1951

IRE DIRECTORY

A YEARBOOK CONTAINING

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

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Bown, Ralph	1926–29; 1937–39	1927	1926	
Brown, J. E.	1938; 1947			
*Bullard, W. H. G.	1916; 1920–21			
Cady, W. G.	1928–29; 1932–34	1932		Editor, 1929
Caldwell, O. H.	1932–35			
Carter, E. F.	1943–45			
Chaffee, E. L.	1922		1922	
Chamberlain, A. B.	1941–44			
Chambers, C. C.	1942			
Clark, T. H.	1950			
Clayton, J. M.	1928–29			Secretary, 1928–29
Clement, L. M.	1945			
Coggeshall, I. S.	1941–44; 1951	1951		
Coleman, J. B.	1948–49			
*Colpitts, E. H.	1921–23			
*Conrad, Frank	1927		1927	
Cosentino, A. T.	1941		1941	
Craven, T. A. M.	1937			
Crosby, M. G.	1947–49			
Cullum, A. E., Jr.	1948			
Cunningham, F. W.	1938–40			
Cutting, R. F.	1920–24	1922	1921	
Dart, H. F.	1951			
*Davis, G. S.	1915; 1917–19			
de Forest, Lee	1930–32	1930		
Dellinger, J. H.	1924–31	1925	1924	
Deloraine, E. M.	1946		1946	
Doherty, W. H.	1951			
Eastham, Melville	1922–41			Treasurer, 1927–40
Eastman, A. V.	1950–51			
Eckersley, P. P.	1937		1937	
Edwards, C. P.	1931		1931	
Engstrom, E. W.	1949			
Espenschied, Lloyd	1912–13; 1915–26; 1931			
Everitt, W. L.	1942–47; 1949–51	1945		
Fay, Frank	1912			
Fink, D. G.	1949–51			

* Deceased.

Name	Member, Board of Directors	President	Vice-President	Other Offices Held
Fisk, E. T.	1938		1938	Treasurer, 1912
Forbes, E. D.	1912			
Forbes, H. C.	1940			
Friis, H. T.	1941–43			
Fuller, L. F.	1928			
Goldsmith, Alfred N.	1912–51	1928		Secretary, 1918–27 Editor, 1912–28; 1930–51
Graham, Virgil M.	1935–41; 1946–48			
*Grebe, A. H.	1924–26; 1928			
Gustafson, G. E.	1943			Treasurer, 1947
Guy, R. F.	1944–48; 1950–51	1950		
Hackbusch, R. A.	1938; 1944–46		1944	
Hamburger, F., Jr.	1950–51			Treasurer, 1913–14
Hammond, J. H., Jr.	1912; 1913–17			
Hanson, O. B.	1938–43			
Hazeltine, Alan	1923–28; 1936–39	1936		
Heising, R. A.	1927–31; 1933–35; 1939–41; 1943–45; 1947–49	1939		Treasurer, 1943–45
Henney, Keith	1945–48			
Hewlett, W. R.	1950–51			
*Hill, Guy	1914–16; 1918–20			
Hogan, J. V. L.	1912–36; 1948–50	1920	1916–19	
Hoover, P. L.	1951			
Horle, L. C. F.	1934; 1936–42; 1944–46	1940		
Horn, C. W.	1933–34			
Houck, H. W.	1931–32			
Howes, F. S.	1948			
*Hubley, Warren	1915–27			Treasurer, 1915–16; 1918–27
Hull, L. M.	1929–35	1933		
Hunter, T. A.	1948–50			
Hutcheson, J. A.	1948			
Jansky, C. M., Jr.	1929–42	1934		
Jett, E. K.	1938			
Johnson, J. K.	1942			
Jolliffe, C. B.	1936–37; 1944			
Kaar, I. J.	1939; 1948			
*Kennelly, A. E.	1916–18	1916		
Kolster, F. A.	1933–35			
Kranz, H. E.	1949–50			
Krumm, L. R.	1917; 1921			Treasurer, 1917
Lack, F. R.	1940; 1946–47			
Langmuir, Irving	1923–25	1923		
Lee, A. G.	1930		1930	
Lewis, G. H.	1918–19; 1923–26; 1935			
Llewellyn, F. B.	1939–48	1946		
*Lowenstein, Fritz	1912		1912	
Manson, R. H.	1927–33	1931		
Marriott, R. H.	1912–16; 1920–22; 1926–32	1912	1913	
McDonald, A. S.	1949		1949	
McNicol, Donald	1919–28	1926	1925	
McRae, J. W.	1949–51			
Meissner, Alexander	1929		1929	
*Morecroft, J. H.	1922–26	1924	1923	

* Deceased.

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Nelson, E. L.	1932–36			
Nichols, H. W.	1924–25			
Oxley, A. B.	1951			
*Pederson, P. O.	1939		1939	
Pickard, G. W.	1912–15	1913		
Pierce, G. W.	1915; 1918–21	1918–19	1915	
Piore, E. R.	1951			
Poppele, J. R.	1947			
*Poulsen, Valdemar	1936		1936	
*Pounsett, F. H. R.	1949–50			
Pratt, Haraden	1935–51	1938		Treasurer, 1941–42 Secretary, 1943–51
*Pupin, M. I.	1917–19	1917		
Reich, H. J.	1944; 1948–51			
Reid, J. D.	1950–51			
Reoch, A. E.	1924–27			
Royden, G. T.	1946			
Rush, W. A.	1942		1942	
Rust, W. M.	1951			
Rybner, Jorgen	1951		1951	
Sarnoff, David	1915–20			Secretary, 1915–17
Shackelford, B. E.	1945–50	1948		
Shepherd, J. E.	1948–50			
Shute, E. R.	1933–34			
Simon, E. J.	1912–15			Secretary, 1912–14
Sinclair, D. B.	1945–51			Treasurer, 1949–50
Smith, D. B.	1947			
Smith-Rose, R. L.	1948		1948	
*Squier, G. O.	1918–22			
*Stone, J. S.	1912–19	1915	1914	
Stratton, J. A.	1948–51			
Swinyard, W. O.	1945–46			
Taylor, A. H.	1929–31	1929		
Terman, F. E.	1940–43; 1948–49	1941	1940	
*Thompson, B. J.	1937–44			
Town, G. R.	1949; 1951			
Turner, H. M.	1933–46	1944		
*van der Bijl, H. J.	1945		1945	
van der Pol, Balth.	1934		1934	
Van Dyck, A. F.	1930–35;1939–44	1942		
Watson-Watt, R. A.	1950		1950	
*Weagant, R. A.	1913–17			
Webb, W. L.	1946			
Webster, E. M.	1946			
Westman, H. P.	1930–42			Secretary, 1930–42
Wheeler, H. A.	1934; 1940–45			
Wheeler, L. P.	1940–45	1943		
White, W. C.	1943–47			Treasurer, 1946
Whittemore, L. E.	1926–29; 1935–37		1928	
*Wilson, William	1932–36			
Zahl, H. A.	1949			
Zenneck, Jonathan	1933		1933	

* Deceased.

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3.1 Definitions of Audio Systems and Components Excluding Recording

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3.2 Methods of Measurement of Audio Systems and Components Excluding Recording

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3.5 Revision of ASA C16.5-1942

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R. W. Grantham — B. J. Rothlein

7.7.1 Task Group on Crystal Rectifiers

J. A. Morton, *Chairman*

7.8 Phototubes

A. M. Glover, *Chairman*

8. ELECTRONIC COMPUTERS

Nathaniel Rochester, *Chairman*
Robert Serrell, *Vice-Chairman*

D. R. Brown — J. A. Rajchman
R. D. Elbourn — C. V. L. Smith
J. W. Forrester — R. L. Snyder, Jr.
E. L. Harder — W. H. Ware
John Howard — C. R. Wayne
E. Lakatos — J. R. Weiner
G. W. Patterson — C. F. West
Way Dong Woo

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8.1 Definitions

W. H. Ware, *Chairman*

C. H. Doersam, Jr. — H. R. Grosch
R. D. Elbourn — F. J. Murray
N. Rochester
Robert Serrell

8.2 Analog Computers

E. L. Harder, *Chairman*

J. S. Calvert — A. C. Hall
Sidney Goedet — E. Lakatos
G. D. McCann

8.3 Storage Devices

J. Rajchman, *Chairman*

9. FACSIMILE

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Henry Burkhard, *Vice-Chairman*

A. G. Cooley — John V. Hogan
I. H. Franzel — Pierre Mertz
J. H. Hackenberg — C. J. Young

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Eugene Mittelmann, *Vice-Chairman*

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J. M. Cage — E. H. Schulz
E. W. Chapin — C. F. Spitzer
J. E. Eiselein — W. R. Thurston
G. W. Klingaman — R. S. Tucker
H. R. Meahl — M. P. Vore
H. W. Parker — Julius Weinberger
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10.1 Definitions for Induction and Dielectric Heating

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Eugene Mittelmann — Walther Richter

10.2 Dielectric Measurements

John Dalke, *Acting Chairman*

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10.4 Methods of Measurement

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11. MODULATION SYSTEMS

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Harry Davis — K. A. Norton
R. E. Gray — Winslow Palmer
L. M. Sherer

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12.1 Definitions

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Warren Burgess — K. A. Norton

12.2 Standard DF Measurements

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W. A. Edson — P. L. Smith
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15. RADIO TRANSMITTERS

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T. J. Boerner — L. A. Looney
H. R. Butler — J. F. McDonald
L. K. Findley — John Ruston
Harold Goldberg — Berthold Sheffield
J. B. Heffelfinger — I. R. Weir

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15.1 FM Transmitters

John Ruston, *Chairman*

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J. B. Knox — H. P. Thomas

15.2 Radio Telegraph Transmitters up to 50 MC

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J. L. Finch — Berthold Sheffield
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15.3 Double Sideband Transmitters

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15.4 Pulse-Modulated Transmitters

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Ross Bateman — W. E. Newlon
L. L. Bonham — W. K. Roberts
Joseph Kaufman — W. G. Tuller
H. Kohler — R. M. Whitehorn

15.5 Single-Sideband Radio Communication Transmitters

A. E. Kerwien, *Chairman*

Leonard Kahn — N. J. Oman
E. A. Laport — R. L. Robbins
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16. MOBILE COMMUNICATIONS

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16.2 Systems

E. H. B. Bartelink, *Chairman*

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17.5 Annual Review Material

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17.6 Definitions Revision

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17.7 Survey of Other Fields

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19.1.1 Task Force for Definitions of Magnetic Recording in Computer Work

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19.2.1 Task Group on Symbols

Harry Schecter

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Charles Townsend

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V. J. Duke — B. F. Tyson
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Scott Helt — J. F. Wiggin

23.2 Utilization, Including Video Recording: Methods of Measurement

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V. J. Duke — Leonard Mautner
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L. D. Grignon — J. H. Roe
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23.3 Video Systems and Components: Methods of Measurement

A. J. Baracket, *Chairman*

I. C. Abrahams — R. W. Clark

(23.3 Continued)

R. DeBaun — J. R. Hefele
G. L. Fredendall — J. F. Wiggin

23.4 Video Signal Transmission: Methods of Measurement

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S. Brand — L. W. Morrison
Rodney Chipp — Keith Mullemger
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W. S. Duttera — Newbern Smith
E. G. Fubini — R. L. Smith-Rose
I. H. Gerks — A. W. Straiton
M. C. Gray — A. H. Waynick
D. E. Kerr — J. W. Wright

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24.1 Standards and Practices

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24.2 Theory and Application of Tropospheric Propagation

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Marion C. Gray — R. P. Wakeman

24.3 Theory and Application of Ionospheric Propagation

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C. W. McLeish — Newbern Smith
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24.4 Definitions and Publications

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A. B. Crawford — E. G. Fubini
J. E. Eaton — Martin Katzin
D. E. Kerr

24.5 Annual Review

H. W. Wells, *Chairman*

24.6 Radio Astronomy

C. R. Burrows, *Chairman*

A. E. Covington — J. Hagen
Grote Reber

25. MEASUREMENTS AND INSTRUMENTATION

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P. S. Christaldi, *Vice-Chairman*

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C. C. Chambers — C. D. Owens
John Dalke — A. P. G. Peterson
G. L. Fredendall — J. G. Reid, Jr.
W. D. George — J. R. Steen
E. I. Green — R. S. Tucker
Ernst Weber

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25.1 Basic Standards and Calibration Methods

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F. J. Gaffney

25.2 Dielectric Measurements

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C. A. Bieling — Fred A. Muller

25.3 Magnetic Measurements

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25.4 Audio-Frequency Measurements

A. P. G. Peterson, *Chairman*

25.5 Video-Frequency Measurements

G. L. Fredendall, *Chairman*

25.6 High-Frequency Measurements

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I. G. Easton — E. W. Houghton
F. J. Gaffney — H. E. Webber

25.7 Noise Measurements

R. S. Tucker

25.8 Interference Measurements

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25.9 Measurements of Radio Activity

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25.11 Statistical Quality Control

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25.12 Basic Techniques of Instrumentation

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25.13 Telemetering

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W. Hausz — G. F. C. Weedon
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M. V. Kievert — G. E. White
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25.14 Electronic Components

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*Arkansas, University of: Ross E. Lanier
*British Columbia, University of: L. R. Kersey
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*Brooklyn, Polytechnic Institute of, (Evening Division): A. B. Giordano
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*Carnegie Institute of Technology: E. M. Williams
*Case Institute of Technology: J. D. Johannesen
Cincinnati, University of: A. B. Bereskin
*Clarkson College of Technology: F. A. Record
*Colorado, University of: H. W. Boehmer
*Columbia University: J. R. Ragazzini
*Connecticut, University of: C. W. Schultz
*Cooper Union: J. B. Sherman
*Cornell University: True McLean
Dartmouth College: M. G. Morgan
*Dayton, University of: Appointment later
*Delaware, University of: H. S. Bueche
*Denver, University of: Herbert Reno
*Detroit, University of: Thomas Yamauchi
*Drexel Institute of Technology: R. T. Zern
Duke University: W. J. Seeley
Evansville College: J. F. Sears
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Santa Clara, University of: W. J. Warren
*Seattle University: Appointment later
*South Carolina, University L. R. Wever
*South Dakota School of Mines and Technology: Appointment later
*Southern California, University of: G. W. Reynolds
*Southern Methodist University: E. J. O'Brien
*Stanford University: J. M. Pettit
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*Toronto, University of: George Sinclair
*Tufts College: A. H. Howell
*Tulane University: James A. Cronvich
Union College (Nebr.): M. D. Hare
Union College (N.Y.): R. B. Russ
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National Electronics Conference Board of Directors: John D. Reid, Jr.
National Research Council, Division of Engineering and Research: F. B. Llewellyn
International Scientific Radio Union (URSI) Executive Committee: S. L. Bailey
U. S. National Committee, Advisers on Electrical Measuring Instruments: Melville Eastham
U. S. National Committee, Advisers on Symbols: L. E. Whittemore, J. W. Horton
U. S. National Committee of the International Electrotechnical Commission: L. G. Cumming, E. A. LaPort, F. B. Llewellyn

THE INSTITUTE

GENERAL

THOUSANDS of persons are today engaged in furthering, through research and engineering, the art of radio and the many fields ancillary thereto. And yet, of the important technical developments of mankind, few have as good a case as does radio in attributing its origin to a single individual. It is true that Clerk Maxwell, in the middle of the nineteenth century, drew upon the experiences of Faraday and Oersted; but the conception of electromagnetic waves was distinctly new and was due solely to that first director of the now celebrated Cavendish Laboratory. It remained for Heinrich Hertz, in his laboratory at Karlsruhe, to demonstrate experimentally for the first time the transmission and reception of electromagnetic waves generated by an oscillating circuit.

Alert to the significance of this phenomenon, Marconi, Poulsen, Alexanderson, Fessenden, and other engineers at home and abroad developed equipment by which messages in code could be transmitted without wires and over long distances. With the advent of the vacuum tube in the early years of the first World War; wireless telegraphy gave way to wireless telephony and, later, to radio broadcasting. Today radio in all its ramifications stands as a superb tribute to the combined developmental genius of many thousands of engineers skilled in electricity, acoustics, and electronics.

In May, 1912, which was about midway in the period between the Hertz experiments and the present, a small group of far-seeing engineers recognized in wireless of that day an infant industry which, through scientific research and engineering development, could be brought to magnificent fruition for the benefit of mankind. Here, as never before, was a means of communication which knew no national boundaries. The growth and success of radio development were than clearly seen to rest not alone upon international co-operation, but also upon collaboration in allied fields of science and engineering. It was against this background that A. N. Goldsmith, J. V. L. Hogan, and R. H. Marriott founded,

through the merger of two small professional societies, The Institute of Radio Engineers. Starting with fewer than fifty members in 1912, the Institute today embraces some 29,000 members from every corner of the earth.

Let us now turn to the present Institute and consider its organization, management, publications, and aspirations.

The Institute of Radio Engineers is an incorporated, nonprofit organization having as its object the advancement of the theory and practice of radio and electronics, including allied branches of engineering and all related arts and sciences. To this end, the Institute prepares technical papers, reports, and general information of interest to radio engineers. It holds meetings and discussions in numerous localities throughout the United States and Canada. It maintains committees engaged in collating and standardizing the results of technical research and development. Typical 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, and medical electrical research and applications.

Membership in the Institute is distributed among various grades representative of 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 similarly is 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 Constitution.

In the interest of promoting the arts and techniques incident to radio development, the Institute has established some 22 technical committees covering fields of current activity in radio engineering and composed of persons of demonstrated ability in their respective fields. Through the Institute, these committees publish standards whose object in general is to set forth, partly in collaboration with technical committees of other engineering societies, accepted definitions of terms, and methods of measurements of physical quantities used in radio engineering practices.

To afford opportunity for personal contact and oral discussions, the Institute holds, at least once a year, a technical meeting for its entire membership. At this annual meeting, it is customary to invite manufacturers to 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. To facilitate interim meetings, Sections have been established throughout the United States, Canada, Territory of Hawaii, and Argentina, functioning under the aegis of the Institute. Section meetings afford opportunity for members to make acquaintances locally and to present and discuss matters of common interest.

In order that members might be well served in their particular 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, and may publish technical material for distribution to their memberships. In addition, the Groups provide a means for ensuring proper coverage of their fields in the publications of the Institute and for promoting recognition of their leaders among the Institute membership at large.

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 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. The President and Vice-President are elected annually from the body of Fellows and Senior Members.

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. In 1913, the year following the founding of the Institute, appeared the first issue of the Proceedings of the Institute of Radio Engineers. Established first as a quarterly and later a bimonthly, the Proceedings for the last 24 years has been published in twelve numbers annually. In 1939, the name of this technical organ of the Institute was shortened to Proceedings of the I. R. E., and the format was changed to the style now in use.

The Proceedings of the I.R.E. is the official publication of The Institute of Radio Engineers, and in it are published technical papers, discussions, and communications which have been submitted to it and approved by the Papers Review Committee, Board of Editors, and Administrative Committee of the Board of Editors of the Institute, and IRE Standards prepared by Institute technical committees. Over 3,800 papers have been published in the Proceedings dealing with advanced research topics, mathematico-physical analyses of engineering problems, current engineering developments of equipment and methods, 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 organizational and membership news, book reviews, announcements of new products, and abstracts of papers published in technical publications the world over. Of

late years an increasing volume of nontechnical material in its pages has proved of interest to members. The PROCEEDINGS OF THE I.R.E. is mailed without charge to all members; subscription price to nonmembers is $18.00 per year, $19.00 if sent to foreign destinations.

STANDARDS

Standardization reports have been issued since 1913. The early reports were confined to the definition of technical terms and presentation of standard graphical symbols. The more recent reports have gone considerably beyond this scope and include methods of testing certain items of equipment and measuring quantities associated with the radio art, and letter symbols and mathematical notation. Starting in 1949, IRE Standards have been published in the PROCEEDINGS, rather than as separate reports, in order that they might be available to all members at no extra charge. They are also available in reprint form. The following IRE Standards reports and reprints are available:

ELECTROACOUSTICS:

Standards on Electroacoustics, 1938. Definitions of Terms, Letter and Graphical Symbols, Methods of Testing Loud Speakers.
Standards on Electroacoustics: Definitions of Terms, 1951.

MEMBERSHIP REQUIREMENTS AND DUES

GRADE	AGE	EXPERIENCE*	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.	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," 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."	Four Fellows, Senior Members, Members, or other responsible individuals.	3.00	15.00
ASSOCIATE	18	Interest in radio engineering or allied field.	Three Fellows, Senior Members, Members, Associates, or other responsible individuals.	3.00	15.00 and 10.00[1]
STUDENT[2]	—	College student pursuing regular 4-year engineering or science course leading to degree.	College Faculty Member.	—	5.00

* For more detailed information, see Bylaws, Sec. 1-5, p. 29.

[1] $10.00 for each year that is within the first five years of Associate membership, starting January 1, 1948. After five years the dues shall automatically be increased from $10.00 to $15.00. The five years are retroactive from January 1, 1948, and are based on either consecutive or intermittent membership.

[2] A special application blank is required for this grade. Upon the expiration of student status no entrance fee is required if immediate transfer is made to Associate grade.

ELECTRON TUBES:

Definition of Terms, 1950.
Methods of Testing, 1950.

ELECTRONIC COMPUTERS:

Standards on Electronic Computers: Definitions of Terms, 1950.

TRANSMITTERS AND ANTENNAS:

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

PULSES:

Standard Definitions of Pulse Terms, Part I, 1951.

RADIO RECEIVERS:

Definitions of Terms, 1938. A reprint (1942) of the like-named section of "Standards on Radio Receivers, 1938."
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.
Standards on Radio Receivers, 1951.

RADIO WAVE PROPAGATION:

Measuring Methods, 1942. Methods of Measuring Radio Field Intensity, Measuring Power Radiated from an Antenna, Measuring Noise Field Intensity.
Definitions of Terms Relating to Guided Waves, 1945.
Definitions of Terms, 1950.

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.

FACSIMILE:

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

PIEZOELECTRIC CRYSTALS:

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

SYMBOLS:

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

RADIO AIDS TO NAVIGATION:

Definitions of Terms, 1949.

RAILROAD AND VEHICULAR COMMUNICATIONS:

Methods of Testing, 1949.

The Institute of Radio Engineers sponsored the publication of two standards of the American Standards Association, as follows:

AMERICAN STANDARDS:

Loudspeaker Testing. (ASA C16.4–1942.)
Volume Measurements of Electrical Speech and Program Waves. (ASA C16.5–1942.)

YEARBOOKS AND DIRECTORIES

YEARBOOKS have been issued at various intervals. The first was published in 1914, the second in 1916 and the next seven were published 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."

AWARDS

The Institute annually bestows six awards in recognition of outstanding achievements in the theory, practice, or applications in the field of radio communication.

MEDAL OF HONOR

The Institute Medal of Honor is awarded in recognition of distinguished service rendered through substantial and important advancement in the science and art of radio communication. The recipient of this Medal is named by the Board of Directors upon recommendation by the Awards Committee.

RECIPIENTS OF THE MEDAL OF HONOR

E. H. Armstrong	1917	Balth. van der Pol	1935
E. F. W. Alexanderson	1919	G. A. Campbell	1936
Guglielmo Marconi	1920	Melville Eastham	1937
R. A. Fessenden	1921	J. H. Dellinger	1938
Lee de Forest	1922	A. G. Lee	1939
John Stone Stone	1923	Lloyd Espenschied	1940
M. I. Pupin	1924	A. N. Goldsmith	1941
G. W. Pickard	1926	A. H. Taylor	1942
L. W. Austin	1927	William Wilson	1943
Jonathan Zenneck	1928	Haraden Pratt	1944
G. W. Pierce	1929	H. H. Beverage	1945
P. O. Pedersen	1930	R. V. L. Hartley	1946
G. A. Ferrié	1931	L. C. F. Horle	1948
A. E. Kennelly	1932	Ralph Bown	1949
J. A. Fleming	1933	F. E. Terman	1950
S. C. Hooper	1934	V. K. Zworykin	1951

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, "a friend and member of the Institute," to preserve the memory of Colonel Morris N. Liebmann, who gave his life in the cause of the United States in the first World War. This prize is given an-

nually 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	F. B. Llewellyn	1935
R. A. Weagant	1920	B. J. Thompson	1936
R. A. Heising	1921	W. H. Doherty	1937
C. S. Franklin	1922	G. C. Southworth	1938
H. H. Beverage	1923	H. T. Friis	1939
J. R. Carson	1924	H. A. Wheeler	1940
Frank Conrad	1925	P. T. Farnsworth	1941
Ralph Bown	1926	S. A. Schelkunoff	1942
A. H. Taylor	1927	W. L. Barrow	1943
W. G. Cady	1928	W. H. Hansen	1944
E. V. Appleton	1929	P. C. Goldmark	1945
A. W. Hull	1930	Albert Rose	1946
Stuart Ballantine	1931	J. R. Pierce	1947
Edmond Bruce	1932	S. W. Seeley	1948
Heinrich Barkhausen	1933	C. E. Shannon	1949
V. K. Zworykin	1934	O. H. Schade	1950
		R. B. Dome	1951

Browder J. Thompson Memorial Prize

The Browder J. Thompson Memorial Prize was established in 1945 for the purpose of stimulating research in the field of radio and electronics and to provide incentive for the careful preparation of papers describing such research. The award 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, which, in the opinion of the Board of Directors, upon the recommendation of the Awards Committee, constitutes the best combination of technical contribution to the field of 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 when he was 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
C. L. Dolph	1947
W. H. Huggins	1948
R. V. Pound	1949
J. F. Hull and A. W. Randalls	1950
A. B. Macnee	1951

Harry Diamond Memorial Award

The Harry Diamond Memorial Award was established in 1949 and is given annually to a person or persons in the 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 the proceeds of a fund established by friends of Harry Diamond, a Fellow of the Institute, who felt that his professional life exemplified the highest type of scientific effort in government service. The 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
M. J. E. Golay	1951

Editor's Award

The Editor's Award was established in 1948 by the Board of Directors to stimulate the use of good English in technical writing. It recognizes that author who, in the opinion of the Editor of the Proceedings, and upon the recommendation of the Awards Committee and the Board of Directors, submitted an outstanding paper from the standpoint of good presentation in general. It is administered by a subcommittee of the Awards Committee which functions as an advisory group to the Editor.

RECIPIENTS OF THE EDITOR'S AWARD

E. J. Barlow	1950
W. W. Harman	1951

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 of the Institute who shall have made either 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 which was donated to the Institute by Vladimir K. Zworykin to encourage outstanding technical developments in fully electronic television. The recipient of this award is named by the Board of Directors upon the recommendation of the Awards Committee.

IRE HEADQUARTERS BUILDING

During the recent war, electronic methods and apparatus became of such importance that the directors of the Institute were convinced The Institute of Radio Engineers was destined to remain one of the great engineering societies of the world. Pressed by the need for adequate headquarters space, a Building Fund campaign was launched to provide the Institute with a permanent home, expand the Institute facilities, and, thereby, create a closer union between radio engineers and their industry.

Over $600,000 was donated by Institute members and by the radio-electronic industry. The Institute purchased, in 1945, the building on the northeast corner of 79 Street and Fifth Avenue in New York City as a permanent home. The house was designed, in 1899, to be one of New York's show places.

The establishment provides offices for the permanent headquarters staff, facilities for the activities for the Institute's official family, and dignified and impressive meeting places for its directors, officers, committees, and members. Members of the Institute are always welcome to utilize these facilities, and to avail themselves of the services of the headquarters staff.

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 fulfillments 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 admissions, 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 I.

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 chairman shall be at the discretion of the Board of Directors.

SEC. 2—The Board of Directors shall manager 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 therefor 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 of 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 meeting 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 percent 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 March 10, 1951)

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 therefor 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 field, 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. 2A—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, had 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 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. 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—Graduate from a radio or allied curriculum in an accredited professional school shall be accepted as equivalent to two years' experience in radio or allied field.

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. 8-A—Subject to the provisions of the Constitution and prior to March 1, 1948, the qualifications for election of candidates to membership in the Institute shall be considered as satisfied if they meet the Constitution in effect prior to August 15, 1947, or the Bylaws in effect on the date of election. After March 1, 1948, the qualifications must meet the Bylaws in effect on the date of election.

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. 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 who 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 grade.

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 following election.

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 will be computed for the annual period beginning with the first day of the month following his election. 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, 1948, the annual dues for all grades shall be fifteen dollars ($15), except for Student which shall be three dollars ($3), 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).

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 of 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 the 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, Executive, Nominations, Policy Development, 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 of 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 and Canada shall be divided into Regions, as follows: (1) North Atlantic, (2) North Central Atlantic, (3) Central Atlantic, (4) East Central, (5) Central, (6) Southern, (7) Pacific, (8) Canadian.

Regions which fail to maintain reasonable 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 normally shall consist of the Regional Director, the junior past Regional Director, and the chairman and junior past chairman of each Section in the Region. 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. Each member of the Regional Committee shall be, ex-officio, a member of the Executive Committee of his own Section.

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 at which a quorum shall be necessary for the transaction of business of the Committee. A quorum shall consist of at least one-third of the members of the Committee 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—All Sections authorized by the Board of Directors shall accept and conform to a Constitution provided by the Board of Directors.

SEC. 64—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. 65—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. 66—Local noncompulsory financial contributions may be accepted by Sections.

SEC. 67—All Sections shall be exclusively those of the Institute. No joint Section shall be recognized. However, Sections of the Institute may co-perate with other organizations in the holding of joint meetings and may invite members of such organizations and the public to their meetings.

SEC. 68—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. 69—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 part, the application of this Bylaw for the duration of war and six months thereafter.

SEC. 70—For Section maintenance, the Institute shall pay to each Section for each calendar year the following sums:

One dollar ($1.00) for each member, except Students, up to and including seven hundred, and one dollar fifteen cents ($1.15) for each member, except Students, over seven hundred, with mailing addresses within the territory of the Section, on December 31 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. 70-1—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. 70-2—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. 70A—A petition for the formation of a Professional Group shall be signed by not fewer than twenty-five (25) members, other than Students.

SEC. 70B—Each Professional Group authorized by the Board of Directors shall 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 approval of the Executive Committee.

SEC. 70C—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. 70D—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. 70E—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. 70F—All members of the Institute except Students, may become members of Professional Groups in conformance with the respective Group Constitutions.

SEC. 70G—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. 70H—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. 70I—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. 70J—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 Board of Directors 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 Board of Directors may join with one or more other national engineering or technical societies to co-sponsor a Joint Student Branch in that school.

SEC. 73A—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 noncompulsory 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:

- Administrative Committee of the Board of Editors
- Admissions
- Appointments
- Awards
- Board of Editors
- Constitution and Laws
- Education
- Executive Committee of the Board of Directors
- Finance
- Membership
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- Electronic Computers
- Facsimile
- Industrial Electronics
- Measurements and Instrumentation
- Mobile Communication
- Modulation 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 Administrative Committee of the Board of Editors, Admissions, Awards, Board of Editors, Constitution and Laws, Education, Finance, Membership, Nominations, Papers Review, Policy Development, Professional Groups, Public Relations, Sections, 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: Annual Review, Antennas and Waveguides, Audio Techniques, Circuits, Electroacoustics, Electron Tubes and Solid-State Devices, Electronic Computers, Facsimile, Industrial Electronics, Measurements and Instrumentation, Mobile Communication, Modulation 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. 83—The Sections Committee shall include the Chairman of each Section, ex-officio.

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

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

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 Development, and Tellers Committees.

SEC. 85—The Treasurer shall make a report to the Executive Committee semiannually 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. 85A—The Building Fund established by action of the Board of Directors on January 10, 1945, shall be maintained as an entity on the books of the Institute. All income derived from the Building Fund shall be transferred quarter-annually to the account of the Institute for general purposes. The principal of the Building Fund in whole or in part from time to time may be appropriated by the Board of Directors for the purpose of providing for the housing of the general activities of the Institute, and for no other purpose unless authorized by affirmative vote of two-thirds of all the members of the Board of Directors at a stipulated meeting and unless the proposal of authorization and reasons therefor shall have been been mailed to all members of the Board at least thirty days before the stipulated meeting at which the vote shall be taken.

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*
Individual non-members	$18.00	$19.00
Public Libraries	13.50	14.50
Colleges	13.50	14.50
Subscription Agencies	13.50	14.50
Institute members, additional subscriptions	9.00	10.00

Individual Copies

Individual non-members	$ 2.25	$ 2.35
Public Libraries	1.65	1.75
Colleges	1.65	1.75
Subscription Agencies	1.65	1.75
Institute members, additional copies	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.

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March 10, 1951

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CONSTITUTION FOR SECTIONS

ARTICLE I

NAME AND OBJECT

Sec. 1—This organization shall be known as the ..... Section of The Institute of Radio Engineers, Inc.

Sec. 2—The Section shall strive for the advancement of the theory and practice of radio engineering and of the allied arts and sciences, and the maintenance of a high professional standing among its members, all in consonance with the Constitution and Bylaws of the Institute and with special attention to such aims within the territory of the Section as are hereinafter defined.

Sec. 3—The Section shall aid in promoting close cooperation and good fellowship among its members and to this end shall hold meetings for the transaction of the regular business of the Section and for the presentation of papers and their discussion.

ARTICLE II

MEMBERSHIP

Sec. 1—All members of the Institute residing within the territory of the Section are automatically members of this Section. There shall be no other grades of membership.

Sec. 2—All Fellows, Senior Members, and Members of the Institute residing within the territory of the Section shall be entitled to attend the meetings, vote, and hold office. Associates of the Institute residing in the territory of a Section shall be entitled to attend meetings, vote and hold office, except the offices of Chairman and Vice-Chairman.

Sec. 3—Student members of the Institute shall be entitled to attend meetings but shall not have the right to vote or hold office.

ARTICLE III

TERRITORY

Sec. 1—The territory of the Section shall be set by the Board of Directors, and may be enlarged, reduced, or otherwise altered by the Board at any time.

Sec. 2—Whenever within a Section circumstances arise which indicate the need for meetings in different areas, it shall be permissible for the Section to foster and inaugurate one or more subsections locally to carry out the functions of obtaining speakers and holding meetings.

Sec. 3—A subsection may be formed and operated on any plan not inconsistent with the powers of the Executive Committee.

ARTICLE IV

DUES

Sec. 1—There shall be no Section dues.

Sec. 2—The ordinary expenses of the Section shall be defrayed by the funds supplied by the Institute.

Sec. 3—Emergency or extraordinary expenses may be provided for by voluntary contribution from the membership of the Section. A unanimous vote of the Executive Committee is required before such a request may be made.

Sec. 4—The Section may require nonmembers, who wish to be placed on the mailing list for notices and to pay in advance for the estimated cost of such notices.

ARTICLE V

OFFICERS

Sec. 1—The officers of the Section shall be a Chairman, a Vice-Chairman, and a Secretary-Treasurer.

Sec. 2—The terms of office for all officers shall begin at the close of the annual meeting, or as soon thereafter as the election result is determined, and shall end at the close of the next annual meeting, or as soon thereafter as the result of the election of new officers is determined, and in any case continue until their successors are duly elected and take office.

Sec. 3—The terms of office set forth above shall be approximately one year, and may exceed this interval only in the case where the date of the annual meeting is being changed and a continuation in office is necessary to effect the new schedule, or no successor has been elected or appointed.

ARTICLE VI

MANAGEMENT

Sec. 1—There shall be an Executive Committee consisting at least of officers, the junior past chairman, and the chairmen of all the standing committees listed in Section 5 of Article VI.

The chairman may appoint, subject to confirmation by a majority vote of the above members of the Executive Committee, additional members to the Executive Committee from the Section membership.

Sec. 2—The Chairman, responsible to the Executive Committee, shall have general supervision of the affairs of the Section. He shall preside at meetings of the Section and the Executive Committee and have such other powers and perform such other duties as may be provided for in the Bylaws, or as may be delegated to him by vote of the Section. In his absence his duties shall be performed by the Vice-Chairman.

Sec. 3—The Secretary-Treasurer shall receive and deposit all monies in the name of the Section in such depository as shall be determined by the Executive Committee. He shall make only such disbursements as shall be ordered by the Executive Committee.

Sec. 4—The Secretary-Treasurer shall send out notices, prepare the agenda for, and record the Minutes of all meetings of the Section and of the Executive Committee. He shall make such reports of his activities as may be required by the Executive Committee of the Institute.

Sec. 5—The Chairman, as soon as expedient after the annual meeting, shall appoint the following standing committees:

Meetings and Papers Committee
Membership Committee
Publicity Committee.

Members appointed shall serve until their successors are appointed or the committee dissolved.

Other committees may be authorized by vote of the Section at any regular meeting, and shall be appointed by the Chairman of the Section.

Sec. 6—The Chairman shall, when notified of the annual meeting of the Committee on Sections, arrange for representation of his Section at such annual meeting by himself or by some member of his Section or he shall forward a letter to the Committee Chairman explaining inability to provide representation and giving the views of his Section on the agenda or proposals before the meeting.

Failure to comply with the above shall be punished by a fine of $10 to be deducted from the rebates to the Section. Sections so remotely located as to make the requirements unusually difficult may be excused by the Sections Committee from these penalties.

The above penalty shall not be exacted if the Chairman of the Sections Committee shall fail to forward to each Section Chairman and Secretary, at least forty-five days in advance of the date of the annual meeting of the Sections Committee, notice of that meeting and the agenda to be considered thereat.

ARTICLE VII

NOMINATION AND ELECTION OF OFFICERS

Sec. 1—All officers shall be elected at the annual meeting of the Section upon nomination by a nominating committee of three members not then officers of the Section, duly appointed by the Chairman of the Section two months before the annual meeting. These nominations shall be announced in the notice of the annual meeting. Nominations may also be made from the floor.

Sec. 2—When at an annual meeting there is more than one nominee for any one of the offices of Chairman, Vice-Chairman, or Secretary-Treasurer, the Chairman of the Section may conduct the election at the annual meeting if it is evident that a fair expression of the wishes of the membership can be then determined. As an alternative, he may announce that the results shall be determined by a letter ballot to be taken prior to the next regular meeting of the Section.

Sec. 3—In the event that election of officers is to be determined by letter ballot, the Secretary shall provide promptly to each voting member of the Section a letter ballot with return envelope as used by the Institute and with a return date specified, which shall in no case be later than six weeks after date of the annual meeting.

The Chairman shall call a meeting of the Executive Committee to constitute a tellers committee to count the vote and determine the successful candidate.

The Chairman shall inform the successful candidates of their election and arrange for the transfer of responsibility to the new officers without delay.

Sec. 4—Vacancies in office occurring during the year shall be filled by the Executive Committee for the remainder of the unexpired term unless otherwise provided for.

Sec. 5—If for any reason the best interests of the Section seem to require a change in the governing body during the year, the matter shall be duly and carefully considered by the Executive Committee. Upon not less than two-thirds vote of the Executive Committee, or upon receipt by the Executive Committee of a petition signed by fifteen (15) members of the Section, recommendation shall be made to the Section for action at a special meeting to be duly called by the Executive Committee for the sole purpose of considering and voting upon such a change.

A two-thirds vote of the members present shall be necessary to declare an office vacant. Upon two-thirds vote of the members present the vacant office may be filled for the unexpired term upon nominations from the floor.

ARTICLE VIII

MEETINGS

Sec. 1—The Section shall not hold less than five regular meetings during the year, one of which shall be an annual meeting.

Sec. 2—These meetings shall be held at some specific time in the year as prescribed in the Section Bylaws.

Sec. 3—The start of the fiscal year of the Sections shall coincide with the start of any one of the quarters of the fiscal year of the Institute.

Sec. 4—At least fifteen members shall be present to constitute a quorum at all meetings of the Section called for the transaction of regular business and requiring a vote to be taken, but a higher number may be set to constitute a quorum, such number to be determined by a Bylaw voted upon by the Section membership.

Sec. 5—A plurality vote of the members present is necessary for the election of officers.

Sec. 6—Meetings of the Executive Committee shall be held at such times as shall be found necessary. Executive Committee meetings may be called by the Chairman of the Section at his own discretion or shall be at the request of three members of the committee.

Sec. 7—A majority of the members of the Executive Committee shall constitute a quorum at all meetings of the Executive Committee, except as otherwise provided herein.

Sec. 8—A majority vote of the Executive Committee shall be necessary in the conduct of its business except as otherwise provided in this Constitution or in the Section Bylaws.

Sec. 9—The Secretary-Treasurer shall send out notices of all regular Section meetings to all Institute members in the territory of the Section at least one week prior to the date of the meeting. These notices shall contain a full statement of the time, place and business of the meeting.

ARTICLE IX

SUBSECTIONS

Sec. 1—Subsections shall be geographical subdivisions of the Section and subject to the same limitations as the Section.

Sec. 2—Subsection membership shall be limited to members, except Students, of the Institute.

Sec. 3—The territory of a Subsection shall be set by the Section Executive Committee within the territory of the Section.

Sec. 4—All Subsections shall be exclusively those of the Section. No joint Subsections shall be recognized. Subsections may cooperate with other organizations in holding joint meetings and may invite members of such organizations and the public to their meetings.

Sec. 5—All Fellows, Senior Members, Members, and Associates with mailing addresses within Subsection territory shall have voting privileges in Subsection activities.

Sec. 6—Rules pertaining to the election of officers and other procedures shall be the same as for the Section.

Sec. 7—The Section will furnish Subsections with suitable stationery, membership blanks, Institute literature, and necessary forms.

Sec. 8—The Section shall pay to each Subsection a portion of the rebate received from the Institute by the Section for each member with mailing address within Subsection territory. The portion shall be set by the Section Executive Committee.

Sec. 9—A Subsection shall not have authority to contract debts for, pledge the credit of, or in any way bind the Section or the Institute.

Sec. 10—A petition for the formation of a Subsection shall be submitted to the Section Executive Committee. The petition for the formation of the Subsection may be approved by the Section Executive Committee.

Sec. 11—Subsections may qualify for meeting allowances provided the petition is signed by not fewer than twenty (20) Fellows, Senior Members, Members, or Associates with mailing addresses within the proposed territorial limits. A copy of this petition, together with copy of the motion passed by the Section or the Section Executive Committee approving the formation of a Subsection, and an accompanying letter signed by the Secretary

of the Section attesting to the action, shall be forwarded to the Secretary of the Institute for the purpose of securing approval of the Executive Committee of the Institute.

SEC. 12—A Subsection which has qualified for meeting allowances, upon failure to maintain a minimum of twenty (20) resident members, other than Students, and to hold at least three (3) meetings each year, shall be placed on probation. All members of such Subsection shall be informed of the probation by the Section Secretary-Treasurer, who shall call their attention to the requirements for meeting allowances. If delinquency continues for a second year, the Section Executive Committee shall notify the Secretary of the Institute that the Subsection is no longer qualified for meeting allowances.

SEC. 13—The Secretary of each Subsection shall forward to the Secretary of the Section a report of each meeting held by the Subsection for presentation or discussion of technical material. A yearly financial report shall be forwarded to the Secretary of the Section, and this report shall be incorporated in the yearly report of the Section to the Institute. This financial report shall be submitted to the Section at a date suitable to the Section Executive Committee.

SEC. 14—Notices of Subsection meetings shall be mailed to the Chairman, Secretary, and Chairman of the Program Committee of the Section, and to other members of the Section Executive Committee upon request.

SEC. 15—The Chairman of each Subsection shall be ex officio a member of the Section Executive Committee.

SEC. 16—The Chairman of a Subsection qualified for meeting allowances shall be of Member grade or higher.

ARTICLE X

AMENDMENTS

SEC. 1—This Constitution may be amended by a two-thirds vote of all members present at any annual meeting of the Committee on Sections, provided that notices of the proposed meeting and the proposed change have been sent to all members of the Committee on Sections at least one month in advance of the meeting. Such action shall be subject to the approval of the Board of Directors of the Institute.

SEC. 2—In the event of absence of any member of the Committee on Sections, he may vote by proxy on amendments to this Constitution.

SEC. 3—Suitable Bylaws to this Constitution may be adopted by a two-thirds vote of the voting members present at any regular meeting, providing that notice of the proposed change has been sent to each voting member at least three weeks prior to such meeting. Such Bylaws must be consonant with the Constitution and Bylaws of the Institute and this Constitution. A copy of these Bylaws shall be filed in the Institute Office.

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MEMBERSHIP LISTS

Including

BIOGRAPHIES OF FELLOWS

A LIST OF SENIOR MEMBERS

AN ALPHABETICAL LISTING (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 four headings, as follows:

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

Names of Senior Members; an alphabetical list of names only.

Membership Roster; a complete listing of all members (not including Students) on record as of May 15, 1951; giving membership grades, business affiliations, and home addresses.

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, 1951.

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, 1951)

On the following pages will be found the biographical sketches of 349 Fellows of The Institute of Radio Engineers.

Late in 1941, it was decided that the Fellow grade should be made an honorary one and the recipients be selected solely by the Awards Committee and approved by the Board of Directors. In the case of readmissions, when the Fellow grade was granted before the end of 1941, and before citations were granted, no citations are given in the biographies.

MARCUS A. ACHESON
(A'36—M'37—F'41)

Chief Engineer, Radio Division, Sylvania Electric Products Inc., Emporium, Pa. Born: January 18, 1903, Denison, Texas. B.S. (E.E.), 1924, Rice Institute.

Committees: Papers, 1937.

GEORGE P. ADAIR
(A'42—SM'44—F'47)

Consulting Radio Engineer, 1833 M St., N.W., Washington 6, D.C. Born: December 8, 1903, Rancho, Texas. B.S.(E.E.), 1926, Agricultural and Mechanical College of Texas.

Fellow Award, 1947, for his
"technical direction of matters relating to allocation of radio frequencies."

Sections: Washington, *secretary, 1946; vice-chairman, 1947; chairman, 1948.* Mid-Atlantic Regional, *vice-chairman, 1948.*

Life Honorary Member, International Municipal Signal Association, 1944. Phi Beta Pi, 1949.

ROBERT ADLER
(A'42—SM'47—F'51)

Research Engineer, Zenith Radio Corporation, 6001 W. Dickens Ave., Chicago, Ill. Born: December 4, 1913, Vienna, Austria. Ph.D., 1937, University of Vienna.

Fellow Award, 1951, for his
"developments of transmission and detection devices for frequency-modulated signals and of electro-mechanical filter systems."

Committees: Modulation Systems, 1948-1950.

HERMAN A. AFFEL
(A'14—M'40—SM'43—F'49)

Director of Transmission Systems Development, Bell Telephone Laboratories, Inc., Murray Hill, N.J. Born: August, 1893, Brooklyn, N.Y. S.B., 1914, Massachusetts Institute of Technology.

Fellow Award, 1949, for his
"contributions to the communications art, and his guidance of important developments in carrier systems for multiplex telephone and television transmission."

Committees: Meeting and Papers, 1930; New York Program, 1939, *chairman, 1940,* 1941; Papers, 1931-1945; Papers Review, 1946-1951.

Modern Pioneers Award, National Association of Manufacturers, 1940.

ARTHUR L. ALBERT
(A'31—SM'47—F'50)

Professor of Communication Engineering, Department of Electrical 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.

Fellow Award, 1950, for his
"contribution to electronics as a teacher and writer."

Committees: Membership, 1947-1948.

Institute Representative: Oregon State College, 1942-1951.

Fellow, AIEE, 1941.

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

ERNST F. W. ALEXANDERSON
(A'13—M'13—F'15) (L'49)

Consulting Engineer, General Electric Company, 1 River Rd., Schenectady, N. Y. Born: January 25, 1878, Uppsala, Sweden. EE., 1900, Royal Technical University, Stockholm, Sweden; Sc.D., 1926, Union College; Ph.D., 1938, Uppsala University, Sweden.

Medal of Honor, 1919, in
"recognition of his pioneer accomplishments in the field of long-distance radio communication, including his development of the radio-frequency alternator which bears his name, a magnetic amplifier permitting effective modulation of the output of such an alternator, and a cascade radio-frequency vacuum-tube amplifier yielding exceptional total amplification."

President, 1921; Vice-President, 1920; Manager, 1917–1919; Director, 1920–1923.

Committees: Meetings and Papers, 1928; Standardization, 1916–1923: Wave Length Regulation, 1916, 1919.

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.

ANDREW ALFORD
(A'35—M'40—F'42)

Consulting Engineer, 299 Atlantic Ave., Boston 10, Mass. Born: August 5, 1904, Samara, Russia. A.B., 1924, University of California.

Fellow Award, 1942, for his
"contributions to the theory of radiation and the design of short-wave antennas."

Committees: Annual Review, 1944–1945; Antennas, *chairman, 1944–1945,* 1946–1949; Papers Procurement, 1947–1950; Radio Transmitters, 1944–1945; Standards, 1944–1945; Transmitters and Antennas, 1943–1944.

President's Certificate of Merit, 1948, for
"Outstanding Services, June, 1943 to December, 1945, in the field of Counter-measures as a staff member of the Radio Research Laboratory of the National Research and Defense Council."

CLIFFORD N. ANDERSON
(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, 1930–1931; New York Program, 1932; Sections, 1941–1944; Tellers, 1932–1933.

EDWARD V. APPLETON
(A'26—F'31)

Principal and Vice-Chancellor. The University of Edinburgh, Edinburgh, Scotland. M.A., D.Sc., LL.D., F.R.S.

Morris Liebmann Memorial Prize, 1929, for his
"investigations in the field of wave propagation phenomena."

Vice-President, 1932; Director, 1932.

Committees: Meetings and Papers, 1929; Wave Propagation, 1937–1938.

EDWIN H. ARMSTRONG
(A'14—F'27)

Professor of Electrical Engineering, Columbia University, 206 Philosophy Hall, New York 27, N.Y. Born: December 18, 1890, New York, N.Y. E.E., 1913, D.Sc., 1929, Columbia University; D.Sc., 1941, Muhlenberg College; D.Sc., 1948, Laval University.

Medal of Honor, 1917, in
"recognition of his work and publications dealing with the action of the oscillating and non-oscillating audion."

Manager, 1916–1922; Director, 1936–1938.

Committees: Admissions, 1926; Awards, *chairman, 1936;* Frequency Modulation, 1941; Nominations, 1940; Radio Receivers, 1936–1941; Receiving Sets, 1927; Standardization, 1917–1921, 1924–1926; Tellers, *chairman, 1937;* Wave Length Regulation, 1916, 1919.

Washington Award, 1951, Washington Award Commission, Western Society of Engineers.

SIR NOEL ASHBRIDGE
(F'38)

Director of Technical Services, British Broadcasting Corporation, Broadcasting House, London, W.1., England. Born: December 10, 1889, Wanstead, Essex, England. B.Sc. (Engineering), 1911, King's College, London University.

Vice-President, 1947.

Fellow of King's College, London; Knight of the Royal Order of Dannebrog (Danish), 1934; Knighted, 1935; James Watt Medal, The Institution of Civil Engineers, 1937; President, The Institution of Electrical Engineers, 1941–1942; President, Junior Institution of Engineers, 1949–1950; Faraday Medal, 1949. MICE; MIEE.

ARTHUR O. AUSTIN
(F'30)

Manufacturing Engineer, Box 109, Barberton, Ohio. Born: December 28, 1879, Stockton, Calif. A.B., 1903, Stanford University.

AUSTIN BAILEY
(A'25—M'25—F'36)

Telephone 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, 1940–1942.

Committees: Admissions, 1934, *chairman, 1935;* Awards, 1945, 1949; Constitution and Laws, 1932–1934, 1936–1942, *chairman, 1942,* 1944–1945; Convention Policy, 1947–1950; Membership, 1941; National Convention, 1947–1950; New York Program, 1930, *chairman, 1931,* 1932–1934, 1937, *chairman, 1938,* 1939–1940; Sections, 1929, *chairman, 1930,* 1931–1933; Tellers, *chairman, 1939,* 1940; Winter Technical Meeting, *chairman, 1945,* 1946.

Institute Representative: ASA Sectional Committee on Graphic Symbols and Abbreviations for Use on Drawings, 1940–1950; Sectional Committee on Standards for Drawings and Drafting Room Practices, 1940–1950.

STUART L. BAILEY
(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.

Fellow Award, 1943 for his
"pioneering accomplishment in the application of radio engineering principles to the solution of technical problems in broadcasting."

President, 1949; Treasurer, 1948; Director, 1943–1951.

Committees: Admissions, 1943–1944; Appointments, 1948; Awards, 1950–1951; Broadcasting, *alternate, 1931–1932,* 1934; Constitution and Laws, 1944, 1948, 1951; Executive, 1945–1947, *vice-chairman, 1948; chairman, 1949,* 1950–1951; Finance, 1948, 1950–1951; Nominations, *chairman, 1946,* 1947–1951; National Convention, 1947–1948; Office Practices, 1947; Planning, 1947; Policy Development, 1948, 1951; Professional Groups, 1950; Public Relations, *alternate, 1945–1946,* 1950; Radio Wave Propagation, 1942–1945; Radio Wave Propagation and Utilization, 1945–1947; Sections, 1946–1947; Special Publication Fund, 1947; Wave Propagation, 1937–1941, 1948–1951; Winter Technical Meeting, 1946.

Institute Representative: IRE-RMA Co-ordination Committee, 1949; U.S.A. National Committee, URSI, 1949–1951; Executive Council, Central Radio Propagation Laboratory, 1949–1951; Joint AIEE-IRE Co-ordination Councillor, 1950, 1951; Joint Technical Advisory Committee, 1949, 1951.

W. R. G. BAKER
(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.

President, 1947; Director, 1940, 1946–1951; Standards Co-ordinator, 1948–1950; Treasurer, 1951.

Committees: Admissions, 1941; Annual Review, 1948; Appointments, 1948; Awards, 1940; Broadcasting 1935; Executive, *chairman, 1947,* 1948–1951, *vice-chairman, 1951;* Finance, *chairman, 1948–1951;* Meetings and Papers, 1926, *alternate, 1928,* 1929; Membership, 1928; Nominations, 1930, 1948; Nuclear Studies, *chairman, 1948,* 1949; Policy Development, 1948; Preparedness, 1940–1941; Professional Groups, *chairman, 1950–1951;* Public Relations, 1950; Sections, 1931–1932; Standardization, 1925; Subcommittee on Power Supply, 1928; Standards, 1938–1940, 1948–1949.

Sections: Connecticut Valley, *secretary, 1938–1940;* Philadelphia, *chairman, 1930–1931.*

Institute Representative: ASME Review Board, 1948-1950.

JOHN A. BALCH
(M'17—F'40)

Retired. Formerly, Chairman of the Board, Mutual Telephone Company, Alakea St., Honolulu, Hawaii. Born: August 6, 1876, San Francisco, Calif.

Marconi Medal, Pioneer Wireless Telegraph Operators, 1940.

MILLARD W. BALDWIN, 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.

Fellow Award, 1948, for his
"fundamental investigations of the quality of television pictures."

Committees: Special Television Test Methods, 1940; Facsimile, 1941; Methods of Testing Television Transmitters, 1945–1947; Standards, 1949–1950, *vice-chairman, 1951;* Television, 1948; Television Definitions, 1945–1948; Television Systems, 1949–1951; Television Co-ordination Subcommittee, *chairman, 1949;* Video Techniques, 1949–1951.

WILMER L. BARROW
(A'28—VA'39—M'40—F'41)

Chief Engineer, Sperry Gyroscope Company, Division of the Sperry Corporation, Great Neck, L.I., N.Y. Born: October, 1903, Baton Rouge, La. M.S., 1929, Massachusetts Institute of Technology; Sc.D., 1931, Technische Hochschule, Munich, Germany.

Fellow Award, 1941, for his
"pioneering investigation of ultra-high-frequency wave propagation and many of its practical applications."

Morris Liebmann Memorial Prize, 1943, for his
"theoretical and experimental investigations of ultra-high-frequency propagation in waveguides and radiation from horns, and the application of these principles to engineering practice."

Director, 1943–1945.

Committees: Antennas, 1945-1947; Awards, 1944—1945, 1948, 1949; Board of Editors, 1946–1951; Constitution and Laws, 1943–1944; Executive, 1945; Nominations, 1943, 1949; Papers, 1941–1945; Papers Procurement, 1942–1943; Professional Groups, 1948; Regular Papers, 1941; RMA-IRE Co-ordinating, 1948; Research, 1946–1947, 1949; Standards, 1938–1941; Wave Guides, 1943–1944; Wave Propagation, 1941.

Sections: Boston, *chairman, 1939–1941.*

Institute Representative: Radio Technical Planning Board, *alternate, 1944–1945,* 1945–1946.

F. SHERBROOKE BARTON
(F'35)

Principal Director of Telecommunications (Research and Development), Ministry of Supply, Shell Mex House, Strand, London, W.C.2, England. Born: May 13, 1895, Nottingham, England. Scholar, 1914, St. Johns College, Cambridge; M.A., 1920, University of Cambridge; B.Sc., 1920, University of London.

Vice-President, 1943; Director, 1943.

Committees: International Liaison, 1947.

RALPH R. BATCHER
(J'16—A'18—M'22—SM'43—F'50)

Electronics Consultant, 240-02 42 Ave., Douglaston, L.I., N.Y. Born: June, 1897, Dysart, Iowa. B.S., 1920, E.E., 1920, Iowa State College.

Fellow Award, 1950, for his
"pioneer work with cathode-ray instruments and more recently for his development of precision variable frequency standards and meters."

Committees: Annual Review, *chairman, 1949–1951;* Board of Editors, 1928–1951; Meetings and Papers, 1927–1929; Public Relations, *chairman, 1950–1951;* Standards, 1949–1951; Symbols, 1940–1947; Television, 1939–1942; Television and Facsimile, 1937–1938.

Member, Tau Beta Pi.

MAX C. BATSEL
(A'21—F'27)

Chief Engineer, Engineering Products Department, RCA Victor Division, Radio Corporation of America, Cooper St., Camden, N.J. Born: June 16, 1894, Fulton, Ky. B.M.E., 1915, University of Kentucky.

Director, 1933.

Committees: Bibliography, 1930–1932; Meetings and Papers, 1928–1929; Membership, 1926–1927; New York Program, 1931–1933; Receiving Sets, 1927–1928; Standardization, 1925, 1927–1930; Use of the Transmission Unit, 1928.

BENJAMIN de F. BAYLY
(M'34—SM'34—F'47)

President, Bayly Engineering Ltd., Ajax, Ont., Canada. Consulting Engineer and Director of Development, Radio Engineering Products, Montreal, P.Q., Canada. Born: June, 1903, London, Ont., Canada. B.A.Sc., 1930, University of Toronto.

Fellow Award, 1947, for his
"contributions as a teacher in the field of radio communications and his service in the co-ordination of communications security."

Committees: Papers Review, 1947–1949.

Sections: Toronto, *chairman, 1936–1937.*

Institute Representative: University of Toronto, 1941–1942.

O.B.E., Canadian Government, 1946.

ALDA V. BEDFORD
(A'31—SM'46—F'50)

Television Research Engineer, RCA Laboratories, Radio Corporation of America, Princeton, N.J. Born: January, 1904, Winters, Tex. B.S.(E.E.), 1925, University of Texas; M.S., 1929, E.E., 1929, Union College.

Fellow Award, 1950, for his
"many contributions to sound recording and the development of many circuits of basic importance to present-day television."

Sections: Princeton, *secretary-treasurer, 1946; vice-chairman, 1947; chairman, 1948–1949.*

Modern Pioneer Award, National Association of Manufacturers, 1940; Incentive Awards, RCA Laboratories, 1949 and 1950.

LESLIE H. BEDFORD
(S'34—SM'43—F'48)

Chief Television Engineer, Marconi's Wireless Telegraph Company, Chelmsford, Essex, England. Born: June 23, 1900, London, England. B.Sc., 1919, B.Sc. (Engineering), 1921, University of London; M.A., 1924, Cambridge University.

Fellow Award, 1948, for his
"development of special circuits, in particular those used for scanning purposes, in television."

IEE Premium, Institution of Electrical Engineers, London, 1934; Order of the British Empire, 1943.

GEORGE L. BEERS
(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.

Fellow Award, 1947, for his
"numerous advances in circuits and systems leading to improved radio broadcasting, particularly in the receiver field."

Committees: Papers Procurement, 1946; Radio Receivers 1942–1949; Receivers, 1949–1951.

Modern Pioneer Award, National Association of Manufacturers, 1940.

Fellow, Society of Motion Picture and Television Engineers.

F. J. BEHR
(A'13—M'13—F'20) (L'49)

Colonel, retired, 727 Cowper St., Palo Alto, Calif.

Committees: Increase of Membership, 1913–1914.

RAWSON BENNETT
(A'36—M'43—SM'43—F'50)

Captain, United States Navy; Director, United States Navy Electronics Laboratory, San Diego, Calif. Born: June, 1905, Chicago, Ill. B.S., 1927, United States Naval Academy; M.S., 1937, University of California.

Fellow Award, 1950, for his
"contributions in programming, guiding, and developing sonar systems for military use and his contribution to the administration of military electronics laboratories."

Sections: San Diego, *chairman, 1947.*

Fellow, Acoustical Society of America, 1947.

LLOYD V. BERKNER
(A'26—M'34—SM'43—F'47)

President, Associated Universities, Inc., Brookhaven National Laboratory, Upton, N.Y. Born: February 1, 1905, Milwaukee, Wis. B.S. (E.E.), 1927, University of Minnesota; attended George Washington University.

Fellow Award, 1947, for his
"investigation of ionospheric phenomena and his contributions to airborne radar development."

Committees: Board of Editors, 1941; Papers, 1941; Wave Propagation, 1937–1941.

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.

H. H. BEVERAGE
(A'15—M'26—F'28)

Director, Radio Systems Research Laboratory, RCA Laboratories Division, Radio Corporation of America, 66 Broad St., New York 4, N.Y. Born: October 14, 1893, North Haven, Me. B.S., 1915, D.E., 1938, University of Maine.

Morris Liebmann Memorial Prize, 1923, for his
"work on directional antennas."

Medal of Honor, 1945, in
"recognition of his achievements in radio research and invention, of his practical applications of engineering developments that greatly extended and increased the efficiency of domestic and world-wide radio communications, and of his devotion to the affairs of The Institute of Radio Engineers."

President, 1937; Director, 1936–1939.

Committees: Admissions, 1936, 1939, 1941–1947; Awards, *chairman, 1938,* 1939; Board of Editors, 1932–1937; High-Frequency Receivers, 1930–1931; New York Program, 1932–1935; Nominations, *chairman, 1942,* 1943; Standards, 1934.

Armstrong Medal, 1938, Radio Club of America; Signal Corps Certificate of Appreciation, 1944; President's Certificate of Merit, 1948.

FRANK JAMES BINGLEY
(A'34—M'36—SM'43—F'50)

Chief Television Research Engineer, Philco Corporation, C and Tioga Sts., Philadelphia, Pa. Born: November 13, 1906, Bedford, Bedfordshire, England. B.Sc. (Mathematics), 1926, B.Sc. (Physics), 1927, University of London.

Fellow Award, 1950, in
"recognition of his contributions in the field of television broadcast engineering."

Committees: Admissions, 1940, 1943; Papers Review, 1946–1951.

Gold Medal, Television Broadcasters' Association.

HAROLD BISHOP
(F'38)

Chief Engineer, British Broadcasting Corporation, Broadcasting House, London, W. 1, England. Born: October 29, 1900, London, England. City and Guilds College (Imperial College of Science and Technology), 1917–1920; B.Sc. (Engineering), University of London, 1920.

Institution Premium, Institution of Electrical Engineers, 1935; Commander of the (Order of the) British Empire, 1938; Vice-President, Institution of Electrical Engineers, 1948; Member, Institution of Mechanical Engineers; Fellow, The City and Guilds Institute, 1947.

HAROLD S. BLACK
(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.

Fellow Award, 1948, for his
"work on the negative-feedback amplifier and for his application of pulse techniques to radio-communication systems."

Committees: Annual Review, 1948–1949; Awards, 1948; Board of Editors, 1949, 1951; Editorial Administrative, 1948–1951; Education, 1948; Frequency Modulation, 1946; Modulation Systems, 1947, *chairman, 1948–1950;* Papers Review, 1947–1948; Standards, 1948–1950.

Best Paper Prize, AIEE, 1934; Modern Pioneer Award, National Association of Manufacturers, 1940; John Price Wetherill Medal, The Franklin Institute, 1941.

KNOX CHARLTON BLACK
(M'29—SM'43—F'49)

Technical Advisor to the Commander, Naval Air Development Center, Johnsville, Pa. Born: April 23, 1905, Cambridge, Mass. A.B., 1924, A.M., 1926, Ph.D., 1927, Harvard University.

Fellow Award, 1949, for his
"outstanding wartime work on radio countermeasures and his many contributions to the design of coaxial cable transmission systems."

Committees: Awards, 1951; Technical Committee, No. 4, Electro-Acoustic Devices, 1930, Policy Development, 1949–1950.

President's Certificate of Merit, 1948.

OTTO B. BLACKWELL
(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, 1920–1923.

KNUT HUGO BLOMBERG
(M'45—F'50)

President, Svenska Radioaktiebolaget, 12 Alströmergatan, Stockholm, Sweden. Born: October 25, 1897, Stockholm, Sweden. E.E., 1920, Royal Technical University of Stockholm.

Fellow Award, 1950, in
"recognition of his many contributions to development and engineering in the field of communications in Sweden."

JOHN G. BRAINERD
(F'51)

Professor, Moore School of Electrical Engineering, University of Pennsylvania, 200 S. 33 St., Philadelphia, Pa. Born: August 7, 1904, Philadelphia, Pa. B.S.(E.E.) 1925, D.Sc. 1934, University of Pennsylvania.

Fellow Award, 1951, for his
"contributions to the technical literature, to the teaching profession, and to the art of electronic computation."

Committees: Annual Review, 1948–1951; Circuits, 1947, *chairman, 1948–1949,* 1949–1951; Standards, 1948–1949, *chairman, 1949–1951.*

Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949–1951; ASA Sectional Committee (C16) on Radio, 1950–1951; ASA Standards Council, 1950; ASA Subcommittee on General Terms, 1948.

Professional Groups: Circuit Theory, 1950.

CORNELIUS G. BRENNECKE
(F'51)

Professor and 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.

Fellow Award, 1951, for his work as
"teacher, engineer and physicist, and in recognition of his excellent work in basic research."

Committees: Education, 1951.

Sections: North Carolina-Virginia, *vice-chairman* and *program chairman, 1946–1948; chairman, 1948–1949.*

Institute Representative: Lehigh University, 1943–1945.

ROBERT M. BOWIE
(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.

Fellow Award, 1948, for his
"contributions in the field of microwave techniques, spectroscopic methods and standards, and for his development of means to avoid the effect of ion bombardment on cathode-ray tube screens."

Committees: Admission, 1945–1948; Board of Editors, 1947–1951; National Convention, 1950; Nuclear Studies, 1948–1950; Research, 1946–1947; Papers Procurement, 1945–1950; Television Committee, 1948–1949; Television Systems, 1949–1951, *vice-chairman, 1951.*

EDWARD L. BOWLES
(A'22—M'28—SM'43—F'47)

Consulting Professor of Electrical Communications, Massachusetts Institute of Technology; Consulting Engineer, Scientific Warfare Advisor, Office of Defense. Born: December 9, 1897, Westphalia, Mo. B.S., 1920, Washington University; M.S., 1922, Massachusetts Institute of Technology; D.Sc.(Honorary), 1945, Norwich University.

Fellow Award, 1947, for his
"activities in making possible the maximum practical use of advanced radio equipment in military operations and for his work in the educational field."

Committees: Membership, 1937–1940; Papers Procurement, 1942–1943; Regular Papers, 1941; Standardization, 1929–1931; Standards, 1932.

Sections: Boston, *chairman, 1935–1937.*

Distinguished Service Medal, 1945; Honorary Commander, Civil Division of Most Excellent Order of British Empire, February, 1948; Presidential Medal for Merit, June, 1948.

RALPH BOWN
(M'22—F'25)

Director of Research, 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.

Morris Liebmann Memorial Prize, 1926, for his
"researches and investigations into the more difficult element of wave transmission phenomena which have resulted in extensive and useful additions to existing knowledge."
Medal of Honor, 1949, for his
"extensive contributions to the field of radio and for his leadership in Institute affairs."
President, 1927: Vice-President, 1926; Director, 1926–1929, 1937–1939.
Committees: Admissions, *chairman, 1926,* 1939–1940; Awards, 1928–1931, 1938–1941, 1946, *chairman, 1942;* Board of Editors, 1946–1951; Constitution and Laws, 1929, 1937–1940; Convention Policies, 1940; Finance, *chairman, 1926;* International Liaison, *chairman, 1947, 1949;* Meetings and Papers, 1929; Nominations, 1937, 1940–1943, 1949, 1950, 1951, *chairman, 1944,* 1950; Receiving Sets, 1927–1928; Standards, 1941; Standardization, *chairman, 1925,* 1926; Research, 1949–1950; IRE-RMA Joint Technical Advisory Committee, 1948–1951.

GREGORY BREIT
(SM'45—F'45)

Professor, Department of Physics, Sloane Physics Laboratory, Yale University, New Haven 11, Conn. Born: July 14, 1898, Russia. A.B., 1918, A.M., 1920, Ph.D., 1921, The Johns Hopkins University.
Fellow Award, 1945, for his
"pioneering in the experimental probing of the ionosphere and giving to the world the first publication of the experimental proof of the existence of the ionosphere; and for having initiated at an early date the pulse method of probing by reflection which is the basis of modern radar."
Committee: Research, 1949–1950.

GEORGE H. BROWN
(A'30—VA'39—F'41)

Research Engineer, 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.
Fellow Award, 1941, for his
"studies and publications in the field of radio antennas."
Committees: Annual Review, 1947; Antennas, 1944–1947, 1948; Papers Procurement, 1948–1950.
Fellow, AIEE.

JESSE E. BROWN
(A'24—M'28—SM'43—F'49)

Assistant Vice-President and Chief Engineer, Zenith Radio Corporation, 6001 W. Dickens St., Chicago 39, Ill. Born: September, 1902, Greenport, N.Y. Attended Cornell University, 1920–1924.
Fellow Award, 1949, for his
"contributions in the field of broadcast receiver design."
Director, 1938, 1947.
Committees: Admissions, 1940; Awards, 1940; Frequency Modulation, 1940–1946; Industrial Electronics, 1947–1949; Membership, 1949–1950; Modulation Systems, 1947; Nominations, 1947; Papers Procurement, 1942–1945; Public Relations, 1940; Radio Receivers, 1941, 1945–1949; Receivers, 1949–1951; Regular Papers, 1941; Sections, 1937; Special Publications Fund, 1947; Television, 1940–1948; Television Systems, 1949–1951.
Sections: Chicago, *secretary, 1936, chairman, 1938–1939.*
Institute Representative: Army Signal Association, 1947.

CLEDO BRUNETTI
(A'37—SM'46—F'49)

Associate Director, Stanford Research Institute, Stanford, Calif. Born: April, 1910, Virginia, Minn. B.E.E. (with High Distinction), 1932, Ph.D., 1937, University of Minnesota.
Fellow Award, 1949, in
"recognition of his pioneering work on printed circuits."
Committees: Circuits, 1944–1951, *vice-chairman, 1949,* 1950; Radio Transmitters, 1946–1949; Papers Procurement, 1948–1950.
National Scholarship Key, National I. A. Civic League, 1937; "America's 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.

GEOFFREY BUILDER
(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.
Fellow Award, 1941, for his
"contributions as an engineer, executive, and organizer and for his work in behalf of the radio engineering profession, notably in Australia."
Fellow, Institute of Physics, London, England.

CHARLES T. BURKE
(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, 1945–1947; Papers Procurement, 1946; Power Supply, 1928; Receiving Sets, 1927; Standards, 1941–1943.

ROBERT S. BURNAP
(A'30—F'47)

Manager, Commercial Engineering, Tube Department, Radio Corporation of America, 5 & Sussex Sts., Harrison, N.J. Born: July 12, 1894, Monterey, Mass. S.B., 1916, Massachusetts Institute of Technology.
Fellow Award, 1947, for his
"many technical and administration contributions to the welfare of the Institute and radio field as an active chairman or member of numerous technical committees."
Committees: Annual Review, 1943-1948; Awards, 1948; Board of Editors, 1944–1951; Editorial Administrative, 1946–1951; Electronics, 1936–1941, *chairman, 1942–1945;* Subcommittee on Small High-Vacuum Tubes, 1936–1938, *chairman, 1939–1941;* Electron Tubes, *chairman, 1946–1948;* Electron Tubes and Solid-State Devices, 1949–1951; Handbook, 1945–1947; Papers Procurement, 1942–1944; Regular Papers, 1941; Standards, 1942–1949; Symbols, 1940–1941, 1943–1947; Tellers, 1942.
Institute Representative: Subcommittee No. 14 of ASA (C-42), 1947–1950.

CHARLES R. BURROWS
(A'24—M'38—SM'43—F'43)

Professor of Electrical Engineering and 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.
Fellow Award, 1943, for his
"contributions in the field of radio wave propagation, particularly for his investigations of propagation along the ground at ultra-high-frequencies."
Committees: Annual Review, 1943–1945; Circuits, 1945–1950; National Convention, 1948; Radio Wave Propagation, 1942, *chairman, 1943–1945;* Radio Wave Propagation and Utilization, 1945–1947; Standards, 1943–1945, 1949–1950; Symbols, 1940–1951; Wave Propagation, 1937–1941, *vice-chairman, 1948, chairman, 1949,* 1950, 1951.

HENRI G. BUSIGNIES
(M'42—SM'43—F'45)

Technical Director, Federal Telecommunication Laboratories, Inc., 500 Washington Ave., Nutley, N.J. Born: December 29, 1905, Sceaux, Paris, France. E.E., 1926, Institut Normal Electrotechnique, Paris.
Fellow Award, 1945, for his
"accomplishments in the field of radio direction finders, particularly pioneering work on instruments having automatic indicating features."
Committees: Annual Review, 1948; Navigation Aids, 1946, 1947, *vice-chairman, 1948, chairman, 1949,* 1950; Standards, 1948–1950.
Presidential Certificate of Merit, 1948.

HAROLD H. BUTTNER
(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, Port Costa, Calif. B.S.(E.E.), 1915, University of California.
Fellow Award, 1944, in
"recognition of his direction of radio communication activities in the international field."
Committees: Electronics, 1940; Meetings and Papers, 1929; Standards, 1938–1939.

JOHN F. BYRNE
(SM'45—F'50)

Director of Engineering, Communications and Electronics Div., Motorola, Inc., 4546 Augusta Blvd., Chicago 51, Ill. Born: October 26, 1905, Cincinnati, Ohio. B.S., 1927, M.S. (E.E.), 1928, Ohio State University.
Fellow Award, 1950, for his
"development of a system of polyphase broadcasting and for effective engineering administration in connection with radar countermeasures during the war."
Committees: Tellers, 1949.
United States Navy Certificate of Commendation, February, 1947; Presidential Certificate of Merit, September, 1948; Panel on Electronic Countermeasures Research and Development Board, Chairman, 1949–1951.

WALTER G. CADY
(A'14—F'27)

Research Associate, Department of Physics, Norman Bridge Laboratory, California Institute of Technology, Pasadena, 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.
Morris Liebmann Memorial Prize, 1928, for his
"fundamental investigations in piezoelectric phenomena and their application to radio technique."
President, 1932; Editor, 1929; Director 1928–1929, 1932–1934.
Committees: Annual Review, 1942–1949; Awards, 1928–1929, *chairman, 1930,* 1933; Bibliography, 1930–1931; Board of Editors, 1928, *chairman, 1929,* 1945; Institute Sections, 1928; Meetings and Papers, 1928–1929; Nominations, 1930, *chairman, 1933–1934,* 1939; Papers, 1931; Piezoelectric Crystals, 1941, *chairman, 1942–1949,* 1951; Standards, 1943–1951.
Sections: Connecticut Valley, *chairman, 1927–1928.*
Duddell Medal, Physical Society of London, 1936.

ORESTES H. CALDWELL
(M'28—SM'43—F'44)

Treasurer, Caldwell-Clements, Inc.; Editor, *Tele-Tech,* 480 Lexington Ave., New York 17, N.Y. Born: March 8, 1888, Lexington, Ky. B.S.(E.E.), 1908, E.E., 1931, D.E., 1933, Purdue University.
Fellow Award, 1944, for his
"contribution in broadening the horizon of the engineer by his long-continued effort to increase the use of electronic principles in industrial operations."
Manager, 1932; Director, 1932–1935.
Committees: Admissions, 1933; Annual Review, 1942–1943; Board of Editors, 1946–1951; Constitution and Laws, 1932–1933, 1935; Nominations, 1934; Public Relations, *chairman, 1942,* 1943–1946, 1949–1950; Publicity, 1931–1933, *chairman, 1934–1936,* 1937, 1939; Tellers, 1932–1933.

RICHARD D. CAMPBELL
(F'51)

Engineer, 195 Broadway, New York, N.Y. Born: May 26, 1899, Saint Louis, Mo. B.S.(E.E.), 1922, George Washington University.
Fellow Award, 1951, for his
"work in the internationally important field of radio-frequency allocations."
Committees: Industrial Electronics, 1947; National Convention, 1947; Registration, *chairman, 1946.*

WENDELL L. CARLSON
(A'36—SM'47—F'49)

Research Engineer, RCA Laboratories Division, Princeton, N.J. Born: January, 1897, Jamestown, N.Y.
Fellow Award, 1949, in
"recognition of his contributions over many years to the development of radio receivers and their components."
Committees: Radio Receivers, 1946–1947.

E. FINLEY CARTER
(A'23—F'36)

Vice-President, Engineering, Sylvania Electric Products Inc., 1740 Broadway, New York 19, N.Y. Born: July 1, 1901, Elgin, Tex. B.S., 1922, Rice Institute.
Director, 1943–1945.
Committees: Admissions, 1944; Constitution and Laws, 1945–1948; Executive, 1944–1945; National Convention, 1947–1948; Professional Recognition, 1947; Editorial Administrative, 1949–1950.

PHILIP S. CARTER
(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.
Fellow Award, 1949, for his
"many contributions in the fields of radio transmission and communication systems."
Committees: Annual Review, 1945–1948; Antennas, *chairman, 1945–1948;* Antennas and Waveguides, 1949–1951; Board of Editors, 1937–1948; Standards, 1945–1951; Professional Group on Antennas and Propagation, 1949. Technical Program Committee, National Convention, 1949.
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.

E. LEON CHAFFEE
(M'17—F'21)

Professor of Applied Physics; Director of Laboratories of Engineering Sciences and Applied Physics, 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, 1936–1945; Membership, 1925; Papers, 1918–1919; Papers Procurement, 1942–1943; Regular Papers, 1941; Research, 1949–1950; Standardization, 1927–1931; Symbols, 1940–1943; Technical Committee, No. 3, Vacuum Tubes, 1930; Vacuum Tubes, 1945.
Sections: Boston, *chairman, 1932–1935.*
Institute Representative: Harvard University, 1941–1951.
Longstreth Medal of Merit, Franklin Institute, 1912.

ADOLPH B. CHAMBERLAIN
(A'27—M'30—F'41)

Chief Engineer, General Engineering Department, Columbia Broadcasting System, Inc., 485 Madison Ave., New York 22, N.Y. Born: February 3, 1901, Franklin, Mass.
Fellow Award, 1941, for his
"engineering leadership in broadcast transmission and operation."
Director, 1941–1944.
Committees: Admission, 1940–1941; Annual Review, 1947–1948; Awards, 1942; Broadcast, *alternate, 1932;* Constitution and Laws, 1947; Frequency Modulation, 1940–1941; Membership, 1949–1950; National Convention, 1947; New York Program, 1938–1939, *chairman, 1940,* 1941–1942; Papers, 1942; Professional Groups, 1948–

1949, 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, 1929–1930; Standards, 1946, *chairman, 1947–1949,* 1950; Tellers, *chairman, 1942;* Transmitters and Antennas, 1936.

Sections: Buffalo-Niagara, *chairman, 1930-1931;* Rochester, *chairman, 1928–1929.*

Institute Representative: ASA Standard Council, 1948–1949; ASA Section Committee on Definitions of Electrical Terms, 1948–1949.

DUDLEY E. CHAMBERS
(M'41—SM'43—F'48)

Executive Engineer, Research Laboratory, General Electric Company, The Knolls, Schenectady, N.Y. Born: November 27, 1905, Kansas City, Mo. A.B., 1927, E.E., Stanford University.

Fellow Award, 1948, for the
"outstanding leadership he has provided in the translation of research to engineering in one of the country's large industrial laboratories."

Committees: Awards, 1948–1951; Research, *chairman, 1949;* Standards, 1949–1950.

Fellow, AIEE, 1948.

HOWARD A. CHINN
(A'42—SM'45—F'45)

Chief Audio-Video Engineer, Columbia Broadcasting System, Inc., 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.

Fellow Award, 1945, for his
"contributions to improved broadcasting."

Committees: Admissions, 1945–1948; Audio and Video Techniques, *chairman, 1948;* Education, 1945; Membership, 1934, 1936–1938; Papers, 1935–1940, 1944–1945; Papers Review, 1946–1951; Professional Groups, 1948; Standards, 1948; Tellers, 1946, *chairman, 1947.*

JAMES K. CLAPP
(A'24—M'28—F'33)

Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass. Born: December 30, 1897, Denver, Colo. S.B., 1923, S.M., 1926, Massachusetts Institute of Technology.

Committees: Papers, 1931–1945; Papers Review, 1946–1951; Piezoelectric Crystals, 1940–1951; Standards, 1934–1935.

ANDRÉ G. CLAVIER
(M'30—F'39)

Technical Assistant to the President, Federal Telecommunication Laboratories, Inc., 500 Washington Ave., Nutley 10, N.J. Born: February 15, 1894, Cambrai, France. Licencié-es-sciences physiques et mathématiques, 1918, Paris; Ingénieur de l'Ecole Supérieure d'Electricité, 1920, Paris.

Committees: Admissions, 1951; Symbols, 1949–1950, *vice-chairman, 1950–1951, chairman, 1951.*

President, Fifth Section, Société des Radioélectriciens, Paris, 1945–1947. Member, IEE (Great Britain).

LEWIS M. CLEMENT
(A'14—M'17—F'26)

Technical Advisor to the General Manager, Crosley Division, Avco Manufacturing Corporation, 1329 Arlington St., Cincinnati 25, Ohio. Born: January 25, 1892, Oakland, Calif. B.S.(E.E.), 1914, University of California.

Director, 1945.

Committees: Board of Editors, 1941–1951; Electro-Acoustic Devices, 1930–1931; Meetings and Papers, 1929; Papers Procurement, 1948–1950; Receiving Sets, 1927–1928; Regular Papers, 1941; Standardization, 1929–1930; Vacuum Tubes, 1929–1930.

Sections: Cincinnati, *chairman, 1945.*

IVAN S. COGGESHALL
(A'26—M'29—F'42)

General Traffic Manager, Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y. Born: September 30, 1896, Newport, R.I.

Fellow Award, 1942, for his
"services to the welfare of the Institute and the engineering profession."

President, 1951; Director, 1941–1944, 1951.

Committees: Admissions, 1934–1935, 1941–1942; Annual Review, 1944–1947; Building Fund, *vice-chairman, 1945;* Constitution and Laws, 1942, 1945–1947, *chairman, 1948,* 1949, *chairman, 1950;* Executive, 1942; *chairman, 1951;* Finance, 1948–1951; Membership, 1928, *chairman, 1929–1930,* 1931, *chairman, 1934–1935,* 1936–1940, *chairman, 1941;* National Convention, *vice-chairman, 1948;* New York Program, 1938, *chairman, 1939,* 1940; Nominations, 1944; Papers, 1942–1945; Papers Procurement, *group chairman, 1945,* 1946; Papers Review, 1946–1947; Professional Groups, 1950; Public Relations, *chairman, 1943–1945,* 1946; Sections, 1933–1935, 1938–1942; Standards, 1945–1946.

Fellow, AIEE.

JOHN B. COLEMAN
(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.

Fellow Award, 1948, for his
"contribution through development, design and technical direction of work in the field of radio transmitters."

Director, 1948–1949.

Committees: Broadcast, 1933; Membership, 1949–1951.

Sections: Philadelphia, *chairman, 1942–1943.*

ELLSWORTH D. COOK
(A'21—VA'39—F'41)

Division Engineer, High-Frequency Division, 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.

Fellow Award, 1941, for his
"contributions to a wide range of important radio engineering projects."

Committees: Admissions, 1944–1948; Membership, 1936–1939, *chairman, 1940,* 1942–1943, *chairman, 1944–1945,* 1946–1948; Sections, 1935, 1937, *chairman, 1938–1939,* 1940–1948; Standards, 1932–1933.

Sections: Philadelphia, *chairman, 1934–1935.*

Institute Representative: ASA Sectional Committee on Acoustical Measurements and Terminology, 1936–1937, 1939–1946.

ADOLFO T. COSENTINO
(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, 1940–1941, 1947–1948.

Sections: Buenos Aires, *chairman, 1940–1941;* 1947–1948.

TUNIS A. M. CRAVEN
(F'29)

Partner, Craven, Lohmes 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, 1932–1941; Radio Transmitters and Antennas, 1930–1931; Standardization, 1929–1930; Subcommittee on Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, 1929–1930; Subcommittee on Nomenclature, Symbols and Definitions, *chairman, 1929–1930.*

MURRAY G. CROSBY
(A'25—M'38—SM'43—F'43)

Radio-Electronic Consultant; President, Crosby Laboratories, Inc., 126 Herrick Rd., Mineola, L.I., N.Y. Born: September, 1903, Elroy, Wis. B.S., 1927, E.E., 1943, University of Wisconsin.

Fellow Award, 1943, for his
"contributions to the development of high-frequency radio communications, including a careful study of frequency modulation."

Director, 1947–1949.

Committees: Admissions, 1945–1946; Annual Review, 1946–1947; Appointments, *chairman, 1948;* Awards, 1950-1953, *chairman, 1950;* Board of Editors, 1946–1951; Editorial Administrative, 1946–1949; Executive, 1949; Frequency Modulation, 1940–1945, *chairman, 1946;* Modulation Systems, *chairman, 1947,* 1948–1950; National Convention, 1948; Papers, 1944–1945; Papers Procurement, 1945; Papers Review, *chairman, 1946–1948,* 1949–1951; Policy Development, 1948–1949; Professional Groups, 1948; Standards, 1946–1948.

Modern Pioneer Award, National Association of Manufacturers, 1940.

A. EARL CULLUM, JR.
(J'28—A'31—SM'45—F'48)

Consulting Radio Engineer, Highland Park Village, Dallas 5, Tex. Born: September, 1909, Abilene, Texas. B.S. (Communications Engineering), 1931, Massachusetts Institute of Technology.

Fellow Award, 1948, for his
"contribution to the wartime radio-countermeasures program."

Director, 1948.

Committees: Annual Review, 1948; Education, 1945; Radio Wave Propagation and Utilization, 1946–1947; Standards, 1948; Wave Propagation, *chairman, 1948,* 1949–1951; Policy Development, 1949–1950; Nominations, 1949–1950

Presidential Certificate of Merit, 1948.

FULTON CUTTING
(M'15—F'21)

Professor of Physics and Assistant to the President for Research, Stevens Institute of Technology, Hoboken, N.J. Born: December 27, 1886, New York, N.Y.

President, 1922; Vice-President, 1921; Manager, 1920; Director, 1921–1924.

Committees: Education, 1944; Investments, 1944–1946.

RALPH W. DEARDORFF
(F'51)

Transmission and Protection Engineer, The Pacific Telephone and Telegraph Company, 509 South West Oak St., Portland, Ore. Born: August 9, 1894, Portland, Ore.

Fellow Award, 1951, for his
"technical contributions to communications and his work on behalf of the radio engineering profession."

Sections: Portland, *chairman, 1942–13; vice-chairman, 1946–1947.*

LEE de FOREST
(M'14—F'18) (L'49)

United Engineering Labs, 1027 No. 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, Ala.

Medal of Honor, 1922, for his
"major contributions to the communications arts and sciences, as particularly exemplified by his invention of that outstandingly significant device: the three-electrode vacuum tube, and his work in the fields of radio-telephonic transmission and reception."

Edison Medal, 1947; President, Society of Wireless Telegraph Engineers, 1909–1910.

President, 1930; Director, 1930–1932.

Committees: Specifications for Steamship Radio Equipment, 1914; Wave Length Regulations, 1916.

FERNAND E. d'HUMY
(A'41—SM'45—F'49)

Director, Western Union Telegraph Co., Western Union Telegraph Company, 60 Hudson St., New York 13, N.Y. Born: August, 1873, London, England.

Fellow Award, 1949, in
"recognition of his long service in the communications field and for pioneering in the application of radio relays to telegraph message service."

JOHN HOWARD DELLINGER
(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.

Medal of Honor, 1938, for his
"contributions to the development of radio measurements and standards, his researches and discoveries of the relation between radio-wave propagation and other natural phenomena, and his leadership in international conferences contributing to world-wide co-operation in telecommmunications."

President, 1925; Vice-President, 1924; Director, 1924–1927, Manager, 1928–1931.

Committees: Annual Review, 1938–1943; Awards, 1934, 1936; Bibliography, 1930, *chairman, 1931,* 1932, 1934; Meetings and Papers, 1926, *chairman, 1928;* Nominations, 1928, *chairman, 1931,* 1935; Radio Wave Propagation, *chairman, 1942,* 1945; Receiving Sets, 1927; Revision of the Constitution, *chairman, 1927;* Standardization, 1920–1925, 1927–1928, *chairman, 1929–1930,* 1931; Standards, 1932, 1934–1941, 1943; Symbols, 1940–1941, 1943–1948; Use of the Transmission Unit, 1928; Wave Propagation, *chairman, 1937–1941.*

Sections: Washington, D.C., *chairman, 1932–1933.*

Institute Representative: American Documentation Institute, 1944–1951; ASA Sectional Committee on Electric and Magnetic Magnitudes and Units, 1936–1937, 1939–1948.

EDMOND M. DELORAINE
(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, 1944–1945; International Liaison, 1947; Membership, 1927.

JOHN H. DE WITT
(A'31—M'38—SM'43—F'51)

President, WSM Incorporated, 7th and Union Sts., Nashville, Tenn. Born: February 20, 1906, Nashville, Tenn.

Fellow Award, 1951, for his
"achievements in the field of radio broadcast engineering and for his demonstration of radar reflections from the moon."

Professional Groups: 1948.

Sigma Xi, 1949.

WILLIAM F. DIEHL
(A'19—M'29—F'36)

Assistant Vice-President, Airplane and Marine Instruments, Inc., 1014 S. 2 St., Clearfield, Pa. Born: December 18, 1896, New York, N.Y.

Committees: Building Fund, 1945; Radio Transmitters and Antennas, 1929–1930; Subcommittee, Receiving Sets, 1928.

Sections: Philadelphia, *chairman, 1933–1934; convention chairman, 1934.*

United States Navy Certificate Commendation.

WILLIAM H. DOHERTY
(A'29—M'36—SM'43—F'44)

Director of Electronic and Television Research, 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.

Fellow Award, 1944, for his
"contributions to the development of radio transmitting equipment."

Morris Liebmann Memorial Prize, 1937, for his
"improvement in the efficiency of radio-frequency power amplifiers."

Director, 1951.

Committees: Membership, 1943–1946; Policy Development, 1951; Professional Groups, 1948–1951.

ROBERT B. DOME
(A'27—M'38—SM'43—F'48)

Electrical Consultant and Section Engineer, Receiver Division, Electronics Department, General Electric Company, P.O. Box 1122, 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.

Fellow Award, 1948, for his
"many technical contributions to the profession and for his accomplishments in the training of young engineers."

Committees: Board of Editors, 1946–1951; Papers, 1940–1945.

Sigma Xi, 1926; Coffin Awards, 1936 and 1948.

HERBERT GROVE DORSEY
(M'19—F'34)

Instructor in Physics, Capitol Radio Engineering Institute, 3224 16 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, 1930–1932; chairman, 1933.*

Washington Academy of Sciences, Section Representative, Vice-President, 1941–1951.

First Annual Award, Washington Society of Engineers, 1941; Fellow: American Physical Society; Acoustical Society of America; AIEE.

JENNINGS B. DOW
(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, Harvard University.

Fellow Award, 1942, for his
"engineering accomplishments in the development and procurement of radio equipment for the United States Navy."

WILLIAM G. DOW
(M'39—SM'43—F'50)

Professor, Department of Electrical Engineering, University of Michigan, Ann Arbor, Mich. Born: September 30, 1895, Fairbault, Minn. B.S.(E.E.), 1916, University of Minnesota, M.S.E.(E.E.), 1929, University of Michigan.

Fellow Award, 1950, for his
"outstanding contributions to the teaching and understanding of electronics through the organization of educational material and the stimulation of students and others to critical thought."

Committees: Board of Editors, 1944–1951; Electronics, 1939–1945; Electron Tubes, 1946–1947; Electron Tubes and Solid-State Devices, 1949–1951; Papers, 1941–1944, Research, 1949–1950; Vacuum Tubes, 1945–1946.

Fellow, AIEE.

WILLIAM DUBILIER
(A'14—M'18—F'29)

Vice-President and Technical Director, Cornell-Dubilier Electric Corporation; President, Radio Patents Corporation; President, Patents Research Corporation; President, Koldweld Corporation, 10 E. 40 St., New York 16, N.Y. Born: July 25,1888, New York, N.Y. Attended Cooper Institute, New York, N.Y.

Fellow, AIEE, 1925.

Recipient French Legion of Honor and made Officer of the French Academy, July, 1949.

ALLEN B. DUMONT
(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, 1929–1931; Standards, 1932–1933; Television, 1939–1945.

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; Member, National Television Systems Committee, 1940–1944.

GANO DUNN
(F'15) (L'50)

President, The J. G. White Engineering Corporation, 80 Broad St., New York 4, N.Y.; President, Cooper Union for the Advancement of Science and Art, New York, N.Y. B.S., 1889, M.S., 1897, College of the City of New York; E.E., 1891, Columbia University; D.Sc. (Honorary), 1938, Columbia University; D.Sc. (Honorary), 1938, Rutgers University; D.Sc. (Honorary), 1941, New York University; D.Eng. (Honorary), 1942, Lehigh University; D.Sc. (Honorary), 1947, College of the City of New York; LL.D. (Honorary), 1947, Bowdoin College.

Honorary Members, Association of Iron and Steel Engineers, 1930; Honorary Member, ASME, 1944; Honorary Member, AIEE, 1945; Honorary Member, ASCE, 1948; Townsend Harris Medal, College of the City of New York, 1933; Edison Medal, 1937; Hoover Medal, 1939; Egleston Medal, Columbia University, 1939; Modern Pioneer Award, National Association of Manufacturers, 1940; Peter Cooper Medal, 1950.

JOHN N. DYER
(J'30—A'32—SM'45—F'49)

Director, 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.

Fellow Award, 1949 for his
"administrative and technical contributions to radio including polar expedition communications and important wartime radio countermeasures."

Committees: Navigation Aids, 1949–1950.

Sections: Long Island Subsection, *vice-chairman, 1949, chairman, 1950.*

MELVILLE EASTHAM
(A'13—M'13—F'25) (L'50)

8 Graygardens East, Cambridge, Mass. Born: June 26, 1885, Oregon City, Ore. Dr.Eng. 1946 (Honorary), Oregon State College.

Medal of Honor, 1937, for his
"pioneering work in the field of radio measurement, his constructive influence on laboratory practice in communication engineering, and his unfailing support of the aims and ideals of the Institute."

Treasurer, 1927–1940; Manager, 1922–1926; Director, 1927–1941; Administrator, Building Fund, 1947–1948.

Committees: Admissions, 1937–1939, 1941–1942; Awards, *chairman, 1929,* 1931, 1935, 1939, *chairman, 1941,* 1942; Bibliography, 1930–1931, *chairman, 1932,* 1934; Constitution and Laws, 1930–1931; Education, 1944–1948; Nominations, *chairman, 1929,* 1930, 1932, *chairman, 1935,* 1936, 1938–1939, 1941, 1949–1950; Papers, 1916–1919; Revision of the Constitution, 1925; Sections, 1925; Standardization, 1925, 1927–1928, 1930; Subcommittee on Electro-Acoustic Devices, 1927–1928; Subcommittee on Circuit Elements, 1928; Technical Committee No. 4 on Electro-Acoustic Devices, 1929–1930; Standards, 1936–1938; Wave Length Regulation, 1916.

Sections: Boston, *secretary, 1914–1915; secretary-treasurer, 1916–1929; secretary, 1930–1932.*

Institute Representative: Engineering Index National Committee, 1926, 1939–1943; Radio Broadcasting Committee, American Engineering Council, 1930, 1936, 1939, 1940; United States National Committee, Advisers on Electrical Measuring Instruments, 1936, 1939–1950.

New England Engineering Award, 1948; Medal for Merit, 1948.

AUSTIN V. EASTMAN
(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, 1950–1951.

Committees: Admissions, 1951; Awards, 1951; Membership, 1941–1948; Papers Procurement, 1942–1943; Policy Development, 1949–1951; Regular Papers, 1941.

Sections: Seattle, *chairman, 1929–1930.*

Institute Representative: University of Washington, 1941–1947.

PETER PENDLETON ECKERSLEY
(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.

Premium Prize Award, Institution of Electrical Engineers, 1928, 1930.

CORNELIUS D. EHRET
(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.

BENNETT S. ELLEFSON
(A'38—M'44—F'48)

Director of Central Engineering Laboratories, Sylvania Electric Products Inc., 40-22 Lawrence St., Flushing, 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.

Fellow Award, 1948, for his
"contributions to cathode-ray tube development, proximity-fuze tube design, and wartime electronic research."

Committees: Annual Review, 1946–1947.

HAROLD F. ELLIOTT
(F'51)

Consulting Engineer, 1216 Webster St., Palo Alto, Calif. Born: June 17, 1892, Durango, Calif. B.A., Stanford University.

Fellow Award, 1951, for his
"contributions of important mechanical advances in both the civil and the military electronic arts."

CYRIL F. ELWELL
(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, 1913–1914.

CARL R. ENGLUND
(A'17—F'28)

Retired. Formerly, Technical Staff, Bell Telephone Laboratories, Inc. Born: November 13, 1884, Sioux City, Iowa. B.S., 1909, University of South Dakota.

Committees: Fundamental Units and Measurements, 1933.

ELMER W. ENGSTROM
(A'25—M'38—F'40)

Vice-President in Charge of Research, RCA Laboratories Division, 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, N.Y.U., N.Y.

Director, 1949.

Committees: Awards, 1945, *chairman, 1946,* 1947–1949; Board of Editors, 1940–1951; Nominations, 1947; Public Relations, 1940; Regular Papers, 1941; Research, 1946–1947, 1950; Television and Facsimile, 1936–1938; Television, 1939–1940.

LLOYD ESPENSCHIED
(M'12—F'24)

Research Consultant, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y. Born: April 27, 1889, St. Louis, Mo. Pratt Institute, 1909.

Medal of Honor, 1940, for his
"accomplishments as an engineer, as an inventor, as a pioneer in the developments of radio-telephony, and for his effective contributions to the progress of international radio co-ordination."

Manager, 1912–1913, 1915–1926, 1931.

Committees: Admissions, 1942–1947; Awards, 1919; Editing, 1914; Increase of Membership, 1917–1918; Radio Telephone and Receiver Terminology, *chairman, 1924–1925;* Revision of the Constitution, 1925; Standardization, 1924–1925; Wave Length Regulation, 1916, 1919.

Sections: New York, *chairman, 1944–1945.*

Institute Representative: National Advisory Council on Radio in Education, 1936–1937, 1939–1940; Committee on Engineering Developments, 1941–1943.

AIEE Award (co-receiver), 1945; Medal Award, Television Broadcasters Association, 1944.

PORTER H. EVANS
(M'23—F'31)

Engineer, Western Electric Company, 120 Broadway, New York 5, N.Y. Born: January 11, 1891, Erie, Pa. B.S.(E.E.), 1914, M.S., 1920, University of Michigan.

Committees: Standardization 1930–1931.

WALTER C. EVANS
(M'26—SM'43—F'45)

Vice-President, Westinghouse Electric Corporation; President, Westinghouse Radio Stations, Inc., Box 416, Baltimore 3, Md. Born: August 27, 1898, Columbus, Ohio.

Fellow Award, 1945, in
"recognition of his past contributions to radio and his present active participation in the affairs of the Institute."

Committees: Awards, 1948; Public Relations, 1947.

WILLIAM L. EVERITT
(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, 1942–1947, 1949–1951.

Committees: Awards, 1943, *chairman, 1944,* 1948, 1949; Board of Editors, 1941–1951; Circuit, 1944–1951; Education, *chairman, 1944,* 1950; Executive, *chairman, 1945;* Frequency Modulation, 1941–1945; Investments, 1945; Membership, 1942–1943; Nominations, 1942, 1946, *chairman, 1948,* 1949–1950; 1941–1942; Papers Procurement, *vice-chairman, 1943–1945;* Policy Development, 1948–1951; Professional Groups, *chairman, 1947–1949,* 1950–1951; Public Relations, 1951; Regular Papers, *vice-chairman, 1941;* Research, 1946–1947.

Institute Representative: Ohio State University, 1941–1942; AIEE-IRE Co-ordinating Committee, 1950-1951.

PHILO T. FARNSWORTH
(A'28—M'34—F'39)

Director and Vice-President in Charge of Research and Advanced Development Engineering, Capehart-Farnsworth Corporation, 3700 E. Pontiac St., Fort Wayne, Ind. Born: August 19, 1906, Beaver, Utah.

Morris Liebmann Memorial Prize, 1941, for his
"contributions in the field of applied electronics."

Committees: Television, 1939-1941; Television and Facsimile, 1936-1938.

Honorable Mention Citation for Outstanding Young Electrical Engineer, 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.

CLAIR L. FARRAND
(A'14—M'23—F'31)

President, Farrand Optical Co., Inc., Bronx Blvd. and E. 238 St., New York 70, N.Y. Born: October 22, 1895, Newark, N.J.

JOHN J. FARRELL
(A'43—SM'47—F'48)

Engineer, Commercial Products, Commercial Equipment Division, Electronics Department, General Electric Company, Electronics Park, Syracuse, N.Y. Born: March, 1897, Watervliet, N.Y.

Fellow Award, 1948, for his
"contributions to the design of radio and radar transmitters, and for his leadership in the establishing of industry standards."

Committees: RMA-IRE Co-ordination, 1945-1947; Nominating, 1947.

Institute Representative: ASA Sectional Committee (C16) on Radio, 1949-1950.

JOHN F. FARRINGTON
(A'19—M'29—F'31)

Engineer, Raytheon Manufacturing Company, Waltham, Mass. Born: January 11, 1895, New York, N.Y. Licensed Professional Engineer, New York State Education Department, 1931.

Committees: Admissions, 1938-1939; New York Program, 1939.

CARL B. H. FELDMAN
(A'26—VA'39—F'43)

Transmission 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.

Fellow Award, 1943, for his
"investigations of the characteristics of radio waves and his developments in antennas and receiving systems."

CLIFFORD G. FICK
(F'51)

Head, Communications Research Division, Research Laboratory, General Electric Company, Schenectady, N.Y. Born: December 13, 1904, Ida Grove, Iowa. B.Sc.(E.E.), 1925, Iowa State College.

Fellow Award, 1951, for his
"leadership and contributions in the development and design of a wide variety of radio and radar equipment."

Committees: Annual Review, 1949-1950. Television Systems, 1948-1951.

ROBERT F. FIELD
(A'18—M'20—SM'43—F'47)

Retired. Formerly, Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge 39, Mass. Born: July 10, 1885, Tuftonboro, N.H. A.B., 1906, A.M., 1907, Brown University; A.M., 1916, Harvard University.

Fellow Award, 1947,
"as an engineer and physicist, who improved methods and standards in alternating current measurements."

Committees: Meetings and Papers, 1930.

Sections: Boston, *chairman, 1912–1914.*

DONALD G. FINK
(A'35—SM'45—F'47)

Editor-in-Chief, *Electronics,* 330 W. 42 St., New York 18, N.Y. Born: November 8, 1911, Englewood, N.J. B.Sc., 1933, Massachusetts Institute of Technology; M.S., 1942, Columbia University.

Fellow Award, 1947, in
"recognition of his espousal of high standards of technical publishing and for his wartime contributions in the field of electronic aids to navigation."

Director, 1949-1951.

Committees: Annual Review, 1946-1948; Appointments, 1948-1949; Awards, 1947; Board of Editors, 1946-1951; Handbook, 1945-1947; Joint Technical Advisory, 1948-1951, *vice-chairman, 1948, chairman, 1949;* Membership, 1942-1945, *chairman, 1946,* 1947-1948; Navigation Aids, *chairman, 1946-1947,* 1948-1951; Papers, 1943-1945; Preparedness, 1940-1941; Public Relations, 1940-1942; Research, 1946-1947; Standards, 1946-1948; Television, 1946-1947, *chairman, 1948;* Television Systems, 1949-1951; Tellers, 1949.

Medal of Freedom, War Department, 1946; Presidential Certificate of Merit, 1948.

SIR ERNEST T. FISK
(M'15—F'26)

Managing Director, Electric and Musical Industries, Ltd., Blyth Rd., Hayes, Middlesex, England. Born: August 8, 1886, Sunbury-on-Thames, Middlesex, England.

Vice-President, 1938; Director, 1938.

Fellow, IRE, Australia; President, 1932-1937, 1939-1943. Honorary Member, Institution of Electrical Engineers, London; Honorary Member, British Institution of Radio Engineers.

HENRY C. FORBES
(A'20—M'29—SM'43—F'48)

President, Forbes and Wagner, Inc., 339 Central Ave., Silver Creek, N.Y. Born: February 27, 1899, Rockland, Mass. B.S., 1922, E.E., 1923, University of Minnesota.

Fellow Award, 1948, for his
"contributions as an engineer and executive in the field of home and automobile broadcast receivers and military radio equipment."

Director, 1940.

Committees: Board of Editors, 1946-1951; Membership, 1950-1951; Public Relations, 1947; Receivers, 1941-1947.

DUDLEY E. FOSTER
(A'26—M'37—SM'43—F'50)

Vice-President, Hazeltine Research, Inc., of California, 2120 Cahuenga Blvd., Los Angeles 28, Calif. Born: December, 1900, Newark, N.J. E.E., 1922, Cornell University.

Fellow Award, 1950, for his
"contributions and technical direction of work leading to better radio receiver design."

Committees: Annual Review, 1938-1941, 1945-1946; New York Program, 1937; Papers Procurement, 1941-1943; Radio Receivers, 1936-1937, *chairman, 1938-1941,* 1942-1945, *chairman, 1945-1946,* 1947; Regular Papers, 1941; Standards, 1938-1941, 1945-1946; Television, 1939-1946; Television and Facsimile, 1938.

Modern Pioneer Award, National Association of Manufacturers, 1940.

HARALD T. FRIIS
(A'18—M'26—F'29)

Director of Radio Research, Bell Telephone Laboratories, Inc., Box 107, Red Bank, N.J. Born: February 22, 1893, Naestved, Denmark. E.E., 1916, Dr. Eng., 1938, Royal Technical College, Copenhagen, Denmark.

Morris Liebmann Memorial Prize, 1939, for his
"investigations in radio transmission including the development of methods of measuring signals and noise and the creation of a receiving system for mitigating selective fading and noise interference."

Director, 1941-1943.

Committees: Admissions, 1941; Papers, 1941; Research, 1946-1947.

LEONARD F. FULLER
(A'14—M'14—F'25)

Acting Professor of Electrical Engineering and Co-ordinator of Government Research Contracts, Stanford University, Stanford, Calif. Born: August 21, 1890, Portland, Ore. M.E., 1912, Cornell University; Ph.D., 1919, Stanford University.

Morris Liebmann Memorial Prize, 1919, for his
"contributions to long-distance radio communication."

Manager, 1928.

Committees: Admissions, 1928-1929; Sections, 1926-1928; Specifications for Steamship Radio Equipment, 1914; Standardization, 1916-1919, 1930; Technical Committee No. 2, Radio Transmitters and Antennas, 1930-1931; Subcommittee on the Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, 1930-1931; Subcommittee on Methods of Testing Apparatus, Equipment, Devices, and Materials Used in Radio Transmitters and Antennas, 1930-1931; Transmitters and Antennas, 1929-1930; Wave Length Regulation, 1916, 1919.

Sections: San Francisco, *chairman, 1928–1929.*

LOUIS AUGUST GEPHARD
(A'20—M'42—SM'43—F'49)

Superintendent, Radio Division II, United States Naval Research Laboratory, Washington, D.C. Born: June, 1896, Buffalo, N.Y. B.S.(E.E.), George Washington University; LL.B. Georgetown University.

Fellow Award, 1949, for his
"pioneering work in the military application of radio."

Presidential Certificate of Merit, 1946; Fellow, American Physics Society.

ARCHIBALD J. GILL
(M'20—F'40)

Assistant Director General (Engineering) and Engineer-in-Chief, General Post Office, London, E.C. 1, England. Born: May 13, 1889, Stoke-Sub-Hamdon, Somerset, England. B.Sc. (Engineering), University of London, 1909.

GLENN D. GILLETT
(A'22—M'27—F'34)

Senior Partner, Glenn D. Gillett and Associates, Consulting Radio Engineers, 982 National Press Bldg., Washington 4, D.C. Born: April 14, 1898, Sterling, Colo. A.B., 1919, Harvard College; S.B.(E.E.), 1921, Harvard Engineering School.

Committees: Broadcast, 1935, 1937; Radio Wave Propagation, 1942-1945; Wave Propagation, 1937-1941.

GEORGE W. GILMAN
(A'29—SM'47—F'50)

Director of Transmission Engineering, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N.Y. Born: August, 1901, Salmon River, Nova Scotia, Canada. M.S., 1923, Massachusetts Institute of Technology.

Fellow Award, 1950, for his
"contributions to the communication art and for his direction of important developments in the field of radio transmission systems."

Committees: Board of Editors, 1945-1948; Frequency Modulation, 1940-1942; Public Relations, 1940-1941; Publicity, 1941.

EDWARD L. GINZTON
(F'51)

Professor of Applied Physics; Director, Microwave Laboratory, Stanford University, Stanford, Calif. Born: December 27, 1915, Ekaterinoslavsk, Russia. B.S., 1936, M.S., 1937, University of California; E.E., 1938, Ph.D., 1940, Stanford University.

Fellow Award, 1951, for his
"numerous contributions to the microwave art, especially in the development of high-power klystrons."

PETER G. GOLDMARK
(A'36—M'38—F'42)

Vice-President, Engineering Research and Development, 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, Vienna, Austria.

Fellow Award, 1942, for his
"contributions to the development of practical color television."

Morris Liebmann Memorial Prize, 1945, for his
"contributions to the development of television systems, particularly in the field of color."

Committees: Board of Editors, 1941-1950; Television and Facsimile, 1938; Television Systems, 1949-1951; Television, 1939-1948.

Technical Progress Medal, Television Broadcasters Association, 1944.

ALFRED N. GOLDSMITH
(M'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.

Medal of Honor, 1941, for
"his contributions to radio research, engineering, and commercial development, his leadership in standardization, and his unceasing devotion to the establishment and upbuilding of the Institute and its PROCEEDINGS."

President, 1928; Secretary, 1918-1927; Editor, 1912-1928, 1930-1951; Director, 1912-1951.

Committees: Administrative Committee of the Board of Editors, *Chairman, 1951;* Admission, 1925; Awards, 1919, 1931, *chairman, 1930,* 1932-1933, 1935, 1938; Bibliography, 1934; Board of Editors, *chairman, 1928, 1930–1951;* Constitution and Laws, *chairman, 1935,* 1936-1940; Convention Policies, 1940; Editorial Administrative, *chairman, 1946–1950;* Executive, 1942-1950, 1951; Finance, 1914, *chairman, 1915;* Fiscal, 1947-1948; Meetings and Papers, 1925-1926; Nominations, 1929, *chairman, 1930,* 1931, 1936, *chairman, 1940;* Office Quarters, 1947; Papers, *chairman, 1913–1919;* Planning, 1947; Special Papers, 1940-1941; Membership Solicitation Policy, 1945; Standardization, *secretary, 1913, chairman, 1915,* 1916-1931; Subcommittee, Circuit Elements, 1928; Standards, 1932-1936; Television and Facsimile, 1936-1938; Tellers, *chairman, 1932;* Wave Length Regulation, 1916, 1919.

Institute Representative: ASA Standards Council, 1936, 1939-1946; ASA Sectional Committee on Radio, 1936, 1939-1940, *chairman, 1942–1948;* ASA Subcommittee on Insulating Material Specifications for the Military Services, *chairman, 1943–1948;* ASA War Committee on Radio, 1943-1948; National Advisory Council on Radio in Education, 1936, 1939-1940; National Advisory Council on Radio in Education, Committee on Engineering Developments, 1941-1943; National Television Systems Committee, 1940-1943, 1950-1951; Panel 2, *chairman, 1942–1943,* 1950-1951.

Modern Pioneer Award, National Association of Manufacturers, 1940; Townsend Harris Medal, College of the City of New York, 1942; Medal Award, Television Broadcasters Association, 1945; and other awards.

THOMAS T. GOLDSMITH, JR.
(A'38—SM'46—F'49)

Director of 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.

Fellow Award, 1949, for his
"contributions in the development of cathode-ray instrumentation in the field of television."

Committees: Admissions, 1944-1947; Electronics, 1942-1945; Electron Tubes, 1946; Professional Groups, 1948; Regular Papers, 1941; Television, 1939-1946; Tellers, 1944; Vacuum Tubes, 1945-1946.

Fellow, Society of Motion Picture Engineers.

WILLIAM McH. GOODALL
(F'51)

Technical Staff, Bell Telephone Laboratories, Inc., Whalepond Road, Deal, N.J. Born: September 7, 1907, Washington, D.C. B.Sc., 1928, California Institute of Technology.

Fellow Award, 1951, for his
"researches in the fields of ionospheric phenomena and pulse communications."

Committees: New York Program, 1939–1941; Papers Review, 1946–1951; Tellers, *chairman, 1939,* 1941.

Sections: Monmouth, N.J. Subsection, *secretary-treasurer, 1950.*

VIRGIL M. GRAHAM
(A'24—M'27—F'35)

Director of Technical Relations, Sylvania Electric Products Inc., 40-22 Lawrence St., Flushing, L.I., N.Y. Born: January 22, 1902, Rochester, N.Y. Attended University of Rochester.

Director, 1935–1941, 1946–1948.

Committees: Appointments, 1948; Awards, 1940, 1947–1949; Constitution and Laws, 1940, 1944; Executive, 1948; Meetings and Papers, 1928–1929; Membership, 1949, 1950; National Convention, 1947–1950; Nominations, 1940; Papers Procurement, 1942–1943, 1946; Professional Groups, 1948–1949; Public Relations, *chairman, 1940,* 1947–1948, 1951; Publicity, 1935–1936; Radio Receivers, 1936–1940; Regular Papers, 1941; RMA-IRE Co-ordinating, *chairman, 1947;* 1948–1949; Sections, 1930–1934, *chairman, 1936–1937,* 1938–1945, 1948; Standardization, 1925, 1929–1930; Subcommittee, Aircraft Receivers, *chairman, 1929–1930;* Subcommittee Power Supply, 1928; Technical Committee No. 1 Radio Receivers and Parts, 1929–1930; Standards, 1932, 1935–1943, 1945–1947.

Sections: Rochester, *chairman, 1926–1927.*

Institute Representatives: ASA Sectional Committee on National Electrical Safety Code, Radio Broadcast Reception Equipment, (Alternate 1939–1948); ASA Sectional Committee on Radio (C60); *chairman, 1949–1950.*

Professional Groups: Broadcast and Television Receivers, 1949, 1950, *chairman, 1949–1950.*

ALFRED L. GREEN
(A'28—F'38)

Officer-in-Charge, Ionospheric Prediction Service of The Commonwealth Observatory, Mount Stromlo, Canberra, A.C.T., Australia. Born: February 3, 1905, London, England. B.Sc., 1926, M.Sc., 1929, Ph.D., 1934, D.Sc., 1944, King's College, University of London.

FREDERICK W. GROVER
(M'17—SM'43—F'49)

Professor (Emeritus) of Electrical Engineering, Union College, Schenectady, N.Y. Bureau of Standards, 1902–1907; 1908–1911. 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.

Fellow Award, 1949, for his
"long activities and contributions in the field of electrical units and measurements, and for his publications."

Committees: Board of Editors, 1932–1950; Papers, 1941–1945.

Institute Representative: Union College, N.Y., 1941–1948.

E. A. GUILLEMIN
(A'41—SM'48—F'49)

Professor of Electrical Communications, Massachusetts Institute of Technology, Cambridge, 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).

Fellow Award, 1949, for his
"outstanding work in the field of electric circuit analysis and synthesis, and for his inspired leadership as a teacher."

Committees: Annual Review, 1944–1946; Circuits, *chairman, 1944–1947,* 1947–1951; Education, 1947–1948; Standards, 1944–1946.

Institute Representative: Massachusetts Institute of Technology, 1941–1950.

Presidential Certificate of Merit, 1948.

ROSS GUNN
(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.

Fellow Award 1949, for his
"long service and many technical contributions in the radio and electronics fields."

Distinguished Service Citation, United States Navy, 1945.

GILBERT E. GUSTAFSON
(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.

RAYMOND F. GUY
(A'25—M'31—F'39)

Manager, Radio and Allocation Engineering, National Broadcasting Company, 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, 1944–1948, 1950–1951.

Committees: Annual Review, 1943–1946; Antennas, 1944–1947; Broadcasting, 1929–1932; Building Fund, 1948; Constitution and Laws, 1945, *chairman, 1946,* 1947–1948; Education, 1945–1948; Executive, 1946, *vice-chairman, 1947, chairman, 1950,* 1951; Fiscal, 1947–1948; Finance, 1951; Founders, *chairman, 1947–1950;* Frequency Modulation, 1942–1946; Membership, 1947–1948, *chairman, 1949;* Modulation Systems, 1947–1950; Nominations, 1951; Office Practices, *chairman, 1947;* Professional Groups, 1951; Public Relations, *chairman, 1949,* 1951; Standards, 1943–1945, *chairman, 1945–1946;* Radio Transmitters, *chairman, 1944–1945;* Transmitters and Antennas, 1936–1942, *chairman, 1943–1944;* Winter Technical Meeting, 1946.

Institute Representatives: ASA Standards Council, *alternate, 1946–1948;* Joint Technical Advisory Committee, 1950.

RALPH A. HACKBUSCH
(A'26—M'30—F'37)

President and Managing Director, Stromberg-Carlson Company, Ltd., 211 Geary Ave., Toronto 4, Ont., Canada. Born: September 18, 1900, Hamilton, Ont., Canada.

Vice-President, 1944. Director, 1938, 1944–1946.

Committees: Admissions, 1940; Awards, 1947–1950; Public Relations, 1940, 1947–1951; Sections, 1936–1937; Standards, 1949–1951.

Sections: Toronto, *secretary, 1930–1931; chairman, 1932–1933.*

ANDREW V. HAEFF
(A'34—M'40—SM'43—F'49)

Head, Electron Tube Laboratory, Hughes Aircraft Company, Culver City, Calif. Born: December, 1904, Moscow, Russia. E.E. and M.F., 1928, Russian Polytechnic Institute, Harbin, China; M.S.(E.E.), 1929, Ph.D., 1932, California Institute of Technology.

Fellow Award, 1949, for his
"contributions to ultra high-frequency radio tubes and electronics."

Committees: Board of Editors, 1951; Editorial Administrative, 1949–1950; Nuclear Studies, 1948.

Special Research Fellowship, California Institute of Technology, 1932–1933; Harry Diamond Memorial Award, 1950.

HENRY E. HALLBORG
(F'45)

Retired. Formerly, Research and Engineering Consultant on High-Frequency Propagation, and Associated Equipments to RCA Laboratories Division, Radio Corporation of America, 66 Broad St., New York, N.Y. Born: April, 1884, Stockholm, Sweden. B.Sc.(E.E.), 1907, Brown University.

Committees: Constitution and Laws, 1928–1932; Radio Transmitters and Antennas, 1930–1931; Standardization, 1929–1930; Subcommittee on the Establishment of Provisions for Safety of Operating and Other Personnel in Relation to Radio Transmitting Equipment, *chairman, 1930–1931;* Subcommittee on Methods of Testing Apparatus, Equipment, Devices, and Materials Used in Radio Transmitters and Antennas, 1930–1931; Transmitters and Antennas, 1930.

GEORGE L. HALLER
(A'28—M'36—SM'43—F'50)

Dean, School of Chemistry and Physics, The Pennsylvania State College, 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 College.

Fellow Award, 1950, for his
"work on aircraft antennas and for his diversified radio effort during the war."

Committees: Papers Review, 1946–1950.

Sections: Dayton, *chairman, 1944–1945;* Centre County (subsection), *chairman, 1949–1950.*

Legion of Merit, United States Air Force, 1946.

CLARENCE W. HANSELL
(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, Purdue University.

Fellow Award, 1945, for his
"pioneer work in the development and application of equipment for the ever higher frequencies employed for radio communication."

Joint Modern Pioneer Award, National Association of Manufacturers, 1940.

O. B. HANSON
(A'18—M'27—F'41)

Vice-President and Chief Engineer, National Broadcasting Company, 30 Rockefeller Plaza, New York, N.Y. Born: February 11, 1894, Huddersfield, Yorkshire, England.

Director, 1938–1943.

Committees: Meetings and Papers, 1929, Members, 1950; Nominations, 1944–1945, 1948; Papers, 1942–1945; Papers Procurement, 1942–1943; Papers Review, 1946–1951; Public Relations, 1940–1946; Regular Papers, 1941; Standardization, 1929; Tellers, *chairman, 1941.*

DANIEL E. HARNETT
(A'25—M'35—F'42)

General Electric Company, Electronics Park, Syracuse, N.Y. Born: July 20, 1899, Elmira, N.Y. A.B., 1922, E.E., 1925, Columbia University.

Fellow Award, 1942, in
"recognition of his outstanding direction of radio engineering activities."

Committees: Admissions, 1941–1943; Awards, 1945–1946; New York Program, 1940; Papers Procurement, 1947–1948; Radio Receivers, 1936–1941; Standardization: Technical Committee No. 3, Vacuum Tubes, 1929–1930.

RALPH V. L. HARTLEY
(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.

Medal of Honor, 1946, for his
"early work on oscillating circuits employing triode tubes, and likewise for his early recognition and clear exposition of the fundamental relationship between the total amount of information which may be transmitted over a transmission system of limited bandwidth and the time required."

Committees: Sections, 1945.

LESLIE W. HAYES
(F'38)

Vice-Director, International Radio Consultative Committee, International Telecommunication Union, Palais Wilson, Geneva, Switzerland. Born: May 31, 1896, London, England.

ALAN HAZELTINE
(A'16—M'18—F'21)

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, 1923–1928; Director, 1936–1939.

Committees: Admissions, 1925–1928; Awards, *chairman, 1937,* 1938; Education, 1945–1947; Meetings and Papers, 1925, 1927; New York Program, 1935; Standardization, 1924–1928. Subcommittee on Receiving Sets, 1927–1928; Subcommittee on Vacuum Tubes, *chairman, 1927;* Subcommittee on Vacuum Tube Terminology, *chairman, 1924–1925.*

Armstrong Medal, Radio Club of America, 1937.

RALPH M. HEINTZ
(A'21—M'27—F'30)

Consulting Engineer, P.O. Box 546, Los Gatos, Calif. Born: April 20, 1892, St. Louis, Mo. A.B., 1920, Stanford University.

Committees: Membership, 1938–1940; New York Program, 1938; Papers Review, 1946; Sections, 1938–1940.

Sections: San Francisco, *chairman, 1931–1932.*

RAYMOND A. HEISING
(A'20—F'23)

Patent Engineer, Bell Telephone Laboratories, Inc., Murray Hill, 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.

Morris Liebmann Memorial Prize, 1921, in
"recognition of the publication of his basic work in the field of the signal modulation of an oscillator output, and in particular of his invention and development of constant-current modulation as first applied to radiotelephony."

President, 1939; Treasurer, 1943–1945; Manager, 1927–1931; Director, 1933–1935, 1939–1941, 1943–1945, 1947–1949.

Committees: Admissions, 1927, *chairman, 1928–1930, vice-chairman, 1931,* 1933, 1935–1938; Appointments, 1948; Constitution and Laws, 1930–1934, 1941–1942, *chairman, 1943–1944,* 1945–1951; Executive, *vice-chairman, 1943–1945;* Investments, *chairman, 1944–1945,* 1946; Meetings and Papers, 1926; Membership Solicitation Policy, 1945; New York Program, 1933, 1935–1937; Nominations, 1933, *chairman, 1941, 1950;* Office Quarters, *chairman, 1947;* Planning, *chairman, 1947;* Policy Development, 1948–1950; Preparedness, 1940–1941; Professional Groups, 1948–1951; Sections, *chairman, 1941–1945,* 1946–1951; Standardization, 1925.

Modern Pioneer Award, National Association of Manufacturers, 1940; Fellow, AIEE; Fellow, American Physical Society.

JOHN T. HENDERSON
(F'51)

Senior Research Officer, National Research Council, Sussex St., Ottawa, Ontario, Canada. Born: December 9, 1905, Montreal, P.Q., Canada. B.S., 1927, M.S., 1928, McGill University; Ph.D., 1932, University of London.

Fellow Award, 1951, for his
"contributions in the field of radio direction-finding systems, and in particular, for his work in the development of Canadian radar during the war."

Sections: Ottawa, 1948–49, *vice-chairman, 1949–50, chairman, 1950–1951.*

Fellow, Royal Society of Canada, 1944.

M.B.E., Dominion of Canada, 1943.

KEITH HENNEY
(A'18—M'26—SM'43—F'43)

Consulting Editor, *Electronics;* Editor, *Nucleonics,* McGraw-Hill Publishing Company, Inc., 330 W. 42 St., New York, N.Y. Born: October 28, 1896, McComb, Ohio. A.B., 1921, Western Reserve University; A.M., 1925, Harvard University.

Fellow Award, 1943, in
"recognition of his accomplishments in obtaining publication of the technical information essential to the radio engineer."

Director, 1945–1948.

Committees: Annual Review, 1937–1948; Awards, 1945–1946, 1948, *chairman, 1949,* 1950; Executive, 1946–1947; Membership Solicitation Policy, 1945; New York Program, 1934, 1936–1938, 1940–1941, *chairman, 1942;* Nominations, 1950; Nuclear Studies, 1948; Planning, 1947; Policy Development, 1951; Publicity, 1937–1939; Public Relations, 1943–1950; RMA-IRE Co-ordinating, 1947–1949; Standards, 1945–1948. Institute Representative: IRE-RMA Co-ordination Committee, 150; Atomic Energy Commission for the Release of Technical Information.

EDWARD W. HEROLD
(A'30—M'38—SM'43—F'48)

Section Head, 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.

Fellow Award, 1948, for his
"contributions to theory and design in the field of vacuum tubes."

Committees: Board of Editors, 1946–1951: Editorial Administrative, 1946–1951; Membership, 1942; Papers, 1944, 1945; Winter Technical Meeting, 1945.

Sections: Princeton, *vice-chairman, 1948; chairman, 1949.*

WILLIAM R. HEWLETT
(S'35—A'38—M'47—F'48)

Vice-President, Hewlett-Packard Company, 395 Page Mill Rd., Palo Alto, Calif. Born: May 20, 1913, Ann Arbor, Mich. A.B., 1934, Stanford University; M.S., 1936, Massachusetts Institute of Technology; E.E., 1939, Stanford University.

Fellow Award, 1948, for his
"initiative in the development of special radio measuring technique."

Director, 1950, 1951.

Committees: Nominations, 1950–1951; Policy Development, 1950–1952.

Sections: San Francisco, *vice-chairman, 1948–1949; chairman, 1949–1950.*

ALBERT G. HILL
(SM'46—F'50)

Professor of Physics; Director, Research Laboratory of Electronics, 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.

Fellow Award, 1950, for his
"work in the utilization of electronics to research in physics and his contribution in the conversion of wartime development laboratories to peacetime fundamental research."

Presidential Certificate of Merit, 1948.

FRANK A. HINNERS
(M'15—F'26)

Vice-President in Charge of Engineering, Jewel Radio Corporation, 10–40 45 Ave., Long Island City, L.I., N.Y. Born: February 19, 1894, New York, N.Y. I.E.E., 1915, Pratt Institute.

Committees: New York Program, 1941–1942.

Charter Member, Wireless Institute.

CHARLES J. HIRSCH
(F'51)

Chief Engineer, Research Division, 58–25 Little Neck Parkway, Little Neck, L.I., N.Y. Born: October, 1902, Pittsburgh, Pa. A.B., 1923, Columbia College; E. E., 1925, Columbia University.

Fellow Award, 1951, for his
"contributions in the fields of radio broadcast receivers, electronic aids to navigation, and electric computers."

Committees: Navigation Aids, 1947–1950, *vice-chairman, 1950–1951.*

Certificate of Commendation, U.S. Navy, 1947.

JOHN V. L. HOGAN
(M'12—F'15)

President, Hogan Laboratories, Inc., 155 Perry St., New York, N.Y. Born: February 14, 1890, Philadelphia, Pa.

President, 1920; Vice-President, 1916–1919; Manager, 1912–1915, 1921–1932; Director, 1916–1920, 1932–1936, 1948–1950.

Committees: Annual Review, 1927, 1947–1951; Appointments, 1948; Awards, 1919, *chairman, 1928,* 1932–1933, 1945, 1948; Broadcasting, 1929–1937; Constitution and Laws, 1928–1929, *chairman, 1932–1934,* 1935–1936; Constitutional Amendments, *chairman, 1915;* Editing, *chairman,* 1914; Facsimile, 1939–1946, *chairman, 1947–1951;* Finance, 1915; Financial Matters, 1915; Increase of Membership, *chairman, 1916,* 1917–1919; Nominations, 1931, 1937–1938, 1943–1944, *chairman, 1945;* Papers, 1915–1919, 1942–1945; Papers Procurement, 1947; Papers Review, 1946; Policy Development, 1950–1951; Professional Groups, 1950; Professional Recognition, 1947; Publicity, *chairman, 1913,* 1914, *chairman, 1915,* 1916–1919; Revision of the Constitution, *chairman, 1925,* 1926–1927; Sections, 1925; Specifications for Steamship Radio Equipment, 1914; Standardization, 1913, 1915, *chairman, 1916–1919,* 1920–1929, 1932, 1936–1937, 1947–1951; Subcommittee on Vacuum Tubes, *chairman, 1927;* Subcommittee on Receiving Sets, 1927–1928; Subcommittee on Use of the Transmission Unit, *chairman, 1928.*

Institute Representative: ASA Sectional Committee on Electrical Installation on Shipboard, 1930, 1936; ASA Sectional Committee on Radio, 1930; ASA Sectional Committee on Radio Electrical Coordination, 1936, 1939–1946.

LYNN C. HOLMES
(M'44—SM'46—F'49)

Director of Research, Stromberg-Carlson Company, 100 Carlson Rd., Rochester, N.Y. Born: April, 1904, Brookfield, N.Y. E.E., 1925, M.E.E., 1932, Rensselaer Polytechnic Institute.

Fellow Award, 1949, for his
"contributions to theory and practice in the field of magnetic recording."

STANFORD C. HOOPER
(F'28—A'33—F'46)

Rear Admiral, United States Navy, retired. 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.

Medal of Honor, 1934, for
"the orderly planning and systematic organization of radio communication in the Government Service with which he is associated, and the concomitant and resulting advances in the development of radio equipment and procedure."

Committees: Increase of Membership, 1913–1914.

Elliot Cressen Medal, Franklin Institute; Marconi Medal of Merit; Veterans Wireless Medal.

CHARLES W. HORN
(A'14—M'28—F'30)

Partner and Manager, Radio Impulsora Mexicana, S.A., Calle Rhin 33, Colonia Cuauhtemoc, Mexico City, D.F., Mexico. Born: July 9, 1894, New York, N.Y.

Director, 1933–1934.

Committees: Admissions, 1933–1937, 1940–1942; Broadcasting, 1928–1932; Broadcast, 1933–1937; New York Program, 1932, *chairman, 1933,* 1934; Public Relations, 1945–1946; Sections, 1929–1930, *chairman, 1931–1932,* 1933; Television and Facsimile, 1936–1938.

Institute Representative: National Advisory Council on Radio in Education, 1936, 1939–1940; Committee on Engineering Developments, 1941–1943.

J. WARREN HORTON
(A'20—F'29)

Research 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, 1930–1931, 1935–1940; Meetings and Papers, 1929, *chairman, 1930;* Membership, 1947; Standards, *chairman, 1931–1932;* Technical Committee No. 3, Vacuum Tubes, 1929–1930.

Institute Representative: United States National Committee, Advisers on Symbols (International Electrotechnical Committee), 1936–1937, 1939–1950.

FREDERICK S. HOWES
(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.

Fellow Award, 1950, for his
"contributions as a teacher in the field of communication engineering."

Director, 1948.

Committees: Education, 1945–1946, 1951; Awards, 1950. 1951.

Sections: Montreal, *chairman, 1941–1945;* Canadian Council, *chairman, 1947–1948.*

Institute Representative: McGill University, 1941–1951.

ALBERT W. HULL
(M'41—SM'43—F'44)

Retired. Formerly, Assistant Director, Research Laboratory, General Electric Company, The Knolls, Schenectady, N.Y. Born: April 19, 1880, Southington, Conn. A.B., 1905, Ph.D., 1909, Yale University; Sc.D. (Honorary), 1930, Union University; Sc.D., 1931, Middlebury College; D.Eng., 1944, Worcester Polytechnic Institute; Sc.D., 1947, Yale University.

Fellow Award, 1944, for his
"many contributions to the development and design of electron tubes, both for radio and industrial applications."

Morris Liebmann Memorial Prize, 1930, in
"recognition of the many advances in vacuum-tube development which were due to his fundamental researches in the field of electronics."

Howard N. Potts Medal, Franklin Institute, 1923.

DAVID R. HULL
(A'36—F'47)

Captain, United States Navy, retired; Vice-President, General Manager, Equipment Divisions, Raytheon Manufacturing Company, Waltham, Mass. Born: October, 1903, Newton, N.J. B.S. 1925, United States Naval Academy; M.S., 1933, Harvard University.

Fellow Award, 1947, for his
"contributions in developing a program utilizing electronic advances in military equipment and tactics."

Committees: Electron Tube, 1946–1947; Electronics, 1943–1945; Vacuum Tubes, 1945–1946.

Legion of Merit; Navy Commendation Ribbon.

LEWIS M. HULL
(J'17—A'19—M'27—F'28)

President, 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, 1929–1932; Director, 1932–1935.

Committees: Admissions, 1927–1928; Awards, *chairman, 1935,* 1936–1937; Broadcasting, *chairman, 1928–1931,* 1932; Meetings and Papers, 1928–1930; New York Program, 1931; Nominations, 1928–1931, *chairman, 1934,* 1935; Papers, 1931; Standardization, 1927–1928; Receiving Sets, 1927–1928; Use of the Transmission Unit, 1928; Registration of Engineers, 1940.

Institute Representative: Radio Advisory Committee, Bureau of Standards, Department of Commerce; ASA Sectional Committee on Radio, 1930; National Advisory Council on Radio in Education, 1936–1937, 1939–1940; National Advisory Council on Radio in Education, Committee on Engineering Developments, 1941–1943; Radio Advisory Committee, Bureau of Standards, Department of Commerce, 1930, 1936.

AUGUST HUND
(M'16—F'27)

Consulting Engineer, 718 Adelaide Pl., Santa Monica, Calif. Born: December 17, 1887, Offenburg, Baden, Germany. E.E., 1911, Eng.D., 1913, Technische Hochschule, Karlsruhe, Germany; Graduate Study, University of California.

Committees: Standardization, Subcommittee on Electro-Acoustic Devices, 1927–1928.

Sections: San Diego, *acting chairman, 1945.*

FREDERICK V. HUNT
(A'28—M'41—SM'43—F'47)

Gordon McKay Professor of Applied Physics, 222 Lyman Laboratory, Harvard University, Cambridge 38, Mass. Born: February 15, 1905, Barnesville, Ohio. B.A., 1924, B.E.E., 1925, Ohio State University; A.M., 1928, Ph.D., 1934, S.D., 1945, Harvard University.

Fellow Award, 1947, for his
"work as a scientist, teacher, and administrator and his contributions to acoustics."

Committees: Audio Techniques, 1949–1950; Electroacoustics, 1941–1951; Papers, 1942–1945; Papers Procurement, 1942–1943, 1947–1948; Papers Review, 1946–1948; Regular Papers, 1941.

JOHN A. HUTCHESON
(A'28—M'30—SM'43—F'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.

Fellow Award, 1948, for his
"contributions and technical directions of work in radio research."

Director, 1948.

Committees: Board of Editors, 1946–1950; Nominations, 1948; Nuclear Studies, 1948; Policy Development, 1948.

Sections: Connecticut Valley, *chairman, 1935–1936;* Pittsburgh, *chairman, 1945–1946.*

HARLEY A. IAMS
(A'31—M'38—SM'43—F'50)

Associate Department Head, Hughes Aircraft Company, Florence at Teale St., Culver City, Calif. Born: March 13, 1905, Lorentz, W.Va. B.A.(M.E.), 1927, Stanford University.

Fellow Award, 1950, for
"the development of electronic apparatus for converting images formed by electromagnetic waves to electrical signals, first in the television field, and later, using new principles, in the realm of short radio waves."

Committees: Papers, 1941–1945; Papers Review, 1946–1947.

Joint Award, Modern Pioneers, National Association of Manufacturers, 1940; Sigma Xi.

DORMAN D. ISRAEL
(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.

Fellow Award, 1942, in
"recognition of his contributions to the engineering of broadcast receivers."

Committees: Awards, 1943–1944, 1947; Membership, 1941; National Convention, 1947; New York Program, 1940–1941; Nomina-

tions, 1946; Papers, 1940–1941; Papers Procurement, *chairman, 1942–1943, general chairman, 1944–1947;* Public Relations, 1940–1944; Radio Receivers, 1938–1941; Regular Papers, *chairman, 1941;* RMA-IRE Co-ordinating, 1947–1948; Television and Facsimile, 1936–1937; Winter Technical Meeting, 1946.

Sections: Cincinnati, *chairman, 1931–1932.*

Professional Groups: Broadcast and Television Receivers; *chairman, 1951;* Administrative Committee, 1949–1951.

WILLIAM E. JACKSON
(F'51)

Chief, Electronics Division, Civil Aeronautics Administration, Technical Development and Evaluation Center, Weir Cook Airport, Indianapolis, Ind. Born: May 8, 1904, Bridgewater, Mass. B.S.(E.E.), 1925, Brown University.

Fellow Award, 1951, for his

"technical contributions to electronic aids to air navigation, and control, and for his administrative contribution in the Civil Aeronautics Administration."

Committees: Antennas, 1944–1946; Navigation Aids, 1947–1948; Radio Transmitters, 1946; Transmitters, 1944–1945; Transmitters and Antennas, 1938–1944.

Citation for service on Radio Technical Commission for Aeronautics Special Committee 31, which established a guide plan for development and implementation of a system of air navigation and traffic control. The Collier Trophy for 1948 was awarded the RTCA for this work.

Cull Prize in Engineering, Brown University, 1925.

WILLIS JACKSON
(SM'48—F'50)

Professor of Electrical Engineering, and Head, Electrical Engineering Department, Imperial College, Exhibition Rd., South Kensington, London, S.W.7, England. Born: October 29, 1904, Burnley, Lancs., England. D.Sc., 1936, Manchester University; Ph.D., 1936, Oxford University.

Fellow Award, 1950, for his

"service as an educator and his many contributions to the literature in both the radio and electrical fields."

C. M. JANSKY, JR.
(A'18—M'25—F'28)

Partner, Jansky & Bailey, National Press Bldg., Washington, D.C. Born: June 28, 1895, Delton, Mich. B.A., 1917, M.A., 1919, University of Wisconsin.

President, 1934; Manager, 1929–1932; Director, 1932–1942.

Committees: Admissions, 1929–1930, *chairman, 1931,* 1932–1933, *chairman, 1936–1937,* 1938–1940; Awards, 1942; Board of Editors, 1942–1950; Broadcasting, 1931–1933; Broadcast, 1935–1936, *chairman, 1937;* Constitution and Laws, 1932–1933, 1941; Education, 1944; Frequency Modulation, 1940–1943; Membership, 1925, 1928, 1941–1943; Nominations, 1936, *chairman, 1937,* 1938, *chairman, 1939,* 1940–1942, 1945; Preparedness, 1940–1941; Publicity, 1936; Public Relations, 1946; Receiver Sets, 1928; Standards, 1932; Sections, 1925; Standardization, 1928–1931; Use of the Transmission Unit, 1928.

Institute Representative: American Documentation Institute, 1939–1943; First National Conference on Educational Broadcasting, 1937; American Council on Education, Planning Committee, National Conference on Educational Broadcasting, 1936–1937, 1939–1943; URSI Executive Committee, 1936–1937, 1939–1949; ASA Sectional Committee on Radio-Electrical Co-ordination, 1926, 1939–1946.

KENNETH W. JARVIS
(A'24—M'27—F'34)

President, Jarvis Electronics Corporation, Chicago, Ill., and Manager, Electronics Division, Automatic Electric Corporation, 1033 W. Van Buren St., Chicago, Ill. Born: October 18, 1901, Mansfield, Ohio. B.E.E., 1923, Ohio State University.

Committees: Receivers, 1947–1951; Radio Receivers and Parts, 1930–1931; Receiver Sets, 1927–1928.

Sections: Chicago, *chairman, 1948–1949.*

AXEL G. JENSEN
(A'23—M'26—F'42)

Engineer in Charge 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, Copenhagen; Post Graduate, 1921–1922, Columbia University.

Fellow Award, 1942, for his

"constructive participation in the development of the short-wave transatlantic telephone, the development of broad-band, multi-channel telephony, and the art of television."

Committees: Audio and Video Techniques, 1948; Co-ordination For International Technical Organizations, *chairman, 1950–1951;* Instruments and Measurements, 1949–1950; IRE, RTMA, SMPTE Television Co-ordinating Committee, *Chairman, 1950–1951;* Standards, 1948, *vice-chairman, 1949–1950, chairman, 1951;* Television, 1939–1947, *chairman, 1948;* Television and Facsimile, 1938; Television Systems, *chairman, 1949–1951.*

Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1949–1951; IRE, AIEE, ASA (C42), Definitions Co-ordinating Committee, 1949–1951.

EWELL K. JETT
(A'29—M'38—F'39)

Vice-President and Director of Radio, Baltimore Sunpapers, Baltimore, Md. Born: March 20, 1893, Baltimore, Md.

Director, 1938.

Committees: Public Relations, 1945–1946.

Sections: Washington, D.C., *chairman, 1935–1936.*

J. KELLY JOHNSON
(A'25—M'35—SM'43—F'49)

Consulting Engineer, 511 Fifth Ave., New York, N.Y. Born: January, 1903, Oskaloosa, Iowa. A.B., 1923, B.S., 1923, Penn College; A.B., 1924, Columbia College; B.S.(E.E.), 1926, E.E., 1927, Columbia University.

Fellow Award, 1949, in

"recognition of his leadership in the design and manufacture of radio broadcast receivers."

Director, 1942.

Committees: Board of Editors, 1946–1951; Nominations, 1942; Papers Procurement, 1944–1945; Radio Receivers, 1936–1937, 1941–1950; Receivers, 1950–1951; Registration of Engineers, 1940–1943; Regular Papers, 1941; Sections, 1943–1944.

Sections: Chicago, *secretary, 1935–1936, chairman, 1937–1938;* New York, *treasurer, 1948–1949.*

JOHN B. JOHNSON
(F'51)

Research Physicist, Bell Telephone Laboratories, Inc., Murray Hill, N.J. Born: October 2, 1887, Gothenberg, Sweden. B.S., 1913, M.S., 1914, University of North Dakota; Ph.D., 1917, Yale University.

Fellow Award, 1951, for his

"discovery of the limiting noise in electric circuits and his early developments in cathode-ray tubes."

CHARLES B. JOLLIFFE
(M'25—F'30)

Executive Vice-President in Charge of RCA Laboratories Division, Radio Corporation of America, Princeton, N.J. Born: November 13, 1894, Mannington, W.Va. B.S., 1915, M.S., 1920, West Virginia University; Ph.D., 1922, Cornell University; LL.D., 1942, West Virginia University.

Director, 1936–1937, 1944.

Committees: Admissions, 1938; Awards, 1942; Bibliography, 1930–1932; Broadcast, 1932, 1936–1937; Frequency Modulation, 1940–1941; Meetings and Papers, 1930; Nominations, 1937, 1941; Piezoelectric Crystals, 1940; Policy Development, 1948; Preparedness, 1940–1941; Subcommittee on Receiving Sets, 1927; Standardization, 1925–1926, *chairman, 1928–1931;* Subcommittee on Vacuum Tubes, 1927–1928, *chairman, 1928;* Television and Facsimile, 1936–1948.

Sections: Washington, D.C., *chairman, 1929–1930.*

Institute Representative: American Council on Education, Planning Committee, National Conference on Education Broadcasting, 1936–1937, 1939–1943.

IRA J. KAAR
(J'22—A'24—M'29—F'41)

Manager of Engineering, Electronics Department, 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, 1940–1945; Awards, 1947–1948; Nominations, 1949–1950; Public Relations, 1940, 1942; Standards, 1940–1945; Television, 1939, *chairman, 1940–1946,* 1947–1948; Television Systems, 1949–1951.

ARMIG G. KANDOIAN
(F'51)

Head, Radio and Radar Components Division, Federal Telecommunication Laboratories, Inc., 500 Washington Ave., Nutley, N.J. Born: November, 1911, Van, Armenia. B.S., 1934, M.S., 1935, Harvard University.

Fellow Award, 1951, for his

"important contributions to the development of antennas and navigation systems."

Committees: Papers Review, 1946–1951.

SHANKAR R. KANTEBET
(A'25—M'31—SM'43—F'49)

General Manager, 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; A.M.I.E.E., 1928; M.I.E.(I), 1944.

Fellow Award, 1949, for his

"services as an educator, engineer, and administrator in the fields of radio and cable communication in India."

EDUARD KARPLUS
(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.

RAY D. KELL
(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.

Fellow Award, 1947, for his

"extensive contributions, over many years, to television for both civilian and military use."

Committees: Television, 1941, 1946–1948; Television Systems, 1949–1951.

Modern Pioneer Award, National Association of Manufacturers, 1940; Stuart Ballantine Medal of the Franklin Institute, 1948.

MERVIN J. KELLY
(M'25—F'38)

Executive Vice-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; 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, 1927–1929; Technical Committee No. 3, Vacuum Tubes, 1930.

Institute Representative: ASA Technical Committee, Vacuum Tubes, 1930.

JOHN E. KETO
(A'38—SM'46—F'48)

Chief, Aircraft Radiation Laboratory, Wright Field, Dayton, Ohio. Born: June 9, 1909, Maynard, Mass. E.E., 1932, M.S., 1935, University of Cincinnati.

Fellow Award, 1948, for his

"contributions to the development of electronic equipment for military purposes."

Committees: Wave Propagation, 1948–1951.

Sections: Dayton, *chairman, 1946–1947.*

CHARLES E. KILGOUR
(F'51)

Staff Engineer, Crosley Division, AVCO Manufacturing Corporation, 1329 Arlington St., Cincinnati, Ohio. Born: March 29, 1886, Detroit, Mich. C.E., 1910, University of Cincinnati.

Fellow Award, 1951, for his

"contributions in the application of graphical methods to the analysis of detector and output tube performance."

Committees: Facsimile, 1940; Papers Procurement, 1947–1948, 1949–1950; Television and Facsimile, 1940.

Sections: Cincinnati, *chairman, 1932–1933.*

THOMAS J. KILLIAN
(F'51)

Science Director, Office of Naval Research, Navy Department, Washington, D.C. Born: August 4, 1904, Schenectady, N.Y. B.S., M.S., 1926, Massachusetts Institute of Technology; M.A., 1927, Ph.D., 1929, Princeton University.

Fellow Award, 1951, for his

"enlightened guidance of basic scientific research."

Committees: Nuclear Studies, 1947–1950.

Regional Prize, AIEE, 1936.

HAROLD L. KIRKE
(M'25—SM'43—F'45)

Assistant Chief Engineer, British Broadcasting Corporation, Broadcasting House, London, W.1, England. Born: January 7, 1895, London, England.

Fellow Award, 1945, for his

"services to broadcasting in the British Isles and in particular for his leadership in the research activities of the British Broadcasting Corporation."

HUGH S. KNOWLES
(A'25—F'41)

Consulting Engineer, 350 Forest Ave., Glen Ellyn, Ill.; President and Director of Research, Industrial Research Products, 9400 Belmont Ave., Franklin Park, Ill. Born: September 23, 1904, Hynes, Iowa. A.B., 1927, Columbia University.

Fellow Award, 1941, for his

"engineering leadership in the field of acoustics and its radio applications."

Committees: Annual Review, 1938–1941; Board of Editors, 1945–1951; Electroacoustics, 1936–1937, *chairman, 1938–1941,* 1946–1947; Papers, 1941; Papers Procurement, 1942–1943; Regular Papers, 1941; Standards, 1938–1941; Symbols, 1940–1941, 1943–1947.

Sections: Chicago, *chairman, 1934–1935.*

JAMES B. KNOX
(F'51)

1001 Lenoir, Montreal, P.Q., Canada. Born: November, 1910, Winnipeg, Manitoba, Canada.

Fellow Award, 1951, for his

"contributions to the development and design of radio transmitters and communication systems, and radio aids to air navigation in Canada."

Committees: Radio Transmitters, 1947–1951.

FREDERICK A. KOLSTER
(A'12—M'13—F'16) (L'49)

Consulting Engineer, c/o Bohemian Club, Post and Taylor Sts., San Francisco, Calif. Born: January 13, 1883, Geneva, Switzerland.

Director, 1933–1935.

Committees: Admissions, 1935–1936; Membership, 1930–1932; Nominations, 1933; Papers, 1913; Sections, 1933; Standardization, 1914–1919, 1920–1921, 1925, 1927–1930; Subcommittee on Marine and Direction-Finding Receivers, *chairman, 1928–1930;* Wave Length Regulation, 1916; Wave Propagation, 1937–1938.

RUDOLPH KOMPFNER
(F'50)

Clarendon Laboratory, Parks Rd., Oxford, England. Born: May 16, 1909, Vienna, Austria. Engineering Diploma, 1933, Technical College, Vienna. Ph.D., Oxford University.

Fellow Award, 1950, for his
"research in electron tube theory and particularly for his original contributions to the concepts of the traveling-wave amplifier."

FREDERICK R. LACK
(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, 1946–1947.

Committees: Appointments, 1948; Awards, 1941, 1948; Board of Editors, 1946; Electronics, 1936–1940; Executive, 1947; Fiscal, 1947–1948; National Convention, 1947; Nuclear Studies, 1948; Office Practices, 1947; Papers, 1942–1945; RMA-IRE Co-ordinating, 1948; Special Publication Fund, 1947; Tellers, 1940.

Institute Representative: ASA Board of Directors, 1945–1951.

HORATIO W. LAMSON
(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, 1937–1939.*

VERNON D. LANDON
(F'51)

Radio Research Engineer, RCA Laboratories, Princeton, N.J. Born: May, 1901, Denver, Colo. Attended Detroit Junior College, 1920.

Fellow Award, 1951, for his
"contributions to communication system, filter, and noise theory."

Committees: Frequency Modulation, 1941–1946; Modulation Systems, 1947–1951; Papers Review, 1947—1951.

RALPH H. LANGLEY
(A'12—M'16—F'29)

Assistant to the President, Farrand Optical Company, Inc., 4401 Bronx Blvd., New York, N.Y. Born: January 5, 1889, New York, N.Y. E.E., 1913, Columbia University.

Committees: Admissions, 1945; Awards, 1934; Bibliography, 1930–1932; New York Program, 1934; Radio Telegraph and Receiver Terminology, *chairman, 1924–1925;* Registration of Engineers, 1940–1941; Sections, 1930–1933, 1935; Standardization, 1924–1927, Technical Committee No. 1, Radio Receivers and Parts, 1930; Standards, 1934–1935; Wave Length Regulation, 1916.

Sections: Cincinnati, *chairman, 1929–1930.*

PENDLETON E. LEHDE
(A'14—F'27)

President, Electron Engineering Company; President, Tidewater Terminal Company, Inc.; President, Pendleton Terminal Corporation, 1050 Constance St., New Orleans, La. Born: October 2, 1892, New Orleans, La. B.E., 1914, M.E.E., 1926, Tulane University.

Committees: Membership, 1927–1929.

Sections: New Orleans, *chairman, 1928–1933.*

GEORGE H. LEWIS
(A'12—M'15—SM'43—F'51)

Retired. Formerly Assistant Vice-President, International Telephone and Telegraph Corporation, 67 Broad St., New York, N.Y. Born: September 15, 1886, Media, Pa. M.E.I., 1911, Bliss School of Applied Science.

Fellow Award, 1951, for his
"important pioneering contributions, including the objective co-ordination of many management and engineering activities."

Manager, 1918–1919, 1923, 1926; Director, 1935.

Committees: Admissions, 1929–1930, 1942; Awards, 1935; Electronics, 1936–1939; Facsimile, 1939–1941; New York Program, *chairman, 1935,* 1936; Public Relations, 1947–1948; Standardization, 1916–1917, 1919, 1925, 1928–1930; Symbols, 1940; Technical Committee No. 3—Vacuum Tubes, 1929–1930; Television, 1939–1941.

NILS E. LINDENBLAD
(M'34—SM'43—F'48)

Research Engineer, RCA Laboratories, Princeton, N.J. Born: October 30, 1895, Norrkoping, Sweden. M.E., 1915, Norrkoping Polytechnic Institute; Attended Royal Institute of Technology, Stockholm, 1916–1919.

Fellow Award, 1948, for his
"many contributions to the theory and design of transmitting antennas and related equipment."

Committees: Antenna Subcommittee, 1940.

Modern Pioneer Award, National Association of Manufacturers, 1940; RCA Laboratories Award for Pioneering in Slot Antennas, Radio Corporation of America, 1947.

WILLIAM W. LINDSAY, JR.
(A'24—M'26—F'39)

Consulting Engineer, 230 S. Thurston Ave., Los Angeles 49, Calif. Born: November 16, 1899, Overbrook, Pa. Privately educated, equivalent "Doktor Ingenieur" degree.

Committees: Nominations, 1942; Transmitters, 1946–1947.

Sections: Los Angeles, *secretary-treasurer, 1928, 1929; chairman, 1940–1941.*

DONALD G. LITTLE
(A'20—M'27—F'29)

Assistant Engineering Manager and Consulting Engineer, Electronics and X-Ray Division, 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, 1944–1951; Meetings and Papers, 1928–1929; Standardization, Technical Committee No. 2, Radio Transmitters and Antennas, 1929–1930; Subcommittee on Nomenclature, Symbols, and Definitions, 1929–1930; Subcommittee on Methods of Testing Apparatus, Equipment, Devices, and Materials Used in Radio Transmitters and Antennas, 1929–1930; Standardization, 1931–1932; Standards, 1932; Transmitters and Antennas, 1936–1938.

CHARLES V. LITTON
(A'25—SM'44—F'47)

President, Litton Industries, P.O. Box 937, San Carlos, Calif. Born: March 13, 1904, San Francisco, Calif. A.B., 1924. E.E., 1925, Stanford University.

Fellow Award, 1947, for his
"contributions to theory and practice in the field of high vacuum techniques, including processes and precision devices for the production of electron tubes."

Committees: Papers, 1945; Papers Review, 1946–1951.

Sections: San Francisco, *chairman, 1932–1933.*

FREDERICK B. LLEWELLYN
(A'23—F'38)

Consulting Engineer, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y. Born: September 16, 1897, New Orleans, La. M.E., 1922, Stevens Institute of Technology; Ph.D., 1928, Columbia University.

Morris Liebmann Memorial Prize, 1935, for his
"analysis and disclosures of the effects and reactions within vacuum tubes at ultra-high frequencies."

President, 1946; Director, 1939–1948.

Committees: Awards, 1942, *chairman, 1947,* 1948; Board of Editors, 1949, 1951; Constitution and Laws, 1947, 1950; Electronics, 1939–1943; Editorial Administrative, 1946–1951; Executive, 1942–1944, *chairman, 1946;* Finance, 1948–1951; Fiscal, 1947–1948; International Liaison, 1947, 1949; Investment, 1946; Membership, 1941, 1949, 1950; Membership Solicitation Policy, 1945; Nominations, 1944, 1947–1948; Office Quarters, 1947; Papers, 1932–1939, *vice-chairman, 1940–1942, chairman, 1943–1946;* Policy Development, 1949–1950, *chairman, 1951;* Professional Groups, 1948; Public Relations, 1950; Symbols, 1940–1941.

Institute Representative: ASA Electrical Standards Committee, 1948–1950; National Research Council, Division of Engineering and Research, 1948–1950; United States National Committee of the International Electrotechnical Commission, 1949–1950.

WILLIAM B. LODGE
(A'34—M'37—SM'43—F'49)

Vice-President in Charge of General Engineering, Columbia Broadcasting System, Inc., 485 Madison Ave., New York 22, N.Y. Born: August 17, 1907, Whitemarsh, Pa. B.S., 1930, M.S., 1931, Massachusetts Institute of Technology.

Fellow Award, 1949, for his
"many contributions to broadcast engineering and in particular for his work in the field of frequency allocations."

Committees: Annual Review, 1946–1948; Antennas, 1944–1945; Awards, 1946; Transmitters, 1944–1945; Transmitters and Antennas, 1940–1941; Winter Technical Meeting, 1946.

ALFRED L. LOOMIS
(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.

Fellow Award, 1944, in
"recognition of his work in the application of electronic techniques to medical research and for contributions to microwave development."

John Price Wetherill Medal, The Franklin Institute, 1934.

WILLIAM D. LOUGHLIN
(M'29—F'35)

President, Boonton Radio Corporation, Boonton, N.J. Born: January 22, 1893, Philadelphia, Pa. A.B., 1912, St. Josephs College.

Committees: Broadcast, 1935; Sections, 1933.

ARTHUR V. LOUGHREN
(A'24—M'29—SM'43—F'44)

Vice-President in Charge of Research, Hazeltine Electronics Corporation, 58-25 Little Neck Pkwy., Little Neck, L.I., N.Y. Born: September 15, 1902, Rensselaer, N.Y. B.A., 1923, E.E., 1925, Columbia University.

Fellow Award, 1944, for his
"many valuable contributions to broadcast and television engineering and his untiring efforts to advance this profession."

Committees: Admissions, 1931–1933; Awards, 1949–1951; Membership, 1934; Papers Procurement, 1947–1948, 1949–1950; Radio Receivers, Subcommittee on Definitions, 1927–1928; Standardization, Subcommittee on Vacuum Tubes, 1927–1928; Standards, 1947; Television, 1940–1945.

HARRY R. LUBCKE
(F'51)

Consulting Engineer, 1313 N. Vine St., Hollywood, Calif. Born: August 25, 1905, Alameda, Calif. B.S., 1929, Graduate Study, 1930, University of California.

Fellow Award, 1951, for his
"courageous pioneering work in television production and transmission."

Committees: Papers Review, 1946–1947.

Sections: San Francisco, Organization Committee, 1927.

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; Sigma Xi.

DAVID G. C. LUCK
(M'46—SM'50—F'51)

Research Staff, RCA Laboratories Division, Radio Corporation of America, Princeton, N.J. Born: July, 1906, Whittier, Calif. B.S., 1927, Ph.D. 1932, Massachusetts Institute of Technology.

Fellow Award, 1951, for his
"early development of the omni-directional radio range."

SAMUEL S. MACKEOWN
(M'29—F'40)

Professor of Electrical Engineering, California Institute of Technology, Pasadena, Calif. Born: December 3, 1895, New York, N.Y. B.A., 1917, Ph.D., 1923, Cornell University.

Committees: Board of Editors, 1941–1951.

Institute Representative: California Institute of Technology, 1941–1950.

KEITH ABBOTT MacKINNON
(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.

Fellow Award, 1949, for his
"technical contributions in Canada to the theory and design of transmitting antennas and the development of a coverage plan for a national network."

Committees: Antennas, 1946–1948.

Sections: Ottawa, *chairman, 1947.*

IOURY G. MALOFF
(M'27—F'36)

Development Engineer, RCA Victor Division, Radio Corporation of America, Camden, N.J. Born: June 3, 1899, Vladivostok, Russia.

Committees: Bibliography, 1928; Papers Procurement, 1947–1950; Receiving Sets, 1928; Tellers, 1940.

RAY H. MANSON
(M'23—F'30)

Board Chairman and Director, Stromberg-Carlson Company, 100 Carlson Rd., Rochester, 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, 1927–1930; Director, 1931–1933.

Committees: Awards, 1932, 1940; Bibliography, 1930; Nominations, 1929–1930, *chairman, 1932,* 1934, 1940; Public Relations, 1940, 1947–1948; Regular Papers, 1941; Standardization, 1926–1930; Subcommittee on Electro-Acoustic Devices, *chairman, 1928;* Technical Committee No. 4, Electro-Acoustic Devices, 1930; Tellers, 1932–1933; Television and Facsimile, 1936–1938.

Institute Representative: ASA Electrical Standards Committee, 1936–1939.

ROBERT HENRY MARRIOTT
(A'12—M'12—F'15) (L'49)

Consulting Engineer, 1470 E. 18 St., Brooklyn, N.Y. Born: February 19, 1879, Richwood, Ohio. B.Sc., 1901, Ohio State University.

President, 1912; Vice-President, 1913; Director, 1912–1913, 1932; Manager, 1914–1916, 1920–1922, 1926–1932.

Committees: Admissions, 1926, 1930–1931; Broadcasting, 1928–1933; Convention, *chairman, 1925–1926;* Constitution and Laws, *chairman, 1928–1931;* Finance, 1914; Membership, 1925; Meetings and Papers, *chairman, 1926–1927;* Nominations, 1928; Papers,

1915, 1931–1933; Publicity, *chairman, 1914,* 1915–1919; Standardization, *chairman, 1913,* 1915, 1925; Specifications for Steamship Radio Equipment, *chairman, 1914;* San Francisco Representation, 1915.

Sections: Formation of Seattle Section, *chairman, 1915;* Seattle, *chairman, 1915–1919,* 1924.

Institute Representative: Fourth National Radio Conference, 1926; National Advisory Council on Radio in Education, Committee on Engineering Developments, 1936, 1939–1943. URSI Executive Committee, American Section, 1931–1932.

HARRY B. MARVIN
(M'31—SM'43—F'50)

Development Engineer, General Electric Company, Electronics Park, Syracuse, N.Y. Born: August, 1894, Charleston, Pa. B.S., (E.E.), 1915, M.E.(E.E.), 1925, Union College.

Fellow Award, 1950, for his
"outstanding contributions to the measurements art and pioneering work in FM, television, and allied fields."

Committees: Admissions, 1940; Awards, 1940; Frequency Modulation, 1940–1945; Papers, 1940; Papers Procurement, 1946–1950.

WARREN P. MASON
(A'36—VA'39—F'41)

Research Physicist, 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.

Fellow Award, 1941, for his
"investigations of piezoelectric crystals and their application to quartz-crystal filters."

Committees: Papers Procurement, 1947–1950; Papers Review, 1947–1951; Piezoelectric Crystals, 1940–1951.

EMIL E. MAYER
(F'34)

Consulting Engineer, 10 E. 40 St., New York, N.Y. Born: January 7, 1885, Elberfeld, Germany. E.E., 1906, Technical University, Berlin; D.S., 1919, University of Munich.

Committees: Specifications for Steamship Radio Equipment, 1914; Standardization, 1914; Wave Length Regulation, 1916.

ELMER D. McARTHUR
(M'42—SM'43—F'45)

Head, Electron Tube Division, 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.

Fellow Award, 1945, for his
"developments in the field of ultra-frequency electron tubes."

Committees: Board of Editors, 1945–1950, 1951.

BRUNSON S. McCUTCHEN
(A'21—M'26—F'32)

Chairman of Board, Applied Science Corporation of Princeton, P.O. Box 44, Princeton, N.J. Born: November 20, 1892, North Plainfield, N.J. Lit.B., 1915, E.E., 1917, Princeton University.

ARTHUR S. McDONALD
(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.

Fellow, Past President, IRE, Australia.

PAUL K. McELROY
(A'25—M'27—F'31)

Design Engineer, General Radio Company, 275 Massachusetts Ave., Cambridge, Mass. Born: August 7, 1899, Toledo, Ohio. A.B., 1920, A.M., 1921, Harvard University.

Committees: Membership, 1940.

Sections: Boston, *secretary, 1939–1941.*

KNOX McILWAIN
(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.

Fellow Award, 1948, for his
"contribution to the technical literature of radio and his activity in the field of radio aids to navigation."

Committees: Admissions, 1944–1945; Board of Editors, 1946–1951; Circuits, 1944–1945; Editorial Administrative, 1949–1951; Education, 1945; Electroacoustics, 1936–1945; Electronics, 1936–1938; Handbooks, 1945–1947; Papers, 1942–1945; Standards, 1945–1946.

Sections: Philadelphia, *chairman, 1935–1936.*

Institute Representative: National Television Systems Committee, Panel 8, 1940–1943.

DONALD W. R. McKINLEY
(A'39—SM'46—F'48)

Research Physicist, National Research Council, Sussex St., Ottawa, Ont., Canada. Born: September 22, 1912, Shanghai, China. B.A., 1934; M.A., 1935, Ph.D., 1938, University of Toronto.

Fellow Award, 1948, for his
"contributions to the development in Canada of radio aids to air navigation."

Sections: Ottawa, *chairman, 1946–1947.*

O.B.E., King's Honours List, July, 1946.

Fellow, American Physical Society.

LESLIE McMICHAEL
(M'20—F'25)

Chairman and Managing Director, McMichael Radio, Ltd., Wexham Rd., Slough, Bucks., England. Born: November 17, 1884, Birkenhead, Cheshire, England.

Committees: Membership, 1925; Receiving Sets, 1927; Sections, 1925; Standardization, 1926.

Began experimental work in radio, 1903. Joint Founder, July, 1913, Vice-President, 1924, Honorary Member, 1945, Radio Society of Great Britain; *Chairman, 1933,* Council of Radio Manufacturers Association (England); Fellow, Television Society (England); President, 1944–1945, Honorary Member, 1949, British Institute of Radio Engineers; Fellow, 1948, IRE (Australia).

DONALD M. McNICOL
(A'14—M'14—F'24) (L'49)

Consulting Communication Engineer, 25 Beaver St., New York, N.Y. Born: July 23, 1875, Hopetown, Ont., Canada. Instructor, Teachers College, Columbia University; Lecturer on Communications, University of Utah, Sheffield Scientific School, Yale University, and Cooper Union.

President, 1926; Vice-President, 1925; Manager, 1919–1924; Director, 1925–1928; Advertising Manager, 1921–1922.

Committees: Admissions, 1935; Advertising, 1925; Bibliography, 1930–1932; Editorial Administrative, 1946–1951; Meetings and Papers, *chairman, 1925;* Membership, 1925; Nominations, 1928–1930, 1933; Publicity, 1931–1934; Revision of the Constitution 1927; Sections, *chairman, 1925,* 1928; Standardization, 1922–1927.

Institute Representative: Fourth National Radio Conference 1926; National Fire Protection Association (National Electric Code), 1936; American Engineering Standards Committee (now American Standards Association) Sectional Committee on Electric Wiring and Apparatus in Relation to Fire Hazard (National Electric Code), 1930.

JAMES W. McRAE
(A'37—F'47)

Director of Transmission Development, Bell Telephone Laboratories, Inc., Murray Hill, N.J. 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.

Fellow Award, 1947, for his
"outstanding work in the planning of research and development programs in radar and counter-measures and for his researches in radio transmitting methods."

Director, 1949–1951.

Committees: Appointments, 1950; Awards, 1948–1951; Board of Editors, 1946–1951; Executive, 1950–1951; Policy Development, 1948; Tellers, *chairman, 1948.*

Sections: New York, *chairman, 1948–1949.*

Legion of Merit, War Department, 1945; Eta Kappa Nu, Honorable Mention, 1943.

LARNED A. MEACHAM
(A'39—SM'45—F'48)

Technical Staff, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y. Born: September, 1908, Denver, Colo. B.S.(E.E.), 1929, University of Washington; Certificate of Research, 1930, Cambridge University, England.

Fellow Award, 1948, for his
"contributions in the fields of radar range measurement and pulse code modulation."

Committees: Board of Editors, 1946–1951; Modulation Systems, 1950–1951.

Eta Kappa Nu Award, "Outstanding Young Electrical Engineer of 1939," January, 1940.

PIERRE MERTZ
(SM'44—F'50)

Engineer, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y. Born: April, 1897, Paris, France. A.B., 1918, Ph.D., 1926, Cornell University.

Fellow Award, 1950, in
"recognition of his important contributions to the fundamental concepts of television transmission and reception."

Committees: Facsimile, 1939–1951; Papers Procurement, 1945–1950.

Army Navy Certificate of Appreciation, Department of Defense, 1948; Fellow, Society of Motion Picture and Television Engineers.

GEORGE F. METCALF
(A'34—M'38—F'42)

Manager, Commercial Equipment Division, General Electric Company, Electronics Park, Syracuse, N.Y. Born: December 7, 1906, Milwaukee, Wis. B.S.(E.E.), 1928, Purdue University.

Fellow Award, 1942, for his
"development work on vacuum tubes and vacuum-tube circuits and the successful co-ordination of many technical projects requiring broad scientific knowledge."

Associate Editor, 1926–1928.

Committees: Board of Editors, 1946–1951; Editorial Administrative, 1949; Electronics, 1936–1941; Papers Review, *chairman, 1949, 1950;* Tellers, 1948, *chairman, 1949.*

BENJAMIN F. MIESSNER
(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, 1908–1909; Attended Purdue University, 1913–1916.

JOHN H. MILLER
(A'19—M'25—SM'43—F'50)

Vice-President and Chief Engineer, Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark, N.J. Born: June 6, 1893, Oak Park, Ill. B.S.(E.E.), 1915, University of Illinois.

Fellow Award, 1950, for his
"long activity and many contributions in the field of electrical metering and measuring technique."

Committees: Institute Sections, 1928; Sections 1933–1934, 1938–1939, *chairman, 1940,* 1941–1944.

Sections: Chicago, *chairman, 1927–1929, secretary, 1929–1930.*

Institute Representative: ASA Subcommittee on Electrical Instruments (C42.6), 1949–1950.

JOHN M. MILLER
(A'17—F'20)

Superintendent, Radio Division I, Naval Research Laboratory, Washington, D.C. Born: June, 1882, Hanover, Pa. B.A., 1904, M.A., 1907, Ph.D., 1915, Yale University.

Distinguished Civilian Service Award, United States Navy, 1945.

J. P. MINTON
(F'39)

Research Adviser, Magnolia Petroleum Company, Field Research Department, Dallas, Tex. 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, 1927–1928; Membership, 1941–1943.

Fellow in Physics, National Research Council, University of Chicago, 1921–1922. Fellow, American Physical Society, American Association for Advancement of Science.

JOHN F. MORRISON
(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.

Fellow Award, 1951, for his
"contributions in the field of broadcast antenna and transmitter design."

Committees: Annual Review, 1945–1946; Antennas, 1944–1945; Awards, 1951; Radio Transmitters, *chairman, 1945,* 1946; Standards, 1945–1946; Transmitters, 1944–1945; Transmitters and Antennas, 1938–1944.

Sections: North Jersey Subsection, *vice-chairman,* 1950.

GEORGE A. MORTON
(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.

Fellow Award, 1951, for his
"contributions to research on electronic imaging and electronic applications in the field of nucleonics."

Committees: Measurements and Instrumentation, 1951; Nuclear Studies, 1948.

Overseas Premium Award, Institute of Electrical Engineers, 1937–1938; Certificates of Commendation, Bureau of Ships, National Defense Research Council, United States Air Force.

GARRARD MOUNTJOY
(A'37—M'40—SM'43—F'50)

Chief Engineer, Radio-Television Division, Stromberg-Carlson Company, 100 Carlson Rd., Rochester, N.Y. Born: October 21, 1905, Boscobel, Wis. B.S., 1929, Washington University.

Fellow Award, 1950, for his
"contributions to the design of radio and television broadcast receivers."

Committees: Radio Receivers, 1942–1951; Television, 1945–1947; Subcommittee on Methods of Testing Television Receivers, *chairman, 1947;* Subcommittee on Standards on Radio Receivers, Definition of Terms, *chairman, 1950.*

Sections: Rochester, *secretary, 1948–1949, vice-chairman, 1950.*

Institute Representative: ASA War Standards Committee on Methods of Measuring Radio Noise, 1945–1948.

Modern Pioneer Award, National Association of Manufacturers.

ILIA E. MOUROMTSEFF
(A'34—SM'45—F'47)

Professor, Upsala College, Prospect Ave., East Orange, N.J. Born: December 9, 1881, St. Petersburg, Russia. Mil. Eng., 1906, Nicholas Engineering Academy; Dipl. Eng. (E.E.), 1910, Grand Ducal Institute of Technology, Darmstadt, Germany.

Fellow Award, 1947, in
"recognition of his contributions to vacuum-tube development, particularly transmitting tubes."

Committees: Electronics, 1941–1945; Electron Tubes, 1945–1946; Electron Tubes and Solid-State Devices, 1949–1951; Membership, 1947–1948; Papers, 1944–1945; Papers Procurement, 1945–1950; Papers Review, 1946–1950; Vacuum Tubes, 1945–1946.

Order of Merit (Silver W), Westinghouse Electric Corporation, 1947, "in recognition of distinguished service, for his work in connection with the development of ultra-high frequency radio; for his development of electronic tubes; and for the important knowledge which he has contributed to the art of electronics."

ALBERT F. MURRAY
(A'20—M'26—F'38)

Consulting Television Engineer, 4707 Windom Pl., N.W., Washington, 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, 1936–1939.

Committees: Awards, 1936; Electronics, 1937–1940; Institute Sections, 1929–1930, 1936; Membership, 1929–1939; Papers, 1934–1945; Papers Review, 1946–1951; Papers Procurement, 1947–1950; Television, 1939–1945; Television and Facsimile, 1936–1938; Television Systems, 1949–1951.

Sections: Philadelphia, *chairman, 1937–1938.*

EDWARD L. NELSON
(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, 1932–1936.

Committees: Awards, 1929; Board of Editors, 1941–1951; Broadcasting, 1928–1931, *chairman, 1932;* Broadcast, *chairman, 1933–1936;* Meetings and Papers, 1928–1929; Nominations, 1932, 1935; Registration of Engineers, 1940–1943; Standardization, 1927–1931; Subcommittee on the Use of the Transmission Unit, 1928; Standards, 1932–1936.

Institute Representative: Planning Committee, National Conference in Educational Broadcasting, American Council of Education, 1936, 1939–1943.

DANIEL E. NOBLE
(A'25—SM'44—F'47)

Vice-President in Charge, Communications and Electronics Division, and Director, Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill. Born: October 4, 1901, Naugatuck, Conn. B.S., 1929, University of Connecticut.

Fellow Award, 1947, in
"recognition of his contributions to the design and application of very-high-frequency voice communication systems for police and other emergency services."

Committees: Standards, 1940–1942, 1946; Annual Review, 1941–1942, 1946; Regular Papers Committee, 1941; Papers Procurement, 1942–1943, 1947, 1949–1950; Frequency Modulation, *chairman, 1940–1942,* 1943–1945; Mobile Communication, *chairman, 1945–1947, 1949–1951.*

Sections: Connecticut Valley, *chairman, 1938.*

PEDRO J. NOIZEUX
(A'30—F'47)

Assistant General Manager, Transradio Internacional, Compania Argentina de Telecommunicaciones, San Martin, 379, Buenos Aires, Argentina. Born: 1900, France.

Fellow Award, 1947, for his
"leadership in development of radio communication services."

Founder, Buenos Aires Section, 1939; *chairman, 1941.*

DWIGHT O. NORTH
(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.

Fellow Award, 1943, for his
"contributions to the knowledge of the fundamentals of vacuum-tube performance, especially with regard to fluctuation phenomena and the effects of electron transit time."

Committees: Awards, 1948; Board of Editors, 1946–1951; Papers, 1944–1945.

KENNETH A. NORTON
(A'29—M'38—SM'43—F'43)

Chief, Frequency Utilization Research Section; Assistant Chief, Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C. Born: February 27, 1907, Rockwell City, Iowa. B.S., 1928, University of Chicago.

Fellow Award, 1943, in
"recognition of his work in applying his conclusions from the theory of radio wave propagation to the problems of frequency allocation."

Committees: Editorial Administrative, *alternate, 1949–1951;* Navigation Aids, 1950–1951; Papers Procurement, 1949–1950; Papers Review, 1946–1951; Radio Wave Propagation, 1942–1945; Radio Wave Propagation and Utilization, 1947–1948; Wave Propagation and Utilization, 1947–1948; Wave Propagation, 1937–1941, 1949–1951.

GORDON W. OLIVE
(A'29—VA'39—F'51)

Director General of Engineering, Canadian Broadcasting Corporation, 1425 Dorchester St. West, Montreal, P.Q., Canada. Born: March 18, 1898, Montreal, P.Q., Canada. Attended McGill University, 1919–1922.

Fellow Award, 1951, for his
"major contributions to the development of radio broadcasting in Canada, and in particular, for the engineering and organization of Canadian Overseas broadcast service during the war."

Committees: Frequency Modulation, 1946; Modulation Systems, 1947.

HARRY F. OLSON
(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.

Fellow Award, 1949, for his
"outstanding developments and publications in the fields of acoustics and underwater sound."

Committees: Annual Review, 1949–1950; Board of Editors, 1940–1951; Electroacoustics, 1932–1951, *chairman, 1934–1938;* Papers Procurement, 1943–1947; Standards, 1934–1938.

Institute Representative: ASA Sectional Committee on Acoustical Measurements and Terminology, 1940–1950; Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1949–1950.

GEORGE D. O'NEILL
(A'28—SM'46—F'49)

Supervisor, Sylvania Electric Products Inc., Bayside, N.J. Born: July, 1900, Montclair, N.J. B.S., 1924, University of Michigan.

Fellow Award, 1949, for his
"work in electron tube theory and design."

Electron Tube Conference, *chairman, 1947.*

Committees: Electronics, 1936–1945; Electron Tubes, 1946–1948; Electron Tubes and Solid-State Devices, 1949–1951, *vice-chairman, 1951;* Vacuum Tubes, 1945–1946, *chairman, 1946–1951.*

HAROLD S. OSBORNE
(A'14—M'29—SM'43—F'45)

Chief Engineer, American Telephone and Telegraph Company, 195 Broadway, New York, N.Y. Born: August 1, 1887, Fayetteville, N.Y. B.S., 1908, Eng.D., 1910, Massachusetts Institute of Technology.

Fellow Award, 1945, for his
"contributions in the electrical communication field including outstanding leadership and direction in the application of new techniques to telephony."

Committees: Standardization, 1926–1928.

ARTHUR A. OSWALD
(A'19—M'25—F'28)

Overseas Radio Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J. Born: March 3, 1891, Lake Linden, Mich. B.S.(E.E.), 1916, E.E., 1927, Armour Institute of Technology (now Illinois Institute of Technology).

Committees: Papers Procurement, 1942–1943; Regular Papers, 1941; Standardization, 1925.

LOUIS G. PACENT
(A'12—M'15—F'27)

President and Technical Director, Pacent Engineering Corporation, 79 Madison Ave., New York, N.Y. Born: June 23, 1893, New York, N.Y. I.E.E., 1916, Pratt Institute.

Advertising Manager, 1915–1920.

Committees: Membership, 1925, 1934, 1936–1940; New York Program, 1936–1937; Publicity, 1916–1919; Sections, 1926–1927; Standardization, 1929–1930; Subcommittee, Circuit Elements, 1925; Tellers, *chairman, 1938.*

Institute Representative: American Engineering Standards Committee (now ASA), Technical Committee, Component Parts and Wiring, *chairman, 1926.*

General chairman, Radio Pioneers Reunion, 1945.

DAVID PACKARD
(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.

Fellow Award, 1948, for
"his initiative in the development of special radio testing and measuring techniques."

Committees: Awards, 1949; Instruments and Measurements, 1949–1950.

Sections: San Francisco, *secretary, 1943–1944; chairman, 1945–1946.*

ROBERT M. PAGE
(SM'45—F'47)

Superintendent, Radio Division III, United States Naval Research Laboratory, Washington, D.C. Born: June 2, 1903, St. Paul, Minn. B.Sc., 1927, D.Sc. (Honorary), 1943, Hamline University; M.A., 1932, George Washington University.

Fellow Award, 1947, in
"recognition of his pioneering achievements in solving some of the early problems of basic importance to radar."

Committees: Board of Editors, 1946–1951.

Distinguished Civilian Service Award, United States Navy, 1945; Citation O.S.R.D., 1946; Certificate of Merit, The President of the United States, 1947.

CHARLES J. PANNILL
(M'13—F'16) (L'49)

Retired as Consultant. Formerly President and Director, RCA Institutes, Inc., and Radiomarine Corporation of America, 30 Rockefeller Plaza, New York, N.Y. Born: May 13, 1879, Petersburg, Pa.

Committees: Publicity, 1916–1919.

Sections: Washington, *secretary-treasurer, 1914, vice-chairman, 1916–1919.*

First Certificate of Skill in Radio, 1911, No. 1 Commercial Radio Operators License, 1912, United States Government. Pioneer Radio Communication, 1902. Sent First Trans-Atlantic Radiogram, 1906. Chevalier of the First Order of Leopold; Marconi Memorial Medal of Achievement, The Veteran Wireless Operators Association, 1943. Delegate, International Radio and Telecommunication Conventions, 1927–1947. Delegate, London Conference Society Naval Architects and Marine Engineers, 1951.

LEONARD S. PAYNE
(M'16—SM'43—F'49)

Manager, Patents Division, Canadian Marconi Company, 2442 Trenton Ave., Montreal, P.Q., Canada. Born: February 28, 1886, London, England.

Fellow Award, 1949, for his
"contributions in Canada to the field of international communications."

HAROLD O. PETERSON
(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, University of Nebraska.

Fellow Award, 1941, for his
"engineering leadership in radio communications and contributions to the ultra-high-frequency field."

Committees: Board of Editors, 1944–1951; Industrial Electronics, 1947–1950; Instruments and Measurements, 1949–1950; Papers, 1934–1944; Radio Receivers, 1936–1947; Radio Wave Propagation and Utilization, 1945–1948; Standardization, Subcommittee on Aircraft Receivers, 1930–1931; Standards, 1934–1935; Transmitters and Antennas, 1936; Wave Propagation, 1937–1941, 1949–1951.

GREENLEAF W. PICKARD
(M'12—F'15) (L'49)

President, Pickard and Burns, Inc., 240 Highland Ave., Needham, Mass. Born: February 14, 1877, Portland, Me.

Medal of Honor, 1926, for his
"contributions as to crystal detectors, coil antennas, wave propagation and atmospheric disturbances."

President, 1913; Manager, 1912; Director, 1913–1915.

Committees: Board of Editors, 1928–1951; Bibliography, 1930–1932; Constitution and Laws, 1928–1931; Meetings and Papers, 1927–1929; Nominations, 1929, 1933, *chairman, 1938;* Specifications for Steamship Radio Equipment, 1914; Standardization, 1914–1915, 1925; Wave Length Regulation, 1916; Wave Propagation, 1937–1938.

Sections: Organization of Boston Section, 1914.

Armstrong Medal, Radio Club of America, 1940.

GEORGE W. PIERCE
(M'13—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.

Medal of Honor, 1929, for his
"major contributions in the theory and operation of crystal detectors, piezoelectric-crystals and magnetostriction frequency controls, and magnetostriction devices for the production of sound; and for his instructional leadership as a teacher and as a writer of important texts in the electric-wave field."

President, 1918–1919; Vice-President, 1915; Director, 1915, 1918–1921.

Committees: Sections, 1925, 1928; Standardization, 1914–1919.

Sections: Organization of the Boston Section 1914, *chairman, 1922–1932.*

Franklin Medal, Franklin Institute, 1943.

JOHN ALVIN PIERCE
(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.

Fellow Award, 1947, for his
"contributions to the development of Loran, a radio aid to navigation."

Committees: Annual Review, 1948; Radio Wave Propagation and Utilization, 1945–1948; Navigation Aids, 1947, *chairman, 1948–1949,* 1950; Standards, 1948; Wave Propagation, 1949–1950.

Fellow, American Association for the Advancement of Science.

JOHN R. PIERCE
(S'35—A'38—SM'46—F'48)

Technical Staff, 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.

Fellow Award, 1948, for his
"many contributions to the theory and design of vacuum tubes."

Morris Liebmann Memorial Prize, 1947, for his
"development of a traveling-wave tube having both high gain and very great bandwidth."
Committees: Papers Procurement, *second vice-chairman, 1943.* Eta Kappa Nu Award, "Outstanding Young Electrical Engineer," 1942.

EMANUEL R. PIORE
(A'38—M'42—SM'43—F'50)

Deputy for Natural Sciences, Office of Naval Research, Navy Department, Washington, D.C. Born: July 19, 1908, Wilno, Russia. B.A., 1930, Ph.D., 1935, University of Wisconsin.
Fellow Award, 1950, for his
"many contributions in the fields of engineering and physical sciences, and for outstanding service in enhancing the national effort in basic research."
Committees: Awards, 1949; Director, 1951. Technical Program Committee, 1950 IRE Convention.

FRANK A. POLKINGHORN
(A'25—F'38)

Technical Staff, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y. Born: July 23, 1897, Holbrook, Mass. B.S., 1922, University of California.
Committees: Admissions, 1943–1948, *vice-chairman, 1945–1948;* National Convention, 1948; Sections, 1941–1945; Standardization: Subcommittee on High-Frequency Receivers, 1930–1931.

J. R. POPPELE
(A'30—M'39—SM'43—F'50)

Vice-President and Chief Engineer, Radio Stations WOR and WOR-TV, General Teleradio, Inc., 1440 Broadway, New York, N.Y. Born: February 4, 1898, Newark, N.J.
Fellow Award, 1950, for his
"long and continued leadership in the broadcasting field and in particular for his recent contributions to television broadcasting."
Director, 1947.
Committees: Building, 1945–1946; Facsimile, 1940, 1942; Membership, 1939–1940; New York Program, 1940; Papers, 1942–1945; Papers Procurement, 1942–1943; Public Relations, 1943–1946; Regular Papers, 1941; National Committee, 1947.

RALPH K. POTTER
(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, 1931–1941.

FRANK H. R. POUNSETT
(A'26—SM'44—F'47)

Chief Engineer and Factory Manager, Stromberg-Carlson Company, Ltd., 211 Geary Ave., Toronto 4, Ont., Canada. Born: September 12, 1904, London, England. B.A.Sc., 1928, University of Toronto.
Fellow Award, 1947, in
"recognition of his contributions to the engineering development and production design of radar apparatus in Canada."
Director, 1949–1950.
Committees: Canadian Building Fund and Auditor, 1945; Members, 1951; Nominations, 1948–1950; Radio Receivers, 1946–1951.
Sections: Toronto, *chairman, 1945–1946.*

HARADEN PRATT
(A'14—M'17—F'29)

Vice-President, American Cable and Radio Corporation; Mackay Radio and Telegraph Company, Inc., 67 Broad St., New York, N.Y. Born: July 18, 1891, San Francisco, Calif. B.S., 1914, University of California.
Medal of Honor, 1944, in
"recognition of his engineering contributions to the development of radio, of his work in the extension of communication facilities to distant lands, and of his constructive leadership in Institute affairs."
President, 1938; Treasurer, 1941–1942; Secretary, 1943–1951; Director, 1935–1951.
Committees: Admissions, 1937; Annual Review, 1937; Appointments, *chairman, 1947;* Awards, 1937, *chairman, 1939,* 1940–1941, 1944, *vice-chairman, 1945, chairman, 1948;* Board of Editors, 1941–1951, Building Fund Administrator, 1947–1948; Constitution and Laws, 1941, 1951; Editorial Administrative, 1947–1950; Executive, *vice-chairman, 1941–1942, secretary, 1943–1951;* Fiscal, *chairman, 1947, 1948;* Investments, 1944–1946; New York Program, 1933, 1935, *chairman, 1936,* 1937; Joint Technical Advisory, 1948–1949; Nominations, 1941–1943, *chairman, 1936,* 1947, 1948; Office Quarters, 1947; Policy Development, *chairman, 1951* Preparedness, *chairman, 1940–1941;* Standardization, 1928–1931; Technical Committee No. 2, Radio Transmitters and Antennas, 1930; Standards, 1932, *chairman, 1934–1935,* 1936–1937; Tellers, *chairman, 1936.*
Institute Representative: ASA Sectional Committee (C42) on Definitions of Electrical Terms, 1930–1946, 1949–1950; ASA Board of Directors, 1939–1941; ASA Sectional Committee on Radio, 1936–1948; Joint Technical Advisory Committee, 1949–1951. Radio Technical Planning Board, 1944, *chairman, 1945–1948.*

JACKSON H. PRESSLEY
(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.

LLOYD M. PRICE
(A'31—SM'46—F'49)

Chief Engineer, Radio Valve Company of Canada, Ltd., 189 Dufferin St., Toronto, Ont., Canada. Born: August, 1897, St. Thomas, Ont., Canada. B.A.Sc., 1923, University of Toronto.
Fellow Award, 1949, for his
"contributions to the development, production and application of electron tubes in Canada."
Committees: Electron Tubes, 1946–1947.
Sections: Toronto, *chairman, 1935–1936, secretary, 1934.*

CONAN A. PRIEST
(A'24—M'38—SM'43—F'47)

Manager of Engineering, Commercial Equipment Division, Electronics Department, General Electric Company, Electronics Park, Syracuse, N.Y. Born: August 11, 1900, Solon, Me. B.S. (E.E.), 1922, E.E. (Professional), 1925, University of Maine.
Fellow Award, 1947, for his
"contributions to the development of Loran, a radio aid to navigation."
Committees: Board of Editors, 1941–1951.
Sections: Syracuse, *chairman, 1947.*

SIMON RAMO
(A'38—SM'44—F'50)

Co-Director, Research and Development Laboratories, Hughes Aircraft Company, Culver City, 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.
Fellow Award, 1950, for his
"many contributions to the analysis of electromagnetic phenomena and for his leadership in research."
Committees: Board of Editors, 1946–1951; Papers, 1941–1945.
Eta Kappa Nu Honorable Mention Award, 1941.

RICHARD H. RANGER
(F'37)

President, Rangertone, Inc., 73 Winthrop St., Newark, N.J. Born: June 13, 1889, Indianapolis, Ind. B.S., 1911, Massachusetts Institute of Technology.
Committees: Meetings and Papers, 1928–1930; New York Program, *chairman, 1930–1932;* Papers, 1931–1933.

HERBERT J. REICH
(A'26—M'41—SM'46—F'49)

Professor of Electrical Engineering, Yale University, New Haven, Conn. Born: October, 1900, Staten Island, N.Y. M.E., 1924, Ph.D. (Physics), 1929, Cornell University.
Fellow Award, 1949, for his
"contributions as a teacher and author in the radio and electronics fields."
Director, 1944, 1948–1951.
Committees: Admissions, 1945–1946; Appointments, 1950; Awards, 1948; Board of Editors, 1943–1951; Constitution and Laws, 1949–1950; Education, 1945–1948, *chairman, 1949–1951;* Electronics, 1941–1945; Electron Tubes, 1945–1948; Electron Tube Conference Committee, 1946, 1950, *chairman, 1951;* Electron Tubes and Solid-State Devices, 1949–1951.
Institute Representative: University of Illinois, 1941–1943; Yale University, 1948–1950.
Fellow, American Physical Society.

JOHN D. REID
(A'41—M'44—SM'46—F'49)

Vice-President in Charge of Engineering, American Radio and Television Inc., N. Little Rock, Ark. Born: March, 1907, Morristown, N.J. Attended University of Pennsylvania, 1925–1928.
Fellow Award, 1949, for his
"developments in radio-frequency circuits."
Director, 1950–1951.
Committees: Awards, 1951; Board of Editors, 1947–1951; Editorial Administrative, 1949–1950; Membership, 1949–1950; Papers Procurement, 1945–1946, *chairman, 1948–1949;* Papers Review, 1946; Policy Development, 1950–1952; Professional Groups, 1948, 1950; Receivers, 1946–1950, *vice-chairman, 1950–1951.*
Sections: Cincinnati, *chairman, 1946–1947.*
Presidential Certificate of Merit, 1948; Naval Ordnance Development Award, United States Navy, 1945.

ALEXANDER E. REOCH
(M'14—F'16) (L'49)

Assistant Treasurer, RKO Service Corporation, 1270 Sixth Ave., New York, N.Y. Born: April 27, 1884, Sheffield, England. E.E., 1902, Sheffield University College, England.
Manager, 1924–1927.
Committees: Meetings and Papers, 1925; Standardization, 1925–1926.

FRANCIS X. RETTENMEYER
(A'26—M'29—SM'43—F'44)

Chief Engineer, Federal Telephone and Radio Corporation, 100 Kingsland Rd., Clifton, N.J. Born: July 27, 1900, Kendrick, Okla. B.S.(E.E.), 1922, University of Colorado.
Fellow Award, 1944, in
"recognition of his accomplishments in the development of broadcast and automobile receivers and aviation radio."
Committees: Board of Editors, 1946–1951; Editorial Administrative, 1951; Membership, 1938–1940; Papers, 1942–1945; Papers, Procurement, 1947–1949; Public Relations, 1941–1942; Publicity, 1939, Radio Receivers, 1936–1937; Sections, 1936; Standardization: Technical Committee No. 1, Radio Receivers and Parts, 1929–1930.

LESTER E. REUKEMA
(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.
Fellow Award, 1951, for his
"research in electromagnetic radiation and a distinguished record in the teaching of electronics."
Sections: San Francisco, *secretary, 1946–1947.*
Fellow, American Institute of Electrical Engineers, 1946.

CHESTER W. RICE
(A'16—M'26—F'28)

Retired. 1161 Lowell Rd., Schenectady, N.Y. Born: December 16, 1888, Lynn, Mass. S.B., 1910, M.E.E., 1911, Harvard University.

HAROLD B. RICHMOND
(A'14—M'23—F'29)

Chairman of the Board, General Radio Company, 275 Massachusetts Ave., Cambridge, 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, 1940–1941; Public Relations, 1947; Registration of Engineers, *chairman, 1940–1943;* Standardization, 1928–1930.
Presidential Medal for Merit, 1947, Guided Missiles Development

WALTER vanB. ROBERTS
(A'22—F'29)

RCA Laboratories Division, Radio Corporation of America, Princeton, N.J. 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.

RONALD J. ROCKWELL
(A'25—M'31—SM'43—F'45)

Vice-President in Charge of Engineering, Crosley Broadcasting Corporation, Radio Station WLW, 140 W. Ninth St., Cincinnati, Ohio. Born: February 5, 1904, Omaha, Neb. B.S.(E.E.), 1927, Iowa State College; E.E. (Professional), 1946.
Fellow Award, 1945, for his
"active work in affairs of the Institute and in engineering of high-power international broadcast transmitters."
Committees: Electroacoustics, 1951; Sections, *ex-officio,* 1938–1939.
Sections: Cincinnati, *chairman, 1938–1939.*

ALBERT ROSE
(A'36—M'40—SM'43—F'48)

Physicist, 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.
Fellow Award, 1948, for his
"contributions in the field of television camera tubes and associated equipment."
Morris Liebmann Memorial Prize, 1946,
"for his contributions to the art of converting optical images to electrical signals, particularly the image orthicon."
T.B.A. Award (with P. K. Weimer and H. B. Law), Television Broadcasters Association, 1945; Journal Award, Society of Motion Picture Engineers, 1946.

GEORGE T. ROYDEN
(A'19—M'27—F'33)

Engineer, Mackay Radio and Telegraph Company, 67 Broad St., New York, N.Y. Born: June 20, 1895, Fort Clark, Tex. A.B., 1917, Engineer, 1924, Leland Stanford Junior University.
Director, 1946.
Committees: Admissions, 1941–1942, *chairman, 1943–1948;* Awards, 1946; Constitution and Laws, 1944, 1949; New York Program, 1938–1942; Sections, 1941–1945.
Sections: San Francisco, *chairman, 1933–1934.*

WALTER A. RUSH
(F'36) (L'49)

Retired. 200 Rideau Terr., Ottawa, Ont., Canada. Born: April 25, 1880, London, England.
Vice-President, 1942; Director, 1942.

FRANCIS M. RYAN
(J'14—A'17—M'26—F'40)

Radio Engineer, American Telephone and Telegraph Company, 195 Broadway, New York, 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, 1931–1936; Railroad and Vehicular Communication, 1945–1946; Tellers, 1938.
Institute Representative: Committee on Aeronautic Radio Research, Department of Commerce, 1930–1931; Liaison Committee on Aeronautic Radio Research, 1936–1937, 1939–1941.

HANS W. G. SALINGER
(A'37—SM'46—F'51)

Research Engineer, Capehart-Farnsworth Corporation, 3700 East Pontiac St., Fort Wayne, Ind. Born: April 1, 1891, Berlin, Germany. Ph.D., 1915, University of Berlin.

Fellow Award, 1951, for his
"original contributions to electro-noptic and filter theory."

Committees: Papers Procurement, 1947–1950.

Sections: Fort Wayne, *chairman, 1949–1950.*

WINFIELD W. SALISBURY
(SM'44—F'47)

Director, Research Division, Collins Radio Company, 855 35 St., N.E., Cedar Rapids, Iowa. Born: December 27, 1903, Carthage, Ill. A.B., 1926, University of Iowa; D.S. (Honorary), 1950, Cornell College, Iowa.

Fellow Award, 1947, for his
"contributions to the generation of high power continuous wave energy at ultra-high frequencies."

Committees Education, 1946; Nuclear Studies, 1948; Papers Review, 1946; Railroad and Vehicular Communications, 1945–1947.

ARTHUR L. SAMUEL
(A'24—VA'39—SM'44—F'45)

Senior Engineer, 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.

Fellow Award, 1945, for his
"fundamental work in the field of electronic research and for developments of electronic devices of particular value at very high frequencies."

Paper Award, 1937, for his paper on "A Negative-Grid Triode Oscillator and Amplifier for Ultra-High Frequencies."

Committees: Annual Review, 1950; Electronics, 1944–1945; Electron Tubes, 1946–1947; Electron Tubes and Solid-State Devices, 1949, *vice-chairman, 1950–1951, chairman, 1951;* Research, 1949–1950; Symbols, 1946–1951; Vacuum Tubes, 1945.

DAVID SARNOFF
(A'12—M'14—F'17)

Chairman of the Board, Radio Corporation of America, 30 Rockefeller Plaza, New York, N.Y. 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.

Secretary, 1915–1917; Director, 1915–1917; Manager, 1918–1920.

Committees: Constitutional Amendments, 1915; Financial Matters, 1915; Increase of Membership, 1916–1918; Publicity, 1915–1916, *Chairman, 1916–1919;* Wave Length Regulation, 1916.

Sections: San Francisco Representation, 1915.

Grand Medal of Association des Ingenieurs-Docteurs of France, 1950. National Chairman, 1951, Red Cross Fund Campaign.

OTTO H. SCHADE
(M'40—SM'43—F'51)

Senior Engineer, RCA Victor Division, Radio Corporation of America, 415 S. Fifth St., Harrison, N.J. Born: April 27, 1903, Schmalkalden, Germany. Attended Technische Hochschule, Berlin-Carlottenburg, Germany, 1922–1925.

Fellow Award, 1951, for his
"many contributions in the development of circuits and electronic devices used in television."

Modern Pioneer Award, National Association of Manufacturers, 1940; RCA Victor Award of Merit, Radio Corporation of America, 1946.

SERGEI A. SCHELKUNOFF
(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.

Fellow Award, 1944, in
"recognition of his mathematical contributions to electro-magnetic theory."

Morris Liebmann Memorial Prize, 1942, for his
"contributions to the theory of electromagnetic fields in wave transmission and radiation."

Committees: Annual Review, 1947; Antennas, 1945–1948; Antennas and Waveguides, 1949–1951; Papers, 1942–1945; Papers Review, 1946; Radio Wave Propagation and Utilization, 1945–1946, *chairman, 1947;* Standards, 1947.

Institute Representative: ASA Sectional Committee (C61) on Electric and Magnetic Magnitudes and Units, 1949–1950.

Franklin Institute Stuart Ballantine Medal, 1949, for his
"outstanding contributions to communications and reconnaissance."

JOHN C. SCHELLENG
(A'23—M'25—F'28)

Radio Research Engineer, Bell Telephone Laboratories, Inc., Deal, N.J. Born: November 12, 1892, Freeport, Ill. A.B., 1915, Cornell University.

Committees: Annual Review, 1937; Antennas, 1944–1948; Antennas and Waveguides, 1949–1950; Awards, 1943; Handbooks, 1945; Radio Transmitters, 1945–1947; Standardization, 1931; Subcommittee on Methods of Testing Apparatus, Equipment, and Devices, 1929–1930; Standards, 1936–1937; Transmitters, 1944; Transmitters and Antennas, 1938–1944; *chairman, 1936–1937.*

Institute Representative: ASA Definitions Co-ordinating Committee, 1948; ASA Sectional Committee on Definitions of Electrical Terms, 1948–1950; ASA Subcommittee on Communications, *vice-chairman, 1948–1950;* Joint IRE, AIEE, ASA (C42) Definitions Co-ordinating Committee, 1949–1950.

ARNE SCHLEIMANN-JENSEN
(A'45—SM'47—F'48)

Owner and Director, Schleimann-Jensen Laboratoriet, Stockholm-Johanneshov. Born: July 27, 1906, Randers, Denmark. Paternostervägen 13-17, Radio and Telephone Course, Royal Technical University of Denmark, 1925–1931.

Fellow Award, 1948, for his
"contributions as an engineer and executive in the electron tube industry in Sweden under adverse war conditions."

DOMINIC F. SCHMIT
(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.

Fellow Award, 1951, for his
"outstanding leadership and direction in many phases of radio engineering."

JOHN SCOTT-TAGGART
(A'18—F'35)

Wynwood, Beaconsfield, Bucks., England. Born: May 27, 1897, Bolton, Lancs., England.

STUART W. SEELEY
(M'40—SM'43—F'43)

Director, Industry Service Laboratory, RCA Laboratories Division, Radio Corporation of America, 711 Fifth Ave., New York, N.Y. Born: June 23, 1901, Chicago, Ill. B.S.(E.E.), 1925, Michigan State College.

Fellow Award, 1943, for
"the development of practical apparatus for the radio industry, particularly in the fields of television and high-frequency broadcast reception."

Morris Liebmann Memorial Prize, 1948, for
"his development of ingenious circuits related to frequency modulation."

Committees: Admission, 1944–1948; Awards, 1949; Board of Editors, 1947–1951; Circuits, 1944–1947; Modulation Systems, 1947–1950; Professional Groups, 1948; Receivers, 1950–1951.

BENJAMIN E. SHACKELFORD
(A'23—M'26—F'38)

Director, License Department, RCA International Division, Radio Corporation of America, 30 Rockefeller Plaza, New York, 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, 1945–1950.

Committees: Appointments, 1948; Awards, 1941, 1943–1944, 1950–1951; Bibliography, *chairman, 1930,* 1931; Board of Editors, 1937–1940; Building Fund, *chairman, 1944–1945,* Constitution and Laws, 1946, *chairman, 1947;* Convention Policy, 1947–1950; Education, 1949; Executive, *chairman, 1948,* 1949; Frequency Modulation, 1942–1945, Institute Sections, 1929–1932, *chairman, 1933,* 1934; Meetings and Papers, 1929; National Convention, *chairman, 1944,* 1947; New York Program, 1941–1942; Nominations, 1949–1950; Papers, 1932–1936; Papers Procurement, 1942–1943; Planning, 1947; Policy Development, *chairman, 1949,* 1950; Professional Groups, 1950; Sections, 1943–1945, 1949–1950; Special Papers, *chairman, 1940–1941;* Special Publications Fund, 1947; Standardization, 1941; Standards, 1932.

Institute Representative: ASA Sectional Committee on Definition of Electrical Terms, Subcommittee on Vacuum Tubes, 1936, 1939–1948; ASA Sectional Committee on Vacuum Tubes for Industrial Purposes, 1936, 1939–1948.

CLAUDE E. SHANNON
(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.

Fellow Award, 1950, for his
"contributions to the philosophy of new pulse methods and to the basic theory of communications."

Morris Liebmann Memorial Prize, 1949, for his
"original and important contributions to the theory of the transmission of information in the presence of noise."

Institute Representative: IRE, AIEE Committee on Noise Definitions, 1949–1950.

Alfred Noble Prize, AIEE, 1940.

HENRY S. SHAW
(A'17—M'21—F'35)

Retired. R.F.D. 1, Box 294-B, Westbrook, Maine. Born: November 29, 1884, Boston, Mass. A.B., 1906, Harvard University.

ROBERT E. SHELBY
(A'29—M'36—SM'43—F'48)

Director of Television Engineering Operations, National Broadcasting Company, Inc., 30 Rockefeller Plaza, New York, N.Y. Born: July 20, 1906, Austin, Tex. B.S.(E.E.), 1927, B.A., 1928, M.A. (Physics), 1929, University of Texas.

Fellow Award, 1948, for his
"many contributions to sound and television broadcasting."

Committees: Annual Review, 1950–1951; Papers Procurement, 1947–1950; Papers Review, 1948–1951; Television, 1939–1948; Television and Facsimile, 1938; Television Systems, *vice-chairman, 1949–1951, chairman, 1951.*

JAMES E. SHEPHERD
(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.

Fellow Award, 1948, for his
"contributions to the development of airborne radar armament and for his active participation and leadership in the functions of the Institute."

Director, 1948–1950.

Committees: Admissions, 1944; Awards, 1951; Constitution and Laws, *chairman, 1949;* Convention Policy, *chairman, 1947–1948;* Membership, 1943; National Convention, *chairman, 1947;* Sections, 1946–1951, Tellers, 1946–1947; Winter Technical Meeting, *vice-chairman, 1945–1946.*

Sections: New York, *secretary, 1944–1945; vice-chairman, 1946–1947; chairman, 1947–1948.*

WILLIAM E. SHOUPP
(SM'45—F'51)

Director of Research, 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.

Fellow Award, 1951, for his
"work in applying electronics to nuclear research."

Committees: Nuclear Studies, 1948–1951; Paper Procurement, 1949–1950.

Sections: Pittsburgh, *chairman, 1946–1947.*

PHILIP F. SILING
(M'40—SM'43—F'51)

Engineer-in-Charge, RCA Frequency Bureau, 1625 K St., N.W., Washington, D.C. Born: August 14, 1897, Oil City, Pa. Ph.B., 1917, Yale University.

Fellow Award, 1951, for his
"contributions to the establishment and administration of national and international radio frequency allocations."

Committees: Nominations, 1946; National Convention, *vice-chairman, 1947;* Winter Technical Meeting, 1946.

Institute Representative: Joint Technical Advisory Council, 1948–1951, *chairman, 1948–1949.*

Sigma Xi.

EMIL J. SIMON
(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 to 1909.

Secretary, 1912–1914; Director, 1912–1914; Manager, 1915.

Committees: Publicity, 1913, 1915; Specifications for Steamship Radio Equipment, 1914; Standardization, 1915.

DONALD B. SINCLAIR
(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. S.B., 1931, S.M., 1932, Sc.D., 1935, Massachusetts Institute of Technology.

Fellow Award, 1943, for the
"development and application of various types of networks for high-frequency measurement of impedance."

Treasurer, 1949–1950; Director, 1945–1951.

Committees: Admission, 1948; Antennas, 1944–1946; Awards, 1951; Executive, 1948, *vice-chairman, 1949–1950;* Finance, ex-officio, *Treasurer, 1949–1950;* Membership, 1947–1948, 1950; National Convention, 1949; Nominations, 1948; Papers, 1941–1945; Papers Procurement, 1945–1946; Planning, 1947; Radio Transmitters, 1945–1946; Special Publication Fund, 1947; Television, 1940–1946; Transmitters, 1944; Transmitters and Antennas, 1941–1944.

Institute Representative: Radio Technical Planning Board, 1945–1946, *alternate, 1947–1948.*

HECTOR R. SKIFTER
(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.

Fellow Award, 1951, for his
"technical contributions to radio broadcasting and leadership of electronics research and development."
Presidential Certificate of Merit, 1947.

JOSEPH SLEPIAN
(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; M.Sc. (Honorary), 1950, Leeds University, England.
Fellow Award, 1945, in
"recognition of his contributions as scientist, engineer, and inventor to the field of electronics."
AIEE Award, 1933, for the "best paper in theory and research."
Elected to Membership, National Academy of Science, 1941.
John Scott Medal, 1932.
Benjamin Garver Lamme Medal from AIEE, 1942, for
"his contributions to the development of circuit interrupting and circuit-rectifying apparatus."

DAVID B. SMITH
(A'35—SM'44—F'48)

Vice-President, Research, Philco Corporation, Tioga and C Sts., Philadelphia, Pa. Born: December 3, 1911, Newton, N.J. S.B., 1933, S.M., 1934, Massachusetts Institute of Technology.
Fellow Award, 1948, for his
"outstanding leadership in standardization activities, particularly in the field of television."
Director, 1947.
Committees: Frequency Modulation, 1940–1946; IRE-RMA Problem No. 2 Committee; Membership, 1949–1951; Public Relations, 1947–1948; Special Publication Fund, 1947; Television, 1942–1948; Television Systems, 1949–1951.
Sections: Philadelphia, *chairman, 1945.*

REGINALD L. SMITH-ROSE
(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, London.
Fellow Award, 1944, in
"recognition of his pioneer work in the field of direction finding and radio propagation, allied to his leadership of an outstanding radio research group."
Vice-President, 1948; Director, 1948.
Committees: Radio Wave Propagation, 1944–1945; Radio Wave Propagation and Utilization, 1945–1948; Wave Propagation, 1949, 1951.
Students Premium, 1917; Wireless Premium, 1925, 1938, 1939; Dudell Premium, 1942, Institution of Electrical Engineers, London; Coronation Medal, 1937; United States Medal of Freedom with Silver Palm, 1947.

GEORGE C. SOUTHWORTH
(M'26—F'41)

Radio Research Engineer, Bell Telephone Laboratories, Inc., 463 West St., New York, N.Y. 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.
Fellow Award, 1941, for his
"pioneering investigations in ultra-high-frequency communication and transmission."
Morris Liebman Memorial Prize, 1938, for his
"theoretical and experimental investigations of the propagation of ultra-high-frequency waves through confined dielectric channels and the development of a technique for the generation and measurement of such waves."
Committees: Meetings and Papers, 1930; Papers, 1931–1934; Standardization, Circuit Elements, 1928.
Louis Edward Levy Medal, Franklin Institute, 1946; Stuart Ballantine Medal, Franklin Institute, 1947.

KARL R. SPANGENBERG
(A'34—SM'45—F'49)

Professor of Electrical Engineering, Stanford University, 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.
Fellow Award, 1949, for his
"many technical contributions, particularly his analytical work on vacuum tubes."
Committees: Awards, 1950; Education, 1946, 1949–1951; Membership, 1941; Papers, 1943–1945; Papers Procurement, 1942–1943, 1945; Regular Papers, 1941.
Sections: San Francisco, *secretary, 1940–1942, chairman, 1943–1944.*
Institute Representative: Stanford University, 1942–1947.

W. ARTHUR STEEL
(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.
Fellow Award, 1950, for his
"contributions in Canada in advancing development of military radio, broadcasting, and international communication."
Committees: Broadcast, 1936.
Sections: Ottawa, *chairman, 1945–1946.*

JEROME R. STEEN
(A'24—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.
Fellow Award, 1950, for his
"work in the introduction and development of statistical quality control techniques in electron tube manufacturing."
Committees: Annual Review, 1948; Electronics, 1944–1945; Electron Tubes, 1946–1947; Instruments and Measurements, 1949–1951; Papers Review, 1948–1951; Professional Groups, 1951; Standards, 1948–1951; Symbols, 1946–1947; Vacuum Tubes, 1945–1946.
Institute Representative: ASA (C67) Committee, 1951.
Fellow, American Society for Quality Control.

GEORGE E. STERLING
(M'41—SM'43—F'49)

Commissioner, Federal Communications Commission, New Post Office Bldg., Washington, D.C. Born: June, 1894, Peak's Island, Me.
Fellow Award, 1949, in
"recognition of his long public service in the radio communication field and, in particular, for the organization and operation of radio wartime intelligence activities, which were of significant importance."

ARCHIE M. STEVENS
(A'12—M'25—F'31)

Radio Engineer, Operating Department, International Telephone and Telegraph Corporation, 67 Broad St., New York, N.Y. Born: September 22, 1887, Glidden, Iowa. A.B., 1909, Leland Stanford Junior University.
Sections: Buenos Aires, *chairman, 1940.*

ELLERY W. STONE
(A'14—M'16—F'24)

Rear Admiral, United States Naval Reserve; President, American Cable and Radio Corporation; President, All America Cables and Radio, Inc.; President, The Commercial Cable Co.; President, Mackay Radio and Telegraph Co., 67 Broad St., New York, N.Y.; Vice-President, 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.
Grand Officer, Crown of Italy, 1944; Knight Commander, British Empire, 1945; Knight of Grand Cross of St. Maurice and St. Lazarus, Italian Government, 1945; United States Army Distinguished Service Medal, 1945; Knight of Grand Cross, San Marino, 1946; United States Navy Distinguished Service Medal, 1946.

JULIUS A. STRATTON
(M'42—SM'43—F'45)

Provost, Massachusetts Institute of Technology, Cambridge 39, Mass. Born: May 18, 1901, Seattle, Wash. S.B., 1923, S.M., 1925, Massachusetts Institute of Technology; Sc.D., 1927, Technische Hochschule, Zurich, Switzerland.
Fellow Award, 1945, in
"recognition of his contributions as a teacher and author, adept in the field of fundamental research, who has applied his knowledge to improve radio communications."
Director, 1948–1951.
Committees: Annual Review, 1945–1946; Appointments, 1948; Board of Editors, 1946–1951; Education, 1945; International Liaison, 1949; Membership, 1947; Policy Development, 1949–1951; Radio Wave Propagation and Utilization, 1945, 1947, *chairman, 1946,* 1947–1948, Standards, 1945–1946.
Presidential Medal for Merit, 1946.

CHARLES E. STRONG
(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, Eire. B.A., 1922, Trinity College, Dubin; B.A.I., 1922, University of Dublin; A.M., 1933, M. 1937, The Institution of Electrical Engineers.
Fellow Award, 1949, for his
"pioneering work in the radio equipment design and development field, particularly broadcasting transmitters, both medium and high frequency, and his many wartime contributions in England."
Officer of the Order of the British Empire, 1947.
Chairman, Radio Section of the Institution of Electrical Engineers, 1947–1948.

WILLIAM O. SWINYARD
(A'37—M'39—SM'43—F'45)

Chief Engineer, Hazeltine Research, Inc., 325 W. Huron St., Chicago, Ill. Born: July 17, 1904, Logan, Utah. B.S., 1927, Utah State College.
Fellow Award, 1945, in
"recognition of his work in promoting electronics and the affairs of the Institute, particularly in his district."
Director, 1945–1946.
Committees: Annual Review, 1947–1949; Education, 1945–1948; National Convention, 1947; Radio Receivers, *chairman, 1946–1948,* 1949–1951; Receivers, 1949–1950; Sections, 1945, *chairman, 1946–1947,* 1948–1950; Standards, 1947–1948.
Sections: Chicago, *chairman, 1944–1945; secretary, 1943–1944.*

FRANZ TANK
(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, 1943–1947.
Fellow Award, 1949, for his
"contributions to the field of radio education in Switzerland, and his accomplishments in ultra-short wave communications."

A. HOYT TAYLOR
(M'16—F'20) (L'50)

Retired. 343 E. Cucamonga Ave., Claremont, Calif. Born: January 1, 1879, Chicago, Ill. B.S., 1902, Northwestern University; Ph.D., 1909, University of Goettingen, Germany.
Morris Liebmann Memorial Prize, 1927, for his
"work in connection with the investigation of radio transmission phenomena."
Medal of Honor, 1942, for his
"contributions to radio communication as an engineer and organizer, including pioneering work in the practical application of piezoelectric control to radio transmitters, early recognition and investigation of skip distances and other high-frequency wave-propagation problems, and many years of service to the government of the United States as an engineering executive of outstanding ability in directing the Radio Division of the Naval Research Laboratory."
President, 1929; Director, 1929–1931.
Committees: Awards, 1928–1931; Meetings and Papers, 1928; Sections, 1928.
Sections: Washington, *chairman, 1919–1928.*
John Scott Medal and Premium, Board of City Trustees, Philadelphia, 1942; Medal of Merit, President of the United States, 1944.

CHARLES H. TAYLOR
(M'13—F'15)

390 Riverside Dr., New York, N.Y. Born: August 22, 1875, Uxbridge, Middlesex, England.
Committees: Antenna Terminology, *chairman, 1924–1925;* Membership, 1925; Sections, 1925; Standardization, 1915–1921, 1924–1925.

BENJAMIN R. TEARE, JR.
(A'41—SM'45—F'51)

Head, Department of Electrical Engineering; Dean, Graduate Studies, 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.
Fellow Award, 1951, for his
"contributions in teaching and research in the fields of engineering methods, network theory, and servo-mechanisms."
Committees: Education, 1944.
Sections: Pittsburgh, *chairman, 1943–1944.*
Institute Representative: Carnegie Institute of Technology, 1944–1945.
George Westinghouse Award, American Society for Engineering Education, 1947.

FREDERICK E. TERMAN
(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, 1940–1943, 1948–1949.
Committees: Admissions, 1940; Annual Review, 1946–1947; Appointments, 1949; Awards, 1940, 1942–1932; Constitution and Laws, 1944–1947; Education, 1949, 1950; Handbook, 1945–1947; Membership, 1939–1940, *chairman, 1942,* 1949–1950; Nominations, 1943, 1948–1949, *chairman, 1951;* Policy Development, 1948–1950; Professional Groups, 1948; Research, *chairman, 1945–1948;* Standards, 1934–1940, 1946.
Sections: San Francisco, *secretary, 1931–1932; chairman, 1939.*
Institute Representative: Stanford University, 1941; National Research Council, Division of Engineering and Research, 1943–1946.

GORDON N. THAYER
(SM'47—F'51)

Assistant Director of Transmission Systems Development, Bell Telephone Laboratories, Inc., Mountain Ave., Murray Hill, N.J. Born: October 6, 1908, Delta, Colo. M.E., 1930, Stevens Institute of Technology.
Fellow Award, 1951, for his
"leadership in the engineering of long-distance microwave links for network television and multiplex telephony."

HENRY P. THOMAS
(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.

Fellow Award, 1951, for his
"pioneering contributions in the development of high-frequency and microwave equipment and communication systems."

Committees: Papers Review, 1946-1951; Radio Wave Propagation, 1942-1945; Wave Propagation, 1940-1941.

Coffin Award, General Electric Company, 1948.

WILLIAM C. TINUS
(A'31—M'36—SM'43—F'51)

Director of Military Electronics Development, Bell Telephone Laboratories, Inc., Whippany, N.J. Born: October, 1905, Chicago, Ill. B.S.(E.E.), 1928, Texas Agricultural and Mechanical College.

Fellow Award, 1951, for his
"contributions to fire control radar and his guidance of postwar electronic developments for military purposes."

Committees: Board of Editors, 1946–1951.

GEORGE R. TOWN
(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.Eng., 1929, Rensselaer Polytechnic Institute.

Fellow Award, 1950, for his
"contributions in radio receiver engineering and research."

Director, 1949, 1951.

Committees: Awards, 1948–1949; Education, 1945–1948; Frequency Modulation, 1946; Papers Procurement, 1947–1950.

Sections: Rochester, *secretary, 1942–1944, chairman, 1944–1946.*

HUBERT M. TURNER
(A'14—M'20—F'37) (L'49)

Associate Professor 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, 1933–1946.

Committees: Admissions, 1936, 1939–1940, *chairman, 1941–1942;* 1943; Annual Review, 1937–1939, 1943–1944; Awards, *chairman, 1934,* 1938–1939, *chairman, 1940,* 1941; Bibliography, 1930–1931; Circuit Elements, *chairman, 1927–1928;* Constitution and Laws, *chairman, 1936–1940,* 1941–1943; Executive, *chairman, 1944;* Investments, 1944–1946; Meetings and Papers, 1929; Nominations, 1938, 1941, *vice-chairman, 1945;* Papers, 1932–1944; Papers Procurement, 1942–1943; Preparedness, 1940–1941; Regular Papers, 1941; Sections, 1925; Standardization, 1926–1931; Standards, 1932–1937, 1940–1947; Symbols, 1946; *chairman, 1940–1944;* Tellers, 1940.

Institute Representative: Yale University, 1941–1945; United States National Committee of the International Electrotechnical Commission, 1944–1948, Paris, July, 1950; Technical Advisor, Electrotechnical Letter Symbols, 1946–1950; Chief Delegate, United States National Committee Letter Symbols for Electrical Quantities, Paris, France, 1950; United States Paper Committee World Power Conference, London, 1950; ASA Sectional Subcommittee on Letter Symbols for Radio, 1936, 1939–1949; Electrical Standards Committee, 1939–1946; Sectional Committee on Specifications for Dry Cells and Batteries, 1936–1937, 1939–1949; Subcommittee on Communication Symbols of Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings, 1939–1948; Sectional Committee on Letter Symbols and Abbreviations for Science and Engineering, 1940–1948, 1950.

W. NORRIS TUTTLE
(A'26—SM'46—F'49)

Engineering Consultant, General Radio Company, 275 Massachusetts Ave., Cambridge, Mass. Born: March, 1902, Croton-on-Hudson, N.Y. A.B., 1924, S.M. (Electrical Communication Engineering), 1926, Ph.D. (Physics), 1929, Harvard University.

Fellow Award, 1949, for his
"application of sound theoretical principles to the design of commercial measuring equipment."

Committees: Annual Review, 1949–1951; Circuits, 1944–1948, *chairman, 1949–1951;* Papers Review, 1948–1950; Policy Development, 1948–1950; Standards, 1949–1951.

MERLE A. TUVE
(A'45—F'45)

Director, Department of Terrestrial Magnetism, Carnegie Institution of Washington, 5241 Broad Branch Rd., N.W., Washington, D.C. Born: June 27, 1901, Canton, 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.

Fellow Award, 1945, for
"pioneering in the experimental probing of the ionosphere and giving to the world the first publication of the experimental proof of the existence of the ionosphere; and for having initiated at an early date the pulse method of probing by reflection which is the basis of modern radar."

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 (with L. R. Hafstad and O. Dahl), 1931; Presidential Medal for Merit, 1946; Research Corporation Award, 1947; John Scott Award, 1948; Comstock Prize, 1949; C.B.E., 1949.

EDWARD HILL ULLRICH
(M'26—F'39)

Standard Telephones and Cables, Ltd., North Woolwich, London, E.16, England. Born: December 8, 1894, Cardiff, Wales. Mechanical Sciences Tripos 1921, Christ's College, Cambridge.

Committees: Membership, 1927.

Institution Premium, Institution of Electrical Engineers, 1936.

DAYTON ULREY
(A'28—M'40—SM'43—F'50)

Consultant, Tube Department, RCA Victor Division, Radio Corporation of America, New Holland Pike, Lancaster, Pa. Born: September, 1884, North Manchester, Ind. B.A., 1911, M.A., 1912, Indiana University; Ph.D., 1917, Stanford University.

Fellow Award, 1950, for
"pioneering research and for administrative and technical contributions to the development of special purpose and power tubes."

Committees: Electronics, 1936–1937; Papers, 1940–1945; Papers Review, 1946–1950.

BALTHASAR VAN DER POL
(M'25—F'29)

Director, International Radio Consultative Committee, Palais Wilson, Geneva, Switzerland. Born: January 27, 1889. D.Sc., 1919, Utrecht.

Medal of Honor, 1935, for his
"fundamental studies and contributions in the fields of circuit theory and electromagnetic wave propagation phenomena."

Vice-President, 1934; Director, 1934.

Committees: Electronics, 1936–1940; Meetings and Papers, 1929; Wave Propagation, 1937–1939.

ARTHUR F. VAN DYCK
(A'12—M'18—F'25)

Staff Assistant to Executive Vice-President, Radio Corporation of America, 30 Rockefeller Plaza, New York, N.Y. Born: May 20, 1891, Stuyvesant Falls, N.Y. Ph.B., 1911, Yale University.

President, 1942; Manager, 1930–1932; Director, 1932–1935, 1939–1944.

Committees: Admissions, 1930–1931, *chairman, 1932–1933,* 1934, 1937–1939, *chairman, 1940,* 1943; Annual Review, *chairman, 1937–1939,* 1943–1944; Awards, 1934, 1940; Bibliography, 1930–1932; Constitution and Laws, 1933–1934, 1943; Executive, *chairman, 1942,* 1943; Nominations, 1932, 1951; New York Program, *chairman, 1934,* 1935, 1939–1940; Papers, 1940; Papers Procurement, 1942–1943; Public Relations, 1940, *chairman, 1941,* 1943–1946; Registration of Engineers, 1940; Regular Papers, 1941; Research, 1946–1947; Standards, 1933–1935; Tellers, 1932–1933, *chairman, 1936.*

Institute Representative: ASA Sectional Committee on Preferred Numbers, 1936, 1939–1950; ASA Sectional Committee on Preferred Voltages, 100 Volts and under, 1949–1950.

Modern Pioneer Award, National Association of Manufacturers, 1940; Legion of Merit, 1946.

KARL S. VAN DYKE
(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.

Fellow Award, 1944, in
"recognition of his work in research on characteristics of piezoelectric crystals and their application to frequency control."

Committees: Admissions, 1929; Annual Review, 1941–1951; Board of Editors, 1933–1940, 1947–1951; Meetings and Papers, *chairman, 1929,* 1930; Membership, 1942–1947; Papers, 1932–1933, 1944–1945; Papers Procurement, 1945–1948; Papers Review, 1946; Piezoelectric Crystals, *chairman, 1940–1941,* 1942–1943, 1945–1949, *chairman, 1949–1951;* Standards, 1941, 1949–1951.

Sections: Connecticut Valley, *secretary-treasurer, 1927, chairman, 1934–1935.*

ROBERT R. WARNECKE
(SM'48—F'50)

Technical Director, Electronics Department, Centre de Recherches de la Compagnie Générale de Télégraphie Sans Fil, 23 Rue du Maroc, Paris, France. Born: November, 1906, Tours, France. Doctor, 1933, University of Paris.

Fellow Award, 1950, for his
"engineering and research contributions to vacuum-tube theory and design in France."

Henri Becquerel Prize, Academy of Sciences of Paris, 1945; Ancel Prize, French Society of Electricians, 1943; Silver Medal, General Syndicate of Electrical Construction, 1948; Member of the Council, French Society of Physics, 1950.

SIR ROBERT WATSON-WATT
(SM'46—F'47)

Governing Director, Sir Robert Watson-Watt and Partners, Ltd., 7 Gayfere St., London, S.W. 1, England. Born: April 13, 1892, United Kingdom. B.Sci., 1912, LL.D., 1942, University of St. Andrews, Dundee. D.Sc. (Honorary), 1943, University of Toronto.

Vice-President, 1950; Director, 1950.

Fellow Award, 1947, for
"his early contributions to radio and for pioneering work in radar."

ERNST WEBER
(M'41—SM'43—F'51)

Director, Microwave Research Institute; Head, Department of Electrical Engineering, Polytechnic Institute of Brooklyn, 85 Livingston St., Brooklyn, N.Y. Born: September 6, 1901, Vienna, Austria. Dipl.Eng. (E.E.), 1924, Technical University, Vienna; Ph.D., 1926, University of Vienna; Sc.D., 1927, Technical University.

Fellow Award, 1951, for his
"outstanding service and achievement in the field of engineering education and for his many contributions to electromagnetic theory."

Committees: Annual Review, 1950–1951; Board of Editors, 1951; Circuits, 1949–1951; Editorial Administrative, 1949–1951; Education, 1944–1951; Instruments and Measurements, *chairman, 1949–1950,* 1951; Membership, 1941–1948; National Convention, 1947, 1951; Standards, 1949–1951, *vice-chairman, 1951.*

Professional Groups: Instrumentation, 1950–1951.

Fellow, AIEE; Fellow, American Physical Society; President's Certificate of Merit, 1948.

EDWARD M. WEBSTER
(A'30—M'38—SM'43—F'44)

Commissioner, Federal Communications Commission, Washington, D.C. Born: February 28, 1889, Washington, D.C.

Fellow Award, 1944, for his
"contributions to the development of the maritime mobile radio services and his leadership in promoting measures for enhancing the safety of life and property at sea."

Director, 1946.

Committees: Membership, 1940; Public Relations, 1945–1946.

Sections: Washington, *secretary, 1940, chairman, 1942.*

JULIUS WEINBERGER
(A'13—F'25)

Staff Member, RCA Laboratories Division, Radio Corporation of America, 711 Fifth Ave., New York, N.Y. Born: July 22, 1893, New York, N.Y. B.S., 1913, College of the City of New York.

Committees: Industrial Electronics, 1946–1951; Meetings and Papers, 1929; Research, 1946–1947.

Modern Pioneer Award, National Association of Manufacturers, 1940.

IRVIN REED WEIR
(A'25—M'41—SM'43—F'49)

Designing Engineer, Transmitter Division, General Electric Company, Electronics Park, Syracuse, N.Y. Born: September, 1897, Prairie Creek, Ind. B.S., 1921, E.E. (Professional), 1932, Rose Polytechnic Institute.

Fellow Award, 1949, for his
"pioneering work in the development and application of transmitting equipment for higher frequencies and higher power."

Committees: Annual Review, 1950–1951; Antennas, 1944–1945; Radio Transmitters, 1945–1951; Transmitters, 1944–1945.

EDWARD N. WENDELL
(A'26—M'33—SM'43—F'47)

Executive Technical Director, International Telephone and Telegraph Corporation, 67 Broad St., New York, N.Y. Born: August 11, 1903, Rockport, Mass. B.Sc., 1925, Massachusetts Institute of Technology.

Fellow Award, 1947, for his
"contributions to the development and production of radio systems for navigating and landing airplanes by instrument."

HAROLD A. WHEELER
(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.

Morris Liebmann Memorial Prize, 1940, for his
"contribution to the analysis of wide-band high-frequency circuits particularly suitable for television."

Director, 1934, 1940–1945.

Committees: Annual Review, 1937, 1940–1948; Awards, 1942, *chairman, 1943,* 1944; Bibliography, 1930–1932; Board of Editors, 1940–1951; Broadcast, 1935–1937; Circuits, 1944–1946; Editorial Administrative, 1949–1951; Executive, 1943–1944; Handbook, *chairman, 1945–47;* Meetings and Papers, 1929–1930; Membership, 1941–1942; New York Program, 1931; Nominations, 1948; Papers, 1931–1933, 1935–1939; Papers Procurement, 1942–1944; Professional Recognition, 1947; Public Relations, 1940; Radio Receivers, 1936, *chairman, 1937;* Regular Papers, 1941; Special Papers, 1940–1941; Standardization, 1931; Subcommittee on Electroacoustic Devices, 1927–1928; Technical Committee No. 4 on Electroacoustic Devices, 1930; Standards, 1932, 1936–1939, *chairman, 1940–1945,* 1945–1948; Symbols, 1946.

Sections: Long Island Subsection, *chairman, 1948–1949.*

Institute Representative: ASA Sectional Committee on Definitions of Electrical Terms, (C-42), 1948, 1950; National Television Systems Committee, *alternate, 1940–1943.*

Fellow, AIEE; Radio Club of America; Associate, I.E.E. Modern Pioneer Award, National Association of Manufacturers, 1940; United States Navy Certificate of Commendation, 1947.

LYNDE P. WHEELER
(F'28)

Vice-President, Pickard and Burns, Inc., 240 Highland Ave., Needham, Mass. Born: July 27, 1874, Bridgeport, Conn. Ph.B., 1894, Ph.D., 1902, Yale University.

President, 1943; Director, 1940–1945.

Committees: Bibliography, 1930–1932; Board of Editors, 1930–1932; Executive, *chairman, 1943;* Frequency Modulation, 1940–1945; Meetings and Papers, 1929–1930; Membership Solicitation Policy, 1945; Nominations, 1939, 1942, 1944; Papers, 1931–1932, 1934; Papers Procurement, 1942–1943; Public Relations, 1945–1946; Regular Papers, 1941; Standardization Subcommittee on Circuit Elements, 1928.

Sections: Washington, *chairman, 1930–1932.*

Institute Representative: RMA-IRE Co-ordinating, 1943.

WILLIAM C. WHITE
(A'15—M'25—F'40)

Electronics Engineer, Research Laboratory, General Electric Company, The Knolls, Schenectady, N.Y. Born: March 24, 1890, Brooklyn, N.Y. E.E., 1912, Columbia University.

Treasurer, 1946; Director, 1943–1947.

Committees: Awards, 1944, *chairman, 1945,* 1946; Bibliography, 1930–1932; Board of Editors, 1930, 1944, 1946–1951; Education, 1945–1946; Executive, *vice-president, 1946;* Investments, *chairman, 1946;* Meetings and Papers, 1928–1930; Membership, 1947–1951; Nominations, 1933, 1940, 1944–1946; Office Practices, 1947; Papers, 1931–1944; Papers Procurement, 1944–1950; Professional Recognition, *chairman, 1947;* Standardization, 1925, 1929–1930; Subcommittee on Vacuum Tubes, 1927–1928.

Institute Representative: National Electronics Conference Board of Directors, 1947–1950.

LAURENS E. WHITTEMORE
(A'16—M'25—F'27)

Special Representative, 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, 1926–1927, 1929; Director, 1928, 1935–1937.

Committees: Administrative, Board of Editors, 1951; Annual Review, 1937–1939, *chairman, 1940–1949,* 1950–1951; Awards, 1937, 1948; Bibliography, 1930–1932; Board of Editors, 1929–1951; Broadcast, 1933; Editorial Administrative, 1946–1950; Institute Sections, *chairman, 1926;* Meetings and Papers, 1929; Membership, *chairman, 1925;* Standardization, 1920–1925, *chairman, 1926–1929,* 1929–1931; Subcommittee on Direction Finding Terminology, *chairman, 1924–1925;* Subcommittee on Electroacoustic Devices, 1927–1928; Standards, 1932–1935, 1944–1951; 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, 1939–1948; ASA Sectional Committee on Radio Electrical Co-ordination, 1936, 1939–1946; ASA Sectional Committee on Standards for Drawing and Drafting Room Practices, 1930, 1936, 1939; ASA Subcommittee on Electrical Abbreviations, Including Radio, 1930; United States National Committee on Advisors on Symbols, 1936, 1939–1950.

RAYMOND H. WILLIAMSON
(A'31—M'44—SM'46—F'51)

Electrical Design Engineer on Transmitters, 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.

Fellow Award, 1951, for his
"accomplishments in the design of very high power radio transmitters and for his contributions to transmitter industrial standards."

Committees: Membership, 1945–1946; Papers Procurement, 1947–1948, 1949–1950.

Sections: Syracuse, *vice-chairman, 1948–1949, chairman, 1949.*

RAYMOND M. WILMOTTE
(M'29—F'38)

President, Raymond M. Wilmotte, Inc., 1469 Church St., N.W., Washington, D.C. Born: August 13, 1901, Paris, France. M.A., 1921, Cambridge University, England.

Committees: Handbook, 1945–1947; Industrial Electronics, 1947–1948; New York Program, 1933; Nomenclature, Symbols, and Definitions, 1929–1930; Papers, 1932–1933; Papers Review, 1946–1950; Radio Receivers, 1940–1947; Radio Transmitters and Antennas, 1929–1930; Sections, 1932; Standardization, 1931; Standards, 1932.

Premium for Research, Institution of Electrical Engineers, 1930.

WILLIAM T. WINTRINGHAM
(A'26—SM'45—F'51)

Television Research Engineer, Bell Telephone Laboratories, Inc., Murray Hill, N.J. Born: January 18, 1904, Brooklyn, N.Y. B.S.(E.C.E.), 1924, Harvard University.

Fellow Award, 1951, for his
"studies of colorimetry and color television, and for his work on television interference problems."

Committees: Papers Review, 1948, 1949.

Sections: New York, *treasurer, 1949–1950.*

IRVING G. WOLFF
(A'27—VA'39—F'42)

Director, Radio Tube Research Laboratory, 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.

Fellow Award, 1942, for his
"basic research in centimeter-wave radio and application of it to the development of navigation instruments."

Committees: Board of Editors, 1946–1951; Education, 1945–1946, 1948–1951; Electronics, 1943–1945; Meetings and Papers, 1928–1930; Papers, 1931–1945; Sections, 1937; Standardization: Electroacoustic Devices, 1927–1928; Technical Committee No. 4, Electroacoustic Devices, 1929–1930; Use of the Transmission Unit, 1928.

Sections: Philadelphia, *chairman, 1936–1937.*

Institute Representative: ASA Sectional Committee on Acoustical Measurements and Terminology, 1936, 1939.

Distinguished Public Service Award, United States Navy, 1949.

ROBERT B. WOOLVERTON
(A'13—M'13—F'15) (L'49)

Colonel, United States Army, retired, 654 Twelfth Ave., San Francisco, Calif. Born: September 22, 1884, Greensboro, Pa. S.B., 1912, Harvard University.

Committees: Increase of Membership, 1914; Papers, 1915; Publicity, 1915–1919.

Sections: San Francisco Representation, *chairman, 1915.*

GARNET A. WOONTON
(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.

Fellow Award, 1951, for his
"distinguished service as a teacher of electronics and for varied contributions through research in the same field."

Committees: Education, 1945–1946.

Sections: London, *chairman, 1945.*

Institute Representative: University of Western Ontario, 1941–1947.

LEO C. YOUNG
(A'19—M'29—F'43)

Consultant, Naval Research Laboratory, Washington, D.C. Born: January 12, 1891, Danville, Ill.

Fellow Award, 1943, in
"recognition of his pioneer work on the causes of the vagaries of short-wave propagation and for his invaluable contributions to the efficient operation of an outstanding research laboratory."

Sections: Washington, *secretary, 1938–1939, chairman, 1940.*

Fellow, AIEE; Member APS, Member SPE; President's Certificate of Merit, 1946.

HAROLD A. ZAHL
(A'39—SM'46—F'50)

Director of Research, Signal Corps Engineering Laboratories, Fort Monmouth, N.J. Born: August, 1904, Chattsworth, Ill. A.B., 1927, North Central, Naperville, Ill.; M.S., 1929, Ph.D., 1931, State University of Iowa.

Fellow Award, 1950, for his
"guidance of the Army Signal Corps research program in the transition from war to peace and for his contribution to radar in its early development stages."

Director, 1949.

Committees: Administrative, Board of Editors, 1949–1951; Electroacoustics, 1936–1937; Electronics, 1943–1944.

Legion of Merit, Department of the Army, 1945.

JONATHAN A. W. ZENNECK
(F'48)

Professor, Retired, Technical Physics Institute, Munich, Germany; President, Deutsches Museum; Geheimer Regierungsrat. Born: April 15, 1871, Ruppertshofen, Wuerttemberg, Germany. D.Sc., 1894, University of Tuebingen; Dr. Ing. (Honorary), Institute of Technology, Dresden.

Vice-President, 1933; Director, 1933.

Committees: Standardization, 1915–1917, 1927.

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.

PAUL D. ZOTTU
(A'31—M'38—SM'43—F'44)

President, Electronic Heating Corporation, 66 Needham St., Newton Highlands 61, Mass. Born: March 22, 1906, Bucharest, Roumania. B.A., 1931, Wesleyan University.

Fellow Award, 1944, for his
"contributions in the field of high-frequency heating, particularly in the application of dielectric heating in industry."

Committees: Annual Review, 1945–1946; Board of Editors, 1943; Industrial Electronics, 1945–1947; *chairman, 1945,* 1946–1947; Membership, 1947–1948; Papers Procurement, 1946; Standards, 1945–1946.

VLADIMIR K. ZWORYKIN
(M'30—F'38)

Director of Electronic Research, Vice-President, and Technical Consultant, RCA Laboratories Division, 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.

Medal of Honor, 1951, for his "outstanding contributions to the concept and development of electronic apparatus basic to modern television, and his scientific achievements that led to fundamental advances in the application of electronics to communications, to industry, and to National security."

Morris Liebmann Memorial Prize, 1934, for his
"contributions to the development of television."

Committees: Board of Editors, 1944–1951.

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; Modern Pioneer Award, American Association of Manufacturers, 1940; 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 Program Medal Award, 1951; 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 Academy of Arts and Sciences; American Philosophical Society; National Research Council; Sigma Xi; Office of French Academy of Science.

NAMES OF SENIOR MEMBERS

(As of May 15, 1951)

A

Abbott, W. R.
Abel, A. E.
Aboussleman, W.
Abraham, L. G.
Abramovich, M. N.
Aceves, J. G.
Ackerman, E. K.
Ackman, H. E.
Adams, E. L.
Adams, G. I.
Adams, J. J.
Adams, M. D.
Adams, R. J.
Adler, H. J.
Adorian, P.
Ahern, W. R.
Ahmad, R.
Aiken, C. B.
Ainsworth, A. L.
Ainsworth, M. J.
Akerman, B.
Albersheim, W. J.
Albertson, F. W.
Albrecht, A.
Albright, R. B.
Allen, H. C.
Allen, H. E.
Allen, J. G.
Allen, W. S.
Allison, J. L.
Allison, R. E.
Allsop, R. C.
Allured, R. B.
Alter, A. R.
Altovsky, V. A.
Amy, E. V.
Anderson, B. S.
Anderson, E. C.
Anderson, E. L.
Anderson, H. V.
Anderson, H. W.
Anderson, K. W.
Anderson, R. S.
Andres, L. J.
Andresen, E. H.
Andrew, G. W.
Andrew, V. J.
Andrews, G. J.
Andrews, P. D.
Angell, A. H.
Angevine, O. L., Jr.
Ankenbrandt, F. L.
Anthes, R. G.
Antman, M. A.
Anton, N. G.
Appel, H. W.
Applegarth, A. R., Jr.
Applegate, H. E.
Apstein, M.
Apuli, J. A.
Arditi, M.
Arenstein, G. H.
Armstrong, C. A.
Arnaud, J. P.
Arndt, W. F.
Arnett, R. A.
Arnold, J. W.
Arnold, P. N.
Arnson, L.
Aronson, C. A.
Ashbrook, F. M.
Ashby, R. M.
Astin, A. V.
Athey, S. W.
Atkins, C. E.
Attwood, S. S.
Atwood, B. E.
Atwood, J. B.
Atwood, N. A.
Auerbacher, W. F.
Augustadt, H. W.
Aull, W.
Austin, F. M.
Austrian, R. B.
Avery, R. E.
Avins, J.
Ayer, R. B.
Ayres, R. C.

B

Babillus, J.
Babits, V. A.
Bach, J. R.
Bach, R. O.
Backus, C. D.
Bagnall, V. B.
Bailey, A. B.
Bailey, G. W.
Bailey, L. W.
Bailey, R. C.
Bailey, R. S.
Bailey, W. F.
Bailey, W. M.
Bain, J. R.
Baker, C. I.
Balasundaram, N.
Baldwin, A. V.
Baldwin, C. F.
Baldwin, J. M.
Baldwin, L. W.
Baldwin, P. K.
Ball, I. D.
Ballard, B. G.
Ballard, R. C.
Ballentine, E. C.
Bamford, H. S.
Bang, M. W.
Baracket, A. J.
Barbour, C. W., Jr.
Barclay, A. P. H.
Barclay, J. N.
Barclay, W. J.
Barco, A. A.
Bardin, W. F.
Bareiss, M.
Barhydt, C. R.
Barkley, W. J.
Barkson, J. A.
Barlow, D. S.
Barnes, J. L.
Barney, H. L.
Barone, S. A.
Barrett, A. E.
Barry, J. G.
Barstow, J. M.

Bartelink, E. H. B.
Bartlett, S. C.
Barton, L. E.
Barzilai, G.
Bassett, D. M.
Bastedo, G. R.
Batchelder, L.
Batchelor, J. C.
Battison, J. H.
Bauer, B. B.
Baughman, G. W.
Beach, A. R.
Beagles, R.
Beam, R. E.
Bean, L. P. R.
Bearup, T. W.
Beasley, W. A.
Beck, A. C.
Beck, V. R.
Beckwith, J. R.
Beegle, D. H.
Beggs, G. E., Jr.
Begun, S. J.
Bell, A. L.
Bellare, D.
Belock, H. D.
Benkelman, G. F.
Bennett, G. T.
Bennett, H. S.
Bennett, R. D.
Bennett, S. D.
Bennett, W. R.
Benson, J. E.
Bentley, A. V.
Beranek, J. A.
Beranek, L. L.
Berens, G. E.
Bereskin, A. B.
Berger, U. S.
Bergren, A. L.
Berkley, J. B.
Bernard, W. B.
Bernier, J. C.
Bernreuter, H. A.
Bernstein, H. E.
Bernstein, J.
Bertram, S.
Bescherer, E. A.
Betts, P. H.
Beusman, R. M.
Beyer, J. W.
Bhatt, N. B.
Bibbero, R. J.
Binyon, B.
Bird, R. J.
Bisby, J. F.
Bischoff, A. F. H.
Biser, M. H.
Bishop, H. O.
Bishop, J. B.
Bishop, N.
Biskner, L. J.
Bitter, A. R.
Black, D. M.
Black, E., Jr.
Black, L. J.
Black, R. R.
Black, W. L.
Blackman, B. G.
Blahna, C.
Blaisdell, H. L.
Blaisdell, W. C.
Blake, F. G., Jr.
Blanchard, A.
Blasi, E. A.
Blauvelt, R. C.
Bleil, F. J.
Bliss, W. H.
Blodgett, E. D.
Blom, B. V.
Bloomer, T. M.
Bode, H. W.
Boerner, T. J.
Boese, W. C.
Bohren, A. K.
Bollman, J. H.
Bond, C. H.
Bond, D. S.
Bond, M. E.
Bond, W.
Bond, W. L.
Bonney, R. B.
Booker, H. G.
Boone, E. M.
Boothroyd, W. P.
Borgeson, C. A.
Bossart, P. N.
Boswau, H. P.
Boucheron, P.
Boundy, G. G.
Bourland, L. T.
Bousky, S.
Bousquet, A. G.
Bowden, B. V.
Bower, J. L.
Bowie, W. G.
Bowie, W. S.
Bowler, G. E.
Bowman, L. H.
Boyajian, J. A.
Boyd, J. C.
Boyd, L. K.
Boyer, J. M.
Boykin, J. R.
Boymel, B. R.
Bozzoli, G. R.
Braaten, A. M.
Brackett, Q. A.
Bradley, J. K.
Bradley, W. E.
Brady, F. B.
Brady, J. B.
Brady, R. F.
Bramhall, E. H.
Bramhall, F. B.
Branch, G. E.
Brand, P. M.
Brandt, R. W.
Brauer, H. H.
Braun, W. L.
Brazee, G.
Breazeale, W. M.
Breeze, J. E.
Brereton, C. H.
Brewer, A. F.
Brewster, F. C.
Bricaud, J. M.
Brick, F. R., Jr.
Bridges, J. M.
Bridgland, C. J.
Briggs, M. R.
Briggs, T. H.
Bright, D. C.
Brillouin, L. N.
Brittin, F. L.
Brockner, C. E.
Broding, R.
Brolly, A. H.
Bronwell, A. B.
Brooke, H. A.
Brophy, R. M.
Brothers, J. T.
Brott, F. J.
Brouse, H. L.
Brown, A. S.
Brown, B. F. A.
Brown, C. W.
Brown, G. M.
Brown, H. A.
Brown, J. F.
Brown, J. S.
Brown, M. H.
Brown, W. J.
Brown, W. N., Jr.
Brown, W. W.
Browning, G. H.
Bruck, G. G.
Brueckmann, H. L.
Bruene, W. B.
Brumbaugh, J. M.
Brunet, M.
Brunner, G. V.
Brustman, J. A.
Bryant, N. W.
Buchanan, A. B.
Budenbom, H. T.
Bueffel, B. H., Jr.
Bulgin, A. F.
Bull, W. I.
Bunday, D. L.
Burgess, A. G.
Burgess, W. B.
Burgett, M. L., Jr.
Burghard, D. G. E.
Burke, R. J.
Burley, F. E.
Burlingame, B. O.
Burnell, L. G.
Burnett, C. E.
Burns, E. E.
Burns, R. O.
Burnside, C. J.
Burnside, D. G.
Burrill, C. M.
Burroughs, F. L.
Burroughs, H. A.
Burton, E. T.
Busenkell, C. G.
Bush, G. P.
Bushby, T. R. W.
Buss, R. R.
Bussard, E. J. H.
Butler, E. W.
Butterworth, J. W.
Byerlay, H. L.
Byers, H. G.
Byers, V. J.
Byrnes, I. F.

