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330 West 42nd Street, New York, N. Y.

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H. P. Westman, Secretary

* President serves as a member of the Board of Directors for two succeeding years.
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<td>Trapnell, T. T.</td>
<td>1933-42</td>
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<td>Turner, H. M.</td>
<td>1934 1930-35; 1939-42</td>
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<td>van der Pol, Balth.</td>
<td>1912; 1914-17 1912; 1914-17</td>
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<td>Van Dyck, A. F.</td>
<td>1933-42 1930-35; 1939-42</td>
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<td>Weagant, R. A.</td>
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<td>Westman, H. P.</td>
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<td>Wheeler, L. P.</td>
<td>1934; 1940-42 1934</td>
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<td>Whittemore, L. E.</td>
<td>1926-29; 1935-37 1934</td>
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<td>Zenneck, Jonathan</td>
<td>1933 1933</td>
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*Deceased.

Treas., 1915-16; 1918-27
Treasurer, 1917
Assist. Sec'y, 1914
Assoc. Editor, 1926-27
Assist. Sec'y, 1928
Treasurer, 1941-42
Sec'y, 1915-17
Sec'y, 1913-14
Assist. Treasurer, 1914
Assist. Sec'y, 1929
Sec'y, 1930-42
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and E. Guillem
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Minnesota, University of: H. E. Hartig
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Northeastern University: A. B. Bronwell
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Western Ontario, University of: G. A. Woonton
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Wyoming, University of: Carl Brown

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## INSTITUTE REPRESENTATIVES ON OTHER BODIES

A.I.E.E.—Subcommittee on Radio of the Committee on Applications to Marine Work

<table>
<thead>
<tr>
<th>Standards Council</th>
<th>Alfred N. Goldsmith (H. P. Westman, alternate)</th>
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<tr>
<td>Board of Examination</td>
<td>H. P. Westman, chairman</td>
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<tr>
<td>Electrical Standards Committee</td>
<td>H. M. Turner (H. P. Westman, alternate)</td>
</tr>
<tr>
<td>Sectional Committee on Acoustical Measurements and Terminology</td>
<td>E. D. Cook and H. F. Olson</td>
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<td>Sectional Committee on Definitions of Electrical Terms</td>
<td>Haraden Pratt</td>
</tr>
<tr>
<td>Subcommittee on Vacuum Tubes</td>
<td>B. E. Shackelford</td>
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<tr>
<td>Sectional Committee on Electric and Magnetic Magnitudes and Units</td>
<td>J. H. Dellinger</td>
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<tr>
<td>Sectional Committee on Electrical Installations on Shipboard</td>
<td>I. F. Byrnes and V. R. Russ</td>
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<tr>
<td>Sectional Committee on Electrical Measuring Instruments</td>
<td>Wilson Aull</td>
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<td>Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings</td>
<td>Austin Bailey (H. P. Westman, alternate)</td>
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</tbody>
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### AMERICAN STANDARDS ASSOCIATION

| Subcommittee on Communication Symbols | Austin Bailey (H. P. Westman, alternate) |
| Sectional Committee on Letter Symbols and Abbreviations for Science and Engineering | H. M. Turner |
| Subcommittee on Letter Symbols for Radio Use | H. M. Turner |
| Sectional Committee on National Electrical Safety Code, Subcommittee on Article 810, Radio Broadcast Reception Equipment | E. T. Dickey (Virgil M. Graham, alternate) |
| Sectional Committee on Preferred Numbers | A. F. Van Dyck |
| Sectional Committee on Radio | Alfred N. Goldsmith, chairman; Haraden Pratt, and L. E. Whittemore |
| Sectional Committee on Radio-Electrical Co-ordination | J. V. L. Hogan, C. M. Jansky, Jr., and L. E. Whittemore |
| Sectional Committee on Specifications for Dry Cells and Batteries | H. M. Turner |
| Sectional Committee on Standards for Drawings and Drafting Room Practices | Austin Bailey |
| Sectional Committee on Vacuum Tubes for Industrial Purposes | B. E. Shackelford |
On May 13, 1912, the Institute of Radio Engineers was formed through the merging of two organizations active in the technical radio field. One of these was the Wireless Institute, the headquarters of which were in New York City and the other, which was located in Boston, was known as the Society of Wireless Telegraph Engineers. The former organization had a membership of fourteen at the start of 1909 and twenty-seven on January 1, 1912. The Society of Wireless Telegraph Engineers had eleven members on the first day of 1907 and forty-three on January 1, 1912. At the time of its foundation, the Institute of Radio Engineers had fewer than fifty members.

Prominent in the early work of the Society of Wireless Telegraph Engineers were John Stone Stone, Lee de Forest, and Fritz Lowenstein. Those identified with the initial work of the Wireless Institute included John S. Murphy, R. A. Somerville, Joseph D. Fountain, R. B. Respress, R. A. Cleva, John Gregg, E. Barnwell, Philip Fransworth, Sidney L. Williams, Robert H. Marriott, G. W. Pickard, Harry Shoemaker, and Eugene M. Thurston. The consolidation of these two societies and the initial work of organizing the Institute of Radio Engineers were done by Alfred N. Goldsmith, J. V. L. Hogan, and R. H. Marriott.

**General**

The object of The Institute of Radio Engineers is to advance the theory and practice of radio and allied branches of engineering. It includes among its members those who have played prominent parts in the development of radio in the United States as well as many noted radio engineers and scientists in other countries.

Membership in the Institute is strictly personal and several grades have been established. The requirements for admission to these grades are contained in the Institute’s Constitution, and the eligibility of the applicant is determined by the Board of Directors. In many cases, the Admissions Committee recommends a course of action to the Board of Directors.

**Services**

An important service which the Institute renders its membership is the publication of papers. In addition, many papers are presented at meetings where informal discussions may be effective in increasing the knowledge of those present. Standardization reports provide a mechanism for establishing recognized meanings of technical terms and methods of testing and rating equipment. By the awarding of honors and prizes, the publication of papers describing important developments is encouraged.

**Publications**

The Proceedings of the I.R.E., is the name of the official publication. In it are published all the papers, discussions, and communications which have been submitted for publication and approved by our Papers Committee and Board of Editors. The first issue was published in 1913 and the first three volumes were comprised of four issues each. Volume 4 through Volume 14 contain six numbers each and all the succeeding volumes are composed of twelve issues each. Prior to 1939 the publication was titled The Proceedings of the Institute of Radio Engineers and its size was six inches by nine inches. In 1939 it was enlarged to eight and a half inches by eleven inches and its name shortened. Over 2000 papers are contained in the twenty-four volumes which were published up to the end of 1941. Of these approximately a quarter were published during the last five years. The Proceedings is mailed without additional charge to all Institute members. The subscription price to nonmembers is $10.00 per year.

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 and rating both equipment and antennas. Letter symbols for mathematical and other notation are also included. The most recent reports issued are dated 1938 and are under the following titles: Electroacoustics, Electronics, Radio Receivers, and Transmitters and Antennas. Additional reports on Facsimile, Frequency Modulation, and Radio Wave Propagation are scheduled for distribution during 1942.

Yearbooks have been issued at irregular intervals. The first was published in 1914, and the second in 1916. The next seven were published annually between 1926 and 1932. This 1942 issue is the eleventh to be published by the Institute.

**Awards**

Each year the Institute recognizes outstanding achievements in the radio communication field by the bestowal of two awards. One recognizes, in general, an extensive service over a period of years while the other is usually conferred for a more recent contribution.

**Medal of Honor**

The Institute Medal of Honor is given in recognition of distinguished service in radio communication. It is awarded to one who has been responsible for an important advance in the science or art of radio communication. This advancement may be a single development or it may be a series of developments which in the aggregate have resulted in substantial improvements in radio communication.
The achievement may be a patented or unpatented invention. It may also be a theoretical analysis of a hitherto unexplained phenomenon of distinct importance to the radio art, though the application thereof need not be immediate. Preference will be given analyses which are directly applicable to the art.

Further, the advance may be a new system of traffic regulation or control, a new system of administration of a radio company or the radio communication service for military, transportation, or other organizations; a legislative program beneficial to the radio art or any portion of the operating or regulating features of the art.

The achievement for which this award is granted preferably must be completely and adequately described in a scientific or engineering publication of recognized standing and should have been actually applied to radio communication problems. A development may be of recent origin or otherwise and a series of developments may extend over a long period of years. Preference will be given to widely used and generally useful inventions.

The recipient of this award shall be named by the Board of Directors which will normally receive recommendations from the Awards Committee.

Recipients of Medal of Honor
E. H. Armstrong .......1917 P. O. Pedersen .......1930
E. F. W. Alexander .........1919 A. E. Kennelly .......1932
G. Marconi ..............1920 J. A. Fleming .......1933
R. A. Fessenden .........1921 S. C. Hooper .......1934
Lee de Forest .........1922 Balth. van der Pol ....1935
John Stone Stone .........1923 G. A. Campbell .......1936
M. I. Pupin .............1924 Melville Eastham .......1937
G. W. Pickard .........1926 J. H. Dellinger .......1938
L. W. Austin ...........1927 A. G. Lee ...........1939
Jonathan Zenneck .........1928 Lloyd Espenschied ....1940
G. W. Pierce ........1929 Alfred N. Goldsmith .......1941
A. H. Taylor ........1942

Morris Liebmann Memorial Prize
The Morris Liebmann Memorial Prize, to perpetuate the memory of the late Colonel Morris N. Liebmann, is made possible through the generosity of E. J. Simon, a Fellow of the Institute. Colonel Liebmann's activities in radio were as vice president and chief engineer of Foote-Pierson, an organization which manufactured radio equipment to the order of several radio companies. In this work he provided important engineering services. As a lieutenant colonel in the 23rd Regiment, New York National Guard, he arrived in France in July, 1917, and was killed in action shortly thereafter. The award consists of the income from a gift of $10,000, and is not a stated amount as it is the interest from the securities in which the principle is invested.

The recipient shall be a member of the Institute who shall have made public during the recent past an important contribution to radio communication. The contribution shall be completely and adequately described in a scientific or engineering publication of recognized standing.

How remote this publication may be is left to the judgment of the committee and will depend upon the rapidity with which the advancement is applied in practice, such application indicating its importance. Where several contributions are being considered, that which is widely used or is generally useful shall be given preference.

The recipient of this award is named by the Awards Committee, appointed annually by the Board of Directors.

Recipients of Morris Liebmann Memorial Prize
L. F. Fuller ...........1919 Stuart Ballantine .......1931
R. A. Weagant ........1920 Edmond Bruce .......1932
R. A. Heising ........1921 Heinrich Barkhausen ....1933
C. S. Franklin ........1922 V. K. Zworykin .......1934
H. H. Beverage ........1923 F. B. Llewellyn .......1935
J. R. Carson ...........1924 B. J. Thompson .......1936
Frank Conrad ...........1925 W. H. Doherty .......1937
Ralph Bown ...........1926 G. C. Southworth .......1938
A. H. Taylor ........1927 H. T. Friss .......1939
W. G. Cady ...........1928 H. A. Wheeler .......1940
E. V. Appleton ........1929 P. T. Farnsworth .......1941
A. W. Hull ...........1930 S. A. Schelkunoff .......1942

Membership
The Constitution of the Institute provides for several grades of membership, each of which has been established to meet the requirements of a particular group of members. The tabulation on page 13, gives for each membership grade the requirements as to age, experience, and references, together with entrance and transfer fees, and dues. Full details are contained in the first few articles of the Constitution which is published elsewhere in this Yearbook.

Membership in the Institute includes a number of valuable features which are of inestimable importance to those active in the technical radio field and those connected with closely related lines of activity. Regardless of grade, each member receives the PROCEEDINGS regularly and copies of all Yearbooks and Standards reports when they are published. Notices of meetings at which papers are presented are forwarded to all members located in the territory which is immediately adjacent to the city in which the meeting is held. Convention and regional meetings are announced in the PROCEEDINGS. Additionally, membership enrolls one with those others who have indicated their interest in this field and whose activities therein are predominantly responsible for the progress which each year witnesses.
The grade of Fellow is reserved for those whose contributions to radio have raised them to a place of distinction among their fellow workers. To the Fellow is reserved the honor of serving as president or vice president of the Institute.

The Member grade is the professional grade and is open to recognized engineers and comparably qualified individuals who have served sufficiently long in their field to establish their standing.

The Associate and Junior grades are provided for those with a general interest in the field or whose technical qualifications are not such as to permit their acceptance as Members. The only difference between these two grades is that of age.

The Student grade of membership permits those enrolled as students in our engineering colleges to become affiliated with the Institute and receive its publications at a very low annual cost. Membership in this grade is sharply restricted to bona fide students taking engineering and science courses in recognized colleges.

Before applying for membership, the applicant should consider carefully the various grades of membership available and choose that one which best fits his qualifications. Extracts of the Constitution pertaining to membership requirements are given on application forms which may be obtained from the Institute.

When filling in the application form, the applicant should submit the names of those persons who have knowledge of his professional experience, in preference to those who have a high professional standing but cannot vouch for him. The personal signatures of references are not required.

**IDENTIFICATION OF MEMBERSHIP GRADE**

Two general means of identifying an Institute member and indicating his grade of membership are through the use of a membership badge and an abbreviation following his written name.

All Institute badges are of the design shown in the accompanying illustration. Badges are available in three forms; a screw-back lapel button, a lapel pin, and a watch charm. The lapel button is approximately half the size of the illustration and may be purchased from the Institute office at $2.75 each. The lapel pin is of approximately the same size as the illustration and is priced at $3.00. The watch charm, finished on both sides, is provided with a ring to permit its suspension from a watch fob or chain and is also of the same size as illustrated. It is supplied at $5.00. All badges are of 14-carat gold. The grade is indicated by the color of the background, the lettering being in gold. The only exception is in the Fellow grade in which the lettering is in blue. The following tabulation gives the color of the background for the emblem of that grade and also the authorized abbreviations to be used for written communications:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Emblem</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fellow</td>
<td>Gold</td>
<td>F.I.R.E.</td>
</tr>
<tr>
<td>Member</td>
<td>Blue</td>
<td>M.I.R.E.</td>
</tr>
<tr>
<td>Associate</td>
<td>Maroon</td>
<td>A.I.R.E.</td>
</tr>
<tr>
<td>Junior</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>Green</td>
<td></td>
</tr>
</tbody>
</table>

All other methods of indicating membership are contrary to the expressed opinion of the governing body of the Institute. The use of the Institute emblem on personal or business stationery, cards, etc., is likewise not approved and members are requested to call such use to the attention of the secretary.

