58, Calif., 15 (REP)

Power, Ralph L., 767 Castelar St., Los Angeles 12, Calif., 15 (REP)

Purdy, Wm. J., 312 7th St., San Francisco 3, Calif., 15 (REP)
Tel: Underhill 3-4321

Purdy, Wm. J., Jr., 312 Seventh St., San Francisco 3, Calif., 15 (REP)

Quemont, Inc., Frank, 161 W. San Fernando St., San Jose, Calif., 10 (NEDA)

Radio Equip. Distributor, 1340 South Olive, Los Angeles 15, Calif., 10 (NEDA)

Radio Products Sales, 1501 S. Hill St., Los Angeles 15, Calif., 10 (NEDA)

Rissi, Al J., 2724 S. Peck Rd., Monrovia Calif., 15 (REP)
Tel: Douglass 6-2137

Roberts, Ernest V., 5068 W. Washington Blvd., Los Angeles 16, Calif., 15 (REP)
Tel: Webster 8-2541

Ross, David H., 534 El Camino Real, San Carlos, Calif., 15 (REP)
Tel: Lytell 3-8224

Rudat, Dan J., 383 Brannan St., San Francisco 7, Calif., 15 (REP)
Tel: Yukon 2-2982

(Continued on page 562)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10. Distributional Functions

104. Distribution.

(Continued from page 561)

Rupp, Vern T., 2230 W. 11th St., Los Angeles 6, Calif., 15 (REP)
Tel: Dunkirk 3-4197

San Francisco Radio & Supply, 1282 Market St., San Francisco, Calif., 10 (NEDA)

Saul, Howard M., 5015 San Vicente Blvd., Los Angeles 19, Calif., 15 (REP)
Tel: Webster 1-8901

Scott Radio Supply, 266 Alamitos Ave., Long Beach 2, Calif., 10 (NEDA)

Siegel, Samuel, 1133 S. La Cienega Blvd., Los Angeles 35, Calif., 15 (REP)
Tel: Bradshaw 2-4183

Silvey, Charles, 8575 W. Washington Blvd., Culver City, Calif., 15 (REP)

Sinai, Arnold A., 65 Ninth St., San Francisco 3, Calif., 15 (REP)
Tel: Underhill 1-6259

Sindsay, Lawrence L., Jr., c/o W. S. Harmon Co., 121 N. Robertson Blvd., Beverly Hills, Calif., 15 (REP)
Tel: Bradshaw 2-3321

Smith & Crawford, 789 Stevenson St., San Francisco 3, Calif., 10 (NEDA)

Sodaro, Joseph F., 2924 Selby Ave., Los Angeles 64, Calif., 15
Tel: Texas 0-3213

Stolaroff, M. A., 4614 Northridge Dr., Los Angeles 43, Calif., 15 (REP)
Tel: Axminster 3-6219

Stone, Carl A., 1102 S. Western Ave., Los Angeles 6, Calif., 15 (REP)
Tel: Republic 2-8103

Stone, Richard L., 5864 Hollywood Blvd., Hollywood 28, Calif., 15 (REP)

Strassner, Conrad R., 1865 N. Western Ave., Los Angeles 27, Calif., 15 (REP)
Tel: Hollywood 7-3052

Strassner, Ellard E., 1865 N. Western Ave., Los Angeles 27, Calif., 15 (REP)
Tel: Hollywood 7-3052

Strassner, Richard A., 1865 N. Western Ave., Los Angeles 27, Calif., 15 (REP)
Tel: Hollywood 7-3052

Tompkins, Win W., 941 Newell Rd., Palo Alto, Calif., 15 (REP)
Tel: Davenport 3-3270

TUBERGEN ASSOCIATES

Engineering and Sales Representatives
So. California—Arizona

John B. Tubergen
Robert L. Bray
Jack Carter
S. S. Stevens

2232 W. 11th St. Los Angeles 6

Tubergen Associates, 2232 W. 11th St., Los Angeles 6, Calif., 15
For details see ad on page 562
Tel: Dunkirk 9-3173

Vermilya, Robert H., 1258 Fitzgerald Ave., San Francisco 24, Calif., 15 (REP)
Tel: Valencia 4-6714

Wallace, Don C., 1206 Maple Ave., Los Angeles 15, Calif., 15 (REP)
Tel: Richmond 7-0401

Wallace, Wm. H., 1206 Maple Ave., Los Angeles 15, Calif., 15 (REP)
Tel: Richmond 7-0401

Weatherford Co., R. V., 6921 San Fernando, Glendale 1, Calif., 10 (NEDA)

Weber, Wedge, 1206 Long Beach Ave., Los Angeles 21, Calif., 15 (REP)
Tel: Vandike 2009

Wedemeyer, R. C., 1234 Folsom St., San Francisco 3, Calif., 15 (REP)

Wiley, Paul F., 1632 Silverlake Blvd., Los Angeles 26, Calif., 15 (REP)

Wood, Ash M., P. O. Box 150, El Monte, Calif., 15 (REP)
Tel: Cumberland 3-1201

Woodbury, Robert W., 8812 Villanova Ave., Los Angeles 45, Calif., 15 (REP)

Wresco, 140 Ninth St., San Francisco 2, Calif., 10 (NEDA)

Wright Eng. Co., 180 E. Calif. St., Pasadena 1, Calif., 15
Tel: Ryan 1-8488

Zack Radio Supply Co., 1424 Market St., San Francisco 2, Calif., 10 (NEDA)

OREGON

Burcham, Don H., 510 N.W. 19th Ave., Portland 9, Ore., 15 (REP)
Tel: Broadway 7333

Carlson, Hatton & Hay, Inc., 96 E. Tenth Ave., Eugene, Ore., 10 (NEDA)

Central Distributors, 1331 N.W. Couch, Portland 9, Ore., 10 (NEDA)

Legg, Richard R., 2118 S.E. Div. St., Portland 2, Ore., 15 (REP)
Tel: Empire 8918

Minthorne, Roger M., 7521 N.E. Glisan, Portland 16, Ore., 15 (REP)
Tel: Kenwood 0010

Portland Radio Supply Co., 1234 S.W. Stark, Portland 5, Ore., 10 (NEDA)

Stubbs Elec. Co., 33 N.W. Park Ave., Portland 9, Ore., 10 (NEDA)

Tracey & Co., Inc., 937 N.W. Glisan, Portland 9, Ore., 10 (NEDA)

United Radio Supply, Inc., 22 N.W. 9th Ave., Portland 9, Ore., 10 (NEDA)

Walker Co., Verl G., P. O. Box 1586, Medford, Ore., 10 (NEDA)

Weber, Dale G., 234 Sherlock Blvd., Portland 4, Ore., 15 (REP)
Tel: Atwater 5403

WASHINGTON

C & G Radio Supply Co., Corner 13th & Pacific, Bremerton, Wash., 10 (NEDA)

C & G Radio Supply Co., 2502 Jefferson Ave., Tacoma 2, Wash., 10 (NEDA)

General Radio, Inc., 100 Wall St., Seattle 1, Wash., 10 (NEDA)

Haight, Fred H., 3212 Eastlake Ave., Seattle 2, Wash., 15 (REP)
Tel: East 1818

Harper-Meggee, Inc., 960 Republican, Seattle 9, Wash., 10 (NEDA)

James, Ralph, 4130 First Ave., S. Seattle 4, Wash., 15 (REP)
Tel: Eliot 8882

Lee, David M., 2517 Second Ave., Seattle 1, Wash., 15 (REP)
Tel: Main 5512

Marsh, Lloyd D., 2601 First Ave., Seattle 1, Wash., 15 (REP)
Tel: Main 8762

Merritt, Ron, 120 W. Thomas, Seattle 99, Wash.
Tel: Garfield 6644

Northwest Electr., Inc., N. 102 Monroe St., Spokane, Washington, 10 (NEDA)

Parsons, C. B., 3028 First Ave., Seattle 1, Wash.
Tel: Mutual 3933

Porter, Burt C., 4310 Roosevelt Way, Seattle 5, Wash., 15 (REP)
Tel: Melrose 6828

Pringle Radio Wholesale, 2514 Colby, Everett, Wash., 10 (NEDA)

Radio Prods. Sales Co., 1214 First Ave., Seattle, Wash., 10 (NEDA)

Seattle Radio Supply, Inc., 2117 Second Ave., Seattle 1, Wash., 10 (NEDA)

Stroum, Samuel N., 1612 Broadway, Seattle 22, Wash., 15 (REP)
Tel: Franklin 7515

Wedel, Frank, 3215 Western Ave., Seattle, Wash., 15 (REP)
Tel: Garfield 0222

Western Electronic Supply, 717 Dexter Ave., Seattle 9, Wash., 10 (NEDA)

Wible Radio Supply, Inc., 2360 S. Fawcett Ave., Tacoma 1, Wash., 10 (NEDA)

Widdekind, M. K., 216 First Ave., N. Seattle 9, Wash., 15 (REP)
Tel: Eliot 6981

Zobrist, Herb E., 2121 Westlake Ave., Seattle 1, Wash., 10 (NEDA)

Mountain

UTAH

Electrical TV Eng. Co., 45 E. Broadway, Salt Lake City 1, Utah, 15, 20
Tel: 4-6732

Gates, Franklin Y., 200 S. Main St., Salt Lake City, Utah, 15 (REP)
Tel: 9-1101

ARIZONA

Elliott Electronics, Inc., 418 N. 4th Ave., Tucson, Ariz., 10 (NEDA)

Radio Parts of Arizona, 214 S. 11th Ave., Phoenix, Ariz., 10 (NEDA)

Standard Radio Parts, 218 North 1st Ave., Tucson, Ariz., 10 (NEDA)

10. Distributional Functions

104. Distribution.

COLORADO

Bishop, Harry L., Jr., c/o Ronald G. Bowen, 446 Broadway, Denver 3, Colo., 15 (REP)
Tel: Sherman 2501

Bowen, Ronald G., 446 Broadway, Denver 3, Colo., 15 (REP)
Tel: Sherman 2501

Bush, Leon S., 439 Redondo Ave., Salt Lake City, Utah, 15 (REP), c/o A. J. Nelson, P. O. Box 5502, Denver, Colo.
Tel: Spruce 7878

Cathey, Ray, c/o Ronald G. Bowen, 446 Broadway, Denver 3, Colo., 15 (REP)
Tel: Sherman 2501

Connors, W. H., 5532 E. Colfax Ave., Denver, Colo., 15 (REP)
Tel: Fremont 0566

Cox, John, c/o Dick Hyde, 3250 S. Dexter St., Denver 20, Colo., 15 (REP)
Tel: Skyline 6-7151

Golliher, W. B., 1003 Grandview Ave., Boulder, Colo., 15 (REP)
Tel: 2790

Hyde, Dick, 3250 S. Dexter St., Denver 20, Colo., 15 (REP)
Tel: Skyline 6-7151

Mc Loud, W. Clif, 5528 E. Colfax Ave., Denver 7, Colo., 15 (REP)
Tel: Fremont 3967

Moss, Gordon, Box 428, Greeley, Colo., 15 (REP)
Tel: Greeley 770

Moss, Leroy G., c/o Gordon Moss, Box 428, Greeley, Colo., 15 (REP)

Murray Radio Co., 9 E. Vermijo, Colorado Springs, Colo., 10
Tel: ME 3-8248

Nelson, Arthur J., P. O. Box 5502, Denver, Colo., 15 (REP)
Tel: Keystone 6751

Pearson, Bob, c/o Mel Pearson, 1011 S. Josephine St., Denver 9, Colo., 15 (REP)
Tel: Melrose 4-3401

Pearson, Mel, 1011 S. Josephine St., Denver 9, Colo., 15 (REP)
Tel: Spruce 7878

Peyser, W. J., 1501 N. Weber, Colorado Springs, Colo., 15 (REP)
Tel: Melrose 4-3401

Raymond, Kenneth N., c/o W. Clif Mc Loud, 5528 E. Colfax Ave., Denver 7, Colo., 15 (REP)
Tel: Fremont 3067

Walker Radio Co., L. B., 100 N. Victoria Ave., Pueblo, Colo., 10 (NEDA)

Williams, Allen I., Jr., 124 W. 12th Ave., Denver 4, Colo., 15 (REP)
Tel: Main 3-0343

WYOMING

Houge Radio & Supply Co., 4012 Central Ave., Cheyenne, Wyo., 10 (NEDA)

Cluphf, Stanley W., 555 North 12th St., Laramie, Wyo., 15 (REP)
Tel: Laramie 4075

IDAHO

Craddocks Radio Supply, Box 279, Boise, Idaho, 10 (NEDA)

Kopke Electr., Inc., 119 Peasley St., Boise, Idaho, 10 (NEDA)

West So. Central

TEXAS

All-State Distributor Co., 2407 Ross Ave., Dallas 1, Tex., 10 (NEDA)

Anderson, George E., 1903 Griffin St., Dallas 2, Tex., 15 (REP)
Tel: Riverside 5931

Aymond, Edward F., Jr., 4310 Maple Ave., Dallas 4, Tex., 15 (REP)
Tel: Logan 5233

Berthold, A. L., 4111 Maple Ave., Dallas 4, Tex., 15 (REP)
Tel: Logan 8329

Branum, More, 123 Manufacturing St., Dallas, Tex., 15 (REP)
Tel: Riverside 4995

Campion, R. M., Sr., P. O. Box 4116 Sta. "A," Dallas 8, Tex., 15 (REP)
Tel: Randolph 6620

Campion, R. M., Jr., P. O. Box 4116 Sta. "A," Dallas 8, Tex., 15 (REP)
Tel: Randolph 6620

Clark & Gose Radio Supply, 1203 Indiana, Wichita Falls, Tex., 10 (NEDA)

Corry, Hal F., 3111 Knox St., Dallas 5, Tex., 15 (REP)
Tel: Justin 9172

Crabtrees Wholesale Radio, 2608 Ross Ave., Dallas 1, Tex., 10 (NEDA)

Crockett, John I., 2204 Griffin St., Dallas 1, Tex., 15 (REP)
Tel: Randolph 5764

Delzell, G. W., 643 Coombs Creek Dr., Dallas 11, Tex., 15 (REP)
Tel: Justin 2411

Denison Radio Supply, 310 W. Woodward, Denison, Tex., 10 (NEDA)

Electronic Equip. & Eng. Co., 805 S. Staples St., Corpus Christi, Tex., 10 (NEDA)

Electronic Equip. Co., 917 Florence St., Fort Worth 3, Tex., 10 (NEDA)

Equipment & Service Co., Box 7224, Dallas 9, Tex., 10, 15, 20

Fort Worth Radio Supply Co., 1317 Kings Hwy., Fort Worth, Tex., 10 (NEDA)

Green, Co., John A., 6815 Oriole Dr., Dallas 9, Tex., 15, 20
Tel: Dixon 7000

Guenther J. B., 7322 Marquette, Dallas 5, Tex., 15 (REP)
Tel: Emerson 6286

H & L Radio Supply Co., 1608 Commerce, Fort Worth, Tex., 10 (NEDA)

Hall, Inc., R. C. & L. F., P. O. Box 2434, Houston, Tex, 10 (NEDA)

Hargis Co., 410 Baylor, Austin, Tex., 10 (NEDA)

Hargis Co., Inc., 1205 Washington Ave., Waco, Tex., 10 (NEDA)

Hayes, W. R., c/o J. Y. Schoonmaker, 2011 Cedar Springs, Dallas 1, Tex., 15 (REP)
Tel: Sterling 3335

Heindenreich, Max, 6505 Park Lane, Dallas, Tex., 15 (REP)
Tel: Dixon 3389

Industrial Electr. Supply, 134 Leslie St., Dallas, Tex., 10 (NEDA)

Klicpera, M. F., P. O. Box 3113, Houston 1, Tex., 15 (REP)
Tel: Jackson 8459

Lassberg, Alex A., 5004 Ross Ave., Dallas 6, Tex., 15 (REP)
Tel: Tenison 6735

Lassberg, Edwin K., 5004 Ross Ave., Dallas 6, Tex., 15 (REP)
Tel: Tenison 6735

Lipscomb Assoc., Earl, P. O. Box 8042, Dallas 5, Tex., 15, 20
Tel: Elmhst 5345

Lund, Lloyd S., 2204 Griffin St., Dallas, Tex., 15 (REP)
Tel: Randolph 5764

Mc Kinney, Jack F., 1330 N. Industrial Blvd., Dallas, Tex., 15 (REP)
Tel: Sterling 1997

Mission Radio, Inc., 521 Broadway, San Antonio, Tex., 10 (NEDA)

Montague Radio Distributor Co., 760 Laurel, Beaumont 1, Tex., 10 (NEDA)

Mooney Radio Supply Co., 1635 Huff, Wichita Falls, Tex., 10 (NEDA)

R & R Electr. Co., P. O. Box 325, Abilene, Tex., 10 (NEDA)

R & R Electr. Co., 707 Adams, Amarillo 1, Tex., 10 (NEDA)

R & R Supply Co., Inc., P. O. Box 329, Lubbock, Tex., 10 (NEDA)

Ray-Tel, Inc., 2033 Levee, Dallas, Tex., 10 (NEDA)

Radio Parts Co., 902 Crawford, Houston Tex., 10 (NEDA)

Radio & Television Parts, 118 Seventh St., San Antonio 2, Tex., 10 (NEDA)

Schoonmaker, J. Y., 2011 Cedar Springs, Dallas 1, Tex., 15 (REP)
Tel: Sterling 3335

Scooters Radio Supply, 509 Commerce St., Fort Worth, Tex., 10 (NEDA)

Smith, Dolores, 505 N. Ervay St., Dallas 1, Tex., 15 (REP)
Tel: Randolph 2966

Smith, J. Earl, 505 N. Ervay St., Dallas 1, Tex., 15 (REP)
Tel: Randolph 2966

Southern Radio Supply, 3004 Ross Ave., Dallas 1, Tex., 10 (NEDA)

Southwest Radio Supply, 1820 N. Howard St., Dallas, Tex., 10 (NEDA)

Sterling Radio of Beaumont, P. O. Box 4164, Beaumont, Tex., 10 (NEDA)

Sterling Radio Prods. Co., 1616 Mc Kinney St., Houston 1, Tex., 10 (NEDA)

Suttons Wholesale Elec., Box 1505, Fort Worth 2, Tex., 10 (NEDA)

Texas Sound Studios, 506 W. Hildebrand Ave., San Antonio 12, Tex., 10
Tel: Pershing 3-1721

West Texas Radio Supply, 1026 West Sixth, Amarillo, Tex., 10 (NEDA)

(Continued on page 564)

104. Distribution.

(Continued from page 563)

Wickes Radio Equip. Co., 513 So. Staples St., Corpus Christi, Tex., 10 (NEDA)
Wilks, Ernest L., 1212 Camp St., Dallas 2, Tex., 15 (REP)
Tel: Riverside 4059
Wilkinson Brothers, 2406 Ross Ave., Dallas 1, Tex., 10 (NEDA)
Willison, G. G., 1821 W. Alabama St., Houston 6, Tex., 15 (REP)
Tel: Justin 1634
Yount, W. J., 1431 Pleasant Dr., Dallas, Tex., 15 (REP)
Tel: Express 0988

