

**American Institute of
Electrical Engineers**



WINTER

GENERAL

MEETING

Program

*Please retain for use during
entire meeting*

NEW YORK, N. Y.

JANUARY 18-22

1954

Meeting Headquarters

HOTEL STATLER

GENERAL INFORMATION

This 1954 Winter General Meeting features a well diversified program of technical and social activities. A group of inspection trips has also been arranged closely allied with the technical sessions. 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.

Vice-Admiral Harold G. Bowen, U. S. Navy, Retired, will deliver the principal address at the General Session to be held at 2:00 p.m. Monday, January 18, 1954. Admiral Bowen, now executive director of the Thomas Alva Edison Foundation, will speak on the subject "Genesis of the Electric Light and Power Industry." At this session also, the Edison Medal will be presented to John F. Peters and the Institute Paper Prizes will be presented. President Elgin B. Robertson will preside.

Due to the large number of technical sessions, it has been necessary to schedule several to be held in the Hotel McAlpin, Broadway and 33rd Street.

REGISTRATION FEES REQUIRED. As instituted several 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 the Sutton Room. 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. The Institute rooms and offices on the 10th floor of the Engineering Societies Building are open to all members.

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 in duplicate of numbered papers must be sent to Edward C. Day, Assistant Secretary for Technical Papers, Committee on Technical Operations, 33 West 39th Street, New York 18, N. Y., before February 5, 1954. Discussions received later may be returned depending upon the printing schedule of the paper to which the discussion is directed. The original typewritten double-spaced copy, together with original illustrations as glossy photographs and inked tracings should be submitted.

Authors and discussors 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. 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. Numbered papers will ultimately be published in the Bimonthly Publications 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. Power Generation <i>Keystone Room</i></p> <p>Distribution Systems <i>Ballroom</i></p> <p>Relays <i>Georgian Room</i></p> <p>Chemical Industry <i>Ballroom, McAlpin</i></p> <p>Rotating Machinery <i>Penn Top North</i></p> <p>Dielectrics <i>Penn Top South</i></p> <p>Medicine & Biology <i>Colonial Room, McAlpin</i></p> <p>Management <i>Skytop</i></p> <p>Electronic Control <i>Winter Garden, McAlpin</i></p>	<p>9:30 A.M. Rotating Machinery <i>West Room</i></p> <p>Power Generation <i>Winter Garden, McAlpin</i></p> <p>Transmission Systems <i>Ballroom, McAlpin</i></p> <p>Safety <i>Georgian Room</i></p> <p>Wire Insulation <i>Colonial Room, McAlpin</i></p> <p>Relays <i>Ballroom</i></p> <p>Electronic Power Conv. <i>Keystone Room</i></p> <p>The Elusive Lumen <i>Penn Top South</i></p> <p>Facsimile <i>East Room</i></p> <p>Instruments & Measurements <i>Skytop</i></p>	<p>9:30 A.M. Heat Pumps <i>Penn Top North</i></p> <p>Synchronous Machinery <i>West Room</i></p> <p>Switchgear <i>Ballroom</i></p> <p>Insulated Conductors <i>Georgian Room</i></p> <p>Industrial Power Systems <i>Penn Top South</i></p> <p>Electrostatic Processes <i>Ballroom, McAlpin</i></p> <p>Noise <i>Ante Room, McAlpin</i></p> <p>Computing Devices <i>Skytop</i></p> <p>Land Transportation <i>Keystone Room</i></p> <p>Wire Communications <i>Colonial Room, McAlpin</i></p> <p>Electrochemical Processes <i>East Room</i></p> <p>Min. & Metal Industry <i>Winter Garden, McAlpin</i></p>	<p>9:30 A.M. Min. & Metal Industry <i>West Room</i></p> <p>Rotating Machinery <i>Colonial Room, McAlpin</i></p> <p>Switchgear <i>Ballroom, McAlpin</i></p> <p>System Engineering <i>Penn Top South</i></p> <p>Television Tubes <i>Winter Garden, McAlpin</i></p> <p>Magnetic Materials <i>Georgian Room</i></p> <p>Circuit Theory <i>Penn Top North</i></p> <p>Color Television <i>Skytop</i></p> <p>Communication Switching <i>East Room</i></p> <p>Storage Batteries <i>Keystone Room</i></p> <p>Transmission Systems <i>Ballroom</i></p>	<p>9:30 A.M. Min. & Metal Industry <i>Skytop</i></p> <p>Rotating Machinery <i>East Room</i></p> <p>Transformers <i>Ballroom</i></p> <p>Carrier Current <i>Penn Top North</i></p> <p>Feedback Control Sys. <i>Keystone Room</i></p> <p>Infrared Transducer Sys. <i>West Room</i></p> <p>Selenium & Tellurium <i>Ballroom, McAlpin</i></p> <p>Magnetic Amplifiers <i>Penn Top South</i></p> <p>Television Systems <i>Colonial Room, McAlpin</i></p> <p>System Engineering <i>Winter Garden, McAlpin</i></p> <p>Switchgear <i>Georgian Room</i></p>

<p>2:00 P.M. General Session <i>Ballroom</i></p>	<p>2:00 P.M. Sections Committee <i>Penn Top North</i></p> <p>Synchronous Machinery <i>West Room</i></p> <p>Power Generation <i>Winter Garden, McAlpin</i></p> <p>Transmission Lines <i>Ballroom, McAlpin</i></p> <p>Electrical Regulators <i>Keystone Room</i></p> <p>Wire Insulation <i>Colonial Room, McAlpin</i></p> <p>Computing Devices <i>Ballroom</i></p> <p>Marine Transportation <i>Georgian Room</i></p> <p>The Elusive Lumen <i>Penn Top South</i></p> <p>Telegraph Systems <i>East Room</i></p> <p>Instruments & Measurements <i>Skytop</i></p>	<p>2:00 P.M. Power Field Research <i>East Room</i></p> <p>Rotating Machinery <i>West Room</i></p> <p>Switchgear <i>Ballroom</i></p> <p>Insulated Conductors <i>Georgian Room</i></p> <p>Industrial Power Sys. <i>Penn Top South</i></p> <p>Semi-Conductors <i>Winter Garden, McAlpin</i></p> <p>Feedback Control Sys. <i>Ballroom, McAlpin</i></p> <p>Metallic Rectifiers <i>Skytop</i></p> <p>Land Transportation <i>Keystone Room</i></p> <p>Wire Communications <i>Colonial Room, McAlpin</i></p> <p>Petroleum Industry <i>Penn Top North</i></p> <p>Min. & Metal Industry <i>Ante Room, McAlpin</i></p>	<p>2:00 P.M. Min. & Metal Industry <i>West Room</i></p> <p>Rotating Machinery <i>Colonial Room, McAlpin</i></p> <p>System Engineering <i>Penn Top South</i></p> <p>Substations <i>East Room</i></p> <p>Magnetic Materials <i>Georgian Room</i></p> <p>Transistors <i>Keystone Room</i></p> <p>Color Television <i>Skytop</i></p> <p>Insulated Conductors <i>Ballroom, McAlpin</i></p> <p>Transmission & Distribution <i>Ballroom</i></p> <p>Electronic Education <i>Winter Garden, McAlpin</i></p>	<p>2:00 P.M. Min. & Metal Industry <i>Skytop</i></p> <p>Rotating Machinery <i>East Room</i></p> <p>Transformers <i>Ballroom</i></p> <p>Feedback Control Sys. <i>Keystone Room</i></p> <p>High-Frequency Conductors <i>West Room</i></p> <p>Selenium & Tellurium <i>Ballroom, McAlpin</i></p> <p>Magnetic Amplifiers <i>Penn Top South</i></p> <p>Broadcast Receivers <i>Winter Garden, McAlpin</i></p> <p>Switchgear <i>Georgian Room</i></p> <p>Basic Sciences <i>Penn Top North</i></p>
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Monday, January 18

10:00 a.m.—Power Generation

Committee on Power Generation
Keystone Room
J. H. KINGHORN, Presiding

- 54-150. Minimum Excitation Limit for Magnetic Amplifier Regulating System. J. T. Carleton, P. O. Bobo and D. A. Burt, Westinghouse Electric Corp.
- 54-41. Magamp Regulator Tests and Operating Experience on West Penn Power System. E. W. Hand, West Penn Power Com.; F. N. McClure, P. O. Bobo and J. T. Carleton, Westinghouse Electric Corp.
- CP.** Underexcited Reactive Ampere Limit for Modern Amplidyne Voltage Regulator. A. S. Rubenstein and M. Temoshok, General Electric Co.

10:00 a.m.—Distribution Systems and Lightning Protection

Committee on Transmission and Distribution
Ballroom
T. J. BROSANAN, Presiding

- 54-39. Evaluation of Test Data in Determining Minimum Design Requirements for Aluminum to Copper Connectors. D. C. Hubbard, R. W. Kunkle and A. B. Chance, A. B. Chance Co.
- 54-142. Useful Methods for Determining Primary Feed Points in Future Distribution System Planning. D. L. Hopkins and D. R. Samson, General Electric Co.
- 54-52. Unbalanced Loading and Voltage Unbalance on Three Phase Distribution Transformer Banks. H. M. Bankus and J. E. Gerngross, General Electric Co.
- 54-4. Lightning Surges on Overhead Distribution Lines Caused by Indirect and Direct Lightning Strokes. R. H. Golde, The Electrical Research Assoc.
- CP.** The New Thyrite Magna-Valve Station Arrester. W. J. Rudge, General Electric Co.

10:00 a.m.—Relays

Committee on Relays
Georgian Room
W. E. MARTER, Presiding

- 54-147. All Electronic Carrier Relaying Reduces Fault Clearing Time. H. C. Barnes, American Gas & Electric Service Corp. and L. F. Kennedy, General Electric Co.
- 54-111. The All-Electronic-One-Cycle Carrier Relaying System Overall Operating Principles. H. T. Seeley and N. A. Koss, General Electric Co.
- 54-148. All-Electronic, One-Cycle Carrier Relaying Equipment—Relay Operating Principles. M. E. Hodges and R. H. Macpherson, General Electric Co.
- 54-149. Performance Evaluation of all Electronic One Cycle Carrier Relaying Equipment. W. S. Price, American Gas & Electric Service Corp.; R. E. Cordray and R. H. Macpherson, General Electric Co.

10:00 a.m.—Chemical Industry

Committee on Chemical, Electrochemical and Electrothermal Applications
Ballroom, 24th Floor, Hotel McAlpin
F. S. GLAZA, Presiding

- CP.** Short Cuts in Estimating Electrical Materials Costs for Chemical Plants. W. E. Burpee, Stone and Webster Engineering Corp.
- CP.** Electric Variable Speed Drives in the Chemical Industry. J. W. Picking, Reliance Electric and Engineering Corp.

- CP.** Electrical Problems Relating to Relaying and Protection in Chemical Process Plants. W. C. Woods and L. V. Edison, Westinghouse Electric Corp.

- CP.** Some Problems of Purchasing Electrical Equipment for a Chemical Plant. J. H. Snow, Dow Chemical Co.

10:00 a.m.—Rotating Machinery

Committee on Rotating Machinery
Penn Top North, 18th Floor
A. T. McCLINTON, Presiding

- CP.** Elementary Principles of Matrix Algebra. M. B. Reed, University of Illinois.

- CP.** General Network Theory in Terms of Matrix Algebra. M. B. Reed, University of Illinois.

- 54-87. Application of Network Theory to the Analysis of Rotating Machinery. Part I—Synchronous and Asynchronous Machines. H. E. Koenig, University of Illinois.

- 54-88. Application of Network Theory to the Analysis of Rotating Machinery. Part II—Commutating Machines. H. E. Koenig, University of Illinois.

10:00 a.m.—Dielectrics and Insulation Temperature Standards

Committee on Basic Sciences
Penn Top South, 18th Floor
L. J. BERBERICH, Presiding

- 54-69. Impulse Ionization and Breakdown in Liquid Dielectrics. G. M. L. Sommerman, Battelle Memorial Institute; C. J. Bute, Bonneville Power Authority, and E. L. C. Larson, Otter Tail Power Co. Re-presented for discussion.

- 54-70. Effect of Electrical Discharges on the Breakdown of Solid Insulation. T. W. Dakin, H. M. Philofsky and W. C. Divens, Westinghouse Electric Corp. Re-presented for discussion.

- CP.** General Problems Relating to the Classification of Insulating Materials. H. F. Miller, General Electric Co.

