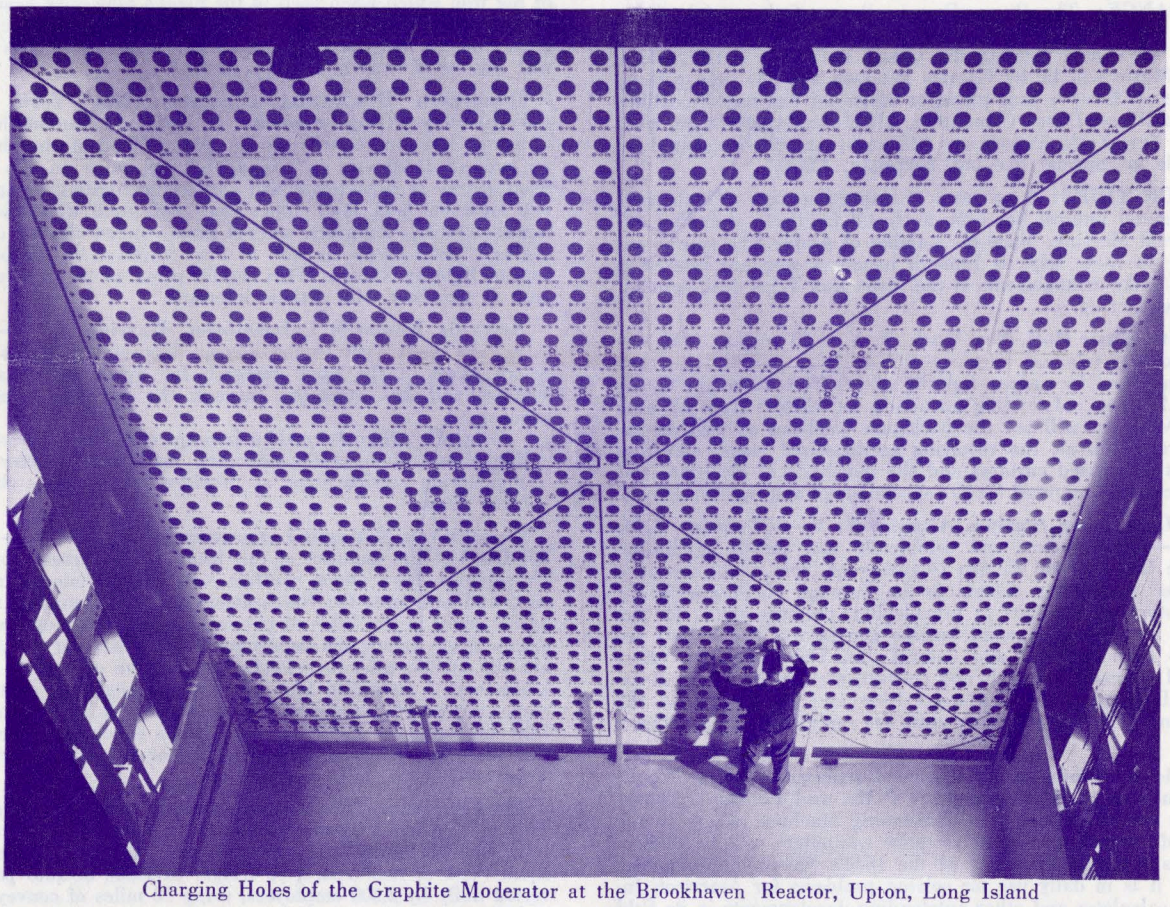
Winter General Meeting

January 31 - February 4, 1955

Headquarters
Hotel Statler



Charging Holes of the Graphite Moderator at the Brookhaven Reactor, Upton, Long Island

The AIEE Winter General Meeting to be held at the Hotels Statler and Governor Clinton in New York, N. Y., January 31-February 4, 1955, will feature one of the largest technical programs in the history of the Institute. The social activities, for which the Winter General Meeting also is known, again will be one of the outstanding features. A group of varied and interesting inspection trips has been arranged also, closely allied with the technical sessions.

At the General Session on Monday, January 31st at 2:30 p. m. Brig. General David Sarnoff will give the principal address. Just prior to General Sarnoff's remarks, the John Scott Medal will be presented to Dr. Marvin Camras. At this same meeting the Institute Paper Prizes will be awarded. President A. C. Monteith will open the session with his report to the membership.

At a special session Tuesday at 1:45 p.m. the John Fritz Medal will be presented to Mr. Harry A. Winne, Vice-President of the General Electric Company. On Wednesday at the same hour the Edison Medal will be presented to Dr. Oliver E. Buckley, President of the Bell Telephone Laboratories. To each of these three sessions the public is cordially invited.

INFORMAL TEA: This social gathering before the formal program begins has been enjoyed by more and more people each year. Make it a point to attend this year—Sunday afternoon, January 30, from 4 to 6 p.m., in the Georgian Room of the Statler. There will be no charge. During this period the registration facilities will be open for those wishing to avoid the Monday morning rush.

HOTEL RESERVATIONS: Blocks of rooms have been set aside at the Statler and nearby hotels for members and guests attending the meeting. Requests for reservations should be sent, prior to January 17, directly to the hotel of choice and to only one hotel. AIEE should be mentioned in the request. If rooms are not available at the hotel of your choice, your request will be referred to the Hotel Accommodations Committee. This committee will then place it with another convention hotel.

Because of the current accommodations situation in New York reservations for arrival on Sunday, January 30, are suggested.

Hotel Statler (meeting Headquarters), 7th Avenue, 32nd to 33rd Sts.	
Single room with bath	$ 6.50 to $11.00
Double room	9.50 to 14.00
Twin bedroom	10.50 to 18.00
Suites	28.00 to 30.00
Hotel New Yorker, 34th Street and 8th Avenue	
Single room with bath	$ 6.00 to $12.00
Double room	9.00 to 14.50
Twin bedroom	10.50 to 16.00
Hotel Governor Clinton, 7th Avenue at 31st Street	
Single room with bath	$ 6.00 to $ 9.00
Double room	8.50 to 11.50
Twin bedroom	10.50 to 14.50
Hotel McAlpin, Broadway and 34th Street	
Single room with bath	$ 4.50 to $ 9.25
Double room	7.00 to 13.50
Twin bedroom	8.50 to 13.50
Hotel Roosevelt, Madison Avenue at 45th Street	
Single room with bath	$ 7.50 to $14.00
Double room	12.50 to 17.50
Twin bedroom	15.00 to 20.00
Hotel Martinique, Broadway and 32nd Street	
Single room with bath	$ 5.00 to $ 7.00
Double room	8.50 to 11.00
Twin bedroom	9.00 to 12.00

Rates are subject to 5 percent New York City hotel room tax.

AIEE WINTER GENERAL MEETING

SMOKER: A smoker is scheduled for Tuesday evening, February 1. Attention is called to the fact that the smoker will be held at the Hotel Statler, rather than at the Hotel Commodore as in recent years. Tickets will be $10.00 each. Make checks payable to "Special Account Secretary, AIEE." Reservations should be made at an early date and addressed to: Smoker Committee, AIEE Headquarters, 33 West 39th Street, New York 18, N. Y. Reservations received after January 11 will not be honored.

