

**American Institute of  
Electrical Engineers**



**WINTER  
GENERAL  
MEETING**

**Program**

*Please retain for use during  
entire meeting*

**NEW YORK, N. Y.**

**JANUARY 21-25**

**1952**

*Meeting Headquarters*

**HOTEL STATLER**

## GENERAL INFORMATION

This 1952 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 and conferences. 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.

Charles E. Wilson, Director, Office of Defense Mobilization, will deliver the keynote address entitled "Building Toward Strength" at the general session to be held at 2:00 p.m., Monday, January 21, 1952. At this session also, the Edison Medal will be presented to C. F. Wagner, followed by the award of the Alfred Noble Prize to Eldo C. Koenig by T. M. Linville, AIEE Representative, Alfred Noble Prize Award Committee. The Institute Prize Paper Awards will also be made at this time. President F. O. McMillan will open the general session with an address entitled "Some Neglected Obligations."

On Wednesday evening, January 23, Professor A. D. Moore of the University of Michigan will give a lecture-demonstration on "Fluid Mapper Patterns." In a fluid mapper the fluid flows in streamline fashion. The flow pattern is made visual by dye lines formed by potassium permanganate crystals. These flow patterns simulate electrostatic, magnetic, heat flow, and other fields and can lead to their solution. A dental stone slab for a mapper will be cast, finished and operated in a fluid mapper. A tilted mirror enables the audience to follow every step. Color slides of many fluid mapper patterns will be shown.

**REGISTRATION FEES REQUIRED.** As instituted three 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. 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 triplicate of Transactions papers must be left with the chairman or sent to Edward C. Day, Secretary, Technical Program Committee, 33 West 39th Street, New York 18, N. Y., before February 8. 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¢ 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 numbered 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><b>10:00 A.M.</b> Switchgear <i>Ballroom</i></p> <p>Carrier Current <i>Penn Top North</i></p> <p>Conference on Lightning Protection of Substations <i>Parlor 1</i></p> <p>Substations <i>Georgian Room</i></p> <p>Land Transportation <i>Keystone Room</i></p> <p>Industrial Control <i>Penn Top South</i></p> <p>Electric Space Heating and Heat Pumps <i>Sky Top</i></p>	<p><b>9:30 A.M.</b> Switchgear <i>Ballroom</i></p> <p>Power Generation Excitation Systems <i>Georgian Room</i></p> <p>Conference on Dielectrics <i>Penn Top South</i></p> <p>Electronics in Industry <i>Penn Top North</i></p> <p>Electronic Instruments <i>Sky Top</i></p> <p>Metallic Rectifiers <i>Parlor 1</i></p> <p>Land Transportation <i>Keystone Room</i></p> <p>Communication Switching Systems <i>Parlor 2</i></p>	<p><b>9:30 A.M.</b> Distribution <i>Ballroom</i></p> <p>Synchronous Machinery <i>Penn Top South</i></p> <p>Relays and Carrier Current <i>Georgian Room</i></p> <p>Basic Sciences <i>Parlor 2</i></p> <p>Recent Developments in Electron Emitters <i>Sky Top</i></p> <p>Instruments and Measurements <i>Keystone Room</i></p> <p>Safety <i>Penn Top North</i></p> <p>New Techniques in Facsimile <i>Parlor 1</i></p>	<p><b>9:30 A.M.</b> Conference on Sleet Melting Practices <i>Ballroom</i></p> <p>Electric Couplings <i>Penn Top South</i></p> <p>Permanent Magnets <i>Georgian Room</i></p> <p>Electron Tubes <i>Penn Top North</i></p> <p>Wire and Radio Telegraph Systems <i>Parlor 1</i></p> <p>Electrical Applications in Pipe Line Transportation <i>Keystone Room</i></p> <p>Electric Heating <i>Parlor 2</i></p> <p>Digital Computers—New Storage Developments and Application of Transistors <i>Sky Top</i></p>	<p><b>9:30 A.M.</b> Transformers <i>Ballroom</i></p> <p>Station and Control Cable Symposium <i>Georgian Room</i></p> <p>Transmission and Distribution <i>Keystone Room</i></p> <p>Magnetic Amplifier Materials <i>Sky Top</i></p> <p>Industrial Power Systems <i>Penn Top North</i></p> <p>Feedback Control Systems <i>Parlor 1</i></p> <p>Single Phase and Fractional Horsepower <i>Penn Top South</i></p>

<p><b>2:00 P.M.</b> General Session <i>Ballroom</i></p>	<p><b>2:00 P.M.</b> Switchgear <i>Ballroom</i></p> <p>Power Generation, Hydroelectric Systems <i>Georgian Room</i></p> <p>Conference on Dielectrics <i>Penn Top South</i></p> <p>Instruments and Measurements <i>Sky Top</i></p> <p>The Mechanism of Communication <i>Keystone Room</i></p> <p>Conference on Management <i>Parlor 1</i></p> <p>Sections Committee <i>Penn Top North</i></p> <p><b>5:30 P.M.</b> The Smoker <i>Hotel Commodore</i></p>	<p><b>2:00 P.M.</b> Transmission and Distribution <i>Ballroom</i></p> <p>Insulation <i>Penn Top South</i></p> <p>Conference on Fundamental Processes in Gas Discharge Tubes <i>Keystone Room</i></p> <p>Color Tubes for Television <i>Sky Top</i></p> <p>Education <i>Penn Top North</i></p> <p>System Engineering <i>Georgian Room</i></p> <p>New Techniques in Facsimile <i>Parlor 1</i></p> <p><b>8:00 P.M.</b> Fluid Mapper Patterns—A Lecture-Demonstration <i>Georgian Room</i></p>	<p><b>2:00 P.M.</b> Transmission and Distribution <i>Ballroom</i></p> <p>D-C Machinery <i>Penn Top South</i></p> <p>High Permeability Magnetic Materials <i>Georgian Room</i></p> <p>Mobile Radio Systems <i>Parlor 1</i></p> <p>Electrical Applications in Pipe Line Transportation <i>Keystone Room</i></p> <p>Symposium on Heating Application Data <i>Parlor 2</i></p> <p>Small Digital Computers <i>Sky Top</i></p> <p>Conference on Energy Sources <i>Penn Top North</i></p> <p><b>7:00 P.M.</b> Dinner Dance <i>Hotel Statler</i></p>	<p><b>2:00 P.M.</b> Transformers <i>Ballroom</i></p> <p>Insulated Conductors <i>Georgian Room</i></p> <p>Magnetic Amplifier Circuits <i>Sky Top</i></p> <p>Industrial Power Systems and Relays <i>Penn Top North</i></p> <p>Symposium on Germanium Rectifiers and Transistors <i>Penn Top South</i></p> <p>Feedback Control Systems <i>Parlor 1</i></p> <p>A-C Network Calculator Designs and Experience <i>Parlor 2</i></p>
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# Monday, January 21

## 10:00 a.m.—Switchgear

Ballroom  
H. V. NYE, Presiding

- 52-27. Short Circuit Ratings of Power Circuit Breakers. R. C. Van Sickle, Westinghouse Electric Corporation.
- 52-11. Consideration in Testing, Rating, and Application of Power Circuit Breakers. Byron Evans, C. L. Killgore, Bureau of Reclamation.
- 52-17. Correlation of Interrupting Rating and Application of Power Circuit Breakers. J. A. Elzi, Commonwealth Services, Inc.
- 52-28. The Effect of Current Asymmetry on Circuit Interruption. W. F. Skeats, General Electric Company.
- 52-29. Considerations in the Rating and Testing of Power Circuit Breakers. H. P. St. Clair, Otto Naef, American Gas & Electric Service Corp.

## 10:00 a.m.—Conference on Lightning Protection of Substations

Parlor 1  
H. R. STEWART, Presiding

- 51-285. Lightning Arrester Application Guide—Preliminary Working ACO.\* Group Report. Project Committee on Application Guide of Methods for Lightning Protection of Substations. Committee on Protective Devices.

NOTE: Advance pamphlet copies of this paper are not available for sale as the previous supply has been exhausted.

- CP.\*\* Comments on the Proposed Lightning Arrester Application Guide. R. O. Bigelow, H. R. Tomlinson, New England Power Service Co.

## 10:00 a.m.—Substations

Georgian Room  
R. C. ERICSON, Presiding

- 52-21. Basic Structural Design for Transmission Substations Including Light Metals. Substation Committee Project No. 8.
- CP.\*\* Outdoor Substation Standardization Saves Critical Engineering Time. A. H. Powell and C. B. Hinton
- CP.\*\* Substation Grounding Practices. Committee on Substations Working Group.
- 52-22. Automatic Phase Angle and Voltage Control of Unattended Marcus Hook Substation. W. A. Derr, Westinghouse Electric Corp.; F. H. Travers, Philadelphia Electric Co.; R. M. Jolly, City Public Service Board of San Antonio.

## 10:00 a.m.—Land Transportation

Keystone Room  
L. W. BIRCH, Presiding

- 52-23. A New Electric Locomotive for the Pennsylvania Railroad. F. D. Gowans, B. A. Widell, A. Bredenberg, General Electric Co.
- 52-24. The Pennsylvania Railroad Ignitron-Rectifier Locomotive. C. C. Whittaker, W. M. Hutchison, Westinghouse Electric Corp.
- CP.\*\* Progress of Electrification in Europe with Special Emphasis on the ANNECY Conference. H. F. Brown, New York, New Haven & Hartford Railroad.