OKLAHOMA

Muskogee Electr. Supply Co., 229 Court St., Muskogee, Okla., 10 (NEDA)
Radio, Inc., 1000 S. Main St., Tulsa 3, Okla., 10 (NEDA)
Radio Supply, Inc., 2824 Ft. Sill Blvd., Lawton, Okla., 10 (NEDA)
Radio Supply, Inc., 724 N. Hudson St., Oklahoma City, Okla., 10 (NEDA)
S & S Radio Supply, 537 S. Kenosha, Tulsa 10, Okla., 10 (NEDA)

LOUISIANA

Central Radio Supply, P. O. Box 1688, Alexandria 1, La., 10 (NEDA)
Crescent Radio Supply, Inc., 1600 Baronne St., New Orleans 13, La., 10 (NEDA)
Hale & McNeil, 421 Walnut St., Monroe, La., 10 (NEDA)
Koelemay Sales Co., 2530 Linwood Ave., Shreveport, La., 10 (NEDA)
Ralphs Radio Electr. Supply, 812 Main St., Baton Rouge, La., 10 (NEDA)
Ralphs Radio Electr. Supply, 3004 Cameron St., Lafayette, La., 10 (NEDA)
Southern Radio Supply Co., 1900 Tulane Ave., New Orleans 16, La., 10 (NEDA)

ARKANSAS

Lavender Radio Supply Co., 520 E. Fourth, Texarkana, Ark. (NEDA)
Wise Radio Supply, 1001 Towson Ave., Fort Smith, Ark. (NEDA)

East So. Central

MISSISSIPPI

Cabell Elec. Co., 422 South Farish St., Jackson, Miss., 10 (NEDA)

ALABAMA

Allen & Jemison Co., Tuscaloosa, Ala., 10 (NEDA)
Clary Co., James W., 1713 Second Ave., So. Birmingham 3, Ala., 10 (NEDA)
Reid Distributing Co., 1724 5th Ave., North Birmingham 3, Ala., 10 (NEDA)

TENNESSEE

Bluff City Distributing Co., 905 Union St., Memphis 3, Tenn., 10 (NEDA)
Cartwright, James B., 1336 Madison Ave., Memphis 4, Tenn., 15 (REP)
Tel: Memphis 2-1914
Chemcity Radio Elec. Co., 12 Emory Pk., Knoxville 17, Tenn., 10 (NEDA)
Roden Electrical Supply, 808 No. Central Ave., Knoxville, Tenn., 10 (NEDA)
Rush Co., L. K., 103 Highland Ave., Jackson, Tenn., 10 (NEDA)

KENTUCKY

Peerless Electr. Equip., 2210 So. 7th St., Louisville 8, Ky., 10 (NEDA)
Radio Equipment Co., 480 Skain Ave., Lexington 34, Ky., 10 (NEDA)
Universal Radio Supply Co., 533 S. 7th St., Louisville, Ky., 10
Tel: Jackson 4166

South Atlantic

FLORIDA

American Airmotive Corp., P. O. Box 6, Bldg. 146, Miami Springs, Fla., 5, 15, 20, 25
Tel: 88-8411
Cole, Harry A., P. O. Box 852, Jacksonville Beach, Fla., 15 (REP)
Herman Radio Supply Co., Box 358 Allapattah, Miami 42, Fla., 10 (NEDA)
Jauden, Wm. C., 207 W. Alfred St., Tampa, Fla., 15 (REP)
Tel: 24-4221
Thurow Distributors, 342 Third Ave. S., St. Petersburg, Fla., 10 (NEDA)
Thurow Distributors, Inc., P. O. Box 1529, Tampa, Fla., 10 (NEDA)
Van Dusen, R. H., 940 Lake Elbert Dr., Winter Haven, Fla., 15 (REP)
Tel: 2-2684
Walder Radio & Appliance, 1809 N. E. 2nd Ave., Miami, Fla., 10 (NEDA)
Wallace, Stanley K., P. O. Box 744, Sutz, Fla., 15 (REP)
Tel: Tampa 99-3241

GEORGIA

Adair, C. E., 1426 High Point Pl., Atlanta 6, Ga., 15 (REP)
Tel: Emerson 3979
Adams, Harold, c/o Avis McCorvey, 307 Church St., Decatur, Ga., 15 (REP)
Tel: Crescent 6167
Adams, Thomas N., P. O. Box 2158, Greensboro, N.C., 15 (REP)
Atcheson, Stewart, P. O. Box 2158, Greensboro, N.C., 15 (REP)
Bean, Everett P., 3812 Ivy Lane N.E., Atlanta, Ga., 15 (REP)
Tel: Cherokee 9926
Burwell, Henry W., 1025 Ponce De Leon, Atlanta, Ga., 15 (REP)
Tel: Atwood 2127
Burwell, Henry W., Jr., c/o Frank C. Nickerson, 901 Bernina Ave., Atlanta 6, Ga., 15 (REP)
Tel: Lamar 6878
Cain, H. E., c/o Maitland K. Smith, 315 Forrest Ave. N.E., Atlanta 3, Ga., 15 (REP)
Tel: Walnut 6094
Cartwright, James B., 3812 Ivy Lane N.E., Atlanta, Ga., 15 (REP)
Clymer, James M., c/o Maitland Smith, 315 Forrest Ave. N.E., Atlanta 3, Ga., 15 (REP)
Tel: Walnut 6094
Cochrane, Earl J., c/o J. B. Pepper, Herb Erickson Co., 1429 Peachtree St. N.E., Atlanta, Ga., 15 (REP)
Tel: Atwood 8266
Cota, John J., 1409 Peachtree St., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 3020
Duckett, Grady M., 1145 Peachtree St., Atlanta 5, Ga., 15 (REP)
Tel: Atwood 6916
Erickson Co., Herb, P. O. Box 7036 Sta. "C," Atlanta 5, Ga., 15
Tel: Atwood 8266
Fausett, Floyd, 538 Westend Pl. S.W., Atlanta, Ga., 15 (REP)
Tel: Amherst 5781
Giddings, Hoy J., c/o Grady M. Duckett, 1145 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
Tel: Atwood 6916
Harpe, Harry K., c/o James Millar, 1036 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 0919
Hawkins, Walter E., c/o James Millar, 1036 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 0919
Hayden, Paul, 126 Miles Circle, East Point, Ga., 15 (REP)
Tel: Fairburn 9646
Hollingsworth, E. L., 407 Whitehead Bldg., Atlanta 3, Ga., 15 (REP)
Tel: Main 5878
Hutto, V., 1036 Peachtree St., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 0919
Joyner, J. E., Jr., P. O. Box 341 Sta. "A," Atlanta, Ga., 15 (REP)
Tel: Franklin 4910
Little, W. T., 704 Lumpkin St., East Point, Ga., 15 (REP)
Tel: Calhoun 3160
McCorvey, V. Avis, 307 Church St., Decatur, Ga., 15 (REP)
Tel: Crescent 6167
Millar Associates, James, 1036 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
For details see ad on page 565
Tel: Elgin 0919
Millar, J. Robert, 1036 Peachtree St., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 0919
Moore, Winton S., c/o J. B. Pepper, 1429 Peachtree St., Atlanta, Ga., 15 (REP)
Tel: Atwood 8266
Murphy, Brower, 1409 Peachtree St., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 3020

104. Distribution.

Nickerson, F. C., 901 Bernina Ave., Atlanta 6, Ga., 15 (REP)
Tel: Lamar 6878
Odom, H. J., c/o Wallace Assoc., 2151 Becher Rd., Atlanta, Ga., 15 (REP)
Tel: Raymond 8463
Palmisana, Ralph J., c/o J. B. Pepper, 1429 Peachtree N.E., Atlanta, Ga., 15 (REP)
Tel: Atwood 8266
Pepper, John B., 1429 Peachtree St., Atlanta, Ga., 15 (REP)
Tel: Atwood 8266
Prestwood Electr. Co., 1445 Greene St., Augusta, Ga., 10 (NEDA)
Radio Sales & Service Co., 1326 First Ave., Columbus, Ga., 10 (NEDA)
Smith, J. J., c/o Grady M. Duckett, 1145 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
Tel: Atwood 6916
Smith, Maitland K., 315 Forrest Ave., Atlanta 3, Ga., 15 (REP)
Tel: Walnut 6094
Still, L. C., 407 Whitehead Bldg., Atlanta 3, Ga., 15 (REP)
Tel: Main 5878
Thompson, John F., 315 Forrest Ave. N.E., Atlanta 3, Ga., 15 (REP)
Tel: Walnut 6094
Warbington, R. E., c/o Hollingsworth Still, 407 Whitehead Bldg., Atlanta 5, Ga., 15 (REP)
Tel: Atwood 6916
Watts, Lester T., Jr., c/o James Millar, 1036 Peachtree St. N.E., Atlanta 5, Ga., 15 (REP)
Tel: Elgin 0919
Williams, Norman D., c/o Hollingsworth Still, 407 Whitehead Bldg., Atlanta 3, Ga., 15 (REP)
Tel: Main 5878

NORTH AND SOUTH CAROLINA

Butters, John T., 4924 Oleander Dr., Wilmington, N.C., 15 (REP)
Dalton-Hege Radio Supply, 924 W. 4th St., Winston-Salem, N.C., 10 (NEDA)
Dixie Radio Supply Co., 306 Wade Hampton Blvd., Greenville, S.C., 10 (NEDA)
Dixie Radio Supply Co., 715 W. Moorehead St., Charlotte, N.C., 10 (NEDA)
Dixie Radio Supply Co., 1700 Laurel St., Columbia, S.C., 10 (NEDA)
Florence Radio Supply, Inc., 223 E. Cheves St., Florence, S.C., 10 (NEDA)
Freck Radio & Supply Co., 38 Baltimore Ave., Asheville, N.C., 10 (NEDA)
Highsmith & Co., James L., 205 E. Washington Ave., Charlotte, N.C., 15
Tel: Frank 5-6436
Howard, Foy M., 2908 Hutchinson, Charlotte 6, N.C., 15 (REP)
Johannesen Elec. Co., Inc., 312 No. Eugene St., Greensboro, N.C., 10 (NEDA)
Radiotronic Distributors, 208 No. College St., Charlotte, N.C., 10 (NEDA)
Scott, E. E., c/o Atcheson & Adams, P. O. Box 2158, Greensboro, N.C., 15 (REP)
Southeastern Radio Supply, 411 Hillsboro St., Raleigh, N.C., 10 (NEDA)

VIRGINIA

Baker Sales Co., Inc., H. C., 19 Franklin Rd., Roanoke, Va., 10 (NEDA)
Chemcity Radio & Elec. Co., P. O. Box 2066, Charleston 1, W.Va., 10 (NEDA)
Electronic Supply, Inc., 422-11th St., Huntington 1, W.Va., 10 (NEDA)
Johnston-Gasser Co., Inc., 3023 W. Marshall St., Richmond 21, Va., 10 (NEDA)
Meridian Electr. Equip. Co., 608 W. Broad St., Richmond, Va., 10
Tel: 3-3459
Meyers Electronics, Inc., 813 Bluefield Ave., Bluefield, W.Va., 10 (NEDA)
Radio Equipment Co., 821 West 21st St., Norfolk 10, Va., 10 (NEDA)
Radio Parts Distributors Co., 128 W. Olney Rd., Norfolk 10, Va., 10 (NEDA)
Radio Supply Co., Inc., 711 Granby St., Norfolk 10, Va., 10 (NEDA)
Radio Supply Co., Inc., 3302 W. Broad St., Richmond 21, Va., 10 (NEDA)
Winfree Supply Co., 800 W. Cary St., Richmond 20, Va., 10 (NEDA)
Womack Radio Supply Co., 502 Craghead St., Danville, Va., 10 (NEDA)

DISTRICT OF COLUMBIA

American Amp. TV Corp., 1111 19th St. N.W., Washington 6, D.C., 10, 15, 20
Tel: Republic 7-7900
British Radio Electr., Ltd., 1833 Jefferson Pl. N., Washington 6, D.C., 5
Tel: Metr 8-6564
Capitol Radio Wholesaler, 2120 14th St., Washington 9, D.C., 10 (NEDA)
Electronic Wholesalers, 2345 Sherman Ave., Washington 9, D.C., 10 (NEDA)
Gallant Eng. Co., 261 Constitution Ave., Washington 1, D.C., 15, 20
Tel: EX 3-1692
Rucker Electr. Prods. Co., 1312 14th St. N.W., Washington, D.C., 10 (NEDA)
Silberne Radio & Elec., 3308 Eleventh St. N.W., Washington 10, D.C., 10 (NEDA)
Southern Electronics, 3405 Georgia Ave. N.W., Washington 10, D.C., 10 (NEDA)
Spivey, Inc., James S., 1406 "G" St. N.W., Washington, D.C., 20, 25
Tel: Sterling 3-2215

MARYLAND

Barnhill & Assoc., R. B., 412 Woodbine Ave., Towson 4, Md., 10, 15, 30
Tel: Valley 5-3431
Carmine, Ferrell S., c/o Charles W. Lienau, 10203 McKenney Ave., Silver Spring, Md., 15 (REP)
Tel: Juniper 7-5888
Houck, J. W., Box 6844, Towson 4, Md., 15 (REP)
Tel: Valley 5-4441
Kann-Ellert Electr., 9 S. Howard St., Baltimore 1, Md., 10 (NEDA)
Lamont, M. B., c/o M. F. Taylor, Box 111, Silver Spring, Md., 15 (REP)
Tel: Shepherd 4002
Lienau, Charles W., 10203 McKenney Ave., Silver Spring, Md., 15 (REP)
Tel: Juniper 7-5888
National Elec. Mach., Inc., 919 Jesup Blair Dr., Silver Spring, Md., 20
Tel: Juniper 5-8300
Radio Electric Service Co., 5 N. Howard St., Baltimore 1, Md., 10 (NEDA)
For details see ad on page 565

(Continued on page 566)

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Electrons
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Sylvania
United Transformer
Radio Electric Service Co.
5 N. Howard St. Baltimore 1, Maryland

10. Distributional Functions

104. Distribution.

(Continued from page 565)

Taylor, M. F., Box 111, Silver Spring, Md., 15 (REP)
Tel: Shepherd 4002
Van Gilder, Frank, c/o M. F. Taylor, Box 111, Silver Spring, Md., 15 (REP)
Tel: Shepherd 4002
Wholesale Radio Parts Co., 311 W. Baltimore St., Baltimore 1, Md., 10 (NEDA)
Wilkinson, Robert L., Maxalea Dr., Baltimore 12, Md., 15 (REP)
Tel: Towson 7800
Zimmerman Wholesalers, 114 E. Washington St., Hagerstown, Md., 10 (NEDA)
Zimmerman Wholesalers, 162 Bedford St., Cumberland, Md., 10 (NEDA)

West No. Central

KANSAS

Acme Radio Supply, 412 E. 10th St., Topeka, Kansas, 10 (NEDA)
Amateur Radio Equip. Co., 1203 E. Douglas, Wichita, Kan., 10 (NEDA)
Excel Distributors, 118 W. Second St., Wichita 2, Kan., 10 (NEDA)
Haase, E. J., 450 Funston Rd., Kansas City, Kan., 15 (REP)
Interstate Electr. Supply, 230 Ida St., Wichita 1, Kan., 10 (NEDA)
Interstate Electr. Supply, 325 West 4th, Hutchinson, Kan., 10 (NEDA)
Koenig, G. L., 6359 Antioch Ave., Merriam, Kan., 15 (REP)
Tel: Hedrick 3166
Overton Elec. Co., Inc., 522 Jackson St., Topeka, Kan., 10 (NEDA)
Radio Supply Co., Inc., 1125 E. Douglas, Wichita 7, Kan., 10 (NEDA)
Western Distributors, 22M Santa Fe, Salina, Kan., 10 (NEDA)

NEBRASKA

Hicks Radio Co., 1422 "O" St., Lincoln 8, Neb., 10 (NEDA)
J. B. Distributing Co., 1616 Cass St., Omaha 2, Neb., 10 (NEDA)
Leuck Radio Supply Co., 243 S. 11th St., Lincoln, Neb., 10 (NEDA)
Radio Equip. Co., 2852 Douglas St., Omaha 2, Neb. (NEDA)
Sidles Co., 1002 Davenport St., Omaha, Neb. (NEDA)

SOUTH DAKOTA

Power City Radio Co., 209 S. First Ave., Sioux Falls, S.D., 10 (NEDA)
Warren Radio Supply, 115 S. Indiana Ave., Sioux Falls, S.D. (NEDA)

NORTH DAKOTA

Bristol Distributing Co., 419 N. Pacific Ave., Fargo, N.D., 10 (NEDA)

MISSOURI

Acme Radio Supply, 819 S. 8th St., St. Joseph 7, Mo., 10 (NEDA)
Ashe Radio Co., Walter, 1125 Pine St., St. Louis 1, Mo., 10 (NEDA)
Bettis, Maury E., 406 W. 34th St., Kansas City 11, Mo., 15 (REP)
Tel: Logan 0772
Brotherson, Martin, 515 N. Byers St., Joplin, Mo., 10 (NEDA)



Burstein-Applebee Co., 1012-14 McGee St., Kansas City 6, Mo., 10 (NEDA)
For details see ad on page 566
Tel: BA 1155