**MEMBERSHIP CERTIFICATES**

Membership cards are issued to those requesting them of the secretary. Similarly, diplomas are prepared and forwarded to Members and Fellows who desire them.

**MEETINGS**

About eight meetings are held in the Engineering Societies Building, 33 West 39th Street, New York City, each year. Usually, no meetings are held during the
summer months. Meetings are devoted to the presentation of technical papers and their discussion. Normally, the meetings are held on the first Wednesday of each month.

**Sections**

Where a sufficient number of Institute members are located in a relatively small territory, a section of the Institute may be established, primarily for the purpose of holding meetings at which technical papers are presented. Twenty-six sections are now in active operation in the United States, Canada, and Argentina.

**Organizing a Section**

In organizing a new section of the Institute, some difficulties may be avoided and the efforts of the organizers made more effective by observing the suggestions which follow:

a) The Constitution for Sections which appears elsewhere in this book should be read carefully as should Sections 37-44 and 47 of the Institute Bylaws. A section manual may be obtained from headquarters. In it will be found answers to practically all questions that will arise in the operation of a section. While the basic requirements are contained in the Constitutions and Bylaws, the manual gives much additional information on the practical running of a section.

b) A small group of local members who are interested in the formation of a section should act as a temporary organization committee. There may be obtained from Institute headquarters a list of all members of the Institute residing in the proposed territory of the section. This will permit the committee to canvass existing members and obtain opinions as to the probable support they will give the proposed section, also, it will disclose the lack of membership on the part of acquaintances whose interests might logically indicate the desirability of their becoming affiliated with the Institute. Membership applications may be distributed to this latter group.

c) At least twenty-five Fellows, Members, and Associates residing in the proposed territory must sign a petition for the formation of a section. This is the minimum number of members required for the continued operation of a section.

d) An organization meeting of the Institute members in the proposed section territory should be called. The notification of the meeting should contain a statement of its purpose and the fact that signatures of active members will be requested on a petition for the establishment of a section. In order to stimulate attendance at this meeting, it is essential that a technical paper be presented as it is exceedingly difficult to obtain a satisfactory turnout of people for a purely business meeting. A petition may read as follows:

Board of Directors,
Institute of Radio Engineers,
330 West 42nd Street,
New York, N.Y.

Gentlemen:

We, the undersigned Fellows, Members, and Associates of the Institute of Radio Engineers, residing within the city of _____________________________ and its environs, respectfully petition for the establishment of a new section to be known as the _____________________________ Section of the Institute of Radio Engineers which is to be operated in conformance with the governing documents and rules of the Institute.

Unless the names on the petition are checked against membership lists supplied from Institute headquarters it is desirable that thirty or thirty-five names be obtained before the petition is forwarded to headquarters. Unless extreme care is taken, signatures of nonmembers will be included in these petitions. The petition and a report of the activities of the meeting should be forwarded to the Institute office.

e) A petition for a section will be considered by the Board of Directors which may request an examination and recommendation from the Sections Committee.

f) On approval of the Board of Directors, the first official meeting of the section should be called. Permanent officers should be elected and standing committees appointed.

g) At least one Section Bylaw should be established. This fixes the date of the annual meeting of the section at which new officers are elected.

h) As a portion of the section income is computed on the basis of the number of meetings held, it is essential that the secretary forward a report of each meeting to Institute headquarters. No funds will be forwarded to sections which are delinquent in submitting financial statements at the end of each calendar year.
REPORT OF SECRETARY—1941

The following report is submitted to inform the membership of the activities of the Institute during the calendar year 1941.

MEMBERSHIP

The paid membership increased to 7021, which is 23 per cent larger than at the end of 1940. Fig. 1 gives data on the variation of membership throughout the life of the Institute. The proportion of the membership located in countries outside of the United States and its possessions dropped from its high of 24.2 per cent in 1935, to 14.3 per cent. The foreign membership, considered separately, decreased 3.5 per cent during the past year while the domestic membership increased by 28.7 per cent.

An increase of 10.6 per cent occurred in the membership in the British Empire during 1941 compared with a reduction of 15 per cent during 1940. The European membership was reduced by 28 per cent during 1940 and 59 per cent in 1941. Increases of 13 and 28 per cent were recorded in the South American membership for the two years.

Table I gives a breakdown of the distribution of the membership by grades. The percentage of the total in each grade is also noted.

There were 1643 new members admitted during 1941, in contrast to 855 during 1940, an increase of 92 per cent. During the year, 1608 applications for membership were received, 76 per cent more than the 913 submitted during 1940. The increase of Student applications amounted to 48 per cent and for all other grades, 90 per cent.

TABLE I—MEMBERSHIP DISTRIBUTION BY GRADES

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fellow</td>
<td>166</td>
<td>2.4%</td>
</tr>
<tr>
<td>Member</td>
<td>761</td>
<td>10.8%</td>
</tr>
<tr>
<td>Associate</td>
<td>5135</td>
<td>73.1%</td>
</tr>
<tr>
<td>Junior</td>
<td>50</td>
<td>0.7%</td>
</tr>
<tr>
<td>Student</td>
<td>905</td>
<td>13.0%</td>
</tr>
<tr>
<td>Total</td>
<td>7021</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

PROCEEDINGS

Because there were fewer acceptable manuscripts available than was anticipated, the December, 1940, issue of the Proceedings was delayed until February, 1941. Under a broadened scope as to both subject material and its treatment, a committee, under the chairmanship of B. E. Shackelford, was set up to solicit papers of a special type and another, under the chairmanship of D. D. Israel, was established to procure papers of the regular variety. An increased number of manuscripts were then procured and the rate of publication speeded up so that the December, 1941, issue appeared during that month.

Volume 29 (1941) contained 668 pages of technical papers and editorial material (numbered in Arabic), an increase of 14 per cent over the 1940 volume.

SECTIONS

The Dallas-Fort Worth, Kansas City, St. Louis, and Twin Cities Sections were established this year, bringing the total to 27 sections.

FIG. 1. The variation in paid membership is shown by the solid graph. The dotted line is for the number of pages of technical and editorial material in the Proceedings. Starting in 1939, a larger format was used and the scale of pages should be divided by 2.2.

Under the provisions of a bylaw, established in 1939, requiring each section to hold a minimum of 5 meetings per year, the New Orleans Section was dissolved. This reduced the number of sections to 26.

The 235 meetings held by the sections exceeded the previous record of 200 attained in 1940, and the number of members in sections reached a new maximum of 3543, compared with 2642 for 1940. The proportion of the total membership located in section territories rose from 46 per cent in 1940 to a new high of 51 per cent.

MEETINGS

In addition to the 235 meetings held by our sections and the 8 meetings held in New York City, there were 4 conventions.

The Winter Convention was held on January 9, 10, and 11 in New York City. There were 28 technical papers presented during 6 sessions. Inspection trips numbered 4 for the men and 3 for the women. The attendance totaled 1243 men and 67 women.

Detroit, Michigan, was the headquarters for the Sum-
of 33 committees and subcommittees. These groups were responsible for 29 meetings.

**Summary of Meetings**

There were 3 additional meetings held by special groups to consider matters which did not require formal committees. A summary of the number of meetings of all groups held during the year follows.

<table>
<thead>
<tr>
<th>Table II—Meetings Held During 1941</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>29</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>94</td>
</tr>
</tbody>
</table>

**Constitution and Bylaws**

The Constitution was amended by vote of the membership. The modifications included a broadening of the requirements for Member, a reduction in entrance fee for Fellow, and changes and clarification of the procedures for the appointment of committees and directors. A proposal to establish regional directors failed. The amendments of the bylaws, which are made by the Board of Directors, were too extensive for enumeration in this report.

**Awards**

The Institute Medal of Honor for 1941 was presented to Alfred Norton Goldsmith for his contributions to radio research, engineering, and commercial developments, his leadership in standardization, and his unceasing devotion to the establishment and upbuilding of the Institute and its Proceedings.

The Morris Liebmann Memorial Prize was bestowed on Philo T. Farnsworth for his contributions in the field of applied electronics.

In recognition of their contributions to radio, the following 7 members were transferred to Fellow:

- Marcus A. Acheson
- Edmund N. Deloraine
- Austin V. Eastman
- Ralph K. Potter

**Finances**

A comparative statement of income and expenses for 1941 and 1940, which is based on data contained in the annual audits prepared by Patterson and Ridgway, certified public accountants, and a comparative balance sheet for the same periods also taken from their reports are given herewith. In addition, the income and expenses over the life of the Institute are plotted in Fig. 2.
**Headquarters Staff**

The headquarters staff was composed of 16 persons at the end of the year as contrasted with 11 at the close of 1940. Of these, 3 were on a temporary basis and 1 was on sick leave. In addition, the arrangements for the solicitation of advertising in the Proceedings were changed in the latter part of the year to a contractual basis which made available to the Institute the services of an advertising manager and his secretary. Thus, 18 persons were “employed” by the Institute at the end of the year.

**Deaths**

The deaths of a Fellow, 3 Members, and 3 Associates, whose names are listed below, were reported during 1941.

T. S. Baker (A’29-M’37)    J. R. Carson (M’16-F’38)
F. B. Borges (A’31)        A. Hall (M’27)
W. N. Capen (M’31)         S. S. Kirby (A’27)
E. G. Moutoux (A’31)

**COMPARATIVE STATEMENT OF INCOME AND EXPENSES FOR THE YEARS ENDING DECEMBER 31, 1941, AND 1940**

<table>
<thead>
<tr>
<th>Income</th>
<th>1941</th>
<th>1940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dues, Current and in Arrears</td>
<td>$41,760.15</td>
<td>$40,487.50</td>
</tr>
<tr>
<td>Entrance and Transfer Fees</td>
<td>2,926.00</td>
<td>1,774.00</td>
</tr>
<tr>
<td>Subscriptions</td>
<td>10,959.04</td>
<td>11,399.95</td>
</tr>
<tr>
<td>Advertising</td>
<td>16,560.40</td>
<td>13,138.66</td>
</tr>
<tr>
<td>Binders, Bound Volumes, Emblems, Reprints</td>
<td>3,266.15</td>
<td>1,795.55</td>
</tr>
<tr>
<td>Interest from Investments</td>
<td>1,122.20</td>
<td>626.00</td>
</tr>
<tr>
<td>Conventions</td>
<td>2,938.50</td>
<td>1,770.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>178.17</td>
<td>502.87</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>$79,710.61</td>
<td>$71,494.53</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expenses</th>
<th>1941</th>
<th>1940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising Commissions, Salaries, Expenses</td>
<td>$5,172.69</td>
<td>$1,180.23</td>
</tr>
<tr>
<td>Bad Debts, Less Recoveries*</td>
<td>3,462.18</td>
<td>4,874.42</td>
</tr>
<tr>
<td>Binders, Bound Volumes, Emblems, Reprints</td>
<td>2,493.52</td>
<td>1,380.64</td>
</tr>
<tr>
<td>Conventions</td>
<td>4,172.31</td>
<td>3,023.12</td>
</tr>
<tr>
<td>Membership Solicitation</td>
<td>1,470.60</td>
<td>142.01</td>
</tr>
<tr>
<td>New York Meetings</td>
<td>881.09</td>
<td>796.22</td>
</tr>
<tr>
<td>Office</td>
<td>6,677.81</td>
<td>4,128.68</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$21,369.62</td>
<td>$17,255.23</td>
</tr>
</tbody>
</table>

**Net Profit**                         | $79,381.17 | $62,420.95 |

---

*Morris Liebmann Memorial Fund and Prize not included in this accounting.

**Acknowledgment**

A large part of the substantial progress made by the Institute during 1941 was the result of the tireless direction and stimulation by President Terman. He devoted many weeks during the year to a detailed examination and analysis of the Institute’s affairs. The active support of the Board of Directors, Executive, and other committees was essential to this work and contributed to the rapidity and extent of the progress.

Respectfully submitted,

Harold P. Westman
Secretary

June 13, 1942
### Comparative Balance Sheet

**December 31, 1941 and 1940**

<table>
<thead>
<tr>
<th>Assets</th>
<th>December 31, 1941</th>
<th>December 31, 1940</th>
<th>Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$44,968.09</td>
<td>$33,131.01</td>
<td>$11,837.08</td>
</tr>
<tr>
<td>Accounts Receivable—Current Dues</td>
<td>360.22</td>
<td>450.72</td>
<td>90.52</td>
</tr>
<tr>
<td>Advertising</td>
<td>2,341.32</td>
<td>3,153.00</td>
<td>811.68</td>
</tr>
<tr>
<td>Reprints</td>
<td>158.90</td>
<td>51.17</td>
<td>107.73</td>
</tr>
<tr>
<td>Exhibition Booths</td>
<td>150.00</td>
<td></td>
<td>150.00</td>
</tr>
<tr>
<td>Inventories (as submitted by the management)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceedings Bound Volumes</td>
<td>7,363.28</td>
<td>6,901.84</td>
<td>461.44</td>
</tr>
<tr>
<td>Binders</td>
<td>216.55</td>
<td>278.45</td>
<td>61.90</td>
</tr>
<tr>
<td>Emblems</td>
<td>191.98</td>
<td>360.34</td>
<td>168.36</td>
</tr>
<tr>
<td>Accrued Interest on Investments</td>
<td>94.17</td>
<td>167.50</td>
<td>73.33</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>56,051.51</td>
<td>44,688.03</td>
<td>11,363.48</td>
</tr>
<tr>
<td>Investments—at Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Market Value, Dec. 31, 1941, $21,609.08)</td>
<td>36,246.37</td>
<td>36,947.87</td>
<td>701.50</td>
</tr>
</tbody>
</table>

**Morris Liebmann Memorial Fund**

<table>
<thead>
<tr>
<th>Assets</th>
<th>December 31, 1941</th>
<th>December 31, 1940</th>
<th>Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments (Market Value, Dec. 31, 1941, $6,210.75)</td>
<td>10,012.45</td>
<td>10,012.45</td>
<td>351.08</td>
</tr>
<tr>
<td>Cash</td>
<td>351.08</td>
<td>351.08</td>
<td></td>
</tr>
<tr>
<td><strong>Total Fund Assets</strong></td>
<td>10,363.53</td>
<td>10,012.45</td>
<td>351.08</td>
</tr>
</tbody>
</table>