- CP.\*\* Impressions of European Electrification Including the New Single-Phase 50-Cycle System in France and Possible Bearing on U.S. Electrification. J. C. Aydelott, General Electric Co.

- 52-18. Railway Power Contracts. T. M. C. Martin, Bonneville Power Administration.

- 52-25. Railway Electrification, Diesel-Electric Locomotives and Some Future Aspects of Electric Traction. G. Huldschiner, College of City of New York.

## 10:00 a.m.—Carrier Current

Penn Top North  
L. F. KENNEDY, Presiding

- 52-96. Proposed Definitions Relating to Power Line Carrier. Carrier Current Project Committee. Presentation by title only for discussion.

- 52-97. A Power Line Carrier System for Maximum Channel Utilization. J. A. Doremus, Motorola Inc.

- 52-98. Carrier-Frequency Characteristics of Power Transformers. T. R. Specht, R. C. Cheek, Westinghouse Electric Corp.

- 52-99. Input Filter Design for Frequency Modulated Power Line Carrier Receivers. R. L. Fillmore, University of Minnesota.

## 10:00 a.m.—Industrial Control

Penn Top South  
J. A. CORTELLI, Presiding

- CP.\*\* Fundamental Considerations in the Use of Feedback Control. O. W. Livingston, General Electric Co.

- CP.\*\* Regulators from the Electronic Point of View. E. H. Vedder, Westinghouse Electric Corp.

- CP.\*\* Rotating Regulator Applications in the Steel Industry. W. R. Harris, Westinghouse Electric Corp.

- CP.\*\* Synthesizing the Armature Circuit of a D.C. Shunt Motor Supplied by Half Wave Rectifiers. W. S. Kupfer, Jr., E. E. Moyer, Rensselaer Polytechnic Institute.

## 10:00 a.m.—Electric Space Heating and Heat Pumps

Sky Top  
H. F. HOEBEL, Presiding

- CP.\*\* Experiences with Compression-Type Electric Water Heaters. M. S. Oldacre, Utilities Research Commission.

- CP.\*\* Residential Heat Pump Experiments in Philadelphia—Installation and Operating Experience. J. H. Harlow, G. E. Klapper, Philadelphia Electric Co.

- CP.\*\* Residential Heat Pump Experiments in Philadelphia—Earth as a Heat Source. A. H. Kidder, J. H. Neher, Philadelphia Electric Co.

- CP.\*\* Residential Heat Pump Experiments in Philadelphia—Suggested Possibilities for Practical Applications. Constantine Bary, Philadelphia Electric Co.

- CP.\*\* A New Packaged Heat Pump. H. G. Fifield, C. I. Bacheller, General Electric Co.

- 52-69. Application of Motors to Household Refrigeration Compressors. L. C. Packer, Westinghouse Electric Corp. Presentation by title only for discussion.

2:00 p.m.—General Session

Ballroom  
PRESIDENT F. O. McMILLAN, Presiding

"Some Neglected Obligations"—President F. O. McMillan.

Edison Medal Presentation to Dr. C. F. Wagner.

Establishment of the Edison Medal: Prof J. F. Calvert, Chairman, Edison Medal Committee.

Career of the Medalist: A. C. Montieth, Vice-President, Westinghouse Electric Corporation.

Presentation of Medal: President F. O. McMillan.

Response of the Medalist: Dr. Charles F. Wagner.

Presentation of the Alfred Noble Prize to Eldo C. Koenig by T. M. Linville, AIEE Representative, Alfred Noble Prize Award Committee.

Presentation of Institute Prizes.

"Building Toward Strength." Charles E. Wilson, Director, Office of Defense Mobilization.

ASCE Centennial of Engineering 1952, Carlton S. Proctor, President.

ETA KAPPA NU DINNER

An outstanding event of the Winter General Meeting is the Award Dinner of the Eta Kappa Nu Association, Electrical Engineering Honor Society. This year it will be held in the Tudor Room of the Henry Hudson Hotel, 353 West 57th Street, New York, N. Y. on Monday evening, January 21, 1952 at 6:30 p.m. During this dinner, a Recognition Award is presented to the most outstanding young electrical engineer of the past year. He is selected on the basis of contributions to his profession, community and church, as well as his technical achievements.

L. G. Gitzendanner, Section Engineer, General Engineering Laboratory, General Electric Company, Schenectady, N. Y. is this year's Award winner. He is cited for his skillful management of the concurrent development of varied complex electro mechanical devices, his inspirational leadership of associates and his unselfish participation in school and professional affairs. Honorable Mentions will be presented to R. L. Trent, Member of the Technical Staff of Bell Telephone Laboratories, Murray Hill, N. J. and to B. R. Lester, Section Head, Electronics Park, General Electric Company, Syracuse, N. Y.

In addition to these citations, three distinguished engineers will be made Eminent Members of Eta Kappa Nu. These men are S. H. Mortensen, Chief Electrical Engineer, Allis Chalmers Mfg. Co.; W. H. Timbie, Professor Emeritus of Electrical Engineering at MIT; and K. B. McEachron, Engineering Mgr. General Electric Company, Pittsfield, Mass.

As in previous years, dress is informal, ladies are cordially invited, and a pleasant evening is assured. Dinner, including gratuities and tax is \$4.75 per person. Tickets are available at the Eta Kappa Nu table in the Ballroom Foyer or at the door of the Tudor Room in the Henry Hudson Hotel.

Tuesday, January 22

9:30 a.m.—Switchgear

Ballroom  
A. W. HILL, Presiding

52-20. New High-Capacity Switchgear Testing Laboratory. V. L. Cox, General Electric Co.

52-10. High-Speed Multiple Reclosing Oil Circuit Breaker for 161 Kv 10,000,000 KVA. B. P. Baker, G. B. Cushing, Westinghouse Electric Corp.

52-30. High Voltage Circuit Breakers in the Bonneville Power System. O. A. Demuth, A. Dovjickov, Bonneville Power Administration.

52-31. Ultra-High Capacity Field Tests on 230-Kv Air-Blast Circuit Breaker at Grand Coulee Power Plant. A. C. Conger, C. L. Killgore, Bureau of Reclamation; Dr. William Wanger, Brown, Boveri & Co., Baden, Switzerland.

52-16. Out-of-Phase Switching Voltages and Their Effect on High-Voltage Circuit Breaker Performance. W. M. Leeds, D. J. Povejsil, Westinghouse Electric Corp.

9:30 a.m.—Power Generation, Excitation Systems

Georgian Room  
A. J. KRUPY, Presiding

52-33. Selection of Characteristics for Turbine-Generator Motor-Driven Exciters. H. G. Frus, Duquesne Light Co.; F. N. McClure, W. H. Ferguson, Westinghouse Electric Corp.

52-34. Experience with Automatic Voltage Regulation on a 115 MW Turbogenerator. H. A. Cornelius, W. F. Cawson, Public Service Co. of Northern Illinois; H. W. Cory, Allis-Chalmers Mfg. Co.

CP.\*\* Static Stability Considerations for Proposed Turbine-Generator Ratings. R. F. Lawrence, A. A. Johnson, Westinghouse Electric Corp.

CP.\*\* Power Generation Equipment for the Future. W. A. Hirt, Consulting Engineer.

9:30 a.m.—Conference on Dielectrics

Penn Top South  
L. J. BERBERICH, Presiding

CP.\*\* Interpretation of the Dielectric Behavior of Solid Long-Chain Derivatives. J. D. Hoffman, General Electric Co.

CP.\*\* Lanosterol—A New High Dielectric Constant Dielectric. W. McMahon, G. T. Kohman, Bell Telephone Labs., Inc.

CP.\*\* Electrical and Physical Properties of IN-420—A New Chlorinated Liquid Dielectric. A. J. Warner, Federal Telecommunications Labs.

CP.\*\* Impulse Dielectric Strength Characteristics of Liquid Impregnated Pressboard. T. W. Dakin, C. N. Works, Westinghouse Electric Corp.

CP.\*\* The Effect of Increasing Frequencies on Dielectric Strength of Electrical Insulators. J. J. Chapman, Johns Hopkins University.

9:30 a.m.—Electronics in Industry

Penn Top North  
L. A. UMANSKY, Presiding

CP.\*\* Electronics in Textiles. F. D. Snyder, Westinghouse Electric Corp. and L. T. Jester, General Electric Co.

CP.\*\* Electronic Control of Machine Tools. J. M. Delfs, General Electric Co.

CP.\*\* The Use of Electronics for Material Handling Systems. S. W. Jessop, Jervis B. Webb Co.

52-101. Theory of Electric Spark Machining. E. M. Williams, Carnegie Institute of Technology.

52-1. Tests of Electrostatic Controls for Hazardous Industrial Applications. Robin Beach, Engineers Associated. Presentation by title only for discussion.

9:30 a.m.—Electronic Instruments

Sky Top  
RUDOLF FELDT, Presiding

CP.\*\* Over-Temperature Monitor for Multiple Thermocouple Systems. F. H. Bayhi, Jr., M. L. Greenough, M. Martens, National Bureau of Standards.

## American Institute of Electrical Engineers

- CP.\*\* An Electronic Peak Reading Kilovoltmeter. R. E. Brueckmann, National Bureau of Standards.
- CP.\*\* An Elliptical Polarization Synthesizer. G. H. Friedman.
- CP.\*\* A System for Measuring Change of Phase Path of Pulsed Radio Signals Vertically Incident on the Lower Ionosphere. R. E. Jones.
- CP.\*\* Measurement of High Frequency Speed Variation in Rotating Equipment. E. G. Manning, North Carolina State College.