C

Cady, C. A.
Cage, J. M.
Cahill, F. C.
Cahoon, R. D.
Cairnes, W. E.
Caldwell, J. J., Jr.
Caldwell, L. G.
Callahan, J. L.
Callanan, J. A.
Callick, E. B.
Calvert, J. F.
Cambridge, C. G.
Campbell, J. A.
Campbell, R. L.
Campbell, V. H.
Campbell, W. H.
Camras, M.
Canavaciol, F. E.
Canon, H. B.
Caplan, R. S.
Capodanno, R. T.
Caporale, P.
Carey, J. G.
Carlin, H. J.
Carlisle, R. W.
Carlson, C. G.
Carlson, R. F.
Carnahan, C. W.
Carne, G. G.
Carnes, W. T., Jr.
Carpenter, D. D.
Carroll, D. V.
Carroll, M. J.
Carson, R. E.
Carter, J. M.
Carter, R. H. A.
Carter, W. H., Jr.
Cassell, W. L.
Castle, D. H.
Cattell, G. W.
Cawein, M.
Caywood, W. P., Jr.
Cerillo, M. V.
Cervenka, F. J.
Chaffee, J. G.
Chakravarti, S. P.
Chambers, C. C.
Chambers, J. A.
Chance, B.
Chandler, C. H.
Chandler, G. C.
Chandler, V. H.
Chandrashekhar Aiya, S. V.
Chaney, J. G.
Chapin, R. S.
Chapman, F. W.
Chapman, J. K.
Charp, S.
Chase, C. T.
Chatterjee, S. D.
Chauvierre, M.
Cheng, D. K.
Cherry, S. J.
Chesney, A. P.
Chew, T. W.
Chick, A. J.
Chinski, G. R.
Chipman, R. A.
Chipp, R. D.
Chittick, K. A.
Chodorow, M.
Christaldi, P. S.
Christensen, J. W.
Christensen, R. J.
Chu, L. J.
Cimorelli, J. T.
Clapp, R. G.
Clark, A. B.
Clark, C.
Clark, D. E.
Clark, E. L.
Clark, H. T.
Clark, J. F., Jr.
Clark, J. H.
Clark, J. R.
Clark, R. G.
Clark, R. L.
Clark, T. H.
Clark, W. B.
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Killian, L. G.
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Anniston
Powers, W. D. (A)

Auburn
Clements, C. C. (A)
Saunders, G. H. (A)

Axis
Kirk, D., Jr. (A)

Birmingham
Duggan, O. T. (A)
Gillespie, E. S. (A)
Gray, C. M. (A)
Henagan, C. S., Jr. (A)
Jones, R. M., Jr. (A)
Lowery, H. R. (A)
Newton, R. L. (A)
Wood, T. D., Jr. (A)

Cullman
Roberts, W. T. (A)

East Gadsden
Earnest, H. N. (A)

Gadsden
Rifenbergh, C. M. (A)

Huntsville
Farrior, J. S., Jr. (A)

Jacksonville
Stephens, J. C. (A)

Mobile
Andrews, E. W. (A)
Baucum, P. G. (M)
Moody, C. S. (A)

Montgomery
Duran, F. A., Jr. (A)
Edwards, H. T. (A)
Lehr, O. A. (A)

North Birmingham
Sims, D. S. (A)

Oxford
Bunn, H. L. (A)

Pine Apple
Dudley, H. J. (A)

Tuscaloosa
Todd, T. H. (M)

Tuscumbia
Riley, C. W., Jr. (A)

Verbena
Howard, E. G. (A)

ARIZONA

Coolidge
Knight, J. D. (A)

Glendale
Edwards, M. J. (A)

Goodyear
Chadek, T. J. (A)

Jerome
Ruddock, K. A. (A)

Kingman
Wallace, P. H. (A)
Wester, E., Jr. (A)

Marana
Wong, B. G. (A)

Mesa
Ham, N. C. (A)
McCoy, E. W., Jr. (M)
Sabin, W. D. (A)
Smith, D. A. (A)

Phoenix
Anderson, H. R. (A)
Benham, M. J. (A)
Blackert, R. O. (A)
Bloom, J. D. (A)
Butterfield, F. E. (M)
Carter, D. F. (A)
Chambers, J. A. (SM)
Creighton, A. M., Jr. (M)
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Hammond, J. R. (A)
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McFaul, Z. F. (A)
Meyer, C. F., Jr. (A)
Miller, R. H. (A)
Morgan, H. L. (M)
Morrison, F. (A)
Morton, D. E. (A)
Noon, J. R. (A)
Pennington, R. J. (A)
Phillips, T. A. (M)
Pomeroy, I. D. (A)
Pool, E. B. (A)
Reeves, D. B. (A)
Relyea, R. A. (A)
Riddle, F. M. (A)
Roberts, R. E. (A)
Samuelson, R. E. (SM)
Shannon, C. V. (A)
Stautner, P. L. (M)
Stevens, C. R. (A)
Stoklas, F. P. (A)
Tehan, M. F. (A)
Ward, S. A. (M)
Wiley, C. A. (M)
Winkler, M. R. (VA)

Prescott
Brooks, H. B. (M)

Safford
Cloer, H. A. (A)

Scottsdale
Estes, C. L. (M)
Rich, G. C. (SM)

Temple
Merritt, C. H. (A)

Thatcher
Hitt, W. R. (A)

Tucson
Armstrong, S. E. (A)
Bartholomew, D. (A)
Bookman, R. E. (A)
Garrigus, N. F. (A)
Hausenbauer, C. R. (A)
Hochdorf, M. (A)
Koerner, H. (A)
Perkins, G., Jr. (A)
Poulson, W. A. (A)
Stewart, H. E. (SM)
Whitehouse, J. E. (SM)

Yuma
Bryner, D. B. (A)

ARKANSAS

Carlisle
Clayton, J. W. (A)

Conway
Reid, J. D. (F)

Fayetteville
Lanier, R. E. (A)
Scott, G. H. (SM)

Fort Smith
Carterette, A. A. (M)

Hope
Klipsch, P. W. (SM)

Jonesboro
Johnston, G. T. (A)

Little Rock
Dillaha, W. B. (A)
Dillaplain, V. L. (A)
Gallman, R. B. (A)
Goode, J. T. (A)
Harington, C. F. (A)
Kimball, V. L., Jr. (M)
Pierce, R. R. (A)
Rogers, J. A. (A)
Spilman, J. C. (A)

Magnolia
Sorrells, W. E. (A)

Mountain Home
Pulliam, P. E. (A)

North Little Rock
Furnell, W. W., Jr. (A)
Meyer, J. A. (A)
Wood, M. L. (A)

Osceola
McDonald, J. E. (A)

Pine Bluff
Thompson, E. E. (A)

Russellville
Grannemann, W. W. (A)

Siloam Springs
Anderson, M. K. (A)

Van Buren
Duvall, G. (A)

CALIFORNIA

Alameda
Crill, P. D. (A)
Freiermuth, V. J. (M)
Hall, T. D. (A)
Hansen, H. M. (A)
Holloman, C. J. (A)
McNulty, J. W. (M)
Thompson, E. M. (A)

Albany
Elskin, R. H. (A)
Kiessling, R. C. (A)
Sorensen, E. G. (M)

Alhambra
Bunker, E. R. Jr. (A)
Cary, H. H. (A)
Gleim, R. A. (A)
Miller, G. R. (A)
Mueller, F. W. (A)
Jackson, K. R. (M)
Seidner, O. R. (A)
Silva, J. D. (A)
Weeks, A. D. (A)
Welliver, C. L. (A)

Altadena
Alrich, J. C. (A)
Braun, V. J. (M)
Christman, T. J. (M)
Cummings, C. I. (A)
Curtis, H. A. (A)
Davis, F. H. (A)
Downes, G. W. (SM)
Ellis, A. T. (A)
Ellis, D. D., Jr. (A)
Gismot, W. (A)
James, J. N. (A)
Johnson, H. S. (M)
Johnson, R. T. (A)
Locanthi, B. N. (A)
Pickering, W. H. (SM)
Popenoe, P., Jr. (A)
Sellars, R. F. (A)
Shuey, C. W. (A)
Sink, R. L. (SM)
Stanton, G. V. (A)
Stephenson, H. G., Jr. (A)
Talmo, R. E. (A)
Thomson, B. Jr. (A)
Walker, F. R. (SM)
West, L. E. (SM)
Younger, U. E. (A)

Anaheim
Hilbers, G. R. (A)
Jeschke, A. W. (A)
Maass, C. F. (A)

Angwin
Neilsen, I. R. (A)

Aptos
Wrathall, G. R. (A)

Arcadia
Babeaux, A. G. (A)
Backus, R. A. (A)
Burns, C. H., Jr. (A)
Eidson, D. W. (A)
Fiske, J. J. (M)
Holmes, P. J. (A)
Montgomery, D. N. (A)
Pitzer, R. L. (A)
Sanders, R. W. (SM)
Stimson, J. D. (A)

Artesia
Johnson, W. F. (A)

Atherton
Eldred, W. N. (SM)
Most, N. (M)
Scofield, P. F. (SM)
Wilder, K. T. (A)

Bakersfield
Anderson, J. F. (A)
Hood, H. E. (A)
Martin, F. C., Jr. (A)
Mills, W. W. (A)
Pack, H. G. (A)
Whiting, W. E. (M)
Worrell, E. A. (A)

Balboa Island
Hansen, E. H. (SM)

Baldwin Park
Harrison, A. E. (A)
Hartman, A. M. (A)
Hopper, B. (A)

Banning
Fawcett, H. G. (A)

Bay Shore City
Chandler, C. F. (A)

Bell
Heckert, R. E. (A)
Louie, W. (A)
Zelenay, J. (A)

Bellflower
Thompson, M. F. (A)

Bell Gardens
Adams, R. L. (A)

Belmont
Harp, M. C. (A)
Hyne, A. D. (A)
Speir, F. H. (SM)
Towne, A. E. (M)

Berkeley
Abbott, W. R. (SM)
Adachi, T. (A)
Adams, C. H. (A)
Aiken, W. R. (A)
Anderson, O. A. (A)
Anger, H. O. (A)
Bandtel, K. C. (A)
Barnes, J. W. (A)
Beauchamp, L. J. (A)
Beaver, W. L. (A)
Benson, F. S. (VA)
Best, L. E., Jr. (A)
Bonner, H. W. (A)
Bright, H. S. (A)
Broekemeier, A. E. (A)
Brown, C. J. (A)
Bruns, R. A. (M)
Buffum, J. H. (A)
Carter, L. J., Jr. (A)
Cattell, G. W. (SM)
Clapp, F. D. (M)
Davis, D. D. (VA)
Davis, R. W. (A)
Ellsworth, R. L. (A)
Eukel, W. W. (A)
Farley, G. M. (VA)
Farnsworth, H. D. (VA)
Fass, S. J. (VA)
Faulkner, W. H., Jr. (M)
Freeman, E. D. (A)
Gallenson, L. (A)
Goldsmith, A. (M)
Goodman, D. H. (A)
Griffith, J. E. (A)
Harris, B. J. (A)
Haubrock, F. W. (M)
Heard, H. G. (A)
Jackson, B. B. (A)
Keller, J. E. (A)
Larsh, A. E., Jr. (A)
Lathrop, P. A. (A)
Lin, W. (A)
Lutz, I. C. (A)
Lyons, L. H. (A)
Maeshner, E. A. (A)
Mains, M. C. (A)
Morton, P. L. (SM)
Marshall, L. C. (SM)
McClellan, L. D. (A)
McKinney, L. F. (A)
Meisling, T. H. (A)
Morcott, T. (A)
Nelson, W. H. (SM)
Noller, W. E. (SM)
Norcross, J. B. (A)
Norris, W. E. (M)
Ogg, R. D. (M)
Papas, C. H. (A)
Preidigkeit, J. H. (M)
Radsliff, J. L. (A)
Relf, K. E. (A)
Reukema, L. E. (F)
Roberts, W. L. (A)
Robertson, R. D. (A)
Schroder, R. D. (M)
Sedon, P. H. (A)
Shiu, Peter D. C. (A)
Silver, S. (SM)
Silverman, B. P. (A)
Sleeper, G. E., Jr. (SM)
Sloan, D. H. (SM)
Smith, B. H. (A)
Smith, O. J. M. (M)
Taskett, D. A. (A)
Vogelsberg, F. E. (A)
Williams, C. S. (A)
Wood, F. B. (A)
Woodyard, J. R. (VA)

Beverly Hills
Albin, F. G. (A)
Barnett, H. A. (A)
Berliner, O. (A)
Lichterman, G. (M)
Rutherford, C. E. (A)
Tidmarsh, G. P. (A)
Wolcott, C. F. (SM)

Bishop
Bailey, R. L. (A)
Pearson, D. R. (A)
Rudolph, E. G. (VA)

Brawley
Markling, J. C. (A)
Pace, T. L. (A)

Burbank
Anderson, R. W. (A)
Angwin, B. S. (A)
Beagles, R. (SM)
Brockway, D. C. (VA)
Brown, W. A. (A)
Burks, R. C. (A)
Davis, W. K. (A)
Edgerton, A. K. (A)
Everett, F. A. M. (VA)
Gardner, F. H. (SM)
Gilbert, E. M. (A)
Haninger, G. A. (A)
Hathaway, J. C. (A)
Higgins, S. F. (A)
Hodson, W. G. (SM)
Humphries, L. W. (A)
Jackson, R. S. (A)
Larson, H. T. (A)
Lloyd, A. T. (A)
Martin, V. G. (SM)
Martin, W. R. (A)
Parker, A. T. (M)
Seitz, F. R. (VA)
Shrader, V. L. (A)
Sibley, A. E. (A)
Slocomb, G. M. (A)
Taber, J. E. (A)
Tucker, M. N. (A)
Van Groos, J. C. (SM)
Weatherford, R. V. (A)
White, R. A. (A)
Woodard, T. C. (A)
Woods, H. D. (A)
Worthen, W. L. (A)

Burlingame
Fleming, H. B. (A)
Gates, W. F. (A)
Hart, A. L. (A)
Maudens, L. C. (A)
Reinartz, J. L. (SM)
Woodruff, R. L. (A)

Camarillo
Baldwin, L. W. (SM)
Canning, R. G. (M)
Coe, J. C. (M)
Dance, D. W. (A)
Jennett, N. E. (A)
Johnson, S. F. (M)
Pruett, J. W. (A)
Shaw, G. W. (A)

Canoga Park
Bertucci, J. F. H. (M)
Clark, J. F., III (M)
Frankiewich, C. (A)
Mallach, L. W. (SM)
Peterson, M. C. (A)

Carmel-by-the-Sea
Riggin, J. D. (M)

Carmichael
Maki, G. J. (SM)

China Lake
Anderson, A. B. C. (A)
Ashbrook, F. M. (SM)
Backman, M. E. (A)
Beauchamp, E. P. (M)
Beresford, D. R. (A)
Biberman, L. M. (M)
Boyle, J. M. (A)
Brunn, D. R. (A)
Crawford, J. A. (A)
Creusere, M. C. (A)
Dember, A. B. (A)
Everett, J. A. (A)
Ewing, A. E. (A)
Ewing, D. L. (M)
Ferris, A. B. (A)
Freeman, C. F. (A)
Gado, L. G. (A)
Gregory, J. H. (M)
Hopkins, R. C. (A)
Isenberg, H. R. (A)
Jackson, B. B. (A)
Johnson, R. W. (SM)
Kean, D. W. (A)
Keyes, J. C. (M)
Kirby, F. J. (M)
Larsen, C. L. (A)
Leffler, J. M. (A)
Mathison, W. W. (A)
Means, P. S. (A)
Merriam, R. T. (A)
Newburgh, H. (M)
Ollikkala, E. E. (A)
Pike, B. W. (M)
Quackenbush, R. E. (A)
Rosenberg, H. W. (A)
Shield, R. G., Jr. (A)
Smith, R. R. (A)
Swift, I. H. (A)
Thompson, W. C., Jr. (M)
Toporeck, E. R. (SM)
Vore, W. E. (M)
Wansovich, J. (A)
Warr, G. D. (M)
Wong, T. (A)

Chula Vista
Chiles, J. R., Jr. (A)
Hart, J. M. (A)
Hauk, G. L. (A)
Yager, J. C. (A)

Claremont
Bradley, C. F. (M)
Fryer, E. (M)
Taylor, A. H. (L)

Cloverdale
Kellogg, Walter D. (VA)

Compton
Begley, W. W. (M)
Hodgson, R. W. (A)
Keppel, R. A. (A)
Myers, W. A. (A)
Noar, R. (A)
Weber, W. R. (A)
Wolfe, A. E., Jr. (A)

Concord
Nielsen, G. A. (A)
Rose, J. E. (A)
Sweetnam, G. E. (A)

Corona
Bogue, H. (A)

Corona Del Mar
McFarlane, M. D. (SM)
Poole, J. H. (VA)

Coronado
Franks, B. W. (M)
Garard, E. A. (SM)
Greene, G. M. (SM)
Leftwich, L. L. (M)
Lucas, F. G. (A)
Schaefer, R. W. (A)
Spear, L. P. (A)
Spilmer, B. H. (A)

Corte Madera
Brown, E. L. (M)
Clark, J. H. (SM)
Walters, A. M. (A)

Costa Mesa
Hennigar, N. E. (A)
Sampson, G. L. (A)

Covina
Clark, J. H. (SM)

Culver City
Allen, B. G. (A)
Barnett, J. T. (A)
Burns, G. A. (VA)
Campbell, R. A. (A)
Chalfin, N. L. (A)
Clement, A. J. F. (M)
Crockett, J. E. (A)
Euler, K. C. (A)
Evenson, R. C. (A)
Follis, F. R. (M)
Forbath, F. P. (A)
Ford, J. R. (A)
Frye, W. E. (A)
Gold, B. (M)
Lee, F. F. (A)
Munsey, C. J. (A)
Ramo, S. (F)
Schwartz, E. V. (A)
Shield, C. F., Jr. (A)
Smith, H. M. (A)
Smith, J. C. (A)
Smith, R. T. (A)
Taylor, T. T. (M)
Vandergrift, R. B. (SM)
Williamson, A. P. (A)
Witth, S. R. (M)

Cupertino
Gillmeister, F. W. (VA)

Danville
Bundrick, R. J. (A)

Davis
Jacob, F. C. (A)
Kleist, L. C. (A)

Delano
Quinn, J. R. (M)
Russell, J. D., Jr. (A)

Del Paso Heights
Reinhardt, P. M. (A)

Del Rosa
Binder, J. T. (M)

Downey
Bower, J. L. (SM)
Brown, E. L. (A)
Kleinhofer, B. A. (M)
Popp, D. R. (A)
Taylor, L. A. (A)
White, J. G. (A)

Duarte
Hooper, P. B. (A)
Lothringer, R. C. (A)
McMenomey, J. M. (A)

Eagle Rock
Arman, A. J. (A)

East Palo Alto
Rockwood, C. G. (A)

East Whittier
Knox, R. V. (A)

El Cajon
Burton, K. M. (A)
Clarke, C. A. (A)
Dana, J. J. (M)
Heilbeck, H. L. (A)
Pitt, C. J. (A)
Sherburne, C. J. (M)
Soltesz, E. S. (A)
Turner, P. M. (A)

El Centro
Womack, J. R. (A)

El Cerrito
Anson, C. T. (VA)
Dazey, M. H. (A)
Jensen, R. H. (A)
Lawrence, M. J. (A)
MacLane, A. B. (A)
Manhart, R. A. (A)
Stoney, W. E. (A)
Watson, H. M. (M)

El Monte
Crain, J. T. (A)
Hayes, E. A. (SM)
Lee, R. K. P. (A)
MacIntyre, R. M. (A)

El Segundo
Fitzgerald, R. T. (A)
Johnson, R. A. (A)
Mesak, C. (A)
Randolph, R. C. (A)
Wilson, T. A. (A)

El Sobrante
Johnson, W. J., Jr. (A)
Thomason, T. H. (A)

Encino
Chesney, A. P. (SM)
Pischel, E. F. (M)
Russell, R. M. (SM)
Schollard, R. J. (A)

Escondido
Moore, R. M. (VA)

Eureka
Hauser, C. R. (M)
Mueller, E. H. (A)
Smullin, W. B. (A)

Exeter
White, W. L. (A)

Fairfax
Love, B. E. (VA)
Weible, N. R. (VA)

Fillmore
Stewart, W. A. (A)

Flintridge
Biasier, H. E. (VA)

Fontana
Pierce, R. L. (A)

Fort Jones
Fowler, J. A. B. (A)

Fortuna
Steele, C. M. (A)

Fresno
Bartlett, P. R. (A)
Foin, O. F., Jr. (M)
Gerner, A. J., Jr. (A)
Mealey, K. L. (A)
O'Neal, K. R. (A)
Onnigian, P. K. (A)
Schuler, R. M. C. (A)
Simpson, H. J. (VA)

Fullerton
Clark, C. M. (A)
Englund, C. R. (F)
Gaines, B. R. (SM)
Kerber, S. M. (A)
Riffle, L. V. (A)
Werner, W. R. (A)

Gardena
Brown, M. H. (SM)
Black, L. D., Jr. (A)
Cornell, L. L. (A)
Cother, R. H. (A)
Harris, A. W. (M)
Koontz, W. A. (A)
Miller, F. A. (A)
Thompson, R. B. (A)
West, S. F. (A)

Garvey
Fairbanks, A. F. (A)

Glendale
Auerbach, M. (A)
Barnett, K. G., II (A)
Brown, C. M. (A)
Campbell, R. L. (SM)
Chester, C. L. (A)
Curran, G. W. (SM)
Foster, D. E. (F)
Glassford, H. A. (A)
Greenwood, D. T. (A)
Hamilton, H. J. (A)
Hasche, J. C. (A)
Huntsman, H. F. (A)
Kennedy, M. E. (SM)
Kreuder, N. L. (A)
Koerner, C. T. (VA)
Lewi, J. B. (A)
McCleece, H. M. (A)
McMahon, H. F. (A)
Mitchell, J. A. (A)
Montaperto, J. J. (A)
Newcomb, R. (VA)
Nuut, A. (A)
Paul, F. A. (A)
Read, G. W. (VA)
Rudin, M. B. (A)
Shapiro, H. (A)
Steele, E. E. (A)
Swenson, A. N., Jr. (A)
Westenhaver, J. L., Jr. (A)
Zechiel, W. J. (A)

Glendora
Jones, J. G. (VA)
Wolfe, C. M. (VA)

Granada Hills
Midcalf, W. A. (A)

Hamilton
Yeager, H. R. (SM)

Hamilton Field
Ritter, F. O. (A)

Hanford
Nelson, R. A. (A)

Hawthorne
Butler, A. G. (VA)
Gerson, Harold (A)
Hagbopian, J. J. (M)
Hall, Clyde A. (A)
Heaverlo, H. D. (A)
Klestadt, B. (A)
McCann, F. A. (A)
Petersen, M. C. (A)
Scanlan, J. A. (A)
Stephenson, R. O. (A)
Vail, A. E. (A)
Williams, C. (A)
Witten, E. L. (M)
Young, G. O. (A)

Hayward
George, A. A. (A)

Hermosa Beach
Carlton, L. A., Jr. (A)
Eckdahl, D. E. (A)
Emmerich, L. (A)
McVey, B. D. (A)
Sundt, P. C. (A)

Highland
McAlpine, W. N. (A)

Hollydale
Stone, L. M. (A)

Hollywood
Bodge, A. H. (A)
Bowman, R. B. (A)
Bradish, W. M. (A)
Denechaud, R. G. (VA)
Denney, B. H. (A)
Fischer, B. (A)
Gardner, L. B., II (A)
Grant, R. L. (A)
Iannelli, E. (M)
Joseph, H. M. (A)
Kaiser, A. H. (A)
Lubcke, H. R. (F)
Mueller, W. A. (VA)
Neely, N. B. (A)
Reiche, L. P. (A)
Ross, E. H. (M)
Sawyer, G. E. (VA)
Stafford, J. W. (M)
Stark, H. P. (A)
Stevens, T. E. (A)
Stoddart, R. R. (SM)
Stormes, J. M. (A)
Urey, G. M. (A)
Weber, G. J. (A)

Huntington Beach
Linton, T. B. (A)

Huntington Park
Allen, R. M. (A)
Dickson, E. L. (A)
Gilliam, C. E. (A)
Griffith, M. H. (VA)
Martin, P. W. (A)
Pierson, J. E. (A)
Scheuer, R. D. (A)

Imperial Beach
Brown, A. L. (A)

Inglewood
Anderson, R. S. (A)
Carlson, C. G. (SM)
Connely, R., Jr. (A)
De Cuir, L. E. (A)
Gregory, C. N., Jr. (A)
Gustin, J. T. (A)
Hiehle, M. E. (SM)
Hurley, R. B. (A)
Kayner, H. J. (SM)
Kroft, H. M. (A)
Langdon, J. G. (A)
Mac Kenzie, L. G. (A)
Malone, H. L. (A)
Reichert, D. G. (A)
Rodgers, G. H. (A)
Saint John, E. E. (A)
Sander, M. H. (A)
Schwank, R. T. (A)
Sisson, A. R. (A)
Stevens, J. E. (M)
Ulman, L. J. (A)
Vose, A. W. (M)
Wick, O. F. (A)
Willis, M. R. (A)

Inverness
Matthews, W. I. (M)
Reid, I. C. (A)
Stagner, G. H. (A)
Streich, R. J. (VA)

Inyokern
Kirkendall, W. L. (A)
Warner, S. D. (A)

Jackson
Van Thiel, J. (VA)

Kentfield
Conrad, R. C. (M)
Kimbell, G. D. (A)

Kenwood
Carden, M. W., Jr. (A)

La Canada
Hopkins, W. L. (A)
Hylkema, C. G. (A)
Kenkel, H. H. (A)
Knight, J. B., Jr. (SM)
Larter, T. C. (A)
Lehan, W. F. (A)
Newberry, A. W. (A)
Rosman, A. S. (A)
Scoville, R. R. (SM)
Stagnaro, J. A. (SM)
Templin, E. W. (SM)
Weil, F. M. (M)
Wolfe, H. (M)

La Crescenta
Graff, B. J., Jr. (A)
Hirschberg, W. J. (A)
O'Niel, W. T. (A)
Ott, L. G. (A)
Silvertooth, E. W. (M)
Willey, J. D. (A)

Lafayette
Waddell, J. F. (A)

Laguna Beach
Smith, R. A. (A)

La Habra
Bechtold, I. C. (A)
Blake, F. G., Jr. (SM)

La Jolla
Bishop, H. O. (SM)
Bowman, W. B. (A)
Burns, R. O. (SM)
Cawley, J. H., Jr. (A)
Chadbourne, H. L. (A)
Coleman, G. M. (A)
Copson, A. P. (A)
Fox, E. M. (M)
Huntington, A. (M)
Jones, B. R. (M)
Jones, L. E. (A)
McRae, F. B. (M)
Orpin, L. H. (SM)
Stevenson, W. A. (M)
Symonds, R. J. (A)

Lakeside
Gimble, E. G. (M)

La Mesa
Christensen, R. J. (SM)
Fisher, H. G. (A)
Freedman, S. (SM)
Gray, K. B. (A)
Grumbein, P., Jr. (VA)
Ivans, W. S., Jr. (A)
McAdam, J. C. (M)
Urlovic, W. C. (A)
Walker, W. D. (A)

Lancaster
Chernof, J. (A)
Ishii, F. K. (A)

Lawndale
Bullock, W. W. (M)

Leevining
Kelley, J. R. (A)

Lomita
Conrad, E. G. (A)
Showalter, R. L. (A)

Lomita Park
Simonson, H. E. (A)

Long Beach
Ahrens, G. W. (M)
Ashcraft, A. E., Jr. (A)
Blowers, R. C. (A)
Cole, B. T. (A)
Dahlin, R. K. (A)
Davis, F. L. (A)
Dean, N. W. (A)
De Lisle, J. E. (A)
Drankhan, O. W. (A)
Ellison, M., Jr. (A)
Farrand, C. E. (A)
Gamara, N. J. (M)
Grammes, E. G., Jr. (A)
Greenslade, R. S. (A)
Hirst, W. B., Jr. (A)
Jones, G. B. (A)
Kilpatrick, J. R. (A)
Kluehe, W. (A)
Koepsel, W. W. (A)
Leslie, P. L. (A)
Loewenstein, C. N. (A)
Long, F. R. (A)

McWilliams, J. D. (A)
Newhouse, G. B., Jr. (A)
Paulson, H. R. (A)
Pelc, T. (A)
Petersen, E. L. (M)
Peterson, W. D. (A)
Reeves, P. E. (A)
Soergel, D. G. (M)
Stephens, H. M. (A)
Streifus, C. A. (A)
Tapp, J. E. (M)
Thresh, J. L. (A)
Underberge, G. M. (A)
Vandal, W. L., Jr. (A)
Wallace, D. C. (VA)
Wiley, F. L. (A)

Los Altos
Bagley, A. S. (A)
Blanchard, H. P. (M)
Blumberg, M. (M)
Bohlke, P. G. (M)
Burkhard, F. J. (A)
Elwell, C. F. (F)(L)
Ginzton, E. L. (F)
Heintz, R. M., Jr. (A)
McGuigan, W. D. (M)
Miller, H. C. (VA)
Moreno, T. (A)
Mullins, W. H. (A)
Noe, J. D. (M)
Overacker, H. E. (A)
Packard, D. (F)
Sawyer, H. F. (A)
Schrock, N. B. (SM)
Van Rensselaer, C. (M)
Wholey, W. B. (SM)

Los Angeles
Abernathy, O. R. (A)
Ackerlind, E. (VA)
Adams, E. S., Jr., (A)
Alagna, G. I. (A)
Ambrosio, A. (A)
Ambrosio, B. F. (A)
Anker, E. R. (A)
Antell, S. (A)
Atherton, C. A. (A)
Baird, L. I. (M)
Baldwin, R. S. (VA)
Ball, L. D. (A)
Barnard, R. E. (A)
Bassett, R. K. (A)
Bayer, B. P. (A)
Bayley, R. M. (A)
Beck, W. R. (A)
Beckstead, D. L. (A)
Begovich, N. A. (A)
Bender, F. A. (A)
Bennett, R. R. (A)
Beranek, J. A. (SM)
Bernard, G. (A)
Bersbach, A. J. (A)
Blackman, B. G. (SM)
Blois, R. W. (A)
Boling, H. E. (A)
Bomeisler, R. E. (A)
Bonney, R. B. (SM)
Bowler, G. E. (SM)
Bowler, J. A. (A)
Bradley, J. L. (A)
Bravo, A. (A)
Briggs, V. R. (M)
Brockway, W. W. (VA)
Brooks, W. O. (M)
Brown, B. J. (A)
Brown, N. M., Jr. (A)
Brown, P. M. (A)
Bryant, H. L. (A)
Buell, F. D. (A)
Bundy, R. C. (A)
Burbeck, D. W. (A)
Burke, J. J. (A)
Burnsweig, J., Jr. (M)
Burr, K. L. (A)
Chandler, J. A. (A)
Chavarria, J. N. (A)
Chernlack, I. L. (A)
Clark, D., Jr. (A)
Clark, F. J. (A)
Clark, R. W. (VA)
Clark, T. C. (M)
Clarke, W. R. (A)
Cole, B. M. (A)
Cole, F. H. (VA)
Coleman, A. F. (M)
Connelly, H. J. (A)
Conviser, H. (VA)
Cooper, P. V. (A)
Corey, E. J. (A)
Corner, K. T. (M)
Cowden, E. R. (A)
Crabb, R. C. (A)
Craig, L. J. (A)
Crownover, J. W. (A)
Cunninghani, E. W. (VA)
Curtis, C. W. (A)
Curtis, E. C. (A)
Curtis, J. P. (A)
Curtiss, A. N. (SM)
Daily, C. R. (VA)
Deen, J. R. (A)
DeForest, L. (F) (L)
Deming, H. N. (A)
Dempster, B. (SM)
Denny, W. I. (A)
Depew, H. D., Jr. (A)
Dexter, G. W. (A)
Deitrich, J. E. (A)
Dinning, J. R. (A)
Dodak, M. (A)
Dowers, A. A. (VA)
Downes, L. C. (A)
Dunnigan, F. A. (A)
Dye, R. C. (A)
Eckert, J. A., Jr. (A)
Edgerton, D., Jr. (A)
Edwards, R. O. (A)
Ekparian, J. (A)
Elliott, P. C., Jr. (A)
Ellsworth, A. R. (A)
Enenstein, N. H. (A)
Ester, C. R. (VA)
Evans, H. C. (A)
Evans, H. W. (A)
Evans, J. C. (A)
Fails, W. A. (M)
Favreau, R. R. (A)
Fenton, A. N. (SM)
Ferber, D. (A)
Filizola, V. F. (A)
Filman, N. J. (A)
Fine, E. (A)
Finkelstein, L. I. (A)
Finney, B. W. (A)
Firth, E. (A)
Fjelsted, N. B. (A)
Flock, W. L. (A)
Flynn, F. V. (A)
Focke, A. B. (SM)
Fodor, F. H. (VA)
Forrest, C. B. (A)
Foulon, F. (M)
Franco, M. (M)
Frazer, R. L. (A)
Frear, G. C. (A)
Fredricks, J. E. (VA)
Freytag, R. C. (A)
Friedlander, S. L. (A)
Fuller, T. D. (A)
Fulton, A. S. (A)
Futterman, M. (A)
Gabler, R. T. (SM)
Garber, R. S. (A)
Gates, H. P., Jr. (M)
Geissinger, G. L. (A)
Gillmer, A. H. (A)
Glon, J. A. (A)
Glancy, D. R. (M)
Gochis, G. G. (A)
Gold, D. (A)
Gonzales, T. (A)
Gottier, T. L. (SM)
Gourlich, G. E. (A)
Grant, E. W. (M)
Grater, V. M. (A)
Greathouse, D. E. (A)
Green, J. S. (A)
Green, R. G. (A)
Green, S. S. (A)
Gregg, D. P. (A)
Grignon, L. D. (SM)
Gross, F. A. (A)
Guptill, H. R. (A)
Gurley, J. G. (A)
Guthrie, W. R. (A)
Hadden, F. A. (A)
Hall, E. C. (A)
Hall, N. I. (SM)
Hansen, H. R. (A)
Hanson, R. O. (M)
Harmon, W. S. (SM)
Harper, R. B. (M)
Harris, C. M. (SM)
Harris, R. C. (A)
Henderson, K. W. (A)
Henry, D. S. (A)
Henschke, R. A. (A)
Herriman, T. D. (A)
Herrnfeld, F. P. (SM)
Hershberger, W. D. (SM)
Hildreth, D. E. (A)
Hill, W. B. (A)
Himes, R. H. (M)
Hodder, W. K. (A)
Hoffart, H. M. (A)
Hoffman, L. A. (A)
Hoffman, L. E. (A)
Hoffman, S. (A)
Hornbostel, W. G. (A)
Horton, D. K. (A)
Howes, R. E. (A)
Hughes, H. M. (A)
Hulteen, C. K. (A)
Hulteen, C. K. (A)
Hurooda, K. W. (A)
Huskey, H. D. (A)
Hyden, I. F. (M)
Ireland, F. (SM)
Jacobi, W. J. (A)
Jaffe, J. S. (A)
Jamieson, H. W. (M)
Jamison, J. W., Jr. (A)
Johnson, C. E. (A)
Johnson, G. N. (A)
Johnson, J. S. (A)
Johnson, R. D. (A)
Johnson, R. M. W. (M)
Kagan, M. F. (A)
Kane, D. P. (A)
Kane, P. (A)
Kappler, M. O. (A)
Karaki, L. C. (A)
Karl, D. R. (A)
Katz, L. (A)
Kaufman, A. B. (M)
Kelly, R. S. (A)
Kennedy, F. M. (SM)
Kibler, P. J. (SM)
Kilpatrick, L. L. (A)
King, E. F. (M)
King, S. W. (A)
Klein, W. S. (M)
Kliment, P. (A)
Knittle, D. L. (A)
Knopoff, L. (A)
Kodera, C. F. (A)
Krausz, R. (A)
Kroll, W. (A)
Kuratani, K. K. (A)
Kurtz, L. A. (A)
Kryske, L. E. (A)
Lark, E. J. (M)
Laverty, P. N. (M)
La Violette, R. F. (A)
Lebell, D. (A)
Le Von, M., Jr. (A)
Lew, H. W. (A)
Lieberknecht, J. A. (A)
Lietzan, A. A. (A)
Lindsay, W. W., Jr. (F)
Lipman, C. E. (A)
Lissauer, S. (A)
Lockard, R. E., Jr. (A)
Lord, D. L. (A)
Loudon, R. E. (A)
Loveberg, G. A., Jr. (A)
Lovejoy, R. E. (SM)
Lynch, F. W. (A)
Mackeown, S. S. (F)
Magid, M. (A)
Malbrain, J. P. (A)
Manderfeld, E. C. (SM)
Margolin, A. R. (A)
Markakis, M. J. (A)
Marosz, M. J. (A)
Marshall, G. E. (A)
Martin, W. L. (A)
Matheny, L. E. (A)
Matsumoto, E. (A)
Mautner, L. (SM)
McAllister, J. T. (A)
McEuen, A. H. (A)
McGaughey, J. R. (SM)
McNair, R. W. (A)
McRuer, D. T. (A)
McKenna, Q. C. (A)
Meigs, V. C. (A)
Merrill, J. A. (A)
Metcalf, D. E. (M)
Metcalf, H. E. (SM)
Meyers, R. C. (A)
Milek, J. T. (A)
Miller, B. F. (SM)
Miller, F. G. (A)
Millstone, S. D. (A)
Milwitt, W. (A)
Mirakentz, A. (A)
Mitchell, B. B. (A)
Mitchell, P. R. (A)
Moore, R. T. (A)
Morrison, R. (A)
Moser, C. M. (A)
Moss, J. F. (A)
Mullin, J. T. (M)
Myers, J. L. (A)
Myers, K. E. (A)
Neal, F. R. (A)
Neelands, R. (A)
Newman, C. (A)
Nichols, A. H. (A)
Nichols, F. J. (M)
Nicholson, W. Q. (M)
Norby, H. A. (A)
Nunan, J. K. (A)
O'Connor, G. J. (M)
Oodrys, A. A. (A)
Ordesch, W. E. (A)
Osborn, R. H. (A)
Ovitt, M. D. (A)
Paddock, O. K. (M)
Paddock, R. B. (M)
Painchaud, P. A. (A)
Pastor, C. C. (A)
Patten, D. M. (A)
Paul, B. (VA)
Pellock, J. (A)
Perry, J. T. (A)
Peterson, F. V. (A)
Peterson, R. W. (A)
Peterson, W. E. (SM)
Pidhayny, D. D. (A)
Pierce, C. G. (M)
Pincus, L. (A)
Pollack, M. (SM)
Pregler, R. A. (A)
Presael, P. I. (A)
Profumo, V. J. (A)
Prothers, L. T. (A)
Rambo, L. W. (A)
Rappaport, R. B. (A)
Rasmussen, C. F. (A)
Read, K. E. (A)
Reed, R. H. (A)
Reimer, R. N. (A)
Reinsch, F. J. (A)
Reynolds, G. W. (A)
Richards, J. A. K. (M)
Richards, W. S. (VA)
Rittersbacher, J. E. (A)
Rhoads, J. A. (SM)
Roberts, L. L. (A)
Robinson, W. H. (A)
Robyn, A. (A)
Rockwell, R. G. (A)
Rodman, S. B. (A)
Rogers, G. L. (A)
Rogers, T. A. (M)
Rosen, S. A. (A)
Rubel, J. H. (A)
Ruderman, M. (A)
Rufo, J. D. (M)
Rutkin, B. B. (A)
Rypinski, C. A. Jr. (A)
Saturensky, G. (A)
Saxton, A. H. (A)
Scarbrough, A. D. (A)
Schachat, T. (M)
Schafferman, D. (A)
Schick, H. G. (M)
Schmidt, B. F. (A)
Schmidt, J. C. (M)
Schoen, S. (A)
Schroeder, R. L. (A)
Schull, G. R. (M)
Schreiber, E. H. (SM)
Seaton, A. F. (A)
Seid, E. (A)
Selleck, R. S. (A)
Seltzer, L. J. (A)
Sepmeyer, L. W. (SM)
Shaw, R. G. (M)
Shoulders, H. D. (A)
Shuler, M. H. (M)
Silent, H. C. (VA)
Skoller, M. (A)
Slavitt, J. (A)
Sloman, F. A. (A)
Smith, H. E. (A)
Smith, M. H. (A)
Snow, V. M. (A)
Sollars, R. C. (A)
Sodaro, J. F. (A)
Sodaro, R. M. (A)
Somers, F. J. (SM)
Speer, W. S. (A)
Spriggs, A. J. (SM)
Stein, S. (A)
Sterns, W. G. (M)
Stewart, A. A. (A)
Stone, C. A. (A)
Sutherland, L. C. (A)
Sutton, W. R. (A)
Swanson, E. R. (M)
Swarthe, E. (M)
Thatcher, R. (A)
Thompson, J. B. (A)
Thompson, T. H., Jr. (A)
Thomsen, P. H. (SM)
Thorp, W. E. (A)
Tinsley, W. E. (M)
Titcomb, E. C. (A)
Tobin, G. C. (A)
Trautman, D. L., Jr. (M)
Tufts, R. M. (A)
Uecke, E. H. (A)
Upton, D. J. (A)
Van Ackere, M. G. (A)
Van Kirk, F. W. (A)
Veneklasen, P. S. (M)
Villa, R. (A)
Vitzello, R. B. (A)
Walker, G. A., Sr. (M)
Walley, B. (SM)
Ward, R. A. (M)
Warner, D. E. (M)
Warshaw, M. (A)
Watanabe, E. (A)
Webb, M. G. (A)
Weingarten, R. (A)
Weintraub, H. H. (A)
Welcome, W. W. (A)
Weller, E. J. (A)
Wersen, D. T. (M)
Werts, C. L. (A)
Whiston, R. W. (M)
Whitacre, D. P., Sr. (M)
Wight, R. W. (A)
Wilson, H. G. (A)
Wilson, L. W. (M)
Wolverton, R. W. (A)
Wood, G. (A)
Wood, L. E. (A)
Woodcock, A. J. (M)
Woodruff, T. E. (A)
Woster, S. H., Jr. (A)
Wright, P. B. (A)
Wybrow, E. (M)
York, E. (A)
Zimmerman, R. L. (A)
Zukin, A. S. (A)
Zwelzig, R. (A)

Los Gatos
Bramley, N. V. (A)
Heintz, R. M. (F)
Hodges, E. B. (A)
Hummel, K. H., Jr. (A)
Sund, H. E., Jr. (A)

Lynwood
Bell, H. J. (A)
Gerken, G. H. (M)

Madera
Inami, F. K. (A)

Malibu
Coltin, A. H. (A)
Silhavy, W. M. (M)

Manhattan Beach
Bissett, T. B. (A)
Blight, A. F., Jr. (A)
Dobbins, W. E. (A)
Domnick, J. R. (A)
Fonda-Bonardi, G. (SM)
Genco, F. (A)
Hennies, S. R. (A)
Hill, D. M. (A)
Kirkland, V. D. (A)
Moore, J. M. (A)
Parode, L. C. (A)
Paul, A. D. (M)
Phelps, W. H. (A)
Sinclair, J. G., Jr. (A)
Starkey, M. J. (A)
Suffield, F. G. (SM)
Tucker, V. L. (A)
Walz, R. F. (SM)
Young, R. D. (A)

Mar Vista
Jamieson, J. L. (A)

Marysville
Le Boeuf, M. L. (A)

Maywood
Campbell, B. (A)
Stenger, F. J. (M)

Menlo Park
Chodorow, M. (SM)
De Liban, R. (M)
Ellis, A. R. (M)
Evans, W. E. (A)
Flammer, C. C. (A)
Floyd, W. B., Jr. (A)
Gammell, H. C. (A)
Geick, G. H. (A)
Gillette, P. R. (M)
Goldberg, J. (A)
Grass, J. W. (A)
Gunn, L. W. (A)
Harman, W. A. (A)
Hatch, R. M., Jr. (M)
Helwig, N. C. (A)
Honey, J. F. (A)
Jobbins, C. W. (A)
Kaar, J. M. (VA)
Kane, R. W. (M)
Levinthal, E. C. (A)
Long, R. A. (A)
Malling, L. R. (VA)
Nelson, B. E. (A)
Pettit, J. M. (SM)
Salmon, V. (SM)
Sphar, C. H. (VA)
Stearns, H. M. (SM)
Trumbull, A. F. (A)

Merced
Ivester, H. E. (A)
Thatcher, J. W. (SM)

Millbrae
McCullough, J. A. (A)
Moore, K. A. (M)
Murdock, C. E. (A)
Ogilvie, A. R. (SM)
Rozen, D. A. (A)

Mill Valley
Behringer, D. S. (M)
Isberg, R. A. (SM)
Kiesling, W. I. (A)
Smith, H. H. (A)
Vreeland, R. (A)

Modesto
Bates, W. H. (VA)
Hancock, J. B. (A)

Monrovia
Boulton, V. R. (A)
Rozas, F. N. (A)

Montebello
Crozer, W. A. (A)
Doeleman, H. (A)
Hodge, J. (M)

Monterey
Hoisington, D. B. (SM)
Pette, D. C. (A)
Smith, M. C. (M)

Monterey Park
Alker, C. A. (A)
Bacon, W. L. (A)
Blackman, W. S. (A)
Bolton, M. W. (A)
Gleghorn, G. J., Jr. (A)
Houdyshell, H. H., Jr. (A)
Kaluger, M. M. (A)
Leff, B. (M)

Montrose
Bullock, R. E. (A)
Christilaw, J. S. (A)
Jensen, A. K. (M)
Morecroft, J. H., Jr. (SM)

Moor Park
Beymer, E. H. (A)

Moraga
Tibbetts, D. R. (A)

Mountain View
Gomez, J. R. (A)
Jahn, D. M. (A)
Maccono, F. J. (VA)
Nelson, R. B. (M)
Patton, H. C., Jr. (A)
Sherron, R. J., Jr. (A)
Stead, D. A. (A)
Yagi, H. S. (A)

Mount Wilson
Barnes, R. B. (VA)

Muroc
Jaworowicz, J. H. (A)

National City
Fredlund, F. A. (A)
Fuller, J. D. (A)
Linhart, T., Jr. (A)

North Fork
Franklin, L. F. (A)

North Hollywood
Abousseleman, W. (SM)
Arne, R. E. (A)
Bakst, A. A. (A)
Bertolet, E. C. (M)
Busenkell, C. C. (SM)
Campbell, B. K. (A)
Ceccarini, R. E. (A)
Crow, J. R. (A)
Cutler, S. (A)
Delano, R. H. (A)
Deyo, A. E. (A)
Elster, S. (A)
Farrand, W. A. (M)
Fielding, B. L. (A)
Fox, M. (M)
Futchik, A. J. (A)
Gieseke, G. R. (A)
Gove, E. L. (SM)
Grinnell, A. L. (A)
Hoffman, W. C. (A)
Jensen, K. K. (M)
Klotz, E. S. (A)
Leonard, N. E. (A)
Mleczko, E. L. (M)
Mobley, M. P., Jr. (M)
Mont, C. H. (A)
Moody, R. C. (SM)
Moore, V. (SM)
Osborne, W. E. (A)
Rawlins, R. E. (SM)
Rogers, G. F. (SM)
Ross, H. H., Jr. (A)
Sandor, J. (A)
Scott, H. A. (A)
Seabaugh, D. A. (A)
Stanton, I. W. (M)
Sullivan, J. R. (M)
Ter Veen, L. A. G. (A)
Toomim, H. (M)
Tucker, R. E. (M)
Vincent, R. C. (A)
Wilson, J. W. (A)
Winkler, J. L. (A)
Woodward, E. O. (A)

North Long Beach
Ley, E. W. (A)

Northridge
Ainsworth, M. J. (SM)
Chrystie, H. (M)
Daush, A. A., Jr. (A)
Wyland, G. P. (M)

North Sacramento
Kelliher, J. E. (VA)
Land, D. W. (A)
Smith, J. G. (A)

Norwalk
Campbell, D. H. (A)
Miller, E. F. (A)
Monroe, A. J. (A)
Page, R. K. (A)

Novato
Weiss, S. B. (A)

Oakland
Black, L. J. (SM)
Cagle, D. S. (A)
Celestre, R. G. (A)
Cole, C. H. (VA)
Dahinden, D. T. (A)
Donahue, W. J. (A)
Downey, C. E. (A)
Drake, H. B. (M)
Farrington, H. W. (A)
Ferreira, Ernest (A)
Fowler, B. V. (A)
Freiberg, L. (A)
Gennett, D. F., Jr. (A)
Gilbert, R. M. (VA)
Gilliland, W. D. (M)
Glessner, J. M. (M)
Hedberg, H. E. (A)
Kan, G. S. (A)
Jiu, R. (A)
Johnson, R. M. (A)
Lar Ricu, E. A., Jr. (M)
Lee, L. K. (M)
MacLeod, D. A. (A)
Malone, W. C., Jr. (A)
Mansir, D. L. (A)
Masse, C. J. (A)
McMahon, M. E. (A)
Monson, D. J. (A)
Morrison, K. G. (M)
Notthoff, A. P., Jr. (A)
Owren, H. M. (A)
Pattison, A. (A)
Peacock, M. L. (A)
Penther, C. J. (SM)
Plonsey, R. (A)
Ramos, Z. P. (A)
Rosenberg, J. M. (A)
Schwemin, A. J. (A)
Scott, H. J. (SM)
Struven, W. C. (A)
Tom, H. (A)
Upham, F. T. (A)
Viales, L. O. (A)
Wahlgren, W. W. (SM)
Wolfe, H. T. (A)

Oceanside
Ulmer, H. W. (A)

Oildale
Mitchell, P. P. (A)

Ontario
Gould, R. W., Jr. (A)
Pollock, R. D. (M)
Ritter, E. H. (SM)

Orange
Bond, C. H. (SM)

Orinda
Lippencott, D. K. (SM)
Thunen, G. W. (A)

Oxnard
Akers, R. F. (A)
Anderson, R. I. (A)
Bowen, W. A., Jr. (M)
Bradford, W. O. (M)
Brown, W. C. (M)
Cornwall, E. A., Jr. (A)
Crippa, E. R. (M)
Darden, R. R., Jr. (M)
Fields, M. H. (M)
Ford, J. P. (A)
Fraser, G. R. (M)
Green, C. A. (A)
Harris, B. E., Jr. (A)
Hollmann, H. E. (A)
Horn, R. H. (A)
Hoyt, E. M. (A)
Jarmie, T. W. (SM)
La Plant, O. (M)
Masin, G. F. (M)
McKee, D. I. (A)
McQuiston, W. R. (A)
Miller, W. A. (A)
Moore, M. H. (A)
Mumma, J. W. (A)
Packard, A. C. (M)
Palter, N. H. (A)
Russell, J. H. (M)
Sedlacek, W. C. (M)
Skiff, W. S. (A)
Spranger, P. B. (A)
Sternke, E. C. (SM)

Pacific Palisades
Alberts, W. A. (A)
Albrecht, A. (SM)
Arndt, W. F. (SM)
Barnes, J. L. (SM)
Brewer, A. F. (SM)
Cronin, W. J. (M)
Gerlough, D. L. (M)
Green, D. J. (A)
Haeff, A. V. (F)
Hollands, L. C. (SM)
Howard, L. W. (SM)
Iams, H. (F)
Julian, R. S. (M)
Kauke, J. R. (A)
Kelsey, A. L. (A)
Le Grand, C. (A)
Mallett, J. D. (A)
McCann, J. G. (A)
McCloud, W. W. (A)
Mohr, M. E. (M)
Muchmore, R. B. (SM)
Tyson, O. A. (A)
Van Atta, L. C. (SM)
Whelan, D. E. (A)

Palmdale
Thomas, R. (A)

Palo Alto
Abraham, W. G. (A)
Alexander, R. (A)
Athey, S. W. (SM)
Bauer, B. (VA)
Behr, F. J. (F) (L)
Bolljahn, J. T. (A)
Brinton, R. L. (A)
Brunetti, C. (F)
Carter, P. S., Jr. (A)
Christensen, P. C. (A)
Clark, J. W. (M)
Clelland, F. W., Jr. (M)
Clifford, D. G. (M)
Cone, D. I. (VA)
Crapuchettes, P. W. (M)
Davis, R. (M)
Dawson, J. W. (A)
Dethlefson, D. G. (A)
Doll, E. B. (SM)
Elliott, H. F. (F)
Fechter, H. R. (A)
Field, L. M. (M)
Fisher, G. (SM)
Fong, A. (SM)
Fuller, L. F. (F)
Gamson, E. R. (A)
Girdner, W. L. (A)
Graham, B. (SM)
Granger, J. V. N. (SM)
Hand, B. P. (A)
Harris, D. B. (SM)
Hewlett, W. R. (F)
Hilton, E. A. (A)
Holden, G. R. (A)
Hopf, E. W. (A)
Hornby, D. A. (A)
Huggins, R. A. (A)
Hummer, J. L. (M)
Jesse, E. (A)
Jones, C. B. (SM)
Jones, E. M. T. (A)
Jones, R. E. (A)
Kebby, M. H., Jr. (A)
Kirkwood, R. L. (A)
Krause, R. A. (SM)
Kruse, F. W., Jr. (A)
Learnard H. (A)
Lingle, R. H., Jr. (A)
Lynch, W. M. (M)
Mathers, G. W. (A)
Miller, S. W. (A)
Moore, E. J. (A)
Moynahan, G. F., Jr. (A)
Nelson, F. A. (A)
Porter, N. E. (M)
Renihan, L. B. (A)
Reynolds, D. K. (A)
Robbiano, P. P. (M)
Roberts, L. A. (A)
Saint Clair, M. W. (A)
Sanders, R. W. (A)
Scheuch, D. R. (SM)
Soderstrom, H. W. (M)
Spangenberg, K. (F)
Stanbury, R. J. (A)
Stelter, E. C. (A)
Swain, J. R. (A)
Tal, C. T. (SM)
Vane, A. B. (M)
Veltfort, T. E., Jr. (A)
Villard, O. G., Jr. (SM)
Wagener, W. G. (SM)
Ward, C. E. (M)
Weaver, D. K., Jr. (A)
Westburg, V. B. (A)
Whitby, O. (M)
Wright, O. (M)
Wyatt, W. C. (A)
Young, B. U. (A)
Zeidler, H. M. (M)
Zinky, W. R. (A)

Palos Verdes Estates
Bakeman, D. C. (A)
Caldwell, J. J., Jr. (SM)
Flynn, F. J. (M)
Hannum, D. E. (M)
Hebenstreit, W. B. (SM)
Moore, C. C., Jr. (A)
Reitz, L. P., Jr. (A)
Stevens, F., Jr. (A)
Wagenseil, W. (SM)

Panama City
Wald, K. A. (A)

Paramount
Haddon, R. E. (A)
Williams, N. (A)

Pasadena
Ashby, R. M. (SM)
Baird, A. D. (A)
Barasch, M. V. (M)
Benioff, H. (VA)
Blatterman, H. L. (M)
Boice, F. S. (A)
Booth, F. O., Jr. (A)
Braun, T. H. (M)
Cady, W. G. (F) (L)
Caldwell, P. G. (SM)
Chalmers, P. H. (A)
Chambers, G. R. (A)
Chase, N. C. (A)
Conn, R. B. (A)
Crossett, E. C. (VA)
Dantine, W. A. (A)
David, J. R. (A)
Dennison, P. R. (A)
Dwyer, R. J. (VA)
Erdman, D. C. (A)
Escher, P. H. (A)
Everitt, R. S. (A)
Foster, J. F. (A)
Gates, C. R. (A)
Giannini, G. M. (SM)
Gilbert, J. A. (A)
Gilbertson, B. I. (A)
Glasscock, R. D. (A)
Goeppinger, A. L. (M)
Goodell, E. M. (M)
Goodwin, P. S. (M)
Gosswiller, R. O. (A)
Granger, W. E. (A)
Grigg, R. W. (A)
Grobecker, A. J. (M)
Grove, H. G. (A)
Harden, P. A. (M)
Hare, G. H. (A)
Hiraoka, F. A. (A)
Holden, W. H. T. (SM)
Holmgren, J. D. (A)
Hoskins, E. E. (A)
Howes, E. T. (VA)
Hull, R. W. (VA)
Marshall, R. (A)
Mathews, W. E. (A)
Mattson, E. (A)
Moran, R. B., Jr. (A)
Moseley, F. L. (SM)
Motta, N. (A)
Nikirk, T. E. (VA)
Owen, R. P. (SM)
Peoples, J. E. (A)
Ray, P. J., Jr. (A)
Rechtin, E. (A)
Robinson, L. P. (A)
Rose, F. W. (VA)
Rutishauser, R. W. (A)
Schwartz, E. D. (A)
Sefton, W. E. (A)
Seiler, R. C. (A)
Shultise, O. M. (M)
Sibbet, J. H. (A)
Simmons, E., Jr. (A)
Skeeters, R. N. (A)
Slavin, M., III (A)
Smith, G. F. (A)
Spaulding, C. P. (A)
Stensgaard, C. P., Jr. (A)
Stewart, J. (A)
Stott, R. F. (A)
Swain, J. S. (A)
Swan, M. L. (M)
Tejada, L. H. (A)
Trussell, A. B. (M)
Tucker, M. C. (A)
Valle, B. E., Jr. (A)
Wedel, J. J., Jr. (M)
Williams, R. W. (A)
Wilts, J. R. (A)
Young, W. D. (A)
Zarem, A. M. (A)
Zeuschner, R. F. (A)

Petaluma
Boutz, F. E. (M)
Ravenscroft, H. A. (A)

Pico
Belove, C. (A)
Fuller, C. A. (A)
Nelson, E. K. (A)

Piedmont
Evans, C. P. (M)
Forster, A. G. (VA)
Lasky, P. G. (A)

Pittsburg
Haag, M. W. (VA)

Playa Del Rey
Kennedy, W. R. (A)
Mettler, R. F. (A)
Woods, W. A. (VA)

Point Loma
Raleigh, J. H. (M)

Point Mugu
Johnson, L. B. (A)
Wenters, R. L. (A)

Pomona
Ellis, G. M. (A)

Porterville
Poundstone, J. R. (A)

Port Hueneme
Binkley, M. E. (A)
Nauss, B. M. (A)
Reedy, C. W. (M)
Sandler, B. (A)

Puente
Linebarger, P. J. (A)

Rancho Santa Fe
Baker, R. H. (M)

Redlands
Mead, C. E. (A)

Redondo Beach
Barlow, D. S. (SM)
Boyer, B. E. (M)
Boyer, J. M. (A)
Dutton, O. B. (A)
Jolley, N. A. (A)
Knox, R. M. (A)
Lundstrom, O. C. (A)
Sarkissian, H. H. (A)
Stroud, S. G. (A)

Redwood City
Bloom, G. (VA)
Bradford, C. W. (A)
Brewer, M. S. (A)
Burgess, J. E. (M)
Cowell, D. F. (A)
Eddy, J. S. (A)
Foster, C. P., Jr. (A)
Greene, H. A., Jr. (M)
Hackley, G. E. (A)
Hanson, L. B. (A)
Jaski, T. (A)
Kellogg, H. A. (A)
Kline, S. H. (A)
Lacy, P. D. (A)
Leslie, F. E. (M)
Litton, C. V. (F)
Morris, A. J. (M)
Patterson, G. K. (SM)
Patton, P. B. (A)
Ripperger, E. A. (A)
Romander, H. (VA)
Scarborough, D. S. (A)
Show, O. C. (A)
Sorg, H. E. (M)
Stahl, R. J. (M)
Tinney, F. B. (VA)
Tipping, C. C., Jr. (A)

Reseda
Ames, B. C. (M)
Colander, R. E. (M)
Eckard, P. E. (A)
Jakubowski, M. C. (A)
Penniwell, A. F. (A)
Peterson, J. A. (A)
Schultheis, H. B., Jr. (A)
Woodson, W. L. (A)

Richmond
Angella, C. P. (A)
Brown, D. R. (M)
Brubaker, E. A. (A)
Burns, M. C. (A)
Carlson, E. H., Jr. (A)
Carstensen, H. K. (A)
Corl, J. L. (M)
Crew, B. L. (A)
Crooke, V. E. (A)
Haase, W. D. (A)
Hamren, S. D. (A)
Holtmann, E. H. (A)
Jacobs, H. N. (M)
Lovell, E. L. (A)
Lowe, C., Jr. (VA)
Murray, J. H. (A)
Mingst, H. C. (A)
Pritchett, W. (A)
Schrader, G. F. (A)
Scott, N. B. (A)
Tajima, G. K. (A)

Ridgecrest
Harris, J. F. (A)
Kimball, G. D. (A)

Rio Linda
Beaudine, D. M. (A)

Rivera
Anderson, M. E. (A)
Cahn, S. L. (M)
Geiger, R. F. (A)
Gismot, W. (A)
King, R. L., Jr. (A)
Schmidt, J. N. (A)
Shade, R. R. (A)

Riverside
Andres, P. G. (VA)
DeMarco, R. J. (A)
Fournier, L. W. (A)

Rosemead
Ferl, R. H. (A)

Sacramento
Bairos, C. A. (A)
Barkman, R. N. (A)
Bennett, R. C. (A)
Berger, E. W. (M)
Breuer, H. J. (M)
Broderson, L. V. (A)
Buechner, J. F. (A)
Byrd, V. E. (A)
Darlington, E. S. (SM)
Dickinson, I. E. (A)
Driggs, L. O. (A)
Durr, E. (A)
Dutton, I. L. (M)
Feeney, C. J. (A)
Godgrey, X. W. (M)
Hartman, H. W. (A)
Kemp, E. M. (A)
Klinke, E. R. (A)
Koch, W. F. (M)
Leecing, R. W. (A)
Martin, J. B. (A)
Mason, C. F. (A)
Miller, J. R. (VA)
Myers, E. G. (A)
Naschke, F. S. (M)
Nielson, R. W. (A)
Oates, T. L. (VA)
Russell, E. B., Jr. (A)
Russell, M. F. (A)
Slater, A. P. (A)
Slater, H. C. (M)
Smart, M. E. (A)
Smith, C. N. (A)
Spadoni, A. F. (A)
Sronce, G. S. (M)
Starzec, J. S. (A)
Tippett, D. W. (A)
Webster, N. D. (M)
Wilson, V. C. (A)
Wolfe, H. W. (A)

Salinas
Wright, Omer, N. (A)

San Bernadino
Emm, T. (A)
Ewing, G. W. (A)
Featherstone, S. J. (M)
Joe, R. H. (A)
Marlow, H. C. (A)
McAlearney, P. H. (A)
McMahon, J. H. (A)
Pettit, H. L. (A)
Verbance, A. (A)

San Bruno
Preist, D. H. (M)
Snoddy, R. E. (A)

San Carlos
Ayer, W. E. (M)
Brown, J. F. (SM)
Brown, R. W. (A)
Byrne, P. F. (VA)
Cool, L. R. (A)
Cummings, K. M. (SM)
Dumas, K. L. (A)
Hall, E. G. (M)
Harper, J. W. (A)
Heflin, W. H. (A)
McAulay, W. H. (VA)
Patton, W. R. (VA)
Paul, R. S. (A)
Petrak, J. R. (SM)
Smaha, N. F. (A)
Stolaroff, M. J. (M)

San Diego
Abbey, K. (A)
Abel, C. F. (A)
Abramis, B. D. (M)
Altman, D. E. (A)
Anderson, J. S. (VA)
Anderson, K. B. (A)
Anthony, D. J. (A)
Applin, R. H. (A)
Barker, R. D. (M)
Beyer, C. M. (M)
Blasdel, F. G. (A)
Block, K. A. (A)
Bowers, J. L. (A)
Bowers, R. W. (VA)
Brackett, R. T. (A)
Brady, M. E. (A)
Breitwieser, C. J. (VA)
Bremmer, R. A. (A)
Brokaw, H. R. (M)
Brooks, J. L. (M)
Browder, J. W. (M)
Burkhardt, R. H. (A)
Burnett, W. W. L. (M)
Byrnes, F. X. (M)
Caporaletti, G. A. (A)
Cary, R. J. (A)
Caspers J. W. (A)
Cassidy, B. F. R. (A)
Castillo, E. A. (A)
Chew, T. W. (SM)
Chmielewicz, L. S. (A)
Clapp, E. B. (A)
Collins, W. G. (M)
Combs, S. A. (A)
Coombs, G. F. (A)
Cram, C. C. (M)
Crispell, H. L. (M)
Crowell, D. D. (A)
Curl, G. H. (A)
Daigle, W. A. (A)
Day, J. P. (M)
Dellinger, J. T. (A)
Dewey, D. A. (A)
Dobbertin, W. H. (A)
Doig, J. H. (VA)
Donahue, J. (M)
Drayner, A. H. (A)
Eikelman, J. A., Jr. (A)
Ferreira, R. (A)
Fish, W. Y. (A)
Flatten, O. H. (A)
Frank, M. E. (A)
Freres, C. H. (A)
Gabrielson, H. C. (A)
Garrison, F. W. (A)
Geren, K. E. (A)
Glenn, A. J. (A)
Goddard, W. R., Jr. (M)
Gottwald, C. H. (A)
Gramman, E. G. (A)
Green, J. W. (A)
Hale, C. F. (A)
Hall, R. F. (A)
Harrington, F. C. (A)
Hedlund, K. W. (A)
Herbert, W. J. (A)
Heritage, D. P. (A)
Heritage, J. L. (A)
Hixson, E. L. (A)
Holcomb, D. E., Jr. (A)
Holloway, J. (SM)
Holmes, G. B. (A)
Hom, F. M. (SM)
Homer, C. W. (A)
Hopkins, R. U. (M)
Huckle, D. R. (A)
Hughes, L. R. (A)
Hulbert, S. G. (A)
Igram, R. G. (A)
Jones, H. G. (M)
Kalbfell, D. C. (SM)
Kaplan, M. N. (A)
Keeler, P. M. (A)
Keeran, R. V. (A)
Keith, I. W. (A)
Kiernan, E. P. (SM)
Kimball, J. L. (A)
Kirkman, R. A. (SM)
Knapp, R. L. (A)
Krunkkala, G. H. (A)
Lambert, T. M. (A)
Lauritzen, I. L. (A)
Lazelle, L. L. (A)
Lee, H. E. (M)
Liddiard, G. E. (A)
Linton, R. L., Jr. (M)
Little, W. A. (A)
Long, J. V. (VA)
Long, L. A. (A)
Lund, T. J. (A)
Magnuson, R. W. (A)
Makinson, H. O. (M)
Martin, G. E. (A)
McCharles, J. R. (M)
McDaniel, G. A. (A)
McGee, H. A. (A)
McKinley, W. H. (A)
McNally, I. L. (SM)
Miller, C. N. (A)
Miller, R. H., Jr. (M)
Moe, C. R. (SM)
Montalvo, E. (A)
Moon, R. F. (A)
Mulvey, J. X., Jr. (A)
Naylor, J. E. (A)
Ogram, R. L. (A)
Ohlinger, P. M. (A)
Olds, O. S. (M)
O'Neill, J. R. (A)
Orr, J. B. (M)
Parker, A. B. (M)
Parker, S. E. (A)
Parker, T. J. (M)
Perkins, B. M. (A)
Pickens, G. O. (A)
Phillips, E. T. (A)
Poe, C. M. (A)
Prather, A. W. (M)
Quintana, I. M. (A)
Raaberg, M. T. (A)
Redelings, J. T. (A)
Robinson, E. B. (SM)
Rogers, S. (M)
Romans, W. E. (A)
Roshon, A. H., Jr. (M)
Rountree, W. R. (A)
Ryan, A. H. (A)
Scott, J. E., Jr. (M)
Schafer, H. G. (A)
Schreiber, O. W. (A)
Schulman, M. (A)
Seaward, P. E. (A)
Sessions, S. H. (M)
Shellabarger, J. N. (A)
Sherwood, R. M. (M)
Shimada, G. (A)
Silberman, R. T. (A)
Skaggs, E. R. (A)
Sprague, Z. E. (A)
Squibb, W. F. (VA)
Stecker, E. J. (A)
Steidley, J. W. (SM)
Steppler, R. V. (M)
Sterling, W. V. (A)
Stoltz, J. R. (A)
Stoltz, P. G. (A)
Taylor, B. M. (M)
Teeter, W. L. (A)
Thatcher, E. W. (SM)
Thiel, W. H. (M)
Tibbals, L. (VA)
Tirrell, C. W. (M)
Trolese, L. G. (SM)
Tyrrell, R. A. (A)
Volberg, H. W. (A)
Wade, O. (A)
Walden, L. H. (A)
Walton, H., Jr. (A)
Weisbrod, S. (A)
Welch, W. E. (A)
Welge, V. (SM)
Wells, W. B. (VA)
Werner, H. C. (A)
Whitaker, J. L. (A)
Wildman, R. C. (M)
Wilson, W. D. (A)
Wolf, J. E. (A)
Wolff, H. G. (M)
Woolfolk, E. W. (A)
Young, C. W. (M)
Zumkehr, J. L. (A)

San Dimas
Lawler, R. H. (A)

San Fernando
Duncan, J. R. (A)
Graber, R. E. (M)
Girouard, L. O., Jr. (A)
Warne, V. J. (VA)

San Francisco
Adler, J. A. (A)
Anderson, F. A. (A)
Austin, J. B., Jr. (A)
Beatty, G. C. (A)
Berte, D. W. (A)
Berry, F. W. (A)
Birkenhead, W. D. (M)
Bogdanoff, A. G. (A)
Boss, L. J. (M)
Bowie, R. L. (A)
Brace, F. R. (M)
Brill, G. J. (A)
Brown, R. L. (A)
Castle, R. L. (A)
Chadwick, J. H. (A)
Chapman, C. I. (A)
Chan, C. (A)
Cheu, E. D. (A)
Chow, B. (M)
Clark, B. L. (M)
Code, J. A., Jr. (SM)
Cogswell, W. P. (SM)
Convery, T. J. (A)
Cooke, L. G. (M)
Cronan, W. C. (A)
Curtis, R. E. (A)
Damonte, J. B. (A)
Danielson, E. G. (VA)
Davy, L. H. (A)
Dent, W. U. (A)
Doyle, W. T. (A)
Dunlap, H. B. (M)
Epstein, H. (A)
Falthorn, N. R. (M)
Fisher, W. P. (SM)
Fong, B. W. (A)
Fong, L. F. (A)
Gaither, T. B. (A)
Gallo, F. J. (A)
Golosman, B. S. (A)
Goodwin, C. E. (A)
Gordon, H. L. (A)
Halloran, A. H. (SM)
Hames, W. A. (A)
Hankel, E. M. (A)
Hanscom, W. W. (SM) (L)
Hartong, H. H. (A)
Hatch, R. I. (VA)
Haus, R. (A)
Heasly, C. C., Jr. (A)
Held, H. E. (VA)
Henry, J. L. (A)
Hoeflich, A. F. (A)
Holmes, H. B., III (M)
Howard, R. D. (A)
Hughes, J. M. (A)
Hussey, W. J. (VA)
Ingersoll, J. C. (A)
Johnson, J. B. (A)
Johnston, J. G. (A)
Jones, P. W. (A)
Kafafian, J. (M)
Kalb, H. N. (A)
Karp, P. W. (A)
Kasai, G. S. (A)
Kaufman, A. W. (VA)
Kavanaugh, J. C. (A)
Keast, A. K. (A)
Kees, A. A. (M)
Kelley, T. B. (A)
King, H. D. (A)
Kiyoi, G. T. (A)
Kochenderfer, W. E., Jr. (A)
Kramer, J. W. (VA)
La Forge, L. H., Jr. (SM)
Landells, J. H. (A)
Lewis, E. L. (A)
Lee, F. B. (A)
Lee, J. A. (A)
Littman, E. D. (A)
Macewka, N. (A)
Marshall, E. G. (M)
Marshall, E. L. (A)
McDade, J. J., Jr. (A)
McKay, H. B. (A)
McKinnon, R. J. (A)
Meader, H. W. (A)
Melnicoe, S. A. (M)
Miller, C. M. (A)
Morrison, A. C. (VA)
Moulin, H. J. (A)
Muller, F. P. (A)
Nemchuk, W. J. (A)
Nikonenko, P. V. (M)
Noble, W. E. (A)
Nyberg, R. A. (A)
Nye, W. H. (M)
Oberg, V. H. (A)
O'Neil, J. A. (A)
Ong, A. M. (A)
Pacher, F. A. (A)
Patterson, K. P. (A)
Pichetto, P. B. (A)
Pinkney, J. L. (A)
Poole, A. L. (A)
Reese, J. S. (VA)
Richardson, A. S. (M)
Robinson, J. A. (A)
Rocklitz, H. C. (A)
Salisbury, J. D. (A)
Schwarz, C. (A)
Scrievers, B. J. (A)
Sharman, H. M. (A)
Slavin, S. (M)
Smith, D. C. (A)
Smith, S. B. (SM)
Stand, T. R. (A)
Stello, K. H. (M)
Talago, J., Jr. (A)
Thille, R. W. (A)
Thompson, H. K. (A)
Thompson, L., Jr. (SM)
Tognazzini, M. O. (A)
Tomlin, W. T. (A)
Traver, L. L. (A)
Unsworth, R. G. (A)
Uribe, E. (A)
Van Cott, J. M. (A)
Wellen, L. F. (A)
Whitehead, E. A. (M)
Wholey, C. W. (A)
Williams, P. A. (VA)
Williams, T. G. (A)
Winenow, R. E. (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, R. W. (A)
Woolverton, R. B. (F) (L)
Zimmerman, W. L. (A)

San Gabriel
Adamson, P. A. (A)
Alverson, J. G. (M)
Bowman, J. V. (A)
Garland, M. D., Jr. (A)
Heffner, E. K. (A)
Horton, E. J. (A)
Redlin, C. A. (A)
Reilly, R. R. (A)
Schwarzmann, W. A. (A)
Spargo, P. W. (A)
Stumpf, R. J. (A)
Weaver, C. E. (VA)

Sanger
Jones, C. H. (A)
Nielsen, J. J., Jr. (SM)

San Jose
Dowling, R. H. (M)
Engwicht, H. (SM)
Farlow, C. C. (A)
Ferguson, L. N. (A)
Ginsburg, C. P. (A)
Gonzalez, J. (A)
Hamann, H. D. (A)
Hancock, N. (A)
Johnstone, F. C. (A)
Libby, L. L. (SM)
McCullough, J. S. (A)
McVea, N. C. (A)
Perry, R. L. (M)
Quement, F. J. (VA)
Rambo, W. R. (SM)
Ross, H. C. (A)
Shellhammer, W. I. (A)
Stuart, G. S. (A)
Townsend, C. K. (A)
Turner, T. F. (A)

San Leandro
Albrecht, J. F. (A)
Bidwell, H. H. (A)
Cerruti, B. A. (A)
Newell, R. S. (A)
Regnier, N. J. (A)

San Lorenzo
Chase, R. C. (A)
Farrelle, P. S. (M)
Winningstad, C. N. (A)

San Luis Obispo
Larsen, H. F. (A)
Radius, C. (SM)
Redden, R. L. (A)
Reed, D. E. (A)
Roney, E. L. (M)
Watson, K. J. (M)
Wolf, H. K. (M)

San Marino
Angus, D. G. (A)
Bucknell, W. H. (VA)
Fuller, B. L. (A)
Gauldin, C. B. (A)
Herbert, C. (SM)
Irwin, E. M. (A)
Mason, C. W. (M)
Mauritz, F. E. (M)
Rankin, J. A. (SM)
Sanders, L., Jr. (A)
Shultz, E. P. (VA)
Smith, W. E. (A)
Whistler, J. P. (VA)

San Mateo
Anderson, R. C. (A)
Barkely, J. W., Jr. (A)
Bartholomew, H. C., Jr. (A)
Demere, R. M., Jr. (A)
Downie, W. A. (A)
Erickson, L. G. (A)
Garard, E. A. (SM)
Grace, J. R. (SM)
Haylock, F. B. (A)
Heller, R. E. (A)
Huynen, J. R. (M)
Langevin, R. Z. (A)
Leo, R. E. (A)
Line, G. D. (M)
Loretz, H. G. (A)
See, H. P. (A)
Shaw, C. E. (VA)
Stoddard, D. J., Jr. (A)
Taylor, R. A. (A)
Wagner, E. S. (A)
West, J. P. (A)
Zweifel, F. A. (A)

San Pablo
Groves, W. E. (SM)
Luckenbach, R. R. (A)

San Pedro
Elliott, J. W. (A)
Moore, M. E. (VA)
Rich, A. P. (M)

San Rafael
Freeman, W. L. (A)
Leicester, J. F., III (A)
Matthews, D. W. (A)
Schaub, L. E. (A)
Wells, F. D. (A)

Santa Ana
Corvi, J. A. (A)
Hudspeth, T. (A)
Knipe, W. M. (A)
Levering, C. A. (VA)
Porter, W. R. (A)

Santa Barbara
Czepinsky, W. (A)
Dawley, R. L. (A)
Nicolay, A. A. (M)
Pressley, J. H. (F)
Schnell, L. J. (VA)
Smith, D. S. (A)
Smith, H. W. (A)

Santa Clara
Ganahl, P. J. (A)
Hansen, H. W., Jr. (A)
Murphy, T. P., Jr. (A)
Warren, W. J. (SM)

Santa Cruz
Ottem, I. E. (A)

Santa Maria
Smith, W. W. (A)

Santa Monica
Brown, H. M. (A)
Burgar, D. G. (A)
Cain, G. H., Jr. (A)
Cruse, P. M. (A)

Digby, J. F. (A)
D'Nelly, G. O. (A)
Doersam, P. D. (M)
Durham, L. G. (A)
Everest, F. A. (SM)
Exner, W. L. (A)
Frampton, M. W. (A)
Fredenall, B. F. (VA)
Gage, B. M. (A)
Greenbaum, M. (A)
Hatch, M. M. (A)
Herr, D. L. (SM)
Hierath, D. C. (M)
Hoefener, C. E. (A)
Hund, A. (F)
Hund, E. (A)
Justice, L. E. (A)
Krantz, C. H. (VA)
Loretz, N. F. (A)
McKinley, H. W. (VA)
Miller, R. J. (A)
Mizell, M. H. (A)
Morrow, J. E. (M)
Post, G. (A)
Quavraux, H. F. (A)
Reich, E. (A)
Ryland, M. E. (A)
Schott, F. W. (M)
Shear, H. J., Jr. (A)
Smith, H. A. (VA)
Tillotson, J. H. (A)
Wehner, R. S. (M)
Whitaker, J. N. (SM)
Whitlock, J. R. (A)

Santa Paula
Haas, C. H. (M)
Sharp, J. M. (VA)
Teague, D. S., Jr. (A)

Santa Rosa
Bettendorff, O. A. (A)
Merrill, G. E. (A)
Morrison, A. I. (A)
White, M. E. (A)

Saratoga
Nettesheim, H. P. (A)

Sepulveda
Chmilowski, J. B. (M)
Olson, C. P., Jr. (M)
Tasker, R. B. (S)

Sharp Park
Piltz, F. (A)

Sherman Oaks
Cartheuser, W. (A)
Conn, J. W. (M)
Dean, J. P. (A)
Eicher, W. F. (A)
Epstein, S. (A)
Foote, S. H. (A)
Gould, E. W. (A)
Miller, G. B. (VA)
Monderer, B. A. (M)
Monroe, J. C. (A)
Overmire, M. O. (M)
Pratt, A. (M)
Rice, H. E. (SM)
Ross, M. N. (A)
Russell, D. C. (M)
Rutland, D. F. (A)
Schinazi, N. B. (A)
Shank, R. J. (SM)
Wiggins, C. P. (A)
Wooldridge, D. E. (SM)

Sierra Madre
Abrams, H. S. (A)
Evans, J. R. (A)
Phillips, E. V. (A)
Ruth, L. C. (M)
Sheriff, D. R. (M)

Solana Beach
Allen, J. R. (A)
Alnutt, M. W. (A)
Domike, D. A. (A)

Sonoma
Johnston, H. R. (M)

Sonoma County
Hosmer, E. A. (SM)

South Gate
Dreessen, W. B. (A)

South Palo Alto
Clarke, L. G. (A)

South Pasadena
Boggs, C. A. (A)
Fesko, J., Jr. (A)
Davis, D. C. (A)
Kuck, R. G. (A)
Widenmann, J. A. (M)
Wood, W. S. (A)

South San Francisco
Tripp, A. L. (M)

Stanford
Clark, C. B. (M)
Dodd, G. M. (A)
Giulii, J. D. (A)
Helliwell, R. A. (SM)
Hessemer, R. A. (A)
Hobson, J. E. (M)
Hoover, W. G. (A)
Jasberg, J. H. (A)
Kamphoefner, F. J. (M)
Krueger, R. E. (M)
Manning, L. A. (A)
Moore, A. D. (A)
Putz, J. L. (A)
Terman, F. E. (F)
Tuttle, D. F., Jr. (M)
Van Valkenburg, M. E. (A)
Varian, R. H. (A)
Zitelli, L. T. (A)

Stockton
Fegan, A. A. (A)
Hollingsworth, K. M. (A)
Welch, H. E. (A)

Studio City
Sigmon, L. C. (SM)

Sunland
Robinett, D. B. (A)

Sunnyvale
Adams, M. B. (M)
Avis, A. J. A. (A)
Case, M. D. (VA)
Hartke, D. C. (A)
Hiestand, N. P. (A)
Senstad, P. D. (A)
Watson, R. H. (A)

Sunol
West, C. F. (M)

Sun Valley
Buie, J. L. (A)
Lumenello, K. A. (A)
Parks, R. J. (A)

Tarzana
Meyer, D. R. (A)
Rhoad, E. J. (M)
White, G. E. (SM)

Temple City
Armagost, H. C. (VA)
Ming, D. L. (A)

Terra Bella
McMaster, W. J. (A)

Thousand Oaks
Gard, C. D. (A)
Neuron, E. (A)
Schnert, P. J. (A)

Torrance
Hoffman, P. L., Jr. (A)
Newton, S. H. (A)
Norris, R. M. (A)
Rovenstine, J. A. (A)

Treasure Island
Detrick, D. M. (A)

Tujunga
Holmes, L. O. (A)

Turlock
Jorge, C. D. (A)

Upland
Campbell, A. T. (A)

Vacaville
Young, W. E. (A)

Vallejo
Abjornson, C. A. (A)
Angst, D. C. (A)
Ekstrand, P. A. (SM)
Eliander, H. F., Jr. (A)
Erdman, J. P. (A)
Fuller, G. R. (A)
Hanley, R. J. (A)
Hansen, E. N. (A)
Helneman, J. T. (VA)
Hoskins, J. W. (A)
Hough, J. M. (A)
Mann, F. E. (A)
O'Bryan, R. L. (A)
Poe, W. E. (A)
Quick, T. C. (A)
Strong, J. A., Jr. (M)
Timmerman, H. A. (A)
Tucker, E. A. (A)

Van Nuys
Anderson, G. R. (M)
Bailey, F. W. (A)
Bettencourt, V. S. (A)
Bowman, L. H. (SM)
Boyd, J. C. (A)
Caggiano, V. D. (A)
Carter, S. T. (A)
Corduan, A. E. (A)
Crowther, E. E. (A)
Dadant, P. M. (A)
Dolde, L. A. (A)
Fredman, N. E. (A)
Green, A. P. (VA)
Hawkins, W. G. (M)
Hirsch, M. R. (A)
Jones, A. C. (A)
Klemens, W. P. (A)
Lovick, E., Jr. (A)
Lyon, R. E. (A)
McClanahan, R. T. (M)
Merrill, D. H. (A)
Miller, C. E. (SM)
Moller, B. N. (A)
Morgan, R. L. (M)
Nibbe, G. H. (SM)
O'Halloran, J. F. (M)
Paller, J. L. (A)
Pangborn, H. W. (SM)
Perry, R. H. (A)
Powers, S. L. (A)
Radmacher, D. S. (M)
Rosa, G. N. (A)
Rumer, W. I. (A)
Snyder, W. (A)
Stevens, R. W. (A)
Urman, B. S. (A)
Whitman, K. C. (A)
Willcocks, S. J. (A)
Wilson, R. A. (A)
Wolman, L. L. (A)
Wright, D. (VA)

Venice
Cochran, K. W. (A)
Foy, R. H. (A)
Gunning, W. F. (A)
Johnson, G. (A)
Landis, R. I. (A)
Lawson, M. H. (A)
Love, C. E. (A)
Robbins, W. M. (A)
Whinnery, J. R. (SM)
Woltz, R. L. (A)

Ventura
Arnold, W. F. (M)
Bernhardt, E. C. (A)
Cohen, H. I. (A)
Dame, R. O. (A)
Edwards, R. S. (A)
Hoover, L. R. (A)
Leiper, J. H. (M)
MacDonald, W. L. (A)
Shrock, J. B. (M)
Sisson, R. L. (M)
Snow, L. L. (A)
Stuart, C. E. (A)

Victorville
Johanson, E. H. (A)

Vista
Albert, S. L. (A)
Provost, R. D., Jr. (A)

Walnut Creek
Mitchell, J. R. (A)
Norris, N. J. (A)

Waterford
Sayre, M. B. (A)

Watsonville
Duer, S. J. (A)

Weaverville
Mosley, R. B. (A)
Snyder, W. G. (A)

Westchester
Stantin, R. S. (VA)

West Los Angeles
Gossland, R. D. (M)
Hilliard, J. K. (SM)
Marsh, D. S. (A)
Pastan, H. L. (A)
Perry, C. S. (A)
Taylor, P. G. (M)
Theodore, C. (A)
Wright, E. C. (M)
Zint, K. E. (SM)

Westmoreland
Austin, H. B. (M)

West Sacramento
Zahatie, J. (A)

Whittier
Allison, R. E. (SM)
Campbell, J. R. (A)
Conly, E. R. (A)
Donoghue, J. J. (M)
Elbinger, B. (A)
Gow, K. P. (A)
Ingersoll, E. R. (A)
Kent, S. S. (A)
Krelder, P. A. (A)
Losey, J. J. (M)
Marsh, J. A. (A)
Olsen, V. O. (A)
Parker, N. F. (A)
Polder, J. H. (A)
Poole, W. S. (A)
Randall, G. M. (A)
Tilley, A. E. (M)
Triman, E. L. (A)
Wilcox, D. E. (A)

Wilmington
Brunner, R. A. (A)
Geisert, F. W. (A)
Harris, H. M. (A)

Woodland Hills
Berman, H. (A)
Chikar, R. E. (A)
Ellis, J. W., Jr. (A)
LaGasse, S. G. (A)

Woodside
Eitel, W. W. (A)
Stoner, J. W. (A)

COLORADO

Arvada
Spano, A. J. (A)

Aurora
Yourdon, F. R. (A)

Boulder
Bitter, C. R., Jr. (A)
Boehmer, H. W. (M)
Johnson, H. C. (A)
Luebke, W. R. (A)
Moore, J. E. (A)
Stacey, D. S. (A)

Colorado Springs
Ashby, G. L. (M)
Estin, A. J. (A)
Hornberg, K. O. (A)
Maloney, L. J. (A)
Russell, J. D. (M)
Scharp, G. A. (A)
Victoreen, J. A. (SM)
Visliscl, R. L. (A)
Vogt, E. J. (SM)
Walters, A. W. (A)
Weiner, J. H. (M)

Denver
Ahlbeck, W. H. (A)
Anderson, G. H. (A)
Beasley, C. F. (A)
Bliss, W. R. (M)
Blake, A. F. (A)
Blanchard, R. R. (M)
Bowen, R. G. (M)
Christie, F. W. (A)
Clarke, R. L. (A)
Connell, J. B. (A)
Cullen, J. G. (A)
Cunningham, R. D. (A)
Deutsch, K. T. (M)
Eddy, R. C. (M)
Ekrem, T. C. (A)
Fingado, F. H. (A)
Fleming, C. W. (A)
Forsman, E. H. (A)
Foy, T. J. (A)
Freudenberg, H. O. (A)
Fuqua, C. (M)
Gessert, E. C., Jr. (A)
Grimmett, L. J. (A)
Goble, R. W. (A)
Hagin, E. J. (A)
Harvey, S. A. (M)
Hedberg, C. A. (M)
Heyliger, G. E. (A)
Johnson, H. S. (A)
Keenan, E. L. (A)
Keys, D. D. (A)
Knight, S. J., Jr. (A)
Koch, R. C. (A)
La Hue, P. M. (M)
Lauterbach, R. E. (A)
Lewand, J. (A)
McLoud, W. C. (M)
Morrissey, T. G. (SM)
Morroni, D. J. (A)
Mueller, A. G. (A)
Murahata, S. (A)
Peterson, D. I. (A)
Petitjean, A. E. (A)
Pierce, O. B. (A)
Post, E. A. (SM)
Raper, A. J. (A)
Read, R. A., Jr. (A)
Reno, H. (A)
Sakaguchi, H. K. (A)
Sargent, R. E. (A)
Sharp, H. (A)
Shreve, T. S. (M)
Smith, W. F., Jr. (A)
Stewart, M. J. (A)
Swanson, R. E. (A)
Todd, F. J. (M)
Trukken, H. R. (A)
Wang, C. S. (A)
Wright, P. H. (A)

Durango
Heatwole, E. P. (A)

Englewood
Thaxton, H. A. (A)

Erie
Petticrew, C. A. (A)

Fort Collins
Bottom, V. E. (M)
Britton, C. C. (A)
Cowart, B. E. (A)

Fort Morgan
Watson, G. W. (A)
Zambo, J. W. (A)

Golden
Fletcher, H. C. (A)

Grand Junction
McCormick, C. E. (A)

Lakewood
Garretson, H. W. (A)

Limon
Laudeman, J. A. (A)

Loveland
Kelley, E. K. (M)

Manitou Springs
Hartwigsen, C. K. (A)

Montrose
Sidwell, R. D. (A)

Salida
James, V. N. (SM)

Wheatridge
Clyne, W. E. (SM)

Wiley
Carlin, P. W. (A)

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Ansonia
Pigaty, J. B., Jr. (A)

Berlin
Heinzmann, J. D. (A)

Bethel
Beschle, R. G. (A)
Pearlman, L. S. (M)

Bloomfield
Whitney, D. J. (A)

Bridgeport
Autuori, V. A. (M)
Bary, V. (A)
Bruntil, I. M. (M)
Digrindakis, J. (A)
Dimenna, D. L. (A)
Held, R. W. (A)
Kohn, I. A. (A)
Lapinski, C. S. (A)
Merryman, P. (SM)
Mike, J. G. (A)
Millikin, B. J. (A)
Nash, J. O. (A)
Paradise, R. Y. (A)
Pensiero, L. R. (A)
Perez, M. (A)
Prince, M. J. (A)
Rado, S. J. (A)
Ragonese, F. L. (A)
Rescoe, J. M. (A)
Stanio, D. D. (A)
Wood, E. W. (A)

Bristol
Nelson, A. B. (SM)
Vaughan, E. W. (M)
Williams, J. J. (A)

Brookfield
Concelman, C. W. (A)
Gordon, T. M., Jr. (A)

Byram
Wallace, M. (SM)

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Spencer, R. H. (A)

Clinton
Passera, A. L. (A)

Cos Cob
Caldwell, O. H. (F)

Cromwell
Grundy, A. B., Jr. (A)

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Campbell, C. A. (M)
Darmento, J. (A)
Elias, L. G. (A)
Fackler, B. E. (A)
Hardie, F. H. (A)
Johns, N. H. (A)
Minton, W. C. (A)
Webb, R. H. (A)

Darien
Ghirardi, A. A. (SM)
Jacobson, L. (A)
Liston, M. D. (A)
MacGregor, R. R. (A)
McElrath, G. (SM)
Mills, C. A. (M)
Minnich, E. L. (M)
Morawetz, F. (M)
Starr, J. O. (M)

East Haddam
Nemcovsky, R. (A)

East Haven
Keay, R. M. (A)

East Norwalk
Henrich, W. H. (M)

Fairfield
Bishop, N. (SM)
Brustman, J. A. (SM)
DiMattia, A. L. (A)
Hartman, R. B., II (A)
Mitchell, W. C. (A)
Paneyko, M. (A)

Glastonbury
Perry, T. (A)
Waterman, A. (M)

Glenbrook
Klyce, B. H. (SM)
Versoy, I. R., Jr. (A)

Greenwich
Anderson, W. C. (VA)
Madsen, R. G. (M)
Shecklen, G. F. (A)
Wesley, C. A. (A)

Groton
Blaisdell, K. L. (A)
Kimble, C. B. (A)
Miller, K. K. (M)
Milmer, C. T. (A)

Guilford
Hanson, N. L. (A)

Hamden
Akin, G. E. (A)
DiElsi, F. J. (A)
Doolittle, R. M. (SM)
Etter, H. H. (A)
Hewitt, C. D. (A)
Hovey, D. P. (A)
Krauss, H. L. (SM)
Larock, F. N. (A)
Reich, H. J. (F)
Schorr, M. G. (A)
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Stancliff, V. A. (A)
Sundius, H. W. (SM)

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Berman, G. (A)
Bourret, C. J. (A)
Bullock, J. B. (A)
Clinton, H. H. (A)
Dickon, A. J. (A)
Eckel, C. C. (A)
French, E. C. (VA)
Galin, J. L. (A)
Haugens, D. (A)
Handy, F. E. (VA)
Harris, D. J. (A)
Hildebrant, W. J. (A)
Moffitt, G. R., Jr. (A)
Moses, S. (A)
Pinkor, J. (A)
Waffle, W. M. (M)
Zaslow, J. (A)

Long Hill
Dresser, W. R. (SM)

Manchester
Dean, C. M. (A)
Larue, R. S. (A)

Mansfield Center
Anderson, A. E. (M)
Benson, R. K. (A)
Robb, E. J. (A)

Meriden
Lavin, H. (A)
Schmitz, J. F. (A)

Middletown
Gamble, G. W. (A)
Hallworth F. D. (A)
Palmer, W. F. (A)
Tuccio, M. S. (A)
Van Dyke, K. S. (F)

Milford
Baldwin, A. L., Jr. (A)
Lyman, H. T., Jr. (SM)

Milldale
Fontana, J. A. (A)

Mount Carmel
Conrad, A. G. (SM)
Worster, J. R. (A)

Mystic
Atwood, W. A., Jr. (A)
Coppolino, L. S. (A)
Earley, W. B., Jr. (A)
Merritt, N. A. (A)
Sologlozy, C. S. (A)

Naugatuck
Baldwin, E. G. (A)
Thynell, G. M. (A)

New Britain
Carino, J. J. (A)
Knight, R. A. (A)

New Canaan
Castle, D. H. (SM)
Chinn, H. A. (F)
Couch, W. M., Jr. (A)
Goldmark, P. C. (F)
Hamme, R. D. (A)
Maxwell, D. E. (SM)
Tingley, G. R. (A)
Waldron, T. J. (A)

New Haven
Arthur, G. R. (A)
Bergmann, H. M. (A)
Black, D. G., Jr. (A)
Bloom, T. (A)
Breit, G. (F)
Carver, J. G. (A)
Cunningham, W. J. (M)
Curtis, R. C. (SM)
Fountain, H. F. (A)
Genera, V. A. (A)
Goldenthal, S. (A)
Grew, L. B. (SM)
Izenour, G. C. (M)
Kouvelites, J. (A)
Lyons, W. J., Jr. (A)
Mauro, A. (A)
May, J. C. (M)
Millard, A. M. (VA)
North, S. M. (A)
Oestreicher, D. L. (A)
Quirk, W. B. (M)
Rubin, H. B. (VA)
Schultheiss, P. M. (A)
Shank, R. R. (A)
Sherman, E. W. (A)
Skalnik, J. G. (A)
Spitzer, C. F. (A)
Thompson, G. S. (A)
Turner, H. M. (F)
Wakeman, C. B. (A)

Newington
Bliss, Philip (M)
Olsen, C. E. (A)

New London
Bennett, P. E. (A)
Friedman, S. (A)
Fucci, S. (A)
Gubin, S. (SM)
Haefner, S. J. (VA)
Herrera, J. C. (A)
Hoag, J. B. (SM)
Horton, J. W. (F)
Kroenert, J. T. (A)
Merrill, J. (M)
Olson, C. L. (A)
Pfautz, C. E. (A)
Pollack, D. (SM)
Powers, A. B. (M)
Rager, G. T. (A)
Rudensey, M. B. (M)
Schulkin, M. (A)
Turner, R. W. (A)
Videberg, J. (A)

Noroton
Mason, H. L. (A)
Stillman, A. H. (A)

North Branford
Bernard, J. T. (A)

North Haven
Chichester, J. (A)
Rohloff, H. E. (A)
Steward, J. F. (A)

North Woodbury
Petit, F. W. (A)

Norton Heights
Wood, W. A. (A)

Norwalk
Gabor, W. D. (A)
Hutchinson, F. B. (A)
Jefferies, D. W. (A)
Mason, W. (SM)
Parker, F. J. (A)
Schulz, H. R. (M)
Thompson, R. G. (VA)
Towles, W. B. (A)
Traver, H. A. (M)

Oakdale
Berman, R. (A)
Whannel, R. L. (A)

Old Greenwich
Cassidy, J. J., Jr. (A)
Fenn, W. W. (A)
Filgate, J. T. (SM)
Lott, A. L. (M)

Old Saybrook
Bang, M. W. (SM)
Radom, R. (A)
Pollock, A. H. (A)

Putnam
Bosworth, C. D. (A)
Roller, E. R. (A)

Quaker Hill
Bishop, H. M. (A)
Ide, J. M. (SM)
Nash, H. (A)

Ridgefield
Doll, H. G. (SM)
Ferre, M. C. (M)
Hering, K. W. (A)
Huston, O. H. (VA)
Peck, W. D. (A)
Resides, W. C. (SM)
Segesman, F. F. (A)
Sloughter, G. S. (SM)
Sloughter, W. J. (M)

Riverside
Lemmon, W. S. (SM)
Long, R. (A)
Ryan, W. R. (M)
Smith, N. F., Jr. (SM)
Sontheimer, C. G. (A)

Rockville
Weston, F. B. (VA)

Rowayton
Benson, S. E. (A)
Harris, R. V. (A)

Saugatuck
Van der Veen, H. (VA)

Seymour
Fryncko, P. (A)

Shelton
Zaskalicky, J. J. (M)

Simsbury
Griffin, D. C. (A)
Somers, B. A. (VA)
Stocking, M. H. (A)

Southington
Raymond, G. H. (M)

South Norwalk
Benson, K. B. (M)
Duncan, H. (SM)
Gray, J. B. (M)
Greunke, O. V. (A)
Hodgson, A. R., Jr. (M)
Lamb, J. J. (SM)
Rand, P. S. (M)
Schilling, C. R. (A)
Winter, C. W., Jr. (A)
Yellin, H. (M)

Southport
Armstrong, C. W. (A)
Bachman, W. S. (M)
Evans, R. E. (A)

Springdale
DeLucia, V. E. (A)
Fluke, J. M. (M)
Leferson, J. (A)
Peery, W. E. (VA)
Yanagisawa, S. T. (SM)

Stepney
Weller, B. L. (A)

Stamford
Anderson, B. G. (A)
Bailey, E. M. (A)
Baker, G. W. (A)
Cooke, H. S. (A)
Doolittle, H. D. (M)
Geist, H. J. (SM)
Germain, J. (A)
Helterline, L. L., Jr. (A)
Hotz, M. (A)
Magida, N. H. (A)
Molday, B. V. (SM)
Polis, J. M. (A)
Rendell, G. (A)
Rheaume, R. H. (M)
Rider, P. Z. (M)
Sachs, S. (A)
Salzman, C. F., Jr. (A)
Schonert, K. E. (M)
Siegel, J. R. (A)
Singer, E. (A)
Skehan, J. W. (A)
Steinberg, E. B. (SM)
Tabisz, S. C. (A)
Wilder, M. P. (A)

Stonington
York, E. P. (A)

Storrs
Fribourg, F. H. (A)
Heydt, H. L. (M)
Knauss, H. P. (M)
Schultz, C. W. (M)
Scott, N. R. (SM)
Timoshenko, G. S. (A)
Williams, L. E. (SM)

Stratford
Craig, G. F. (M)
DeTar, D. R. (SM)
Fox, F. J. (M)

Terryville
Krenecki, J. (A)

Thomaston
Brazee, J. A. (A)
Getsinger, W. J. (A)

Torrington
Guerrini, J. G. (A)

Unionville
Jones, M. C. (A)

Wallingford
Ehler, A. F. (A)
Tuttle, R. W. (M)

Waterbury
Brennan, D. G. (A)
Cannizzaro, M. (A)
Hales, F. B. (A)
McLeod, K. A. (A)
Nicholson, W. E. (A)
Pichard, L. A. (A)
Quinn, Q. Q. (M)
Somers, D. L. (A)
Stromwall, C. W. (VA)
Winchell, A. M. (VA)

Waterford
Bartow, J. G., Jr. (A)
Dunn, C. M. (M)
Galagan, S. (A)
Heindsmann, T. E. (A)
Murphree, F. J., Jr. (A)

West Cheshire
Thompson, L. (A)

West Hartford
Acker, A. E. (A)
Block, A. V. (A)
Ferla, S. J. (A)
Grammer, G. (A)
Holt, H. W. (SM)
Lalanne, R. L. (A)
Mathes, R. E. (SM)
Roth, W. (A)
Snow, C. A., Jr. (A)
Warner, S. E. (SM)

West Mystic
White, C. E. (M)

Westport
Cooper, F. S. (A)
DeWitz, G. H. (M)
Ellis, L. W., Jr. (A)
Hanson, O. B. (F)
Vasques, H. A. (A)

Wethersfield
Beal, E. W. (M)
Cox, N. W. (A)
Harden, L. R. (A)
House, L. G. (M)
Mitchell, J. A. (A)
Quayle, G. (A)
Szegda, A. (A)

Willimantic
Obsharsky, P. (A)

Wilton
Aiken, C. B. (SM)

Winsted
Lescarbeau, R. F. (M)

Woodbridge
Cannon, J. F. (M)
Martino, I. A. (VA)

Woodmont
Jacobson, E. R. (A)
Meier, A. S. (A)

DELAWARE

Claymont
Hughes, R. M. (A)

Dover
Erdle, F. E. (A)

Milford
Myers, B. D., Jr. (A)

Newark
Bueche, H. S. (A)
Lutz, B. C. (A)
Perkins, J. R. (SM)
Young, M. G. (SM)

Rehoboth Beach
Salin, J. A. (M)

Wilmington
Albright, C. M., Jr. (A)
Greeff, C. E. (M)
Horak, R. J. (A)
Kibby, J. R. (A)
Owens, J. E. (A)
Pastell, D. L. (A)
Tisdale, G. E. (A)
Walsh, R. R. (A)
Wild, R. F. (SM)

Wilmington Manor
Hampton, L. R. (A)

Wyoming
Frasher, M. M. (A)

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Washington
Abraham, G. (M)
Adair, G. P. (F)
Adams, R. J. (SM)
Albertson, F. W. (SM)
Allman, F. L. (VA)
Andrae, P. H., II (A)
Andrew, W. M. (M)
Ansher, N. (A)
Applebaum, A. (A)
Apuli, J. A. (SM)
Arnett, H. D. (M)
Atwell, R. G. (A)
Awramik, J., Jr. (A)
Baldwin, C. H. (A)
Barlow, H. B., Jr. (A)
Battan, L. J. (A)
Baum, R. F. (A)
Bearce, L. S. (A)
Beck, E. A. (A)
Beck, H. M. (M)
Beecher, D. W. (A)
Bell, L. F. (A)
Benns, W. E., Jr. (A)
Berquist, P. N. (M)
Berson, A. S. (A)
Birnbaum, G. (A)
Bishop, B. E. (A)
Blachman, N. M. (A)
Black, R. R. (SM)
Blake, L. V. (M)
Blau, W. (A)
Blumberg, W. J. (A)
Bohnert, J. I. (M)
Bonham, L. L. (A)
Bortniker, E. (A)
Bourland, L. T. (SM)
Bowers, R. E. (A)
Bowne, W. L. (M)
Boymel, B. R. (SM)
Brantley, W. W. (M)
Breeskin, S. D. (A)
Brester, W. A. (VA)
Brogden, J. W. (A)
Brooks, J. F. (A)
Brown, T. H. (VA)
Bull, W. I. (SM)
Bullock, G. M. (M)
Burbage, G. H. (A)
Burgess, W. B. (SM)
Cacheris, J. C. (M)
Caldwell, L. G. (SM)
Callahan, H. R. (M)
Campbell, J. K. (A)
Carley, W. S. (M)
Carlson, C. O. (A)
Carlson, R. C. (A)
Carnes, W. T., Jr. (SM)
Carnine, R. L. (A)
Carroll, T. J. (M)
Carter, H. J. (M)
Cervenka, F. J. (SM)
Chambers, T. H. (A)
Chase, D. G. (A)
Chromy, B. J. (VA)

Clark, H. L. (A)
Clark, N., Jr. (A)
Clarke, A. S. (SM)
Cleeton, C. E. (SM)
Coates, R. J. (A)
Codel, M. (A)
Cohen, M. (A)
Collier, J. W. (M)
Collins, J. (M)
Colvin, R. (VA)
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Condon, E. U. (SM)
Conway, B. B. (A)
Cook, H. D. (A)
Copsey, J. F. (A)
Cotton, A. F. R. (M)
Craig, P. M., Jr. (A)
Crane, R. R. (A)
Crenca, G. (A)
Cummings, J. J. (SM)
Dalton, R. A. (A)
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Daubenheyer, H. W. (M)
Davies, R. C. (A)
Davis, T. McL. (SM)
Davis, W. J. (A)
Dawley, J. R., Jr. (M)
Decker, K. M. (A)
Delort, R. (M)
Dellinger, J. H. (F)
DeVore, C. (A)
Dewey, G. C. (A)
Dillard, E. L. (VA)
Dinger, H. E. (SM)
Dinnick, G. M. (M)
Distad, M. F. (SM)
Dixon, J. T. (A)
Dorrell, R. E. (M)
Dorsey, H. G. (F)
Dove, P. S. (M)
Drubin, M. (A)
Duncan, F. B. (A)
Dunkelman, L. (A)
Easley, R. L. (M)
Easton, R. L. (M)
Eisenschmied, M. D. (A)
Elam, F. E. (A)
Elbourn, R. D. (M)
Elices, F. J. (A)
Ellermann, K. E. (A)
Engelman, C. L. (SM)
Ennis, A. G. (A)
Ertman, R. J. (A)
Erwin, V. R. (M)
Faraday, B. J. (A)
Faust, W. R. (A)
Favorov, P. A. (A)
Feinstein, J. (A)
Fellers, R. G. (M)
Ferris, W. R. (SM)
Finch, W. G. H. (SM)
Fine, H. (A)
Finkel, A. (A)
Finn, P. L. (A)
Finney, W. J. (SM)
Flarity, W. H. (A)
Flath, E. H., Jr. (M)
Fleming, E. W. (A)
Fleming, J. J. (A)
Florman, E. F. (A)
Fluhr, F. R. (A)
Foss, W. L. (A)
Franklin, P. J. (SM)
Franta, A. L. (A)
Fratianni, S. V. (A)
Frazier, H. S. (SM)
Fuller, G. A., Jr. (A)
Fuller, I. W., Jr. (A)
Gabriel, W. F. (A)
Galane, I. B. (A)
Gale, M. (A)
Gall, J. E. (VA)
Garrison, M. M. (SM)
Gayle, A. (A)
Gaylord, R. E. (A)
Geary, L. W. (A)
Gebhard, L. A. (F)
George, S. F. (SM)
George, W. D. (VA)
Gerb, B. (A)
Gibson, G. B. (M)
Gilder, G. (A)
Giles, J. K. (A)
Giles, R. C. (M)
Gillette, K. G. (VA)
Ginsberg, M. B. (A)
Glaze, G. O. (M)
Gleason, R. F. (A)
Goldberg, H. (SM)
Goldstein, E. (A)
Good, C. A., Jr. (A)
Gordon, H. L. (M)
Gordon, S. H. (A)
Goumas, N. P. (A)
Gracely, F. R. (A)
Graham, H. U. (SM)
Grant, C. R. (A)
Grantham, R. W. (A)
Gratton, R. E. (A)
Grebenkemper, C. J. (A)
Greer, J. W. (SM)
Grenier, T. J. (A)
Greulich, H. J. (A)
Graim, R. J. (A)
Gridley, D. H. (A)
Griffin, G. J., Jr. (A)
Griffith, R. E. (A)
Grimm, H. H. (A)
Grimm, R. E. (M)
Groverman, A. B. (M)
Gruber, J. R. (A)
Guarino, P. A. (SM)
Gunn, R. (F)
Gursky, E., Jr. (M)
Guthrie, F. P. (SM)
Guthrie, R. C. (VA)
Halbrooks, C. N. (A)
Halvorsen, H. W. (A)
Hamilton, R. E. (A)
Hammond, N. B. (A)
Hanley, T. E. (A)
Harper, H. (A)
Harrison, H. (SM)
Haskins, R. L. (SM)
Hastings, A. E. (A)
Hastings, H. F. (VA)
Harter, J. R. R. (M)
Haueter, R. C. (A)
Hayes, J. B. (A)
Heaton, V. E. (SM)
Hedberg, R. W. (A)
Hedge, L. B. (A)
Hedrich, A. L. (M)
Heilprin, L. B. (A)
Heinmiller, D. R. (A)
Hemenway, D. F. (A)
Hennessy, R. G. (A)
Henry, J. H. (A)
Herbert, L. G. (A)
Herman, H. (A)
Herring, R. A., Jr. (A)
Herson, J. L. (M)
Hiatt, R. S., Jr. (A)
Hickley, T. J. (SM)
Himmelstein, S. (A)
Hodges, M. F. (M)
Holliday, F. S. (M)
Hopkins, C. (M)
Hotchkin, E. E. (A)
Houston, R. H. (A)
Howard, D. D. (A)
Howe, W. E. (M)
Hull, M. I. (M)
Humphrey, T. I. (SM)
Hutchinson, H. P. (SM)
Isely, F. C. (SM)
Jansky, C. M., Jr. (F)
Jennings, T. F. (A)
Johnston, E. L. (VA)
Johnson, S. F. (A)
Jones, A. B. (SM)
Jones, A. E. (A)
Julian, O. K. (M)
Justman, S. (A)
Kalmus, H. P. (SM)
Katzin, M. (SM)
Kaufman, I. (SM)
Kaufman, M. G. (M)
Kellerman, K. F. (SM)
Kennedy, R. L. (A)
Killian, T. J. (SM)
King, A. F. (A)
King, A. M. (A)
Kluck, J. H. (A)
Knochel, R. F. (M)
Kohler, H. W. (VA)
Kolkedy, J. G. (M)
Kortman, C. M. (A)
Kouchnerkavich, T. A. (VA)
Krasnick, B. (A)
Kraus, D. G. (A)
Kraus, R. W. (A)
Krueger, R. E. (M)
Krug, J. A. (A)
Krupen, P. (A)
Kuder, M. L. (A)
Kyne, J. T. (M)
Kyser, R. H. (A)
Lacey, H. F. (A)
Lambert, T. A. (A)
Landsman, L. (A)
Lantz, P. A. (A)
Lapham, E. G. (SM)
Lapp, R. E. (SM)
Latt, H. A. (A)
Leavitt, W. E. (A)
Leinbach, H. J., Jr. (A)
Leiphart, J. P. C. (A)
Lepanto, P. J. (A)
Leppert, M. L. (VA)
Levy, I. J. (A)
Libby, J. N. (A)
Lichtman, S. W. (SM)
Light, L. (A)
Lilmatainen, T. M. (M)
Link, J. C. (A)
Link, J. H. (VA)
Lipscomb, J. L. (A)
Little, R. P. (A)
Loeber, C. W. (M)
Lohnes, G. M. (SM)
Long, M. C. (A)
Long, T. L. (A)
Longman, E. R. (M)
Looney, C. H., Jr. (A)
Lorenzen, H. O. (VA)
Loucks, P. G. (VA)
Lovejoy, E. W. (SM)
Lovoff, A. (SM)
Lowe, D. M. (A)
Lowell, R. (A)
Luecker, G. E. (A)
Lynch, D. W. (M)
MacGregor, E. I. (SM)
Mack, S. J. (A)
Maddox, C. H. (SM) (L)
Maiden, R. M. (SM)
Main, W. F., Jr. (A)
Marin, J. W. (A)
Markell, J. H. (M)
Martin, P. J. (A)
Maskaleris, C. L. (A)
Mathes, R. H. (A)
Mayeda, T. A. (A)
Mayer, C. H. (M)
Maynard, C. W. (A)
Mayo, R. D. (A)
Mayo-Wells, W. J. (SM)
Mazur, D. G. (A)
McClain, E. F., Jr. (M)
McConnell, I. R. (M)
McEwan, A. J. (A)
McKey, D. B. (A)
McLaughlin, D. J. (M)
Medrow, K. R. (M)
Meyer, R. B. (SM)
Miles, K. G. (M)
Miller, J. (F)
Mirick, C. B. (SM) (L)
Mizell, B. B. (A)
Morgan, E. D. (A)
Moore, A. H. (M)
Moore, S. F. (A)
Morehouse, G. D. (A)
Moseley, J. C., Jr. (A)
Moyer, W. A., Jr. (A)
Muncy, J. H. (M)
Munzer, E. N. (M)
Murray, A. F. (F)
Neely, G. M. (VA)
Newberry, D. A. (M)
Newlon, A. E. (SM)
Newman, W. P. (A)
Norgorden, O. (A)
Norton, K. A. (F)
Odarenko, T. M. (SM)
Olken, H. (A)
O'Reilly, G. A. (SM)
Ornstein, E. (A)
Ostrow, S. M. (A)
Ottinger, G. L. (A)
Otto, E. D. (M)
Ould, R. S. (VA)
Owen, E. A. (A)
Owens, R. B. (S)
Page, E. C. (SM)
Page, R. M. (F)
Paine, H. G. (M)
Palasky, E. C. (A)
Palmer, C. E., Jr. (A)
Parker, R. D. (SM)
Parker, R. O. (A)
Pernice, J. R. (SM)
Peterkin, E. W. (A)
Peterson, H. L. (A)
Petes, J. (A)
Phelps, F. P. (A)
Pierce, J. F. (VA)
Plummer, C. B. (SM)
Plummer, W. E. (SM)
Poast, L. M. (VA)
Poland, W. B., Jr. (A)
Powles, F. T. (SM)
Pratt, H. A. (M)
Pressnall, J. R. (A)
Probert, L. J. (A)
Randall, H. L. (A)
Ransom, R. A. (A)
Rattner, S. (M)
Ray, H. B. (M)
Raymond, H. A. (A)
Raymond, J. L. (A)
Reber, G. (SM)
Redcay, P. W. (M)
Reed, S. F. (M)
Reid, J. G., Jr. (SM)
Reiser, D. (A)
Reynard, A. I. (A)
Riccobono, S. (VA)
Richards, A. P. (SM)
Richardson, W. M. (SM)
Ripnitz, A. (A)
Ritz, W. A. (M)
Rivera, E. R. (A)
Robertson, B. S., Jr. (A)
Rohrich, G. J. (VA)
Rosenberg, J. D. (A)
Rowe, D. E. (M)
Rundlett, L. M. (M)
Russell, D. H. (A)
Ryssy, J. W. (VA)
Sackman, R. (A)
Salzberg, B. (SM)
Sanborn, R. H. (A)
Sandock, J. (A)
Santucci, D. A. (A)
Sarbacher, R. I. (SM)
Saunders, C. J. (A)
Scal, R. K-F. (SM)
Schairer, N. J. (A)
Schleter, G. C. (VA)
Schmalbach, S. (M)
Schmertz, R. C. (A)
Schmidt, R. A. (A)
Schooley, A. H. (SM)
Schrack, R. A. (A)
Schrenk, M. H. (SM)
Schwartz, R. G. (A)
Segal, P. M. (SM)
Seielstad, H. D. (SM)
Selby, M. C. (SM)
Seager, F. A. (A)
Shapiro, G. (A)
Sheets, M. J. (A)
Sherertz, P. C. (A)
Sherman, W. K. (VA)
Shultz, R. S. (A)
Silberstein, R. (SM)
Siling, P. F. (SM)
Silsbee, H. B. (A)
Silver, S. H. (A)
Simas, V. R. (A)
Simmons, A. J. (A)
Simon, A. (A)
Simonton, L. J. (A)
Small, B. I. (M)
Smeltzer, J. C. (A)
Smith, F. A. B. (A)
Smith, L. D. (A)
Smith, O. H. (A)
Smith, R. P. (A)
Smith, S. T. (A)
Smokler, M. I. (A)
Snider, D. A. (A)
Snyder, E. O. (A)
Spatz, S. (A)
Speakman, E. A. (SM)
Spencer, H. L. (M)
Sreb, J. H. (A)
Stahl, B. E. (VA)
Stair, R. (A)
Starobin, A. F. (A)
Staub, D. W. (A)
Stec, C. L. (SM)
Stecca, A. J. (A)
Stein, M. (A)
Stephenson, E. D. (A)
Stiles, R. G. (A)
Stine, P. T. (M)
Stoddard, R. N. (A)
Stormer, W. J. (A)
Struthers, F. W. (VA)
Stuff, A. C. (A)
Sugar, G. R. (A)
Summers, E. L. (A)
Summers, S. D. (SM)
Suski, H. M. (M)
Sutherland, J. A. (A)
Swanson, M. W. (SM)
Taber, H. E. (SM)
Taishoff, S. (A)
Talkin, A. I. (A)
Tanke, H. F. (VA)
Temple, F. B. (A)
Tershoff, A. I. (A)
Thomas, E. W. (M)
Thomas, L. W. (M)
Thompson, D. G. (A)
Thompson, D. B. (A)
Thrift, S. R. (M)
Timm, R. S. (M)
Toense, E. R. (A)
Trafton, D. C. (SM)
Trexler, J. H. (A)
True, V. (A)
Tucker, D. P. (SM)
Tuckerman, L. P. (SM)
Turner, G. S. (SM)
Upp, C. B. (SM)
Vargas, V. A. (A)
Vignali, J. A. (A)
Voznak, E. (A)
Wagner, T. C. G. (A)
Walden, G. R. (A)
Waldschmitt, J. A. (SM)
Wallace, J. D. (SM)
Wang, M. T. (A)
Ward, W. H. (A)
Ware, R. S. (A)
Waterman, P. (A)
Watkins, W. H. (M)
Watts, F. C. (A)
Watts, J. M. (M)
Webb, D. J. (A)
Weber, J. (M)
Weber, W. J., Jr. (A)
Webster, E. M. (F)
Weedman, W. F. (M)
Weidemann, H. K. (A)
Weimer, E. W. (M)
Weinstein, M. S. (A)
Weiss, F. (A)
West, J. S. (A)
Wheeler, F. K. B. (A)
White, C. F. (M)
White, W. A. (A)
Whittemore, W. K. (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)
Wilson, M. S. (A)
Winick, A. B. (A)
Winston, G. C. (A)
Woodson, M. P. (A)
Works, H. A. (A)
Wright, J. H. (A)
Wright, R. B. (VA)
Yaffee, P. (M)
Yaplee, B. S. (A)
Young, J. D. (A)
Young, J. S. (A)
Young, L. C. (F)
Zandonini, E. M. (M)
Zee, D. M. (A)
Zeek, R. W. (M)
Zoller, C. J. (A)

FLORIDA

Bartow
Chasteen, J. W., Jr. (M)
Morrison, H. G. (A)

Belle Glade
Clemens, C. S. (M)

Bradenton
Brown, J. M. (A)
Lampkin, G. F. (VA)

Clearwater
Abernathy, T. C. (A)
Reynolds, G. E., Jr. (A)

Cocoa
Bower, G. E. (A)
Friedland, M. S. (A)
Hines, W. S. (A)
Mueller, G. J. (SM)
Schultz, R. L. (A)
Summer, C. F., Jr. (A)
Warner, A. H. (M)
Ziolkowski, A. (M)

Cocoa Beach
Epstein, R. A. (A)
Rahner, H. B. (A)
Thoman, C. A. (A)

Coral Gables
Brand, C. W. (A)
Cheng, K. Y. (A)
Chiles, W. R. (A)
Craig, P. H. (SM)
Epperson, W. H. (VA)
Eubanks, J. M. (A)
Griffith, M. H. (VA)
Rogers, C. E. (A)
Wise, D. O. (A)

Crestview
Holleman, W. B. (A)

Daytona Beach
Emmons, A. W. (A)

De Bary
Alley, W. D. (A)

De Land
Blount, R. H. (M)
Kelsey, E. L. (A)

Dunedin
McCarthy, C. J. (A)

Eau Gallie
Beach, A. R. (SM)
Cohen, P. (A)
Johnston, S. L. (M)
Olson, R. E. (A)
Preece, R. G. (A)
West, K. A. (M)
Wynn, J. B., Jr. (A)

Eglin Air Force Base
Macklin, T. G. (A)
Seestedt, H. C. (A)

Fort Lauderdale
Anderson, G. F. (A)
Bassett, R. E., Jr. (VA)
Fruin, R. J. (A)
Stetson, H. T. (VA)
Thompson, H. V. (SM)

Fort Myers
Lynch, Arthur H. (SM)

Fort Pierce
Braden, J. R. (A)

Fort Walton
Brown, M. J. (A)
Falkenberg, H. R. (M)

Gainesville
Chamberlin, R. M. (M)
Gano, O. R. (A)
Harman, W. W. (A)
Harris, L. A. (A)
Johnson, R. C., Jr. (A)
Jones, M. W. (M)

Latour, M. H. (A)
Lear, W. E. (SM)
Nelson, P. H. (SM)
Owen, H. A., Jr. (A)
Pumphrey, F. H. (SM)
Schrader, G. F. (A)
Shaffer, C. V. (A)
Tedder, P. M. (A)
Thurston, J. N. (SM)
Well, J. (SM)
White, D. C. (A)
Zetrouer, W. F., II (A)

Glen Saint Mary
Carr, L. O. (A)

Hollywood
Smith, W. N. (M)

Holt
Hare, C. M. (A)

Jacksonville
Ballou, H. A. (A)
Boyer, L. R. (A)
Bernard, E. E. (A)
Cissel, F. G. (A)
Dandelake, J. (M)
Ffoulkes, C. E. (M)
Joller, C. R. (A)
Oberle, E. J. (M)
Richards, J. R. (A)
Vordermark, E. B. (M)
Winfree, W. C. (A)
Zimmerman, J. (A)

Keystone Heights
Browning, R. H. (A)

Key West
Bradley, J. J. (A)
Chandler, R. D., Jr. (A)
Forman, A. H., Jr. (A)
Gardner, R. S. (A)
Kemp, J. C., Jr. (A)
McAllister, J. A. (A)
McKnight, D. R. (A)
McMasters, P. A. (A)
Montgomery, R. A. (A)

Lake Wales
Kimbrel, G. M. (M)

Melbourne
Denius, H. R. (SM)
Dillon, J. D. (A)
Dryden, R. E. (A)
Holmes, T. G. (A)
Kramer, A. W. (SM)
Reedy, P. H. (VA)
Shaw, G. S. (M)
Smith, E. L., Jr. (A)
Van Patten, W. D. (A)
Vansant, F. T. (VA)
Wiener, A. (M)
Wilson, H. C. (A)

Melbourne Beach
Preston, L. S. (A)

Melrose
Barnett, H. A., Jr. (A)
Sashoff, S. P. (SM)

Miami
Adcock, S. E. (VA)
Barwick, M. N. (A)
Bernard, H. F. (A)
Birch, R. S., Jr. (A)
Broen, J. H., Jr. (A)
Bryant, C. S. (A)
Buckler, D. R. (M)
Dillon, J. C., Jr. (A)
Easterbrook, L. J., Jr. (A)
Goetz, O. E. (A)
Hastings, L. E. (M)
Herrmann, N. P. (A)
Jamieson, J. G. (A)
Jorgensen, O. J. (A)
Kimball, E. W. (A)
Kinney, W. E. (M)
Lee, W. M. (A)
Lewis, E. W. (VA)
Lucas, F. B. (A)
Mangus, G. (A)
McKee, C. W. (VA)
Mennitt, L. C. (A)
Reid, T. D. (A)
Rider, F. E. (A)
Roberts, F. G., Jr. (VA)
Rosenson, A. H. (A)
Ross, J. W., Jr. (A)
Saari, E. S. (A)
Sammon, P. J. (A)
Scott, M. C., Jr. (SM)
Selin, F. R. (A)
Shamblin, H. D. (M)
Shearer, S. L. (A)
Shropshire, A. W. (VA)
Snyder, A. D. (A)
Van Haaren, R. H. C. (A)

Miami Beach
Hooper, S. C. (F)

Miami Shores
Howe, J. W. (A)

Miami Springs
Cook, C. (A)
Hart, E. D. (A)
Mehrling, H. W. (M)
Murr, V. E. (VA)

North Miami
Sawyer, J. L. (A)

Ocala
Wells, J. D. (A)

Orlando
Adams, I. D. (A)
Bentley, A. D., Jr. (A)
Bratcher, A. L. (A)
Hawley, D. T. (A)
Mantey, W. F. (A)
Petersen, J. A. (A)
Schact, E. L. (M)

Pahokee
Sullenger, J. E., Jr. (A)

Palm Beach
Coleman, J. H. (A)

Panama City
Aucremann, R. C. (A)
Conner, J. F. (A)
Donegon, R. E. (A)
Erickson, E. E. (A)
Hawkins, E. M. (A)
Miller, C. E., Jr. (A)
Moore, F. B. (A)
Watz, N. P. (A)

Pensacola
Douglass, F. W. (A)
Wells, M. T. (M)

Plant City
Cockrell, J. H. (A)

Saint Andrews
Koesy, C. B. (A)

Saint Augustine
Berger, M. (A)

Saint Petersburg
Kent, R. (SM)
Link, L. J. (VA)
Pheil, C. E. (A)

Sanford
Williamson, J. S. (A)
Wright, J. C. (A)

Shalimar
Overton, B. H. (SM)
Swain, R. R. (VA)

South Miami
Rich, R. S. (A)

Tallahassee
Ford, H. P., Jr. (A)

Tampa
Brice, J. R. (A)
Harnett, C. E. (A)
Hill, E. W. (A)
Jean, R. P. (VA)
King, C. J. (M)
Mitchell, J. H. (M)
Pearson, R. V. (A)

Valparaiso
Hlavaty, E. M. (A)
Vermillion, R. K. (A)

Vero Beach
Paddock, D. G. (M)

West Miami
Spiers, G. E. (A)

West Palm Beach
Edleman, V. W. (A)

Winter Garden
Whitehurst, C. H., Jr. (A)

Winter Park
Gay, J. L. (A)

GEORGIA

Albany
Thibodeau, J. E. (A)

Athens
Whelchel, G. O., Jr. (A)

Atlanta
Akerman, B. (SM)
Badgett, A. F. (A)
Baker, J. H., Jr. (A)
Bangs, P. C. (VA)
Barr, E. W. (A)
Bartlett, O. H., Jr. (A)
Berry, G. C. (A)
Borman, A. P. (A)
Branch, B. S. (A)
Bromfield, G. M. (M)
Buchanan, D. B. (M)
Byrd, C. B. (A)
Clary, W. T., Jr. (A)
Daugherty, C. F. (A)
Dunn, B. B. (A)
Edson, W. A. (SM)
Fausett, F. (SM)
Fielder, D. C. (SM)
Flynt, E. R. (A)
Foster, H. O. (A)
Fowler, N. B. (SM)
Geeslin, J. W. (M)
Gentry, W. E. (A)
Gober, R. H. (A)
Hammond, W. M. (A)
Hawthorne, G. B., Jr. (A)
Herndon, P. H., Jr. (SM)
Hollis, J. S. (A)
Honnell, M. A. (SM)
Howard, G. M. (SM)
Jenkins, P. M. (A)
Johnson, W. D. (M)
Jones, C. T. (A)
Jones, W. B., Jr. (A)
Kelly, W. F. (A)
Lammers, E. S., Jr. (SM)
Lee, R. A. (A)
Long, M. W. (A)
Marshall, J. G. (A)
Martin, R. A. (M)
Mattson, C. L. (A)
Mauldin, H. W., Jr. (A)
McPherson, J. R. (A)
Miller, W. J. (SM)
Mooney, M. H., Jr. (A)
Morris, J. S. (M)
Murphy, B. (A)
Prince, M. D. (A)
Ragsdale, H. W. (SM)
Rainwater, J. H. (A)
Reid, H. L. (VA)
Rivers, T. A. (A)
Rosselot, G. A. (A)
Shalloway, A. M. (M)
Shortley, W. M. (A)
Siegel, J. S. (A)
Smith, S. R. (SM)
Strain, C. E. (A)
Teeple, R. P. (A)
Tutwiller, C. E., Jr. (A)
Teasdale, R. D. (M)
Walker, M. C. (M)
Walsh, J. R., Jr. (A)
Walters, J. M. (A)
White, W. H. (M)
Widerquist, V. R. (M)
Worsham, R. E. (A)
Wright, W. W. (A)

Augusta
Britton, R. C. (A)
Curry, T. E. (A)
De Hart, W. D. (A)
Dye, R. R. (A)
Hansen, G. F. (A)
McKewen, W. R. (A)
Murray, J. M. (A)
Profitt, C. L. (A)
Tarpley, M. W. (A)
Toole, P. C. (M)
Touw, C. C. (A)

Brookhaven
Boland, C. E. (A)
Honer, R. E. (A)
Minton, R. W. (A)
Smith, G. B. (M)

Carrollton
Crawford, E. W. (A)

Chamblee
Bratcher, W. H. (A)
Holder, F. P. (A)
Luongo, J. (A)
McCoy, M. B. (A)
Needs, W. R. (A)
Talmage, G. E. (A)

College Park
Billings, R. H. (A)
Hogg, J. C., Jr. (A)

Columbus
Gamble, J. A. (M)
Jenkins, S. P., Jr. (A)

Dalton
Andrews, J. S. (A)

Decatur
Brown, H. L. (A)
Bugg, K. W. (A)
Dewar, H. D. (A)
Holbrook, R. A. (M)
Jones, H. D., Jr. (A)
McCorvey, A. (M)
Morris, R. B. (A)
Robertson, D. W. (A)
SoRelle, J. L. (A)

Demorest
Davis, J. C., Jr. (A)

Doraville
Galyean, M. W. (A)

East Point
Brewer, R. V. (A)
McCurley, E. A. (A)

Emory University
Fattig, W. L. (M)
Weissenberger, H. G. (A)

Forest Park
Adamson, H. D. (A)

Fort McPherson
Lyman, R. P. (SM)

Hapeville
White, L. E. (M)

Macon
Cox, R. F. (A)
Denton, F. L. (A)
Farber, E. (A)

Marietta
Dunphey, H. B., Jr. (A)
Hunter, H. A. (A)
Jones, A. L. (A)
Luedtke, A. (A)
Moore, G. M., Jr. (A)

Norcross
Stone, E. W. (A)

Rome
Starr, R. A. L. (M)

Savannah
Bahlay, A. (M)
Counts, G. W. (A)
Rheden, V. C., Jr. (A)
Todd, J. S. (A)

Thomaston
Carter, R. C. (A)

West Point
Strother, F. P. (A)

IDAHO

Boise
Hinshaw, R. M. (A)
Oberbillig, D. D. (M)
Von Alven, W. H. (M)

Burley
Miller, E. C. (A)

Fish Haven
Kearl, J. A. (A)

Kimberly
Watkins, P. E. (A)

Meridian
Johntz, J. A., Jr. (A)

Moscow
Craine, L. B. (A)
Peterson, C. H. (M)
Shea, G. J. (A)

Nezperce
Wysong, G. H. (A)

Pingree
Judge, H. (M)

Pocatello
Ritland, H. O. (A)

Rexburg
Chapman, H. R. (A)

Twin Falls
Cox, F. V. (VA)

ILLINOIS

Addison
Kyburz, U. L. (A)

Alton
Johnk, C. T. A. (M)

Antioch
Pechousek, T. W. (A)

Arlington Heights
Abfalter, H. F. (VA)
Gaardner, K. M. R. (M)
Howe, J. S. (A)
Kuykendall, J. H. (A)
Mueller, A. A. (A)
Thompson, O. I. (M)

Aurora
Bulger, R. C. (A)
Quackenbush, E. C. (A)
Seid, H. R. (A)

Barrington
Price, R. L. (M)

Batavia
Semm, P. T. (M)

Belleville
Arnold, J. B. (A)
Fitzsimmons, R. S. (M)
Frierdich, W. J. (A)
Germain, R. C. (A)
Gilfilen, L. J. (M)
Johnson, P. B. (M)
Perro, E. J. (A)
Sigvaldson, J. M. (M)
Steward, R. H. (A)
Swantz, F. W. (M)
Weiss, L. (M)

Bellwood
Kafka, N. (A)
Marik, E. (A)

Bensenville
Landeck, J. H. (M)
Ripperger, W. A. (A)
Sullivan, E. F. (M)

Berkeley
Eckmann, L. G. (A)

Berwyn
Becker, C. A. (A)
Burns, E. E. (SM)
Fanta, F. A., Jr. (A)
Fligel, F. J. (A)
Fligel, W. P. (A)
Glozer, A., Jr. (A)
Jiral, J. N., Jr. (A)
Prentiss, J. G. (SM)
Russ, W. E. (M)
Schimpf, R. G. (M)
Sirvatka, W. E. (A)
Valach, C. F. (M)
Veverka, G. C. (A)
Ward, A. G. (A)
Weiss, H. (A)
Wittmann, R. C. (A)

Bloomington
Johnson, M. S. (A)
Moulic, W. E., Jr. (M)

Broadview
Gray, R. O. (M)
Roschke, E. M. (A)
Ross, H. M. (A)

Brookfield
Clark, J. M. (A)
Collins, E. A. (M)
Dyke, E. (SM)
Frihart, H. N. (M)
Holpuch, D. J. (A)
Ives, G. M. (M)

Calumet City
Mattingly, C. A. (A)

Catlin
Lindberg, A. C. (A)

Centralia
Hart, M. T. (A)

Champaign
Armstrong, T. R. (A)
Dahms, L. B. (A)
Emery, W. L. (SM)
Fett, G. H. (SM)
Fry, W. J. (A)
Gilden, M. (A)
Hathaway, S. D. (A)
Heitzeberg, C. H. A. (A)
Holshouser, D. F. (M)
Howard, L. L. (A)
Hudson, P. K. (M)
Hughes, E. L. (A)
Jensen, R. S. (A)
Johnston, R. H. (A)
Kaufman, I. (A)
McMullen, G. D. (A)
Meagher, R. E. (M)
Mesnard, M. R. (A)
Reed, M. B. (SM)
Rheams, C. J. B. (M)
Robertson, J. E. (A)
Ryder, J. D. (SM)
Saxe, R. K. (VA)
Schwartzlose, P. F. (M)
Wainscott, J. M. (M)
Waller, S. L. (A)
Welkowitz, W. (A)
Williams, D. G. (A)
Wu, H. S. (A)

Chester
Rockwell, D. A. (A)

Chicago
Ackerman, N. A. (A)
Adamson, A. C. (A)
Addison, W. G. (A)
Adison, J. C. (A)
Aklinski, M. J. (A)
Alaimo, J. J. (A)
Alday, R. R. (A)
Ambos, C. (A)
Anderson, C. K. (A)
Anderson, G. J. (A)
Anderson, G. W. (A)
Anderson, W. J. (A)
Andresen, E. H. (SM)
Andrew, V. J. (SM)
Andrews, E. F. (VA)
Apger, F. E. (A)
Argall, G. J. (A)
Arimura, T. (A)
Arnold, R. M. (VA)
Arnolt, A. K. (A)
Augustine, A. F. (A)
Baker, K. F. (A)
Ball, R. M. (A)
Balousek, M. W. (A)
Balsamello, J. A. (A)
Ban, G. R. (A)
Baron, T. (A)
Bartha, S. J. (A)
Bauman, H. W. (M)
Becker, P. M. (A)
Becker, H. W. (M)
Beliss, G. J. (A)
Bell, V. (A)
Beneke, E. H. (A)
Berberian, S. K. (A)
Berg, H. O., Sr. (A)
Bergen, H. A. (A)
Berger, D. (A)
Bergo, E. S. (A)
Bernat, L. (A)
Bhote, K. R. (A)
Bialek, S. T. (A)
Bickel, R. C. (A)
Biernat, W. M. (A)
Bishop, E. F. (A)
Black, J. G. (A)
Blahna, C. (SM)
Blinoff, W., Jr. (A)
Blohm, R. W. (A)
Bloom, M. S. (M)
Bloomenthal, S. (M)
Boesen, G. F. (A)
Borchardt, R. L. (A)
Boroff, D. (A)
Borsi, P. N. (A)
Borth, J. W. (A)
Bousky, S. (SM)
Bowen, J. L. (VA)
Boyajian, J. A. (SM)
Boyd, G. M. (A)
Boyll, L. O. (A)
Bradford, C. E. (A)
Brandt, R. W. (A)
Branscome, E. O. (A)
Brar, S. S. (A)
Brauer, H. H. (SM)
Bravo, M. V. (A)
Breibach, P. J. (A)
Bridges, J. E. (A)
Brittain, G. H. (A)
Brittin, F. L. (SM)
Brock, W. R. (A)
Brook, J. B. (A)
Brown, J. S. (SM)
Brown, R. V. (A)
Buchholz, F. G. (A)
Burgwald, G. M. (A)
Burns, R. P. (A)
Busch, A. E. (A)
Butler, J. J. (A)
Cairnes, W. E. (SM)
Callanan, J. A. (SM)
Camillo, C. (A)
Camras, M. (SM)
Carlson, E. V. (A)
Carr, R. W. (A)
Carroll, C. T. (M)
Carter, A. J., Jr. (A)
Casciotti, R. J. (A)
Catlin, F. (A)
Cawthon, E. F. (A)
Chandler, J. F. (A)
Christensen, R. L. (A)
Clardy, L. (M)
Clark, D. E. (SM)
Cleveland, W. C. (A)
Cline, B. V. (A)
Cohan, O. (A)
Cohen, T. A. (SM)
Cohn, C. M. (A)
Colling, T. S. (A)
Conn, R. A. (A)
Conrad, P. J., Jr. (A)
Contri, A. (A)
Cook, R. H. (M)
Cooper, N. J. (M)
Cordulack, M. E. (A)
Correla, F., Jr. (A)
Cotter, W. F. (SM)
Cowgill, L. R. (A)
Cox, C. R. (SM)
Coyle, P. L. (A)
Coyne, J. M., Jr. (A)
Craig, L. E. (A)
Craine, W. P. (A)
Crane, S. D. (M)
Crow, R. P. (M)
Crupi, D. W. (A)
Cunningham, B. B. (A)
Currier, M. G. (M)
Czeropski, W. P., Jr. (A)
Dahlin, E. K. (M)
Daly, W. E. (A)
Damm, G. J. (A)
D'Arcy, E. W. (A)
Darsch, A. P. (A)
Davidson, P. (A)
Davis, R. G. (A)
Davis, S. (A)
Deal, J. H. (A)
DeBord, M. J. (A)
DeBusman, D. J. (A)
Decho, K. R. (A)
DeHaan, J. (A)
Dellekamp, K. J. (A)
DeRose, R. A. (A)
Deruishian, E. (A)
Devine, W. F. (VA)
Dezettel, L. M. (A)
Donaldson, R. J. (A)
Doremus, J. A. (SM)
Dover, M. (A)
Drozt, P. (A)
Druz, W. S. (SM)
DuChatellier, R. (A)
Dunlap, J. F. (A)
Dunlavey, E. O. (A)
Durkee, C. E. (M)
Easterday, R. B. (A)
Edwards, F. W. (M)
Elbinger, L. P. (M)
Elliott, H. R. (M)
Entin, A. J. (A)
Erickson, D. L. (A)
Evans, A. R. (A)
Ewing, G. E. (A)
Fagerhaugh, K. H. (A)
Farley, J. E. (A)
Farnsworth, R. L. (A)
Fasick, R. C. (A)
Faulkner, A. H. (M)
Feldman, H. (A)
Feldman, S. (A)
Ferguson, R. L. (A)
Ferketich, G. (A)
Ferris, W. T. (VA)
Fetterman, D. M. (VA)
Field, B. (A)
Fields, T. (A)
Filips, R. P. (A)
Filmer, J. C. (A)
Fischer, F. C. (A)
Fischer, J. (A)
Fisher, B. A. (SM)
Fitzgibbons, A. C. (A)
Flocken, L. H. (SM)
Flour, W. (A)
Fonte, G. (A)
Foot, N. J. (A)
Foster, G. E. (M)
Fox, M. L. (A)
Franklin, H. B. (A)
Frieberg, M. (A)
Friedman, I. B. (A)
Fudaley, S. L. (A)
Fujimoto, J. J. (A)
Fujimoto, K. K. (A)
Fuller, F. C. (A)
Furedy, F. (A)
Furst, R. E. (M)
Furst, U. R. (M)
Gabriel, R. R. (A)
Galluppi, A. J. (A)
Gates, H. A. (SM)
Gates, R. A. (A)
Gawel, E. W. (A)
Gehmlich, A. P. (A)
Gemulla, W. (A)
Genovese, A. N. (A)
Gerlach, A. A. (SM)
Gerler, K. E. (A)
Gershater, S. H. (M)
Gershon, J. J. (M)
Gerstein, B. (A)
Giolitto, A. P. (A)
Gleason, M. J. (A)
Glenn, R. J. (A)
Glentzer, K. V. (SM)
Glyptis, N. (A)
Goldfus, S. M. (A)
Goldsmith, P. (A)
Goldstein, M. (M)
Gooch, M. W. (A)
Gornick, S. A. (A)
Gray, D. (VA)
Grimalla, A. G. (A)
Grisanti, J. L. (A)
Groenier, R. S. (M)
Gruen, H. E. (A)
Gruenloh, G. J. (A)
Grunwald, R. (M)
Gundy, G. L. (A)
Hackney, C. B. (A)
Hajduk, E. C. (A)
Halimton, H. (M)
Halverson, S. L. (A)
Hammer, R. A. (A)
Hanik, P. (VA)
Hansel, R. J. (A)
Hansen, W. H. (VA)
Hansen, W. W. (SM)
Harris, E. F. (A)
Hartmann, C. L. (A)
Hassel, K. E. (SM)
Hassler, E. B. (A)
Haupt, R. H. (A)
Hay, E. (A)
Hayes, H. D. (SM)
Heidelmeier, R. F. (A)
Heidgen, B., Jr. (A)
Hemphill, F. A. (A)
Henley, E. J. (A)
Hercher, F. J. (A)
Hermanny, W. F. (VA)
Herst, R. J. (A)
Herz, A. J. (M)
Hess, D. C. (A)
Hill, B. J. (A)
Hill, C. F. (A)
Hingson, G. D. (A)
Hines, W. W. (A)
Hissong, A. L. (M)
Hjermstad, H. (VA)
Hoehn, A. J., Jr. (M)
Hoffman, H. E. (A)
Hollander, K. W. (A)
Hollandsworth, W. J. (A)
Hollich, F. J. (A)
Hollowed, E. J. (A)
Holpuch, C. J. (M)
Holubow, H. (M)
Honda, T. (A)
Horwitz, S. J. (M)
Howell, H. R. (A)
Hoyt, W. A. (A)
Huston, P. D. (A)
Hutcheon, R. S. (A)
Hynes, E. A. (A)
Ihde, W. M. (M)
Imerson, H. E. (A)
Ingram, C. (A)
Iverson, F. A. (A)
Jackson, J. J. (A)
Jacob, F. N. (SM)
Jacobsen, I. (A)
Jacobson, L. (A)
Jahnke, C. E. (A)
Janzow, R. C. (A)
Jensen, J. O. (VA)
Jensen, R. E. (A)
Joerding, E. R. (A)
Joerger, J. C. (A)
Jones, R. M. (SM)
Jorgensen, C. M. (SM)
Jorgensen, N. A. (A)
Kadetz, W. (A)
Kahn, J. J. (A)
Kahn, L. (VA)
Kalandik, J. L. (A)
Kalman, J. (A)
Kaluzna, I. J. (A)
Kaminski, H. S. (A)
Kaminsky, L. M. (A)
Kamys, J. E. (A)
Kaplan, H. (A)
Karel, L. G. (A)
Karr, R. J. (A)
Kearse, G. P. (M)
Keller, W. P. (A)
Kennedy, J. P. (A)
Kerby, G. A. (A)
Kerney, R. W. (A)
Ketchum, D. L. (A)
Kidd, W. E. (SM)
Kiefer, J. C. (M)
Kirby, R. C. (A)
Kissinger, R. G. (A)
Kiver, M. S. (A)
Klapperich, A. J. (VA)
Klein, J. (A)
Kloga, P. J. (A)
Kmiec, W. J. (A)
Kneen, W. (M)
Knudsen, T. R. (A)
Koerner, F. A. (A)
Koenig, H. G. (A)
Kobos, F. (A)
Kohler, E., Jr. (VA)
Kohn, E. B. (A)
Kohner, M. (SM)
Kolberg, E. G. (A)
Komm, J. (A)
Kopeny, L. J. (A)
Kopp, C. J. (M)
Kowitz, A. E. (A)
Krakora, J. J., Jr. (SM)
Kramer, K. (SM)
Kransz, P. A. (M)
Krasovec, A. C. (A)
Kraitsik, N. I. (A)
Krempel, F. M. (A)
Krieg, B. E. (A)
Kratenansky, J. S. (A)
Krueger, R. M. (SM)
Krueger, W. F. (A)
Kuhltz, E. H. (A)
Kuffel, L. A. (M)
Kunst, A. F. (A)
Kurinsky, J. S. (A)
Kuroye, K. (A)
Kusack, W. P. (A)
Labarthe, L. C. (A)
Lamons, R. P. (A)
Lange, W. W. (A)
Lapin, S. P. (A)
Larks, S. D. (M)
LaRose, A. P. (A)
Lassila, A. (A)
Latzer, R. I. (A)
Lawton, B. E. (M)
Lee, A. W. (A)
Lee, R. J. (A)
Leedy, H. A. (SM)
Leonhardi, J. O. (A)
Leslie, W. A. G. (A)
Lewis, F. O'N. (A)
Lewis, W. A. (SM)
Liberman, A. (SM)
Liddle, R. W., Jr. (A)
Liepold, R. B. (A)
Lindberg, A. F. (A)
Lipinski, W. C. (A)
Littlewood, W. N. (A)
Lock, R. W. (A)
Lockhart, R. W. (SM)
Lubeck, W. A. (A)
Lucas, D. T. (A)
Lytle, C. W. (SM)
Maack, H. E. (A)
MacDonald, W. D. (A)
Macres, G. S. (A)
Madland, G. R. (A)
Magnuski, H. (SM)
Malinowski, S. (A)
Mankin, A. H. (M)
Mansfield, R. (M)
Maravich, R. (A)
Margowsky, H. M. (A)
Markarian, M. V. (A)
Marsh, S. V. (A)
Marshall, C. E. (VA)
Marsland, H. W. (A)
Massie, H. B. (A)
Masters, E. W. (SM)
Matthews, L. E. (A)
Maximeff, B. S. (A)
Mays, G. L. (A)
McCain, G. (A)
McCarthy, H. J. (A)
McCarty, J. M. (A)
McDonald, J. J. (A)
McDonell, W. J. (VA)
McFarland, R. B. (A)
McMahon, J. P. (A)
McManus, J. E. (A)
Medkeff, R. J. (A)
Meehan, E. L. (A)
Meinema, H. (A)
Merrill, H. M. (VA)
Messinger, H. P. (A)
Mette, R. J. (A)
Meuer, A. G. (A)
Meyer, C. H. (A)
Michalski, R. A. (A)
Michels, J. A. (A)
Minkus, F. (A)
Minton, R. E. (A)
Mikos, E. J. (A)
Mirkin, M. (A)
Mitchell, T. E. (A)
Mittelmann, E. (SM)
Mocking, F. J. (A)
Moffatt, V. J. (A)
Molnar, I. (SM)
Moon, R. J. (SM)
Moore, E. N. (A)
Morgan, D. E. (A)
Morgan, G. M. (M)
Morris, L. P. (VA)
Mueller, E. I. (A)
Murphy, J. L. (SM)
Myse, A. G., Jr. (A)
Nakata, C. K. (A)
Neben, H. M. (M)
Nedved, O. M. (A)
Neudorfer, W. L. (A)
Neumark, J. (A)
Niederman, B. (A)
Nienaber, F., Jr. (A)
Nierman, L. G. (A)
Nishimura, K. K. (A)
Novic, R. H. (A)
O'Brien, E. (VA)
Offner, F. (SM)
Olson, C. F. (A)
Orr, B. B. (A)
Osterlund, S. G. (M)
Owen, G. E., Jr. (A)
Pacholke, F. (SM)
Paddock, D. E. (A)
Padva, P. D. (A)
Palm, H. A., Jr. (A)
Panec, G. A. (M)
Parkinson, J. A. (A)
Patrick, A. L. (A)
Pavela, H. W. (M)
Pendleton, J. R. (A)
Pepperberg, L. E. (M)
Perlman, M. (A)
Petersen, C. C. (M)
Peterson, C. D. (A)
Petzing, E. W. (VA)
Pfaff, E. R. (SM)
Phinney, T. W. (A)
Pickens, D. H. (M)
Piecha, L. M. (M)
Pierson, C. D., Jr. (SM)
Pippenger, C. R. (M)
Pivan, D. B. (A)
Pivarnik, W. (A)
Plaisance, S. F. (A)
Plamondon, A. D. (SM)
Pocius, J. B. (A)
Podlusky, M. V. (A)
Pollen, L. K. (A)
Potter, J. D. (A)
Powell, C. S. (A)
Proctor, S. A. (A)
Quateman, M. H. (A)
Quarfoot, H. B. (VA)
Quinn, B. O. (A)
Quist, W. G. (A)
Race, R. T. (A)
Rahnert, R. G. (A)
Ramler, W. J. (A)
Rattray, A. I. (M)
Raucher, W. L. (A)
Rauscher, F. J. (A)
Raymond, W. D. (A)
Read, C. T. (A)
Redfield, S. I. (A)
Reed, W. O. (VA)
Reiffel, L. (A)
Reiling, G. E. (A)
Rennick, J. L. (SM)
Rett, H. C. (A)
Reynolds, J. L. (A)
Rhodes, M. M. (A)
Rice, P. (A)
Richter, F. A. (A)
Riddel, O. A. (VA)
Roach, W. E. (A)
Roberts, E. A. (M)
Rockwell, R. G. (A)
Rodgriguez, A. E. (VA)
Rokes, N. W. (A)
Rokoszewski, J. S. (A)
Ronning, H. (A)
Rose, J. K. (VA)
Rosencranz, R. (A)
Rosenman, L. (A)
Ross, E. H. (SM)
Rossetti, A. (A)
Rowe, T. L. (SM)
Rubinfien, D. (M)
Rusnak, M. (A)
Rylewicz, C. (A)
Rymas, S. J. (A)
Saffro, Y. L. (A)
Salter, F. O. (A)
Sammons, F. D. (A)
Schaffner, G. (A)
Scharding, R. M. (A)
Scheffel, A. G. (A)
Schiffelbein, W. L. (A)
Schlesinger, W. A. (VA)
Schmidt, L. D. (A)
Schnell, F. H. (SM)
Schloeneck, W. H. (A)
Schor, F. W. (SM)
Schover, D. S. (SM)
Schram, C. B. (A)
Schram, P. J. (A)
Schrot, E. H. (A)
Schultz, C. J. (A)
Schulze, C. H. (A)
Schumacher, H. W. (A)
Schurak, K. M. (A)
Schwartz, B. S. (A)
Schwarzenbach, E. E. (VA)
Schwennesen, D. (A)
Sciuto, F. A. (A)
Seligmann, P. (A)
Shall, H. N. (M)
Shallcross, G. P. (A)
Shallon, S. C. (A)
Shapin, T. Jr. (A)
Shevick, P. (A)
Shonerock, R. C. (M)
Shulman, A. (M)
Shuppert, W. G. (A)
Shure, S. N. (VA)
Siegel, D. T. (M)
Siegel, S. (A)
Silverstein, M. M. (A)
Sinclair, D. C. (A)
Sirri, N. (A)
Sivin, L. (A)
Skrip, E. D. (A)
Slagel, R. J., Jr. (A)
Sloan, A. C. (A)
Slugodzki, L. K. (VA)
Spano, A. J. (A)
Spiegel, L. (M)
Spitz, H. (A)
Sprayberry, F. L. (VA)
Sprung, L. H. (A)
Stadler, R. (A)
Stahl, J. E., Jr. (A)
Stahl, W. L. (SM)
Stan, J. (A)
Starzec, F. J. (A)
Steele, A. J. (A)
Steen, W. J. (M)
Steinberg, E. E. (A)
Stene, W. M. (A)

Stenerson, C. K. (A)
Stenhouse, J. M. (A)
Stettler, C. O. (A)
Stone, C. H. (SM)
Stone, R. S. (A)
Stonevic, V. R. (A)
Stout, E. R. (A)
Sugimoto, J. Y. (A)
Sukup, J. P. (A)
Sullivan, J. E. (A)
Sullivan, J. L. (A)
Sussman, M. (A)
Swan, L. L. (A)
Swanson, B. E. (M)
Swanson, C. W. (A)
Swanson, W. G. (A)
Swartz, F. E. (A)
Switzenberg, E. A. F. (M)
Szegho, C. S. (SM)
Taira, W. C. (A)
Tanana, E. J. (A)
Tanrath, E. G. (A)
Tenenberg, L. (A)
Territo, J. N. (A)
Teslik, J. A. (A)
Thomas, R. R., Jr. (A)
Thompson, J. E. (A)
Timmings, G. H. (SM)
Tinkham, R. J. (M)
Titus, R. W. (A)
Todd, S. R. (SM)
Torode, S. W. (A)
Toy, T. G. (A)
Trimarco, F. J. (A)
Trittenbach, J. M. (A)
Turner, J., Jr. (VA)
Turner, K. D. (A)
Tuttle, E. G. (A)
Ule, L. A. (M)
Unger, E. E. (M)
Uyeda, M. (A)
Valasek, H. H. (A)
Vale, S. D. (A)
Vander Werf, J. L. (A)
Van Scoyoc, J. N. (SM)
Varone, R. A. (SM)
Verbanec, W. R. (A)
Viele, D. D. (A)
Volpe, F. (A)
Voorhaar, F. R. (A)
Votocek, J. (A)
Wakabayashi, G. J. (A)
Wallace, G. A. (A)
Waller, E. E. (A)
Wallin, G. (A)
Waterman, H. C. (A)
Wazlo, C. J. (A)
Weaver, W. B. (A)
Webb, E. M. G. (A)
Weber, D. R. (A)
Weber, J. P., Jr. (M)
Weber, L. J. (SM)
Weber, R. I. (VA)
Weed, A. C., Jr. (M)
Weeks, G. E. (VA)
Weiger, H. O. (A)
Weirich, E. M. (A)
Weisenfeld, S. (A)
Weisz, W. J. (A)
Wells, R. E. (A)
Wendt, R. H. (VA)
West, R. E. (A)
Wheeler, G. D. (M)
White, J. F., Jr. (A)
Whiting, R. F. (A)
Whitman, M. R. (A)
Whitney, S. D. (A)
Whitlock, M. C. (A)
Wicker, G. E. (A)
Wickline, B. D. (M)
Wickstrom, T. S. (M)
Wieczorek, S. A. (A)
Wike, E. A. (A)
Wilby, E. W. (M)
Wildman, A. J. (A)
Wingert, R. R. (A)
Wise, G. H. (A)
Wisner, C. V., Jr. (A)
Wodzinsky, W. T. (A)
Wolff, J. R. (A)
Wolff, K. A. (A)
Wolff, R. E. (A)
Wolkert, I. I. (A)
Wood, P. E. (A)
Woodruff, A. E. (VA)
Woods, A. A. (VA)
Woodson, R. A. (SM)
Woolsey, R. J. (M)
Wszolek, W. (A)
Wunderlich, N. E. (M)
Yanagihara, F. T. (A)
Yeslin, A. (A)
Zale, W. J. (A)
Zarky, B. (M)
Zelinski, F. P. (A)
Zeller, H. R. (A)
Zilis, G. S. (A)
Zilles, F. J. (A)
Zucker, M. J. (A)

Chicago Heights
Albert, A. A. (A)
Gillin, J. M. (A)
Parker, M. M. (A)
Sedik, J. J. (A)
Weltin, O. K. (M)

Cicero
Davis, M. E. (A)
Hajek, A. F. (A)
Harhat, T. (A)
Jucius, S. W. (A)
Siemen, H. A., Sr. (A)
Wein, F. (A)

Clarendon Hills
Jurnecka, J. E. (A)
Marks, M. (SM)
Pritchard, D. A. (A)
Silberg, W. F. (A)

Crystal Lake
Friend, H. H. (SM)

Danville
Banks, D. S. (A)
Johnson, R. H., Jr. (A)

Decatur
Cupp, E. W. (A)
Hines, H. H. (A)
Williams, J. T. (A)

Deerfield
Carr, D. G. (A)
Clough, K. (VA)
Phillips, W. E. (VA)

Des Plaines
Bernin, V. M. (A)
Bushman, S. F. (M)
Cortright, R. D. (M)
Evans, T. M. (A)
Fountain, B. C., Jr. (A)
Hills, E. G. (A)
Himebrook, F. C. (A)
Koenig, G. (A)
Langstaff, R. H. (M)
Marco, F. (SM)
Mathews, K. C. (M)
McIlvaine, D. K. (A)
Remley, H. L. (VA)
Robertson, J. P. (A)
Smith, P. A. (A)
Taylor, E. H. (M)
Utter, R. A. (A)

Downers Grove
Bateman, L. A. (A)
Brookshier, W. K. (A)
Eddy, W. J. (A)
Harder, R. B. (VA)
Johnson, A. R. (A)

Dundee
Boswau, H. P. (SM)

Dwight
Seabert, F. (A)

East Saint Louis
Beckett, E. J. (A)
Kenney, C. L. (A)
Lutz, R. W. (A)
Reiniger, R. A. (A)
Wise, H. G. (M)

Edwardsville
Gartner, A. J. (A)

Effingham
Delong, W. A. (A)

Elgin
Atkins, C. E. (SM)
Irelan, H. F. (A)
Kadow, A. C. (A)
Kult, M. L. (A)
Lang, G. W. (VA)

Elmhurst
Aberer, J. C. (A)
Adams, J. J. (SM)
Aldred, A. D. (VA)
Arnold, G. G. (A)
Beck, V. R. (SM)
Beier, L. W. (M)
Beier, M. G. (M)
Blum, G. E. (A)
Bond, M. E. (SM)
Byrne, J. F. (F)
Chelgren, A. E. (A)
Cook, H. L., Jr. (A)
Davis, J. (SM)
Disney, V. H. (SM)
Goertz, R. C. (A)
Graffam, P. S. (A)
Haines, D. G. (SM)
Jacker, E. W. (SM)
Kearney, L. E. (A)
Lindsay, W. R. (M)
Marquardt, J. A. (A)
Noble, D. E. (F)
Probeck, C. (SM)
Ronzheimer, S. P. (M)
Russell, W. W. (M)
Schulz, E. H. (SM)
Songayllo, A., Jr. (A)
Steinhoff, I. J. (A)
Troxel, R. E. (A)
Wakefield, S. J. (A)
Wilkinson, E. W., Jr. (A)
Winemiller, H. R. (M)

Elmwood Park
Bernreuter, H. A. (SM)
D'Orio, A. F. (A)
Ferro, J. A. (A)
Githens, T. A. (A)
Goldstein, R. (A)
Williams, G. I. (A)

Evanston
Adler, H. J. (SM)
Batten, J. C., Jr. (A)
Battocletti, J. H. (A)
Beam, R. E. (SM)
Bothwell, F. E. (M)
Bronwell, A. B. (SM)
Burroughs, H. A. (SM)
Buss, R. R. (SM)
Christian, H. S. (A)
Cozzens, W. B. (A)
Crossley, A. (SM)
Crossley, R. C. (A)
Deal, H. B. (SM)
Downing, J. (SM)
Ducker, J. D. (A)
Freeman, R. L. (SM)
Gassner, F. (A)
Hammond, C. R. (A)
Hopkin, A. M. (A)
Huxtable, C. K. (SM)
Kingwill, H. S. (A)
Maltby, A. I. (A)
Nordby, R. M. (A)
Orner, R. J. (M)
Osborn, R. L. (A)
Owen, E. R. (M)
Rahmel, H. (SM)
Read, O. (A)
Reichenbach, R. K. (A)
Rollefson, K. E. (SM)
Saberson, C. J. (A)
Smith, A. B. (SM)
Smythe, E. H. (SM)
Thompson, R. D. (A)
Toth, W. S. (A)
Vilas, E. T. (A)
Williams, C. E. (A)
Wing, A. H., Jr. (SM)

Evansville
Steele, C. W. (A)

Evergreen Park
Kostyal, S. P. (A)

Fairbury
Ellers, C. G. (A)

Flossmoor
Caywood, T. E. (M)
Portz, H. G., Jr. (A)

Forest Park
Warnke, G. F. (M)
Wood, R. D. (A)

Franklin Park
Arand, E. M. (M)
Baltezore, R. C. (A)
Brewster, F. C. (SM)
McNatt, W. E. (M)
Stroh, W. J. (A)

Freeport
Nestlerode, B. W. (A)
O'Connell, G. M. (VA)

Geneva
Ewald, E. R. (A)

Glencoe
Bennett, A. H. (M)
Brown, J. E. (F)
Ferry, J., Jr. (A)
Speigel, G. W. (M)

Glen Ellyn
Beeson, W. E. (A)
Christensen, A. (M)
Dymond, C. W. (VA)
Hupert, J. J. (SM)
Knowles, H. S. (F)
Rous, W. H. (A)
Tingley, E. M., Jr. (A)

Glenview
Bell, J. F. (A)
Buzzard, C. R. (A)
Dunn, W. L. (SM)
English, W. C. (M)
Everett, J. E. (M)
Lewis, G. E. (A)
Luthans, R. L. (A)
Lyon, J. A. M. (SM)
Patterson, W. S. (VA)

Granite City
Rasche, D. O. (A)
Tatosian, V. (A)

Grays Lake
Schweizer, E. G. (M)

Great Lakes
Faulks, H. R. (A)
Kuranko, C. G. (A)
Peavey, E. A. (M)

Gurnee
Raupp, R. A. (A)

Harvey
Boyers, J. S. (M)
Eznoznik, F. J. (M)
Karlson, A. T. (M)
Renne, H. S. (SM)

Highland Park
Crouch, C. A. (A)
Firestone, W. L. (M)
Miller, E. S. (M)
Walling, G. P. (A)

Hillside
Currier, R. A. (A)

Hinsdale
Doyle, E. J. (SM)
Hanson, A. N. (A)
Mueller, F. L. (A)
Talmage, T. D. (M)

Hollywood
Keranen, E. W. (M)
Poll, V. M. (A)
Zenner, R. E. (SM)

Homewood
Berry, R. F. (A)
Green, C. A. (A)
Hall, H. H. (A)

Ingleside
Reese, K. E. (M)

Itasca
Andres, L. J. (SM)
Florman, L. W. (M)
Frankart, W. F. (M)

Jacksonville
Baptist, W. G. (M)

Joliet
Kramer, R. F. (M)
Sperelakis, P. (A)

Jonesboro
Kinder, H. R. (A)

Kankakee
Bernier, V. A. (A)

Kansas
Lacy, L. Y. (SM)

Kenilworth
Howell, E. R. (A)

Kewanee
Stouffer, R. L. (A)

La Grange
Adams, K. (M)
Bouska, J. F. (A)
Brodie, G. H. (M)
Guggi, W. B. (A)
Hagey, W. C. (SM)
Johnson, G. L., Jr. (A)
Knouf, R. J. (SM)
Komm, P. M. (VA)
Kongable, L. S. (A)
Medill, J. W. (M)
Richie, S. M. (SM)
Snelling, E. A. (M)

La Grange Park
Hansen, C. A. (M)
Weill, A. E. (A)

Lake Bluff
Wegner, D. A. (A)

Lake Forest
Cohn, G. I. (M)
Heffner, R. W. (A)
Kramer, A. W. (VA)

LaSalle
Hunter, W. T. (A)

Lebanon
Maertz, W. A. (A)
Worthington, J. W., Jr. (A)

Lemont
Bard, R. E. (M)
Chu, J. C. (A)
Purinton, R. M. (M)
Schaefer, J. H. (A)
Soria, R. M. (SM)

Leyden
Witt, C. E. (M)

Libertyville
Bottorff, P. A. (VA)
Bruna, R. F. (A)
Martin, W. S. (M)
Perkins, H. T. (A)

Lincolnwood
Moskow, H. J. (M)
Swain, J. E. (A)

Lockport
Carter, O. M. (VA)

Loda
Johnson, M. C. (A)

Lombard
Bennett, G. T. (SM)
Berry, R. E. (A)
Clark, B. H. (A)
Dimmer, R. P. (SM)
Dyer, J. H. (M)
Fyler, G. W. (SM)
Hotchkiss, C. S. (A)
Jackson, W. C. (SM)
Mattingly, L. J. (A)
McCreary, H. J. (SM)
Olson, E. L. (M)
Patchell, J. T. (A)
Pomon, J. D. (A)
Puhalski, D. (A)
Tschannen, R. F. (M)

Loves Park
Knowles, R. G. (A)

Macomb
Wilcox, S. R. (A)

Marion
Kenyon, F. R. (VA)
McGee, K. (M)

Marissa
Church, C. J. (M)

Mattoon
Fortner, O. D. (VA)

Maywood
Cromer, E. G. (A)
Del Camp, S. M. (A)
Forst, P. P., Jr. (A)
Hall, H. R. (A)
Mages, L. J. (A)
Moore, G. F. D. (A)
Schlesinger, K. (A)
Tahl, J. E. (A)

Melrose Park
Dore, A. J. (A)
Fetzner, R. W. (A)
Hardy, H. C. (SM)
Tofani, H. D. (A)

Midlothian
McCoy, J. G. (A)

Monmouth
Ekblaw, W. E. (A)

Morrison
Van Osdol, R. L. (VA)

Morton Grove
Durkee, J. D. (M)
Trowbridge, F. (A)

Mount Carmel
Duncil, G. K. (A)

Mount Prospect
Bierwirth, R. A. (M)
Cahalan, E. T. (VA)
Yoder, D. R. (A)

Mundelein
Hansen, A. S. (A)
Wahle, J. J. (A)

Murphysboro
Mitchell, L. W. (A)

Naperville
Rockwood, C. H. (A)

New Baden
Croumlich, R. M. (A)

New Lenox
Ellis, C. O. (M)

Normal
Lichty, R. E. (A)

Northbrook
Cherry, W. L., Jr. (A)

Freeman, W. H. (M)
Hoffman, R. Y., Jr. (M)

Northfield
Adler, R. (F)
Green, L. F. (A)

Northlake
Dolhar, J. L. (A)

Northlake City
Romano, S. S. (A)

Oak Lawn
Blevins, E. L. (A)
Hanner, J. B. (A)
Hultberg, R. M. (A)
Nelson, R. A. (A)
Prokes, P. H. (M)

Oak Park
Anderson, C. M. (A)
Armstrong, M. M. (A)
Bauer, B. B. (SM)
Beitz, R. E. (A)
Benzuly, H. J. (A)
Bennett, A. L. (A)
Beusman, R. M. (SM)
Bryan, R. H. (VA)
Christensen, R. T. (A)
Cotsworth, A., III (A)
Danz, E. J. (A)
De Shong, J. A., Jr. (SM)
Desmond, W. F. (A)
D'Orio, P. A. (A)
Duffy, E. J. (M)
Fitch, W. M., Jr. (A)
Goebel, E. S. (M)
Graziano, V. (A)
Hawkins, B. C. (A)
Hombrighous, J. H. (A)
Inman, J. F. (SM)
Jacobi, R. J. (A)
Jelen, M. J. (SM)
Kelley, W. A. (A)
Kenney, M. W. (SM)
Laube, W. C., Jr. (A)
LeBaron, T. (A)
Linell, C. S. (A)
Marsh, W. E. (A)
May, H. E. (M)
Mehaffey, W. R. (SM)
Messerschmidt, H. L. (A)
Mittman, E. E. (A)
Murphy, O. R. (A)
Nangle, W. O. (A)
Needham, D. P. (A)
Pakan, J. J. (M)
Pye, H. C. (VA)
Sage, T. C. (A)
Schwalm, W. A. (SM)
Sinninger, D. V. (SM)
Skinner, M. R. (A)
Stemm, R. E. (M)
Stewart, J. A. (VA)
Taylor, C. A. (A)
Van Denend, H. (A)
Wehrle, R. P. (A)
Welker, J. J. (A)
Yoder, R. S. (SM)
Zender, R. G. (SM)

O'Fallon
Chamberlain, P. E. (M)
Eike, O. M. (M)

Orient
Sakonyi, F. W. (A)

Ottawa
Ftacek, J. J. (A)

Palatine
Currey, C. H. (A)
Leger, R. M. (A)
Powers, J. S. (M)

Palos Heights
Scheldorf, M. W. (SM)
Witzel, A. B. (A)
Wood, C. E. (A)

Park Forest
Bradley, J. K. (SM)
Brown, W. (A)
Chynoweth, W. R. (A)
Levi, J. S. (M)
Macdonald, J. R. (A)
Miller, G. E. (A)
Sandequist, J. W. (A)
Wallin, W. (M)

Park Ridge
Aram, N. W. (M)
De Cola, R. (SM)
Erwood, J. (SM)
Foxen, W. B. (A)
Fredine, E. L. (M)
Franklin, W. S. (SM)
Gannaway, R. R. (SM)
Hill, O. O. (A)
Larsen, P. J. (SM)
Luttgens, H. C. (SM)
Mead, L. R. (SM)
Mroz, M. (SM)
Mueller, A. J. (A)
Passow, E. B. (SM)
Schreiner, L. W. (A)
Silver, J. F. (VA)
Smith, P. S. (SM)
Whiteman, R. A. (M)

Paxton
Foote, G. A. (A)

Pecatonica
Van Antwerp, M. C. (VA)

Peoria
Rohrer, C., Jr. (A)
Royal, D. E. (A)
Shapiro, M. D. (A)

Prospect Heights
Carmody, T. P. (A)
Drechsel, R. E. (A)
Mitchell, W. T. (A)

Quincy
Banks, T. G., Jr. (A)
Damm, F. (A)
Grimwood, F. O. (SM)
Parker, B. E. (SM)
Stratman, H. G. (A)

Rantoul
Brown, H. W. (VA)

River Forest
Barrett, A. M., Jr. (A)
Beiser, F. D. (A)
Berkey, W. E. (M)
Ellett, A. (SM)
Gustafson, G. E. (F)
Lewis, R. S. (A)
Maciszewski, A. H. (SM)
Michaels, E. L. (M)

River Grove
Tarantur, S. (A)

Riverside
Bachhuber, R. A. (A)
Cihak, W. E. (A)
Kean, W. F. (SM)
Modry, J. F. (A)
Novy, J. F. (SM)
Wesselman, E. (VA)

Richview
Ackerson, B. R. (A)

Rock Island
Lambert, R. L. (A)
Lynch, L. J. (A)
Pierce, F. W. (SM)
Roberts, J. O. (A)
Sinnett, R. J. (M)

Rockford
Bullen, C. V. (M)
Hand, C. A. (VA)
Tvelt, T. J. (A)

Saint Charles
MacDermaid, L. D. (A)
Sagert, H. T. (M)
Weibler, C. T. (SM)
Winston, R. H. (A)

Saint Joseph
Tehon, S. W. (A)

Schiller Park
Theurer, D. L. (A)

Shipman
Talley, H. L. (A)

Skokie
Bobera, J. A. (A)
Carter, R. W. (A)
DeJanovich, C. R. (A)
Fenske, O. E., Jr. (M)
Fruth, H. F. (SM)
Galitz, R. J. (A)
Killian, L. G. (SM)
Krus, G. D. (A)
McDonald, D. C. (SM)
O'Callaghan, J. J. (SM)
Pierce, C. B. (M)
Reeve, R. C. (A)
Schafer, W. W. (A)
Swinyard, W. O. (F)

Sparta
Richard, C. W. (SM)

Springfield
Bunn, C. N. (A)
Genung, N. W. (A)
Kamp, F. M. (A)
Leach, E. A. (SM)
McCormick, J. E. (A)
Oram, D. K. (VA)
Sherwood, W. W. (A)
Weatherford, H. L. (A)
Wood, H. C. (A)

Streator
Gotch, J. X. (A)
Martin, H. R. (A)

Sycamore
Chapman, A. K. (M)

Table Grove
Harlan, J. R. (A)

Taylorville
DeVore, G. D. (A)

Trenton
Waigand, L. E. (A)

Urbana
Albright, W. G. (M)
Barkson, J. A. (SM)
Bauman, P. A. (A)
Brearley, H. C., Jr. (A)
Crothers, M. H. (M)
Everitt, B. W. (A)
Everitt, W. L. (F)
Farnsworth, G. W. (A)
Hansen, R. C. (A)
Hayden, E. C. (A)
Jordan, E. C. (SM)
Knoebel, H. W. (A)
Lin, C. Y. (A)
Lob, C. G. (A)
Mann, R. W. (A)
McVay, M. S. (A)
Murrell, T. (A)
Myers, J. J. (SM)
Nash, C. C., Jr. (A)
Silverman, B. (A)
Snapp, K. M. (A)
Tykociner, J. T. (SM)
Van Winkle, R. E. (A)
Wainwright, R. M. (SM)
Wax, N. (M)
Webb, H. D. (M)
Wellinger, R. P. (M)

Villa Park
Fernandez, D. T. (VA)
Gorbunoff, A. (VA)
Kimmel, L. D. (A)
Kirby, T. H. (A)
Mathews, C. A., Jr. (A)
Sparf, W. H. (A)
Voss, H. J. (A)
Zaruba, E. J. (A)

Washington
Ebel, A. J. (SM)
Planck, R. M. (VA)

Watseka
Cox, L. H. (M)

Waukegan
Anderson, C. A. (A)
Tucker, G. L. (M)

Westchester
Beckwith, J. R. (SM)

Western Springs
Ahlswede, W. J. (A)
Bracken, J. F. (A)
Dondanville, R. V. (SM)
Duncan, D. C. (VA)
Hungerford, N. C. (A)
Kallus, P. (A)
Levy, G. F. (SM)
Whitney, M. E. (SM)

Wheaton
Dieter, R. E. (A)
Frank, C. W. (M)
Hayworth, D. F. (SM)
Kunde, W. W., Jr. (A)
Matthews, G. D. (M)
Savage, L. E. (M)
Sengel, P. A. (VA)
Squires, E. G. (M)
Upton, E. C., Jr. (A)

Wheeling
Naber, J. S. (M)

Wilmette
Bercaw, O. M., Jr. (A)
Calvert, J. F. (SM)
Gorder, L. O. (A)
Ragsdale, R. G. (A)
Saunders, H. O., Jr. (A)
Schnell, W. J. (SM)
Sundt, E. V. (SM)
Thomas, L. R. (M)

Winfield
Stillman, M. C. (M)

Winnetka
Jarvis, K. W. (F)
Morrison, R. T. (M)
Weissenberger, E. G. (A)

Wood Dale
Bierach, K. F., Jr.
Noskowicz, T. S. (A)
Washburn, C. A. (A)

Woodstock
Sharp, J. W. (SM)
Thompson, A. C. (M)

Zion
Dunn, L. J. (A)
Hamilton, R. D. (A)

INDIANA

Advance
Waters, F. J. (A)

Anderson
Holt, D. L. (M)
Nelson, J. B. (A)
Pilegar, C. L., Jr. (M)
Reynolds, B. G. (A)

Angola
Ax, L. S. (M)
Holmes, W. R. (A)
Southern, C. D. (A)

Arcadia
Nightenhelser, K. W. (A)

Auburn
Capen, G. A. (A)

Bedford
Rothrock, H. B. (VA)

Bloomington
Cameron, E. G. (M)
Hahn, J. H. (A)
Krepps, J. E., Jr. (A)
Marvin, P. R. (SM)
Siddons, G. F. (A)
Sonntag, W. A. (A)
Tarzian, S. (SM)
Trumpy, J. W. (A)

Boonville
Brosheats, D. S. (A)

Bourbon
Hollander, A. G. (A)

Brookston
Todd, A. C. (M)

Cedar Grove
Verkely, B. M. (A)

Cedar Lake
Norris, P. C. (A)

Charlestown
Hertzog, W. K. (A)
McGrath, T. F. (A)
Most, N. S. (A)

Clarksville
Nelson, E. A. (M)

Clayton
Winton, H. J. (A)

Columbus
Harden, R. D. (A)
Silva, A. D., Jr. (A)
Silva, D. M. (A)
Stambaugh, D. W. (A)

Connersville
Wulliman, J. C. (A)

Crawfordsville
Bechtel, B. (A)
Zieman, C. M. (A)

Crown Point
Caspers, G. E., Jr. (A)

Dayton
Yost, K. E. (A)

East Chicago
Boyan, M. J. (A)
Post, R. F. (A)

Elkhart
Best, J. G. (A)
Christophel, G. H. (A)
Goppert, H. R. (A)
Houck, H., Jr. (A)
Krauss, S. L. (A)
Kent, E. L. (SM)
McDonald, L. J. (A)
Moore, C. C. (M)
Smith, R. A. (A)
Vakavik, A. J. (A)

Elwood
Ridenour, H. E. (A)

Evansville
Baldridge, B. H. (M)
Barrick, W. E. (A)
Clemens, J. F. (A)
Decker, R. H. (A)
Fischer, N. C. (A)
Flacklbert, W. D. (A)
Funkhouser, R. E., Jr. (A)
Gehres, F. A. (SM)
Gregory, E. C. (A)
Hatfield, P. E. (A)
Hennel, J. R. (A)
Hoffman, G. R. (M)
Kappes, A. V. (A)
Kees, H. (SM)
McGuyer, C. C. (A)
McNeely, W. E. (A)
Miegl, A. K. (A)
Quirk, J. A. (A)
Raburn, L. E. (SM)
Ryerson, J. L. (A)
Schneider, J. E. (A)
Schoch, J. W. (A)
Schoeny, E. P. (A)
Schwartz, B. A. (A)
Sears, J. F. (SM)
See, R. M. (A)
Stoltz, G. F. (A)
Williams, W. A. (A)
Willis, H. W. (M)

Floyd Knobs
Marven, E. L. (M)

Fort Wayne
Ackworth, D. L. (A)
Adams, G. E. (A)
Bartel, R. C. (A)
Beach, H. W. (A)
Berghoff, R. R. (A)
Boucheron, P. H. (SM)
Brandt, R. W. (SM)
Browde, A. (A)
Buchter, T. W. (A)
Carson, R. S. (A)
Cawein, M. (SM)
Clements, L. E. (A)
Conway, J. F., Jr. (M)
Crankwright, R. E. (A)
Dreisbach, R. H. (VA)
Duncan, V. W. (A)
Farnsworth, P. T. (F)
Fisher, H. F. (VA)
Fong, S. G. (A)
Freimann, F. (A)
Grosvenor, H. D. (A)
Guichard, R. S. (A)
Hardwick, C. L. (A)
Harris, A. S. (A)
Harris, S. J. (SM)
Henderson, J. A. (A)
Hill, B. F. (A)
Hoekstra, C. E. (SM)
Houser, N. W. (A)
Humphrey, E. L. (A)
Ifland, J. J. (M)
James, D. C. (M)
Johnson, L. (A)
Jones, R. B. (M)
Kearney, F. W. (A)
Keithley, R. D. (A)
Kennedy, J. L. (A)
Kocher, M. E. (A)
Kral, I. H. (A)
La Fleur, R. S. (A)
Lawburgh, R. H. (A)
Lima, E. J. T. (A)
Lovegren, P. B. (A)
Martin, D. W. (SM)
Mayle, A. T., Jr. (SM)
Mayle, L. F. (A)
Nicholas, E. A. (SM)
Norton, F. R. (SM)
Papazian, M. G. (A)
Peckhart, M. A. (A)
Ragni, V. F. (A)
Rasley, D. R. (SM)
Ratts, B. H. (M)
Richards, C. A. (A)
Root, C. S. (M)
Salinger, H. W. G. (F)
Sellers, G. W. (M)
Silvey, J. O. (A)
Slater, T. L. (A)
Snyder, R. M. (A)
Swartwout, R. E. (A)
Wexler, M. P. (A)
White, E. A. (A)
Whitten, G. A. (A)
Wright, A. (M)
Upshaw, V. (A)
Yoder, L. (M)

Franklin
Abel, F. W. (A)

Gary
Bestich, J. P. (A)
Buccicone, V. S. (M)
Hesky, E. A. (A)
Horn, L. H. (SM)
Ireland, R. P. (M)
Jones, W. V., Jr. (A)
Shirk, K. C. (VA)
Vedo, J. B. (A)

Goshen
Brown, R. (A)

Corporon, R. F. (A)
Webber, L. E. (A)

Hammond
Graf, A. W. (SM)
La Salle, E. (A)
Pattee, H. E. (A)
Pozdol, A. J. (A)

Hope
Hiatt, W. C. (A)

Hudson
Tressler, J. B. (A)

Huntington
Bliss, G. B. (A)

Indianapolis
Aderhold, H. J. (A)
Alden, E. E. (M)
Anderson, S. R. (A)
Archer, J. R. (A)
Arvin, M. J. (A)
Astholz, P. T. (M)
Benson, N. P., Jr. (A)
Boyle, B. H. (M)
Carson, H. E. (A)
Coatney, A. E. (M)
Crawford, A. L. (A)
De Voe, L. M. (A)
Dold, C. W. (A)
Drilling, N. G. (A)
Du Vall, W. E. (A)
Edwards, J. N. (A)
Ellis, R. M. (SM)
Evans, A. G. (A)
Fathauer, G. H. (M)
Garstang, W. W. (SM)
Goldstein, S. J., Jr. (A)
Gross, F. J. (A)
Harden, J. G. (SM)
Harris, H. F. (A)
Harrison, R. E. (A)
Heimburger, W. M. (A)
Holland, H. S. (A)
Holland, H. A. (A)
Hromada, J. C. (SM)
Hundley, T. C. (A)
Hurley, H. C. (A)
Jackson, W. E. (F)
Jacobs, V. J. (A)
Jones, M. N. (A)
Keary, H. F. (A)
Lockwood, E. C. (M)
Luke, C. H. (A)
MacNabb, V. C. (A)
Mallory, H. R. (A)
Marsh, G. E. (M)
Maxwell, J. W. (SM)
McCormick, R. E. (M)
McLawler, M. S. (A)
McWhortor, W. F. (A)
Meadows, F. D. (A)
Montague, L. L. (A)
Norsell, H. C. (A)
Oxner, E. S. (A)
Ray, J. (A)
Reager, A. M. (VA)
Record, W. V. (M)
Reynolds, J. H. (M)
Richmond, I. (A)
Rosser, T. N. (SM)
Schager, R. J. (A)
Schultz, A. J. (SM)
Schuts, E. A. (A)
Selig, B. L. (A)
Shultz, J. H. (M)
Smith, R. S. (A)
Stuart, D. M. (SM)
Trout, C. C. (M)
Tudor, E. C. (M)
Tulauskas, L. (SM)
Van Niman, R. T. (M)
Vehling, A. I. (A)
Vizanko, D. J. (A)
Watson, J. T. (M)
Weaver, R. J. (A)
Wolff, H. R. (SM)
Young, E. A. (A)
Zoechke, J. H. (A)

Kokomo
Atkinson, J. R. (A)
Busby, L. A. (A)
Carlson, E. C. (A)
Galser, 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)
Prewitt, T. A. (A)
Pyle, H. T. (A)
Rector, C. V. (A)
Schwarz, B. A. (SM)
Siefken, R. M. (A)
Vogt, K. S. (A)
Weber, J. W. (A)

Lafayette
Berkery, E. A. (A)
Evans, H. R. (M)
Hazby, R. O. (SM)
Kennedy, P. (A)
Reukauf, D. C. (A)
Siskind, R. P. (SM)

LaPorte
Finlay, G. E. (A)

Lawrenceburg
Achatz, R. V. (VA)
Beehler, J. E. (A)

Liberty
Bethge, C. E. (A)

Logansport
Harrell, D. H. (M)

Marion
Fenton, N. L. (A)
Misey, J. J. (A)

Michigan City
Brolly, A. H. (SM)
Evans, W. E. (A)
Raatz, M. (A)
Wright, C. R. (A)
Zerber, F. A. (A)

Mishawaka
Koch, W. J. (A)
Mauk, M. E. (A)
Metzner, P. E. (A)
Van Tilbury, J. D. (A)
Wook, D. F. (M)

Muncie
Budd, M. A. (A)
Burton, D. A. (A)

New Haven
Hallmark, C. E. (SM)

Newport
Pueschner, H. O. (A)

Norman
Fish, R. L. (A)

Notre Dame
Coomes, E. A. (SM)

Oriole
Frakes, S. E. (A)

Orleans
Friedman, E. (A)

Peru
Briner, G. L. (A)

Plymouth
Murphy, R. L. (A)
Orlowski, E. (A)
Slack, R. W. (A)

Richmond
Kienker, J. (A)
Maddox, R. D. (M)
Nobbe, K. L. (A)
Young, K. W. (A)

Saint Meinrad
Ringeman, O. E. (A)

Sandborn
Begeman, R. H. (A)

South Bend
Angelakos, D. J. (A)
Briggs, R. H. (A)
Burroughs, L. R. (A)
Cole, H. G. (A)
Ducoff, G. (A)
Durbin, H. M. (A)
Ellithorn, H. E. (SM)
Grant, J. H. (A)
Harding, R. L. (A)
Jacobs, B. (A)
Kahn, A. (A)
Kirlin, W. F. (A)
Knoblock, E. C. (A)
Kunz, W. J., Jr. (SM)
O'Neil, A. R. (A)
Puca, O. J. (A)
Quigley, A. J. (A)
Ross, A. E. (SM)
Stauder, L. F. (A)
Sutton, J. R. (A)
Thaler, G. J. (A)
Tomcik, D. J. (A)
Vernon, H. J. (A)
Weller, G. (A)
Wiggins, A. M. (A)

Speedway
Setzer, L. E. (A)
Watts, C. B., Jr. (A)

Terre Haute
Aiken, D. W. (A)
Berntsen, W. H. (A)
Garrigus, W. E. (A)
Moench, H. A. (VA)
Olson, W. J. (A)

Valparaiso
Alinsky, J. W. (A)
Book, E. G. (A)
Bullis, E. E. (A)
Hershman, J. B. (SM)
Packman, M. E. (VA)
Palmer, R. P. (A)

Wanamaker
Eckert, E. R. (A)

West Lafayette
Burnett, J. R. (A)
Cage, J. M. (SM)
Clark, J. R. (SM)
Cooper, G. R. (A)
Foley, J. S. (A)
Freeman, S., Jr. (M)
George, R. H. (SM)
Happell, G. E. (A)
Hayt, W. H., Jr. (M)
Heim, H. J. (VA)
Hesselberth, W. M. (A)
Holler, J. R. (A)
Metcalf, E. D. (A)
Oorthuys, H. J. (M)
Partridge, G. R. (A)
Smead, H. J. (A)
Thanos, H. (A)
Truxal, J. G. (A)
Williamson, R. J., Jr. (A)

Whiting
Walter, G. W. (A)

Winamac
Kempf, K. R. (A)

IOWA

Ames
Callen, M. W. (A)
Carney, D. A. (A)
Cassell, W. L. (SM)
Colgan, A. R. (A)
Coover, M. S. (SM)
Curl, G. W. (A)
Evans, W. H. (A)
Haas, M. H. (A)
Harper, C. E. (A)
Klopfenstein, R. W. (M)
Lewis, L. L. (M)
Read, A. A. (A)
Rathburn, E. R., Jr. (A)
Richardson, G. A. (M)
Stewart, R. M., Jr. (M)
Town, G. R. (F)
Von Tersch, L. W. (M)

Atlantic
Sander, W. E. (A)
Zellmer, N. A. (A)

Bettendorf
Arvidson, P. G. (M)

Boone
Garretson, D. (A)

Buffalo Center
Jordal, V. M. (A)

Burlington
Cone, J. H. (M)
Hawk, J. M. (A)
Ross, K. B. (VA)
Taylor, D. L. (A)

Carroll
Neher, B. (A)
Polking, U. H. (A)

Cedar Rapids
Abrams, H. T. (A)
Anderson, A. E. (A)
Andrade, E. A. (M)
Antrim, G. H. (A)
Arnold, D. C. (A)
Babillus, J. (SM)
Bellew, R. W. (A)
Bellville, W. H. (A)
Biggs, J. A. (M)
Breed, W. M. (A)
Bruene, W. B. (SM)
Bucksbaum, A. M. (A)
Buffington, L. R. (A)
Caquelin, M. W. (A)
Carlson, D. V. (A)
Cassutt, R. J. (A)
Collins, A. A. (SM)
Corbell, P. I., Jr. (M)
Cox, R. T. (SM)
Craft, L. M. (M)
Craiglow, R. L. (A)
Dabinett, J. T. (M)
Dalton, J. L. (M)
Dickens, L. A. (A)
DeLong, V. R. (A)
Elliott, N. J. (A)
Emerson, R. E. (A)
England, L. C. (A)
Everson, C. T. (A)
Farley, W. W., III (SM)
Felt, W. A. (A)
Findley, L. K. (SM)
Finger, P. R. (A)
Fink, J. G. (M)
Fletcher, K. L. (A)
Flynn, J. G., Jr. (A)
Fritze, E. H. (A)
Garcia, A. (A)
Gates, R. S. (A)
Gerks, I. H. (SM)
Giacoletto, J. P. (A)
Goetz, J. L. (A)
Graham, N. L. (A)
Hancock, N. W. (M)
Heath, J. W. (A)
Henrici, C. R. (A)
Hirsch, H. D. (A)
Hixenbaugh, G. P. (M)
Hodgin, D. M. (A)
Holec, V. P. (A)
Hollis, J. L. (SM)
Hollister, R. H. (A)
Holmes, D. W. (A)
Hubbard, M. R. (M)
Hudek, V. R. (M)
Hutchison, R. P. (A)
Johnson, R. D. (A)
Klehfoth, W. G. (M)
Kohl, W. H. (SM)
Lieske, E. W. (M)
Ludvigson, M. T. (A)
Luebs, A. H. (A)
March, G. W. (A)
Mark, J. G. (A)
Martin, E. L. (A)
Martz, F. W. (A)
Mattison, V. S. (A)
Mayfield, J. D. (A)
McConnell, T. E. (SM)
McCoy, D. O. (SM)
McCreary, R. L. (SM)
McNees, S. G. (M)
Mitchell, R. M. (M)
Morrison, S. M. (A)
Nordstrom, G. J. (M)
Ocnaschek, F. J. (A)
Oemcke, E. C. (A)
Olson, H. O. (A)
Pappenfus, E. (SM)
Perry, V. G. (A)
Phillips, G. D. (A)
Plotkin, L. E. (M)
Price, G. W. (M)
Read, E. F. (A)
Regis, R. J. (A)
Roberts, B. W. (A)
Runft, A. J. (A)
Salisbury, W. W. (F)
Sandberg, H. L. (M)
Schuster, H. E. (A)
Seidmore, D. L. (A)
Shanklin, J. P. (M)
Smith, J. W. (SM)
Stephens, T. C. (SM)
Stewart, C. (A)
Stewart, W. F. (SM)
Stover, H. A. (A)
Streeter, R. A. (A)
Thompson, P. (A)
Truesdell, R. M. (A)
Vanous, J. A. (A)
Vick, E. K. (A)
Vrbik, J. (A)
Walnwright, L. F. (M)
Weeks, R. R. (M)
Westcot, J. L. (A)
Willis, T. R. (A)
Windus, W. A. (A)
Winkler, W. H. (M)
Wulfsberg, A. H. (SM)
Wulfsberg, P. G. (SM)

Chariton
Miller, E. L. (A)

Council Bluffs
Hansen, B. P. (M)
Moss, T. L. (VA)
Snyder, E. H. (A)

Crown Point
Franz, B. E. (A)

Davenport
Keefe, J. W. (A)
Petersen, V. L. (A)
Ramsey, R. C. (A)
Vaughan, E. M. (A)

Des Moines
Amoo, L. R. (A)
Anderson, R. H. (A)
Bartlett, F. E. (M)
Bobenhouse, C. J. (M)
Eastman, J. W. (M)
Foster, F. H. (A)
Fry, A. L., Jr. (A)
Gusler, F. C. (A)
Loyet, P. A. (SM)
Miller, O. M. (A)
Parrott, A. D. (A)
Price, R. E. (A)
Quentin, C. F. (A)
Rissler, H. D. (VA)
Snyder, R. E. (A)
Sparks, W. J., Jr. (A)
Stauffer, R. E. (VA)
Tennant, O. A. (A)

Dubuque
Hancock, R. I. (A)

Essex
Johnson, V. N. (A)
Johnson, W. C. (A)

Grinnell
Denny, W. B. (A)

Humboldt
Wier, J. M. (A)

Iowa City
Edberg, R. A. (M)
Essler, W. O. (A)
Fankhauser, J. E. (M)
Hunter, T. A. (SM)
Lonsdale, E. M. (SM)
Malmberg, P. (A)
Menzer, C. H. (SM)
Randall, J. E. (A)
Ware, L. A. (SM)

Manchester
Kratzer, D. J. (A)

Manly
Brunsvold, M. O. (A)

Marion
Brandon, W. S. (A)
Carney, C. S. (A)
Hutchinson, N. D. (A)
Lehman, H. W. (A)
Smith, M. S. (SM)
Winter, L. E. (A)

Mason City
McCallum, R. D. (A)

Morning Sun
Sheafor, J. D. (A)

Mount Vernon
Ford, D. W. (A)
Parker, G. W. (M)

Mount Zion
Campbell, D. B. (A)

Muscatine
Hansen, W. N. (A)

Nora Springs
Rooks, H. B. (A)

Oelwein
McGinnis, S. E. (A)

Oskaloosa
Jensen, P. A., Jr. (A)

Sioux City
Babbitz, H. B. (A)
Call, G. R. (A)
Smith, A. H. (A)

Waterloo
Butts, J. H. (A)

West Burlington
Wallis, T. F., Jr. (A)

KANSAS

Axtell
Bergmann, G. M. (A)

Bethel
Barnes, O. C. (A)

Boiscourt
Witcher, J. F. (A)

Brazilton
Pralle, E. H. (A)

Cherryvale
McGinness, C. C. (A)

Council Grove
Wilson, R. R., Jr. (A)

Fort Leavenworth
Johnson, L. E. (M)

Gardner
Gault, W. E. (A)

Gardner Lake
Reed, D. M. (A)

Holyrood
Vicek, D. H. (A)

Hutchinson
Burdick, E. E. (A)
Lareau, J. G. (A)

Jennings
Hickert, E. G. (A)

Junction City
Allensworth, J. A. (A)
George, J. E. (A)

Kansas City
Ayres, R. C. (SM)
Benson, M. C. (A)
Burch, E. C. (M)
Dogantzis, B. E. (A)
Gardner, C. L. (A)
Garrett, R. E. (A)
Hanson, P. C. (A)
Hole, W. G. (A)
Pierce, C. H. (M)
Rogers, A. L. (A)
Sprecher, N. D. (A)
Williams, M. (A)
Wilson, D. R. (A)
Woster, G. W. (M)

Larned
Wallack, C. A. (M)

Lawrence
Black, H. L. (A)
Brown, H. B. (M)
Wilson, D. G. (M)

Manhattan
Audo, P. D. (A)
Callahan, B. E. (A)
Ford, W. R. (A)
Hewson, K. D. (A)
Kloeffler, R. G. (SM)
Lavin, H. P. (A)
Riley, O. V. (M)
Skinner, W. B. (A)
Wolfe, J. E. (SM)

Marysville
Parker, H. L. (A)

Merriam
Ellis, T. H. (A)
Kolen, N. (A)

Mission
Babbit, E. B. (A)
Brown, E. B. (A)
Burns, L. V. (A)
Butler, R. W. (A)
Chester, W. G. (M)
Curtis, G. L. (A)
Ferguson, J. C., Jr. (M)
Hoyt, W. S. (M)
Jacobson, R. E. (M)
Jones, M. R. (SM)
Peterson, R. A. (M)
Shirer, H. W. (A)
Spannuth, W. H. (M)
Varnum, W. B. (A)
Walkup, J. F. (A)
Wearth, A. W. (M)

Olathe
Krout, H. L. (A)

Overland Park
Betros, L. A. (A)
Files, C. O. (M)
Gay, W. D. (M)
Kroencke, E. A., Jr. (A)
Miller, C. V. (A)
Shaw, H. W. (A)
Wagner, F. R. (M)

Pittsburg
Green, R. E. (A)
Johnston, J. L. (A)

Randolph
Hillstrom, W. B. (A)

Shawnee
Hannan, C. V., III (A)

Topeka
Cook, J. W. (VA)
Costelow, J. A. (A)
Dickensheets, L. (A)
Grantham, R. B. (A)
James, E. (A)
Mannell, L. H. (A)
Meyer, M. T. (A)
Thompson, R. L. (A)

Wichita
Bunyar, P. A. (A)
Byers, G. D. (A)
Durham, B. H. (A)
Geiser, D. T. (A)
Gordon, J. M. (A)
Harrell, J. W. (A)
Hickerson, H. H. (A)
Keene, A. W., Jr. (A)
Kidd, T. L. (M)
Leek, A. R. (A)
Leighton, C. P. (A)
Logan, W. L. (A)
Lynch, F. R. (A)
Moody, R. E. (A)
Newby, H. H. (A)
Patterson, D. L. (A)
Peeler, R. L. (A)
Piper, E. (A)
Pyle, K. W. (A)
Rogers, L. W. (A)
Schultz, R. E. (A)
Vandegrift, A. E. P. (A)
Walsh, J. J. (A)
Womack, R. H. (A)

KENTUCKY

Anchorage
Towner, O. W. (SM)
Williams, L. A. (M)

Ashland
Weaver, C. W. (A)

Barlow
Terrell, R. E. (A)

Bellevue
Young, C. E. (A)

Buechel
Henson, C. E. (M)

Centertown
Ross, W. C. (A)

Covington
Curtis, W. T. (A)
Goode, J. P. (A)
Odenthal, L. H. (A)
Taglauer, E. R. (A)
Topmiller, C. H. (VA)
Weaver, J. A. (A)

Erlanger
Conner, J. C. (A)

Finchville
Covert, J. L. (A)

Fort Thomas
Kolo, R. E. (SM)
Sims, T. W. (A)

Greenville
Wickliffe, P. R., Jr. (A)

Harrods Creek
Sweets, F. M. (M)

Hazard
French, J. C. (A)

Hopkinsville
Heasty, C. N. (A)

Jeffersontown
Hewitt, L. G. (M)

Lexington
Helt, S. (M)
Lang, E. T. (A)
Peed, A. C., Jr. (A)
Rafajko, M. (A)
Smith, G. E. (A)
Stewart, C. H., II (A)
Yount, W. R. (A)

London
Cottongim, E. K. (A)

Louisville
Alpiger, W. E. (A)
Bell, R. V. (A)
Cart, R. E. (A)
Devine, P. F., Jr. (A)
Duncan, E. C. (A)
Esten, P. W. (M)
Fife, S. T. (SM)
Fishback, K. H. (A)
Fox, J. C. (M)
Gates, S. H. (A)
Haines, M. D. (A)
Hartmann, E. E. (A)
Hope, C. R. (M)
Hudson, W. E. (M)
Kaplan, R. (A)
Koller, O., Jr. (A)
La Vielle, W. R. R. (M)
Lyle, I. W., Jr. (M)
McAfee, C. S. (A)
McGregor, R. B. (M)
Miller, P. G. (A)
Mills, R. W. (A)
Morrison, W. J. (A)
Nevitt, R. G. (A)
Parks, H. F. (A)
Probst, M. C. (M)
Ryan, W. J., Jr. (A)
Schwalbe, M. I. (A)
Skaggs, E. P. (A)
Smith, H. T. (A)
Sprowls, P. H. (M)
Stanonis, A. F. (A)
Summerford, D. C. (SM)
Warren, H. R. (M)
Winges, C. D. (A)
Yunk, G. W. (A)

Ludlow
Reynolds, D. J. (VA)

Olive Hill
Barker, E. E. (A)

Owensboro
Bowie, W. S. (SM)
Chalberg, H. W. A. (A)
Field, R. W. (M)
Gage, G. H., Jr. (M)
Haase, A. P. (M)
Horton, C. E. (M)
Lattin, W. J. (A)
McCready, K. F. (M)
Millis, W. T. (SM)
Moe, R. E. (SM)
Munday, W. S. (A)
Pate, W. R. (A)

Paintsville
Noonan, J. A. (A)

Philpot
Jackson, J. E. (A)

Science Hill
Lester, V. R. (A)

Somerset
Parsons, J. A. (A)

South Fort Mitchell
Schipper, R. J. (A)

Utica
Speights, M. T. (A)

LOUISIANA

Alexandria
Sandefur, M. N. (A)

Barksdale Air Force Base
Derey, C. H. (A)

Bastrop
Green, W. M., Jr. (A)

Baton Rouge
Crum, F. M. (A)
McLean, L. V. (M)
Tims, E. F. (A)
Voss, C. H., Jr. (A)

Crowley
Crook, T. N. (A)

De Quincy
Vincent, R. S. (A)

Golden Meadow
Brady, J. A. (A)

Gretna
Hero, G. A., III (A)

Homer
Allen, C. A. (A)

Kenner
Codington, J. H. (VA)

Lacombe
Rust, J. J. (A)

Mandeville
Shoemaker, W. J. (A)

Minden
Wilcox, R. L. (A)

New Orleans
Anderson, H. V. (SM)
Andry, J. R. (A)
Becker, H. C. (A)
Craig, G. H. (A)
Cronvich, J. A. (VA)
Dawson, W. S. (A)
Deiler, T. G. (SM)
Domec, J. D. (A)
Du Treil, L. J. N. (SM)
Falk, B. (A)
Forsman, M. E. (A)
Horsman, J. O. (A)
Hyatt, W. R., Jr. (A)
Jensen, J. (A)
Landry, N. R. (A)
Laurent, J. A., Jr. (A)
Lehde, P. E. (F)
Lund, J. E. (A)
Lyon, D. J. (A)
Mayoral, G. A. (SM)
Monroe, W. J. (M)
Morris, J. C. (A)
Peirce, G. H. (VA)
Price, G. A., Jr. (M)
Spencer, J. C. (A)
Talbot, W. S. (A)
Tanner, H. A. J. (M)
Taucer, C. W. (A)
Tong, E. (A)
Tyrolf, E. O., Jr. (A)
Woods, T. D. (VA)
Wooten, L. B. (A)

Rayne
Bailey, B. H., Jr. (A)

Ruston
Owen, W. E. (A)

Shreveport
Gago, F. J. (A)
Keen, C. D. (A)
Maddox, C. H. (VA)
McCoy, W. B. (A)
Nuttall, E. D. (M)
Randolph, A. M. (A)
Sherman, R. L. (M)
Stouse, L. E., Jr. (A)
Tickell, E. B. (A)

Slidell
Booker, J. L. (A)

Sulphur
Albright, A. L. (M)
McNamara, J. E. (A)

Vivian
Janik, J. L. (A)

MAINE

Auburn
Nichols, G. P., Jr. (A)

Augusta
Parker, R. H. (M)

Bangor
Chandler, J. (A)
Creamer, W. J. (SM)
Jones, J. W. (A)
Libbey, W. M. (A)
Pinsky, B. N. (A)

Biddeford
Deters, A. A. (A)

Brunswick
Little, N. C. (VA)

Calais
Reynolds, J. C. (M)

Camden
Tibbetts, G. C. (A)

Cape Cottage
Smith, D. H. (SM)

Cape Elizabeth
Hodgkins, R. W. (SM)

Kingfield
Wambsganss, B. A. (A)

Kittery
Hoffman, W. R. (VA)

Old Town
Edmunds, J. J., Jr. (A)
Parsons, K. L. (A)

Orono
Blake, C. (A)
Seal, P. M. (SM)

Portland
Brewer, L. F. (A)
Heartz, L. C. (M)
Len, R. G. (A)
Woodbrey, C. S. (A)

Randolph
Newell, G. R. (A)

Rumford
Works, A. R. (A)

Saco
Hallisey, R. J. (A)

Waldoboro
Cooney, J. R. (A)

Westbrook
Shaw, H. S. (F)
Wellcome, F. L., Jr. (A)

Woolwich
Bailey, A. B. (A)

MARYLAND

Aberdeen
Asmuth, J. L. (A)
Egger, R. J. (A)
Gregory, R. M. (A)
Harding, E. W. (A)
Hodge, A. H. (VA)
Kirkpatrick, E. L. (M)
Richard, V. W. (A)
Roediger, E. F. (A)
Seewald, E. C. (A)
Snyder, R. L., Jr. (M)
Spence, H. W. (A)
White, E. A. (A)

Accobeek
Harris, F. H. (A)

Adelphi
Levine, S. S. (A)

Annapolis
Alba, C. J. (A)
Albright, E. L. (M)
Bauer, R. E. (A)
Bauer, W. M. (M)
Butt, H. R. (A)
Chaney, J. G. (SM)
Cockaday, L. M. (M)
Cortner, H. M. (A)
Daley, J. L. (M)
Daughton, G. B. (M)
Davis, D. W. (SM)
Estelie, W. E. (M)
Frey, A. R. (SM)
Giet, G. R. (SM)
Glasgow, S. R. (SM)
Goddard, E. G. (M)
Goodhue, W. W. (VA)
Klamm, C. F., Jr. (A)
Leydorf, G. E. (A)
Maling, H. F., Jr. (A)
Menneken, C. E. (A)
Miller, R. L. (M)
Sheingold, A. (M)

Arbutus
Donsbach, W. R. (A)
Frandsen, L. N. (A)
Hrybyk, W. L. (A)

Arnold
Gregory, L. W. (SM)

Baldwin
Morgan, R. H. (A)

Baltimore
Aldrich, D. H. (A)
Allen, J. W. (A)
Allen, T. E. (A)
Andersen, A. (M)
Anderson, A. W. (A)
Anderson, C. F. W. (M)
Anderson, T. J. (A)
Arnold, T. G., Jr. (A)
Barrack, C. M. (A)
Baker, R. H. (M)
Balthis, D. L. (M)
Barthel, D. R. (A)
Basil, I. T. (A)
Beser, J. (A)
Bicomer, T. M. (SM)
Bondy, M. F. (A)
Booth, J. D. (VA)
Brodwin, M. E. (A)
Brown, E. A. (A)
Buchanan, J. M. (A)
Buckley, F. P. (A)
Bulkley, A. W. (M)
Byerly, E. H. (A)
Carter, J. M. (SM)
Chenoweth, W. G. (A)
Chioma, L. (A)
Chrisman, D. W. (M)
Claus, O. R., Jr. (A)
Clotworthy, J. H. (A)
Cohen, H. A. (M)
Cooper, S. (A)
Crosby, E. L., Jr. (M)
Danner, R. V. (A)
Davies, L. E. (A)
Davis, J. W. (M)
Davis, J. S. (A)
Deise, L. F. (M)
De Socio, G. (A)
Dike, S. H. (SM)
Doyle, R. E. (A)
Duff, J. S. (A)
Eadie, D. (A)
Eckels, A. E. (VA)
Edwards, R. B. (M)
Ellett, C. A. (A)
Evans, W. C. (F)
Farmer, W. C., Jr. (A)
Fasulo, J. L. (A)
Ferguson, W. F. (A)
Fischer, F. W. (SM)
Fleischmann, F. A. (A)
Foley, J. F. (A)
Foley, W. V. (A)
Franz, W. J. (A)
Friesner, J. M. (A)
Frisco, L. J. (A)
Fullerton, R. D. (A)
Fuqua, H. G. (A)
Gambrill, R. D. (A)
Garrett, W. O. (A)

Goldbach, A. G. (A)
Good, M. B. (A)
Goodman, J. L. (A)
Goodnow, A. C. (VA)
Graf, H., Jr. (VA)
Grauberger, W. E. (A)
Grauling, C. H., Jr. (M)
Greene, J. C. (M)
Griffith, B. H., Jr. (A)
Grossman, D. (A)
Grossman, R. (A)
Grumich, J. (M)
Hale, W. B. (A)
Haller, E. J. (A)
Hamburger, F., Jr. (SM)
Hammond, J. G. (M)
Hanna, R. E. (A)
Harris, H. N. (A)
Hastings, M. S. (A)
Hauck, V. D. (SM)
Hayes, B. (A)
Heath, G. F. (A)
Heck, J. R. (SM)
Hedeman, W. R., Jr. (SM)
Heller, D. M. (SM)
Hemphill, A. (M)
Henthorn, J. E. (A)
Hershfield, S. (SM)
Hirsch, A. E., Jr. (A)
Hoffman, P. A. (A)
Hogan, A. W. (M)
Holdt, D. H. (A)
Hom, W. R. (A)
Hornstein, L. (A)
Houck, J. W. (A)
Houston, G. P. (SM)
Howe, W. F. (A)
Humiston, H. A. (A)
Hunt, W. W. (A)
Hurley, W. A. (M)
Hutchinson, J. O. (A)
Hymowitz, E. W. (A)
Jackson, H. L. (M)
Jenkins, J. (SM)
Jett, E. K. (F)
Jones, M. L. (A)
Jones, O. J., Jr. (M)
Kempf, R. A. (VA)
Kephart, D. C. (A)
Kerr, D. E. (VA)
Killman, R. T. (A)
Kinn, T. P. (SM)
Koll, A. J., Jr. (A)
Konigsberg, R. L. (A)
Koppl, W. (M)
Kraeger, G. W. (A)
Kreager, P. H. (M)
Krebs, W. N. (VA)
Kudo, F. M. (A)
Lahman, G. H. (A)
Laitinen, P. O. (M)
Lamb, W. G. (A)
Lau, C. B. (A)
La Vier, E. C. (A)
Leap, G. A. (A)
Lee, R. E. (M)
Lee, W. J. (A)
Lindemann, H. B. (A)
Lindsay, G. A. (M)
Lisiecki, M. (A)
Little, D. G. (F)
London, C. (SM)
Mabry, F. S. (A)
MacAskill, R. B., Jr. (A)
Mack, K. M. (M)
Malta, S. V. (A)
Marcroft, H. C. (SM)
Markland, R. M., Jr. (A)
Marsh, H. S. (M)
Martin, G. E. (A)
Mayer, R. H. (A)
Maze, R. O. (A)
McCartin, L. M. (A)
McComas, A. D., Jr. (A)
McNally, H. R., Jr. (A)
Meador, A. B., Jr. (A)
Meier, W. M. (A)
Melvin, E. A. (A)
Mester, J. C. (A)
Meyer, A. W. (A)
Michnik, L. (A)
Miller, C. R. (A)
Miller, J. H. (A)
Miller, J. M., Jr. (A)
Miller, L. A. (A)
Minneman, M. J. (M)
Molloy, G. C. (A)
Moore, W. T. (A)
Morris, W. J. (A)
Mueller, E. J. (A)
Mueller, P. L. (A)
Mullins, F. G., Jr. (A)
Munson, L. A. (A)
Mutch, J. J. (A)
Nawalinski, T. E. (A)
Neff, R. R. (A)
Nelson, R. P. (A)
Nims, A. A., Jr. (SM)
Nobles, C. E. (SM)
Nopper, C. G. (A)
Nord, H. H. (A)
O'Donnell, A. J. (SM)
O'Donnell, R. J. (A)
Olha, W. R. (A)
Page, F. T. (A)
Pearce, J. M. (SM)
Pistiner, J. S. (A)
Powell, F. P. (A)
Price, B. F. (A)
Pride, E. W. (M)
Pullen, K. A., Jr. (M)
Purinton, H. G. (M)
Rambo, S. I. (SM)
Randolph, G. W. (M)
Ranft, W. Q. (A)
Rao, F. A. (A)
Raynes, H. D. (A)
Rehrig, N. W. (A)
Reisman, S. J. (A)
Rice, W. M. (A)
Richardson, W. R. (A)
Ridenour, W. S. (A)
Ridgely, N. R., Jr. (A)
Riley, R. N. (A)
Rockwell, P. (M)
Rohner, A. J. (M)
Rosenblum, I. I. (A)
Rothauge, C. H. (A)
Roush, R. G. (A)
Royce, H. W. (A)
Ruark, A. E. (M)
Russell, W. J., Jr. (A)
Sands, L. G. (SM)
Sanford, R. W. (A)
Scheiner, S. R. (M)
Scheneman, E. E. (A)
Schrank, H. E. (M)
Schultz, A. E. (A)
Schutz, H. (SM)
Schwartz, T. F. (A)
Shelor, E. G., Jr. (A)
Shropshire, H. C. (A)
Sion, E. (A)
Silverman, H. M. (A)
Skolnik, M. I. (A)
Slottow, H. G. (A)
Smeltzer, R. F. (A)
Smith, E. L., Jr. (A)
Smith, J. S. (M)
Smith, L. R. (A)
Soroka, B. (A)
Spicer, W. T. (M)
Stephenson, J. O. (A)
Strandberg, P. R. (A)
Stout, G. P. (SM)
Stout, J. V. (M)
Sturtevant, C. E. (M)
Tashjian, D. R. (SM)
Taylor, M. (VA)
Teres, B. W. (A)
Thomas, A. G. (A)
Thomas, R. K. (A)
Tischler, M. (M)
Todes, R. S. (A)
Tomey, T. B. (A)
Trinter, V. E. (A)
Tuttle, L. (VA)
Tylor, H. L. (A)
Umpleby, K. F. (SM)
Vana, C. J. (A)
Viener, A. H. (A)
Vitek, W. J. (A)
Volk, N. (A)
Von Kummer, F. G. (A)
Waldorf, S. K. (SM)
Walker, H. (SM)
Warner, H. V. (A)
Watts, H. M., Jr. (SM)
Webb, W. L. (SM)
Welch, G. H. (A)
Werth, M. W. (A)
Whitcomb, M. F. (A)
Whitney, A. (VA)
Whitney, W. L. (A)
Wilkes, L. D. (A)
Wilkinson, R. L. (A)
Williams, A. D. (A)
Wilner, J. T. (SM)
Winter, H. A. (A)
Wolfe, B. (M)
Wolfe, R. E. (A)

Beltsville
McClenon, D. (M)
Norris, K. H. (M)

Berwyn
Beyer, G. L., Jr. (M)
Brown, J. (M)
Bryan, J. W. (A)
Cook, M. F. (A)

Bethesda
Apstein, M. (SM)
Arnold, P. N. (SM)
Arsem, C. (A)
Astin, A. V. (SM)
Bagg, T. C. (M)
Bailey, S. L. (F)
Baluta, R. E. (A)
Bastedo, G. R. (SM)
Berkner, L. V. (SM)
Boese, W. C. (SM)
Brady, F. B. (SM)
Bush, G. P. (SM)
Caplan, N. (M)
Carlson, H. D. (A)
Culver, R. H. (VA)
Curtis, R. W. (SM)
Dalke, J. L. (A)
Davis, H. B. O. (A)
Doyle, E. M. (M)
Ellsworth, W. C. (SM)
Fong, L. B. C. (SM)
Grantham, R. E. (M)
Hartz, J. E. (SM)
Ikelman, G. J. (A)
Karr, P. R. (A)
Kelley, J. J. (A)
Laker, E. F. (A)
Lance, H. W. (M)
Lent, W. C. (SM)
Liddel, U. (SM)
Loucks, I. H. (SM)
Mahaffey, G. N. (VA)
Marthens, A. S. (M)
McBirney, H. R. (A)
McNary, J. C. (SM)
Melton, B. S. (SM)
Mickey, L. (VA)
Mills, M. H. (A)
Mitchell, F. A. (A)
Montgomery, G. F. (M)
Philpott, L. R. (SM)
Queen, J. L. (A)
Ranneft, J. E. M. (A)
Ring, A. D. (VA)
Roddy, V. S. (VA)
Rohrer, R. E. (M)
Rohrich, C. G., Jr. (M)
Russ, J. A. (VA)
Schuyler, W. E., Jr. (M)
Senf, H. R. (SM)
Smith, N. (SM)
Smith, P. L. (M)
Stinchfield, J. M. (SM)
Trasher, P. M. (A)
Viera, F., Jr. (A)
Wheeler, L. B. (M)
Whitelock, L. D. (SM)
Wolzien, E. C. (M)

Bladensburg
Hiller, A. J. (A)
Simonds, R. E. (A)

Braddock Heights
Sausser, J. M. (A)

Brandywine
Conner, L. M. (A)
Rabb, J. W. (M)

Brentwood
Pendleton, E. E. (A)

Brookeville
Dudley, J. A. (A)

Brooklandville
Hervey, J. P. (VA)

Capitol Heights
Hengstler, J. J. (A)

Catonsville
Briggs, M. R. (SM)
Burnside, C. J. (SM)
Chapin, E. W. (M)
Cole, D. P. (A)
Des Lauriers, E. L. (A)
Frattali, F. A. V. (A)
Hoffman, H. C. (A)
Jacob, M. I. (M)
Johnson, J. L. (A)
Kinsman, W. D. (M)
Macdonald, A. A. (A)
Miller, C. W. (M)
Miller, C. J. (A)
Singel, J. B. (A)
Vore, M. P. (A)

Chesapeake Beach
Grosvenor, A. C. (M)
Mickelson, T. H. (A)
Pearson, C. A. (M)

Cheverly
Beegle, D. H. (SM)
Chitty, H. W. (A)
Collins, A. B. (VA)
Davis, R. E. (M)
Ostrander, R. (A)
Waldo, G. V. (VA)
Wenziger, C. J., Jr. (A)

Chevy Chase
Alexander, S. N. (A)
Booth, R. M., Jr. (A)
Brady, J. B. (SM)
Chernosky, E. J. (M)
Caporale, P. (SM)
Cottony, H. V. (M)
Daniels, R. G. (A)
Doane, J. E. (M)
Dougherty, J. G., Jr. (A)
Dyer, F. C. (A)
Engel, F. H. (SM)
Ewing, D. H. (SM)
Forsyth, W. A., Jr. (A)
Fletcher, R. C. (A)
Frederick, C. L. (M)
Goldstein, M. K. (SM)
Hagerty, G. E. (M)
Hall, E. L. (SM)
Hummel, C. F. (A)
Inglis, A. F. (SM)
Jacocks, T. B. (VA)
Kear, F. G. (SM)
Kelley, G. W., Jr. (VA)
Lamm, R. A. (SM)
Lyons, H. (SM)
Maller, M. (M)
Massey, M. M. (M)
McIntosh, F. H. (M)
Michalowicz, J. C. (M)
Mitchell, F. T., Jr. (M)
Morton, R. C. (A)
Murphy, C. H. S. (A)
Nuckolls, R. G. (SM)
Petry, C. A. (SM)
Piore, E. R. (F)
Saito, S. (A)
Sommer, H. (A)
Stewart, R. B. (SM)
Walls, H. J. (SM)
Wells, H. W. (SM)
Williams, S. B. (A)
Wright, J. W. (VA)

Chillum
Turner, W. R. (M)
Wimmer, P. L. (A)

Clinton
Huntley, K. L. (M)

Cockeysville
Healey, D. J., III (A)

College Park
Beam, W. R. (A)
Corcoran, G. F. (A)
Craig, F. D. (M)
Etzweiler, G. A. (A)
Headrick, J. M. (M)
Middlekamp, L. C. (M)
Pear, C. B., Jr. (VA)
Smith, H. B. (M)
Tozzi, L. M. (A)

Colmar Manor
Slaughter, J. E. (A)

Cumberland
Clendenning, W. P. (A)
Stern, H. (M)

Dundalk
Hanley, N. B. (A)
Hughes, W. R. (SM)
Jones, O. L. (A)

Edgewater
Rosenberry, W. W. (A)

Elkridge
Shriver, J. A., Jr. (A)

Ellicott City
Tharp, N. B. (M)

Emmitsburg
Simpson, R. L. (A)

Essex
Cook, H. A. (M)
Goldsmith, J. (SM)

Frederick
Miller, C. F. (M)
Price, O. I. (A)

Fullerton
Van Horn, J. E. (M)

Gaithersburg
Adams, J. T. (A)

Garrett Park
Aylor, R. P., Jr. (VA)

Germantown
Gormley, P. M. (A)

Glen Arm
Hebb, A., Jr. (A)
Moon, R. B. (A)

Glen Burnie
Arnold, D. E. (M)
Frame, T. E. (A)
Koether, G. H., Jr. (A)
Mathieu, R. E. (M)
McClellan, C. E. (M)
Musk, H. A. (M)
Sullivan, P. H. (A)
Young, A. F. (A)

Glen Echo
Strothers, H. (A)

Glyndon
MacNichol, E. F., Jr. (A)

Greenbelt
Goldstein, G. D. (A)
Hanyok, J. (A)

Hagerstown
Maycock, J. C. (A)
McIntire, G. W. (A)

Havre de Grace
Arnold, N. W. (M)
DeLand, R. E. (A)
Putnam, R. E. A. (VA)
Zancanata, H. W. (A)

Hollywood
Lundquist, C. R. (A)
Young, C. H. (A)

Huntingtown
Voisich, J. (A)

Hyattsville
Albright, J. D. (A)
Arnstein, P. B. (A)
Ballard, A. H. (A)
Becker, W. E., Jr. (A)
Berry, R. J. (A)
Bers, G. M. (A)
Bevitt, W. D. (VA)
Bloom, R. A. (A)
Borden, T. G. (A)
Byrd, R. E. (A)
Campbell, L. E. (A)
Cancro, C. A. (A)
Carleton, H. (A)
Davis, J. J. (A)
DeBolt, H. E. (A)
Ehrhart, E. H. (A)
Fisher, E. M. (A)
Flyer, I. N. (A)
Gager, F. M. (SM)
Gale, M. (A)
Gipe, R. C. (A)
Gisser, M. (A)
Globe, S. (A)
Goldsmith, T. H. (A)
Gossard, W. H. (A)
Greene, F. M. (M)
Hickenlooper, M. M. (A)
Hirschel, L. R. (A)
Hoadley, J. C. (M)
Hoff, R. S. (M)
Ingalls, R. S. (A)
Kent, J. S. (A)
Leveringston, R. D. (A)
Levinson, S. (A)
Lyon, H. H. (VA)
Martin, A. D. (A)
Messenheimer, A. D. (A)
Morse, M. S. (SM)
Morse, W. R. (VA)
Odekirk, M. D. (A)
Osborn, M. E. (A)
Powell, R. M. (A)
Price, J. F. (A)
Reinhard, J. A. (VA)
Riggs, R. N. (A)
Rotkin, I. (SM)
Schuchard, E. A. (M)
Stein, A. J. (A)
Stell, J. P. (A)
Tall, M. M. (A)
Trotter, B. E. (A)
Williams, L. L., III (A)
Woodyard, R. H. (A)
Wyman, R. C. (M)
Zielinski, C. A. (A)

Indian Head
Ramey, R. A. (M)
Stambach, G. L. (A)
Weatherlow, H. R. (A)

Jessups
Shinn, E. N. (A)

Kensington
Alldredge, L. R. (M)
Andrews, B. H. (A)
Bell, W. S. (M)
Brown, V. A. (M)
Butenhoff, R. L. (A)
Carpenter, R. C. (M)
Freienmuth, W. L. (A)
Gilford, S. R. (A)
Hens, R. J. (A)
Joseph, H. M. (A)
Kaiser, J. A., Jr. (A)
MacQuivey, D. R. (M)
Meadows, L. A. (M)
Palik, F. (VA)
Parker, M. J. (M)
Polydoroff, W. J. (SM)
Roberts, J. P. (A)
Robertson, R. E. (A)
Saunders, E. R., Jr. (A)
Shepperd, I. J. (M)
Spinks, A. W. (A)
Spriggs, J. O. (A)
Sulzer, P. G. (A)
Sweeney, J. F. (A)
Taylor, R. E. (A)
Webster, E. (A)

Landover
Sencenbauth, D. W. (A)

Landover Hills
Corkill, J. F. (M)
Moltrup, G. R. (M)
Odom, G. R. (M)

Lanham
Stoops, C. W. (M)

Laurel
Ball, I. D. (SM)
Craig, A. G. (VA)
Mobley, M. C., Jr. (A)
O'Connor, G. S. (A)
Roberts, W. K. (M)
Sanders, J. F. (A)
Shadle, F. W. (A)

Leonardtown
Lambert, R. M. (M)

Lexington
Bartels, W. S. (A)

Lexington Park
Browne, W. M. (A)
Ganiere, H. C. (A)
Kinaga, T. (A)
Leopard, G. W. (A)
Martin, W. A., Jr. (A)
Polk, J. O. (A)
Smith, E. D. (A)
Sweet, R. A. (A)
Wilson, R. T. (A)

Linthicum
Kuehn, H. S. (A)

Linthicum Heights
Lee, R. (SM)

Lutherville
Davis, R. J. (SM)
Fales, D., III (A)

Mayo
Williams, W. S. (A)

Meade Heights
Swain, A. T. (A)

Middle River
Konkel, T. C. (A)

Mount Rainier
Aucremanne, M. J. (M)
Beatty, R. W. (M)
Blank, S. (A)
Devey, G. B. (M)
Doud, R. D. (A)
Greenwald, S. (A)
Hilman, J. (A)
Holt, A. W. (A)
Kulikowski, E. F. (SM)
Leslie, C. B. (A)
Norton, J. M. (A)
Sheitelman, H. D. (M)
Snow, C. E. (A)
Sokol, G. M. (A)
Solomon, K. (A)
Thurston, E. G. (A)
Wieder, H. H. (A)

North Beach
Whiting, W. K. (A)

North Linthicum
James, C. L. (A)
Mack, M. C. (M)

Owings Mills
Lebacqz, J. V. (M)
Omberg, A. C. (SM)

Oxen Hill
Wilcox, R. L., Jr. (M)

Oxford
Appel, J. H., Jr. (M)

Pasadena
Fox, R. C. (A)

Patuxent River
Daughton, A. J. (A)
Gutcheon, W. Y. (A)
Hayes, H. J., Jr. (M)
Keith, E. N. (A)
Laub, R. E. (SM)
Nell, G. W. (A)
Perecinik, W. S. (A)
Plummer, J. W. (M)

Phoenix
Abel, A. E. (SM)

Pikesville
Harmon, R. N. (SM)
Marie, C. S. (A)
McCusker, R. W. (A)
McDade, J. G. (A)

Potomac Heights
Bissett, E. B. (A)

Randallstown
Wallace, B. E., Jr. (A)

Reisterstown
McConnel, W. G. (SM)

Riverdale
Kelley, J. R. (M)
Knowles, W. S. (A)
Moody, W. R. (M)
Pike, W. N. (M)
Withrow, W. E. (A)

Rockville
Biser, M. H. (SM)
Blow, T. C. (A)
Brodie, A. H. (M)
Colledge, C. H. (M)
Nordseth, M. P. (A)
Snyder, S. (A)
Stovall, H. E. (A)

Ruxton
King, D. D. (M)
Martin, A. C. (M)
Moore, H. N. (A)

Saint Michaels
Lewis, G. (F)

Salisbury
Smith, W. H. (A)

Silver Spring
Abramovich, M. N. (SM)
Affanasiev, K. J. (M)
Ahern, C. R. (A)
Altomare, R. E. (M)
Anderson, H. W. (SM)
Anderton, H. L. (A)
Anspacher, W. B. (M)
Aristei, J. (M)
Backus, C. D. (SM)
Barnabel, A. (A)
Barnard, E. H. (A)
Barse, G. R. (A)
Becker, S. (A)
Bedford, P. L. (M)
Beer, A. C. (A)
Bennett, R. D. (SM)
Bohn, A. L. (A)
Bond, E. G. (M)
Bonwit, S. E. (A)
Bowman, H. A. (A)
Braum, C. M. (VA)
Brager, C. H. (A)
Brimberg, M. M. (M)
Brown, C. W. (SM)
Brown, J. H. (A)
Buckingham, S. A. (A)
Burke, R. J. (SM)
Bush, G. B. (A)
Byer, D. L. (M)
Channon, K. F., Jr. (A)
Clark, J. F., Jr. (SM)
Cohen, J. (M)
Cook, F. W. (VA)
Cook, W. F. (M)
Costrell, L. (M)
Crain, R. W. (A)
Daspit, J. I. (A)
Davies, G. L. (SM)
Davis, G. W. (A)
Davis, M. F. (A)
DeMarr, J. D. (VA)
Dippell, R. E., Jr. (A)
Dobbins, B. D. (M)
Dorsett, J. W., Jr. (A)
Durkovic, J. (M)
Dye, R. E. (A)
Edwards, P. L. (A)
Ellis, R. T., Jr. (A)
Fannin, B. B. (A)
Flato, M. (A)
Floegel, M. E. (A)
Frederick, R. E., Jr. (A)
Freeman, J. J. (A)
Fund, S. R. (SM)
Gilbert, J. N. (A)
Gleason, R. J. (SM)
Goerke, V. H. (M)
Gordon, D. I. (A)
Greenwald, M. H. (A)
Guida, J. A. (A)
Haberland, E. R. (M)
Hammack, J. W. (A)
Henry, R. L., Jr. (A)
Herider, E. D. (M)
Higgins, W. F. (A)
Hilburn, E. D. (A)
Holmboe, L. W. (M)
Hosea, M. E. (A)
Huntoon, R. D. (SM)
Hurlburt, E. H. (A)
Jablonski, F. E. (A)
Jacob, F. (A)
Johnston, T. F. (M)
Jordan, S. A., Jr. (A)
Kanter, J. I. (A)
Keck, A. (M)
Kee, J. W. (A)
Kirby, R. S. (M)
Kirkland, G. I. (M)
Klapper, E. (A)
Klein, W. J. J. (A)
Klink, G., Jr. (A)
Knowles, R. B. (A)
Koeblitz, W. E. (A)
Kramer, E. R. (A)
Kreis, A. L. (VA)
Kreitzer, H. M. (M)
Kuck, J. H. (A)
Laden, H. N. (A)
Landis, P. E. (A)
Latson, F. W., Jr. (A)
Leach, J. H. (M)
Leinfelder, E. J. (A)
Leonard, F. M. (M)
Looney, H. C. (VA)
Lorentz, E. F. (A)
Lundquist, G. A. (A)
Mann, D. O. (A)
Manov, F. S. (A)
Marimont, R. B. (A)
Martin, K. H. (SM)
Massey, A. P. (M)
McCarter, G. B. (A)
McDonald, L. W. (A)
McKeel, P. D. (SM)
Melton, G. H. (A)
Merchant, W. J. (SM)
Metz, H. I. (SM)
Mitoma, E. Y. (A)
Morison, R. (A)
Myer, D. A. (SM)
Nagy, A. W. (SM)
Ober, H. E. (A)
Page, C. H. (SM)
Plotkin, G. N. (M)
Plotkin, I. (A)
Poritzky, S. B. (A)
Portmann, P. A. (M)
Preisman, A. (SM)
Randolph, J. P., Jr. (A)
Redler, W. M. (A)
Redmond, J. J. (SM)
Reed, H. Z. (A)
Reed, O. W. B., Jr. (SM)
Rice, L. W. (VA)
Rice, S. M. (M)
Rebel, R. B. (A)
Robertson, T. M. (A)
Robinson, R. O., Jr. (SM)
Ross, R. R. (A)
Rowland, H. L. (A)
Sanders, M. (A)
Scheets, D. F. (A)
Schenk, P. J. (A)
Schuttig, L. A. (SM)
Seaton, J. W. (M)
Sharpless, W. R. (VA)
Sheppard, T. W. (M)
Smith, W. L. (A)
Sorrows, H. E. (A)
Sterling, G. E. (F)
Tellman, H. A. (SM)
Terrell, R. L. (VA)
Totah, E. J. (A)
Tregidga, A. C. (SM)
Trout, P. A. (A)
Udelson, B. J. (A)
Uglow, K. M., Jr. (A)
Vann, W. L. (A)
Wales, R. O. (A)
Walters, L., Jr. (M)
Ward, H. T., Jr. (A)
Weinschel, B. O. (M)
White, N. (SM)
Williams, W. F. (A)
Wilson, C. A. (A)
Wise, J. W. (M)
Witow, M. I. (M)

Snow Hill
Powell, J. L., Jr. (A)

Solomons
Abell, V. F. (A)
Ikerd, H. M. (A)
Jones, W. C. (A)

Takoma Park
Anderson, L. D. (A)
Applegate, C. J. (A)
Barbier, L. I. (M)
Barsis, A. P. (A)
Bliss, D. S. (A)
Cannon, R. E., Jr., (M)
Chaney, A. L., Jr. (A)
Darne, F. R. (A)
Dye, J. E. (A)
Geer, D. A. (A)
Holbrook, R. O. (A)
Irons, H. R. (A)
Jaques, A. L. (M)
Lane, A. L. (A)
Miller, R. E. (A)
Moore, W. J. (A)
Ribner, M. (A)
Sledge, O. D. (SM)
Stewart, H. K. (A)
Teske, J. A. (A)
Toth, E. (SM)
Van Zant, R. R. (A)
White, P. E. P. (A)

Timonium
Logan, H. L. (A)

Towson
Ackerman, W. W. (A)
Babb, D. D. (A)
Barbour, C. W., Jr. (SM)
Bath, C. C. (A)
Borden, E. L. (A)
Brown, D. (A)
Butler, H. J. (M)
Carter, G. W. (A)
Clark, R. G. (SM)
Clark, M. M. (A)
Colvin, J. W. (M)
Congdon, K. P. (A)
Cosby, J. R. (M)
Crane, R. B. (A)
Daniel, R. L. (M)
Eby, J. T. (A)
Frazier, R. K. (A)
Frazier, R. V. (A)
Galuppi, A. J. (A)
Gleeecke, H. W. (A)
Gimon, E. E. (M)
Gordon, J. F. (M)
Graffis, L. F. (A)
Hammond, J. W. (SM)
Hatfield, G. I. (A)
Hyder, H. R. (M)
King, E. J. (A)
Kitty, F. J. (M)
Knarr, C. E. (M)
Kochevar, H. J. (M)
Kolar, E. F. (SM)
Kubilius, A. A. (A)
Lally, V. E. (A)
Laning, W. A. (M)
Leder, A. (A)
Naidich, H. H. (A)
Nunn, E. C. (A)
Parrish, W. F. (A)
Pfund, C. E. (A)
Pratt, J. W., Jr. (A)
Ringenbach, M. E. (A)
Seisler, M. (A)
Sims, W. H. (VA)
Shackelford, W. T., III (A)
Shearer, A. D. (M)
Slavin, M. (A)
Taylor, J. H. (SM)
Thomas, A. R. (A)
Welman, W. W. (A)
Whiffen, R. E. (M)
White, G. R. (A)
Whitehorn, R. M. (A)

Trapp
Fishlock, R. C. (A)

University Park
Rayback, C. B. (A)

Washington Grove
Seaton, S. L. (SM)

West Hyattsville
Culling, E. J. (A)
Stalford, W. E. (A)

Wheaton
Catcher, A. L. (A)
Johler, J. R. (A)
Renick, M. R., Jr. (A)

Woodbine
Mullinix, N. E. (A)

Woodmoor
Smith, C. B. (A)

MASSACHUSETTS

Abington
Mielke, E. S. (A)

Acushnet
Sobolewski, F. (A)

Allston
Morita, T. (A)
Oliver, J. J. (A)
Stadig, S. V. (M)
Taeschner, L. (A)
Wulfsberg, K. N. (A)

Amherst
Chang, S. Y. (A)
Langford, J. W., Jr. (A)
Marsh, R. F. (A)

Andover
Pray, E. B. (M)
Zink, A. J., Jr. (SM)

Arlington
Aden, A. L. (A)
Benson, R. A. (A)
Bogart, R. M. (A)
Cavalieri, A. L., Jr. (A)
Cohen, M. S. (A)
Combelic, D. (A)
Cowie, R. J. (VA)
Dallin, E. B. (SM)
De Blois, S. W. (M)
Hanson, G. (A)
Hiatt, R. E. (M)
Holt, R. B. (M)
Howell, A. H. (SM)
King, J. G. (A)
Knight, H. M. (A)
Lamson, H. W. (F)
Lester, D. R. (A)
Michaelis, H. P. (M)
Morley, H. B. (M)
Morrow, W. E. (A)
Nelson, J. R. (SM)
Pierce, J. A. (F)
Plotts, E. L. (SM)
Robinson, W. H. (M)
Sloan, G. H. (A)
Smith, B. H. (A)
Spencer, R. C. (SM)
Torrey, B. M. (M)
Ware, L. R. (A)
Warren, R. M. (A)
Webster, W. G. (SM)

Ashland
Rice, J. W. (A)

Assinippi
Cary, T. R., Jr. (M)
Hall, I. A., Jr. (M)

Attleboro
Blottman, J. B., Jr. (A)
Kray, E. (A)

Auburn
Bonvouloir, F. D. (A)

Auburndale
Hall, R. E. (A)
Ryan, C. E. (M)
Skowron, J. F. (A)
White, A. D. (A)

Ayer
Erskine, H. E. (A)

Bedford
Barrett, R. M. (A)
Field, W. G. (A)
Hammond, G. H. (SM)
Harrison, J. R. (VA)

Belmont
Allen, E. B. (A)
Bean, O. E. (A)
Blackburn, J. F. (A)
Crosby, R. C. (M)
Dolbear, B. L. (SM)
Dudley, B. (SM)
Duncan, N. L. (A)
Elliott, C. I. (A)
Gerber, I. B. (A)
Getting, I. A. (SM)
Gray, H. L. (A)
Harper, J. B., Jr. (A)
Hazen, H. L. (SM)
Hickman, R. W. (SM)
Hildebrand, J. G., Jr. (VA)
Hill, A. G. (F)
Hunt, F. V. (F)
Karplus, E. (F)
Klemperer, H. (A)
Lane, J. F., Jr. (A)
Le Van, J. D. (A)
Linvill, J. G. (A)
Luke, T. C. (M)
McElroy, P. K. (F)
McVicar, K. E. (A)
Mercer, W. R. (SM)
Nottingham, W. B. (SM)
O'Day, M. D. (VA)
Ray, G. H. (A)
Reed, J. (A)
Reintjes, J. F. (SM)
Shaw, G. J. (M)
Stratton, J. M. (F)
Wagner, R. W. (M)
Wiesner, J. B. (SM)
Woodward, R. H. (A)
Zimbel, N. S. (A)

Beverly
Biggs, O. H. (A)
Dillaby, E. F. (VA)
Flashner, G. (A)
Perron, R. R. (M)
Petit-Clerc, M. (A)
Porter, R. G. (VA)
Straney, K. O. (A)

Boston
Baptiste, G. F. (A)
Bardfield, M. L. (A)
Bauer, P. S., Jr. (A)
Berliner, J. M. (A)
Blitz, D. (M)
Charton, S. (A)
Chin, F. K. (A)
Cohen, R. (A)
Colmar, P. V. (SM)
Connell, M. E. (A)
Dean, F. R. (A)
Di Nozzi, A. D. (A)
Fellows, G. E. (A)
Foundas, G. J. (A)
Gilroy, R. B. (A)
Golden, N. J. (A)
Hanke, E. (A)
Hare, V. M., Jr. (A)
Heising, C. R. (A)
Helm, G. D. (A)
Hom, R. N. G. (A)
Hurney, P. A., Jr. (A)
Jayne, A. W. (A)
Kim, Y. S. (A)
Kosteckl, W. (A)
Larouche, O. S. (A)
Lee, W. (M)
Loewenthal, M. (A)
Long, R. G. (A)
Madek, J. J. (A)

Magenheim, B. (A)
Martin, P. E. (A)
Martin, S. T. (SM)
Millen, S. G. (A)
Moats, R. R. (M)
Moy, M. (A)
Pomper, V. H. (M)
Roberts, T. E. (A)
Schindler, J. A. (A)
Schnitzler, R. K. (A)
Smith, C. P. (M)
Stevenson, L. A., Jr. (A)
Stobach, F. (A)
Teixeira, N. A. (A)
Thomson, E. C. (A)
Van Meter, J. L. (A)
Verzuh, F. M. (M)
Vosburgh, M. C. (A)
Whitney, L. E. (M)
Wilkens, W. B. (SM)

Braintree
Brennan, J. E. (A)
Massa, F. (VA)
Myrbeck, E. R. (M)
Sibley, R. C. (A)

Brighton
Alpert, E. (A)
Bishop, W. B. (M)
Chang, S. H. (A)
Chu, L. J. (SM)
Greene, B. F. (A)
Hanopol, L. (VA)
Hedlund, D. A. (A)
Hyde, C. M. (A)
Margolin, M. C. (A)
Montanari, R. E. (A)
Riceman, S. (A)
Schreiber, W. F. (A)
Sheingold, L. S. (A)
Wallace, G. S. (VA)
Yurt, F. X. (VA)

Brockton
Davis, B. J. (A)
Fortier, O. V. (A)
Hannon, S. (M)
James, P. G., Jr. (A)
MacAdam, M. I. (M)

Brookline
Bark, A. (M)
Bartzoff, B. (A)
Bloom, J. H. (A)
Davidson, D. (A)
Dyett, E. G., Jr. (A)
Fano, R. M. (SM)
Golembe, S. N. (M)
Hall, R. E. (A)
Hollander, G. L. (M)
Jorgensen, S. W. (A)
Levine, L. (A)
Lourie, N. M. (A)
Nyhen, E. M. (M)
Pfeffer, I. (A)
Polayes, M. B. (A)
Rappaport, M. B. (VA)
Rines, D. (VA)
Segel, H. P. (A)
Shapiro, S. (A)
Wong, G. W. (A)

Cambridge
Adams, J. Q. (A)
Adler, R. B. (A)
Alford, A. (F)
Angelo, E. J., Jr. (A)
Antman, M. A. (M)
Barnard, G. A., III (A)
Batchelder, L. (SM)
Baxter, L., II (A)
Belinski, A. M. (A)
Beth, E. W. (A)
Booton, R. C., Jr. (A)
Boucher, G. F. (A)
Buckley, E. F. (M)
Capen, E. B. (A)
Cerrillo, M. V. (SM)
Chaffee, E. L. (F)
Clapp, J. K. (F)
Clapp, R. E. (A)
Considine, D. P. (A)
Dairiki, S. (A)
Dentler, C. E. (M)
Downing, R. E. (VA)
Dunn, B. C., Jr. (A)
Eastham, M. (L)
Elias, P. (A)
Fallows, E. M. (A)
Faran, J. J., Jr. (A)
Fucile, F. B. (A)
Gilleo, M. A. (A)
Gray, T. S. (SM)
Green, P. E., Jr. (A)
Grometstein, A. A. (A)
Gudaitis, W. V. (A)
Hall, G. O. (A)
Harman, A. R. (A)
Hersh, J. F. (A)
Hilliger, R. E. (A)
Hogan, W. D. (A)
Hooper, J. R., Jr. (A)
Huggins, W. H. (A)
Jervis, F. J. (A)
Johnson, L. E. (A)
Joy, C. R., Jr. (A)
Kennedy, F. (A)
Kodis, R. D. (A)
Krohn, E. H. (A)
Lephakis, A. J. (A)
Lewis, G. A. (A)
Luse, J. D. (A)
Lusted, L. B. (A)
Lyman, F., Jr. (VA)
Mack, R. A. (A)
Margolin, B. (A)
Marshall, J. F. (M)
McPherson, R. R. (A)
Michaud, R. E. (A)
Middleton, D. (M)
Mooers, C. N. (A)
Moritz, C. (A)
Ostroff, E. D. (A)
Parker, E. O., Jr. (A)
Pierce, G. W. (L)
Pontecorvo, P. J. (SM)
Quint, A. S. (A)
Radford, W. H. (SM)
Read, R. W. (A)
Rettig, A. S. (A)
Richmond, M. R. (A)
Riley, J. C. (A)
Rogers, J. R. (SM)
Ross, D. A. (A)
Ruze, J. (M)
Salzer, J. M. (A)
Schreitmueller, R. F. (A)
Scotney, J. H. (M)
Searle, C. L. (A)
Sensiper, S. (SM)
Sheingold, D. H. (A)
Sinclair, D. B. (F)
Stevens, K. N. (A)
Susskind, A. K. (A)
Tariot, J. N. (A)
Thiessen, A. E. (SM)
Timbie, W. H. (SM)
Toomey, J. (A)
Walworth, W. Y. (A)
Wang, A. N. (A)
Westphal, W. B. (A)
Wheatland, D. P. (A)
White, S. A. A. (A)
Wildes, K. L. (A)
Willenbrock, F. K. (A)
Wingate, S. A. (A)
Wood, R. V., Jr. (M)
Youtz, P. (A)

Centerville
Hamilton, H. D., Jr. (A)

Charlestown
Noonan, J. T. (A)

Chelsea
Wolfson, W. (A)

Cheshire
Leonard, S. C. (VA)

Chestnut Hill
Cox, W. W. (A)
de Bettencourt, J. T. (A)
Kellner, R. L. (M)
Matz, C. H. (SM)
McFarlan, R. L. (SM)
Rosenthal, I. (A)

Chicopee
Higda, F. J. (A)
Rist, D. H. (A)
Schumacher, H. (A)
Stefanik, S. M. (A)

Chicopee Falls
Dulchinos, J. (A)

Cochituate
Halder, G. W. (M)
Keleher, A. E., Jr. (M)

Cohasset
Jacobson, R. V. (A)

Concord
Benfield, A. E. (M)
Hollingsworth, L. M. (SM)
La Bounty, J. E. (A)
Macdonald, W. S. (M)
Mathis, G. (M)
Packard, L. E. (SM)
Parke, N. G., III (M)
Roberts, G. T. (A)
Smith, M. T. (SM)
Tuttle, W. N. (F)
Wadsworth, W. B. (M)
Wellman, B. (VA)

Danvers
Koen, F. T. (A)
Proctor, H. E., Jr. (A)
Wroblewski, T. (A)

Dedham
Altel, M. L. (A)
Barus, C. (A)
Jenks, F. A. (SM)
Reed, R. C. (M)

Dorchester
Austin, C. S. (A)
Berman, J. (A)
Berner, A. S. (A)
Di Loreto, A. A. (A)
Futran, S. M. (A)
Heins, H. (A)
Kirkland, R. E. (A)
Lenson, S. (M)
Lerner, H. A. (A)
Matarazzo, T., Jr. (A)
Polito, V. J. (A)
Renner, G. W. (A)
Robinson, S. (A)
Rochefort, J. S. (A)
Rubin, M. D. (M)
Ruplenas, R. J. (M)
Saltzberg, W. (A)
Stanney, W. J. (A)
Topol, S. (A)
Walker, R. M. (SM)

Dover
Paulsen, W. H. (A)
Tucker, J. A. (A)

East Boston
Pesaturo, E. R. (A)

East Brookfield
Houlihan, R. P. (A)

East Hampton
Kuzeja, C. (A)
Mesh, T. J. (A)

East Longmeadow
Landers, T. P. (A)

East Natick
Horton, W. P. (A)
Massard, R. L. (A)

East Weymouth
Fricks, R. E. (M)

Egypt
Eyon, W. T. (M)

Everett
De Agazio, E., Jr. (A)
Finkle, M. (A)
Macmillan, R. R. (A)

Fairhaven
Bailey, W. M. (SM)
Grobowski, Z. V. (A)

Fall River
Ryan, J. E. (A)

Feeding Hills
Call, S. S. (A)

Fitchburg
Arthur, G. M. (A)
Kalin, T. (A)
Testarmata, N. R. (A)

Foxboro
Munro, W. D. (A)
Scanlon, W. C. (A)
Sturgeon, S. S. (VA)

Framingham
Fraim, E. G. (A)
Hall, R. T. (A)
Tanigawa, G. T. (A)
Ungvary, R. L. (M)

Franklin
Handel, N. E. (M)

Gardner
Richelieu, C. C. (M)
Stewart, R. F. (A)

Georgetown
Nunan, K. W., Sr. (A)

Gloucester
Hammond, J. H., Jr. (SM)
Ktistes, P. J. (A)
Purington, E. S. (SM)

Granby
Mack, P. W. (M)

Great Barrington
Hemmes, R. T. (M)
Sleeper, M. B. (SM)

Greenbush
Brooks, G. W. (M)

Groton
Roberts, R. A. (A)

Groveland
Bartlett, R. S. (A)

Haverhill
Atwood, D. J., Jr. (A)
Safran, L. (A)

Hingham
Broster, G. S. (A)
Cowperthwait, F. N., Jr. (A)
Dorschug, H. A. (M)
Dougherty, J. D. (A)
Drisko, B. B. (VA)
Harris, C. C. (SM)
Madsen, C. J. (SM)
Pratt, F. (VA)
Wood, J. O. (M)

Holyoke
Hampson, F. W. (A)
Junkins, C. E., Jr. (A)
Kennedy, D. J. (A)
King, F. H. (A)
Marek, L. W. (A)
Wernick, H. (A)

Hopedale
Tinkham, M. E. (A)

Hull
Pokat, B. (A)

Hyde Park
Mitchell, R. J. (A)
O'Neil, S. J. (A)

Ipswich
Baker, J. R., Jr. (A)
McMillan, E. B. (SM)
Murrish, C. H. (A)

Jamaica Plain
Arenberg, D. L. (A)
Busharis, J. G. (A)
Kunz, K. S. (A)
Newbold, R. F. (M)
Petraitis, A. J. (A)
Phillips, T. L. (M)
Pihl, G. E. (A)
Stampalia, I. J., Jr. (A)

Lawrence
Ameen, S. J. (A)
Calobrisi, P. A. (A)
Milliken, R. A. (A)

Lee
Forni, P. A. (A)

Lenox
Slagter, H. C. (A)

Leveritt
Roys, C. S. (SM)

Lexington
Atchley, D. W., Jr. (M)
Bousquet, A. G. (SM)
Brodhead, W. M. (A)
Burgess, L. M. (M)
Carr, V. R. (A)
Chute, D. H. (M)
Clark, J. F. (A)
Cleveland, A. W. (M)
Davenport, W. B., Jr. (M)
Dawes, H. H. (M)
Dearborn, F. K., Jr. (M)
Eames, A. M., Jr. (M)
Easton, I. G. (SM)
Emerson, W. P. (A)
Freeman, L. D. (A)
Gilman, M. A. (VA)
Gross, E. E., Jr. (SM)
Hale, R. C. (M)
Hall, W. M. (SM)
Hammett, T. F. (A)
Harrington, J. V. (A)
Hauser, W. H. (M)
Kline, F. S. (VA)
Knauss, H. C. (SM)
Kramp, K. M. (A)
Lewis, F. D. (SM)
Littlejohn, H. C. (A)
Mac Donald, D. A. (A)
Mac Kechnie, H. K. (M)
Martel, C. W. (SM)
McLeod, W. W., Jr. (A)
Mimno, H. R. (VA)
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)
Sanders, R. C. (VA)
Schecter, H. (A)
Trantham, H., Jr. (M)
Walen, R. S. (A)
Weis, J. L. (M)
Wentworth, A. M. (A)
Williams, S. B. (A)
Wilson, H. M. (SM)

Lincoln
Scott, H. H. (SM)

Linwood
Willis, F. A. (A)

Littleton
McElroy, T. R. (A)

Longmeadow
Bassett, E. D. (A)
Brackett, Q. A. (SM)
Cohen, M. (VA)
Gostyn, E. (M)
Hadley, A. M. (A)

Lowell
Gavriel, S. N. (A)
Giddis, A. N. (A)
Landry, L. H. (VA)
Mac Gowan, J. G., Jr. (A)
Michaels, A. G. (M)

Lynn
Burke, E. W., Jr. (A)
Dumanian, J. A. (A)
Jackson, S. P. (A)
Parsons, R. L., Jr. (M)
Riska, G. G. (M)
Thurell, J. R., Jr. (A)

Malden
Baller, M. D. (M)
Cutler, C. I. (A)
Hood, C. R. (A)
Jackson, R. H. (A)
Klane, C. H. (A)
Linell, A. E. (A)
Lowe, M. E. (M)
Meyer, R. A. (A)
Nelson, B. R. (A)
Shapiro, C. M. (A)
Slade, M. G. (A)
Tribou, P. W. (M)
Whitcraft, W. A., Jr. (A)
Williams, E. E. (M)

Manchester
Hadfield, B. M. (SM)

Marblehead
Bauer, P. S. (VA)
Chun, H. H. (VA)
Dane, F. W. (SM)
Hiser, P. K. (A)
Hubbard, M. M. (SM)
Martin, W. H. (A)
Massa, E. A. (SM)
Mead, D. C. (SM)
Stromeyer, C. F. (VA)
Viebranz, A. C. (A)

Marion
Warriner, R. R. (A)

Marlboro
Clark, F. E. (A)

Marshfield Hills
Strandberg, M. W. P. (A)

Mattapan
Fertig, K. (A)
Ginsberg, I. (A)

Mattapoisett
Arnold, O. F. A. (A)
Brown, H. J. (A)
Simmons, F. A. (A)

Medfield
Waddell, R. B. (A)

Medford
Adams, G. J. (M)
De Young, J. A. (A)
Healy, D. W., Jr. (M)
Hobbs, C. F. (M)
Ivers, J. H. (A)
James, G. E. (A)
Mofenson, J. (M)
Morelli, A. (A)
Nault, F. J. (A)
Stevens, W. J. (A)
Walkley, S. E. (A)

Melrose
Benson, E. D. (A)
Black, P. B. (M)
Burwen, R. S. (A)
Byers, W. F. (M)
Lewis, E. W. (A)
Murphy, J. E. (A)
Rogers, W. S. (A)
Rose, L. J. (A)
Whitman, J. A. (A)
Young, N. H. (A)

Merrimac
Bishop, F. L. (A)

Methuen
Hurd, P. A. (A)

Milford
Kurlansky, S. (A)

Milton
Bradshaw, D. B. (A)
Bulger, J. F. (A)

Day, W. J. (A)
Donovan, A. C. (A)
O'Day, A. C. (A)
Pritchard, E. M. (VA)
St. Jean, L. E. (A)
Smith, W. A. (A)
Thompson, R. W. (A)
Torney, F. L., Jr. (A)

Nahant
Radnor, R. R. (A)
Woodcock, C. A. (A)

Natick
Bastow, W. R. (M)
Cole, A. D. (A)
Friedman, B. L. (A)
Goulder, M. E. (A)
Gray, L. E., Jr. (A)
Heaton, R. G. (A)
Hoffman, M. (A)
Keesler, E. F. (A)
Lockhart, H. H. (A)
Meyer, M. A. (A)
Nye, J. H. (M)
Ricardi, L. J. (A)
Sanders, A. C. W. (M)
Shelton, E. J., Jr. (A)
Vant, L. M. (M)
Walsh, J. E. (M)

Needham
Anderson, F. J. (A)
Baldwin, P. K. (SM)
Channing, W., Jr. (A)
Creaser, C. W., Jr. (M)
Gage, D. D. (A)
Henry, J. M. (VA)
Kinne, C. B. (A)
Krueger, A. F. (M)
Mahoney, T. F. (M)
Pease, M. C., III (M)
Sargent, H. P., Jr. (A)
Tiffany, G. B. (A)
Whittemore, H. B. (A)
Whittier, E. W. (VA)

Needham Heights
Crowley, D. J., Jr. (A)
Pamler, R. G. (M)

New Bedford
Goldenpaul, C. (A)
Kahn, L. (VA)
Klemm, G. H. (A)
Saltus, G. E. (A)

Newburyport
Brent, C. H., Jr. (A)
Christiansen, D. (A)
Farley, J. L. (A)
Harcher, A. J. (A)
Lemnios, W. Z. (A)
Mavroides, J. G. (A)
Soorsoorian, S. A. (A)
Wimpy, E. K. (A)

Newton
Bolan, R. S. (M)
Coleman, P. D. (A)
Dasher, B. J. (A)
Dean, W. B. (A)
Dolce, S. L. (A)
Handly, E. J. (A)
Hough, H. O. (A)
Jacobs, B. S. (M)
Kadet, J. (A)
Morse, C. H. (A)
Nishball, J. L. (A)
Rockwood, A. C. (SM)
Rudenberg, H. G. (A)
Wheeler, Lynde, P. (F)
Wilcox, R. B. (M)

Newton Center
Bettencourt, J. P. (A)
Heick, B. K. (VA)
Krim, N. B. (VA)
Lannary, J. (A)
Martin, L. B. (M)
Moore, W. C. (SM)
Pickard, G. W. (L)
Waite, S. (VA)
Ward, A. E. (M)
Zottu, P. D. (F)

Newton Highlands
Brock, K. S. (A)
Cummings, S. J. (M)
Eckhardt, D. L. (M)
Edwards, C. M. (M)
Friree, F. L. (A)
Hull, D. R. (F)
Jackson, S. R. (A)
Kelly, J. P. (A)
Lowery, W. E. (M)
Muckenhoupt, F. W. (A)
Peterson, A. P. G. (SM)
Taylor, A. R. (SM)

Newton Upper Falls
Alessi, P. A. (M)
Hall, J. D. (A)
Smith, L. C. (SM)

Newtonville
Richardson, C. M. (A)
Wolfe, J. A. (A)
Worthen, C. E. (SM)

Norfolk
Howard, G. E. (SM)

North Adams
Allison, W. M. (A)
Brafman, H. E. (A)
Dorst, S. (A)

North Agawam
Miller, G. N. (A)

Northampton
Ciaschini, W. (A)
Combie, A. A. (A)
King, A. D. (A)

North Beverly
Briggs, R. S. (A)

North Chelmsford
Hathaway, S. W. (M)

North Easton
Ames, D. (A)

North Quincy
Pote, A. J. (SM)
Thomas, H. C. (M)

North Reading
Millen, J. (VA)

Norton
Woodward, C. A., Jr. (SM)

Norwood
Burns, H. S. (M)
Chase, W. (A)
Gonroos, E. O. (A)
Johnson, H. A. (A)
Kleps, E. W. (A)
Sanders, E. W. (M)

Orange
Rivers, R. A. (A)

Orleans
Taylor, J. R. (A)

Paxton
Stannard, G. E. (A)

Peabody
Koskinen, G. K. (A)
Maguire, W. M. (A)
Osepchuk, J. M. (A)
White, M. M. (A)

Pepperell
Wood, R. (SM)

Pittsfield
Chertok, S. L. (A)
Deuring, W. G. (A)
Grahame, F. W., Jr. (A)
Green, W. W. (A)
Lubin, S. (M)
Pack, E. L. (A)
Pierce, J. L. (A)
Podolsky, L. (M)

Quincy
Burak, M. (A)
Grass, A. M. (VA)
Hyland, R. C. (A)
Zinchuk, M. (A)

Randolph
Rubin, R. (A)

Reading
Caywood, R. W. (A)
Hill, J. E. (M)
Kuczun, C. G. (A)
Lindsay, J. E. (A)
Richardson, L. D. (A)
Saylor, W. R. (SM)
Skitzki, P. (M)
Taylor, N. H. (SM)

Revere
Brown, E. B. (A)
Rosenbaum, B. (A)
Rotman, W. (A)

Roslindale
Ausin, H. A. (M)
Nyswander, R. E. (A)
Palmer, P. J. (A)
Ryder, E. M. (A)
Sheehan, J. A. (A)

Roxbury
Bovarnick, M. L. (A)
Freedman, N. (A)
Jewell, R. L., Jr. (M)
Kline, J. (M)
Metten, W. H. (M)
Wolf, S. H. (A)

Salem
Paczkowski, H. (A)
Shortell, A. V., Jr. (A)

Saugus
Bradbury, R. A. (A)

Saxonville
Shepard, E. S. (A)

Scituate Harbor
Alexander, R. M. (A)

Seekonk
Tilley, H. H. (SM)

Sharon
Cushman, R. W. (A)
Johnson, R. E. (A)

Shrewsbury
Cowan, C. D. (A)

Somerset
Ironfield, R., Jr. (A)

Somerville
Cohan, L. (A)
De Hart, W. R. (A)
Hilsdale, F. A. (A)
Huntley, W. F. (M)
Kalakowsky, C. B. (A)
Kolster, C. C. (SM)
Maartmann, M. R. (A)
Matthews, E. W., Jr. (A)
McCormack, T. L. (A)
Rider, D. V. (M)
Trimble, R. F. (M)
Vaughan, T. J. (A)

South Acton
Kaufmann, H. W. (A)
Palmer, F. J. (A)

Southampton
Bray, D. W. (A)

Southbridge
Tillyer, E. D. (SM)
Wells, J. M. (SM)

South Dartmouth
Davis, S. L. (SM)

South Easton
Allen, L. W. (A)

South Hamilton
Davis, C. W. (A)

South Lincoln
Gibbs, N. E. (A)
Gross, T. A. O. (M)
Lush, M. J. (A)

South Natick
Horan, W. H. (A)

South Sudbury
Throckmorton, K. L. (A)

South Weymouth
Fisher, A. B. (M)
Hall, J. R. (M)
Hill, H. F. (VA)

Springfield
Andrews, W. J. (A)
Bedard, G. O. (M)
Blow, A. W. (A)
Burnett, K. H. (M)
Carlson, F. A. (A)
Cameron, J. A. (M)
Cushing, T. F. (VA)
DaPrato, C. L. (A)
DeFlorio, L. F. (A)
Dewey, C. S. (A)
Fratar, F. J. (M)
Guertin, R. (A)
Norkin, H. (A)
Plummer, C. H. (A)
Ryan, W. E. (A)
Webber, F. G. (SM)

Squantum
Bobroff, D. L. (M)
Jones, T. F., Jr. (SM)

Stoneham
Finley, A. D. (A)
Gardner, H. A. (M)
Rounds, W. A. (A)

Stoughton
Myers, H. W. (M)
Sevian, E. A. (A)

Sudbury
Forbes, G. D. (M)

Swampscott
French, I. F. (M)
Moses, R. C. (M)
Zimmermann, H. J. (SM)

Taunton
Barker, D. R. (M)

Tyngsboro
Spindell, F. A. (M)

Waban
Goddess, E. D. (A)
McCormack, R. L. (A)
Morrison, L. H. (SM)
Young, K. A. (SM)

Wakefield
Bianco, J. F. (A)
Jappe, H. C. (A)
Webb, H. A. J. (M)

Waltham
Abate, A. (M)
Alstad, N. J. (A)
Ashton, D. (A)
Balmuth, N. (A)
Benkley, F. G. (A)
Bickford, W. J. (A)
Blass, J. (M)
Brown, D. F. (A)
Butler, J. L. (A)
Chittenden, K. M. (A)
Clark, R. (A)
Clement, I. C. (A)
Cole, B. R. (A)
Coroniti, S. C. (M)
Day, J. H. (A)
Dixon, R. K. (M)
Dukat, F. M. (M)
Durfee, G. H. (A)
Ellowitz, H. I. (A)
Faigen, I. M. (A)
Guba, R. F. (A)
Hines, P. P. (A)
Hoeppner, C. H. (SM)
Hutchins, W. R. (SM)
Hubel, R. M. (A)
Jacobs, H., Jr. (A)
Kaye, R. L. (A)
Kokidko, A. (A)
Kurth, H. H. (SM)
Lehr, C. G. (M)
Mandell, A. (M)
Parkin, T. R. (A)
Parkinson, G. B. (A)
Porter, A. D. (A)
Reifel, H. (A)
Rogers, T. F. (M)
Santangelo, J. (M)
Searle, R. W. (A)
Soltes, A. S. (A)
Stocker, D. V. (A)
Stockman, H. (SM)
Sullivan, J. B. (M)
Taylor, K. A. (M)
Vacca, R. H. (A)
Warner, G. L. (A)
Watkins, A. E. (A)

Watertown
Altieri, J. R. (A)
Aronow, S. (A)
Bagnall, J. J., Jr. (A)
Bakura, J. (M)
Baruch, J. J. (M)
Burke, C. T. (F)
Daggett, N. L. (A)
De Shon, H. C. (A)
Elmer, W. D. (A)
Epstein, D. J. (M)
Field, R. F. (F)
Fishman, M. (A)
Frey, H. B., Jr. (M)
Graustein, W. W. (M)
Handy, R. A. (A)
Kessel, R. (A)
Kunstadt, G. H. (A)
Lazarkis, P. J. (A)
Lee, R. H. (A)
Memishian, J. (A)
Miller, A. (A)
Nelson, A. A. (A)
Pressman, A. (M)
Pritchard, W. L. (M)
Read, V. H. (A)
Robinson, M. P., Jr. (A)
Samson, E. W. (SM)
Smallin, L. D. (SM)
Thompson, D. C. (A)
Weingarten, J. (A)
Weiss, H. G. (SM)

Waverley
Mekota, J. E. (A)

Wayland
Cady, C. A. (SM)
Campbell, R. E. (VA)
Gillespie, C. N. (A)
Hodgkinson, W. S. (A)
Kather, E. N. (M)
Larkin, K. T. (M)
Tuckerman, L. S. (A)

Webster
Rudenauer, F. (M)
Stuart, R. M. (A)

Wellesley
Bobrow, E. N. (A)
Brainerd, H. B. (A)
Bristol, H. B. (A)
Buckbee, J. A. (M)
Forrester, J. W. (SM)
Gada, N. (A)
McDowell, L. S. (SM)
Newton, G. C., Jr. (M)
Rowland, H. J. (SM)
Wellendorf, J. J. (M)

Wellesley Hills
Bowles, E. L. (F)
Chaffee, R. E. (M)
Eager, M. (SM)
Greene, G. G. (M)
Guillemin, E. A. (F)
Humphrey, G. S. (A)
Pamphilon, L. E. (A)
Riblet, H. J. (A)
Smith, H. J. (A)
Tucker, F. L. (A)
Weeks, P. T. (SM)

Wenham
Tarr, R. K. (A)

West Acton
Panetta, A. R. (A)
Taintor, H. G., Jr. (A)

West Bridgewater
Maglathlin, R. N. (A)

West Boylston
Surprenant, A. H. (A)

West Concord
Holtje, M. C. (A)
Soderman, R. A. (SM)

West Falmouth
Austin, J. F. (A)

West Lynn
Cunningham, J. E. (A)
White, A. (A)
Whittaker, H. F., Jr. (A)

West Medford
Lanciani, D. A. (A)
Stevens, C. A. (SM)
Sutro, L. L. (A)

West Medway
Yewell, P. G. (M)

West Newton
Angell, J. B. (A)
Armstrong, D. G. (A)
Davis, D. P. (A)
Devereux, J. G. F. (A)
Eggers, P. (A)
Hergenrother, R. C. (VA)
Mac Dowell, K. M. (A)
Myers, H. L. (M)
Pekin, H. T. (SM)
Scott, R. E. (A)
Smith, J. E. (SM)
Wyckoff, P. H. (M)

Weston
Beveridge, H. N. (A)
Brown, W. C. (VA)
Burt, W. G., Jr. (A)
Gouin, P. L. (A)
Gross, F. A. (VA)
Hills, C. E., Jr. (VA)
Martin, R. R. (A)
Ready, W. A. (SM)
Van Rennes, A. B. (M)
Waters, R. A. (M)

West Roxbury
Alessi, V. J. (A)
Downing, J. T. (A)
Finnegan, F. J. (A)
Haddad, S. G. (M)
Parisi, F. E. (A)
Saad, T. S. (A)
Teachman, A. E. (SM)

West Springfield
Rich, E. A. (A)

West Wayland
Ballou, E. T. M. (M)

Westwood
Arlin, M. N. (M)
Staples, E. B. (A)
Westborn, A. C., Jr. (A)

Weymouth
Fallows, R. (A)

Whitman
Simmons, E. C. (M)
Tucker, C. E. (SM)

Williamstown
Burnham, J. (M)
Curry, J. R. (A)
Postle, A. H. (A)
Sheehan, R. P. (A)
Shuey, L. S. (A)

Winchester
Babakian, J. (M)
Beranek, L. L. (SM)
Browning, G. H. (SM)
Cade, P. J. (A)
Callahan, J. J. (A)
Chandler, G. E. (M)
Fritch, D. J. (A)
Hanson, P. R. (M)
King, R. W. P. (SM)
McFarlane, D. J. (M)
Mingins, C. R. (SM)
Richmond, H. B. (F)
Sawyer, D. S. (A)
Segerstrom, C. A., Jr. (SM)

Winthrop
Bird, W. A. (A)
Coffey, E. T. (A)
Somers, L. (A)
Stacy, J. E. (SM)
Stephanz, G. H. (A)

Woburn
Corderman, C. L. (A)
Cullen, A. E., Jr. (A)
Katz, L. (SM)
Lawler, J. J. (A)
Seifert, W. W. (A)

Wollaston
Bixby, W. L. (A)
Burgoyne, C. L. (A)
Edmonston, A. S. (A)
Heron, L. R. (A)
McNamara, T. J. (A)
Whitham, G. E. (A)

Worcester
Achramowicz, M. J. (A)
Alexander, D. C. (M)
Browning, E. A. (A)
Connolly, J. K. (A)
Didio, R. E. (A)
Dymek, B. (A)
Eteson, D. C. (A)
Goldstein, I. (A)
Handkman, M. (A)
Howe, D. W., Jr. (M)
Howes, D. E. (VA)
Manoog, J. C. (M)
Newell, H. H. (SM)
Siff, A. W. (A)
Stega, E. A. (M)
Stockman, W. E. (M)
Sulkoski, W. M. (A)

MICHIGAN

Allen Park
Duzick, F. E. (A)
Tosh, W. M. (M)

Alma
Robinson, R. D. (A)

Ann Arbor
Attwood, S. S. (SM)
Black, J. R. (A)
Boll, R. W. (M)
Boorsma, C. J. (A)
Bozian, M. (A)
Bridgman, A. D., Jr. (A)
Brown, R. K. (A)
Chaney, L. W. (A)
Cline, J. F. (SM)
Correa, W. R. (A)
Deutsch, R. (A)
Dow, W. G. (F)
Early, H. (SM)
Graham, R. R. (A)
Hart, S. V. (M)
Herring, O. L., Jr. (A)
Hok, G. (SM)
Holland, L. N. (SM)
Kazda, L. F. (A)
Kroll, R. T. (A)
Liang, D. Y. (A)
McFee, R. (A)
Martens, H. A. (M)
Middleton, W. B. (A)
Needle, J. S. (A)
Ohlsson, R. L. (A)
O'Neal, R. D. (SM)
Pantek, H. R. (A)
Podewils, N. R. (A)
Rajeswari, (Miss) (A)
Rogers, P. H. (A)
Rupke, E. (A)
Schaeffer, E. J. (A)
Schulte, H. F., Jr. (A)
Stout, M. B. (SM)
Strand, J. (A)
Theofil, D. V. (A)
Tiffany, O. L. (A)
Welch, H. W., Jr. (A)

Battle Creek
Stone, E. J. (A)
Thunder, L. C. (A)

Bay City
Woody, F. (A)

Belleville
Benner, W. (A)

Benton Harbor
Buhl, W. T. (VA)
Miller, W. C. (A)
Saint John, R. F. (A)

Berkley
Mallon, R. H. (A)
Thrun, A. G. (VA)

Berrien Springs
Lashier, H. M. (A)

Birmingham
Booth, F. E., Jr. (A)
Boundy, G. G. (SM)
Burge, F. L. (A)
Casselberry, R. L. (A)
Chapman, F. W. (SM)
Emmett, R. A., Jr. (M)
Hall, A. C. (SM)
Hyland, L. A. (VA)
McMclymonds, C. C. (A)
McDonnell, W. F. (A)
Mika, H. S. (SM)
Kiebert, M. V., Jr. (SM)
Oxford, C. J., Jr. (A)
Rykala, T. P. (A)
Selvidge, H. (SM)
Simpson, E. J. (A)
Smith, H. B. (A)
Somerville, A. (A)
Sumpter, P. B. (A)
Vogel, C. L. (A)
Zatorsky, E. F. (VA)

Brighton
Kelly, D. V. (A)

Brown City
Detweiller, D. C. (A)

Carrollton
Mendel, F. S. (A)

Center Line
Kearney, K. (A)
Turkish, M. C. (A)

Charlotte
Moehring, W. D. (A)
Rypstra, B., Jr. (A)
Widrig, D. R. (A)

Clayton
Hinderer, E. F. (A)

Coldwater
Munn, E. H., Jr. (A)

Concord
Warnock, E. W. (M)

Davisburg
Kinney, K. W. (A)

Dearborn
Bevis, J. H. (A)
Boltz, H. A. (M)
Coleman, H. B. (A)
Fisk, R. H. (A)
Lien, C. E. (VA)
McLaren, I. H. (A)
Scherba, M. B. (A)
Smith, E. H. (M)

Detroit
Adelson, E. R. (A)
Adkins, H. T. (A)
Albers, J. M. (A)
Allured, R. B. (SM)
Almas, S. L. (M)
Amick, R. H. (A)
Audretsch, L. M., Jr. (A)
Ballard, R. L. (A)
Bedard, H. W., Jr. (A)
Benagluo, R. V. (A)
Blett, E. B. (VA)
Boulet, L. A. (A)
Brinn, J. M. (A)
Brooks, J. H. (A)
Brown, R. L. (A)
Buchanan, A. B. (SM)
Buckwitz, S. (A)
Buehler, F. A. (M)
Burley, H. A. (A)
Busuttil, H. L. (A)
Butler, R. I. (A)
Caffrey, T. J. (A)
Capron, R. W. (M)
Clark, M. R. (A)
Clark, R. R. (M)
Cohen, B. E. (A)
Crows, H (A)
Currie, J. H. (A)
Da Roza, F. G. (A)
Darlington, H. T. (A)
Davis, C. (VA)
Davis, J. I. (A)
De Garmo, A. V. (A)
Delmege, A. H. (A)
Denstaedt, E. C. (SM)
Detar, J. B. (A)
Donovan, R. (A)
Drouillard, C. T. (A)
Dudeck, P. H. (M)
Dumon, L. H. (A)
Duston, D. L. (A)
Earle, D. H. (A)
Eisen, C. G. (VA)
Erickson, E. A. (A)
Fahringer, W. H. (A)
Ferguson, D. R. (A)
Fisk, N. C. (SM)
Fitzner, B. J. (A)
Forbes, C. S. (A)
Forsythe, E. H. (A)
Fox, D. J. (A)
Friedenthal, A. (M)
Fuchs, A. M. (A)
Garelis, C. (A)
Gasparovitch, S. (A)
Greenfield, A. (A)
Hamilton, R. E., Jr. (A)
Hanes, M. (A)
Hanysz, E. A. (A)
Hartman, G. J. (A)
Hartz, F. M. (A)
Haurlan, P. N. (M)
Head, J. W. (M)
Hein, D. W. (A)
Hemenway, B. J. (A)
Hess, H. M. (M)
Hill, F. E. (A)
Hill, N. E. (A)
Horreli, M. W. (M)
Houpis, C. H. (A)
Hubbard, W. B. (A)
Hughes, E. J. (M)
Hunter, J. S., Jr. (A)
Jarosik, N. A. (A)
Jarvis, D. T. (A)
Johnson, K. E. (A)
Jones, C. W. (A)
King, L. E. (VA)
Kocher, C. F. (M)
Konopka, E. P. (A)
Korby, I. (A)
Kossuth, A. K. (A)
Kranz, H. E. (SM)
Krulikoski, S., Jr. (A)
Kuba, R. E. (A)
Kubala, A. M. (A)
La Joie, Z. A. (A)
Lamb, W. X., Jr. (M)
Lawrence, S. C. (M)
Lee, E. H. I. (SM)
Lessem, M. (A)
Leydorf, G. F. (SM)
Lipkin, L. (A)
Lippmann, S. A. (M)
Loiacono, J. V. (A)
Love, E. J. (M)
Luzer, H. J. (A)
Lynn, H. F. (A)
MacDuff, G. R. (A)
Madgett, W. H. (A)
Mandzyn, M. (A)
Manning, D. C. (M)
Manning, S. R. (VA)
Mason, D. F. (A)
McCall, W. A. (A)
McCollum, S. B. (A)
McFatridge, J. E. (A)
Membery, A. H. (A)
Metevia, E. E. (A)
Michaels, C. L. (A)
Mitchell, G. A. (A)
Miller, R. C. (A)
Millett, L. F. (M)
Miwa, G. Y. (A)
Mohr, D. B. (A)
Moiln, D. C., Jr. (A)
Morrow, E. E. (A)
Nartonis, W. C. (A)
Niles, J. R. (A)
Nutter, M. J. (A)
Nymberg, R. J., Jr. (A)
Olson, D. R. (A)
Osborne, R. L. (VA)
Pecar, A. J. (A)
Penhollow, H. A. (VA)
Piper, C. A. (SM)
Poppe, P. A. (A)
Renkiewicz, R. (A)
Retko, E. (A)
Reust, R. H. (A)
Rissi, T. L. (A)
Robb, D. E. (SM)
Robinson, T. (A)
Rudolph, I. W. (A)
Roush, F. H. (VA)
Runkle, E. G., Jr. (A)
Ryff, A. S. (A)
Sather, R. O. (A)
Satullo, A. B. (A)
Scanlan, R. J. (VA)
Schiffman, J. (A)
Schmeisser, K. R. (M)
Scott, D. E. (A)
Scrimshire, J. B., Jr. (A)
Shepard, T. (A)
Skinner, F. L. (A)
Slabiak, W. (A)
Smith, B. F. (VA)
Snodgrass, N. E. (A)
Spragg, L. A. (M)
Sterling, S. (A)
Stahl, T. H., Sr. (A)
Stanko, E. S. (A)
Stretanski, P. A. (A)
Studnica, G. J. (A)
Tomaszewski, R. W. (A)
Tompos, S. F. (A)
Travis, E. W. (A)
Tuksal, M. A. (A)
Van Dusen, H. J. (A)
Walker, J. R. (A)
Weagel, K. D. (A)
Webb, A. E. (A)
Webb, H. E., Jr. (A)
Wicks, C. E. (A)
Williams, W. B. (SM)
Wolf, I. B. (A)
Wolf, S. B. (A)
Yaskoff, R. (A)
Ziniuk, M. A. (M)
Zoss, C. L. (A)

Dexter
Boettcher, A. J. (A)

Dundee
Broughton, G. E. (A)

East Ann Arbor
Bethel, H. W. (A)
Cutrona, L. J. (SM)

East Detroit
Boyda, M. C. (A)

East Grand Rapids
Friedman, S. N. (M)

East Lansing
Ebert, I. O. (A)
Hogle, R. C. (A)
Jeffries, R. J. (A)
Rogers, M. D. (A)
Smollett, R. J. (A)

Ecorse
Saigeon, N. D. (M)

Escanaba
Degeneffe, H. A. (A)

Ferndale
Amman, E. A. (A)
Clark, J. E. (A)
Ferrara, G. N. (M)
Hart, D. E. (A)
Hutchinson, R. W. (A)
Reiss, N. D. (M)

Flat Rock
Munro, G. M. (A)

Flint
Colosi, A. (A)
Fallain, F. D. (M)
Hooper, W. D. (A)
Ryan, G. E. (VA)

Freeland
Carpenter, R. H. (VA)

Garden City
Harwood, F. E. (A)

Grand Junction
Krieger, H. C. (A)

Grand Rapids
Bateman, G. H. (A)
Bell, R. E. (A)
Berg, R. C. (A)
Bocast, D. R. (A)
Carrington, W. A. (A)
Davis, R. L. (VA)
De Jong, P. G. (A)
Densem, A. N. (A)
Gaydos, G. J. (VA)
Gorton, E. D. (A)
Immen, G. H. (M)
Kandra, J. P. (A)
McCurdy, D. L. (A)
McKay, R. L. (M)
Naylor, A. F. (A)
Stevens, L. G. (M)
Van Zoest, C. (A)
Wilson, R. A. (A)

Grandville
Korb, A. W. (M)

Grass Lake
James, F. M. (M)
Laban, J. (M)

Grosse Pointe
Martz, A. F., Jr. (A)
Walton, H. E. (A)

Grosse Pointe Farms
Book, E. (A)

Grosse Pointe Woods
Butcher, J. H. (A)
Dacken, L. L. (VA)
Gulevich, J. H. (A)
Kuecken, J. A. (A)

Hastings
Branch, R. (VA)

Highland
Beach, E. H. (M)

Highland Park
Byerlay, H. L. (SM)
Gould, H. S. (M)
Hack, N. R. (A)
Shields, R. A., Jr. (A)
Stinson, R. C. (VA)

Holland
Tysse, H. L. (VA)
Westrate, M. C. (A)

Homer
Alley, R. P. (A)

Houghton
Jones, R. J. (A)

Huntington Woods
Day, J. A. (A)
Dushane, H. W. (A)
Lendway, J. M., III (A)
Master, W. R. (A)
Wilton, V. A. (M)

Inkster
Tillv, V. F. (M)

Iron Mountain
Sciez, L. C. (A)

Jackson
Baker, F. J. (A)
Bell, D. L. (A)
Foy, S. (A)
Geizer, J. R. (M)
Greaige, R. L. (A)
Hungerford, R. S. (A)
Knubbe, H. (M)
Larsen, J. (M)
Ruppel, D. (A)
Sorem, H. (A)
White, R. T. (M)
Whyman, E. W. (A)

Kalamazoo
Fetzer, J. E. (SM)
Lee, C. E. (A)
Marburger, W. G. (A)
Wells, L. V. (SM)

Lansing
Castle, C. X. (M)
Russell, R. S. (A)
Stahl, C. J. (A)
Winters, L. C. (A)

Lapeer
Moule, W. N. (A)

Lincoln Park
Moore, J. B. (VA)
Tank, H. F. (VA)

Ludington
Petters, J. F. (A)

Marysville
Stoner, M. J. (A)

Midland
Bauss, H. H. (A)
Miller, H. L. (A)
Woodland, P. C. (A)

Milford
Newell, C. J. (A)

Monroe
Barfuss, J. D. (A)
Cooley, P. (A)

Morenci
Cottrell, M. (VA)

Mount Clemens
Miller, C. E. (A)
Sullivan, R. P. (A)

Mount Morris
Anderson, H. J. (M)

Muskegon
Castenholz, F. E. (M)
Garcia, S. C. (M)
Hammer, R. V. (A)
Spoon, G. E. (A)

New Baltimore
Driver, J. P. (A)

Niles
Beaverson, W. A. (A)
Gensiorowski, H. J. (A)
Odehnal, J. J. (A)

Novi
Jennings, F. S. (A)

Oak Park
Babaca, J. (A)

Ortonville
Solley, S. W. (A)

Paw Paw
Evans, R. J. (A)

Petoskey
Horniman, N. L. (A)

Pontiac
Cook, W. N. (A)
Fisher, M. R., Jr. (A)
Fowler, T. W., Jr. (A)
Ragsdale, W. H. (A)

Pullman
Robinson, G. D. (VA)

Richmond
Clark, N. M. (A)

River Rouge
Hansen, D. K. (A)
Haney, C. A. (A)
Shepley, L. (A)

Rives Junction
Monroe, D. G. (A)

Rockford
Eslinger, R. L. (A)

Roseville
Hoehn, A. M. (A)
Meltvedt, H. M. (M)

Royal Oak
Andrews, G. B. (A)
Bass, W. A. (A)
Coates, A. L. (VA)
Frincke, P. O. (M)
Gundy, P. L. (M)
Hagemann, R. C. (A)
Hagerty, J. J. (A)
Hughes, J. B. (A)
Larime, L. H. (SM)
Reinhold, H. W. (M)
Vincent, C. J. (A)
Yamauchi, T. T. (A)

Saginaw
Beardslee, D. A. (A)
Brace, L. H. (A)
Hensel, M. L. (A)
Kelb, A. J. (A)

Saint Clair Shores
Dute, J. C. (A)
Spero, A. F. (A)

Sault Saint Marie
Champion, R. W. (A)

Scotts
Woods, O. R. (A)

Selfridge Air Force Base
Haas, D. B. (A)

Sturgis
Cadwell, E., B., Jr. (A)
Grim, R. L. (A)

Three Rivers
Perkins, M. L. (VA)

Traverse City
Biederman, L. M. (M)

Trenton
Clark, R. K. (VA)
Jewell, E. J. (A)
Mills, G. L. (A)
Thornton, C. H. (A)
Workman, W. B. (A)

Utica
Schoonover, D. J. (A)

Walled Lake
Belprez, G. R. (M)
Ristow, H. E. (M)

Wayne
Francis, E. P. (A)
McConoughey, S. R. (A)

West Branch
Nauman, J. G. (A)

Whitehall
Stansfield, S. J. (M)

Willis
Sherman, H. W. (A)

Willow Run
Brewer, G. R. (M)
Dougherty, R. H. (A)
Kruger, V. (A)
Macnee, A. B. (A)
Talpey, T. E. (A)

Willow Village
Bartman, F. L. (M)

Wyandotte
Welter, L. J. P. (A)
Wesser, C. H. (SM)

Ypsilanti
Augustus, L. M. (VA)
Howard, L. R. (A)
Miller, R. E. (A)
Wheatley, W. A. (A)
Wilbur, E. T. (M)
Wilcox, G. A. (A)
Williams, R. O. (SM)

MINNESOTA

Ankona
Anderson, I. H. (M)
Collier, G. X. M. (VA)

Barnum
Lanxon, R. C. (A)

Brainerd
Spieker, L. J. (A)

Champlin
Lautzenheiser, R. W. (A)

Chisago City
Witthans, V. R. (A)

Cloquet
Chartier, E. G. (A)

Duluth
Farrell, C. (A)
Persons, C. B. (SM)

Elk River
Longfellow, R. C. (SM)

Excelsior
Watterberg, J. (A)

Fairbault
Folsom, D. E. (M)
Hyde, J. E., Jr. (A)

Forest Lake
Carpenter, D. L. (A)

Glen Lake
Biltz, F. J. (A)

Hibbing
Floyd, R. A., Jr. (A)

Hopkins
Carlson, K. J. (M)

Mankato
Ellis, G. A. (A)
Linder, D. O. (A)

Minneapolis
Adkisson, W. M. (A)
Ainsworth, F. W. (A)
Alderson, R. C. (A)
Anderson, G. P. (A)
Anderson, P. M. (M)
Babcock, D. F. (A)
Bakken, E. E. (A)
Baldwin, J. H. (M)
Bergan, K. N. (A)
Bramsen, E. A. (A)
Brewer, J. W. (A)
Briggs, J. G. (A)
Brown, S. R. (A)
Burmaster, L. (A)
Burrell, W. P. (A)
Callan, R. W. (A)
Carney, P. G. (VA)
Casey, T. J. (A)
Chapin, M. F. (M)
Christensen, T. W. (A)
Cohen, A. A. (M)
Culmer, W. J. A. (A)
Cummings, K. C. (A)
Dale, E. H. (A)
Davis, R. H. (A)
Disser, C. J. (M)
Dundovic, J. F. (A)
Eckstein, E. A. (A)
Edhlund, A. J. (A)
Engelman, C. W. (M)
Ewart, J. M. (A)
Featherstone, R. P. (A)
Frohbach, H. F. (A)
Gabrielsen, F. T. (A)
Gise, F. G., Jr. (A)
Grindheim, E. A. (A)
Hallaway, A. B. (M)
Hartig, H. L. (A)
Haverstock, C. B. (A)
Headen, H. V. (M)
Hendry, A. J. (A)
Herrmann, F. W. (M)
Hill, B. M. (A)
Hird, F. S. (A)
Hogie, W. L. (A)
Hunt, G. W., Jr. (A)
Iverson, M. W. (A)
Johnson, D. A. (A)
Johnson, G. H. (A)
Jones, W. N. (A)
Jorgenson, P. E. (A)
Kalb, R. M. (SM)
Kelar, J. (SM)
Kershaw, J. A. (A)
Knox, M. E. (M)
Laitinen, W. R. (A)
Langlie, L. O. (A)
Lees, R. E. (A)
Lehnert, W. E. (A)
Little, G. W. (A)
Lower, J. W. (A)
Lund, R. E. (A)
Manson, W. R. (A)
Markusen, D. L. (A)
McElroy, W. J. (A)
McGinnis, W. J. (A)
Miller, H. A. (A)
Moerke, R. W. (A)
Mooers, H. T. (A)
Muckenhirn, O. W. (M)
Museus, H. P. (A)
Nawrocki, J. T. (A)
Ney, E. P. (A)
Nicjols, R. F. (A)
O'Brien, H. G. (A)
Olson, K. A. (A)
Ostberg, E. H. (A)
Papenfuss, C. A. (M)
Pearson, V. H. (A)
Pedersen, I. C. (M)
Phelps, B. (A)
Pree, W. G. (M)
Premack, J. (M)
Quanrud, O. G. (M)
Rainville, L. E. (A)
Reid, J. M. (A)
Reinke, R. F. (A)
Renk, B. J. (A)
Rice, C. I. (M)
Riddell, R. J. (A)
Sabine, L. E. (A)
Schmitt, O. H. (SM)
Schott, O. A. (M)
Schuck, O. H. (SM)
Schulz, S. W. (M)
Schwantes, R. C. (A)
Seils, H. A. (VA)
Sell, R. L. (A)
Sherman, J. M. (SM)
Sininger, W. B. (A)
Smith, M. R. (A)
Snegoski, J. J. (A)
Snow, S. F. (A)
Stahmann, J. R. (A)
Stavnes, S. A. (A)
Stinger, H. J. (M)
Stone, N. T. (A)
Sweet, R. E. (A)
Thoen, R. L. (A)
Thompson, P. G. (A)
Tidball, F. E. (M)
Tobin, R. D. (A)
Trapp, J. A. (A)
Wagner, F. C. (A)
Walsh, J. D. (A)
Warhol, N. (A)
Webb, J. S. (SM)
Weber, R. G. (A)
Wold, E. A. (M)
Van Der Ziel, A. (SM)
Velkers, G. D. (A)
Vogel, V. H. (M)
Zierhut, L. C. (A)

Newport
Stief, F. W. (A)

Northfield
Jensen, M. C. (M)

Owatonna
Christensen, P. G. (A)

Ramsey County
Butler, W. W. (A)

Red Wing
Jelatis, D. G. (A)
Lee, G. M. (A)

Redwood Falls
Beran, L. S. (A)

Renville
Francis, O. T. (VA)

Richfield
Sifford, B. M. (A)

Robbinsdale
Hartig, H. E. (SM)

Rochester
Herrick, J. F. (M)
Jones, R. E. (SM)

Rosemount
Kubicek, W. G. (M)

Saint Paul
Albrecht, J. C. (M)
Anderson, E. M. (A)
Anderson, L. T. (M)
Barnes, J. C. (VA)
Baumgaertner, C. J. (A)
Beck, V. W. (A)
Becklund, O. A. (M)
Benassi, D. A. (A)
Coil, N. B. (M)
Coombs, J. M. (A)
DeVir, J. F. (A)
Erickson, R. S. (A)
Graebner, M. S. J. (A)
Hardenbergh, G. A. (A)
Hess, P. N. (A)
Hilker, B. R. (M)
Huntington, R. C. (A)
Jensen, W. S. (M)
Kahnke, J. (M)
Kelsey, J. R. (A)
Kiger, L. L. (A)
Kleason, D. B. (A)
Knoblauch, A., Jr. (A)
Lampert, L. F. (A)
Lillo, C. L. (A)
Macker, J. A. (A)
Mayo, P. M. (A)
McMahon, J. H. (A)
Melius, F. G. (A)
Miles, J. G. (M)
Moe, W. J. (A)
Murray, D. A. (M)
Nelson, E. A. (A)
Newman, M. M. (A)
Pierce, A. J. (A)
Porrazzo, R. J. (A)
Purcell, C. J. (A)
Rowland, C. A., Jr. (A)
Shepherd, W. G. (SM)
Shiely, A. R., Jr. (A)
Shubert, H. N. (A)
Svendsen, E. C. (A)
Thornton, J. E. (A)
Tomash, E. (A)
Tunnicliffe, W. W. (A)
Winget, W. F. (A)

Stillwater
Bashara, N. M. (A)
Bend, C. M., Jr. (A)

Virginia
Bibbins, L. L. (A)

Waseca
Hager, F. M., Jr. (SM)
Johnson, E. F. (VA)
Kozan, F. J. (A)

Wayzata
Jonasson, L. E. (M)
Young, S. B. (VA)

White Bear Lake
Edstrom, C. A. (A)
Pool, K. C. (M)

MISSISSIPPI

Baldwyn
Peach, S. E. (M)

Bay Saint Louis
Rawls, H. F. (A)

Biloxi
Dille, A. C. (A)
Ingling, T. M. (A)
Maxwell, R. F., Jr. (A)
Williams, E. A. (M)

Collins
Daniels, L. H. (A)

Corinth
James, G. F. (A)

Gloster
Brown, W. L. (A)

Greenwood
Johnson, H., Jr. (A)
Perkins, E. G. (A)

Gulfport
Kethulas, A. T. (A)
Malaszewski, J. C. (A)
Van Loon, R. M. (A)

Hernando
Browning, J. W. (A)

Iuka
McCulley, C. R., Jr. (A)

Jackson
Benson, G. G. (M)
Courtenay, J. A. (SM)
Tucker, J. W., III (A)

Meridian
Bates, G. W. (A)

Mississippi City
Kopulsky, S. (A)

Natchez
Bush, C. C. (A)

Oxford
Chapman, D. C. (A)

State College
Hutchison, P. T. (A)
Simrall, H. C. (SM)

Vicksburg
Menger, W. M. (A)

MISSOURI

Affton
Brickler, J. B. (M)
Toenebocbin, C. C. (M)
Winters, D. E. (A)

Brentwood
Hall, R. S. (A)
Hicks, H. J. (M)
Sullivan, A. D. (A)

Clayton
Andersen, A. R. (A)
Dbouby, G. J. (A)
O'Hare, E. F. (A)
Roberts, E. M., Jr. (A)
Ross, D. K. (A)

Columbia
Lago, G. V. (A)
Lamb, J. F. (M)
Waidelich, D. L. (SM)
Wallis, C. M. (SM)
Woodruff, C. M. (A)

Corder
Fahrmeier, M. L. (A)

Creve Coeur
Lechtreck, L. W. (A)

Ferguson
Jones, C. W. (M)
Rekart, A. F. (VA)

Florissant
Detchemendy, J. A. (A)
Pondrom, A. J. (A)

Fulton
Archibald, R. D. (A)
Nickles, R. W. (A)

Girardeau
Hirsch, O. C. (M)

Glendale
Harris, H. H. (A)
Hexem, J. (A)
Malsbury, J. S. (M)
Rustemeyer, G. L. (A)

Grain Valley
Harmon, R. C. (A)

Grandview
Battey, B. H. (A)

Hickman Mills
Bergren, A. L. (SM)
Newton, K. V. (A)
Wolfskill, R. F. (M)

Hopkins
Wilson, W. R. (M)

Independence
Fetter, R. W. (A)
Hathhorn, W. R. (A)
Moler, A. R. (VA)

Jameson
Somerville, J. R., Jr. (A)

Joplin
Harrison, A. A. (A)
Hutton, J. E. (A)
Nickel, W. L. (A)

Kansas City
Anderson, K. W. (SM)
Anderson, R. W. (A)
Arndt, A. E. (A)
Artman, R. G. (A)
Barker, F. L. (A)
Berry, F. M. (M)
Bishop, G. W. (M)
Bishop, W. T., Jr. (VA)
Boutros, O. L. (M)
Braidwood, D. W. (A)
Constant, P. C., Jr. (M)
Cook, K. H. (A)
Cotts, A. C. (A)
Curtis, C. V. (M)
Davis, S. E. (A)
De Board, E. B. (A)
Delano, H. C. (A)
Dunn, J. R. (A)
Earp, J. A. (M)
Easterday, M. R. (A)
Epstein, S. (A)
Fernane, J. (M)
Finke, H. G. (A)

Foster, C. L. (M)
Fouts, A. L. (VA)
Francis, M. C. (A)
Frost, S. H. (A)
Gibbs, D. R. (A)
Glass, A. H. (M)
Goldenberg, H. E. (M)
Halley, W. H. (A)
Harris, J. B. (M)
Hax, D. H. (A)
Heffelfinger, J. B. (SM)
Heister, C. F. (M)
Hoffman, G. R. (A)
Inderwiesen, F. H., Jr. (M)
Johnson, C. K. (M)
Johnson, C. L., Jr. (A)
Jones, T. L. (SM)
Kimball, C. N. (SM)
Kuhlman, E. A. (A)
Lane, C. A., Jr. (M)
Lipin, B. (A)
Lutes, R. K. (M)
Majorowicz, G. A. (A)
Manship, J. F. (A)
Markey, L. T., Jr. (A)
Martin, E. J., Jr. (A)
McCall, E. A. (M)
McCallum, A. J. (A)
McMurray, D. D. (A)
Meador, B. M. (M)
Moore, H. H. (M)
Morgan, H. K. (SM)
Morse, L. H. (M)
Nigg, D. J. (A)
Pool, M. A. (A)
Powell, K. W. (A)
Reitz, W. H. (A)
Rode, J. J. (A)
Rollert, C. R. (M)
Salzer, C. E. (VA)
Schilling, J. T. (A)
Shapiro, E. (A)
Sharp, W. C. (A)
Shirling, G. K. (M)
Simons, F. A. (M)
Slusher, R. W. (A)
Smith, C. B. (A)
Stearns, C. F. (A)
Taylor, G. L. (SM)
Uhrig, R. B. (A)
Van Gundy, C. G. (VA)
Van Horn, J. H. (M)
Welter, N. E. (A)
White, R. N. (SM)
Whittle, O. W. (A)
Wilcox, J. V. (SM)
Wilder, M. K. (A)
Williams, C. S. (A)
Ziegler, G. E. (SM)

Kirkwood
Cornell, J. I. (SM)
Dornhoffer, W. J. (A)
Dubuque, T. J. (A)
Fiedler, G. J. (SM)
Harvey, H. (SM)
Helmrich, L. W., Jr. (A)
Martin, G. I. (SM)
Risk, J. E. (A)
Saint Vrain, W. E. (A)
Winter, D. F. (SM)
Yount, T. L. (SM)

Lee's Summit
Hieronymus, T. G. (A)

Liberty
Budd, R. W. (M)
Hilton, W. A. (A)
Lovan, J. E. (M)
Troeglen, K. (SM)

Maplewood
Binzel, M. S. (A)
Earley, J. M. (A)
Kolb, R. O. (A)

Marshfield
Payne, W. E. (A)

New Melle
Hommes, H. E. (A)

Normandy
Lowell, T. B. (A)
Reed, D. L. (A)
Stephens, E. T. (A)
Volk, J. A. (VA)

North Kansas City
Lewis, W. R. (A)
Nail, P. L. (A)
Smith, Z. R. (A)
Turner, C. G. (SM)

Overland
Blackstock, R. S. (A)

Parkville
Culver, C. A. (SM)

Perry
Davis, C. L. (SM)

Richmond
Basham, R. (A)

Richmond Heights
Cummings, G. M. (M)
Schulte, O. J. (A)
Yarger, C. R. (A)

Rockhill
Baker, S. E., Jr. (A)

Rogersville
Ruberson, B. R. (A)

Rolla
Nolte, R. E. (M)
Mitchum, M. M. (A)
Skitek, G. G. (A)

Saint Ann
Decker, D. D. (A)
Woodley, W. T. (A)

Saint Charles
Heembrock, M. R. (A)

Saint Joseph
Clark, R. M. (A)
Dowd, F. W. (A)
Koch, J. W. (M)
Lux, K. E. (A)

Saint Louis
Apel, C. K. (A)
Behr, J. L. (A)
Beller, E. H. (A)
Binkholder, C. E. (A)
Bitzer, R. J. (M)
Black, D. R. (A)
Brent, L. L. (M)
Bubb, F. W., Jr. (A)
Caglia, A. J. (A)
Calafati, S. S., Jr. (M)
Ceries, R. E. (A)
Chambers, R. M., Jr. (S)
Cook, A. B. (A)
Deml, A. J. (A)
Deutschmann, F. C. (A)
Devereux, J. (A)
Dirkers, N. A. (A)
Dreifke, G. E. (A)
Dunn, C. A. (A)
Faust, C. W. (A)
Fillmore, F. A. (M)
Furfine, A. L. (A)
Glaser, J. L. (A)
Gooch, J. D. (A)
Gottschalk, M. (A)
Greenawalt, H. W. (A)
Greene, J. E. (A)
Groeteke, E. A. (M)
Hannon, J. P. (M)
Harney, P. J. (M)
Harris, S. E. (A)
Harrison, C. E. (SM)
Helgeson, V. L. (A)
Hoffman, H. T. (A)
Hoffman, L. (A)
Honnell, P. M. (SM)
Hubenschmidt, W. E. (A)
Huebschen, R. G. (A)
Johnson, H. L. (A)
Kathrinus, N. W. (A)
Klamm, G. E. (A)
Koerner, C. C. (A)
Lenkerd, J. P. (M)
Lennert, A. E. (A)
Lucas, E. J. (A)
McBride, J. R. (A)
McDaniel, O. S. (SM)
McGary, W. T. (A)
McHoney, L. M. (M)
Miller, G. L. (A)
Mollman, L. A. (M)
Motchan, H. L. (A)
Murty, E. H. (M)
Nurre, H. H., Jr. (A)
O'Shaugnessy, V. P. (A)
Pauls, G. C. (A)
Pingree, S. J. (A)
Richardson, R. P. (A)
Rosenkoetter, E. A. (A)
Sack, V. M. (A)
Schaeperkoetter, L. C. (A)
Schillinger, E. J. (A)
Schmidt, W. F., Jr. (A)
Schreiner, K. E. (A)
Schwarz, C. J. (A)
Sevett, R. (A)
Sheehan, J. S. (A)
Shepard, W. D. (M)
Siepman, A. B. (A)
Small, F. R. (SM)
Sorensen, W. N. (A)
Stertmann, W. E. (A)
Stocker, D. O. (A)
Strebe, A. C., Jr. (A)
Thess, J. H. (A)
Thielen, H. H. (A)
Trogdon, R. L. (A)
Upton, L. (A)
Van Wambeck, S. H. (SM)
Waelterman, E. H. (A)
Walker, K. E. (A)
Wiese, A. H. (M)
Young, A. E. (M)
Zehr, N. J. (M)
Zurbriggen, J. H. (A)

Sappington
Bennetsen, W. J. (M)

Springfield
Bauer, F. (M)
Bell, A. L. (SM)
Brock, C. B. (A)
Curry, W. F. (A)
Thompson, O. E. (A)
Wheat, W. M. (A)

Steelville
Green, C. S. (A)

University City
Busch, M. H. (A)
Rabushka, M. (A)
Rosenfelder, N. F. (A)
Taylor, J. J. (A)

Webster Groves
Frazier, R. L. (A)
Nagel, R. F. (A)
Sigman, H. M. (M)
Sudfeld, C. C. (A)

Weldon Springs
McCaffrey, F. K. (M)

Winfield
Crosby, H. A. (A)

MONTANA

Billings
Carrick, D. S. (A)
Kilchli, J. A. (M)
Lundquist, F. E. (A)

Butte
Jameson, F. P. (A)
Kerns, R. (A)
McCourt, A. R. (A)

Great Falls
Cockrill, M. S. (A)
Dolva, V. A. (A)
Edwards, K. A. (A)
Lopuch, A. J. (A)
Parker, J. E. (VA)
Pipher, R. W. (A)

Missoula
Taylor, A. S. (M)

NEBRASKA

Avoca
Stutt, C. A. (A)

Beatrice
Emerson, W. R. (A)

Bellevue
Hower, P. A. (M)

Broken Bow
Crawford, B. (A)

Crete
Skocpol, C. L. (A)

Elmwood
Hirst, J. L. (A)

Fremont
Zambarelon, J. T. (A)

Grand Island
Fuller, C. M. (M)
Lynch, U. L. (M)

Hastings
Allison, D. B. (A)
Watson, B. (A)

Hordville
Veburg, J. C. (A)

Imperial
Karns, K. B. (A)

Kearney
Beshore, P. S. (VA)

Lincoln
Bonness, O. L. (M)
Bullock, M. W. (M)
Burden, B. C. (M)
Chamberlain, I. J. (A)
Davis, B. E. (SM)
Depew, H. H. (A)
Flyr, J. G. (A)
Harper, J. M. (A)
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)
Sheffrey, T. N. (A)
Soderholm, L. H. (A)
Swift, H. G. (M)
Swift, W. B. (A)
Wight, V. H. (M)
Winkler, C. W. (VA)

Madison
Strom, L. D. (A)

McCook
Lenwell, L. W. (A)

Morrill
Campbell, W. O. (A)

North Platte
Griffin, D. C. (A)

Omaha
Bates, A. G. (A)
Becker, H. W. (M)
Borcher, E. J. (A)
Butler, W. E. (A)
Curry, H. D. (A)
Dunbar, B. L. (A)
Engdale, R. J. (A)
Flynn, G. (M)
Hadsell, G. C. (M)
Herold, J. L. (A)
Jeffery, T. H. (A)
Jelinek, G. S. (A)
Kolar, A. (A)
Kotera, W. J. (VA)
Liston, K. L. (A)
McGowan, M. L. (M)
Noland, J. W. (M)
Peck, R. E. (A)
Sibilia, L. (A)
Wesslund, R. E. (A)

Osmond
Pochop, L. C. (A)

Overton
Wycoff, K. H. (A)

Papillion
Israel, L. J. (M)

Plattsmouth
Gayer, J. H. (M)

Plymouth
Nider, M. E. (A)

Scotts Bluff
Garber, M. L. (A)

Valentine
Jones, H. I., Jr. (A)

NEVADA

Boulder City
Hill, C. R. (A)
Swartz, R. L. (A)

Carson City
Nason, C. H. W. (A)

Las Vegas
Rugar, J., Jr. (M)
Weissmantel, F. A. (VA)
Wieland, C. W. (A)

Reno
Harvey, D. M. (A)
Hendriks, H. J. (M)
Sandorf, I. J. (SM)
Shearer, R. W. (A)

NEW HAMPSHIRE

Canterbury
Grace, G. M. (M)

Concord
Evans, C. B. (M)

Dover
Gagne, F. W. (A)
Youngblood, I. J. (A)

Durham
Blanchard, F. A., Jr. (A)
Leoutsakos, G. N. (A)
Sanderson, R. F. (A)
Winn, A. L. (M)

East Lempster
Weiser, W. W. (A)

Epsom
Nutter, E. H. (A)

Exeter
Carbonneau, V. J. (A)

Francestown
Bailey, A. B. (SM)

Goffstown
Rust, W. F., Jr. (SM)

Hanover
Evans, W. R., Jr. (A)
Morgan, M. G. (SM)

Keene
Batchelder, E. F., Jr. (A)

Kingston
Jervis, E. W., Jr. (A)

Laconia
Farrington, J. F. (F)

Lyme
Wood, J. A., Jr. (SM)

Manchester
Castor, A. H. (A)
Chandler, V. H. (SM)
Tilton, D. S. (A)

Milford
Romney, E. (A)

Pelham
Edwards, L. C. (A)

Portsmouth
Allen, J. H. (A)
Molla, J. J. (A)
Taylor, W. E. (A)

Rochester
Mucher, G. J. (VA)

Salem
Thompson, G. L. (A)

Warner
Mason, J. B. (A)
Morrissey, R. D. (A)

NEW JERSEY

Allendale
Havatad, H. (VA)
Johnson, L. R. (A)
Maninger, R. C. (M)

Allenhurst
Lewis, H. M. (SM)
Nagel, J., Jr. (A)

Allentown
Dodds, W. (SM)

Almonesson
Borzi, B. S. (A)

Alpine
Borders, C. R. (A)

Andover
Ostlund, E. M. (SM)

Arlington
Bremer, F. V. (A)
Durie, J. C., Jr. (A)
Fischer, L. G. (A)
Millard, J. W. (A)
Savedelis, L. C. (A)
Wise, R. J. (SM)

Asbury Park
Acker, M. (A)
Albersheim, W. J. (SM)
Aron, S. (A)
Bifson, M. (A)
Bolton, A. (A)
Dombrowski, G. E. (A)
Dravneek, W. R. (M)
Finkelstein, S. I. (A)
Gorham, J. E. (SM)
Greenblum, C. (A)
Grossman, S. J. (A)
Hammond, A. L. (A)
Hilberg, E. A., Jr. (A)
Hughes, W. A. (M)
Jones, J. D. (M)
Lipman, N. (A)
Milby, B. C. (M)
Mittelman, W. (A)
Randals, A. W. (M)
Rehm, W. L. (M)
Reilly, V. E. (M)
Rosenberg, M. W. (A)
Salvano, D. P. (A)
Schelleng, J. C. (F)
Strasser, S. (A)
Sugarman, R. H. (A)
Wagner, H. M. (SM)
Weitz, S. (A)
Young, L. G. (SM)

Atco
Freedman, L. A. (A)

Atlantic City
Barrett, C. S. (A)
Schwab, P. E. (A)
Thron, B. K. (M)

Atlantic Highlands
Barreto, J. M. (A)
Durrer, J. H. (A)

Krinsky, S. S. (A)
Mumford, W. W. (SM)
Petersen, P. B. (A)
Pochmerski, D. (A)

Audubon
Broadwell, H. S. (A)
Henderson, R. A. (SM)
Kozanowski, H. N. (SM)
Perry, S. V. (VA)
Sheridan, E. W. (A)
Skorup, G. E. (M)
Smalts, F. W. (VA)
Stasz, C. E. (A)
Woll, H. J. (M)

Avenel
Felton, L. E. (M)

Avon
Egley, T. H. (A)

Barnsboro
Beauchemin, A. K. (M)

Barrington
Ross, G. T. (A)

Basking Ridge
Elmendorf, C. H. (SM)
Fair, I. E. (VA)
Finch, T. R. (M)
Goddard, C. T. (SM)
Hull, R. W. (M)
Kock, W. E. (SM)
Kolding, A. R. (A)
McLaughlin, K. M. (SM)
Pentico, G. W. A. (M)
Perkins, E. H. (SM)

Bayonne
Kessler, S. (A)
Mack, E. J. (A)
Oleyar, M., Jr. (A)
Sigel, D. (A)
Skibneski, C. E. (A)

Bedminster
Rumpel, C. H. (VA)

Belle Mead
De Vore, H. B. (SM)
Minks, F. A. (SM)

Belleville
Brown, A. T., III (A)
Dorfman, J. (M)
Evon, J. (A)
French, H. A. (A)
Koch, H. J. (A)
La Marca, P. J. (A)
Miller, H. G. (SM)
Petruzzelli, R. T. (A)
Sherman, V. W. (SM)
Taylor, I. R. (M)
Wallace, F. C. (SM)
Whittle, R. L. (A)
Winship, T., Jr. (A)

Belmar
Blevins, L. G. (A)
Brenner, M. M. (A)
Daniels, T. E. (SM)
Gibbons, D. R. (VA)
Jarema, E. D. (A)
Kamplinsky, A. (A)
Novick, G. (A)
Owens, H. L. (M)
Peterson, A. C. (A)
Reddick, D. M. (A)
Rothstein, J. (A)
Salem, J. (A)
Townes, W. D. (A)

Bellmawr Park *U*
Hunt, C. M. (A)

Bergenfield
Abend, I. J. (M)
Bright, T. F. (A)
Claassen, F. S. (A)
Crawford, A. R. (A)
Engert, G. W. (A)
Ewert, A. C. (M)
Fee, D. R. (A)
Foster, D. J. (M)
Frankel, S. (SM)
Grube, W. O. (A)
Meadow, S. (M)
Metzger, S. (M)
Musselman, H. (A)
Olson, R. E. (A)
Shenk, E. R. (SM)
Shotliff, L. A. (SM)
Summerlin, W. O. (A)
Westlake, P. R. (A)
Worster, M. C. (A)

Berkeley Heights
Alsberg, D. A. (M)
Church, S. E. (A)
Dennis, F. R. (M)
Doba, S., Jr. (A)
Loman, G. T. (A)
Mischler, W. D. (A)
Pierce, J. R. (F)
Quate, C. F. (A)
Shapiro, L. (A)

Bernardsville
Bescherer, E. A. (SM)
Matthews, J. G. (A)
Nielsen, G., Jr. (A)
Pomeroy, A. F. (SM)
Schmid, E. R. (A)
Wentz, J. F. (SM)

Bloomfield
Baracket, A. J. (SM)
Bates, J. K., Jr. (A)
Bishop, J. B. (SM)
Brindley, H. H. (A)
Cornwell, R. C. (M)
Daubaras, E. J. (M)
De Rosa, L. A. (A)
De Ryder, H. (VA)
Dettman, M. C. (M)
Di Toro, M. J. (SM)
Evander, H. S. (A)
Everett, L., Jr. (SM)
Fink, J. H. (A)
Glomb, W. L. (A)
Hawk, W. H. (A)
Hayes, W. A. (M)
Hogin, P. E. (A)
Ivey, H. F. (SM)
Johnson, H. W. (SM)
Kram, W. (A)
Kreer, J. G. (SM)
Laitinen, M. W. (M)
Merrill, H. B., Jr. (A)
Miller, C. F. (SM)
Mitchell, C. D. (SM)
Moran, W. G. (A)
Nelson, R. E. (M)
Perry, B. A. (A)
Pike, D. E. (A)
Polkinghorn, F. A. (F)
Rhodes, H. (A)
Scott, R. E. (A)
Stewart, N. H. (SM)
Sweeney, F. C. (A)
Taylor, H. P. (A)
Wakeman, R. P. (M)
Wallace, P. A. (A)
Weckwerth, H. A. (A)
Widell, E. G. (SM)

Bloomingdale
Coon, C. E. (VA)

Bogota
Gilcher, V. J. (A)
Hiller, F. L. (A)

Boonton
Aikens, A. J. (A)
Anderson, N. J. (A)
Berlin, W. N. (A)
Clark, T. H. (SM)
Cook, L. (VA)
Daverio, A. J. (A)
Drake, F. H. (SM)
Franks, C. J. (SM)
Grimm, E. M. (M)
Hazelhurst, E. (VA)
Hill, D. M. (M)
Houlroyd, G. F. (A)
Hull, C. J. (A)
Hull, L. M. (F)
Ladner, H. (VA)
March, P. S. (VA)
Minter, J. (VA)
Montcalm, S. R. (SM)
Paine, R. C. (SM)
Pittenger, A. W. (A)
Plahn, R. W. (A)
Redington, J. H. (SM)
Richardson, A. G. (SM)
Richardson, S. A. (A)
Sanderson, A. E. (A)
Urbach, K. (SM)
Zavoda, J. P. (A)
Zayac, F. R. (A)

