

**American Institute of
Electrical Engineers**



**SUMMER
GENERAL
MEETING**

Program

SWAMPSCOTT, MASS.

JUNE 20-24

1949

**Meeting Headquarters
NEW OCEAN HOUSE**

SCHEDULE OF EVENTS

See Separate Schedule for Ladies Program

Monday, June 20

- 8:30 a.m. Registration
- 9:30 a.m. Trip to Boston Naval Shipyard
Switchgear
Electric Welding
E.C.P.D. Accrediting of E.E. Curricular
Instruments and Measurements
- 2:00 p.m. Insulated Conductors
Industrial Control and Servomechanisms
Substations
Conference on Nucleonics
- 8:00 p.m. Informal Dancing

Tuesday, June 21

- 9:30 a.m. Trip to M. I. T. and Harvard
Institute Publicity and Policy
Symposium on Relay Switching Circuits
Carrier Current
Radio Telemeter Instrumentation
- 1:30 p.m. Trip to WBZ-Television
Section Delegates' Conference
- 2:00 p.m. Relays
Wide-Band Communication Media
Instruments and Measurements
- 8:00 p.m. Old-Fashioned Barn Dance

Wednesday, June 22

- 10:00 a.m. Annual Meeting
- 1:30 p.m. Trip to Lynn Telephone Exchange
- 2:00 p.m. Transformers
Computing Devices
Basic Science
- 6:30 p.m. President's Reception and Banquet

Thursday, June 23

- 9:30 a.m. Trip to Mystic Station Boston Edison Co.
Transmission and Distribution and System Engineering
Symposium on Semiconductors
Statistical Applications
- 1:30 p.m. Trip to Lynn Plant General Electric Co.
- 2:30 p.m. Transformers
Symposium on Semiconductors
Land Transportation and Lighting
- 8:00 p.m. New England Entertainment

Friday, June 24

- 9:30 a.m. Symposium on Primary Network Systems
District Branch Prize Papers
Infra-Red Radiation
Pulp and Paper
- 2:00 p.m. Electric Heating
Magnetic Amplifiers and D-C Saturated Reactors
Storage Batteries
Applied Mathematics

GENERAL INFORMATION

This Meeting in Swampscott, Massachusetts, marks the 64th Annual Summer General Meeting of the AIEE. A technical program of broad interest, with opportunity for inspection trips and social recreation, has been provided.

The Lamme medal presentation ceremonies will take place at the Annual Meeting Wednesday morning, June 22, 1949. There will also be addresses by Mr. W. F. Ryan, Engineering Manager of the Stone & Webster Engineering Corporation, and our President, Everett S. Lee.

On the social side, there will be an Old-fashioned Barn Dance, President's Reception and Banquet and special entertainment for the ladies.

Registration Fees Required. In accordance with the policy as set up by the Board of Directors, a registration fee of \$3.00 has been established for members and a fee of \$5.00 for nonmembers. This is to help make the meeting self-supporting and obviate the need for raising the annual dues. Enrolled students and the immediate families of members will not be required to pay any fee.

Information on all features may be obtained at the registration desk. Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail are asked to inquire frequently at the mail and registration desk.

Technical Sessions and Discussions are covered by the "Conduct of Technical Sessions" at the discretion of the presiding officers. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication, discussions must be left with the chairman or sent to Edward C. Day, AIEE, 33 West 39th Street, New York 18, N. Y., before July 8, 1949. Discussions received later will be returned. The original typewritten double-spaced copy, together with original illustrations with photostats or blueprints should be submitted.

Authors and discussers should make their presentation as effective as possible. Remember your audience. Stress the salient features of the paper which are new or novel. When using slides, please turn toward the audience before speaking and raise your voice. Extemporaneous delivery is preferable to reading unless done slowly and emphasis is put in the proper places.

Advance Copies of Papers may be purchased by members at the registration desk at the uniform price of \$.30 each (\$.60 each to nonmembers). Only numbered papers are available. Conference papers denoted by CP are intended for presentation only and are not available. Mail orders, particularly from out-of-town members, are advisable, inasmuch as an adequate supply of each paper, at the meeting cannot be assured. Coupon books in \$9.00 denominations are available for those who wish to avoid remittance by check or otherwise. Mail orders should be addressed to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. Most of the papers will ultimately be published as AIEE Proceedings and in the TRANSACTIONS.

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Monday, June 20

9:30 a.m.—Switchgear

Ballroom
F. A. LANE, Presiding

- 49-128. Field Tests of Oil Circuit Recloser Substantiate Analytical Coordination Method. G. G. Auer, R. A. Branflick, L. J. Woodward, General Electric Company; W. C. McKinley, Central Electric Cooperative, Inc.
- CP.** Metal Clad Switchgear Manufacture, Test, and Inspection. B. I. Hayford, Westinghouse Electric Corporation.
- CP.** Selective Tripping of Low Voltage Air Circuit Breakers for Power Station Auxiliaries. J. M. Geiger, L. L. Fountain, Westinghouse Electric Corporation.
- CP.** Guide for the Application of Low Voltage Air Circuit Breakers. Committee Report.