- CP.** Principles for Temperature Classification of Insulating Materials by Functional Test. K. N. Mathes, General Electric Co.

- CP.** International Activities on Thermal Evaluation of Insulation Materials. L. J. Berberich, Westinghouse Electric Corp.

10:00 a.m.—Medicine and Biology

Committee on Electrical Techniques in Medicine and Biology
Colonial Room, 3rd Floor, Hotel McAlpin
J. A. REYNOLDS, Presiding

- CP.** A Sealed Off Betatron Donut for Electron Beam Extraction. T. H. Rogers, Machlett Labs., Inc. and D. T. Scag, Allis-Chalmers Mfg. Co.

- CP.** Instrumentation for Electrical Impedance Plethysmography. Matthew Conrad, Philadelphia, Pa.

- CP.** An Electrical Analog for Biological Systems. J. Berman and R. Schoenfeld, Sloan-Kettering Institute.

- CP.** X-Ray Equipment for Radiobiology. E. D. Trout, J. P. Kelley and A. C. Lucas, General Electric Co.

10:00 a.m.—Management

Committee on Management
Skytop, 18th Floor
F. K. McCUNE, Presiding

- CP.** The Development of Managers. Richard DeMott, SKF Roller Bearing Co.

- CP.** New Horizons for Engineers. Harold Smiddy, General Electric Co.

10.00 a.m.—Electronic Control

Committee on Industrial Control
Winter Garden, 24th Floor, Hotel McAlpin
E. W. HUTTON, Presiding

- CP.** Some Practical Applications of Photoelectric Inspection to Industrial Control. R. C. Booth, Electric Eye Equipment Co.
- CP.** A Electronic Power Supply for Integral Horsepower Motors. J. H. Gregson and E. G. Cowie, Canadian Westinghouse Company, Ltd.
- CP.** Performance Specifications Are Needed for Electronic Control. B. Cooper, General Electric Co.
- CP.** Performance Specifications for Regulated Drives. F. Slamar and E. H. Vedder, Westinghouse Electric Corp.

2:00 p.m.—General Session

Ballroom
President ELGIN B. ROBERTSON, Presiding

- “Address.” President Elgin B. Robertson.
- Edison Medal Presentation to John F. Peters.
Establishment of the Edison Medal: James F. Fairman, Chairman, Edison Medal Committee.
Career of the Medalist: A. C. Montieth, Vice-President in charge of engineering, Westinghouse Electric Corp.
Presentation of Medal: President Elgin B. Robertson.
Response of the Medalist: John F. Peters.
- Presentation of the Institute Paper Prizes.
- “Presentation of Letters to Sir William Siemens.” E. S. Dean representing Sir George H. Nelson.
- “Genesis of the Electric Light and Power Industry.” Vice-Admiral H. G. Bowen, U. S. Navy (Retired), Executive Director, Thomas Alva Edison Foundation.

Tuesday, January 19

9:30 a.m.—Rotating Machinery and Carbon Brushes.

Committee on Rotating Machinery
West Room
F. R. TERRANT, Presiding

- 54-89. Practical Aspects of Brush Contact Stability. W. B. Belt, Morganite, Inc.
- 54-90. The Use of Microwaves in Observing Commutator and Slip Ring Surfaces During Operation. A. H. Ryan and S. D. Summers, Naval Research Lab.
- 54-91. Electrical Resistance of Carbon Brushes on Copper Rings. E. I. Shobert II, Stackpole Carbon Co.
- CP.** Quantitative Analysis of Carbon Brush Treatments Using X-Ray Photometer Absorption Method. A. C. Titus, General Electric Co.
- CP.** Air Humidity and Brush Contact Drop. H. M. Elsey, Westinghouse Electric Corp.

9:30 a.m.—Power Generation

Committee on Power Generation
Winter Garden, 24th Floor, Hotel McAlpin
F. L. LAWTON, Presiding

- 54-151. The Hungry Horse Project Power Development. F. M. Wilson, U. S. Bureau of Reclamation.
- 54-152. Supervisory Control and Remote Control Help TVA Cut Operating Costs. R. M. Alspaugh and A. P. Maness, Tennessee Valley Authority.

- 54-57. The OVEC Project. Philip Sporn and V. M. Marquis, American Gas & Electric Service Corp.
- 54-153. Tests and Operating Experiences at the Ottawa River Plants for the Hydro-Electric Power Commission of Ontario. J. J. Traill, F. C. Lawson, H. C. Ross and G. B. Tebo, The Hydro-Electric Power Commission of Ontario. Re-presented for discussion.

9:30 a.m.—Transmission Systems

Committee on Transmission and Distribution
Ballroom, 24th Floor, Hotel McAlpin
R. L. WITZKE, Presiding

- 54-5. A Simplified Approach to Steady State Stability Limits. W. G. Heffron, Jr., General Electric Co.
- 54-14. Analyzer Interconnections for Direct Determination of Power System Swing Curves. G. A. Bekey and F. W. Schott, University of California.
- 54-143. Digital Load Flow Studies. L. A. Dunstan, Beaverton, Oregon.
- CP.** Evaluation of the Integration Method for Analysis of Non-Standard Surge Voltages. A. R. Jones, Westinghouse Electric Corp.
- CP.** Electrical Clearances for Transmission Line Design at the Higher Voltages. P. L. Bellaschi, Consulting Engineer.

9:30 a.m.—Factors Affecting Permissible Leakage Currents in Portable Electrical Equipment.

Committee on Safety
Georgian Room
H. B. WHITAKER, Presiding

- 54-38. Safety in High Voltage Testing. A. F. Rohlfs and T. Brownlee, General Electric Co.
- CP.** The Threshold of Perception Currents. C. F. Dalziel, University of California.
- CP.** The Viewpoint of the Electrical Manufacturer. W. P. Von Behren, General Electric Co.
- CP.** The Viewpoint of the Electric Utility. H. A. Brown, Rochester Gas & Electric Co.
- CP.** The Viewpoint of the Electrical Equipment Merchandiser. O. D. Johnson, Sears, Roebuck & Co.

9:30 a.m.—Thermal Evaluation of Magnet Wire Insulation.

Committee on Basic Sciences
Colonial Room, 3rd Floor, Hotel McAlpin
T. W. DAKIN, Presiding

- CP.** Thermal Life of Magnet Wire Insulation. Ralph Hall, Phelps Dodge Copper Products Corp.
- CP.** Determination of Thermal Life of Enameled Wire by Laboratory Test Methods. F. A. Sattler, Westinghouse Electric Corp.
- CP.** A Method of Evaluating Thermal Stability of Magnet Wire Enamel. C. G. Currin and J. F. Dexter, Dow Corning Corp.
- CP.** Functional Evaluation of Enameled Wire-Varnish Combinations. H. I. Morgan and K. N. Mathes, General Electric Corp.
- CP.** Effects of Accelerated Aging on the Dielectric Strength and Power Factor of Magnet Wire Measured at the Aging Temperature. H. L. Saums and W. W. Pendleton, Anaconda Wire & Cable Co.

9:30 a.m.—Relays

Committee on Relays
Ballroom
FRANK VON ROESCHLAUB, Presiding

- 54-113. Loss-of-Field Protection for Synchronous Machines. R. L. Tremaine and J. L. Blackburn, Westinghouse Electric Corp.

TUESDAY (continued)

54-112. An Improved Transformer Differential Relay. C. A. Mathews, General Electric Co.

54-145. More About Setting Industrial Relays. F. P. Brightman, General Electric Co.

CP.** Single Pole Reclosing on Shawinigan Water and Power Co. 230 KV Transmission Lines. R. B. Reed and B. C. Hicks, Shawinigan Water and Power Co.

9:30 a.m.—Electronic Power Converters
Committee on Electronic Power Converters
Keystone Room
L. W. MORTON, Presiding

54-43. Rectifier Arc-Back Study on the Analogue Computer. J. K. Dillard and C. J. Baldwin, Jr., Westinghouse Electric Corp.

CP.** Pumplless Ignitrons—Field Experience and New Developments. R. J. Moran and E. J. Remscheid, General Electric Co.

CP.** Methods of Measuring Arc-Drop Voltage on Mercury Arc Rectifiers. H. Winograd, Allis-Chalmers Mfg. Co. and W. E. Lawton, Aluminum Co. of America.

9:30 a.m.—Behavior of the Elusive Lumen
Committee on Production and Application of Light
Penn Top South, 18th Floor
R. L. OETTING, Presiding

CP.** Economics of Lamp Operation and Replacement Under Normal and Abnormal Conditions. E. A. Lindsay, General Electric Co.

CP.** Industrial Luminaires Designed for Cleaner, Better Operation. Eric Church, Benjamin Electric Mfg. Co.

CP.** Commercial Luminaires Designed for Longer Life, Easier Maintenance. Dana Rowten, Westinghouse Electric Corp.

Discussion Forum on How the Elusive Lumen Gets Away.

9:30 a.m.—Facsimile
Committee on Telegraph Systems
East Room
A. G. COOLEY, Presiding

CP.** Signal Corps Engineering Laboratory Facsimile Activities. W. H. Junkelman, Coles Signal Lab.

CP.** A New Continuous-Feed Facsimile Scanner. J. V. L. Hogan and G. M. Stamps, Hogan Labs., Inc.

CP.** Problems in Facsimile Scanning with Cathode-Ray Tubes. W. H. Bliss, RCA Labs.

CP.** Design Factors in Continuous Facsimile Recorders. P. L. Grafstein and A. G. Cooley, Times Facsimile Corp.

9:30 a.m.—Instruments and Measurements
Committee on Instruments and Measurements
Skytop, 18th Floor
J. H. MILLER, Presiding

54-170. Thermocouple Type Ammeters for Use at Very High Frequencies. O. G. McAninch, General Electric Co.

54-16. A Tungsten Resistance Thermometer. F. R. Sias, J. R. Macintyre and A. Hansen, General Electric Co.

54-171. Basic Theory and Experimental Verification of the Alternating-Current Galvanometer. T. J. Higgins, University of Wisconsin and William Kneen, Pullman Standard Car Mfg. Co. Represented for Discussion.

CP.** A Comparison Standard for Electrical Energy Measurement. A. W. Spinks and T. L. Zapf, National Bureau of Standards.

2:00 p.m.—Sections Committee and Section Representatives
Penn Top North, 18th Floor
W. R. HOUGH, Presiding

2:00 p.m.—Synchronous Machinery
Committee on Rotating Machinery
West Room
E. I. POLLARD, Presiding

54-49. Direct Cooling of Turbine Generator Field Windings. C. H. Holley and H. D. Taylor, General Electric Co.

54-48. A New Fully Supercharged Generator. S. Beckwith and L. T. Rosenberg, Allis-Chalmers Mfg. Co.

54-92. Additional Design Features of the Fully Supercharged Generator. B. M. Koetting and G. W. Staats, Allis-Chalmers Mfg. Co.

54-50. Ventilation of Inner-Cooled Generators. R. A. Baudry and P. R. Heller, Westinghouse Electric Corp.

CP.** Test Results of an Inner Cooled Generator. W. C. Brenner and P. R. Heller, Westinghouse Electric Corp.

2:00 p.m.—Power Generation
Committee on Power Generation
Winter Garden, 24th Floor, Hotel McAlpin
A. P. HAYWARD, Presiding

54-154. Controls for Operation of Steam Turbine-Generator Units. O. N. Bryant, C. C. Sterrett and D. M. Sauter, Westinghouse Electric Corp.

54-155. Turbine and Boiler Protection and Interlocking on the A.G.&E. Company System. H. C. Barnes and C. P. Lugin, American Gas & Electric Service Corp.

54-40. Turbine Generator Controls, Protections and Accessories. G. W. Cunningham and M. A. Eggenberger, General Electric Co.

54-37. Methods of Starting Gas Turbine-Generator Units. W. B. Boyum, R. W. Ferguson and J. G. Partlow, Westinghouse Electric Corp.

2:00 p.m.—Wood and Steel Transmission Lines
Committee on Transmission and Distribution
Ballroom, 24th Floor, Hotel McAlpin
E. L. KANOUSE, Presiding

54-35. 230 KV Wood Pole Transmission Line Design. J. J. Trainor, Public Service Co. of Indiana and L. B. LeVesconte, Sargent & Lundy.

54-21. Foundation Stability of Wood Pole H-Frame Structures for Transmission Lines. R. W. Caswell and F. E. Andrews, Commonwealth Edison Co.