DINNER-DANCE: The Dinner-Dance, climax of the social affairs planned for the Winter General Meeting, is scheduled for Thursday, February 3, 1955, at 7 p.m. in the Grand Ballroom, Hotel Statler, New York. Music will be by Charles Peterson and the food will be better than ever. Reserve your place, or tables for ten, now by calling or writing to Dinner-Dance Committee, AIEE Headquarters, 33 West 39th Street, New York. Tickets are $12 each, and checks should be made payable to "Special Account, Secretary, AIEE."

INSPECTION TRIPS: A program of inspection trips of both technical and general interest has been arranged for those attending the Winter General Meeting. Since the number of people who can be accommodated on these trips is limited, members who are interested are urged to make arrangements at the Inspection Trips desk immediately after registering.

Radio City Music Hall, New York, N. Y.—(Tuesday A.M.)—This ever popular trip has been scheduled again. Spectacular stage shows distinguished by unique lighting effects have made the Radio City Music Hall an outstanding attraction for visitors from all over the world. Members will see the backstage facilities as well as unusual features, such as, the revolving sectionalized stage, elevating orchestra pit, motorized curtains and the multitude of electrical and mechanical controls required for the special stage and lighting effects.

Astoria Generating Station, Astoria, N. Y.—(Tuesday A.M. and P.M.)—This modern and completely new indoor generating plant of the Consolidated Edison Company of New York, Inc. is a "unit System" installation located in the Borough of Queens. There are two 13-story high boilers to provide high-pressure steam for the two 180,000 kw cross compound turbine generators. The boilers are equipped to burn coal, oil and natural gas. The Company's latest steps toward automatic controls and instrumentation should prove interesting. All elements for the supervision and the control of the major equipment for the generator units are centralized. U. S. citizens only.

International Business Machines Corporation, New York, N. Y.—(Tuesday A.M., Wednesday P.M., and Friday A.M.)—IBM's Type 701 Electronic Data Processing Machine, which is one of the world's fastest and most versatile computers will be demonstrated. This installation is part of the IBM's Scientific Computing Service and it is in daily use for solving problems for American Industry. The calculator and other outstanding developments in its field will be explained and some of its many applications will be described.

New York Stock Exchange—(Tuesday P.M., Wednesday and Thursday A.M.)—Arrangements have been made to permit a limited number of persons to visit the famous New York Stock Exchange. A talk on the Exchange's function in the economic welfare of the nation will be followed by a technicolor movie entitled, "What Makes Us Tick." In addition, visitors will be allowed to watch activities on the floor of the Exchange from the gallery.

United Nations, New York, N. Y.—(Tuesday P.M.)—This trip will include the regular guided tour and will be preceded by a talk on the electrical equipment by a representative of the consulting engineers who worked on the design of the buildings. Many unusual features are to be seen, such as, unique lighting effects and special acoustical treatments. A complex communication system enables listeners to hear a speech as it is being delivered in any one of five languages by a twist of a dial.

Federal Pacific Electric Company, Newark, N. J.—(Wednesday A.M.)—This plant is an example of modern production methods utilizing fully automatic forming, assembling and calibrating equipment and decentralized independent work centers. This decentralized production has replaced the standard twentieth century type floor length assembly lines. Visitors will see the manufacture of the complete line of low-voltage circuit breakers and enclosures. They will be shown multiple operation presses forming enclosures from rolls of sheet steel, plastic circuit breaker cases being formed in molding machines and the assembling and testing of breakers in work centers. Assembly lines of safety switches, fusible service equipment, industrial circuit breakers, and motor control are also in this plant.

Fairless Steel Plant, Fairless, Pa.—(Wednesday, All Day)—The Fairless Works is U.S. Steel's first integrated steel plant in the East and covers 3,900 acres of land near Trenton, New Jersey, of which 175 are under roof. The Inspection Party will see all of the operations from the stockpile of raw materials (iron ore, coal and limestone) through the Blast Furnaces and Open Hearth Plant to the Hot Strip Mill and Sheet and Tin Finishing Mills.

This plant has an annual capacity of approximately 1,200,000 tons of pig iron which when used in the plant's nine open hearth furnaces, furnish 1,800,000 tons of steel. The large amount of electrical equipment used for driving and controlling various operations in the mills will also be of interest to our members.

Rambusch Decorating Company, New York, N. Y.—(Wednesday P.M.)—Founded in 1890, the Rambusch Decorating Company has progressed from its original field of church painting to its present status as an outstanding specialist in the design and manufacture of ornamental and engineered lighting equipment. Here, our members will find, under one roof, such diversified crafts as mural painting, sculpture, stained glass window design, cabinet making and metal shops, as well as those involved in the production of special lighting fixtures. This should prove to be an unusual experience to members with artistic interests.

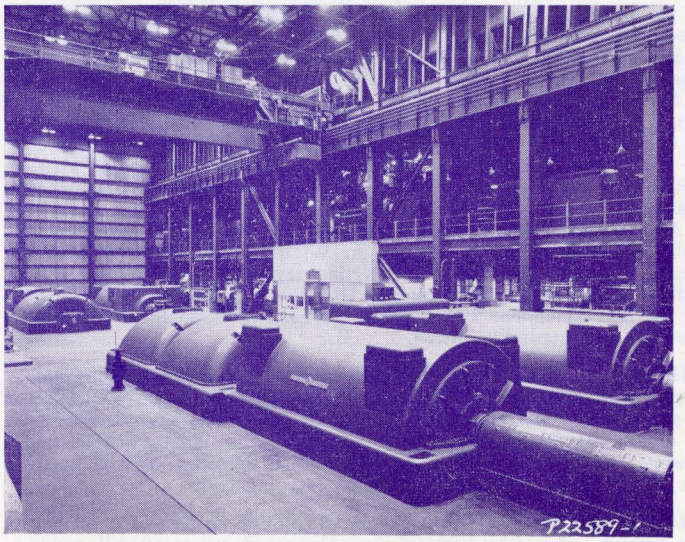
Sylvania Research Laboratories, Bayside, N. Y.—(Wednesday P.M.)—A visit to the physics laboratory will be undertaken where much of the basic research for Sylvania products is done. Visitors will be conducted through the following areas in small groups:

Research Areas devoted to luminescence, color television, travelling wave tubes, semi-conductors, mass spectrometry as well as engineering service areas as provided by the glass shop and machine shop.

Brookhaven National Laboratory, Upton, N. Y.—(Thursday, All Day)—The facilities at this location are operated by Associated Universities, Inc., under contract with the Atomic Energy Commission, and constitute the Northeastern Center for nuclear research and development in the fields of physics, chemistry, biology, medicine and engineering. Among the important exhibits that our members will see are the atomic pile, the cloud chamber, the cosmotron and the hot laboratory. A complete tour has been arranged in great detail and competent guides, engineers and scientists will be on hand to explain fully the extensive facilities and exhibits which have been erected at this vast site. Members must sign up for this trip before 4:30 p.m., February 1, 1955. U.S. citizens only.