### 9:30 a.m.—Metallic Rectifiers

Parlor 1  
L. W. BURTON, Presiding

- CP.\*\* Comparative Characteristics of Metallic Rectifiers. E. A. Harty, General Electric Co.
- 52-100. Automatic Regulation of Metallic Rectifiers by Electronic Control. J. A. Potter, Reeves Instrument Corp.
- CP.\*\* Recent Applications of Selenium Rectifiers. O. S. Aikman, Fansteel Metallurgical Corp.
- CP.\*\* High Voltage Selenium Rectifiers. I. R. Smith, Westinghouse Electric Corp.
- CP.\*\* Capacitor Loading of Metallic Rectifiers. C. E. Hamann, General Electric Co.
- 52-102. Automatic Regulation of Metallic Rectifiers by Magnetic Control. D. H. Smith, Bell Telephone Labs., Inc.

### 9:30 a.m.—Land Transportation

Keystone Room  
L. W. BIRCH, Presiding

- 52-35. A New Wheel-Slip Protective Scheme. R. M. Smith, General Electric Co.
- CP.\*\* The Theory and Practice of Wheel Control. C. L. Eksergian, The Budd Co.
- 52-36. Coordinated Transportation for Large Metropolitan Communities. E. E. Kearns, General Electric Co.
- 52-37. New Series Type Motor for Trolley Coaches. G. M. Woods, C. R. Steen, Westinghouse Electric Corp.
- 52-38. A New Control for Trolley Coaches. N. H. Willby, Westinghouse Electric Corp.

### 9:30 a.m.—Communication Switching Systems

Parlor 2  
JOHN MESZAR, Presiding

- CP.\*\* European Switching Systems. H. H. Schneekloth, Bell Telephone Labs., Inc.
- CP.\*\* European Switching Apparatus. A. C. Keller, Bell Telephone Labs., Inc.
- CP.\*\* Survey of Telephone Switching in Alaska. D. L. Solomon, Signal Corps Plant Engineering Agency.
- CP.\*\* Development of REA Requirements for Switching Equipment in the U.S.A. R. S. Neikirk, Rural Electrification Administration.

### 2:00 p.m.—Switchgear

Ballroom  
K. J. C. FALCK, Presiding

- 52-39. Switching Capacitive KVA With Power Circuit Breakers. N. E. Dillow, I. B. Johnson, N. R. Schultz, A. E. Were, General Electric Co.

## Winter General Meeting

- 52-40. New Design Concepts Applied to a Side Break Outdoor Dis-ACO.\* connecting Switch. H. R. Harrison, General Electric Co.
- 52-41. Refinements in Dual Selective Overcurrent Trip Design. Carl ACO.\* Thumin, I-T-E Circuit Breaker Company.
- 52-42. A New Design of Metal Clad Switchgear. J. G. Torbit, General ACO.\* Electric Co.
- 52-15. A New Line of Magnetic-Type Power Circuit Breakers for ACO.\* Metal Clad Switchgear. R. B. Shores, E. T. McCurry, General Electric Co.

### 2:00 p.m.—Power Generation, Hydroelectric Systems

Georgian Room  
F. L. LAWTON, Presiding

- 52-43. Performance of a New Magnetic Amplifier Type Voltage Regulator for Large Hydroelectric Generators. G. K. Kallenbach, Niagara Mohawk Power Corp.; F. S. Rothe, H. F. Storm, General Electric Co.; P. L. Dandeno, Hydro-Electric Power Comm. of Ontario.
- 52-44. Application of Hydrostatic Lubrication to Vertical Water Wheel Generator Thrust Bearings. J. E. Housley, T. L. Corey, Aluminum Co. of America; G. E. Peterson, Westinghouse Electric Corp.
- CP.\*\* Experience in Operation of Hydroelectric Generator Bearings. J. P. Fraser, British Columbia Electric Co., Ltd.
- CP.\*\* Experience with Bearings on Hydro-Electric Generating Units. J. M. Sharpe, A. L. Hough, Shawinigan Water & Power Co.

### 2:00 p.m.—Conference on Dielectrics

Penn Top South  
L. J. BERBERICH, Presiding

- CP.\*\* The Electrical, Physical and Chemical Properties of MYLAR Polyester Film. R. C. Krueger, A. B. Ness, E. I. du Pont de Nemours & Co.
- CP.\*\* Polyethylene Terephthalate—Its Use As A Capacitor Dielectric. M. C. Wooley, G. T. Kohman, W. C. McMahon, Bell Telephone Labs., Inc.
- CP.\*\* Corona Studies on Silicone Rubber. S. I. Reynolds, General Electric Co.
- CP.\*\* The Electrical Properties of Glass-Fiber Paper. R. T. Lucas, T. D. Callinan, Naval Research Lab.
- CP.\*\* Manufacture and Processing of Mica Paper for Use in Electrical Insulation. R. L. Griffith, E. R. Younglove, Mica Insulator Co.

### 2:00 p.m.—Instruments and Measurements

Sky Top  
J. G. REID, JR., Presiding

- 52-7. Overload Protection of Alternating Current Instruments. Wilson Pritchett, Elazar Trau, University of California.
- 52-46. A 10 Cycle to 10 Megacycle Gain and Phase Angle Measuring ACO.\* Set. F. B. Anderson, Bell Telephone Labs., Inc.
- CP.\*\* A Barium Titanate Accelerometer. L. T. Fleming, National Bureau of Standards.
- CP.\*\* Shore-Based Radar for Harbor Surveillance. E. J. Isbister, W. R. Griswold, Sperry Gyroscope Co.

### 2:00 p.m.—The Mechanism of Communication

Keystone Room  
L. G. ABRAHAM, Presiding

- CP.\*\* Humanizing the Technical Speech. O. J. Drake, New York University.

- CP.\*\* Writing Visually. E. L. McAdam, Jr., New York University.  
 CP.\*\* Exploitation of Message Statistics. B. M. Oliver, Bell Telephone Labs., Inc.

**2:00 p.m.—Conference on Management**  
 Parlor 1  
 C. J. BELLER, Presiding

- CP.\*\* Science of Leadership. M. J. Evans, Melvin J. Evans Co.  
 CP.\*\* Rotation of Assignment for Executive Development. D. S. Sargent, Consolidated Edison Co. of N. Y., Inc.

**2:00 p.m.—Sections Committee**  
 Penn Top North  
 C. S. PURNELL, Presiding

## Wednesday, January 23

**9:30 a.m.—Distribution**  
 Ballroom  
 T. J. BROSNAN, Presiding

- 52-13. Progress Report on Coordination of Construction and Protection of Distribution Circuits Based on Operating Data for Year 1949. Joint AIEE-EEI Working Group on Coordination of Construction and Protection of Distribution Circuits.

- CP.\*\* Changing Concepts of Weatherproof Wire Use and Protection. L. L. Carter, Anaconda Wire & Cable Co.

- CP.\*\* Advantages and Disadvantages of Electric Distribution about 5000 Volts. W. R. Bullard, Ebasco Services, Inc.

**9:30 a.m.—Synchronous Machinery**  
 Penn Top South  
 M. R. LORY, Presiding

- 52-32. Supercharged Hydrogen Cooling of Generators. Sterling Beckwith, Allis-Chalmers Mfg. Co.

- 52-47. Improved Cooling of Turbine-Generator Windings. R. A. Baudry, P. R. Heller, H. K. Reamey, Jr., Westinghouse Electric Corp.

- 51-363. Equivalent Circuits of Reluctance Machines. Chi-Yung Lin, Shanghai, China. Presentation by title only for discussion.

- 52-60. Exciter Polarity Reversals in Voltage-Regulated Aircraft Alternators. R. P. Judkins, Westinghouse Electric Corporation; H. M. McConnell, Carnegie Inst. of Technology.

- 52-83. Induction Motor Damping and Synchronizing Torques. Charles Concordia, General Electric Co.

**9:30 a.m.—Relays and Carrier Current**  
 Georgian Room  
 A. J. McCONNELL, Presiding

- 52-51. Protective Relaying over Microwave Channels. H. W. Lensner, Westinghouse Electric Corp.

- 52-52. A Phase-Comparison Carrier-Current Relaying System for Broader Application. N. O. Rice, J. S. Smith, General Electric Co.

- 52-2. Considerations in Selecting a Carrier Relaying System. R. C. Cheek, J. L. Blackburn, Westinghouse Electric Corp.

**9:30 a.m.—Basic Sciences**  
 Parlor 2  
 M. G. MALTI, Presiding

- CP.\*\* Self-Generated Oscillations in the D.C. Carbon Arc. B. H. List, T. B. Jones, Johns Hopkins University.

- 52-84. The Calculation of the Magnetizing Force. A. A. Halacsy, Dominica, B. W. I.

- 52-3. Mapping Techniques Applied to Fluid Mapper Patterns. A. D. Moore, University of Michigan.

- 52-45. Electromechanical Analogies of a Separately-Excited D.C. Machine. R. E. Vowels, W. G. Forte, The University of Adelaide.

- 52-114. Equations for the Inductance and Short-Circuit Forces of Busses Comprised of Double Channel Conductors. C. M. Siegel, University of Virginia; T. J. Higgins, University of Wisconsin.