Bound Brook
McMillin, W. R. (A)
Mitchell, D. (SM)
Romano, V. J. (A)
Uphoff, R. L. (A)

Bradley Beach
Blackwell, E. L. (A)
Brown, M. A. (A)
Caparn, C. C. (A)
Levy, S. J. (SM)
MacAllister, A., Jr. (A)
Miller, M. (A)
Rosmovsky, P. (M)
Taffel, B. R. (A)
Wurman, G. (A)

Brielle
Schor, H. (M)
Taylor, G. W. (A)

Brooklawn
Stetser, M. E. (A)

Brookside
Jansen, J. J. (A)

Budd Lake
Allen, G. W. (A)

Butler
Downsbrough, G. A. (A)

Caldwell
Corum, D. R. (A)
Hotopp, A. H., Jr. (SM)
James, W. M. (SM)
McBrair, H. C. (A)
Meixell, O. S. (SM)
Nuner, J. F., Jr. (VA)
Sutherlin, L. (SM)
Vogel, W. H., Jr. (A)
Williams, W. J., Jr. (A)

Camden
Auerbach, B. (A)
Bradshaw, G. V., Jr. (A)
Brownfield, L. B. (A)
Cornell, J. A. (A)
Crosby, D. R. (SM)
Eaton, T. T. (SM)
Feyerherm, M. P. (M)
Finkelstein, M. B. (M)
Foley, A. A. (A)
Gore, E. M. (A)
Henry, E. A. (M)
Koros, L. L. (SM)
Ksiazek, F. T. (A)
Lauer, H. (A)
Layer, J. H. (A)
Lovvorn, J. L. (A)
Maloff, I. G. (F)
McCoy, J. F. (A)
McDermid, W. L. (A)
Merrill, R. B. (A)
O'Brien, J. A. (A)
Price, W. E. (SM)
Robinson, C. R. (A)
Rudner, M. A. (SM)
Sherman, S. M. (M)
Spielberg, A. M. (A)
Trachtenberg, R. (A)
Udell, W. B. (A)
Underwood, J. F. (A)
Vilkomerson, B. S. (A)
Wittels, J. L. (A)

Cape May
Pearson, H. S. (A)

Carlstadt
Hanft, K. E. (A)

Cedar Grove
Amos, B. (M)
Asdal, M. K. (A)
Capen, H. N. (A)
Himmel, L. (A)
Kellom, B. K. (A)
Reeves, E. H. (A)
Rickett, S. B. (A)
Schmidt, F. W. (SM)
Shackelford, C. L. (A)
Van Duyne, J. P. (A)
Weitmann, O. (SM)
Wheeler, M. S. (A)
Yasinsac, A. G. (A)

Cedar Knolls
Menzel, H. W. (A)

Chadwick Beach
Shanahan, J. C. (M)

Chatham
Anderson, T. G. (A)
Babcock, S. M. (VA)
Babcock, W. C. (M)
Baker, H. W., Jr. (M)
Bawden, H. G. (M)
Bryant, N. W. (SM)
Calbick, C. J. (A)
Campbell, R. D. (F)
Cobb, L. J. (M)
Cousins, V. M. (VA)
Duckworth, G. W. (M)
Dungan, M. R. (M)
Eisenscher, E. S. (M)
Evans, H. J. (SM)
Frantz, D. R. (M)
Fay, C. E. (SM)
Felch, E. P. (SM)
Ferrell, E. B. (SM)
French, H. N. (M)
Geiges, K. S. (A)
Hensel, W. G. (VA)
Herud, E. C. (A)
Houghton, E. W. (SM)
Kirkpatrick, W. E. (VA)
Klesse, W. R. (M)
Lebert, A. W. (VA)
Moorhead, G. H. (VA)
Penick, D. B. (VA)
Peterson, A. C., Jr. (SM)
Peterson, L. C. (VA)
Romnes, H. I. (SM)
Rose, R. H., II (A)
Rupp, O. R. (A)
Sproul, P. T. (SM)
Sweeny, C. P. (SM)
Taylor, P. H. (VA)
Winans, R. C. (A)
Wintringham, W. T. (F)
Woodmansee, B. S. (A)
Word, J. A. (SM)

Chatham Township
Graham, R. E. (M)

Chester
Braun, C. G. (A)
Pardee, S., Jr. (A)

Clayton
Breitwieser, G. F., Jr. (A)

Cliffside Park
Betz, E. S. (A)
Flosdorf, F. H. (A)

Clifton
Alter, R. S. (A)
Arditl, M. (SM)
Arp, R. H. (A)
Atwood, H., Jr. (M)
Baker, H. C. (A)
Battel, F. A. (A)
Campbell, E. J. (A)
Carow, W. M. (A)
Croxville, W. B. (M)
Davidoff, F. (M)
Goldan, T. J. (A)
Horvath, A. (SM)
Hunt, D. G. (A)
Jones, D. M. (A)
Kern, G. A. (A)
Kirksey, T. W. (A)
Koch, S. J. (A)
MacMillan, T. S. (A)
Mihalik, J. J. (A)
Murphy, G. G. (A)
Pastor, J., Jr. (A)
Pollack, L. (A)
Postal, R. H. (A)
Ronald, T. T. (A)
Schneiderman, M. (A)
Schreiner, S. M. (A)
Snadyc, A. M. (A)
Snell, P. A. (M)
Spector, M. (A)
Stein, S. (A)
Straube, H. M. (SM)
Verson, R. D. (A)
Webb, J. A. (A)
Weis, M. (A)
White, L. E. (A)
Wilson, C. R. (A)
Yard, R. R. (A)

Clifton-Allwood
Messerschmidt, W. T. (A)

Closter
Davis, R. H. (A)
Havens, B. L. (SM)
Soderquist, W. A. (A)

Collingswood
Ackerman, M. J. (VA)
Andrews, D. R. (M)
Armstrong, C. W. (A)
Benner, A. H. (M)
Bremmer, A. J. (M)
Brotzman, E. S. (M)
Brown, L. R. (M)
Buck, D. G. (M)
Clark, E. L. (SM)
Daubert, A. G. (A)
Davis, C. E. (A)
Drumm, J. C. (A)
Eiselein, J. E. (SM)
Ellis, I. M. (M)
Fink, L., III (M)
Gluyas, T. M., Jr. (SM)
Goodman, H. (A)
Goodrich, H. C. (A)
Hermeling, G. C., Jr. (A)
Holshouser, J. R., Jr. (A)
Keefe, J., Jr. (A)
Korman, N. I. (SM)
Lewis, E. S. (A)
Lewis, J. R. (A)
Linden, D. A. (A)
Matson, L. E., Jr. (A)
Meeker, W. F. (M)
Neubauer, J. R. (M)
Obenland, D. K. (A)
Ohler, A. E. (A)
Pan, W. Y. (SM)
Pettengill, G. W. (M)
Phillips, L. B. (M)
Post, D. B. (A)
Riser, C. R. (A)
Roe, J. H. (SM)
Selby, E. O. (VA)
Smith, F. E. (A)
Stupp, R. W. (VA)
Talmage, F. E. (SM)
Tate, J. B. (M)
Thomas, L. P., Jr. (A)
Turner, A. H. (VA)
Umbach, L., Jr. (A)
Weise, D. S. (A)
White, R. J. (A)
Wittenburg, C. W. (A)
Wolcott, R. G. (A)
Wolf, L. J. (SM)
Woodward, B. J. (VA)

Colonia
Stultz, L. R. (M)

Convent Station
Ong, F. C. (SM)

Cranbury
Applegate, H. E. (A)
Forgue, S. V. (M)
Morgan, J. M. (M)
Shankweiler, R. G. (VA)

Cranford
Alger, P. B. (A)
Blackman, R. B. (A)
Blair, G. H. (A)
Lakatos, E. (SM)
Rathje, E. (A)
Stewart, J. A. (A)
Sullivan, H. J. (M)
Taris, C. M. (A)
Williams, J. B., Jr. (A)

Cream Ridge
Chambers, F. T., III (A)

Cresskill
West, J. L. (A)

Deal
Ference, M., Jr. (SM)
Hunt, L. E. (SM)
Rose, C. F. P. (SM)

Delanco
Potter, E. H. (SM)

Denville
Backer, L. A. (VA)
Christensen, H. (M)
Curtice, J. D. (A)
Dewar, W. (A)
Eells, M. M. (SM)
Gilbert, E. A. (M)
Gissler, F. E. (M)
Lyon, R. S. (M)
Molloy, C. T. (SM)
Nebel, C. N. (A)
Peterman, W. G. (VA)
Porter, E. A. (A)
Vanek, L. J. (VA)

Dover
Harris, J. R. (M)
Rennenkampf, L. J. (M)
Widenor, P. E., Jr. (A)
Wilde, A. E., Jr. (A)

Dumont
Apfel, G. J. (A)
Deerhake, W. J. (A)
Gillen, R. G. (A)
Martin, S. J. (A)
Oesterle, A. G., Jr. (A)
Prior, T. K. (A)
Reinecke, H., Jr. (A)
Sundberg, A. A. (A)

Dunellen
Lamphear, G. (A)
Lautenberger, H. W. (A)

East Orange
Arams, F. R. (A)
Aster, A. K. (A)
Atran, L. (A)
Bartholomew, C. Y., Jr. (A)
Beckers, A. E. (M)
Bemis, E. W. (M)
Bondy, M. (A)
Boyd, R. C. (A)
Busby, J. W. (A)
Carlin, H. J. (SM)
Cherry, S. J. (SM)
Cobb, W. A. (M)
Conrad, T. E., Jr. (M)
Drazy, E. J. (A)
Drosback, E. A. (A)
Erstad, J. (A)
Evans, P. H. (F)
Felsenheld, R. A. (M)
Fultz, K. E. (A)
Gawler, H. C. (SM)
Geiss, G. K., Jr. (A)
Gennrich, A. (A)
Gifford, J. S. (A)
Grandmont, P. E. (M)
Gray, F. (A)
Hansen, J. A. (A)
Hayman, W. H. (A)
Hess, R. C. (A)
Jarmick, R. J. (A)
Johnson, R. L. (M)
Keim, F. J., Jr. (A)
Kendall, B. W. (SM)
Knochel, W. J. (VA)
Koch, D. G. (A)
Laube, O. T. (VA)
Lindon, J. (A)
Lundstrom, A. A. (SM)
Macalpine, W. W. (SM)
McCarroll, A. K. (A)
McCarroll, J. F., Jr. (A)
McCorry, J. R. (A)
McNall, J. W. (SM)

Meyers, S. T. (SM)
Misenheimer, H. N. (SM)
Mitchell, J. K. (SM)
Morris, R. M. (A)
Morrow, H. W. (M)
Mulligan, J. H., Jr. (M)
Newman, R. J. (SM)
Padalino, J. J. (M)
Rice, S. O. (SM)
Rose, G. M., Jr. (SM)
Sandretto, P. C. (SM)
Smith, H. H. (M)
Spencer, M. C. (VA)
Stephenson, H. L. (A)
Stiles, M. G. (A)
Sutton, J. C., Jr. (A)
Van Iderstine, A. (A)
Webb, C. E. (A)
Weber, L. A. (A)
Weden, C. V., Jr. (A)
Willson, F. E. (A)

East Paterson
Abbenhouse, R. P. (M)
Cramer, L. F. (A)
Foerster, W. (A)
Franzel, I. H. (A)
Hesse, H. R. (M)
Hoffman, P., Jr. (A)
Marx, E. A. (A)
Ruston, J. (M)
Schacher, D. L. (A)
Schmidt, C. R. (M)
Van Vechtan, R. K. (A)
Warren, H. B. (A)

East Rutherford
Kesgen, E. W. (A)

Eatontown
Albright, A. R. G. (M)
Bady, I. (A)
Blutman, E. (A)
Budenkaye, A. C. (M)
Butler, H. (M)
Castellini, N. R. (A)
Epstein, M. (A)
Fox, A. G. (SM)
Giacoletto, L. J. (SM)
Gikow, E. (A)
Glassman, S. (M)
Gordon, L. (M)
Gruol, J. W. (M)
Justus, J. R. (A)
Morris, M. M. (SM)
Occhlogrosso, T. (M)
Rand, A. (M)
Ribe, M. L. (A)
Robbins, T. N., Jr. (A)
Sharki, P. (M)
Siderman, J. A. (M)
Thompson, J. M. (M)
Whitten, C. L. (A)
Winer, J. D. (M)

Edgewater
Gonzalez, V. M. (A)

Elberon
Betts, P. H. (SM)
Dale, G. V. (VA)
Gerber, E. A. (A)
Goodall, W. M. (F)
Gould, W. B., III (A)
Hatkin, L. (A)
Kerwien, A. E. (SM)
Martin, B. (A)
Moss, H. (A)
Newman, P. (M)
Schafer, J. P. (SM)
Schlaack, N. F. (SM)
Sheftelman, E. H. (A)
Sussdorff, R. R. (M)
Woodworth, J. D. (A)
Wynne, W. M. (VA)
Yamins, H. G. (M)
Zeitz, A. (SM)

Elizabeth
Abrahamovsky, J. J. (A)
Blaisdell, W. C. (SM)
Eichel, J. H. (SM)
Frank, L. H. (A)
Greenberg, N. S. (A)
Harkins, P. B. (SM)
Hold, H. W. (A)
Kahant, C. G. (A)
Nelson, D. E. (M)
Pappas, N. L. (A)
Peterson, T. A., Jr. (M)
Sable, A. J. (A)
Samolonis, A. T. (A)
Schrader, L. W., Jr. (A)
Singer, C. H. (SM)
Walsh, L. (VA)

Endicott
Magnani, P. L. (A)

Englewood
Anick, G. (A)
Cramer, R. A. (A)
Guy, R. F. (F)
Hillman, L. (A)
Marshall, J. R. (A)
Miller, W. F. (A)
Saliba, G. J. (SM)
Thomas, E. R. (VA)

Englewood Cliffs
Savory, W. A. (M)

Erlton
Lindenberg, E. C. (A)
Mechler, E. A. (M)
More, C. C. (VA)
Pratt, D. (VA)
Price, J. F. (M)

Essex Fells
Lederer, E. A. (SM)

Fair Haven
Algor, M. M. (A)
Aronoff, M. (A)
Berg, R. A. (M)
Chappell, J. F. (A)
Crawford, A. B. (SM)
Fast, S. (A)
Harbridge, E. A. (A)
Hessel, J. (SM)
Ohl, R. S. (SM)
Priebe, F. K. (M)
Puzio, P. S. (A)
Robertson, S. (SM)
Sharpless, W. M. (SM)
Van Deusen, G. L. (SM)

Fair Lawn
Baasch, H. C. (M)
Bradburd, E. (A)
Bradford, D. C. (A)
Browne, R. (A)
Buyer, E. M. (A)
Diepeveen, N. (A)
Fischer, L. O. (VA)
Heiser, W. H. (A)
Hill, E. N. (VA)
Howitt, G. (A)
Jacobson, N. (A)
Jochlin, N. C. (A)
Kuras, H. F. (A)
Lafferty, R. E. (M)
Martin, D. (VA)
Moskowitz, S. (M)
Nuttall, A. F. (A)
O'Meara, W. J. (A)
Scarr, H. F. (SM)
Silver, M. (A)
Sprinkle, M. C. (A)
Stein, E. (A)

Fanwood
Anderson, F. B. (SM)
Bollman, J. H. (SM)
Cottrell, B. P. (A)
Jordan, H. G. (A)
Kemp, T. H. (A)
Sykes, R. A. (SM)
Wise, W. H. (SM)

Far Hills
Trent, R. L. (M)

Farmingdale
Burke, M. H. (A)
Stoeckert, E. D. (A)

Florham Park
Bostwick, L. G. (VA)
Brown, C. H. (A)
Littell, J. G. (A)
Thatcher, W. H. (M)

Fort Lee
Davies, R. J., Jr. (A)
Franz, K. A. (A)
Frisch, F. W. (A)
Gannett, E. K. (A)
Grant, M. S. (A)
Heir, D. H. (A)
Kerver, N. E. (A)
Stansfield, F. H. (A)

Fort Monmouth
Beasley, W. A. (SM)
Bernstein, H. E. (SM)
Meyer, R. G. H. (SM)
Robertson, G. R. (A)

Freehold
Bastian, C. W. (A)
Buck, D. T. (A)
Chasinowitz, G. (A)
Fishbein, S. B. (A)
Katz, S. (A)
Lawn, F. (A)
Quinn, W. H. (A)

Garfield
Di Stadio, D. (A)
Guros, F. S. (A)
Sammon, A. C. (A)
Sudia, A. T. (A)

Gibbsboro
Schwartz, R. F. (A)

Gillette
Kannenberg, W. F. (SM)
Rystedt, T. (M)

Glen Ridge
Baldwin, M. W., Jr. (F)
Black, D. M. (SM)
Brubaker, P. M. (A)
Dart, H. F. (SM)
Dorff, L. A. (SM)
Hall, R. E. (VA)
Hoffman, R. B. (SM)
Hopgood, R. C. (A)
Long, M. B. (VA)
Olsen, E. U. (VA)
Reveal, P. A. (M)
Ritter, E. W. (SM)
Schenck, A. K. (M)
Seufert, F. J., Jr. (A)
Smith, H. D. (A)
Terry, C. B. (A)
Thayer, G. N. (F)

Glen Rock
Becken, E. D. (M)
Clark, L. E. (VA)
Hagmann, N. (VA)
Kandoian, A. G. (F)
Reynolds, J. H. (M)
Ringer, R. L., Jr. (M)
Sanger, R. B. (A)
Schwerin, P. (SM)
Thomas, H. E. (SM)
Vehling, R. H. (VA)

Gloucester
Hatchwell, J. A. (A)

Gloucester City
MacDermott, J. G. (A)

Gloucester Heights
King, H. E. (A)

Great Notch
Godley, P. F., Jr. (A)
Holtz, R. F. (SM)
Shaw, J. L. (A)

Guttenberg
Pramshefer, T. W. (VA)

Hackensack
Chaffee, J. G. (SM)
Chin, E. (A)
Elwell, H. G., Jr. (A)
Honeiser, V. P. (A)
Lindemann, C., Jr. (A)
Lupo, F. J. (A)
McKenzie, A. A. (SM)
Meyerhoff, A. J. (A)
Reed, S. I. (A)
Robertson, C. B. (M)
Schentes, M. J. (A)
Siganowick, J. (A)

Hackettstown
Dinzl, R. A. (A)
Ebersol, E. T., Jr. (M)

Haddonfield
Achenbach, J. C. (A)
Aldous, C. N. (A)
Arbuckle, F. M. (M)
Arndt, R. B. (A)
Bailey, R. E. (M)
Beers, G. L. (F)
Blodgett, E. D. (SM)
Boerner, T. J. (SM)
Brandt, M. M. (M)
Caron, E. J. (A)
Carrell, R. M. (A)
Chittick, K. A. (SM)
Cochran, S. W. (SM)
Cole, D. D. (SM)
Coleman, J. B. (F)
Corrington, M. S. (SM)
Cramer, R. E., Jr. (M)
Cunningham, O. B. (SM)
Dennison, R. C. (A)
Deuitch, D. E. (A)
Fricke, R. H. (A)
Gehman, J. B. (M)
Glick, J. (A)
Goodwin, W. V. (A)
Grever, J. L. (A)
Gunther, C. A. (SM)
Haining, L. E. (A)
Harris, W. A. (A)
Haynes, H. E. (M)
Hobbs, L. C. (A)
Hoffman, W. H. (VA)
Howery, R. W. (A)
Hubbard, B. L. (VA)
Hucke, H. M. (SM)
Iden, C. C. (A)
Johnson, E. O. (SM)
Jones, L. F. (A)
Joyner, A. A. (SM)
Kalkman, E. C. (A)
Kerfoot, B. P., Jr. (A)
King, R. E. (A)
Kolar, R. F. (A)
Lapidos, R. W. (A)
Lasby, R. O. (A)
Lewis, C. M. (A)
Lind, A. H. (A)
Love, J. E. (VA)
Luddy, E. N. (M)
Lyndon, W. L. (SM)
Mathwich, H. R. (A)
McGaughey, P. C. (M)
Merle, C. W. (A)
Murakami, T. (M)
Newman, R. J. (A)
Phelps, G. H. (SM)
Plouffe, R. L., Jr. (A)
Pyle, M. O. (A)
Reed, P. B. (M)
Robinson, J. E. (A)
Sands, W. F. (SM)
Schrader, H. J. (SM)
Scull, W. E., Jr. (M)
Spielman, H. (A)
Starner, C. J. (A)
Stone, F. B. (SM)
Sublette, I. H. (A)
Sutherland, E. F. (A)
Taylor, J. P. (A)
Terrell, J. A. (SM)
Tissot, P. T., Jr. (A)
Trouant, V. E. (SM)
Turner, R. R. (M)
Watson, S. H. (SM)
Welsh, R. R. (SM)
Welsher, C. E. (VA)
Wentworth, J. W. (A)
Whatley, R. L. (M)
Wheeler, B. F. (M)
Widmann, F. W. (A)
Williams, R. J., III (A)
Willman, R. C. (SM)

Haddon Heights
Adler, B. (A)
Carlson, D. J. (A)
Darnell, W. E. (A)
Duffin, J. D. (A)
Ferber, L. W. (A)
Franke, J. L. (SM)
Gunter, D. L. (M)
Halstead, W. K. (A)
Latham, N. D. (A)
McKee, D. M. (A)
McMorrow, C. F. (A)
Parker, J. R. (A)
Pewitt, B. D. (A)
Roys, H. E. (SM)
Stanko, E. (VA)

Hamilton Square
Reed, R. D. (A)

Hammonton
Campanella, M. J. (A)

Harrington Park
McElroy, G. E. (M)

Harrison
Bitinas, J. (A)
Brown, B. B. (A)
Poch, S. (M)

Hasbrouck Heights
Cimorelli, J. T. (SM)
Franklin, L. W. (SM)
Green, N. H. (A)
Hochheiser, J. S. (A)
Weiner, M. J. (VA)

Haskell
Ryan, H. J. (M)

Haworth
Osborn, P. H. (VA)

Hawthorne
Berkley, C. (A)
Petry, C. B. (A)

Highland Park
Andreasen, I. (A)
Molony, D. A. (A)
Petrucci, F. A. (A)
Potter, J. L. (SM)

Highlands
Rohrle, T. A. (A)
Weiss, R. A. (SM)

Hillsdale
Dimond, J. (A)
Fingerle, W., Jr. (SM)
Gormley, R. S. (SM)
Marriner, A. W. (A)
Marsh, C. O., Jr. (A)
Snow, J. E. (A)

Hillside
Irwin, R. P. (A)
Levy, L. G. (A)
Wright, D. S. (A)

Hoboken
Hertzberg, A. (A)
Neitzert, C. (A)

Hohokus
Harrison, A. E. (M)
Lamb, H. A. (A)
Markus, J. (M)
Saul, E. R. (A)

Holmdel
Bania, S. E. (A)
Burlingame, B. O. (SM)

Hopatcong
Chambers, A. B. (A)
Johnson, J. R. (M)

Hopewell
Weston, L. V., Jr. (A)

Hudson Heights
Hughes, H. K. (M)

Interlaken
Todd, W. (M)

Irvington
Drexler, J. (A)
Elbert, C. H. (A)
Gegenheimer, R. F. (A)
Goidshine, A. O. (A)
Gropp, B. P. (A)
Jordan, C. J. (A)
Kosmaczewski, I. (A)
Mitchell, A. V. (A)
New, W. J. (A)
Tulchin, H. (A)
Zaepfel, C. G. (A)

Jersey City
Bernhard, H. A. (A)
Brogan, J. M. (A)
Brown, G. J. (A)
Deichert, R. W. (A)
Durstewitz, D. (A)
Fromer, M. (A)
Genser, A. (A)
Goldfarb, S. (A)
Higgins, L. A. (A)
Howell, W. J. (SM)
Kovarik, H. (A)
Lindner, N. J. (A)
Lolterman, L. (A)
Narze, J. S. (A)
Normando, N. J. (A)
Ockene, N. J. (A)
Olin, I. D. (A)
Potocki, J. A. (A)
Putt, D. R. (A)
Raffel, L. (A)
Sielski, A. T. (A)
Smith, W. M. (VA)
Uminowicz, A. J. (A)
Weiss, S. I. (SM)
Wormcke, W. (M)
Zegers, T. A. (A)

Kearny
Crawford, D. J. (A)
Helwig, W. J. (A)
Jacobs, J. (A)
Kaczynski, R. F. (A)
Lalkevich, A. (A)
Percival, W. R. (M)

Keyport
Austin, F. H. (A)
Bernard, J. L., Jr. (VA)
Hindin, A. (A)

Kingston
Herold, E. W. (F)

Lake Hiawatha
Bremer, H. A. (VA)
Gebhardt, J. W. (A)

Lakehurst
Galloway, J. E. (A)

Lakewood
Gross, A. S. (M)
Lerner, A. M. (A)
Rosen, M. (A)

Landing
Grissler, H. W. (M)

Laurelton
Vorwerk, F. A. (A)

Lawrenceville
Kihn, H. (SM)

Leonia
Ackerman, B. F., Jr. (A)
Biosca, L. F. (VA)
Brooke, A. W. (A)
Burger, F. J. (A)
Dietsch, C. G. (SM)
Sargeant, C. E. (VA)

Liberty Corner
Hibbert, J. J. (A)

Lincoln Park
Hudack, J. M. (SM)
Keefe, O. A. (A)
Young, C. H. (SM)

Linden
Kardauskas, E. (A)
Osburn, C. M. (M)
Riley, G. B. (A)

Little Falls
Borgeson, P. W. (A)
Budelman, F. T. (A)
Kocan, J. (A)
Morris, G. F. (A)
Talamini, A. J. (SM)

Little Ferry
Trenn, A. L. (A)

Little Silver
Borgeson, C. A. (SM)
Bower, G. G. (M)
Brueckmann, H. L. (SM)
Graig, L. H. (A)
Cushman, J. K. (A)
Garoff, K. (A)
Harrison, D. J. H. (A)
Havel, J. M. (A)
Herber, J. C. (SM)
Jensen, A. M. (M)
Kelly, R. L. (SM)
Klenk, L. M. (SM)
Lewis, W. D. (A)
Lowry, L. R. (SM)
Meyer, H. F. (SM)
Mond, L. I. (VA)
Perley, A. L. (A)
Poteet, D. P. (VA)
Rubin, I. (M)
Senn, G. F. (SM)
Sharp, C. E. (A)

Livingston
Bareiss, M. (SM)
Blikken, W. A. (A)
Felker, J. H. (A)
Kirkpatrick, D. N. (SM)
Mennie, J. H. (M)
Nordlin, H. G. (A)
Ports, E. G. (SM)
Safford, F. J. (SM)
Scott, R. G. (A)
Sherman, C. M. (A)
Steers, W. F. (A)
Ussery, P. W. (A)
Ward, S. A. (A)

Locust
Massell, E. (M)

Lodi
DiMaria, C. P. (A)
Meyer, R. W. (A)

Long Branch
Anderson, B. S. (SM)
Arons, E. L. (A)
Barr, H. (A)
Bedrosian, S. D. (A)
Beizer, H. H. (M)
Bennett, H. S. (SM)
Bracken, J. R. (A)
Braun, M. (A)
Bryan, J. F. (A)
Burkhard, H. F. (A)
Chernow, M. B. (M)
Coleman, A. H. (A)
Davis, H. (SM)
Ducore, H. (M)
Dwin, D. (A)
Emurian, A. D. (SM)
Freedman, W. (A)
Friedman, H. (M)
Gatkin, T. E. (VA)
Goldberg, W. P. (M)
Goubau, G. J. E. (A)
Gubin, L. L. (A)
Guenther, R. (M)
Guttwein, G. K. (A)
Inslerman, H. E. (VA)
Jacoby, D. L. (M)
Kaplan, J. (A)
Kazan, B. (A)
Malkin, S. (VA)
Marks, W. S., Jr. (SM)
Martin, J. R. (A)
McKenley, R., Jr. (A)
Mencher, H. (A)
Miller, L. (SM)
Pomerantz, M. (A)
Riehs, R. C. (SM)
Search, R. W. (A)
Shirley, T. L. (A)
Trauben, W. (A)
Tykulsky, A. (A)
Vieweger, A. L. (A)
Wolfskill, J. R. (M)
Wolinsky, A. (A)

Lyndhurst
Friberg, V. (A)
Gilmore, A. C., Jr. (A)
Petrina, R. J. (A)
Robinson, G. D. (A)
Sichak, W. (M)

Madison
Abraham, L. G. (SM)
Barney, H. L. (SM)
Bonanno, J. L. (VA)
Bullington, K. (A)
Burnett, C. E. (SM)
Carbrey, R. L. (M)
Carter, H. T. (M)
Clark, O. (M)
D'Heedene, A. R. (SM)
Ellis, B. T., Jr. (SM)
Ford, W. W. (A)
Hammann, P. L. (SM)
Holmes, D. B. (A)
Hough, R. R. (SM)
Howard, E. J. (SM)
Livera, A. L. (M)
Marble, F. G. (SM)
McRae, J. W. (F)
Morrison, L. W. (VA)
Nowell, R. E. (A)
Packard, G. N. (M)
Phillips, W. E., Jr. (M)
Potter, R. K. (F)
Roetken, A. A. (SM)
Ruckelshaus, J. G. (SM)
Schmied, J. W. (VA)
Shepard, F. H., Jr. (A)
Skellett, A. M. (SM)
Smith, J. W. (SM)
Talpey, R. G. (SM)
Thomas, B. J. (M)
Thomas, D. E. (SM)
Tucker, R. S. (SM)

Magnolia
Foley, T. U. (A)
Hibbs, R. J. (A)

Mahwah
Tiedeman, I. B., Jr. (A)

Manasquan
Cline, D. E. (M)
Wagner, R. L. (A)
Romano, G. F. (A)
Skirrow, J. F. (SM)

Manasquan Beach
Baganz, A. (A)

Manville
Pontus, A. M. (A)

Maple Shade
Warren, M. V. (A)

Maplewood
Alexander, A. A. (A)
Almquist, M. L. (A)
Bailey, A. (F)
Bailey, B. (A)
Barkley, H. F. (VA)
Baulch, E. L. (A)
Bosshart, R. F. (A)
Bown, R. (F)
Carpenter, L. B. (A)
Clark, A. B. (SM)
Cunningham, F. W. (SM)
Dickey, D. W. (M)
Fishman, S. (SM)
Frils, R. W. (SM)
Hazeltine, A. (F)
Helfrich, J. H. (A)
Humphrey, H. C. (VA)
Johnson, J. B. (F)
Keith, C. R. (A)
Meola, T. D. (A)
Mommo, E. J. (VA)
Oswald, A. A. (F)
Prosser, T. C. (A)
Puder, R. K. (A)
Reichle, W. E. (SM)
Strieby, M. E. (SM)
Tinus, W. C. (F)
Vance, H. C. (SM)
Worne, B. E. (M)
Youngstrom, N. C. (VA)

Marlton
Kentner, C. D. (VA)
Koch, W. R. (SM)

Martinsville
King, F. H. (A)

Matawan
Baumann, D. A. (A)
Chartoff, M. (A)
Crawford, R. D. (A)
Fisher, W. W. (A)
Lavole, S. D. (A)
Lundy, C. C. (SM)
Oster, F. J. (A)
Ronson, H. T. (A)

Maywood
Babcock, W. E. (A)
Benenson, C. A. (A)
Bruggeman, J. T. (A)
Coggeshall, I. S. (F)
Fichti, R. R. (A)
Fitzmaurice, W. A. (A)
Honig, A. R. (A)
Koechel, W. P. (VA)
Koehler, J. A. (A)
Lempert, I. E. (M)
Phelan, T. H. (SM)
Seibert, J. L. (VA)

Mendham
Brunet, M. (SM)
Donald, D. D. (SM)
Martin, J. F. P. (A)
Willis, F. H. (VA)

Menlo Park
Arveschoug, N. F. (A)
Schnebbe, A. D. (A)

Merchantville
Buder, S. H. (A)
Combellack, E. M. (M)
Conron, W. H. (SM)
Denton, B. E. (SM)
Dunn, T. E. (A)
Hamm, N. G. (M)
Hopkins, A. R. (SM)
Lappin, L. S. (SM)
Lawrence, W. L. (VA)
Luther, A. C., Jr. (A)
Marsh, D. R. (M)
McKinney, R. S. (A)
Oman, N. J. (VA)
Patterson, E. B. (SM)
Petry, G. F. (VA)
Sanborn, J. W. (SM)
Staton, M. G. (M)
Story, T. H. (SM)
Swierczak, P. C. (A)
Thompson, L. E. (SM)
Walter, J. C. (SM)
Washburn, E. M. (SM)
Young, J. E. (SM)

Metedeconk
Fox, N. S. (M)

Metuchen
Achard, F. H., Jr. (A)
Dranetz, A. (A)
Hunter, P. B. (SM)
Kmosko, J. A. (A)
O'Reilly, J. P. (A)
Schiffmayer, G. F. (M)

Middlesex
Schreiber, O. P. (A)

Middletown
Hayes, F. A. (A)
Keen, H. J. (A)
Miller, S. E. (M)

Millburn
Bobeck, A. H. (A)
Freeman, R. H. (A)
Leef, G. R. (A)
Marks, R. L. (M)
Morris, R. M. (SM)
Newhouse, R. C. (SM)
Schaeffer, M. J. (A)
Schafer, E. W. (SM)
Stansel, F. R. (SM)

Millington
Cutler, C. C. (A)

Montclair
Busignies, H. (F)
Cavanagh, R. T. (A)
Charton, P. W. (A)
Dickson, D. C., Jr. (A)
Fulmer, N. C. (M)
Gabriel, E. Z. (A)
Gage, W. M. (A)
Gilbert, R. W. (M)
Haynes, H. S. (A)
Hobbs, J. (A)
Hooven, M. D. (VA)
Kauffman, C. W. (A)
Lane, F. A. (VA)
Leighton, H. W. (A)
McCann, M. J. (A)
Mouromtseff, I. E. (F)
Muller, C. R. (A)
Myers, M. C., Jr. (M)
Okress, E. C. (SM)
Seidler, R. L. (A)
Siemens, R. H. (SM)
Sprague, V. G. (VA)
Wendell, E. N. (F)
Wheeler, C. M. (SM)
Yamagami, Y. (A)

Moorestown
Baker, H. F. (A)
Ballentine, E. C. (SM)
Batsel, M. C. (F)
Bright, D. C. (SM)
Bucher, T. T. N. (A)
Duszak, H. (M)
Endres, R. O. (A)
Gillespie, H. C. (A)
Herbst, P. J. (SM)
Palm, K. E. (A)
Poch, W. J. (SM)
Rettenmeyer, F. X. (F)
Schmit, D. F. (F)
Stewart, W. (SM)
Vance, D. H. (VA)
Wilson, R. E. (A)

Morganville
Barrett, L. C., Jr. (A)

Morris Plains
Engstrom, O. D. (SM)
Freeman, W. C., Jr. (SM)
Geils, J. W. (M)
Hollenberg, A. V. (SM)
McLay, J. (A)
McWhan, B. (A)
Mraz, W. L. (A)
Rogers, R. (A)
Townley, R. C. (M)
Trecker, J. M. (A)

Morristown
Anderson, A. B. (A)
Apgar, R. R., Jr. (A)
Bodle, D. W. (M)
Braga, F. J. (M)
Chruney, M. (A)
Cook, J. H. (VA)
D'Albora, J. B., Jr. (SM)
De Motte, F. E. (A)
Dobler, V. W. H. (A)
DuBois, D. A. (A)
Enright, D. J. (A)
Filmer, W. L. (VA)
Follingstad, H. G. (A)
Gibson, J. W. (A)
Gillson, M. H. (SM)
Giloth, P. K. (A)
Hagelbarger, D. (A)
Herr, F. J. (A)
Jacobs, O. B. (A)
Johnson, G. D. (A)
Kammerer, F. W. (VA)
Kellogg, W. M. (SM)
King, R. A. (M)
Krallo, P. (A)
Lang, H. J. (A)
Leighton, J. (M)
Leaser, T. S. (SM)
Lesser, W. J. (A)
Mason, D. R. (A)
Mattingly, R. L. (M)
Michaels, S. E. (SM)
Miessner, B. F. (F)
Morrison, H. (SM)
Oliver, B. M. (M)
Olmstead, N. C. (SM)
Pierson, V. F. (A)
Shannon, C. E. (F)
Slade, B. N. (M)
Simkins, Q. W. (A)
Simons, B. H. (A)
Sinclair, R. O., Jr. (A)
Thacker, W. E. (A)
Thayer, P. H., Jr. (M)
Thulin, C. W. (A)
Ulrich, V. K. (SM)
Van Beuren, J. M. (A)
Wall, V. W. (A)
Weinberg, N. L. (A)
Welber, I. (A)
Wheeler, G. W. (A)
Winternitz, T. W. (A)

Mount Bethel
Haydu, G. K. (A)

Mount Ephraim
Oser, E. A. (SM)
Taylor, J. M., Sr. (M)

Mount Gilead
Johnson, V. L. (A)

Mount Holly
Colby, N. C. (A)
Million, J. W., Jr. (SM)
Westcott, H. H. (A)
Williams, E. A. (A)

Mountain Lakes
Barstow, J. M. (SM)
Beck, R. J. (A)
Black, W. L. (SM)
Campbell, M. E. (M)
Ford, G. T. (A)
Gannett, D. K. (SM)
Houck, H. W. (SM)
Hughes, R. W. (M)
King, P. B., Jr. (VA)
Krist, H. K. (SM)
McCouch, G. P. (A)
Nelson, E. L. (F)
Nexon, V. J. (A)
Nordstrom, B. H. (SM)
Noyes, A., Jr. (SM)
Osterland, E. H. (SM)
Parkes, A. W., Jr. (SM)
Phillipps, R. J. (SM)
Tyzzer, H. J. (SM)
Webster, F. D. (SM)
Wilson, J. R. (SM)

Mountainside
Anderson, A. E. (M)
Anderson, T. N. (A)
Browne, G. W. (M)
Depp, W. A. (SM)
Ingalls, D. (A)
Kniazuk, M. (A)
Sears, P. R. (M)

Mountain View
Coan, E. M. (A)
Dilatush, E. (M)
Lathrop, L. L. (A)

Mullica Hill
Clement, B. R. (A)

Murray Hill
Anderson, R. E. (A)
Bode, H. W. (SM)
Chick, A. J. (SM)
Eglin, J. M. (A)
Fairweather, B. A. (A)
Farley, B. G. (A)
Fisher, H. J. (SM)
Flood, J. D. (A)
Gray, M. C. (A)
Ingram, S. B. (SM)
Jensen, A. G. (F)
Johanson, A. E. (M)
Marrison, W. A. (SM)
McCoy, J. C. (SM)
McNally, J. O. (SM)
Munn, A. J. (A)
Myers, P. B. (A)
Stevens, R. R. (A)
Townley, R. K. (A)
Wrathall, L. R. (A)

Neptune
Ackerman, J. C. (M)
Armstrong, R. W. (VA)
Bert, J. E. (A)
Danko, S. F. (M)
Evers, J. T. (VA)
Frevert, A. W. (M)
Holtum, A. G., Jr. (A)
Hull, J. F. (M)
Mudgett, A. H. (A)
Schiff, W. J. (A)
Smith, H. A. P. (A)
Stodola, E. K. (SM)
Swingle, D. M. (M)
Terrell, J. M., Jr. (A)
Woodyard, O. C. (M)

Nesbanic
Kuthe, H. K. (VA)
Morton, J. A. (SM)

Netcong
Reichard, W. C. (VA)

Newark
Abrams, H. (A)
Acosta, F. B. (A)
Affelder, C. (M)
Bernstein, B. (A)
Bizon, M. J. (A)
Block, F. C. (A)
Block, R. C. (A)
Carter, J. M. (A)
Cohen, S. (SM)
Cook, A. W. (A)
Cunniff, T. W. (M)
Day, J. N., Jr. (A)
Denney, J. M. (A)
Faughnan, J. F. (A)
Feigenbaum, I. A. (A)
Giordano, A. F. (A)
Gladden, C. J. (A)
Glick, C. L. (A)
Goldberg, D. L. (A)
Goodwin, W. N., Jr. (SM) (L)
Grayson, E. L. (M)
Haeseler, P. R. (A)
Hautzik, R. M. (A)
Heberling, W. W., Jr. (A)
Hehm, R. J. (A)
Henry, T. J. (SM)
Hoagland, K. A. (A)
Holdman, M. (A)
Houghton, H. V. (A)
Jennings, J. T. (A)
Kelso, R. J. (A)
King, R. L. (A)
Klappholz, L. (A)
Klein, M. (A)
Koppelson, R. (A)
Korman, G. (A)
Krause, C. K. (VA)
Kups, E. F. (A)
Lamb, F. X. (VA)
Lebednik, M. A. (A)
Meier, W. L. (VA)
Meyerson, M. (A)
Nagy, J., Jr. (A)
Nahay, L. P. (A)
Newman, L. (A)
Osiecki, C. J. (A)
Penk, C. (A)
Ranger, R. H. (F)
Salerno, J. (A)
Schnitzer, E. (A)
Smith, P. H. (SM)
Sussman, E. B. (M)
Treuhaft, M. A. (A)
Tutty, J. E. (A)
Wallenstein, J. P. (A)
Warren, J. E. (M)
Widzemok, W. (A)

New Brunswick
Antonevich, J. N. (A)
Bocchieri, A. J. (A)
Borkan, H. (A)
Butenko, J. W. (A)
Fich, S. (M)

Fimmel, R. O. (A)
Holmes, D. D. (A)
Koch, J. G. (A)
Longo, C. V. (A)
Meyer, R. C., Jr. (A)
Meyerhoff, A. A. (A)
Olive, G. A. (A)
Parr, H. M. (A)
Rhodes, R. N. (A)
Rosenthal, L. (A)
Ubry, L. E., Jr. (A)
Williams, R. L. (A)

Newfield
Mullen, C. V. (A)

New Milford
Chadney, H. B. (A)
Frye, F. X. (A)
Harris, G. D. (A)
Labagh, E. L. (A)
Lippke, J. A. (M)
MacDermid, B. W. (A)
Patremio, S. R. (M)
Reich, P. J. (M)
Volger, W. A. (A)

New Providence
Borden, C. C., Sr. (M)
Cisne, L. E. (A)
Ferrar, R. C. (SM)
Harvey, F. K. (A)
Hunter, W. C. (M)
Kelley, R. A. (S)
Kinzer, J. P. (SM)
Schimpf, L. G. (SM)
Thatcher, T. W., Jr. (A)
Thomas, G. B., Jr. (SM)

Newton
Weaver, P. F. (A)

Nixon
Unger, R. J. (A)
Zapotocky, A. C. (M)

North Arlington
Balter, S. A. (A)
Bruning, J. M. (M)
Markscheid, E. (A)
Mindes, A. S. (A)
Neuman, G. J. (A)

North Bergen
Feucht, R. E. (A)
Horner, R. G. (A)
Kuhnapfel, R. H. (A)
Lo, A. W. (A)
Nasto, S. N. J. (A)
Perlis, H. J. (A)
Sanborne, J. M. (A)
Smith, F. C. (A)
Wolter, H. R. (A)

North Branch
Willison, R. E. (A)

North Caldwell
Baldwin, W. O. (A)
Clark, T. G. (A)
Goldman, H. (A)
Grieg, D. D. (SM)

North Hackensack
Gumaer, H. (A)
Hammerich, H. A. (A)

North Merchantville
Obert, M. J. (SM)

North Plainfield
Deeley, P. M. (SM)
Eggerding, H. B. (A)
Noble, R. B. (A)
Russo, L. J., Jr. (A)
Sharp, W. O. (M)
Talley, T. J., III (M)
Vergon, T. F. (A)
Wahl, A. (A)
Warren, C. W. (A)

Norwood
Brick, F. R. (SM)
Gunther-Mohr, G. R. (A)
Vieth, W. G. (A)

Nutley
Alexander, B. (M)
Allison, J. L. (SM)
Bailey, R. S. (SM)
Bondy, J. O. (A)
Brett, H. M. (M)
Bryant, J. H. (M)
Bucher, F. X. (A)
Burroughs, G. (VA)
Cater, J. R. (A)
Clavier, A. G. (F)
Davis, R. C. (SM)
De Vany, B. V. (A)
Dishal, M. (SM)
Dlouhy, F. W. (M)
Evans, N. L., Jr. (A)
Gray, R. E. (VA)
Green, A. (A)
Gronberg, H. C. (VA)
Hamilton, G. E. (SM)
Happe, W. H., Jr. (A)
Harris, W. A. (SM)
Hulce, R. L. (A)
Johnson, W. C. (A)
Jones, M. A. (A)
Lohrenz, C. A. (A)
Lundburg, F. J. (A)
Magdeburger, P. E. (A)
Marchese, T. J. (SM)
Miner, W. A., Jr. (A)
Polyzou, J. (A)
Rogoff, M. (M)
Rutherford, R. E. (A)
Seideman, I. M. (A)
Shapiro, O. (M)
Stevens, F. J. (M)
Stone, E. W. (F)
Symonds, G. W. (M)
Troutman, J. E. (A)
Tyminski, W. V. (A)
Westbrook, E. P. (A)
Wickersham, W. H. (A)
Wing, A. K., Jr. (SM)
Wirth, C. H. (A)
Young, N. H., Jr. (SM)
Zaret, M. E. (SM)

Oaklyn
Beleskas, S. M. (A)
Boe, R. O. (A)
Crawford, R. D. (A)
Fiet, O. (SM)
Freeman, L. C. (A)
Kirkwood, L. R. (SM)
Scheldorf, R. D. (VA)

Oceanport
Day, J. L. (A)
Schnabolk, H. L. (A)

Oradell
Bemis, P. S. (A)
Brackett, H. H. (VA)
Schwartz, H. C. (A)
Yeutter, C. S. (A)

Orange
Baker, G. H. (A)
Burkhart, W. H. (A)
Closson, H. T. (A)
Del Vento, J. M. (A)
Gardner, P. S. (A)
Hardwick, A. H. (SM)
Kersta, L. G. (SM)
Martin, De Loss K. (SM)
Millman, S. (SM)
Nimmcke, F. E. (SM)
Noland, A. R. (A)
Shackelford, B. E. (F)
Suydam, C. H. (M)
Wohlert, A. M. (A)

Packanack Lake
Bentley, A. Y. (SM)
Brown, P. F. (M)
Fockler, W. G. (A)
Knoop, W. A., Jr. (M)
Wixson, F. C. (A)

Palisade
Andrews, E. (A)
Coppell, F. K. (A)
Schnoll, N. (A)

Palisades Park
Biamonte, O. A. (A)
Kuehn, R. L. (A)

Palmyra
Ringer, H. N. (A)
Waring, J. W. (A)
Woestman, J. W. (A)
Yewdall, G. E. (A)

Paramus
Braun, W. E. (A)
Deiss, E. W. (A)
Poarch, M. F. (A)

Park Ridge
Ecklund, E. E. (A)

Parsippany
Helm, H. A. (A)
Mehrbach, E. (M)
Petrich, L. G. (A)
Stanton, S. W. (VA)

Passaic
Brussel, E. H. (A)
Dalkiewicz, J. M. (A)
Debell, J. M., Jr. (A)
Dehoney, R. J. (A)
Faust, W. E. (A)
Gordon, J. P. (A)
Johnson, F. H. (A)
Maron, M. (M)
Murakami, P. K. (A)
Schildknecht, R. O. (A)
Stoj, F. R. (A)
Suszek, E. J. (A)
Van Savage, J. (A)
Yu, Y. P. (A)

Paterson
Barker, B. B., Jr. (A)
Biagi, A. D. (A)
Binneveld, H. A. J. (A)
Bryant, R. M., Jr. (A)
Geller, W. (A)
Goforth, J. L. (A)
Grabowsky, L. (A)
Grimes, W. M., Jr. (A)
Lome, J. B. (A)
Lucas, E. F. (A)
Mock, W. C., Jr. (M)
Norton, M. H. (A)
Petruska, P. C. (A)
Priest, R. B. (A)
Ransom, D. H. (M)
Rich, P. A. (A)
Seymour, H. A. (A)
Volpe, D. F. (A)
Wehner, J. H. (A)

Paulsboro
Michelson, H. J. (A)

Pennington
Fernsler, G. L. (SM)

Pennsauken
Bauer, J. A. (A)
Gihring, H. E. (SM)
Hobson, N. L. (A)
Katella, A. J. (A)
Lambert, V. L. (A)
Robins, B. W. (SM)
Uphoff, F. B. (A)

Penns Grove
Tipton, W. F. (M)

Perth Amboy
Garretson, T. A. (M)
Gumbs, J. (A)
Sher, H. (A)
Ullmann, M. A. (A)

Phillipsburg
Hill, C. A. (A)

Plainfield
Alston, W. H. (A)
Bauder, G. E. (A)
Boise, E. B. (A)
Bomberger, D. C. (VA)
Cocker, J. T. (A)
Cowperthwait, W. L., Jr. (M)
Coxhead, H. B. (SM)
Custer, C. J. (VA)
Edson, J. O. (SM)
Ingerson, W. E. (A)
Kelly, H. P. (A)
Larisch, R. W. (A)
Lund, N. (A)
Mentcher, I. (A)
Miller, R. A. (VA)
Saunders, H. M. (A)
Smith, A. E. (M)
Snyder, C. L. (A)
Ware, G. D. (A)

Point Pleasant
Scharmann, L. E. (A)

Pompton Lakes
Carlson, O. E. (M)
Hansen, R. K. (A)
Stone, F. C. (A)
Wachter, J. E. (A)

Pompton Plains
Arnold, A., Jr. (A)
Clough, R. F. (A)
Coffman, B. C. (M)
Hannell, F. D. (A)
Lowers, C. E. (M)
Muller, F. A. (A)
Palmer, R. C. (M)
Sayer, W. H. (A)
Thompson, R. D. (M)
Ware, P. (SM)

Preakness
Noll, J. W. (A)

Princeton
Alexander, H. R. (A)
Allen, H. C. (SM)
Allwine, H. S. (A)
Artzt, M. (VA)
Axeling, G. S. (A)
Baker, G. M. K. (M)
Barco, A. A. (SM)
Barnes, W. E. (A)
Barton, L. E. (SM)
Bashkow, T. R. (A)
Bedford, A. V. (F)
Behrend, W. L. (M)
Bliss, W. H. (SM)
Bond, D. S. (SM)
Braden, R. A. (VA)
Brinster, J. F. (M)
Brown, G. H. (F)
Burns, L. L., Jr. (M)
Burnside, D. G. (SM)
Burrill, C. M. (SM)
Carlson, W. L. (F)
Carpenter, M. M., Jr. (A)
Chandler, C. H. (SM)
Chandler, H. M., Jr. (M)
Christen, A. L. (A)
Clement, P. R. (A)
Cowan, E. J. (M)
Creager, F. L. (VA)
Davey, J. R. (A)
Dickey, E. T. (SM)
Dodge, S. W. (SM)
Donal, J. S. (SM)
Engstrom, E. W. (F)
Epstein, D. W. (SM)
Epstein, J. (SM)
Estrin, G. W. (A)
Flory, L. E. (SM)
Frantz, S. G. (A)
Fred, E. H. (M)
Friend, A. W. (SM)
Garretson, E. B. (A)
George, R. W. (SM)
Gibson, W. G. (A)
Hackley, R. A. (A)
Hart, H. C. (M)
Harvey, R. L. (SM)
Hegyi, I. J. (M)
Herkart, P. G. (M)
Holmes, R. S. (SM)
Hook, H. O. (A)
Houghton, W. D. (A)
Hoyler, C. N. (SM)
Hubbard, R. R. (VA)
Hufford, G. (A)
Hunter, D. (A)
Hutter, E. C. (A)
Jenny, D. A. (A)
Jensen, A. S. (M)
Jolliffe, C. B. (F)
Johnson, E. O. (A)
Johnson, H. (SM)
Johnson, W. C. (SM)
Kaisel, S. F. (A)
Karns, M. E. (VA)
Keizer, E. O. (M)
Kell, R. D. (F)
Kroger, M. G. (A)
Kurshan, J. (SM)
Landon, V. D. (F)
Law, H. B. (SM)
Law, R. R. (SM)
Lindenblad, N. E. (F)
Linder, E. G. (SM)
Luck, D. G. C. (F)
Malter, L. (SM)
Martinelli, C. C. (SM)
Mather, N. W. (M)
Mesner, M. H. (SM)
Mitchell, O. V. (M)
Morrison, W. C. (SM)
Morton, G. A. (F)
Mueller, C. W. (SM)
Nergaard, L. S. (SM)
Nicoll, F. H. (SM)
Norman, F. H. (A)
North, D. O. (F)
Olson, H. F. (F)
Olyphant, M., Jr. (A)
Pantchechnikoff, J. I. (A)
Pearson, R. W. (M)
Pennie, D. F. (M)
Pensak, L. (SM)
Person, L. B. (A)
Peter, R. W. (A)
Peterson, D. W. (A)
Pike, W. S. (M)
Pomerene, J. H. (M)
Pyne, I. B. (A)
Rajchman, J. A. (SM)
Ralston, G. (M)
Raymond, C. A. (A)
Richey, J. L. (SM)
Roberts, W. V. (F)
Robinson, D. (A)
Robinson, J. G. (A)
Robinson, K. W. (A)
Rose, A. (F)
Rosenberg, J. (M)
Roush, G. E. (M)
Rudnick, P. (SM)
Ruetz, J. A. (A)
Rynn, N. (M)
Schairer, O. S. (SM)
Schrader, H. E. (A)
Serrell, R. (SM)
Shulman, C. (SM)
Smith, J. P. (SM)
Smith, P. T. (SM)
Stone, R. P. (SM)
Surber, W. H., Jr. (M)
Sziklai, G. C. (SM)
Tolson, W. A. (SM)
Trevor, B. A. (SM)
Tuska, C. D. (SM)
Vose, C. H. (SM)
Ware, W. H. (SM)
Webb, R. C. (M)
Webster, W. M., Jr. (A)
Weimer, P. K. (A)
Wendt, F. S. (A)
Westneat, A. S., Jr. (SM)
Wilkinson, W. C. (M)
Wolff, I. (F)
Woodbridge, D. E. (A)
Woodward, O. M., Jr. (A)
Yamada, D. A. (A)
Young, C. J. (SM)
Zworykin, V. K. (F)

Princeton Junction
De Remer, K. R. (A)
Matheson, R. M. (A)
Wadlin, M. L. (A)

Radburn
Eaton, R. D. (M)

Rahway
Braun, L. (A)
Grill, C. (A)
Lucier, O. S. (A)
Robinson, G. D. (A)
Sensenig, W. A. (A)
Turnbull, H. A., Jr. (A)
Wexler, P. D. (A)

Ramsey
Armstrong, C. A. (SM)
Cox, J. L. (A)
Gray, L. F. (M)
Mason, R. S. (A)

Red Bank
Allen, J. A. (A)
Azaren, D. (A)
Beck, A. C. (SM)
Billick, P. (A)
Bond, F. E. (M)
Browne, L. (A)
Bush, J. A. (A)
Daniels, F. B. (A)
Dathe, L. C. (A)
Di Perry, J. (A)
Doane, H. J. (M)
Doering, K. M. (A)
Domidion, W. G., Jr. (A)
Edwards, C. F. (A)
Edwards, H. D. (A)
Egli, J. J. (A)
Fisher, G. F. (A)
Fleary, W. K. (A)
Fox, J. (SM)
Frankel, H. C. (M)
Graham, R., Jr. (A)
Hiltner, E. B. (A)
Huebner, D. L. (M)
Hunt, D. W. (M)
Jakes, W. C., Jr. (A)
Jakubowski, G. C. (A)
Johnson, G. D., Jr. (VA)
King, A. P. (SM)
King, H. D. (A)
Krevsky, S. (SM)
Kulinyi, R. A. (M)
Lacy, R. E. (SM)
Lader, L. J. (M)
Legg, W. E. (A)
Levine, R. H. (A)
Lindner, G. H. (A)
Lindner, H. G. (M)
Lippel, B. (A)
Mack, A. (A)
Maloney, T. E. (M)
Moore, J. C., Jr. (M)
Morris, A. E. (A)
Perkins, O. D. (SM)
Petrillo, S. F. (A)
Ring, D. H. (VA)
Rivers, L. B. (A)
Rosenberg, S. (A)
Rosenzvaig, J. E. (A)
Schatz, H. J. (A)
Shein, S. (A)
Sherburne, F. B. (A)
Smith, S. S. (M)
Spergel, J. (A)
Weiss, M. T. (A)
White, A. S., Jr. (A)
Wood, B. C. (A)
Wopat, J. W., Jr. (A)
Zucker, N. (A)
Zurcher, L. A. (A)
Zahl, H. A. (F)

Ridgefield
Fristensky, C. A. (A)
Greenbaum, J. R. (A)

Ridgefield Park
Gardner, R. O. (A)
Phelps, R. B. (A)
Skalski, W. A. (A)
Strain, M. (A)

Ridgewood
Altman, F. J. (M)
Anderson, C. W. (A)
Boyle, G. G. (A)
Cahill, W. J. (VA)
Cotellessa, R. F. (A)
De Leon, J. (A)
De Mars, S. A. (A)
Dowell, K. P. (A)
Dufour, R. D. (A)
Engel, G. C. (A)
Fitts, W. F. (A)
Holt, A. C. (SM)

Howite, R. (A)
McKesson, L. J. (A)
Roberts, J. M. (SM)
Robertson, J. D. (A)
Seeley, E. S. (SM)
Simpson, L. C. (SM)
Troell, R. E. (A)
Warsher, A. (M)

Riverdale
Hegeman, B. L. (A)

River Edge
Baum, E. (A)
Bochet, F. J. (A)
Colman, L. (A)
Ennis, F. T. (VA)
Kennedy, A. (SM)
Levine, A. M. (A)
Levitsky, J. (A)
Mazzola, J. R. (SM)
Samuelson, C. D. (VA)
Seldin, L. (A)
Slack, S. J. (A)
Willms, G., Jr. (A)

Riverton
Benware, R. T. (A)
Collings, F. C., Jr. (M)
Gook, L. H. (M)
Williams, J. B. (SM)

Rochelle Park
Coughlin, J. J. (A)
Hammond, M. L. (A)
Hancock, P. L. (A)
Martinez, C. I. (A)

Rockaway
Berger, U. S. (SM)
Carne, G. G. (SM)
Lundstedt, C. V. (VA)

Roselle
Altman, N. G. (A)
Atlas, Z. (A)
Bishop, J. C., Jr. (A)
Gspann, C. J. (A)
Judin, H. (A)
Randa, G. C. (A)

Roselle Park
McNicol, D. (F)
Olsen, R. F. (A)
Reichert, W. G., Jr. (A)

Rumson
Blom, B. V. (SM)
Brogle, A. P., Jr. (A)
De Lange, O. E. (A)
Friis, H. T. (F)
Maron, I. (A)
McCandless, J. B. (M)
Reinhart, A. G. (M)
Southworth, G. C. (F)
Strothman, R. A. (M)
Teeter, A. A. (A)
Voigt, G. (A)

Runnemede
Oda, D., Jr. (A)

Rutherford
Balter, L. (M)
Gillette, D. (A)
Green, M. W. (A)
Hanley, J. F. (VA)
Hartmann, W. A., Jr. (A)
Horbach, S. (M)
Kline, M. B. (SM)
Merrill, J. B. (A)
Muniz, R. (SM)
Reenstra, W. A. (A)
Ring, C. E. (A)
Sakate, F. S. (A)
Schneider, A. E. (M)
Scott, G. R. (M)
Simpson, W. F. (VA)
Van Winkle, E. W. (M)
Walter, C. W. P. (SM)
Wattson, H. B. (SM)
Wilmarth, R. W. (A)
Windsor, R. B. (SM)

Saddle River
Manty, W. A. (SM)

Salem
Bailey, L. W. (SM)
Morton, R. S. (VA)
Perlsweig, A. M. (A)

Scotch Plains
Bell, J. S. (A)
Bell, N. W. (A)
Montllor, J. A. (A)
White, J. A. (A)

Sea Bright
Steinman, R. E. (A)
Van Doeren, C. A. (VA)

Sea Girt
Larson, R. C. (M)

Secaucus
Bartlett, B. R. (A)

Sewell
Woodward, J. D. (SM)

Short Hills
Adams, R. T. (A)
Brown, J. T. L. (VA)
Budenbom, H. T. (SM)
Butler, E. W. (SM)
Carroll, M. J. (SM)
Cozier, J. R. (A)
Fischer, H. B. (SM)
Giese, R. C. (SM)
Gilman, G. W. (F)
Green, E. I. (SM)
Heberlein, A. A. (SM)
Hershey, L. M. (SM)
Hilliard, W. P. (VA)
Hillyer, C. (M)
Huber, G. H. (SM)
Jones, H. B., Jr. (A)
Kelly, M. J. (F)
Knowlton, A. D. (SM)
Lozier, J. C. (SM)
Macrae, R. B. (A)
Martin, W. H. (SM)
Miller, J. H. (SM)
Morelock, O. J. (VA)
Norwine, A. C. (SM)
Opie, A. (M)
Robinson, A. F. (SM)
Tidd, W. H. (SM)
Tucker, J. P. (VA)
Vanderbilt, S. (A)
Whittemore, L. E. (F)
Wright, A. K. (SM)

Shrewsbury
Covici, W. (A)
Keigher, B. J. (A)
Ross, A. H. (SM)
Tillotson, L. C. (SM)

Sicklerville
Ayres, J. J. (M)

Somerville
Larky, N. D. (A)
Steplen, W. P. (A)

South Orange
Andrews, F. T., Jr. (A)
Augenblick, H. A., Jr. (A)
Burnap, R. S. (F)
Ehrlich, N. (A)
Field, W. T. (VA)
Given, F. J. (SM)
Hight, S. C. (SM)
Horton, A. W., Jr. (SM)
Jervis, E. R. (VA)
McDowell, H. L. (A)
Miller, H. J. (SM)
Neary, J. F. (A)
Poppele, J. R. (F)
Royden, G. T. (F)
Stanwick, C. A. (VA)
Wright, S. B. (SM)

South Plainfield
Bellew, F. N. (A)

South River
Blanchard, C. K. (A)

Sparta
Hussey, L. W. (SM)
Skene, A. A. (SM)
Skene, R. A. (A)

Springfield
Beyer, J. W. (SM)
Cavenaugh, D. E. (A)
Emmel, L. L. (A)
Feindel, A. (M)
Hallenbeck, F. J. (SM)
Lane, R. F. (VA)
Ozsvath, D. R. (M)
Rogers, A. W. (M)

Spring Lake
Bozzelli, J. F. (A)
Hul er, W. A. (SM)
Kilgore, G. R. (SM)
Slattery, J. J. (SM)

Stelton
White, S. D. (M)

Summit
Affel, H. A. (F)
Anderson, C. N. (F)
Bangert, J. T. (A)
Bennett, W. R. (SM)
Black, H. S. (F)
Bohren, A. K. (SM)
Bond, W. L. (SM)
Bower, M. M. (M)
Clement, A. W. (SM)
Dailey, R. R. (A)
Davirl, E. E., Jr. (A)
De Rienzo, F. (A)
Doherty, W. H. (F)
Dudley, H. W. (SM)
Eberhart, E. K. (SM)
Ehrbar, R. D. (SM)
Fagen, M. D. (M)
Feldman, C. B. (F)
Gabel, W. (M)
Grierson, C. A. W. (SM)
Grieser, T. J. (M)
Grossman, A. J. (M)
Hammell, R. (A)
Hanchett, G. D., Jr. (SM)
Hartley, R. V. L. (F)
Hartman, C. D. (VA)
Heising, R. A. (F)
Hines, M. E. (M)
Hopper, A. L. (M)
Kircher, R. J. (SM)
Koerner, L. F. (VA)
Kretzmer, E. R. (A)
Lenigan, T. E. (VA)
Lewis, H. A. (SM)
Llewellyn, F. B. (F)
Lundry, W. R. (A)
MacWilliams, W. H., Jr. (SM)
Maggio, J. B. (SM)
Manley, J. M. (SM)
Marshall, R. W. (M)
McGuigan, J. H. (A)
McKay, K. G. (M)
Meacham, L. A. (F)
Mendenhall, H. E. (SM)
Michon, A. E. (M)
Millar, J. Z. (SM)
Millar, W. M. (A)
Moeder, W. D. (A)
Moore, G. E. (SM)
Moster, C. R. (A)
Nordahl, J. G. (SM)
Orth, R. T. (SM)
Power, D. W. (SM)
Quarles, D. H. (SM)
Ransom, G. B. (M)
Reiling, P. A. (VA)
Ridings, G. H. (M)
Robb, D. T. (A)
Robertson, G. H. (A)
Russell, F. A. (M)
Ryder, R. M. (SM)
Satterthwaite, W. F. (A)
Snow, W. B. (SM)
Steiger, B. F. (A)
Stevens, H. R. (A)
Stiles, K. P. (SM)
Taylor, E. R. (VA)
Trucksess, D. E. (SM)
Valdes, L. (A)
Veazie, E. A. (VA)
Williams, J. R. L. (A)
Wood, I. E. (A)
Young, W. R., Jr. (A)

Sussex
Bliss, D. C. (A)

Tabor
Stephenson, R. G. (M)

Teaneck
Cohen, N. L. (A)
Klein, M. E. (M)
Luhrs, C. H. (M)
Mezger, G. R. (VA)
Preston, J. G. (VA)
Pulley, A. A. (VA)
Ross, G. G. (M)
Sather, O. J. (SM)
Shelby, R. E. (F)
Thurston, W. R. (SM)

Tenafly
Copp, W. C. (A)
Fink, D. G. (F)
Hull, R. E. (A)
Paulson, G. A. (A)
Russell, J. B., Jr. (SM)
Swenson, J., Jr. (A)

Toms River
Zelnick, S. (A)

Towaco
Falkinburg, R. P. (A)

Trenton
Ballard, R. C. (SM)
Carver, L. A. (M)
Denzler, E. W., III (A)
Di Guiseppe, A. (A)
Dilley, J. E. (A)
Edwards, L. M. (A)
Freund, J. A. (A)
Harris, F. M. (VA)
Helgeson, W. B. (A)
Kellock, J. H., Jr. (A)
Kuvylo, W. (A)
Larson, K. T. (A)
Mark, R. B. (A)
Miller, R. (A)
Newhart, E. L. (A)
Orlowski, J. S. (A)
Praszynski, P. C. (A)
Rosenberg, M. (A)
Sherman, J. (A)
Strother, W. F. (A)
Wentzel, A. G., Jr. (M)
Yard, E. M. (M)

Tuckerton
Munzer, L. F. (M)

Union
D'Agostino, V. F. (A)
Edwards, J. B. (VA)
Erholm, W. H. (M)
Hora, A. M., Jr. (A)
Hultquist, J. F. (A)
Lambert, G. W. (A)
Pfost, R. H. (A)
Wagner, S. J. (SM)

Union City
Bedolan, B. (A)
Bonazza, W. J. (A)
Feit, L. (A)
Kulesha, K. J. (A)
Lee, J. P. (A)
Musto, A. A. (A)
Ricca, R. F. (A)
Rottner, A. W. (A)
Tahan, E. N. (A)
Tucker, W. (A)
Vaughan, C. (A)
Yockel, A. P. (A)

Upper Montclair
Benner, T. A. (M)
Borden, E. W. (A)
Christaldi, P. S. (SM)
Crane, R. E. (SM)
De Long, O. A. (VA)
Dumont, A. B. (F)
Eager, G. S., Jr. (A)
Fahnestock, R. J. (A)
Ferguson, J. G. (SM)
Fernald, O. H. (A)
Findlay, J. H. (SM)
Godley, P. F. (VA)
Godley, W. P. (A)
Goldsmith, T. T., Jr. (F)
Hallborg, H. E. (F)
Heims, F. W. (A)
Hicks, B. A. (M)
Hulst, G. D. (M)
Hunkins, H. R. (VA)
Osborne, H. S. (F)
Patten, S. F. (SM)
Roemisch, J. L. (SM)
Rose, F. C. (A)
Ruiter, J. H., Jr. (M)
Steadman, A. (A)
White, R. A. (A)

Vaux Hall
Accardo, N. A. (A)

Ventnor
Kingan, J. (A)
Yamron, J. (A)

Verona
Baxter, C. L. (A)
Buck, D. C. (A)
Butler, H. R. (VA)
Caspar, C. W., Jr. (A)
Curtis, L. B. (A)
Edwards, P. G. (SM)
Griffith, B. G. (VA)
Jacobs, G. W. (M)
Janes, A. W. (A)
Knowles, D. D. (SM)
Peet, E. C. (M)
Rothe, C. W. (A)
Scheraga, M. G. (A)
Shaw, G. R. (SM)
Smith, H. R. (A)
Tobler, C. R. (A)
Van Brunt, L. B. (A)

Waldwick
Rollman, R. F. (M)
Vallarino, A. R. (A)

Wanamassa
Ercolino, M. D. (A)
Goldberg, B. (M)
Hixson, J. D. (M)
Johnson, P. K. (A)
Klayton, M. H. (SM)
Lonnie, W. P. (A)
Mirman, I. (A)
Treston, P. (A)
Zuckerman, B. (A)

Warren Point
Caltabiano, J. E. (A)

Washington
Aten, D. C. (M)

Watchung
Warren, C. A. (SM)

Weehawken
Langfelder, R. (A)

Wenonah
Starr, D. A., Jr. (A)

West Belmar
Strom, C. A., Jr. (SM)

West Caldwell
Capodanno, R. T. (SM)
Crump, E. E. (M)
Eberhard, L. E. (VA)
Hampshire, R. A. (VA)
Kramer, A. S. (SM)
Lynn, P. R. (A)
McKechnie, J. S. (SM)
Miller, H. P., Jr. (SM)
Myers, R. H. (A)
Schade, O. H. (F)

West Collingswood
Barton, R. H. (A)
Berry, H. W. (A)
Daly, G. M. (A)
Goldstone, B. J. (A)
Muggleworth, J. C. (A)

West End
Berliner, J. (A)
Bias, G. H., Jr. (A)
Dorfman, E. (A)
Friedrich, V. L. (A)
Golay, M. J. E. (SM)

West Englewood
Anthony, I. B. (A)
Anthony, R. L. (A)
Blank, R. E. (A)
Brown, W. G. (A)
Dwork, L. E. (SM)
Scott, D. A. (A)
Walsh, A. A. (SM)
Wilbur, E. C. (VA)
Zuschlag, T. (A)

Westfield
Augustadt, H. W. (SM)
Bacon, D. R. (A)
Burns, G. K. (VA)
Chalmers, E. D. (A)
Frantz, G. R. (SM)
Goldsmith, B. M. (SM)
Hart, G. W. (A)
Klute, W. A. (SM)
Melhose, A. E. (M)
Moons, A. G., Jr. (A)
Peterson, L. J. (M)
Pulley, L. A. (VA)
Siegelin, C. O. (SM)
Smith, K. D. (SM)
Stillwell, A. L. (SM)
Van Tassel, E. K. (SM)
Winter, H. F. (A)

West Long Branch
Bassler, S. G. (A)
Deisinger, D. A. (SM)
Griffith, P. E. (M)
Levine, S. (A)

West Milford
Goebel, R. J. (A)

Westmont
Brown, E. M. (A)
Grundmann, G. L. (SM)
Kelly, G. E. (A)
Lev, S. N. (VA)
Sinnett, C. M. (SM)

West New York
Brownell, H. R. (A)
Fennick, B. (A)
Mendez, C. (A)
Parrott, R. D. (M)
Sabo, J. (A)
Setaro, J. E. (A)

West Norwood
Griffin, A. T. (A)

West Orange
Clutts, C. E. (A)
Crowley, H. L. (SM)
Dabrowski, H. L. (A)
Edison, T. M. (VA)
Grady, C. B., Jr. (A)
Haines, A. B. (A)
Hetherington, G. V. (A)
Higgins, W. H. C. (M)
Higgs, R. E. (M)
Israel, J. O. (M)
Kishpaugh, A. W. (SM)
Lindley, L. F. (A)
Magee, T. T. (A)
Mason, W. P. (F)
Milner, C. M. (M)
Niemann, L. H. (A)
Panter, P. E. (SM)
Perkins, G. C. (VA)
Perkins, T. B. (M)
Reed, E. D. (A)
Reise, H. A. (SM)
Ryan, F. M. (F)
Sears, R. W. (SW)
Shangraw, C. C. (SM)
Snow, H. A. (VA)
Somers, R. M. (SM)
Taft, C. R. (SM)

West Summit
Steele, R. B. (A)

Westwood
Gregory, G. S. (A)
Hylas, A. E. (A)
Murnighan, R. J. (A)
Spanos, W. M. (A)

Whippany
Carlisle, H. C., Jr. (A)
Hoffmann, E. H. (M)
Jenny, H. K. (SM)
Kovach, L. (A)
Morrison, E. D. (A)
Morrison, J. F. (F)

Wildwood Crest
Stewart, J. L. (A)
Van Etten, J. P. (A)

Woodbine
Magel, A. (A)

Woodbridge
Warner, H. K. (M)

Woodbury
Greer, W. R., Jr. (M)
Jackson, A. (A)
Neubert, H. A., Jr. (A)
Reeder, C. E. (A)
Seeberger, L. M. (A)
Shuskus, J. M. (A)
Skinner, R. L. (A)
Stark, J., Jr. (A)

Woodlynne
Gerber, P. D. (VA)
Miller, J. P. (VA)

Wood Ridge
Arcand, W. (M)
Bruno, G. A. (A)
Gempp, T. A. (A)
Le Grand, J. S. (VA)

Wyckoff
Menes, H. (A)
Samson, R. L. (A)

NEW MEXICO

Alamogordo
Apa, F. E. (A)
Brown, A. E. (A)
Johnson, R. R. (M)
Lovell, R. E. (M)
Mahaffey, R. F. (M)
Muehlner, J. W. (M)
Shelton, J. T. (A)
Steele, O. A. (M)
Torrible, A. W. (A)
Wisner, R. M. (SM)

Albuquerque
Aas, A. E. (A)
Adkins, A. W., Jr. (M)
Allen, T. L., Jr. (M)
Arnot, G. A., Jr. (A)
Bachand, G. R. (A)
Baltz, L. E. (A)
Bender, S. P. (A)
Billups, E. E. (A)
Biskner, L. J. (SM)
Bittner, B. J. (M)
Black, W. W. (A)
Bostwick, W. E. (M)
Burk, P. O. (A)
Butler, E. R. (A)
Carman, W. H. (M)
Carnahan, C. W. (SM)
Cattermole, G. B. (A)
Church, T. S. (M)
Cole, H. H. (M)
Cole, W. Y. (A)
Connell, J. C. (M)
Cox, L. H. (A)
Courtney, J. M. (SM)
Creveling, R. (M)
Crane, J. L. (A)
Cunningham, F. B. (M)
Davis, J. H. (A)
Deer, J. W. (A)
Delicath, R. C. (A)
Dodge, W. A., Jr. (A)
Doherty, R. P. (A)
Dossey, J. L. (A)
Egger, S. L. (A)
Everhart, W. H. (A)
Ferner, R. O. (A)
Fisher, I. L. (M)
Foster, C. E. (M)
Fowler, G. A. (SM)
French, L. E. (SM)
Frenkel, L. J., Jr. (M)
Garblik, A. M. (A)
Glasser, O. J. (SM)
Grovenor, F. R., Jr. (A)
Hackmann, P. E. (A)
Halliday, J. R. (M)
Heider, W. H., Jr. (A)
Hicks, C. W. (SM)
Hodges, E. M. (A)
Hopkins, L. A., Jr. (M)
Hulme, J. R. (A)
Janvrin, W. A., Jr. (SM)
Jensenius, J. S. (A)
Jeske, H. O. (A)
Johnson, G. S. (A)
Jones, K. N. (A)
Jones, M. C. (M)
Kabell, J. (A)
Kidwell, W. M. (A)
Kilbey, A. R. (M)
Klink, E. J. (M)
Komarek, E. E. (A)
Kowallis, O. K. (A)
Lawrence, G. H. (A)
LeFever, C. F. (A)
Livingston, J. L. (A)
Lommasson, T. F. (A)
Lorentz, N. A. (M)
Lusk, T. D. (A)
Macurak, A. (A)
Maguire, N. L. (A)
Martin, T. L., Jr. (M)
Matthews, R. P. (M)
Maxon, J. S. (M)
McCarthy, F. M. (VA)
Metcalfe, J. D. (A)
Miller, E. G., Jr. (M)
Milton, O. (A)
Myers, V. V. (A)
Noe, J. B. (M)
Oltman, H. G., Jr. (A)
Opperman, R. H. (A)
Paddison, L. J. (A)
Padilla, D. J. (A)
Palmer, J. E. (M)
Petersen, R. P. (SM)
Poole, R. E. J. (SM)
Rehberg, J. C. (A)
Roeschke, C. W. (SM)
Sangster, L. M. (M)
Schauer, J. D. (A)
Scheible, W. R. (M)
Scroggs, J. P. (A)
Seifert, F. F. (M)
Senter, C. H. (SM)
Shoup, J. P. (M)
Sinkew, E. J. (A)
Smith, W. T. (A)
Smoll, L. A. (M)
Spear, E. D. (A)
Starks, J. C. (M)
Strasburger, T. J. (A)
Strother, J. F. (A)
Tillman, J. E. (SM)
Van Every, A. (A)
Villers, D. (A)
Walker, H. C. (A)
Washburn, B. W. (A)
Washburn, C. A. (A)
Watkins, L. C., Jr. (M)
Weber, M. (M)
Westcott, H. S., Jr. (M)
Wilde, N. (A)
Winter, H. (SM)
Wooten, A. D. (A)
Wright, O. L. (M)

Belen
Ellermeyer, W. (A)

Cedar Crest
Boyes, W. E. (A)
Urquhart, K. J. (M)

Deming
Frei, J. (A)

Holloman
Greene, J. F. (A)

Las Cruces
Barton, D. K. (A)
Boone, B. B. (A)
Dann, J. A. (A)
Goff, R. H. (A)
Hemingway, F. S., Jr. (M)
Hessler, J., Jr. (A)
Krivanich, M. A. (A)
Pierce, J. R. (A)
Wiewara, E. J. (M)

Los Alamos
Alello, W. P. (A)
Boyd, T. J., Jr. (A)
Briscoe, W. L. (A)
Brousseau, A. T. (A)
Brower, H. P. (A)
Byington, P. W. (A)
Crew, W. H. (SM)
Deal, J. B., Jr. (A)
Doremire, F. E. (A)
Featherston, J. R. (A)
Freyman, R. W. (A)
Harrington, D. C. (A)
Harris, J. N. (A)
Hiebert, R. D. (A)
Hull, D. E. (A)
Jensen, K. S. (SM)
Johnstone, C. W. (SM)
Kemp, E. L. (A)
Klein, E. F. (A)
Lamb, J. K. (SM)
Lane, C. A. (A)
Lilienthal, J. R. (A)
Martin, C. F. (VA)
Mason, H. (M)
Merwin, R. E. (A)
Newlin, G. C. (A)
Parsons, J. H. (M)
Patton, R. B. (A)
Peck, R. C. (A)
Rawcliffe, A. S. (A)
Sperling, P. (SM)
Watts, R. J. (A)
Weber, W. (A)

Mesilla Park
Blackmon, M. E. (A)
Munnell, E. T. (A)

Mountainair
Smith, L. L. (A)

Mountain Park
Rothman, M. I. (M)

Raton
Pitts, D. S. (A)

Roswell
Coursey, J. R. (M)
Schwartz, A. J. (A)

Santa Fe
Woodward, M. W. (SM)

Silver City
Robinson, R. C. (A)

State College
Brown, H. A. (A)
Ewing, R. D. (A)
Gough, L. E. (A)
Ohlemacher, R. F. (A)
Simmons, J. M., Jr. (M)

Tijeras
Middleton, A. D. (SM)

Truth or Consequences
Carpenter, R. M. (A)

Tularosa
Crom, G. C. (SM)
Martin, W. T. (A)

NEW YORK STATE

Albertson, L. I.
Conner, H. G. (A)
Forrest, J. C. (A)
Kelvin, W. (A)

Albany
DeWire, D. S. (M)
Feiker, G. E., Jr. (M)
Ferguson, J. A. (A)
Gisser, D. (A)
Johnson, G. L. (M)
Marin, I. L. (A)
Myers, S. F. (A)
Norvik, F. J. (A)
Otis, G. E. (A)
Pino, J. (A)
Portanova, M. C. (A)
Schwedock, B. (A)
Wilbur, D. A. (SM)

Albany County
Dillenback, G. V., Jr. (A)

Alfred
Burzycki, M. (A)

Altamont
Betts, R. I. (A)
Hackley, C. L. (M)

Amityville, L. I.
Brockner, C. E. (SM)
Hubbard, L. J. (A)
Isherwood, H. (A)
Schabbehar, E. A. (A)

Amsterdam
Garratt, P. M. (A)
Jarek, J. J. (A)

Apalachin
Swarthout, W. M. (M)

Armonk
Hector, L. G. (SM)
Kneale, A. T. (A)

Averne, L. I.
Foschi, E. J. (A)

Auburn
House, H. J. (A)
Woodruff, J. H. (A)

Babylon, L. I.
Abernethy, R. L. (A)
Albin, F. I. (A)
Bleil, F. J. (SM)
Buff, C. (M)
Clark, H. L. (M)
Ewanus, W. (A)
Gollhofer, P. J. (M)
Seklemian, R. S. (A)
Slusser, E. A. (M)

Baldwin, L. I.
Andrews, E. G. (A)
Barnes, R. S. (A)
Browning, S. D. (VA)
Dayton, F. R. (A)
Dosch, T. J. (A)
Fleming, C. C. (M)
Fraser, R. M. (M)
Hults, E. H. (M)
Lefgren, A. H. (A)
McConaughy, R. L. (A)
O'Connor, D. G. (M)
Rohner, G. J. (M)
Spencer, W. H. (A)
Storey, A. E. (A)
White, C. E. (A)

Baldwinsville
Cooper, F., Jr. (A)
Cooper, J. V. B. (M)
Custin, T. G. (M)
Fitzmorris, S. R. (M)
Jensen, R. C. (VA)
Johnson, M. R. (SM)
Kuhn, D. H. (M)
Mace, J. W. (A)
Mayer, H. F. (SM)
Oberrender, G. F., Jr. (A)
Rhodehamel, A. J. W. (A)
Thorarenson, R. (A)
Waugh, G. T. (M)
Winchester, D. S. (A)
Vladimir, L. O. (M)

Ballston Lake
Bristol, T. R. (A)
Kunz, L. C. (M)
Reynolds, M. T. (M)
Teare, W. H. (SM)

Ballston Spa
Bischoff, A. F. H. (SM)
Uiga, E. (A)

Bay Shore, L. I.
Cady, R. T. (A)

Bayville, L. I.
Bartolomei, G. G. (A)
George, H. A. (A)
Hotine, W. (M)

Beacon
Cahill, R. (A)
Conover, D. G. (A)
Cummings, C. E. (M)

Bedford Hills
Huntington, W. J., Jr. (A)
Preston, F. S. (M)

Beechhurst, L. I.
Battin, D. C. (A)
Friedman, D. (A)

Belle Harbor, L. I.
Gruss, R. F. (A)
Mahland, E. W. (M)
Rhodes, C. E. (A)

Bellerose, L. I.
Altman, D. (A)
Brown, R. W. (A)
Burgess, H. R. C. (A)
Chaber, R. K. (A)
Feinne, L. (A)
Hettich, R. E. (A)
Hutchison, T. C. (A)
Mertz, P. (F)
Murtough, W. L. (A)
Sillman, D. (A)
Ziblatt, R. (A)

Bellmore, L. I.
Glaser, E. M. (SM)
Jackson, C. H. (A)
Packard, K. S., Jr. (M)
Young, R. A. (A)

Bellport, L. I.
Cowan, F. P. (M)
Richards, P. I. (A)

Bethpage, L. I.
Beaumariage, D. C. (M)
Brown, R. M. (A)
Gorman, N. M., Jr. (A)
Margolin, J. (M)

Binghamton
Adler, S. B. (M)
Bechtol, H. (M)
Burton, W. E. (A)
Decker, G. A. (VA)
Fursa, A. (A)
Hayes, M. H., Jr. (A)
Hemstreet, H. S. (A)
Hicken, J. (SM)
Higgs, P. T. (A)
Hunt, J. M. (M)
Kelley, A. A. (M)
Klinko, E. H. (A)
Lavender, R. W. (M)
Ling, O. T. (A)
McConnell, M. J. (A)
Merchant, J. H. (M)
Nash, R. W. (A)
New, R. F. (A)
Reed, G. G. (A)
Ricciardelli, G. (A)
Rice, P. P. (A)
Searle, W. B. (A)
Sedlack, G., Jr. (A)
Shaheen, M. R. (A)
Shaw, W. A. (A)
Stantz, L. H. (M)
Vacca, L. N. (A)
Wilson, R. M. (A)

Black Creek
Lewis, R. M. (A)

Blue Point, L. I.
Gledhill, A. P. (A)

Bowmansville
MacArthur, R. C. (A)

Brewerton
Mills, T. L. (A)
Wassilak, E. J. (A)

Brightwaters, L. I.
Faltin, J. W. (A)
Geiger, J. M. (A)
Lang, J. G. (VA)

Bronxville
Ashby, A. L. (VA)
Ayer, O. G. (VA)
Bartelink, E. H. B. (SM)
Beverage, H. H. (F)
Bowyer, K. M. (A)
Farrand, C. L. (F)
Fisher, S. (A)
Gray, H. F., Jr. (M)
Grossman, H. (SM)
Hackett, A. J. (A)
Hodges, A. R. (SM)
Hussey, C. M. (A)
Keller, A. C. (SM)
King, R. W., Jr. (A)
Kroeger, R. D. (A)
Langley, R. H. (F)
Lurie, W. B. (SM)
Lutz, S. G. (SM)
McCoy, R. D. (A)
Pannhill, C. J. (F) (L)
Scholtz, C. E. (SM)
Spence, P. W. (M)
Stein, R. S. (A)
Udolf, R. (A)
Whittemore, D. B. (A)

Brookhaven, L. I.
Chase, R. L. (A)

Brooktondale
Beck, G. (A)

Buchanan
Rose, H. E. (A)

Buffalo
Albin, J. F. (A)
Arent, E. V. (A)
Ausbourne, R. K. (A)
Ayer, D. R. (A)
Bargman, M. (A)
Beckerle, F., Jr. (A)
Bergerson, W. (A)
Bibbero, R. J. (SM)
Chapman, S. (M)
Chester, E. B. (A)
Clune, E. F. (A)
Costanzo, P. A. (M)
Dell, C. G. (A)
DeWire, G. M. (A)
Dobson, H. R. (A)
Dunn, J. L. (A)
Dybowski, A. J. (VA)
Earl, R. J. (M)
Finke, H. J. (A)
Finkelstein, A. (A)
Fischler, P. E. (M)
Flemming, F. L. (A)
Fogel, C. M. (A)
Grantham, G. W. (A)
Greis, W. K. (VA)
Hall, J. R. (A)
Halsted, G. P. (A)
Hamer, H. (A)
Haney, D. W. (M)
Holley, M. V. (M)
Horton, A. B., Jr. (A)
Huber, C. W. (VA)
Iddings, H. G., Jr. (A)
Jachym, T. M. (A)
Kahn, D. A. (A)
Kell, R. E. (A)
Kiefer, C. F., Jr. (A)
Kingsley, R. J. (M)
Kinsell, W. L. (SM)
Kitchin, H. W. (SM)
Landay, R. B. (A)
Lang, H. J. (A)
Laurien, I. M. (A)
Lautz, C. F., Jr. (A)
Lerner, T. (A)
Levy, R. S. (A)
Lindberg, E. (A)
Marciniak, A. E. (A)
Marcinkowski, C. J. (A)
Mitscher, R. W. (A)
Morgan, R. B. (M)
Newman, H. L. (A)
Nowicki, J. J. (A)
Okonski, C. B. (A)
Olney, V. W. (A)
Parlett, W. G. (A)
Pennoyer, R. T. (SM)
Phillips, J. (A)
Puttick, A. W. (A)
Rizzo, S. J. (A)
Roy, E. H. (A)
Schultze, W. J. (A)
Shub, L. (A)
Smith, R. J. (A)
Snow, G. M. (A)
Steeb, E. C., Jr. (A)
Stevens, H. V. (A)
Sullivan, P. E. (M)
Swartzel, K. D. (SM)
Taylor, F. E. (A)
Thalner, R. R. (M)
Van Every, B. (A)
Watson, W., II (A)
Waud, E. C. (VA)
Weinberg, D. H. (A)
Wilkins, F. W. (A)
Wineman, T. S. (A)

Burnt Hills
Chadwick, M. M. (A)

Caledonia
Chapin, D. W. (A)

Callicoon
Holt, D. G. (A)

Cambria Heights, L. I.
Behr, J. (A)
Cohen, S. A. (A)
Cooper, C. W. (A)
Lilly, J. L. (A)

Camillus
Farnsworth, E. P. (A)
Giles, J. W. (A)
Place, J. F. (A)

Canandaigua
Mountjoy, G. (F)

Canastota
Kuehl, W. J. (A)

Carle Place, L. I.
Bowman, D. F. (M)
Gill, H. A. (SM)
Richardson, F. L. (M)

Cato
Sproul, S. S. (A)

Catskill
Bryant, H. G. (A)
Gardner, C. B. (A)

Cazenovia
Chamberlain, P. L. (A)

Cedarhurst, L. I.
Levine, A. M. (A)
Mercier, A. E. (VA)
Norris, S. (A)
Seliger, V. H. (A)

Center Moriches, L. I.
Burditt, W. F. (A)

Centerport, L. I.
Klaus, G. H. (M)

Chappaqua
Dellenbaugh, F. S., III (A)
D'Humy, F. E. (F)
Kellogg, D. S. (A)
Lentz, J. (A)
Short, W. P. (SM)

Cheektowaga
Maltais, W. E. (A)

Chittenango
Everts, W. J. (M)

Churchville
Zimer, E. C. (A)

Clarence
Doolittle, J. H. (A)
Popovich, B. (A)

Clay
Bailey, R. L. (A)
Ellis, C. L. (A)
Fowler, A. K. (A)

Cohoes
Hickey, J. S., Jr. (A)

College Point, L. I.
Hoffman, R. A. (A)

Commack, L. I.
James, G. W. (M)

Conesus
Young, F. C. (SM)

Constantia
Copp, J. H. (SM)
Day, R. G. (A)

Copiague, L. I.
Leedham, R. (A)

Corning
Bell, A. N. (A)
Eilers, W. (A)
Gumbart, H. E. (A)
Guyer, E. M. (M)
Hocker, J. P. (M)
Jessen, F. A., Jr. (A)
Mann, R. H. (A)
Nitsche, J. E. (A)
Shaw, M. R., Jr. (M)
Wetmore, W. L. (A)

Crestwood
Fogel, M. H. (A)
Krauer, O. (A)
Phinney, E. D. (SM)
Rackey, C. A. (SM)

Cropseyville
Hicks, H. F., Jr. (A)

Croton-on-Hudson
Jones, C. E. (M)
Sear, H. S. (A)

Cuba
Miller, E. A. (A)

De Witt
Clark, H. T. (SM)
De Vore, L. T. (SM)
Ferrell, R. W. (A)
Haeger, J. R. (M)
Harnett, D. E. (F)
Hausz, W. (SM)
Taylor, F. W. (M)
Walker, O. F. (SM)
Watts, D. E. (SM)

Dobbs Ferry
Crawford, R. V. (SM)
Espersen, G. (VA)
Trifari, F. R. (SM)

Dolgeville
Pickert, C. E. (A)

Douglaston, L. I.
Anderson, E. C. (SM)
Batcher, R. R. (F)
Bristol, R. W. (A)
De Floria, R. N. (A)
Delany, F. J. (A)
Grover, H. G. (SM)
Hirsch, C. J. (F)
Long, F. A. (A)
McClellan, G. B. (SM)
Pinkham, G. E. (A)
Ruvin, A. E. (A)
Shanck, R. B. (SM)
Tyson, B. F. (SM)

Dryden
Gordon, W. E. (M)

Duanesburg
Barlow, D. P. (A)

Earville
Lippitt, K. H. (M)

East Aurora
Finnigan, C. W. (SM)
Frazier, R. E. (A)
Hopkins, J. E. (M)
Scrafford, R. L. (A)

East Hampton, L. I.
Dominy, J. F., Jr. (A)

East Hempstead, L. I.
Aha, R. S. (A)
Fay, A. H. (A)
Fragola, C. F. (A)
Johl, M. J. (A)
Keen, H. S. (A)
Murphy, E. J. (M)
Slack, W. J. (M)

East Hills, L. I.
Gray, J. E. (A)

East Meadow, L. I.
Frerking, H. W. (A)
Godwin, C. J., Jr. (A)
Grodzinsky, S. (A)
Guiles, C. H. (A)
Koch, J. F. A. (A)
Morse, D. P. (A)
Pretl, L. L. (A)
Salz, N. P. (A)
Saxe, R. E. (A)
Spencer, B. F. (SM)

East Northport, L. I.
Wallace, R. A. (A)

East Norwich, L. I.
Churchill, D. B. (M)
Fowler, C. A. (A)

East Patchogue, L. I.
Blewett, J. P. (A)
Del Duca, A. (A)

East Rochester
Smyth, K. A. (A)

East Setauket, L. I.
Kemie, C. S. (A)

East Syracuse
Barlow, L. C. (A)
Boothroyd, G. A. (A)
Corbell, I. T., Jr. (A)
Downie, J. W. (SM)
Glasford, G. M. (SM)
Wintle, H. C. (M)

East Williston, L. I.
Schulz, R. F. (A)

Eden
Pontius, J. C. (M)

Eggertsville
Borkowski, C. J. (M)
Harvey, H. F. (A)
Harvey, N. L. (SM)
Mezger, C. C. (A)
Tittle, H. C. (VA)
Wendt, K. R. (SM)

Elma
Stoll, V. B. (A)
Vorie, I. N. (VA)

Elmhurst, L. I.
Auditore, C. J. (M)
Caretto, H. L. (A)
Flattau, W. (A)
Gaus, E. J. (A)
Hannah, M. R. (A)
Leonard, E. (M)

Elmira
Greene, T. A. (M)
Krowl, G. W. (A)

Elmont, L. I.
Cronin, D. (A)
Dressler, R. (A)
Griffen, K. A. (A)
Guenther, J. H. (M)
Haymes, I. (A)
Kuck, G. P. (A)
Kuhn, J. J. (A)
Lee, S. R. (A)
Miller, G. (A)
Nord, R. H. (M)
Paradise, L. P. (M)
Rhodes, M. L. (A)

Elmsford
Carlisle, R. W. (SM)
Carlisle, S. F., Jr. (A)
Greenbaum, W. H. (M)
Sabol, R. W. (A)
Von Baudissin, J. (VA)

Elsmere
Maguire, H. S. (A)

Endicott
Black, T. L. (A)
Caulfield, J. T. (A)
Cooper, A. E. (A)
Foss, F. A. (A)
Hamburger, A. (A)
Mulock, L. E. (A)
Perrin, L. A. (A)
Pratt, R. L. (M)
Pyle, C. L. (A)
Raiter, S. J. (A)
Schwabel, C. A. (A)
Skoe, R. (A)
Strup, C. F., Jr. (M)
Willard, D. D. (A)

Fairport
Harris, L. M., Jr. (SM)
Holmes, L. C. (F)

Farmingdale, L. I.
DeLalio, L. D. (A)
Rowley, W. E., Jr. (A)
Troll, J. H. (A)

Fayetteville
Barhydt, C. R. (SM)
Dean, W. W. (SM)
Deerhake, F. M. (SM)
Dickey, F. R., Jr. (A)
Galbraith, R. A. (SM)
Ganzberg, F. (A)
Gridley, P. A. (A)
Jones, J. L. (SM)
Kelley, J. J. (A)
Mushrush, R. S., Jr. (A)
Norem, R. E. (A)
Ryerson, J. D. (A)
Seely, S. (SM)
Spence, D. W. (A)
Thomas, H. P. (F)
Trotter, G. C. (M)
Williamson, R. H. (F)

Fishkill
Pullis, F. P. (A)

Floral Park, L. I.
Acheson, M. A. (F)
Ahern, W. R. (SM)
Calhoon, T. G. (A)
D'Andrea, L. L. (A)
Eberle, E. E. (M)
Friedman, I. (M)
Garrand, L. W. (SM)
Goodwin, V. D. (VA)
Gunnell, G. T. (VA)
Haack, R. W. (A)
Halbleb, F. C. (SM)
Hoffman, E. J. (SM)
Kaufman, I. (A)
Keen, A. W. (SM)
Loynes, O. H. (VA)
Marshall, T. A. (A)
Mooney, V. J. (A)
Moore, F. H. (A)
Nixon, G. M. (VA)
Novikoff, E. B. (M)
Rehnke, C. H. (A)
Sanekoff, R. (A)
Schmidt, R. D. (A)
Spittal, W. R. (A)
Stokes, B. C. (M)
Sunder, J. E. (A)
Whitford, J. R. (A)
Willcox, P. D. (A)

Franklin Square, L. I.
Balogh, J. (A)
Biberacher, R. (A)
Blaisdel, H. L. (SM)
Kirby, M. J. (M)
Lee, V. C. (A)
Lorch, J. (M)
Moreno, C. A. (A)
Rogers, A. P. (A)
Salit, L. (A)

Franklinville
Mott, R. H. (A)
Wagner, D. W. (A)

Freeport, L. I.
Barone, S. A. (SM)
Belderok, H. C. (A)
Dolphy, E. L. (VA)
Hesse, A. N. (VA)
Johnson, G. R. (M)
Kao, C. (M)
Kennedy, E. D. (A)
Knight, P. (A)
Miller, D. A. (A)
Prichard, J. S. (A)
Tricamo, V. A. (M)
David, W. R. (A)

Fulton
Clark, W. D., Jr. (A)
Plehn, J. G. (S)

Garden City, L. I.
Allen, H. E. (SM)
Barnaby, R. H. (A)
Beardsworth, R. (A)
Beetham, R. B. (A)
Berglund, E. B. (A)
Bernsley, J. T. (A)
Caswell, J. N. (A)
Dembinski, L. J. (A)
Dunn, L. J. (SM)
Eveland, E. H. (A)
Ferrill, T. M., Jr. (SM)
Fitch, W. A. (SM)
Frantz, W. P. (M)
Fricker, J. N. (M)
Gemmil, F. O. (A)
Hancock, J. R. (A)
Hauser, A. A., Jr. (M)
Heins, J. L. (VA)
Henny, K. (F)
Isbister, E. J. (SM)
Keim, D. Y. (VA)
Learned, V. (SM)
Lebenbaum, M. T. (SM)
Marston, R. S. (M)
Mellor, W. N. (VA)
Palmer, R. N. (SM)
Peterson, R. M. (A)
Rau, D. S. (SM)
Sadler, J. T. (M)
Schuck, J. O. (M)
Schwartz, H. E., Jr. (A)
Shepherd, J. E. (F)
Shute, E. R. (SM)
Simpson, S. H., Jr. (SM)
Sweeney, W. R. (A)
Vodak, A. W. (A)
Webber, H. E. (SM)
Wies, G. A. (M)
Winchell, W. H. (VA)
Woodworth, F. B. (SM)

Geneva
Benda, D. (A)

Glen Cove, L. I.
Buchtenkirch, A. J. (A)
Doncese, G. (A)
Downes, J. W. (A)
Duffy, D. P. (A)
Ellis, F. W. (A)
Fenn, W. H. (SM)
Firth, L. G., Jr. (A)
Kiser, W. L. (M)
Lee, M. (A)
McDonough, J. A. (SM)
Papas, J. (A)
Stobbe, J. A. (SM)
Sullivan, J. W. (A)

Glendale, L. I.
Bushbaum, W. H. (A)
Chapman, R. F. (M)
Mutange, N. D. (A)
Trelewicz, E. R. (A)
Vett, F. (A)
Vought, N. F. (M)

Glen Ford
Johnson, J. D. (A)

Glen Head
Hanson, G. N. (SM)
Keeneth, J. A. (A)
Le Vay, T. C. (M)
Martin, E. E. (A)
McBee, W. D. (A)
Reed, F. C., Jr. (A)
Shannon, W. W. (A)
Swanson, E. H. (M)
Zylla, H. R. (A)

Glen Oaks, L. I.
Baldwin, L. D. (A)
Boito, A. P. (A)
Buegler, R. J. (A)
Cramer, S. (A)
Dohn, R. (A)
Eggart, G. J., Jr. (A)
Gilmore, E. M. (M)
Goldman, S. (A)
Kassler, R. (A)
Koenig, R. H. (A)
McKeand, R. W. (A)
Micalowsky, M. (A)

Glens Falls
Wells, H. D., Jr. (M)

Gloversville
Horton, M. D. (A)

Goshen
McClean, J. F. (M)

Grand Island
Hamlin, N. (A)

Grand View
Snyder, E. P. (A)

Great Neck, L. I.
Barney, K. H. (A)
Beach, J. B. (A)
Beck, D. H. (M)
Berg, S. (M)
Bonner, M. K. (A)
Bradley, G. G. (M)
Chaikin, M. (A)
Clark, F. K. (A)
Clark, R. V. (A)
Crawford, J. D. (SM)
Davidson, E. D. (A)
Davis, C. W. (M)
Dean, C. E. (SM)
Dettinger, D. (M)
Dostal, F. X. (VA)
Dunlap, O. E., Jr. (SM)
Edwards, A., Jr. (A)
Espenlaub, W. C. (A)
Forrest, G. E. (M)
Gamble, J. H. (A)
Greene, A. H. (A)
Grumb, D. F. (A)
Halpern, W. (A)
Hannan, P. W. (A)
Harms, R. G. (M)
Herring, F. G. (A)
Hinchey, R. L. (A)
Hinds, J. E., Jr. (A)
Jacobson, R. S. (A)
Kelleher, R. L. (A)
Krieger, P. (A)
Kuranuki, L. A. (A)
Larick, S. H. (M)
Levers, E. O. (A)
Loughren, A. V. (F)
Mac Cullem, J. M., Jr. (A)
Marcuvitz, N. (VA)
Mazer, W. M. (A)
Michel, P. C. (SM)
Morgan, J. F. (A)
Morrow, C. T. (A)
Palmer, R. D. (A)
Pasek, D. M. (SM)
Poulos, N. M. (A)
Powell, T. (A)
Relson, M. (M)

Rickert, H. H. (A)
Roake, W. C. (M)
Roberts, W. W. (A)
Rosenberg, S. (A)
Saint John, K. M. (A)
Schwartz, L. S. (SM)
Sege, T. D. (A)
Seigle, R. K. (M)
Spencer, N. A. (A)
Sperling, J. G. (M)
Steen, P. W. (A)
Strawbridge, R. B. (M)
Sturgeon, W. S. (M)
Sussman, H. (SM)
Tenenbaum, F. (A)
Vanderburgh, A., Jr. (A)
Verges, H. P. (A)
Weinberger, J. (F)
Wheeler, H. A. (F)
Yale, W. H. (A)

Greenlawn, L. I.
Sadler, W. E. (A)

Greenvale, L. I.
Atwood, S. (VA)
Debaun, J. R. (A)
Hansel, P. G. (SM)
Siegmund, E. L. (A)

Guilford
Hamilton, O. M. (A)

Halesite, L. I.
Boughtwood, J. E. (M)

Hamburg
Fiedler, L. (M)
Haushalter, C. H. (A)

Hampton Bay, L. I.
Moore, H. A. (A)

Hampton Bays, L. I.
Turner, F. T. (M)

Harmon
Devereux, W. E. (A)

Harpursville
Lawrence, N. S. (M)

Harrison
De Pasquale, R. H. (M)
Iannelli, J. A. (A)
Katz, L. (A)
Yahn, P. F. (A)

Hartsdale
Deuth, A. F. (SM)
Engelhardt, G. B. (VA)
Lawrence, J. G. (A)

Hastings-on-Hudson
Batchelor, J. C. (SM)
Fenaughty, A. L., Jr. (A)
Harnack, W. P. (A)
Kothe, E. W. (A)
Landry, A. W. (A)
Lodge, W. B. (F)
Miller, D. H. (VA)

Hawthorne
Barrett, E. T. (M)
Casabona, A. M. (A)
Dean, N. J. (M)
Hales, E. B. (A)
Hannahs, W. H. (M)
Hill, D. R. (A)
Smith, L. A. (A)

Hempstead, L. I.
Allen, W. T. (A)
Bellmar, C. L. (A)
Bond, L. (M)
Bowers, W. B. (M)
Buck, J. D. (A)
Close, R. N. (A)
Cornes, R. W. (SM)
Dannals, E. W. (M)
Dannals, H. J. (A)
Dean, W. N. (A)
Dick, T. M. (A)
Dorne, A. (M)
Fener, H. (A)
Fromm, W. E. (SM)
Folland, D. F. (M)
Fuchs, M. M. (A)
Gould, R. V. (SM)
Hopkins, J. J. (M)
Johnson, H. E. (A)
Lester, J. M. (SM)
Mandl, G. P. (M)
McDonough, V. J. (A)
Miller, D. M. (SM)
Morton, G. W. (M)
Norde, L. (A)
Olthuis, R. W. (A)
Peters, J. L. (VA)
Rich, C. E. (A)
Skirrow, J. E. (A)
Stahl, J. (M)
Stewart, J. W. (A)
Thwing, R. W. (A)
Venaglia, E. J. (M)
Westover, T. A. (A)
Wilkerson, J. R. (A)
Williams, R. J. (A)
Wright, G. B. (A)
Yuran, T. (A)

Hewlitt, L. I.
Carduner, W. (VA)
Metcalf, D. (SM)

Hicksville, L. I.
Bradley, J. R. (A)
Burns, R. C. (A)
Craib, J. F. (SM)
Donald, A. B. (A)
Dusseau, A. E., Jr. (A)
Eisele, W. (A)
Goldstein, A. D. (A)
Hastings, T. M., Jr. (SM)
Horvath, C. (A)
McGregor, J. C. (SM)
Morgan, W. E., Jr. (A)
Nehrbas, T. C. (A)
Sicuranza, C. A. (A)
Tolles, W. E. (M)
Walsh, C. (SM)
Wisdom, A. H. (A)

Hillsdale
Sabeff, S. S. (M)

Hoosick Falls
Case, C. C., Jr. (A)

Hopewell Junction
Femmer, M. E. (A)

Hornell
Robinson, W. C. (A)

Houghton
Wightman, E. R. (SM)

Huntington, L. I.
Bethel, C. E., Jr. (M)
Burr, R. P. (A)
Cahill, F. C (SM)
Dalman, C. (A)
Hartman, L. A. (A)
Howell, R. O. (A)
Joss, E. T. (VA)
Litchford, G. B. (M)
Lyons, R. C. (A)
McIlwain, K. (F)
Reyling, G. F. (A)
Simons, R. F. (M)
Steber, W. C (A)
Stengel, J. F., Jr. (A)
Stephenson, J. G. (SM)
Sterling, R. W. (A)
Swatko, J. J. (A)
Weaver, S. E. (A)

Huntington Station, L. I.
Aske, V. H. (M)
Fraser, R. (M)
Frehundlich, M. M. (SM)
Lehr, P. N. (SM)
Mezger, G. (VA)
Ritchey, N. B. (A)
Roller, W. P. (A)
Russell, J. A., III (A)
Serniuk, W. (SM)

Ilion
Johnson, G. L. (A)

Irondequoit
Schlecht, M. F. (A)

Irving
Forbes, H. C. (F)

Irvington,
Colehower, C. H., Jr. (A)
Kohler, T. R. (A)
Wood, A. G. (A)

Islip, L. I.
Wiener, W. A. (A)

Ithaca
Ankrum, P. D. (A)
Ballard, W. C., Jr. (SM)
Booker, H. G. (SM)
Burrows, C. R. (F)
Colbert, S. M. (A)
Credle, A. B. (VA)
De Neuf, D. K. (SM)
Docherty, L. H. (A)
Humphrey, T. R. (A)
Ingalls, C. E. (SM)
Jones, W. R. (SM)
Larson, R. E. (A)
McGaughan, H. S. (M)
McLean, T. (SM)
Moore, R. K. (M)
Nichols, B. (A)
Northrop, B. K. (M)
Smith, H. G. (A)
Whitman, R. N. (A)
Wilson, R. D. (A)
Zimmerman, S. W. (SM)

Jamestown
Anderson, S. E. (A)
Babcock, T. R. (A)
Heston, W. S. (M)
Johnson, M. P. (A)

Jamesville
Good, W. E. (SM)
Sullivan, J. F. (A)

Johnson City
Demer, F. M. (A)
Gottlieb, D. C. (A)
Pittsley, E. L. (M)
Rochm, F. J. (M)

Johnstown
Davis, D. M. (A)

Jonesville
Schwarz, T. G. (A)

Kenmore
Browne, J. F. (A)
Field, T. O. (A)
Fisk N. H (A)
Gauthier, L. P. (A)
Haugen, O. B. (A)
Higgs, H. P. (A)
Himler, G. J. (A)
Hohenstein, M. R. (A)
Kaushagen, W. M. (A)
Koons, E. E. (A)
Kwit, C. J. (A)
Lamy, R. H. (A)
McDonough, S. L. (A)
Milton, L. A. (M)
Myers, J. F., (SM)
Okun, A. M. (M)
Richmond, G. E., Jr. (A)
Riggs, J. H. (A)
Schlosser, G. A. (A)
Squires, W. K. (A)
Stephenson, H. B. (M)
Vanacere, T. (VA)
Wiley, V. H. (A)
Yost, D. E. (A)
Zehr, R. M. (A)

Kings Park, L. I.
Young, R. D. (A)

Lake Ronkonkoma
Pine, C. C. (M)

Lake Success, L. I.
Widenor, M. D. (A)

Lakewood,
Nelson, V. A. (A)

Larchmont
Connor, G. C. (VA)
Cooper, W. H. (SM)
Eaves, A. J. (SM)
Feldhaus, J. M. (A)
Galione, W. J. (A)
Harris, C. M. (A)
Johnson, E. M. (SM)
Levy, M. L. (SM)
McVity, L. H. (A)
Mullenger, K. E. (A)
Nielsen, H. V. (VA)
Plowman, F. R. (A)
Roberts, E. A. (A)
Schneider, J. R. (A)
Shapiro, H. L. (A)
Watson, E. F. (SM)

Laurelton, L. I.
Francoeur, G. R. (A)
Glaser, M. (SM)
Green, M. (M)
Hubbard, R. G., Jr. (A)
King, P. D. (A)
Lurie, E. M. (VA)
Robinson, R. J. (A)
Shapiro, D. L. (M)
Wendelken, G. J. (A)

Lawrence, L. I.
Ferrier, D. T. (SM)

Lee Center
Brunette, G. E. (A)
Kunze, A. A. (SM)

Le Roy
Lapp, R. S. (VA)
Unger, J. W. (A)

Levittown, L. I.
Adams, B. L. (A)
Alter, J. (A)
Avrutik, R. F. (A)
Bawer, L. L. (M)
Benn, P. E. (A)
Bostrom, R. C. (A)
Chandler, C. W. (A)
Coleman, S. F. (A)
Crane, R. (A)
Davis, E. W. (A)
Dudeck, M. P. (A)
Duggan, J. R. (A)
Duquet, E. A. (A)
Eigner, H. (A)
Fahnestock, J. D. (A)
Feltham, C. F., Jr. (A)
Fry, W. H. (A)
Gere, A. J. (A)
Goodman, D. M. (A)
Goodman, J. (A)
Grace, D. J. (A)
Heacock, W. J., Jr. (A)
Hooper, H. B. (A)
Houseworth, G. H. (A)
Howard, F. J. (A)
Kawaller, J. (A)
Kenny, J. A. (A)
Ladof, L. G. (A)
Lally, P. M. (A)
Lamb, H. M. (A)
Lenfest, G. C., Jr. (A)
Marsden, W. Y. (A)
Mehr, A. (A)
Niewenhous, J. H. (A)
Olson, C. (A)
Paley, A. I. (A)
Paul, I. (A)
Purnell, L. (M)
Quick, A. E., Jr. (M)
Rabbin, I. G. (A)
Redlien, H. W., Jr. (A)
Rigdon, C. A. (A)
Rudich, L. (A)
Saur, R. D. (A)
Schwalbe, J. H. (A)
Seadale, S. A. (A)
Sferrazza, P. J. (A)
Sherman, S. (A)
Smith, P. A. (A)
Smith, P. G. (A)
Tribken, E. R. (A)
Stateman, M. J. (M)
Stern, J. L. (A)
Stone, W. R. (A)
Strum, P. D. (A)
Thompson, J. L. (A)
Walker, A. C. (A)
Warner, W. V. (A)
Weiss, M. (A)
Williams, F. H. (M)
Woodcock, E. L. (A)

Lewiston
Buranich, G. F. (M)
Vincent, W. R. (A)

Liberty
Mauer, W. V. (A)

Lido Beach, L. I.
Gutterman, A. Z. (A)

Lincolndale
Bruns, W. H. (M)

Lindenhurst, L. I.
Canty, E. T. (A)
Castaneda, R. A. (A)
Church, T. A. (A)
Delany, E. B. (A)
Myers, R. T. (A)
Sixbey, S. R. (A)
Tate, H. J. (A)

Little Neck, L. I.
Bosman, E. H. (M)
Browning, J. H. (A)
Clothier, S. L. (A)
Curtis, L. F. (SM)
De Wit, D. (A)
Hallden, A. R. (A)
Kunicky, B. F. (VA)
Lane, C. C. (A)
MacDonald, W. A. (SM)
Neff, W. H. (A)
Nurmela, G. E. (A)
Pacent, L. G. (F)
Rudd, J. E. (A)
Van Davelaar, F. S. (A)
Wilson, W. H. (M)
Zimmer, E. W. (A)

Little Silver
Tyack, L. C. (SM)

Liverpool
Brown, W. W. (SM)
Capri, M. F. (A)
Chivers, C. C. (A)
Clark, M. E. (A)
Eachus, E. D. (A)
Fisk, R. E. (M)
Goetter, W. F. (A)
Grimmett, C. A. (A)
Hafstrom, W. F. (M)
Hall, W. H. (M)
Hatchett, S. E. (SM)
Hogan, E. V., Jr. (A)
Jankowski, H. (M)
Klous, G. A. (A)
Kovacs, F. M. (A)
Lewis, R. V. (A)
May, E. L. (A)
Miner, C. R. (M)
Morlock, W. J. (SM)
Neelands, L. J. (M)
Novak, W. D. (A)
Wadsworth, C. A. (M)
Wayne, C. R. (A)
Williamson, J. C. (A)
Willard, C. H. (A)
Whitmore, R. C. (A)

Lockport
Bulmore, H. R. (A)
Rupp, R. B. (A)

Locust Valley, L. I.
Honaski, H. H. (A)
Lovett, R. S. (A)
Williams, R. B., Jr. (A)

Long Beach, L. I.
Acunto, V. S. (A)
Meehan, J. D. (A)

Loudonville
Kendall, P. R. (M)
Rulison, J. P. (M)

Lynbrook, L. I.
Boecker, A. (A)
Budd, W. E. (A)
Dixon, L. G. (M)
Duttera, W. S. (SM)
Ebert, J. E. (A)
Heitner, A. J. (M)
Knaack, F. E. (A)
Landrey, L. R. (SM)
Lough, J. L. (A)
Loughlin, B. D. (M)
Magin, J. J. (A)
Mahoney, J. J., Jr. (A)
Richardson, K. (A)
Simon, W. C. (SM)
Teommey, G. H., Jr. (M)
Vandenburgh, A. A. (A)

Malba, L. I.
Sorensen, E. (A)

Malone
Turner, J. L. (A)

Malverne, L. I.
Callahan, J. L. (SM)
Deans, W. L. (A)
Felix, E. H. (SM)
Gaffney, F. J. (SM)
Gibbs, E. D. (A)
Naybor, E. V. (A)
Rojas, F. R. (SM)
Sauer, H. E. (A)
Schneider, R. E. (VA)
Tanck, H. (VA)
Van Rosenbergh, W. (A)

Malverne Oaks
Di Blasi, J. (M)

Mamaroneck
Foodim, C. (M)
Pelton, R. G. (M)
Romero, R. F. (A)
Van Lieshout, L. J. (SM)
Vollenweider, A. D. (M)

Manhasset, L. I.
Barrow, W. L. (F)
Bitner, R. E. (A)
Bowie, R. M. (F)
Brunn, R. B. (VA)
Carter, E. F. (F)
Dimock, P. V. (SM)
Friebele, E. J. (VA)
Hamlett, R. T. (SM)
Hathaway, J. L. (SM)
Love, F. B. (A)
Miller, R. E. (A)
Napoli, C. A. (A)
Nickel, F., Jr. (VA)
O'Neill, G. D. (F)
Peck, A. G. (SM)
Pratt, H. (F)
Rea, W. T. (SM)
Rogan, J. J. (SM)
Scott, G. G. (A)
Srebroff, C. M. (SM)
Steen, J. R. (F)
Taylor, C. C. (M)
Wright, J. W. (SM)

Marcellus
Devine, G. F. (M)
Stonger, W. L. (A)

Maspeth, L. I.
Clinton, R. E. (A)
Heichlinger, C. L. (A)
Jaffe, D. L. (SM)
Kline. L. M., Jr. (A)
Sean, H. (M)
Treitel, W. S. (A)
Tullius, A. B. (A)

Massapequa, L. I.
Athus, A. (A)
Baunach, E. L. (VA)
Davidson, S. (A)
Desnoes, A. B. (A)
Gaenzle, J. B. (M)
Krueger, A. C. (M)

Martin, J. L. (A)
Mautner, R. S. (SM)
Osmundson, W. O. (A)

Massena
Bond, N. T. (A)

Mastic Beach, L. I.
Fuelling, P. W. (A)

Medford, L. I.
Kelly, J. M., Jr. (A)

Merrick, L. I.
Dodd, F. L. (SM)
Groves, Q. D. (A)
Miller, R. H. (A)
Moore, W. H. (M)
Randall, G. A. (SM)
Sahm, E. J. (A)
Squitieri, A. (A)
Thienpont, M. C. (A)
Woodbury, C. P. (M)

Middletown
Fellenzer, A. D. (A)

Middle Village, L. I.
Blum, M. P. (A)
Eisenhauer, F. E. (A)
Ettlinger, A. B. (A)
Harrison, S. W. (M)
Reinhard, F. C. (A)

Millbrook
Kerbin, J. F. (A)

Mineola, L. I.
Barry, J. G. (SM)
Bateman, L. J. (A)
Bentield, C. J. (A)
Berge, R. G. (M)
Brockman, M. H. (M)
Bock, E. L. (A)
Cooper, H. W., III (A)
Crosby, M. G. (F)
Dieli, F. J. (A)
Gilchriest, C. E. (A)
Graber, L. J. (A)
Guarrera, J. (A)
Houck, S. C. (A)
Hronek, R. L. (A)
Johnson, J. H. (A)
Jones, B. F., Jr. (VA)
Lory, J. (A)
Lynch, W. A. (A)
Maggio, T. (A)
Mieher, W. W. (M)
Pride, D. W. (A)
Skifter, H. R. (F)
Stewart, S. W. (M)
Tionaytis, C. J. (A)
Wang, C. C. (SM)
White, W. D. (SM)
Woodward, J. E. (M)
Yost, R. R., Jr. (M)

Monroe
Sperr, A. E. (A)
Vollkommer, W. A. (VA)

Monsey
Hoffman, S. (A)

Montour Falls
Shepard, W. H. (A)

Mount Kisco
Doyle, R. J. (A)
Fredrick, A. H. (A)

Mount Vernon
Baroi, G. B. (A)
Brazee, G. (SM)
Callahan, J. P. (A)
Campbell, C. H. (M)
Gurdus, H. W. (A)
Blonder, I. S. (A)
Bloom, F. J. (A)
Hineline, H. D. (A)
Jones, A. J. (A)
Mina, P. P. (A)
O'Connor, R. A. (M)
Pearson, H. A. (VA)
Podell, S. (M)
Schwarzkopf, J. (A)
Sonkin, D. (SM)
Stone, C. G. (A)
Weber, E. (F)
Tongue, B. H. (A)
Winkelstein, R. A. (A)

Munsey Park, L. I.
Heindel, H. J. (SM)

Muttontown, L. I.
Fubini, E. G. (SM)

Nassau
Merchant, R. (A)
Smith, G. H. (A)

Nedrow
Smith, P. J. (M)

Neponsit, L. I.
Mitchell, I. A. (VA)

Newburg
Youngblood, H. R. (M)

Newfield
Fannin, B. M. (A)

New Hyde Park, L. I.
Anderson, D. B. (M)
Angevine, R. A. (A)
Blackstone, H. (A)
Borgelt, W. E. (A)
Bozwick, G. E. (A)
Bruce, G. B. (VA)
Camp, S. N. (A)
Delof, D. J. (M)
Duffy, A. F. (A)
Forgacs, R. L. (A)
Gilmartin, J. J., Jr. (M)
Graham, V. M. (F)
Haas, P. (VA)
Intiso, J. F. (A)
Kaplan, M. (A)
Langston, J. F. (A)
Leftwich, R. F. (A)
Madrick, S. A. (A)
McDonald, J. F. (A)
McKee, L. H. (M)
Miles, R. C. (M)
Nachemson, P. R. (A)
Neidert, J. H. (A)
O'Brien, T. H. (A)
Rabinowitz, I. M. (A)
Scordato, M. (A)
Seymour, J. W. (A)
Shannon, G. C. (A)
Shaper, H. B. (A)
Sherbin, L. E. (M)
Sherry, R. S. (A)
Ulm, E. H. (M)
Wankel, F. A. (SM)
White, W. T. (SM)

New Rochelle
Andraud, R. J. (A)
Bennett, R. S. (A)
Bollettieri, P. (A)
Burnell, L. G. (SM)
Burnell, N. (A)
Burnett, L. J., Jr. (A)
De Hart, R. N. (M)
Dubillier, W. (F)
Elderkin, C. D. (A)
Goodale, E. D (SM)
Greibach, E. H. (SM)
Hemming, C. B. (A)
Hirsch, J. D. (A)
Israel, D. D. (F)
Krasner, H. J. (A)
Mayer, E. E. (F)
Moffat, W. H. (SM)
Parker, J. D. (VA)
Pels, E. (A)
Pray, G. E. (SM)
Prestholdt, O. (M)
Reilly, W. J. (A)
Rosett, E. (A)
Rozzoni, A. C. (A)
Stephenson, S. S., Jr. (A)
Temple, D. I. (A)
White, F. E., Jr. (VA)
Williams, J. E. (A)

New York Mills
Waxler, D. (A)

Niagra Falls
Babcock, L. F. (A)
Gleason, M. H. (A)
Kurchin, A. (A)
Leming, J. G. (A)
Le Van, W. I. (A)
Lidbury, F. A. (SM)
Morrison, D. A. (A)
Puro, W. O. (A)
Rowe, R. G. (M)
Sarkees, V. T. (A)
Schneider, R. J. (A)
Shulman, H. (A)
Steigerwalt, O. I. (A)

North Baldwin, L. I.
Alberts, H. C. (A)
Kappelmann, G. E. (A)

North Bellmore, L. I.
Biulianelli, R. R. (A)
Wheeler, R. B. (A)

North Merrick, L. I.
Schoenfuss, A. F. (A)
Thogersen, G. O. (A)
Tolsch, I. H. (A)

Northport, L. I.
Dreyer, J. F., Jr. (SM)
Lockwood, M. D. (M)
Trinkle, F. J. (A)
Watson, R. F. (M)

North Rockville Center, L. I.
Melman, I. (SM)

North Syracuse
Beckwith, R. W. (M)
Bunger, J. W. (M)
Bussey, H. C. (A)
Coullard, J. B. (M)
Deitzler, R. P. (A)
Felice, J. J. (A)
Greenwood, P. E., Jr. (A)
Hundstad, C. E. (A)
Muldoon, W. J. (A)
Muschamp, R. A. (M)
Records, J. K. (A)
Reve.comb, H. E. (M)
Russell, A. W. (A)
Shumway, N. R. (A)
Smee, P. G. (M)
Smith, J. S (A)
Thomas, E. R. (A)
Torsch, C. E. (SM)
Wagner, R. W. (M)
Wood, R. F. (A)

North Tarrytown
Akin, R. M. (VA)
Brown, G. M. (SM)
Palmquist, C. A. (A)

North Tonawanda
Bryzinski, T. F. (A)
Janowsky, R. H. (A)
Johnston, G. D. (A)
Lauffenburger, H. A. (A)
Schmidt, F. M. (VA)

Norwich
Herzog, E. E. (A)
Knudson, L. I. (M)

Nyack
Murphy, R. P. (A)

Oakdale, L. I.
Van Weele, J. C. (M)

Oceanside, L. I.
Rubenson, J. G. (SM)
Schrader, W. A. (M)
Urbanik, J. G. (A)

Old Westbury, L. I.
Beard, A. D. (A)
Curtis, R. C. (VA)

Olean
Pope, L. A. (A)

Oneida
Johnston, P. G. (A)

Onondaga County
Bennett, H. W. (M)

Orangeburg
Costello, A. W. (A)
Schwartz, E. I. (A)

Orchard Park
Ball, M. T. (A)

Ossining
Lescarbouta, A. C. (SM)
Stavis, G. (M)
Webb, J. C. (A)

Owego
Knox, L. A. (M)

Oyster Bay, L. I.
Avery, R. E. (SM)
Bisby, J. F. (SM)
Comstock, G. C. (M)
Dyer, J. N. (F)

Ozone Park, L. I.
Gilbert, I. B. (A)

Painted Post
Dawson, A. W. (A)

Patchogue, L. I.
Peterson, L. E. (A)
Plotkin, M. (A)
Weiss, M. M. (M)
Wise, A. (A)
Young, L. L. (A)

Pattersonville
Oakes, W. S. (A)

Pearl River
Porter, H. A. (A)

Peekskill
Lewis, E. J. (A)
Millinowski, A. S., Jr. (VA)
Walder, B. (A)

Penfield
Atwood, B. E. (SM)
Enslein, K. (A)
Heit, J. C. (A)
Tennant, M. J. (A)

Penn Yan
Swing, M. (A)

Phoenix
Blanchard, J. W. (A)

Piermont
Bangs, J. R. (M)

Pittsford
Herrick, M. P. (M)

Plandome, L. I.
Blackwell, O. B. (F)
Dunning, O. M. (SM)
Striker, R. G. (A)

Pleasant Valley
Noell, N. G. (A)

Pleasantville
Dewhirst, T. P. (VA)
Gamertsfelder, G. R. (SM)
Garman, R. L. (SM)
Gillette, F. N. (A)
Greenwood, I. A., Jr. (M)
Kranz, F. W. (SM)
McKendry, J. K. (A)
Mellger, A. W. (M)
Pourciau, L. L. (A)
Reed, H. J., Jr. (A)
Tull, W. J (M)
Urban, C. (A
Warriner, B., IV (M)

Point Pleasant
Bullis, O. F (A)
Traino, C. (A)

Port Chester
Houck, G. B., Jr. (A)
Hutchinson, R. B. (M)
Marcus, J. A. (A)
Stone, E. S. (A)

Port Jefferson, L. I.
Carter, P. S. (F)
Dow, O. E. (VA)
Hansell C. W. (F)
Usselman, G. L. (VA)

Port Jefferson Station, L. I.
Goldstine, H. E. (SM)

Port Washington, L. I.
Aitken, R. K. (A)
Anderson, E. I. (SM)
Anpach, K. E. (M)
Barrett, A. E. (SM)
Baston, W. M. (M)
Carleson, E. O. (A)
Craig, D. R., Jr. (A)
Cronauer, E. A. (A)
Doersam, C. H., Jr. (SM)
Erickson, J. S. (A)
Halenbeck, A. D. (A)
Hassler, N. A. (A)
Kezer, C. F. (M)
Knights, C. F. (A)
Little, D. S (SM)
Macadam, W. K. (SM)
Marion, J. F. (M)
Marsh, K. W. (M)
McBrian, J. E. (A)
Pacent, H. C. (A)
Pasqua, L. (A)
Rantzen, H. B. (SM)
Robberson, E. L. (A)
Schooley, C. E. (SM)
Sparacino, R. R. (A)
Stubbe, R. R. (A)
Tawney, G. L. (SM)
Vadersen, C. W. (M)
Veronda, C. M. (A)
Weaver, A. (A)
Winter, N. L. (M)
Witten, A. L. (M)

Potsdam
Merrill, L. L. (SM)
Record, F. A. (A)
Salerno, J. (A)
Sebold, A. J. (A)
Surenian, D. (A)

Poughkeepsie
Abell, G. R. (A)
Albanes, N. J. (A)
Anagnost, A. L. (A)
Astrahan, M. M. (A)
Bartelt, J. E. (A)
Bashe, C. J. (A)
Buchholz, W. (A)
Cameron, D. P. (A)
Crago, R. P. (A)
Dean, K. W. (M)
De Lano, R. B., Jr. (A)
Edwards, N. P. (A)
Frizzell, C. E. (A)
Garvey, E. J (M)
Goetz, J. A. (A)
Gommo, F. J. (M)
Harper, L. R. (M)
Helland, J. C. (A)
Horn, H. S. (A)
Karan, C. (A)
Koelsch, A. C., Jr. (A)
Luhn, H. P. (M)
Mutter, W. E. (M)
Nordyke, H. W., Jr. (A)
O'Farrell, J. J., Jr. (A)
Phelps, B. E. (M)
Phillips, F. G., Jr. (A)
Pickarski, S. (M)
Platter, A. V. (A)
Reinheimer, H. J., Jr. (A)
Robins, R. D. (A)
Rochester, N. (SM)
Ross, H. D., Jr. (A)
Samuel, A. L (F)
Santino, L. (A)
Sochor, J. J. (A)
Steinberg, R. K (A)
Stevens, L. D. (A)
Underhill, G. H. (M)
Verven, S. J. (A)
Ward, R. H. (A)
Williams, J. V., Jr. (M)
Wilson, E. S. (SM)
Wolfe, I. P. (A)

Queens Village, L. I.
Kleinoder, J. (A)

Rhinebeck
Mussell, H. A. (A)

Richmond Hill, L. I.
Mesa, J. O. (SM)

Riverdale
Crane, H. D. (A)
Fulton, O. H., Jr. (M)

Riverhead, L. I.
Atwood, J. B. (SM)
Braaten, A. M. (SM)
Goddard, D. R. (SM)
Hansell, G. E. (SM)
Lindow, I. L. (VA)
MacLean, K. G. (SM)
Olsen, W. E. (A)
Peterson, H. O. (F)
Schock, R. E. (SM)
Schoenborn, F. J. W. (M)
Taylor, H. A. (SM)
Wickizer, G. S. (SM)

Rockland County
Doellner, L. J. (A)

Rochester
Andzer, A. (A)
Angevine, O. L., Jr. (SM)
Apolant, R. J. (A)
Arato, R. S. (M)
Arnett, W. (A)
Balling, A. W. (VA)
Barr, E. M. (M)
Bellor, W. F. (VA)
Boscia, A. F. (A)
Burrows, H. R. (A)
Chesna, J. (A)
Cheston, H. C. (A)
Clark, D. L. (A)
Cox, P. G. (A)
Crowley, H. J. (A)
Dahl, A. H. (M)
Dasburg, A. V. (M)
DeMong, M. D. (A)
Ferry, R. N. (M)
Fink, E. J. (A)
Freehafer, J. E. (M)
Gardner, K. J. (M)
Grammer, R. A., Jr. (A)
Gundersen, N. A. (A)
Guth, R. J. (A)
Hailes, W. D. (SM)
Haupt, G. H. (VA)
Hausler, W. H. (A)
Helpert, L. R. (A)
Holstrom, A. (A)
Huntington, M. B. (VA)
James, C. L. (A)
Karker, E. C. (M)
Kendall, H. C. (SM)
Klumb, H. J. (VA)
Logemann, H., Jr. (M)
Lovick, R. C. (A)
Lyke, E. F. (M)
Malone, W. J. (A)
Manson, R. H. (F)
Mavis, G. W. (A)
McArdle, B. L. (SM)
McCanne, L. (SM)
McKnight, R. W. (A)
Morken, D. A. (A)
Morse, J. E. (A)
Murphy, W. L., Jr. (A)
O'Brien, B. C. (A)
O'Brien, J. C. (SM)
Odell, N. H. (A)
Ossmann, E. A. (A)
Ozone, K. (A)
Palmer, O. F. (A)
Prasil, A. (A)
Rayl, G. J. (A)
Rodgers, J. A. (SM)
Russell, G. M. (M)
Schlifino, A. G. (M)
Schoen, A. L. (M)
Sheve, H. C. (VA)
Slaymaker, F. H. (M)

Stevenson, H. (M)
Tapernoux, P. J. (A)
Tholstrup, H. (SM)
Trotter, H., Jr. (SM)
Turner, W. (A)
Van Voorhis, S. N. (SM)
Wilcox, D. D. (A)
Yeaton, E. C. (A)
Ziehm, A., Jr. (A)

Rockville Centre, L. I.
Corrarino, C. W. (SM)
DeWeese, H. W. (SM)
Duke, V. J. (SM)
Everett, F. C. (VA)
Gilman, B. S. (A)
Harris, H. (A)
Hinners, F. A. (F)
Hoxie, L. R., Jr. (A)
Lester, P. S. (A)
Leuteritz, H. C. (VA)
Levenstein, H. (A)
Perry, J. S. (A)
Phelps, R. J. (A)
Rich, E. M. (A)
Riker, W. E. (A)
Singer, F. J. (SM)
Stotz, C. C. (A)
Usmann, J. G. (SM)
White, H. A. (A)

Rocky Point, L. I.
Aird, A. W. (VA)
Martin, C. A. (VA)
Watson, C. W. (A)

Rome
Beane, S. M. (A)
Bennison, G. K. (A)
Benoit, R. C., Jr. (M)
Boxer, R. (A)
Bromley, J. E. (A)
Cole, R. I. (SM)
DeRosa, A. L. (A)
Diamond, F. L. (A)
Eannarino, J. M. (A)
Feiner, A. (A)
Freedman, J. (A)
Friedman, H. (M)
Frohlich, A. J. (A)
Gabelman, I. J. (M)
Graham, R. C. (A)
Hammond, L. A. (M)
Jaeger, M. (A)
Kant, M. (A)
Kirshner, D. R. (A)
Levine, M. (A)
Libby, R. L. (A)
Loreto, D. R. (M)
Mackey, C. L. (A)
Meier, D. J. (M)
Merer, G. E. (M)
Moskowitz, F. (M)
Neeley, A. C. (A)
Pope, W. T., Jr. (M)
Repella, N. (A)
Ratynski, M. V. (M)
Sherman, H. (SM)
Silva, A. A. (M)
Small, P. (A)
Vogelman, J. H. (M)
Warner, M. (M)
Winkler, E. H. (M)

Roosevelt, L. I.
Adachi, W. Y. (VA)
Bailey, S. J. (A)
Beck, G. S. (A)
Brown, E. M. (A)
Gager, C. H. (A)
Karpen, E. W. (A)
Luntz, J. D. (A)
Popkin-Clurman, J. R. (SM)
Uzzo, A. (A)

Rosedale, L. I.
Epstein, M. (A)

Roslyn, L. I.
Moerman, N. A. (M)
Rimmler, F. F. (A)
Wild, J. J. (A)

Roslyn Harbor, L. I.
Minc, A. (M)

Roslyn Heights, L. I.
Adams, E. W., Jr. (A)
Bourke, W. A. (A)
Browder, J. E. (M)
Cetrone, V. C. (A)
Corwin, A. (A)
Day, W. B. (A)
Easton, A. (A)
Harges, M. T. (M)
Harris, H. C., Jr. (A)
Hayward, G. H. (A)
Kahn, H. (A)
Kearney, J. W. (SM)
Knutson, H. C. (A)
Pace, R. T. (M)
Seeley, S. W. (F)
Skipper, L. C. (M)
Smith, C. A. (M)
Snyder, W. W. (M)
Spielberger, S. C. (A)
Weinmann, R. H. (M)
Willenbecher, J. F. (SM)
Willey, F. G. (M)

Rye
Buttner, H. H. (F)
Denny, C. R. (A)
Deri, H. B. (A)
Haselton, M. L. (M)
Lawton, L. M., Jr. (A)
Palmer, J. H. (A)

Sanborn
Whitson, A. L. (A)

Sands Point, L. I.
Potter, J. T. (A)

Saratoga Springs
Krafft, W. R. (A)

Scarsdale
Andrews, C. (A)
Bagnall, V. B. (SM)
Butler, G. H. (A)
Crews, F. H. (VA)
Fox, W. C. O. (M)
Griffiths, R. W. (M)
Heller, S. (A)
Hoehn, A. F. (A)
Hultquist, J. A. (M)
King, K. L. (SM)
Knox, W. E., Jr. (A)
Kraepelien, H. Y. (M)
Marx, F. L. (SM)
Maser, H. T. (SM)
McKirdy, R. W. (M)
Monroe, R. B. (SM)
Munson, S. E. (A)
Robin, H. L. (A)
Seitz, F. A. (VA)
Stansfield, J. Q. (A)
Turner, A. (VA)
Vehslage, E. P. (A)

Schenectady
Allen, C. C. (A)
Alexanderson, E. F. W. (F) (L)
Amsturz, R. W. (A)
Anderson, R. E. (M)
Austin, R. W. (M)
Baker, R. G. (A)
Bartley, W. P. (A)
Belyeu, J. P., Jr. (A)
Bender, D. R. (A)
Bernstein, S. (A)
Billingsley, F. C. (A)
Bohanske, T. A. (A)
Borst, D. W. (A)
Broughton, W. G. (VA)
Clark, S. C., Jr. (A)
Cleary, C. J., Jr. (A)
Cobine, J. D. (SM)
Cohen, A. (A)
Collins, R. N. (A)
Corwin, N. J. (M)
Crane, W. R. (SM)
Cruger, B. W. (A)
Dehn, R. A. (M)
Dickey, F. E. (M)
Dickinson, T. M. (VA)
Driskill, R. D. (A)
Duckwald, C. S. (A)
Dunham, S. B. (M)
Dunnegan, T., Jr. (A)
Engman, G. E. (A)
Fick, C. G. (F)
Floyd, G. H. (M)
Ford, W. A. (SM)
Gable, A. C. (SM)
Gaines, W. M. (A)
Gardner, A. J. (A)
Gehrig, J. W. (A)
Graham, J. M. (A)
Grover, F. W. (F)
Gurewitsch, A. M. (SM)
Grisetti, R. S. (A)
Hansen, W. O. (M)
Harrison, C. W. (A)
Hawkins, D. W. (M)
Henyan, G. W. (VA)
Horton, W. H. (A)
Hurley, D. T. (A)
Jernakoff, G. (A)
Kaplan, S. M. (A)
Karlberg, B. G. (A)
Kessler, G. W. (A)
Kirchmayer, L. K. (A)
Knight, C. R. (M)
Lafferty, J. M. (SM)
Lake, C. J. (A)
Lang, J. M. (A)
Larson, R. W. (SM)
Lee, E. S. (SM)
Lee, J. E. (A)
Lemmond, C. O. (A)
Licata, J. P. (A)
Maginniss, F. J. (A)
Manfredi, R. E. (A)
McArthur, E. D. (F)
Mead, M. S., Jr. (SM)
Meahl, H. R. (SM)
Milhran, T. G. (A)
Moles, F. J. (SM)
Moore, R. E. (A)
Morgan, R. E. (A)
Mumford, L. G. (A)
Nelson, J. E. (SM)
Newman, R. W. (M)
Ogle, H. M. (SM)
Olson, H. A. (A)
Patterson, F. G. (VA)
Pester, R. F. (A)
Peters, P. H., Jr. (A)
Peterson, E. F. (M)
Peterson, N. J. (A)
Pravda, M. F. (A)
Prince, D. C. (SM)
Pritchard, R. L. (A)
Pughe, E. W., Jr. (A)
Purcell, W. J. (VA)
Radcliffe, F. R. (A)
Ralls, J. W. (A)
Reed, R. L. (SM)
Reque, S. G. (A)
Rice, C. T. (A)
Ringland, R. S. (A)
Ringlee, R. J. (A)
Robbins, N. P. (A)
Ross, R. D. (A)
Rothe, F. S. (A)
Russ, R. B. (SM)
Sampson, E. S. (A)
Samsel, R. W. (A)
Sayles, P. W. (A)
Scharla-Nielsen, H. (A)
Schwarzhaupt, P. J. (VA)
Shuey, R. L. (M)
Singleton, H. E. (SM)
Smith, R. L. (M)
Stein, A. J. (A)
Stevens, G. E. (A)
Stocki, S. S. (A)
Summerhayes, H. R., Jr. (SM)
Taylor, L. A. (VA)
Thorson, H. L. (SM)
Turrentine, R. E. (A)
Upham, S. W. (M)
Warner, D. F. (M)
Watson, R. P. (M)
Watters, R. L. (A)
Webber, S. E. (SM)
White, W. C. (F)
Woodbeck, R. J. (A)
Woodward, G. F. (A)
Yann, G. W., Jr. (A)
Zecher, R. O. (A)

Scipio Center
Matuzich, J. D. (A)

Scotia
Bailey, F. M. (M)
Bernier, J. A. (A)
Borgese, A. J. (A)
Bowles, L. T., Jr. (A)
Chambers, D. E. (F)
Clapp, C. W. (A)
Coffey, W. N. (A)
Cook, E. D. (F)
Coolidge, A. W., Jr. (M)
Curtis, T. P. (SM)
Dickinson, R. H. (M)
Edwards, M. A. (SM)
Elder, T. A. (SM)
Fraenckel, V. H. (A)
Fritschel, E. H. (SM)
Gardiner, P. C. (SM)
Gardner, G. F. (VA)
Lowry, H. R. (A)
Masnik, M., Jr. (A)
Neuland, J. G. (A)
Norgaard, D. E. (VA)
Petty, R. W., Jr. (A)
Roberts, S. (M)
Shepard, B. R. (A)
Travis, E. F. (M)
Wilson, T. M. (M)

Sea Breeze
Hampshire, J. R. (A)

Sea Cliff, L. I.
Brown, B. (A)
Busching, H. L. (A)
Cooke, W. T. (SM)
Crist, P. W. (SM)
Flackbert, A. C. (A)
Jagoe, R. W. (A)
Peter, R. E. (A)

Seaford, L. I.
Ihrig, L. C. (M)
Torn, L. J. (M)
Watkins, J. E. (A)
Weston, S. (M)

Selkirk
Wetmore, G. C. (A)

Seneca Falls
Broderick, N. E. (A)
Burroughs, F. L. (SM)
Coble, R. B. (A)
Cohen, L. D. (A)
Dickinson, W. A. (SM)
Dowse, E. C. (A)
Faust, A. C. (A)
Fogg, G. E., Jr. (A)
Gardner, G. F. (A)
Gessford, R. K. (SM)
Greenberg, I. D. (A)
Jans, J. T. (A)
Kahl, M. I. (SM)
Lane, J. H. (A)
Osborn, C. M. (A)
Ottemiller, W. H., Jr. (SM)
Sinnott, J. (A)
Stone, E. O. (A)
Swan, R. A., Jr. (M)
Wipson, J. W. (A)

Setauket, L. I.
Kuper, J. B. H. (SM)

Shenorock
Renke, A. (A)

Sherburne
Lundahl, T. (SM)

Sidney
Lias, R. B. (A)
Lindsey, O. C. (A)
Maylott, C. F. (VA)

Silver Creek
Gull, R. A. (SM)

Snyder
Breeden, F. C. (M)
Forster, H. F. (A)
Fischer, F. P. (SM)
Hultberg, C. A. (SM)
Hunt, R. A. (A)
Ridgeway, F. B. (M)
Sanders, E. R. (SM)
Schantz, J. D. (SM)

Sodus Point, L. I.
Hunter, N. E. (A)

Solvay
Shofstall, N. F. (SM)

Southampton, L. I.
Buckingham, W. D. (A)
Homer, E. C. (SM)
Lamar, R. E. (A)

Sparkill
Smith, D. P. (M)

Spencerport
Sibley, H. C., Jr. (A)

Springfield, L. I.
Berthold, R. V. (A)
Mortensen, G. E. (A)

Springfield Gardens, L. I.
Schwenker, R. B. (M)
Steen, D. R. (A)

Spring Glen
Greenberg, H. (A)

Spring Valley
Cook, S. (A)
Faist, C. A. (A)
Rosenbaum, J. (M)
Welan, I. (A)

Stanley
Bogart, P. M. (A)

Stony Brook, L. I.
Medd, J. S. (SM)

Suffern
Fezer, H. (M)
Mapes, C. M. (SM)

Sunnyside, L. I.
Castrignano, R. A. (A)
Hellige, H. C. (A)

Syosset, L. I.
Bruck, G. G. (SM)
Carlton, M. D. (M)
Greenleaf, F. D. (A)
Lang, H. M. (A)
Thomas, E. U. (M)
Ward, J. W. (M)

Syracuse
Abbott, R. C. (A)
Abrahams, I. C. (M)
Ackley, E. H. (A)
Allen, J. E. (M)
Allison, D. M., Jr. (A)
Andrews, P. D. (SM)
Aoyama, C. (A)
Apple, L. S. (A)
Aronson, C. A. (SM)
Bachman, C. H. (VA)
Bahr, R. J. (A)
Baker, W. R. G. (F)
Baldwin, C. F. (SM)
Barker, J. (A)
Barton, A. J. (A)
Barton, L. M. (M)
Beard, C. E. (A)
Belle Isle, A. G. (A)
Bergman, C. E. (A)
Biele, R. J. (A)
Bowie, W. G. (SM)
Bradbury, B. (M)
Broudy, R. M. (A)
Brown, J. S. (A)
Buchanan, H. R. (A)
Callahan, G. F. (A)
Campbell, C. M. (M)
Campbell, V. C. (M)
Canfield, E. B. (A)
Carrillo, E. B. (A)
Carson, R. E. (SM)
Chapman, J. K. (SM)
Cheng, D. K. (SM)
Cleary, E. P. (A)
Clement, R. R. (M)
Cochran, N. B. (M)
Cohen, L. R. (A)
Cole, F. G. (A)
Cottle, D. W. (A)
Coykendall, J. C. (SM)
Cronshey, R. W. (A)
Croshy, H. M. (SM)
Cummings, A. P. (VA)
Davids, H. H. (SM)
Davis, R. J. (A)
Dewalt, K. C. (SM)
Dome, R. B. (F)
Downey, R. L. (A)
Earls, H. G. (M)
Ellis, C. R. (A)
Ernst, E. C. (A)
Ewing, L. M. (SM)
Fancher, H. B. (SM)
Farrell, J. J. (F)
Fink, L. R. (SM)
Forman, J. (M)
Foster, R. F. (SM)
Fritschel, P. G. (A)
Galidas, P. (A)
Geppert, D. V. (A)
Geyer, B. H., Jr. (A)
Gibbons, E. H., Jr. (A)
Gibbs, F. R. (A)
Gildersleeve, R. E. (A)
Gleason, J. P. (A)
Glenn, A. B. (SM)
Goldman, S. (SM)
Goodwin, A. R. (A)
Griffith, W. A. (A)
Gruen, W. J. (M)
Gunn, A. C. (SM)
Haedecke, A. D. (SM)
Hall, H. E., Jr. (A)
Heaton, H. T. (A)
Heiden, C. M. (SM)
Hellerman, H. (A)
Herzog, E. F. (A)
Hinkle, N. G. (A)
Hocking, L. J. (A)
Hurford, W. L. (VA)
Hyde, W. E., Jr. (A)
Ingerson, F. A. (A)
Jeffers, W. M. (A)
Johnson, C. W. (A)
Junken, L. H. (VA)
Kaar, J. F. (F)
Keister, J. E. (SM)
Kenefake, F. W. (SM)
Ketchum, P. M. (SM)
Killion, R. H. (A)
Kinzie, M. M. (A)
Kirkpatrick, G. M. (M)
Kluender, E. C. (SM)
Koprowski, E. M. (A)
Learned, A. J. (M)
Leeds, L. M. (SM)
Lemon, S. G. (A)
Lepage, W. R. (SM)
Lester, B. R. (M)
Lett, R. P. (SM)
Linker, J. B., Jr. (A)
Lippert, H. B. (M)
Lob, C. G. (A)
Lothes, R. N. (A)
Lucas, V. M. (M)
Lynn, L. H. (SM)
MacLeod, W. R. (M)
Manke, A. G. (SM)
Marvin, H. B. (F)
Mather, D. L. (A)
Mattern, J. (A)
McAllister, J. F., Jr. (SM)
Meehan, J. A. (A)
Merrithew, R. F. (A)
Merwin, R. L., Jr. (A)
Messer, H. G. (SM)
Metcalf, G. F. (F)
Morrison, R. H. (M)
Moyer, J. N. (A)
Mullin, L. A. (SM)
Muntz, W. E. (SM)
Nelson, J. W., Jr. (SM)
Ocko, R. (A)
Orlander, L. W. (VA)
Olson, F. A. (M)
Orosco, E. M. (A)
Pachuta, J. R. (A)
Palmquist, M. L., Jr. (A)
Parder, O. O. (A)
Passarelli, W. F. (A)

Perkins, D. W. (A)
Peterson, E. H., Jr. (A)
Pfefer, B. L. (M)
Phillips, J. M., Jr. (A)
Pinkerton, D. C. (SM)
Plusc, I. (M)
Polisse, L. F. (M)
Potter, H. C. (A)
Powell, B. O., Jr. (A)
Powell, F. E., Jr. (A)
Priest, C. A. (F)
Pugsley, D. W. (SM)
Quinn, W. M., Jr. (A)
Randall, D. P. (SM)
Ranks, J. E. (A)
Rector, R. V. (SM)
Reibert, F. A. (A)
Reinsmith, G. M. (A)
Reynolds, F. M. (VA)
Reynolds, R. H., Jr. (A)
Rives, T. C. (SM)
Roberts, E. G., Jr. (M)
Rosen, C. A. (A)
Rubin, I. E. (M)
Rudolph, R. H. (M)
Ryland, B. G. (M)
Sadowsky, S. S. (A)
Sample, G. A. (A)
Samulon, H. A. (A)
Santa, M. M. (A)
Schaffer, G. W. (A)
Schatz, F. W. (A)
Schick, N. E. (SM)
Schmidt, L. M. (A)
Schupp, G. A., Jr. (A)
Sear, A. W. (SM)
Shaw, C. A. (A)
Shaw, D. B. (A)
Shea, R. F. (SM)
Shetler, R. L. (A)
Simon, C. J. (M)
Smoll, A. E. (M)
Stanley, E. R. (A)
Swank, W. B. (A)
Teich, P. J. (A)
Thomas, W. P., Jr. (A)
Towlson, H. G. (SM)
Uren, D. E. (A)
Vaccaro, R. A. (A)
Venema, H. J. (A)
Weir, I. R. (F)
Weise, D. M. (A)
Wexler, C. H. (A)
Wick, R. S. (A)
Wiggin, J. F. (A)
Wilcox, J. F. (SM)
Wilkinson, D. A. (A)
Wilson, G. G. (A)
Wooley, R. L. (M)
Yeandle, R. S. (SM)
Yerian, C. S. (SM)
Young, M. C. (A)
Yungwirth, G. J. (A)
Zachary, R. A., Jr. (M)
Zwayer, B. E. (A)

Tappan
Ulrich, E. C. W. (A)

Tarrytown
Brackmann, W. J. (M)
Moffett, R. (SM)
O'Brien, R. S. (M)

Thornwood
Bollari, L. (A)
Burns, G. D. (A)
Newsom, E. G. (A)
Orth, F. (M)

Tonawanda
Hix, E. W. (A)
Kaswen, M. (A)
Reese, J. S. (A)
Rockman, I. A. (A)
Wehrung, N. J. (A)
Wolcott, J. R. (A)

Troy
Babits, V. A. (SM)
Beers, R. B. (A)
Beers, R. F. (A)
Campese, N. H. (A)
Chernoch, J. (A)
Chismark, A. H. (A)
Gudzin, M. G. (A)
Hall, C. F. (A)
Hall, G. M. (A)
Harris, H. D. (VA)
Hartnett, G. C. (A)
Holzman, G. R. (A)
Love, A. L., III (A)
Merrigan, C. F. (A)
Mortenson, K. E. (A)
Peterson, R. E. (A)
Plavcan, C. T. (A)
Raschke, R. R. (A)
Runkle, L. D. (A)
Stoker, W. C. (SM)
Stuarts, A., Jr. (M)

Tuckahoe
Austin, K. B. (VA)
Brooks, L. P. (A)
Collison, P. B. (SM)
Drew, C. E. (SM)
Eckert, A. B., Jr. (A)
Engel, J. S. (A)
Genz, W. F. (A)
McGinnis, F. (M)
Porterfield, E. A. (A)
Waldron, R. E. (A)

Unadilla
Struble, R. C. (A)

Uniondale, L. I.
Armentano, J. A. (A)
Harmon, W. R. (M)

Upton, L. I.
Graham, M. H. (A)
Kassner, R. R. (A)
Logue, J. C. (A)
Oakes, J. B. (A)
Rankowitz, S. (A)
Rate, W. R., Jr. (A)
Wantuch, E. (A)

Utica
Ainsworth, M. G. (A)
Convertino, R. O. (A)
Dowdell, J. T. (A)
Humphrey, J. G. (A)
Kubik, C. P. G. (A)
Kulmus, R. J. (M)
Layton, D. T., Jr. (A)
Owens, A. T. (A)
Pacini, H. P. (M)
Romanelli, P. A. (A)
Schlegelmilch, R. O. (SM)
Sherline, M. J. (A)

Valhalla
Mainberger, W. A. (A)
Parr, A. F. W. (A)

Valley Stream, L. I.
Bailey, W. G. (SM)
Buckley, R. E. (A)
Beaton, C. R. (M)
Cruickshank, J. E. (SM)
Elderkin, C. J. (A)
Grant, E. F. (A)
Griesan, G. F. (A)
Gunn, D. W. (M)
Hansen, J. A. (SM)
Harley, J. B. (VA)
Horning, J. L. (SM)
Jackson, B. A. (M)
Kalmar, J. (A)
Kappauf, E. F. (A)
Kerzner, N. A. (A)
Lazinski, R. H. (A)
Match, M. J. (A)
Muth, J., Jr. (A)
Nelson, R. T. (A)
Rokosz, A. J. (A)
Schottland, F. D. (VA)
Swenson, W. J. (A)
Voelpel, J. (A)
Woodbury, W. F. (M)
Zeichner, D. (A)
Ziegler, F. W. (A)

Vestal
Bartholy, F. E. (VA)
Ingram, J. J. (A)
Marcy, H. T. (M)

Wantagh, L. I.
Arndt, W. R. (M)
Berler, R. M. (A)
Ellis, H. J., Jr. (A)
Farkas, F. S. (SM)
Kahan, I. (A)
Levey, A. W. (M)
Salzberg, A. (A)

Wappingers Falls
Fernekees, J. E. (M)
Fox, P. E. (A)
Geisler, H. J. (A)
Haddad, J. A. (M)
Hickerson, J. E. (A)
Seimes, M. S. (A)

Waterford
Connelly, E. J. (A)

Water Mill, L. I.
Deibert, C. R. (M)

Watertown
Bonadio, G. (A)
Morgan, C. W. (A)

Watervliet
Block, T. S. (A)
Lavoo, N. (M)
Pike, D. (A)

Webster
Vosteen, R. E. (A)

West Albany
Maurer, J. W. (A)

West Bloomfield
Fallon, M. W. (A)

Westbury, L. I.
Abajian, H. B. (M)
Adams, R. L. (M)
Benson, C. L. (A)
Dasher, P. M. (A)
Douglas, W. S. (A)
Eldredge, E. E. (VA)
Fishman, G. N. (A)
Haegele, R. W. (M)
Hana, T. C. (VA)
Hellemann, R. K. (VA)
Lowman, R. V. (M)
Mac Veety, R. C., Jr. (A)
O'Meara, T. J. (A)
Proskauer, R. (A)
Richards, G. F. (M)
Rosar, M. T. (A)
Schumacker, A. L. (VA)
Schwiebert, H. (A)
White, J. R. (A)
Wilson, L. B. (M)

West Falls
Holmes, W. S. (A)

West Hempstead, L. I.
Aveney, R. J. (M)
Brody, H. (A)
Childs, A. F. (M)
Clarke, R. L. (A)
Evans, C. L. (A)
Fairweather, R. W. (A)
Hollingsworth, R. L. (M)
La Rosa, R. (A)
Palmer, W. (SM)
Rockett, F. H., Jr. (A)
Simmons, J. C. (M)
Thiede, F. C. W. (VA)
Walker, R. M. (SM)
Westman, H. P. (SM)
Westman, H. P., Jr. (A)
Williamson, R. G. (A)

West Point
Curtis, H. W. (M)
Gillette, E. C., Jr. (A)
Green, J. W., Jr. (SM)
Skinner, L. V. (A)
Strohm, W. E. (M)
Tetley, W. H. (M)

White Plains
Adler, B. (VA)
Atlee, R. Y. (A)
Bernardi, A. R. (A)
Bolsey, E. J. (A)
Byers, A. E. (A)
Colvin, J. D. (M)
Desnoyers, H. (M)
Duffendack, O. S. (SM)
Fearing, J. L. (VA)
Fetherolf, J. M. (A)
Flower, R. A. (A)
Gano, A. S. (SM)
Gilbert, J. (A)
Green, H. (A)
Gresko, J. J. (M)
Grim, W. M., Jr. (A)
Hillmann, D. A. (A)
Ingles, H. C. (SM)
Jacobus, H. R. (SM)
Jenkins, H. C. (M)
Kaye, H. W. (M)
Lamarque, J. W. (VA)
Landberg, A. (A)
Mountain, J. D. (A)
Pickens, R. T. (A)
Pickles, S. (A)
Shortt, H. L. (M)
Speller, J. B. (SM)
Zieserman, M. (A)

Williamson
Anderson, R. S. (SM)

Williamsville
Corp, D. E. (A)
Gnau, D. V. (A)
Hart, W. E. (M)
Kuhn, H. G. (M)
Maynard, H. M. (A)
Pifer, M. J. (A)

Williston Park, L. I.
Beverly, N. E. (A)
Fisher, D. L. (M)
Ghirlando, F. L. (A)
Hopkins, G. C. (M)
Lerch, G. A., Jr. (A)
Lovell, J. A. (A)
Napolin, S. (A)
Parsons, B. L. (A)
Kile, R. L. (M)

Woodmere, L. I.
Bach, H. M. (A)
Kessler, W. B. (A)

Woodstock
Van Rijn, J. C. (SM)

Yonkers
Anner, G. E. (A)
Bailey, R. B. (A)
Balletta, A. G. (A)
Barlett, S. C. (SM)
Campbell, J. A. (A)
Davidoff, S. (M)
Douglas, R. H. (M)
Fortington, W. H. (M)
Freid, J. (A)
Garbowitz, L. (A)
Graveson, R. T. (A)
Heifele, J. R. (VA)
Hesse, G. L. (A)
Korewock, J. (A)
Lisewski, E. E. (A)
Looney, L. A. (VA)
Lowenstein, M. (A)
Lynch, H. G. (A)
Maurer, J. A. (A)
Miller, K. S. (A)
Miller, T. W. (A)
Morris, M. J. (A)
Neumann, K. L. (A)
Perelman, I. B. (A)
Robbins, L. (A)
Roth, S. S. (A)
Rourke, C. R. (A)
Runyon, C. R., Jr. (VA)
Ryan, J. U. C. (A)
Schreiner, R. J. (A)
Staudt, W. (A)
Wilson, L. F. (A)

Yorktown Heights
Matarainen, K. O. (M)

Yorkville
Zawada, J. D. (A)

NEW YORK CITY

Bronx
Abbott, S. L. (M)
Ackerman, D. D. (A)
Affias, J. M. (M)
Allen, M. H. (A)
Altman, S. S. (A)
Altman, W. J. (A)
Altmann, S. (A)
Aman, O. B. (A)
Antin, J. (A)
Arcidiacono, J. (A)
Arfin, B. (A)
Axelrod, A. (A)
Axelson, B. H. (A)
Barbaccia, A. J. (A)
Barnev, R. J. (A)
Barosio, S. (A)
Benedetti, J. (A)
Beers, Y. (M)
Bennett, R. E. (A)
Berger, L. (A)
Berger, L. J. (A)
Berger, M. (M)
Bergherr, W. (A)
Bergman, S. (A)
Berkoff, S. (M)
Bernard, N. (A)
Bernard, P. (A)
Bernstein, H. (A)
Bernstein, J. (SM)
Bertan, L. L. (A)
Bertero, E. P. (A)
Birenbaum, L. (A)
Blasbalg, S. (A)
Blickstein, M. J. (A)
Bloom, L. (A)
Bodow, J. (A)
Bosco, A. (A)
Bromberg, J. J. (A)
Buchalter, M. (A)
Buchbinder, M. M. (A)
Busch, W. R. (VA)
Byrnes, J. F. (SM)
Camizzi, V. J. (A)
Canavan, T. P. (A)
Cantor, T. E. (A)
Capasso, L. V. (A)
Carter, D. (A)
Cash, W. I. (A)
Cassidy, J. J. (A)
Celestino, L. (A)
Chapel, I. J. (M)
Chenery, P. J. (M)
Chanzit, L. (A)
Chirhan, P. M. (A)
Cohen, A. B. (A)
Cohen, B. C. (A)
Cohen, D. (A)
Cohen, J. (A)
Conway, J. F., Jr. (A)
Cosgrove, T. (M)
Costa, T. A. (A)
Crimmins, T. J. (A)
Cuccia, J. F. (A)
Cuddy, E. J. (A)
Davidson, G. M. (A)
Davidson, R. A. (A)
Dechovitz, H. (A)
De Dufour, W. F. (A)
Del Vecchio, S. (A)
Dergane, W. (A)
Di Carlo, G. J. (A)
Dichter, H. S. (A)
Dick, A. I. (A)
Dickstein, M. (A)
Divins, R. (A)
Dolm, M. (A)
Doniger, J. (A)
Doran, J. W. (A)
Dressel, H. O. (A)
Dubin, L. (A)
Dujack, R. L. (A)
Dunn, E. J., Jr. (A)
Dwork, B. M. (A)
Dzik, S. (A)
Einsohn, I. A. (A)
Eisenberger, A. J. (A)
Engel, N. D. (A)
Engle, V. M. (M)
Federing, A. M. (VA)
Fenichel, I. (A)
Fenichel, L. (A)
Fidelman, D. (A)
Fichberg, S. (VA)
Fium, E. (A)
Flynn, W. J. (A)
Frezzolini, D. (VA)
Friedberg, I. S. (A)
Friedman, O. (A)
Galanter, M. (A)
Gerhold, R. A. (M)
Giradnas, R. M. (A)
Glaser, E. M. (A)
Glueckler, E. J. (A)
Godofsky, M. (A)
Goetzl, M. (M)
Goldberg, H. D. (A)
Goldberg, M. I. (A)
Golden, D. (A)
Golden, H. (A)
Goldsmith, A. S. (A)
Goldspinner, E. (A)
Goldstein, B. N. (A)
Gottheb, H. B. (A)
Grabois, B. (A)
Grandizio, L. A. (A)
Greenquist, R. E. (A)
Greenstein, P. (VA)
Gregg, W. G. (A)
Gross, S. (A)
Guarino, M., Jr. (A)
Gunderson, R. W. (M)
Hafner, C. G. (A)
Haimowitz, S. (A)
Halsall, M. (A)
Handros, R. (A)
Harmatuk, S. N. (M)
Harrison, R. I. (A)
Hatzakortzian, H. T. (A)
Hauptschein, A. (A)
Hefter, M. (A)
Henning, R. E. (A)
Hershler, A. (A)
Hertsch, G. J. (A)
Hillman, P. L. (A)
Hinrichs, J. H. (A)
Hittner, C. (A)
Hoffman, H. L. (A)
Hoffmann, R. R., Jr. (A)
Holder, C. R., Jr. (A)
Horvath, J. S. (A)
Huebscher, H. (A)
Hughes, F. J. (A)
Hutson, L. S. (A)
Isaacs, S. J. (A)
Isole, J. J., Jr. (A)
Jacobi, G. T. (A)
Jatlow, J. L. (SM)
Javitz, A. E. (A)
Johnson, R. K. (A)
Jones, E. D. (A)
Kalish, H. M. (A)
Kalt, C. G. (A)
Kantor, F. I. (A)
Kantrowitz, P. (A)
Kaplan, H. (A)
Karda, W. O. (A)
Karmiol, E. D. (A)
Kassel, P. (A)
Katz, A. J. (A)
Katz, E. S. (A)
Kilian, L. H. (A)
Klein, R. M. (SM)
Klein, S. (A)
Klipper, S. (A)
Knapp, J. Z. (A)
Kohman, W. G. (A)
Korn, S. J. (A)
Kruse, C. L. (A)
Kukasch, H. L. (A)
Kulik, H. S. (A)
Lapatine, S. (A)
Leberman, L. (A)
Leff, R. J. (A)
Leibowitz, R. C. (A)
Levens, L. M. (A)
Levin, M. S. (A)
Levin, R. M. (A)
Levine, D. (A)
Levinski, J. (A)
Lichtenstein, M. J. (M)
Linder, A. (A)
Linhardt, R. J. (A)
Littleboy, H. S. (A)
Lopatin, M. (A)
Losow, H. C. (A)
Loveman, H. J. (A)
Lunchick, A. (A)

Makstein, F. I. (A)
Mandel, M. (A)
Marcus, M. A. (A)
Margolis, A. B. (A)
Marolda, J. (A)
Massy, F. M. (A)
Matarese, J. (A)
Mattison, G. H. (A)
Mayer, J. M. (A)
Mayerson, M. I. (M)
McPherson, L. G. (A)
Meyer, H. (A)
Meyers, J. G. (A)
Michael, H. (M)
Michaels, H. M. (A)
Miller, M. P. (A)
Monturo, J. B. (A)
Moran, T. G. (A)
Muchnick, P. (A)
Nelson, J. A. (A)
Nelson, M. D. (A)
Newman, L. (A)
Nissen, J. H. (A)
O'Hea, J. T. (A)
Olick, J. (A)
Orazio, A. F. (A)
Orlov, I. (A)
Palumbo, F. A. (A)
Parnes, J. J. (A)
Paskin, M. (A)
Petrakos, N. (A)
Phillips, D. (A)
Pintell, R. H. (SM)
Pizzuti, F. D. (M)
Polcyn, S. J., Jr. (A)
Posternak, H. (A)
Potak, I. W. (A)
Preisig, J. O. (A)
Press, A. (A)
Pristop, W. A. (A)
Reeves, J. J. (A)
Reicher, M. D. (A)
Reiner, S. (A)
Reiss, E. V. (A)
Rizzo, J. E. (A)
Robin, N. (A)
Roman, S. (A)
Romanyszyn, M. T. (A)
Rosnick, M. (A)
Rothschild, R. F. (M)
Rotker, W. (A)
Rubin, J. (A)
Rudis, M. (A)
Rusnak, W. (A)
Sageman, R. E. (A)
Samuelian, B. (A)
Schaller, J. (A)
Scherer, B. L. (A)
Schiffman, M. M. (A)
Schlossberg, H. (A)
Schmidt, F. J. (A)
Schneider, P. (A)
Schneider, S. (A)
Schwartz, A. J. (A)
Schwartz, M. (A)
Scollar, I. (A)
Shainis, M. J. (A)
Shapiro, M. (A)
Shaw, D. (A)
Shea, J. F. (A)
Sheeter, E. S. (A)
Sheglrian, P. (A)
Sherman, S. (A)
Shirley, G. (A)
Shulman, I. (A)
Silberman, A. (A)
Simon, M. L. (A)
Skinner, F. J. (SM)
Solomon, M. N. (A)
Spergel, P. (A)
Squires, C. (A)
Stenhammar, H. T. (A)
Stern, E. (A)
Stuart, A. F. (A)
Swedlow, S. (A)
Taffet, M. S. (A)
Taffet, W. (A)
Talambiras, R. P. (A)
Tarowsky, H. (A)
Taub, J. J. (A)
Taylor, S. G. (M)
Trinkaus, B. B. (A)
Tucker, M. H. (A)
Van Gieson, W. D., Jr. (A)
Victor, H. W. (A)
Vieira, A. (A)
Vorperian, H. (A)
Wachspress, M. H. (A)
Wasserman, H. (A)
Wasson, I. (A)
Waxler, B. (M)
Wechsler, M. S. (A)
Weil, R. T., Jr. (SM)
Weinberger, E. F. (A)
Weinshenker, T. J. (A)
Weinstein, D. (A)
Weiss, G. D. (A)
Weiss, L. M. (A)
Weiss, S. (A)
Wessbecher, F. W. (A)
West, S. S. (A)
Whalen, B. F. (A)
Willner, P. (A)
Wohl, C. J. (A)
Wolf, F. E., Jr. (A)
Wolfson, H. (A)
Wolotkin, A. (A)
Yostpille, J. J. (A)
Zadeh, L. A. (M)
Zaslavsky, S. (A)
Zeines, B. (A)
Zuckerbraun, J. (A)

Brooklyn

Abilock, S. (A)
Abrams, I. (A)
Aguele, A. (A)
Ahrena, G. C. (A)
Allen, T. (A)
Amaitis, E. J. (A)
Anderson, C. L. (A)
Angelari, R. D. (A)
Anton, N. G. (SM)
Arcate, J. A. (A)
Arkus, H. (A)
Aronoff, M. (A)
Aronowitz, L. (A)
Artuso, N. F. (A)
Ascione, R. (A)
Auerbacher, W. F. (SM)
Avallone, A. (A)
Backinoff, B. (A)
Bahr, R., Jr. (A)
Bailin, R. C. (A)
Bambara, J. E. (M)
Baum, L. (A)
Baum, S. H. (VA)
Beck, L. (A)
Beckhardt, T. G. (M)
Bellare, D. (SM)
Benanti, M. A. (A)
Berger, Martin (A)
Berger, Marvin (A)
Berinsky, M. (A)
Bernstein, B. (A)
Bernstein, G. (A)
Bernstein, M. H. (A)
Berridge, G. J. (A)
Berriman, M. (A)
Besmertnik, J. (A)
Bialowski, M. (A)
Biondo, E. J., Jr. (A)
Blasberg, L. A. (A)
Blazek, H. F. (A)
Blecker, H. (A)
Blocker, C. (A)
Blum, A. (A)
Blum, R. E. (A)
Blumkin, R. (A)
Bogossian, Z. (A)
Boilen, I. (A)
Borowski, E. (A)
Borst, J. M. (VA)
Bower, J., Jr. (VA)
Boyle, B. (A)
Brazdionis, J. (A)
Breitzer, D. I. (A)
Brennan, J. L. (A)
Bresson, J. (A)
Bricker, L. (A)
Bridgeman, T. H. (A)
Bright, F. W. (M)
Briskin, H. B. (A)
Brodsky, J. L. (A)
Brotman, H. F. (M)
Brown, C. (A)
Brown, I. A. (A)
Brown, L. L. (A)
Brown, S. J. (A)
Cahan, L. C. (M)
Canavan, J. J. (M)
Capellupo, F. V. (A)
Carnegie, V. F. (A)
Carlin, J. R. (A)
Cashman, H. W. (A)
Cataldo, J. T. (M)
Catapano, R. L. (A)
Cawood, D. W. (A)
Ceccanti, L. P. (A)
Chays, S. (A)
Chernoff, I. E. (A)
Chittick, C. (A)
Cincotta, J. A. (A)
Cohan, H. R. (A)
Cohen, A. (A)
Cohen, L. (A)
Cohen, S. B. (A)
Colton, A. J. (A)
Coltun, L. (A)
Comninos, R. (A)
Conley, W. H. (A)
Conroe, A. H. (A)
Coppola, A. S. (A)
Cornfeld, N. J. (A)
Cottam, R. W. (A)
Crane, R. L. (A)
Crystal, A. H. (A)
Curtin, J. N. (M)
Dagauarian, H. O. (M)
Dahlbom, C. A. (M)
D'Amato, R. J. (A)
D'Amico, S. P. (A)
Danziger, A. (M)
Darcey, R. J. (A)
Daugherty, R. M. (SM)
Davidson, S. (A)
Davis, H. (M)
Davis, Samuel (A)
Davis, S. (A)
Davis, S. (M)
Day, G. (SM)
Dean, M. A. (A)
De Blasio, C. G. (A)
Decker, S. M. (A)
Deitz, J. L. (A)
De Rosa, T. (A)
Dery, G. F. (A)
De Satnick, S. (A)
De Simone, D. J. (A)
Deutsch, L. (A)
Deutsch, S. (A)
Diamond, E. H. (A)
Diamond, S. (M)
Di Lauro, A. (A)
Di Lustro, F. J. (A)
Diorio, J. (A)
Dolinko, L. (A)
Dooner, J. L. (A)
Drosin, A. B. (A)
Dunefsky, M. (A)
Eagan, J. F., Jr. (A)
Eckert, G. F. (A)
Eckstein, G. (A)
Edelberg, S. (A)
Edwards, D. S. (A)
Egert, S. S. (A)
Eichwald, B. (SM)
Eisenmeyer, J. S. (A)
Elice, S. S. (A)
Farkas, R. D. (A)
Feder, E. I. (A)
Feinman, G. (A)
Feldman, L. L. (A)
Feller, M. (A)
Fenichel, M. (A)
Fetsch, J. T. (SM)
Fialkov, H. (A)
Fine, A. M. (A)
Fink, M. (A)
Finke, H. A. (M)
Fioravanti, J. S. (A)
Fishman, T. (A)
Flomenhaft, L. (A)
Foecke, H. A. (A)
Frankel, A. (A)
Frawley, J. E. (A)
Freed, L. E. (A)
Freedman, R. H. (A)
Friedman, D. S. (A)
Friedman, E. D. (M)
Friedman, H. (A)
Friedman, L. (M)
Friedman, M. (A)
Frisch, E. S. (A)
Fruchter, C. L. (A)
Gatzke, F. W. (A)
Gedicks, F. H. (A)
George, D. E. (M)
Gerber, S. (A)
Glantz, L. M. (A)
Gleimer, L. (A)
Glowalla, J. (A)
Goldbaum, S. (A)
Goldberg, A. S. (A)
Goldberg, Edward (A)
Goldberg, Ernest (A)
Goldberg, R. J. (A)
Goldstein, M. (A)
Goldstone, L. O. (M)
Goodman, H. C. (A)
Gorczycki, E. (A)
Gorelick, G. (A)
Goronin, A. (A)
Gottlieb, A. W. (A)
Gottlieb, E. D. (A)
Govinsky, W. (A)
Gray, G. A. (A)
Grebler, M. (A)
Green, E. H. (A)
Green, J. R. (M)
Green, W. F. (A)
Greene, I. (A)
Greene, J. C. (A)
Greene, L. R. (A)
Green, S. (A)
Greenidge, G. (A)
Greenspan, J. (M)
Greenspan, L. E. (A)
Greenspan, S. (A)
Greenstein, E. (A)
Greenwald, C. (A)
Greick, H. L. (M)
Grib, B. F. (A)
Griffing, W. W. (A)
Groder, M. L. (A)
Gross, V. (A)
Grossman, M. (A)
Gruber, P. (A)
Gurevich, D. (A)
Hachmeister, C. A. (SM)
Halpern, H. M. (A)
Hammer, R. M. (A)
Handelman, S. M. (A)
Hanft, H. (M)
Harder, J. F. (A)
Harris, L. (M)
Hart, G. K., Jr. (A)
Hashmall, M. (A)
Haskell, I. I. (A)
Heckelman, A. J. (A)
Hein, E. (A)
Heller, J. I. (M)
Hembrooke, E. F. (VA)
Hendler, A. J. (A)
Hermida, R. J. (A)
Hevesh, A. H. (A)
Hoffer, G. J. (A)
Hoffman, G. (A)
Hollis, W. C. (SM)
Honig, W. M. (A)
Hopkins, E. J. (VA)
Horowitz, J. (A)
Hyman, A. (A)
Immarco, A. E. (A)
Jacobs, G. (A)
Jacobowitz, A. (A)
Jaffe, L. D. (A)
James, W. S., Jr. (M)
Jones, H. W. (A)
Jorysz, A. (M)
Kahgan, J. J. (M)
Kahn, H. S. (A)
Kaplan, I. (A)
Kaplan, J. (A)
Kaplowitz, M. (A)
Kastner, E. (A)
Katz, S. H. (A)
Kaufman, L. (A)
Kaufman, S. (A)
Keefe, G. (A)
Kerman, M. (A)
King, W. E., Jr. (A)
Kirdahy, E. (M)
Klein, A. M. (A)
Klevans, S. E. (A)
Kline, A. (A)
Kline, M. (M)
Klug, S. H. (A)
Kofler, M. (A)
Kopp, E. H. (A)
Korkes, H. (A)
Kuzitzky, W. J. (A)
Kramer, B. H. (A)
Kramer, M. (A)
Krawitz, M. (SM)
Krimsky, W. J. (A)
Kronengold, M. (A)
Kullback, I. (A)
Kunnes, H. (A)
Kurss, H. (A)
Kurtz, J. A. (VA)
Kuzmyak, M. G. (A)
Laemmel, A. E. (A)
Lamb, C. W. (A)
Laskin, H. J. (A)
Lebowitz, L. L. (A)
Lebowitz, R. A. (A)
Leccadito, R. R. (A)
Levi, S. (VA)
Levin, S. (A)
Levine, H. A. (A)
Levine, S. (A)
Levy, L. (A)
Lewis, M. B. (A)
Lewyt, A. M. (SM)
Liberman, G. (A)
Liebell, E. (A)
Lieberman, J. L. (A)
Liebersohn, A. (A)
Likel, H. C. (SM)
Lindeman, B. (M)
Lindenfelser, W. A. (A)
Lipkin, W. (A)
Lisiansky, W. (A)
Litsios, J. (A)
Livingston, D. B. (A)
Loecher, G. S. (A)
Lord, N. W. (A)
Lowe, M. H. (A)
Luber, L. (A)
Lubkin, S. (SM)
MacLean, W. (A)
Madey, R. (A)
Maedel, G. F. (SM)
Makleff, P. (A)
Malchman, F. L. (A)
Mandel, M. (A)
Mankoff, L. L. (A)
Marantz, S. A. (A)
Marcus, D. H. (A)
Marcus, P. (A)
Margulies, F. (A)
Marriott, R. H. (F)
Marshak, B. (A)
Mason, L. (A)
McCormick, L. P. (A)
Meaney, M. H., Jr. (A)
Mehlman, S. J. (M)
Meixner, E. J. (A)
Merenda, C. T. (A)
Meth, I. (M)
Meyer, B. (A)
Meyers, S. (A)
Milazzo, S. (M)
Milkman, N. (A)
Miller, M. H. (A)
Miller, S. S. (M)
Mills, N. B. (A)
Mitchell, S. L. (A)
Monroe, J. (A)
Morgen, M. (A)
Morris, A. A. (A)
Moses, A. I. (A)
Moss, J. A. (A)
Mostofsky, D. (A)
Moore, J. B. (SM)
Morton, A. R. (SM)
Morton, E. R. (SM)
Musicaro, J. J. (A)
Nachtigall, S. (SM)
Najmy, F. A. (A)
Nasipak, V. (A)
Nechemias, M. (A)
Nelson, H. C. (A)
Nestor, G. (M)
Newdorf, A. S. (A)
Newton, A. (A)
Nitzberg, R. (A)
Nozick, S. (A)
Ocheret, R. S., (A)
Oliner, A. A. (M)
Oliver, G. E. (M)
Osbahr, B. F. (M)
Ost, S. B. (A)
Painting, J. A. (A)
Papamarcos, G. (A)
Parke, H. G. (A)
Parker, S. (A)
Parszik, P. J. (A)
Pearlman, L. (A)
Pelavin, M. H. (A)
Pelitsch, E. J. (A)
Perliss, R. E. (A)
Perlman, I. (A)
Perlman, J. A. (A)
Perlman, S. (M)
Perry, M. A. (A)
Peters, A. D. (A)
Petkof, B. (A)
Petkofsky, L. (A)
Phillips, A. B. (A)
Pillinger, L. (A)
Platzer, H. L. (A)
Polak, H. L. (A)
Pollack, H. W. (A)
Pollack, I. (M)
Portnoy, A. (A)
Rabin, G. C. (A)
Radicchi, P. O. (A)
Ramsay, W. R. (A)
Rappoport, J. F. (A)
Reader, M. (A)
Reed, D. S. (A)
Reichenthal, A. (A)
Reinish, G. B. (A)
Richards, A. (A)
Rigby, S. (A)
Riley, C. D. (A)
Robles, E. F. (A)
Roel, E. L. (A)
Rolnik, J. A. (A)
Roselli, D. J. (A)
Rosenbaum, A. H. (VA)
Rogner, I. S. (A)
Rothman, L. (A)
Rowe, I. (M)
Rubin, A. I. (A)
Rubin, S. (A)
Rubin, W. L. (A)
Ruderfer, M. (A)
Rudofsky, R. (A)
Rudolf, S. (A)
Ruggi, A. G. (A)
Ryan, E. H. (A)
Sable, J. D. (A)
Sacco, V. (A)
Sachar, H. N. (A)
Sachs, A. (A)
Sachs, M. (A)
Sackler, A. A. (A)
Saffitz, I. M. (A)
Saks, H. L. (A)
Salica, R. R. (S)
Savalli, F. P. (A)
Sawelson, A. I. (A)
Schachter, J. (A)
Scheblein, G. M. (A)
Schlang, A. (A)
Schneider, R. M. (A)
Schuchman, N. (A)
Schure, A. (A)
Schwartz, P. (A)
Sees, J. H. (A)
Seewald, E. J. (M)
Segner, S. M. (A)
Seidel, H. (A)
Seitz, S. S. (A)
Selender, H. (A)
Seldon, W. Z. (A)
Senauke, A. (SM)
Shaffer, A. (M)
Shapiro, L. (M)
Sheffield, B. (A)
Shulman, J. (A)
Sills, M. M. (A)
Silver, B. L. (VA)
Simon, E. (A)
Simone, C. F. (A)
Singer, E. M. (A)
Sira, M. A., Jr. (A)
Sirota, N. (M)
Slatic, G. A. (A)
Slobodin, L. (A)
Small, B. (A)
Smith, E. J. (A)
Smith, E. K., Jr. (M)
Smith, J. S. (A)
Smith, P. (A)
Smith, R. H. (A)
Smykowski, C. P. (A)
Sobel, A. D. (SM)
Sokol, L. L. (A)
Sokol, S. (A)
Soreny, E. V. (A)
Spector, L. (A)

Spellman, F. C. (A)
Spencer, G. D. (A)
Spiegel, R. M. (A)
Standig, H. L. (A)
Steele, H. (A)
Steinberg, W. A. (A)
Stephens, G. F. (A)
Stillerman, M. (A)
Stitch, M. (A)
Strazzulla, R. L. (A)
Talley, D. (SM)
Tanenbaum, M. S. (A)
Taub, S. (A)
Tellerman, J. (A)
Temple, W. J. (A)
Tocci, D. P. (A)
Trimboli, B. J. (A)
Trock, R. (A)
Trupiano, J. F. (A)
Turczyn, W. A. (M)
Umles, M. S. (A)
Uslan, S. D. (M)
Vagt, H. T., Jr. (A)
Volpe, I. D. (M)
Vonn, K. C. (A)
Vitrogan, D. (A)
Waas, G. J. (A)
Wald, D. (A)
Walker, A. S. (A)
Waller, W. E. (M)
Wambold, R. F. (M)
Ward, W. P. (A)
Watine, M. N. (A)
Weinberg, M. (A)
Weinberg, S. (A)
Weinberger, A. (A)
Weinstein, D. C. (A)
Weissman, S. (A)
Weitz, M. K. (A)
Werman, H. M. (A)
Werner, G. L. (M)
Werner, W. F. (A)
Wiener, S. (A)
Williams, D. G. (A)
Wimmer, A. A. (A)
Wind, M. (A)
Wohl, R. J. (M)
Wohlgemuth, A. J. (A)
Wolensky, W. (A)
Wolf, E. G. (A)
Wolff, F. (A)
Wolk, N. (A)
Wollman, E. (A)
Yaffe, T. H. (A)
Yelsey, B. (M)
Yokelson, B. J. (A)
Yusem, S. (A)
Zbar, P. B. (M)
Zeiger, L. B. (VA)
Zetekoff, A. (A)
Zimmerman, S. (M)
Zupnick, I. N. (M)
Zweibel, J. (A)
Zweifler, I. (A)
Zwerin, M. I. (A)

Manhattan

Aceves, J. G. (SM)
Adams, G. R. (A)
Adams, J. P. (A)
Adams, M. D. (SM)
Adler, R. L. (A)
Agree, I. (A)
Aiken, D. R. (A)
Albert, D. (A)
Alexander, L. (VA)
Alexander, S. B. (A)
Allen, M. E. (A)
Alliot, E., Jr. (A)
Altschuler, H. M. (A)
Amatneek, K. Y. (A)
Amy, E. V. (SM)
Andrasko, J. P. (VA)
Appel, H. W. (SM)
Arany, D. M. (A)
Armstrong, E. H. (F)
Arnold, J. W. (SM)
Arnson, L. (SM)
Austrian, R. B. (SM)
Bachman, G. F. (A)
Baer, R. H. (A)
Baer, T. M. (A)
Bailey, G. W. (SM)
Bales, N. M. (M)
Barkley, W. J. (SM)
Barron, L. (A)
Barth, J. E. (A)
Baruch, S. N. (A)
Battison, J. H. (SM)
Beal, E. (A)
Becchetti, F. J. (A)
Bein, W. (A)
Belli, J. L. (A)
Bell, W. L. (A)
Belle, J. M. (A)
Benzon, C. G. (VA)
Bereza, A. (A)
Berl, S. (A)
Bernstein, C. (A)
Bernstein, E. (A)
Bertram, A. A. (M)
Bibeon, R. F. (A)
Binns, J. R. (VA)
Birnbaum, I. (M)
Blachere, B. (A)
Black, E., Jr. (SM)
Blitzer, R. (M)
Boatwright, L. T., Jr. (A)
Bocharoff, G. M. (VA)
Bogatko, A. S., Jr. (A)
Borner, R. C. (A)
Bose, J. H. (VA)
Bouie, W. (M)
Boyens, R. D. (A)
Bramhall, E. H. (SM)
Bramhall, F. B. (SM)
Braunfeld, M. T. (A)
Braverman, M. (A)
Brenner, B. (VA)
Bresler, A. D. (A)
Bressler, J. J. (A)
Brillouin, L. N. (SM)
Brociner, V. (M)
Brown, D. S. (VA)
Brown, F. L. (A)
Brown, R. I. (A)
Brown, W. J. (SM)
Brown, W. A. R. (A)
Brownman, H. L. (A)
Burger, E. (A)
Burghard, G. E. (SM)
Burton, E. T. (SM)
Byron, M. (A)
Cadek, J. (A)
Cahn, C. E. (A)
Callan, H. (A)
Cambridge, C. G. (SM)
Campbell, E. A. (A)
Canfora, A. E. (A)
Capon, N. J. (A)
Carlebach, W. M. (VA)
Carlin, B. (A)
Carpenter, R. E. (A)
Cassell, J. L. (VA)
Cerino, R. (A)
Charchian, M. (M)
Chen, T. S. (A)
Chipp, R. D. (SM)
Chomsky, S. R. (A)
Christensen, J. W. (SM)
Cinelli, H. L. (A)
Coe, R. L. (SM)
Cohen, E. (A)
Cohn, E. (A)
Cohn, H. (SM)
Coler, B. A. (A)
Coles, F. A. (SM)
Colton, R. B. (SM)
Comitz, P. (A)
Connally, J. J. (A)
Cooley, A. G. (M)
Corbin, J. E. (A)
Correa, H. A. (A)
Corson, B. R. (A)
Corwith, H. P. (SM)
Cowan, F. A. (SM)
Cowan, S. R. (A)
Cravis, H. (A)
Cruse, A. W. (SM)
Cumming, L. G. (SM)
Cutting, F. (F)
Cybick, J. J. (A)
Darrell, R. D. (A)
Daskam, E., Jr. (M)
Davidson, W. F. (SM)
Davies, R. H. (SM)
Davis, R. F. (A)
Deakin, G. (VA)
De Andrade, W. C. (M)
De Bilderling, A. (A)
De Cubas, J. D. (A)
Delorraine, E. M. (F)
De Salvo, A. F. (SM)
De Vincent, J. (A)
Dibrell, J. W. (M)
Dickieson, A. C. (SM)
Dickson, J. F. (M)
Dietrich, F. (VA) (L)
Dietzold, R. L. (SM)
Dilson, J. (A)
DiMeglio, E. (A)
Donovan, W. E. (SM)
Dorf, R. H. (A)
Dorfman, N. G. A. (A)
Drake, J. B., IV (A)
Dubbs, B. (M)
Dunlap, K. S. (A)
Dunn, G. (F) (L)
Durkee, A. L. (VA)
Durkee, C. H. (M)
Duskis, E. F. (A)
Echtman, L. (A)
Edrich, J. G. (A)
Ehrlich, C. N. (VA)
Eisenberg, A. J. (A)
Elliott, H. M. (A)
Elliott, S. J. (VA)
Elspas, B. (A)
Eoyang, T. T. (SM)
Ernst, R. F. (A)
Esternaux, F. L. (A)
Ettenberg, M. (M)
Evalenko, G. A. (A)
Evans, H. W. (SM)
Facey, J. W. (VA) (L)
Farley, J. (A)
Fash, R. E. (VA)
Feeney, J. M. (A)
Feher, E. (A)
Feitler, J. (A)
Feldt, R. (M)
Fels, L. (A)
Fendrich, L. (A)
Fernandez, M. (SM)
Fingerhood, S. A. (A)
Finkelstein, M. J. (A)
Fish, P. (SM)
Fisher, A. (A)
Fordon, W. A. (A)
Fowler, J. A., III (A)
Foyer, D. R. (A)
Franchina, M. A. (A)
Frank, R. L. (M)
Franke, H. C. (A)
Freed, A. (A)
Freed, L. (A)
Freed, R. D. (A)
Freiman, M. J. (A)
Freud, E. L. (A)
Froehlich, C. (A)
Frum, A. (A)
Fugazzi, C. (A)
Fusfeld, M. (A)
Gaillard, R. L. (A)
Gaines, R. I. (A)
Ganzenhuber, J. H. (A)
Gardner, D. A. (A)
Geiling, H. F. (A)
Gelernter, B. (A)
Geller, D. (A)
Gellman, E. S. (A)
Gerstein, M. G. (A)
Gervch, W. E. (A)
Gibbs, J. B. (A)
Gilbert, J. J. (SM)
Girdwood, J. (A)
Glass, M. S. (VA)
Glasser, H. (A)
Golbert, S. A. (A)
Gold, J. I. (A)
Goldberg, H. S. (A)
Goldmuntz, L. A. (A)
Goldsmith, A. N. (F)
Goldwater, F. J. (A)
Goodstein, L. P. (A)
Gordon, L. (A)
Gottfried, N. J. (M)
Gould, G. B. (A)
Gould, R. G. (A)
Gould, S. (A)
Goyder, C. W. (SM)
Grace, F. C. (M)
Graham, W. (A)
Greenwald, M. S. (A)
Greer, L. H. (A)
Greig, J. H. (A)
Grob, B. (M)
Gross, R. D. (A)
Grosselfinger, W. H. (SM)
Gruber, A. E. (A)
Gruenberg, E. L. (A)
Grumet, A. (A)
Guild, B. (SM)
Gulack, J. G. (A)
Gunzbourg, P. M. (SM)
Guterman, H. C. (SM)
Habich, R. C. (A)
Haertig, M. M. (A)
Hafemeister, E. F. (M)
Hamme, R. J. (A)
Hammer, H. (A)
Handelman, R. B. (A)
Haney, F. J. (A)
Hanson, C. E. (A)
Hara, B. (VA)
Harmatz, H. J. (A)
Harris, R. L. (A)
Hartley, S. H. (M)
Harvey, J. D. (A)
Havens, A. C. B. (A)
Heising, W. P. (A)
Helt, S. (M)
Herbin, L. (A)
Herrman, R. F. (A)
Herrmann, F. J. (M)
Hollander, J. M. (A)
Hollen, F. M. (A)
Honaman, R. K. (SM)
Hopkins, P. E. (SM)
Hopper, R. H. (A)
Horan, J. J. (A)
Hovgaard, O. M. (SM)
Howard, T. E. (M)
Hsu, H. (A)
Hubscher, E. W. (A)
Hughes, K. E. (A)
Huntley, H. R. (SM)
Huston, O. E. (A)
Huth, A. G. (M)
Ignatowsky, P. (A)
Isele, H. A. (A)
Jackson, H. H. (A)
Jacobs, C. F. (A)
Jacoby, N. (A)
Jagerman, D. L. (A)
Joel, A. E., Jr. (A)
Johnson, H. C. L. (A)
Johnson, P. I. (A)
Johnson, R. E. (SM)
Jones, J. W. (M)
Jones, S. F. G. (A)
Jones, W. J. (SM)
Jorgensen, P. S. (A)
Joseph, B. (A)
Juanillo, J. J. (A)
Julie, J. (A)
Julie, L. (A)
Juviler, P. H. (A)
Kahn, B. (A)
Kahn, I. (A)
Kallmann, H. E. (SM)
Kamen, I. (M)
Kanarek, J. J. (A)
Karg, L. A. (A)
Katzman, J., Jr. (A)
Kaylor, R. L. (A)
Kearny, D. H. (A)
Keene, J. (A)
Keller, E. A. (A)
Kendall, J. A. (A)
Kennedy, T. R., Jr. (SM)
Kent, R. A. (A)
Keonjan, E. (M)
Kievit, B. (SM)
King, F. (SM)
Kingsbury, S. W. (A)
Kinsburg, B. J. (M)
Kiriloff, A. (M)
Kishi, H. J. (A)
Klein, R. C. (A)
Knapp, J. F. (VA)
Knaul, J. E. (A)
Kobi, J. (A)
Koch, R. F. (M)
Koehler, A. O. (A)
Kopecky, G. F. (M)
Kovalevski, N. N. (A)
Krasicki, J. (A)
Krasnick, S. (A)
Kraus, J. (A)
Krause, A. M. (A)
Kunc, F. (VA)
Kunik, I. J. (A)
Kurrelmeyer, B. (SM)
Labin, E. (SM)
Lambert, J. S. (M)
Landauer, W. E. (A)
Landis, M. (A)
Langan, J. E. (A)
Laport, E. A. (SM)
Larkin, J. P. (M)
Lavallee, M. L. (A)
Lawsine, L. (M)
Lebel, C. J. (SM)
Lederman, A. (A)
Lee, H. T. (M)
Leichtman, J. A. (A)
Leopold, G. R. (A)
Leslie, F. (A)
Levey, L. (A)
Levin, S. A. (VA)
Levine, D. J. (M)
Levine, R. J. (A)
Lieberman, E. (A)
Lienhard, J. W. (M)
Liguori, A. (A)
Limansky, I. (A)
Lincoff, W. (A)
Lincoln, J. K. (A)
Lindsay, M. H. A. (SM)
Littner, G. H. (A)
Lockwood, L. W. (A)
Loomis, A. L. (F)
Loring, B. L. (A)
Lott, J. C. (A)
Lucero, W. H. (A)
Lukas, W. (A)
Lukashewitz, P. (A)
Lun, M. J. (A)
Lurye, J. R. (A)
Lynch, J. A. (A)
Machover, C. (A)
MacLean, N. W. (M)
Macovski, A. (A)
Mahler, R. J. (A)
Mansberg, H. P. (A)
Marcus, M. (A)
Marin, F. L. (A)
Markel, A. (A)
Marks, T. P. (A)
Martin, A. E. (SM)
Martin, H. B. (SM)
Martin, R. E. (M)
Matsuoka, M. E. (A)
Mayper, V., Jr. (A)
McCann, T. A. (A)
McCluskey, V. (M)
McCutchen, B. S. (F)
McDavitt, M. B. (M)
McGee, F. M. (M)
McManus, T. J. (A)
McProud, C. G. (M)
McSweeny, R. (SM)
Mead, S. P. (A)
Mele, B. T. (A)
Menes, M. (A)
Merrill, B. (A)
Meserve, G. D. (A)
Meslener, G. J. (A)
Messner, G. P. (A)
Meyerson, A. H. (M)
Miller, H. M. (A)
Miller, M. L. (VA)
Miller, S. C. (SM)
Mitchell, T. H. (SM)
Moglia, R. E. (A)
Mohan, M. (M)
Mony, A. J. (A)
Moro-Lin, H. (A)
Morse, M. (A)
Moses, K. (A)
Murphy, O. J. (SM)
Murray, H. J., Jr. (A)
Naidamast, D. (A)
Nash, A. (A)
Nathan, A. M. (A)
Naumberg, W., Jr. (A)
Neuwirth, P. (A)
Nicholides, E. C. (A)
Nisteruk, C. J. (A)
Noble, J. S. (A)
Norton, H. N. (M)
Nowogrodzki, M. (A)
Nyquist, H. (SM)
Oettinger, A. G. (A)
Onder, K. (SM)
O'Neill, L. H. (A)
Oppenheimer, F. W. (A)
Osiatinsky, L. (SM)
Ostrolenk, S. (VA)
Oujevolk, G. B. (A)
Overby, H. (M)
Owen, C. H. (VA)
Paledes, T. P. (M)
Paley, W. D. (A)
Paracchini, G. B. (A)
Parisier, M. (A)
Parry, J. P. (A)
Paul, G. S. (VA)
Paulsen, H. (M)
Pegram, G. B. (VA)
Pellegrinelli, G. L. (A)
Pelzman, L. (A)
Pernick, H. L. (A)
Peskin, E. (SM)
Peterson, E. (SM)
Peterson, R. A. (A)
Petranek, L. (A)
Pickus, M. L. (A)
Pitman, D. A. (M)
Platt, S. (A)
Platzman, M. M. (M)
Pollack, P. (A)
Polin, H. S. (A)
Pomeroy, D. (A)
Ponsolle, W. J. (VA)
Post, R. D. (A)
Predmore, E. E. (A)
Prisament, N. T. (A)
Purgett, L. J. (SM)
Racker, J. (A)
Ragazzini, J. R. (M)
Raju, T. V. R. (M)
Rawitz, H. (A)
Razdowitz, A. (M)
Reid, W. (A)
Reiner, M. (M)
Reiss, L. (A)
Reoch, A. E. (F) (L)
Reynolds, G. (A)
Rice, P. J. (SM)
Richardson, G. G. (A)
Richman, P. L. (A)
Rider, J. F. (VA)
Robbins, D. N. (A)
Robertson, A. S. (M)
Robinson, H. A. (SM)
Rocke, A. (A)
Roder, C. C. (VA)
Rogers, W. (A)
Rose, A. F. (SM)
Rose, T. T. (A)
Rosenberg, P. (A)
Roth, H. H. (A)
Roth, J. E., Jr. (A)
Rothbart, A. (A)
Rothschild, R. S. (A)
Rubino, J. W. (A)
Rubenstein, A. L. (A)
Ruggiero, R. J. (A)
Rusinow, K. (A)
Sadenwater, P. O. (A)
Safir, R. (A)
Sail, A. H. (A)
Sanders, R. G. (A)
Sarasohn, H. M. (M)
Sarnoff, D. (F)
Saron, R. B. (A)
Scharf, E. (A)
Schawlon, A. L., Jr. (A)
Scheiner, M. L. (A)
Shelkunoff, S. A. (F)
Schild, P. (A)
Schneider, H. A. (A)
Schupak, L. (A)
Schwartz, A. A., Jr. (A)
Schwartz, E. (A)
Schwartz, H. T. (A)
Schwartz, M. J. (A)
Schwarz, R. J. (M)
Sciorra, A. F. (A)
Sears, C. B. (A)
Seay, P. A. (A)
Seckler, H. N. (A)
Seeley, S. W. (VA)
Segel, R. E. (A)
Seger, L. (VA)
Seidler, S. W. (A)
Senitzky, B. (A)
Serikawa, F. (A)
Shackleton, S. P. (SM)
Shamis, S. S. (M)
Shamos, M. H. (M)
Shanahan, W. J. (A)
Shaw, A. B. (M)

Shaw, B. (A)
Sheer, C. (SM)
Sheldon, I. R. (A)
Shelley, E. F. (A)
Sheppard, H. S. (M)
Sher, F. D. (A)
Sherman, J. B. (SM)
Sherman, S. (A)
Sherwood, H. R. (M)
Shmoys, J. (A)
Sieger, J. (SM)
Silber, A. (A)
Simon, D. R. (A)
Simon, E. J. (F) (L)
Simon, W. (A)
Simpson, M. (M)
Skelley, C. L. (A)
Skrobisch, A. (A)
Slate, M. W. (A)
Sling, O. H. (A)
Small, H. (A)
Smith, A. V. (M)
Smith, C. A. (SM)
Smith, F. W. (M)
Smith, G. M. (VA)
Smith, P. W. (A)
Smithline, H. (A)
Sohne, G. C. (A)
Sommers, C. E. (A)
Sonkin, S. (M)
Sonnenschein, A. H. (A)
Spangenberg, L. F. (M)
Spector, M. S. (A)
Speed, R. B. (VA)
Spett, H. (A)
Spiegel, R. E. (A)
Spitalny, M. (M)
Sprung, J. (A)
Stahl, P. D. (M)
Stanton, L. J. (M)
Statsinger, J. (A)
Steinman, B. (A)
Sterk, A. A. (A)
Stern, M. K. (A)
Stern, R. M. (A)
Stevens, A. M. (F)
Steves, P. J. (A)
Stiefel, R. C. (A)
Strauss, R. (A)
Strelzik, J. (A)
Sullivan, H. (A)
Sumerlin, W. T. (SM)
Sutter, A. W. (A)
Swanson, J. W. (SM)
Swern, L. (A)
Szalach, F. E. (A)
Talshoff, J. (A)
Taylor, C. H. (F) (L)
Taylor, E. S. (A)
Taylor, W. H., Jr. (SM)
Tierney, W. L. (SM)
Tiger, H. S. (A)
Tobin, M. W. (A)
Toeppen, M. K. (SM)
Tompson, E. C. (A)
Torgow, E. N. (A)
Torian, J. T. (A)
Toufexis, S. (M)
Trevor, J. B., Jr. (M)
Tucker, S. A. (SM)
Tuttle, C. W. (A)
Twersky, V. (A)
Uttendorfer, E. A. (M)
Uzel, F., Jr. (A)
Van Breems, A. (A)
Vandervoort, A. (A)
Van Dyck, A. F. (F)
Verseput, P. C. (A)
Vrabel, N. (A)
Vroom, E. (SM)
Wager, G. C. (A)
Walker, P. F. (A)
Walsh, A. L. (A)
Walsh, J. V. (A)
Ward, H. R. (A)
Warnick, G. H. (A)
Wehrlin, R. F. (A)
Weil, K. L. (A)
Weissman, E. (A)
Wentzel, M. G. (A)
Weppler, H. E. (M)
Weyer, E. R. (A)
White, L. E. (A)
White, M. F. (M)
Wilson, I. G. (SM)
Winner, L. (M)
Winters, A. (A)
Witt, V. R. (A)
Wojciechowski, B. M. (M)
Wolf, S. K. (SM)
Wolters, J. T. (A)
Wood, R. A. (A)
Worthen, G. B. (A)
Wouk, V. (M)
Yamasaki, A. A. (A)
Yieh, T. T. (M)
Yin, H. B. (A)
Young, H. H. (A)
Young, R. O. (A)
Zauderer, J. (A)
Zemanian, A. H. (A)
Zemans, H. R. (VA)
Zippler, W. N. (A)
Zuckenberg, H. (A)
Zwick, G. (A)

QUEENS, L. I.

Astoria
Benesch, E. J. (A)
Berkley, F. E. (A)
Brody, J. (A)
Chanes, H. (A)
Fontana, R. E. (SM)
Garretto, L. A., Jr. (A)
Greiger, G. (A)
Iversen, R. J. (SM)
Kafalas, C. (A)
Lanzisero, N. T. (A)
Pores, E. B. (A)
Puntin, E. J. (VA)
Schwab, D. (M)
Willett, E. (A)

Bayside
Adler, L. L. (A)
Battle, R. P. (A)
Berge, P. J. (A)
Bernstein, J. L. (A)
Bonney, H. W. (A)
Boyce, J. (A)
Bracco, D. J. (M)
Burke, J. F. (M)
Carlsten, E. E. (A)
Clavier, P. A. (M)
De France, J. J. (SM)
Dinga, E. W. (A)
Ellefson, B. S. (F)
Farel, V. M. (SM)
First, D. (A)
Frink, F. W. (SM)
Gale, G. L. (A)
Gardiner, C. E. (M)
Gatti, W. (A)
Gauger, R. H. (A)
Gellert, J. (A)
Grazda, E. E. (A)
Harvey, G. L. (A)
Hayes, K. V. (A)
Hutter, R. G. E. (SM)
Janis, P. (SM)
Laufman, T. D. (A)
Leifer, M. (SM)
Leone, R. J. (A)
Levine, S. (SM)
Levinson, E. (A)
Lawrance, R. E. (A)
Mansur, F. (M)
Mausler, R. (A)
Miner, W. A. (A)
Moncton, H. S. (M)
Muchmore, D. E. (A)
Nadler, B. D. (M)
Potts, T. J., Jr. (A)
Prufer, E. F. (A)
Relis, M. J. (M)
Ressler, H. C. (SM)
Robinett, L. L., Jr. (A)
Shipley, D. W. (M)
Spears, R. W. (A)
Stolze, W. J. (M)
Suito, T. (A)
Sussman, N. (M)
Toman, J. J. (A)
Troxler, L. J. (SM)
Vogel, R. Q. (M)
Waller, H. H. (A)
Weichardt, H. H. (M)
Whalley, W. B. (VA)
White, W. H. (A)
Wilson, M. C. (A)

College Point
Fury, A. E. (A)
Stiepel, G. W. (A)
Wappler, A. C. (A)
Di Franco, J. V. (A)
Silbar, J. I. (A)
Smith, H. H. (A)
Strauss, G. M. (A)

East Rockaway
Brown, W. (M)
Cohen, G. (A)
Finch, J. L. (SM)
Ruppel, A. E. (A)
Symanovich, T. (A)

Elmhurst
Blumenstock, N. R. (A)
Erdman, A. (A)
Middleton, R. G. (A)
Picus, F. (A)
Stuhler, R. E. (A)
Weida, R. L. (A)

Far Rockaway
Edelstein, H. N. (A)
Haynes, N. M. (M)
Liegey, P. R. (A)
Rojak, F. A. (A)

Floral Park
Stattel, R. J. (A)
Vodak, A. W. (A)
Vogel, E. (A)

Flushing
Abjanich, G. S. (M)
Aull, W. (SM)
Barber, A. W. (VA)
Beckham, C. L. (A)
Belock, H. D. (SM)
Benjaminson, A. (A)
Berkowitz, M. W. (A)
Birnham, D. Z. (A)
Bostick, G. (A)
Boyer, J. M. (SM)
Brown, H. A. (SM)
Burns, E. P. (A)
Chapin, R. S. (SM)
Climint, L. J. (M)
Cohen, A. L. (A)
Cohn, I. H. (A)
Cohn, S. B. (M)
Cooperstein, M. (A)
Corderman, S. A. (A)
De Clerck, C. E. (A)
Del Giorno, A. E. (A)
Dittenhoefer, H. F. (A)
Dong, J. G. (A)
Eaton, J. E. (M)
Eisaman, L. C. (A)
Farber, R. J. (A)
Findley, P. B. (SM)
Frangoulis, S. I. (A)
Gleimer, B. (A)
Goldschmidt, K. (A)
Goodfriend, L. S. (A)
Goodstein, J. (A)
Hackenberg, J. H. (M)
Hall, R. C. (A)
Hatfield, L. N. (SM)
Hillman, K. (A)
Holloway, H. R. (A)
Howard, L. L. (A)
Jansky, C. M. (A)
Jasik, H. (SM)
Juhas, L. A. (A)
Jurow, S. (A)
Kahrilas, P. J. (A)
Kaplan, R. (A)
Klein, H. (A)
Kritz, J. (M)
Lawrence, G. (A)
Leskinen, J. I. (A)
Letendre, L. J. (A)
Lyons, W. (SM)
Mahren, A. A. (A)
Martin, P. S. (M)
Meinheit, C. E. (M)
Melancon, N. J. (A)
Merten, D. J. S. (M)
Millman, J. (SM)
Neeck, J. E. (A)
Nittoli, A. J. (A)
Nogi, T. T. (A)
Odessey, P. H. (A)
Okrent, J. J. (SM)
Olson, O. F. (M)
Orne, P. W. (A)
Oszy, A. J. (M)
Page, C. E. (A)
Palline, E. H. (A)
Paradis, H. (A)
Parker, H. W. (SM)
Pater, O. C. (A)
Plamjack, H. J. (A)
Rado, J. A. (SM)
Robinson, A. S. (A)
Rossoff, A. L. (A)
Rothstein, M. (A)
Russ, B. H. (VA)
Sanial, A. J. (SM)
Saunders, C. L. (A)
Schlegel, R. A. (A)
Schoenfeld, K. (VA)
Schroeder, K. R. (A)
Seabury, E. M. (M)
Shubel, E. J. (A)
Sieminski, E. (A)
Spain, F. K. (A)
Strauss, K. J. (A)
Strong, J. J., Jr. (A)
Susskind, S. E. M. (A)
Tepper, H. H. (M)
Thropp, C. H. (VA)
Tomiyasu, K. (M)
Tsao, C. Y. (A)
Weindorf, D. R. (A)
Weiss, W. I. (M)
White, E. S. (M)
Wittman, F. (A)
Zion, H. (A)

Forest Hills
Bendett, R. M. (A)
Bloom, W. E. (A)
Brenneman, D. E. (M)
Brown, W. R. (M)
Burns, R. F. (A)
Carlat, B. (M)
Canavaciol, F. E. (SM)
Chamberlain, A. B. (F)
Chin, P. H. (A)
Della, C. J. P. (SM)
Dietz, H. G. (A)
Durbin, E. (A)
Engel, L. (A)
Freeman, E. E. (SM)
Gilbert, R. C. (A)
Greene, A. N. (A)
Hollywood, J. M. (SM)
Herz, H. (A)
Hogan, J. V. (A)
Hogan, J. V. L. (F)
Jasik, C. (A)
Kalet, E. (A)
Kantor, G. (A)
Krainin, S. (A)
Koppel, A. U. (A)
Koppel, R. J. (M)
Lampert, M. A. (A)
Leeds, M. F. (A)
Levy, S. L. (M)
Lidz, S. (A)
Marcinko, F. C. (A)
Margosian, J. W. (SM)
Markantes, P. N. (A)
Mazel, L. G. (A)
McDonough, V. T. (A)
Mitchell, W. M. (A)
Onyskin, M. (M)
Parzen, B. (A)
Palester, J. (A)
Petrik, A. (A)
Pritkin, L. (A)
Rabin, R. (A)
Sollie, S. A. (SM)
Solzberg, S. (A)
Toepel, W. A. (A)
Weiner, S. L. (A)
Wengryn, M. (A)
Wu, W. I. L. (A)
Youdin, M. (M)

Fresh Meadows
Freeman, O. S., Jr. (A)
Richman, D. (A)

Garden City
Wathen, R. L. (M)

Great Neck
Hollister, D. G. (A)

Hollis
Beidler, S. (A)
Booth, R. E. (A)
Caputo, N. J. (VA)
Chubbuck, E. L., Jr. (M)
Clemens, G. J. (A)
Edell, J. J. (A)
Edmonds, R. H. (M)
Klein, H. M. (A)
Koppels, P. N. (A)
Mann, A. (A)
Martin, E. J. (M)
McBride, W. O. (A)
Paula, G. (A)
Sard, E. W. (A)
Squire, F. M. (A)

Jackson Heights
Abell, C. W. (A)
Blankmeyer, W. A. (A)
Callais, R. T. (M)
Callan, J. M. (A)
Carter, W. S., Jr. (A)
Coundjeris, A. (A)
Enzer, A. (A)
Fenster, A. (A)
Fogel, L. J. (A)
Foster, J. E. (A)
Galella, P. F. (SM)
Giordano, A. B. (SM)
Goldschmidt, A. M. (A)
Hockenjos, R. M. (A)
Hollahaugh, M. G. (M)
Hertzberg, R. E. (A)
Kelley, L. A. (VA)
Levy, B. (A)
Michaelson, H. B. (M)
McDonnell, W. E. (A)
Milton, L. (A)
Pleasure, M. (M)
Plum, M. J. (A)
Rehberg, C. F. (A)
Sanchez, H. M. (A)
Schiavoni, T. V. (A)
Snyder, N. (SM)
Sobel, A. (A)
Solt, H. B. (M)
Toth, W. E. (A)
Truhlar, G. (A)
Whitmer, R. F. (A)
Williamson, C. R. (A)
Wortzman, S. K. (A)

Jamaica
Baldwin, T. W. (A)
Barzilai, G. (SM)
Beck, A. J. (A)
Beck, A. T. (A)
Belchis, S. (A)
Berkowitz, B. (M)
Breitbord, J. L. (A)
Brodek, W. J. (A)
Chanko, P. N. (A)
Chow, W. T. (M)
Cope, R. H., Jr. (A)
Dow, J. B. (F)
Eland, P. D. (A)
Freeman, H. (A)
Glaser, P. F. (A)
Imgram, R. H. (A)
Jahrling, R. J. (M)
Lewinstein, M. (SM)
McCabe, P. I. (A)
Morgenstern, A. (A)
Novick, R. (A)
Shottenfeld, R. (A)
Staschover, L. (A)
Swearingen, T. J. (M)
Theodoseau, T. (A)
Wainwright, E. A., Jr. (A)
White, J. D., Jr. (VA)
Young, H. D. (A)

Jamaica Estates
Selbmann, R. W. (A)

Kew Gardens
Brilmayer, E. W. (A)
Champness, N. A. (M)
Dolnick, A. (SM)
Elsea, I. W. (M)
Espenschied, L. (F)
Fein, B. (A)
Grahant, R. E. (M)
Granger, W. T. (M)
Jacobson, R. I. (SM)
Kent, L. I. (A)
McElwee, E. M. (M)
Piller, S. E. (A)
Reitlinger, N. E. (A)
Segal, R. J. (M)
Roberts, A. K. (A)
Smith, C. R. (SM)
Trott, B. S. (SM)
Trotter, W. E. (A)
Weintraub, R. (A)
Wiesner, L. (A)
Wilson, A. L. (A)

Kew Gardens Hills
Beltner, C. R. (A)
Freedman, M. M. (M)
King, M. (A)
Klein, M. M. (A)
Medwin, A. H. (A)
Necol, J. C. (M)
Newman, S. O. (A)
Press, M. (A)
Rifkin, M. S. (M)
Ruben, A. S. (VA)
Tucker, W. J., Jr. (M)

Long Island City
Albanese, V. J. (A)
Alterman, F. J. (M)
Bagno, S. M. (VA)
Buda, P. V. (A)
Douglas, D. A. (A)
Dzilvelis, A. A. (A)
Fairman, H. E. (A)
Fletcher, R. (A)
Gerry, M. E. (M)
Janiszewski, F. A. (A)
Kellerman, D. (A)
Martin, L. (M)
Meichner, F. T. (M)
Meltzer, H. S. (A)
Oliva, F. J. (A)
Poehler, H. A. (A)
Pagano, C. N. (A)
Pease, C. H. (A)
Roeloffs, E. G. (A)
Rubin, S. W. (M)
Snyder, S. J. (M)
Watson, R. R. (A)
Weissman, J. G. (M)
Xikes, N. W. (A)
Zentner, J. E. (A)

Maspeth
Siekanowicz, W. W. (A)
Walcule, D. (A)

Middle Village
Knights, J. E., Jr. (M)

Ozone Park
Corcoran, J. W. (A)
Daniher, C. E. (A)
Mellard, J. (A)
Saltsburg, S. S. (A)
Simon, L. (A)

Queens Village
Davis, M. (A)
Griemsmann, J. W. E. (A)
Hansen, E. L. (M)
Hickman, W. C. (A)
Kahn, A. (A)
King, L. H. (A)
Koffman, H. J. (A)
Mazzel, A. L. (A)
Moore, C. E. (M)
Schefer, N. A. (A)
Schmidt, H. P. (A)
Smyth, F. J. (A)
Stangl, F. P. (M)
Urban, W. D. (A)
Yeager, J. R. (A)

Rego Park
Astrow, M. (A)
Atlas, H. T. (A)
Gams, T. C. (A)
Hochman, S. (A)
Seidner, J. H. (M)
Weiner, L. H. (A)

Richmond Hill
Casper, S. (A)

Charlton, J. (A)
Egan, W. G. (A)
Feulner, F. A. (A)
Jacobs, F. (VA)
Jensen, A. J. (A)
Jones, A. H. (A)
LoGatto, S. J. (A)
Loth, P. A. (A)
Loughlin, R. G. (A)
Oakes, R. E. (A)
Schwaninger, J. W. (A)
Turnow, W. F. (A)
Wolf, H. (SM)
Woodruff, E. T. (A)

Ridgewood
Ruddy, W. R. (A)
Wirfel, W. M., Jr. (A)

Saint Albans
Appel, H. G., Sr. (A)
Figlia, J. R. (M)
Klaus, G. H. (M)
Masucci, C. (A)
Meyer, E. G. (A)
Parker, H. L. (A)
Prunty, P. F. (A)
Przybyla, E. M. (A)
Ramsey, W. S. (M)
Reisman, S. J. (M)
Rothenberg, S. M. (VA)
Schlafly, H. J., Jr. (SM)
Smedes, R. L. (A)
Vetter, W. F. (A)
Wheeler, W. R. (M)

South Ozone Park
Derderian, G. (A)
Koelle, A. R. (A)
Lizzio, J. (A)
Pierce, V. M. (A)
Samoluk, P. (A)
Triantafellow, W. (A)
Wittenberg, R. C. (A)

Sunnyside
Majlinger, A. (A)

West Forest Hills
Hagedorn, H., Jr. (A)
Powers, J. T. (M)

Whitestone
Di Cecio, S. A. (A)
Herbig, A. J. (A)
O'Connell, T. P. (A)
Smith, J. W. (A)
Von Kunits, P. (M)

Woodhaven
Barzilaski, P. M. (A)
Diemer, F. P. (A)
Frochlich, F. J. (A)
Hannon, R. J. (A)
Hintz, R. T. (VA)
Reitlinger, A. (A)
Scheen, J. (A)
Winter, D. W. (A)

Woodside
Bukofzer, R. (A)
Carlan, L. B. (A)
Dowds, H. M. (A)
Fraleigh, J. B. (A)
Garbarini, G. S. (A)
Gaynor, E. (A)
Green, W. (A)
Gronner, A. D. (SM)
Jahoda, J. R. (A)
Joseph, M. M. (A)
Keith, W. S. (A)
McCann, M. R., Jr. (A)
Paschetto, D. D. (A)
Postman, M. H. (A)
Rabinowitz, M. H. (A)
Reuman, W. H. (VA)
Richter, F. G. (A)
Schlessel, J. H. (A)
Stavitski, L. X. (A)
Thieblemont, A. H. (VA)

STATEN ISLAND

Auriema, R. C. (A)
Avins, J. (SM)
Bellis, R. P. (A)
Bremmer, L. F. (M)
Brossok, W. C. (A)
Culicetto, P. J. (A)
Darch, N. S. (A)
Donaldson, W. G. (A)
Embrechts, A. C. (SM)
Gannett, E. (A)
Gunther, F. A. (SM)
Harper, R. (A)
Hartnett, E. J. (A)
Heerlein, W. J. (A)
Kostriza, J. A. (M)
Lapenna, F. W. (A)
Levine, M. E. (M)
Mallin, J. A. (A)
Martenson, R. B. (A)
Nagy, W. Z. (A)
Radgowski, S. P. (A)
Reeves, J. F. (A)
Rodwin, G. (SM)
Romanofsky, N. K. (A)
Ruedisuell, R. W. (A)
Schreyer, S. D. (A)
Weinberg, T. L. (A)
Woodland, J. M. (A)

NORTH CAROLINA

Aberdeen
Gustafson, C. E. (A)

Albemarle
Fletcher, C. H. (A)

Asheville
Chambers, W. M. (A)
Morgan, Z. K., Jr. (A)

Burlington
Adams, W. (A)
Apple, H. L. (M)
Day, J. L. (M)
Franevsky, M. (A)
Hastings, C. L. (M)
Kelly, I. E. (A)
Smith, C. P. (A)
Turrini, J. J. (M)

Chapel Hill
Caldwell, E. E. (M)

Charleston
Harrole, J. L. (A)

Charlotte
Brown, F. R. (A)
Bush, T. K. (M)
Carey, J. G. (SM)
Caudle, L. L., Jr. (M)
Hatley, M. T., Jr. (A)
Hicklin, W. H. (A)
Jones, C. A., Jr. (A)
Keniston, H. E. (A)
Kickle, M. E. (A)
Minor, M. J. (SM)
Ramsey, R. W. (VA)
Ramsey, R. W., Jr. (A)
Sellars, E. A. (A)
Smith, H. O. (A)
Stewart, A. E. (VA)
Walker, L. L. (A)

Clinton
Vann, I. M., Jr. (A)

Concord
Kennedy, K. R. (A)

Draper
Swinney, J. G. C., Jr. (SM)

Durham
Bailey, J. H. (VA)
Dere, E. B. (A)
Hedgecock, D. M. (A)
Mincey, J. H. (A)
Peyton, P. B., Jr. (A)
Seeley, W. J. (SM)

Elizabethtown
Baird, J. W. (A)

Fayetteville
Deal, W. R. (A)
Swaringen, C. T., Jr. (A)

Fort Bragg
Christian, H. K. (A)

Gastonia
Chaney, H. L. (M)
Mills, C. W. (A)

Goldsboro
Hicks, J. M. (A)
Trueblood, D. B. (A)

Graham
Troc, J. L. (A)

Greensboro
Aitkenhead, J. (A)
Atcheson, S. E. (M)
Best, R. H. (A)
Coble, R. P., Jr. (A)
Cummings, M. M. (M)
Gardiner, J. G. (SM)
Marteena, J. M. (VA)
Norwood, C. A. (A)
Strandberg, C. F. (A)

Hendersonville
Corriher, H. A., Jr.

Hickory
Long, T. E. (A)

High Point
Morris, W. L. (A)

Kernersville
Lasley, L. C. (A)

Lenoir
White, R., Jr. (A)

Lexington
Myers, A. S., Jr. (A)

Nathans Creek
Hurt, A. B., Jr. (A)

New Bern
Jouppi, A. F. (A)

North Wilkesboro
Harmon, W. R., Jr. (A)

Plumtree
Benfield, C. W. (A)

Raleigh
Brennecke, C. G. (F)
Carson, V. S. (SM)
Dawkins, L. L. (A)
Dillon, P. (M)
Duncan, V. D. (A)
Eckels, A. R. (A)
Hall, W. H. C. (A)
Hoadley, G. B. (SM)
Hulick, H., Jr. (VA)
Kahn, S. H. (M)
MacIntyre, A. B. (A)
Manning, E. G. (A)
McArthur, C. S., Jr. (A)
Meadow, W. L. (M)
Merritt, R. E. (A)
Porter, B. E. (A)
Ramey, R. L. (A)
Sherman, J. H., Jr. (A)
Sidnam, R. D. (A)
Tompkins, E. H., Jr. (A)
Webb, G. N. (A)
Willard, F. R. (M)

Randleman
Elliott, J. O. (A)

Roanoke Rapids
Meares, C. W. (A)

Rocky Mount
Arrington, J. L., II (A)
Aycock, B. B. (A)

Salisbury
Ramsey, M. F. (A)
Smith, A. D., Sr. (A)

Wendell
Todd, M. C. (M)

West Asheville
Mills, E. R. (A)

Whiteville
DeLoney, W. W. (A)
Wescott, J. C. (A)

Wilmington
Aycock, E. H. (A)
Coward, R. W. (A)
Peebles, N. A. (A)

Winston-Salem
Arnold, H. H. (M)
Beard, C. E. (VA)
Bertie, C. E. (A)
Burley, F. E. (SM)
Coan, J. O., Jr. (A)
Corderman, R. C. (SM)
Gegenheimer, W. C. (SM)
Gerth, J. H. (A)
Hedrick, P. F. (SM)
Hege, A. L. (A)
Herman, L. R. (A)
Hodge, C. E. (A)
Hopper, F. L. (SM)
Huffman, J. C. (A)
Kernkamp, C. F. (A)
King, L. C. (A)
Lanford, W. E. (A)
Leonard, A. B. (A)
Lyon, Z. G., Jr. (A)
McCauley, C., Jr. (M)
McNeill, L. P. (A)
Mitchell, D. H. (A)
Moore, W. C. (A)
Palmer, C. W. (SM)
Peters, R. A. (A)
Porter, G. R. (A)
Reisenweaver, W. B. (A)
Rollick, W. D. (A)
Seamans, J. O. (A)
Schaffer, L. I. (A)
Siphers, J. W. (A)
Smith, C. M., Jr. (SM)
Spikula, R. W. (A)
Stavrou, N. C. (A)
Sugg, L. M. (A)
Tardiff, R. C. (A)
Ward, D. L. (A)
Welsh, W. A. (A)

NORTH DAKOTA

Bismarck
Murdoch, J. P. (A)
Nelson, I. (M)
Vavra, H. G. (A)
Fargo
Hetland, J. M. (VA)
Sandberg, A. J., Jr. (A)
Tate, J. A. (A)

Grand Forks
Foerster, A. C. (A)
Thomforde, C. (M)
Zobel, E. R. (A)

Sheyenne
Rudy, E. W. (A)

OHIO

Akron
Baum, R. V. (A)
Berg, B. (M)
Berkey, R. H. (A)
Bock, A. W. (A)
Boedeker, H. F. (A)
Bosomsworth, G. P. (VA)
Branch, G. E. (SM)
Brands, F. W. (A)
Buchtel, P. E. (A)
Byrne, R. M. (A)
Caulkins, F. A. (A)
Colletti, N. (A)
Curtis, W. P., Jr. (A)
Eckert, H. R. (A)
Eddey, E. E. (A)
Farnsworth, N. B. (A)
Felsman, W. O., Jr. (A)
Fordham, C. E. (A)
Funk, R. W. (M)
Gabres, R. S. (A)
Goedde, H. A. (A)
Haljak, C. A. (A)
Holmes, G. A. (A)
Huffman, E. B. (A)
Johns, L. T. (M)
Jonard, H. A. (A)
Jones, J. W. (A)
Kelly, K. O. (A)
Kime, J. M. (A)
Knopp, I. L. (M)
Lambert, C. O. (M)
Lanier, H. F. (M)
Leibowitz, S. (A)
Mast, P. E. (A)
McLane, R. C. (A)
McLaughlin, F. G. (A)
Nelson, J. L. (A)
Nerhood, H. E. (A)
Opperman, A. G. (M)
Pasquier, C. J. (A)
Redmond, J. F. (A)
Reymer, E. H. (A)
Ryburn, P. W. (A)
Shively, H. G. (A)
Smith, P. C. (SM)
Snooks, W. E. (A)
Tass, M. H. (A)
Trutko, J. M. (A)
Twombly, J. W. (A)
Weinsheimer, W. E. (A)
Wittig, W. L. (A)

Alliance
Smith, A. E. (A)

Alpha
Phillips, S. C. (A)

Arcanum
Weber, S. E. (A)

Ashtabula
Bernato, F. N. (A)
Cornwell, R. G. (A)
Harris, W. C. (A)
Morrison, H. F. (A)
Stevenson, L. M. (A)

Ashville
Young, P. D. (A)

Athens
Green, D. B. (VA)

Avon Lake
Dobosy, J. F. (SM)

Barberton
Austin, A. O. (F)
Crom, H. D. (A)
Tompkins, F. G. (M)

Bay Village
Friswold, F. A. (A)
Hoffman, H. J. (A)
Schneider, P. (A)
Smith, C. W. (A)
Stickney, J. B. (A)
Tabler, J. G. (A)
Wolfe, P. N. (A)

Beachwood Village
Petras, W. M. (A)

Bedford
Jerome, W. R. (VA)
Washko, F. H. (A)

Bellefontaine
Weisz, H. (A)

Bellevue
Summers, W. P. (A)

Beloit
Cobbs, E. R. (A)

Berea
Altmos, D. A. (A)
Blackman, C. P. (A)
Epperson, J. B. (SM)
Hammerschmidt, A. L. (SM)
Sanderson, R. B. (A)
Steele, S. E. (A)

Bethel
Drody, J. L. (A)

Bexley
Brooke, E. F. (M)

Blacklick
Ishmael, O. L. (A)

Bluffton
Triplett, M. M. (A)

Bowling Green
Synnamon, J. H. (A)

Brady Lake
Cory, R. W. (A)

Brecksville
Csensich, J. E. (A)
Hutton, W. G. (SM)
Nace, A. S. (SM)
Olsen, R. K. (SM)
Sanderson, J. K. (M)
Ulrich, J. F. (VA)

Bridgeport
Snefsky, E. A. (A)

Brilliant
Morgan, W. S. (A)

Byesville
Stropki, G. T. (A)

Cable
Alty, R. L. (M)

Cambridge
Randles, W. C. (M)

Canton
Boudler, A. G. (A)
Burtner, R. L. (M)
Greenham, R. L. (A)
Koenreich, J. L. (A)
Leist, L. G. (M)
Matzinger, J. R. (M)
Phillips, W. M. (VA)
Rexroad, R. A. (A)
Roderick, E. R. (A)
Vignos, J. P. (A)
Walker, N. S. (VA)

Centerburg
Dixon, E. D. (A)

Centerville
Piety, E. W. (M)

Chagrin Falls
Lowe, R. E. (A)

Chesterland
Mumma, H. A., Jr. (A)

Chillicothe
Hinkle, J. E. (A)

Cincinnati
Adams, C. E., Jr. (A)
Alberts, W. S. (M)
Ashman, A. B. (A)
Bereskin, A. B. (SM)
Bissonette, A. J. (M)
Bonem, E. J. (A)
Boothe, A. M. (A)
Bopp, C. (M)
Boyle, H. G. (A)
Brennemann, A. E., Jr. (A)
Brockway, R. M. (A)
Brooks, R. D. (A)
Brouse, H. L. (SM)
Bussard, E. J. H. (SM)
Byard, E. J. (A)
Clement, L. M. (F)
Crosley, P., Jr. (SM)
Davison, F. A. (A)
Delker, A. G., Jr. (A)
DeLorenzo, V. H. (A)
Doctor, B. H. (A)
Duncan, D. B. (A)
Ebbeler, J. R. (A)
Edelsohn, C. R. (A)
Emmerling, E. J. (A)
Fenstermacher, A. L. (A)
Ferrell, D. (A)

Fischer, R. E. (M)
Fox, W. F. (M)
Frommer, J. C. (SM)
Gieringer, C. K. (SM)
Gulden, W. W. (M)
Haehnle, C. G. (A)
Hentz, E. G. (A)
Herb, A. P. (A)
Himes, H. D. (A)
Hoeltge, E. J. (A)
Hogan, C. M. (SM)
Hosea, R. A. (A)
Inderbees, J. A. (A)
Jones, E. M. (M)
Jordan, D. M. (VA)
Kay, E. D. (A)
Kilgour, C. E. (F)
King, F. W., Jr. (M)
Kiss, J. S. (M)
Knoblaugh, A. F. (M)
Krueger, S. W. (A)
Kuck, B. M. (A)
Lambert, R. (A)
Lantzer, F. N. (M)
Lehnhoff, R. G. (M)
Maher, R. A. (M)
Makinson, G. E. (VA)
Mather, T. S. (A)
Matthews, L. M. (M)
McDonald, J. M. (M)
McKay, M. W. (A)
Medkeff, D. D. (A)
Meyer, A. (A)
Miller, L. W. (A)
Montgomery, W. D. (M)
Morse, C. (A)
Nason, D. B. (M)
Nathan, R. (M)
Novy, E. W. (M)
Osterbrock, W. C. (SM)
Overman, C. I. (A)
Platts, G. F. (SM)
Quitter, J. P. (M)
Ransom, A. W. (A)
Rockwell, R. J. (F)
Ross, J. M. (A)
Saville, H. F., Sr. (A)
Schenck, R. L. (M)
Schneider, C. A. (A)
Schroeder, W. R. (VA)
Schwarz, H. G. (A)
Scott, V. J., Jr. (A)
Shirk, W. B. (M)
Siefker, R. G. (A)
Spinner, L. N. (A)
Stacy, R. A. (M)
Starek, R. A. (A)
Stewart, A. W. (M)
Stimson, R. L. (A)
Stubbins, W. F. (M)
Stuhlbarg, S. M. (A)
Symons, W. E. (M)
Taylor, G. O. (M)
Thornell, J. H. (A)
Turrell, R. M. (M)
Uphaus, R. H. (A)
Warren, J. B. (A)
Weber, C. E. (M)
Wedig, F. L., Jr. (M)
Welch, C. A. (A)
Wernz, G. L. (A)
Williamson, G. F. (M)
Winkle, L. (A)
Wissel, F. A. (SM)
Young, P. A. (M)
Zimov, L. R. (A)

Clairsville
Gaston, E. E. (M)

Clayton
Battelle, R. B. (A)

Cleveland
Ackerman, E. K. (SM)
Anderson, C. L. (A)
Bakos, M. A. (M)
Bazik, W. (A)
Bergold, G. F. (A)
Berlincourt, D. (A)
Blauvelt, R. C. (SM)
Bletcher, A. L. (A)
Bossard, G. L. (M)
Briggs, R. F. (M)
Brincka, J. J. (A)
Brown, B. K., Jr. (A)
Caskey, H. B. (M)
Cervenak, E. D. (A)
Chatterton, L. N. (A)
Collins, D. L. (M)
Cornell, P. M. (A)
Cull, R. R. (M)
Dannemiller, J. R. (A)
Delany, R. H. (A)
Diamantides, N. D. (A)
Dittenberger, R. J. (A)
Dittoe, R. E., Jr. (A)
Dombey, W. C. (A)
Domoracki, W. (A)
Dugan, T. J. (A)
Eddleston, J. H. (A)
Elvis, J. C. (A)
Farr, H. J., Jr. (A)
Farrance, J. (A)
Flagg, W. A., Jr. (A)
Franks, C. V. (A)
Friedman, T. B. (SM)
Geiger, D. L. (A)
Grasson, W., Jr. (A)
Guild, E. G. (A)
Heinzelman, G. J. (M)
Heller, H. H. (A)
Humphrey, A. J. (A)
Jira, J. W. (M)
Johns, P. K. (A)
Jones, R. B. (A)
Karbo, D. J. (A)
Keithley, J. F. (M)
Ketchum, J. R. (A)
Kres, A. J. (A)
Leonard, S. E. (SM)
Lewis, A. M. (A)
Lippert, G. R. (A)
Lister, G. H. (SM)
Lotzow, M. F. (A)
Managan, W. W. (M)
Mason, N. O. (A)
McCollister, D. R. (A)
Miller, K. W. (A)
Nash, H. C. (A)
Newborg, D. S. (A)
Newell, P. A. (A)
Oestermeyer, C. F. (A)
O'Gara, J. J. (A)
Ostrand, K. T. (A)
Peden, M. (A)
Petrarca, T. (A)
Pettus, R. (A)
Plakadis, A. P. (VA)
Rockwell, W. S. (A)
Roeger, R. E. (A)
Seaton, G. (A)
Semenluk, M. H. (A)
Seybold, J. F. (A)
Sherman, K. S. (SM)
Sindelar, E. E. (A)
Slor, A. D. (A)
Snedeker, M. L. (M)
Sobeich, C. A. (A)
Sombor, H. (A)
Sourek, R. A. (A)
Springer, R. W. (A)
Stoffel, L. L. (A)
Thayer, J. W. (A)
Viton, E. J. (A)
Watson, B. S. (A)
Weiler, R. J. (A)
Welman, V. A. (A)
Willard, R. C. (A)
Williams, H. C. (M)
Yeager, J. R. (A)
Yochelson, S. B. (A)
Zelle, J. (SM)

Cleveland Heights
Baerwald, H. G. (M)
Begun, S. J. (SM)
Butterworth, J. W. (SM)
Brown, C. W. (A)
David, B. W. (SM)
Dean, K. R. (A)
Earle, E. W. (A)
Field, B. W. (A)
Fox, R. A. (SM)
Friedberg, M. R. (M)
Heckelman, R. W. (A)
Hoover, P. L. (SM)
Hudson, A. E. (A)
Johannesen, J. D. (A)
Keachie, J. H. (SM)
Kline, L. H. (M)
Lowenstein, J. F. (A)
Novak, A. J. W. (A)
O'Connor, R. A. (A)
Ringo, K. A. (A)
Rogert, H. E. (A)
Scott, E. P. (A)
Smith, C. E. (SM)
Stevens, H. E. (M)
Ulmer, R. M. (A)

College Corner
Moor, W. L. (A)

Columbus
Anthony, G. E. (A)
Bacon, J. (A)
Baird, C. W. (A)
Benedict, G. R. (A)
Bennett, L. C. (A)
Bertram, S. (SM)
Bollinger, L. E. (A)
Boone, E. M. (SM)
Bryant, L. L. (A)
Carter, C. J. (A)
Chope, W. E. (A)
Cleckner, D. C. (A)
Clutter, E. C. (A)
Cohen, M. H. (A)
Cosgriff, R. L. (A)
Crane, N. B., Jr. (A)
Crowley, T. H. (A)
Daugherty, W. M. (A)
Davis, W. L. (M)
Dawson, D. E. (A)
Danson, P. M. (A)
Early, J. M. (A)
Ebers, J. J. (A)
Fouty, R. A. (M)
Gamble, E. H. (SM)
Guernsey, E. D. (A)
Hayden, J. R. (A)
Higgy, R. C. (SM)
Huffman, D. A. (A)
Hughes, J. G. (A)
Ingledue, E. F. (M)
Jacques, R. B. (M)
Jaeger, J. H. (M)
Jones, E. A. (A)
Kouns, W. D., Jr. (A)
Kraus, J. D. (SM)
Krausz, A. (A)
Kreis, R. J. (A)
Kroeger, F. B. (A)
Kutzley, V. J. (A)
Lawrence, G. M. (A)
Lodge, L. L. (A)
Lorenz, T. J. (A)
Maier, R. H. (A)
Masters, R. W. (SM)
McNichols, H. B. (A)
Mendenhall, W. S., Jr. (A)
Merrill, R. L. (A)
Minor, W. C. (M)
Molloy, G. P. (SM)
Nafzger, L. H. (VA)
Ort, W. (A)
Peters, L., Jr. (A)
Rife, W. E. (A)
Rumsey, V. H. (SM)
Schneider, H. U. (A)
Shepherd, L. P. (A)
Sherwood, E. M. (VA)
Sloan, C. B. (M)
Smreek, P. C. (A)
Tice, T. E. (A)
Tracy, R. C. (A)
Truxall, F. W. (A)
Walter, C. H. (A)
Washburn, F. L., Jr. (A)
Weimer, F. C. (M)
Williams, J. C. (A)
Wolf, F. A. (A)
Yaw, D. F. (A)
Young, D. A. (VA)

Conneaut
Chorpening, C. M. (M)
Dvorsky, A. L. (A)
Keskinen, A. R. (M)
Morrell, G. A., Jr. (A)

Cuyahoga Falls
Burke, J. T. (A)
Davis, H. P. (A)
Deacon, N. E. (A)
Flowers, H. L. (A)
Hartig, E. O. (A)
Hegbar, H. R. (SM)
Horton, M. C. (A)
Kennedy, E. D. (SM)
McCormick, E. M. (M)
Meneley, C. A. (M)
Miller, R. F. (A)
Morrill, C. D. (A)
Sibila, K. F. (A)
Toman, W. J. V. (M)
Tracy, T. (A)
Van Horn, I. H. (M)
Waldvogel, J. (M)
Wildermuth, J. L., Jr. (A)

Damascus
Tary, J. (A)

Dayton
Acree, A. J. (M)
Adams, E. L. (SM)
Aleo, J. (A)
Allen, F. W. (A)
Althouse, J. M. (A)
Amrhein, O. C. (A)
Anderson, H. L. (A)
Andrew, C. W. (SM)
Anglin, D. (A)
Arenstein, G. H. (SM)
Aschbacher, S. J. (A)
Bailey, H. R. (A)
Baker, W. H. (A)
Baran, M. (A)
Barker, W. J. (M)
Bassett, D. M. (SM)
Baxter, W. D. (A)
Becker, R. H. (A)
Behnke, A. O. (M)
Berens, G. E. (SM)
Biddle, W. G. (M)
Blasi, E. A. (SM)
Boehme, C. D. (A)
Bordewisch, J. F. (A)
Borgelt, E. H. (A)
Box, F. M. (A)
Braden, P. F. (A)
Braverman, N. (A)
Brothers, A. L., Jr. (M)
Brown, A. S. (SM)
Bryan, C. R., Jr. (A)
Buehler, M. E. (A)
Butler, G. T., Jr. (A)
Byre, E. W. (A)
Carpantier, V. J. (M)
Carr, J. W. (A)
Chapman, J. M. (A)
Cherpeski, R. P. (M)
Clark, A. H. (M)
Clute, D. G. (M)
Cochran, E. J. (A)
Cochran, H. E. (A)
Cohen, G. S. (A)
Combs, J. A. (A)
Combs, J. F. (A)
Conrad, C. G. (M)
Cooper, E. H. (M)
Cooper, R. E., Jr. (A)
Copp, R. S. (A)
Couch, P. W. (A)
Cronin, W. M. (M)
Deal, D. L. (A)
Deeken, J. W. (A)
De Luna, J. (A)
Dennis, J. L. (SM)
Desch, J. R. (A)
Dicke, A. H. (A)
Dietrich, D. J. (M)
Dillow, J. C. (A)
Distler, J. E. (A)
Drake, R. E. (SM)
Drexler, J. E. (A)
Duckwitz, W. G. (M)
Dunn, F. S. (A)
Easley, L. E. (M)
Eaton, W. G. (SM)
Eckert, C. C. (SM)
Elfenbein, W. (A)
Ellis, C. E., Jr. (A)
Ellis, T. E., Jr. (A)
Ely, C. H. (A)
Fanning, G. B. (A)
Federlin, H. M. (A)
Fedotin, L. S. (A)
Ferrin, K. S. (A)
Fessler, A. L. (M)
Ficek, J. A. (A)
Finders, R. M. (A)
Finocharo, J. J. (M)
Fisher, P. A. (A)
Fishman, S. (A)
Foreman, J. J. (A)
Framme, R. J. (SM)
Franklin, C. S. (A)
French, B. V. K. (SM)
Fried, W. R. (A)
Gadler, S. J. (M)
Galbraith, H. J. (A)
Garber, J. F., Jr. (A)
Gardner, B. R. (A)
General, J. (SM)
Gerdemann, E. A. (A)
Gerdes, C. V. (A)
Giannetto, C. (M)
Gibbons, T. J. (M)
Gibbs, L. L. (A)
Glan, G. (M)
Goldfarb, B. J. (A)
Goldman, A. (M)
Gould, G. T., Jr. (A)
Gregersen, K. J. (A)
Griffing, B. L. (SM)
Grimm, F. W. (A)
Groszewski, D. J. (A)
Gulden, E. V. (M)
Haag, S. J. (A)
Hagstrum, W. R. (A)
Hallman, L. B., Jr. (SM)
Hamilton, R. C. (A)
Hansen, G. M. (A)
Harpster, W. T. (A)
Hauser, P. D. (M)
Hayes, T. J. (M)
Hazlett, W. D. (A)
Hearsum, D. R. (M)
Hedges, H. G. (A)
Helldoerfer, C. S. (M)
Henderson, A. E. (SM)
Hendricks, L. A. (SM)
Herb, J. W. (M)
Herter, V. E. (M)
Herzog, W. F. (A)
Heyd, J. W. (A)
Hill, M. A. (M)
Hilsabeck, D. M. (M)
Hinman, W. H. (A)
Hites, C. E. (A)
Hitzenhammer, A. D. (A)
Holloway, F. L. (SM)
Holman, W. S. (A)
Holt, T. (A)
Hood, W. L. (A)
Horrigan, J. S. (A)
Huckaby, J. H. (A)
Hull, R. S. (A)
Hunter, L. W. (A)
Ittelson, R. W. (SM)
Jacobs, M. (SM)
Jacobs, V. (A)
James, R. L. (M)
Javorsky, J. J. (A)
Jesurun, M. M. (A)
Johnson, E. G. (A)
Johnson, P. C. (A)
Johnson, R. A. (A)
Keller, C. N. (A)
Kennedy, J. B. (A)
Kern, J. I. (A)
Kesler, C. K. (A)
Kester, R. E. (A)
Keto, J. E. (F)
Kidd, G. B. (VA)
Kilheffer, L. D. (SM)
Kilroy, J. W. (A)
Knight, A. R. (SM)
Koehl, H. L. (A)
Koenig, P. E. (SM)
Kovski, J. J. (SM)
Kozloff, V. S. (A)
Krenzer, B. A. (A)
Kress, O. C. (A)
Kuhlman, P. W. (VA)
Lahn, F. C. (A)
Langston, G. A. (A)
Larkin, E. D. (A)
Laschever, N. L. (A)
Lauth, R. E. (A)
Lawson, S. A. (A)
Lawrence, J. T. (M)
Lepple, H. (M)
Levine, D. (M)
Lieber, M. (A)
Littell, C. C., Jr. (M)
Little, W. E. (A)
Lloyd, L. H. (M)
Lockwood, G. C. (A)
Long, L. E. (M)
Long, R. E. (M)
Lopez, J. L. (A)
Lord, A. S. (A)
Manley, T. M. (M)
Marshall, C. J. (SM)
Mawdsley, R. L. (SM)
McCoy, O. Z. (A)
McElroy, G. A. (A)
McInnis, A. K., Jr. (A)
McLaughlin, C. E. (M)
McLennan, M. A. (M)
McNally, W. P. (A)
McRae, A. H. (M)
Melron, M. E. (A)
Mendelson, D. A. (A)
Miller, R. A. (M)
Moore, W. E. (A)
Mumma, R. E. (SM)
Murray, P. R. (SM)
Nettleinghani, M. D. (A)
Nelson, J. L. (A)
Nelson, N. A. (A)
Niersteimer, P. H. (A)
Noble, J. C. (M)
Northrop, P. G., Jr. (A)
Oebels, C. J. (A)
Overcash, F. J. (A)
Overholser, W. E. (A)
Overholt, R., Jr. (VA)
Owen, H. W. (M)
Palm, W. A. (A)
Parker, A. P. (VA)
Pasek, J. (A)
Perdzock, R. C. (A)
Perper, L. J. (SM)
Peters, A. L., Jr. (VA)
Petit, A. H. (A)
Pierce, R. R. (A)
Pope, J. C. (A)
Pratt, C. B. (M)
Raabe, H. P. (A)
Rappaport, G. (SM)
Rautio, R. W. (A)
Rawhouser, R. (M)
Reedy, J. F. (A)
Regnier, L. A. (A)
Reintjes, J. C. (A)
Richards, E. L. (A)
Richmond, L. P. (SM)
Rogers, A. J. (M)
Root, L. W. (M)
Rottenberg, M. J. (A)
Rounds, J. M. (A)
Ruble, H. E. (M)
Russ, F. J. (A)
Russell, H. J. (A)
Rychlik, R. F. (SM)
Rynda, T. C. (A)
Sandor, L. K. (M)
Sauer, R. J. (A)
Schantz, G. W. (A)
Scheer, G. H., Jr. (SM)
Schmeck, J. S. (A)
Schoenberger, W. J. (M)
Schommer, G. R. (A)
Schoonover, W. C. (A)
Schram, S. M., Jr. (A)
Schwennesen, A. B. (M)
Sen, W. J. (SM)
Senecal, T. L. (M)
Shea, J. H. (A)
Sherman, J. M. (A)
Shipp, R. L., Jr. (M)
Siek, J. R. (A)
Slusny, M. D. (A)
Smith, W. R. (A)
Spandau, E. P. (SM)
Springer, L. D. (A)
Springer, P. W. (M)
Stanton, J. S. (M)
Stimmel, R. G. (A)
Stolzenbach, R. W. (M)
Stouch, D. H. (A)
Stuetzer, O. M. (A)
Sullivan, A. H., Jr. (SM)
Tarrants, G. (A)
Teegarden, J. W. (A)
Theobald, D. J. (A)
Thresher, W. E. (A)
Thurston, M. O. (A)
Tomberg, S. (A)
Turner, E. M. (A)

Velesky, J. J. (A)
Vendely, B. (A)
Walker, R. V. (A)
Wamboldt, H. (A)
Warwick, J. D. (A)
Waterfall, F. E. (M)
Watton, A., Jr. (SM)
Webb, R. C. (A)
Wehner, G. L. (A)
Wehner, G. K. (M)
Wehrman, R. B. (A)
Weiner, G. (A)
Weis, C. F. (A)
Weiss, E. J. (A)
Weissman, S. (SM)
Wells, M. M. (SM)
White, S. B. (A)
Whitlock, R. S. (A)
Wiegert, P. G., Jr. (M)
Wieland, E. S. (A)
Wilkie, H. (SM)
Wilkinson, J. E. (A)
Williams, H. L. (A)
Wilson, J. E. (SM)
Wimer, A. G., Jr. (M)
Winston, C. B. (A)
Winters, W. D. (A)
Wolf, E. W. (A)
Wolford, C. E. (A)
Wong, M. S. (A)
Volles, J. (SM)
Yoshida, H. (A)
Young, L. M. (SM)
Zimmerman, R. F. (M)
Zwissler, H. R. (A)

Deer Park
Sheridan, C. J. (A)

East Cleveland
Bowerman, R. H. (A)
Guthrie, H. G. (A)
Pritchard, H. T. (A)
Rety, E. E. (A)
Schunemann, C. F. (M)
Sheetz, J. L. (A)
Ward, D. O. (A)
Westbrook, R. D. (A)

East Liverpool
Foulks, E. D. (A)

Elmore
Bay, R. J. (A)

Elyria
Finegold, I. (A)
Moline, J. C. (A)
Mull, H. R. (A)

Euclid
Daniels, G. N. (A)
Goodman, P. D. (M)
Mason, R. F. (A)
Pfaff, R. W. (A)
Reeves, H. J. (A)
Shearer, R. L. (M)
Vendeland, R. N. (A)
Weiss, W. A. (A)

Fairborn
Adamson, L. B. (A)
Baer, C. E. (M)
De Jonghe, J. J. (A)
Ebert, H. P. (A)
Ensall, T. (M)
Glidewell, J. J., Jr. (A)
Jones, T. G., Jr. (A)
Levy, J. (A)
Mayer, E. S. (VA)
Miller, F. P. (A)
Miller, G. S. (A)
Reber, J. H. (A)
Rizos, J. G. (A)
Showen, L. (M)
Snyder, B. L. (A)
Stecher, L. J. (A)
Taylor, P. B. (SM)
Timineri, A. A. (A)
Tyzzer, C. E. (M)
Vance, W. H., Jr. (M)
Worthington, D. T. (A)

Fairview Park
Atkisson, E. A. (A)
Leemon, W. (A)

Findlay
Smith, E. C. (A)
Truman, L. N. (A)

Foster
Porter, J. R. (A)

Franklin
Barlow, D. E. (A)
Bryant, V. D. (M)

Fremont
Leite, R. C. (A)
Swartzlander, G. W. (A)

Galion
Blashfield, W. H. (A)
Crissinger, W. W. (A)
Haferd, F. H. (A)
Lewis, F. C. (A)
Lounsberry, E. P. (A)
Murphy, C. E. (A)
Shuey, P. F. (M)

Garfield Heights
Coffe, S. A. (A)
Manley, E. B. (A)

Girard
Kinney, R. V. (A)

Granville
Clark, J. V. (A)
Marlow, W. C., Jr. (VA)

Green Hills
Wahl, A. C. (M)

Greentown
Myers, W. D. (A)

Hamilton
Bange, J. B. (A)
Purdy, J. A. (A)
Staege, S. A. (VA)
Stump, A. M. (M)
Wear, J. (A)
Winkeljohann, A. (A)

Hartford
Hawkins, R. L. (A)

Hudson
Hill, J. S. (M)

Ironton
Loftis, H. J. (VA)

Kent
George, E. M. (M)
Newman, H. S. (A)
Wightman, E. E. (A)

Kingston
Leasure, R. B. (M)

Lakewood
Baker, A. L. (A)
Benkelman, G. F. (SM)
Bidlack, C. S. (VA)
Bledsoe, R. E. (A)
Bloyd, J. E. (A)
Cameron, D. B. (M)
Child, R. W. (A)
Daykin, D. R. (A)
Dutton, C. E. (VA)
Faulkner, A. (A)
Flack, S. G. (VA)
Hajny, E. J. (A)
Hamann, K. R. (A)
Hamman, G. B. (VA)
Jacob, W. P. (M)
Kline, R. L. (A)
Pierce, R. M. (SM)
Shandy, G. P. (M)
Thacker, C. E. (A)
Wells, M. (A)
White, G. M. (M)

Lancaster
Good, J. A. (M)
Iler, G. W. (A)
Magestro, J. C. (A)

Lima
Ridenour, P. W. (M)

Logan
Ricketts, F. E. (M)

Lorain
Cox, R. C. (A)
Goodell, W. A. (A)
Heisner, D. A. (M)
Herrick, R. H. (SM)
Huge, H. M. (A)
Kauffman, H. C. (M)
Lorence, E. L. (A)
Romoser, P. E. (A)

Loveland
Hancock, H. E. (M)

Lyndhurst
Dalasta, F. (M)
Jackson, W., Jr. (A)
Nau, W. H. (A)

Macedonia
Weaver, J. H. (A)

Mansfield
Cassidy, R. J. (M)
Kissel, M. M. (A)
Lanning, W. E. (A)

Maple Heights
Crail, A. C. (M)
Helber, C. A. (M)

Marietta
Clark, C. E. (A)
Walker, R. E. (A)

Massillon
Schwab, C. B. (M)

Medway
Ketcher, R. B. (A)
Neill, W. R. (A)
Soorin, A. J. (A)

Miamisburg
Gnagey, L. B. (A)
Teetzel, F. M. (A)

Middletown
Christner, E. N. (VA)
Shively, E. H. (A)

Millersport
Storck, H. C. (M)

Mingo Junction
Crisante, A. E. (VA)

Mount Healthy
Bass, H. (M)
Holst, P. F. G. (SM)

Mount Vernon
Woodward, R. O. (A)

Napoleon
Roessing, E. F. (A)

New Carlisle
Clark, T. P. (A)
Jeffers, G. N. (A)
Lewis, L. F. (A)
Lower, R. (SM)
Perkins, R. M. (M)
Shanteau, N. G. (A)

New Milford
Miller, C. L. (A)

New Philadelphia
Kohler, N. E. (A)

Newtown
Martin, D. W. (M)

New Washington
Krem, W. J. (A)

North Canton
Duff, J. E. (A)
Gray, D. W. (A)
Stahl, M. D. (VA)
Trego, D. G. (M)
Wahl, G. E. (A)

North Olmsted
Kennedy, D. D., Jr. (M)

Norwood
Balaban, S. A. (A)
Haas, D. L. (A)
Harmon, C. J. (A)
Kleinman, J. M. (A)
Lehman, R. H. (A)
Nitchals, J. L. (A)

Oberlin
Howe, C. E. (M)
McGee, C. G. (A)
Young, M. L. (A)

Orrville
Rouvalis, G. (A)

Osborn
Archer, C. J. (M)
Blasingame, J. J. (M)
Ingling, W. G. (A)
Varga, M. J., Jr. (A)

Ottawa
Andrews, F. B., Jr. (A)
Barber, L. E. (A)
Forbush, E. G. (A)
Goodkin, S. S. (A)

Painesville
Campbell, J. H. (M)
Plaisted, R. J. (A)

Parma
Berardi, C. S. (A)
Crozia, R. W. (A)
Halle, C. F. (A)
Hartman, A. E. (A)
Hoff, H. B. (M)
Howard, W. A. (M)
Pranitch, J. (A)
Satava, C. R. (A)
Schindler, R. W. (A)
Washeim, W. G. (A)

Parma Heights
Boyd, B. (M)
Brinkman, H. A. (A)
Shipley, L. L. (A)

Perrysburg
Griss, C. H. (M)

Phoneton
Brode, R. L. (A)

Piqua
Sprinkle, R. E. (M)

Portage
Lepper, W. E. (A)

Port Clinton
Morgan, W. O. (A)
Wozniak, A. J. (A)

Portsmouth
Gilmer, C. J. (A)
Gilmer, R. L. (A)
Gilmer, W. R. (A)
Morrell, A. (A)

Ravenna
Braden, W. V. (A)
Morton, R. F. (A)

Rocky River
Douglass, J. D. (A)
Marsal, P. (M)
Smart, T. E. (M)
Whipple, G. D. (M)

Rossford
Petch, D. F. (A)

Rossmoyne
Murphy, R. (M)

Saint Bernard
St. Villiers, D. R. (A)

Saint Clairsville
Skoff, J., Jr. (A)

Salem
Schott, J. E. (A)

Sandusky
Derrick, W. A. (A)
Fraser, R. J. (A)
Henry, W. E. (A)
Hummer, E. W. (A)
Kenyon, H. S. (SM)
Searle, L. M. (M)
Wild, J. H. (A)

Shaker Heights
Elmendorf, D. E. (A)
Gotschall, G. D. (A)
Havs, M. L. (A)
Pritchard, W. S. (A)
Rickards, W. H. (A)
Seidman, S. M. (A)

Sidney
Ulman, W. H. (A)

Silverton
Bertram, M. A. (A)

South Euclid
Davis, W. C. (SM)
Frankel, B. L. (A)
Louden, W. C. (A)

Springfield
Abbitt, C. W. (A)
Cunningham, H. W. (A)
Davis, C. R. (A)
Falkenbach, G. J. (A)
Hockman, P. E. (M)
Maxim, W. A. (A)
Meilander, W. C. (A)
Parker, A. J. (A)
Pingel, N. D. (A)
Rhein, G. W. (M)

Sterling
Myers, O. C. (A)

Steubenville
Troesch, J. M. (VA)

Stow
Andresen, G. J. C. (A)

Strongsville
Bowditch, F. T. (M)

Sugar Creek
Hershberger, W. O., Jr. (VA)

Terrace Park
Jordan, J. F. (M)

Tiffin
Hartman, R. E. (A)

Tipp City
Linder, W. J. (A)

Toledo
Ambrose, J. W. (A)
Bailey, C. B., Jr. (A)
Beins, J. K. (M)
Birk, E. V. (A)
Bitter, A. R. (SM)
Brown, W. R. (A)
Byram, E. T. (A)
Chapman, L. B. (A)
Conklin, H. A., Jr. (A)
Corey, V. B. (A)
Czajka, R. F. (A)
Dielman, J. P. (A)
Eash, G. H. (A)
Erb, D. M. (A)
Ferch, B. C. (A)
Galambos, L. G. (A)
Gramlich, H. F. (A)
Hanna, R. N. (A)
Hawley, F. S. (A)
Hedler, R. C. (A)
Heller, E. A. (A)
Herrick, K. 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)
Kotlewski, J. P. (A)
Larson, R. G. (A)
Line, F. M. (A)
Loutzenhiser, C. F. (A)
McCown, W. E. (A)
Nagy, L., Jr. (A)
Neuert, H. L. (VA)
Novo, R. B. (A)
Petty, D. E. (A)
Pierce, E. W. (A)
Plummer, J. H. (M)
Powers, D. A. (M)
Quam, R. W. (A)
Ragen, J. R. (A)
Rowe, H. N. (M)
Ryndet, L. S. (A)
Schnell, W. S. (A)
Sexton, E. M. (M)
Seybold, R. E. (A)
Sheehan, F. J. (A)
Sprengel, W. L. (A)
Stringfellow, W. M. (VA)
Szymkowiak, E. (A)
Thome, R. J. (A)
Thomson, C. R. (M)
Weeber, R. E. (A)
Wiese, A. A. (A)
Yang, T. (A)
Yen, J. T. (A)

Trotwood
Barkley, M. M. (A)

Troy
Rench, C. F. (A)
Wheelock, W. I. (A)

Uhrichsville
Charlton, V. E. (A)

Union
Apple, R. C. (VA)

University Heights
Monroe, R. T., Jr. (A)
Schram, F. B. (M)

Vandalia
Mayer, J. M. (A)
Thumser, L. F., Jr. (A)

Van Wert
Conley, W. H. (A)
Lindsay, J. T. (A)

Warren
Atwood, W. L. (A)
Bondy, H. A. (VA)
Shoemaker, W. F. (A)
Thoman, R. E. (A)

Waynesville
Smith, D. I. (A)
Wilde, A. J. (SM)

Westlake
Fletcher, E. S. (SM)

West Richfield
Bear, N. (A)

West Toledo
Rees, V. C. (A)

Wickliffe
Schilling, M. O. (M)

Wilmington
Whiting, R. J. (A)

Worthington
Crooks, R. K. (SM)
Davis, W. C. (M)
Gahm, W. L. (A)
Mueller, G. E. (SM)
Neubauer, R. A. (A)
Walls, E. L., Jr. (A)
Work, R. A., Jr. (A)

Wyoming
Bolenbaugh, R. K. (M)

Diehl, J. A. (A)
Foster, A. P. (M)
Walcher, J. F. (A)
Zupansky, M. (A)

Xenia
Anderson, C. W. (VA)
Arment, D. E. (A)
Doran, R. J. (M)
Hill, L. P. (M)
Jones, E. D., Jr. (A)
Lipp, J. P. (A)
Mead, W. L. (A)
Noble, H. V. (SM)
Nordlund, R. J. (M)
Rooten, A. (A)
Sides, J. D. (A)
Wogan, R. S. (A)

Yellow Springs
Carr, D. L. (A)
Colbert, C. (A)

Youngstown
Cherpack, J., Jr. (A)
Conroy, M. J. (A)
Dieringer, F. A. (VA)
Dolence, J. J. (A)
Hulme, W. P. (A)
Kuduk, S. T. (A)
Phillips, R. G. (A)

Zanesville
Gay, J. W. (A)
Hunt, W. A. (M)
Thompson, C. O. D., Jr. (A)

OKLAHOMA

Ada
Turley, J. R. (A)
Williams, C. S., Jr. (A)

Ardmore
Benson, H. H. (A)

Bartlesville
Adams, M. M. (A)
Hensley, W. A. (M)
McMillan, F. L., Jr. (M)
Parsons, J. R. (A)
Piety, R. G. (VA)
Thomas, M. E. (A)

Bethany
Hill, W. M. (A)

Billings
Rush, O. A., Jr. (A)

Broken Arrow
Hawkins, J. E. (A)

Chickasha
Gilhousen, L. E. (A)

Edmond
Ralls, R. H. (A)

Enid
Harvey, W. M., Jr.

Frederick
Jones, J. D., Jr. (M)

Newkirk
Brown, G. L. (A)

Norman
Farrar, C. L. (M)
Green, B. B. (A)
Mathis, H. F. (M)
Tuma, G. (A)

Okeene
Kammerzell, C. E. (A)

Oklahoma City
Ashby, R. H. (A)
Bennett, P. L. (M)
Bird, D. W. (A)
Bond, R. M. (A)
Chapman, C. W. (A)
Clinkenbeard, H. A. (A)
Crippen, E. G. (A)
Dawson, O. D. (A)
Easum, C. M. (A)
Eastman, C. W. (A)
Fancher, V. M. (A)
Freeland, R. R. (A)
Glass, W. G. (A)
Gray, L. D. (A)
Hammer, F. E. (A)
Hazelwood, C. A. (A)
Herrmann, F. (VA)
Jackson, J. H. (A)
Lyons, E. F. (A)
Marrinan, H. J. (A)
McClung, R. R. (A)
Miller, W. E. (A)
Nash, O. A. (A)
Nessmith, J. T., Jr. (A)
Pendery, R. A. (A)
Ricciotti, S. (M)
Rivers, M. D. (A)
Sheaffer, C. F. (VA)
Spooner, A. J. (A)
Thomas, M. W. (A)
Williams, F. G. (A)

Pawhuska
Fisher, F. E. (A)

Perry
Folan, W. (A)

Ponca City
Horwitz, L. B. (A)
Kaufman, H. (A)
Lerner, I. S. (A)
Mead, W. A. (A)
Ruppe, K. E. (A)

Shawnee
Kolp, J. S. (A)

Stillwater
Betts, A. L. (M)
Buck, R. F. (A)
Cawood, J. L. (A)
Fristoe, H. (SM)
Johnson, D. L. (M)
Jones, H. L. (SM)

Tulsa
Born, W. T. (VA)
Burton, R. G. (A)
Bushnell, J. M., Jr. (A)
Day, C. E. (M)
Dikmen, B. I. (A)
Durham, E. R. (A)
Egan, D. G. (VA)
Fuller, W. D. (M)
Gilmartin, T. (M)
Goetz, L. P. (M)
Hadley, C. F. (M)
Harper, F. N. (A)
Hearn, D. P. (A)
Hidy, J. H. (SM)
Jacobs, G. G. (A)
Kenney, B. D. (A)
Koeppel, B. W. (A)
McManis, L. B. (A)
Miller, J. W. (M)
Mooney, P. (A)
Peterson, G. (SM)
Rice, E. A., Jr. (A)
Silverman, D. (A)
Stampalia, J. T. (A)
Stinson, L. W. (A)
Stover, E. B., Jr. (A)
Stowell, N. J. (M)
Thompson, R. R. (M)
Vene, J. M. (A)

OREGON

Albany
Davidson, H. A. (A)

Astoria
Cohan, A. H. (A)
Ellis, P. V. (A)

Baker
Simpson, K. R. (A)

Beaverton
Haase, H. W. (A)
Tweedie, D. A. (A)

Corvallis
Albert, A. L. (F)
Ballard, B. J. (A)
Barclay, W. J. (SM)
Beals, E. L. (A)
Feikert, G. S. (SM)
Hix, R. C. (A)
Hunnicutt, A. L. (A)
McMillan, F. O. (SM)
Merritt, R. P. (A)
Michael, R. R. (M)
Yunker, E. A. (SM)

Eugene
Hoppe, P. R. (A)
Surdam, E. L. (M)

Gresham
Marsh, W. E. (VA)

Hillsboro
Fishback, C. V. (A)
Varenhorst, V. D. (A)

Klamath Falls
Chandler, H. J. (A)
Cramer, K. H. (A)
Woodward, C. (A)

McMinnville
Anderson, C. M. (A)

Medford
Burnside, C. A. (A)
Walker, V. G. (VA)

Milwaukie
Edens, G. E. (A)

Oswego
Ballieu, H. L. (A)
Church, P. K. (A)

Pendleton
Willey, V. E. (A)

Philomath
Plunkett, D. T. (A)

Portland
Arnold, E. F. (A)
Arnstein, G. P. (A)
Backstrand, W. C. (A)
Bargfeld, F. G. (A)
Belleville, L. M. (M)
Biggerstaff, W. F. (A)
Bishop, A. R. (M)
Brittain, V. M. (M)
Broms, B. H. (A)
Calnon, D. C., Jr. (A)
Christensen, H. E. (A)
Claypool, W. S. (VA)
Cole, J. A. (A)
Cutting, W. A. (M)
Dallas, W. K. (A)
Davis, R. J. (A)
Day, J. E. (A)
Deardorff, R. W. (F)
Densmore, M. E. (A)
Dingman, E. H. (A)
Doel, D. (A)
Doherty, D. E. (A)
Duba, L. (A)
Eastlund, L. C. (A)
Edmonds, S. C. (A)
Ellis, D. G. (A)
Ellison, G. C., Jr. (M)
Foster, J. C. (M)
Frost, F. K. (A)
Getgen, L. E. (A)
Griese, R. H. (A)
Harmer, H. S. (A)
Herrmann, T. A. (A)
Holtzman, M. (M)
Hood, F. D. (M)
Horseman, T. E. (A)
James, S. D. (A)
James, T. W. (A)
Kenneth, L. W. (A)
Kidd, D. E. (A)
Komen, P. J., Jr. (A)
Lawrence, H. M. (A)
Lund, C. W. (SM)
Marihart, D. J. (A)
Marsa, A. R. (A)
McCann, F. H. (M)
McCoy, R. E. (M)
McKay, W. M. (VA)
Meissner, E. R. (M)
Mendoza, D. C. (A)
Miller, F. E. (M)
Miller, V. F. (A)
Morey, A. M. (M)
Moulton, C. H. (A)
Murdock, M. J. (A)
Murphy, R. T. (A)
Nolan, C. A. (A)
Paul, B. R. (VA)
Peterson, R. M. (A)
Pittard, F. (A)
Poulin, R. A. (A)
Ramberg, H. C. (A)
Raupach, R. C. (A)
Rhiger, R. A. (M)
Richmond, A. E. (M)
Ritter, H. C. (A)
Roberts, J. M. (A)
Roberts, M. L. (A)
Rogers, W. J., Jr. (A)
Ropiequet, L. L. (A)
Schmidt, R. W. (A)
Schmitt, G. W. (A)
Scott, E. D. (SM)
Sells, G. B. (M)
Singleton, H. C. (SM)
Smith, A. V. (A)
Smith, D. E. (VA)
Spaulding, L. R. (M)
Stoll, J. L. (A)
Strain, D. C. (A)
Sweeney, P. M. (A)
Tada, S. (A)
Thomson, A. (A)
Tippery, M. W. (A)
Tunturi, A. R. (A)
Tyle, A. B. (M)
Vassallo, W. H. (A)
Vollum, H. (SM)
Warchol, E. J. (M)
Watson, D. L. (A)
Webber, W. B. (A)
White, L. C. (M)
Wilson, D. R. (A)
Winkler, L. R. (VA)
Witty, H. E. (A)

Salem
Perlich, W. F., Jr. (A)
Steiner, F. W. (A)

Springfield
Huster, G. B. (A)

Warrenton
Knotts, R. B. (A)

PENNSYLVANIA

Abington
Glassman, F. P. (A)

Allentown
Allerton, G. L. (A)
Baker, C. I. (SM)
Bolez, E. C. (A)
Breslar, M. A. (A)
Buehler, P. R. (A)
Eisenhard, S. E., Jr. (A)
Gray, G. E. (A)
Hansen, E. (VA)
Lisicky, A. J. (A)
Moose, L. F. (A)
Newhard, C. E. (M)
Nitschke, N. E. (A)
Paulsen, J. F. (A)
Schlesman, C. H. (SM)
Schlichter, E. S. (A)
Simpson, A. D. (SM)
Smith, R. T. (A)
Stubner, J. W. (A)
Taylor, K. R. (VA)
Tooker, H. A. (A)
Von Ohlsen, L. H., Jr. (A)
Young, C. S. (VA)

Allison Park
Brinda, J., Jr. (A)
Phillips, D. E., Jr. (A)

Altoona
Burgoon, G. R. (A)
Kilgore, W. (A)
Reitz, N. J. (SM)
Sable, R. L. (A)

Ambler
Armstrong, D. E. (A)
Bullard, H. M. (A)
Clark, G. F. (M)
Closson, L. E. (SM)
Hambleton, P. N. (SM)
Mauchly, J. W. (A)
Pratt, G. W. (M)
Schoenberg, J. P. (A)

Ardmore
Brookfield, R. F. (A)
Fuller, L. C., Jr. (A)
Hamilton, S. (SM)
Zentgraf, J. A. (A)

Ardsley
John, L. E. (A)

Ashland
Tesno, R. R. (A)

Ashley
Kunicki, H. R. (A)

Aspinwall
Uleman, T. (M)

Bakerstown
Mag, A. (VA)

Bala-Cynwyd
Faries, W. R. (M)
Goldich, N. H. (A)
Julstedt, E. C. (A)
Pitman, J. E. (A)
Sunstein, D. E. (M)

Bareville
Beal, D. W. (A)

Beaver Falls
Hines, J. W. (A)

Bedminster
Moyer, L. K. (VA)

Bellefonte
Donelson, C. H. (M)

Belleville
Fleming, H. D. (A)

Bernville
Gantert, A. (A)

Berwyn
Phelan, L. T. (A)

Bethlehem
Agocs, W. B. (A)
Appleman, C. G. (A)
Curtis, R. B. (A)
Damon, F. A. (A)
Downing, H. L. (VA)
Erdle, P. J. (A)
Hambor, J. A. (A)
Hanson, F. E. (SM)
Jackson, E. A. (A)
Karakash, J. J. (A)
Lisle, J. (A)
Overdeer, R. H. (A)
Purcell, R. H. (SM)
Van Haste, W. (M)

Bloomsburg
Galbreath, J. R. (A)

Braddock
Zygmunt, H. J. (M)

Bradford
Blumenthal, L. J. (A)
Craumer, H. S. (A)

Bridgeville
Adkins, J. M. (M)
Didinger, G. H. (A)
Wirant, J. A. (A)

Brookville
Cummings, J. C. (M)
De Mott, J. (A)
Miller, R. C. (M)
Porsch, A. W. (M)
Spicer, W. A. (A)

Broomall
Dunn, E. B. (M)

Broughton
Gibson, F. C. (A)

Bryn Athyn
Lee, C. F. (A)
Simons, K. A. (M)

Bryn Mawr
Baird, G. A. (A)
Hertzberg, J. M. (M)
Marshall, J. N. (M)
Reich, A. L. (A)

Bustleton
Just, G. A. (A)

Butler
Heitzer, J. B.