Ford Assembly Plant, Edgewater, N. J.—(Thursday A.M.)—This plant offers a good opportunity to see all the interesting detail work that goes into the assembly of an automobile. Here, on 961,000 square feet of floor space, 45 freight carloads of auto parts are converted daily by 2,800 employees, using 10 miles of conveyor lines and a 1,025-foot final car assembly line, to completed cars and trucks.

Continued on page 12



Astoria Generating Station, Consolidated Edison Co.

TECHNICAL PROGRAM

ADVANCE COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 30c each (60c each to nonmembers), by sending enclosed order form and remittance to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. 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. Most of the numbered papers will be published in the bimonthlies and in the Transactions. *Conference Papers* denoted by CP.** are intended for presentation only, and are not available.

Monday, January 31

10:00 a.m.—Switchgear

55-213. The Results of Seven Years' Experience with High Capacity Outdoor Oil Breakers. C. J. Balentine and K. G. Darrow, General Electric Co.

55-216. Dynamics of High Capacity Outdoor Oil Breakers. Philip Barkan, General Electric Co.

55-219. Application of Volume Theory of Dielectric Strength to Oil Circuit Breakers. W. R. Wilson, A. L. Streater and E. J. Tuohy, General Electric Co.

55-220. Capacitance-Switching Facilities at the Switchgear Development Laboratory, R. L. Williams, L. L. Mankoff and H. N. Schneider, General Electric Co.

10:00 a.m.—Transformers

55-43. Evaluation and Application of Silicone-Organic Resin Combinations for Dry-Type Transformer Insulation. G. F. Simmons and A. L. Scheideler, General Electric Co.

55-44. Functional Temperature Endurance Tests on a Silicone Glass Fiber Insulation System for Dry-Type Transformers. M. L. Manning, Pennsylvania Transformer Co.

55-34. Epoxy Resin Casting of Dry-Type Current Transformers. W. C. Farneth and George Gallousis, Allis-Chalmers Mfg. Co.

CP.** Functional Life Expectancy Tests for Liquid Filled Distribution Transformers. A. M. Lockie, Westinghouse Electric Corp.

10:00 a.m.—Special Communications Applications

55-177. A Tapered Strip Transmission Line for Pulse Transformer Service. F. G. Primozich, North American Aviation, Inc., E. R. Schatz and J. B. Woodford, Carnegie Institute of Technology.

CP55-178. Wartime Telecommunications Experiences. A. C. Kovats, Northern Electric Co.

55-179. Economic Design of Saturating Reactor Magnetic Pulsers. R. A. Mathias and E. M. Williams, Carnegie Institute of Technology.

10:00 a.m.—Electrochemical Processes

CP.** Lightning Protection at Chalmette, La. Aluminum Reduction Plant, G. B. Scheer, Kaiser Engineers.

CP.** Latest Operating Experience with Mechanical Rectifiers. A. Hooker,

CP.** Maintenance Practices in Large Converting Substations of Electrochemical Plants.

55-138. Application of Germanium Power Rectifiers. R. M. Crenshaw, General Electric Co.

10:00 a.m.—Conference on Fields

CP.** Solution of Field Problems with the Aid of Distributed Circuit Parameter Concepts. S. A. Schelkunoff, Bell Telephone Labs., Inc.

CP.** Effects of Random Variations on the Patterns of Discreet Antennae Arrays. E. N. Gilbert and S. P. Morgan, Jr., Bell Telephone Labs., Inc.

55-104. An Automatic Field Plotter. R. Gelfand, B. J. Shinn and F. B. Tuteur, Yale University.

55-105. Improving Field Analogues Through Conformal Mapping. H. K. Farr and W. A. Keen, Jr., General Electric Co.

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

CP.** A Glance at the Progress of the Heat Pump. E. R. Ambrose, Chairman, Joint AEIC-EEI Heat Pump Committee.

CP55-233. A Brief Description of the Design and Operation of Four Heat Pump Installations in the Tennessee Valley, B. H. Martin, Tennessee Valley Authority and C. L. Carter, Celanese Corp.

CP.** Earth Source Heat Pumps Characteristics, Design and Operation. E. A. Freund and G. S. Whitlow, Union Electric Co. of Missouri.

CP.** NEC Provisions for Fixed Electrical Space Heating. J. M. Turnbull, Western Massachusetts Electric Co.

CP.** Load Characteristics of the Residential Consumer Using Electricity for House Heating. W. R. New, Tennessee Valley Authority.

55-232. Residential Electric Space Heating in Detroit for 1952-1953 Heating Season. A. E. Bush and R. P. Woodward, The Detroit Edison Co. Re-presented for discussion.

CP55-237. Alternating Current Release of Thermal-Electric Devices. P. L. Betz, Consolidated Gas, Electric and Power Co. of Baltimore.

10:00 a.m.—Semi-Conductor Devices

CP.** Switching Transistor Control System for a Magnetic Amplifier. W. G. Hall and R. I. VanNice, Westinghouse Electric Corp.

CP.** Silicon Transistor. A. D. Rittmann, Philco Corporation.

CP.** Advances in Design and Application of the Double-Base Diode. J. J. Suran, R. W. Aldrich, I. A. Lesk, General Electric Co.

CP.** Forming Techniques and Measurements on Gold-Bonded Transistors. M. W. Aarons, W. E. Bulman and E. B. Dale, Batelle Memorial Institute.

2:30 p.m.—General Session

"Address". President A. C. Monteith.

Presentation of the Institute paper prizes.

Presentation of the John Scott Medal to Dr. Marvin Camras.

"Address". Brig. General David Sarnoff.

Tuesday, February 1

9:30 a.m.—Switchgear

55-13. High-Current Testing of Air-Disconnect Switches. B. F. Gostin, Tennessee Valley Authority.

55-9. Results of High-Current Tests on 161-Kv Disconnecting Switches. A. M. McNerney, Tennessee Valley Authority.

55-11. Behavior of High Voltage Busses and Insulators During Short Circuits. R. M. Milton and Fred Chambers, Tennessee Valley Authority.

55-217. Ribbon Elements for High Voltage Current Limiting Fuses. A. H. Powell and C. L. Schuck, General Electric Co.

CP.** Report of International Electrotechnical Commission. V. L. Cox, General Electric Co.

9:30 a.m.—Section Delegates Conference

9:30 a.m.—Electronic Power Converters

55-39. Field Tests on a 100-Megawatt Rectifier Installation. J. K. Dillard, C. S. Hague, Westinghouse Electric Corp. and John Kiefer, Reynolds Metals Co.

55-45. Regulation Curves and Transient Currents of Double-Way and Double-Wye Rectifiers. L. E. Jensen and C. E. Rettig, General Electric Co.

CP.** Safety, Experience and Practice, in the Operation of Mercury Arc Rectifiers in an Aluminum Plant. R. N. Wagner and J. P. Pitman, Aluminum Co. of America.

CP.** Amplistat Regulators for Mercury Arc Rectifiers. M. M. Morack and A. Schmidt, Jr., General Electric Co.

