

**American Institute of
Electrical Engineers**



**WINTER
GENERAL
MEETING**

Program

*Please retain for use during
entire meeting*

NEW YORK, N. Y.

JANUARY 22-26

1951

Meeting Headquarters

HOTEL STATLER

Future AIEE Meetings

Southern District Meeting

Miami, Fla.

April 11-13, 1951

(Final date for submitting papers—closed)

North Eastern District Meeting

Syracuse, N. Y.

May 2-4, 1951

(Final date for submitting papers—February 1)

Great Lakes District Meeting

Madison, Wis.

May 17-19, 1951

(Final date for submitting papers—February 16)

Summer General Meeting

Royal York Hotel, Toronto, Ontario, Canada

June 25-29, 1951

(Final date for submitting papers—March 27)

Pacific General Meeting

Portland, Oreg.

August 20-23, 1951

(Final date for submitting papers—May 21)

Fall General Meeting

Hotel Cleveland, Cleveland, Ohio

October 22-26, 1951

(Final date for submitting papers—June 22)

GENERAL INFORMATION

This Winter General Meeting features an expanded program of professional and social activities. The technical program is the largest in the history of the Institute.

During the meeting three medals will be presented to Institute members. At a General Session to be held Monday afternoon, the Hoover Medal will be presented to Dr. Karl T. Compton. At this time also Ralph J. Kochenburger will be awarded the Alfred Noble Prize and the Institute Prize Paper Awards will be made. Dr. Compton in responding will speak on the subject "Engineers and National Security." Our president, Titus G. LeClair will open this General Session with an address entitled, "Continuing Technical Leadership."

In General Sessions to be held Tuesday and Wednesday afternoons, the John Fritz Medal will be awarded to Dr. Vannevar Bush and the Edison Medal to O. B. Blackwell respectively.

A group of inspection trips has also been arranged, closely allied with the subject matter of the technical program. On the social side, there will be a dinner-dance, a smoker, theater tickets for out-of-town members, and special entertainment for the ladies.

REGISTRATION FEES REQUIRED. As instituted two years ago, a registration fee of \$3.00 has been established for members and \$5.00 for nonmembers. These fees have made the meetings self-supporting and have been largely responsible for postponing 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. Press headquarters will be in Conference Room 8. The Institute rooms and offices on the 10th floor of the Engineering Societies Building are open to all members. Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail are asked to collect same promptly at the mail and telegram desk. Please check this desk frequently.

BROADCAST TICKETS have been obtained for many of the principal broadcasts in various evenings during the week. These are available at the entertainment desk. Some prior reservations and theater tickets are still available.

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 February 9. 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 presentations 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. Members may obtain preprints of numbered papers at the registration desk at the uniform price of 30¢ each (60¢ each to nonmembers). 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 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 ultimately will be published as AIEE Proceedings and in the Transactions. Conference Papers denoted by CP.** are intended for presentation only, and are not available.

SCHEDULE OF EVENTS

For Entertainment, Inspection Trips and Points of Interest, See Separate Folder

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|--|--|---|--|---|
| <p>10:00 A.M. Relays and Instrument Transformers (Ballroom)</p> <p>Field Testing of Insulation and Oil Tests (Skytop)</p> <p>New Types of Power Rectifiers (Penn Top South)</p> <p>Basic Sciences (Keystone Room)</p> | <p>9:30 A.M. Operation of Power, Communication and Transportation Utilities Under Military Attack (Ballroom)</p> <p>Relays and Industrial Power Systems (Georgian Room)</p> <p>Electronic Instruments At High Frequencies (Skytop)</p> <p>Magnetic Materials (Keystone Room)</p> <p>Cables for Chemical Plants (Parlor 2)</p> <p>Management (Penn Top North)</p> <p>Industrial Control (Parlor 1)</p> <p>Semi-Conductors (Penn Top South)</p> | <p>9:30 A.M. Transformers (Ballroom)</p> <p>Insulation (Georgian Room)</p> <p>Electronic Education (Penn Top North)</p> <p>Instruments and Measurements (Skytop)</p> <p>New Techniques of Network Synthesis (Keystone Room)</p> <p>Recent Developments in Electronic Telegraph Methods (Parlor 1)</p> <p>Arc Welding (Parlor 2)</p> <p>Electrical Applications in Hazardous Areas (Penn Top South)</p> | <p>9:30 A.M. Transmission (Ballroom)</p> <p>Transformers (Georgian Room)</p> <p>Insulation and Synchronous Machinery (Keystone Room)</p> <p>Radiation Detection Devices (Penn Top North)</p> <p>Computing Devices (Penn Top South)</p> <p>A New Carrier System for Medium Haul Telephone Circuits (Parlor 1)</p> <p>Industrial Power Systems (Skytop)</p> <p>Electric Space Heating and Heat Pumps (Parlor 2)</p> | <p>9:30 A.M. Capacitors and Switchgear (Ballroom)</p> <p>Power Generation (Georgian Room)</p> <p>Some New Electron Tubes (Penn Top North)</p> <p>Radio Communication, Point-to-Point and Mobile (Parlor 1)</p> <p>Feedback Control Systems (Penn Top South)</p> <p>Heavy Tractor (Parlor 2)</p> <p>Rotating Machinery (Skytop)</p> <p>I. and M. Standards and Spectrographic Instrumentation (Keystone Room)</p> |

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| <p>2:30 P.M. General Session (Ballroom)</p> | <p>1:45 P.M. General Session (Georgian Room)</p> <p>2:30 P.M. Operation of Power, Communication and Transportation Utilities Under Military Attack (Ballroom)</p> <p>Protective Devices (Georgian Room)</p> <p>Nucleonic Instruments (Skytop)</p> <p>Therapeutics (Parlor 2)</p> <p>Electrical Breakdown in Gases (Keystone Room)</p> <p>Industrial Control (Parlor 1)</p> <p>Catholic Protection (Penn Top South)</p> <p>Sections Committee (Penn Top North)</p> <p>5:30 P.M. The Smoker (Hotel Commodore)</p> | <p>1:45 P.M. General Session (Georgian Room)</p> <p>2:30 P.M. Insulated Conductors (Georgian Room)</p> <p>Transformers (Ballroom)</p> <p>Insulation (Keystone Room)</p> <p>Magnetic Amplifiers (Penn Top South)</p> <p>Instruments and Measurements (Skytop)</p> <p>Advances in the Communication Switching Art, Telephone and Telegraph (Parlor 1)</p> <p>Graduate Study in Electrical Engineering (Penn Top North)</p> <p>Resistance Welding (Parlor 2)</p> | <p>2:00 P.M. Capacitors (Ballroom)</p> <p>Substations (Keystone Room)</p> <p>Symposium on the Determination of What Units in What Plants Should be Used for Load and Frequency Control (Georgian Room)</p> <p>Power Tubes for Electronic Heating (Penn Top North)</p> <p>Analog Computers (Penn Top South)</p> <p>Electric Paths Under the Sea—Century (Parlor 1)</p> <p>Industrial Power Systems (Skytop)</p> <p>The Measurement and Control of Audible Noise from Fluorescent Lamp Ballasts (Parlor 2)</p> <p>7:00 P.M. Dinner Dance (Hotel Statler)</p> | <p>2:00 P.M. Transmission and Distribution (Ballroom)</p> <p>Switchgear (Keystone Room)</p> <p>Hydroelectric Outage Experience (Georgian Room)</p> <p>Some New Electronic Devices and Techniques (Penn Top North)</p> <p>Color Television (Skytop)</p> <p>Feedback Control Systems (Penn Top South)</p> <p>Light Traction (Parlor 2)</p> <p>Rotating Machinery (Parlor 1)</p> |
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Monday, January 22

10:00 a.m.—Relays and Instrument Transformers

Ballroom

J. E. CLEM, Presiding

- 51-42. Relay Protection of A-C Generators. Project Committee on Generator Protection.
- CP.** Ground Relay Protection for Generators. E. T. B. Gross, Illinois Institute of Technology.
- 51-38. Bibliography of Relay Literature 1947-1949. Project Committee on Relay Bibliography. Presentation by title only.
- 51-113. Report on Transformer Magnetizing Current and Its Effect on Relaying and Oil Switch operation. Subcommittee on Magnetization Characteristics of Transformers.
- ACO.*
- CP.** Overvoltage Caused by Current Transformers in a Generator Differential Relaying Circuit. C. R. Mason, General Electric Company.
- 51-133. A Report on Proposed Changes In the Standards for Instrument Transformers. Project Subcommittee on Rating Factors for Instrument Transformers.
- ACO.*
- 51-14. Neutral Inversion of a Single Potential Transformer Connected Line to Ground on an Isolated Delta System. L. L. Gleason, Puget Sound Power and Light Co.

10:00 a.m.—Field Testing of Insulation and Oil Tests

Skytop

F. C. DOBLE, Presiding

- CP.** Current Practices in Electrical Tests on Dielectrics in the Field. Subcommittee on Electrical Tests on Dielectrics in the Field.
- 51-43. Insulation Field Test Results. W. F. Dunkle, Pennsylvania Power and Light Co.
- ACO.*
- 51-37. Power-Factor Testing of Electrical Equipment to Determine Insulation Values. J. A. Rawls, Virginia Electric and Power Co.
- ACO.*
- CP.** A New Concept of Insulating Oil Characteristics. F. C. Doble, Doble Engg. Co.

10:00 a.m.—New Types of Power Rectifiers

Penn Top South

W. N. FARQUHAR, Presiding

- CP.** The Mechanical Rectifier. Otto Jensen, ITE Circuit Breaker Co.
- CP.** Commutating Reactor Control for Mechanical Rectifiers. E. J. Diebold, ITE Circuit Breaker Co.
- CP.** Development of a Pumpless Ignitron. C. C. Herskind, E. J. Remscheid, General Electric Co.
- CP.** Studies of Degassing Processes by Mass Spectrometer. J. G. Neuland, General Electric Co.
- CP.** Application of Pumpless Rectifiers. Ralph Siegel, General Electric Co.
- 51-131. Sealed Ignitron Rectifiers for Urban Transit Power Supply. D. W. Borst, General Electric Co. Presentation by title only.