Camp Hill
Dugan, D. J. (A)
Hykes, G. R. (A)
Knerr, G. R. (A)
Morris, G. W. (VA)

Canonsburg
Krulce, F. R. (A)
Sulkowski, E. L. (A)

Carlisle
Hill, B. C. (A)
Meyers, K. D. (A)
Samuelson, W. H. E. (A)
Van Gavree, R. L. (A)

Carnegie
Gannon, M. G. (A)

Castle Shannon
Coombs, S. H. (A)

Chadd's Ford
Kieselbach, R. (A)

Chalfont
Curtis, C. T. (M)

Cheltenham
Pike, F. R. (A)
Sheppard, C. B. (M)

Chester
Simpson, O. (SM)
Thorpe, W. H. (A)

Chestnut Hill
Woods, L. J. (SM)

Cheswick
Bossart, P. N. (SM)

Clairton
Trbovich, J. (A)
Vergona, A. J. (A)

Clarks Summit
Jones, J. (A)
Mack, D. W. (VA)

Clearfield
Black, A. M. (A)
Bolton, S. W. (VA)
Boyd, J. C. (SM)
Diehl, W. F. (F)

Clifton Heights
Bradley, W. E. (A)
Warshaw, J. (M)

Coatesville
Bell, W. I. (A)

Collegeville
Kurgan, G. J. (A)

Collingdale
Schulz, K. A. (A)

Shallcross, D. H. (A)
Thompson, G. H., Jr. (A)

Coopersburg
MacFarland, H. T. (A)
Spence, A. H. (A)

Coudersport
Carpenter, L. C. (A)

Crafton
Miller, J. W. (A)

Curwensville
Harcarufka, J. F. (A)

Cynwyd
Eachus, L., Jr. (A)

Dalton
Meng, E. D. (A)

Dillsburg
Ryesky, S. (M)

Doylestown
Ansley, A. C. (VA)
Blake, R. P. (A)
Butt, C. (M)
Davis, R. W., Jr. (A)
Gerlach, G. G. (VA)
Lozo, K. G. (A)
Manoogian, H. (A)
McGlone, J. M. (M)

Dravosburg
Whipple, W. G., Jr. (A)

Dresher
Ellis, W. G. (SM)

Drexel Hill
Allgrunn, A. E. (A)
Biles, L. G. (A)
Free, A. L. (M)
Gleason, H. H. (SM)
Haber, F. (A)
Hoberg, G. G. (A)
Koch, J. F., Jr. (M)
Lewis, G. (VA)
Maginnis, W. P. (SM)
Mural, F. (VA)
Pitts, W. L. (M)
Pritchard, C. A. (A)
Segal, B. (A)
Shannon, F. J., Sr. (A)

Du Bois
Cowles, R. J. (A)
McGarvey, H. J. (A)

Dunlo
Cimba, J. (A)

Dunmore
Kwiatek, W. K. (A)
Walsh, R. J. (A)

Duquesne
Brannen, P. M. (M)
Lundin, J. A. (A)

East Lansdowne
Trainer, M. A. (SM)

East McKeesport
Sprow, J. H. (A)

Easton
Fairer, W. B. (A)
Gares, L. F. (A)
Green, D. W. (A)
Krohn, P. L. (A)
Miller, R. E. (A)
Nethken, R. T. (A)
Schaefer, J. B. (SM)
Smith, F. W. (SM)
Waer, R. R. (A)

East Pittsburgh
Boykin, J. R. (SM)
Conley, P. (A)
Kadak, E. (M)

Ebensburg
Willman, T. A. (A)

Elkins Park
Auerbach, A. A. (A)
Barnett, G. F. (M)
Biernbaum, J. W. (A)
Bossi, E. W. (A)
Davenport, E. J. (A)
Godshall, H. K., Jr. (A)
Kreuzer, B. (M)
Krutter, H. (SM)
Lesniewski, J. T. (A)
Porter, H. F. (VA)
Rath, H. B. (A)
Rothschild, L. I., Jr. (A)
Sheldon, H. W. (A)
Thomas, T. R. (A)
Weinstock, W. W. (A)
Wood, R. F., Jr. (A)

Emmaus
Herman, L. C. (A)

Emporium
Ackman, H. E. (SM)
Anderson, W. J. (A)
Andrews, R. W. (M)
Baldwin, A. W. (SM)
Boden, E. H. (A)
Boots, W. K. (A)
Brunner, G. V. (SM)
Buescher, W. E. (A)
Buschmann, W. T. (A)
Campbell, V. H. (SM)
Carlson, R. F. (SM)
Carlstrom, T. H. (M)
Clark, J. H. (A)
Curry, G. T. (SM)
Dander, D. A. (A)
Dixon, L. H., Jr. (A)
Douglass, C. F. (M)
Dresser, S. R., Jr. (A)
Drummeter, W. (A)
Grund, J. B. (A)
Hagman, H. B. (A)
Kahl, E. (M)
Kamler, H. V., Jr. (A)
Klinestiver, G. H. (SM)
Lambert, R. L. (M)
Loomis, G. L. (SM)
Maguire, L. R. (A)
McClintock, R. K. (SM)
McNaughton, R. A. (M)
Metzer, H. (VA)
Mueller, W. P. (M)
Munger, J. C. (A)
Neuber, R. E. (SM)
Overmier, E. E. (SM)
Palen, H. A. (M)
Palmateer, R. E. (SM)
Patterson, T. A., Jr. (A)
Peterson, A. W. (M)
Peterson, W. J. (A)
Quigley, F. T. (M)
Rishell, G. L. (M)
Robbins, J. D. (A)
Rocheleau, G. S. (A)
Rolf, W. R. (M)
Schultz, A. J. (M)
Shields, R. R. (M)
Slinkman, R. W. (SM)
Stonesifer, R. A. (A)
Vergason, D. L. (M)
Willardson, F. W. (A)
Winnette, E. A. (A)

Erie
Burdg, C. E. (A)
Carlson, P. N. (A)
Davidson, A. R. (M)
Dymski, D. A. (A)
Foster, J. H. (M)
Gilmore, J. P. (A)
Hestor, K. L. (A)
Liberatore, D. F. (A)
Minnium, B. B. (SM)
Orr, R. W. (VA)
Page, R. S. (A)
Raub, L. A. (VA)
Van Arsdell, J. C., Jr. (M)
Wolfskill, J. M. (A)

Fayette City
Weldon, T. P. (A)

Flourtown
Preston, G. W. (A)

Fort Washington
Schantz, J. S. (VA)

Gettysburg
Pace, E. C. (A)

Gladwyne
Eckert, J. P., Jr. (A)

Glassport
Czarnecki, E. J. (A)
Leib, F. E. (A)

Glen Mills
Leitch, J. G. (SM)

Glenolden
Stott, H. B. (M)

Glenshaw
Alexander, F. C., Jr. (M)

Glenside
Bamford, H. S. (SM)
Bobb, L. J. (M)
Cooper, D. T. (VA)
Haines, B. P. (A)
Hoagland, C. C. (A)
Lauderdale, D. M. (A)
Lynn, R. B. (A)
Miller, A. C. (SM)
Stein, H. B. (A)
Wilson, H. R. (A)

Grampian
Moore, W. R. (VA)

Greensburg
Dimasi, L. A. (A)
Stark, R. E. (VA)

Groveton
Petrowski, P. (A)

Gwynedd Valley
Applegarth, A. R., Jr. (SM)

Hallstead
Hallinan, C. (M)

Hanover
Cumeralto, Q. C. (A)
Rohrbaugh, P. A. (A)

Harrisburg
Blacksmith, P., Jr. (A)
Drumheiser, A. W. (VA)
Fiet, J. H., III (A)
Gault, A. A. (A)
Gault, G. W. (A)
Lyon, C. M. (A)
Middleton, W. W. (A)
Peffer, R. M. (A)
Reisman, E. (A)
Yingst, T. E. (A)

Hatboro
Barry, F. N. (VA)
Brenner, W. F. (A)
Brooks, C. E. (A)
Bugay, J. P. (A)
Caffrey, G. H. (A)
Churchill, H. J. (A)
Gleiter, W. C. (M)
Grzywacz, W. (A)
Gulick, E. C. (M)
Harrison, R. K. (A)
Himmer, F., Jr. (A)
House, H. J. (A)
Lewis, J. E. (A)
Long, M. L., Jr. (A)
Machuta, A. J. (A)
Marchetta, P. (A)
Martin, H. B. (A)
Munkasey, P. F. (A)
Munster, A. C. (M)
Noll, E. M. (A)
Pennini, R. V. (A)
Remich, J. E. (A)
Spacie, R. W. (A)
Steele, E. R. (A)
Suter, H. (SM)
Tiley, J. W. (M)
Tremblay, H. G. (A)
Weinberg, A. D. (A)

Haverford
Benham, T. A. (A)
Clapp, R. G. (SM)
Crawford, A. L., Jr. (SM)

Havertown
Amelotti, E. (A)
Blumenthal, E. I. (A)
Chen, T. C. (A)
Crockett, J. G. (M)
Denk, W. E. (VA)
Endres, J. M. (A)
Fulmer, J. W. (VA)
Hecht, B. (M)
Jones, G. I. (SM)
Lofton, J. H. (M)
Miehle, W. (M)
Oliver, J. K. (A)
Riegel, R. B. (A)
Sachs, A. F. (M)
Shea, E. T. (A)
Showers, R. M. (M)
Sohon, H. (SM)
Thomas, R. G. (A)
Van Horn, J. C. (SM)
Woll, C. F. (SM)
Zappacosta, A. D. (M)

Hershey
Smith, E. C. (A)

Hilliards
Boyd, D. B. (A)

Holland
Blodhet, R. (M)

Homestead
Franz, J. P., Jr. (A)

Hooversville
Orasin, J. W. (A)

Huntingdon Valley
Barsky, H. S. (A)
Boothroyd, W. P. (SM)
Fredendall, G. L. (SM)
Hearn, O. E. (SM)
Irick, J. (A)
Polster, N. E. (A)
Schroeder, A. C. (SM)
Spielman, S. C. (SM)
Thompson, M. L. (SM)

Indiana
Hitchcock, R. C. (SM)
Yarmack, J. E. (A)

Irwin
Brook, A. (A)
Cheek, R. C. (M)

Iryland
Bicking, H. P. (A)
Lee, W. S. (A)

Jeannette
Kihchel, O. D. (M)

Jenkintown
Block, E. (A)
Clark, W. R. (SM)
Green, K. E. (M)
Koehler, J. F. (SM)
Liebscher, A. (M)
Schnitzer, B. E. (M)
Senausky, P. V. (A)
Sherman, F. L. (A)
Terzian, J. (A)

Johnstown
Ackley, R. M. (A)
Campbell, T. E. (A)
Coleman, M. J. (A)
Je Schonek, A. A. (A)
Jones, R. D. (A)
Koesan, E. S. (A)
Long, M. G. (A)
Stouppe, J. J. (A)
Straub, N. L. (A)

Johnsville
Moulton, S. W. (A)

Kennerdell
Smith, S. A. (A)

Kingston
Sakoski, C. (A)

Lafayette Hill
Adamson, R. G. (M)
Bloomsburgh, R. A., Jr. (M)
Brown, D. G. (A)

Lancaster
Ayer, R. B. (SM)
Ballard, D. C. (A)
Bennett, W. P. (M)
Brett, G. F. (M)
DeVoll, C. W. (A)
Dyall, W. T. (A)
Ellingboe, J. K. (A)
Foreman, J. M. (M)
Freund, W. H. (M)
Fry, H. M. (SM)
Glover, A. M. (SM)
Gordon, A. D. (A)
Grimm, A. C. (SM)
Hagmann, R. W. (A)
Headrick, L. B. (SM)
Hirlinger, J. F. (SM)
Jones, R. B. (SM)
Kaseman, P. W. (A)
Kazanowski, H. F. (A)
Lemeshka, M. B. (M)
Martin, I. E. (A)
Mathiot, J. E. (A)
McNickle, R. E. (M)
Nekut, A. G. (M)
Nelson, R. M. (A)
Quinn, J. L., Jr. (A)
Ransom, D. J. (A)
Richards, P. A. (SM)
Rueggeberg, W. (M)
Scholes, G. S. (A)
Scott, G. W., Jr. (SM)
Seelen, H. R. (SM)
Smith, C. P. (M)
Spitzer, E. E. (SM)
Swedlund, L. E. (SM)
Sweet, A. P., Jr. (A)
Ulrey, D. (F)
Van Ormer, D. D. (A)
Veith, F. S. (SM)
Wamsley, D. H. (SM)
Wasserman, J. (A)
Weaver, J. L. (A)
Wilhelm, J. F. (SM)

Lansdale
Criss, G. B. (A)
Glauber, J. J. (SM)
Ishler, H. K. (SM)
Robinson, S. A. (SM)
Smith, W. E. (A)
Swift, M. E. (SM)

Lansdowne
Brumbaugh, J. M. (SM)
Dougherty, J. W. (M)
Felton, W. W. (SM)
Tarca, E. L. (A)

Langhorne
Annett, M. E. (A)
Phelps, R. E. (VA)
Rabe, W. A. (A)

Latrobe
Shaffer, R. E. (A)

Laureldale
Joseph, D. (A)

Lebanon
Moyer, J. J. (A)

Leechburg
Boario, W. R. (A)

Lemoyne
Bair, J. H. (A)
Beebe, W. J. (A)
Smiley, W. A. (VA)

Lewisburg
Benin, Z. (VA)
Bueffel, B. H., Jr. (SM)
Kornetz, N. S. (VA)
Scheer, F. H. (SM)
Walker, R. C. (A)

Lock Haven
Hartwell, H. G. (M)
Reiner, A. (A)
Schwartz, E. (A)

Loupurex
La Sota, L. S. (A)

Lynnport
Klingaman, G. W. (A)

Macungie
Hosfeld, R. K. (A)

Manor
Anderson, J. W. (A)

Mars
Berninger, J. W. (A)

McKeesport
Durnal, R. G. (A)
Henrich, C. A. (A)
Johnson, E. M. (A)
Pridmore, T. C. (M)

Meadowbrook
Bingley, F. J. (F)
Reese, J. R. (A)
Walker, H. (VA)

Meadville
Brown, R. L. (M)

Mechanicsburg
Rife, C. J. (M)

Mechanicsville
Brown, H. W. (A)

Media
Chambers, C. C. (SM)
Miller, A. F. (M)
Saulnier, G. S. (A)
Travis, I. (SM)

Merion
Dilks, U. C. S. (M)

Merion Station
Lawler, J. A., Jr. (A)

Middleburg
Steininger, J. J. (A)

Milford
Weber, V. J. (A)

Milton
Blythe, R. (M)

Minersville
Palasky, H. (A)

Mont Clare
Fegley, K. A. (A)

Morrisville
Steck, G. W. (A)

Morton
Ward, E. P. (A)

Mountville
Hoover, M. V. (M)
Konrad, R. J. (A)

Munhall
Siedlarz, J. B., Jr. (A)

Nanticoke
Hyzinski, B. (A)

Narberth
Forstall, E. L. (VA)
McCoy, C. T. (SM)
Williamson, J. F. (VA)

Natrona Heights
Baechtel, A. R. (A)

Nazareth
Mackes, D. V. (A)

Nesquehoning
McMichael, H. E. (A)

New Britain
West, H. L. (A)

New Castle
Yesenski, J. A. (A)

New Cumberland
Stevens, D. L. (M)

New Hope
Bradley, W. E. (SM)

Newtown
Beck, K. H., Jr. (A)
Cushman, R. W. (M)

Newtown Square
Ogletree, W. A. (A)
Shawhan, E. N. (A)
Yetter, E. W. (M)

Newville
McElwain, J. L. (A)

Noble
Hilliard, D. M. (A)

Norristown
Anders, R. D. (A)
Briggs, T. H. (SM)
Eney, I. N. (A)
Laurent, G. J. (A)
Paxson, R. F. (A)
Place, S. W. (VA)
Spenser, C. W. (A)
Thomas, J. K., II (A)
Zern, R. T. (VA)

North Braddock
Koschik, W. E. (A)

North Girard
Wervey, W. J. (A)

North Hills
Dolberg, C. E. (SM)
Gable, N. P. (M)
Reichert, H. A. (A)

North Wales
Lyle, A. E. (SM)

Oakmont
Peters, L. J. (SM)
Title, C. W. (SM)

Oil City
Bossler, F. B. (A)
Graham, J. W. (A)

Orcland
Chudleigh, W. H., Jr. (A)
George, T. S. (A)
Hargens, C. W. (SM)
Hartley, H. F., Jr. (SM)
Hooper, G. A. (M)
Jackson, R., Jr. (A)
Keener, C. E. (A)
Lockhart, J. C., Jr. (A)
Michael, F. R. (M)
Nelson, F. H. (A)
Nupp, W. D. (A)
Packer, W. H. (A)

Oxford
Mallalieu, F. R. (A)

Palmerton
Kannapel, W. A. (A)

Paoli
Overmiller, C. M. (VA)
Reiss, H. R. (M)

Parkland
Miller, R. L. (A)

Paxinos
Farr, K. E. (SM)

Perkasie
Moll, W. H. (A)
Smith, H. B. (A)

Philadelphia
Aarons, C. R. (A)
Albee, C. (A)
Albright, R. B. (SM)
Alexander, E. M. (A)
Alter, A. R. (SM)
Ames, M. E., Jr. (M)
Anderson, W. S. (A)
Andrade, L. (A)
Apolenis, C. J. (A)
Applegate, C. E. (A)
Armbruster, G. J. (A)
Auerbach, I. L. (M)
Backer, C. M. (M)
Baines, E. L. (A)
Balaklan, G. (A)
Balmer, D. W. (A)
Baloga, J. J. (A)
Banks, J. (A)
Baran, P. (A)
Bargellini, P. L. (A)
Bartik, W. J. (A)
Bash, I. F. (A)
Baumann, J. A. (A)
Beane, T. E. (A)
Bechler, W. C., Jr. (VA)
Beckman, C. (A)
Bedner, J. S. (A)
Bell, R. A. (M)
Benge, J. R. (VA)
Bennon, M. (A)
Berkowitz, R. S. (A)
Bernbaum, B. (A)
Bernbaum, L. M. (A)
Best, D. T. (A)
Beter, R. H. (A)
Biberman, L. S. (A)
Blumberg, M. (A)
Boisvert, E. L. (A)
Boktos, P. (A)
Bolton, W. D. (A)
Bonaccorsi, J. R. (A)
Bonn, T. H. (A)
Booker, R. W. (A)
Boyajian, M. M. (A)
Boyle, R. C. (A)
Brachman, R. J. (A)
Brady, P. B. (A)
Braverman, R. (A)
Briles, W. F. (A)
Bristow, F. E. (A)
Brough, H. J. (A)
Brown, I. (A)
Brown, K. H. (A)
Broxmeyer, C. (A)
Brunner, D. H. (A)
Bryson, H. C., Jr. (M)
Buggy, R. V. (M)
Burgett, M. I., Jr. (SM)
Busser, J. H. (A)
Butts, L. E. (A)
Byers, A. C. (A)
Callaghan, J. W. (A)
Capek, S. J. (A)
Carapellotti, L. T. (A)
Carnuccio, J. N. (A)
Cartwright, L. W. (A)
Cavileer, F. E. (A)
Chadwick, P. S. (A)
Chamberlin, N. K. (A)
Chance, B. (SM)
Chatten, J. B. (A)
Chatterton, E., Jr. (A)
Chedaker, J. (A)
Christiansen, W. G. (A)
Ciletti, V. J. (A)
Cilyo, F. F. (A)
Clark, E. G. (A)
Clarke, I. A. (A)
Coffin, B. E., Jr. (A)
Colodny, S. H. (SM)
Conrad, M. (A)
Cooley, C. C., Jr. (A)
Cooper, R. D. (A)
Cornet, E. (M)
Craft, C. J., III (A)
Creamer, E. M., Jr. (A)
Crooks, W. R. (A)
Cummings, E. J. (A)
Davies, R. S. (A)
D'Avino, R. F. (A)
De Coatsworth, C. G. (A)
Dempster, B. W. (A)
De Zube, L. H. (M)
Diamond, J. (A)
Di Campli, B. A. (A)
Dicker, P. E. (A)
Diem, G. W. (M)
Diem, J. M. (A)
Disson, S. B. (A)
Doland, G. D. (A)
Doto, N. J. (A)
Dove, J. B. (A)
Drill, B. F. (A)
Duncan, R. D., Jr. (SM)
Earnshaw, D. P. (SM)
Eckenrode, R. L. (A)
Ederer, N. (A)
Eells, W. A. (A)
Ehret, C. D. (L)
Ehret, R. J. (M)
Eland, R. C. A. (M)
Emerson, K. H. (SM)
Eng, J. W. (A)
Epstein, H. (A)
Estersohn, H. (A)
Etkin, H. A. (VA)
Evry, A. A. (A)
Faust, A. C. (A)
Feeney, E. J. (A)
Fernbach, M. (A)
Ferrell, O. P. (A)
Field, L. (A)
Filderman, J. (A)
Fischer, L. A. (A)
Florence, V. H. (M)
Fogarty, J. D. (A)
Foley, G. M. (A)
Forman, A. J. (A)
Forster, W. H. (SM)
Fowler, C. J. (A)
Fox, B. (A)
Frear, W. (SM)
Freeland, E. C. (SM)
Frekot, J. J. (A)
Friedman, M. (A)
Fryburg, C. H. (A)
Gable, A. W. (A)
Gallagher, G. J. (A)
Garfinkel, A. R. (A)
Gelardi, M. (VA)
Gellert, M. E. (A)
Gelles, A. J. (A)
Geschwind, R. A. (A)
Gilbert, W. E. (SM)
Gillies, J. H. (SM)
Gittens, V. S. (A)
Glace, K. (M)
Glassman, I. (M)
Gluck, S. E. (A)
Godsho, A. P. (SM)
Gold, M. B. (A)
Goldfisher, J. (A)
Goldstein, I. E. (A)
Goodman, R. M. (A)
Goodwin, D. P. (A)
Gordon, B. M. (A)
Gottlieb, M. (A)
Grabiec, J. J. (M)
Grande, F. M. (A)
Gray, H. J., Jr. (A)
Greenwood, R. W. (A)
Grossman, S. (A)
Gudis, R. S. (A)
Haas, N. V. (A)
Haigh, L. E. (A)
Haimowitz, B. (A)
Haines, J. H. (A)
Haley, I. (A)
Hall, R. M. (A)
Harris, H. H. (SM)
Hastings, J. A. (A)
Hayward, J. W. (VA)
Hazeltine, A. V. (A)
Henninger, J. H. (M)
Hershfield, L. L. (A)
Hilbourn, C. L. (A)
Hintz, H. F. (A)
Honda, H. (A)
Hopwood, A. M., Jr. (VA)
Houser, W. G. (A)
Hubbert, E. C. (A)
Husband, R. E. (A)
Hudson, C. F. (A)
Hunt, D. F. (A)
Hunter, G. T. (M)
Hussey, E. E. (M)
Hyams, I. (A)
Innes, F. T. (A)
Jacobson, L. J. (M)
Joffe, A. S. (A)
Jones, J. T., Jr. (A)
Jones, L. F. (SM)
Kahn, H. (A)
Kall, A. R. (A)
Kalos, S. (A)
Kane, J. V. (A)
Katz, S. (A)
Kauders, R. M. (A)
Khoury, N. (A)
Kilpatrick, D. G. (A)
Kimel, H. (A)
King, C. W. (A)
Kingsley, B. (A)
Kirsch, A. L. (A)
Klein, S. (A)
Kleinman, R. L. (A)
Kolodner, M. (A)
Konrad, L. J. (A)
Koop, W. S. (A)
Koss, N. A. (A)
Kraus, C. R. (M)
Kraus, F. A. (A)
Kugler, F. (A)
Kutner, N. H. (A)
Kyne, T. (A)
Landfried, H. H. (A)
Laskin, R. S. (A)
Lawton, H. J. (A)
Leader, R. (A)
Lee, D. H. (A)
Lex, R. G., Jr. (A)
Lewis, P. S. (A)
Lindley, P. L. (A)
Loeb, J. W. (A)
Loginow, S. (SM)
Macfadden, W. C. (VA)
MacKay, R. F. (A)
Magasiny, I. P. (A)
Maguire, L. A. (A)
Major, R. P. (M)
Markowitz, R. S. (A)
Marsten, J. (SM)
Masurat, G. (A)
McDowell, A. P., Jr. (VA)
Merrihew, H. W. (A)
Michaels, C. J., Jr. (A)
Miller, E. (A)
Miller, M. (A)
Minderjahn, R. L. (A)
Molieri, J. T. (A)
Montgomery, A. P. (VA)
Moore, R. C. (SM)
Morgan, W. A. (A)
Moskowitz, N. (A)
Mouradian, H. (VA)
Murphy, E. J. (A)
Myers, A. S., Jr. (A)
Myers, G. T. (A)
Nachman, M. W. (A)
Namaroff, J. H. (A)
Natkin, H. B. (A)
Neuber, H. K. (VA)
Neumann, A. J. (M)
Newhoffer, F. L. (A)
Newmeyer, D. R. (A)
Nishino, H. H. (A)
Niu, T. C. T. (A)
Norton, R. (A)
Nowak, R. F. O. (A)
Okada, R. H. (A)
Ottolini, D. F. (A)
Pagano, E. L. (A)
Palmer, G., Jr. (A)
Parker, S. R. (A)
Parnell, J. (M)
Perkins, G. O. (A)
Perna, F. J. (A)
Peters, A. E. (A)
Petterson, E. F., Jr. (M)
Petterson, W. N., Jr. (M)
Phillips, P. C. (A)
Plotkin, M. (A)
Poellnitz, F. D. (A)
Pommer, J. M. (A)
Porter, T. J. (A)
Rataski, C. P. (M)
Rees, W. M., Jr. (A)
Reynolds, V. F. (A)
Richter, F. (A)
Riebman, L. (A)
Robins, M. N. (A)
Robinson, H. A. (SM)
Rodgers, L. M. (SM)
Rodman, M. D. (A)
Rogell, P. S. (A)
Rogers, R. F. (A)
Rollo, W. S. (A)
Rosenstein, G. M. (A)
Rosenthal, D. (A)
Ross, I. L. (A)
Rowe, C. R. (SM)
Ruben, H. (SM)
Rubin, L. (A)
Rubin, S. (A)
Rubinoff, M. (A)
Russo, J. S. (A)
Sabatoff, S. (M)
Salati, O. M. (SM)
Sall, I. (A)
Sands, E. A. (A)
Santoro, J. L. (A)
Sapoff, M. (A)
Sayer, T. C. (A)
Schafer, R. H. (A)
Schifreen, C. S. (A)
Schnipper, A. (A)
Scholes, W. R. (A)
Schreiner, E. D. (A)
Schulz, R. B. (M)
Schweiss, W. W. (M)
Seltzer, A. M. (A)
Shaw, R. F. (SM)
Sheldon, E. J., Jr. (A)
Sher, N. (A)
Shucker, S. (A)
Sichel, A. T. (VA)
Silverman, E. (A)
Sirinsky, R. (A)
Slawek, J. E. (A)
Smith, D. B. (F)
Smith, D. W. (A)
Smith, T. A. (SM)
Soorenko, T. (A)
Spector, E. N. (A)
Speer, T. K. (A)
Speed, D. K. (A)
Spencer, D. L. (A)
Stamtaugh, J. C. (M)
Stanton, L. (M)
Starks, W. H. (A)
Stavrou, A. (A)
Steinberg, B. D. (A)
Stephenson, J. M. (A)
Stovall, J. R., Jr. (M)
Stratton, C. H. (A)
Suckle, B. W. (A)
Sullivan, H. B. (A)
Sulpizio, T. J. (A)
Svihel, B. T. (A)
Swedloff, B. (A)
Sweigart, A. S. (A)
Sysko, S. J. (M)
Tarpley, R. E. (VA)
Tarzian, V. (A)
Tellier, J. C. (SM)
Tenenbaun, E. (A)
Thomson, D. N. (A)
Thorne, P. A. (A)
Torrey, R. D. (A)
Tourshou, S. (A)
Trinkle, W. S. (M)
Turner, M. L., Jr. (A)
Turner, R. J. (A)
Urkowitz, H. (A)
Ussler, W., Jr. (A)
Van Name, J. M. (A)
Varallo, F. A. (A)
Vasilevskis, H. S. (A)
Viles, F. M., Jr. (A)
Violante, R. V. (A)
Voegtlin, E. (A)
Walant, C. A. (A)
Warner, H. (A)
Warshaw, C. H. (A)
Watson, R. E. (A)
Webb, D. T. (SM)
Weidknecht, C. J., Jr. (A)
Weiner, J. R. (A)
Weiner, M. H. (A)
Weintraub, I. A. (A)
Weise, R. C. (VA)
West, W. P. (SM)
White, J. P. (A)
Wightman, R. R. (M)
Willenborg, E. J. (A)
Williams, A. J., Jr. (SM)
Williams, C., Jr. (A)
Wills, W. P. (SM)
Wilsker, O. (A)
Wilson, L. D. (M)
Winzemer, A. M. (SM)
Wise, B. (A)
Witkin, E. (A)
Wojcik, J. J. (A)
Wolf, A. A. (S)
Wolin, L. (A)
Wolin, S. (M)
Wood, H. O. (M)
Woodward, C. P. (A)
Woolridge, A. C. (SM)
Wyeth, F. H. (A)
Wylen, J. (A)
Yang, C. C. (A)
Young, C. P. (SM)
Young, R. T. (A)
Yust, H. J. (A)
Zappacosta, J. A. (A)
Zebrowitz, S. (A)
Zimmerman, M. S. (A)
Zipper, I. (A)

Pine Grove Mills
Hollis, R. H. (A)

Pineville
Schreiner, W. A. (A)

Pittsburgh
Agnew, N. F. (A)
Anderson, G. M. (A)
Barron, F. E. (M)
Barton, J. P. (VA)
Baughman, G. W. (SM)
Bean, R. H. (A)
Beatty, C. G. (A)
Benson, H. C. (A)
Blair, H. A., Jr. (A)
Bosted, N. P. (A)
Boyer, J. L. (A)
Bright, R. L. (A)
Browder, F. E. (M)
Brown, W. J. (A)
Burgard, G. J. (A)
Busse, C. C. (M)
Caywood, W. P., Jr. (M)
Chackman, N., Jr. (A)
Chosky, P. (A)
Cole, N. D. (SM)
Coleman, W. E. (A)
Coles, D. K. (SM)
Coltman, J. W. (SM)
Crandon, L. H. (M)
Csepely, J. A. (A)
Cyphers, J. A. (A)
Diamond, H. (M)
Dodd, A. E. (A)
Dollens, D. J. (A)
Doucette, A. R. (M)
Duckett, E. J. (M)
Engel, F. A., Jr. (M)
Findley, R. W. (A)
Firschein, O. (A)
Fisher, E. H. (A)
Fitzsimmons, D. P. (SM)
French, C. G. (A)
French, G. J. (A)
Friedman, J. B. (A)
Fromm, K. N. (M)
Gates, P. W. (A)
Gilbert, C. W. (M)
Goodboy, G. O. (VA)
Graul, T. A. (A)
Greenwood, J. H. (A)
Hall, C. T. (A)
Hall, R. L. (A)
Hamilton, W. H. (SM)
Hanna, C. R. (SM)
Hansen, J. R. (A)
Harder, E. L. (SM)
Harriman, D. E., Jr. (A)
Horstmann, A. F., Jr. (A)
Hovey, B. K. (SM)
Howell, G. A. (A)
Huggler, L. R. (A)
Hutcheson, J. A. (F)
Imboden, H. B. (A)
Jackson, A. H. (A)
Jarrett, M. G. (SM)
Jones, C. H. (SM)
Jones, D. H. (A)
Jones, G. E., Jr. (A)
Kaiser, H. R. (M)

Karlson, E. L. (M)
Kenney, T. C. (A)
Klotsbaugh, G. A. (A)
Knox, W. G. (A)
Koenig, J. G. (A)
Kostalos, J., Jr. (A)
Krasik, S. (A)
Lazich, B. (SM)
Leonard, R. R. (A)
Leone, H. A. (A)
Ley, G. S. (SM)
Luscombe, C. F. (M)
Luther, G. M. (A)
Maas, W. C. (A)
Marlowe, E. W. (M)
Marshall, B. O., Jr. (A)
Marshall, S. C. (A)
Matland, C. G. (A)
McConaughy, D. L. (M)
McConnell, R. A. (SM)
McCoubrey, A. O. (SM)
McCreary, H. S., Jr. (A)
McIntosh, R. O. (SM)
McKinley, J. G. (A)
Middleton, M., Jr. (A)
Miller, T. (M)
Miller, W. M. (VA)
Mooney, D. H., Jr. (A)
Moore, G. E. (M)
Moynihan, J. D. (A)
Mulligan, J. R. A., Jr. (A)
Nagel, G. W. (A)
Nelkin, A. (A)
Nicholson, F. H. (SM)
O'Brien, F. E. (A)
O'Donnell, T. J. (A)
Osbon, W. O. (VA)
O'Shea, J. (M)
Pagels, W. (A)
Perkins, H. A., Jr. (A)
Petrocelli, E. A. (A)
Pickholtz, L. (A)
Pierce, J. F. (SM)
Place, W. P. (A)
Plutt, J. A., Jr. (A)
Pudlak, A. (A)
Rau, F. J. (A)
Reed, J. F., Jr. (A)
Renkiewicz, H. F. (A)
Rodgers, R. W. (A)
Royer, G. H. (A)
Ruth, D. K. (A)
Sander, H. F. (A)
Saviers, G. B. (M)
Schatz, E. R. (A)
Schneeberger, R. J. (SM)
Schultz, J. J. (A)
Schultz, M. A. (SM)
Shafer, W. L. (A)
Shaw, V. G. (SM)
Sheppard, G. E. (M)
Siebert, W. M. (A)
Slepian, J. (F)
Smith, C. H., Jr. (A)
Sprague, W. C. (A)
Staubitz, E. J. (VA)
Strasser, A. (A)
Sunnergren, A. P. (VA)
Suter, S. G. (A)
Taylor, K. A. (A)
Taylor, W. E., Jr. (A)
Taylor, W. J. (A)
Teare, B. R., Jr. (F)
Thomas, J. E. (A)
Thompson, J. H. (A)
Thornton, F., Jr. (A)
Uhrich, W. J. (SM)
Valenta, M. F. (A)
Vallese, L. M. (SM)
Van Nice, R. I. (A)
Vogeley, C. E., Jr. (SM)
Walters, J. R. (A)
Williams, E. M. (SM)
Woodford, J. B., Jr. (A)
Wyckoff, R. D. (SM)
Yarussi, F. P. (A)
Zabetakis, S. G. (A)
Zierdt, C. H., Jr. (M)

Pittston
Bruno, A. R. (A)
Miller, A. N. (A)

Plains
Olszewski, L. V. (A)

Plymouth
Majcher, C. L. (A)

Plymouth Meeting
Jensen, C. L. (A)

Port Vue
Bush, N. E. (A)

Pottstown
Mellon, R. E. P. (VA)

Pottsville
Hafer, F. L. (A)

Primos
Thompson, L. G. (A)

Quakertown
Bartholomew, R. G. (A)
Cole, W. P. (M)
Granberry, D. S. (M)
Hendricks, P. S. (VA)
Keil, O. C., Jr. (M)
Mode, D. E. (SM)
Sattler, E. W., Jr. (A)
Shower, E. G. (SM)

Radnor
Coles, R. V. (SM)

Reading
Antosy, S. J. (A)
Brobst, A. K. (A)
Canto, L. (A)
Emerich, W. E. (A)
Fister, T. J. (A)
Hornberger, J. E. (M)
Landis, H. O. (VA)
McCormack, J. E. (M)
Wagner, R., Jr. (A)

Ridley Park
Culbertson, C. H. (A)
Johnson, F. L. (M)
Thompkins, H. E. (M)

Ronks
Harsh, M. D. (A)
Perry, H. E. (A)

Rosemont
Schaefer, H. W. (A)
Woodcock, V. E. (A)

Roslyn
Baumgartner, W. H. (A)
Beaver, J. A., Jr. (M)
Lavin, H. D. (A)
Pearson, S. S. (A)
Shirley, R. C. (M)

Rutledge
Bellew, H. P. (A)

Rydal
Grimditch, W. H. (SM)
Herr, R. F. (SM)

Safe Harbor
Landis, C. G. (A)

Saint David's
Carroll, C. F., Jr. (A)

Saint Mary's
Abbott, H. W. (VA)
Andrews, L. D. (A)
Bickmire, R. L. (A)
Dressel, H. M. (A)
Hoffman, R. R. (SM)
McKnight, G. P. (M)
Pierson, I. S. (VA)
Speer, J. S., II (A)

Saxonburg
Neumeyer, B. W. (A)

Sayre
Spencer, S. W. (M)

Scranton
Cooke, K. R. (A)
Kuzma, A. (A)
Kuzma, P., Jr. (A)
McGoldrick, J. P. (A)
Miller, W. A. (A)
Pettinato, J. D. (A)
Quinn, J. M. (A)
Schiller, J. (A)
Weiss, H. (A)
Witkowski, J. F. (VA)

Secane
Wagenseller, J. E. (A)

Selinsgrove
Kindred, R. L. (A)

Shamokin
Bonshock, S. N. (A)

Shamokin Dam
Baugh, C. W., Jr. (A)

Sharon
Fisher, S. G. (A)
Jones, L. S. (A)
Zahniser, R. M. (A)

Smethport
Peterson, C. A. (A)
Simpson, C. L. (M)

Somerset
Sanner, G. E. (A)

Spring City
Clevenstine, W. M. (A)

Springdale
Bauer, J. W., Jr. (A)

Springfield
Albee, M. M. (A)
Ebling, W. F., Jr. (A)
Eichert, E. S. (A)
Hoepfner, K. B. (A)
Horrocks, S. W. (VA)
Howard, J. H. (SM)
Irby, J. G. (A)
Schneider, S. (A)
Weiss, E. (M)

Springhouse
Sims, J. C., Jr. (A)

Springtown
Vance, R. L. (SM)

State College
Ammerman, C. R. (M)
Axman, E. (M)
Baker, W. L. (A)
Brown, W. S., Jr. (SM)
Coolidge, J. E. (A)
Crossley, G. L. (SM)
Detwiler, S. P. (A)
Ebaugh, P. (A)
Files, W. D. (A)
Hall, F. T., Jr. (M)
Haller, G. L. (F)
Harris, D. E. (A)
Hemman, R. J. E. (M)
Higdon, R. V. (A)
Hunter, R. P. (A)
Jackson, T. T. (A)
John, F. T. (A)
Key, C. L., Jr. (A)
Knausenberger, G. E. (A)
Kohn, S. A. (A)
Kush, L. J., Jr. (M)
Lopez, A. F. (M)
McCracken, L. G. (A)
McCusker, J. H. (A)
McLucas, J. L. (A)
Sebring, P. B. (M)
Smith, W. R. (M)
Stavely, E. B. (M)
Van Meter, D. (M)
Volz, C. (M)
Warfield, J. N. (A)
Waynick, A. H. (SM)
Wischnia, H. F. (A)

Sterling
Decino, A. A. (SM)

Sunbury
Bubb, A. H. (A)
Carr, G. W. (A)
Larson, G. C. (SM)
Reitz, H. W. (A)
Schofield, C. R. (A)
Sloan, F. M. (A)
Van Horn, W. E. (A)

Swarthmore
Hayes, R. S. (VA)
Patterson, G. W. (A)
Roberts, G. A. (M)

Tarentum
Chantler, G. D. (A)

Telford
Spencer, G. R. (A)

Towanda
Owen, E. R. (A)

Tunkhannock
Inman, A. D. (A)

Tyrone
Kearney, H. B., Jr. (VA)
Skipper, R. E. (A)

Upper Darby
Boghosian, W. H. (M)
Charp, S. (SM)
Desi, G. R. (M)
Garkav, E. (A)
Jednacz, J. E. (A)
Mannino, A. J. (A)
Mitchell, W. J., Jr. (A)
Murray, R. W., Jr. (M)
Peckham, M. A. (A)
Regan, E. D. (A)
Santaguida, C. (A)
Streater, A. L. (A)
Vick-Roy, J. W. (A)

Verona
Darr, J. E. (A)
Davis, D. A. (A)
Lorentzen, P. E. (M)
Muffly, G. (SM)
Williams, R. W. (M)

Villanova
Klekotka, J. A. (M)
Sheker, E. B. (A)

Wallingford
Chase, C. T. (SM)

Warminster
Baldwin, G. F. (A)
Helfrich, N. (A)

Warren
Wanner, L. R. (M)

Warrington
Beggs, G. E., Jr. (SM)
Belz, A. R. (A)
Clarance, A. L. (A)

Washington
Lottredi, A. J. (A)
Paul, D. R. (A)

Washington Crossing
Fineman, P. (M)

Wayne
Calvarese, J. F. (A)
MacInnes, N. A. (A)
Miller, H. G. (M)
Mitchell, H. F., Jr. (A)
Spencer, H. H. (A)

Weatherly
Janis, A. G. (A)
Kiser, N. L. (SM)

Wellsville
Rodgers, L. D., Jr. (A)

West Chester
Brainerd, J. G. (F)
Burleigh, J. P., Jr. (A)
Green, R. E., Jr. (A)
Haner, L. P. (SM)
Veldhuis, A. C. (M)

West Pittston
Barritt, R. C. (A)

Weyford
Brendle, T. A. (A)

White Haven
Slavics, J. W. (A)

Wilkes-Barre
Kruger, H. A. (A)
Shuster, E. F. (A)

Wilkinsburg
Allen, J. E. (A)
Allen, J. G. (SM)
Boolos, C. A., Jr. (A)
Hlavka, L. F. (A)
Hollandbeck, R. F. (A)
Shoupp, W. E. (F)
Sims, R. U. (A)

Williamsport
Bresee, W. H. (A)
Canning, J. H. (M)
Fechtel, M. R. (A)
Lavo, H. J. (M)
Lepley, R. C. (SM)
Petts, R. G. (M)

Willow Grove
Borman, S. H. (A)
Bowley, R. J. (VA)
Dibos, R. A. (M)
Gallagher, V. C. (A)
Mason, E. C. (A)
Payne, J. F., Jr. (VA)
Phillips, J. W. (A)
Shaw, H. H. (A)
Zohn, R. L. (A)

Woodlyn
Russo, L. J. (A)

Wycombe
Black, K. C. (F)
Herbott, H. A., III (A)

Wyncote
Brothers, J. T. (SM)
Craig, P. M. (SM)
Dorris, R. C. (M)
Hance, H. V. (M)
Kinnier, D. (VA)

Wynnewood
Dohan, W. R. (VA)
Fisher, J. F. (SM)
Johnson, N. (M)
Owings, J. L. (A)

Wyomissing
Huyett, W. I. (A)

Yeardon
Stewart, B. L. (A)

York
Boyer, W. H. (A)
Eberhart, W. G. (A)
Goodling, G. E., Jr. (VA)
Hafer, A. C. (A)

RHODE ISLAND

Apponaug
Truell, R. (SM)

Apponaug Station
Lovering, C. B., Jr. (A)

Barrington
Thornley, H. W. (VA)

Bristol
De Wolf, J. B., Jr. (A)

Central Falls
Grzesik, J. (A)
Shock, W. R. (A)

East Greenwich
Tyler, E. M. (A)

East Providence
Bland, G. F. (A)

Greenville
Anderson, A. W. (A)

Greenwich
Wong, G. J. (A)

Johnston
Iannotti, J. D. (A)

Kingston
Haas, R. S. (A)
Mowbray, W. H. (A)

Manville
Hembise, P. M. (A)

Middletown
Clay, W. H. (A)

Newport
Craig, A. G., Jr. (A)
Furland, F. W. (A)
Harben, L. A. (M)

Providence
Bailey, L. E. (A)
Dandreta, W. (VA)
Farrell, F. X. (M)
Finocchiaro, E. C. (A)
Folsom, W. A. (A)
Friebourn, J. K. (A)
Gordon, M. F. (M)
Halton, E. B. (A)
Klemer, B. H. (A)
Krogstad, M. O. (A)
McGinn, B. A. (A)
Murtaugh, W. A. (M)
Ruina, J. P. (A)
Testa, E. (A)
Wilkins, H. A. (A)

Quonset Point
Mitchell, F. O. (A)

Riverside
Allen, G. W. (A)

Rumford
Arnold, R. D. (A)
Huber, P. (VA)
Parker, G. I. (A)
Prior, T. C. J. (M)

Warren
Bowen, H. C. (A)
Nans, E. A., Jr. (A)

Woonsocket
Donneau, P. J. (A)

SOUTH CAROLINA

Bennettsville
Weatherly, R. T., Jr. (A)

Charleston
Buehler, E. R. (A)
Edgerly, J. J. (A)
Edmonds, J. B. (A)
McCarley, H. H. (M)
McCoy, F. G. (SM)
Nolen, J. F. (A)
Schachte, W. L. (M)
Schleppegrell, J. R. (A)
Shimp, R. P. (A)

Clemson
Klein, N. E. (VA)
Long, J. T. (A)
Tingley, F. T. (A)

Columbia
Cosby, J. C. (M)
Dominick, J. B. (A)
Gill, C. W. (A)
Gramling, R. M. (A)
Lambert, R. D., Jr. (M)
Wever, L. B. (M)

Dillon
Howell, J. E. (A)

Fairforest
Greer, P. A. (M)

Florence
Pritchett, W. A. (A)

Fort Jackson
Bouffiou, C. L. (A)

Greenville
Garrison, W. E. (M)
Pace, M. W. (A)
Smith, D. L. (A)
Tate, G. D. (M)

Greer
Belcher, A. C. (A)

Isle of Palms
Creighton, C. C. (A)
Delgado, R. N. (A)
Lee, P. H. (M)

Mount Pleasant
Bennett, J. H. V. (A)

Naval Base
Flynn, L. A. (A)
Jones, R. W. (M)
Lyerly, E. E. (A)
Rice, J. E. (A)
Sims, A. C. (A)

North Charleston
Gatch, C. E. (A)
Gumley, C. E. (A)
Lax, C. B. (M)

Spartanburg
Bailey, C. W. (A)
Brockman, J. T. (A)

West Columbia
Hafely, C. H. (A)

SOUTH DAKOTA

Aberdeen
Webster, C. J. (A)

Alexandria
Pitts, M. J. (A)

Arlington
Dill, E. C. (M)

Brookings
Cheadle, N. J. (M)

De Smet
Petersen, M. E. (A)

Huron
Meile, J. W. (A)

Pierre
Jones, M. G. (A)

Rapid City
Grassia, C. C. (A)
Hughes, W. L. (A)
Hunt, E. B. (A)
Wells, W. S. (A)

Sioux Falls
Boese, M. T. (A)
McKenna, W. E. (M)
North, C. W. (M)
Pierce, M. E. (A)
Warren, L. C. (A)
Weir, E. J. (A)

Vermillion
Block, E. J. (A)
Graf, S. J. (M)

Viborg
Nelson, H. G. (A)

Vienna
Froke, L. C. (A)

Watertown
Smedley, J. A. (A)

Yankton
Cope, J. L. (A)

TENNESSEE

Big Sandy
Dowdy, Q. B. (A)

Bristol
King, L. A. (SM)

Chattanooga
Anderson, J. L. (A)
Barnes, B. B. (A)
Dean, W. E., Jr. (A)
Sibold, A. P., Jr. (A)
Thurnauer, H. (VA)

Clarksville
Bailey, J. H. (A)

Cleveland
Meagher, A. W. (A)

Franklin
Montgomery, L. H., Jr. (SM)

Greeneville
Sheese, O. C. (A)

Johnson City
Garland, O. K. (A)

Kingsport
Devaney, R. G. (A)

Knoxville
Bradley, J. A., Jr. (A)
Goddard, C. A. (A)
Horton, J. R. (A)
Losee, W. B., Jr. (A)
King, S. (A)
Oakes, L. C. (A)
Sauber, J. W. (M)
Schultz, F. V. (SM)
Stanbery, J. F. (M)
Stevenson, M. W. (A)
West, K. W. (A)

Livingston
Patterson, H. H., Jr. (A)

Madison
Powell, M., Jr. (A)

Maryville
Warren, M., Jr. (A)

Memphis
Busler, L. F., Jr. (A)
Fitzgerald, G. M., Jr. (A)
Frase, E. C. (M)
Logan, E. W., Jr. (A)
Marsh, W. (A)
McGee, W. F., Jr. (SM)
McLin, J. T. (A)
Orr, W. S. (A)
Raney, L. W. (A)
Smith-Vaniz, W. R., Jr. (A)
Stewart, E. B. (A)
Tuttle, F. M., Jr. (A)
Viser, J. H., Jr. (A)
Weeks, J. P. (A)
Wofford, D. R. (A)

Nashville
Anderson, W. G. (A)
Campbell, H. S. (M)
DeWitt, J. H. (F)
Goodloe, R. R. (A)
Graham, E., Jr. (A)
Kearley, R. I., Jr. (A)
Parker, C. B. (M)
Pearsall, S. H. (A)
Rawls, L. E. (A)
Reynolds, G. A. (M)
Schumann, F. (SM)
Shelton, A. C. (M)
Weiland, R. L. (A)
Zimmer, C. R. (A)

Norris
Manning, F. W. (A)

Oak Ridge
Banta, H. E. (M)
Brashear, C. (A)
Breazeale, W. M. (SM)
Burmaster, K. E. (M)
Donaldson, M. R. (A)
Evans, E. C. (A)
Fairstein, E. (A)
Fort, W. G. S. (A)
Garrett, G. A. (M)
Gerhard, W. J. (A)
Gilmore, R. M., Jr. (A)
Goss, C. G. (A)
Hanauer, S. H. (A)
Holt, G. A. (M)
Kelley, G. G. (A)
Knowles, D. J. (M)
Quarles, L. R. (SM)
Quinn, R. L. (A)
Reese, H., Jr. (M)
Richards, H. K. (VA)
Robinson, G. P., Jr. (A)
Schede, R. W. (A)
Scott, P. E. (A)
Shipley, E. D. (A)
Vansant, W. G., Jr. (A)
Walchli, H. E. (M)
Weinberg, D. I. (A)
Witt, E. C. (A)

Paris
Jones, C. W. (A)

Signal Mounatin
Richmond, R. E. (A)

Springfield
Williams, W. R. (A)

TEXAS

Abilene
Henley, R. D. (A)
McBeath, H. M., Jr. (A)

Alice
Williams, C. S. (M)

Amarillo
Baker, G., Jr. (A)
Gardner, J. M. (A)
Hankison, W. C. (A)
Harris, H. W. (M)
Martin, J. L. (M)
McBride, G. H. (M)
New, H. J., Jr. (A)
Torrey, W. H. (A)
Williams, A. M. (A)

Anson
Gill, R. M. (A)

Arlington
Bushart, G. J., Jr. (A)
Hutcheson, G. C. (SM)
Oster, R. E. (A)
Saffarrans, F. L., Jr. (A)

Austin
Balkanli, H. (A)
Baltzer, O. J. (A)
Barclay, J. N. (SM)
Brandt, W. L. (A)
Brooks, F. E., Jr. (M)
Carpenter, J. W., Jr. (A)
Crain, C. M. (M)
Daniels, T. E. (SM)
Davis, A. (SM)
Duderstadt, A. R. (A)
Frobese, C. W. (A)
Hargis, P. M. (VA)
Holly, L. C. (A)
Kreuz, L. B. (A)
Kuehne, W. (M)
La Grone, A. H. (M)
Lincoln, J. P. (A)
Metcalf, D. (M)
Moore, J. E., Jr. (A)
Pritchett, W. C. (A)
Reed, B. S. (A)
Rogers, R. G. (A)
Rummel, E. C. (A)
Slaton, J. H. (A)
Smith, H. W. (M)
Straiton, A. W. (SM)
Teasdale, A. R., Jr. (A)
Tolbert, C. W. (M)
Ward, T. L., Jr. (A)
Williams, C. E. (A)
Wood, G. W. (A)
Yeagley, F. W. (M)

Baytown
Cornelius, L. W. (VA)
Hiner, T. L. (A)

Beaumont
Aubey, L. J. (A)
Balch, S. (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)
Dutton, C. G. O. (A)
Ferguson, J. D. (A)
Hughes, B. F. (M)
Kay, L. E. (A)
Kirby, R. P. (A)
Laughlin, C. E. (A)
Lawrence, T. B. (M)
McDaniel, L. W. (M)
Morgan, J. G. (A)
Montague, L. E. (A)
Nelson, R. A. (A)
Ogden, L. E. (A)
Petrovsek, J. C. (M)
Roy, H. L. (A)
Shane, Z. G. (A)
Smith, H. K. (A)
Smith, S. L. (A)
Southwell, J. D. (M)
Stockard, L. C. (A)
Straughn, W. L., Sr. (M)
Thompson, M. A. (A)
Trevey, C. B. (M)
Weaver, W. T. (A)
Winterhalter, A. C. (A)

Bellaire
De Crosta, E. A. (A)
Loofbourrow, R. J. (M)
Manry, L. V., Jr. (A)
Stelzer, R. B. (A)
Taylor, A. D. (A)
Weinstein, D. H. (A)
Wheeler, H. T. (M)

Big Spring
Carr, B. J. (A)
Culp, H. R. (A)
Dahse, C. A. (A)
Walton, H. T. (A)

Breckenridge
James, J. L. (A)

Brownfield
Spear, R. B. (M)

Brownsville
Brand, J. J. (M)
Hawkins, D. W. (A)
Johnston, H. M. (A)

Bryan
Dillingham, H. C. (SM)
Hetlinger, F. J. (A)
Sosolik, F. J. (A)

Canyon
Thompson, C. E. (A)

College Station
Baird, J. A. (A)
Melloh, A. W. (SM)
Webb, J. O. (A)

Conroe
Madeley, P. E. (A)

Cooper
Hodges, S. E. (A)

Corpus Christi
Cuesta, N., Jr. (A)
Dunn, E. C. (A)
Lockhart, H. B. (A)
Mayberry, J. H. (A)
Taylor, P. (M)
Widener, M. W. (A)
Williams, R. J. (A)

Dallas
Albano, J. A. (M)
Arnett, R. A. (SM)
Austin, B. C., Jr. (A)
Aymond, E. F. (A)
Bailey, W. R. (A)
Blacketer, J. R. (A)
Brawner, C. A., Jr. (A)
Brewer, H. D. (A)
Brock, F. A. (A)
Broding, R. (SM)
Brown, L. E. (A)
Burg, K. E. (A)
Canfield, W. B. (A)
Chapman, A. B. (VA)
Chenault, H. P. (A)
Christopher, J. R. (A)
Clewell, D. H. (SM)
Clithero, W. H., Jr. (A)
Collins, F. (A)
Collins, J. R. (A)
Compton, J. M. (M)
Congdon, R. L. (M)
Conrad, R. S. (SM)
Crandell, C. F. (M)
Culbertson, H. B. (A)
Cullum, A. E., Jr. (F)
Demsky, J. C. (A)
Doherty, D. T. (A)
Dudley, T. C. (A)
Earhart, C. E. (A)
Edwards, J. B., Jr. (A)
Elkins, C. C., Jr. (M)
Ellis, W. C. (M)
Englehart, C. F. (A)
Ernest, R. E. (A)
Fleck, J. J. (A)
Fox, C. H. (M)
Gats, D. L. (A)
Geisel, F. J. (A)
Glider, E. E. (A)
Godbey, J. J. (A)
Godbey, J. K. (M)
Green, J. A. (SM)
Green, J. W. (A)
Green, P. M. (A)
Griffith, B. W., Jr. (A)
Haahn, F. J. (A)
Haggerty, P. E. (A)
Hallford, B. R. (A)
Hammett, R. L. (M)
Hampton, J. W. (A)
Harrison, L. E. (A)
Haskins, D. E. (A)
Harton, P. L. (A)
Hathaway, W. L. (A)
Hayes, A. J. (A)
Heard, B. E. (A)
Hegar, E. A. (SM)
Herriott, A. H. (A)
Hilmer, J. W. (A)
Hirschberg, J. K. (A)
Holaday, D. F. (M)
Homsy, J. H. (SM)
Hood, E. B. (A)
Hunt, J. T. (A)
Hutson, R. N. (A)
Jurek, W. M. (A)
Kasmar, R. A. (A)
Keener, R. F. (A)
Kelly, R. W. (A)
Kelsay, W. D. (A)
Kennedy, J. H., Jr. (A)
Krames, C. V. (A)
Lane, E. F. (A)
Lawrence, L. J. (A)
Lee, I., II (A)
Leedom, J. N. (M)
Le Velle, A. S. (M)
Lewis, M. T. (M)
Lipscomb, E. W. (SM)
Loper, G. B. (M)
Mallory, V. L. (M)
Martin, G. W., Jr. (A)
Mason, A. E., Jr. (A)
Maxson, G. W. (A)
McAnally, D. G. (A)
McArthur, H. K. (A)
McBride, D. C., Jr. (A)
McCasland, R. S. (A)
McConathy, W. J. (A)
McDermott, E. (VA)
McNeely, J. S. (SM)
Miller, J. C., Jr. (A)
Miller, N. D. (A)
Mills, R. L. (M)
Minton, J. P. (F)
Mitchell, W. R. (VA)
Moseley, T. B. (M)
Mut, S. C. (A)
Naab, P. J. (A)
Nelson, T. J. (A)
Newell, B. J. (A)
Newton, W. W. (VA)
Nilson, O. J. (A)
Norkus, B. S. (A)
Norvell, K. A. (A)
O'Brien, E. J. (SM)
Olson, R. W. (M)
Palmquist, J. F. (SM)
Parker, H. W. (A)
Paslay, L. C. (VA)
Peacock, R. M., Jr. (A)
Penn, W. D. (SM)
Peterson, D. A. (SM)
Prickett, T. Jr. (M)
Renner, D. S. (VA)
Richards, C. D. (A)
Roberts, J. D. (A)
Riser, H. N. (A)
Rosier, E. S. (A)
Ross, C. C. (VA)
Rountree, J. G. (SM)
Royalty, M. C. (M)
Russell, C. A. (A)
Sainton, J. B. (A)
Sartor, J. O., Jr. (A)
Shook, E. M. (A)
Smallwood, J. L. (A)
Smith, F. G. (A)
Smith, H. J. (M)
Smith, J. E. (A)
Sorkin, S. A. (A)
Stover, J. S. (M)
Summers, G. C. (A)
Tabolowsky, J. L. (A)
Tourville, G. A. (M)
Tucker, D. J. (SM)
Wadel, L. B. (A)
Wallace, R. M. (A)
Waters, W. F. (M)
Waltz, D. M. (M)
Weedfall, W. W. (A)
Weldon, J. O. (SM)
Wenger, W. D. (SM)
Wilkinson, J. D. (A)
Williams, B. M. (A)
Winston, G. R. (M)
Wright, T. A. (A)
Varbrough, A. D. (A)
Varbrough, K. A. (A)
Zimmerman, C. W. (A)

Del Rio
Donaldson, C. A. (M)

Denton
Taylor, T. W. (A)

Dumas
Price, J. R. (A)

Edinburg
Meiners, W. H. (A)

El Paso
Deakins, G. (A)
Holmes, C. J. (A)
Howelsen, H. T. (A)
McGraw, J. E. (SM)
Salerno, A. (A)
Sell, W. B. (A)
Sunderland, H. L. (A)
Talbott, E. P. (VA)

Fort Bliss
Blandford, J. T., Jr. (A)
Clanton, H. M. (A)
Johns, C. N. (A)
Osteyee, W. W. (A)
Paul, T. T., Jr. (A)

Fort Worth
Abernathy, H. D. (A)
Aldrich, C. E. (M)
Anderson, K. W. (A)
Ankele, E. T., Jr. (A)
Applegate, H. E. (SM)
Asendorf, J. A. (A)
Beisel, R. W. (M)
Bryan, K. W. (A)
Bunday, D. L. (SM)
Cochran, U. E. (A)
Crosson, J. W. (M)
Dunn, J. E. (M)
Hay, G. W. (A)
Hebert, M. R. (M)
Hosemann, J. H. (A)
Keplinger, M. (M)
Kimzey, T. (M)
Koski, J. I. (M)
Lynch, B. (M)
MacLean, W. D. (A)
Mayfield, S. A. (A)
McFarland, R. T. (M)
McLarin, M. (A)
Metcalf, J. E. (A)
Miller, W. B. (A)
Mills, H. J. (A)
Neher, H. T. (A)
Palmer, J. E. (VA)
Peterson, W. E. (A)
Prior, R. R. (A)
Rea, R. W. (M)
Reynolds, D. E. (M)
Rafferty, W. G. (A)
Sandlin, G. L. (M)
Shepherd, M. F. (M)
Soucy, H. A. (A)
Stinson, R. C. (SM)
Sylvester, G. E. (A)

Freeport
Coker, S. G. (A)

Friendswood
Havard, W. L. (A)

Galveston
Freeman, G. A., Jr. (A)
Lee, J. L. (A)
Pearce, O. M. (A)

Garland
Lynn, J. C. (A)
Ming, M. M. (M)

Gorman
Bettis, W. E. (A)

Grand Prairie
Kollar, T. J. (A)
Kurkjian, E. (A)
Lowrey, T. M., Jr. (A)
Martin, R. L. (A)
Seegers, J. A. (A)

Greenville
Perkins, C. S. (A)

Hooks
Guinn, J. R., Jr. (A)

Houston
Anthony, J. P., Jr. (A)
Asbury, R. T. (M)
Ashenden, G. K. (M)
Atkinson, C., Jr. (A)
Austin, F. M. (SM)
Ball, D. F. (M)
Bambrach, A. W. (A)
Beeman, K. R. (M)
Beyer, A. R. (A)
Bird, G. T. (M)
Blanchard, A. (SM)
Bodin, J. A. (A)
Branen, S. M. (A)
Bricaud, J. M. (SM)
Brougher, R. M. (A)
Browning, C. L. (A)
Buck, H. M. (M)
Busacker, J. W. (A)
Bush, R. S. (M)
Campbell, J. R. (A)
Caplan, R. S. (SM)
Carlisle, C. H. (M)
Carter, W. H., Jr. (SM)
Chinski, G. R. (SM)
Cowles, L. G. (M)
Crossland, O. C. (A)
Dixon, T. K., Jr. (A)
Drisdale, T. B. (A)
Dupree, E. M. (SM)
Edwards, W. H. (A)
Erath, L. W. (M)
Feagin, F. J. (M)
Fielder, C. K. (M)
Francis, C. A. (M)
Franklin, P. E. (A)
Franklin, R. M. (A)
Frosch, A. (A)
Gardner, D. H. (VA)
Geery, P. W. (A)
Godfrey, R. M. (A)
Gollwitzer, L. H. (A)
Greenwood, H. M. (A)
Greer, W. J. (SM)
Hegar, D. T. (A)
Hale, E. M. (M)
Halliday, O. T. (M)
Hanus, F. J. (A)
Hatchl, S. (A)
Hazlett, W. S. (A)
Heintz, K. O. (M)
Helken, W. E. (A)
Herzog, G. (SM)
Hiltpold, L. E. (A)
Holmes, E. G. (M)
Hougen, H. C. (M)
Hubbard, C. L. (M)
James, W. B. (A)
Jenkins, E. W., Jr. (A)
Jipp, J. (M)
Johns, R. W. (A)
Johnson, J. C. (M)
Kannenstine, F. M. (VA)
Kaufman, S. (M)
Keep, H. A. (A)
Keller, R. C. (A)
Klicpera, M. F. (A)
Kriegel, H. C. (M)
Lenert, R. H., Jr. (A)
Long, F. V. (SM)
Lorenz, L. H. (A)
Lorenzen, B. (A)
Martin, G. H. (A)
Martin, S. A., Jr. (M)
Masterson, H. T. (M)
McCabe, L. L. (SM)
McConnell, H. E. (VA)
McKay, G. C., Jr. (A)
Melton, D. P. (A)
Miller, G. K. (SM)
Mims, A. J. (A)
Mitchell, J. L. (A)
Monkhouse, J. R. (M)
Morton, O. L. (A)
Mullan, L. A. (A)
Neuenschwander, E. F. (M)
Neuman, L. J. (A)
North, R. C., Jr. (A)
Ording, J. R. (A)
Owens, D. L. (A)
Palmer, C. C. (M)
Palmer, O. M., Jr. (A)
Parker, R. H. (A)
Pearson, J. B. (M)
Peay, L. W., Jr. (M)
Phelps, W. (A)
Phillips, F. S. (M)
Pierson, A. L., III (A)
Purser, W. G., Jr. (A)
Rank, W. B. (A)
Ransome, R. L. (A)
Reynolds, R. C. (A)
Richards, D. E. (A)
Robidoux, F. T. (A)
Robinson, J. C. (A)
Root, V. B. (A)
Rusche, C. L. H. (A)
Rust, W. M., Jr. (SM)
Sawyer, W. G. (A)
Schmidt, H. (A)
Schmuck, R. H. (M)
Sears, G. D. (A)
Sears, H. A. (A)
Sharpe, M. O. (SM)
Shawver, E. F. (M)
Simonds, F. W. (A)
Smith, J. D. (A)
Steward, W. B. (SM)
Stotler, D. E. (A)
Stroble, R. R. (A)
Sutton, R. A. (M)
Tanguy, D. R. (M)
Teal, E. E. (A)
Thomas, C. W., Jr. (A)
Tullos, F. N. (M)
Valcik, J. H. (A)
Vincent, L. P., Jr. (M)
Washburn, W. M. (A)
Waters, J. S. (VA)
Weber, M. E. (A)
Weinzel, H. F. (A)
Welz, W. C. (M)
Whitaker, T. N. (A)
Whyman, L. O. (A)
Wiley, J. L. (A)
Wischmeyer, C. R. (SM)
Wofford, J. H. (A)
Wofford, W. D., Jr. (A)
Youngblood, W. A. (A)

Huntsville
Gulihur, D. L. (A)

Irving
Martin, J. L. (A)
Parchman, J. B. (M)
Shoulders, K. R. (M)

Kermit
Bowles, M. E. (M)

Kerrville
Mason, A. F., Jr. (A)

Killeen
Bicknell, J. E., Jr. (A)

Kingsville
Dean, J. E. (M)
Edmonson, J. W. E. (A)

Laredo
Bondy, M. A. (A)

Lexington
Thomas, C. V. (A)

Longview
Bean, R. N. (A)
Maxwell, K. D. (A)
Webb, E. E. (M)

Lubbock
Bryant, R. S. (A)
Elmore, C. M., Jr. (A)
Fagan, J. R. (A)
Harman, D. G. (A)
Houston, C. E. (M)
Lee, R. F. (M)
McKinney, C. M. (M)
Morrisset, J. B. (A)
Spuhler, H. A. (A)

Lufkin
Saxon, M. (SM)

McLean
Patterson, J. M. (A)

Mesquite
Surber, D. H. (A)

Midland
Cecil, J. (A)
Richardson, T. W. G., Jr. (A)
Yates, T. (A)

Mineral Wells
Canon, H. B. (SM)
Irwin, C. B. (A)
Mitchell, D. H. (SM)
Raits, E. J. (M)

Mount Vernon
Rutherford, C. R. (M)

Nederland
Coburn, E. D. (M)
Radford, J. V. (A)

Palacios
Swenson, H. T. (A)

Palestine
Laurie, B. (M)

Phillips
Hancock, W. L. (A)

Port Arthur
Escagne, I. E. (A)
Farrell, J. F. (A)
Krute, E. H. (A)
Lawson, R. G. (A)
Redwine, O. W. (A)
Riley, H. E. (A)
Staggers, R. D. (A)

Port Lavaca
Caraway, J. C. (A)

Prairie View
Wesley, F. D. (M)

Rusk
Urdal, S. (A)

San Antonio
Annis, R. W. (A)
Arnold, J. B. (A)
Bagby, C. K. (A)
Brogan, F. A. (A)
Campbell, H. G. (A)
Case, B. (A)
Case, E. E. (A)
Conley, W. S. (A)
Crockett, A. E. (A)
Dunlap, R. H. (A)
Egerton, W. G. (VA)
Erlandson, P. M. (SM)
Gallagher, J. D. (M)
Glenn, R. F. (A)
Hallam, J. T. (VA)
Hamm, W. J. (M)
Hasbrook, A. F. (A)
Hopper, R. W. (A)
Ing, G. W. (A)
Jeffers, C. L. (SM)
Jonas, L. K. (M)
Kelton, W. (M)
Kennedy, C. B. (A)
Kiley, W. A. (A)
Lampl, M. B. (A)
Lord, W. P. (M)
Mabry, J. H. (A)
Nelson, S. R. (A)
Ohman, J. (M)
Parr, J. O., Jr. (M)
Patton, A. D. (A)
Pomy, H. J. (M)
Porter, J. B. (M)
Prucha, J. M., Jr. (A)
Rives, J. B. (A)
Schock, W. R. (A)
Scroggins, C. M. (A)
Sears, D. (A)
Smith, R. J., Jr. (A)
Sullivan, M. C. (M)
Tarrodaychik, P. (A)
Wilson, R. M. (A)

San Diego
Stribling, J. L., Jr. (A)

Santa Anna
Johnson, D. M. (A)

Sherman
Gorski, A. A. (A)

Sinton
Mayer, E. G. (M)

South Houston
Cleic, M. C. (A)

Texas City
Da Prato, B. F. (A)

Tyler
Stone, R. M. (A)
Wileman, R. A. (M)

Waco
Appleman, L. H. (VA)
Dinter, H. A. (A)
Fulwiler, R. J. (A)
Guzzardo, B. A. (A)
Schwetman, H. D. (SM)

Wharton
Wearden, P. L. (A)

Wichita Falls
Adams, J. (A)
Horn, W. F. (A)
Wiley, H. T. (A)

Yoakum
Beardsley, W. S. (A)

UTAH

Cedar City
Heyborne, R. L. (A)

Hyrum
Purcell, R. B. (A)

Logan
Clark, C. (SM)
Cole, L. S. (SM)
Jones, W. L. (A)

Mount Pleasant
Stewart, C. O. (A)

Murray
Richardson, R. S. (A)

Ogden
Arrington, A. C. (A)
Hess, N. E. (A)
Holstead, A. J. (A)
Lee, G. F. (M)
Salisbury, D. L. (A)
Waterfall, G. M. (A)

Salt Lake City
Ahearn, J. M. (A)
Allen, S. L., Jr. (A)
Baldwin, J. M. (SM)
Benson, S. (A)
Burn, C. A. (A)
Carman, F. C. (A)
Clayton, V. E. (A)
Cozzens, W. D. (M)
Diehl, C. E. (M)
Evans, C. R. (M)
Gates, F. Y. (A)
Glantz, R. H. (A)
Gleason, J. L. (A)
Golightly, R. T. (A)
Greene, O. E. (A)
Grow, R. W. (A)
Hammond, S. B. (A)
Hardy, W. G. (A)
Haycock, O. C. (SM)
Holmes, R. L. (A)
Hooper, J. S. (A)
Hudson, J. C. (A)
Jepson, L. (A)
Johnson, D. R. (A)
Kolinalis, L. E. (A)
Lewis, A. H., Jr. (A)
Madsen, E. C. (M)
Manning, C. H. (A)
McCartney, J. D. (A)
Monsen, G. L. (A)
Roberg, W. F. (A)
Robinson, W. H. (A)
Roylance, D. T. (A)
Sutton, R. H. (A)
Tate, W. R. (A)
Wald, F. O. (A)
Worthen, K. J. (A)

Sandy
Atwood, K. W. (A)

Spanish Fork
Staheli, G. D. (A)

VERMONT

Brattleboro
Hadden, G. H. (M)

Burlington
Hayles, O. J. (M)

Gilman
Podall, B. A. (A)

Northfield
Staake, D. B. (A)

Plainfield
Frazer, J. F. (A)

Putney
Campbell, R. H., Jr. (A)

South Woodstock
Garceau, L. (VA)

Springfield
Lush, W. G. (SM)

VIRGINIA

Alexandria
Aasen, C. L. (A)
Adams, J. F., Jr. (A)
Arneth, A. P., Jr. (A)
Aymar, E. (VA)
Balwanz, W. W. (A)
Bawer, R. (A)
Bewig, K. W. (A)
Blasbalg, H. (A)
Brown, L. (A)
Carr, L. H. (VA)
Christian, O. R. (A)
Cohen, J. (M)
Connor, J. A. (A)
Cutler, C. R. (A)
Diehl, E. J. (A)
Dixon, G. P. (SM)
Dougherty, H. T. (A)
Dowie, J. A. (SM)
Eggerton, W. H. (A)
Eliot, A. B. (A)
Farago, J., Jr. (A)
Feuerstein, E. (A)
Gable, M. L. (A)
Gillett, G. D. (F)
Goeser, J. N. (A)
Goff, L. O. (A)
Grant, J. A. (A)
Gravlee, G. P. (A)
Habecker, T. B. (A)
Haddock, F. T., Jr. (A)
Hallenstein, N. A. (VA)
Hausman, A. H. (A)
Harris, J. E., Jr. (A)
Hopkins, A. F., Jr. (VA)
Horne, C. F., Jr. (A)
Johnson, C. Y. (A)
Jones, R. H. (M)
Keefer, D. E. (A)
Kelleher, K. S. (M)
Kimble, J. A. (A)
King, C. J., Jr. (SM)
La Fevre, L. M. (A)
Lair, J. R. (VA)
Larson, C. O. (SM)
Lewis, O. I. (SM)
Libby, E. C. (A)
Lindamood, T. C. (A)
Longfellow, B. S. (M)
Marshall, F. M. (M)
McFadden, R. R. (A)
McNaughten, N. (M)
Miller, J. W. (A)
Montague, H., III (A)
Moreland, H. H. (A)
Myers, J. C. (A)
Parker, C. V. (SM)
Pawley, M. G. (SM)
Peake, H. J. (SM)
Pettingill, S. A. (A)
Price, H. W., Jr. (M)
Prugh, T. A. (A)
Reickord, A. W. (A)
Rod, R. L. (M)
Ryan, A. H. (SM)
Schaffert, J. C. (A)
Schulman, J. R. (A)
Seecombe, W. T. (A)
Seddon, J. C. (A)
Shoemaker, J. R. (M)
Smith, B. D. (A)
Smith, G. S. (A)
Smith, W. M. (SM)
Stacey, J. M. (A)

Stastny, G. F. (A)
Stone, R. E. (A)
Stewart, C. (SM)
Stuckert, E. M. (SM)
Templeton, C. J., Sr. (A)
Thiebaud, P. M. (A)
Thompson, M. S. (A)
Varela, A. A. (SM)
Von Dohlen, H. W. (VA)
Weid, A. C. (M)
White, E. L. (SM)
White, R. E. (A)
Wilson, E. C. (A)
Wright, C. S. (A)
Zablocki, H. S. (A)
Zelazo, N. K. (M)

Annandale
Garlan, H. (M)
Lowrie, R. W. (A)

Arlington
Allen, E. W., Jr. (M)
Allred, C. M. (A)
Andrew, R. T. (A)
Ankenbrandt, F. L. (SM)
Ankers, R. E., Jr. (M)
Atkinson, E. E. (A)
Banks, C. R. (VA)
Bankson, H. D. (A)
Beecher, W. C. (A)
Bell, W. F., Jr. (A)
Bennett, R. (F)
Boehm, W. R. (A)
Borsody, B. F. (M)
Bridges, J. M. (SM)
Buchanan, O. R. (VA)
Burcham, D. P. (M)
Burleson, M. M. (A)
Butts, R. S. (M)
Campbell, W. H. (SM)
Cardwell, L. R. (M)
Chaffee, M. A. (M)
Chambers, G. R (A)
Chasnov, B. (A)
Clark, R. L. (SM)
Clark, S. F. (A)
Cohen, C. L. (A)
Cook, D. C. (A)
Craver, J. N. (M)
Croy, J. R. (M)
Darwin, F. A. (SM)
Davie, M. C. (A)
Dennison, B. H., Jr. (SM)
Dewey, D. L. (A)
Dickinson, W. T. (A)
Dingley, E. N., Jr. (SM)
Disenhaus, N. (A)
Drew, J. L. (M)
Dunlap, C. R. (A)
Dutton, W. P. (A)
Eichberg, R. L. (M)
Ellis, R. E. (A)
Ernst, A. A. (A)
Etter, W. A. (M)
Feick, J. C., Jr. (A)
Gartzke, F. J. (A)
Gauss, H. (A)
Gautney, G. E. (M)
Girard, E. J. (SM)
Gordon, R. F. (A)
Gregory, C. A. (M)
Guest, W. T. (SM)
Hackman, E. H. (VA)
Hagen, J. P. (SM)
Hamann, O. F. (A)
Hamilton, E. E. (A)
Hardwick, J. E. (A)
Hauber, E. N. (M)
Hay, R. R. (A)
Higgins, F. V. (M)
Himes, B. T. (A)
Hinsdale, E. M., Jr. (SM)
Holmes, W. M. (A)
Hopper, F. E. (A)
Hudgins, W. D. (SM)
Husten, B. F. (A)
Jackson, C. H. (SM)
Jensen, G. L. (M)
Jones, R. C., Jr. (A)
Kerns, D. M. (A)
Kershner, S. W. (A)
King, W. P. (A)
Klima, W. M. (A)
Klotz, J. W. (M)
Kudlich, K. H. (A)
Lamontagne, R. S. (M)
Lasher, C. C. (SM)
Leas, J. W. (M)
Lee, J. M. (SM)
Lenoir, S. P., Jr. (A)
Licwinko, L. S. (M)
Long, G. A., Jr. (M)
Lorenz, R. J. (A)
Martin, O. L. (M)
Martin, R. D. (M)
Mathews, M. M., Jr. (A)
McCachren, W. S. (SM)
McClurg, G. H. (SM)
McDowell, W. E. (A)
Merkel, H. E. (A)
Miller, J. L. (M)
Miller, R. E. (A)
Montgomery, B. E. (SM)
Montgomery, J. N., III (A)
Morgan, A. H. (M)
Morley, L. N. (A)
Moulton, A. B. (M)
Nash, P. E. (SM)
Norman, L. S., Jr. (A)
Orwin, R. J. (M)
Parlas, J. L. (M)
Ports, D. C. (SM)
Powell, D. S. (A)
Powers, D. M. (A)
Price, R. L. (A)
Quinn, F. S., Jr. (A)
Quinn, R. B. (M)
Racine, R. F. (A)
Redden, M. S., Jr. (M)
Renner, J. J. (M)
Riblet, H. B. (SM)
Richman, H. R. (A)
Robinson, H. E. (M)
Rosen, L. (M)
Ross, E. S. (A)
Schuette, H. (A)
Selby, H. A. (A)
Shapiro, S. (A)
Shephard, W. E. (A)
Sherer, L. M. (SM)
Sieck, L. W. (M)
Sikes, R. E. (A)
Sinback, W. R. (M)
Smith, A. W. (A)
Smith, C. H., Jr. (A)
Smith, C. V. L. (M)
Smith, J. M. (A)
Smith, K. A. H. (A)
Spies, M. C. (VA)
Staras, H. (M)
Stephan, H. W. (VA)
Stewart, J. M. (A)
Strang, R. P. (A)
Sunde, D. H. (A)
Sutton, B. L. (A)
Thomasson, H. B. (A)
Tieman, C. R. (A)
Tucker, J. W. (A)
Tuller, W. G. (SM)
Veatch, J. P. (SM)
Walker, E. A. (M)
Wearn, W. C. (A)
Weihe, V. I. (SM)
Weinstein, A. (A)
Wicker, J. L. (M)
Wilson, N. B. (A)
Young, A. H. (A)
Young, E. W. (A)

Blacksburg
Martin, E. T. (A)
Murray, W. A. (VA)
Wright, R. R. (SM)

Camp Pickett
Rahal, N. S. (A)

Charlottesville
Goeller, L. F., Jr. (A)
Lotz, W. E., Jr. (A)
Updike, O. L. (A)

Christiansburg
Gannaway, T. C. (A)

Colonial Beach
Brooks, F. E. (M)

Colonial Heights
Palmer, O. A., Jr. (A)

Cradock
Shepherd, J. F. (A)

Dahlgren
Hayden, L. O. (A)
Henderson, J. (A)
Poorte, G. E. (A)
Potter, R. R. (A)
Romero, E. S. (A)
Thornhill, J. E. (A)

Danville
Lea, H. D. (A)

Fairfax
Herbstreit, J. W. (SM)
Lee, F. N. (A)
MacGregor, W. R. (A)

Falls Church
Anderson, H. C. (VA)
Anderson, W. L. (A)
Bateman, R. (A)
Berghoefer, F. G. (A)
Berkley, J. B. (SM)
Billheimer, C. R. (A)
Boland, J. N. (VA)
Bradford, H. K. (M)
Brady, R. F. (SM)
Bull, J. T. (A)
Burton, G. D. (M)
Carr, S. O. (M)
Cave, E. L. (M)
Clements, S. E. (SM)
Colgin, J. R. (A)
Coss, W. L. (A)
Curtis, R. P. (VA)
Covington, O. C. (A)
Curran, B. F. (A)
Davis, J. N. (M)
Deeter, C. R. (M)
Dick, J. O. (A)
Dickson, F. H. (A)
Donics, W. (A)
Eiscle, E. J. (A)
Fleming, L. (M)
Frey, S. C. (M)
Fulton, W. L. (A)
Gould, G. P. (A)
Grimm, R. S. (A)
Hadley, F. P. (A)
Harding, G. C. (M)
Hibberd, P. A. (A)
Hobbs, M. (SM)
Houghton, E. G. (M)
Hunt, C. M. (SM)
Jones, M. S. (A)
Karsh, H. (A)
Kelleher, J. J. (M)
Krcek, J. A. (A)
Loughridge, D. H. (SM)
Marshall, E. L. (VA)
Martin, E. O. (A)
McDowell, R. B. (SM)
McGinnis, C. E. (A)
Moffet, J. A. (M)
Monte, H. S. (A)
Mulligan, W. J. (A)
Nelson, C. W., Jr. (A)
Norman, S. W. (M)
Oyster, D. E. (M)
Parris, D. S. (A)
Patterson, T. T., Jr. (A)
Proferes, N. J. (A)
Ray, H. A., Jr. (M)
Renton, R. J. (M)
Richter, A. R. (M)
Rooney, J. D. (M)
Scott, R. M. (A)
Scott, S. R. (A)
Sjoholm, E. M., Jr. (A)
Skrivseth, A. G. (SM)
Smith, A. E. (A)
Svedlow, J. D. (A)
Ware, M. (M)
Watts, G. J. (A)
Welling, C. G. (A)
Wolfand, D. (A)
Zartman, I. F. (M)

Fort Belvoir
Gang, R. E. (A)
Hata, F. T. (M)
Weihe, W. K. (A)

Fort Myer
Hessler, W. G., Jr. (A)

Hamilton
Bouchey, S. H. (A)

Hampton
Beazell, H. L., Jr. (A)
Boyer, W. J. (A)
Brown, R. L., Jr. (M)
Brummer, E. A. (A)
Courtney, R. H., Jr. (A)
Fuhrmeister, P. F. (A)
Harris, O. R. (A)
Hastings, C. E. (SM)
Haywood, V. M. (A)
Knoll, D. W. (A)
Louer, P. E. (A)
Rogers, W. H., Jr. (A)
Swafford, J. E. (A)
Turnage, H. C. (A)
Vavra, P. H. (A)
Wood, R. M., Jr. (A)

Harrisonburg
Braun, W. L. (SM)

Herndon
Brown, J. N. (A)

Hilton Village
Marshall, A. R. (A)

Langley Air Force Base
Raines, W. (A)

Leesburg
Meloy, T. (A)

Lexington
Horne, R. C., Jr. (M)
Miller, E. A. (A)

Lynchburg
Gordon, R. T. (A)
Orth, J. T. (M)
Pinkerton, F. J. (A)

Manassas
Coffland, A. E. (A)

Martinsville
Muse, D. W. (A)

McLean
Craven, T. A. M. (F)
Creutz, J. (VA)
Davis, G. C. (SM)
Dee, H. E. (A)
Rietzke, E. H. (SM)
Smith, J. E. (SM)
Smoot, W. S., III (A)

Mineral
Kiblinger, W. H. (A)

Morgantown
Cornetet, W. H., Jr. (A)

Newport News
Aaron, B. D. (M)
Bjerke, J. O. (A)
Comstock, A. L. (A)
Lederer, P. S. (A)
McFall, C. H., Jr. (A)
Slaughter, W. R. (A)

Norfolk
Ayers, J. G., Jr. (A)
Baker, E. E. (M)
Bernard, W. B. (SM)
Betzer, W. E. (A)
Busby, E. S., Jr. (A)
Carr, B. C., Jr. (A)
Crandall, W. R. (M)
Dickerson, B. C. (M)
Greene, W. E. (M)
Hufnell, R. N. (A)
Jewell, E. D. (A)
Kaserman, F. S. (VA)
King, W. C., Jr. (A)
Koontz, C. E. (A)
Lindell, R. L. (M)
Martin, C. B. (A)
Norman, R. H. (A)
Palmer, L. N. (A)
Peffer, J. C. (A)
Peghiny, J. W. (A)
Ryscuck, J. (A)
Smith, R. S. (A)
Spandorfer, L. M. (A)
Stoddert, T. M. (A)
Swacker, S. W. (A)
Thompson, L. H. (A)
Trip, R. E. (A)
Triplett, T. R. (A)
Wicks, D. S. (SM)
Wicks, W. F. (A)

Orange
Grymes, J. R. (A)

Palls
Garber, L. F. (A)

Poquoson
Burlock, J. (A)

Portsmouth
Bernhard, H. H. (A)
Dodson, H. L. (A)
Donahue, R. M. (A)
Fahey, E. J. (A)
Fivel, M. J. (A)
Friel, F. J., Jr. (VA)
Long, K. G. (A)
Stewart, C. E. (A)

Quinby
Cameron, C. E. (A)

Richmond
Alley, R. E., Jr. (A)
Bailey, R. C. (SM)
Conte, T. M. (SM)
Cosman, A. (A)
Eubank, R. N. (M)
Golding, R. M. (A)
Gragnani, O. J. (A)
Holup, A. C. (A)
Mayer, D. S. (A)
Ogg, W. M. (A)
Selden, W. R. (M)
Shultz, L. R. (A)
Stone, J. L., III (A)
Sturm, F. L. (A)
Thorpe, R. A. (A)
Toms, E. C. (A)
Woods, D. C. (M)
Wrisley, J. C. (A)

Roanoke
Briggs, J. P. (A)
Lane, J. P. (A)
Lemon, E. B. (A)
Newman, J. E. (A)
Pickett, R. T., III (A)
Sharpe, E. F. (A)

Sabot
Jones, T. W., Jr. (A)

Shadwell
Mace, J. C. (SM)

Staunton
Miller, A. G. (A)

Tauxemont
Ringwalt, D. L. (A)

Vienna
Cooke, N. M. (SM)
Davis, W. L. (A)
Meisinger, H. P. (SM)
Robinson, C. A., Jr. (A)
Rodimon, C. C. (M)
Stewart, T. E., Jr. (A)

Virginia Beach
Balch, J. A. (F)
Caffrey, J. V. (A)
Corkran, R. L., Jr. (A)
Hunnicutt, W. R., Jr. (A)
Zakowski, L. F. (A)

Waynesboro
Klann, P. A. (A)

Wealthia
Russell, C. M. (SM)

Williamsburg
Peyton, H. A. R. (A)

Yorktown
Chambers, G. S. (A)

WASHINGTON

Aberdeen
Pooley, R. R. (A)

Auburn
Harting, D. R. (A)

Bellevue
Chewning, W. H. (A)
Hyland, F. G. (M)
Olson, J. H. (M)
Pile, D. H. (M)

Bellingham
Harper, E. E. (A)
Jones, V., Jr. (A)
Troetschel, W. O. (A)

Bremerton
Brown, M. H. (A)
Brudwig, A. H. (M)
Byer, E. D. (M)
Criddle, C. B. (M)
Dausman, R. H. (M)
Eck, H. J. (A)
Gruwell, F. N. (M)
Himoe, C. E. (M)
Levin, R. J. (A)
Linkletter, R. L. (A)
Lyngstad, E. O. (M)
Marsolan, V. C. (SM)
Mason, J. E. (M)
Paterson, J. M. (M)
Pitts, H. L. (SM)
Purbaugh, H. O. (A)
Striebel, J. E. (A)
Vulliet, P. O. (A)
Weyrauch, H. E. (M)
Whittier, M. L. (A)
Witbeck, L. H. (A)

Buckley
Garrett, D. E. (A)

Burton
Little, J. T. (A)
Shahan, R. L. (A)

Carnation
Martin, D. L. (A)

Colbert
Sparling, A. G. (SM)

College Place
Brown, R. H. (M)

Des Moines
Swain, C. W.

Easton
Grandstaff, H. H. (A)

East Stanwood
Short, R. C. (A)

Edmonds
Farr, W. (A)
Fleming, H. A. (M)

Ephrata
Backman, J. A. (A)
Boydstun, L. D. (A)

Everett
Evans, R. E. (A)
Hall, T. S. (A)

Fairchild Air Force Base
Stroman, C. F. (A)

Fall City
Gonnason, J. A. (A)

Gig Harbor
Berkheimer, R. H. (M)

Kelso
Collins, H. E. (A)

Kennydale
Green, G. G. (A)

Manson
Marshall, R. W. (A)

Mercer Island
Bruland, R. V. (M)
Fitch, J. L. (A)
Hagler, D. L. (M)
Maynard, J. E. (SM)
Taylor, J. M. (A)

Mineral
Rowe, V. G. (M)

Montesano
Ferguson, R. E. (A)

Olympia
Christensen, A. B. (VA)
Lewis, C. (M)
Scott, C. V. (A)

Opportunity
Roeschlein, E. R. (A)

Othello
Koch, F. R. (A)

Pacific Beach
Howe, R. B. (A)

Pasco
Kenoyer, H. W. (A)
Schilling, R. D. (A)
Swanson, C. D. (A)

Pullman
Harbour, R. D. (A)

Puyallup
Herr, M. D. (M)
Korp, J. E. (A)

Raymond
Price, T. P. (A)

Renton
Dorband, A. E. (A)
Schwartz, M. J. (A)

Richland
Andersen, R. K. (A)
Clark, R. G. (A)
Connally, R. E. (A)
Jacobs, I. M. (A)
Keene, L. M. (A)
Larrick, C. V. (SM)
Libby, H. L. (A)
Lindberg, B. G. (A)

Seahurst
Stroebel, J. C. (SM)

Seattle
Aburano, P. F. (A)
Armour, R. B. (A)
Armstrong, A. B. (A)
Arnold, N. E. (A)
Ashleman, F. C., Jr. (A)
Auvil, C. K. (A)
Bach, R. O. (SM)
Baer, D. D. (A)
Banks, R. B. (A)
Barger, G. K. (A)
Barger, S. D. (A)
Bark, R. S. (M)
Barringer, E. E. (A)
Barter, L. D. (A)
Bennett, S. D. (SM)
Berkman, R. D. (A)
Berntsen, D. G. (A)
Berry, D. C. (A)
Betten, C. B. (A)
Birch, J. S. (A)
Black, J. C. (A)
Blagsvedt, M. L. (A)
Blatt, F. J. (A)
Bookwalter, L. S. (VA)
Bower, R. L. (A)
Broderick, D. L. (A)
Brott, F. J. (SM)
Bruening, A. J., Jr. (A)
Bull, W. A. (A)
Bush, B. E. (A)
Bushman, F. W. (M)
Caproni, G. A. (A)
Chase, R. F. (M)
Claar, D. E. (A)
Clark, L. G. (A)
Cochran, L. B. (SM)
Cohen, A. D. (A)
Colby, R. L., Jr. (M)
Colvin, R. S. (A)
Coombs, W. C. (VA)
Cooper, L. V. (A)
Craig, D. I. (A)
DeGregorio, J. F. (A)
Doolittle, K. H. (A)
Dorratcague, P. E. (A)
Dorwart, R. J. (A)
Dunbar, E. E. (A)
Duncan, J. A. (M)
Eastman, A. V. (F)
Eldridge, D. F. (A)
Ellerbeck, K. (VA)
Elliott, L. (A)
Embree, R. R. (A)
Erwin, E. V. (A)
Erwin, R. L. (A)
Estes, F. B. (VA)
Evenson, H. J. (A)
Fahley, W. A. (A)
Feinstein, H. (A)
Fender, K. L. (A)
Finch, H. D. (M)
Fisher, R. C. (SM)
Flewelling, J. D. (SM)
Fonda, K. A. (A)
Foss, R. N. (A)
Foster, J. H. (A)
Foster, N. H. (A)
Friedland, R. J. (A)
Frost, J. D. (A)
Galloway, W. C. (A)
Gibbs, R. M. (A)
Gibson, H. D. (VA)
Gilbertson, S. R. (A)
Glaser, R. A. (A)
Grantham, M. D. (A)
Griffin, S. J. (A)
Hage, G. H. (A)
Hall, G. D. (A)
Hancock, R. L. (A)
Harris, B. L. (A)
Harrison, A. E. (SM)
Hatfield, J. B. (A)
Havens, J. D. (A)
Hill, W. R., Jr. (M)
Hoard, G. L. (SM)
Hogg, J. E. (M)
Hoglund, R. H. (M)
Horn, H. T. (A)
Illman, R. W. (A)
Jacobsen, A. B. (M)
James, M. B. (A)
Jobe, R. E. (A)
Johns, L. W. (A)
Johnson, J. F. (SM)
Jones, J. (M)
Jones, W. L. (A)
Judson, H. H., Jr. (A)
Kahan, D. F. (A)
Kalmus, F. W. (A)
Kaminoff, M. (A)
Kellar, J. B. (A)
Kindall, E. W. (A)
Kirkpatrick, R. L. (A)
Kish, S. A. (A)
Kleckner, U. F. (A)
Larson, L. A. (A)
Lazarus, A. (A)
Lee, C. Y. (A)
Lee, R. C. (A)
Libby, T. M. (SM)
Lind, P. C. (A)
Louie, C. H. (A)
Lundberg, R. M. (A)
Martin, G. C. (A)
Maurer, R. A. (A)
Maxwell, R. L. (A)
McCabe, A. P. (M)
McHenry, G. A. (A)
McVey, C. A., Jr. (A)
Mendenhall, G. G. (M)
Merk, R. V. R. (A)
Miller, D. F. (A)
Morgan, J. C. (A)
Mossman, F. B. (SM)
Nakahara, T. (A)
Nakamura, K. (A)
Nelson, C. E. (A)
Nelson, D. D. (A)
Newell, S. E. (A)
Niemi, L. T. (A)
Nunner, R. J. (M)
Nutting, D. C. (M)
Olson, D. L. (A)
Olson, N. K. (M)
Orth, J. W. (A)
Ostrom, C. W. (A)
Palladino, M. J. (A)
Parrott, J. E. (M)
Pascual, R. A. (A)
Pedersen, R. E. (M)
Perkins, L. C. (A)
Perry, F. E. (A)
Perry, R. E. (A)
Petrich, R. O. (M)
Pierce, W. E. (A)
Polcuch, A. F. G. (A)
Porad, B. L. (A)
Pratt, L. M. (A)
Price, H. J. (SM)
Quantz, R. G. (A)
Ralston, C. (A)
Reilly, J. A. (A)
Rehkopf, C. L. (M)
Renfro, H. E. (VA)
Rickett, R. J. (A)
Roberts, B. J. (A)
Robinson, R. B. (A)
Rodenhouse, E. (M)
Saint John, I. S. (A)
Samson, C. A. (A)
Sauber, P. T. (A)
Scharfman, H. (A)
Scovill, J. M. (A)
Sheldon, J. K. (A)
Sheppard, J. J., Jr. (A)
Shook, W. A. (A)
Shipek, R. H. (A)
Shiplett, K. E. (A)
Sidor, E. N. (M)
Simler, L. L. (M)
Smith, C. R. (SM)
Smith, W. B. (A)
Soward, R. (M)
Stedman, C. K. (SM)
Sterley, R. R. (A)
Stoner, F. E. (SM)
Story, W. L. (A)
Stout, T. M. (A)
Stroheeker, J. P. (A)
Swarm, H. M. (M)
Swift, J. D. (A)
Takemura, T. P. (A)
Talcott, M. L. (A)
Temple, P. E. (A)
Thomasson, L. T. (A)
Thompson, A. G. (A)
Thorne, C. M. (A)
Todaro, C. N. (A)
Tolmie, J. R. (SM)
Traub, L. A. (M)
Triplett, W. R. (SM)
Tustin, W. (M)
Wall, R. E. (A)
Ward, D. M. (A)
Wedin, A. G. (SM)
Weinstein, G. (A)
Wellens, E. J. (A)
Williams, C. E. (SM)
Willson, A. R. (SM)
Willson, R. R. (A)
Wilson, D. W. (M)
Winlund, E. S. (M)
Wong, H. Y. (A)
Woodhouse, G. H. (A)
Young, J. A., Jr. (A)
Young, K. J. (A)

Spokane
Coates, F. M. (M)
Gehr, G. A. (A)
Gorman, D. P. (M)
Hale, H. E. (A)
Hammond, C. K. (A)
Hoke, V. L. (VA)
Mackenstadt, R. A. (A)
MacLean, T. W. (A)
Storms, H. H. (VA)
Walter, H. S. (A)
Trebby, F. J. (A)
Tucker, J. R. (A)
Walker, J. (A)

Tacoma
Carlson, E. R. (A)
Curtis, G. N. (A)
Hammersand, F. G. (A)
Hartwell, S. A. (A)
King, H. F. (A)
Klitsch, L. L. (A)
McClamrock, J. M. (A)
McDonough, D. M. (A)
Miller, G. E. (A)
Perkins, M. G. (A)
Thompson, K. J. (M)

Vancouver
Mumford, E. R. (A)
Palmer, M. Y. (A)
Rogers, E. J. (A)
Thurman, H. (A)
Wiles, F. L. (A)
Wohlgemuth, D. G. (A)

Vashon
Bey, W. I. (M)
Miller, C. E. (A)

Walla Walla
Parmelee, W. G. (A)
Wilken, B. W. (A)

Washougal
Gill, F. K. (A)

Wenatchee
Perry, W. T. (A)
Wallace, J. W. (SM)

WEST VIRGINIA

Bluefield
Flanagan, P. T. (A)

Charleston
Shipman, W. A. (A)
White, M. A. (A)
York, D. E. (A)
Zaharis, G. (A)

Charles Town
Nichols, D. S., Jr. (A)

Clarksburg
Bedford, S., Jr. (A)
Hough, R. D. (M)

Cowen
Haller, M. N. (A)

Dunbar
Hammet, A. C. (A)

Elkins
Stoller, M. D. (A)

Fairmont
Curry, D. L. (A)

Grafton
Sinsel, P. W. (A)

Huntington
Bromley, R. A. (A)
Bruch, R. (VA)
Gilmore, J. E. (A)
Hawes, J. G. (A)
Menefee, H. R. (A)
Reash, C. W. (SM)

Lewisburg
Snyder, G. H. (VA)

Lumberport
Lambert, F. C. (A)

Mechen
Beltz, G. E. (A)

Mercer County
Bones, T. M., Jr. (M)

Morgantown
Colwell, R. C. (SM)
Keener, E. L. (A)
Seibert, C. B. (A)

Oak Hill
Thomas, R. R., Jr. (A)

Parkersburg
Snyder, H. H. (A)
Spence, R. C. (A)

Point Pleasant
Roberts, V. B. (A)

Saint Albans
Bucy, P. T. (A)

Salem
Warren, D. S. (A)

Sistersville
Laing, J. T. (A)

South Charleston
Barlow, A. D. (A)
Rogers, L. J. (A)

Welch
Kish, F. (A)

Wheeling
Levenson, D. W. (A)

Williamstown
Manley, E., II (VA)

WISCONSIN

Antigo
Hurlbut, G. N. (A)
Parfitt, R. J. (A)

Appleton
Grist, F. J., Jr. (A)

Beloit
Schutz, G. C. (SM)

Cuba City
Hauser, D. J. (A)

Cudahy
Patrick, P. J. (A)
Ross, C. O. (A)

Eagle River
Sorensen, R. L. (A)

Eau Claire
Jorgenseon, T. O. (M)

Edgerton
Hubbard, B. F. (M)

Elm Grove
Bailey, T. J. (A)

Ettrick
Rogne, R. J. (A)

Fort Atkinson
Beischel, J. R. (A)

Fox Point
Koch, M. E. (A)

Grafton
Konig, V. A. V. (A)

Hartland
Harry, W. R. (VA)

Hurley
Pedri, J. N. (VA)

Janesville
Clay, W. A. (VA)
Gates, C. E. (M)
Glander, H. H. (A)
Williams, C. R. (A)

Kenosha
Algiers, E. P. (A)
Bauer, W. E. (A)
Heide, S. M. (A)
Gottliebsen, L. H. (A)
MacDowell, G. E. (A)
Thiel, W. L. (A)

La Crosse
Leeman, A. (VA)
Steele, T. S. (A)

Ladysmith
Doughty, S. D. (A)

Madison
Foote, W. B. (A)
Hatstrom, J. R. (M)
Halan, N. G. (A)
Kelley, W. V. (VA)
Koehler, G. (SM)
Levinthal, J. G. (A)
Mobley, R. C. (A)
Onsgard, C. P. (A)
Parent, R. J. (M)
Peterson, H. A. (SM)
Petree, B. (A)
Retherford, B. C. (A)
Rideout, V. C. (M)
Roedel, J. (A)
Scheibe, E. H. (A)
Simon, J. M. (A)
Skibs, J. J. (A)
Swenson, G. W., Jr. (A)
Vick, H. J. (A)
Wickhem, R. J. (A)
Young, C. E. (A)

Manitowoc
Reed, D. M. (M)

McFarland
Ottum, R. W. (A)

Menasha
Harris, R. J. (A)

Menominee Falls
Nadlund, R. S. (VA)
Van Alstyne, A. B. (M)

Merrill
Secard, E. L. (A)

Middleton
Miller, J. B. (A)

Milwaukee
Anthes, J. (A)
Atwood, A. R. (A)
Austin, E. N. (A)
Baird, J. T. (A)
Barszcz, A. M. (A)
Baumeister, E. A. (A)
Behagen, E. L. (A)
Berge, O. L. (A)
Brown, H. W. (A)
Burkhalter, B. L. (A)
Burns, R. E. (A)
Butler, L. W. (M)
Christie, C. B. (A)
Cordes, E. L. (M)
Crago, P. H. (A)
Crowell, G. F. (M)
Danielsen, A. C. (M)
Dilger, L. E. (A)
Ebel, F. E. (A)
Eckert, F. A., Jr. (VA)
Elliot, W. H. (M)
Farber, E. R. (A)
Frater, G. A. (A)
Gad, P. (A)
Gainer, W. P. (VA)
Ganiere, H. C. (A)
Geiger, L. C. (A)
Gellerup, D. W. (SM)
Goeden, H. E. (A)
Hebal, W. H. (M)
Hesse, M. H. (A)
Hines, L. J. (A)
Hoffman, P. F. (A)
Hogan, H. A. (A)
Holbrook, J. G. (A)
Holdredge, R. F. (M)
Horvath, A. E. (A)
Jacobs, J. E. (A)
Kartel, H. C. (VA)
Kaiser, E. H. (A)
Kane, E. W. (M)
Kane, J. R. (A)
Kasdorf, G. R. (A)
Katsekes, S. G. (A)
Kennedy, H. D. (A)
Kent, O. J. (A)
Keppert, G. D. (A)
Khourl, A. (A)
Kilby, J. S. (A)
Kulorn, A., Jr. (A)
Kurylo, E. F. (A)
Laeser, P. B. (M)
Levin, S. (A)
Lieb, J. S. (A)

Lindner, F. A. (A)
Limpel, E. J. (M)
Luecke, M. W. (A)
Maertz, R. J. (A)
Maklary, J. R. (A)
Makowski, J. J. (A)
Manske, W. C. (A)
Matthias, L. H. (VA)
McCarthy, R. R. (A)
Mereen, D. E. (M)
Mueller, H. W. (A)
Naughton, G. J. (VA)
Nunn, D. E. (M)
Ollenburg, M. A. (A)
Pfeifer, J. W. (VA)
Pirhofer, D. J. J. (A)
Reinke, J. A. (A)
Richardson, M. S. (VA)
Richter, W. (SM)
Rodewald, M. V. (A)
Roethle, R. H. (A)
Rubinstein, H. W. (A)
Ruff, H. M. (A)
Rugg, D. A. (A)
Saari, L. V. (M)
Scheel, R. J. (A)
Scheer, D. (A)
Schlicke, H. M. (M)
Schmitz, J. V. (A)
Schmitzer, R. W. (A)
Schowalter, E. A. (A)
Schwartz, C. R. (A)
Seiser, E. O. (A)
Serota, R. M. (A)
Sharp, R. L. (A)
Sherwood, E. T. (SM)
Siegel, E. J. (A)
Sperry, L. (A)
Steffen, R. V. (A)
Sward, W. O. (A)
Tait, R. B. (A)
Vandeven, D. W. (A)
Van Zeeland, F. J. (SM)
Weller, D. A. (SM)
West, B. M. (A)
Wille, E. A. (A)
Wille, E. F. (A)
Williams, S. B. (A)
Wolff, R. L. (M)
Woods, K. C. (A)
Young, T. P. (A)
Zanin, S. R. (A)
Zechel, L. A. (A)
Zwerra, H. J. (A)

Neenah
Morgan, F. B. (M)
Zabel, L. W. (M)

North Fond du Lac
Young, R. G. (A)

Oconomowoc Lake
Wilson, R. F. (A)

Oshkosh
Williams, N. (VA)
Ziehlke, R. J. (A)

Princeton
Kalupa, C. J. (A)

Racine
Campbell, R. H. (A)
Hassel, E. W. (M)
Kofler, E. J. (A)
Majewski, E. H. (A)

Shawano
Priem, E. S. (A)

Sheboygan
Mayer, H. J. (A)

Superior
Kilpinen, R. M. (A)

Tomah
Kamrath, R. W. (A)

Waterford
Cummings, H. R. (M)

Waukesha
Dole, L. H. (A)
Randall, A. E. (A)
Ritzow, N. R. (A)
Vernon, R. R. (A)

Wausau
Zielesch, B. E. (M)

Wauwatosa
Matthews, R. B. (M)
Pinnow, R. L. (A)
Watts, W. E. (M)
Wollaeger, L. A. (A)

West Allis
Benedict, D. E. (A)
Doylen, D. H. (M)
Graham, R. H. (M)
Hoehne, V. M. (A)
Reinke, H. J. (M)
Schlehlein, G. J. (A)
Syverson, C. L. (A)
Wright, B. G. (A)

West DePere
Stangel, W. (A)

West Salem
Rhodes, H. G. (A)

Williams Bay
Gibson, J. G. (A)
Hoefle, R. R. (A)

WYOMING

Buffalo
Stanton, J. M. (M)

Casper
Frary, R. S. (A)
Hathaway, D. L. (SM)

Cheyenne
Burton, E. B. (A)
Grove, W. C. (A)
Hallen, E. (M)
Waller, R. L. (A)
Watson, H. K. (A)

Gillette
Clement, P. F. (VA)

Laramie
Garrod, T. W., Jr. (A)
Mallory, W. M. (M)
Trueblood, R. O. (M)

Rawlins
Seaverson, O. I. (VA)

Riverton
Schaefer, R. G. (M)

Rock Springs
Adovnik, F. W. (A)
Montgomery, E. G. (A)
Noffsinger, D. T. (A)

Wheatland
Leet, D. N. (A)

Worland
Ujifusa, R. L. (A)

Upton
Clingan, H. E. (VA)
Rinehart, B. H. (VA)

FOREIGN GEOGRAPHICAL LISTING OF MEMBERSHIP

ALASKA

Anchorage
Daniel, R. D. (A)
Donohoe, T. K. (A)
Follensbee, W. R. (A)
Grimstad, E. J. (A)
Heckart, H. A. (A)
Johnson, C. A. (A)
Johnson, R. L. (A)
Manning, C. T. (M)
Manuel, W. O. (A)
Mohler, C. W. (M)
Nichols, W. R. (M)
Rogers, D. C. (A)
Smith, C. H. (M)
Wagner, W. J. (SM)
Whittaker, G. A. (A)
Wheaton, T. H. (A)
Wayer, C. F., Jr. (A)
Walker, R. T. (M)
Walker, R. E. (M)
Walden, J. M. (M)

Annette
Pace, R. A. (M)

College
Jacobs, G. B. (A)
Wilson, J. E. (A)

Fairbanks
Shurtleff, C. H. (A)

Gustavus
Hannon, G. A. (A)
O'Brien, E. G. (A)

Kodiak
Haskin, R. H. (A)
Deschamps, T. (A)
Whitney, J. E. (A)

Kuskokwim
Rhode, S. F. (A)

Nome
McKim, W. J. G. (A)

Petersburg
Post, M. O. (A)
Pierce, E. R. (A)

Spenard
Davenport, F. S. (A)
Peterson, J. E. (A)

ANGLO-EGYPTIAN SUDAN

Khartoum
Hudson-Davies, J. (M)

Malakal
Palfreman, E. G. (A)

ARGENTINA

Bahia Blanca
Carlos, J. P. S. (A)

Bartolome Mitre
Alacantara, R. (A)

Bella Vista
Bolwig, A. C. (A)

Buenos Aires
Acerbi, R. S. (A)
Alzona, A. L. (A)
Andrews, G. J. (SM)
Arbo, O. (A)
Baldwin, E. V. (A)
Barcala, J. M. (A)
Baumann, C. (A)
Benjamin, M. (A)
Bermudez, J. (A)
Bertola, J. (A)
Bonzo, H. M. (A)
Brandt, L. (A)
Burmester, R. E. R. (M)
Cacavelos, A. A. (A)
Calderaro, A. A. (A)
Cambre, C. A. (A)
Canepa, A. M. (A)
Canepa, J. A. (A)
Caprioli, L. E. (A)
Cassiet, A. H. (A)
Cerrato, E. M. (A)
Cook, W. A. (SM)
Cosentino, A. T. (F)
Dickson, A. R. K. (A)
Di Marco, A. (M)
Fuks, E. (A)
Gandolfo, A. (A)
Gary, A., Jr. (A)
Gil Giron, D. (A)
Gluckmann, A. (A)
Gonzalez, F. (A)
Grant, F. W. (A)
Grant, I. C. (SM)
Guardado, N. (A)
Guntsche, G. E. (A)
Harris, F. (SM)
Hayes, G. W. (A) (L)
Hojman, M. (A)
Hurtado, C. B. (A)
Kline, L. (A)
Kobilsky, M. J. (M)
Krahenbuhl, H. (A)
Laconca, F. (A)
Langhi, M. A. (A)
Levin, J. (A)
Lojkasek, T. (A)
Maget, R. (A)
Magno, H. T. (A)
Malagamba, R. A. (A)
Malinowski, E. (A)
Martinez, J. (A)
McLoughlin, R. P. (SM)
Nicholson, A. A. (A)
Noviks, B. (A)
Onativia, R. A. (A)
Pardo, E. M. (A)
Patrucco, M. E. (A)
Penin, R. L. (A)
Perez, C. P. (A)
Picard, A. (A)
Pinasco, S. F. (A)
Pluss, C. P. (A)
Portnoy, B. (A)
Richheimer, E. (M)
Rojo, A. (A)
Rubio, J. M. (A)
Rueda, J. V. (A)
Sarli, M. V. (A)
Schwartz, O. (A)
Scott, R. H. (SM)
Sipman, L. C. (A)
Suarez, C. A. (A)
Treillard, C. E. (A)
Tufro, A. (A)
Valdes, S. A. (A)
Van Spankeren, G. H. (SM)
Ventoso, O. H. (A)
Visscher, J. F. (A)
Von Pieschel, A. E. (A)
Von Trentini, G. (A)
Ziger, A. (A)
Zollfrei, C. D. (A)
Zuchenbrojt, H. (A)

La Plata
Bilottl, A. (A)
Borrego, G. (A)

Lopez
Arnaud, J. P. (SM)

Ranelagh
Schweimer, K. P. (A)

Salta
Sola, M. C. (A)

San Isidro
Ooiman, A. (SM)

Santa Fe
Munoz de Toro, A. (A)

AUSTRALIA

NEW SOUTH WALES

Ashfield
Barrett, J. O. G. (M)

Bankstown
Ferguson, G. S. (A)

Bexley
Wardale, A. H. (M)

Blue Mountains
Munro, G. H. (SM)

Burwood
Builder, G. (F)

East Lindfield
Allsop, R. C. (SM)

Five Dock
Martin, A. F. (A)
Winglee, C. R. (A)

Glebe
Scott, H. G. (M)

Hurstville
Hall, G. G. (M)

Inverell
Bartle, O. E. (A)

Killara
Hooke, L. A. (SM)

Kingsgrove
Birchmeier, C. E. (A)

Longueville
Beard, M. (A)
Swire, B. E. (A)

Mosman
Wyles, D. G. (SM)

Mulgoa
McDonald, A. S. (F)

North Sydney
McDougall, N. R. (A)

Orange
Crouch, E. C. (A)

Potts Point
Green, A. L. (F)

Sans Souci
Larkin, J. H. (A)

Sydney
Bardin, W. F. (SM)
Bean, L. P. R. (SM)
Brown, B. F. A. (SM)
Bushby, T. R. W. (SM)
Cansick, N. V. C. (A)
Cumpston, L. W. (M)
Dobbie, L. G. (SM)
Dudman, V. H. (SM)
Gutmann, F. (M)
Hall, L. S. (SM)
Hansen, I. C. (M)
Hirschl, H. P. (M)
Langford-Smith, F. (SM)
Mingay, O. F. (SM)
Minnett, H. C. (A)
Parish, H. C. (VA)
Ryan, R. D. (A)
Shaw, R. H. (M)
Stevenson, M. H. (SM)
Thom, F. W. P. (SM)
Warner, J. (A)

Thornleigh
Hope, R. S. (M)

Turramurra
Cooper, B. F. (M)
Kerr, F. J. (SM)

Vaucluse
Pawsey, J. L. (A)

West Ryde
Benson, J. E. (SM)

QUEENSLAND

Brisbane
Ham, G. (VA)
Oliver, E. (M)
Webster, H. C. (M)

SOUTH AUSTRALIA

Adelaide
Sekay, S. J. (A)
Willoughby, E. O. (A)

Kilkenny
Whitley, K. C. (A)

Largs Bay
Davies, R. J. C. (A)

Plympton
Treharne, R. F. (A)

TASMANIA

Hobart
Tuck, H. P. (VA)

Launceston
Jebb, T. K. (A)

VICTORIA

Ballarat
McCulloch, G. R. (VA)

Beaumaris
Murphy, W. T. (A)

East Prahran
Kennewell, E. M. (A)

Elwood
Ward, J. F. (M)
Warner, G. A. (A)

Elsternwick
Brodribb, M. I. (A)
Skelton, T. H. (SM)

Melbourne
Brownless, S. F. (VA)
Cannon, A. H. (A)
Collins, R. J. (A)
Cox, L. V. (A)
Freeman, J. E. (A)
Glover, A. J. G. (A)
Hooper, E. M. (VA)
Rubenstein, S. J. (VA)
Serpell, N. (A)

Richmond
Webb, A. L. C. (VA)

WESTERN AUSTRALIA

Bellevue
Laisk, E. (A)

Claremont
Hayman, W. G. (A)

Cottesloe
Muhling, C. H. (A)

BELGIUM

Antwerp
Cornet, J. F. E. J. (A)
Van Dyck, E. A. (A)

Brussels
Bernaert, A. L. J. (A)
Marique, J. (M)
Tavernier, G. (M)
Van De Velde, F. J. (A)

Ghent
Buys, W. L. (M)
Van Den Meersche, A. J. (VA)

Liege
Henroteau, F. C. P. (A)

BERMUDA

Hamilton
Harries, J. H. O. (SM)
McCarthy, A. A. (A)
Watlington, F. W. (A)

BOLIVIA

La Paz
Weil, R. B. (A)

BRAZIL

Isabel Rio
Pradal, H. A. (A)

Para
Maia, J. R. DE B. (A)

Porto Alegre
Peixoto, E. S. (SM)
Ritter, G. (A)

Rio De Janeiro
Benchimol, A. (A)
Bonapace, H. (M)
DE Britto-Pereira, M. P. (M)
Carmo, A. C., Jr. (A)
Clews, M. M. (A)
Costa, H. (A)
Da Rosa, A. V. (A)
De Bustamante, I. S. (A)
De Oliveira, A. M. (SM)
De Medeiros, L. A. (VA)
Greis, W. F. (A)
Heininger, W. W. L. (A)
Lacombe, C. G. (A)
Obermuller, W. (M)
Pareto, J. V. N. (VA)
Schlaepfer, E. D. (A)

Sao Paulo
Beaman, W. G. (A)
Cajone, E. (A)
De Arruda, P. R. (A)
De Macedo, A., Jr. (A)
Fanta, P. (M)
Garcia, L. A. (A)
Goldberger, N. (A)
Guimaraes, B. Q. (A)
Kimbark, E. W. (M)
Klotzel, E. (A)
Langdon, G. G. (A)
Meyer, L. V. (A)
Rubin, L. (M)
Smit, J. (A)
Stokes, H. S. (SM)
Woelz, A. L. (M)

BRITISH EAST AFRICA

Zanzibar
Bruce, J. R. (VA)

BRITISH GUIANA

Rio Demerara
Greaves, H. A. (M)

BRITISH MALAYA

Kuala Lumpur
Isherwood, C. F. (M)
Roberts, R. E. (M)
Stubbs, W. (M)
Trafford, W. (M)
Voon, A. K. (A)

Penang
Tan, K. H. (M)

Singapore
Hock, T. C. (A)
Llewellyn, T. E. R. C. (M)
Rudd, C. G. (A)
Snowden, J. (A)

BRITISH WEST AFRICA

Nigeria
Oshokoya, S. O. (A)

BRITISH WEST INDIES

BAHAMAS

Nassau
Ingraham, K. R. (M)

BARBADOS

Hastings
Girling, K. W. (A)
Lawson, C. J. V. (M)
Stewart, R. D. (M)

Jamaica
Gauntlett, G. A. R. (M)

TRINIDAD

Port-of-Spain
Borde, E. H. (A)

CANADA

ALBERTA

Bruderheim
Kittlitz, R. S. (A)

Calgary
Allan, W. K. (A)
Bingley, C. R. T. (A)
Caldwell, L. W., Jr. (A)
Cooper, R. J. G. (A)
Davis, A. P. (A)
Hockin, W. J. (A)
McGibbon, G. D. (A)
Monkman, W. J. (A)
Newhall, S. O. (A)
Partin, W. (A)
Smith, O. A. (VA)
Underhill, R. W. (A)
Zowtiak, J. (A)

Drumheller
MacLachlan, J. H. (A)

Edmonton
Baker, J. E. (A)
Cable, R. P. (A)
Carty, D. G. (A)
Donovan, L. N. (A)
Hall, T. W. (A)
Jones, W. S. (A)
Lawrence, A. H. (A)
MacDonald, D. L. (A)
Neelands, H. H. (A)
Porteous, J. W. (A)
Rice, G. R. A. (A)
Usher, R. (A)

Red Deer
Sturrock, J. K. (A)

Lethbridge
Reagh, R. A. (A)

BRITISH COLUMBIA

Esquimalt
Davidson, H. H. A. (SM)

Hollyburn
Green, M. (M)
Jackson, A. (M)
Miles, W. F. (A)
Jefferey, A. P. (A)

New Westminster
Collins, W. F. (A)

North Burnaby
McInnes, H. W. (A)

North Vancouver
Fitzgerald, M. W. (A)
Hepburn, J. T. (A)
Riddell, A. I. (A)
Wilson, C. M. (A)

Penticton
Paton, I. W. (A)

Prince George
Spencer, R. E. (A)

Read Island
Taylor, A. H. (SM)

Steveston
Wighton, J. J. (A)

Sidney
McCoig, K. W. (A)

Trail
Gowans, W. K. (A)
Mattson, N. H. (A)

Trutch
Brown, E. L. (A)

Vancouver
Breeze, J. E. (SM)
Carpenter, D. D. (SM)
Chandler, A. H. (A)
Chandler, G. C. (SM)
Chisholm, E. (A)
Cook, R. M. (A)
Cuddeford, R. A. (A)
Cushing, T. D. (A)
Grant, D. A. (A)
Gray, J. S. (A)
Gregory, A. H. (M)
Hale, S. T. (A)
Hatton, W. L. (A)
Hilton, B. C. (A)
Hings, D. L. (VA)
Itenson, V. A. (A)
Jones, D. T. (A)
Kent, N. S. (A)
Kersey, L. R. (M)
Kolbeins, E. N. (A)
Koombes, I. (A)
MacLeod, H. J. (SM)
Marsh, R. A. (A)
Martin, J. H. (A)
McCarter, W. L. (A)
Nasmyth, P. W. (M)
Neveroski, F. (A)
Newton, W. K. (A)
Niblock, P. A.
Norman, R. O. (M)
Pye, R. M. (A)
Quealy, O. H. (A)
Redpath, D. C. (A)
Saunders, M. E. (M)
Trainor, W. J. (M)
Tripp, H. H. (A)
Tupper, B. R. (SM)
Wade, D. (VA)

Victoria
Tebby, J. C. (A)
Weir, R. C. (A)

West Vancouver
Bonnett, J. D. (A)
Brown, T. J. (A)

MANITOBA

Flin Flon
Pettersen, G. A. A. (A)

Fort Garry
Cahoon, R. D. (SM)
Gimli
Stroud, E. L. (A)

Lac du Bonnet
Blanchard, J. L. (A)
Uhlman, J. C. (A)

Saint James
Robertson, W. J. P. (A)

Saint Vital
Brown, J. R. B. (A)
Galloway, N. D. (A)

Winnipeg
Anthes, R. G. (SM)
Ardelian, T. E. (A)
Body, H. T. (A)
Cross, I. F. (A)
Curtis, R. W. (A)
Delve, D. A. (A)
Gissing, H. R. (A)
Gregory, B. J. (A)
Hopper, A. W. (A)
Horner, S. G. L. (SM)
Hulme, H. (A)
King, R. W. (A)
Kinnear, H. E. (A)
Klein, B. L. (A)
MacDonald, P. A. (SM)
Mestery, S. (A)
Poloway, A. A. (A)
Salton, L. V. (SM)
Simister, R. M. (A)
Sloker, G. H. (A)
Souch, W. F. (A)
Tritter, A. O. (A)
Vernon, H. (A)
Ward, F. L. (A)

NEW BRUNSWICK

Fredericton
Cassidy, S. B. (A)
Love, G. D. (A)
Tillotson, J. G. (A)

Sackville
Hart, E. S. (A)
Smith, H. M. (SM)

Saint John
Bishop, J. G. (A)

York County
Richardson, C. H. (A)

NOVA SCOTIA

Dartmouth
Byrnes, E. M. (A)
Milovick, M. (A)
Wilkinson, J. G. (A)

Halifax
Burchill, G. H. (A)
Greig, A. W. (A)
Jefferson, W. E. (M)
Lee, F. B. (A)
Paddon, J. W. (SM)
Root, J. S. (A)
Rowlatt, J. H. (M)

Truro
Creelman, J. K. (A)

ONTARIO

Ajax
Bayly, B. D. E. F. (F)
Cohen, H. A. (A)
Faudell, C. L. (SM)
Gates, R. E. (A)
Pynn, R. D. (A)
Wall, E. (A)

Amherstburg
Tillson, L. J. P. (A)

Ancaster
Rutledge, C. H. (A)

Arnprior
Hamford, D. (A)
Blow, A. H. (A)
Boire, P. C. (A)

Ashburn
Anderson, W. H. (M)

Belleville
Blacker, H. L. (A)
Burkett, K. V. (M)
Kootasluk, S. S. (A)
Pugh, J. E. (A)
Punchard, J. C. R. (SM)
Sillitoe, S. (VA)
Smith, R. L. (A)
Tanner, R. H. (SM)
Turner, R. J. A. (A)
Billings Bridge
Covington, A. E. (M)
Field, G. S. (SM)
McLeish, C. W. (M)
Park, F. R. (M)
Staniforth, A. (A)

Camlachie
Hartley, M. S. (M)

Centralia
Forman, T. F. (A)

Cliffcrest
Godden, L. C. (A)
Luke, L. M. (A)

Clinton
Burbank, S. R. (M)
Coburn, G. S. (A)
Matusiak, M. E. (A)
Paterson, H. R. M. (A)
Smith, D. E. (A)
Williams, E. M. (A)

Deep River
Bedford, C. F. (A)
Davis, R. E. (A)
De Grey, E. H. (A)
Langmuir, D. B. (SM)
Lepage, J. L. (A)

Deseronto
Brand, P. M. (SM)
Leavitt, J. N. (A)

Dunnville
Vollick, C. N. (A)

Eastview
Hunka, D. (A)
Henderson, D. P. (A)

Elgin Mills
Musson, M. S. (A)

Fonthill
Kinsman, D. R.

Forest Hill
Van Dyk, T. (A)

Fort Erie
Eng, T. S. (A)

Foxboro
Barrie, W. H. (A)
Waller, M. J. (M)

Galt
Sweet, J. L. (A)

Georgetown
Andrews, A. G. (A)
Bell, J. W. (M)
Ruddell, J. F. (A)
Rugg, H. H. (M)

Glencoe
Wylie, T. C. (M)

Goderick
Perry, G. C. (A)

Guelph
Brown, R. M. (A)
Robinson, C. A. (VA)

Hamilton
Ainley, A. (M)
Attack, H. G. (A)
Beaumont, G. F. (A)
Bodo, A. (A)
Connor, J. J. (A)
Farley, T. S. (SM)
Fromanger, A. L. (A)
Furneaux, W. H. (A)
Gomard, P. (A)
Harris, L. R. (A)
Hayward, J. R. (A)
Hore, H. B. (A)
Kelterborn, W. H. (SM)
Lucyk, J. W. (A)
Moody, R. N. (A)
Olson, E. (SM)
Peterson, D. A. (A)
Pickett, J. H. (M)
Ratz, H. C. (A)
Ruse, E. (A)
Sievert, A. H. (SM)
Thomas, E. A. (A)
Thwaites, J. T. (SM)
White, R. H. (A)
White, W. (M)
Wilk, J. (A)

Islington
Baker, C. R. (M)
Ratz, A. G. (M)

Kenora
Brereton, C. H. (SM)
Chapman, K. F. (A)

Fisher, W. C. (SM)
Hackett, F. J. (A)

Kingston
Bresee, C. W. (A)
Campling, C. H. R. (A)
Pollock, H. S. (A)
Robinson, M. R. (A)
Shaver, D. K. (A)
Stewart, H. H. (A)

Kitchener
Banks, F. A. O. (M)
Borth, L. A. (A)
Clark, W. B. (SM)
Cox, G. M. (SM)
Enns, E. G. (A)
Ritz, E. A. (A)
Smallwood, S. G. (A)

Lansing
Fisher, G. W. (A)
Holroyd, W. H. (A)
Leaver, E. W. (M)
Lloyd, C. G. (SM)

Leaside
Fitzallen, J. H., Jr. (M)
Flynn, H. (A)
Houlgrave, A. G. (A)
Paterson, S. G. (M)
Pringle, F. V. (M)
Simmonds, L. C. (VA)
Wiggins, J. D. (A)

Lethbridge
Tyrrell, C. (A)

London
Allen, R. L. (A)
Athersych, F. B. (A)
Aselstyne, J. G. (A)
Bach, J. R. (SM)
Blackburn, W. J. (A)
Blackwell, J. H. (M)
Collins, A. D. (A)
Cox, G. C. (A)
Crossan, G. W. (M)
Dearle, R. C. (SM)
Downs, E. E. (A)
Fisher, F. J. (A)
Foster, G. L. (M)
Graham, B. (SM)
Hart, J. W. (A)
Holmes, W. H. (A)
Hosker, G. R. (M)
Hudson, G. W. (A)
Hunt, C. A. (A)
Jackson, N. B. (A)
Johnston, S. N. A. (A)
Laird, E. R. (A)
Langford, C. H. (A)
Lansing, L. M. (A)
Luke, R. W. (M)
Lumsden, R. B. (M)
Montreuil, R. E. (A)
Moore, J. D. (M)
Patterson, D. W. (A)
Prodger, A. (A)
Robertson, J. D. (A)
Rumbold, D. G. (A)
Ruse, W. A. (A)
Ruth, C. G. (M)
Sanders, G. E. (A)
Suchard, D. G. (M)
Taylor, C. G. (A)
Tull, E. H. (M)
Warder, J. C. (M)
Wiltor, R. (SM)

Manotick
Allworth, J. C. (A)

Maple
Wynn, W. W. (A)

Markham
Cranston, T. K. (A)
Dodge, A. G. (A)

Merritton
Heathcote, E. T. B. (A)
Parkhill, D. F. (A)

Mimico
McFadden, H. W. (M)

New Liskeard
Russell, W. D. (A)

Newtonbrook
Penrose, R. M. (A)

Orangeville
Clewes, T. W. (M)

Oshawa
Fox, S. J. (A)
Mackay, F. S. (SM)
Ticknor, A. E. (A)

Ottawa
Aksim, V. E. (A)
Ballard, B. G. (SM)
Bayley, A. K. (VA)
Beauchesne, L. A. (A)
Bennett, J. R. G. (A)
Bradley, J. H. (A)
Britney, O. L. (M)
Broten, N. W. (A)
Brown, W. C. (A)
Carroll, D. V. (SM)
Caton, W. A. (M)
Chrome, J. T. (A)
Coffey, L. E. (M)
Couzens, D. T. (A)
Cox, L. G. (A)
Cumming, W. A. (M)
Davidson, G. K. (M)
Des Brisay, A. W. Y. (M)
Dingwall, R. A. (A)
Dover, W. (A)
Dure, J. D. (A)
Fawcett, G. M. (VA)
Field, P. A. (VA)
Fitzgerald, H. M. (M)
Flagg, D. G. (A)
Galbraith, R. A. H. (SM)
Gillean, I. (A)
Glinski, G. (M)
Grant, A. S. G. (A)
Gruenberg, H. (A)
Heathcote, E. B. (A)
Henshaw, C. H. (A)
Henderson, J. P. (SM)
Henderson, J. T. (F)
Hutton, E. A. D. (M)
Kenniger, A. (M)
Kitces, S. (A)
Knights, S. F. (SM)
Lomas, E. G. (M)
Love, G. R. (A)
Loutit, J. A. (M)
Mackay, J. G. (A)
Mackinnon, K. A. (F)
Matte, G. (A)
McCully, G. R. (A)
McIntosh, J. A. (A)
McKendry, B. A. (M)
McKinley, D. W. R. (F)
McLeod, J. W. (M)
Merriman, H. O. (VA)
Miller, G. A. (SM)
Milne, A. R. (A)
Modley-Jones, H. S. (A)
Netterville, S. D. (A)
Parnell, B. (A)
Patterson, C. F. (A)
Pond, J. F. (A)
Porter, E. F. (M)
Pouliot, J. A. (A)
Purvis, W. J. (A)
Rayment, C. V. (A)
Redhead, P. A. (A)
Reiche, H. (M)
Risteen, H. C. (A)
Robinson, E. F. V. (SM)
Roue, J. E. (M)
Ruedy, R. (A)
Rush, W. A. (L)
Scott, J. C. (M)
Searle, W. M. (A)
Sheffield, A. G. (A)
Simpson, F. W. (A)
Smith, A. H. R. (SM)
Smith, W. B. (M)
Smyth, H. R. (SM)
Stewart, G. H. (A)
Stock, E. H. (A)
Surtees, W. J. (M)
Swail, J. C. (A)
Tipple, H. L. (M)
Vail, F. T. (A)
Walsh, H. E. (M)
Webb, E. L. R. (SM)
Wells, G. (A)
Wightman, B. A. (A)
Wilmot, R. D. (A)
Wilson, W. R. (VA)

Peterborough
Brock, F. M. (A)

Picton
Grainger, G. E. (A)

Port Arthur
Hunter, W. C. (A)
Parker, R. H. (A)

Port Colborne
Turchan, P. J. (A)

Port Credit
McLean, D. F. (M)
McTaggart, J. E. (A)
Pearson, J. L. (A)

Port Rowan
Martin, J. O. (A)

Riverside
Creed, F. C. (A)

Rockcliffe
France, J. R. (A)
Mackay, E. M. (A)
Patterson, G. N. (A)

Saint Catharines
Heathcote, E. B. (A)
Schultz, R. M. (A)

Saint Huberts
Kirkby, R. L. (M)

Sarnia
Thomas, A. (M)

Scarboro Bluffs
Gladys, S. J. (A)
Holmquist, C. A. (A)

Scarboro Junction
Brophy, R. M. (SM)

Stratford
Kenny, H. J. (A)

Streetsville
Meredith, C. C. (M)

Swansea
Bow, A. (A)

Thornhill
Blackett, L. G. (A)
Cottington, H. T. (A)
Halina, J. W. O. (A)
Henry, D. A. T. (A)
Poulter, R. C. (SM)
Scott, C. R. (A)

Timmons
Mott, E. D. (A)

Toronto
Armitage, G. G. (M)
Armstrong, H. D. (VA)
Bain, J. R. (SM)
Baldwin, C. O. (VA)
Balmer, P. D. (A)
Barclay, A. P. H. (SM)
Beaudoin, D. P. (A)
Bell, C. W. (A)
Bell, H. C. (A)
Berry, F. G. (A)
Bradford, L. C. (A)
Bremner, D. S. (A)
Bridgland, C. J. (SM)
Bridgman, J. M. (M)
Brodsky, S. (A)
Bullock, R. G. (A)
Burgess, N. M. (M)
Burke, A. C. (M)
Butler, C. A. (A)
Byers, H. G. (SM)
Byers, V. J. (SM)
Carew, S. J. H. (M)
Cary, F. C. (M)
Chapman, C. N. (A)
Chisholm, K. G. (M)
Choat, W. F. (M)
Chown, B. F. (A)
Cole, W. A. (SM)
Collins, G. S. (A)
Cotterill, M. J. (A)
Curran, W. T. (A)
Dakin, O. C. (M)
Dawson, H. S. (SM)
Dennis, J. (A)
Diamond, S. (A)
Dinnin, A. J. (A)
Dulmage, H. B. (A)
Dworkin, A. E. (A)
Eakins, J. R. (A)
Eastwood, G. C. (M)
Eaton, G. F. (M)
Edson, M. (A)
Etches, E. D. (M)
Evis, F. A. (A)
Falbb, N. R. (A)
Flemons, R. S. (A)
Freeman, H. L. (A)
Flynn, M. W. (A)
Geiger, D. G. (SM)
George, J. N. S. (A)
Goldin, H. C. (M)
Gombita, M. S. (A)
Graham, H. E. (A)
Guess, A. L. (A)
Hackbusch, R. A. (F)
Haiblen, A. H. D. (A)
Halischuk, E. (A)
Hames, A. L. (A)
Hamilton, H. E. S. (A)
Hanna, F. M. (A)
Harris, D. L. (A)
Harris, K. B. (A)
Heath, F. J. (SM)
Hedley, C. E. (A)
Helwig, C. G. (A)
Henderson, G. J. (A)
Henderson, R. C. (A)
Henderson, V. L. (M)
Hobbs, F. B. (VA)
Holm, H. R. (A)
Hudson, S. A. (A)
Hunt, J. W. (A)
Hunter, J. B. (A)
Irwin, G. J. (SM)
Isserstedt, G. (M)
Jackson, C. M. (A)
Jackson, H. W. (M)
James, W. E. (M)
Jones, R. (A)
Katchky, M. (A)
Kempling, H. W. (A)
Kerfoot, J. H. (A)
King, G. L. (A)
Knowlton, K. R. (M)
Kravetz, A. J. (A)
Lang, G. R. (A)
Leslie, J. M. (M)
Longstaffe, J. R. (VA)
Lord, F. B. (A)
Lower, W. H. (A)
Mackie, A. S. (A)
MacKenzie, K. (A)
Marchant, C. (A)
Marshall, O. H. (A)
Mathers, F. F. (A)
McCurdy, G. E. (M)
McLaughlin, G. H. (A)
Millen, T. I. (SM)
Mounce, G. R. (M)
Mudry, J. (A)
Muller, R. A. (SM)
Nicholls, R. J. (A)
Norris, C. A. (SM)
Nylin, M. E. (A)
Ogden, R. N. (A)
Otsuki, J. S. (A)
Paisley, R. S. (A)
Palin, E. L. (SM)
Parker, D. L. (A)
Patterson, M. C. (M)
Paulin, W. P. (M)
Pfeiffer, T. J. (VA)
Pipe, G. E. (A)
Pointon, C. G. (A)
Ponze, L. S. (A)
Posnikoff, P. (M)
Potter, N. M. (VA)
Pounsett, F. H. R. (F)
Price, E. G. (A)
Price, L. M. (F)
Putz, H. R. (A)
Reesor, G. E. (A)
Richards, G. A. (A)
Richardson, G. E. (A)
Robertson, J. J. C. (VA)
Robinson, W. A. (A)
Rose, A. B. (A)
Rosenfield, L. (A)
Rosenthal, A. L. (A)
Rotenberg, A. B. (A)
Sample, W. G. M. (A)
Sawitzki, N. (A)
Scholfield, W. D. (A)
Schroter, E. (A)
Shino, J. S. (A)
Siezen, G. J. (SM)
Sinclair, A. M. (A)
Sinclair, G. (SM)
Smith, W. R. (M)
Soanes, S. V. (A)
Stapley, B. E. (A)
Stavaou, S. (A)
Stewart, G. L. (A)
Story, R. (A)
Swan, E. O. (SM)
Taylor, D. P. (A)
Toye, J. M. (M)
Turner, K. A. (A)
Ward, R. F. (A)
Ward, W. G. (M)
Warren, J. R. (SM)
Webster, C. G. (A)
Weedon, G. F. C. (A)
Welch, D. P. (A)
Westrick, E. W. (M)
Whyte, J. R. (M)
Williams, J. H. M. (A)
Williams, J. K. (M)
Wood, L. R. (A)
Yablo, S. (A)
Yachimec, P. (A)

Trenton
Lawrence, F. G. (A)
MacNair, E. A. (A)

Uxbridge
Leask, R. D. (A)

Wallaceburg
Heath, R. E. (A)
Lawson, R. (A)

Waterloo
Aikenhead, B. A. (A)

West Hill
Sokolowski, W. E. (A)

Weston
Jones, A. W. (M)
Lazowski, J. M. (A)
Macumber, M. G. (A)
Thomson, J. M. (SM)

Willowdale
Elliott, A. W. D. (A)
Kernohan, E. J. (A)
Purdy, T. W. (A)
Secord, A. H. (A)
Sheppard, R. D. B. (A)
Young, J. A. I. (A)

Windsor
Shirley, Q. H. (A)
Walker, G. B. (A)
Wingham
Fletcher, R. E. (A)

York Mills
Ainsworth, A. L. (SM)
Kelk, G. F. (M)
Lindsay, L. C. (A)

PRINCE EDWARD ISLAND

Charlottetown
Rogers, K. S. (A)

QUEBEC

Bagot
Boisvert, M. (A)

Beaurepaire
Farrell, G. L. (A)
Lisle, J. R. D. (M)
Watson, A. D. (M)

Charlesbourg
Beaulieu, W. R. (M)

Charlesbourg Village
Fortin, R. A. (A)

Donnacona
Julien, G. (A)

Dorval
Haacke, E. M. (M)
Marshall, J. L. (M)

Drummondville
Marceau, J. P. (VA)
McWilliam, E. A. (VA)

Granby
Sterling, J. A. (A)

Hampstead
Payne, L. S. (F)
Wallace, O. C. S. (A)

Howick
Logan, R. W. (A)

Hudson
Knox, J. B. (F)

Hull
Cairns, F. V. (A)
Haney, W. L. (M)
Wright, G. M. (A)

Isle Bigras
Clarkson, L. (M)

Lachine
Clarke, J. L. (A)
Isaac, V. E. (A)
Kelsey, E. S. (SM)
McNeil, B. T. (M)
Sharp, D. R. (A)
Wright, D. F. (M)

Lakeside
Archambault, G. (A)

Lennoxville
Bennett, L. F. (A)

Maple Grove
Jobidon, L. (A)

Matane
Du Berger, P. (A)

Montreal
Abugov, B. (A)
Anderson, D. A. (A)
Anderson, L. W. (A)
Argall, J. R. C. (A)
Argue, T. A. (A)
Audet, H. A. (M)
Baily, F. A. A. (M)
Bantin, W. F. (A)
Barrow, F. A. (VA)
Baylis, G. F. (A)
Bernier, J. C. (SM)
Best, J. H. (A)
Bonneville, S. (A)
Brooks, D. A. (A)
Campbell, J. A. (SM)
Cardella O. (A)
Challis, W. L. (A)
Charlebois, J. C. (A)
Chipman, R. A. (SM)
Coffin, G. C. (M)
Conroy, J. M. (VA)
Cox, J. R. G. (A)
Davis, J. F. (A)
Dickie, W. G. (A)
Ditkofsky, H. (M)
Dobridge, R. W. (M)
Doucet, M. (A)
Dumas, J. (A)
East, L. A. W. (SM)
Fairfield, J. H. (A)
Fallon, C. C. (A)
Fisher, C. B. (A)
Fisher, F. S. (M)
Fisk P. (A)
Follett, D. J. (A)
Fowlie, W. D. (VA)
Fraser, F. S. (A)
Fratkin, B. (A)
Frenette, C. (M)
Gilmore, J. P. (A)
Greven, P. J. (M)
Groome, G. R. (A)
Hall, J. S. (A)
Hayes, J. E. (VA)
Hicks, E. P. (A)
Hobbs, N. M. (A)
Hodgson, A. D. (SM)
Horsey, R. M. (A)
Howes, F. S. (F)
Hunt, A. B. (SM)
Kadish, J. E. (M)
Kahan, J. G. (M)
Kashtan, S. (A)
Kassner, M. H. (A)
Jackson, J. E. (SM)
Jaderholm, H. W. (VA)
Jamieson, F. C. (A)
Kingan, J. J. (SM)
Kinross, R. I. (A)
Lalonde, R. P. (A)
Laporte, J. M. (M)
Lavallee, J. A. G. P. (A)
Lundy, A. B. (A)
Mackenzie, D. G. (M)
Margolick, F. H. (M)
Marshall, G. K. (A)
Matthews, R. P. (M)
McClelland, W. R. (A)
McCormick, J. D. (A)
McDonald, D. J. (A)
McKee, D. A. (A)
McMurray, J. L. (VA)
Meek, T. J., Jr. (A)
Meunier, L. A. (A)
Murray, C. W. (A)
Nachfolger, N. (A)
Nichols, W. A. (SM)
Nienaltowski, W. (M)
Ouimet, J. A. (SM)
Olding, N. R. (M)
Olive, G. W. (F)
Oxley, A. B. (SM)
Patience, A. M. (SM)
Pauch, J. E. (M)
Pavlasek, T. J. F. (M)
Peedo, E. (A)
Pelletier, R. S. L. (A)
Poznanski, Z. J. (A)
Pratt, J. H. (SM)
Preziosi, F. W. (A)
Provost, P. (A)
Pullan, E. (A)
Rethoret, R. H. (A)
Richardson, W. G. (SM)
Robillard, P. A. (A)
Ross, A. T. (A)
Schwartz, H. H. (M)
Seabrook, H. B. (M)
Smith, F. A. (A)
Soucy, C. L. (SM)
Stachiewicz, B. R. (A)
Stauffer, R. L. (A)
Steel, W. A. (F)
Taylor, A. K. (A)
Walker, A. S. (M)
Wells, A. F. (A)
Whealy, J. E. (M)
Williamson, D. B. (A)
Woonton, G. A. (F)
Ziemelis, V. (A)

Montreal West
Turnbull, J. A. (A)

Noranda
Aitchison, J. H. (A)

Porte Claire
Dean, W. W. H. (SM)

Quebec
Boulet, L. (A)
Chinnick, R. F. (A)
Nadeau, A. G. (M)
Sarault, G. E. (M)
Watson, G. D. (A)

Riviere du Loup Station
Montgomery, V. A. (A)

Saint Hyacinthe
Doiron, J. A. B. (A)

Saint Lambert
Hammond, R. E. (SM)
Letts, R. (M)
Roach, C. L. (A)
Wright, J. R. (A)

Saint Laurent
Bellringer, C. C. E. (M)
MacRae, R. M. (A)
Oakes, H. S. (A)
Ornstein, W. (A)
Pimenoff, V. J. (A)

Senneville
Patrick, K. R. (SM)
Stevens, S. S. (SM)

Sherbrooke
Boduch, T. S. (A)

Sillery
Aubin, W. I. (A)
Bricout, P. A. (M)

Strathmore
Quance, F. R. (A)

Terrebonne
Farmer, E. W. (SM)

Town of Mount Royal
Beddoe, A. C. (A)
Bird, L. T. (M)
Desaulniers, R. R. (M)
Douglas, J. C. (A)
Elliott, L. W. (A)
Fisher, S. T. (SM)
Geddes, L. A. (A)
Glegg, K. C. M. (A)
Taylor, D. R. (M)

Valois
Collins, J. A. (M)

Verdun
Morrison, W. B. (A)

Westmount
Christmas, W. I. (A)
Dorey, J. D. (A)
Mackimmie, G. B. (A)
Raynsford, R. P., Jr. (M)
Wallace, R. J. (M)

Yamachiche
Bird, C. H. R. (VA)

SASKATCHEWAN

Kamsack
Lavrench, W. (A)

Regina
Mowbray, D. R. (A)

Saskatoon
Clarke, H. W. (A)
Funk, J. A. (A)
Hoskins, L. C. (M)
Michalenko, A. (A)

Tisdale
Welch, R. C. (A)

YUKON TERRITORY

Whitehorse
Berube, J. P. G. (A)

CANAL ZONE

Balboa
Mason, J. L. (A)

Curundu
Michalk, E. R. (A)

Fort Amador
Young, J. W. (VA)

CEYLON

Colombo
Makalanda, A. (M)

Dankotuwa
Appuhamy, F. A. (A)

CHILE

Santiago
Abascal, N. (M)
Aldridge, K. S. (A)
Collyer, J. H. (M)
Holley, T. A. (A)
Jones, N. (A)
Vallarino, A. D. (A)
Wood, R. (M)

Valparaiso
Lira, A. (A)

CHINA

Hong Kong
Braude, A. N. (M)
Lau, J. (A)
Li, N. F. C. (M)
Luk, Y. K. (A)
Monfon, L. (A)
Wong, H. T. (A)

Hu-Peh
Yeh, Y. C. (A)

Peiping
Yeh, C. (A)

Peking
Maa, D. (M)

Shanghai
Chang, T. (M)
Ho, L. (A)
Jen, L. (A)
Loo, T. C. (SM)
Pao, C. S. (A)
Tsu, D. S. L. (SM)

COLOMBIA

Bogota
Amore, I. (M)
Arboleda, C. E. (A)
De Mello, G. H. (A)
De Mello, W. (SM)
Estevez, C. L. (M)
Gabrianas, K. B. (A)
Jimenez, A. (A)
Rodriguez-Eslava, E. (A)
Silva, W. (VA)

COSTA RICA

San Jose
Craigie, S. M. (SM)

CUBA

Havana
Chisholm, E. E. (A)
Condom, S. A. (SM)
De Boer, J. J. (A)
Martinez, B. (M)
Montes, V. J. (A)
Polanco, G. (A)
Ramirez, C. G. (A)
Valladares, J. A. (M)
Zamorano, A. (A)

Marianao
Guiral, R. L. (VA)

CYPRUS

Nocosia
Dennis, F. L. (M)

CZECHOSLOVAKIA

Prague
Bena, J. J. (A)
Caha, V. (A)
Havelka, J. (M)
Horna, O. A. (A)
Krejcar, J. R. (A)
Nadler, M. (A)
Nemec, I. V. (M)
Zacek, A. (SM)

DENMARK

Bagsvaerd
Elnegaard, E. (A)

Copenhagen
Bruun, G. (A)
Carstens, L. (A)
Gronlund, M. P. S. (A)
Grue, O. E. (A)
Larsen, B. F. (A)
Lund, C. O. (A)
Nielsen, B. A. (A)
Svensson, R. (A)

Gentofte
Langgaard, E. (A)
Pedersen, N. T. (A)

Hellerup
Jacobsen, H. V. (M)
Pedersen, G. (VA)
Rybner, J. (SM)

Kobenhavn F
Gudmandsen, P. E. (A)

Lyngby
Christensen, C. L. (A)
Iversen, J. (M)
Jorgensen, B. (A)
Morch, V. H. (A)

Naerum
Kjaer, V. (A)

Struer
Jensen, S. E. (A)

ECUADOR

Quito
Collins, E. W. J. (A)
Jacobson, H. P., Jr. (A)
Myhre, P. K. (M)

EGYPT

Alexandria
Assaf, E. J. (A)
Elabd, I. (A)
Mostafa, A. (SM)

Cairo
Ahmed, M. A. (M)
Grdseloff, L. (M)
Mahmoud, A. A. (M)
Mahmoud, H. M. (A)
Mathias, E. L. A. (A)
Reda, M. S. (M)

Dakahlieh
El-Said, M. A. H. (SM)

Heliopolis
Chalekian, J. S. (A)
De Barro, F. (M)
Makar, R. T. (A)

EIRE

Dublin
Ferguson, J. D. (SM)
Folan, A. J. P. (A)
McGovern, M. C. (A)
Poole, H. H. (A)

ENGLAND

BEDFORDSHIRE

Dunstable
Fry, J. A. (A)

Luton
Sowerby, J. H. (A)

Studham
Vedy, L. G. (A)

BERKSHIRE

Abingdon
Fry, D. W. (A)
Wells, F. H. (SM)

Aldermaston
Liebmann, G. (A)

Didcot
Attewell, T. H. D. (M)

Faringdon
Cooke-Yarborough, E. H. (M)

Reading
Sperring, F. E. (M)

Sunningdale
Barton, F. S. (F)

Wantage
Cox, R. J. (M)

BUCKINGHAMSHIRE

Great Missenden
Reyner, J. H. (SM)

High Wycombe
Simmonds, J. C. (A)

Newport Pagnell
Boswell, L. I. (A)

Slough
Diver, F. G. (SM)
Wilkins, A. F. (SM)

Stoke Poges
McLean, F. C. (SM)

Syke Cluan Iver
Rhys-Jones, J. E. (SM)

Taplow
Hobday, S. W. (M)

CAMBRIDGESHIRE

Cambridge
Dalgleish, J. W. (SM)
Edwards, B. J. (SM)
Germany, L. W. (M)
Horne, R. W. (M)
Lurion, E. (A)
Moullin, E. B. (SM)
Pound, J. P. (M)
Rao, G. V. (M)
Ratcliffe, J. A. (A)
Townsend, F. H. (SM)

CHESHIRE

Altringham
Bowden, B. V. (SM)

Bebington
Thomas, H. A. (SM)

Bowdon
McIlwrick, K. N. (M)

Stockport
Weaver, C. (M)

Timperley
Vernon, B. H. (A)

Wilmslow
Brown, R. H. (M)

Wirral
Chalmers, D. (A)
Higham, F. H. (M)

CORNWALL

Porthcurno
Warwick, G. F. A. (A)

CUMBERLAND

Seaton
Williams, C. E. (A)

DERBYSHIRE

Derby
Buckland, V. (A)
Marshall, R. V. (M)

DORSET

Beaminster
Bird, R. J. (SM)

DURHAM

Easington Colliery
Angell, A. G. H. (SM)

Houghton-Le-Spring
Patterson, T. C. (SM)

ESSEX

Barking
Bulgin, A. F. (SM)

Burnham-on-Crouch
Robertson, N. C. (SM)

Chelmsford
Amey, S. H. (A)
Cafferata, H. (M)
Deeley, A. R. (A)
Eckersley, T. L. (F)
Helsdon, P. B. (A)
Maunsell, H. L. G. (A)
O'Donovan, D. E. (A)
Partington, G. E. (A)
Rose, S. P. (A)
Sarkar, N. (A)
Thomasson, J. G. (A)

Colchester
Churchman, A. (A)

Danbury
Young, A. J. (A)

Gidea Park
Pitts, W. J. (A)

Great Badow
Esterson, M. (A)
Smith, S. B. (SM)

Great Chesterford
Neeve, F. W. (M)

Hornchurch
Parker, J. W. (A)

Ilford
O'Brien, D. (M)

Romford
Stott, H. T. (SM)

Southend-on-Sea
Phillips, D. J. (M)
Rao, S. S. (M)
Roberts, C. A. (A)

Writtle
Cooper, V. J. (A)

GLOUCESTERSHIRE

Bristol
Horrigan, E. W.

HAMPSHIRE

Bournemouth
Scott, P. R. (VA)

Christchurch
Fisher, E. C. (A)
Ford, D. (A)

Emsworth
Barnsdale, E. A. (A)

Farnborough
Dale, T. G. M. (M)
Debski, J. M. (M)
Inskip, F. A. (VA)
Reid, D. G. (A)
Stratton, A. (A)

Fleet
Harvey, J. P. (A)

Gosport
Silvester, D. D. (M)

Near Andover
Rao, D. V. R. (A)

Old Bursledon
Fairfax, O. M. (M)

Portsmouth
Bettinson, S. F. (M)

Southsea
Brooks, G. R. (M)

HERTFORDSHIRE

Ashwell
Callick, E. B. (SM)

Cockfosters
Cattanes, E. (A)

Garden City
Strong, C. E. (F)

Letchworth
Cartwright, J. R. (A)
Pollard, J. (M)

New Barnet
Allen, W. G. (M)

Radlett
Coales, J. F. (A)

Rickmansworth
Montgomery, A. W. (SM)

Saint Albans
Fryer, L. (A)
Hornby, F. R. (A)

Watford
Johnston, D. L. (A)

KENT

Beckenham
Herdman, T. L. (A)

Bexleyheath
Brown, D. C. (A)

Bromley
Stoner, C. R. (M)
Sutherland, J. G. (SM)

Dover
Smye-Rumsby, B. A. A. (A)

Edenbridge
Whitehouse, M. H. L. (M)

Gravesend
Sale, P. A. (A)

Hayes
Binyon, B. (SM) (L)

Orpington
Lawrence, E. (A)
Saraga, W. (SM)

Sevenoaks
Brooke, H. A. (VA)
Van Hasselt, M. (SM)

Sidcup
Scully, C. T. (SM)
Spagnoletti, P. H. (A)

Westerham
Griffiths, H. V. (SM)

LANCASHIRE

Accrington
Bleasdale, J. (A)
Bleasdale, W. W. (A)

Burnley
English, E. H. (A)

Heywood
Fielding, E. A. (A)

Liverpool
Halsall, J. R. (A)
Leyland, A. J. (A)

Manchester
Ross, J. D. (A)
Roberts, W. G. (A)
Rouse, W. D. (A)
Sproson, J. (A)
Stuart-Williams, R. (M)

McRecambe
Oliver, W. (A)

North Oldham
Searby, N. H. (SM)

Prescot
Muir, L. M. (A)

Skelmersdale
Michie, J. L. (M)

Southport
Fennessy, J. R. (M)

Ulverston
Oxley, R. F. (SM)

Warrington
Hunt, T. W. (M)
Veevers, J. F. (A)

LINCOLNSHIRE

Boston
Silson, R. G. (A)

LONDON

Abel-Harry, C. B. (A)
Ashbridge, N. (F)
Atwood, N. A. (SM)
Bargery, C. J. (A)
Bearup, T. W. (SM)
Beck, A. H. W. (A)
Bedford, L. H. (F)
Boyle, H. (A)
Bruce, D. C. (M)
Budge, R. K. (A)
Conway, T. D. (A)
Crampton, W. J. (SM)
Crosfield, J. F. (A)
Dawe, F. W. (A)
Dawes, E. J. (SM)
Doherty, D. J. (M)
Dunn, S. C. (A)
Earp, C. W. (SM)
Eckersley, P. P. (F)
Emery, E. J. (SM)
Faulkner, H. (SM)
Finney, R. (A)
Flack, W. L. (SM)
Glendinning, W. (A)
Godbold, B. C. (M)
Graf, V. V. (A)
Griffiths, W. H. F. (SM)
Hamilton, D. (VA)
Heaton-Armstrong, L. J. (SM)
Herczeg, A. (A)
Hersch, W. (M)
Hilgedick, W. C. (SM)
Hirshman, C. L. (SM)
Kirke, H. L. (F)
Knight, S. G. (A)
Lehne, O. T. (A)
Love, S. F. (A)
Lyons, C. L. (SM)
Mayer, C. G. (SM)
McKelvie, J. L. (A)
McMichael, L. (F)
Meyer, L. W. (SM)
Mirk, D. B. (SM)
Mooney, R. E. (M)
Mortada, I. O. (M)
Nelson, C. V. (M)
Nicholls, G. K. (A)
Pack, L. (SM)
Parchment, E. D. (A)
Parr, G. (SM)
Paynter, A. E. (M)
Peck, D. G. (M)
Pocock, H. S. (SM)
Primich, R. I. (A)
Pybus, A. W. (SM)
Rahman, U. U. (A)
Roberts, R. S. (VA)
Rose, A. (A)
Schwarz, H. F. (A)
Shelley, B. J. (M)
Skerry, C. E. (M)
Slemon, G. R. (A)
Sly, R. J. (A)
Smailes, G. (A)
Smillie, P. V. (M)
Starr, C. H. (SM)
Straughan, T. A. (M)
Stripp, W. C. (A)
Thomas, D. L. (A)
Toward, T. (M)
Troutbeck, W. H. (VA)
Valder, F. L. (M)
Walmsley, T. (SM)
Wase, A. E. H. (M)
Waterton, P. J. (A)
Watson-Watt, R. (F)
Wilson, A. G. (M)
Wrede, D. F. (M)
Younson, E. J. (M)

MIDDLESEX

Enfield
Oldham, C. A. (A)

Greenford
Mac Lachlan, V. D. (M)

Hayes
Fisk, E. (M)

Heston
Williams, H. P. (SM)

Northholt
Mole, G. (A)

Northwood Hills
Pattinson, T. H. (M)

Potters Bar
Capelli, M. P. (M)

Ruislip
Banham, J. C. (A)

South Ruislip
Singh, W. K. (A)

Stanmore
Howse, H. A. G. (SM)
Greig, J. (SM)

Sunbury-On-Thames
Roe, J. N. (M)

Twickenham
Gill, A. J. (F)
Keen, A. W. (M)
Morley, J. E. (A)

Wembley
Burgess, A. G. (SM)

West Drayton
Morton, H. B. (M)

NORFOLK

Gorleston-on-Sea
Rayment, K. I. (A)

Great Yarmouth
Dyson, A. A. (VA)
Hayes, J. (A)

King's Lynn
McLaren, J. H. (A)

NORTHAMPTONSHIRE

Kingsthorpe
Kaye, J. B. (VA)

NORTHUMBERLAND

Newcastle-on-Tyne
Hare, J. (A)
Hodgson, C. C. V. (M)
Parsons, D. R. (SM)

Whitley Bay
Kerr, A. (M)

NOTTINGHAMSHIRE

Beeston
Pollard, J. R. (M)

Broxtowe Lane
Dabell, H. (A)

West End Beeston
Hancock, G. N. (SM)

OXFORDSHIRE

Oxford
Kompfner, R. (F)
Voss, R. G. P. (A)

SHROPSHIRE

Salop
Parkinson, W. R. (A)

SOMERSET

Burnham-on-Sea
Thomas, W. D. (A)

Ilminster
Macnee, D. H. (SM)
Ullrich, E. H. (F)

STAFFORDSHIRE

Bloxwich
Hardcastle, C. (A)

Old Hill
McDonald, D. M. (A)

Stoke-on-Trent
Gawthy, H. R. B. (A)

Wolverhampton
Taylor, D. (A)

SURREY

Banstead
Smith-Rose, R. L. (F)

Camberly
Clarke, G. F. (A)

Cheam
Bond, W. (SM)
Jackson, W. (F)

Chobham
Gabriel, R. P. (VA)

Coulsdon
Waldock, D. A. G. (SM)

Croydon
Hale, J. A. B. (A)
Ringham, G. B. (SM)
Thompson, A. E. (SM)
Truscott, D. N. (VA)

East Horsley
Milsom, W. T. (A)

East-Molesey
Coursey, P. R. (A)

Elstead
Nobbs, W. J. (A)

Ewell
Bishop, H. (F)

Farnham
Forsyth, P. G. (SM)
Hickson, P. W. (SM)

Guildford
McPetrie, J. S. (SM)
Williams, R. C. G. (SM)

Haslemere
Bainbride-Bell, L. H. (VA)

Hindhead
Rowe, J. H. (A)

Kingston Hill
Adorian, P. (SM)

Mitcham
Payne, C. E. (VA)

Richmond
Head, J. E. (VA)

Sanderstead
Dupree, F. H. (SM)
Morgan, S. G. (M)

Surbiton
Brennand, R. (A)
Kerawalla, R. D. (M)

Tadworth
Somerville, T. (SM)

Worcester Park
Walker, T. H. (M)

Wormley
Rzymowski, E. (A)

SUSSEX

Hastings
Mortlock, A. (A)

Rottingdean
Madgwick, G. (SM)

Three Bridges
Abel, H. L. (M)

WARWICKSHIRE

Birmingham
Allen, W. S. (SM)
Caro, D. E. (A)
Hibbard, L. U. (A)
Jones, H. H. (A)
Pigache, N. L. (A)

Coventry
Allan, R. G. (A)
Sharp, S. (A)
White, G. J. (M)
Williams, I. J. S. (M)
Wilson, R. (A)

Nuneaton
Robinson, C. A. (A)

Rugby
Hulme, F. H. (M)
Kinman, T. H. (SM)

WILTSHIRE

Devizes
Savage, W. B. (M)

Swindon
Cook, K. L. W. (A)

West Malmesbury
Irvin, J. L. (A)

WORCESTERSHIRE

Evesham
Smith, C. (A)

Great Malvern
Mac Farlane, G. G. (A)

Malvern
Carter, R. H. A. (SM)
Cooper, W. H. B. (A)
Whitehead, J. R. (SM)

Wesham
Sturley, K. R. (SM)

YORKSHIRE

Bradford
Patchett, G. N. (M)

Doncaster
Flintham, H. (A)

Ilkley
Hartley, A. (M)

Leeds
Westwood, D. (M)

Sheffield
Benson, F. A. (M)

ETHIOPIA

Addis Ababa
Lindahl, H. C. (A)

FIJI ISLANDS

Suva
Exon, F. C. (SM)

FORMOSA

Taiwan
Ong, H. Y. (A)
Wei, L. Y. (A)

FRANCE

Neuilly Sur Seine
Lochard, J. (A)
Toulon, P. M. G. (SM)

Norde
Ducastel, G. (A)

Paris
Aigrain, P. R. (A)
Altovsky, V. A. (SM)
Chauvierre, M. (SM)
David, P. B. (SM)
De Bozas, G. D. (A)
Fabricant, P. (VA)
Gerten, N. (A)
Giboin, E. (SM)
Grivet, P. A. (A)
Gustinelli, J. (M)
Kruesi, G. G. (A)
Labin, E. (SM)
Lehmann, G. J. (SM)
Levy, L. (M)
Mandel, P. (A)
Matare, H. F. (SM)
Moisson, A. A. (SM)
Ortusi, J. A. (SM)
Ponte, M. J. H. (SM)
Richon, E. (A)
Szilasi, A. (A)
Touraton, E. R. (SM)

SEINE

Antony
Fromageot, A. P. A. (SM)

Asnieres
Kraemer, G. S. (SM)

Boulogne
Chauchat, J. N. (M)
Nill, A. A. (A)

Clichy
Warin, M. P. (A)

Colombes
Cosnard, F. F. (A)

Courbevoie
Gennard, P. R. (SM)

Malakoff
Besson, P. (M)

Pantin
Churg, E. (A)

Sceaux
Surdin, M. M. (SM)

Villemoble
Warnecke, R. R. (F)

SEINE ET OISE

Croissy
Goudet, G. (SM)

Essonnes
Behm, L. F. (A)

Gif-s-Yvette,
Fishoff, L. A. (A)

Le Vesinet
Bussat, R. M. A. (A)
Raymond, F. H. (SM)

Saint Cloud
Goublin, R. O. (A)
Roncier, R. (M)

Versailles
Prache, P. M. (M)

GERMANY

Althegnenberg ueber Mering
Zenneck, J. (F)

Dachau
Breymayer, K. (A)

Donau
Hess, H. A. (A)

Ulm-Soeflingen
Rothe, H. (M)

GREECE

Athens
Cassapoglou, C. B. (A)
Ichiakis, M. A. (A)
Katzelis, N. G. (M)
Pezopoulos, K. N. (SM)
Siocos, C. A. (A)
Tavaniotis, C. (A)
Timmerman, F. (M)

GUAM

Agana
Bresett, C. K. (A)

GUATEMALA

Guatemala City
Garrison, H. L. (A)

HAWAIIAN ISLANDS

Hakalau
Makasato, J. (A)

Hilo
Honda, M. (A)
Izumi, G. Y. (A)
Jaeger, J. E. (A)

Honolulu
Alden, R. M. (A)
Allison, J. B. (A)
Anderson, J. W. (A)
Atherton, B. J. (A)
Baker, J. H. (A)
Bostwick, C. B. (A)
Brown, M. J. (A)
Chang, D. C. (A)
Chang, R. H. M. (A)
Chingon, A. C. (A)
Chittenden, W. R. (A)
Chow, W. H. P. (A)
Chun, C. C. K. (A)
Chun, H. W. M. (A)
Davis, C. H. (A)
Davis, R. L. (A)
Downie, R. S. (A)
Edwards, N. R. (A)
Ege, T. (A)
Fuchikami, A. H. (A)
Gilbert, L. H. (VA)
Grubb, D. L. (A)
Higa, J. J. (A)
Higa, K. (A)
Honda, J. M. (A)
Howard, R. V. (SM)
Ing, S. C. (A)
James, F. L. (A)
Janitschke, E. O. (VA)
Jensen, P. A. (A)
Johnson, W. G. (A)
Kadi, F. S. (A)
Kam, P. Y. T. (A)
Kang, Y. O. (A)
Kato, R. S. (A)
Kilbride, E. E. (A)
Kimball, L. L. (A)
Kung, L. (A)
Larsen, D. A. (A)
Lewbel, S. H. (A)
Lindemann, E. G. (A)
Lindsey, H. K. (M)
Masching, R. G. (A)
Mason, F. L. (SM)
McClung, D. C. (A)
McLane, A. R. (A)
Mercer, I. G. (M)
Mew, H. Y. (A)
Miyake, I. (VA)
Newell, A. E. (A)
North, R. S. F. (A)
Pang, D. L. (A)
Peterson, J. E. (A)
Pierce, R. J. (SM)
Piety, E. A. (A)
Rathjen, J. C. (A)
Rogers, R. N. (A)
Rotolo, N. V. (M)
Rudisuhle, E. J. (A)
Schoen, E. C. (A)
Seibert, G. J. (A)
Smith, R. J. (A)
Takase, R. H. (VA)
Tanigawa, N. F. (A)
Tittle, J. F. (A)
Turner, H. E. (M)
Turner, J. S. (A)
Vaughan, V. (A)
Vittum, M. S. (A)
Vogel, H. O. (A)
Walker, P. M. (A)
Walley, J. E. (A)
Warren, H. E. (A)
Young, M. F. (A)

Kauai
Neifert, K. G. (A)

Lanakai
Tucker, W. K. Jr. (A)
Willard, R. S. (A)

Maui
Chong, W. S. (A)
Harris, E. A., Jr. (A)
Honea, L. W. (A)
Katahara, S. (A)

Oahu
Andrews, F. D. (A)
Balfour, A. J. (A)
Brenessel, A. (A)
Buzzard, R. (A)
Clark, G. W. (A)
Dillon, R. E. (A)
Ellison, J. L. (A)
Farinon, W. B. (SM)
Florez, H. (SM)
Gray, G. P. (VA)
Hahn, G. K. P. (A)
Hart, B. H. (A)
Hendricks, J. C. (A)
Hill, R. R. (M)
Hunter, G. H. (A)
Hurst, F. C. (A)
Janda, E. G. (A)
Kekauoha, G. W. (A)
Kelly, V. (A)
Lee, R. T. S. (A)
Little, S. (A)
Loebl, H. A. (A)
Powell, L. H. (VA)
Sanders, J. R. (A)

HONDURAS

Tegucigalpa
Taft, E. A. (A)

ICELAND

Reykjavik
Thorkelsson, S. (A)

INDIA

Agra Cant
Joshi, K. D. (A)
Subramaniam, C. R. (A)

Ahmedabad
Doshi, K. M. (A)
Kotadia, K. M. (M)
Pancholy, N. H. (A)

Allahabad
Ganguly, S. K. (M)
Mehyay, P. N. (A)

Annamalainagar
Vijayaraghavan, K. (M)

Assam
Sarma, P. L. (A)

Aurangabad
Basole, G. M. (A)

Bangalore
Chatterjee, S. K. (M)
Desikachar, P. R. (M)
Iyengar, R. A. P. (M)
Kagalli, S. T. (M)
Ramachandran, P. (A)
Rao, P. L. S. (M)
Rao, R. (A)
Seshadri, K. V. S. (A)
Sreenivasan, A. P. (A)
Sreenivasan, K. (SM)
Thacker, M. S. (A)
Venkateswaran, S. (A)

Baroda
Bhonsle, S. B. (A)

Belguam
Paramasivayya, G. S. (M)

Bihar
Sastry, S. S. (M)

Bombay
Agrawal, C. L. (A)
Apte, B. M. (M)
Bajaj, P. L. (A)
Bhatnagar, H. M. (A)
Bulsara, M. S. (A)
Choksy, N. H. (A)
Dastur, J. B. (A)
De Figueiredo, B. F. (A)
Huang, G. T. C. (A)
Husein, A. E. (A)
Kagalwala, A. F. (M)
Kamat, V. Y. (A)
Kannan, S. (A)
Kantebet, S. R. (F)
Karanjia, K. F. (M)
Katre, V. S. (A)
Khambata, A. J. (A)
Marathe, D. H. (SM)
Muthuswamy, S. V. (A)
Pai, M. V. (A)
Phatak, R. K. (SM)
Saini, B. R. (A)
Shroff, T. R. (A)
Srinivasan, R. S. I. (A)
Sukhadia, P. U. (M)
Tejuja, M. M. (A)
Telang, V. S. (M)
Toshniwal, G. R. (SM)

Burdwan
Chaudhuri, K. D. (A)

Calcutta
Banerjee, A. (A)
Banerjee, S. K. (M)
Banerji, S. (A)
Bhattacharyya, K. K. (A)
Bose, K. K. (M)
Chatterjee, A. K. (M)
Chatterjee, S. D. (SM)
Fogg, J. (M)
Gangopadhya, I. (M)
Ghose, S. C. (A)
Kar, D. C. (A)
Mitra, A. K. (M)
Mitra, S. C. (A)
Mukerji, M. M. (A)
Pillai, K. N. R. (A)
Raha, H. (A)
Sen, B. B. (A)

Chingleputsis
Gopalakrishnan, E. S. (A)

Chittagong
Baziuddin, S. M. (A)

Chromepet
Filipowsky, R. F. J. (A)

Coimbatore
Mahalingam, N. (SM)

Dhond
Ramaswamy, S. (A)

Dum Dum
Ghosh, J. (M)
Sengupta, D. P. (M)

East Punjab
Bhashyam, S. R. (A)

Gorakhpur
McAuliffe, E. B. (SM)

Guntur
Ravindranath, T. (A)
Satyanarayana, K. (A)

Hooghly
Das, P. N. (M)

Hyderbad
Rangachari, M. (A)
Saifuddin, (M)

Jubbulpore
Das Gupta, S. M. (M)
Jain, P. L. (A)
Srivastava, T. N. (M)

Lucknow
Chakravarti, S. P. (SM)
Greig, C. (M)
Hulse, B. T. (M)
Joshi, C. P. (M)
Kohli, F. C. (A)
Saxena, A. P. (A)
Srivastava, G. P. (A)
Sweet, C. M. (M)

Ludhiana
Basil, V. P. (M)

Madras
Balasubrahmanyam, V. (A)
Balasundaram, N. (SM)
Belgamwala, M. K. (A)
Clarke, K. K. (A)
Felix, E. A. (A)
Krishna, S. P. (A)
Mudaliyar, K. N. D. (M)
Patel, S. N. (M)
Rajan, S. S. (A)
Rajaratnam, T. (A)
Raju, P. V. (A)
Ramakrishna, P. R. (A)
Rao, D. A. (A)
Rao, H. J. (M)
Rao, M. V. S. (M)
Rao, V. V. L. (SM)
Seshadri, T. N. (M)
Subrahmanyam, G. (M)
Venkatakrishnan, R. (A)

Madurai
Subrahmanyan, T. R. (A)

Mangalore
Rao, P. R. (A)
Sarma, P. H. N. B. (M)

Masulipatam
Ramanadham, R. (M)

Mysore
Rao, K. R. (A)
Seetharam, H. R. B. (A)

Nagpur
Pai, N. N. (A)
Raf, B. K. (A)
Sarwate, V. (A)

New Delhi
Baliga, B. V. (A)
Bhatt, N. B. (SM)
Dewan, R. N. (M)
John, A. G. (M)
Kalra, S. N. (A)
Khosla, H. L. (M)
Maed, A. S. (A)
Mitra, S. N. (A)
Mohan, M. A. (A)
Prasad, K. V. K. (A)
Ramamurti, T. V. (A)
Ramanathan, A. R. (M)
Rangan, C. S. (M)
Rao, K. L. (A)
Singh, K. J. (A)
Sodhi, S. S. (M)
Tandan, P. D. (A)
Tandan, R. K. (A)

Orissa
Mishra, S. (A)
Ramadas, B. (A)
Rao, J. (A)

Poona
Aiya, S. V. C. (SM)
Nagarajan, M. S. (A)
Rao, L. P. (A)
Row, D. P. (SM)
Seshadri, G. (A)

Roorkee
Ramashadran, S. (A)

Secunderabad
De Souza, F. X. (A)
Mani, C. V. (A)

South Kanara
Hegde, K. S. (A)

Taikad
Ramanathan, G. (A)

Trichur
Rajan, K. T. (A)
Subbaraman, V. (A)

Trivandrum
Nair, P. R. (A)
Raja, M. V. R. V. (A)

Vizaga Patam
Rao, M. K. (M)

Waltair
Somayajulu, Y. (A)

IRAN

Teheran
Ball, R. M., Jr. (M)

IRAQ

Bagdad
Rifaat, R. (A)

ISRAEL

Haifa
Dobkin, L. (M)
Herzberg, E. N. (A)
Ross, B. R. (A)
Zakhaim, M. (A)
Zelinger, G. (M)

Jerusalem
Nissim, S. (A)

Kfar Ata
Cohen, E. (A)

Ramat-Gan
Baer, J. (M)
Matan, A. A. (A)

Rehovot
Kass, S. (M)

Tel Aviv
Fliderblum, D. D. (A)
Hellinger, H. R. J. (A)
Kaplan, D. (A)
Riesel, H. (A)
Schaerf, M. (A)

ITALY

Firenze
Francini, G. (A)

Genoa
Rutelli, G. (SM)

Milan
Bacchini, C. (A)
Banfi, A. (A)
Borsarelli, C. (A)
Cioni, G. (A)
De Dominicis, C. M. (A)
Ducati, A. (A)
Ducati, M. (A)
Guglielmo, G. (A)
Gurviz, A. A. (A)
Monti-Guarnieri, G. (A)
Palandri, G. L. (A)
Tescari, A. (A)
Vecchiacchi, F. (A)

Naples
Mazzarella, M. (A)

Rome
Fox, K. R. (A)
Koch, R. (SM)
Mair, A. D. (SM)
Marino, A. (A)
Silleni, S. R. (M)

Torino
Bertolotti, S. (A)
Egidi, C. (A)

JAPAN

Nagano Ken
Payne, D. T. (A)

Takata Honcho
Kawai, W. T. (A)

JORDAN

Jerusalem
Abouchanab, M. T. (M)

KENYA

Nairobi
Gross, J. (M)
Hastings, D. J. (M)
Hillier, R. J. (A)
Paterson-Jones, E. A. (SM)
Pegrume, S. A. (M)
Proud, E. (M)

LEBANON

Beyrouth
Khouri, J. O. (M)
Shoucair, S. F. (A)

Ras-Beirut
Fawwaz, R. A. (A)
Hoffman, J. D. (A)

MEXICO

Chihuahua
Buttner, J. G. (A)
Carrillo, E. A. (A)

Coah
Rodriguez, E. (A)

Mexico, D. F.
Caballero, C. A. (A)
Fernandez, M. A. (VA)
Guaragna, L. F. (VA)
Gutierrez, E. D. (SM)
Herrera, F. (A)
Horn, C. W. (F)
Gomez, T. J. C. (A)
Kurz De Lara, T. M. (A)
Marquez, J. (A)
Mendez, E. D. (M)
Montes, G. R. (A)
Nunez, A. C. (A)
Porras, R. B. (A)
Rodriguez, M. F. (M)
Rojas, J. L. P. (A)
Saul, R. (A)
Simon, T. J. (A)
Spoor, T. A. (A)
Tellez, J. M. B. (M)
Vazquez, M. (A)
Viggers, A. (A)

Vera Cruz
Hartig, D. (A)

MOROCCO

Fedala
Haubert, A. (SM)

Tangier
Jorgensen, A. C. (A)
Pfund, E. T., Jr. (M)

NEWFOUNDLAND

Stephanville
Myers, E. N. (A)

NETHERLANDS

Amsterdam
Broersma, C. B. (M)
Layzell, L. M. (M)
Schotel, G. (SM)

Eindhoven
Rinia, H. (SM)
Stumpers, F. L. H. M. (A)
Van Der Mark, J. (A)

Heemstede
Bontekoe, H. (A)

Hilversum
Breimer, S. (M)
Miedema, H. (SM)

Leiden
Hung, C. S. (A)

The Hague
Bloemsma, J. (A)
De Voogt, A. H. (M)
Houtsmuller, J. (SM)
Polak, H. (M)

NETHERLANDS EAST INDIES

NEW GUINEA

Madang
Spehr, C. J. (A)

Port Moresby
Gee, W. C. (SM)

NORTH BORNEO

Jesselton
Wade, C. F. N. (SM)

NETHERLANDS WEST INDIES

Curacao
Bergman, L. C. H. M. (A)

NEW ZEALAND

Auckland
Blackwell, W. J. (A)
Cholmodeley-Smith, D. R. (M)
Crawford, W. C. (A)
Joseph, P. D. (A)
Mavo, L. E. (A)
McRae, I. H. (M)
Orbell, R. J. (A)
Shackelford, J. W. (A)
Walding, N. N. (A)

Dunedin
Smith, C. A. (A)

Gisborne
Paulson, E. J. (VA)

Makara
Martin, L. H. (A)

Roturua
Field, A. N. (A)

Titahi Bay
Gilby, K. B. (M)

Wellington
Henderson, B. G. (A)
Hurrell, L. W. (M)
Ryland, A. (M)

NORTHERN RHODESIA

Lusaka
Reeves, J. M. (M)

NORWAY

Bergen
Hisdal, B. (A)
Knudtzon, N. H. (A)
Mack, E. (A)

Lillehammer
Rorholt, B. A. (M)

Lysaker
Nickelsen, J. C. (VA)

Oslo
Hoff, K. (M)
Gaudernack, L. F. (SM)
Sorbye, K. E. (A)
Taranger, A. (M)

PAKISTAN

Abbottabad
Mumtaz, S. U. D. (A)

Dacca
Ahmed, W. (M)

Karachi
Ahmad, R. (SM)
Aziz, S. A. (M)
Hameed, A. (A)
Qureshi, M. A. (M)
Rafi, M. A. (M)

Lahore
Bhatti, M. H. (A)

Mandi Bhauddin
Ahmad, M. M. (A)

PANAMA

Panama
Durling, F. A. (M)
Miro, L. M. (M)

PERU

Lima
Bragagnini, R. E. A. (A)
Kline, J. (A)
La Pierre, V. M. (SM)
Pinczowski, J. (A)
Singleton, C. M. (M)
Tringham, W. S. L. (A)

PHILIPPINE ISLANDS

Baguio City
Dayot, V. B. (A)

Dumagueto City
Knox, J. L. (A)

Manila
Bourret, P. L. (M)
Eachus, W. J. (A)
Green, W. C. (VA)
Picornell, J. J. (A)

San Juan
Ozaeta, E. H. (A)

Sariaya
Hidalgo, M. T. (M)

PORTUGUESE WEST AFRICA

Luanda
Alegria, M. G. S. (A)

PORTUGAL

Lisbon
Bauser, S. F., Jr. (A)
De Bivar, A. M. B. (SM)
Fernandes, A. A. D. (M)
Victorino, J. M. C. (A)

PUERTO RICO

Arecibo
Mercado, C. R. (A)
Perry, R. P. (A)

Hate Rey
Acosta, R. J. (M)
Petersen, R. L. (VA)

Juncos
Pereda, E. F. (A)

Quebradillas
Soler, J. (M)

Rio Piedras
Arce-Blanco, R. (A)
Delg, J. J. (A)

San Juan
Negroni, J. A. (M)
Rose, J. (M)
Schwarz-Rexach, W. (A)

Santurce
Boyd, L. K. (SM)
Cline, A. T., Jr. (M)
Collins, P. B. (A)
Girard, P. A. (M)

SAUDI ARABIA

Dhahran
Barnes, L. (A)
Monser, C. S. (A)
O'Brien, D. D. (A)

Djeddah
Andreou, A. J. (A)

Jeddah
Content, E. J. (SM)
Teeuw, J. W. (A)

SCOTLAND

AYRSHIRE

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Rhodes, A. J. (M)

EAST LOTHIAN

Gullane
Taylor, M. K. (SM)

North Berwick
Oliphant, W. D. (SM)

LANARKSHIRE

Glasgow
Chamberlain, E. (A)
Eaton, J. C. (M)
Lenihan, J. (A)

MIDLOTHIAN

Edinburgh
Appleton, E. V. (F)
Groom, B. G. (M)
Small, J. E. (M)
Tait, J. S. (A)
Thompson, A. G. (M)
Whyte, R. P. (A)

SOUTH PACIFIC

PHOENIX GROUP

Canton Island
Drake, L. J. (A)

SOUTHERN RHODESIA

Salisbury
Burnell, J. D. (A)

SPAIN

Barcelona
Castellani, M. F. (A)
Parenti, V. M. (A)
Pascucci, A. A. (SM)
Zobel, E. V. (M)

Madrid
de Onis, A. (M)
Escolano, M. (M)
Huerta, A. F. (A)
Kleen, W. J. (SM)
Millan, A. (A)

SWEDEN

Alsvjo
Svala, C. G. (M)

Arboga
Olsson-Seffer, R. (A)
Roll, A. (A)

Bromma
Braune, E. H. J. (M)
Wallmark, J. T. (A)
Wallmark, M. M. (A)

Enskede
Carlander, A. (M)

Goteborg
Lundwall, B. H. (A)

Gothenburg
Hellstroem, P. G. (A)
Wallman, H. (A)

Johanneshav
Edsman, K. S. (A)
Granler, S. G. (A)
Schleimann-Jensen, A. (F)

Lidingo
Dalen, G. S. (M)
Granquist, C. E. (A)
Scholdstrom, R. K. O. (A)
Solders, G. P. (A)
Stannow, J. C. (A)
Westerhult, B. C. O. (A)

Saltsjoebaden
Lundgren, E. H. (A)

Stockholm
Ahlgren, S. I. (A)
Aurell, C. G. P. (M)
Backmark, N. (A)
Bolinder, E. F. (A)
Elfving, A. L. (A)
Hullegard, E. W. (A)
Kruse, S. D. N. (A)
Lindstrom, G. (A)
Lofgren, E. O. (SM)
Nelson, R. H. (M)
Nilsson, B. N. A. (A)
Ollner, J. A. V. (A)
Pilp, A. T. (A)
Scheftelowitz, H. (A)
Sivers, C. H. V. (SM)
Sundquist, A. (A)
Vos, M. (SM)
Von Utfall, J. C. J. (A)
Werthen, H. L. O. (A)
Wiklund, T. E. (A)

SWITZERLAND

Aarau
Tanner, W. E. (A)

Baden
Schupbach, R. (A)

Basle
Hagger, H. J. (A)

Berne
Anselmi, S. C. (M)
Epprecht, G. W. (A)
Fontanellaz, G. C. (A)
Gerber, W. (A)

Geneva
Grise, G. M. (A)
Hayes, L. W. (F)
Miles, P. D. (SM)
Svoboda, J. J. (M)
Van Der Pol, B. (F)

Meilen
Diemer, F. (A)

Neuchatel
Christeler, A. (M)

Nussbaumen
Schonsleben, M. W.

Prangins
Maeder, M. (A)

Prex
Villars, C. (A)

Solothurn
Giger, A. J. (A)
Lang, G. J. (M)

Vaud
Gross, G. C. (SM)

Wettingen
Guettinger, P. (A)
Neck, H. (A)

Zurich
Angst, E. (A)
Atiya, F. S. (M)
Barut, A. O. (A)
Braun, A. F. (A)
Brumm, G. (A)
De Quervain, A. P. (A)
Egli, E. M. (A)
Epstein, R. R. (A)
Fehlmann, H. R. (A)
Gloor, B. R. (A)
Guanella, G. (A)
Haffter, T. F. (A)
Hohermuth, H. U. (M)
Keller, J. (A)
Klauser, H. U. (A)
Klein, A. L. (A)
Margna, C. R. (A)
Strohschneider, W. (SM)
Strutt, M. J. O. (SM)
Stuber, R. (A)
Tank, F. (F)
Weber, G. C. (A)
Westerwick, R. A. (A)

SYRIA

Damascus
Atassi, A. S. D. (A)
Saba, F. N. (A)

THAILAND

Bangkok
Poonpatana, S. (A)
Sookswasdi, S. (A)

TURKEY

Ankara
Duruturk, A. (A)
Parrott, J. H. (A)

Eski Sehir
Basacik, N. (A)

Istanbul
Argon, R. S. (A)
Ataman, A. (A)
Uzgoren, F. (A)

Izmer
Guralp, I. (A)

UNION OF BURMA

Rangoon
Ba Hii, F. (A)

UNION OF SOUTH AFRICA

Benoni
Grobler, J. J. (M)
Simons, A. H. (SM)

Carolina
Van Niekerk, T. (A)

Durban
Huang, S. H. (A)
Katz, L. (M)
Phillips, W. E. (SM)

Germiston
Holscher, H. D. (A)

Green Point
De Jong, A. C. (A)

Honeydew
Morris, R. (A)

Johannesburg
Aron, C. L. (A)
Beard, R. G. (M)
Bennett, N. (A)
Berkowitz, R. (A)
Bozzoli, G. R. (SM)
Davis, T. J. A. (A)
Hers, J. (M)
Hewitt, F. J. (M)
Jacobs, A. J. (M)
Jamieson, R. T. (A)
Kltai, R. (A)
Krause, V. R. (M)
Kucera, F. L. (M)
Lichtenstein, A. H. (A)
Lipschitz, S. (M)
Price, M. (A)
Rex, D. F. (A)
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Silbermann, H. (SM)
Sive, F. (A)
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Stephen, I. R. G. (A)
Suttner, R. (A)
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Van Gogh, W. D. (M)
Velleman, F. F. (A)

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Cotty, W. F. (A)
Morris, H. R. (A)

Klipheuwel
Egenes, O. K. (M)

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Muizenberg
Gilmour, R. R. (M)

Pinelands
Dunbar, J. (A)

Pretoria
Haupt, G. E. (A)
Malan, D. G. (A)
McDougal, R. H. (A)

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Ambrose, D. M. (A)

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Semmelink, A. (A)

Stellenbosch
Olen, C. L. (A)

Swartruggens
Goodman, J. (A)

Voortrekkerhoogte
Vlok, T. C. B. (A)

Vredehoek
Brickhill, G. A. (A)

Welgedacht
How, F. (A)

Worcester
Smuts, M. N. (A)

URUGUAY

Montevideo
Guimaraes, A. (A)
Larranaga, G. (M)
Moran, W. F. (M)
Valverde, R. D. (VA)

VENEZUELA

Caracas
Applewhite, V. C. (A)
Gonzalez, E. (A)
Guitian, J. E. (A)
Hackett, A. H. (M)
Jimenez-Michelena, L. G. (SM)
Lopez, A. L. (SM)
Nevitt, H. J. B. (SM)
Pachano, P. I. (A)
Santos, P. J. (M)
Shattuck, J. C. (A)
Suarez-Flamerich, O. (A)

Chivacoa Estado De Yaracuy
Reguera, J. J. (A)

Edo Miranda
Siblesz, G. M. (A)

La Guaira
Morrissey, D. J. (A)

VIRGIN ISLANDS

Saint Thomas
Greer, W. N. (M)

WAKE ISLAND

Cameron, D. F. (M)

WALES

Meliden
Anderson, A. G. (A)

Swansea
Boutle, H. R. (A

NOTES

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 Parts of the IRE DIRECTORY are:

Part		Page
2	Company List of Radio-Electronic Manufacturers	3
3	Product Index of Engineering Equipment and Parts	49 & 108
4	The Radio-Electronic Distribution Field (Class 22)	93
5	Catalogs and Complete-Data-Spreads Section	224

—Advertisers Index—Cover III, 49 & 219—

Part 2

2932 firms have supplied us voluntarily with information about the components, equipment and services which they render the radio-electronic industry. The 1899 manufacturers are listed alphabetically in this section beginning on page 1 and ending on page 48. 1033 non-manufacturers such as distributors and representatives are listed under heading 22 in the product index section. This index therefore gives the names of manufacturers of specific products available for purchase, with their addresses and code numbers indicating 73 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 1952 edition.

Part 3

The Product indexes start on page 53 and continue through 218. 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 advertisers of a given product, let us say "Amplifiers" look this product up in the table facing page 48. You will see that it is classification Number 1. A full listing of Amplifier manufacturers starts on page 53. Turn to this classification in part 3.

Part 4

As a service to engineers, both buyer and seller, we have included a list of 1033 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 #22, starting on page 93.

There are several other helpful indexes. Advertisers are given on Cover III (inside back cover) and page 49; and an index to 1951 Radio Engineering Show Exhibitors, and Proceedings of the IRE Advertisers is on page 219.

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. An innovation this year is the inclusion of numbers for sub-classifications in the Product Indexes for all firms listed. We have tried vigorously to make this truly a useful "Radio Engineers Directory."

Part 5

Part 5 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 double page spreads of their products (see pages 224-243). This is followed by a complete catalog file supplied by 14 manufacturers. These catalogs are filed in alphabetical order. 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.

Please submit all changes, corrections, additions and classification questions to Industry Research Div., c/o Proceedings of the IRE, 303 West 42nd St., New York 18, 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 49, 219 and inside back cover.

Key to Products (full) 50 & 51.

Index to Spreads & Catalogs, 224.

Guide to Machol Thumb Indexes facing 48 & 49

The Machol system will help you find both alphabetical and product sections swiftly.

INSTRUCTIONS

1. **Place the four fingers of your RIGHT hand back of the last page of this book.**
2. **Place your RIGHT thumb just below the 1 or 2 line symbol adjacent to the section you want.**
3. **Raise your RIGHT hand slightly and push it to the left bending the pages almost double. *This will spread the edges and cause the edge marks to show more clearly.***
4. **Move your RIGHT thumb across the page edges, fanning the pages until you reach the corresponding symbol.**
5. **Open there—that will be the page you want.**

A	3
B	5
C	9
D	11
E	13
F	15
G	17
H	19
IJ	21
KL	23
M	27
N	29
OP	31
QR	35
S	37
T	43
UVW	45
XYZ	47

PATENT APPLIED FOR MACHOL EDGE INDEX LICENSE NO. 25

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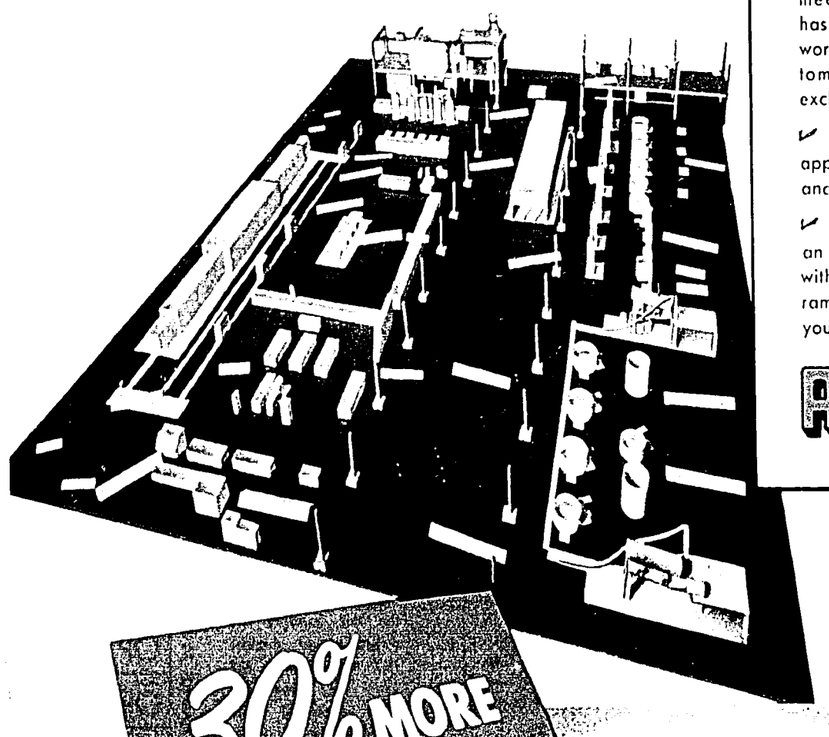


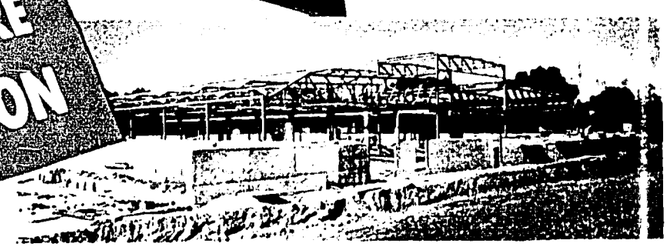
- 30% more production will soon be available from American Lava Corporation as new units rapidly near completion.
- Continuous expansion to meet customers' requirements has made American Lava the world's largest producer of custom made technical ceramics exclusively.
- Average daily production approximates four million parts and is rapidly increasing.
- This expansion program is an all out effort to supply you with custom made technical ceramics in the quality and quantity you need—when you need them.

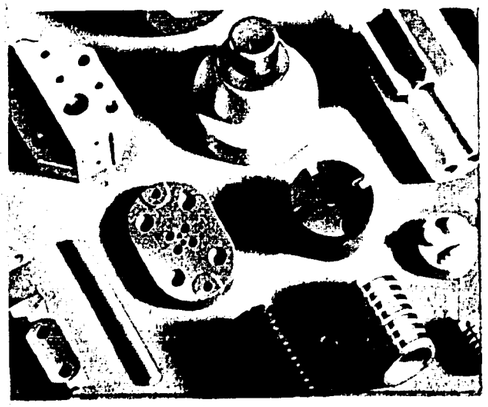
ALSIMAG

"TRADE MARK REG. U.S. PAT. OFF."

This building, photographed in May 1951, will be completed about the time this picture is published. Other units will speedily follow.

30% MORE PRODUCTION





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- New production facilities are speeding deliveries. The experience gained in half a century of specialization is available to you on request. You are most apt to find at American Lava Corporation the solution to any problem involving technical ceramics.
- Equipment shown in this mock up is under construction. Carefully selected personnel has been added to the present skilled staff to provide experienced operators for all plants.

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NEW ENGLAND, 38-B Brattle St., Cambridge, Mass., Kirkland 7-4498 • ST. LOUIS, 1123 Washington Ave., Garfield 4959

A B Metal Products Ltd., Abercynan, Glamorganshire, England, 2, 34, 46, 64

ABC Radio Laboratories, 3334 N. New Jersey St., Indianapolis 5, Ind., 18

A. J. F. Industries, Inc., 852 Monroe St., Brooklyn 21, N.Y., 14, 70

A. P. W. Co., 72 W. Main St., Rockaway, N.J., 14, 49

A. R. F. Products, Inc., 7627 Lake St., River Forest, Ill., 4, 54, 59, 69, 71

Abalon Precision Mfg. Corp., 540 Casanova St., New York 59, N.Y., 8, 13, 25, 30

Abbott Instruments, Inc., 8 W. 18 St., New York 11, N.Y., 35

Able Scientific Glass Apparatus, 6859 S. Anthony Ave., Chicago 37, Ill., 72

Accurate Insulated Wire Corp., 25 Fox St., New Haven 3, Conn., 9

Accurate Paper Tube Co., 852 N. Noble St., Chicago 22, Ill., 30, 32

Ace Engineering & Machine Co., Inc., 3644 N. Lawrence St., Philadelphia 40, Pa., 67, screen rooms
For details see ad on page 191

Acme Electric Corp., 44D Water St., Cuba, N.Y., 70, 74
For details see ad on page 206

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif., 14, 27, 35, 58, 70

Acme Litho Plate Graining, Inc., 90 Jay St., Brooklyn 1, N.Y., 56

Acme Telectronix, 1200 W. Third St., Cleveland 13, Ohio, 26

Acoustical Mfg. Co. Ltd., St. Peters Rd., Huntingdon County, England, 1, 17, 37, 66

Acro Tool & Die Works, 4554 North Broadway, Chicago 40, Ill., 30, 38

Acro Transformer & Mfg. Corp., 26-02 Fourth St., Long Insland City, N.Y., 14, 37, 70

Acromark Co., The, 9-13 Morrell St., Elizabeth 4, N.J., 30, 38

Adair, George P., 1833 M St., N.W., Washington 6, D.C., 17, 35

Adler Communications Labs., 1 Lefevre Lane, New Rochelle, N.Y., 1, 17

Advance Electronics Co., 451 Highland Ave., Passaic, N.J., 1, 27, 66, 67, 68

Advance Insulated Wire & Cable Co., 115 Spring St., Morristown, N.J., 9

Advance Recording Prods. Co., 36-12 34th St., Long Island City 1, N.Y., 56

Aerovoil, Inc., 507—26 St., Union City, N.J., 14, 27, 52, 54, 65, 69, 70, 71

Aero Electronics Co., 1902 West Division St., Chicago 22, Ill., 1, 14, 17, 23, 25, 29, 31, 35, 48, 53, 59, 67, 71

Aero Instrument Co., 11423 Van Owen, N. Hollywood, Calif., 41

Aero Crafters Aero Needle Co., 911 W. Superior St., Chicago 22, Ill., 49

Aerolite Electr. Hardware Corp., 507-26 St., Union City, N.J., 14, 25, 30, 50, 51, 64, 70

Aerolux Light Corp., 653 Eleventh Ave., New York 19, N.Y., 25, 57, 67, 72, 73

Aeronautical Communication Equip., Inc., 3090 Douglas Rd., Miami 33, Fla., 2, 52, 54, 71

Aeronautical Elec. & Mfg. Co., 5103 W. Lawrence Ave., Chicago 30, Ill., 30, 50
For details see ad on page 185

Aero-Sonic Mfg. Co., 2015 Pontius Ave., Los Angeles 25, Calif., 15, 25, 35, 53, 74

Aerovox Corp., 740 Belleville Ave., New Bedford, Mass., 10, 27, 60
For details see ad on page 72

Air Equipment, 18 Rue Basly Asnieres-Paris, France, 54, 71

Air King International Corp., 75 West St., New York 6, N.Y., 54, 55, 65

Air-Marine Motors, Inc., 2183 Jackson Ave., Seaford, L.I., N.Y., 6, 45
For details see ad on page 154

Airborne Instruments Lab. Inc., 160 Old Country Road, Mineola, L.I., N.Y., 2, 25, 29, 35, 54, 59, 71

Aircraft-Marine Products, Inc., 2100 Paxton St., Harrisburg, Pa., 3

Aircraft Radio Corp., Boonton, N.J., 52, 54, 69, 71
For details see ad on pages 165, 190

Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa., 62

Airlectron, Inc., 295 Bloomfield Ave., Caldwell, N.J., 17, 23, 25, 35, 54, 59, 67

Airmec Labs. Ltd., High Wycombe, Bucks, England, 1, 23, 27, 31, 41, 45, 48, 53, 66, 67, 68, 69

Airpax Products Co., P.O. Box 137, Middle River, Baltimore 20, Md., 14, 18, 53, 58, 70

Airplane & Marine Ins., Inc., Box 92, Clearfield, Pa., 1, 15, 17, 18, 35, 53, 54, 59, 69, 71

Air-Tone Sound & Recording Co., 1527 Chestnut St., Philadelphia 2, Pa., 1, 17, 35

Airtron, Inc., 105 E. Elizabeth Ave., Linden, N.J., 2, 16, 35, 75
For details see ad on page 217

Airtronix Development Corp., 20-26 W. 22 St., New York 10, N.Y., 1, 25, 53

Ajax Condenser Co., 932 W. Wrightwood, Chicago, Ill., 10, 27

Akron Rubber Co., 53 Warren St., New York 7, N.Y., 30, 32, 46

Aladdin Radio Industries, Inc., 703 Murfreesboro Rd., Nashville 10, Tenn., 14, 19, 65, 70

Alcah, Inc., 335 Barton St., Pawtucket, R.I., 2, 23, 31, 52

Alden Products Co., 117 N. Main St., Brockton 64, Mass., 8, 9, 13, 14, 15, 16, 25, 30, 33, 34, 46, 48, 50, 62, 70
For details see ad on page 114

Alertronic Protective Corp., 116 John St., New York, N.Y., 23

Alfax Paper & Engineering Co., P.O. Box 125, Westboro, Mass., 1, 26, 29

All American Tool & Mfg. Co., 1014 W. Fullerton Ave., Chicago 14, Ill., 67

All Star Products, Inc., Squire Ave., Defiance, Ohio, 11

Allegheny Ludlum Steel Corp., 522 Oliver Bldg., Pittsburgh 22, Pa., 39

Alliance Manufacturing Co., Lake Park Blvd., Alliance, Ohio, 1, 44, 49

Allied Asphalt & Mineral Corp., 217 Broadway, New York 7, N.Y., 76

Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y., 14, 39, 58

Allied Elec. Products, Inc., 68-98 Colt St., Irvington 11, N.J., 57, 58, 72

Allied Radio Corp., 833 W. Jackson Blvd., Dept. 35-J-1, Chicago 7, Ill., 22
For details see ad on page 94

Allis Co., The Louis, 427 E. Stewart St., Milwaukee 7, Wis., 44

Alpha Electronics, Inc., 55 Bergen Turnpike, Little Ferry, N.J., 14

Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N.Y., 40, 63

Alpha Wire Corp., 430 Broadway, New York, N.Y., 9

Altec Lansing Corp., 1161 N. Vine St., Hollywood 38, Calif., 1, 13, 37, 42, 54, 59, 70

Aluminum Co. of America, Gulf Bldg., Pittsburgh 19, Pa., 40

Aluminum Foils, Inc., 155 E. 44 St., New York 17, N.Y., 40

Amalgamated Electronics, Clinton Corners, N.Y., 9

American Barrograph Corp., 500 Sackett St., Brooklyn 30, N.Y., 19, 60

American Brass Co., The, Dept. WBG, Waterbury 20, Conn., 9, 25, 30, 40, 73
For details see ad on page 112

American Brass Co., 25 Broadway, New York 4, N.Y., 9, 25, 30, 40, 73

American Chain & Cable Co., Inc., Continental Ave., Bridgeport, Conn., 38

American Chronoscope Corp., 316 W. 3 St., Mt. Vernon, N.Y., 41

American Cladmetals Co., P.O. Box 543, Carnegie, Pa., 40

American Communications Corp., 30 Broadway, New York 7, N.Y., 1, 2, 8, 9, 14, 25, 33, 37, 46, 52, 53, 54, 57, 71

American Electric Cable Co., 181 Appleton St., Holyoke, Mass., 9

American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich., 38

American Electro Metal Corp., 320 Yonkers Ave., Yonkers 2, N.Y., 17, 19, 25, 39, 40

American Electronecting Corp., The, 5027 W. Jefferson Blvd., Los Angeles, Calif., 1, 2, 4, 8, 15, 23, 35, 43, 52, 53, 54, 59, 66, 69, 71

American Gas Accumulator Co., 1027 Newark Ave., Elizabeth 3, N.J., 58, 64
For details see ad on page 177

American Gem & Pearl Co., 6 W. 48th St., New York 19, N.Y., 20

American Hinge Co., 206 Wallabout St., Brooklyn 6, N.Y., 30
For details see ad on page 123

American Hydromath Co., 145 W. 57 St., New York 19, N.Y., 15, 17, 23, 25, 59

American Insulator Corp., New Freedom, Pa., 8, 46

American Laubscher Corp., 333 W. 52 St., New York 19, N.Y., 30, 49, 56

American Lava Corp., Cherokee Blvd. & Mfrs. Rd., Chattanooga 5, Tenn., 3, 10, 12, 46
For details see ad on page 2

American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 2, 3, 9, 16, 25, 46, 62
For details see ad on page 4

American Quartz Labs., Inc., Route 9-D, Garrison, N.Y., 2, 13, 20

(Continued on page 5)

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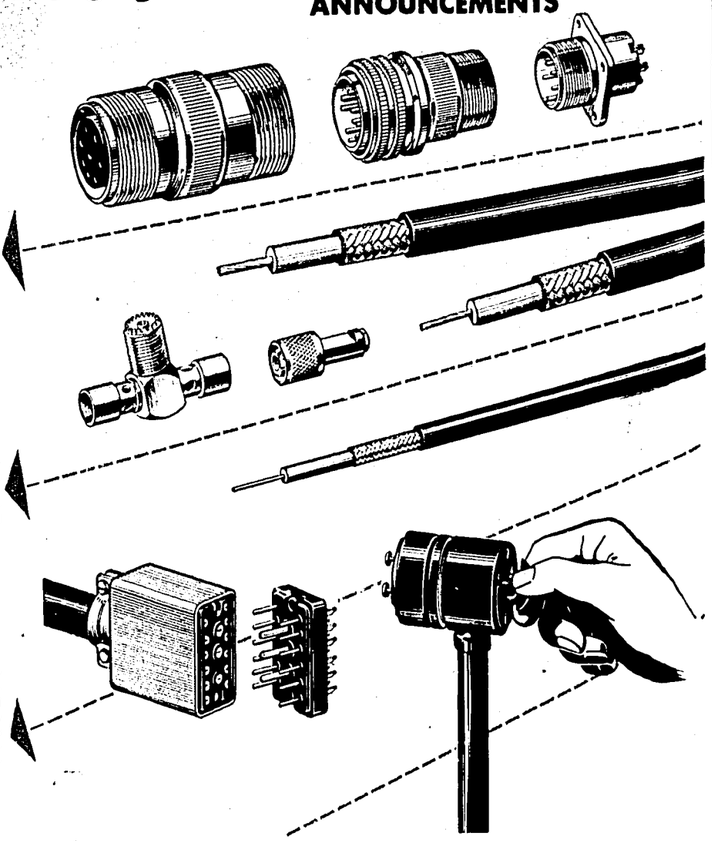
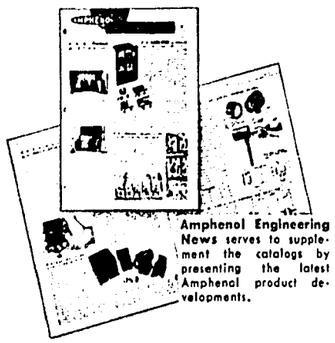
CATALOG D-2 — comprehensive engineering details and classification of Amphenol's Radio Frequency cables and connectors.

CATALOG 74 — greatly condensed listing of products in other Amphenol catalogs and complete listing of radio sockets and connectors and Amphenol TV and FM antennas.





Amphenol Engineering News serves to supplement the catalogs by presenting the latest Amphenol product developments.

The complete line of Amphenol products includes over 9,000 items designed and produced to the exacting standards required by radio-electronic applications. Amphenol's reputation for superior products of outstanding design is the result of rigid quality control from the development laboratory to the model shop; from the engineering department to the field testing laboratory; from production to finished product.

Amphenol quality products include the most complete line of RG cables, RF connectors, AN connectors and fittings, radio sockets and connectors available from any one source in the world today. To facilitate comprehensive listing of the many components Amphenol produces, cataloging is divided into three sections according to product adaptability and usage. Amphenol Engineering News supplements the catalogs with information on the latest Amphenol product developments. Request the catalogs you require.

Choose AMPHENOL — the quality name in electronics!

AMERICAN PHENOLIC CORPORATION • CHICAGO 50, ILLINOIS

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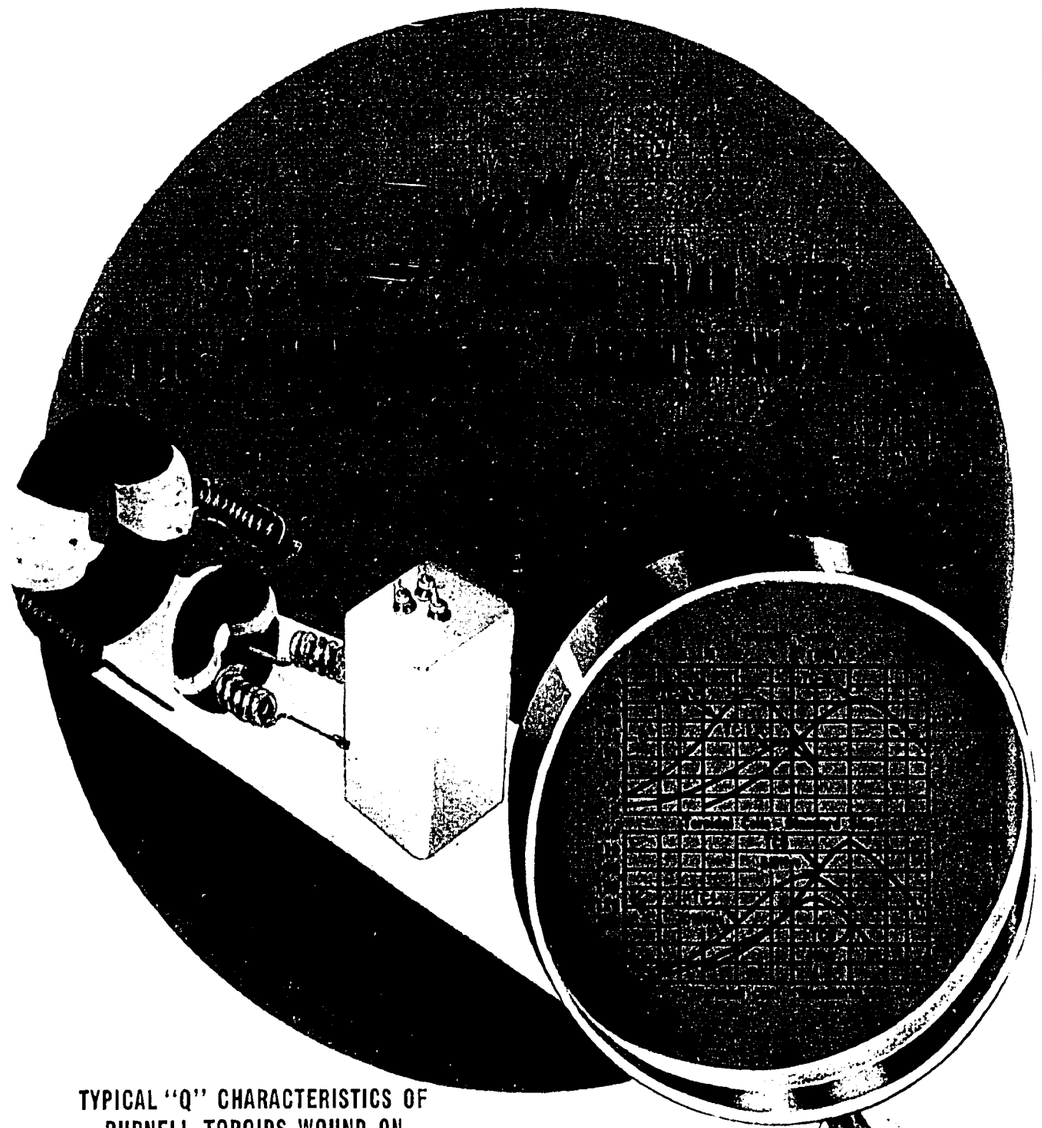

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Several years ago we began to specialize in the design and manufacture of toroidal coils and audio filter networks. At that time too few electronic engineers were aware of the full value of toroids (particularly those wound on molybdenum permalloy dust cores) as very little publicity had ever been devoted to a product that was fast becoming one of the most vital in the development of modern communications and control equipment.

We believe that since then through our technical service and advertising methods we have helped thousands of engineers to understand and appreciate the toroid as an essential in network applications.

The resulting popularity and industry acceptance of our toroidal coils and filters have necessitated an expansion of our production facilities to ten times what they were five years ago and we are proud to point to this growth as an expression from our customers of their satisfaction in the quality of our product and our service.

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TC-1	1⅛" O.D. x ⅜"
TC-2	2¼" O.D. x ⅜"
TC-3	1½" O.D. x 9/16"
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TC-0	⅛" O.D. x ⅛"
TC-4	1-3/16" O.D. x 9/16"
TC-5	1-3/16" O.D. x 9/16"
MAXIMUM INDUCTANCE	
TC-1 — Ind.-Up to 10 Hys.	
TC-2 — Ind.-Up to 100 Hys.	
TC-3 — Ind. MHY-Up to 750	
TC-0 — Ind.-Up to 2 Hys.	
TC-4 — Ind.-Up to 10 Hys.	
TC-5 — Ind. MHY-Up to 750	

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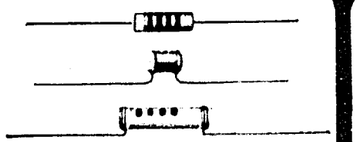
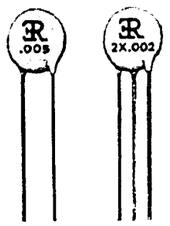
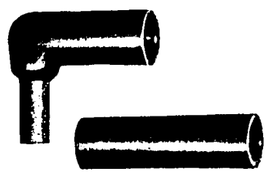
ERIE RESISTOR COMPONENTS



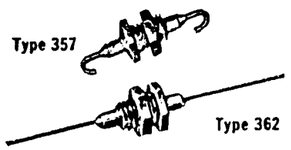
Erie "GP"* Molded Insulated Ceramicons
5 MMF—5,000 MMF
Erie "GP" Dipped Insulated Ceramicons
5 MMF—5,000 MMF
Erie "GP" Non-Insulated Ceramicons
5 MMF—5,000 MMF



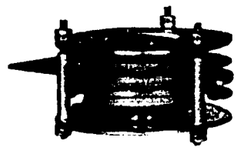
Erie Disc Ceramicons
Up to .01 MFD



Types L-4, L-7, S-5 Suppressors
for Spark Plugs and Distributors

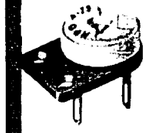


Feed-Thru Ceramicons
5 MMF—1,000 MMF
5 MMF—1,500 MMF

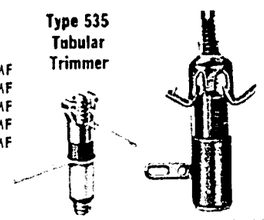


Type 3688
High Voltage Ceramicons
Up to 15,000 Volts
WORKING

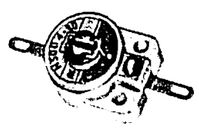
Type 557 Ceramicon Trimmer
1.5-7 MMF
3-12 MMF
5-25 MMF
5-30 MMF
8-50 MMF



Type 535 Tubular Trimmer

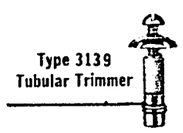


Type 531 and 532 Tubular Trimmers
0.5-5 MMF
1-8 MMF



Type TS2A Ceramicon Trimmer
1.5-7 MMF 3-13 MMF 4-30 MMF
3-12 MMF 5-20 MMF 7-45 MMF

Type 3139 Tubular Trimmer



Erie Resistor Components are designed with definite objectives in mind: they must be accurate and well within the tolerances required for their application; they must be reliable for sustained satisfactory service based on time proven life tests; they must be compact and sturdy for easy installation on the assembly line and in the service shop.

Erie manufactures a complete line of Ceramic and Button Mica Capacitors for transmitter and receiver applications: Fixed Ceramic and Mica Capacitors, Variable Ceramic Capacitors, Carbon Suppressors, Custom Injection Molded Plastic Knobs, Dials, Bezels, Name Plates and Coil Forms. Complete technical information on request.

*Ceramicon, Hi-K, GP, and Plexicon are registered trade names of Erie Resistor Corporation.

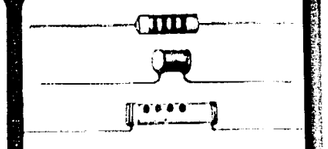
Electronics Division

ERIE RESISTOR CORP., ERIE, PA.

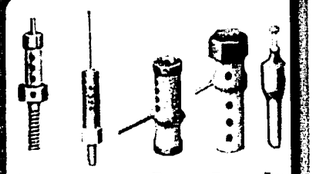
LONDON, ENGLAND • TORONTO, CANADA

Cinch-Erie Plexicon* Tube Sockets with built in by-pass Ceramicons 10 to 1,000 MMF

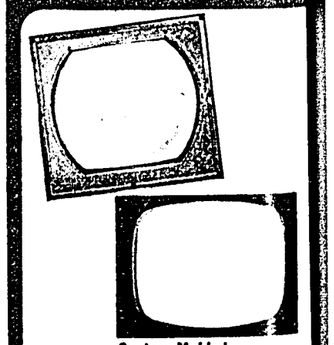
Button Mica Condensers
15 MMF—6,000 MMF



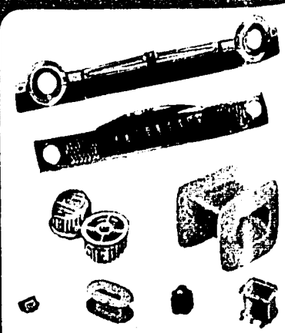
Temperature Compensating Molded Insulated Ceramicons
0.5 MMF—550 MMF
Temperature Compensating Dipped Insulated Ceramicons
0.5 MMF—1,800 MMF
Temperature Compensating Non-Insulated Ceramicons
0.5 MMF—1,800 MMF



Erie Stand-Off Ceramicons
5 MMF—5,000 MMF



Custom Molded Plastic TV Lenses and Frames



Custom Injection Molded Plastic Knobs, Dials, Bezels, Name Plates, Coil Forms, etc.

Buck Engineering Co., Inc., 37-41 Marcy St., Freehold, N.J., 8, 13, 25, 35, 38, 53
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Cleveland Container Co., The, 6201 Barberton Ave., Cleveland 2, Ohio, 32
Cleveland Electronics, Inc., 6611 Euclid Ave., Cleveland 3, Ohio, 37

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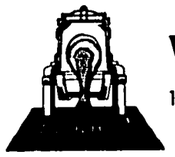

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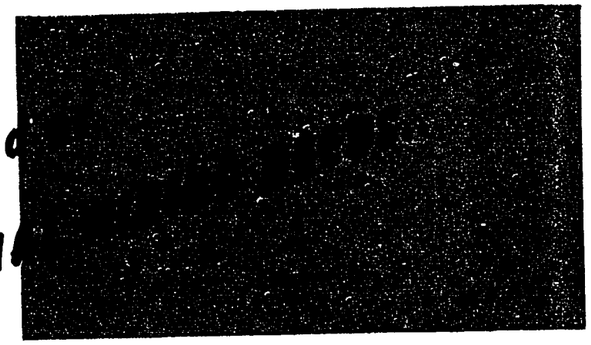

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Driver Co., Wilbur B., 150 Riverside Ave., Newark 4, N.J., 9, 40, 73
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Dumont Labs., Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N.J., 48, 66
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Dumont Labs., Inc., Allen B., C-R Tube Div., 750 Bloomfield Ave., Clifton, N.J., 72
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Dynamic Electronics-N.Y., Inc., 73-39 Woodhaven Blvd., Glendale, L.I., N.Y., 25
Dzus Fastener Co., Inc., Babylon, N.Y., 30
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City 1, N.Y., 28, 60, 64
Eastern Air Devices, Inc., 585 Dean St., Brooklyn 17, N.Y., 6, 45, 49
Eastern Brass & Copper Co., Inc., 1123 E. 180 St., New York, N.Y., 40
Eastern Mike-Stand Co., 56 Christopher Ave., Brooklyn 12, N.Y., 42
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Edgerton, Germeshausen, & Grier, Inc., 160 Brookline Ave., Boston 15, Mass., 17, 35, 48, 67
Edin Co., Inc., 207 Main St., Worcester, Mass., 1, 4, 25, 29, 48, 66, 69
Edison, Inc., Thomas A., Battery Div., West Orange, N.J., 5
Edison, Inc., Thomas A., Instr. Div., West Orange, N.J., 55, 58
Edsan Laboratory, 107-56 113 St., Richmond Hill 19, L.I., N.Y., 35
Egyptian Lacquer Mfg. Co., Inc., 1270 6 Ave., New York 20, N.Y., 36
Eichwald & Co., Inc., B., 51 E. 42 St., New York 17, N.Y., 17, 35
Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill., 18, 23, 44, 45, 53, 55, 74
Eidson Electronic Co., 1802 N. 3 St., Temple, Tex., 20, 21
Eisler Engineering Co., 757 S. 13 St., Newark 3, N.J., 14, 35, 38
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Eitel-McCullough, Inc., 1113 San Mateo Ave., San Bruno, Calif., 10, 11, 38, 57, 62, 72, 73
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Eldi Electronic Devices, 204 W. Houston St., New York 14, N.Y., 9, 17, 25, 60, 64
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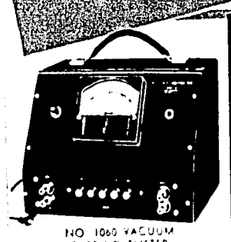
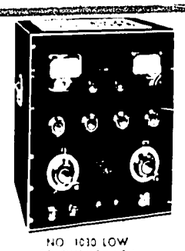
FREED TRANSFORMERS & INSTRUMENTS

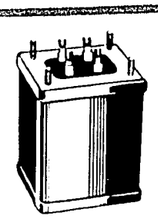
"PRODUCTS OF EXTENSIVE RESEARCH"



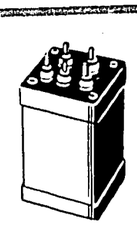
NO. 1060 VACUUM TUBE VOLTMETER INPUT IMPEDANCE 50 MEGOHMS



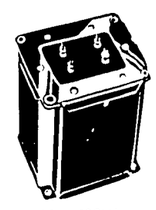
NO. 1030 LOW FREQUENCY "Q" INDICATOR



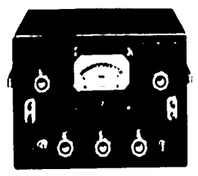
HIGH FIDELITY TRANSFORMERS ½ DB 20 CPS TO 30 KC



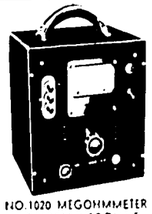
DISCRIMINATORS 10 CPS TO 1 MC



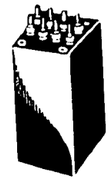
COMMERCIAL COMPONENTS QUALITY—DEPENDABILITY—PRICE



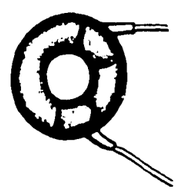
NO. 1140 NULL DETECTOR COMPLETE WITH SELECTIVE CIRCUITS



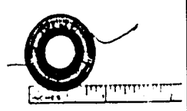
NO. 1020 MEGOHMMETER 2 000 000 MEGOHMS DIRECT READING



HERMETICALLY SEALED COMPONENTS TO MEET MIL-T-27 SPECS



TOROIDAL INDUCTORS 60 CPS TO 1 MC



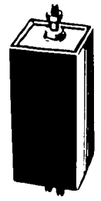
MINIATURE INDUCTORS 1000 CPS TO 100 KC

NO. 1210 NULL DETECTOR & VACUUM TUBE VOLTMETER

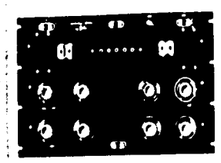
DECADE INDUCTORS 30 CPS TO 300 KC

SUB MINIATURE HERMETICALLY SEALED TOROIDAL INDUCTORS

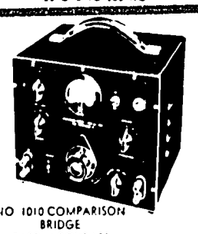
SUB MINIATURE HERMETICALLY SEALED COMMUNICATION COMPONENTS



SLUG TUNED COMPONENTS 1000 CPS TO 1 MC

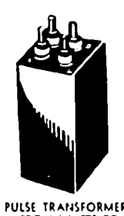


NO. 1150 UNIVERSAL BRIDGE 5 A.C. BRIDGES IN ONE UNIT

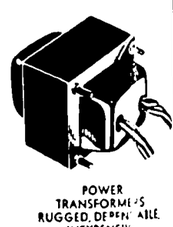


NO. 1010 COMPARISON BRIDGE FAST, ACCURATE, RELIABLE

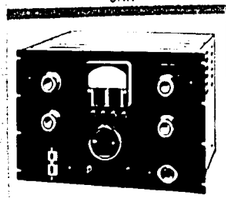
STEPDOWN TRANSFORMERS 50 WATTS TO 3 KW



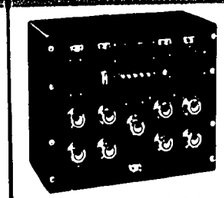
PULSE TRANSFORMERS FROM WATTS TO MEGAWATTS



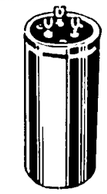
POWER TRANSFORMERS RUGGED, DEPENDABLE INEXPENSIVE



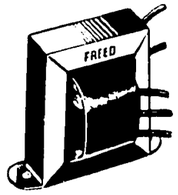
1170 D.C. SUPPLY DIRECT CURRENT UP TO 500 MA.



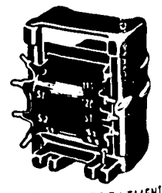
NO. 1110-A INCREMENTAL INDUCTANCE BRIDGE A NECESSITY FOR EVERY LAB



PRECISION FILTERS 10 CPS. TO 1 MC.



CHANNEL MOUNTING INEXPENSIVE—RELIABLE



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DEPT. DI 1718-36 WEIRFIELD ST., (RIDGEWOOD) BROOKLYN 27, NEW YORK

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Electrical Testing Labs., Inc., 80 St. & E. End Ave., New York 21, N.Y., 17

Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill., 14, 70

Electrical Transformer Co., Westerly Rd., Ossining, N.Y., 1, 14, 53, 70

Electro Craft, Inc., 68 Jackson St., Stamford, Conn., 1, 2, 8, 13, 14, 17, 18, 25, 35, 38, 52, 53, 54, 55

Electro Development Corp., 6014 W. Washington Blvd., Culver City, Calif., 46, 64

Electro Engineering & Mfg. Co., 627 W. Alexandrine Ave., Detroit 1, Mich., 25

Electro Mec Lab., 225 Broadway, New York 7, N.Y., 14, 17, 35, 59, 60, 61, 67

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Electronic Research & Mfg. Corp., 1420 E. 25 St., Cleveland 14, Ohio, 2, 35, 43, 52, 54, 71

Electronic Signal Co., 541 Willis Ave., Williston Park, L.I., N.Y., 1, 23, 55, 59

Electronic Systems Co., 555 E. Tremont Ave., New York 57, N.Y., 27, 68

Electronic Transformer Co., Inc., 207 W. 25 St., New York 1, N.Y., 14, 24, 27, 70, 74

Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 1, 35, 48, 72
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Electronics Research, Inc., P.O. Box 327, Evansville 4, Ind., 35

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Eveready Label Corp., 357 Cortlandt St., Belleville 9, N.J., 30

ESD Laboratories, 2660 North Ave., Bridgeport 4, Conn., 17, 35

Fairchild Camera & Instrument Corp., 88-08 Van Wyck Blvd., Jamaica 1, L.I., N.Y., 48, 60
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Fairchild Recording & Equip. Corp., 154 St. & 7 Ave., Whitestone, L.I., N.Y., 1, 49, 53, 55

Falls Metal Works Ltd., 409 E. Main St., Little Falls, N.J., 8, 13

Falstrom Co., 46 Falstrom Court, Passaic, N.J., 8, 13

Fansteel Metallurgical Corp., 220 Sheridan Rd., North Chicago, Ill., 10, 40, 53, 57, 73

Farmers Engineering & Mfg. Co., 549 Brushton Ave., Pittsburgh 21, Pa., 1, 52

Fasco Industries, Inc., P.O. Box 500, Rochester 2, N.Y., 45, 64

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TUBE TEST EQUIPMENT

- Aging and Life Racks
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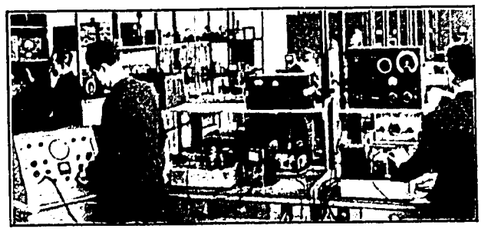

At the top of the Sherron personnel pyramid are physicists with electronic knowledge who will provide the necessary research for your project . . . electronic and mechanical engineers who will develop it . . . technicians who will accredit its workability. These men work hand in hand with our production engineers, who have at their command the necessary sheet metal fabrication facilities and manpower to turn out a finished prototype . . . ready for you to manufacture. Whether we initiate the design — or work from your prints and specifications — our service is confidential.

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- DRIVING AND CONTROLLING EQUIPMENT
- REGULATORS
- MICRO WAVE APPARATUS
- RADAR MECHANISMS
- COMPUTER MECHANISMS
- MECHANICAL OPTICAL SPECIALTIES
- MECHANISMS OF NAVIGATIONAL DEVICES
- VIBRATION CONTROL MOUNTINGS
- PRECISION GEAR TRAINS

Sherron Electronics

SHERRON ELECTRONICS COMPANY

(Continued from page 15)

Fast & Co., John E., 3117 N. Pulaski Rd., Chicago 41, Ill., 10, 14

Faximile, Inc., 155 Perry St., New York 14, N.Y., 26

Federal Electric Mfg. Co., Ltd., 9600 St. Lawrence Blvd., Montreal 14, Ont., Canada, 1, 2, 3, 14, 27, 33, 52, 54, 57, 58, 64, 70, 71, 72

Federal Electric Products Co., 50 Paris St., Newark, N.J., 8, 13, 14, 16, 17, 18, 19, 23, 28, 38, 39, 46, 54, 58, 59, 64, 71, 74

Federal Engineering Co., 37 Murray St., New York 7, N.Y., 57, 72

Federal Enterprises, Inc., 8700 S. State St., Chicago 19, Ill., 2, 9, 13

Federal Instrument Corp., 1402 Broadway, Long Island City 2, N.Y., 14, 60

Federal Mfg. & Engineering Corp., 215 Stephen St., Brooklyn 5, N.Y., 1, 54, 69

Federal Screw Products, Inc., 224 W. Huron St., Chicago 10, Ill., 30, 58

Federal Telecommunication Labs., 500 Washington Ave., Nutley 10, N.J., 2, 35, 43, 69, 71, 72

Federal Telephone & Radio Corp., Cable & Wire Div., 100 Kingsland Rd., Clifton, N.J., 9

For details see ad on page 232-3

Federal Telephone & Radio Corp., Selenium & Intelin Div., Dept. F 7104, 100 Kingsland Rd., Clifton, N.J., 2, 23, 34, 52, 57, 58, 66, 69, 71, 73, 74

For details see ad on page 232-3

Federal Telephone & Radio Corp., Tube Div., 100 Kingsland Rd., Clifton, N.J., 72

For details see ad on page 174

Federated Metals Div., see American Smelting & Refining Co.

Federated Purchaser, Inc., 60 Dey St., New York 7 (Neda) N.Y., 22

Federated Purchaser, Inc., 1115 Hamilton St., Allentown, (Neda) Pa., 22

Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill., 46

Felt Products Mfg. Co., 1504-14 Carroll Ave., Chicago 7, Ill., 30, 32

Fenwal, Inc., 43 Pleasant St., Ashland, Mass., 64

Ferranti Electric, Inc., 30 Rockefeller Plaza, New York 20, N.Y., 14, 27, 70

Ferris Instrument Co., 110 Cornelia St., Boonton, N.J., 69

Ferro Co. Corp., 21-33 N. 11 St., Brooklyn, N.Y., 2, 5, 6, 8, 13, 25, 38, 40, 59

Fidelitone, Inc., 1016 Devon Ave., Chicago 26, Ill., 56

Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill., 1, 49

Fidelity Chemical Prods. Corp., 472 Frelinghuysen Ave., Newark 5, N.J., 30

Fidelity Tube Corp., 900 Passaic Ave., East Newark, N.J., 72

Fidelia Instrument Corp., 2920 N. 4 St., Philadelphia 33, Pa., 29

Filtron Co., Inc., The, 131-05 Fowler Ave., Flushing, L.I., N.Y., 27

Fischer & Co., Robert A., 517 Commercial St., Glendale 3, Calif., 31

Fisher-Schurman Corp., 230 E. 45 St., New York 17, N.Y., 47

Fisher Radio Corp., 41 E. 47 St., New York 17, N.Y., 1, 54

Fisher Research Lab., Inc., 1961-65 University Ave., Palo Alto, Calif., 35, 52, 54, 57, 68, 71

Flader, Inc., Frederick, 1330 Lackey Rd., Toledo 12, Ohio, 2, 3, 15, 23, 29, 35, 59, 67, 68

Flexilab Products Co., 4945 Colorado Blvd., Denver 16, Colo., 33

Fluke Engineering Co., John, P.O. Box 755, Springdale, Conn., 1, 33, 66, 67

Fondiller Ind'l. Consultants, Robert, 33 W. 60 St., New York 23, N.Y., 17

Forbes & Wagner, Inc., 339 Central Ave., Silver Creek, N.Y., 14, 25, 70

Ford Engineering Co., 134 N. Second, Upland, Calif., 60

Ford Instrument Co., Inc., 31-10 Thomson Ave., Long Island City, N.Y., 15, 45, 59

Ford Radio & Mica Corp., 558 63rd St., Brooklyn 20, N.Y., 32

Foredom Electric Co., 27 Park Pl., New York 7, N.Y., 38

Formica Co., 4614 Spring Grove Ave., Cincinnati 32, Ohio, 25, 32, 46, 51

Foss, Inc., William L., 927 15 St. N.W., Washington 5, D.C., 17

Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio, 14, 70

Franklin Institute, The, 20 & Benjamin Franklin Pkwy., Philadelphia, Pa., 35, 61

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Freed Transformer Co., Inc., 1718-36 Weirfield St., Dept. D1, Brooklyn 27, N.Y., 1, 14, 24, 27, 41, 53, 66, 67, 69, 70

For details see ad on page 14

Freeland Products Co., 700 Dryades St., New Orleans 13, La., 72

Frequency Standards Corp., P.O. Box 66, Eatontown, N.J., 2, 4, 35, 45, 54, 67

For details see ad on page 195

Frommer, Joseph Co., 1525 Bakewood Ave., Cincinnati 24, Ohio, 17

Fryling Mfg. Co., 639 W. 12 St., Erie, Pa., 25

Fugle-Miller Laboratories, 399 Main St., Metuchen, N.J., 14, 70

For details see ad on page 80

Furst Electronics, 12 S. Jefferson St., Chicago 6, Ill., 1, 17, 23, 25, 43, 53, 66, 74

Furzehill Labs. Ltd., Borehamwood, Hertfordshire, England, 4, 48, 66, 67, 69

Fusite Corp., 5324 Carthage Ave., Cincinnati 12, Ohio, 30

G-M Laboratories, Inc., 4300 N. Knox Ave., Chicago 41, Ill., 41

G-V Controls, Inc., 28 Hollywood Plaza, East Orange, N.J., 58

G. W. Associates, P.O. Box 2263, El Segundo, Calif., 2, 17, 41

Gables Engineering, Inc., P.O. Box 751, Coral Gables, Fla., 1, 52, 53, 59, 64, 69, 71

Gadgets, Inc., 3629 N. Dixie Dr., Dayton 5, Ohio, 2, 13, 25, 30

Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill., 38, 47

Gamewell Co., The, 1238 Chestnut St., Newton Upper Falls 64, Mass., 25, 66

Gardner Electric Mfg. Co., 4227 Hollis St., Emeryville 8, Calif., 70

Garrison, Millard M., 1519 Connecticut Ave., Washington 6, D.C., 17

Gates Radio Co., 123 Hampshire St., Quincy, Ill., 1, 2, 3, 4, 6, 8, 9, 13, 14, 23, 24, 41, 43, 49, 52, 53, 55, 58, 67, 70, 71, 74

Gaumey & Ray, 1052 Warner Bldg., Washington 4, D.C., 17

Gavitt Manufacturing Co., Inc., The, Central St., Brookfield 1, Mass., 2, 9

Geddes, L. A., 157 Trenton Ave., Montreal 2, Quebec, Canada, 35

Gee Dar Manufacturing, 1330 Tenth Ave., Rockford, Ill., 3, 30, 46, 64

Gellerup, D. W., 5437 N. Santa Monica Blvd., Milwaukee 11, Wis., 17

General Cable Corp., 420 Lexington Ave., New York 17, N.Y., 9

General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill., 2, 3, 10, 25, 28, 30, 32, 33, 39, 46, 59, 62, 64

General Ceramics & Steatite Corp., Plant 3, Crows Mill Rd., Keasbey, N.J., 12, 19, 46

For details see ads on pages 18, 60

General Communication Co., 330 Commonwealth Ave., Boston 15, Mass., 69

General Control Co., 1200 Soldiers Field Rd., Boston 34, Mass., 23, 34, 59, 64

General Dry Batteries, Inc., 13000 Athens Ave., Cleveland 7, Ohio, 5

General Dyestuff Corp., see Antara Products Div.

General Electric Co., 1 River Rd., Schenectady 5, N.Y., 1, 3, 8, 9, 10, 18, 20, 23, 28, 29, 31, 32, 38, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 57, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74

General Elec. Co., Electronics Dept., Electronics Park, Syracuse, N.Y., 1, 2, 13, 20, 24, 26, 27, 31, 37, 41, 43, 48, 49, 52, 53, 54, 57, 59, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74

General Electronics, Inc., 101 Hazel St., Paterson, N.J., 72

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General Industries Co., Taylor & Olive Sts., Elyria, Ohio, 8, 30, 49, 55

General Instruments, Inc., 4000 Lemmon Ave., Dallas, Texas, 14, 29, 48, 54, 59, 70, 71

General Insulated Wire Works, Inc., 60 Gordon Ave., Providence 5, R.I., 9

General Lab Associates, Inc., Norwich, N.Y., 2, 14, 27, 53, 54, 70, 72

General Laminated Prod. Inc. of Ill., 2857 S. Halsted St., Chicago 8, Ill., 25, 32, 50, 51, 62

General Precision Laboratory, Inc., 63 Bedford Rd., Pleasantville, N.Y., 17, 35, 43, 54, 59, 65

For details see ad on page 234-5

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 1, 4, 9, 10, 11, 16, 23, 27, 30, 33, 41, 43, 46, 48, 53, 60, 64, 66, 67, 68, 69, 70, 72, 74

For details see ads on pages [illegible], back cover

General Transformer Co., 1840 Harwood Ave., Homewood, Ill., 53, 70, 74

General Electronics & TV Corp., 715 Hamilton St., Geneva, Ill., 72

Geotator Corp., 1820 N. Nash St., Arlington 9, Va., 18, 35, 39, 44, 53, 68, 72

Geotechnical Corp., 5531 Yale Blvd., Dallas 5, Tex., 1, 17, 27, 29, 48, 67

Gerber Products, Inc., N. 7 St. at Monroe Ave., Kenilworth, N.J., 51

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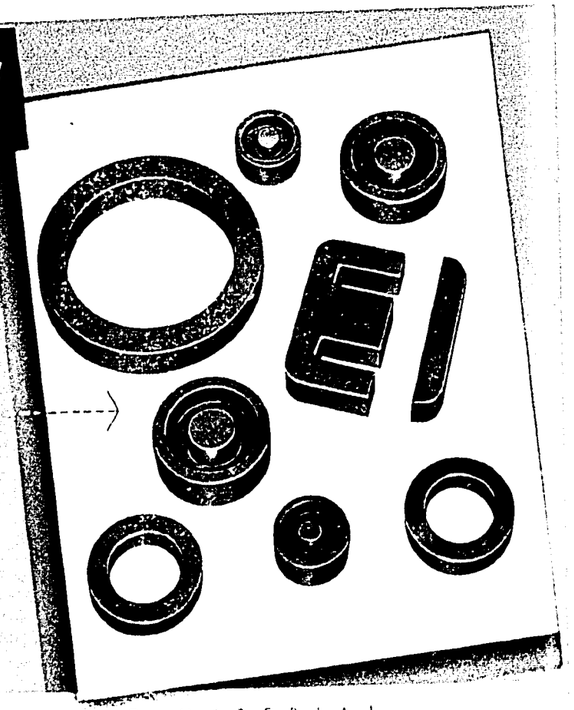
FERRAMIC Cores by GENERAL CERAMICS



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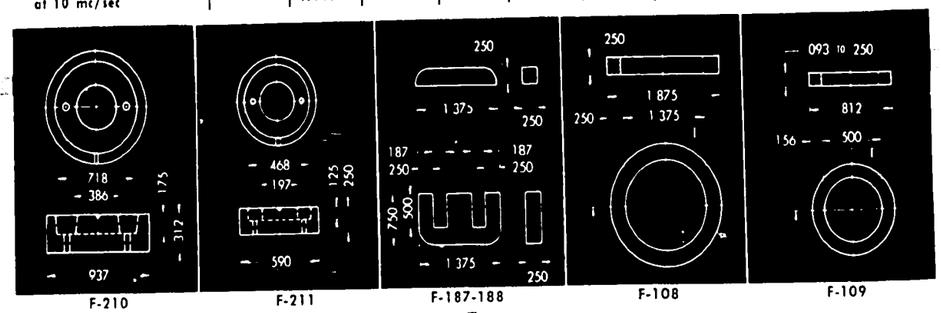
ELIMINATE LAMINATIONS

TYPE OF FERRAMIC MATERIAL

PROPERTY	UNIT	A 34	B 90	C 159	D 216	E 174	G 254	H 419	I 141	J 472
Initial permeability at 1mc/sec	—	15	95	220	410	750	410	850	600	330
Maximum permeability	—	97	183	710	1030	1710	3300	4300	1010	750
Saturation flux density	Gauss	840	1900	3800	3100	3800	3200	3400	1540	2900
Residual magnetism	Gauss	615	830	2700	1320	1950	1050	1470	660	1600
Coercive force	Oersted	3.7	3.0	2.1	1.0	0.65	0.25	0.18	0.40	.80
Temperature coefficient of initial permeability	%/°C.	0.65	0.04	0.4	0.3	0.25	1.3	0.66	0.3	0.22
Curie point	°C.	280	260	330	165	160	160	150	70	180
Volume resistivity	Ohm-cm	$1x10^9$	$2x10^5$	$2x10^3$	$3x10^7$	$4x10^5$	$1.5x10^8$	$1x10^4$	$2x10^5$	—
Loss Factor: at 1 mc/sec	—	—	.00016	.00007	.00005	.00008	.00008	.00030	.0003	.000055
at 5 mc/sec	—	.0004	.0011	.0008	.0012	.002	.00075	.00155	.005	—
at 10 mc/sec	—	.0005	—	—	—	—	.0017	.00275	—	—



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MAKERS OF STEATITE, TITANATES, ZIRCON PORCELAIN, FERRAMICS, LIGHT DUTY REFRACTORIES, CHEMICAL STONEWARE, IMPERVIOUS GRAPHITE

[illegible] Products, Inc., 1846 Mississippi [illegible], Los Angeles 25, Calif., 1, 27, 35, 53, 59

[illegible] & Cox, Inc., 21 West St., New [illegible], N.Y., 17

[illegible] Mfg. & Research Corp., 450 N. Main St., Janesville, Wis., 1, 2, 15, 17, 23, 44, 45, 48, 54, 66, 67, 71

[illegible] Hopkins, 1000 40 Ave., Oakland [illegible], Calif., 10, 60

[illegible] Corp., Thermex Div., 224 E. Broadway, Louisville 1, Ky., 31

[illegible] Lead Co., Inc., 31 Washton Ave., Brooklyn 27, N.Y., 68

Glass Products Co., 6911 S. South Chicago Ave., Chicago 37, Ill., 4, 10, 59, 60, 64
For details see ad on page 77

[illegible] Corp., Durham Ave., Metuchen, N.J., 10, 11, 12, 20, 21, 35, 42, 57

[illegible] Falls Laboratory, Inc., 284 Glen St., Glens Falls, N.Y., 17, 28, 29, 35, 47

[illegible] Products Corp., P.O. Box 197, Southport, Conn., 14, 28, 53, 66, 69, 70

[illegible] Products Co., Inc., 26 Court St., Brooklyn 2, N.Y., 70

[illegible] Mfg. Co., 171 S. Second St., Milwaukee 4, Wis., 1

Godley Co., Paul, 10 Marion Rd., Upper Montclair, N.J., 17
For details see ad on page 87

[illegible] Co., 1054 58 St., Brooklyn 19, N.Y., 13, 25

[illegible] Bros. Smelting & Refining, 2 N. Wabash Ave., Chicago 2, Ill., 7, 40, 58, 63, 73

[illegible] F. L., 572 Broome St., New York 13, N.Y., 17

Gomtos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 12, 16, 25, 30, 46, 75
For details see ad on page 91

[illegible] Co., 72 E. Tujunga Ave., Burbank, Calif., 2, 3, 9, 18, 52, 54

[illegible] Chem. Co., B. J. E. & Bros., 324 Rose Bldg., Cleveland 15, [illegible], 32, 51

[illegible] Co., The B. F., 500 South Main St., Akron 18, Ohio, 51

[illegible] Aircraft Corp., Akron 15, [illegible], 13, 15

Gordon, Herman L., Warner Bldg., Washington 4, D.C., 17
For details see ad on page 87

[illegible] Specialties Co., 59 E. Madison, Chicago 2, Ill., 25, 58

[illegible] & Gorrell, Haworth, N.J., 29, 41

[illegible] Electric & Mfg. Co., 2921 W. [illegible] St., Burbank, Calif., 14, 70

[illegible] Mfg. Co., 2110 Clear Lake Ave., Springfield, Ill., 44, 45

[illegible] Engineering, 37 W. 52 St., New York 19, N.Y., 17, 35

[illegible] Storage Battery Corp., Trenton 7, N.J., [illegible]

[illegible] Mfg. Co., Inc., 47 Bridge St., Greenwich, R.I., 35

[illegible] Transmissions, Inc., 3754 North [illegible] St., Milwaukee 12, Wis., 14, 70

Granger Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 14, 70
For details see ad on page 200

[illegible] & Sons, Inc., L. F., 90 Union St., Allentown, Pa., 25, 30

[illegible] Inc., L. P., 40 E. 49 St., New York 22, N.Y., 17

Grant Pulley & Hardware Corp., 31-33 Whitestone Expy., Flushing 54, N.Y., 25, 53

Graphite Metallizing Corp., 1057 Nepperhan Ave., Yonkers 3, N.Y., 60
For details see ad on page [illegible]

Gray Instrument Co., [illegible] Ave., Quincy 7, Mass., 29, 45

Gray Instrument Co., [illegible] St., Philadelphia 44, Pa.

Gray Radio Co., 3[illegible] West Palm Beach, Fla.

Gray Research & Dev. Co., Inc., 16 Arbor St., Hartford 1, Conn., 34, 36, 43, 47, 49, 52, 65
For details see ad on page [illegible]

Greenlee, 4523 W. [illegible] St., Chicago 24, Ill., 45, 64

Green Instrument Co., [illegible] Cambridge, Mass.

Green Mfg. Co., [illegible] W. Warren, Pa., 25

Greenlee Mfg. Co., 2[illegible] Industrial Ct., St. [illegible]

Greenlee Tool Co., 2[illegible] Second St., Rockford, Ill., 8

Greenleaf, Richard A. [illegible] Pilot Internat. N.Y. Int. [illegible], 35, 41, 42, 45, 56

Greiner Engineering Corp., 370 [illegible] New York 16, N.Y.

Grieger's, 1633 [illegible] Ave., Newport Beach, Calif.

Guardian Electric Mfg. Co., 1628 DY W. Walnut St., Chicago 12, Ill., 14, 55, 59, 64, 65
For details see ad on page [illegible]

Guderman Corporation, 2[illegible] W. [illegible] Chicago 39, Ill., 1

Guffon Mfg. Co., 22[illegible] Detroit St., Medina, N.Y., 25, 45, 49, 67

Guillemin & Co., Ba[illegible] Pierce St., Chicago 5, Ill., 14, 25, 70

Hadley Co., B[illegible] Ave., Los Angeles 64, Calif.

Hadley Mfg. Co., [illegible] Phoenix, Ariz.

Halcross Engineering Co., [illegible] Quarry St., Watertown, Conn.

Hamilton Standard, [illegible] ada, Conn.

Hammarlund Mfg. Co., Inc., 460 W. 34 St., New York 1, N.Y., 14, 24, 34, 35, 58

Handy Hardware, 2[illegible] York 7, N.Y., 9, 24

Hansen Co., Wm., [illegible] Sycamore, Ill., 25

Hardwick, Hindle, Inc., [illegible] Newark 5, N.J., 29

Harmon Electronics, 11431 Truman Rd., Independence, Mo., 35
For details see ad on page [illegible]

Harnett Electric Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 34, 35, 36, 76
For details see ad on page [illegible]

Harper Co., The H. M., [illegible] Ave., Morton Grove, Ill.

Hartenstine-Zahn Co., Inc., [illegible] way, New York 7, N.Y.

[illegible] Hawes, 152 Hamilton [illegible]

[illegible] 34, 59, 74

Hawley Products Co., 333-339 N. 9 St., St. Charles, Ill., 60

Haydon Co., The A. W., 241 N. Elm St., Waterbury 20, Conn., 43, 45, 58, 64

Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 2, 48, 67

[illegible] for Mfg. Co., Div. Holder Bushing & Terminal Co., Inc., 225 Bloomfield Ave., [illegible] P, Bloomfield, N.J., [illegible] 46

Hemmway & Barnes, 275 [illegible] Fifth Ave., New York 16, N.Y., 60

Heppner Mfg. Co., Box 612, Round Lake, Ill., 28, 52, 54

Hermetic Seal Products Co., 99-31 S. 6 St., Newark 7, N.J., 31, 32

Hewlett Packard Co., 3[illegible] Page Mill Rd., Palo Alto, Calif., 5, 66, 67, 69

Heyman Mfg. Co., 3[illegible] Michigan Ave., Kenilworth 7, N.J., 60

Hickok Elect. Inst. Co., 10531 DuPont Ave., Cleveland 8, Ohio, 41, 48, 66, 67, 69

[illegible] Hi[illegible] 14 Ob[illegible] [illegible] Bell, 27, 31, 35

[illegible] Instrument Co., 7 Uni[illegible] Cambridge 38, Mass., 27, [illegible] 68

Highland Engineering Co., Main & Urban, Westbury, L.I., N.Y., 24, 53, 57, 70
For details see ad on page 205

[illegible] Hi[illegible] Tools Co., 55 Ave. B, Hicksville, N.Y., 14, 60, [illegible]
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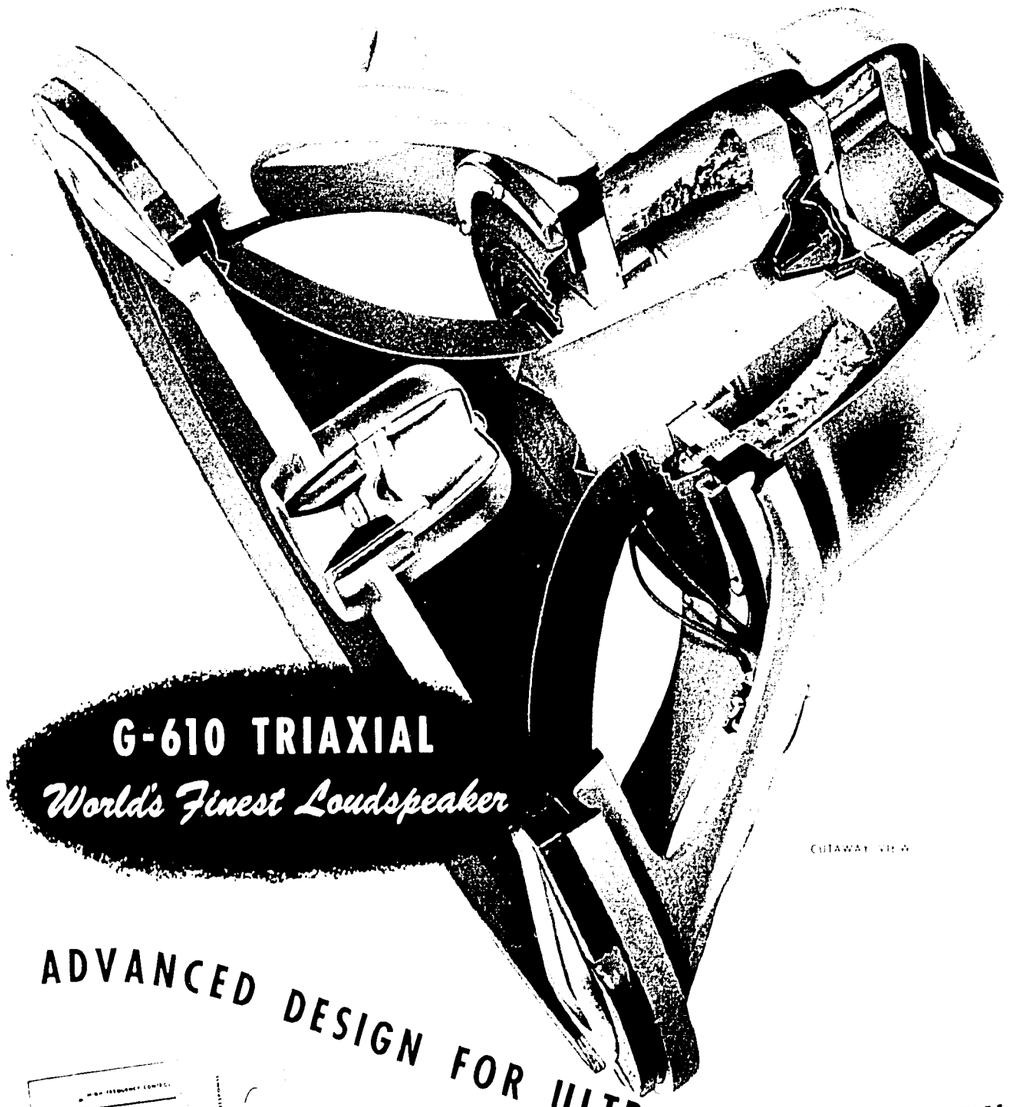

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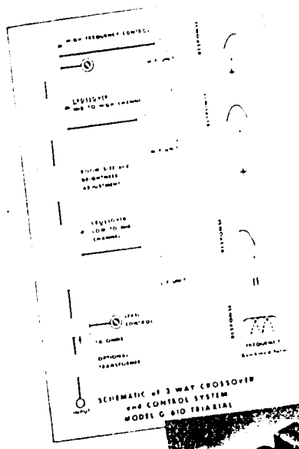
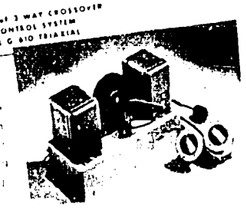


Crossover and Control Network is a separate chassis unit, with all connections for speaker and impedance adjusting transformer (if needed)



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[illegible] Instrument Co., Inc., 54 Lewis St., New York 13, N.Y., 15, 25, 28

[illegible] IV Avenue Corp., 854 Rosedale Ave., Chicago 15, Ill., 2

Hi-Test Chemical Corp., 722 64 St., Brooklyn 20, N.Y., 76
- details see ad on page 76

[illegible] Brothers, 3049 W. Belmont Ave., Chicago 18, Ill., 53

[illegible] Radio Corp., 37 E. 18 St., New York 3, N.Y., 5, 15, 17, 25, 52, 54, 71

Hogan, John V. L., 155 Perry St., New York 14, N.Y., 17
- details see ad on page 87

Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 1, 15, 27, 29, 35, 53, 54, 71
- details see ad on page 87

[illegible] Division, David E. Rist, Box 147, Del Rio, Calif., 17

[illegible] Audio Industries, 9215 Venice Blvd., Los Angeles 34, Calif., 37

[illegible] Recording Products Corp., 3 Rd., Freeport, L.I., N.Y., 56

[illegible] Printers, R. 12 & 12 St., Phila., Pa., 17

[illegible] Co., William L., 469 Atlantic Ave., Boston 10, Mass., 17, 18, 28, 43

[illegible] Co., Inc., A. C., 10 St. & 44 Ave., Long Island City 1, N.Y., 36, 75

[illegible] Machine Products Co., 1051 Conway Ave., Valley Stream, L.I., N.Y., 37

[illegible] son Laboratories, Inc., Office, 325, 332, 336, 51

[illegible] an Co., T. J., 2508 W. Lexington, Chicago 25, Ill., 14, 39, 59

[illegible] on Corp., The, 1801 W. Olympic Blvd., Los Angeles 64, Calif., 8, 13, 17, 25, 52, 54, 71, 75

[illegible] American Corp., 25 W. 43 St., New York 18, N.Y., 52, 54, 71

Hudson Radio & TV Corp., 43 W. 48 St., New York 7, N.Y., 22
- details see ad on page 100

[illegible] Wire Co., Winsted Div., 981 Main St., Winsted, Conn., 9

[illegible] Laboratories, 700 Hamilton Ave., Menlo Park, Calif., 17, 23, 35, 53, 72

[illegible] Aircraft Co., Florence Ave. at Teale St., Culver City, Calif., 35

Hughey & Phillips, Tower Lighting Div., 4 Beverly Blvd., Los Angeles 4, Calif., 3, 14, 23, 58, 64, 65
- details see ad on page 22

Hunter Corp., The, 453 Lincoln St., Carlisle, Pa., 20
- details see ad on page 91

[illegible] Liberty Mica Co., 171 Camden St., Boston 18, Mass., 32

[illegible] son, Guy C., 1100 W. Abram St., Arlington, Tex., 17

[illegible] Co., The, 11423 Vanowen St., North Hollywood, Calif., 14, 24, 27, 60

[illegible] Radio & Electronics Corp., 76 Lafayette St., Salem, Mass., 72

[illegible] Circuit Breaker Co., 1924 Hamilton St., Philadelphia 30, Pa., 14, 60

[illegible] Instrument Co., Inc., 1 Bergen Blvd., Ridgefield, N.J., 7

[illegible] Manufacturing Co., 4401 N. Broad St., Philadelphia 40, Pa., 60

[illegible] Mfg. Co., 1900 Prairie Ave., Chicago 16, Ill., 8, 67

Indiana Steel Products Co., Valparaiso, Ind., 36, 40

[illegible] Inductograph Products, Inc., 37-06 12 St., Long Island City 1, N.Y., 56

[illegible] Industrial Control Co., Straight Path & Arlington Ave., Dept. RD, Wyandanch, L.I., N.Y., 35, 41, 54, 67

[illegible] Instrument Resistors Co., 1 Jo. Commerce Ave., Union, N.J., 67

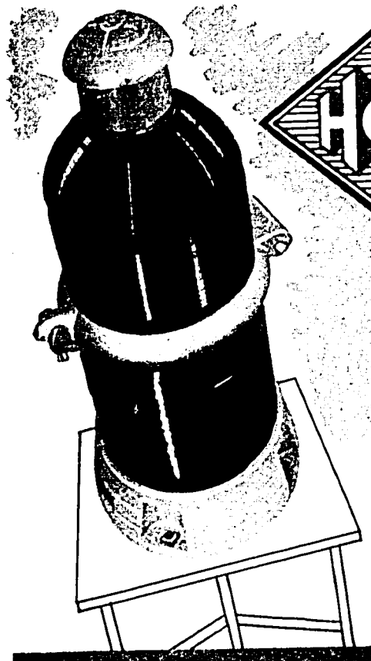
[illegible] Instrument Specialties Co., Inc., 7 Bergen Blvd., Little Falls, N.J., 7

[illegible] Insulation [illegible] Co., 1 St., P.O. Box 2, Pa., 32, 51

[illegible] IFD Manufacturing Co., Inc., 6058 19 Ave., Brooklyn 4, N.Y., 5, 9, 13, 15, 17, 24, 74

[illegible] Jennings Radio Mfg. Co., 970 McLaughlin Ave., P.O. Box 1278, San Jose 1, Calif., 3, 22, 58, 64

[illegible] Jensen Manufacturing Co., 6601 S. Laramie Ave., Chicago 38, Ill., 8, 67



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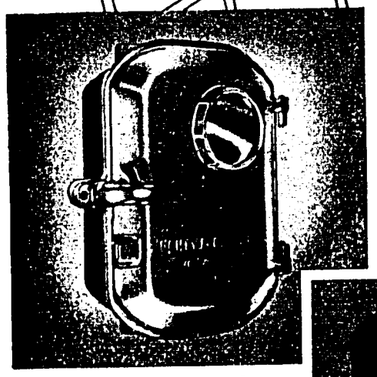
Everything Needed for any Tower, 150 to 900 feet!

H & P *Complete* Tower Lighting Kits include every item essential to the completed installation — every bolt and fitting... H & P Complete Lighting Kits, in today's critical market, will save you on purchasing, erection, and completion time... The H & P 300 MM Code Beacon (shown left) has 10 exclusive features, is CAA approved.



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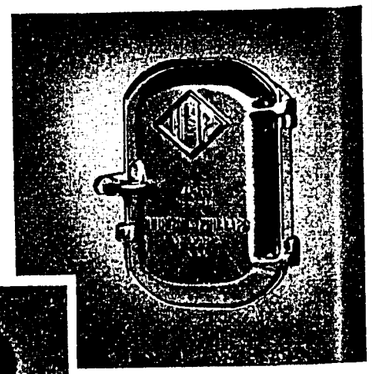
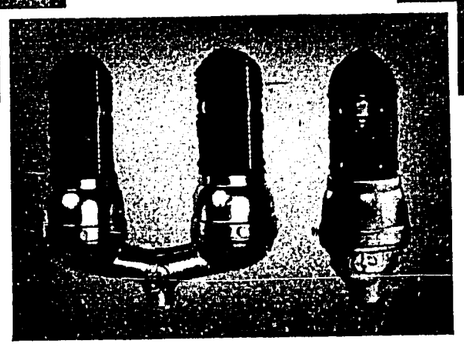
"PECA" Series Photo-Electric Control

Factory-set to turn lights on at 35 f.c.; off at 58 f.c. as specified by CAA. Low-loss circuit insulation. High-wattage industrial type resistors. Tube ratings well over operational requirements. Fail-Safe: if any parts fail in service, lights automatically turn on.

Single and double Obstruction Lights below

Bases ruggedly constructed of heavy aluminum alloy castings. Precision machining insures proper light center when used with specified lamp. Prismatic globes meet CAA light specifications. Relamping accomplished without removing prismatic globes. Mounting base designed for standard A-21 traffic signal lamps.





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Mercury Code Flasher

Only four moving parts which run in lifetime lubricated ball bearings. No contact points to wear out. Speed adjustment, 14 to 52 flashes per minute. Motor separately fused for continuous operation of lights in event of mechanical failure.

Sold only through jobbers and Tower Manufacturers.

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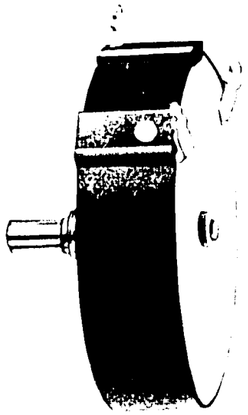

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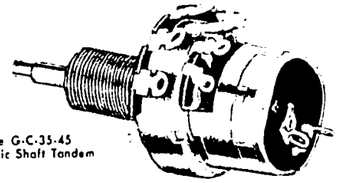

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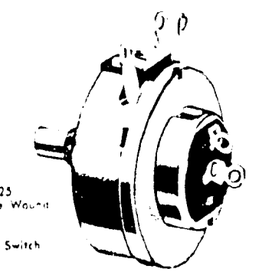
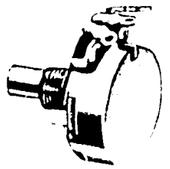
Type 25
4 Watt, Wire Wound

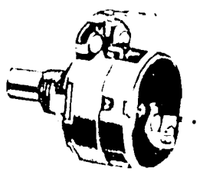
GC 25 with Switch

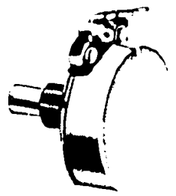




Type 45
15/16" Diameter,
Composition.

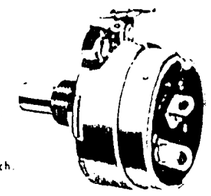
GC 45 with Switch.

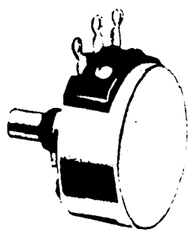




Type 35
1⅛" Diameter,
Composition.

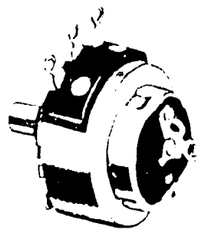
GC 35 with Switch.





Type 252
2 Watt, Wire Wound

GC 252 with Switch



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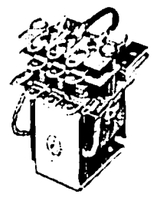

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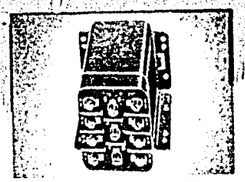

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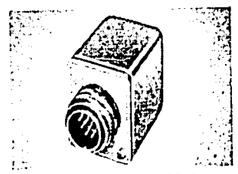
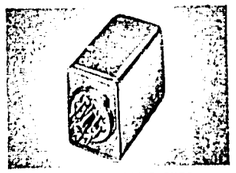


THE A. N. CONNECTOR TYPE

SERIES 395 RELAY



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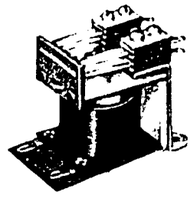

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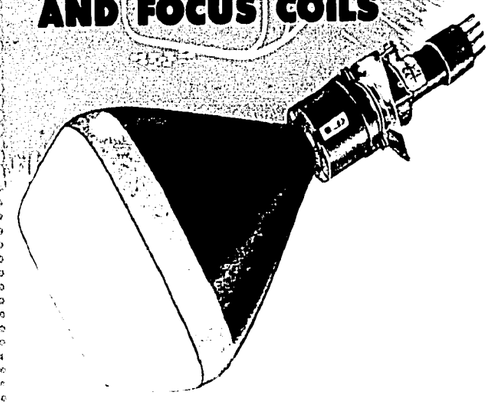

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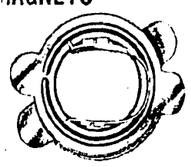
The Guardian Centering Magnet compensates magnetically for any misalignment of the electronic beam or the focus coil assembly. Eliminates manual adjustment of the raster.



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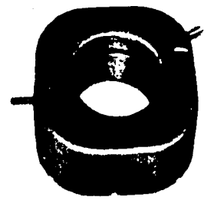

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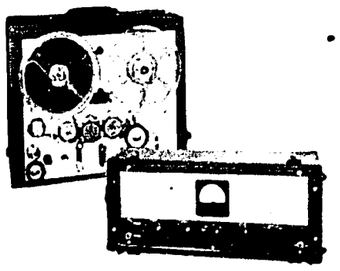

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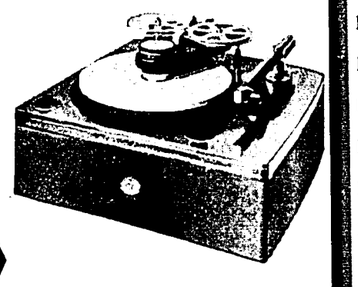

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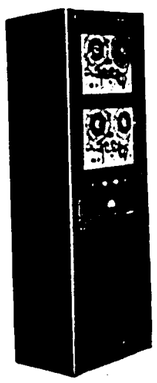

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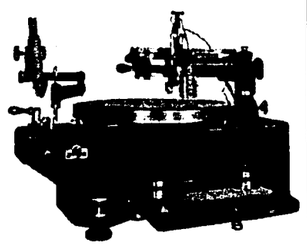

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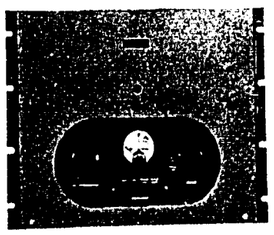

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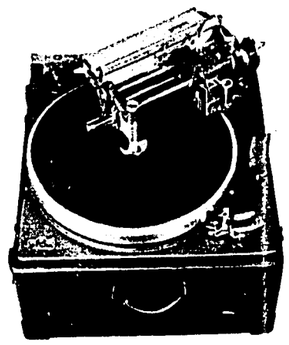

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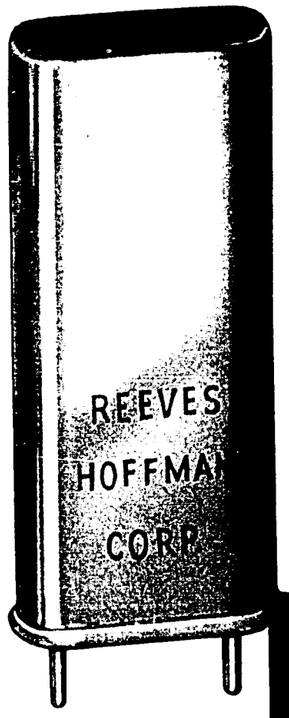

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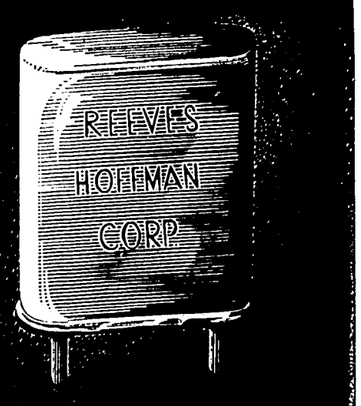

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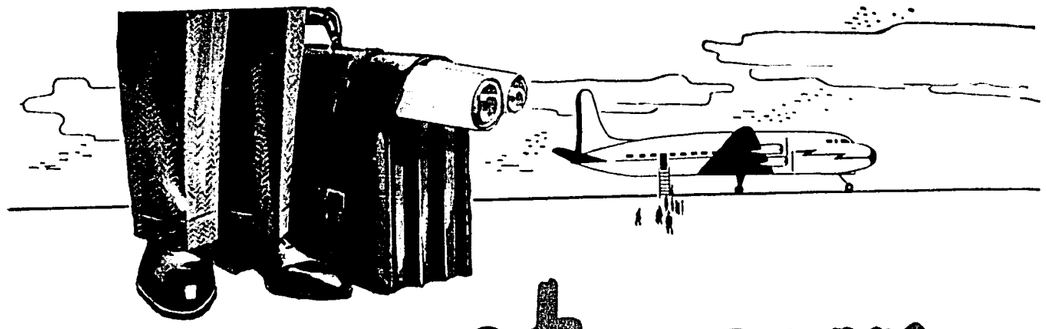

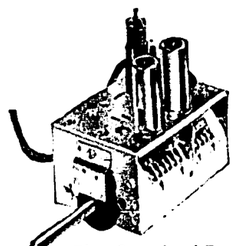

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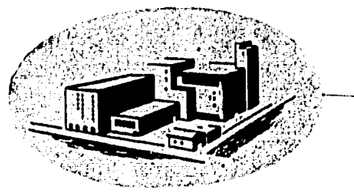

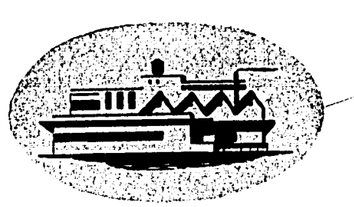

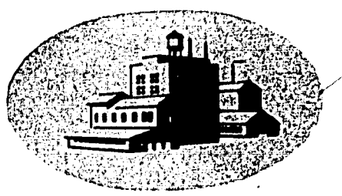

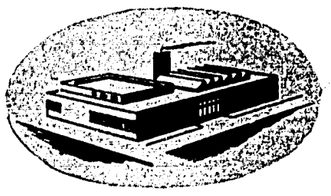

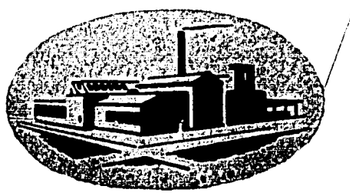

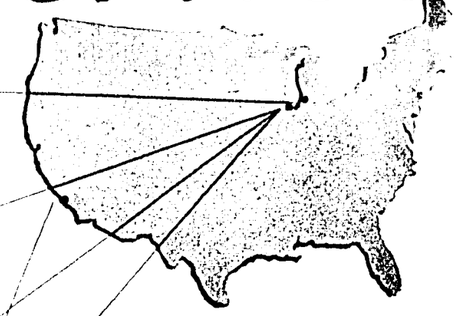

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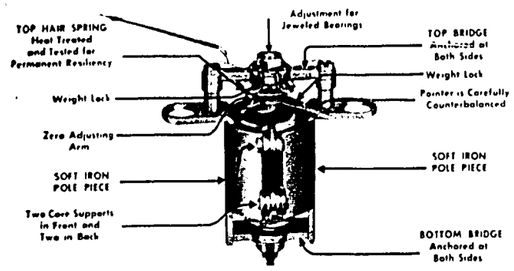

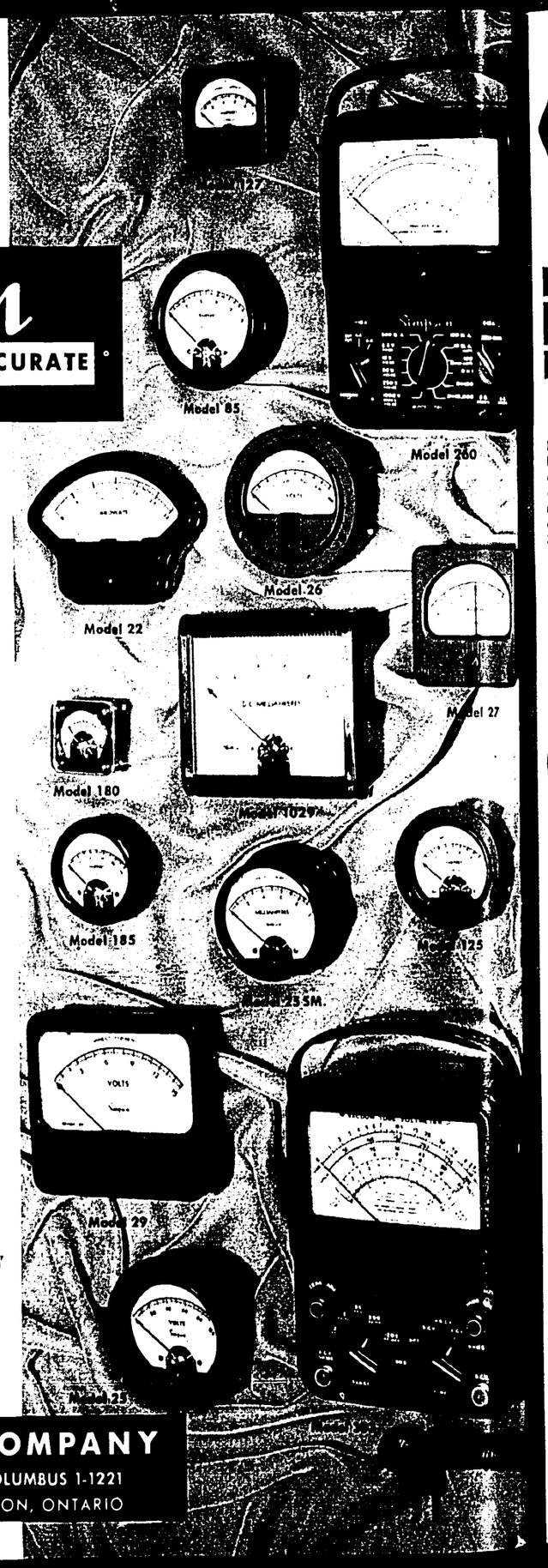

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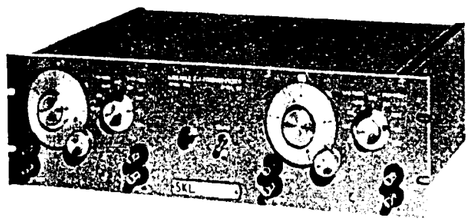
IN CANADA: BACH-SIMPSON, LTD., LONDON, ONTARIO

SKL The Finest In PRECISION EQUIPMENT

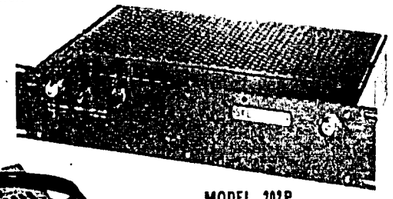


MODEL 302
Variable Electronic Filter

FEATURES

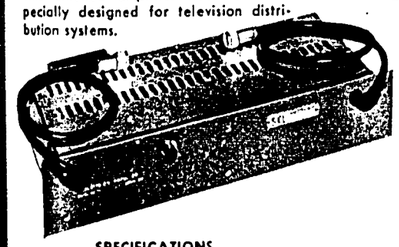
Cutoff Range: Continuously variable from 20 cps to 200 KC.
Sections: Two.
Function: High-pass, low-pass, band-pass.
Attenuation Rates: Band-pass max. 18 db per octave. Series max. 36 db per octave.
Insertion Loss: 0 db.

Providing a continuous choice of cutoff frequencies from 20 cps to 200 KC, the Model 302 Variable Electronic Filter consists of two identical filter sections. Each section has 18 db per octave attenuation. A range switch selects either high or low-pass operation and, when the sections are in series, a band-pass connection. An insertion loss of 0 db and a low noise, well-regulated power supply make the Model 302 ideal for use in the aircraft, automotive, moving picture and radio broadcasting industries as well as in many general laboratory applications. Also available: the Model 300 single-section Variable Electronic Filter.



MODEL 212TV—Amplifier

This untuned amplifier has been especially designed for television distribution systems.



SPECIFICATIONS

Bandwidth: 40 to 225 MC.
Gain: 20 db.
Impedance: 52 or 72 ohms unbalanced.
Response: ± 2 db from 50 to 220 MC.
Power Supply: 115 volts, 60 cycles.

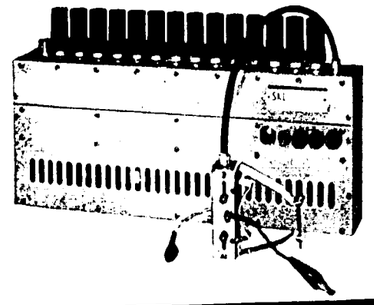
MODEL 202P
Wide-Band Chain Amplifier

A two-stage, traveling wave amplifier designed for high speed pulse amplification.

SPECIFICATIONS

Bandwidth: 100 KC to 200 MC.
Voltage Gain: 20 db.
Impedance: 200 ohms.
Risetime: Less than .003 usec.
Response: ± 1.5 db from 100 KC to 200 MC.
Power Supply: Stabilized, 115 volts, 60 cycles.
Connectors: Standard Type N.
Also available: the Model 200A single-stage, the Model 202 dual-stage.

Designed for use with cathode ray tubes, high speed counters, and other pulse circuits requiring high driving voltages, the Model 214 Chain Pulse Amplifier has a maximum output voltage of 125 volts with a risetime of less than .006 usec. More than one inch of deflection on a cathode ray tube can be obtained for the viewing of high speed pulses. The input impedance of 180 ohms is provided so that the Series 200 Wide-Band Chain Amplifiers may be used where additional gain is required. Supplied with a special output termination at the end of 15" of cable, the input connector is a standard type N for convenient coupling to associated equipment.



MODEL 214
Chain Pulse Amplifier

FEATURES

Response: 40 KC to 100 MC, ±1½ db — 50 KC to 80 MC.
Output Voltage: 125 volts max.
Pulse Gain: 30 db.
Input Impedance: 180 ohms.
Rise Time: Less than .006 usec.
Connector: Standard type N.
Power Supply: 115 v., 60 cyc.

SKL SPENCER-KENNEDY LABORATORIES, INC.
181 MASSACHUSETTS AVE., CAMBRIDGE 39, MASS.

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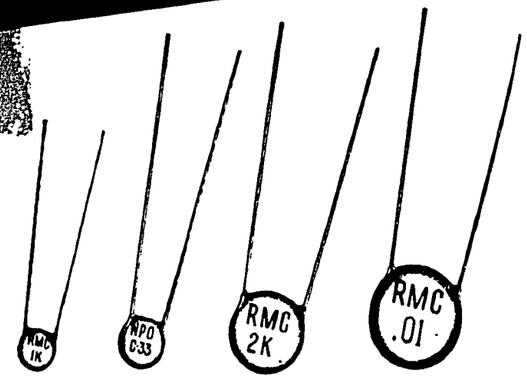
RMC CERAMIC DISCAPS

. . . THE MONEY-SAVING REPLACEMENT FOR MICA AND CERAMIC TUBULAR CONDENSERS

RMC DISCAPS are approved and used by leading manufacturers of TV sets and tuners, radio receivers and high frequency electronic equipment. In addition to their lower cost, they offer the advantages of small size, low self inductance, low power factor, high working voltage, greater mechanical strength and faster production line handling.



TYPE B DISCAPS

GMV By-Pass Series

Type B DISCAPS are the finest high frequency by-pass capacitors available and are engineered to exceed guaranteed minimum capacity at 85° C with 250 applied V.D.C. Capacity change between room temperature and 65° C is only +18%,—0%. Available in all standard capacities from .001 MFD to .02 MFD and in a number of dual capacity types.

SPECIFICATIONS

POWER FACTOR.....1.5% at 1 KC
WORKING VOLTAGE.....600 V.D.C.
TEST VOLTAGE.....1200 V.D.C.
INSULATION. Durez Phenolic—Vacuum Waxed
RESISTANCE.....Initial 7500 Megohms
After Humidity 1000 Megohms
LEADS.....#22 Tinned Copper (.026 DIA.)
CAPACITY TOLERANCE.....GMV

TYPE C DISCAPS

NPO and TC

Type C DISCAPS are ideally suited to coupling and tuned circuit applications. Their capacity will not change under voltage. Available in a wide range of capacities and temperature coefficients conforming to the RMA specifications for Class I ceramic condensers.

SPECIFICATIONS

POWER FACTOR.....
Less than .1% at 1 Megacycle
WORKING VOLTAGE.....600 V.D.C.
TEST VOLTAGE.....1200 V.D.C.
INSULATION.....
Durez Phenolic—Vacuum Waxed
RESISTANCE.....Initial 7500 Megohms
After Humidity 1000 Megohms
LEADS #22 Tinned Copper (.026 DIA.)
CAPACITY TOLERANCE....
±5%, ±10%, ±20%

TYPE D DISCAPS

STABLE CAPACITY

Specify Type D DISCAPS when a more stable capacity is required for coupling and by-passing filter networks. Available in a capacity range between 150 MMF and 5000 MMF. They feature a very small capacity change between +25° C and +85° C.

SPECIFICATIONS

POWER FACTOR.....1% at 1 KC
WORKING VOLTAGE.....600 V.D.C.
TEST VOLTAGE.....1200 V.D.C.
INSULATION.....
Durez Phenolic—Vacuum Waxed
RESISTANCE.....Initial 7500 Megohms
After Humidity 1000 Megohms
LEADS...#22 Tinned Copper (.026 DIA.)
CAPACITY TOLERANCE....
±20% at + 25° C

Every DISCAP Is 100% Tested for Capacity, Leakage Resistance and Breakdown

RMC production checks eliminate costly service failures. Because RMC produces the complete condenser, even to the processing of the dielectric element itself, it is possible to exercise the finest quality control. If you are interested in improving the uniformity of your product you will be interested in RMC DISCAPS.

SEND FOR SAMPLES AND TECHNICAL DATA

DISCAP CERAMIC CONDENSERS

RMC

RADIO MATERIALS CORPORATION

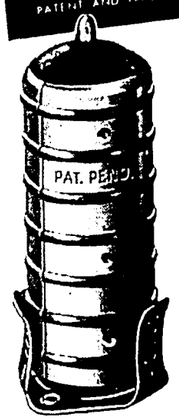
GENERAL OFFICE: 3325 North California Avenue, Chicago 18, Illinois

FACTORIES AT CHICAGO, ILL. AND ATTICA, IND.

Two RMC Plants Devoted Exclusively to Ceramic Condensers

The New STAVER MINI-SHIELD

PATENT AND TRADE MARK REG. PEND



The shield that fits all Miniature Tubes

A flexible shield that snugly fits all miniature tubes because it compensates for all variations in tube dimensions. Mini-Shields are made for both T5½ and T6½ bulb tubes. Send for catalog sheet.

The New STAVER MINI-SPRING

PATENT AND TRADE MARK REG. PEND

Available! Special Improved Types for Military Apparatus

Gives support two ways—Keeps pressure downward and gives sideway support. The spring action is constant and resilient permanently. Send for catalog sheet.

THE Staver COMPANY INCORPORATED

91 PEARL STREET • BROOKLYN 1, N. Y.

ULSTER 5-6303

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These leading TV set makers use Sylvania Picture Tubes

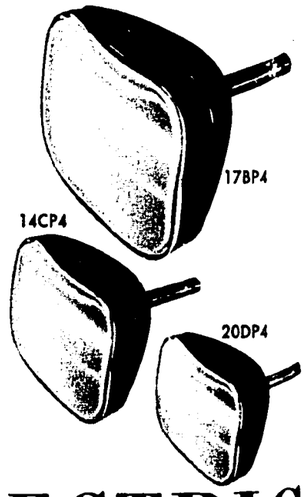
We're PROUD of this picture!

Today's sales picture shows that 75% of the leading television set manufacturers use Sylvania picture tubes.

This popularity is no accident. It's based on a sure foundation of outstanding performance. For, Sylvania picture tubes have won their prized position through years of research and quality production techniques developed during more than a quarter of a century of leadership in radio, electronics, and lighting.

Remember, too, when you choose Sylvania picture tubes, you choose products of nationally recognized excellence . . . products that carry prestige and sales appeal when listed among your sets' specifications.

Send today for new folder giving complete descriptions and ratings of all Sylvania TV Picture Tubes. Simply write a postal card to Sylvania Electric Products Inc., Dept. R-6351. Emporium, Penna. *Sylvania Representatives are also located in all foreign countries. Names on request.*



SYLVANIA ELECTRIC

RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS; TELEVISION SETS

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Transformer Specialty Co., 328 Rockhill Rd., Bala-Cynwyd, Pa., 1, 53, 57, 70, 74

Transicoil Corp., 107 Grand St., New York 13, N.Y., 1, 30, 45

Servo Amplifiers & Gear Trains
For details see ad on page 55

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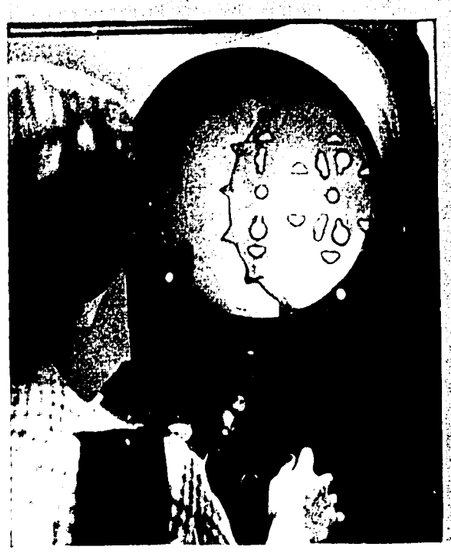
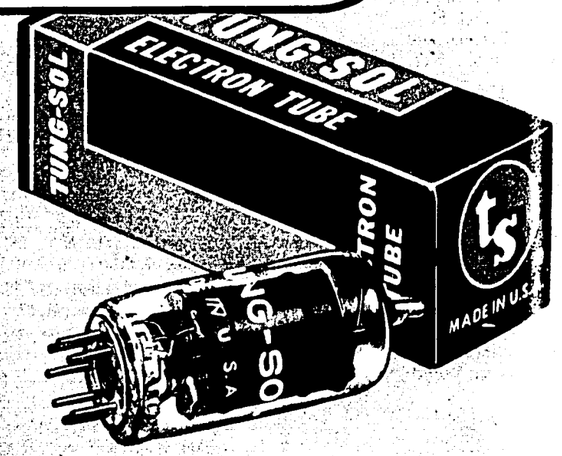
ONE STANDARD – *The best that can be made* –
For Initial Equipment and Replacement

TUNG-SOL
RADIO, TV TUBES, DIAL LAMPS





Optical comparator is used to check mica disc specifications to thousandth-inch accuracy.