9:30 a.m.—Transformers

55-31. Recent Contributions to Transformer Audible Noise Control. W. B. Conover and R. J. Ringlee, General Electric Co.

55-26. An Anechoic Chamber for Noise Tests on Large Power Transformers. A. W. Benoit (retired), R. T. Hemmes and M. W. Schulz, Jr., General Electric Co.

55-12. An Experimental Gas-Insulated 138 KV Current Transformer. G. Camilli, General Electric Co.

9:30 a.m.—Antennas and Propagation

CP.** TV Assignment Rules and Policies. C. B. Plummer, Federal Communications Comm.

CP.** UHF Wave Propagation. R. P. Wakeman, Allen B. DuMont Labs.

CP.** Performance of Sectionalized Broadcasting Towers. C. E. Smith, Carl E. Smith Consulting Engineers, D. B. Hutton, Federal Communications Comm. and W. G. Hutton, Goodyear Aircraft Corp.

55-139. Television Receiver Signal Overload. C. Masucci, CBS-Columbia.

9:30 a.m.—Thermal Aging of Insulation

55-46. A Method for Evaluation of Thermal Stability of Magnet Wire Enamel. G. C. Currin and J. F. Dexter, Dow Corning Corp. Re-presented for discussion.

55-47. Determination of Thermal Life of Enameled Wire by Laboratory Test Methods. F. A. Sattler, Westinghouse Electric Corp. Re-presented for discussion.

CP.** Heat Resistant Magnet Wire. W. F. Gilliam, E. M. Boldebuck and J. R. Elliott, General Electric Research Lab.

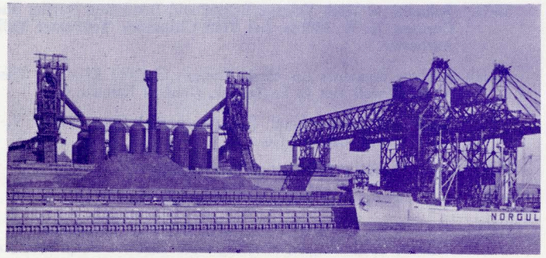
55-48. Functional Evaluation of Magnet Wire Insulation. E. L. Brancato and R. S. Phillips, Naval Research Lab.

CP.** Thermally Stable Wire Enamel. F. A. Sattler, J. Swiss and C. B. Leape, Westinghouse Research Labs.

CP.** Screening Tests for the Thermal Stability of Magnet Wire. W. W. Wareham, General Electric Co.

9:30 a.m.—Basic Concepts

CP.** Comments on Definition and Measurement of Physical Quantities with Particular Reference to Rationalized, Non-rationalized, and Gaussian Forms of Maxwells Equations. S. A. Schelkunoff, Bell Telephone Labs., Inc.



U. S. Steel Fairless Works, Morrisville, Pa.

55-49. Recommendations of I.E.C. Technical Committee No. 24 on Electric and Magnetic Magnitudes and Units (E.M.M.U.). J. J. Smith, General Electric Co.

CP.** The Definition of Voltage. W. R. LePage, C. R. Cahn and D. W. Spence, Syracuse University.

CP.** The Definition of Magnetic Vector Potential. W. R. LePage, Syracuse University.

9:30 a.m.—Insulated Conductors

55-32. Oil Flow and Pressure Calculations for Pipe-Type Cable Systems. AIEE Working Group on Pipe-Type Cable Hydraulics.

55-50. Gas Pressurized, 120 KV and 161 KV, Pipe Type Cables in Ontario. S. Kozak, Canada Wire & Cable Co., Ltd. and C. Prescott, Hydro Electric Power Commission of Ontario.

CP55-240. Freezing Pipe Type Cable. E. J. Merrell, Phelps Dodge Copper Products Corp.

CP.** Charging Current Limitations on Power Output of High Voltage Cable Lines. C. S. Schifreen and W. C. Marble, Philadelphia Electric Co.

55-51. An Improved Approximate Technique for Calculating Cable Temperature Transients. F. C. Van Wormer, General Electric Co.

9:30 a.m.—Land Transportation

55-202. Ignitron Multiple-Unit Cars for the New Haven Railroad. E. W. Ames, Westinghouse Electric Corp. and V. F. Dowden, New York, New Haven and Hartford RR Co.

55-203. Considerations in Applying D-C Traction Motors on Rectified Single-Phase Power. M. Simon, General Electric Co.

55-204. Thermal Stability of a New Insulating Material Used in Traction Motors. R. W. Finholt, General Electric Co.

55-205. A New Power Supply for Railway Cars. E. F. Bredenberg, General Electric Co.

9:30 a.m.—Direct Current Machines

55-106. Correlation of Temperature Measurements on D-C Armatures. D. D. Gerbetz and J. W. Ewing, Reliance Electric & Engineering Co.

55-107. A Circuit Approach to the Analysis of a Two Stage Dynamo-Electric Amplifier. R. W. Burtness, La Grange Park, Illinois.

CP55-108. Metadyne Transients. K. A. Fegley, University of Pennsylvania.

55-109. D-C Machines: Response to Impact Excitation. J. J. Brockman and C. E. Linkous, General Electric Co.

9:30 a.m.—Transistor Reliability—Session I—Devices

CP.** A Survey of the Scientific Aspects of Transistor Reliability. Part A—G. W. Pratt, Massachusetts Institute of Technology. Part B—J. E. Thomas, Massachusetts Institute of Technology.

CP.** A Reliable Point Contact Transistor for Military Operations. N. J. Herbert, Bell Telephone Labs., Inc.

CP.** Reliability of Hermetically Sealed Junction Transistors. C. H. Zierdt, General Electric Co.

9:30 a.m.—Safety

S-69. Bibliography on Electrical Safety—1930-1953. J. A. Gienger. Eastman Kodak Co. and R. L. Lloyd, National Bureau of Standards. Re-presented for discussion.

CP55-239. Practical Effects of Electricity on the Heart. S. A. Talbot, The Johns Hopkins Hospital.

55-95. Electric Defibrillation. W. B. Kouwenhoven and W. R. Milnor, The Johns Hopkins University.

55-87. Field Current Sources for Electric Defibrillation. P. L. Betz, Consolidated Gas Electric Light and Power Co. of Baltimore.

1:45 p.m.—Presentation of the John Fritz Medal to Harry A. Winne

2:30 p.m.—Switchgear

55-218. A 69 KV Compressed Air Circuit Breaker for 5,000,000 KVA. R. E. Kane and J. K. Walker, Westinghouse Electric Corp.

55-215. High Current Arc Erosion of Electric Contact Materials. W. R. Wilson, General Electric Co.

55-221. Short-Circuit Currents and Circuit Breaker Recovery Voltages Associated with Two-Phase-to-Ground Short-Circuits. W. F. Skeats, General Electric Co.

55-222. Field Tests on a 138 KV High Speed Oil Circuit Breaker at Philip Sporn Power Plant. O. Naef, American Gas & Electric Co. and R. D. Hambrick, Federal Pacific Electric Mfg. Co.