10:00 a.m.—Basic Sciences

Keystone Room

M. G. MALTI, Presiding

- 51-44. Transmission Line Load Impedance for Maximum Efficiency. S. G. Lutz, Bronxville, N. Y.
- 51-45. Networks for Which Magnitude or Phase Angle of Input Impedance or Transfer Admittance Remains Constant as Load Varies. R. S. Berkowitz, University of Pennsylvania.
- 51-46. The Generalized Transmission Matrix Stability Criterion. P. M. Honnell, Washington University.

- 51-47. Loci of Complex Impedance and Admittance Functions. E. L. Michaels, The Rauland Corp.
- 51-48. Contact Transients in Simple Electrical Circuits. F. E. Martin, H. E. Stauss, Naval Research Lab.
- 51-49. The Finite Representation of Impulse Functions in Solving ACO.* Differential Equations. J. J. Smith, P. L. Alger, General Electric Co.
- 51-50. Calculation of Flux Distributions with Saturation. H. Poritsky, General Electric Co. Presentation by title only.
- 51-6. Tables of Green's Functions, Fourier Series, and Impulse Functions for Rectangular Coordinate Systems. J. J. Smith, General Electric Co. Presentation by title only.

2:30 p.m.—General Session

Ballroom

PRESIDENT T. G. LeCLAIR, Presiding

Address: Continuing Technical Leadership. President T. G. LeClair.

Award of Student Prizes.

Award of Institute Prizes in the Five Technical Divisions.

Presentation of the Alfred Noble Prize to Ralph J. Kochenburger by E. E. Howard, Past President, American Society of Civil Engineers.

Hoover Medal Presentation to Dr. Karl T. Compton.

Presiding: Dr. Scott Turner, Chairman, Hoover Medal Board of Award.

Career Citation: Dr. C. G. Suits, Vice-President and Director of Research, General Electric Company.

Presentation of Medal: Dr. Scott Turner.

Response, and Address: Engineers and National Security. Dr. Karl T. Compton, Chairman of the Board, Massachusetts Institute of Technology Corporation.

ETA KAPPA NU DINNER

The Eta Kappa Nu Association will hold its Annual Recognition Dinner on Monday evening, January 22, 1951. This dinner will be held at 6:30 p.m. in the Blue and Green Room, Hotel McAlpin, Broadway and 34th Street, New York City, N. Y. At this dinner, Mr. D. P. Campbell will receive the Eta Kappa Nu plaque in commemoration of his being chosen the Most Outstanding Young Electrical Engineer for 1950. Honorable Mention certificates will be awarded to Messrs. R. W. Mayer, A. W. Edwards, K. A. Kesselring. These gentlemen were selected from among 50 candidates for the 1950 recognition by a jury consisting of Dr. Erich Hausmann, Dean, Polytechnic Institute of Brooklyn; Messrs. A. H. Kehoe, Vice President, Consolidated Edison, Incorporated; Robin Beach, Robin Beach Associates; Fischer Black, Editor, Electrical World; and F. E. Sanford, National President of Eta Kappa Nu Association.

COLUMBIA ENGINEERS DINNER

THE COLUMBIA ELECTRICAL ENGINEERS DINNER will be held at 6:30 p.m., Monday, January 22, at the Old Timer's Grill, 7 East 40th Street. Informal.

Tuesday, January 23

9:30 a.m.—Operation of Power, Communication and Transportation Utilities Under Military Attack—Panel Discussion

Ballroom

H. I. ROMNES, Presiding

I. INTRODUCTION

H. I. Romnes—American Telephone and Telegraph Co.

American Institute of Electrical Engineers

II. DESTRUCTIVE EFFECTS OF ATOMIC WEAPONS AND PROTECTIVE MEASURES

- (a) Physical Structures
W. E. Kelley—Atomic Energy Commission
- (b) Personnel
Dr. Bernard S. Wolf—Atomic Energy Commission

III. EFFECT OF BOMB BLAST ON POWER STATIONS DURING WORLD WAR II

J. G. Noest
Consolidated Edison Company of New York, Inc.

IV. MOBILIZATION BY COMMUNICATION COMPANIES

- (a) Telephone Industry
O. G. Smith, Illinois Bell Telephone Company
- (b) Telegraph Industry, Domestic and Ocean Cables
I. S. Coggeshall, Western Union Telegraph Company
- (c) International Radio Communications
T. H. Mitchell, RCA Communications
- (d) Broadcasting
A. F. Van Dyck, RCA Laboratories Division

9:30 a.m.—Relays and Industrial Power Systems

Georgian Room

J. S. GAULT and E. L. MICHELSON, Presiding

- CP.** Relaying of Interconnections Between Industrial and Utility Generating Systems. Project Committee on Relaying of Interconnections Between Industrial and Utility Generating Systems.
- CP.** Industrial Power System Protection. J. E. Barkle, H. G. Barnett, Westinghouse Electric Corp.
- CP.** Bendix Products Division's Seven Years Operating Experience with Split Bus Substation. T. W. Dugdale, Indiana and Michigan Electric Co.; K. K. Falk, Bendix Aviation Corp.
- CP.* Relay Protection of Mobile, Alabama Alumina Plant. F. H. Kimmel, Aluminum Ore Co.

9:30 a.m.—Electronic Instruments

Skytop

RUDOLPH FELDT, Presiding

- CP.** The NOL Self-Contained Multi-Channel Cathode Ray Recorder. S. H. Silver, U. S. Naval Ordnance Laboratory.
- CP.** Dynamic Strain Analysis. C. M. Hathaway, K. C. Rock, Hathaway Instrument Co.
- CP.** Polarimeter for the Study of Low Frequency Echoes. A. H. Benner, H. J. Nearhoof, Pennsylvania State College.
- CP.** New Oscillograph Recording Cameras. H. P. Mansberg, Allen B. Du Mont Laboratories, Inc.
- CP.** Electronic Counting of Worn-Out Paper Money. H. M. Joseph, National Bureau of Standards.

9:30 a.m.—Magnetic Materials at High Frequencies

Keystone Room

R. M. BOZORTH, Presiding

- CP.** Electronic and Nuclear Magnetic Resonance. K. K. Darrow, Bell Telephone Labs., Inc.
- CP.** Structure and Properties of the Ferrites. F. G. Brockman, Philips Labs.
- CP.** Measurement Technique for Magnetic Materials in the Frequency Range 10^6 to 2.5×10^{10} c/s. W. B. Wesphal, Massachusetts Inst. of Technology.
- CP.** Production and Properties of Magnetic Materials Used at High Frequencies. E. Albers-Schoenberg, General Ceramics and Steatite Corp.

Winter General Meeting

9:30 a.m.—Cables for Chemical Plants

Parlor 2

L. W. ROUSH, Presiding

- CP.** The Installation of Electrical Cables in Chemical Plants. J. J. Loustaunau, E. B. Badger & Sons Company.
- CP.** The Installation of Electrical Cables in Chemical Plants. R. C. Graham, Rome Cable Corporation.
- CP.** The Installation of Electrical Cables in Chemical Plants. Victor Siegfried, W. P. Lewis, American Steel and Wire Co.
- CP.** An Installation of 15 KV Polyethylene Insulated Cable. P. N. Lubke, Ford, Bacon and Davis, Inc.

9:30 a.m.—Management

Penn Top North

C. J. BELLER, Presiding

- CP.** The Organization for the War Effort. Leslie E. Simon, Brigadier General, U. S. Army.
- CP.** Management Development. William Maloney, ESSO Standard Oil Co.

9:30 a.m.—Industrial Control

Parlor 1

G. W. HEUMANN, Presiding

- CP.** A New D-C Contactor—Laboratory and Field Development. F. C. Iglehart, B. C. Wells, Westinghouse Electric Corp.
- 51-51. An Electronic Power Source for Large D.C. Contact Testing. D. L. Pettit, Square D Co.
- 51-52. Instrumentation for Analysis of Contact Wear. M. R. Swine-ACO.* hart, Cutler-Hammer, Inc.

9:30 a.m.—Semi-Conductors

Penn Top South

C. B. BROWN, Presiding

- CP.** Germanium Photocells. Mrs. F. A. Stabl, Sylvania Electric Products.
- CP.** Noise Due to Current in Semi-conductors. S. J. Angello, Westinghouse Electric Corp.
- CP.** Circuit Application Problems in Transistors. C. B. Brown, Naval Ordnance Lab.
- CP.** The Hall Effect. W. C. Dunlap, Jr., General Electric Co.

1:45 p.m.—General Session

Georgian Room

PRESIDENT T. G. LeCLAIR, Presiding

John Fritz Medal Presentation to Dr. Vannevar Bush.

Presiding: James F. Fairman, Chairman, John Fritz.

Medal Board of Award.

Career Citation: Everett S. Lee, Executive Engineer, General Engineering and Consulting Laboratory, General Electric Company.

Presentation of Medal: James F. Fairman.

Response: Dr. Vannevar Bush.

2:30 p.m.—Operation of Power, Communication and Transportation Utilities Under Military Attack—Panel Discussion—Continued

Ballroom

EARLE WILD, Presiding

V. MOBILIZATION BY TRANSPORTATION COMPANIES

- (a) Transportation and Civil Defense
Col. S. H. Bingham, Chairman, Board of Transportation of the City of New York.

- (b) The Railroad Problem, H. F. Brown.
New York, New Haven and Hartford Railroad Company.