TUNG-SOL ELECTRIC INC., Newark 4, N. J.—Sales Offices: Atlanta
Chicago • Dallas • Detroit • Los Angeles • Newark

Trav-ler Corp., Refrigerator Div., 3257 N. New York 26, N.Y., 47, 55
Triangle Equipment Mfg. Co., 35 Hudson St., New York 14, N.Y., 52, 53, 54, 59, 71
Triplett Elec. Instr. Co., 286 Harmon Rd., Bluffton, Ohio, 41, 48, 58, 67, 69
Triplett, S.W. 7, England, 9, 25, 35
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Turntable Case Corp., 320 W. 1st Ave., Mt. Vernon, N.Y., 5
Twin Transformer Mfg. Co., 2254 Second Blvd., Los Angeles 34, Calif., 17, 70
Tyrrell Products Co., 1558 N. Ashland Ave., Chicago 22, Ill., 2, 25, 35
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Ungar & Barton, Inc., 581 N. Lake St., Burbank, Calif., 17
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United Tubes, 369 Shunk Lane, Philadelphia 28, Pa., 9
United Wire Co., The, 459 Watertown St., Newtonville 60, Mass., Pg. 25, 50, 62, 64
Universal, George, 413-15 Market St., Newark 5, N.J., 58, 64
Universal Electric Tool Co., Inc., 615 Durfee St., Los Angeles 54, Calif., 38
Universal Switch Corp., Div. W. L. Maxson, 460 W. 34 St., New York 1, N.Y., 64
Universal Wire Products, Inc., 1048 Potomac St., N.W., Washington 7, D.C., 13
Universal Zipper Fastener Corp., 31 Ames St., Cambridge 42, Mass., 62, 64
University Catalog Publishers, Inc., 110 La Salle St., New York 13, N.Y., 7
University Condenser Corp., 337 E. 139 St., New York 54, N.Y., 10
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University Electrical Tool Co., 1050 Findlay St., Cincinnati 14, Ohio, 38
United States Gasket Co., Teflon Products Div., 612 N. 30 St., Camden 2, N.J., 50, 51, 62
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United States Steel Supply Co., Pacific Coast Dist., 1 Sansome St., San Francisco 4, Calif., 2, 3
United Transformer Co., 150 Varick St., New York 13, N.Y., 4, 34, 36, 37, 70
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Universal Mfg. Co., Inc., 404 Hillside Ave., Hillside, N.J., 14, 28
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Utah Radio Products Co., 1123 S. Hoover St., Los Angeles 6, Calif., 34, 37
Utica Drop Forge & Tool Co., 2200 Court St., Utica 4, N.Y., 2

V-I-P Electronic Products, Box 1, Lenox, Mass., 7
V-M Corp., 33 E. Front St., Benton Harbor, Mich., 49
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Watson Machine Co., 1 Watson Ave., Stratford, Conn., 42, 48, 72
Watson-Stillman Co., 192 Fair St., Roselle, N.J., 2
Watts Regulator Co., 1 Lowell St., Lawrence, Mass., 2

WORKSHOP antennas

A Complete Line for all High-Frequency Bands

COMMERCIAL		GOVERNMENT
AMATEUR	RADIO RELAY	RADAR
TELEVISION	MICROWAVE RELAY	GUIDED MISSILE OR ROCKET-BORNE
FM	STL RELAY	COMMUNICATION AND NAVIGATION
EMERGENCY SERVICES	TV RELAY	

The WORKSHOP line covers all bands from 28 mc. up. Our standard antennas fit the majority of applications, but where special situations must be met, slight modifications in design usually accomplish the desired result.

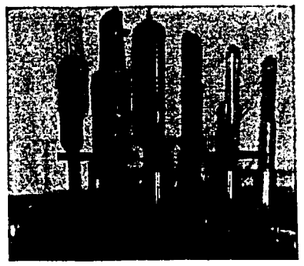
Engineering and Contract Service. The WORKSHOP handles scores of special government and commercial antenna problems every year from design through production. With our new plant and greatly expanded facilities, we are able to handle a larger proportion of this type of contract work than ever before.

TYPE and USE	MODEL NO.	FREQUENCY (MCS.)	GAIN* (DB.)	HALF POWER ANGLE E Plane*	H Plane*
PARABOLIC For radio, microwave, STL and TV relay, radar, and communications.	940	920– 960	19.0–28.0	19.75–7.8	17.75–6.9
	2000	1990–2110	27.0–34.5	10.28–3.65	9.2 –3.25
	6075	5925–6225	36.0–42.0	3.24–1.47	2.86–1.32
	6725	6575–6875	36.8–42.8	2.79–1.47	2.50–1.32
	7275	7125–7425	37.0–43.0	2.70–1.36	2.42–1.21

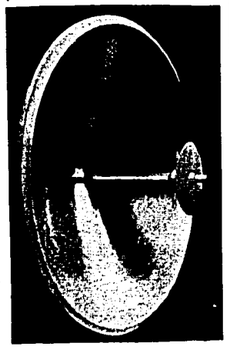
* Gain and Half Power Angles are dependent on size of parabolas, — 4, 6, 8 or 10 foot diameter.

				Horizontal	Vertical
DIRECTIONAL and BI-DIRECTIONAL For police, highway patrol, railway, forestry, utilities, oil fields.	33C	29.5–36.5	7.8	64°	68°
	40C	36.5–43.5	7.8	64°	68°
	47C	43.5–50.5	7.8	64°	68°
	74C	72–76	7.8	64°	68°
	144C	140–146	7.8	64°	68°
	149C	146–152	7.8	64°	68°
	155C	152–157	7.8	64°	68°
	160C	157–162	7.8	64°	68°
	165C	162–168	7.8	64°	68°
	171C	168–174	7.8	64°	68°
BEACON For fire, police, taxicab, aeronautical, and private fleet communications.	2HW	108–144	2.7	31°	
	3HW-B	144–152	4.2	24°	
	3HW-A	152–162	4.2	24°	
	3HW-2	162–174	4.2	24°	
	6HW-A	450–460	8		
	6HW-B	460–470	8		

TELEVISION	A	3-element, high gain (5 db.), directional; a model for each TV channel.
	2A	Two series A's spaced ½ wave apart, connected by cable harness.
	VV	All-channel, high gain, sharp directivity, patented.
	2VV	Double-stacked VV for higher gain, distant reception.
AMATEUR		A complete line for 2, 6, 10 meters and UHF.



A representative group of high-precision radar antennas.

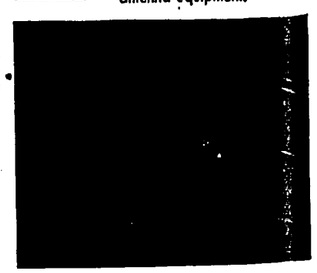


Standard Parabolic Relay Antenna for Studio-to-Transmitter Link on 920-960 mc. band.

Left — High-Gain Beacon Antenna. Recommended by all 152-162 mc. equipment manufacturers. Hundreds are in use throughout the country.

Below — WORKSHOP DUBL-VEE Television Antenna, double-stacked.

Below — 10 over 20 Stacked Array — the last word in amateur antenna equipment.



CABLE FITTINGS AND ACCESSORIES

Model T-72 Matching Transformer. Matches 72 ohm coaxial cable such as RG-59/U to 300 ohm receivers. Voltage step up of 2 : 1, with a flat response over the TV channels from 52-216 mcs. A W-50 solderless cable connector is furnished. Size 2 inches long, 1-inch diameter.

Model T-300 Exterior Matching Transformer. Completely weatherproof device for converting 72 ohm antennas for use with inexpensive 300 ohm Twin Lead transmission line at reasonable efficiency. Can also be used with 300 ohm antennas to realize benefits of 72 ohm coaxial cable.

Model W-50 Silver Plated Solderless Cable Connector (Male). Used with RG-59/U coaxial cable. Specially slotted to withstand considerable strain. Mates with W-60 receptacle (on R-4A switch) and W-80 junction listed below.

Model W-60 Silver Plated Chassis Receptacle (Female). Mates with W-50 cable connector. For chassis or panel mounting. Threaded stem ⅓ inch long. Soldering terminal protrudes from rear.

Model W-80 Silver Plated Cable or Panel Junction (Female). Mates at either end with W-50 male connector. A complete splice requires one W-80 junction and two W-50 connectors which must be ordered separately.

Model W-100 Cable Adaptor. Required when changing from larger size RG-11/U or RG-8/U to smaller RG-59/U coaxial cables. No soldering necessary. W-50 cable connector furnished.

Model R-4A New Coaxial Switch (SP4T). This virtually lossless, constant impedance switch will connect any one of four single-channel TV antennas to a receiver. By simply using additional switches it can also be used for demonstrating any number of TV receivers in a display room, or for low-level audio applications. Size — 2⅝ inches front to back; 2-inch diameter.

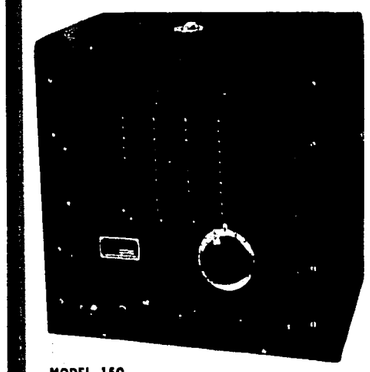
If your product or service requires high-frequency antennas—research, design, test, or production—get in touch with the WORKSHOP. Write, or phone Needham 3-0005. No obligation.

THE WORKSHOP ASSOCIATES

DIVISION OF THE GABRIEL COMPANY

135 CRESCENT ROAD, NEEDHAM HEIGHTS 94, MASSACHUSETTS

KEYBOARD OSCILLATOR SPECIFICATIONS



MODEL 150

This oscillator covers a range from 1 to 100,000 cycles with decades of pushbuttons. It has excellent frequency stability and its output is of low distortion. The instrument is especially useful for checking of filters, since it enables the user to explore a small portion of the curve in detail. For similar reason it has wide applications in tachometry and vibration analysis. Its wide frequency coverage facilitates testing of audio and carrier equipment. Due to its high accuracy and stability, it is commonly used for checking the accuracy of beat-frequency oscillators.

Its outstanding features are:

Ease and speed of frequency selection.

Ease and accuracy of repeating previous settings.

Ability to vary frequency in small steps over a wide range.

On both lower ranges, the frequency is selected by the use of 4 decades of pushbuttons. On the top range, 3 decades of pushbuttons are used together with a continuous control.

Separate trimming controls for each range are readily accessible in the rear. It is possible to track any part of a range against external standards, if an increased accuracy is required over a portion of that range.

Frequency Range: .3 to 100,000 cycles. Range 1—1 to 1,000 cycles in steps of .1 cycles. Range 2—1,000 to 10,000 cycles in steps of 1 cycles. Range 3—10 to 100 kilocycle in steps of 100 cycles, also a continuous fine control covering plus or minus 1% adjustable to 1 cycle.

Frequency Accuracy: 1 to 99.9 cycles, .5% plus .2 cycles. 100 to 999 cycles, .2%. 1,000 to 9,999 cycles, .3%. 10 to 100 kilocycles, 1%.

Frequency Stability: After 30 minutes warm-up, drift less than .02% per hour if room temperature stays within plus or minus 5°F.

Total Distortion: Less than .5% from 20 to 100 cycles. Less than .3% from 100 to 20,000 cycles, for loads above 2,000 ohms.

Output Impedance: One side grounded, internal generator impedance less than 150 ohms, connected to output through 250 MFD coupling condenser, terminals in rear for addition of external coupling condenser.

Panel Finish: Standard black crackle.

Power Requirements: 105-125 volts, 60 cps., 80 watts.

Size: Without cabinet—width 19", height 17.5", depth 13".

Weight: Net 90 lbs., packed for domestic shipment 200 lbs.

Weinschel Engineering Co.

919 JESUP BLAIR DRIVE
SILVER SPRING, MD.

SHEPHERD 4231

Alphabetical Directory

(Continued from page 45)

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L. S. THEES
General Sales Manager

W. L. ROTHENBERGER, Manager, Sales Operations
M. J. CARROLL, Manager, Equipment Sales
R. H. SIEMENS, Manager, Receiving Tube & Kinescope Sales
C. E. BURNETT, Manager, Industrial Tube Sales
H. B. WILSON, Manager, Electronic Components Sales
C. W. TAYLOR, Manager, Tube Parts & Machinery Sales

H. S. GWYNNE, Ass't to General Sales Manager
D. R. OZSVATH, Ass't to Manager, Equipment Sales
R. L. KELLY, Manager, Field Application Engineering
G. R. RIVERS, Manager, Government Sales
G. H. MYERS, Manager, Customer Relations

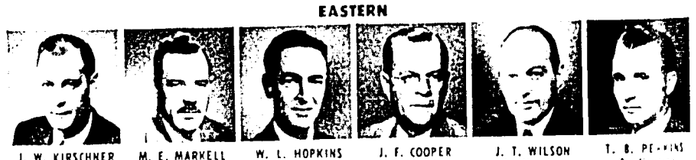
Headquarters Group

to solve your tube and component problems

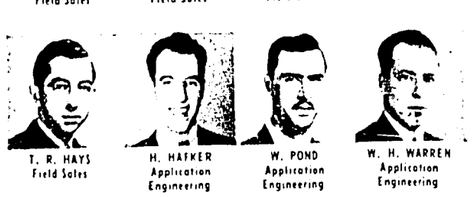
CENTRAL

L. D. KIMMEL, Field Sales
W. HIEATT, Field Sales
D. R. YODER, Field Sales

EASTERN



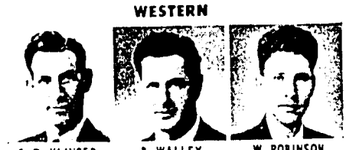
J. W. KIRSCHNER, Field Sales
M. E. MARKELL, Field Sales
W. L. HOPKINS, Field Sales
J. F. COOPER, Field Sales
J. T. WILSON, Application Engineering
T. B. PERKINS, Application Engineering



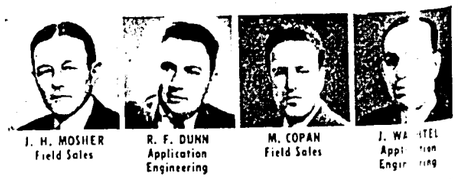
T. R. HAYS, Field Sales
H. HAFKER, Application Engineering
W. POND, Application Engineering
W. H. WARREN, Application Engineering

H. F. MACKENZIE, Application Engineering
G. D. HANCHETT, Application Engineering
G. W. DUCKWORTH, Application Engineering
C. P. VOGEL, Application Engineering
J. H. HAGREN, Application Engineering

WESTERN



C. R. KLINGER, Field Sales
B. WALLEY, Application Engineering
W. ROBINSON, Application Engineering



J. H. MOSHER, Field Sales
R. F. DUNN, Application Engineering
M. COPAN, Field Sales
J. WALTEL, Application Engineering

L. T. WEAGLE, Tube Parts & Machinery Sales
R. E. NELSON, Field Sales, Gov't
W. D. LEAHY, Field Sales, Gov't
M. SPEVACK, Field Sales, Gov't

At your service – *when* and *where* you want them – these seasoned experts devote their time exclusively to the problems of equipment manufacturers and government agencies.

In addition, the service of three completely equipped application engineering laboratories, in Harrison, N. J., Lancaster, Pa., and Chicago, Ill., are at the disposal of all RCA tube and component customers. Through these laboratory facilities, equipment manufacturers can avail themselves of RCA's extensive engineering skills and tube and component experience.

RCA maintains conveniently located district offices in Harrison, Chicago, and Los Angeles. To put RCA's sales and engineering organization to work for you, phone the nearest office* . . . or write RCA, Commercial Engineering, Section 44FR, Harrison, New Jersey.

*(EAST) Humboldt 5-3900, 415 S. 5th St., Harrison, N. J. (MIDWEST) Whitehall 4-2900, 589 E. Illinois St., Chicago, Ill. (WEST) Trinity 5611, 420 S. San Pedro St., Los Angeles, Calif.

RADIO CORPORATION of AMERICA

ELECTRON TUBES — **HARRISON, N. J.**

Part Three—1951

The Business and Product Sections of this Directory are included for the service of IRE 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.

Grateful acknowledgement is made to the nearly 3000 firms who so helpfully cooperated by answering our detailed questionnaires, and to the 260 advertisers whose informative advertising, and financial investment in space has made this project possible.

Parts 2 through 5 have been prepared by the Advertising Department, plan and make-up by William C. Copp; supervision Lillian Petranek; research, Frank G. MacAloon; IBM data Florence Diciedue. Part 4 includes information supplied by NEDA and The Reps. All product data is from questionnaires, Product News Stories and salesmen's reports received in 1950 and 1951, and firms not answering within 18 months of publication have been omitted for the sake of accuracy.

An index to Advertisers follows immediately on page 49.

The complete code to products is given on pages 50 and 51 together with cross-references and sub-classifications. The major product class numbers are shown after each firm name in the alphabetical list. Sub-classifications are shown by number after each firm name in the product index, giving much more detail than shown in earlier IRE DIRECTORIES. Addresses are not given for nonadvertisers, but full sub-classifications are shown and the state address is given for identification. Turn to the Part 2 Alphabetical List for addresses.

How to Use the Machol Edge Index

INSTRUCTIONS

1. Place the four fingers of your RIGHT hand back of the last page of this book.
2. Place your RIGHT thumb just below the 1 or 2 line symbol adjacent to the section you want.
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MACHOL EDGE INDEX (PATENT APPLIED FOR)

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3	Antenna Acces.	
4	Attenuators	
5	Batteries	
6	Blowers & Fans	
7	Books, Publishers	
8	Cabinets Consoles	
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10	Capacitors: Fixed	
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12	Ceramics	
13	Chassis & Racks	
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16	Connectors	
17	Consult. Eng'rs	
18	Converters	
19	Cores & Core Mat.	
20	Crystals	
21	Crystal Holders	
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39	Magnets	
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76	Waxes & Seals	
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	Advertisers Indexes	

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:

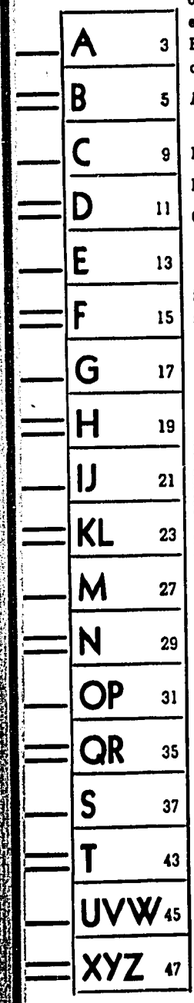
Advertisers Index, pages 49, 219 and inside back cover.

Key to Products (full) 50 & 51.

Index to Spreads & Catalogs, 224.

Guide to Machol Thumb Indexes facing 48 & 49

The Machol system will help you find both alphabetical and product sections swiftly.



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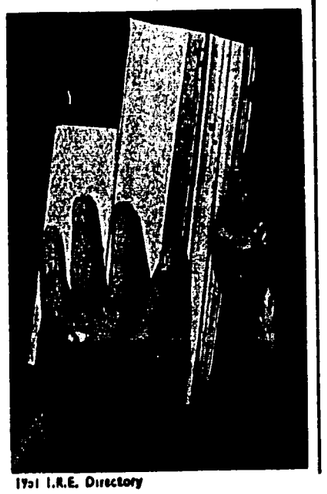

1951 I.R.E. Directory

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 Parts of the IRE DIRECTORY are:

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2	Company List of Radio-Electronic Manufacturers	3
3	Product Index of Engineering Equipment and Parts	49 & 108
4	The Radio-Electronic Distribution Field (Class 22)	93
5	Catalogs and Complete-Data-Spreads Section	224

—Advertisers Index—Cover III, 49 & 219—

Part 2

2932 firms have supplied us voluntarily with information about the components, equipment and services which they render the radio-electronic industry. The 1899 manufacturers are listed alphabetically in this section beginning on page 1 and ending on page 48. 1033 non-manufacturers such as distributors and representatives are listed under heading 22 in the product index section. This index therefore gives the names of manufacturers of specific products available for purchase, with their addresses and code numbers indicating 73 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 1952 edition.

Part 3

The Product Indexes start on page 53 and continue through 218. 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 advertisers of a given product, let us say "Amplifiers" look this product up in the table facing page 48. You will see that it is classification Number 1. A full listing of Amplifier manufacturers starts on page 53. Turn to this classification in part 3.

Part 4

As a service to engineers, both buyer and seller, we have included a list of 1033 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 #22, starting on page 93.

There are several other helpful indexes. Advertisers are given on Cover III (inside back cover) and page 49; and an index to 1951 Radio Engineering Show Exhibitors, and "Proceedings of the I.R.E" Advertisers is on page 219.

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. An innovation this year is the inclusion of numbers for sub-classifications in the Product Indexes for all firms listed. We have tried vigorously to make this truly a useful "Radio Engineers Directory."

Part 5

Part 5 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 double page spreads of their products (see pages 225-250). This is followed by a complete catalog file supplied by 14 manufacturers. These catalogs are filed in alphabetical order. 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.

Please submit all changes, corrections, additions and classification questions to Industry Research Div. c/o Proceedings of the I.R.E, 303 West 42nd St., New York 18, N.Y.

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MULTIPLANE MOUNTINGS—

isolate vibration from all directions. Light in weight, small in size, they are widely used to mount electronic units.

PLATE FORM MOUNTINGS—

Standard—isolate steady vibrations. Shock-resistant—easily installed. Loads ½ to 320 pounds per mount.

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Standard—for steady vibration and severe shock. Have great radial stability. Loads from ½ to several thousand pounds.

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Isolate steady vibration . . . cushion shock. Good for mobile equipment.

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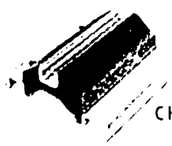

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have exceptional torsional flexibility . . . accommodate parallel and angular misalignment. Ratings from 1 fiftieth to 1 hp.

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protect small meters and instruments from destructive vibration. One piece construction, easily installed . . . many sizes for most commonly used models.

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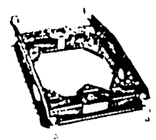
For Airborne Electronic Equipment

- Designed for use with JAN-C-172A cases.
- Exceed AN-E-19 drop test requirements.
- Maintain efficiency from −80° to +250° F.

*Temperature-proof



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Maximum Protection for Airborne

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1 Broadcast Speech Equipment
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7 Photograph Preamplifiers equalized
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10 PA Systems
11 Recording Amplifiers
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Amplifiers

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Affiliate of GENERAL CERAMICS & STEATITE

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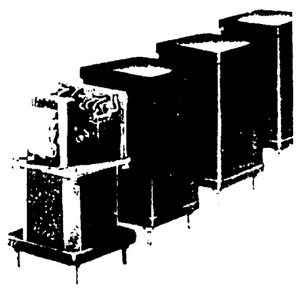

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- Push-Pull or Single
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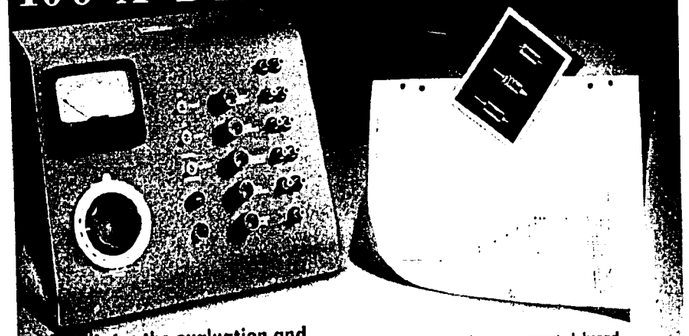

- Facilitates the evaluation and adjustment of servo performance in the laboratory and on the production line.
- Determines transient and frequency response of a servo loop or its components.
- Measures phase and amplitude as functions of frequency; damped natural frequency, and first overshoot.

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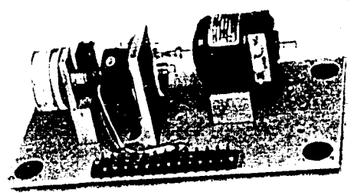

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RANGE OF DATA FREQUENCIES: 1 CPM TO 50 CPS.

RANGE OF CARRIER FREQUENCIES: 50 TO 2500 CPS.

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Components and Test Equipment

CARRIER FREQUENCY AMPLIFIERS
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410-B SERVO AMPLIFIER

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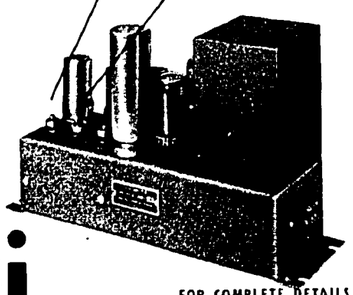

- A 60 cycle, carrier frequency servo amplifier.
- Drives 2 phase motor with 5 watt mechanical output.
- Features independent controls on damping, gain, and carrier phase.
- A stock item with universality of application because of its range of adjustment.

FOR COMPLETE DETAILS WRITE DEPT. RD

IC co. INDUSTRIAL CONTROL CO.

WYANDANCH LONG ISLAND NEW YORK

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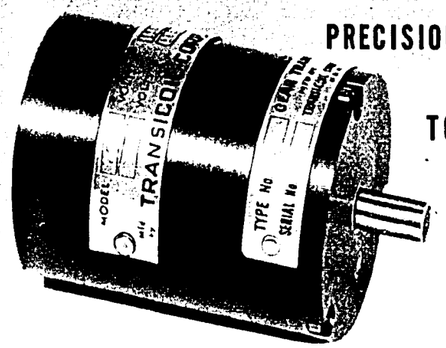
TRANSICOIL



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CONTROL MOTORS

Transicoil Servo Control Motors are 2-phase units, available for either 60-cycle or 400-cycle operation, in sizes from fractions of a watt to 10 watts mechanical output. They are precision assembled to operate under difficult conditions. Manufactured to your phase voltage requirements—line operation or plate-to-plate. Plate-to-plate types are a Transicoil development that has reduced weight and size. Moreover, they eliminate the need for output transformers.

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Designed for operation in electronic equipment in which a variable voltage output must be proportional to a shaft speed having the same frequency as the supply. Output voltage is linear over an extended range. Low residual voltage, as a function of the design, enhances the performance of associated components. Induction generators also furnished with motor gear trains as a complete assembly when desired.

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There are no fixed restrictions when you use Transicoil Servo Amplifiers! You specify such characteristics as: phase voltage, reduction rate, mounting, gain, phase shift, input impedance, and damping. We confine standardization to physical dimensions! Electromechanical feedback loops can also be built up with Transicoil components.

NOW! GREATLY EXPANDED FACILITIES

To meet the fast-growing demand for its products, Transicoil has recently tripled its production facilities. As in the past, there will be no "standard" Transicoil components. Each unit is designed, electrically and mechanically, to match your specifications *exactly*. Engineering representatives in leading cities. They will be happy to give you information on any specific problem.

TRANSICOIL CORPORATION
107 Grand Street New York 13, N.Y.

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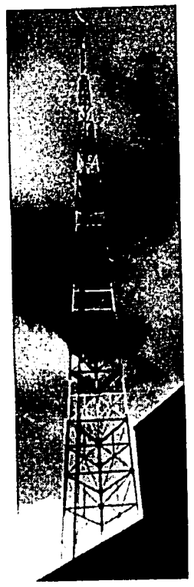
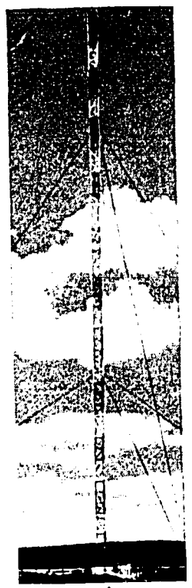
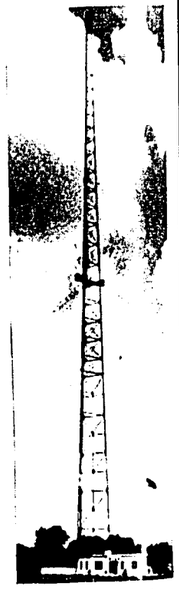
TRUSCON... a name you can build on



WOW, Omaha, Nebr., Truscon Self-Supporting Radio Tower, 590 feet high overall.

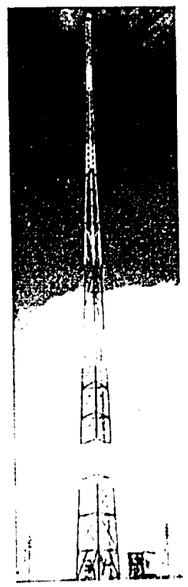


WHDH, Boston, Mass. Three Truscon Guyed Towers; 505 feet, 605 feet, and 645 feet high.



WSAM AM-FM, Saginaw, Mich. Truscon Self-Supporting Tower, 386 feet high.

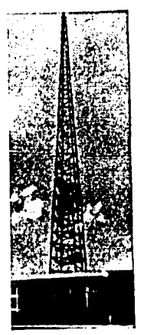
world leader in better radio tower engineering



KAA-284, Owatonna, Minnesota, Northern Natural Gas Co. Truscon Self-Supporting Tower, 260 feet high.

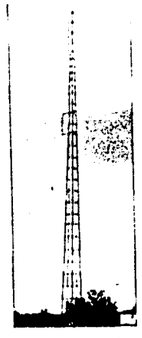
Truscon experience in radio tower engineering is world wide... meeting all types of topographical and meteorological conditions... and supplying many different tower types—guyed or self-supporting ...tapered or uniform in cross-section ...for AM, FM or TV transmission.

Your phone call or letter to any convenient Truscon district office, or to our home office in Youngstown, will bring you immediate, capable engineering assistance. Call or write today.



WXEL-TV Cleveland, Ohio. Truscon Self-Supporting Tower, 437 feet high.

WTCH, Shawano, Wisconsin. Truscon Self-Supporting Tower, 240 feet high.



WMRI-FM, Marion, Indiana. Truscon Self-Supporting Tower, 336 feet high.

WEMP-FM, Milwaukee, Wisconsin. Truscon Self-Supporting Tower, 456 feet high.

TRUSCON® STEEL COMPANY Youngstown 1, Ohio

Subsidiary of Republic Steel Corporation

Amplifiers

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- TRYLON Vertical Radiators
- Micro-wave relay towers
- Complete antenna systems with switching units
- Communications antenna supports ... and dozens of special items

Hundreds of installations in all parts of the world, under all conditions of use attest to Trylon Tower dependability. As specialists in antenna supports for over 18 years, Trylon offers a broad, time-tested line of standard units plus complete facilities for the economical production of special types and designs.

Write for literature on any desired type—or, better yet, outline your antenna support problem for recommendation by Trylon specialists.

Trylon Towers are made only by

WIND TURBINE CO.

WEST CHESTER, PA

TRYLON

2. Antennas.

1 AM Broadcast.
2 Dummy.
3 FM Broadcast.
4 Miscellaneous.
5 Receiving Types.
6 Relay Systems.
7 Television Broadcast.
8 TV Multiple Outlet distribution Systems.
9—UHF-VHF.

A B Metal Products Ltd., England, 4, 5, 7
Aeronautical Communic. Equip., Inc., Fla., 2
Airborne Instruments Lab., Inc., N.Y., 4, 9
Airtron, Inc., 105 E. Elizabeth Ave., Linden, N.J., 2
For details see ad on page 217
Alab, Inc., R.I., 5
American Communications Corp., N.Y., 8
American Electroneering Corp., The, Calif., 9
American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 4, 5, 9
For details see ad on page 4
American Quartz Labs., Inc., N.Y., 5, 6
Amy, Aceves & King, Inc., N.Y., 5, 8
Andrew Corp., Ill., 3, 4, 6, 7
Antenna Research Lab., Inc., Ohio, 2, 4, 9
Apex Products, N.Y., 6
Bart Labs. Co., Inc., 227 Main St., Belleville, N.J., 4
See complete catalog listed alphabetically in last section
Bassett, Inc., Rex, Fla., 4
Belden Manufacturing Co., Ill., 5
Bendix Radio Communications Div., E. Joppa Rd., Towson 4, Md., 4
Bendix Avia. Corp. Friez Instr. Div., 1400 Taylor Ave., Baltimore 4, Md., 4
Bird Electronic Corp., Ohio, 2, 9
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Bone Engineering Corp., Calif., 9
Brach Mfg. Corp., N.J., 1, 2, 3, 5, 8, 9
Bremer Electronics, N.J., 9
Brown, Boveri, & Co., Ltd., Switzerland, 1, 2, 3, 6, 7, 9
Buggie & Co., H. H., Ohio, 4
Camburn, Inc., N.Y., 2, 4, 5, 8, 9
Campbell Mfg. Co. Ltd., Canada, 4, 5, 8
Canadian General Elec. Co. Ltd., Canada, 1, 3, 7
Canoga Corp., Calif., 4, 9
Central Rediffusion Services Ltd., England, 6, 8
Channel Master Corp., N.Y., 4, 5
Circle-X Antenna Corp., N.Y., 3, 6
Clear Beam Antenna, Calif., 5, 9
Coil Winders, Inc., N.Y., 2, 4
Collins Radio Co., 855 35 St. N.E., Cedar Rapids, Iowa, 3, 5, 9
For details see ad on page 226-7
Communication Coil Co., Ill., 6
Communication Measurements Lab., Inc., N.Y., 7
Communication Products Co., Inc., N.J., 4
Communications Co., Inc., Fla., 4, 9
Consolidated Wire & Assoctd Cos., Ill., 4, 5
Cornell-Dubilier Elec. Corp., 1000 Hamilton Blvd., South Plainfield, N.J., 1, 3-5, 7, 9
For details see ad on page 74
Crown Engineering, N.Mex., 5, 8
Dalmo-Victor, Inc., Calif., 4, 6
Dorne & Margolin, N.Y., 9
Dumont Labs., Inc., Allen B. TV Transmitter Div., Bldg. 16, 1000 Main Ave., Clifton, N.J., 6, 9
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Electro Craft, Inc., Conn., 9
Electronic Products Co., Ill., 9
Electronic Research & Mfg. Corp., Ohio, 4
Elk Electronics Labs., 333 W. 52 St., New York 19, N.Y., 2, 4, 5
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Emsco Derrick & Equipment Co., Calif., 1
Federal Electric Mfg. Co. Ltd., Canada, 3, 4, 6, 9
Federal Enterprises, Inc., Ill., 4
Federal Telecommunication Labs., 500 Washington Ave., Nutley 10, N.J., 7
Federal Telephone & Radio Corp., Selenium & Intelin Div., 100 Kingsland Rd., Dept. F7104, Clifton, N.J., 9
For details see ad on page 232-3
Ferro-Co., Corp., N.Y., 4
Flader, Inc., Frederick, Ohio, 4
Frequency Standards Corp., P.O. Box 66, Eatontown, N.J., 9
For details see ad on page 195
G. W. Associates, Calif., 1, 2
Gadgets, Inc., Ohio, 5
Gates Radio Co., Ill., 1, 2
Gavitt Manufacturing Co., Inc., Mass., 1
General Cement Mfg. Co., Ill., 4
General Elec. Co., Electronics Dept., N.Y., 2, 6, 7, 9
General Lab. Associates, Inc., N.Y., 4
Gibbs Mfg. & Research Corp., Wis., 4
Gon-Set Co., Calif., 4, 7, 9
Gutlman & Co., Inc., Edwin I., Ill., 1, 5
Hi-Lo TV Antenna Corp., Ill., 4, 5, 8, 9
Houston-Fearless Corp., Calif., 6
Industrial Dev. Eng'rg. Assoc., Inc., Ind., 4, 9
Industrial Precision Products, Ill., 4, 7
Insuline Corp. of America, N.Y., 5
Int'l. Derrick & Equip. Co., Ohio, 1
Jerrold Electronics Corp., Pa., 8
Johanson Mfg. Co., N.J., 4
Johnson Co., E. F., Minn., 4
Jones Electronics Co., M. C., Conn., 2
Keller Products, Inc., N.H., 7
Kennedy & Co., D. S., Mass., 4
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 2, 4, 9
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Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y., 2, 9
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Lear, Inc., Mich., 4
Lear, Inc., Calif., 9
Leonard Electric Products Co., Inc., N.Y., 2, 4
Lingo & Son, Inc., John E., N.J., 1, 3, 4, 7
Link Radio Corp., N.Y., 3, 5
Louis Brothers, Calif., 5
McCarter Radio & TV Co., Canada, 4, 5, 9
Mark Products Co., Ill., 4, 5, 9
Martin Co., Glenn L., Electr. Section, Md., 4, 9
Maryland Electronic Mfg. Corp., Md., 4
Melpar, Inc., Va., 6, 9
Metal Products Co., Tenn., 2
Metal Textile Corp., 653 E. First Ave., Roselle, N.J., 4
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Microlab., N.J., 2, 4, 9
Microwave Dev. Labs., Inc., Mass., 9
Motorola Inc., Comm. & Elec., Ill., 5, 9
Mullard Electronic Prods. Ltd., England, 4
National Electronic Mfg. Co., N.Y., 4, 5
Ohmite Mfg. Co., Ill., 4
Palmer, Inc., M. V., Wash., 9
Peerless Products Industries, 812 N. Pulaski Rd., Chicago 51, Ill., 5
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Philco Corp., Pa., 4
Philson Mfg. Co., Inc., N.Y., 1, 3, 5, 7
Polarad Electronics Corp., N.Y., 4
Polk Electronic Co., N.Y., 7
Polytron Corp., N.Y., 1
Porter Mfg. Co., Ill., 5
Premax Products Div., Chisholm Ryder, N.Y., 4, 5, 9
Press Wireless Mfg. Co., Inc., N.Y., 2
Presto Electric Co., Inc., N.J. 2
Product Development Co., Inc., N.J., 6
Pye Ltd., Radio Works, England, 9
Radiart Corp., The, Ohio, 5, 9
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RCA Eng. Prod. Div., Camden, N.J., 1, 3-9
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Radio Merchandise Sales, Inc., N.Y., 5
Radio Specialty Mfg. Co., Ore., 9
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Robberson Marine Radio, N.Y., 4
Rosen Eng'ng. Prods., Inc., Raymond, 32 & Walnut St., Philadelphia 4, Pa., 4, 9
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Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 9
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Self Winding Clock Co., Inc., N.Y., 5
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Sierra Electronic Corp., Calif., 6
Smallwood Ltd., S. G. Canada, 5
South River Metal Prod. Co., Inc., N.J., 5
Southwest Technical Lab., N.Mex., 2, 9
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 2, 4, 9
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Square Root Mfg. Corp., N.Y., 2, 4, 5, 7, 9
Stainless, Inc., Pa., 1, 3, 6, 8
States Co., The, Conn., 4
Tech Laboratories, Inc., N.J., 8
Technical Appliance Corp., N.Y., 4, 5, 8
Technicraft Laboratories, Inc., Conn., 6
Tele-Dale Distributing Co., Ohio, 7
Television Equipment Corp., N.Y., 8
Television Labs., Inc., Ill., 3, 5, 7
Telrex, Inc., 26 Neptune Highway, Asbury Park, N.J., 5, 9
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Truscon Steel Co., Albert St., Youngstown 1, Ohio, 1
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Walworth Co., Inc., N.Y., 9
Ward Products Corp., The, Ohio, 2, 4, 5, 6, 9
West Coast Electronics Co., Calif., 4, 5, 6
Wind Turbine Co., 248 E. Market St., West Chester, Pa., 1, 3-6
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Workshop Associates, Div. Gabriel Corp., 135 Cresecent Rd., Needham, Mass., 3-6, 9
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3. Antenna Accessories.

1—Feeder Systems.
2—Insulators.
3—Phasing & Tuning Equipment.
4—Support Towers.
5—Tower Lighting Equipment.

American Lava Corp., Cherokee Blvd. & Mfrs. Rd., Chattanooga 5, Tenn., 2
For details see ad on page 2
American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 1, 2
For details see ad on page 4
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E-I-W ENGINEERED
COMMUNICATION TOWERS
FOR ALL PURPOSES
Designed and Fabricated to your Specifications
SELF-SUPPORTING OR GUYED

Tower Division
ELIZABETH IRON WORKS, Inc.
Engineers, Fabricators, Erectors—FOUNDED 1907
BOX 360 ELIZABETH, NEW JERSEY

Antenna Accessories

(Continued from page 55)

Anchor Industrial Co., Andrew Corp., Ill., 1, 3, 5
Asheville-Schoonmaker Mica Co., Va., 2
Barker & Williamson, Inc., 237 Fairfield Ave. PR-751, Upper Darby, Pa., 3
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Blaw Knox Co., Pa., 4
Bone Engineering Corp., Calif., 1
Brach Mfg. Corp., N.J., 1
Brand & Co., William, Conn., 1
Bud Radio, Inc., Ohio, 4
Camburn, Inc., N.Y., 1, 2
Canadian Porcelain Co., Canada, 2
Citation Products Co., N.Y., 2
Coil Winders, Inc., N.Y., 2, 3
Collins Radio Co., 855 35 St. N.E., Cedar Rapids, Iowa, 3, 5
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Continental Electronics Mfg. Co., Texas, 3
Diamond Mfg. Co., Mass., 3
Dresser Equipment Co., Ideco Div., Ohio, 4
Electronic Mechanics, Inc., 68 Clifton Blvd., Clifton, N.J., 2
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Elizabeth Iron Works, Inc., P.O. Box 360, Elizabeth, N.J., 4, 5
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Emsco Derrick & Equipment Co., Calif., 4
Federal Electric Mfg. Co. Ltd., Canada, 3
Ferro-Co. Corp., N.Y., 4
Flader, Inc., Frederick, Ohio, 2
Gates Radio Co., Ill., 1-5
Gee-Lar Manufacturing, Ill., 2
General Cement Mfg. Co., Ill., 2
General Electric Co., N.Y., 5
Gon-Set Co., Calif., 1
Hartenstine-Zane Co., Inc., N.Y., 4
Hughey & Phillips, Tower Lighting Div., 4075 Beverly Blvd., Los Angeles 4, Calif., 5
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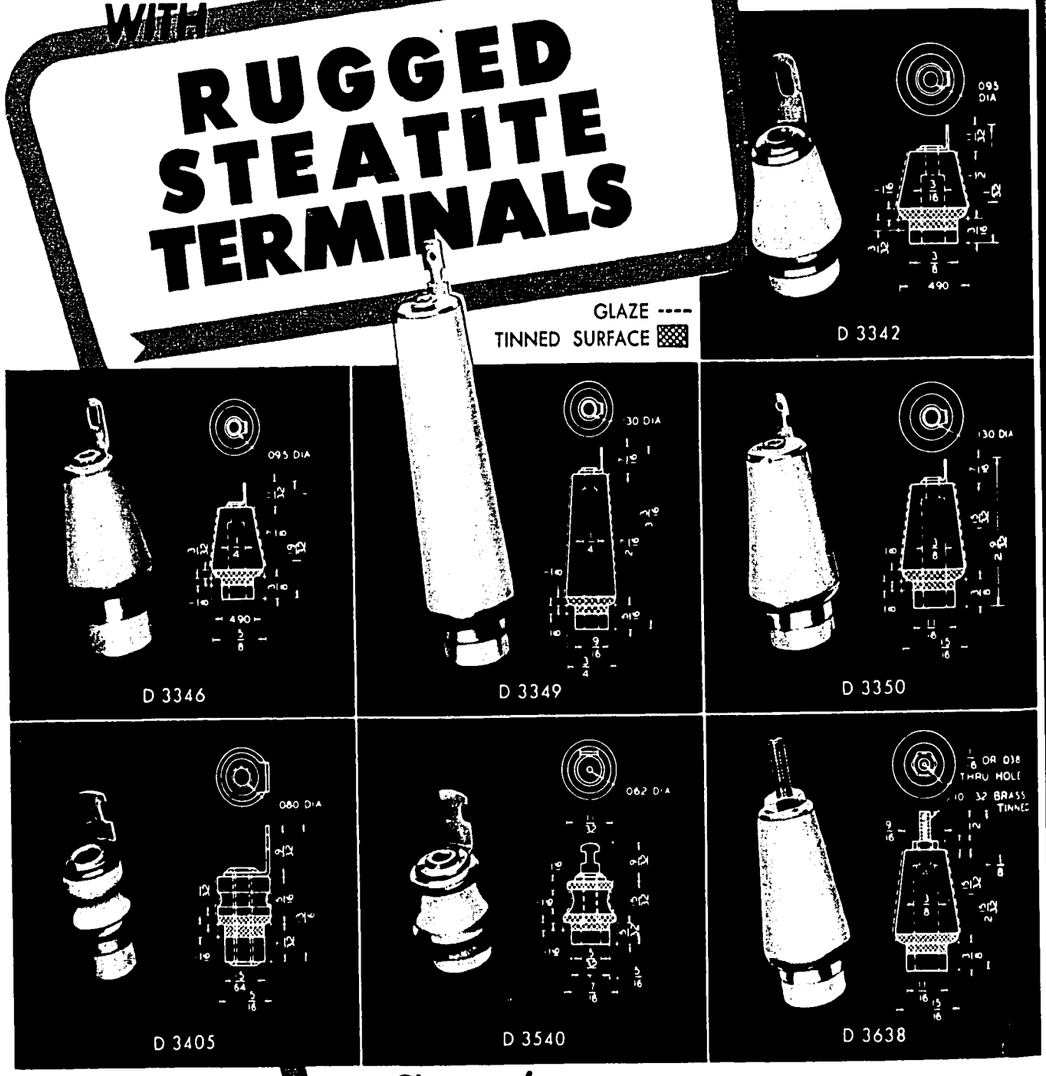
Industrial Devices, Inc., N.J., 2
Industrial Precision Products, Ill., 2
Insuline Corp. of America, N.Y., 2
Intl. Derrick & Equip. Co., The, Ohio, 2, 4, 5
Isolantite Mfg. Corp., N.J., 2
JFD Manufacturing Co., Inc., 6154 16 Ave., Brooklyn 4, N.Y.,
For details see ad on page 119
Jacobs, Charles F., N.Y., 2
Johnson Co., E. F., Minn., 2, 3
Keller Products, Inc., N.H., 4
Keystone Electronics Co., N.Y., 2
Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y., 1, 3
For details see ad on page 244-5
(Continued on page 61)

Solve your Hermetic Seal Problems WITH RUGGED STEATITE TERMINALS

GLAZE ----
TINNED SURFACE ▩



STEATITE OFFERS:

EASY ASSEMBLY
SUPERIOR STRENGTH
NON-DETERIORATION
PERMANENT SEALING
RESISTANCE TO HEAT
EXTREMELY LOW-LOSS

Specify General Ceramics and Steatite for complete dependability in critical applications

General Ceramics low-loss Steatite sealed leads feature superior mechanical strength that insures permanent, positive hermetic sealing under practically any operating condition. Immune to severe thermal shock, they are easily soft-soldered to closures without developing the strains that are an incipient cause of trouble in many other types of leads. There are no rubber or plastic gaskets to deteriorate. Resistance to mechanical shock and vibration is excellent. The types shown are standard and can be supplied promptly from stock. For complete information on these and for consultation on custom-made terminals to your specification, phone, call or write today.

General CERAMICS AND STEATITE CORP.
Telephone Perth Amboy 4-5100
GENERAL OFFICES and PLANT: KEASBEY, NEW JERSEY

MAKERS OF STEATITE, TITANATES, ZIRCON PORCELAIN, FERRAMICS, LIGHT DUTY REFRACTORIES, CHEMICAL STONEWARE, IMPERVIOUS GRAPHITE

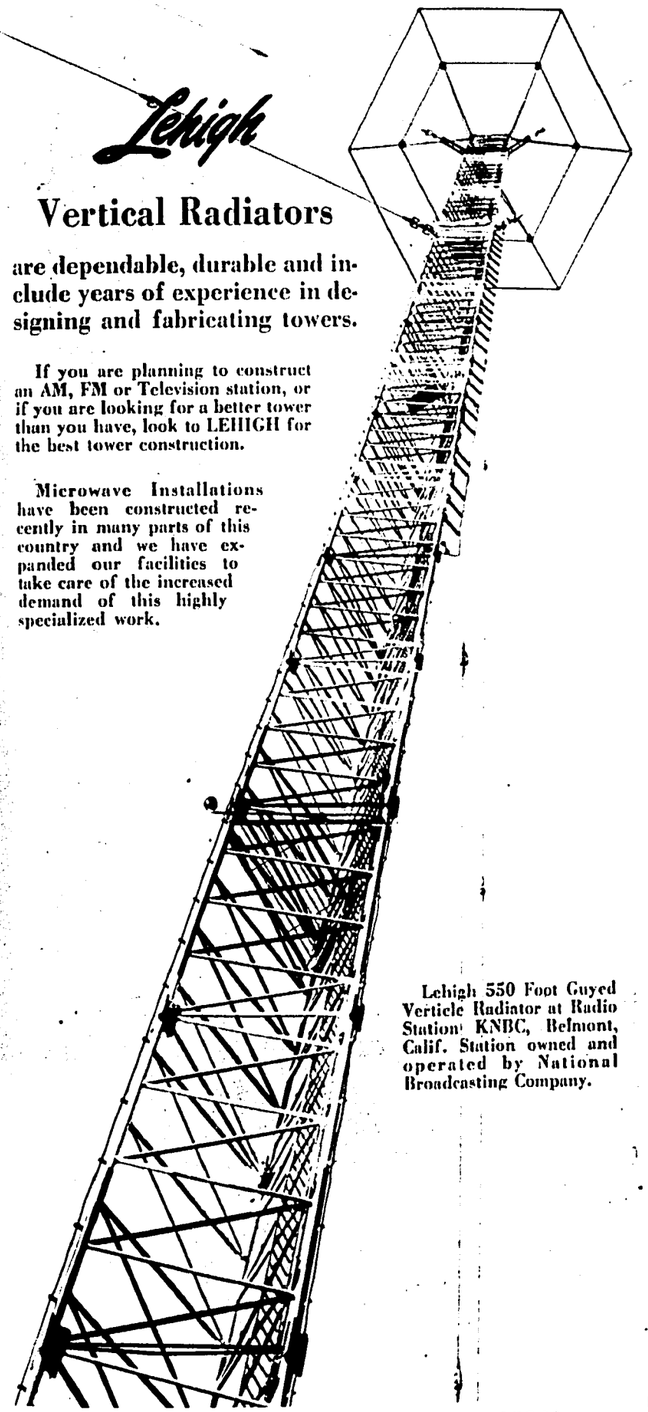
Lehigh

Vertical Radiators

are dependable, durable and include years of experience in designing and fabricating towers.

If you are planning to construct an AM, FM or Television station, or if you are looking for a better tower than you have, look to LEHIGH for the best tower construction.

Microwave Installations have been constructed recently in many parts of this country and we have expanded our facilities to take care of the increased demand of this highly specialized work.



Lehigh 550 Foot Guyed Verticle Radiator at Radio Station KNBC, Belmont, Calif. Station owned and operated by National Broadcasting Company.

Consult Radio Division (established 1932)

Lehigh Structural Steel Co.
17 Battery Place, New York 4, N. Y.

Telephone WHitehall 4-1424 • Plant at Allentown, Pa., Offices in Principal Cities

Antenna Accessories

(Continued from page 59)

Lapointe-Plascomold Corp., Conn., 4
Lehigh Structural Steel Co., 17 Battery Pl., New York 4, N.Y., 4
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Microlab, N.J., 3
Millen Mfg. Co. Inc., James, Mass., 2
Miller Co., J. W., Calif., 5
Mueller Electric Co., Ohio, 2
Philco Corp., Pa., 1
Pickard and Burns, Inc., Mass., 1, 2
Polk Electronic Co., N.Y., 3
Porcelain Products, Inc., Ohio, 2
Premax Products Div., Chisholm Ryder, N.Y., 2
Product Development Co., Inc., N.J., 1, 4, 5
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 1, 3
RCA Eng. Prod. Div., Camden, N.J., 1, 3, 4, 5
Radio Merchandise Sales, Inc., N.Y., 2
Redifon Ltd., England, 1, 3
Rostan Corp., N.Y., 4
Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 3
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Russell & Stoll Co., Inc., N.Y., 5
Sierra Electronic Corp., Calif., 3
Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y., 2
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Southwest Technical Lab., N.Mex., 3
Square Root Mfg. Corp., N.Y., 3
Stainless, Inc., Pa., 4
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 2
For details see ad on page 64
Technical Appliance Corp., N.Y., 1, 2
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Tele-Dale Distributing Co., Ohio, 4
Telrex, Inc., 26 Neptune Highway, Asbury Park, N.J., 3
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Wind Turbine Co., 248 E. Market St., West Chester, Pa., 1, 2, 4, 5
For details see ad on page 57

4. Attenuators.

1—Audio Frequency. 2—Radio Frequency. 3—Microwave Attenuators.

A. R. E. Products, Inc., Ill., 2
American Electroneering Corp., Calif., 2
Atlas Coil Winders, Inc., 392 State St., Stamford, Conn., 1
For details see ad on page 80
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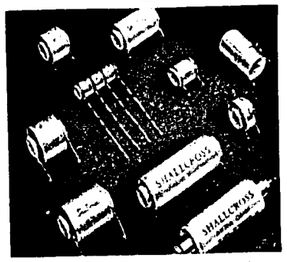
SHALLCROSS

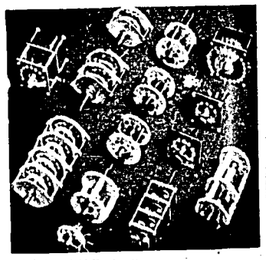


AKRA-OHM PRECISION RESISTORS

Not only are Shallcross Akra-Ohm wire wound precision resistors made to extremely close tolerances; equally important, they are physically protected to maintain their accuracy under difficult operating conditions. Types, shapes, sizes, and mounting styles for JAN and other exacting needs. Guaranteed tolerances from 0.1% to 0.02% and stabilities as low as 0.003% where required. Matched pairs and sets available. Write for Shallcross Resistor Bulletin R3A.

MULTI-POSITION SELECTOR SWITCHES

Shallcross regularly manufactures a wide variety of single or multi-deck selector switches having up to 180 positions and designed for dependable performance up to 250 volts 10 amperes or 2500 volts 1 ampere A.C. Contact resistance ranges from a low of 0.0005 ohms to a maximum of 0.005 ohms depending upon the size and material of the contacts. Outline your requirements on Specification Sheet No. 6 for recommendation. Write for Data Bulletin. L13.



PRECISION ATTENUATORS

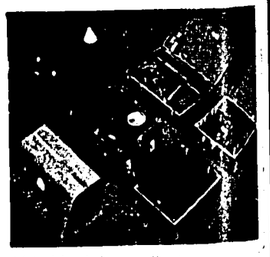
Improved materials and production techniques and careful quality control for Shallcross Attenuators have resulted in a line that sets new, higher standards of attenuation performance for practically every audio and communications use. Included are single and dual potentiometers, variable impedance matching networks, V. U. meter multipliers, cueing attenuators, fixed pads, pre-emphasis and de-emphasis networks, attenuation boxes, ladder and balanced ladder controls, and bridged T, straight T, bridged H, and straight H attenuators. Write for Attenuator Bulletin 4.

PRECISE MEASURING INSTRUMENTS

As long-time specialists in standard and special electrical measuring instruments, Shallcross welcomes your inquiry for any desired type. Standard instruments include:

Resistance Standards • Decade Potentiometers • Decade Resistance Boxes • Bridges, Wheatstone • Bridges, Kelvin-Wheatstone • Bridges, Limit • Bridges, Megohm • Capacitor Analyzers • Decibel Meters • Tone Generators • Telephone Test Equipment • Low-Resistance Test Sets • Insulation Test Sets • High-Voltage Test and Measuring Equipment.

Write for Shallcross Bulletin 10

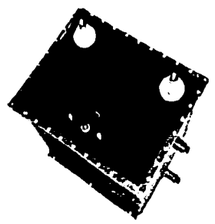


HI-MEG, HI-VOLTAGE RESISTORS

Special resistance elements hermetically sealed in ceramic tubes with ferrule terminals. Three standard sizes offer values to over 100 megohms. Write for Bulletin F.

HERMETICALLY-SEALED NETWORKS

Resistance, capacitance, bridge and inductance types available to meet critical electrical specifications and space requirements. Outline details of your requirements for recommendation by Shallcross Engineers.

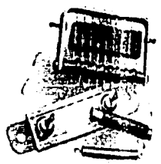


HIGH-RANGE KILOVOLTMETER MULTIPLIERS

Whether for direct high-voltage measurements or for use as standards, Shallcross KV meter multipliers combine close accuracy with safety and dependability. Various types are available for voltages up to 200,000 volts or higher if required. Write for Bulletin F.

CUSTOM-BUILT SPECIALTIES AND ENGINEERING SERVICE

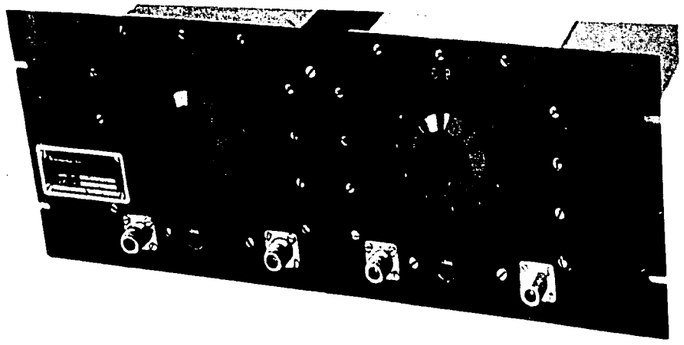
Sealed networks, high voltage measuring equipment, special test sets, thermally controlled networks, precise decades and networks for computer devices, high resistance standards, and critical coil assemblies are designed by Shallcross Engineers and built to meet your requirements. Forward your specifications for further information.



SHALLCROSS MANUFACTURING CO., Dept. PY-61, Collingdale, Pa.

HIGH FREQUENCY STEP ATTENUATORS

MODEL 60 AND MODEL 64



MODEL 60
MODEL 64 NOT SHOWN

These step attenuators exhibit negligible attenuation error over the frequency range of D.C. to 1,000 Megacycles.

Model 60 is supplied with an impedance of 50.0 ohms, and covers a range of 0-60 DB in steps of 1 DB, containing 2 drums, while Model 64 contains steps of .1 DB, using 3 drums.

Coaxial pads are used throughout. The resistance elements of each pad consist of stable, aged conductive films on ceramic or glass. A set of pads is mounted on a drum which is rotated to align any pad with a pair of matched, coaxial switches. The drums are mounted on one panel. Each drum through its switches and associated cables connects to a separate pair of female type "N" connectors located on the front panel. In order to minimize crosstalk, each drum is contained in its own shield.

The calibration is unaffected by operation at relative humidities as high as 95%.

SPECIFICATIONS

Frequency Range: D.C. to 1,000 Megacycles.

Accuracy (each drum): D.C. to 60 Megacycles. Attenuation departs less than plus or minus .2 DB from nominal attenuation.

D.C. TO 1,000 MEGACYCLES

0-10 DB Drum: Attenuation departs less than plus or minus .3 DB from D.C. attenuation.

0-50 DB Drum: Attenuation departs less than minus 1 DB from D.C. attenuation.

0-3-4 DB Drum (Model 64 only): Attenuation departs less than plus or minus .2 DB from D.C. attenuation.

Stability of Resistance Elements: Better than 1% per year and better than 2% per 5 years.

V.S.W.R.: Less than 1.02 at D.C. Less than 1.15 to 1,000 Megacycles when properly terminated. Zero Insertion Loss at 1,000 MC is less than .1 DB.

Attenuation: Model 60 0-60 DB in steps of 1 DB
Drum A, 0 DB, 10 DB, 20 DB, 30 DB, 40 DB, 50 DB.
Drum B, 0 DB, 1 DB, 2 DB, 3 DB, 4 DB, 5 DB, 6 DB, 7 B, 8 DB, 9 DB, 10 DB.

Model 64 Drums A and B same as Model 60.
Drum C 0 DB, 3.0 DB, 3.1 DB, 3.2 DB, 3.3 DB, 3.4 DB, 3.5 DB, 3.6 B, 3.7 DB, 3.8 DB, 3.9 DB, 4.0 DB.

Impedance: 50.0 ohms, unbalanced, non-directive, type "N" connectors.

Power Capacity: 100 milliwatts CW.

Temperature Coefficient of Resistance Elements: Less than .07%/°C.

Calibration Supplied: Insertion Loss, V.S.W.R., at D.C. and 1,000 Megacycles.

Dimensions: Unit panel mounted, supplied suitable for rack mounting, panel 19" x 7", max. depth behind panel 15".

Each pad contains several series pads and shunt disc resistance elements consisting of stable, aged conductive films on ceramic or glass properly protected from atmospheric effects. Connections between terminal strips and resistance elements are soldered. Due to their special construction these elements may be exposed to considerable shock and vibration without damage.

The attenuator pad is provided with one female and one male type "N" connector at opposite ends.

A longitudinal pressure of over 20 lbs. on either center pin is required before damage to the resistive element occurs. Therefore breakage of attenuator elements due to mating with misalignment or out-of-tolerance connectors is minimized.

SPECIFICATIONS

Available Attenuation Range: Any value from 1 DB to 10 DB in 1 DB intervals. Any value from 10 DB to 50 DB in 10 DB intervals. Suffix numerals of model number represent attenuation in DB.

Accuracy: At 60 Megacycles attenuation departs less than plus or minus 1 DB from D.C. attenuation.

D.C. TO 1,000 MEGACYCLES

Range 1-10 DB: Attenuation departs less than plus or minus .3 DB from D.C. attenuation.

Range 10-50 DB: Attenuation departs less than minus 1 DB from D.C. attenuation.

V.S.W.R.: To 1,000 Megacycles less than 1.15.

Impedance: 50.0 ohms, unbalanced, non-directive.

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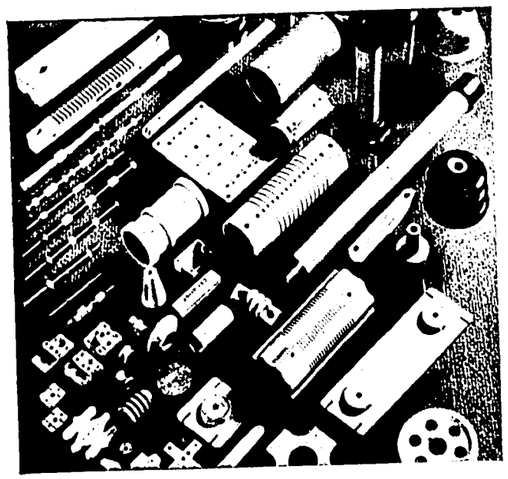

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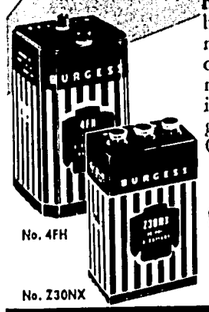

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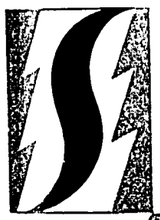

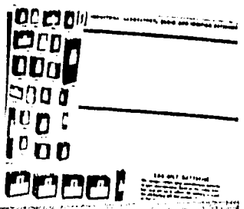

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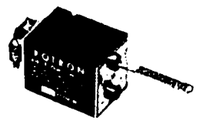

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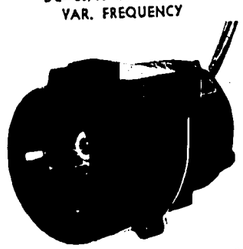

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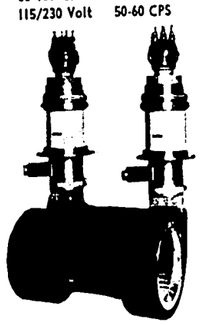

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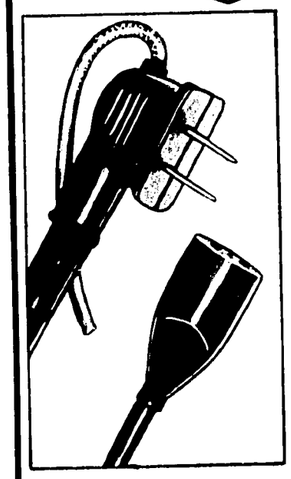

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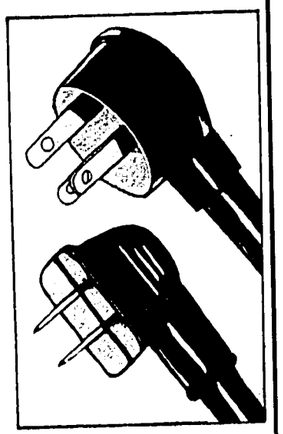

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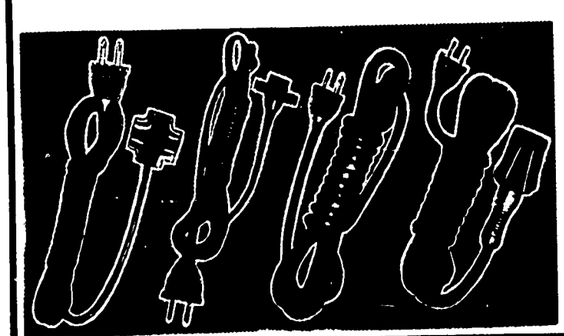

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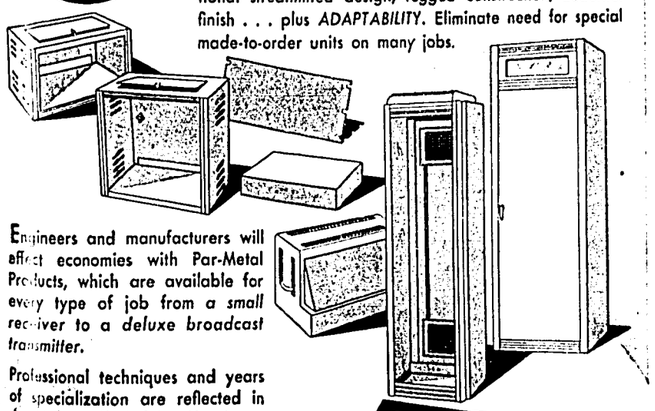

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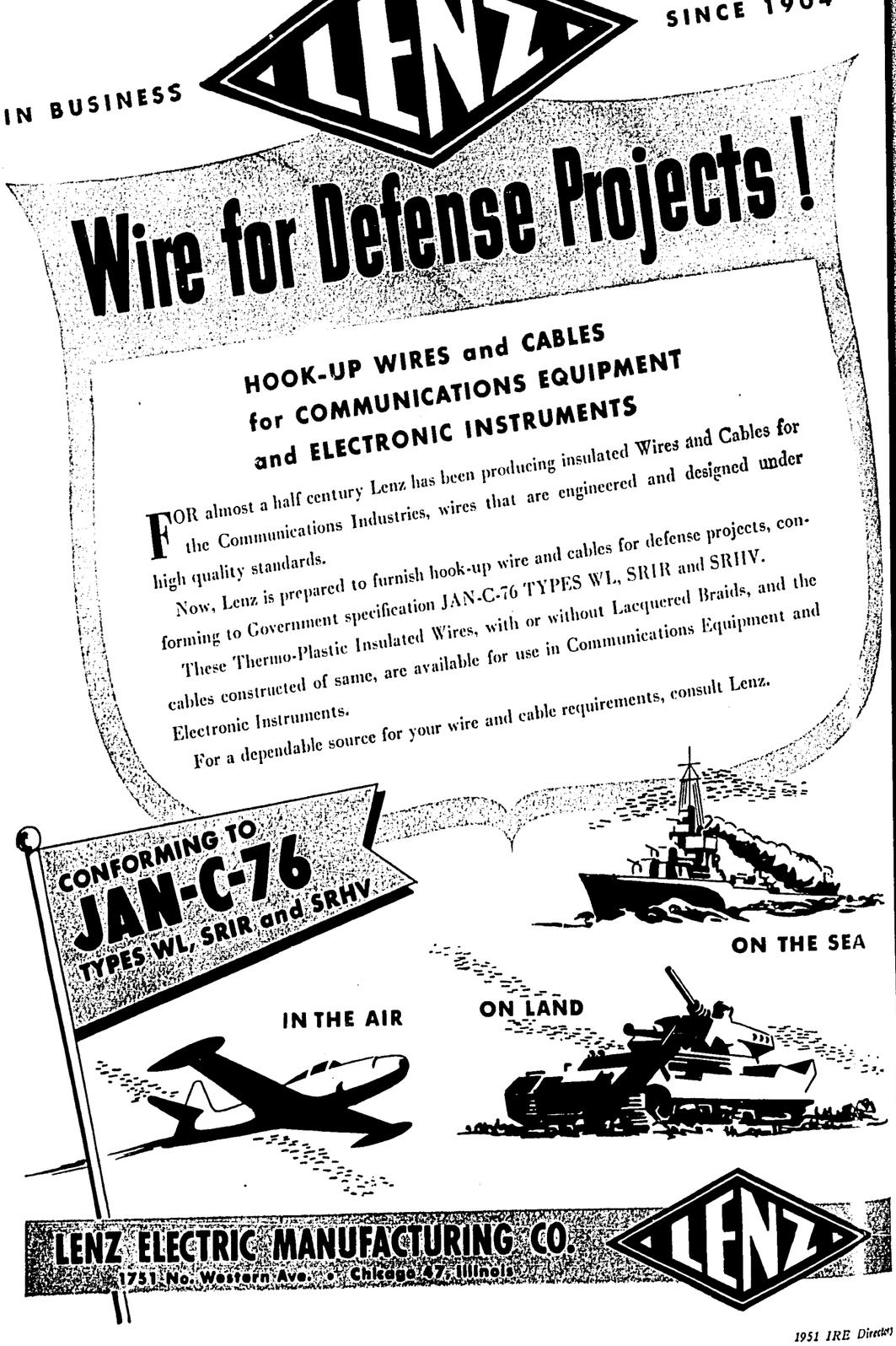

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Cable & Wire

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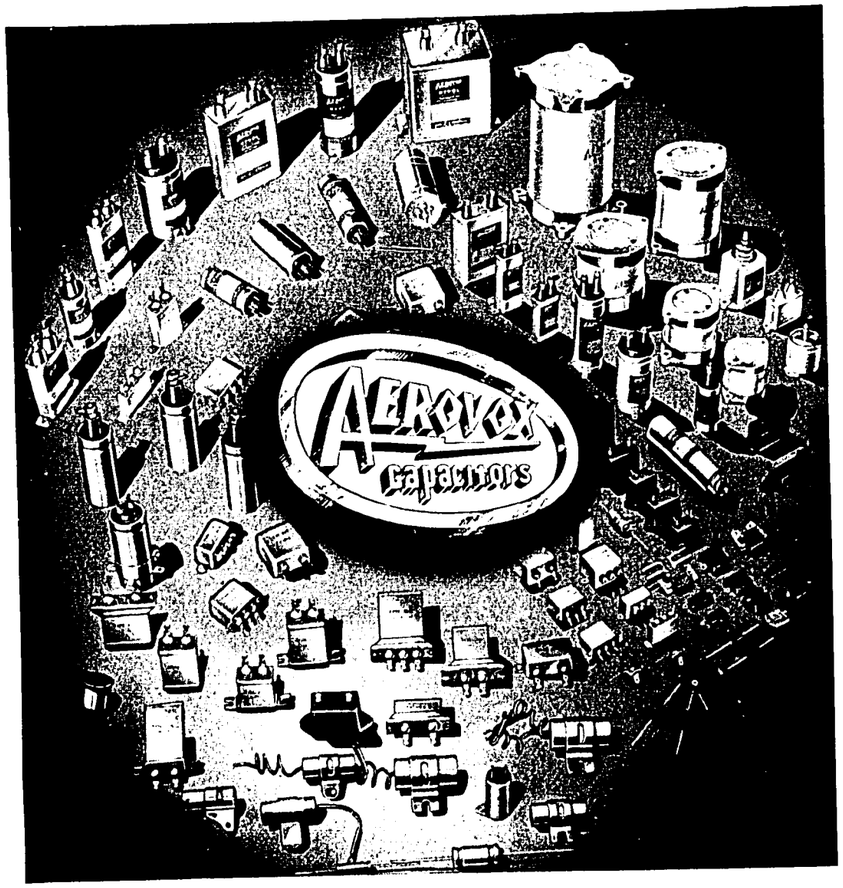

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● From tiniest metallized-paper capacitor symbolizing *miniaturization*, to giant oil capacitor for atom-smashing Betatron, you are SAFE in *specifying Aerovox*. For Aerovox makes *all* categories, types, sizes and ratings. More than that: with a background experience second to none, Aerovox engineers are always ready to study your circuitry, components, operating conditions and anticipated life. Thus capacitor selection is custom-fitted to your exact requirements. And that is why Aerovox capacitors have such outstanding service records.

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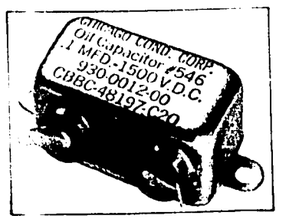
CHICAGO CONDENSER'S rectangular type capacitors are hermetically sealed and tested at twice-rated voltage.



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MOTORS • ELECTRONICS
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CHICAGO CONDENSER'S bathtub type capacitors are hermetically sealed and tested at three-times voltage.

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8 Vacuum.

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IF IN DOUBT,

THROW IT OUT!

That is our rule for raw materials going into Planet electrolytic capacitors. The manufacturing standards set for high-quality Planet capacitors will not allow compromise in the matter of materials and components.

Aluminum foil, condenser paper, chemicals — all items used in our electrolytics — are purchased against strict specifications from thoroughly reliable sources, then subjected to exhaustive analysis and tests before usage.

Screening out all possible trouble at the source makes the finished product trouble-free — eligible to bear the Planet trademark.

For complete information, write for the latest Planet Catalog, C-2.

PLANET MANUFACTURING CORPORATION
225 Belleville Avenue, Bloomfield, N.J.

PLANET

CORNELL-DUBILIER ELECTRIC CORP.

South Plainfield, N. J. Other plants in New Bedford, Brookline and Worcester, Mass.; Providence, R. I., Indianapolis, Ind., and subsidiary, The Radiart Corp., Cleveland, O.

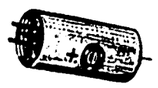
41ST ANNIVERSARY CORNELL-DUBILIER CAPACITORS 1910-1951

CONSISTENTLY DEPENDABLE

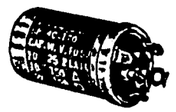
CORNELL-DUBILIER

CAPACITORS — AUTO VIBRATORS
TV AND FM ANTENNAS — ROTATORS — CONVERTERS

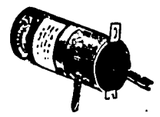
ELECTROLYTICS



"BLUE BEAVER*" Electrolytics — most popular for all applications where dependability and economy are essential. In single and dual capacities at 25 to 500 V.D.C.W.



TYPE UP's for safe operation at temperatures +65°C. or +85°C. In all commercial capacities at voltages from 10 to 500 V.D.C.W.



TYPE EZ universal mounting units. Practical, dependable, economical. In all capacities at voltages from 150 to 450 V.D.C.W.

PAPER CAPACITORS

ROYAL TIGER Polykane Tubulars for operation at −35° to +100°C. A new type tubular in all capacities from 100 V.D.C. to 1000 V.D.C.

TYPE TMC's are also available in all standard capacities and voltage ratings up to 6,000 V.D.C. Can also be furnished to JAN specifications.

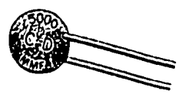
TYPE DYR Oil-filled "bath tub" capacitors. Provided with terminals either side, top or bottom. In all capacity combinations and voltages to 1000 V.D.C.

DYKANOL* TRANSMITTER CAPACITORS

TYPE T's are the finest, most dependable capacitors obtainable for broadcast and commercial transmitting application. In all popular capacities up to 7,500 V.D.C.

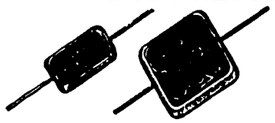
TYPE TQ DYKANOL* CAPACITORS. Hermetically sealed in round aluminum containers. With two insulated terminals available at voltages between 600 and 3,000 V.D.C.

TINY MIKE* CERAMICS



Miniature disc type—highly efficient, low cost. Remarkably rugged. Available in capacity range of 1,000 mmfd. to 5,000 mmfd. guaranteed minimum capacity, at 500 V.D.C.W. Units of between 100 and 150 mmfd. at ±20% or ±10%.

MICA RECEIVING AND TRANSMITTING CAPACITORS



MOULDED MICAS for all requirements. Available moulded in low loss bakelite. "Silver-Mike" micas for use in high Q electronic circuits.

TYPES 4 and 9—for amplifier and transmitter applications. All capacities in voltages to 5,000 V.D.C. test.

TYPE 50 Series Transmitter micas feature world famous series stack construction.

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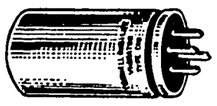
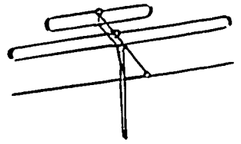


C-D vibrators are quieter, longer lasting, more efficient.

CONVERTERS

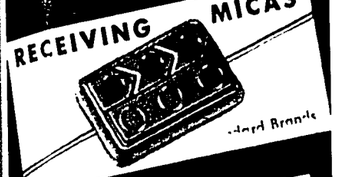
FOR D.C. TO A.C.; A.C. TO D.C.; D.C. TO D.C. CONVERSION.

TV, AM, FM, AUTO and ROTATOR ANTENNAS



Sturdily constructed for a lifetime of trouble-free service.

RECEIVING MICAS



CM Types
Silver and Regular Micas
All Capacities
Tolerances 1% and up
Immediate Delivery

Discount Schedule
1-24 ..... 60/10%
25-49 ..... 70%
50 or over 70/10%

Write for latest price schedule.

Mica Condensers Corp.
71 MURRAY STREET • NEW YORK 7, N.Y.
TEL — DIGBY 9-0512

Capacitors: Fixed

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11. Capacitors: Variable.

1—Neutralizing. 2 Precision. 3—Temperature Frequency Compensating. 4—Trimmers. 5 Tuning. 6 Vacuum.

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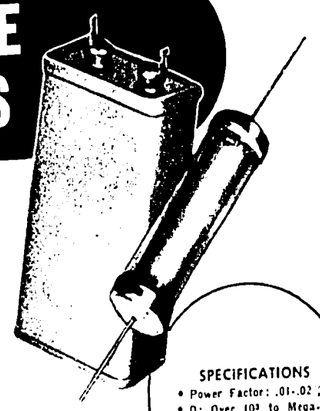
POLYSTYRENE CAPACITORS



Unicon Polystyrene Capacitors are characterized by extremely low losses. The power factor and the dielectric absorption are so low as to be practically negligible, while the insulation resistance is so high that less than 1% of the original charge on one of these capacitors is lost after a 24 hour period. The capacitance stability is of a high order. Possessing such high electrical qualities, Unicon Polystyrene Capacitors are ideal elements for use in electronic analyzers and computers, in tuned circuits and wave filters, as standards of capacitance, in radiation detection equipment, and in batteryless power supplies.

Unicon Polystyrene Capacitors are available in several different types of housings, including wax-filled cardboard tubes, hermetically sealed glass tubes with metal end caps, hermetically sealed metal cans with low-loss glass or ceramic terminals. They are also available uncased for inclusion in cases holding other components.

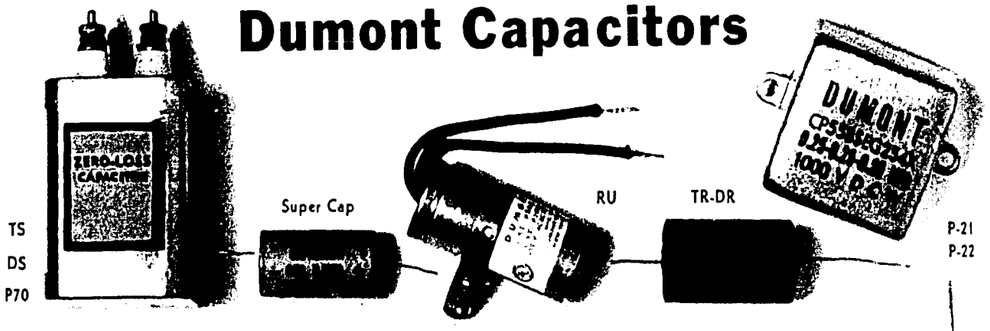
Prices on Unicon Polystyrene Capacitors are reasonable, and delivery is excellent.

SEND FOR CATALOG "I" TODAY

SPECIFICATIONS
- Power Factor: .01-.02
- Q: Over 10³ to Megacycle Range
- I.R: 10 Megamegohms per MF
- Residual Charge: 0.05% after 0.1 Second Discharge
- Temp. Coef: 500 PPM/°C nom.
- Bulk: 36 cu. In/mf. at 2000 volts; 9 cu. In/mf. at 200 volts
- Voltage: 200-50,000 VDC
- Capacity Tolerance: ±3% Special to ±1%

united condenser corporation
337 east 139th street • new york 54, n y • cypress 2 5180

Quick-easy Selector Chart
for
Dumont Capacitors



DUMONT CAPACITOR ENGINEER SELECTOR CHART

Key	Model	VOLTAGE RANGE	CAP RANGE	DIELECTRIC	CASING	TEMP. RANGE	MAX. CAP. CHANGE	INS. RES. (Megs. x Mfds.)	P.F.	Group
	TR	200—40KV	.00005— 2MFD	Thermofilm	Bakelite or Ceramic	—65°C + 150°C	2%	10^4	.0001	a
	TS	200—40KV	.00005—10MFD	Thermofilm	Metal Can all types	—65°C + 150°C	2%	10^4	.0001	a
	TM	200— 5KV	.00005— 2MFD	Thermofilm	Molded plastic	—65°C + 150°C	2%	10^4	.0001	a
	DR	500—40K	.00005— 2MFD	Durene	Bakelite or Ceramic	—65°C + 70°C	2%	10^3	.0005	b
	DS	500—40K	.0005 —10MFD	Durene	Metal Cans all types	—65°C + 70°C	2%	10^3	.0005	b
&	* P6M	200—20KV	.001 — .5	Paper	Molded in bakelized tube	—40°C + 85°C	5%	2500meg—MFD	.005	c
&	* PB	200—20KV	.00025— 2.0	Paper	Molded in Bakelite	—40°C + 85°C	5%	2500meg—MFD	.005	c
&	* PC	200—20KV	.00025— 2.0	Paper	Molded in Ceramic	—40°C + 85°C	5%	3000meg—MFD	.005	c
&	* PBM	200—1000	.0001 — 2.0	Paper	Molded in Bakelite	—40°C + 85°C	5%	2000meg—MFD	.005	c
&	* PCM	200—1000	.0001 — 2.0	Paper	Molded in Ceramic	—40°C + 85°C	5%	2500meg—MFD	.005	c
	PCF	400— 600	.01 — .22	Paper	Ceramic	—40°C + 85°C	5%	2500meg—MFD	.005	d
	PCST	600—1000	.001 — .068	Paper	Ceramic	—40°C + 85°C	1%	3000meg—MFD	.005	d
&	* P-20	100—2000	.001 — 2MFD	Paper	Metal Tubular Can	—20°C + 100°C	5%	3000meg—MFD	.005	e
&#	* P-21	100—1500	.05 — 5MFD	Paper	Metal Bathtub with Silicone Rubber Seal	—40°C + 85°C	5%	2500meg—MFD	.005	e
&#	* P-22	100—1500	.05 — 5MFD	Paper	Metal Bathtub with Glass Seal	—40°C + 85°C	5%	3000meg—MFD	.005	e
&#	* P-70	600—6000	.05 —10MFD	Paper	Rectangular Metal Can	—40°C + 85°C	5%	3000meg—MFD	.005	e
&	FPI	200—600	.00005— 1MFD	Paper	Flat Miniature Paper wrapped	—50°C + 85°C	5%	2000meg—MFD	.005	f
&	* RP2	200—600	.00005— 2MFD	Paper	Round Miniature Cardboard Tube	—40°C + 85°C	5%	2000meg—MFD	.005	f
	SuperCap	6—450	4—1000		Metal or Paper Tubes					g
	DPF	100—400V	1 — 8MFD	Paper	Metal Cans	Fluorescent-Lighting Power Factor Correction Capacitor				
	RU	120—240	Radio Noise Suppressors		(65% & 85% noise elimination)					

Key: & = Can be supplied with plastic impregnation for 125°C operation (cap. variation 15%)—improved moisture proof qualities.
= Can be supplied with Duroil impregnate for 100°C.
* = Can be supplied with Silcone oil impregnate for 125°C (capacity variation 3%).

Group a: TR—, TS—, TM— Suitable for high temperatures with high stability and low power factor. Completely molded, otherwise same as above.

Group b: DR—Highly stable low power factor capacitor.
DS—Highly stable low power factor capacitor.

Group c: P6M—, PB, PC Quality low cost commercial capacitor line with long life and low leakage.
PBM Miniature line similar to the above.
PCM Miniature line similar to the above.

Group d: PCF Fireproof capacitor.
PCST Circuit Stabilizer (television).

Group e: P-20, P-21, P-22, P-70 A hermetically sealed line of metal casing capacitors with glass seals, silicone rubber seals, plastic seals, ceramic bushings.

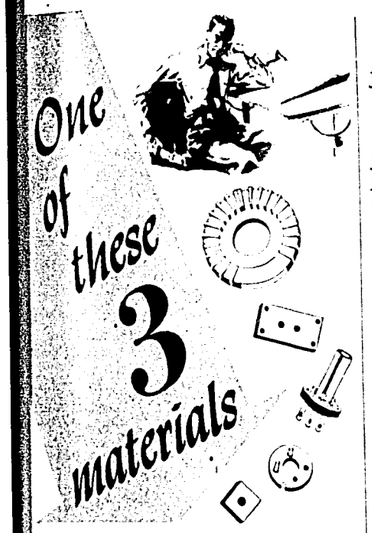
Group f: FPI Flat wax or plastic impregnated adapted to close spacing.
RP2 Round wax or plastic impregnated.

Group g: Super Cap. These electrolytics are available in hermetically sealed cans.

Serving Electronic Engineers Since 1928

DUMONT ELECTRIC CORP.

308 Dyckman Street, New York 34, N. Y., Telephone LOrraine 9-2800



may cure your insulating headaches

TEFLON

MYKROY (glass bonded mica)

KEL-F

You are invited to explore the wide possibilities of these 3 materials. They have limitless industrial and electrical applications. From our experience with many extraordinary high voltage, high frequency and high temperature requirements, we are certain one of the 3 will hold the answer you are looking for.

TEFLON, MYKROY and KEL-F are available to you in sheets and rods or molded and machined to your specifications.

Write for descriptive literature on any or all of these materials. We'll be pleased to quote on your own requirements. No obligation.

ELECTRONIC MECHANICS INC.
68 CLIFTON BOULEVARD,
CLIFTON, NEW JERSEY

Capacitors: Variable

(Continued from page 75)

Jennings Radio Mfg. Co., 970 McLaughlin Ave., P.O. Box 1278 San Jose 12, Calif., 1, 2, 4, 5, 6
For details see ad on page 240-1
Johanson Mfg. Co., N.J., 4, 5
Johnson Co., E. F., Minn., 1, 4, 5
Lapp Insulator Co., Inc., N.Y.
Leeds & Northrup Co., Pa., 2
Leonard Electric Products Co., Inc., N.Y., 3, 4
Link Radio Corp., N.Y., 1-6
Maida Development Co., Va., 4
Measurements Corp., Intervale Rd., Bonton, N.J., 4, 5
See complete catalog filed alphabetically in last section
Millen Mfg. Co., Inc., James, Mass., 1, 2, 4, 5
Miller Co., J. W., Calif., 4, 5
Molded Insulation Co., Pa., 5
Muirhead & Co., Ltd., England, 2
Mullard Electronic Prods. Ltd., England, 4
National Co., Inc., Mass., 1, 2, 4, 5
Peerless X-Ray Labs. & Mfg. Co., N.Y., 2
Plessey International Ltd., England, 4, 5
Radio Condenser Co., N.J., 2, 3, 5, 6
Radio Industries, Inc., Ill., 1, 4
Radio Materials Corp., 3325 N. California Ave., Chicago 18, Ill., 3, 4
For details see ad on page 40
Rogers Majestic Ltd., Canada, 1, 2, 4, 5, 6
Sickles Co., The, F. W., Mass., 4
Special Products Co., Md., 4
Sprague Electric Co., Mass., 3, 4
Tarzian Inc., Sarkes, Ind., 4
Teleradio Engineering Corp., N.Y., 1, 2, 4
Vacuum Tube Products, Calif., 6
Vitramon, Inc., Conn., 2, 3
Wadsworth Mfg. Associates, N.Y., 4
Woodwelding, Inc., Calif., 6

12. Ceramics.

1—Coil Forms
2—Custom Fabrication.
3—Rods.
4—Sheets.

American Lava Corp., Cherokee Blvd. & Mfrs. Rd., Chattanooga 5, Tenn., 1-4
For details see ad on page 2
American Radio Co., Inc., N.Y., 1, 2
Bendix Avi. Corp., Scintilla Magneto Div., Sherman Ave., Sidney, N.Y. 2
Bud Radio, Inc., Ohio, 1
Cambridge Thermionic Corp., Mass., 1, 2
Canadian Porcelain Co., Canada, 2
Centralab, Div. of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis., 1, 2
See complete catalog filed alphabetically in last section
Ceramic Specialties Co., Ohio, 1, 2, 3.
Du Plate Canada Ltd., Canada, 2
Electronic Mechanics, Inc., 68 Clifton Blvd., Clifton, N.J., 1-4
For details see ad on page 77
General Ceramics & Steatite Corp., Plant 3, Crows Mill Rd., Keasbey, 1-4
For details see ad on page 18, (a)
Glenco Corp., N.J., 2, 3, 4
Gombos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 2
For details see ad on page 91
Insuline Corp. of America, N.Y., 1, 3
Isolantite Mfg. Corp., N.J., 1, 2, 3
Jeffers Electronics, Inc., Pa., 3
Lapp Insulator Co., Inc., N.Y., 3
Mackay, A. D., N.Y., 4
Maida Development Co., Va., 1
Mucon Corp., N.J., 4
Mycalex Corp. of America, 30 Rockefeller Plaza, New York 20, N.Y., 1-4
For details see ad on page 28, 246-7
National Co., Inc., Mass., 1
Plastic Accessories, Inc., N.Y., 1, 2
Plessey International Ltd., England, 2, 3
Polk Electronic Co., N.Y., 2
Porcelain Products, Inc., Ohio, 2
Printloid, Inc., N.Y., 1, 2
Radio Materials Corp., 3325 N. California Ave., Chicago 18, Ill., 2
For details see ad on page 40
Saxonburg Potteries, Pa., 1, 2, 3
Smith & Stone Limited, Canada, 2
Speer Resistor Corp., Pa., 1
Stelon, Inc., N.J., 1, 2
Steward Mfg. Co., D. M., Tenn., 1, 2, 3
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 1-4
For details see ad on page 64
United States Electronics Corp., N.J., 1

13. Chassis & Relay Racks.

1—Open Stock. 2—Custom Fabrication.

Abalon Precision Mfg. Corp., N.Y., 1, 2
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 1, 2
For details see ad on page 114
Altec Lansing Corp., Calif., 1

(Continued on page 79)

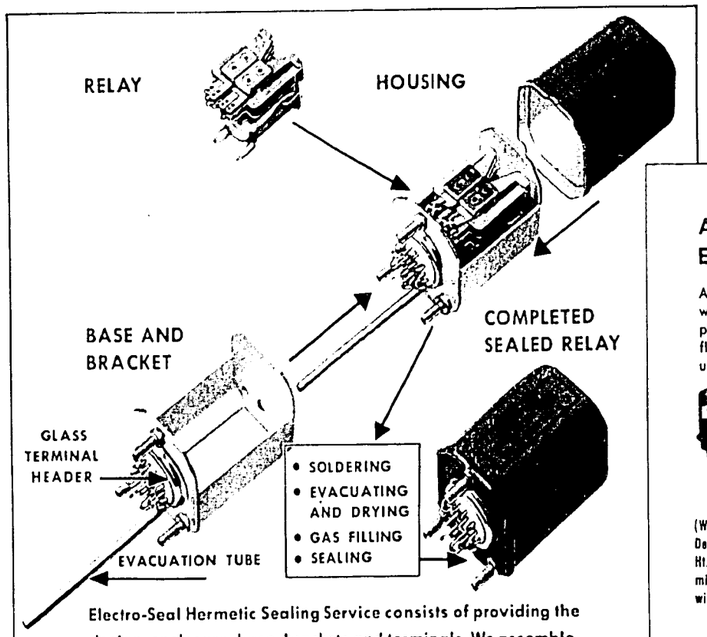
TO CUT COSTS — Or For Miniaturization
. . . Consider Printed Circuits

The low cost, high production aspects of printed circuitry is worthy of your investigation. We will be happy to provide you with samples and information relating to our printed circuit work upon your request.

Complete and cordial co-operation will be given in adapting our printed circuits to your design.

GLASS PRODUCTS CO. 6911 S. South Chicago Ave. FAirfax 4-1050 Chicago, 37, Ill.

Make atmosphere a part of your product



Electro-Seal Hermetic Sealing Service consists of providing the design, enclosure, base, brackets and terminals. We assemble, wire and seal your component in an atmosphere of dry, inert gas. Enclosure is evacuated by high vacuum system and thoroughly tested for leaks by means of a mass spectrometer.

A FEW STANDARD TYPES OF ELECTRO-SEAL ENCLOSURES

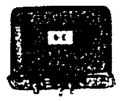
All Electro-Seal Enclosures can be equipped with individual terminals, multiple headers or plug-in arrangements as well as mounting flanges or studs. Dimensions given are inside usable dimensions.

SERIES 5-E

(Dia: 1 ½", Depth: 1 ⅞", Overall Outside Ht.: 2 ⅜"). Normally equipped with octal plug.

SERIES 6-E

(Width: 1 ⅞", Length: 4 ⅜", Depth: 2 $^{15}/_{16}$", Overall Outside Ht.: 3 $^{1}/_{16}$"). Size frequently permits sealing several components within the enclosure.



SERIES 8-E

(Dia: 2 $^{19}/_{64}$", Depth: 2 ⅞", Overall Outside Ht.: 3 ½"). Normally equipped with octal plug. Maximum base area required: 2 ½" x 2 ½".

SERIES 13-E

(Width: 1 $^{9}/_{64}$", Length: 1 $^{33}/_{64}$", Depth: 2 $^{3}/_{16}$", Overall Outside Ht.: 2 $^{3}/_{8}$"). Base provided with three mounting studs.

SERIES 14-E

(Width: 1 $^{9}/_{16}$", Length: 2 ⅝", Depth: 2 $^{11}/_{32}$", Overall Outside Ht.: 2 ½") Size frequently permits sealing of several items within the enclosure.

Electro-Seal Hermetic Sealing Increases Usefulness, Life and Freedom from Maintenance of Many Types of Electrical Products

No matter how efficient and dependable your product . . . relay, transformer, flasher, timer, amplifier, vibrator or other electrical device . . . it will only operate most reliably in "ideal" atmosphere.

Electro-Seal Hermetic Sealing Service permanently surrounds your product with atmosphere free of moisture, dust, fungi or pressure changes . . . makes it tamper-proof.

For aircraft use, hermetic sealing guards against failure caused by varying air pressure and condensation. In industry, it provides a safe enclosure in hazardous locations and complete protection from dirt and dust.

Let us show you how Electro-Seal Hermetic Sealing Service can add to the life and reliability of your product by making atmosphere a "built-in" part of the product.

Enclosures can be made up by temporary tools to provide small quantities for engineering samples or limited production schedules. We invite you to send complete engineering information and samples of parts to be hermetically sealed.

ELECTRO-SEAL CORPORATION

946 LEE STREET • DES PLAINES, ILLINOIS

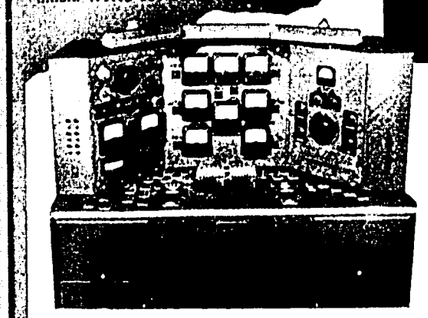
Specify **BUCK** DESIGNING

-for practical solutions to problems of

-IN

PRODUCTION
ORDNANCE
TESTING
RESEARCH

Buck has the capabilities and facilities to work with your engineering staff from the initial planning stage. Also, Buck can work out construction details using your rough sketches or specifications. Either way, you are assured of sound, practical design on special equipment or production pieces. Buck experience solves your problems economically by painstaking attention, from [illegible] finish. Write for folder.



Power output Test Set. Laboratory unit designed and built for Sperry Gyroscope Co. Measures AC gain and power output of receiving tubes.

COMPLETE FACILITIES FOR

SHEET METAL WORK

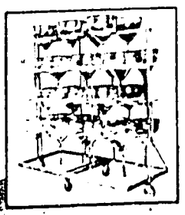
INCLUDING

- SHEARING
- BENDING
- CUTTING
- BURNING
- WELDING
- MACHINING
- FINISHING

Fully equipped sheet metal shop including engineering, drafting and planning department. Buck fabricates mild steels up to 12 gauge, stainless, monel, aluminum, copper, galvanized iron. Buck will work from your rough sketches, finished blueprints or design the job for you. Call or write for estimates or full information.

BUCK STANDARD TUBE CARRIERS

Designed to facilitate TV tube production by providing safe handling of costly tubes. One of the many standard Buck developments available to manufacturers. Complete catalog on request.



BUCK engineering co., inc.

DESIGNERS AND BUILDERS OF ELECTRONIC, ELECTRICAL AND MECHANICAL INSTALLATIONS

37-41 MARCY STREET, FREEHOLD, NEW JERSEY

Chassis & Relay Racks

(Continued from page 77)

American Quartz Labs., Inc., N.Y., 2
Auto-Test, Inc., Ill., 2
Avion Instrument Corp., N.Y., 2
Ballantyne Co., The, Nebr., 2
Barreca Products Co., Inc., N.Y., 2
Bowen & Co., Inc., Md., 2
Brelco Electronics Corp., N.Y., 2
Buck Engineering Co., Inc., 37-41 Marcy St., Freehold, N.J., 2
For details see ad on page 79
Bud Radio, Inc., Ohio, 1, 2
Canadian General Elec. Co., Ltd., Canada, 2
Chisholm Industries, Ltd., Canada, 2
Collins Radio Co., 855 35 St. N.E., Cedar Rapids, Iowa, 1
For details see ad on page 226-7
Dahlstrom Metallic Door Co., N.Y., 2
Donnelly Mfg. Div., Donnelly & Sons, Mass., 2
Electro Craft, Inc., Conn., 2
Electro-Seal Corp., 946 Lee St., Des Plaines, Ill., 2
For details see ad on page 78
Falls Metal Works Ltd., N.J., 2
Falstrom Co., N.J., 2
Federal Electric Products Co., N.J., 2
Federal Enterprises Inc., Ill., 2
Ferro-Co. Corp., N.Y., 1, 2
Gadgets, Inc., Ohio, 2
Gates Radio Co., Ill., 1, 2
General Elec. Co., Electronics Dept., N.Y., 1
Golden Co., N.Y., 2
Goodyear Aircraft Corp., Ohio, 2
Hadley Co., Robert M., Calif., 1, 2
Houston Corp., The, Calif., 2
Industrial Hardware Mfg. Co., Inc., N.Y., 2
Industrial Precision Products, Ill., 2
Insuline Corp. of America, N.Y., 1, 2
JFD Manufacturing Co., Inc., 6154 16 Ave., Brooklyn 4, N.Y., 1
For details see ad on page 119
Johnson Co., E. F., Minn., 1
Karp Metal Prod., Co., Inc., N.Y., 2
Kellogg Switchboard & Supply Co., Ill., 1, 2
Korrol Products Corp., N.Y., 2
LaRose & Assoc., W. T., N.Y., 2
Maryland Electronic Mfg. Corp., Md., 2
Meissner Mfg. Co., Div. Maguire Inds., Ill., 1
Metal Products Co., Tenn., 1, 2
Minute Man Products, Inc., N.Y., 2
Mullard Electronic Prods., Ltd., England, 2
Multi-Metal Wire Cloth Co., Inc., N.Y., 2
Nestor Engineering Co., N.J., 2
Newcomb Audio Products Co., Calif., 1, 2
Oilpak Mfg. Co., Inc., The, N.[illegible]
Palmer, Inc., M. V., Wa[illegible]
Par-Metal Products Corp., 32-62 49 St., Long Island City 3, N.Y., 1
For details see ad on page 69
Patterson-Moos & Co., Inc., N.Y., 2
Plessey International Ltd., England, 2
Press Wireless Mfg. Co., Inc., N.Y., 2
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 1, 2

(Continued on page 80)

ACW INC

ATLAS COIL WINDERS INC.

STAMFORD, CONN.

CUSTOM WINDING

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EXPERIMENTAL

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ELECTRONIC SUB-ASSEMBLIES

To Meet Government Specifications

Telephone Stamford 48-2661

Chassis & Relay Racks

(Continued from page 79)

Radio Engineering Labs., Inc., N.Y., 2
Radio 1936, Ltd., New Zealand, 1, 2
Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 2
For details see ad on page 115
Santay Corp, Ill., 2
Scientific Electric, 105-119 Monroe St., Garfield, N.J., 2
See complete catalog filed alphabetically in last section
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N.Y., 2
For details see ad on page 16
Stamford Metal Specialty Co., Inc., N.Y., 2
Suckle Electronics Co., N.J., 2
Tech Laboratories, Inc., N.J., 2
Uni-Products, Inc., D.C., 2

Choppers, see: 18 Subhead 2

14. Coils.

1—AF Chokes.
2—Miscellaneous.
3—RF Chokes.
4—Toroids.
5—Transformer Coils.
6—Tuning.

A. J. F. Industries, Inc., N.Y., 1, 2, 5
A. P. W. Co., N.J., 1, 4, 5
Acme Electronics, Calif., 1-6
Acro Transformer & Mfg. Corp., N.Y., 1, 5
Aero Coil, Inc., N.J., 2-6
Aero Electronics Co., Ill., 2, 3
Aerolite Electr. Hardware Corp., N.J., 1, 6
Airpax Products Co., Md., 1, 5
Aladdin Radio Industries, Inc., Tenn., 2, 3, 5, 6
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 4
For details see ad on page 114
Allied Control Co., Inc., N.Y., 1, 2, 5
Alpha Electronics, Inc., N.J., 2
American Communications Corp., N.Y., 2
American Relay & Controls, Inc., Ill., 2
Amplifier Corp. of America, N.Y., 5
Anchor Electronic, Inc., N.J., 2, 3, 5, 6
Associated Eng'ng. Corp. of Boston, Mass., 1, 2, 3
Associated Research, Inc., Ill., 5
Atlas Coil Winders, Inc., 392 State St. Stamford, Conn., 2-5
For details see ad on page 80
Audio Development Co., Minn., 1
Automatic Mfg. Corp., N.J., 3, 5
Barker & Williamson, Inc., 237 Fairfield Ave., Pr-751 Upper Darby, Pa., 1-4, 6
See complete catalog filed alphabetically in last section
Bendix Avia. Corp., Friez Instr. Div. 1400 Taylor Ave., Baltimore 4, M.D. 2
Bond Electronics Corp., N.J., 2, 3, 4, 6
Bud Radio, Inc., Ohio, 2, 3
Burnell & Co., 45 Warburton Ave., Yonkers 2, N.Y., 1, 4
For details see ad on page 6
Caddel-Burns Mfg. Co., N.Y., 2
Caledonia Electr. & Trans. Corp., N.Y. 1, 4, 5
Caltron Co., Calif., 3
Central Transformer Co., Ill., 1, 2, 5
Centronics Co., 41-05 Lawrence St. Flushing, L.I., N.Y., 2, 3, 5, 6
For details see ad on page 83
Chicago Transformer Div., Essex Wire 3501 W. Addison St., Chicago 18, Ill. 1
For details see ad on page 203
Clippard Instrument Lab., Inc., Ohio 2, 3
Coil Winders, Inc., N.Y., 2-6
Cole Instrument Co., Calif., 2, 3, 4
Columbus Process Co., Inc., Ind., 1, 2, 5
Communication Accessories Co., Mo., 4
Communication Coil Co., Ill., 1, 2, 3
Communication Parts, Ill., 3, 6
Control Corp., Minn., 1, 5
Copper Wire Products Ltd., Canada, 1 2, 4, 5
Corning Glass Wks., Tech Prods. Div. Corning, N.Y., 2, 6
For details see ad on page 212
Corona Engineering Service, N.Y., 2
Custom Electronics Corp., N.J., 3, 6
DX Radio Products Co., Inc., Ill., 2, 4, 5
DeCoursey Engineering Labs. Calif., 4
Delco Appliance Div. of Gen Motors N.Y., 3, 5, 6
Delco Radio Div. of General Motors Ind., 3, 5, 6
Delta Radio Co., N.Y., 2, 3, 4, 6
Dietz Design & Mfg. Co., Grand View, Mo., 1-5
For details see ad on page 81
Dinion Coil Co., Inc., N.Y., 1, 2, 5
Dormitzer Elec. & Mfg. Co., Inc., Mass. 1, 5

(Continued on page 81)

COILS

TO

YOUR SPECIFICATIONS

We manufacture quality coils for the radio and electronics industry. Universal, bank-wound, universal-progressive or solenoid coils made to JAN specifications. Let us know your requirements: We will quote promptly.

FUGLE-MILLER LABORATORIES

399 Main St. METUCHEN — Me 6-2245 NEW JERSEY

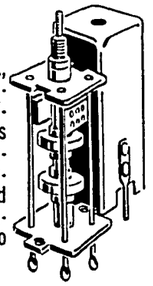
RELY on desco for Quality Engineering!

Desco Coils to JAN Specs

...waxed, varnished, baked, thermo-setting plastic coated, vacuum impregnated, potted, etc.

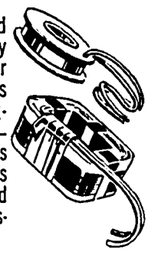
UNIVERSALS

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.



SOLENOIDS

All types—Single and Multiple Layer • Relay Coils • Audio-power transformer windings • Bobbin Coils—Magnetic Head Coils—Recorder Erase Coils Paper Interleaved Coils Hermetically Sealed units in standard transformer cases.



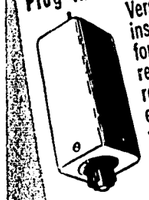
TOROIDS

All sizes including wedding rings—cased or uncased—wound on stabilized cores and heat cycled • Hermetically sealed Filters & Transformers of all types.

Coils also available to usual commercial requirements for TV, FM, AM receivers, etc.

Plug-in Housings—30 Models

Versatile aluminum plug-ins, with threaded bases for stud mounting coils, relays, filters, crystals, resistors, condensers, etc. • Special models with permeability tuned coil forms—various pin arrangements—etc.



Your inquiries handled promptly.

DIETZ DESIGN and Manufacturing Company

INDUCTANCE SPECIALISTS Grandview Missouri

Coils

(Continued from page 80)

Dresser Electric Co., Mich., 5
Dumont Labs., Inc., Allen B., Electronic Parts Div., 25 Market St., East Paterson, N.J., 2, 6
For details see ad on page 161
Eastern Specialty Co., The, Pa., 5
Eisler Engineering Co., Inc., 757 S. 13 St., Newark 3, N.J., 5
For details see ad on page 141
Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill., 1, 2, 5
For details see ad on page 205
Electrical Reactance Corp., P.O. Box 237, Olean, N.Y., 2, 3
For details see ad on page 228-9
Electrical Windings, Inc., Ill., 1, 2, 5
Electricoil Transformer Co., N.Y., 2, 5
Electro Craft, Inc., Conn., 2
Electro Mec Lab., N.Y., 4
Electro-Temp, Inc., Mich., 2
Electrometric Co., The, Ill., 2-6
Electronic Coils, Inc., Mass., 2, 3, 6
Electronic Components Corp., Ill., 5
Electronic Transformer Co., Inc., N.Y., 1, 2, 5
Electyme Motor Products Corp., Ill., 2
El-Rad Mfg. Co., Ill., 2, 3, 6
Epco Products, Inc., N.Y., 1, 2, 5
Essex Electronics, N.J., 3
Etraco Mfg. Co., Inc., N.J., 5
Fast & Co., John E., Ill., 1
Federal Electric Mfg. Co., Ltd., Canada, 1-6
Federal Electric Products Co., N.J., 2
Federal Instrument Corp., N.Y., 2
Ferranti Electric, Inc., N.Y., 1, 5
Forbes & Wagner, Inc., N.Y., 2, 3, 5, 6
Foster Transformer Co., Inc., Ohio, 1, 4, 5
Freed Transformer Co., Inc., 1718-36 Weirfield St., Dept. D1, Brooklyn 27, N.Y., 1, 4, 5
For details see ad on page 14
Fugle-Miller Laboratories, 399 Main St., Metuchen, N.J., 2, 3, 5, 6
For details see ad on page 80
Gates Radio Co., Ill., 3, 6
General Instruments, Inc., Texas, 3, 5
General Lab. Associates, Inc., N.Y., 2, 3, 4
Globe Products Corp., Conn., 2, 3, 4
Goslin Electric & Mfg. Co., Calif., 1, 2, 4, 5
Graham Transmissions, Inc., Wis., 2, 5
Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill., 2, 5
For details see ad on page 206
Guardian Electric Mfg. Co., 1628 DY W. Walnut St., Chicago 12, Ill., 6
For details see ad on page 26
Guthman & Co., Inc., Edwin I., Ill., 1-6
Hammarlund Mfg. Co., Inc., N.Y., 6
Harnett Elec. Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 2-6
For details see ad on page 83
Hercules Electric & Mfg. Co., Inc., N.Y., 2, 5
Hillburn Electronic Products Co., N.Y., 2, 3, 4, 6
Houlihan Co., T. J., Ill., 2, 3, 6
Hughey & Phillips, Tower Lighting Div., 4075 Beverly Blvd., Los Angeles 4, Calif., 1, 3
For details see ad on page 22
Hycor Co., The, Calif., 1, 4
I-T-E Circuit Breaker Co., Pa., 2, 4
Illinois Transformer Co., Ill., 2, 5
Inductance Corp., Ill., 2, 3, 5, 6
Insuline Corp. of America, N.Y., 3
Jeffers Electronics, Inc., Pa., 2, 3, 5
Johnson Co., E. F., Minn., 2, 3
Johnson Laboratories, N.Y., 6
Joyner Corp., The, Ind., 1-3, 5, 6
Keller Products, Inc., N.H., 5
Kenyon Transformer Co., Inc., 840 Barry St., New York 59, N.Y., 1, 5
For details see ad on page 204
Kurman Electric Co., 35-18 37th St., Long Island City 1, N.Y., 2
For details see ad on page 178
K-V Transformer Corp., N.Y., 1, 2, 5
Langevin Manufacturing Corp., 37 W. 65 St., New York 23, N.Y., 1, 2
For details see ad on page 137
LaRose & Assoc., W. T., N.Y., 5
Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J., 1-3
For details see ad on page 160
Lenkurt Electric Co., Inc., 1129 County Rd., San Carlos, Calif., 4, 6
For details see ad on page 91, 119
Leonard Electric Products Co., Inc., N.Y., 1-6
Linell Eng. Corp., Charles S., Ill., 3, 5, 6
Loral Electronics Corp., N.Y., 2, 3
Lytle Engineering & Mfg. Co., Ill., 3-6
M P Concert Installations, Conn., 2, 3
Magnetic Windings Div., Essex Wire, Pa., 2, 5
Magnetics Inc., Pa., 4
Mallory & Co., Inc., P. R., Ind., 3
Maryland Electronic Mfg., Corp., Md., 3, 5, 6
Measurements Corp., Intervale Rd., Boonton, N.J., 1, 2, 3
See complete catalog filed alphabetically in last section
Meissner Mfg. Co. Div., Maguire Inds., Ill., 2, 3, 5
Mercury Electronic Labs., Inc., Ill., 3
Mico Instrument Co., Mass., 4
Millen Mfg. Co., Inc., James, Mass., 3, 6
Miller Co., J. W., Calif., 2, 3, 6
Mullard Electronic Prods., Ltd., England, 2
Muter Co., The, Ill., 3, 4
National Co., Inc., Mass., 1, 2, 3
New York Transformer Co., Inc., N.J., 1
Oak Manufacturing Co., Ill., 6
Ohmite Mfg. Co., Ill., 3
Painton Co., Ltd., England, 3
Palmer, Inc., M. V., Wash., 4, 5
Pearl Engineering, N.J., 2, 5
Permoflux Corp., Ill., 5
Phelps-Dodge Copper Prods., N.Y., 1-6
Plastic Accessories, Inc., N.Y., 2, 5
Plessey International Ltd., England, 1-6
Polytron Corp., N.Y., 6
Polytronics Co., Canada, 2
Porter Mfg. Co., Ill., 1, 2, 3, 6
Potter Co., The, Ill., 3, 4
Power Transformer Co., N.J., 2, 5

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Coils

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Presto Electric Co., Inc., N.J., 1-5
Printloid, Inc., N.Y., 2, 5
Q. L. C. Corp., N.J., 2, 3, 6
R. K. L. Electro Winding Corp., N.Y., 1, 2, 3, 5, 6
Radio Condenser Co., N.J., 1, 2, 3, 6
RCA Tube Dept., 415 S. Fifth St., Harrison, N.J., 1, 3, 5
For details see ad on page 48
Radio Hispano Suiza, S.A., Spain, 5
Radio Industries, Inc., Ill., 2, 3, 5, 6
Radio (1936) Ltd., New Zealand, 1, 2, 3, 5, 6
Raypar, Inc., 7800 W. Addison St., Chicago 34, Ill., Video & Horizontal Peaking
For details see ad on page 207
Relay Service Co., Ill., 2
Reliable Spring & Wire Forms Co., Ohio, 6
Rollan Electric Co., Ill., 1-6
Ross Mfg. Co., Ill., 2, 3, 5, 6
SMA Company, Ill., 6
SNC Mfg. Co., Inc., Wis., 5
Santay Corp., Ill., 6
Savage Transformers, Ltd., England, 1
Shallcross Mfg. Co., 520 Pusey Ave., PY 61, Collingdale, Pa., 3
For details see ad on page 62
Shore Engineering, Inc., N.J., 2, 3, 6
Sickles Co., The, F. W., Mass., 2, 3, 6
Smallwood Ltd., S. G., Canada, 2, 3
Southern Elec. & Transmission Co., Texas, 4
Southwest Technical Lab., N.Mex., 2, 5
Spellman Television Co., Inc., N.Y., 5, 6
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 2, 3, 5
See complete catalog filed alphabetically in last section
Square Root Mfg. Corp., N.Y., 1-6
Stamford Transformers Inc., Conn., 1, 3, 5
Standard Coil Products Co., Inc., 2329 N. Pulaski Rd., Chicago 39, Ill., 2, 3, 6
For details see ad on page 36
Standard Electrical Prods. Co., Ohio, 1, 4, 5
Standard Transformer Corp., Ill., 1, 2, 5
Stanwyck Winding Co., N.Y., 2, 3, 5
Stephens Mfg. Corp., Calif., 2
Sterling Engineering Co., Inc., N.H., 2, 4
Stolle Engineering & Mfg. Co., Calif., 1, 2, 3, 5
Sun Copper & Wire Co., N.J., 5
Super Electric Products Corp., N.J., 1, 2, 3, 5, 6
Superex Electronics Corp., N.Y., 2
Tartak-Stolle Electronics, Inc., Calif., 1, 2, 5
Telectron Co., The, Ohio, 2, 5
Teleradio Engineering Corp., N.Y., 2, 3, 5, 6
Television Labs., Inc., Ill., 2, 5
Tetrad Co., Inc., Calif., 1-6
Thordarson Elec. Mfg. Div., Ill., 1, 2, 3, 5, 6
Todd Tran Corp., N.Y., 1-6
Torocoil Co., Mo., 4
Triad Transformer Mfg. Co., Calif., 4, 5
Trimm, Inc., Ill., 2
United States Electronics Corp., N.J., 1-6
United Transformer Co., 150 Varick St., New York 13, N.Y., 1, 2, 4, 5
For details see ad on page 256
Universal Mfg. Co., Inc., 404 Hillside Ave., Hillside, N.J., 4
For details see ad on page 82
Utah Radio Products Co., Ind., 1, 2, 3, 5
Vokar Corp., Mich., 1, 3, 6
Westinghouse Electric Corp., Pa., 1-6
Wheeler Insulated Wire Co., Inc., Conn., 1, 2, 5
Wilkor Products, Inc., Ohio, 3
Yonkers Industries, Inc., N.Y., 1-3, 5, 6

15. Computers.

1—Analog. 2—Digital.

Aero-Sonic Mfg. Co., Calif., 1, 2
Airplane & Marine Inst., Inc., Pa., 1
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 2
For details see ad on page 114
American Electroneering Corp., The, Calif., 2
American Hydromath Co., N.Y., 1
Arma Corp., N.Y., 1
Atlantic Electronics Corp., 4A Manhasset Ave., Port Washington, L.I., N.Y., 1
For details see ad on page 88
Austin Co., Special Devices Div., N.Y., 1, 2
Avion Instrument Corp., N.Y., 1, 2
Belock Instrument Corp., N.Y., 1, 2
Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, North Hollywood, Calif., 1
Burroughs Adding Machine Co., Inc. Pa., 2
Cole Instrument Co., Calif., 1, 2
Computer Corp. of America, N.Y., 1
Computer Research Corp., Torrance, California
For details see ad on page 83
Computing Devices of Canada Ltd. Canada, 1, 2
Condor Radio Mfg. Co., Ariz., 2
Consolidated Engineering Corp., Calif., 1
Davies Laboratories, Inc., The, Md., 1
Doelcam Corp., Mass., 1
Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J., 1
For details see ad on page 170
Electronic Computer Corp., N.Y., 2
Flader, Inc., Frederick, Ohio, 1
Ford Instrument Co., Inc., N.Y., 1
Gibbs Mfg. & Research Corp., Wis., 1
Goodyear Aircraft Corp., Ohio, 1
Hillyer Instrument Co., Inc., N.Y., 1, 2
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 1, 2
For details see ad on page 87
Industrial Electronic Engineers, Calif., 2
Int'l Business Machines Corp., N.Y., 1, 2
Jacobs Instrument Co., Md., 4

(Continued on page 83)

High-quality, Low-cost
TOROIDAL COILS

Universal-developed coil-winding machines produce a *better* toroidal coil, *custom-built* to your blueprint specifications, at considerably *lower unit cost!* Wound on any type cores (any I.D. to ⅜"), in any size wire, Universal toroidal coils are perfectly uniform and fully insulated. Send your blueprint specifications today, and let us quote the lower cost of better Universal toroidal coils on your next order.

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404 Hillside Avenue · Hillside N. J.

DIGITAL ELECTRONIC COMPUTERS

...CRC 101—50 Integrator, Remote Control, Digital Differential Analyzer

...CRC 102—1,000 Word, Binary, Universal Computer

...CRC 105—60 Integrator, Decimal, Remote Control, Digital Differential Analyzer

...CRC 106—11,000 Word, Decimal, Universal Computer

...Ferro-Resonant Flip-Flop

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Facilities for special Development Problems in Digital Electronic Computation, Communication and Control

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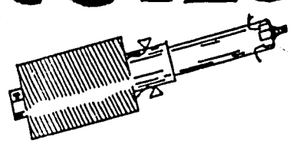
COILS



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For quick dependable service.

For long or short production runs.

Write, wire, phone or send your prints. No obligation of course.

Complete facilities and experience available to complete your entire subassembly

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Leader in the field of electronic design and manufacture
41-05 Lawrence St., Flushing 55, L.I., N.Y.
FLushing 3-7390

Computers

(Continued from page 82)

Krohn-Hite Inst. Co., Mass., 1
Lab. for Electronics, Inc., Mass., 1, 2
Lawton Products Co., Inc., N.Y., 2
Link Aviation, N.Y., 1
Manufacturers' Research Corp., Md., 1, 2
Melpar, Inc., Va., 1
Metrotype Corp., Ill., 2
Miller Corp., William, Calif., 1
Minnesota Electronics Corp., The, Minn., 1, 2
PSC Applied Research Ltd., Canada, 1
Philbrick Res., Inc., George A., Mass., 1
Philco Corp., Pa., 1
Phillips Petroleum Co., Okla., 1
Polytronics Co., Canada, 1
Potter Instrument Co., Inc., 115 Cutter Mill Rd., Dept. 5 YB, Great Neck, L.I., N.Y. 2
For details see ad on page 199
Raymond Engineering Lab., Inc., Conn., 1, 2
Servo Corp. of America, 20-20 Jericho Tnpke, New Hyde Park, L.I., N.Y., 1, 2
For details see ad on page 166
Servomechanisms, Inc., N.Y., 1
Servo-Tek Products Co., Inc., N.J., 1
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N.Y., 2
For details see ad on page 16
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 1, 2
See complete catalog filed alphabetically in last section
Streeter-Amet Co., Ill., 1, 2
Sylvania Electric Products Inc., Dept. R-6351 Emporium, Pa.
For details see ad on page 42
Telecomputing Corp., Calif., 2
Transmitter Equipment Mfg. Co., Inc., N.Y., 1

Condensers, see: 10 & 11

16. Connectors.

1—AN Standard Types. 2—Coaxial. 3—Microphone. 4—Power.

Airtron, Inc., 105 E. Elizabeth Ave., Linden, N.J., 4
For details see ad on page 217
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 2
For details see ad on page 114
American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 1-4
For details see ad on page 4
Astatic Corp., Ohio, 2
Barker & Williamson, Inc., 237 Fairfield Ave., PR-751, Upper Darby, Pa., 2
See complete catalog filed alphabetically in last section
Bendix Avi. Corp. Scintilla-Magneto Div., Sherman Ave., Sidney, N.Y., 1, 4
Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 2, 3
For details see ad on page 189
Brach Mfg. Corp., N.J., 2
Breeze Corp., Inc., N.J., 1
Bud Radio, Inc., Ohio, 3
Buggie & Co., H. H., Ohio, 1
Cannon Electric Development Co., Calif., 1, 2, 3, 4

(Continued on page 85)

RADIO FREQUENCY COILS
TO YOUR SPECIFICATIONS

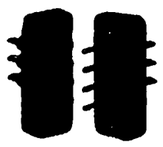
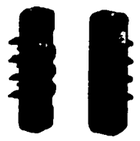
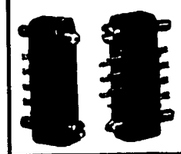
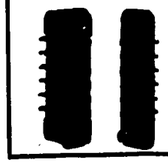
HARNETT

We stand prepared to serve your most exacting needs with windings that function under the most diversified and demanding operating conditions of both commercial and military requirements.

HARNETT ELECTRIC CORPORATION
138 Haven Ave., Port Washington, Long Island, N. Y.
Telephone Port Washington 7-3334

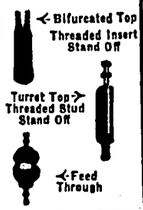
ELECTRICAL CIRCUIT CONNECTORS

MONOBLOC* CONSTRUCTION eliminates unnecessary creepage paths and reduces possibility of moisture and dust pockets and provides stronger molded parts.
MOLDED MELAMINE body parts insure greater mechanical strength and high dielectric and arc resistance.
PRECISION MACHINED CONTACTS are gold plated over silver for consistent electrical conductivity, prevention of corrosion and ease in soldering.
MANY FEATURES ARE COVERED BY OUR PATENT NUMBERS: DES 161900, DES 162795, 2466370, 2513080, 2526325, 2532538 and other patents pending.
*Trade Mark

CONNECTORS	DESCRIPTION	Types Available
SERIES A 	LIGHTWEIGHT AIRCRAFT RECTANGULAR Polarized, Rack, Panel or Cable Mounted—with Hood or Clamp and Cable Strain Relief.	Receptacle / Plug A7S / A7P A10S / A10P A15S / A15P A18S / A18P (Figures in above Code Nos. indicate number of contacts.)
SERIES SA 	LIGHTWEIGHT AIRCRAFT RECTANGULAR—SMALL Polarized, Rack, Panel or Cable Mounted—with Hood or Clamp and Cable Strain Relief.	Receptacle / Plug SA7S / SA7P SA10S / SA10P SA15S / SA15P SA18S / SA18P (Figures in above Code Nos. indicate number of contacts.)
SERIES M	MINIATURE For Aircraft, Instruments and Portable Equipment Light Weight, Polarized, Locking Ring, Panel or Cable Mounted with Hood and Cable Strain Relief.	Receptacle / Plug M4S / M4P M5S / M5P PM6S / PM6P M7S / M7P M9S / M9P M12S / M12P (Figures in above Code Nos. indicate number of contacts.)
SERIES MRE 	MINIATURE RECTANGULAR For Aircraft, Instruments and Portable Equipment Light Weight, Polarized, Self-Aligning with special Guide Pins, Rack, Panel or Cable Mounted with Hood and Cable Strain Relief.	Receptacle / Plug MRE7S / MRE7P MRE9S / MRE9P MRE12-2S / MRE12-2P MRE14S / MRE14P MRE18S / MRE18P MRE20S / MRE20P MRE21S / MRE21P MRE34S / MRE34P MRE41S / MRE41P MRE50S / MRE50P MRE75S / MRE75P
SERIES SMRE	MINIATURE RECTANGULAR—SMALL For Aircraft, Instruments and Portable Equipment Light Weight, Polarized, Self-Aligning with special Guide Pins, Rack, Panel or Cable Mounted with Hood and Cable Strain Relief.	Receptacle / Plug SMRE14S / SMRE14P SMRE20S / SMRE20P SMRE26S / SMRE26P SMRE29S / SMRE29P (Other sizes to meet your requirements)
SERIES QRE 	QUICK-DISCONNECTING SELF-ALIGNING Spring Loaded Contacts for ease in separation. Self-Aligning with Special Guide Pins, Rack, Panel or Cable Mounted with Hood and Cable Strain Relief.	Receptacle / Plug QRE6S / QRE6P QRE12S / QRE12P QRE18S / QRE18P QRE24S / QRE24P QRE34S / QRE34P QRE208S / QRE208P (Figures in above Code Nos. indicate number of contacts.)

CONNECTORS	DESCRIPTION	Types Available
SERIES R	WATER TIGHT AND PRESSURE-TIGHT Center Lock Screw with Bale facilitates engagement and disengagement and prevents accidental disconnection. Cable Entry with Strain Relief can be oriented in any desired position.	Receptacle / Plug R4S / R4P R9S / R9P R14S / R14P MR30S-PR / MR30P-PR (Figures in above Code Nos. indicate number of contacts.)
SERIES 200-900 Generally Mounted in A-N Shells	HIGH VOLTAGE HEAVY DUTY PRESSURE-TIGHT Center (H.V.) contacts separated by deep molded barriers and removable in the field for soldering wire leads. Other contacts for lower voltages. Neoprene Ring Sealed Contacts and Inserts for Pressure Tight Sealing in A-N Shells.	Receptacle / Plug 202 / 201 202B / 201B 202B-PR * / 201B-PR 302 * / 301 422 * / 421 451 * / 450 455 / 455 456-PR * / 455-PR 902 * / 921 *Pressure Tight Sealed in A-N Shells
SERIES HM	HERMETIC PLUG (Round Hole) Each special contact fused in glass into special base plate provided for soldering into a round hole in an hermetically sealed housing or bulkhead. Used with Standard "M" Receptacle.	Plug (Used with Standard M5S or M7S Recep'ts) HM5P HM7P
SERIES HMRE	HERMETIC PLUG (Rectangular Hole) Each special contact fused in glass into special base plate provided for soldering into a rectangular hole in an hermetically sealed housing or bulkhead. Used with Standard MRE Receptacle.	Plug (Used with Standard MRE Recep'ts) HMRE7P HMRE9P HMRE14P HMRE18P HMRE20P HMRE21P HMRE34P HMRE41P HMRE50P
SERIES PT	MINIATURE For Instrumentation, Communication and other Electronic Equipment. Compact, Lightweight, Polarized. Plug mounted on flat surface or spun in end of tube. Receptacle mounted on end of cable with special clamping hood and holding screw which also prevents accidental disconnection.	Receptacle / Plug PT4S / (PT4P (PT4P2 PT6S / (PT6P (PT6P2 (First Figure in above Code Nos. indicates number of contacts.)

Terminals

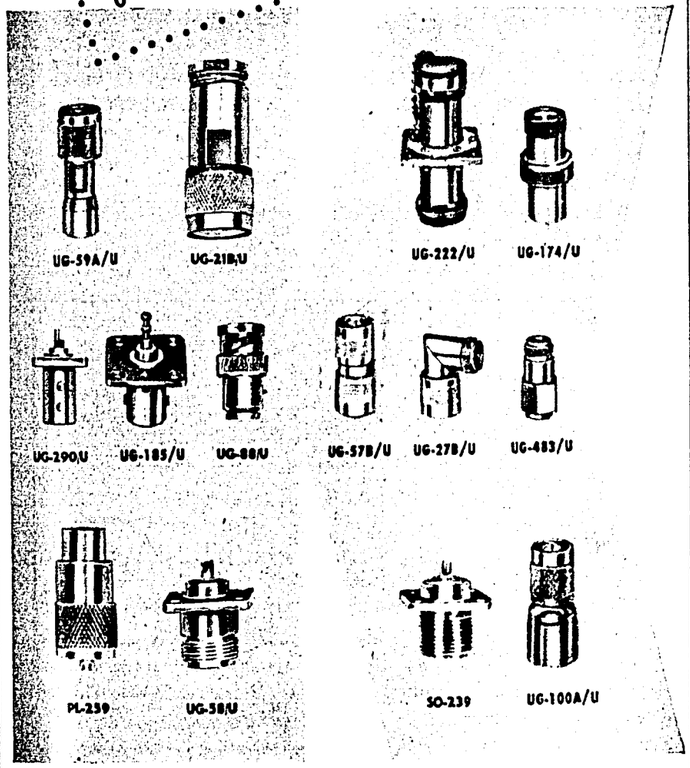


	Bifurcated	Turret	Threaded
Threaded Insert	750 756 773 753 770 776	760 780 763 783	860 863 861
Threaded Stud	754 775 755	784 784 765 785	79 82
Rivet End	751 752	731 767 762	
Threaded Stud Miniature		MTS7 MTS12	
Feed Through		FT9 FT5	

Write or telephone our Engineering Department for information on the above or other connectors—or for consultation on difficult connector problems. Many other standard and special types available.

Winchester Electronics Incorporated
GLENBROOK, CONNECTICUT, U.S.A.

KINGS COAXIAL CONNECTORS



preferred by engineers everywhere

From coast-to-coast, engineers in all fields look to Kings Electronics for the finest coaxial connectors.
Special problems in design and fabrication receive the wholehearted cooperation of Kings own engineering department.
For precision-made, pressurized R.F. Connectors call on Kings—the leader. Quotations on request.

KINGS Electronics

40 MARBLEDALE ROAD, TUCKAHOE, N.Y.
IN CANADA: ATLAS RADIO CORP., TORONTO

Connectors

(Continued from page 83)

Cinch Mfg. Corp., Ill., 3, 4
Commercial Radio Sound Corp., N.Y., 2
Dage Electric Co., Ind., 2
Dial Light Co. of America, Inc., 900 Broadway, New York 3, N.Y., 3
For details see ad on page 163
Diamond Mfg. Co., Mass., 2
Display Lighting, Inc., N.Y., 3
Du Plate Canada, Ltd., Canada, 2, 3, 4
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa., 3, 4
For details see ad on page 125
ELCO Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa., 4
For details see ad on page 185
Federal Electric Products Co., N.J., 1-4
General Cement Mfg. Co., Ill., 3
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 2
For details see ad on page 236-7, Back Cover
Gombos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 2
For details see ad on page 91
Industrial Precision Products, Ill., 1, 2
Industrial Products Co., Conn., 2, 4
Insuline Corp. of America, N.Y., 3
Jones Div., Howard B., Cinch Mfg. Corp., Ill., 4
Joy Manufacturing Co., Pa., 4
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 2, 3, 4
For details see ad on page 85, 130
Link Radio Corp., N.Y., 1, 2, 3
Mandex Mfg. Co., Ill., 3, 4
Methode Mfg. Corp., Ill., 1
Millen Mfg. Co., Inc., James, Mass., 4
Mines Equip. Div., Joy Mfg. Co., Md., 3
Molded Insulation Co., Pa., 1, 2
Neptune Electronics Co., N.Y., 1, 2
Plessey International Ltd., England, 2, 3, 4
Presto Electric Co., Inc., N.J., 3
Product Development Co., Inc., N.J., 2
Pye Ltd., Radio Works, England, 2
Pyle-National Co., Ill., 4
Remler Co. Ltd., Calif., 3
Roanwell Corp., Aviometer Div., N.Y., 3
Russell & Stoll Co., Inc., N.Y., 4
Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y., 3
See complete catalog filed alphabetically in last section
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 1, 2
See complete catalog filed alphabetically in last section
Standard Electric Time Co., The, 97 Logan St., Springfield 2, Mass., 4
For details see ad on page 151
Technical Appliance Corp., N.Y., 2
Technicraft Laboratories, Inc., Conn., 1
Transradio Ltd., England, 2
Trimm, Inc., Ill., 1, 2
Ucinite Co., The, Mass., 2
Waltham Horological Corp., Mass., 2
Winchester Electronics Co., 15 Crescent St., Glenbrook, Conn., 4
For details see ad on page 84
Workshop Associates, Div. Gabriel Co., 135 Crescent Rd., Needham, Mass., 2
For details see ad on page 46

Consoles, see: 8

(Continued on page 87)

ASCOP

Designer & Producer of New Electronic Devices

- SCIENTIFIC RESEARCH, DEVELOPMENT AND CONSULTATION.
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- COMPARATIVE ANALYSIS OF SPECIFIC EQUIPMENTS AND TECHNIQUES.
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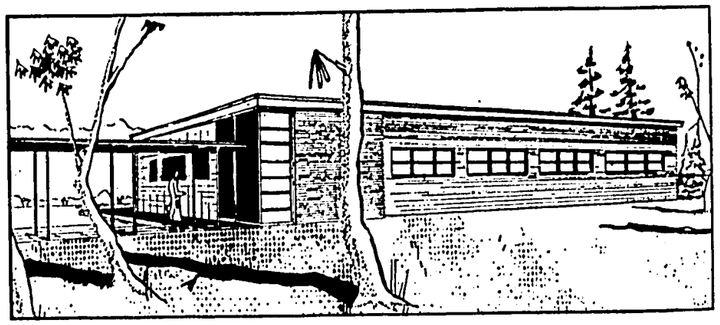
HIGH AND LOW SPEED MULTICHANNEL MECHANICAL SAMPLING DEVICES

DATA TREATING, ANALYZING AND DISPLAY METHODS AND TECHNIQUES

CUSTOM BUILT ELECTRONIC AND ELECTRO-MECHANICAL EQUIPMENT



ASCOP makes its expanded facilities available to you for the application of basic scientific principles to the design and development of electronic and electro-mechanical devices. The new and modern ASCOP laboratory, centrally located on the East Coast, is in the heart of one of the country's leading research centers.

The ASCOP Group offers you experience in many scientific fields—particularly those related to Aircraft and Guided Missile development. A unique combination of theoretical and practical approaches assures the best and latest techniques in product design and development.

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Laboratory and offices located two miles southeast of U.S. 1 Princeton traffic circle adjacent to the Princeton Junction Station of the Pennsylvania Railroad midway between New York City and Philadelphia.
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The Applied Science Corporation of Princeton

Post Office Box 44, Princeton, New Jersey

17. Consulting Engineers.

1—Accoustical. 2—Electrical. 3—Mechanical. 4—Radio.

Adair, George P., D.C., 4
Adler Communications Labs., N.Y., 4
Antenna Research Lab., Inc., The, Ohio, 4
Applegate & Co., C. J., Colo., 2
Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J., 2, 3, 4
For details see ad on page 86
Arenberg, David L., Mass., 1
Associated Broadcasters, Inc., Calif., 4
Atlantic Electronics Corp., 4A Manhasset Ave., Port Washington, L.I., N.Y., 2, 4
For details see ad on page 88
Austin Co., Special Devices Div., N.Y., 2, 3
Auto-Test, Inc., Ill., 2
Babillius, John, Iowa, 2, 3, 4
Bailey, Lester W., N.J., 2, 3, 4
Baldwin Engineering Service, Minn., 2
Ballantyne Co., The, Nebr., 2
Barker & Williamson, Inc., 237 Fairfield Ave., Pr-751, Upper Darby, Pa., 4
See complete catalog filed alphabetically in last section
Baruch Laboratories, N.Y., 2, 4
Bassett, Inc., Rex, Fla., 4
Beckman & Whitley, Inc., Calif., 2, 3, 4
Bolt, Beranek & Newman, Mass., 1
Bone Engineering Corp., Calif., 2, 3, 4
Breon Laboratories, Pa., 2, 4

W. J. BROWN, B.Sc.
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INDUSTRIAL ELECTRONICS, RADIO & TELEVISION
Write 17th Floor, 100 Broadway, New York 5, N.Y.
Specialist in Thyratron & Mercury Arc Controls

Brown, W. J., 100 Broadway, 17th Floor, New York 5, N.Y., 2, 4
For details see ad on page 87
Brownell, H. Russell, N.Y., 2
Burnett Radio Lab., Wm. W. L., Calif., 4
Busse & Schroeder, Pa., 1, 2, 4
Byerlay & Assoc., H. L., Mich., 4
Carnine & Bitter, D.C., 2, 3, 4
Charp, S., Pa., 2, 4
Commonwealth Eng'ng. Co. of Ohio, Ohio, 2, 3, 4

A FUNDAMENTALLY SOUND EQUATION
• Application Know-How
+ Time Proven Equipment
= High Quality—Reliable Sound Systems
*On contractural foreign assignment with International Standard Electric Corporation until January 1, 1952.
Edward J. Content
CONTENT ENGINEERING ASSOCIATES
Roxbury Road, Stamford, Conn.
Stamford 3-7459

Computer Research Corp., 1954½ Carson Ave., Torrance, Calif., 2
For details see ad on page 83
Content, Edward J., Roxbury Rd., Stamford, Conn., 1
For details see ad on page 87
Continental Electronics Ltd., N.Y., 1, 2, 4
Cook & Co., Mass., 1, 2

CROSBY LABORATORIES, INC.
Murray G. Crosby & Staff
Radio-Electronic Engineering, Research & Development
FM, Communications, TV
Test Equipment
Offices, Laboratory & Model Shop at: 126 Herricks Rd., Mineola, N.Y.
Garden City 7-0284

Crosby Laboratories, Inc., 126 Herricks Rd., Mineola, L.I., N.Y., 4
For details see ad on page 87, 171
Crossland & Co., W., England, 1, 2, 4
Davis, George C., D.C., 4
Deflorez Co., Inc., N.Y., 2, 3
Deryder, H., N.J., 4
Design Service Co., N.J., 2, 3, 4
Designers for Industry, Inc., Ohio, 2, 3, 4
Doble Engineering Co., Mass., 2
Edgerton, Germeshausen, & Grier, Inc., Mass., 2
Eichwald & Co., Inc., B., N.Y., 2, 4
Electrical Testing Labs., Inc., N.Y., 2, 4
Electro Craft, Inc., Conn., 3, 4
Electro Mec Lab., N.Y., 2, 3

Richard B. Schultz
Electro-Search
Radio-Interference Reduction; Development of Interference-Free Equipment, Filters, Shielded Rooms
515 W. Wyoming Ave., Philadelphia 40, Pa.
Gladstone 5-5353

Electro-Search, 515 W. Wyoming Ave., Philadelphia 40, Pa., 4
For details see ad on page 87
Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J., 4
For details see ad on page 170

ELK ELECTRONIC LABORATORIES
Jack Rosenbaum
Specializing in the design and development of Test Equipment for the communications, radar and allied fields.
333 West 52nd St. New York 19, N.Y.
Telephone: PLAZA 7-0520

Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y., 4
For details see ad on page 87
Ellis Associates, N.Y., 3
Empire Devices, Inc., 38-25 Bell Blvd., Bayside, L.I., N.Y., 4
For details see ad on page 198
Engineering Development, Nebr., 2, 3, 4
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Gibbs & Cox, Inc., N.Y., 1, 2, 4
Glens Falls Laboratory, Inc., N.Y., 2, 4

PAUL GODLEY CO.
Consulting Radio Engineers
P.O. Box J. Upper Montclair, N.J.
Offs & Lab.: Great Notch, N.J.
Phone: Montclair 3-3000
Established 1926

Godley Co., Paul, 10 Marion Rd., Upper Montclair, N.J., 1, 2, 3, 4
For details see ad on page 87
Goldwater, F. J., N.Y., 2

HERMAN LEWIS GORDON
Registered Patent Attorney
Patent Investigations and Opinions
Warner Building, Washington 4, D.C., National 2497
100 Normandy Drive, Silver Spring, Md., Shepherd 2433

Gordon, Herman L., Warner Bldg., Washington 4, D.C., 1, 2, 3, 4
For details see ad on page 87
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Graner, Inc., L. P., N.Y., 2, 4
Heffelfinger, John B., Mo., 4
Hegeman Labs., N.J., 1, 2
High Voltage Engineering Corp., Mass., 2, 3

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Hogan, John V. L., 155 Perry St., New York 14, N.Y., 4
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Hoopes, Penrose R., Pa., 3
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Industrial Electronics, Inc., Mich., 2
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Instrument Laboratories, N.Y., 2
Ivanhoe Electronics Labs., Ill., 4
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Jansky & Bailey, D.C., 4
Johnson, R. W., Calif., 2, 4

DAVID C. KALBFELL, Ph.D.
Laboratory and Manufacturing Facilities
Specializing in Electronic Instrumental and Industrial Problems
1076 Morena Blvd. San Diego 10, Calif.

(Continued on page 88)

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MAGNETIC AMPLIFIERS for speed control for temperature control

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RESOLVER DRIVE AMPLIFIERS

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King, Albert D., Mass., 4
Little, Inc., Arthur D., Mass., 2, 3
Long Engineering Co., N.C., 1
Lubcke, Harry R., Calif., 2, 4
Lynmar Engineers, Pa., 2, 4
McCoy, Robert E., Ore., 2, 4
McNeal, J. D., Conn., 2
Mackinnon, Keith A., Canada, 4
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Management Training Associates, D.C., 1, 4
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Manufacturers Research Corp., Md., 2, 3
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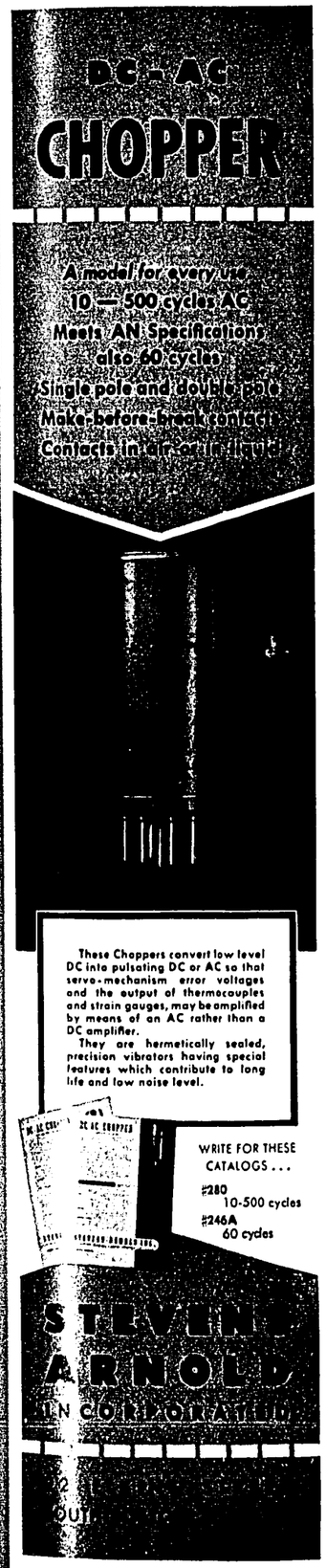

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Stockman Electronics Research Co., Mass., 4

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Murray Hill 2-2655

Sutter, Alfred W., 141 E. 44 St., New York 17, N.Y., Management
For details see ad on page 89, 137
Technical Advisory Associates, N.Y., 2, 3, 4
Technical Associates, Calif., 2
Technical Materiel Corp., N.Y., 4
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Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 2
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Wadsworth Mfg. Associates, N.Y., 3
Wappler, Inc., N.Y., 2
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Wertz Engineering Co., Pa., 1, 2, 4

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Harold A. Wheeler and Engineering Staff
Great Neck, N.Y. Great Neck 2-7806

Wheeler, Harold A., 122 Cutter Mill Rd., Great Neck, N.Y., 4
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Winters, T. Starling, N.J., 2
Yoh Co., Inc., H. L., Pa., 1-4

18. Converters.

1—Frequency. 2—Vibrator.

ABC Radio Laboratories, Ind., 1
Airpax Products Co., Md., 1, 2
Airplane & Marine Inst., Inc., Pa., 1
American Television & Radio Co., Minn., 2
Boonton Radio Corp., N.J., 1
Clark Crystal Co., Mass., 1
Continental Electric Co., Inc., N.J., 1
Cornell-Dubilier Elec. Corp., 1000 Hamilton Blvd., South Plainfield, N.J., 2
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Electro Products Labs., Inc., Ill., 2
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Gibbs Mfg. & Research Corp., Wis., 1
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Russell Electric Co., Ill., 1
Sierra Electronic Corp., Calif., 1
Sorensen & Co., Inc., Conn., 1
Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass., 2
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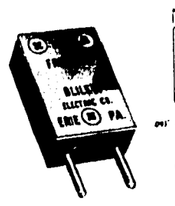
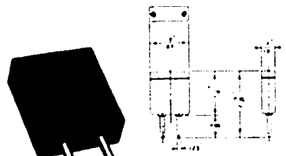
MILITARY REQUIREMENTS — Bliley Crystals — COMMERCIAL APPLICATIONS



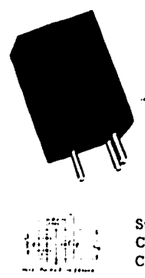
TYPE MC9
RANGE: 1.0-10.0 mc
Supplied per mil type CR-5; CR-6; CR-8; CR-10 when specified.



TYPE SR5A
RANGE: 2.0-15.0 mc
Supplied per mil type CR-1A when specified.

TYPE BH6A
RANGE: 0.8-75.0 mc
Supplied per mil type CR-18; CR-19; CR-23; CR-27; CR-28; CR-32; CR-33; CR-35; CR-36 when specified.

TYPE TCO-1
200-600 kc, 1-100 mc
Dimension "L" is 1½" for TCO—1 oven (single crystal) Dimension "L" is 1 11/16" for TCO—2 oven (two crystals)



TYPE AR23W
RANGE: 0.080-0.19999 mc
Supplied per mil type CR-15; CR-16; CR-29; CR-30 when specified.

TYPE BH7A
RANGE: 15.0-50.0 mc
Supplied per mil type CR-24 when specified.

BLILEY . . . THE STANDARD FOR COMMERCIAL APPLICATIONS FOR OVER TWENTY YEARS!

TYPE SR8

TYPE MC7

TYPE SR10

TYPE CF6

TYPE SR7

TYPE BH9

TYPE FM6

TYPE BC46T

TYPE TC92
Temperature Stabilizer

Whenever precision frequency control is needed . . . Bliley crystals are predominately chosen for dependability and accuracy. For over 20 years Bliley has supplied the crystals used in equipment by research, manufacturing and engineering organizations.

ULTRASONICS: Quartz blanks produced to customer specifications for ultrasonic application or research. Material carefully processed to individual requirements.

DELAY LINES: Fused quartz delay lines custom-built to specifications.

CUSTOM ASSEMBLIES: Facilities are available for *volume* production of complete crystal oscillator subassemblies in accordance with military specifications.

Bliley ELECTRIC COMPANY
UNION STATION BLDG. • ERIE, PA.

19. Cores & Core Materials.

1—Complete Cores. 2—Laminations. 3—Powdered Metal.

Aladdin Radio Industries, Inc., Tenn., 3
American Electro Metal Corp., N.Y., 3
American Radio Co., Inc., N.Y., 3
Amplex Mfg. Co., Mich., 3
Antara Products Div., General Dyestuff Corp., 435 Hudson St., Dept. 91, New York 14, N.Y., 3
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Delco Radio Div., of General Motors, Ind., 1, 3
Du Plate Canada Ltd., Canada, 3
Federal Electric Products Co., N.J., 3
General Ceramics & Steatite Corp., Plant 3, Crows Mill Rd., Keasbey, N.J., 1
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Johnson Laboratories, N.Y., 1
Keller Products, Inc., N.H., 2
Kobzy Tool Co., Ill., 2
Leeds Engineering Co., N.Y., 1, 2
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Standard Transformer Corp., Ill., 1
Thomas & Skinner Steel Prods. Co., Ind., 2
Thordarson Elec. Mfg. Div., Ill., 2, 3
Todd Tran Corp., N.Y., 1
Westinghouse Electric Corp., Pa., 1, 2
Williams & Co., C. K., Ill., 3

20. Crystals.

1—Germanium & Silicon, etc. 2—Oscillating Quartz. 3—Piezo-Electric.

American Gem & Pearl Co., N.Y., 2
American Quartz Labs., Inc., N.Y., 2, 3
Bassett, Inc., Rex, Fla., 2, 3
Berkshire Labs., Mass., 1
(Continued on page 93)

Custom Built Electronic Components

Micro-Wave components include radar filters—cross bar switches—magnetic tuners—crystal holders—crystal converters—dial assemblies—jacks and connectors—coil forms—crystal heater ovens—cavity tuners and cathode-ray tube parts.

Precision machined parts, stampings and castings used in communication and aircraft industries.

Fabricated in beryllium copper, mclybdenum, tantalum, monel, plexiglass and polystyrene.

Competent engineering and experienced design assistance is available.

JOHN GOMBOS CO., INC.
103 Montgomery St. ESSEX 3-6633 Irvington 11, N.J.

LOW-COST Q, BUT QUICK

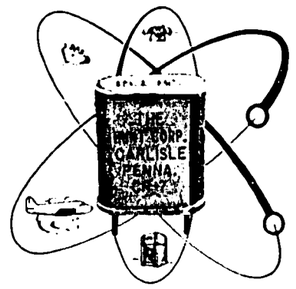
If you need powder-iron cores quickly, call on Lenkurt. A substantial increase in productive capacity just completed means fast deliveries and *reduced prices*, together with better mechanical and electrical control over quality.

Cylindrical iron-powder tuning-slug cores illustrated are available in all popular sizes between 0.195 and 3.375 in. diameter. Up to 1 inch O.D. with threaded inserts as required. Powder-iron assemblies in other forms — particularly toroids — are also produced for rapid deliveries.

Special sizes and types as well as standard items can be supplied in a wide range of magnetic materials to suit your application. Write today for further data or specific recommendations.

Lenkurt LENKURT ELECTRIC CO.
SAN CARLOS • CALIFORNIA

STABILITY
HUNT CR-7 CRYSTAL



Miniature Type CR-7 Crystal Unit
(Illustration is actual size)

THE Hunt CORPORATION
CARLISLE 2, PENNSYLVANIA

SETTING EVER HIGHER STANDARDS OF PERFORMANCE

STABILIZED CRYSTALS

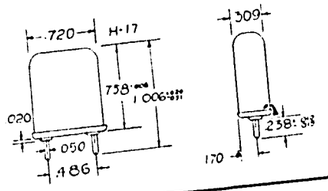
Performance is proof of product quality, and that's why JK STABILIZED CRYSTALS are held in such high esteem by those who depend on them.

Listed here are only a few of the many, many high quality crystals and ovens produced by the JAMES KNIGHTS COMPANY — the company that is constantly pioneering improved crystal performance.

Write now for complete catalog that lists them all, including the outstanding FS 344 Frequency Standard.

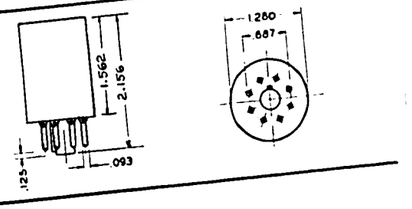
H-17

- Frequency Range 200 kc to 100 mc
- Hermetically sealed metal holders
- Wire mounted, silver-plated crystals
- Two type H-17 holders fit loctal socket.
- H-17 is military type HC6/U, CAATC No. 3R1-3



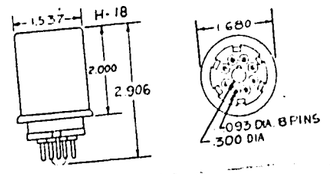
JKO-2

- Holds two type H17 (Military HC6/U)
- Normal temperature 75° ± 2°C
- Ambient range −55 to + 70°C
- Heater 6.3 volts, under 1 amp.
- Standard octal base



H-18

- Frequency range 80 kc to 2 mc
- Hermetically sealed metal holder
- Wire mounted silver-plated crystals
- H-18 has octal base.
- H-18-5 has standard 5 pin tube base.

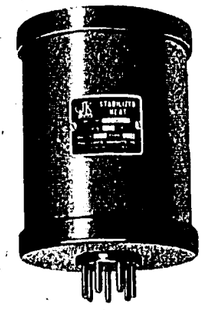


THE JAMES KNIGHTS COMPANY, SANDWICH, ILLINOIS

JK-57-MT

- Frequency range 400 kc to 1750 kc adjustable ± .01%
- Normal temperature 60°C ± 2°C (adjustable ± 10°C)
- Ambient range for 60°C operation, −20 to +58°C
- Heater 6.3 volts at 1-1/2 amp
- JK-57-M has standard 5 pin base, JK-87-M has octal base
- Low temperature coefficient plate will stay within FCC tolerance during warmup from normal room temperature
- F C C approved for broadcast use
- JK-57MT & JK-87MT have thermometer

JK-07



- Will hold any JK type crystal except H-6, H-18T and H-19
- Normal operating temperature 50°C ± 2°C
- Will hold temperature as much as 75°C above the ambient
- Supplied complete with Johnson No. 237 socket
- JKO-7E has sealed-in-glass thermostat for greater precision and longer life
- Available as JKO7 or JKO7E with 6.3 volt 10 watt heater or 115 volt 12 watt heater on either model
- Ideal for frequency standards and broadcast (FM & TV) FCC approved

CRYSTALS FOR THE CRITICAL

Crystals

(Continued from page 91)

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Brush Development Co., Ohio, 3
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Clark Crystal Co., Mass., 2, 3
DX Radio Products Co., Inc., Ill., 2, 3
Dallons Laboratories, Calif., 2, 3
Eidson Electronic Co., Texas, 2
General Electric Co., N.Y., 1
General Elec. Co., Electronics Dept., N.Y., 1-3
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Gulton Mfg. Corp., N.J., 3
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Polytech Devices, Inc., N.J., 2, 3
Precision Piezo Service, La., 2, 3
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 2
RCA Eng. Prod. Div., Camden, N.J., 3
Radio Specialty Mfg. Co., Ore., 2
Reeves-Hoffman Corp., 145 Cherry St., Carlisle 4, Pa., 2, 3
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Ross Mfg. Co., Ill., 2
Scientific Radio Service, Md., 2
Standard Crystal Co., Kans., 2
Standard Piezo Co., Pa., 2, 3
Sylvania Electric Products Inc., Dept. R-6351 Emporium, Pa., 1
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Tibbetts Industries, Inc., Maine, 3
Valpey Crystal Corp., Mass., 2, 3

21. Crystal Holders.

Bliley Electric Co., 227 Union Station Bldg., Erie, Pa.
For details see ad on page 90
Eidson Electronics Co., Texas
Elm Laboratories, N.Y.
Glenco Corp., N.J.
Gulton Mfg. Corp., N.J.
Hermetic Seal Products Co., 29-31 South 6 St., Newark 7, N.J.
For details see ad on page 116
Isolantite Mfg. Corp., N.J.
Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y.
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Knights Co., James, 131 S. Wells St., Sandwich, Ill.
For details see ad on page 92
Molded Insulation Co., Pa.
Pix Mfg. Co., Inc., N.J.
Polytech Devices, Inc., N.J.
Precision Piezo Service, La.
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y.
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Distributors Directory Class 22

As a service to members we have included a list of 1033 individuals and firms in the radio-electronic distributing business, with addresses, keyed:

1. Jobbers and Wholesalers
2. Manufacturers Representatives
3. Sales and Service

NEDA identifies members of the National Electronic Distributors Association, and REP members of "The Representatives," through the courtesy of these organizations.

Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa.
For details see ad on page 64

Discs, Recording, see: 56 Subhead 1

22. Distribution.

1—Jobbers and Wholesalers. 2—Manufacturers Representatives. 3—Sales & Service.

A. C. Radio Supply Co., 1539 W. Passyunk Ave., Philadelphia 45, Pa., 1 (NEDA)
A. G. Radio Parts Co., 3515 N. 17 St., Philadelphia 40, Pa., 1 (NEDA)
Aaron, Irvin A., 829 N. Marshall St., Milwaukee 2, Wis., 2 (REP)
Aaron, Paul D., 120 Liberty St., New York 7, N.Y., 2 (REP)
Acme Radio Supply Corp., 510 W. State St., Milwaukee 3, Wis., 1 (NEDA)
Adair, C. E., 1426 High Point Pl. N.E., Atlanta, Ga., 2 (REP)
Adirondack Radio Supply Co., 32 Guy Park, Amsterdam, N.Y., 1 (NEDA)
Aeronautical Radio Mfg. Co., 185 1 St., Mineola, L.I., N.Y., 1
Akeroyd, Arthur E., John Hancock Bldg., Boston 16, Mas., 2 (REP)
Alex Radio Lab., 1701 W. 25 St., Cleveland 13, Ohio, 3
All-State Distributing Co., 2407 Ross Ave., Dallas 1, Tex., 1 (NEDA)
Allen Communications, Inc., 1845 Broadway, New York 13, N.Y., 1
Allen Electronics Co., 147 Chestnut St., Garden City, N.Y., 1,2,3
Allen & Hurley, 25 S. Warren St., Trenton 10, N.J., 1
Allen Leonard, 2401 S. State St., Syracuse 5, N.Y., 2 (REP)
Allen & Jemison Co., Tuscaloosa, Ala., 1 (NEDA)
Allen Supply Co., Wm. B., 1601 Orleans St., New Orleans 16, La., 1 (NEDA)
Alliance Distributors, 281 Lyons Ave., Newark 8, N.J., 1
Alliance Tool & Motor Co., Ltd., Grand Ave. & Queens Way, Toronto 14, Ont., Canada, 2
Allied Elec. Appliance Pts., Inc., 3640 Elder St., Philadelphia 40, Pa., 1 (NEDA)
Allied Radio Corp., 833 W. Jackson Blvd., Dept. 35-J-1, Chicago 7, Ill., 1 (NEDA)
For details see ad on page 94
Allison Radar Corp., 11 W. 42 St., New York 18, N.Y., 3

(Continued on page 95)

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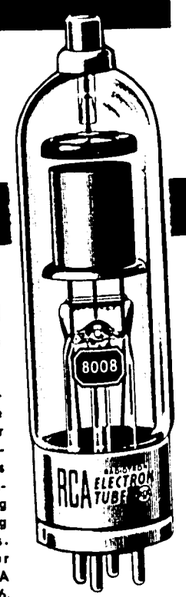
RCA

electron tubes for industry



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* RCA-8008 Rectifier (illustrated). We stock the full line of famous RCA mercury-vapor rectifiers, including such well-known types as the 575-A, 673, 816, 857-B, 866-A, 869-B, 872-A, and 5558.

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* RCA WV-97A Senior Voltohmyst (illustrated). We can supply *all* RCA instruments, including the following well-known lab measurement equipment:

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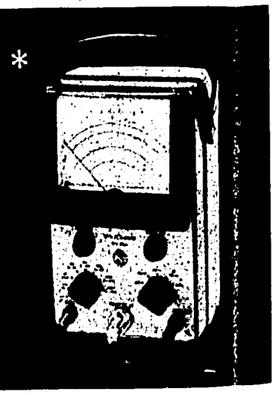
- *WO-57B 3" Oscilloscope*
- *715-B 5" Lab Oscilloscope*
- *WV-84A DC Microammeter*
- *WR-39C TV Marker Generator*
- *WR-59B TV Sweep Generator*



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(Continued from page 93)

Almo Radio Co., 412 N. 6 St., Philadelphia 23, Pa., 1 (NEDA)
Alverson Sales Co., 208 E. Front St., Bloomington, Ill., 1 (NEDA)
Alvo Recording Co., 51 W. Third St., Williamsport, Pa., 1,3
American Airmotive Corp., P.O. Box 6, Miami Springs, Fla., 1,2,3
American British Technology, Inc., 57 Park Ave., New York 16, N.Y., 1
American Radio Corp., 510 Central Ave., Dover, N.H., 1 (NEDA)
Anderson, Donald J., 318 Harvard St., Brookline, Mass., 2 (REP)
Anderson, George, 1901 Griffin St., Dallas 2, Tex., 2 (REP)
Anderson, Robert B., 172 State St., Boston 9, Mass., 2 (REP)
Andrews, A. R., 521 Cumberland Ave., Syracuse 10, N.Y., 2 (REP)
Andrews, Martin P., Mott Rd., Fayetteville, N.Y., 2 (REP)
Angel, Les, Oakland Rd., Loveland, Ohio, 2 (REP)
Antle, Glen, 5024 Bradford St., Dallas, Tex., 2 (REP)
Appleton, Harry N., 136 San Fernando Rd., Los Angeles 31, Calif., 2 (REP)
Arace Electr. Distributors, 25 Henry St., Kingston, N.Y., 1 (NEDA)
Arrow Electronics, Inc., 82 Cortlandt St., New York 7, N.Y., 1 (NEDA)
See complete catalog filed alphabetically in last section
Arrowhead Radio & TV Supply Co., 1216 D St., San Bernadino, Calif., 1
Ash Radio Co., Walter, 1125 Pine St., St. Louis, Mo., 1 (NEDA)
Ashman Distributing Co., 24 & Monticello Ave., Norfolk 4, Va., 1 (NEDA)
Associated Electronics Co., 132 Nassau St., New York 7, N.Y., 1
Assocated Radio Distrs., 1251 Folsom St., San Francisco, Calif., 1 (NEDA)
Atlantic Industrial Co., 101-38 91 St., Ozone Park, L.I., N.Y., 1
Atlas Radio Corporation Ltd., 560 King St., West, Toronto 1, Ont., Canada 2
Audio & Video Products Corp., 1650 Broadway, New York 19, N.Y., 23
Aymond, Edward F., 4310 Maple Ave., Dallas 4, Tex., 2 (REP)
Aymond Jr., E. F., 4310 Maple Ave., Dallas 4, Texas, 2 (REP)
B & R Electric Co., St. Marys, Pa., 1 (NEDA)
Baier, Arthur H., 1306 Center Rd., S. Euclid Ohio, 2 (REP)
Baker Radio Electric, 111 Johns St., Johnstown, Pa., 1 (NEDA)
Baker Sales Co., Inc., H. C., 19 Franklin Rd., Roanoke, Va., 1 (NEDA)
Ball, Marshall T., 58 E. Quaker St., Orchard Park, N.Y., 2 (REP)
Barbey Co., Inc., George D., 2 & Penn Sts., Reading, Pa., 2
Barnett Bros. Radio Co., 147 N. 7 St., Philadelphia, Pa., 1 (NEDA)
Bartlett, Frederick P., 6114 N. Lawndale, Chicago 45, Ill., 2
Bauman & Bluzat, 2753 W. North Ave., Chicago 47, Ill., 2 (REP)
For details see ad page 95
Bauman Co., 3033-35 Lyndale Ave., S. Minneapolis 8, Minn., 1 (NEDA)
Bauman, W. J., 2753 W. North Ave., Chicago 47, Ill., 2 (REP)
Beacon Electronics, Inc., 14 Catherine St., Utica, N.Y., 1 (NEDA)
Beam Instruments Corp., 350 5 Ave., New York 1, N.Y., 12
Bean, Everett P., 1336 Madison Ave., Memphis 4, Tenn., 2 (REP)
Bear, Howard, 168 Oak Rd., Stow, Ohio, 2 (REP)
Bear, Neal, Corp., West Richfield, Ohio, 2 (REP)
Becker, Herbert, 1406 S. Grand Ave., Los Angeles 15, Calif., 2 (REP)
Becker, R. F., 3020 N. Cicero Ave., Chicago 41, Ill., 2 (REP)
Beckman Co., C. E., 11-35 Commercial St., New Bedford, Mass., 1 (NEDA)
Beebe, J. R., 5707 W. Lake St., Chicago 44, Ill., 2 (REP)
Beier Co., Leroy W., 6518 W. North Ave., Chicago 35, Ill., 2 (REP)
Bell, Fred, 11621 Detroit Ave., Cleveland 2, Ohio, 2 (REP)
Bellchamber, Philip A., 212 9 St., Oakland 7, Calif., 2 (REP)
Belusko, Jos V., 819 Thomas Ave., Seattle 1, Wash., 2 (REP)
Benge, J. R., 507 E. Willow Grove Ave., Philadelphia 18, Pa., 2 (REP)
Berger, Cyrus, 1775 Broadway, New York 19, N.Y., 2 (REP)
Berman, Alvin A., 3757 Northwood Rd., University Hts. 18, Ohio, 2 (REP)

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Berman, Eugene L., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Berndt, W. E., 655 S. Warren St., Syracuse, N.Y., 1
Berthold, A. L., 4411 Maple Ave., Dallas 4, Tex., 2 (REP)
Bettis, Maury E., 3119 Gilliham Rd., Kansas City, Mo., 2 (REP)
Beyer & Co., A. R., 1318 Polk Ave., Houston 2, Texas, 1
Bieberich, Walter, 2817 Plaza Dr., Ft. Wayne 5, Ind., 1 (NEDA)
Biernbaum, J. W., 834 Western Saving Fund Bldg., Philadelphia, Pa., 2 (REP)
Biggs, J. Alan, Gardenville, Pa., 2 (REP)
Bittan Co., D. R., 53 Park Pl., New York, N.Y., 2 (REP)
Bluff City Distributing Co., 905 Union St., Memphis 3, Tenn., 1 (NEDA)
Boe Distributing Co., 498 N. Grandview Ave., Dubuque, Iowa., 1 (NEDA)
Boehme, C. D., 4 Talbott Bldg., Dayton 2, Ohio, 1
Boenecke, C. A., 445 Conger Ave., Collingswood, N.J., 2 (REP)
Bond Radio Supply, 439 W. Main St., Waterbury, Conn., 1 (NEDA)
Boniface, R. L., 7422 Melrose Ave., Hollywood 46, Calif., 2 (REP)
Bonn Co., Lew, 1211 LaSalle Ave., Minneapolis 4, Minn., 1 (NEDA)
Booth, Claude R., 4000 W. North Ave., Rm. 324, Chicago 39, Ill., 2 (REP)
Border, Barrett, 88-08 Selfridge St., Long Island City, N.Y., 2 (REP)
Borghoff, Wm., 4018 Greer Ave., St. Louis 7, Mo., 2 (REP)
Bowman & Co., J. G., 513 E. 75 St., Chicago 19, Ill., 1 (NEDA)
Bowman & Co., J. G., 103 Lafayette St., Valparaiso, Ind., 1 (NEDA)
Bowen, Ronald G., 852 Broadway, Denver 7, Colo., 2 (REP)
Boyd Electronic Supply, 1153 Union Ave., Memphis, Tenn., 1 (NEDA)
Boyd, P. A., 436 Biddle Ave., Pittsburgh 21, Pa., 2 (REP)
Branum, Mose, Reserve Loan Life Bldg., Dallas 1, Tex., 2 (REP)
Brauer, Walter J., 15631 Lakewood Hts. Blvd., Cleveland 7, Ohio, 2 (REP)
Brennan, F. X., 38 Lackawanna Plaza, Montclair, N.J., 2 (REP)
Bressler, Jules J., 1780 Broadway, New York 19, N.Y., 2 (REP)
Breuer Co., R. E., 250 W. 57 St., New York 19, N.Y., 2 (REP)
Briggs Co., Perry, 1220 Huron Rd., Cleveland 15, Ohio, 3
Brill Co., W. D., 198 Tenth St., Oakland 7, Calif., 1 (NEDA)
British Electronic Group, 30 Madison Ave., New York 17, N.Y., 1
British Industries Corp., 164 Duane St., New York 13, N.Y., 2
Brookfield, R. F., 55 Cricket Ave., Ardmore, Pa., 2 (REP)
Brotherson, M., 515 N. Byers St., Joplin, Mo., 1 (NEDA)
Brotherson, R., 325 Hibbard Ave., Jackson, Mich., 2 (REP)
Brown Co., C. C., 61 Ninth St., San Francisco 3, Calif., 1 (NEDA)

(Continued on page 97)

TERMINAL
RADIO CORPORATION
Distributors of Radio & Electronic Equipment
85 CORTLANDT STREET
NEW YORK 7, N. Y. Phone: WOrth 4-3311

Distribution

(Continued from page 96)

Brown, Donald G., 507 E. Willow Grove Ave., Philadelphia 18, Pa., 2 (REP)
Brown Co., Thomas H., 15-25 Whiting St., New Haven 10, Conn., 1 (NEDA)
Brujac Electronic Corp., 103 Lafayette St., New York, N.Y., 2
Bruno-New York, Inc., 460 W. 34 St., New York 1, N.Y., 1 (NEDA)
Burcham, Don H., 917 S.W. Oak St., Portland 5, Ore., 2 (REP)
Buchman, Radio Co., 492 Atlantic Ave., Brooklyn 17, N.Y., 1 (NEDA)
Burghardt Radio Supply, 12 N. Broadway, Watertown, S.D., 1 (NEDA)
Burgoyne, Wm. E., 6663 Northwest Hwy., Chicago 31, Ill., 2 (REP)
Burlingame Associates Ltd., 103 Lafayette St., New York 13, N.Y., 2
Burnett, Gerald G., 504 South 21 St., Irvington, N.J., 2 (REP)
Burroughs Radio Co., 711 Second N.W., Canton 3, Ohio, 1 (NEDA)
Burroughs Radio Co., 218 E. Second St., Mansfield, Ohio, 1 (NEDA)
Burwell, Henry W., 1133 Ponce de Leon Ave. N.E., Atlanta 3, Ga., 2 (REP)
Burwell Jr., Henry W., 1133 Ponce de Leon Ave. N.E., Atlanta, Ga., 2 (REP)
Bush, Robert W., c/o Allen, 2401 S. State St., Syracuse 5, N.Y., 2 (REP)
Buss Radio Electric Supply, 61-63 E. Broad St., Bethlehem, Pa., 1 (NEDA)
C & G Radio Supply Co., 2504 Jefferson Ave., Tacoma 2, Wash., 1 (NEDA)
C. L. & R. Avnet, Inc., 6 W. Broadway, New York 7, N.Y., 1
Cabell Electric Co., 422-24 S. Farish St., Jackson, Miss., 1 (NEDA)
Cain, H. E., 388 Atlanta Ave. S.E., Atlanta, Ga., 2 (REP)
Camber, Marty, 30 Dongan Pl., New York 34, N.Y., 2 (REP)
Cambria Equipment Co., 17-27 Johns St., Johnstown, Pa., 1 (NEDA)
Cameradio Co., 963 Liberty Ave., Pittsburgh 22, Pa., 1 (NEDA)
Campion Sales Co., Bob, P.O. Box 4116, Station A, Dallas, Texas, 2 (REP)
Campion Jr., R. M., Nat'l Life Bldg., Dallas, Texas, 2 (REP)
Canadian Aviation Electr. Ltd., St. Hubert Airport, Montreal, Quebec, Canada, 2
Cardunet, Eugene, 164 Duane St., New York 13, N.Y., 2 (REP)
Carey Jr., Thos. J., 744 Broad St., Newark 2, N.J., 2 (REP)
Carlson, Hatton & Hay, Inc., 96 E. Tenth Ave., Eugene, Ore., 1 (NEDA)
Carolina Radio Equip. Co., Inc., 105 E. Martin st., Raleigh, N.C., 1 (NEDA)
Carolina Sound Equipment Service, 614 Clement Ave., Charlotte 4, N.C., 1
Cartwright, J. M., 1336 Madison Ave., Memphis 4, Tenn., 2 (REP)
Cartwright, James B., 1336 Madison Ave., Memphis 4, Tenn., 2 (REP)
Cartwright, W. C., 4030 Club Dr. N.E., Atlanta, Ga., 2 (REP)
Central Distributors, 1131-35 S.W. Washington, Portland 5, Ore., 1 (NEDA)
Central Electr. Supply Co., Inc., 600 W. Third St., Owensboro, Ky., 1 (NEDA)
Central Missouri Distrg. Co., 324 E. Capital St., Jefferson City, Mo., 1 (NEDA)
Central Radio Parts Co., 1723 W. Road du Lac Ave., Milwaukee 5, Wis., 1 (NEDA)
Central Radio Supply, 519 Monroe St., Alexandria 1, Va., 1 (NEDA)
Cerf & Co., Art, 744 Broad St., Newark 2, N.J., 12 (REP & NEDA)
Certified Radio Supply, 45 Grange St., Middletown, N.Y., 1 (NEDA)
Chamberlain, Harold A., 81 Mt. Ida St., Boston 9, Mass., 2 (REP)
Chambers Electr. Supply Co., Inc., 3rd & 71 Central Pkwy., Cincinnati, Ohio, 1 (NEDA)
Chantose Radio Stores, Inc., 179-25 Jamaica Ave., Jamaica 3, L.I., 1 (NEDA)
Chauncey's, Inc., 4757 W. Chicago Ave., Chicago 51, Ill., 1 (NEDA)
Chemcity Radio & Elec. Co., 12 Emory Park, Knoxville 17, Tenn., 2 (NEDA)
Chief Electronics, Inc., 304 Main St., Poughkeepsie, N.Y., 1 (NEDA)
Churchill, Floyd, Rm. 411, Broadway Stevens Bldg., Camden, N.J., 2 (REP)
Clancy, Bernard, Webber Rd., Arcadia, Ind., 2 (REP)
Clancy, Joseph J., Webber Rd., Arcadia, Ind., 2 (REP)
Clark & Gose Radio Supply, 329 E. Ohio Ave., Wichita Falls, Tex., 1 (NEDA)
Clark-Reiss, Inc., 55 Walker St., New York 13, N.Y., 1
For details see ad on page 97

WANTED
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Electronic
PARTS

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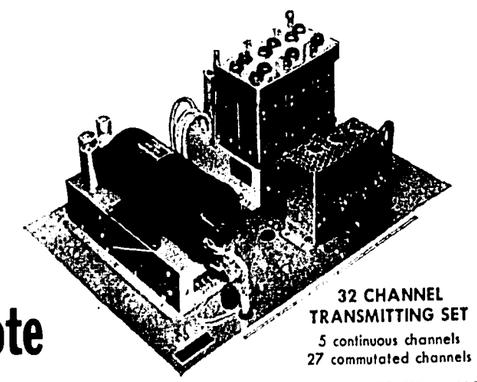
Clary Co., James W., 3024 Fourth Ave., Birmingham, Ala., 1 (NEDA)
Cockley, Jem, 11 Beacon St., Boston 10, Mass., 2 (REP)
Coast Electronic Supply Co., 527 W. Main St., Alhambra, Calif., 1 (NEDA)
Cohax, Robert L., RR 6, Ft. Wayne, Ind., 2 (REP)
Columbia Radio & Supply Co., 3040 Bird St., New Orleans 18, La., 1 (NEDA)
Communication Devices Co., 2331 12 Ave., New York 27, N.Y., 1
Communications Equipment Co., 350 Pearl St., Brooklyn 1, N.Y., 1
Communication Equipment & Eng. Co., 5446 W. Race St., Chicago 44, Ill., 1
Components Supply Co., 151 Washington St., New York 6, N.Y., 1
Concord Radio Corp., 901 W. Jackson Blvd., Chicago 7, Ill., 1
Connor, Daniel L., 1616 Broad St., Stanton Bldg., Philadelphia 2, Pa., 2 (REP)
Cosmos Co., W. H., 1590 Eudora St., Denver, Colo., 12 (REP & NEDA)
Consolidated Radio Co., 612 Arch St., Philadelphia 6, Pa., 1 (NEDA)
Consolidated Radio Sales Corp., 708 Amsterdam Ave., New York 25, N.Y., 1 (NEDA)
Continental Sales Co., 295-301 Central Ave., Newark, N.J., 1 (NEDA)
Cooper, B. C., 229 W. 14 St., New York 11, N.Y., 2 (REP)
Corman, Henry, 18 W. Chelten Ave., Philadelphia 44, Pa., 2 (REP)
Corry, Hal F., 3522 Gillon Ave., Dallas 5, Tex., 2 (REP)
Crescent Canada Ltd., 364 Windsor St., Halifax, N.S., Canada, 2
Cross Elec. Co., 5 Ivy St. N., Atlanta 3, Ga., 2 (REP)
Crosett, John R., 708 Grant St., Pittsburgh 19, Pa., 2 (REP)
Crowns & Lamert, 720 Main St., Evanston, Ill., 2
Crabtree's Wholesale Radio, 2608 Ross Ave., Dallas 1, Tex., 1 (NEDA)
Crabtree's Radio Supply, 112 State St., Boise, Idaho, 1 (NEDA)
Crockett, John, Rm. 1040 Life Bldg., Dallas 1, Tex., 2 (REP)
Crossley, Wirrel, 4501 N. Ravenswood, Chicago 40, Ill., 2 (REP)
Cummins, Bruce, 228 N. LaSalle St., Chicago 1, Ill., 2 (REP)
Cunningham, Quinn, 9208 College Ave., Indianapolis 20, Ind., 2 (REP)
Curb Radio Supply, 825 Cherry St., Chattanooga, Tenn., 1 (NEDA)
Curran, Robert, 436 Dolham Ave., Meriden, Conn., 2 (REP)
Cushing, Co. E. F., 349 W. Emerson St., Melrose, Mass., 1
Custom Electronics, 631 Chartres St., New Orleans, La., 1
Dage, Corp., 40 Hudson St., New York 13, N.Y., 1
For details see ad on page 99
Dakota Electric Supply Co., 1017-23 4 Ave. N., Fargo, N.D., 1 (NEDA)
Dale, E. L., 926 E. Ivy Ave., St. Paul 6, Minn., 2 (REP)
(Continued on page 98)



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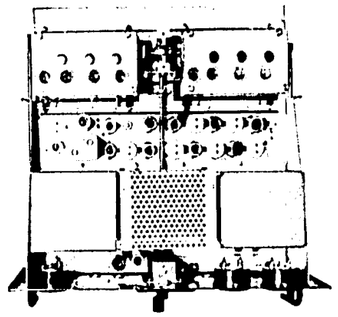
5 continuous channels
27 commutated channels

FM RECEIVER TYPE 842C
(Top view)



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RREP commercial telemetering systems are designed using standard RREP units as a foundation . . . standard units which are specifically designed to complement each other . . . these units, by building block incorporation into the over-all system, insure excellence of systems performance as additional needs arise.

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RREP telemetering systems are presently used by State and U.S. Government Agencies, Scientific Laboratories and Research Organizations, and by Industrial Manufacturers.

Your Inquiry is Invited

RREP

RAYMOND ROSEN ENGINEERING PRODUCTS, Inc.
32nd & Walnut Streets • Philadelphia 4, Pa

Distribution

(Continued from page 97)

Dalis, Inc., H. L., 175 Varick St., Dept. IND., New York 14, N.Y., 1 (NEDA)
For details see ad on page 93

Dares Radio Service, 22 E. Genesee St., Auburn, N.Y., 1 (NEDA)

Darmstader, S. B., 520 N. Michigan Ave., Chicago 11, Ill., 2

Daugherty, Frank A., 100 Woodrow Ave., Columbus 6, Ohio, 2 (REP)

Davis Electronics Corp., 204 Main St., Hempstead, L.I., N.Y., 1 (NEDA)

Davis, George W., 5127 Whittier Blvd., Los Angeles 22, Calif., 2 (REP)

Decosta, Edward, 401 N. Broad St., Philadelphia 8, Pa., 2 (REP)

Demambro Radio Supply Co., 1111 Commonwealth Ave., Boston 15, Mass., 1 (NEDA)

Demambro Radio Supply, Inc., 1308 E. St., Manchester, N.H., 1 (NEDA)

Demambro Radio Supply, Inc., 90 Broadway, Providence, R.I., 1 (NEDA)

Demambro Radio Supply, Inc., 222 Summer St., Worcester, Mass., 1 (NEDA)

Dempster, Burgess, 180 S. Alvarado St., Los Angeles 4, Calif., 2 (REP)

Denison Radio Supply, 310 West Weyard, Denison, Tex., 1 (NEDA)

Derr, Norbert F., 1086 Oakwood Ave., Columbus 6, Ohio 2 (REP)

Detsch, Bruce, 6100 Garfield Ave., Los Angeles 22, Calif., 2 (REP)

Devoe, Leslie M., 4014 Washington Blvd., Indianapolis 5, Ind., 2

Diamond, Simon, 75 West St., New York 6, N.Y., 2 (REP)

Diblasi, John, 259 W. 14 St., New York 11, N.Y., 2 (REP)

Diethert, Russ, 2323 W. Devon Ave., Chicago 45, Ill., 2 (REP)

Dietrich Co., Earl S., 320 Hanna Building, Cleveland 15, Ohio, 1,2 (REP & NEDA)

Dietz Distributing Co., 217 East 71 St., Chicago 19, Ill., 1

Dixie Radio Supply Co., 22 Richardson St., Greenville, S.C., 1 (NEDA)

Dixie Radio Supply Co., 1700 Laurel, Columbia, S.C., 1 (NEDA)

Dixie Radio Supply Co., Inc., 715 W. Morehead St., Charlotte, N.C., (NEDA)

Dolfuss, Jr., C. H., 2108 Payne Ave., Cleveland 14, Ohio, 2 (REP)

Doran, Wylie M., 1408 S. Grand, Los Angeles 15, Calif., 2 (REP)

Dowers, Alfred A., 1517 W. Pico Blvd., Los Angeles 15, Calif., 2 (REP)

Duckett, Grady M., 1145 Peachtree St., N.E., Atlanta, Ga., 2 (REP)

Dukes Radio Co., P.O. Box 1227, Sioux City 7, Iowa, 1 (NEDA)

Duncombe Co., J. V., 1011 W. 8 St., Erie, Pa., 1 (NEDA)

Dunlap Whsle. Radio Co., Carter, 27 N. Grant St., Box 1109, Stockton 8, Calif., 1 (NEDA)

Dymac, Inc., 2329 Main St., Buffalo 14, N.Y., 1 (NEDA)

Ealy, M. D., 633 S. Labrea Ave., Los Angeles 36, Calif., 2 (REP)

Ebinger Radio & Supply Co., 2211 Gravois St., St. Louis 4, Mo., 1 (NEDA)

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Distribution

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Economy Electronics, 624 Ridge Rd., Lyndhurst, N.J., 1 (NEDA)

Edlie Electronics, Inc., 154 Greenwich St., New York 6, N.Y., 1

Edmunds, E. J., 5344 Irving St., Philadelphia 39, Pa., 2 (REP)

Edwards, E. C., 2123 E. 9 St., Cleveland 15, Ohio, 2 (REP)

Egert, Samuel S., 11 Park Pl., New York 17, N.Y., 2 (REP)

Ellinger, Fred R., 6663 Northwest Hwy., Chicago 31, Ill., 2 (REP)

Ellinger, Wm. H., 6663 Northwest Hwy., Chicago 31, Ill., 2 (REP)

Electra Distributing Co., 1914 West End Ave., Nashville 4, Tenn., 1 (NEDA)

Electric City Radio Supply, 1566 State St., Schenectady, N.Y., 1 (NEDA)

Electric Products Sales Co., 427 E. Michigan Ave., Lansing 29, Mich., 1 (NEDA)

Electric Supply Co., 149 12 St., Oakland, Calif., 1 (NEDA)

Electrical Supply Corp., 1739 Massachusetts Ave., Cambridge 40, Mass., 1 (NEDA)

Electrodesign, 1178 Phillips Pl., Rm. 209, Montreal, Que., Canada, 2

Electro-Pliance Distrs., Inc., 2458 W. Lisbon Ave., Milwaukee 5, Wis., 1 (NEDA)

Electro Sales Co., 110 Pearl St., Boston 10, Mass., 1

Electro-Tech Equipment Co., 309 Canal St., New York, N.Y., 1

Electronic Distributing Co., 856 Raymond Ave., St. Paul 4, Minn., 1 (NEDA)

Electronic Equipment Distrs., 1228 Second Ave., San Diego 1, Calif., 1 (NEDA)

Electr. Equipment & Eng. Co., 805 S. Staples St., Corpus Christi, Tex., 1 (NEDA)

Electr. Labs. & Supply Co., 915 Lincoln Ave., Utica 4, N.Y., 1 (NEDA)

Electronic Service Corp., 121 S. Seventh St., Louisville, Ky., 1

Electronic Supplies, 219 East First, Tulsa, Okla., 1

Electronic Supply Co., 248 E. Pike St., Pontiac, Mich., 1 (NEDA)

Electronic Supply Corp., 134 E. Long St., Columbus 15, Ohio, 1 (NEDA)

Electronic Supply, Inc., 422-11 St., Huntington 1, W.Va., 1 (NEDA)

Electronic Wholesalers, Inc., 2010 14 St., N.W., Washington 9, D.C., 1 (NEDA)

Electronicraft, Inc., 27 Milburn St., Bronxville 8, N.Y., 1

Emerson Radio of Pa., Inc., 223-225 N. Broad St., Philadelphia 7, Pa., 1 (NEDA)

Empire Electr. Distributors, Inc., 37 E. Union St., Pasadena 1, Calif., 1

Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio, 1

Engle, Bernard, 4724 N. Sheridan Rd., Chicago 40, Ill., 2 (REP)

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Equipment & Service Co., 6815 Oricke Dr., Dallas 9, Tex., 2

Erde, Seymour, 139 Lafayette St., New York 13, N.Y., 2 (REP)

Erdman, K. B., 2401 N. Broad St., Philadelphia 32, Pa., 2 (REP)

Erickson, Herb, P.O., Box 179, Hendersonville, N.C., 2 (REP)

Esse Radio Co., 42 W. South St., Indianapolis 4, Ind., 1

Estersohn, Harry, 395 W. Cliveden St., Philadelphia 19, Pa., 2 (REP)

Evans Radio, 10 Hills Ave., Concord, N.H., 1 (NEDA)

Everett Associates, 2202 Touhy Ave., Chicago 45, Ill., 2

Everett Associates, 411 W. 74 Terrace, Kansas City 5, Mo., 1

Excel Distributors, 118 W. Second St., Wichita 2, Kans., 1 (NEDA)

Fairbanks, Howard J., 1733 Academy Lane, Havertown, Pa., 2 (REP)

Farber, Joseph, 157 Hartwell Rd., Buffalo 16, N.Y., 2 (REP)

Farber, Maury, 157 Hartwell Rd., Buffalo 16, N.Y., 2 (REP)

Farris, S. W., 406 W. 34 St., Kansas City 2, Mo., 2 (REP)

Fausett, Floyd, Sr., 1347 Beecher St. S.W., Atlanta, Ga., 2 (REP)

Federal Radio Supply Co., 188 State St., Binghamton, N.Y., 1 (NEDA)

Federated Purchaser, Inc., 66 Dey St., New York 7, N.Y., 1 (NEDA)

Federated Purchaser, Inc., 1115 Hamilton St., Allentown, Pa., 1 (NEDA)

Feldman, Henry, 400 W. Pico Blvd., Los Angeles 15, Calif., 12 (REP & NEDA)

Felleisen, Tod, 612 N. Michigan Ave., Chicago 11, Ill., 2 (REP)

Ferguson Radio Supply Co., 622 West Baltimore, Detroit 2, Mich., 1 (NEDA)

Ferguson, William, 117 Fayette St., Manlius, N.Y., 2 (REP)

Fidelatone Co., 851 Atlantic Ave., Brooklyn 17, N.Y., 1

Fields, Jack, 11 Park Pl., New York 7, N.Y., 2 (REP)

Finkelstein, Harry, 136 Liberty St., New York 6, N.Y., 2 (REP)

Finlay, Robert, 104 Brookside Ave., Ridgewood, N.J., 2 (REP)

Fisch, Bud, 419 Sherwood Tr., Ft. Wayne 6, Ind., 2 (REP)

Fischer Distributing Co., 118 Duane St., New York 7, N.Y., 1 (NEDA)

Fitzner Co., B. J., 76 W. Adams St., Detroit 26, Mich., 2

Fitzpatrick Elec. Supply Co., 444 Irwin St., Muskegon, Mich., 1 (NEDA)

Foley, Andrew S., 640 Federal St., Camden, N.J., 2 (REP)

Fordham Radio Supply, 5669 Broadway, New York 53, N.Y., 1 (NEDA)

Forrest, B. J., 71 Murray St., New York, N.Y., 2 (REP)

Foster, Melville E., 409 Lumber Exchange, Minneapolis 1, Minn., 2 (REP)

Forshay, John M., 27 Park Pl., New York 7, N.Y., 2 (REP)

(Continued on page 101)

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(Continued from page 99)

Fort Orange Radio Distrib. Co., 642 Broadway, Albany, N.Y., 1 (NEDA)
Fort Worth Radio Supply Co., 1201 Commerce St., Fort Worth, Texas, 1 (NEDA)
Four State Radio & Supply Co., 201 Main, Joplin, Mo., 1 (NEDA)
Franklin, Merrill K., 712 16 Ave., S. Minneapolis 15, Minn., 2 (REP)
Freck Radio & Supply Co., Inc., 38 Biltmore Ave., Asheville, N.C., 1 (NEDA)
Freed & Co., Leo, 420 Lexington Ave., New York 17, N.Y., 2 (REP)
Freistroffer, Richard, 255 Central Bldg., Fort Wayne 2, Ind., 2 (REP)
Friedman, Adolph, 220 E. 23 St., New York 10, N.Y., 2 (REP)
Friedman, Martin, 1006 Western Savgs. Fd. Bldg., Philadelphia, Pa., 2 (REP)
Fritzner, B. J., 1409 Kales Bldg., Detroit 26, Mich., 2 (REP)
Fry, William E., 406 W. 34 St., Kansas City 2, Mo., 2 (REP)
Fryburg, Chas. H., 111 S. 22 St., Philadelphia, Pa., 2 (REP)
Fulton Radio Supply Co., 1208 Greenwood Ave., Jackson, Mich., 1 (NEDA)
Furman, Nat., 395 Broadway, New York 13, N.Y., 2 (REP)
Garrard Sales Corp., 164 Duane St., New York 13, N.Y. 1
Gates, Alexander W., 46½ Summer St., Manchester, Conn., 2 (REP)
Gates, Franklin Y., 200 Main St., Salt Lake City, Utah, 2 (REP)
Gebhard, Harry W., 3129 W. Devon Ave., Chicago 30, Ill., 2 (REP)
Geist & Assoc., Inc., Henry J., 60 E. 42 St., New York 17, N.Y., 2
General Radio, Inc., 100 Wall St., Seattle 1, Wash., 1 (NEDA)
Genesee Radio & Parts Co., 205 Genesee St., Buffalo 3, N.Y., 1 (NEDA)
Gerber, Harry, 739 Boylston St., Boston 16, Mass., 2 (REP)
Gerber Radio Supply Co., 1900 Columbus Ave., Roxbury 19, Mass., 1 (NEDA)
Gianaris, Alec K., 2345 W. Devon Ave., Chicago 45, Ill., 2 (REP)
Gibson, William S., 1018 Commonwealth Ave., Boston 15, Mass., 2 (REP)
Gifford Brown, Inc., 106 1 St. S.W., Cedar Rapids, Iowa, 1 (NEDA)
Gifford Brown, Inc., 1216 Grand Ave., Des Moines 9, Iowa, 1 (NEDA)
Gold, William, 350 Fifth Ave., New York 1, N.Y., 2 (REP)
Golton Co., Jerry, 2750 W. North, Chicago 47, Ill., 2 (REP)
Goss, Jack, 26 Gloucester St., Arlington, Mass., 2 (REP)
Graham, Wilfrid, 747 Revere Rd., Yeadon, Pa., 2 (REP)
Grand, Jack, 103 Lafayette St., New York 13, N.Y., 2 (REP)
Gray, Gordon E., 4524 W. Madison St., Chicago 24, Ill., 2 (REP)
Graybar Electric Co., 420 Lexington Ave., New York 17, N.Y., 1
Green Co., John A., 6815 Oriole Dr., Dallas 9, Texas, 2
Greene, Dan, 2311 John Hancock Bldg., Boston 16, Mass., 2 (REP)
Green Radio Distributors, 482 Sutter Ave., Brooklyn 7, N.Y., 1 (NEDA)
Green Tele-Radio Dist., Inc., 472 Sutter Ave., Brooklyn 7, N.Y., 1
Greenwich Sales Co., 59 Cortlandt St., New York 7, N.Y., 1
Grimm, Stephen, 2400 W. Bryn Mawr Ave., Chicago 45, Ill., 2 (REP)
Gross, Fred, 2011 Cedar Springs Ave., Dallas, Tex., 2 (REP)
Haggerty, J. J., 1225 Lonsdellow Rd., Royal Oak, Mich., 2 (REP)
Haggerty, Jr., J. J., 1225 Lonsdellow Rd., Royal Oak, Mich., 2 (REP)
Haggerty Sales Co., 1022 Woodward, Detroit 2, Mich., 2
Hale & McNeil, Corner N. Third & Pine Sts., Monroe, La., 1 (NEDA)
Halmton Co., Inc., Harry, 912 N. Michigan Ave., Chicago 11, Ill., 2 (REP)
Hall Electric Co., 850 Minnesota St., St Paul 1, Minn., 1 (NEDA)
Hall, Inc., R. C. & J. F., 1219 Caroline St., Houston, Texas, 1 (NEDA)
Hall Radio Labs., 943 Liberty Ave., Pittsburgh 22, Pa., 1
Hamilton, Don, 256 First Ave. N. Minneapolis 1, Minn., 2 (REP)
Hannigan, Walter T., 43 Leon St., Boston 15, Mass., 2 (REP)
Hansen, Dudley A., 1901 W. Montrose Ave., Chicago 13, Ill., 2 (REP)
Hardie, Robert M., 1127 Wilshire Blvd., Los Angeles 14, Calif., 2 (REP)
Hargis Co., Inc., 1205 Washington Ave., Waco, Texas, 1 (NEDA)
Hargis Co., The, P.O. Box 79, Austin, Texas, 1 (NEDA)
Harmon, Walter S., 4057 McKinney Dr., Los Angeles 5, Calif., 2 (REP)
Harpe, Harry K., c/o J. Millar, 1050 Peachtree St., N.E., Atlanta 5, Ga., 2 (REP)
Harper-Meggee, Inc., 1500 N.W. Irving, Portland 9, Ore., 1 (NEDA)
Harper-Meggee, Inc., 900 Republican, Seattle 9, Wash., 1 (NEDA)
Harris, Millard V., 220 E. 23 St., New York 10, N.Y., 2 (REP)
Harris Radio Corp., 125 N. Fourth St., Manitowoc, Wis., 1 (NEDA)
Harris, Stanley, 318 Harvard St., Brookline 46, Mass., 2 (REP)
Harrison, Fred C., 108 W. Church St., Elmira, N.Y., 1 (NEDA)
Harrison Radio Corp., 20 W. Broadway, New York 7, N.Y., 1
Hathaway, Glenn M., 27 Main St., Cambridge 22, Mass., 2 (REP)
Hatry & Young, 42 Franklin, Boston 10, Mass., 1 (NEDA)
Hatry & Young, Inc., 203 Asylum St., Hartford 3, Conn., 1 (NEDA)
Hatry & Young, Inc., 77 Broadway, New Haven, Conn., 1 (NEDA)
Hatry & Young, Inc., 89 Cherry St., Waterbury, Conn., 1 (NEDA)
Hatry & Young, Inc., 525 Main St., Stamford, Conn., 1 (NEDA)
Hatry & Young, Inc., 1730 Main St., Bridgeport, Conn., 1 (NEDA)
Hatry & Young of Mass., 262 Lowell St., Lawrence, Mass., 1 (NEDA)
Hatry & Young of New London, Inc., 428 Bank St., New London, Conn., 1 (NEDA)
Hatry & Young of Springfield, 109 Spring St., Springfield, Mass., 1 (NEDA)
Hausfeld Radio Supply, 116 N. Third St., Steubenville, Ohio, 1 (NEDA)
Hays, Jr., W. R., 2011 Cedar Springs Ave., Dallas, Tex., 2 (REP)
Hege Radio Supply Co., Dalton, 340 Brookstown Ave., Winston Salem, N.C., 1 (NEDA)
Heimann, Jack, 1215 Harmon Pl., Minneapolis 3, Minn., 2 (REP)
Herbach & Rademan, Inc., 1204 Arch St., Philadelphia 7, Pa., 1 (NEDA)
Herbertzer Radio Supply, P.O. Box 1197, Peoria 1, Ill., 1 (NEDA)
Herman Radio Supply Co., 1745 N.E. Second Ave., Miami 36, Fla., 1 (NEDA)
Hermans, James P., 1234 Folsom St., San Francisco 3, Calif., 2 (REP)
Hertelmeer Distributing Co., 1436 Vine St., Cincinnati 29, Ohio, 1 (NEDA)
Hershel Radio Co., 5249 Grand River, Detroit 8, Mich., 1
Hicks Radio Co., 1422 "O" St., Lincoln 8, Neb., 1 (NEDA)
Hicks, Wm. M., 29-09 Bridge Plaza N., Long Island City, N.Y., 2 (REP)
Higgins, John B., 7345 Cottage Grove Ave., Chicago 19, Ill., 2 (REP)
Higgins, Royal L., 7345 Cottage Grove Ave., Chicago 19, Ill., 2 (REP)
Hughsmith & Co., James L., P.O. Box 1011, Charlotte, N.C., 2
Hill, Fred B., 256 Lake Ave., N. Minneapolis 1, Minn., 2 (REP)
Hill, James L., 809 West II St., Los Angeles 15, Calif., 2 (REP)
Hill, Jerry T., 809 W. II St., Los Angeles 15, Calif., 2 (REP)
Hill, John T., 809 W. II St., Los Angeles 15, Calif., 2 (REP)
Hitt, W. C., 1109 S. Broadway, Los Angeles 15, Calif., 2 (REP)
Hoenig, Chas. N., 1730 Covert Lane, Ft Wayne 7, Ind., 2 (REP)
Hold, Henry W., 744 Broad St., Newark, N.J., 2 (REP)
Hollenbacks Radio Supply, 2221 Eighth Ave., Altoona, Pa., 1 (NEDA)
Holliday-Hathaway Co., 238 Main St., Cambridge 42, Mass., 2 (REP)
Hollingsworth, E. L., 407 Whitehead Bldg., Atlanta 3, Ga., 2 (REP)
Holmes, Frank B., 139 N. Central Ave., Clayton 5, Mo., 2 (REP)
Hooker, Samuel C., Brattleboro, Vt., 2 (REP)
Hornbeam Dist. Co., Inc., 67-15 Fresh Pond Rd., Brooklyn, N.Y., 1 (NEDA)
Horick, James W., Box 6844, Towson 4, Md., 2 (REP)
House Radio & Supply, 2008 Carey Ave., Cheyenne, Wyo., 1 (NEDA)
Houston Radio Supply Co., Inc., Clay at La Branch, Houston 3, Tex., 1
Howard, Roy M., Hanna Bldg., Cleveland 15, Ohio, 2 (REP)
Hub-Distributors, 106 N. Main St., Crown Point, Ind., 1 (NEDA)
Hudson Radio & TV Corp., 48 W. 48 St., New York 19, N.Y., 1
For details see ad on page 100
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Hughes, Kenneth E., 17 West 60 St., New York 23, N.Y., 2 (REP)
Hughes-Peters, Inc., 1128 Sycamore St., Cincinnati, Ohio, 1 (NEDA)
Hughes-Peters, Inc., 111 E. Long St., Columbus 15, Ohio, 1 (NEDA)
Hughes-Peters, Inc., 300 W. Fifth St., Dayton, Ohio, 1 (NEDA)
Hunter, John F., 1234 Falsom St., San Francisco 3, Calif., 2 (REP)
Hustis, Walter C., Florida Rd., Ridgefield, Conn., 2 (REP)
Hutto, V., 1036 Peachtree St., N.E., Atlanta, Ga., 2 (REP)
Industrial Elec. Supply Co., 1839 Peck St., Muskegon 27, Mich., 1 (NEDA)
Industrial Engineering Service, 1381 Elmhurst Dr. N.E., Cedar Rapids, Iowa, 2
Inland Electronic Supply, 863 Colton Ave., San Bernardino, Calif., 1 (NEDA)
Instrument Sales Co., 3947 Lawrence, Chicago 25, Ill., 2
Int'l. Distributing Co., 821 S. Orange Ave., East Orange, N.J., 1 (NEDA)
International Television Corp., 238 William St., New York 7, N.Y., 1
Interstate Distributors, Inc., 1236 E. Douglas, Wichita 7, Kan., 1 (NEDA)
Interstate Supply Co., 10 & Walnut Sts., St. Louis, Mo., 1 (NEDA)
Intervox Corp., 2701 California Ave., Seattle 6, Wash., 1
Iowa Radio Corp., 1212 Grand Ave., Des Moines 9, Iowa, 1 (NEDA)
Ireland, Frederick, 1000 N. Seward, Hollywood 38, Calif., 2 (REP)
Island Radio Distributors, 412 Fulton Ave., Hempstead, L.I., N.Y., 1 (NEDA)
J. B. Distributing Co., 2855-57 Farnam St., Omaha 2, Neb., 1 (NEDA)
J. R. S. Distribtors, 646 W. Market St., York, Pa., 1 (NEDA)
Jacobs, George, 2753 W. North Ave., Chicago 47, Ill., 2 (REP)
Jacobs, Jack, 1800 E. 12 St., Brooklyn 29, N.Y., 2 (REP)
Jackson, Robert, Ellicott Square Bldg., Buffalo, N.Y., 2 (REP)
James, Ralph, 4130 First Ave. S., Seattle 4, Wash., 2 (REP)
Jaques, L. E., 8112 Tulane Ave., University City 5, Mo., 2 (REP)
Jefferies, Samuel A., 105 Forrest Ave., Narbeth, Pa., 2 (REP)
Jersey Electronic Distrg. Co., 301 Grand St., Paterson 1, N.J., 1 (NEDA)
Jester, Oden, 510 N. Dearborn St., Chicago 10, Ill., 2 (REP)
Joe's Radio Shop, 67-69 S. Pearl St., Bridgeton, N.J., 1 (NEDA)
Johannesen Elec. Co., Inc., 312-314 N. Eugene St., Greensboro, N.C., 1 (NEDA)
Johnson, Jesse P., 3535 Dell Trail, Chattanooga 4, Tenn., 2 (REP)
Johnston-Gasser Co., 3023 W. Marshall St., Richmond 21, Va., 1 (NEDA)
Jones, Kenneth H., Apartado 2250, Mexico, D.F., Mexico, 2
Jones, Mel, 2800 Milwaukee Ave., Chicago 18, Ill., 2 (REP)
Jones & Sons, 254 Jericho Tpke., Mineola, L.I., N.Y., 3
Jordan Electronic Co., 1130 German St., Erie, Pa., 1 (NEDA)
Joseph, Ben, 551 Fifth Ave., New York 17, N.Y., 2 (REP)
Joseph Radio Parts, Inc., Irving, 215 S. Halsted, Chicago 6, Ill., 1
Joyner, J. E., 1036 Peachtree St. N.E., Atlanta 5, Ga., 2 (REP)
K-L-A Labs., Inc., 7422 Woodward Ave., Detroit 2, Mich., 1 (NEDA)
Kaelber, J., 1270 Broadway, New York 1, N.Y., 2 (REP)
Kadell, Harold W., 2406 W. Bryn Mawr, Chicago 45, Ill., 2 (REP)
Kaemper-Barrett Dlrs. Supply, 1850 Mission St., San Francisco, Calif., 1 (NEDA)
Kahn, Irving, 333 N. Michigan Ave., Chicago 1, Ill., 2 (REP)
Kahn, Irving I., 3324 Main St., Hartford 1, Conn., 2 (REP)
Kann-Ellert Electr. Inc., 9 S. Howard St., Baltimore 1, Md., 1 (NEDA)
Karet, Robert, 510 N. Dearborn, Chicago 1, Ill., 2 (REP)
Karman, Roberto, O'Reilly 519, P.O., Box 647, Habana, Cuba, 1
Kathrinus & Co., N.W., 1218 Olive St., St. Louis 3, Mo., 2 (REP)
Kay, J. P., 3760 Broadway, Kansas City 2, Mo., 2 (REP)
Kearns, Inc., Harrisburgh & Atlantic Aves., Atlantic City 1, N.J., 1 (NEDA)
Keefe, John Jr., 539 Market St., Camden, N.J., 2 (REP)
Keeneth, John A., 29-09 Bridge Plaza N., Long Island City, N.Y., 2 (REP)
Kelley, J. E., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Kemp Co., E. M., 1115 R St., Sacramento, Calif., 1 (NEDA)
Ken-Els Radio Supply Co., 810 N. Ninth, Fort Dodge, Iowa, 1 (NEDA)
Kenyon Radio Supply Co., 2214 14 St. N.W., Washington 9, D.C., 1 (NEDA)
Kilroy, John W., 4052 Riverside Dr., Dayton 5, Ohio, 2 (REP)
King-Irwin, Inc., 314 11 St., Huntington, W.Va., 1 (NEDA)
Kirreby, Marvin H., 437 Oliver Ave. S., Minneapolis 5, Minn., 2 (REP)
Kittleson, Harold A., 7614 Melrose Ave., Los Angeles, Calif., 2 (REP)
Klecker, Jerome, 177 Sunset Ave., Glen Ellyn, Ill., 2 (REP)
Klipera, M. F., P.O. Box 3113, Houston 1, Texas, 2 (REP)
Knight, W. Bert., 10373 W. Pico Blvd., Los Angeles 64, Calif., 2 (REP)
Koelemay Sales Co., 220 Crockett St., Shreveport, La., 1 (NEDA)
Koenig, G. L., 6359 Antioch Ave., Merriam, Kan., 2 (REP)
Koessler, Frank B., 7422 Melrose Ave., Hollywod 46, Calif., 2 (REP)
Kopke Electronics Co., 119 Peasley St., Boise, Idaho, 1 (NEDA)
Kopple, John, 60 E. 42 St., New York 17, N.Y., 2 (REP)
Krich-New Jersey, Inc., 428 Elizabeth Ave., Newark 8, N.J., 1 (NEDA)
Lafayette-Concord Radio, 901 W. Jackson Blvd., Chicago 7, Ill., 1
Landis, B. C., 81-11 Rosevelt Ave., Jackson Hts., L.I., N.Y., 2 (REP)
Larrabee, Fred H., 6033 Main St., Kansas City 2, Mo., 2 (REP)
Lassberg, Edwin K., 5004 Ross Ave, Dallas, Texas, 2 (REP)
Lasure Co., H. A., 2216 W. 11 St., Los Angeles 6, Calif., 2 (REP)
Laub, Nick, 413 Merchandise Bldg, Minneapolis 1, Minn., 2 (REP)
Lavender Radio Supply Co., 520 E Fourth, Texarkana, Ark., 1 (NEDA)
Lavin, Henry, P.O. Box 196, Meriden, Conn., 2 (REP)
Lawton, Norman H., 75 West St., New York, N.Y., 2 (REP)
Lazar Radio Co., Nat., 4231 Lancaster Ave., Philadelphia 4, Pa., 1 (NEDA)
Leader, Robert, 111 South 22 St., Philadelphia 3, Pa., 2 (REP)
Leban, Albert D., 218 Lloyd Lane, Philadelphia 31, Pa., 2 (REP)
Lectronic Research Labs., 1021 Callowhill St., Philadelphia 23, Pa., 1
Lee, David M., 819 Thomas Ave., Seattle, Wash., 2 (REP)
Lee, William S., 13715 Gratiot St., Detroit 5, Mich., 2 (REP)
Leeb, Norman, 53 Park Pl., New York 7, N.Y., 2 (REP)
Lehner, J. C., 4301 Daisy Ave., Cleveland 3, Ohio, 2 (REP)
Lehner, J. W., Windham, Ohio, 2 (REP)
Leinau, Chas. W., 10203 McKenney Ave, Silver Spring, Md., 2 (REP)
Leonard Electr. Supply Co., 131 Center Ave. N.W., Roanoke, Va., 1 (NEDA)
Leonard Radio, Inc., 69 Cortland St. New York 7, N.Y., 1 (NEDA)
Leroy, Gordon C., 29 Bancroft Dr. Rochester, N.Y., 2 (REP)
Leuck Radio Supply Co., 243 S. Eleventh St., Lincoln, Neb., 1 (NEDA)
Lewis, Chas. W., c/o Allen, 2401 S. State St., Syracuse 5, N.Y., 2 (REP)
Lewis, Dean A., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Liberty Electronics, Inc., 135 Liberty St. New York 6, N.Y., 1
Lichter, Wm., 164 Duane St., New York 13, N.Y., 2 (REP)
Liddle, Edwin F., 18925 Grand River Ave., Detroit 23, Mich., 2 (REP)
Life Electronic Sales, 91 Gold St., New York 7, N.Y., 1
Lifsey Distributing Co., 726-30 N. Saginaw, Flint 3, Mich., 1 (NEDA)
Lima Radio Parts Co., 641-43 N. Main St., Lima, Ohio, 1 (NEDA)
Linke, E. J., 6663 Northwest Highway, Chicago 31, Ill., 2 (REP)
Lippman & Co., Aaron, 246 Central Ave. Newark 4, N.J., 1 (NEDA)
Lipscomb Assoc., Earl, 4433 Stanford P.O., Box 8042, Dallas 5, Texas, 2
Little, W. T., 704 Lumpkin St., East Point, Ga., 2 (REP)
Lofgren Distributing Co., 1202 4 Ave., Moline, Ill., 1 (NEDA)
Logan, Jack, 530 Gough St., San Francisco 2, Calif., 2 (REP)
Logan, Les, 530 Gough St., San Francisco 2, Calif., 2 (REP)

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Lohmann, Sid, 4829 Woodward Ave., Detroit 26, Mich., 2
Lohse, Perry A., 2123 East 9 St., Cleveland 15, Ohio, 2 (REP)
Long Island Radio Co., 164-21 Northern Blvd., Flushing, L.I., N.Y., 1
Longs Distributing Co., 12 Biltmore Ave., Asheville, N.C., 1 (NEDA)
Longstaffe Ltd., J. R., 351 Carlaw Ave., Toronto 8, Ont., Canada, 2
Loukota, Douglas H., 1052 W. 6 St., Los Angeles 17, Calif., 2 (REP)
Lowell, Theo. B., P.O., Box 21, Normandy 21, Mo., 2 (REP)
Lowery, L. D., 1343 Arch St., Philadelphia 7, Pa., 2 (REP)
Lowry, W. F., 3239 Faronia St., Pittsburg 4, Ohio, 2 (REP)
Lund, Lloyd S., Res. Loan Life Bldg., Dallas 1, Texas, 2 (REP)
Lukko Sales Corp., 5024 Irving Park Blvd., Chicago 41, Ill., 1
Lund-Hansen Co., 1900 W. Montrose Ave., Chicago 13, Ill., 2 (REP)
Lurtz Electric Co., 210 N. Illinois St., Belleville, Ill., 1 (NEDA)
Luske, William E., 612 N. Michigan Ave., Chicago 11, Ill., 2 (REP)
McCorvey, V. Avis, 212 Mimosa Dr., Decatur, Ga., 2 (REP)
McGary, William T., 6635 Delmar Blvd., St. Louis 5, Mo., 2 (REP)
McGee Radio Co., 1422 Grand Ave., Kansas City, Mo., 1 (NEDA)
M & H Sporting Goods Co., 512 Market St., Philadelphia 6, Pa., 1 (NEDA)
McCarthy, L. C., 9 South Clinton St., Chicago 6, Ill., 2 (REP)
McDonough, James D., 9 S. Clinton St., Chicago 6, Ill., 2 (REP)
McFadden, Wm. E., 150 E. Broad St., Columbus 15, Ohio, 2 (REP)
McGrade, E. W., 406 W. 34 St., Kansas City 2, Mo., 2 (REP)
McKinney, Jack F., 1523 Dragon St., Dallas 1, Tex., 2 (REP)
McCloud, W. Clif, 5528 E. Colfax Ave., Denver 7, Colo., 2 (REP)
McNeil, Don, c/o Ball, 58 E. Quaker St., Orchard Park, N.Y., 2 (REP)
MacDonald, Samuel K., 1531 Spruce St., Philadelphia 2, Pa., 2 (REP)
MacInnis, Norman R., 53 Youle St., Melrose 76, Mass., 2 (REP)
Mack, Kaelber & Mack, 1270 Broadway, New York 1, N.Y., 2 (REP)
Mack, Preston W., 1270 Broadway, New York 1, N.Y., 2 (REP)
MacNabb, Vernon C., 915 Westfield Blvd., E. Indianapolis 20, Ind., 2 (REP)
MacPherson, Bruce L., 601 Ft. Wayne Bank Bldg., Ft. Wayne 2, Ind., 2 (REP)
Magnuson, Edw. G., 2323 W. Devon Ave., Chicago 45, Ill., 2 (REP)
Magnuson, Roy. J., 2323 W. Devon, Chicago 45, Ill., 2 (REP)
Maguire, James A., 522 Drexel Blvd., Philadelphia 6, Pa., 2 (REP)
Mahannah, Forrest G., 1456 Waterbury Rd., Cleveland 7, Ohio, 2 (REP)
Mahoney, J., 1531 Spruce St., Philadelphia 2, Pa., 2 (REP)
Maine Electr. Supply Corp., 13 Deer St., Portland, Me., 1 (NEDA)
Malone, Pierce B., 2345 W. Devon Ave., Chicago 45, Ill., 2 (REP)
Margolin, John, 510 N. Dearborn St., Chicago 10, Ill., 2 (REP)
Maritime Switchboard, 336 Canal St., New York 13, N.Y., 1
Marsey, Joseph S., 74 Park Ave., Rochester 7, N.Y., 2 (REP)
Marsh Co., J. W., 1515 W. Pico Blvd., Los Angeles 15, Calif., 2 (REP)
Marsh, Lloyd D., 2601 First Ave., Seattle, Wash., 2 (REP)
Marsh Radio Supply Co., 526 W. State St., Milwaukee 3, Wis., 1 (NEDA)
Marsh, Walter, 6518 W. North Ave., Chicago 35, Ill., 2 (REP)
Marshall, Gordon S., 40 South Los Robbs, Pasadena 1, Calif., 2 (REP)
Marshall Co., John, 201 Anderson St., Pittsburgh, Pa., 1 (NEDA)
Marshank, David N., 672 S. Lafayette Park Pl., Los Angeles 5, Calif., 2 (REP)
Marshank, N. J., 672 S. Lafayette Park Pl., Los Angeles 5, Calif., 2 (REP)
Martin, Les., 31 Milk St., Boston 9, Mass., 2 (REP)
Massey Associates Inc., 1124 Vermont Ave., N.W., Washington, D.C., 2
Mayer Co., A. W., 895 Boylston St., Boston 15, Mass., 1 (NEDA)
Maynard, John M., 4507 Shenandoah, Dallas 5, Tex., 2 (REP)
Maynard, Lee, 139 N. Central Ave., Clayton 5, Mo., 2 (REP)
Measurement Engineering Ltd., Arnprior, Ontario, Can., 2
Melrose Sales Co., 407 Franklin St., Melrose 77, Mass., 1 (NEDA)
Melville Radio Corp., 160-13 Northern Blvd., Flushing, L.I., N.Y., 1
Melville Radio Corp., 15 W. 46 St., New York 18, N.Y., 1 (NEDA)
Merchant, R. C., 4829 Woodward Ave., Detroit 26, Mich., 2 (REP)
Meridian Electronic Equipment Co., 1517 W. Main St., Richmond 20, Va., 1
Metropolitan Electr. & Instr., 106 5 Ave., New York 11, N.Y., 1
Meyberg Co., Leo J., 33 Gough St., San Francisco 2, Calif., 1 (NEDA)
Meyer, Charles N., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Mica Condensers Corp., 71 Murray St., New York 7, N.Y., 1
Michigan Electronics Inc., 854 N. Rockwell Ave., Chicago 22, Ill., 2
Midwest Electronics, 6907 North Western Ave., Chicago, Ill., 1 (NEDA)
Midwest-Timmermann Co., 114 Western Ave., Davenport, Iowa, 1 (NEDA)
Millar Assoc., James, 1036 Peachtree St. N.E., Atlanta 5, Ga., 2 (REP)
Miller, Gerald B., 1540 N. Highland Ave., Hollywood 28, Calif., 2 (REP)
Miller, Jackson Co., Inc., 111-119 E. California, Oklahoma City, Okla., 1 (NEDA)
Miller, Jerry W., 5917 S. Main St., Los Angeles 3, Calif., 2 (REP)
Millers Radio & T.V. Supply, 336 E. 8 St., Oakland 6, Calif., 1 (NEDA)
Milo Radio & Electr. Corp., 200 Greenwich St., New York 7, N.Y., 1 (NEDA)
Milsk, Robert, 522 Michigan Bldg., Detroit 26, Mich., 2 (REP)
Minthorne, Leonard L., Weatherly Bldg., Portland 4, Ore., 1
Minthorne, Roger M., Weatherly Bldg., Portland 4, Ore., 2 (REP)
Mission Radio Inc., 814 South Presa St., San Antonio, Tex., 1 (NEDA)
Mitscher Co., R. W., 487 Ellicott Square Bldg., Buffalo 3, N.Y., 2 (REP)
Mitchell, Richard W., 6208 College Ave., Indianapolis 20, Ind., 2 (REP)
Moe, John, 1215 Harmon Pl., Minneapolis 3, Minn., 2 (REP)
Monarch Radio & T.V. Corp., 2430 Atlantic Ave., Brooklyn 33, N.Y., 3
Monson Sales Corp., 919 N. Michigan Ave., Rm. 612, Chicago 11, Ill., 1
Montague Radio Distr. Co., 220 Willow Ave., P.O. Box 3045, Beaumont, Tex., 1 (NEDA)
Mooney Radio Supply Co., 1635 Huff, Wichita Falls, Tex., 1 (NEDA)
Moore, Jack B., 4500 Dublin Rd., Columbus 2, Ohio, 2 (REP)
Morrisons Radio Supply, 331 Centre St., Ashtabula, Ohio, 1 (NEDA)
Morrow, Les., 3123 W. 117 St., Cleveland 11, Ohio, 2 (REP)
Morrow, Samuel R., Willou Sales Eng., Rydal, Pa., 2 (REP)
Moses Radio Electronics Co., 54 Flower St., Hartford 5, Conn., 1 (NEDA)
Moss, Charles R., 1817 Marloes Ave. E., Cleveland 12, Ohio, 2 (REP)
Moss, Gordon G., P.O. Box 428, Greeley, Colo., 2 (REP)
Moulthrop, Richard, 234 Ninth St., San Francisco 3, Calif., 2 (REP)
Moyer Electr. Supply Co., Inc., 330 E. Norwegian St., Pottsville, Pa., 1 (NEDA)
Mugerl, Rudy R., 1517 W. Pico Blvd., Los Angeles 15, Calif., 2 (REP)
Muggleworth, J. C., 432 Virginia Ave., Collingswood 6, N.J., 2 (REP)
Murphy, Brower, 5 Ivy St., N.E., Atlanta 3, Ga., 2 (REP)
Murphy & Cota, 5 Ivy St., N.E., Atlanta 3, Ga., 2
Murray, Harry R., c/o Taylor, P.O. Box 316, Dewitt, N.Y., 2 (REP)
Muskogee Electr. Supply Co., 231 Court St., Muskogee, Okla., 1 (NEDA)
Musser, Vic., 5376 E. Washington St., Indianapolis 19, Ind., 2 (REP)
Myers, Zell S., 4550 Main St., Kansas City, Mo., 2 (REP)
Nace, Allen, 7601 Parkview Rd., Brooksville, Ohio, 2 (REP)
National Radio Distributors, 1348 Southern Blvd., New York 59, N.Y., 1 (NEDA)
Nat. Radio Parts Dist. Co., 611 New York Ave., Brooklyn, N.Y., 1 (NEDA)
National Sound Services Ltd., 1247 Quy St., Montreal, Quebec, Can., 1
Naudain, L. Parker, Broad St. Sta. Bldg., Philadelphia 3, Pa., 2 (REP)
Neely Enterprises, Norman B., 7442 Melrose Ave., Hollywood 46, Calif., 2 (REP)
Nelson Radio & Supply Co., 451 St. Louis St., Mobile 10, Ala., 1 (NEDA)

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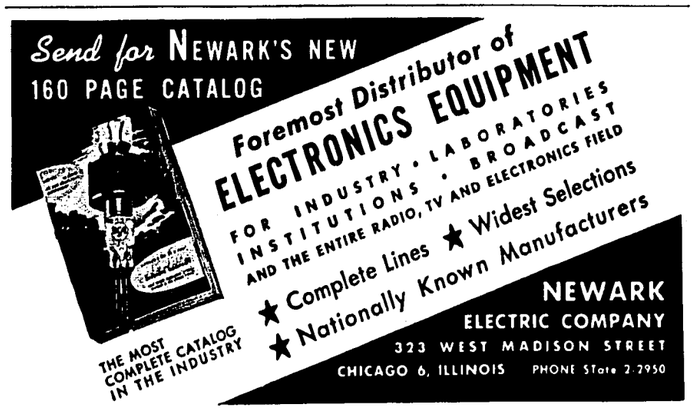
Nelson, Arthur J., P.O. Box 2244, Denver 1, Colo., 2 (REP)
Nemec, John, 4000 W. North Ave., Chicago 51, Ill., 2 (REP)
Neuber, Herbert K., 1207 Race St., Philadelphia 7, Pa., 3
Neumann, Edna, 2753 W. North Ave., Chicago 47, Ill., 2 (REP)
Newark Electric Co., 323 W. Madison St., Chicago 6, Ill., 1
For details see ad on page 104
Newark Electric Co., Inc., 242 W. 55 St., New York 19, N.Y., 1
Newell, Lloyd L., 4524 W. Madison St., Chicago 24, Ill., 2 (REP)
Newman, Charles, 53 Park Pl., New York 7, N.Y., 2 (REP)
Newnan, Harold, 420 Market St., San Francisco 11, Calif., 2 (REP)
Niagara Radio Supply Corp., 160 Greenwich St., New York 6, N.Y., 1
Nichols, Paul, 1819 Broadway, New York 23, N.Y., 2 (REP)
Nichols Ltd., R. H., 2781 Dufferin St., Toronto 10, Ontario, Can., 2
Nicholson, V. F., c/o Taylor, P.O. Box 316, Dewitt, N.Y., 2 (REP)
Nickerson, Frank C., 1133 Ponce de Leon Ave. N.E., Atlanta, Ga., 2 (REP)
Nordstrom, R. C., 15840 Second Blvd., Detroit 3, Mich., 2 (REP)
Norman Radio Distrs. Inc., 94-29 Merrick Rd., Jamaica 5, L.I., N.Y., 1 (NEDA)
Northern Electric Co. Ltd., 1261 Shearer St., Montreal, Quebec, Can., 1
Northern Radio & Television Co., 708 S. Broadway, Green Bay, Wis., 1
Northwest Radio, 109 E. First St., Duluth 2, Minn., 1 (NEDA)
Northwest Radio & Electr. Sup., 52 S. Twelfth St., Minneapolis 4, Minn., 1 (NEDA)
Northwest Radio of Mich., 435 Tamarack St., Laurium, Mich., 1 (NEDA)
Nott, L. A., 1061 Howard St., San Francisco 3, Calif., 2 (REP)
Nott, Willard M., 1061 Howard St., San Francisco 3, Calif., 2 (REP)
Nulsen, Marvin E., 5376 E. Washington St., Indianapolis 19, Ind., 2 (REP)
Oak Electronics, 21-49 William St., Buffalo 3, N.Y., 1
Offenhauer Co., 227 W. Washtenaw, Lansing, Mich., 1 (NEDA)
Olsen Co., John O., 1456 Waterbury Rd., Cleveland 7, Ohio, 2 (REP)
Omega Mfg. Inc., 40 Hudson St., New York 13, N.Y., 1,2
Opad & Green Co., 71 Warren St., New York 7, N.Y., 1
Osborne, Richard E., 1127 Wilshire Blvd., Los Angeles 14, Calif., 2 (REP)
Overton Elec. Co., Inc., 522 Jackson St., Topeka, Kans., 1 (NEDA)
O. & W. Radio Co., 141 Cedar St., New York, N.Y., 1 (NEDA)
Owens, Lee H., 2331 W. Washington Blvd., Los Angeles 18, Calif., 2 (REP)
Pacific Wholesale Co., 116 Ninth St., San Francisco, Calif., 1 (NEDA)
Paden, Ward, P.O. Box 569, Jefferson City, Mo., 2 (REP)
Parsons, C. B., 119 Belmont N., Seattle, Wash., 2 (REP)
Patterson, Wm. G., 210 W. 7 St., Los Angeles 14, Calif., 2 (REP)
Pearson, R. T., 1528 Upland Ave., Noble, Pa., 2 (REP)
Pearson, Mel., 1011 S. Josephine St., Denver 9, Colo., 2 (REP)
Peerless Electr. Equipt. Co., 912 S. Second St., Louisville 3, Ky., 1 (NEDA)
Peerless Electronics Dist. Corp., 76 Willoughby St., Brooklyn 1, N.Y., 1
Penn Electronic Parts Co., 5303 Frankford Ave., Philadelphia 24, Pa., 1 (NEDA)
Pepper, John B., P.O. Box 179, Tuxedo, N.C., 2 (REP)
Perna, Frank J., 111 S. 22 St., Philadelphia 3, Pa., 2 (REP)
Perron & Co., Ray, 131 Clarendon St., Boston 16, Mass., 2 (REP)
Peterson, Arthur H., 6518 W. North Ave., Chicago 35, Ill., 2 (REP)
Petitt, George, 549 W. Washington, Chicago 6, Ill., 2 (REP)
Peyser, J. J., 318 Harvard St., Brookline, Mass., 2 (REP)
Pheasant, Charles E., 18 N. Bolton St., Indianapolis 19, Ind., 2 (REP)
Phelps, James L., 1215 Harmon Pl., Minneapolis 3, Minn., 2 (REP)
Pickett, James M., 12 E. 78 St., New York 21, N.Y., 2 (REP)
Pittsfield Radio Co., 44 West St., Pittsfield, Mass., 1 (NEDA)



Portland Radio Supply Co., 1300 W Burnside, Portland 9, Ore., 1 (NEDA)
Pilgrim Distributing Co., 910 W. Jackson Blvd., Chicago, Ill., 1 (NEDA)
Podolny, James, 5844 Beacon St., Pittsburgh, Pa., 2 (REP)
Poinsettia Co. Inc., 110 Cedar Ave., Pitman, N.J., 1
Pound & Co., Harris, 5093 Randall Ave., Montreal 28, Can., 2 (REP)
Powell, Harold H., 632 Arch St., Philadelphia 7, Pa., 1
Powell Radio Supply, 142 W. 169 St., New York 52, N.Y., 1 (NEDA)
Power City Radio Co., 209 S. First Ave., Sioux Falls, S.D., 1 (NEDA)
Power, Ralph D., 767 Castelar St., Los Angeles 12, Calif., 2 (REP)
Pray Sales, W. B., 18 Brewster Rd., Wellesley 82, Mass., 2 (REP)
Prestwood Electronics Co., 708 Reynolds St., Augusta, Ga., 1 (NEDA)
Purdy, William J., 79 Ninth St., San Francisco 3, Calif., 2 (REP)
Purdy, Wm., Jr., 79 Ninth St., San Francisco 9, Calif., 2 (REP)
Pugh, C. L., 4500 Dublin Rd., Columbus 2, Ohio, 2 (REP)
Quement Inc., Frank, 161 W. San Fernando St., Box 527, San Jose, Calif., 1 (NEDA)
Quick, H. L., 919 N. Michigan Ave., Chicago, Ill., 2 (REP)
Quinlan, D. G., 4700 Frankford Ave., Philadelphia 24, Pa., 2 (REP)
R & M Radio Co., 2701 Wilson Blvd., Arlington, Va., 1
R & R Supply Co. Inc., 706 Main St., Lubbock, Texas, 1 (NEDA)
Rad-El-Co Mfg. Co., 6300 Euclid Ave., Cleveland 3, Ohio, 2
Radio Distributing Co., 915 S. 13 St., Harrisburg, Pa., 1 (NEDA)
Radio Distributors, 701 E. Johnson St., Madison 3, Wis., 1 (NEDA)
Radio Elec. Service Co., 3 N. Howard St., Baltimore 1, Md., 1 (NEDA)
Radio Electric Ser. Co. of Pa., N.W. Cor. 7 & Arch Sts., Philadelphia 1, Pa., 1
Radio Electric Shop, 631 S. 60 St., Philadelphia 43, Pa., 3
Radio Electric Service Co., 406 N. Albany Ave., Atlantic City, N.J., 1 (NEDA)
Radio Elec. Service Co., 3 N. Howard St., Baltimore 1, Md. 1 (NEDA)
Radio & Electr. Parts Corp., 3235 Prospect Ave., Cleveland 15, Ohio, 1 (NEDA)
Radio Electronic Sales Co., 46 Chandler St., Worcester 2, Mass., 1 (NEDA)
Radio Electronic Supply, 1419-21 Cameron St., Lafayette, La., 1 (NEDA)
Radio Electronic Supply Co., 1112 West Warren Detroit 1, Mich., 1 (NEDA)
Radio Electronic Supply Co., 505 Jefferson Ave. S.E., Grand Rapids, Mich., 1 (NEDA)
Radio Eng'ng & Maintenance Corp., 208 W. Third St., Lexington, Ky., 1
Radio Equipment Co., 480 Skain Ave., Lexington 34, Ky., 1 (NEDA)

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Radio Equipment Co., 2820-22 Farnam St., Omaha 2, Neb., 1 (NEDA)
Radio Equipment Co., 821 W. 21 St., Norfolk 10, Va., 1 (NEDA)
Radio Inc., 1000 S. Main St., Tulsa 3, Okla., 1 (NEDA)
Radio Equipment Dist., 312 Pico Blvd., Los Angeles 15, Calif., 1 (NEDA)
Radio Ham Shack Inc., 189 Greenwich St., New York, N.Y., 1
Radio Maintenance Co., 3016½ 27 St., S., Minneapolis 6, Minn., 1 (NEDA)
Radio Maintenance Supply Co., 19-25 Central St., Worcester 8, Mass., 1 (NEDA)
Radio Mdse. Sales, 1165 Southern Blvd., New York 59, N.Y., 1
Radio Parts Company, 612 W. Randolph St., Chicago 6, Ill., 1 (NEDA)
Radio Parts Co., 902 Crawford, Houston, Texas, 1 (NEDA)
Radio Parts Co., Water & Milliard Sts., Saginaw, Mich., 1 (NEDA)
Radio Parts of Arizona, 36 W. Madison St., Phoenix, Ariz., 1 (NEDA)
Radio Parts Co., 929 Liberty Ave., Pittsburgh, Pa., 1 (NEDA)
Radio Parts Co. Inc., 538 W. State St., Milwaukee 3, Wis., 1 (NEDA)
Radio Parts Distrg. Co., 128 W. Olney Rd., Norfolk 10, Va., 1 (NEDA)
Radio Products Sales Co., 1214 First Ave., Seattle, Wash., 1 (NEDA)
Radio Products Sales Inc., 1501 S. Hill St., Los Angeles 15, Calif., 1 (NEDA)
Radio & Refrigeration Sup. Co., 1220 Jackson St., Cincinnati, Ohio, 1 (NEDA)
Radio Sales & Service Co., 1326 First Ave., Columbus, Ga., 1 (NEDA)
Radio Service Lab., 670 Chestnut St., Manchester, N.H., 1 (NEDA)
Radio Serv. & Supply Co., Inc., 615 Third St., Wausau, Wis., 1 (NEDA)
Radio Shack, The, 167 Washington St., Boston, Mass., 1 (NEDA)
Radio Specialties, 456 Charlotte St., Detroit 1, Mich., 1 (NEDA)
Radio Specialties Company, 1956 S. Figueroa St., Los Angeles 7, Calif., 1
Radio Specialties, 136 Pine Ave. S.E., Warren, Ohio, 1 (NEDA)
Radio Supply Co., 711 Granby St., Norfolk 10, Va., 1 (NEDA)
Radio Supply Co., 3302 W. Broad St., Richmond 21, Va., 1 (NEDA)
Radio Supply Co., Inc., 28 Cross St., Auburn, Maine, 1 (NEDA)
Radio Supply, Inc., 724 N. Hudson St., Oklahoma City, Okla., 1 (NEDA)
Radio Supply Co., 200 Walton St., Syracuse, N.Y., 1 (NEDA)
Radio Trade Supply Co., 1224 Grand Ave., Des Moines 9, Iowa 1 (NEDA)
Radio Trade Supply Ltd., 595 Yonge St., Toronto 5, Ont., Can., 1 (NEDA)
Radio & Television Parts Co., 118-120 Seventh St., San Antonio 2, Texas, 1 (NEDA)
Radio & TV Service Co., Westwood Hse., Southtown Rd., Yarmouth, Norfolk, England, 3
Radio Tube Merchandising Co., 508 Clifford St., Flint 3, Mich., 1 (NEDA)
Radio Wire Television Inc., 100 Sixth Avenue, New York 13, N.Y., 1
Radiotronic Distributors Inc., 208 N. College St., Charlotte, N.C., 1 (NEDA)
Radonics, 5040 Easton Ave., St. Louis, Mo., 1 (NEDA)
Rahe, Norman H., 11816 McCracken Rd., Cleveland 25, Ohio, 2 (REP)
Randall, Kenneth W., 121 N. Broad St., Philadelphia 7, Pa., 2 (REP)
Ra-Tel Inc., 2409 Ross Ave., Dallas 1, Tex., 1 (NEDA)
Rauer, Frank W., 4144 Marvin Ave., Cleveland 9, Ohio, 2 (REP)
Ray Distributing Co., 284 Glen St., Glen Falls, N.Y., 1 (NEDA)
Ray & Mac Supply Co., 613 Water St., Waterloo, Iowa 1 (NEDA)
Richardson, H. M., 2210 Forshay Tower, Minneapolis 2, Minn. 2. (REP)
Reid, Ralph K., 1911 W. 9 St., Los Angeles 6, Calif., 2 (REP)
Reid, Robert L., 6325 Guilford St., Indianapolis 20, Ind., 2 (REP)
Reed Radio & Supply Co., Harry, Main Post Office Box 149, Springfield, Mo., 1 (NEDA)
Relinger, Albert R., 3617 N. 8 St., Philadelphia 40, Pa., 2 (REP)
Resistor Wholesalers Corp., 71 Murray St., New York 7, N.Y., 1
Reynolds, Harrison, 313 Washington St., Newton 58, Mass., 2 (REP)
Ridley Associates, 1551 N. Austin Blvd., Chicago 51, Ill., 2 (REP)
Rio Radio Supply Co., P.O. Box 168, McAllen, Texas, 1 (NEDA)
Rissi, Al, J., 1169 Broadway, Los Angeles 15, Calif., 2 (REP)
Rissi Electronic Supply Co., 1112 W. Warren Ave., Detroit 1, Mich., 1
Ritter, Ralph B., 612 N. Michigan Ave., Chicago 11, Ill., 2 (REP)
Roberts, E. V., 5068 W. Washington, Los Angeles 16, Calif., 2 (REP)
Roberts & O'Brien, 714-716 Park Ave., Syracuse 4, N.Y., 1 (NEDA)
Rochester Radio Supply Co., 114 St. Paul St., Rochester 4, N.Y., 1 (NEDA)
Rockbar Corp., 13 E. 40 St., New York 16, N.Y., 2
Rocket Distributors Inc., 209-14 41 Ave., Bayside, L.I., N.Y., 2
Roden Electrical Supply Co., 808 N. Central Ave., Knoxville, Tenn., 1 (NEDA)
Roes, H. Courtney, 1805 Grand Ave., Kansas City 8, Mo., 2 (REP)
Roes, Herbert A., 1805 Grand Ave., Rm. 518, Kansas City 8, Mo., 2 (REP)
Rollan Sales Corp., 663 N. Wells St., Chicago 10, Ill., 1
Rose, J. K., 2323 W. Devon Ave., Chicago, Ill., 2 (REP)
Rosen & Co., Raymond, 32 & Walnut Sts., Philadelphia 4, Pa., 1
Ross, David H., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Roye, Marvin, 11 Warren St., New York 7, N.Y., 2 (REP)
Rucker Radio Wholesalers, 1312 14 St. N.W., Washington, D.C., 1
Rudat, Dan J., 383 Brannan St., San Francisco 7, Calif., 2 (REP)
Rupp, V. T., 1150 W. Olympic Blvd., Los Angeles 15, Calif., 2 (REP)
Rush Co., L. K., 206 E. Baltimore St., Jackson, Tenn., 1 (NEDA)
Rywelski, Joseph M., 27 Park Pl., New York 7, N.Y., 2 (REP)
S & S Radio Supply, 721 South Detroit, Tulsa, Okla., 1 (NEDA)
Sacramento Elec. Supply Co., 1219 S. St., Sacramento, Calif., 1 (NEDA)
Saftler, Perry, 53 Park Place, New York 7, N.Y., 2 (REP)
Sanford Electronic Corp., 157 Chambers St., New York 7, N.Y., 1 (NEDA)
San Francisco Rad & Supply Co., 1282-84 Market St., San Francisco, Calif., 1 (NEDA)
Sargent & Rayment Co., The, 212 Ninth St., Oakland 7, Calif., 12
Sargent, Robert E., 1819 Broadway, New York 23, N.Y., 2 (REP)
Sarkis, Henry D., 6560 N. Sheridan Rd., Chicago 26, Ill., 2 (REP)
Satterfield Radio Supply, 326 W. Gorham St., Madison, Wis., 1 (NEDA)
Saul, Howard M., 5720 Wilshire Blvd., Los Angeles, Calif., 2 (REP)
Scarborough, George G., 1343 Arch St., Philadelphia 7, Pa., 2 (REP)
Schenck, L. R., 31 Clinton St., Newark 2, N.J., 2 (REP)
Schmitt, F. Edwin, 136 Liberty St., New York 6, N.Y., 2 (REP)
Schmitz, J. O., 406 W. 34 St., Kansas City, Mo., 2 (REP)
Scholfield, R. J., 6663 Northwest Hwy., Chicago 31, Ill., 2 (REP)
Scholz, Paul G., 210 W. 8 St., Kansas City 6, Mo., 2 (REP)
Schoonmaker, J. Y., 2011 Cedar Springs, Dallas 1, Tex., 2 (REP)
Schottenberg, Ray T., 152 Merion Ave., Haddonfield, N.J., 2 (REP)
Schroeder, Wm., 915 Westfield Blvd., Indianapolis 20, Ind., 2 (REP)
Schryver, Clyde H., 4550 Main St., Kansas City 2, Mo., 2 (REP)
Schulz, Edwin, 721 Sherwood Dr., Indianapolis 20, Ind., 2 (REP)
Schuster Elec. Co., The, 321 E. Eighth St., Cincinnati 2, Ohio, 2 (NEDA)
Schwartz, Adolph, 1 Exchange Pl., Jersey City 2, N.J., 2 (REP)
Schwartz, Bernard, 4934 N. Lawndale Ave., Chicago 25, Ill., 2
Scooters Radio Supply, 509-511 Commerce St., Fort Worth, Tex., 1 (NEDA)
Scott Sales Co., Ernest P., 1836 Euclid Ave., Cleveland, Ohio, 2 (REP)
Scott Radio Supply, 266 Alamitos Ave., Long Beach 2, Calif., 1 (NEDA)
Scranton Radio & T.V. Supply, 519-521 Mulberry St., Scranton 2, Pa., 1 (NEDA)
Sears Co., M. J., 52 Clark St., Brooklyn 2, N.Y., 2
Seattle Radio Supply Inc., 2117 Second Ave., Seattle 1, Wash., 1 (NEDA)
Shand Radio Specialties, 203 W. Kearsley, Flint 3, Mich., 1 (NEDA)
Shaw, John, 1264 Folsom St., San Francisco 3, Calif., 2 (REP)

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D170396 Hi-Freq. Pwr. Meas.	.90	ICBulb Time Delay	.90
WEco40A Varistor	1.50	WEco 41A Varistor	1.50
CW/20259 U. S. Navy		38C Varistor	2.95

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4,000 Batteries	2,000 Selsyns
300,000 Capacitors	1,000 Blowers
20,000 Chokes & Coils	1,100 Tach Gens.
15,000 Circuit Br'krs.	2,500 Rectifiers
1,000 Clock Motors	20,000 Relays
40,000 Connectors	250,000 WW Res.
12,000 Piezo Xtals	2,500,000 Prec. Res.
1,200 Dynamotors	65,000 Pot's.
15,000 ft. Film	23,000 Rheostats
1,250,000 Fuses, Holders	6,000 Tech Manuals
10,000 ft. Spaghetti	
45,000 Insulators	50,000 Tube Sckts.
5,500 Meters	500,000 pcs Tele-Equipt. (jacks, lamps, etc.)
25,000 Rotary Switches	
20,000 Toggle Switches	
15,000 Micro-switches	
100,000 ft. Wire, Cable	40,000 Transformers
5,000,000 pcs Hardware, Lugs	250,000 Tubes
2,500 Headsets	Million of Odds N'Ends
2,300 Line Filters	

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HI-VOLT OIL-FILLED CONDENSERS

Mfd.	Ea.	Mfd.	Ea.	mfd.	Ea.
1500 wvdc		2500 wvdc		7000 wvdc	
.05	$ .79	.25	$2.29	.0075	$1.98
.5	1.59	3000 wvdc		.1	4.98
.75	1.69	.1	2.49	7500 wvdc	
1	1.79	.25	2.69	.03	2.98
2	2.29	.5	2.98	.05	3.49
4	2.98	3	5.59	.1	5.98
5	3.49	4	6.49	10 KVDC	
6	3.98	4000 wvdc		.03	3.49
2000 wvdc		2	8.98	12 KVDC	
.1	1.49	5000 wvdc		.02	4.98
1	1.98	.2	4.49	12.5 KVDC	
2	2.49	2	10.98	.65	16.98
3	3.98	4	10.98	2	65.00
4	4.49	5500 wvdc		15 KVDC	
5	5.39	2	12.98	.0016	9.98
8	9.49	7000 wvdc		25 KVDC	
2x.1	1.75	.002	1.69	.00025	7.49
				1	95.00

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Send List & Prices—Immediate Reply

FULL-WAVE BRIDGE RECTIFIERS

Amps.	Ea.	Amps.	Ea.	Amps.	Ea.
	18 Volts In, 14 Volts Out				
1.5	$2.29	4	$3.98	12	$ 7.98
2	2.45	8	5.98	24	15.95
	36 Volts In, 28 Volts Out				
1	2.69	4	5.98	10	13.95
2	3.98	8	11.98	12	15.95

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Money Back Guarantee.
Return Mdse. Prepaid.

"TAB" That's a Buy!

Distribution

(Continued from page 105)

Shaw, Samuel A., 101 Park Ave., New York 17, N.Y., 2 (REP)
Shaw Television Corp., 195 Front St., Brooklyn, N.Y., 3
Shilt, Noble, 1531 Spruce St., Philadelphia 2, Pa., 2 (REP)
Shuler Supply Co., 415 Dryades St., New Orleans, La., 1 (NEDA)
Signal Radio Supply, Goldsboro, N.C., 1 (NEDA)
Silberne Radio & Elec. Co., 3308-10 11 St. N.W., Washington 10, D.C., 1 (NEDA)
Simberkoff, J. A., 68 Hudson St., Hoboken, N.J., 2 (REP)
Simberkoff, S. W., 68 Hudson St., Hoboken, N.Y., 2 (REP)
Sinai, Arnold A., 65 Ninth St., San Francisco 3, Calif., 2 (REP)
Skolburg, John E., 912 Ft. Wayne Bank Bldg., Ft. Wayne 2, Ind., 2 (REP)
Slate & Co., 2755 Webster Ave., New York 58, N.Y., 1 (NEDA)
Smith & Crawford, 1345 Mission St., San Francisco 3, Calif., 1 (NEDA)
Smith, Dolores, 505 N. Ervay St., Dallas 1, Texas, 2 (REP)
Smith, Earl J., 505 N. Ervay St., Dallas 1, Tex., 2 (REP)
Smith, Howard F., 259 W. 14 St., New York 11, N.Y. 2 (REP)
Smith, Maitland K., 315 Forrest Ave. N.E., Atlanta, Ga., 2 (REP)
Smith, Oren H., 225 W. Huron St., Chicago 10, Ill., 2 (REP)
Smith, Orville A., 403 Second Ave., Jackson, Mich., 2 (REP)
Snyder & Co., V. A., 25 Hyatt St., Staten Island 1, N.Y., 2 (REP)
Solo Electronics Sales Corp., 190 Washington St., New York 7, N.Y., 3
Somers, Jr., F. C., 1805 Grand Ave., Kansas City 8, Mo., 2 (REP)
Sonics Equipment Co., 2321 Hudson Blvd., Jersey City 4, N.J., 3
Sonkin, David, 1775 Broadway, New York 19, N.Y., 2 (REP)
Southeastern Rad. Supply Co., 411-15 Hillsboro St., Raleigh, N.C., 1 (NEDA)
Southeastern Radio Supply Co., 416 Market St., Greensboro, N.C., 1 (NEDA)
Southern, Charles D., 1135 Lincoln Tower, Ft. Wayne 2, Ind., 2 (REP)
Southern, Paul D., 1135 Lincoln Tower, Ft. Wayne 2, Ind., 2 (REP)
Southern Radio Supply Co., 1900 Tulane Ave., New Orleans, La., 1 (NEDA)
Southern Radio Supply, 1419 Main St., Little Rock, Ark., 1 (NEDA)
Southern Radio Supply, 32-21 Ross Ave., Dallas 1, Texas, 1 (NEDA)
Southwest Radio Supply, 1820 N. Harwood St., Dallas, Tex., 1 (NEDA)
Sparf, Walter H., 2753 W. North Ave., Chicago 47, Ill., 2 (REP)
Springfield Radio Co., Inc., 405 Dwight St., Springfield, Mass., 1 (NEDA)
Springfield Sound Co., 147 Dwight St., Springfield, Mass., 1 (NEDA)
Sprung, Joseph, 254 West 31 St., New York 1, N.Y., 2 (REP)
Squibb, Raymond K., 2601 First Ave., Seattle 1, Wash., 2 (REP)
Srepco, Inc., 135 E. Second St., Dayton 2, Ohio, 1 (NEDA)
Stallman of Ithaca, 123-131 S. Tioga St., Ithaca, N.Y., 1 (NEDA)
Stan-Burn Radio & Electr. Co., 558 Coney Island Ave., Brooklyn 18, N.Y., 1 (NEDA)
Stan-Burn Radio & Electrs., 1697 Broadway, New York 19, N.Y., 1 (NEDA)
Standard Parts Corp., 277 N. Franklin St., Hempstead, L.I., N.Y., 1 (NEDA)
Standard Radio Electl. Prods., 2260 Washington Ave., New York 57, N.Y., 1
Standard Radio Parts Co., 1244 State St., Racine, Wis., 1 (NEDA)
Stark Radio Supply Co., 71 South 12 St., Minneapolis 4, Minn., 1 (NEDA)
Steffen, Delbert, 320 E. 211 St., Cleveland 23, Ohio, 2 (REP)
Steinberg & Co., Albert, 2520 N. Broad St., Philadelphia 32, Pa., 1 (NEDA)
Steinberg, Hy, 395 Broadway, New York 13, N.Y., 2 (REP)
Steinbergs, Inc., 633 Walnut St., Cincinnati 2, Ohio, 1 (NEDA)
Steinke, A. R., 19277 Henry Rd., Fairview Pk., Cleveland 26, Ohio, 2 (REP)
Stem, Royal A., 21 E. Van Buren St., Chicago 5, Ill., 2 (REP)
Stemm, Royal A., 5707 W. Lake St., Chicago 5, Ill., 2 (REP)
Sterling Radio Products Co., 1616 McKinney St., Box 1746, Houston, Tex., 1 (NEDA)
Stevens, Fred J., 15324 Mack Ave., Detroit 24, Mich., 2 (REP)
Stevens, K. C., Box N, Lincoln, Mass., 2 (REP)
Stevens Radio Parts, 713 Portage St., Kalamazoo, Mich., 1 (NEDA)
Smith, Inc., Stewart W., 325 E. Water St., Syracuse 2, N.Y., 1 (NEDA)
Still, Arden, 8405 Park Pl. Blvd., Houston, Tex., 2 (REP)
Still, L. C., 407 Whitehead Bldg., Atlanta 3, Ga., 2 (REP)
Stone, Carl A., 1102 S. Western Ave., Los Angeles, Calif., 2 (REP)
Stone, John L., 1445 Teall Ave., Syracuse 6, N.Y., 2 (REP)
Stone, Carrington H., 205 W. Wacker Dr., Chicago 6, Ill., 2
Straits Distributing Co., 200 South Main St., Sheboygan, Mich., 1 (NEDA)
Strassner, Conrad R., 5108 Melrose Ave., Los Angeles 38, Calif., 2 (REP)
Stratton, C. H., 2601 N. Broad St., Philadelphia 32, Pa., 2 (REP)
Strauss, Mae, 425 Surf St., Chicago 14, Ill., 2 (REP)
Strong Television Corp., 286 Main St., Farmingdale, L.I., N.Y., 1 (NEDA)
Stroum, Samuel N., 610 19 Ave., North Seattle 2, Wash., 2 (REP)
Stubbs Electric Co., 33 N.W. Park Ave., Portland 9, Ore., 1 (NEDA)
Sturgeon, Paul R., 25 Huntington Ave., Boston 16, Mass., 2 (REP)
Suedekum Electr. Supply Co., 902 South Sprigg St., Cape Girardeau, Mo., 1 (NEDA)

(Continued on page 107)

Distribution

(Continued from page 106)

Sun Radio Co., 110 E. Market St., Akron 8, Ohio, 1 (NEDA)
Superior Distributing Co., 5124 Liberty Ave., Pittsburgh 24, Pa., 1 (NEDA)
Sussman, Ira, 130 Lafayette St., New York 13, N.Y., 2 (REP)
Sussman, Jules, 130 Lafayette St., New York 13, N.Y., 2 (REP)
Suttons Whlse. Electr., Bill, 601 Commerce St., Fort Worth 2, Tex., 1 (NEDA)
Swank, Wally B., 400 Cherry Rd., Syracuse 9, N.Y., 2 (REP)
Swift Electr. Sales Corp., 190 Washington St., New York 7, N.Y., 3
Sylvan-Wellington Co., 269 Canal St., New York, N.Y., 1 (NEDA)
Sylvester, R. A., 1343 Arch St., Philadelphia 7, Pa., 2 (REP)
TAB, 6 Church St., Dept. 91R, New York 6, N.Y., 1
For details see ad on page 106
TV Supply Co., 1226 Third Ave., Huntington 1, W.Va., 1 (NEDA)
Tallen Co., Inc., 562 Atlantic Ave., Brooklyn 17, N.Y., 1
For details see ad on page 107
Tanner, G. O., 600 Grant St., Room 407, Pittsburgh 19, Pa., 2 (REP)
Tatro, Frank B., 6022 N. Rogers, Chicago, Ill., 2 (REP)
Taylor Co., E. E., 465 Central Ave., Albany 5, N.Y., 1 (NEDA)
Taylor Co., Frank W., P.O. Box 316, Dewitt, N.Y., 2 (REP)
Taylor Co., Morris F., 8416 Georgia Ave., Silver Spring, Md., 2 (REP)
Taylor Co., Robert F., 308 W. Washington St., Chicago 6, Ill., 2 (REP)
Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass., 2
Telemarine Communication Co., 536-542 W. 27 St., New York 1, N.Y., 3
Tel-Rad Co., 274 Farmington, Hartford 51, Mass., 3
Television Utilities Corp., 1261 Broadway, New York 1, N.Y., 1
Terminal Radio Corp., 85 Cortlandt St., New York 7, N.Y., 1 (NEDA)
For details see ad on page 96
Terwilliger, Percy D., 636 E. 96 St., Kansas City 6, Mo., 2 (REP)
Test Equipment Sales Co., Inc., 1505 Race St., Philadelphia 3, Pa., 1
Thacher Bros., 458 Statler Bldg., Boston 16, Mass., 2
Thibau, A. R., 402 Mfrs. Exchange Bldg., Kansas City 6, Mo., 2 (REP)
Thompson, John F., 315 Forrest Ave. N.E., Atlanta, Ga., 2 (REP)
Thompson Radio Supplies, 182 E. Long St., Columbus 15, Ohio, 1 (NEDA)
Tilton, John R., 11 Union St., E. Waterloo, Ontar.o, Canada, 2
Tobias, David F., 30 Church St., New York 7, N.Y., 2 (REP)
Toledo Radio Specialties, 1215 Jackson St., Toledo 2, Ohio, 1 (NEDA)
Tomlin, H. M., 1212 Camp St., Dallas 2, Tex., 2 (REP)
Tracey & Co., Inc., 937 N.W., Glisan, Portland 9, Ore., 1 (NEDA)
Tri-City Radio Supply, 1919 Fourth Ave., Rock Island, Ill., 1 (NEDA)
Trinkle, Wilmer S., 2601 Broad St., N. Philadelphia 32, Pa., 2 (REP)
Trojan Radio Co., Inc., 426 River St., Troy, N.Y., 1 (NEDA)
Tubergen, John B., 2232 W. 11 St., Los Angeles 6, Calif., 2 (REP)
Turney & Beale Co., 40-08 Corporal Kennedy St., Bayside, L.I., N.Y., 2
Tycho Roberg, A-B, Gothenburg, Sweden, 23
Tydings Co., 5800 Baum Blvd., Pittsburgh 19, Pa., 1 (NEDA)
United Radio & Elec. Co., 47 W. 63 St., New York 23, N.Y., 1 (NEDA)
United Radio Supply, 47-53 E. Main St., New Britain, Conn., 1 (NEDA)
United Radio Supply, Inc., 22 N.W. Ninth Ave., Portland 9, Ore., 1 (NEDA)
Universal General Corp., 324 Canal St., New York 13, N.Y., 3
Universal Radio Supply Co., 533 S. Seventh, Louisville 3, Ky., 1 (NEDA)
Universal Radio Supply Co., 1404-06 Venice Blvd., Los Angeles 6, Calif., 1 (NEDA)
Vandusen, R. H., 940 Lake Elbert Dr., Winter Haven, Fla., 2 (REP)
Vangroos, J. C., 1436 N. Serrano, Hollywod 27, Calif., 2 (REP)
Vansickle Radio Supply Co., 102 S. Pennsylvania St., Indianapolis, Ind., 1 (NEDA)
Vansickle Radio Co., 1113 Pine St., St. Louis 1, Mo., 1 (NEDA)
Vega Co., 155 Columbus Ave., Boston 16, Mass., 2
Vermilya, Robert A., 1355 Market St., San Francisco 3, Calif., 2 (REP)
Vetsalco, Inc., 78 21 Ave., Paterson, N.J., 3
Wahl Co., A. C., 9448 Winton Rd., Greenhills 18, Ohio, 2
Walder Radio & Appliance, 1809 N.E. Second Ave., Miami, Fla., 1 (NEDA)
Walker Co., Verl G., P.O. Box 1586, Medford, Ore., 1 (NEDA)
Walker-Jamieson, Inc., 311 S. Western Ave., Chicago 12, Ill., 1
Walker Radio Co., L. B., 218 W. Eighth St., Pueblo, Col., 1 (NEDA)
Wallace, Don C., 1206 Maple Ave., Los Angeles 15, Calif., 2 (REP)
Wallace Sales Agency, S. K., P.O. Box 744, Lutz, Fla., 2 (REP)
Wallace, Wm. H., 1206 Maple Ave., Los Angeles 15, Calif., 2 (REP)
Walton, H. E., 128 Kercheval, Grosse Point 30, Mich., 2 (REP)
Warbington, R. E., 407 Whitehead Bldg., Atlanta, Ga., 2 (REP)
Ward Mfg. Co., 80 E. Jackson Blvd., Chicago 4, Ill., 2
Ware Radio Supply Co., 913 Centre St., Brockton 11, Mass., 1 (NEDA)

(Continued on page 108)

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RELAYS—TUBES
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ART 13
AN/TRC-1
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T14/TRC-1
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J68/ARC-3
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GENERATORS
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TEST SETS
MC-203
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CLAMPS
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SWITCHES
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JUNCTION BOXES
SOCKETS
ANTENNAS
INDICATORS
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TALLEN CO., INC.

562 ATLANTIC AVENUE
BROOKLYN 17, N.Y.
TELEPHONE: TRIANGLE 5-8241

(Continued from page 107)

Warner, Al., J., 5022-29 Ave. S., Minneapolis 17, Minn., 2 (REP)
Warren Radio Co., 222 S. Elizabeth, Lima, Ohio, 1 (NEDA)
Warren Radio Co., 479 S. Main St., Akron, Ohio, 1 (NEDA)
Warren Radio Co., 1320 Madison Ave., Toledo 2, Ohio, 1 (NEDA)
Warren Radio Co., 720 S. Clinton, Fort Wayne, Ind., 1 (NEDA)
Warren Radio, Inc., 1125 State St., Erie, Pa., 1 (NEDA)
Warren Radio Supply, 115 S. Indiana Ave., Souix Falls, S.D., 1 (NEDA)
Washabaugh David G., 401 N. Broad St., Philadelphia 8, Pa., 2 (REP)
Weatherford Co., 6919 San Fernando Rd., Glendale 1, Calif., 1 (NEDA)
Weber, Dale G., 234 Sherlock Bldg., Portland 4, Ore., 2 (REP)
Wedel, Frank, 3215 Western Ave., Seattle 99, Wash., 2 (REP)
Wedemeyer Electr. Supply Co., 2005 E. Michigan Ave., Lansing, Mich., 1 (NEDA)
Wedemeyer Electr. Supply Co., 215 N. 4 Ave., Ann Arbor, Mich., 1 (NEDA)
Weller, Roy H., 620 Penn Ave., Pittsburgh 21, Pa., 2 (REP)
Weller, W. R., 361 E. Kanawha Ave., Worthington, Ohio, 2 (REP)
Wellman, W. N., 575 Arcade Bldg., St. Louis 1, Mo., 2 (REP)
Wells Sales, Inc., 320 N. LaSalle St., Chicago 10, Ill., 3
Wendling Tom F., c/o Allen, 2401 S. State St., Syracuse 5, N.Y., 2 (REP)
West, Jack, 6747 North Octavia, Chicago 31, Ill., 2 (REP)
West Michigan Sound Co., 1495 Lakeshore Dr., Muskegon, Mich., 3
West Texas Radio Supply, 1026 West Sixth, Amarillo, Tex., 1 (NEDA)
Westchester Electr. Supply Co., 420 Mamaroneck Ave., White Plains, N.Y., 1 (NEDA)
Western Distributors, 227 Santa Fe, Salina, Kan., 1 (NEDA)
Western Electr. Enterprises, 3348 W. Compton Blvd., Gardena, Calif., 2
Western Electr. Supply Co., 717 Dexter Ave., Seattle 9, Wash., 1 (NEDA)
Western Electr. Supply Corp., 7005-07 Melrose Ave., Los Angeles, Calif., 1 (NEDA)
Western International Co., 45 Vesey St., New York 7, N.Y., 3
Western Sound & Elec. Labs., Inc., 805 South 5 St., Milwaukee 4, Wis., 3
Westrex Corporation, 111 Eighth Ave., New York 11, N.Y., 3
White, P. H., 111 Hoover Rd., Needham Heights, Mass., 2 (REP)
White Radio Supply Co., David, 1222 Main St., Little Rock, Ark., 1 (NEDA)
Whitehead Radio Co., 124 E. Long St., Columbus 5, Ohio, 1 (NEDA)
Whitehead Radio Co., Inc., 813 Bluefield Ave., Bluefield, W.Va., 1 (NEDA)
Wholesale Radio Parts Co., Inc., 311 W. Baltimore St., Baltimore 1, Md., 1 (NEDA)
Wible Radio Supply Co., 907 S. Tacoma Ave., Tacoma 3, Wash., 1 (NEDA)
Wicks-De Vilbiss Co., 513-15 S. Staples St., Corpus Christi, Tex., 1 (NEDA)
Wilco Radio Distributors, 383 E. 138 St., New York, N.Y., 1 (NEDA)
Wile, R. H., 218 S. Eleventh St., Philadelphia 7, Pa., 1 (NEDA)
Wiley, Paul F., 1406 South Grand Ave., Los Angeles 15, Calif., 2 (REP)
Wilkinson Brothers, 2406 Ross Ave., Dallas, Tex., 1 (NEDA)
Wilkinson, Robert L., Maxela Dr., Baltimore 12, Md., 2 (REP)
Willett Radio Supply, Inc., 11 Court St., Natick, Mass., 1 (NEDA)
Williams Jr., Allen I., 230 Cooper Bldg., Denver 2, Colo., 2 (REP)
Williams Co., Carl B., 154 S. Main St., Phillipsburgh, N.J., 1 (NEDA)
Williams, Carroll, 1901 Griffin St., Dallas, Texas, 2 (REP)
Williams, Victor W., 415 Fifth St., Harrison, N.J., 2 (REP)
Williamsport Radio Supply, 518 W. Third St., Williamsport 28, Pa., 1 (NEDA)
Wilson, Gerald 403 2 Ave., Jackson, Mich., 2 (REP)
Wilson Supply Co., 108 W. Jefferson St., Springfield, Ill., 1 (NEDA)
Wineblatt, Edward, 61 W. Grand St., Mt. Vernon, N.Y., 2 (REP)
Winfree Supply Co., 800 W. Cary St., Richmond 20, Va., 1 (NEDA)
Winteradio, Inc., 1468 W. 25 St., Cleveland 13, Ohio, 1 (NEDA)
Winters Radio Lab., 11 Warren St., Rm. 317, New York 7, N.Y., 3
Wise Radio Supply, 1001 Towson Ave., Fort Smith, Ark., 1 (NEDA)
Wolfe-Marsey Sales Co., 74 Park Ave., Rochester 7, N.Y., 2
Wolf, O. C., P.O., Box 81, Camillus, N.Y., 2 (REP)
Wolfe, Michael, 136-52 71 Rd., Flushing, L.I., N.Y., 2 (REP)
Womack Electric & Supply Co., 502-504 Craghead St., Danville, Va., 1 (NEDA)
Wood, Ash M., P.O. Box 150, El Monte, Calif., 2 (REP)
Wood, John A., c/o Sylvania, 6450 Hollis Ave., Emeryville, Calif., 2 (REP)
World Radio Labs., Inc., 740-744 W. Broadway, Council Bluffs, Iowa, 1 (NEDA)
Wresco, 140 9 St., San Francisco, Calif., 1 (NEDA)
Wright, Austin L., 24 Decatur Rd., Havertown, Pa., 2 (REP)
Wright, Wm. A., 106 Edtim Rd., Syracuse, N.Y., 2 (REP)
York Radio & Refrig. Pts., 265 W. Market St., York, Pa. 1 (NEDA)
Zack Radio Supply Co., 1426 Market St., San Francisco 2, Calif., 1 (NEDA)
Zimmerman Wholesalers, 114 E. Washington St., Hagerstown, Md., 1 (NEDA)
Zimmerman Wholesalers, 162 Bedford St., Cumberland, Md., 1 (NEDA)
Zimmerman Wholesalers, 55 Morgantown St., Uniontown, Pa., 1 (NEDA)
Zobrist Co., Herb E., 2125 Westlake Ave., Seattle 1, Wash., 1 (NEDA)

Dynamotors, see 44 Sub-head 1

23. Electronic Control Equipment.

1—Air Conditioning Controls.
2—Burglar Alarm & Protection Devices.
3—Combustion & Smoke Elimination.
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6—Variable Speed Regulators.
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Aero Electronics Co., Ill., 5, 6
Airlectron, Inc., N.J., 2, 5
Airmec Labs. Ltd., England, 5, 7
Alcah, Inc., R.I., 2, 5
Alertronic Protective Corp., N.Y., 2
American Communications Corp., N.Y., 4
American Electroneering Corp., The, Calif., 7
American Hydromath Co., N.Y., 5
Applegate & Co., C. J., Colo., 4-7
Arlington Electric Prods., Inc., N.Y., 2, 6, 7
Arma Corp., N.Y., 5
Associated Eng'ng. Corp. of Boston, Mass., 7
Atlantic Electronics Corp., 4A Manhasset Ave., Port Washington, L.I., N.Y. 5, 6, 7
For details see ad on page 88
Automatic Temp., Control Co., Inc., Pa., 1, 3, 5
Autotron Co., The, Ill., 2-5
Avimo Ltd., England, 6
Avion Instrument Corp., N.Y., 6, 7
Barber-Colman Co., Ill., 1
Belock Instrument Corp,, N.Y., 5, 6
Bendix Avi. Corp., Eclipse-Pioneer Div, Dept. G, Teterboro, N.J., 7
For details see add on page 154
Berkeley Scientific Co., 2200 Wright Ave., Richmond, Calif., 5
For details see ad on page 109
Berkshire Labs., Mass., 5
Beta Electric Corp., 333 E. 103rd St, New York 29, N.Y., 7
For details see ad on page 167
Blaco Mfg. Co., Ohio, 2, 4
Bliss-Warren Electronic Corp., N.J., 5
Brelco Electronics Corp., N.Y., 2, 4-6
Bristol Co., The, Conn., 1, 5
Brociner Electronics Lab., N.Y., 2, 5, 7
Browning Laboratories, Inc., 750 Main St., Winchester, Mass., 2
See complete catalog filed alphabetically in last section
Brownthorn Electronics Corp., N.Y., 1, 6, 7
Bruel, A-S, & Kjaer, Denmark, 5
Buehler & Co., Ill., 5, 6, 7
Central Rediffusion Services Ltd., England, 2
Coax Electronics Co., N.Y., 5
Cole Instrument Co., Calif., 5, 6
Computing Devices of Canada Ltd, Canada, 5, 7
Control Engineering Corp., Mass., 5
Control Systems Co., N.Y., 6, 7
Cutler-Hammer, Inc., Wis., 1, 6
Denrad Mfg. Co., Inc., Texas, 2, 5
Dietz Co., The Henry G., N.Y., 1
Display Lighting, Inc., N.Y., 4
Doeclam Corp., Mass., 6, 7

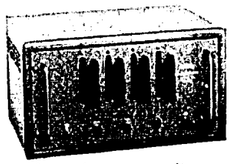
(Continued on page 109)

ELECTRONIC INSTRUMENTATION

for **LABORATORY** *or* **PRODUCTION LINE!**

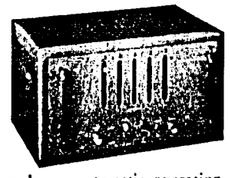
DECIMAL COUNTING UNIT, MODEL 700 is a direct reading electronic counter capable of operating at speeds up to 30,000 counts per second. Digits from 0 to 9 are presented on illuminated front panel. Electrical reset to zero. Plug-in octal mounting for easy interchangeability. The counter operates on input pulse of 100 volt neg. with 2 microsec. max. rise time. Output will drive following unit in cascade. Dimensions 1⅜" x 5" x 5¼". Wt. 12 oz. Other models to a million counts per second.

ELECTRONIC COUNTER, MODEL 10 was developed to meet the need for a rugged industrial counter operating at speeds up to 6000 counts per minute. Total count is displayed on the Decimal Counting Unit and the mechanical register to a maximum capacity of 9,999,999. Unit may be operated from closing contacts, photocell, or any means that will supply a positive potential of at least 3 volts. All circuitry moisture and fungus proofed. Unit is available in a variety of vapor-proof and explosion-proof housings to meet individual requirements. Dimensions 6¼" x 7¼" x 6½". Weight approximately 6 lbs.



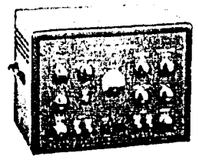
PRESET COUNTER consists of a series of scale-of-10 electronic counting units each in parallel with a 10-position push-button switch. This instrument accepts counts in the conventional manner at rates up to 10,000 cps. Any number from 0 to maximum capacity may be preset merely by depressing appropriate push-button in each column. Upon reaching the preset count, the unit supplies an output pulse to drive a register, close a gate, divert a production line or perform any other desired function. It then resets to 0 and recycles automatically. Available in any desired capacity.

EVENTS PER UNIT TIME METER, MODEL 554 will automatically count and display the number of events that occur during a precise one second interval at rates up to 100,000 events per second. Accuracy is ± one event. Will operate either manually or automatically to count any mechanical, electrical, or optical occurrences, regularly or randomly spaced, that can be converted into changing voltages. Instrument counts for one second and displays the results on illuminated five-digit panel. Will recycle continuously on automatic operation. Convenient test switch permits 2 second self-check of entire unit. Dimensions 20¾" x 10½" x 15". Weight approximately 68 lbs.



TIME INTERVAL METER, MODEL 510 provides a direct reading of elapsed time between any two events in the range of 0.000010 to 1.00000 seconds. Accuracy is ± 10 microseconds. Any occurrences that can be translated into changing voltages may be so timed. Timing may be started and stopped by independent voltages, the polarity of which may be selected by means of toggle switches. Sensitivity control permits selection of the amplitude of start or stop voltages at optimum level for elimination of interference. Dimensions 20¾" x 10½" x 15". Weight approximately 58 lbs.

SINGLE/DOUBLE PULSE GENERATOR MODEL 903 is a general purpose laboratory instrument that supplies either single or paired pulses individually variable in amplitude, width and polarity. Pulse spacing is continuously variable from 0 to 10 microseconds, pulse width from 0.10 to 1.6 microseconds and pulse amplitude from 200 volts maximum negative and 50 volts maximum positive for 1000 ohm load, and 10 volts maximum negative and 50 volts maximum positive for 50 ohm load. Single or double pulses are available through separate panel connectors. Repetition rate internally controlled 1 to 1000 cps. Push-button control single cycle. External signal control for any rate up to 1000 cps.



These are basic descriptions of representative standard instruments. A variety of modifications, both standard and special, are available to meet specific requirements. For complete details write Dept. Y.

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Electronic Control Equip.

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Electric Regulator Corp., Conn., 6, 7
Electro-Physics Co., N.Y., 2, 5
Electro-Seal Corp., 946 Lee St., Des Plaines, Ill., 5
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Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J., 5
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For precision and dependability look to Kollsman

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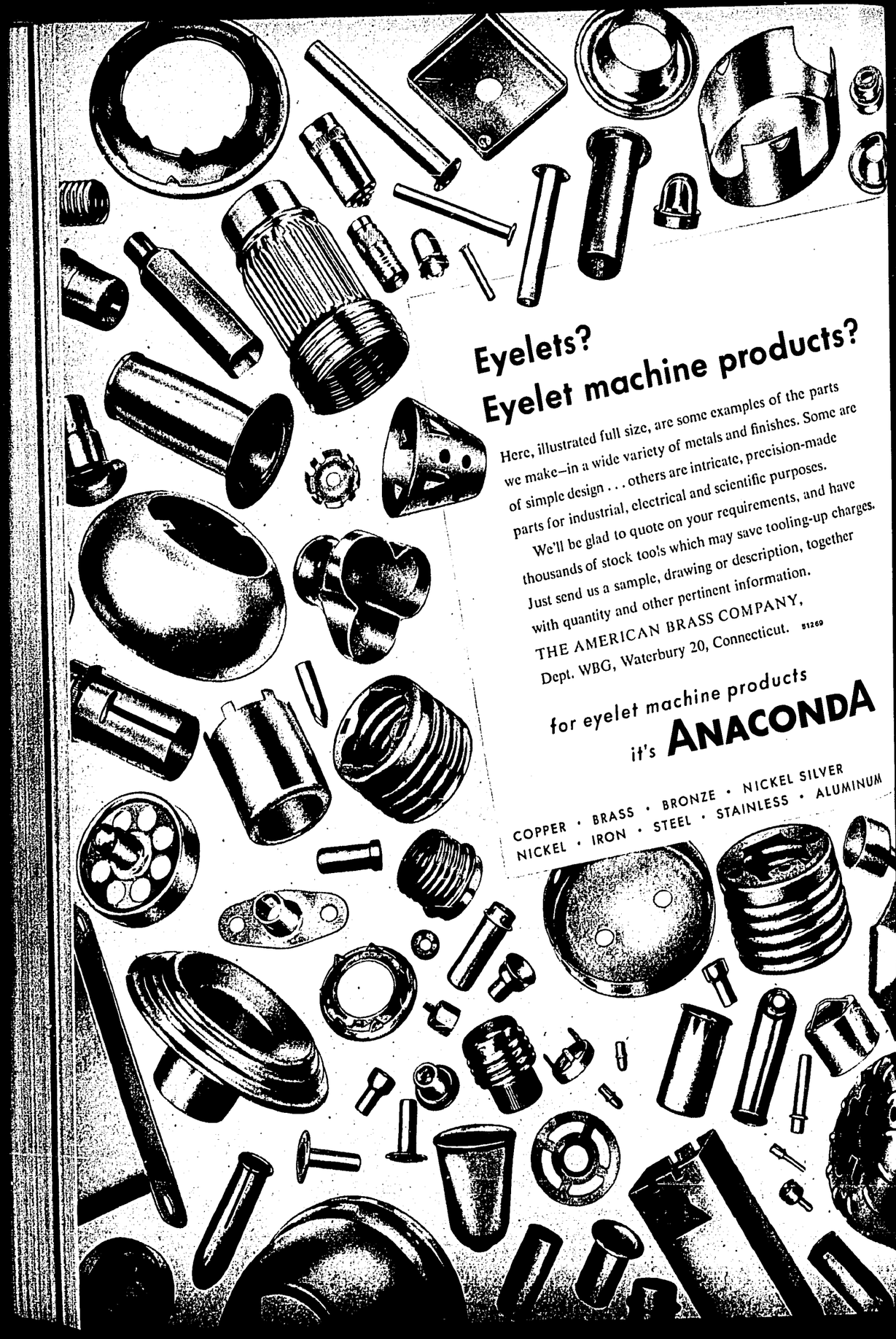

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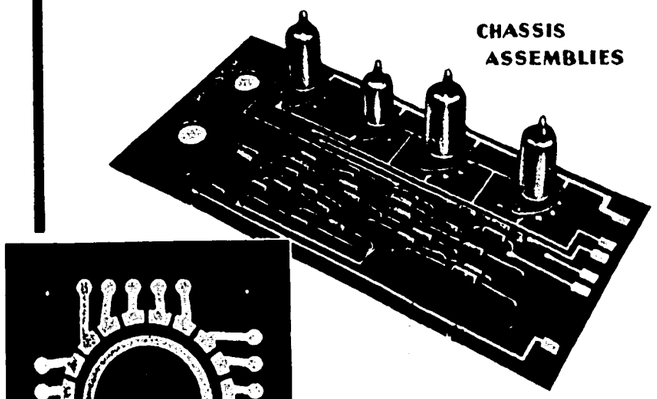

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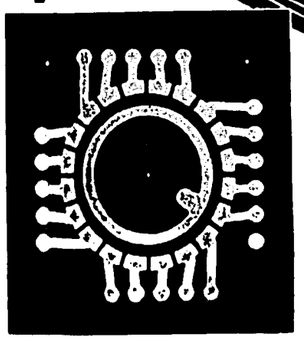

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(Continued on page 115)

In Connectors.. *it's Alden First*

The tremendous expansion in electronic equipment, uses and design call for connectors and connecting devices that are more than just holdovers from the battery set era. Here at Alden's we feel we are approaching the connector component problem with a conception most in keeping with the advanced electronic trends.

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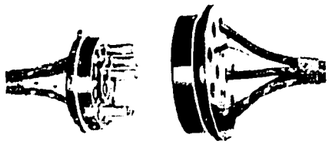
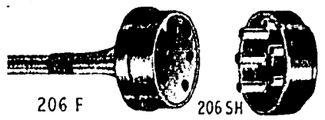


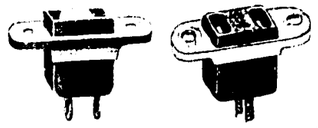
Multiwire connectors with 2 to 11 contacts in variable pin layouts. . . . Commercial replacement for AN connectors.

Plugs & Sockets 200FC/SH Series



Ideal detachable terminal connectors—3 to 7 contacts—UL collars—top engineering.

ELECTRICAL SPECIALTIES



Smallest, most rugged UL approved AC convenience outlets available, 402 AC Series—Saves space and critical material.

RUGGED DIAL LIGHT SOCKETS

80 Series with exclusive NA-ALD "center file" contacts—hold each strand of wire tip against bulb base—for cutting through corrosion—crimps around wire insulation for strain relief.

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Ideal miniature 2 to 5 contact metal seal plugs and sockets for carrying power or signal—extremely compact and rugged.

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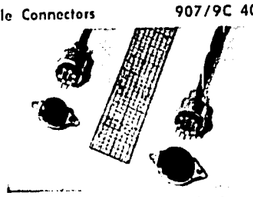

Ultra-compact 7 or 9 pin layout for low voltage applications—less than ¾" diameter—with or without leads—metal shell for easy gripping.

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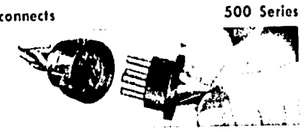
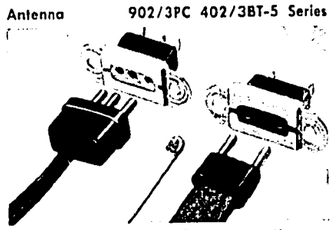


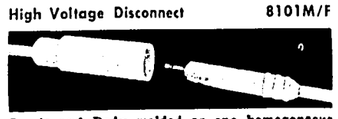
Most compact connector for AC current or signal—2 to 4 contacts.

Antenna 902/3PC 402/3BT-5 Series



In wide use for low voltage connections on instruments and all types of electronic equipment.

High Voltage Disconnect 8101M/F



Leads and Body molded as one homogeneous unit in low loss polyethylene. Rated at 15,000 volts DC or AC peak.

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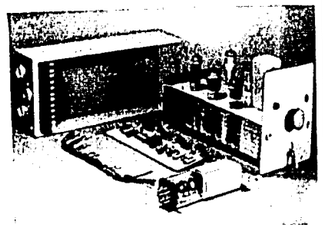
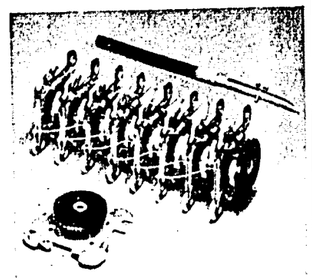
Alden is pioneering a whole series of components for plug-in unit construction . . . (1) accessible, back connected, slide-in lock-in chassis (2) rugged, color coded back connectors (3) dress up housings (4) rugged bases for plug-in units and (5) quick acting, easily operable fastenings and locks for plug-in units (6) terminal card mounting system which allows related circuits to be wired rapidly in open or straight line bench work.



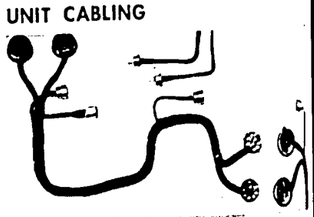
Extremely flexible plug-in kits allow you to design circuits and mount components as ultimate assembly basis. *Send for catalogue "Components for Plug-in Unit Construction."*

COMPUTER COMPONENTS



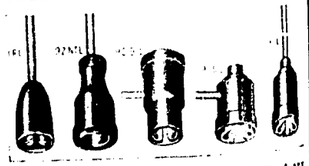
Manufacture of the revolutionary Static Magnetic Memory (a new device for pulse handling and storing developed by Harvard Computation Laboratory) is typical of Alden's ability to take the problem in the idea stage, develop working production design and get into volume production. *For further information*, write for special technical bulletins on the *Alden SMM*.

UNIT CABLING



Alden can take your equipment and design and engineer to your requirements economical and efficient unit cables of good appearance. Cabling built as units allows instant continuity check and rapid replacement in the field.

TUBE CAPS FOR EVERY PURPOSE



Alden has a tube cap connector to meet any need you might have. Contacts are carefully designed; leads have complete strain relief; connectors are fully insulated.

This is only a partial listing—Write Dept. IR for Catalog.

ALDEN PRODUCTS COMPANY

Dept. IR, 117 N. Main St. Brockton 64, Mass.

Fabricators

(Continued from page 113)

Erwood, Inc., Ill., 1, 6
Ferro-Co. Corp., N.Y., 1, 2, 6, 7
Forbes & Wagner, Inc., N.Y., 1
Formica Co., Ohio, 6
Fryling Mfg. Co., Pa., 6
Furst Electronics, Ill., 1
Gadgets, Inc., Ohio, 1, 6
General Cement Mfg. Co., Ill., 1, 6
General Laminated Prod., Inc. of Ill., Ill., 1, 6
Golden Co., N.Y., 6
Gombos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 1
For details see ad on page 91
Gordon Specialties Co., Ill.
Grammes & Sons, Inc., L. F., Pa., 6
Green Mfg. Corp., G. G., Pa., 6

- **Special Attention Given to Prototypes**
- **Development of Special Devices**
- **Contract Manufacturing of:**

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Audio, Video, and other Electronic Assemblies

Inquiries given special attention.
Write for full details our facilities.