CP.** Problems Associated with Maintenance of Steel Transmission Towers. L. K. Yerger, Niagara Mohawk Power Corp.

CP.** Light versus Heavy Transmission Steel Towers. F. B. Di Castelbianco, Milan, Italy.

CP.** Effects of Tornadoes on Steel and Wood Lines. C. A. Booker, New England Power Service Co.

CP.** Use of Aluminum Alloys for Transmission Line Structures. G. H. Phillips and J. E. Williams, Aluminum Co. of America.

CP.** Construction Costs, Design Factors and Operating Experience on Long Span 'H' Frame Transmission Lines. C. H. Schofer, Penna. Power & Light Co.

2:00 p.m.—Electrical Regulators for Industrial Machines. Characteristics and Economic Fields of Applications.

Committee on General Industry Applications
Keystone Room
M. H. FISHER, Presiding

- CP.** Electronic Regulators. E. J. Luoma, Reliance Electric and Engineering Co.
CP.** Rotating Regulators. G. E. Shaad, General Electric Co.
CP.** Magnetic Amplifier Regulators. R. W. Moore, Westinghouse Electric Corp.

2:00 p.m.—Thermal Evaluation of Magnet Wire and Flexible Sheet Insulation

Committee on Basic Sciences
Colonial Room, 3rd Floor, Hotel McAlpin
L. J. BERBERICH, Presiding

- 54-71. Significant Measurements for Determining the Stability of High Temperature Magnet Wire Insulation. A. L. Scheideler, General Electric Co.
54-72. Calculation of Life Characteristics of Insulation. L. C. Whitman and Paul Doigan, General Electric Co.
CP.** Significance of Thermal Aging Tests on Varnish Impregnated Sheet Insulation. T. W. Dakin, H. J. Philofsky and W. C. Divens, Westinghouse Electric Corp.
CP.** Aging Tests of Class H Layer Insulations. N. W. Edgerton and P. Greebler, Johns-Manville Corp.
CP.** Thermal Aging Tests on Silicone Rubber and Class B and H Mica Insulation. E. J. Croop, Westinghouse Electric Corp.

2:00 p.m.—Comparison of Analogue Computers

Committee on Computing Devices
Ballroom
A. W. McCOURT, Presiding

- CP.** Theory and Application of High-Speed Electronic Models. D. H. Sheingold, GAP/R.
CP.** An Improved Electronic Function Generator. H. C. Vivian, Boeing Airplane Co.
CP.** Servo Phase Measurements at Low Frequencies. M. A. Miller and H. Hamer, Electronic Associates, Inc.
CP.** Use of Flight Simulators in the Design of Aircraft Control Systems. H. E. Blanton, Massachusetts Institute of Technology.

2:00 p.m.—Marine Transportation

Committee on Marine Transportation
Georgian Room
W. E. JACOBSEN, Presiding

- CP.** Nuclear Power Plants for Ship Propulsion—Description. F. E. Crever and K. Trocki, General Electric Co.
CP.** Nuclear Power Plants for Ship Propulsion—Application. R. L. Witzke and S. A. Haverstick, Westinghouse Electric Corp.
CP.** Forty Years of Electrical Engineering Progress in Tankers. L. M. Goldsmith, Atlantic Refining Co.
54-144. Series versus Parallel Connected Generators for Multiple Engine, Direct Current, Diesel Electric Ship Propulsion Systems. J. A. Wasmund, Westinghouse Electric Corp.

2:00 p.m.—Controlling the Elusive Lumen

Committee on Production and Application of Light
Penn Top South, 18th Floor
J. F. DICKERHOFF, Presiding

- CP.** Mass-production Methods Applied to Lamp Replacements and Fixture Cleaning. Fred Vorlander, Vorlander Lighting.
CP.** The Practical, Profitable Maintenance Program at Sperry. James Kimball, Sperry Gyroscope Co.
CP.** John Hancock Insurance Company's Program to Insure Good Lighting at Low Cost. T. C. Sargent, Sylvania Electric Products, Inc.
CP.** Making a Business of Lighting Maintenance. A. Marmon, Broadway Maintenance Co.
Discussion Forum on How Simplified Maintenance Keeps the Elusive Lumen at Work.

2:00 p.m.—Telegraph Systems

Committee on Telegraph Systems
East Room
E. F. WATSON, Presiding

- 54-105. A New Portable Telegraph Transmission Measuring Set. S. I. Cory, Bell Telephone Labs., Inc.
CP.** RCA's International Teleprinter Exchange System. R. E. Hammond, RCA Communications, Inc.
54-114. High Speed Teletypewriter Equipment for the Armed Services. C. E. Schultheiss, Klienschmidt Labs., Inc.
54-115. A Step Forward in Printing Telegraphy. A. S. Benjamin and W. J. Zenner, Teletype Corp.

2:00 p.m.—Instruments and Measurements

Committee on Instruments and Measurements
Skytop, 18th Floor
ERNEST WEBER, Presiding

- 54-172. A Signal Generator Using A Short Circuit Rotor. V. A. Orlando, General Electric Co.
CP.** A Flexible, Wide-Range Potentiometer for the Instrument Laboratory. H. B. Brooks, Consulting Engineer; F. K. Harris, National Bureau of Standards and F. K. Schroyer, Leeds and Northrup Co.
CP.** A Camera Obscura for Instrument Reading. F. K. Harris and F. D. Weaver, National Bureau of Standards.
CP.** Stabilized Power Supplies for Instrument Applications. W. G. Amey, F. H. Krantz, and A. J. Williams, Jr., Leeds & Northrup Co.
54-173. Sheet and Plated-Metal Measurements with a Phase-Angle-Type Probe. W. A. Yates and J. L. Queen, National Bureau of Standards. Re-presented for discussion.

Wednesday, January 20

9:30 a.m.—Heat Pumps

Committee on Domestic and Commercial Applications
Penn Top North, 18th Floor
CONSTANTINE BARY, Presiding

- CP.** Load Characteristics of Twenty-nine Domestic Electric Space Heating Installations in the Detroit Area. A. E. Bush and R. P. Woodward, Detroit Edison Co.
CP.** Performance of Earth Reservoir Heat Pumps. Merl Baker, The Kentucky Research Foundation.

WEDNESDAY (continued)

- CP.** Advancements in the Weathertron Program. P. F. O'Neill, General Electric Co.
- CP.** The Residential Heat Pump. J. L. Ditzler and F. R. Benedict, Westinghouse Electric Corp.
- CP.** Discussion on Residential Heat Pump Development. C. D. Graham, General Motors Corp.

9:30 a.m.—Synchronous Machinery

Committee on Rotating Machinery
West Room
L. O. DORFMAN, Presiding

- 54-93. Magnetic Vibrations in Alternating-Current Generator Stators. R. A. Baudry, P. R. Heller and L. P. Curtis, Westinghouse Electric Corp.
- CP.** Turbine Generator Stator Winding Temperatures at Various Hydrogen Pressures. J. R. M. Alger, C. E. Kilbourne and D. S. Snell, General Electric Co.
- 54-94. Temperature Drop to Resistance Temperature Detector in Stator Windings of Turbine Generators. J. P. Jerrard, General Electric Co.
- 54-42. New Developments in Armature Winding Arrangements for Large Turbine Generators. D. Harrington, General Electric Co. and J. E. McElligott, Palmer Electric Mfg. Co.

9:30 a.m.—Switchgear

Committee on Switchgear
Ballroom
R. L. WEBB, Presiding

- 54-31. A New Hydraulic Mechanism for Power Circuit Breakers. E. R. Perry and N. W. Morelli, Allis-Chalmers Mfg. Co.
- 54-130. An Advance in Pneumatic Mechanisms for High Voltage Power Circuit Breakers. R. C. Van Sickle and R. N. Yeckley, Westinghouse Electric Corp.
- 54-131. A Compressed Air Circuit Breaker for Continuous Currents in Excess of 5000 Amperes. H. H. Rugg and J. E. Schrameck, Westinghouse Electric Corp.
- 54-132. A New 115-Kv Stored-Energy Type Capacitor Switch. D. C. Prince, Consulting Engineer; P. Wildi, W. H. Claggett and J. Gregg, Pacific Oerlikon Co.
- 54-133. Guide for Application and Operation of Outdoor Metal Clad Switchgear. Subcommittee on Switchgear Assemblies.

9:30 a.m.—Insulated Conductors

Committee on Insulated Conductors
Georgian Room
M. H. McGRATH, Presiding

- 54-73. Pipe Type Cable Installation Techniques. R. W. Gillette, Consolidated Edison Co. of N. Y., Inc. and F. M. Hull, Detroit Edison Co.
- 54-56. 120 KV Self-Contained Compression Cable Installation at Montreal. S. H. Cunha, M. P. Gunning and D. M. Farnham Quebec Hydro Electric Commission.
- 54-74. 115 KV Pipe-Type Compression Cable Installation at Toronto, Canada. G. E. Kewin, J. M. Blades, Hydro-Electric Power Commission of Ontario, and G. B. Russel, Enfield Cables, Ltd.
- CP.** High Pressure Self Contained Gas Filled Cable Installation. G. B. Shanklin, General Electric Co.

9:30 a.m.—A Report on Industrial Power Systems Grounding

Committee on Industrial Power Systems
Penn Top South, 18th Floor
D. L. BEEMAN, Presiding

- CP.** Part I. System Neutral Grounding. H. B. Thacker, Westinghouse Electric Corp.
- CP.** Part II. Equipment Grounding. H. H. Angel, Bethlehem Steel Corp.
- CP.** Part III. Static Grounding and Grounding for Lightning Protection. C. C. Saunders, E. I. du Pont de Nemours & Co.
- CP.** Part IV. Earthing. M. A. Leland, Burndy Engineering Co.

9:30 a.m.—Electrostatic Processes

Committee on Electronics
Ballroom, 24th Floor, Hotel McAlpin
H. J. WHITE, Presiding

- 54-174. Recent Developments in the Theory and Design of Electric Spark Machine Tools. E. M. Williams, J. B. Woodford, Jr. and R. E. Smith, Carnegie Institute of Technology.
- CP.** Industrial Electrostatic Processes for Particulate Matter. O. C. Ralston, Bureau of Mines.
- CP.** Corona Currents in Electrostatic Precipitation. G. W. Penney and E. A. Sack, Carnegie Institute of Technology.
- CP.** Development of Power Supplies for Electrostatic Air Cleaners. A. C. Fields, Westinghouse Electric Corp.
- 54-175. An Automatic Voltage Control System for Electrical Precipitators. H. J. Hall, Research Corp.

9:30 a.m.—Conference on Noise

Committee on Basic Sciences
Colonial Anteroom, 3rd Floor, Hotel McAlpin
M. G. MALTI, Presiding

- CP.** Sources and Properties of Electrical Noise. W. R. Bennett, Bell Telephone Labs., Inc.
- CP.** Signal Detection in Noise. G. W. Preston, Philco Corp.
- CP.** The Measurement of Noise Spectra. J. W. Tukey, Bell Telephone Labs., Inc.
- 54-162. The Use of Instantaneous Point Sources or Green's Functions in Evaluating Electromagnetic Fields. J. J. Smith, General Electric Co.
- 54-183. Analysis of Linear Time-Varying Circuits by the B. W. K. Method. L. A. Pipes, University of California.

9:30 a.m.—Computing Devices

Committee on Computing Devices
Skytop, 18th Floor
G. D. McCANN, Presiding

- CP.** Transistor Building Blocks for Analogue Computers. H. Hellerman, Syracuse University.
- CP.** A Static Ferromagnetic Memory with Microsecond Access. I. L. Auerbach, L. C. Thompson and J. Wylen, Burroughs Adding Machine Co.
- 54-168. Digital Computers as an Aid in Electrical Machine Design. R. M. Saunders, University of California.
- 54-169. Bibliography on Data Storage and Recording. G. L. Hollander, Massachusetts Institute of Technology.
- CP.** Design Features of Two Large Scale Analog Computers on the West Coast. Stanley Rogers and Dov Abramis, Consolidated Vultee Aircraft Co.