9:30 a.m.—Electric Welding

Meeting Room Front
E. H. VEDDER, Presiding

- CP.** Arc Metal Transfer Analyzer. R. C. McMaster, D. C. Martin, A. Leatherman, Battelle Memorial Institute.
- 49-129. Characteristics of Arcs Between Moving Electrodes. ACO.* W. B. Kouwenhoven, T. B. Jones, The Johns Hopkins University.
- CP.** Operational Timing Pattern for Electronic Resistance Welding Control. H. B. Hills, General Electric Company.
- CP.** Electrical Advantages of Low Frequency Welding Converters. C. B. Stadum, Westinghouse Electric Corporation.

9:30 a.m.—ECPD Accrediting of Electrical Engineering Curricula

Priscilla Room
H. N. MULLER, Presiding

- CP.** ECPD Accrediting Program. D. B. Prentice, President Emeritus, Rose Polytechnic Institute and Past Chairman, ECPD Committee on Engineering Schools.
- CP.** What the Accrediting Visitor Sees. E. L. Moreland, Executive Vice-President, M.I.T. and Senior Partner, Jackson and Moreland, Engineers.

9:30 a.m.—Instruments and Measurements

Green Room
E. I. GREEN, Presiding

- 49-130. The Measurement of Dielectric Loss at High Frequencies and Under Changing Temperatures. J. B. Whitehead, W. Rueggeberg, The Johns Hopkins University.
- 49-131. Instrumentation for the Evaluation of the Stability of the Welding Arc. Lauriston P. Winsor, L. McDonald Schetky, Robert A. Wyant, Rensselaer Polytechnic Institute.

- 49-132. A Wide Band DC Amplifier Stabilized for Gain and For Zero. A. J. Williams, Jr., W. G. Amey, W. McAdam, Leeds and Northrup Company.
- CP.** Unusual Applications of the Cathode-Ray Oscilloscope in the Electrical Industry. P. S. Christaldi, W. J. Fockler, Allen B. DuMont Laboratories, Inc.
- CP.** Impulse Measurements by Repeated Structure Networks. C. L. Dawes, C. H. Thomas, A. B. Drought, Harvard University.

2:00 p.m.—Insulated Conductors

Ballroom
L. F. HICKERNELL, Presiding

- 49-133. Transformer Manholes and Vaults—Design and Ventilation. L. F. Porter, Consolidated Edison Company of New York, Inc.
- 49-134. The Temperature Rise of Cables in a Duct Bank. J. H. Neher, Philadelphia Electric Company.
- 49-135. A-C Resistance of Segmental Cables in Steel Pipe. L. Meyerhoff, G. S. Eager, Jr., General Cable Corporation.
- 49-136. 69 KV Pipe-Type Cable Circuits in Philadelphia. A. H. Kidder, G. S. Van Antwerp, Philadelphia Electric Company.
- 49-137. Observations on Recent Developments and the ACO.* Trends in High Voltage Cable Transmission. P. H. Chase, Philadelphia Electric Company.

2:00 p.m.—Industrial Control and Servomechanisms

Meeting Room Front
G. S. BROWN, Presiding

- 49-138. Dynamic Braking Control of D-C Series Motors—Experimental Study of Speed-Torque Curves. G. W. Heumann, General Electric Company.
- 49-199. A Wide Range Adjustable Speed Drive. A. G. Conrad, E. R. Tribken, Yale University.
- 49-197. Instrument Inaccuracies in Feedback Control Systems with Particular Reference to Backlash. H. T. Marcy, Morris Yachter, Jerome Zauderer, The M. W. Kellogg Company.
- 49-196. Comparison of Steady-State and Transient Performance of Servomechanisms. R. W. Mayer, H. Chestnut, General Electric Company.
- CP.** Characteristics of Some Magnetic-Fluid Clutch Servomechanism Systems. A. J. Parziale, P. D. Tilton. Massachusetts Institute of Technology.

2:00 p.m.—Substations

Priscilla Room
G. S. LUNGE, Presiding

- 49-141. Aluminum Alloy Substation Structures. A. M. ACO.* Baker, Pennsylvania Electric Company.

- 49-142. Application of the "Multiplex" Scheme at Urban ACO.* Distribution Substations in Baltimore. M. Mortara, Consolidated Gas Electric Light and Power Company of Baltimore.
- 49-143. Automatic Grounding and Air Break Switches for Protection of Transformer Stations. E. A. Ricker, The Hydro-Electric Power Commission of Ontario.
- 49-144. A New Two-Signal Supervisory Control System. W. A. Derr, Westinghouse Electric Corporation.

2:00 p.m.—Conference on Nucleonics

Green Room
G. W. DUNLAP, Presiding

- CP.** Problems in Health Physics Instrumentation. Samuel Levin, Massachusetts Institute of Technology.
- CP.** Some Electronic Aids to the Nuclear Physicist. Emil de Agazio, Massachusetts Institute of Technology.
- CP.** Thickness Gauges in Industry Employing Radioactivity. J. R. Carlin, Tracerlab, Inc.
- CP.** Scintillation Counters. William G. Cross, Harvard University.

