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YEAR BOOK
OF
THE INSTITUTE OF
RADIO ENGINEERS

1914



CORRECTED TO MARCH 1, 1914



Gift of Miss Crosby

THE INSTITUTE OF RADIO ENGINEERS

ORGANIZED IN 1912
INCORPORATED IN 1913

Library
California Historical
Radio Society



YEAR BOOK 1914

CORRECTED TO MARCH 1, 1914

PUBLISHED BY
THE INSTITUTE OF RADIO ENGINEERS
3507 W 4th
NEW YORK

THE TROW PRESS



THE TROW PRESS



THE TROW PRESS
NEW YORK

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COLLEGE

OFFICERS AND BOARD OF DIRECTION, 1914

(Term expires January 8, 1915)

PRESIDENT

LOUIS W. AUSTIN

VICE-PRESIDENT

JOHN STONE STONE

TREASURER

JOHN HAYS HAMMOND, JR.

SECRETARY

EMIL J. SIMON

EDITOR OF PUBLICATIONS

ALFRED N. GOLDSMITH

MANAGERS

JOHN L. HOGAN, JR.
GUY HILL

ROBERT H. MARRIOTT
ROY A. WEAGANT

ASSISTANT TREASURER

THOS. T. TRAPNELL

ASSISTANT SECRETARY

RALPH H. LANGLEY

GENERAL COUNSEL

HAROLD R. ZEAMANS

PAST-PRESIDENTS

SOCIETY OF WIRELESS TELEGRAPH ENGINEERS

JOHN STONE STONE, 1907-8 LEE DE FOREST, 1909-10
FRITZ LOWENSTEIN, 1911-12

THE WIRELESS INSTITUTE

ROBERT H. MARRIOTT, 1909-10-11-12

INSTITUTE OF RADIO ENGINEERS

ROBERT H. MARRIOTT, 1912 GREENLEAF W. PICKARD, 1913

STANDING COMMITTEES

1914

COMMITTEE ON PAPERS

ALFRED N. GOLDSMITH, *Chairman*,
College of the City of New York, New York
ARTHUR E. KENNELLY.....Cambridge, Mass.
JOHN STONE STONE.....New York
LOUIS W. AUSTIN, *Ex-officio*.....Washington, D. C.

COMMITTEE ON STANDARDIZATION

JOHN STONE STONE, *Chairman*, National Arts Club..New York
ARTHUR E. KENNELLYCambridge, Mass.
ERNEST R. CRAM.....Washington, D. C.
GUY HILLNew York
GREENLEAF W. PICKARD.....Boston, Mass.
FREDERICK A. KOLSTER.....Washington, D. C.
ALFRED E. SEELIG.New York
LOUIS W. AUSTIN, *Ex-officio*.....Washington, D. C.

COMMITTEE ON PUBLICITY

ROBERT H. MARRIOTT, *Chairman*, Custom House....New York
JOHN L. HOGAN, JR.....New York
ROY A. WEAGANT.....New York
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SPECIAL COMMITTEE

COMMITTEE ON INCREASE OF MEMBERSHIP

JOHN HAYS HAMMOND, JR., *Chairman*.....Gloucester, Mass.
THOMAS E. CLARK.....Detroit, Mich.
GEORGE S. DAVIS.....New Orleans, La.
CHARLES P. EDWARDS.....Ottawa, Canada
CYRIL F. ELWELL.....London, England
V. FORD GREAVES.....Washington, D. C.
OSCAR C. ROOS.....Manila, P. I.
FRANCIS J. BEHR, CAPT. U. S. A.....Gloucester, Mass.
STANFORD C. HOOPER, LIEUT. U. S. N....Flagship "Wyoming"
LOUIS W. AUSTIN, *Ex-officio*.....Washington, D. C.

GENERAL INFORMATION

History and Scope of the Institute.

The Institute of Radio Engineers is to-day the only society of the radio engineering profession. Previous to its formation the two most influential organizations in this field of endeavor were The Society of Wireless Telegraph Engineers and The Wireless Institute. To the end that the influence exerted by those societies might gain greater effectiveness through concentration, efforts were made to secure their consolidation. These attempts were successful, and on May 13, 1912, the Institute of Radio Engineers was formerly established.

The remarkable progress in the art of communicating through space during the present decade has made desirable a parallel development of an organization of this character. The future advance of the radio profession will owe much to the men who founded these parent societies, and those who succeeded in accomplishing their consolidation. These men foresaw the possibilities which might grow from an organization that would foster and encourage the development of this useful art, and that would afford opportunity for its members to meet and discuss radio problems and developments. The Institute will be no small factor in bringing about the progress which will take place not only in applications of the art but also in the advancement of its individual members and of the radio profession as a whole.

Eligibility to Membership.

The Institute membership consists of Associates, Members and Honorary Members.

An Associate, according to the Constitution of the Institute, may be any person who is interested in the advancement of radio transmission.

A Member must be a person of good professional standing who has engaged in arts pertaining to the development of radio transmission for at least five years.

A Member must first be elected as an Associate and then, if eligible, may make application for transfer.

Honorary Members are chosen from among those who have rendered acknowledged eminent service to the art or science of radio transmission.

Applications for Membership.

All applications must be made on forms which are provided for that purpose and which can be obtained from the Secretary. These forms provide space for the required reference to five Members or Associates, and for a brief record of the professional or commercial experience of the candidate. If the applicant is not personally acquainted with five Members or Associates of the Institute, he may refer to non-members, preferably members of other engineering organizations, in which case the members of the Board of Direction will personally endorse his application, provided their investigation through his references is satisfactory.

Entrance Fee. Annual Dues.

There is at the present time no entrance fee for admission to the Institute.

The annual dues are five (5) dollars for Members and three (3) dollars for Associates, payable in advance on January 1st of each year.

A person transferred from the grade of Associate to the grade of Member is required to pay the dues of the higher grade.

A person elected after July 1st of any year is required to pay one-half the dues for that year.

An honorary member is exempt from all payments.

Membership.

The membership of the Institute is made up of scientists and engineers engaged in the development of the theory and practice of the radio science and art, and many others who through their business or mental trend are seriously concerned with this new field of endeavor.

All branches of the profession and of allied professions are represented. The membership includes inventors, authors, consulting engineers; professors and instructors of physics and engineering; chief engineers, managers and other officers connected with commercial companies; officers and officials of the several branches of the United States Government and foreign governments concerned with radio communication; professional and amateur investigators, professional and amateur operators; and other persons interested in the advancement of the art.

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This large increase in membership has come from all parts of the United States and from foreign countries. The large number of members distant from New York is especially worthy of note, as it indicates the value placed upon Institute membership by engineers who reside at too great a distance to attend the regular meetings.

Meetings.

Institute meetings are held in New York monthly excepting in July and August of each year, for the presentation and discussion of engineering papers. These papers are presented by members who have specialized in some division of the subject and who desire to lay their results before the profession.

The annual meeting of the Institute is held in the first week of January, and although it has been customary in the past to hold this meeting in New York City, it is the intention of the Institute to have it held in different sections of the country from year to year, according to the distribution of the membership,

and with special regard to conventions or congresses of the radio or allied professions which may from time to time convene.

Section Meetings.

Section meetings of the Institute are held each month in the City of Washington for the benefit of the large number of members residing in the vicinity of the Capital.

As the membership in various cities increases it is expected that other sections will be formed. Section meetings will in all probability be held in the City of Boston before the end of the present year.

Publications.

The Proceedings of the Institute are published quarterly and contain the papers and their discussion as presented at the meetings in New York and other cities. Hereafter they will also include other matters of general interest such as lists of new members elected, personal notes, reports of meetings and committees and other information pertaining to the Institute.

Payment of the annual dues by a member entitles him to one copy of each number of the Proceedings issued during the period of his membership. Members may purchase, when available, copies of the Proceedings issued prior to their election at 75 cents each.

Subscriptions to the Proceedings are received from non-members at the rate of \$1.00 per copy or \$4.00 per year. To foreign countries the rates are \$1.25 per copy or \$5.00 per year, 25 per cent. discount being allowed to libraries and booksellers.

Members presenting papers before the Institute are entitled to ten copies of the paper and of the discussion.

Government.

The Institute is governed by a Board of Direction consisting of the President, the Vice-President, the Treasurer, the Secretary, the Editor of Publications and four Managers. The four officers and the four managers are elected annually by the members. The Editor of Publications is appointed by the Board of Direction. The term of office in each case is one year beginning and ending with the annual meeting in January. All Members and Associates are eligible for any of the offices excepting that Associates

are not eligible to the offices of President and Vice-President. All Members and Associates have equal privileges in voting for officers.