2:30 p.m.—Section Delegates Conference

2:30 p.m.—Transformers

55-30. Magnetization of Transformer Cores During Impulse Testing. M. F. Beavers, J. E. Holcomb and L. C. Leoni, General Electric Co.

55-29. Oscillations of Coupled Windings. P. A. Abetti, G. E. Adams and F. J. Maginniss, General Electric Co.

55-52. Thyrite Protection for Series Windings of Autotransformers. J. W. Albright, General Electric Co.

CP55-27. Impulse Tests on the Low-Voltage Windings of Distribution Transformers. J. E. Holcomb, General Electric Co.

2:30 p.m.—Color Television

CP.** Design for Production of Color Television Receivers. J. P. Vandune, Westinghouse Electric Corp.

CP.** Chromacoder. P. C. Goldmark and J. F. Bambara, Columbia Broadcasting System.

CP.** Development of the RCA 21-Inch Metal Envelope Color Kinescope. H. R. Seelen, H. C. Moodey, D. D. Van Ormer and A. M. Morrell, Radio Corp. of America.

CP.** Deflection and Convergence of the RCA 21-Inch Color Kinescope. M. J. Obert, Radio Corp. of America.

2:30 p.m.—Cathodic Protection

55-111. Electrical Grounding Systems and Corrosion. L. P. Schaefer, The Hinchman Corp.

55-113. Underground Corrosion on Rural Electric Distribution Lines. O. W. Zastrow, Rural Electrification Administration.

CP.** Panel Discussion on Electrical Grounding in Cathodically Protected Systems.

55-110. Electrical Grounding and Cathodic Protection at the Fairless Works. W. E. Coleman and H. G. Frostick, U. S. Steel Corp. Re-presented for discussion.

2:30 p.m.—Thermal Aging of Insulation

CP.** Magnetic and Electrical Properties of Polymers Subjected to Thermal Aging. F. H. Winslow, W. O. Baker and W. A. Yager, Bell Telephone Labs., Inc.

CP55-234. Appraisal of High Temperature Behavior Laminates with Time. G. E. Power, Formica Co.

CP.** Heat Aging of Teflon Tetrafluoroethylene. G. McMahon and B. E. Ely, E. I. duPont de Nemours and Co., Inc.

55-35. Insulation Aging Characteristics as Measured by Shearing Modulus. L. C. Whitman and A. L. Scheideler, General Electric Co.

CP.** Heat Resistant Insulation for Motors. J. H. Clawson, C. J. Herman and K. N. Mathes, General Electric Co.

CP.** Measurement of Thermal Aging of Insulation Over Varying Temperature Cycles. H. M. Philofsky, F. A. Sattler and T. W. Dakin, Westinghouse Research Labs.

2:30 p.m.—Insulated Conductors

55-53. Aluminum Sheathed Power Cable. W. A. Del Mar and E. J. Merrell, Phelps Dodge Copper Products Corp.

55-54. Mineral-Insulated Metallic-Sheathed Cables. C. A. Jordan and G. S. Eager, Jr., General Cable Corp.

55-55. An Analog Solution of Cable Heat Flow Problems. E. deHaas, P. J. Sandiford and A. W. W. Cameron, Hydro Electric Power Commission of Ontario.

55-56. The Co-Ordination of Power and Communication Cable Characteristics. H. D. Short, Canada Wire & Cable Co.

2:30 p.m.—Land Transportation.

55-206. Rectifier Locomotives for the New York, New Haven and Hartford Railroad. F. D. Gowans, General Electric Co.

CP55-207. Multiple Unit Rectifier Motive Power Inductive Coordination Considerations on the New York, New Haven and Hartford Railroad. L. J. Hibbard, Westinghouse Electric Corp.; F. T. Garry, Southern New England Telephone Co.; and G. N. Loomis, New York, New Haven and Hartford Railroad.

55-208. Considerations in the Development of a High-Power Rectifier Locomotive. H. S. Ogden, General Electric Co.

55-209. Graphic Aids for Calculating Rectifier Locomotive Performance. R. D. Charlton, General Electric Co.

55-210. An Electric Drive for Rotary Snow Plows. A. H. Hoffer and R. E. Willhite, General Electric Co.

2:30 p.m.—Direct Current Machines

55-112. D-C Machines—A Method for Short-Circuit Calculation. John Cybulski and J. P. O'Connor, Naval Research Lab.

55-114. D-C Machines—Short Circuit Calculation and Test Results. J. P. O'Connor and John Cybulski, Naval Research Lab.

CP55-228. D-C Power Systems—Short Circuit Calculations and Test Results. John Cybulski and J. P. O'Connor, Naval Research Lab.

55-115. The Induction Machines with Solid Iron Rotor. H. M. McConnell and E. F. Sverdrup, Carnegie Institute of Technology.

2:30 p.m.—Transistor Reliability—Session II—Circuits

CP.** Small Signal Low Frequency Transistor Amplifiers. F. M. Dukat, Raytheon Mfg. Co.

CP.** Transistor Radio Circuits. N. B. Saunders, Consulting Engineer.

CP.** Junction Transistor Switching Circuits. R. H. Baker, Massachusetts Institute of Technology.

CP.** Point Contact Transistor Switching Circuits. J. A. DiGiorgio and A. W. Carlson, AF Cambridge Research Center.

2:30 p.m.—Preventing Fires from Electrical Causes

CP.** Electrical Fire Loss Statistics. C. L. Smith, National Fire Protection Association.

CP.** Prevention of Fires from Electrical Causes in Plant and Building Wiring. W. H. Biester, Jr., Electro Construction Co.

CP.** Reduction of Fire Hazard in the Design and Application of Electric Motors. Sol London, General Electric Co.

CP.** Preventing Fires from Electrical Causes in the Design and Manufacture of Appliances. H. A. Strickland, Jr. and R. A. Ackerman, Hotpoint Co.

CP.** Preventing Fires from Electrical Causes in the Design and Manufacture of Radio and Television Receivers. H. T. Heaton, General Electric Co.

2:30 p.m.—Magnetic Amplifiers

55-57. A Fast Response Magnetic Servo Amplifier. J. W. Kallander, Naval Research Lab.

55-58. A New Full-Wave Magnetic Amplifier Output Stage. P. W. Barnhart, Feedback Controls, Inc.

55-59. Elimination of Asymmetry Zero-Drift Errors in Magnetic Servo Amplifiers. W. A. Geyger, U. S. Naval Ordnance Lab.

55-60. Magnetic-Amplifier Control of D-C Motors. A. Kusko, Massachusetts Institute of Technology and J. G. Nelson, Minneapolis-Honeywell Regulator Co.

55-61. 160,000 Ampere, High Speed Magnetic Amplifier Design. A. B. Rosenstein, University of California.

Wednesday, February 2

9:30 a.m.—Switchgear

55-102. Analysis of Fault Currents for High Voltage Circuit Breaker Interruption. M. J. Lantz, Bonneville Power Administration.

55-223. Design Problems and Field Tests Concerning Circuit Breakers for Switching Long 230 Kv Lines. E. M. Umphrey and D. J. Marsden, Federal Pacific Electric Co.