- 52-85. Wave Filter Characteristics by a Direct Method. R. C. Taylor, Mrs. C. U. Watts, Western Union Telegraph Co.

**9:30 a.m.—Recent Developments in Electron Emitters**  
 Sky Top  
 L. S. NERGAARD, Presiding

- CP.\*\* The Nickel Base Indirectly Heated Barium Oxide Cathode. A. M. Bounds, P. N. Hambleton, Superior Tube Co.

- 52-53. Characteristic Shifts in Oxide Cathode Tubes. W. P. Bartley, J. E. White, General Electric Co.

- CP.\*\* Lanthanum Boride Cathodes. J. M. Lafferty, General Electric Research Lab.

- CP.\*\* Further Developments in the Structure and Methods of Fabricating L-Cathodes. R. Levi, O. G. Koppius, J. Lambertson, Philips Labs., Inc.

**9:30 a.m.—Instruments and Measurements**  
 Keystone Room  
 J. H. MILLER, Presiding

- 52-54. A High-Speed Direct-Writing Oscillograph. A. R. Eckels, North Carolina State College; I. S. Blumenthal, Northrop Aircraft, Inc.

- 52-55. A High-Sensitivity Ratio Instrument for Industrial Resistance Thermometers. E. W. Clark, General Electric Co.

- 52-56. Methods and Apparatus Employed in the Testing of Single-Phase A.C. Watthour Meters. F. C. Holtz, Sangamo Electric Co.

- CP.\*\* Winding Hot Spot Temperature Equipment for Transformers. G. Camilli, A. R. Kimball, H. A. Fohrhaltz, General Electric Co.

**9:30 a.m.—Safety**  
 Penn Top North  
 HENDLEY BLACKMON, Presiding

- CP.\*\* Organizing for Effective Accident Prevention. H. J. Crisick, Cleveland Electric Illuminating Co.

- CP.\*\* Some Fundamental Principles for Safe Electrical Design of Appliances. G. E. Schall, Jr., Underwriters Labs., Inc.

- CP.\*\* Brief Review of European Electrical Safety Requirements. Frank Thornton, Jr., Consulting Engineer, Pittsburgh, Pa.

- CP.\*\* Report on Trends in the Revisions of the National Electrical Code. H. H. Watson, General Electric Co.

- CP.\*\* Progress Report on Electrical Defibrillation. W. B. Kouwenhoven, Johns Hopkins University.

**9:30 a.m.—New Techniques in Facsimile**  
 Parlor 1  
 A. G. COOLEY, Presiding

- CP.\*\* General Aspects and Problems of Military Facsimile. C. K. Clauer, Bureau of Ships.

## American Institute of Electrical Engineers

CP.\*\* Military Design Requirements. H. F. Burkhard, Signal Corps Engg. Labs.

CP.\*\* Automatic Controls on a Facsimile Weather Service Network. K. R. McConnell, P. R. Marzan, Times Facsimile Corp.

CP.\*\* A Facsimile System having Response Linear with Optical Density. J. V. L. Hogan, F. A. Hester, Hogan Labs., Inc.

### 2:00 p.m.—Transmission and Distribution

Ballroom

F. V. SMITH, Presiding

52-104. Sixty-Cycle and Impulse Sparkover of Large Gap Spacings. H. J. Hagenguth, A. F. Rohlf, W. J. Degnan, General Electric Co.

52-105. Impulse Corona—Detection, Measurement of Intensity and Damage Produced. J. H. Hagenguth, T. W. Liao, General Electric Co.

52-106. Investigation of Radio Noise as it Pertains to the Design of High Voltage Transmission Lines. H. L. Borden, R. S. Gens, Bonneville Power Administration.

52-107. Lightning Protection in Extra High Voltage Stations—Analysis, Anacom Study, and Results. I. W. Gross, American Gas & Electric Corp.; T. J. Bliss, J. K. Dillard, Westinghouse Electric Corp.

### 2:00 p.m.—Insulation

Penn Top South

L. J. BERBERICH, Presiding

52-57. Functional Evaluation of Motor Insulation Systems. G. A. Cypher, R. Harrington, General Electric Co.

52-58. Aging of Small Motor Insulation. K. N. Mathes, General Electric Co.

52-59. Diagnoses of A-C Generator Insulation Condition by Non-Destructive Tests. A. W. W. Cameron, The Hydro-Electric Power Comm. of Ontario.

CP.\*\* The Re-examination of Insulation Temperature Standards. G. L. Moses, Westinghouse Electric Corp.

CP.\*\* Stator Winding Surface Protection. Th. de Koning, Philadelphia, Pa.

### 2:00 p.m.—Conference on Fundamental Processes in Gas Discharge Tubes

Keystone Room

T. B. JONES, Presiding

CP.\*\* Physics of Gas Discharges. S. C. Brown, Massachusetts Inst. of Technology.

CP.\*\* Drift Velocities of Charged Particles in Gases. J. A. Hornbeck, Bell Telephone Labs., Inc.

CP.\*\* The Electron-Ion Recombination Process in Gases. S. Borowitz, New York University.

CP.\*\* Studies of Hot Cathode Arcs and Their Engineering Consequences. L. Malter, Radio Corp. of America.

### 2:00 p.m.—Color Tubes for Television

Sky Top

W. R. G. BAKER, Presiding

CP.\*\* A Three Gun Shadow Mask Color Kinescope. D. W. Epstein, Presented by H. B. Law, R.C.A. Laboratories.

CP.\*\* Color Phosphors for Television. A. Steadman, Allen B. Dumont Labs., Inc.

CP.\*\* The Chromatron—A Single or MultiGun Cathode Ray Tube. Robert Dressler, Chromatic Television Labs., Inc.

CP.\*\* Colorimetry in Television. F. J. Bingley, Philco Corp.

## Winter General Meeting

### 2:00 p.m.—Education

Penn Top North

H. N. MULLER, Presiding

CP.\*\* The Objectives of Graduate Engineering Education—An Employer's View. William Oncken, Jr., Bureau of Ordnance.

CP.\*\* Objectives of Graduate Education as Seen by the Public Utility. E. R. Gaty, Philadelphia Electric Co.

CP.\*\* Specific Objectives of Electrical Engineering Curricula. E. A. Walker, Pennsylvania State College.

52-9. A Water Rheostat Using Untreated Water. J. F. Engle, Oregon State College. Presentation by title only for discussion.

### 2:00 p.m.—System Engineering

Georgian Room

W. B. FISK, Presiding

52-12. Evaluation of Capacity Differences in the Economic Comparison of Alternative Facilities. P. H. Jaynes, Public Service Electric & Gas Co.

52-61. Investment Costs for Use in the Economic Comparison of Alternative Facilities. F. L. Lawton, Aluminum Labs., Ltd. Presentation by title only for discussion.

CP.\*\* Current Expansion, with ECA Sponsorship, of Italy's Thermo-electric Generating Capacity. Fremont Felix, International General Electric Co.

52-62. A Power System Analog and Network Computer. E. A. Baldini, A. P. Fugill, The Detroit Edison Co.

52-14. Calculating Machine Simplifies Power Plant Performance Calculations. E. Daniele, L. J. Parsons, G. R. Baiter, Consolidated Edison Co. of N. Y., Inc.

52-63. Planning a Metropolitan Transmission and Sub Transmission ACO.\* System. D. C. Vaughan, Potomac Electric Power Co.

### 2:00 p.m.—New Techniques in Facsimile

Parlor 1

A. G. COOLEY, Presiding

CP.\*\* Some of the Aspects of High Speed Facsimile Design. M. Alden, Alden Products Co.

52-103. A High-Speed Direct-Scanning Facsimile System. C. R. Deibert, F. T. Turner, R. H. Snider, The Western Union Telegraph Co.

CP.\*\* A High Speed Facsimile Recorder. D. M. Zabriskie, Western Union Telegraph Co.

CP.\*\* A High Speed Facsimile Transmitter. L. G. Pollard, Western Union Telegraph Co.

CP.\*\* An Improved Desk-Fax Transceiver. G. H. Ridings, R. J. Wise, Western Union Telegraph Co.

### 8:00 p.m.—Fluid Mapper Patterns

Georgian Room

W. G. DOW, Presiding

A Lecture Demonstration. A. D. Moore, University of Michigan.

## Thursday, January 24

### 9:30 a.m.—Conference on Sleet Melting Practices

Ballroom

E. L. KANOUSE, Presiding

CP.\*\* 35 Years Experience Combating Sleet Accumulations. A. N. Shealy, K. L. Althouse, R. N. Youtz, Pennsylvania Water and Power Co.



- CP.\*\* Sleet Thawing Practices on New England Electric System. C. P. Corey, H. R. Selfridge, H. R. Tomlinson, New England Power Service Co.
- CP.\*\* Sleet Melting Practices Niagara Mohawk System. H. B. Smith, W. D. Wilder.
- CP.\*\* Sleet Melting on the American Gas and Electric System. S. C. Bartlett, C. A. Imburgia, G. H. McDaniel.
- CP.\*\* The Detroit Edison Company Method of De-Icing Its 120-Kv Lines. D. D. Chase.
- CP.\*\* Ice Melting and Prevention Practices on Transmission Lines. V. L. Davies, L. C. St. Pierre.