Committees.

A considerable portion of the important work of the Institute is accomplished by committees. The standing committees, as required by the Constitution, are appointed annually by the President. These are the Committee on Papers, the Committee on Standardization, and the Committee on Publicity. The Committee on Papers aims to secure for presentation to the members only those papers which merit serious consideration and which deal with topics in which the greater portion of the membership is expected to be interested. It is the function of the Committee on Standardization to prepare standard terms, symbols, units and methods of testing and rating radio apparatus. The duty of the Committee on Publicity is to keep the public and the technical press informed as to the work done by the Institute and its recommendations, thus insuring that the public and the art shall benefit by the labors of the Institute. Other Committees are appointed from time to time, as occasion requires.

There exists at present a Committee on Increase of Membership, whose duty it is to interest non-members in the work of the Institute with a view to obtaining their affiliation.

Emblem.



The Emblem of the Institute which all Members and Associates are privileged to wear is shown in the margin. The badge is of solid 14K. gold and finely finished. The enameled background is blue for Members and maroon for Associates with letters and borders in gold. This emblem is made in the form of a pin and can be purchased through the Secretary's office for \$2.50 each. Member's initials are engraved on the back of each pin.

Insignia.

All Members are entitled to place after their names the following letters to indicate their relation to the Institute:

Member—Mem. I.R.E.

Associate—Assoc. I.R.E.

Honorary Member—Hon. Mem. I.R.E.

Resolution

(Unanimously adopted by the Board of Direction and members of the Institute of Radio Engineers, assembled for regular meeting at Columbia University, New York, February 4, 1914, and at the Bureau of Standards, Washington, D. C., February 5, 1914.)

WHEREAS, we have lost by death our charter member, Clark H. Sphar; and

WHEREAS, he was a member of the Board of Direction of The Wireless Institute, a parent organization of the Institute of Radio Engineers, and

WHEREAS, he was an active worker in the building of our Institute, and

WHEREAS, he was noted among us for his honorable, dependable, sincere and gentle qualities as a man, as an engineer, and as a member of the Institute; it is hereby

Resolved, That the Institute of Radio Engineers considers his death on January 23, 1914, deprives the Radio Fraternity of a loved and valued Member; and it is further

Resolved, That the Institute of Radio Engineers hereby express to the wife and family of Clark H. Sphar and to the world its sincere sorrow; and it is further

Resolved, That these resolutions be spread upon the minutes, and a copy of them be sent to his wife and family, and that they be printed in the Proceedings.

CONSTITUTION

ADOPTED AT THE FIRST MEETING OF THE INSTITUTE OF RADIO ENGINEERS, MAY 13, 1912.

ARTICLE I

NAME AND OBJECT

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

SEC. 2. Its object shall be to advance the art and science of radio-transmission.

ARTICLE II

MEMBERSHIP

SEC. 1. The membership shall consist of:

a. Members, who shall be entitled to all the privileges of the Institute.

b. Associates, who shall be entitled to all the privileges of the Institute, except the right to hold office as President or Vice-President.

c. Honorary Members, who shall be entitled to all the privileges of the Institute.

SEC. 2. A Member shall be a person of good professional standing who has engaged in arts pertaining to the development of radio-transmission for at least five years.

SEC. 3. An Associate shall be a person who is interested in the advancement of radio-transmission.

SEC. 4. An Honorary Member shall be a person who has rendered acknowledged eminent service to the art or science of radio-transmission.

ARTICLE III

ADMISSIONS AND EXPULSIONS

SEC. 1. Honorary Members shall be recommended by at least ten members to the Board of Direction, and upon unanimous vote

of that Board shall be proposed to the membership for election. A person elected an Honorary Member shall be promptly notified thereof by letter. The election shall be cancelled if an acceptance is not received within six months after the mailing of notice.

SEC. 2. An application for admission to the Institute, or for transfer from one grade to another, shall embody a concise statement with dates, of the candidate's training and experience, and shall be in such form and in such detail as may be prescribed by the Board of Direction. It shall be signed by the applicant, and shall contain a promise to conform to the requirement of membership, if elected.

The applicant shall furnish the names of at least five members to whom he is personally known. Each of these shall be requested by the Secretary to address a letter to the Board of Direction, stating the extent of the writer's personal knowledge of the applicant and his training and experience. If at least three of the corporate members named as references do not furnish the requisite endorsement; the Secretary shall call upon the applicant for additional names, and not until written communications have been received from at least three members shall the application be considered by the Board of Direction.

Applicants who may be so situated as not to be personally known to three members may be recommended for ballot by three members after they have secured, in their opinions, sufficient evidence to show that the candidate is worthy of admission.

SEC. 3. Subject to the discretion of the Board of Direction, and at stated periods to be determined by that Board, there shall be issued to each member whose address is known, a list of all new applications received for admission or for transfer, which list shall be dated and shall contain a concise statement of the record of each applicant and the names of his references, with a request that members transmit to the Board of Direction any information in their possession which may affect the disposition of the applications. Not less than twenty days after the issue of such list the Board of Direction shall consider these applications, together with any information with regard to the applicants which may have been received; may make further inquiries if deemed expedient; on application being approved by the Board the applicant may be balloted upon by the membership. More than

one-fifth of the votes of those present (but not less than three votes) adversely cast shall suffice for the rejection of the candidate.

SEC. 4. A rejected applicant may renew his application for membership at any time after the expiration of one year from the date of the ballot rejecting his previous application.

SEC. 5. All elected candidates shall be duly notified and shall subscribe to the Constitution and Rules of the Institute. Forms for these purposes shall be prescribed by the Board of Direction. If these provisions are not complied with within six months from the notification of election, such election shall be considered void, unless for special reason the time shall be extended by the Board of Direction. Membership of any person shall date from the date of his election.

SEC. 6. Members or Associates, if found delinquent in their duties may be tried by the Board of Direction, and upon decision of the Board their names shall be submitted to the Institute to determine their suspension or expulsion. A three-quarters vote of the Institute shall be necessary to ratify such action of the Board.

SEC. 7. A member may resign his membership by a written communication to the Secretary, who shall present the same to the Board of Direction; when, if all his dues have been paid, his resignation shall be accepted.

ARTICLE IV

DUES

SEC. 1. The annual dues payable by members, whether resident or non-resident, shall be as follows: by Members, five dollars (\$5); by Associates, three dollars (\$3).

SEC. 2. A person transferred from the Associate grade to the Member grade shall pay the dues of the higher grade.

SEC. 3. The annual dues shall be payable on the first day of January, in advance for the ensuing year. It shall be the duty of the Secretary to notify each member of the amount due at the time of giving notice of the annual meeting.

CONSTITUTION

SEC. 4. Persons elected after July 1st of any year shall pay only one-half of the dues for that year.

SEC. 5. Any person whose dues are more than three months in arrears shall be notified by the Secretary. Should his dues not be paid when they become six months in arrears, he shall lose the right to vote or to receive the publications of the Institute. Should his dues become nine months in arrears, he shall be again notified in form prescribed by the Board of Direction, and if such dues become one year in arrears he shall forfeit his connection with the Institute. The Board of Direction may, however, for cause deemed by it sufficient, extend the time for payment and for the application of these penalties.

SEC. 6. The Board of Direction may, for sufficient cause, temporarily excuse from payment of annual dues any member; and the Board may remit the whole or part of dues in arrears, or accept in lieu thereof desirable additions to the library or collections.

SEC. 7. Every person admitted to the Institute shall be considered as belonging thereto and liable for the payment of all dues until he shall have resigned, been expelled, or have been relieved therefrom by the Board of Direction.

ARTICLE V

OFFICERS

SEC. 1. The governing body of the Institute shall be a President, a Vice-President, a Secretary, and a Treasurer, an Editor of Publications, and four Managers, who shall together constitute the Board of Direction.

SEC. 2. The terms of all officers named in the preceding section shall be one year, shall begin at the close of the annual meeting at which election is made, and shall continue until successors are duly elected.

ARTICLE VI

MANAGEMENT

SEC. 1. The President shall have general supervision of the affairs of the Institute. He shall preside at meetings of the In-

stitute and of the Board of Direction at which he may be present, and shall be an ex-officio member of all committees. He shall deliver an address at the annual meeting.

SEC. 2. The Board of Direction shall manage the affairs of the Institute in conformity to the laws under which the Institute is organized and the provisions of the Constitution. It shall direct the investment and care of the funds of the Institute; make appropriations for specific purposes; act upon applications for membership as heretofore provided; take measures to advance the interests of the Institute; appoint all its employees, and generally direct its business. The Board of Direction shall make an annual report at the annual meeting, transmitting the report of the Treasurer and of other officers and of committees. A majority of the Board of Direction shall constitute a quorum.