VI. MOBILIZATION BY POWER COMPANIES

- (a) Review of Hypothetical Atomic Attack Problem in Chicago. O. E. Anderson, Commonwealth Edison Company.
(b) Emergency Procedure of a Metropolitan Utility under Military Attack. O. W. Manz, Jr., Consolidated Edison Company of New York, Inc.

2:30 p.m.—Protective Devices

Georgian Room
W. J. RUDGE, Presiding

- 51-63. Some Effects of Lightning Arrester Protective Characteristics and Location Upon Station Apparatus Protection. J. W. Kalb, The Ohio Brass Co.
51-64. Application of Resonant Grounding in Power Systems in the U. S. E. T. B. Gross, Illinois Institute of Technology; E. W. Atherton, Drexel Hill, Pa.
51-65. A Study of Conduction Phenomena Near Current Zero for an A-C Arc Adjacent to Refractory Surfaces. T. E. Browne, Jr., A. P. Strom, Westinghouse Electric Corp.
51-66. Power System Fault Control. Working Group on Power System Fault Limitation.
51-1. The Power Interruption Testing of Lightning Arresters. Otto Ackermann, Westinghouse Electric Corp.
CP.** Standardization of Rating of Neutral Grounding Reactors. J. L. Thomason, General Electric Co.

2:30 p.m.—Nucleonic Instruments

Skytop
G. A. MORTON, Presiding

- CP.** Role of Instrumentation in Civil Defense. R. L. Butenhoff, Atomic Energy Commission.
CP.** A Portable Gamma Scintillation Counter. C. J. Borkowski, R. A. Dandl, Oak Ridge National Lab.
CP.** A Vibrating Reed Recording Electrometer. J. V. Werme, Brown Instrument Co.
CP.** Ion Current Measurement with Stabilized Zero Ionization Indicator. A. J. Williams, Jr., R. E. Watson, W. R. Clark, W. G. Amey, Leeds and Northrup Co.

2:30 p.m.—Therapeutics

Parlor 2
H. D. MORELAND, Presiding

- CP.** The Bases for Establishment of Maximum Energy Ratings for X-Ray Tubes. T. H. Rogers, Machlett Labs., Inc.
CP.** High Speed Exposure Timing in the Application of X-Rays. R. L. Wright, Westinghouse Electric Corp.
CP.** The Electrical Conductivity of Cadmium Sulphide When Exposed to Pulsating X-Radiation. J. E. Jacobs, General Electric X-Ray Corp.
CP.** The Intensification of X-Ray Fluorescent Images. W. S. Lusby, Westinghouse Electric Corp.
CP.** A Rotating Anode Tube for Medium Powered Self-Rectified X-Ray Equipment. W. W. Lang, Eureka X-Ray Tube Corp.

2:30 p.m.—Electrical Breakdown in Gases

Keystone Room
T. B. JONES, Presiding

- CP.** Electrical Breakdown in Gases at High Pressure. J. G. Trump, Massachusetts Inst. of Technology.
CP.** Electrical Breakdown of Very Short Gaps. L. H. Germer, Bell Telephone Labs., Inc.

- CP.** The Roll of Corona Discharge in the Electrical Precipitation Process. H. J. White, Research Corp.
CP.** The Operation of Carbon Brushes at High Altitudes. Dimiter Ramadanoff, National Carbon Co.

2:30 p.m.—Industrial Control

Parlor 1
G. W. HEUMANN, Presiding

- 51-13. Transient Response of Saturable Reactors with Resistive Load. H. F. Storm, General Electric Co.
CP.** Electronically Controlled Half-Wave Excitation for D-C Shunt Motors. W. S. Kupfer, Jr., E. E. Moyer, Rensselaer Polytechnic Institute.
CP.** A Short-Cut Method for Determining the Coil Temperature Rise of Solenoids on Duty Cycle. T. M. Spittler, General Electric Co.
CP.** Hermetically Sealed Components for Industrial Control. E. B. Steinberg, Remington Rand, Inc.

2:30 p.m.—Cathodic Protection

Penn Top South
R. M. WAINWRIGHT, Presiding

- CP.** The Electrical Nature of Corrosion and Cathodic Protection. H. D. Holler, National Bureau of Standards.
CP.** Cathodic Protection of Water Storage Tanks. H. W. Hosford, Harco Corp.
CP.** Economic Aspects of Cathodic Protection. R. M. Wainwright, Univ. of Illinois.
CP.** Field Practices on Cathodic Protection.

Wednesday, January 24

9:30 a.m.—Transformers

Ballroom
J. B. HODTUM, Presiding

- 51-113. Report on Transformer Magnetizing Current and Its Effect on Relaying and Oil Switch operation. Subcommittee on Magnetization Characteristics of Transformers.
CP.** Inrush Currents. W. H. Mutschler, Allis Chalmers Mfg. Co., L. A. Finzi, Carnegie Inst. of Technology.
51-53. Transformer Magnetizing Inrush Current. T. R. Specht, Westinghouse Electric Corp.
51-54. Improved Core Form Transformer Winding. E. J. Grimmer, ACO.* W. L. Teague, Westinghouse Electric Corp.
51-55. An Investigation of Audio Noise in Substation Type Transformers. J. H. Vivian, Southern California Edison Co.; R. R. Peck, Line Material Co.
51-56. Acoustic Models of Transformer Installations. Briggs Gettys, W. B. Conover, General Electric Co.

9:30 a.m.—Insulation

Georgian Room
J. W. JONES, Presiding

- CP.** Evaluation of Insulation Materials. F. Brown, Jr., A. Pletenik, G. W. Young, General Electric Co.
51-127. A.C. and D.C. Voltage Endurance Studies on Mica Insulation for Electrical Machinery. G. L. Moses, Westinghouse Electric Corp.
51-69. Aging of Class B Insulating Material in Nitrogen. H. C. Stewart, L. C. Whitman, General Electric Co.

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51-128. D.C. Overpotential Testers for High Voltage Insulation Fault ACO.* Detection. F. W. Atkinson, The Takk Corp.; J. K. Hewson, The John Hewson Co.

51-129. Dielectric Absorption Studies at Higher Voltages on Large ACO.* Rotating Machines. W. Schneider, Westinghouse Electric Corp.

51-130. Non-Destructive Testing of Generator Insulation. E. H. ACO.* Povey, F. S. Oliver, Doble Engineering Co.

9:30 a.m.—Electronic Education

Penn Top North

J. T. THWAITES, Presiding

CP.** Electronic Education Requirements for Industry. Walther Richter, Allis Chalmers Mfg. Co.

CP.** Electronic Education Requirements for the Research Laboratory, W. G. Shepherd, University of Minnesota.

CP.** Electronics in Electrical Education. J. D. Ryder, University of Illinois.

9:30 a.m.—Instruments and Measurements

Skytop

J. H. MILLER, Presiding

51-57. Total Hemispherical Radiometers. J. T. Gier, R. V. Dunkle, Univ. of California.

51-28. Output Analysis and Alignment Techniques for Phase-Rotation Single Sideband Transmitters. Oliver Whitby, D. R. Scheuch, Stanford Research Institute.

51-29. An Electromechanical Transducer. J. F. Engelberger, H. W. Kretsch, Manning, Maxwell and Moore, Inc.

51-58. An Electromagnetic Induction Method of Measuring Oscillating Fluid Flow. A. J. Morris, Office of Naval Research; J. H. Chadwick, Stanford Univ.

CP.** Resistance Thermometry System for Measuring Turbine Blade Temperatures. M. L. Greenough.

51-59. Three-Phase Measurements of Resistance. L. W. Matsch, N. C. Basu, Illinois Inst. of Technology; G. R. Horcher, Univ. of Kansas. Presentation by title only.

9:30 a.m.—New Techniques of Network Synthesis

Keystone Room

H. J. CARLIN, Presiding

CP.** The Application of Special Functions to Network Synthesis. R. M. Fano, Massachusetts Inst. of Technology.

CP.** Network Synthesis without Mutual Reactance. R. J. Duffin, Carnegie Inst. of Technology.

CP.** Synthesis of R-C Networks with Prescribed Transfer Function. A. D. Fialkow, Polytechnic Inst. of Brooklyn.

CP.** Transducer Design Based on Statistical Properties of the Signal. R. B. Blackman, Bell Telephone Labs., Inc.

9:30 a.m.—Recent Developments in Electronic Telegraph Methods

Parlor 1

J. A. DUNCAN, JR., Presiding

51-60. An Electronic Time Division Multiplex Telegraph Set. T. A. Hansen, R. D. Slayton, Teletype Corp.

51-61. Four-Two Channel Time Division Multiplex Telegraph System for Long Distance Radio Circuits. W. C. Peterman, All America Cables and Radio, Inc.; A. Minc, Mackay Radio and Telegraph Co.

51-5. A Teleprinter Signal Bias Meter. H. F. Wilder, Western ACO.* Union Telegraph Co.

Winter General Meeting

51-62. A Nationwide FM Telegraph Network. F. B. Bramhall, L. A. Smith, Western Union Telegraph Co.

9:30 a.m.—Arc Welding

Parlor 2

L. P. WINSOR, Presiding

51-142. The Physical Mechanism of Low- and High-Current Arcs, and their Relation to the Welding Arc. Wolfgang Finkelnburg. Engineer Research and Development Laboratories. Presentation by title only.

51-143. New Electrodes for Stabilizing Inert-Gas Welding Arcs. J. D. Cobine, C. J. Gallagher, General Electric Co. Presentation by title only.

51-139. AC Arc Welders with Saturable Reactor Control. S. Oestreicher, Harnischfeger Corp., Presentation by title only.

CP.** Report of Subcommittee on Fundamentals of Electric Arc Research, R. C. McMaster, Battelle Memorial Institute.

CP.** Gas Coverage of the Inert Welding Arc. R. W. Tuthill, General Electric Co.