**Furniture and Fixtures After Reserve for Depreciation**

|                  | 5,279.70         | 3,289.30         | 1,990.40         |

**Prepaid Expenses**

|                  | 49.76            | 85.12            | 35.36            |

**Stationery Inventory—Estimated**

|                  | 200.00           | 200.00           |                  |

**Convention Expenses**

|                  | 327.19           | 475.95           | 148.76           |

**Salaries**

|                  | 181.20           | 181.20           |                  |

**Yearbook Expenses**

|                  | 98.70            |                  | 98.70            |

**Total Prepaid Expenses**

|                  | 856.85           | 761.07           | 95.78            |

**Total Assets**

|                  | **$108,797.96**  | **$95,698.72**   | **$13,099.24**   |

<table>
<thead>
<tr>
<th>Liabilities and Surplus</th>
<th>December 31, 1941</th>
<th>December 31, 1940</th>
<th>Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accrued Wages</td>
<td></td>
<td>$345.88</td>
<td></td>
</tr>
<tr>
<td>Accounts Payable</td>
<td></td>
<td>$3,717.01</td>
<td>503.45</td>
</tr>
<tr>
<td>Section Repate—Buenos Aires</td>
<td>170.00</td>
<td>44.50</td>
<td>125.50</td>
</tr>
<tr>
<td>Suspense</td>
<td></td>
<td>15.07</td>
<td>15.07</td>
</tr>
<tr>
<td>Advance Payments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dues</td>
<td>15,708.12</td>
<td>2,119.16</td>
<td>13,588.96</td>
</tr>
<tr>
<td>Subscriptions</td>
<td>1,862.51</td>
<td>2,735.37</td>
<td>872.86</td>
</tr>
<tr>
<td>Amount Withheld from Employees</td>
<td>335.41</td>
<td>50.56</td>
<td>284.85</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td>21,793.05</td>
<td>9,531.00</td>
<td>12,262.05</td>
</tr>
</tbody>
</table>

**Morris Liebmann Memorial Fund Investment Fund**

|                  | 10,012.45         | 10,012.45         |                  |

**Unexpended Income**

|                  | 351.08            | 77.87             | 273.21           |

**Total Fund**

|                  | 10,363.53         | 10,090.32         | 273.21           |

**Deferred Income—Convention**

|                  | 1,135.00          | 615.00            | 520.00           |

**Surplus—Donated**

|                  | 1,997.80          | 1,997.80          |                  |

**Surplus—Earned**

|                  | 73,508.58         | 73,464.60         | 43.98            |

**Total Liabilities and Surplus**

|                  | **$108,797.96**   | **$95,698.72**    | **$13,099.24**   |
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; and November 5, 1941.

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 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  
fulfilment 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. 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.

c. Associates, who shall be entitled to attend all meetings and  
and to receive copies of all Institute publications. In addition,  
Associates of record at the time of adoption of this Constitution  
shall be voting members so long as a continuous membership is  
maintained.

d. Juniors, who shall be entitled to attend all meetings and  
and to receive copies of all Institute publications.

e. Students, who shall be entitled to attend all meetings and  
and to receive copies of all Institute publications.

Sec. 2—Fellow: For admission or transfer to the grade of  
Fellow, a candidate shall be at least thirty-two years of age and  
shall be either:

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

portant radio work for at least three years.

When the candidate holds, in a principal national society of  
an allied branch of engineering or science, membership in a  
grade for which the qualifications indicate a standing equal to  
that required for the grade of Fellow herein, such membership  
shall be considered equivalent to three years of the required  
ten years of active practice of the radio profession.

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

c. A person who has done notable original work contributing  
to the advancement of radio engineering which has given him a  
recognized standing at least equivalent to that required for Fel-

low under paragraph “a” or “b.”

d. A person regularly engaged in radio work for at least ten  
years, who, by invention or by contributions to the advancement  
of radio engineering or radio science, or to technical radio litera-
ture has attained a standing at least equivalent to that required  
for Fellow under paragraph “a” or “b.”

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

a. A radio engineer or radio scientist. As such he shall have  
performed and taken responsibility for important radio engineer-
ining or scientific work and shall have been in the active practice  
of his profession for at least four years.

b. A teacher of radio or closely allied subjects for at least  
four years in a school of recognized standing. He shall have been  
in responsible charge of a major course in such fields.

c. A person regularly employed in radio or closely allied  
work for at least four years, who by invention or by contributions  
to the advancement of radio engineering or radio science,  
or to technical radio literature, has attained a standing equivalent  
to that required for Member under paragraph “a.”

d. A person at least twenty-eight years of age who is an  
gineer or scientist by profession in work closely allied to  
radio. As such, under general direction, he shall have taken  
responsibility in important engineering or scientific work in his  
field and shall have been in active practice of his profession for  
at least seven years.

e. An executive of a radio enterprise who, for at least six  
years, has had under his direction, important radio engineering  
or research work and who is qualified for direct supervision  
of the technical or scientific features of such activities.

Sec. 4—Associate: For admission or transfer to the grade of  
Associate, a candidate shall be at least twenty-one years of  
age and shall be interested in the theory or practice of radio  
communication or of the closely related arts and sciences.

d. A Junior shall be transferred to the Associate grade on  
reaching the age of twenty-one years.

Sec. 5—Student: For admission to the grade of Student, a  
candidate shall be devoting a major proportion 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 one and one-half years beyond  
the termination of his student status described above.

Sec. 7—The expression “school of recognized standing” is  
interpreted as applying to schools of college grade providing  
an engineering or scientific curriculum of not less than four  
years and granting degrees.

Sec. 8—In all cases, graduation from a radio or electrical  
course of a school of recognized standing shall be accepted in lieu  
of one year’s radio experience.

Sec. 9—The time requirements for admission 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. 10—The terms “member” and “membership” when  
printed without an initial capital where used in this Constitution  
and Bylaws includes all grades.

Sec. 11—The term “voting member” where used in this  
Constitution and Bylaws means a member entitled to vote on  
Institute matters.
ARTICLE III
ADMISSIONS, TRANSFERS, AND EXPULSIONS

Sec. 1—Admission or transfer to Fellow grade shall be by invitation by the Board of Directors only.
Sec. 2—Applications for admission or transfer to any grade of membership, except Fellow, shall be submitted to the Board of Directors. An affirmative vote of at least two thirds of the Board members voting shall elect or transfer an applicant to any grade.
Sec. 3—A reapplication for admission or transfer may be made after the expiration of one year from the date of rejection.
Sec. 4—The admission fee and dues are payable on notification of election and if not received within six months from notification, the election shall be considered null.
Sec. 5—A member in good standing may resign by submitting a written resignation to the Secretary.
Sec. 6—Subject to the approval of the Board of Directors, a resigned member may resume his membership upon payment of current dues.
Sec. 7—When a member’s dues become three months in arrears his membership shall be terminated. Subject to the approval of the Board of Directors, such membership may be resumed on payment of a new entrance fee and current dues or by the payment of all dues in arrears.
Sec. 8—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.

ARTICLE IV
ENTRANCE FEES AND DUES

Sec. 1—The entrance fees, transfer fees, and annual dues shall be as follows:

Entrance Fees
Fellow ............................ $ 5.00
Member ............................ 5.00
Associate .......................... 3.00
Junior ............................. 1.00
Student .............................

The transfer fee from one grade of membership to another shall be the difference between the corresponding entrance fees except that there shall be no fee when transferring immediately from Student to Associate membership.

Annual Dues
Fellows .............................. $10.00
Members .............................. 10.00
Associates ........................... 6.00
Juniors ............................... 4.00
Students .............................. 3.00

Sec. 2—The annual dues shall be payable in advance on the first day of January.
Sec. 3—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 V
OFFICERS

Sec. 1—The governing body of the Institute shall be the Board of Directors and shall consist of the President, Vice President, Secretary, Treasurer, Chairman of the Board of Editors, nine elected Directors, five appointed Directors, and the two most recent past Presidents.
Sec. 2—Except for the elected Directors, the terms of all officers shall be for one year each.
Sec. 3—The terms of the elected Directors shall be for three years each.
Sec. 4—The terms of the appointed Directors shall be for the current calendar year.
Sec. 5—No officer shall receive, directly or indirectly, any salary, compensation, or emolument from the Institute, either as such officer, or in any other capacity, unless authorized by a vote of a majority of the entire Board of Directors, except as authorized by the Bylaws.

ARTICLE VI
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 and vote at Board meetings. The tenure of such temporary chairman shall be at the discretion of the Board of Directors.

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

Six 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 received at the stipulated meeting shall be required to approve any new Bylaw, amendment, or revocation.

Sec. 4—The Treasurer, under the control of the Board of Directors, shall have general supervision of the fiscal affairs of the Institute.

The Institute shall secure a surety bond on the Treasurer.
Sec. 5—The Secretary shall attend all meetings of the Board of Directors and principal meetings of the Institute and prepare the minutes and record the proceedings thereof. He shall have charge of the books of account of the Institute, and shall furnish from them such information as is requested by the Board of Directors. He shall conduct the correspondence of the Institute and keep full records thereof.

The Institute shall secure a surety bond on the Secretary.

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, Treasurer, Secretary, and Chairman of the Board of Editors. Funds from this account shall, in general, be deposited in a second account which shall never exceed an amount specified by the Board of Directors and be withdrawable on the signature of the Secretary alone for current disbursements. Before funds are transferred from the first-mentioned account to the other, the Secretary 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.
Sec. 8—The fiscal year of the Institute shall end with the thirty-first day of December.

ARTICLE VII
NOMINATION AND ELECTION OF PRESIDENT, VICE PRESIDENT, AND THREE DIRECTORS, AND APPOINTMENT OF SECRETARY, TREASURER, CHAIRMAN OF THE BOARD OF EDITORS, AND FIVE 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 office of President and
Constitution

vice president and at least six names for the office of elected director and shall call for nominations by petition.

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 executive office before august fifteenth of any year and shall be signed by at least thirty-five voting members.

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 the voting members as of august fifteenth, a list of nominees for the offices of president, vice president, and elected 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 executive office 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 first meeting in november and the nominees for president and vice president and the three nominees for director receiving the greatest number of votes shall be declared elected. in the event of a tie vote the board shall choose between the nominees involved.

sec. 2—the secretary, treasurer, and chairman of the board of editors, shall be appointed by the board of directors at its annual meeting to serve until the next annual meeting.

sec. 3—the five appointed directors shall be appointed by the board of directors at its annual meeting to serve for the remainder of the calendar year.

sec. 4—the board of directors is authorized to fill a vacancy occurring in the governing body.

article viii
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. there shall be a meeting of the board of directors in november or after the first wednesday to receive the report of the tellers committee.

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 general 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.

article ix
institute sections

sec. 1—sections of the institute may be authorized by the board of directors.

sec. 2—the board of directors may at any time terminate the existence of any section when in its judgment the interests of the institute makes such action desirable.

article x
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 thirty-five voting members. such proposed amendments 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 letter ballot to each 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 executive office. 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 seventy-five per cent of all votes cast shall be favorable, the proposed amendment or amendments shall become part of this constitution.

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 November 5, 1941)

article vi, 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 received at the stipulated meeting shall be required to approve any new bylaw, amendment, or revocation.”

membership

sec. 1—institute members are authorized to use the following abbreviations or symbols indicating their grade of membership:

fellow—F.I.R.E.
member—M.I.R.E.
associate—A.I.R.E.

sec. 2—the emblem of the institute is copyrighted and shall be reproduced only in connection with official business of the institute.

sec. 3—applicants for membership shall furnish names of sponsors as follows:

for member—five fellows or members.
for associate—three fellows, members, associates, or other responsible individuals.
for junior—three fellows, members, associates, or other responsible individuals.
for student—a member of the faculty of his school.

sec. 4—when the work or location of an applicant for member grade is such as to make impracticable compliance with section 3, the admissions committee may waive that section upon obtaining other suitable references.

sec. 5—the name of each applicant for admission or transfer to the grade of member shall be posted in the proceedings, after approval by the admissions committee.
SEC. 6—Objection to the admission of a candidate must include reasons for such objection and must reach the office of the Institute by the first day of the month following posting in the PROCEEDINGS. All such statements shall be treated as confidential.
SEC. 7—The name of each newly admitted or transferred Associate or Member shall be published in the PROCEEDINGS.
SEC. 8—A notice of his election shall be sent to each newly admitted member together with a bill for his entrance fee and dues, if not previously paid, dues being computed for the remainder of the calendar year beginning with the quarter next succeeding that of his election. He shall receive his dues remaining unpaid, additional bills shall be sent the newly elected member sixty days and one hundred and twenty days after notification of his election, in the last instance accompanied by a warning that his election will be considered void if his admission 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 their dues within six months of notification of election shall be turned over to the Membership Committee.
SEC. 9—The name of each applicant for admission to the Institute except in the case of Member grade, shall be placed on the mailing list for the PROCEEDINGS immediately upon admission to membership and the receipt of his entrance fee and dues.
SEC. 10—The name of each applicant for admission to the grade of Member shall be placed on the mailing list for the PROCEEDINGS immediately upon receipt of his application and the entrance fee.
SEC. 11—PROCEEDINGS will be sent to members for a period not shorter than that covered by the payment of dues. Upon request, a newly admitted member may receive the PROCEEDINGS for previous quarters of the current year provided dues are remitted with such additional period.
SEC. 12—Transfer of an Associate to Member grade may be proposed by any member acting as sponsor, in which case the sponsor shall fill in the application blank and provide letters of reference for submission to the Admissions Committee. If the application is favorably acted on, the sponsor shall secure the candidate's signature to a duplicate application blank after which the application shall be submitted to the Board of Directors.
SEC. 13—The Membership Committee may recommend for transfer to higher grade those members who they think are qualified.
SEC. 14—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. 15—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. 16—A bill shall be sent to each member not later than December 1 covering his dues for the following year. A second bill shall be mailed on or about February first to each member whose dues remain unpaid. Not later than March first, each member whose dues remain unpaid shall be so notified by the Secretary and informed that, in accordance with Article III, Section 7, of the Constitution, should his dues remain unpaid after March 31, his membership will terminate and he will lose the right to vote and to receive the publications of the Institute. On April first, the name of each member whose dues remain unpaid shall be removed from the roll of membership and such member shall be sent a notice to the effect that according to Article III, Section 7, his membership in the Institute has in fact terminated. The list of such terminated memberships shall be turned over to the Membership Committee.
SEC. 17—The mailing of bills or statements to the last known address of a member shall be considered a valid notice of indebtedness.
SEC. 18—On resuming membership and paying dues in arrears, a member may receive available copies of the PROCEEDINGS 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 not available.
SEC. 19—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, the respective 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. 20—Regular meetings of the Board of Directors shall be held in the office of the Institute in New York, N.Y., on the first Wednesday of each month except in July and August, unless otherwise set as provided for in Section 21.
SEC. 21—The time or place of a regular Board meeting may be altered or the meeting cancelled only by majority vote 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 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 case.
SEC. 22—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.
SEC. 23—The Secretary, appointed as prescribed in Article VII, Section 2, of the Constitution, shall be paid a salary determined by the Board of Directors.