SEC. 3. The Treasurer shall receive all moneys and deposit same in the name of the Institute. He shall invest all funds not needed for current disbursements, as shall be ordered by the Board of Direction. He shall pay all bills, when certified and audited, as provided by this Constitution and by rules to be prescribed by the Board of Direction. He shall make an annual report and such other reports as may be prescribed by the Board of Direction.

The Board of Direction shall secure a satisfactory surety for the faithful performance of his duties by the Treasurer, and shall renew the same during the month of January of each year.

SEC. 4. The Secretary will be expected to attend all meetings of the Institute and of the Board of Direction; prepare the business therefor, and duly record the proceedings thereof. He shall see that all moneys due the Institute are carefully collected, and without loss transferred to the custody of the Treasurer. He shall carefully scrutinize all expenditures and use his best endeavor to secure economy in the administration of the Institute. He shall personally certify the accuracy of all bills or vouchers on which money is to be paid, and shall countersign the checks drawn by the Treasurer against the funds of the Institute, when such drafts are known to him to be proper and duly authorized by the Finance Committee. He shall have charge of the books of account of the Institute, and shall furnish when required by the Board of Direction a statement of receipts and expenses under

their several headings, and also a statement of monthly balances. He shall present annually, to the Board of Direction, a balance sheet of his books as of the 31st of December, and shall furnish from time to time such other statements as may be required of him. He shall conduct the correspondence of the Institute and keep full records of the same. He shall perform all other duties which may from time to time be assigned to him by the Board of Direction.

SEC. 5. The Board of Direction may also, if they deem it necessary, appoint an Assistant Secretary, who shall aid the Secretary and be under his immediate direction in all matters.

SEC. 6. The President, within twenty days after the annual meeting, shall appoint from the membership the following standing committees:

- Committee on Papers.
- Committee on Standardization.
- Committee on Publicity.

These committees shall report to the President and perform their duties under his supervision.

ARTICLE VII

NOMINATION AND ELECTION OF OFFICERS

SEC. 1. One month before the annual meeting, nominations for the offices of President, Vice-President, Secretary, Treasurer, and four Managers, shall be called for from the entire membership. Two weeks before the annual meeting the Board of Direction shall submit to the membership a list of nominees, which list shall consist of the pairs of names receiving the largest number of nominations for each office. In the event of ties in nomination, the Board of Direction shall select the name of the man in its opinion best fitted for that office. The membership shall then submit a written ballot voting for officers from the list of nominees above described. A majority vote up to the time of the closing of the polls (24 hours before the opening of the annual meeting) shall elect. Before nominees' names are submitted to the membership for final vote each nominee shall be consulted, and, if he so requests, his name shall be withdrawn and the next ranking name substituted.

SEC. 2. The Editor of Publications shall be elected by a majority vote of the Board of Direction at their meeting next after the annual meeting of the Institute.

ARTICLE VIII

MEETINGS

SEC. 1. There shall be an Annual Meeting, at which the annual reports for the year ending December 31st previous shall be presented, and the ballot for officers canvassed. At this meeting 15 members shall constitute a quorum.

SEC. 2. Business meetings shall be held as prescribed by the by-laws.

SEC. 3. In addition to the Annual Meeting, meetings for the reading and discussion of papers shall be held as ordered by the Board of Direction.

SEC. 4. Special meetings may be called by the Board of Direction, and shall be so called upon the request of ten members, which request shall state the purpose of such meeting. The call for such meeting shall be issued ten days in advance, and shall state the purpose thereof, and no other business shall be taken up at such meeting. At these meetings ten members shall constitute a quorum.

SEC. 5. The Institute may adopt, from time to time, rules for the order of business at its meetings.

SEC. 6. Meetings of the Board of Direction shall be held at the time of the Annual Meeting and such other times as the Board may determine.

ARTICLE IX

AMENDMENTS

SEC. 1. Proposed amendments to this Constitution must be reduced to writing and signed by not less than ten members, and be submitted to the membership who shall vote by letter ballot. The amendment shall be adopted if 75 per cent. of the votes received are in favor of such action.

TREASURER'S REPORT

STATEMENT OF RECEIPTS AND DISBURSEMENTS FROM FEBRUARY 6
TO DECEMBER 31, 1913.

RECEIPTS

Amount turned over by former Treasurer of Institute of Radio Engineers, February 6, 1913.....	\$150.97
Amount received from J. L. Hogan, Jr., account balance Society of Wireless Telegraph Engineers.....	50.00
Dues	476.75
Gift—Dr. A. N. Goldsmith	50.00
Anonymous Gift through Dr. A. N. Goldsmith.....	100.00
Sale of Proceedings	23.21
	<hr/>
	\$850.93

DISBURSEMENTS

Printing Proceedings of Institute.....	\$647.25
Swastika Office Equipment Co., for duplicating letters, addressing, etc.	68.69
Postage, typewriting, stationery, etc.....	67.56
Fayerweather Hall—Janitorial service	16.00
Coal & Iron National Bank, check book and charges for handling account	7.00
Fees for incorporating Institute, exchange and miscel- laneous charges	20.00
	<hr/>
	\$826.50
Cash on hand and in bank.....	24.43
	<hr/>
	\$850.93

CATALOGUE OF MEMBERS

Listed Alphabetically

ALEXANDERSON, E. F. W., Consulting Engineer, Gen'l Electric Co., Schenectady, N. Y.	A Mar. 12, 1913 M Mar. 26, 1913
AUSTIN, LOUIS W., <i>Ph.D.</i> [<i>President</i>], Head, U. S. Naval Radio Telegraphic Laboratory, Bureau of Standards, Washington, D. C.	A Jan. 22, 1913 M Feb. 14, 1913
BEHR, CAPT., F. J., War Dept. Representative, Hammond Radio Research Laboratory, Gloucester, Mass.	A Jan. 22, 1913 M Dec. 3, 1913
BULLARD, CAPT., W. H. G., Supt., U. S. Naval Radio Service, Radio, Va.	A Oct. 15, 1913 M Oct. 15, 1913
BUTCHER, E. E., Instructing Engineer, Marconi Wireless Telegraph Co., 29 Cliff St., N. Y.	A Sep. 3, 1913 M Sep. 3, 1913
CHEETHAM, HENRY R., Instructing Engineer, Eastern Radio Institute, Boston., res., 81 Avon Street, Somerville, Mass.	A June 4, 1913 M Feb. 18, 1914
CLARK, GEO. H., Radio Engineer, Navy Dept., Washington; res., Apt. 103, Fontenet Courts, Fairmount St., N. W., Washington, D. C.	A Charter Member, S.W.T.E. M June 1, 1913
CLARK, THOS. E., President, Clark Wireless Telegraph-Telephone Co., 193-195 Cass Ave., Detroit, Mich.	A Charter Member, S.W.T.E. M Apr. 2, 1913
CLAY, FRANCIS W. H., Patent Attorney, 2658 Frick Annex, Pittsburgh, Pa.	A Feb. 4, 1914 M Feb. 18, 1914
COHEN, LOUIS, Physicist, Bureau of Standards, Washington, D. C.; res., 1855 Calvert Street, Washington, D. C.	A June 3, 1912 M Jan. 20, 1914
CRAM, ERNEST R., Radio Expert, Signal Corps, War Department, Bureau of Standards, Washington, D. C.	A Charter Member, S.W.T.E. M Feb. 14, 1913
CURTIS, AUSTIN M., Engineer, Western Electric Co., N. Y.; res., 1297 St. Johns Ave., Brooklyn, N. Y.	A Nov. 4, 1912 M July 10, 1913
DAVIS, GEORGE S., General Supt., Tropical Radio Telegraph Co., New Orleans, La., care Box 116, New Orleans, La.	A Charter Member, S.W.T.E. M Feb. 14, 1913
EASTHAM, MELVILLE, Partner, Clapp-Eastham Co., Boston; res., 139 Main St., Cambridge, Mass.	A Jan. 22, 1913 M Feb. 14, 1913
EDWARDS, CHARLES P., Director, Radio Telegraph Branch, Dept. of Naval Service, Ottawa, Ont., Canada.	A June 12, 1913 M June 12, 1913
ELWELL, CYRIL F., Chief Engineer, Universal Radio Syndicate, London, Eng.; res., 85 Kings Hall Road, Bechenham, London, Eng.	A May 28, 1913 M May 28, 1913
ERSKINE-MURRAY, JAMES, <i>D.Sc.</i> , Author and Consulting Engineer in Radio Telegraphy, 4 Great Winchester St., London, E. C. Eng.	A June 25, 1913 M June 25, 1913
ESPENSCHIED, LLOYD, Engineer, American Telegraph & Telephone Co., 15 Dey St., New York.	A Charter Member, W. I. M May 28, 1913
FARNSWORTH, PHILIP, Patent Attorney, 149 Broadway, New York City	A Charter Member, W. I. M Apr. 2, 1913
FORBES, E. D., Chief Engineer, National Electric Signaling Co., Brooklyn, N. Y.; res., 215 Clarkson Ave., Brooklyn, N. Y.	A Charter Member, S.W.T.E. M Dec. 20, 1912