CP.** Stud Welding Method. T. L. Hufert, Graham Mfg. Corp. Presented by Jack Nater, Graham Mfg. Corp.

CP.** Application and Developments in the Electric Arc Stud Welding Field, R. C. Singleton, Nelson Stud Welding Co.

9:30 a.m.—Electrical Applications in Hazardous Areas

Penn Top South

K. PINDER, Presiding

CP.** Tests of Electrostatic Control Equipment for Industrial Applications. Robin Beach, Engineers Associated.

CP.** Lightning Protection for Hazardous Buildings and Structures. J. Z. Linsenmeyer, E. Beck, Westinghouse Electric Corp.

50-221. Instruments for Detection of Toxic and Explosive Gases. ACO.* N. W. Hartz, Mines Safety Appliance Co.

CP.** Maintaining Electrical Apparatus for Hazardous Locations. General Industry Applications Committee.

CP.** Control Rooms vs NEMA Enclosures for Electrical Equipment. R. G. Rudrow, Atlas Powder Co.

1:45 p.m.—General Session

Georgian Room

PRESIDENT T. G. LeCLAIR, Presiding

Edison Medal Presentation to Otto B. Blackwell.

Origin of the Edison Medal: J. B. MacNeill, Chairman, Edison Medal Committee.

Career Citation: Dr. Harold S. Osborne, Chief Engineer, American Telephone and Telegraph Company.

Presentation of Medal: President LeClair.

Response: Otto B. Blackwell.

2:30 p.m.—Insulated Conductors

Georgian Room

HERMAN HALPERIN, Presiding

51-10. Radial and Tangential Stresses in Impregnated Paper Insulation. J. B. Whitehead, The Johns Hopkins University.

51-9. Thermal Transients on Buried Cables. F. H. Buller, General Electric Co.

51-67. 69 Kv Medium Pressure Gas-Filled Cable, Washington, D.C. H. W. Clark, Potomac Electric Power Co.

51-68. Lead-Alloy Sheaths for Underground Power Cable. Herman Halperin, C. E. Betzer, Commonwealth Edison Co.

51-22. Thermal Expansion Effects in Power Cables. C. S. Schifreen, Philadelphia Electric Co.

2:30 p.m.—Transformers

Ballroom

J. E. CLEM, Presiding

- 51-134. Provisional Progress Report on Proposed Changes of Temperature Rise Tests on Transformers—A.S.A. Transformer Standards C57.22. Subcommittee on Methods of Making Temperature Rise Tests on Transformers.
- CP.** Temperature Tests of Transformers by the Loading Back Tests. W. C. Hughes, A. & M. College of Texas.
- 51-4. Deterioration of Transformer Oil and Paper Insulation by Temperatures. F. J. Vogel, C. C. Petersen, L. W. Matsch, Illinois Inst. of Technology.
- 51-69. Aging of Class B Insulating Material in Nitrogen. H. C. Stewart, L. C. Whitman, General Electric Co.
- 51-135. Progress Report on Cooperative Tests on Aging of High-ACO.* Temperature Insulations. Subcommittee No. 5 on Coordinated Study of Life of Transformer Insulation.
- 51-132. Proposed AIEE Guide for Operation and Maintenance and ACO.* Dry-Type Transformers with Class B Insulation. Working Group No. 24 AIEE Com. on Transformers.

2:30 p.m.—Insulation

Keystone Room

J. W. JONES, Presiding

- 51-125. A Maintenance Inspection Program for Large Rotating Machines. J. S. Johnson, Westinghouse Electric Corp.
- CP.** Electrical Maintenance of Large Rotating Machines. H. F. McCullough, General Electric Co.
- 51-126. Routine Insulation Testing of Synchronous Machines. L. F. Hunt, J. H. Vivian, Southern California Edison Co.
- 51-41. Detection of Turn-to-Turn Faults in Large High Voltage Turbine Generators. R. M. Sexton, R. J. Alke, Westinghouse Electric Corp.
- CP.** A-C and D-C Dielectric Breakdown Testing of a Large Turbine Generator Stator. E. R. Morris, Philadelphia Electric Co.; R. D. Case, Westinghouse Electric Corp.
- CP.** Turn-to-Turn Insulation Over-potential Tests and General Dielectric Tests of a Turbo Generator. H. C. Marcroft, Pennsylvania Water and Power Co.

2:30 p.m.—Magnetic Amplifiers

Penn Top South

E. V. WEIR, Presiding

- 51-71. Progress Report of the AIEE Magnetic Amplifier Subcommittee. Subcommittee on Magnetic Amplifiers.
- 51-72. Steady-State Analysis of Self-Saturating Magnetic Amplifiers Based on Linear Approximations of the Magnetization Curve. W. H. Esselman, Westinghouse Electric Corp.
- CP.** Transient Response of Magnetic Amplifiers. L. A. Finzi, D. P. Chandler, D. C. Beaumariage, Carnegie Inst. of Technology.
- CP.** Magnetic Amplifiers using Ferrite Cores. W. C. Johnson, Princeton Univ.
- CP.** Types of Magnetic Amplifiers—A Survey. J. G. Miles, Engineering Research Associates, Inc.

2:30 p.m.—Instruments and Measurements

Skytop

W. R. CLARK, Presiding

- 51-30. Frequency Compensation of A-C Instruments. J. H. Miller, Weston Electrical Instrument Corp.
- 51-3. Marking of Varmeters. Subcommittee on Marking of Varmeters and Related Instruments.

- 51-74. A Winding Insulation Tester for D-C Armatures. F. H. Catlin, N. Rohats, General Electric Co.
- 51-75. A Hook-on Power Factor Meter. A. J. Corson, A. L. Nylander, General Electric Co.

2:30 p.m.—Advances in the Communication Switching Art, Telephone and Telegraph

Parlor 1

R. C. DAVIS, Presiding

- 51-76. A Full Automatic Private Line Teletypewriter Switching System. W. M. Bacon, G. A. Locke, Bell Telephone Labs., Inc.
- 51-77. Public Address System Used in Western Union Reperforator ACO.* Switching Centers. R. W. Good, The Western Union Telegraph Co.
- 51-78. Automatic Trunk Selection in Reperforator Switching. W. B. Blanton, The Western Union Telegraph Co.
- 51-79. Single Frequency Signaling System for Supervision and Dialing Over Long Distance Telephone Trunks. N. A. Newell, A. Weaver, Bell Telephone Labs., Inc.

2:30 p.m.—Graduate Study in Electrical Engineering

Penn Top North

J. D. RYDER, Presiding

- CP.** Mathematics in Electrical Graduate Education. E. W. Anderson, Iowa State College.
- CP.** Graduate Examination Procedures. J. G. Brainerd, University of Pennsylvania.
- CP.** The Importance of Graduate Work in the Power Field. W. A. Lewis, Illinois Inst. of Technology.

2:30 p.m.—Resistance Welding

Parlor 2

R. S. PHAIR, Presiding

- 51-137. Probabilities of Interference Between Resistance Welders. W. K. Boice, General Electric Co. Presentation by title only.
- 51-138. Welding Calculations: Effect of Conductor Configuration in Overhead Lines. H. W. Tietze, Public Service Electric & Gas Co. Presentation by title only.
- 51-140. Contact Resistance—the Contribution of Non-Uniform Current Flow. W. B. Kouwenhoven, W. T. Sackett, Jr., Johns Hopkins Univ.
- 51-141. Selection of Fuses for Resistance Welding Machines. C. B. Stadum, Westinghouse Electric Corp.
- CP.** Resistance Welding Transformers. Karl Sarafian, General Motors Corp.
- CP.** Magnetic Force Welder. Jerome Welch, Cutler-Hammer, Inc.
- CP.** Fusionette Welding Equipment. Harry Marx, Primeweld Corp.
- CP.** Welding Supply. C. W. Wright, General Motors Corp.

Thursday, January 25

9:30 a.m.—Transmission

Ballroom

I. W. GROSS, Presiding

- 51-80. Techniques of Corona Loss Measurement and Analysis—500 Kv Test Project of the American Gas and Electric Company. O. Naef, American Gas and Elec. Service Corp.; R. L. Tremaine, A. R. Jones, Westinghouse Electric Corp.
- 51-12. Corona Investigation on Extra High Voltage Lines—500-Kv Test Project of the American Gas and Electric Company. I. W. Gross, O. Naef, American Gas and Electric Service Corp.; C. F. Wagner, R. L. Tremaine, Westinghouse Electric Corp.

51-40. Radio Influence Tests in Field and Laboratory—500 Kv Test Project of the American Gas and Electric Company. G. D. Lippert, S. C. Bartlett, American Gas and Electric Service Corp.; W. E. Pakala, C. D. Fahrnkopf, Westinghouse Electric Corp.

CP.** System Economics of Electric Power Transmission at Extra High Voltage. H. P. St. Clair, E. L. Peterson, American Gas and Electric Service Corp.

51-11. The 300/315 Kv Extra High Voltage Transmission System of the American Gas and Electric Company. Philip Sporn, E. L. Peterson, I. W. Gross, H. P. St. Clair, American Gas and Electric Service Corp.

9:30 a.m.—Transformers

Georgian Room

M. K. BROWN, Presiding

51-39. Single-Step Voltage Regulator Application. R. W. Schlie, ACO.* Rural Electrification Administration.

CP.** The Effect of Voltage Variations on Voltage Regulator Design. D. R. Samson, General Electric Co.

51-81. Insulation Co-ordination and a New Line of Oil Insulated ACO.* Potential Transformers. F. J. Vogel, Illinois Inst. of Technology; D. R. Laib, Allis-Chalmers Mfg. Co.

51-2. A 2,000,000 KVA Transformer Core. W. C. Sealey, Allis-Chalmers Mfg. Co.