Tuesday, June 21

9:30 a.m.—Institute Publicity and Policy
(Meeting of Section Delegates)

Ballroom
C. S. PURNELL, Presiding

Section Publicity

1. Purpose of Meeting. J. C. Strasbourger.
2. Institute Public Relations. R. K. Honaman.
3. Specific Section Publicity Problems.
4. Mechanics of News Releases.
5. News Stories for Electrical Engineering, C. S. Rich.
6. Discussion of Publicity Material. G. T. Minasian.
7. Summary.

Civic and Legislative Activities of the A.I.E.E.

Special Committee—M. D. Hooven; J. L. Callahan; R. T. Henry. An open discussion by Section Delegates regarding participation of the A.I.E.E. in civic and legislative activities. All Delegates should be prepared to present the opinion of their Section membership.

9:30 a.m.—Symposium on Fundamental and Functional Design of Relay Switching Circuits

Meeting Room Front
A. J. BUSCH, Presiding

- 49-145. The Logic of Relay Circuits. W. Keister, Bell Telephone Laboratories, Inc.

- 49-146. Sequential Aspects of Relay Circuits. A. E. Ritchie, Bell Telephone Laboratories, Inc.
- 49-147. Relay "Trees" and Symmetric Circuits. S. H. Washburn, Bell Telephone Laboratories, Inc.
- 49-148. Counting with Relays. G. R. Frost, Bell Telephone Laboratories, Inc.
- 49-149. Codes and Translations. Oscar Myers, Bell Telephone Laboratories, Inc.

9:30 a.m.—Carrier Current

Priscilla Room
S. C. LEYLAND, Presiding

- 49-150. Loss Measurements Made on Underground-Cable Overhead-Conductor 132 Kv Transmission Line at Carrier Current Frequencies. H. A. Cornelius, B. Wade Storer, Commonwealth Edison Company.
- 49-151. Power Line Carrier for Relaying and Joint Usage—1, G. W. Hampe, B. Wade Storer, Commonwealth Edison Company.
- CP.** Microwave Equipment for 900 and 2000 Megacycles. W. E. Sutter, R. V. Rector, General Electric Company.
- CP.** Design and Plans for the Bonneville Microwave System. T. W. Stringfield, Bonneville Power Administration.
- CP.** A Place for Microwave Radio in the Power Industry. D. R. Pattison, Pennsylvania Electric Company.
- CP.** A Development of Microwave Equipment for Power System Applications. M. H. Wood, F. B. Gunter, Westinghouse Electric Corporation.

9:30 a.m.—Radio Telemeter Instrumentation

Green Room
J. G. REID, JR., Presiding

- CP.** Upper Air Meteorological Telemetering. B. K. Hawes, National Bureau of Standards.
- 49-152. Automatic Range-Adjusting Radiosonde Recorder. George E. Beggs, Jr., Leeds and Northrup Company.
- CP.** A Pulse Width Modulation Telemetering System. Walter Hausz, General Electric Company.
- CP.** An FM-FM Telemetering System. W. J. Mayo-wells, Johns Hopkins Applied Physics Laboratory.

2:00 p.m.—Relays

Ballroom
W. R. BROWNLEE, Presiding

- 49-153. Relaying of Transmission Lines From the New Sunbury Generating Station. H. H. Green, J. A. G. Oewel, O. Ramsaur, Pennsylvania Power and Light Company.
- 49-154. Graphical Method for Estimating the Performance of Distance Relays During Faults and Power Swings. A. R. vanC. Warrington, General Electric Company.

- CP.** A New Loss of Excitation Relay for Synchronous Generators. C. R. Mason.
- CP.** Practice and Extent of Loss of Excitation on Rotating Machines. G. B. Miller.

2:00 p.m.—Wide-Band Communication Media

Meeting Room Front
H. A. AFFEL, Presiding

- 49-155. BI Alarm and Control System for Remote Control of Coaxial Cable Stations. R. B. Hearn, Laurence A. Weber, Bell Telephone Laboratories, Inc.
- 49-156. Power Supplies for Coaxial Systems. H. H. Spencer, Bell Telephone Laboratories, Inc.
- 49-157. Power Supplies for Microwave Relay Systems. H. M. Ward, The Western Union Telegraph Co.
- 49-158. A Microwave Communication Relay System. W. P. Boothroyd, H. J. Churchill, Philco Research Division.

1:30 p.m.—Section Delegates' Conference

Priscilla Room
J. C. STRASBOURGER, Presiding

1. New Sections and Territorial Changes
 - a. Ottawa Section
 - b. Western Virginia Section
 - c. Hardin County, Ohio, from Columbus to Dayton Section
 - d. Vancouver Section
2. Prize Paper Rules—Fischer Black
3. Speakers' List—C. S. Purnell; W. J. Barrett
4. Section Finances—G. W. Bower
Report and discussion on financial requirements of Sections for next five years.
5. Institute Affairs—Everett S. Lee, President; James F. Fairman.
6. Recognition of Past Section Chairmen—W. F. Henn.
7. Other Business.