55-212. Test Circuits for Capacitance Switching Devices. K. G. Darrow, V. E. Phillips, A. J. Schultz and R. B. Shores, General Electric Co.

55-224. Some Fundamentals on Capacitance Switching. I. B. Johnson, A. J. Schultz, N. R. Schultz and R. B. Shores, General Electric Co.

9:30 a.m.—Wire Communications

55-229. Telephone Lines for Rural Subscriber Service. L. Hochgraf and R. G. Watling, Bell Telephone Labs., Inc.

CP.** A Subscriber Carrier Telephone System, Description, Equipment and Utilization, James MacDowell, North Electric Mfg. Co.

CP.** Recent Developments in Subscriber Carrier Equipment. W. Fingerle, Budelman Radio Corp.

CP.** Type S (FM) Subscriber Carrier Equipment. Clem Boucher and Wendell Boucher, McElroy Mfg. Corp.

CP.** Use of Subscriber Line Carrier Equipment in the Design of Rural Telephone Systems. W. T. Smith and J. M. Flanigan, Rural Electrification Administration.

CP.** Problems and Promises of Rural Carrier. H. R. Huntley, American Telephone and Telegraph Co. and J. W. Emling, Bell Telephone Labs.

9:30 a.m.—Petroleum Industry

CP55-62. Modernization of the Electrical Distribution System—Tide Water Associated Oil Company-Avon Refinery. W. H. East, Tide Water Associated Oil Co., and G. R. Dunbar, Westinghouse Electric Corp.

CP55-20. Lighting a Modern Refinery Process Unit. E. A. Clarke, Humble Oil & Refining Co.

55-63. Basic Circuitry for Electrically Powered Pipeline Pump Stations Under Automatic or Remote Control. M. A. Hyde and W. A. Derr, Westinghouse Electric Corp. Re-presented for discussion.

CP.** Operating Experience with Electrical Transducers for Pipe Line Pressure and Flow Measurements and Controls. R. S. Cannon and W. W. Holt, Plantation Pipe Line Co.

9:30 a.m.—Electronic Aids to Navigation

CP.** Long-Distance Navigation—Past, Present and Future. J. A. Pierce, Harvard University.

CP.** Electronic Navigation Over Land Areas. Vernon Weihe, Air Transport Association of America (and) Melpar, Inc.

CP.** Electronic Guidance of Aircraft in the Vicinity of Airports. Peter Sandretto, Federal Telecommunications Labs.

9:30 a.m.—Symposium on Liquid Dielectrics

CP55-64. Properties of Oil Affecting Its Use in Apparatus. F. J. Vogel, Allis-Chalmers Mfg. Co.

55-65. Empirical Formulas for the 60 Cycle Sparkover Gradients in Commercial Oil. W. F. Gauster, North Carolina State College.

55-66. Gas and Moisture Equilibria in Transformer Oil. R. B. Kaufman, E. J. Shimanski and K. W. MacFadyen, General Electric Co.

CP.** Some Factor Influencing Electric Breakdown in Liquids. A. H. Sharbaugh, General Electric Co.

CP55-103. The Effect of Gamma Radiation on Liquid Dielectrics. T. D. Callinan, U. S. Naval Research Lab.

CP.** Characteristics of Corona Discharges in Liquid Dielectrics. T. W. Dakin, D. Berg, Westinghouse Electric Corp.

9:30 a.m.—Circuit Theory

55-140. A Supplement to the Brune Synthesis. F. M. Reza, Massachusetts Institute of Technology. Re-presented for discussion.

CP.** Mathematical Properties of Root Loci for Control-System Design. F. Reza, Massachusetts Institute of Technology.

CP.** A Note on Network Approximation Functions. N. Balabanian, Syracuse University.

CP.** Is the Impulse Function Necessary or Desirable in Network Theory? M. B. Reed and C. L. Coates, University of Illinois.

CP.** Response of Certain Basic Circuits to a Sine-Squared-Loop Voltage Pulse. T. J. Higgins, University of Wisconsin and O. H. Bieck, Allen Bradley Corp.

9:30 a.m.—Feedback Control Systems

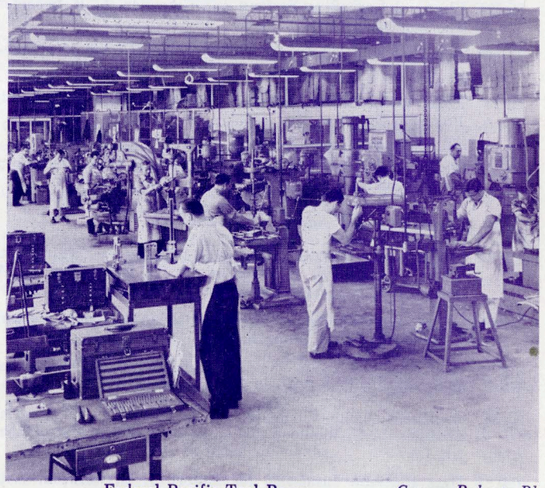
55-185. Further Effects of the Pole and Zero Locations on the Step Response of Fixed, Linear Systems. A. H. Zemanian, New York University.

55-186. The Effect of Pole and Zero Locations on the Transient Response of Sampled-Data Systems. E. I. Jury, University of California.

55-187. An Analytical Method for the Design of Relay Servomechanisms. J. E. Hart, Naval Research Lab.

55-188. A Method for Evaluating Nonlinear Servomechanisms. M. V. Mathews, Massachusetts Institute of Technology.

55-202. Conditional Feedback Systems—A New Approach to Feedback Control. G. Lang, Ferranti Electric, Ltd. and J. M. Ham, University of Toronto.



Federal Pacific Tool Room *George Roberts Photo*

55-189. Analysis of Errors in Sampled-Data Feedback Systems. J. Sklansky and J. R. Ragazzini, Columbia University. Re-presented for discussion.

55-190. Transient Analysis of A-C Servomechanisms. S. S. L. Chang, New York University. Re-presented for discussion.

55-15. Analysis of Backlash in Feedback Control Systems with One Degree of Freedom. L. M. Vallese, Polytechnic Institute of Brooklyn. Re-presented for discussion.

9:30 a.m.—Synchronous Machines

55-116. Operation of Hydrogen Cooled Turbine Generators. C. C. Sterrett and R. A. Towne, Westinghouse Electric Corp.

55-117. Turbine Generator, Operation and Maintenance Practice of Philadelphia Electric Co. E. I. Gallagher, Philadelphia Electric Co.

55-118. Turbine Generator Stator Winding Temperatures at Various Hydrogen Pressures. J. R. M. Alger, C. E. Kilbourne, D. S. Snell, General Electric Co.

55-119. Steam Turbine-Generator Operating and Maintenance Methods of the Southern California Edison Company. C. L. Sidway and C. M. Clevenger, Southern California Edison Co.

CP.** Operation and Maintenance of Hydrogen Systems for Turbine Generators. S. C. Barton and W. H. M. Olson, General Electric Co.

9:30 a.m.—Magnetic Amplifiers

55-68. An Analysis of Optimum Core Configuration for Magnetic Amplifiers Introducing a Simplified Method. B. D. Bedford, G. C. Dodson, General Electric Co. and C. H. Willis, Princeton University.