**9:30 a.m.—Electric Couplings**

*Penn Top South*  
E. I. POLLARD, Presiding

- 52-64. Magnetic Revolving Field Couplings. Giovanni Silva, Compagnia Nazionale Imprese Elettriche.
- 52-65. Performance Calculations on Electric Couplings. P. H. Trickey, Vickers Inc.
- CP.\*\* Reluctance-Type Magnetic Couplings. F. W. Suhr, General Electric Co.
- CP.\*\* Magnetic Automotive Fan Drives. R. L. Jaeschke, Eaton Mfg. Co.
- CP.\*\* New Uses for Magnetic Friction Couplings. J. A. Mason, Warner Electric Brake & Clutch Co.

**9:30 a.m.—Permanent Magnets**

*Georgian Room*  
R. M. BOZORTH, Presiding

Co-Sponsored by the Permanent Magnet Panel of the National Research Council.

- CP.\*\* Introduction to Permanent Magnets. W. E. Ruder, General Electric Co.
- CP.\*\* Present Problems in the Production of Permanent Magnets. A. D. Plamondon, Jr., Indiana Steel Products Co.
- CP.\*\* Some Theoretical Aspects of Iron Powder Magnets. B. Kopelman, Sylvania Electric Products, Inc.
- CP.\*\* A New Permanent Magnet of Non-Strategic Material. F. G. Brockman, Philips Labs.
- CP.\*\* Magnetic Structures of Alnico 5. E. A. Nesbitt, Bell Telephone Labs., Inc.
- CP.\*\* Permanent Magnetism of Ordered Structures. D. L. Martin, A. H. Geisler, General Electric Co.

**9:30 a.m.—Electron Tubes**

*Penn Top North*  
J. T. THWAITES, Presiding

- 52-66. Tubes for Dielectric Heating at 915 MC. R. B. Nelson, General Electric Research Lab. Presentation by title only for discussion.
- CP.\*\* A New Rectifier Tube for Extremely High Power and Voltage Levels. T. H. Rogers, Machlett Labs., Inc.
- CP.\*\* High Power Industrial Vacuum Tubes with Thoriated Tungsten Filaments. R. B. Ayer.
- CP.\*\* The Influence of a Transverse Magnetic Field on an Unconfined Glow Discharge. W. D. McBee, W. G. Dow, University of Michigan.

**9:30 a.m.—Wire and Radio Telegraph Systems**

*Parlor 1*  
E. C. CHAMBERLIN, JR., Presiding

- CP.\*\* A Carrier Telegraph System for Short Haul Applications. J. L. Hysko, W. T. Rea, L. C. Roberts. Bell Telephone Labs., Inc.
- CP.\*\* Twinplex and Twinmode Radio Telegraph Systems. C. Buff, Mackay Radio and Telegraph Co.
- CP.\*\* RCA Electronic Time Division Multiplex Equipment. A. Kahn, E. R. Shenk, RCA Laboratories, Inc.
- 52-75. Characteristic Impedance of Rectangular Coaxial Transmission Lines. Y. A. Omar, Ports & Lighthouses Adm., Alexandria, Egypt. C. F. Miller, Johns Hopkins University.

**9:30 a.m.—Electrical Applications in Pipe Line Transportation**

*Keystone Room*  
L. W. ROUSH, Presiding

- CP.\*\* The History of Oil Pipe Line Developments. H. H. Anderson, Shell Pipe Line Corp.
- CP.\*\* Construction of the Ozark Pipe Line. Technicolor-sound Film. Shell Pipe Line Corp.
- CP.\*\* Electrical Design of Pipeline Pumping Stations for Safety under Hazardous Atmospheric Conditions. M. A. Hyde, Westinghouse Electric Corp.
- CP.\*\* Centralized Control of Oil Pipe Line Pumping Stations. C. B. Lester, Mid-Valley Pipeline Co.

**9:30 a.m.—Electric Heating**

*Parlor 2*  
W. C. RUDD, Presiding

- 52-68. Bus Bar Design for High-Frequency Induction Heating. J. W. Williamson, The Ohio Crankshaft Co.
- CP.\*\* Characteristics of Single Conductor Electric Cable at High Frequency. J. T. Sabol, The Ohio Crankshaft Co.
- 52-4. Induction Preheating of Electrolytic Tin Plate for Flow Brightening with High Frequency Rotating Equipment. W. T. Thomas, General Electric Co. Presentation by title only for discussion.

**9:30 a.m.—Digital Computers—New Storage Developments and Application of Transistors**

*Sky Top*  
W. H. MacWILLIAMS, Presiding

- CP.\*\* Three-Dimensional Magnetic Storage. J. W. Forrester, Massachusetts Inst. of Technology.
- CP.\*\* Ferroelectric Materials as Storage Elements for Digital Computers and Switching Systems. J. R. Anderson, Bell Telephone Labs., Inc.
- CP.\*\* An Improved Cathode-Ray Tube for Application in Williams Memory Systems. W. E. Mutter, International Business Machines Corp.
- CP.\*\* Catalog of Digital Computer Designs. J. H. Felker, Bell Telephone Labs., Inc.

**2:00 p.m.—Transmission and Distribution**

*Ballroom*  
R. L. WITZKE, Presiding

- 52-6. Report of Joint AIEE-EEI Subject Committee on Line Outages.
- CP.\*\* Recovery Voltage Characteristics of Distribution Circuits. General Systems Subcommittee Report.

52-108. Guides for Short-Time 60-Cycle Overvoltage Operation of Power Capacitors. Working Group of the Capacitor Subcommittee.

52-109. General Circuit Constants—Their Formation and Use. R. D. Goodrich, Jr., Bureau of Reclamation.

**2:00 p.m.—D-C Machinery**

Penn Top South  
LANIER GREER, Presiding

52-70. A Simple, Effective Method of Representing the Load Current ACO.\* of a D.C. Machine. G. L. Hall, General Electric Co.

52-71. Rate of Rise of Short Circuit Current of D-C Motors and Generators. Subcommittee on D-C Machinery. Presentation by title only for discussion.

52-72. Commutation of Large Direct Current Motors and Generators. T. M. Linville, G. M. Rosenberry, General Electric Co.

52-73. Test Code for Carbon Brushes. Joint Subcommittee on Carbon ACO.\* Brushes. Presentation by W. W. Walker.

CP.\*\* Contact Thermocouple for Measuring Commutator Temperatures. A. T. McClinton, Naval Research Lab.

52-74. Increased Losses in a DC Motor When Operated from Grid-Controlled Rectifiers. C. R. Reiter, Shell Oil Co.; C. R. Armerman, The Pennsylvania State College.

**2:00 p.m.—High Permeability Magnetic Materials**

Georgian Room  
R. M. BOZORTH, P. L. SCHMIDT, Presiding

CP.\*\* Dynamic Hysteresis Loops. H. Lord, General Electric Co.

CP.\*\* Mathematical Description of Core Losses. F. H. Richardson, General Electric Co.; J. W. Hale, Allegheny Ludlum Research Lab.

CP.\*\* Problems in the Application of Oriented Nickel-Iron Alloys. A. C. Beiler, Westinghouse Electric Corp.

CP.\*\* Magnetic Properties of Ferrite Materials. Frank Gelbard, H. A. Goldsmith, General Ceramics and Steatite Corp.

**2:00 p.m.—Mobile Radio Systems**

Parlor 1  
A. C. DICKIESON, Presiding

CP.\*\* Lightning Protection of Base Stations in the Mobile Radio Service. Report by Committee on Radio Communications Systems.

52-67. A Radio Dispatching System for Large Taxicab Fleet Operation. A. R. Vallarino, S. W. Lewinter, Federal Telecommunication Labs., Inc.

CP.\*\* Radio Communication Equipment AN/GRC-3 thru 8. J. H. Durrer, David Talley, International Telephone and Telegraph Corp.

**2:00 p.m.—Electrical Applications in Pipe Line Transportation**

Keystone Room  
L. W. ROUSH, Presiding

CP.\*\* Automatic Control of Gas Turbines for Natural Gas Pipeline Pumping. C. R. Ingemanson, Arne Loft, H. J. Wilt, General Electric Co.

CP.\*\* Remote Operation of Pipeline Stations by Supervisory Control. L. B. Eddy, Westinghouse Electric Corp.

CP.\*\* Automatic and Remote Control of Electrified Pipe Lines. B. M. Mills, General Electric Co.

CP.\*\* New Electric Pressure Instrumentation on Petroleum Pipelines. M. J. Dabney, Plantation Pipeline Co.

**2:00 p.m.—Symposium on Heating Application Data**

Parlor 2  
L. P. HYNES, Presiding

A discussion with several members of the Electric Heating Committee, presenting either tables, charts or nomographs covering some phase of the subject.

**2:00 p.m.—Small Digital Computers**

Sky Top  
J. M. COOMBS, Presiding

CP.\*\* The USAF-Fairchild Computer. J. J. Stone, Oak Ridge National Lab.

CP.\*\* The MADDIDA—Its Operation and Mathematics. C. B. Dennis, Northrup Aircraft Corp.

CP.\*\* The JAINCOMP Computer. D. H. Jacobs, Jacobs Instrument Corp.

CP.\*\* The CADAC. W. E. Dobbins, Computer Research Corp.

**2:00 p.m.—Conference on Energy Sources**

Penn Top North  
L. W. MATSCH, Presiding

CP.\*\* Magnetic Storms. O. B. Jacobs, J. J. Gilbert.

CP.\*\* Sunspots and Planetary Effects Upon Radio Signals. J. H. Nelson.