2:00 p.m.—Instruments and Measurements

Green Room
H. C. KOENIG, Presiding

- 49-159. A Thermal Converter for Telemetering and Totalizing. W. C. Downing, Jr., Sangamo Electric Company.
- 49-160. Heat Flow Ratio as a Design Parameter in Thermal Demand Meters. J. S. Nelson, General Electric Co.
- 49-161. A New Expanded Scale A-C Voltmeter, N. P. Millar, General Electric Company.
- 49-162. A New Instrument Mechanism. Allen Stimson, ACO.* F. B. Jennings, C. W. McCarty, General Electric Company.
- CP.** Theoretical Considerations in the Use of an Ergometer. J. Schroeder, Naval Ordnance Laboratory.

Wednesday, June 22

10:00 a.m.—Annual Meeting

Ballroom
President EVERETT S. LEE, Presiding

1. Report of Board of Directors. H. H. Henline, Secretary.
2. Report of Treasurer. W. I. Slichter.
3. Report of Committee of Tellers on vote for nominees for A.I.E.E. offices.
4. (a) Introduction of, and presentation of, President's badge to J. F. Fairman.
(b) Response by Mr. Fairman.
5. Presentation of Lamme Medal to V. K. Zworykin, Vice President and Technical Consultant, RCA Laboratories.
 - (a) The Establishment of the Medal. N. S. Hibshman, Chairman, Lamme Medal Committee.
 - (b) The Career of the Medalist. Brig. Gen. David Sarnoff, Chairman of the Board of Directors, Radio Corporation of America.
 - (c) Presentation of Medal and Certificate by President Lee.
 - (d) Response by Mr. Zworykin.
6. Any other business that may be presented.
7. Address, "The Expanding Horizons in Engineering Education," W. F. Ryan, Engineering Manager, Stone and Webster Engineering Corp.
8. President's Address. Everett S. Lee.

2:00 p.m.—Transformers

Ballroom
F. S. BROWN, Presiding

- CP.** Progress Report on Proposed Transformer Standards. A.I.E.E. Transformer Committee.
- 49-188. Economic Loading of a Transformer System. D. L. Levine, H. E. Smith, Commonwealth Edison Co.
- 49-189. Heating of Transformers Under Short-Circuit Conditions. V. M. Montsinger, G. H. Halsey, General Electric Company.
- 49-190. Standardization of Reactor Ratings. F. H. Kierstead, J. L. Thomason, General Electric Company.
- 49-191. Transformer Audio Noise Problems on an Electric Power System. C. S. Murray, Consolidated Edison Company of New York, Inc.

2:00 p.m.—Computing Devices

Priscilla Room
C. CONCORDIA, Presiding

- 49-163. A New Fourier Coefficient Harmonic Analyzer. S. Champ, The Franklin Institute.

- 49-164. An Improved A-C Network Analyzer. W. A. Morgan, Bureau of Reclamation; F. S. Rothe, J. J. Winsness, General Electric Company.

CP.** The Bell Computer, Model VI. E. G. Andrews.

- 49-165. Application of the Cal-Tech Electric Analog Computer to Nonlinear Mechanics and Servomechanisms. G. D. McCann, C. H. Wilts, B. N. Locanthi, California Institute of Technology. Presentation by title only.
- 49-166. Summary of Transformations Useful in Constructing Electrical Analogs of Linear Vibration Problems. J. P. Corbett, Northwestern University. Presentation by title only.

2:00 p.m.—Basic Science

Meeting Room Front
W. RICHTER, Presiding

- 49-167. Formulas and Tables for the Calculation of the Magnetic Field Components of Circular Filaments and Solenoids. F. W. Grover, Union College.
- 49-168. General Theory, and Experimental Confirmation, of the Moving Coil Fluxmeter. T. J. Higgins, University of Wisconsin, Glenn Robertson, Illinois Institute of Technology.
- 49-169. Nomenclature for the Symbolic Treatment of Sinu-ACO.* soids. W. R. LePage, Syracuse University.
- 49-170. Non-Harmonic Oscillations as Caused by Magnetic Saturation. Reinhold Rudenberg, Harvard University.

Thursday, June 23

9:30 a.m.—Transmission and Distribution and System Engineering

Ballroom
I. W. GROSS and E. WILD, Presiding

- 49-171. Planned Development of a Power System. N. N. ACO.* Smeloff, Pennsylvania Power and Light Company.
- 49-172. A 66-Kv Sub-Transmission Plan for a Metropolitan Area. K. M. Smith, E. L. Michelson, Commonwealth Edison Company.
- 49-173. Comparative Performance Records of Steel and Wood Transmission Lines. C. A. Booker, New England Power Service Company.
- 49-174. Stationary Networks and Transmission Lines Along Uniformly Rotating Reference Frames. Gabriel Kron, General Electric Company.
- 49-175. Overcurrent Investigation on a Rural Distribution System. G. F. Lincks, General Electric Company; D. R. Edge, Graybar Electric Company, Inc.; W. C. McKinley, Central Electric Cooperative, Inc.; J. H. Leh, General Electric Company. Presentation by title only.

- 49-61. Advances in Technique of Lighting Measurements. T. Brownlee, General Electric Company. Presentation by title only.
- 49-177. Short Circuit Currents and Recovery Voltages on Rural Distribution Systems. W. H. Eason, I. B. Johnson, J. W. Kalb, General Electric Company; H. A. Peterson, University of Wisconsin. Presentation by title only.