55-21. Inductive Load Instability in Magnetic Amplifiers, H. I. Leon and A. B. Rosenstein, University of California.

55-69. Analysis and Design of a Magnetic Frequency Multiplier. O. J. M. Smith and J. T. Salihi, University of California.

55-70. An All-Magnetic Audio Amplifier System. J. J. Suozzi and E. T. Hooper, U. S. Naval Ordnance Lab.

CP55-71. Voltage Gain of a Resonant Dielectric Amplifier. E. A. Sack, Westinghouse Electric Corp. and G. W. Penney, Carnegie Institute of Technology.

9:30 a.m.—Computing Devices

CP.** Transfer Function Synthesis with Computer Amplifiers and Passive Networks. M. V. Mathews and W. W. Seifert, Massachusetts Institute of Technology.

CP.** Simulation by Modelling Techniques. Norman Irvine, Aerojet Corp.

CP.** The Evolution of the Electric Analog Computer. G. D. McCann, California Institute of Technology.

55-5. Computer for Automatizing Network-Analyzer Operation. A. Kusko, Massachusetts Institute of Technology and P. N. Heller, Raytheon Mfg. Co.

9:30 a.m.—System Engineering

55-25. The Determination of Incremental and Total Loss Formulas from Functions of Voltage Phase Angles. C. R. Cahn, Syracuse University.

55-90. A General Transmission Loss Equation. E. D. Early, G. L. Smith, Southern Services, Inc. and R. E. Watson, Leeds & Northrup Co.

55-141. An Incremental Cost of Power Delivered Computer. E. D. Early, Southern Services, Inc., W. E. Phillips and W. T. Shreve, Leeds & Northrup Co.

55-24. Load-Phase-Tie Line Energy Control of Interconnected Power Systems. F. Cahen, Electricite de France.

9:30 a.m.—Engineering Code of Ethics

CP.** Ethics for the Engineering Profession. T. M. Linville, General Electric Co.

CP.** Canons of Ethics for Engineers—Their History and Future Importance. R. E. Argersinger, Stone & Webster Engineering Corp.

1:45 p.m.—Presentation of the Edison Medal to Oliver E. Buckley

2:30 p.m.—Switchgear and Substations

55-225. Pittsburgh Downtown 69 KV Power Supply—Part I— Planing. V. E. Hill, Duquesne Light Co.

55-226. Pittsburgh Downtown 69 KV Power Supply—Part II—Substation. E. M. Gue, Duquesne Light Co.

55-214. Pittsburgh Downtown 69 KV Power Supply—Part III—Switchgear. P. R. Pierson, Westinghouse Electric Corp.

CP55-227. An Air Supply System for Compressed Air Circuit Breakers. J. E. Schrameck, Westinghouse Electric Corp.

2:30 p.m.—Wire Communications

55-230. A Transatlantic Telephone Cable. M. J. Kelly, G. W. Gilman, Bell Telephone Labs., Inc., Sir W. Gordon Radley and R. J. Halsey, Post Office of the United Kingdom.

52-231. Open-Wire Carrier Systems in South Africa. C. F. Boyce, Government Post Office, Pretoria, South Africa.

CP.** Frequency Shift Signaling Circuit for 45 Type Carrier Systems. R. S. Caruthers and K. E. Appert, Lenkurt Electric Co.

CP.** Cable Dancing. N. Aamodt, Bell Telephone Labs.

CP.** Experiences with "B" Rural Distribution Wire. J. C. Leffel, Michigan Bell Telephone Co.

2:30 p.m.—Industrial Power Systems

55-142. Time Variation of Industrial System Short-Circuit Currents and Induction Motor Contributions. W. C. Huening, Jr. General Electric Co.

CP55-244. Surge Protection on Industrial Systems. C. L. Wagner, Westinghouse Electric Corp.

CP55-143. Directional Relays Provide Differential Type Protection on Large Industrial Plant Power System. M. M. Gilbert and R. N. Bell, E. I. Du Pont de Nemours & Co.

2:30 p.m.—Symposium: How Can the Utilities Best Make Use of Modern Science?

55-144. Implementation of a Research Program for the Electric Utility Industry. J. E. Hobson, M. S. Oldacre, Standford Research Institute and W. A. Lewis, Illinois Institute of Technology.

55-145. Research in the Electric Power Industry. L. R. Gaty, Philadelphia Electric Co.

CP.** The Role of the Manufacturer in Utility Research. E. E. Parker and J. Baird, General Electric Co.

CP55-40. Educating Electrical Engineers to Exploit Science. G. S. Brown, Massachusetts Institute of Technology.

2:30 p.m.—Liquid and Gaseous Dielectrics

55-72. Phenomena Accompanying Transient Low-Voltage Discharges in Liquid Dielectrics I. Anode Phenomena at Low Currents. E. M. Williams and R. E. Smith, Carnegie Institute of Technology.

55-36. The Propagation Mechanism of Impulse Creepage Discharges over Oil-Immersed Surfaces. J. G. Anderson and T. W. Liao, General Electric Co.

CP55-241. The Dielectric Behavior of Some Fluorogases and Their Mixtures with Nitrogen. G. Camilli, T. W. Liao and R. E. Plump, General Electric Co.

CP.** Dielectric Breakdown of Perfluorocarbon Vapors and Gases and their Mixtures with Nitrogen. L. J. Berberich, C. N. Works and E. W. Lindsey, Westinghouse Electric Corp.

55-10. Some Electrical and Thermal Characteristics of Helium and Sulfur-Hexafluoride Mixtures. J. D. Cobine, General Electric Research Lab.

55-37. Significant Factors in Thermal Aging Tests on Flexible Sheet Insulation. T. W. Dakin, H. M. Philofsky and W. C. Divens, Westinghouse Electric Corp. Re-presented for discussion.

2:30 p.m.—Chemical Industry

CP55-238. Emergency Power Supply in Chemical Manufacturing Operations. R. F. Shumar, Dow Chemical Co.

CP.** Modern Trends in Design of Electrical Distribution Systems in Chemical Plants. G. B. Jamison, Crouse-Hinds Co.

CP.** Training Program to Qualify Plant Electricians as Satisfactory High Voltage Cable Splicers. T. O. Wood, Dow Chemical Co.

CP.** Lightning Protection of Chemical Plant Structures. A. M. Opsahl, Westinghouse Electric Corp.

2:30 p.m.—Transmission and Distribution

55-91. Automatically Switched Capacitors in Steps on a Single Distribution Feeder. W. C. Fowler, Sangamo Electric Co. and C. W. Thomas, Public Service Co. of Oklahoma.

55-146. Balancing Double-Wye High Voltage Capacitor Banks. O. R. Compton, Virginia Electric and Power Co.

55-41. Fundamental Relations of System Voltage Drop and System Loads. G. M. Miller and L. W. Robbins, General Electric Co.

55-89. A Simplified Method of Calculating Voltage Regulation Using Unit Impedance Power-Reactive Diagrams. R. M. Butler, General Electric Co.