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Guthman & Co., Inc., Edwin L., Ill., 2, 6
Harnett Elec. Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 4
For details see ad on page 83
Heppner Mfg. Co., Box 612, Round Lake, Ill., 1, 6
For details see ad on page 115
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For details see ad on page 116
Hillyer Instrument Co., Inc., N.Y., 1
Hoffman Radio Corp., Calif., 1, 7
Houghton Laboratories, Inc., N.Y., 5
Houston Corp., The, Calif., 1
Houston-Fearless Corp., Calif., 1
Industrial Dev. Eng'rg. Assoc., Inc., Ind., 1
Industrial Devices, Inc., N.J., 5, 6
Industrial Hardware Mfg. Co., Inc., N.Y.
Industrial Precision Products, Ill., 1, 4, 6
Insulation Products Co., Pa., 5
Insuline Corp of America, N.Y., 6
Jackson Elect. Instrument Co., Ohio, 1
Johnson & Hoffman Mfg. Co., 65 Ongley St., Rockville Centre, L.I., N.Y., 6
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Kent Co., F. C., N.J., 7
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 6
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Kolton Electric Mfg. Co., N.J., 1, 6
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Kulka Electric Mfg. Co., Inc., N.Y., 9
Lamicoid Fabricators, Inc., Ill., 6
Lamoree, C. D., Calif., 6, 7
Langevin Manufacturing Corp., 37 W. 65 St., New York 23, N.Y., 3
For details see ad on page 137
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Linell Eng. Corp., Charles S., Ill., 1
Long, Inc., Thomas J., N.Y., 1-6
Loral Electronics Corp., N.Y., 1
Louis Brothers, Calif., 6, 7
Lunn Laminates, Inc., N.Y., 5
Lysco Labs. Mfg. Co., Inc., N.J., 1, 7
Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill., 7
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Manhattan Research Laboratories, N.Y., 7
Marco Industries Co., Calif., 1
Marion Elect. Inst. Co., 408 Canal St., Manchester, N.H., 3
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Metals & Controls Corp., Mass., 6
Metaplast Process, Inc., N.Y., 2
Methode Mfg. Corp., Ill., 5, 6
Mica Insulator Co., N.Y., 6
Minute Man Products, Inc., N.Y., 6
Molded Insulation Co., Pa., 1, 2, 5, 6
Multi-Metal Wire Cloth Co., Inc., N.Y., 1, 4, 6, 7
N. R. K. Mfg. & Engineering Co., Ill., 1, 7
National Electronics Labs., Inc., D.C., 1, 2, 4, 6
National Res. Corp., Vacuum Eng. Div., Mass., 7
Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J., 2, 3, 5
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Panelyte Div., St. Regis Sales Corp., N.Y., 5, 6
Park Armature Co., Mass., 1, 7
Paul & Beekman, Inc., Pa., 6
Peerless Products Industries, 812-16 N. Pulaski Rd., Chicago 51, Ill., 1, 6
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Petroff, Peter A., N.Y., 1
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Plessey International Ltd., England, 1, 2, 6
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Penn Machine & Cutting Co., Mass., 6
Porter Mfg. Co., Ill., 1
Ports Mfg. Co., Calif., 6, 7
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y., 1
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Precision Metal Products Co., Mass., 6
Presto Electric Co., Inc., N.J., 6
Printloid, Inc., N.Y., 6
Quality Components, Inc., Pa., 5
Radio Engineering Labs., Inc., N.Y., 1
Rapid Electroplating Process, Inc., Ill., 2
Regulator Equipment Corp., N.Y., 1
Resistoflex Corp., Belleville, 9, N.J., 5
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Rogan Brothers, 250 Irving Park Blvd., Chicago 18, Ill., 7
For details see ad on page 135
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Self Winding Clock Co., Inc., N.Y., 1
Sierra Electronic Corp., Calif., 1
Sievering, Inc., Philip, N.Y., 2
Southwest Technical Lab., N.Mex., 7
Special Products Co., Md., 1
Spincraft, Inc., Wis., 4
Square Root Mfg. Corp., N.Y., 1, 5, 6
Standard Coil Products Co., Inc., 2329 North Pulaski Rd., Chicago 39, Ill., 1
For details see ad on page 36

(Continued on page 117)

HEPPNER for Precision Parts . . .

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Facilities and "KNOW HOW" for Prime and Sub-Contracts.

Our own tool shop—presses, winding equipment, vacuum impregnation, welding, silver plating.

Present Civilian Products—Ion Traps—Radio Loud Speakers—PM Focusing Devices—Centering Devices for Electrostatic Tubes—Horizontal Output Transformers.

Present Military Products—Machine Gun Heaters—Shock Mounts—Cord Assemblies—Coils.

For further information call or write:

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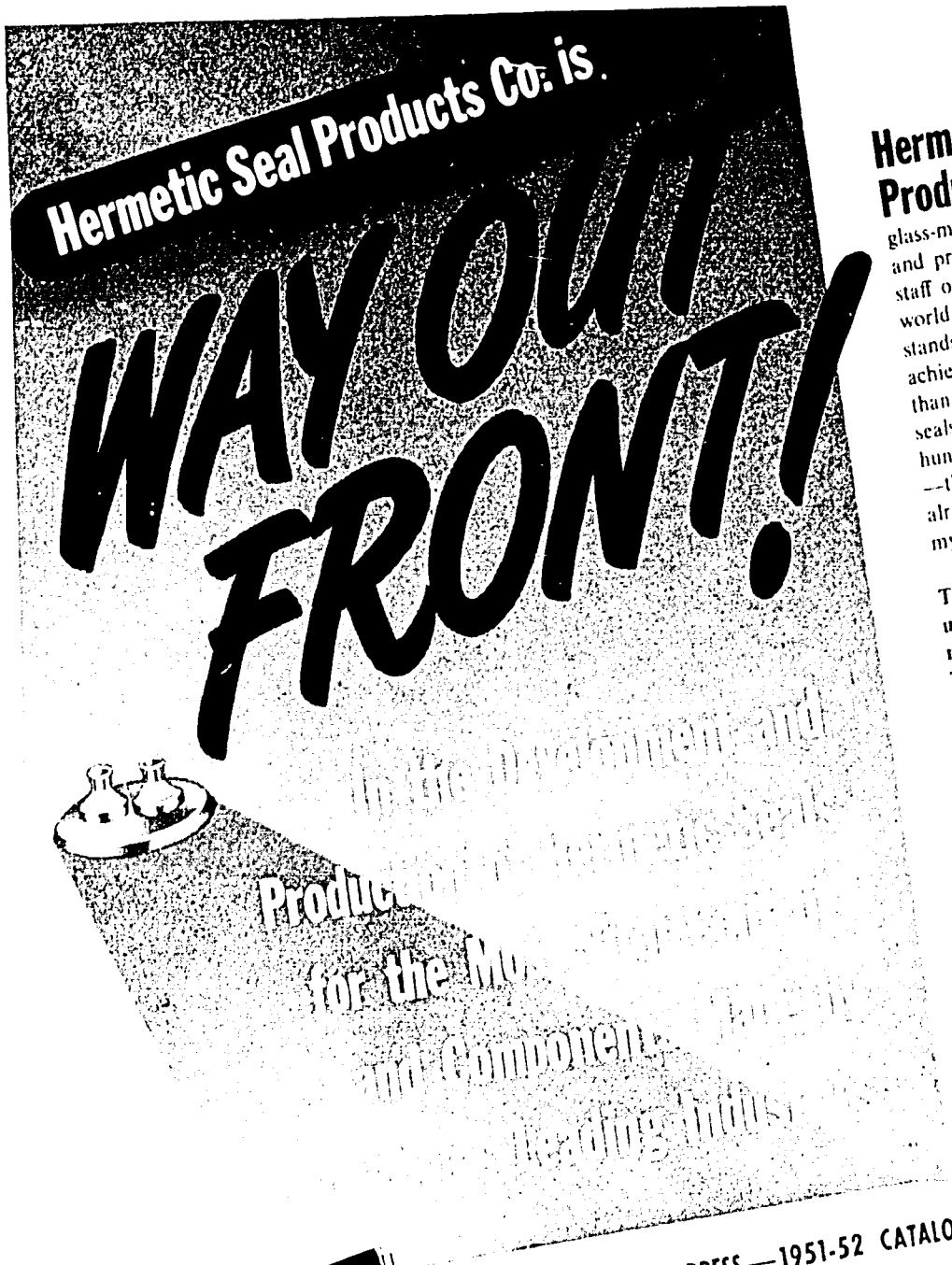

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makes only glass-metal headers—created and produced by the largest staff of specialist-engineers in the world. This company truly stands alone in its remarkable achievements in smaller-than-small miniature plugs and seals. Its line embraces literally hundreds of new practical designs —thoroughly field tested and already in production for myriad applications.

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Important!

Terminals and Headers are available in RMA Color Code.

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Invaluable information on miniatures and hundreds of exclusive new developments in hermetic seals have been incorporated into a greatly needed NEW catalog. This book features many illustrations and complete technical data to make it easy for you to determine the right glass-metal header for the components you are planning. This book is available to you without cost. Write for your FREE copy today.

Remember, too, that Hermetic Seal Products' staff of specialist-engineers is waiting to help you with your problems in this ever-expanding field.

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Fabricators

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Dedicated to Quality Output and Golden Rule Service

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STARTLINGLY SMALL
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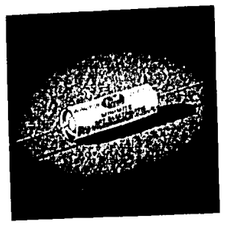
"METALITE"

METALLIZED PAPER CAPACITORS

DRY ELECTROLYTICS



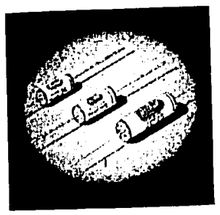
"MINIMITE" Type MM Metal Tubular

For under-chassis and other "limited space" mounting. Multiple paper spacers assure adequate voltage breakdown; riveted cathode tab; hermetically sealed; low leakage, withstand high surge voltage.

Type EY Twist Prong

Hermetically sealed in seamless aluminum cans, single and multiple, for operation at ambient temp. up to 85°C Terminal coding clearly stamped. Electrically welded terminal tabs.

MOLDED PAPER TUBULARS



Rugged—high temp.—humidity proof—heat resistant. Perfectly sealed to meet extreme field conditions, will not cold-flow at 100°C. For TV, radio and other electronic applications.

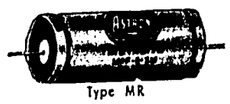
OIL-FILLED BATHTUB

Type ADM Capacitor, non-inductively wound, mineral oil impregnated and filled. Hermetically sealed in metal cans, solder lugs side, top, bottom or ends.

Also type ADH, wax-impregnated and filled.

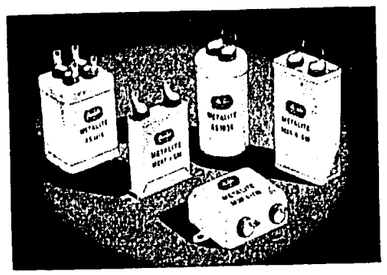
Type ML

Type MQ



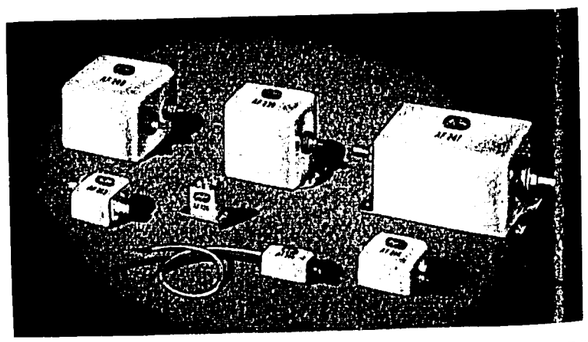
Type MR

We have concentrated in research and development here, until the very term "METALLIZED" is almost synonymous with the name ASTRON. Whether in Cardboard Tubulars . . . in Metal Encased Tubulars, or in special designs engineered to your particular requirements . . . "METALITE" represents supreme ECONOMY and EFFICIENCY in miniature capacitors.



Type MD, MX and other standard and special "METALITES" available in wide range of ratings, multiple as well as single. Special case styles if you wish.

INTERFERENCE FILTERS



Applying the sensationally economical, space-saving "METALITE" capacitors with a success that has made these Filters MUST with leading mfrs. of aircraft, aircraft-electronic and electrical equipment, and all types of electrical systems and apparatus where noise suppression is a vexing problem. We are equipped to design just the Filter for YOU.

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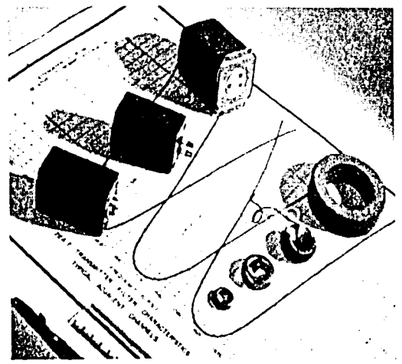
TOROIDS & FILTERS

Toroidal Powder Iron Cores in a wide variety of types and sizes for use over a broad range of frequencies.

Wound Toroidal Coils available with taps and multiple windings; cased or uncased according to your specifications.

Electric-Wave Filters of low-pass, high-pass, band-pass and band-rejection types. Response characteristics and housings to your specifications. Hermetically-sealed units illustrated.



Let Lenkurt help with your special core and coil problems; write:

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Your SINGLE Source of Supply For Radio and Television Parts and Accessories...

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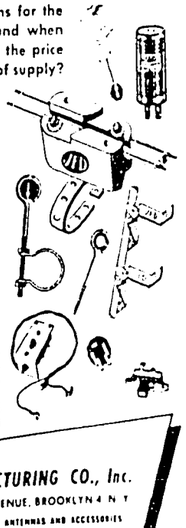

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FIRST IN TELEVISION ANTENNAS AND ACCESSORIES

"The Exclusiveness" Of JFD Is The Quality Of Its Products"

(Continued from page 117)

27. Filters.

1 Band Pass & Band Rejection. 2 Dividing Networks. 3 Noise Elimination.

Acme Electronics, Calif., 1, 2

Aero Transformer & Mfg. Corp., N.Y., 1, 2, 3

Advance Electronics Co., N.J., 1, 2

Aero Coil, Inc., N.J., 1

Aerovox Corp., 740 Belleville Ave., New Bedford, Mass., 3

For details see ad on page 72

Airmec Labs. Ltd., England, 1

Ajax Condenser Co., Ill., 3

Arlington Electric Prods., Inc., N.Y., 1, 2

Arrow Radio Co., Canada, 3

Astron Corp., 255 Grant Ave., E. Newark, N.J., 3

For details see ad on page 118

Atlantic Electronics Corp., 4A Manhasset Ave., Port Washington, L.I., N.Y., 1

For details see ad on page 88

Audio Development Co., Minn., 1

Barker & Williamson, Inc., 237 Fairfield Ave., PR-751, Upper Darby, Pa., 1-3

See complete catalog filed alphabetically in last section

Bendix Avi. Corp. Scintilla-Magneto Div., Sherman Ave., Sidney, N.Y., 3

Bra[illegible] Mfg. Corp., N.J., 1, 3

Bro[illegible] Electronics Lab., N.Y., 2

Bruel [illegible] & Kjaer, Denmark, 1

Burnell & Co., 45 Warburton Ave., Yonkers, N.Y., 1, 2, 3

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Central Transformer Co., Ill., 1

Centronics Co., 41-05 Lawrence St., Flushing 55, N.Y. 1

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Cole Instrument Co., Calif., 1, 3

Communication Accessories Co., Mo., 1, 2, 3

Continental Electronics Ltd., N.Y., 1

Control Corp., Minn., 1

Cornell-Dubilier Elec. Corp., 1000 Hamilton Blvd., South Plainfield, N.J., 3

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DeCoursey Engineering Labs., Calif., 1, 2, 3

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Dietz Design & Mfg. Co., Grandview, Mo., 1

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Electronic Systems Co., N.Y.

Electronic Transformer Co., Inc., N.Y., 1, 2

Electronics of Staten Island, N.Y., 2

Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y., 1

For details see ad on page 87

Empire Devices, Inc., 38-25 Bell Blvd., Bayside, L.I., N.Y., 3

For details see ad on page 108

Federal Electric Mfg. Co., Ltd., Canada, 1, 2

(Continued on page 121)

When It's A Fuse You Need . . . think first of BUSS

For Television . . . Radio
Radar . . . Instruments
Controls . . . Avionics

It's easy to select a BUSS fuse to do the job right for BUSS makes a complete line of fuses and behind each BUSS fuse is the world's largest fuse research laboratory and fuse production capacity. That's why the BUSS trademark has for 37 years stood for fuses of unquestioned quality that can be depended upon to protect but not to blow needlessly.

Every BUSS Fuse Electronically Tested

Each individual BUSS fuse is tested in a highly sensitive electronic device that records if the fuse is calibrated correctly, if the solder joints are properly made, if the mechanical dimensions of the fuse are right, and if the fuse can be depended upon to operate properly under all service conditions.

BUSS Fuses are made to protect . . . not to blow.

SPECIAL FUSES, FUSE CLIPS, FUSE BLOCKS AND FUSE HOLDERS

Sometimes a special fuse or fuse mounting is required. In such cases we welcome your requests either to quote — or to help in designing or selecting the special type of fuse or fuse mounting best suited to your particular conditions.

Submit description or sketch, showing type of fuse to be used, number of circuits, type of terminal, etc. If your protection problem is still in the engineering state, tell us current, voltage, load characteristics, etc.

At any time our staff of fuse engineers is at your service to help solve your problems in electrical protection.

USE THIS COUPON — *Get All The Facts*

Bussmann Mfg. Co., University at Jefferson
St. Louis 7, Mo. (Division McGraw Electric Co.)

Please send me Bulletin SFB containing complete facts on BUSS Small Dimension Fuses and Fuse Holders.

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Title _____
Company _____
Address _____
City _____ State _____

IRE 5

Filters

(Continued from page 119)

Federal Telephone & Radio Corp., Selenium & Intelin Div., 100 Kingsland Rd., Box 7104, Clifton, N.J., 1
For details see ad on page 232-3
Ferranti Electric, Inc., N.Y., 1
Filtron Co., Inc., The, N.Y., 1, 3
Freed Transformer Co., Inc., 1718-36 Weirfield St., Dept. D1, Brooklyn 27, N.Y., 1-3
For details see ad on page 14
General Elec. Co., Electronics Dept., N.Y., 1
General Lab. Associates, Inc., N.Y., 1, 3
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 1
For details see ad on pages 236-7, Back Cover
Geotechnical Corp., Texas, 1
Gertsch Products, Inc., Calif., 1
Gulton Mfg. Corp., N.J., 1
Hallett Manufacturing Co., Calif., 3
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 1
For details see ad on page 87
Hycor Co., The, Calif., 1
Inductance Corp., Ill., 1
Industrial Condenser Corp., Ill., 3
Insuline Corp. of America, N.Y., 3
JFD Manufacturing Co., Inc., 6154 16 Ave., Brooklyn 4, N.Y., 3
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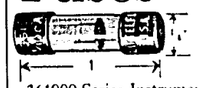
Kalbfell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif., 1
For details see ad on page 87
Kellogg Switchboard & Supply Co., Ill., 1
Klipsch & Associates, Ark., 2
Krohn-Hite Inst. Co., Mass., 1
K-V Transformer Corp., N.Y., 1
LaPointe-Plascomold Corp., Conn., 2
Lenkurt Electric Co., Inc., 1129 County Rd., San Carlos, Calif., 1
For details see ad on page 91, 119
Linell Eng. Corp., Charles S., Ill., 1
Loral Electronics Corp., N.Y., 1
Magnatron, Inc., N.J., 1, 3
Maryland Electronic Mfg. Corp., Md., 1
Microlab, N.J., 2
Miller Co., J. W., Calif., 1, 3
Minnesota Electronics Corp., The, Minn., 1
Mullard Electronic Prods., Ltd., England, 1
National Electronics Labs., Inc., D.C., 3
Neptune Electronics Co., N.Y., 1
Newcomb Audio Products Co., Calif., 3
Northern Radio Co., Inc., 143 W. 22 St., New York 11, N.Y. 1
For details see ad on page 248-9
Palmer, Inc., M. V., Wash., 1
Patterson-Moos & Co., Inc., N.Y., 1
Potter Co., The, Ill., 2, 3
Presto Electric Co., Inc., N.J., 1, 2, 3
Professional Electronics Co., Calif., 1, 2
Pyramid Electric Co., N.J., 3
RK Manufacturing Co., Ill., 1
RCA Eng. Prod. Div., Camden, N.J., 1, 2, 3
Radio Engineering Products Ltd., Canada, 1, 2
Radio-Music Corp., N.Y., 1, 2
Radio (1936) Ltd., New Zealand, 1, 3
Raypar, Inc., 7800 W. Addison St., Chicago 34, Ill., 3
For details see ad on page 207
Rich Electronics, Inc., Fla., 2, 4
Rogers Majestic, Ltd., Canada, 1

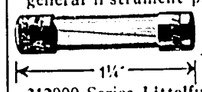
Chicago 40
LITTELFUSE

Precision Engineered Fuses



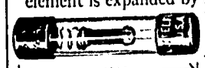
8 AG

361000 Series Instrument **Littelfuses**—You can rely on the efficiency and high speed action of these fuses—always "quicker than a short circuit". Designed for high-speed action. For the protection of delicate electrical equipment—microammeters, galvanometers, milliammeters, wattmeters, radio "B" circuits, thermocouples, voltmeters, test equipment, telephone systems, small rectifier and power tubes, railway signal meters, set analyzers, therapeutic machines and general instrument protection.



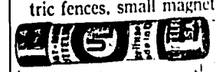
3 AG

312000 Series **Littelfuses**—Quick-acting fuses—for low time-lag applications. Protective-coated elements, on fuses to 3 amperes, prevent oxidation and promote clean break on fusion. Diagonal element alignment of this fuse assures accurate alignment and calibration, even when the fuse element is expanded by heat.



3 AG

313000 Series **Littelfuses**—**Slo-Blo** fuses with high time-lag to withstand heavy surges—quick on shorts. Designed for circuits with equipment having high inductive or capacitative surges, such as magnets, solenoids, etc., and for circuits with heavy starting currents, such as motors and lamp circuits. Anti-fatigue construction (compound element, with spring and resistor) makes these fuses ideal for intermittent-duty circuits on vibrators, control circuits, hi-tension electric fences, small magnets, coils, etc.



3 AB

314000 Series **Littelfuses**—The smallest Underwriters' Laboratory approved fuses in ratings this high. Steatite enclosed, arc-quenching, powder filled fuses. Shatter-proofed against quick shorts. Medium time lag. Recommended for use with amplifiers, rectifiers, battery charging equipment, small generators, control panels, amusement devices, communication and electronic equipment, radios, signal apparatus, small motor circuits, etc.

Also, S.F.E., 4 AG, 4 AB, 5 AG, 5 AB Fuses, Fuse Extractor Posts, Fuse Mountings, Fuse Retainers, Fusible Binding Posts.

Filters

Rollin Co., The, Calif., 1
Scott, Inc., Hermon Hosmer, Mass., 3
Sickles Co., The F. W., Mass., 1
Southern Elec. & Transmission Co., Texas, 1
Spencer-Kennedy Labs., Inc., 181 Massachusetts Ave., Cambridge 39, Mass., 1, 2
For details see ad on page 39
Sprague Electric Co., Mass., 3
Square Root Mfg. Corp., N.Y., 1, 3
Standard Electrical Prods. Co., Ohio, 3
Standard Transformer Corp., Ill., 1
Stephens Mfg. Corp., Calif., 2
Super Electric Products Corp., N.J., 1, 2, 3
Tartak-Stolle Electronics, Inc., Calif., 1
Technical Appliance Corp., N.Y., 2
Tetrad Co., Inc., Calif., 1, 2, 3
Thordarson Elec. Mfg. Div., Ill., 1
Torocoil Co., Mo., 1
Transelectric Mfg. Co., Pa., 2
United States Electronics Corp., N.J., 1, 2, 3
U. S. Recording Co., D.C., 1, 2
United Transformer Co., 150 Varick St., New York 13, N.Y., 1, 2, 3
For details see ad on page 256
University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N.Y., 2
For details see ad on page 139
Vectron, Inc., Mass., 1
Vertex Corp., N.Y., 3
Vitavox Ltd., England, 2
Vokar Corp., Mich., 1, 2, 3
West Coast Electronics Co., Calif., 1, 3
Westinghouse Electric Corp., Pa., 1
Yonkers Industries, Inc., N.Y., 1, 3

Filters, Sound effects, see: 24 subhead 2

Frequency Measuring Equip., see: 43, 66, 69

28. Fuses & Fuse Holders.

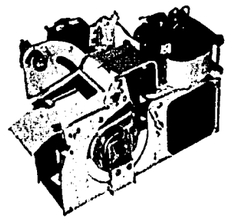
Bel Fuse, Inc., N.J.,
Bussmann Mfg. Co., University at Jefferson, St. Louis, Mo.
For details see ad on page 120
Cinch Mfg. Corp., Ill.
Eagle Electric Mfg. Co., Inc., N.Y.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
For details see ad on page 125
Federal Electric Products Co., N.J.
General Cement Mfg. Co., Ill.
General Electric Co., N.Y.
Industrial Devices, Inc., N.J.
Insuline Corp. of America, N.Y.
Johnson & Hoffman Mfg. Co., 65 Ongley St., Rockville Centre, L.I., N.Y.
For details see ad on page 242-3
Jones Div. Howard B., Cinch Mfg. Corp., Ill.
Littelfuse, Inc., 4757 N. Ravenswood Ave., Chicago 40, Ill.
For details see ad on page 121
Multi Electrical Mfg. Co., Ill.
National Electronic Mfg. Co., N.Y.
Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J.
For details see ad on page 156
Smith, Inc., Herman H., 436 18th St., Brooklyn 15, N.Y.
See complete catalog filed alphabetically in last section

(Continued on page 122)

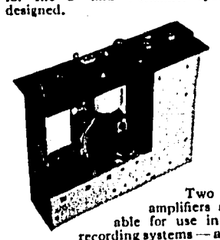
SANBORN

RECORDING SYSTEMS

RECORDERS AND AMPLIFIERS AVAILABLE SEPARATELY



In all Sanborn recorders, tracings are produced by a heated writing stylus in contact with heat sensitive, plastic-coated paper. The paper is pulled over a sharp edge in the paper drive mechanism, and the stylus wipes along this edge as it swings; thus producing records in true rectangular coordinates. The writing arm is driven by a D'Arsonval moving coil galvanometer with extremely high torque movement (200,000 dyne cm/cm deflection). Standard paper speed for the Model 51-600 recorder assembly, shown above, is 25 mm/sec. Slower speeds are available. Paper width 6 cm with 5 cm recording area. The assembly shown above is used in Models 128 and 141 (described above right) and provides the basic principles and methods on which recorders for the 2- and 4-channel systems are designed.

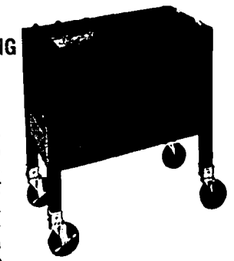


Two types of amplifiers are available for use in Sanborn recording systems — a DC General Purpose Amplifier, and a Strain Gage amplifier (shown above). The amplifiers used in the 2- and 4-channel systems are generally identical with those in the 1-channel system, which are available, as are also all the recorders, for separate application.

1 CHANNEL RECORDING SYSTEMS

Model 128 comprises a DC General Purpose Amplifier in combination with the Recorder Assembly shown below left, to which is added panel, transformer, and controls. Both instruments are contained in a single hardwood carrying case. The complete system is a vacuum tube recording voltmeter capable of reproducing in rectangular coordinates any electrical phenomena from the order of a few millivolts to more than 200 volts. When a Strain Gage Amplifier is specified, the system becomes Model 141. Amplifiers are readily interchangeable. When a built-in timer is included for either, the Model numbers become 128T or 141T.

2 CHANNEL RECORDING SYSTEMS



The two channels of **Model 60** operate independently of each other, but record simultaneously. Ten paper speeds are standard equipment, in pairs of: 5 and 0.5, 10 and 1, 25 and 2.5, 50 and 5, 100 and 10 mm/sec. Ready interchangeability of amplifiers (DC and Strain Gage) and preamplifiers (DC and AC) makes possible the availability of a variety of input circuits. Timing and coding are built-in features. Each channel has a 5 cm recording width.

4 CHANNEL RECORDING SYSTEMS

Model 67 provides for the direct, simultaneous registration of up to four phenomena on one record, using the same principles and methods as the two systems described above. In addition, there is a selection of eight paper speeds: 50, 25, 10, 5, 2.5, 1.0, 0.5, and 0.25 mm/sec., and provision for the use of 4-, 2-, or 1-channel recording Permapaper. As in Model 60, above, amplifiers and preamplifiers are readily interchangeable.

For complete descriptions, illustrations, tables of constants, and prices, write for catalog.

INDUSTRIAL DIVISION

Sanborn Company

CAMBRIDGE 39 MASSACHUSETTS

Fuses and Fuse Holders

(Continued from page 121)

Smith & Stone Limited, Canada
Star Fuse Co., Inc., N.Y.
Titeflex, Inc., 499 Frelinghuysen Ave., Newark 5, N.J.
For details see ad on page 216
Woodwelding, Inc., Calif.

Geiger-Mueller Tubes, see: 72 Sub-head 2

Generators, see: 44 sub-head 3

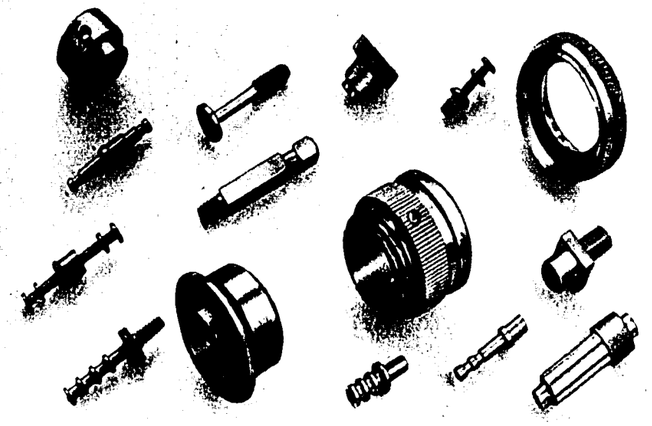
Getters, see: 73 sub-head 7

29. Graphic Recorders.

1—Industrial. 2—Medical.

Aero Electronics Co., Ill., 1, 2
Airborne Instruments Lab., Inc., N.Y., 1
Alfax Paper & Engineering Co., Mass., 1
The Antenna Research Lab., Inc., Ohio, 1
Associated Research, Inc., Ill., 2
Audio Instrument Co., N.Y., 1
Audio-Tone Oscillator Co., Conn., 1
Automatic Temp. Control Co., Inc., Pa., 1
Bendix Avia. Corp., Friez Instr. Div., 1400 Taylor Ave., Baltimore 4, Md.
Bludworth Marine Div., Nat'l. Simplex, N.Y., 1
Boehme, Inc., H. O., N.Y., 1
Bristol Co., The., Conn., 1
Bruel, A/S, & Kjaer, Denmark, 1
Brush Development Co., Ohio, 1, 2
Bunnell & Co., J. H., N.Y., 1
Cambridge Instrument Co., N.Y., 2
Edin Co., Inc., Mass., 1, 2
Electro-Medical Lab., Inc., Mass., 2
Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J., 1
For details see ad on page 170
Fielden Instrument Corp., Pa., 1
Flader, Inc., Frederick, Ohio, 1
General Electric Co., N.Y., 1
General Instruments, Inc., Texas, 1
Geotechnical Corp., Texas, 1, 2
Glens Falls Laboratory, Inc., N.Y., 1
Gorrell & Gorrell, N.J., 1
Grass Instrument Co., Mass., 2
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 1, 2
For details see ad on page 87
Korb Engineering & Mfg. Co., Mich., 1
Manufacturers Research Corp., Md., 1, 2
Marconi Instruments Ltd., N.Y., 1, 2
Melody Master Mfg. Co., Ill., 2
Minneapolis-Honeywell Reg. Co., Minn., 1
Offner Electronics, Inc., Ill., 1
Photron Instrument Co., Ohio, 2
Pickard and Burns, Inc., Mass., 1
Pioneer Elec. & Research Corp., 7213 Circle Ave., Forest Park, Ill., 1
For details see ad on page 117
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y., 1
For details see ad on page 141
Professional Electronics Co., Calif., 2
Radiation Counter Labs., Ill., 2
R-C Scientific Instr. Co., Calif., 2
Rahm Instruments, Inc., N.Y., 1, 2

(Continued on page 123)



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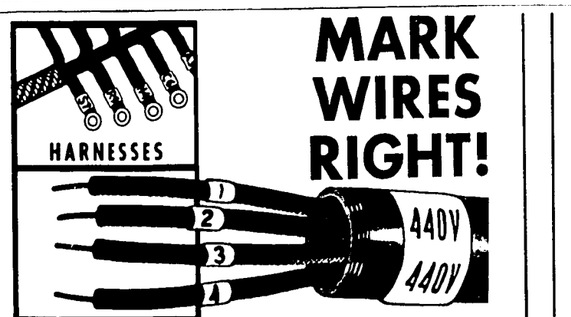

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Graphic Recorders

(Continued from page 122)

Sanborn Co., Industrial Div., 39 Osborn St., Cambridge 39, Mass., 1, 2
For details see ad on page 122
Servo-Tek Products Co., Inc., N.J., 1
Sound Apparatus Co., N.J., 1
Streeter-Amet Co., Ill., 1
Wheelco Instruments Co., Ill., 1

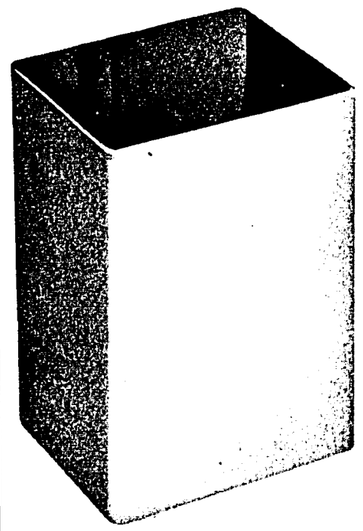
30. Hardware & Manufacturing Aids.

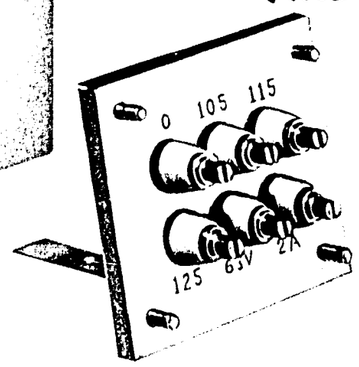
1—Adhesive Labels.
2—Bushings.
3—Cans.
4—Dials.
5—Gaskets.
6—Gromets.
7—Knobs.
8—Metal Bolts, Nuts, Rivets, Screws, Studs.
9—Terminals.
10—Other.
11—Vibration Mountings

Abalon Precision Mfg. Corp., N.Y., 2, 3
Accurate Paper Tube Co., Ill., 10
Acro Tool & Die Works, Ill.
Aeromark Co., The, N.J., 4
Aerolite Electr. Hardware Corp., N.J., 2, 6, 8, 9
Aeronautical Elec. & Mfg. Co., 5103 W. Lawrence Ave., Chicago 30, Ill., 9
For details see ad on page 185
Aircraft-Marine Products, Inc., Pa., 9
Akron Rubber Co., N.Y., 5, 6
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 7, 8, 9
For details see ad on page 114
American Brass Co., The., Dept. WBG, Waterbury 20, Conn., 9
For details see ad on page 112
American Brass Co., 25 Broadway, New York 4, N.Y., 9
American Hinge Co., 206 Wallabout St., Brooklyn 6, N.Y., 8
For details see ad on page 123
American Laubscher Corp., N.Y., 4, 8
American Screw Co., Conn., 8
Armstrong Cork Co., Pa., 5
Associated Eng'ng. Corp. of Boston, Mass., 10
Aymond Sales Co., Texas, 7
Baer Co., N. S., N.J., 5, 10
Barreca Products Co., Inc., N.Y., 9
Barry Corp., The, 718 Pleasant St., Watertown 72, Mass., 11
For details see ad on page 126
Bead Chain Mfg. Co., 11 Mountain Grove St., Bridgeport 5, Conn., 10
For details see ad on page 214
Belock Instrument Corp., N.Y., 4, 10
Berkshire Labs., Mass., 3, 9
Birtcher Corp., The, Calif., 10
Blaco Mfg. Co., Ohio, 10
Borg Corp., George W., Borg Equip. Div., Delevan, Wis., 4
For details see ad on page 181
Bowen & Co., Inc., Md., 9
Brady Co., W. H., 1613 E. Spring St., Chippewa Falls, Wis., 1, 5
For details see ad on page 123
Buchanan Electrical Products Corp., 225 Highway 29, Hillside, N.J., 2, 9, 10
For details see ad on page 141
Cambridge Thermionic Corp., Mass., 2, 9
Camloc Fastener Corp., N.Y., 10
Canadian General Elec. Co., Ltd., Canada, 7
Cathodeon Ltd., Meadowcraft Labs., England, 9
Chase Brass & Copper Co., Conn., 6, 8
Chicago Die Mold Mfg. Corp., Ill., 7
Chicago Rivet & Machine Co., Ill., 8

(Continued on page 125)

HELDOR
MIL-T-27 CANS
ARE STOCK ITEMS-





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Philadelphia, Pa.

Hardware & Manufacturing Aids

(Continued from page 123)

Chicopee Mfg. Corp. of Ga., N.Y., 10
Cinch Mfg. Corp., Ill., 6, 9, 10
Cincinnati Electronics Co., Ohio, 9
Citation Products Co., N.Y., 2, 3, 5, 7, 8, 9
Clarkstan Corp., Calif., 7
Cole Instrument Co., Calif., 9
Continental Screw Co., Mass., 8
Craft Manufacturing Co., Ill., 3
Creative Plastics Corp., N.Y., 2, 6
Daven Co., The, N.J., 4, 7
Delco Radio Div., of General Motors, Ind., 7, 8
Dietz Design & Mfg. Co., Grandview, Mo., 3
For details see ad on page 81
Dimco-Gray Corp., Ohio
Donnelly Mfg. Div., Donnelly & Sons, Mass., 3
Dzus Fastener Co., Inc., N.Y., 10
Eastern Specialty Co., Inc., Pa., 8, 9
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa., 7, 9, 10
For details see ad on page 125
Electrical Industries, Inc., 44 Summer Ave., Newark 4, N.J., 9—Sealed Leads and Multiple Headers
For details see ad on page 184
Electro Tec. Corp., 4 Romanelli Ave., S. Hackensack, N.J., 10
For details see ad on page 125
Electronic Mechanics, Inc., 68 Clifton Blvd., Clifton, N.J., 5
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Erie Resistor Corp., Erie, Pa., 4, 7, 9
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Eveready Label Corp., N.J., 1
Federal Screw Products, Inc., Ill., 2, 6-10
Felt Products Mfg. Co., Ill., 5, 6
Fidelity Chemical Prods. Corp., N.J., 10
Fusite Corp., Ohio, 9
Gadgets, Inc., Ohio, 2, 8
Gee-Lar Manufacturing, Ill., 7
General Cement Mfg. Co., Ill., 2, 6-10
General Industries Co., Ohio, 7
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 4, 7
For details see ad on pages 236-7, Back Cover
Gombos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 9, 10
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Grammes & Sons, Inc., L. F., Pa., 4
Grant Pulley & Hardware Co., N.Y., 10
Graphite Metallizing Corp., 1057 Nepperhan Ave., Yonkers 3, N.Y., 2, 10
For details see ad on page 129
Greenlee Tool Co., Ill., 10
Gries Reproducer Corp., N.Y., 8
Harnett Elec. Corp., 138 Haven Ave., Port Washington, L.I., N.Y., 2
For details see ad on page 83
Harper Co., The, H. M., Ill., 8
Hawley Products Co., 333-339 N. 6 St., St. Charles, Ill., 10
For details see ad on page 138
Heldor Mfg. Co., Div., Heldor Bushing & Terminal Co., Inc., 225 Bloomfield Ave., Dept. P, Bloomfield, N.J., 2, 3, 8, 9
For details see ad on page 124
(Continued on page 127)

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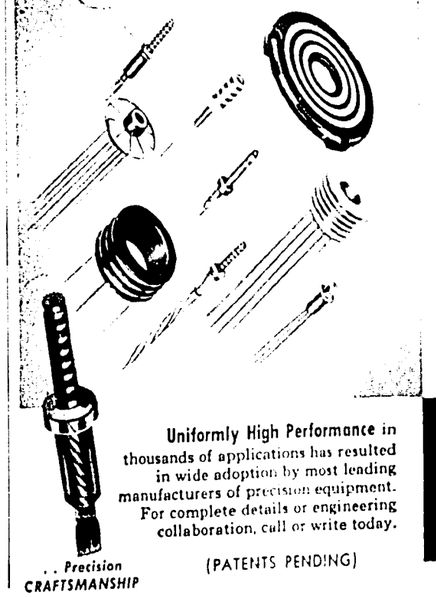
SLIP RING ASSEMBLIES & COMMUTATORS
for GYROS, COMPUTERS RESOLVERS, MOTORS, SELSYNS, INSTRUMENTS



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(PATENTS PENDING)

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SHOCK and VIBRATION NEWS

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for Miniaturized Airborne Equipment

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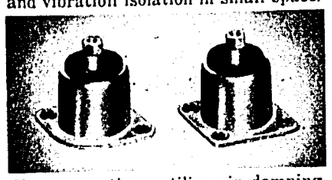
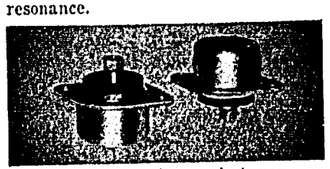
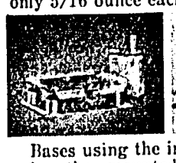
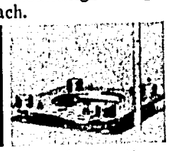


These mountings utilize air damping to minimize shock of aircraft landing and taxiing and to limit excursion so there is no snubber contact, even at resonance.



Upright and inverted types are available for two-hole or four-hole mounting. Unit mountings are one inch in diameter and 1-1/32 inches high under maximum rated load. Load ratings are 0.1 to 3.0 pounds per mount. The mountings weigh only 5/16 ounce each.





Bases using the inverted mountings raise the mounted equipment only 1/2 inch. Either upright or inverted unit mountings can be furnished on bases that conform to your specifications, load-ratings, and dimensions.

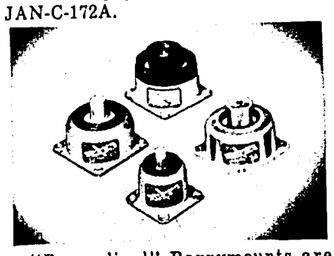
FREE CATALOGS

- 611 — "Ruggedized" Barrymounts and mounting bases tested to meet AN-E-19 shock-test requirements for equipment sizes listed in JAN-C-172A.
- 605-606 — Miniaturized air-damped Barrymounts for use with airborne equipment.

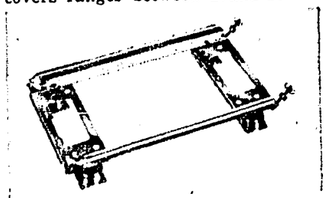
"RUGGEDIZED" BARRYMOUNTS AND MOUNTING BASES

Now Available to Meet Shock Requirements of AN-E-19

Barry vibration isolators and mounting bases are now available in "ruggedized" construction, to withstand the severe shocks of arrested landings in aircraft carrier service and of crash landings. These units are tested to meet the shock-test requirements of Specification AN-E-19, for the equipment sizes listed in JAN-C-172A.



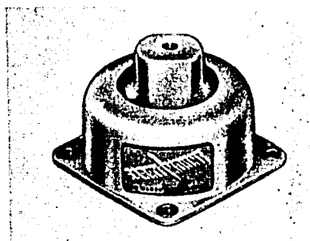
"Ruggedized" Barrymounts are available in both the air-damped type and the ALL-METL type. Air-damped Type 770R covers load ranges between ¼ lb. and 9 lbs. Air-damped Type 780R covers load ranges between 4 lbs. and 35 lbs. ALL-METL Type 6600R covers load ranges between 4 lbs. and 35 lbs. Type M-112R covers ranges between 2. and 10 lbs.



"Ruggedized" mounting bases, equipped with Barrymounts of the above types, are available in standard JAN sizes (JAN-C-172A) and in special sizes to meet customers' requirements. A conspicuous advantage of these "ruggedized" Barry bases is the gain in strength of the base framework itself — beyond JAN requirements — achieved with very little increase in weight for loads up to 60 lbs. by design modification of standard JAN bases. For greater loads, the "ruggedized" Barry bases are of stainless steel instead of aluminum. Write for data sheet.

NEW ALL-METL BARRYMOUNTS

for Unusual Airborne Applications



These new Barrymounts provide the aircraft and electronic engineer with a vibration isolator designed to meet the unusual temperature and environmental conditions encountered in high-altitude, high-speed flight. Employing no organic materials, these mountings are not subject to temperature influences that may affect the performance of other mountings.

ALL-METL Barrymounts offer a wide load range with uniform performance. They have a natural frequency of about 7½ cycles per second, with low horizontal stiffness for maximum isolation of horizontal vibration. Transmissibility at resonance is only 4½. There is no snubber contact nor resonance carry-over when ALL-METL Barrymounts are vibrated at government-specified amplitudes.

These mountings are designed especially for unusual military conditions. They meet the vibration requirement of JAN-C-172A, MIL-E-5272 (USAF), and MIL-T-5422 (BuAer). For details of sizes, ranges, and construction of unit mounts and bases using ALL-METL Barrymounts, see catalog 509.

FREE CATALOGS

- 502 – Air-damped Barrymounts for aircraft service; also mounting bases and instrument mountings.
- 509 — ALL-METL Barrymounts and mounting bases for unusual airborne applications.
- 504 — Shock mounts and vibration isolators for marine, mobile, and industrial uses.
- 607 — How to cut maintenance costs by using Barrymounts with punch presses.

THE **BARRY** CORP.

718 PLEASANT ST., WATERTOWN 72, MASSACHUSETTS

SALES REPRESENTATIVES IN

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"MICRO-PROCESSED" I-S BERYLLIUM COPPER SPRINGS

MICRO-PROCESSED BERYLLIUM COPPER SPRINGS

AVAILABLE—from Stock
- Contacting Rings for 2C39 Tubes
- Flea Contacts
- Engineer's Assortment of Compression Springs

AVAILABLE—on Short Notice
- Six different contour designs of grounding strips
- Finger and Slot designs
- High Frequency Contact Rings
- Small Lot and Sample work

AVAILABLE—to your Specifications
- Compression Coil Springs
- Strip Springs
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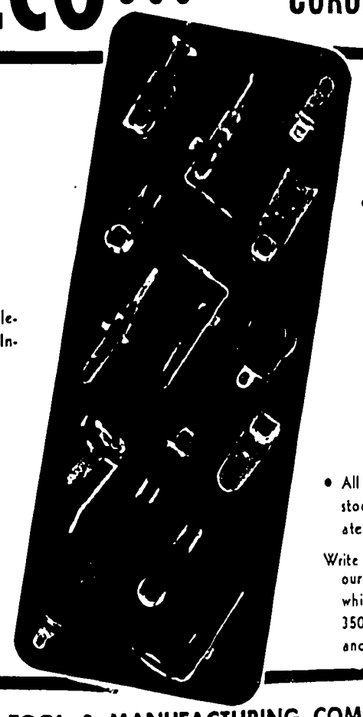
For full information on I-S Micro-Processed Springs—Write today for your free copy of Catalog No. 6—"Micro-Processed Springs of Beryllium Copper."

INSTRUMENT SPECIALTIES COMPANY, INC.

Telephone: Little Falls 4-0280

232 Bergen Blvd., Little Falls, New Jersey

MALCO... LUGS and TERMINALS CORONA RINGS



- Standard to the Television and Radio Industries
- Why not write us about your problems?

Perhaps our engineering department can help you as they have helped others

- Designed and held to very close tolerances to meet individual requirements
- All standard lugs are stocked for immediate shipment

Write for your copy of our parts catalogue which illustrates over 350 Lugs, Terminals, and Brackets

MALCO TOOL & MANUFACTURING COMPANY

4025 West Lake Street Chicago 24, Illinois

Hardware & Mfg. Aids

(Continued from page 125)

Heminway & Bartlett Mfg. Co., 500 Fifth Ave., New York 18, N.Y., 10, Lacing Cord
For details see ad on page 188

Heyman Mfg. Co., 300 Michigan Ave., Kenilworth 7, N.J., 2, 10
For details see ad on page 188

Industrial Precision Products, Ill., 8, 9

Instrument Specialties Co., Inc., 232 Bergen Blvd., Little Falls, N.J., 10, Beryllium Copper Springs, Grounding Strips, Contacting Rings
For details see ad on page 127

Insuline Corp. of America, N.Y., 4, 6, 7, 9

Johnson & Hoffman Mfg. Co., 65 Ongley St., Rockville Centre, L.I., N.Y., 3, 9
For details see ad on page 242-3

Jones Div., Howard B., Cinch Mfg. Corp., Ill., 9

Kaywoff Products Co., Neb., 5, 6, 10

Keystone Electronics Co., N.Y., 9

Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 9
For details see ad on page 85, 130

Korrol Products Corp., N.Y., 3

Lapointe-Plascomold Corp., Conn., 10

Lord Manufacturing Co., 1635 W. 12 St., Erie, Pa., 10, Shock Mounts & Vibration Control
For details see ad on page 52

Lotis Brothers, Calif., 7

Lumley Associates, Mass., 9

Lyscr Labs. Mfg. Co., Inc., N.J., 9

Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill., 9
For details see ad on page 127

Mandex Mfg. Co., Ill., 9, 10

Metal Textile Corp., 653 E. First Ave., Roselle, N.J., 5
For details see ad on page 211

Methode Mfg. Corp., Ill., 9

Micro-Circuits Co., Industrial Coatings Dept., New Buffalo, Mich., 3, 10
For details see ad on page 138

Milford Rivet & Machine Co., Conn., 8

Miller Co., J. W., Calif., 3, 4

Miniature Precision Bearings, Inc., N.H., 10

National Co., Inc., Mass., 2, 7, 9

Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J., 5, 6
For details see ad on page 156

New Hampshire Ball Bearings, Inc., N.H., 10

Palnut Co., The., N.J., 8

Paramount Paper Tube Corp., Ind., 10

Parker-Kalon Corp., N.Y., 8

Patton-MacGuyer Co., R.I., 9

Patent Button Co. of Tennessee, 2006 Century St., Knoxville, Tenn., 7
For details see ad on page 135

Paul & Beekman, Inc., Pa., 3

Peck Spring Co., The., Conn., 10

Pheoll Manufacturing Co., Ill., 8

Pix Mfg. Co., Inc., N.J., 2, 3, 6, 9, 10

Plessey International Ltd., England, 2-4, 8-10

Ponn Machine & Cutting Co., Mass., 5

Precision Metal Products Co., Mass., 9

Rajah Co., The., N.J., 9

Reed & Prince Mfg. Co., Mass., 8

Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N.J., 11, Shock Mounts & Vibration Control
For details see ad on page 128

Rogers Majestic Ltd., Canada, 7

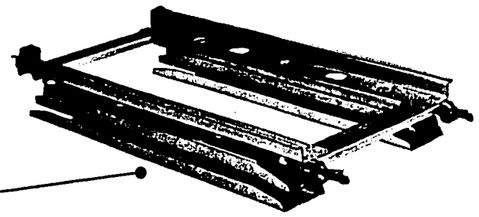
(Continued on page 129)

ROBINSON *engineered mounting systems*

SHOCK MOUNTS and VIBRATION ISOLATORS *With* MET-L-FLEX

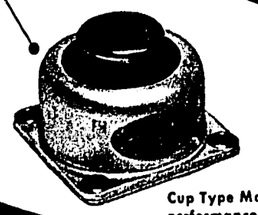
***First** All-Metal All-Weather* **MOUNTING SYSTEMS . . .**

Robinson pioneered, *in 1946,* all-metal, all-weather vibration and shock mounting systems. Built for the electronic and instrument panel installations of today's high performance commercial and military aircraft, more than 50,000 all-metal systems have been delivered. Robinson MET-L-FLEX unit mounts and complete mounting systems meet specifications JAN-C-172A. Mounting systems in JAN form factors and special designs are available—write today for full engineering data.

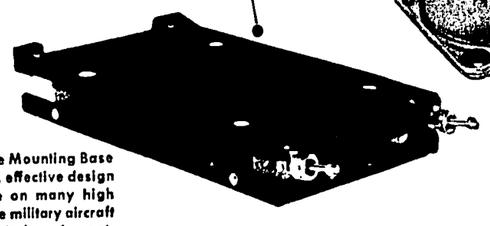


Dual Suspension Mounting Base—provides the ultimate in isolation efficiency. Dual Suspension Mounting Bases are specified for the ART-13, ARC-1, ARC-12 and many other widely known airborne equipments. More than two hundred thousand of these bases have been delivered to the armed services and commercial companies.

Dual Suspension and Single Stage Beam Assemblies—for direct attachment to equipment or mounting trays.



Cup Type Mount, providing performance and balanced equipment protection for sub-base mounting systems.



Single Stage Mounting Base—a rugged, effective design now in use on many high performance military aircraft to protect vital equipment.

ROBINSON AVIATION INC.

TETERBORO, NEW JERSEY

Vibration Control Engineers

GRAPHALLOY TRADE MARK REG. U. S. PAT. OFF.

BRUSH AND CONTACT

Materials for Exacting Applications

The **GRAPHALLOY** family of metal-impregnated graphite brush and contact materials is specially designed for a wide range of applications requiring very low contact drop, very low electrical brush noise level or non-welding contact operation. Made by impregnating metals into solid graphite, they are inherently fitted for high speed, high altitude applications and for low-current circuits. Certain types are valuable for their arc-quenching characteristics in opening inductive circuits.

A few of the more commonly used types are given in the following table:

Material	Typical Current Density* Amperes per Square Inch	Typical Rubbing Speeds Feet per Minute
LOW-METAL GRADES		
Silver GRAPHALLOY	100-150 and higher	5000
Copper GRAPHALLOY	90	3000
Cadmium GRAPHALLOY	75	4000
HIGH-METAL GRADES		
Copper GRAPHALLOY	100-125	3000
Special Copper GRAPHALLOY	150	3000

*Depending on brush size.

Silver GRAPHALLOY, the supreme *brush* material, is widely used in brush applications where low, constant contact drop and low resistance are needed and where a low electrical noise level is imperative. Its high quality results from the use of extremely pure silver for impregnation into the graphite. Adapted for high-altitude brush applications and for low current circuits. It operates best against coin-silver slip rings.

As a non-welding *contact* material, **Silver GRAPHALLOY** is valuable in circuits where a low and constant contact drop are necessary or where contact welding must be prevented.

Copper GRAPHALLOY — This material is widely used as brush material for small and medium sized motors and generators where long brush and commutator life are important.

As a contact, certain types are extensively used for arcing and main contact tips in circuit breakers and contactors.

Cadmium GRAPHALLOY — This material is particularly adapted for commutating or opening circuits which are subject to heavy inductive arcing. The arc quenching characteristics of the Cadmium vapor which is released during arcing make this material very valuable for high duty contactors and for brush applications where wear conditions and arcing are severe.

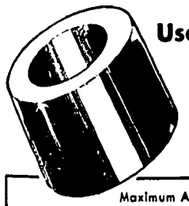
HIGH METAL TYPES

Copper GRAPHALLOY is extensively used for rotary converter slip ring brushes, plating generator brushes and for other applications requiring extremely high current carrying capacity with low or moderate friction.

Special Copper GRAPHALLOY grades have been developed for contacts which are required to carry extremely high operating current without overheating and without sacrificing arc-quenching qualities.

APPLICATION DATA

Upon receipt of a brief description of your contact or brush problem we shall be glad to suggest a suitable design and material. We suggest that you send the current and voltage conditions, proposed rubbing speed, commutator or slip ring width and material. Send for our special brush inquiry sheet which outlines the required information.



Use GRAPHALLOY for OILLESS BUSHINGS

CHARACTERISTICS OF COMMONLY USED GRAPHALLOY GRADES

Material	Maximum Ambient Temperature In Air	Maximum Ambient Temperature In non-oxidizing conditions
Babbitt GRAPHALLOY	300	300
Copper "	700	1700
Bronze "	600	600
Cadmium "	250	550
Silver "	700	1500

Coefficient of friction, .12 to .25, dry; .02 to .13 submerged.

Specify GRAPHALLOY materials which contain *no oil* and *need no oil* for efficient operation dry, submerged in liquids, or at extremely *high* or *low temperatures* where ordinary lubricants would carbonize, congeal or decompose.

Excellent for *current carrying bushings.*

Widely used for pump bushings and vanes, seal rings, stoker and high temperature conveyor bushings.

Ideal for use where ordinary bushing lubricants would contaminate food products.

Send for further information. Or, if you have a specific application, supply us the details of speed, load, shaft material and temperature conditions and we shall be glad to make recommendations or supply test samples.

Call on the accumulated design experience of our engineers for help in solving your problem.

GRAPHITE METALLIZING CORPORATION

1057 NEPPERHAN AVE · YONKERS, NEW YORK

Hardware & Mfg. Aids

(Continued from page 127)

Rohden Mfg. Co., 4739 W. Montrose Ave., Chicago 41, Ill., 7, 9
For details see ad on page 157
Schott Co., Walter L., Calif., 6, 8, 9
Semrow Products Co., Inc., Ill., 10
Shakeproof Incorporated, Ill., 8, 9
Simmons Fastener Corp., N.Y., 7, 8
Smith, Inc., Herman H., 436 18 St, Brooklyn 15, N.Y., 2, 6-10
See complete catalog filed alphabetically in last section
South River Metal Prod. Co., Inc., N.J., 4, 5, 9, 10
Southwest Technical Lab., N.Mex., 4
Standard Pressed Steel Co., Pa., 8
Star Expansion Products Co., 147 Cedar St., New York 6, N.Y., 2, 5, 8, 10
For details see ad on page 143
Staver Co., Inc., The, 91 Pearl St., Brooklyn 1, N.Y., Tube Shields
For details see ad on page 41
Stevens Mfg. Co., Inc., 69 S. Walnut St., Mansfield, Ohio, 10, Thermostats-Bimetal
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Stover Lock Nut & Machinery Corp., Pa., 8
Sun Dial Corp., N.J., 4
Sylvania Electric Products Inc., Dept. R-6351, Emporium, Pa., 4, 7
For details see ad on page 42
Technology Instrument Corp., Mass., 4, 7
Telex, Inc., 26 Neptune Highway, Asbury Pk., N. J., 10
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Tinnerman Products, Inc., Ohio, 8
Topflight Tape Co., Pa., 1, 10
Transicoil Corp., 107 Grand St., New York 13, N.Y., 10, Gear Trains
For details see ad on page 55
Tubular Rivet & Stud Co., Ill., 8
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United Technical Labs., N.J., 10
Vaco Products Co., Ill., 9
Vallorbs Jewel Co., Pa., 8, 9
Vitroseal Corp., The, Ohio, 8, 9
Wadsworth Mfg. Associates, N.Y., 9, 10
Waldes Kohinoor, Inc., N.Y., 10
Walker Co., George, 118 Amsterdam Ave., Passaic, N.J., 2, 10
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Waltham Horological Corp., Mass., 9
Waltham Screw Co., Mass., 8
Western Lithograph Co., Calif., 1, 10
Westfield Metal Products Co., Inc., Mass., 8
Winchester Electronics Co., 15 Crescent St., Glenbrook, Conn., 9
For details see ad on page 84

31. Induction Heating Equipment.

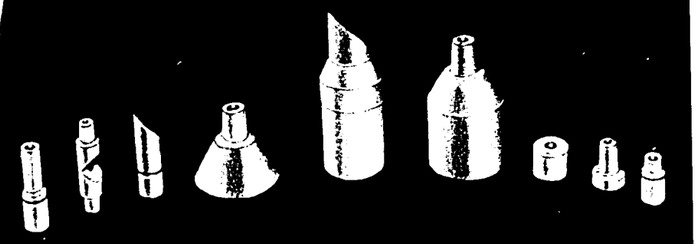
1—Manufacturing Processes. 2—Medical Applications.

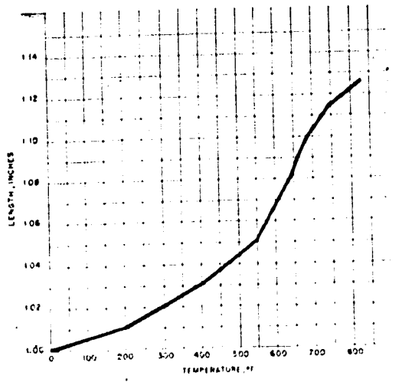
Aero Electronics Co., Ill., 1, 2
Airmec Labs., Ltd., England, 1
Alcah, Inc., R.I., 1
American Radio Co., Inc., N.Y., 1
Birtcher Corp., The, Calif., 2
Brown, Boveri & Co., Ltd., Switzerland, 1
Burdick Corp., The, Wis., 2
Central Rediffusion Services Ltd., England, 1

(Continued on page 131)

KINGS solves your insulation problems with **TEFLON** and **TEXTOLITE**

Production Facilities Available For Manufacture of Insulation Parts To Your Specifications.





LINEAR EXPANSION OF POLYTETRAFLUOROETHYLENE (TEFLON) TOTAL LENGTH VS. TEMPERATURE

Manufacturers from coast-to-coast call on Kings to produce their insulation parts from machined bar stock made from Teflon or Textolite 1422.

Tolerances are held extremely close. Special lubricants developed by Kings will not affect the dielectric characteristics of these materials.

For most purposes of electrical insulation, in relatively high frequency fields, Textolite 1422 is recommended. Where impact strength, chemical inertness, and resistance to heat are major factors, Teflon is recommended.

Kings fabricates its own Teflon Rod and Tubing which is also available to industry in raw form. Whatever your insulation problem, you can rely on Kings. Distributors inquiries solicited.

KINGS *Electronics*

Plastics Division, BOX 217, TUCKAHOE, N.Y.

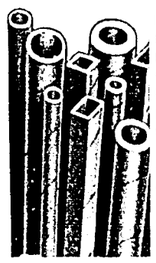
IN CANADA: ATLAS RADIO CORP., LTD., TORONTO

PRECISION offers you...

LABORATORY CONTROL of all materials...

...assures alkali-and acid-free coils that are non-corrosive to copper wire.

PRECISION PAPER TUBES



Precision's Laboratory Control of materials plus spiral winding and heat-treated compression provide better insulation, heat dissipation and resistance to moisture. Also, greater strength is combined with light weight. Made to your exact specifications in any shape—round, square, oval or rectangular—any length, ID or OD.

PRECISION COIL BOBBINS

Plastic-coated core anchors flanges securely, keeps them positioned during winding and avoids crowding of turns—provides more winding space. Plastic coating also improves insulation, makes Precision Bobbins stronger. Any size or shape available. Flanges with leads, slots, holes or plain—furnished flat, recessed or embossed to fit any mounting. Low-cost dies.

Tubes and bobbins made of finest dielectric Kraft, Fish Paper, Cellulose Acetate or combinations.

Write today for free samples and Mandrel list of over 1,000 sizes.

PRECISION PAPER TUBE CO. 2062 West Charleston St Chicago 47, Ill Plant No. 2, 79 Chapel St Hartford, Conn.

The leaders specify *Tensolite*

MINIATURE FLEXIBLE INSULATED **WIRE & CABLE**

CABLES { TWISTED PARALLEL BRAIDED

BARE COPPER TINNED COPPER SILVER PLATED } **SHIELDS**

BRAIDS { COTTON NYLON PLASTIC*

*TENSOLITE'S exclusive plastic film-covered Fiberglas

Leading engineers specify TENSOLITE Miniature Wire and Cable *because*- miniaturization programs demand *less* weight, *less* space and *greater* flexibility. Only TENSOLITE is devoted exclusively to this field — assuring you of *faster* service, *lower* cost, *supreme* quality, *advanced* design and know-how, and specialized facilities.

TYPICAL **MINIATURE WIRES and CABLES**

Plastic Insulated HOOK-UP — CODE 1507 A-1 — SIZE 32 AWG (7/40) O.D.—.030"

Cotton Covered SHIELDED LEAD — CODE 1919 D-1 — SIZE 30 AWG (6/38) O.D.—.075"

SHIELDED 4-Cond. TWISTED CABLE — CODE 2059 F-4 — SIZE 27 AWG (7/35) O.D.—.120"

OTHER CONSTRUCTIONS IN STRANDED SIZES FROM #40 TO #20 AWG

• Free wire samples and information on request. Special constructions made to your specifications.

TENSOLITE INSULATED WIRE CO., INC. 196 MAIN STREET TARRYTOWN, N.Y. Tarrytown 4 2616

Induction Heating Equip.

(Continued from page 129)

Chatham Electronics Inc., 475 Washington St., Newark 2, N.J., 1
For details see ad on page 130
Dallons Laboratories, Calif., 2
Deryder, H., N.J., 1, 2
Electronic Engineers, Calif., 1, 2
Electronic Heating Corp., Mass., 1
Electronic Processes Corp., Calif., 1
Engineering Research & Dev. Co., Ill., 1
Fischer & Co., Robert A., Calif., 2
General Electric Co., N.Y., 1, 2
General Elec. Co., Electronics Dept., N.Y., 1
Girdler Corp., The, Thermex Div., Ky., 1
Haydu Brothers, N.J., 1
High Frequency Heating Co., Ind., 1, 2
Induction Heating Corp., N.Y., 1
Interelectronics Corp., N.Y., 1, 2
Ipsen Industries, Ill., 1
Ipsen, Elasheim Co., Ohio, 2
Lepkenbach & Co., Inc., Paul, N.Y., 2
Marion Elect. Inst. Co., 408 Canal St., Manchester, N.H., 1
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Mullard Electronic Prods. Ltd., England, 1, 2
New London Instrument Co., Conn., 1
Ohio Crankshaft Co., Ohio, 1
Plessey International Ltd., England, 1
Polk Electronic Co., N.Y., 1, 2
Preston-Edson Electronics Co., Calif., 1
Professional Electronics Co., Calif., 1, 2
Progressive Electronics Co., Inc., N.Y., 1
Py[illegible], Radio Works, England, 1
RCA Eng. Prod. Div., Camden, N.J., 1
Radio Engineering Labs., Inc., N.Y., 1
Radio Receptor Co., 251 W. 19 St., New York 11, N.Y., 1
For details see ad on page 153
Raytheon Mfg. Co., Commercial Prod. Div., Mass., 2
Redifon Ltd., England, 1
Reeve Electronics, Inc., Ill., 1
Richardson Labs., Kenneth, N.Y., 1
Scientific Electric, 105-119 Monroe St., Garfield, N.J., 1
See complete catalog tded alphabetically in last section
Sherman Industrial Elect. Co., Inc., N.J., 1
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N.Y., 1
For details see ad on page [illegible]
Sierra Electronic Corp., Calif., 1
Specialty Insulation Mfg. Co., Inc., N.Y., 1
Spectrum Engineers, Inc., Pa., 1
Wappler, Inc., N.Y., 2
Weltronic Company, Mich., 1
Westinghouse Electric Corp., Pa., 1
Woodwelding, Inc., Calif., 1

Inductors, see: 14

32. Insulation.

1 Cloth.
2 Glass.
3 Mica.
4 Paper.
5 Plastic.
6 Rubber.
7 Synthetic.
8 Varnished Cambric

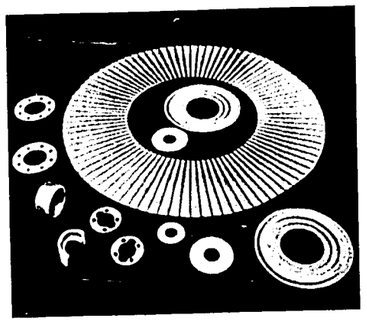
Accurate Paper Tube Co., Ill., 5
Akron Rubber Co., N.Y., 6
Anchor Industrial Co., N.Y., 5
Anchor Plastics Co., Inc., N.Y., 5
Atlantic India Rubber Works, Inc., 571 W. Polk St., Chicago 7, Ill., 6
For details see ad on page 155
Atmoid Sales Co., Texas, 5

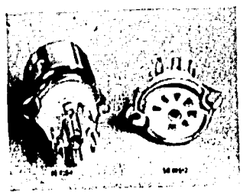
(Continued on page 132)

TEFLON

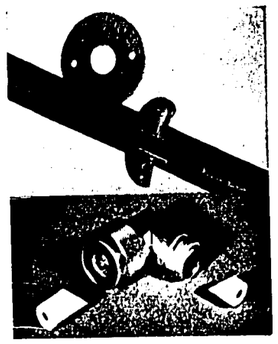
ELECTRONIC PARTS

Teflon's outstanding electrical properties make it an ideal insulating material for high-voltage, high-temperature, high- or ultra-high-frequency service. Component parts fabricated of Teflon are finding a steadily increasing number of applications in radio, radar, TV and other electrical and electronic equipment.





Teflon's loss factor is less than 0.0005; its dielectric constant only 2.0—at all frequencies measured to date. Teflon is serviceable throughout the entire temperature range of —110° F to 575° F. with negligible change in critical electrical characteristics. Teflon is tough, somewhat resilient, weather-proof, has zero water absorption and is absolutely non-corroding.



We manufacture all types of molded or machined Teflon parts including coaxial spacers and coaxial connectors for electronic equipment, component parts for switches, relays, and contactors, as well as tube sockets, high-voltage brackets for power resistors, gaskets, specialties, etc. For more information request Catalog No. 400. Also available — Teflon sheets, cylinders, rods, tubing and bars. *We are the country's foremost manufacturer of Teflon products.*

Teflon Products Division

UNITED STATES GASKET CO.

612 N. 10th Street • CAMDEN, NEW JERSEY

Typical Properties of "Teflon"

Tensile Strength @ 77 F	1500 to 7500 psi	Specific Heat	0.25 Btu lb deg F
Elongation @ 77 F	100 to 200%	Heat Distortion Temperature for 66 psi	270 F
Flexural Strength @ 77 F	Did not break (D790-44T)	Surface Arc Resistance	Does not track even after 1200 seconds of exposure ASTM D 495-42T
Stiffness @ 77 F	60,000 psi	Volume Resistivity	10^{18} ohm cm
Izod Impact Strength @ 70 F 77 F 170 F	2.0 ft lb in 4.0 ft lb in 6.0 ft lb in	Surface Resistivity @ 100% Rel. Hum.	3.6×10^{6} megohms
Durometer Hardness	55 to 70 R	Dielectric Constant 60 to 10^{6} Cycles	2.0-2.05
Compressive Stress @ 01% Deformation	1700 psi	Power Factor 60 to 10^{6} Cycles	0.0005
Deformation under Load @ 122 F, 1200 psi, 85 hr	4 to 8%	Water Absorption	0.0%
Coefficient of Linear Thermal Expansion from 77 to 140 F	5.5×10^{-5} per deg F	Flammability	Nonflammable
Thermal Conductivity	1.7 Btu hr sq ft deg F in	Resistance to Weathering	Excellent
		Specific Gravity	2.1 to 2.3

Insulation

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Bache & Co., Semon, N.Y., 2
Bentley Harris Mfg. Co., 501 Barclay St., Conshohocken, Pa., 2, 8
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Brady Co., W. H., 1613 E. Spring St., Chippewa Falls, Wis., 1, 4
For details see ad on page 123
Brand & Co., William, Conn., 1, 3, 5
Canadian General Electric Co. Ltd. Canada, 8
Carol Cable Div., The Crescent Co., R.I. 5, 6, 7
Cinch Mfg. Corp., Ill., 5
Citation Products Co., N.Y., 5
Cleveland Container Co., The, Ohio, 4, 5
Continental-Diamond Fibre Co., Del., 3, 5
Corning Glass Wks., Tech Prods. Div., Corning, N.Y., 2
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Crane Packing Co., Ill., 7
Dielect, Inc., N.J., 5
Dow Corning Corp., Mich., 2, 3, 7
Electronic Mechanics, Inc., 68 Clifton Blvd., Clifton, N.J., 5—Teflon
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Felt Products Mfg. Co., Ill., 4, 6
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General Cement Mfg. Co., Ill., 8
General Electric Co., N.Y., 1, 2, 7, 8
General Laminated Prod., Inc., of Ill. Ill., 1, 2, 4, 5
Goodrich Chem. Co., B. J., Ohio, 5
Hermetic Seal Products Co., 29-31 South 6 St., Newark 7, N.J., 2
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Huse-Liberty Mica Co., Mass., 1-5, 8
Industrial Devices, Inc., N.J., 5
Industrial Tape Corp., N.J., 1, 4
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Lunn Laminates, Inc., N.Y., 5
Martin Co., H. S., Ill., 2
Mica Insulator Co., N.Y., 1-5, 8
Micarta Fabricators, Inc., Ill., 1-4, 8
Minerals & Insulation Co., N.J., 5, 8
Molded Insulation Co., Pa., 5
Mycalex Corp. of America, 30 Rockefeller Plaza, New York 20, N.Y.
For details see ad on page 28, 246-7
Mykroy, Inc., Ill., 2, 3, 5
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Panelyte Div., St. Regis Sales Corp. N.Y., 5
Plax Corp., Conn., 5
Ponn Machine & Cutting Co., Mass., 5, 6, 7

(Continued on page 133)

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Fluorocarbon resins at Resistoflex are processed under rigid control in the latest type of equipment expressly designed to provide complete polymerization without degradation. You get rod and sheet with *maximum tensile*, *"plastic memory"* and *flexibility* without internal strains, cracks or porosity.

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Insulation

(Continued from page 132)

Precision Paper Tube Co., 2062 W. Charleston St., Chicago 47, Ill., 4
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Ruberoid Co., The, N.Y., 4
Schott Co., Walter L., Calif., 7
Schweitzer, Inc., Peter J., N.Y., 4
Specialty Insulation Mfg. Co., Inc., N.Y., 5, 6
Spruce Pine Mica Co., N.C., 3
Stevens Products, Inc., N.J., 1, 2, 4, 8
Surprenant Mfg. Co., Mass., 5
Synthane Corp., Pa., 1, 2, 3
Tensolite Insulated Wire Co., Inc., 196 Main St., Tarrytown, N.Y., 5
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United States Gasket Co., Teflon Products Div., 612 N. 10 St., Camden 2, N.J., 7, Teflon
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West Virginia Pulp & Paper Co., N.Y., 4
Wilbur & Williams Co., The, Mass., 7
Wilmington Fibre Specialty Co., Del., 4, 5
Woodwelding, Inc., Calif., 5, 8
Wright & Sons Co., Wm. F., Mass., 1, 7
Zophar Mills, Inc., 112-130 26 St., Brooklyn 32, N.Y., 5, 7
For details see ad on page 218

33. Jacks, Jack Fields. Plugs & Patch Cords.

Alden Products Co., 117 N. Main St., Brockton 64, Mass.
For details see ad on page 114
American Communications Corp., N.Y.
Associated Eng'ng. Corp. of Boston, Mass.
Audio Development Co., Minn
Audio Equipment Sales, N.Y.
Bead Chain Mfg. Co., 11 Mountain Grove St., Bridgeport 5, Conn.
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Burgess & Co., H. H., Ohio
Cannon Electric Development Co., Calif.
Carter Parts Co., Ill
Clarke Instr. Div., Nat'l. Elect. Mach., Md
Federal Electric Mfg. Co. Ltd., Canada
Flexilab Products Co., Colo
General Cement Mfg. Co., Ill
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass.
For details see ad on pages 236-7, Back Cover
Hobson Bros., Ill
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y.
For details see ad on page 85, 130
Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y.
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Lapp Insulator Co., Inc., N.Y.
Newton Electronics Co., N.Y.
Picker X-Ray Labs. & Mfg. Co., N.Y.
Precision Electric Co., Inc., N.J.
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y.
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Rauland Instrument Corp., N.Y.
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See complete catalog titled alphabetically in last section

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Compact, simple design featuring notched Bakelite insulation mechanically interlocking all electrical parts: "V-bend" in tip spring firmly holds mating plug. Available in most common circuits, mounts single 3/8" dia. hole, panels up to 5/32" thick; requires less than 1" behind panel. Available in most common circuits. Military types such as JK-33A (JJ-033), JK-34A (JJ-034) and JJ-089.

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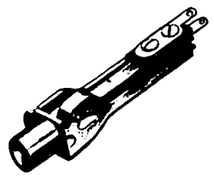

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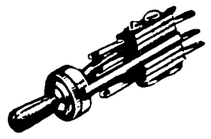
An unusually small, lever-action switch; available in numerable circuits, to provide the simplest in switching design. Requires only one single round hole for mounting; black plastic knob. Made in 2- and 3-position, locking or non-locking types.



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Jacks, Jack Fields

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Standard Electric Time Co., The, 93 Logan St., Springfield 2, Mass.
For details see ad on page 151
Switchcraft, Inc., 1328 N. Halstead St. Chicago 22, Ill.
For details see ad on page 134
Telephonics Corp., N.Y.
Trimm, Inc., Ill.
Vokar Corp., Mich.
Waltham Horological Corp., Mass.

34. Keys.

1—Switching. 2—Telegraph.

A. B. Metal Products Ltd., England 1
Alden Products Co., 117 N. Main St. Brockton 64, Mass., 2
For details see ad on page 114
Arlington Electric Prods., Inc., N.Y., 1
Automatic Electric Co., Ill., 1
Boehme, Inc., H. O., N.Y., 2
Brelco Electronics Corp., N.Y., 2
Bunnell & Co., J. H., N.Y., 2
Carter Parts Co., Ill., 1
Cinema Engineering Co., Calif., 1
Clare & Co., C. P., Ill., 1
Connecticut Tel. & Elec. Div., Conn., 1
Corona Engineering Service, N.Y., 2
Elliott Brothers Ltd., England, 2
Federal Telephone & Radio Corp. Selenium & Intelin Div. 100 Kingsland Rd., Dept. F7104, Clifton, N.J., 1
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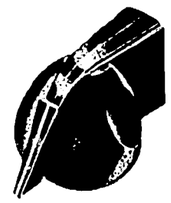
Part 1: IRE Members, first half of Book	

Exclusive



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Knobs, see: 30 sub-head 7; 46 sub-head 3

Patent Button Co. of Tennessee, Inc., 2006 Century St., Knoxville, Tenn.
For details see ad on page 135
Rogan Brothers, 2508 Irving Pk. Blvd., Chicago 18, Ill.
For details see ad on page 135

35. Laboratories & Custom Builders of Equipment.

Abbott Instruments, Inc., N.Y.
Acme Electronics, Calif.
Adair, George P., D.C.
Aero Electronics Co., Ill.
Aero-Sonic Mfg. Co., Calif.
Airborne Instruments Lab., Inc., N.Y.
Airlectron, Inc., N.J.
Airplane & Marine Inst., Inc., Pa.
Air-Tone Sound Recording Co., Pa.
Airtron, Inc., 105 E. Elizabeth Ave., Linden, N.J.
For details see ad on page 217
American Electroneering Corp., The, Calif.
Antenna Research Lab., Inc., Ohio
Applied Physics Corp., Calif.
Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J.
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Arma Corp., N.Y.
Atlas Coil Winders, Inc., 392 State St., Stamford, Conn.
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Audio Instrument Co., N.Y.
Austin Co., Special Devices Div., N.Y.
Ballantyne Co., The, Neb.
Barber Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing, L.I., N.Y.
For details see ad on page 135

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See complete catalog filed alphabetically in last section
Bart Labs. Co., Inc., 227 Main St., Belleville, N.J.
See complete catalog filed alphabetically in last section
Bassett, Inc., Rex, Fla.
Beckman & Whitley, Inc., Calif.
Berkshire Labs., Mass.
Bliss-Warren Electronic Corp., N.J.
Boehme, Inc., H. O., N.Y.
Boom Electric & Amplifier Co., Inc., Ill.
Brociner Electronics Lab., N.Y.
Brownell, H. Russell, N.Y.
Brownthorn Electronics Corp., N.Y.
Buck Engineering Co., Inc., 37-41 Marcy St., Freehold, N.J.
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Burnett Radio Lab., Wm. W. L., Calif.
Canadian Research Institute, Canada
Carnine & Bitter, D.C.
Cathodeon Ltd., Meadowcraft Labs., England
Central Rediffusion Services Ltd., England
Central Research Labs., Inc., Minn.
Cinema Engineering Co., Calif.
Cinematic Dev. & Cinechrome Lab., Calif.
Collins Audio Products Co., Inc., N.J.
Computer Research Corp., 1954½ Carson Ave., Torrance, Calif.
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Computing Devices of Canada Ltd., Canada
Control Engineering Corp., Mass.
Cook & Co., Mass.
Cornell Aeronautical Lab., N.Y.
Cosmo Engineering Labs., Inc., N.J.
Crest Televison Labs., N.Y.
Crosby Laboratories, Inc., 126 Herricks Rd., Mineola, L.I., N.Y.
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Dallons Laboratories, Calif.
Davies Laboratories, Inc., The, Md.
Dellorez Co., Inc., N.Y.
Delta Electronics, Inc., Ohio
Deryder, H., N.J.
Design Service Co., N.J.
Dice Co., J. W., N.J.
Dietz Co., The Henry G., N.Y.
Douglas Radio Laboratories, Mass.
Eastern Specialty Co., The, Pa.,
Edgerton, Germeshausen, & Grier, Inc., Mass.
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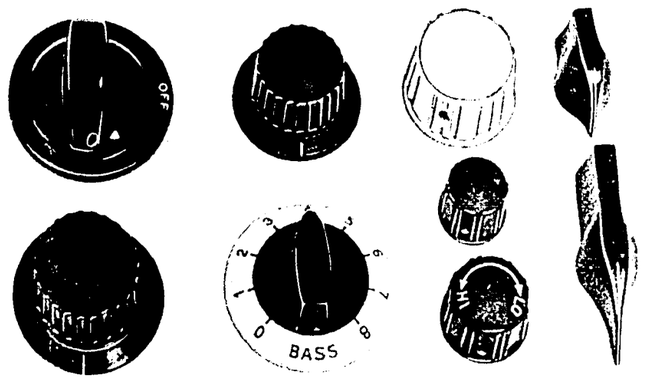

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(Continued from page 135)

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Eichwald & Co., Inc., B., N.Y.
Eisler Engineering Co., 757 S. 13 St., Newark 3, N.J.
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Electro-Impulse Laboratories, N.J.
Electro Mec Lab., N.Y.
Electro-Mechanical Research, Inc., Conn.
Electro-Physics Co., N.Y.
Electro Products Labs., Inc., Ill.
Electrodyne Co., Mass.
Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J.
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Electronic Instruments Ltd., England
Electronic Prototypes, Inc., Mass.
Electronic Research & Mfg. Corp., Ohio
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.
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Electronics Research, Inc., Ind.
Elm Laboratories, N.Y.
Engineering Development, Neb.
Engineering Research Assoc., Inc., Minn.
Eppley Laboratory, Inc., R.I.
Erco Radio Labs., Inc., N.Y.
FSD Laboratories, Conn.
Federal Telecommunication Labs., 500 Washington Ave., Nutley 10, N.J.
Fisher Research Lab., Inc., Calif.
Flader, Inc., Frederick, Ohio
Franklin Institute, The, 20 & Benjamin Franklin Pkwy., Philadelphia 3, Pa.
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Frequency Standards Corp., P.O. Box 66, Eatontown, N.J.
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General Precision Laboratory, Inc., 63 Bedford Rd., Pleasantville, N.Y.
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Gertsch Products, Inc., Calif.
Glenco Corp., N.J.
Glens Falls Laboratory, Inc., N.Y.
Gottschalk Engineering, N.Y.
Graham Mfg. Co., Inc., R.I.
Grant Pulley & Hardware Co., N.Y.
Greenleaf Mfg. Co., Mo.
Greibach Research & Dev. Labs., N.Y.
Gulton Mfg. Corp., N.J.
Harmon Electronics, 11431 Truman Rd., Independence, Mo.
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Health Therapy Research, N.Y.
Hegeman Labs., N.J.
High Frequency Heating Co., Ind.
High Voltage Engineering Corp., Mass.
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y.
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Huggins Laboratories, Calif.
Hughes Aircraft Co., Calif.
Industrial Control Co., Straight-Path & Arlington Ave., Wyandanch, L.I., N.Y.
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Industrial Devices, Inc., N.J.
Industrial Electronic Engineers, Calif.
Industrial Electronics of Can. Ltd., Canada
Industrial Nucleonics Corp., Ohio
Instrument Laboratories, Ill.
Instrument Laboratories, N.Y.
Jarvis Electronics Corp., Ill.
Johanson Mfg. Co., N.J.
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Kay Electric Co., 25 Maple Ave., Pine Brook, N.J.
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Kent Engineering Co., Ill.
Kepco Laboratories, Inc., N.Y.
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Lab. for Electronics, Inc., Mass.
Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J.
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Leru Laboratories, Inc., N.Y.
Linell Eng. Corp., Charles S., Ill.
Little, Inc., Arthur D., Mass.
Livingstone Electronic Labs., N.J.
Lorain County Radio Corp., Ohio
Loral Electronics Corp., N.Y.
McNeal, J. D., Conn.
Mackenzie Products Co., Conn.
MacLeod & Hanopol, Inc., Mass.
Manhattan Research Laboratories, N.Y.
Manufacturers Research Corp., Md.
Marchand, Nathan, Conn.
Massa Laboratories, Inc., Mass.
Measurements Corp., Intervale Rd, Boonton, N.J.
See complete catalog filed alphabetically in last section
Melpar, Inc., Va.
Melody Master Mfg. Co., Ill.
Menlo Research Laboratory, Calif.
Mico Instrument Co., Mass.
Missouri Research Labs., Inc., Mo.
Mittelmann, Eugene, Ill.
Modulation Products Co., N.Y.
Morecroft Design Eng., J. H., Calif.
Munston Mfg. & Service, Inc., N.Y.
National Electronics Labs., Inc., D.C.
National Instrument Co., Mass.
National Radio Research Labs., N.Y.
Newton Scientific Co., Mass.
Nilsson Electrical Lab., Inc., N.Y.
North American Philips Co., Inc., N.Y.
Northwest Radio Consultant Service, Idaho
Norwegian Def. Res. Establishment, Norway
Nucleonic Corp. of America, N.Y.
Optical Film Eng. Co., Pa.
Optionic Research, Inc., Mass.
Orthon Corp., The, N.J.
PSC Applied Research Ltd., Canada
Palmer, Inc., M. V., Wash.
Palo Alto Physicists, Calif.
Park Armature Co., Mass.
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Petitt & Co., Geo., Ill.
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Photocircuits Corp., N.Y.
Pickard and Burns, Inc., Mass.
Pioneer Elec. & Research Corp., 7212 Circle Ave., Forest Park, Ill.
For details see ad on page 117

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Pittsburgh Testing Lab., Pa.
Polarad Electronics Corp., N.Y.
Polytronics Co., Canada
Ports Mfg. Co., Calif.
Potter Instrument Co., Inc., 115 Cutter Mill Rd., Dept. 5-YB, Great Neck, L.I., N.Y.
For details see ad on page 199
Precision Rectifier Corp., N.Y.
Press Wireless Mfg. Co., Inc., N.Y.
Preston-Eidson Electronics Co., Calif.
Radiation Counter Labs., Ill.
RCA Laboratories, 711 Fifth Ave., New York 22, N.Y.
Radio Engineering Labs., Inc., N.Y.
Radio Instrument Labs., N.J.
Radioactive Products, Inc., Mich.
Raymond Engineering Lab., Inc., Conn.
Reed Research, Inc., D.C.
Reflectone Corp., The, Conn.
Research Electronics Labs., Pa.
Research Instrument Co., Inc., N.Y.
Revere Electronics Co., N.Y.
Rich Electronics, Inc., Fla.
Rich-Roth Laboratories, Conn.
Richardson Labs., Kenneth, N.Y.
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Rosen Eng'ng. Prods., Inc., Raymond, 32 & Walnut St., Philadelphia 4, Pa.
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Rowe Industries, 1702 Wayne St., Toledo 9, Ohio
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Scientific Instrument Labs., N.Y.
Scientific Specialties Corp., Mass.
Seaboard Electric Co., N.Y.
Servomechanisms, Inc., N.Y.
Shepard Labs., N.J.
Sherwood, Robert H., N.Y.
Shores Laboratory, N.Y.
Shrader Mfg. Co., D.C.
Smith-Meeker Engineering Co., N.Y.
Smuckler & Co., Inc., A. F., N.Y.
Southwestern Ind. Electr. Co., Tex.
Special Instrument Lab., Inc., Tenn.
Spectrum Engineers, Inc., Pa.
Spencer-Kennedy Labs., Inc., 186 Massachusetts Ave., Cambridge 39, Mass.
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For details see ad on page 151
Stuedeman, W., N.J.
Superex Electronics Corp., N.Y.
Sutter, Alfred W., 141 E. 44 St., New York 17, N.Y.
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Technical Associates, Calif.
Technical Materiel Corp., N.Y.
Technisonic Studios, Mo.
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y.
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Telecomputing Corp., Calif.
Telectro Industries Corp., N.Y.
Telemark, Inc., Conn.
Teleregister Corp., The, N.Y.
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For details see ad on page 137
Tenney Engineering, Inc., 26 Avenue B, Newark 5, N.J., Atmospheric Test and Calibration Chambers, Glass Laboratory Apparatus and Ovens.
For details see ad on page 197
Terpening Co., L. H., N.Y.
Triumph Mfg. Co., Ill.
U. S. Testing Co., Inc., 1415 Park Ave., Hoboken, N.J., Environmental and Functional Testing.
For details see ad on page 195
Varian Associates, Calif.
Vectron, Inc., Mass.
Walkirt Co., The, Calif.
Weingarten Electr. Labs., Inc., Calif.
Westchester Res. & Dev. Labs., N.Y.
Wheeler Labs., Inc., 122 Cutter Mill Rd., Great Neck, L.I., N.Y.
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Wickes Eng. & Constr. Co., N.J.
Wilcox Electric Co., Inc., Md.
Williams, Everard M., Pa.
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Brooklyn Varnish Mfg. Co., Inc., N.Y., 2, 3, 4
Communication Products Co., Inc., N.J., 2, 3
Cortland Industries, Inc., Ill., 2, 3, 4
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Korrol Products Corp., N.Y., 2, 3, 4
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Tricraft Products Co., Ill., 3, 4
Vorac Co., N.J., 1-4

37. Loudspeakers & Headphones.

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Acoustical Mfg. Co., Ltd., England, 3
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American Communications Corp., N.Y., 3
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SUBMERGENCE-PROOF SPEAKERS These types are designed for use where extreme ruggedness and immunity to spray, gases, live steam or dust are essential. Function even under water, drain automatically, operate continuously regardless of exposure. Models available for directional or radial projection, wall or bulkhead mounting, swivel mount and with or without built-in line matching transformer and attenuator. Design is ideal for railroad use, shipboard, industries, docks, rough mobile work, etc. Model MM-2, illustrated, is rated at 15 watts continuous IPM, frequency 300-6000 cps, impedance 16 ohms.

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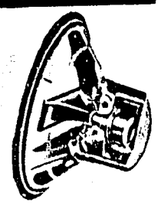
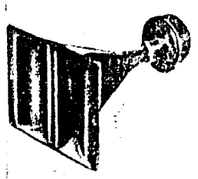


WIDE RANGE CONE SPEAKERS Model 6201 comprises a superb 12" cone speaker with a driver type tweeter mounted coaxially. The cone speaker features a 24 oz. "W" shaped Alnico magnet and edge treated cone for distortion-free low frequency response. Tweeter has wide angle horn. A built-in LC crossover network and external high frequency attenuator are included. Capacity is 25 watts, response 45-15,000 cps, impedance 8 ohms. Other cone speakers for high fidelity, as well as submergence-proof or blast-proof service for commercial and military applications.



HI-FREQUENCY TWEETERS University offers a complete line of single and double tweeter units for both 2000 and 6000 cycle crossover. Exclusive University "reciprocating flare" horn construction assures uniform wide angle dispersion. A complete line of accessories are included—crossover networks, adapter for mounting tweeter on a standard cone speaker, etc. These tweeters may be added to any standard amplifier and speaker to provide the finest in high fidelity reproduction—and at a very low cost.

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University LOUDSPEAKERS
INCORPORATED
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Loudspeakers & Headphones

(Continued from page 138)

Copper Wire Products Ltd., Canada, 1, 3, 4, 5
Crescent Industries, Inc., Ill., 1
DX Radio Products Co., Inc., Ill., 1
Delco Appliance Div. of Gen. Motors, N.Y., 1
Delco Radio Div. of General Motors, Ind., 1
Dominion Sound Equipments Ltd., Canada, 1-5
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Hartley Co. Ltd., H. A., England, 3
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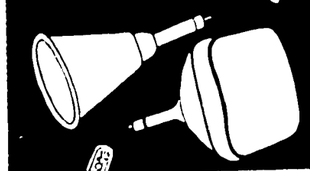
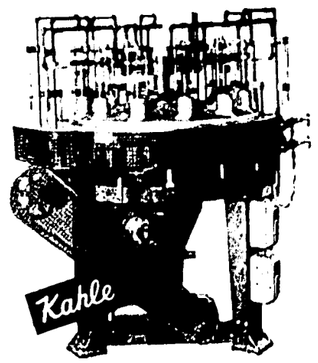
University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N.Y., 1, 3, 4, 5
For details see ad on page 139

(Continued on page 141)

Kahle equipment for manufacturing sub-miniature, miniature, power and cathode-ray tubes



FOR SUB-MINIATURE TUBES



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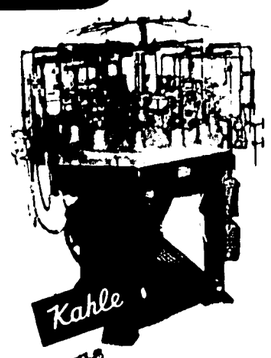
Button ¼" in diameter with 5 long wires. Hand loading and unloading. Dual motor drive. Available for any number of heads and automatic feeds.



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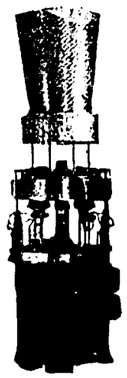
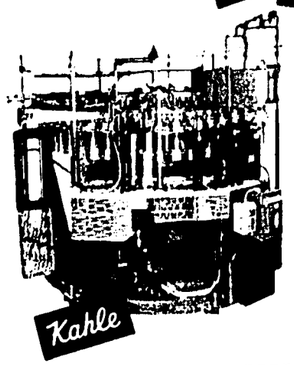


#1502
AUTOMATIC GLASS TUBING CUTTING MACHINE

Vertical type; for soft glass, chill cut, 8-head; indexing. Dual motor drive; variable speed. Single or double cut-off stations. With or without upper structure glass guard. Cap. 1-3,000 pcs. per hour.

Also available for manufacture of sub-miniature tubes:

TUBING (BULB) FLATTENING MACHINE to produce tubulated flattened bulbs. TUBULATED BULB CONSTRICTING MACHINE to produce a definitely shaped and sized constriction between the top of the flattened bulb and the tubulation position.



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48-POSITION EXHAUST MACHINE

All degrees of operation from manual to completely automatic. Production limited only by pump equipment or loading speed of operator. Also available with 12 and 32 positions.

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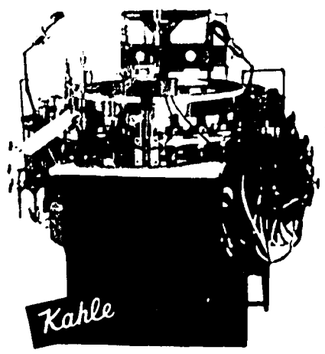

#1197
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Complete range of manufacturing equipment for miniature tubes to be produced.

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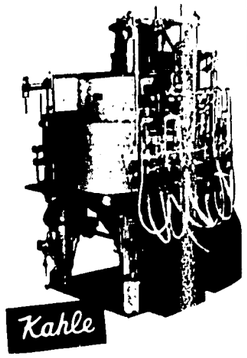
#1414
CATHODE RAY TUBE BUTTON STEM MACHINE

Turns out 400-500 TB stems per hour. Fine adjustment of speed, pressure, heat, sequence of operations. Labor saving development for automatic tubulation flaring.



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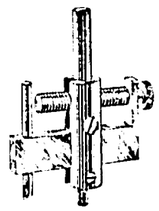

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10	Round Shank	11 inch	$15.00

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Covers with attaching screws
Marking Strips (1 to 4, 1 to 8, 1 to 12)

BUCHANAN
Electrical Products Corporation
HILLSIDE N. J.

Write for Catalog R105

Loudspeakers & Headphones

(Continued from page 139)

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Vitavox Ltd., England, 1, 3, 4, 5
Webster Electric Co., Wis., 5
Winslow Co., Inc., N.J., 2
Wright Inc., Minn., 1, 4, 5

38. Machinery & Tools.

1—Coil Winders.
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Acromark Co., The, N.J., 3
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Artos Engineering Co., Wis., 2
Associated Production Co., Ill., 1
Atlas Metal Stamping Co., Pa., 2
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Citation Products Co., N.Y., 2
Coil Winding Equipment Co., 57 W. Main St., Oyster Bay 9, L.I., N.Y., 2
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Copper Wire Products, Ind., 4
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DX Radio Products Co., Inc., Conn., 2
Drake Electric Works, Inc., 3656 Lincoln Ave., Chicago 13, Ill., 4
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Electronic Control Corp., Mo., 7, 8
Fraser Co., Inc., Ind., Ind. Prods. Inc., N.Y., 8
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Fenn Co., Conn., N.Y., 8
Fischbach & Moore, Inc., N.Y., 2
Gardner Screen Co., Ill., 3
General Electric Co., N.Y., 4, 7
Graham Transformer Co., Inc., Wis., 2
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Industrial Machine Works, N.J., 5, 6
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Kwikheat Mfg. Co., Calif., 4
Leaf, Inc., Mich., 2
Lerman Brothers, Inc., N.J., 6
Eagle Art Products Co., Inc., N.Y., 4, 7
Lema Electric Equip. Co., Ohio, 5, 8
Malsom Machine Co., N.H., 3
Marx Tool & Die, Ill., 2
Mass. Instrument Co., Mass., 1, 3
Multicraft Co., Ill.
National Vacuum Equip. Co., Mass.
New Hermes Engraving Mach. Corp., 15-19 University Pl., New York 3, N.Y., 3
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O'Neil Irwin Mfg. Co., Minn., 2
Optical Res. Lab. Co., Pa., 1
Peerless Roll Leaf Co., Inc., N.Y.
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Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y., 8
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Pt. Instrument Equipment Co., N.Y., 2
Progressive Machine Co., N.J., 2
Reed Electronics, Inc., Ill., 7
Reinhold Publishing Corp., N.Y., 8

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STANDARD — SPECIAL DESIGN
30 Years Experience

CATHODE RAY TELEVISION
RADIO TUBES - ELECTRONIC DEVICES
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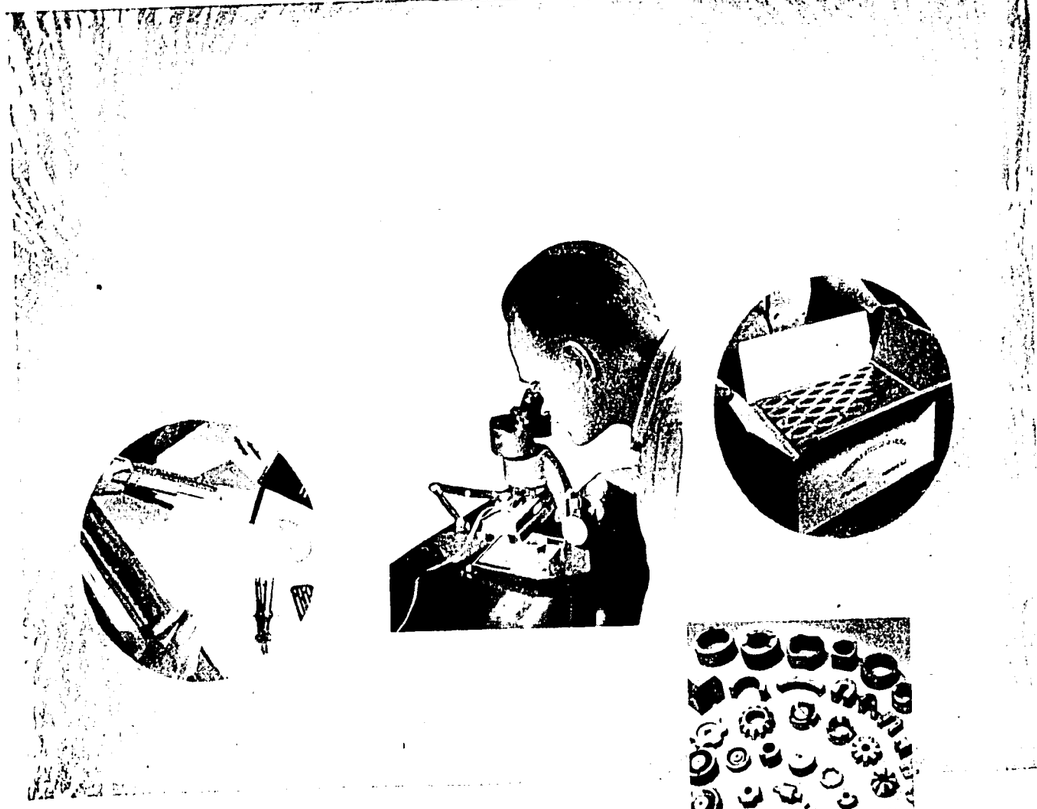
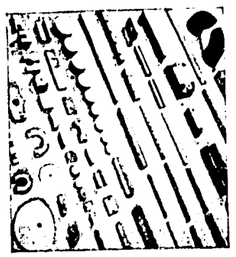
AND MANY OTHERS

TV Sealing Machine

EISLER ENGINEERING CO., Inc.
757 S. 13th St., Newark 3, N.J.



quality magnets from start to finish



From the first engineering drawing to the final inspection and shipping, Crucible Permanent Alnico Magnets receive the same careful attention and workmanship that is found in all Crucible specialty steels. Rigid quality control at every step in the production of Crucible Alnico . . . with a keen devotion to detail . . . is the reason that users of Crucible Permanent Alnico Magnets have found that from Crucible they get a better magnet with *higher gap flux per unit weight.*

Crucible Alnico Magnets are serving successfully in thousands of varied applications. The experience of Crucible's alert staff of metallurgists and engineers is freely available to you. Take advantage of Crucible's half century of specialty steel leadership. When you think of permanent magnets . . . call Crucible. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N.Y.

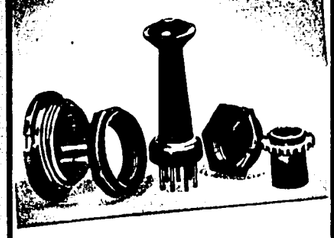
CRUCIBLE first name in special purpose steels

PERMANENT ALNICO MAGNETS

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE • STEELS

★STAR

Specialists in Internal and External Perfect Threaded Die Cast Units



Intricate parts of 100% rust-proof Zinc alloy.
Accurate to specification. Held to tolerances of .005.
Threads require no machining.
Ideal for instrument, small machine and minute electronic parts.

PRODUCERS OF VITAL AIDS TO MANUFACTURERS OF 7 & 9 PIN MINIATURE TUBE RADIOS AND ELECTRONIC APPARATUS

Write for complete information.

STAR EXPANSION PRODUCTS CO.
(INCORPORATED)
147 Cedar St. New York 6, N.Y.

INDIANA PERMANENT MAGNETS

—for Uniform High Energy!

Look to INDIANA for *quality* permanent magnets—for skill in manufacture—for ingenious engineering aid in *both* design and application. INDIANA is the world's largest exclusive producer of permanent magnets. More than 30,000 different needs have been met successfully by INDIANA *"packaged energy."*

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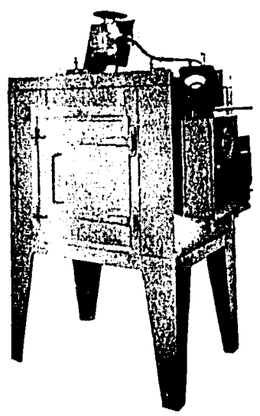
★ ALL SIZES
ALL SHAPES
ALL MATERIALS

INDIANA is the only manufacturer furnishing *all* commercial grades of permanent magnet alloys. And you have a choice of cast, sintered formed, or ductile metals *whatever* the requirement, INDIANA can serve you well Sales offices coast to coast.

Sole Makers of HYFLUX Alnico V—highest energy product of any magnet material.

THE INDIANA STEEL PRODUCTS CO.
Valparaiso, Indiana
Specialists in Permanent Magnets Since 1908



OVENS

Forced Air Circulation Cabinet Types, as illustrated, for glass annealing, coil baking curing

* * *

Also conveyor ovens for high production of electronic tubes and components of all types

* * *

STEINER-IVES COMPANY

16 AVENUE L NEWARK 5, NEW JERSEY
DESIGNERS AND BUILDERS OF INDUSTRIAL OVENS
Since 1889

Machinery & Tools

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Reflan Electric Co., Ill., 1, 2
Sargent & Co., Conn., 8
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Utica Drop Forge & Tool Corp., N.Y., 8
Vacuum Electronic Engineering Co., N.Y., 8
Vacuum Tube Products, Calif., 7
Vellumoid Co., Inc., Mass., 4
Walker-Turner Div., N.J., 2
Welch Scientific Co., W. M., Ill., 8
Weller Electric Corp., Pa., 3
West Coast Electronics Co., Calif., 1, 2
Windsor Machine Co., Pa.
Wilder Mfg. Co., Inc., Mechanic St. & Erie R.R., Port Jervis, N.Y., 8, Soldering Iron Holders
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39. Magnets.

1 Electro. 2 Permanent.

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Allied Control Co., Inc., N.Y., 1
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Ampex Mfg. Co., Mich., 2
Arnold Engineering Co., Ill., 2
Associated Research, Inc., Ill., 1
Canadian General Elec. Co., Ltd., Canada, 2
Carboloy Co., Inc., Mich., 2
General Transformer Co., Ill., 1
Crucible Steel Co. of America, 405 Lexington Ave., New York 17, N.Y., 2
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Plessey International Ltd., England, 1, 2
Precision Instruments, N.Y., 1
Pyrotector, Inc., Ill., 2
Richardson Labs., Kenneth, N.Y., 1
Simonds Saw & Steel Co., N.Y., 2
Sorensen Manufacturing Corp., Ill., 1
(Continued on page 145)

The Development of CARBONYL IRON POWDERS

Carbonyl Iron Powder is an extremely pure form of iron, the metal content being over 99.99% iron, produced in the form of almost perfect spheres only one to fifteen microns in diameter—the average diameter being 8 microns (.00032 inches). It has been produced commercially for some years, primarily for use in magnetic cores for electronic equipment. Its production is therefore now under perfect control to give absolute reliability in quality and properties.

The production of Iron Carbonyl, from which Carbonyl Iron Powders are made, depends on a unique reaction, which was discovered in 1890 by the distinguished British chemist, Sir Ludwig Mond. When iron is treated with carbon monoxide it reacts to form iron pentacarbonyl, a rare case of a liquid compound of a metal. Each atom of iron combines with five molecules of carbon monoxide to give a compound with the formula $Fe(CO)_5$. This reaction leaves behind any impurities in the original iron.

This liquid is vaporized and the vapor heated above 200°C, when it decomposes into its constituents. The carbon monoxide is driven off and the iron separates from the vapor phase, first in the form of free atoms, then as ultramicroscopic crystals, finally as microscopic, almost perfect spheres. The particle size distribution can be controlled by temperature, pressure and other operating conditions.

Controlled purity and distribution of particle size is essential for use of the powder in electronics, where minor variations in these properties have exaggerated consequences in delicate electrical and magnetic effects.

The only other elements present are non-metals such as carbon, oxygen and nitrogen. In G A & F Carbonyl Iron Powder, they amount to not more than 0.8% carbon, 0.9% oxygen and 0.7% nitrogen.

The first large-scale production of Iron Carbonyl was undertaken in Germany shortly after 1920. By 1928 the process had been adapted to the continuous commercial production of Carbonyl Iron Powder. Subsequently, detailed studies and meticulous laboratory-type controls in the plant permitted accurate regulation of purity and particle size for the needs of the modern electronic industry.

The first commercial Carbonyl Iron plant in the United States was opened at Grasselli, N. J. in 1941 by the General Aniline & Film Corporation, primarily to meet the large wartime demand for electronic equipment. Newer and finer grades of the powder were developed for use in high-frequency electronic equipment for radar and television. Later a second plant was put into operation at Huntsville, Alabama.

Thus the G A & F Carbonyl Iron Process is now well established and in steady operation. It is an outstanding case of the succesful precision control of a sensitive chemical reaction to produce a unique material that must meet extraordinary specifications of purity, particle shape and size, and uniformity.

Write today for a free book—fully illustrated with performance charts and application data. It will help radio engineers or electronics manufacturers to step up quality, while saving real money. Kindly address your request to Dept. #91.

These unique properties tell why G A & F® Carbonyl Iron Powders are superior:

PROPERTY	ADVANTAGE
Spherical structure . . .	Facilitates insulation and compacting
Concentric shell structure (some types only) . . .	Low eddy current losses
High iron content . . .	Exceptional permeability and compressibility
Absence of non-ferrous metals . . .	Absence of corresponding disturbing influences
Relative absence of internal stress; regular crystal structure . . .	Low hysteresis loss
Spheres of small size . . .	Low eddy current losses; usable for high frequencies
Variations of sphere size . . .	Extremely close packing

ANTARA® PRODUCTS

DIVISION OF

GENERAL DYESTUFF CORPORATION

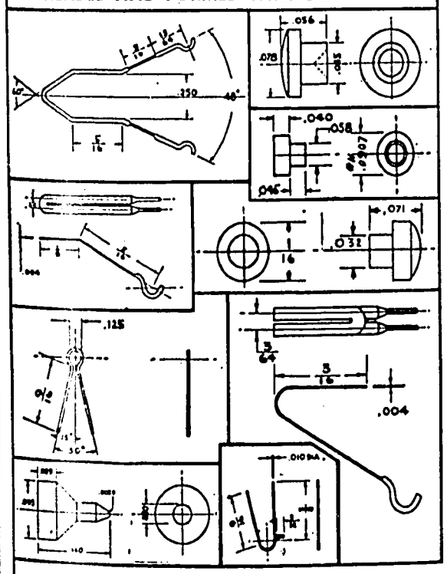
435 HUDSON STREET • NEW YORK 14, NEW YORK

G A & F® Carbonyl Iron Powders . . . .

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

Write or phone (Hartford 2-4271) our Research Department.

THE J. M. NEY COMPANY 171 ELM STREET • HARTFORD 1, CONN.

SPECIALISTS IN PRECIOUS METAL METALLURGY SINCE 1812

Magnets

(Continued from page 143)

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Tetrad Co., Inc., Calif., 1
Thomas & Skinner Steel Prods. Co., Ind., 2
Varian Associates, Calif., 1
Wheeler Insulated Wire Co., Inc., Conn., 1

Measuring Equipment, see: 41, 66, 67, 68, 69

40. Metals: Base.

1—Copper, 2—Ferrous, 3—Non-ferrous, excluding Copper. 4—Powdered. 5—Precious & Rare.

Alpha Metals, Inc., N.Y., 3, 4
Aluminum Co. of America, Pa., 3, 4
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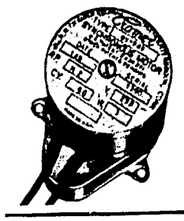
Mackay, A. D., N.Y., 1-5
Magnetic Core Corp., N.Y., 4
Makepeace Co., D. E., Mass., 5
(Continued on page 147)

Cramer

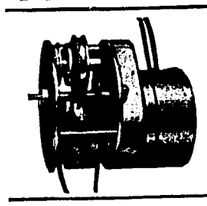
SYNCHRONOUS MOTORS - ELECTRIC TIMERS

A wide range of timing devices, extensively used on electrically-operated commercial and industrial equipment where accurate, dependable timing is essential to insure efficient product performance . . . to add convenience of operation . . . to prevent work spoilage and protect equipment itself. We are frequently called upon to design special equipment to meet specific requirements . . . consult us about your timing problems. Write for complete information.

The R.W. CRAMER Co., Inc., Box #22, Centerbrook, Conn.



TYPE SX SYNCHRONOUS MOTORS — Widely used for instrument and control applications requiring constant speed at a given frequency. Powerful, precision-built. Produce an exceptionally high torque. Available with output speeds from 60 RPM to 1/24 RPH.

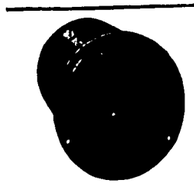


TYPES SCS-SCR CLUTCH MOTORS — Designed to meet the needs of many timing, recording, indicating and switching applications requiring reset operation. TYPE SCS — standard clutch type. Type SCR — reversible clutch type.

TYPE IE INTERVAL TIMERS — Setting to any desired time opens one load circuit, closes another, starting time cycle. Restores to normal position at end of time interval. Designed to control electrically operated equipment such as mixers, X-ray machines, ovens, plating processes, etc.

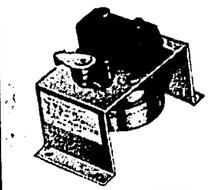
TYPE IG INTERVAL TIMERS — Holds one or two circuits either open or closed for pre-set time and returns them to original position at end of interval. Used for built-in applications in microfilming equipment, battery chargers, therapeutic machines, etc.

TYPE RE RESET TIMERS— Automatically closes one circuit and opens another for a pre-set time when started. Used for control of process work where accuracy of repeat operation is required — on copying machines, laboratory equipment, photo printers, etc.

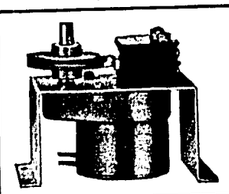


TYPE TE TIME DELAY RELAYS — Provides adjustable time delay between closing of control circuit and subsequent closing or opening of load circuit. Used to control heat treating equipment, shakers, etc.

TYPES TEC - TER TIME DELAY RELAYS — Provide an adjustable time delay between operation of a control circuit and subsequent closing or opening of load circuit. Used in industrial controls for heat treating, lapping, grinding, induction heating, mixing, etc.



TYPE TF2 TIME DELAY RELAYS — Provide a fixed time delay between closing of control circuit and opening or closing of one or two load circuits. Used to protect high voltage electronic tubes, control of signalling devices, machines or process control, etc.

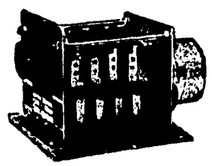


TYPES CF3 - CF6 CYCLE TIMERS — For built-in applications where from one to eight circuits are to be controlled in accordance with a predetermined program — commercial dishwashers, ice-making units, to reverse motors, to operate motors, solenoid valves, etc.

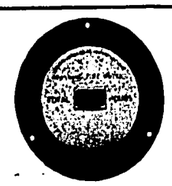
TYPE V PULSE TIMERS — Continuously electrical impulses of a definite set duration at end of successive identical time intervals. Used for control of automatic lubricators, conveyors, pumps, electron tube testing, etc.

TYPE DU DUPLEX CYCLE TIMERS — Designed to open or close one or two load circuits continuously or to perform one complete cycle and stop. Used to control idle and running time of machines, periodic feeding of chemicals to boilers, etc.

TYPE PE PERCENTAGE TIMER — Designed to control percent of time in which electrical circuit is closed or open out of definite time cycle. Used to regulate input to electrically operated furnaces, ovens or heaters, etc.



TYPE M MULTI-CONTACT TIMERS — Designed to control automatically a number of electrical circuits in predetermined sequence. Used to control a series of machine operations, to reverse motors, valves, signals or combinations in sequence, etc.

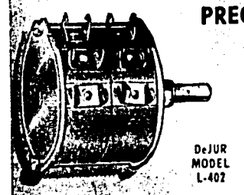


TYPE E RUNNING TIME METERS — Designed to cumulatively register total operating or idle time of any circuit, machine or system. Used to record operating time of vacuum tubes, to forecast need for servicing of machines, etc.

OVER 30 YEARS OF PRECISION ELECTRICAL EXPERIENCE

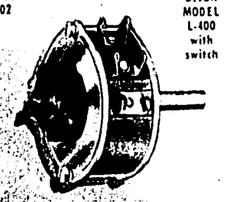
DeJUR

PRECISION *Potentiometers*



SERIES L-400

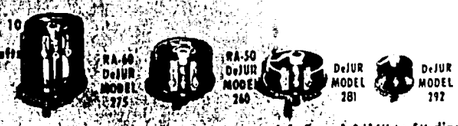
DeJUR MODEL L-402



DeJUR MODEL L-400 with switch

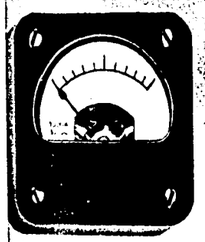
To meet the increasing demand for small compact precision potentiometers for military airborne instrumentation and similar applications, DeJUR is now producing the L-400 series potentiometers, built to rigid mechanical and electrical requirements of JAN-R-19 specifications.

FEATURES:
- 1½" diameter
- 3 watts fully enclosed
- 5 to 125,000 ohms
- accuracy up to 0.5%
- linearity up to 0.1%
- 300° rotation mechanical and electrical
- on-off switch
- ganging up to 10 units
- double end shafts available



RA-60 DeJUR MODEL 275 · RA-50 DeJUR MODEL 260 · DeJUR MODEL 281 · DeJUR MODEL 192

Built to JAN-R-19 specifications. Other models from 1-3/16" to 5" diameter.



1½" *Panel* INSTRUMENTS

Also available • 2½" • 3½" • 4" panel meters in all standard ranges. JAN-1-6 and A. S. A.

- DC VOLTMETERS
- AMMETERS
- MILLIVOLT METERS
- MILLIAMMETERS
- AC RECTIFIER TYPES (self-contained).

DeJUR MODEL 112

DeJUR MODEL 120

Aluminum Case • One Hole Ring Mounting.

FEATURES: Precision built DeJUR 1½" instruments for applications where space must be conserved • DeJUR rugged construction • Both models in all ranges and sensitivities • External shunts and multipliers available for various ranges • Complete magnetic shielding and methods of lighting scale • Approved source for government services meets JAN specifications.

Power RHEOSTATS

Built to JAN-R-22 specifications, DeJUR Rheostats are available in 25 or 50 watt sizes, single or dual ganged. Resistances up to 50,000 ohms in the 25 watt size and 75,000 in the 50 watt size.

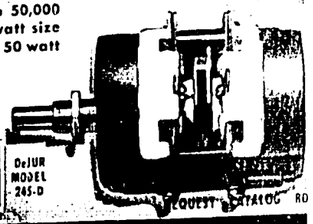
DeJUR MODEL 241

All Metal Construction

DeJUR MODEL 245

For Further Information Write Dept. R-81

DeJUR MODEL 245-D



REQUEST CATALOG RD

DeJUR AMSCO CORPORATION

45-01 NORTHERN BOULEVARD, L. I. C. 1, N. Y.

MANUFACTURERS OF PRECISION EQUIPMENT FOR OVER A QUARTER OF A CENTURY

• CAMERAS • PROJECTORS • ENLARGERS • EXPOSURE METERS •

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41. Meters.

1—Ammeters.
2—Elapsed Time.
3—Frequency Indicating.
4—Voltmeters.
5—Volume level. Meters (db & vu).
6—Wattmeters & Watt Hour Meters.

Aero Instrument Co., Calif., 2, 3
Airmec Labs. Ltd., England, 2, 3, 4
American Chronoscope Corp., N.Y., 2
Audio Instrument Co., N.Y., 5
Automatic Temp. Control Co., Inc., Pa., 2
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Cramer Co., Inc., The R. W., P.O. Box 22, Centerbrook, Conn., 2
For details see ad on page 146

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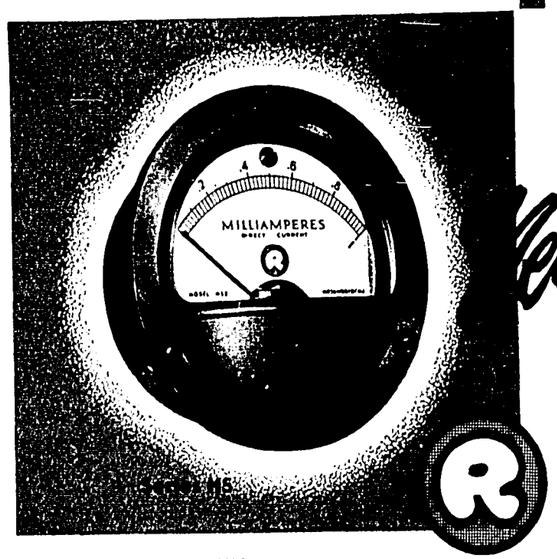
MARION

means the *most* in meters



New MARION *RUGGEDIZED* METERS HERMETICALLY SEALED

Series HS

Standard 1½", 2½" Mr 26 Series, 3½" Mr 36 Series, and 4½" sizes. Extremely accurate and sensitive in any application, even under critical conditions of Shock, Vibration, Mechanical Stress, Strain, Weather Conditions and Climate. Gives faster response time, more sustained accuracy, lower bearing friction and longer life. Meet dimensional requirements of JAN-I-6. Completely interchangeable with standard 2½" and 3½" types.

Series HM

SEALED LIKE A VACUUM TUBE FOR GUARANTEED PERFORMANCE

Magnetically shielded. 2½" & 3½". Hermetically Sealed. Unaffected by heat, cold, humidity, giving peak performance with critical accuracy. Interchangeable round and square colored flanges for different panel needs. One year unconditional guarantee on materials and workmanship. Extra guarantee for replacement of burned out or abused hermetically sealed meter. (On flat fee basis, $1.50 for 200 microamps upward; $2.50 if more sensitive than 200 microamps.)

HM 2 HM 3

Large, 4½" × 4⅛". Gives critical readability on 100° scale. Alnico V magnets for sensitive range; heavy Alnico for standard ranges. Extreme accuracy assured. Designed for permanent and portable test equipment.

Model 55

Marion Null Indicators are extremely sensitive shaded pole piece D'Arsonval type galvanometers. They are used primarily as bridge and potentiometer balance indicators and in any application where an instrument with very high sensitivity about the zero or balance point is desired. We particularly recommend Types HM2 and HM3 because they are hermetically sealed instruments which completely shield the galvanometers from the effects of moisture and dirt, and external factors. Ideal for use in discriminator alignment of FM receivers and as general laboratory balance indicators.

Null Indicators

Space saver, yet has superior damping characteristics. Available in standard 2½" square (Model 52S). Dependable, extra strong — has well-aged Alnico magnet and heavy flanged construction. Popular for pocket test, portable radio, medical equipment and general electrical service where size and dependability count.

Model 52N

Model 56

New 6½" × 5¼" bakelite cased meter. Easy reading at a distance. Large open face has 100° scale in 5½" arc. Room for multirange scale if needed. Milliamp ranges are Alnico II constructed, Alnico V for microamps. Strong, accurate, efficient, dependable.

Model 57S

Superb milliameter — more than a mere overgrown 3 incher. 8½" × 7", open face, extra long scale. Enlarged pole shoes — higher torque movement — higher damping factor. Accurate within 1%. Used in large vacuum tube voltmeters, multitesters and production testing.

Model 53SN

Standard commercial 3½" rectangular type. Also available in 3½" JAN Spec., round case. All Alnico construction. Excellent scale distribution characteristics. Ideal for portable test equipment and general electronic equipment application.

A Special Marion Service

In addition to manufacturing the finest standard electrical indicating instruments money can buy, Marion will design, engineer and manufacture precision products to meet your most exacting requirements. Let Us quote on your specifications. Write the Marion Electrical Instrument Company, Canal Street, Manchester, New Hampshire.

M·E marion meters

MARION ELECTRICAL INSTRUMENT COMPANY 408 Canal Street, Manchester, New Hampshire. Export Division, 458 Broadway, New York 13, U.S.A., Cables MORHANEX. In Canada: The Astral Electric Company, 44 Danforth Road, Toronto, Ontario

Timers by the A. W. HAYDON CO.

A. W. Haydon's timing devices are specified where performance is paramount. Let us apply our 20 years experience to your electrical timing and control problems.

CHRONOMETRIC D. C. GOVERNED TIMING MOTOR

- Extreme accuracy — 1/10 of 1%.
- Wide range of voltage, temperature, load.
- Light weight . . . Compact.
- Reversible.

TIME DELAY RELAY WITH ADJUSTABLE DIAL A.C. OR D.C.

- Wide selection of time range.
- Features ease of adjustment.
- Flexible, compact design.
- Positive operation.

REPEAT CYCLE TIMER A.C. OR D.C.

- Durable . . . Long Life.
- Wide range of time cycles.
- Multiple controlled circuits.
- Easily adaptable to meet specific requirements.

ELAPSED TIME INDICATOR A.C. OR D.C.

- Exceptionally compact and accurate.
- Registers tenths of minutes, minutes, tenths of hours, hours.
- Also available in aircraft instrument housing.

D.C. TIMING MOTOR

- Rugged Accurate Reliable.
- Compact . . . Reversible . . . Variable Speed.
- Special windings available for operation from vacuum tubes or as tachometer generator.

HERMETICALLY SEALED TIMER

- Maximum protection against weather, humidity, explosive atmospheres and high altitude.
- Light weight, corrosion-resistant enclosure.
- Flexible design.

STANDARDIZED A.C. TIMING MOTOR

- High starting and running torque.
- Synchronous Hysteresis Type.
- Extremely quiet in operation.
- Capillary Lubrication.

Design and Manufacture of Electrical Timing Devices

THE A. W. HAYDON COMPANY

240 North Elm Street, Waterbury 20, Connecticut

Meters

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Palmer, Inc., M. V., Wash., 3, 5

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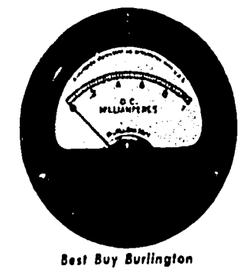
FOLLOW THE PARADE TO THE *New* Burlington *Hermetically Sealed* INSTRUMENT

JUST PLAIN RUGGED . . . yet an instrument of highest QUALITY . . . PRECISION . . . ACCURACY

The Burlington "Hermetically Sealed" *Instrument* was designed and is manufactured to conform to JAN specifications for sealed *instruments*.

- Steel case with heavy copper-cadmium plate and black finish.
- Excellent shielding due to case material and construction.
- Double strength clear glass.
- Black satin onodized aluminum bezel.
- Glass to metal seal under controlled humidity and temperature conditions.
- D'Arsonval permanent magnet type movement for DC applications.
- Designed to enhance panel appearance.
- Available in 1½" square, 2½" and 3½" round case types.
- Guaranteed for one year against workmanship and materials.



Best Buy Burlington

BURLINGTON INSTRUMENT COMPANY
DEPT. 1-51, BURLINGTON, IOWA

There's a NEW SILHOUETTE on the Microphone Horizon . . .

MODEL 55s
List Price $72.50

The New Small Unidyne is approximately only half as large as the Standard Unidyne.

The NEW ULTRA-CARDIOID DYNAMIC 55s "THE PERFECT PERFORMER"

SMALL Unidyne

- Eliminates Feedback Problems
- Permits performer to stand farther from the microphone

This mighty, though little, Microphone, is the *only* small-size, uni-directional moving-coil dynamic microphone! With this "Perfect Performer," all the important directional qualities are retained. This New Small "Unidyne" Model 55s offers superior performance, featured in a streamlined, small, functionally designed case. The 55s is actually a new Microphone retaining all the highly desirable features of the Model 55 "Unidyne."

The internal unit is based on the Shure-patented "Uni-Phase" principle. The moving-coil system has a high over-all efficiency and smooth frequency response. A large air-gap clearance and a rugged coil construction provide immunity of the moving-coil system to abnormal atmospheric conditions and severe mechanical shocks.

The New Small "Unidynes," Models 55s and 556s, are not replacements for the current Models 55 and 556 "Unidynes." The regular "Unidynes" will not be discontinued. Let your customers decide which they prefer of these four outstanding microphones.

"not 2 but 4!"

Model 55s Small Unidyne	Code: RUDOT	List Price: $72.50
Model 556 Small Broadcast	Code: RUDOV	List Price: 100.00
Model 55 Standard Unidyne	Code: RUMUL	List Price: 72.50
Model 556 Standard Broadcast	Code: RUMUB	List Price: 100.00

Patented by Shure Brothers, Inc.

SHURE

SHURE BROTHERS, Inc. ★ MANUFACTURERS of MICROPHONES and ACOUSTIC DEVICES

225 W. Huron St., Chicago 10, Illinois • Cable Address: SHUREMICRO

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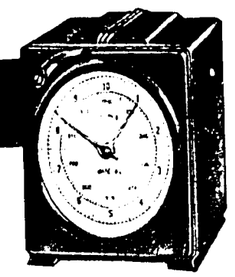
Standard TIMERS



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 min	±.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 153.

THE Standard Electric Time Co.

97 Logan Street STANDARD FOUNDED 1884 Springfield, Mass.

Meters

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Sangamo Electric Co., Ill., 6
Sensitive Research Inst. Co., N.Y., 1, 4
Sierra Electronic Corp., Calif., 4
Simpson Electric Co., 5200 W. Kinzie St., Chicago 44, Ill., 1, 4, 5, 6
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Supreme, Inc., Miss., 1, 4
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Tech-Instrument Co., Mass., 4
Telex [illegible] Minn., 4
Triplett Electrical Inst. Co., Ohio, 1, 3, 4, 5
Walkart Co., The, Calif., 3
Welch Scientific Co., W. M., Ill., 3, 4
Westinghouse Electric Corp., Pa., 1, 4, 6
Weston Electrical Instr. Corp., 628 Frelinghuysen Ave., Newark 5, N.J., 1-6
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42. Microphones.

1 Carbon. 2 Condenser. 3—Crystal. 4 Magnetic.

Altec Lansing Corp., Calif., 2, 4
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Connecticut Tel & Elec. Div., Conn., 1
Dominion Sound Equipments Ltd., Canada, 2, 3, 4
Eastern Mike-Stand Co., N.Y., [illegible]
Electro Voice, Inc., Mich., 1 [illegible] 4
[illegible] Corp., N.J., 3
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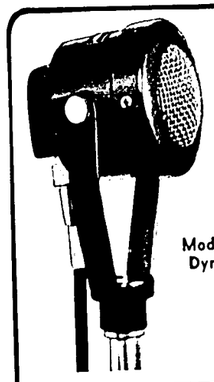
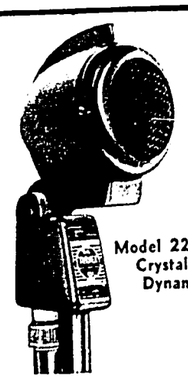
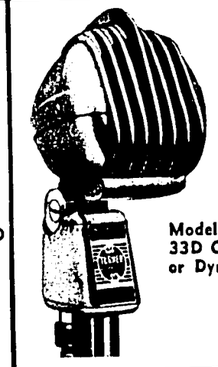


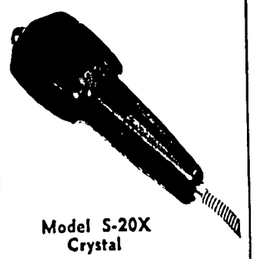
Model 99
Dynamic



Model 22X-22D
Crystal or
Dynamic



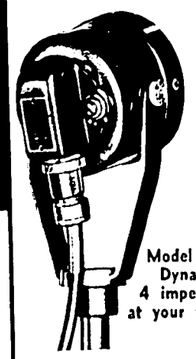
Model 33X-
33D Crystal
or Dynamic



Model S-20X
Crystal

FOR SOUND PERFORMANCE *Specify* TURNER

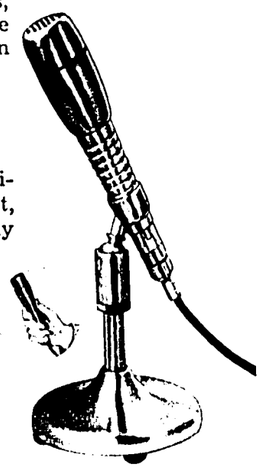
Turner Microphones invite comparison from every angle. Compare the style, ruggedness, dependability, performance and price. Name the job — there's a Turner Microphone you can specify with confidence. Write for literature.

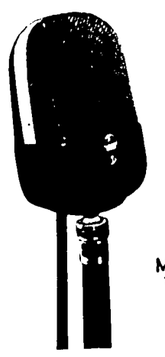


Model U9S
Dynamic
4 impedances
at your fingertips

The Aristocrat Model 50D

World's finest dynamic. Laboratory calibrated. For TV, FM, AM. Broadcast, recording and public address. No closely associated auxiliary equipment required. Response: 50 - 15,000 c.p.s. flat within ± 2½ db. Level: 56 db below 1 volt/dyne/sq. cm.

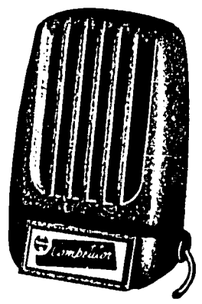




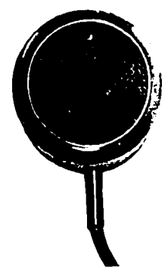
Model 87
Velocity

The "Competitor" Model 60X

A new low priced crystal desk and hand microphone for economical recording and sound systems, dictating machines, etc. High output moisture sealed crystal circuit. Response: 70 - 7000 c.p.s. Level: 52 db below 1 volt/dyne/sq.cm.



Model 9D
Dynamic



Model L-40 Crystal
Lapel Microphone

In Canada:
Canadian Marconi Company, Toronto, Ontario

Export:
Ad. Auriema, Inc., 89 Broad Street, New York 4, N.Y.

Detailed Data on Request

THE TURNER COMPANY
909 17th Street N.E., Cedar Rapids, Iowa

Crystals licensed under patents of the Brush Development Company

Microphones

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RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 4
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Remler Co. Ltd., Calif., 4
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Turner Co., 905-17 St. N.E., Cedar Rapids, Iowa, 1, 3, 4
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Microwave Attenuators, see: 4 sub-head 3

Microwave, Pulse, Radar, Test Equip., see: 69 sub-head 8

43. Monitoring Equipment.

1—Frequency.
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3—Television.

Airmec Labs. Ltd., England, 2
American Electronecring Corp., The, Calif., 1, 2
Berkeley Scientific Corp., 2200 Wright Ave., Richmond, Calif., 1
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Biddle Co., James G., Pa., 1
Browning Laboratories, Inc., 750 Main St., Winchester, Mass., 1, 2
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Canadian General Elec Co. Ltd., Canada, 1, 3
Doolittle Radio, Inc., Ill., 1, 2
DuMont Labs., Inc., Allen B., TV Transmiter, Bldg. 16, 1000 Main Ave., —Clifton, N.J., 3
For details see ad on page 161
Electronic Research & Mfg. Corp., Ohio, 2
Elliott Brothers Ltd., England, 1
Federal Telecommunication Labs., 500 Washington Ave., Nutley 10, N.J., 3
Furst Electronics, Ill., 1
Gates Radio Co., Ill., 1, 2
General Electric Co., N.Y., 1-3
General Elec. Co., Electronics Dept., N.Y., 1-3
General Precision Laboratory, Inc., 63 Bedford Rd., Pleasantville, N.Y., 3
For details see ad on page 234-5
General Radio Co., 275 Massachusetts Ave., Cambridge 3, Mass., 1, 2, 3
For details see ad on page 236-7, back cover
Gray Research & Dev. Co., Inc., 16 Arbor St., Hartford 1, Conn., 3
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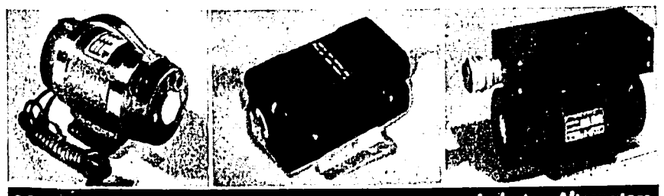
Kent Engineering Co., Ill., 1, 2
Lampkin Laboratories, Fla., 1, 2
Link Radio Corp., N.Y., 1, 2
Marconi Instruments Ltd., N.Y., 1, 2, 3
Motorola, Inc., Comm & Elec. Div., Ill., 1, 2
Northern Radio Co., Inc., 143 W. 22 St., New York 11, N.Y., 1
For details see ad on page 238-9
Philco Corp., Pa., 3
Polarad Electronics Corp., N.Y., 3
Potter Instrument Co., Inc., 115 Cutter Mill Rd., Dept. 5-YB, Great Neck, L.I., N.Y., 1
For details see ad on page 170
Press Wireless Mfg. Co., Inc., N.Y., 1
Pye Ltd., Radio Works, England, 3
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 1, 2, 3
RCA Eng. Prod. Div., Camden, N.J., 1, 2, 3
Radio Engineering Labs., Inc., N.Y., 2
Radio Hispano Suiza, S.A., Spain, 3
Sierra Engineering Co., Calif., 1
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 1
See complete catalog tiled alphabetically in last section
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 3
For details see ad on page 89
Telepoise Radio Co., Ill., 3
West Coast Electronics Co., Calif., 1, 2



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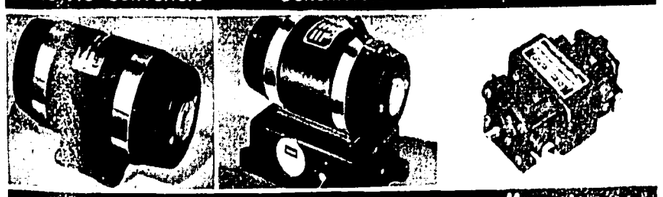

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Made in a wide variety of types and capacities adaptable to communications, [illegible] and industrial applications of many kinds. Famous for dependable performance. Specially engineered for compact size, light weight, long life. Precision built. Widely used for aircraft communications, direction finders, mobile radios, geophysical [illegible] ignition and timing equipment, and many other exacting requirements.

MAIL COUPON FOR FREE CATALOGS

CARTER MOTOR COMPANY
2645 Maplewood Avenue
Chicago 47, Illinois
Please send Converter Catalog and Dynamotor Catalog [illegible] mation on the entire line of Carter Rotary Power Supplies [illegible] distributor.
Name .....
Address .....
City ..... State .....

44. Motor Generators.

1 Dynamotors.
2 Frequency Changers.
3 Motor-Generators.
4 Rotary Converters.

Alliance Manufacturing Co., Ohio, 1
Allis Co., The Louis, Wis., 2, 3, 4
American Television & Radio Co., Minn., 4
Avion Instrument Corp., N.Y., 1
Bendix Avi. Corp., Eclipse-Pioneer Div., Dept. G, Teterboro, N.J., 2, 3, 4
For details see ad on page 154
Bendix Aviation Corp., Red Bank Div., 134 Pearl St., Red Bank, N.J., 1, 3, 4
Electrotech Marine Div., Nat'l Simplex, N.Y., 3
Electric Mfg. Co., N.J., 1-4
Brown Boveri Co., Inc., Ohio, 1, 3
Burke Electric, Div. of Marathon El., Pa., 3, 4
Canadian General Elec. Co. Ltd., Canada, 2, 3, 4
Carter Motor Co., 2645 N. Maplewood Ave., Chicago 47, Ill., 1, 4
For details see ad on page 153
Century Electric Co., Mo., 3
Continental Electric Co., Inc., N.J., 1-4
Elcor, Inc., Ill., 1-4
Electric Machinery Co., Conn., 1, 3
Electro Products Co., The, Ohio, 2, 3
Electro Specialty Co., Conn., 1-4
Electronic Engineering Assoc. Ltd., Calif.
General Electric Co., N.Y., 1-4
Generator Corp., Va., 2, 3, 4
Globe Mfg. & Research Corp., Wis., 2
Goodrich Mfg. Co., Ill., 1, 3, 4

(Continued on page 154)

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PRECISION-BUILT BY

ECLIPSE-PIONEER

GUARANTEED ACCURACY TO WITHIN 15 MINUTES ON ALL PRODUCTION UNITS

For more than 17 years Eclipse-Pioneer has been a leader in the development of high precision synchros for aircraft, marine and industrial applications. Today, thanks to this long experience and specialization, Eclipse-Pioneer Autosyn* Synchros give you a *guaranteed* accuracy of 15 minutes (maximum) on all individual AY 200 type 400 cycle transmitters, differential generators, control transformers and resolvers. Furthermore, this phenomenal accuracy, applies to *all production units* in this series. Where special applications are involved, Eclipse-Pioneer will supply Autosyn Synchros with an even *finer* degree of accuracy. And remember, when you buy from Eclipse-Pioneer, this high precision is yours at the lowest possible cost.

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LOOK FOR THE PIONEER MARK OF QUALITY REG. U. S. PAT. OFF.

Typical Performance Characteristics for one AY-201-3 Autosyn Synchro when transmitting to:

	One Control Transformer	Two Control Transformers	Three Control Transformers
INPUT			
Voltage	26-volts, single-phase	26-volts, single-phase	26-volts, single-phase
Frequency	400 cycles per second	400 cycles per second	400 cycles per second
Current	105 milliamperes	130 milliamperes	155 milliamperes
Power	0.99 watts	1.4 watts	1.9 watts
Impedance	85+j240 ohms	80+j180 ohms	77+j149 ohms
OUTPUT			
Voltage max. (rotor output)	18.0 volts	15.5 volts	13.3 volts
Voltage at null	30 millivolts	20 millivolts	20 millivolts
Sensitivity	315 millivolts/degree	270 millivolts/degree	230 millivolts/degree
Voltage phase shift	18.5 degrees	24.5 degrees	28.0 degrees
System accuracy (max. possible spread)	0.5 degrees	0.5 degrees	0.5 degrees

Other E-P precision components for servo mechanism and computing equipment:

Servo motors and systems • rate generators • gyros • stabilization equipment • turbine power supplies • remote indicating-transmitting systems and special purpose electron tubes.

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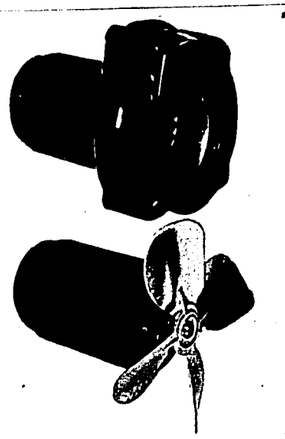
Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.



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IN A SMALL PACKAGE

Ruggedly constructed durable motors (precisionly designed for 400 cycles—60 cycles—variable frequency) operating dependably in equipment requiring specialized performance, are being produced with superior accuracy through the advanced ideas of our designing engineers.

Experimental production, made possible through flexible engineering experience plus experienced production, has resulted in production designs that include motors for fan and blower duty as well as power and drive motors; these will be made exclusively for the electronic industries supplying equipment for military applications.

Our is an experienced organization with engineering model shop and electrical laboratory for prototypes—this means you gain personnel with "know how" to solve your special motor and A.C. power problems.

Rugged construction of our motors demands a one piece solid die cast housing with machined cover for back bearing (ball type used throughout), thru bolts, and riveted stator. This insures a continuation of excellent performance after high impact tests by maintaining a concentric air gap at all times.

We are stocked with fans and blowers of the standard types (as illustrated), and are constantly developing special models to meet your exacting needs.

WRITE OR CALL

AIR MARINE MOTORS INC.

2183 JACKSON AVENUE, WAntagh 2-7309 SEAFORD, L. I., N. Y.

Motor Generators

(Continued from page 153)

Horlick Co., William I., Mass., 1, 2, 3, 4
Keene Electrical Machinery Co., Ill., 3
Kollsman Instrument Corp., 80-08 45 Ave., Elmhurst, L.I., N.Y., 3
For details see ad on page 110
Lear, Inc., Mich., 1, 3
Leland Electric Co., Ohio, 2, 3
Link Radio Corp., N.Y., 1, 3, 4
Marathon Elec. Mfg. Corp., Wis., 1, 2, 3, 4
Pioneer Elec. & Research Corp., 7212 Circle Ave., Forest Park, Ill., 2
For details see ad on page 117
Pioneer Gen-E-Motor Corp., Ill., 1-4
Plessey International, Ltd., England, 1, 3, 4
Reeves Equipment Corp., N.Y., 3
Reeves Instrument Corp., N.Y., 3
Russell Electric Co., Ill., 1-4
Westinghouse Electric Corp., Pa., 1, 4
Wincharger Corp., Iowa, 4

45. Motors: Very Small.

1—Blower Motors. 2—Syncro Controls. 3—Timing Devices.

Air-Marine Motors, Inc., 2183 Jackson Ave., Seaford, L.I., N.Y., 1
For details see ad on page 154
Amglo Corporation, Ill., 3
Ampex Electric Corp., Calif., 2
Arma Corp., N.Y., 2
Atlas Coil Winders, Inc., 392 State St., Stamford, Conn., 1, 2
For details see ad on page 80
Automatic Temp. Control Co., Inc., Pa. 2, 3
Avion Instrument Corp., N.Y., 2
Barber-Colman Co., Ill., 1-3
Bendix Aviation Corp., Eclipse-Pioneer Div., Teterboro, N.J., 2
For details see ad on page 154
Bendix Aviation Corp., Red Bank Div. 134 Pearl St., Red Bank, N.J., 1
Brown-Brockmeyer Co., The, Ohio, 1
Buehler & Co., Ill., 3
Century Electric Co., Mo., 1
Cole Instrument Co., Calif., 3
Control Instrument Co., Inc., N.Y., 2
Control Systems Co., N.Y., 1, 3
Cramer Co., Inc., The R. W., P.O. Box 22, Centerbrook, Conn., 2, 3
For details see ad on page 146
Eastern Air Devices, Inc., N.Y., 1
Eicor, Inc., Ill., 1
Electric Indicator Co., Conn., 1, 2, 3
Electyme Motor Products Co p., Ill., 3
Fasco Industries, Inc., N.Y., 2, 3
Ford Instrument Co., Inc., N.Y., 2
Frequency Standards Corp., P.O. Box 62, Eatontown, N.J., 3
For details see ad on page 195
General Electric Co., N.Y., 1, 3
Gibbs Mfg. & Research Corp., Wis., 3
Gothard Mfg. Co., Ill., 1
Haydon Co., The A. W., 240 North Elm St., Waterbury 20, Conn., 3
For details see ad on page 149
Haydon Mfg. Co., Inc., Conn., 3
Keene Electrical Machinery Co., Ill., 1
Ketay Manufacturing Co., N.Y., 2
Kollsman Instrument Corp., 80-08 45 Ave., Elmhurst, L.I., N.Y., 1, 2
For details see ad on page 110

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Motors: Very Small

(Continued from page 154)

Kurman Electric Co., 35-18 37 St., Long Island City 1, N.Y., 3
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Lear, Inc., Mich., 1, 2
Manufacturers Research Corp., M.D., 3
Marathon Elec. Mfg. Corp., Wis., 1
Minneapolis-Honeywell Reg. Co., Minn., 3
Pioneer Gen-E-Motor Corp., Ill., 1
Reeves Instrument Corp., N.Y., 2
Rotron Mfg. Co., Inc., 7-9 Schoonmaker Lane, Woodstock, N.Y., 1
For details see ad on page 66
Russell Electric Co., Ill., 1, 2
Servo-Tek Products Co., Inc., N.J., 1, 3
Specialty Battery Co., 212 E. Washington Ave., Madison 10, Wis., 1
For detail see ad on page 65
Sperry Gyroscope Co., Div. Sperry Corp., Great Neck, L.I., N.Y., 2
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Square Root Mfg. Corp., N.Y., 2
Stancil-Hoffman Corp., Calif., 2
Telechron, Inc., Mass., 3
Thomas Clock, Seth, Conn., 3
Transicoil Corp., 107 Grand St., New York 13, N.Y., 2
For details see ad on page 55
Wil-Mar Co., Mass., 3

46. Moulded Products & Services.

1—Cabinets. 2—Insulators. 3—Knobs & Parts. 4—Proprietary Mouldings. 5—Special Fabrication.

A. B. Metal Products Ltd., England, 3, 4
Akron Rubber Co., N.Y., 5
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 3, 5
For details see ad on page 114
American Communications Corp., N.Y., 5
American Insulator Corp., Pa., 1, 3
American Lava Corp., Cherokee Blvd. & Mfrs. Rd., Chatanooga 5, Tenn., 2
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American Phenolic Corp., 1830 S. 54 Ave., Chicago 50, Ill., 5
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Anchor Industrial Co., N.Y., 5
Atlantic India Rubber Works, Inc., 571 W. Polk St., Chicago 7, Ill., 2, 3
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Aymond Sales Co., Texas, 3
Bendix Avi., Corp., Scintilla Magneto Div., Sherman Ave., Sidney, N.Y., 4
Biwax Corp., 3445 Howard St., Skokie, Ill., 2, 3
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Burke Electric, Div. of Marathon El., Pa., 5
Canadian General Elec. Co., Ltd., Canada, 1-5
Central Rediffusion Services Ltd., England, 5
Chicago D 2 Mold Mfg. Corp., Ill., 1, 2, 3, 4
Cinch Mfg. Corp., Ill., 2, 4, 5
Cincinnati Molding Co., Ohio, 2, 3, 5
Citation Products Co., N.Y., 2, 5
Creative Plastics Corp., N.Y., 1, 2, 3, 5

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BUMPERS • BUSHINGS • EXTRUSIONS
GASKETS • GROMMETS • MOLDS • RINGS
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All Phones HArrison 7-8290

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INDUSTRIAL RUBBER PRODUCTS

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Croname, Inc., Ill., 3
Dimco-Gray Corp., Ohio, 2, 3, 4
Du Plate Canada Ltd., Canada, 1, 2, 4, 5
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa., 2, 3, 4, 5
For details see ad on page 125
ELCO Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa., 2, 3
For details see ad on page 185
Electro Development Corp., Calif., 4, 5
Electronic Mechanics, Inc., 68 Clifton Blvd., Clifton, N.J., 2, 4, 5
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Emerson Radio & Phonograph Corp., N.Y., 1, 3
Erie Resistor Corp., Erie, Pa., 1-3, 5
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Ethylene Chemical Corp., N.J., 5
Federal Electric Products Co., N.J., 2, 3, 4
Felsenthal & Sons, Inc., G., Ill., 1, 3, 5
Formica Co., Ohio, 5
Gee-Lar Manufacturing, Ill., 3
General Cement Mfg. Co., Ill., 3
General Ceramics & Steatite Corp., Plant 3, Crows Mill Rd., Keasbey, N.J., 2, 5
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General Electric Co., N.Y., 1-5
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 3
For details see ad on page 236-7, back cover
Gombos Co., Inc., John, 103 Montgomery Ave., Irvington 11, N.J., 5
For details see ad on page 91
Grayhill, Ill., 5
Heldor Mfg. Co., Div., Heldor Bushing & Terminal Co., Inc., 225 Bloomfield Ave., Dept. P, Bloomfield, N.J., 2
For details see ad on page 124
Industrial Devices, Inc., N.J., 4, 5
Insulation Manufacturers Corp., Ill., 2, 5
Insulation Products Co., Pa., 2, 3
Jeffers Electronics, Inc., Pa., 5
Johnson Co., E. F., Minn., 3
Kaywoff Products Co., Neb., 3, 4, 5
Keller Products, Inc., N.H., 1-5
Keystone Electronics Co., N.Y., 2, 5
Kilburn Glass Co., Inc., J. R., Mass., 2, 5
Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe 7, N.Y., 2, 5
For details see ad on page 85, 130
Klise Mfg. Co., Mich., 2-5
Lapointe-Plascomold Corp., Conn., 5
Lunn Laminates, Inc., N.Y., 1, 2, 5
Maico Co., Inc., The, Minn., 3
Melpar, Inc., Va., 5
Millen Mfg. Co., Inc., James, Mass., 3, 4, 5
Mills Corp., Elmer E., Ill., 1, 3
Molded Insulation Co., Pa., 1-4
Modern Mfg. Services, N.Y., 2-5
Mycalex Corp. of America, 30 Rockefeller Pl., New York 20, N.Y., 2, 5
For details see ad on page 28, 246-7
Mykroy, Inc., Ill., 2
National Co., Inc., Mass., 2, 3
National Moldite Co., N.J., 5

(Continued on page 157)

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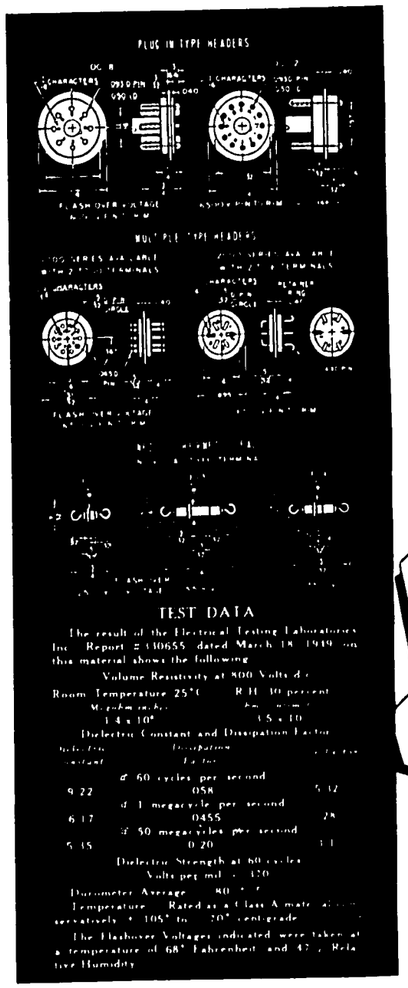
Hi Points in Hermetic Sealing!



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ROTARY WATERSEAL PANEL ASSEMBLIES — These units have an excellent five year customer history on gas filled pressurized components. They are available for 1/4" shafts and for potentiometers and switch bushings.

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LINE CORDS WITH PLUGS FOR EUROPEAN USE, HERMETICALLY SEALED — These units are completely sealed at the plug and are being used on pressurized units.

GASKETS, METER, PANEL, COVER, ETC. Molded from Neoprene for complete sealing.

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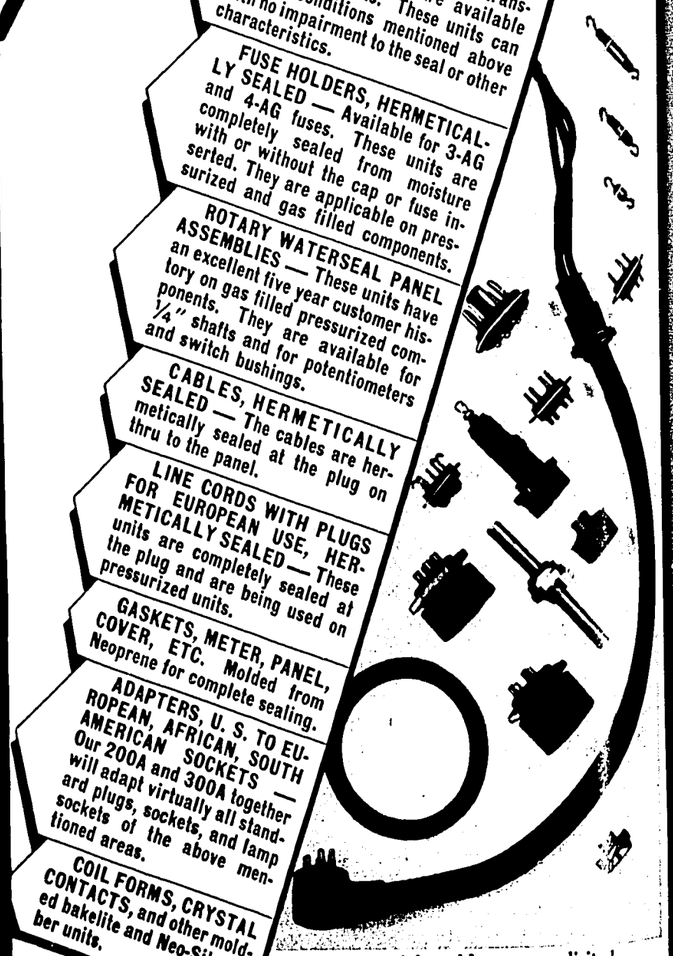
COIL FORMS, CRYSTAL CONTACTS, and other molded bakelite and Neo-Sil rubber units.



Your special problems are solicited.

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Moulded Products & Services

(Continued from page 155)

Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J., 5
For details see ad on page 156
Optical Film Eng. Co., Pa., 5
Panelyte Div., St. Regis Sales Corp., N.Y., 4, 5
Patent Button Co. of Tennessee, 2006 Century St., Knoxville, Tenn., 3, 5
For details see ad on page 135
Plax Corp., Conn., 2, 5
Preston-Eidson Electronics Co., Calif., 1
Quality Components, Inc., Pa., 5
Radio (1936) Ltd., New Zealand, 1, 3, 5
Remler Co., Ltd., Calif., 1-4
Resistoflex Corp., Belleville 9, N.Y., 2, 5
For details see ad on page 133
Richardson Co., The, Ill., 4, 5
Rogan Brothers, 2508 Irving Park Blvd., Chicago 18, Ill., 3
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Rohden Mfg. Co., 4739 Montrose Ave., Chicago 41, Ill., 3, 5
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Santay Corp., Ill., 1, 3, 5
Smith & Stone Limited, Canada, 4, 5
Specialty Insulation Mfg. Co., Inc., N.Y., 1-5
Square Root Mfg. Corp., N.Y., 2, 3, 4, 5
Stelon, Inc., N.J., 5
Stokes Molded Products, Inc., N.J., 4, 5
Stupakoff Ceramic & Mfg. Co., Box 390, Hillview Ave., Latrobe, Pa., 2
For details see ad on page 64
Superior Plastics, Ill., 1, 3, 4, 5
Superior Porcelain Co., W.Va., 2
Sylvania Electric Products Inc., Dept. R-6351, Emporium, Pa., 3, 5
For details see ad on page 42
Syracuse Ornamental Co., N.Y., 3, 4, 5
Vertrod Corp., N.Y., 3, 4, 5
Wadsworth Mfg. Associates, N.Y., 1, 3, 5
Winslow Co., Inc., N.J., 3

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A Complete Line of Radio and Television KNOBS

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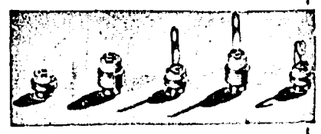

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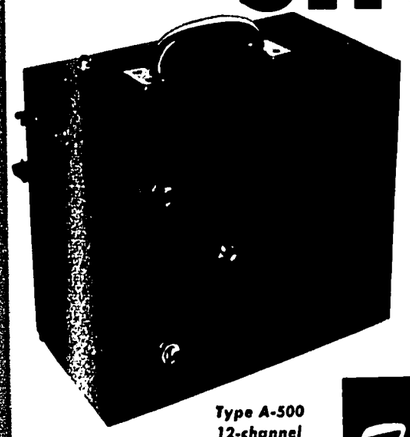

- Portable
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Back Video Corp., F. G., N.Y.
Camera Equipment Co., N.Y.
Clarkstan Corp., Calif.
Fish-Schurman Corp., N.Y.
Gaertner Scientific Corp., Ill.
General Electric Co., N.Y.
Glens Falls Laboratory, Inc., N.Y.
Gray Research & Dev. Co., Inc., 16 Arbor St., Hartford 1, Conn.
For details see ad on page 162
Larrimore Sales Co. Mfg. Div., Mo.
Manufacturers Research Corp., Md.
Metaplast Process, Inc., N.Y.
Miller Corp., William, Calif.
Multi-Tron Lab., Ill.
National Photocolor Corp., N.Y.
North American Philips Co., Inc., N.Y.
Panero Mirrors, Inc., Calif.
Perkin-Elmer Corp., The, Conn.
Process & Instruments, N.Y.
Servo Corp. of America, 20-20 Jericho Tnpke., New Hyde Park, L.I., N.Y.
For details see ad on page 166
Television Zoomar Corp., N.Y.
Thall Plastic Engineering Co., N.Y.
Translux Corp., Teleprocess Div., N.Y.
Waters, Inc., Robert A., Mass.
Zenith Optical Laboratory, N.Y.

Oscillators, see: 66 subhead 1; 69 subhead 2, 3, 4, 5

48. Oscillographs & Accessories

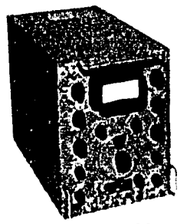
1—General Purpose, Cathode Ray.
2—Recording.
3—Recording.
Cameras.
4—Synchroscopes, Cathode Ray.
5—UHF C-R Equip.

Aero Electronics Co., Ill., 1, 2
Airmec Labs. Ltd., England, 1-3
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 2
For details see ad on page 114
Approved Electronic Instr. Corp., 142 Liberty St., New York 6, N.Y., 1
See complete catalog filed alphabetically in last section.
Avimo Ltd., England, 2
Beta Electric Corp., 333 E. 103 St., New York 29, N.Y., 1
For details see ad on page 167
Browning Laboratories, Inc., 750 Main St., Winchester, Mass., 1, 4
See complete catalog filed alphabetically in last section.
Brush Development Co., Ohio, 2
Cambridge Instrument Co., N.Y., 3
Canadian General Elec. Co. Ltd., Canada, 1

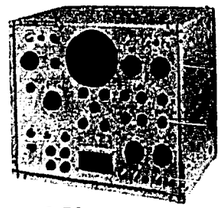
(Continued on page 159)

THE WATERMAN LINE-UP

PULSESCOPES

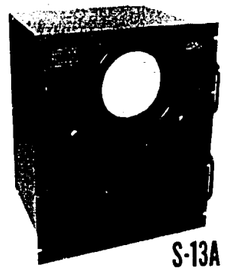


S-4A

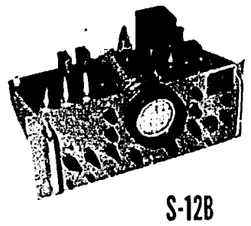


S-5A

RAKSCOPES



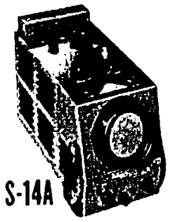
S-13A



S-12B

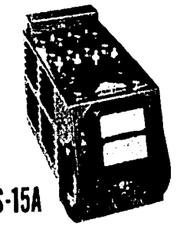
POCKETSCOPES

S-11A



S-14A

S-14B



S-15A

S-10B

CONDENSED TABLE OF SPECIFICATIONS

		S-4A	S-5A	S-10B	S-11A	S-12B	S-13A	S-14A	S-14B	S-15A
CR TUBE	QTY & TYPE	1—3KP1	1—3JP1	1—2AP1	1—3MP1	1—3RP1	1—7GP4	1—3RP1	1—3RP1	2—3SP1
	VOLTAGE	1000	3000	350	560	920	3000	900	900	900
SCOPE	CHANNELS & TYPE	1—AC	1—AC	1—AC	1—AC-DC	1—AC-DC	1—AC-DC	1—AC-DC	1—AC-DC	2—DC
	MARKERS μs	10 and 50	.2 to 500	.....	.....	.....	.....	.....	.....	.....
	CALIBRATION	YES	YES	.....	.....	.....	.....	YES	YES	YES
VERTICAL RESPONSE	MAX. RMS V/IN	.24	0.04	1.0	.1	0.05	0.05	0.01	0.05	0.01
	SINE CPS —2DB	2—8.5 MC	6—7 MC	20—150 KC	0—200 KC	0—200 KC	0—600 KC	0—180 KC	0—700 KC	0—180 KC
	PULSE RISE μs	0.035	0.045	.....	2	1	0.4	1.8	0.35	1.8
HORIZONTAL RESPONSE	MAX. RMS V/IN	.....	3	1.0	0.1	0.05	0.05	0.015	0.15	1.0
	SINE CPS —2DB	.....	2—700 KC	20—150 KC	0—200 KC	0—200 KC	0—600 KC	0—180 KC	0—200 KC	0—150 KC
	PULSE RISE μs	.....	0.5	.....	2	1	0.4	1.8	1.8	3
LINEAR TIME BASE	RANGE IN CPS	80—800 KC	8—800 KC	10—50 KC	3—50 KC	5—50 KC	0.5—50 KC	0.5—50 KC	0.5—50 KC	0.5—50 KC
	TYPE	REP—TR—A—R	REP—TR	REP	REP	REP—TR	REP—TR	REP—TR	REP—TR	REP—TR
CASE	SIZE (APPROX.)	17x9x11	13x16x14	10x4x6	11x5x7	9x19x7	14x19x21	12x6x7	12x6x7	12x6x7
	WEIGHT	31.5	60	5	8¼	30	110	12¾	14	16¼
POWER	INPUT—WATTS	150	215	23	43	80	330	50	70	75

RAYONIC C-R TUBES (Available in P1-P2-P7 and P11 Phosphor)

3 SP

3 MP

TYPICAL OPERATION

TUBE	VOLTS ANODE #2	VOLTS ANODE #1	VOLTS GRID #1	V/IN D1, D2	V/IN D3, D4	MAX. VOLT ANODE #2	MAX. VOLT ANODE #1	VOLTS HEATER	CURRENT HEATER
3SP	1000	165 to 310	—28 to —67	73 to 99	52 to 70	2750	1100	6.3	.6 Amp.
	2000	330 to 620	—58 to —135	146 to 198	104 to 140				
3MP	1000	200 to 350	0 to —68	140 to 190	130 to 180	2500	1000	6.3	.6 Amp.
	2000	400 to 700	0 to —126	280 to 380	260 to 360				

For further information write to

WATERMAN PRODUCTS COMPANY, INC.

PHILADELPHIA 25, PA., U. S. A.

Cable Address "Pokebscope Phila."

WATERMAN PRODUCTS

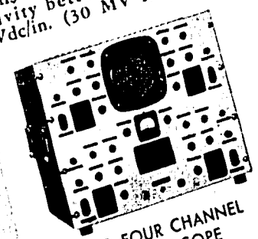
...FOR CRITICAL ANALYSES

H-21 DUAL CHANNEL OSCILLOSCOPE

Indicates 2 independent signals simultaneously. Sensitivity better than 0.085 Vdc/in. (30 MV rms/in.)

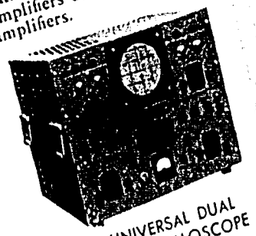
H-45 FOUR CHANNEL OSCILLOSCOPE

Offers choice of any combination of high sensitivity dc amplifiers or wide band ac amplifiers.



H-43 FOUR CHANNEL OSCILLOSCOPE

Designed for strip-film recording of up to 4 variables on a single 5" tube. Readily portable.



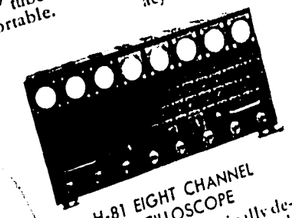
H-22 UNIVERSAL DUAL CHANNEL OSCILLOSCOPE

Plug-in ac or dc amplifiers. Two independent channels on a single tube register phenomena from dc to 1 meg. acycle.

ETC

Multi-Channel Oscilloscopes

As specialists in multi-channel 'scopes, ETC offers a broad line for critical testing, production and research needs. In addition to standard types incorporating 2, 4, and 5 wave forms on a single tube, many special designs and adaptations are regularly produced for specific uses. Full details on any type will gladly be sent on request.



H-81 EIGHT CHANNEL OSCILLOSCOPE

A unique design originally developed for film strip recording of seismographic phenomena. Frequency response 20 to 150,000 cps. A DC model with sensitivity of 2 MV dc in. also available.

MULTI-GUN CATHODE TUBES

The answer to problems involving registration of a multiplicity of transients on a single screen. 2-, 4-, 6-, 8- and 10-gun types. Also a complete line of standard 5" cathode ray tubes.

electronic tube corporation

PHILADELPHIA 18, PENNSYLVANIA

Oscillographs

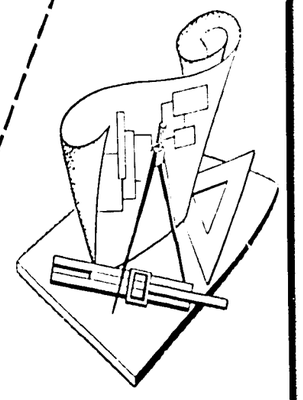
(Continued from page 157)

Central Research Labs., Inc., Minn., 2, 5
Century Geophysical Corp., Okla., 2, 3
Consolidated Engineering Corp., Calif., 2, 3
Douglas Radio Laboratories, Mass., 1
DuMont Labs., Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N.J., 1
For details see ad on page 161
Edgerton, Germeshausen, & Grier Inc., Mass., 2, 3, 5
Edin Co., Inc., Mass., 2, 4
Electro-Impulse Laboratories, N.J., 5
Electrodyne Co., Mass., 3
Electronic Designs, Inc., N.Y., 1
Electronic Instrument Co., Inc., N.Y., 1
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa., 1, 3
For details see ad on page 159
Engineering Labs., Inc., Okla., 2
Fairchild Camera & Instr. Corp., 88-08 Van Wyck Blvd., Jamaica 1, L.I., N.Y., 3
For details see ad on page 230-1
Furzehill Labs. Ltd., England, 1, 3
General Electric Co., N.Y., 1, 2, 4
General Elec Co., Electronics Dept., N.Y., 1, 5
General Instruments, Inc., Texas, 3
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 3
For details see ad on page 230-7, back cover
Geotechnical Corp., Texas, 2
Gibbs Mfg. & Research Corp., Wis., 4
Grass Instrument Co., Mass., 3
Heath Co., The, Mich., 1
Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 1, 2
For details see ad on page 157
Hickok Elect. Inst. Co., 10551 Dupont Ave., Cleveland 8, Ohio, 1
For details see ad on page 161
Instrument Laboratories, N.Y., 2
Jackson Elect. Instrument Co., Ohio, 1
Lab. for Electronics, Inc., Mass., 4, 5
Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J., 1, 4
For details see ad on page 160
Manufacturers Research Corp., Md., 3
Marconi Instruments Ltd., N.Y., 5
Maryland Electronic Mfg. Corp., Md., 2, 3
Melpar, Inc., Va., 5
Midwestern Geophysical Lab., Okla., 2, 3
Millen Mfg. Co., Inc., James, Mass., 1, 4
Miller Corp., William, Calif., 2
Mullard Electronic Prods. Ltd., England, 1, 2, 5
Offner Electronics, Inc., Ill., 2
Photographic Products, Inc., Calif., 2
Photron Instrument Co., Ohio, 2
Plastics & Electronics Corp., N.Y., 1
Polaraid Electronics Corp., N.Y., 1
Precision Apparatus Co., Inc., N.Y., 1
Professional Electronics Co., Calif., 2
Radio City Products Co., Inc., N.Y., 1
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 1
RCA Tube Dept., 415 S. Fifth St., Harrison, N.J., 1
For details see ad on page 48
RCA Eng. Prod. Div., Camden, N.J., 1
Radio Supply & Engineering Co., Inc., Mich., 1, 5

(Continued on page 161)

UHF

DEVELOPMENT
DESIGN
MANUFACTURE
EQUIPMENT



. . . **if** UHF design or development is a major problem with you, or . . .

. . . **if** low-unit manufacturing cost is essential to satisfactorily meet competition, or . . .

. . . **if** trustworthy, confidential collaboration is a highly necessary factor . . .

THEN Lavoie Laboratories, Inc. can be of invaluable assistance. We have the Engineering Staff . . . the shop techniques . . . a competent understanding of government contract procedures . . . and the reputation for satisfactorily meeting *all* of these requirements.

We welcome your inquiries on any phase of UHF design, development or production.

LAVOIE PRODUCTS INCLUDE:

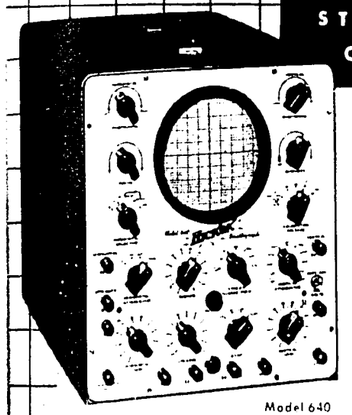
RADAR RECEIVERS
RADIO RECEIVERS
SIGNAL GENERATORS
FREQUENCY METERS
ANTENNA EQUIPMENT
PULSE GENERATORS
OSCILLOSCOPES
RADAR BEACONS
COMMUNICATION SYSTEMS
CRYSTAL IMPEDANCE METERS
ETC., ETC.

Lavoie Laboratories, Inc.

MORGANVILLE, N. J.

HICKOK *new model* 640 OSCILLOGRAPH

STABLE • VERSATILE
OUTSTANDING RANGE



Model 640

For Industrial and Electronic *Laboratories*

The new HICKOK Model 640 Oscillograph with its exceptional design features and characteristics provides an outstanding versatile instrument for the engineer in observing regular recurring or transient phenomena.

Wide Band Amplifier: Frequency response DC, [illegible] to 4.5 mc. (down 3 db.)

Vertical DC and AC Amplifier: 10 MV per inch with sensitivity switch in high position. 25 MV per inch in low position.

Frequency Response: 0 to 1,000,000 cycles (3 db point), in high position. 0 to 4,500,000 cycles (3 db point), in low.

Maximum Input Potential, 1000 volts peak. Input Impedance, 2 megohms. 50 mmf.

Horizontal Amplifier: Deflection Factor—Direct, 20 volts RMS per inch.

Full Gain Setting, 50 millivolts RMS per inch. Frequency Response, 0 to 200,000 cycles (3 db down).

Test Signals: Line Frequency, 3 volts RMS per inch.

Sawtooth available from front panel. Direct connection to both horizontal and vertical deflection plates.

Linear Time Base: [illegible] 2 cycles to 5 [illegible]

Provision for [illegible]

Sweep Speeds: [illegible] per second.

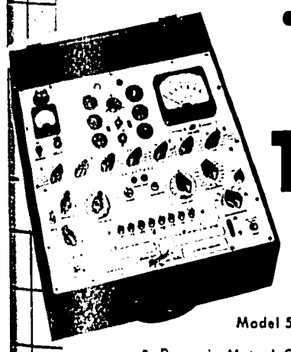
Trigger for [illegible] for external [illegible] in the [illegible] sweeps.

Synchronizing [illegible] frequency.

"Z" Axis Modulation: [illegible] the grid of the [illegible] beam [illegible]

Shielded Shock Mounted Built-in Calibrating Voltages. Excellent Stability and Expandable Sweep. [illegible] several added [illegible] instrument [illegible] Price $355 [illegible]

● Also manufacturers of a complete line of electrical indicating instruments and test equipment. Full information sent [illegible]



DYNAMIC MUTUAL CONDUCTANCE

TUBE TESTER

HIGHLY ACCURATE

Laboratory Model

Model 539

- Dynamic Mutual Conductance circuits . . . Readings in [illegible]
- Permits choice of 3 AC signals, .25, .5 and 2.5 volts
- Vernier adjustment permits accurate setting of grid voltage
- Separate AC meter measures line voltage at all times
- Provision for insertion of plate millimeter for measuring plate current
- Optional self-bias arrangement.
- Tube life and tube gas

Write for additional information today!

THE HICKOK ELECTRICAL INSTRUMENT CO.

10553 DUPONT AVENUE • CLEVELAND 8, OHIO

THE STANDARD OF QUALITY FOR OVER 30 YEARS

Oscillographs

Sanborn Co., Industrial Div., 370 Albany St., Cambridge 39, Mass., 2

Simpson Electric Co., 5200 W. Kinzie St., Chicago 44, Ill., 2

Spencer-Kennedy Labs., Inc., 186 Massachusetts Ave., Cambridge 39, Mass., 4, 5

Stevens Electric Products Inc., Dept. R, 1652 Emporium, Pa., 1, 4

Telechrome, Inc., 88 Merrick Rd., Amityville, L. I., N. Y., 4

Waterman Products Co., Inc., 3445 Emerald St., Philadelphia 25, Pa., 1, 4

Panels, see: 13

FIRST WITH THE FINEST IN . . .

- CATHODE-RAY OSCILLOGRAPHY

[illegible] Co. [illegible] Main Ave., Clifton, N. J.

- CATHODE-RAY TUBES

[illegible] Tube Co. [illegible] Main Ave., Clifton, N. J.

- ELECTRONIC PARTS

Electronic Parts [illegible] Market Street, East Paterson, N. J.

- TELEVISION TRANSMITTING EQUIPMENT

Television Transmitter Division, [illegible] Main Ave., Clifton, N. J.

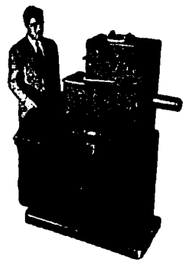
DUMONT

ALLEN B. DU MONT LABORATORIES, INC.

EQUIPMENT FOR AM-FM-TV STATION USE—BY Gray RESEARCH

GRAY professional equipment for broadcast station use is conceived, designed, engineered and built by specialists in the audio-video field. The products here described are widely used, approved and recommended by networks and independent stations. Broad acceptance by the industry is our best testimonial to the high quality and serviceability built into equipment manufactured by Gray.

Gray TELOP *(TELevision Optical Projector)*



Makes PROFITS GROW for TV Stations. The Gray Telop projects low-cost, easily produced TV 'commercials.' Without keystoning, any two photos, titles, slides, etc., or small objects may be broadcast with superimposition, lap dissolve or fade-out. Four optical openings. Strip material may be used horizontally or vertically with Stages #2 and #3. (For full details write for Bulletin T-101.)

Gray STAGE #2

Attaches to three optical openings of the Telop. Accommodates roll stock *vertically* to televise commentary or the commercial in the same way movie introductions are projected.

Gray STAGE #3

Attaches to optical openings of the Telop. News ticker tape fed from 8-mm reels is projected on any part of the screen, top to bottom, horizontally. May be used with test pattern or other commercial.

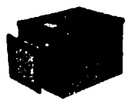
Gray TV CAMERA TURRETS

Enable a Single Camera to Serve up to 8 Projectors

MODEL 556

Centered on a rugged 'square' pedestal, requires a minimum of space. Heavy duty ball bearings. Rotates 360°.

Gray LIGHT BOX for Transparencies



Provides back lighting for Telop use.

Gray REVERSE READING CLOCK

For use where reversal is required. Designed to permit superimposing of the commercial or other copy.

Gray MULTIPLEXER Model 600

A precision arrangement of mirrors for operation of pairs of projectors simultaneously into a single TV camera or individually into two separate cameras. *Enables a greater number of projectors to be used with fewer highly expensive TV cameras.*

Gray TRANSCRIPTION ARMS

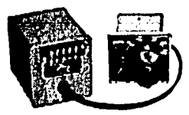
NEW Viscous-Damped
Model 108-B Arm

For all records — 33⅓, 45 and 78 r.p.m. Radically new suspension development on the viscous damping principle *for perfect tracking* of records and elimination of tone arm resonances. Instant cartridge change with automatic correct stylus pressure. Solves all transcription problems. IDEAL FOR LP RECORDS. For Pickering and GE cartridges.

Model 106-SP Arm

Designed to meet strictest requirements of modern highly compliant pickup cartridges. Three cartridge slides furnished enable GE 1-mil, 2½-mil or 3-mil cartridges or Pickering cartridge to be slipped into position in a jiffy. No tools or solder! Superb reproduction of 33⅓, 45 or 78 r.p.m. records. Low vertical inertia, precisely adjustable stylus pressure.

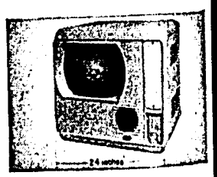
Gray EQUALIZERS



MODEL 602 EQUALIZER has been specially engineered to provide constant velocity frequency response for both conventional and LP records. Four steps—flat, transcriptions, good records, poor records. Gray Equalizers used as standard professional equipment by broadcast stations.

MODEL 603 — Has 5 control positions. For both GE and Pickering cartridges.

Gray Color Television Monitor



This latest product of Gray Research was developed for professional monitoring of color telecast of the CBS field sequential system.

Gray MILITARY PRODUCTS

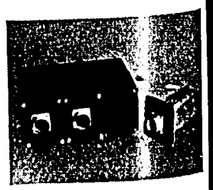


Illustration shows typical airplane controls made for Hamilton Standard, Division of United Aircraft Corporation. Other military developments and products include video indicators, intricate mechanisms, trainers, electronic-mechanical development contracts.

Please write for bulletins describing the above equipment.

GRAY RESEARCH
and Development Co., Inc., 16 Arbor St., Hartford 1, Conn.

Milton C. Gray
President

Division of The GRAY MANUFACTURING COMPANY—Originators of the Gray Telephone Pay Station and the Gray Audograph

49. Phonograph & Transcription Reproducing Equipment.

1—Crystal Pick-ups. 2—Magnetic Pick-ups. 3—Phonograph Motors. 4—Playback Arms. 5—Record Changers. 6—Styli. 7—Turntables, complete.

A. P. W. Co., N.J., 2
Aerocrafters Aero Needle Co., Ill., 6
Alliance Manufacturing Co., Ohio, 3
American Laubscher Corp., N.Y., 6
Ansley Mfg. Co., Arthur, Pa., 7
Astatic Corp., Ohio, 1, 2, 4, 6
Atlas Coil Winders, Inc., 392 State St., Stamford, Conn., 3
For details see ad on page 80
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Barber-Colman Co., Ill., 3
Bell Sound Systems, Inc., Ohio, 7
Bogen Co., David, N.Y., 7
Bowen & Co., Inc., Md., 3, 7
Caltron Co., Calif., 2, 4, 6, 7
Clarkstan Corp., Calif., 2, 4, 6
Crescent Industries, Inc., Ill., 5
Diamond Tool Engineering Co., Mass., 6
Dominion Sound Equipments Ltd., Canada, 1-6
Duotone Co., Inc., N.J., 6
Du Plate Canada Ltd., Canada, 6
Eastern Air Devices, Inc., N.Y., 3
Electric Indicator Co., Conn., 3
Electrovox Co., Inc., N.J., 2, 4, 6
Electro-Voice, Inc., Mich., 1, 4, 6
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Fidelity Amplifier Co., Ill., 5
Gates Radio Co., Ill., 7
General Electric Co., N.Y., 2
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General Industries Co., The, Ohio, 3, 7
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Jensen Industries, Inc., Ill., 6
Klipsch & Associates, Ark., 7
Lincoln Engineering Co., Mo., 5
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Micro Engineering Labs., Canada, 4, 7
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Mullard Electronic Prods. Ltd., England, 2, 3, 5
Permo, Inc., Ill., 6
Philco Corp., Pa., 1-6, 7
Plessey International Ltd., England, 1, 2, 3, 5, 7
Presto Recording Corp., (P.O. Box 500, Hackensack), Paramus, N.J., 2, 4, 6, 7
For details see ad on page 32
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Radio Hispano Suiza, S.A., Spain, 1-5, 7
Radio-Music Corp., N.Y., 2, 3, 4, 6
Recoton Corp., N.Y., 2, 4
Reeves Soundcraft Corp., N.Y., 6
Rek-O-Kut Co., N.Y., 1-4, 7
Robinson Recording Labs., Pa., 2, 4, 7
Rock-Ola Mfg. Corp., Ill., 5
Rogers Majestic Ltd., Canada, 5
Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 2
For details see ad on page 115
Russell Electric Co., Ill., 3
Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill., 1, 4, 6
For details see ad on page 150
Sonotone Corp., N.Y., 1
Televex, N.Y., 6
Tetrad Corp., N.Y., 6
Trav-Ler Radio & TV Corp., Ill., 5
V-M Corp., Mich., 5, 7
Valhorbs Jewel Co., Pa., 6
Waters-Conley Co., Minn., 4
Webster-Chicago Corp., Ill., 5
Webster Electric Co., Wis., 1, 4
West Coast Electronics Co., Calif., 4
Zephyr Products Co., N.Y., 6

FOR YOUR PANEL

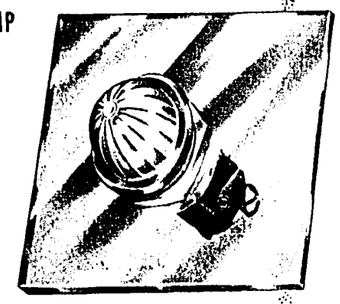
DIALCO

A NOVEL and UNIQUE CIRCUIT INDICATOR

DESIGNED FOR NE-51 NEON LAMP
For 110 or 220 volt circuits

The required resistor is an integral part of this assembly —"built-in."

RUGGED • DEPENDABLE
LOW IN COST



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WILL *YOU* TRY A SAMPLE?

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No charge, of course.

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Among our *thousands of Pilot Light Assemblies* there is one which will fit *your special conditions.* Many are especially made and approved for *military* use. We pride ourselves on prompt deliveries—*any quantity.*

ASK FOR OUR APPLICATION ENGINEERING SERVICE

Foremost Manufacturer of Pilot Lights

The DIAL LIGHT COMPANY of AMERICA
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50. Pilot Lights & Assemblies.

1—Incandescent. 2—Neon.

Aerolite Electr. Hardware Corp., N.J., 1, 2
Aeronautical Elec. & Mfg. Co., 5103 W. Lawrence Ave., Chicago 30, Ill., 2
For details see ad on page 185
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 1
For details see ad on page 114
Canadian General Elec. Co., Ltd., Canada, 1, 2
Dial Light Co. of America, Inc., 900 Broadway, New York 3, N.Y., 1, 2
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General Laminated Prod., Inc., of Ill., Ill., 1
Hetherington, Inc., Pa., 1
Industrial Devices, Inc., N.J., 2
Johnson Co., E. F., Minn., 1, 2
Kellogg Switchboard & Supply Co., Ill., 1
Kirkland Co., H. R., N.J., 1
Marco Industries Co., Calif., 1
Micarta Fabricators, Inc., Ill., 1, 2
Mullard Electronic Prods. Ltd., England, 1
National Carbon Ltd., Canada, 1
National Union Radio Corp., N.J., 1
RCA Tube Dept., 415 S. Fifth St., Harrison, N.J., 1
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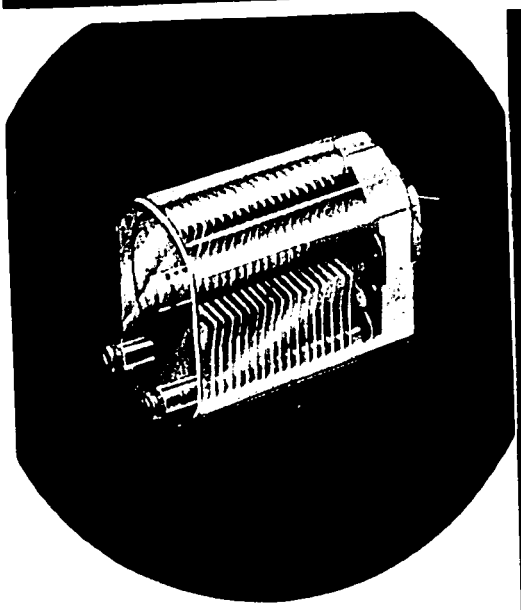
Plastic PA



Condenser Covers

For RCCO, APC and GI Condensers, 25-140 mmf.

PEERLESS plastic condenser protector covers prevent mechanical damage; keep stray wire clippings, solder and dust from shorting the plates; and add eye-appeal to your product. They are made of water-clear high-dielectric plastic material .020 inch thick. Covers are easily applied and securely held in place by our No. 300 cement. Covers are made with two holes spaced .562" or .500", or with one hole, and with or without perforation. Lengths of covers are $\frac{5}{8}$", $\frac{7}{8}$", $1\frac{1}{16}$", $1\frac{1}{4}$", $1\frac{9}{16}$" and $1\frac{5}{8}$". Special sizes and dimensions made to your specifications. Catalog sheet available on request.

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PEERLESS coil forms can be made to your particular specifications from Acetate, Bakelite, Methacrylate, Polystyrene or any of the other plastics. Dimensions will be held to closest tolerances and forms furnished either for random or spaced winding, either with center hole or threaded ends.

In addition to these two special items, production is available in aluminum, brass, copper, steel or other metals, *of parts needed by radio and electronic manufacturers.*

Without obligation, send us your B/P specification today for our quotation and guaranteed delivery.

Peerless PRODUCTS

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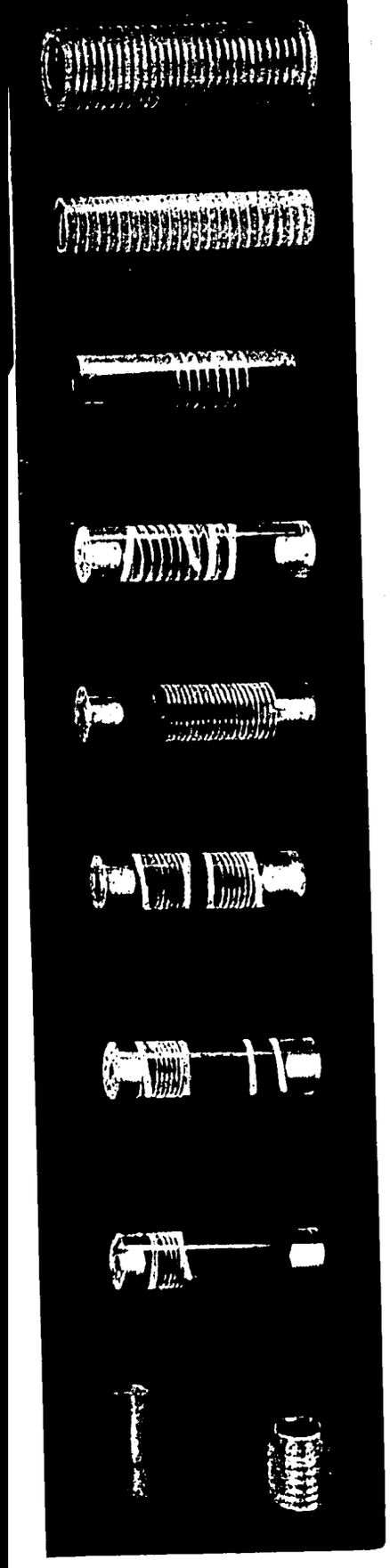

UCTS INDUSTRIES
CHICAGO 51, ILLINOIS

51. Plastics.

1—Raw Powders, for Moulding
2—Rods.
3—Sheets.
4—Other Forms

Aerolite Electr. Hardware Co., [illegible] 2, 3
Anchor Industrial Co., N.Y., 2
Anchor Plastics Co., Inc., N.Y.
Aymond Sales Co., Texas, 2, 3
Baer Co., N. S., N.J., 2, 3
Borden Co., Chemical Div., N.Y., 3
Brillhart Plastics Corp., N.Y., 3
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Cast Optics Corp., Conn., 3
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Continental-Diamond Fibre Co., [illegible] 3
Cortland Industries, Inc., Ill., [illegible]
Diamond Drill Carbon Co., [illegible], N.Y.
Dielect, Inc., N.J., 3
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Goodrich Co., The B. F., Ohio, [illegible]
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For details see ad on page [illegible]
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Lamoree Co., C. D., Calif., 2
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Lunn Laminates, Inc., N.Y., [illegible]
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Micarta Fabricators, Inc., [illegible] 2, 3
Minerals & Insulation Co., [illegible]
Monsanto Chemical Co., [illegible] Mass., 1, 3
Mycalex Corp. of America, 30 R[illegible] **feller Plaza, New York** 2[illegible] N.Y.
For details see ad on page [illegible]
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Panelyte Div., St. Regis [illegible] N.Y., 2, 3
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Plastic Process Co., Inc., [illegible]
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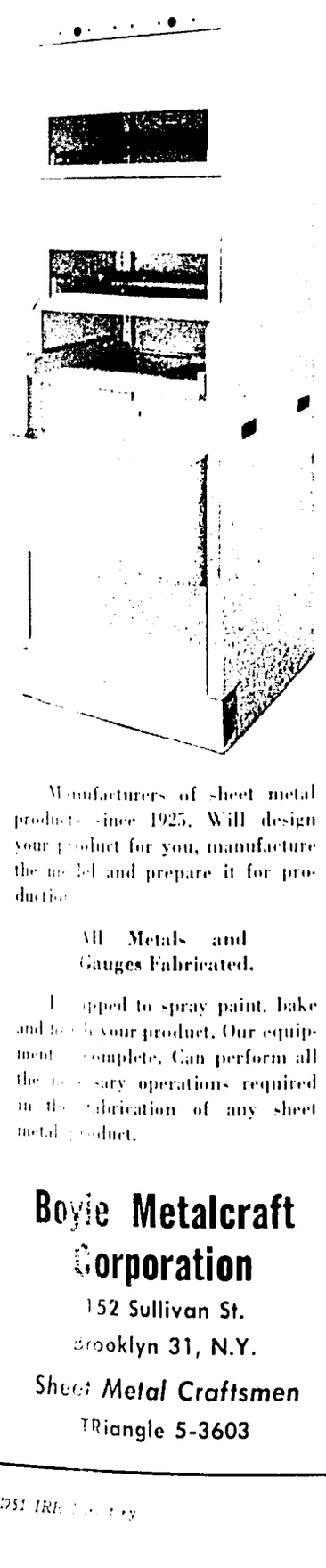
Ponn Machine & Cutting [illegible]
Printloid, Inc., N.Y., 3
Resistoflex Corp., Bellevill[illegible], N.J., **Teflon**
For details see ad on page [illegible]
Richardson Co., The, Ill., 2
Rohm & Haas Co., Pa., 1, 2

(Continued on page [illegible])

This Cabinet

Is Only One Of Many That We Manufacture

Transmitter and Radar Cabinets, Chassis, Panels, and many special component parts such as are required by laboratories and manufacturers.



Manufacturers of sheet metal products since 1925. Will design your product for you, manufacture the model and prepare it for production.

All Metals and Gauges Fabricated.

Equipped to spray paint, bake and handle your product. Our equipment is complete. Can perform all the necessary operations required in the fabrication of any sheet metal product.

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Brooklyn 31, N.Y.
Sheet Metal Craftsmen
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Plastics

Shawmut Products, [illegible] 3
Specialty Insulation M[illegible] 1, 2, 3
Superior Plastics, [illegible]
Supremacy Mfg. Co., [illegible]
Synthane Corp., Pa., [illegible]
Syntar Corp., Del., 3
Taylor Fibre Co., Pa., 3
Thall Plastic Products, [illegible] 3
United States Gasket Co., Teflon Products Div., 612 N. [illegible] St., Camden 2, N.J., 2, 3
For details see ad on page [illegible]

Plastics, other forms, see: 51 subhead 4

Plugs, see: 16, 33

52. Point To Point Communication Equipment.

1 Aircraft & Airport Equipment.
2 Citizen Radio.
3 Emergency Communications.
4 Fleet Dispatching.
5 Police & Fire De[illegible]
[illegible] Equipment.
[illegible] Equipment.
[illegible] Equipment.

Aero Geo[illegible], Pa., [illegible]
Aeronautical [illegible] Fla., 1
Allen, Inc., [illegible]
American Co[illegible] 1, 3, 5
American [illegible] Calif., 1, 3, 5, 6
Apple [illegible]
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Electronic Measurements, Bank, N.J., 1, 6
For details see ad on page [illegible]

Point to Point Communication Equip.

[illegible] Research & Mfg. Co., Office, 2, 7
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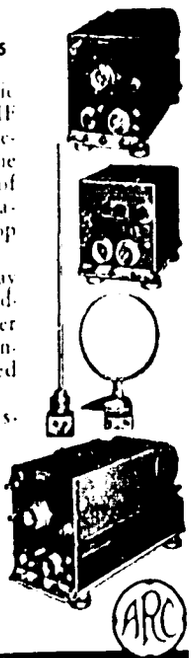
[illegible] Instruments & Mfg. Co., Pa., 1
[illegible] Electronic Mfg. Co., [illegible], Canada, 1, 3, 7
Federal Telephone & Radio Corp., Selenium & Intelin Div., 1100 Kingsland Rd., Dept. F7104, Clifton, N.J., 1, 3, 4, 5, 7
[illegible]
[illegible]
[illegible]
Gray Research & Dev. Co., Inc., 16 Arbor St., Hartford 1, Conn., 7
[illegible]
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 1, 3
[illegible]

WHEREVER YOU GO
WHATEVER YOU FLY
ARC EQUIPMENT
Meets Your Operational Needs



ARC Type 11A meets basic needs by providing VHF transmission, LF range reception suitable for the exacting requirements of night instrument operation, and rotatable loop navigation.

ARC Type 17 is 2-way VHF equipment, including tunable VHF receiver and one or more 5-channel, crystal controlled VHF transmitters.

ARC Type 12 (illustrated) gives you advantages of both Type 11A and Type [illegible] systems.

All ARC airborne equipment is designed for reliability and performance, not to meet a price.

AIRCRAFT RADIO CORPORATION
Boonton, New Jersey
Dependable Electronic Equipment Since 1928

PRECISION ELECTRONIC SYSTEMS

RADIO
- Direction Finders Electronic Goniometer
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- Servoboard
- System Synthesis
- Reluctance Amplifiers
- 60 ~ Servo Amplifier
- Plug-in Component Assemblies

RADIATION
- Servotherm Bolometers
- Bolometer Preamplifiers
- Thermistor Power Supply
- Servotherm Pyrometers

Write today for complete information

SERVO CORPORATION OF AMERICA

Point to Point Communication Equipment

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Workshop Associates, Div. Gabriel Co., 135 Crescent Rd., Needham, Mass., 1, 5, 7
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53. Power Supplies.

1—Electrically Powered. 2—Gasoline Driven. 3—Voltage Regulated Output types.

Aero Electronics Co., Ill., 1
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Airmec Labs. Ltd., England, 1, 3
Airpax Products Co., Md., 1, 3
Airplane & Marine Inst., Inc., Pa., 1
Airtronix Development Corp., N.Y., 3
American Communications Corp., N.Y., 1, 3
American Electroneering Corp., The, Calif., 1, 3
American Television & Radio Co., Minn., 1
Amplifier Corp. of America, N.Y., 3
Applegate & Co., C. J., Colo., 3
Applied Science Corp. of Princeton, P.O. Box 44, Princeton, N.J., 3
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Approved Electronic Instr. Corp., 10 Liberty St., New York 6, N.Y., 1
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Atlantic Electronics Corp., 4A Manhasset Ave., Port Washington, L.I., N.Y., 3
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Doelcam Corp., Mass., 1, 3
Douglas Radio Laboratories, Mass., 3
Eicor, Inc., Ill., 1, 3

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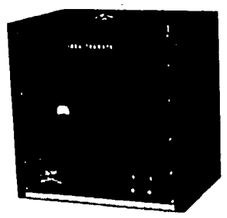
VARIABLE DC HIGH VOLTAGE!

RADIO FREQUENCY TYPE DC POWER SUPPLIES



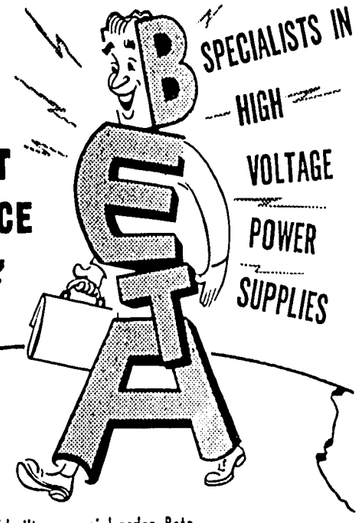
MODEL 401—Covers a range from below 5KV to 50KV with a maximum power output of 40 watts and an internal resistance of approximately 40 megohms. 500 microamperes of current are available over the entire range. For voltages up to 30 KV, 1 milliampere of current can be obtained. Can also develop voltages higher than 60KV under light load.

MODEL 201—Capable of producing from 1 to 20KV at a maximum power output of approximately 10 watts and an internal resistance of about 30 megohms. This unit can furnish 250 microamperes of current over the entire range. For voltages up to 10KV, currents of 500 microamperes may be obtained.

SPECIAL NOTE: We have recently added a number of new models to our line of High Voltage Power Supplies covering both variable and fixed voltage outputs from 1 KV to 60 KV and current ranges from 50 microamperes to 2 milliamperes. Both self regulating and electronically stabilized DC Power Supplies are available. Write for complete information.

INDUCTOGRAPH PRODUCTS, INC.
236B W. 55th Street, New York 19, N.Y. • JUdson 6-1549
Plant—Brookfield, Conn.

Only **BETA** *gives you* **ON THE SPOT ENGINEERING SERVICE** *Coast to Coast*



Power supplies up to 30 KV in stock . . . up to 250 KV quickly available from standard designs . . . up to 500 KV built on special order. Beta supplies the correct equipment for your job . . . designed for long, accurate, trouble-free life. Beta field engineers will be glad to consult with you on your high voltage power supply problems and will give you expert advice on proper voltage, current, regulation, metering, safety devices, control circuits, etc. for your particular application.

BETA Electric Corporation
333 East 103rd St.
New York 29, N. Y.
ENright 9-8520

Power Supplies

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Electric Regulator Corp., Conn., 3
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Embassy Engineering Co., N.Y., 1
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Lambda Electronics Corp., 103-02 Northern Blvd., Corona, L.I., N.Y., 1, 3
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For details see ad on page 137
Link Radio Corp., N.Y., 1, 2, 3

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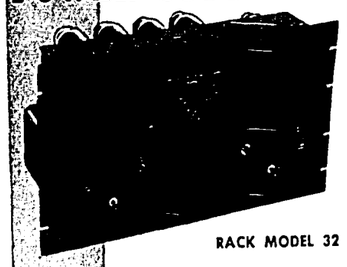
ELECTRONICALLY REGULATED

LABORATORY POWER SUPPLIES



RACK MODEL 32

- STABLE
- DEPENDABLE
- MODERATELY PRICED

STANDARD RACK MOUNTING PANEL SIZE 16½" x 19" DEPTH 9" WEIGHT 38 LBS

- INPUT: 105 to 125 VAC, 50-60 cy
- OUTPUT #1: 200 to 325 VDC at 300 ma regulated
- OUTPUT #2: 6.3 Volts AC CT at 5A unregulated
- OUTPUT #3: 6.3 Volts AC CT at 5A unregulated
- RIPPLE OUTPUT: less than 10 millivolts rms

For complete information write for Bulletin GD-2

LAMBDA ELECTRONICS CORP.
CORONA NEW YORK

Power Supplies

(Continued from page 167)

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McColpin-Christie Corp. Ltd., Calif., 1, 3
MacLeod & Hanopol, Inc., Mass., 1, 3
Magnatran, Inc., N.J., 1
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Plessey International Ltd., England, 1, 3
Polarad Electronics Corp., N.Y., 3
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 3
For details see ad on page 250-1
Power Transformer Co., N.J., 1, 3
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y., 1
For details see ad on page 141
Precision Rectifier Corp., N.Y., 1, 3
Process & Instruments, N.Y., 3
Radiart Corp., The, Ohio, 1
Radiation Counter Labs., Ill., 3
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 2
Radio Engineering Products Ltd., Canada, 3
Radio (1936) Ltd., New Zealand, 1, 3
Ready-Power Co., Power Plant Div., Mich., 2
Rosen Eng'ng. Prods., Inc., Raymond, 32 & Walnut St., Philadelphia 4, Pa., 1, 3
For details see ad on page 98
Schauer Mfg. Corp., The, Ohio, 1
Scientific Electric, 105-119 Monroe St, Garfield, N.J., 3
See complete catalog filed alphabetically in last section
Scientific Instrument Labs., N.Y., 3
Scott, Inc., Hermon Hosmer, Mass., 1
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N.Y., 1, 3
For details see ad on page 16
Shore Engineering, Inc., N.J., 1, 3
Sierra Electronic Corp., Calif., 1, 3
Simplex Electric Products Co., N.Y., 1
Sorensen & Co., Inc., Conn., 1, 3
Spellman Television Co., Inc., N.Y., 1, 3
Spencer-Kennedy Labs., Inc., 181 Massachusetts Ave., Cambridge 39, Mass., 1
For details see ad on page 39
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 3
See complete catalog filed alphabetically in last section.
Stancil-Hoffman Corp., Calif., 3
Standard Transformer Corp., Ill., 1
Stephens Mfg. Corp., Calif., 1
Superex Electronics Corp., N.Y., 1
Superior Electric Co., The, 83 Laurel St., Bristol, Conn., 3
See complete catalog filed alphabetically in last section
Tarzian, Inc., Sarkes, Ind., 1
Tektronix, Inc., Ore., 3
Teletronics Labs., Inc., N.Y., 3
Tel-Instrument Co., Inc., N.J., 3
Thordarson Elec. Mfg. Div., Ill., 1, 3
Transformer Specialty Co., Pa., 1, 3
Transmitter Equipment Mfg. Co., Inc. N.Y., 1, 3
U. S. Recording Co., D.C., 1
Varian Associates, Calif., 3
Victoreen Instrument Co., Ohio, 3
Vokar Corp., Mich., 1, 3
Westinghouse Electric Corp., Pa., 1

Pre-Amplifiers, see: 1 sub-head 9

Printed Circuits, see: 10 sub-head 7, 36 sub-head 1, 60 sub-head 5

Racks, see: 13

Radar, see: 54 sub-head 5, 71 sub-head 4

54. Receivers.

1—Broadcast.
2—Communications.
3—Fixed Frequency.
4—Frequency Modulation.
5—Radar.
6—Special Purpose.
7—Television.
8—UHF-VHF

A. R. F. Products, Inc., Ill., 2, 4, 5, 6, 8
Aero Coil, Inc., N.J., 1, 3, 6
Aeronautical Communic. Equip., Inc. Fla., 3
Air Equipment, France, 2, 8
Air King International Corp., N.Y., 1, 4, 5, 6, 7
Airborne Instruments Lab., Inc., N.Y., 5-8 *(Continued on page 169)*

D. C. POWER SUPPLIES

Selenium Rectifier Power Units

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.
- High current selenium rectifier plate power supplies.
- Commercial operation of D.C. motors, dynamotors, vibrator power packs, relays and other devices which require D.C.
- Replacing storage or primary batteries
- Battery charging
- Electrolytic processing and electroplating

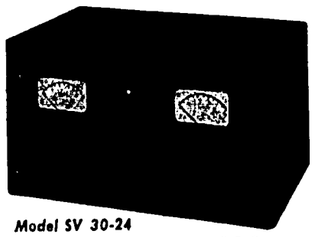
INPUT: 115 volts, 60 cycle, single phase

OUTPUT: (Variable) 0-30 volts at up to 24 Amperes of Filtered D.C.

RECTIFIER: Full wave bridge selenium stack.

FILTER: Single section choke input followed by capacitor. 3% ripple, excellent regulation.

$350.00 Net
F.O.B. Brooklyn



Model SV 30-24

This unit is representative of one of the types we supply. The majority of D.C. power supplies we manufacture are designed to the exact requirements of the user, effecting maximum economy. Prompt delivery of units for your specific job. Thousands of our power supplies now in service attest to the quality and durability of our equipment.

Quotations on your requirements promptly furnished.

MODEL RECTIFIER CORPORATION

1510 Nostrand Avenue
Brooklyn 26, N.Y. Tel. BUckminster 7-0029

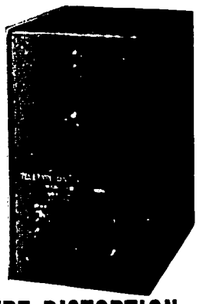
TERMINAL EQUIPMENT

RANGE: Mark or space bias distortion 0 to 50%.

ACCURACY: ± 3%.

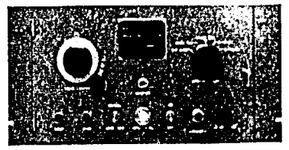
INPUT: 30 or 60 M.A. neutral or polar. 60 WPM teletype signal.

INPUT IMPEDANCE: 200 ohms.



TELETYPE DISTORTION INDICATOR Model 22

A portable unit that measures bias distortions. May be connected in any teletype circuit with teletype-writer printer without disturbing its operation.



DIPLEX RECEIVING KEYER or Regenerative Repeater

Type CA-1447

Double the Number of Teletype Messages on Any Circuit by Time Division

INPUT: 500-10,000 cps tone keyed with diplex signal ODBM to —40DBM level. Compression amplifier permits uniform operation with varying line levels with or without filters in line. Input distortion may exceed 40%. Manual adjustment will allow unit to tolerate over 50% distortion. OUTPUT: Two simplex neutral outputs each in form of relay contacts. Output distortion—less than 2%. POWER: 105-130 V., 80 watts, 50-60 cps. CONSTRUCTION: Rack panel 19" long x 8¾" high x 10¼" deep. Vertical chassis with tubes in rear. All parts available from front door.

TELETYPE TONE KEYER

The Model TTK-10 Tone Keyer provides keyed tone at its output when keyed DC neutral or polar circuit is connected to the input. Keying speeds of 500 wpm are possible with unit. Only vacuum tube keying is employed.

Specifications INPUT: 20 to 60 ma. neutral operation with remote or local (from the unit) battery; either side of line may be grounded. 30 ma polar operation with remote battery; either side of line or center point may be grounded. OUTPUT: Level —15 DBM to + 15 DBM. Tone frequency 400 to 8000 cps. Keying speed to 180 dot cycles. Output tone wave form—less than 5% distortion. Output impedance—600 ohms balanced or unbalanced to ground. Bias distortions of ± 20% at input of unit may be corrected to less than 2% at output. Line voltage variations of ± 10% will not affect local battery current by more than 1% or output distortion by more than 2%. Metering is provided in unit to measure input line current and output tone level. POWER REQUIREMENTS: 115 or 230 VAC, 50 to 60 cps.—90 watts.

TUBES: 1—Type 6Y6-G, 1—Type 12AT7, 1—Type 5R4-GY, 1—Type 6AU6, 1—Type 6X4, 1—Type 6H2, 4—Type 12AU7, 1—Type 6H3

Physical: 19" x 8¾" panel for rack mounting. Chassis extends 12" behind panel. All operating controls available from front panel. Weight—25 lbs. Construction and components—to Govt. specifications.

TELETYPE TONE DEMODULATOR

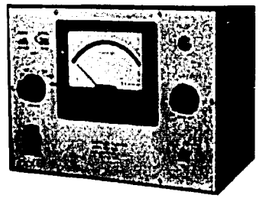
This Model TTD-10 Teletype Tone Demodulator is designed to receive a keyed tone signal and supply either neutral or polar output. Vacuum tube keying circuits used throughout. Output current is regulated to 1% for line voltage variations of ± 10%. Keying speeds of up to 500 words per minute are possible with the unit.

Specifications INPUT: Keyed tone, 300 to 10,000 cps. Line level —25 DBM to + 10 DBM. Balanced or unbalanced 600 ohm. Keying speed—180 dot cycles. OUTPUT: Neutral, 20 to 60 ma., 120 v., either side of line may be grounded or open; battery supplied from unit. Neutral, 20 to 60 ma., either side of line may be grounded or open; remote battery. Polar, 20 to 30 ma., 120 v., either side of line may be grounded or open; battery supplied from unit. Adjustment is provided so that input bias distortions of ± 20% may be corrected to less than 2% at output. Input level variations of ± 5 DBM will cause less than 2% change in output bias distortion. (For square wave keying.) POWER REQUIREMENTS: 115 v. or 230 v. 50-60 cycle AC—130 watts.

TUBES: 4—Type 6Y6-G, 1—Type 6AU6, 1—Type 5R4-GY, 1—Type 6X4, 3—Type 12AU7, 1—Type 0A3, 2—Type 6AL5, 2—Type OB2

Physical: 19" x 8¾" panel for rack mounting. Chassis extends 12" behind panel. All operating controls available from front panel. Meter provided for input level and output current measurements. Weight—30 lbs. Construction and components—to Govt. regulations.

* Model TTD-11 Teletype Tone Demodulator is available with a compression amplifier instead of a clipping amplifier and will provide an output with bias variations under 5% for ± 10 DB line level variations with standard filters in tone line.

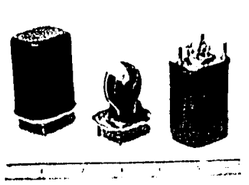


PEAK PULSE VOLTMETER

Model 80A

VOLT RANGES: 0-10, 0-50, 0-100, 0-500, 0-1000, 0-5000 volts.
PULSE WIDTH: 0.25 microseconds to 50 milliseconds.
REPETITION RATES: 10 to 20,000 pps.
ACCURACY: ± 3% of full scale.
INPUT IMPEDANCE: 200,000 ohms.

An automatic slideback instrument which secures rapid and accurate readings at pulse widths of .25 microseconds and at 10 pps. Controls include on-off switch, range selector switch, input polarity switch, zero-set control, and peak to peak switch.



INCREDUCTOR

Newest Component in the Electronic Field

INCREDUCTOR is trademark of new type variable inductor that is:
—electrically controlled—no moving parts.
—variable over useful inductance range of 100 to 1—or 200 to 1—or even more in some applications.
—low in loss—maintains high Q even at megacycles.
—controlled with minimal power, compact and light in weight.
—result of years of intensive research by C. G. S. engineers.

These valuable characteristics of the INCREDUCTOR are attained by use of separate control and signal windings, specially arranged on ceramic core having unusual magnetic properties.

Alternating or direct current variations, through the low power control winding, produce corresponding variations in inductance of INCREDUCTOR signal winding.

The standard line of C. G. S. INCREDUCTORS now available includes units with wide range of starting inductances and frequencies. For applications in which standard C. G. S. INCREDUCTORS will not provide requisite characteristics, C. G. S. will design and produce INCREDUCTORS to meet your specific requirements.

Write us on your letterhead for a descriptive bulletin, including information and prices on standard units, together with helpful design data.

C. G. S. LABORATORIES, INC.
393 LUDLOW ST. STAMFORD, CONN.

Receivers

(Continued from page 168)

Aircraft Radio Corp., Boonton, N.J., 2
For details see ad on page 165, 199
Airlectron, Inc., N.J., 6
Airplane & Marine Inst., Inc., Pa., 6
Altec Lansing Corp., Calif., 1, 4, 7
American Communications Corp., N.Y., 2, 3, 6
American Electroneering Corp., The, Calif., 2, 3, 8
Ansley Mfg. Co., Arthur, Pa., 1, 4
Apex Products, N.Y., 1, 7
Applied Electronics Co., Calif., 2
Approved Electronic Instr., Corp., 142 Liberty St., New York 6, N.Y., 3, 4
See complete catalog filed alphabetically in last section
Arlington Electric Prods., Inc., N.Y., 2, 3, 6
Arvin Industries, Inc., Ind., 1, 4, 7
Bassett, Inc., Rex., Fla., 2, 3, 4, 5, 6, 7
Bendix Radio Comm. Div., E. Joppa Rd., Towson 4, Md., 1-8
Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, North Hollywood, Calif., 5
Brelco Electronics Corp., N.Y., 2, 6
Bremer Electronics, N.J., 8
Browning Laboratories, Inc., 750 Main St., Winchester, Mass., 4
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C. G. S. Laboratories, Inc., 391 Ludlow St, Stamford 1, Conn., 6
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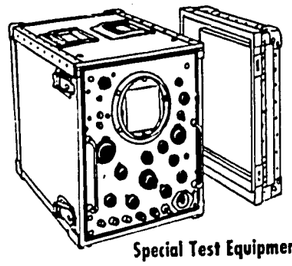
Canadian General Elec. Co. Ltd., Canada, 1-8
Canoga Corp., Calif., 5, 8
Capehart-Farnsworth Corp., Ind., 1, 4, 7
Central Rediffusion Services Ltd., England, 2
Chisholm Industries Ltd., Canada, 1, 2, 4, 6, 7, 8
Cincinnati Electronics Co., Ohio, 8
Clarke Instr. Div., Nat'l. Elect. Mach., Md., 6
Cole Instrument Co., Calif., 6
Collins Audio Products Co., Inc., N.J., 1, 3, 4
Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Iowa, 2, 3, 6, 8
For details see ad on page 226-7
Colonial Radio & TV Div., N.Y., 1
Communication Measurements Lab., Inc., N.Y., 6
Communications Co., Inc., Fla., 2, 3, 4, 6, 8
Condor Radio Mfg. Co., Ariz., 6, 8
Control Corp., Minn., 2
Control Engineering Corp., Mass., 6
Crosby Laboratories, Inc., 126 Herricks Rd., Mineola, L.I., N.Y., 2
For details see ad on page 87, 171
Crown Engineering, N.Mex., 5, 6
Delco Appliance Div. of Gen. Motors, N.Y., 5
Delco Radio Div. of General Motors, Ind., 1-8
Dominion Sound Equipments Ltd., Canada, 2
Doolittle Radio, Inc., Ill., 2, 3, 4, 6, 8
DuMont Labs., Inc., Allen B., TV Receiver Div., 35 Market St., E. Paterson, N.J., 7
For details see ad on page 161

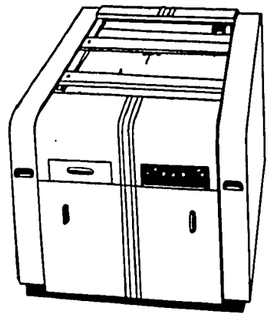
(Continued on page 170)

"Black boxes" to your specifications

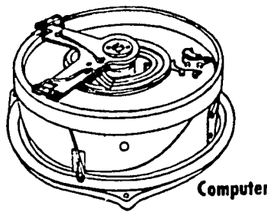
RESEARCH - DEVELOPMENT - PRODUCTION



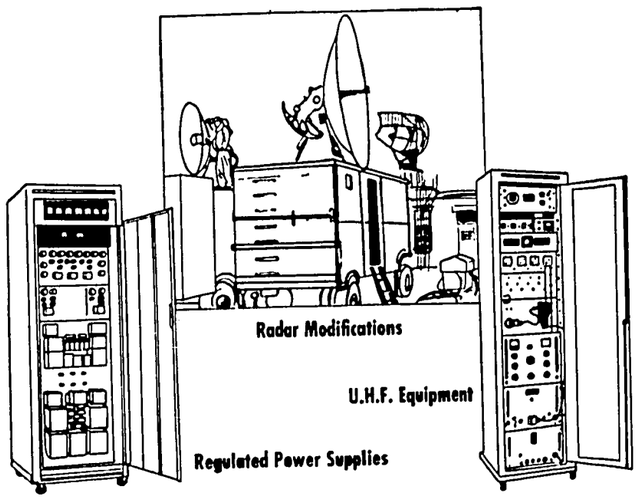
Special Test Equipment



Plotting Boards—such as the Variplotter Model 205 Series for accurately presenting X vs Y, curve following, point plotting, etc.



Computer Potentiometers



Radar Modifications

U.H.F. Equipment

Regulated Power Supplies

Electronic Associates, Inc., is a coordinated group of electronic engineering consultants fully equipped to perform electronic research, development and production. They include engineering, production, and administrative personnel capable of handling a wide range of problems including design studies, applied research, and the production of highly complex electronic devices.

Plant facilities comprise laboratories; model, welding and machine shops; paint, anodizing, and test departments; assembly and tool rooms; foundry and other contributing functions of production.

A few of the many products the Concern has manufactured are illustrated here.

More detailed information will be furnished on request.

ELECTRONIC ASSOCIATES, INC.

Long Branch, New Jersey

Receivers

(Continued from page 169)

Eckstein Radio & Television Co., Minn., 1, 2, 4
Electro Craft, Inc., Conn., 3, 6
Electro-Impulse Laboratories, N.J., 3, 8
Electronic Associates, Inc., Long Branch Ave., Long Branch, N.J., 5, 8
For details see ad on page 170
Electronic Research & Mfg. Corp., Ohio, 8
Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y., 6
For details see ad on page 87
Elm Laboratories, N.Y., 1, 2, 6
Emerson Radio & Phonograph Corp., N.Y., 1, 4, 7
Empire Devices, Inc., 38-25 Bell Blvd., Bayside, L.I., N.Y., 2, 5, 6, 8
For details see ad on page 198
Engineering Research & Dev. Co., Ill., 6
Erco Radio Labs., Inc., N.Y., 2, 3, 6, 8
Espey Mfg. Co., Inc., N.Y., 1, 2, 4
Federal Electric Mfg. Co. Ltd., Canada, 8
Federal Electric Products Co., N.J., 6
Federal Mfg. & Engineering Corp., N.Y., 2
Federal Telephone & Radio Corp., Selenium & Intelin Div., 100 Kingsland Rd., Dept. F7104, Clifton, N.J., 1, 2
For details see ad on page 232-3
Fisher Radio Corp., N.Y., 1, 4, 7
Fisher Research Lab., Inc., Calif., 2
Frequency Standards Corp., P.O. Box 66, Eatontown, N.J., 6
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General Electric Co., N.Y., 1-8
General Elec. Co., Electronics Dept., N.Y., 2, 3, 4, 5, 8
General Instruments, Inc., Texas, 5, 6
General Lab. Associates, Inc., N.Y., 6
General Precision Laboratory, Inc., 63 Bedford Rd., Pleasantville, N.Y., 7
For details see ad on page 234-5
Gertsch Products, Inc., Calif., 6
Gibbs Mfg. & Research Corp., Wis., 5
Gon-Set Co., Calif., 2, 6, 8
Gray Radio Co., Fla., 2
Hammarlund Mfg. Co., Inc., N.Y., 2, 3, 5, 6
Hastings Instrument Co., Inc., Va., 3, 4, 6
Heath Co., The, Mich., 1, 2
Hoffman Radio Corp., Calif., 1-8
Hogan Laboratories, Inc., 155 Perry St., New York 14, N.Y., 2, 6
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Houston-Fearless Corp., Calif., 2, 3, 5, 6
Hudson American Corp., N.Y., 1, 2, 6
Industrial Television, Inc., N.J., 7, 8
Jackson Industries, Inc., Ill., 1, 7
Jacobs Instrument Co., Md., 5, 6
Jarvis Electronics Corp., Ill., 6
Kaar Engineering Co., Calif., 3, 4, 8
Kay-Halbert Corp., Calif., 7
Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y., 3, 6, 8
For details see ad on page 244-5
Korb Engineering & Mfg. Co., Mich., 6
Lab for Electronics, Inc., Mass., 5, 6
Langevin Manufacturing Corp., 37 W. 65 St., New York 23, N.Y., 3
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Laurehk Radio Mfg. Co., Mich., 1, 6
Lear, Inc., Mich., 2, 5

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Receivers

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Link Radio Corp., N.Y., 2-5
Loral Electronics Corp., N.Y., 4, 5, 6
Lytle Engineering & Mfg. Co., Ill., 1, 7, 8
M P Concert Installations, Conn., 7
Mackay Radio & Tel. Co., Inc., N.Y., 2
Magnavox Co., Ind., 1, 4, 7, 8
Marconi Instruments Ltd., N.Y., 1-5, 8
Martin Co., Glenn L., Electr. Section, Md., 5, 8
Maryland Electronic Mfg. Corp., Md., 2, 4, 5, 6, 8
Measurements Corp., Intervale Rd., Boonton, N.J., 6
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Meissner Mfg. Co., Div. Maguire Inds., Ill., 1, 2, 4
Melpar, Inc., Va., 3, 5, 6, 8
Mercury Electronic Labs., Inc., Ill., 1, 6
Micro Radio Co., Ind., 1, 6
Microwave Dev. Labs., Inc., Mass., 5
Midwest Radio & TV Corp., Ohio, 1, 4, 7
Millen Mfg. Co., Inc., James, Mass., 6
Morrow Radio Manufacturing, Ore., 2
Motorola, Inc., Comm. & Elec. Div., Ill., 1-8
Mullard Electronic Prods. Ltd., England, 1, 2, 3, 4, 6, 7, 8
National Aeronautical Corp., Pa., 3, 6
National Co., Inc., Mass., 2, 7, 8
National Electronics Labs., Inc., D.C., 3, 6, 8
New London Instrument Co., Conn., 4
Newcomb Audio Products Co., Calif., 1
North American Philips Co., Inc., N.Y., 7
Northern Radio Co., Inc., 143 W. 22 St., New York 11, N.Y., 2, 6
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Northern Radio Company, Wash., 2, 3
Palmer, Inc., M. V., Wash., 2, 4, 6, 8
Patterson-Moos & Co., Inc., N.Y., 3, 6, 8
Philco Corp., Pa., 1, 4, 5
Pickard and Burns, Inc., Mass., 6
Pioneer Elec. & Research Corp., 7212 Circle Ave., Forest Park, Ill., 6
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Plastics & Electronics Corp., N.Y., 1, 3, 6
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Polarad Electronics Corp., N.Y., 3, 5, 6
Polk Electronic Co., N.Y., 5
Press Wireless Mfg. Co., Inc., N.Y., 2, 3, 5, 6, 8
Pye Ltd., Radio Works, England, 1
RCA International Div., 30 Rockefeller Plaza, New York 20, N.Y., 1-4, 6-8
RCA Eng. Prod. Div., Camden, N.J., 1, 2, 4-8
Radio Craftsman, Inc., Ill., 1, 4, 7
Radio Engineering Labs., Inc., N.Y., 3, 4, 5
Radio Engineering Products Ltd., Canada, 3
Radio Hispano Suiza, S.A., Spain, 1, 7
Radio (1936) Ltd., New Zealand, 1, 2, 6
Radio Receptor Co., Inc., 251 W. 19 St., New York 11, N.Y., 8
For details see ad on page 173
Redifon Ltd., England, 2
Rogers Majestic Ltd., Canada, 1, 2, 4, 7, 8
Rosen Eng'ng Prods., Inc., Raymond, 32 & Walnut St., Philadelphia 4, Pa., 4, 6, 8
For details see ad on page 98
SMA Company, Ill., 1, 4, 7
Sargent-Rayment Co., Calif., 1, 3, 4
Schuttig & Co., Inc., D.C., 6
Scientific Electric, 105-119 Monroe St., Garfield, N.J., 7
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Self Winding Clock Co., Inc., N.Y., 4, 8
Sierra Electronic Corp., Calif., 6
Sondyna, A. G., Switzerland, 1-4, 6-8
Sparks-Withington Co., Mich., 1, 4, 7
Sparton of Canada Ltd., Canada, 1, 4, 7
Sparton Radio & Television, Mich., 1, 7
Spera Electronic Labs., N.Y., 3, 4, 6, 8
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 6
See complete catalog filed alphabetically in last section
Spilsbury & Hepburn Ltd., Canada, 2, 3, 6, 8
Square Root Mfg. Corp., N.Y., 5
Standard Coil Products Co., Inc., 2329 N. Pulaski Rd., Chicago 39, Ill., 8
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Stewart-Warner Electric Div., Ill., 1, 2, 7
Stolle Engineering & Mfg. Co., Calif., 1, 7
Superex Electronics Corp., N.Y., 6, 7

(Continued on page 172)

Accurate FABRICATION of FUSED QUARTZ

PRECISION FABRICATED TO SPECIFICATIONS

Specialists in the fabrication of FUSED QUARTZ, ceramics, alumina, norbide, sapphire or any other hard material to closest tolerance. All sizes and shapes for production and research in chemistry, electricity, and physics.

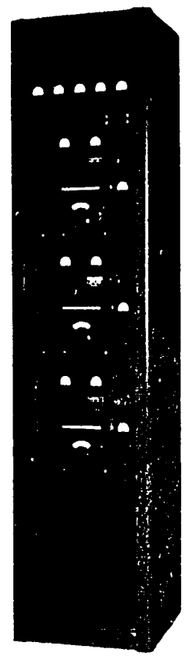
SYNCOR PRODUCTS COMPANY

FACTORY AT 26 IRVING COURT, MALDEN, MASS.

SYNCOR PRODUCTS CO. BOX 51, MALDEN 48, MASS.

Exalted-Carrier Diversity Receiver

A New standard of performance in high-frequency reception



Combines all advantages of the best diversity reception plus new exalted-carrier detection which eliminates selective fading distortion and greatly reduces interference from interfering stations within the received channel.

Supplied in compact three-receiver combination with high continuity-of-service factor and switching flexibility.

New diversity selector chooses strongest of the three signals and completely rejects the weaker signals.

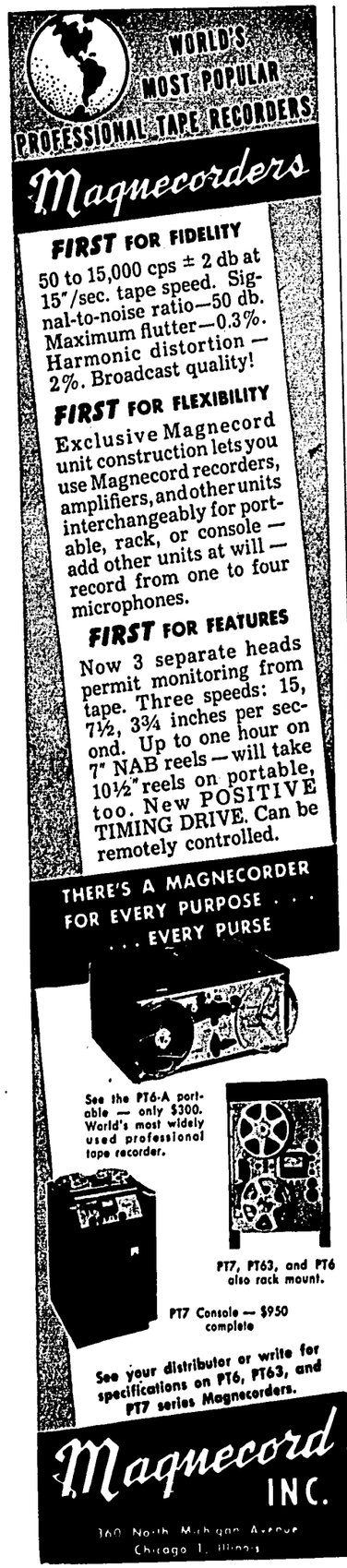
For reception of voice, program, or tone-multiplex transmited by either amplitude or phase modulation.

Exalted-carrier adapters also available for single-receiver use.

Inquiries invited

CROSBY LABORATORIES, INC.

126 Herricks Road, Mineola, N.Y., GArden City 7-6487



Receivers

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Superior Marine Radio Co., Fla., 2, 3, 6
Sylvania Electric Products, Inc., Dept. R-6351, Emporium, Pa., 1, 4, 7
For details see ad on page 42
Symphony Radio & Tel. Corp., Calif., 1, 4, 7
Tech-Master Products Co., N.Y., 1, 4, 7
Technical Materiel Corp., N.Y., 2, 3
Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 2, 6, 7
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Trav-Ler Radio & TV Corp., Ill., 1, 7
Tycho Roberg, A. B., Sweden, 2, 4, 5, 6, 8
Vidaire Television Co., N.Y., 1, 4, 7
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Walworth Co., Inc., N.Y., 5, 8
Weingarten Electr. Labs., Inc., Calif., 1, 4
Wells-Gardner & Co., Ill., 1-7
Westinghouse Electric Corp., Pa., 1, 5, 6, 7

55. Recording Equipment.

1—Disc Recorders. 2—Magnetic Tape Recorders. 3—Magnetic Wire Recorders.

Air King International Corp., N.Y., 3
Amplifier Corp. of America, N.Y., 2
Avion Instrument Corp., N.Y., 2, 3
Bell Sound Systems, Inc., Ohio, 1, 2
Berlant Associates, Calif., 2
Brush Development Co., Ohio, 2, 3
Caltron Co., Calif., 1, 2
Campbell Mfg. Co., Ltd., Canada, 2
Cinema Engineering Co., Calif., 2
Coax Electronics Co., N.Y., 1
Cook Electric Co., Ill., 2
Cook Laboratories, N.Y., 1
Crescent Industries, Inc., Ill., 3
Crestwood Recorder Corp., Ill., 2
Dalmo-Victor, Inc., Calif., 2
Davies Laboratories, Inc., The, M.D., 2
Daystrom Electric Corp., N.Y., 3
Dominion Sound Equipments Ltd., Canada, 1-3
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Eicor, Inc., Ill., 2
Electro Craft, Inc., Conn., 2
Electronic Signal Co., N.Y., 2
Elm Laboratories, N.Y., 3
Fairchild Recording & Equip. Corp., N.Y., 1, 2
Gates Radio Co., Ill., 1
General Industries Co., The, Ohio, 1, 2
Hegeman Labs., N.J., 2
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Korb Engineering & Mfg. Co., Mich., 3
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Reeves Equipment Corp., N.Y., 1, 2
Rek-O-Kut Co., N.Y., 1
Robinson Recording Labs., Pa., 1
Rogers Majestic Ltd., Canada, 2
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Sound, Inc., Ill., 2
Soundscriber Corp., The., Conn., 1, 2
Speak-O-Phone Record'g & Equip., N.Y., 1

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BATTERY RECORDER-PLAYBACK
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MILES REPRODUCER CO., INC.
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Recording Equipment

(Continued from page 172)

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Thordarson Elec. Mfg. Div., Ill., 1
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Video Corp. of America, N.Y., 2
Webster-Chicago Corp., Ill., 2, 3
Webster Electric Co., Wis., 2
Zephyr Products Co., N.Y., 1, 2, 3

56. Recording Accessories & Supplies.

1—Blanks. 2—Cutting Needles. 3—Disc Recording Heads. 4—Magnetic Recording Playback & Biasing Heads. 5—Magnetic Recording Tape. 6—Magnetic Recording Wire.

Acme Litho Plate Graining, Inc., N.Y., 5
Advance Recording Prods. Co., N.Y., 1
American Laubscher Corp., N.Y., 2
Ampex Electric Corp., Calif., 5
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Crestwood Recorder Corp., Ill., 5

Recording Accessories and Supplies

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Duotone Co., Inc., N.J., 2, 3, 4
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Minnesota Mining & Mfg. Co., Minn., 5
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Rowe Industries, 1702 Wayne St., Toledo 9, Ohio, 2, 5
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U. S. Recording Co., D.C., 1-6
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57. Rectifiers.

1—Metallic. 2—Vacuum Tube.

Aerolux Light Corp., N.Y., 2
Allied Elec. Products, Inc., N.J., 2
American Communications Corp., N.Y., 1, 2
American Television & Radio Co., Minn., 1
Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N.Y., 2
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MINIATURE SELENIUM RECTIFIERS
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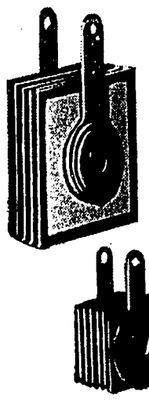

MODEL NO.	PLATE SIZE	STACK THICKNESS	MAX. INPUT VOLTAGE R. M. S.	MAX. PEAK INVERSE VOLTAGE	MAX. D.C. OUTPUT CURRENT
1M1	1" sq.	3/8"	25	75	100 MA
8Y1	½" sq.	9/16"	130	380	20 MA
16Y1	½" sq.	15/16"	260	760	20 MA
8J1	11/16" sq.	9/16"	130	380	65 MA
5M4	1" sq.	11/16"	130	380	75 MA
5M1	1" sq.	7/8"	130	380	100 MA
5P1	1-3/16" sq.	7/8"	130	380	150 MA
6P2	1-3/16" sq.	1-3/16"	156	456	150 MA
5R1	1½"x1¼"	7/8"	130	380	200 MA
5Q1	1½" sq.	1⅛"	130	380	250 MA
6Q1	1½" sq.	1⅛"	156	456	250 MA
6Q2	1½" sq.	1⅜"	156	456	250 MA
6Q4	1½" sq.	1¾"	130	380	300 MA
5QS1	1½"x2"	1⅛"	130	380	350 MA
6QS2	1½"x2"	1¼"	156	456	350 MA
5S1	2" sq.	1⅛"	130	380	500 MA
6S2	2" sq.	1⅜"	156	456	500 MA

For more complete listings write for Bulletin No. 104-Y.

SELETRON Selenium Rectifiers are constantly specified by an increasing number of radio engineers in the U.S. and throughout the world because they are so thoroughly dependable under all types of grueling applications. SELETRON engineers will be glad to aid you in the solution of your rectifier problems.

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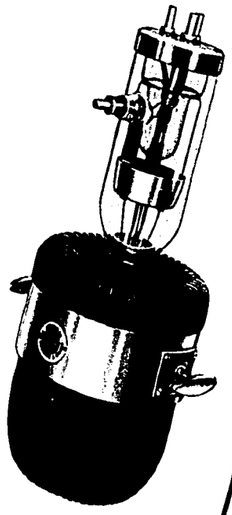
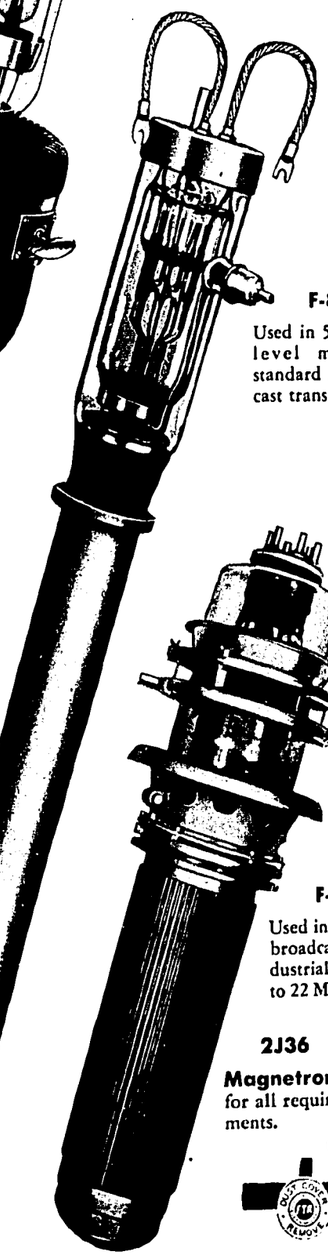
Electronic Vacuum Tubes for all power requirements: Transmitting, Rectifying, Industrial, Special Purpose, Television.



F-892-R
Used in 5 and 10 KW AM transmitters.



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Used in 50 KW low level modulated standard AM broadcast transmitters.

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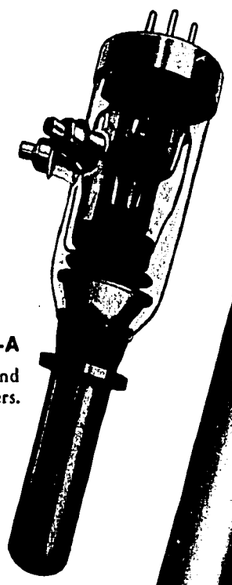
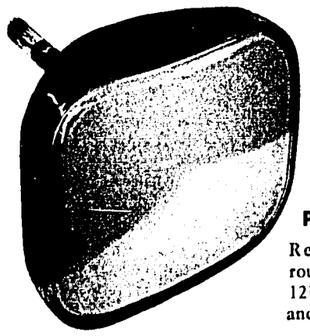
F-5680
Used in broadcasting and industrial applications up to 50 Mc.



F-124-A
Used in 50 KW AM and short wave transmitters.

F-134
Used in high power broadcasting and industrial service up to 22 Mc.



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Rectangular and round screen types: 12½, 14, 16, 17, 19 and 20 inch.

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Magnetrons for all requirements.

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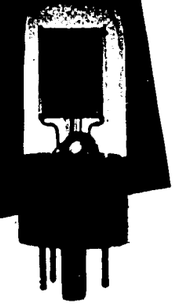
CETRON engineer perfected phototubes. Many types for innumerable applications. "Insist on CETRON."



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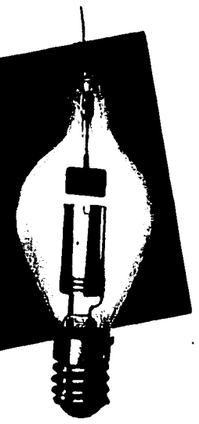
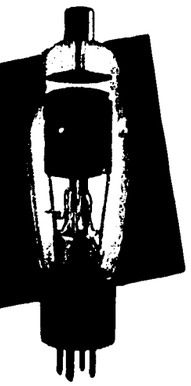
CETRON industrial rectifiers in full and half wave mercury vapor, full and half wave gas filled using both mercury vapor and gas. "Insist on CETRON."



THYRATRONS

CETRON grid controlled thyratrons have a longer life and better performance. "Insist on CETRON."



For over a quarter of a century CETRON phototubes, industrial rectifiers, and thyratrons have been meeting the needs of the industry effectively and efficiently. Send for a copy of our 50 page catalog. It contains all the technical data and specifications of all electronic tubes in our large line.

CONTINENTAL ELECTRIC CO.
Geneva, Illinois

Rectifiers

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Mitus, Inc., N.Y., 1
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North American Philips Co., Inc., N.Y., 2
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Rogers Majestic Ltd., Canada, 2
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Weltronic Company, Mich., 2
Westinghouse Electric Corp., Pa., 1, 2
Woodwelding, Inc., Calif., 2

Regulators, Voltage, see: 74

58. Relays.

1—Hermetically sealed.
2—Instrument.
3—Keying.
4—Mercury.
5—Power Control & Overload.
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7—Telephone Types.
8—Time Delay.
9—Resonant and Others

Acme Electronics, Calif., 1
Airpax Products Co., Md., 1, 2
Allied Control Co., Inc., N.Y., 1-3, 5-8
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American Gas Accumulator Co., 1027 Newark Ave., Elizabeth 3, N.J., 8
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Bunnell & Co., J. H., N.Y., 6

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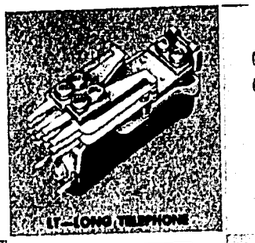
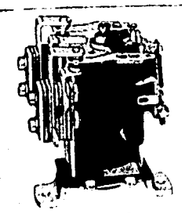
MT—SMALL TELEPHONE

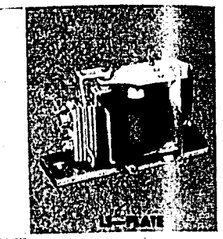
ST—SHORT TELEPHONE



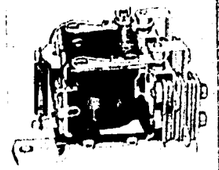
LT—LONG TELEPHONE



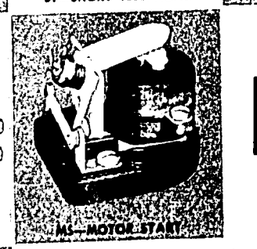
LM—PLATE



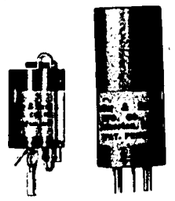
L—PLATE



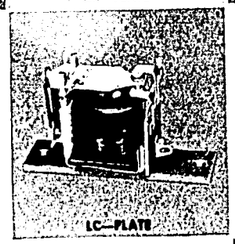
MR—MEDIUM POWER



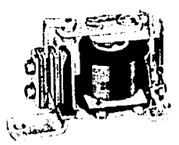
MS—MOTOR STAT



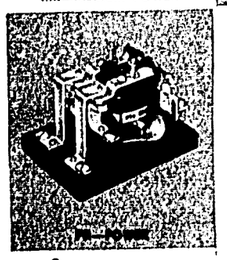
SM—SUPER MIDGET



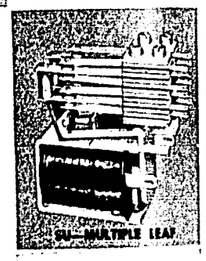
LC—PLATE



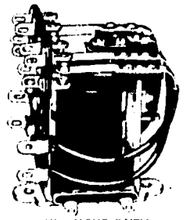
LP—PLATE



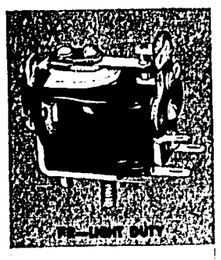
HP—POWER



SU—MULTIPLE LEAF

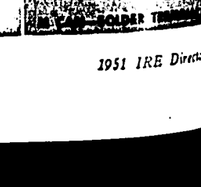


KL—LIGHT DUTY



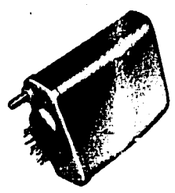
FR—LIGHT DUTY

HG—MERCURY CONTACT

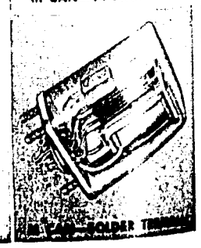


K CAN—OCTAL PLUG

K CAN—SOLDER TERMINAL



M CAN—14 PRONG PLUG



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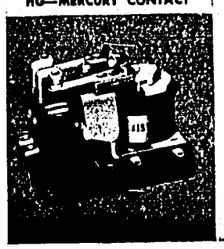
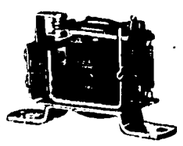
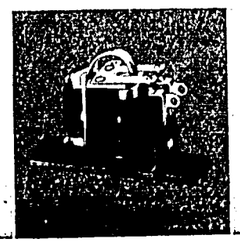
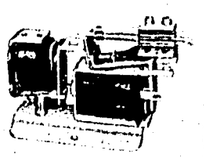




FR—PHOTO FLASH





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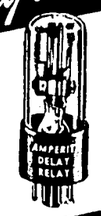

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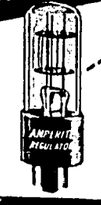

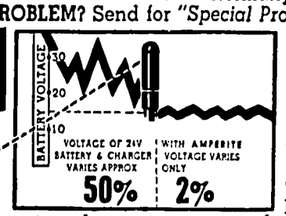

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Relays

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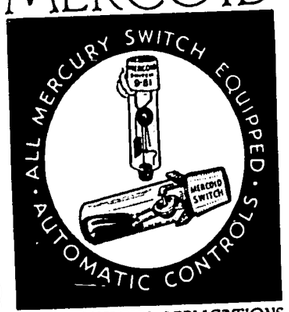

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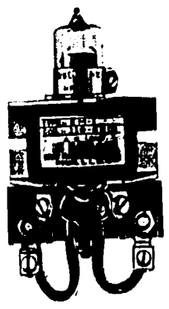

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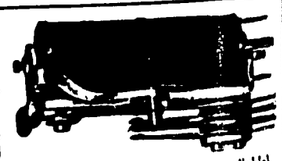

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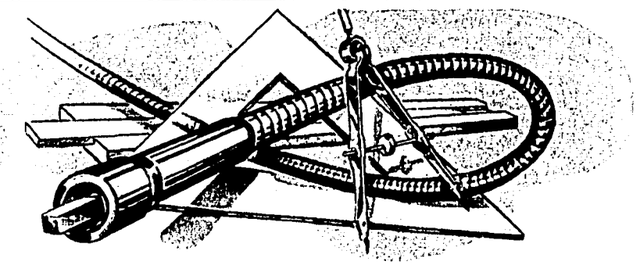

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White S. S., Industrial Div., N.Y., 2
Woodwelding, Inc., Calif., 1

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MEPCO, INC. PRECISION RESISTORS

JAN-R-93
LUG TERMINAL TYPES

CERAMIC FORMS: Non-hygroscopic material, high dielectric, low coefficient of expansion. No. 6 screw hole through center.

WIRE: Highest grade alloys; Cu-Ni, Ni-Cr, Cu-Mn-Ni, Ni-Cr-Al-Cu, Ni-Cr-Fe, enamel or fabric covered. Minimum size .0015 standard, .0007 special.

TEMPERATURE COEFFICIENT: ± .002%/°C for ohmages up to approx. 2500; .017%/°C above 2500. .002%/°C may be ordered special on any type resistor.

TOLERANCE: ± 1%, ±.5%, ±.25% standard. ±.1, ±.05 special.

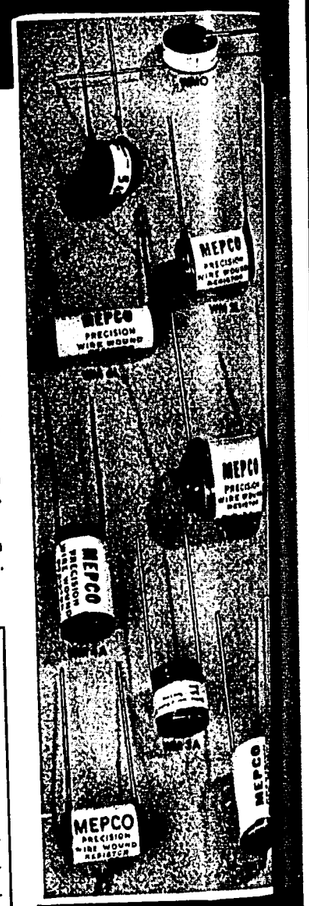
MOISTURE PROTECTION: Standard units thoroughly impregnated with moisture and salt water proofing compounds and fungus resistant acetate label. Vacuum impregnating and other special sealing on request.

INSULATION: Each cross-over wire insulated from winding by acetate cloth. All units receive 500V. breakdown test.

INDUCTANCE: Reversed, balanced winding in each pie section minimizes inductance up to approx 50KC. Special frequency characteristics upon request.

Type		Wattage Rating		Resistance Range			Dimensions (Inches)		Jan Voltage Ratings		
Jan.	Mepco	Jan.	Commercial	Low (OHM)	High (MEG)	Special* (MEG)	Length	O. D.	1%	.5%	.25%
RB 10	RB 10	1/4	1/2	.1	.2	.5	15/32	1/2	215	186	152
RB 11	WM 3	1/3	1	.1	.2	.4	9/16	9/16	316	274	224
RB 12	WM 4	1/2	1	.1	.6	1.5	1	9/16	387	335	274
RB 13	WM 5	1/2	1	.1	.9	3	1 1/4	3/4	612	520	433
RB 14	WM 2	1	2	1	3	5	2	7/8	2000	1732	1414
RB 21	WM 1	1	1	1.0	.5	1	2 1/8	9/16	895	775	632
RB 40	WM 12	.4	1	.1	.15	.3	1	3/4	245	212	173
RB 41	WM 13	1/2	1	.1	.3	.6	1 1/4	3/4	387	335	274
RB 42	WM 14	.6	1	.1	.5	1.5	1 3/8	3/4	520	450	367
RB 51	RB 51	1/4	1/2	.1	.1	.3	3/8	3/8	158	137	112

* Higher maximum resistance at reduced power rating using smaller wire sizes.



COMMERCIAL
LEAD TERMINAL TYPES

MOLDED★ lead terminal PRECISION RESISTORS: Per... Connection between Winding and Terminal. Elimina... soldered joints in resistor. No flux used—all connections ... corrosive. Cannot "OPEN" due to flexing of lead wire. Same construction as our JAN R-93 Lug terminal types.

★Terminal and end of winding are imbedded together by ... metal molding process, assuring a positive electrical and ... chanical connection.

Other lead terminal types are of the same basic construction as Lug Types. Terminals are No. 21 AWG copper wire, ... 1½" long. Wire fastened on resistor so it cannot turn or ... loose. Wire from winding attached to lead at side opp... terminal to prevent breaking when terminal is flexed.

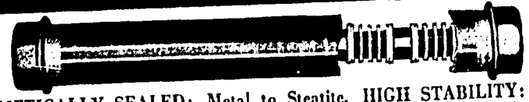
Type WM-O resistor usually supplied with an inductive ... ing. Special non-inductive construction on request.

Type	Wattage Rating	Resistance Range		Dimensions (Inches)	
		Low	High	Length	O. D.
WM 1/4	1/20	50 ohms	.03 meg	9/32	
WM 1/2	1/10	5 ohms	.05 meg	7/16	
WM 0	1/4	1 ohm	.2 meg	1/4	
WM 2L	1/2	.1 ohm	.1 meg	3/4	
★ ML-3	1	.1 ohm	.2 meg	9/16	
★ ML-4	1	.1 ohm	.6 meg	1	
★ ML-5	1	.1 ohm	.9 meg	1 1/4	
★ ML-2	2	1 ohm	3 meg	2	
WM 6L	1	.1 ohm	.2 meg	13/16	
WM 3A	1	.1 ohm	.5 meg	1/8	
WM 4A	1	1 ohm	.8 meg	1	
WM 5A	1	1 ohm	1 meg	3/4	

† Not illustrated.
* Higher maximum resistance, at reduced power ... may be had by using smaller wire sizes. Data on request

MEPCO METER MULTIPLIER

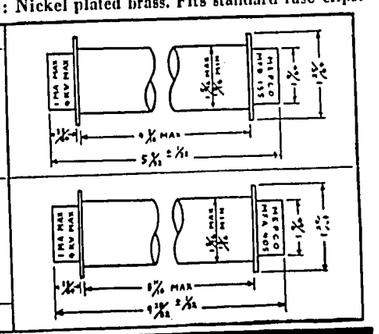
JAN R-29
TYPES MFA & MFB



HERMETICALLY SEALED: Metal to Steatite. HIGH STABILITY: Finest grade Alloy wire—Properly aged. SHOCK RESISTANT: Suspended elements—Internal cushioning. REPLACEABLE SECTIONS: Eliminates complete loss of unit if damaged. TEMPERATURE COEFFICIENT: ±.017%/°C standard, ±.002%/°C special. TERMINALS: Nickel plated brass. Fits standard fuse clips.

Type	Megohms†	Kilovolts
MFB 105*	1.0	1.0
MFB 155	1.5	1.5
MFB 205	2.0	2.0
MFB 255	2.5	2.5
MFB 305	3.0	3.0
MFB 355	3.5	3.5
MFA 355*	3.5	3.5
MFA 405	4.0	4.0
MFA 455	4.5	4.5
MFA 505	5.0	5.0
MFA 605	6.0	6.0

*U.S.N. replacement †±.5%



MEPCO, INC. 37 Abbett Avenue Morristown, N. J.
Telephone: Morristown 4-5777

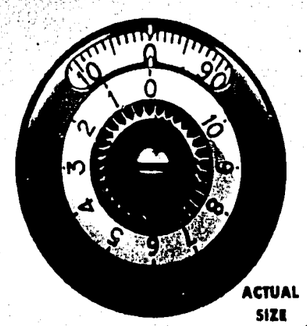
MICRODIAL
TEN TURN-COUNTING DIAL

Microdial is composed of two concentrically mounted dials . . . one for counting increments of each turn and the other for counting turns. The incremental dial has 100 equal divisions and is attached rigidly to the shaft so there is no backlash. Thus the contact position is indicated to an indexed accuracy of 1 part in 1000. Rotation is continuous in either direction. There are no stops on the Microdial assembly.

COMPACT . . . Microdial has same O.D. as Micropot . . . requires no more panel space.

CLEAR READING . . . Forced fast-reading tests showed only 1/20th as many errors with Microdial open window as with next most legible dial. Turn counter distinguishes between 0 and 10 turn readings, and accelerates to avoid confusion on readings near integral turns. Precise readings are made from larger dial with maximum separation of graduations and wide angle visibility.

CONVENIENT . . . delivered completely assembled with dials synchronized. Easily mounted in a few seconds. All dials may be locked.

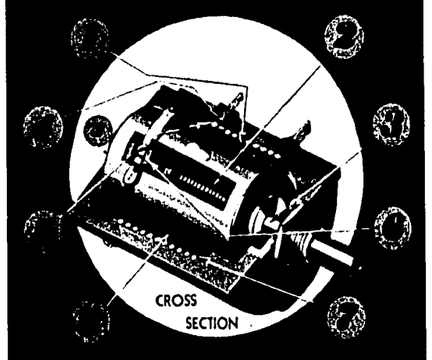


Microdial . . . turn-counting dial, primarily designed for use on Micropot ten turn linear potentiometers . . . use it on any multiturn device having ten turns or less.

BORG EQUIPMENT DIVISION
THE GEORGE W. BORG CORPORATION
DELAVAN • WISCONSIN

MICROPOT
PRECISION TEN-TURN POTENTIOMETER

1. You get permanent accuracy because the resistance wire is locked in place. It is precision positioned and moulded integrally with the housing.
2. You get permanently accurate settings, smooth action and low uniform torque provided by the stainless steel, precision ground, double thread lead screw guiding the moving contact.
3. You get precise positioning of the moving contact because of the two bearings supporting the rotor assembly.
4. You get good rigid terminals because they are moulded integrally with the housing.
5. Terminals soldered to ends of resistance element before moulding. Entire resistance circuit is an integral part of the housing.
6. You get accurate setting and resetting due to anti-backlash spring in contact guide.
7. You get a fine resolution because of the 431⅛" length of resistance wire in the spiral element.
8. You get a resistance output directly proportional to shaft rotation within ±0.1% of the total resistance. Every potentiometer is automatically machine tested for linearity at 101 points.



LINEARITY ACCURACY ± 0.1%

Units for immediate shipment:
1,000 to 30,000 ohm range.
Special resistance values made to order.

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BORG EQUIPMENT DIVISION
THE GEORGE W. BORG CORPORATION
DELAVAN • WISCONSIN

60. Resistors.

1—Carbon Fixed.
2—Carbon Variable.
3—Potentiometers.
4—Precision.
5—Printed Circuit.
6—Rheostats.
7—Vacuum Sealed.
8—Wire Wound, Fixed.
9—Wire Wound, Variable.

Aerovox Corp., 740 Belleville Ave., New Bedford, Mass., 1, 4, 8, 9
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General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 2, 3, 4, 6, 8, 9
For details see ad on page 236-7, Back Cover
(Continued on page 182)

sub-miniature AND moisture-proof

IN-RES-CO S-15 & S-30 WIRE WOUND RESISTORS

THE ECONOMICAL SOLUTION where moisture proof resistive elements of comparatively small size are required for commercial applications. Type S-15 is ⅜" long by ¼" diameter; type S-30 measures ¾" by ¼" diameter. Both types are moisture proof and capable of high performance over long periods of continuous service. IN-RES-CO Resistors for every ordnance or civilian requirement are available at a cost that solves circuit design problems both performance-wise and cost-wise. Check up now, on the complete line of IN-RES-CO quality wire wound resistors

TYPE S-15
¼" DIA. x ⅜" LG.

TYPE S-30
¼" DIA. x ¾" LG.

INSTRUMENT RESISTORS CO.
COMMERCE AVENUE UNION NEW JERSEY

FOR JAN SPECIFICATION RESISTORS — consult the new illustrated literature describing the complete In-res-co line. Write for your copy today!

APPLICATION-DESIGNED RESISTORS FOR ELECTRONICS AND INSTRUMENTATION

SPACE SAVERS FOR MODERN CIRCUITRY – MONEY SAVERS FOR PRODUCTION ECONOMICS –

IN-RES-CO TYPE IR WIRE WOUND RESISTORS

The practical, low cost solution for circuit designers striving for the subminiature. Type IR units offer precision resistance values capable of retaining stability through long periods of continuous or intermittent service. Type IR resistors are available at prices based on mass production methods of manufacture. Wound to a tolerance of ±1%, they are permanently accurate. Conservative ratings allow ample safety margin in all classes of service. Special Bakelite forms eliminate shrinking, swelling and temperature effects. IN-RES-CO moisture and fungus proof coating offers absolute protection against climatic extremes. Specify IR Type resistors for all applications where precision performance and limited space are important determining factors.

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WRITE FOR NEW RESISTOR HANDBOOK — Contains complete data and recommended applications for resistors for every purpose.

APPLICATION-DESIGNED RESISTORS FOR ELECTRONICS AND INSTRUMENTATION

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IN-RES-CO TYPES CX & BX WIRE WOUND RESISTORS

FEATHERWEIGHT! —another IN-RES-CO solution for CIRCUIT DESIGNERS

SEALED IN MOLDED BAKELITE PLUS LIGHTWEIGHT

The dependable resistive elements that combine positive sealing with the important advantage of lightweight Molded Bakelite core reduces weight by one-half compared to ceramics. Positive seal effectively protects the winding against harmful climatic conditions. Additional IN-RES-CO features include long life stability, hard soldered connections to terminals and extra-sturdy, vibration proof terminal leads. Both CX and BX Resistors include space-saving terminal supported axial terminals of tinned wire.

IN-RES-CO TYPE CX NON-INDUCTIVE RESISTOR

IN-RES-CO TYPE BX NON-INDUCTIVE RESISTOR

ASK FOR THE NEW RESISTOR HANDBOOK – Contains complete data on resistors for every purpose and their recommended applications. Please make request on company letterhead

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APPLICATION-DESIGNED RESISTORS FOR ELECTRONICS AND INSTRUMENTATION

IN-RES-CO TYPES SM-15 & SM-30 WIRE WOUND RESISTORS

SUB-MINIATURE weather-tested midgets

Type SM-15 and SM-30 Resistors offer three vital advantages: sub-miniature size, weather resistant construction and high resistance. The elimination of center hole mounting and the inclusion of axial leads increases winding area and results in 25% greater resistance value than resistors of standard design. Special coating is moisture and fungus proof and designed to meet JAN R 93 specifications. Sealed in Bakelite construction affords additional climatic protection. As ratings are conservative, types SM-15 and SM-30 can be specified with confidence for service under rigorous conditions.

TYPE SM-15
5/16" DIA. x ⅜" LG.

TYPE SM-30
5/16" DIA. x ¾" LG.

ASK FOR THE NEW RESISTOR HANDBOOK – Contains complete data on resistors for every purpose and their recommended applications. Please make request on company letterhead

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APPLICATION-DESIGNED RESISTORS FOR ELECTRONICS AND INSTRUMENTATION

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OhmWeve RESISTORS

NEW non-Inductive resistors

50% less resistance variation with frequency and 50% less inductance than conventional woven resistors.

- for Rf Loads
- for Pulse Work
- for Hydrogen Thyratron Loads

Also other types for crystal oven heaters, etc.
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Hartford 32-1104

OhmWeve
THE OHMWEVE COMPANY
43 DARCY ST., WEST HARTFORD 6, CONN.

One Source of Supply—Headquarters for

E-I sealed leads and multiple headers

FOR EVERY APPLICATION

Standard SEALED LEADS

Over 50 standard types to choose from. Made of hard glass, preformed with microscopic air cushioning. Absolutely free from internal strain. Tin dipped for easy soldering. Write for Bulletin 849 for complete information.

Standard MULTIPLE HEADERS

Over 100 standard types available. All headers vacuum tight, with cushioned glass preforms. Completely strain free, tin dipped, silicone treated. Many optional features including CRT closures. Full information can be obtained by writing for Bulletin 850.

CUSTOM SEALS to Specification

Practically any type of sealed terminal or multiple header can be produced to exact customer requirements. Whether your problem involves a new design or the application of a standard item, E-I engineers offer complete collaboration.

SAMPLE KIT for Designers

Contains 81 standard terminals, 11 different headers. All economy priced items—picked to solve practically any problem. Transparent case with labeled bins for easy selection. Complete kit sells for only $10.00—check or money order.

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MANUFACTURERS OF SPECIALIZED ELECTRONIC EQUIPMENT

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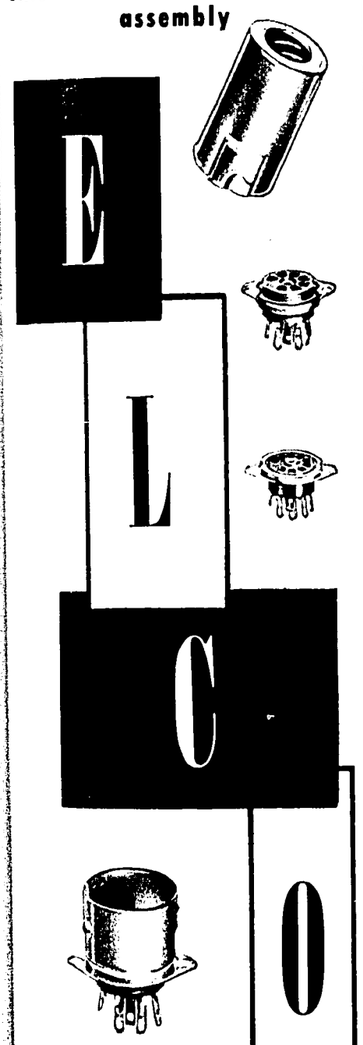
E I INC

greater precision in components . . . facilitates and improves assembly



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7-pin and 9-pin miniatures in all basic types

TUBE SHIELDS

7-pin and 9-pin miniatures in JAN, RMA and snap-on types . . . with or without lead shields

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COMING SOON . . . the most revolutionary new connector ever furnished the electrical and electronic field. WATCH FOR IT from . . .

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61. Schools & Institutions, Technical.

American Television, Inc., Ill.
Capitol Radio Engineering Inst., D.C.
Deforests Training, Inc., Ill.
Franklin Institute, The, 20 & Benjamin Franklin Pkwy., Philadelphia 3, Pa.
For details see ad on page 136
Illustrated Technical Prods. Corp., N.Y.
National Radio Institute, D.C.
Preisman & Biser, D.C.
RCA Institutes, Inc., N.Y.

Servo-Mechanisms, see: 45 sub-head 2

Shielded Screen Rooms, see: 67 sub-head 11

62. Sockets, Vacuum Tube.

1—Receiving Tube Types.
2—Transmitting Tube Types.
3 Underwriters Laboratories Approved Types.

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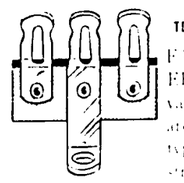
TERMINAL STRIPS PILOT LIGHT SOCKETS



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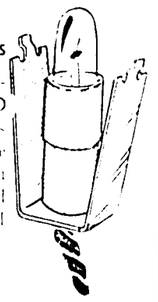
FAST DELIVERY of a wide variety of standard and special types in small lots.

NYLON INSULATED PILOT LIGHT SOCKETS



UNDERWRITERS APPROVED Dial Light Sockets with unbreakable molded Nylon sleeves. Supplied with standard and special brackets.

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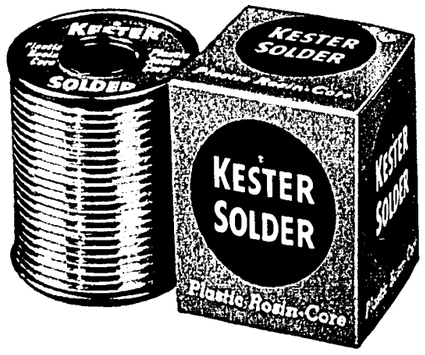
For The Television, Radio, And Electronics Industry

KESTER "RESIN-FIVE" CORE SOLDER

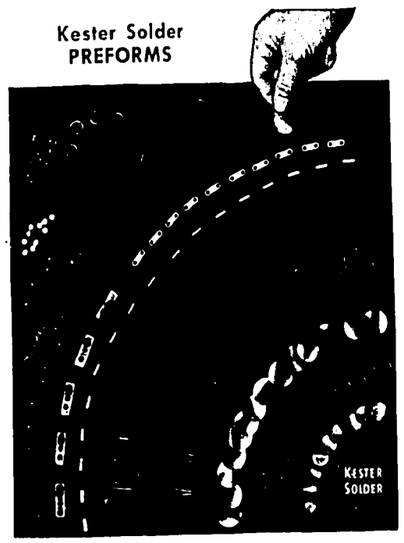
Formulated especially for Radio and TV; will easily solder such metals as brass, zinc, and ferrous alloys. It is non-corrosive and non-conductive.



KESTER PLASTIC ROSIN-CORE SOLDER

The most widely used solder in the TV and Radio fields. All Kester Solders are made from the finest tin and lead available.

Kester Solder PREFORMS



Use Kester *Soft Solder* Preforms for flame, oven, and induction soldering. Write today for samples and complete information.

OTHER KESTER PRODUCTS

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- ★ Kester Nosput Flux-Core Solder
- ★ Kester Knorust Flux Core Solder
- ★ Specialized Flux-Core Solders (over 100,000 different types and sizes)
- ★ Kester Acid-Core Solder
- ★ Solid Wire and Bar Solders
- ★ External Rosin Soldering Fluxes
- ★ Other Fluxes
- ★ Kester Soldering Iron Brackets

A TECHNICAL SERVICE FOR MANUFACTURERS

If you are not getting peak efficiency or have a specific problem in your soldering operations, take advantage of the facilities of Kester's Technical Department . . . It costs you nothing.

STANDARD FOR THE RADIO AND TV FIELDS

KESTER SOLDER

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DRAKE
insta-heat
SOLDERING GUN

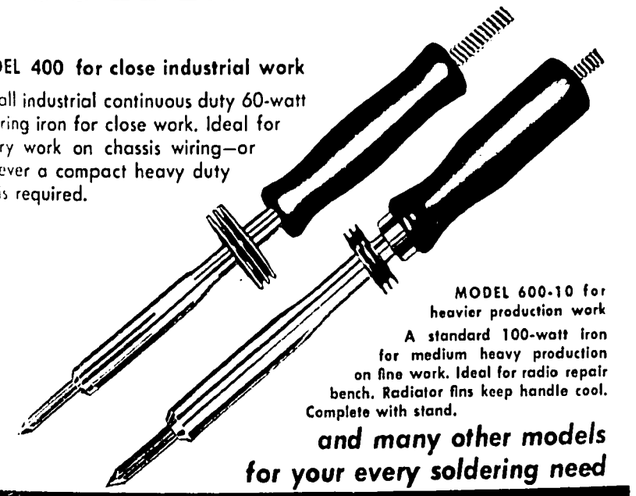
convenient - efficient - always ready!

Solder with the greatest of ease with the Drake Insta-Heat Soldering Gun—built with *useful* features you'll like. Ready stand provides convenient storage, keeps gun ready for instant use—visa-lite keeps work in sight—press the trigger and—presto!—you have soldering temperature almost immediately. Perfectly balanced—a pleasure to use . . . the Drake Insta-Heat Soldering Gun.

DRAKE
SOLDERING IRONS

MODEL 400 for close industrial work

A small industrial continuous duty 60-watt soldering iron for close work. Ideal for factory work on chassis wiring—or wherever a compact heavy duty iron is required.



MODEL 600-10 for heavier production work

A standard 100-watt iron for medium heavy production on fine work. Ideal for radio repair bench. Radiator fins keep handle cool. Complete with stand.

and many other models for your every soldering need

DRAKE ELECTRIC WORKS, INC.
3656 LINCOLN AVE. CHICAGO 13, ILLINOIS

63. Solder.

1—Acid Cored. 2—Plain. 3—Precious Metal. 4—Pre-forms. 5—Rosin Cored.

Alpha Metals, Inc., N.Y., 1, 2, 4, 5
Anchor Metal Co., N.Y., 1-5
Brach Mfg. Corp., N.J., 2
Cohn Corp., Sigmund, 44 Gold St., New York 7, N.Y., 3
For details see ad on page 145
Division Lead Co., Ill., 1-5
Enthoven & Sons Ltd., H. J., England, 5
Glaser Lead Co., Inc., N.Y., 1, 2, 4, 5
Goldsmith Bros. Smelting & Refining, Ill., 3
Handy-Harman, N.Y., 3
Kester Solder Co., 4219 Wrightwood Ave., Chicago 39, Ill., 1, 2, 4, 5
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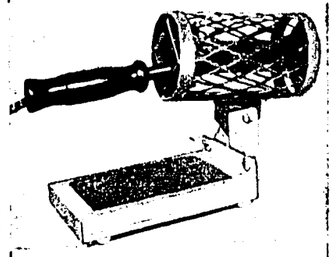
Lenk Mfg. Co., Mass., 1, 2, 4, 5
Linick Chemical Co., Ill., 3
Makepeace Co., D. E., Mass., 3
Manhattan Research Laboratories, N.Y., 3
Metals & Controls Corp., Mass., 3
Micro-Circuits Co., Industrial Coatings Dept., New Buffalo, Mich., 3
For details see ad on page 138
Multicore Sales Corp., 164 Duane St., New York 13, N.Y., 5
For details see ad on page 30
Multicore Solders Ltd., Mellier House, Albemarle St., London, W.I., England
For details see ad on page 30
National Lead Co., N.Y., 1-5

(Continued on page 188)

FIRST WILDER IN QUALITY

ADJUSTABLE SOLDERING IRON HOLDER



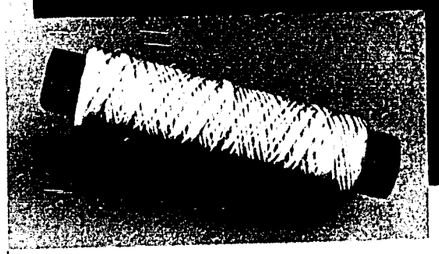
FOR *Safety* AND *Speed* IN SOLDERING

AVAILABLE WITH WIPING PAD AS SHOWN ABOVE OR WITH BRACKET FOR BENCH AND SHELF MOUNTING

For Complete Information Write

WILDER MFG. CO., INC.
MECHANIC ST. & ERIE R.R.
PORT JERVIS, N.Y.

Sensational New NYLON Lacing Cords win approval of "Big Name" Companies*



* names on request

"Never anything like it before", say the big companies in the electronics field. They're referring to Heminway & Bartlett's new fungus-proof Nylon Lacing Cords, specially coated to resist mold and micro-organisms and at the same time retain malleability.

With a tensile strength to suit your particular problem, and a synthetic resin finish with a melting point of over 190°, these new cords meet every installation requirement.

We'll be glad to give you complete information, including samples for field testing. No obligation, of course.

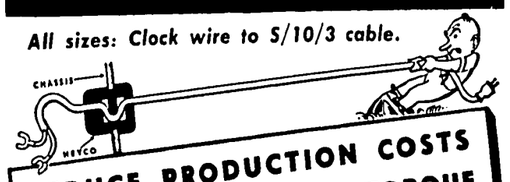
THE HEMINWAY & BARTLETT MFG. CO., 500 Fifth Avenue, New York 18, New York. *Branches*: Chicago, Ill., St. Louis, Mo., Cincinnati, Ohio, Charlotte, N. C., Gloversville, N. Y.

HEMINWAY & BARTLETT FUNGUS-PROOF *Nylon Lacing Cords*

HEYCO STRAIN RELIEFS

Provide permanent protection and anchor cords to chassis or machine housing.

All sizes: Clock wire to S/10/3 cable.



REDUCE PRODUCTION COSTS
PREVENT PUSH, PULL, TORQUE
ELIMINATE ENTRANCE GROMMETS

FREE TEST SAMPLES!

Let us know the size wires you are using...we'll send you free Heyco samples and application data so that you can test them yourself. Many hundreds of products now incorporate UL Approved Nylon Heycos...*accepted standard in Strain Relief Bushings.*

UL HEYCO C. S. A.

HEYMAN MANUFACTURING COMPANY
KENILWORTH 7, NEW JERSEY

Solder

(Continued from page 187)

Ney Co., J. M., 171 Elm St., Hartford 1, Conn., 4
For details see ad on page 145
Ruby Chemical Co., The, Ohio, 1, 5
Secon Metals Corp., N.Y., 3
Soldering Specialties Co., N.J., 1-5
Stelon, Inc., N.J., 3, 4
Super Flow Solder Co., Inc., N.Y.
Todd Tran Corp., N.Y., 5

Speakers, see: 37

Strain Reliefs (Wiring Accessories) see: 30 sub-head 2 and below

Heminway & Bartlett, Mfg. Co., 500 Fifth Ave.. N.Y.
For details see ad on page 188
Heyman Mfg. Co., Kenilworth, N.J.
For details see ad on page 188
Walker Co., George, 118 Amsterdam Ave,. Passaic, N.J.
For details see ad on page 189

64. Switches.

1—Band Switches.
2—Circuit Breaking.
3—Key.
4—Mercury Switches.
5—Momentary Contact.
6—Power.
7—Precision Snap-Acting.
8—Rotary.
9—Time Delay.
10—Toggle & Push Button.

A. B. Metal Products Ltd., England, 1, 2, 3, 8, 10
Aerolite Electr. Hardware Corp., N.J., 5
American Gas Accumulator Co., 1027 Newark Ave., Elizabeth 3, N.J., 9
For details see ad on page 177
Applied Science Corp., of Princeton, P.O. Box 44, Princeton, N.J., 8
For details see ad on page 86
Ark-Les Switch Corp., Mass., 8, 10
Arlington Electric Prods., Inc., N.Y., 3
Automatic Electric Sales Corp., Ill., 3
Automatic Switch Co., N.J., 6
Automatic Temp. Control Co., Inc., Pa., 9
Aymond Sales Co., Texas, 8
Bendix Avi., Corp., Scintilla Magneto Div., Sherman Ave., Sidney, N.Y., 8
Birnbach Radio Co., Inc., 145 Hudson St., New York 13, N.Y., 6, 8, 10
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Brach Mfg. Corp., N.J., 2, 6, 8
Brown Electro-Meas. Corp., Ore., 8
Bud Radio, Inc., Ohio, 1
Canadian General Elec. Co. Ltd., Canada, 2, 4, 6, 8, 9, 10
Carter Parts Co., Ill., 2, 3, 5, 10
Centralab Div. of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis., 1, 2, 5, 6, 8
See complete catalog filed alphabetically in last section.
Cinema Engineering Co., Calif., 3, 8, 10
Clare & Co., C. P., Ill., 3
Clarostat Mfg. Co., Inc., N.H., 8
Cole Instrument Co., Calif., 1, 8
Communication Products Co., Inc., N.J., 1, 8
Connecticut Tel. & Elec. Div., Conn., 3
Coral Designs, N.Y., 2
Cramer Co., Inc., The R. W., P.O. Box 22, Centerbrook, Conn., 9
For details see ad on page 146
(Continued on page 189)

PROTECT YOUR PRODUCT
at point of strain

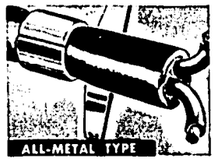
Protect product saleability too—by insuring long life for cords, cables and conductors. Genuine "GRIPMASTER" Strain Reliefs provide these vital features—

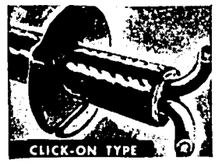
★ Anchor cords to housings
★ Eliminate taping or threading
★ Prevent unraveling
★ Prevent cord pull damage
★ All sizes and styles
★ Easy to apply
★ Inexpensive

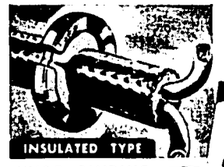
Gripmaster Strain Reliefs are "tremendous trifles" that make good products better!

Ask for samples.

4 WAYS TO END ALL CORD AND CABLE SERVICE FAILURES *Economically*







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

WRITE FOR SAMPLES AND LITERATURE TODAY!

GEORGE WALKER COMPANY
118 AMSTERDAM AVE., PASSAIC, NEW JERSEY

BIRNBACH

For all your needs in
RADIO • ELECTRONIC • TELEVISION
Accessories
Wire • Components

See Birnbach!

GOVT. SPEC.
- **HOOK-UP WIRE**
  SRIR JAN-C-76
  THERMOPLASTIC
  WL-GLASS BRAID
  90°C. UL APPROVED
- **JACKS—PLUGS**
- **INSULATORS**
  STEATITE-CERAMIC
- **WIRE—CABLE**
- **HARDWARE**
- **COMPONENTS**
- **ACCESSORIES**
- **TEST LEADS**
- **SWITCHES**

Yes, BIRNBACH is your DEPENDABLE SOURCE of SUPPLY! Cut production costs, speed operations, by specifying BIRNBACH—Manufacturers of Quality Products, serving the Electronics Industries since 1923.

New 1951 Catalog just out—
Send for Your copy today!

BIRNBACH RADIO CO. INC.
145 HUDSON STREET
NEW YORK 13, N. Y.

Switches

(Continued from page 188)

Cutler-Hammer, Inc., Wis., 5, 6, 7, 8, 10
Daven Co., The, N.J., 8
Designers for Industry, Inc., Ohio
Dimco-Gray Corp., Ohio, 9
Display Lighting, Inc., N.Y., 5, 7, 10
Dominion Sound Equipments Ltd., Canada, 8, 10
Du Plate Canada Ltd., Canada, 1, 4, 5, 7, 9
Eagle Electric Mfg. Co., Inc., N.Y., 1
Eastern Specialty Co., The, Pa., 8
Eldi Electronic Devices, N.Y., 8
Electro Development Corp., Calif., 8
Electro Mec. Lab., N.Y., 8
Electro Switch Corp., Mass., 5, 6, 8
Fasco Industries, Inc., N.Y., 2, 8
Federal Electric Mfg. Co., Ltd., Canada, 8
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Fenwal, Inc., Mass., 2
Gables Engineering, Inc., Fla., 8
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Hughey & Phillips, Tower Lighting Div., 4075 Beverly Blvd., Los Angeles 4, Calif., 4, 9
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J-B-L Instrument Co., Pa., 2, 6, 8
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Kellogg Switchboard & Supply Co., Ill., 3
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Littelfuse, Inc., 4757 N. Ravenswood Ave., Chicago 40, Ill., 4
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Mallory & Co., Inc., P. R., Ind., 2, 8, 10
Maxson Corp., W. L., 406 West 34 St., New York 1, N.Y., 7
For details see ad on page 202
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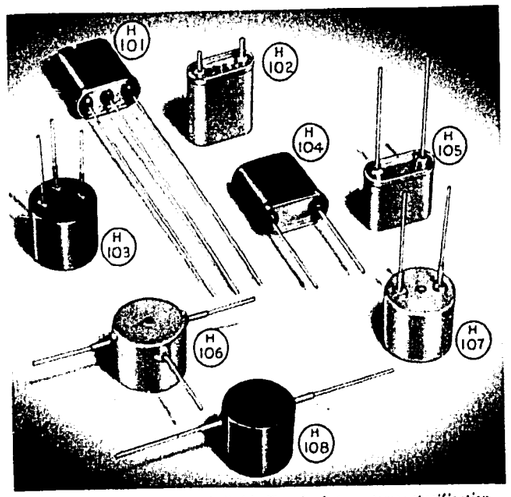
STEVENS HERMETICALLY SEALED THERMOSTATS

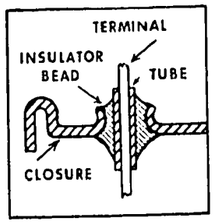


Bright-plated or dull-black finish. Terminals to customer specification.

- fast response
- close control
- operation from -60° to 600°F
- dust, moisture and explosion-proof

Specially engineered for precision control of radio and electronic devices, instruments, cameras and other equipment subjected to dust, moisture or corrosive atmospheres, Stevens hermetically sealed thermostats are enclosed in corrosion-resistant metal cans.