GOLDSMITH, ALFRED N., <i>Ph.D.</i> [<i>Editor of Publications</i>], Director, Radio Research Laboratory, College, City of New York; res., 100 Hamilton Place, New York.	A Charter Member, W. I. M Dec. 20, 1912
GREAVES, V. FORD, Radio Engineer, Department of Commerce, Washington; res., 1 The Chevy Chase, Washington, D. C.	A Charter Member, S.W.T.E. M Dec. 20, 1912
HANSCOM, W. W., Consulting Electrical and Mechanical Engineer, 848 Clayton St., San Francisco, Cal.	A Nov. 4, 1912 M Feb. 18, 1914
HILL, GUY, [<i>Manager</i>], Radio Inspector, Bureau of Steam Engineering, Navy Yard, New York.	A Charter Member, S.W.T.E. M Feb. 14, 1913
HOGAN, JOHN L., JR., [<i>Manager</i>], Chief, Operating & Erecting Dept., National Electric Signaling Co., 67 35th St., Brooklyn, N. Y.	A Charter Member, S.W.T.E. M Dec. 20, 1912
HOGG, COMM. W. S., Retired Naval Officer, U. S. Navy, 2812 Cathedral Ave., Washington, D. C.	A Charter Member, S.W.T.E. M Feb. 18, 1914
ISBELL, ARTHUR A., Assistant Manager, Pacific Coast Division, Marconi Wireless Telegraph Co., 1220 Pine St., San Francisco, Cal.	A Nov. 26, 1913 M Nov. 26, 1913
KENNELLY, ARTHUR E., <i>Ph.D.</i> , Professor of Electrical Engineering, Harvard University, Cambridge, Mass.	A Dec. 4, 1912 M Feb. 14, 1913
KEOCH, ALEX. E., Chief Engineer, Canadian Marconi Co.; res., 4840 Western Ave., Westmount, Montreal, Canada.	A Jan. 7, 1914 M Jan. 2, 1914
KINTNER, SAMUEL M., Receiver and General Manager, National Electric Signaling Co., 514 Farmers Bank Building, Pittsburg, Pa.	A Sep. 3, 1913 M Sep. 3, 1913
KOLSTER, FREDERICK A., Radio Expert, Dept. of Commerce, Bureau of Standards, Washington, D. C.	A June 3, 1912 M Feb. 14, 1913
KROGER, F. H., Designing Engineer, National Electric Signaling Co., 67 35th St., Brooklyn, N. Y.	A Charter Member, S.W.T.E. M Feb. 14, 1913
LEARY, JOHN J., Superintending Engineer, Marconi's Wireless Telegraph Co., Ltd., Marconi House, Strand, London, W. C., England.	A Nov. 4, 1912 M June 12, 1913
LOWENSTEIN, FRITZ [<i>Past-President, S. W. T. E.</i>], Consulting Engineer, 397 Bridge St., Brooklyn, N. Y.	A Charter Member, S.W.T.E. M Feb. 14, 1913
MADDOX, ENSIGN CHAS., Radio Officer, U. S. S. Utah, care Postmaster, New York.	A June 25, 1913 M June 25, 1913
MARRIOTT, ROBERT H., [<i>Past-President, W. I.</i>] [<i>Past-President</i>] [<i>Manager</i>], Radio Inspector, Dept. of Commerce, Custom House, New York; res., Dumont, N. J.	A Charter Member, W. I. M Dec. 20, 1912
MARSHALL, CLOYD, General Manager, Wireless Specialty Apparatus Co., New York; res., Box 188, Dumont, N. J.	A Mar. 12, 1913 M Mar. 26, 1913
MARTIN, JULIUS, Radio Engineer, Marconi Wireless Telegraph Co., 233 Broadway, New York.	A June 25, 1913 M June 25, 1913
MASSIE, WALTER W., President and General Manager, Massie Wireless Telegraph Co., Providence, R. I.	A Charter Member, S.W.T.E. M Feb. 14, 1913
MAYER, EMIL E., Chief Engineer, Tuckerton Radio Station, Tuckerton, N. J.	A Sep. 3, 1913 M Sep. 3, 1913
MIDGLEY, FREDERICK W., Engineer, care, Harry McFarlane Glass Co., Mt. Vernon, N. Y.	A June 12, 1913 M June 12, 1913
PANNILL, CHAS. J., [<i>Secretary-Treasurer, Washington Section</i>], Supt., Southern Division, Marconi Wireless Telegraph Co., 1013 American Bldg., Baltimore, Md.	A June 25, 1913 M June 25, 1913
PARKHURST, A. F., Division Superintendent, Tropical Radio Telegraph Co., New York; res., 545 E. 26th St., Brooklyn, N. Y.	A Charter Member, W. I. M Feb. 14, 1912
PFUND, RICHARD, Radio Engineer, 111 Broadway, New York.	A Aug. 7, 1913 M Aug. 7, 1913
PICHON, PAUL, Patent Expert and Oberingenieur, Telefunken Co., Berlin; res., Lichtenrade, Germany.	M Jan. 7, 1914

PICKARD, GREENLEAF W., [<i>Past-President</i>], Vice-President, Wireless Specialty Apparatus Co., Boston, Mass.; res., Amesbury, Mass.	A Charter Member, S.W.T.E. & W. I. M Dec. 20, 1912
PIERCE, GEO. W., <i>Ph.D.</i> , Author and Assistant Professor of Physics, Harvard University; res., 7 Berkeley Place, Cambridge, Mass.	A June 25, 1913 M June 25, 1913
PROCTOR, J. A., Engineer, Wireless Specialty Apparatus Co., 126 State St., Boston, Mass.	A Feb. 14, 1913 M Apr. 2, 1913
RICE, A. R., Radio Inspector, Dept. of Commerce, Custom House, New Orleans, La.	A Sep. 3, 1913 M Sep. 3, 1913
ROOS, OSCAR C., Consulting Engineer, U. S. Insular Bureau, Phillipine Islands.	A Charter Member, S.W.T.E. M Apr. 2, 1913
RUSH, W. A., Chief Inspector, Radio Telegraph Service, Canadian Government; res., 92 First Ave., Ottawa, Canada.	A Oct. 15, 1913 M Oct. 15, 1913
SEIBT, GEORG, <i>Ph.D.</i> , Radio Engineer & Inventor, Hauptstrasse 9, Schoenberg, Berlin, Germany.	A Nov. 26, 1913 M Nov. 26, 1913
SHOEMAKER, HARRY, Research Engineer, Marconi Wireless Telegraph Co., Hudson & Sussex Sts., Jersey City., N. J.	A Charter Member, W. I. M Feb. 14, 1913
SIMON, EMIL J., [<i>Secretary</i>], Chief Engineer, Wireless Improvement Co., 81 New St., New York; res., 140 West 93rd Street, New York.	A Charter Member, W. I. M Dec. 20, 1912
SIMPSON, FRED G., Gen'l. Manager & Chief Engineer, Kilbourne & Clark Mfg. Co., Seattle; res., 3313 Bella Vista Ave., Mount Boker Park, Seattle, Wash.	A Aug. 7, 1913 M Aug. 7, 1913
SPAIN, H. Q., In charge, Radio Service, Government of British Guiana, General Post Office, Georgetown, British Guiana.	A Aug. 7, 1913 M Oct. 15, 1913
STONE, JOHN STONE, [<i>Past-President</i> , S. W. T. E.] [<i>Vice-President</i>] Inventor & Consulting Electrical and Radio Engineer; res., National Arts Club, New York.	A Charter Member, S.W.T.E. M Feb. 14, 1913
SWEET, CMDR., GEO. C., Radio Officer, Navy Department, Washington, D. C.	A Oct. 15, 1913 M Oct. 15, 1913
THOMPSON, ROY E., Radio Inspector, Dept. of Commerce, Custom House, Seattle, Wash.	A June 3, 1912 M Dec. 3, 1913
TORIKATA, WICHI, Chief Electrician of Wireless Section, Imperial Japanese Electro-Technical Laboratory, Omori-Sanno, Tokyo, Japan.	A Dec. 3, 1913 M Dec. 3, 1913
WALTON, CAPT. JOHN Q., In charge Radio Apparatus, U. S. Revenue Cutter Service, Treasury Dept., Washington, D. C.	A Jan. 22, 1913 M Apr. 2, 1913
WEAGANT, ROY A., [<i>Manager</i>], Designing Engineer, Marconi Wireless Telegraph Co., Aldene, N. J.	A Charter Member, W. I. M Feb. 14, 1913
WOOLVERTON, R. B., Radio Inspector, Dept., of Commerce, Custom House, San Francisco, Cal.	A June 4, 1913 M Sep. 3, 1913
ZENNECK, J., <i>Ph.D.</i> , <i>Prof. Dr.</i> , Author & Professor of Physics, Technische Hochschule, Langfuhr-bei Danzig, Germany.	A July 24, 1913 M July 24, 1913