9:30 a.m.—Symposium on Electrical Properties of Semiconductors and the Transistor

Meeting Room Front
Jointly Sponsored by the COMMITTEES ON BASIC SCIENCE, COMMUNICATIONS and ELECTRONICS

(A) Nature of the Conductivity in Semiconductors, particularly Silicon and Germanium

K. LARK-HOROVITZ, Presiding

- CP.* The Conductivity of Silicon and Germanium as Affected by Chemically Introduced Impurities. G. L. Pearson, Bell Telephone Laboratories, Inc.
- CP.** Nucleon-bombarded Semiconductors. K. Lark-Horovitz, Purdue University.
- CP.** The Control of the Conductivity of Oxide Semiconductors by Admixture of Other Oxides. N. C. Jamison, Phillips Laboratories.

(B) Photo Effects in Semiconductors

L. SMITH, Presiding

- CP.** General Features of Photoconductivity and Photoemission in Semiconductors. Lloyd Smith, Cornell University.
- CP.** External Photoelectric Effects in Semiconductors.
- CP.** Internal Photoeffects in Germanium. J. N. Shive, Bell Telephone Laboratories, Inc.

9:30 a.m.—Conference on Statistical Applications

Green Room
W. P. DOBSON and L. ROSENBLUM, Presiding

- CP.** Quality Control as a Management Method. A. V. Feigenbaum, General Electric Company.
- CP.** Diagnosis with Diagrams. L. A. Seder, Gillette Safety Razor Company.
- CP.** Tests of Significance. P. E. Thompson, General Electric Company.
- 49-187. Saving Time in Testing Life of Incandescent Lamps. W. R. Purcell, Sylvania Electric Products.

2:00 p.m.—Transformers

Ballroom
J. E. CLEM, Presiding

- CP.** General British Standardization. Hugh Jack, British-Thomson Houston Company.
- 49-192. Use of Thyrite in Power Transformers. J. R. Meador, General Electric Company.
- 49-193. Controlled Temperature and Insulation Protection in the Operation of Power Transformers. W. W. Satterlee, R. D. Reed, Westinghouse Electric Corp.

- 49-194. A Small High-Voltage Bushing Design for High Altitude. F. J. Vogel, Illinois Institute of Technology and H. A. Hart, Armour Research Foundation.
- 49-195. Extremes in the Insulation Co-ordination of Oil Insulated Transformers. F. J. Vogel, Illinois Institute of Technology.

2:00 p.m.—Symposium on Electrical Properties of Semiconductors and the Transistor

Meeting Room Front

(C) Semiconductor Rectifiers

F. SEITZ, Presiding

- CP.** Theory of Rectification. F. Seitz, Carnegie Institute of Technology.
- CP.** A Comparison Between the Schottky Rectifier Theory and Measurements Upon Cuprous Oxide Cells. S. J. Angello, Westinghouse Research Laboratories.
- CP.** Boundary Layers in Rectifiers. H. Y. Fan, Purdue University.
- CP.** Noise in Semiconducting Contacts. P. H. Miller, University of Pennsylvania.

(D) The Transistor

J. A. BECKER, Presiding

- CP.* Theory of Transistor Action. W. Shockley, Bell Telephone Laboratories, Inc.
- CP.** Equivalent Circuits for Transistor Action and Noise. R. M. Ryder, Bell Telephone Laboratories, Inc.
- CP.** The Possible Significance of Transistors in the Power Field. J. A. Hutcheson, Westinghouse Research Laboratories.

2:00 p.m.—Land Transportation and Lighting

Green Room
H. F. BROWN, Presiding

- 49-176. Industrial Plants Prefer Diesel-Electric Switching Locomotives. Thomas J. Woods, Westinghouse Electric Corporation.
- 49-186. Measurements of Erythema Energy. Hoyt S. Scott, General Electric Company.
(Presentation of the above papers will be followed by a meeting of the Land Transportation Committee.)

Friday, June 24

9:30 a.m.—Symposium on Primary Network Systems

Ballroom
H. COLE, Presiding

- 49-178. Improvements to Oklahoma City Primary Network. Bryce Brady, Oklahoma Gas and Electric Company.
- 49-179. Primary Networks on the Duquesne Light Company System. W. P. Holben. J. E. Lange, Duquesne Light Company.

49-180. Design and Experience with 4Kv Primary Network Systems in the Washington Area. W. J. Lank, Potomac Electric Power Company.

49-181. Primary Network Installations on the Boston Edison Company's System. L. J. Weed, Boston Edison Company.

9:30 a.m.—District Branch Prize Papers

Priscilla Room
E. W. BOEHNE, Presiding

Presentation of District Branch Prize papers by the winners from the odd-numbered Districts, Nos. 1, 3, 5, 7, and 9.

9:30 a.m.—Infra-Red Radiation.

Meeting Room Front
A. H. CANADA, Presiding

CP.** The Basic Optics of Infrared Radiation. R. C. Lord, Massachusetts Institute of Technology Spectroscopy Laboratory.

CP.** Radiation Detectors Applicable to Infrared Investigations. A. R. Dennett, Eppley Laboratories.

CP.** A New Thermionic Detector for Infrared Radiation. E. D. Wilson, Westinghouse Electric Corporation.