Carefully precalibrated in pots simulating your actual service conditions, Stevens* hermetically sealed thermostats have a tight, permanent seal that *prevents deterioration or sulphiding of contacts*. They can also be sealed in helium or other inert gas atmosphere. Terminals are sweat-soldered into inert alloy tubes interfused with inorganic glass insulator bead.



Stevens hermetically sealed thermostats—featuring an electrically independent bi-metal element that eliminates artificial cycling or life-shortening "jitters"—are available in disc types for controlling higher-wattage circuits, or in strip types for controlling low-wattage circuits or for use in conjunction with disc thermostats.

To insure the satisfactory performance of your product, specify Stevens hermetically sealed thermostats—*they perform better . . . last longer.* A-2914

*Stevens also makes a complete line of semi-sealed and standard bi-metal disc and strip thermostats. Write for data.

STEVENS *manufacturing company, inc.*
MANSFIELD, OHIO

Switches

(Continued from page 189)

Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill., 4
For details see ad on page 178
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North Electric Mfg. Co., Ohio, 8
Oak Manufacturing Co., Ill., 1, 8, 10
Ohmite Mfg. Co., Ill., 1, 2, 6, 8
Painton Co., Ltd., England, 8, 10
Plessey International Ltd., England, 1, 2, 3, 8, 10
Press Wireless Mfg. Co., Inc., N.Y., 8
Presto Electric Co., Inc., N.J., 3, 10
Pye Ltd., Radio Works, England, 7
R. B. M. Division, Essex Wire Corp., Ind., 5, 10
Radio Condenser Co., N.J., 1
Radio Engineering Products Ltd., Canada, 3
Relay Service Co., Ill., 3
Rhodes, Inc., M. H., Conn., 9
Roanwell Corp., Aviometer Div., N.Y., 7
Roller-Smith Div., Pa., 6, 8
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Ucinite Co., The, Mass., 1, 5, 7, 8, 10
Ulanet Co., George, N.J., 9
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United States Instrument Corp., N.J., 6, 8
Valverde Labs., N.Y., 7
Vokar Corp., Mich., 2, 7
Ward Leonard Electric Co., N.Y., 6, 9
Wirt Co., Pa., 2

65. Television Equipment.

1—Cameras.
2—Camera Chains.
3—Color Adaptors.
4—Color Converters.
5—Projectors.
6—Studio Lighting Equipment.
7—TV Tuners.

(Continued on page 191)

Television Equipment

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Automatic Projection Corp., N.Y., 5
Berndt-Bach, Inc., Calif., 1
Camera Equipment Co., N.Y., 6
DX Radio Products Co., Inc., Ill., 7
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DuMont Labs., Inc., Allen B., TV Transmitter, Bldg. 16, 1000 Main Ave., Clifton, N.J., 1, 2, 5
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Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y., 1-4
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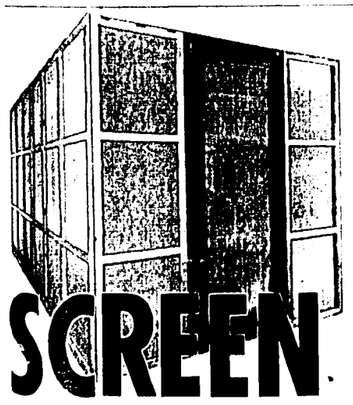
Thall Plastic Engineering Co., N.Y., 3, 4
Translux Corp., Teleprocess Div., N.Y., 5
Vidaire Television Co., N.Y., 3, 4



HIGHER ATTENUATION . . . at no greater cost

Built to match the most exacting requirements for radio interference reduction, ACE SCREEN ROOMS cost little or no more than home-made rooms of far lower filtering and shielding efficiency. Used and approved by leading laboratories and plants.

SCREEN ROOMS

READY-BUILT · READY TO INSTALL

- Provide attenuations of 100 to 140 db. —at frequencies from 0.15 to 10,000 mc.
- Easy to install—easy to move to a new location or to enlarge.
- Fully proved in more than 6 years of use.
- Standard and special types available for every need.

SHIELDED ACE ROOMS PHILA. PA.

ACE ENGINEERING and MACHINE CO., INC.
3644 N. Lawrence St. Philadelphia 40, Pa.
Telephone: REgent 9-1019

See also: sub-head 7, 8; 43 sub-head 3, 54 sub-head 7, 69 sub-head 4, 71 sub-head 6, 72 sub-head 3, 4, 6, 7

66. Testing & Measuring Equipment: Audio Frequency.

1—Beat Frequency Oscillators.
2—Distortion & Noise Analyzers.
3—Intermodulation Distortion Analyzers.
4—Resistance Capacity Oscillators.
5—Square Wave Generators.
6—Wave Form Analysis Equipment.

Acoustical Mfg. Co. Ltd., England, 2
Advance Electronics Co., N.J., 2
Airmec Labs. Ltd., England, 4
Altec Lansing Corp., Calif., 3
American Electroneering Corp., The, Calif., 1, 5
Amplifier Corp. of America, N.Y., 1, 4
Audio Instrument Co., N.Y., 3
Audio-Tone Oscillator Co., Conn., 1
Barker & Williamson, Inc., 237 Fairfield Ave., PR-751 Upper Darby, Pa., 1, 2, 6
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Clough-Brengle Co., The, Ill., 1
Coax Electronics Co., N.Y., 5
Cole Instrument Co., Calif., 1, 4, 5
Computing Devices of Canada Ltd., Canada, 4, 5
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Davies Laboratories Inc., The, Md., 6
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Electronic Engineering Assoc. Ltd., Calif.
Electronic Instrument Co., Inc., N.Y., 4, 5
Electronic Measurements Co., Red Bank, N.J., 1, 4, 5
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Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y., 1, 5, 6
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Fluke Engineering Co., John, Conn.
Freed Transformer Co., Inc., 1718-36 Weirfield St., Dept. D1 Brooklyn 27, N.Y., 3
For details see ad on page 14

(Continued on page 193)

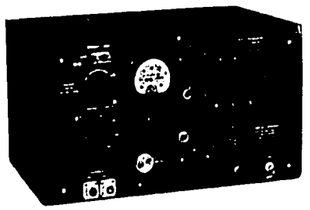
THE NEWEST IN INSTRUMENTS FOR SUB-AUDIO Thru MICROWAVES

These six instruments have been developed and engineered in the interests of providing laboratories and production lines with the newest in instrumentation tehcniques. A postal card or letter will bring you a copy of our new catalog A-51 with complete specifications. Write for it today.

THE MARKA-SWEEP
Model Video

An electronically swept video sweep oscillator covering frequencies up to 20 mc. Crystal positioned marks of pip type are provided at 1, 2, 5, 10, 15 and 20 mc. By use of external signal generator a variable frequency pip type marker is available. Output maximum is 0.3 volt from a 72 ohm internal impedance. Price $495.00.

THE CALIBRATED MEGA-SWEEP

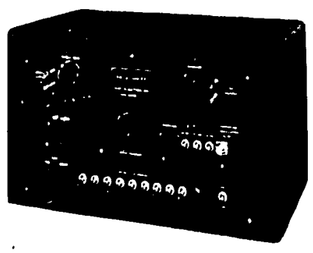


The Widest Range Sweeping Oscillator Available. Single control tuning from 100 kcs to 900 mcs. Approximate center frequency indicated on dial. Sweep width variable 0-30 mcs. Sawtooth sweep—no phasing. Easily pulse modulated. Output approximately 100 mv max. Precision micrometer wavemeter included. Price $425.00.

THE VIBRALYZER

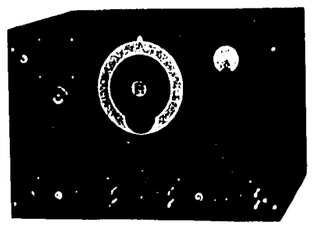
Analyzes signals in the 5-4400 cps region in three frequency ranges, with broad and narrow analysis filters on each range. It is useful for studies of transient and steady state signals on aircraft, ships, rotating and reciprocating machinery, and in fields such as ordnance, ballistics, seismology and acoustics. Displays: 1. Amplitude vs. frequency vs. time; 2. Amplitude vs. frequency at selected times. Price $2500.00.

THE SONALIGNER

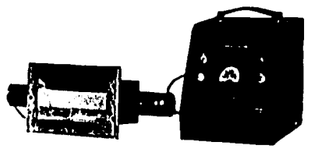


THE RADA-SWEEP

An all electronic sweeping oscillator for use in aligning Radar IF strips. It is swept by a symmetrical sawtooth which is also available for sweeping the oscilloscope. Marks may be individually switched on and off and attenuators are available on the pip and high frequency outputs. A true zero level reference baseline is provided. Price $395.00.



A very stable and accurate oscillator in the ultrasonic range suitable for use in determining the pass band of narrow band ultrasonic filters and other accurate work in this range. Calibration: Crystal Check Points Accurate to 0.01% included—may be externally calibrated—marks every 2, 10, 50, 200 kcs.—Timing "comb" may be used for accurate alignment of Radar range circuits. Output level meter and attenuators included. Price: $695.00.



MICRO-WAVE MEGA-NODE
L-Band, New Model

Provides a primary source of random noise for the L-Band. May be used for measurement of noise figure, receiver gain and calibration of standard signal source. The specifications are as follows:

Waveguide RG-69/U
Flange UG-417/U

Noise Power Output .....at 20° C.—15.84 db
Frequency Range .....1200 to 1400 mc.
Information on Microwave Mega-Nodes and other frequency ranges within the L-Band may be obtained on application.

All Prices F.O.B. Factory.

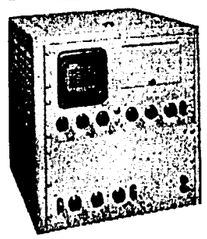
KAY

KAY ELECTRIC COMPANY

25 Maple Avenue — Pine Brook, New Jersey
Phone CAldwell 6-4000

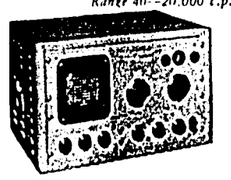
QUICK EASY ACCURATE

SPECTRUM AND WAVEFORM ANALYSIS WITH PANORAMIC INSTRUMENTS



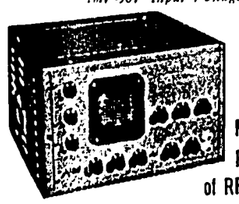
Audio Wave Analysis in 1 Second

Panoramic Sonic Analyzer, Model AP-1
Automatically measures frequency and magnitude of wave components for high speed analysis of vibrations, harmonics, noises, acoustics, and intermodulation under static or dynamic conditions.
Optimum Frequency Resolution Range 40--20,000 c.p.s.



High Speed Spectrum Analysis

Panoramic Ultrasonic Analyzer, Model SB-7
Continuously variable scanning width, 200KC to zero, for channel monitoring, telemetering and investigation of ultrasonic waveform content. Allows overall observation of wide bands; 500 c.p.s. resolution for highly detailed examination of selected narrow bands.
2KC-300KC, Linear Scale
1mV-50V Input Voltage



Maximum Resolution of RF Spectrum

Panadaptor, SA-8 ● Panalyzor SB-8
Variable resolution; variable scanning width. Synchronous and non-synchronous scanning; variable scanning rates. Linear and Log Amplitude scale. Long persistence display. Three types of instruments, maximum scanning widths of 200 KC, 1 MC and 10 MC.
Resolutions down to 100 C.P.S. available

Write for complete specifications and prices

PANORAMIC
RADIO PRODUCTS, INC.

12 South Second Ave., Mount Vernon, N.Y.

Testing & Measuring Equipment: Audio Frequency

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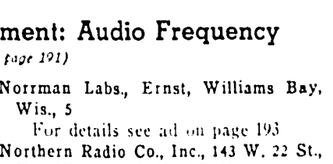
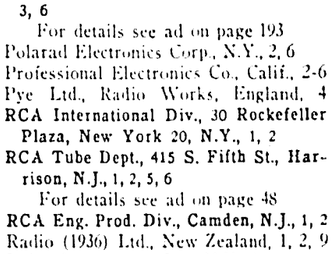
and many other applications based on precision timing, sidereal and mean time.

FOR A MORE COMPLETE LISTING OF MODELS SEE OUR AD IN THE 1950 ELECTRONIC BUYERS GUIDE. LOOK FOR THE DESCRIPTION OF MODEL 105 AND OTHERS.



Model 127. This is a unit on an 11¼ x 4¼ inch mounting plate COMPLETE WITH POWER SUPPLY. It can be had with an output frequency as low as 60 cps. Temperature controlled crystal if required.



Model 125. This unit is built on a mounting plate 9 x 4½ inches. It has sine wave outputs at BOTH 400 CPS AND 60 CPS.

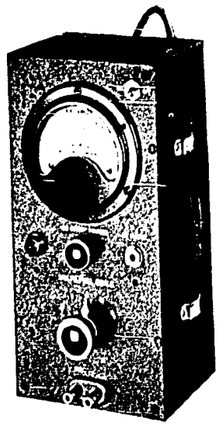
We now have 25 standard models and we are expanding our line at the present time.

Catalog or further information gladly furnished on request.

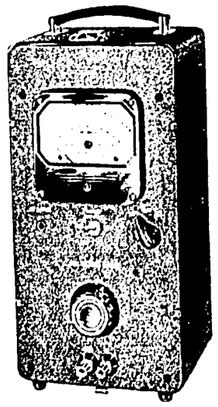
ERNST NORRMAN *Laboratories*
WILLIAMS BAY, WISCONSIN
20 Years of Specialization in Constant Frequency

BALLANTINE

STILL THE FINEST IN ELECTRONIC VOLTMETERS

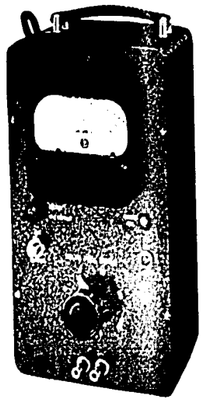


MODEL 300

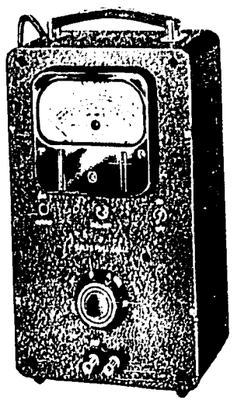


MODEL 302B

MODEL 304

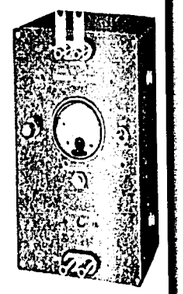


MODEL 305



MODEL 310A

MODEL	FREQUENCY RANGE	VOLTAGE RANGE	INPUT IMPEDANCE	ACCURACY
300	10 to 150,000 cycles	1 millivolt to 100 volts	1 2 meg. shunted by 30 mmfds.	2% up to 100 KC 3% above 100 KC
302B Battery Operated	2 to 150,000 cycles	100 microvolts to 100 volts	2 megs. shunted by 8 mmfds. on high ranges and 15mmfds. on low ranges	3% from 5 to 100,000 cycles; 5% elsewhere
304	30 cycles to 5 [illegible] megacycles	1 millivolt to 100 volts except below 5 KC where max. range is 1 volt	1 meg. shunted by 9 mmfds. on low ranges. 4 mmfds. on highest range	3% except 5% for frequencies under 100 cycles and over 3 megacycles and for voltages over 1 volt
305	Measures peak values of pulses as short as 3 microseconds with a repetition rate as low as 20 per sec. Also measures peak values for sine waves from 10 to 150,000 cps.	1 millivolt to 1000 volts Peak to Peak	Same as Model 302B	3% on sine waves 5% on pulses
310A	10 cycles to 2 megacycles	100 microvolts to 100 volts	Same as Model 302B	3% below 1 MC 5% above 1 MC



MODEL 220A
BATTERY OPERATED DECADE AMPLIFIER gives exact voltage gains of 10 or 100 permitting a corresponding increase in voltmeter sensitivity from 10 to 150,000 cycles.

PRECISION SHUNT RESISTORS

Four different types of Precision Shunt Resistors, varying from 1 to 1000 ohms, permit the Voltmeters to be used to measure currents from 1 ampere to one-tenth of a microampere.

MULTIPLIERS

Five different types of Multipliers, whose input resistance varies from 5 to 40 megohms, permit the voltage range of the Voltmeters to be increased 10 or 100 times.

1300A

1300R

BALLANTINE pioneered circuitry and manufacturing integrity assure the maximum in

SENSITIVITY • ACCURACY • STABILITY

- All models have a single easy-to-read logarithmic voltage scale and a uniform DB scale.
- The logarithmic scale assures the same accuracy at *all* points on the scale.
- Multipliers, decade amplifiers and shunts shown above extend range and usefulness of voltmeters.
- Each model may also be used as a wide-band amplifier.

For further information, write for catalog

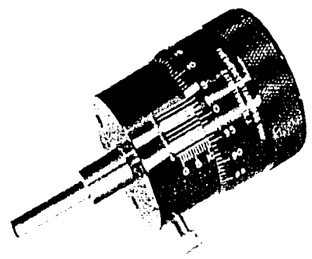
BALLANTINE LABORATORIES, INC.

102 FANNY ROAD, BOONTON, NEW JERSEY

FSC MICROMETER HEAD for the Electronics Industry

[illegible] thoroughly job-tested and field checked by electronics engineers for many diversified applications. Reports continue to indicate that it is successfully meeting the requirements in those fields and applications for which it was designed.

1. Elimination of back-lash for positive resetting in either direction of rotation.
2. Automatic compensation for wear of spindle and nut thread.
3. Large, legible, easy to read calibrations.
4. Temperature compensation construction.
5. Thimble stop to prevent thread jamming.
6. Positive spindle lock.
7. Convenient means of resetability for calibrated instruments.
8. Vernier scale on all models.
9. Furnished in either English or Metric scale.
10. A degree of accuracy in reading, hitherto unattainable in any micrometer head.
11. Non-corrosive finish.



Low coefficient Invar nut and spindle with precision ground threads, hard chromium-plated for wear on spindle and thread-form.

Patented thread-form with radially-loaded nut for elimination of back lash and wear compensation.

Black anodized aluminum barrel and thimble with yellow filled scales and numbers.

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- **VIBRATION** (Standard High Frequency)
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Write or call, and we will arrange technical discussions without obligation.

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Testing & Measuring Equip.: Audio Frequency

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67. Testing & Measuring Equipment: General.

1 Bridges, all types.
2 Capacitance Decades.
3 Capacitor Testers.
4 Multi-meters.
5 Resistance Decades.
6 Resistor Testers-Ohmmeters.
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9 Vacuum Tube Voltmeters.
10 Vibration Testing Equipment.
11 Shielded Screen Rooms

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dependable Electronic measurements

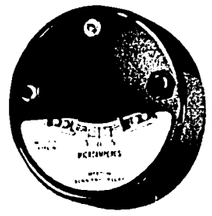
FOR LABORATORY—PRODUCTION TESTING—MAINTENANCE

MUTUAL CONDUCTANCE TUBE ANALYZER

(Model 686 Type 9B) A complete "all purpose" tube analyzer that provides accurate testing of true mutual conductance of all receiving tubes in accordance with manufacturers rated operating conditions, as well as at other values not conforming to standard ratings and conditions. Ideal for electronic laboratories, and production quality control.

ULTRA SENSITIVE PORTABLE TEST INSTRUMENTS

(Model 622) High sensitivity, large scale A-C and D-C instruments of double pivoted type, ideal for precision measurement of low potentials and minute current. Available in single or multi range as D-C voltmeters, millivoltmeters, milliammeters, microammeters; and milliammeters and voltmeters in thermo and rectifier types for RF and A-C.



SUPER-SENSITIVE SENSITROL® RELAYS

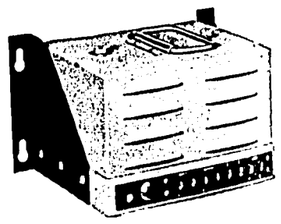
(Model 705) Operate reliably on values as low as ½ microampere, direct from photocells, resistance bulbs, thermocouples and other generators of minute energy. Control up to ten watts at 120 volts on non-chattering magnetic contacts. No standby power required, no batteries, tubes, transformers. Available in single and double contact types—manual or solenoid reset.

HIGH FREQUENCY ELECTRONIC ANALYZER

(Model 769) A three-in-one instrument providing a self-contained Volt-Ohm-Milliammeter, a high impedance electronic D-C Volt-Ohmmeter, and a probe type vacuum tube voltmeter for use to 300 megacycles. Exceptionally stable and accurate. Has specially designed extremely small RF and D-C probes.

PANEL INSTRUMENTS OF HIGH SENSITIVITY

In all types, sizes and ranges for all critical measurements encountered in electronics, nuclear research and general testing. All D-C, rectifier type A-C and RF instruments have built-in magnetic shunts for minor adjustments if necessary.



INDUCTRONIC® D-C AMPLIFIER

(Model 1411) A new, stable D-C Amplifier which employs new Induction galvanometer and provides high degree of resolution even at fractional loads. Reaches steady, full-scale deflection in a fraction of a second. Interchangeable plug-in range standards for either microamperes or millivolts. Uses standard tube components.

Literature on these and other WESTON instruments for electrical and electronic requirements sent on request.
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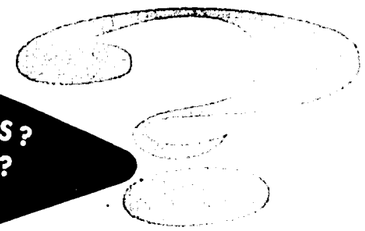

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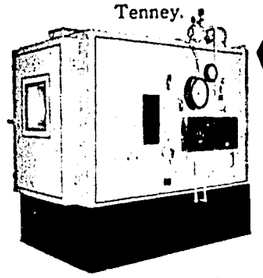
Tenney has combined years of specialized experience with the most advanced engineering methods. Results have convinced industry that Tenney testing equipment is the finest available. For complete confidence, specify Tenney.

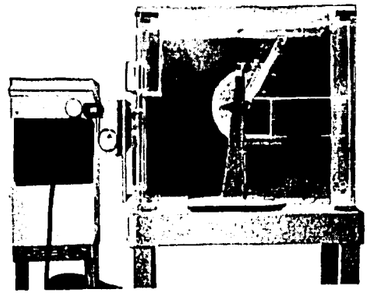


TENNEYZPHERE ALTITUDE CHAMBERS

Designed to withstand atmospheric pressure and to simulate global conditions of pressures, temperatures and humidities. Altitudes from sea level to approx. 75,000 ft. Temperature range from plus 200°F to minus 100°F. Also simulates desired relative humidity.

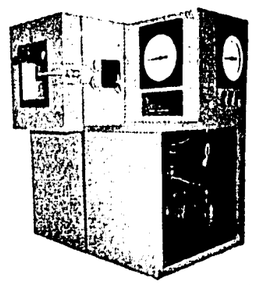
TENNEY SERVO UNIT

Portable air conditioning unit which may easily be attached to various types of laboratory enclosures—impact machines; tension machines; torsion testers; cold boxes and similar equipment. Through its use, articles undergoing testing, aging or weathering can be subjected to wide variations of humidity, heat and cold.



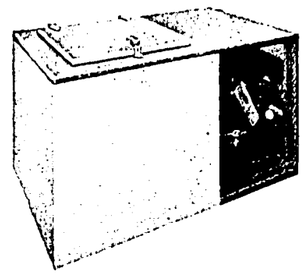
TENNEY TEMPERATURE AND HUMIDITY CHAMBER

Designed for positive control of temperature, humidity and air circulation. Permits the accurate checking of physical quality, fragility, tension and other factors.



TENNEY SUB-ARCTIC INDUSTRIAL CABINETS

Designed for low-temperature testing of metals, radios, instruments, plastics, liquids, chemicals and pharmaceuticals. Temperature ranges of −40°F, −60°F, −95°F and −150°F are standard for each size.



For further information on these and other Tenney test equipment, write to Tenney Engineering, Inc., Dept. N, 26 Avenue B, Newark 5, New Jersey.

Tenney

Engineers and Manufacturers of Automatic Temperature, Humidity and Pressure Control Equipment

7854

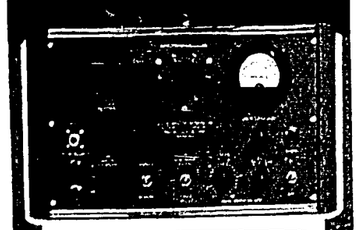
Testing & Measuring Equipment: General

(Continued from page 195)

Cornell-Dubilier Elec. Corp., 1000 Hamilton Blvd., South Plainfield, N.J., 2, 3
For details see ad on page 74
Custom Craft Mfg. Co., N.Y., 2, 3, 5
Daven Co., The, N.J., 5, 9
Delta Electrical Instrument Co., Calif., 4, 5, 6
Denrad Mfg. Co., Inc., Texas, 1
De Ryder, H., N.J., 9
Dice Co., J. W., N.J., 6
Doelcam Corp., Mass., 1
Douglas Radio Laboratories, Mass., 4
Edgerton, Germeshausen, & Grier, Inc., Mass., 7
Electro Mec. Lab., N.Y., 1
Electro Products Labs., Inc., Ill., 1
Electronic Designs, Inc., N.Y., 4, 6, 8, 9
Electronic Instrument Co., Inc., N.Y., 1, 3, 4, 6, 8, 9
Electronic Measurements Co., Red Bank N.J., 7, 9
For details see ad on page 215
Electronic Measurements Corp., N.Y., 4, 7, 9
Elliott Brothers Ltd., England, 1, 4, 5, 6, 9, 10
Ellis Associates, N.Y., 1
Engineering Research & Dev. Co., Ill., 7, 10
Fisher Research Lab., Inc., Calif., 1
Flader, Inc., Frederick, Ohio, 1
Fluke Engineering Co., John, Conn., 4
Freed Transformer Co., Inc., 1718-36 Weirfield St., Dept D1, Brooklyn 27, N.Y., 1, 2, 3, 9
For details see ad on page 14
Frequency Standards Corp., P.O. Box 66, Eatontown, N.J., 1, 10
For details see ad on page 195
Furzehill Labs. Ltd., England, 5, 9
Gates Radio Co., Ill., 1
General Electric Co., N.Y., 1, 4, 7-10
General Elec. Co., Electronics Dept., N.Y., 8
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 1, 2, 5, 7, 9, 10
For details see ad on page 236-7, Back Cover
Geotechnical Corp., Texas, 1
Gibbs Mfg. & Research Corp., Wis., 1
Glenco Corp., N.J., 1
Gray Instrument Co., Pa., 1, 2, 5, 6
Gulton Mfg. Corp., N.J., 1
Heath Co., The, 1, 2, 3, 4, 5, 8, 9
Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo., 10
For details see ad on page 157
Hewlett-Packard Co., 2310 Page Mill Rd., Palo Alto, Calif., 9
See complete catalog filed alphabetically in last section
Hickok Elect. Inst. Co., 10551 Dupont Ave., Cleveland 8, Ohio, 3, 6, 8, 9
For details see ad on page 161
Huggins Laboratories, Calif., 7
Industrial Control Co., Straight-Path & Arlington Ave., Dept. RD, Wyananch, N.Y., 9
For details see ad on page 54
Industrial Dev. Eng'rg. Assoc., Inc., Ind., 9
Industrial Electronics, Inc., Mich., 1
Industrial Instruments, Inc., N.J., 1, 2, 5

(Continued on page 198)

EMPIRE DEVICES



UHF IMPULSE GENERATOR

Model IG-102

Pulse width less than 0.001 microseconds, spectrum flat within 0.5 DB from 0.01 MC to 1000 MC; Pulse repetition rate 2 to 2500 CPS; Output level continuously adjustable from 7 to 70,000 microvolts per megacycle bandwidth; Impedance 50 ohms; Permanent accuracy and stability.

Application: Standard signal source for study and measurement of RF interference. Calibrating standard for noise meters. Bandwidth measurements. Transient response and receiver alignment.

STEP ATTENUATOR

Model AT-100

50 ohm resistive networks; VSWR-1.2 from DC to 1000 MC; Six positions; Up to 80 DB attenuation.

UHF ATTENUATOR

Model AT-50

50 ohm precision pad; VSWR-1.1 from DC to 4000 MC; Attenuation from 1 DB to 80 DB; Accuracy—3%.

NOISE AND FIELD INTENSITY METER

Model NF-105

Frequency range 20 to 400 MC; Built-in standard impulse noise and sine wave calibrators; Regulated "A" and "B" supply; Slide back and meter indication; True peak reading meter; Sensitivity 2 to 100,000 microvolts.

Accessories: Broad band antenna, Dipoles, Magnetic and electric field probes, Line probes, Inverter for battery operation and Remote indicator.

Further Technical data available
Your inquiries are invited

EMPIRE DEVICES, INC.
38-25 BELL BOULEVARD
BAYSIDE, N. Y.

Testing & Measuring Equipment: General

(Continued from page 197)

Instrument Electronics Corp., Va., 9
Instrument Laboratories, Ill., 1, 4, 6
Instrument Resistors Co., 1036 Commerce Ave., Union, N.J., 5
For details see ad on page 182-3
International Instruments, Inc., Conn., 4
Jackson Elect. Instrument Co., Ohio, 3, 4, 6, 8, 9
Kalbfell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif., 3
For details see ad on page 87
Kartron, Inc., Calif., 1, 10
Kay Electric Co., 25 Maple Ave., Pine Brook, N.J., 10
For details see ad on page 192
Keithley Instruments, Ohio, 9
L. A. B. Corp., N.J., 1
Leeds & Northrup Co., Pa., 1, 2, 5, 6
Lysco Labs. Mfg. Co., Inc., N.J., 4
MacLeod & Hanopol, Inc., Mass., 6, 8
Marconi Instruments Ltd., N.Y., 1, 9
Marma Electronic Co., Ill., 5
Maurer, Inc., J. A., N.Y., 1
Measurements Corp., Intervale Rd., Boonton, N.J., 1, 9
See complete catalog filed alphabetically in last section.
Meters, Incorporated, Ind., 4
Miller Corp., William, Calif., 1
Millivac Instrument Corp., Conn., 4, 9
Muirhead & Co. Ltd., England, 1, 2, 5, 10
Mullard Electronic Prods. Ltd., England, 1, 9, 10
National Technical Laboratories, Calif., 9
National Union Radio Corp., N.J., 8
Oak Ridge Prods., Div. of Video TV, N.Y., 4, 5
Panoramic Radio Products Inc., 12 S. Second Ave., Mount Vernon, N.Y., 10
For details see ad on page 193
Pearl Engineering, N.J., 1
Pennsylvania Testing Lab., Pa., 1, 3, 8
Photobell Co., N.Y., 1
Polytronics Co., Canada, 1, 2, 3, 5, 6
Precision Apparatus Co., Inc., N.Y., 4, 8, 9
Professional Electronics Co., Calif., 1
Pye Ltd., Radio Works, England, 1, 5
Radio City Products Co., Inc., N.Y., 4, 8, 9
RCA Tube Dept., 415 S. Fifth St., Harrison, N.J., 9
For details see ad on page 48
Radio Hispano Suiza, S.A., Spain, 7
Radio Supply & Engineering Co., Inc., Mich., 7, 10
Rawson Electrical Inst. Co., Mass., 4, 6
Redifon Ltd., England, 9
Reiner Electronics Co., Inc., N.Y., 4, 9
Rogers Majestic Ltd., Canada, 1-4, 6-10
Roller-Smith Div., Pa., 6
Rollin Co., The, Calif., 1
Rubicon Co., Pa., 1, 5
Scientific Electric, 105-119 Monroe St., Garfield, N.J., 8
See complete catalog filed alphabetically in last section.
Scott, Inc., Hermon Hosmer, Mass., 1
Shallcross Mfg. Co., 520 Pusey Ave., PY 61, Collingdale, Pa., 1, 5
For details see ad on page 62
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N.Y., 1, 3, 6, 8, 9, 10
For details see ad on page 16
Shore Engineering, Inc., N.J., 1 7
Sierra Electronics Corp., Calif., 9
Simpson Electric Co., 5200 W. Kinzie St., Chicago 44, Ill., 4, 6, 8, 9
For details see ad on page 38
Sondyna, A. G., Switzerland, 9
Special Instrument Lab., Inc., Tenn., 1
Sperry Gyroscope Co., Div., Sperry Corp., Great Neck, L.I., N.Y., 1, 10
See complete catalog filed alphabetically in last section
Sprague Electric Co., Mass., 3
Square Root Mfg. Corp., N.Y., 3
Standard Electric Time Co., The, 7 Logan St., Springfield 2, Mass., 7
For details see ad on page 151
States Co., The, Conn., 7
Statham Laboratories, Inc., Calif., 1
Sterling Instruments Co., Mich., 1
Stieht & Co., Inc., Herman H., N.Y., 1
Superior Instruments Co., N.Y., 4, 6
Supreme, Inc., Miss., 3, 4, 6, 8, 9
Sylvania Electric Products, Inc., Dept. R-6351, Emporium, Pa., 4, 8, 9
For details see ad on page 42
Taco West Corp., Ill., 6
Tech Laboratories, Inc., N.J., 1, 3
Technology Instrument Corp., Mass.
Telecomputing Corp., Calif., 1
Televac Instrument Co., Mass., 9
Thomas Electronics, Inc., N.J., 8
Triplett Electrical Inst. Co., Ohio, 4
V. F. B.-Line Corp., Md., 1
Victoreen Instrument Co., Ohio, 1
Vidaire Television Co., N.Y., 6
Waterman Products Co., Inc., 2445 Emerald St., Philadelphia 25, Pa., 4, 9
For details see ad on page 158
Wayne-Kerr Labs. Ltd., England, 1, 3
Westinghouse Electric Corp., Pa., 1
Weston Electrical Instr. Corp., 62 Frelinghuysen Ave., Newark 5, N.J., 4, 6, 8, 9
For details see ad on page 196
Winslow Co., Inc., N.J., 1, 5, 6
Yonkers Industries, Inc., N.Y., 3, 4, 6, 9, 10

68. Testing & Measuring Equipment: Nuclear.

1—Dosimeters.
2—Ionization Chambers.
3—Scalers.
4—Scintillation Counters.
5—Survey Meters

Advance Electronics Co., N.J., 3
Airmec Labs. Ltd., Eng., 3, 4
Applied Physics Corp., Calif., 2
Beckman Instruments Inc., Calif., 2, 3
Berkeley Scientific Co., 2200 Wright Ave., Richmond, Calif., 3, 4
For details see ad on page 109
Bruel, A-S, & Kjaer, Denmark, 3
Cambridge Instrument Co., N.Y., 1, 2
Clarkstan Corp., Calif., 4
Cole Instrument Co., Calif., 3-5
Condor Radio Mfg. Co., Ariz., 3
Consolidated Engineering Corp., Calif., 1, 2
Dormitzer Elec. & Mfg. Co., Inc., Mass., 5
Douglas Radio Laboratories, Mass., 3-5
Electronic Systems Co., N.Y., 3
Espey Mfg. Co., Inc., N.Y., 2
Fisher Research Lab., Inc., Calif., 5
Flader, Inc., Frederick, Ohio, 3, 4
General Electric Co., N.Y., 2, 3, 4, 5
General Elec. Co., Electronics Dept., N.Y., 1-5

(Continued on page 199)

Check-up CHECK OUT

with SIGNAL GENERATORS
by AIRCRAFT RADIO CORPORATION

TYPE H-14
108-132 Megacycles
24 omni courses
Left-center-right phase localizer

Left-center-right 90/150 cps localizer

Signal source for bench or ramp testing of VHF airborne omnirange and localizer receivers. RF output for ramp checks, 1 volt into 52 ohms; for bench checks, 0-10,000 microvolts.

Price $885.00 net, f.o.b. Boonton, N.J.

TYPE H-12 900-2100 mc. RF signal source, CW or pulse amplitude-modulated. Equal to military TS-419/U.

Price: $1,950.00 net, f.o.b. Boonton, N.J.

WRITE FOR DETAILS AND SPECIFICATIONS

ARC AIRCRAFT RADIO CORPORATION
Boonton New Jersey
Dependable Electronic Equipment Since 1928

Testing & Measuring Equipment: Nuclear

(Continued from page 198)

General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 5
For details see ad on page 236-7, Back Cover
Georator Corp., Va., 5
Greibach Research & Dev. Labs., N.Y., 1
Halross Instruments Corp., Ltd., Canada, 4
High Voltage Engineering Corp., Mass., 2
Jacobs Instrument Co., Md., 3
Kelley-Koett Instrument Co., Ohio, 1, 2, 3, 5
Lawton Products Co., Inc., N.Y., 3
MacDonald Co., Inc., W. S., Mass., 4
Manhattan Research Laboratories, N.Y., 1-5
Marconi Instruments Ltd., N.Y., 1
Minnesota Electronics Corp., The, Minn., 3
Mullard Electronic Prods. Ltd., England, 3
National Technical Laboratories, Calif., 2, 5
New London Instrument Co., Conn., 5
North American Philips Co., Inc., N.Y., 3
Nuclear Development Lab., Mo., 3, 5
Nuclear Instrument & Chem. Corp., Ill., 2, 3, 4, 5
Nucleonic Corp. of America, N.Y., 3, 5
Oak Ridge Prods., Div. of Video TV, N.Y., 2, 3, 4
Potter Instrument Co., Inc., 115 Cutter Mill Rd., Dept. 5YB, Great Neck, L.I., N.Y., 3
For details see ad on page 199
Precision Radiation Instr., Inc., Calif., 5
Process & Instruments, N.Y., 2, 4
Professional Electronics Co., Calif., 1, 3, 5
Radiation Counter Labs., Ill., 2, 3, 4, 5
R-C Scientific Instr. Co., Calif., 3, 4
Radioactive Products, Inc., Mich., 2, 3, 5
Special Instrument Lab., Inc., Tenn., 2, 5
Sylvania Electric Products, Inc., Dept. R-6351, Emporium, Pa., 5
For details see ad on page 42
Technical Associates, Calif., 1-5
Tracerlab, Inc., Mass., 1-5
Victoreen Instrument Co., Ohio, 1, 2, 5
Walkirt Co., The, Calif., 3
Wood Counter Laboratory, N., Ill., 2, 4

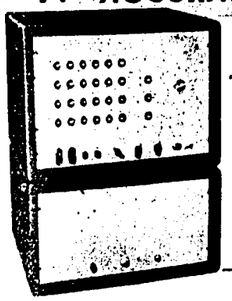
69. Testing & Measuring Equipment: Radio Frequency.

1—"Q" Meters.
2—Signal Generators, AM.
3—Signal Generators, FM.
4—Signal Generators, TV.
5—Standard Frequency Generators & Multi-Vibrators.
6—Sweep Generators & Calibrators.
7—Wavemeters.
8—Microwave, Pulse, Radar

A. R. F. Products, Inc., Ill., 3, 6
Aero Coil, Inc., N.J., 7
Aircraft Radio Corp., Boonton, N.J., 2
For details see ad on page 105, 199
Airmec Labs. Ltd., England, 2, 5
Airplane & Marine Inst., Inc., Pa., 7
American Electroneering Corp., The, Calif., 2, 3
American Time Products, Inc., 580 5th Avenue, New York 19, N.Y., 5
For details see ad on page 200
Antenna Research Lab., Inc., Ohio, 7
Anton Electronic Labs., Inc., N.Y., 1, 2, 5
Approved Electronic Instr. Corp., 142 Liberty St., New York 6, N.Y., 2, 3, 4
See complete catalog filed alphabetically in last section
Automatic Coil Winder Elec., Equip., England, 2, 4
Barber Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing, L.I., N.Y., 2
For details see ad on page 135
Bassett, Inc., Rex, Fla., 2, 5
Bliley Electric Co., 227 Union Station Bldg., Erie, Pa., 5
For details see ad on page 90
Boonton Radio Corp., N.J., 1, 2, 3
Burnett Radio Lab., Wm. W. L., Calif., 5, 7
C. G. S. Laboratories, Inc., 391 Ludlow St., Stamford 1, Conn., 6
For details see ad on page 109
Canoga Corp., Calif., 6
Clark Crystal Co., Mass., 5
Clarkstan Corp., Calif., 5
Clough-Brengle Co., The, Ill., 2
Cole Instrument Co., Calif., 2, 5
Communication Measurements Lab. Inc., N.Y., 2
Crest Televison Labs., N.Y., 4, 6
Crown Engineering, N.Mex., 6
Daven Co., The, N.J., 2, 5, 6
Decimeter, Inc., Colo., 7
Diamond Mfg. Co., Mass., 1, 7
Edin Co., Inc., Mass., 1-7
Electro-Impulse Laboratories, N.J., 2, 7
Electronic Designs, Inc., N.Y., 2, 3, 4, 6
Electronic Measurements Co., Red Bank, N.J., 1, 6
For details see ad on page 215
Electronic Measurements Corp., N.Y., 2

(Continued on page 201)

NEW! FREQUENCY AND TIME MEASUREMENTS ACCURATELY . . . CONVENIENTLY!



-using $f=\frac{n}{t}$

ANY FACTOR MAY BE MEASURED FOR FIXED VALUE OF THE OTHER

Universal 6-in-One
MEGACYCLE FREQUENCY-TIME COUNTER

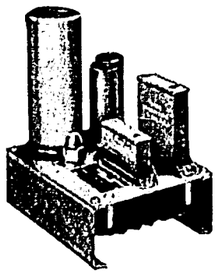
Model 801 by Potter

Now, the Potter Instrument Company offers all in one equipment, the features heretofore available only in separate counting systems. Two complete counting channels, a 100 kc crystal oscillator time base and unique gating circuits are combined to provide the new FREQUENCY-TIME COUNTER.

FREQUENCY MEASUREMENTS	0 to 1 mc range by counting cycles per pre-selected time or by measuring time per pre-selected count. Accuracy 0.001% minimum.
TIME INTERVAL MEASUREMENTS	0 to 10 seconds ± 10 microseconds.
FREQUENCY RATIO MEASUREMENTS	Ratio of two external frequencies can be measured.
SECONDARY FREQUENCY	100 kc crystal oscillator with divided frequencies available at 10, 1 kc and 100, 10, 1 cps.
TOTALIZING COUNTER	Six decades, pulses 0 to 1 mc, sine wave 10 cps to 1 mc.
DIRECT RPM READING TACHOMETER	Through the use of an external 60 count per revolution photoelectric disc generator an accuracy of ± 1 rpm is obtained.

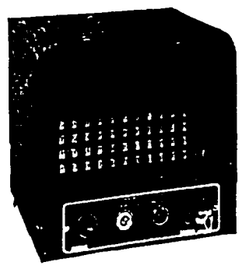
Please address inquiries to Dept. 5 YB

POTTER INSTRUMENT COMPANY
INCORPORATED
115 CUTTER MILL RD., GREAT NECK, NEW YORK



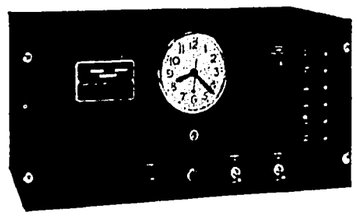
TYPE 2001-2, BASIC UNIT

Frequencies 200 to 2500 cycles. Dividers and Multipliers available for lower and higher frequencies. Miniaturized and JAN construction. Output, 6 volts.



TYPE 2005, UTILITY UNIT

Consists of Type 2001-2 and booster to provide 10 watts at 110V at precision frequencies from 50 to 500 cycles at input power frequencies of 50 to 500 cycles, 45 watts.



TYPE 2121-A, LAB. STANDARD

Outputs, 60 cycle, 0-110 Volts, 10 Watts; 120-240 cycle impulses. Input, 50-400 cycles, 45 Watts.

Precision FREQUENCIES

GUARANTEED ACCURATE TO 1 PART IN 100,000 (.001%)

TYPE 2111, POWER UNIT

50 Watt output. 0-110-220V at 60 cycles, or any frequency 50 to 1000 cycles. Input, 50-100 cycles, 275 watts.

THE basis of these frequency standards is an electronic fork which is temperature-compensated and hermetically sealed against humidity and barometric pressure.

Type 2001-2 and similar units are available independently. Complete instruments of our manufacture are used extensively by industry and the armed forces where unvarying, dependable high precision is required, such as for bombsights and fire control.

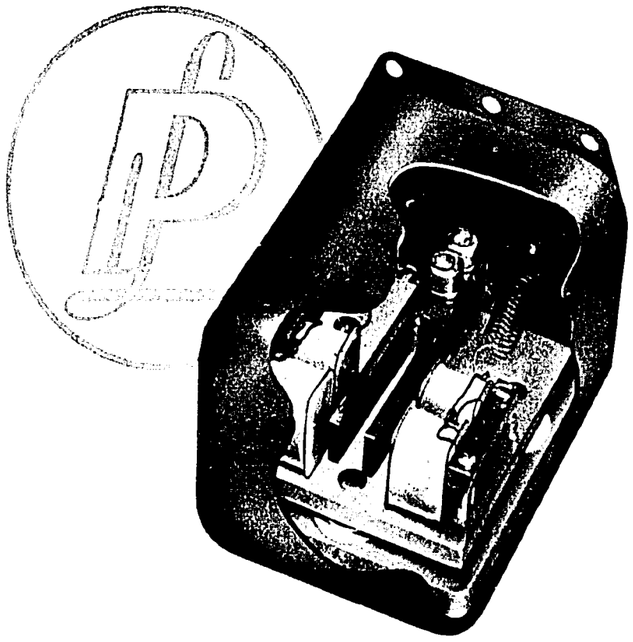
WIDELY USED IN SUCH FIELDS AS:

Aviation
Astronomy
Ballistics
High-Speed Photography
Viscosity Measurement
Nuclear Physics
Telemetering
Radiation Counting
Fluid Flow
Chemical Reaction
Navigation
School Laboratories
Industrial Research Labs.
Accurate Speed Control

WHATEVER YOUR FREQUENCY PROBLEMS, OUR ENGINEERS ARE READY TO COOPERATE. PLEASE REQUEST DETAILS BY TYPE NUMBER.

American Time Products, Inc.

580 Fifth Avenue OPERATING UNDER PATENTS OF WESTERN ELECTRIC COMPANY **New York 19, N. Y.**



Tuning Forks

for precision frequency control

A complete line of tuning fork resonators to meet your reference standard . . . timing . . . or speed control requirements.

ACCURATE...Manufactured in accuracies up to 1 part in 10,000 for operation from −40 to +75°C.—and up to 1 part in 100,000 for operation from 0 to +75°C.

COMPENSATED . . . Thermal compensation method employed maintains fork accuracy throughout rated operating temperature range without benefit of oven control or warm-up time.

RUGGED . . . Internally shock-mounted using relatively permanent, semi-inorganic, silicone rubber—a desirable feature for stringent shock and vibration applications.

HERMETICALLY SEALED... Solder-sealed evacuated container prevents barometric pressure and relative humidity variations from affecting fork accuracy.

FREQUENCIES . . . 400 cycles and from 700 to 3,000 cycles for accuracies up to 1 part in 10,000—from 1,000 to 3,000 cycles for accuracies up to 1 part in 100,000.

Available individually—as a part of compact subassemblies—or in completely engineered equipment constructed to your specifications.

Write Dept. A for complete information or telephone HYacinth 2-4800.

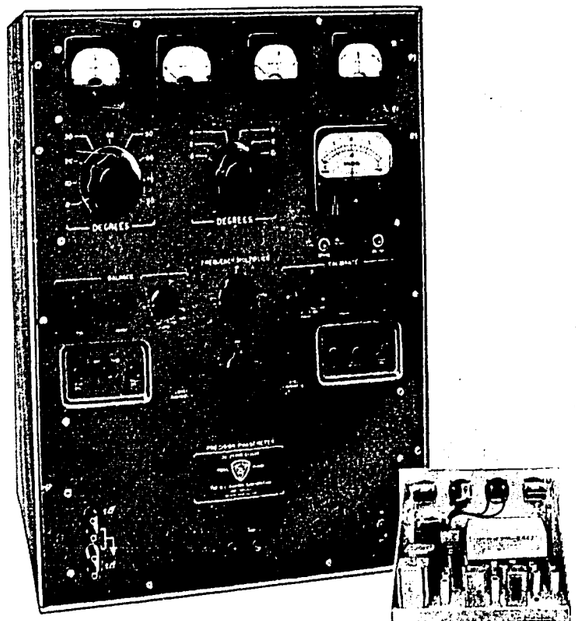
PHILAMON LABORATORIES
5717 Third Avenue Brooklyn 20, N. Y.

Testing Equip.: RF

(Continued from page 199)

Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y., 1-3, 5, 6
For details see ad on page 87
Federal Mfg. & Engineering Corp., N.Y., 2, 7
Federal Telecommunication Labs., 500 Washington Ave., Nutley, N.J., 7
Federal Telephone & Radio Corp., Selenium & Intelin Div., 100 Kingsland Rd., Dept. F7104, Clifton, N.J., 3
For details see ad on page 232-3
Ferris Instrument Co., N.J., 2, 3, 4
Freed Transformer Co., Inc., 1718-36 Weirfield St., Brooklyn 27, N.Y., 1
For details see ad on page 14
Furzehill Labs. Ltd., England, 5
Gables Engineering, Inc., Fla., 2
General Communication Co., Mass., 2, 3
General Electric Co., N.Y., 2-7
General Elec. Co., Electronics Dept., N.Y., 4, 6, 7
General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass., 2, 3, 5, 7
For details see ad on page 236-7, Back Cover
Gertsch Products, Inc., Calif., 5
Globe Products Corp., Conn., 6
Heath Co., The, Mich., 2, 6
Hewlett-Packard Co., 2310 Page Mill Rd., Palo Alto, Calif., 2, 4, 5, 7
See complete catalog filed alphabetically in last section
Hickok Elect. Inst. Co., 10551 Dupont Ave., Cleveland 8, Ohio, 2, 3, 4, 6
For details see ad on page 161
Instrument Engineering, Inc., Calif., 8
Jackson Elect. Instrument Co., Ohio, 2, 3, 4, 6
Jones Electronics Co., M. C., Conn., 8
Kay Electric Co., 25 Maple Ave., Pine Brook, N.J., 1-7
For details see ad on page 192
Kent Engineering Co., Ill., 1, 6, 7
Kings Microwave Co., 50 Marbledale Rd., Tuckahoe 7, N.Y., 7
For details see ad on page 244-5
Lavoie Laboratories, Inc., Matawan-Freehold Rd., Morganville, N.J., 2, 5, 7
For details see ad on page 160
Loral Electronics Corp., N.Y., 5
Lysco Labs. Mfg. Co., Inc., N.J., 7
Lytle Engineering & Mfg. Co., Ill., 6
Marconi Instruments Ltd., N.Y., 1-7
Measurements Corp., Intervale Rd., Boonton, N.J., 2, 3, 4, 6, 7
See complete catalog filed alphabetically in last section
Metal Products Co., Tenn., 5
Mico Instrument Co., Mass., 7
Microlab, N.J., 7
Millen Mfg. Co., Inc., James, Mass., 5, 6, 7
New London Instrument Co., Conn., 2, 3, 6
Norrman Labs., Ernst, Williams Bay, Wis., 5
For details see ad on page 193
Owen Laboratories, Calif., 6
Philamon Labs., 5717 3 Ave., Brooklyn 20, N.Y., 5
For details see ad on page 201
Pioneer Elec. & Research Corp., 7212 Circle Ave., Forest Park, Ill., 2
For details see ad on page 117
(Continued on page 202)

MAXSON
PRECISION PHASE METER



for precise measurement of phase difference at audio frequencies

THE MODEL P-1060 PHASE METER is invaluable wherever precise knowledge of phase relationships in the audio-frequency range must be obtained. It has found increasing acceptance in the design of reactive components or of equipment using them, and in such analytical applications as measurement of residual inductance in "non-inductive" resistors, measurement of stray capacitance across resistors, and investigation of phase relationships in navigational and data-transmission systems.

Employing the phase-comparison method, the instrument exhibits a high degree of accuracy and incremental discrimination. The calibration may be checked with auxiliary equipment available in most laboratories. Even-order harmonic distortion is cancelled and odd-order distortion up to 1% will not affect accuracy of reading.

SPECIFICATIONS

Equipment, when removed from cabinet, is suitable for mounting in standard 19" relay rack.

Frequency range	30 to 20,000 cps
Phase range	0 to 360 degrees
Accuracy	0.1 degree
Incremental discrimination	0.01 degree
Signal level	0.5 to 10 volts rms
Input impedance	10 megohms shunted by 25 μμf
Display	Decade null system
Output jack	Can be provided for operating external recorder
Power requirements	200 watts at 105-125 volts, 60 cycles
Size	19½" wide, 16¼" deep, 25" high
Weight	110 pounds
Cabinet	Internally shielded walnut cabinet.

WRITE TODAY for descriptive bulletin 950-I

THE W. L. MAXSON CORPORATION
460 West 34th Street New York 1, N. Y.

Plessey International Ltd., England, 4, 5, 7
Polarad Electronics Corp., N.Y., 2, 4
Polytechnic Research & Dev. Co., Inc., 202 Tillary St., Brooklyn 1, N.Y., 2, 5
For details see ad on page 259-I
Potter Instrument Co., Inc., 115 Cutter Mill Rd., Dept. 5YB, Great Neck, L.I., N.Y., 5
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RCA Tube Dept., 415 S. Fifth St., Harrison, N.J., 2, 3, 4, 6, 7
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70. Transformers.

1—Audio Frequency.
2—Hermetically Sealed.
3—High Fidelity Audio.
4—Power Components
5—Pulse Generating
6—Radio Frequency.
7—Voltage Regulating.

A. J. F. Industries, Inc., N.Y., 1-5, 7
Acme Electric Corp., 44D Water St., Cuba, N.Y., 1-4, 6, 7
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Acro Transformer & Mfg. Corp., N.Y., 1, 3

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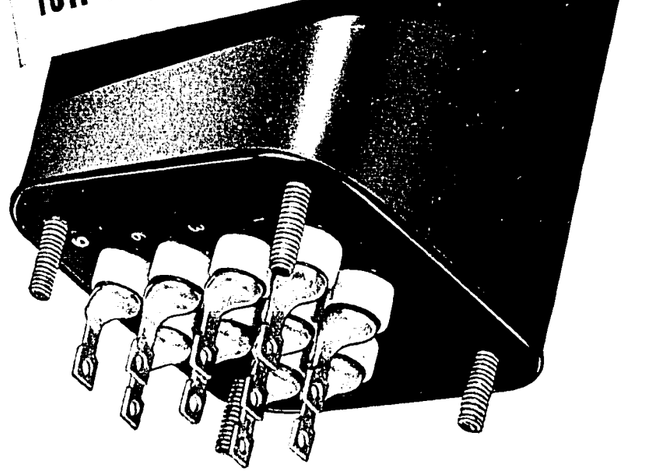
CHICAGO

hermetically-sealed TRANSFORMERS and Filter Reactors meet the full requirements of MIL-T-27



the Complete Transformer line that Meets Military Specifications

If you require fully approved MIL-T-27 Transformers and Filter Reactors for prototype models, pilot runs or special applications, and need them in a hurry—call your electronic parts distributor for *quick service* on CHICAGO Hermetically-Sealed units. Chances are he'll have them in stock—and you'll save valuable time and effort. There's a *complete* range of CHICAGO MIL-T-27 Transformers available: *Power, Bias, Filament, Filter, Audio.*

CHICAGO Hermetically-Sealed Transformers are the world's toughest units, preferred by engineers for those rugged applications. These stock transformers may be incorporated in your equipment with full assurance that they meet *complete* MIL-T-27 specifications.

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Have the full details at your fingertips on CHICAGO'S *New Equipment Line*—covering all MIL-T-27 units as well as famous Sealed-in-Steel transformers engineered for every application and geared to today's circuit requirements. Write for your free copy of this important catalog today, or get it from your distributor.

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DIVISION OF ESSEX WIRE CORPORATION
3501 ADDISON STREET • CHICAGO 18, ILLINOIS

Aero Coil, Inc., N.Y., 5
Aerolite Electr. Hardware Corp., N.Y., 5
Airpax Products Co., 224, 1-5, 7
Aladdin Radio Industries, Inc., Tenn., 6
Alden Products Co., 117 N. Main St., Brockton 64, Mass., 5
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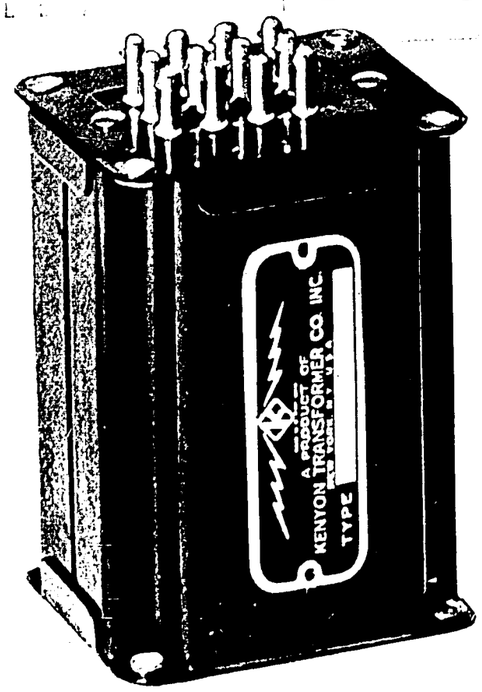
ONE OF THE OLDEST NAMES IN TRANSFORMERS...

Kenyon



FOR OVER TWENTY-FIVE YEARS, KENYON has been selling engineering ability and know-how, as well as transformers and associated products. Yes, the KENYON "K" is a sign of quality, dependability and sound construction.

Whether it be the standard KENYON "T" Line or "specials" custom-built to your requirements — practically at catalog prices, you are always assured of skillful engineering, progressive design and rugged construction.

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BROADCAST	RADAR
INDUSTRIAL MACHINERY	EXPERIMENTAL LABORATORIES
AUTOMATIC CONTROLS	ATOMIC ENERGY EQUIPMENT

Consult our engineering staff on any of your "special" problems at no obligation. Call or write now for our engineering representative.

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Kenyon TRANSFORMER CO., Inc.

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★ TRANSFORMERS
★ SATURABLE REACTORS
★ ELECTRONIC DEVICES

Specialists in SMALL quantities of custom built transformers from milliwatts to 50 KVA, single or polyphase—designed and manufactured to best meet your exact requirements.

Each Electran Transformer is built to the highest standards of quality and precision. There is no "second" grade at Electran.

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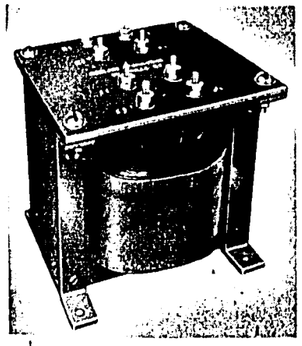

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MAIN & URBAN, WESTBURY, N. Y.

Telephone: Westbury 7-2933

Transformers

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To: PRIME CONTRACTORS and SUBCONTRACTORS on GOVERNMENT WORK . .

Invitation
TO RECEIVE A
PRODUCTION SAMPLE
Transformer
BUILT TO YOUR SPECIFICATIONS

this is our offer to you . . .

WE WILL, without cost or any obligation whatever, design a PRODUCTION SAMPLE transformer (hermetically sealed to JAN-T-27 or MIL-T-27 Government specifications), or open type construction, if unit is to be used for awarded prime or sub-contract work. Our approach stresses quality of product, efficiency in service and an alertness to techniques that discard the old for more functional methods.

James M. Blacklidge
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TYPICAL **GRACOIL** PRODUCTS

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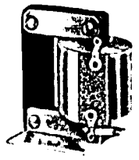
REACTOR

POWER TRANSFORMER

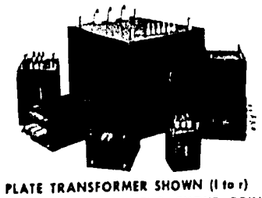
PLATE TRANSFORMER SHOWN (l to r) WITH POWER, FILAMENT, CHOKE, DRIVER, FILAMENT AND SMALLER PLATE TRANSFORMERS ALL BUILT TO MIL-T-27 SPECIFICATIONS.

POWER TRANSFORMER BUILT TO MIL-T-27 SPECIFICATIONS

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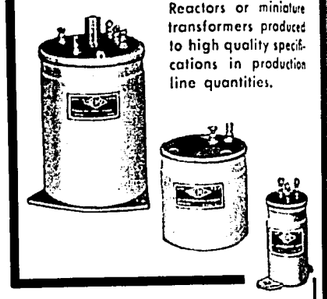
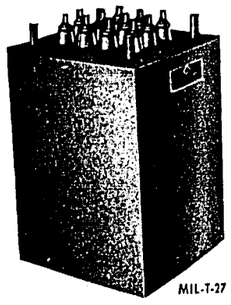


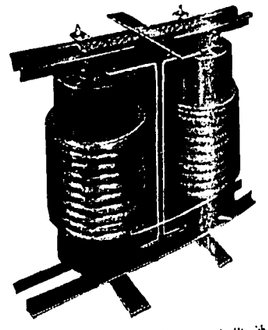
Reactors or miniature transformers produced to high quality specifications in production line quantities.

Hermetically sealed type transformers to specifications.

MEDIUM SIZE TRANSFORMERS


MIL-T-27

LARGE TRANSFORMERS

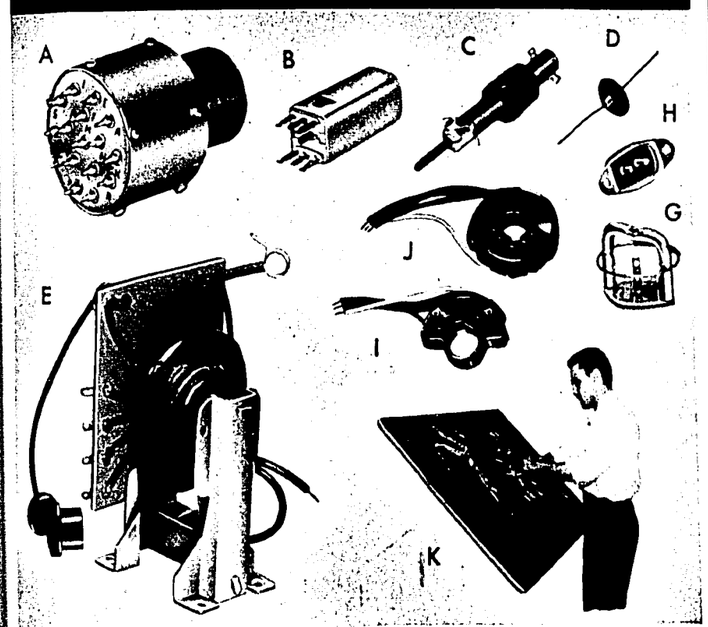


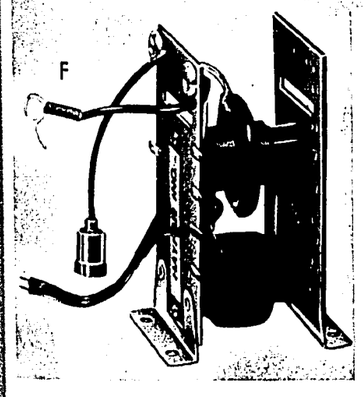
Transformers up to 225 KVA are built with attention to detail perfection to assure high performance, long-life service.

ACME ELECTRIC CORP.
440 Water St. Cuba, N. Y., U. S. A.

Acme Electric
TRANSFORMERS

Specialists IN RADIO, T-V, AND ELECTRONIC COMPONENTS





A—R. F. Filter unit (special military application)
B—I. F. Transformer
C—Horizontal width coil
D—Video peaking coil
E—Flyback transformer conventional type
F—Flyback Transformer high efficiency auto-transformer
G—Patented high voltage corona free tube socket assembly
H—Patented feed-thru interlock assembly
I—Exclusive design duo decal sector assembly
J—Duo-decal assembly for electro-static tube
K—Special wiring harness (ARC-27)

RAYPAR also manufactures all sorts of I. F. and R. F. windings, such as antenna coils, oscillator coils, R. F. chokes, flyback transformers, width coils, linearity coils, video peaking coils, filter assemblies, and special purpose R. F. coils of any type or construction.

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SERVING AMERICA'S LEADING [illegible] MANUFACTURERS

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Transformers
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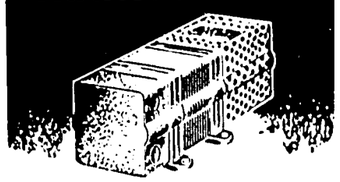
VOLTAGE REGULATING TRANSFORMERS



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 DCV-102. We welcome any inquiries regarding specific applications to your requirements.

SOLA *Constant Voltage* TRANSFORMERS
SOLA ELECTRIC CO.
4633 W. 16th Street, Chicago 50, Illinois

Transformers

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71. Transmitters.

1—AM Broadcast. **2—Communications.** **3—FM Broadcast.** **4—Radar.** **5—Special Types.** **6—TV Broadcast.** **7—UHF-VHF.**

A. R. F. Products, Inc., Ill., 2, 5

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Aero Coil, Inc., N.J., 2, 5, 7
Aero Electronics Co., Ill., 5
Aeronautical Communic. Equip., Inc., Fla., 2
Air Equipment, France, 2, 7
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Bendix Radio Comm. Div., E. Joppa Rd., Towson 4, Md., 2, 4, 5, 7
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Espey Mfg. Co., Inc., N.Y., 2
Federal Electrical Mfg. Co., Ltd., Canada, 1, 2, 3, 6, 7
Federal Electric Products Co., N.J., 5
Federal Telecommunication Labs., N.J., 6
Federal Telephone & Radio Corp., Selenium & Intelin Div., 100 Kingsland Rd., Dept. F7104, Clifton, N.J., 2, 7
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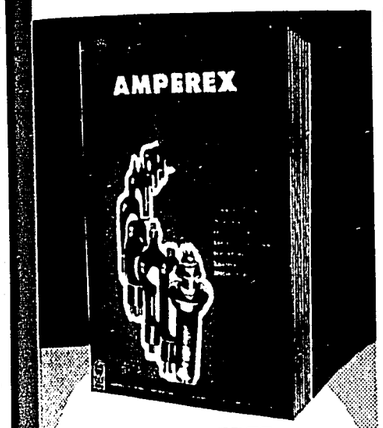

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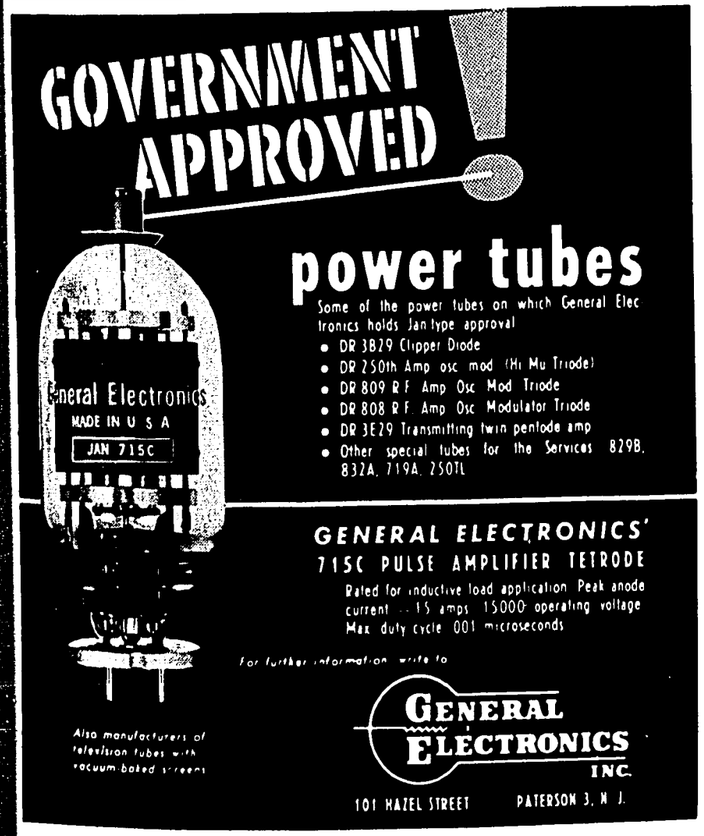

72. Vacuum Tubes.

1—Cathode Ray. **2—Geiger-Mueller.** **3—Iconoscopes.** **4—Image Orthicon.** **5—Industrial Types.** **6—Kinescopes, Black & White.** **7—Kinescopes, Color.** **8—Klystrons & Magnetrons.** **9—Phototubes.** **10—Pirani Tubes.** **11—Receiving Types.** **12—Rectifiers.** **13—Special Purpose.** **14—Thyratrons.** **15—Transmitting Types.** **16—Voltage Regulators.**

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(Continued on page 211)

CHATHAM ELECTRONIC TUBES and EQUIPMENT

TUBES LISTED ON THIS PAGE CAN BE SUPPLIED DIRECT FROM STOCK—MOST OF THESE TUBES ARE TO JAN SPECIFICATIONS

Many other types are also available for immediate delivery. Write for the completely illustrated catalog today. CHATHAM also designs, develops and manufactures special tubes to exact customer specification. Inquiries regarding this service are invited.

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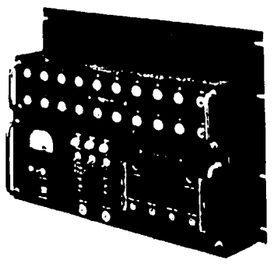
HYDROGEN THYRATRONS

VC1257	VC1258	VC1754	VC1907

CONVENTIONAL TUBES

3B28	395A	BS101	1B46
4B32	1Z2	338A	323B



• Pulse life test equipment built by CHATHAM checks receiver type tubes under pulse operating conditions.

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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 for complete information.

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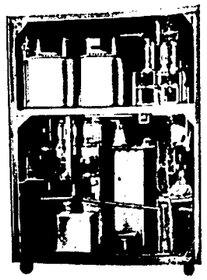

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127 SUSSEX AVENUE
NEWARK, N. J.
Inert gas rectifier and thyratron tube specialists since 1928. Send for our catalog.

FOR POSITIVE AND INEXPENSIVE SHIELDING
—use Metex "Electronic Weather Strips"

Because they combine exceptional *resiliency* with good *conductivity*, Metex Electronic Products made of knitted wire mesh offer an unusually effective means of sealing and shielding a wide variety of types of electronic equipment.

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Applications in which "Electronic Weather Strips" have already proved their effectiveness include pulse modulator shields, wave-guide choke-flange gaskets, replacement of beryllium-copper fingers and springs on TR and ATR tubes.

We will be glad to put our experience at your disposal. A letter to Mr. R. L. Hartwell, outlining your problem, will receive immediate study. For preliminary information, write for bulletin "Metex 'Electronic Weather Strips.'"

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Recommended for use in Army, Navy and Air Force equipment.

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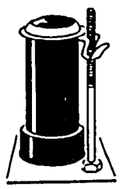

. . . for holding tubes and other plug-in components securely in position . . . are made in a variety of sizes to fit almost any type tube . . . will not loosen under the most extreme condition of shock or vibration.

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Electronic Sales Department — Electrical Products Division

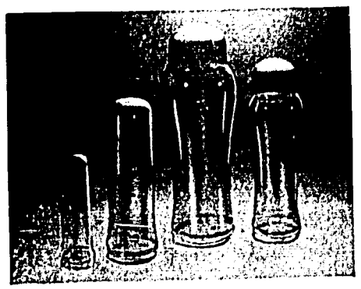
CORNING, N. Y.

ELECTRONIC AND TELEVISION TUBE BLANKS—ELECTRONIC GLASSWARE—METALLIZED GLASS

CORNING TELEVISION TUBE BLANKS

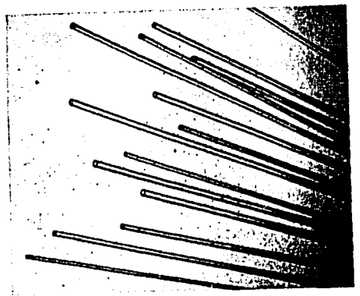
Corning Television Tube Blanks are made of strong, lightweight, lead-free glass with electrical properties ideal for television reception. They are produced automatically to uniformly close tolerances in both round and rectangular design. One-piece construction of neck and funnel provides additional strength. This also improves alignment, eliminating neck shadow and interference with yoke assembly. Large face plates are electrically sealed to prevent distortion, boiling or unsightly variations and again increase overall strength. Round T. V. bulbs—8½", 10", 12½", 16" and 19" in diameter; rectangular 14", 16" and 20" diagonal.

CORNING ELECTRONIC TUBE BLANKS



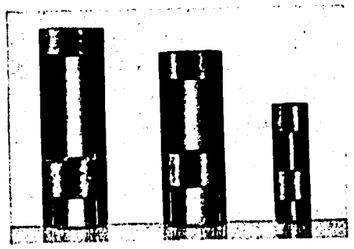
Electronic Tube Blanks are available in hundreds of sizes and shapes which are low in cost and of uniform high quality. Special glass formulas insure bulbs with desirable electrical properties for applications involving high frequency, high voltage, and ultraviolet transmission. In addition, special sealing characteristics for temperature requirements can be obtained.

CORNING ELECTRICAL GLASS TUBING



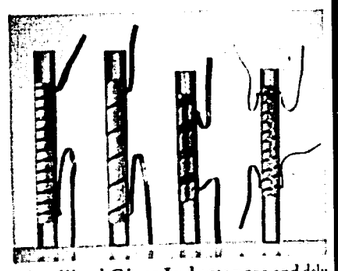
Electrical Glass Tubing performs a multitude of services in the Electronics Industry from supporting and sealing tube elements to providing inductance and capacitor forms. It is available in a wide range of diameters and at low cost. It provides an unusually versatile material for the design engineer.

CORNING HERMETICALLY SEALED BUSHINGS



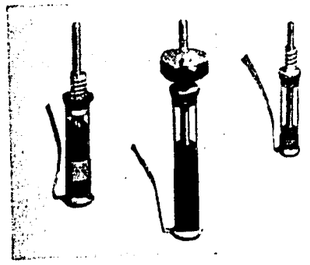
Corning Metallized Glass Bushings provide high quality hermetically sealed terminals for high voltage transformer and capacitor applications. Ease of installation reduces production costs. Although a complete standard line is available, special designs can be made to individual requirements.

CORNING HIGH FREQUENCY INDUCTANCES



Metallized Glass Inductances and delay line coil forms have high temperature stability and low loss—contribute negligible drift characteristics. They can be obtained with uniform, variable, or double pitch windings and for fixed tuned, permeability tuned or permeability tuned inductance trimmer combinations. They are easily duplicated within very close tolerances in any quantity.

CORNING MIDGET TRIMMER CAPACITORS



Metallized Midget Trimmer Capacitors are especially suitable for high frequency work where co-axial trimmers are desirable. Small size saves space. Low temperature coefficient insures stability. Design is arranged to make fine adjustments possible.

TECHNICAL SERVICES

Specialists in glass working, quality control, product engineering or design are available to tube and set manufacturers on glass problems.

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KING LABORATORIES, INC. has been a leading supplier of GETTERS for "electron tube" production for many years. Throughout tube development we have produced better and more economical GETTERS to the most stringent specifications.

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Syracuse 4, New York

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1—Anodes.
2—Envelopes, Glass.
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5—Guns—Gun Parts.
6—Pins—Prongs.
7—Getters

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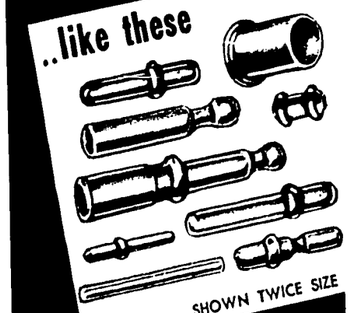
SAVINGS
to **VOLUME** users
of small parts

..like these



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Many prominent users of solid pins for electronic and mechanical purposes have cut costs by switching to Multi-Swaged *tubular* pins . . . without sacrificing strength or accuracy.

Typical Applications—

As terminals, contacts, bearing pins, stop pins, male-female connections, etc., in a wide variety of products such as Business Machines, Ventilator Louvres, Toys, Radio and Television Apparatus, Terminal-boards, Electric Shavers, Phonograph Pickups, etc.

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- Tungsten Lead wires and hooks
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Stampings and spinnings for all inside parts of transmitter tubes.

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Ribbons—Strips and Formed Pieces of

Pure Tungsten—Thoriated Tungsten Molybdenum and Tantalum

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SIZES:
Widths
from .004" up to .125"
Thicknesses
from .040" down to .001"
Down to .0008" at widths up to .060"
Down to .0005" at widths up to .015"
Below .0002" at widths up to .006"
Tungsten ribbon made to above sizes is manufactured from round, ductile wire.

CHEMICAL PURITY:
99.9% pure

FINISH:
Roll finish—black or cleaned

CAMBER:
Approximately 1/16" in 2' lengths

EDGES:
Slightly rounded and smooth

TOLERANCES:

Thicknesses:	.0005"	to .001"	± .00005"
	.002"		± .0001"
	.003"		± .00015"
	.004"		± .0002"
	.005"	to .006"	± .00025"
	.007"	to .010"	± .00035"
	.011"	to .030"	± .0005"
	.031"	to .040"	± .001"
Widths:	.006"	to .010"	± .0005"
	.011"	to .020"	± .001"
	.021"	to .030"	± .0015"
	.031"	to .060"	± .002"
	.061"	to .093"	± .003"
	.100"	to .125"	± .005"

Supplied to mg. wgt.—if required.

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SIZES:
Widths from .006" up to .250"
Thicknesses from .060" down to .0006"
Molybdenum Ribbon made to above sizes is manufactured from round, ductile wire.

CHEMICAL PURITY:
99.9% pure

FINISH:
Roll polished finish, cleaned

CAMBER:
Approximately 1/16" in 2' lengths

EDGES:
Slightly rounded and smooth

TOLERANCES:

Thicknesses:	.0004"	to .001"	± .00004"
	.0011"	to .010"	± .00025"
	.011"	to .030"	± .0003"
	.031"	to .060"	± .0005"
Widths:	.006"	to .010"	± .0005"
	.011"	to .020"	± .001"
	.021"	to .030"	± .0015"
	.031"	to .090"	± .002"
	.091"	to .125"	± .003"
	.126"	to .160"	± .0035"
	.161"	to .250"	± .005"

Supplied to mg. wgt.—if required.

STRIP

Widths up to 1½" with thickness down to .001" in random lengths 6" and up. This is rolled from heavy strip. Larger sizes also available.

STRIP

Widths up to 2" with thicknesses down to .001" in random lengths 6" and up. This is rolled from heavy strip. Larger sizes also available.

THORIATED

Widths up to .125" down to .001" thick
Widths up to ½" down to .002 thick

TANTALUM

Strip and ribbon available from .008" to 1½" wide at thickness from .001" down to .0004".

INQUIRIES on formed pieces made of tungsten or molybdenum ribbon and strip, thoriated tungsten, or tantalum will receive prompt attention.

Developed and Manufactured by

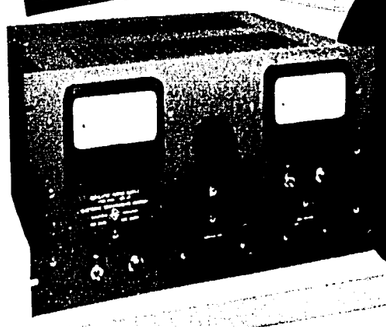
H. Cross Co.

15 Beekman Street New York 38, N.Y.
WOrth 2-2044 and COrtland 7-0470

REGULATED D. C.
UP TO 1000 VOLTS AT 500 M. A.

featuring continuously variable output voltage Without Switching

Here are four power supplies especially designed to cover a wide range of applications in development and production. These instruments feature continuously variable output voltage, good regulation, low hum level, good stability and overload protection. Models 200-B, 204-A 205-A and 207-B will operate from line input of 105 to 125 volts A.C. 50-60 cycles and provide rated regulation within this change. Examine the specifications carefully and you may find that one or more of these units has an application in your research or production program.



MODEL 204-A
0-500v D. C. at 300 MA.

Output Voltage
0-500v D.C. at 300 Ma. regulated
6.3v A.C. at 6 Amps. unregulated
Regulation Within 1% from 30-500 v
Hum Within 10 millivolts at full load
Meters 0-500v D.C.
0-300 Ma. D.C.
Negative or positive side of high voltage output may be grounded.

MODEL 207-B
200-1000v D. C. at 500 MA.

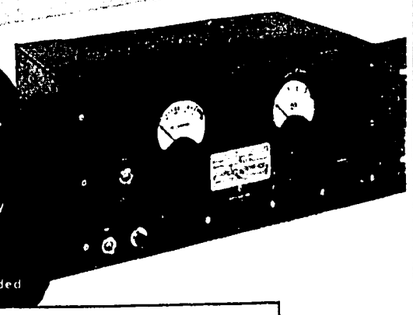
Output Voltage
200-1000v D.C. at 500 Ma. regulated
Regulation: Within 1% from 200-1000 Volts
Hum: Within 20 millivolts at full load
Meters: 0-1000v D.C.
0-500 Ma. D.C.
Negative side of high voltage grounded.

MODEL 205-A
100-325v D. C. at 150 MA.

Output Voltage:
100-325v D.C. at 150 Ma. regulated
0-150v D.C. at 5 Ma. regulated by VR tube
6.3v A.C. at 6 Amps. unregulated
Regulation: Within 1% from 100-325v D.C.
Hum: Within 10 millivolts at full load
Meters: None
Negative or positive side of high voltage output may be grounded.

MODEL 200-B
0-325v D. C. at 125 MA.

Output Voltage
0-325v D.C. at 125 Ma. regulated
6.3v A.C. at 6 Amps. unregulated
Regulation Within 1% from 20-325 V
Hum: Within 10 millivolts at full load
Meters: 0-500v D.C.
0-150 Ma. D.C.
Negative side of high voltage grounded



Detailed information on any or all of the instruments above will be sent upon request. Price and delivery information will also be forwarded at the time of your request. Send for Catalog "A"—there is no obligation.

ELECTRONIC MEASUREMENTS COMPANY
Red Bank (E/M) New Jersey
REGULATED POWER SUPPLIES — VACUUM TUBE VOLTMETERS — SIGNAL GENERATORS

Vacuum Tube Parts

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Electronic Manufacturing Co., 20 Orange St., Newark 2, N.J., 1, 4, 5
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Fansteel Metallurgical Corp., Ill., 1
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King Laboratories, Inc., 127 Solar St., Syracuse 3, N.Y., Getters
For details see ad on page 213
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74. Voltage Regulators.

1—Automatic. 2—Manually Controlled.

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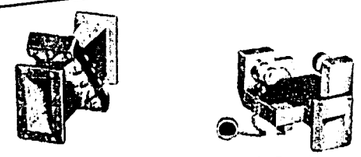
Titeflex has the experience

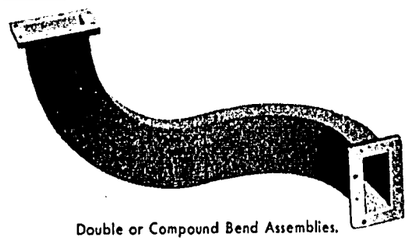
in WAVEGUIDES COMPONENTS ASSEMBLIES

Regardless of the types of waveguides and components you require, Titeflex can supply them. As an A-N approved source, our engineering and testing facilities are available for developing new designs. Titeflex *has the experience!*

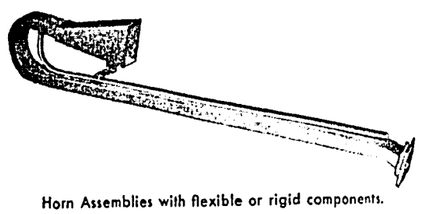
Rotary Joints, long, short or special.



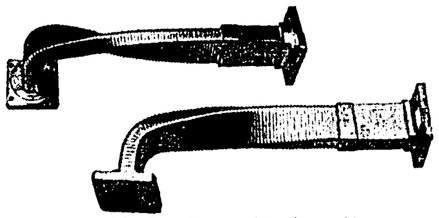
Mitred Joints and Directional Couplers.



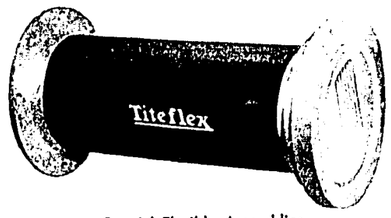
Double or Compound Bend Assemblies.



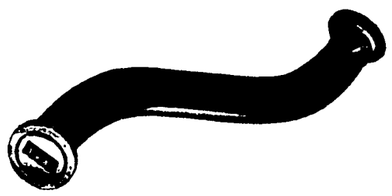
Horn Assemblies with flexible or rigid components.



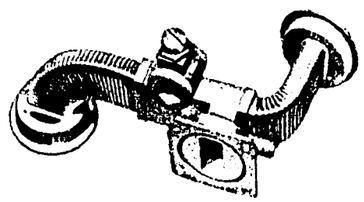
Twisted Single or Compound Bend Assemblies.



Special Flexible Assemblies.



Flexible Waveguides—all types. Twistable and Non-Twistable.



Flexible to Rigid Combinations.

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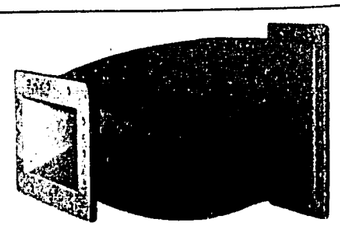
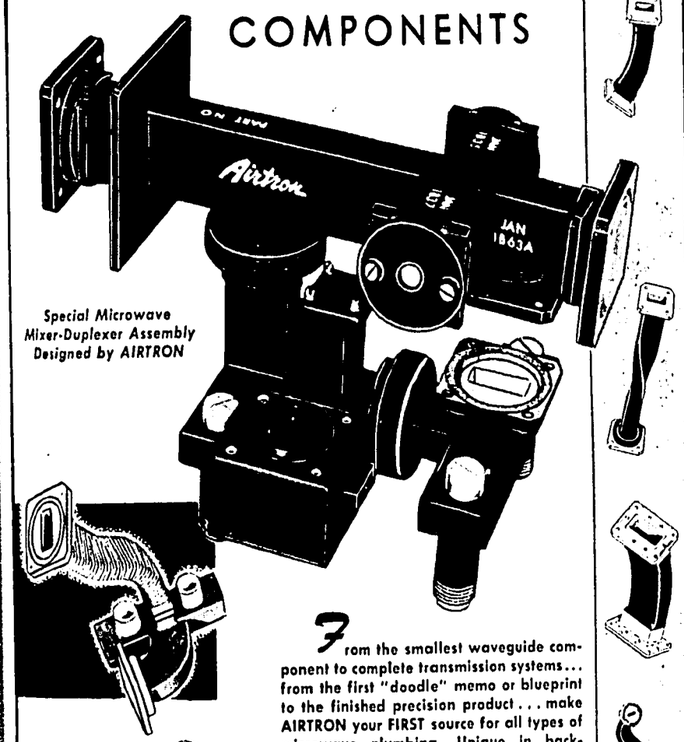


Rigid Twisted Sections, custom built.

Airtron DESIGNS AND PRODUCES

Flexible and *Rigid*

WAVEGUIDE COMPONENTS



Special Microwave Mixer-Duplexer Assembly Designed by AIRTRON

From the smallest waveguide component to complete transmission systems... from the first "doodle" memo or blueprint to the finished precision product . . . make **AIRTRON your FIRST source for all types of microwave plumbing. Unique in background, technical savvy, plant facilities and the WILL to SERVE, this organization is prepared to engineer and manufacture your staple or special requirements in:**

Mixers
Duplexer Assemblies
Magic Tees
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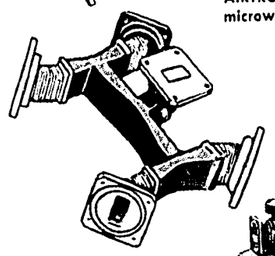
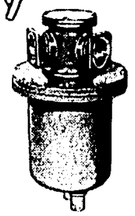
Twisted Sections
Rigid Twists
Choke Fittings
Flexible Waveguides
Straight Section
Rotary Joints





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Airtron INC.

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Voltage Regulators

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Weltronic Company, Mich., 1, 2
Westinghouse Electric Corp., Pa., 1, 2

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75. Waveguides.

1—Couplings. 2—Flexible Types. 3—Rigid Types.

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76. Waxes, Potting & Sealing Compounds.

Allied Asphalt & Mineral Corp., N.Y.
Biwax Corp., 3445 Howard St., Skokie, Ill.
For details see ad on page 218
Borthig Co., Inc., G. C., N.J.
Ciba Co., Inc., N.Y.
Glyco Products Co., Inc., N.Y.
Hansen Co., Wm., Mich.
Hi-Test Chemical Corp., 722 64 St., Brooklyn 20, N.Y.
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Melpar, Inc., Va.
Square Root Mfg. Corp., N.Y.
Zophar Mills, Inc., 112-130 26 St., Brooklyn 32, N.Y.
For details see ad on page 218

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Scientifically compounded for specific applications from waxes, resins, asphalts, pitches, oils, and minerals. Available in wide range of melting points and hardnesses. Special potting compounds are heat conducting and crack resistant at extremely low temperatures. Recommendations, specific data, and samples will be furnished on request.

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condensers
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Waxes and compounds from 100° F to 285° F Melting Points for electrical, radio, television, and electronic components of all types.

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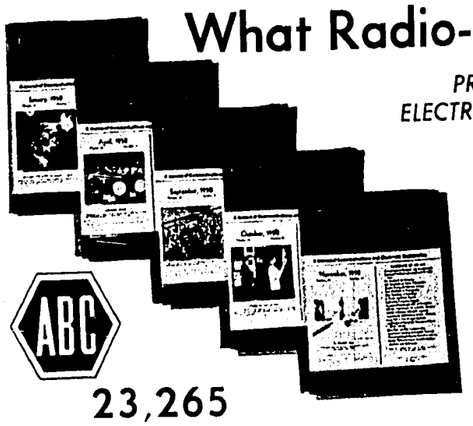
To SELL the Radio Industry, TELL the Radio Engineers!

What Radio-Electronic Engineers Read!

PRE-SPECIFICATION SELLING IS THE KEY TO THE ELECTRONIC MARKET — — AN ENGINEERING JOURNAL IS THE AVENUE TO SUCH SALES.



23,265

Research and Engineering in print —

has been the vital job of "Proceedings of the I.R.E" in its service to its members and to industry since 1913.

Published by The Institute of Radio Engineers so that the knowledge of technical radio in all its branches might be shared and spread world-wide, this journal ranks first in accuracy, authority, and volume of material published. In 1950 it printed 1480 pages of technical data, the word-count equivalent of five 600 page textbooks. This is the way that the engineer keeps up-to-the-minute in his professional knowledge of a rapidly expanding science.

"Proceedings" articles cover twenty-two fields of application of the radio tube, but IRE is truly an "Institute of Related Electronics" serving engineers from Broadcasting to Nucleonics, from Television to Industrial Electronics.

Covering a "Key Man" audience —

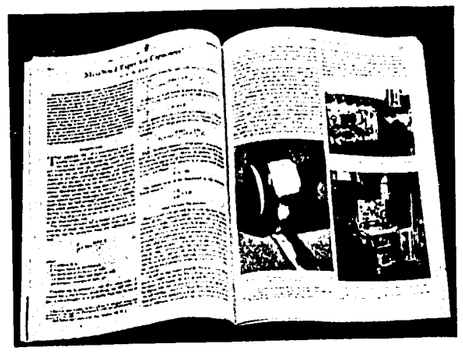
is the marketing function of "Proceedings of the I.R.E"

Strict membership requirements, and an annual investment of from $10. to $15. per member serves to cut out the uninterested and keep the reader audience controlled to active engineers — the kind who read to learn, and are qualified by education and experience to rate as "engineers". The non-member subscription is $18.00. Total net paid including 20,420 members is 23,265 ABC, giving "key-man coverage" in 5000+ firms.

Only the engineer can qualify to "set-the-specs" for buying in a technical industry. This is the man who must be sold, and he can be reached through his engineering journal, economically and effectively.

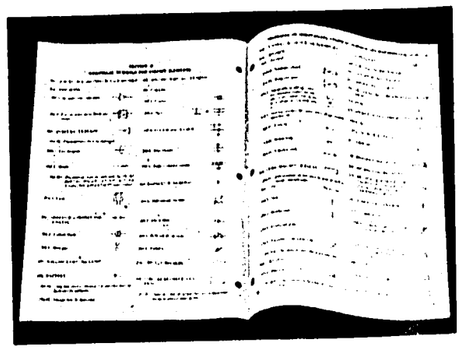
Advertisers have found it pays —

to tell their story to the engineer, if they would sell this industry. 276 different advertisers used "Proceedings of the I.R.E" in 1950. They used 869 pages, and invested over $209,000, an all-time high, to tell their stories. Results have been good, fully in keeping with the quality of the publication and its unequalled audience.



By Engineers — for Engineers —

is the secret to the power and influence of this oldest, yet ever youngest of journals. Its articles are literally years ahead of manufacture, in research; and as practical as the engineer, in application. 298 different authors, most of them members of the IRE contributed 272 articles or features in 1950, covering some 491 engineering topics. Written strictly for engineers, by engineers, and screened by editorial boards of engineers, these articles are authentic, and immensely valuable.



Extra Reader Services — *"Standards" shown above* beyond the valuable research and engineering application articles, add to the value of this magazine. The member is deeply interested in "Institute News and Notes" and the stories of fellow members in "IRE People". He uses the "Abstracts and References" to watch out for papers on his specialty in other books and periodicals which are checked on a world-wide basis. "Product News" and "Industrial Engineering Notes" broaden the news coverage.

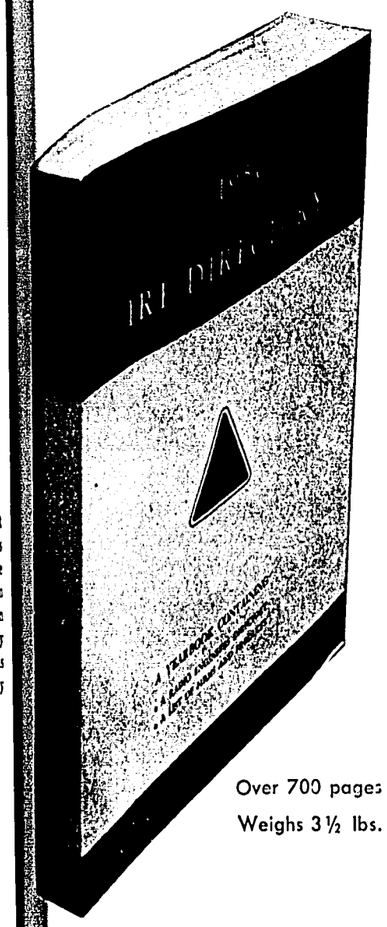
SELL RADIO INDUSTRY TELL RADIO ENGINEERS

Proceedings of the I.R.E

The Institute of Radio Engineers, Inc.

Advertising Dept. 303 West 42nd St., New York 18, N. Y.

What Radio-Electronic Engineers use for Product Reference



Over 700 pages

Weighs 3½ lbs.

Electronic Facts Fast!

The Engineer knows how to use a reference book. He wants his facts, right and fast! Fundamental classifications save him the time of useless duplication of listings typical of "terminology listings" directories. The IRE DIRECTORY of firms and of products is written the way an engineer wants it!

In this directory, a comprehensive picture of the firm and what it makes is given by 76 basic product classes, code amplified to specify 353 products and services. Simple, clean-cut product grouping "by use" speeds "look-up time". Bold-faced type and skillful cross-reference to the ad itself gives advertisers the chance to tell their own story in full.

Pre-Specification Selling —

is soundly promoted by advertising where the buyer looks for information. Advertising in "Proceedings of the I.R.E." is what we call "product promotion" but the IRE DIRECTORY is "product reference" and is fundamental or basic to any campaign. Always make it easy for the buyer to find your firm and product and you have bought business insurance. The IRE Engineer "sets-the-specs" and an ad in his own personal directory will be used exactly when, and as often as he needs such product information. Thus, you sell, when he wants data.

3 Directories in 1:

Nothing in the radio-electronic industry matches the completeness of service and usefulness of the IRE DIRECTORY. It lists 20,420 IRE members both alphabetically and geographically, with data on each member. It provides much Institute information on men, committees and activities.

The Directory of Firms gives names, addresses and code to all electronic products of 3000 organizations, a very complete picture of each firm's part in this industry.

The Product Index shows each firm, its state and sub-classification for the 76 basic classifications. Here the advertiser is shown in bold with full address and cross reference. The less-than-page ad units face these listings. In fact, all advertising faces listings of related value except spreads and catalog inserts.

Expert Compilation —

is a necessary requisite of an engineer's own directory. The year-round research of Frank MacAloon, transferred to a 5000 card master wheeldex; and Miss Florence Decidue's accurate IBM tabulations, keep our listings up-to-the-minute by the combination of skill and modern methods.

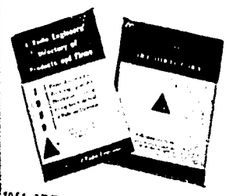
Catalog Section —

is a most useful, well used, and economical service of the IRE DIRECTORY. Preprinted inserts supplied by the advertiser (standard 8½" x 11" catalog page) will be bound in complete for $300 for 4 pages, $540 for 8 pages. This cost is competitive to postage and addressing. It provides complete coverage, permanent filing in an accessible book, and maximum reference value. The IRE DIRECTORY is issued annually in September, and closes June 30th. It is part of the IRE "balanced promotion package".

Distribution:

The IRE DIRECTORY is an annual issued to all IRE Members above student grade. 20,420 guaranteed. Distributor and Purchasing Agent edition is 1500. A balance to serve new members brings the total to 23,000.

The qualifications of IRE Members insures you that these men are active engineers, approved by experience, education, and occupation before they can be members. High dues and the technical nature of "Proceedings of the I.R.E" safeguard the quality of this "key-men-of-an-industry" list, insuring you a buying audience.



1951 IRE Directory

THE 1951 IRE DIRECTORY of

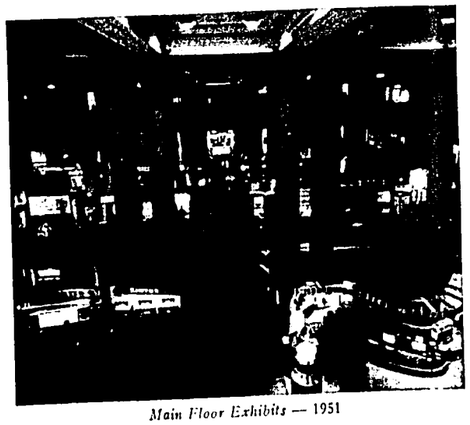
The Institute of Radio Engineers, Inc.

© 1951 IRE

Advertising Dept., 303 West 42nd St., New York 18, N. Y.

What Radio-Electronic Engineers come to see —

Audience at Technical Papers Session



Main Floor Exhibits — 1951

The Radio Engineering Show —

held each March in Grand Central Palace, New York City, attracts thousands of radio engineers from all parts of the world. In March 1951, the EAAB audited attendance was 22,814, of which 7,416 were IRE Members. Nearly one-third of the total membership attended this annual Convention and Exhibition. They came to hear technical papers on every phase of electronics and communications; for truly IRE is an *Institute of Related Electronics.* They came to see 277 exhibitors use 369 units totalling 45,672 square feet of exhibit space to show products.

The Show proves engineers are buyers —

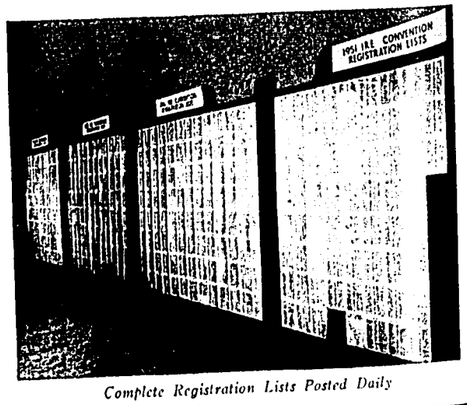
because only definite results in sales would support so tremendous a market-place. Year-after-year, both the Radio Engineering Show and its audience has grown, until today this event is the "big date" of an entire industry — toward which the time-table of production and research points new models and product advances.

All types of interests are served. The exhibits include an Audio Center, a Nucleonic Center, practically a floor of Instrument and Test and Measurement Equipment Exhibits, and every component known to radio. Large scale apparatus exhibited includes color television transmitters, cameras and studio equipment, all kinds of communication equipment, computors, and even electronic manufacturing machinery.

The Show brings manufacturer and engineer together to the profit of both. Admissions are strictly limited, and the registration is carefully analyzed. Here the exhibitor meets the IRE audience face-to-face and finds that engineers control buying in this industry.

A balanced promotion package —

is thus provided to industry by the marketing services of the IRE. "Proceedings of the I.R.E" gives *product promotion*, helping the manufacturer sell the radio industry by telling the radio engineer. The IRE DIRECTORY delivers *product reference*, insuring that the men who "write the specs" can easily find full data on your product when they need it. The Radio Engineering Show completes the package with *product presentation.* All three services can be purchased as a program, putting strength, stability and economy into your campaign.



Complete Registration Lists Posted Daily

All Advertising and Exhibit Sales are handled by:

△ WILLIAM C. COPP, *National Advertising & Exhibit Manager*, M. Jean Herbert A. White, *Greater New York*, △ Dayton, Ohio 18, N.Y. *New Jersey-Eastern Pennsylvania*, 303 West 42nd St., New York 18, N.Y. CIrcle 6-3026, 7 & 8, △ Scott Kingwill, Central *States Representative*, 35 E. Wacker Drive, Chicago 1, STate 2-4227 △ Duncan A. Scott & Company, *Pacific Coast Representative*, Mills Building, San Francisco 4, GArfield 1-1950; 2978 Wilshire Blvd., Los Angeles 5, DUnkirk 8-4151

THE RADIO ENGINEERING SHOW

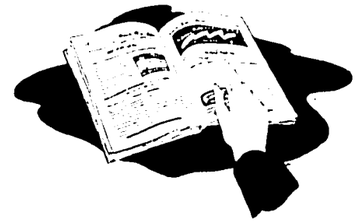
March 3-6, 1952 Grand Central Palace, New York

The Institute of Radio Engineers, Inc.

Advertising Dept., 303 West 42nd St., New York 18, N. Y.

© 1951 IRE

What it Costs to Advertise in the IRE Directory or in "Proceedings of the I.R.E"



Here is the answer—

given in some detail because engineers like the complete facts.

In the center column the unit ad rates are shown. The price of most advertising is based on "circulation" or the number of readers reached. Real costs, therefore, are determined by dividing the number of readers into the rate to find the cost per reader.

Figured this way, in the IRE DIRECTORY a page costs 1⅓ cents, and a column ad 4⅓ mills per copy, or reader, which is less than a one-cent postal! The same economy occurs in "Proceedings of the I.R.E" where the reader cost is even a little less, omitting all students. 6 and 12 time advertisers earn 10% and 20% discounts, reducing costs even lower.

The catalogs bound into the DIRECTORY cost advertisers less for that service than the cost of addressing and mailing to the same number of engineers.

IRE keeps these rates economical as a service to the Industry and its member engineers.

RATES

In "Proceedings of the I.R.E" and the IRE DIRECTORY

One page costs	$300.00
a 2/3 page	200.00
a column or 1/3	100.00
a 1/6 page	60.00

Quantity discounts:

Advertisers using six or more units in "Proceedings of the I.R.E" earn 10% off; and using every issue get 20% off (within 1 year). Bulking is permitted. Directory ads do not help earn this rate, but do receive the discount if it is earned in a "Proceedings" schedule.

Extra charges:

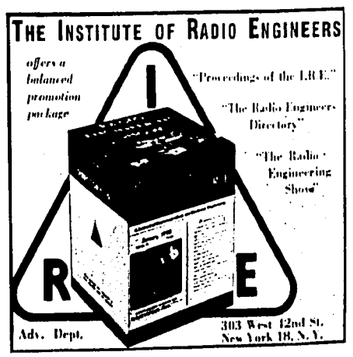
Color costs $60.00 extra for red or blue (standard) and $138.00 for any other color. Bleed costs $10.00 and "guaranteed positions" $25.00 extra.

Catalogs in the IRE DIRECTORY:

Such literature is supplied preprinted by the advertiser, charges prepaid to Menasha, Wis. Quantities increase each year (22,500 in 1951). Catalogs are carefully cross-referenced in listings, receive permanent filing, are bound in the DIRECTORY, and are distributed to all IRE Members except students. Rates are:

4 pages $300.	16 pages $960.
8 pages $540.	20 pages $1000.
12 pages $720.	24 pages $1200.

Detailed rate card and mechanical requirements cheerfully sent on request.



What the Advertiser gets—

These publications render two different kinds of service. The IRE DIRECTORY gives "product reference" usefulness; while "Proceedings of the I.R.E" gives the advertiser "product promotion." Each medium reaches the cream of radio-electronic engineers, and lends prestige value through the association of a firm's product with the progress and accuracy of IRE's publications.

What the Reader gets—

is of the utmost importance. These publications are of great service to the reader. Good advertising adds to the scientific worth of engineering application articles (in "Proceedings"), and listing usefulness (in the DIRECTORY), the value of "product information." This is of practical importance because the apparatus, components and materials advertised are essential to the carrying out of "theory" into engineering applications. Advertising tells the story of tools and materials, with which the engineer must work! The reader wants such information.

Part Five—1951
Catalogs and 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 adequately describe products 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 Part Five 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 1951 IRE DIRECTORY to you.

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Johnson & Hoffman Mfg. Co.	242-3
Kings Microwave Co., Inc.	244-5
Mycalex Corp. of America	246-7
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Approved Elec. Instr. Corp.
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Browning Laboratories, Inc.
Centralab, Div. of Globe-Union, Inc.
Coil Winding Equip. Co.
Hewlett-Packard Co.
Machlett Laboratories, Inc.
Measurements Corp.
New Hermes, Inc.
Scientific Electric
Herman H. Smith, Inc.
Sperry Gyroscope Co.
Superior Electric Co.

CHESTER

JAN-C-76 APPROVED WIRES

80° 90° 105°C HOOK-UP WIRES

SHIELDED WIRES and CABLES

FLEXIBLE CORDS

TELEVISION LEAD-IN CABLES

GAS TUBE & OIL BURNER IGNITION WIRE

TELEPHONE WIRE

THERMOSTAT CABLES

BELL-OFFICE-BLASTING WIRES

TW BUILDING & FIXTURE WIRES

Everything in wiring

More and more—engineers, designers, production men and purchasing officials have come to regard Plasticord and Plasticote Wires and Cables by Chester as the standard of comparison. This is because every inch of these dependable insulated conductors is made to conform to exacting quality controls that assure long service life, and performance as specified by the factory. That's the reason electrical men, everywhere, look for the Chester trademark when they're looking for the best!

"Chesty" says—

Our new catalog is a complete guide to plastic insulated wire and cable for every purpose. Write for a copy of this important data compilation for your files today.

CHESTER CABLE CORP.

CHESTER, NEW YORK

COLLINS RADIO COMPANY

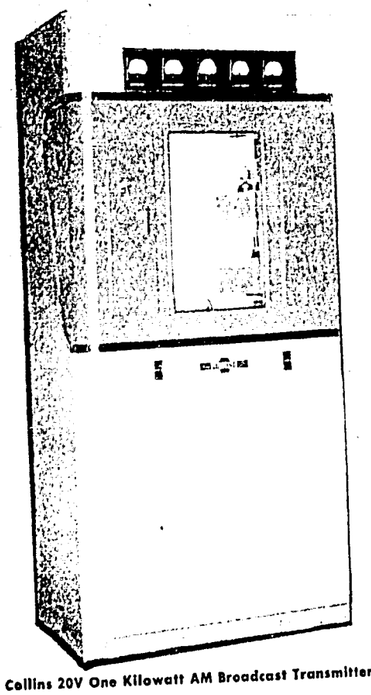
CEDAR RAPIDS, IOWA

11 W. 42nd St.
NEW YORK 18

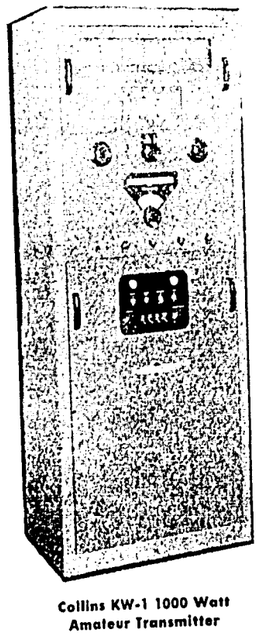
2700 W. Olive Ave.
BURBANK

1937 Irving Blvd.
DALLAS

Dogwood Rd., Fountain City
KNOXVILLE

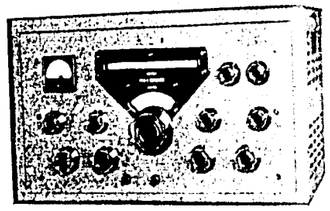


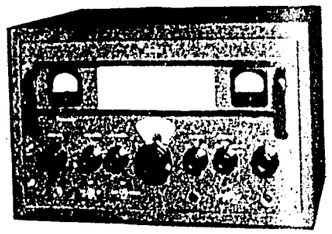
Collins 20V One Kilowatt AM Broadcast Transmitter



Collins KW-1 1000 Watt Amateur Transmitter

Collins 75A-2 Amateur Receiver





Collins 32V-3 Amateur Transmitter

BROADCAST TRANSMITTERS

AM

1000	250 watts
20V	1000 watts
21E	5000 watts
21L	10,000 50,000 watts

FM

2.5A	250 watts
1.0A	1000 watts
2.0A	2000 watts
5.0A	5000 watts
10.0A	10,000 watts
20.0A	20,000 watts
2.5A	50,000 watts
7.0A	

SPEECH EQUIPMENT AND ACCESSORIES

Collins has everything for AM and FM broadcasting and is often called on to equip complete stations. The Collins Broadcast Speech Equipment and Accessories book is a standard reference work of 65 pages which should be kept in the files of all engineers in the broadcast field. It pictures and describes a wide variety of high quality speech input consoles, remote equipment, rack mounted audio units, test and control apparatus, custom designed equipment, transducers, power supplies, meter and rack panels, terminal boards, cabinets — everything which conceivably could be needed in building a new station or modernizing an old one. If you haven't a copy of this book, your nearest Collins office will be glad to supply it.

AMATEUR EQUIPMENT

75A-2 double conversion superheterodyne receiver, advanced design throughout, covers 160, 80, 40, 20, 15, 11 and 10 meter bands, permeability tuned crystal controlled oscillator dial calibrated directly in frequency, selectivity, sensitivity, stability and tuning accuracy, signal to noise ratio 50 db, image rejection on all bands, noise limiter, amplified, delayed AVC with operation tubes, price, less speaker

50 speaker in matching cabinet

KW-1 transmitter — One kilowatt input AM, SSB and CW, covers 160, 80, 40, 20, 15, 11 and 10 meter bands designed to avoid TVI with additional attenuation, output network and filtered control leads; complete assembly, usual excellent Collins audio with speech, high level low pass filter for bandwidth limitation, single control tuning, single bandswitch for entire tuning dial, similar to 75A-2, output 50 ohms, 3 to 1 SWR, PA tubes conservatively rated at one kilowatt

Price

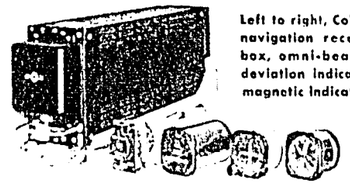
32V-3 transmitter — 150 watts input CW, 120 watts Collins 70E-8A VFO controlled, bandswitching, designed for maximum reduction of TVI by use of shielded circuits in the exciter and an added L network, balanced pi output network, plus double shielding on all leads. Price

75S-3 low pass filter — inserted in well shielded line from 32V-1, 2, or 3, provides approximately 80 db reduction of harmonic emissions at the television frequencies

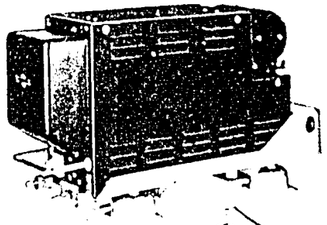
Price

51SB-1 narrow band FM adapter — plugged into VFO of the 32V-1, 2, or 3, it is suitable for FM on 6 meter bands. Price

AIRBORNE COMMUNICATION AND NAVIGATION EQUIPMENT



Left to right, Collins 51R-2 VHF navigation receiver, control box, omni-bearing selector, deviation indicator, and radio magnetic indicator.



Collins 51V-1 UHF Glide Slope Receiver

FREQUENCY SHIFT, RECEPTION, TRANSMISSION

Collins 37J-2 VHF Aircraft Antenna

Collins 37P-2 UHF Glide Slope Antenna

Collins 51J-2 Communication Receiver

GROUND STATION COMMUNICATION EQUIPMENT

50 kilowatt CW or ISK. Continuously over the entire range of 4-26 mc

15 kilowatts CW or ISK. Continuously over the entire range of 4-26 mc

transmitter. Frequency range

watts speech, 5 kilowatts CW.

transmitter. Frequency range 2-30

500 watts CW.

Two channels, each pretuned

and 30 mc, 500 watts CW, 250

Four channels, each pretuned

and 15 mc, 75 watts CW, 50 w

provides continuous coverage from 500 k

high stability and tuning accuracy

mounting receiver. Single channel pre-frequency between 118 and 136 mc

single channel for AF, A2 and A

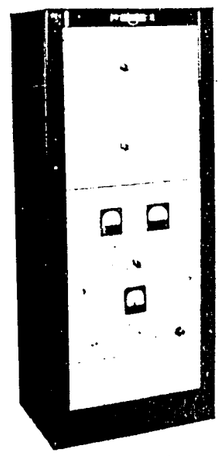
frequency between 2 and 24 mc

with coherent signal sensing circuit

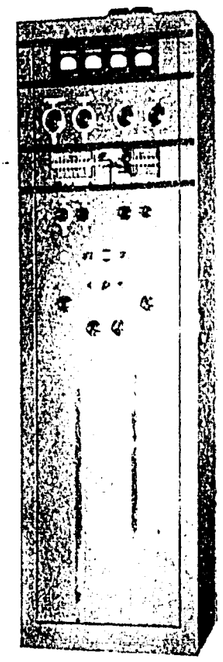
Single channel anywhere between 2

receiver. Single channel, pretuned to any fre-

2 and 24 mc.



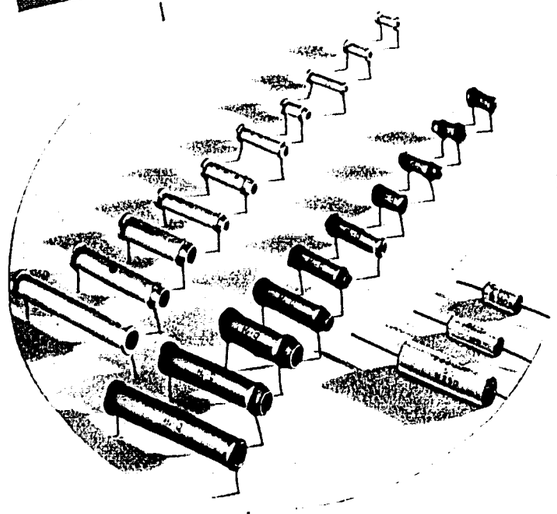
Collins 716A-2 frequency shift receiving terminal. Top to bottom: two 51N-5 communication receivers, 706A-2 frequency shift converter, 707A-1 power supply.



Collins 30K-4 two-channel Communication transmitter.

Hi-Q*

PRODUCED BY THE MILLIONS



Hi-Q BC TUBULAR CERAMIC CAPACITORS

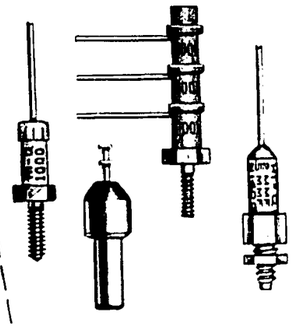
For coupling, by-passing and filtering where frequency control is not a critical parameter. Readily replace mica and paper condensers of corresponding value. (Not to be confused with Hi-Q close tolerance, temperature compensating units.) Available in capacity ranges from 5 mmf. to 33,000 mmf.

Hi-Q TEMPERATURE COMPENSATING CAPACITORS

Tubular ceramic construction with pure silver electrodes precision coated. Capacities from .25 mmf. to 1830 mmf. and a temperature coefficient range from P 100 to N 1400.

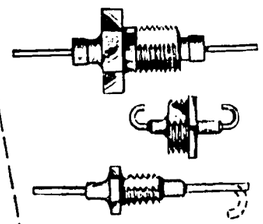
Insulation: Both Hi-Q BC Tubular and Hi-Q Temperature Compensating Capacitors are available with any of three types of insulation:—Clear non-hydroscopic styrene coating (CN) . . . Durez impregnated with low-loss microcrystalline wax (SI) . . . or a ceramic (Steatite) cover tube sealed with a specially developed end seal where applicable (CI).

Hi-Q STAND-OFF CAPACITORS



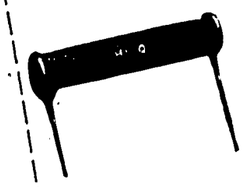
Basically, these are tubular units with a screw fixture for mounting to chassis or common ground. Type MCS has a ceramic tube enclosed in husky cadmium plated metal case with a specially developed end seal for protection against humidity and temperature changes. Close coupling and their unique construction make them excellent for by-passing RF in the high frequencies. Standard capacity tolerances are ± 10%, ± 20%, and GMV for "stand-off" capacitors and —20%, + 30%, and GMV for multiple tap units. MCS has a capacity of 1500 mmf. ± 500 mmf. All units flash tested for 1000 volts DC, power factor under 3% maximum. Insulation resistance is above 10,000 megohms.

Hi-Q FEED-THRU CAPACITORS



Provide perfect transmission through shields or ground potentials and simultaneously by-pass unwanted frequencies. Extremely rugged to withstand severe vibrations such as those encountered in aircraft, missiles and automotive requirements.

Hi-Q HIGH VOLTAGE TUBULAR CAPACITORS



Available in capacities from 25 mmf. to 250 mmf. Units with working voltage of 3,000 V. D. C. are 1.840" in length and .375" in diameter. Units with working voltages between 500 V. D. C. and 3,000 V. D. C. can be slightly smaller. All are Durez coated and are selected from ceramic bodies having good dielectric characteristics.

Hi-Q* COMPONENTS

Capacitors
Trimmers • Choke Coils
Wire Wound Resistors

BETTER 4 WAYS

✓PRECISION
✓UNIFORMITY
✓DEPENDABILITY
✓MINIATURIZATION

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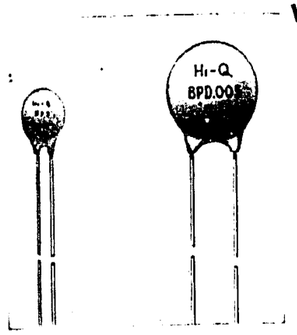
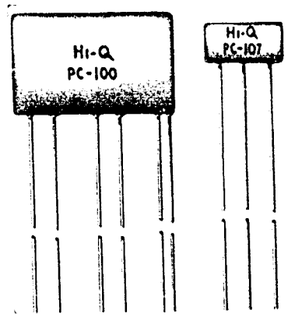
— by the top specialists in the ceramic field . . .



Hi-Q CERAMIC DISK & PLATE CAPACITORS



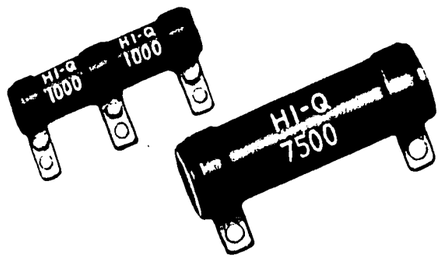
Hi-Q Disks are high K dielectric by-pass, blocking or coupling capacitors. Multiple capacities may be fabricated on a single disk to eliminate two or more conventional units. Insulated with Durez and high temperature microcrystalline wax for protection against moisture and high humidity. Available in a wide range of capacities and sizes.

Hi-Q Plates are essentially similar to Disks other than in shape. Multiple units do *not* require a common ground as do Disks and the number of capacities on a plate is limited only by the K of the material and physical size of the unit. Guaranteed minimum capacity values up to 33,000 mmf. per sq. in. are available.

Hi-Q TUBULAR TRIMMERS

Hi-Q Steatite adjustable, high-frequency capacitors are noted for their simplicity of design, mechanical strength and electrical stability. Available in two sizes: ½" with two capacity ranges, 0.5 mmf. to 3.0 mmf. and 1.0 mmf. to 4.0 mmf.; and ⅜" with capacity 1.0 mmf. to 6.0 mmf.

Hi-Q WIRE WOUND RESISTORS

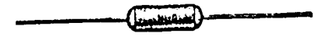


Hi-Q Resistors are made by winding special resistance wire upon a high refractory ceramic core. Element is anchored at each end to copper terminals and silver soldered for good contact. Wattage rated according to dissipation of heat each Hi-Q Resistor will handle without exceeding 300°C (570°F) at its hotspot from a starting ambient temperature not exceeding 40°C (104°F).

Hi-Q NON-INSULATED CHOKE COILS

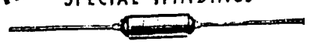
Hi-Q non-insulated choke coils are a solenoid type of winding on forms moulded from mineral filled moulding material, powdered iron cores, metallic oxides such as titanium, or on a steatite core. Available in many sizes.

Hi-Q INSULATED CHOKES



Available in various values insulated either by a Steatite cover tube or with Durez and high temperature crystalline wax, assuring maximum protection against high humidity and temperature change.

Hi-Q SPECIAL WINDINGS



Available in certain types and combinations of special windings. C and L combinations of capacity and inductance are available in many values.

Write FOR THE Hi-Q DATALOG

giving complete details of these and other Hi-Q Components. Please feel free to consult our engineers at any time concerning specific applications. We assure you of complete and fullest cooperation.

JOBBERS—ADDRESS: 740 Belleville Ave., New Bedford, Mass.

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Hi-Q* Electrical Reactance Corp.
OLEAN, N. Y.

SALES OFFICES: New York, Philadelphia, Detroit, Chicago, Los Angeles

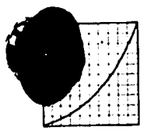
PLANTS: Olean, N. Y., Franklinville, N. Y. Jessup, Pa., Myrtle Beach, S. C.

FAIRCHILD precision potentiometers

Expertly designed and built with extreme mechanical precision to meet individual specifications, Fairchild Precision Potentiometers offer:

COMPACTNESS • LONG LIFE • SUSTAINED ACCURACY • LOW NOISE LEVEL • HIGH RESOLUTION • MULTIPLE GANGING

Unique Facilities for Unsurpassed Precision



The outstanding performance of Fairchild Precision Potentiometers is the result of careful design and scrupulous attention to every phase of manufacture from the selection of materials to the precision machining of mechanical components.

Precision windings are custom-made by an exclusive technique on machines built expressly for the purpose. Wiper arm contacts are made of precious metal alloys. Mechanical parts are machined to extremely close tolerances. For example, diameters of shafts and pilot bushings are held to a tolerance of +.0000, —.0005 inch, and radial shaft play is held to a maximum of .0005 inch or better at full indicator reading. Taps are accurately located to within ±1°, and in some cases to ±0.5°.

Since performance requirements vary with each individual application, complete standardization of units is impossible. For this reason the facilities of the Fairchild Potentiometer Sample Laboratory and the services of its specially trained personnel are available for analyzing customers' application problems.

Described on this page are four basic designs now available with linear or non-linear windings tailored to meet the individual requirements of virtually any application.

FAIRCHILD TYPE 746 PRECISION POTENTIOMETER

This new unit offers a number of unusual features never before available to precision potentiometer users. It has low torque, a new, more accurate phasing adjustment, and a new method of stacking that permits ganging up to 20 cups on a shaft. Individual cups in a gang are easily replaced where necessary. Supplied with linear or non-linear windings to meet your specifications.

SPECIFICATIONS (Nominal Values)

Resistance—Linear, 100,000 ohms max.; non-linear, as specified
Electrical Function Angle—310° ±1° max.
Electrical Contact Angle—325° max.
Mechanical Rotation—continuous
Functional Tolerance (guaranteed)—±0.5% (linear), ±1.0% (non-linear)
Mechanical Accuracy—*concentricity* (shaft to pilot bushing)—.001 in. FIR max.; *radial shaft play*—.0009 in. FIR max.; *Shaft*—centerless ground to .2500 diam. (+.0000, —.0005 in.) *pilot hub*—machined to .5000 (+.0000, —.0005 in.)
Torque—1.5 oz-in. per cup
Wattage (rated at +40° C ambient temperature)—2.5
Terminal Voltage—400 max.
Voltage Breakdown at sea level (60 cycles)—900 RMS
Taps—One per cup*; location accurate to ±1°; ±0.75° max. width
Operating Ambient Temp. Range— —55°C to +71°C
Guaranteed Service Life (Nichrome Wire)—1,000,000 cycles
Dimensions—diam. 1.750; length (1 cup) .800 in. ±.005 in.; added length per unit ganged, .580 in. ±.002 in.
Case—grey anodized aluminum for greater accuracy

**Two taps can be provided by slight design modification using terminal board clamp screw modified for wiper terminal; 19 taps can be provided by addition of dummy cup section.*

FAIRCHILD TYPES 747 AND 748 PRECISION LINEAR POTENTIOMETERS

The Type 748 is a linear potentiometer with a guaranteed functional tolerance of ±0.10%! The Type 747, similar in nearly all respects except size, has a guaranteed functional accuracy of ±0.15%. Type 747 has a nominal diameter of about 2 inches, while the 748 is about 3 inches in diameter. Flexibility of these units permits their combination with other units having non-linear windings to meet special application problems.

SPECIFICATIONS (Nominal Values)

Resistance—747, 75,000 ohms max.; 748, 125,000 ohms max.
Electrical Function Angle—747, 351.3° ±1°; 748, 354.5° ±1°
Electrical Contact Angle—747, 351.3° +4°, —0°; 748, 354.5° +4°, —0°
Mechanical Rotation—continuous
Functional Tolerances (guaranteed)—748, ±0.15%; 747, ±0.10%
Mechanical Accuracy—*concentricity* (shaft to pilot bushing)—.0025 in. FIR max.; *radial shaft play*—.0015 in. FIR max.; *shaft*—centerless ground stainless steel to .2500 diam. (+.0000, —.0005 in.); *pilot hub*—machined to .7500 (+.0000, —.0005 in.)
Torque—1.0 oz-in. per cup
Wattage (rated at +40°C ambient temperature)—747, 4 watts; 748, 5 watts
Terminal Voltage—400 max.
Voltage Breakdown at sea level (60 cycles)—900 RMS
Taps—747, 12 per cup*; 748, 16 per cup*; location accurate to ±1°; ±5° max. width
Operating Ambient Temp. Range— —55°C to +71°C
Guaranteed Service Life (Nichrome Wire)—1,000,000 cycles
Dimensions—diam., 747, 2.093 in.; 748, 3.093 in.; length (1 cup) 1.156 max.; added length per unit when ganged, .594 in.

**Depends on spacing requirements. Without moving bridge or wiper terminal.*

FAIRCHILD D-C-P*

***Differential Computing Potentiometer**

The Fairchild Differential Computing Potentiometer is virtually two precision linear potentiometers in one. With it, you can combine two input variables and obtain an output that is proportional to their sum or difference. Instead of using terminal lugs, the D-C-P provides for external connections to winding ends and wiper by means of three coin-silver slip rings to permit continuous rotation of body as well as shaft.

SPECIFICATIONS (Nominal Values)

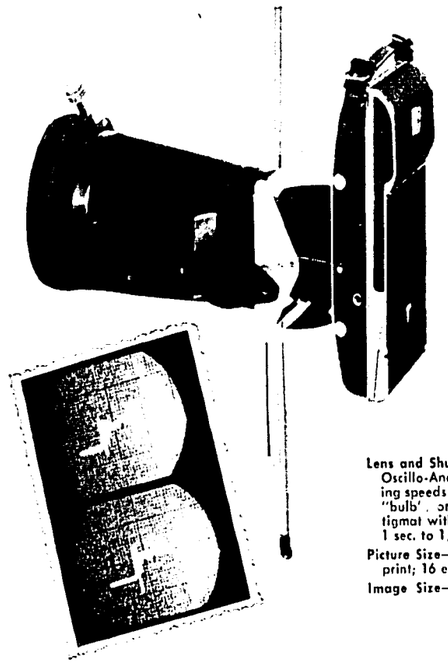
Resistance—125,000 ohms, max.
Electrical Function Angle—354.5° ±1°
Electrical Contact Angle—354.5° +4°, —0°
Mechanical Rotation—continuous
Functional Tolerance (guaranteed)—±0.10%
Mechanical Accuracy—*concentricity (shaft to pilot bushing)*—.0025 in. FIR max.; *radial shaft play*—.0015 in. FIR max.; *shaft*—centerless ground stainless steel to .2500 diam. (+.0000, —.0005 in.); *pilot hub*—machined to .7500 (+.0000, —.0005 in.)
Torque—1.0 oz-in. per cup
Wattage (rated at +40°C ambient temperature)—5 watts
Terminal voltage—400 max.
Voltage Breakdown at sea level (60 cycles)—900 RMS
Taps—number per cup* (see note); location accurate to ±1°; ±.5° max. width
Operating Ambient Temp. Range— —55°C to 71°C
Guaranteed Service Life (Nichrome wire)—1,000,000 cycles
Dimensions—diam. 3.093 in., length 1.219 max.

**No slip rings provided for taps, but 16 taps can be provided within the cup depending on spacing requirements and without moving bridge or wiper terminal.*

WRITE TODAY FOR COMPLETE INFORMATION

FAIRCHILD oscilloscope cameras

For Permanent Oscilloscope Records—on the spot!



THE FAIRCHILD-POLAROID® OSCILLOSCOPE CAMERA PRODUCES A PHOTOGRAPHIC PRINT IN ONE MINUTE

When you need Oscilloscope records in a hurry, you can't beat this new camera. It's a special Fairchild adaptation of the Polaroid-Land principle of "a photographic print in one minute." Because these prints are immediately available to the engineer, lab work can proceed continuously without the interruptions or long waiting periods required with conventional methods.

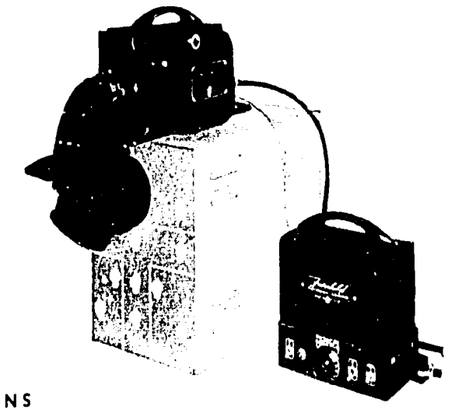
For the first time, the camera makes it economically practical to record many traces that were formally sketched or carried in the engineer's memory. No focusing or special training is required—just snap the shutter, pull down a paper tab, and remove the finished print 60 seconds later. Each 2¼ x 3¼ print records two traces at exactly one-half life size for easy comparison and measurement.

SPECIFICATIONS

Lens and Shutter—Choice of 75mm f2.8 Wollensak Oscillo-Anastigmat with ±2 Alphax shutter having speeds of 1/25 sec. to 1/100 sec., "time" and "bulb"; or, 75mm f1.9 Wollensak Oscillo-Anastigmat with ±3 Alphax shutter having speeds of 1 sec. to 1/100 sec., "time" and "bulb".
Picture Size—3¼ x 4¼ in. (2 or more images per print; 16 exposures per roll of film.)
Image Size—One-half reduction of scope image.
Writing Speed—With f2.8 lens, up to 1 in./usec at only 3000V accelerating potential; higher speeds at higher voltages. With f1.9 lens these values are approximately doubled.
Dimensions—Camera, 10½ x 5¼ x 6¼ in.; hood, 11 in. length, 7½ in. dia.; adapter, 2 in. width, 6⅝ in. max. dia.
Weight—Complete, 7¾ lb.

For both still and continuous-motion Oscilloscope Recording on 35-mm film or paper

THE FAIRCHILD OSCILLO-RECORD CAMERA



The Fairchild Oscillo-Record Camera is the first specifically designed for the purpose of recording cathode-ray oscilloscope images. The unit is designed for both still and continuous motion photography on standard 35 mm film. No special experience is necessary to set up the equipment.

Dynamic braking stops film instantly when switch is turned off. Remote control connection provides automatic means of monitoring random transients without necessity of having camera run continuously.

Other features: Written data record, film speed continuously variable from 1 to 3,600 in./min., remote control provision, protective interlock.

SPECIFICATIONS

Assembly—Consists of: (a) camera; (b) electronic film speed control unit; (c) periscope cone; (d) standard mount; (e) data card unit; (f) cables.
Lens—50mm f/2.8 Wollensak Velostigmat; 50mm f1.5 Wollensak (optional at extra cost).
Shutter—Wollensak ±2 Rapax Between-the-Lens Shutter; speeds from 1 second to 1/200th second. (Wollensak ±3 shutter supplied with f1.5 lens; speeds from 1 second to 1/400 second.)
Film Size—Any standard 35mm motion picture negative film; or recording paper.
Film Capacity and Negative Size—(a) Standard 100-foot roll; (b) External Magazines (optional at extra cost)—400-ft. or 1000-ft. When single exposures are made on stationary film, negative size is .953" high x .937" wide. However, film may be advanced from ¼ of a standard 35mm frame height to the full advance of a double 35mm frame (5 to 39mm).
Data Record—Illuminated data card on which any data may be written is provided. Data may be recorded photographically at the beginning or end of each run.
Electronic Control Unit—Provides direct film speed settings over a range of 1 to 3,600 in./min.
Remote Control—Connector is provided for remote control of film-drive motor.
Spacing Bars—Permanently attached to oscilloscope for quick and easy attachment or removal of complete camera and mount assembly.
Approximate Weight—Camera 15 lbs.; Electronic Control, 10¼ lbs.; Periscope and Mount Assembly, 7¾ lbs.; Total, 33 lbs.
Approximate Dimensions—Camera, 9⅛ x 11½ x 7½ in.; Electronic Control, 9¼ x 10 x 5½ in.; Periscope and Mount Assembly, 21¼ x 11⅝ x 5½ in.
Film Speed—Continuously adjustable from 1 in. per min. to 3,600 in. per min. Film movement is continuous, not intermittent.
Interlock—Prevents starting motor when camera is set for single exposures; and vice versa.
Power Requirements—Approximately 135 watts of 110 volt, 60-cycle a.c. are required for the variable speed drive.

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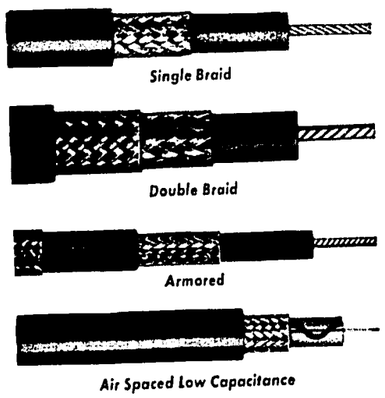

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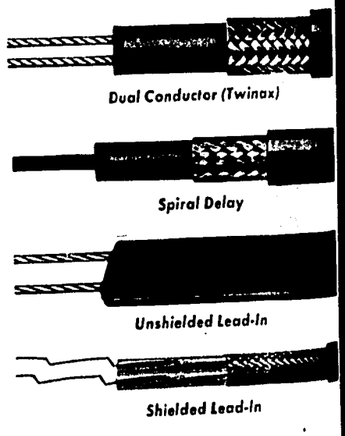

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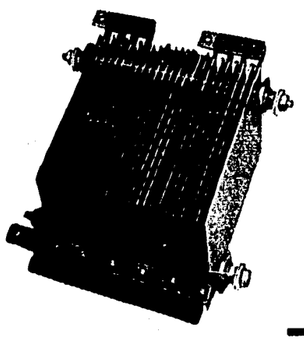
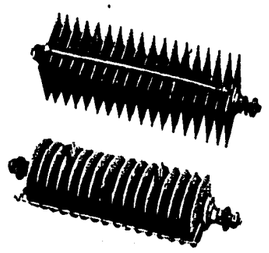
For Every Industrial Power Conversion Application





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Federal Cat. No.	Federal Code No.	Output MA-DC	Input (RMS) Volts	Input (RMS) MA	Inverse Volts	Peak MA	Plate Size	Application
1097	1097	20	130	50	380	200	½" Sq.	B+ Boosters; Bias
1002	402D3452A	65	130	160	380	750	1" Sq.	B+ AC-DC (5 tube)
1003	402D3150A	75	130	220	380	900	1" Sq.	B+ 3-way Radios
1101	1101A	100	130	160	380	750	1" Sq.	B+ Radios, Television
1004	403D2625A	100	130	325	380	1200	1 13/64" Sq.	B+ Radios, Television
1005	403D2787A	150	130	425	380	1200	1 13/64" Sq.	B+ Radios, Television
1006	404D2795A	200	130	550	380	2000	1 17/32" Sq.	B+ Television
1010	404D3450	250	130	625	380	2000	1 17/32" Sq.	B+ Television
1087	1087A	275	130	700	380	2000	1 17/32" Sq.	B+ Television
1090	1090A	300	130	750	380	2000	1 17/32" Sq.	B+ Television
1023	1023	350	130	900	380	3000	1¾" Sq.	B+ Television
1130	1130	400	130	1000	380	4000	2" Sq.	B+ Television
1021	439D4200	450	130	1150	380	4000	2" Sq.	B+ Television
1014	403D2889A	100	160	325	440	1200	1 9/32" Max.	Vibrator
1022	439D4300	450	160	1150	440	4000	2" Sq.	B+ Television
1007	402D3239A	75	160*	220	440	900	1" Sq.	Vibrator Doubler
1008	403D3240A	100	160*	325	440	1200	1 13/64" Sq.	Vibrator Doubler
1009	404D3241A	200	160*	550	440	2000	1 17/32" Sq.	Vibrator Doubler
1015	402D3550	150	25	270	35	1800	1" Sq.	Bridge Rectifier
1016	403D3551	300	25	540	35	2400	1 13/64" Sq.	Bridge Rectifier
1017	404D3552	600	25	1080	35	4000	1 17/32" Sq.	Bridge Rectifier
1013	4D2814AS	700	18†	....	....	....	1 17/32" Sq.	Battery Charger
1018	104D2943S	2000	18‡	....	....	....	4¼" lg. (Mtg. Plt.)	Battery Charger
1001	402D3151	75	20	220	55	900	1" Sq. (Mtg. Plt.)	Bias Rectifier
1019	N.T.C. Resistor (Resistance: Cold, 1400 ohms, Hot, 200 ohms)							

*These rectifiers have two sections—characteristics given apply to one section only; if both sections are used half-wave, 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.

Federal's Miniature Selenium Rectifier Handbook... 48 pages of valuable design, characteristics and application. Available for 25 cents (coin only)

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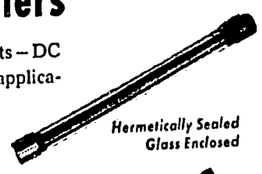
for Photo-Flash Power Supplies—Cathode Ray Oscilloscopes—Television Circuits—DC Power Supplies—Bias Supplies—High Voltage Testing Equipment—and other applications requiring high voltage at low current.

Federal Code Number	DC Output Voltage	Max. Peak Inverse Voltage	AC Input Voltage	Max. Eff. Inverse Voltage
123D1101	1400	4000	1400	2000
123D1071	1050	3000	1050	1500
123D1126	700	2000	700	1000
123D1182	350	1000	350	500



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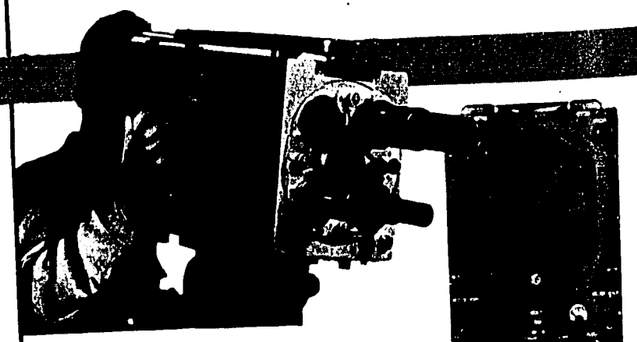
GPL
the Complete NEW LINE for Studio and Field that Increases TV Efficiency

YOU CAN DO *More*— DO IT *Better* WITH GPL TELEVISION EQUIPMENT

Introduced only last year, this GPL equipment has already received wide industry acceptance for its flexibility, convenience and advanced design features. Developed for easy, attention-free operation, built with watchmaker's precision, the GPL line will do more, do it better, for years of dependable service. Write now for full details . . . act now for early deliveries.



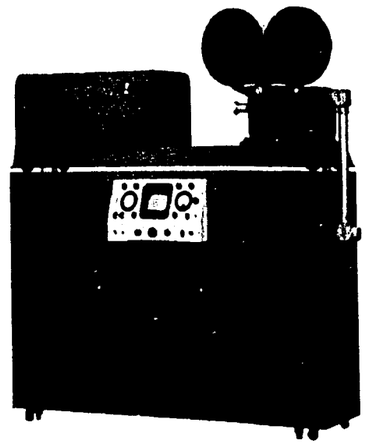
Compact Camera Chain Gives Improved Picture Control

Camera, control unit, power unit make up world's smallest, lightest broadcast chain. Improved picture quality with remote control iris, uniform focus adjustment for all lenses. Remote lens change, focus, pan and tilt also available. Simplified adjustments. Better accessibility. 8½" monitor tube.

TV CAMERA CHAINS—TV FILM CHAINS
TV FIELD AND STUDIO EQUIPMENT
THEATRE TV EQUIPMENT

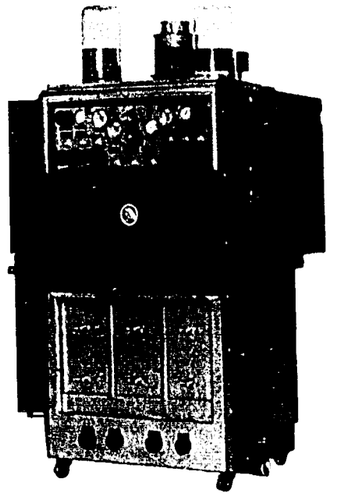
Single-Unit Sync Generator Requires No Adjustment

This unit, complete with power supply, is packaged for field use, may be removed from case for rack mounting. With binary counting circuits and pulse width controlled by delay lines, it provides circuit reliability better than present studio equipment and eliminates operator adjustments.



Video Recordings of Live-Program Quality

Precision electronic shutter provides steady interlace and eliminates shutter bar. High-fidelity sound recorded on the film simultaneously. New vacuum gate camera runs continuously without emulsion pile-up. Telecast recording looks and sounds like a live show.

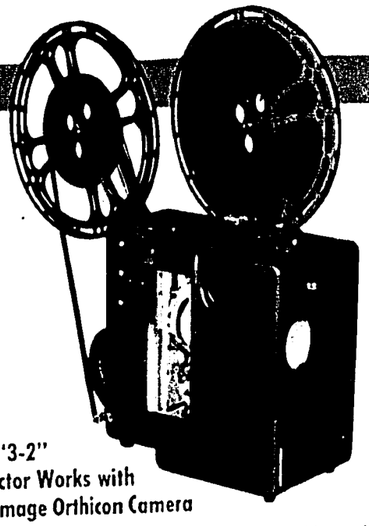


Film Permanently Processed in 40 Seconds

The GPL Rapid Processor develops, rinses, fixes, washes, dries and waxes 16-mm film synchronously as it comes from the Recorder, or its own feed magazine. This facilitates rebroadcasts to other time zones. Operation is fully automatic, gives uniform, highest quality results.

First Professional Sync Projector for 16-mm Film

Designed for TV studio use. Has the reliability of professional 35-mm equipment. Sharper, steadier pictures, finer sound. Uniform illumination, ample light, with 100 foot-candles delivered to camera tube. May be used with any full-storage type film pick-up. Fully enclosed, 4,000 foot film magazine provides for 110 minutes of continuous operation—an entire feature.



New "3-2" Projector Works with Any Image Orthicon Camera

A portable unit of tremendous utility. Used with standard studio or field cameras without special phasing, it makes transmission of motion pictures as simple as stills. Handles film features with results comparable to specialized iconoscope chains. Projects rear-screen effects. Projects commercials to cameras in the field, eliminating expensive studio stand-by facilities. For preview work, its synchronous motor simplifies sound scoring.

General Precision Laboratory

PLEASANTVILLE **NEW YORK**

WRITE, WIRE OR PHONE FOR DETAILS

frequency measurements
accurate to 1 part in 10 Million
over a large portion of the RF Spectrum

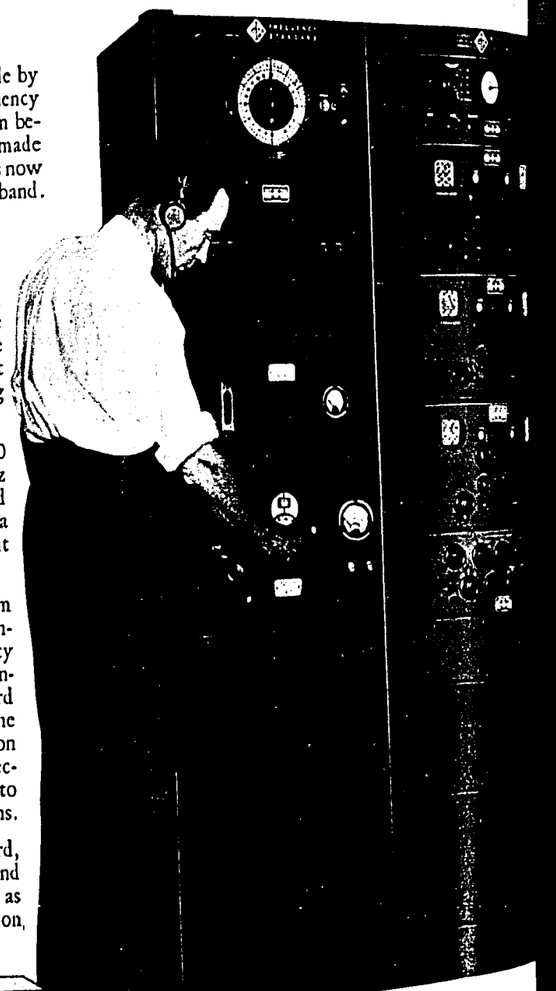
Frequency standards and measuring equipment made by General Radio Company make accurate frequency measurements possible throughout the radio spectrum below 3,000 Mc. Measurements in the v-h-f range can be made with only slightly less accuracy and convenience than is now considered routine in the standard a-m broadcast band.

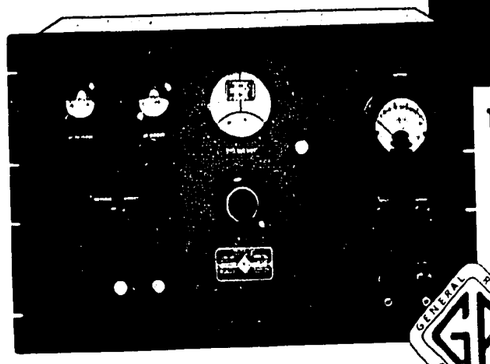
The Type 1100-AP Primary Standard (*at the left of the large photo*), with its associated Type 110-5A Frequency Measuring Assembly (*at the right*), provides hundreds of known frequencies up to 100 Mc with an accuracy of one part in ten million. With the minimum number of adjustable controls and the maximum of convenience, this equipment is the most accurate commercially-available frequency measuring assembly obtainable.

The Type 1100-AP Primary Standard comprises a 100 kc oscillator, with temperature-controlled quartz bar, multivibrator units for 100 kc, 10 kc, 1 kc and 100 cycles, with a-c operated power supply and a Syncronometer clock with micro-dial arrangement for comparison with standard time signals.

The Measuring Equipment, which operates from the Standard, contains three transfer units each containing a tuned detector and heterodyne frequency meter. Beat frequency differences between the frequency under measurement and the nearest standard frequency harmonic are measured by means of the calibrated interpolation oscillator and the comparison oscilloscope. A circular sweep, with radial deflection, can be used on the oscilloscope in addition to the usual Lissajous figures, for frequency comparisons.

Various combinations of the Primary Standard, Secondary Standard, Interpolation Oscillator and auxiliary measuring equipment are available as catalog items. For complete and detailed information, write us, without obligation of course.

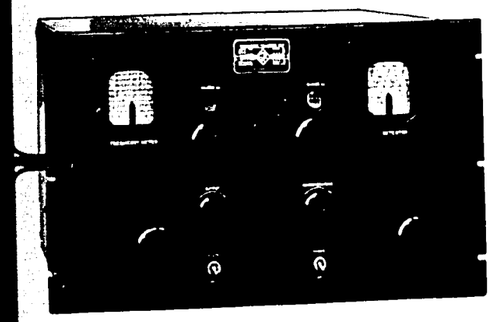




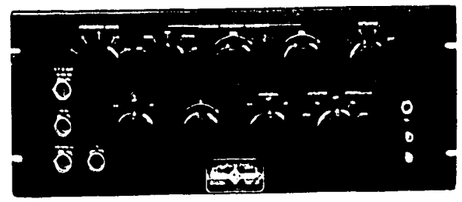
Type 1107-A Interpolation Oscillator is used to measure the difference between the unknown frequency and a known harmonic of the Standard. The direct-reading linear scales of 0 to 5,000 and 5,000 to 10,000 cycles make possible the rapid evaluation of the frequency difference *by addition only*. The actual frequency range is 0 to 5,000 cycles.

Since 1915 — *Designers and Manufacturers of Electronic Test Equipment*

Type 1109-A Comparison Oscilloscope is used as an aid in making interpolations, or in checking calibrations with high accuracy. It contains a 3-inch, radial deflection cathode-ray tube and its power supply. Circular sweeps can be obtained at power line, 0.1, 1 and 10 kc from the Standard, and at variable frequencies from the Interpolation Oscillator. A radial deflection amplifier is provided for showing the input signal on the circular sweep base.



Type 1106-A Frequency Transfer Units, of which there are three, contain a heterodyne frequency meter and heterodyne detector, with direct-reading scales. The ranges of the three units are: 100 kc to 2,000 kc; 1 Mc to 10 Mc and 10 Mc to 100 Mc. Harmonic output of the frequency meter can be used at frequencies considerably higher than those covered by the dial ranges.



Type 1108-A Coupling Panel provides a centralized control panel for quickly and conveniently interconnecting those units of the equipment used in a particular measurement. It carries the necessary switches and volume controls for all operations in making frequency measurements. The bottom panel contains a Type 1105-P1 Speaker for audible monitoring of beat frequencies.

GENERAL RADIO Company

275 Massachusetts Avenue, Cambridge 39, Mass.

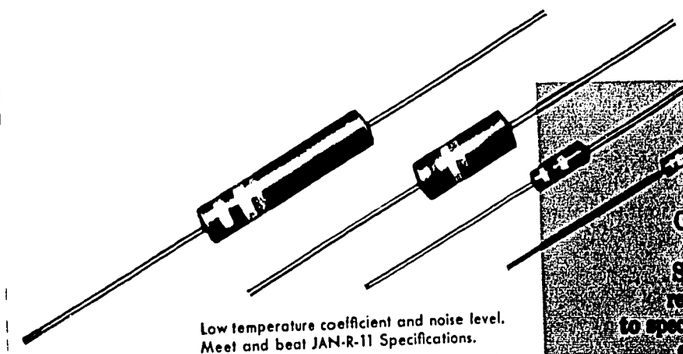
90 West Street NEW YORK *920 S. Michigan Ave.* CHICAGO *1000 N. Seward St.* LOS ANGELES

A number of years ago General Radio Company instituted a continuous research program looking to the development of an improved primary frequency standard, a commercial standard requiring little attention or maintenance and supplying usable frequencies of high and known accuracy over an extremely wide frequency range. The current G-R standard and associated measuring equipment are known the world over for their reliability and high accuracy.

In addition to the equipment shown here, G-R manufactures a number of auxiliary frequency measuring devices such as an interpolation frequency standard, heterodyne frequency meters, frequency deviation monitors, f-m monitors, audio-frequency meters, precision tuning forks and general-purpose wavemeters.

Low temperature is essential *in resistors too!*

Any resistor can reduce voltage and dissipate heat. Amazingly few can do it without overheating themselves! Chief among those who *can* are IRC Resistors. Advanced, yet practical design—unusual use of heat-dissipating materials—and a rigid quality control system—all combine to give these resistance units low operating temperatures, greater efficiency and longer life.



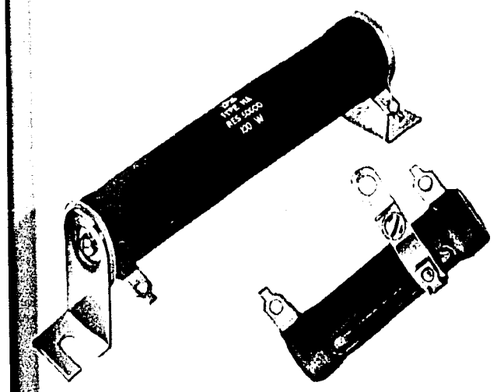
Low temperature coefficient and noise level. Meet and beat JAN-R-11 Specifications.

⅓, ½, 1 and 2 watts—available in ±5%, ±10%, and ±20% tolerance.

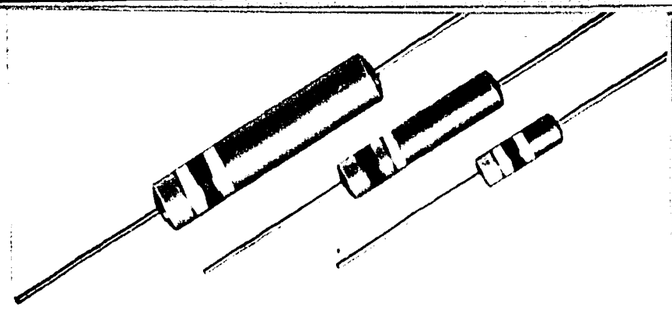
Easily meet critical requirements of television.

Fully tested by independent agencies under actual field conditions.

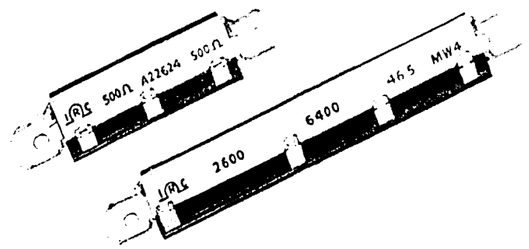
Extremely low operating temperature only one feature of Advanced Type BT Composition Resistors. These compact, light fully insulated units actually surpass JAN Specifications at ⅓, ½, 1 and 2 watts! In BT resistance material is permanently cured and to special glass. Leads extend into filament for conductivity. Molded bakelite seals element moisture and prevents grounding. BT available as standard RTMA resistance Send for full details in 12-page technical data Bu



Besides unusually rapid dissipation of heat, IRC Fixed and Adjustable Power Wire Wound Resistors give balanced performance in every characteristic. Special cement coatings are designed for low range high temperature requirements—or for maximum protection against extreme atmospheric conditions. For exacting, heavy-duty applications—high voltage bleeders, bias supply, grid and filament dropping resistors—PWW's are available in a full range of sizes, types and terminals. Leading industrial, aircraft and broadcasting users have specified them for more than 14 years. Technical data Bulletin C-2 gives complete information.

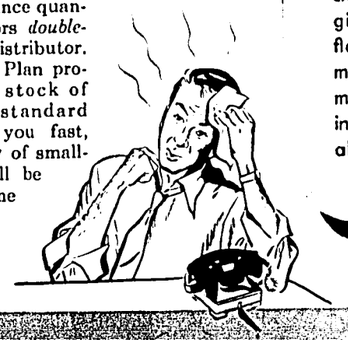


Temperature coefficients cover many resistance values in IRC Type BW Insulated Wire Wound Resistors. At ½, 1 and 2 watts, they are exceptionally stable, economical units for low range applications such as meters, analyzers, spark suppression units, TV circuits, low power ignition circuits. Resistance elements are wound uniformly on insulated core. Molded phenolic housing protects against humidity and grounding. Noise and aging are negligible. Technical data Bulletin B-5 contains full details.



For extremely fast heat dissipation, the unique mounting brackets of Type MW Wire Wound Resistors actually transfer heat from chassis to outside. Other radical departures from conventional design give MW's widest adaptability to individual requirements. MW's are flat wire wound resistor strips, permanently enclosed by high pressure molding in a special mica-filled phenolic compound. Special feet permit mounting on any flat metal surface. Low initial cost, lower mounting cost, flexibility in providing taps at low cost, and savings in space, all offer amazing economies. Ask for technical data Bulletin B-2.

When you're in a hot spot and need experimental or maintenance quantities of standard resistors *double-quick*, phone your IRC Distributor. IRC's Industrial Service Plan provides him with a full stock of uniformly dependable standard resistors; he can give you fast, round-the-corner delivery of small-order requirements. We'll be glad to send you his name and address.



Resistors • Voltmeter Multipliers • Composition Resistors • Low Wattage Wounds • Volume Controls • Voltage Precision Wire Wound • Deposited Precisors • Ultra-Hi and High Volt Resistors • Insulated Chokes

Wherever the Circuit Says —WW—

IRC

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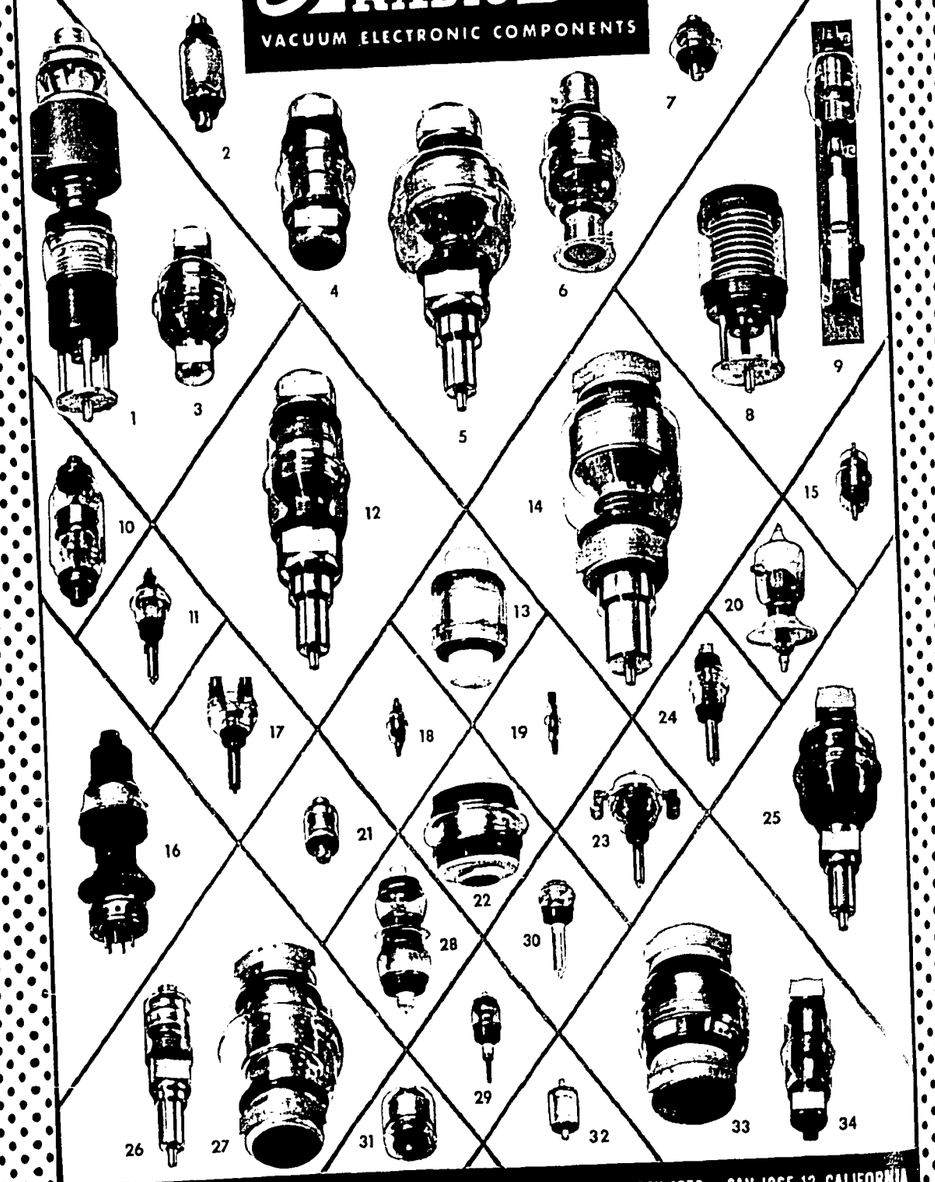
Originators, Exclusive Designers and Producers of JENNINGS

FIXED AND VARIABLE HIGH VOLTAGE VACUUM CAPACITORS & SWITCHES

Jennings RADIO

VACUUM ELECTRONIC COMPONENTS



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Jennings RADIO VACUUM ELECTRONIC COMPONENTS

FIXED and VARIABLE HIGH VOLTAGE VACUUM CAPACITORS and SWITCHES

SPECIFICATIONS

	FIGURES	NICKEL TYPES	COPPER TYPES	CAPACITY MMFD.	PEAK VOLTAGE KILOVOLTS	RMS AMPERES NICKEL	RMS AMPERES COPPER	OVERALL LENGTH	MAXIMUM O. D.	CONTACT DIAMETER	MOUNTING CENTERS
VACUUM FIXED CAPACITORS	2	VC	VCC	6, 12, 25, 50, 75, 100, 150	20, 25, 30	14	42	6½	2½	⅞	5⅛
	2	VC	VCC	200, 250	20, 25, 30	14	42	6½	2⅝	⅞	5⅛
	15	W		6, 12, 25, 50, 100	20	10.5		4⅜	2¼	⅝	3⅛
	18	X		5, 10, 15, 20, 25	17	7		3½	1¼	⅝	2⅛
	19	Y		1, 2, 3, 4, 5	17	7		3½	⅞	⅝	2⅛
	21		JCS-1	25, 50, 75, 100, 150	7.5, 10, 15		28	3⅝	2⅜	⅞	3
	32		JCS-2	5-10-20-50	10, 15, 20		21	2⅜	1⅜	⅝	1⅝
	31		JCS	250	7.5, 10, 15		42	3⅝	2⅜	⅞	3⅛
	31		JCS	500	7.5, 10		42	3⅝	3⅛	⅞	3⅛
	13		JCS	1000	7.5, 10		42	5¼	3½	2	4⅛
	7		JC-2	25, 50, 100	15, 20, 25		42	3¾	3½	⅞	3⅛
	34		JC-3	20, 40, 50, 60	35, 40, 50, 60		140	8¼	4	2	6⅛
	4		JC-4	100, 125	35, 40, 50, 60		175	9¼	5	3⅛	7
	27		JC-5	200	35, 40, 50, 60		225	11¼	7	4⅛	8¾
	3	M	MC	500, 750, 1000	10, 15, 20	21	60	8⅜	5	2	6⅝
	6	ML	MLC	500, 750, 1000	25, 30	21	60	9¼	5	2	7⅛
	3	MH	MHC	200 or less	35, 40, 50	21	60	8¼	5	2	6⅝
	33	MM	MMC	1500, 2000	10, 15	21	125	9¼	6½	4⅛	6⅞
	33	MMH	MMHC	450	35, 40, 45	21	125	9⅜	6½	4⅛	6⅞
	22		MC-1	500-750-1000	10, 15		150	4⅜	4½	3⅛	3⅜
	10	K		12, 25, 50	35, 40, 50	14		8¼	3	1⅝	7⅛
VACUUM VARIABLE CAPACITORS	30		TRC-1	1-8, 2-10	15		30	4⅛	1⅜	1	2
	11	T		5-25	20	10.5		6¼	2¼	1⅜ x ⅝	4
	11		TC	5-25	20		21	6¼	2¼	1⅜ x ⅝	4
	24	TR		2-8	17	10.5		6½	2¼	1⅜ x ⅝	4
	24		TRCS	2-8	7.5, 10, 15		21	6⅛	2¼	⅝	4
	23	SS		10-30 per section	25, 30, 35	7		6⅜	3	1⅜ x ⅝	3⅛ x 2¼
	17		SSC-1	2-10 per section	10		15	6⅛	2⅜	1⅜ x ⅝	1¼ x 3⅛
	11	AT		10-50	20, 25, 30	10.5		6¼	3	1⅜ x ⅝	4⅛
	26		UCS	5-200	7.5, 10, 15		42	8¼	2⅜	⅝ x 2	4⅜
	26		UCS	10-300	7.5, 10, 15		42	8¼	2⅜	⅝ x 2	4⅜
	26		UCS	25-500	7.5, 10, 15		42	8¼	3	⅝ x 2	4⅜
	26		UCSX	10-500	7.5, 10		42	6¾	3¼	2 x 3¼	5¼
	26		UCSX	25-700	7.5, 10		42	6¾	3¾	2x3¼	4⅛
	26		UCSX	25-1000	7.5, 10		42	6¾	3¾	2x3¼	4⅛
	25	U	UC	50-250	10, 15, 20	21	60	11⅛	5	2	6½
	25	UH	UHC	10-75	35, 40, 50	21	60	11⅛	5	2	6½
	25	UH	UHC	75-150	35, 40, 50	21	60	12	5	2	7⅛
	12	UX	UXC	25-500	10, 15, 20	21	60	14	5	3⅛	7⅛
	12	UXH	UXHC	25-150	35, 40, 50	21	60	14⅜	5	3⅛	8⅛
	8		UXC-1	25-500	10, 15		125	9	4½	3⅛	5⅛
	5	VM	VMC	50-1000	10, 15	21	100	14	7	3⅛	7⅛
	14	VMM	VMMC	100-2000	10, 15	21	125	15¼	6½	4⅛	8⅛
	14	VMMH	VMMHC	25-450	35, 40, 45	21	125	15¼	6½	4⅛	8½
TRONAD	16			TAS-4 Variable Capacitor in above ranges 500 JR Tube EIMAC Type 4x500							
	1			TAS-5 Variable Capacitor in above ranges 2500 JR Tube EIMAC Type 3x2500 Also available in both air- and water-cooled units from 50 watts to 25 kilowatts. Write for details.							
VACUUM RELAY	30		R-1	Vacuum Relay	50		50	7	3	⅞	5⅛
	30		R-2	Vacuum Relay	65		50	9	3	⅞	7⅛
	29		R-4	Vacuum Relay	20		50	5¼	1⅝	⅝	3⅛
	29		R-6	Vacuum Relay	15		35	3⅜	1⅝	⅝	2⅝
MISC.	28			Feed Thru Up to 100 MMFD	20		21	6¼	2¼	⅞	5⅛
	29			Vacuum Transformer 2:1 step-up to 40 kv.				5¾	2¼	⅞	

CURRENT RATINGS MAY BE INCREASED BY FORCED COOLING WITH ADEQUATE MOUNTINGS
CORRESPONDENCE INVITED FOR OTHER CAPACITIES AND VOLTAGES

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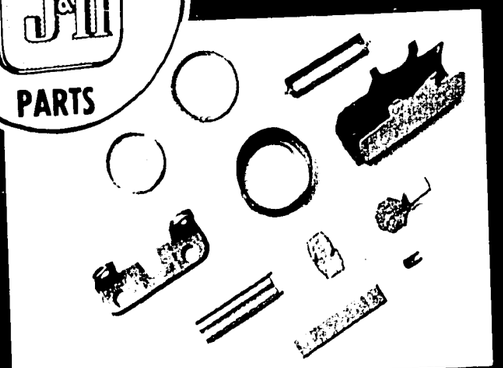
Preferred Electronic

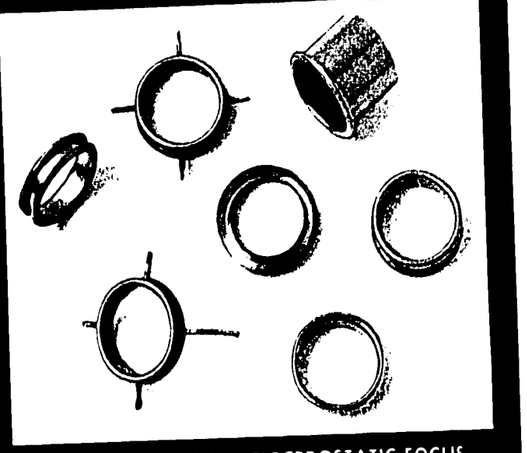
ELECTRONIC J&H PARTS



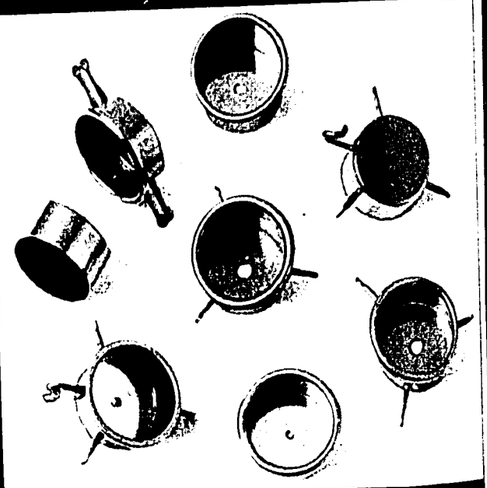
MINIATURE and SUB-MINIATURE TUBE PARTS.
SPECIAL METAL and MICA STAMPINGS

SUB-MINIATURE TUBE PARTS

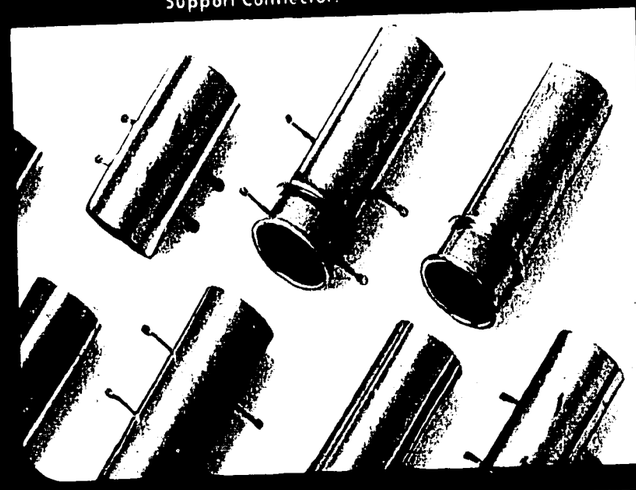
J & H is prepared to supply your requirements for close tolerance parts for tubes specified in equipment for the defense program. Experienced for almost two decades in the design, fabrication and application of these highly precise components.

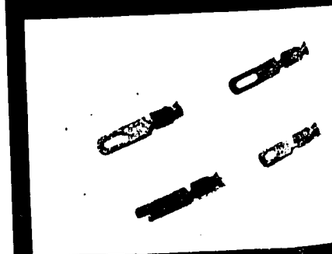


FOCUS ANODES FOR ELECTROSTATIC FOCUS GUNS · Available with or without Pins and Support Connector.



NO. 2 GRIDS and PINNED NO. 2 GRID ASSEMBLIES



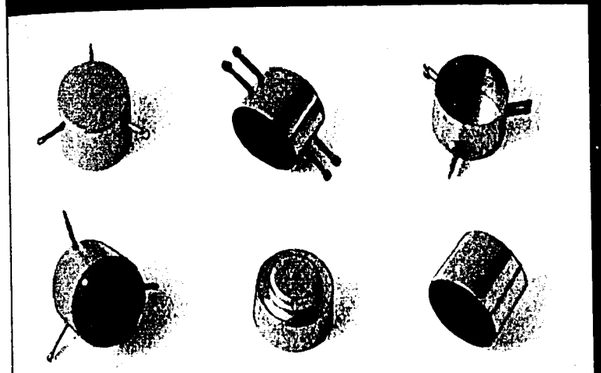


TUBE SOCKET TERMINAL CONTACTS
Produced from brass, phosphor bronze beryllium copper, Inconel and steel.

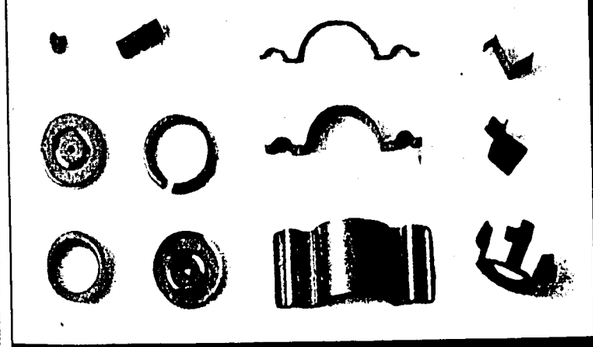
ANODE CYLINDERS and PINNED ANODE ASSEMBLIES

ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE

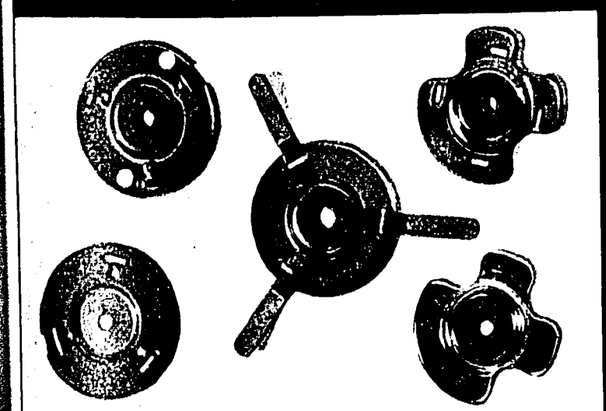
Parts · Components by J & H



NO. 1 GRIDS and PINNED NO. 1 GRID ASSEMBLIES



ONE PIECE CATHODES, STEM LEAD EYELETS, APERTURE CUPS, CATHODE RETAINERS, CATHODE SPACERS, POLE PIECES, SUPPORT STRAPS.



TOP APERTURE SPACERS FOR MAGNETIC AND ELECTROSTATIC FOCUS GUNS

Illustrated are typical examples of our wide range of parts and assemblies employed by leading TV and receiving tube manufacturers. J & H Seamless Anodes and Grids are produced on precision deep drawing machines from high quality strip material—entirely free of contaminent lodging seams and crevices. Our completely equipped tool and die shop in conjunction with high speed automatic production facilities is prepared to undertake your most critical and exacting parts problems from design to completed product.

J & H Cathode Ray Tube Parts and Assemblies have been specified for original and advanced gun designs. The new revolutionary zero voltage electro-static focus gun design soon to be announced by the industry will feature especially developed J & H components.

Looking for Subminiature Tube Parts?

J & H in anticipation of defense tube requirements is in a position to supply critically required parts for tubes now specified in equipment for armed services. Investigate J & H facilities for your standard and special electronic parts requirements today. Write or phone—Rockville Centre 6-0500.

RTMA Radio-Television Manufacturers Association Member

ELECTRONIC J&H PARTS

Johnson & Hoffman Manufacturing Co.

65 Ongley Street · Rockville Centre, N.Y.

Telephone ROckville Centre 6-0500

ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE

KINGS MICROWAVE

Shown on the next page are but a few of the many precision-engineered components made by Kings Microwave Company. The complete line offers features of advance design and dependability that assure maximum accuracy and versatility.

Our fully-staffed engineering department welcomes the opportunity of assisting you with your individual microwave and research problems. Your inquiries and requests for catalogs are invited.

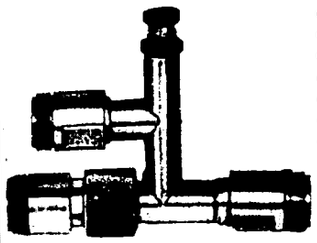
PHOTO	MODEL No.	DESCRIPTION	FREQUENCY RANGE, MCS	TRANS. LINE SIZE	CONNECTORS	SPECIAL FEATURES
1	073	Crystal Mixer	2,600-3,400	5/8" coax.	3-UG-21B/u	1, 2, 3, 4, 11
2	434	Feed Horn	8,500-9,600	RG-52/u	1-UG-39/u	2, 5, 6, 7, 11
3	403	Wavemeter, Direct Reading	8,500-9,600	RG-52/u	2-UG-40/u	1, 7, 8, 9, 11
4	047	Double Stub Tuner	1,000-10,000	5/8" coax.	UG-21B/u, UG-18B/u	1, 2, 3, 7, 11
5	108 S1	Adapter	0-4,000	5/8" to 7/8" coax.	UG-46/u, UG-21B/u	1, 2, 3, 6, 10, 11
6	948	Antenna	75	5/8" coax.	1-UG-21B/u	3, 8, 11, 12
7	972	Mixer-TR. Assembly	2,700-2,900	5/8" coax.	3-UG-21B/u	1, 2, 3, 4, 11
8	002	Filter-Detector Assembly	2,600-3,400	5/8" coax.	1-UG-21B/u, 1-SO-239	1, 2, 3, 6, 7, 8, 11, 13
9	026 S	Oscillator Cavity	2,600-3,300	5/8" coax.	1-UG-21B/u	1, 2, 3, 8, 11, 14
10	025	Hi Power Load	2,600-3,400	RG-48/u	UG-200/u	7, 11, 12, 15
11	248	Antenna	2,600-3,400	5/8" coax.	UG-21B/u	1, 2, 3, 6, 11
12	165	Oscillator Cavity	1,200-1,400	5/8" coax.	UG-21B/u	1, 2, 3, 7, 11, 14, 16
13	068 C	Standing Wave Indicator	4,000-6,000	RG-49/u	2-UG-149/u	1, 2, 3, 4, 7
14	138	Wavemeter	3,700-4,400	5/8" coax.	UG-21B/u	1, 2, 3, 4, 7, 8
15	040 X	E/H Tee	8,200-12,400	RG-52/u	4-UG-39/u	1, 2, 7, 11
16	106 V	Series Tee	12,400-18,000	RG-91/u	3-UG-419/u	1, 2, 7, 11
17	264 Y	E Plane Elbow	7,050-10,000	RG-51/u	2-UG-51/u	1, 2, 6, 7, 11
18	288 Y	Bidirectional Coupler	8,500-9,600	RG-51/u	2-UG-51/u, 2-UG-21B/u	1, 2, 3, 6, 7, 11
19	401 X	Waveguide Coaxial Adapter	8,500-9,600	RG-52/u	1-UG-39/u, 1-UG-21B/u	1, 2, 3, 7, 11
20	134 Z	Flap Attenuator	5,850-8,000	RG-50/u	UG-344/u	1, 2, 7

SPECIAL FEATURES

1 Silver Plated
2 Brass Construction
3 All Contacts Beryllium Copper
4 Uses 1N21 B Crystal
5 Gold Plated
6 Pressurized
7 Enamel External Finish
8 Temperature Compensated
9 Calibrated to ± 2 mcs
10 All Insulators Teflon
11 Used in Armed Services Equipment
12 Aluminum Construction
13 Uses 1N32 Crystal
14 Uses 2C40 Vacuum Tube
15 Maximum Average Power 1 KW
16 Motor Operated

RADIO FREQUENCY COMPONENTS

1



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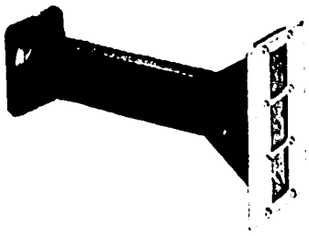

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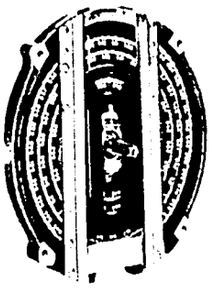

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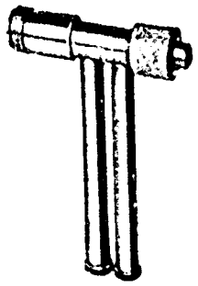

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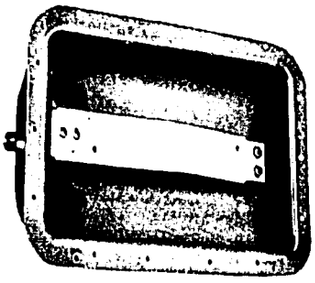

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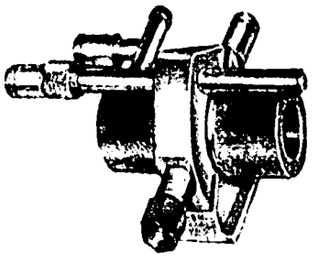

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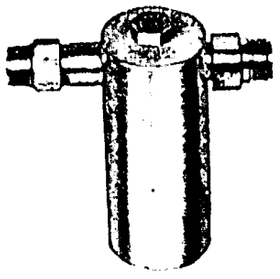

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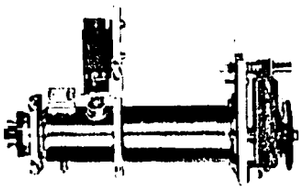

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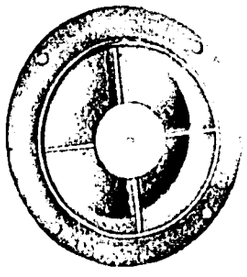

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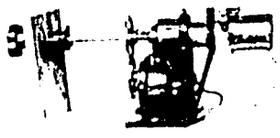

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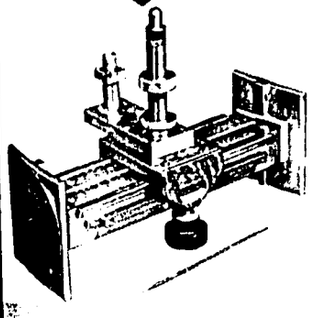

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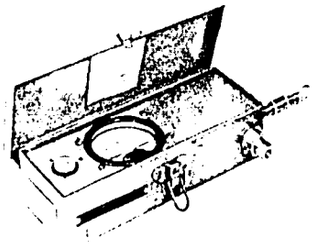

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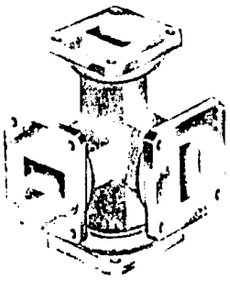

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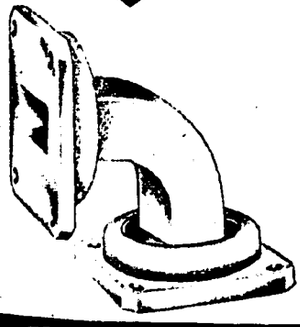

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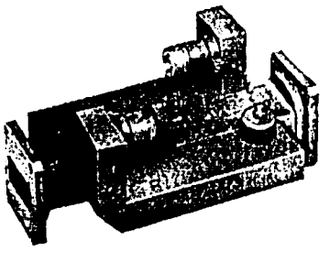

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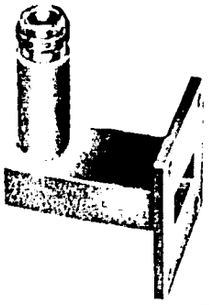

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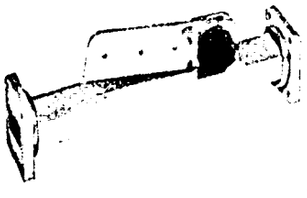


KINGS MICROWAVE CO., INC. 50 Marbledale Road, Tuckahoe, New York

an affiliate of Kings Electronics Company, Inc.

MYCALEX the ideal insulat[or] for ALL frequencies MYCALEX

INJECTION MOLDED GRADES:

MYCALEX 410

MYCALEX 410 IS APPROVED FULLY AS GRADE L-4B UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-1-10 "INSULATING MATERIALS, CERAMICS, RADIO, CLASS L.". CAN BE INJECTION MOLDED, WITH OR WITHOUT METAL INSERTS, TO EXTREMELY CLOSE TOLERANCES.

CHARACTERISTICS

Power Factor, 1 megacycle	0.0015
Dielectric Constant, 1 megacycle	9.2
Loss factor, 1 megacycle	0.014
Dielectric Strength, volts/mil	400
Volume Resistivity, ohm/cm	$1x10^{15}$
Arc Resistance, seconds	250
Impact Strength, Izod ft-lb/in of notch	0.7
Max. Safe Operating Temp. °C	350
°F	650
Water Absorption, % in 24 hours	nil
Coefficient of Linear Expansion, °C	$11x10^{-6}$
Tensile Strength, psi	6000
Compression Strength, psi	27,000

★ ★ ★

MYCALEX 410X

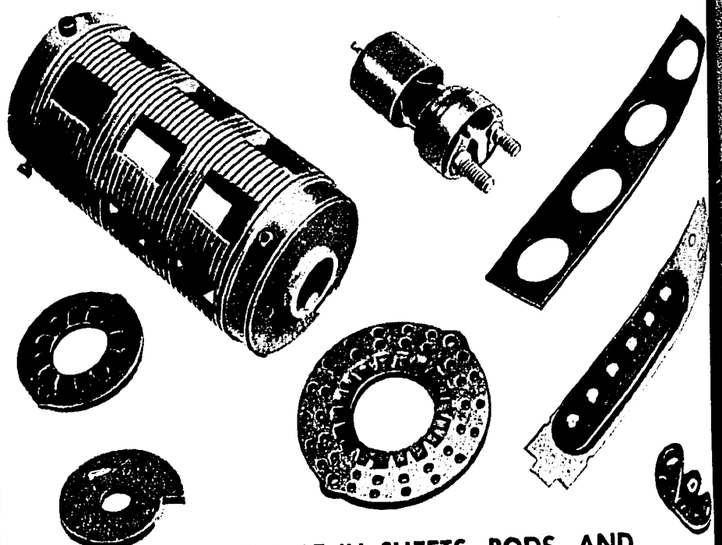
MYCALEX 410X CAN BE INJECTION MOLDED, WITH OR WITHOUT METAL INSERTS, TO EXTREMELY CLOSE TOLERANCES.

CHARACTERISTICS

Power Factor, 1 megacycle	0.012
Dielectric Constant, 1 megacycle	6.9
Loss factor, 1 megacycle	0.084
Dielectric Strength, volts/mil	400
Volume Resistivity, ohm/cm	$5x10^{14}$
Arc Resistance, seconds	250
Impact Strength, Izod, ft.-lb/in of notch	0.6
Max. Safe Operating Temp., °C	350
°F	650
Water Absorption, % in 24 hours	nil
Coefficient of Linear Expansion, °C	$12x10^{-6}$
Tensile Strength, psi	6000
Compressive Strength, psi	28000

—a non-organic glass-bonded mica insulation featuring—

- LOW LOSS — HIGH EFFICIENCY
- HIGH DIELECTRIC STRENGTH
- IMPERVIOUS TO OIL OR WATER
- FREEDOM FROM CARBONIZATION
- PERMANENT DIMENSIONAL STABILITY
- WITHSTANDS HIGH TEMPERATURE
- IMMUNE TO HUMIDITY
- EXCELLENT MECHANICAL CHARACTERISTICS



AVAILABLE IN SHEETS, RODS, AND FABRICATED TO SPECIAL SHAPES

MYCALEX

LOW-LOSS MINIATURE TUBE SOCKETS

These sockets cost no more than ordinary phenolic types yet electrical characteristics are far superior. Dimensional accuracy and uniformity are unexcelled.

PRODUCED IN TWO GRADES

MYCALEX 410 is approved fully as Grade L-4B under N.M.E.S. JAN-1-10 "Insulating Materials, Ceramic, Radio, Class L."

MYCALEX 410X is lower in cost but it's insulating properties greatly exceed those of general purpose phenolics.

Both types available in 7-pin, and 9-pin and subminiature. All are injection molded to high precision. For MYCALEX 410 and 410X physical properties see opposite page.

FOR LITERATURE, INFORMATION OR QUOTATIONS

SINCE 1919 MYCALEX THE INSULATOR TRADE MARK REG. U.S. PAT. OFF.

MYCALEX CORPORATION OF AMERICA
Owners of "MYCALEX" Patents and Trade-Marks

—economical, widely applicable machines and molds to close tolerances

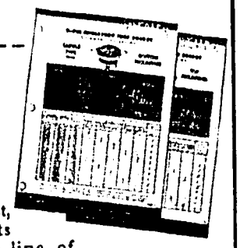
Mycalex is a highly developed glass-bonded mica insulation backed by over a quarter-century of continued research and successful performance. In its present high state of development, MYCALEX combines every important characteristic demanded of a modern, permanent, efficient electrical insulating material. MYCALEX is supplied in sheets or rods, can be injection or compression molded to close tolerance, is readily machineable, and can be fabricated in practically any size or shape. Dielectric losses are very low from 60 cycles to 24 kilomegacycles per second, arc resistance, volume resistivity and other electrical characteristics meet the most rigorous requirements. Physical properties are equally advantageous.

CAN BE TAPPED, DRILLED, THREADED GROUND, OR MOLDED WITH INSERTS

MYCALEX

GENERAL CATALOG

Your copy of the new up-to-the-minute MYCALEX CATALOG and ENGINEERS HANDBOOK will be sent promptly on request. Tells the entire MYCALEX insulation story — contains 70 pages of factual information including design, engineering, and practical manufacturing data.



TUBE SOCKET DATA SHEETS

Available on request, these data sheets cover the entire line of MYCALEX tube sockets. MYCALEX tube sockets offer outstanding advantages over practically every other type yet are priced competitively with the cheapest sockets available anywhere. Get the facts today.

ENGINEERING COLLABORATION

MYCALEX engineers are always at your service for assistance in solving design problems with MYCALEX insulation. Their wide experience can be helpful in reducing the cost and increasing dependability and saleability of your product.

CALL, WRITE OR WIRE 60 CLIFTON BLVD., CLIFTON, N. J.

Executive Offices: 30 Rockefeller Plaza, New York 20
Mfg. and General Offices: Clifton, New Jersey

MACHINEABLE GRADES:

MYCALEX 400

MYCALEX 400 IS APPROVED FULLY AS GRADE L-4A UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-1-10 "INSULATING MATERIALS, CERAMIC, RADIO, CLASS L."

CHARACTERISTICS

Power Factor, 1 megacycle	0.0018
Dielectric Constant, 1 megacycle	7.4
Loss Factor, 1 megacycle	0.013
Dielectric Strength, volts/mil	500
Volume Resistivity, ohm/cm	$2x10^{15}$
Arc Resistance, seconds	300
Impact Strength, Izod, ft.-lb./in of notch	1.85
Max. Safe Operating Temp., °C	370
°F	700
Water Absorption, % in 24 hours	nil
Coefficient of Linear Expansion, °C	$10.2x10^{-6}$
Tensile Strength, psi	6000
Compressive Strength, psi	35000

★ ★ ★

MYCALEX K-10

MYCALEX K-10 CONFORMS FULLY TO GRADE HIC5H4 UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-1-12.

CHARACTERISTICS

Dielectric Constant, 1 megacycle	10.6
Q Factor, 1 megacycle	300
Loss factor, 1 megacycle	0.034
Volume Resistivity, ohm/cm	$3.0x10^{14}$
Dielectric Strength, volts/mil (0.10 in. thickness)	270
Fractional Decrease of Capacitance with Temperature Change	0.0056
Fractional Increase of Capacitance with Temperature Change	0.0076
Max Safe Operating Temperature, °C	400

MYCALEX K embraces an entire series of capacitor dielectrics, each with specific characteristics. These can be supplied on special order in sheets 14" x 18" in area and from 1/8" to 1" in thickness, also available in rods. MYCALEX K can be machined to close tolerance or molded.

SINCE 1919 MYCALEX THE INSULATOR TRADE MARK REG. U.S. PAT. OFF.

Commerce and the Military write THEIR SPECIFICATIONS to...

The Industry's Complete Line of High Quality Communications Equipment

In war or peace, in Commerce or the Military, the men who make the decisions have always known the vital importance of the "nerve network." Now, in these days of modern high-speed telegraph and tele-printer radio communications equipment—especially unattended and multi-channel—these men demand the highest precision, speed and dependability—**without compromise.**

And they **get** it—from **NORTHERN RADIO!**

During and directly following World War II, the engineers at Northern Radio pioneered and concentrated research against the classic enemies of dependable communications—transients, parasitics, spurious and undesired side-bands, susceptibility to atmospherics, adjacent channel interference, static, fading, etc.

The result of this exhaustive, specialized research was to demonstrate the superiority of the **Frequency Shift System** of transmission and reception. And today, many of the items in the complete Northern Radio line are based upon Frequency Shift.

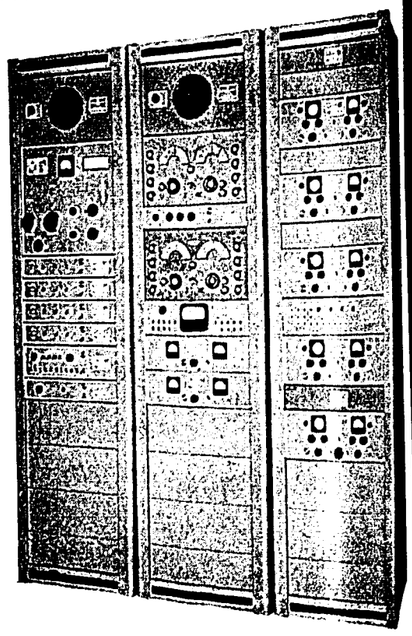
Further, Northern Radio's consistent research continues to push Frequency Shift to newer, ever-greater heights of achievement.

—So that, when Commerce or the Military write their equipment specifications, they draw them directly from many of the features of Northern Radio units.

Around the globe today, from the Poles to the Equator, there is hardly an important station where Northern Radio equipment is not on day-after-day duty—serving the needs of Commerce and the Military with communications of the fastest speed and highest fidelity.

RADIO MULTIPLEX SYSTEM

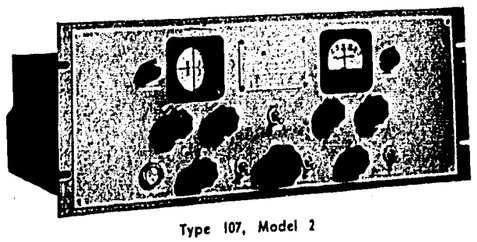
Multi-Channel Equipment for Standard Communications Frequencies. Adapts existing transmitting and receiving facilities for radio multiplex.



The system illustrated is a four-channel unit, used for transmitting and receiving radio tele-printer, telegraph or other similar low speed keying intelligence, where a limited assigned carrier band-width may be utilized. The two bays at the right are the complete receiving units; left, the transmitter terminal and exciter facilities. The system may be adjusted for band widths of 3 to 12 kc and is intended to take advantage of periods of time where propagation conditions give signals which are better than the minimum required for one channel of normal frequency shift operation. Simple operation of key switches will insert as many channels as the conditions permit. These switches automatically maintain the pre-set bandwidth regardless of the number of channels in use. The system also provides front panel switching to standard 850 cycle frequency shift operation. However, experience indicates that when propagation conditions permit frequency shift operation, they will usually allow at least two channels of multiplex.

★ ★ ★ ★

FREQUENCY SHIFT CONVERTER



Type 107, Model 2

A dual channel unit, used with frequency shift receiving systems to convert the mark and space tones from the output of single or diversity receivers, into DC pulses capable of operating a tele-printer, tape recorder or other device so operated. Also used as a demodulator when receiving make and break CW or ICW signals.

2" oscilloscope tuning pattern indicates proper receiver adjustment of both mark and space frequencies, either during initial setup or under actual keying conditions. This pattern and a specially designed discriminator, coupled with a high degree of limiting, make it the outstanding performer in its field.

INPUT FS LIMITS 100 to 1000 cps. frequency shift. Mark frequency set at 2975 cps.

CW-ICW INPUT 400 to 7500 cps.

KEYING SPEED Up to 600 w.p.m.

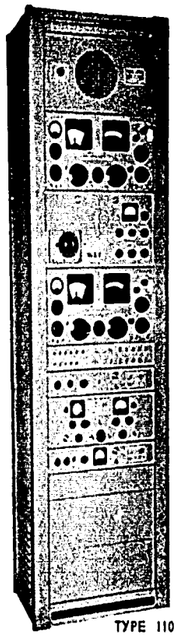
OUTPUT: 1. Neutral DC pulses, 0 ma in 1800 ohm external load. One side grounded.

2. Polar DC pulses ± 9 ma in 1800 ohms load. Center grounded.

3. May be operated into any impedance from 100 to 100,000 ohms.

NORTHERN RADIO 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



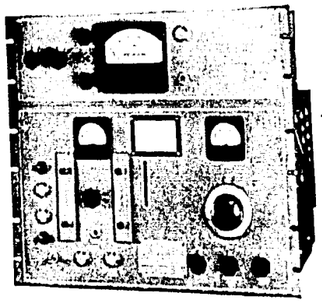
TYPE 110

DUAL DIVERSITY RECEIVER

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 arrangements. 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. For special features of this receiver see individual units described on this and the preceding page.

FREQUENCY and SHIFT MONITOR SYSTEM



METER: TYPE 127 MODEL 2
MONITOR: TYPE 106 MODEL 4

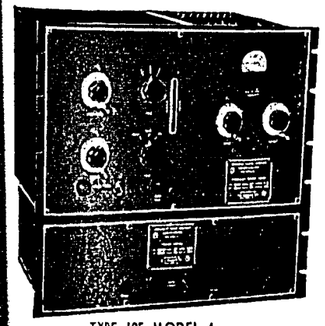
This system consists of a Type 106 Frequency and Shift Monitor and a Type 127 Frequency Meter. It is designed as a secondary standard to monitor the frequency and amount of shift of transmitter carrier outputs. It is particularly intended to measure the frequency shift of a mark and space (FS) signal 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.

FREQUENCY SHIFT KEYER

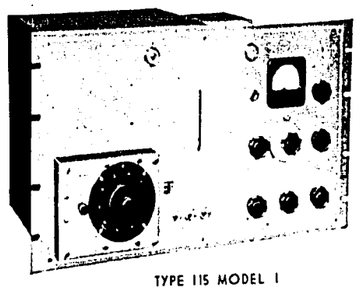
incorporates the following outstanding features:



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. • Direct reading of calibration of output frequency vernier ± 600 cycles. • Pulse shaping circuit to permit operation within assigned bandwidth 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.

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 ohm 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 resetability 20 cps per mc for readability

This unit can also be used as a transmitter exciter or for laboratory measuring purposes.

TONE CHANNELING SYSTEMS

Complete package systems of Multi-Channel Tone Equipment (both AM and Frequency Shift) are available for application to land line or radio link systems.

FOR FULL DATA ON THE COMPLETE LINE, WRITE NOW FOR CATALOG PD.

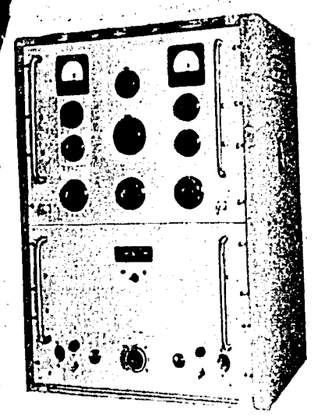
NORTHERN RADIO COMPANY, inc. *Pace Setters in Quality Communication Equipment*

143 WEST 22ND STREET, NEW YORK 11, N. Y. **WATKINS 9-9117**

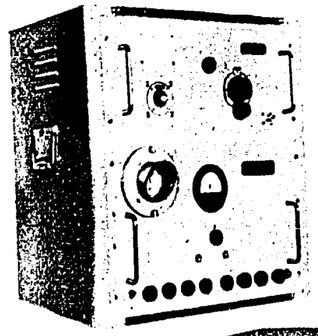
When you use the THE STANDARD OF COMPARISON IN from to it's PRD

QUALITY, ACCURACY, DEPENDABILITY

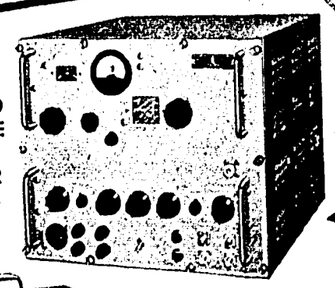
Type 578-A
PRECISION COAXIAL FREQUENCY METER
0.925–1.70 kmc/s



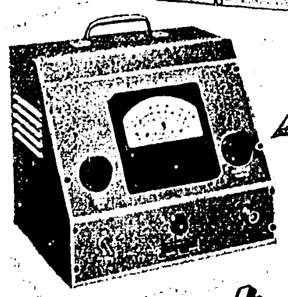
Type 801-A
UNIVERSAL KLYSTRON POWER
300-1500 V at 65 ma;
1.5–3.6 KV at 25 ma



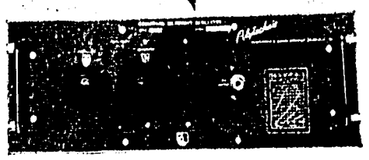
Type 854
UNIVERSAL SPECTRUM ANALYZER
8.5–9.6 kmc/s



Type 902
BROADBAND MICROWAVE SIGNAL GENERATOR
3.65–7.3 kmc/s



Type 904
VHF-UHF NOISE GENERATOR
.01–1.0 kmc/s



Type 706
BROADBAND MICROWAVE OSCILLATOR
3.6–7.3 kmc/s

Augmented by many new components, the PRD line of RF Test Equipment is presently the most complete line available covering the entire frequency range from .01 to 40 kilomegacycles per second. The units listed indicate the wide diversity and applicability of PRD equipment. In addition to the standard line, PRD specializes in the design and manufacture of special equipment to meet special requirements. A skilled staff of engineers is available to analyze your requirements and to assist in the application of standard or special components to your test problem. PRD equipment is engineered and manufactured to the highest attainable standards. No effort has been spared to make this equipment the finest available anywhere with the result that PRD equipment is now used in leading laboratories all over the world.

FREQUENCY MEASURING DEVICES

Frequency Meters	Frequency Range (kmc/sec)	Type No.	Transmission Line Size (Nominal O.D.—inches)	R—Reaction T—Transmission
General Purpose	0.47–0.95	584	⅜	T
	3.95–5.85	574	2 x 1	R
	4.00–10.0	562-A	⅜	Detector included
	5.85–8.20	575	1 ½ x ¾	R
	7.05–10.0	576	1 ¼ x ⅝	R
	8.45–9.91	551-E	1 x ½	R
	8.45–9.91	551-F	1 x ½	T
	8.45–9.91	551-G	1 ¼ x ⅝	R
	8.45–9.91	551-H	1 ¼ x ⅝	T

In addition to the General Purpose Frequency Meters listed above, PRD manufactures a complete line of Precision Frequency Meters covering the entire frequency range from 0.55 to 39.0 kmc/s. Transmission line sizes include ⅜" coaxial line and all standard wave guide sizes from 0.280" x 0.140" I.D. to 2" x 1" O.D. All types are available in Reaction and Transmission styles.

The Type 500 Frequency Standard Multiplier is available to generate standard frequency signals in the UHF and microwave regions when used with the Type 612-A Tunable Crystal Mount.

SIGNAL SOURCES AND RECEIVERS

ITEM	DESCRIPTION
TUBE MOUNTS Type 701 Type 702 Type 703	 For type 2K28 klystrons, 2.400–3.445 kmc/sec For type 2K25 klystrons, 8.50–9.60 kmc/sec, 1 ¼ x ⅜ waveguide For type 2K25 klystrons, 8.50–9.60 kmc/sec, 1 x ½ waveguide
OSCILLATORS Type 705 Type 706	 Covering the frequency range from 7.0 to 11.0 kmc/sec Covering the frequency range from 3.6 to 7.3 kmc/sec
POWER SUPPLIES Type 801-A	 Providing all required electrode voltages to operate a wide variety of klystrons, plus internal modulators
SPECTRUM ANALYZERS Type 853 Type 854 Type 855	 Covering the frequency range from 2.40 to 3.40 kmc/sec Covering the frequency range from 8.50 to 9.60 kmc/sec Combining both of the above ranges in one instrument
SIGNAL GENERATORS Type 902 Type 903	 Covering the frequency range from 3.65 to 7.30 kmc/sec Covering the frequency range from 7.00 to 10.5 kmc/sec
NOISE GENERATORS Type 904	 For the direct measurement of noise factors in the range of 10 to 1000 mc/sec

ITEM	TRANSMISSION LINE SIZE: COAXIAL (Nominal O.D.—inches) ⅞	⅜	WAVEGUIDE (Nominal O.D.—inches) 3x1⅓	2x1	1⅓x¾	1¼x⅝	1x½	0.622x 0.311 I.D.	0.420x 0.170 I.D.	0.280x 0.140 I.D.
ATTENUATORS AND TERMINATIONS										
Variable Attenuators Uncalibrated			171	162	161	160	154	189	190	191
Dial			174-A	169-A	177-A	184-A	196-A 195-A	187-A		
Precision			175-A	170-A	178-A	185-A	195-A	188-A	153-A	192
Cut-Off		181, 198					180			
Fixed Attenuators Low Power	136 series 142 series	130 series 135 series	s	s	s	s	140 series	s		
High Power	141, 143	144								
Terminations	145	139	129	115	121	114	116	131	132	133
TRANSMISSION LINE COMPONENTS										
Waveguide to Coaxial Adapters			365	357	356	355	354			
Coaxial Transitions	389, 390 391, 392	389, 390 391, 392								
Directional Couplers				400	404	401	402	405		
Waveguide Stands			375-A	376-A	377-A	378-A	379-A	386A	387-A	388-A
Flange Bolt and Nut Assemblies			369-A	369-B	369-B	369-C	369-D	369-E		
Bends and Tees				s	s	s	462 465 461	s	s	s
IMPEDANCE MEASUREMENT AND TRANSFORMATION										
Slotted Sections	200-C 200-D	205-A 215-A	209-A	201-A	204-A	202-A	203-A	210	211	212
Tuners		306	309	300	305	302	303	311 314	313	312

The Type 250-A Broadband Probe is designed for use with the Types 200-C through 209-A and 215-A Slotted Sections; Types 210-212 are supplied with built-in tunable probes. The Type 361 R-F Adapter is available for use with the Type 250-A Probe.

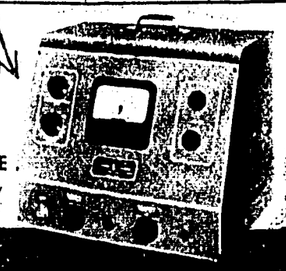
DETECTION AND POWER MEASUREMENT										
Detector Mounts Crystal		612-A 613					601	616	621	615
Bolometer	623, 624 625, 626	612-A, 613 627, 628						616	620 621	618
Thermistor							635			

The Type 650 Universal Power Bridge is designed to be used with any of the bolometers or thermistors listed for the measurement of absolute power level.

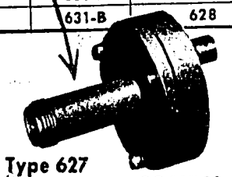
BOLOMETERS

TYPE No.	FOR USE WITH	TYPE No.	FOR USE WITH	TYPE No.	FOR USE WITH
610-A	210-A, 212-A, 613	629-A	623	630-B	626
614	210, 211, 616, 621	629-B	624	631-A	627
617	212, 618, 620	630-A	625	631-B	628

—Equipment supplied with captive flange screws
—Available on special order only

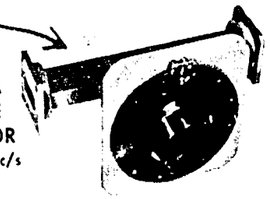


Type 650
UNIVERSAL POWER BRIDGE
.1, 1.0, 10, 100 mw full scale

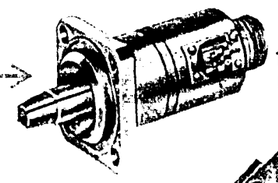


Type 627
BROADBAND COAXIAL BOLOMETER MOUNTS
4.0–10.0 kmc/s

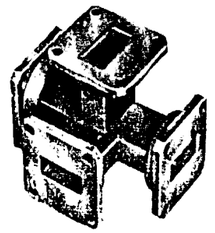
Precision RF Test Equipment



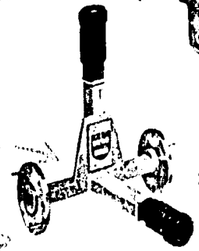
Type 196-A
VARIABLE ATTENUATOR
8.20–12.4 kmc/s



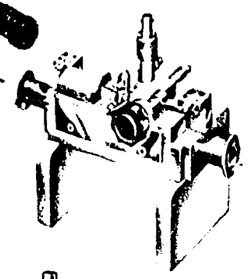
Type 389
COAXIAL TRANSMISSION LINE ADAPTER
0–4.0 kmc/s



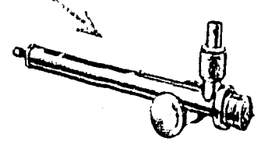
Type 481
E/H TEE
8.20–12.4 kmc/s



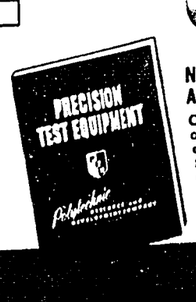
Type 312
E/H TUNER
26.5–40.0 kmc/s



Type 211
PRECISION WAVEGUIDE SLOTTED SECTION
18.0-26.5 kmc/s



Type 250-A
BROADBAND PROBE
1.00–12.4 kmc/s



NEW ILLUSTRATED CATALOG AVAILABLE ON REQUEST

Contains complete information on the entire PRD line of precision rf test equipment. Write for your copy today on your company letterhead — no obligation; address Dept. KG.

PRD

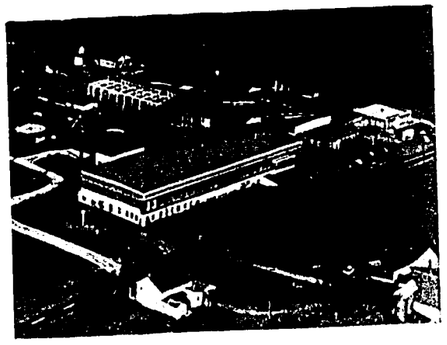
Polytechnic

Superior TUBE COMPANY
Electronics Division

Electronic Tubing—Tailored to Your Needs

"Quality" is the keyword to success in electronics applications. It is also a synonym for Superior in fine small tubing for the Electronics Industry. The newest addition to the Superior plant, at the left in the picture, (more than 50,000 square feet) houses the Electronics Division's production facilities. It is devoted to research, engineering and production of tubing and finished parts to do a better job in tough electronics applications.

For many years the Electronics Industry has come to Superior for tubing and tubular parts tailored to specific needs. We have been able to assist materially in the development of many of these parts. We are now ready, willing and able to work closely with manufacturers toward the solution of any problems which may be solved through such development and refinement. Elsewhere on these pages are some details about a few of the many kinds and types of parts we now make. If you desire more information about them, or wish to consult us about a problem, please write—no obligation, of course.



NICKEL CATHODES

Seamless

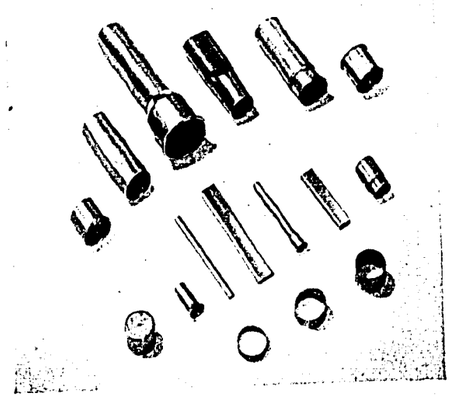
Standard production calls for an O.D. range of .010" to .121" inclusive with wall thickness from .0015" to .005" inclusive (most generally used, .002" ± .00025"). Cathodes with larger diameters and heavier walls can also be produced. The International Nickel Company's #220 grade of Seamless Nickel is the most widely used material. Seamless cathodes may be cut to practically any length required. Bead (emboss) may be located anywhere on the Cathode, .040" minimum. Seamless Nickel Cathodes are available in round, oval, elliptical or rectangular shapes.

For information about #220 grade of Seamless Nickel ask for Data Memo #5-2. For detailed data on standard cathode tolerances ask for Specification EM-2.

Lockseam*

This type of cathode is produced from nickel strip especially rolled for the purpose. Present standard range of sizes is .040" to .100" O.D. inclusive with wall thicknesses of .0021" ± .0001" and .0025" ± .0001". Lengths are from 11.5MM to 42MM inclusive. Various analyses of nickel strip are used, depending upon characteristics required. Bead or emboss may be located anywhere on the cathodes, .040" minimum. A vertical bead or emboss can also be furnished on certain sizes. Lockseam Cathodes are available in round, oval or rectangular shapes. Most recent Lockseam Cathode development at Superior is integral tabbed sleeves. For information about various analyses of nickel strip write for Data Memo #5-2.

*Manufactured under U. S. Patents.



FABRICATED PARTS

Research, engineering experience, production know-how and highly specialized equipment are the factors that have made Superior fabricated parts the standard for the Electronics Industry. At the left are shown a handful of the hundreds of parts we can make.

All of this experience, know-how, and equipment is at your service in the development of a part or parts to suit your particular needs.

We have specialty, automatic and semi-automatic, equipment for cutting, stamping and drilling operations, as well as excellent tumbling equipment. Together with our rigid quality control system, this machinery permits the high-speed production of anodes, grid cylinders and other parts for television and cathode ray gun structures. Parts may be rolled at either end, to meet any requirement. We will be glad to send detailed information promptly upon request.

Superior TUBE COMPANY
Electronics Division

DISC CATHODE ASSEMBLY

The Superior Disc Cathode which has proved so satisfactory during the past several years has recently been improved by the addition of the following new feature:

1—The end of the nickel shank opposite the emission cap has been given a slight flare. This insures easier insertion of the coated heater wire and cuts down considerably on heater shrinkage.

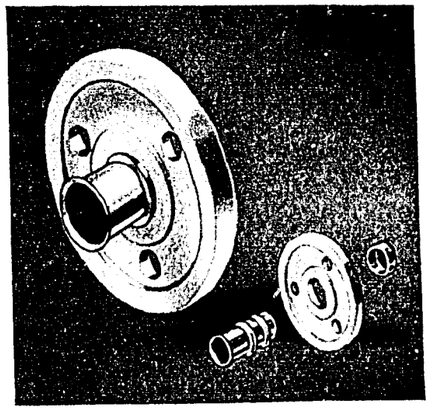
To this new feature add the following "old" details which made the Superior assembly outstanding and the result is a product that is truly superior in every respect.

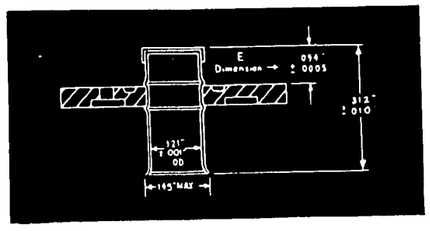
1—Double beaded construction for attaching the ceramic insulator to the nickel shank. This insures the minimum loss of heat and forms a *tight* construction that will not come loose in use.

2—The "E" dimension (distance between top of ceramic and top of emission cap) is held to the rigid tolerance of ± .0005". This cuts down on the number of spacer combinations that have to be used, and gives better cut-off characteristics.

3—The emission cap has no flange—does not touch the ceramic insulator at all—thus eliminating any additional danger of heat loss.

For information about the Disc Cathode Assembly, ask for Superior print ED-3.



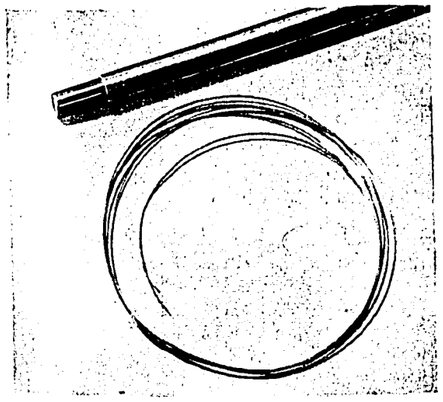


KULGRID†

a product of *Sylvania Electric Products, Inc.*

Pictured at the top of the illustration below is a section of ⅜" O.D. x .0273"/.02955" wall "A" Nickel(1) tubing drawn by Superior over OFHC (oxygen free high conductivity) copper rod. This is the raw material from which Sylvania Electric draws their KULGRID nickel clad wire shown at the bottom of the picture.

KULGRID is a conductor suitable for application in close proximity to high operating temperatures. It provides good electrical conductivity plus the protection afforded by heat and corrosion resistant nickel. Stranded conductors of this wire may be used as electrical leads for aircraft, electric furnaces, appliances, jet engines and a wide variety of laboratory and industrial equipment.



Export Representatives: Driver-Harris Company, Harrison, New Jersey, and affiliated European companies. Phone, Harrison 6-4800.

Superior, by cold drawing, can produce composite tubing or rod of many different materials. We cold draw tubing over plastics, insulated wire, mesh and many other materials which may or may not possess ductility. We are small diameter tubing specialists who have licked many materials problems in cooperation with our customers' engineers.

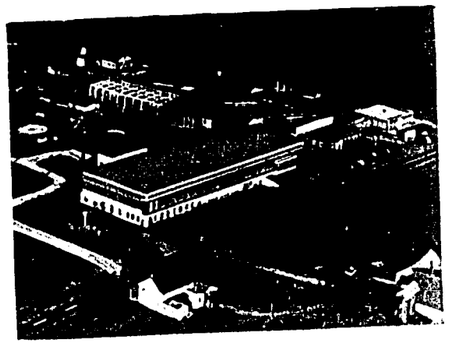
Just as we were able to assist Sylvania Electric in the production of the material for their KULGRID we may be able to help you. We will welcome the opportunity to do so.

†Covered by U. S. Patent 2,120,561
(1) Reg. U. S. Trademark—The International Nickel Co.

Superior
PRECISION SEAMLESS NICKEL TUBING
All analyses .010" to ⅜" O.D.
Certain analyses (.035" max. wall) up to 1⅜" O.D.
SUPERIOR TUBE COMPANY
Electronics Division
2500 Germantown Ave., Norristown, Pennsylvania

Superior TUBE COMPANY
Electronics Division

Electronic Tubing—Tailored to Your Needs



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NICKEL CATHODES

Seamless

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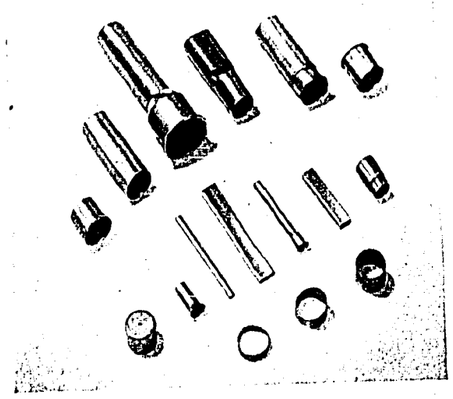
For information about #220 grade of Seamless Nickel ask for Data Memo #5-2. For detailed data on standard cathode tolerances ask for Specification EM-2.

Lockseam*

This type of cathode is produced from nickel strip especially rolled for the purpose. Present standard range of sizes is .040" to .100" O.D. inclusive with wall thicknesses of .0021" ± .0001" and .0025" ± .0001". Lengths are from 11.5MM to 42MM inclusive. Various analyses of nickel strip are used, depending upon characteristics required. Bead or emboss may be located anywhere on the cathodes, .040" minimum. A vertical bead or emboss can also be furnished on certain sizes. Lockseam Cathodes are available in round, oval or rectangular shapes. Most recent Lockseam Cathode development at Superior is integral tabbed sleeves. For information about various analyses of nickel strip write for Data Memo #5-2.

*Manufactured under U. S. Patents.



FABRICATED PARTS

Research, engineering experience, production know-how and highly specialized equipment are the factors that have made Superior fabricated parts the standard for the Electronics Industry. At the left are shown a handful of the hundreds of parts we can make.

All of this experience, know-how, and equipment is at your service in the development of a part or parts to suit your particular needs.

We have specialty, automatic and semi-automatic, equipment for cutting, stamping and drilling operations, as well as excellent tumbling equipment. Together with our rigid quality control system, this machinery permits the high-speed production of anodes, grid cylinders and other parts for television and cathode ray gun structures. Parts may be rolled at either end, to meet any requirement. We will be glad to send detailed information promptly upon request.

Superior TUBE COMPANY
Electronics Division

DISC CATHODE ASSEMBLY

The Superior Disc Cathode which has proved so satisfactory during the past several years has recently been improved by the addition of the following new feature:

1—The end of the nickel shank opposite the emission cap has been given a slight flare. This insures easier insertion of the coated heater wire and cuts down considerably on heater shrinkage.

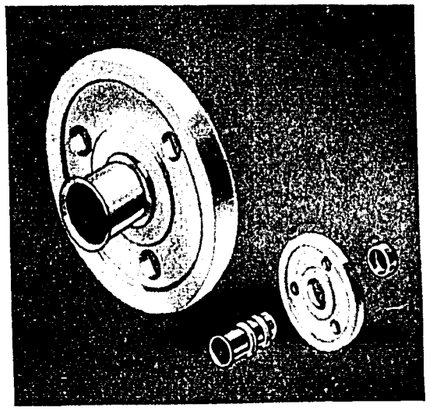
To this new feature add the following "old" details which made the Superior assembly outstanding and the result is a product that is truly superior in every respect.

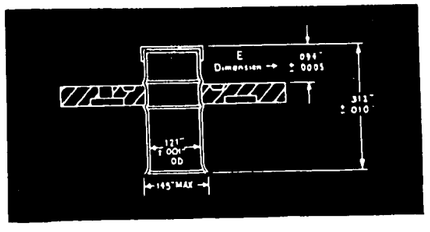
1—Double beaded construction for attaching the ceramic insulator to the nickel shank. This insures the minimum loss of heat and forms a *tight* construction that will not come loose in use.

2—The "E" dimension (distance between top of ceramic and top of emission cap) is held to the rigid tolerance of ± .0005". This cuts down on the number of spacer combinations that have to be used, and gives better cut-off characteristics.

3—The emission cap has no flange—does not touch the ceramic insulator at all—thus eliminating any additional danger of heat loss.

For information about the Disc Cathode Assembly, ask for Superior print ED-3.



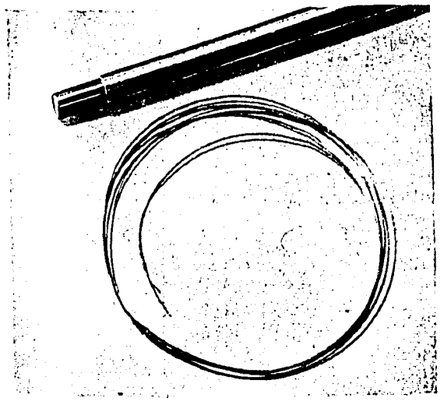


KULGRID†

a product of *Sylvania Electric Products, Inc.*

Pictured at the top of the illustration below is a section of ⅜" O.D. x .0273"/.02955" wall "A" Nickel(1) tubing drawn by Superior over OFHC (oxygen free high conductivity) copper rod. This is the raw material from which Sylvania Electric draws their KULGRID nickel clad wire shown at the bottom of the picture.

KULGRID is a conductor suitable for application in close proximity to high operating temperatures. It provides good electrical conductivity plus the protection afforded by heat and corrosion resistant nickel. Stranded conductors of this wire may be used as electrical leads for aircraft, electric furnaces, appliances, jet engines and a wide variety of laboratory and industrial equipment.



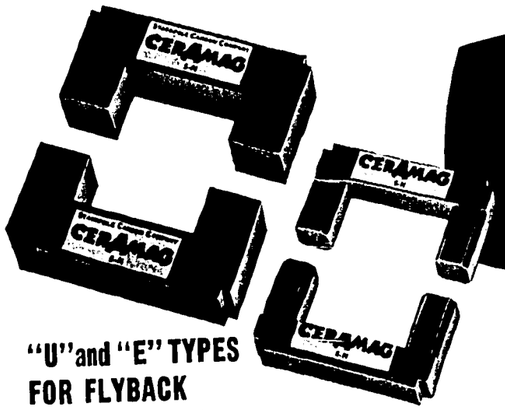
Export Representatives: Driver-Harris Company, Harrison, New Jersey, and affiliated European companies. Phone, Harrison 6-4800.

Superior, by cold drawing, can produce composite tubing or rod of many different materials. We cold draw tubing over plastics, insulated wire, mesh and many other materials which may or may not possess ductility. We are small diameter tubing specialists who have licked many materials problems in cooperation with our customers' engineers.

Just as we were able to assist Sylvania Electric in the production of the material for their KULGRID we may be able to help you. We will welcome the opportunity to do so.

†Covered by U. S. Patent 2,120,561
(1) Reg. U. S. Trademark—The International Nickel Co.

Superior
TUBULAR METAL SMALL TUBING
All analyses .010" to ⅜" O.D.
Certain analyses (.035" max. wall) up to 1⅜" O.D.
SUPERIOR TUBE COMPANY
Electronics Division
2500 Germantown Ave., Norristown, Pennsylvania



STACKPOLE
ELECTRICAL AND ELECTRONIC COMPONENTS

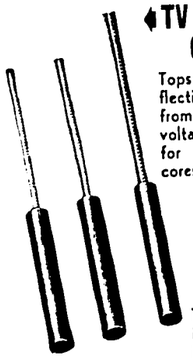
Ceramag® FERRITE CORES

"U" and "E" TYPES FOR FLYBACK TRANSFORMERS and DEFLECTION YOKES

These units assure permeability on the order of 10 to 1 by comparison with conventional iron cores. They are much smaller, have high resistance and operate cooler.

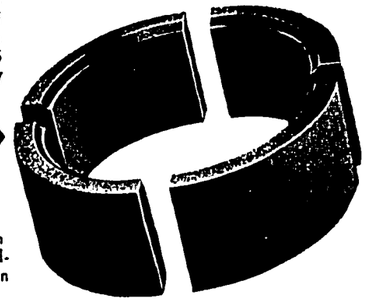
◀TV IMAGE W-I-D-T-H CONTROL TYPES

Tops for TV horizontal image deflection circuits. Give ratios of from 1 to 8 or more in low line voltage areas compared with 1-5 for ordinary high permeability cores.



SEGMENTED ▶ DEFLECTION YOKE CORES

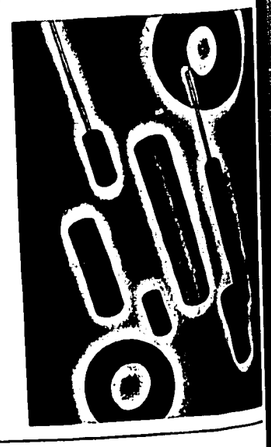
This popular 4-segment design is highly efficient and can readily be handled in set production with little breakage.



Advantages of Stackpole Ceramag (ferrite) cores include much higher permeability, lower losses with higher efficiency and lower operating temperatures, less corona effect, lower cost, lighter weight and smaller sizes. All types can be supplied in two standard grades:

CERAMAG 5N —A medium Q material temperature stabilized for minimum permeability change at temperatures up to 100° C. Primarily designed for low flux density uses.

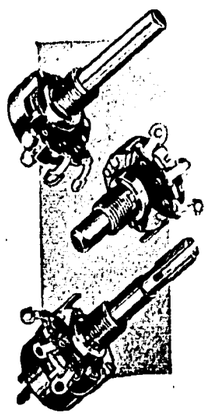
CERAMAG 7 —Ideal for high flux densities as in television flyback transformer applications. Temperature stabilized.



STANDARD AND SPECIAL IRON CORES

The rapid increase in the use of molded iron cores throughout electronic engineering has resulted in large part from Stackpole engineering that has made new and improved types available in a wide assortment of shapes, sizes and ranges. Special Stackpole manufacturing techniques assure cores of outstanding dependability for exacting specifications. Write for details on any type.

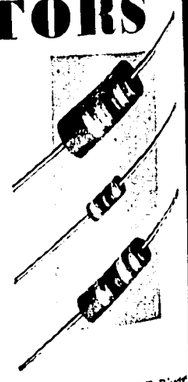
STANDARD AND HIGH-FREQUENCY TYPES — SIDE-MOLDED CORES
HIGH-RESISTIVITY CORES — IRON CORES FOR CHOKE COILS
IRON SLEEVE CORES — THREADED CORES — CUP CORES
INSULATED CORES — MOLDED COIL FORMS — CERAMAG® CORES



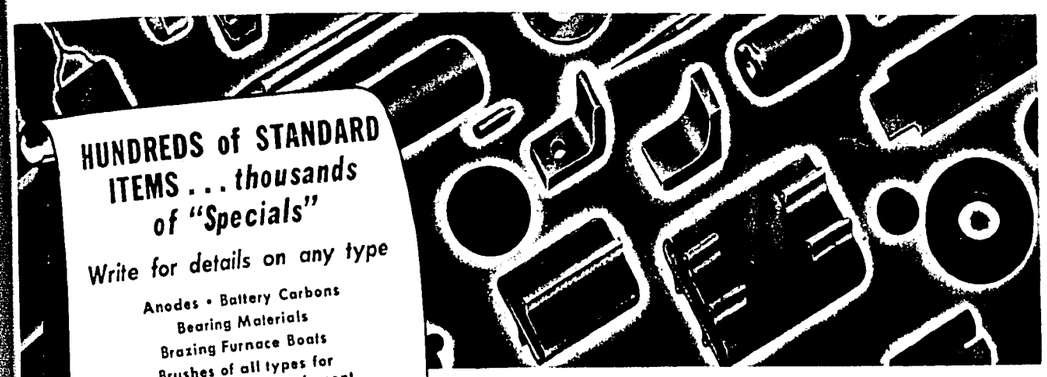
FIXED AND VARIABLE RESISTORS

Stackpole Variable Resistors offer a fully proved selection of types and sizes for volume control, tone control, potentiometer and similar applications in values from 500 ohms to 5 megohms and in ratings to .6 watt. Recent developments include exceptionally small units conservatively rated at .5 watt and concentric shaft controls for TV.

Fully insulated and moisture-protected by phenolic sleeves, Stackpole molded carbon composition fixed resistors are available in ½-, 1- and 2-watt sizes in all standard and many special values for electrical, radio, TV and other uses. Special Stackpole resistors include capacitor discharge, surge, lightning arrester, ignition suppressor and other types.



MILITARY TYPES— Need fixed or variable resistors for JAN or MIL specification uses? Send details of your requirements for recommendation by Stackpole engineers.



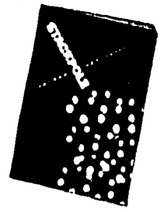
HUNDREDS of STANDARD ITEMS . . . thousands of "Specials"

Write for details on any type

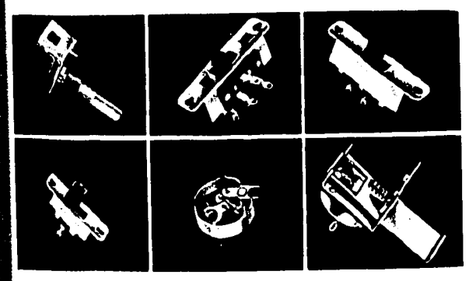
Anodes • Battery Carbons
Bearing Materials
Brazing Furnace Boats
Brushes of all types for rotating electrical equipment
Carbon and Graphite Contacts
Chemical Carbons • Clutch Rings
Dash Pot Plungers
Electric Furnace Heating Elements
Electrolytic Anodes • Friction Segments
Glass Molds • Ground Rods (carbon)
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
Spectrographite No. 1
Trolley and Pantograph Shoes
Voltage Regulator Discs
Water Heater and Pasteurization Electrodes
Welding Carbons
Welding Plates and Paste

CARBON-GRAPHITE SPECIALTIES

The unique electrical, mechanical, physical and chemical properties of Stackpole carbon, graphite and molded carbon-graphite products solve countless problems of friction, temperature, arcing, corrosion, shaft sealing, voltage regulation and others. So broad is the line of Stackpole products in this field, so extensive the facilities for "specials" that it is practical to list only a few of them here. Stackpole engineers welcome the opportunity to assist in adapting any of these products to your specific design, engineering or production needs.



GET THIS DATA BOOK! Stackpole Booklet 40 contains a wealth of helpful data on carbon, graphite and carbon-graphite engineering uses. Write on company stationery.



INEXPENSIVE LINE AND SLIDE SWITCHES

including new 3 amp. types

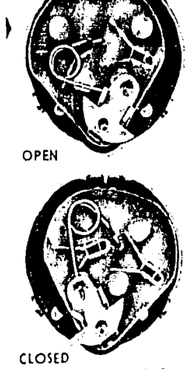
Dress up your product—add to its convenience and "salability" with these sturdy, low-cost switches! 18 fractional amperage and new 3 amp. types are available. Modifications can be produced economically for quantity users. Write for Bulletin RC7C. State details of your application for samples.

SEND FOR COMPLETE DATA

Catalog RC-8 listing the complete line-up of Stackpole Electronic Component Specialties will gladly be sent on letterhead request. Write for your copy today.

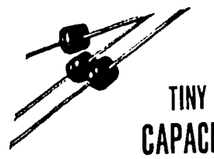
LINE SWITCHES for Stackpole Controls

Only .888" in diameter by .312" thick, the Stackpole A-10 DP ST line switch fits even the smallest Stackpole variable resistor controls. Rated 1 amp. 250 volts AC-DC or 3 amps. 125 volts it combines outstanding ruggedness with ample-sized contacts and positive contact wiping action. Ideal for long, trouble-free service for portable and auto radios and numerous other uses. A similar single-pole design, Type A-11, with or without dummy terminal, will soon be available.



OPEN

CLOSED



TINY GA CAPACITORS

Stackpole GA Capacitors cost no more than "gimmicks" and assure far greater stability, higher Q, better insulation resistance and higher breakdown voltage. Moreover, they are mechanically superior and eliminate the inductive characteristic of twisted wires. Capacities of 0.5; 0.68; 1.0; 1.5; 2.2; 3.3 and 4.7 mmfd. are available. ±20% tolerance.

BAKELITE COIL FORMS

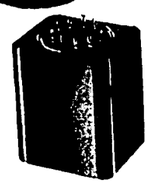
Stackpole molded coil forms are the modern answer to the need for inexpensive mechanical supports for windings. Cost is low, space factor is reduced, assembly is easier and point-to-point wiring is feasible with far fewer soldered connections. Write for details and samples to your specifications.

STACKPOLE

Electronic Components Division

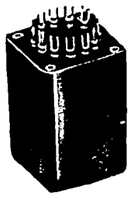
STACKPOLE CARBON COMPANY, ST. MARYS, PA.

COMPONENTS FOR EVERY APPLICATION



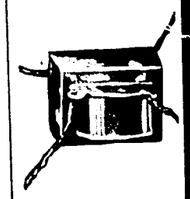
LINEAR STANDARD
High Fidelity Ideal

HIPERM ALLOY
High Fidelity . . . Compact

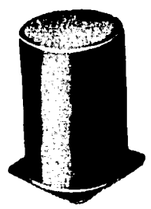


ULTRA COMPACT
Portable . . . High Fidelity

OUNCER
Wide Range . . . 1 ounce

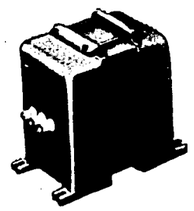


SUB OUNCER
Weight 1/3 ounce

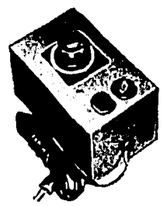


COMMERCIAL GRADE
Industrial Dependability

SPECIAL SERIES
Quality for the "Ham"

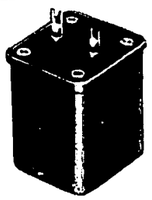


POWER COMPONENTS
Rugged . . . Dependable



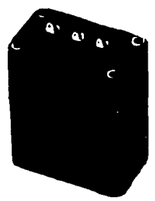
VARITRAN
Voltage Adjustors

MODULATION UNITS
One watt to 100KW

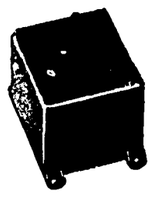


VARIABLE INDUCTOR
Adjust like a Trimmer

TOROID HIGH Q COILS
Accuracy . . . Stability

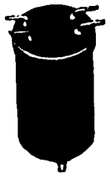


TOROID FILTERS
Any type to 300KC



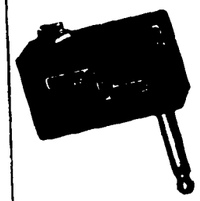
MU-CORE FILTERS
Any type ½ — 10,000 cyc.

EQUALIZERS
Broadcast & Sound



PULSE TRANSFORMERS
For all Services

HERMETIC COMPONENTS
Ceramic Terminals



PLUG IN ADAPTER
Impedance Matching

FOSTERITE
Grade 3 JAN Components

CABLE TYPE
For mike cable line

VERTICAL SHELLS
Husky . . . Inexpensive

REPLACEMENT
Universal Mounting

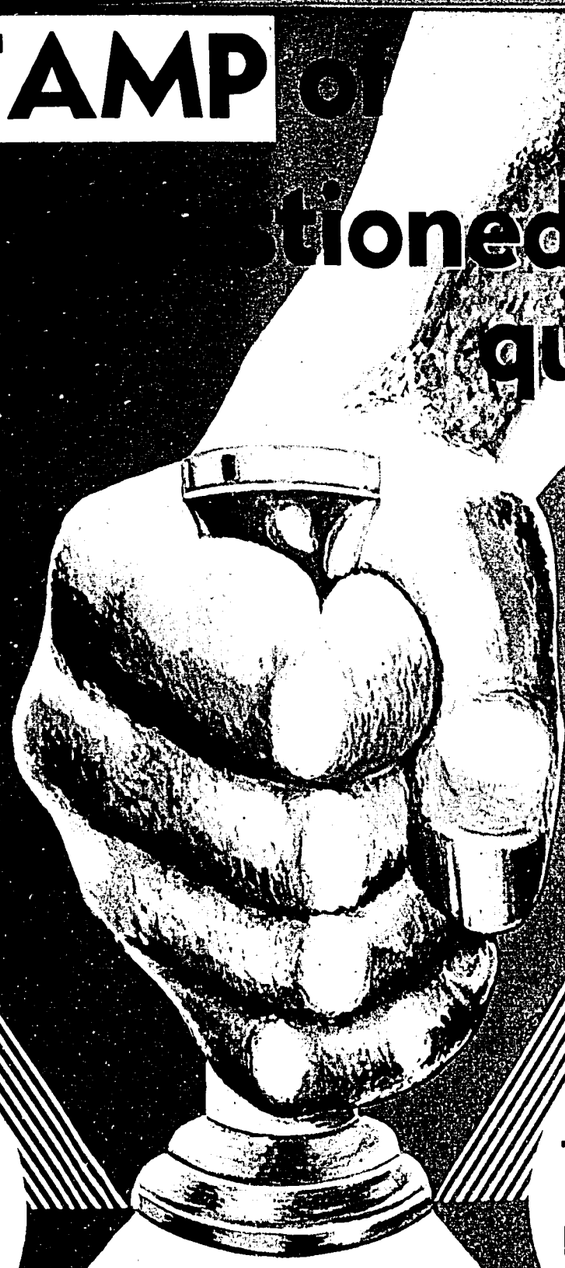
STEP-DOWN
Up to 2500W . . . Stock

LINE ADJUSTORS
Match any line voltage

CHANNEL FRAME
Simple . . . Low cost

United Transformer Co.

he STAMP of tioned quality!



AUDIO UIPMENT

FM-AM and AM RECEIVING EQUIPMENT

TESTING EQUIPMENT

TELEVISION EQUIPMENT

Approved

PRODUCTS

1952 EDITION

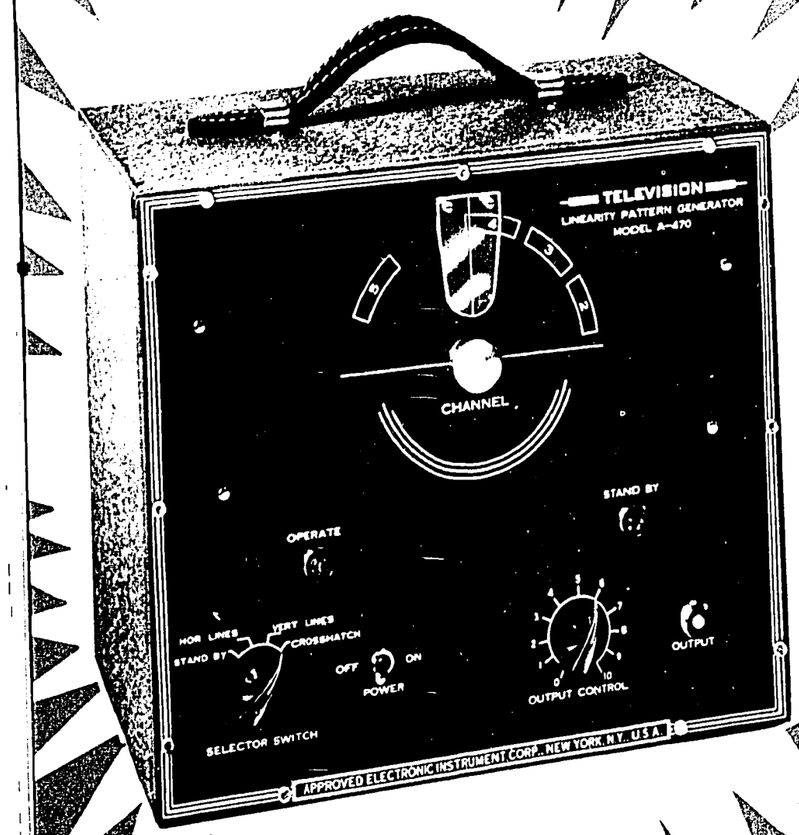
ROVED ELECTRONIC INSTRUMENT CORP. 142 LIBERTY STREET . NEW YORK 6, N. Y.

Approved TELEVISION LINEARITY PATTERN GENERATOR

Model A-470 is a testing device th
provides a complete video signal t
the adjustment of TV receivers wh
no station pattern is available.

CRYSTAL CONTROLLED

ANYWHERE
ANYTIME



FEATURES

- Without test pattern from station, adjust deflection, horizontal and vertical controls, sweep width, linearity, ion trap adjustment, etc.
- Provides 3 different types of signals.
- Crystal control for line frequency oscillator.
- Vertical, horizontal and cross-hatch pattern available.
- Shielded attenuator control.
- 100-6,000 MV output voltage.
- Approx. 50 ohm output impedance.
- Matches 72 or 300 ohm inputs.

Model A-470 is the latest test instrument available to the television service engineer to assist in the proper adjustment and installation of TV receivers, when no station pattern is on the air. Many tests may be performed with Model A-470 that would be otherwise impossible unless a station pattern is available.

Fig. 1, Fig. 2 and Fig. 3 show the various signals provided by this instrument. The above illustrations are based on a conventional TV receiver with a 4:3 aspect ratio. With the aid of Model A-470 all routine adjustments can be made, such as:

- Adjustment of vertical and horizontal linearity.
- Setting of hold control.
- Checking for hum in deflection circuits.
- Relative sensitivity measurements.
- Trouble shooting without station pattern available.

TECHNICAL SPECIFICATIONS

- Power supply — 105-125 volt, 60 cycles.
- Power consumption approximately 25 watts.
- Voltage regulated power supply.
- Variable output frequencies.
- Channels 2-5 available.
- Large, easy to tune dial.
- Output voltage — 100-6000 m/v.
- Shielded output attenuator.
- Coaxial output cable.
- Selection of 8 or 9 horizontal lines or 12 vertical lines or as a cross-hatch pattern.
- Excellent stability.
- Simple to operate.
- Rugged steel case, battleship gray finish.

TUBE COMPLEMENT

1	12AU7 (½)	line freq. osc.
	12AU7 (½)	horizontal osc.
1	12AT7	Buffer amplifier
1	12AT7	Inter. oscillator
1	6AK5	Variable R.F. osc.
1	12AU7	Mixer
1	0A2	Voltage regulator
1	7Y4	Rectifier

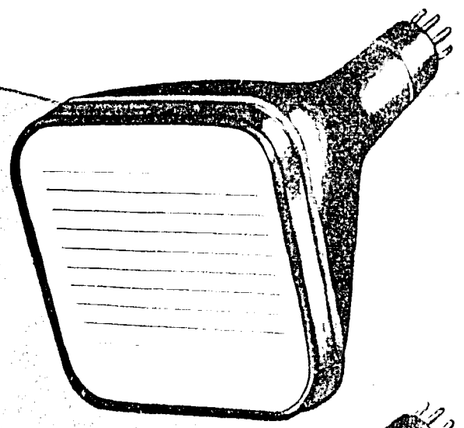


Fig. 1
Horizontal Lines

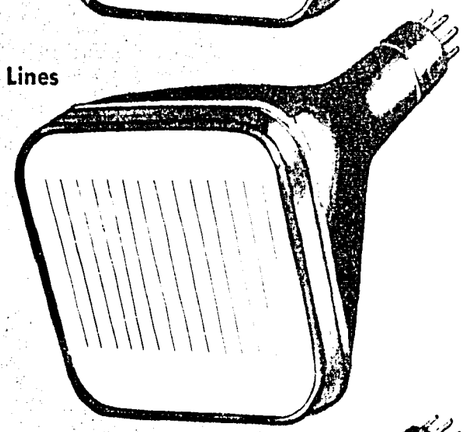


Fig. 2
Vertical Lines

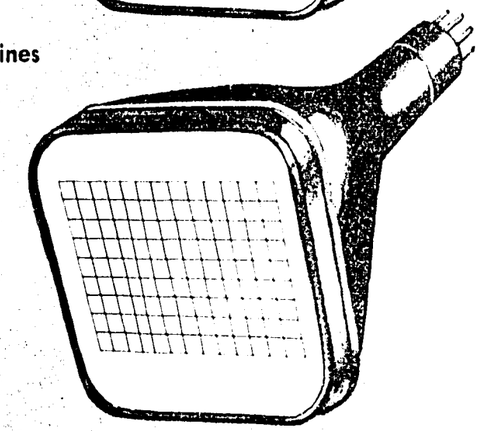


Fig. 3
Cross Hatch
3-4 Aspect Ratio

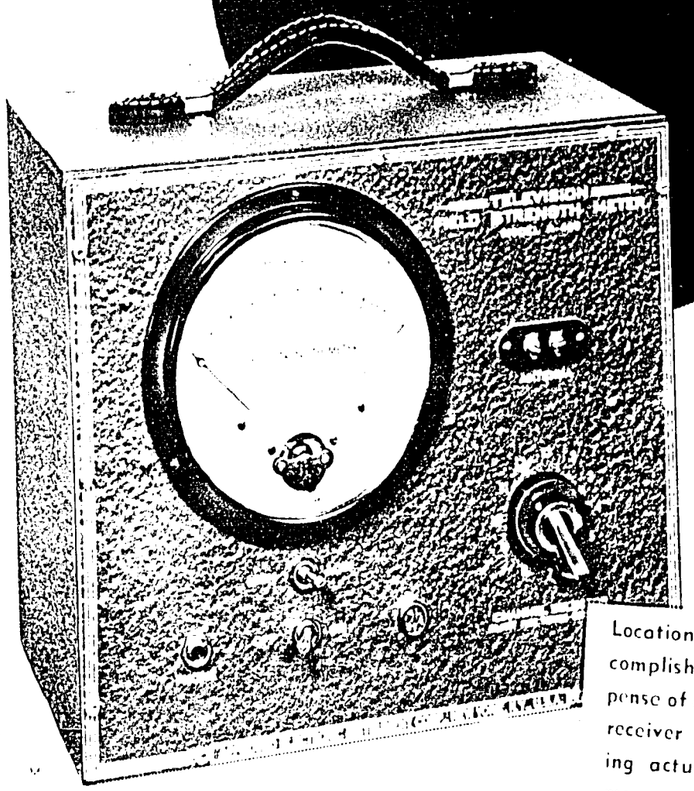
Model A-470 crystal controlled linearity pattern generator is housed in a heavy gauge steel cabinet, battleship gray finish. 7 standard brand tubes and IN34 crystal including 1 special oscillator crystal for high stability, operating instructions, output cable, circuit diagram and guarantee card. Shipping weight 25 lbs. Size D-8" x H-10" x W-12".

PRICE SLIGHTLY HIGHER WEST OF THE ROCKIES

Approved

TELEVISION
FIELD STRENGTH METER
FOR FRINGE AREA SERVICE

MODEL
A-460



- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible] Picture Carrier Only
- [illegible]
- [illegible]
- [illegible] 30-50 MC
- [illegible]
- [illegible]
- [illegible]
- Rugged [illegible] finish
- 300 [illegible]
- [illegible]
- Individually Calibrated Channels

Location survey [illegible] accomplished without the expense of complete Television receiver installation reducing actual work to a one man operation.

Now . . . for the first time . . . Full Scale Sensitivity . . . Calibrated readings from 30-20,000 microvolts.

"Low" scale, 100-20,000 mivrovolts for metropolitan areas. "High" scale, 30-500 microvolts full scale for fringe areas.

If any signal is present at all . . . you can measure it.

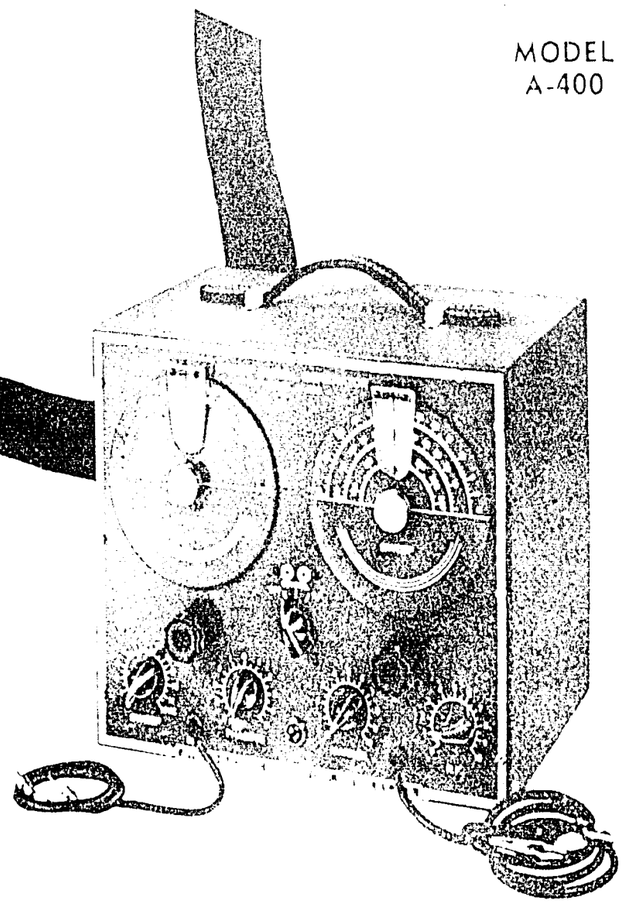
More accurate antenna orientation possible by greatly increased meter movement on "high" scale.

Light, ruggedly built for constant use . . . take it up on the roof . . . out in the weather . . . PAYS FOR ITSELF!!!

★ PRICE SLIGHTLY HIGHER WEST OF ROCKIES

Approved

MODEL
A-400



- [illegible]
- [illegible]
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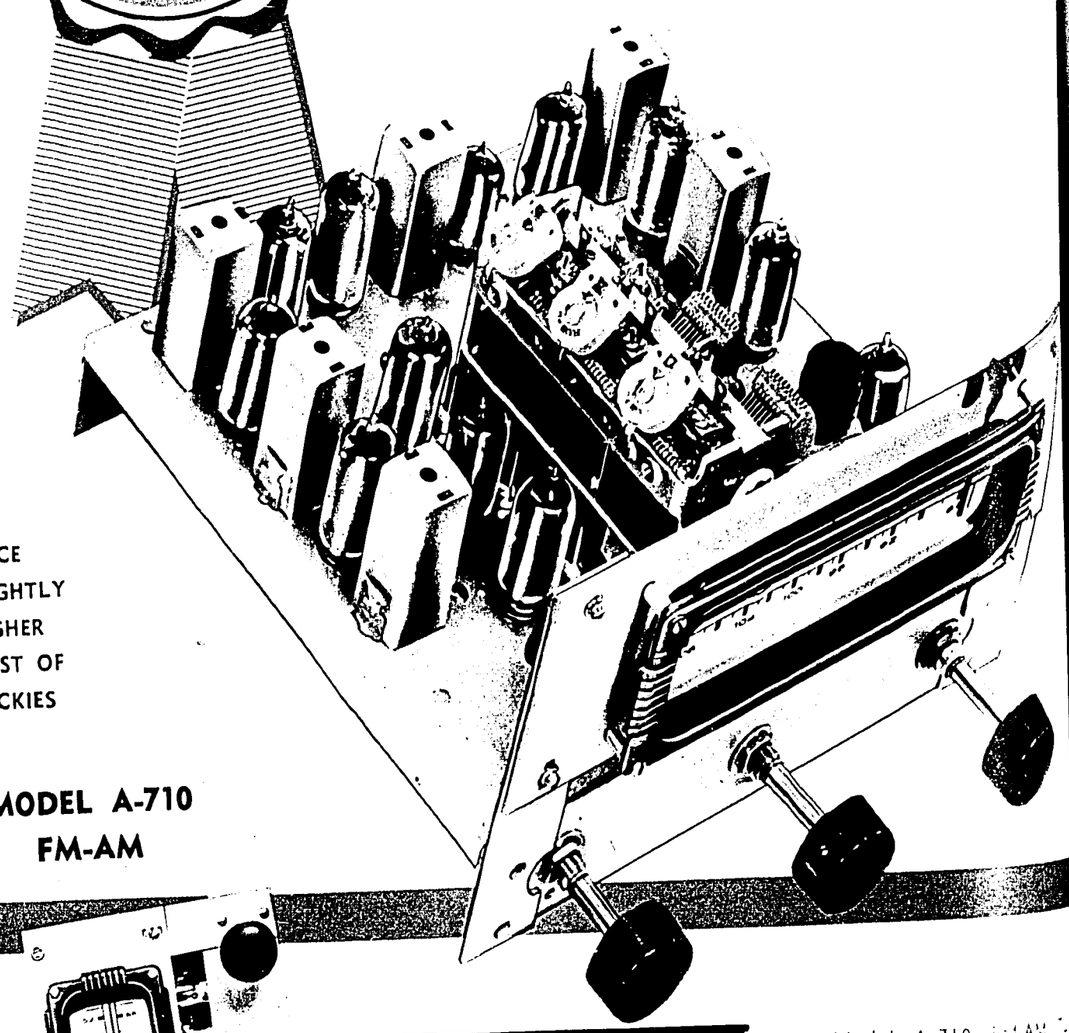
Approved

GIANT PERFORMANCE

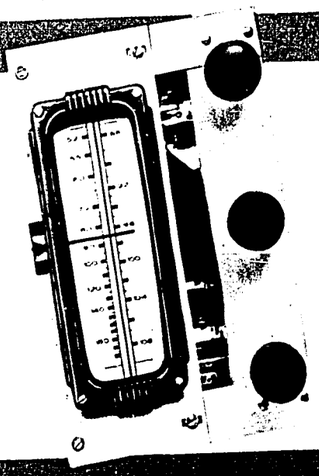
MINIATURE CHASSIS

12 MINIATURE TUBES



PRICE SLIGHTLY HIGHER WEST OF ROCKIES

MODEL A-710
FM-AM



MODEL A-710 B
Vertical Tuning Dial Scale

Chassis dimensions: 8¼" wide, 5⅜" high, 8" deep. Net weight: 5½ lbs. Power requirements: 170 Volt DC. 20 MILS and/or 150 Volt DC. 40 MIL. 6.3v. 4 AMP.

Model A-620 universal power supply will match above power requirements.

Model A-710 [illegible] chassis is supplied complete [illegible] 12 (standard [illegible]) miniature tubes, horizontal tuning scale [illegible] escutcheon plate and knobs [illegible] plete operating instructions [illegible] diagram and guarantee. A-[illegible] and aligned.

NEW IMPROVED

MODEL A-710
High Fidelity
FM-AM TUNER

Approved

- Chassis size — W-8¼" — H-5⅜" — D-8"
- Six section variable condenser.
- Temperature compensated trimmers on FM.
- Separate tuning and IF channels for FM and AM.
- IF transformers 10.7 MC iron core tuned on FM.
- IF transformers 456 KC iron core tuned on AM.
- Special slug tuned coils for FM (Ant. Mixer. Oscillator.)
- High impedance antenna and RF coil on AM.
- Slug tuned oscillator coil on AM.
- Frequency range 88-108 MC FM— 540 KC-1800 KC AM.
- Tuned RF stage on FM and AM.
- Two stage limiter circuit on FM
- Genuine discriminator circuit.
- Separate diode detectors for AM and FM.
- Common stage of audio on FM and AM.
- High sensitivity on both channels.
- Excellent stability.
- Flat frequency response.
- Separate shielded audio output terminal (high impedance)
- High quality components used throughout.
- Special printed circuit [illegible] on FM.
- Three simple controls (selectorswitch, tuning, volume)
- Easy to read slide rule dial 88-108 MC — 540-1800 KC
- Dial opening 5 [illegible]
- Tuning ratio 8:1.
- Separate antenna terminals for FM and AM
- Power required 6.3 volt AC 4 AMP. — 150 volt DC 40 MA on FM — 170 volt DC 20 MA on AM.
- May be operated from storage battery and B batteries
- Upright dial Scale [illegible] for vertical mounting
- Dial escutcheon.
- Hardware knobs [illegible] included.
- 3 ft. power supply cable [illegible] connected, color coded for easy identification.

PRICE SLIGHTLY HIGHER WEST OF ROCKIES

FM SPECIFICATIONS

- Receives FM Broadcasts 88 to 108 MC.
- Separate RF and IF channel.
- New type permeability-tuned IF—10.7 MC transformers
- Miniature tubes used throughout for high frequency efficiency.
- Separate Diode detector.
- Tuned RF stage
- 3 Section tuning condenser.
- Special slug tuned coils. Antenna — Mixer — Oscillator)
- Temperature compensated trimmers.
- Two stage limiter circuit.
- Genuine discriminator circuit.
- Audio stage.
- Special printed circuit capacitors.
- Separate antenna terminals (300 ohm input)
- 200 KC Bandwidth.
- Sens. 92 MC — 10 U/V.
- Sens. 106 MC — 12 U/V.
- Full Quieting sensitivity, 25-30 u/v across FM band
- 40-12,000 CPS Response on FM.

AM SPECIFICATIONS

- Receives AM Broadcast 540 to 1800 KC.
- Separate RF and IF Channel.
- New type permeability-tuned. IF 456 KC transformer.
- Miniature tubes used throughout for highest efficiency.
- Separate diode detector
- Tuned RF stage
- Slug tuned oscillator coil
- Audio stage
- Separate antenna terminals
- High impedance antenna and RF coils
- 3 section tuning condenser
- 1450 KC 7.5 KC bandwidth

TUBES USED ON FM
1—6CB6 RF Amplifier
1—6BE6 Mixer-Oscillator
1—6AU6 IF Amplifier
1—6AU6 IF Amplifier
1—6AU6 Limiter
1—6AU6 [illegible]
1—6AL5 [illegible]

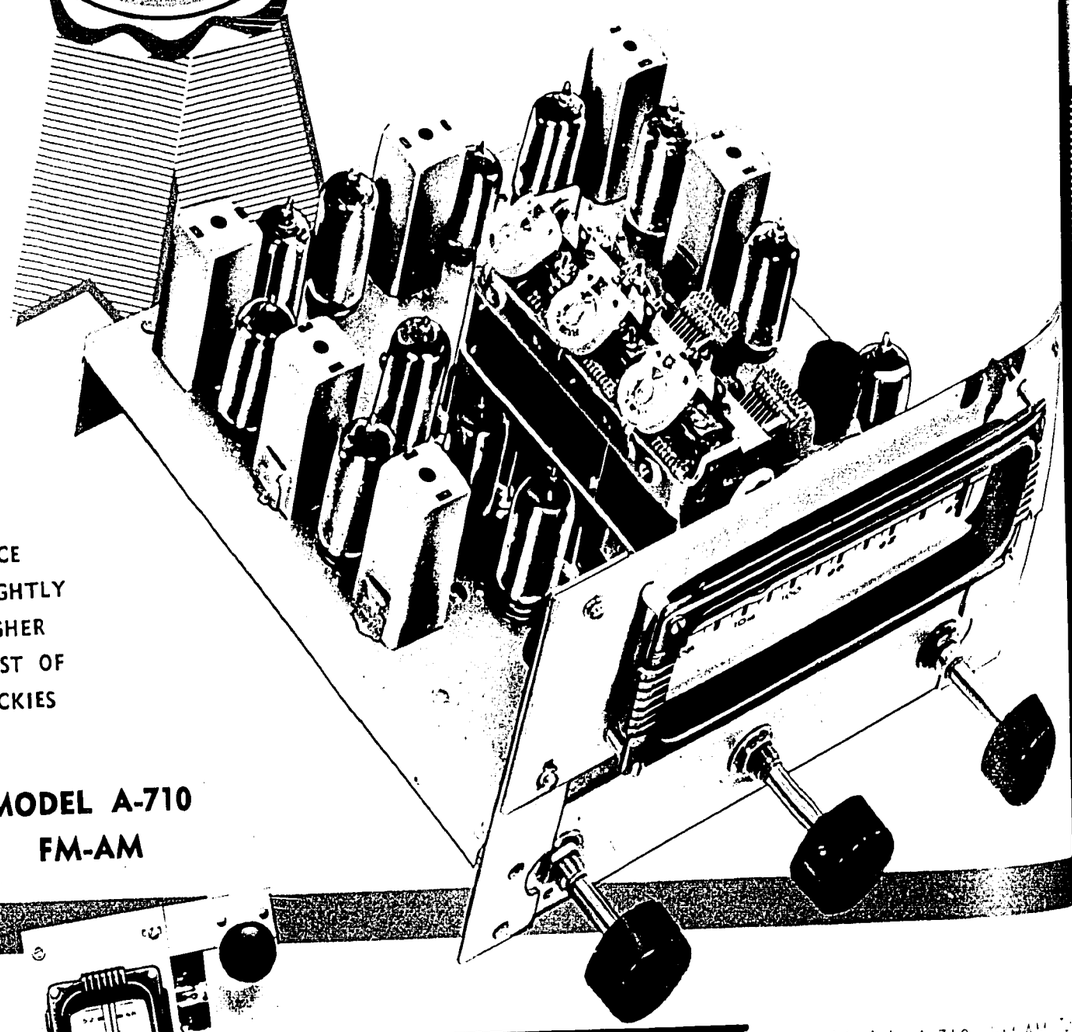
TUBES USED ON AM
1—6BA6 RF Amplifier
1—6BE6 Converter
1—6BA6 IF Amplifier
1—6AT6 Diode (audio amplifier common to AM-FM)

Approved

GIANT PERFORMANCE

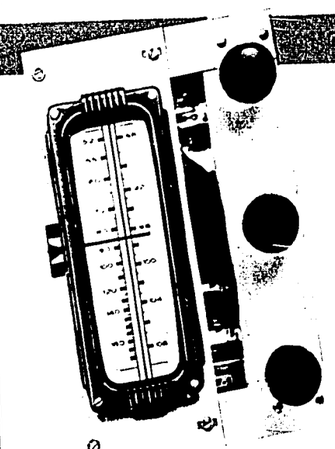
MINIATURE CHASSIS

12 MINIATURE TUBES



PRICE SLIGHTLY HIGHER WEST OF ROCKIES

MODEL A-710
FM-AM



MODEL A-710 B
Vertical Tuning Dial Scale

Chassis dimensions: 8¼" wide, 5⅜" high, 8" deep. Net weight: 5½ lbs. Power requirements: 170 Volt DC. 20 MILS and/or 150 Volt DC. 40 MIL. 6.3v. 4 AMP.

Model A-620 universal power supply will match above power requirements.

Model A-710 [illegible] chassis is supplied complete with 12 (standard [illegible]) tubes, horizontal tuning scale escutcheon plate and knobs complete operating instructions with diagram and guarantee. Aligned and aligned.

NEW IMPROVED

MODEL A-710

High Fidelity

FM-AM TUNER

Approved

- Chassis size — W-8¼" — H-5⅜" — D-8"
- Six section variable condenser.
- Temperature compensated trimmers on FM.
- Separate tuning and IF channels for FM and AM.
- IF transformers 10.7 MC iron core tuned on FM.
- IF transformers 456 KC iron core tuned on AM.
- Special slug tuned coils for FM (Ant. Mixer, Oscillator.)
- High impedance antenna and RF coil on AM.
- Slug tuned oscillator coil on AM.
- Frequency range 88-108 MC FM— 540 KC-1800 KC AM.
- Tuned RF stage on FM and AM.
- Two stage limiter circuit on FM.
- Genuine discriminator circuit.
- Separate diode detectors for AM and FM.
- Common stage of audio on FM and AM.
- High sensitivity on both channels.
- Excellent stability.
- Flat frequency response.
- Separate shielded audio output terminal (high impedance).
- High quality components used throughout.
- Special printed circuit capacitors on FM.
- Three simple controls (selector-switch, tuning, volume).
- Easy to read slide rule dial 88-108 MC — 540-1800 KC.
- Dial opening 5 [illegible]
- Tuning ratio 8 [illegible]
- Separate antenna terminals for FM and AM.
- Power required 6.3 [illegible] AC 4 AMP. — 150 [illegible] DC 40 MA on FM — 170 [illegible] DC 20 MA on AM.
- May be operated from storage battery and B batteries.
- Upright dial. Scale [illegible] for vertical mounting.
- Dial escutcheon.
- Hardware, knobs, circuit diagram included.
- 3 ft. power supply cable internally connected, color codes for easy identification.

PRICE SLIGHTLY HIGHER WEST OF ROCKIES

FM SPECIFICATIONS

- Receives FM Broadcasts 88 to 108 MC.
- Separate RF and IF channel.
- New type permeability-tuned IF—10.7 MC transformers.
- Miniature tubes used throughout for high frequency efficiency.
- Separate Diode detector.
- Tuned RF stage.
- 3 Section tuning condenser.
- Special slug tuned coils. Antenna — Mixer — Oscillator)
- Temperature compensated trimmers.
- Two stage limiter circuit.
- Genuine discriminator circuit.
- Audio stage.
- Special printed circuit capacitors.
- Separate antenna terminals (300 ohm input)
- 200 KC Bandwidth.
- Sens. 92 MC — 10 U/V.
- Sens. 106 MC — 12 U/V.
- Full Quieting sensitivity, 25-30 u/v across FM band
- 40-12,000 CPS Response on FM.

AM SPECIFICATIONS

- Receives AM Broadcast 540 to 1800 KC.
- Separate RF and IF Channel.
- New type permeability-tuned. IF 456 KC transformer.
- Miniature tubes used throughout for highest efficiency.
- Separate diode detector
- Tuned RF stage
- Slug tuned oscillator coil
- Audio stage
- Separate antenna terminals
- High impedance antenna and RF coils
- 3 section tuning condenser
- 1460 KC 7.5 KC bandwidth

TUBES USED ON FM
1—6CB6 RF Amplifier
1—6BE6 Mixer-Oscillator
1—6J6 [illegible]
1—6AU6 IF Amplifier
1—6AU6 IF Amplifier
1—6AU6 Limiter
1—6AU6 [illegible]
1—6AL5 [illegible]

TUBES USED ON AM
1—6BA6 RF Amplifier
1—6BE6 Converter
1—6BA6 IF Amplifier
1—6AT6 Diode (audio amplifier common to AM-FM)

HIGH

Approved MODEL A-850

AUDIO AMPLIFIER

10 WATTS

TECHNICAL SPECIFICATIONS

- Power supply: 105-125 volts, 60 Cycles.
- Power consumption. 40 Watts.
- Power output: 10 Watts max.
- Hum level: —76 DB below full output.
- Tone controls: 1 high — 1 low.
- Separate volume control.
- Frequency Response: ± 2 db 50-10,000 c.
- Gain: 75 db.
- Input impedance: [illegible] ohms
- Output impedance: 4-8-[illegible] 500 ohms.
- Heavy duty power transformer
- Long life loctal tubes.
- Provision for reluctance pickup pre-amp (Power Supply).

FEATURES

- Wide range reproduction
- [illegible]
- Hi-Lo tone compensation
- [illegible]
- Compact size.

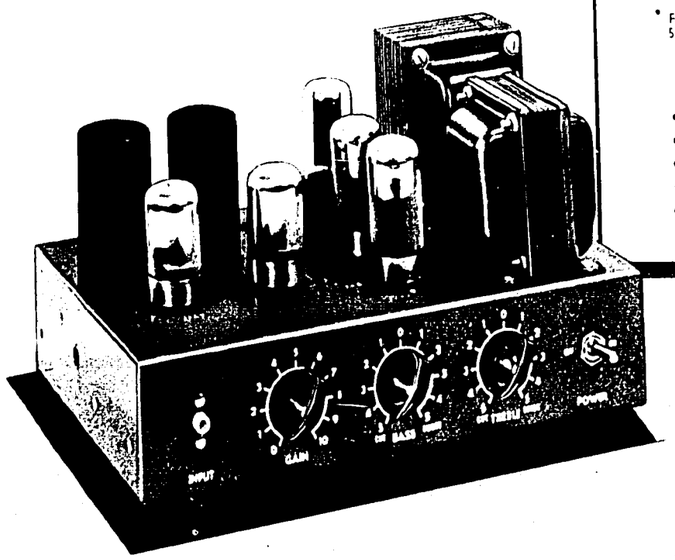
TUBES

1—5Y3 [illegible]

1—7F7 [illegible]

2—7C5 [illegible]

1—7F7 [illegible]



Model A-850 is a high fidelity audio amplifier providing an output of 10 watts. May be used with any good FM-AM Tuner or for the reproduction of phonograph records. Its high impedance input is practically universal. Approved Model A-710 AM-FM Tuner is ideally suited for this amplifier.

PRICE SLIGHTLY HIGHER WEST OF ROCKIES

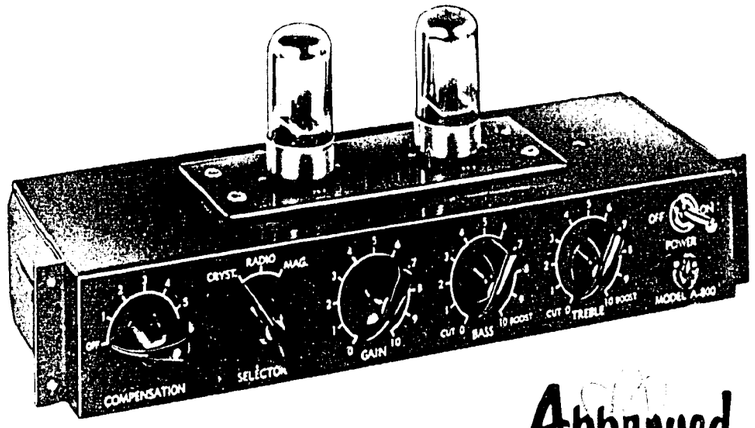
MODEL A-800

re- mplifier

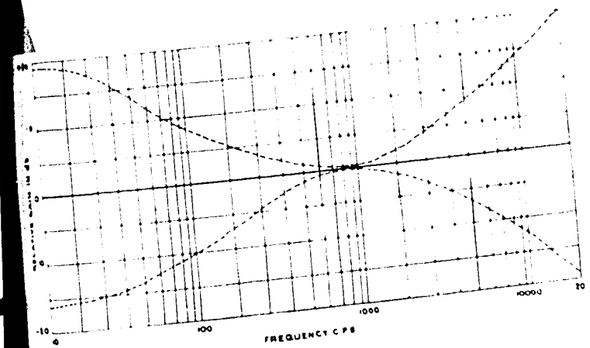
With Built-in 6 Position Equalizer For GE and Pickering Cartridges

for the Williamson [illegible]

& other high qua[illegible]



Approved



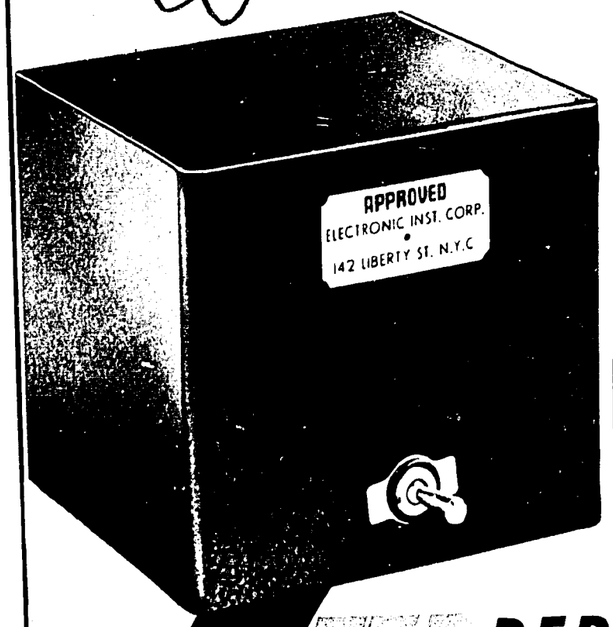
- Dimensions 12" W x 4" D x 2" H.
- Finish Grey Hammertone
- Adjustable [illegible] to fit any [illegible] of preamp.
- 36" power supply [illegible] with [illegible] connector [illegible] amplifier.
- Power line cord [illegible] and rear mounted [illegible] for main amplifier.
- Pilot light.
- Floated tube deck to prevent tube microphonism
- 3 input connectors—magnetic crystal radio
- Input selector switch
- 6 position equalizer switch for GE and Pickering cartridges
- Compensator for crystal cartridge
- Overall gain control.
- High-Low tone controls approx. 15 DB
- Tubes: 2 7F7
- Power supply [illegible] for AC or DC [illegible] ohms 250-300 Volts DC at 7 milliamps

PRICE SLIGHTLY HIGHER WEST OF ROCKIES

Approved (FIXED FREQUENCY)

MODEL A-TVB

TELEVISION BOOSTER



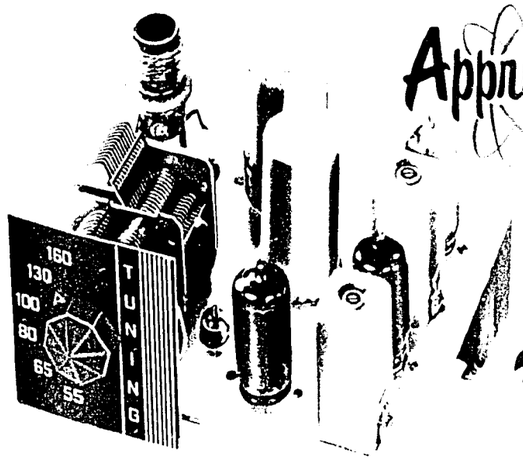
PERFORMANCE in FRINGE AREAS

- Wide band width
- Improved [illegible]
- Extra high gain
- Improved sensitivity
- Completely shielded — 2 stage — push pull — [illegible]
- Improved [illegible]
- Completely wired and tested
- Height [illegible]

PRICE SLIGHTLY HIGHER WEST OF ROCKIES

Model A-TVB comes complete with 2 tubes (standard brands) tested and aligned on oscilloscope, operating instructions, circuit diagram, guarantee.

Size: H—4" — W—4¾" — D—4¼". Weight: 3½ lbs. Shipping weight: 5 lbs.



Approved

MODEL A-600 AC

4 TUBE MINIATURE

Broadcast Superhet Tuner

AC OPERATION

Model A-600 AC [illegible] complete with 4 tubes (standard brands) [illegible] A [illegible] and A good quality [illegible] [illegible] [illegible] Size [illegible]

Price Slightly Higher West of the Rockies

TECHNICAL SPECIFICATIONS

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

APPLICATIONS

- [illegible]
- [illegible]
- [illegible]
- [illegible]
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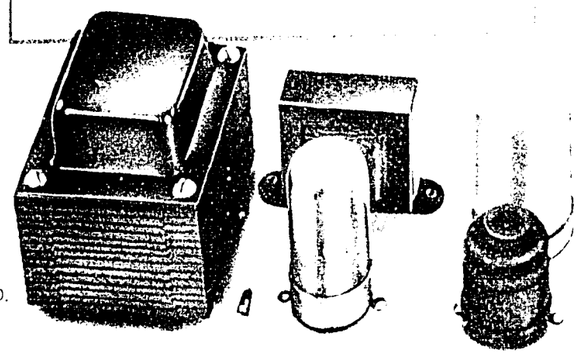
MODEL A-PS

Universal Power Supply



117 volt 60 cycles — choke filter system — power transformer electrostatically shielded — hum free. Completely isolated from power line. Rectifier tube 7Y4. Completely wired and tested including tube, instructions, circuit diagram and guarantee.

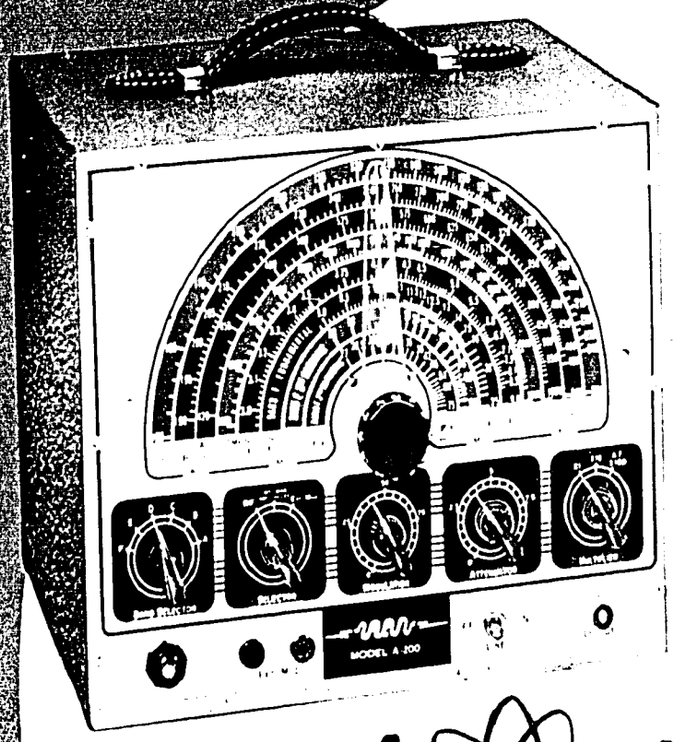
PRICE SLIGHTLY HIGHER WEST OF ROCKIES

SPECIFICATIONS

6.3 Volts @ 4 Amps
150 Volts DC @ 40 Ma.
170 Volts DC @ 20 Ma.
Chassis Size: 3½" W x 4⅝" H x 8" D.
Net Weight: 5½ lbs.

Signal Generator Kit

MODEL A-200K



COMPARE THESE OUTSTANDING FEATURES

- Large Open Face Frequency Dial.
- Only Silver Ceramic or Air Trimmers Used.
- Multicolor Frequency Dial Scales (non-glare design).
- 455 KC Position Indicated in Red.
- 8 RF Brands.
  A—100-250 Kilocycles
  B—190-500 Kilocycles
  C—420-1000 Kilocycles
  D—1000-3000 Kilocycles
  E—3.0-9.0 Megacycles
  F—9.0-2.5 Megacycles
  F_2—18-50 Megacycles
  F_3—27-75 Megacycles
- External Modulation possible at from 40 to 30,000 Cycles.
- Internal Modulation at 440 Cycles (same as WWV Standard).
- Phase Shift Audio Oscillator and Internal Modulator.
- A.C. Operation. 105 to 120 Volt. 50 to 60 Cycles.
- Extremely Low Leakage on All Bands (Power Transformer Electrostatically Shielded).
- Completely Isolated from Power Line.
- Special Wide Spacing, Low Drift "Invarmetal" Hammarlund Variable Condenser Used as Frequency Selector, Ceramic Insulation Throughout.
- 3 Step RF Attenuator.
- Continuously Variable RF-AF Fine Attenuator Control.
- Heavy Gauge Non-Warping Lucite, Fabricated Dial Pointer.
- Tubes used are as follows.
  1—6SN7—RF Oscillator
  1—6SH7—AF Oscillator and Modulator
  1—6SH7—Cathode Follower Output Stage
  1—7Y4—Rectifier
- Negligible Harmonic Output (2nd Harmonic 28 DB Down as measured against higher priced units).
- Specially Designed Ultra Stable Two Terminal RF Oscillator.
- Pilot Light Line Indicator.
- Cathode Follower Output Tube (attenuator settings have no effect whatever on frequency).
- Modulation Percentage continuously variable from front panel, internal or external, 0 to 100%.
- Co-Axial Output Lead Furnished.

Approved

MODEL A-200 K

Signal Generator Kit comes complete with 4 tubes, cables, cabinet, circuit and pictorial diagrams, operating instructions, etc. Shipping weight 25 lbs. Size: 8" x 10" x 12".