**Friday, January 25**

**9:30 a.m.—Transformers**

Ballroom  
M. K. BROWN, Presiding

52-76. The Impulse Testing of Low Voltage High KVA Transformer Windings. L. C. Aicher, Allis-Chalmers Mfg. Co.

52-77. The Impulse Generator and Its Uses. J. H. Chiles, Jr., W. L. Teague, Westinghouse Electric Corp.

CP.\*\* Impulse Testing of Power Transformers. J. R. Meador, J. H. Hagenguth, General Electric Co.

52-78. Gaseous Insulation for High Voltage Transformers. G. Camilli, R. E. Plump, General Electric Co.; G. S. Gordon, Skillman, N. J.

52-79. Recent Improvements in Theory and Practice of Vacuum Plastic-Filled Insulation for Voltage Transformers. E. C. Wentz, F. B. Colby, Westinghouse Electric Corp.

**9:30 a.m.—Station and Control Cable Symposium**

Georgian Room  
W. T. PIERCE, Presiding

CP.\*\* Economy and Reliability of Control Cable Installations. U. S. Sherman, Philadelphia Electric Co.

CP.\*\* Auxiliary Power and Control Cables. E. E. McIlveen, R. C. Waldron, The Okonite Co.

CP.\*\* Airport Cable Installations. C. R. Johnson, Port of N. Y. Authority.

CP.\*\* Effect of Environment and DC Potentials on Non Metallic Sheath Control Cables. G. J. Crowdes, Simplex Wire & Cable Co.

**9:30 a.m.—Transmission and Distribution**

Keystone Room  
S. B. CRARY, Presiding

51-110. Power System Stability Criteria for Design. W. A. Morgan, Bureau of Reclamation, now with Ebasco Services, Inc.

CP.\*\* An Analogue of a Synchronous Machine for Use in Transient Stability Studies. J. E. Van Ness, Northwestern University.

52-111. Tensorial Analysis of Integrated Transmission Systems, Part II—Off Nominal Turn Ratios. Gabriel Kron, General Electric Co.

52-112. Evaluation of Methods of Coordinating Incremental Fuel Costs and Incremental Transmission Losses. L. K. Kirchmayer, General Electric Co.; G. W. Stagg, American Gas & Electric Service Corp.

**9:30 a.m.—Magnetic Amplifier Materials**

Sky Top  
P. L. SCHMIDT, Presiding

CP.\*\* Report of the Materials Subcommittee of the Magnetic Amplifier Committee.

CP.\*\* Magnetic Properties of Ultra-Thin Magnetic Alloys—Manufacture. M. F. Littmann.

CP.\*\* Magnetic Properties of Ultra-Thin Magnetic Alloys—Application. J. G. Miles, Engineering Research Associates, Inc.

52-26. The Effect of Core Materials on Magnetic Amplifier Circuits. L. J. Johnson, Naval Research Laboratory.

**9:30 a.m.—Industrial Power Systems**

Penn Top North  
H. G. BARNETT, Presiding

52-80. Electric Power Supply for a Large Chemical Plant. A. C. Friel, The Dow Chemical Co.; J. P. Smith, General Electric Co.

CP.\*\* Electrical Systems in the Port Authority Bus Terminal. W. Henschel, H. W. Wenson, Jr., Port of N. Y. Authority.

CP.\*\* Electrical Systems for the United Nations Headquarters. F. B. Graham, Syska & Hennessy, Inc.

**9:30 a.m.—Feedback Control Systems**

Parlor 1  
F. W. HERWALD, Presiding

52-81. The Writing of Closed-Loop Control System Transfer Function by Inspection. J. B. Flannigan, Sperry Gyroscope Co.; H. S. Kirschbaum, Ohio State University.

52-82. Synthesis of Closed Loop Systems Using Curvilinear Squares to Predict Root Location. D. W. Russell, Arnold Engg. Development Center; C. H. Weaver, The University of Tennessee.

CP.\*\* Additions to the Stability Theory and Design of Servomechanisms. J. F. Koenig, University of Illinois.

**9:30 a.m.—Single Phase and Fractional Horsepower**

Penn Top South  
R. F. MUNIER, Presiding

52-48. Toward An Accurate Evaluation of Single-Phase Induction-Motor Constants. F. W. Suhr, General Electric Co.

52-49. A Quadrature-Phase-Shift Voltage Transformer Device and Its Applications. R. L. Hupp, F. W. Suhr, General Electric Co.

52-50. Moneca—A New Network Calculator for Motor Performance Calculations. C. G. Veinott, Westinghouse Electric Corp.

52-86. An Equivalent Cantilever Circuit for Polyphase Induction Motor for Practical Calculations. T. C. Tsao, Consolidated Edison Co. of N. Y., Inc.; N. F. Tsang, University of Arkansas.

**2:00 p.m.—Transformers**

Ballroom  
F. J. VOGEL, Presiding

52-87. Field Tests on Power Transformers Equipped with Thermosiphon Oil Filters. E. W. Tipton, Westinghouse Electric Corp.

CP.\*\* New Equipment for Field Drying of Transformers. D. R. Baldwin, N. R. Maleady, E. A. Elge, General Electric Co.

52-88. Controlled Temperature and Insulation Protection in the Operation of Power Transformers. W. W. Satterlee, Westinghouse Electric Corp.

CP.\*\* Winding Hot Spot Temperature Equipment for Transformers. G. Camilli, A. R. Kimball, H. A. Forhalt, General Electric Co.

52-89. The Economics of High-Temperature Dry-Type Transformers. L. C. Whitman, General Electric Co.

52-90. Characteristics of Overlapping Joints in Magnetic Circuits. T. D. Gordy, General Electric Co.; H. L. Garbarino, Armour Research Foundation.

52-115. A New Concept of Insulating Oil Life Characteristics. Frank C. Doble, Doble Engineering Co.

**2:00 p.m.—Insulated Conductors**

Georgian Room  
C. T. HATCHER, Presiding

52-91. A-C Resistance of Pipe-Cable Systems with Segmental Conductors. AIEE Working Group of Cable Characteristics Subcommittee.

52-92. Auxiliary Power and Control Cables for Steam Electric Generating Stations. F. V. Smith, E. G. Norell, Sargent & Lundy.

52-93. Generator Lead Practice. M. J. Lowenberg, Stone & Webster ACO.\* Engg. Corp.

**2:00 p.m.—Magnetic Amplifier Circuits**

Sky Top  
W. E. DORNHOEFER, Presiding

52-94. Series-Connected Magnetic Amplifier with Inductive Loading. T. G. Wilson, Naval Research Lab.

52-5. Compensating for the Quiescent Current in Multi-Stage Magnetic Amplifiers. A. S. Fitzgerald, San Francisco, Calif. Presented by M. C. Burns, Berkeley Scientific Corp.

CP.\*\* On the Effective Feedback Ratio of Magnetic Amplifiers. L. A. Finzi, H. L. Durand, G. F. Pittman, Carnegie Inst. of Technology.

CP.\*\* Ferroresonant Effects and Their Application to Magnetic Amplifier Circuits. E. M. Bauer, Polytechnic Institute of Brooklyn.

**2:00 p.m.—Industrial Power Systems and Relays**

Penn Top North  
H. G. BARNETT, Presiding

CP.\*\* Power Distribution at New York International Airport. C. R. Johnson, Port of N. Y. Authority; V. P. Brodsky, A. B. Henderson, Consolidated Edison Co. of N. Y., Inc.

CP.\*\* Selecting AC Overcurrent Protective Device Settings for Industrial Plants. F. P. Brightman, General Electric Co.

CP.\*\* Some Considerations of the Relay Protection Problem of Industrial Distribution Systems. W. A. Frankenfield, Detroit Edison Co.

**2:00 p.m.—Symposium on Germanium Rectifiers and Transistors.**

Penn Top South  
W. C. DUNLAP, JR., Presiding

CP.\*\* A-B-C of Germanium. J. P. Jordan, General Electric Co.

CP.\*\* Conduction Properties of Germanium Single Crystals. W. C. Dunlap, Jr., General Electric Co.

CP.\*\* The N-P-N Junction Transistor. J. A. Morton, Bell Telephone Labs., Inc.

CP.\*\* Circuits for Junction Transistors. R. L. Wallace, Bell Telephone Labs., Inc.

CP.\*\* Recovery of Germanium from Factory Waste. V. Ozerow, General Electric Co.

CP.\*\* A New Germanium Power Rectifier. F. J. Lingel, General Electric Co.

**2:00 p.m.—Feedback Control Systems**

Parlor 1  
F. E. CREVER, Presiding

52-95. A New Parallel Type Compensation Network. G. F. Warnke, ACO.\* V. H. Disney, Armour Research Foundation.

CP.\*\* Stabilization Templates for Servomechanisms. O. J. M. Smith, University of California.

52-8. An Electronic Apparatus for the Study of the Human Operator in a One-Dimensional, Closed-loop, Continuous Pursuit Task. C. E. Warren, P. M. Fitts, J. R. Clark, Ohio State University.

CP.\*\* The Figure of Merit of Direct Current Rotating Power Amplifiers. J. T. Carleton, Westinghouse Electric Corp.

2:00 p.m.—A-C Network Calculator Designs and Experience  
Parlor 2  
G. D. McCANN, Presiding

52-19. A New Principle is Employed for 60-Cycle A-C Network Analyzers. E. B. Phillips, University of Kansas.