EXECUTIVE COMMITTEE
SEC. 24—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. 25—The Executive Committee shall direct and coordinate the work of all committees except Appointments, Awards, Constitution and Bylaws, Executive, Nominations, and Tellers, unless the Board of Directors directs otherwise.
SEC. 26—The Executive Committee shall approve all membership applications below Fellow grade if and when such applications comply with entrance or transfer routines specified in the Constitution and Bylaws. The Executive Committee shall handle readmissions on the basis of policies established by the Board.
SEC. 27—The Executive Committee shall direct the formulation of and present the annual budget to the Board of Directors for approval.
SEC. 28—The Executive Committee shall manage the office of the Institute, which will include publications, advertising, and the setting of salaries (with the exception of Officers' salaries), within the limits of the budget.
SEC. 29—The Executive Committee shall set dates and locations of conventions, conferences, and meetings of the Institute and shall manage them.
CONSTITUTION

Sec. 30—The Executive Committee shall supervise the formation and operation of Sections and propose their approval to the Board of Directors.

Sec. 31—The Executive Committee shall direct and manage Institute standardization activities including relations with other organizations.

Sec. 32—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. 33—Minutes of the meetings of the Executive Committee shall be sent to the members of the Board of Directors.

Sec. 34—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. 35—The Nominating Committee shall submit more than one name for each elective office.

Sec. 36—The Nominating Committee shall transmit its list of proposed nominees to members of the Board of Directors at least a week before the date at which the Board is expected to act upon them.

SECTIONS

Sec. 37—A petition for the formation of a Section shall be signed by not fewer than twenty-five (25) Fellows, Members, and Associates residing within the proposed territorial limits.

Sec. 38—The territory of a Section shall be specified by the Board of Directors.

Sec. 39—All Sections shall accept and conform to a “Constitution for Sections” provided by the Institute Board of Directors.

Sec. 40—For Section maintenance, fifty cents shall be paid by the Institute to each Section for each Fellow, Member, and Associate residing within the territory of the Section at the end of the fiscal year, namely, December 31, plus ten ($10.00) dollars for each meeting up to and including the tenth meeting held during the year.

Sec. 41—Sections shall have no authority to contract debts for, pledge the credit of, or in any way bind the Institute.

Sec. 42—Section Secretaries shall forward to the Secretary of the Institute a report of each meeting held by the Section for the presentation or discussion of papers, and during January of each year a financial statement for the preceding year.

Sec. 43—A Section 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 its meetings.

Sec. 44—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 25 Associates, Members, and Fellows, 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, be dissolved. The Secretary shall so report to the Board of Directors and so inform the Section membership.

COMMITTEES AND REPRESENTATIVES

Sec. 45—The standing Committees, each of which shall normally consist of five or more persons, shall include the following:

- Admissions
- Appointments
- Awards
- Board of Editors
- Constitution and Laws
- Executive Committee of the Board of Directors
- Membership
- New York Program
- Nominations
- Papers
- Public Relations
- Sections
- Tellers

These committees shall be advisory to the Board of Directors on those matters which are reasonably described by the committee names.

Sec. 46—The Membership Committee shall include the Secretary of each Section, ex-officio.

Sec. 47—The Sections Committee shall include the Chairman of each Section, ex-officio.

Sec. 48—The Appointments Committee shall be appointed by the Board of Directors at its regular November meeting. Its membership shall be chosen from the continuing and newly elected members of the Board of Directors. 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 Chairmen and members of the Awards, Constitution and Laws, Executive, Nominations, and Tellers Committees.

Sec. 49—The Executive Committee shall recommend to the Board of Directors candidates for all standing committees except the Appointments, Awards, Constitution and Laws, Executive, Nominations, and Tellers Committees.

Sec. 50—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.

Sec. 51—The President, with the consent of the Board of Directors, 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. 52—The Board of Directors may appoint representatives of the Institute on joint committees, boards, and other local, national, and international bodies.

PUBLICATIONS

Sec. 53—The Secretary is authorized to receive annual subscriptions to the monthly PROCEEDINGS at the rate of ten ($10.00) dollars per annum with an extra postage charge when the bulk rate of postage does not apply. A discount of fifty per cent from the subscription price of ten ($10.00) dollars will be allowed to colleges and public libraries upon direct subscription to Institute headquarters. Members, publishers, and subscription agencies may be allowed a discount of twenty-five per cent.

Sec. 54—The price of a single annual subscription to the PROCEEDINGS for a Fellow, Member, or Associate shall be $5.00, to be included in his annual dues as specified in Article IV of the Constitution.

Sec. 55—The price of copies of the PROCEEDINGS supplied to a newly admitted Fellow, Member, or Associate in advance of the period for which dues are payable shall be included in his entrance fee which is specified in Article IV of the Constitution.
INDEX TO CONSTITUTION AND BYLAWS

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</table>
The Institute of Radio Engineers
Incorporated August 23, 1913

CONSTITUTION FOR SECTIONS

ARTICLE I
NAME AND OBJECT

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

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 co-operation 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, Members, and Associates of the Institute residing within the territory of the Section shall be entitled to attend meetings, vote, and hold office.

Sec. 3—Junior and 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.

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 request may be made.

Sec. 4—The Section may require nonmembers who wish to be placed on the mailing list for notices 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—Terms of all officers shall be for one year beginning at the close of the annual meeting at which election is held and continuing until their successors are duly elected and take office.

ARTICLE VI
MANAGEMENT

Sec. 1—There shall be an Executive Committee consisting of the officers, the Junior Past Chairman, the Chairman of the Meetings and Papers Committee, the Chairman of the Membership Committee, the Chairman of the Publicity Committee, and, if desired by the Executive Committee, one additional member to be appointed by the Chairman.

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 expeditious 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.

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—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. 3—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 a 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 fiscal year of the Section shall correspond with the fiscal year of the Institute. (Calendar year.)
Sec. 4—Fifteen members shall constitute a quorum at all meetings of the Section called for the transaction of regular business and requiring a vote to be taken.

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—Four members 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 meeting. These notices shall contain a full statement of the time, place, and business of the meeting.

ARTICLE IX
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 has 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 Section provided they are consonant with the Constitution and Bylaws of the Institute and this Constitution. A copy of these Bylaws shall be filed in the Institute office.

ANNUAL MEETINGS

The annual meeting at which officers for the succeeding year are elected is usually a regular monthly meeting. The particular month chosen by each of the Sections is tabulated below.

<table>
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<tr>
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<tr>
<td>Buenos Aires</td>
<td>May</td>
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<td>Buffalo-Niagara</td>
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<tr>
<td>Cleveland</td>
<td>December</td>
</tr>
<tr>
<td>Connecticut Valley</td>
<td>Last regular meeting of calendar year</td>
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<tr>
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<td>December</td>
</tr>
<tr>
<td>Detroit</td>
<td>December</td>
</tr>
<tr>
<td>Emporium</td>
<td>December</td>
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<tr>
<td>Indianapolis</td>
<td>May</td>
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<td>Kansas City</td>
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<td>April</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>June</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>May</td>
</tr>
<tr>
<td>Portland</td>
<td>January</td>
</tr>
<tr>
<td>Rochester</td>
<td>Last spring meeting</td>
</tr>
<tr>
<td>St. Louis</td>
<td>May</td>
</tr>
<tr>
<td>San Francisco</td>
<td>June</td>
</tr>
<tr>
<td>Seattle</td>
<td>December</td>
</tr>
<tr>
<td>Toronto</td>
<td>May</td>
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<tr>
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<td>December</td>
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INDEX TO SECTION CONSTITUTION AND BYLAWS

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<tr>
<td>Vice Chairman</td>
<td>V, 1</td>
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Use these cards for sending in the names of persons who may be interested in membership in the Institute

Name
Address

I believe the individual named above may be interested in membership in the Institute of Radio Engineers.

Signature

You may use my name in writing to him.  [ ] Yes  [ ] No
Please send me some additional cards.  [ ]

The Membership Committee
Would appreciate
The name
And address
Of anyone
Not listed
In this directory
Who may be
Interested in
Membership in
The Institute of
Radio Engineers

Name
Address

I believe the individual named above may be interested in membership in the Institute of Radio Engineers.

Signature

You may use my name in writing to him.  [ ] Yes  [ ] No
Please send me some additional cards.  [ ]

Name
Address

I believe the individual named above may be interested in membership in the Institute of Radio Engineers.

Signature

You may use my name in writing to him.  [ ] Yes  [ ] No
Please send me some additional cards.  [ ]
The Institute is especially valuable to its members in wartime because of up-to-date technical papers published monthly in The Proceedings.
CATALOG of MEMBERSHIP

Arranged Alphabetically and Geographically
NOTE

The following list of membership is divided into four sections; the first contains an alphabetical list of all Fellows and the second gives a similar list of all Members. The third section contains an alphabetical list of members of the Institute of all grades but Student; the last comprises a geographical list of members. In the general alphabetical portion, the letter and date immediately following the member's name indicate the grade of membership and date of election. Additional notations indicate transfers to other grades. The meaning of the symbols is as follows:

(F) Fellow
(M) Member
(‡A) Voting Associate
(A) Associate
(J) Junior

Where only one address is shown in the alphabetical list it is the mailing address. The geographical list contains the state and town in which the member is located and his present grade of membership in the Institute.

These lists contain the names of all members on record as of December 1, 1941, and newly elected members whose memberships have been completed by January 20, 1942. The data listed for each member have been corrected to March 20, 1942.

The number of listings for each grade of membership is as follows:

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<td>Associates</td>
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<td><strong>Total</strong></td>
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</table>
ALL-ARA

University of Western Ontario, London, Ont., Canada.

ALLEY, CHARLES L (A'41), Assistant Instructor, Radio Engineering, Air Force Technical Training Command, Department of Commerce, Scott Field, Belleville, Ill. 62220.

ALLISON, RALPH E (A'41), Electrical Engineer, Audiovisual Center, University of Minnesota, 105 Morris Hall, Minneapolis, Minn. 55455.


ALLEN, FRANCIS J (S'35-A'37), Electrical Engineer, Internal Combustion Engine Service at Large, U. S. War Department, Mill: 22 Asylum St., New Haven, Conn.

ALLEN, GEORGE A (S'38-A'43), Second Lieutenant, Signal Corps, United States Army, Washington, D.C. 25300.

ALLEN, BENJAMIN W (S'38-A'43), Assistant Professor, Electrical Engineering, United States Air Force Academy, Colorado Springs, Colo. 80840.

ALLEYNE, CHERLES L., of Commerce, Scott Field, Belleville, Ill. 62220.

AMERICAN LEEUWENHOEK SOCIETY, 141 East 65th St., New York, N.Y. 10021.

ANDERSON, HERBERT L (S'33-S'41-A'41), Research Physicist, Columbia University, 522 International Affairs Building, New York, N.Y. 10027.

ANDERSON, JOHN L D (A'34), 33 Rush姆s Rd., Burlington, Vt.

ANDERSON, KENNETH B (A'41), 229 W. 5th St., Montclair, N.J. 07042.

ANDERSON, LEROY C (A'39), 631 Blvdy St., Burlington, Vt.

ANDERSON, ROY S. (J'31-A'36), Researcher, Bell Labs, Murray Hill, N. J. 07974.

ANDERSON, WALTER A (A'33), Research Physicist, RCA Laboratories, Princeton, N. J. 08540.

ANDERSON, WILLIAM A (A'37), Flight Officer, Pan American Airways, P.O. Box 1110, Mexico City, D.F., Mexico 01000.


ANDERSON, WALTER A (A'33), Research Physicist, RCA Laboratories, Princeton, N. J. 08540.


ANDREWS, RAYMOND W (A'33), General Sales Manager, General Electric Company, Buffalo, N.Y. 14208. Mail: 36 Clark St., Orchard Park, N.Y. 14223.

ANGEL, OLIVER L. JR. (S'36-A'-43), Engineer, Telecommunications Laboratory, Stromberg-Carlson Telephone Manufacturing Company, 3300 North Broad Street, Philadelphia, Pa. 19130.

ANGST, DERRILL C (A'41), Assistant Radio Engineer, U.S. Navy, Mare Island, Calif. 94550.

ANGUS, GEORGE W (A'36), Communications Engineer, Pan American Airways, Inc., Treasure Island, San Francisco, Calif. 94129.


DALE, DARWIN L. (A’41), Inspector Signal Corps Equipment, War Department, Aircraft Radio Laboratory, Dayton, Ohio. Mail: 35 Broad St., Newark, N. J.

DALE, GEORGE V. (A’30), Member of Technical Army, Fort Meade, Md., Inc., Deal, N. J.

DAULMAN, CONRAD (S’40-A’41), Special Purpose Electronic Engineer, RCA Manufacturing Company, Inc., Harrison, N. J. Mail: 72 Broad St., Newark, N. J.

DALRYMPLE, HENRY C. (S’38-A’40), Research Engineer, 118 E. 25 St., New York, N. Y. Mail: 46 Colony Dr., East New York, L. I., N. Y.


DAVIS, RAYMOND A. (A’42), Lieutenant, U. S. Naval Reserve, U. S. Naval Academy, Department of Electrical Engineering, Annapolis, Md.

DAVIS, DONALD W. (A’42), Lieutenant Commander, U. S. Naval Reserve, U. S. Naval Academy, Department of Electrical Engineering, Annapolis, Md.


DECHAMP, RALPH (A’42), Engineer, Federal Telecommunications, New York, New York. Mail: 1107 Woodside Parkway, Silver Spring, Md.


DAY, CHARLES F., President and Director, Senior Engineer on Sonograph Corp, Amersham Petroleum Corporation, Box 2840, Tulsa, Okla.


DECKERT, H. (A’42), Engineer, Radio Engineer, REM, Fresno, Calif. Mail: 564 Shields Ave., P. O. Box 191, San Francisco, Calif.


DECOEUILLE, JOSEPH (A’41), Outside Plant Transmission Engineer, Pacific Telephone and Telegraph Company, Portland, Ore.

DE GANDA, PAULO R. (A’41), Rua Tibagi, Caxias, Brazil. Apts. 201 "Laranjeiras", Rio de Janeiro, Brazil.

DE LA RUE, FRANCIS (T’31), Marconi Transmitting Station, Abo-Zabal, Cairo, Egypt.

DEBAUM, JAMES R. (T’37), Member of Board of Directors, National Broadcasting Company, 30 Rockefeller Plaza, New York, N. Y. Mail: Parkebisher Apts., 180 Montgomery St., San Francisco, Calif.