WEDNESDAY (continued)**9:30 a.m.—Land Transportation**

Committee on Land Transportation
Keystone Room
J. P. STAIR, Presiding

- 54-116. Some Application Phases of the Ignitron Rectifier Locomotives on the Pennsylvania Railroad. F. D. Brown, Westinghouse Electric Corp.
- 54-110. Rectifier Motive Power—Inductive Coordination Considerations. E. B. King, American Telephone & Telegraph Co.; K. H. Gordon, The Pennsylvania Railroad and L. J. Hibbard, Westinghouse Electric Corp.
- CP.** New Ignitron Multiple-Unit Car Equipment for the New Haven Railroad. E. W. Ames, W. M. Hutchison and V. A. Moore, Westinghouse Electric Corp.
- 54-29. A Re-Appraisal of the Economics of Railway Electrification. How, When and Where Can It Compete with the Diesel-Electric Locomotive? H. F. Brown and R. L. Kimball, Gibbs & Hill, Inc.

9:30 a.m.—Wire Communication Systems

Committee on Wire Communication Systems
Colonial Room, 3rd Floor, Hotel McAlpin
W. F. POTTER, Presiding

- 54-101. Line Amplifiers for Community Television Systems. K. A. Simons, D. Kirk and H. J. Arbeiter, Jerrold Electronics Corp.
- 54-58. Application and Transmission Features of a New Twelve-Channel Open-Wire Carrier System. K. E. Appert, R. S. Caruthers and W. S. Chaskin, Lenkurt Electric Co., Inc.
- 54-102. Mechanical Aspects and Component Features of a New Twelve-Channel Open-Wire Carrier System. A. G. Ewing, F. W. Frazee and Dale Welling, Lenkurt Electric Co., Inc.
- CP.** A Pole-Mounted Repeater for a Twelve-Channel Open-Wire Carrier System. George Searle, Wisconsin Bell Telephone Co.

9:30 a.m.—Electrochemical Processes

Committee on Chemical, Electrochemical, and Electrothermal Applications
East Room
W. E. CUTZWILLER, Presiding

- 54-176. A New High Current Switch for Electrochemical and Electrothermal Applications. H. W. Graybill, Railway and Industrial Engineering Co. Re-presented for discussion.
- 54-178. Magnetic Amplifiers for Metering DC Current on Electrolytic Cell Lines. E. A. Downing, Columbia Southern Chemical Corp. Re-presented for discussion.
- CP.** Operating Experience with a Mechanical Rectifier. J. Chamulak, J. W. Tracht, Pennsylvania Salt Mfg. Co.; W. C. McCullough, I-T-E Circuit Breaker Co.
- Panel Discussion—Layout of Modern Rectifier Substations for Electrolytic Plants.

9:30 a.m.—Mining and Metal Industry

Committee on Mining and Metal Industry
Winter Garden, 24th Floor, Hotel McAlpin
R. B. MOORE, Presiding

- CP.** Application of Motors and Control to Crushers. H. A. Wright and T. Bellinger, Allis-Chalmers Mfg. Co.
- CP.** Application of Motors and Control on Ball Mills and Rod Mills. W. H. Schwedes, General Electric Co.
- CP.** Part Winding Starting of Large Motors. E. A. E. Rich, General Electric Co.
- CP.** Factors Affecting Choice of Mine Hoist Drive. R. B. Moore, General Electric Co.

2:00 p.m.—Research In the Power Field

Committee on Research
East Room
J. A. HUTCHESON, Presiding

- CP.** Principles of Operations Research. J. B. Lathrop, Arthur D. Little, Inc.
- CP.** An Application of Operations Research in the Power Field. E. W. Boehne, Massachusetts Institute of Technology.
- CP.** Active Research in the Development of Atomic Fuels for the Generation of Electric Power. W. L. Cisler, Detroit Edison Co. and A. P. Donnell, The Dow Chemical-Detroit Edison Nuclear Power Project.
- CP.** Research for and by the Electric Power Industry. J. E. Hobson, Stanford Research Institute and W. A. Lewis, Illinois Institute of Technology.
- CP.** No Research Means No Students. E. A. Walker, The Pennsylvania State College.

2:00 p.m.—Rotating Machinery

Committee on Rotating Machinery
West Room
J. G. NOEST, Presiding

- 54-20. Induction Motor Theory—Some Elementary Concepts Extending to Supra-Synchronous Speeds. C. T. Button, National Pneumatic Co., Inc.
- 54-17. Physical Concepts of Stray Load Loss in Induction Machines. S. S. L. Chang, New York University.
- 54-22. Torque-Energy Relations in Induction Machines. P. L. Alger and W. R. Oney, General Electric Co.
- 54-26. Induction Generator Theory and Application. J. E. Barkle and R. W. Ferguson, Westinghouse Electric Corp.
- 54-28. Accuracy and Simplicity in Induction Motor Calculations. J. F. H. Douglas, Marquette University. Re-presented for discussion.

2:00 p.m.—Switchgear

Committee on Switchgear
Ballroom
J. D. WOOD, Presiding

- 54-134. A New Basis for Rating Power Circuit Breakers. Working Group on Methods of Rating Power Circuit Breakers of the Subcommittee on Power Circuit Breakers.
- 54-32. A 10,000 MVA 138 KV Outdoor Oil Circuit Breaker. A. W. Hill and G. B. Cushing, Westinghouse Electric Corp.
- 54-135. 138 KV Line Dropping Field Tests. D. L. Finneran, R. D. Allen, Commonwealth Associates, Inc.; L. J. Linde and A. E. Kilgour, Allis-Chalmers Mfg. Co.

2:00 p.m.—Insulated Conductors

Committee on Insulated Conductors
Georgian Room
M. W. GHEN, Presiding

- 54-11. Single Phase Impedance to Ground in Pipe-Type Cable. E. R. Thomas, Consolidated Edison Co. of N. Y., Inc.
- 54-75. Control of the Thermal Environment of Buried Cable Systems. L. H. Fink, Philadelphia Electric Co.
- 54-76. Ratings of Pipe-Cable Systems During Steady-State and Transient Cyclical Loading. M. Morris and R. W. Burrell, Consolidated Edison Co. of N. Y., Inc.
- 54-77. Corrosion Control of Underground Power Cable in New York. F. E. Kulman, Consolidated Edison Co. of N. Y., Inc.

2:00 p.m.—Industrial Power Systems

Committee on Industrial Power Systems
Penn Top South, 18th Floor
S. A. WARNER, Presiding

- 54-9. Coordinated Fuse Protection for Low-Voltage Distribution Systems in Industrial Plants. J. C. Lebens, Bussmann Mfg. Co.
- 54-36. Iron Conduit Impedance Effects in Ground Circuit Systems. A. J. Bisson and E. A. Rochau, Consolidated Edison Co. of N. Y., Inc.
- CP.** Higher Voltage Power Distribution Systems for Large Office Buildings. H. D. Kurt and D. L. Beeman, General Electric Co.

2:00 p.m.—Semi-Conductor Devices

Committee on Electronics
Winter Garden, 24th Floor, Hotel McAlpin
J. P. JORDAN, Presiding

- CP.** A Silicon Junction Diode Sealed in Glass. S. H. Barnes, Hughes Research Lab.
- CP.** Silicon High Level P-N Junction Devices. Vernon Ozarow, General Electric Co.
- CP.** A Two Emitter Transistor with a High Adjustable Alpha. R. F. Rutz, International Business Machines.
- CP.** The Surface—Barrier Transistor. W. H. Forster, Philco Corp.
- CP.** Junction Transistors as Controlled Switches. R. L. Bright and G. H. Royer, Westinghouse Electric Corp.
- CP.** Noise Characteristics of P-N Junction Diodes. D. P. Kennedy, Raytheon Mfg. Co.
- CP.** Frequency Response of Grounded-Base and Grounded-Emitter Junction Transistors. R. L. Pritchard, General Electric Co.

2:00 p.m.—Feedback Control Systems

Committee on Feedback Control Systems
Ballroom, 24th Floor, Hotel McAlpin
L. C. HARRIOTT, Presiding

- CP.** An Extension of Frequency Domain Methods to Non-Linear Systems, Including Servomechanisms. Howard Hamer, Electronic Associates, Inc.
- CP.** Electrical Components of the Gyrotron Vibratory Rate Gyro. J. B. Chatterton, Sperry Gyroscope Co.
- 54-123. Contactor Servomechanisms Employing Sampled-Data. C. K. Chow. Pennsylvania State College.

2:00 p.m.—Metallic Rectifiers

Committee on Metallic Rectifiers
Skytop, 18th Floor
GLEN RAMSEY, Presiding

- 54-163. Electrical Properties of Microcrystalline Selenium. Gilbert Halverson, Fansteel Metallurgical Corp.
- 54-164. Instantaneous Electrical Characteristics of Selenium Rectifiers. G. F. Pittman, Jr., Westinghouse Electric Corp.
- CP.** Applications of Germanium Power Rectifiers. E. A. Harty, General Electric Co.
- CP.** Evaluating Rectifiers for Magnetic Amplifiers. D. J. Sikorra, Minneapolis-Honeywell Regulator Co.

2:00 p.m.—Land Transportation

Committee on Land Transportation
Keystone Room
J. P. STAIR, Presiding

- 54-45. Fundamentals of Flashing of Diesel-Electric Motors and Generators. C. A. Atwell, Westinghouse Electric Corp.

- CP.** Flashovers of Diesel Traction Motors and Main Generators. J. R. Schoonover, Lehigh Valley R.R.
- CP.** D. C. Machine Flashover Behavior. O. C. Coho, Jr., General Electric Co.
- CP.** Summary of Report on Diesel-Locomotive Flashovers. W. B. Miller, Chicago & North Western Ry.
- CP.** Static Excitation Control for Diesel-Electric Locomotives. S. W. McElhenny and R. M. Smith, General Electric Co.

2:00 p.m.—Wire Communications

Committee on Wire Communications
Colonial Room, 3rd Floor, Hotel McAlpin
L. R. MONTFORT, Presiding

- 54-103. Some Engineering Considerations in the Design of Telephone Systems to Serve Predominantly Rural Areas. T. J. McDonough and W. T. Smith, U. S. Dept. of Agriculture.
- CP.** Telephone Lines for Rural Subscribers Service. L. Hochgraf and R. G. Watling, Bell Telephone Labs., Inc.
- CP.** Polyethylene Insulated Telephone Cable—Quadded Construction. E. R. Kerwin and F. J. Gorman, Ansonia Wire and Cable Co.
- 54-104. Polyethylene Insulated Telephone Cable. A. S. Windeler, Bell Telephone Labs., Inc.

2:00 p.m.—Petroleum Industry

Committee on Chemical, Electrochemical and Electrothermal Applications
Penn Top North, 18th Floor
J. Z. LINSEMEYER, Presiding

- CP.** Selection and Application of Large Motors for Petroleum Refineries. C. M. Lathrop and E. J. Winsor, Standard Oil Development Co.
- CP.** The Design and Application of Large Inert-Gas Filled Motors for Explosive Atmospheres. R. W. Mills, Standard Oil Co. of Ohio and J. M. Butler, Jr., General Electric Co.
- CP.** Design of a 3000 HP Explosion Proof Motor. A. R. Gilmour, Westinghouse Electric Corp.
- CP.** Supervisory Control for Pipeline Pumping Stations. M. A. Hyde and W. A. Derr, Westinghouse Electric Corp.

2:00 p.m.—Mining and Metal Industry

Committee on Mining and Metal Industry
Colonial Anteroom, 3rd Floor, Hotel McAlpin
R. B. MOORE, Presiding

- CP.** Remotely Controlled Bore Mining and Its Electrical Considerations. R. R. Cosner, Carbide & Carbon Chemicals Corp.
- CP.** Electric Equipment for Rotary Blast Hole Drills. G. F. Johnson, Joy Mfg. Co.
- CP.** Electric Power Distribution and Utilization Problems at Georgetown Open Cut Coal Mine. E. E. Gaston, Hanna Coal Co.
- CP.** Distribution and Utilization of Electric Power in Underground Mines. B. E. Rector, Westinghouse Electric Corp.

Thursday, January 21

9:30 a.m.—Mining and Metal Industry and Industrial Control

Committees on Mining and Metal Industry and Industrial Control
West Room
F. O. SCHNURE, Presiding

- CP.** Characteristics and Design of Regulating Systems for 7000 FPM Tandem Cold Strip Mill. R. G. Beadle and R. E. Manko, General Electric Co.

THURSDAY (continued)

CP.** Characteristics and Design of the Temper Mill Drive. A. C. Halter and T. B. Montgomery, Allis-Chalmers Mfg. Co.

CP.** The A-C Power System at Fairless Works. L. L. Fountain, W. A. Derr, R. B. Squires, Westinghouse Electric Corp. and S. Watkins, Gibbs & Hill, Inc.