51-136. Report of Working Group on Dielectric Tests. Subcommittee ACO.* on Revision of Dielectric Tests.

51-70. Economics of Power Transformer Application. J. E. Barkle, R. L. Witzke, Westinghouse Electric Corp. Presentation by title only.

9:30 a.m.—Insulation and Synchronous Machinery

Keystone Room

W. R. HOUGH, Presiding

51-121. A New High Voltage Insulation for Turbine-Generator Stator Windings. C. M. Laffoon, C. F. Hill, G. L. Moses, L. J. Berberich, Westinghouse Electric Corp.

CP.** Turbo Generator for Use in Short Circuit Testing. Sterling Beckwith, Allis-Chalmers Mfg. Co.

51-122. Synchronous Machine Damping and Synchronizing Torques. Charles Concordia, General Electric Co.

51-123. Factors Affecting Minimum Surface Leakage Distances in Direct Current Power Systems. J. E. Hart, A. T. McClinton, Naval Research Lab.; W. W. Rosenberry, Naval Engg. Experiment Station.

51-124. Telephone Influence Factor in Synchronous Machines. G. L. Oscarson, I. C. Benson, Electric Machinery Mfg. Co. Presentation by title only.

CP.** Silastic Tape—A New Insulating Material. G. E. McIntyre, J. F. Dexter, Dow Corning Corp.

9:30 a.m.—Radiation Detection Devices

Penn Top North

SCOTT HELT, Presiding

CP.** Scintillation Counters. George Morton, R.C.A. Labs.

CP.** Quenching and Lifetime of Geiger-Muller Counters. J. B. H. Kuper, Brookhaven National Laboratory.

CP.** Electrometer Tubes. D. L. Collins, Victoreen Instrument Co.

CP.** Calibration of Radiation Detection Devices. G. Failla, Columbia Univ.

9:30 a.m.—Computing Devices

Penn Top South

S. N. ALEXANDER, Presiding

51-82. The Input-Output System of the EDVAC. R. L. Snyder, Jr., Aberdeen Proving Ground.

CP.** Improvement in the Security of Large Masses of Valuable Records by Use of Computer Techniques. S. N. Alexander, National Bureau of Standards.

51-83. A Method of Gating for Parallel Computers. A. G. Ratz, V. G. Smith, University of Toronto.

51-84. Systematization of Tube Surveillance in Large Scale Computers. H. W. Spence, Aberdeen Proving Ground.

51-85. Design of a Flip-Flop Circuit by Linear Circuit Analysis, J. F. ACO.* Donan, Computer Research Corp.; L. D. Hindall, Northrop Aircraft, Inc.

9:30 a.m.—A New Carrier System for Medium Haul Telephone Circuits

Parlor 1

P. G. EDWARDS, Presiding

51-86. The Type N-1 Carrier Telephone System Objectives and ACO.* Transmission Features. R. S. Caruthers, Bell Telephone Labs., Inc.

51-87. N-1 Carrier Telephone System Apparatus and Equipment. ACO.* W. E. Kahl, L. E. Pedersen, Bell Telephone Labs., Inc.

CP.** The Type N-1 Carrier Telephone System—Engineering and Application. A. B. Covey, H. R. Huntley, American Tel. & Tel. Co.

9:30 a.m.—Industrial Power Systems

Skytop

J. S. GAULT, Presiding

CP.** Parallel Operation of Industrial Generating Plants and Public Utility Systems. G. C. Harness, G. E. Grosser, Westinghouse Electric Corp.

CP.** Utilization of Purchased Electric Power in an Oil Refinery. A. J. Claes, Socony-Vacuum Oil Co.

CP.** Industrial Plant Power Sources. R. T. Woodruff, Aluminum Ore Co.

CP.** Emergency Electric Generating Plant. B. F. Thomas, Jr., N. A. Lougee and Co.

9:30 a.m.—Electric Space Heating and Heat Pumps

Parlor 2

T. C. JOHNSON, Presiding

CP.** Five All Electric Homes Using the Heat Pump for Year Round Air Conditioning. E. R. Ambrose, American Gas and Electric Service Corp.

CP.** Ignition Delay in Oil Burners. F. Hamburger, Jr., Johns Hopkins Univ.

CP.** Electric Panel Heating. C. Frere, General Electric Co.

CP.** Controls for Heat Pump Applications. E. F. Snyder, Minneapolis-Honeywell Regulator Co.

2:00 p.m.—Capacitors

Ballroom

F. V. SMITH, Presiding

51-15. Application of Shunt Capacitors at Transmission and Distribution Stations. F. M. Porter, C. P. Zimmerman, American Gas and Electric Service Corp.

51-88. Technical Problems Associated with the Application of a Capacitor in Series with a Synchronous Condenser. R. L. Witzke, Westinghouse Electric Corp.; E. L. Michelson, Commonwealth Edison Co.

51-89. Fundamental Effects of Series Capacitors in High-Voltage Transmission Lines. A. A. Johnson, J. E. Barkle, D. J. Povejsil, Westinghouse Electric Corp.

51-20. The Application of a Series Capacitor to a Synchronous Condenser for Reducing Voltage Flicker. P. M. Black, Illinois Northern Utilities Co.; L. F. Lischer, Commonwealth Edison Co.

2:00 p.m.—Substations

Keystone Room

R. C. ERICSON, Presiding

51-90. Direct Current Power Supplies and Isolation of Faults on Electric Transit Systems—Part I. S. S. Watkins, Gibbs and Hill, Inc.; M. E. Reagan, Westinghouse Electric Corp.

- 51-91. Direct Current Power Supplies and Isolation of Faults on Electric Transit Systems—Part II. S. S. Watkins, Gibbs and Hill, Inc.; M. E. Reagan, Westinghouse Electric Corp.
- 51-92. Group Regulation of Urban 4-Kv Feeders. C. L. Grim, H. B. Peck, Consolidated Gas, Electric Light and Power Co. of Baltimore.
- CP.** The Trend Toward Bus Regulation on the System of the Detroit Edison Company. I. S. Mendenhall, Detroit Edison Co.
- CP.** Considerations That Led to Radial Distribution with Bus Regulation in Preference to Primary or Secondary Networks in the City of Los Angeles. M. V. Eardley, Dept. of Water and Power, The City of Los Angeles.

2:00 p.m.—Symposium on the Determination of What Units in What Plants Should be Used for Load and Frequency Control

Georgian Room
C. P. ALMON, JR., Presiding

- CP.** Introduction to the Subject. S. B. Morehouse, Leeds & Northrup Co.
- CP.** Allocation and Assignment of Frequency-Tie Line Control. G. H. McDaniel, American Gas and Electric Service Corp.
- CP.** Methods of Scheduling Load Regulations When Using Automatic Load Control. A. P. Hayward, Duquesne Light Co.
- CP.** The Determination of What Units in What Plants on A System should be Assigned to Load Regulation. E. C. Stewart, Middle South Utilities Co.
- CP.** Load Regulation Practices of Cincinnati Gas and Electric Company. S. Goldsmith, Cincinnati Gas and Electric Co.
- CP.** Assignment of Load Regulating Burden to Stations of the Commonwealth Edison Group of Companies. R. T. Purdy, Commonwealth Edison Co.

2:00 p.m.—Power Tubes for Electronic Heating

Penn Top North
W. G. DOW, Presiding

- CP.** Tubes for Dielectric Heating at 915 Megacycles. R. B. Nelson, General Electric Research Labs. Presentation by P. W. Morse, General Electric Co.
- CP.** Selection and Application of Tubes for Induction and Dielectric Heating. H. J. Dailey, C. H. Scullen, Westinghouse Electric Corp.
- CP.** The Design of High Power Vacuum Tubes for Industrial Heating Applications. H. B. Doolittle, Machlett Labs.
- CP.** A VHF High Power Triode. W. Schmitt, Federal Telephone and Radio Corp.

2:00 p.m.—Analog Computers

Penn Top South
E. L. HARDER, Presiding

- 51-93. Analog Computing Techniques Applied to Economics. R. H. Strotz, J. F. Calvert, N. F. Morehouse, Northwestern University.
- CP.** A High Performance Servo Multiplier and Function Generator For Use in an Electronic Analog Computer. R. M. Byrne and J. F. Redmon, Goodyear Aircraft Corp.
- CP.** The Design and Operation of an Advanced Time Scale Analog Computer. Irving Glassman, Franklin Institute.
- CP.** Analog Computation of Paper Mill Speed Regulation. D. B. Breedon, M. M. Matthews, Westinghouse Electric Corp.

2:00 p.m.—Electronic Paths Under the Sea—Centenary

Parlor 1
F. B. BRAMHALL, Presiding

- CP.** The Genesis of Submarine Cables. L. Espenschied, Bell Telephone Labs., Inc.
- CP.** Submerged Repeaters for Long Submarine Telegraph Cables. C. H. Cramer, Western Union Telegraph Co.
- 51-94. A Submarine Telephone Cable with Submerged Repeaters. J. J. Gilbert, Bell Telephone Labs., Inc.

2:00 p.m.—Industrial Power Systems

Skytop
J. S. GAULT, Presiding

- CP.** High Voltage Motor Starters Coordinated with Distribution Switchgear. T. B. Montgomery, Allis-Chalmers Mfg. Co.
- CP.** Power Modernization of an Old Plant. A. W. Howard, General Electric Co.
- CP.** Power Distribution System Expansion Bethlehem Steel Co., Lackawanna Plant. T. O. Zittel, Bethlehem Steel Co.; R. M. Wilson, General Electric Co.
- CP.** Power Distribution System of the United States Government Accounting Office Building, Washington, D. C. F. J. Muller, Public Building Service; D. S. Brereton, General Electric Co.