CATALOGUE OF ASSOCIATES

Listed Alphabetically

ABBOTT, E. G. , Capt., Signal Corps, U. S. A., Army Bldg., 39 Whitehall St., New York.	Oct. 15, 1913
APGAR, CHAS. E. , Haynes Auto Co., New York City; res., Westfield, N. J.	Apr. 2, 1913
APPLEBY, THOS. , Instructor, Phila. School of Wireless Telegraphy, Parkway Building, Broad & Cherry Sts., Philadelphia, Pa.	Sep. 3, 1913
APPLEGATE, D. V. , Inspector, Marconi Wireless Telegraph Co., 29 Cliff St., N. Y.	Jan. 7, 1914
ARMOR, J. C. , Transformer Engineering Dept., General Electric Co., Pittsfield, Mass.; res., 11 Wheeler Ave., Ingram, Pa.	Charter Member, S.W.T.E.
ASHTON, JOHN O. , Salesman, Radio Telephone and Telegraph Co., New York; res., 7 Halycon Place, Yonkers, N. Y.	Sep. 3, 1913
AYLSWORTH, HOWARD G. , General Manager, Aylsworth Agencies Co., San Francisco, Cal.; res., 149 New Montgomery St., San Francisco, Cal.	Dec. 3, 1913
BALOU, H. Y. , 528 Jefferson Street, Portland, Ore.	Nov. 4, 1912
BARKLEY, WILLIAM J. , Confidential Clerk, Wireless Specialty Apparatus Company, 126 State St., Boston, Mass.	June 12, 1913
BARTH, JULIAN , Engineer, Marconi Wireless Telegraph Co., New York; res., 538 W. 124th St., New York.	Feb. 14, 1913
BEAM, VICTOR S. , Consulting Engineer, 55 John Street, N. Y.	Feb. 4, 1914
BENNING, B. S. , Engineer, Marconi Wireless Telegraph Co., Marconi House, Strand, London, W. C. England.	June 3, 1912
BEST, PAUL T. , Chief Radio Electrician, U. S. S. Constellation, Newport, R. I.	Oct. 15, 1913
BISHOP, LEON W. , Electro-Mechanic, Wireless Specialty Apparatus Co., Boston, Mass.; res., 18 Irving Street, Boston, Mass.	June 4, 1913
BISSING, WILLIAM F. , Attorney at Law, 2 Rector Street, New York.	Charter Member, W. I.
BOWEN, CHAS. F. , Manchester, N. H.	Nov. 4, 1912
BOWEN, PAUL , Radio Operator, Tropical Radio Telegraph Co., 80 South Street, N. Y.	July 16, 1913
BOYNTON, HAROLD W. , Radio Officer, Navy Dept., Washington, D. C.	Sep. 3, 1913
BRACKETT, QUINCY A. , Electrical Engineer, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.; res., 6919 Frankstown Ave., Pittsburgh, Pa.	June 3, 1912
BURKHEAD, C. H. , U. S. N., Chief Radio Electrician, Radio Station, Jupiter, Fla.	Feb. 4, 1914
BURNSIDE, DON G. , Assistant Chemist, Fred'k Stearns Chemical Co., Morgantown, W. Va.; res., 69 Beverly Ave., Morgantown, West Va.	Nov. 4, 1912
BROWN, D. S., JR. , Radio Experimenter; res., 206 West 86th St., New York.	July 24, 1913
BROWN, GEO. , Chief Radio Electrician, U. S. S. Jenkins, care Postmaster, New York.	Sep. 3, 1913
BROWNE, A. P. , Patent Attorney, 60 Congress St., Boston, Mass.	June 3, 1912
BROWNLIE, ROLAND , Laboratory Assistant, Wireless Specialty Apparatus Co., Boston, Mass.; res., 45 Webster St., Everett, Mass.	June 12, 1913

ASSOCIATES

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CABOT, SEWELL , Electrical Engineer, Electric Conversion Co., Boston, Mas.; res., 232 High St., Brookline, Mass.	Charter Member, S.W.T.E.
CADMUS, RICHARD G. , Radio Inspector, Dept. of Commerce, Custom House, Baltimore, Md.	Jan. 22, 1913
CALVERT, R. NEIL , res., 1216 Elmwood Ave., Charlestown, W. Va.	Nov. 4, 1912
CAMP, V. F. , Automobile Salesman, 1700 Broadway, N. Y.	July 24, 1913
CAMPBELL, H. E. , Inspector, Marconi Wireless Telegraph Co.; res., 1547 Westminster Road, Brooklyn, N. Y.	Jan. 21, 1914
CAMPBELL, J. E. , Electrical Sub-inspector, Machinery Division, Navy Yard, New York.	Nov. 4, 1912
CAMPBELL, J. H. , res., Brant Rock, Mass.	June 3, 1912
CHADBOURNE, W. E. , Engineer, Marconi Wireless Telegraph Co., 233 Broadway, N. Y.	Charter Member, S.W.T.E.
COLE, A. B. , Manager, Wireless Department, Manhattan Electrical Supply Co., 17 Park Place, New York; res., Caldwell, N. J.	Charter Member, W. I.
COLE, GEO. E. , Inspector, National Electric Signaling Co., 67 35th St., Brooklyn, N. Y.	Aug. 7, 1913
COLLINS, CHARLES H., JR. , Radio Experimenter, Bay View Hotel, Somers Point, N. J.	Nov. 4, 1912
COLLISON, P. B. , New York Edison Co.; res., 172 Maple St., Brooklyn, N. Y.	Charter Member, W. I.
CONWAY, UREY W. , Flotilla Radio Officer, U. S. Atlantic Torpedo Flotilla; res., U. S. S. Birmingham, care Postmaster, New York.	Aug. 13, 1913
COWAN, CAPT. A. S. , Radio Officer, Signal Corps, U. S. A., Fort Leavenworth, Kansas.	June 3, 1912
CROSBY, ROY CORWIN , Radio Experimenter; res., 211 West 148th St., New York.	Oct. 15, 1913
CURTIS, OTTO E. , Operator, Marconi Wireless Telegraph Co.; res., 84 St. Stephen Street, Boston, Mass.	Jan. 21, 1914
DAGES, JAMES N. , Electrician; Western Union Telegraph Co., 195 Broadway, New York; res., 335 Mosel Ave., Concord, Staten Island, New York.	Charter Member, W. I.
DAVIS, F. C. , Inspector, Dept. of Water Supply, Gas, and Electricity, City of New York; res., 130 W 104th St. New York.	June 3, 1912
DeFOREST, LEE, Ph.D. [<i>Past-President, S. W. T. E.</i>], Radio Inventor; res., Spuyten Duyvil, N. Y.	Charter Member, S.W.T.E.
DOLBEAR, BENJ, L. , Telephone Engineer, New England Telegraph & Telephone Co., Boston; res., 14 Wyman Street, Arlington, Mass.	Jan. 7, 1914
DONLE, HAROLD P. , Radio Engineer; res., 9 Phillips St., Providence, R. I.	Nov. 4, 1912
DOOLITTLE, FRANKLIN M. , Student, Yale University, New Haven, Conn.; res., 174 Bradley St., New Haven, Conn.	Aug. 7, 1913
DUNCAN, R. D. , Special Student, Washington University; res., 6114 Washington St., St. Louis, Mo.	Jan. 22, 1913
DUNN, J. J. , Auditor, Tropical Radio Telegraph Co., 80 South St., N. Y.	July 24, 1913
EDWARDS, JOS. B. , Student in Electrical Engineering, Columbia University, N. Y.; res., 236 Linden Avenue, Flatbush, Brooklyn, N. Y.	Jan. 7, 1914
ELENSCHNEIDER, J. B. , Engineer, Marconi Wireless Telegraph Co., Brooklyn, N. Y.; res., 4006 Sixth Ave., Brooklyn, N. Y.	Nov. 4, 1912
ENGLAND, GEO. B. , Engineer, Dept. of Education, City of New York; res., 917 St. Nicholas Ave., N. Y. C.	Sep. 3, 1913
ENGLER, JOHN , Engineer, Atlantic Communication Co., 47 West St., N. Y.	Nov. 4, 1912
ENGST, NORBERT K. , Treasurer's Assistant, Roeber & Kuebler Co., Newark; res., 128 Monmouth St., Newark, N. J.	Apr. 2, 1913
EVANS, JAMES , Chief Radio Electrician, Radio Laboratory, Bldg. 43, Navy Yard, N. Y.	Feb. 18, 1914
EVERETT, L. C. , Engineer, Marconi Wireless Telegraph Co., 233 Broadway, Broadway, N. Y.	Sep. 3, 1913
FACEY, JOHN W. , Electrician, with Mr. Richard Pfund, 54 Stone St., N. Y.	Sep. 3, 1913