Central Missouri Distributing Co., 324 E. Capital St., Jefferson City, Mo., 10 (NEDA)
Clement, C. F., c/o Norman W. Kathrinus, 4356 Duncan Ave., St. Louis 10, Mo., 15 (REP)
Tel: Olive 2-7005
Clemenson, Robert E., Jr., 210 W. 8th St., Kansas City 6, Mo., 15 (REP)
Tel: Harrison 4428
Ebinger Radio & Supply, 2501 S. Jefferson, St. Louis 4, Mo., 10 (NEDA)
Farris, R. W., 406 W. 34th St., Kansas City 11, Mo., 15 (REP)
Tel: Logan 7495
Four State Radio & Supply Co., 201 Main St., Joplin, Mo., 10 (NEDA)
Fry, William E., 406 W. 34th St., Kansas City 11, Mo., 15 (REP)
Tel: Jefferson 5236
Henshaw Radio Supply, 3617 Troost, Kansas City 3, Mo., 10 (NEDA)
Homes, Frank B., c/o Lee Maynard, 139 N. Central Ave., Clayton 5, Mo., 15 (REP)
Tel: Park 5-3723
Interstate Supply Co., 10th & Walnut Sts., St. Louis, Mo., 10 (NEDA)
Kathrinus, Norman W., 4356 Duncan Ave., St. Louis 10, Mo., 15 (REP)
Tel: Olive 2-7005
Kay, James P., 3760 Broadway, Kansas City 11, Mo., 15 (REP)
Tel: Logan 7640
Kolshorn, Henry, P.O. Box 207, Belton, Mo., 15 (REP)
Larrabee, Fred H., 6033 Main St., Kansas City 13, Mo., 15 (REP)
Tel: Delmar 2804
Lowell, Theodore B., P.O. Box 21, Normandy, St. Louis 1, Mo., 15 (REP)
Tel: Evergreen 5-7803
Manhattan Radio Equip., Inc., 1732 Grand Ave., Kansas City 8, Mo., 10 (NEDA)
Mark Associates, Lee, P. O. Box 8467, Kansas City 14, Mo., 15 (REP)
Tel: Jackson 9299
Maynard, Lee, 139 N. Central Ave., Clayton 5, Mo., 15 (REP)
Tel: Parkview 5-3723
McCune, John N., c/o Norman Kathrinus, 4356 Duncan Ave., St. Louis 10, Mo., 15 (REP)
Tel: Olive 2-7005
McGee Radio Co., 1422 Grand Ave., Kansas City, Mo., 10 (NEDA)
McGrade, E. W., 6315 Brookside Pl., Kansas City 10, Mo., 15 (REP)
Tel: Delmar 9242
McNeal Elec. Equip. Co., 4736 Olive St., St. Louis 8, Mo., 25
Tel: Forest 1-6943
Myers, Zell, 4538 Main St., Kansas City 11, Mo., 15 (REP)
Tel: Jefferson 7221
Paden, Ward, Box 569, Jefferson City, Mo., 15 (REP)
Tel: 6-7990
Radonics, 2218 S. Jefferson Ave., St. Louis 4, Mo., 10 (NEDA)
Radonics, 5040 Easton Ave., St. Louis 13, Mo., 10 (NEDA)
Reed Radio Supply Co., Harry, Main P.O. Box 149, Springfield, Mo., 10 (NEDA)
Roes, Herbert A., 2601 Cherry, Kansas City 8, Mo., 15 (REP)
Tel: Harrison 2036
Roes, H. Courtney, 2601 Cherry, Kansas City 8, Mo., 15 (REP)
Tel: Harrison 2036
Schmitz, J. O., 406 W. 34th St., Kansas City 11, Mo., 15 (REP)
Tel: Logan 9824
Scholz, Paul G., 210 W. 8th St., Kansas City 5, Mo., 15 (REP)
Tel: Harrison 7111
Schryver, Clyde H., 4550 Main St., Kansas City 11, Mo., 15 (REP)
Tel: Westport 4660
Sebright, Russ D., 4030 Chouteau, St. Louis 10, Mo., 15 (REP)
Tel: Olive 2-0784
Smith, Berry, 4528 Main St., Kansas City 2, Mo., 15 (REP)
Somers, F. C., Jr., 1805 Grand Ave., Kansas City 8, Mo., 15 (REP)
Tel: Grand 1355
St. Joseph Radio Supply Co., 922 Francis St., St. Joseph, Mo., 10 (NEDA)
Suedekum Electr. Supply Co., 902 S. Sprigg St., Cape Girardeau, Mo., 10 (NEDA)
Terwilliger, Percy, 9304 High Dr., Kansas City 13, Mo., 15 (REP)
Tel: Mitchell 0188
Thibau, A. R., 402 Mfrs. Exch. Bldg., Kansas City 5, Mo., 15 (REP)
Tel: Victor 7057

10. Distributional Functions

104. Distribution.

Tri-State Radio Supply Co., 536 E. Pine Blvd., Poplar Bluff, Mo., 10 (NEDA)
Van Sickle Radio Co., 1113 Pine St., St. Louis 1, Mo., 10 (NEDA)
Waelterman, L. F., 3938 Lindell Blvd., St. Louis 8, Mo., 15 (REP)
Tel: Olive 2-6455
Walters Radio Supply, 3645 Main St., Kansas City, Mo., 10 (NEDA)
Young, Edward L., 8147 Delmar Ave., St. Louis, Mo., 15 (REP)
Tel: Parkview 5-7701

IOWA

Boe Distributing Co., 1605 Rockdale Rd., Dubuque, Iowa, 10 (NEDA)
Dukes Radio Co., P.O. Box 1227, Sioux City 2, Iowa, 10 (NEDA)
Friday-Lynch Radio Co., 429 W. 2nd St., Ottumwa, Iowa, 10 (NEDA)
Gifford-Brown, Inc., 106 First St. S.W., Cedar Rapids, Iowa, 10 (NEDA)
Gifford-Brown, Inc., 1326 Walnut, Des Moines, Iowa, 10 (NEDA)
Iowa Radio Corp., 1212 Grand Ave., Des Moines 9, Iowa, 10 (NEDA)
Ken-Els Radio Supply Co., 501 First Ave., Fort Dodge, Iowa, 10 (NEDA)
Mid State Distributing Co., 1201 Grand Ave., Des Moines, Iowa (NEDA)
Midwest-Timmerman Co., P.O. Box 360, Davenport, Iowa, 10 (NEDA)
Power City Radio Co., 410 Jones St., Sioux City, Iowa, 10 (NEDA)
Radio Trade Supply Co., 1224 Grand Ave., Des Moines 9, Iowa, 10 (NEDA)
Ray-Mac Supply Co., 200 Ballou St., Waterloo Iowa, 10 (NEDA)
Tri-City Radio Supply, Inc., 320 E. Fourth St., Davenport, Iowa, 10 (NEDA)
Vrbik, Jerry, 309 Guaranty Bldg., Cedar Rapids, Iowa, 15 (REP)
Tel: 4-0833
World Radio Labs., Inc., 738 W. Broadway, Council Bluffs, Iowa, 10 (NEDA)

MINNESOTA

Bauman Co. 3033 Lyndale Ave. S., Minneapolis 8, Minn., 10 (NEDA)
Bonn, Lew Co., 1211 La Salle Ave., Minneapolis 4, Minn., 10, (NEDA)
Electronic Center, Inc., 107 Third Ave. N., Minneapolis, Minn., 10 (NEDA)
Electronic Distributing Co., 856 Raymond Ave., St. Paul 14, Minn., 10 (NEDA)
Hall Elec. Co., 466 N. Robert St., St. Paul 2, Minn., 10 (NEDA)
Northwest Radio, 123 E. First St., Duluth 2, Minn., 10 (NEDA)
Stark Radio Supply Co., 71 S. 12th St., Minneapolis 4, Minn., 10, (NEDA)

East No. Central

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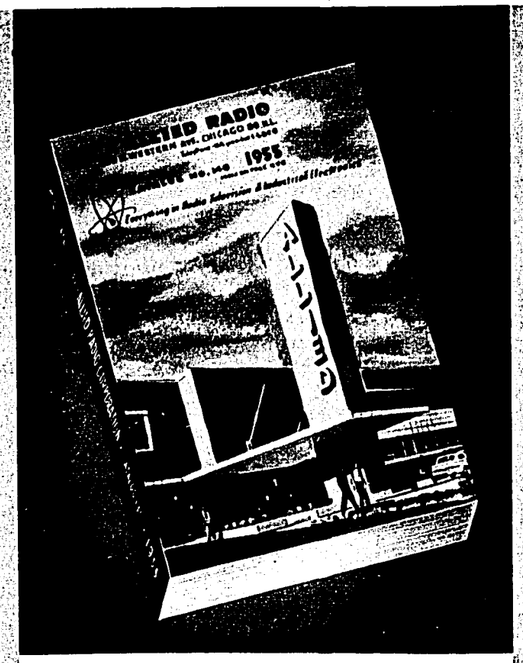
Aaron, Irvin I., 829 N. Marshall St., Milwaukee 2, Wis., 15 (REP)
Tel: Broadway 6-8515
Acme Radio Supply Corp., 510 W. State St., Milwaukee 3, Wis., 10 (NEDA)
Central Radio Parts Co., 1723 W. Fond du Lac Ave., Milwaukee 5, Wis., 10 (NEDA)
Harris Radio Corp., 289 N. Main St., Fond du Lac, Wis., 10 (NEDA)
Marsh Radio Supply Co., 838 N. Fourth St., Milwaukee 3, Wis., 10 (NEDA)
Northern Radio & Television Co., 708 S. Broadway, Green Bay, Wis., 10 (NEDA)
Radio Distributors, 701 E. Johnson St., Madison 3, Wis. 10 (NEDA)
Radio Parts Co., Inc., 538 W. State St., Milwaukee 3, Wis., 10 (NEDA)
Radio Service & Supply Co., 615 Third St., Wausau, Wis., 10 (NEDA)
Satterfield Electr., Inc., 326 W. Gorham St., Madison 3, Wis., 10 (NEDA)
Standard Radio Parts Co., 1244 State St., Racine, Wis., 10 (NEDA)
Stark Radio Supply Co., 131 S. 6th St., La Crosse, Wis., 10 (NEDA)

MICHIGAN

Beitel, Wayne C., 139 W. Maple, Birmingham, Mich., 15 (REP)
Tel: Midwest 6-0311
Burcaw, K. C., 22128 Grand River, Detroit 19, Mich., 15 (REP)
Tel: Kenwood 3-7700
Burns, Walter C., 544 Ruby St., Saginaw, Mich., 15 (REP)
Cowan, Dale, c/o K. C. Burcaw, 22128 Grand River, Detroit 19, Mich., 15 (REP)
Tel: Kenwood 3-7700
Dougherty, R. Gordon, c/o Hagerty Scott, 10116 Puritan, Detroit 38, Mich., 15 (REP)
Tel: University 1-4434
Duffy & Co., M. N., 2040 Grand River Ave., Detroit 26, Mich., 10
Tel: Woodward 3-2270
Electric Prods. Sales Co., 427 E. Michigan Ave., Lansing 29, Mich., 10 (NEDA)
Electronic Supply Co., 248 E. Pike St., Pontiac, Mich., 10 (NEDA)
Electronic Supply Corp., P.O. Box 430, Battle Creek, Mich., 10 (NEDA)
Electronic Supply Corp., 906 E. Michigan Ave., Kalamazoo, Mich., 10 (NEDA)
Ferguson Radio Supply Co., 622 W. Baltimore, Detroit 2, Mich. 10 (NEDA)
Fitzner, B. J., 8803 Michigan, Detroit 10, Mich., 15 (REP)
Tel: Luzon 4-0180
Fitzpatrick Electric Supply Co., 444 Irwin Ave., Muskegon, Mich., 10 (NEDA)
Fulton Radio Supply Co., 1208 Greenwood Ave., Jackson, Mich., 10 (NEDA)
Glendale Electronic Supply Co., 12866 Woodward, Detroit 3, Mich., 10 (NEDA)
Hagerty, J. J., 10116 Puritan, Detroit 38, Mich., 15 (REP)
Tel: University 1-4434
Henschen, W. G., c/o H. E. Walton, 76 Kercheval, Detroit 36, Mich., 15 (REP)
Tel: Tuxedo 1-5858
K-L-A Labs., Inc., 7422 Woodward Ave., Detroit 2, Mich., 10 (NEDA)
Kelley, Wilfred, 24071 Berkley, Oak Park 37, Mich., 15 (REP)
Lee, Wm. S., 22128 Grand River Ave., Detroit 19, Mich., 15 (REP)
Tel: Kenwood 3-7700
Liddle, Edwin F., 18925 Grand River Ave., Detroit 23, Mich., 15, (REP)
Tel: Vermont 7-5310
Lifsey Distributing Co., 726 N. Saginaw, Flint 3, Mich., 10 (NEDA)
Lohmann, Sid, 4829 Woodward, Detroit 1, Mich., 15 (REP)
Tel: Temple 1-1677
Matteson Electr., Inc., 1000 E. Michigan, Jackson, Mich., 10
Tel: 4-4450
Merchant, R. C., 4829 Woodward, Detroit 1, Mich., 15 (REP)
Tel: Temple 1-1677
Milsk, Robert, 19763 James Couzens Hwy., Detroit 21, Mich., 15 (REP)
Tel: Broadway 3-2930
Nordstrom, R. C., 580 N. Woodward, Birmingham, Mich., 15 (REP)
Tel: Midwest 4-1110
Northwest Radio of Mich., 435 Tamarack St., Laurium, Mich., 10 (NEDA)
Radio Electr. Supply Co., 505 Jefferson Ave., Grand Rapids, Mich., 10 (NEDA)
Radio Parts Co., Water & Millard St., Saginaw, Mich., 10 (NEDA)
Radio Specialties, 456 Charlotte St., Detroit 1, Mich., 10 (NEDA)
Radio Supply Eng. Co., Inc., 85 Seldem Ave., Detroit 1, Mich., 10 (NEDA)
Rissi Electr. Supply Co., 1112 W. Warren, Detroit 1, Mich., 10 (NEDA)
Scott, Thomas T., 10116 Puritan, Detroit 38, Mich., 15 (REP)
Tel: University 1-4434
Shaffer, Grant, 16267 James Couzens Hwy., Detroit 21, Mich., 15 (REP)
Tel: University 3-1227
Shand Radio Specialties, 203 W. Kearsley St., Flint 3, Mich., 10 (NEDA)
Straits Distributing Inc., 412 N. Main St., Cheboygan, Mich., 10 (NEDA)
Thorpe, Jack M., 4390 Haverhill, Detroit 24, Mich., 15 (REP)
Tel: Tuxedo 5-4438
Walton, H. E., 76 Kercheval, Detroit 36, Mich., 15 (REP)
Tel: Tuxedo 1-5858
Warren Radio Co., 713 Portage St., Kalamazoo 7, Mich. (NEDA)

(Continued on page 569)

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10. Distributional Functions

104. Distribution.

(Continued from page 567)

Wedemeyer Electr. Supply Co., 213 N. Fourth Ave., Ann Arbor Mich., 10 (NEDA)
Wedemeyer Electr. Supply Co., 800 Merrill St., Lansing, Mich., 10 (NEDA)
West Side Radio Supply, 8140 Michigan Ave., Detroit 10, Mich., 10 (NEDA)
West Mich. Sound Co., 1932 Peck St., Muskegon, Mich., 10
Tel: 2-5910
Wilson, Gerald, 403 Second Ave., Jackson, Mich., 15 (REP)
Tel: Jackson 4-3692
Zaffina, Lawrence F., 14611 Alma, Detroit 5, Mich., 15 (REP)
Tel: Walnut 1-4442

ILLINOIS

Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., 10
For details see ad on page 568
Tel: Haymarket 1-6800
Arnold, A. W., 1321 Rosedale Ave., Chicago 40, Ill., 15 (REP)
Tel: Edgewater 4-6457
Baldwin, D. H., c/o Russ Diethert, 2030 W. Montrose Ave., Chicago 18, Ill., 15 (REP)
Tel: Longbeach 1-6831
Bauman & Bluzat, 2753 W. North Ave., Chicago 47, Ill., 15 (REP)
For details see ad on page 569
Tel: Humboldt 6-6809
Bauman, W. J., 2753 W. North Ave., Chicago 47, Ill., 15 (REP)
Tel: Humboldt 6-6809
Becker, R. F., 3020 N. Cicero Ave., Chicago 41, Ill., 15 (REP)
Tel: Spring 7-4022
Bee, Robert E., c/o C. R. Bluzat, 2842 N. Cicero Ave., Chicago 41, Ill., 15 (REP)
Tel: Pensacola 6-2238
Beebe Associates, 1155 Waukegan Rd., Glenview, Ill., 15 (REP)
Tel: Cornelia 7-2292
Beier, Leroy W., 6518 W. North Ave., Chicago 35, Ill., 15 (REP)
Tel: Berkshire 7-2420
Bluzat, Rene, 2842 N. Cicero Ave., Chicago 41, Ill., 15 (REP)
Tel: Pensacola 6-2238
Booth, Claude R., 4000 W. North Ave., Chicago 39, Ill., 15 (REP)
Tel: Capitol 7-2810
Bouda, Roy J. c/o W. E. Burgoyne, 7001 N. Clark St., Chicago 26, Ill., 15 (REP)
Tel: Hollycourt 5-2112
Bowman & Co., J. G., 513 E. 75 St., Chicago 19, Ill., 10 (NEDA)
Brooks, Wilfred L., c/o JKM, Inc., 13 W. Hubbard St., Chicago 10, Ill. 15 (REP)
Tel: Whitehall 4-6345
Brown, Donald, c/o Gordon Gray, 41½ Harrison St., Oak Park Ill. 15 (REP)
Tel: Estebrook 8-7050
Bruce Co., Harold, 1120 E. Capital Ave., Springfield, Ill., 10 (NEDA)
Burgoyne, Wm. E., 7001 N. Clark St., Chicago 26, Ill., 15 (REP)
Tel: Hollycourt 5-2112
Cameron Co., 114 17th St., Rock Island, Ill., 10 (NEDA)
Chauneeys, Inc., 4737 W. Chicago Ave., Chicago 51, Ill., 10 (NEDA)
Christianson, Howard J. c/o R. Edward Stemm, 5681 W. Lake St., Chicago 44, Ill., 15 (REP)
Tel: Columbus 1-1566
Clark, Roger, 6349 N. Clark St., Chicago 26, Ill., 15 (REP)
Tel: Rogers Park 4-6121
Clears, Gene T., 435 Indianwood Blvd., Forest Park, Ill., 15 (REP)

(Continued on page 570)

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3. Economy

It is a specific purpose of the Institute 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
1475 Broadway
New York 36, N.Y.

10. Distributional Functions

104. Distribution.

(Continued from page 569)

Cole, G. Mcl., 4753 N. Broadway, Chicago 40, Ill., 15 (REP)
Tel: Longbeach 1-7611

Cooper Supply Co., 419 S. Tenth St., Quincy, Ill., 10 (NEDA)

Cozzens Mfrs. Rep., W. B., 220 Kedzie St., Evanston, Ill., 15
Tel: Da 8-4800

Crossley, Alfred, 4501 Ravenswood, Chicago 39, Ill., 15 (REP)
Tel: Uptown 9-1141

Bruce Cumming & Associates

Serving Distributors and Industrials in Illinois and Wisconsin.

Atlas Sound Corp., Bud Radio, Inc., Clarostat Mfg. Co., Crown Controls Co., DuMont Labs., Inc., Finney Co., Planet Mfg. Corp., Quam-Nichols Co., Resistance Products Co., Howard W. Sams & Co., Weller Electric Corp., Xcelite, Inc.