2:00 p.m.—The Measurement and Control of Audible Noise from Fluorescent Lamp Ballasts

Parlor 2
E. H. SALTER, Presiding

- CP.** The Effect of Ambient Noise Level and Human Factors on the Evaluation of Acceptable Ballast Noise Limits. C. H. Burns, Westinghouse Electric Corp.
- CP.** Measurement of Audio Ballast Noise. H. U. Hjermstad, Sola Electric Co.
- CP.** Testing Fluorescent Fixtures for Noise. R. D. Eames, Mitchell Mfg. Co.
- 51-95. Noise Evaluation of Fluorescent Lamp Ballasts. C. P. Hayes, H. R. Gould, General Electric Co. Presentation by title only.

Friday January, 26

9:30 a.m.—Capacitors and Switchgear

Ballroom
R. L. WEBB, Presiding

- 51-19. Switching of Distribution Capacitors by Manual and Automatic Devices. R. J. Hopkins, N. R. Schultz, General Electric Co.
- 51-18. Switching High-Voltage Shunt Capacitor Banks. A. W. Funkhouser, Indianapolis Power and Light Co.; R. C. Van Sickle, D. F. Shankle, Westinghouse Electric Corp.
- 51-21. Capacitor Switching Phenomena. R. C. Van Sickle, Westinghouse Electric Corp.; John Zaborszky, Univ. of Missouri.
- CP.** Capacitor Switching Oil and Air Blast Circuit Breakers. A. E. Kilgour, Allis-Chalmers Mfg. Co.
- CP.** Dielectric Strength of Capacitors. R. J. Hopkins, T. R. Walters, General Electric Co.

9:30 a.m.—Power Generation

Georgian Room
H. R. HARRIS, Presiding

- 51-96. Progress in the Development of Large Turbine Generators. E. D. Huntley, H. D. Taylor, General Electric Co.
- 51-97. Modern Practice in the Balancing of Large Turbine-Generator Rotors. C. M. Laffoon, A. C. Hagg, C. H. Janthey, P. R. Heller, Westinghouse Electric Corp.
- CP.** Progress and Needed Improvements to Electric Power Generating Stations and Machines. I. E. Moulthrop, G. A. Orrok, Jr., Boston Edison Co.
- CP.** Progress in Electrical Machinery and Control for Power System Service. T. B. Montgomery, R. C. Moore, W. L. Ringland, L. T. Rosenberg, Allis-Chalmers Mfg. Co.
- CP.** Recent Improvements Made to Electric Power Generating Machines and Equipment. M. R. Lory, J. W. Batchelor, Westinghouse Electric Corp.

9:30 a.m.—Some New Electron Tubes

Penn Top North
W. C. WHITE, Presiding

- CP.** A Gas-Filled Resonant Window for Radar Duplexing Devices. E. A. Goldman, N. T. Williams, Westinghouse Electric Corp.

- CP.** A High-Current Thyatron. A. W. Coolidge, Jr., General Electric Co.
 CP.** A Tunable Miniature Magnetron. H. W. A. Chalberg, General Electric Co.
 CP.** A Permanent Magnet Electron Microscope. J. H. Reisner, Radio Corp. of America.

9:30 a.m.—Radio Communication, Point-to-Point and Mobile

Parlor 1
 G. T. ROYDEN, Presiding

- 51-7. Operational Study of a Highway Mobile Telephone System. L. A. Dorff, Bell Telephone Labs., Inc.
 CP.** Progress in Radio-Facsimile for Telegram Delivery. C. Jelinek, Jr., K. R. Jones, The Western Union Telegraph Co.
 CP.** Description of Power Amplifier and Exciter Transmitter Units for Transoceanic Point-to-Point Communication Service. H. E. Goldstine, G. L. Usselman, RCA Labs.
 CP.** Simplified Analysis of Non-recurrent Pulse Groups. L. S. Schwartz, Hazeltine Electronics Corp.
 51-98. Pulse Time Modulation Telemetering Systems for Rocket Applications. J. T. Mengel, Naval Research Laboratory. Presentation by title only.

9:30 a.m.—Feedback Control Systems

Penn Top South
 S. W. HERWALD, Presiding

- 51-99. Some Design Criteria for Automatic Controls. P. T. Nims, Chrysler Corp.
 51-100. Effects of Carrier Shifts on Derivative Networks for AC Servomechanisms. G. M. Attura, Industrial Control Co.
 51-101. Network Synthesis by Graphical Methods for A-C Servomechanisms. G. A. Bjornson, Massachusetts Inst. of Technology.
 51-102. A Note on the Design of Conditionally Stable Feedback Systems. Paul Travers, Massachusetts Inst. of Technology.
 51-103. A Phase-Plant Approach to the Compensation of Saturating Servomechanisms. A. M. Hopkin, Northwestern Univ.

9:30 a.m.—Heavy Traction

Parlor 2
 H. F. BROWN, Presiding

The following three papers will be a single presentation.

- 51-104. Selection of Equipment for Multiple-Unit Cars. W. M. Hutchison, Westinghouse Electric Corp.
 51-36. A New MU Car Motor for the Pennsylvania Railroad. H. G. Jungk, Westinghouse Electric Corp.
 51-105. New A.C. MU Car Control for the Pennsylvania Railroad. S. E. Newhouse, Westinghouse Electric Corp.

The following three papers will be a single presentation.

- 51-35. Why Four-Motor Multiple-Unit Car Equipments? R. A. Williamson, General Electric Co.
 51-106. A.C. Multiple-Unit Car Motor. F. C. Kreidler, Jr., General Electric Co.
 51-107. A-C Multiple-Unit Car Control Equipment. W. S. O'Kelly, General Electric Co.
 51-108. A New Train Performance Calculator. S. V. Smith, Pennsylvania Railroad.
 51-34. A Modern Cab Signaling and Train Control System for Railroads. L. R. Allison, Union Switch and Signal Co.

9:30 a.m.—Rotating Machinery

Skytop
 S. S. WOLFF, Presiding

- 51-109. Circuit Analysis Method for Determination of A-C Impedances of Machine Conductors. D. S. Babb, J. E. Williams, University of Illinois.
 51-110. A Simplified Method for Predicting Induction Motor Performance. H. E. Webking, General Motors Corp.

- 51-111. An Experimental Study of Induction Machine End-Turn Leakage Reactance. E. C. Barnes, The Reliance Electric & Engg. Co.

- CP.** The Development of a Treatment for Die-Cast Rotors. Ulrik Krabbe, Thomas B. Thrige.

- 51-117. Die Cast Rotor Studies. L. C. Packer, G. E. Monchamp, ACO.* Westinghouse Electric Corp.

9:30 a.m.—I. and M. Standards and Spectrographic Instrumentation

Keystone Room
 J. H. ENNS, Presiding

- CP.** Standards for Electrical Measurements. F. B. Silsbee, National Bureau of Standards.
 CP.** Atomic Definitions of Primary Standards. R. D. Huntoon, National Bureau of Standards.
 CP.** Some Applications of Photomultiplier Tubes in Spectrographic Analysis. J. K. Brody.
 CP.** Radio Frequency Spectroscopy. D. K. Coles, Westinghouse Electric Corp.

2:00 p.m.—Transmission and Distribution

Ballroom
 J. T. LUSIGNAN, Presiding

- 51-17. Protection of Transmission Lines over Mountainous Region Where Lightning Incidence is High. J. E. Housley, J. D. Harper, Aluminum Co. of America.
 51-16. Geometric Mean Distances of Angle-Shaped Conductors. P. C. Magnusson, Oregon State College.
 51-26. A Per Unit Interpretation of Transmission Line Constants. D. J. Povejsil, A. A. Johnson, Westinghouse Electric Corp.
 51-112. 11 Year Operating Record, Rural Line Sectionalizing by Repeater Fuses. R. M. Schahfer, F. H. Strout, Northern Indiana Public Service Co.

2:00 p.m.—Switchgear

Keystone Room
 H. V. NYE, Presiding

- 51-25. A Spring Mechanism for Hand Closing of Magnetic Power Air Circuit Breakers. R. C. Dickinson, J. D. Findley, Westinghouse Electric Corp.
 51-27. A New 69 Kv Air Blast Circuit Breaker. R. B. Shores, J. W. Beatty, General Electric Co.
 51-8. Ice Testing and Its Influence Upon Switch Design. G. E. Heberlein, E. J. Field, Railway and Industrial Engg. Co.
 CP.** Application of Air Circuit Breakers in Motor Circuits. P. L. Camp, General Electric Company.
 51-113. Report on Transformer Magnetizing Current and Its Effect on Relaying and Air Switch Operation. Subcommittee on Magnetization Characteristics of Transformers. Presentation by J. M. Wallace.

2:00 p.m.—Hydroelectric Outage Experience

Georgian Room
 G. CALABRESE, Presiding

- 51-23. Determination of Generator Standby Reserve Requirements. H. T. Strandrud, Bonneville Power Administration.
 CP.** Factors Determining the Optimum Capacity of an Hydro-Electric Power Installation. J. J. Traill, The Hydro-Electric Power Comm. of Ontario.
 CP.** Determination of Monthly Hydro Dependable Capacity, Niagara Mohawk Electric System. E. B. Strowger, Niagara Mohawk Power Corp.
 CP.** Determination of Reserve Capacity by the Probability Method—Effect of Interconnections. G. Calabrese, New York University.
 Discussions by E. L. Kanouse, Dept. of Water & Power of Los Angeles, E. D. Early, Southern Services, Inc.

2:00 p.m.—Some New Electronic Devices and Techniques

Penn Top North
 E. M. BOONE, Presiding

- CP.** A Metal Evaporator using High-Frequency Induction Heating. R. G. Picard, J. E. Joy, Radio Corp. of America.

- CP.** Use of Diodes as Logarithmic Elements in Measuring and Control Equipment. W. M. Grim, Jr., Massachusetts Inst. of Technology.
- CP.** Measurement of Metal Wall Thickness from One Side by the Ultrasonic Resonance Method. N. G. Branson, Branson Instruments, Inc.
- CP.** The Sona-Stretcher. H. R. Foster, E. E. Crump, J. L. Gogorth, Kay Electric Co.