DE BORD, MARVIN J. (T’37), Student, RCA Scientific Laboratory, New York, N. Y. Mail: 197 Seventeenth St., New York, N. Y.


DECAPOLO, EDWARD J. (A’31), Engineer, Member of Technical Staff, Bell Telephone Laboratories, 32-27 West New St., New York, N. Y. Mail: 84 Laurel Ave., Bloomsfield, N. J.

DECOPR, W. F. (S’39-A’40), Instructor in Meteorology, New York University, University Heights, N. Y.

DECKER, GEORGE A. (T’38), Engineer-in-Charge, Radio Department, Link Aircraft, Inc., Chicago, Ill. R.D. 1, 273, Windsor, N. D.

DEELEY, RALPH R. (T’37), Operator, Adirondack Broadcasting Company, 8 Elk St., Albany, N. Y. Mail: 125 Dana Ave., Albany, N. Y.


DEERING, WARREN M. (A’42), Electrical Engineer, General Electric Company, 837 Oak St., Gloucester, Mass.

DE FIGUEREDO, BRUNO F. (A’39), All India Radio, Queen’s Road, Chimbai, Bombay, India.


DE FORREST, MATTHEW J. (A’37), 2215 Beverly Blvd., Los Angeles, Calif.

DEHART, ROBERT N. (A’41), Radio Engineer, Columbia Broadcasting System, 187 Third Ave., New York, N. Y.

DEJOHNSON, HOWARD (A’38-M’52), Engineer, Tube Division, Hygrade Sylvania

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TUR-VEA

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ZWOYRKIN VALDINI K. (M'38-F'38), Associate Director of Research, Electronic Research Laboratory, RCA Manufacturing Company, Camden, N.J.

## CATALOG OF MEMBERSHIP

The following list gives in geographical order the names of all members except those of Student grade as of December 1, 1941. There have been added the names of newly elected members as of January 20, 1942.

### UNITED STATES

#### ALABAMA
- Auburn: Darling, W. (A)
- Birmingham: Bell, J. C. (A)
- Mobile: Newport, J. H. (A)
- Montgomery: Johnson, H. R. (A)

#### ARIZONA
- Kingman: Wallace, P. H. (A)
- Phoenix: Edwards, S. C. (A)
- Window Rock: Schmitz, W. (A)
- Winslow: Dargle, D. (A)

#### ARKANSAS
- Batesville: Griffin, F. T. (A)
- Blytheville: Grimwood, F. O. (A)
- Camp Robinson: Burns, C. P. (A)
- Fayetteville: Hudson, P. K. (A)
- Little Rock: Tracy, A. (A)
- Texarkana: Mims, M. P. (A)
- Ortiz, J. H. (A)

#### CALIFORNIA
- Albany: Cassen, C. T. (A)
- Alhambra: Cary, H. H. (A)
- Alhambra: Richer, F. R. (A)
- Alameda: Hall, R. W. (A)
- Los Angeles: Johnson, P. F. (M)
- Los Angeles: Ryan, E. (A)
- Los Angeles: Bowden, T. R. (A)
- San Francisco: Minor, L. A. (A)

#### Colorado
- Boulder: Higginbotham, T. P. (A)
- Colorado Springs: Anderson, R. E. (A)
- Denver: Wall, J. H. (A)

#### Connecticut
- New Haven: Eliot, T. A. (A)
- New Haven: Gerstle, J. (A)
- New Haven: Haff, E. C. (A)
- New Haven: Hall, E. C. (A)

#### Delaware
- Delaware: Halsey, H. D. (A)
- Delaware: Hering, T. F. (A)
- Delaware: Johnson, H. R. (A)

#### District of Columbia
- Washington: Ansell, J. W. (A)

#### Florida
- Jacksonville: Ansell, J. W. (A)
- Jacksonville: Bowden, T. R. (A)
- Jacksonville: Bowden, T. R. (A)

#### Georgia
- Atlanta: Ansell, J. W. (A)
- Atlanta: Bowden, T. R. (A)
- Atlanta: Bowden, T. R. (A)

#### Hawaii
- Honolulu: Ansell, J. W. (A)
- Honolulu: Bowden, T. R. (A)
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#### Illinois
- Chicago: Ansell, J. W. (A)
- Chicago: Bowden, T. R. (A)
- Chicago: Bowden, T. R. (A)

#### Indiana
- Indianapolis: Ansell, J. W. (A)
- Indianapolis: Bowden, T. R. (A)
- Indianapolis: Bowden, T. R. (A)

#### Iowa
- Des Moines: Ansell, J. W. (A)
- Des Moines: Bowden, T. R. (A)
- Des Moines: Bowden, T. R. (A)

#### Kansas
- Kansas City: Ansell, J. W. (A)
- Kansas City: Bowden, T. R. (A)
- Kansas City: Bowden, T. R. (A)

#### Kentucky
- Lexington: Ansell, J. W. (A)
- Lexington: Bowden, T. R. (A)
- Lexington: Bowden, T. R. (A)

#### Louisiana
- Baton Rouge: Ansell, J. W. (A)
- Baton Rouge: Bowden, T. R. (A)
- Baton Rouge: Bowden, T. R. (A)

#### Maine
- Portland: Ansell, J. W. (A)
- Portland: Bowden, T. R. (A)
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#### Maryland
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#### Massachusetts
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#### Michigan
- Detroit: Ansell, J. W. (A)
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#### Minnesota
- Minneapolis: Ansell, J. W. (A)
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#### Mississippi
- Jackson: Ansell, J. W. (A)
- Jackson: Bowden, T. R. (A)
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#### Missouri
- St. Louis: Ansell, J. W. (A)
- St. Louis: Bowden, T. R. (A)
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#### Montana
- Billings: Ansell, J. W. (A)
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#### Nebraska
- Omaha: Ansell, J. W. (A)
- Omaha: Bowden, T. R. (A)
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#### Nevada
- Reno: Ansell, J. W. (A)
- Reno: Bowden, T. R. (A)
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#### New York
- New York: Ansell, J. W. (A)
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#### New Jersey
- Newark: Ansell, J. W. (A)
- Newark: Bowden, T. R. (A)
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#### New Mexico
- Albuquerque: Ansell, J. W. (A)
- Albuquerque: Bowden, T. R. (A)
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#### New York
- New York: Ansell, J. W. (A)
- New York: Bowden, T. R. (A)
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#### North Carolina
- Raleigh: Ansell, J. W. (A)
- Raleigh: Bowden, T. R. (A)
- Raleigh: Bowden, T. R. (A)

#### Ohio
- Columbus: Ansell, J. W. (A)
- Columbus: Bowden, T. R. (A)
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#### Oklahoma
- Oklahoma City: Ansell, J. W. (A)
- Oklahoma City: Bowden, T. R. (A)
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#### Oregon
- Portland: Ansell, J. W. (A)
- Portland: Bowden, T. R. (A)
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- Philadelphia: Ansell, J. W. (A)
- Philadelphia: Bowden, T. R. (A)
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- Providence: Ansell, J. W. (A)
- Providence: Bowden, T. R. (A)
- Providence: Bowden, T. R. (A)

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- Columbia: Bowden, T. R. (A)
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- Nashville: Bowden, T. R. (A)
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- Salt Lake City: Bowden, T. R. (A)
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<table>
<thead>
<tr>
<th>Country</th>
<th>Authors</th>
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<tbody>
<tr>
<td>JAPAN</td>
<td>Sugiym, E. (A)</td>
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NOW more than ever before the proper maintenance of measuring equipment to insure maximum life is essential. It is comparatively simple to keep most General Radio apparatus operating with its original accuracy if certain operating precautions are observed and if a maintenance routine is established and followed.

The high accuracy of many G-R instruments is often dependent, in part, upon smooth operation of controls, freedom from backlash, clean contacts and absence of oxidization, dirt and foreign matter. A definite servicing schedule will help to minimize deterioration and failure and will save the user much valuable time (and money) in avoiding the necessity of returning instruments to us for service or repair.

Our Service Department has prepared a comprehensive manual which outlines the routine for maintaining a number of instruments, gives detailed instructions for trouble shooting and suggests a number of precautions to be observed when using G-R apparatus.

Both in the interest of our customers and as some assistance to the national war effort, we would like for users of our apparatus to have that portion of the service manual which is applicable to their instruments.

If you will send us a request for a "Service and Maintenance Notes" order form, the manual will be sent to you without charge.
PZ-100-QD Dual variable transmitting condenser. 9000 V. spacing. Normal airgaps to 1/2 inch.

TC-100-UD Dual variable transmitting condenser. Normal maximum airgap .294 inches. 1/2 inch airgap available in 80 mmf. single or 40 mmf. dual.

HZ-100-ZD Dual fixed transmitting condenser. 1/2 inch airgap 100 mmf. per section.

A-7220 Micro-capacitor bridge adjuster. Typical of the many special components that are produced to customer specifications.

Specified and used generously in practically every type of communications equipment from the lowest power transmitters to the highly complex controls of frequency checking devices, CARDWELLs have never failed to justify their selection.
Introduction to
The Radio Products Section

This section is provided through the support of leading manufacturers of radio equipment, parts, and materials in a sincere effort to make the Yearbook more useful. The product listings have been worked out with the cooperation of Yearbook and PROCEEDINGS advertisers.

We have devoted listings to those firms which have shown by their advertising a genuine interest in the I.R.E. and a desire to serve its members.

For reference convenience we have also included a list of Trade Names used for the products of many of these firms, and an alphabetical index to Yearbook advertisers.

Index to Advertisers xiii
Product Index iii, xiv, etc.
Trade Name Index xl, xli

Product Index

AMPLIFIERS
Ballantine Labs., Inc., Boonton, N.J. (Decade, Battery Operated)
Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N.Y.
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y. (Industrial and P.A.)

ANALYZERS
Hewlett-Packard Co., 481 Page Mill Rd., Palo Alto, Calif. (Harmonic and Distortion)

ANTENNAS
Premax Prods., 4197 Highland Ave., Niagara Falls, N.Y. (Monel, Aluminum and Steel)

ARTIFICIAL EAR
Ballantine Labs., Inc., Boonton, N.J.

ATTENUATORS
Daven Co., 158 Summit St., Newark, N.J. (Volume Controls)
Ohmite Mfg. Co., 4860 W. Flournoy St., Chicago, Ill. (High Wattage T and L Ped)

BAKELITE
A. W. Franklin Mfg. Corp., 175 Varick St., New York, N.Y. (Stampings and panels, also laminated)

BINDING POSTS

BRIDGES

CABINETS
Par-Metal Prods. Corp., 32-62 49th St., Long Island City, N.Y.
Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N.Y. (Metal Fabricated)

CABLES
Lenz Elec. Mfg. Co., 1751 N. Western Ave., Chicago, Ill. (For radio, telephone and special construction)

CAPACITORS—Electrolytic
Cornell-Dubilier Elec. Corp., 1012 Hamilton Blvd., South Plainfield, N.J.
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.

CAPACITORS—Industrial
Cornell-Dubilier Elec. Corp., 1012 Hamilton Blvd., South Plainfield, N.J.
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.

CAPACITORS—Mica
Cornell-Dubilier Elec. Corp., 1012 Hamilton Blvd., South Plainfield, N.J.
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.
RCA Mfg. Co., Inc., Camden, N.J. (Faradon)
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.

CAPACITORS—Paper
Centraher, 900 E. Keefe Ave., Milwaukee, Wis.
Cornell-Dubilier Elec. Corp., 1012 Hamilton Blvd., South Plainfield, N.J.
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.

(Continued on page xiv)
Mica transmitting capacitors, pioneered by William Dubilier, broke the German monopoly on the cumbersome, fragile and inefficient Leyden jar. The Allied Powers, throughout the first World War, depended solely on Dubilier's output of this newly-developed product for all capacitor needs.

In the quarter of a century since those critical days — constant research, continuous improvement, concentration on the manufacture of capacitors exclusively, have maintained Cornell-Dubilier leadership at all times. This accumulated skill is clearly evident in the built-in extra dependability of longer-lasting C-D capacitors—now made in a wide variety to meet the special needs of our government and many industries.

Today, as in the last World War, Cornell-Dubilier is supplying the United Nations' forces with all the capacitors it can make. More than thirty-seven hundred workers in its two big plants are doing their utmost to meet overwhelming demands. If your deliveries are delayed, we beg continuance of your patience. The cause of Victory must precede all other needs! Cornell-Dubilier Electric Corporation, South Plainfield, New Jersey. New England Division: New Bedford, Massachusetts.

MICA • DYKANOL • PAPER

WET & DRY ELECTROLYTICS
Standard
CONFIDENT that the future of radio will be greater even than its past, the Radio Corporation of America has laid the cornerstone for the world's foremost center of radio research and pioneering—RCA Laboratories at Princeton, N.J.

The main section of the Laboratories will open in 1942, dedicated to the service of mankind through increased usefulness of radio and electronics to the nation, to the public and to industry.

Radio has marched hand in hand with progress in electronics. The magic which created electronics—infinitesimal particles of electricity—lifted radio out of its mechanical era...took wireless out of the spark gap and sealed it inside the vacuum tube...took television off the mechanical scanning disc and put it in the Iconoscope.

In this hour of history RCA Laboratories fittingly symbolize our faith in the future—that science will blaze new trails in the unexplored wilderness of the electronic sciences through radio research.

RCA LABORATORIES
A Service of the Radio Corporation of America, Radio City, N. Y.
Other RCA Services: RCA Manufacturing Company, Inc.
Radiomarine Corporation of America, R.C.A. Communications, Inc.
National Broadcasting Company, Inc. RCA Institutes, Inc.
Blue Network Company, Inc.

Main section of the new RCA Laboratories under construction at Princeton, N. J. This section will open in 1942. Inset shows the Laboratories as they will look when completed.
Here's 1 Reason Why

Eimac tubes are unconditionally guaranteed against premature failures caused by gas released internally.

Plate dissipation is run up to ten times normal during the exclusive pumping process

Tube elements are fabricated from Tantalum which has the lowest original gas content of any known metal. This relatively small original gas content is then completely removed by the patented Eimac pumping process which you see illustrated in part above. During this process the plate dissipation is run up to ten times the normal ratings of the tube... and held there for hours... infinitely hotter than they will ever become in operation even under extreme circumstances. All Eimac tubes undergo this severe gruelling and they must pass 100% before they come to you.

Long filament life, uniformity of characteristics, outstanding performance and complete freedom from failures caused by gas released internally are basic reasons why you should adopt Eimac tubes for your transmitter. These are the same reasons why most all the world’s leading engineers choose Eimac... and why practically every major airline and many of the most vital commercial and government transmitters throughout the world have Eimac tubes in the key sockets.