6029 W. Belmont Ave. MErrimac 7-3770
Chicago 34, Ill.

Cumming & Associates, Bruce, 6029 W. Belmont Ave., Chicago 34, Ill., 15 (REP)
For details see ad on page 570
Tel: Merrimac 7-3770

Diethert, Russ, 2030 W. Montrose Ave., Chicago 18, Ill., 15 (REP)
Tel: Longbeach 1-6831

Dolin, David, 1200 N. Ashland Ave., Chicago 22, Ill., 15 (REP)
Tel: Brunswick 8-1515

Doyle, Wm. J. 333 N. Michigan Ave., Chicago 1, Ill., 15 (REP)
Tel: Franklin 2-7200

Dunn, Robert S., c/o Leroy W. Beier, 6518 W. North Ave., Chicago 35, Ill., 15 (REP)
Tel: Berkshire 7-2420

Ellinger Sales Corp., 6540 Northwest Hwy., Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-1570

Ellinger, Wm. H. 6571 N. Olmsted, Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-4154

Ellinger, Wm. H., Jr., c/o W. H. Ellinger, 6571 N. Olmsted, Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-4154

Engle, Bernard, c/o Karl D. Engle, 4724 N. Sheridan Rd., Chicago 40, Ill., 15 (REP)
Tel: Uptown 8-6363

Engle, Karl D., 4724 N. Sheridan Rd., Chicago 40, Ill., 15 (REP)
Tel: Uptown 8-6363

Engstrom, Robert, c/o Harry W. Gebhard, 5129 W. Devon Ave., Chicago 30, Ill., 15 (REP)
Tel: Rodney 3-3636

Fawcett, W. K., c/o Ridley Assoc., 1551 N. Austin Blvd., Chicago 51, Ill., 15 (REP)
Tel: Tuxedo 9-2940

Felleisen, Ted, 5839 W. Montrose Ave., Chicago 34, Ill., 15 (REP)
Tel: Spring 7-1060

Gassner, Frank, c/o Gassner & Clark, 6349 N. Clark St., Chicago 26, Ill., 15 (REP)
Tel: Rodgers Park 4-6121

Gebhard, Harry W., 5129 W. Devon Ave., Chicago 30, Ill., 15 (REP)
Tel: Rodney 3-3636

Gianaras, Alec 2345 W. Devon Ave., Chicago 45, Ill., 15 (REP)
Tel: Ambassador 2-2100

Glaubitz, Frank, c/o Leroy W. Beier, 6518 W. North Ave., Chicago 35, Ill., 15 (REP)
Tel: Berkshire 7-2420

Golten, Jerry, 2750 W. North Ave., Chicago 47, Ill., 15 (REP)
Tel: Everglade 4-5959

Gray, Gordon, 41½ Harrison St., Oak Park, Ill., 15 (REP)
Tel: Estebrook 8-7050

Green, Loren F., 4949 W. Diversey Ave., Chicago 39, Ill., 15 (REP)
Tel: National 2-2370

Grimm, Stephen E., c/o Harold W. Ka Dell, 2406 W. Bryn Mawr, Chicago 45, Ill., 15 (REP)
Tel: Longbeach 1-3042

Halinton, Harry, 5500 W. Devon Ave., Chicago 30, Ill., 15 (REP)
Tel: Rodney 3-2132

Halinton, Melvin, c/o Harry Halinton, 5500 W. Devon Ave., Chicago 30, Ill., 15, (REP)
Tel: Rodney 3-2132

Hansen, Dudley A., c/o Lund-Hansen, 1900 W. Montrose, Chicago 13, Ill., 15 (REP)
Tel: Longbeach 1-2551

Hemminger, W. F., 7522 N. Sheridan Rd., Chicago 26, Ill., 15 (REP)
Tel: Briargate 4-5400

Herberger Radio Supply, P.O. Box 1197, Peoria 1, Ill., 10 (NEDA)

Higgins, John B., c/o Royal J. Higgins, 10105 S. Western Ave., Chicago 43, Ill., 15 (REP)
Tel: Cedarcrest 3-7388

Higgins, Royal J., 10105 S. Western Ave., Chicago 43, Ill., 15 (REP)
Tel: Cedarcrest 3-7388

Hitchcock, Ray C., 5420 W. Fullerton Ave., Chicago 39, Ill., 15 (REP)
Tel: National 2-2355

Hutmacher, Ray R., 664 N. Michigan Ave., Chicago 11, Ill., 15 (REP)
Tel: Whitehall 4-5288

Industrial Instr. Co., 2240 Parmele St., Rockford, Ill., 15
Tel: 5-4890

Jacobs, George, c/o W. J. Bauman, 2753 W. North Ave., Chicago 47, Ill., 15 (REP)
Tel: Humboldt 6-6809

Jonas, Frank, c/o Ellinger Sales, 6540 Northwest Hwy., Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-1570

Jones, Mel, 2800 Milwaukee Ave., Chicago 18, Ill., 15 (REP)
Tel: Everglade 4-2646

Ka Dell, Harold W., 2406 W. Bryn Mawr, Chicago 45, Ill., 15 (REP)
Tel: Longbeach 1-2042

Karet, Robert, 13 W. Hubbard St., Chicago 10, Ill., 15 (REP)
Tel: Whitehall 4-6345

Kleker, Jerome, 177 Sunset Ave., Glen Ellyn, Ill., 15 (REP)
Tel: 2297

Knaggs, Herbert W., 7503 Melba Lane, Belleville, Ill., 15 (REP)
Tel: Central 1-1853

Krueger, Ringland M., c/o Beebe Assoc., 1155 Waukegan Rd., Glenview, Ill., 15 (REP)
Tel: Cornelia 7-2292

Kuehlhorn, Bert, 6129 N. Winchester, Chicago 26, Ill., 15 (REP)
Tel: Ambassador 2-4023

Lampley Radio Co., 802 N. McLeansboro, Benton, Ill., 10 (NEDA)

Langhaus, Marvin, 315 W. Walton St., Chicago 10, Ill., 15 (REP)
Tel: Whitehall 4-2120

Levy, Kenneth W., c/o M. Langhaus, 315 W. Walton St., Chicago 10, Ill., 15 (REP)
Tel: Whitehall 4-2120

Linz, William M., 7115 N. Mobile Ave., Chicago 30, Ill., 15 (REP)
Tel: Rodney 3-3326

Lombard, George, 1034 N. Butrick St., Waukegan, Ill., 15 (REP)

Lombard, Vernon E., P.O. Box 26A, Grayslake, Ill., 15 (REP)
Tel: Round Lake 6-1760

Lukko Sales Corp., 5024 W. Irving Park Rd., Chicago 41, Ill., 10
Tel: AV 3-4800

Lund, Russell O., 1900 W. Montrose, Chicago 13, Ill., 15 (REP)
Tel: Longbeach 1-2551

Lurtz Electric Co., 219 N. Illinois St., Belleville, Ill., 10 (NEDA)

Luske, Wm., c/o Ritter Sales Co., 612 N. Michigan Ave., Chicago 11, Ill., 15 (REP)
Tel: Superior 7-7759

Magnuson, Edward G., 4258 W. Irving Park, Chicago 41, Ill., 15 (REP)
Tel: Palisade 5-1170

Magnuson, Roy J., 4258 W. Irving Park, Chicago 41, Ill., 15 (REP)
Tel: Palisade 5-1170

Malone, Pierce P., c/o Alec Gianaras, 2345 W. Devon Ave., Chicago 45, Ill., 15 (REP)
Tel: Ambassador 2-2100

Markolin, John S., c/o JKM, Inc., 13 W. Hubbard St., Chicago 10, Ill., 15 (REP)
Tel: Whitehall 4-6345

Marsh, Walter F., c/o Leroy W. Beier, 6518 W. North Ave., Chicago 35, Ill., 15 (REP)
Tel: Berkshire 7-2420

McBride, J. J., 14107 Merchandise Mart, Chicago 54, Ill., 15 (REP)
Tel: Superior 7-3310

McCarthy, L. C., 5933 Addison St., Chicago 34, Ill., 15 (REP)
Tel: Kildare 5-7976

McKenzie, Douglas c/o Ellinger Sales Corp., 6540 Northwest Hwy., Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-1570

Meyers, George, c/o Magnuson Assoc., 4258 W. Irving Park, Chicago 41, Ill., 15 (REP)
Tel: Palisade 5-1170

Midwest Electronics, 6907 N. Western Ave., Chicago 45, Ill., 10 (NEDA)

Monson, Harry A., 6059 W. Belmont Ave., Chicago 34, Ill., 15 (REP)
Tel: Merrimac 7-3226

Necker, Ernest, 4753 N. Broadway, Chicago 40, Ill., 15 (REP)

Nemec, John, c/o Claude R. Booth, 4000 W. North Ave., Chicago 39, Ill., 15 (REP)
Tel: Capitol 7-2810

Newark Elec. Co., 223 W. Madison St., Chicago 6, Ill., 10
Tel: State 2-2950

Newell, Lloyd L., c/o Gordon Gray, 411½ Harrison St., Oak Park, Ill., 15 (REP)
Tel: Estebrook 8-7050

Petitt, George, 349 N. Ashland Ave., River Forest, Ill., 15 (REP)
Tel: Columbus 1-0342

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Inquiries Welcomed

Pugh, Warren E., Jr., c/o R. Edward Stemm, 5681 W. Lake St., Chicago 44, Ill., 15 (REP)
Tel: Columbus 1-1566

Radio Parts Co., 612 W. Randolph St., Chicago 6, Ill., 10 (NEDA)

Relay Sales, 4721 W. Madison St., Chicago 44, Ill., 5, 10, 20, 25
Tel: Seeley 8-4146

Ridley, Percival, 1551 N. Austin Blvd., Chicago 51, Ill., 15 (REP)
Tel: Tuxedo 9-2940

Ritter, Ralph B., 612 N. Michigan Ave., Chicago 11, Ill., 15 (REP)
Tel: Superior 7-7759

Rose, J. K., 2323 W. Devon Ave., Chicago 45, Ill., 15 (REP)
Tel: Ambassador 2-5584

Rothschild, Paul A., 221 W. Huron St., Chicago 10, Ill., 15 (REP)
Tel: Superior 7-7919

Saffro, Yale L., 227 W. Chicago Ave., Chicago 10, Ill., 15 (REP)
Tel: Delaware 7-5092

Sarkis, Henry D., 6560 N. Sheridan Rd., Chicago 26, Ill., 15 (REP)
Tel: Hollycourt 5-1481

Scholfield, R. J., c/o Ellinger Sales Corp., 6540 Northwest Hwy., Chicago 31, Ill., 15 (REP)
Tel: Rodney 3-1570

Stemm, R. Edward, 5681 W. Lake St., Chicago 44, Ill., 15 (REP)
Tel: Columbus 1-1566

Stemm, Royal A., 21 E. Van Buren St., Chicago 5, Ill., 15 (REP)
For details see ad on page 571
Tel: Webster 9-4840

Strauss, Mac, 425 Surf St., Chicago 14, Ill., 15 (REP)
Tel: Lakeview 5-1450

Sullivan, Ralph T., 1551 N. Austin Blvd., Chicago 51, Ill., 15 (REP)
Tel: National 2-4074

Swinke, W. F., 541 Diversey Pkwy., Chicago 14, Ill., 15 (REP)
Tel: Bittersweet 8-8044

Tatro, Frank B., 6022 N. Rogers Ave., Chicago 30, Ill., 15 (REP)
Tel: Juniper 8-0333

Taylor, Robert F., 308 W. Washington St., Chicago 6, Ill., 15 (REP)
Tel: Andover 3-1808

Tri-City Radio Supply Co., 1919 Fourth Ave., Rock Island, Ill., 10 (NEDA)

Tripoli Electr. Co., 3415 W. Madison St., Chicago 24, Ill., 25
Tel: Van Buren 6-0232

Twist, John G., 2800 N. Milwaukee Ave., Chicago 18, Ill., 15 (REP)
Tel: Humboldt 9-2550

Tye, Frank E., Jr., c/o Claude R. Booth, 4000 W. North Ave., Chicago 39, Ill., 15 (REP)
Tel: Capitol 7-2810

Vore, Fred, c/o Arnold Vore Assoc., 1321 Rosedale Ave., Chicago 40, Ill., 15 (REP)
Tel: Edgewater 4-6457

(Continued on page 572)

10. Distributional Functions

104. Distribution.

(Continued from page 571)

Walker-Jimieson, Inc., 311 S. Western Ave., Chicago 12, Ill., 10 (NEDA)
Warner, Dayton L., 15423 Honore Ave., Harvey, Ill., 15 (REP)
Tel: Waterfall 8-8060
Wesselman, Eugene, c/o Jerry Golten, 2750 W. North Ave., Chicago 47, Ill., 15 (REP)
Tel: Everglade 4-5959
West, Jack, 6153 N. Milwaukee Ave., Chicago 30, Ill., 15 (REP)
Tel: Rodney 3-3500
Whitmore, Ray C., 639 Diversey Pkwy., Chicago 14, Ill., 15 (REP)
Tel: Webster 5-6460
Wilson Supply Co., 108 W. Jefferson St., Springfield, Ill., 10 (NEDA)
Wilson, Wesley L., 2750 W. North Ave., Chicago 47, Ill., 15 (REP)
Tel: Capitol 7-7600

INDIANA

Bierberich, Walter W., 2817 Plaza Dr., Ft. Wayne 5, Ind., 15 (REP)
Tel: Kenmore 2928
Bowman & Co., J. G., 257 W. Lincolnway, Valparaiso, Ind., 10 (NEDA)
Carney, John P., c/o J. J. Clancy, Wilder Rd., P.O. Box 267, Angola, Ind., 15 (REP)
Tel: 793
Clancy, Bernard, c/o J. J. Clancy, Wilder Rd., P.O. Box 267, Angola, Ind., 15 (REP)
Tel: 793
Clancy, Joseph J., Wilder Rd., Box 267, Angola, Ind., 15 (REP)
Tel: 793
Colfax, Robert L., P.O. Box 326, Ft. Wayne, Ind., 15 (REP) c/o V. C. MacNabb, 909 Westfield Blvd., Indianapolis 20, Ind.
Tel: Br 6770
Cunningham, Quinn, 6101 College Ave., Indianapolis 20, Ind., 15 (REP)
Tel: Glendale 3222
De Voe, Leslie M., 4010 Washington Blvd., Indianapolis 5, Ind., 15 (REP)
Tel: Humbolt 1395
Fish, Bud, 419 Sherwood Terrace, Ft. Wayne 6, Ind., 15 (REP)
Tel: Harrison 1089
Fishman, Paul B., c/o Bud Fish, 419 Sherwood Terrace, Ft. Wayne 6, Ind., 15 (REP)
Tel: Harrison 1089
Freistroffer, Richard, 255 Central Bldg., Ft. Wayne 2, Ind., 15 (REP)
Tel: Eastbrook 6251
Gamble, Milton E., c/o R. O. Whitesell, 2208 E. Washington St., Indianapolis 1, Ind., 15 (REP)
Tel: Market 8517
Hoemig, Charles N. 1730 Clover Lane, Ft. Wayne 7, Ind., 15 (REP)
Tel: Anthony 2083
Homsher, Burt, 2018 Jessie Ave., Ft. Wayne 7, Ind., 15 (REP)
Hub Distributors, 106 N. Main St., Crown Point, Ind., 10 (NEDA)
Kirsch, Herbert J., c/o F. C. Valentine, 507 Ft. Wayne Bank Bldg., Ft. Wayne 2, Ind., 15, (REP)
Tel: Anthony 9122
MacNabb Vernon C., 909 Westfield Blvd., Indianapolis 20, Ind., 15 (REP)
Tel: Broadway 6770
MacPherson, Bruce L., 601 Ft. Wayne Bk. Bldg., Ft. Wayne, Ind., 15, (REP)
Tel: Anthony 9460
Mayle, A. T., Jr., c/o Bud Fish, 419 Sherwood Terrace, Ft. Wayne 6. Ind., 15 (REP)
Tel: Harrison 1089
McSweeney, Frank, 330 W. 5th St., Peru, Ind., 15 (REP)
Pheasant, Charles E., 18 N. Bolton Ave., Indianapolis 19, Ind., 15 (REP)
Tel: Blackstone 6176
Schroeder, Wm. c/o V. C. MacNabb, 909 Westfield Blvd., Indianapolis 20, Ind., 15 (REP)
Tel: Broadway 6770
Schulz, Edwin A., 721 Sherwood Dr., Indianapolis 20, Ind., 15 (REP)
Tel: Broadway 1993
Sellie, John C., c/o F. C. Valentine, 507 Ft. Wayne Bank Bldg., Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 9122
Skolburg, John E., c/o F. C. Valentine, 507 Ft. Wayne Bank Bldg., Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 9122
Southern, Charles D., 1605 Lincoln Tower, Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 5278
Southern, Paul D., c/o Charles Southern, 1605 Lincoln Tower, Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 5278
Thomas, James G., 601 Ft. Wayne Bk. Bldg., Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 9460
Thompson, Harlan, c/o Cunningham, 6101 College Ave., Indianapolis 20, Ind., 15 (REP)
Tel: Glendale 3222
Tucker Joseph L., c/o Charles Southern, 1605 Lincoln Tower, Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 5278
Valentine, Forrest C., 507 Ft. Wayne Bk. Bldg., Ft. Wayne 2, Ind., 15 (REP)
Tel: Anthony 9122
Warren Radio Co., 1716 S. Harrison, Ft. Wayne 2, Ind., 10 (NEDA)
Webb, Cecil E. c/o L. M. De Voe, 4010 Washington Blvd., Indianapolis 5, Ind., 15 (REP)
Tel: Humbolt 1395
Whitesell, Robert O., 2208 E. Washington St., Indianapolis 1, Ind., 15 (REP)
Tel: Market 8517
Wright, James L., 4241 Melbourne Rd., Indianapolis 44, Ind., 15 (REP)
Tel: Humbolt 8800
Wright Warren H., c/o James L. Wright, 4241 Melbourne Rd., P.O. Box 7807, Indianapolis 44, Ind., 15 (REP)
Tel: Humbolt 8800

OHIO

Allied Supply Co., Inc., 359 W. Monument Ave., Dayton 2, Ohio, 10 (NEDA)
Baier, A. H., 2138 Lee Rd., Cleveland 18, Ohio, 15 (REP)
Tel: Fairmount 1-5644
Bear, Barton N., 934 Orchard St., Toledo 9, Ohio, 15 (REP)
Bear, Howard, 3434 Oak Rd., Stow, Ohio, 15 (REP)
Bear, Neal, 3435 Streetsboro Rd., W. Richfield, Ohio, 15 (REP)
Tel: 100
Bell, Fred, 11621 Detroit Ave., Cleveland 2, Ohio, 15 (REP)
Tel: Lakewood 1-8468
Berman, Alvin A., 3757 Northwood Rd., Cleveland 18, Ohio, 15 (REP)
Brauer, W. J., 15631 Lakewood Hts., Cleveland 7, Ohio, 15 (REP)
Tel: Lakewood 1-7268
Bruce, Donald C., 4016 Diehl Ave., Cincinnati 36, Ohio, 15 (REP)
Burroughs Radio, Inc., 218 E. Second St., Mansfield, Ohio, 10 (NEDA)
Burroughs Radio, Inc., 711 Second, N. W., Canton 3, Ohio, 10 (NEDA)
Chambers Electr. Supply, 1669 Central Pkwy., Cincinnati 14, Ohio, 10 (NEDA)
Christianson, O. E., 2706 Alisdale, Toledo 6, Ohio, 15
Crane, J. Richard, 22554 Maple Drive, Cleveland 26, Ohio, 15 (REP)
Crosby, John W., c/o Scott & Steffen, 1836 Euclid Ave., Cleveland 15, Ohio, 15 (REP)
Tel: Main 1-1286
Daugherty, Frank A., 1120 Croyden Rd., Cleveland 24, Ohio, 15 (REP)
Tel: Hillcrest 2-3311
Daugherty, James B., c/o F. A. Daugherty Co., 1120 Croyden Rd., Cleveland 24, Ohio, 15 (REP)
Tel: Hillcrest 2-3311
DeLong, V. D., c/o Scott & Steffen, 1836 Euclid Ave., Cleveland 15, Ohio, 15 (REP)
Tel: Main 1-1286
Dietrich, Earl S., 320 Hanna Bldg., Cleveland 15, Ohio, 15 (REP)
Tel: Cherry 1-7770
Dolfuss, C. H. Jr., 2108 Payne Ave., Cleveland 14, Ohio, 15 (REP)
Tel: Prospect 1-0719
Edwards, E. C., 2123 E. 9th St., Cleveland 15, Ohio, 15 (REP)
Tel: Tower 1-5753
Electronic Supply Corp., 134 E. Long St., Columbus 15, Ohio, 10 (NEDA)
Fusion Eng. Co., 4503 Superior Ave., Cleveland 3, Ohio, 15, 20
Tel: EX 1-9343