CP.\*\* Operating Experience with a 10-KC Network Analyzer. W. B. Boast, Iowa State College.

CP.\*\* Design Improvements in the 10,000-Cycle Network Analyzer. J. D. Ryder, University of Illinois.

52-113. A Compact, Inexpensive A-C Network Analyzer. E. W. Kimbark, Instituto Tecnológico de Aeronáutica; J. H. Starr, LaGrange, Ill.; J. E. Van Ness, Northwestern University.

CP.\*\* Moneca—A Compact Electronic Network Calculator. R. B. Squires, Westinghouse Electric Corp.

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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J. G. Derse  
*Dinner-Dance*

D. T. Braymer  
*General Session*

F. P. Jossion  
*Inspection Trips*

R. T. Weil  
*Monitors*

J. G. Aldworth  
*Theatre-Radio*

**Dinner Dance**

J. G. Derse, *Chairman*

E. S. Banghart

P. T. Gross

E. J. Bateman

W. B. Quirk

J. M. Comly

R. F. Miller

T. E. Davis

James Nesmith

R. L. Dhuy

Ernest Ohnell

H. H. Sheppard

**Hotel Accommodations**

C. N. Metcalf, *Chairman*

W. G. Vieth, *Acting Chairman*

R. W. Behringer

G. Hotchkiss

D. V. Buchanan

J. T. McSweeney

G. V. Cruciani

J. B. Sullivan

J. L. Davidson, Jr.

A. L. Swensk

F. A. DeArcangelis

**Inspection Trips**

F. P. Jossion, *Chairman*

J. V. O'Connor, *Secretary*

T. F. Cofer

E. J. Lassen

R. L. Dhuy

J. L. Spencer

F. K. Faulkner

D. E. Sullivan

D. Halloran

**Ladies Entertainment**

Mrs. R. F. Brower, *Chairman*

Mrs. E. S. Banghart, *Vice Chairman*

Mrs. M. M. Brandon

Mrs. C. N. Metcalf

Mrs. A. J. Cooper

Mrs. C. S. Purnell

Mrs. J. G. Derse

Mrs. D. A. Quarles

Mrs. R. W. Gillette

Mrs. D. M. Quick

Mrs. C. T. Hatcher

Mrs. D. W. Taylor

Mrs. N. S. Hibshman

Mrs. E. R. Thomas

Mrs. F. P. Jossion

Mrs. W. G. Vieth

Mrs. G. J. Lowell

**Registrations**

E. R. Thomas, *Chairman*

H. E. Martin, *Vice Chairman*

Morris Brenner

Henry Kurz

Charles Dorsa

James Nesmith

W. A. Henderson

E. Richman

F. H. Kasten

F. L. Williams

**Smoker**

D. M. Quick, *Chairman*

C. F. Bolles

J. P. Neubauer

R. E. Clisdell

E. G. D. Patterson

A. J. Cooper

H. B. Snow

J. W. Danser

J. H. Spraggon

R. W. Gillette

D. W. Taylor

J. B. Harris, Jr.

E. F. Thrall

Wm. Jordan

W. R. VanSteenburgh

**Theater and Radio Tickets**

J. G. Aldworth, *Chairman*

D. C. Aker

J. C. Hoyt

Parker Austin

Frank Karaus

George Cross

C. H. Wagner

W. R. Francis

COMMITTEE MEETINGS

Monday, January 21

9:30 a.m.—Capacitor Short-Time Characteristics Working Group .....	Conf. Rm. 3
9:30 a.m.—Planning and Coordination Committee.....	Conf. Rm. 4
9:30 a.m.—Rotating Machinery Insulation Subcommittee.....	Room 127
9:30 a.m.—Hot Cathode Power Converters Subcommittee.....	Parlor C
10:00 a.m.—Lightning and Insulator Subcommittee.....	Room 129
10:30 a.m.—Edison Medal Committee .....	Room 111
12:00 noon—Luncheon—Edison Medal Committee.....	Room 112
12:00 noon—PRESS RECEPTION .....	Parlor 2
12:30 p.m.—Luncheon—Domestic and Commercial Applications Committee .....	Room 129
12:30 p.m.—Luncheon—Fault Limiting Devices Subcommittee .....	Room 127
2:00 p.m.—GENERAL SESSION .....	Ballroom
4:00 p.m.—Distribution and Conversion Substations Subcommittee .....	Room 112
4:00 p.m.—T. and D. Capacitor Subcommittee.....	Conf. Rm. 3
4:00 p.m.—Carrier Current Measurements Subcommittee.....	Room 111
4:30 p.m.—Technical Program Committee .....	Conf. Rm. 9
5:00 p.m.—Sections Get-Together .....	Parlors B & C

Tuesday, January 22

8:00 a.m.—Breakfast—Textile Subcommittee .....	Room 112
8:00 a.m.—Towers, Poles and Insulators Subcommittee .....	Room 111
8:15 a.m.—Canadian Members Breakfast .....	Parlor C
9:30 a.m.—Publication Committee .....	Room 127
9:30 a.m.—Executive Committee of Electronic Power Converters and Tube Conference.....	Room 129
9:30 a.m.—Carrier Current Committee .....	Parlor B
9:30 a.m.—AIEE-ASME Joint Committee on Steam Turbine Generators .....	Parlor C
9:30 a.m.—Transmission Substations Subcommittee .....	Conf. Rm. 9
9:30 a.m.—Rotating Machinery Administrative Subcommittee .....	Conf. Rm. 4
9:30 a.m.—Student Branches Committee .....	Conf. Rm. 3
9:30 a.m.—Synchronous Machinery Subcommittee .....	Parlor A
10:00 a.m.—Industrial Control Committee .....	Room 111
10:00 a.m.—Instruments and Measurements Organization Subcommittee .....	**Greeley Room
12:00 noon—Luncheon—Protective Devices Committee.....	Parlor A
12:00 noon—Luncheon—General Industry Applications Committee .....	Parlor C

12:00 noon—Luncheon—Membership Committee Dist. No. 1 .....	Room 129
12:00 noon—Luncheon—Industrial Control Committee .....	Room 111
12:00 noon—Luncheon—Standards Coordinating Committee No. 4 .....	Room 127
12:00 noon—Luncheon—Carrier Current Committee .....	Parlor B
12:00 noon—Luncheon—Land Transportation Committee .....	Conf. Rm. 9
12:00 noon—Luncheon—Induction Machinery Subcommittee .....	Room 112
2:00 p.m.—Sections Committee .....	Penn Top North
2:00 p.m.—Education Committee .....	Conf. Rm. 3
2:00 p.m.—Transmission and Distribution Committee.....	Parlor A
2:00 p.m.—Metallic Rectifiers Committee.....	Penn Top Center
2:00 p.m.—Rotating Machinery Committee .....	Conf. Rm. 4
2:00 p.m.—Electronic Power Converters Committee.....	Room 112
2:00 p.m.—Publication Committee .....	Room 127
2:00 p.m.—Industrial Control Standards Subcommittee .....	**Greeley Room
2:00 p.m.—Lightning Arrester Application Guide Working Group .....	*AIEE Room 1001
2:00 p.m.—Communication Switching Systems Committee.....	Parlor 2
2:00 p.m.—Subcommittee No. 5 of ASA Sectional Committee C42 .....	Room 129
4:00 p.m.—General Applications Committee .....	Parlor C
4:00 p.m.—Rotating Machinery Insulation Subcommittee.....	Parlor B
4:30 p.m.—Wire Communications Systems Committee.....	Room 111
4:00 p.m.—Rectifier Cooling and Corrosion Problems Working Group .....	Room 112
7:00 p.m.—Ladies Dinner .....	Penn Top Center and North

Wednesday, January 23

7:30 a.m.—Industry Division Committee .....	Room 111
9:00 a.m.—IEC Insulation Coordination Committee .....	Room 112
9:00 a.m.—Dielectric Measurements in the Field Subcommittee .....	Parlor C
9:30 a.m.—Lightning Arrester Application Guide Working Group .....	*Room 817
9:30 a.m.—Production and Application of Light Committee .....	Room 129
9:30 a.m.—Substations Committee .....	Parlor A
9:30 a.m.—Industrial Control Test Codes Subcommittee .....	*Room 1105
9:30 a.m.—Probability Methods .....	Room 127
9:30 a.m.—Cathodic Protection Subcommittee.....	Conf. Rm. 4