Follow the leaders to Eimac

EITEL-McCULLOUGH, INC. San Bruno, California

More than 20 tube types. Get information NOW. Data sheets will be sent on request.
Designed Especially for Emergency, Police and Similar Services. This Instrument Is Custom Built for Individual Frequencies

1. Accuracy better than .005%.

2. Will meet the F. C. C. requirements for checking the frequencies of any transmitter which requires a frequency meter accurate to .005%.

3. For more accurate zero beat setting a cathode ray indicator is employed. A jack is provided for aural indication of zero beat.

4. The Browning Frequency Meter is so designed that the precision of the apparatus at any time can be checked to at least fifty parts in five million against the Bureau of Standards Station WWV or against any reliable station operating on frequencies which are an even multiple of 100 KC.

5. Custom-built for specified frequencies. Models from 1 to 5 bands inclusive.

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BROWNING Laboratories INC.
WINCHESTER-MASS.

Designers and manufacturers of custom built Radio and Electronic Equipment for national defense and commercial use.
ENGINEERING skill, care and precision are built into the many types of Transformers manufactured by Thordarson — Transformer Specialists Since 1895.

* Any size — any type
* any quantity
* but only one quality
* Thordarson Quality!
* Consult us regarding your War Production Problems.

Types shown immediately below weigh only one ounce each, others shown weigh from 1000 lbs. to more than two tons.

THORDARSON
ELECTRIC MFG. CO.
500 WEST HURON STREET
CHICAGO, ILLINOIS, U. S. A.
Transformer Specialists Since 1895
Working Data you should have...

- If you are engaged in radio receiver manufacture, or in the designing, building or maintenance of radio transmitters or severe-service electronic equipment, you should have this Aerovox data in your working library. In addition to the usual standard radio receiving condensers, Aerovox now lists those commercial-type or extra-heavy-duty transmitting capacitors heretofore made in limited quantities on special order, in the Aerovox Transmitting Capacitor Catalog, loose-leaf, kept right up to date with new pages issued from time to time.
- Write for Aerovox catalog, on your business stationery. Also be sure you are getting the Aerovox Research Worker with its wealth of timely engineering data. It's free—on request.

Send Us that Problem...
- Whatever your capacitor problem may be, send it to us for engineering collaboration, suggestions, quotations.
- Laboratory Standards
  - Standard Signal Generators
  - Vacuum Tube Voltmeters
  - Square Wave Generators
  - U.H.F. Noisemeters
  - Pulse Generators

Measurements Corporation
Boonton, New Jersey
As the leading supplier of laminated sockets and parts to radio and electrical equipment manufacturers, Franklin has enlarged its line to include MOLDED SOCKETS for aviation, battery, electrical, instrument, radio and allied apparatus. Plugs to match. Plugs for speaker and cable manufacturers.

Another Franklin first developed through design collaboration between our engineers and the engineering department of a leading radio receiver manufacturer.

New terminal strips — with matching, positive-spring-contact male and female connections — for loop aerials, speakers, etc. Reduce assembly and manufacturing costs - replace bulky and more expensive plugs.

Manufacturing facilities for large quantity production on regular or special items — engineers to discuss your design problems — quotations made promptly from your blueprints.

A. W. FRANKLIN MFG. CORP.
175 VARICK STREET    NEW YORK, N. Y.
Sockets • Terminal Strips • Plugs • Switches • Metal Stampings

AR Y — NAV Y
Tube Socket requirements solicited.

Now in Production

Sockets for Ultra-high frequency Acorn Tubes—Grade "G" Ceramic approved for Army, Navy and Signal Corp applications. Special Grade "C" Silver Plated Contacts. Snap-in contact withstands severe vibration.

New Low Loss—"Lock-in" Sockets —Revolutionary designed contact Insures dependable service for Tanks —Airplanes—Ship—etc.

Write our Engineering Department for Samples and Send in your Specifications.
USE THESE RCA TRANSMITTING TUBE INSTRUCTION SHEETS AS YOUR GUIDE

INSURE LONGER LIFE
FOR TUBES THAT MAY BE DIFFICULT TO REPLACE!

FOR LONGER TUBE LIFE—

• For types using pure tungsten filaments, a reduction in filament voltage greatly lengthens tube life.
• For types using thoriated-tungsten filaments, maintaining filament at rated voltage results in longer life. Operation either under or over normal voltage may result in shorter life.
• For types using oxide-coated cathodes, maintain filaments at rated voltage.
• For all types, reduce dissipation in grids and plates to a minimum to avoid overloading and to obtain materially longer life.

Many new Transmitting Tubes for commercial and civilian uses may become even harder to obtain because of the tremendous War-purpose demand. It is, therefore, not only a patriotic duty, but sound business policy as well, for tube users to conserve tube life by observing special care and operating practices which may add thousands of hours of life to tubes now in operation.

It is an old story that RCA Transmitting Tubes are built to withstand plenty of abuse—so much so that abnormal operating conditions are frequently accepted as "normal." Even though tube life has been entirely satisfactory under such conditions, it is by no means as long as might be obtained, simply by careful, conservative use of the tubes as outlined in the Instruction Booklet packed with each one.

In short, these are days when it is essential to give tubes all the care you can give them. Maximum life now becomes far more important than optimum performance. RCA welcomes the opportunity to cooperate in helping RCA Transmitting Tube users extend tube life to its fullest!

If you do not have Instruction Booklets on the RCA Tube types in your transmitter, write Commercial Engineering Section, RCA Manufacturing Co., Inc., Harrison, N.J., for free copies. Be sure to mention type number.

RCA MANUFACTURING CO., Inc., Camden, N.J. - A Service of The Radio Corporation of America
In Canada: RCA Victor Company Limited, Montreal
Product Index

CAPACITORS—Vacuum

CAPACITORS—Variable
Allen D. Cardwell Mfg. Corp., 81 Prospect St., Brooklyn, N.Y.
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.

CATHODE-RAY—See Tubes

CERAMIC MATERIALS
American Lava Corp., Chattanooga, Tenn.
Isolantite, Inc., 233 Broadway, New York, N.Y.

CHASSIS
Par-Metal Prods. Corp., 32-62 49th St., Long Island City, N.Y. (Bases, blank and punched)
Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N.Y. (Metal Fabricated)

CHOKES—Audio
New York Transformer Co., 51 W. 3rd St., New York, N.Y. (Reactors)
United Transformer Co., 150 Varick St., New York, N.Y. (Reactors)

CHOKES—Power
Kenyon Transformer Co., 840 Barry St., New York, N.Y. (Reactors)
New York Transformer Co., 51 W. 3rd St., New York, N.Y.
Standard Transformer Corp., 1500 N. Halsted St., Chicago, Ill.
United Transformer Co., 150 Varick St., New York, N.Y.
Utah Radio Prods. Co., 842 Orleans St., Chicago, Ill.

CHOKES—R.F.
Ohmite Mfg. Co., 4959 W. Flournoy St., Chicago, Ill.

CO-AXIAL CABLES
American Phenolic Corp., 1250 Van Buren St., Chicago, Ill.

COMMUNICATIONS EQUIPMENT
Bendix Aviation, Ltd., North Hollywood, Calif.
Hallcrafters Co., 2611 Indiana Ave., Chicago, Ill.
Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N.Y. (Components)

CONDENSERS—See Capacitors
(Continued on page xvi)

ESPEY
MANUFACTURING CO. INC.
305 EAST 63rd STREET
NEW YORK CITY, N.Y.
Telephone: REgent 7-3090
Send for this New Fastening Data Book!

The most comprehensive reference book of its kind ever published—that's the new Shakeproof catalog. It gives complete information on all Shakeproof fastenings, including full explanation of the advantages of each part, application suggestions and detailed data on sizes, dimensions and weights. In addition, many pages are devoted to valuable related engineering data and there is a special section covering government approvals. Every design engineer and production man will find this book a ready source for ways to improve product performance and increase assembly efficiency. Send for your copy now!

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Fastener Units

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Locking and Plain Terminals

Radio and Instrument Gears

Special Precision Stampings

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SEMS FASTENER UNITS • LOCK WASHERS • LOCKING AND PLAIN TERMINALS • THREAD-CUTTING SCREWS • LOCKING SCREWS • SPRING WASHERS • RADIO AND INSTRUMENT GEARS • ENGINEERED SHAKEPROOF PARTS • SPECIAL STAMPINGS
OHMITE MANUFACTURING CO., 4959 Flournoy St., Chicago, U.S.A.

THE service record of Ohmite Products on land, sea and in the air, in every climate, has proved their complete dependability. Today, Ohmite Rheostats, Resistors, Chokes and Tap Switches are used in endless variety and number in military, radio, electronic and industrial applications. Widest range of types and sizes makes it easier to meet your exact requirements. Many stock items. Units produced to Government specifications or designed for you by experienced Ohmite Engineers.

Ohmite Resistors—Fixed, adjustable or tapped; regular, precision or non-inductive. From 1 to 1500 watts. Variety of terminals and mountings.

Ohmite Tap Switches—Multi-point, load-break, non-shorting rotary selectors. Five sizes rated at 10, 15, 25, 50 and 100 amperes, A.C.

Send for Catalog and Manual No. 40

96 pages of helpful information and engineering data on the selection and application of Rheostats, Resistors, Chokes, Attenuators, Tap Switches. Write on company letterhead for your copy today.

OHMITE SERVICE RECORD
OF
OHMITE PRODUCTS
ON LAND, SEA AND IN THE AIR,
IN EVERY CLIMATE, HAS PROVED THEIR COMPLETE DEPENDABILITY.

TODAY, OHMITE RHEOSTATS, RESISTORS, CHOKES AND TAP SWITCHES ARE USED IN ENDLESS VARIETY AND NUMBER IN MILITARY, RADIO, ELECTRONIC AND INDUSTRIAL APPLICATIONS. WIDEST RANGE OF TYPES AND SIZES MAKES IT EASIER TO MEET YOUR EXACT REQUIREMENTS. MANY STOCK ITEMS. UNITS PRODUCED TO GOVERNMENT SPECIFICATIONS OR DESIGNED FOR YOU BY EXPERIENCED OHMITE ENGINEERS.

* OHMITE RHEOSTATS—WIDELY USED IN RADIO TRANSMITTERS AND ELECTRONIC EQUIPMENT. INCREASE PERMANENTLY SMOOTH, EXACT CONTROL. TEN SIZES FROM 25 TO 1000 WATTS IN STOCK OR SPECIAL UNITS.

OHMITE RESISTORS—FIXED, ADJUSTABLE OR TAPPED; REGULAR, PRECISION OR NON-INDUCTIVE. FROM 1 TO 1500 WATTS. VARIETY OF TERMINALS AND MOUNTINGS.

OHMITE TAP SWITCHES—MULTI-POINT, LOAD-BREAK, NON-SHORTING ROTARY SELECTORS. FIVE SIZES RATED AT 10, 15, 25, 50 AND 100 AMPERES, A.C.

SEND FOR CATALOG AND MANUAL NO. 40

96 PAGES OF HELPFUL INFORMATION AND ENGINEERING DATA ON THE SELECTION AND APPLICATION OF RHEOSTATS, RESISTORS, CHOKES, ATTENUATORS, TAP SWITCHES. WRITE ON COMPANY LETTERHEAD FOR YOUR COPY TODAY.

Be Right with OHMITE
RHEOSTATS • RESISTORS • TAP SWITCHES

PRODUCT INDEX

CONNECTORS
American Phenolic Corp., 1250 Van Buren Ave., Chicago, Ill. (Electrical Connectors to U. S. and British Military specifications)

CONTACTS—Electrical
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.

CONTROLS—Magnetic

CORDS

CORE MATERIALS
Advance Solvents & Chemical Corp., 245 5th Ave., New York, N.Y. (GAW Carboyd Iron)
Stackpole Carbon Co., St. Marys, Pa. (Powdered Iron)

COUPLINGS
Allen D. Cardwell Mfg. Corp., 81 Prospect St., Brooklyn, N.Y. (Insulated, rigid and flexible)

CRYSTALS—Quartz

EQUALIZERS—Audio
United Transformer Co., 150 Varick St., New York, N.Y.

FASTENER UNITS
Shakeproof, Inc., 2501 N. Keeler Ave., Chicago, Ill.

FILTERS—Audio
Bendix Aviation, Ltd., North Hollywood, Calif.
Kenyon Transformer Co., 840 Barry St., New York, N.Y.
New York Transformer Co., 51 W. 3rd St., New York, N.Y.
United Transformer Co., 150 Varick St., New York, N.Y.

FILTERS—Band Pass
Kenyon Transformer Co., 840 Barry St., New York, N.Y.
New York Transformer Co., 51 W. 3rd St., New York, N.Y.
United Transformer Co., 150 Varick St., New York, N.Y.

FILTERS—Interference
Cornell-Dubilier Elec. Corp., 1012 Hamilton Blvd., South Plainfield, N.J.

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1942 Yearbook of the I. R. E.
TODAY three quarters of the world is crying, "For the love of God let us have, and with great haste, more tanks, guns, planes, ammunition, trucks, etc." There can be no doubt in the hearts and minds of all Americans that these demands must and shall be met with all possible haste.

Of equal importance is the reliability of this armament and the permanency of its associated equipment. Greater than we realize is the part radio communication is playing—vital in its necessity, absolute in its dependability. The foundation of all radio equipment is transformers.

We at Kenyon take justifiable pride in knowing that whatever small part has been ours to contribute, then that part carries the character of our company. It is significant that wherever you see the Kenyon "mark of excellence", you will know that the men around it have seen fit to place their lives and their destiny on, "There can be no failure".

To these three-quarters of the world, we are at your service and, "For the love of God we will give you more shot and with greater speed".

THE MARK OF EXCELLENCE

KENYON TRANSFORMER CO., INC.
840 BARRY ST., NEW YORK, U. S. A.
HUGH H. EBY, INC.

An organization furnishing quality components, exclusively for Uncle Sam's war program, to the telephone, telegraph and radio industry.

**Binding Posts**

Insulated and all metal screw and spring head binding posts, also, a complete line of shielded binding posts.

**Sockets**

Molded for standard, low loss and ultra high frequency circuits

**Plugs**

Molded and fabricated

**Terminals**

Individual, pairs or multiples in any form

**Jacks**

For telephone, telegraph and radio apparatus

Have you seen the specification sheet on our 'ULtratine' molded products—sockets, coil forms etc.? It may solve your ultra high frequency problems.