FARRAND, C. L., Engineer, Marconi Wireless Telegraph Co.; res., 36 West Grant Ave., Roselle Park, N. J.	Jan. 7, 1914
FAY, FRANK, Asst. Supervisor, American Telegraph & Telephone Co.; res., 27 Grace Court, Brooklyn, N. Y.	Charter Member, W. I.
FELLER, JOS. E., Electrician, Radio Laboratory, Navy Yard., New York; res., 577 East 2nd St., Kensington, Brooklyn, N. Y.	Feb. 18, 1914
FISCHER, ENSIGN H. E., Radio Officer, U. S. S. North Dakota, care Postmaster, New York.	Sep. 3, 1913
FLETCHER, H. ROBERT, JR., Radio Experimenter; res., 249 Huron Ave., Cambridge, Mass.	Oct. 15, 1913
FORD, RIED G., Sales Manager, Sloan Engineering Co., 240-246 Hall St., Brooklyn, N. Y.	Feb. 14, 1913
FRIED, JOS. A., Switchboard Designer, Sprague Electric Works, New York; res., 525 1st Ave., Astoria, L. I.	Apr. 12, 1913
GAGE, EDWARD G., Partner, Chandler & Gage, 90 West St., N. Y.	Charter Member, W. I.
GAWLER, H. C., Radio Inspector, Dept. of Commerce, Custom House, Barge Office, Boston, Mass.	Nov. 4, 1912
HAFNER, ANDREW J., Radio Operator, Tropical Radio Telegraph Co., New York; res., 656 East 2nd St., Brooklyn, N. Y.	Oct. 15, 1913
HAHNE, CHAS. A., Radio Operator, Tropical Radio Telegraph Co., New York; res., 362 15th St., Brooklyn, N. Y.	July 24, 1913
HALE, W. H., Instructor, New York Military Academy, Nyack-on-Hudson, N. Y.	Nov. 4, 1912
HALLBORG, H. E., Engineer in charge, Marconi Trans-Atlantic Stations, New Brunswick and Belmar, N. J.; res., 220 Lincoln Ave., New Brunswick, N. J.	June 3, 1912
HAMMOND, JOHN HAYS, JR., [<i>Treasurer</i>], Investigator, Hammond Radio Research Laboratory, Gloucester, Mass.	June 3, 1912
HART, FRANCIS A., Engineer, Marconi Wireless Telegraph Co., 233 Broadway, New York; res., 942 St. Marks Ave., Brooklyn, N. Y.	Charter Member, W. I.
HATFIELD, ROBERT L., Signal Corps, N. G. N. J., Jersey City, N. J.	Charter Member, W. I.
HAYES, GEORGE W., Supt. of Factory, Marconi Wireless Telegraph Co., Aldene, N. J.; res., 38 Grand Ave., West Roselle Park, N. J.	Nov. 5, 1913
HEBERT, ARTHUR A., Manager, Midvale Steel Co., New York; res., 27 Maple Place, Nutley, N. J.	Charter Member, W. I.
HEILIG, D. J., Port Manager, Marconi Wireless Telegraph Co., 1002 Parkway Bldg., Philadelphia, Pa.	Oct. 15, 1913
HENDERSON, GEO. E., Radio Operator, Tropical Radio Telegraph Co., 80 South St., N. Y.	July 16, 1913
HENSGEN, W. O., Radio Inspector, Dept. of Commerce, Custom House, Chicago, Ill.	Nov. 4, 1912
HEPBURN, CMDR. A. J., Radio Officer, Bureau of Steam Engineering, Navy Dept., Washington; res., 1826 Wyoming Ave., Washington, D. C.	Oct. 15, 1913
HICKEY, LIEUT. ANDREW S., Electrical Engineer Officer, Navy Yard, Philadelphia, Pa., care Navy Department, Washington, D. C.	Jan. 21, 1914
HINNERS, FRANK, Engineer, Wireless Improvement Co., New York; res., 239 Greene Ave., Brooklyn, N. Y.	Charter Member, W. I.
HOFFMÁN, JOSEPH M., res., 120 E. 92nd St., New York.	Charter Member, W. I.
HOFFMEYER, P., Chief Radio Electrician, U. S. S. Dolphin, care Postmaster, New York.	Sep. 3, 1913
HOLAHAN, JOHN J., Electrical Inspector, Dept. of Electrical Affairs, Norfolk, Va.; res., 523 28th St., Norfolk, Va.	Nov. 26, 1913
HOOPER, LIEUT. S. C., Fleet Radio Officer, U. S. Atlantic Fleet Flagship Wyoming, care Postmaster, N. Y.	June 4, 1913
HOPPOUGH, C. L., Director, Marconi Training School, Cleveland, O.; res., 1120 Prospect Ave., Cleveland, O.	Nov. 4, 1912

HORLE, LAWRENCE C. F., Student, Stevens Institute of Technology, Hoboken, N. J.	Feb. 18, 1914
HOSBACK, HARRY E., Radio Operator, Goodyear Tire & Rubber Co., Detroit, Mich.	Sept. 13, 1913
HOUGHTON, E. J., District Superintendent, Canadian Wireless Service, Old Post Office Bldg., Victoria, B. C.	Jan. 7, 1914
HUBLEY, W. F., President, American Transformer Co., 145 Miller St., Newark, N. J.	Nov. 4, 1912
HUDSON, J. E., Engineer and Inspector, Marconi Wireless Telegraph Co., 29 Cliff St., N. Y.	June 3, 1912
IDDINGS, F. T., Chief Cable Testman, Chesapeake & Potomac Telephone Co.; res., 1608 Linden Ave., Baltimore, Md.	Jan. 21, 1914
ISLER, SAMUEL, Radio Student, City College, N. Y.; res., 753 6th St., New York.	Apr. 2, 1913
ISRAEL, LESTER, Asst. Radio Inspector, Navy Yard New York; res., 106 West 69th St., New York.	Dec. 4, 1912
JEFTGER, WILLIAM, Laboratory Instrument Maker, Clark Wireless Tele- graph-Telephone Co., Detroit, Mich.; res., 16 Plum St., Detroit, Mich.	July 16, 1913
JOHNSON, ALBERT H., Superintendent of Shop, National Electrical Supply Co., Washington, D. C.	Feb. 18, 1914
JOHNSON, H. L., Radio Electrician, Radio Station, Fire Island, N. Y.	Jan. 7, 1914
KAHANT, CHAS. G., Construction Engineer, Atlantic Communication Co., 47 West Street, New York.	Mar. 12, 1913
KEITH, HILTON, Construction Engineer, Marconi Wireless Telegraph Co., Marconi House, Strand, London, England.	July 16, 1913
KELLY, G. MERRILL, JR., Student, University of Maine, Ipswich, Mass.; res., 3 Payne St., Ipswich, Mass.	Nov. 4, 1912
KENT, ROSCOE, Superintendent of Railroad Operation, Tropical Timber Co., Neuva Armenia, (Spanish), Honduras.	Jan. 7, 1914
KETCHAM, J. M., Sales Agent, Sprague Electric Works, New York; res., 24 North 16th Street, East Orange, N. J.	Feb. 4, 1914
KEYTE, CHAS. R., Engineer in charge of Wireless Station, The West India and Panama Telegraph Co., Ltd., Georgetown, British Guiana.	Feb. 18, 1914
KLAUS, WILLIAM, Radio Electrician, U. S. Naval Radio Station, Radio, Va.	Oct. 15, 1913
KNOWLTON, F. A., 31 Henry St., So. Framingham, Mass.	Charter Mem- ber, S.W.T.E.
KOEHL, JAMES C., 67 E. 42nd St., Los Angeles, Cal.	Nov. 4, 1912
KOLSTER, C. C., care Juanica Centrale, Ensenada, Porto Rico.	June 3, 1912
KRUMM, LOUIS R., Chief Radio Inspector, Bureau of Navigation, Dept. of Commerce, Washington, D. C.	May 14, 1913
KUHN, ALFRED S., Radio Engineer, 2508 Broadway, N. Y.	Dec. 12, 1912
KUJIRAI, T., Asst. Professor of Electrical Engineering, Imperial University of Tokyo, Japan; care Takata & Co., 57 Bishopsgate St., London, England.	Jan. 7, 1914
LANG, HARRY J., Inspector and Tester, Marconi Wireless Telegraph Co., New York; res., 142 E. 37th St., New York.	Nov. 5, 1913
LANGLEY, R. H., [Asst. Secretary], Engineer-in-charge, Wireless Improve- ment Co., New York; res., 220 Audubon Ave., New York.	June 3, 1912
LANGMUIR, IRVING, Research Engineer, Research Laboratory, General Electric Co., Schenectady, N. Y.	Feb. 18, 1914
LAURENT, JOSEPH D., Chief Draftsman, Wireless Improvement Co., 81 New St., New York.	Feb. 14, 1913
LEITENBERGER, L. J., Radio Operator, Tropical Radio Telegraph Co.; res., 902 W. Arizona St., Philadelphia, Pa.	Oct. 15, 1913
LEMMON, WALTER S., Student, Columbia University; res., 319 West 94th St., N. Y.	Jan. 21, 1914
LeQUESNE, CHARLES A., Jr., Engineer, Dept. Bldgs. and Supplies, New York Telephone Co.; res., 7809 13th Ave., Brooklyn, N. Y.	June 3, 1912