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10. Distributional Functions

104. Distribution.

Greenleaf, C. T., Jr., 11621 Detroit Ave., Cleveland 2, Ohio, 15 (REP)
Hausfield Radio Supply, 116 N. 3rd St., Steubenville, Ohio, 10 (NEDA)
Holub & Hogg Co., 1400 Sycamore St., Cincinnati 10, Ohio, 10
Tel: Cherry 7974
Howards Electr. Supply, 135 17th St., Toledo 2, Ohio, 10 (NEDA)
Howard, Roy M., Midwest Sales Co., 3219 W. 117th St., Cleveland 11, Ohio, 15 (REP)
Tel: Winton 1-2700
Hughes-Peters, Inc., 111 E. Long St., Columbus 15, Ohio, 10 (NEDA)
Hughes-Peters, Inc., 300 W. Fifth St., Dayton, Ohio, 10 (NEDA)
Hughes-Peters, Inc., 1128 Sycamore, Cincinnati 10, Ohio, 10 (NEDA)
Kilroy, John W., c/o Neal Bear, 3435 Streetsboro Rd., West Richfield, Ohio, 15 (REP)
Tel: 100
Landfear, J. M., 2138 Lee Rd., Cleveland 18, Ohio, 15 (REP)
Tel: Fairmount 1-4533
Lehner, J. W., 367 Brynhild Rd., Columbus 2, Ohio, 15 (REP)
Tel: Ludlow 5260
Liedtke, John E., 4275 W. 215th St., Cleveland 16, Ohio, 15 (REP)
Lima Radio Parts Co., 600 N. Main St., Lima, Ohio, 10 (NEDA)
Lohse, Perry O., 2123 E. 9th St., Cleveland 15, Ohio, 15 (REP)
Tel: Tower 1-5753
Mahannah, F. G., 20599 Almar Dr., Cleveland 22, Ohio, 15 (REP)
McFadden, John J., c/o Wm. E. McFadden, 150 E. Broad St., Columbus 15, Ohio, 15 (REP)
Tel: Main 3363
McFadden Wm. E., 150 E. Broad St., Columbus 15, Ohio, 15 (REP)
Tel: Main 3363
Merchant, Charles J., c/o W. J. Brauer, 15631 Lakewood Hts. Blvd., Cleveland 7, Ohio, 15 (REP)
Tel: Lakewood 1-7268
Merchant, Charles J., 15631 Lakewood Hts., Cleveland 7, Ohio
Moore, Jack B., 4500 Dublin Rd., Columbus 2, Ohio, 15 (REP)
Morrisons Radio Supply, 331 Center St., Ashtabula, Ohio, 10 (NEDA)
Morrow, Les, 3123 W. 117th St., Cleveland 11, Ohio, 15 (REP)
Tel: Clearwater 1-5700
Moss, Charles R., 16956 Van Aken Blvd., Shaker Hts. 20, Ohio, 15 (REP)
Tel: Wyoming 1-6018
Nace, Allen S., 7601 Parkview Rd., Brecksville, Ohio, 15 (REP)
Tel: Jackson 6-7300
Needles, Wm. F., Jr., 4016 Diehl Ave., Cincinnati 36, Ohio, 15 (REP)
Northern Ohio Labs., 2073 W. 85th St., Cleveland 2, Ohio, 10 (NEDA)
Olsen, John O., 16201 Shaker Blvd., Cleveland 20, Ohio, 15 (REP)
Tel: Wyoming 1-2624
Peters, Robert W., 350 E. 215th St., Euclid 23, Ohio, 15 (REP)
Pioneer Electr. Supply Co., 2115 Prospect Ave., Cleveland 15, Ohio, 10 (NEDA)
Plietchwait Richard C., c/o Scott & Steffen, 1836 Euclid Ave., Cleveland 15, Ohio, 15 (REP)
Tel: Main 1-1286
Podolny, James H., 4716 Coleridge St., Pittsburgh 1, Pa., 15 (REP)
Tel: Highland 1-0800
Potapchuk, Wm., 3486 W. 59th St., Cleveland 2, Ohio, 15 (REP)
Pugh, C. L., 4500 Dublin Rd., Columbus 14, Ohio, 15 (REP)
Tel: Kingswood 4855
Radio Specialties, 136 Pine Ave., S.E., Warren, Ohio, 10 (NEDA)
Rahe, Norman H., 11816 McCracken Rd., Cleveland 25, Ohio, 15 (REP)
Rauer, Frank W., 4144 Marvin Ave., Cleveland 9, Ohio, 15 (REP)
Tel: Melrose 1-8350
Root, Eugene S., Jr., c/o Les Morrow, 3123 W. 117th St., Cleveland 11, Ohio, 15 (REP)
Tel: Clearwater 1-5700
Roth Sales Co., Mike, 13947 Cedar Rd., Cleveland 18, Ohio, 15
Schroeder, Henry J., P.O. Box 518, West Richfield, Ohio, 15 (REP)
Schuster Elec. Co., 321 E. Eighth St., Cincinnati 2, Ohio, 10 (NEDA)
Scott, Ernest P., 1836 Euclid Ave., Cleveland 15, Ohio, 15 (REP)
Tel: Main 1-1286
Srepco, Inc., 314 Leo St., Dayton 4, Ohio, 10 (NEDA)
Steakley, Wiley E., 108 W. Kanawha, Worthington, Ohio, 15 (REP)
Steffen, Delbert, 1836 Euclid Ave., Cleveland 16, Ohio, 15 (REP)
Tel: Main 1-1286
Steinbergs, Inc., 633 Walnut St., Cinnati 2, Ohio, 10 (NEDA)
Steinke, A. R., 19277 Henry Rd., Cleveland 26, Ohio, 15 (REP)
Sun Radio Co., 110 E. Market St., Akron 8, Ohio, 10 (NEDA)
Superior Distrib. Co., 5124 Liberty Ave., Pittsburgh 24, Pa., 10 (NEDA)
Tanner, George O., 600 Grant St., Pittsburgh 19, Pa., 15 (REP)
Tel: Court 1-0131
Toledo Radio Specialties, 1215 Jackson St., Toledo 2, Ohio, 10 (NEDA)
Toohig, James D., 1675 Elmwood Ave., Columbus 12, Ohio, 15 (REP)
Vilfroy, Richard H., 3788 E. 183rd St., Cleveland 20, Ohio, 15 (REP)
Wahl Co., A. C., 416 W. Benson St., Cincinnati 15, Ohio, 15
Tel: Valley 3270
Warren Radio Co., 222 S. Elizabeth St., Lima, Ohio, 10 (NEDA)
Warren Radio Co., 1002 Adams St., Toledo, Ohio (NEDA)
Weller, W. R., 361 E. Kanawha Ave., Worthington, Ohio, 15 (REP)
Tel: Franklin 2-7819
Whelan, Robert E., 1110 Broad Blvd., Dayton 9, Ohio, 15 (REP)
Whitehead Radio Co., 124 E. Long St., Columbus 15, Ohio, 10 (NEDA)

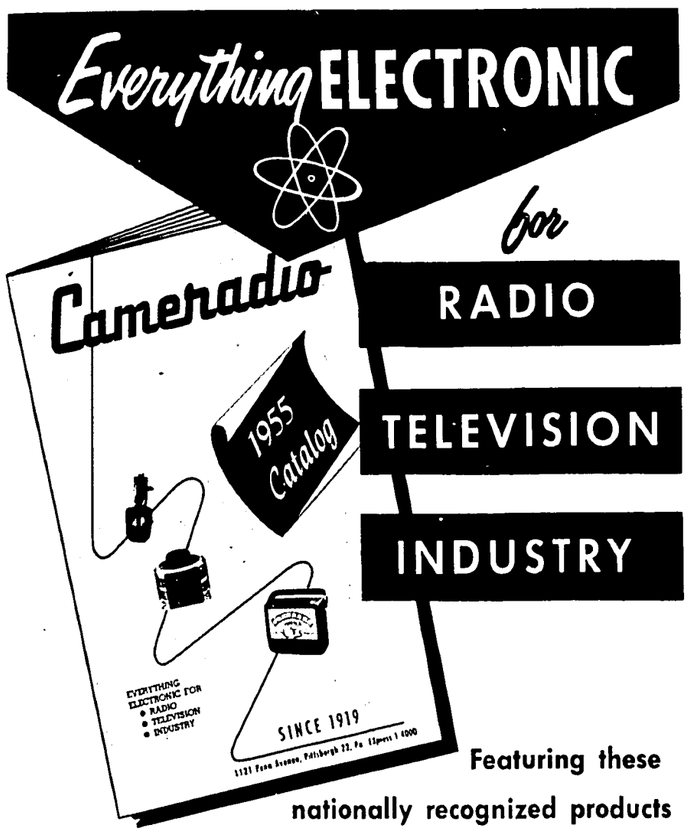
Middle Atlantic

PENNSYLVANIA

A. C. Radio Supply Co., 1539 W. Passyunk Ave., Philadelphia 45, Pa., 10 (NEDA)
A. G. Radio Parts Co., 17th & Venango Sts., Philadelphia 40, Pa., 10 (NEDA)
Algene Sound & Radio Co., 1915 Walnut St., Philadelphia, Pa., 10, 15, 20, 25
Tel: LO 4-1744
Allied Elec. Appliance, 1320 W. Erie Ave., Philadelphia 40, Pa., 10 (NEDA)
Allied Elec. Appliance, 5916 Market St., Philadelphia 39, Pa., 10 (NEDA)
Almo Radio Co., 412 N. 6th St., Philadelphia 23, Pa., 10 (NEDA)
Alvo Electr. Distr., Inc., 240 Pine St., Williamsport, Pa., 10
Tel: 2-4858
Andress, Philip M., 3823 Oak Rd., Philadelphia 9, Pa., 15 (REP)
Tel: Victor 4-9100
B. & R. Elec. Co., St. Marys, Pa., 10 (NEDA)
Baker Radio Electric, 111 Johns St., Johnstown, Pa., 10 (NEDA)
Barbey Co., Inc., George D., 157 Penn St., Reading, Pa., 10
Tel: 6-7451
Barnett Bros. Radio Co., 117 N. 7th St., Philadelphia, Pa., 10 (NEDA)
Tel: LO 3-3947
Barnett Bros. Radio Co., 201 S. 4th St., Reading, Pa., 10 (NEDA)
Barno Radio Co., 321 6th Ave., McKeesport, Pa., 10 (NEDA)
Benge, J. R., 25 S. Easton Rd., Glenside, Pa., 15 (REP)
Tel: Turner 1325
Biggs, J. Alan, P.O. Box 450, Doylestown, Pa., 15 (REP)
Bowman, John, Jr., c/o J. R. Benge, 25 S. Easton Rd., Glenside, Pa., 15 (REP)
Tel: Turner 1325
Boyd, P. A., 409 Todd St., Pittsburgh 21, Pa., 15 (REP)
Brautigam, Edward H., 302 Rockledge Ave., Philadelphia 11, Pa., 15 (REP)
Tel: Cheltenham 2671
Brookfield, R. F., 55 Cricket Ave., Ardmore, Pa., 15 (REP)
Tel: Midway 2-6911
Brown, Donald G., 25 S. Easton Rd., Glenside, Pa., 15 (REP)
Tel: Turner 1325
Buss Rad. Elec. Supply, 61-73 E. Broad St., Bethlehem, Pa., 10 (NEDA)
Cambria Equipment Co., 17-27 Johns St., Johnstown, Pa., 10 (NEDA)

(Continued on page 574)

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.



Featuring these nationally recognized products

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G.E.	Ohmite	Hallicrafters
Westinghouse	P. R. Mallory & Co.	Collins
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Burgess	Stromberg-Carlson	E. F. Johnson Co.
Superior (Powerstat)	Centralab	Sylvania
Amphenol	Triplett	Potter & Brumfield
Belden	Simpson	Struthers Dunn Inc.
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National	Sola	Raytheon

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Established 1919

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1121 Penn Avenue, Pittsburgh 22, Pa

EXpress 1 1000

104. Distribution.

(Continued from page 573)

Cameradio Co., 1121 Penn. Ave., Pittsburgh 22, Pa., 10 (NEDA)
For details see ad on page 574
Tel: EXpress 4-1000

Carmen, O. W., Jr., 1812 Edgewood Rd., Towson 4, Md., c/o L. D. Lowery, 50 Wynnewood Rd., Wynnewood, Pa., 15 (REP)
Tel: Midway 2-9100

Connor, Daniel J., 1346 Suburban St. Bldg., Philadelphia 3, Pa., 15 (REP)
Tel: Locust 4-2870

Consolidated Radio Co., 612 Arch St., Philadelphia 6, Pa., 10 (NEDA)

Cordray, Henry, 18 W. Chelten Ave., Philadelphia 44, Pa., 15 (REP)
Tel: Victor 8-0447

D. Angelo, Jack, c/o S. K. MacDonald, 1531 Spruce St., Philadelphia 2, Pa., 15 (REP)
Tel: Kingsley 5-1205

Duncombe Co., J. V., 902 Parade St., Erie, Pa., 10 (NEDA)

Duncombe Co., J. V., 1011 W. 8th St., Erie, Pa., 10 (NEDA)

Edmunds, E. J., 101 N. Lexington Ave., Haverstown, Pa., 15 (REP)
Tel: Hilltop 6-6472

Erdman, K. B., c/o C. H. Stratton, 7852 Montgomery Ave., Philadelphia 17, Pa., 15 (REP)
Tel: Majestic 5-2231

Fairbanks, H. J., 1615 Darby Rd., Haverstown, Pa., 15 (REP)
Tel: Granite 2-2467

Faries, James P., 1531 Spruce St., Philadelphia 2, Pa., 15 (REP)
Tel: Kingsley 5-1205

Federated Purchaser, Inc., 925 Northampton St., Easton, Pa., 10 (NEDA)

Federated Purchaser, Inc., 1115 Hamilton St., Allentown, Pa., 10 (NEDA)

Frederick Wm., Jr., c/o J. R. Benge, 25 S. Easton Rd., Glenside, Pa., 15 (REP)
Tel: Turner 1325

Friedman, Martin, 1006 Western S. V. B., Philadelphia 7, Pa., 15 (REP)
Tel: Pennypacker 5-4778

Graham, Wilfrid, 610 Latham Dr., Wynnewood, Pa., 15 (REP)
Tel: Ardmore 8644 J

Herbach & Rademan, Inc., 1204 Arch St., Philadelphia 7, Pa., 10 (NEDA)

Hollenbacks Radio Supply, 2221 Eighth Ave., Altoona, Pa., 10 (NEDA)

Keps Elec. Co., 5000 Baum Blvd., Pittsburgh 13, Pa., 5, 10, 15, 20
Tel: Museum 3-3300

J. R. S. Distributors, 644 W. Market St., York, Pa., 10 (NEDA)

Jeffries, S. A., 105 Forest Ave., Narbeth, Pa., 15 (REP)
Tel: Narbeth 8-8500

Joe's Radio Shop, 67 S. Pearl St., Bridgeton, N.J., 10 (NEDA)

Jordan Electronic Co., 1130 German St., Erie, Pa., 10 (NEDA)

Larkin, John E., Jr., 415 Beulah Rd., Pittsburgh, Pa., 15 (REP)

Lawman, Paul M., 1262 Shady Crest Dr., Pittsburgh 16, Pa., 15 (REP)

10. Distributional Functions

104. Distribution.

Lazar Rad. Co., Nat., 4231 Lancaster Ave., Philadelphia 4, Pa., 10 (NEDA)

Leader, Robert, 111 S. 22nd St., Philadelphia, Pa., 15 (REP)

L ban, Albert D., 218 Lloyd Lane, Philadelphia 31, Pa., 15 (REP)
Tel: Ardmore 5515 L

Lectronic Res. Labs., 715 Arch St., Philadelphia 6, Pa., 5, 10, 25
Tel: Mark 7-6771

Lowery, L. D., 50 E. Wynnewood Rd., Wynnewood, Pa., 15 (REP)
Tel: Midway 2-9100

M & H Sporting Goods Co., 722 Market St., Philadelphia 6, Pa., 10 (NEDA)

MacDonald, S. K., 1531 Spruce St., Philadelphia 2, Pa., 15 (REP)
Tel: Kingsley 5-1205

Mahoney, J. J., 1531 Spruce St., Philadelphia 2, Pa., 15 (REP)
Tel: Kingsley 5-1205

Maguire, J. A., 593 Drexel Bldg., Philadelphia 6, Pa., 15 (REP)
Tel: Market 7-1670

Marshall Co., John, 201 Anderson St., Pittsburgh, Pa., 10 (NEDA)

Miller, Clifford P., 121 N. Broad St., Philadelphia 7, Pa., 15 (REP)
Tel: Locust 4-2151

Moore, S. Lloyd, Jr., c/o D. G. Quinlan, 4700 Frankford Ave., Philadelphia 24, Pa., 15 (REP)
Tel: Jefferson 3-0650

Moyer Electr. Sup. Co., Inc., 330 E. Norwegian St., Pottsville, Pa., 10 (NEDA)

Moyer Electr. Sup. Co., Inc., 758 N. Locust St., Hazleton, Pa., 10 (NEDA)

Naudain, L. Parker, Suburban Station Bldg., Philadelphia 3, Pa., 15 (REP)
Tel: Rittenhouse 6-9965

Neuber Sound Equip., H. K., 1539 Race St., Philadelphia 2, Pa., 10, 20
Tel: LO 7-2125

Newson, C. H., Jr., 150 Terminal Ave., Philadelphia 18, Pa., 15 (REP)
Tel: Chestnut Hill 8-0282

Pampa Electr. Sales Corp., 808 N. Broad St., Philadelphia 30, Pa., 10, 20
Tel: Poplar 5-3838

Pearson, Raymond T., 1125 York Rd., Abington, Pa., 15 (REP)

Powell Co., Harold H., 2102 Market St., Philadelphia 3, Pa., 10

Quinlan, David G., 4700 Frankford Ave., Philadelphia 24, Pa., 15 (REP)
Tel: Jefferson 3-0650

Radio Elec. Service Co., 701 Arch St., Philadelphia 6, Pa., 10 (NEDA)

Radio City Prods. Co., Center & Glendale St., Easton, Pa., 5, 10, 15
Tel: Easton 9122

Radio Distrib. Co., 915 S. 13th St., Harrisburg, Pa., 10 (NEDA)

Radio Elec. Shop, 631 S. 60th St., Philadelphia 43, Pa., 20
Tel: GR 6-8125

Radio Service Co., 346 S. Main St., Wilkes-Barre, Pa., 10
Tel: Va 3-7713

Randall, Kenneth, 121 N. Broad St., Philadelphia 7, Pa., 15 (REP)
Tel: Locust 4-2151

Rosen & Co., Raymond, 32nd & Walnut Sts., Philadelphia 4, Pa., 10 (NEDA)

Ryburg, Charles H., 111 S. 22nd St., Philadelphia, Pa., 15 (REP)
Tel: Rittenhouse 6-5699

Scarborough, George G., 50 E. Wynnewood St., Wynnewood, Pa., 15 (REP)
Tel: Midway 2-9100

Scholes, M. W. R., c/o J. R. Benge, 25 S. Easton Rd., Glenside, Pa., 15 (REP)
Tel: Turner 1325

Scranton Radio TV Supply Co., 519 Mulberry St., Scranton 3, Pa., 10 (NEDA)

Shelps, George A., 2604 Cheltenham Ave., Philadelphia 19, Pa., 15 (REP)

Shilt, Noble C., 1531 Spruce St., Philadelphia 2, Pa., 15 (REP)
Tel: Kingsley 5-1205

Snefsky, Edward A., 2046 Brookfield Dr., Pittsburgh 16, Pa., 15 (REP)

Steinberg & Co., Albert, 2520 N. Broad St., Philadelphia 32, Pa., 10 (NEDA)

Steinberg & Co., Albert, 6324 Sackett St., Philadelphia, Pa., 10 (NEDA)

Stratton, C. H., 7852 Montgomery Ave., Philadelphia 17, Pa., 15 (REP)
Tel: Majestic 5-2231

Stuchell, H. E., Jr., c/o L. D. Lowery, 50 Wynnewood Rd., Wynnewood, Pa., 15 (REP)
Tel: Midway 2-9100

Sylvester, R. A., 50 Wynnewood Rd., Wynnewood, Pa., 15 (REP)
Tel: Midway 2-9100

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25 S. Easton Road, Glenside, Penna.
Phones: Turner 1325—1326

Covering Manufacturers and Jobbers in Mid-Lantic Territory Representing
Stackpole Carbon Co.
Federal Telephone & Radio Co.
National Fabricated Products, Inc.
Merit Coil and Transformer Corp.