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4700 Stenton Avenue

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MANUFACTURERS
OPERATORS

COMMUNICATIONS
EQUIPMENT

...G. A. W. Carbonyl Iron Powder

Product of General Aniline Works
435 Hudson Street
New York, N. Y.

GAW Carbonyl Iron Powder "E"
A superior core material for normal frequencies

GAW Carbonyl Iron Powder "TH"
The outstanding core material for high frequencies

for PEAK PERFORMANCE you can depend upon
G.A.W. CARBONYL IRON POWDER

SOLE DISTRIBUTOR:

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Solvents & Chemical Corporation
245, Fifth Avenue
New York, N.Y.
When it's Powered with Taylor HEAVY CUSTOM BUILT DUTY Tubes

Designed, engineered and built for gruelling 24 hour a day applications, Taylor Tubes have proved their ability to "stand up" under the most adverse conditions of service. Famous for their high Safety Factors, long efficient life and lower operating costs, Taylor Tubes provide the maximum in rugged dependability. Their outstanding record of success is growing daily.

**PRODUCT INDEX**

**MEASURING INSTRUMENTS—See Meters**

**METERS—Ammeters**
- Precision Apparatus Co., 647 Kent Ave., Brooklyn, N.Y.
- Simpson Elec. Co., 5212 W. Kinzie St., Chicago, Ill.

**METERS—Electronic or Vacuum Tube**
- Ballantine Labs., Inc., Boonton, N.J.
- General Radio Co., 30 State St., Cambridge, Mass. (Vacuum Tube)
- Precision Apparatus Co., 647 Kent Ave., Brooklyn, N.Y.

**METERS—Frequency**

**METERS—Ohmmeters**
- Precision Apparatus Co., 647 Kent Ave., Brooklyn, N.Y.
- Simpson Elec. Co., 5212 W. Kinzie St., Chicago, Ill.

**METERS—Power Level**
- Daven Co., 158 Summit St., Newark, N.J.
- Simpson Elec. Co., 5212 W. Kinzie St., Chicago, Ill.

**METERS—Voltmeters**
- Ballantine Labs., Inc., Boonton, N.J.
- Measurements Corp., Intervale Rd., Boonton, N.J.
- Precision Apparatus Co., 647 Kent Ave., Brooklyn, N.Y.
- Simpson Elec. Co., 5212 W. Kinzie St., Chicago, Ill.

(Continued on page xxii)

1942 Yearbook of the I. R. E.
Motorola and R-B-M HAVE COMBINED TO MAKE A VITAL DEFENSE PRODUCT

FOR YEARS R-B-M Engineers and Production Experts have specialized in the development and production of Relays, Solenoids, Switches and other small electrical and mechanical devices. When Motorola needed relays for a vital defense product R-B-M was selected because of its highly skilled engineering staff and huge plant facilities. Let R-B-M Engineers make recommendations on your particular problems.

Motorola FM Mobile Transmitters and Receivers are high on the list of products for National Defense. They are used for two way communication in ordnance plants, also the U. S. Mechanized equipment. For Home Defense they serve fire, ambulance and police departments. Motorola uses R-B-M Relays in this vital defense product.

R-B-M MANUFACTURING Co.
Division of
ESSEX WIRE CORPORATION
LOGANSPORT, INDIANA

TYPE 30 RELAY
NEW ACCESSORY FOR MODEL 300 VOLTMETER
FOR MEASUREMENT OF VERY LOW A-C Voltages

Decade Amplifier: This is a highly stable amplifier giving accurately standardized gains of 10x or 100x over a frequency range of 10 to 100,000 cycles. Operated by self-contained batteries having a life of over 150 hours. Used with our Model 300 Electronic Voltmeter (as shown in cut) A-C voltages down to 0.00003 volt (30 microvolts) can be measured. By means of special circuits the gain is independent within 2% of circuit constants, battery voltages and tubes. Fully described in Bulletin 7.

Electronic Voltmeter: A popular instrument for the measurement of A-C voltages, 10 to 150,000 cycles, 1 millivolt to 100 volts (up to 1000 and 10,000 volts with Model 402 Multipliers). Logarithmic voltage scale and auxiliary uniform decibel scale. A-C operated. By means of special circuits indications are independent of fine-voltage, tubes and circuit constants within 3% over entire frequency range. Several accessories, such as an artificial ear, vibration pickup and multipliers are available. Fully described in Bulletin 6.

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Ballantine Laboratories, Inc.

BOONTON, NEW JERSEY
S-1... A Good Receiver!

When we first made the S-1 eight years ago it was a good communications receiver and we knew it contained every possible improvement known to our engineers. Eight years is a long time ... many improvements have been made, our laboratories have been constantly engaged in research for better communications reception. Our work has been rewarded by your confidence in Hallicrafters communications equipment.

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CHICAGO, U. S. A.

Keep Communications Open

The SX-28... A Good Receiver NOW...

Incorporating many years of engineering research the SX-28 has had world wide acceptance. The fifteen tubes, six bands with a frequency range of from 550 kc. to 42 mc. give a new high in quality performance.
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Frazier Hunt broadcasts world news in a new pattern. No other commentator today has the world-wide experience of Frazier Hunt. He has covered both World Wars. "He has met and talked with as many of the world's greatest men and women as any living person."

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ELECTRONIC DEVELOPMENT NEWS

As you well know, electronics itself is making news. Today it is doing important war work. Tomorrow, when peace and victory come, electronics and electronic engineers will do much for business reconstruction. It is ready to offer Americans hundreds of new peace-time products. It will create employment when it will be most needed.

Radio, Television & Electronics Dept., Bridgeport, Conn.

GENERAL ELECTRIC

Product Index

PLUGS
American Phenolic Corp., 1250 Van Buren St., Chicago, Ill. (Radio, microphone and receptacles)
A. W. Franklin Mfg. Corp., 175 Varick St., New York, N.Y.
Utah Radio Products Co., 842 Orleans St., Chicago, Ill.

POLYSTYRENE
American Phenolic Corp., 1250 Van Buren St., Chicago, Ill. (Rod and special molded parts)

POTENTIOMETERS—See Resistors, Variable

POWER SUPPLY PACKS
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind. (DC Power Packs)
Standard Transformer Corp., 1500 N. Halsted St., Chicago, Ill.

PUBLIC ADDRESS EQUIPMENT
Standard Transformer Corp., 1500 N. Halsted St., Chicago, Ill.
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.
United Transformer Co., 150 Varick St., New York, N.Y.
Utah Radio Prods. Co., 820 Orleans St., Chicago, Ill.

QUARTZ CRYSTALS

RACKS
Pan-Metal Prods. Corp., 32-62 49th St., Long Island City, N.Y. (Metal Racks, enclosed type)
Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N.Y.

RADIO-PHONO COMBINATIONS
Espey Mfg. Co., Inc., 305 E. 63rd St., New York, N.Y.
General Electric Co., Bridgeport, Conn.

REACTORS—See Chokes

RECEIVERS
Communications Co., Inc., P.O. Box 91, Coral Gables, Fla.
General Electric Co., Bridgeport, Conn.

(Continued on page xxvi)
SPECIALIZATION

For 17 years the entire IRC organization has focused its research work, its ability and its energy exclusively upon the design and manufacture of fixed and variable resistors. From this specialization have resulted products of tested quality, a world wide reputation for engineering achievement and a thorough knowledge of resistance problems.

DIVERSIFICATION

This concentration of effort has resulted in the development of many kinds of resistors for widely divergent applications and is constantly providing new designs for current research problems.

2 sizes Variable Metallized Controls
4 sizes Insulated Metallized Resistors
10 sizes High Frequency Metallized Resistors (1/3 to 150 watts)
4 sizes Ultra-High Range Metallized Resistors
3 sizes All-Metal Power Rheostats (2 to 50 watts)
2 sizes Attenuators
7 sizes Insulated Wire Wound Resistors (1/2 to 20 watts)
11 sizes High Voltage Metallized Resistors
5 sizes Metallized Suppressors
12 sizes Precision Wire Wound Resistors
53 sizes Fixed and Variable Power Wire Wound Resistors

INTERNATIONAL RESISTANCE COMPANY
431 N. BROAD STREET
PHILADELPHIA, PA.
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QUALITY TRANSFORMERS FOR RADIO
AND ELECTRONIC APPLICATIONS!

FOR many years, Stancor has been known throughout the radio industry
for its production of an excellent variety of commonly used transformers
which are ideal for many radio and electronic applications. Leading dis-
tributors in all principle cities carry complete stocks.

In addition to its standard line Stancor offers to the development engineers
of the electronic industry a service of intelligent helpfulness. In our labora-
tories you will find the kind of understanding talent and resourcefulness you
need.

Stancor offers you a corps of expert technicians who, through years of
training in Stancor ideals of accuracy and quality, can assist you in the
development of special applications and, subsequently, Stancor can give you
quantity production on a quality basis that can be relied upon implicitly.

If you make any electronic apparatus requiring transformers or reactors,
we invite you to write regarding your individual problems.

Write for Stancor’s latest complete transformer catalog.

STANDARD TRANSFORMER
CORPORATION
1500 NORTH HALSTED STREET... CHICAGO

Product Index

Hallicrafters Co., 2611 Indiana Ave., Chicago, Ill.
Harvey Radio Labs., Inc., 445 Concord Ave.,
Cambridge, Mass.
RCA Mfg. Co., Inc., Camden, N.J.
Terminal Radio Corp., 85 Cortlandt St., New
York, N.Y.
Westinghouse Elec. & Mfg. Co., East Pitts-
burgh, Pa.

RECORDING HEADS
Shure Bros., 225 W. Huron St, Chicago, Ill.
(Magnetic Recording Heads.)

RECTIFIERS
International Tel. & Tel. Corp. 67 Broad St.,
New York, N.Y. (Selenium Rectifier)

RECTIFIER TUBES—See Tubes

REGULATORS—Voltage
Acme Elec. & Mfg. Co., 44 Water St., Cuba,
N.Y.
General Radio Co., 30 State St., Cambridge,
Mass.
Solo Elec. Co., 2525 Clybourn Ave., Chicago,
Ill. (Automatic)
Superior Elec. Co., 171 Harrison St., Bristol,
Conn. (Manual & Automatic)
United Transformer Co., 150 Varick St., New
York, N.Y.

RELAYS
Eitel-McCullough, Inc., 798 San Mateo Ave.,
San Bruno, Calif. (Vacuum Relays)

RESISTORS—Decade

RESISTORS—Fixed
International Resistance Co., 431 N. Broad
St., Philadelphia, Pa.
P. R. Mallory & Co., Inc., 3029 E. Wash-
ington St., Indianapolis, Ind.
Ohmite Mfg. Co., 4959 W. Flourny St., Chi-
cago, Ill.
Terminal Radio Corp., 85 Cortlandt St., New
York, N.Y.
Utah Radio Prods. Co., 842 Orleans St., Chi-
cago, Ill.

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1942 Yearbook of the I. R. E.
You Can Put Your Finger On Parts Like These At Your Mallory Distributor

Mallory makes it easy for you to get essential electronic parts...the ones you need for:

- Test or experimental work in your engineering department, research laboratories, pilot plants or proving grounds.
- Replacements in plant equipment.
- Efficient operation of some device you plan to put into production.

Distributors carefully selected by Mallory—253 of them—are ready to serve you promptly. These conveniently located Mallory Distributors keep adequate warehouse stocks. Their representatives are well trained and able to help solve your problems. Want a rectifier? Condenser? Resistor? Switch? Electronic hardware? Your Mallory Distributor is the man to see.

For handy reference, you'll want the Mallory catalog...perhaps several copies for members of your organization. This catalog gives terse, factual information on Mallory parts used in the aeronautical, automotive, electrical, geophysical, radio and other industries. Use this catalog as your buying guide...depend on your Mallory Distributor as your supplier...for your industrial electronic needs.

Write today for free catalog covering entire line of Mallory Approved Precision Products.
PRODUCT SPEED UP
STACKPOLE — the you want positive action and excitement branches, and available to the various government branches, are made with materials that do a big job!

SPECIFY STACKPOLE SWITCHES
- Slide Operated Switches
- Rotary Operated Switches
- Toggle Operated Switches

There’s a Stackpole Switch for every small circuit use—from single pole, single throw to four pole, double throw—and all combinations between. If you want positive action and sturdy construction, specify Stackpole, the little switch that does a big job!

SPECIFY STACKPOLE RESISTORS
- Variable and Fixed

For every type of volume, tone and sensitivity control, as well as special applications for other uses. All Stackpole controls are made with materials satisfactory to the various government branches, and available in complete resistance ranges and curves.

SPECIFY STACKPOLE IRON CORES
- Fixed Inductance
- Variable Inductance
- Station Tuning

Stackpole can supply you with any type of powdered iron cores, with or without adjusting screws. All are superior in mechanical strength and uniform throughout in construction. In requesting samples, please send test coils and complete data.

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Sold to Manufacturers Only

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ST. MARYS, PENNA

PRODUCT INDEX

ELECTRICAL DIVISION
Products Engineering on any Electronic Device—
Quality Amplifiers—
Communications System Components—
Conversion of Laboratory Models into Commercial Production—

SHEET METAL DIVISION
Metal Chassis and Cabinet Fabrication—
Stamping—Forming—Welding—Finishing

Equipment and Wiring for Communications Companies

LET US COOPERATE WITH YOU

SHERRON METALLIC CORPORATION
1201 FLUSHING AVENUE—BROOKLYN—NEW YORK

Product Index

RESISTORS—Variable
P. R. Mallory & Co., Inc., 3029 East Washington St., Indianapolis, Ind.
Ohmite Mfg. Co., 4959 W. Flournoy St., Chicago, Ill.
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.
Utah Radio Products Co., 842 Orleans St., Chicago, Ill.

RESISTORS—Wire Wound
Daven Company, 158 Summit St., Newark, N.J.
P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.
Ohmite Mfg. Co., 4959 W. Flournoy St., Chicago, Ill.

Stackpole Carbon Co., St. Marys, Pa.,
Terminal Radio Corp., 85 Cortlandt St., New York, N.Y.
Utah Radio Products Co., 842 Orleans St., Chicago, Ill.

RESPONSE RECORDER
Sound Apparatus Co., 150 W. 46th St., New York, N.Y.

RHEOSTATS
Daven Co., 158 Summit St., Newark, N.J. (Filement Rheostats)
International Resistance Co., 431 N. Broad St., Philadelphia, Pa. (All-Metal Power)
Ohmite Mfg. Co., 4959 W. Flournoy St., Chicago, Ill. (All Ceramic, Close Control)

SCREWS
Shakeproof, Inc., 2501 N. Keeler Ave., Chicago, Ill. (Thread-Cutting)

SIGNAL GENERATORS—See Test Equipment

(Continued on page xxx)

1942 Yearbook of the I. R. E.
Powerstat—the variable transformer that accurately controls power for all electronic and radio purposes solves such power problems as Tube Filament Voltage Control, Transmitter Bias Power Supply Voltage Control, and Transmitter Plate Supply Control.