LESCARBOURA, AUSTIN C., Editor, Modern Electric and Mechanics; res., 301 St. Nicholas Ave., N. Y.	Jan. 21, 1914
LESH, LAWRENCE, Aeronautical Engineer; res., 57 Johnson Park, Buffalo, N. Y.	June 3, 1912
LEWIS, GEO. H., Asst. Wireless Specialist, U. S. Signal Corps, Bureau of Standards, Washington, D. C.	Nov. 4, 1912
LEWIS, LLOYD V., Asst. Engineer, Union Switch and Signal Co., Swissvale, Pa.; res., 173 Gordon St., Edgewood Park, Pittsburg, Pa.	May 14, 1913
LICHTENSTEIN, BENJ., Student, Horace Mann School, N. Y., 22 West 43rd St., New York.	Apr. 2, 1913
LIEBMANN, M. N., Supt., Foote Pierson Co., 160 Duane St., N. Y.	June 3, 1912
LIEBOWITZ, BENJAMIN, Radio Research Fellow, Columbia University, N. Y.; res., 31 W. 89th St., New York.	June 3, 1912
LINDRIDGE, C. D., Telephone Engineer, 37 Congress Ave., Providence, R. I.	Nov. 4, 1912
LOGAN, WM. S., Superintendent, Telegraph Dept., Pennsylvania R. R., Room 351, Broad Street Station, Philadelphia, Pa.	Jan. 7, 1914
LOGWOOD, CHAS. V., Engineer, Radio Telegraph & Telephone Co., 1391 Sedgwick Ave., New York.	Nov. 5, 1913
MALLOY, MARVIN E., 1st Lieut, 29th Infantry, Fort Jay, Governors Island, N. Y.	Feb. 18, 1914
MAPS, CHARLES E., Operator, Marconi Wireless Telegraph Co., N. Y.; res., 178 Woodworth Ave., Yonkers, N. Y.	Oct. 15, 1913
MCCAA, D. GALEN, M.D., Specialist in Electro-Therapeutics, 218 North Duke St., Lancaster, Pa.	May 28, 1913
McCLATCHIE, STANLEY, Radio Engineer; res., 178 West 82nd St., N. Y.	Jan. 7, 1914
MCDOWELL, LIEUT. C. S., Asst. to Engineer Officer, Navy Yard, Brooklyn N. Y.	Feb. 14, 1913
McSOLEY, FRANK B., Engineer, Narragansett Electric Lighting Co.; res., 585 Cranston St., Providence, R. I.	June 25, 1913
McWADE, WALTER W., Engineer, Clark Wireless Telegraph Co., 4033 Holmes St., Kansas City, Mo.	May 14, 1913
MEISSNER, BENJ. F., Huntingburg, Ind.	June 3, 1912
MENERATTI, H. J., Chief Radio Electrician, U. S. Naval Radio Telegraphic Laboratory, Bureau of Standards, Washington, D. C.	Apr. 2, 1913
MONTCALM, S. R., Chief Radio Electrician, U. S. S. Fanning, care Postmaster, N. Y.	Mar. 12, 1913
MOORE, E. B., Mechanical and Electrical Engineer, Jones & Lamson Machine Co., 47 Summer St., Springfield, Vt.	June 3, 1912
MOORE, H. ATHERTON, Sales Agent for Radio Apparatus; res., Nutley, N. J.	Nov. 6, 1912
MORECROFT, JOHN H., Asst. Professor of Electrical Engineering, Columbia University, N. Y.	Dec. 3, 1913
MORRIS, M. C., Construction Engineer, Marconi Wireless Telegraph Co.; res., 926 South 58th Street, Philadelphia, Pa.	Jan. 21, 1914
MOTA, JOHN, Laboratory Asst., Radio Telephone and Telegraph Co.; res., 187 West 135th St., N. Y.	Jan. 21, 1914
MUEHLMANN, CHAS. J., Experimental Engineer, Clark Wireless Telegraph-Telephone Co.; res., 288 Third Ave., Detroit, Mich.	June 25, 1913
MULLER, FRED, Radio Inspector, Tropical Radio Telegraph Co., 80 South St., New York.	July 16, 1913
MURRAY, EUGENE M., Construction Engineer, Marconi Wireless Telegraph Co., 601 American Bldg., Baltimore, Md.	Jan. 21, 1914
NAUGLE, PHILIP D., Designing Engineer, Kilbourne & Clark Mfg. Co., 71 Columbia St., Seattle, Wash.	Nov. 5, 1913
NEWTON, EDWARD C., Division Superintendent, Marconi Wireless Telegraph Co., Cleveland, O.	July 16, 1913
NOLAN, EDWARD J., Garage Keeper, 151 Willow St., Brooklyn, N. Y.	June 16, 1913
OGDEN, HERBERT G., Patent Attorney, 2 Rector Street, N. Y.	Feb. 4, 1914