CP.** Mercury Arc Rectifiers for 250 Volt D.C. Power Supply at Fairless Works. D. B. Scott and Paul Triplett, Allis-Chalmers Mfg. Co.

9:30 a.m.—Rotating Machinery

Committee on Rotating Machinery
Colonial Room, 3rd Floor, Hotel McAlpin
S. F. HENDERSON, Presiding

54-3. Dynamic Braking of Squirrel Cage Induction Motors. C. F. Evert, Jr., University of Cincinnati.

54-95. A Method of Determining Induction Motor Speed-Torque-Current Curves from Reduced Voltage Tests. R. F. Horrell and W. E. Wood, Electric Machinery Mfg. Co.

54-27. Operation of Three Phase Induction Motors on Unbalanced Voltages. J. E. Williams, University of Illinois.

54-96. Eddy-Current Losses in Induction Motor End-Turn Clamping Rings. John Baird, General Electric Co.

9:30 a.m.—Switchgear

Committee on Switchgear
Ballroom, 24th Floor, Hotel McAlpin
R. L. WEBB, Presiding

54-30. A New Milestone in Circuit Breaker Interrupting Capacity 25 Million KVA at 330 KV. W. M. Leeds and G. J. Easley, Westinghouse Electric Corp.

54-59. A 330 KV-15,000 MVA Steel Clad Impulse Breaker to Guard the Nation's First 330 KV Lines. C. J. Balentine and E. B. Rietz, General Electric Co.

54-34. A 330 KV Air Switch. I. W. Gross, American Gas & Electric Service Corp.; S. C. Killian, H. K. Porter Co., Inc. and J. M. Sheadel, Ohio Brass Co.

54-33. Dielectric and Other Problems in the Design of a New 330 KV Outdoor Air Switch. A. H. Powell, General Electric Co.

CP.** A 330 KV Disconnecting Switch. J. B. Owens, Westinghouse Electric Corp.

9:30 a.m.—System Engineering and Power Generation.

Committees on System Engineering and Power Generation
Penn Top South, 18th Floor
G. H. McDaniel, Presiding

54-25. Tie-Line Power and Frequency Control of Power Systems-II. C. Concordia and L. K. Kirchmayer, General Electric Co.

54-60. Effect of Cyclic Loads on an Interconnected System. C. K. Duff, Hydro-Electric Power Commission of Ontario.

54-61. Load-Phase Control—Method of Automatic Frequency Control of a Multiple Generating Plants System. Francois Cahen, Electricite De France.

54-62. Performance Tests of High-Speed Load and Frequency Control Equipment. C. P. Almon, Jr., and J. Donelson, Jr., Tennessee Valley Authority.

9:30 a.m.—Tubes for Ultra-High Frequency Television

Committee on Electronics
Winter Garden, 24th Floor, Hotel McAlpin
W. B. WHALLEY, Presiding

CP.** High-Power UHF Klystron Design and Application. A. E. Rankin, General Electric Co.

CP.** Design Considerations for Television Tuners Using Pencil Tubes. W. H. Harris and J. J. Thompson, Radio Corp. of America.

CP.** UHF Amplifier Design for a Disc Seal Triode. S. C. Peek, Sylvania Electric Products, Inc.

CP.** Tube Evaluation at UHF. R. L. Bailey, General Electric Co.

9:30 a.m.—Magnetic Materials

Committee on Basic Sciences
Georgian Room
A. C. BEILER, Presiding

CP.** Magnetic Developments in Japan. R. M. Bozorth, Bell Telephone Labs., Inc.

CP.** The Relation Between Domain Phenomena and Crystal Orientation to Design and the Use of Magnetic Materials. L. J. Dijkstra, Westinghouse Electric Corp.

CP.** Domain Structure in Relation to Magnetostriction and Design Factors. P. W. Neurath, General Electric Co.

9:30 a.m.—Electronic Circuit Theory Conference

Committee on Basic Sciences
Penn Top North, 18th Floor
W. R. LePAGE, Presiding

CP.** Responses of Certain Basic Circuits to a Sinusoidal Wave Packet. T. J. Higgins, University of Wisconsin and Thomas Stoner, Kearney and Trecker Corp.

CP.** A New Method for Realizing a Driving Point Impedance Function. R. H. Pantell, Stanford University.

CP.** A Supplement to the Brune Synthesis Procedure. F. Reza, Massachusetts Institute of Technology.

CP.** Synthesis for Structure only of a Ladder Network when the Lattice is known, and is Reactive. G. B. Hoadley, University of North Carolina.

9:30 a.m.—Color Television Networking and Measurements

Committee on Television and Aural Broadcasting Systems
Skytop, 18th Floor
W. F. BAILEY, Presiding

CP.** Differential Gain and Phase Measurements in Color Television Systems. H. Kelly, Bell Telephone Labs., Inc.

CP.** Photo-Electric Colorimeter for Color Television. J. B. Chatten, Philco Corp.

CP.** Phase Analyzer for Color Television. J. F. Fisher, Philco Corp.

CP.** Transmission of Color Over Intercity Television Networks. D. D. Donald, American Telephone & Telegraph Co.

9:30 a.m.—Communication Switching Systems

Committee on Communication Switching Systems
East Room
A. E. FROST, Presiding

54-122. A Fully Automatic Teletypewriter Switching Center for Military Use. Leith Johnston and R. C. Stiles, Automatic Electric Co.

54-24. The Recognition and Identification of Symmetric Switching Functions. S. H. Caldwell, Massachusetts Institute of Technology.

CP.** Switching Functions on an N-Dimensional Cube. C. Y. Lee, Bell Telephone Labs., Inc.

CP.** Experience with Nationwide Dialing at Englewood, New Jersey. E. L. Getz, Bell Telephone Labs., Inc.

THURSDAY (continued)

9:30 a.m.—Cathodic Protection and Storage Batteries

Committee on Chemical, Electrochemical, and Electrothermal Applications
Keystone Room
R. M. WAINWRIGHT and H. C. RIGGS, Presiding

- CP.** Electrical Grounding and Cathodic Protection at the Fairless Works. W. E. Coleman and Harold Frostich, U. S. Steel Corp.
- CP.** Use of Rock Salt and Corrosion Effects in Telephone Structures. J. C. Leffel, Michigan Bell Telephone Co.
- 54-180. Some Aspects of the Charge and Discharge Processes in Lead-Acid Storage Batteries. D. N. Craig and W. J. Hamer, National Bureau of Standards.
- 54-177. Some Discharge Characteristics of Lead Acid Batteries. E. A. Hoxie, The Electric Storage Battery Co.

9:30 a.m.—Extra High Voltage Transmission Systems

Committees on Transmission and Distribution and Standards
Ballroom
F. V. SMITH, Presiding

- 54-19. Protective Practices as a Criterion for High Voltage Transmission Design. H. L. Rorden and R. S. Gens, Bonneville Power Administration.
- 54-55. The American Gas and Electric Company 330 KV Transmission System Design Principles, Electrical Characteristics and Performance. H. P. St. Clair and C. A. Imburgia, American Gas & Electric Service Corp.
- 54-54. Equipment for American Gas and Electric 330 KV System. F. A. Lane, J. H. Kinghorn and F. M. Porter, American Gas & Electric Service Co.
- CP.** Report on Insulation Coordination. J. H. Foote, Chairman, Standards Coordination Committee No. 8.

2:00 p.m.—Mining and Metal Industry and Industrial Control

Committee on Mining and Metal Industry and Industrial Control
West Room
F. O. SCHNURE, Presiding

- 54-107. Considerations in Applying Rectifiers as a Power Supply for Hot Strip Mills. G. M. Zins and E. J. Cham, Westinghouse Electric Corp.
- CP.** Transient Characteristics of Metal Rolling Motors and Generators. E. P. Smith, General Electric Co.
- CP.** Ignitron Rectifier Voltage Regulators. L. F. Stringer, Westinghouse Electric Corp.
- 54-181. Electrical Equipment for Slabbing Mill and Blooming Mill. R. H. Wright and N. L. Kincaid, Westinghouse Electric Corp.

2:00 p.m.—Rotating Machinery

Committee on Rotating Machinery
Colonial Room, 3rd Floor, Hotel McAlpin
T. C. LLOYD, Presiding

- 54-97. The Equivalent Circuit of the Schrage Motor. C. L. Sheng, Pennsylvania State College.
- 54-8. Speed-Torque Calculations for Induction Motors with Part Windings. P. L. Alger and C. H. T. Pan, General Electric Co.; Y. H. Ku, Moore School of Electrical Engineering.
- 54-15. Skin-Effect Bars of Squirrel-Cage Rotors. M. Liwshitz-Garik, Polytechnic Institute of Brooklyn.
- 54-23. Switching Transients in Wound Rotor Induction Motors. P. L. Alger, General Electric Co. and Y. H. Ku, Moore School of Electrical Engineering.
- 54-1. The Magnetic Noise of Polyphase Induction Motors. P. L. Alger, General Electric Co. Re-presented for discussion.

2:00 p.m.—System Engineering and Power Generation

Committees on System Engineering and Power Generation
Penn Top South, 18th Floor
A. P. HAYWARD, Presiding

- CP.** Communication Systems of the Illinois-Missouri Electric Power Pool. G. W. Fox, Union Electric Co. of Missouri; D. F. Hazen, Illinois Power Co., and H. E. Stites, Central Illinois Public Service Co.
- 54-63. Load Control and Telemetering—Ohio Edison System. R. H. Travers, Ohio Edison Co.
- CP.** Design and Operation of System-Wide Automatic Load Frequency Control Equipment. H. A. Bauman, C. N. Metcalf, J. G. Noest, Consolidated Edison Co., and G. B. Carolus, Leeds & Northrup Co.
- CP.** Steam Plant Operation Improved by Load Frequency Control. H. C. Reasoner, Detroit Edison Co.
- 54-64. Principles of A. C. Power System Voltage Control for Operating Personnel. H. B. Smith, Niagara Mohawk Power Corp.

2:00 p.m.—Substations

Committee on Substations
East Room
K. L. WHEELER, Presiding

- 54-83. 330 KV Outdoor Station for the Atomic Energy Commission. F. W. McCloska, Sargent & Lundy, and F. L. Musselman, General Electric Co.
- 54-84. Switching Surge Voltages in High Voltage Stations. I. B. Johnson and A. J. Schultz, General Electric Co.
- 54-80. A Guide for Minimum Electrical Clearances for Standard Basic Insulation Levels. Working Group on Minimum Clearances.
- 54-81. Application Guide on Methods of Substation Grounding. Working Group on Substation Grounding Practices.
- 54-82. A Guide to Safety Considerations in the Design of Substations. Working Group on Safety in Substations.

2:00 p.m.—Magnetic Materials

Committee on Basic Sciences
Georgian Room
R. M. BOZORTH, Presiding

- CP.** What is Ferrimagnetism? L. R. Maxwell, U. S. Naval Ordnance Lab.
- CP.** Properties and Applications of Available Ferrites. V. E. Legg and C. D. Owens, Bell Telephone Labs., Inc.
- CP.** A Comparison of Metals and Ferrites for High Frequency Applications. D. R. Brown, D. A. Buck and Norman Menyuk, Massachusetts Institute of Technology.
- CP.** High Coercive Permanent Magnet Materials and Their Application. T. O. Paine and L. I. Mendelsohn, General Electric Co.

2:00 p.m.—Present Status of Transistors

Committee on Basic Sciences
Keystone Room
S. J. ANGELLO, Presiding

- CP.** Transistor Materials. F. J. Morin, Bell Telephone Labs., Inc.
- CP.** Transistor Devices. W. C. Dunlap, Jr., General Electric Co.
- CP.** Transistor Technology. R. L. Sherwood, RCA Labs.
- CP.** Transistor Applications. R. F. Shea, General Electric Co.

2:00 p.m.—Color Television Transmitting Facilities

Committee on Television and Aural Broadcasting Systems
Skytop, 18th Floor
D. G. FINK, Presiding

- CP.** Color Television Camera Equipment. F. W. Millspaugh, Radio Corp. of America.
- CP.** Equipment for Color Television Broadcasting. R. Popkin-Churman, Telechrome Corp.
- CP.** Color TV Studio Design from an Operational Standpoint. R. Monfort, National Broadcasting Co.
- CP.** Color Television Equipment for the Broadcaster. O. W. B. Reed, Jr., Jansky and Bailey, Inc.