CP.** New Military Needs in the Infrared. C. S. Woodside, Navy Bureau of Ships.

CP.** Industrial Applications of Infrared Spectroscopy. Van Zandt Williams, Perkin-Elmer Corporation.

9:30 a.m.—Pulp and Paper

Green Room
G. W. KNAPP, Presiding

CP.** Subcommittee Report on Electric Equipment for Paper Mill Super-calenders, Part I. V. B. Baker, Westinghouse Electric Corporation.

CP.** Subcommittee Report on Electric Equipment for Paper Mill Winders. C. D. Beck, General Electric Company.

2:00 p.m.—Electric Heating

Ballroom
G. W. SCOTT, JR., Presiding

49-182. Reduction of Interference from Radio-Frequency Heating Equipment. G. W. Klingaman, Radio Corporation of America.

CP.** High Temperature Ceramic Insulations. Hans Thurnauer.

CP.** Electrode Type Electric Steam Boilers and Water Heaters. S. A. Williams.

CP.** Temperature Measurement for Infrared Heating Processes. W. F. Hicks.

CP.** Some Problems in the Measurement of Low Intensity Fields at Ultra-High Frequencies. C. W. Frick.

2:00 p.m.—Magnetic Amplifiers and D-C Saturated Reactors

Meeting Room Front
E. L. HARDER, Presiding

49-183. Fundamentals of the Amplistat, A Magnetic Amplifier. R. E. Morgan, General Electric Company.

49-140. Self-Saturation in Magnetic Amplifiers. W. J. Dornhoefer, Vickers, Inc.

49-139. Analytical Determination of Characteristics of Magnetic Amplifiers with Feedback. D. W. Verplanck, L. A. Finzi, D. C. Beaumariage, Carnegie Institute of Technology.

CP.** An Analysis of Transients in Magnetic Amplifiers. D. W. Verplanck, L. A. Finzi, D. C. Beaumariage, Carnegie Institute of Technology.

49-198. A Method for Designing Pulse Transformers. H. S. Kirschbaum, C. E. Warren, The Ohio State University.

2:00 p.m.—Storage Batteries

Priscilla Room
H. C. RIGGS, Presiding

CP.** Railway Battery Maintenance. E. K. Bloss, Boston and Maine Railroad Company.

CP.** Prolonging Battery Life. Dr. Eugene Willihnganz, Gould Storage Battery Company.

CP.** Design and Application of Dry Disc Rectifiers. H. H. Zielinsky, E. A. Harty, General Electric Co.

2:00 p.m.—Applied Mathematics

Green Room
M. G. MALTI, Presiding

CP.** Introduction. M. G. Malti, Cornell University.

CP.** History and Coordination of Operational and Transform Methods. M. F. Gardner, Massachusetts Institute of Technology.

CP.** Application of Operational and Transform Methods. L. A. Pipes, University of California.

49-184. A Derivation of Heaviside's Operational Calculus Based on The Generalized Functions of Schwartz. J. J. Smith, P. L. Alger, General Electric Company.

49-185. Correlation of the Methods of Operational Calculus. ACO.* W. A. Lewis, Illinois Institute of Technology.

CP.** Conference paper; no advance copies are available; not intended for publication in Transactions. If provided by the author, copies will be available at the door of the meeting room.

ACO.* Advance copies only available; not intended for publication in Transactions.

POINTS OF HISTORICAL INTEREST

Boston, which was settled in 1630, has grown into a great modern manufacturing and commercial center. It contains 200 universities, colleges and schools, 224 public libraries, with more than 12,000,000 books. Five museums are open daily to the public.

The following are some of the points of historical interest in the City itself.

FANEUIL HALL—Sometimes called "The Cradle of Liberty" was built in 1742.

PAUL REVERE HOUSE—Oldest frame house in the City of Boston was built soon after 1676.

OLD NORTH CHURCH—Oldest church edifice in Boston, built in 1723. Here the signal lanterns of Paul Revere were displayed in the steeple on April 18, 1775.

SITE OF BOSTON TEA PARTY—Denoted by a marker reading, "Here formerly stood Griffin's Wharf." This point now incidentally is considerable distance from the shore line.

OLD STATE HOUSE—Marks the location of the first Town House. It was built in 1657.

OLD SOUTH MEETING HOUSE—The men of Boston gathered here to protest against forcing Massachusetts citizens into the English Navy. They demanded the withdrawal of British troops and to decide the fate of the hated tax on tea.

KING'S CHAPEL—Founded in 1686. The first chapel was built in 1688 and the present one in 1749. In the King's Chapel Burying Ground and the Old Granary Burying Ground lie buried most of the historic personages of Boston.

Across the river may be seen Bunker Hill Monument on Breed's Hill, at the foot of which the famous U. S. Frigate "Constitution" is docked at the Boston Navy Yard.

Many of the cities and towns surrounding Boston also have numerous points of interest for the visitor. Cambridge, in addition to being the seat of Harvard University, Radcliffe College, and the Massachusetts Institute of Technology was also the home of many famous literary persons.

Lexington, where occurred the first skirmish of the American Revolution on April 19, 1775, contains many points of historical interest.