OSBORNE, HAROLD S., Engineering Department, American Telegraph and Telephone Co., 15 Dey Street, N. Y.	Jan. 7, 1914
OSGOOD, ENSIGN W. H., Radio Officer, U. S. S. Virginia, care Postmaster, New York.	Oct. 15, 1913
PACENT, L. G., Asst. Manager, Wireless Department, Manhattan Electrical Supply Co., New York; res., 218 Young St., Long Island City, N. Y.	Nov. 4, 1912
PACKMAN, M. E., Consulting Electrical and Radio Engineer, Dodges Institute of Telegraphy, Valparaiso, Ind.	Mar. 12, 1913
PAGE, NEWELL C., Asst. Prof. of Physics, Massachusetts Institute of Technology; res., 28 Maxwell Road, Winchester, Mass.	Mar. 12, 1913
PEGRAM, GEORGE B., Ph.D., Prof. of Physics, Columbia University, New York.	June 3, 1912
PHINNEY, J. NELSON, U. S. N., Operator and Power Man, Naval Radio Station, Jupiter, Fla.	Feb. 4, 1914
PRICE, D. R., res., Y. M. C. A., Erie, Pa.	June 3, 1912
PRICE, H. S., Student, Princeton University; res., 435 Clinton St., Brooklyn, N. Y.	Charter Member W. I.
PRIESS, WM. H., Student, College of the City of New York; res., 523 West 123rd St., New York.	Feb. 14, 1913
PRUDEN, FREDERICK H., Electro Importing Co., 69 West Broadway, New York.	Jan. 22, 1913
RAU, ADOLPH, Engineer in charge, Trans-Pacific Stations, Marconi Wireless Telegraph Co., Marshalls, Marin Co., Cal.	Charter Member W. I.
RAWLES, R. C., Kansas City, Mo.	June 3, 1912
REBER, COL. SAMUEL, Signal Officer, War Department, Washington, D. C.	Charter Member, S.W.T.E.
RICHARDS, THOS. S., Radio Experimenter, 606 East 3rd St., Brooklyn, N. Y.	June 3, 1912
RIDGES, R. VIGURS, Engineer, Radio Telegraph Branch, Dept. of Naval Service, Ottawa, Canada.	Oct. 15, 1913
ROBINSON, R. J., Electrical Draftsman, Drafting Room, Navy Yard, Mare Island, Vallejo, Cal.	Jan. 21, 1914
RUSSEL, EDGAR, Major, Signal Corps, U. S. A., War Department, Washington, D. C.	Feb. 4, 1914
RYAN, FRED C., Engineer, Laboratory, Federal Telegraph Co., 913½ Emerson Street, Palo Alto, Cal.	Nov. 4, 1912
SARNOF, DAVID, Chief Inspector, Marconi Wireless Telegraph Co., 233 Broadway, N. Y.	Dec. 4, 1912
SCHERMERHORN, J. L., Chief Engineer, American Transformer Co., Newark, N. J.	Nov. 4, 1912
SCHLANG, HERMAN, Clerk, Radio Service, Dept. of Commerce, Custom House, N. Y.; res., 234 East 100th St., New York.	Sept. 3, 1913
SCHMIDT, G. A., Watt-hour Meter Tester, Potomac Electric Power Co.; res., 1936 First St., Washington, D. C.	Jan. 21, 1914
SECOR, H. W., Consulting Engineer, Electro Importing Co., New York; res., 2040 Seventh Ave., New York.	Nov. 4, 1912
SEELIG, ALFRED E., Schuchardt & Schutte, 90 West Street, New York; res., 1090 St. Nicholas Ave., New York.	Nov. 4, 1912
SINGER, S., Asst. Purchasing Agent, Marconi Wireless Telegraph Co., New York; res., 2540 Grand Ave., Bronx, N. Y.	Sept. 3, 1913
SLOAN, A. KELLOGG, President, Sloan Engineering Co., 275 Washington Ave., Brooklyn, N. Y.	Charter Member W. I.
SMITH, SIDNEY B., Asst. Engineer, Marconi's Wireless Telegraph Co., Coverdale, Gloucester, Road, Bognor, Sussex, England.	Jan. 21, 1914
SPANENBERG, LESTER, Draftsman, American Locomotive Co.; res., 25 So. 4th St., Lake View, Passaic, N. J.	
SPENCE, PAYTON W., Testing Engineer, Am. Tel. & Tel. Co., New York; res., 293 Lenox Ave., N. Y.	Feb. 4, 1914
STANLEY, HOWARD J., Garage Manager, Babylon, L. I., N. Y.	Nov. 5, 1913

ASSOCIATES

STEDMAN, W. G., Radio Operator, Tropical Radio Telegraph Co.; res., 2929 North Taylor St., Phila., Pa.	Oct. 15, 1913
STEVENS, A. M., Assistant Engineer, Universal Radio Syndicate, 548 Commercial Road, Mile End, Portsmouth, Hants, England.	Nov. 4, 1912
STEWART, DONALD, Clerk, Hardware Co., 52 Elm St., Hudson Falls, N. Y.	Nov. 4, 1912
TABER, WM. T., Tester, Marconi Wireless Telegraph Co.; res., 763 Bloomfield Ave., Mt. Clair, N. J.	Sep. 3, 1913
TAUSSIG, CHAS. WM., Chemical Assistant, American Molasses Co.; res., 36 West 85th St., N. Y.	Feb. 4, 1914
TERRILL, W. D., Radio Inspector, Dept. of Commerce, Custom House, New York.	June 3, 1912
THOMPSON, E. W., Chief Radio Electrician, U. S. S. Vestal, care Postmaster, N. Y.	Oct. 15, 1913
TOWNSEND, T. LINCOLN, Vice-President, National Electric Supply Co., Washington, D. C.	Feb. 18, 1914
TRAPNELL, THOS. T., Assistant Treasurer, Institute of Radio Engineers, 71 Broadway, New York.	Feb. 14, 1913
TROP, RAYMOND F., Installing Engineer, Wireless Specialty Apparatus Co., 126 State St., Boston, Mass.	June 12, 1913
TRUESDELL, 1st LIEUT., KARL, Signal Corps, U. S. A., Army Bldg., Whitehall St., N. Y.	June 12, 1913
UPTON, HARRY E., Electrical Assistant, Signal Service, War Department, 75 Oxford St., Portland, Maine.	July 16, 1913
VANDERPOEL, FLOYD, Radio Experimenter; res., Litchfield, Conn.	Charter Member, W. I.
VAN DYCK, A. F., Research Engineer, Westinghouse Electric & Mfg. Co., Pittsburg, Pa.; res., 7816 Edgewood Ave., Swissvale, Pa.	Charter Member, S.W.T.E.
WALLIS, A. F., Radio Operator, National Electrical Signaling Co., Brooklyn, N. Y.; res., 410 61st St., Brooklyn, N. Y.	June 4, 1913
WATERMAN, FRANK, Consulting Engineer, 100 Broadway, New York.	Dec. 4, 1912
WATROUS, RALPH C., General Manager, R. I. Perkins Horse Shoe Co., 20 Diman Place, Providence, R. I.	Oct. 15, 1913
WEINBERGER, JULIUS, Junior Asst. Engineer, Public Service Commission for the First District, State of New York; res., 214 East 4th St., New York.	Feb. 14, 1913
WESCOE, MORRIS I., Testing Department, American Telegraph and Telephone Co.; res., 145 Westervelt Ave., New Brighton, N. Y.	Feb. 4, 1914
WOLF, ALBERT W., Asst. Engineer, Clark Wireless Telegraph-Telephone Co., Detroit, Mich.; res., 866 Sixth St., Detroit, Mich.	May 14, 1913
WOLF, BENJ. E., Radio Inspector, Bureau of Navigation, Dept. of Commerce, Washington, D. C.	Oct. 15, 1913
WOLFE, A. R., Chief Radio Electrician, U. S. S. No. Dakota, care Postmaster, N. Y.	Sep. 3, 1913
WOOD, A. A., Inspector, New York Telephone Co., 53 Bentley Ave., Jersey City, N. J.	Jan. 8, 1913
WOODWORTH, LIEUT., E. B., Officer-in-charge, U. S. Naval Radio Station, Radio, Va., care Navy Dept., Washington, D. C.	Feb. 14, 1913
ZEAMANS, HAROLD R. [General Counsel], Attorney at Law, 42 Broadway, New York.	June 3, 1912
ZWICKER, ASHLY C., Installer, Clapp, Eastham Co., Boston; res., 99 Yorktown St., West Somerville, Mass.	Nov. 4, 1912

SUMMARY OF MEMBERSHIP

MARCH 1, 1914

Members.....	64
Associates.....	207
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Total.....	271

It is requested that **Changes of Address** be forwarded promptly to:

**The Secretary, Institute of Radio Engineers,
81 New Street, New York.**

GEOGRAPHICAL DISTRIBUTION OF MEMBERSHIP

MARCH 1, 1914

UNITED STATES:	Members	Associates	Total
California	3	5	8
Connecticut .....	..	2	2
District of Columbia.....	9	12	21
Florida .....	..	2	2
Illinois .....	..	1	1
Indiana .....	..	2	2
Kansas .....	..	1	1
Louisiana	2	..	2
Maine .....	..	1	1
Maryland	1	3	4
Massachusetts	7	16	23
Michigan	1	4	5
Missouri .....	..	3	3
New Hampshire .....	..	1	1
New Jersey	4	18	22
New York	18	91	109
Ohio .....	..	2	2
Oregon .....	..	1	1
Pennsylvania	2	13	15
Rhode Island	1	5	6
Vermont .....	..	1	1
Virginia	1	2	3
Washington	2	1	3
West Virginia .....	..	2	2
Aboard Naval Vessels.....	1	8	9

Totals	52	197	249

CANADA	3	2	5
PORTO RICO .....	..	1	1
PHILIPPINE ISLANDS	1	..	1
HONDURAS (Spanish) .....	..	1	1
BRITISH GUIANA	1	1	2
JAPAN	1	1	2
GREAT BRITAIN	3	4	7
GERMANY	3	..	3

Totals	64	207	271

Total Membership 271