2:00 p.m.—Insulated Conductors

Committee on Insulated Conductors
Ballroom, 24th Floor, Hotel McAlpin
L. E. FOGG, Presiding

- 54-10. Evaluation of Cable Movement due to Cyclic Loading. C. A. Bauer and R. J. Nease, Commonwealth Edison Co.
- 54-7. Tellurium Alloy Lead Sheath for Power Cable. G. B. Shanklin and J. F. Eckel, General Electric Co.
- 54-78 Crepe Papers and Crepe-Paper Cables. G. Camilli, L. Mulligan and E. L. Crandall, General Electric Co.
- 54-79. A Submarine Cable for 100 Kv D. C. Power Transmission. B. O. N. Hansson, Aktiebolaget Liljeholmens Kabelfabrik.

2:00 p.m.—Transmission and Distribution and Protective Devices

Committees on Transmission and Distribution and Protective Devices
Ballroom
A. A. JOHNSON, Presiding

- 54-156. Measuring Equipment and Techniques Used for High-Voltage Impulse Tests on Lines and Substations. J. W. Skooglund and T. L. Dyer, Jr., Westinghouse Electric Corp.; W. H. Kolb, American Gas & Electric Service Corp.
- 54-51. High Voltage Impulse Tests on Transmission Lines. C. F. Wagner and B. L. Lloyd, Westinghouse Electric Corp. I. W. Gross, American Gas & Electric Service Corp.
- 54-157. High-Voltage Impulse Tests in Substations. I. W. Gross and W. S. Price, American Gas & Electric Service Corp.; S. B. Griscom and J. M. Clayton, Westinghouse Electric Corp.
- 54-53. Voltage Divider for Measuring Impulse Voltages on Transmission Lines. S. B. Griscom, B. L. Lloyd and A. R. Hileman, Westinghouse Electric Corp.

2:00 p.m.—Electronic Education

Committee on Education
Winter Garden, 24th Floor, Hotel McAlpin
J. M. CAGE, Presiding

- CP.** The Fundamentals of Electronics. I. B. Baccus, Michigan State College.
- CP.** Electronics Education in the Small College. K. F. Sibila, University of Akron.
- CP.** Electronics in the Five-year Undergraduate Program. E. M. Boone, Ohio State University.
- CP.** The effects of Recent Scientific Developments Upon Education in Electronics. J. D. Ryder, University of Illinois.
- CP.** Industry Examines Engineering Education. A. L. Samuel and R. W. Wolslegel, International Business Machines Corp.

Friday, January 22

9:30 a.m.—Mining and Metal Industry and Industrial Control

Committees on Mining and Metal Industry and Industrial Control
Skytop, 18th Floor
T. B. MONTGOMERY, Presiding

- CP.** Electrical Control for Continuous Annealing. P. A. Travisano, General Electric Co.
- CP.** Unusual Electrical Drive Features Applied to Fairless Processing Lines. E. E. Vonada, Reliance Electric & Engineering Co.
- 54-108. Trends in "Automation"—Electrolytic Tinning. P. R. Graevenstreter and R. E. Layton, The Clark Controller Co.
- CP.** 60 Cycle Induction Heating of Aluminum. J. W. Hrovath, Aluminum Co. of America.

9:30 a.m.—Rotating Machinery

Committee on Rotating Machinery
East Room
J. S. ASKEY, Presiding

- 54-98. Effect of Overvoltages and Surges on Machine Insulation. C. L. Sidway and J. E. Conner, Southern California Edison Co.
- 54-18. Stator Insulation Practices for High-Voltage Inner-Cooled Generators. G. L. Moses, Westinghouse Electric Corp.
- 54-99. Corona in Low Voltage Motor Windings. W. T. Starr, General Electric Co.
- CP.** Thermal Endurance of Silicone Magnet Wire Evaluated by Test. W. J. Bush and J. F. Dexter, Dow-Corning Corp.
- CP.** Review of Some Problems in DC Testing Low Voltage Electric Machine Insulation. G. L. Moses, Westinghouse Electric Corp.

9:30 a.m.—Transformers

Committee on Transformers
Ballroom
J. A. ADAMS, Presiding

- 54-46. Parallel Windings in Multiwinding Transformers. Saul Benon, Westinghouse Electric Corp.
- 54-117. Long Time Scale Models of Transformers for the Determination of Transient Voltages. P. A. Abetti, General Electric Co. and H. B. Belck, Rennselaer Polytechnic Institute.
- 54-13. Fundamental Oscillations of Coils and Windings. P. A. Abetti and F. J. Maginniss, General Electric Co.
- 54-118. Some Properties of the Optimum Power Transformer Design. H. L. Garbarino, Armour Research Foundation of Illinois Institute of Technology.
- 54-119. A Stray Loss Problem in Transformer Tanks. F. J. Vogel and E. J. Adolphson, Allis-Chalmers Mfg. Co. Re-presented for discussion.

9:30 a.m.—Carrier Current

Committee on Carrier Current
Penn Top North, 18th Floor
L. G. EATON, Presiding

- 54-85. A New Carrier Current Line Trap for Power Line Application. F. D. Johnson, E. W. Lindsay and Zeno Neri, Westinghouse Electric Corp.
- 54-2. Planning the Carrier Facilities for a Utility System. J. C. G. Carter, Westinghouse Electric Corp.
- 54-86. High Speed Control by Frequency-Shift Audio Tones. D. C. Pinkerton and L. C. Widmann, General Electric Co.
- 54-12. Application Guide for Power Line Carrier. Project Subcommittee #2 of the Committee on Carrier Current.

FRIDAY (continued)

9:30 a.m.—Feedback Control Systems

Committee on Feedback Control Systems
Keystone Room
H. W. CORY, Presiding

- CP.** A Note on the Analysis of Backlash and Hysteresis in Feedback. L. M. Vallese, Brooklyn, New York.
- CP.** Automatic Flight Control Using Rate Gyros for Unlimited Maneuvering. C. R. Hanna, K. A. Oplinger and G. R. Douglas, Westinghouse Electric Corp.
- CP.** Cross-Coupling in Two-Channel Servos. E. L. Peterson, General Electric Co.
- 54-124. The Application of Short Time Memory Devices to Compensator Design. D. J. Ford and J. F. Calvert, Northwestern University.

9:30 a.m.—Infrared Transducer Systems

Committee on Electronics
West Room
A. H. CANADA, Presiding

- CP.** Infrared Detectors and Techniques for Comparison. A. J. Cussen, U. S. Naval Ordnance Lab.
- CP.** Some Aspects of Infrared Image Devices. G. A. Morton, RCA Labs.
- CP.** Instrumentation Problems with Infrared Detectors. W. G. Fastie, The Johns Hopkins University.
- CP.** Photoconductive Detectors and Transducer Systems. R. W. Paulson, General Electric Co.

9:30 a.m.—Conference on Selenium and Tellurium

Committee on Basic Sciences
Ballroom, 24th Floor, Hotel McAlpin
H. W. HENKELS, Presiding

- CP.** A General Mode of the Selenium Semiconductor. H. W. Henkels, Westinghouse Electric Corp.
- CP.** Surface States in Selenium. K. Lehovc, Sprague Electric Co.
- CP.** Microstructures in Selenium. E. F. Losco, Westinghouse Electric Corp.
- CP.** Properties of Liquid Selenium. J. Maczuk, University of Pennsylvania.
- CP.** Diffusion Phenomena in Se-Metal Contacts. A. C. English, General Electric Co.
- CP.** Effects of Thallium in Counter-Electrode Materials. H. Bandes, Sylvania Electric Products, Inc.

9:30 a.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Penn Top South, 18th Floor
E. V. WEIR, Presiding

- 54-158. Analysis of a Single Core Magnetic Amplifier with Real Rectifier and Core Functions. Max Frank, Saul Rabotnick and J. R. Walker, Wayne Engineering Research Institute.
- 54-159. Fast Response Magnetic Amplifiers. G. E. Hughes and H. A. Miller, Raytheon Mfg. Co.
- 54-182. Design Considerations of the Half-Wave Bridge Magnetic Amplifier. C. W. Lufey and H. H. Woodson, U. S. Naval Ordnance.
- 54-160. Frequency Response of a Resonant Dielectric Amplifier. G. W. Penney, E. A. Sack and E. R. Wingrove, Carnegie Institute of Technology.
- CP.** Response Time of Magnetic Amplifiers. L. J. Johnson, D. & R. Ltd. and S. E. Rauch, University of California.

9:30 a.m.—Television Transmitting Equipment and Special Receiving Systems

Committee on Television and Aural Broadcasting Systems
Colonial Room, 3rd Floor, Hotel McAlpin
JESS EPSTEIN, Presiding

- 54-165. High Gain Side-Firing Helical Antennas for Ultra High Frequency Television Broadcasting. H. G. Smith, Cornell University.
- CP.** The Wavestack, a New Type of Antenna for VHF Broadcasting. G. B. MacKimmie, RCA Victor Co., Ltd.
- 54-166. A UHF Transmitter Employing Klystron Power Amplifiers. W. H. Sayer, Allen B. Du Mont Labs. Re-presented for discussion.
- CP.** An On-Channel Television Satellite System. L. E. Rawls, Station WSM.
- CP.** Community TV Systems. M. F. Malarkey, Jr., Transvideo Corp.

9:30 a.m.—System Engineering

Committee on System Engineering
Winter Garden, 24th Floor, Hotel McAlpin
H. L. HARRINGTON, Presiding

- 54-65. Coordination of Incremental Fuel Costs and Incremental Transmission Losses by Functions of Voltage Phase Angles. W. R. Brownlee, Southern Services, Inc.
- 54-66. Loss Evaluation—I Losses Associated with Sale Power in Phase Method. D. C. Harker, Commonwealth Associates, Inc.; W. E. Jacobs, Consumers Power Co., and R. W. Ferguson and E. L. Harder, Westinghouse Electric Corp.
- 54-67. Loss Evaluation—II Current- and Power-Form Loss Formulas. E. L. Harder, R. W. Ferguson, Westinghouse Electric Corp. W. E. Jacobs, Consumers Power Co. and D. C. Harker, Commonwealth Associates, Inc.
- 54-68. A Transmission Loss Penalty Factor Computer. C. A. Imburgia and G. W. Stagg, American Gas & Electric Service Corp.; L. K. Kirchmayer, General Electric Co.
- CP.** Application of Penalty Factor Computer on American Gas and Electric System. G. C. McDaniel, V. R. Peterson and A. H. Willennar, American Gas and Electric Service Corp.

9:30 a.m.—Switchgear

Committee on Switchgear
Georgian Room
R. L. WEBB, Presiding

- 54-129. Short-Circuit Calculating Procedure for Direct-Current Systems with Motors and Generators. W. R. Crites and A. G. Darling, General Electric Co.
- 54-137. Mechanical Properties of Aluminum Electrical Bus. G. W. Stickley and C. O. Smith, Aluminum Co. of America.
- 54-136. Transient Voltage and Current Requirements of Main-Field Circuit Breakers for Synchronous Machines. M. E. Horn and J. C. Cunningham, Westinghouse Electric Corp.
- 54-138. Short-Circuit Forces in Isolated-Phase Buses. W. R. Wilson and L. L. Mankoff, General Electric Co.
- 54-141. Cantilever Loaded Insulators for Isolated Phase Bus. K. T. Ashdown and N. Swerdlow, General Electric Co.

2:00 p.m.—Mining and Metal Industry and Industrial Control

Committees on Mining and Metal Industry and Industrial Control
Skytop, 18th Floor
T. B. MONTGOMERY, Presiding

- CP.** Characteristics of Magnetic Amplifiers for Industrial Processes. R. G. Beadle and B. P. Chausse, General Electric Co.
- CP.** Control Equipment for Sheet Shearing Lines, Fairless Works. R. P. Forrestal and R. J. Byrnes, Cutler-Hammer, Inc.

FRIDAY (continued)

- CP.** A Two Motor AC Mine Hoist Control System. A. H. Myles, Electric Controller & Mfg. Co.
- CP.** Performance of A. C. Cranes. R. W. Wickersham, Westinghouse Electric Corp.

2:00 p.m.—Rotating Machinery

Committee on Rotating Machinery
East Room
E. P. CODLING, Presiding

- 54-100. Single Phase Operation of a Three-Phase Motor with a Simple Phase Converter. R. Habermann, Jr., General Electric Co.
- CP.** Calculation of Temperature Rise of Intermittent Duty Motors with an Electronic Thermal Analog Computer. W. R. Hoffmeyer and E. R. Cunningham, General Electric Co.
- CP.** A New Homopolar Motor. Y. H. Ku and Ahmad Kamal, Moore School of Electrical Engineering.
- CP.** Characteristics of Alnico VI in Two-Pole Permanent Magnet Alternators. J. M. Shulman, Westinghouse Electric Corp.