Technical Representation, 25 S. Easton Rd., Glenside, Pa., 15
For details see ad on page 575
Tel: Turner 1325

Trinkle, W. S., N. 2 Roberts Block, Glenside, Pa., 15 (REP)
Tel: Turner 1075

Williamsport Radio Supply, 518 W. Third St., Williamsport 28, Pa., 10 (NEDA)

Wright, Austin L., 33 E. Golf View Rd., Ardmore, Pa., 15 (REP)

York Rad. Refrigeration, 265 W. Market St., York, Pa., 10 (NEDA)

Zimmerman Wholesalers, 55 Morgantown St., Uniontown, Pa., 10 (NEDA)

NEW JERSEY

Allen & Hurley, 23 Warren St., Trenton 10, N.J., 5, 10
Tel: 3-0386

Allied Elec. Appliance, 333 S. Warren St., Trenton, N.J., 10 (NEDA)

Banfield, Carroll S., 15 Park Ave., Rutherford, N.J., 15 (REP)
Tel: Ho 2-5281

Boeck, G. A., 81 Lake Dr., Mountain Lakes, N.J., 15 (REP)
Tel: Boonton 8-2921

Boenecke, C. A., 210 N. 6th St., Camden, N.J., 15 (REP)
Tel: Woodlawn 4-8650

Border, Barrett, 10 Highwood Ave., Tenafly, N.J., 15 (REP)
Tel: Englewood 3-2354

Braddock, Edward, Browning Lane, Haddonfield, N.J., 15
Tel: Haddonfield 9-0087

Brennan, F. X., 180 Glenridge Ave., Montclair, N.J., 15 (REP)
Tel: Mo 3-2462

Bressler, Jules J., 4808 Bergenline Ave., Union City, N.J., 15 (REP)
Tel: Union 4-9577

Burnett, Gerald G., 504 S. 21st St., Irvington, N.J., 15 (REP)

Cerf, Arthur E., 744 Broad St., Newark 2, N.J., 15 (REP)
Tel: MI 2-6734

Churchill, Floyd W., Rm. 411 Stevens Bldg., Camden, N.J., 15 (REP)

Continental Sales Co., 521 Bloomfield Ave., Newark 7, N.J., 10 (NEDA)

Economy Electr., 624 Ridge Rd., Lyndhurst, N.J., 10 (NEDA)

Federated Purchaser, Inc., 114 Hudson St., Newark 4, N.J., 10 (NEDA)

Finlay, Robert, Lincoln Bldg., Ridgewood, N.J., 15 (REP)
Tel: Ridgewood 6-7218

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Manufacturers' Representative

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Good All Elec. Mfg. Co.—Capacitors
Kurman Electric Company—Relays
Lankevin Mfg. Corporation—Transformers
Micarta Fabricators, Inc.—Bakelite sheets, terminal boards
Model Eng. & Mfg., Inc.—Power resistors, power rheostats
Pyroferric Company, Inc.—Powdered iron cores
Resistance Products Company—Precision resistors
Rockbar Corporation—Deposited carbon resistors

640 Federal Street Camden 3, N.J.
Telephone: WOodlawn 6-2550

Foley, Andrew A., 640 Federal St., Camden, N.J., 15 (REP)
For details see ad on page 575
Tel: Woodlawn 6-2550

Foley, Andrew J., c/o Andrew A. Foley, 640 Federal St., Camden, N.J., 15 (REP)
Tel: Woodlawn 6-2550

(Continued on page 576)

10. Distributional Functions

104. Distribution.

(Continued from page 575)

Galasso, David P., 921 Bergen Ave., Jersey City, N.J., 15 (REP)
Tel: Digby 4-1763

Gentry, Richard, 15 Park Ave., Rutherford, N.J., 15 (REP)
Tel: Ho 2-5281

Hallmark Electr. Corp., 592 Communipaw Ave., Jersey City 4, N.J., 10 (NEDA)

Hughes, Kenneth E., 4808 Bergenline Ave., Union City, N.J., 15 (REP)
For details see ad on page 576
Tel: Oxford 5-0082

Kenneth E. Hughes Company

KENNETH E. HUGHES CO.
UNION CITY, N.J.

Manufacturers' Representatives for Electronic Components and Equipment in the Metropolitan New York area, including Northern New Jersey—Westchester County—All of Long Island
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NJ—Union 7-3204 TWX—Union City, NJ 797

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El Mec Labs.—Development Engineering and Special Products
G. M. Giannini & Co., Inc.—Potentiometers—Rotary and Rectilinear, Pressure Switches, Synchronous Motors, Telemetering Commutators, Magneal Relays
Hickok Electrical Instrument Co.—Indicating Meters, Oscilloscopes, Signal Generators, Tube Testers, Vacuum Tube Voltmeters
Torwico Electronics, Inc.—Toroids, Filters and Magnetic Amplifiers

International Distrib., 185 Central Ave., East Orange, N.J., 10 (NEDA)

Jersey Electr. Distrib., 524 21st Ave., Paterson 3, N.J., 10 (NEDA)

Johnson, Horace C., c/o Andrew A. Foley, 640 Federal St., Camden, N.J., 15 (REP)
Tel: Woodlawn 3-2693

Kearns, Inc., Harrisburg Ave., Atlantic City, N.J., 10 (NEDA)

Keefe, John, Jr., 201 N. 6th St., Camden, N.J., 15 (REP)
Tel: Woodlawn 4-2215

Lippman & Co., Aaron, 99-107 Newark St., Newark 4, N.J., 10 (NEDA)

Luce, R. P., Jr., 480 Morris Ave., Summit, N.J., 15 (REP)
Tel: Su 6-9211

Miller, Harry, 27 Mechanic St., Red Bank, N.J., 15 (REP)
Tel: Red Bank 6-9300

Moyer, Harold A., 152 Merion Ave., Haddonfield, N.J., 15 (REP)
Tel: Lincoln 7-0106

Muggleworth, J. C., 324 Haddon Ave., Collingswood, N.J., 15 (REP)
Tel: Collingswood 5-7200

Rad. Elec. Service Co., 406 N. Albany Ave., Atlantic City, N.J., 10 (NEDA)

Ryan, John L., 263 Edgemont Pl., Teaneck, N.J., 15 (REP)
Tel: TE 6-1075

Schwartz, Adolph, 1 Exchange Pl., Jersey City, N.J., 15 (REP)
Tel: DE 3-2424

Simberkoff, J. A., 68 Hudson St., Hoboken, N.J., 15 (REP)
Tel: HO 2-5211

Simberkoff, S. W., 68 Hudson St., Hoboken, N.J., 15 (REP)
Tel: Ho 2-5211

Sonics Equip. Co., 2321 Hudson Blvd., Jersey City 4, N.J., 10
Tel: He 4-8378

Stangel, Arthur, c/o S. W. Simberkoff, 68 Hudson St., Hoboken, N.J., 15 (REP)
Tel: Ho 2-5211

Variety Elec. Co., Inc., 468 Broad St., Newark 2, N.J., 5, 10
Tel: Mu 2-6760

Williams Co., Carl B., 154 S. Main St., Phillipsburg, N.J., 10 (NEDA)
Tel: 5-1245

Williams, Victor W., 5 Circle Dr., Margate, N.J., 15 (REP)

NEW YORK

Aaron, Paul D., Professional Bldg., Pt. Washington, L.I., N.Y., 15 (REP)
Tel: Pt. Washington 7-5670

Acme Electr., Inc., 74 Willoughby St., Brooklyn 1, N.Y., 10, 20
Tel: Tr 5-3833

Ad Auriema, Inc., 89 Broad St., New York 4, N.Y., 5, 15
Tel: Bo 9-7750

Adelman Co., Leon L., 25 Chittenden Ave., New York 33, N.Y., 15
Tel: Tompkins 7-1145

Adirondack Radio Supply, 32 Guy Park Ave., Amsterdam, N.Y., 10 (NEDA)

Agar, Cross & Co., Ltd., 21 West St., New York 6, N.Y., 5, 15
Tel: Di 4-0260

Allen Electronics Co., 90 Brook St., Garden City, N.Y., 10, 15, 20, 25
Tel: Pioneer 1-2445

Allen, Leonard D., 2401 S. State St., Syracuse 5, N.Y., 15 (REP)
Tel: 4-4195

Allied Electr. Sales, 74 Cortlandt St., New York 7, N.Y., 5, 10, 25
Tel: Barclay 7-5839

American Elite, 1775 Broadway, New York 19, N.Y., 05
For details see ad on page 249
Tel: Plaza 7-7491

Andrews, A. R., 521 Cumberland Ave., Syracuse 10, N.Y., 15 (REP)
Tel: Fayetteville 65-8405

Andrews, Martin P., Mott Rd., Fayetteville, N.Y., 15 (REP)
Tel: Fayetteville 65-8405

Arace Electr. Distr., 25 Henry St., Kingston, N.Y., 10 (NEDA)

Arrow Electr., Inc., 82 Cortlandt St., New York 7, N.Y., 10
Tel: Digby 9-4714

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BARRY ELECTRONICS CORP.
136 LIBERTY ST N.Y 6, N.Y

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10. Distributional Functions

104. Distribution.

Asco Sound Corp., 115 West 45 St., New York 36, N.Y., 10, 20
Tel: Judson 2-1750

Associated Amer. Trad. Div., 8010 Empire St. Bldg., N.Y. 1, N.Y., 5, 15, 20
Tel: Lo 4-2657

Ball, Marshall T., 58 E. Quaker St., Orchard Park, N.Y., 15 (REP)
Tel: 4416

Barry Electronic Corp., 136 Liberty St., New York 6, N.Y.
For details see ad on page 576
Tel: Rector 2-2562

Baum, Sidney H., 70-15 Fleet St., Forest Hills 75, N.Y., 15 (REP)
Tel: Bo 3-8101

Beacon Electr. Distr., 180 Mill St., Watertown, N.Y., 10 (NEDA)

Beacon Electr., Inc., 411 Columbia St., Utica 2, N.Y., 10 (NEDA)

Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 10

Bittan, D. R., 53 Park Pl., New York 7, N.Y., 15 (REP)
Tel: Ba 7-2789

Bloch, Jack, 60 E. 42nd St., New York 17, N.Y., 15 (REP)
Tel: Mu 7-6667

Bloom, Hy, 8 W. 18th St., New York 11, N.Y., 15 (REP)
Tel: Or 5-7565

Brauer, R. E., 250 W. 57th St., New York 18, N.Y., 15 (REP)
Tel: Co 5-0440

Brown, George, 44 Highland Ave., Pt. Washington, L.I., N.Y., 15 (REP)

Brown, Irv., 1500 Carroll St., Brooklyn 13, N.Y., 15 (REP)
Tel: Hy 3-1379

Brown, Jack, 25 Beaumont Circle, Tuckahoe, N.Y., 15 (REP)
Tel: Spencer 9-7330

Buchman, Rad. Co., 492 Atlantic Ave., Brooklyn 17, N.Y., 10 (NEDA)

Bush, Robert T., c/o L. D. Allen, 2401 S. State St., Syracuse 5, N.Y., 15 (REP)
Tel: 4-4195

Callahan, Wilfred J., c/o W. H. Zimmerman, 647 Warren St., Syracuse 2, N.Y., 15 (REP)
Tel: 3-6405

Calvert Electronics, Inc., 59 Fourth Ave., New York 3, N.Y., 5, 10, 25
For details see ad on page 577
. Tel: Oregon 4-3027

Camber, Marty, 1700 York Ave., New York 28, N.Y., 15 (REP)
Tel: En 9-4222

Carduner, Eugene, 164 Duane St., New York 13, N.Y., 15 (REP)
Tel: Walker 5-0900

Chanrose Rad. Distrib., Inc., 170-16 Jamaica, N.Y., 10, 20
Tel: Olympic 8-2900

Chief Electronics, Inc., 14 N. Bridge St., Poughkeepsie, N.Y., 10 (NEDA)

Clarfield, Albert, c/o Paul D. Aaron, Professional Bldg., Pt. Washington, L.I., N.Y., 15 (REP)
Tel: Pt. Washington 7-5670

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4 Electronic Sales Engineers — Established 1930

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Watkins 9-3920

John DiBlasi, Senior Member I.R.E.
Associates: John S. DiBlasi, Jr., Martin M. Holt, Frank J. Cerven

Communications Equip. Co., 131 Liberty St., New York 7, N.Y., 10
Tel: Digby 9-4124

Cooper-Di Blasi, 259 W. 14 St., New York 11, N.Y., 15 (REP)
For details see ad on page 577
Tel: WAtkins 9-3920

Cottone & Co., A., 340 Canal St., New York 13, N.Y., 25
Tel: Digby 9-2188

Cushman, Robert H., c/o Lee Rocke, 6 E. 39th St., New York 16, N.Y., 15 (REP)
Tel: Le 2-7372

Davis Electr. Corp., 204 Main St., Hempstead, L.I., N.Y., 10 (NEDA)

Diamond, Simon, 75 West St., New York 6, N.Y., 15 (REP)
Tel: Wh 4-2970

Dodge, Donald P., 301 W. Main St., Waterloo, N.Y., 15 (REP)

Dymac, Inc., 2329 Main St., Buffalo 14, N.Y., 10 (NEDA)

Eby Sales Co., 130 Lafayette St., New York 13, N.Y., 10
Tel: Wo 2-7766

Egert, Samuel S., 11 Park Pl., New York 7, N.Y., 15 (REP)
Tel: Wo 4-0996

Electr. Labs. & Supply Co., 1415 Oriskany St., W. Utica 4, N.Y., 10 (NEDA)

Electronicraft, Inc., 27 Milburn St., Bronxville, N.Y., 25
Tel: Bronxville 2-0044

Electronic Sup. Brokers, 148 Chambers St., New York 7, N.Y., 25
Tel: Rector 2-1591

Farber, Maury, 1200 Hertel, Buffalo, N.Y., 15 (REP)
Tel: Riverside 2423

Federated Purchaser, Inc., 66 Dey St., New York, N.Y., 10 (NEDA)

Fidelatone Co., Inc., 851 Atlantic Ave., Brooklyn 38, N.Y., 15
Tel: Nevins 8-5210

(Continued on page 578)

Calvert Electronics INCORPORATED

59 FOURTH AVENUE NEW YORK 3, N.Y.
OREgon 4-3027 Cable Address: CALVERTRON

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- CAPACITORS
- RESISTORS

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1H6G	.59	KC4-3	19.00	408A W.E.	2.25
1L4	.64			416A W.E.	Write
1LA5	.64	1B24	6.45	416B W.E.	Write
1LC5	.64	1B35	4.85	421A W.E.	2.45
1LG5	.79	1B36	24.00	422A W.E.	2.45
1LN4	.65	2C43	12.75	464	3.75
1P5GT	.54	2C51	4.05	CK507AX	.65
1Q5GT	.64	2E24	1.75	575A	19.45
2A3	.89	2J21	1.95	722A	.77
2A6	.49	2J22	1.75	730A	19.75
2X2/879	.22	2J26	3.95	815	1.75
5Y4	.50	2J32	17.50	836	1.39
5Y4G	.55	2K31	99.50	841	.19
6AK5	.55	2K36	55.00	866A	1.10
6AL5	.42	2X2/879	.22	872A	1.75
6AQ5	.39	3BP1	2.75	891	99.50
6AS7G	3.35	3B24W	9.45	921	.39
6AT6	.54	3E29	9.45	931A	3.35
6F5	.55	4B28	3.75	CK-1006	1.25
6F6	.50	4C27	8.75	CK-1089	1.00
6G6G	.65	4J25	99.50	1616	.49
		5AP1	2.15	1619	.33
6H6	.29	5BP1	.99	1625	.25
		5BP4	1.75	1626	.19
6J5GT	.35	5CP1	3.95		
6J6	.42	5D21	9.95	1629	.10
6J7	.65	5FP7	1.75		
6K7	.44	7BP7	2.50	1630	.75
6K8G	.75	8GP7	6.45	5800 Victoreen	3.50
6L5G	.59	10	.19	5803 Victoreen	1.75
6L6GA	.75	10Y	.19	5881	2.75
6L6GAY	.85	12DP7	9.45	5964	.99
6L7G	.39	1X2B	.29	6015	14.75
6N7GT	.44	T20	2.00	6038	5.95
6SA7GT	.38	T21	2.00	7193	.19
6SF5	.55	21D4	.44	8011	.35
6SL7GT	.55	FG32	1.25	8025	2.95
6SN7GT	.55	35T-ion Gauge	2.25	8025A	3.45
6T8	.64	T40	2.00	9002	.65
		HY40Z	2.00	9003	.99
7A6	.22	RK49	3.95	9006	.24
7C4	.12	RK62	2.00		
12BH7GT	.59	RKR73	.77	INDIVIDUALLY BOXED	
12SG7	.65	100TH	4.95		
12SK7GT	.48	101D W.E.	.99	•	
12SL7GT	.55	101L W.E.	1.25	STANDARD BRANDS	
14C7	.64	WU-1115	17.75		
19	.65	F-127A		•	
25L6GT	.44			GUARANTEED	
26	.99	FG-172	17.50		
28D7	.99				
37	.54	207	50.00		
43	.55	211	.55		
45	.55	212A	.55		
46	.49	311A W.E.	2.75		
50L6GT	.50	311B W.E.	3.75		
57	.65	CA322	9.45		
70L7GT	.65	373A W.E.	1.75		
71A	.39				
76	.39				
77	.45				

MICA TRANSMITTING CAPACITORS



600 W.V. D.C.

Cap.	Type	Price
.03	9ALS	.39
.039	1650	.55
.04	9LS	.59

1200 W.V. D.C.

.001	9	.19
.002	9	.25

2500 W.V. D.C.

.00027	9	.19
.00039	A	.19
.0004	9	.24
.004	9LS	.55



600 W.V. D.C.

.0001	1455	.19
.0002	1455	.19
.00025	1455	.19
.0003	1455	.19
.0004	1455	.19
.0005	1455	.19
.0015	1455	.19
.002	1455	.20
.0025	1455	.20
.003	1455	.22
.004	1455	.25
.005	1455	.25
.006	1455	.29
.008	1455	.29
.01	45	.35
.01	XQBW	.37
.01	4L8	.37
.015	1455	.40
.02	1455	.42
.03	1455	.64
.04	1455	.76
.05	4	.83