Concord settled in 1635 is closely allied with the early events of the American Revolution, and has also been the home of many literary celebrities.

Salem, which is better known for its legend of witchcraft, contains many points of interest, such as the Old Witch House, witch jail, and dungeon, the House of the Seven Gables, etc.

Marblehead is noted for its beautiful harbor and spectacular yacht racing.

Gloucester is a quaint fishing port and contains the country's largest salt fish processing plant.

Gloucester and Rockport comprise Cape Ann, combining a beautiful summer resort with a famous art colony.

Quincy was settled in 1625 and is the birthplace of two presidents, John Adams and John Quincy Adams. It is also the site of the first commercial railroad in the country.

Plymouth, sometimes referred to as the "Cradle of American Liberty," is famous as the landing place of the pilgrims, and in addition to historic Plymouth Rock, it contains many other points of interest.

The foregoing, as well as countless other points of interest, including museums, libraries, antique shops, art associations, churches, educational institutions, and other public buildings should make your visit to Swampscott a very pleasant and profitable vacation. Also, for those who enjoy motoring there are many miles of scenic shore line within easy reach of Swampscott, and for those who desire longer trips the beautiful mountains, hills, valleys, etc. of northern New England offer some of the most picturesque views to be had in this country.

ENTERTAINMENT AND BANQUET: Monday evening

— Informal Dancing in the Ballroom, for the purpose of getting acquainted with the various members and establishing friendships.

Tuesday evening — Gala Entertainment Event. Old-Fashioned Barn Dance in true New England style, literally and

figuratively. In fact, this will be the chance of a lifetime to get acquainted with what a barn actually looks like. Costumes will add much to the occasion and they may be simple or elaborate as desired, with the understanding that reward is its own merit and prizes for costumes will certainly be awarded. In true New England tradition music will be furnished by the Wayside Inn Early American Dance Orchestra.

There will be souvenir dance programs for the ladies, ample instruction in old-style dancing, and in general a complete, full and satisfying New England evening. Do not miss this gala occasion since it will be one of those once in a lifetime events.

Wednesday evening — President's Reception in the Ballroom. Banquet in the Main Dining Room at which the feature speaker will be President Killian of Massachusetts Institute of Technology. The cost will be \$4.75 per person, and reservations may be made at the registration desk.

Thursday evening — Informal Dancing which will include one hour of typical New England entertainment by a special novelty orchestra as definitely New England as is the one for the Old-Fashioned Barn Dance.

SPORTS: The annual competitions for the Mershon Golf and Tennis Trophies will be held during the week of the meeting. In addition, nearby country clubs will be available for individual play. Adjacent to the headquarters hotel, facilities for horseshoe pitching, bowling, table tennis and a "pitch and putt" golf course will be arranged. If individuals are interested in sailing or motor boating, the committee will help make arrangements for the hiring or chartering of boats from local yards.

LADIES' ENTERTAINMENT:

Monday, June 20

3-5 P.M. Get Acquainted Tea.

Tuesday, June 21

9 A.M.-12:45 P.M. Conducted Tour—Historic Salem and Marblehead.

2:30-6 P.M. Inspection Trip WBZ Television Station, Allston, Mass.

Wednesday, June 22

2:30 P.M. Handwriting Analyst—Bridge and Prizes.

Thursday, June 23

10:00 A.M. Book Review.

1:30-6:00 P.M. Conducted Tour—North Shore and Gloucester.

Friday, June 24

Special conducted tours as requested.

From Monday through Friday, special adjoining meeting rooms will be available for the ladies' use, for cards, special entertainment, etc., to be used exclusively for ladies' entertainment.

Arrangements for sports, such as golf and tennis will be made for those interested.

NOTE: A nominal charge of \$1.00 will be made for each trip involving transportation.

INSPECTION TRIPS: Inspection trips to the following places have been arranged. Others will be announced at the convention.

1. Boston Naval Shipyard—One of the Navy's oldest yards. A rope walk and anchor factory are among the many interesting things to be shown. The historical old Ironsides is one of the first. This trip is on Monday, June 20, 9:30 a.m.

2. M.I.T. and Harvard—The activities of these two institutions are world famous. The inspection trip will include radar laboratories, computation laboratories, nuclear research facilities, museums, and several other places on the campuses. This trip is on Tuesday, June 21, 9:30 a.m.

3. WBZ Television—One of Boston's largest and most modern television stations. The studio as well as the broadcasting facilities will be visited. This trip is on Tuesday, June 21, 1:30 p.m.

4. Lynn Telephone Exchange—The working of a modern crossbar telephone exchange will be shown. This trip is on Wednesday, June 22, 1:30 p.m.

5. The Mystic Station Boston Edison Company—The Mystic Station has about three large generators, two of 57500 KVA and one of 71875 KVA. The distribution system includes two 110,000 volts transformer equipment which are for changing under loads. This trip will include inspection of these facilities. This trip is on Thursday, June 23, 9:30 a.m.

6. The General Electric Company—This trip will include visits to both Lynn Plant Divisions of the company, which will include meters, instruments, motors, aircraft gas turbines, lighting and rectifiers, and turbines. This trip is on Thursday, June 23, 1:30 p.m.