2:00 p.m.—Color Television

Skytop
J. B. COLEMAN, Presiding

- CP.** U.H.F. Television Reception at Bridgeport. R. G. Clapp, Philco Corp.
- CP.** Some Phases of the United States Color Television Standards. P. C. Goldmark, Columbia Broadcasting System, Inc.
- 51-114. A Color Television System for Industry. H. R. Smith, A. L. ACO.* Olson, R. F. Cotellessa, Allen B. Du Mont Labs., Inc.
- CP.** Fundamentals of Color Television and Their Application Today. A. V. Loughren, Hazeltine Electronics Corp.

2:00 p.m.—Feedback Control Systems

Penn Top South
S. W. HERWALD, Presiding

- 51-73. The Effects of Loads and Disturbances Upon Feedback Controllers. R. W. Jones, Northwestern Univ.
- CP.** An Optimization of RC Lead Networks for Servomechanisms. J. R. Ragazzini, L. A. Zadeh, Columbia Univ.
- CP.** Carrier Controlled Relay Servos. J. C. Lozier, Bell Telephone Labs., Inc.
- CP.** Servomechanism Transient Performance from Decibal-Log Frequency Plots. H. Harris, Jr., M. J. Kirby, E. F. von Arx, Sperry Gyroscope Co.

2:00 p.m.—Light Traction

Parlor 2
H. F. BROWN, Presiding

- CP.** Power Supply Study and New Rectifier Installation for the United Electric Railways of Providence. W. C. Whitman, F. F. Schaller, New England Power Service Co.
- 51-115. Economics of Trolley Coach Power Supply. G. R. McDonald, J. C. Price, General Electric Co.
- 51-33. Electrical Equipment and Performance of Lightweight Rapid Transit Cars. W. R. Ellis, M. L. Sloman, Westinghouse Electric Corp.
- 51-31. A New Lightweight Rapid Transit Motor. R. A. Pettersen, General Electric Co.
- 51-32. A New Lightweight Rapid Transit Control Equipment. I. W. Lichtenfels, H. G. Moore, General Electric Co.

2:00 p.m.—Rotating Machinery

Parlor 1
C. G. VEINOTT, Presiding

- 51-116. Equivalent Circuits, and Their Application in Designing Shaded Pole Motors. S. S. L. Chang, Robbins and Myers, Inc.
- 51-24. Commutation in Universal Type Motors. L. C. Packer, Westinghouse Electric Corp.
- CP.* Application of Universal Motors. F. J. Chayka, General Electric Co.
- 51-118. Measurement of D-C Machine Parameters. R. M. Saunders, Univ. of California.
- 51-119. Rules for Designing Frog-Leg Windings of D-C. Machines. H. B. Dwight, R. G. Haltmaier, Massachusetts Inst. of Technology.
- 51-120. Fault Transients in Aircraft D-C Systems. D. G. Scorgie, Naval Research Lab.

- CP.** Conference paper; no advance copies are available; not intended for publication in Transactions.
- ACO.* Advance copies only available; not intended for publication in Transactions.

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| | PRICE | |
|--|-------|-------|
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COMMITTEE MEETINGS

Monday, January 22

| | |
|---|---------------|
| 9:30 a.m.—Chemical, Electrochemical and Electrothermal Committee | Room 127 |
| 10:00 a.m.—Lightning Arrestor Application Guide Working Group | Conf. Rm. 4 |
| 10:00 a.m.—Industrial Control Committee..... | Room 129 |
| 10:00 a.m.—Method of Making Temperature Tests on Transformers Subcom..... | Parlor A |
| 10:00 a.m.—Publication Committee | Room 112 |
| 10:00 a.m.—Lightning and Insulator Subcommittee..... | Parlor B |
| 10:00 a.m.—Volt-Time Characteristics of Capacitors Subcommittee | Room 111 |
| 10:30 a.m.—ASA Sectional Committee C55 on Capacitors | Conf. Rm. 9 |
| 11:00 a.m.—Cathodic Protection Subcommittee..... | Room 127 |
| 12:00 noon—Luncheon—Industrial Control Committee..... | Room 129 |
| 12:00 noon—Luncheon—Medal Awards | Parlor C |
| 12:00 noon—Luncheon—ASA Sectional Committee C68..... | Parlor B |
| 4:00 p.m.—Electrolytic Processes Subcommittee | Parlor 1 |
| 4:00 p.m.—Publication Committee | Parlor A |
| 4:00 p.m.—Lightning Protective Devices Subcommittee..... | Room 111 |
| 4:00 p.m.—Fault Limiting Devices Subcommittee..... | Room 112 |
| 4:00 p.m.—Relays Committee | Conf. Rm. 4 |
| 4:00 p.m.—Therapeutics Committee | Room 129 |
| 4:00 p.m.—Joint Subcommittee on Electrical Aids to Medicine | Room 129 |
| 4:00 p.m.—Capacitors Subcommittee | Room 127 |
| 4:00 p.m.—Technical Program Committee..... | Conf. Rm. 9 |
| 5:30 p.m.—Sections Committee Get-Together..... | Parlors B & C |
| 7:30 p.m.—Forum of Technical Committee Chairmen | Parlor 1 |

Tuesday, January 23

| | |
|--|----------------|
| 9:30 a.m.—Electrical Properties of Gases Subcommittee..... | Room 112 |
| 9:30 a.m.—Protective Devices Committee | Parlor A |
| 9:30 a.m.—Standardization of Limiters Accessories Subcommittee | *SAE Rm. 817 |
| 9:30 a.m.—Correlation of Standard Temperature Rises Subcommittee | Room 127 |
| 9:30 a.m.—Electronic Power Converters Committee..... | Conf. Rm. 9 |
| 9:30 a.m.—Steam Turbine Generators Subcommittee..... | Room 111 |
| 9:30 a.m.—Transmission Substations Subcommittee..... | Conf. Rm. 4 |
| 10:00 a.m.—Radiation Measurements Above 300 M.C. Subcommittee | *AIEE Rm. 1001 |
| 11:00 a.m.—Professional Division Advisory Committee | Parlor B |
| 12:00 noon—Luncheon—1951 Summer General Meeting Committee | Room 112 |
| 12:00 noon—Luncheon—Administration Subcom. of Insulated Conductors Committee | Room 129 |
| 12:00 noon—Luncheon—District No. 1 Membership Committee | Parlor A |
| 12:00 noon—Luncheon—Communications Division Advisory Committee | Room 111 |
| 12:00 noon—Luncheon—Medal Awards | Parlor C |
| 12:00 noon—Luncheon—Electronic Power Converters Committee | Conf. Rm. 9 |
| 12:00 noon—Luncheon—Registration of Engineers..... | Parlor A |
| 2:30 p.m.—Members-for-Life Fund Committee | Room 127 |
| 2:30 p.m.—Sections Committee | Penn Top North |
| 2:30 p.m.—Planning and Coordination Committee..... | Parlor A |
| 2:30 p.m.—Joint Subcom. on Applications of Probability Methods to Power System Problems..... | Room 112 |
| 2:30 p.m.—Carrier Current Committee | Parlor C |
| 2:30 p.m.—Hot Cathode Power Converters Subcommittee | Conf. Rm. 9 |

American Institute of Electrical Engineers

| | |
|---|-----------------|
| 2:30 p.m.—Student Branches Committee..... | Parlor B |
| 2:30 p.m.—Working Group on Pool Tubes..... | Conf. Rm. 4 |
| 2:30 p.m.—Magnetic Amplifiers Subcommittee..... | Florentine Room |
| 2:30 p.m.—AIEE-IRE Task Group on Oscillography..... | *ASCE Rm. 1501 |
| 2:30 p.m.—Radiation Measurements Above 300 M.C. Subcommittee..... | *AIEE Rm. 1001 |
| 2:30 p.m.—Distribution Substation Subcommittee..... | *AIME Rm. 903 |
| 2:30 p.m.—Project Com. on Transmission Line Relay Protection..... | *SAE Rm. 817 |
| 4:00 p.m.—Subcom. on Nuclear Instruments..... | Skytop |
| 4:00 p.m.—Educational Electronics Subcommittee..... | Room 111 |

Wednesday, January 24

| | |
|---|-----------------|
| 7:30 a.m.—Breakfast—Industrial Division Advisory Committee..... | Room 112 |
| 7:30 a.m.—Breakfast—Industrial Control Test Codes Subcommittee..... | Room 111 |
| 9:30 a.m.—Production and Application of Light Committee..... | Room 129 |
| 9:30 a.m.—Membership Committee..... | Parlor A |
| 9:30 a.m.—Working Group on Stds. Automatic Circuit Reclosers..... | Parlor B |
| 9:30 a.m.—Substations Committee..... | Conf. Rm. 4 |
| 9:30 a.m.—Lamme Medal Committee..... | Conf. Rm. 9 |
| 9:30 a.m.—Nucleonics Committee..... | *AIEE Rm. 1001 |
| 9:30 a.m.—Towers, Poles and Conductors Subcommittee..... | Room 127 |
| 9:30 a.m.—Subcommittee on Grounding Practice in Industrial Plants..... | Room 111 |
| 10:00 a.m.—Subcommittee V of ASA Sectional Committee C42 (Control)..... | Room 112 |
| 12:00 noon—Luncheon—AIEE Committee on Standard #4..... | Parlor C |
| 12:00 noon—Luncheon—Subcommittee V of ASA Sectional Committee C42 (Control)..... | Room 112 |
| 12:00 noon—Luncheon—General Industry Applications Committee..... | Parlor B |
| 12:00 noon—Luncheon—Technical Advisory Committee..... | Room 129 |
| 12:00 noon—Luncheon—Industrial Power Systems Committee..... | Gramercy Room |
| 12:00 noon—Luncheon—Medal Awards..... | Room 111 |
| 2:30 p.m.—Mining and Metal Industry Committee..... | Parlor A |
| 2:30 p.m.—Industrial Control Standards Subcom..... | Florentine Room |
| 2:30 p.m.—Nominating Committee..... | Conf. Rm. 9 |
| 2:30 p.m.—AIEE-EEI Working Group on Coordination of Construction and Protection of Distribution Circuits..... | Room 127 |
| 2:30 p.m.—Telegraph Systems Committee..... | Room 111 |
| 2:30 p.m.—Joint Subcommittee on Electronic Instruments..... | *AIEE Rm. 1001 |
| 4:00 p.m.—Communication Switching Systems Committee..... | Parlor 1 |
| 4:00 p.m.—Electronics Committee..... | Parlor B |
| 4:00 p.m.—Electric Welding Committee..... | Room 129 |
| 4:00 p.m.—Wire Communication Systems Committee..... | Room 111 |
| 4:00 p.m.—Safety Committee..... | Conf. Rm. 4 |
| 4:30 p.m.—Computing Devices Committee..... | Room 127 |
| 6:00 p.m.—Dinner—Power Division Advisory Committee..... | Parlor A |
| 8:00 p.m.—Fundamental Arc Research Subcommittee..... | Conf. Rm. 9 |