1200 W.V. D.C.

.0001	4	.24
.0002	4	.24
.00225	4	.24
.0003	4	.24
.0004	4	.24
.002	4	.33
.0022	4	.33
.0025	4	.39
.003	4	.42
.004	4	.45
.005	4	.47
.006	4	.49
.008	4	.50
.01	4	.55

2500 W.V. D.C.

.0001	4	.25
.00025	4	.29
.0003	4	.32
.0004	4	.35
.0005	4	.37
.002	4	.85
.0025	4	.59
.003	4	.65

Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10. Distributional Functions

104. Distribution.

(Continued from page 577)

Fields, Jack, c/o S. S. Egert, 11 Park Pl., New York 7, N.Y., 15 (REP)
Tel: Wo 4-0996

Finkelstein, Harry, 136 Liberty St., New York 6, N.Y., 15 (REP)
Tel: Wo 4-5087

Fisher Distri. Co., Inc., 118 Duane St., New York 7, N.Y., 10 (NEDA)

Fordham Radio Supply, 265 E. 149th St., New York 51, N.Y., 10 (NEDA)

Forrest, Bernard J., 102 Warren St., New York 7, N.Y., 15 (REP)
Tel: Co 7-1712

Forshay, John M., 27 Park Pl., New York 7, N.Y., 15 (REP)
Tel: Ba 7-4977

Fort Orange Radio Distr. Co., 904 Broadway, Albany, N.Y., 10 (NEDA)

Freed, Leo, 420 Lexington Ave., New York 17, N.Y., 15 (REP)
Tel: Le 2-4771

Furman, Nat, c/o Hy Steinberg, 395 Broadway, New York 13, N.Y., 15 (REP)
Tel: Wo 4-7321

Gates Elec. Co., 65 W. Broadway, New York 7, N.Y., 10
Tel: Wo 2-7587

Garfinkle, Wm., 17 E. 42nd St., New York 17, N.Y., 15 (REP)
Tel: Mu 2-6770

Gary, Al, 1961 Broadway, New York 23, N.Y., 15 (REP)
Tel: Tr 3-3759

Geist, Creaser Assoc., Inc., 60 E. 42 St., New York 17, N.Y., 15
Tel: Murray Hill 7-1550

General Electr. Dist. Co., 98 Park Pl., New York 7, N.Y., 5, 10, 20
Tel: Rector 2-1677

Genesee Radio & Parts Co., 205 Genesee St., Buffalo 3, N.Y., 10 (NEDA)

Gold, William, 7806 Empire State Bldg., New York 1, N.Y., 15 (REP)
Tel: LO 4-2525

Graybar Elec. Co., Inc., 420 Lexington Ave., New York 17, N.Y., 10, 15, 20
Tel: LE 2-4000

Green Tele. Radio Distrib., 472 Sutter Ave., Brooklyn 7, N.Y., 10 (NEDA)

Green Tele. Radio Distrib., 67-15 Freshpond Rd., Brooklyn, N.Y., 10 (NEDA)

Green Tele. Radio Distrib., 4123 Ft. Hamilton Pkwy., Brooklyn, N.Y., 10 (NEDA)

Green Tele. Radio Distrib., 1639 Bedford Ave., Brooklyn, N.Y., 10 (NEDA)

Greenberg, Jerry, 23 Park Pl., New York, N.Y., 15 (REP)
Tel: WO 4-8585

Greenwich Sales Co., 59 Cortlandt St., New York 7, N.Y., 10, 25

Gross, Adolph L., 23 Park Pl., New York, N.Y., 15 (REP)
Tel: WO 4-8585

Habig, Wm. E., c/o Sydney Wimpie, 215 E. 37th St., New York 16, N.Y., 15 (REP)
Tel: Va 6-3463

Harris, A. M., 10 Fiske Pl., Mt. Vernon, N.Y., 15 (REP)
Tel: Mo 8-9809

Harrison Co., Fred C., 108 W. Church St., Elmira, N.Y., 10 (NEDA)

Harrison Radio Corp., 225 Greenwich St., New York 7, N.Y., 5, 10, 20
Tel: Barclay 7-7777

Harvey Radio Co., Inc., 103 W. 43 St., New York 36, N.Y., 10
Tel: Judson 2-1500

Hess, Arthur F., 62-07 68th Ave., Brooklyn 27, N.Y., 15 (REP)
Tel: Hy 7-7498

Hicks, Wm. M., 42 Third Ave., Mineola, N.Y., 15 (REP)
Tel: Garden City 3-0101

Holtz, Leo, c/o Eugene Carduner, 164 Duane St., New York 13, N.Y., 15 (REP)
Tel: Walker 5-0900

Hudson Radio & Television Corp., 48 W. 48th St., New York 19, N.Y., 10
For details see ad on page 578
Tel: Circle 6-4060

Island Radio Distrib., 412 Fulton Ave., Hempstead, L.I., N.Y., 10 (NEDA)

Instrument Center, 55 Reade St., New York 7, N.Y., 515
Tel: WO 4-1290

Jackson, Robert, Ellicott Sq. Bldg., Buffalo, N.Y., 15 (REP)
Tel: Madison 3306

Jacobs, Jack, 136 Liberty St., New York, N.Y., 15 (REP)
Tel: Wo 4-6193

Jenkins, Victor E., c/o John H. Forshay, 27 Park Pl., New York 7, N.Y., 15 (REP)
Tel: Ba 7-4977

Joseph, Ben, 521 Fifth Ave., New York 17, N.Y., 15 (REP)
Tel: Mu 2-0815

Joseph, Wm., c/o Jules Sussman, 130 Lafayette St., New York 13, N.Y., 15 (REP)
Tel: Wo 2-7766

Kaelber, Julius, 1 Park Ave., Manhasset, N.Y., 15 (REP)
Tel: Ma 7-1459

Kahant Associates, 11 Park Place, New York 7, N.Y., 5, 15
Tel: Cortlandt 7-5326

Kahgan & Co., Jack J., 40 Exchange Pl., New York 5, N.Y., 15
Tel: Bo 9-8350

Kantor, F. I., 4010 Saxon Ave., New York 63, N.Y., 15 (REP)
Tel: Ki 8-5133

Keeneth, John A., c/o Wm. M. Hicks, 42 Third Ave., Mineola, N.Y., 15 (REP)
Tel: Garden City 3-0110



Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

10. Distributional Functions

104. Distribution.

Kleeman, Edward E., c/o Eugene Carduner, 164 Duane St., New York 13, N.Y., 15 (REP)
Tel: Walker 5-0900

Komisar & Son, Inc., David, 16 Hudson St., New York 13, N.Y., 5, 10, 15
Tel: Worth 4-2195

Kopple, John, 60 E. 42nd St., New York 17, N.Y., 15 (REP)
Tel: Mu 2-1118

Lafayette Radio Wire Inc., 100 6th Ave., New York 13, N.Y., 5, 10
Tel: Re 2-8600

Landis, B. C., 81-11 Roosevelt Ave., Jackson Hts., 72, N.Y., 15 (REP)
Tel: Illinois 8-7900

Landes, E., c/o Les Mingins, Jr., 107-37 71st Ave., Forest Hills, N.Y., 15 (REP)
Tel: Bo 3-1643

Leeds Radio Co., 75 Vesey St., New York 7, N.Y., 5, 10, 20, 25
Tel: CO 7-3440

Leonard Radio, Inc., 69 Cortlandt St., New York 7, N.Y., 10 (NEDA)

Le Roy, Gordon C., R.D. 1, Phelps, N.Y., 15 (REP)

Leuchtmann, E., c/o B. C. Landis, 81-11 Roosevelt Ave., Jackson Hts. 72, N.Y., 15 (REP)
Tel: Illinois 8-7900

Levison, Melvin S., 5 Waverly Pl., New York 3, N.Y., 15 (REP)
Tel: OR 4-4464

Lewis, Chas. W., c/o L. D. Allen, 2401 S. State St., Syracuse 5, N.Y., 15 (REP)
Tel: 4-4195

Lichter, Wm., 90 W. Broadway, New York 7, N.Y., 15 (REP)
Tel: RE 2-5228

Mack, Preston W., c/o J. Kaelber, 1 Park Ave., Manhassett, N.Y., 15 (REP)
Tel: Ma 7-1459

Mandel, J. J., c/o S. S. Egert, 11 Park Pl., New York 7, N.Y., 15 (REP)
Tel: WO 4-0996

Marchiano, Thomas A., c/o Lee Rocke, 6 E. 39th St., New York 16, N.Y., 15 (REP)
Tel: LE 2-7372

Markowitz, Jesse, 10 S. Middle Neck Rd., Great Neck, L.I., N.Y., 15 (REP)
Tel: Hunter 2-9320

Marsey, Joseph S., 74 Park Ave., Rochester 7, N.Y., 15 (REP)
Tel: Monroe 6228

Melville Radio Corp., 259 Mamaroneck Ave., White Plains, N.Y., 10 (NEDA)

Melville Radio Corp., 160-13 Northern Blvd., Flushing, N.Y., 10 (NEDA)

Metropolitan TV Supply Corp., 1133 Broadway, New York 10, N.Y., 5, 10, 15, 20, 25
Tel: Chelsea 3-1105

Mica Condenser Corp., 71 Murray St., New York 7, N.Y., 10
Tel: Digby 9-0512

Milgray Electr., Inc., 120 Liberty St., New York 6, N.Y., 10
Tel: RE 2-1297

Milo Radio Electr. Corp., 200 Greenwich St., New York 7, N.Y., 10

Mingins, Les, Jr., 107-37 71st Ave., Forest Hills, N.Y., 15 (REP)
Tel: BO 3-1643

Moch, Gerald M., c/o Wally Shulan, 136 Liberty St., New York 6, N.Y., 15 (REP)

Morse, Irv, 150 Broadway, New York 38, N.Y., 15 (REP)
Tel: CO 7-2913

Multicore Sales Corp., 164 Duane St., New York 13, N.Y., 10
Tel: Walker 5-0900

National Radio Distrib., 1348 Southern Blvd., Bronx 59, N.Y., 10 (NEDA)

National Radio Distrib., 73-20 Northern Blvd., Jackson Heights, L.I., N.Y., 10 (NEDA)

Newhope Corp., 6 East 39th St., New York 16, N.Y., 15
Tel: Lexington 2-7372

Nichols, Paul, 42 Oak Ave., Tuckahoe, N.Y., 15 (REP)
Tel: TU 3-5500

Norman Radio Distrib., Inc., 94-99 Merrick Rd., Jamaica 5, N.Y., 10 (NEDA)

Paul & Stein Bros., Inc., F., 100 Gold St., New York 38, N.Y., 5, 15
Tel: Barclay 7-1731

Pickett, James M., 205 E. 66th St., New York 21, N.Y., 15 (REP)
Tel: TR 9-9520

Pleasanton, A. W., c/o Sydney Wimpie, 215 E. 37th St., New York 16, N.Y., 15 (REP)
Tel: VA 6-3463

Poly-Tech N.Y., 253 E. 32nd St., New York 16, N.Y., 10, 20, 25
Tel: Murray Hill 6-2650

Powell Radio Supply, 142 W. 169th St., New York 52, N.Y., 10 (NEDA)

Radio Kits, Inc., 120 Cedar St., New York 6, N.Y., 5, 10

Radio Res. Instrument Co., 550 Fifth Ave., New York, N.Y., 25

Ray Distrib. Co., 284 Glen St., Glens Falls, N.Y., 10 (NEDA)

Resistor Wholesalers Corp., 71 Murray St., New York 7, N.Y., 10
Tel: Worth 2-7862

Richter, William, 3 Juniper St., Rochester 10, N.Y.
Tel: Culver 7635

Roberts & O'Brien, P.O. Box 1076, Syracuse 2, N.Y., 10 (NEDA)

Robitaille Lou, c/o John M. Forshay, 27 Park Pl., New York 7, N.Y., 15 (REP)
Tel: BA 7-4977

Rockbar Corp., 215 E. 37 St., New York 16, N.Y., 15

Rocke, Lee c/o Newhope Corp., 6 E. 39th St., New York 16, N.Y., 15 (REP)
Tel: LE 2-7372

Rose Electr., Inc., 76 Vesey St., New York 7, N.Y., 10, 20, 25
Tel: CO 7-6195

Ross, Milton, 550 Fifth Ave., New York 19, N.Y., 15 (REP)
Tel: IN 6-0653

Rywelske, Joseph M., c/o John M. Forshay, 27 Park Pl., New York 7, N.Y., 15 (REP)
Tel: BA 7-4977

Saitler, Perry, 53 Park Pl., New York 7, N.Y., 15 (REP)
Tel: RE 2-5334

Sanford Electr. Corp., 157 Chambers St., New York 7, N.Y., 10 (NEDA)

Sargent, Robert E., 42 Oak Ave., Tuckahoe, N.Y., 15 (REP)
Tel: TU 3-5500

Schmitt, F. Edwin, 136 Liberty St., New York 6, N.Y., 15 (REP)
Tel: WO 2-6550

Schweber Electronics, 122 Herricks Rd., Mineola, L.I., N.Y., 10
For details see ad on page 579
Tel: Pioneer 6-6520

Shaw, Samuel A., 92 S. Central Ave., Hartsdale, N.Y., 15 (REP)
Tel: WH 8-5015

Shulan, Wally, 136 Liberty St., New York 6, N.Y., 15 (REP)
Tel: WO 2-0365

Slate & Co., 2755 Webster Ave., New York 58, N.Y., 10 (NEDA)

Smith, Howard F., 259 W. 14th St., New York 11, N.Y., 15 (REP)
Tel: CH 2-2398

(Continued on page 580)



Code number at end of each address refers to product or service sub-classifications listed at the head of the major classification.

(Continued from page 579)

Smith, Inc., Stewart W., 325 E. Water St., Syracuse 2, N.Y., 10 (NEDA)
Sonkin, David, 10 Fiske Pl., Mt. Vernon, N.Y., 15 (REP)
Tel: MO 8-9809
Spellman, Fred, 206 E. 4th St., Brooklyn N.Y., 15 (REP)
Tel: SO 8-0180
Spera Electr. Supply, 37-10 33rd St., Long Island City, N.Y., 5, 10, 25
Tel: ST 6-2199
Sprung, Joseph, 254 W. 31st St., New York 1, N.Y., 15 (REP)
Tel: LO 5-1820
Stallman of Ithaca, Inc., 123 S. Tioga St., Ithaca, N.Y., 10 (NEDA)
Standard Parts Corp., 277 N. Franklin St., Hempstead, N.Y., 10 (NEDA)
Stang, Robert A., 1 Crestwood Lane, New Rochelle, N.Y., 15 (REP)
Tel: Ne 2-1964
Steinberg, Hy, 395 Broadway, New York 13, N.Y., 15 (REP)
Tel: WO 4-7321
Stone, John L., 1445 Teall Ave., Syracuse 6, N.Y., 15 (REP)
Straw, Edward A., c/o Sydney Wimpie, 215 E. 37th St., New York 16, N.Y., 15
Tel: VA 6-3463
Superex Electr. Corp., 23 Atherton St., Yonkers, N.Y., 15
Tel: YO 8-1838
Sussman, Ira, c/o Jules Sussman, 130 Lafayette St., New York 13, N.Y., 15 (REP)
Tel: WO 2-7766
Sussman, Jules, 130 Lafayette St., New York 13, N.Y., 15 (REP)
Tel: WO 2-7766
Swank, Wally B., 2310 Bellevue Ave., Syracuse 4, N.Y., 15 (REP)
Tel: 4-2141
Sylvan-Wellington Co., 269 Canal St., New York 13, N.Y., 10 (NEDA)
Taylor, Benjamin G., 241 Sunrise Blvd., Rockville Centre, L.I., N.Y., 15 (REP)
Tel: RO 6-1014
Taylor Co., E. E., 465 Central Ave., Albany 5, N.Y., 10 (NEDA)
Telemarine Communication Co., 3040 W. 21st St., Brooklyn 24, N.Y., 5, 20, 25
Tel: Esplanade 2-4300
Time Electr. Sales, 268 Broadway, New York 13, N.Y., 5, 10
Tel: BA 7-3922
Tobias, David F., 30 Church St., New York 7, N.Y., 15 (REP)
Tel: CO 7-4350
Trojan Radio Co., Inc., 420 River St., Troy, N.Y., 10 (NEDA)
United Radio & Elec. Co., 47 W. 63rd St., New York 23, N.Y., 10 (NEDA)
Varrelman, Harry E., Box 503, Hicksville, L.I., N.Y., 15 (REP)
Tel: Ind 3-5000
Wadsworth, H. M., 509 Balsam St., Liverpool, N.Y., 15 (REP)
Tel: 69-7043
Weinberg, Harry, 60 E. 42nd St., New York 17, N.Y., 15 (REP)
Tel: MU 7-6667
Weiss, Wm. W., 509 Fifth Ave., New York 17, N.Y., 15 (REP)
Tel: MU 2-8945
Westchester Electr. Supply, 602 Mamaroneck Ave., White Plains, N.Y., 10 (NEDA)
Western International Co., 45 Vesey St., New York 7, N.Y., 10
Tel: DI 9-2277
Wilco Radio Distrib., 383 E. 138th St., Bronx 54, N.Y., 10 (NEDA)
Willgold Elec. Sales Corp., 350 5th Ave., New York, N.Y., 15
Tel: LO 4-2525
Wimpie, Sydney, c/o Rockbar Corp., 215 E. 37th St., New York 16, N.Y., 15 (REP)
Tel: VA 6-3463
Wineblatt, Edward, 10 Fiske Pl., Mt. Vernon, N.Y., 15 (REP)
Tel: MO 4-3216
Wolf, O. C., 15 Centennial Dr., Syracuse, N.Y., 15 (REP)
Tel: Monroe 6228
Wolfe, Michael, 136-52 71st Rd., Flushing, L.I., N.Y., 15 (REP)
Tel: BO 3-1400
Woolf, Alan, c/o Irving W. Woolf, 135 Liberty St., New York 6, N.Y., 15 (REP)
Tel: RE 2-9673
Woolf, Irving W., 135 Liberty St., New York 6, N.Y., 15 (REP)
Tel: RE 2-9673
Zimmerman, Wilson H., 647 Warren St., Syracuse 2, N.Y., 15 (REP)
Tel: 3-6405