Type 1126 Powerstat
Input: 115 volts 50/60 cycles
Output: 2.0 KVA
Max. Rated Output Current: 15 amp. available over entire range of output voltages
Output Voltage Range: 0 to 135 volts
No-load Power Loss: 16 watts
Over-all Dimensions: 8 x 8 x 7% inches
Net weight: 20 lbs.

Type 1256 Powerstat
Input: 230/115 volts 50/60 cycles
Output: 7.5 KVA on 230 volt line
Max. Rated Output Current: 28 amp. available over entire range of output voltages
Output Voltage Range: 0 to 270 volts
No-load Power Loss: 40 watts
Over-all Dimensions: 14¾ x 14¾ x 8 inches
Net Weight: 66 lbs.

Typical Three Phase Powerstat
Type 1256-2
Input: 230/115 volts 3 phase 50/60 cycles
Output: 13.1 KVA on 230 volt line
Max. Rated Output Current: 28 amp. available over entire range of output voltages
Output Voltage Range: 0 to 270 volts
Connection: See figure 7 of Bulletin 149

Oil Mounted Powerstat in Stainless Steel Tank

Seco Automatic Voltage Regulator
is used for radio transmitters and many types of electronic devices requiring reasonably close tolerances of line voltages. Important for radio transmitters located at the ends of long feeder lines where regulation is poor and voltage fluctuation wide (Send for Bulletin 163 ER).

Send for Powerstat Bulletin 149ER

Superior Electric Co.
171 HARRISON ST.
BRISTOL, CONN.
-hp-Resistance-Tuned Oscillators

have many advantages

The resistance-tuned principal is a stabilized amplifier with regeneration supplied through a frequency selective resistance capacity network. The oscillation frequency is stable and the thermal drift extremely low. Furthermore, the thermal drift is not magnified as is the case with the beat frequency oscillator. A balancing circuit automatically selects the proper operating point for the oscillator. The result...a stable oscillator having constant output and very low distortion.

Other -hp- instruments include these designed for measuring wave form: The Harmonic Wave Analyzer, and Distortion Analyzers. Selectivity of the Wave Analyzer can be varied over a wide range by means of a unique selective amplifier. Accuracy, flexibility, stability and extreme ease of operation make it a great saver of time in both laboratory and production work.

-hp- Vacuum Tube Voltmeter (illustrated above) has a voltage range from 0.3 volts to 300 volts. The response of the meter is constant from 10 c.p.s. to 1,000,000 c.p.s. Measurements with this instrument are particularly accurate because the indication is proportional to the average value of the full wave...thus waveform errors are reduced.

Model 400A Vacuum Tube Voltmeter

Model 320 Series Distortion Analyzers—For studying and measuring harmonic distortion in AC apparatus. Shows characteristic of distortion being measured. 320A for measuring at 400 c.p.s. or 5000 c.p.s. 320 B for measuring 50, 100, 400, 1000, 5000 and 7500 c.p.s.

Model 300A Harmonic Wave Analyzer—Measures individual components of complex waves from 30 c.p.s. to 10,000 c.p.s.

WRITE FOR COMPLETE DETAILS AND TECHNICAL DATA

You'll profit many ways by investigating the outstanding merits of -hp- Laboratory instruments. There's no obligation, of course.

HEWLETT-PACKARD

COMPANY

Box 135 B, Station A • Palo Alto, California, U S A.

(Continued on page xxxii)

1942 Yearbook of the I. R. E.
AN ORGANIZATION EQUIPPED IN EVERY WAY TO FILL EVERY RADIO AND ELECTRONIC REQUIREMENT...

Our Tremendous Stock incorporates all these well known makes and others equally desirable...

AEROVOX • ALLIED RELAY • AMPHENOL • A T R
AMPEREX • ASTATIC • AUDAK • B & W • BELDEN
BIRNBACH • BLILEY • BRUSH • BUD • BURGESS
CANNON • CARDWELL • CENTRALAB • CINAUD-AGRAPH • CORNELL-DUBILIER • DRAKE • DUNCO
ECHOPHONE • EIMAC • ESICO • ELECTROVOICE
GAMMATRON • GUARDIAN • HALICRAFTERS
HAMMARLUND • I R C • JENSEN • JONES
KENYON • LITTELFUSE • MALLORY • MEISSNER
MILLEN • MILLER • MUELLER • NATIONAL
OHMITE • PAR-METAL • PRESTO • RAYTHEON
R C A • SHURE • SPEED-X • TAYLOR
THORDARSON • TRIMM • TRIPLETT • U T C
VASCO • WEBSTER-RAULAND • WESTON

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SPEED • on special orders with rigid specifications

Complete machine shop and laboratory facilities.

HARVEY Radio Laboratories, Inc.
445 CONCORD AVENUE, CAMBRIDGE, MASS.

Product Index

HARVEY 100-XE. 100-Watt Transmitter. Rapid frequency shift. 10 Crystal-controlled frequencies. Withstands extreme climatic conditions.

DESIGNED AND CUSTOM BUILT TO YOUR SPECIFICATION BY MASTER CRAFTSMEN.

SPECIAL SAMPLE DEPARTMENT
Recognizing the need for speed in turning out sample units to meet deadlines, New York Transformer Co. some time ago, organized a special department for this work. This department is making transformer history due to the fact that in many instances it is able to deliver special transformers in a short time.

Supplier to foremost manufacturers of electronic devices demanding highest quality.

NEW YORK TRANSFORMER CO.
51 WEST 3RD ST., NEW YORK, N. Y.
Sprague Koolohms are not “just another” make of resistor, they embody exclusive structural and design features that make them the greatest wire wound resistor development in 20 years. That is why Koolohms have met specifications heretofore impossible—have proved particularly helpful in meeting the exact demands made of war manufacturers. Because they have set new high standards of performance under adverse salt water immersion conditions, Koolohm Resistors are approved for much military and naval equipment, for which average resistors were inadequate.

Enjoy the unique advantages created by Koolohm’s distinctive feature—the ceramic insulation of the wire BEFORE it is wound. See how this improvement makes Koolohms smaller, sturdier, better protected. See for yourself how accurate are Koolohms and how long they stay accurate.

**Koolohm Non-Inductive Resistors**

Ceramic insulated wire permits perfect interleaved Ayton-Perry windings reducing inductance to practically negligible values, even at frequencies of the order of 60 mc. Distributed capacitance is very small.

**Koolohm Single-Layer Winding**

Because Koolohm wire is ceramic insulated before it is wound, each turn can be wound tightly against the next. The insulation on the wire provides absolute protection against shorts and changed values. The ceramic insulation on Koolohm wire has a dielectric strength of 350 volts per mil at 400° C.!

**Koolohm Progressive Winding**

Koolohm ceramic insulated wire can be wound in high density patterned windings giving the electric equivalent of many layers of winding without high potential gradients.

This permits much larger wire sizes with the resultant safety factor, and much higher resistance values in small space. For example, 7500 ohms of 2.5 mil wire, or 70,000 ohms of 1.5 mil wire in a fully rated 10 watt resistor only 15/32” x 1-27/32” long.

**Section With Ceramic Insulation Removed**

The ceramic insulation now used exclusively on Koolohm wire is heat-proof—is actually applied to the wire at 1000° C. It is so moisture-proof it can be boiled in water—provides heretofore impossible humidity protection.

**Koolohm Unique Mounting Features**

Although the wire is insulated before winding, Koolohms are doubly protected. Most types are encased in a sturdy outer ceramic shell that will not peel or chip and allows quicker, easier, time and space saving mounting directly to metal or grounded parts with complete resistor circuit insulation.

SEND TODAY FOR CATALOG!

Catalog and samples free upon request.

SPRAGUE SPECIALTIES COMPANY

THE ONLY RESISTORS WOUND WITH CERAMIC-INSULATED WIRE!
The practical advantages of this new Super-Cardioid make it especially useful in both studio and remote broadcast service. That's why Broadcast Engineers are enthusiastic about it. The Super-Cardioid pick-up pattern, together with the Shure Uniphase single-unit moving-coil construction, eliminates undesired noises more easily — simplifies sound pick-up problems — makes it ideal for outdoor as well as indoor locations. Get all the facts — Send for Super-Cardioid Booklet No. 172.

30-Day Trial, Broadcast Engineers: Try the Super-Cardioid for 30 days in your station without obligation. Write us today.

SHURE BROTHERS
Designers and Manufacturers of Microphones and Acoustic Devices
225 West Huron Street, Chicago, Illinois

Model 556A for 35-50 ohms, Model 556B for 200-350 ohms, Model 936C high impedance, — at only $75.00 list.

* More unidirectional than the cardioid, yet has wide-angle front pick-up.
* Decreases pick-up of reverberation energy and random noise 73%.
* Improved wide-range frequency response — from 40 to 10,000 cycles.
* Symmetrical axial polar pattern at all frequencies.
* Highly immune to mechanical vibration and wind noises.

SHURE ENGINEERING

Many important advancements in Microphone design and performance are the result of Shure specialized engineering. Today, Shure Engineers devote their skill and their energy to the production of Microphones and Acoustic Devices for military, scientific and civilian defense needs in a determined effort to help win the war.

Product Index

Measurements Corp., Intervale Rd., Boonton, N.J. (U.H.F. Radio Noisemeter)

TRANSFORMERS—Audio
Acme Elec. & Mfg. Co., 44 Water St., Cuba, N.Y.
Kenyon Transformer Co., 840 Barry St., New York, N.Y.
New York Transformer Co., 51 W. 3rd St., New York, N.Y.
Standard Transformer Corp., 1500 N. Halsted St., Chicago, Ill.
United Transformer Co., 150 Wahr St., New York, N.Y.
Utah Radio Prods. Co., 842 Orleans St., Chicago, Ill.

TRANSFORMERS—Power
Acme Elec. & Mfg. Co., 44 Water St., Cuba, N.Y.
Kenyon Transformer Co., 840 Barry St., New York, N.Y.
New York Transformer Co., 51 W. 3rd St., New York, N.Y.
Standard Transformer Corp., 1500 N. Halsted St., Chicago, Ill.
United Transformer Co., 150 Varick St., New York, N.Y.
Utah Radio Prods. Co., 842 Orleans St., Chicago, Ill.

TRANSFORMERS—Voltage, Regulating
Acme Elec. & Mfg. Co., 44 Water St., Cuba, N.Y.
Solo Elec. Co., 2525 Clybourn Ave., Chicago, Ill. (Also special Transformers)
Standard Transformer Corp., 150 N. Halsted St., Chicago, Ill.
Superior Elec. Co., 171 Harrison St., Bristol, Conn.
United Transformer Co., 150 Varick St., New York, N.Y.

TRANSMITTERS—Broadcast

(Continued on page xxxvi)
The radio engineer today is faced with a greater responsibility than ever before. It is a responsibility that he should not face alone. In the selection of component parts for equipment now being built for our armed forces, he can share the responsibility with the manufacturer.

Take wire, for instance, any one of several different types of wire might do for a particular job, yet there is only one wire that is best for the purpose.

Who would be better suited to share the responsibility of selection than the engineers that developed the wire? They have lived with it, studied it, know exactly how it will perform under all conditions.

Lenz engineers know insulated wire—they are ready and eager to help solve any of your wire problems—and have a line of insulated wires and cables that will suit a wide variety of conditions.

Call in a Lenz wire specialist for consultation. The facilities of our Engineering Department are at your disposal.

LENZ ELECTRIC MANUFACTURING COMPANY
1751 N. Western Avenue, Chicago, Ill.
Electric Cords, Wires and Cables

ENJOYING ITS 36TH YEAR OF SUCCESSFUL BUSINESS

1942 Yearbook of the I. R. E.
Product Index

TRANSMITTERS—F. M.
General Electric Co., Bridgeport, Conn.

TRANSMITTERS—Police
Communications Co., Inc., P.O. Box 91, Coral Gables, Fla.
General Electric Co., Bridgeport, Conn.

TRANSMITTERS—Miscellaneous
Bendix Aviation, Ltd., North Hollywood, Calif.
Communications Co., Inc., P.O. Box 91, Coral Gables, Fla.
Espey Mfg. Co., Inc., 305 E. 63rd St., New York, N.Y.
Holliscraften, 2611 Indiana Ave., Chicago, Ill.

TUBES—Cathode-Ray
Allen B. Dumont Labs., Inc., 2 Main Ave., Passaic, N.J.
General Electric Co., Bridgeport, Conn.
Hygrade Sylvania Corp., 500 Fifth Ave., New York, N.Y.
RCA Mfg. Co., Inc., Camden, N.J.

TUBES—Photoelectric
Bradley Labs., Inc., 82 Meadow St., New Haven, Conn.
General Electric Co., Bridgeport, Conn.
RCA Mfg. Co., Inc., Camden, N.J.

TUBES—Receiving
General Electric Co., Bridgeport, Conn.
Hygrade Sylvania Corp., 500 Fifth Ave., New York, N.Y.
Hytron Corp., 76 Lafayette St., Salem, Mass.
RCA Mfg. Co., Inc., Camden, N.J.

TUBES—Rectifier
General Electric Co., Bridgeport, Conn.
Heintz & Kaufman, Ltd., South San Francisco, Calif.
Hygrade Sylvania Corp., 500 Fifth Ave., New York, N.Y.
RCA Mfg. Co., Inc., Camden, N.J.
Taylor Tubes, Inc., 2341 Wabansia Ave., Chicago, Ill.

(Continued on page xxxviii)
We are happy to have made this contribution to the electronic art

Today tantalum tubes are doing their part in the National Defense program. It is natural that GAMMATRONS play an important role, that designers should turn to the pioneer in the field for new tantalum tube developments. It is natural that when tantalum tubes are considered users all say—

GAMMATRONS of course!
ELASTIC STOP NUTS are made in more than 2500 combinations of type, size, material, finish, and thread system ... to provide safe and economical bolted fastenings for any mechanical or electrical application.

Each nut embodies the Elastic Stop resilient non-metallic self-locking collar that assures a tight hold under all conditions of vibration, shock, and prolonged hard service.

Catalog on request

ELASTIC STOP NUT CORPORATION • 2379 VAUXHALL ROAD • UNION, NEW JERSEY

Product Index

TUBES—Special Purpose
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General Electric Co., Bridgeport, Conn.
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