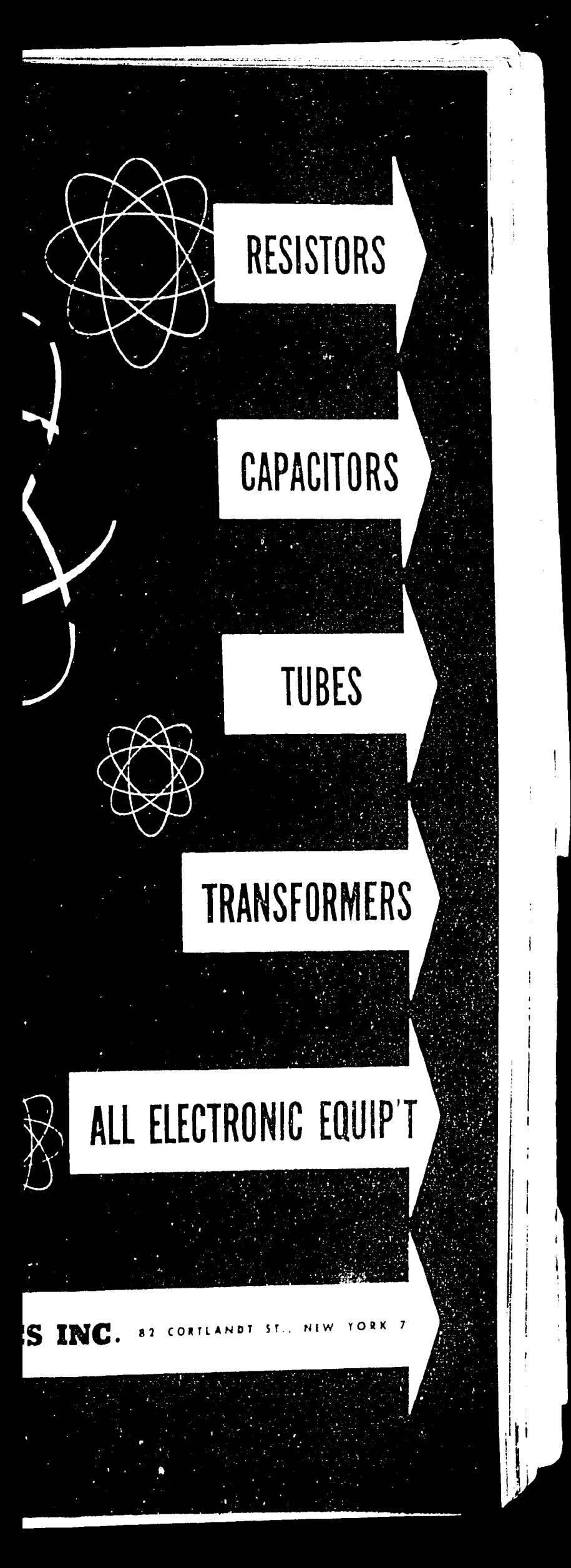
PRICE SLIGHTLY HIGHER WEST OF THE ROCKIES

this is a

PRAK-T-KAL

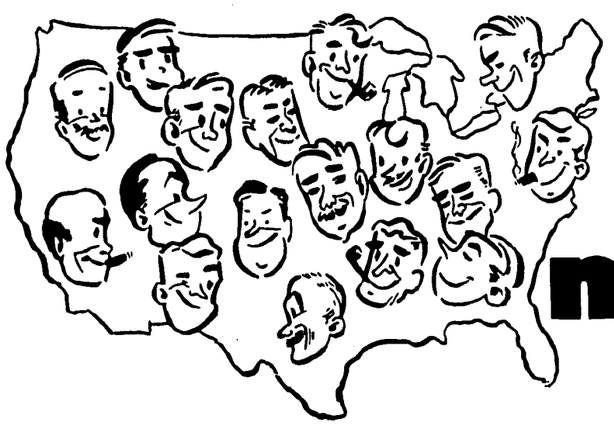
EDUCATIONAL KIT

The Model A-200 Signal Gene[illegible] is enclosed in a heavy 16-gauge steel cab[illegible] ship grey, crackle finish. Com[illegible]ete with 4 [illegible] brand) tubes, Amphenol Co[illegible]al connecting [illegible] ground cable, operating inst[illegible]ions, circuit [illegible] and guarantee. Shpg. weight [illegible] lbs. Size: [illegible]


RESISTORS
CAPACITORS
TUBES
TRANSFORMERS
ALL ELECTRONIC EQUIP'T
S INC. 82 CORTLANDT ST., NEW YORK 7

ARROW is sure to have it! New ideas and equipment are being developed daily . . . advancements that insure better results and simplify production. These new products, whether it be a new micro-miniature capacitor or a complete test equipment laboratory, are available at ARROW without waiting . . . because ARROW has always made certain to check every recent development to insure being among the first to have it.

more



and

more engineers co

Naturally...ARROW has all of them... and in substantial quantities. Our extensive and complete stocks are available at a moments notice insuring prompt delivery. You may know from your own experience the annoyance and time lost looking for either a lone component or equipment you needed in large quantities...save yourself this irritation in the future and check with ARROW first...they're sure to have it.

Any source of supply is judged by the size and diversity of its stocks . . . and ARROW has one of the largest in the country. Our 3 New York warehouses are jam packed with every conceivable type of electronic equipment, both JAN and commercial. From such supplies you can be certain that we will have anything you would want. Call, write or teletype us for your immediate requirements or future specs.

Service is another prime consideration in choosing your supply house. We pride ourselves on the speed and accuracy with which we process an order . . . a complete staff of sales technicians, warehousemen, expediters and shippers go into action immediately upon receipt of your order. With such service we couldn't help but make hordes of friends. Learn the miracle of ARROW service, where each order is treated as if it were the most important order in the house.

Of course no service can be properly executed unless handled by thoroughly experienced men and women. Each department at ARROW, whether it be Industrial, Sound, Television, Shipping or Clerical, is headed by a man, with long experience and thorough knowledge, who works with a hand-picked staff trained in the fine details of their job . . . and all give courteous and sincere attention to even the smallest request.

WRITE!
PHONE!
TELEGRAPH!
TELETYPE!
FOR WHAT YOU NEED

ARROW
ELECTRONICS

CORTLANDT ST., NEW YORK 7, N.Y. DIGBY 9-4714 TELETYPE NO. N.Y. 1-472

ARROW

WHERE TIME COUNTS...

ARROW

WHERE THE RIGHT EQUIPMENT IS IMPORTANT

HERE'S WHY

- ALL ORDERS PROCESSED IMMEDIATELY
- TREMENDOUS JAN AND COMMERCIAL STOCKS
- MODERN AND EFFICIENT SHIPPING METHODS
- PERSONNEL WITH "KNOW-HOW"
- DIRECT WIRE SERVICE THROUGHOUT THE COUNTRY

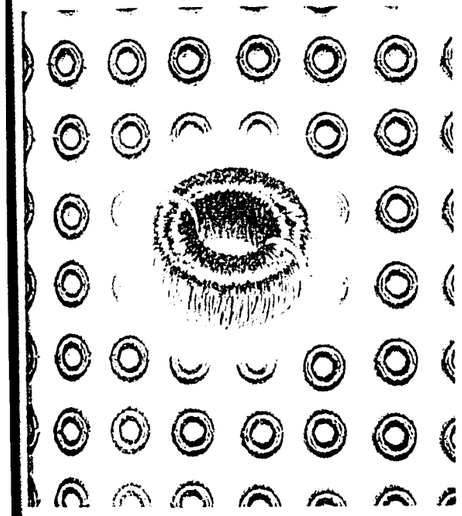
INDUSTRIAL SALES DEPT.

ARROW ELECTRONICS INC.

82 CORTLANDT ST., NEW YORK 7, N. Y. • DIGBY 9-4714

B&W

TOROIDS



B&W is equipped to design and manufacture toroidal coils in frequency ranges from 1000 cycles to 2[illegible] KC, with inductance and Q value to your specific application requirements. Sizes for these toroids range from ¾" to 3" diameter.

These coils have a specific application in low and medium frequency ranges and provide a high degree of stability vs. voltage and temperature. When required, they may be designed to compensate for conditions of extreme temperature variations.

Barker & Williamson's long background in coil design, engineering and manufacture, assures a quality product, manufactured to rigid specifications. Available in either open, cased, potted or hermetically sealed types, wound on cores having any desired properties, including the latest high permeability cores.

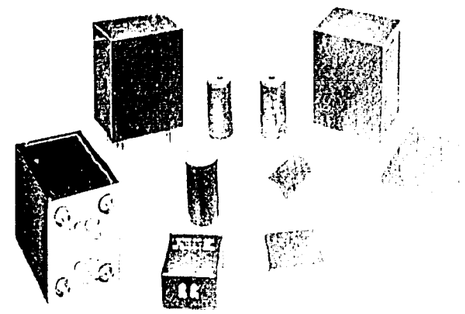
*Trade Mark

Barker & Williamson is constantly developing new and improved components for the design, engineering and manufacture of electronic components and [illegible] equipment.

Filters, Discriminators, Toroidal [illegible] many other components are utilized over the [illegible] Television and Short Wave [illegible] are designed and manufactured by [illegible] with the name [illegible] a trademark of excellence in the electronic industry.

In addition to the [illegible] B&W offers the facilities of two plants and an experienced personnel for the production of special equipment designed and manufactured to [illegible]

FILTERS — DISCRIMINATORS — SPECIAL COMPONENTS



B&W [illegible]

BARKER & WILLIAMSON

237 [illegible] FIELD AVENUE

DEPT. PR-751

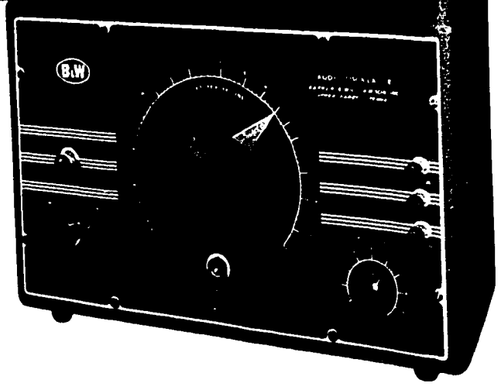
B&W TEST INSTRUMENTS

B&W AUDIO OSCILLATOR

MODEL 200

Net Price: $138.00. Dimensions: 13¾" x 7¼" x 9½"

Ideal for use in distortion measurements, frequency measurements or in any application where a stable, accurately calibrated source of frequencies between 30 and 30,000 cycles is required. No zero reset or line calibration is required. Self-contained power supply. Housed in an attractive black crackle finished steel cabinet with carrying handle and rubber feet. Panel is of 1/16" reverse etched aluminum.



FEATURES

Voltage Output: 10 volts into a 500 ohm load.

Wave Form: RMS harmonics at 3 volts on 500 ohm load less than 1% on all frequencies between 50 and 15,000 cycles.

Frequency Response: Better than ±1 D.B. from 30 to 15,000 cycles with 500 ohm load.

Stability: Better than 1%.

Calibration: ±3% of scale reading.

B&W LINEAR DETECTOR

MODEL 404

Dimensions: 8¾" x 7½" x 5"

Net Price $85.00

Provides combined RF detection and audio bridging circuits for use with any distortion meter, to measure distortion or noise in AM carriers or in balanced and unbalanced audio circuits. Includes a bridging transformer, a vacuum tube rectifier, a 40 D.B. pad adjustable in 10 D.B. steps, and a function selector switch.

FEATURES

RF Operating Range: 400 kc. to 30 mc.

Input: Single-ended; impedance 10,000 ohms.

Bridging Impedance: 6000 ohms; insertion loss 1 D.B.

Frequency: Essentially flat from 20 to 50,000 C P S.

B&W SINE WAVE CLIPPER

MODEL 250

Dimensions: 2" x 4" x 5½"

Net Price $10.00

Speeds accurate analysis of audio circuits by providing a test signal for examining transient and frequency response at a fraction of the cost of a square wave generator. Designed to be driven by an audio oscillator.

B&W DISTORTION METER

MODEL 400

Net Price: $168.00. Dimensions: 13¾" x 7¼" x 9½"

A sensitive instrument having a wide range of applications in the audio frequency measurements field. Ideal for measuring low level audio voltage and determining noise and harmonic content of same. Variable frequency selective filter provides a single frequency suppression circuit for the frequency range of 30 to 15,000 cycles. Small size, light weight and outstanding performance make this instrument an ideal unit for either laboratory or field work. Panel is of 1/16" reverse etched aluminum.

FEATURES

1. Frequency Range:

(a) Distortion meter, for fundamentals from 30 to 15,000 cycles, measuring harmonics to 45,000 cycles.

(b) As a voltmeter and D.B. meter from 30 to 45,000 cycles.

2. Sensitivity:

(a) Noise and distortion measurements, minimum input .3 volts.

(b) Voltmeter, full scale readings of .3, .1, .03, .01, .00 volts.

3. Calibration:

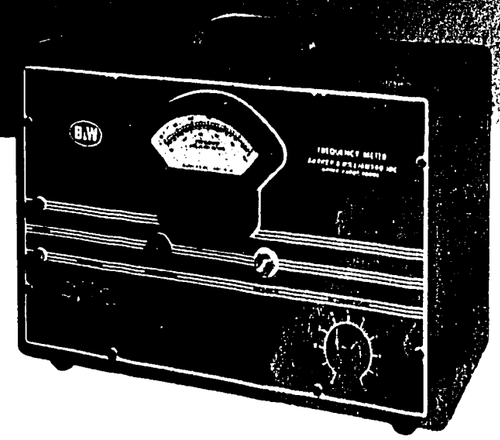
For distortion measurements: ±5 D.B. For voltage measurements ±5% of full scale at 1000 cycles.

B&W FREQUENCY METER

MODEL 300

Net Price: $126.00.

Dimensions: 13¾" x 7¼" x 9½"



An accurate and convenient means of making direct measurements of unknown audio frequencies up to 30,000 cycles. Integral power supply. Extremely useful for routine checking of audio oscillators or tone generators. Housed in an attractive black crackle finished steel cabinet with carrying handle and rubber feet. Panel is of 1/16" reverse etched aluminum.

FEATURES

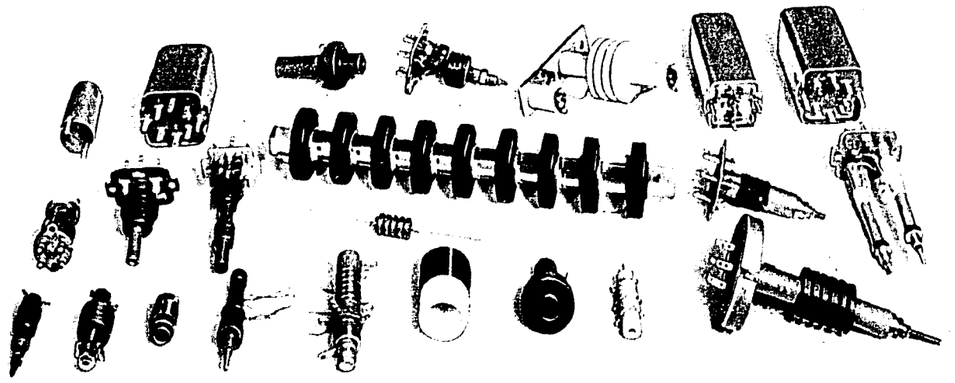
Frequency Range: 0 to 30,000 cycles in 6 ranges.

Sensitivity: Minimum .25 volts input.

Wave Form: Will operate on any wave form with peak ratios of less than 8 to 1.

Calibration: When referenced against 60 cycles line frequency, all other frequencies will fall within 5%.

B&W INDUSTRIAL COILS



- Single layer solenoid coils
- Universal wound coils of single, multiple pie, and progressive construction
- RF, IF, and Oscillator Coils
- Traps, Discriminators, Filters, RF and Delay Line Chokes

These are but a few of the many types of industrial coils which can be designed and built to answer your specific needs.

Whether your problems are in the research, design, development, or production stage . . . in electronics, television, radio broadcasting, or radio communications . . . you'll find the complete facilities of Barker & Williamson ready, willing and able to answer your coil problems. Distinctive production methods make it possible for us to fulfill your specifications no matter how exacting, no matter how long the production run.

A PARTIAL LIST OF EQUIPMENT B&W HAS DESIGNED AND MANUFACTURED OR IS EQUIPPED TO MANUFACTURE

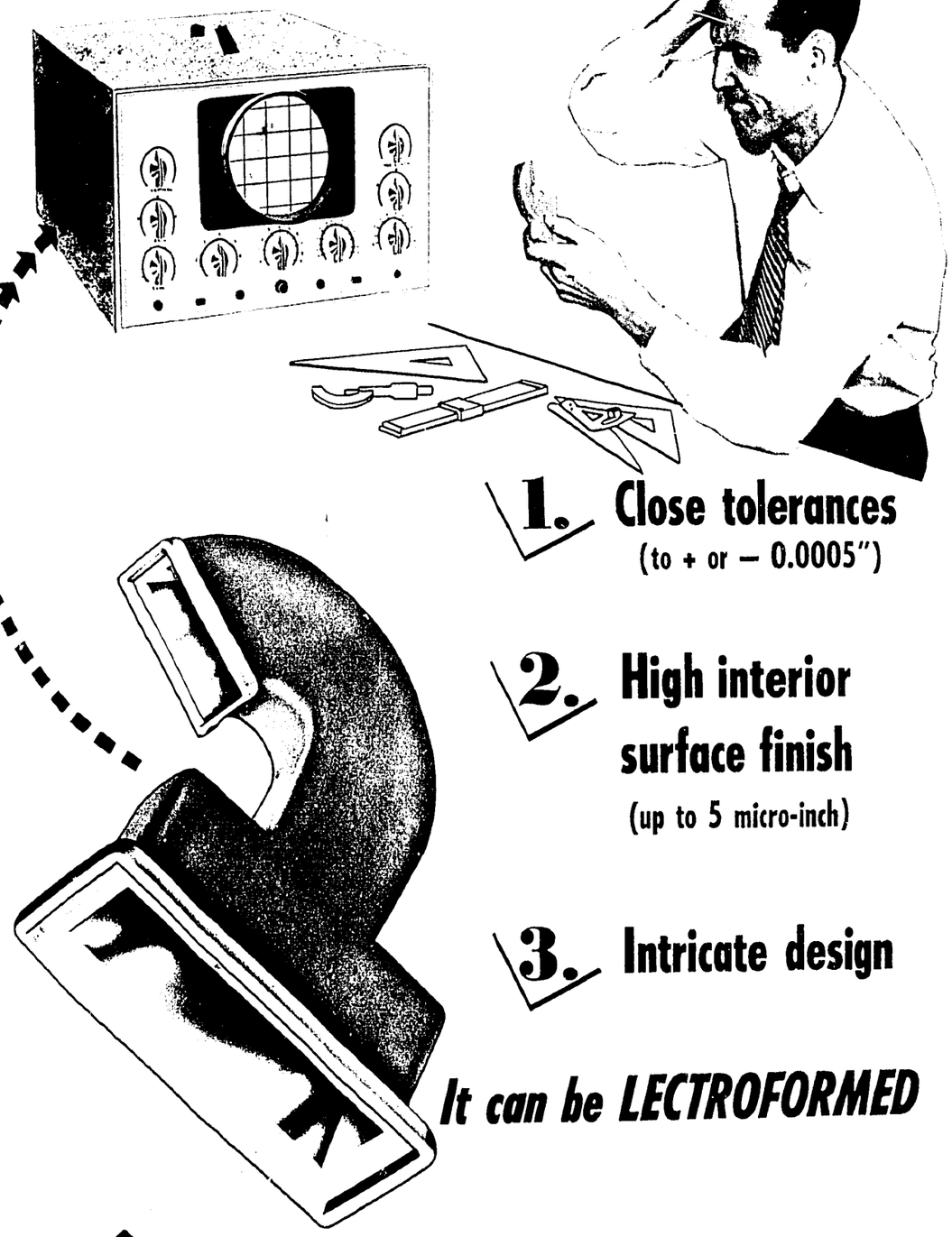
SPECIAL EQUIPMENT: Complete Systems V.H.F. Radio Relay Equipment • Complete Systems Mobile Frequency Shift Radio Teletype Equipment • Complete Systems Point-to-Point Frequency Shift Radio Teletype • Radio Transmitters, Low, Medium and High Power • High Power R. F. Amplifier • Frequency Shift Teletype Exciter Units, M.O. or Xtal (T-) Types) Dual Diversity Teletype Receiver Converters • Single Channel Teletype Receiver Converters • Control units for Teletype Communications Systems • Direction Finding Equipme- • TEST **EQUIPMENT:** Audio Oscillators • Distortion Meters • Audio Frequency Meters • Sine Wave Clippers • Comparison Oscilloscopes with circular sweep • Impedance M-asuring equipment • R.F. Signal Generators • Crystal Comparators • Special Purpose Test and Measuring equipment • **COMPONENTS:** Toroidal Coils • Intermediate Frequency and R. F. Transformer Assemblies • Oscillator Coils • Special R.F. and Audio Filter Units • Radio Frequency Chokes • Air Wound Inductors • Transmitting Condensers (Va- able air) Frequency Multipliers • Band Switching Turrets • Rotory Coils • Antenna Tuning Networks, etc., • Switching Boxes • Accessories • **MISCELLANEOUS:** Automatic Ra- • Alarms A.F. Amplifiers • Audio Attenuators • Antennas (all types) • Capacitors (AIR Fixed and Variable) • Computers (other than Radar) • Counters • Coupling Units Antenn- • Dials Electronic Navigational Aids, Long Range, Short Range • Filters, A.F. and R. F. • Forms—Coil • Frequency Shift Keyers • Generators, A.F. Signal, R.F. Signal, Pulse a- • Sweep Induction Heating Equipment • Industrial Electronic Systems • Infrared Equipment • Precision Frequency Control Equipment for Radio Transmitters • Radar Sub-A- emblies, Electrical Development, Electronic production, Mechanical production • Radio Communication Systems • Radio Frequency Amplifiers • Radio Relay links • Radiosond- • Radio Receiving Equipment • Remote Control Equipment • Remote Control Units and Adaptor for Radio Transmitters • Servo Units, Control Amplifiers, Control Drive Units • Sw- hboards Telemetering Equipment • Telegraph Electronic Equipment • Timer electric frequency dividers • Transmitters, Accessory Equipment • Transmitters (large shore transmitters up to 50 KW) • Transmitters and Tranceivers (Shipboard and small shore) • Transmitting/Receiving Equipment (Portable, Engineering and Rescue) Transmitting/Receiving Equipment (Portable and Transportable) • Transmitter (Countermeasures).

Printed in U.S.A.

Form 751—23M

BARKER & WILLIAMSON, INC.

237 FAIRFIELD AVENUE — UPPER DARBY, PENNA.



1. Close tolerances
(to + or — 0.0005")

2. High interior surface finish
(up to 5 micro-inch)

3. Intricate design

It can be LECTROFORMED

PIONEERS IN PRECISION LECTROFORMING

BART LABORATORIES CO., INC.

227 Main Street, Belleville 9, New Jersey

Intricate Parts and Precision Components can be

The art of LECTROFORMING* and its contribution to industry was extensively developed by BART LABORATORIES during World War II.

Intricate parts such as Sonar feed tubes requiring extremely close tolerances and high interior surface finish were developed and mass produced by BART LABORATORIES. Since that time, many applications and new techniques have been found to serve the electronic industry.

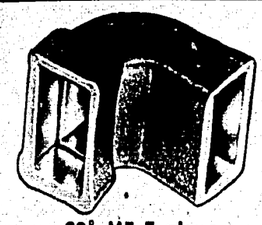
Precision equipment designed by engineers to close tolerances are reproduced with extreme exactness by LECTROFORMING. BART LABORATORIES is now producing many parts of intricate design, accurate interior dimensions and with high interior surface finish up to 5 RMS. For specific applications combinations of metals may be used such as silver, gold, copper, nickel and iron — for conductivity, strength and corrosion resistance. LECTROFORMING assures close tolerances otherwise impossible by any other process. Many precision parts can be made faster and more economically than by other methods.

LECTROFORMING can answer most difficult problems.

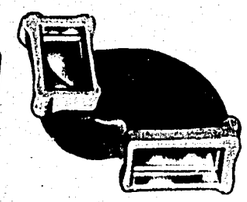
We invite your inquiries.

BART LABORATORIES CO., Inc.
227 Main Street, Belleville 9, New Jersey

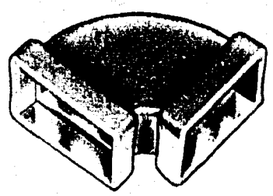
Various sized wave guide antennae



90° MF E plane wave guide elbow

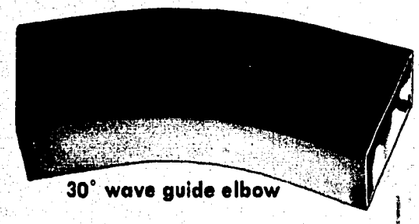


Double 90° wave guide bend

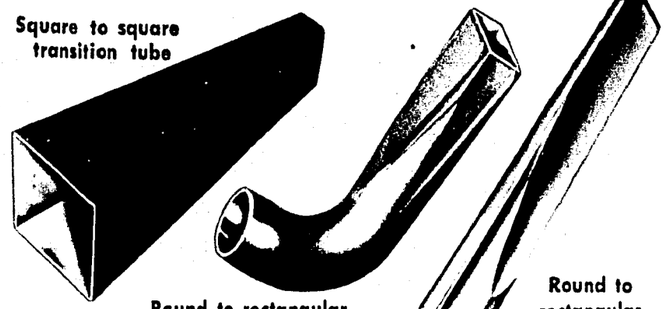


90° H bend

Cavities for wave guide tuning



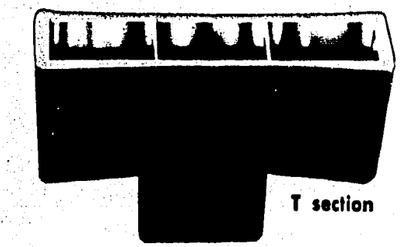
30° wave guide elbow



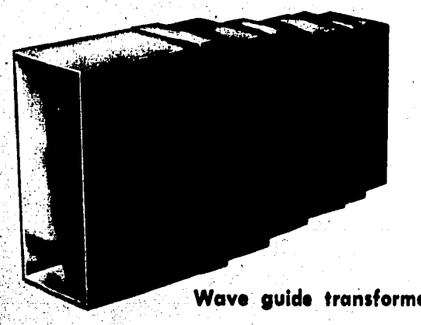
Square to square transition tube

Round to rectangular transition elbow

Round to rectangular sonar feed tube

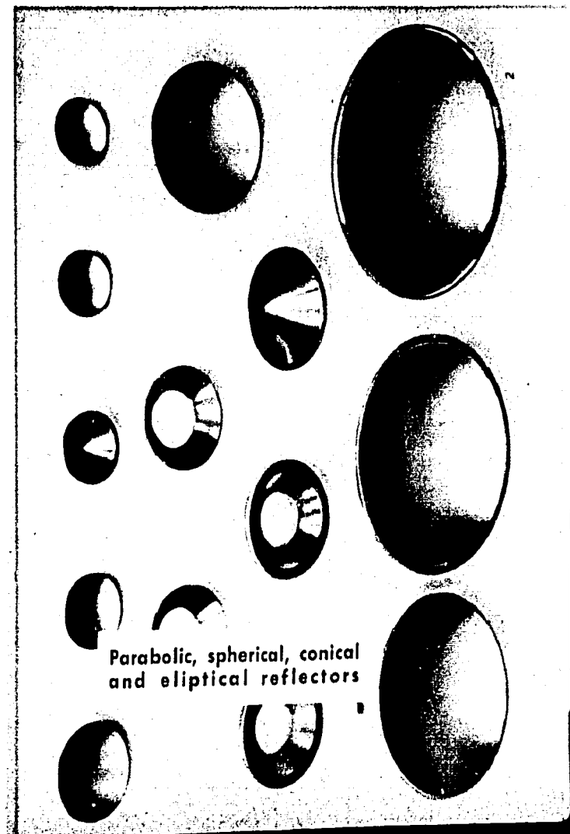


T section



Wave guide transformer

LECTROFORMING is a special process of manufacture, developed by BART LABORATORIES. The principle employs the fundamentals of electroforming. The electrodeposition of metal on a form of predetermined size, shape, accuracy and finish. AFTER COMPLETION NO ADDITIONAL MACHINING TAKES PLACE TO ALTER ITS INTERIOR PRECISION.



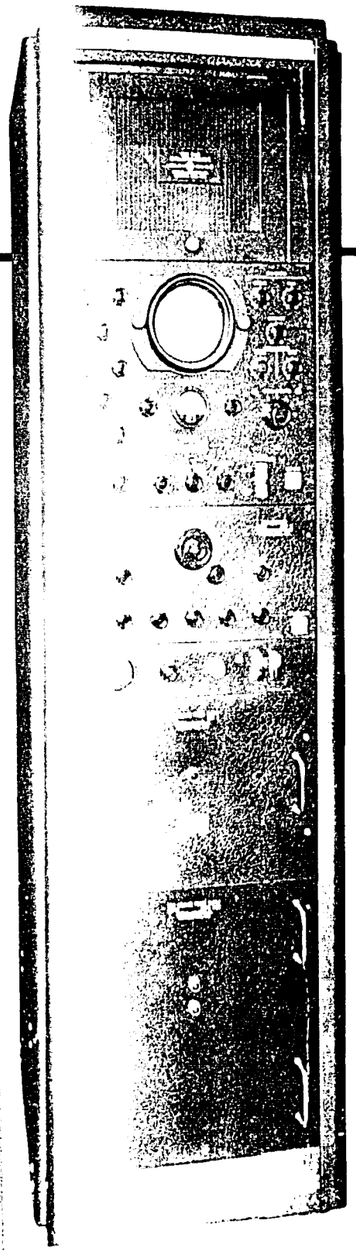
Parabolic, spherical, conical and eliptical reflectors

BART engineers and master craftsmen producing an intricate component for Reaction Motors Co.

lectronic design engineers of America's foremost manufacturers are using more LECTROFORMED components than ever because designs can be produced to THEIR requirements without compromise and still hold the degree of perfection they demand.

BART LABORATORIES CO., Inc.

227 Main Street, Belleville 9, New Jersey



RADIO ELECTRONIC EQUIPMENT

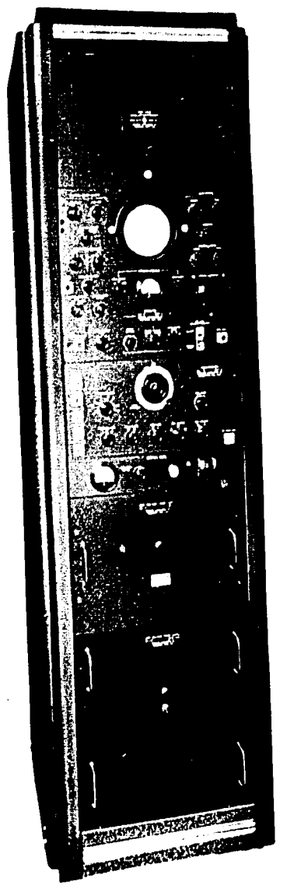
Engineered

FOR ENGINEERS

BROWNING LA... WINC...

BROWNING INSTRUMENTS *Precisioneered* FOR EFFICIENT PERFORMANCE

OSCILLOSYNCHROSCOPE MODEL OJ-17



This instrument meets the demand for an oscillosynchroscope producing satisfactory traces in high-speed pulse work. The 'scope, synchronizer, high-voltage power supply, low-voltage power supply, and control panel are mounted in a rack cabinet on casters with space at the top for a Fairchild Oscillo-record camera.

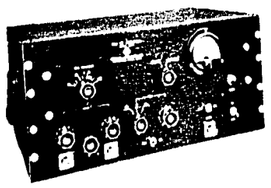
Vertical amplifier band width—16 mc; deflection sensitivity—.05 volts/inch at maximum gain; video delay circuit with delay of 0.2 microsecond. Horizontal amplifier: band width 2 mc; deflection sensitivity .25 volts/inch at maximum gain. Uses 5RP or 5XP with anode voltage variable from 10 to 20 KV. Driven sweep: 0.05 to 500 microseconds per inch; may be triggered from (1) external pulses of 0.1 volt or higher, (2) video amplifier signals, (3) scope trigger generator. Sawtooth recurrent sweep: 5 to 500,000 cycles per second. Trigger generator: pos... and negative output of 100 volts from $00 ... running rate — 20-20,000 cps. Markers: ... internal blanking or deflection type: 0.1, 10... 100 microsecond ranges. Blanking: external ... nection to grid provided. Variable delay ... operates from internal trigger generator or ... ternal sync.; provides positive and negative ... layed output triggers; may be used to ... sweep from external sync. or internal ... generator. Delay continuously variable to ... microseconds. Adjusts by 4-1/2", directly ... ibrated dial. Voltage calibration circuit ... ures input signals by substituting voltages ... form of 1000-cycle square waves. Size: ... x 25-3/8" x 24". Weight: 500 lbs.; ... weight: 750 lbs.

$5000.00

OSCILLOSYNCHROSCOPE MODEL OL-23

The specifications of this new oscillosynchroscope will be announced about Dec. 1, 1951.

MODEL TAA-16A AMPLIFIER



High-gain AC voltmeter for measurement of standing wave ratios with slotted lines.
Range: 500-5000 cps. — broadband or selective controls on front panel; 15 microvolt sensitivity in broadband position and 10 microvolts in selective position. Input tube shock mounted for low microphonics. Meter scales 0-10 and standing-wave voltage ratio. Panel switch for bolometer voltage application. Master gain control switch provides attenuation factors of 1, 10 and 100. 115-volt, 50/60 cycle, regulated power supply. Rack panel in black wrinkle steel cabinet, 9" x 20" x 12". Weight 30-1/2 lbs. Shipping weight 45 lbs.

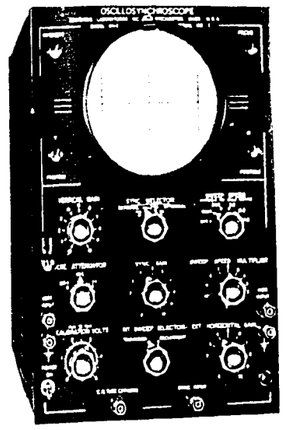
$415.00

MODEL TVN-7 POWER SUPPLY and SQUARE WAVE MODULA...

The basis of a signal generator in the super-high-frequency range. Square-wave modulator for low-powered velocity-modulated tubes such as the 417A, 2K28 and 2K25.

Regulated cathode voltage continuously va... able 280 to ... volts; provision is made for 180 to 300 volt ra... e. Reflector ... tage 15 to 150 volts, controllable from panel. ... rovision is ... for grid pulse modulation or reflector pulse mod... tion. Grid ... amplitude 60 volts; reflector pulse voltage 1... volts maxim... Square-wave modulation frequency 600 to 250... cycles, with ... vision for external modulation. 115 volts, 50/... cycle opera... Designed for rack mounting; cabinet extra. ... " x 19" x 1... Weight 33 lbs. Shipping weight 50 lbs. $16...

OSCILLOSYNCHROSCOPE — MODEL ON-5

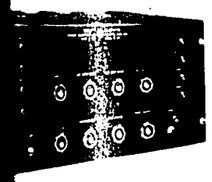


An exceptionally flexible, low-cost instrument for basic laboratory equipment in pulse work.

...SUP1 operates at accelerating potential of 2600 volts. Trig...gered or recurrent sweep: writing rate continuously variable ...rom 1.0 to 25,000 microseconds per inch; sweep speed con...trols directly calibrated; sweep starting time approximately 0.1 ...icrosecond; sweep may be triggered (or synchronized when ...perated as recurrent sawtooth) by positive or negative sine ...ave or pulse signals of 0.5 volts (external) or 0.75 inches ...eflection (from vertical amplifier). Vertical amplifier: flat with...n 3 db. from 5 cycles to 5 megacycles per second with deflec...on sensitivity of 0.075 volts RMS for one-inch deflection, at ...aximum gain; three-step attenuator for gain control 1:1, 10:1, ...nd 100:1 — plus continuous intermediate coverage. Horizontal ...mplifier: operates from 500 KC down to DC.; deflection sensi...ivity is 2.0 volts RMS per inch. Peak-to-peak vertical calibra...on voltages of 0-2, 0-20, and 0-200 switch selected; accuracy ...10%. Front-panel cathode connection allows external blank...ng or marker connection. Direct connection to all deflection ...lates. 115 volt, 50/60 cycle operation. Dimensions: 10" wide, ...4-1/2" high, 16-3/4" deep. Weight: 50 lbs; shipping weight: ...0 lbs.

$485.00

SWEEP CALIBRATOR — MODEL GL-22A



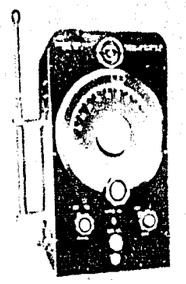
A reliable source of timing markers for the measurement of sweep intervals with oscilloscopes and synchroscopes.

Markers of 0.1, 1.0, 10, 100 microseconds either positive or negative with variable amplitude to 50 volts. Variable-width, variable-amplitude gate for blanking or timing. Trigger generator has positive and negative outputs. Markers may be initiated from external trigger or from ...nal generator ... May be synchronized with triggers up to 100 KC. ...ition rate. A... output connections on front panel. Voltage regula... to timing ci... ts. 115 volt, 50/60 cycle operation. Rack panel ... 8-3/4" x 19... x 10-1/8". Weight: 21 pounds. Shipping weight: ...ounds.

Rack panel ...yle	$285.00
Cabinet sty...	295.00

FREQUENCY METERS

MODEL S-4



Custom-built and hand-calibrated for up to five specified frequencies, from 1.5 to 70 mc. AM or FM. Accuracy: .0025% of specified frequency.
One Band — $170.00
Each Addition Band — $20.00

MODEL S-6

General coverage frequency meter for measurements between 100 kc and 50 mc. Accuracy: .025%. Audio detection of zero beat. $195.00

MODEL S-7

Custom-built, hand-calibrated for one or two frequencies in the 72-76 and/or 152-162 mc bands. Thus one meter may be used to check both central and mobile units. Aural indication of zero beat. Accuracy: .0025% of specified frequency with proper pre-checking.

One Band . . .	$195.00
Two Band . . .	220.00

FM MODULATION MONITOR MD-25A

For monitoring modulation of all fixed or mobile FM transmitters in the 30-162 mc. bands; simple, inexpensive means for compliance with FCC regulations on carrier swing and for reduction of channel interference. Coverage — 30-40, 40-50, 72-76, 152-162 mc. Flasher — indicates peak modulation (peak carrier deviation) in excess of 15 kc. Panel meter indicates modulation swing to 20 kc. Sensitivity approximately 1 millivolt at antenna. $245.00

The information given in this brochure is designed to give you only the highlights on Browning equipment. Data sheets are available giving complete details on features, circuit design, and operation. You may have them upon request.

BROWNING LABORATORIES, INC. - WINCHESTER, MASS.

15526

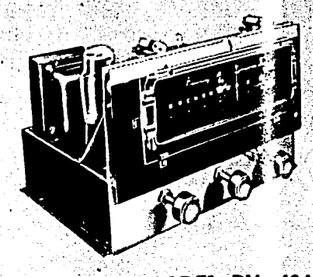
Printed in U.S.A.

Engineered
FOR ENGINEERS

Data sheets are available giving detailed information about each of these tuners. Performance curves, also, will be furnished at your request.

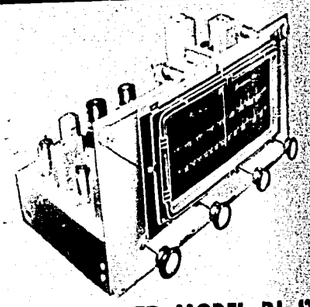
BROWNING
LABORATORIES INC.

In Canada, address Measurement Engineering, Ltd.
Arnprior, Ontario



FM TUNER MODEL RV - 10A

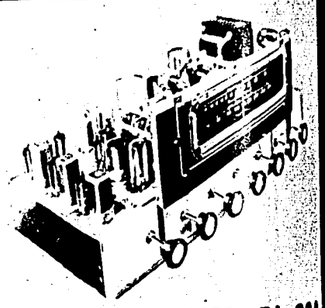
Small, compact, easily mounted high-fidelity FM tuner. A... strong circuit. Drift compensated. Audio response flat f... 15 to 15,000 cycles ± 1-½ db. Self-contained power supp...
Model RV-11A (Rack Pan...



FM - AM TUNER MODEL RJ - 12B

Easy-to-install, highly sensitive tuner for distortion-free FM r... ception and quality AM reception. Armstrong FM circuit. A... compensated. FM audio response flat from 20 to 15,000 cy... within ± 1-½ db. AM audio response flat from 20 to 4... cycles within ± 3 db. Triple-tuned IF transformers.

Model RJ-14B (Rack Pan...



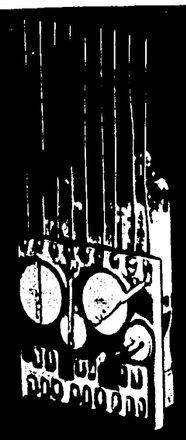
FM - AM TUNER MODEL RJ - 20A

High fidelity in both AM and FM broadcast bands. ... quieting with 6-½ microvolts on FM. Sensitivity of 5 mic... volts on AM. Armstrong FM circuit. Drift compensated. Tu... and bass controls. Variable bandwidth AM IF system gi... full 9 KC bandwidth on broad position and 4 KC on nar... position. FM audio response flat from 15 to 15,000 cycles ... 1-½ db. 100,000 ohm output impedence. Self contained p... supply. Either 300 or 72 ohm input for FM ... (Model RJ-22A) (Rack Panel)

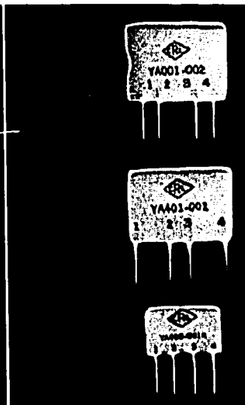
AUTOMATIC FREQUENCY CONTROL ... be switched ON or OFF at the listener's ... included in the FM circuits of all Browning ...

Look to Centralab
DIVISION OF GLOBE-UNION INC., MILWAUKEE, WIS.

Save space, simplify manufacture, step-up production with Centralab's "Printed Electronic Circuits"!

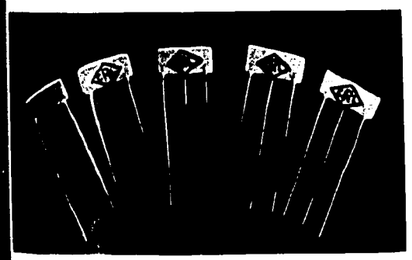


AMPEC
A highly efficient, dependable 3 stage audio amplifier. Can be designed for hearing aids, mike preamps or any amplifier application where small size, high efficiency and reliability is required.

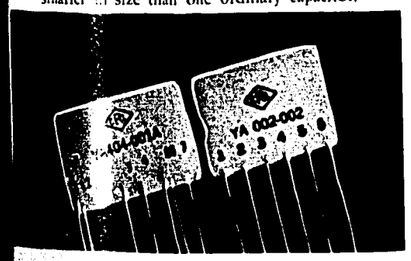


TRIODE COUPLATES
An assembly of 3 capacitors and two resistors bonded to a dielectric ceramic plate. This one unit replaces 5 components normally used in audio circuits, thus saving space and many soldered connections—speeds production!

VERTICAL INTEGRATORS
Vertical integrator for TV application 3 resistors and 3 capacitors bonded to a small 3 lead ceramic plate.



FILPECS — Diode load filters consisting of two capacitors and one resistor — capacitor and resistor plates — lighter in weight, smaller in size than one ordinary capacitor.



AUDET (left)—An audio-detector plate furnishing values of all components which generally comprise the out-put stage of AC-DC radio receivers. 4 capacitors, 3 resistors on a small 7 lead plate.

PENTODE COUPLATE (right) — A complete pentode interstage coupling circuit. Consisting of 3 capacitors, 3 resistors on a 6 lead plate.

For use where miniature size is of utmost importance, more and more manufacturers of electronic equipment are turning to CRL Printed Electronic Circuits because they combine ruggedness, dependability and resistance to humidity in one small unit package.

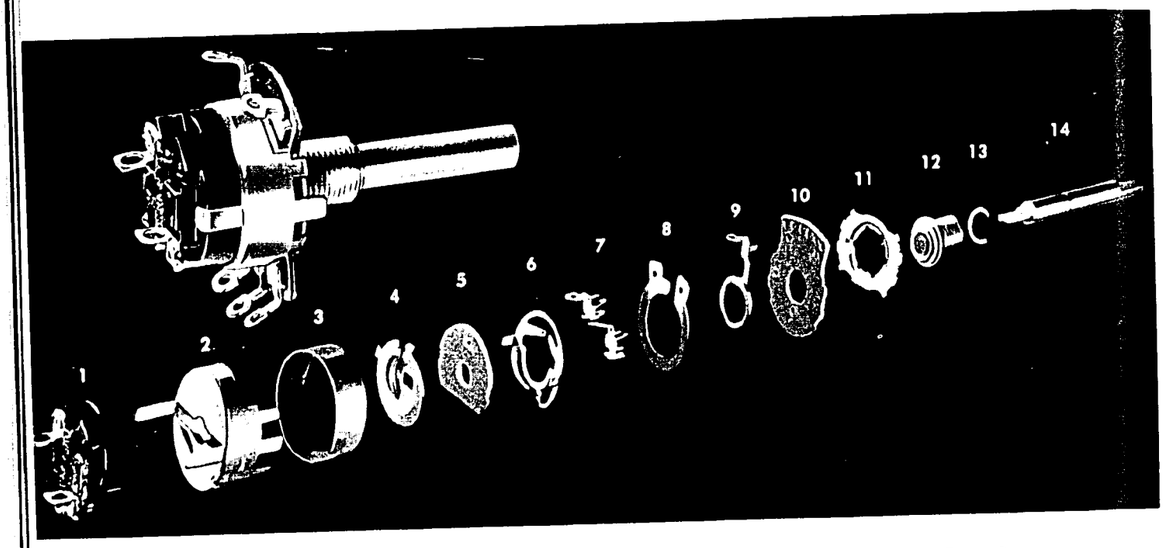
WORKING with your engineers, Centralab may be able to fit its Printed Electronic Circuit to your specific needs.

Integral Ceramic Construction: Each CRL Printed Electronic Circuit is an integral assembly of "Hi-Kap" capacitors ... sistors, closely bonded to a steatite ceramic plate and ... connected by means of metallic silver paths, "printed" on the base plate. All leads are always the same length, each plate is an exact duplicate of the original or "master."

Write to Centralab for complete information on this important new electronic development, or get in touch with your nearest Centralab representative.

Look to Centralab®

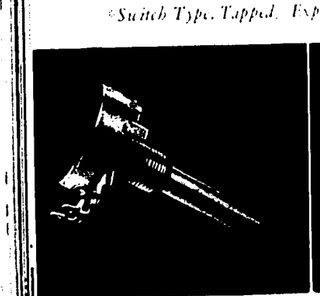
CENTRALAB'S MODEL 2 RADIOHM



Model 2 Radiohm's 14 Points of Superiority

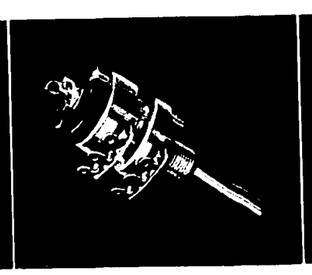
1. **Switch** — with positive detent in both on and off positions. **Terminals** — with surfaces elevated to eliminate danger of shorting to cover legs . . . 1/8" hole diameter for simplified wiring . . . hot tin dipped for easy soldering . . . mechanical lock to prevent loosening in soldering operations.
2. Cadmium plated steel **cover** completely shields resistor.
3. **Insulator's** high dielectric strength permits breakdown test at 1000 volts R. M. S. Dust and dirt can't get in.
4. **Stop,** of cup design, provides superior switch shielding . . . gives you excellent torque strength without distortion.
5. High grade laminated phenolic **shoe** maintains high insulation resistance under humidity conditions.
6. Contact Spring gives you double wiping contacts on both resistor and center terminal ring . . . is accurately formed to maintain uniform pressures and minimize noise.
7. Electro tin-plated **terminals** provide soldering ease. Tightly crimped terminals give you direct contact to resistor . . . assure constant contact under humidity and soldering conditions.
8. **Resistor** is made of special resistance material bonded to high quality phenolic for smooth operation, low noise level, outstanding humidity characteristics.
9. Cadmium-tipped **center terminal** provides easy soldering . . . good shelf life without oxidation. Adequately lubricated for good rotation life, center terminal is finished to give you smooth take-off . . . minimum noise.
10. Laminated phenolic **base** maintains high insulation resistance under humidity conditions.
11. Cadmium-plated steel **ground plate** assures positive grounded cover.
12. Cadmium-plated steel **bushing** is accurately finished and fit to shaft for smooth rotation.
13. **Retaining ring.**
14. **Shaft.** Unlimited variations available to meet your specifications.

Switch Type, Tapped. Exploded View: Switch Type, Untapped.

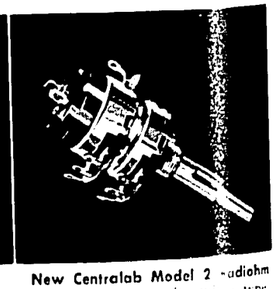


New Centralab Model 2 Radiohm Control — single unit plain type, untapped; with single shaft.

New Centralab Model 2 Radiohm Control—control shown is a single unit switch type, tapped. Control has single shaft.



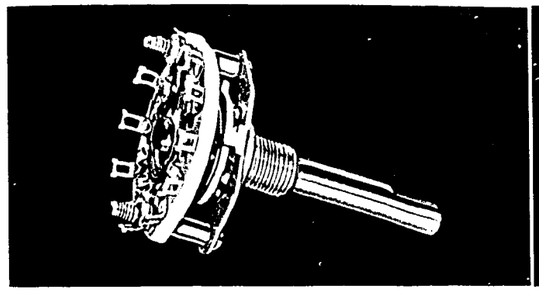
New Centralab Model 2 Radiohm Control — this control is a twin unit switch type, untapped. It has a single shaft.



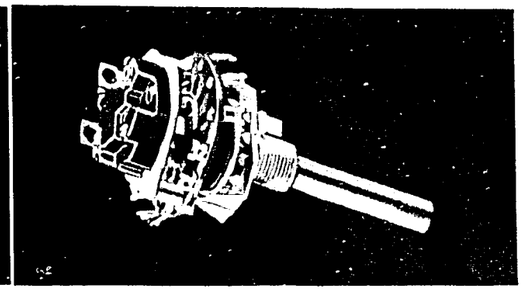
New Centralab Model 2 Radiohm Control — twin unit switch type, rear section tapped. Units are concentric shafts.

First in component research that means lower costs for the electronic industry!

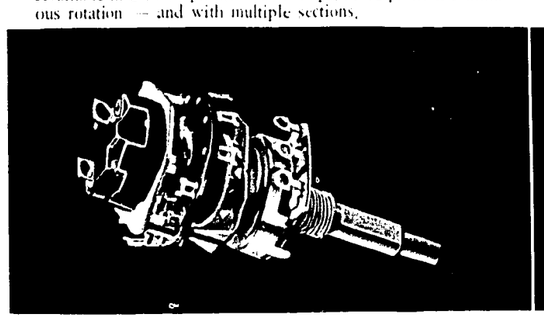
CENTRALAB'S NEW MINIATURE ROTARY SWITCH



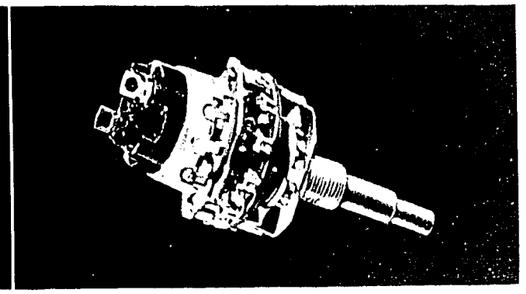
New Centralab Series 20 miniature single steatite section switch Available in 2 to 11 positions with stops, or 12 position continuous rotation — and with multiple sections.



Here's standard Series 20 miniature switch — plain [illegible] with off-on switch added. Standard shaft. Also available with multiple sections.



Combination Series 30 miniature switch unit with dual concentric shaft — permits independent operation of miniature switch including off-on switch, and Model 2 variable resistor.



Same combination Series 30 unit as the [illegible] Model 2 variable resistor is [illegible] Position of resistor provides [illegible]

Now Centralab offers a completely new, unusually small rotary switch line — available in a variety of multi-pole, multi-position, multi-section models and in combination with line switches and variable resistors.

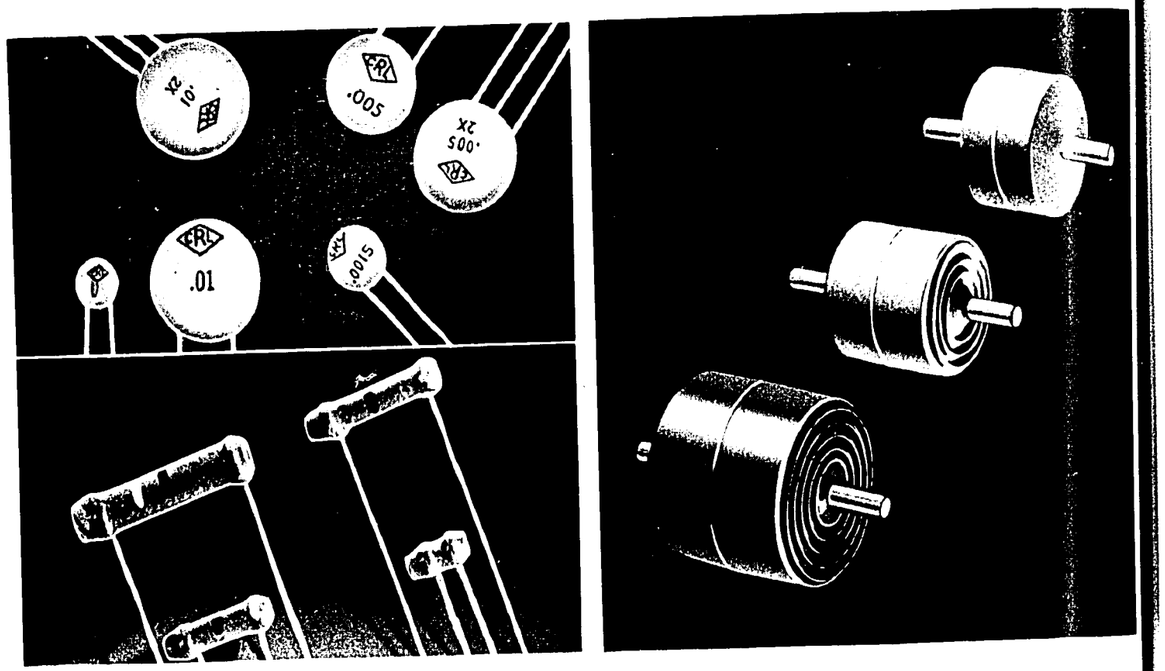
New Centralab Miniature Switches Give You Top-Quality Construction & Performance

Centralab's new Series 20 and Series 30 miniature switches have every quality-construction feature every quality-performance characteristic as furnished with the larger standard size Centralab switch line. Clips and contacts are spring brass with heavy silver plating or coin silver. All other metal parts are adequately plated to meet commercial or government specifications. Sections are finest quality laminated phenolic or Centralab's own grade L-5 Steatite. Switches have positive 30° indexing, available in 2 to 11 positions with stops, or 12 position continuous rotation — and with multiple sections. Also available with plain or dual concentric shafts, attached line switches, and in combination with famous Model 2 Radiohm variable resistors mounted either at front or rear of switch according to wiring need.

If your prime consideration in modern electronic [illegible] performance and [illegible] facts on these [illegible] Series 30 miniature [illegible] Centralab. You'll find [illegible] among the world's [illegible] most reliable [illegible] size, plus the [illegible] and industry engineers [illegible] Centralab Division [illegible] E. Keefe Avenue, Milwaukee 1, Wis.

Centralab Ceramics

YOUR MOST PERMANENT-TYPE CAPACITORS



Choose from the world's widest line of disc and tubular ceramic capacitors

Ceramic capacitors are a well established necessity for the exacting requirements of television and radio circuits. They offer a permanence — a freedom from service troubles — not obtainable with old style paper or mica condensers.

Centralab not only introduced ceramic capacitors, but has constantly devoted more research and larger laboratory and production facilities to this field, than any other firm. Research has included experimentation with over 20,000 different ceramic compounds, of which all but 250 have been discarded. With these 250, a wide variety of formulas has been perfected for highest standards of capacitor performance.

Special advantages of ceramic capacitors —

Highest dependability — The most permanent type of capacitor.

Space saving — Ceramic capacitors are generally less than 1/7 the size of ordinary condensers.

Impervious to moisture — Centralab's Ceramic-X, used for the ceramic body, is nonhygroscopic. Moisture absorption is .00% or less.

Excellent under high temperatures — 80° C. will not harm the ceramic capacitor. High capacity is well maintained under wide temperature variants.

Low power factor — initial, 6%. After 100 hours at 95% humidity, 3%, and will return to normal.

High accuracy — Ceramic capacitors of unusually close tolerance can be supplied for many values.

Temperature compensating qualities — For FM circuits, where frequency drift is critical, and likely to be caused by temperature changes, stabilization can generally be effected by application of temperature compensating capacitors.

New Centralab "HI-VO-KAPS" offer you high voltage ceramic capacitors for television circuits

Designed and developed by Centralab, *Hi-Vo-Kaps* combine high voltage, small size and a variety of terminal connections to fit virtually any television application. The new additions to CRL's line are for use as filter by-pass capacitors in video amplifiers for high DC voltages and small component AC voltages (not for use in peaking compensation or resonant circuits).

Integral Ceramic-X construction features positive protection to moisture, solid brass terminals, soldered direct electrodes...metallic silver electrodes fired directly to the dielectric constant Ceramic-X . . . low loss, mineral paint coating. For complete information write for Bulletin 1R-1-5.

Ratings: Type A — 30,000 WVDC, 40,000 VDC test. Capacity 500 mmf. Diameter 1.4" max., length 1.250". Overall length 2 1/4" max.

Type B — 20,000 WVDC, 30,000 VDC test. Capacity 500 mmf. Diameter 1" max., length .750". Overall length .9" max.

Type C — 10,000 WVDC, 15,000 VDC test. Capacity 500 mmf. Diameter 1" max., length .750". Overall length 1.75" max.

Centralab introduced carbon controls to the radio industry 25 years ago! Today, there's no substitute for Centralab control research and development.

Centralab
Division of GLOBE-UNION INC.
934 East Keefe Avenue
Milwaukee 1, Wisconsin

CONTROLS

BLUE SHAFT RADIOHMS

MODEL "A" RADIOHMS STANDARD SINGLE CONTROLS

ADAMANT RADIOHMS

Cat. No. Plain	Cat. No. Switch	Ohms	Watts	Type	List Price
B	B				
B	B				
B	B				

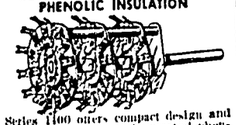
SWITCHES

Centralab®

Division of GLOBE-UNION INC.
934 East Keefe Avenue
Milwaukee 1, Wisconsin

Centralab offers a complete line of switches to meet nearly every low-power and medium duty requirement.

ROTARY SELECTOR SWITCHES PHENOLIC INSULATION



Series 1400 offers compact design and quality construction. Laminated phenolic insulation. Mtg. bushing, ⅜" x 32 thread, ⅜" long. Shaft, 1¾" long. Index, positive, 30°. Adjustable stop. Revisions are easily made, if later required, due to availability of all parts separately. See listing under hardware. Packaged with mtg. nut, lockwasher and 1¼" black bar knob.

Cat. No.	Poles per Sec.	Tot. Sec.	Positions	List Price
SHORTING CONTACTS (make before break)				
1400	1	1	2 to 6	$1.25
1402	1	1	2 to 11	1.50
1404	2	1	2 to 5	1.50
1406	3	1	2 to 3	1.75
1408	4	1	2	1.75
1410	1	2	2 to 6	2.00
1412	1	2	2 to 11	2.25
1414	2	2	2 to 5	2.50
1416	3	2	2 to 3	2.75
1418	4	2	2	2.75
1420	1	3	2 to 6	2.75
1422	1	3	2 to 11	3.00
1424	2	3	2 to 5	3.25
1426	1	4	2 to 6	3.50
1428	1	4	2 to 11	3.75
1430	2	4	2 to 5	4.50
NON-SHORTING (break before make)				
1401	1	1	2 to 6	1.25
1403	1	1	2 to 11	1.50
1405	2	1	2 to 5	1.50
1407	3	1	2 to 3	1.75
1409	4	1	2	1.75
1411	1	2	2 to 6	2.00
1413	1	2	2 to 11	2.25
1415	2	2	2 to 5	2.50
1417	3	2	2 to 3	2.75
1419	4	2	2	2.75
1421	1	3	2 to 6	3.00
1423	1	3	2 to 11	3.25
1425	2	3	2 to 5	3.50
1427	1	4	2 to 6	3.50
1429	1	4	2 to 11	3.75
1431	2	4	2 to 5	4.50

PHENOLIC SECTIONS FOR 1400 SERIES

Cat. No.	Cat. No. Non-Shorting	Poles	Positions	List Price
A	H	1	2 to 6	$ .50
B	J	1	2 to 11	.75
C	K	2	2 to 5	.75
D	L	3	2 to 3	1.00
E	M	4	2	1.00
EE		4	2 to 3	1.50
F	1	1	2 to 5	.75
	Unused contacts on one side of common connected and shorted out.			
G		1	2 to 10	1.00
	All unused contacts connected and shorted out.			
N	Combine N and P for resistance decade switch			.75
P				.75
	Special section for capacitance decade switch			
Q				.75

ROTARY SELECTOR SWITCHES STEATITE INSULATION

2500 Series Switches have highest quality Steatite insulation and meet critical requirements of r.f. circuit applications. Mtg. bushing, ⅜" x 32 thread, ⅜" long. Shaft, 1¾" long. Index, positive, 30°. Adjustable stop. Parts, including sections, also available separately. See listings below. Packaged with mtg. nut, lockwasher and 1¼" black bar knob.

Cat. No.	Poles per Sec.	Tot. Sec.	Positions	List Price
SHORTING CONTACTS (make before break)				
2500	1	1	2 to 6	$2.25
2502	1	1	2 to 11	2.25
2504	2	1	2 to 5	2.25
2506	3	1	2 to 3	2.25
2510	1	2	2 to 6	3.50
2512	1	2	2 to 11	3.50
2514	2	2	2 to 5	3.50
2516	3	2	2 to 3	3.50
2520	1	3	2 to 6	5.00
2522	1	3	2 to 11	5.00
2524	2	3	2 to 5	5.00

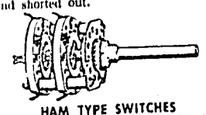
NON-SHORTING (break before make)

Cat. No.	Poles per Sec.	Tot. Sec.	Positions	List Price
2501	1	1	2 to 6	2.25
2503	1	1	2 to 11	2.25
2505	2	1	2 to 5	2.25
2507	3	1	2 to 3	2.25
2511	1	2	2 to 6	3.50
2513	1	2	2 to 11	3.50
2515	2	2	2 to 5	3.50
2517	3	2	2 to 3	3.50
2521	1	3	2 to 6	5.00
2523	1	3	2 to 11	5.00
2525	2	3	2 to 5	5.00

STEATITE SECTIONS FOR 2500 SERIES

Cat. No. Short-ing	Cat. No. Non-Short.	Poles	Positions	List Price
T	X	1	2 to 6	$1.25
U	Y	1	2 to 11	1.25
R	RR	2	2 to 5	1.25
S	SS	3	2 to 3	1.25
V	Z	4	2	1.25
GG		1	2 to 10	1.25

With GG, unused contacts connected and shorted out.



HAM TYPE SWITCHES

Heavier than normal Steatite insulation. Use with tubes operating up to 1000 volts and inputs up to 150 watts. Non-shorting, 30° positive index. Mtg. bushing ⅜" x 32 thread, ⅜" long. Shaft, 1¾" long.

Cat. No.	Poles S c.	Tot. Sec.	Positions	List Price
2542	1	1	2 to 4	$2.25
2543	1	2	2 to 4	3.50
2544	1	3	2 to 4	4.75
2545	1	4	2 to 4	6.00
2546	1	5	2 to 4	7.25

SEPARATE STEATITE SECTIONS — furnished with 4 fibre cushion washers. CAT. No. NX 1 pole 2 to 4 positions Non-shorting $1.25.

TIE BOLT NUTS AND LOCKWASHERS — 3/16" hex. nut 3/32" thick, No. 5-40 thread, cadmium plated steel. Lockwashers split ring, steel, cadmium plated. Packaged 12 per envelope*. Nut—Cat. No. P-147 .15 per Doz. Lockwasher—Cat. No. P-148 .15 per Doz.

DIAL PLATES AND KNOBS — Packaged singly.*

Cat. No.	Description	Price Each	Cat. No.	Description	Price Each
P-115	Dial Plate 1 to 5	.20	P-119	1¼" Round Arrow Knob, Black	.20
P-116	Dial Plate 1 to 6	.20	P-120	1¼" Bar Knob, Black	.15
P-117	Dial Plate 1 to 10	.20	P-193	Knob for Lever Switch, Black	.20
P-118	Dial Plate 1 to 11	.20	P-194	Knob for Lever Switch, Red	.20
P-173	Dial Plate 1 to 23	.25	P-195	Knob for Lever Switch, White	.20

*Minimum order quantities.

ROTARY SWITCH HARDWARE

SHIELD—Cadmium plate .035" steel shield, for insertion between switch sections to reduce coupling effects. Use with 1400 and 2500 series switches. CAT. NO. P-200 Inter-section Shield. List $ .15.

INDEX ASSEMBLIES

Individually cartoned, all hardware and shaft included, except Basic Index 1435W — as supplied in No. 1500 Kit.

Cat. No.	Description	List
P-121	For 1 or 2 sec. switches	1.25
P-122	For 3 or 4 sec. switches	1.75
P-123	For 5 to 6 sec. switches	2.25
1435W	Basic Index only	1.10

HARDWARE AND ACCESSORIES

SPACERS—Cadmium plated seamless brass tubing. .133" I.D., .187" O. D., Chamfered edges. Packaged 12 per envelope*.

Cat. No.	Lgth.	Price Per Doz.	Cat. No.	Lgth.	Price Per Doz.
P-124	¼"	.15	P-126	½"	.30
P-125	⅜"	.30	P-127	¾"	.50
			P-128	1"	.50

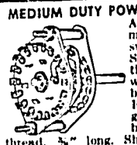
DETACHABLE FLAT SHAFTS .064" x ¼" Cadmium plated steel Packaged singly*.

Cat. No.	Lgth.	Price Per Doz.	Cat. No.	Lgth.	Price Per Doz.
P-129	2"	.30	P-132	5"	.50
P-130	3"	.30	P-133	6"	.75
P-131	4"	.50	P-134	7"	.75
			P-135	8"	.85

TIE BOLTS — No. 5 round head, No. 5-40 thread, Cadmium plated steel. The dimension given is the length. Packaged 12 per envelope*.

Cat. No.	Lgth.	Price Per Doz.	Cat. No.	Lgth.	Price Per Doz.
P-136	1"	.15	P-142	4"	.75
P-137	1¼"	.25	P-143	5"	.85
P-138	2"	.30	P-144	6"	1.00
P-139	2¼"	.33	P-145	7"	1.00
P-140	3"	.50	P-146	9"	1.50
P-141	3¼"	.50			

MEDIUM DUTY POWER SWITCHES



An outstanding medium duty switch of heavy Steatite insulation. Rating 750 watts. Voltage breakdown, 3000 RMS volts to ground. Mtg. bushing, ⅜" x 32 thread, ⅜" long. Shaft, 1¾" long. Index, 20° double roller, non-stalling. Adjustable stops.

Cat. No.	Poles per Sec.	Tot. Sec.	Positions	List Price
SHORTING CONTACTS (make before break)				
JV9000	1	1	2 to 17	$ 12.00
JV9002	3	1	2 to 5	12.00
JV9004	1	2	2 to 17	21.00
JV9006	3	2	2 to 5	21.00
JV9008	1	3	2 to 17	30.00
JV9010	3	3	2 to 5	30.00
JV9012	1	4	2 to 17	39.00
JV9014	3	4	2 to 5	39.00
JV9016	1	5	2 to 17	48.00
JV9018	3	5	2 to 5	48.00
JV9020	1	6	2 to 17	57.00
NON-SHORTING (break before make)				
JV9001	1	1	2 to 17	12.00
JV9003	3	1	2 to 5	12.00
JV9005	1	2	2 to 17	21.00
JV9007	3	2	2 to 5	21.00
JV9009	1	3	2 to 17	30.00
JV9011	3	3	2 to 5	30.00
JV9013	1	4	2 to 17	39.00
JV9015	3	4	2 to 5	39.00
JV9017	1	5	2 to 17	48.00
JV9019	3	5	2 to 5	48.00
JV9021	1	6	2 to 17	57.00

SECTIONS FOR ABOVE SWITCHES

Cat. No.	Type	Positions	List Price
KV -8	Shorting	2 to 17	$9.00
KV -9	Shorting	2 to 5	9.00
KVN-8	Non-short.	2 to 17	9.00
KVN-9	Non-short.	2 to 5	9.00

INDEX ASSEMBLY FOR ABOVE

Includes flat shaft, tie rods, spacers, lockwashers, adjustable stop pins and bar knob.
CAT. NO. KV-7 Power Switch Index. List Price $6.00.

SMALL GENERAL PURPOSE SWITCHES

1462 1461 1460

TYPE 1460 — Single pole, 2 position, shorting contacts, positive index. SPST or SPDT.
CAT. NO. 1460 - - - List $ .75
TYPE 1461 — Single pole, 3 position, shorting, positive index.
CAT. NO. 1461 - - - List $ .75
TYPE 1462 —Double pole, 2 position, shorting, positive index. SPST, SPDT, DPST or DPDT.
CAT. NO. 1462 - - - List $ .75

1463 1464 1465

TYPE 1463 — Single pole, 2 position, non-shorting contacts, spring return index.
CAT. NO. 1463 - - - List $ .75
TYPE 1464—Double pole, 2 position, non-shorting, spring return index. Same as SPST, SPDT, or DPST.
CAT. NO. 1464 - - - List $ .00
TYPE 1465 — Single pole, 4 position, shorting, positive index, with 2 SPST AC line switch attached. Sel- switch has 3 active positions and
CAT. NO. 1465 - - - List $ .25

1473 1483 147

TYPE 1473 — Double pole, 3 position, shorting, positive index.
CAT. NO. 1473 - - - List $ .00
TYPE 1483 — Single pole, 3 position, shorting, positive index.
CAT. NO. 1485 - - - List $ .75
TYPES 1470 and 1471 — Momentary open or closed push switches. Rating 1 amp. at 110 v.a.c. CAT. NO. 1470 — Momentary open — List $ .40.
CAT. NO. 1471 — Momentary closed — List $ .40.

LEVER ACTION SWITCHES

Coil spring index design of very long life. Coil spring easily replaced without removing switch. Mtg. plates available. Black knob is standard.

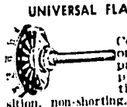
Cat. No.	Tot. Sec.	Positions	Type Index	List Price
SHORTING CONTACTS (make before break)				
1452	2	3	Positive	$1.25
1453	2	3	Spring Ret.	1.25
1456	4	2	Spring Ret.	1.25
1459	4	2	Positive	1.25
1466	2	3	Pos. Spr. Ret.	1.25
NON-SHORTING (break before make)				
1454	2	3	Positive	1.25
1455	2	3	Spring Ret.	1.25
1457	4	2	Spring Ret.	1.25
1458	4	2	Positive	1.25
1467	2	3	Pos. Spr. Ret.	1.25

MOUNTING PLATES FOR ABOVE

Provides ⅜" spacing between switches. Black crackle finish. Width, 2⅝.

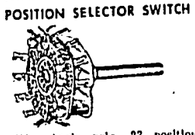
Cat. No.	Number Switches	Length	List Price
P-1755	1	¼"	$ .35
P-1756	2	1½"	.40
P-1757	3	2¼"	.50
P-1758	4	3 "	.60
P-1759	5	3¾"	.75

UNIVERSAL FLAT SWITCHES



Compact. Requires only ⅝" behind panel. Laminated phenolic insulation. 4 pole, 2 position, non-shorting. CAT. NO. 1450 with positive index. List $1.00. CAT. NO. 1451 — similar to 1450, but with spring return index. List $1.75.

23 POSITION SELECTOR SWITCH



Long life, single pole, 23 position, shorting type. Double wipe contacts. 15° positive index.
CAT. NO. 1443 — 23 Position Selector Switch. List Price $3.25.

ROTARY SWITCH KIT

A 4 drawer cabinet holds 33 standard rotary switch phenolic sections (1400 series), 16 index assemblies and all necessary parts which will produce the following, or variations which may meet a sudden requirement: two one condenser decade switch of 2 sections, and one resistor decade switch of 1 section. Refills can be ordered from the Hardware list on this page. CAT. NO. 1500 — Complete Rotary Selector Switch Kit. LIST PRICE $50.00.

4 section rotary switches, two 3 section, four 2 section, six 1 section,

CERAMIC CAPACITORS

Centralab offers the widest variety of ceramic capacitors on the market today for all ranges of voltage and frequency—for any application in circuitry.

Centralab®

Division of GLOBE-UNION INC.
934 East Keefe Avenue
Milwaukee 1, Wisconsin

Centralab introduced ceramic capacitors and has constantly devoted more research and larger laboratory and production facilities to this field, than can be said of any other firm. Ceramics are known as the most permanent type of capacitors.

BC HI-KAP TUBULARS

For bypass, coupling and general use. Tolerance ± 20% through 2200 mmf.; higher cap. Guaranteed Minimum Values (GMV). 85° C. plus operation. Tropicalized. 1000 volts d.c. test; 600 volts d.c. working. Minimum order quantity, 5.

Cat. No.	Cap. MMF.	Size	List Price
D6-100	10	A	$.25
D6-120	12	A	.25
D6-150	15	A	.25
D6-180	18	A	.25
D6-220	22	A	.25
D6-250	25	A	.25
D6-270	27	A	.25
D6-330	33	A	.25
D6-390	39	A	.25
D6-470	47	A	.25
D6-500	50	A	.25
D6-560	56	A	.25
D6-680	68	A	.25
D6-750	75	A	.25
D6-101	100	A	.25
D6-121	120	A	.25
D6-151	150	A	.25
D6-181	180	A	.25
D6-201	200	A	.25
D6-221	220	A	.25
D6-251	250	A	.25
D6-271	270	A	.25
D6-301	300	A	.25
D6-331	330	A	.25
D6-391	390	A	.25
D6-401	400	B	.25
D6-471	470	B	.25
D6-501	500	B	.25
D6-561	560	B	.25
D6-601	600	B	.25
D6-681	680	B	.25
D6-751	750	B	.25
D6-102	1,000	B	.25
D6-122	1,200	B	.25
D6-152	1,500	B	.25
D6-182	1,800	B	.25
D6-202	2,000	B	.25
D6-222	2,200	B	.25
D6-252	2,500	B	.25
D6-272	2,700	B	.25
D6-302	3,000	B	.25
D6-332	3,300	C	.25
D6-402	4,000	C	.25
D6-472	4,700	C	.25
D6-502	5,000	C	.25
D6-562	5,600	D	.25
D6-682	6,800	D	.25
D6-103	10 000	D	.25

Body Dimensions

Size	Diam.	Length
A	.230"	.475"
B	.230"	.750"
C	.255"	.885"
D	.310"	1.180"

DISC HI-KAPS

For narrow spaces. Tolerances GMV except Cat. No. DD-2-502 is —20% + 80%, 1000 d.c. test; 600 volts d.c. working. Min. order quantity, 5.

Cat. No.	Cap. MFD.	Diam. "	Thick. "	List Price
TYPE DD-SINGLE DISCS				
DD-471	.00047	¼	.156	$.25
DD-801	.0008	¼	.156	.25
DD-102	.001	⅜	.156	.25
DD-152	.0015	⅜	.156	.25
DD-202	.002	⅜	.156	.25
DD-502	.005	⅜	.156	.25
DD-103	.01	⅜	.156	.25
TYPE DD-2—DUAL DISCS				
DD-102	2x.001	⅛	.156	.40
DD-152	2x.0015	⅛	.156	.40
DD-502	2x.005	⅜	.156	.45

TYPE DD-3* — SHIELDED DUAL DISCS

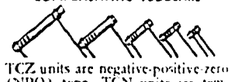
DD-3-102	2x.001	⅛	.225	.45
DD-3-152	2x.0015	⅛	.225	.45
DD-3-202	2x.002	⅛	.225	.45
DD-3-502	2x.005	⅛	.225	.50
DD-3-103	2x.01	⅜	.225	.50

TYPE DF FLAT-PLATE HI-KAPS*

DF-203	.02	1⅛" x 1⅛"	⅛" thick	.70
DF-503	.05	1⅛" x 1⅛"	⅛" thick	.70
DF-104	.1	1⅛" x 1⅛"	⅛" thick	.80

*Packaged singly.

TC TEMPERATURE COMPENSATING TUBULARS



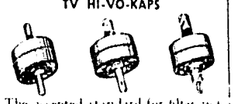
TCZ units are negative-positive-zero (NPO) type. TCN units are temperature compensating, N750 type, giving a negative change of 750 parts per million per degree C. Packaged singly, including instructions. 1200 volts d.c. test; 600 volts d.c. working.

Cat. No.	Cap. MMF.	Tol. MMF.	Size	List Price
TCZ NEGATIVE-POSITIVE-ZERO (NPO)				
TCZ-.5	.5	± .25	A	$.75
TCZ-.68	.68	± .25	A	.75
TCZ-1	1.	± .25	A	.75
TCZ-1.5	1.5	± .25	A	.75
TCZ-2.2	2.2	± .25	A	.75
TCZ-3.3	3.3	± .25	A	.75
TCZ-4.7	4.7	± .5	A	.60
TCZ-6.8	6.8	± .5	A	.60
TCZ-10	10.	± .5	A	.60
TCZ-12	12.	± .5	A	.60
TCZ-15	15.	± .5	A	.60
TCZ-18	18.	± .5	A	.60
TCZ-20	20.	± .5	A	.60
		Tol. %		
TCZ-22	22.	± 2½	A	.50
TCZ-24	24.	± 2½	A	.50
TCZ-27	27.	± 2½	B	.50
TCZ-30	30.	± 2½	B	.50
TCZ-33	33.	± 2½	B	.50
TCZ-36	36.	± 2½	B	.50
TCZ-39	39.	± 2½	B	.50
TCZ-43	43.	± 2½	B	.50
TCZ-47	47.	± 2½	B	.50
TCZ-51	51.	± 2½	B	.50
TCZ-56	56.	± 2½	B	.50
TCZ-62	62.	± 2½	C	.50
TCZ-68	68.	± 2½	C	.50
TCZ-75	75.	± 2½	C	.50
TCZ-82	82.	± 2½	C	.50
TCZ-91	91.	± 2½	C	.50
TCZ-100	100.	± 2½	C	.50
TCZ-110	110.	± 5	C	.50
TCZ-120	120.	± 5	C	.50
TCZ-130	130.	± 5	D	.50
TCZ-150	150.	± 5	D	.50
TCZ-160	160.	± 5	D	.50
TCZ-180	180.	± 5	D	.50
TCZ-200	200.	± 5	E	.50
TCZ-220	220.	± 5	E	.50
TCZ-240	240.	± 5	E	.50
TCZ-270	270.	± 5	E	.50
TCZ-300	300.	± 5	E	.50
TCN NEG. TEMP. UNITS (N750)				
		Tol. MMF.		
TCN-10	10.	± .5	A	$.60
TCN-12	12.	± .5	A	.60
TCN-15	15.	± .5	A	.60
TCN-18	18.	± .5	A	.60
TCN-20	20.	± .5	A	.60
		Tol. %		
TCN-22	22.	± 2½	A	.50
TCN-24	24.	± 2½	A	.50
TCN-27	27.	± 2½	A	.50
TCN-30	30.	± 2½	A	.50
TCN-33	33.	± 2½	A	.50
TCN-36	36.	± 2½	A	.50
TCN-39	39.	± 2½	A	.50
TCN-43	43.	± 2½	A	.50
TCN-47	47.	± 2½	A	.50
TCN-51	51.	± 2½	A	.50
TCN-56	56.	± 2½	A	.50
TCN-62	62.	± 2½	A	.50
TCN-68	68.	± 2½	B	.50
TCN-75	75.	± 2½	B	.50
TCN-82	82.	± 2½	B	.50
TCN-91	91.	± 2½	B	.50
TCN-100	100.	± 2½	B	.50
TCN-110	110.	± 5	B	.50
TCN-120	120.	± 5	B	.50
TCN-130	130.	± 5	B	.50
TCN-150	150.	± 5	B	.50
TCN-160	160.	± 5	B	.50
TCN-180	180.	± 5	C	.50
TCN-200	200.	± 5	C	.50
TCN-220	220.	± 5	C	.50
TCN-240	240.	± 5	C	.50
TCN-270	270.	± 5	C	.50
TCN-300	300.	± 5	C	.50
TCN-330	330.	± 5	C	.50
TCN-360	360.	± 5	D	.50
TCN-390	390.	± 5	D	.50
TCN-430	430.	± 5	D	.50
TCN-470	470.	± 5	D	.50
TCN-510	510.	± 5	D	.50
TCN-560	560.	± 5	E	.50
TCN-620	620.	± 5	E	.50
TCN-680	680.	± 5	E	.50
TCN-750	750.	± 5	E	.50

Body Dimensions

Size	Diam.	Length
A	.200"	.400"
B	.200"	.600"
C	.225"	.860"
D	.285"	1.165"
E	.285"	1.625"

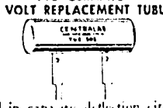
TV HI-VO-KAPS



The accepted standard for filter and bypass applications in television high voltage power supply. Body sizes 501, 1" diam. x .510", 502, 1" diam. x 1.050", 503, 1.4" diam. x 1.240". Terminals: A plain studs, B one slotted ⅛" wide x ⅛" deep, other tapped 6-32, ¼" deep. C screw terminals, male 6-32 x ¼", female 6-32 x ¼". Capacitance — 20% + 80%.

Cat. No.	Cap. MMF.	V.D.C. Working	Term.	List Price
TV1-501	500	10,000	A	$1.75
TV2-501	500	10,000	B	1.75
TV3-501	500	10,000	C	1.75
TV1-502	500	20,000	A	2.25
TV2-502	500	20 000	B	2.25
TV3-502	500	20,000	C	2.25
TV1-503	500	30,000	A	4.50

TV6 CERAMIC 6000 VOLT REPLACEMENT TUBULAR



Used in capacity deflection circuits in electrostatic TV sets, also in voltage divider circuits in electrodynamic TV sets. Molded casing assures adequate external insulation. Tolerance GMV. Body size ¼" diam. x 2¾".

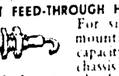
Cat. No.	Cap. MFD.	V.D.C. Working	List Price
TV6-502	.005	6000	$1.10

CERAMIC MIN-KAPS

Tiny flat-plate capacitors, size ⅛" x ⅜" x ⅜". Tolerance — 20% + 80%. Space savers for low voltage applications. 5 per package.

Cat. No.	Cap. MFD.	V.D.C. Working	List Price
DM-201	.0002	150	$ .35
DM-501	.0005	150	.35
DM-102	.001	150	.35
DM-202	.002	150	.35
DM-502	.005	150	.35
DM-103	.01	150	.65

FT FEED-THROUGH HI-KAPS



For single hole mounting where capacity ground to chassis or shield is desired. 1000 volts d.c. test, 600 volts d.c. working. Packaged singly.

Cat. No.	Cap. MMF.	Tol.	List Price
FT-500	500	±20%	$1.00
FT-1000	1000	±20%	1.00
FT-1500	1500	±20%	1.00

HIGH ACCURACY CAPACITORS

Precision ceramic capacitors for applications involving rigid frequency control. Excellent as prime or secondary Standards. 1" diameter. Metal case grounded, with mtg. stud ¼" long 6-32 thread. Other terminal opposite end, plain stud ¼" long. Tolerance ± 1%.

Cat. No.	Cap. MMF.	V.D.C. Wkg.	t	List Price
950-501	500	500	¼"	$40.00
950-102	1000	500	¼"	40.00
950-202	2000	500	¼"	40.00

TRANSMITTING CAPACITORS

Type 858 ceramic capacitors are high voltage units, held to ± 10% tolerance. Size 1½" diam. x 1¼". End terminal plates are center tapped 10-32.

Cat. No.	Cap. MMF.	V.C.D. Wkg.	Temp. COEF.	List Price
858-2SZ	25	15,000	NPO	$10.00
858-5OZ	50	15,000	NPO	10.00
858-100N	100	15,000	N750	10.00
858-200N	200	7,500	N750	10.00

Type 880 high voltage ceramic capacitors are ± 10% tolerance units in cases with centered hex studs, one each end, protecting ¼", tapped 6-32, ¼" deep.

Cat. No.	Cap. MMF.	V.C.D. Wkg.	Temp. COEF.	List Price
880-2SZ	25	2500	NPO	$3.00
880-5OZ	50	2500	NPO	3.00
880-10N	100	2500	N750	3.00
880-5N	50	2500	N750	3.00
880-25N	25	2500	N750	3.00
880-100N	100	5000	N750	3.00

SMALL HIGH VOLTAGE UNITS

The three series which follow are exceedingly compact ceramic capacitors, similar in appearance to type 880S above. Mounting is with axial screw type terminals, tapped 2-56. Tolerance ± 10%. Sizes 855, ¾" diam. x 1⅜", 854, ⅞" diam. x 1⅝", 855, ¼" diam. x 1¾".

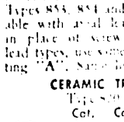
Cat. No.	Cap. MMF.	V.C.D. Wkg.	Temp. COEF.	Price
855A-10Z	10	5000	NPO	$4.00
855A-20Z	20	5000	NPO	4.00
855A-10N	10	5000	N750	4.00
854A-5Z	5	5000	NPO	4.00
854A-10Z	10	5000	NPO	4.00
854A-20N	20	5000	N750	4.00
854A-5Z	5	5000	NPO	4.00
855A-5Z	5	5000	NPO	4.00
855A-10N	10	5000	N750	4.00

Types 855, 854 and 855 are available with axial leads [illegible] in place of screw terminals. Add lead types, see notes at bottom listing "A". Specify [illegible]

CERAMIC TRIMMERS

Type [illegible]

Cat. No.	Cap. [illegible]	List Price
820-A	[illegible]	$ [illegible]
820-B	[illegible]	[illegible]
820-C	[illegible]	[illegible]



Type [illegible] ceramic [illegible] mmf. to [illegible] mmf. [illegible] tolerance [illegible] 1½" [illegible] 6-32 [illegible]

Cat. No.	Range MMF.	List
822-CZ	[illegible]	$ [illegible]
822-BZ	[illegible]	[illegible]
822-AZ	[illegible]	[illegible]
822-CN	[illegible]	[illegible]
822-BN	[illegible]	[illegible]
822-AN	[illegible]	[illegible]

Type 825, [illegible] 1½" [illegible]

Cat. No.	Range MMF.	List
825-CN	[illegible]	$ [illegible]
825-BN	[illegible]	[illegible]
825-AN	20-125	[illegible]

PRINTED ELECTRONIC CIRCUITS

Centralab
®
Division of GLOBE-UNION INC.
934 East Keefe Avenue
Milwaukee 1, Wisconsin

Centralab Printed Electronic Circuits — no other electronic development offers such tremendous time, material and cost saving advantages in low-power applications.

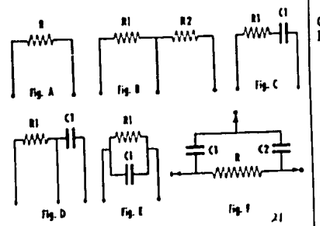
PRINTED ELECTRONIC CIRCUITS

For the first time, Centralab's famous Printed Electronic Circuits (P.E.C.) are now made available as stock items. P.E.C. units, in simplest form for application as components, consist of resistance materials and pure metallic silver fired to sturdy Ceramic-X plates, including integral "printed" circuit connections, brought out to convenient external leads which are mechanically anchored to the plate. The complete unit is protected with a moisture-proof phenolic coating. The result is a combination of resistors and capacitors of ultra compactness and permanence. No other modern development in electronic circuitry offers so many advantages in low powered applications as regards small size, low cost assembly and utmost reliability.

RESISTOR AND RESIS.-CAP. UNITS

Plate size, $\frac{11}{32}$" x $\frac{3}{32}$" x $\frac{3}{64}$" thick, max. Capacitors, 150 v.d.c.w. Resistors, ½ watt.

Cat. No.	Dwg.	Consists of	List Price
PC-2	A	2 meg. Resis.	$ .35
PC-21	B	½ meg.; 110,000 ohms	.50
PC-30	C	R-240,000 ohms. C-1000 mmf.	.50
PC-33	D	R-1 meg. C-1000 mmf.	.50
PC-36	E	R-100,000 ohms. C-100 mmf.	.50

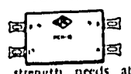


FILPEC BALANCED DIODE LOAD FILTER

Plate size, $\frac{13}{32}$" x $\frac{3}{32}$" x $\frac{3}{64}$" thick max. Capacitors, 100 v.d.c.w. Resistors, ½ watt.

Cat. No.	Dwg.	Consists of	List Price
PC-50	F	C1=100 mmf. C2=100 mmf. R=47,000 ohms	$ .60
PC-51	F	C1=150 mmf. C2=150 mmf. R=47,000 ohms	.60

TELEVISION H-PADS FOR ATTENUATION OF SIGNAL STRENGTH



These handy Centralab P.E.C. units are specially designed for use in television antenna installations where signal strength needs attenuation to secure optimum performance. The proper H-Pad, in many instances, will match the signal strength to the requirements of the receiver. This can prevent overloading, can eliminate tearing of the image, and improve both audio and video results. They are especially valuable where the television set is located too close to the broadcast station. In connection with a switching arrangement, they are helpful to balance signals from stations which, because of high power or location, are too strong in relation to other stations. H-pads also are useful in matching impedance between the antenna and the receiver.

The H-Pad has four terminals, and is for installation in series with the standard 300 ohm antenna. Full directions are included.

SIZE — 1¼" x $\frac{13}{16}$" x $\frac{3}{16}$" thick.

TERMINALS — Solder terminals, $\frac{3}{32}$" long.

PACKAGED — Singly in envelopes. In sets of four, in a plastic box.

Cat. No.	Type	Attenuation Rating	List Price
PCH-10	H-Pad	10 db.	$ .80
PCH-20	H-Pad	20 db.	.80
PCH-30	H-Pad	30 db.	.80
PCH-40	H-Pad	40 db.	.80
PCH-100	SET OF FOUR H-PADS, one each of the above, in plastic box		3.00

TRIODE COUPLATES P.E.C. INTERSTAGE COUPLING PLATES MIDGET NO. 2 COUPLATE

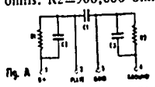
Plate size, $\frac{13}{32}$" x $\frac{3}{16}$" x $\frac{3}{32}$" thick max. Capacitors, 450 v.d.c.w. Resistors, ⅛ watts.

Cat. No. PC-70 MIDGET #2 COUPLATE

Consisting of (See Fig. A)	List Price
C1=.005 mfd. C2 and C3=250 mmf. R1=500,000 ohms. R2=500,000 ohms.	$ .70

Cat. No. PC-71 MIDGET #2 COUPLATE

C1=.005 mfd. C2 and C3=250 mmf. R1=250,000 ohms. R2=500,000 ohms. .70



STANDARD TRIODE COUPLATE

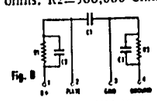
Plate size, $1\frac{3}{32}$" x $\frac{13}{16}$" x $\frac{3}{64}$" thick, max. Capacitors, 450 v.d.c.w. Resistors, ⅛ watt.

Cat. No. PC-80 STANDARD COUPLATE

Consisting of (See Fig. B)	List Price
C1=.01 mfd. C2 and C3=250 mmf. R1=500,000 ohms. R2=500,000 ohms.	$ .75

Cat. No. PC-81 STANDARD COUPLATE

C1=.01 mfd. C2 and C3=250 mmf. R1=250,000 ohms. R2=500,000 ohms. .75



PENTODE COUPLATES

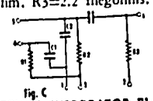
Cat. No. PC-90 PENTODE COUPLATE

Plate size, $1\frac{11}{32}$" x ⅞" x .045" thick max. Capacitors, 450 v.d.c.w. Resistors, ⅛ watt.

Consisting of (See Fig. C)	List Price
C1=.005 mfd. C2=50 mmf. C3=2000 mmf. R1=4.7 megohms. R2=1 megohm. R3=2.2 megohms.	$ .90

Cat. No. PC-91 PENTODE COUPLATE

C1=.005 mfd. C2=100 mmf. C3=.005 mfd. R1=4.7 megohms. R2=1 megohm. R3=2.2 megohms. .90

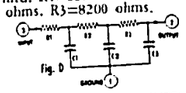


VERTICAL INTEGRATOR PLATES

Due to great saving in assembly costs, this Centralab printed circuit is being used widely in television vertical integrator networks. Two forms are available. Either one has only three external leads. Size, PC-100 $1\frac{3}{32}$" x $\frac{13}{16}$" x ⅛" thick max. PC-101, 1⅝" x $1\frac{1}{16}$" x $\frac{3}{16}$" thick max. Capacitors, 450 v.d.c.w. Resistor, ½ watt.

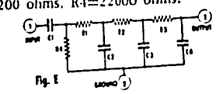
Cat. No. PC-100 VERTICAL INTEGRATOR

Consisting of (See Fig. D)	List Price
C1=.002 mfd. C2=.005 mfd. C3=.005 mfd. R1=22000 ohms. R2=8200 ohms. R3=8200 ohms.	$1.10

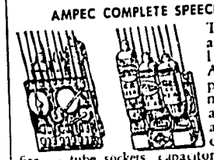


Cat. No. PC-101 VERTICAL INTEGRATOR

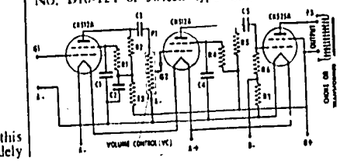
Consisting of (See Fig. E)	List Price
C1=.01 mfd. C2=.002 mfd. C3=.005 mfd. C4=.005 mfd. R1=22000 ohms. R2=8200 ohms. R3=8200 ohms. R4=22000 ohms.	1.25



AMPEC COMPLETE SPEECH AMPLIFIER



There's never been an electronic device like Centralab's Ampec. In the compact unit — permanently bonded to a master plate—are all the components of an audio amplifier — tube sockets, capacitors, resistors, wiring — a three tube, three stage speech amplifier. Similar Centralab units are widely used in hearing aids, for the most trouble-free performance ever attained. Ampec has other interesting applications, as mike preamplifier, etc. Size, 1¼" x $1\frac{1}{16}$" x .340" over tube sockets. Capacitors, 100 v.d.c.w. Resistors, ⅛ watt. Recommended tube complement, T-1 and T-2 (see dwg.) Raytheon type CK512AX; T-3, Raytheon type CK525AX. Gain frequency performance — A voltage 1.2; input voltage, 1 millivolt; B voltage 22. 50,000 ohm load. At 1000 cycles per second, the amplification factor is 4000. Volume control (VC in dwg.) not furnished. The ideal control is Centralab Cat. No. B16-124 or switch type Cat. No. B16-221.

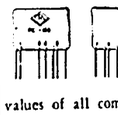


Cat. No.	Type	Consisting of	List Price
PC-200	AMPEC	Complete Three Stage Speech Amplifier, including three built-in sockets, less tubes.	$15.00
PC-201	AMPEC	Same as PC-200, but furnished complete with tubes, two CK512AX and one CK525AX.	26.00

TUBES — Listed separately as a matter of convenience.

Cat. No.		CRL List Price
CK512AX	Raytheon Subminiature Voltage Amplifier Pentode Tube	$3.40
CK525AX	Raytheon Subminiature Output Pentode Tube	4.25

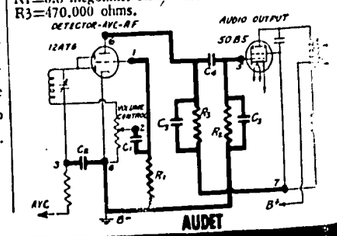
AUDET OUTPUT STAGE FOR AC-DC RADIO RECEIVERS



Audet is a P.E.C. audio-detector plate, with seven leads, and furnishes the values of all components which quite generally comprise the output stage of AC-DC radio receivers. Where there is trouble with old style components in this part of the set, it is easy to replace the entire audio-detector stage with Audet. Plate size, 1⅛" x ⅞" x ⅛" thick max. Capacitors, 450 v.d.c.w. Resistors, ⅛ watt.

Cat. No. PC-150 AUDET

Consisting of (See drawing)	List Price
C1=.002 mfd. C2= 220 mmf. C3 and C5=220 mmf. C4=.005 mfd. R1=6.8 megohms. R2=470,000 ohms. R3=470,000 ohms.	$1.00



See the Centralab Distributor in your neighborhood . . . over 700 in U. S. and Canada

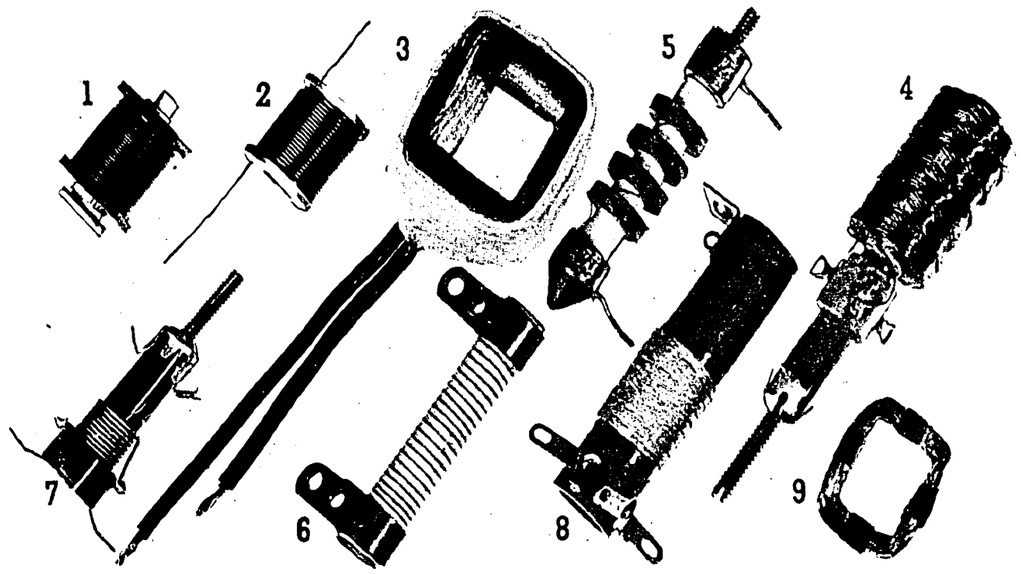
Long Life–High Speed–Coil Winding Machines

TYPE OF COIL As illustrated below	RECOMMENDED MODELS Laboratory	Mod. Production	Max. Production	Typical Application
1. BOBBIN (Solid Core)	W	CRS, CS, W	C, CR*	Relays, Solenoids TV Focus Coils Precision Resistances
2. BOBBIN (Hollow Core)	W	C, CR, W	C, CR	
3. PAPER INTERLEAVED	W	CR, CRS, C-1	AL, AM	Transformers, Reactors
4. LATTICE (Single Pi)	U, W	U, W	U, W*	Flybacks, Antenna and I.F. Coils R.F. Power Supplies
5. LATTICE (Multiple Pi)	U, W	W	W*	
6. SINGLE LAYER (Space Wound)	B, P, W	B, P, W	B, P	Resistors R.F. Coils
7. SINGLE LAYER (Close Wound)	A, AA, W W, L, LL	A, AA L, LL	A, AA L, LL	
8. PROGRESSIVE UNIVERSAL	W	W	W	R.F. & I.F. Inductances Slug Tuned Coils
9. RANDOM	A, AA, W L, LL	L, LL	L, LL*	Motor Fields TV Deflection Coils

* Maximum production of Solid Core Coils is provided by the use of 4 Station Machines.

Illustrated below are nine general types of coils wound on Coil Winding Equipment models as indicated above. Other similar coils not illustrated may also be wound on these basic machines which are more fully described in the following pages.

Models recommended for laboratory use and moderate production are equally accurate and rugged but lack some of the convenience of the maximum production machines.



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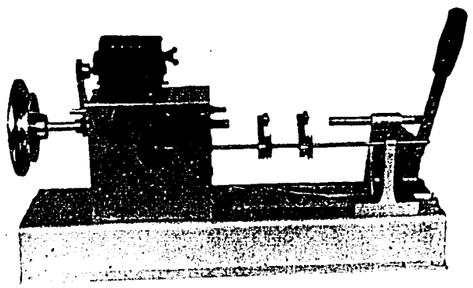
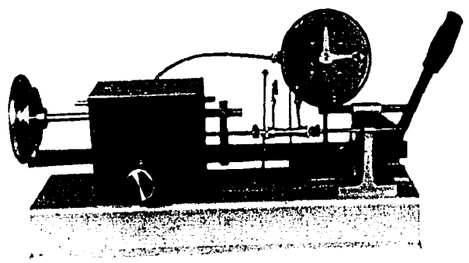


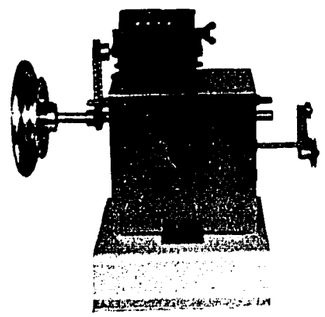
Model C. Bobbin Winder

A high speed winder for bobbins or random wound coils. Change gears permit winding of exact number of turns per layer and accurate cam design assures level wound coils. Hollow core coils may be multiple wound on this machine.



Model W. Progressive Universal Winder

This machine combines the lattice winding mechanism of our Model U with a progressive feed to wind so-called "progressive universal" coils. The full utilization of these two motions makes it possible to wind a wide variety of other coils.



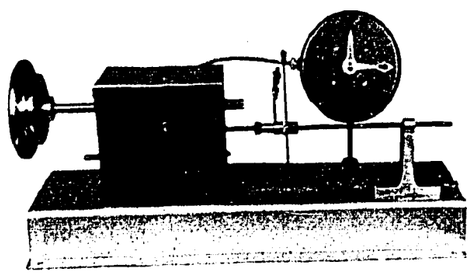
Model CS. Bobbin Winder

Same head as Model C but without bed or tailstock. Especially suited for solid core coils as several of these heads can be mounted conveniently for a single operator. Greater flexibility than multiple spindle machines without increased cost.

LABORATORY WINDERS

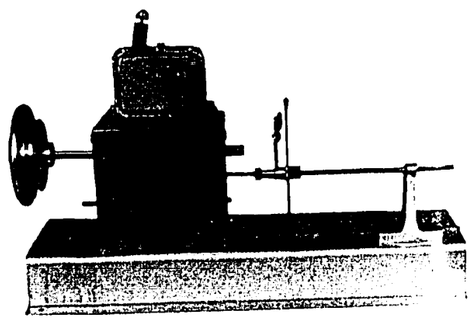
While all of the models illustrated on these pages are designed as production machines the ease of set up and adjustment makes them suitable for laboratory and experimental work as well. When the nature of the work is known in advance a production model will often fill the need. Often a machine can be supplied that combines the features of two models. For example we are supplying a combination bobbin winder and lattice winder under the designation of Model CU.

Most versatile of all models is our Model W which is widely used in schools and laboratories. With a few simple accessories this machine will wind virtually every coil used in the electrical and electronics industries. Write for detailed listing and description.



Model U. Universal Winder

Designed for the rapid production of lattice wound (universal type) coils, this machine has had wide application in the winding of r.f. and i.f. coils. Suitable for T.V. flyback or high voltage coils.



Model UX. Universal Winder

A lattice winder with continuously variable gain for the rapid production of sample or short run coils. This machine automatically indicates the gears required for the duplication of sample coils on standard change gear machines.

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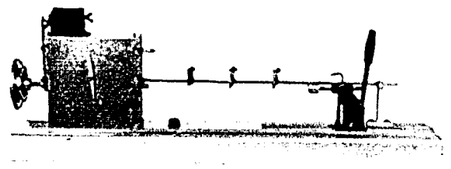
Model AL. Transformer Winder

A rugged and dependable machine for the rapid production of coils in which the paper may be inserted manually. Automatic stop at end of traverse; micrometer traverse adjustment spiralling feed; indicating light; and complete compensation for wear.

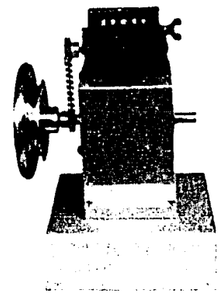


Model C1. Bobbin and Transformer Winder

A larger version of our Model C with the winding fingers in the rear making it suitable for paper interleaving as well as bobbin winding. An indicating hand shows the position of the cam at all times and visual or audible signals can be supplied.

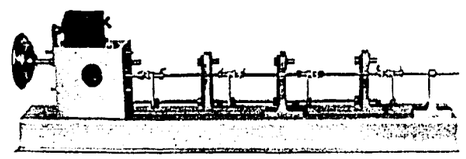
CAMS AND GEARS

We are in a position to supply cams and gears of any size for use in our machines or similar equipment. Our large stock assures prompt handling of your order. If you are purchasing a machine for general or laboratory work, we recommend you include in your order a complete set of gears from 25 to 106 teeth. We also stock gears smaller and larger than those included in the standard set, and when used in conjunction with idler gears of 2-1, 3-1, and 5-2, ratios, the range of the various machines is considerably extended.



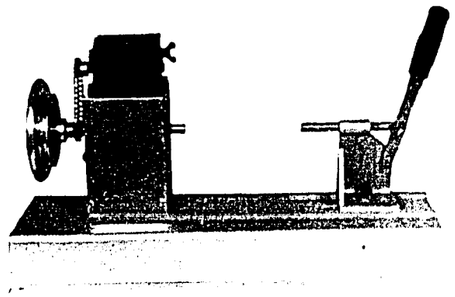
Model L. Hand Winder

An economical winder for random wound or hand spaced coils, such as motor fields, T.V. deflection yokes and other coils of this nature. A predetermining counter stops the machine when the coil is complete.



Model U4 Multiple winder

For the winding of solid core coils we can supply machines with a separate spindle for each coil. Shown here is our Model U set up to wind four coils at a time on resistor type forms. All of our models may be used as multiple winders when the nature of the form permits.



Model LL. Hand Winder

This is a Model L head mounted on a base and equipped with a tailstock for the support of longer forms. For shaped coils such as T.V. deflection yokes, half of the forming block is carried on the tailstock to affect rapid unloading.

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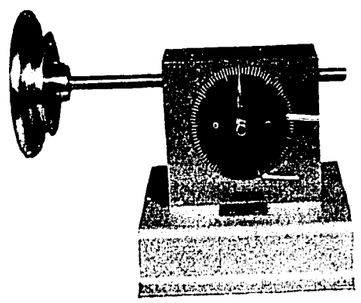
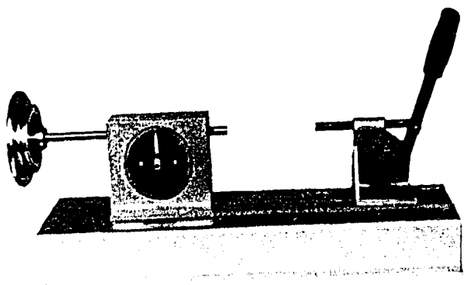


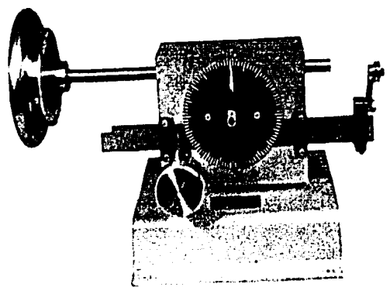
Model A. Hand Winder

An economical model for the production of hand wound coils, including single layer close wound coils and bobbins. Also suitable for limited production of transformer type windings. Available with pulley or hand crank.



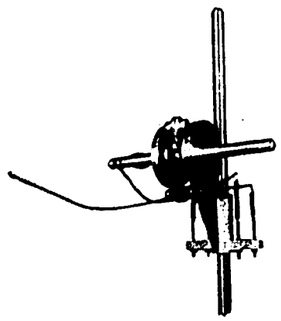
Model AA. Hand Winder

A model A head supplied with bed and tailstock. This permits the winding of long or flexible coils and permits the design of more rapid loading devices. Rugged ball bearing spindle and accurate built-in counter.



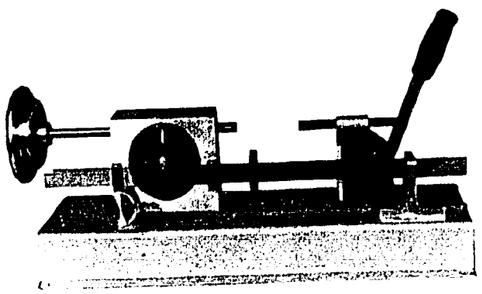
Model B. Space Winder

Accurately spaces or close winds single layer coils, such as resistors, flashers, and solenoids. Accessories include automatic stop, and a feed reverse that permits winding in either direction on transformers, etc.



Model 299. Tension

Illustrated is our 3" sensitive double tension for wire as small as .001" diameter. Precision type instrument bearings avoid undesirable friction. Unique brake design avoids fluctuations in tension with change in spool diameter. Single and double tensions available for 3", 4", and 6" spools.



Model P. Space Winder

This is a Model B head mounted on a bed and supplied with tailstock, to provide support for extra long or flexible forms. Change gears supply thousands of feeds of extreme accuracy from 7 to 1500 turns per inch.

All Coil Winding Equipment coil winding machines are built of finest materials and evidence the best of design and workmanship. Spindles are of stainless steel and run in precision ball bearings. Transverse shafts run in high quality bronze bushings pressed into holes line reamed in the castings, permitting easy replacement. All parts are made to close tolerances and parts may be shifted from one machine to another with complete interchangeability.

All models are built with high speed production in mind but incorporate features that make them attractive for the small shop or laboratory. Among these are their ease of setup, compact design, low cost, and long accurate life.

Accessories and replacement parts are available for all models of our manufacture, regardless of age and we are prepared to suggest such features and details as will assure the maximum production for your present machine.

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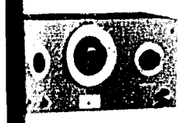
Choose the exact electronic test equipment you need from the -hp- line — the world's most complete line of over 200 test instruments. Enjoy the engineering economies of fast, accurate measurements, sturdy dependability, broad application. Enjoy, too, the "family characteristics" of -hp- instruments—simple operation, minimum adjustment, independence of line voltage and tube changes, generous overload protection, trouble-free performance.

These pages give brief details of major -hp- instruments. For specific data or catalogs, write to factory on your letterhead or see your local -hp- representative.

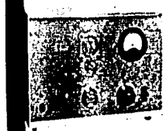
hp Oscillators — Generators — .01 to 10,000,000 cps

-hp- 200 SERIES AUDIO OSCILLATORS



Six standard models. 200A, 200B have transformer-coupled output, deliver 1 watt into matched load. 200C, 200D and 202D (for sub-audio, audio, supersonic and carrier measurements) have resistance-coupled output, supply constant voltages over their entire frequency ranges. 200I, spread-scale oscillator for interpolation or where frequency must be known precisely.

-hp- 650A TEST OSCILLATOR



Highly stable, wide band (10 cps to 10mc) multi-purpose test oscillator for audio, supersonic, video and rf measurements. Output flat within 1 db. Range 0.00003 to 3 v. Output impedance 600 ohms or 6 ohms with voltage divider. $475.00

Instrument	Primary Uses	Frequency Range	Output	Price
-hp- 200A	Audio tests	35 cps to 35 kc	1 watt 22.5 v	$120.00
-hp- 200B	Audio tests	20 cps to 20 kc	1 watt 22.5 v	$120.00
-hp- 200C	Audio and supersonic tests	20 cps to 200 kc	100 mw 10 v	$150.00
hp 200D	Audio and supersonic tests	7 cps to 70 kc	100 mw 10 v	$175.00
-hp- 200H	Carrier current, telephone tests	60 cps to 600 kc	10 mw 1 v	$350.00
-hp- 200I	Interpolation and frequency measurements	6 cps to 6 kc	100 mw 10 v	$225.00
-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	$450.00
-hp- 202B	Low frequency measurements	.1 cps to 50 kc	100 mw 10 v	$350.00
-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	$390.00
-hp- 205AG	High power tests, gain measurements	20 cps to 20 kc	5 watts	$425.00
-hp- 205AH	High power supersonic tests	1 kc to 100 kc	5 watts	$550.00
-hp- 206A	High quality high accuracy audio tests	20 cps to 20 kc	+15 dbm	$550.00
-hp- 650A	Wide range video tests	10 cps to 10 mc	15 mw 1 v	$475.00

hp Vacuum Tube Voltmeters — 2 to 700,000,000 cps

-hp- 410B VACUUM TUBE VOLTMETER

Wide range, flat response performance 20 cps to 700 mc. Convenient, simple to use, occupies minimum bench space. Handy compartment for detatchable probe and leads. Diode probe design places approximately 1.3 μμfd capacity across circuit under test. Low, plus high shunt impedance (10 megohms at low frequencies) means circuits under test are not disturbed, and true voltage readings are assured. Hi accuracy, 20 cps to 700 mc. Also measures dc voltage to 1000 v. and resistances to 500 megohms. $245.00

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	10 megohms shunted by 24 mmfd	$245.00
-hp- 400B	Low frequency ac measurements	2 cps to 100 kc	.005 to 300 v 9 ranges	10 megohms shunted by 24 mmfd	$245.00
-hp- 400C	Wide range ac measurements High sensitivity	20 cps to 2 mc	.0001 to 300 v 12 ranges	10 megohms shunted by 24 mmfd	
-hp- 404A	Portable, battery operated	2 cps to 50 kc	.0005 to 300 v 11 ranges	10 megohms shunted by 24 mmfd	
-hp- 410B	Audio, rf, VHF measurements; dc voltages; resistances	20 cps to 700 mc	1 to 300 v 7 ranges	10 megohms shunted by 1.3 mmfd	

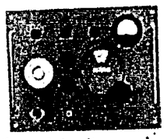
-hp- Voltmeter Accessories (not listed) include voltage dividers, connectors, shunts and multipliers to extend useful range of your equipment.

Data Subject to Change Without Notice. Prices f.o.b. Factory.

HEWLETT-PACKARD hp INSTRUMENTS

Signal Generators—10 to 7,600 mc

-hp- 618A SHF SIGNAL GENERATOR

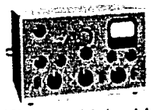


3,800 to 7,600 mc. Provides a 1 mw signal into a 50-ohm coaxial load (zero dbm). Output attenuator directly calibrated in dbm and volts, reduces output level to less than −100 dbm. Frequency dial directly calibrated, accuracy ½ of 1%. Repellor voltage automatically tracked. No adjustment during operation. CW, pulsed and FM output. $2,250.00

Instrument	Frequency	Characteristics	Price
-hp- 608A	10 to 500 mc	Output 1 v to .1 μv. Amplitude modulated, pulsed and CW output. Direct reading.	$850.00
-hp- 610B	450 to 1,200 mc	Calibrated output, .1 v to .1 μv. Internal pulse modulation. Direct calibration	$925.00
-hp- 614A	800 to 2,100 mc	Direct reading. Pulse modulation, CW & FM. Output 1 mw or .223 v to .1 μv	$1,950.00
-hp- 616A	1,800 to 4,000 mc	Direct reading. Pulse modulation, CW & FM. Output 1 mw or .223 v to .1 μv	$1,950.00
-hp- 618A	3,800 to 7,600 mc	Direct reading. External pulse modulation, C W & FM. Output .223 v to 2.23 μv	$2,250.00

Distortion, Wave Form Analyzers—20 cps to 20 kc

-hp- 330B DISTORTION ANALYZER



Measures distortions as low as 0.1% at any frequency, 20 cps to 20 kc. Measures noise voltages as low as 100 μv. High sensitivity, high stability, broad applicability for broadcast, laboratory or production problems. Wide band 20 db gain input amplifier. Built-in vacuum tube voltmeter usable separately. $395.00

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. 330C, $425.00. 330D, $440.00

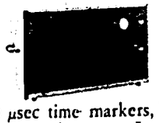
Analyzer	Primary Uses	Frequency Range	Characteristics	Price
-hp- 300A	Wave form analyzer	30 cps to 16 kc	Variable selectivity; measuring range 1 mv to 500 v.	$695.00
-hp- 320A	Measures total distortion	400 cps and 5 kc	Requires external detector	$ 75.00
-hp- 320B	Measures total distortion	50, 100, 400 cps, 1, 5 and 7.5 kc	Same as above	$150.00
-hp- 330B	Measures total distortion	20 cps to 20 kc	Includes input amplifier, VTVM	$395.00
-hp- 330C	For FM measurements	20 cps to 20 kc	Special VU meter to meet F. C. C. requirements	$425.00
-hp- 330D	For AM, FM measurements	20 cps to 20 kc	AM detector and VU meter to meet F. C. C. requirements	$440.00
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

Frequency Measuring Equipment—.01 cps to 10 mc

-hp- 524A FREQUENCY COUNTER

Instantly, automatically, directly measures unknown frequencies, 0.01 cps to 10 mc! One instrument combines functions of frequency standard, interpolating system and detector! Amazingly simple operation—just connect unknown to input terminal, and exact frequency appears automatically on front panel. High speed decade scalers count unknown frequency over measured, crystal-controlled time interval. Accuracy of measurement ±1 count ± crystal stability (2/1,000,000 per week). External higher accuracy standard usable if desired. Minimum of unknown, 1 v peak. $2,000.00

-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 expensive primary standards in audio, rf or supersonic ranges. $600.00

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 524 Frequency Counter	Frequency, interval, time measurements	.01 cps to 10 mc	Direct reading, no interpolation, accuracy about 2/1,000,000	$2,000.00
-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	$ 600.00
-hp- 100C Secondary Standard	Audio, supersonic calibration	100 kc, 10 kc, 1 kc, 100 cps	Accurate within ± .001%. Sine waves only.	$ 450.00
-hp- 500A Frequency Meter	Rapid frequency measurements	5 cps to 50 kc	10 ranges ± 2% accuracy. Input 0.5 to 200 volts.	$ 210.00
-hp- 505A Tachometer	Measurements of high speed machinery	300 to 3,000,000 rpm	10 ranges ± 2% accuracy.	$ 300.00
-hp- 505B Tachometer	Same as above	5 to 50,000 rps	Same as 505A except calibrated in rps.	$ 300.00

Frequency monitors available for FM broadcast, 88 to 108 mc, TV aural broadcast 59.75 to 215.75 mc; and for communications systems, 30 to 175 mc.

Data Subject to Change Without Notice. Prices f. o. b. Factory.

Complete Coverage! HEWLETT-PACKARD

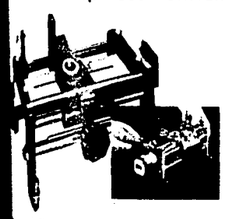
Microwave Test Equipment—10 to 18,000 mc!

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.
Adaptors, Waveguide to Coax		S281A $75.00	G281A $55.00	J281A $50.00	H281A $45.00	X281A $35.00	
Cover to choke flange		S290A $40.00	G290A $30.00	J290A $25.00	H290A $20.00	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 $75.00	G375A $65.00	J375A $60.00	H375A $55.00	X375A $50.00	P375A $55.00
Calibrated		S380A $225.00					
Detector Mounts	440A† $85.00	S485A* $125.00	G485B† $95.00	J485B† $90.00	H485B† $85.00	X485B† $75.00	
Frequency Meters, Reaction				J530A $120.00	H530A $120.00	X530A $120.00	
Slotted Sections	806B§ $200.00	S810A* $450.00	G810B§ $90.00	J810B§ $90.00	H810B§ $90.00	X810B§ $90.00	
Waveguide Tees, Series		S840A $60.00	G840A $50.00	J840A $40.00	H840A $35.00	X840A $30.00	P840A $35.00
Shunt		S841A $60.00	G841A $50.00	J841A $40.00	H841A $35.00	X841A $30.00	P841A $35.00
Hybrid		S845A $90.00	G845A $75.00	J845A $60.00	H845A $55.00	X845A $45.00	P845A $55.00
Transformers, Slide-screw		S870A $150.00	G870A $140.00	J870A $135.00	H870A $130.00	X870A $125.00	P870A $130.00
E-H		S880A $175.00	G880A $155.00	J880A $145.00	H880A $135.00	X880A $130.00	P880A $135.00
Adjustable Shorts		S920A $80.00	G920A $70.00	J920A $65.00	H920A $60.00	X920A $50.00	P920A $55.00
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	
Broad Band Probe	442A $75.00	All Frequencies					
Broad Band Probe, Untuned	444A $50.00	All Frequencies					

*For use with bolometer only. †For use with bolometer or crystal. *Complete assembly including carriage §Mounts in 809B carriage

-hp- 809B UNIVERSAL PROBE CARRIAGE



Now—a single all-purpose probe carriage operates with 5 different *-hp-* slotted sections—waveguide and coaxial. Mounts sections covering frequencies 3,000 to 12,400 mc—*sections can be interchanged in 30 seconds!* Carriage calibrated in mm. to 0.1 mm.; dial gauge may be mounted for more accurate readings. Operates with *-hp-* 442A Broad Band Probe and *-hp-* 440A Coaxial Detector in combination; or with *-hp-* 444A Untuned Probe. *-hp-* 809B, $160.00

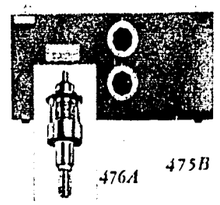
-hp- COAXIAL SLOTTED SECTIONS

-hp- 805A B. 500 to 4000 mc. High accuracy, high stability, negligible slope, minimum leakage. Exclusive parallel plane design with non-bowing center conductor. VSWR of basic section and connectors less than 1.04. *-hp-* 805A, 50 ohms, Type N connectors for flexible cables. *-hp- 805B*, [illegible] ohms, for 3" rigid transmission lines. $475.00

-hp- 806B. 5,000 to 12,000 mc. Same parallel plane design as 805A B. For use with 809B Carriage. VSWR of section and connectors 1.06 to 10,000 mc. 50 ohm impedance, negligible slope. Type N connectors for flexible cable. $200.00

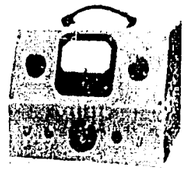
-hp- 803A VHF Bridge reads impedance magnitude and phase *directly* 10 to 500 mc. Rapid operation, for comparative measurements to 1,000 mc. Impedance range 2 to 2,000 ohms. Phase angle −90° to +90° 952 mc and above. $495.00

-hp- 417A VHF Detector, for use with 803A Bridge; or general laboratory readings. Super-regenerative receiver, 10 to 500 mc, 5 bands. Approx. 5 μv sensitivity over entire band. Direct reading frequency control, thoroughly shielded. $200.00



476A 475B

New -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. $125.00. *-hp- 475B Tunable Mount*, continuous 1,000 to 4,000 mc. $200.



-hp- 430A Microwave Power Meter provides instantaneous rf power readings *direct* in db or mw at all bolometer mount frequencies. No calculations, no adjustment except zero set. For *-hp-* bolometer mounts: 475B, 476A, 485. $250.00

-hp- 415A Indicat[illegible] of standing wave ratio. Gives direct reading VSWR [illegible] quarter wavelength [illegible] 50 ohm nominal [illegible] cable [illegible]

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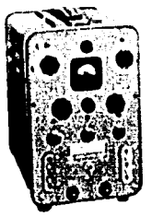
INSTRUMENTS Complete Coverage!

-hp- 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 volts 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.

-hp- 450A Amplifier—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- POWER SUPPLIES

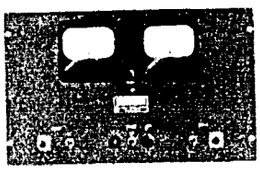


-hp- 715A (illustrated) is a versatile source of regulated beam and reflector voltage for operating most test bench klystron tubes. Beam voltage 250 to 400 v; reflector voltage 10 to 900 v; 6.3 v filament. Internal, 1,000 cps square wave modulation, also 60 cps FM modulation, both on reflector voltage. $300.00

-hp- 710A—Highly stable regulated dc supply, output variable 180 to 360 v at 75 ma., 6.3 v filament. Either terminal may be grounded. Total hum and noise less than 5 mv. $85.00

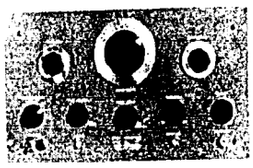
-hp- 712A. Stabilized, variable power supply providing 0 to 500 v at 200 ma and 1/2% regulation. Also variable bias voltages, 0 to 150 v at 5 ma, and 6.3 v filament at 10 amps. Main supply completely metered. Either terminal may be grounded. Hum less than 8 mv. For laboratory, production or general use. $350.00

-hp- 520A NUCLEAR SCALER



-hp- 520A is a new, high-speed 10 mc scaler offering utmost reliability in nuclear counting and frequency measurements. Capable of scaling pulses at rates up to 10,000,000 pps. Has double-pulse resolving time of 0.1 μsec; triple-pulse resolving time of 0.2 μsec. Two-decade circuit gives scaling factor of 100; residual counts are indicated by two panel meters with combined capacity of 100 counts. Instrument may be used with existing low speed scalers to provide any desired count capacity. $600.00

-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 loads). 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. $550.00

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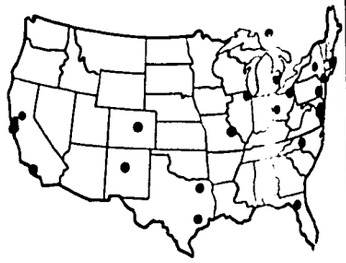
hp offers COMPLETE COVERAGE

in convenient "next door" 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 exact -hp- instrumentation you need. 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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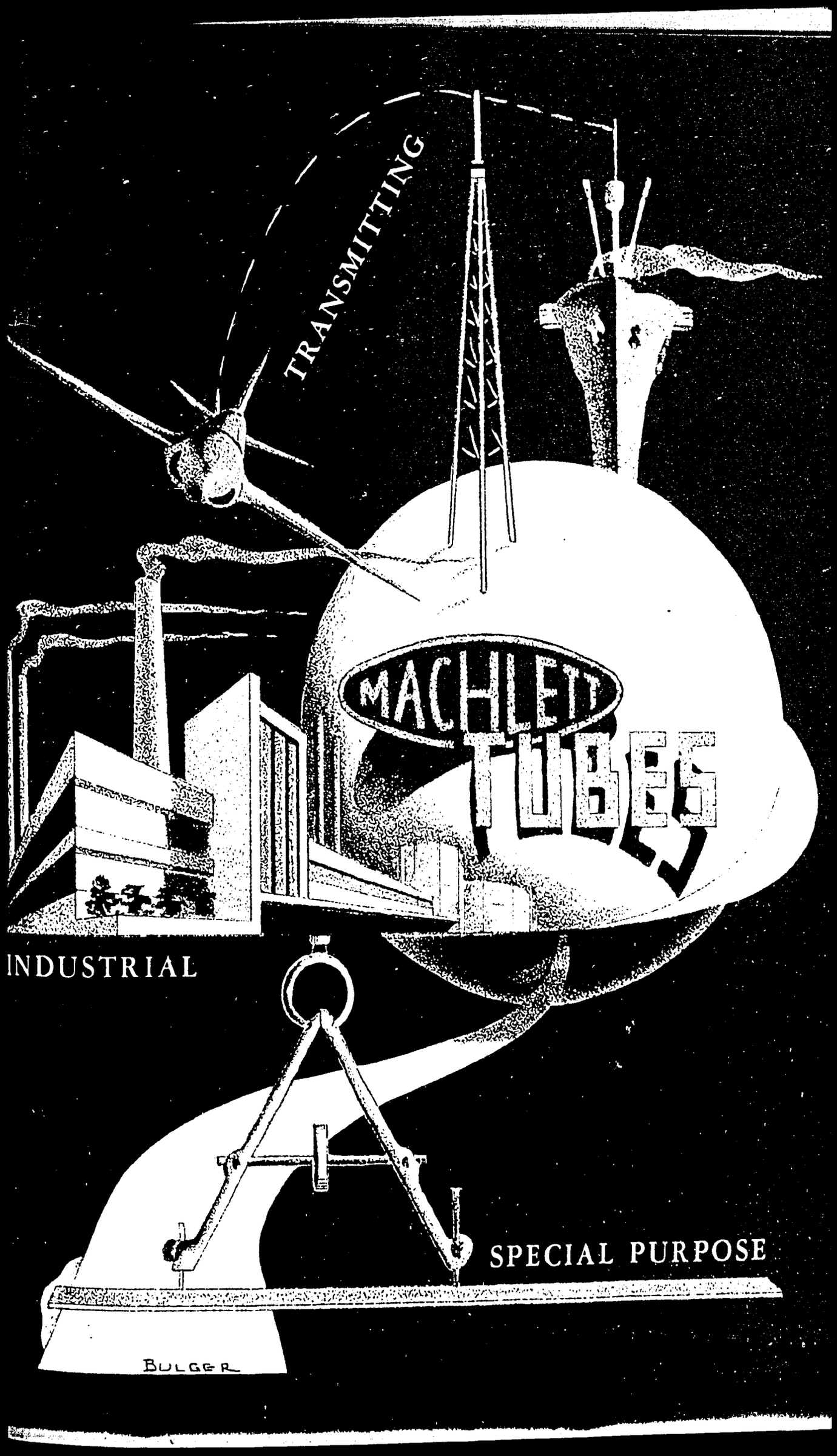
HEWLETT-PACKARD hp INSTRUMENTS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TUBES
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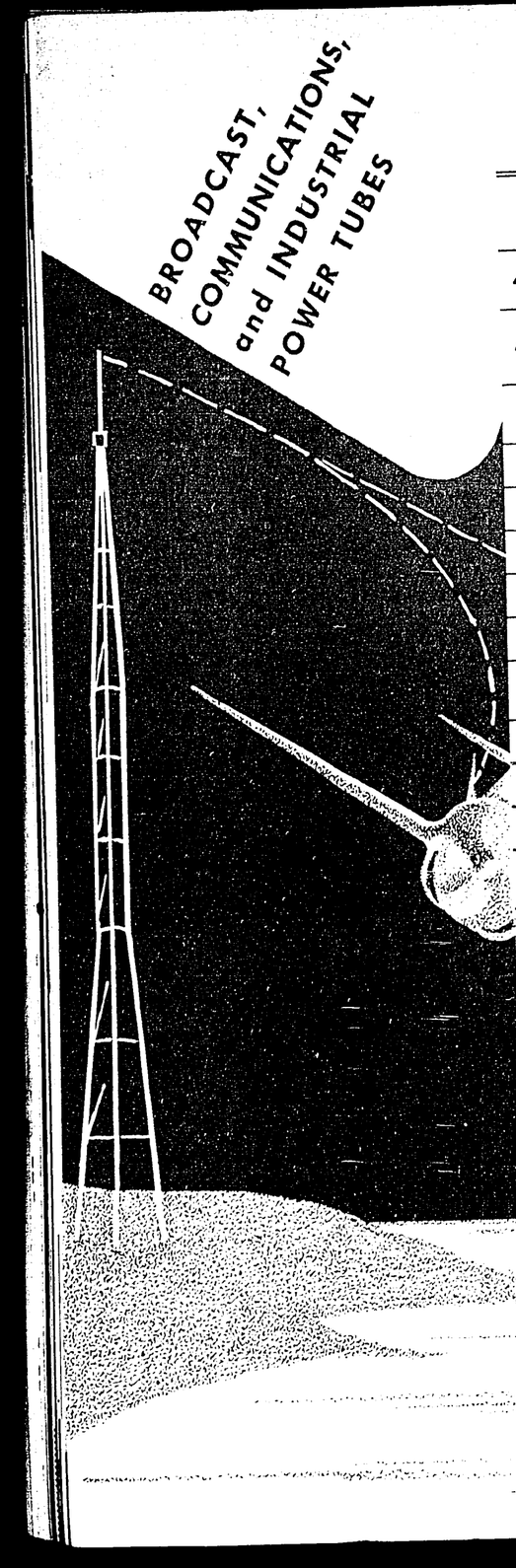
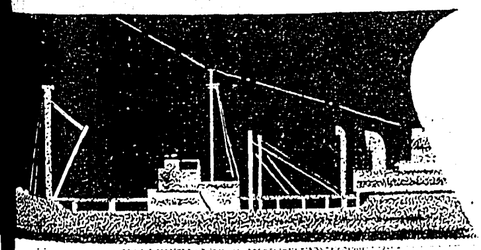


TYPE ML—	DESCRIPTION
2C39A	Forced-air-cooled triode for use as an UHF oscillator, frequency multiplier or r.f. amplifier. Suited to cavity-type circuits. Features include low interelectrode capacitances, high (closely-controlled) transconductance, and high plate dissipation. Cathode is indirectly heated, oxide-coated disc.
4/125A	Convection-cooled tetrode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Forced-air cooling of the envelope is required at frequencies above 30 megacycles. Thoriated-tungsten filament.
4/250A	Convection-cooled tetrode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Forced-air cooling is required on the plate. Forced-air cooling of the envelope is required at frequencies above [illegible]. Thoriated-tungsten filament.
207	Water-cooled triode for use as a modulator, amplifier, or oscillator in broadcast, communication or industrial service. Grid and plate incorporate [illegible] glass seals. Pure-tungsten filament.
212E	Convection-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Thoriated-tungsten filament.
220C	Water-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service.
220CA	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in broadcast and communication service. Pure-tungsten filament.
228A	Water-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Pure-tungsten filament.
232B	Water-cooled triode for use as an amplifier or oscillator in broadcast or communication service. Pure-tungsten filament.
240B	Water-cooled triode for use as a modulator, amplifier, or oscillator in broadcast, communication or industrial service. Incorporates integral-anode water jacket. Pure-tungsten filament.
241B	Convection-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Thoriated-tungsten filament.
242C	Convection-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Thoriated-tungsten filament.
279A	Convection-cooled triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Thoriated-tungsten filament.
298A	Water-cooled, high-power triode for use as a modulator, amplifier, or oscillator in broadcast or communication service. Incorporates integral-anode water jacket. Pure-tungsten filament.
298B	Water-cooled, high-power triode for use as an amplifier or oscillator in broadcast service. Incorporates integral-anode water jacket. Pure-tungsten filament.
342A	Water-cooled triode for use as an amplifier or oscillator in broadcast, communication service. Pure-tungsten filament.

GENERAL CHARACTERISTICS				MAXIMUM RATINGS								TYPE ML
Filament Current Amps	Mu	Gm µMhos	Class of Service	Plate Voltage Vdc	Plate Current Adc	Grid Voltage Vdc	Grid Current Adc	Screen Voltage Vdc	Plate Input Watts	Plate Dissip Watts	Freq Ratings mc sec	
1.0	100	22000	CWO	1000	0.125	—150	——	——	125	100**	2500	
			FM	1000	0.125	—150	0.050	——	125	100**	2500	2C39A
			C-P	600	0.100	—150	0.050	——	100	100**	2500	
6.5	6.2	2450	C-T	3000	0.225	—500	——	400	675	125	120	
			C-P	2500	0.2	—500	——	400	500	85	120	4 125A
14.5	5.1	4000	C-T	4000	0.350	—500	——	600	1400	250	75	
			C-P	3200	0.275	—500	——	600	800	165	75	4 250A
51.0	20	——	B-A	15000	2.0	——	——	——	20000	7500	——	
			C-P	10000	1.0	—3000	0.2	——	10000	6500	1.6	207
			C-T	15000	2.0	—3000	0.2	——	30000	10000	1.6	
6.0	16	8500	C-T	3000	.350	——	.075	——	——	275	1.5	212E
41.0	40	5000	C-T	15000	1.5	——	——	——	——	10000	4	220C
41.0	40	5000	C-T	15000	1.5	——	——	——	——	5000	4	220CA
41.0	16	6500	C-T	6000	1.5	——	——	——	——	5000	3	228A
60.0	40	6500	C-T	20000	3.0	——	——	——	——	25000	3	232B
41.0	40	5000	C-T	12000	1.7	——	——	——	——	16000	20	240B
6.0	16	8500	C-T	3000	.350	——	.075	——	——	275	7.5	241B
3.25	12.5	3600	C-T	1250	.150	—400	.050	——	188	150	6	242C
21.0	10	5000	C-T	3000	.800	——	.100	——	——	1200	20	279A
225	32	22000	C-T	20000	11	——	——	——	——	100000	4	298A
225	57.5	20000	C-T	20000	11	——	——	——	——	100000	4	298B
67	40	6820	C-T	20000	2.5	——	——	——	——	25000	4	342A



NOTES

Ratings are for C.C.S. unless otherwise specified

**—Forced Air Cooling

B-A—A-F Power Amplifier and Modulator, Class B

C-P—Plate Modulated RF Power Amplifier, Class C Telephony

C-T—R-F Power Amplifier and Oscillator, Class C Telegraphy

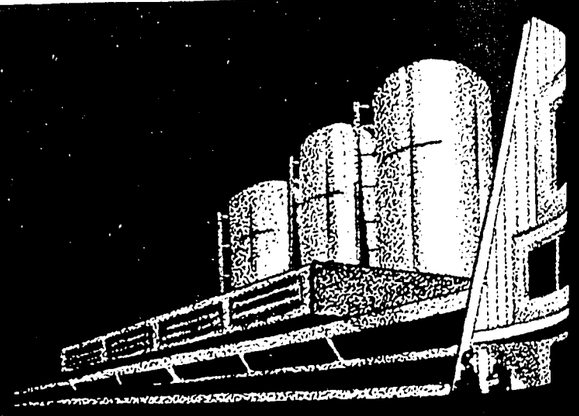
CWO—CW Oscillator, Grid Separation Circuit

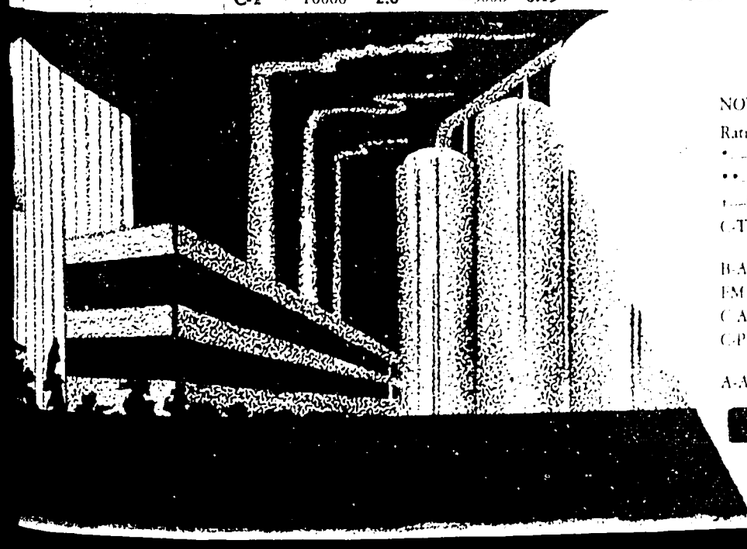
FM—Frequency Multiplier, Grid Separation Circuit

BROADCAST, COMMUNICATIONS, and INDUSTRIAL POWER TUBES

TYPE ML—	DESCRIPTION
343A	Water-cooled triode for use as a modulator, amplifier, or oscillator in [illegible] or communication service. Pure-tungsten filament.
343AA	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator [illegible] cast or communication service. Pure-tungsten filament.
356*	Water-cooled triode for use as a modulator, amplifier, or oscillator in [illegible] communication and industrial service. Replaces Type 5771 tube [illegible] Type 880 tube with reduction in filament power. Includes sturdy kovar [illegible] seals. Thoriated-tungsten stress-free filament.
357B	Convection— or forced-air-cooled triode for use as a modulator, [illegible] oscillator in AM and FM broadcast or communication service. Thoriated [illegible] filament.
379A	Convection-cooled triode for use as a modulator, amplifier, or oscillator [illegible] cast or communication service. Thoriated-tungsten filament.
381	Forced-air-cooled triode for use as a UHF plate-pulsed oscillator, frequency [illegible] plier, or power amplifier. Suited to cavity-type and parallel-line circuits. [illegible] include low interelectrode capacitances, high (closely-controlled) [illegible] ance, and high plate dissipation. Cathode is indirectly-heated, oxide-coated.
450TH	Convection-cooled triode for use as a modulator, amplifier, or oscillator [illegible] cast, communication, or industrial service. Thoriated-tungsten filament.
805	Convection-cooled triode for use as a modulator, amplifier, or oscillator [illegible] cast or communication service. Thoriated-tungsten filament.
813	Convection-cooled beam-power pentode for use as a modulator, amplifier, [illegible] lator in broadcast or communication service. Thoriated-tungsten filament.
814	Convection-cooled pentode for use as a modulator, amplifier, or oscillator [illegible] broadcast or communication service. Thoriated-tungsten filament.
833A	Forced-air or convection-cooled triode for use as a modulator, amplifier or [illegible] in broadcast, communication, or industrial service. Thoriated-tungsten [illegible]
846	Water-cooled triode for use as an amplifier or oscillator in broadcast or [illegible] cation service. Pure-tungsten filament, redesigned for improved life.
880	Water-cooled triode for use as a modulator, amplifier, or oscillator in [illegible] communication, or industrial service. Incorporates sturdy kovar-to-glass [illegible] ruggedized electrode structures. Pure-tungsten, stress-free filament.
889A	Water-cooled triode for use as a modulator, amplifier, or oscillator in [illegible] communication, or industrial service. Incorporates sturdy kovar-to-glass [illegible] ruggedized electrode structures. Pure-tungsten, stress-free filament.
889RA	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in [illegible] communication, or industrial service. Incorporates sturdy kovar-to-glass [illegible] ruggedized electrode structures. Pure-tungsten, stress-free filament.
891	Water-cooled triode for use as a modulator in broadcast or communication [illegible] Incorporates kovar-to-glass seals. Pure-tungsten filament.
891R	Forced-air-cooled triode for use as a modulator in broadcast or communication [illegible] service. Incorporates kovar-to-glass seals. Pure-tungsten filament.

GENERAL CHARACTERISTICS				MAXIMUM RATINGS									TYPE ML—
Filament Type	Current Amps	Mu	Gm μMhos	Class of Service	Plate Voltage Vdc	Plate Current Adc	Grid Voltage Vdc	Grid Current Adc	Screen Voltage Vdc	Plate Input Watts	Plate Dissip. Watts	Freq. Ratings mc sec	
[illegible]	57.5	40	6750	C-T	18000	2.0	——	——	——	——	10000	4	343A
[illegible]	57.5	40	6750	C-T	18000	1.5	——	——	——	——	5000	4	343AA
[illegible]	170	20	——	B-A	12500	5	——	——	——	45000	22500	25	356*
				C-P	10000	4	—1600	0.8	——	40000	15000	——	
				C-T	12500	6	—1600	0.8	——	60000	22500	25	
				C-T	15000	6	—1600	0.8	——	67500	22500	1.6	
[illegible]	10	30	——	C-T	4000	0.5	—500	.100	——	1600	400	110	357B
[illegible]	21.0	10	5000	C-T	3000	.800	——	.100	——	——	2500	20	379A
[illegible]	1.0	100	20000	F-M**	3500	0.0075†	—200	0.0045†	——	25†	[illegible]	3000	381
				C-A**	3500	0.01 †	—150	0.006 †	——	35†	[illegible]	3000	
[illegible]	12.0	38	6650	B-A	6000	0.6	——	——	——	——	250	——	450TH
				C-T	6000	0.6	——	0.125	——	——	450	40	
[illegible]	3.25	Var.	——	B-A	1500	0.210	——	——	——	315	125	——	805
				C-P	1250	0.175	—300	0.070	——	220	85	30	
				C-T	1500	0.210	—300	0.070	——	315	125	30	
[illegible]	5.0	8.5	3750	C-P	1600	0.150	—300	0.025	400	240	60	30	813
				C-T	2000	0.180	—300	0.025	400	360	100	30	
[illegible]	3.25	——	3300	C-T	1250	.150	—300	.015	400	180	50	30	814
[illegible]	10.0	35	——	C-P**	3000	0.45	—500	0.10	——	1250	[illegible]	20	833A
				C-T**	4000	0.50	—500	0.10	——	1800	450	20	
[illegible]	51	40	——	C-P	6000	0.50	—1000	0.15	——	3000	1650	50	846
				C-T	7500	1.0	—1000	0.15	——	7500	2500	50	
[illegible]	315	20	——	B-A	10500	5.0	——	——	——	40000	15000	——	880
				C-P	10500	3.6	—1200	0.80	——	36000	12000	25	
				C-T	10500	6.0	—1200	0.80	——	60000	20000	25	
[illegible]	120	21	——	B-A	8500	2.0	——	——	——	12000	5000	——	889A
				C-P	6000	1.0	—1000	0.25	——	6000	3000	50	
				C-T	8500	2.0	—1000	0.25	——	16000	5000	50	
[illegible]	120	21	——	B-A	8500	2.0	——	——	——	12000	5000	——	889RA
				C-P	6000	1.0	—1000	0.25	——	6000	3000	40	
				C-T	8500	2.0	—1000	0.25	——	16000	5000	40	
[illegible]	60	8.5	——	A-A	12000	——	——	——	——	7500	7500	——	891
				B-A	15000	2.0	——	——	——	20000	5000	——	
				C-P	8000	1.0	—3000	0.15	——	8000	4000	1.6	
				C-T	12000	2.0	—3000	0.15	——	18000	6000	1.6	
[illegible]	60	8.5	——	A-A	10000	——	——	——	——	——	3500	——	891R
				B-A	10000	2.0	——	——	——	10500	3500	——	
				C-P	8500	1.0	—3000	0.15	——	8000	2500	1.6	
				C-T	10000	2.0	—3000	0.15	——	15000	4000	1.6	





NOTES:

Ratings are for C.C.S., unless otherwise specified.

*—Also Industrial Application

**—Forced Air Cooling

†—Duty Cycle = 5 x 10⁻³

C-T—R-F Power Amplifier and Oscillator, Class C Telegraphy

B-A—A-F Power Amplifier and Modulator, Class B

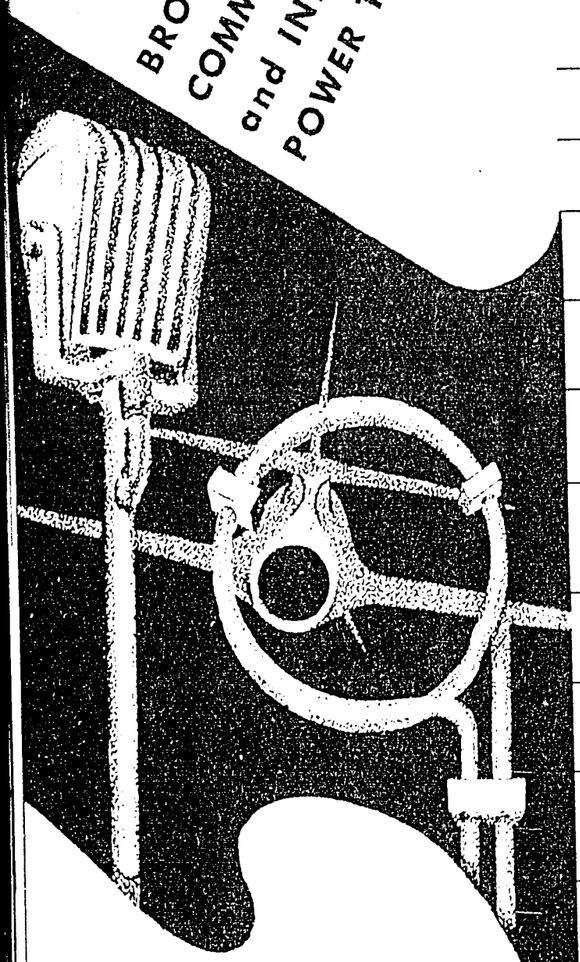
F-M—Frequency Multiplier, Grid Separation Current

C-A—Plate Pulsed Oscillator and Amplifier, Class C

C-P—Plate Modulated RF Power Amplifier, Class C Telephony

A-A—A-F Power Amplifier and Modulator, Class A

BROADCAST, COMMUNICATIONS, and INDUSTRIAL POWER TUBES



TYPE ML—	DESCRIPTION
892	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Incorporates kovar-to-glass seals, thoriated-tungsten filament.
892R	Forced-air cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Incorporates sturdy kovar-to-glass seals. Pure-tungsten filament.
893A	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Pure-tungsten filament designed for use from single-, three-, or six-phase power supply.
893AR	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Pure-tungsten filament designed for use from single-, three-, or six-phase power supply.
5530*	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Especially suited to high-quality FM operation. Incorporates sturdy kovar-to-glass seals. Thoriated-tungsten stress-free filament.
5541*	Forced-air cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Especially suited to high-quality FM operation. Incorporates sturdy kovar-to-glass seals. Thoriated-tungsten stress-free filament.
5604*	Forced-air cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Designed especially for pulsing applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures and heavy-wall anode. Pure-tungsten filament.
5606*	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Replaces Type 892 tube electrically. Pure filament is not required. Designed especially for industrial applications. Incorporates sturdy kovar-to-glass seals and ruggedized electrode structures. Pure-tungsten, stress-free filament.
5619*	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Designed especially for pulsing applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures, and heavy-wall anode. Pure-tungsten filament.
5658*	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Replaces Type 880 tube electrically. Designed especially for industrial heating applications. Incorporates sturdy kovar-to-glass seals and ruggedized electrode structures. Pure-tungsten filament.
5666*	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Uses Machlett automatic seal. Directly replaces Type 892A electrically. Designed especially for pulsing applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures, and heavy-wall anode. Pure-tungsten, stress-free filament.
5667*	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Replaces Type 892RA tube electrically. Designed especially for industrial heating applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures, and heavy-wall anode. Pure-tungsten, stress-free filament.
5668*	Water-cooled triode for use as a modulator, amplifier, or oscillator in communication, or industrial service. Uses Machlett automatic seal. Directly replaces Type 892 tube electrically. Designed especially for pulsing applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures and heavy-wall anode. Pure-tungsten, stress-free filament.
5669*	Forced-air-cooled triode for use as a modulator, amplifier, or oscillator in communication or industrial service. Replaces Type 892R tube electrically. Designed especially for industrial heating applications. Incorporates sturdy kovar-to-glass seals, ruggedized electrode structures and heavy-wall anode. Pure-tungsten, stress-free filament.
5681*	Water- and forced-air-cooled, all-ring-seal triode for high-power AM broadcast, particle-accelerator, and industrial-heating service. Incorporates high-conductivity, gold-plated kovar-to-glass seals, sturdy electrodes, integral water jacket, quick-change water coupling, and heavy-wall copper anode strand, self-supporting, thoriated-tungsten filament.
5682*	Water- and forced-air-cooled, all-ring seal triode for high-power AM and TV broadcasting, particle-accelerator, and industrial heating service. Incorporates high-conductivity, gold-plated kovar-to-glass seals, sturdy electrodes, integral water jacket, quick-change water coupling, and heavy-wall copper anode strand, self-supporting, thoriated-tungsten filament.

NOTES:

Ratings are for CCS, unless otherwise specified.

*—Also Used in Industrial Applications

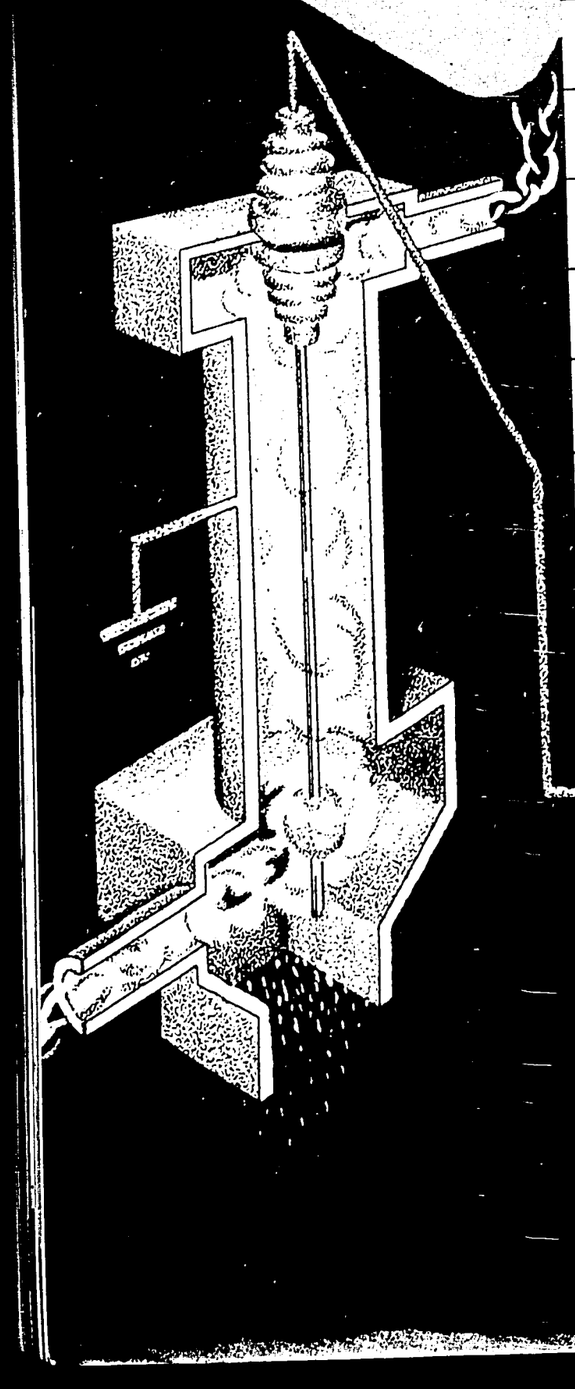
B-A—A-F Power Amplifier and Modulator, Class B

C-P—Plate Modulated RF Power Amplifier, Class C Telephony.

C-T—R-F Power Amplifier and Oscillator, Class C Telegraphy.

GENERAL CHARACTERISTICS					MAXIMUM RATINGS								TYPE ML
Filament Type	Current Amps	Mu	Gm µMhos	Class of Service	Plate Voltage Vdc	Plate Current Adc	Grid Voltage Vdc	Grid Current Adc	Screen Voltage Vdc	Plate Input Watts	Plate Output Watts	Freq. Range mc and
	60	50	—	B-A	15000	2.0	—	—	—	20000	—	—	892
				C-P	10000	1.0	—3000	0.50	—	10000	—	1.6
				C-T	15000	2.0	—3000	0.40	—	30000	—	1.6
	60	50	—	B-A	12500	2.0	—	—	—	12000	—	—	892R
				C-P	10000	1.0	—3000	0.50	—	10000	—	1.6
				C-T	12500	2.0	—3000	0.40	—	15000	—	1.6
	185	35	—	B-A	20000	4.0	—	—	—	60000	—	—	893A
				C-P	12000	2.0	—3000	0.40	—	24000	—	5
				C-T	20000	4.0	—3000	0.40	—	70000	—	5
	185	35	—	B-A	20000	4.0	—	—	—	60000	—	—	893AR
				C-P	12000	2.0	—3000	0.40	—	24000	—	5
				C-T	20000	4.0	—3000	0.40	—	70000	—	5
	55	26	11000	C-T	5000	1.75	—1000	0.20	—	8750	—	110	5530*
	57	26	21000	C-T	8500	2.75	—1800	0.30	—	23000	—	110	5541*
	176	19.5	—	C-T	12500	3.0	—2000	0.45	—	32500	—	22.5	5604*
	60	50	—	C-T	15000	2.0	—3000	0.40	—	30000	—	1.6	5606*
	176	19.5	—	C-T	12500	3.0	—2000	0.45	—	32500	—	22.5	5619*
	310	20	—	C-T	12500	5.0	—1000	0.80	—	60000	—	20	5658*
	120	21	—	C-T	10000	2.0	—1500	0.35	—	20000	—	225	5666*
	120	21	—	C-T	10000	2.0	—1500	0.35	—	20000	—	225	5667*
	60	50	—	C-T	14000	2.0	—3000	0.40	—	28000	—	5	5668*
	60	50	—	C-T	14000	2.0	—3000	0.40	—	28000	—	5	5669*
	220	23	—	C-T	15000	12	—1600	2.5	—	150000	75000	30	5681*
				C-T	9000	12	—1600	2.5	—	100000	75000	110	
	325	32	—	C-T	16000	20	—1600	4.0	—	300000	150000	30	5682*
				C-T	9000	20	—1600	4.0	—	170000	100000	—	

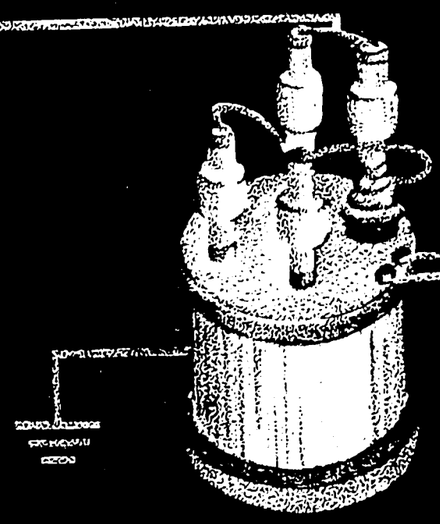
HIGH-VOLTAGE INDUSTRIAL RECTIFIER TUBES

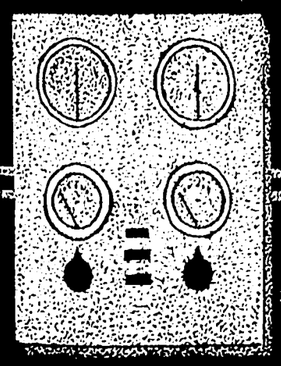


TYPE ML—	DESCRIPTION
102	Air-insulated, high-vacuum, half-wave rectifier tube. Used in smoke, dust, small particle electrostatic precipitation. Sturdy, catenary type, pure filament.
103	Oil-insulated, high-vacuum, half-wave rectifier tube. Used in industrial tions requiring high-voltage, low-current power. Pure-tungsten filament
106	Oil-insulated, high-vacuum, half-wave rectifier tube. Suitable for h cable testing and small particle electrostatic precipitation. Pure-tungsten
108	Oil-insulated, high-vacuum, half-wave rectifier tube. Used in smoke, dus small particle precipitation applications. Sturdy, loop-type, pure-tungsten
110	Air-insulated, high-vacuum, half-wave rectifier tube. Used in industrial tions requiring high-voltage, low-current power. Sturdy, loop-type, pure filament.
115	Air-insulated, high-vacuum, half-wave rectifier tube. Suitable for small electrostatic precipitation and other applications requiring high-v current power. Sturdy, loop-type, pure-tungsten filament.
121	Oil-insulated, high-vacuum, half-wave rectifier tube. Used in industrial requiring high-voltage, low-current power. Sturdy, loop-type pure filament.
120 126	Air-insulated, high-vacuum, half-wave rectifier tube. Used in smoke, dust small particle precipitation applications. Sturdy, loop-type, pure-tungsten ML-120 designed to withstand 140 peak inverse kilovolts, ML-126 inverse kilovolts.
170 180	High-vacuum, half-wave rectifier tube. Useful in high-voltage cable testing of process and exhaust atmospheres, and other small particle precipitation Sturdy, loop-type, pure-tungsten filament. ML-170 designed for air operation, ML-180 oil insulated operation.
222A	Water-cooled, half-wave rectifier for use in broadcast or communication Anode dissipation rating, 25 kilowatts. Pure-tungsten filament.
5575 /100	Air-insulated, high-vacuum, half-wave rectifier tube. Widely used in process and exhaust atmospheres and many particle precipitation Sturdy, catenary type of pure-tungsten filament.
5576 /200	Air-insulated, high-vacuum, half-wave rectifier tube. Widely used in particle precipitation and many high-voltage, high-power applications catenary type of pure-tungsten filament.

RAL CHARACTERISTICS — MAXIMUM RATINGS

Filament Voltage Volts	Filament Current Amperes	Peak Inverse Anode Voltage Kilovolts	Peak Anode Current Milliamperes	Circuit	Load Current Rating Unfiltered* Milliamperes	Load Current Rating Filtered** Milliamperes	TYPE ML—
20	19.0	75	750	Single-Phase, Two-Tube, Half-Wave	238	—	102
				Single-Phase, Four-Tube, Full-Wave	476	750	
				Three-Phase, Double-Y Parallel	1440	1500	
				Three-Phase, Full-Wave	714	750	
10	11.5	125	78	Single-Phase, Two-Tube, Half-Wave	25	—	103
				Single-Phase, Four-Tube, Full-Wave	50	50	
				Three-Phase, Double-Y Parallel	150	156	
				Three-Phase, Full-Wave	74	78	
11	19.0	140	157	Single-Phase, Two-Tube, Half-Wave	50	—	106
				Single-Phase, Four-Tube, Full-Wave	100	100	
				Three-Phase, Double-Y Parallel	302	314	
				Three-Phase, Full-Wave	150	157	
13	12.5	140	200	Single-Phase, Two-Tube, Half-Wave	64	—	108
				Single-Phase, Four-Tube, Full-Wave	128	128	
				Three-Phase, Double-Y Parallel	385	400	
				Three-Phase, Full-Wave	191	200	
10	11.5	140	78	Single-Phase, Two-Tube, Half-Wave	25	—	110
				Single-Phase, Four-Tube, Full-Wave	50	50	
				Three-Phase, Double-Y Parallel	150	156	
				Three-Phase, Full-Wave	74	78	
10	11.5	125	100	Single-Phase, Two-Tube, Half-Wave	32	—	115
				Single-Phase, Four-Tube, Full-Wave	64	64	
				Three-Phase, Double-Y Parallel	192	200	
				Three-Phase, Full-Wave	95	100	
10	11.5	140	100	Single-Phase, Two-Tube, Half-Wave	32	—	121
				Single-Phase, Four-Tube, Full-Wave	64	64	
				Three-Phase, Double-Y Parallel	192	200	
				Three-Phase, Full-Wave	95	100	
13	12.5	140	200	Single-Phase, Two-Tube, Half-Wave	64	—	120
				Single-Phase, Four-Tube, Full-Wave	128	128	
				Three-Phase, Double-Y Parallel	385	400	
		150		Three-Phase, Full-Wave	191	200	126
13	12.5	200	200	Single-Phase, Two-Tube, Half-Wave	64	—	170
				Single-Phase, Four-Tube, Full-Wave	128	200	
				Three-Phase, Double-Y Parallel	385	400	180
				Three-Phase, Full-Wave	191	200	
21.5	41	25	5000	—	—	—	222A
20	24	150	1000	Single-Phase, Two-Tube, Half-Wave	318	—	5575
				Single-Phase, Four-Tube, Full-Wave	636	1000	/100
				Three-Phase, Double-Y Parallel	1923	2000	
				Three-Phase, Full-Wave	955	1000	
20	32	150	2500	Single-Phase, Two-Tube, Half-Wave	796	—	5576
				Single-Phase, Four-Tube, Full-Wave	1592	2500	/200
				Three-Phase, Double-Y Parallel	4820	5000	
				Three-Phase, Full-Wave	2385	2500	





NOTES:

Ratings are for CCS, unless otherwise specified.

*Unfiltered—Load current ratings are based on sine-wave voltage input and resistance load without inductive or capacitive effects.

**Filtered—Load current ratings are based on sine-wave voltage input and infinite inductance choke input filter.

MERCURY VAPOR RECTIFIER TUBES

TYPE ML—	DESCRIPTION
255B	Convection- or air-cooled, half-wave rectifier for use in broadcast or comm... equipment. Oxide-coated filament.
266B	Convection- or air-cooled, half-wave rectifier for use in broadcast or comm... equipment. Oxide-coated filament.
267B	Convection-cooled, half-wave rectifier for use in communication equipment. ...coated filament.
315A	Convection-cooled, half-wave rectifier for use in broadcast or comm... equipment. Oxide-coated filament.
319A	Convection-cooled, half-wave rectifier for use in broadcast or comm... equipment. Oxide-coated filament.
321A	Convection-cooled, half-wave rectifier for use in broadcast or comm... equipment. Oxide-coated filament.
575A	Convection-cooled, half-wave rectifier for use in broadcast, commun... industrial equipment. Oxide-coated filament.
673A	Convection-cooled, half-wave rectifier for use in broadcast, commun... industrial equipment. Oxide-coated filament.
857B	Convection- or air-cooled, half-wave rectifier for use in broadcast, comm... or industrial equipment. Oxide coated filament.
866A	Convection-cooled, half-wave rectifier for use in broadcast, commun... industrial equipment. Oxide-coated filament.
869B	Convection- or air-cooled, half-wave rectifier for use in broadcast, comm... or industrial equipment. Oxide-coated filament.
872A	Convection-cooled, half-wave rectifier for use in broadcast, commun... industrial equipment. Oxide-coated filament.
8008	Convection-cooled, half-wave rectifier for use in broadcast, commun... industrial equipment. Oxide-coated filament.

...AL CHARACTERISTICS		MAXIMUM RATINGS						TYPE ML—
Filament Current Amps	Tube Voltage Drop Volts	Filament Excitation	Cooling	Cond. Merc. Temp. Range °C	Peak Inverse Anode Voltage Volts	Peak Anode Current Amps	Average Anode Current Amps	Surge Current Amps	
19	15	In-Phase	Forced-air	20-40		10.0		100	255B
			Convection	20-50		10.0		100	
		Quadrature	Forced-air	20-40		20.0		100	
			Convection	20-50		20.0		100	
42	15	In-Phase	Forced-air	20-40		20.0		200	266B
			Convection	20-50		20.0		200	
		Quadrature	Forced-air	20-40		40.0		200	
			Convection	20-50		40.0		200	
6.75	10	In-Phase	Convection	20-70		4.0		40	267B
		Quadrature	Convection	20-70		8.0		40	
10	15	In-Phase	Convection	20-55		4.0		40	315A
			Convection	20-65		4.0		40	
		Quadrature	Convection	20-55		8.0		40	
			Convection	20-65		8.0		40	
6.75	10	In-Phase	Convection	20-70		4.0		40	319A
		Quadrature	Convection	20-70		8.0		40	
10	15	In-Phase	Convection	20-55		4.0		40	321A
			Convection	20-65		4.0		40	
		Quadrature	Convection	20-55		8.0		40	
			Convection	20-65		8.0		40	
10	10	In-Phase	Convection	20-50		6.0		60	575A
			Convection	20-60		7.0		60	
10	10	In-Phase	Convection	20-50		6.0		60	673A
			Convection	20-60		7.0		60	
30	15	In-Phase	Forced-air	30-40		20.0		400	857B
			Convection	25-60		20.0		400	
		Quadrature	Forced-air	30-40		40.0		400	
			Convection	25-60		40.0		400	
5.0	15	In-Phase	Convection	25-60		1.0		20	866A
			Convection	25-70		2.0		20	
19	15	In-Phase	Forced-air	30-40		10.0		100	869B
			Convection	30-60		10.0		100	
		Quadrature	Forced-air	30-40		20.0		100	
7.5	10	In-Phase	Convection	20-60		5.0		50	872A
			Convection	20-70		5.0		50	
7.5	10	In-Phase	Convection	20-60		5.0		50	8008
			Convection	20-70		5.0		50	

POWER TUBE ACCESSORIES

CATALOG NUMBER	DESCRIPTION	AVAILABLE FOR TUBE TYPES ML—
R-1001	Filament Terminal Connectors, pair, without straps. Assure minimum I^2R loss connections and provide adequate finned cooling area.	356, 5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1002	Filament Terminal Connectors, pair, complete with straps. Connecting straps are of silver-plated flexible copper provided in 25 inch lengths, unless otherwise specified.	356, 5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1012	Filament Terminal Connectors, pair, complete with straps. Connecting straps are of silver-plated flexible copper provided in 25 inch lengths, unless otherwise specified.	880, 5658.
R-1003	Grid Terminal Connectors, pair with jumper, without strap.	5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1009	Grid Terminal Connectors, pair with jumper, without strap.	356, 880, 5658.
R-1004	Grid Terminal Connectors, pair with jumper, complete with strap. Connecting strap is of silver-plated flexible copper provided in 25 inch lengths, unless otherwise specified.	5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1005	Grid Terminal Connectors, pair with jumper, complete with strap.	356, 880, 5658.
R-1006	Filament and Grid Terminal Connectors, two pairs, with grid jumper but without connecting straps.	5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1010	Filament and Grid Terminal Connectors, two pairs, with grid jumper but without connecting straps.	356, 880, 5658.
R-1007	Filament and Grid Terminal Connectors, two pairs, with grid jumper and connecting straps.	5604, 5606, 5619, 5666, 5667, 5668, 5669, 889A, 889RA.
R-1008	Filament and Grid Terminal Connectors, two pairs, with grid jumper and connecting straps.	356, 880, 5658.
R-1019	Water Jacket, complete with O-ring gasket and helical water guide.	5619.
R-1058	Water Jacket, complete with O-ring gasket.	356, 880, 5658.
R-1066	Water Jacket, complete with O-ring gasket and helical water guide.	5666.
R-1068	Water Jacket, complete with O-ring gasket and helical water guide.	5668.
R-1020	O-ring Gasket, for R-1019, R-1066, R-1068 water jackets.	5619, 5666, 5668.
R-1021	O-ring Gasket, for R-1058 water jacket.	880, 5658, 5771.
R-1038	Gasket, for water jacket.	889A.
R-1043	Gasket, for water jacket.	207, 891, 892, 5606.
R-1046	Gasket, for water jacket.	846.
R-1049	Gasket, for water jacket. Flat-ring type.	356, [illegible]
R-1052	Gasket, for water jacket.	893A.
R-1022	Gasket, for water jacket. (Small)	220C, 232B, 343A
R-1023	Gasket, for water jacket. (Large)	220C, 232B, 343A
R-1028	Gasket, for water jacket. (Small)	228A.
R-1029	Gasket, for water jacket. (Large)	228A.
R-1048	Gasket, for water jacket.	298A.
R-1030	Mounting Plate with Mounting Clamp, for R-1019, R-1066, R-1068 water jackets.	5619, [illegible]
R-1032	Mounting Plate, for mounting of R-1019, R-1066, R-1068 water jackets.	5619, [illegible]
R-1034	Standoff Insulator with Mounting Clamp, for R-1019, R-1066 water jackets.	5619, [illegible]
R-1067	Air-Deflector, for deflection of anode cooling air to dish, terminal seals and terminal connectors.	5667, [illegible]
R-1064	Air-Deflector, for deflection of anode cooling air to dish, terminal seals and terminal connectors.	5667, [illegible]

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Westrex

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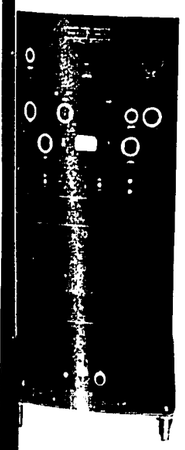
Offices in Over 100

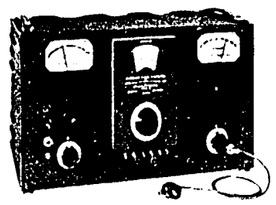
Laboratory Standards

STANDARD SIGNAL GENERATORS

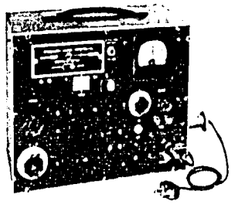
MODEL	FREQUENCY RANGE	OUTPUT RANGE	MODULATION	DIMENSIONS
65-B	75 Kc.-30 Mc.	0.1 microvolt to 2.2 volts	AM. 0 to 100% 400 cycles or 1000 cycles External mod., 50-10,000 cycles	11" high x 20" wide x 10¼" deep Weight: 55 lbs.
78	15-25 Mc.; 195-225 Mc. 15-25 Mc.; 90-125 Mc. other ranges on order	1 to 100,000 microvolts	AM. 8200-400 cycles 625-400 cycles Fixed at approximately 30%	10" high x 13" wide x 7" deep Weight: 22 lbs.
78-FM	86 Mc.-108 Mc.	1 to 100,000 microvolts	Deviation 0-300 Kc., 2 ranges FM. 400-8200 cycles External modulation to 15 Kc.	10" high x 13" wide x 7" deep Weight: 25 lbs.
80	2 Mc.-400 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30% 400 cycles and 1000 cycles External mod., 50-10,000 cycles	10¾" high x 19" wide x 9½" deep Weight: 45 lbs.
82	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.	15" high x 19" wide x 12" deep Weight: 50 lbs.
84	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.	12" high x 26" wide x 10" deep Weight: 135 lbs.
90	20 Mc.-250 Mc.	0.3 microvolt to 0.1 volt	Continuously variable, 0 to 100% Sinusoidal modulation 30 cycles to 5 Mc. Composite TV modulation	58¾" high x 28¼" wide x 25½" deep Weight: 302 lbs.



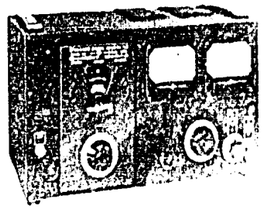
MODEL 90
TELEVISION SIGNAL GENERATOR



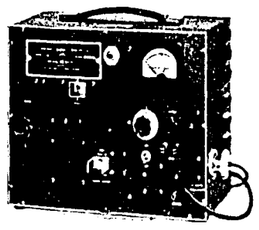
MODEL 65-B
STANDARD SIGNAL GENERATOR



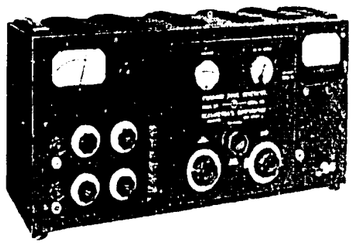
MODEL 78-FM
FM SIGNAL GENERATOR



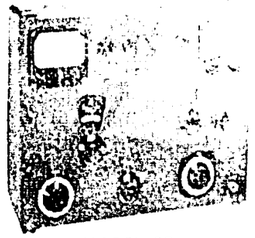
MODEL 80
STANDARD SIGNAL GENERATOR



MODEL 78
STANDARD SIGNAL GENERATOR



MODEL 84
STANDARD SIGNAL GENERATOR



MODEL 82
STANDARD SIGNAL GENERATOR

MEASUREMENTS CORPORATION BOONTON · NEW JERSEY

Laboratory Standards

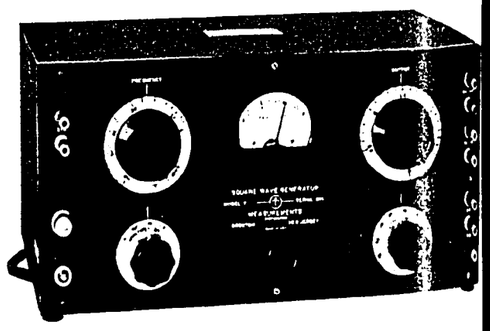
STANDARDS ARE ONLY AS RELIABLE AS THE REPUTATION OF THEIR MAKER

MODEL	FREQUENCY RANGE	WAVE SHAPE	OUTPUT	DIMENSIONS
71	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.	7" high x 15" wide x 7½" deep Weight: 20 lbs.

MODEL	FREQUENCY RANGE	SENSITIVITY RANGE	DIMENSIONS
58	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.	16" wide x 9" high x 11" deep Weight: 35 lbs.

MODEL	REPETITION RATE	PULSE WIDTH	OUTPUT	DIMENSIONS
79-B	60 to 100,000 pulses per second	Continuously variable from 0.5 to 40 microseconds PULSE SHAPE Rise time: approx. 0.5 microseconds. Decay time: no more than 25% of pulse width at a 25% duty cycle.	Approximately 150 volts positive with respect to ground. "Sync. Output" 75 volts positive with respect to ground	10" high x 13½" wide x 10½" deep Weight: 31 lbs.

MODEL 79-B
PULSE GENERATOR



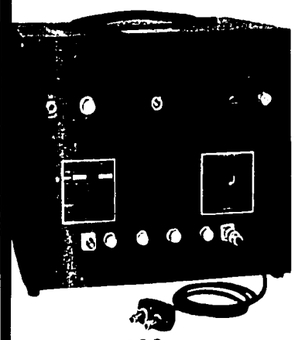
MODEL 71
SQUARE WAVE GENERATOR

MODEL 58
U.H.F. RADIO NOISE and FIELD STRENGTH METER

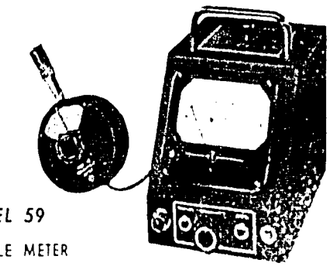
MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	MODULATION	DIMENSIONS
59	2.2 Mc. to 400 Mc.	Within ±2%	CW or 120 cycles fixed at approximately 30%. Provision for external modulation	Oscillator Unit 3¾" diameter; 2" deep. Wt. 1 lb.

MODEL	FREQUENCY	OUTPUT	MODULATION	DIMENSIONS
M-275	4.5 Mc., 10.7 Mc., 21.7 Mc.	10 microvolts to 1.0 volt when used with Model 78-FM	Up to approximately 80% AM combined with or exclusive of FM	10" high x 13" wide x 7" deep Weight: 15 lbs.

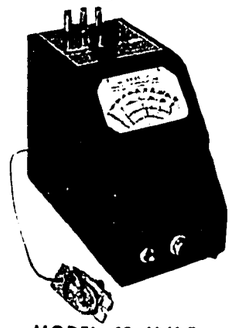
MODEL	VOLTAGE RANGE	FREQUENCY RANGE	INPUT IMPEDANCE	DIMENSIONS
62	0-1, 0-3, 0-10, 0-30 and 0-100 volts AC or DC	30 cycles to over 150 Mc.	Approximately 7 mmfd.	6" high x 4¾" wide x 8½" deep. Wt. 8 lbs.
62-U.H.F.	0-1, 0-3, 0-10, 0-30 and 0-100 volts AC or DC	100 Kc. to 500 Mc.	Approximately 2 mmfd.	6" high x 4¾" wide x 8½" deep. Wt. 15 lbs.
67	.0005 to 300 volts peak-to-peak	5 to 100,000 sine-wave cycles per second	1 megohm shunted by 30 mmfd.	7½" high x 7" wide x 8½ deep. Wt. 10 lbs.



MODEL M-275
I. F. CONVERTER
For use with Model 78-FM FM Signal Generator

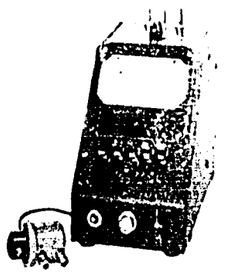


MODEL 59
MEGACYCLE METER



MODEL 62 U.H.F.
VACUUM TUBE VOLTMETER

MODEL 67
PEAK VOLTMETER



MODEL 62
VACUUM TUBE VOLTMETER

MEASUREMENTS CORPORATION BOONTON · NEW JERSEY

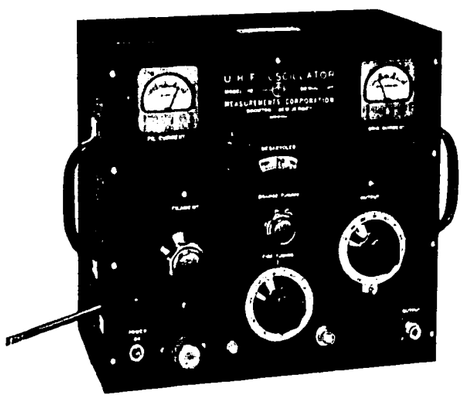
MEASUREMENTS CORPORATION BOONTON · NEW JERSEY

Laboratory Standards

MODEL	FREQUENCY RANGE	OUTPUT RANGE	OUTPUT IMPEDANCE	DIMENSIONS
112	300 Mc.—1000 Mc.	Maximum varies between 0.3 volt and 2 volts Adjustable over 40 db	50 ohms	12½" high x 13½" wide x 8" deep Weight: 22 lbs.

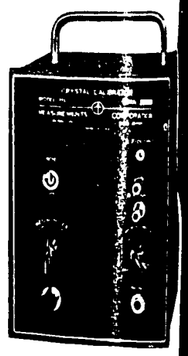
MODEL	INTERMODULATION RANGE	FREQUENCIES	ANALYZER INPUT VOLTAGES	DIMENSIONS
30	0.1% to 30%	LF: 40, 70, 100 cycles HF: 2000, 7000, 12,000 cycles.	.0001 to 100 volts (−70 to + 40 DBM)	9¾" high x 19" wide x 13" deep Weight: 30 lbs.
31	0.5% to 30%	LF: 60 cycles HF: 3000 cycles	Full scale ranges of 3, 10, 30 volts RMS	8" high x 19" wide x 9" deep Weight: 16 lbs.

MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	HARMONIC RANGE	DIMENSIONS
111	.25 Mc. to 1000 Mc.	0.001%	.25 Mc. Oscillator: .25-450 Mc. 1 Mc. Oscillator: 1-600 Mc. 10 Mc. Oscillator: 10-1000 Mc.	8" high x 6" wide x 5" deep Weight: 4 lbs.



MODEL 112
U.H.F. OSCILLATOR

MODEL 31
INTERMODULATION METER



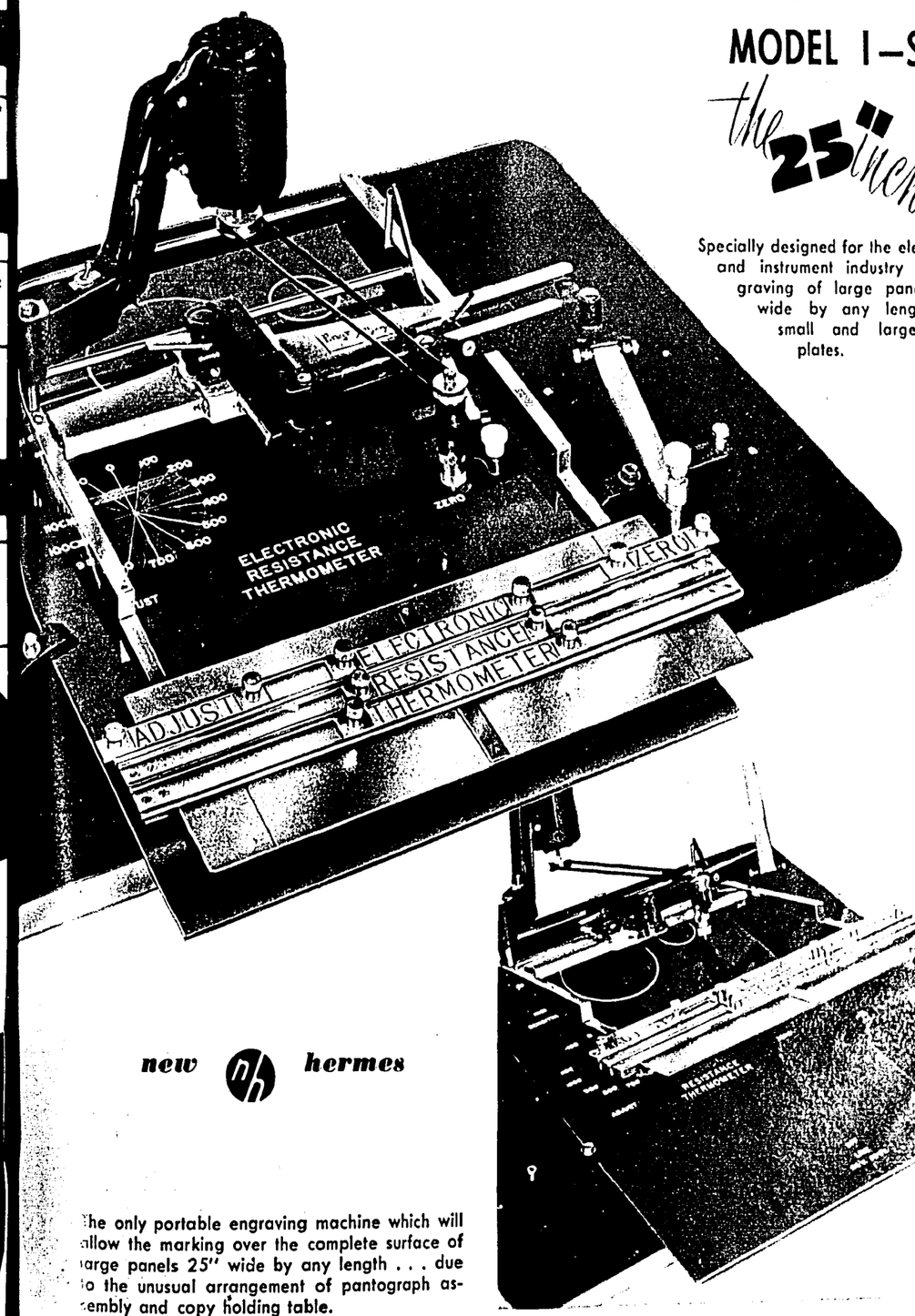
MODEL 111
CRYSTAL CALIBRATOR

COMPLETE descriptive literature on any of our instruments will be sent to you on request.

Consult us regarding your requirements for special electronic measuring equipment.

MEASUREMENTS CORPORATION BOONTON · NEW JERSEY

Introducing the new Engravograph

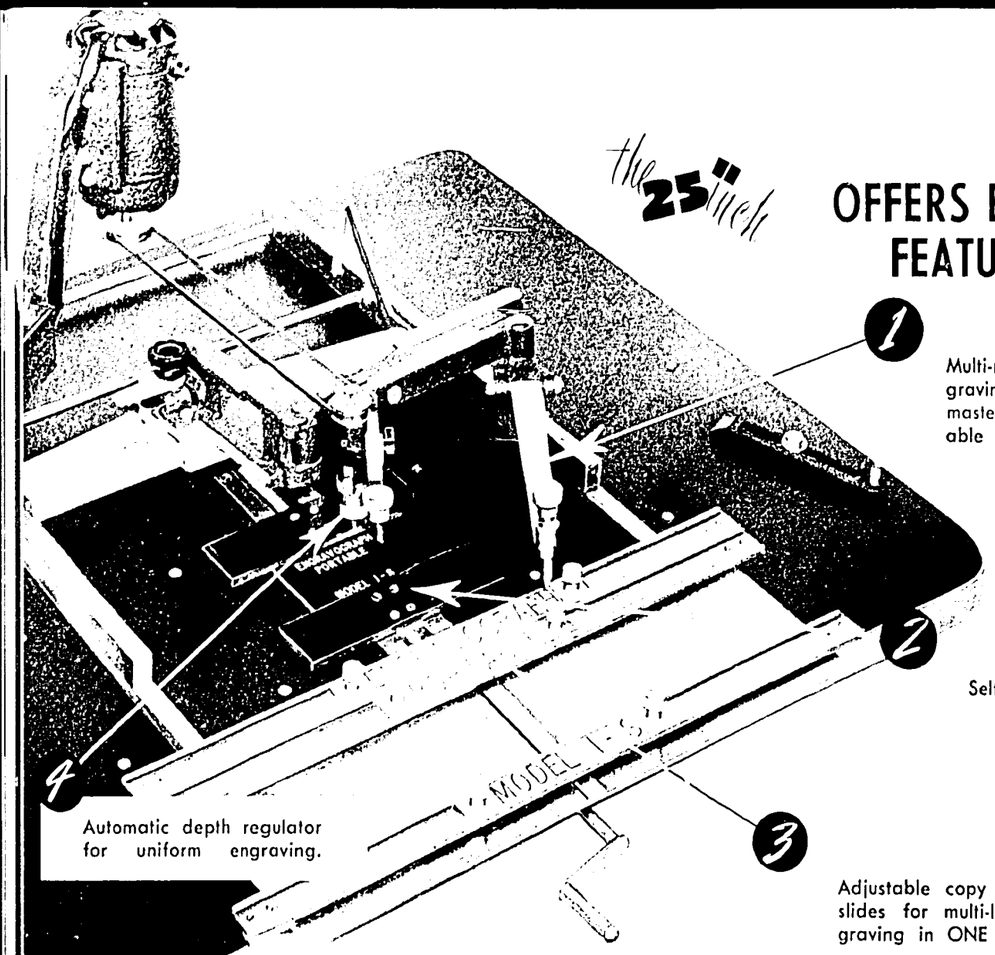


MODEL 1–S
the 25 inch

Specially designed for the electronics and instrument industry for engraving of large panels 25" wide by any length and small and large name plates.

new nh *hermes*

The only portable engraving machine which will allow the marking over the complete surface of large panels 25" wide by any length . . . due to the unusual arrangement of pantograph assembly and copy holding table.



the 25" OFFERS EXCLUSIVE FEATURES . . .

1. Multi-ratio tracing arm for engraving of 15 sizes from ONE master template - easily adjustable without disassembling.
2. Self-centering work holder.
3. Adjustable copy holding slides for multi-line engraving in ONE set up.
4. Automatic depth regulator for uniform engraving.

Tracer guided FOR UNSKILLED LABOR

SPECIFICATIONS

Tracing Arm	Adjustable to 15 sizes from ONE master template	Ratios from 1.2½ up to 1:6 and all intermediates
Cutter Spindle	Sealed ball bearings	⅛" cutter
Depth Regulator	Adjustable for uniform engraving	Micrometer setting from .001 depth up to .015
Engraving Area	Maximum area which can be covered in ONE set up using ratio 1 2½	9" x 2" or 6" x 3"
Work Capacity	Panels up to ½" thickness can be engraved over the whole surface up to	25" wide by any length
Work Holder	Self-centering	Maxim. opening 8" removable for larger sizes
Copy Table	Stainless steel	6" x 16"
Copy Holding Slides	Adjustable for any spacing. Accepting copy type ⅝"	18" long
Motor	Universal continuous duty	1/12 h.p. 115V*
Machine Base	Formica	24" x 30"
	Weight - Net 41 lbs. Gross 61 lbs.	

* 220 volt motors can be supplied

ENGRAVING DATA

Largest engraving obtainable 1"

TYPE

Smallest engraving obtainable 3/64"

TYPE

Specifications of tracing arm, and cutters are shown in folder IM and IT.

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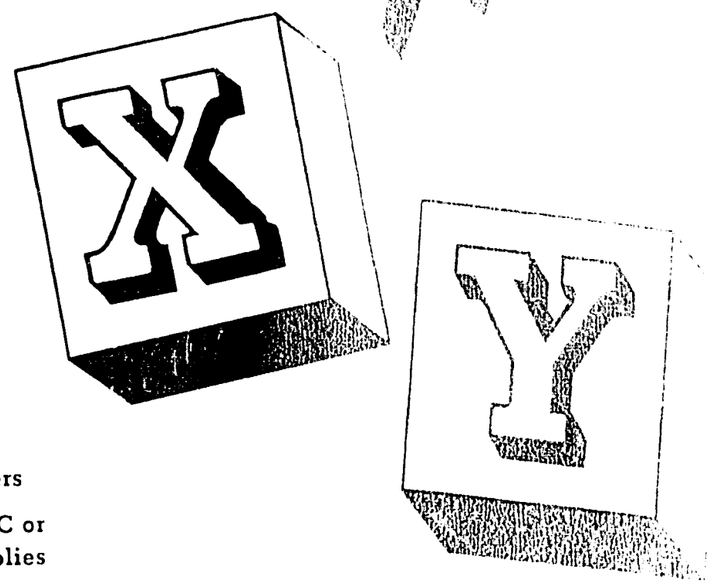
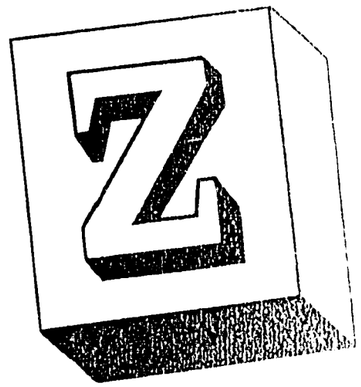
The



- High frequency bombarders or induction heaters
- High voltage AC or DC power supplies
- Spot Welders
- High frequency dielectric heating units
- Test units and test racks
- Industrial applications



OF

ELECTRONICS

HIGH FREQUENCY
HIGH VOLTAGE

OUR SPECIALTY

SCIENTIFIC ELECTRIC

105-119 MONROE STREET GARFIELD, NEW JERSEY

DESIGNERS AND MANUFACTURERS OF HIGH FREQUENCY AND HIGH VOLTAGE EQUIPMENT SINCE 1921

During this time we have built up the technical "know-how" and engineering experience which can prevent you from making costly errors in equipment selection and application.

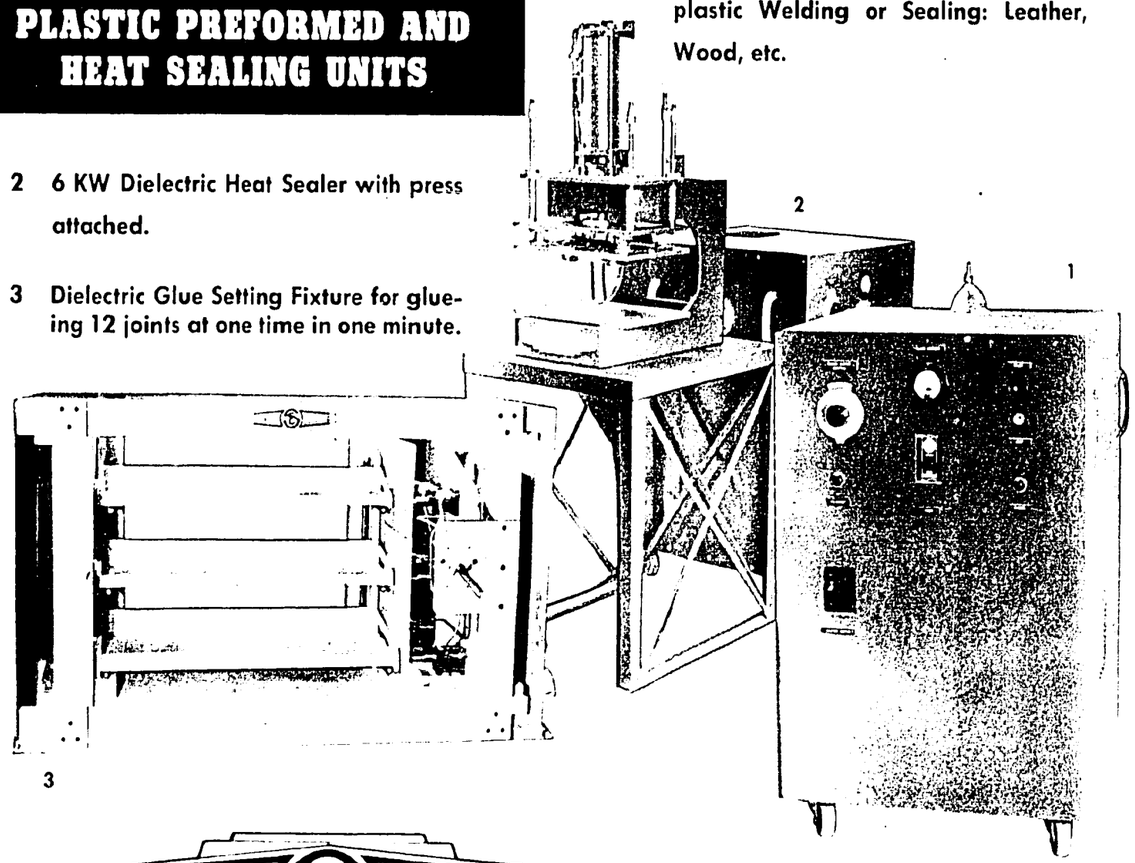
Our units are "standard" in the general usage of the term. They are the products of exhaustive research and field use—and are also made to your individual requirements. Let us solve your electronic equipment problems by giving you exactly the right machine to do a specific job. You'll find our engineers completely qualified to make sound recommendations which generally result in better, faster, quality-controlled production at lower unit cost. Your samples and requirements will bring immediate expert recommendations.

HIGH FREQUENCY DIELECTRIC PLASTIC PREFORMED AND HEAT SEALING UNITS

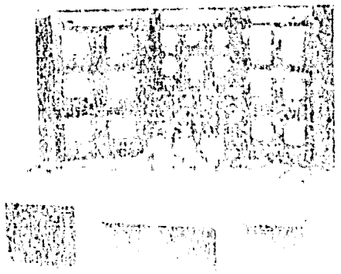
1 **6 KW Dielectric Heat Sealer for Thermoplastic Welding or Sealing: Leather, Wood, etc.**

2 **6 KW Dielectric Heat Sealer with press attached.**

3 **Dielectric Glue Setting Fixture for glueing 12 joints at one time in one minute.**

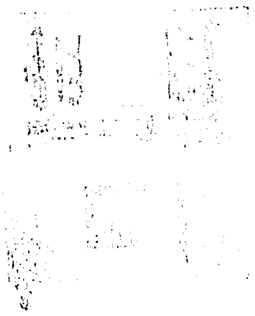


TEST UNITS



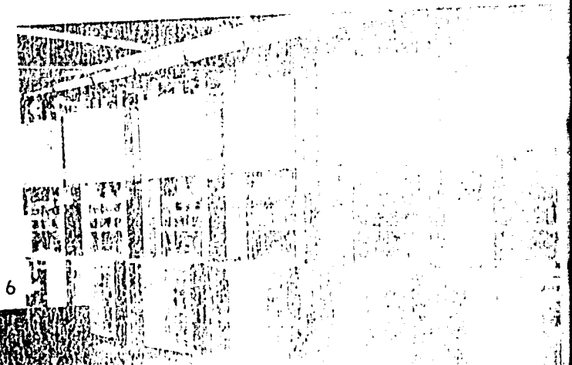
4 This set is designed to give maximum flexibility for development laboratory testing of small multi-element vacuum tubes. Three positive D.C. Power supplies of the series tube regulated type are available. These are continuously variable from 0 to 450 v. at 200 ma. Two negative glow tube regulated supplies are also available and controllable from 0 to 300 v. D.C. Filament supplies variable to 120 v. A.C. and D.C. are also incorporated. A separate regulated supply is available for emission tests. Static characteristics as well as mutual conductance, Mu, and Rp. can be read on a General Radio bridge. Conversion conductance from cut-off to zero bias can be made under standard J.A.N. conditions.

4



5

5 This Universal Cathode Ray tube test set is designed to accommodate all magnetically deflected, magnetically focused types through the 24" size. All power supplies are completely variable regulated and designed for 24 hour per day operation. Scanning is designed to accommodate 55 degree and 70 degree types up to 30 kv second anode. A wide band-pass video amplifier is contained to picture modulate the tube under test. A monoscope signal generator is recommended for supply of video to the set. All standard R.M.A. tests including gas can be made on this set.

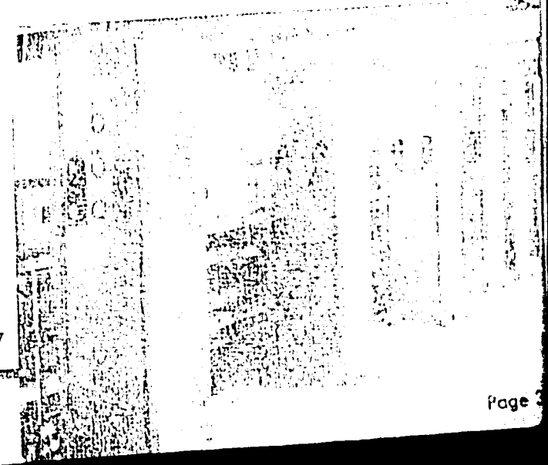


6

SCIENTIFIC ELECTRIC BOMBARDERS

6 Scientific Electric Bombarders in production at one of the largest radio receiving tube manufacturing plants in the East. Approximately 250 Scientific Electric Bombarders are now in use at this plant.

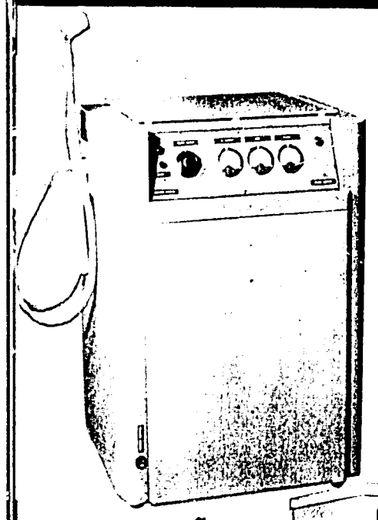
7 Eight 5 KW Bombarders connected to an inline exhaust unit for cathode ray tube production.



7

Bombarders

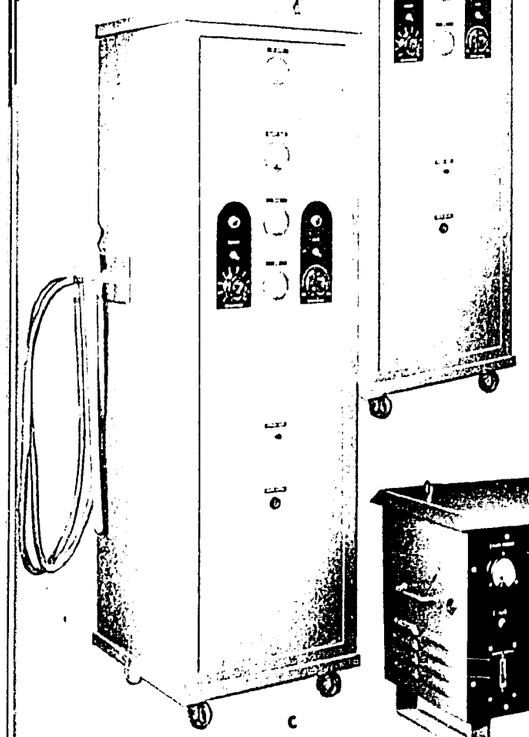
(Induction Heaters)



a

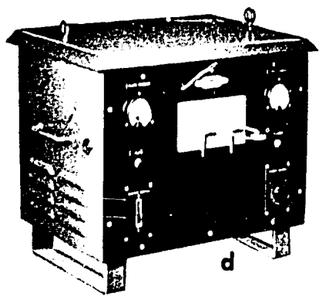
Although electronic heating is generally regarded as an entirely new technique and the number of manufacturers of equipment for the process is not very large, Scientific Electric enjoys the distinction of being a pioneer in the field. We are designers and manufacturers of electronic heaters of the Induction and Dielectric types; and one of the first to build any kind of equipment for this technique. For more than three decades, leading manufacturers of Electronic, Neon, X-ray, Fluorescent and Cathode Ray TV tubes, have used our custom built equipment for such operations as: Degassing, sealing glass to glass or glass to metal. And in the greater field of electronic heating Scientific Electric High Frequency Generators of all types are now performing a great variety of specific heat treating jobs—economically, faster, and with better results over all previous methods.

Of particular interest to the prospective buyer of electronic heating equipment is the fact that the maximum economies effected by the application of the technique to manufacturing processes, can only be realized by utilizing equipment of the correct frequency and power combination. It is significant that only Scientific Electric in the present market, can offer you a selection of frequencies depending on power required, in wide power range . . . 3½-5-6-7½-10-12½-15-18-25-40-60-80-100-125-250 KW. This means that electronic heating equipment produced by Scientific Electric is tailored to your needs . . . fitted perfectly to the task entrusted to it, enabling you to keep your initial investment in equipment to a minimum while affording you all the proven advantages of electronic heating.



b

c



d

a 6 KW Induction Heating Unit (Lowboy).

b 5 & 7½ KW Induction Heating Generator.

c 10 & 12½ KW Induction Heating Unit (Highboy).

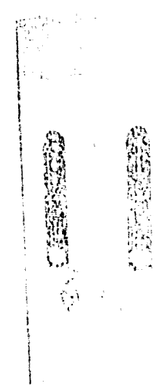
d 2 KW Induction Heating Unit.

Conti Advertising Agency, New York & Ridgewood, N.J.

PROOF BY TRIAL...is the motto of Scientific Electric

In our factory showroom we are ready to demonstrate the operation of any Scientific Electric Electronic Heater in its application to your own specific heating problem. Our laboratory engineers will gladly, and without obligation, make a study of the process to which you wish to apply electronic heating. They will then make recommendations and demonstrations on the equipment best suited for your needs. Before you invest in any electronic heating equipment, you will be able to observe at first hand how your heat treating jobs can be accomplished better . . . faster . . . and more economically with Scientific Electric equipment. You will be able to estimate the actual saving in cost of operation to a degree that will make it possible to approximate the time required to amortize the cost of equipment with the savings resulting from its use.

Submit your heat treating problems to Scientific Electric with the assurance that absolute secrecy will be observed, if so desired. Investigate the possibilities of applying Electronic Heating in your manufacturing processes now. Make a survey and consult with us at your earliest opportunity.



e

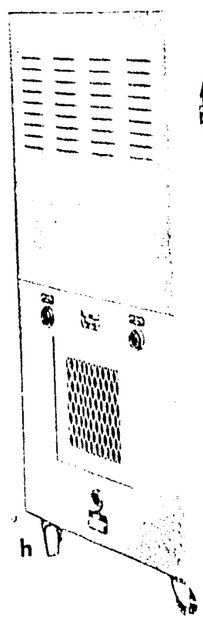
f

e 40 KW bombarder or induction heating unit 200-500 KC.

f 30 KW bombarder or induction heater custom built—200-500 KC.

g 50-60 cycles low frequency 20 KW induction heating unit. Units available from 5 to 200 KW power-factor 95%.

h High voltage neon tube bombarder 10 KVA 25 KV Stepless Control side view — Model PS-196 custom built.



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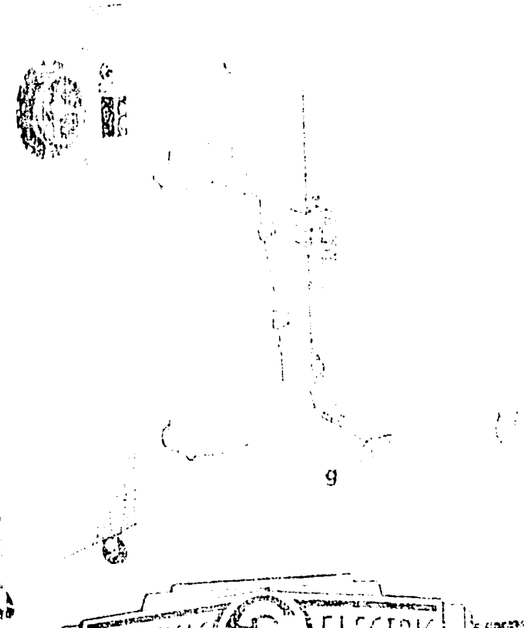
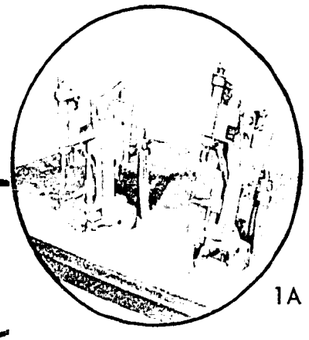


g

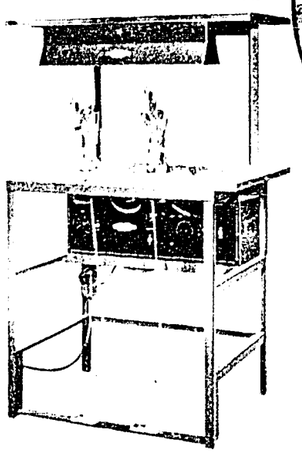
SCIENTIFIC ELECTRIC

SPOT WELDERS



1A

1A–**Model J Spot Welder** complete with 2 K.V.A. 110 Volt, 50 or 60 Cycle Power Supply, including Power Control, Foot Pedal and Electronic Timer.



1

1—**Model JT Spot Welder** complete with 2 K.V.A. 110 Volt, 50 or 60 Cycle Power Supply including Power Control, Foot Pedal and Electronic Timer. Unit mounted ready for operation with metal framework bench designed for side by side production or may be used individually. For convenience of operator a fluorescent lamp is mounted on each bench and serves as a work light and pilot for the electronic timer.

FEATURES:

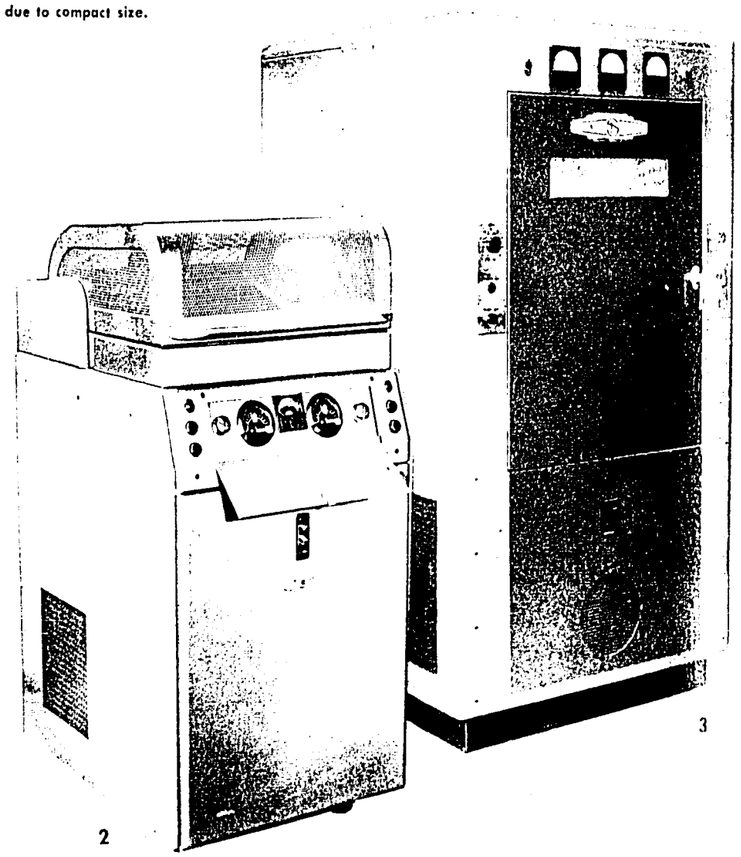
1) Micrometer pressure adjustment ½ to 9 lbs. 2) 30 degree adjustable base. 3) Oiless bearings. 4) Adjustable master micro switch for timer. 5) Heavy duty aluminum frame. 6) Adjustable electrode holder. 7) Vertical motion eliminates rocker arm roll. 8) Sturdy chucks allow quick and simple electrode adjustment. 9) Narrow width suitable for side by side mounting (3½ inches). 10) Substantial work area due to compact size.

DIELECTRIC HEATERS

2 10 KW Preform Dielectric Heating unit with two timers

3 30 KW Dielectric Custom Built High Frequency Heating Unit

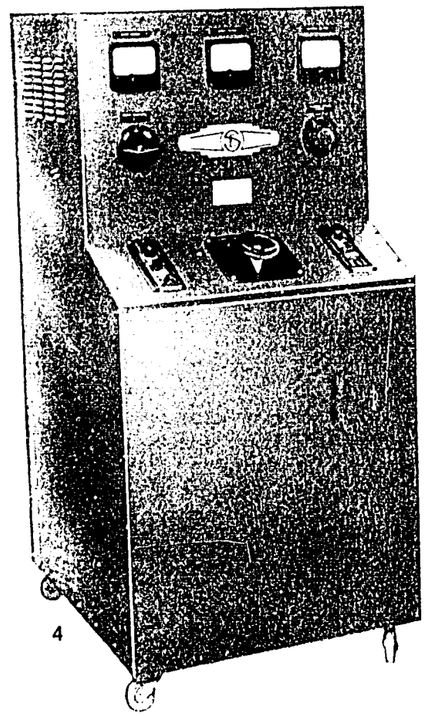
These units are custom built to meet your specific requirements. Their tremendous advantage in production speed and quality make them a necessity to many fields of manufacturing. No technical skill is required by the operator. Working conditions are cleaner.
We will be glad to advise you on the particular type of unit needed to perform the job you need. Let us have your requirements.



2

3

INDUSTRIAL HIGH VOLTAGE POWER SUPPLIES



4

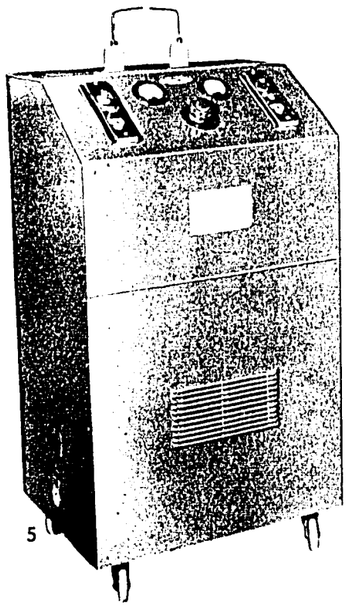
4 High Voltage Rectifier, 0-40 KV Stepless, 100 MA input 3 phases 220 volts 50-60 cycles

5 High Voltage Power Supply Stepless 0-20 KV 35 MA, 1 phase 110 volts 50-60 cycles custom built

6 40 KV at .25 MA High Voltage R.F. Power Supply

High Voltage .... low current positive or negative ground up to 140 KV units, are used in laboratories and on production lines for electrostatic coatings, insulation cable and cathode ray tube testing, etc.

We will welcome the opportunity to give you complete information on this unit and any other one shown here and make recommendations to your specific requirements.



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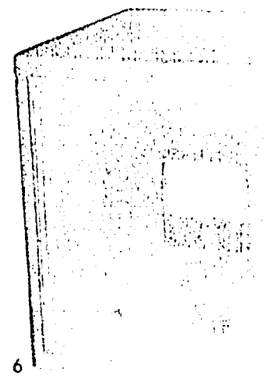

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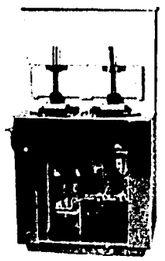
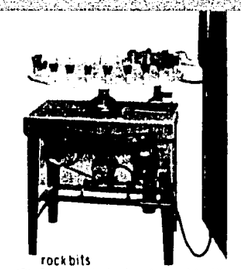
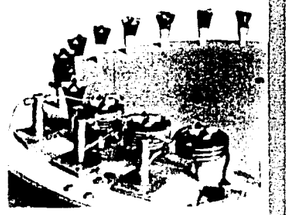


(1) Setup for induction soldering battery cable lugs.

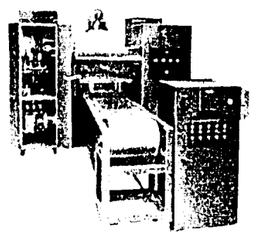


rock bits

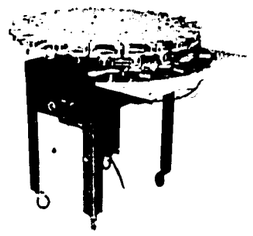
(2) 24 head indexing turntable illustrating the coils loaded and ready for operation. The production is determined by the size of the part and the power employed.



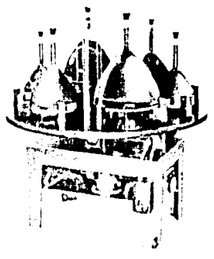
(2)(3) Close view of 24 head indexing turntable illustrating the coils loaded and ready for operation. The operator loads and unloads the rock bits into the water quench when the parts are indexed out of the range of the heating coils.



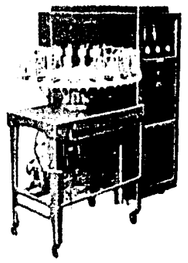
(4) Front view of Belt Conveyor using 3-6 KW dielectric heating units and control cabinet showing exposure of one 6 KW dielectric heating unit.



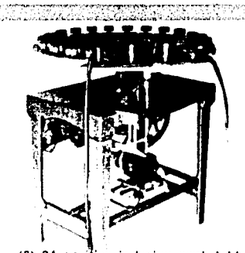
(5) Fully automatic fixture for induction soldering loudspeaker magnets to frames.



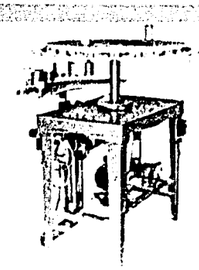
(6) Preheating turntable for cathode ray tubes unit used for pre-heating filaments before testing.



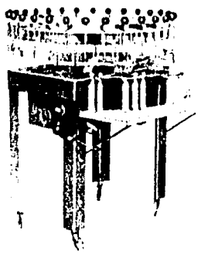
(7) 18 KW induction heater and automatic soldering turntables for cigarette lighters.



(8) 24 position indexing work table for soft soldering automatic sprinkler safety links. A special solder which will melt at 165° is used. Production of this table with a 10 KW high frequency induction heating unit is 4 every 6 seconds.

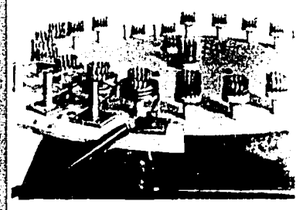


(9) Melting metal for production of precision castings with a 24 position indexing turntable used with 6 25 KW high frequency induction heating units.

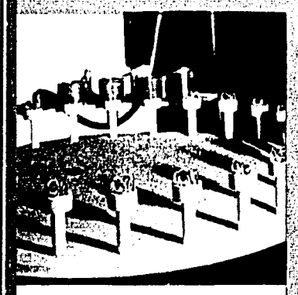


(10) Automatic soldering turntable for cigarette lighters.

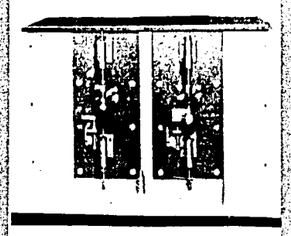
(11) Soldering cigarette lighters with a 25 KW Induction Heater (with turntable).



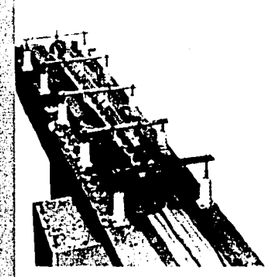
(12) Soldering radio trimmer condensers at a rate of 15 pieces per six seconds with a 25 head turntable. The brass condenser is attached to a specially treated glass tubing preloaded on a special fixture.



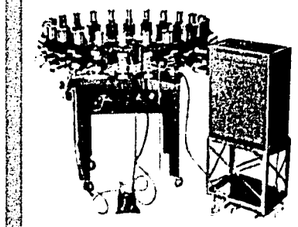
(13) 24 position indexing work table for silver soldering sterling silver rings on a 6 cycle for 5 rings.



(14) Sealing glass to metal for "Lighthouse" Tube manufacturing.



(15) Continuous conveyor silver soldering unit.



(16) 24 position plastic high frequency belt sealer.

APPLICATIONS Here are a few typical examples of Scientific Electric custom built electronic equipment on the production line. Each one is designed and built expressly to meet specific requirements. We welcome the opportunity to discuss your need for similar machines.

SCIENTIFIC ELECTRIC

105-119 MONROE STREET GARFIELD, NEW JERSEY

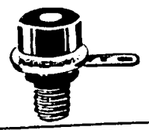
It's Sound Planning to Count On SMITH Components

INSULATED PHONE TIP JACK

Accommodates all standard insulated and non-insulated phone tip plugs. Recommended for use with our Nos. 200 and 201 phone tip plugs. Available in Black, Red, Yellow, Green and Blue. Mounts in a 5/16" hole. Complete with insulating shoulder washer and nut. Specify color.

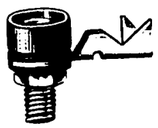
No.	Head Dia.
202	5/16"
223	1/2"

INSULATED BANANA JACK



Accommodates all standard banana type plugs. Mounts in a 5/16" hole in panels up to 3/8" thick. Insulated head 7/16" dia. available in Black, Red, Yellow, Green and Blue. Complete with insulated shoulder washer, soldering lug, and nut. Specify color. No. 205

INSTRUMENT BANANA JACK



Made of brass, nickel plated. Jack receptacle countersunk to accept all standard Banana type plugs for a snug and positive contact. Insulated head 1/2" diameter, supplied complete with insulating washer, lock washer, heavy duty soldering lug and nut. Available in Black, Red, Yellow and Green. Specify color.

No. 219

INSULATED MIDGET BANANA JACK

Accommodates all standard banana type plugs. Mounts in a 3/8" hole in panels up to 1/4" thick. Supplied with soldering lug; overall length 1 1/4". The insulated head as well as the washer insulates the body of jack from the panel to prevent possibility of shock or grounding. Insulated head 3/8" dia. Available in Black and Red colors. Specify color. No. 221

INSULATED COMBINATION JACK

This combination jack accommodates all standard plugs, of the phone tip type or banana type construction. Mounts in a 5/16" hole in panels up to 1/2" thick. Overall length 1 3/8". Complete with insulating shoulder washer and nut. Insulated head available in Black, Red, Yellow and Green. Specify color.

No. 206

BANANA PLUG AND TIP JACK COMBINATION

Insulated banana type plug of the spring type construction. Fits all standard banana type jacks. Rear of plug has standard phone tip jack inserted which assures positive contact and accommodates all standard phone tips so that a phone tip plug can be converted to a banana plug. Insulated handle 1 1/8" long, overall length 1 5/8". Available in Black, Red, Yellow and Green colors. Specify color.

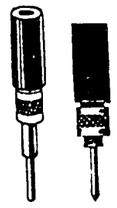
No. 214

COMBINATION BINDING POST

Knurled insulated head binding post. Top of post accommodates standard banana plugs. Hole in side of stud accommodates any standard phone tips. Length 1 3/8" overall with head open, 1 1/4" with head closed. 6-32 x 1/2" long stud supplied with 2 hex nuts. Black and Red. Specify color.

No. 220

INSULATED SOLDERLESS TIP PLUGS



#200 #201

Insulated sleeve 3/4" long, available in Black, Red, Yellow, Green and Blue. Fits all standard phone tip jacks. Wire is fed through sleeve of plug and wrapped around screw portion. The sleeve and the knurled nut provide insulation where unnecessary. Specify color.

No.	Length
200	1"
201	1 1/2"

FIBRE HANDLE SOLDERLESS PLUGS

Fibre handles available in Black and Red colors.

No.	Length
230	1 1/8"
231	1 5/8"

INSULATED SOLDERLESS BANANA PLUGS

Spring type construction designed to fit all types of banana jacks. Plug portion made of Hexagon brass, designed to set into our No. 219 Banana Jack. Small machine screw stud screws into rear of plug so that wire can be wrapped around and tightened without soldering. All external set screws removed to prevent possibility of shock or grounding. Insulated handle 1" long, overall length 1 1/4", cable opening 3/16". Available in Black, Red, Yellow and Green. Specify color. No. 212

Spring type construction with machine screw stud. Same as described above except that plug portion is not Hexagon but made of round brass. Handle is only 3/4" long, overall length 1 1/4", cable opening 3/16". Available in Black, Red, Yellow and Green. Specify color. No. 211

INSULATED BANANA PLUG
Spring Type

Fits all standard banana type jacks. Wire is provided in side of plug to solder or without soldering. Cable opening 3/16". Available in Red, Black, Yellow and Green. Specify color.

No.	Sleeve	Overall
204	1/2"	1"
214	1 1/4"	1 3/4"

INSULATED BANANA PLUG
Split Type

Fits all standard banana type jacks. Wire is provided in side of plug to solder or without soldering. Cable opening 3/16". Available in Red, Black, Yellow and Green. Specify color.

No.	Sleeve	Overall
213	1/2"	1"
215	1 1/4"	1 3/4"

PHONO PLUG

Insulated sleeve 1/2" long, available in Black, Red, Yellow, Green and Blue. Fits all standard phono tip jacks. Wire is fed through sleeve of plug and wrapped around screw portion. The sleeve and the knurled nut provide insulation where unnecessary. Specify color.

No.	Description
241	Solderless
242	Solder

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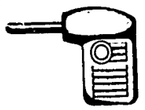
HERMAN H. SMITH, INC.

436 18th STREET, BROOKLYN 15, N. Y.

MOLDED METER TIP PLUG



Molded Meter Type plug molded in two halves for easy assembling with screw and nut. Brass nickle plated tip fits in all standard tip jacks. Available in Red and Black. Specify color. Also available on attractive display card consisting of 24 envelopes, one each Red and Black Tip per envelope.

No. 235 Tip Plug

METER TIP TEST LEAD

Test Leads with 50" rubber covered kinkless test lead wire. Molded Plastic finger-grip tips on one end and 5" plastic test prod handles on other end. Supplied in two types, solderless tip or needle tip prod handles.

No.	Type
625	Solderless Prods
626	Needle Tip Prods

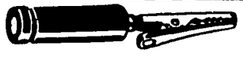
INSULATED ALLIGATOR CLIP

Embodies our No. 300 Alligator Clip. Insulated handle ¾" long and will accommodate all standard banana type plugs. Insulated handle available in Black and Red colors. Specify color. No. 301

ALLIGATOR CLIP PHONE TIP JACK

Insulated alligator clip with phone tip jack in rear of handle. The jack portion will accommodate all standard phone tip plugs. Handle 1" long, overall length 2⅝". Available in Black and Red colors. Specify color. No. 304

ALLIGATOR CLIP COMBINATION JACK



Insulated alligator clip with combination jack in rear of handle. Jack will accommodate standard phone tip plugs or banana plugs. Handle 1⅛" long, overall length 3". Available in Black and Red colors. Specify color. No. 305

ALLIGATOR CLIP

Clips are made so that the jaws match accurately, permitting them to grip all sizes wire securely. The barrel of clip will accommodate all standard banana type plugs. Made of steel, cadmium plated. Overall length 2". No. 300

SOLDERLESS TEST PRODS

Insulated handles, available in Black and Red colors. The wire is fed through the insulated handle, and is wrapped around the screw portion of the plug, and then tightened with the knurled nut provided, making soldering unnecessary. Specify color. Cable opening ⅛".

No.	Overall length
302	5¼"
303	6¾"

PHONO NEEDLE TEST PRODS

Insulated handles available in Black and Red colors. Wires can be assembled to the metal tip by unscrewing the tip from the prod handle. Removable chuck for replacing broken needles. Specify color. Cable opening ⅛".

No.	Overall length
317	5"
318	6⅜"

INSULATED SPADE LUG

Insulated sleeve ¾" long, overall length 1⅝", cable opening ⅛". Available in Black and Red. Barrel of the insulated sleeve accommodates all standard type banana plugs.

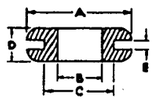
No.	Type
218	Insulated Lug
129	Lug only

INSULATED SHORT PHONE TIP

Fits all standard phone tip jacks of the insulated or non-insulated types. Insulated sleeve ¾" long, overall length 1¼", cable opening ⅛". Available in Black, Red, Yellow and Green. Specify color.

No. 203

RUBBER GROMMETS



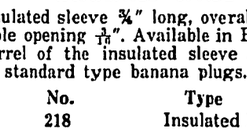
A: O.D.
B: I.D.
C: PANEL
D: THICK
E: P. THICK.

No.	A	B	C	D	E
2185	⅛"	1/16"	1/16"	1/16"	1/16"
2171	3/16"	1/16"	1/16"	¼"	1/16"
2172	1/16"	1/16"	1/16"	1/16"	1/16"
2176	½"	3/16"	3/16"	1/16"	1/16"
2170	5/16"	¼"	3/16"	3/16"	1/16"
2173	1/16"	5/32"	5/32"	¼"	1/16"
2174	5/16"	1/16"	1/16"	¼"	1/16"
2175	11"	1/16"	½"	¼"	1/16"
2177	¾"	1/16"	1/16"	¼"	1/16"
2186	1 1/16"	½"	¾"	1/16"	1/16"
2187	1⅛"	5/16"	7/16"	1/16"	1/16"
2188	1 1/16"	1/16"	13/32"	5/16"	1/16"
2189	1"	¾"	7/16"	5/32"	1/32"

RECESS RUBBER BUMPERS

No. 2192 No. 2193 No. 2194

RUBBER TACK BUMPERS



No. 2190 No. 2191

RUBBER FEET BUMPER

—⅝" diameter x 3/32" thick. Recessed to accommodate a self-tapping screw, machine screw, wood screw or a tack. No. 2184

FELT FEET

Available in two types, either with a 6-32 x ⅜" machine screw or with an "Anchor Fast" nail, which will stay in place, and will not back up, pull out, or "pop."

No.	Type
2181	With Machine Screw
2182	With Stronghold Nail

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SMITH Components

BANANA TYPE PLUG

This plug is hexed brass, nickel plated. The spring is made of spring brass assuring positive and lasting contact. Plug is constructed with a 6-32 female thread inside and is supplied with a 6-32 screw and soldering lug. No. 100

BANANA PLUG SPLIT TYPE

Made of hexed brass, heavily nickel plated overall. Will fit all standard banana type jacks. Overall length 1¼". Threaded portion 6-32 x ½" long. Supplied with two 6-32 hexagon nuts.

No. 104

BANANA TYPE PLUG Spring type

Plug and spring are made of brass, nickel plated. The spring type of construction assures positive and lasting contact. Plug is threaded 6-32 and the threaded portion is ½" long. Supplied with two 6-32 hexagon nuts. No. 103

BANANA PLUG JACK

Recommended as the mate for the No. 100 Banana type plug, but will accommodate all standard banana type plugs. Jack is made of brass, heavily nickel plated overall. Mounts in a ¼" hole and will fit in panels up to 1/16" thick. Jack is furnished with ¼-32 nut and soldering lug. No. 101

BANANA PLUG JACK

Will accommodate all standard banana type plugs and specially recommended as the mate for Nos. 103 and 104 banana plugs. Made of brass, nickel plated, and mounts in ¼" hole in panels up to ⅜" thick. Supplied with nut and soldering lug. No. 109

MINIATURE WAFER SOCKETS

Miniature bakelite sockets with brass cadmium plated contacts. XP bakelite top plate 1/16" thick, bottom plate 3/64" thick; high grade spring brass cadmium plated contact; .095 dia. mounting holes.

SEVEN PIN

No.	Description	MTG. Cen.
880	Eyelet only	⅞"
881	Eyelet and Shield	⅞"
882	Grd Strap and Shield	⅞"
840	Eyelet only	1"
841	Eyelet and Shield	1"
842	Grd Strap and Shield	1"

NINE PIN

890	Eyelet only	1⅛"
891	Eyelet and Shield	1⅛"
892	Grd Strap and Shield	1⅛"

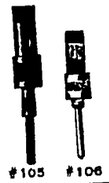
MOLDED MINIATURE SOCKETS

Seven Pin — Saddle Type

Molded of general purpose black bakelite steel cad. plated saddle, .015 thick; contacts high quality spring brass, cad. plated; .098 mtg. holes, 7/32" mtg. centers. Supplied with center shield.

No.	Type
895	Bottom Mount
896	Top Mount

SOLDERLESS PHONE TIPS



These tips are constructed so that the wire fits through the body of the tip, and is wrapped around the screw portion, and tightened with the knurled nut provided, making soldering unnecessary.

No.	Length
105	1⅝"
106	1⅛"

PHONE TIP JACK

Will accommodate all standard phone tip plugs of insulated and non-insulated types. Made of brass, nickel plated. Mounts in a ¼" dia. hole in panels up to ⅜" thick, and is supplied with hexagon nut. No. 107

SOLDER TYPE PHONE TIPS No. 108

Made of brass, nickel plated. Overall length 1". Dia. of tip will fit all standard phone tip jacks.

LARGE DIAMETER PHONE TIP

Material of Brass and Nickel-plated finish. The barrel is drilled extra large to accommodate heavy wire. Diameter hole ⅛"—length of barrel ½" and overall length 1". No. 123

MIDGET PLUGS AND JACKS Banana Type

Midget banana type plugs and jacks, for use where a minimum amount of space is available. Both plugs and jacks made of brass, nickel plated. A hexagon nut is provided with each plug and jack.

No.	Item
111	Plug
112	Jack

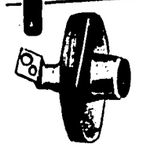
MIDGET PHONE JACK

Signal Corps type J 670—Single open circuit midget phone jack. Mounts in ⅜" hole in panels up to ¼" thick. Bushing is brass, nickel plated. Springs made of phosphor bronze, and the springs are insulated from the frame by heavy duty bakelite washers. No. 122

PHONO ADAPTER ATTACHMENT PLUG

R.C.A. type phono plug. For use with record players, recording and reproducing equipment, etc. Extra long pin for new type jacks and large hole in cap for coaxial cable. No. 125

PHONO JACK



Female for No. 1201 plug. Single open positive grip jack mounted on ¾" bakelite with 1¼" mounting center.

No.
1203

DUAL PHONO JACK

Two positive grip jacks mounted on ¼" bakelite. Double mounting holes spaced ½" x 1½". Jacks are ¾" center to center. Used on recording units and phono players, etc., where dual application is necessary. No. 1214

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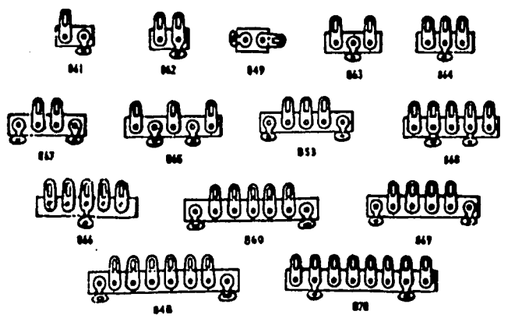
TIE DOWN TERMINAL STRIPS



TERMINAL BOARDS Screw Type

Brass hot tinned lugs mounted on 1/8" bakelite. Lugs are spaced 1/16" center to center.

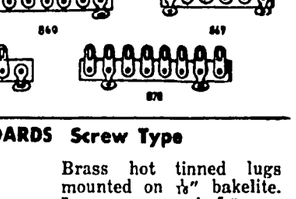
No.	Terminals	Mounting Center
872	2	1 1/16"
873	3	1 3/4"
874	4	2 7/16"
875	5	2 5/8"
876	6	3 1/16"
877	7	3 1/2"

SOLDER TYPE LUGS Brass Hot Tinned

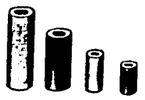
No.	Length	Hole	No.	Length	Hole
1484	5/8"	No. 6	1490	1"	No. 10
1485	5/8"	No. 6	1491	1 1/8"	No. 10
1486	7/8"	No. 6 & No. 8	1492	1-1/8"	1/4"
1487	5/8"	No. 6	1493	1"	1/4"
1488	3/4"	No. 6	1494	5/8"	No. 6 & No. 8
1489	7/8"	No. 8	1495	5/8"	No. 8

LOCKING TYPE TERMINAL LUGS

Brass Electro Plated



No.	Hole Size	Thick
1465	No. 4	.020
1466	No. 6	.020
1467	No. 8	.020
1468	1/4"	.020



BRASS BUSHINGS

These brass bushings are ideal for use in raising sub panels, chassis, condensers, transformers, etc. Hole in bushing to accommodate a No. 6 or No. 8 screw.

1/4" O.D. For No. 6 No.	1/4" O.D. For No. 8 No.	Length	1/8" O.D. For No. 6 No.	1/8" O.D. For No. 8 No.
2100	2105	1/4"	2110	2115
2101	2106	3/8"	2111	2116
2102	2107	1/2"	2112	2117
2103	2108	3/4"	2113	2118
2104	2109	1"	2114	2119

INSULATED BUSHINGS

For No. 6 No.	1/4" O.D. Length	For No. 8 No.
2130	1/4"	2140
2131	3/8"	2141
2132	1/2"	2142
2133	3/4"	2143
2134	1"	2144

THREADED BRASS BUSHINGS

Threaded 6-32 No.	1/4" O.D. Length	Threaded 8-32 No.
2120	1/4"	2125
2121	3/8"	2126
2122	1/2"	2127
2123	3/4"	2128
2124	1"	2129

BRASS AND INSULATED COUPLINGS

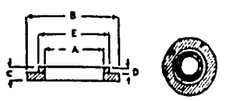
Avaliable in both brass and insulated material. Overall length 3/4", O.D. 1/8". Set screws are provided in coupling for tightening to shaft.

No.	Type	Material
120	1/4"-1/4"	Brass
140	1/4"-1/4"	Insulated
131	3/8"-1/4"	Brass
141	3/8"-1/4"	Insulated
133	3/8"-3/8"	Brass
142	3/8"-3/8"	Insulated

BEARING FOR PANEL ASSEMBLY

Made of brass, nickle plated and fits in 3/8" diameter hole in panels up to 1/8" thick. Bearing is made to accommodate 1/4" shafts. Overall length 1/2". No. 119

FIBRE SHOULDER WASHERS



A. Inside Diameter
B. Outside Diameter
C. Thickness Overall
D. Height of Shoulder
E. Diameter of Shoulder

No.	A	B	C	D	E
2150	.140	.375	.093	.031	.237
2151	.110	.250	.062	.031	.187
2152	.136	.250	.093	.031	.187
2153	.136	.312	.093	.031	.187
2154	.250	.500	.068	.028	.312
2155	.172	.375	.093	.031	.246
2156	.196	.375	.093	.031	.308
2157	.375	.750	.093	.031	.500
2158	.385	.625	.093	.031	.500

FLAT FIBRE WASHERS

No.	I.D.	O.D.	Thickness	No.	I.D.	O.D.	Thickness
2160	.136	.250	1/16	2165	.250	.500	1/16
2161	.110	.250	1/16	2166	.250	.500	3/32
2162	.140	.375	1/16	2167	.312	.500	1/16
2163	.172	.375	1/16	2168	.385	.625	1/16
2164	.196	.375	1/16	2169	.375	.750	1/16

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HERMAN H. SMITH, INC. • **436 18th STREET, BROOKLYN 15, N. Y.**

SPERRY GYROSCOPE COMPANY

KLYSTRON TUBES and MICROLINE† TEST EQUIPMENT

KLYSTRONS

Type	Description	Frequency Range in MC	Output Power*	Beam Voltage Max.	Reflector Voltage Max.	R-F Fittings
3K27	Reflex Oscillator	750 to 960	5w	1000	0 to −1500	1-SKL
SRL17	Reflex Oscillator	750 to 990	5w	1000	0 to −1500	1-SKL
3K23	Reflex Oscillator	950 to 1150	5w	1000	0 to −1500	2-SKL
SRL7C	Reflex Oscillator	1850 to 2160	12w	1000	0 to −1000	1-Type N
2K41	Reflex Oscillator	2660 to 3310	2.5w	1250	0 to −750	2-SKL
2K42	Reflex Oscillator	3300 to 4200	700mw	1250	0 to −750	1-SKL
2K43	Reflex Oscillator	4200 to 5700	600mw	1250	0 to −750	1-SKL
2K44	Reflex Oscillator	5700 to 7500	600mw	1250	0 to −750	1-SKL
2K39	Reflex Oscillator	7500 to 10,300	500mw	1250	0 to −750	1-SKL
SRX16	Reflex Oscillator	10,000 to 15,000	200mw	1250	0 to −750	1-SKL
SRC20	WG Reflex Oscillator	4400 to 4600	2w	1000	0 to −1000	Waveguide 2"x1"
SRC21	WG Reflex Oscillator	4600 to 4800	3w	1000	0 to −1000	Waveguide 2"x1"
SRC12	WG Reflex Oscillator	4800 to 5000	4w	1000	0 to −1000	Waveguide 2"x1"
SRC13	WG Reflex Oscillator	5000 to 5200	4w	1000	0 to −1000	Waveguide 2"x1"
3K21	Amplifier / Oscillator	2300 to 2725	40w	3000	none	4-SKL
3K30	Amplifier / Oscillator	2700 to 3300	40w	3000	none	4-SKL
3K22	Amplifier / Oscillator	3300 to 4000	40w	3000	none	4-SKL
SAC19	Amplifier / Oscillator	6000 to 6300	9w	625	none	2-Waveguide 1½"x½"
SAS28	Cascade Amplifier	**2600 to 2800	225w	4000	none	2-SKL 1-1"-32 special
2K35	Cascade Amplifier	2730 to 3330	40w	3000	none	3-SKL 2-BNC
SAC41	Cascade Amplifier	3700 to 4200	30w	1000	none	1-Waveguide (WR-229)
SAC9	Cascade Amplifier	**4955 to 5065	9w	1000	none	2-BNC 1-SKL
SAC33	Cascade Amplifier	**4600 to 5300	500w	5200	none	2-BNC 1-Waveguide 2"x1"
SAL39	Pulsed Cascade Amp. (1% duty cycle)	960 to 1215	30kw	20,000	none	2-BNC 1-½" coaxial (female)
SAX30	Pulsed Amplifier (3.5% duty cycle)	**9100 to 9500	325w	5000	none	2-Waveguide 1"x½"
SAX22	Pulsed Amplifier (2.5% duty cycle)	**9100 to 9500	7.5kw	17,000	none	2-SKL
2K34	Oscillator-Buffer	2730 to 3330	40w	3000	none	4-SKL
2K47	Frequency Multiplier	250 to 280 in 2250 to 3360 out	140mw	1000	none	2-BNC
SMS27	Frequency Multiplier	** 250 to 270 in **2500 to 2700 out	700mw	1250	none	1-SKL 2-BNC
SMC34	Frequency Multiplier	** 260 to 280 in **4945 to 5320 out	100mw	1000	none	1-SKL 2-BNC
SMC11 series	Frequency Multiplier	** 715 to 875 in **3750 to 6000 out	700mw	1000	none	1-SKL 1-BNC
SMX32	Amp.-Freq. Multiplier	**4500 to 5250 in **9000 to 10,500 out	3w	1000	none	1-SKL 1-Waveguide 1"x½"
SMK40	Amp.-Freq. Multiplier	**4700 to 5200 in **23,500 to 26,000 out	600mw	1500	none	1-BNC 1-SKL 1-Waveguide ½"x¼"

*Typical, mid-band output power.
**Pretuned by manufacturer to center frequency specified by customer. An individual tube has only trimmer tuning.

BARRETTER MOUNTS

Model	Description	Barretter Type	Frequency Range-kmc	Max. VSWR	Fittings Input	Fittings Output
148	⅜" Coaxial (tucable)	811	.5-2.5	2.0	UG-46/U	UHF
163	Type N Coaxial	821	2.5-2.7	1.8	Type N Plug	UHF
85	Type N Coaxial	821	2.7-2.9	1.8	Type N Plug	UHF
164	Type N Coaxial	821	2.9-3.1	1.8	Type N Plug	UHF
285	Type N Coaxial	821	3.1-3.3	1.8	UG-149A/U	UHF
245	2"x1" Waveguide	821	3.7-4.5	1.5	UG-149A/U	UHF
83A	2"x1" Waveguide	821	4.6-5.65	1.5	UG-344/U	UHF
253	1½"x¾" Waveguide	821	5.3-6.6	1.7	UG-344/U	UHF
212	1¼"x⅝" Waveguide	821	6.0-7.6	1.5	UG-344/U	UHF
313	1¼"x⅝" Waveguide	821	6.6-8.1	1.5	UG-39/U	UHF
184	1"x½" Waveguide	821	8.5-9.6	1.5	UG-39/U	UHF

IMPEDANCE METERS

Model	Frequency Range-kmc	Reading Accuracy	Transmission Line Size	Detector Element	Flanges Input	Flanges Output
361A	.65-4.0	0.1mm	¼" Coaxial	1N21B*	UG-46 U	UG-45/U
299	2.6-4.0	0.1mm	3"x1½"	1N21B*	UG-214/U	UG-214/U
103B	3.95-6.0	0.1mm	2"x1"	1N23B*	UG-149A/U	UG-149A/U
116A	3.5-7.0	0.1mm	⅜" Coaxial	1N23B*	UG-141/U	UG-140/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
344	12.4-18.0	0.1mm	.702"x.391"	1N26	UG-419/U	UG-419/U
320	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-381/U	UG-381/U

*The Model 821 barretter element can also be used.

IMPEDANCE TRANSFORMERS

Model	Type	Description	Frequency Range-kmc	Max. VSWR	Fittings
363	Double-Slug	⅛" Coaxial	.65-3.7	5-6	UG-46/U and UG-45/U
34A	Triple-Stub	⅛" Coaxial	1.7-3.75	50	UG-46/U and UG-45/U
137	Double-Stub	¼" Coaxial	2.66-10.3	—	Type N Jack
301	Double-Slug	3"x1½"	2.6-4.0	10	UG-214/U
109B	Double-Slug	2"x1"	3.95-6.0	8-14	UG-149A/U
117B	Waveguide Susceptance	2"x1"	3.95-6.0	40	UG-149A/U
202	Waveguide Susceptance	1½"x¼"	5.3-8.1	40	UG-344/U
178	Waveguide Susceptance	1"x½"	8.1-12.4	40	UG-39/U
146	Waveguide Double-Slug	1"x½"	8.1-12.4	8-14	UG-39/U
409	Waveguide Susceptance	1"x½"	8.1-12.4	40	UG-39/U
408	Waveguide Susceptance	½"x¼"	18.0-26.5	40	UG-425/U
347	Waveguide Susceptance	0.360"x0.220"	26.5-40.0	35	UG-381/U
	Waveguide				

FREQUENCY METERS

Model	Description	Type*	Frequency Range-kmc	Absolute Accuracy	Fittings R-F	Fittings Video
124B	Broadband Coaxial	T	.66-3.0	1/1000	Type N	UHF
S22	Detector Wave-meter 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	UHF
27A	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
207	Coaxial	T	5.3-8.1	1/2000	Type N	UHF
208A	Cavity	T&A	5.49-8.1	1/10,000	UG-344/U	UHF
273	Cavity	T&A	8.1-11.9	1/10,000	UG-39/U	BNC
536	Coaxial	T	12.4-18.0	1/1000	Type N	
540	Cavity	T&A	13.8-18.0	1/5000	UG-419/U	
348	Cavity	T&A	18.0-26.5	1/1000	UG-419/U	
541	Cavity	T&A	19.0-26.0	1/5000	UG-425/U	
349	Cavity	T&A	26.5-39.0	1/1000	UG-425/U	
350	Cavity	T&A	26.5-39.0	1/5000	UG-381/U	
542	Cavity				UG-381/U	

*T—Transmission, A—Absorption

DIRECTIONAL COUPLERS

Model	Description	Frequency Range-kmc	Attenuation-db	Fittings*
518	⅛" Coaxial	.12-2.4	20	UG-45/U*
517	⅛" Coaxial	.24-4.8	20-30-40	UG-45/U*
519	⅛" Coaxial	.48-.96	20-30-40	UG-45/U*
480	⅛" Coaxial	.96-1.99	20-30-40	UG-45/U*
467	⅛" Coaxial	1.99-4.0	26.5	UG-45/U*
730	⅛" Coaxial	2.47-3.13	30	UG-214/U
306	3"x1½" Waveguide	2.6-4.0	24	UG-149A/U
233	2"x1" Waveguide	4.0-6.0	30	UG-149A/U
321	2"x1" Waveguide	4.0-6.0	40	UG-149A/U
322	2"x1" Waveguide	5.3-8.1	24	UG-344/U
209	1½"x¾" Waveguide	5.3-8.1	30	UG-344/U
237	1½"x¾" Waveguide	8.1-12.4	20	UG-39/U
235	1"x½" Waveguide	8.1-12.4	24	UG-39/U
236	1"x½" Waveguide	8.1-12.4	40	UG-39/U
234	1"x½" Waveguide	12.4-17.0	20	UG-419/U
388	0.702"x0.390" Waveguide	18.0-26.5	20	UG-425/U
413	½"x¼" Waveguide	18.0-26.5	40	UG-425/U
415	½"x¼" Waveguide	26.5-36.0	20	UG-381/U
405	0.360"x0.220" Waveguide	32.0-39.0	10	UG-381/U
429	0.360"x0.220" Waveguide			

*Input fitting. Main line output, UG-45/U. Secondary line output, UG-46/U except for Model 730 which has Type N Jack.

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
373	½"x¼" Waveguide	18.0-26.5	UG-425/U
371	0.360"x0.220" Waveguide	26.5-40.0	UG-381/U

ATTENUATORS

Model	Description	Frequency Range—kmc	Attenuation Range—db	Waveguide Size	Fittings
127A	Precision ≙ .2db	29-32mc	15-95		UHF
294	Variable	2.6-4.0	2-16.5	3"x1½"	UG-214/U
289	Variable	3.95-6.0	2-20	2"x1"	UG-149A/U
110	Variable	4.0-6.0	0-20	2"x1"	UG-149A/U
216	Variable	5.3-8.1	2-20	1½"x¾"	UG-344/U
292	Variable	7.0-10.0	2-20	1½"x¾"	UG-51/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
375	Variable	12.4-18.0	0.5-20	0.702"x0.391"	UG-419/U
374	Variable	12.4-18.0	15	0.360"x0.220"	UG-381/U

DETECTORS AND MIXERS

Model	Description	Frequency Range-kmc	Crystal	Fittings Input	Fittings Local osc.	Fittings Output
111A	Detector Sect.	3.95-6.0	1N23B	UG-149A/U	none	UHF
206	Detector Sect.	5.3-8.2	1N21B*	UG-344/U	none	UHF
364	Detector Sect.	7.0-10.0	1N23B*	UG-51/U	none	UHF
360	Detector 1"x½" Waveguide	7.5-9.6	1N23B*	UG-39/U	none	UHF
357	Detector 0.702" x0.391" Waveguide	12.4-18.0	1N26	UG-419/U	none	UHF
358	Detector ½"x¼" Waveguide	18.0-26.5	1N26	UG-425/U	none	UHF
359	Detector 0.360" x0.220" Waveguide	26.5-40.0	1N53	UG-381/U	none	UHF
337	Mixer ⅜" Coaxial	2.6-4.0	1N23	Type N Female	Type N	UHF
378	Mixer	2.6-4.0	1N23B	UG-214/U	Type N	UHF
338	Mixer ⅜" Coaxial	3.95-5.85	1N23B	UG-23B/U	Type N	UHF
334	Mixer	3.95-5.85	1N23B	UG-149A/U	Type N	UHF
339	Mixer ⅜" Coaxial	5.85-8.2	1N23B	UG-23B/U	Type N	UHF
335	Mixer	5.85-8.2	1N23B	UG-344/U	Type N	UHF
340	Mixer ⅜" Coaxial	7.0-10.0	1N23B	UG-23B/U	Type N	UHF
336	Mixer	7.0-10.0	1N23B	UG-51/U	Type N	UHF
379	Mixer	8.1-12.4	1N23B	UG-39/U	UG-39/U	UHF
380	Mixer	12.4-18.0	1N26	UG-419/U	UG-419/U	UHF
381	Mixer	18.0-26.5	1N26	UG-425/U	UG-425/U	UHF
382	Mixer	26.5-40.0	1N53	UG-381/U	UG-381/U	UHF

*The Model 821 barretter element can also be used.

ADAPTERS

Model	Description	Frequency Range-kmc	Fittings	
352A	⅜" Coaxial to Type N	0-4.0	UG-45/U	Type N Jack
217	⅜" Coaxial to Type N	0-4.0	UG-46/U	Type N Jack
354A	⅜" Coaxial to ½" Coaxial	0-4.0	UG-45/U	UG-45/U
355A	⅜" Coaxial to ½" Coaxial	0-4.0	UG-46/U	UG-46/U
101A	⅜" Coaxial to Type N	0-7.0	UG-140/U	Type N Jack
286A	⅜" Coaxial to BNC	0-7.0	UG-140/U	UG-290/U
398	3"x1½" Waveguide to ⅜" Coaxial	2.6-4.0	UG-214/U	UG-140/U
250	3"x1½" Waveguide to Type N	2.6-4.0	UG-214/U	Type N Jack
144A	3"x1½" Waveguide to ⅜" 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 ⅜" 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
251	1½"x¾" Waveguide to ⅜" Coaxial	5.3-7.0	UG-344/U	UG-140/U
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

MAGIC TEES

Model	Description	Frequency Range-kmc	Max. VSWR (Any Arm)	Min. Isolation (Shunt to Series)	Fittings
323	3"x1½"	2.6-4.0	2	35	UG-53/U
324	2"x1"	3.95-6.0	2	35	UG-149A/U
325	1½"x¾"	5.3-8.2	2	35	UG-344/U
326	1¼"x⅝"	7.0-10.0	2	35	UG-51/U
406	1"x½"	8.1-12.4	2	35	UG-39/U
389	0.702"x0.391"	12.4-18.0	2	35	UG-419/U
390	½"x¼"	18.0-26.5	2	35	UG-425/U
391	0.360"x0.220"	26.5-40.0	2	35	UG-381/U

TEES AND BENDS

Model	Description	Frequency Range-kmc	Fittings
274	3"x1½" Waveguide—Series Tee	2.6-4.0	UG-214/U
275	3"x1½" Waveguide—Shunt Tee	2.6-4.0	UG-214/U
106A	2"x1" Waveguide—Series Tee	3.95-6.0	UG-149A/U
107A	2"x1" Waveguide—Shunt Tee	3.95-6.0	UG-149A/U
276	1½"x¾" Waveguide—Series Tee	5.3-8.2	UG-344/U
277	1½"x¾" Waveguide—Shunt Tee	5.3-8.2	UG-344/U
278	1¼"x⅝" Waveguide—Series Tee	7.0-10.0	UG-51/U
279	1¼"x⅝" Waveguide—Shunt Tee	7.0-10.0	UG-51/U
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
170	1"x½" Waveguide—E-Plane Bend	8.1-12.4	UG-39/U
171	1"x½" Waveguide—H-Plane Bend	8.1-12.4	UG-39/U
392	0.702"x0.391" Waveguide—Series Tee	12.4-18.0	UG-419/U
393	0.702"x0.391" Waveguide—Shunt Tee	12.4-18.0	UG-419/U
394	½"x¼" Waveguide—Series Tee	18.0-26.5	UG-425/U
395	½"x¼" Waveguide—Shunt Tee	18.0-26.5	UG-425/U
396	0.360"x0.220" Waveguide—Series Tee	26.5-40.0	UG-381/U
397	0.360"x0.220" Waveguide—Shunt Tee	26.5-40.0	UG-381/U

THERMISTOR MOUNTS

Model	Description	Frequency Range—kmc	Max. VSWR	Fittings Input	Fittings Output
423A	2"x1" Waveguide	5.0-5.9	1.5	UG-149A/U	BNC
219A	1"x½" Waveguide	8.2-9.6	1.5	UG-39/U	BNC
365A	.702"x.391" Waveguide	15.75-18.0	1.5	UG-419/U	BNC
422	½"x¼" Waveguide	23.5-25.1	1.5	UG-425/U	BNC

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
239	3"x1½" Waveguide	2.6-4.0	1900	1.15	UG-53/U
105	2"x1" Waveguide	3.95-6.0	1	1.04	UG-149A/U
113	2"x1" Waveguide	4.0-6.0	310	1.10	UG-149A/U
240	2"x1" Waveguide	3.95-6.0	875	1.15	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
241	1½"x¾" Waveguide	5.85-8.2	420	1.15	UG-344/U
242	1¼"x⅝" Waveguide	7.0-10.0	280	1.15	UG-51/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
400	1"x½" Waveguide	8.1-12.4	175	1.15	UG-39/U
370	0.702"x0.391" Waveguide	12.4-18.0	.5	1.05	UG-419/U
401	0.702"x0.391" Waveguide	12.4-18.0	100	1.15	UG-419/U
418	½"x¼" Waveguide	18.0-26.5	.5	1.07	UG-425/U
316	½"x¼" Waveguide	18.0-26.5	35	1.15	UG-425/U
369	0.360"x0.220" Waveguide	26.5-40.0	.5	1.10	UG-381/U
402	0.360"x0.220" Waveguide	26.5-40.0	18	1.15	UG-381/U

WATTMETER BRIDGES—SIGNAL SOURCES

Model 84C Wattmeter Bridge
Model 123B Wattmeter Bridge
Model 538 Microwave Power Meter
Model 444 Klystron Power Supply
Model 555 Klystron Power Supply
Model 296B Microwave Receiver
Model 38A F. M. Test Set (Commercial equivalent of the TS-147/B)

For detailed information write Special Electronics Department

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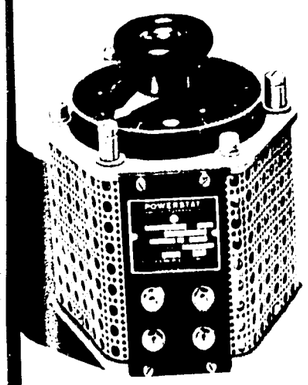

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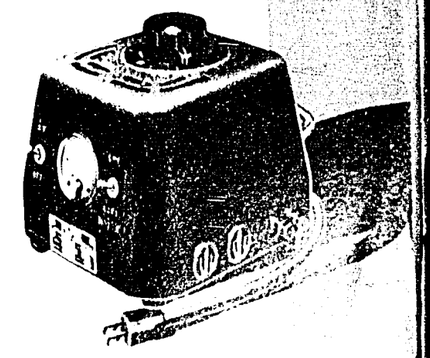

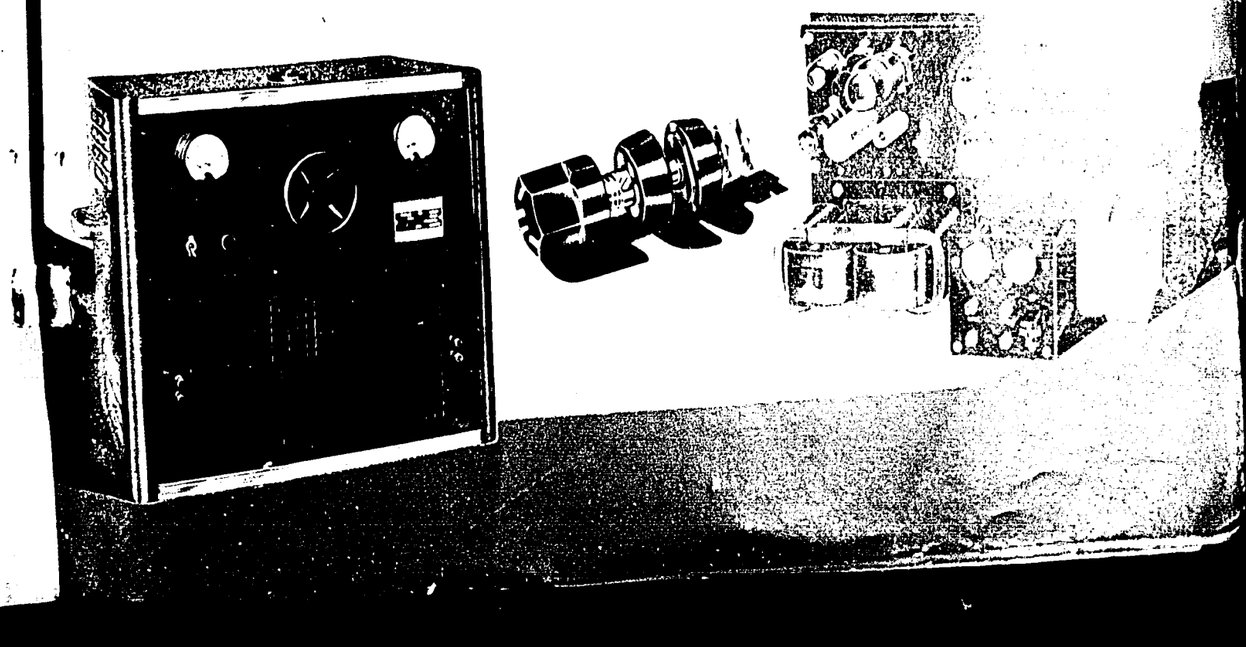

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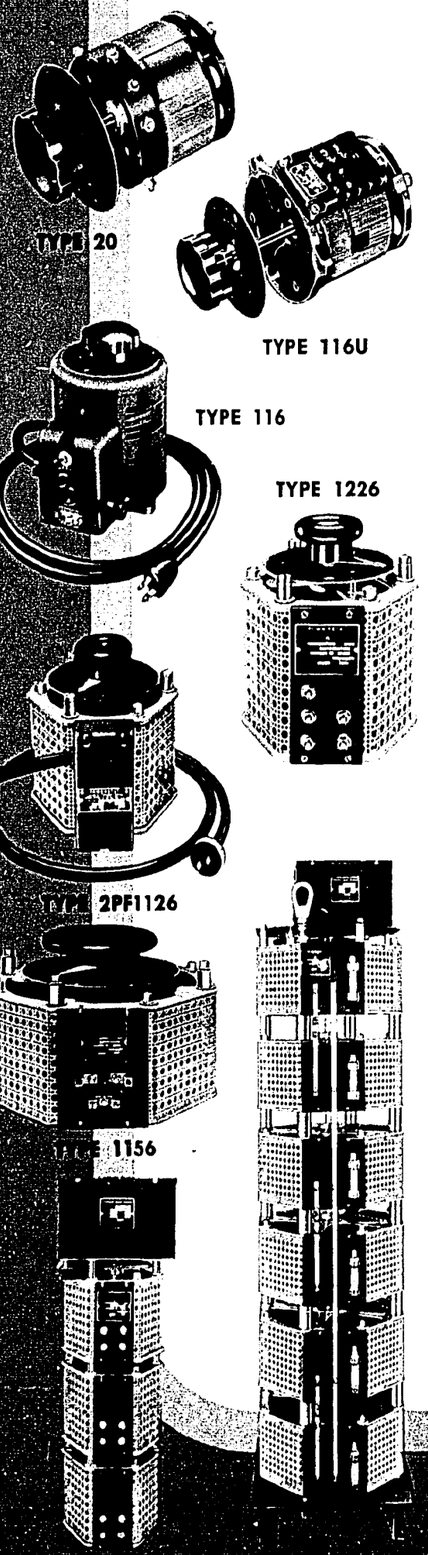


POWERSTAT variable transformers are autotransformers of toroidal core design with a movable brush tap which rotates to deliver a continuously adjustable output voltage from a-c power lines. Features of every POWERSTAT are excellent regulation, high efficiency, conservative ratings, zero waveform distortion, rugged mechanical construction, smooth control and standard mountings. Numerous types are available for 115, 230 and 460 volts, single and three phase operation in ratings from 405 VA to 100 KVA. Most models are offered for either manual or motor-driven operation. In the chart are listed some of the standard types. In addition, oil-cooled and explosion-proof types are available. Therefore, if one of the units listed does not suit your particular need, consult us. There's a POWERSTAT for every variable a-c voltage control requirement.

Line Volt.	Output Volt.	Max. Output Amp.	Output KVA	Frequency	Type	Approximate Net Wt. (Lbs.)	Approximate Shipp. Wt. (Lbs.)	**Standard Motor Speeds	Manually-operated List Price
115	0-135	3.0	0.4	‡60	*20	4	6	.....	$ 12.50
	0-135	7.5	1.0	50/60	*116U	10	11	.....	18.00
	0-135	7.5	1.0	50/60	116	11	12	T	23.00
	0-135	7.5	1.0	50/60	3PF116	11	12	.....	30.00
	G-135	7.5	1.0	50/60	3TF116	11	12	.....	30.00
	0-135	15.0	2.0	50/60	1126	21	25	W,X,Y,Z	46.00
	0-135	15.0	2.0	50/60	F1126	21	25	W,X,Y,Z	50.00
	0-135	30.0	4.0	50/60	1126-2P	48	55	W,X,Y,Z	105.00
	0-135	45.0	6.1	50/60	1156	73	80	W,X,Y,Z	118.00
	0-135	45.0	6.1	50/60	F1156	74	81	W,X,Y,Z	126.00
	0-135	90.0	12.1	50/60	1156-2P	150	170	W,X,Y,Z	269.00
	0-135	135.0	18.2	50/60	1156-3P	225	295	W,X,Y,Z	418.00
	0-135	180.0	24.3	50/60	1156-4P	330	420	W,X,Y	613.00
	0-135	270.0	36.4	50/60	1156-6P	500	600	W,X,Y	1,015.00
230	0-270	3.0	0.81	50/60	*216U	10	11	.....	20.00
	0-270	3.0	0.81	50/60	216	11	12	T	26.00
	0-270	3.0	0.81	50/60	3PF216	11	12	.....	33.00
	0-270	3.0	0.81	50/60	3TF216	11	12	.....	33.00
	0-270	7.5	2.0	50/60	*116U-2S	17	22	.....	44.50
	0-270	7.5	2.0	50/60	*116-2S	18	23	T	49.50
	0-270	9.0	2.4	50/60	1226	25	29	W,X,Y,Z	46.00
	0-270	9.0	2.4	50/60	F1226	25	29	W,X,Y,Z	50.00
	0-270	15.0	4.0	50/60	1126-2S	45	52	W,X,Y,Z	97.00
	0-270	28.0	7.5	50/60	1256	73	80	W,X,Y,Z	118.00
	0-270	28.0	7.5	50/60	F1256	74	80	W,X,Y,Z	126.00
	0-270	45.0	12.1	50/60	1156-2S	144	164	W,X,Y,Z	261.00
	0-270	56.0	15.1	50/60	1256-2P	150	170	W,X,Y,Z	269.00
	0-270	84.0	22.7	50/60	1256-3P	225	295	W,X,Y,Z	418.00
	0-270	112.0	30.2	50/60	1256-4P	330	420	W,X,Y	613.00
	0-270	168.0	45.3	50/60	1256-6P	500	600	W,X,Y	1,015.00
460	0-540	3.0	1.6	50/60	216U-2S	17	22	.....	49.00
	0-540	3.0	1.6	50/60	216-2S	18	23	T	54.00
	0-540	9.0	4.9	50/60	1226-2S	53	60	W,X,Y,Z	97.00
	0-540	28.0	15.1	50/60	1256-2S	144	164	W,X,Y,Z	261.00
	0-540	56.0	30.2	50/60	1256-4PS	330	420	W,X,Y	597.00
	0-540	84.0	45.3	50/60	1256-6PS	500	600	W,X,Y	999.00
Three Phase 115	0-135	3.0	0.7	‡60	*20-2D	9	15	.....	37.00
	0-135	7.5	1.8	50/60	*116U-2D	17	22	.....	44.50
	0-135	7.5	1.8	50/60	*116-2D	18	23	T	49.50
	0-135	15.0	3.5	50/60	1126-2D	45	52	W,X,Y,Z	97.00
	0-135	45.0	10.5	50/60	1156-2D	144	164	W,X,Y,Z	261.00
	0-135	90.0	21.0	50/60	1156-4D	320	410	W,X,Y	597.00
	0-135	135.0	31.6	50/60	1156-6D	490	590	W,X,Y	1,015.00
230	0-230	3.0	1.2	60	20L-3Y	15	24	.....	59.50
	0-270	3.0	1.4	50/60	*216U-2D	17	22	.....	49.00
	0-270	3.0	1.4	50/60	*216-2D	18	23	T	54.00
	0-270	7.5	3.5	‡60	*116U-3Y	26	36	.....	61.50
	0-270	7.5	3.5	‡60	*116-3Y	27	37	T	68.00
	0-270	9.0	4.2	50/60	1226-2D	53	60	W,X,Y,Z	97.00
	0-270	15.0	7.0	‡60	1126-3Y	65	75	W,X,Y,Z	148.00
	0-270	28.0	13.1	50/60	1256-2D	144	164	W,X,Y,Z	261.00
	0-230	45.0	17.9	50/60	1156L-3Y	215	280	W,X,Y,Z	394.00
	0-270	56.0	26.2	50/60	1256-4D	320	410	W,X,Y	597.00
	0-270	84.0	39.3	50/60	1256-6D	490	590	W,X,Y	1,015.00
	0-230	90.0	35.8	50/60	1156L-6Y	500	600	W,X,Y	991.00
460	0-540	3.0	2.8	‡60	*216U-3Y	26	36	.....	69.50
	0-540	3.0	2.8	‡60	216-3Y	27	37	T	76.00
	0-540	9.0	8.4	‡60	1226-3Y	76	86	W,X,Y,Z	148.00
	0-540	28.0	26.2	‡60	1256-3Y	215	280	W,X,Y,Z	394.00
	0-540	56.0	52.5	‡60	1256-6Y	500	600	W,X,Y	991.00

* 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.

** When a motor-drive is required, prefix the letter "M" together with the speed designation letter to the type number. T — 5 seconds, Z — 6 seconds, Y — 14 seconds, X — 19 seconds and W — 45 seconds for full range travel. Since the driving motors are frequency sensitive, be sure to specify whether 50 or 60 cycles is required. Only manually-operated unit weights are listed. For motor-drives add 10, 11 and 14 pounds to the 116-216, 1126-1226 and 1156-1256 types, respectively.

STABILINE

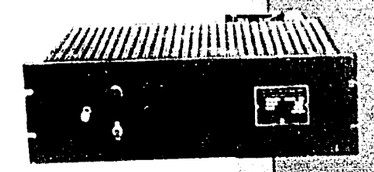
VOLTAGE REGULATORS

Two types of automatic voltage regulators are built by The Superior Electric Company to meet the requirements of maintaining constant voltage to electrical equipment. Type IE is instantaneous in action with no moving parts. Type EM, while not instantaneous, corrects faster than most regulators and is ideal for maintaining constant voltage to large loads without waveform distortion.

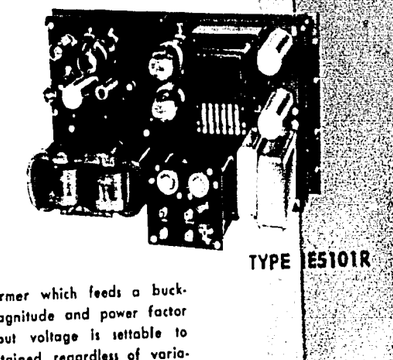
INSTANTANEOUS ELECTRONIC MODELS

Completely electronic, instantaneous in action, with no moving parts. Waveform distortion never exceeds 3%. Output voltage is held to within ±0.1 per cent of nominal for wide line variations; to within ±0.15 per cent of nominal for any load current change or load power factor change from lagging .5 to leading .9. Listed below are standard types.

Output Voltage Range	Input Voltage Range	Frequency In Cycles	Load Range In Amperes	Load Power Factor Range	Rated Output KVA	Type	List Price
110-120	95-135	60 ± 10%	0 - 2.2	0.5 lagging	0.25	IE51002	$175.00
110-120	95-135	60 ± 10%	0 - 2.2		0.25	IE51002R	175.00
110-120	95-135	60 ± 10%	0 - 4.5		0.50	IE51005	210.00
110-120	95-135	60 ± 10%	0 - 4.5		0.50	IE51005R	200.00
110-120	95-135	60 ± 10%	0 - 8.5		1.0	IE5101	225.00
110-120	95-135	60 ± 10%	0 - 8.5		1.0	IE5101R	215.00
110-120	95-135	60 ± 10%	0 - 22.0		2.5	IE5102	335.00
110-120	95-135	60 ± 10%	0 - 22.0		2.5	IE5102R	325.00
110-120	95-135	60 ± 10%	0 - 43.5	to	5.0	IE5105	475.00
110-120	95-135	60 ± 10%	0 - 1.1		0.25	IE52002	175.00
220-240	195-255	60 ± 10%	0 - 1.1		0.25	IE52002R	175.00
220-240	195-255	60 ± 10%	0 - 2.2		0.50	IE52005	210.00
220-240	195-255	60 ± 10%	0 - 2.2		0.50	IE52005R	200.00
220-240	195-255	60 ± 10%	0 - 4.5	0.9 leading	1.0	IE5201	225.00
220-240	195-255	60 ± 10%	0 - 4.5		1.0	IE5201R	215.00
220-240	195-255	60 ± 10%	0 - 11.0		2.5	IE5202	335.00
220-240	195-255	60 ± 10%	0 - 11.0		2.5	IE5202R	325.00
220-240	195-255	60 ± 10%	0 - 22.0		5.0	IE5205	475.00
220-240	195-255	60 ± 10%	0 - 4.5		0.50	IEL51005	245.00
110-120	95-135	50 ± 10%	0 - 4.5		0.50	IEL51005R	235.00
110-120	95-135	50 ± 10%	0 - 8.5		1.0	IEL5101	260.00
110-120	95-135	50 ± 10%	0 - 8.5		1.0	IEL5101R	250.00
110-120	95-135	50 ± 10%	0 - 22.0		2.5	IEL52005	260.00
220-240	195-255	50 ± 10%	0 - 2.2		0.50	IEL52005R	250.00
220-240	195-255	50 ± 10%	0 - 4.5		1.0	IEL5201	275.00
220-240	195-255	50 ± 10%	0 - 4.5		1.0	IEL5201R	265.00
220-240	195-255	50 ± 10%	0 - 11.0		2.5	IEL5202	390.00
220-240	195-255	50 ± 10%	0 - 11.0		2.5	IEL5202R	380.00



TYPE IE51002R

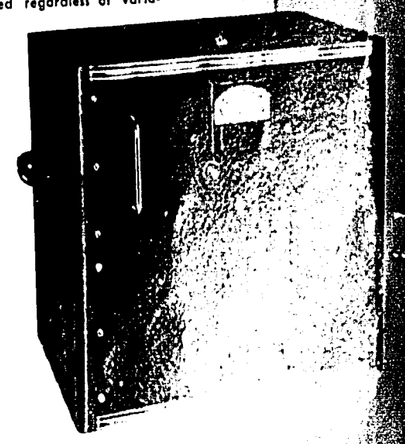


TYPE IE5101R

ELECTROMECHANICAL MODELS

Consists of an electronic detector circuit controlling a motor-driven POWERSTAT variable transformer which feeds a buck-boost auxiliary transformer. Features zero waveform distortion together with insensitivity to magnitude and power factor of load. Has no effect on system power factor. There are no critical adjustments and the output voltage is settable to different values. High efficiency is an inherent characteristic. Constant output voltage is maintained regardless of variations in input voltage or load current.

Nominal Output Voltage	Input Voltage Range	Output Voltage Range	Output Current (Amperes)	Output KVA	Type	List Price
Single Phase 115	95-135	110-120	17.5	2.0	EM4102	$ 325.00
			17.5	2.0	EM4102R	315.00
			52.0	6.0	EM4106	350.00
			130.0	15.0	EM4115	550.00
230	195-255	220-240	32.5	7.5	EM4207	440.00
			120.0	27.5	EM4228	600.00
460	400-520	420-460	15.0	6.6	EM4407	490.00
			40.0	17.6	EM4418	630.00
Three Phase 230	195-255	220-240	25.0	10.0	EM6210Y	770.00
			38.0	15.0	EM6215Y	800.00
			50.0	20.0	EM6220Y	830.00
			113.0	45.0	EM6245Y	1,354.00
			175.0	70.0	EM6270D	1,675.00
460	400-520	420-460	16.0	12.5	EM6412Y	875.00
			22.0	17.5	EM6417Y	915.00
			33.0	25.0	EM6425Y	955.00
			66.0	50.0	EM6450Y	1,360.00
			100.0	75.0	EM6475Y	1,440.00
	420-500	420-460	131.0	100.0	EM64100Y	1,545.00



TYPE EM4115

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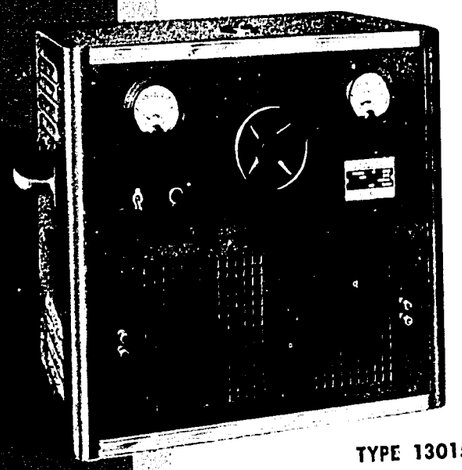
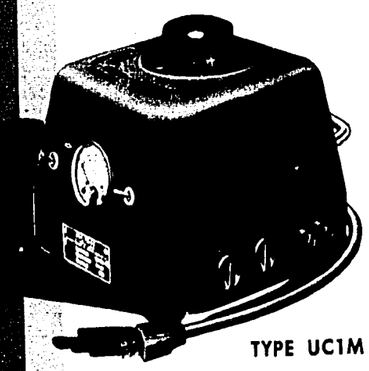
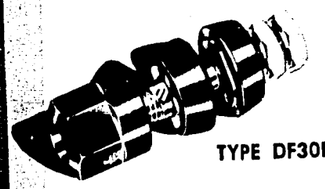
THE SUPERIOR ELECTRIC CO
BRISTOL, CONNECTICUT



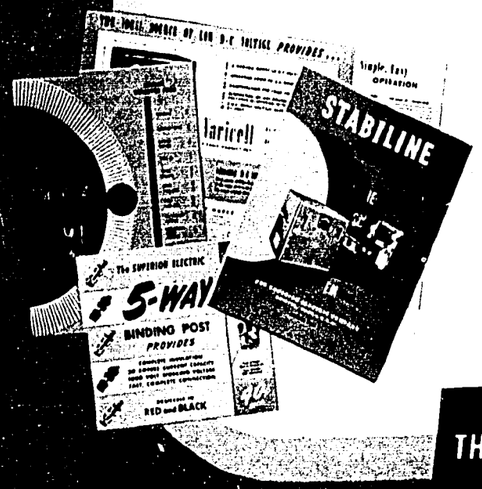
TYPE 13015



TYPE UC1M



TYPE DF30BC



Varicell

THE DEVELOPMENT OF A NEW DC VOLTAGE

Essentially, the basic components of the VARICELL are a POWERSTAT variable transformer, a fixed-ratio rectifier transformer, a saturable core reactor, a rectifier stack and an electronic control circuit. It operates from an a-c source to deliver a variable range of d-c voltages. Any setting of output voltage is not affected by line voltage changes or load current variations. Type 13015, illustrated, is rated 95-135 volts, 60 cycles, 1 phase, a-c input and 0-30 volts, 15 amperes d-c output. Stabilization and regulation is ±0.25 volts and R.M.S. ripple voltage never exceeds 0.1 volts for the output range of 6 to 30 volts. List Price: $765.00.

VOLTBOX A-C TO D-C VOLTAGE STABILIZER

As a compact, portable source of variable a-c voltage, the VOLTBOX provides a much needed instrument for the laboratory, inspection, test and plant maintenance departments. In the cast aluminum case are all the necessary components. Type UC1M is rated 115 volts, 50/60 cycles, 1 phase input; 0-135 volts, 7.5 amperes output. Type UC2M operates from a 230 volts, 50/60 cycles, 1 phase line to deliver 0-270 volts, 3.0 amperes. List Price: UC1M, $46.00; UC2M, $52.00.

TERMINAL BOARDS

Offers complete insulation, a current capacity of 30 amperes, and a working voltage of 1000 volts. Easy to install. Available in black or red phenolic for permanent clamping, spade lug, clip-lead, banana plug, or looping and clamping. List Price $.40 each.

LITERATURE

Comprehensive booklets and folders covering Superior products, ratings, and technical data, with many illustrations and graphs, are available for the asking.

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BRISTOL, CONNECTICUT

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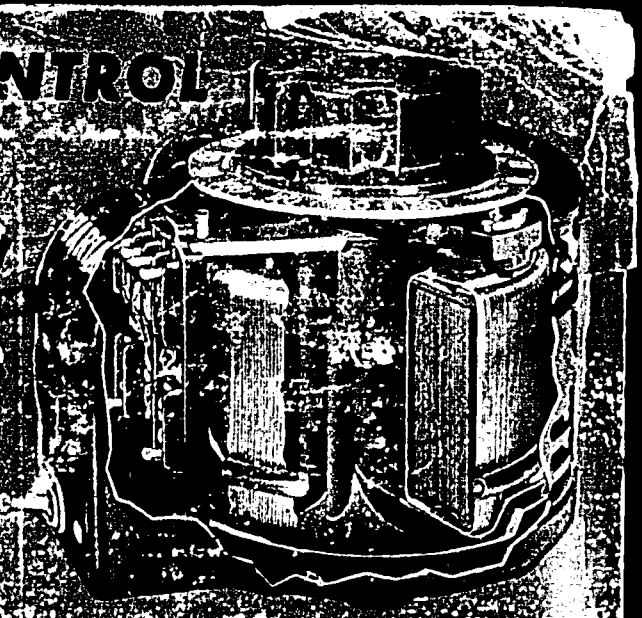
for SMOOTH VOLTAGE CONTROL

Variac®

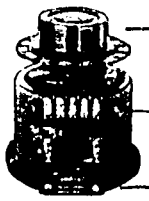


the original continuously adjustable auto-transformer — is the ideal device for controlling any a-c operated equipment. VARIACS not only supply perfectly smooth control of voltage from zero but also furnish output voltages 17% above line voltage. VARIACS are correctly designed for many years of trouble-free operation.

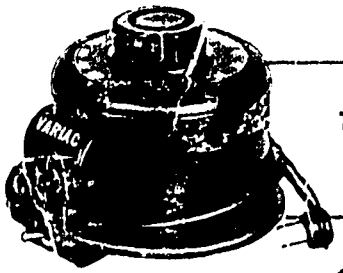
Data below are for single-phase operation. Polyphase and other ganged assemblies are available.

Single-Phase Data

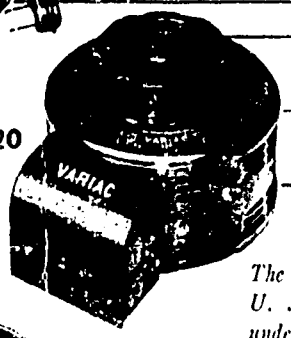
Type 200-B



Type V-5



Type V-10



Type V-20

Type 50

	Input Voltage	KVA	OUTPUT Output Voltage	OUTPUT Amperes Rated	OUTPUT Amperes Maximum	Type of Mounting*	Type	Price
Type 200-B	115	0.17	0-115 0-135	1	1.5 1.0	1	200-B	$12.50
Type V-5	115	0.86	0-115 0-135	5	7.5 5.0	1 2 3	V-5 V-5M V-5MT	18.50 20.50 25.00
	230	0.60	0-230 0-270	2	2.6 2.0	1 2 3	V-5H V-5HM V-5HMT	21.00 23.00 27.50
Type V-10	115	1.5	0-115 0-135	10	13.0 10.0	1 2 3	V-10 V-10M V-10MT	33.00 35.50 40.00
	230	1.2	0-230 0-270	4	5.2 4.0	1 2 3	V-10H V-10HM V-10HMT	34.00 36.50 41.00
Type V-20	115	3.	0-115 0-135	20	26.0 20.0	4	V-20M	55.00
	230	2.4	0-230 0-270	8	10.4 8.0	4	V-20HM	55.00
Type 50	115	5. 10.	0-115 0-115	40 80	45.0 90.0	4 5	50-A 50-AG2	140.00 310.00
	230	7 14.	0-230 0-230	20 40	31.0 62.0	4 5	50-B 50-BG2	140.00 310.00

The trade name Variac is registered at the U. S. Patent Office. Variacs are patented under U. S. Patent No. 2,009,013 and are manufactured and sold only by General Radio Company or its authorized agents.

* 1 Unmounted model.
2 Protective Case around windings.
3 Protective Case, terminal cover line switch, convenience outlet and line cord.
4 Protective Case, terminal cover and BX outlet.
5 Two gang assembly — requires type 50-P1 choke — $12.00.

Write for the NEW Variac Bulletin

GENERAL RADIO Company

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