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Aikins Electr. Supply, Inc., 428 Bank St., New London, Conn., 10 (NEDA)
Aikins Electr. Supply, Inc., 98 Water St., Norwich, Conn., 10 (NEDA)
Bond Radio Supply, 439 West Main St., Waterbury, Conn., 10 (NEDA)
Brown Co., Thomas H., 15 Whiting St., New Haven 10, Conn., 10 (NEDA)
Cushing, T. F., 349 Worthington St., Springfield 3, Mass., 10 (NEDA)
Hatry of Hartford, Inc., 203 Ann St., Hartford 3, Conn., 10 (NEDA)
Hatry of New Haven, Inc., 77 Broadway, New Haven, Conn., 10 (NEDA)
Hatry of Waterbury, Inc., 89 Cherry St., Waterbury 4, Conn., 10 (NEDA)
Hatry of Stamford, Inc., 97 Main St., Stamford, Conn., 10 (NEDA)
Hatry of Bridgeport, Inc., 1700 Main St., Bridgeport 4, Conn., 10 (NEDA)
Kahn, Irving I., 541 Windsor St., Hartford 1, Conn., 15 (REP)
Tel: 46-7431
Lavin Associates, Henry, P.O. Box 196, Meriden, Conn., 15 (REP)
For details see ad on page 580
Tel: 7-4555
Modern Radio Supply Co., 131 Farmington Ave., Kensington, Conn., 10 (NEDA)
Moses Radio Electr. Co., 54 Flower St. Hartford 5, Conn., 10 (NEDA)
Seyd, Ernest K., Longhill Rd., Andover, Conn., 15 (REP)
Tel: Copley 7-6604
Television Radio, Inc., 274 Farmington Ave., Hartford 5, Conn. 10, 20
Tel: Jackson 5-0877

RHODE ISLAND

Dandreta & Co., Wm., 28 Wolcott St., Providence 8, R.I., 10, 20
Tel: Union 1-2800
De Mambro Radio Supply, Inc., 90 Broadway, Providence, R.I., 10 (NEDA)

MASSACHUSETTS

Akeroyd, Arthur E., John Hancock Bldg., Boston 16, Mass., 15 (REP)
Tel: Hancock 6-2433
Anderson, Robert B., 172 State St., Boston 9, Mass., 15 (REP)
Tel: Capitol 7-2980
Beckman Co., C. E., 11 Commercial St., New Bedford, Mass., 10 (NEDA)
Broger Instr. Sales Co., 739 Boylson St., Boston 16, Mass., 15, 20
Tel: Copley 7-0061
Brown, Kenneth L., 277 Humboldt Ave., Boston 21, Mass.
Tel: Highlands 5-7984
Chamberlin, Harold A., 31 Milk St., Boston 9, Mass., 15 (REP)
Tel: Hubbard 27022
Coakley, Tim, 148 Needham St., Newton Highlands, Boston 61, Mass., 15 (REP)
Tel: Decatur 2-4800
Cramer Electronics, Inc., 811 Boylston St., Boston 16, Mass., 10 (NEDA)

Dean & Co., David B., 85 Cohannet St., Taunton, Mass., 10 (NEDA)
De Mambro Radio Supply Co., 1095 Commonwealth, Boston 15, Mass., 10 (NEDA)
De Mambro Radio Supply, Inc., 222 Summer St., Worcester, Mass., 10 (NEDA)
Electrical Supply Corp., 1739 Massachusetts, Cambridge 40, Mass., 10 (NEDA)
Gerber Radio Supply Co., 1900 Columbus Ave., Boston 19, Mass., 10 (NEDA)
Gerber, Harry, 739 Boylston St., Boston 16, Mass., 15 (REP)
Tel: Copley 7-0061
Gibson, W. S., 1018 Commonwealth, Boston 15, Mass., 15 (REP)
Tel: Aspinwall 7-5074
Goss, Jack, 1430 Massachusetts, Cambridge 38, Mass., 15 (REP)
Tel: Eliot 4-5573
Greene, Dan, 11 Fernald Dr., Cambridge, Mass., 15 (REP)
Tel: University 4-2200
Hannigan, Walter T., 43 Leon St., Boston 15, Mass., 15 (REP)
Tel: Garrison 7-2650
Harris, Stanley A., 318 Harvard St., Brookline 56, Mass., 15 (REP)
Tel: Longwood 6-6400

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METHODE MFG. CORP.
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PREMIER METAL ETCHING CO.
Dials • Panels
U. S. COMPONENTS, INC.
Connectors • Plugs
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KENMORE 6-1394 6-5785
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Hathaway, Glenn M., 238 Main St., Cambridge, Mass., 15 (REP)
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Hendrickson, Wm. A., 291 1st Parish Rd., Scituate, Mass., 15
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Hooker, Samuel C., 397 Highland Ave., Winchester, Mass., 15 (REP)
Tel: Winchester 6-2745
Hustis, Walter C., 1105 Commonwealth Ave., Boston 15, Mass., 15 (REP)
Tel: Algonquin 4-8100
Mac Innis, Norman R., 1430 Massachusetts, Cambridge 38, Mass., 15 (REP)
Tel: Eliot 4-5573
Mayer, Co., A. W., 895 Boylston St., Boston 15, Mass., 10 (NEDA)
Melrose Sales Co., 407 Franklin St., Melrose 77, Mass., 10 (NEDA)
Mosher, Robert D., 1116 Great Plain Ave., Needham, Mass., 15 (REP)
Tel: Needham 3-3773
Park Armature Co., 882 Boylston St., Boston 16, Mass., 20
Tel: KE 6-2554
Pittsfield Radio Co., 41 West St., Pittsfield, Mass., 10 (NEDA)

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For details see ad on page 581
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Pray, W. B., 18 Brewster Rd., Wellesley Hills, Mass., 15 (REP)
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Radio Maintenance Supply Co., 80 Thomas St., Worcester 8, Mass., 10 (NEDA)
Reynolds, Harrison, 313 Washington St., Newton 58, Mass., 15 (REP)
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Schaal, Albert A., Jr., 4 Waltham St., Lexington 73, Mass., 15 (REP)
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Scott, Michael, 90 Edmunds Rd., Wellesley Hills 82, Mass., 15 (REP)
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Springfield Radio Co., Inc., 405 Dwight St., Springfield 3, Mass., 10 (NEDA)
Stevens, K. C., Box N, Lincoln, Mass., 15 (REP)
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Sturgeon, Paul R., 25 Huntington Ave., Boston 16, Mass., 15 (REP)
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Ware Radio Supply Co., 913 Centre St., Brockton 11, Mass., 10 (NEDA)
Waters, Robert A., 4 Gordon St., Waltham, Mass., 15 (REP)
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White, P. H., 1116 Great Plain Ave., Needham, Mass., 15 (REP)
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Young & Young of Lawrence, 262 Lowell St., Lawrence, Mass., 10 (NEDA)
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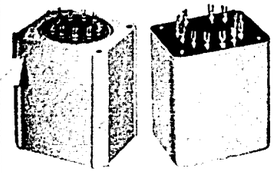
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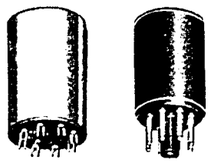
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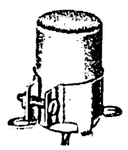
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Ouncer Plug-In



Magnetic Amplifiers

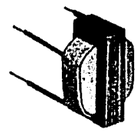


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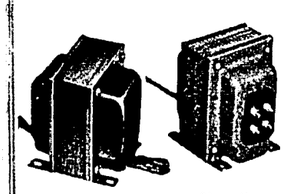
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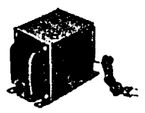
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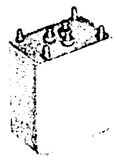
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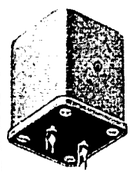


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Equalizers

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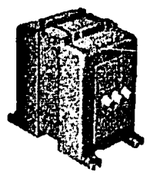


Non-Hermetic



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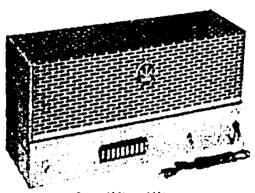


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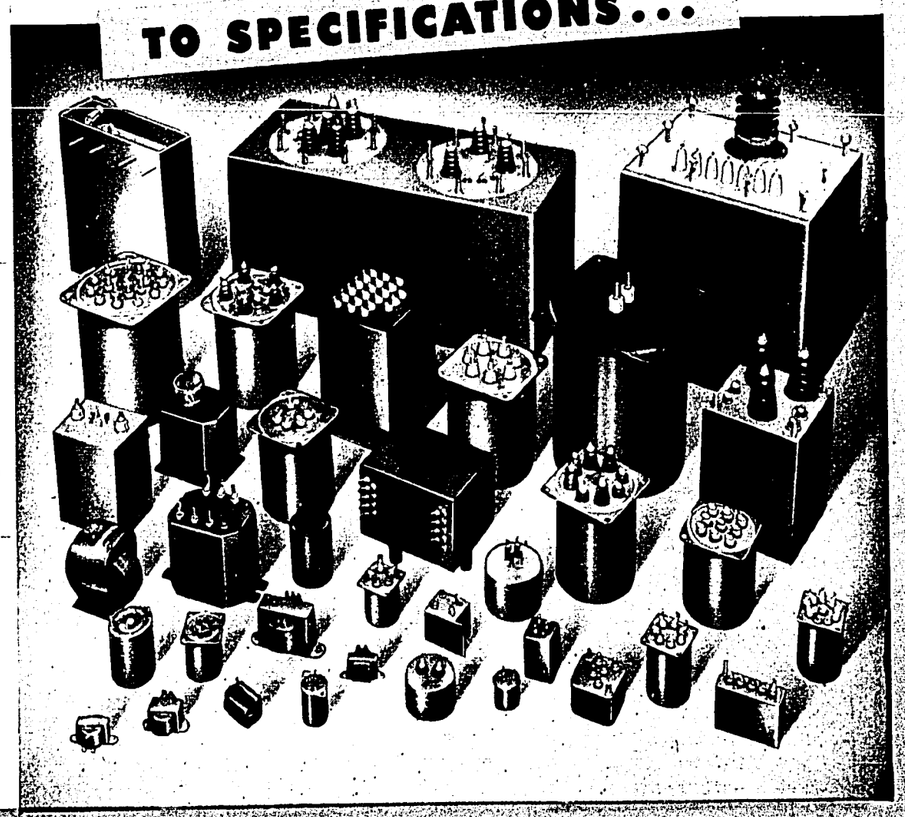


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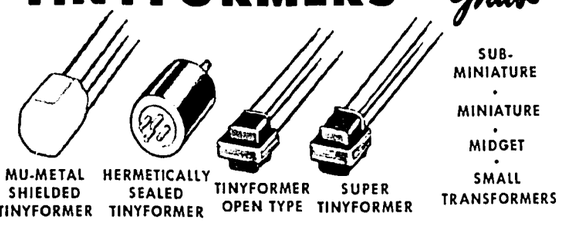
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Stewart Stamping Co.	499
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Stupakoff Ceramic & Mfg. Co.	4-5, 225, 351, 367, 486, 499, 517, 537, 541, 550
Sun Dial Corp.	515
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Superior Steatite & Ceramic Corp.	521
Superior Tube Co.	88-89
Surprenant Mfg. Co.	485
Switchcraft, Inc.	247
Sylvania Electric Products Inc.	9-14
Syncor Products Co.	499
Technical Representation	575
Technology Instrument Corp.	75-79
Telechrome, Inc.	224
Tel-Instrument Co., Inc.	474
Tel-Rad Mfg. Co., Inc.	294
Telrex, Inc.	489
Tempel Mfg. Co.	490
Tenney Engineering, Inc.	442
Tensolite Insulated Wire Co., Inc.	483
Terado Co.	358
Tetrad Co., Inc.	251
Texas Instruments, Inc.	226
Thomas & Skinner Steel Products Co.	325
Thompson Products, Inc.	235
Thor Ceramics, Inc.	487
Times Facsimile Corp.	550
Torngren Co., Inc., C. W.	425
Torwico Electronics, Inc.	295
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Transformer Specialty Co.	391
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Winchester Electronics, Inc.	73
Wind Turbine Co.	256
Yale & Towne Mfg. Co., Powdered Metal Div.	309
Young and Young of Springfield, Inc.	581
Zophar Mills, Inc.	527

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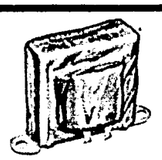
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MICROPHONE • CHOKES



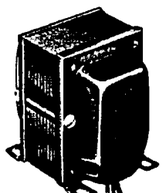
Filter Reactor MIL-T-27 GRD-1 CL-C



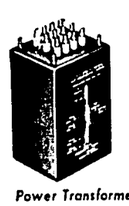
Fosterite Sealed Choke MIL-T-27 GRD-1 CL-B



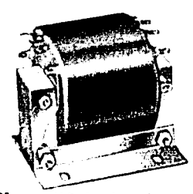
High Fidelity Output Transformer MIL-T-27 GRD-1 CL-A



Power Transformer Fully Enclosed



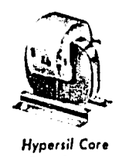
Power Transformer 400 Cycle MIL-T-27 GRD-1 CL-A



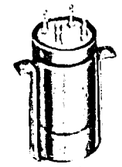
H.D. Laminated Power Transformer



Audio Transformer MIL-T-27 GRD-1 CL-A

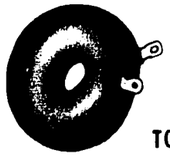


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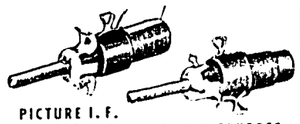
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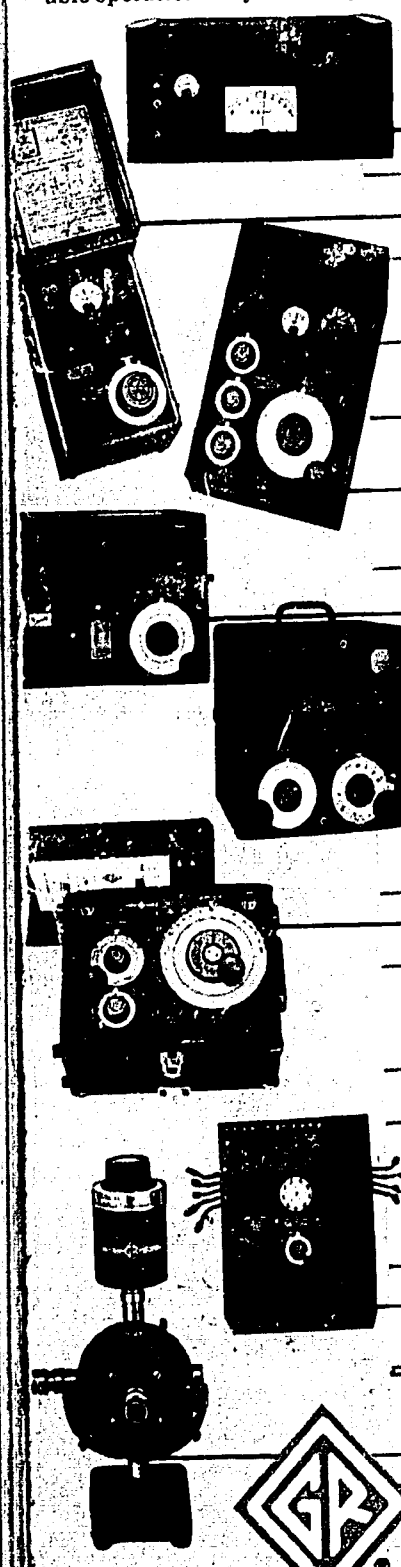
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1652-A Resistance Limit Bridge $425	dc	**R:** 1 to 1,111,111Ω	0.5% as limit bridge 0.25% by null method	Useful in production testing or laboratory
544-BA Megohm Bridge (with a-c power supply) $340	dc	**R:** 0.1 to 1,000,000 MΩ	±3% to 1000 MΩ ±4% to 100,000 MΩ	Measures high resistance — insulation, volume resistivity, etc.
740-B Capacitance Test Bridge $250	60 c	**C:** 5 μμf to 1100 μμf **D:** 0 to 50%	±1% ±1.5% of full scale	Production-test tool — measures ungrounded capacitors
1611-A Capacitance Test Bridge $475	60 c	**C:** 0 to 11,000 μf **D:** 0 to 60%	±1% ±2%	Testing insulators, bushings, cables, grounded capacitors.
650-A Impedance Bridge $260	dc 1. kc 1 kc 1 kc 1 kc	**R:** 0.001Ω to 1 MΩ **L:** 1μh to 100 h **C:** 1 μμf to 100 μf **D:** 0.002 to 1 **Q:** 0.02 to 1000	±1% ±2% ±1% ±20% ±20%	Completely self-contained, general-purpose laboratory and production bridge
716-CM Capacitance Bridge $570	1 kc 0.1, 10, 100 kc 0.1, 1, 10, 100 kc 0 1, 1, 10, 100 kc	**C:** 100 μμf to 1 μf **C:** 100 μμf to 1000 μμf **C:** 0.1 μμf to 1000 μμf **D:** 0.00002 to 0.56	±0.2% of full scale ±0.2% of full scale ±0.2% (substitution) ±2%	For capacitance standardization, precision measurements, dielectrics tests and studies
667-A Inductance Bridge $450	60 c to 10 kc	**L:** 0.1 μh to 1 h	±0.2%	Variety inductance measurements
1604-B Comparison Bridge $390	400 c, 1 kc, 5 kc	**Z:** 2Ω to 20MΩ	±0.1%	Rapid components testing, and sorting
916-AL Radio Frequency Bridge $535	50 kc to 5 Mc	**X:** ±11,000Ω at 100 kc **R:** 0 to 1000Ω	±2% (X-range varies ±1% inversely as frequency)	Measures impedances of antennas, transmission lines, etc. at r-f
916-A Radio Frequency Bridge $495	400 kc to 60 Mc	**X:** ±5,000Ω at 1 Mc **R:** 0 to 1000Ω	±2% ±1%	Similar to Type 916-AL but designed for higher frequencies
821-A Twin-T Bridge $570	460 kc to 40 Mc	**C:** 0 to 1000 μμf **G:** 0 to 100 μmhos at 1 Mc **B:** ±6000 μmhos at 1 Mc	±0.2% (G & B range ±2% vary directly as frequency)	Measures high impedances; parallel components, chokes, resonant impedance, solution conductivity, etc.
1612-A R-F Capacitance Meter $220	1 Mc	**C:** 0 to 1200 μμf	±4%	Rapid, accurate capacitance testing
1612-AL R-F Capacitance Meter $220	1 Mc	**C:** 0 to 100 μμf	±4%	Similar to 1612-A—adaptors available for measuring tube-socket capacitance
1601-A V-H-F Bridge $440	10 to 165 Mc	**X:** ±200Ω at 100 Mc **R:** 0 to 200Ω	±5% (X-range varies ±2% inversely as frequency)	For measurements on either lumped or coaxial circuits
561-D Vacuum Tube Bridge (also measures transistor low-frequency parameters) $750	1 kc	μ 0.001 to 10,000 **rp:** 50Ω to 20MΩ **gm:** 0.02 to 50,000 μmho	±2% ±2% ±2%	Adaptors furnished with instrument for measuring characteristics of receiving tubes and transistors
Slotted Line and Admittance Meter for Measurements to 5000 Mc				
1602-B U-H-F Admittance Meter $295	20 to 1500 Mc	**B:** ±0.2 to ±1000 mmho. **G:** 0.2 to 1000 mmho	±3% ±3%	For measurement of coaxial lines, antennas, networks, and components
874-LB Slotted Line $220	300 to 5000 Mc	VSWR, impedance, power	±2½% or better	Determines characteristics of standing waves in all 50-ohm systems

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