7. Excursion boat trip around historical Marblehead Harbor will be available to those desiring it.

Friday, June 24, will be a full day of activities for Students. In the morning the winners of the District prizes from the odd-numbered Districts (this being an odd-numbered year) will present their papers before a joint student and member session. The afternoon will start with a special luncheon, as guests of the General Electric Company at the Thompson Club, Nahant, Massachusetts. Transportation will be provided. The day will wind up with either a boat trip or field day where tennis, baseball, or swimming can be enjoyed on the grounds of the Thompson Club. The wives of students are cordially invited to attend.

SUMMER GENERAL MEETING COMMITTEE

E. W. Davis, *General Chairman* M. A. Princi, *Vice Chairman*
R. E. Muehlig, *Secretary-Treasurer*

	<i>Members at Large</i>	
R. G. Porter	R. G. Slauer	F. P. Taugher
	<i>Committee Chairmen</i>	
	<i>Hotels</i>	<i>Meetings and Papers</i>
<i>Registration</i>	R. G. Connors	J. O'R. Coleman
A. L. O'Banion		
<i>Publicity</i>	<i>Inspection</i>	<i>Hospitality</i>
H. B. McIntyre	J. R. Macintyre	F. S. Bacon, Jr.
<i>Entertainment and Banquet</i>	<i>Finance</i>	<i>Ladies</i>
G. J. Crowdes	C. A. Corney	Mrs. F. B. Haeussler
<i>Transportation</i>	<i>Students</i>	<i>Sports</i>
A. B. Whitehouse	E. W. Boehne	A. F. Lukens

COMMITTEE MEETINGS

Monday, June 20

9:30 a.m.	—Vice-Presidents and Dist. Secretaries	Standish Studio
9:30 a.m.	—Nucleonics	Suite A
9:30 a.m.	—Substations	Meeting Room Rear
9:30 a.m.	—Joint Subcommittee on Probability Methods	Suite B
9:30 a.m.	—Subcomm. on Std. Temp. Rises	
2:00 p.m.	—Student Branches	Standish Studio
2:00 p.m.	—Electric Welding	Suite A
2:00 p.m.	—Subcom. on Measurements in the Field	Meet. Rm. Rear
2:00 p.m.	—Publication	Suite B
5:30 p.m.	—Section Delegates Get-Together	Meeting Room
8:00 p.m.	—Technical Program Committee	Priscilla Room

Tuesday, June 21

9:30 a.m.	—Professional Group Coordinating	Standish Studio
9:30 a.m.	—D.C. Machinery	Meeting Room Rear
9:30 a.m.	—Communication and Science Coordinating	Suite B
9:30 a.m.	—Transformers	Suite A
2:00 p.m.	—Education	Meeting Room Rear
2:00 p.m.	—Registration of Engineers	Suite B
2:00 p.m.	—Subcommittee on Technical Activities	Standish Studio
2:00 p.m.	—Electronics	Suite A
4:30 p.m.	—Communications	Meeting Room Front

Wednesday, June 22

7:00 a.m.	—Industry Coordinating	Green Room
8:30 a.m.	—Edison Medal Committee	Suite B
8:30 a.m.	—Energy Sources Subcommittee	Suite A
12:30 p.m.	—Luncheon—Lamme Medal Committee	Green Room
2:00 p.m.	—Planning and Coordination	Standish Studio
2:00 p.m.	—Transfers	Meeting Room Rear
2:00 p.m.	—Subcommittee on Resistance Heating	Suite B
2:30 p.m.	—Dist. #1 Executive Committee	Green Room
4:00 p.m.	—Safety	Suite A

Thursday, June 23

7:30 a.m.	—Industrial Control	Meeting Room Rear
9:30 a.m.	—Subcommittee on Radiant Heating	Standish Studio
9:30 a.m.	—Board of Directors	Priscilla Room
9:30 a.m.	—Working Group on Transient Characteristics of Capacitance Potential Devices	Suite B
12:00 noon	—Luncheon—General Industry Applications	Green Room
1:00 p.m.	—Subcomm. on Lightning Prot. Devices	Meeting Room Rear
2:00 p.m.	—Subcommittee on Radiant Heating	Standish Studio
2:00 p.m.	—Subcommittee on Infrared Applications	Suite B
2:00 p.m.	—Board of Directors	Priscilla Room
2:00 p.m.	—Joint Subcommittee on Telemetering	Suite A
3:00 p.m.	—Protective Devices	Meeting Room Rear
2:00 p.m.	—Land Transportation	Green Room

Friday, June 24

9:30 a.m.	—Subcommittee on Metallic Rectifiers	Presidents Room
9:30 a.m.	—NEMA Codes and Standard Com.	Meeting Room Rear
9:30 a.m.	—Basic Science	Standish Studio
9:30 a.m.	—Subcommittee on Storage Batteries	Suite A
9:30 a.m.	—Power Generation	Suite B
2:00 p.m.	—Power Coordinating	Standish Studio
2:00 p.m.	—Subcommittee on Pulp and Paper Industry	Suite A
2:00 p.m.	—Subcommittee on Metallic Rectifiers	Presidents Room
2:00 p.m.	—NEMA Codes and Standard Com.	Meeting Room Rear

NEW OCEAN HOUSE