## American Institute of Electrical Engineers

9:30 a.m.—Membership Committee .....	Conf. Rm. 9
9:30 a.m.—Power Generation Excitation Systems Subcommittee .....	Parlor C
9:30 a.m.—Insulated Conductor Accessories Subcommittee .....	*Room 501B
10:00 a.m.—Mining and Metal Industry Committee .....	Conf. Rm. 3
10:00 a.m.—Lamme Medal Committee .....	*AIEE Room 1001
11:00 a.m.—Petroleum Industry Subcommittee .....	Penn. Top Center
12:00 noon—Luncheon—Communication Division Committee .....	Room 127
12:00 noon—Luncheon—ASA C57 Transformer .....	Parlor C
12:00 noon—Luncheon—Instruments and Measurements Committee .....	Parlor B
12:00 noon—Luncheon—Public Relations .....	Room 111
12:00 noon—Luncheon—D-C Machinery Subcommittee.....	Parlor A
12:00 noon—Luncheon—Committee on Registration of Engineers .....	Room 112
2:00 p.m.—Lightning Arrester Application Guide Working Group .....	*Room 817
2:00 p.m.—Production and Application of Light Committee .....	Room 129
2:00 p.m.—Safety Committee .....	Room 111
2:00 p.m.—Committee on Transfers .....	Conf. Rm. 4
2:00 p.m.—Chemical, Electrochemical and Electro- thermal Applications Committee .....	Conf. Rm. 3
2:00 p.m.—Industrial Control Test Codes Subcom- mittee .....	*Room 1105
2:00 p.m.—Television and Aural Broadcasting Systems Committee .....	Penn Top Center
2:00 p.m.—Nominating Committee .....	Conf. Rm. 9
2:00 p.m.—Non-Linear Circuit Theory Subcommittee .....	**Greeley Room
2:00 p.m.—Power Supply for Resistance Welding Machines Subcommittee .....	*AIEE Room 1001
4:00 p.m.—Electrochemical Processes Subcommittee .....	Room 127
4:00 p.m.—Science and Electronics Division Committee.....	Parlor C
4:00 p.m.—Power Division Committee .....	Parlor 2
4:00 p.m.—Professional Division Advisory Committee.....	Parlor B
5:00 p.m.—Hopkins Hour for Alumni, Faculty, Former Faculty and Friends .....	Penn Top North
5:00 p.m.—Dinner—Electronics Committee .....	Parlor A
7:30 p.m.—Forum of Technical Committee Chairmen.....	Parlor 1
8:00 p.m.—Fluid Mapper Patterns—A Lecture- Demonstration .....	Georgian Room

### Thursday, January 24

8:15 a.m.—Breakfast—Basic Sciences Energy Sources Subcommittee .....	Room 127
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## Winter General Meeting

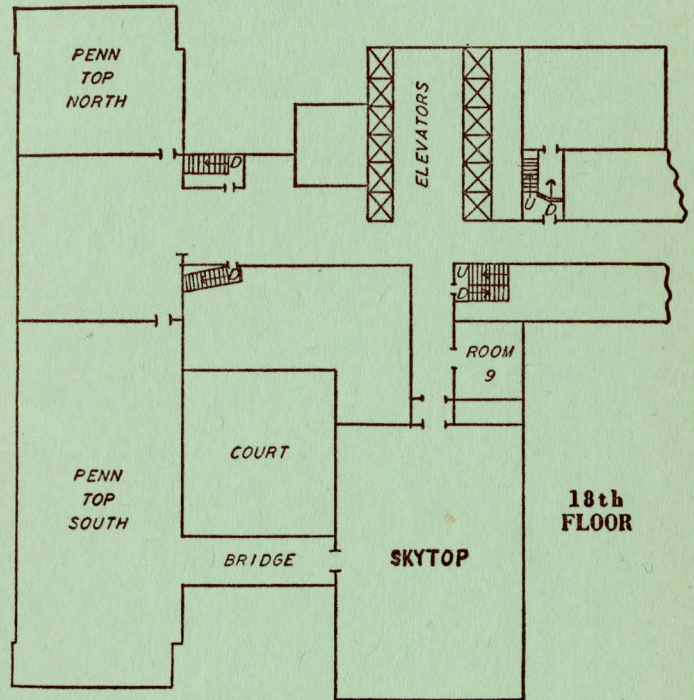
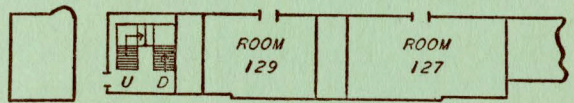
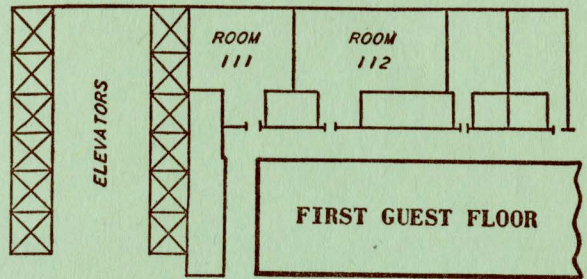
9:30 a.m.—Electric Welding Committee .....	*Room 501B
9:30 a.m.—Relay Committee .....	Parlor B
9:30 a.m.—Board of Directors .....	*AIEE Room 1001
9:30 a.m.—Electrostatic Processes Subcommittee.....	Parlor C
9:30 a.m.—Current Limiting Reactor Standards Project Group .....	Room 129
9:30 a.m.—Master Test Code for Speed Measurements Subcommittee .....	Room 111
9:30 a.m.—Magnetic Amplifier Committee .....	Parlor A
9:30 a.m.—Industrial Grounding Subcommittee.....	Conf. Rm. 4
9:30 a.m.—AEIC-IPCEA Working Group .....	Conf. Rm. 9
9:30 a.m.—Power Generation Committee .....	Conf. Rm. 3
10:00 a.m.—Signal Sources Task Group .....	**Greeley Room
10:30 a.m.—Magnetic Amplifier Application Subcommittee.....	Room 112
12:00 noon—Luncheon—Joint Subcommittee on Carbon Brushes .....	Parlor A
12:00 noon—Luncheon—Industrial Power Systems Com- mittee .....	Room 127
12:00 noon—Luncheon—Technical Advisory Committee.....	Parlor C
12:00 noon—Luncheon—Insulated Conductors Administration Subcommittee .....	Conf. Room 9
12:00 noon—Luncheon—Electric Heating Committee.....	Room 129
12:00 noon—Luncheon—Committee on Research.....	Parlor B
2:00 p.m.—Medicine and Biology Committee.....	Conf. Room 3
2:00 p.m.—Electronic Instruments Subcommittee.....	**Greeley Room
2:00 p.m.—System Engineering Committee .....	Conf. Room 4
2:00 p.m.—Electric Welding Committee.....	*501 B
2:00 p.m.—Feedback Control Systems Committee.....	Room 111
2:00 p.m.—Aircraft Electrical Rotating Machinery Sub- committee .....	*Room 817
2:00 p.m.—Board of Directors .....	*AIEE Room 1001
2:00 p.m.—Electron Tube Subcommittee .....	Room 112
2:00 p.m.—Magnetic Amplifier Test Code Subcommittee .....	Penn Top Center
4:00 p.m.—Basic Sciences Committee .....	Room 129
4:00 p.m.—Radio Communications Systems Committee.....	Room 127

### Friday, January 25

9:30 a.m.—Computing Devices Committee.....	Parlor A
12:00 noon—Luncheon—AIEE-IRE High Frequency Measurement Committee .....	Parlor B

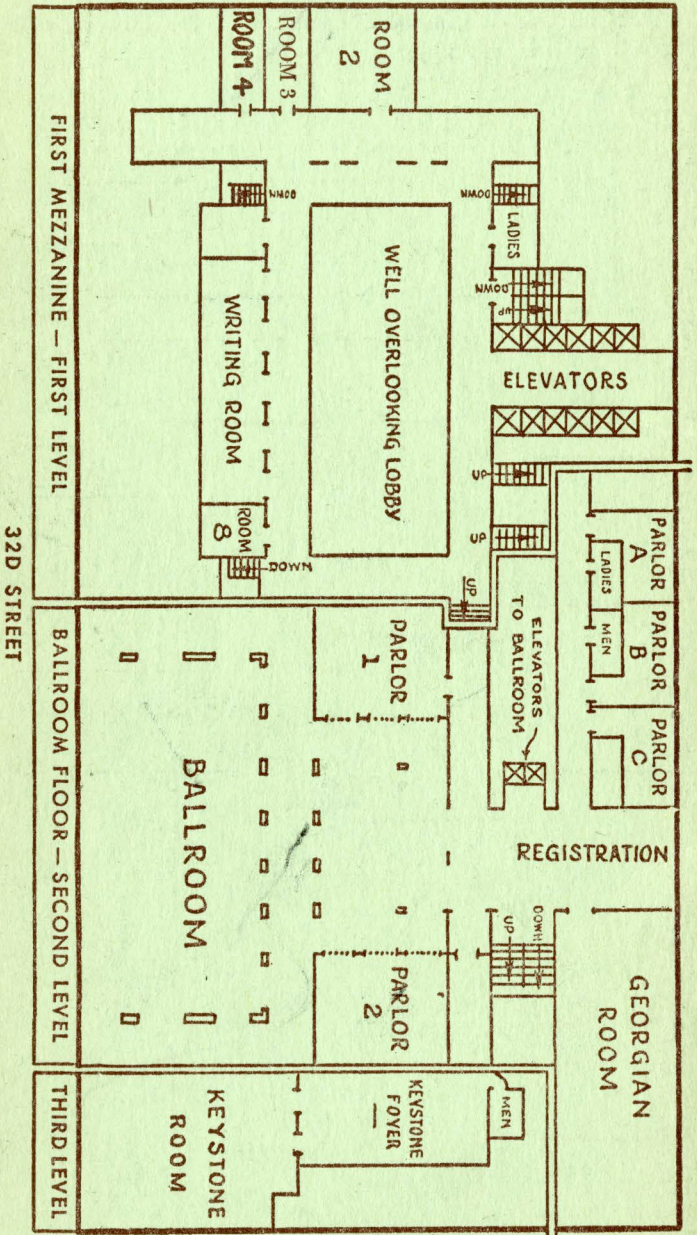
\* Indicated room assignments at Engineering Society's building, 33 West 39th Street.

\*\* The Greeley Room is located in the Hotel Governor Clinton.





SEVENTH AVENUE



HOTEL STATLER