2:00 p.m.—Transformers

Committee on Transformers
Ballroom
J. R. MEADOR, Presiding

- 54-120. Transformer Noise Measurement Methods. Progress Report of Working Group on Instrumentation and Measurement.
- 54-47. A New Development in High Voltage Transformers. H. B. Hansen and F. J. Vogel, Allis-Chalmers Mfg. Co.
- CP.** Effect of Circuit Reclosing Practice on Winding Temperature Limits During Short Circuit Conditions. J. E. Clem, Test Inspection Service.
- 54-121. The Functional Evaluation of Insulation for Small Dry-Type Transformers used in Electronic Equipment. R. L. Hamilton and H. B. Harms, General Electric Co.

2:00 p.m.—Feedback Control Systems

Committee on Feedback Control Systems
Keystone Room
F. E. CREVER, Presiding

- CP.** Impact-Momentum Method of Servo Analysis. Ira Ritow.
- 54-125. Linear Compensation of Saturating Servomechanisms. J. R. Burnett, Purdue University. P. E. Kendall, Cook Research Labs.
- 54-44. An Investigation of the Switching Criteria for Higher Order Contactor Servomechanisms. I. Bogner, Cook Research Labs., and L. F. Kazda, University of Michigan.
- 54-126. The Transient Performance of Servomechanisms with Derivative and Integral Control. R. C. Lathrop and D. Graham, Wright Air Development Center.
- 54-127. A Graphical Procedure for Determining the Gain of a Servomechanism for a Specified Maximum Modulus Less Than Unity. T. J. Higgins, University of Wisconsin.

2:00 p.m.—Symposium on High-Frequency Conductors, Cables and Connectors

Committee on Electronics
West Room
MILTON TENZER, Presiding

- CP.** Styroflex Semi-Flexible Air-Dielectric Coaxial Cable. E. J. Merrell and A. L. McKean, Phelps Dodge Copper Products Corp.
- CP.** Shielding of Communication Cables. F. H. Gooding and H. B. Slade, Okonite Co.
- CP.** Microstrip—A Printed Microwave Transmission System. H. F. Engelmann, Federal Telecommunication Labs., Inc.

- CP.** Printed Circuits. O. I. Steigerwalt, Erie Resistor Corp.
- 54-179. An Annular Waveguide Rotary Joint with Waveguide Feed. L. D. Breetz, Naval Research Lab.

2:00 p.m.—Conference on Selenium and Tellurium

Committee on Basic Sciences
Ballroom, 24th Floor, Hotel McAlpin
P. H. MILLER, Jr., Presiding

- CP.** Selenium-Tellurium Alloys. P. H. Miller, Jr., University of Pennsylvania.
- CP.** Thermoelectric Effect of Intrinsic Semiconductors with Lattice Defects. S. Tanuma, Tohoku University.
- CP.** Intrinsic Lattice Defects in Tellurium. H. Fritzsche, Purdue University.
- CP.** Liquid Tellurium. A. Epstein and H. Fritzsche, Purdue University.
- CP.** Substitute for Selenium in Rectifiers. J. Cataldo, International Rectifier Corp.
- CP.** Capacity-Voltage Studies on Selenium Rectifiers. J. Marinace, General Electric Co.
- CP.** Properties of Selenium Contacts. C. T. Niu, Westinghouse Electric Corp.

2:00 p.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Penn Top South, 18th Floor
W. J. DORNHOEFER, Presiding

- 54-161. Flux Resetting Characteristics of Several Magnetic Materials. Hoobert Huhta, General Electric Co.
- CP.** Magnetic Characteristics Pertinent to the Operation of Cores in Self-Saturating Magnetic Amplifiers. R. W. Roberts, Westinghouse Electric Corp.
- CP.** A Curve Tracer for Displaying the B-H Characteristics of Small Toroidal Cores. C. A. Booker, Jr., New England Power Service Co.
- CP.** On the Operation of Magnetic Amplifiers with Various Types of Loads. L. A. Finzi and R. R. Jackson, Carnegie Institute of Technology.

2:00 p.m.—Broadcast Receivers and Automatic Transmitters

Committee on Television and Aural Broadcasting Systems
Winter Garden, 24th Floor, Hotel McAlpin
C. E. DEAN, Presiding

- CP.** Very Small Speaker-Type Personal Broadcast Receiver. K. James, Emerson Radio & Phonograph Corp.
- CP.** An Improved Vertical Sync Circuit. A. M. Levine, H. Altman and L. Feit, Federal Telecommunications Lab.
- 54-167. A Radio Relay Remote Control System for FM Broadcast Stations. T. R. Humphrey, Rural Radio Network.
- CP.** Automatic Remote Broadcast Stations. S. H. VanWambeek, Hammarlund Mfg. Co.
- 54-6. Torque Requirements of a Radar Antenna. Melvin Mark, Raytheon Mfg. Co.

2:00 p.m.—Switchgear

Committee on Switchgear
Georgian Room
J. D. WOOD, Presiding

- 54-139. Flexible High Power Laboratory Capacitor Bank for Variety of Switching Tests to 65,000 KVAR. R. E. Friedrich and D. J. Burns, Westinghouse Electric Corp.
- 54-140. Measurement of Current Density in the High Current Arc. W. F. Skeats and C. L. Schuck, General Electric Co.

FRIDAY (continued)

54-128. A Guide for the Ice Testing of Outdoor Disconnecting Switches. Working Group of the Switches, Fuses and Insulators Subcommittee.

CP.** High Voltage Switching on Unit Substation Transformers. H. S. Gates and H. G. Barnett, Westinghouse Electric Corp.

CP.** A New 161 kv 10 Million KVA Oil Circuit Breaker. L. J. Linde, A. E. Kilgour, Allis-Chalmers Mfg. Co.

2:00 p.m.—Basic Sciences

Committee on Basic Sciences
Penn Top North, 18th Floor
R. M. BOZORTH, Presiding

54-106. Eddy Current Losses in a Semi-Infinite Solid Due to a Nearby Alternating Current. H. Poritsky and R. P. Jerrard, General Electric Co.

54-146. Eddy-Current Phenomena in Ferro-Magnetic Materials. H. M. McConnell, Carnegie Institute of Technology.

54-109. Flow of Energy in Synchronous Machines. E. I. Hawthorne, University of Pennsylvania.

CP.** Characteristics of the High Current Argon Arc with Various Electrode Materials. J. W. Dzinaski, Allis-Chalmers Mfg. Co. and T. B. Jones, The Johns Hopkins University.

CP.** The Measurement of Electrostatic Potential Due to Net Ion Space Charge in Air. J. S. Carroll and S. R. Hammond, Stanford University.

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

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COMMITTEE MEETINGS

Monday, January 18

- 9:30 a.m.—ASEE Executive Board (10)Town Room
- 9:30 a.m.—Lightning Arrester Standards Working GroupVillage Room
- 10:00 a.m.—Instruments and MeasurementsParlor A
- 11:00 a.m.—Edison MedalHudson Room
- 12:00 noon—Luncheon—Instruments and Measurements...Parlor A
- 12:00 noon—Luncheon—Sections CommitteeEmpire Suite
- 12:00 noon—Luncheon—Edison Medal GroupParlor C
- 12:00 noon—Luncheon—ManagementSchuyler Room
- 12:00 noon—Luncheon—Electrical Techniques in Medicine and BiologyParlor B
- 12:00 noon—Press ReceptionEast Room
- 4:00 p.m.—Distribution SubcommitteeBoston Room
- 4:00 p.m.—Power Generation Excitation Subcommittee (10)Town Room
- 4:00 p.m.—Towers, Poles and Conductors Subcommittee (40)Buffalo Room
- 4:00 p.m.—Capacitor Subcommittee (20)Village Room
- 4:00 p.m.—Chemical Industry SubcommitteeSchuyler Room
- 4:00 p.m.—Group Subcommittee 3 on Recording and Controlling InstrumentsEmpire Suite I
- 4:00 p.m.—National Telemetry Conference..... Hudson Room
- 5:30 p.m.—Section Get-TogetherParlors B & C

Tuesday, January 19

- 7:30 a.m.—Breakfast—Transmission and Distribution Administrative Subcommittee (8) ..Empire Suite II
- 8:00 a.m.—Breakfast—Synchronous Machinery Test Code #503 RevisionSchuyler Room
- 8:15 a.m.—Canadian BreakfastParlors A & B
- 9:00 a.m.—Power Division (25)Parlor C
- 9:30 a.m.—Synchronous Machinery Subcommittee (18)Schuyler Room
- 9:30 a.m.—Working Group on Arc Furnaces (12)....Buffalo Room
- 9:30 a.m.—NucleonicsEmpire Suite II
- 9:30 a.m.—Transfers CommitteeTown Room
- 9:30 a.m.—Project Subcommittee on Instrument Transformer Test Code**Room 364
- 9:30 a.m.—Industrial Spectroscopy Subcommittee (10)Village Room
- 9:30 a.m.—Limiter Study Task Group (Insulated Conductors)*Room 1001
- 9:30 a.m.—Nominating CommitteeParlor B
- 9:30 a.m.—Aerial Cable Lightning Protection Working Group**Room 363
- 9:30 a.m.—Planning and Coordination Committee.....Parlor A
- 9:30 a.m.—Industrial Power Systems Executive Subcommittee (10)**Room 362
- 9:30 a.m.—Standards Coordinating Committee #4...Hudson Room

- 9:30 a.m.—General Industry Applications Committee..Boston Room
- 9:30 a.m.—Radio Communications System.....Empire Suite I
- 12:00 noon—Luncheon—Fortescue Fellowship CommitteeTown Room
- 12:00 noon—Luncheon—Communication Division (12)Empire Suite I
- 12:00 noon—Luncheon—Direct Current Machinery Subcommittee (15)Village Room
- 12:00 noon—Luncheon—Registration of Engineers ..Empire Suite II
- 12:00 noon—Luncheon—Electronic Power Converters Committee (20)Parlor B
- 12:00 noon—Luncheon—Production and Application of Light (20)Parlor C
- 12:00 noon—Luncheon—Industrial Power Systems Committee (30)**Room F
- 12:00 noon—Volta Memorial FundSchuyler Room
- 12:00 noon—Luncheon—Science and Electronics Division Committee (20)Parlor A
- 2:00 p.m.—Sections CommitteePenn Top North
- 2:00 p.m.—Limiter Study Task Group (Insulated Conductors)*Room 1001
- 2:00 p.m.—Research CommitteeBoston Room
- 2:00 p.m.—Pipe Type Cable Hydraulics Task Group (Insulated Conductors)**Room 363
- 2:00 p.m.—Chemical, Electrochemical and Electrothermal Applications CommitteeBuffalo Room
- 2:00 p.m.—Relays CommitteeSchuyler Room
- 2:00 p.m.—Safety CommitteeHudson Room
- 2:00 p.m.—Lightning Protective Devices Subcommittee (19)**Room 362
- 2:00 p.m.—Joint AIEE-NEMA Brush Test Code Subcommittee**Room 366
- 4:00 p.m.—Electrochemical Processes Subcommittee ..**Ante Room
- 4:30 p.m.—Telegraph Systems CommitteeEmpire Suite I

Wednesday, January 20

- 8:30 a.m.—Breakfast—Textile Subcommittee (20) ..Empire Suite I
- 9:30 a.m.—Induction Machinery Subcommittee (18) .Hudson Room
- 9:30 a.m.—Publications CommitteeParlor B
- 9:30 a.m.—Electric Couplings Subcommittee (10) ..Empire Suite II
- 9:30 a.m.—System Engineering CommitteeBoston Room
- 9:30 a.m.—Metallic Rectifiers CommitteeBuffalo Room
- 9:30 a.m.—Transmission Substations Subcommittee**Room 362
- 9:30 a.m.—Distribution Substations Subcommittee**Room 363
- 9:30 a.m.—Automatic Supervisory Control Substations Subcommittee**Room 364