Thursday, January 25

| | |
|--|----------------|
| 9:30 a.m.—Board of Directors..... | *AIEE Rm. 1001 |
| 9:30 a.m.—Telemetering and Supervisory Control Subcommittee..... | Room 112 |
| 9:30 a.m.—Metallic Rectifiers Committee..... | Conf. Rm. 4 |
| 9:30 a.m.—Basic Sciences Committee..... | Parlor B |
| 9:30 a.m.—System Engineering Committee..... | Parlor A |
| 9:30 a.m.—Induction Machinery Subcommittee..... | Room 127 |

Winter General Meeting

| | |
|--|----------------|
| 9:30 a.m.—Education Committee..... | Conf. Rm. 9 |
| 9:30 a.m.—Electric Welding Committee..... | Florentine Rm. |
| 9:30 a.m.—Power Generation Committee..... | Parlor C |
| 10:00 a.m.—I. & M. Organization Committee..... | Room 111 |
| 12:00 noon—Luncheon—ASA Transformer Sectional Committee C57..... | Parlor B |
| 12:00 noon—Luncheon—Electric Heating Committee..... | Conf. Rm. 9 |
| 12:00 noon—Luncheon—Instruments and Measurements Committee..... | Parlor A |
| 12:00 noon—Luncheon—Domestic and Commercial Applications Committee..... | Room 129 |
| 12:00 noon—Luncheon—Rotating Machinery Administrative Subcommittee..... | Room 127 |
| 12:00 noon—Luncheon—Survey of Line Outages Subcommittee..... | Room 112 |
| 2:00 p.m.—Board of Directors..... | *AIEE Rm. 1001 |
| 2:00 p.m.—Metallic Rectifiers Committee..... | Room 127 |
| 2:00 p.m.—Feedback Control Systems Committee..... | Parlor C |
| 2:00 p.m.—Instruments and Measurements Committee..... | Parlor A |
| 2:00 p.m.—Electric Circuit Theory Subcommittee..... | Room 111 |
| 2:00 p.m.—Rotating Machinery Committee..... | Florentine Rm. |
| 2:00 p.m.—Power Supply for Resistance Welding Machines Subcommittee..... | Conf. Rm. 4 |
| 4:00 p.m.—Science and Electronics Division Advisory Committee..... | Room 127 |
| 4:00 p.m.—General Applications Advisory Committee..... | Room 112 |
| 4:30 p.m.—Radio Communication Systems Committee..... | Room 111 |

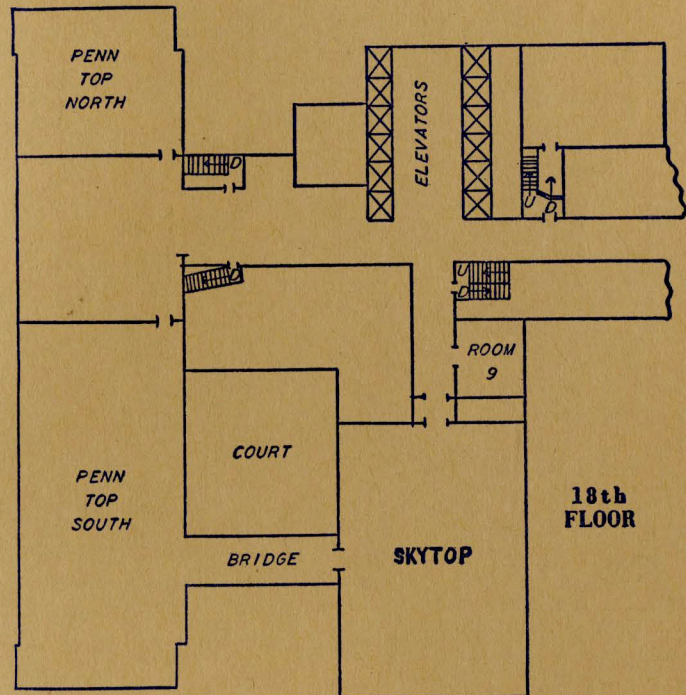
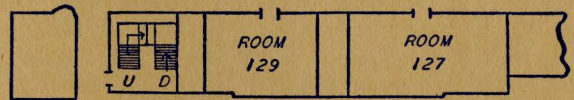
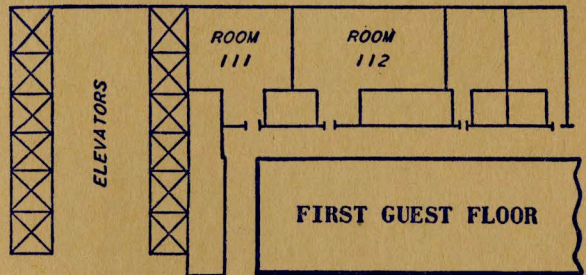
Friday, January 26

| | |
|--|---------------|
| 9:00 a.m.—AIEE-NEMA Committee on Carbon Brush Test Code..... | Parlor B |
| 9:30 a.m.—Transformers Committee..... | *SAE, Rm. 817 |
| 9:30 a.m.—Transformers Subcommittee C42..... | Parlor A |
| 12:00 noon—Luncheon—Single Phase and Fractional Horsepower Subcommittee..... | Parlor A |
| 12:00 noon—Luncheon—D.C. Machinery Subcommittee..... | Parlor C |
| 2:00 p.m.—Working Group on Pool Tubes..... | Parlor B |
| 4:00 p.m.—Land Transportation Committee..... | Parlor 2 |

Saturday, January 27

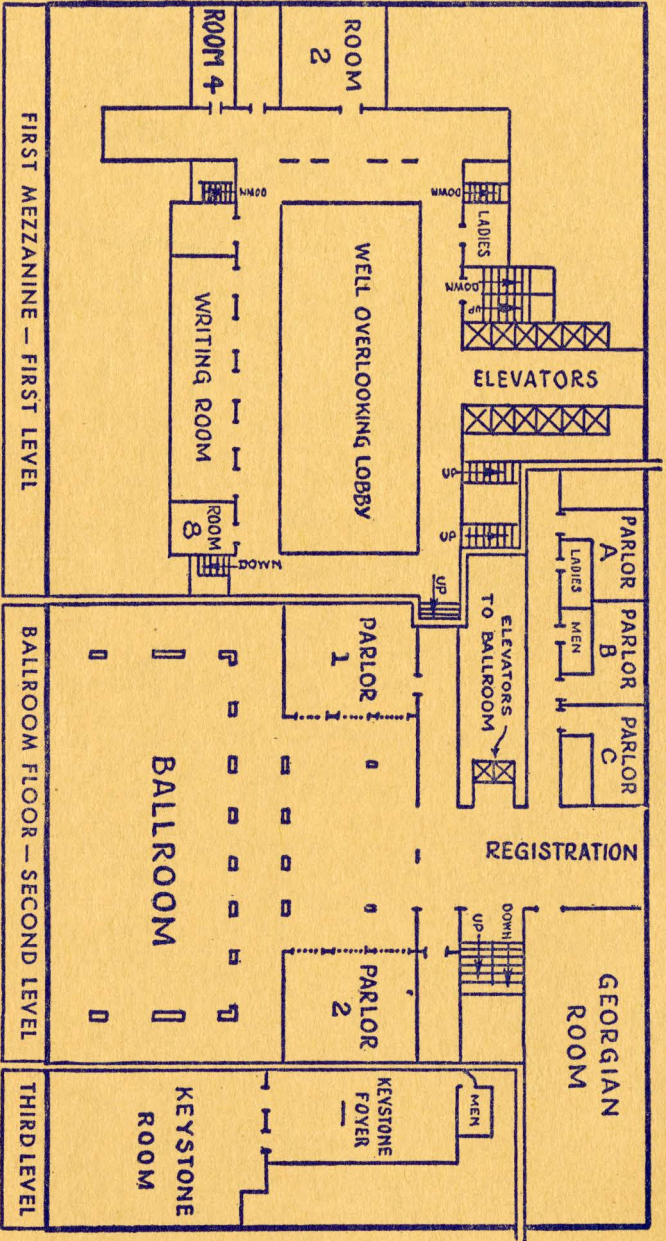
| | |
|--|----------------|
| 9:00 a.m.—Transmission and Distribution Committee..... | *AIEE Rm. 1001 |
|--|----------------|

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NOTE: Florentine Room located in Hotel Governor Clinton.



Thursday, January 23

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32D STREET

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