9:30 a.m.—Industry Division Committee	Parlor A
9:30 a.m.—Education Committee	Schuyler Room
9:30 a.m.—Membership Committee	Village Room
9:30 a.m.—Dielectrics Subcommittee	*AIME Conf. Room
9:30 a.m.—Industrial Control	Parlor C
9:30 a.m.—Conversion Substations Subcommittee	**Room 366
9:30 a.m.—Lightning and Insulator Subcommittee	*Room 1105
9:30 a.m.—Lamme Medal Committee	Town Room
9:30 a.m.—General Systems Subcommittee (14)	*Room 1001
10:00 a.m.—Fault Limiting Devices Subcommittee	EEl Board Room
12:00 noon—Luncheon—Single Phase and Fractional Horsepower Subcommittee (12)	Town Room
12:00 noon—Luncheon—Technical Operations Committee ..	Parlor A
12:00 noon—Luncheon—ASA Sectional C57	Parlor B
12:00 noon—Luncheon—Public Relations Committee (18)	Empire Suite I
12:00 noon—Luncheon—Television & Aural Broadcasting Committee (20)	Empire Suite II
12:00 noon—Luncheon—Domestic and Commercial Applications Committee	Parlor C
12:00 noon—Luncheon—System Planning Subcommittee	Village Room
2:00 p.m.—Substations Executive Subcommittee	Village Room
2:00 p.m.—Electron Tubes Subcommittee	*Room 1001
2:00 p.m.—Computing Devices Committee (25)	**Room 362
2:00 p.m.—Group Subcommittee on Telemetry (12)	**Room 363
2:00 p.m.—Transmission and Distribution Committee (30)	Hudson Room
2:00 p.m.—Student Branches (25)	Schuyler Room
2:00 p.m.—Carrier Current Executive Subcommittee ..	**Room 364
2:00 p.m.—Basic Sciences (30)	Boston Room
3:00 p.m.—Protective Devices Committee (30)	Parlor C
3:00 p.m.—Power Generation (30)	Buffalo Room
4:00 p.m.—Electrochemical Processes Subcommittee ..	**Room 366
7:30 p.m.—Forum of Technical Committee Chairmen	Georgian Room

Thursday, January 21

9:00 a.m.—Board of Directors	*Room 1001
9:00 a.m.—Working Group on Guides for Operation of Oil Insulated Transformers	**Room 363
9:30 a.m.—Rotating Machinery Administrative Subcommittee	**Room 366
9:30 a.m.—Petroleum Industry	Village Room
9:30 a.m.—Synchronous Machinery Test Code #503 Revision	Town Room
9:30 a.m.—Substations	Parlor A
9:30 a.m.—Carrier Radiation Subcommittee	Hudson Room

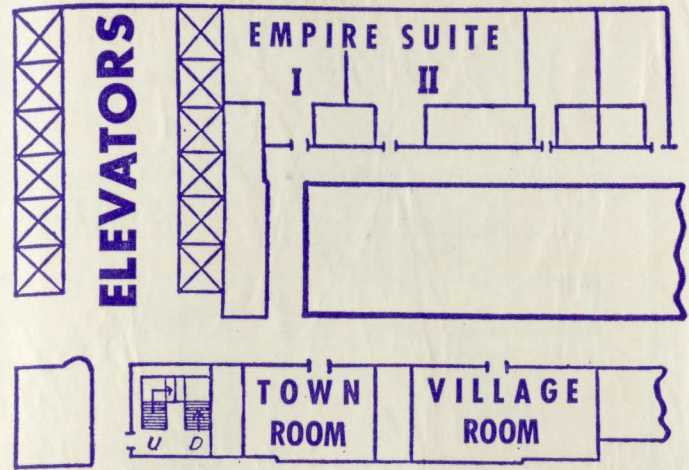
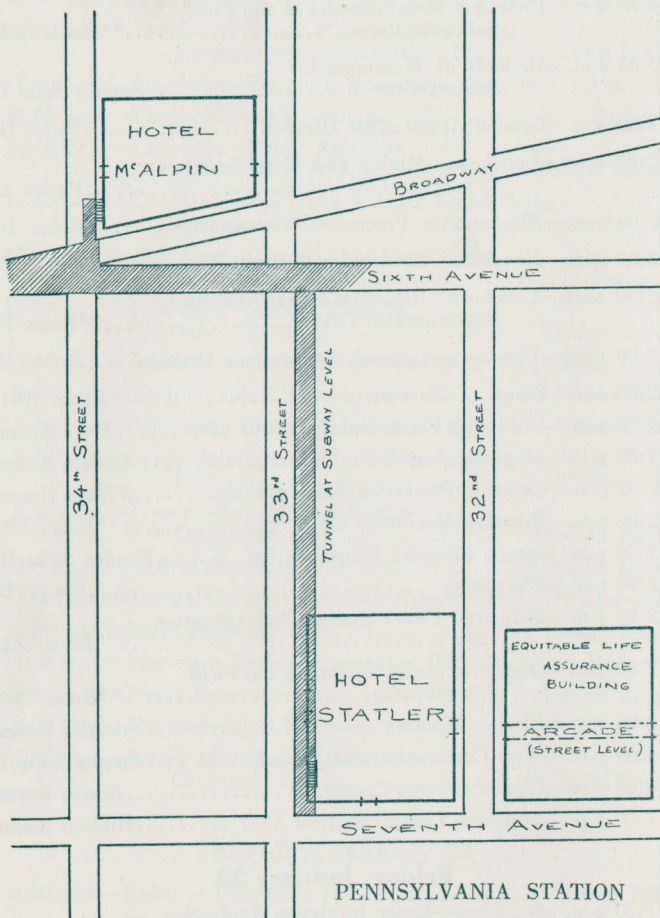
9:30 a.m.—Magnetic Amplifiers Materials Subcommittee	Buffalo Room
9:30 a.m.—Probability Methods Subcommittee	Boston Room
9:30 a.m.—Industrial Power Systems Subcommittee (25)	**Room 362
9:30 a.m.—Magnetic Amplifier Theory Subcommittee ..	Empire Suite II
9:30 a.m.—Fundamental Arc Research Subcommittee	Schuyler Room
9:30 a.m.—Land Transportation Committee	Parlor B
9:30 a.m.—Dielectric Measurements in the Field Subcommittee	**Room 364
10:00 a.m.—Methods of Measurement Subcommittee 3	Empire Suite I
11:30 a.m.—General Applications Division	Parlor C
12:00 noon—Luncheon—Mining and Metal Industry Committee (25)	Parlor A
12:00 noon—Electrostatic Processes Subcommittee	**Room D
12:00 noon—Luncheon—Electronics Committee	Parlor B
12:00 noon—Luncheon—Industrial Power Systems Subcommittee (25)	**Room F
12:00 noon—Luncheon—General Applications Division ...	Parlor C
2:00 p.m.—Board of Directors	*Room 1001
2:00 p.m.—Insulating Fluids Subcommittee (10)	Town Room
2:00 p.m.—Magnetic Amplifiers (20)	Buffalo Room
2:00 p.m.—Cathodic Protection Subcommittee	Village Room
2:00 p.m.—Rotating Machinery (45)	**Room 366
2:00 p.m. Storage Batteries Subcommittee	Empire Suite II
2:00 p.m.—Electronics	Parlor B
2:00 p.m.—Industrial Power Systems Subcommittee (25)	**Room 362
2:00 p.m.—Dielectric Measurements in the Field Subcommittee	**Room 364
2:00 p.m.—Electric Welding	Schuyler Room
4:00 p.m.—Wire Communications Systems (20)	Empire Suite I
4:00 p.m.—Carrier Current Committee	Boston Room
7:00 p.m.—Feedback Control Systems (35)	Hudson Room

Friday, January 22

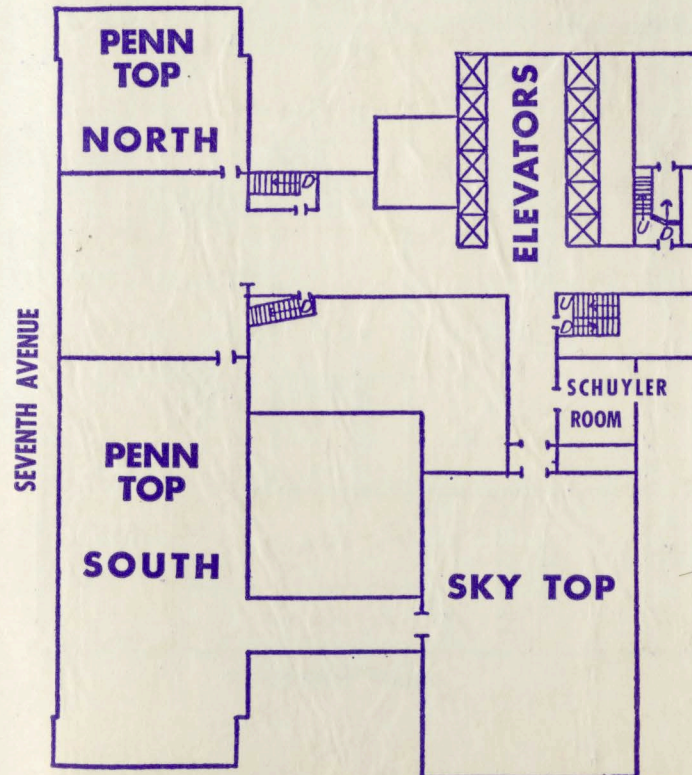
7:30 a.m.—Breakfast—Motor Insulation Evaluation Subcommittee (12)	Parlor A
9:30 a.m.—R. M. Test Code Coordinating Subcommittee (10)	Parlor B
9:30 a.m.—Industrial Power Systems Subcommittee (25)	**Room 362
2:00 p.m.—R. M. Insulation Subcommittee	Parlor A

* Located in the Engineering Societies Building, 33 West 39th Street.
** Located in the Hotel McAlpin, Broadway and 34th Street.

Sheltered Passageway Between Hotels McAlpin and Statler

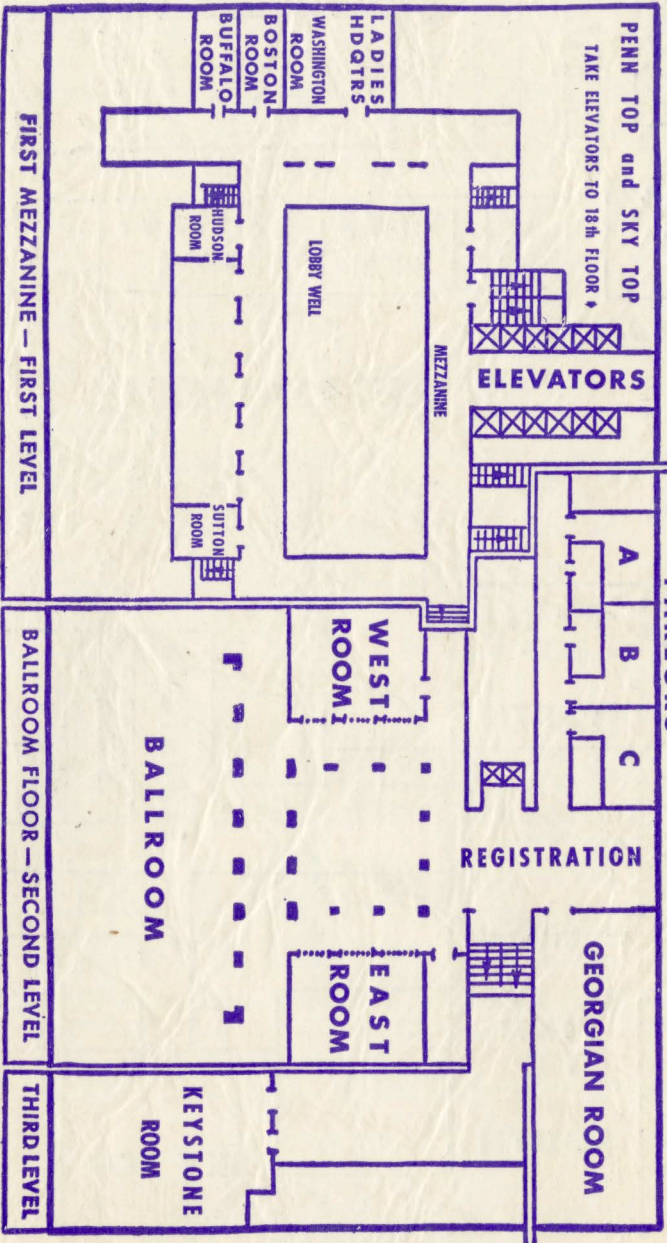


FIRST GUEST ROOM FLOOR



18th FLOOR

SEVENTH AVENUE



PLAN OF HOTEL STATLER