2:30 p.m.—Feedback Control Systems

55-191. Frequency Response from Experimental Nonoscillatory Transient-Response Data. H. Thal-Larsen, University of California.

55-192. A Series Method of Calculating Servomechanism Transient Response from the Frequency Response. D. V. Stallard, Massachusetts Institute of Technology.

55-193. A Method for the Preliminary Synthesis of a Complex Multi-Loop Control System. D. J. Povejsil and A. M. Fuchs, Westinghouse Electric Corp.

Westinghouse TV-Radio Division, Metuchen, N. J.

55-194. Design of Control Systems for Minimum Bandwidth. G. C. Newton, Massachusetts Institute of Technology.

CP.** The Use of Short-Time Memory Units in Feedback Control Systems. T. W. Sze and J. F. Calvert, Northwestern University.

55-195. A General Theory for Determination of the Stability of Linear Lumped-Parameter Multiple-Loop Servomechanisms (and other Feedback Sysems). T. S. Amlie, U. S. Naval Ordnance Test Station and T. J. Higgins, University of Wisconsin. Re-presented for discussion.

55-196. Design and Application of a Peak Voltage Detector to Industrial Control Systems. L. W. Allen, International Business Machines Corp. Re-presented for discussion.

2:30 p.m.—Synchronous Machines

55-120. Operation of Turbine-Generators During Off-Peak High Power-Factor Periods—Practices of One Utility in a Metropolitan Area. W. J. Roberts and R. L. Webb, Consolidated Edison Co. of N. Y., Inc.

CP.** Operation of Turbine Generators. J. H. Carter and R. E. Gorman, General Electric Co.

55-121. Eccentricity, Vibration and Shaft Currents in Turbine Generators. L. T. Rosenberg, Allis-Chalmers Mfg. Co.

CP55-122. Proposed Guide for Maintenance of Turbine-Generators. J. W. Jones, Philadelphia Electric Co.

55-123. Test Report on a Fully Supercharged Generator. S. Beckwith, B. M. Koetting, L. T. Rosenberg and G. W. Staats, Allis-Chalmers Mfg. Co.

2:30 p.m.—Magnetic Amplifiers

55-67. Transistor Demodulator for High-Performance Magnetic Amplifiers in A-C Servo Applications. R. O. Decker, Westinghouse Electric Corp.

55-73. A Switching Transistor D-C to A-C Converter Having an Output Frequency Proportional to the D-C Input Voltage. G. H. Royer, Westinghouse Electric Corp.

55-74. A High-Accuracy Static Time Delay Device Utilizing Transistors. G. F. Pittman, Jr., Westinghouse Electric Corp.

55-75. A Variable Frequency Magnetic-Coupled Multivibrator. R. L. Van Allen, Naval Research Lab.

CP55-76. The Level Comparator. H. Estrada, Jr. and J. P. Ward, Westinghouse Electric Corp.

2:30 p.m.—Computers and Special Instrumentation

55-180. Electronic Computer for Color Printing. H. E. Rose, Radio Corp. of America.

CP.** The Thermal Printer. Herman Epstein, Burroughs Corp.

CP55-181. Raydist Systems for Radiolocation and Tracking. J. M. Benson and J. E. Swafford, Hastings Instrument Co.

CP55-182. An Azimuth and Elevation Photorecording Theodolite. S. W. Silverman, Boeing Airplane Co.

2:30 p.m.—Management

CP.** An Engineering Society's Responsibilities in the Management Field. L. E. Newman, General Electric Co.

CP.** Economic Counsel and Modern Management. J. R. Haas, Lionel D. Edie & Co.

Thursday, February 3

9:30 a.m.—Carrier Current

55-77. A Method of Measurement of Carrier Characteristics on Power Cables. B. J. Sparlin and J. D. Moynihan, Westinghouse Electric Corp.

55-78. Design of the Adjustable Lin-O-Phase Filter. Reuben Lee, Westinghouse Electric Corp.

55-79. An Investigation of the Capture Effect in a Narrow Band Frequency Modulated System. C. D. Hedges, Westinghouse Electric Corp.

55-42. Recommendations for Improving Reliability of Standby Engine Generators for Microwave Communications Systems. N. B. Tharp, Westinghouse Electric Corp.

9:30 a.m.—Communication Switching Systems

CP.** Little Audrey—A Voice Controlled Logic Machine. G. R. Frost, Bell Telephone Labs., Inc.

CP.** The Outguesser and Other Semi-Intelligent Machines. D. W. Hagelbarger, Bell Telephone Labs., Inc.

CP.** A Demonstration of Common Control Telephone Switching Principles. V. F. Blefary, Bell Telephone Labs., Inc.

9:30 a.m.—Industrial Control

CP.** Utilizing the Magnetic Amplifier for Processing Line Loop Control. K. S. Yamamoto, Clark Controller Co.

CP.** Computer Analysis of Industry Control Regulating Systems. W. W. Bolander and J. T. Bradford, General Electric Co.

55-80. Eddy Current Press Drives. F. L. Hopf and T. R. LaVallee, Dynamatic Corp.

CP.** Automatic Positioning of a Rotary Turret Punch Press. D. B. Schneider, General Electric Co.

9:30 a.m.—Solid Dielectrics and Miscellaneous

55-81. Surface and Volume Dielectric Losses. J. J. Chapman, L. F. Blickley and E. A. Szymkowiak, The Johns Hopkins University.

55-82. Dielectric Failure of Volume and Surface Types. J. J. Chapman, L. J. Frisco and J. S. Smith, The Johns Hopkins University.

CP.** The Underwater Spark: A Photographic Light Source of High Brilliance. H. C. Early and E. A. Martin, University of Michigan.

CP.** Velocities of Magnetically Driven Arcs in Air and Helium up to 30 Atmospheres. R. C. Walker and H. C. Early, University of Michigan.

55-83. A Continuous Flow Moisture Detector. M. F. Beavers, E. J. Shimanski and E. F. Timpane, General Electric Co.

9:30 a.m.—Recent Developments in Semiconductors

CP.** Thermoelectric Properties of Semiconductors. T. H. Geballe, Bell Telephone Labs., Inc.

CP.** Carrier Extraction in Germanium. Ralph Bray, Purdue University.

CP.** Cyclotron and Other Resonance Effects in Silicon and Germanium. J. H. Zeiger, Massachusetts Institute of Technology.

CP.** Organic Semiconductors. George Goldsmith, Purdue University.

9:30 a.m.—Computing Devices

CP.** A Self-Checking Card-to-Magnetic-Tape Converter. E. I. Blumenthal, Remington Rand Inc.

CP55-243. A New Magnetic Memory Device for Business Machines. S. J. Begun, Clevite-Brush Development Co.

55-147. An Electronic System for Processing Air Traffic Control Information. R. M. Kalb, Engineering Research Associates.

55-148. Data Transfer and Display Equipment for a Proposed System of Air Traffic Control. G. E. Fenimore, Civil Aeronautics Administration.

9:30 a.m.—Transmission and Distribution

55-22. Voltage Gradients on High Voltage Transmission Lines. G. E. Adams, General Electric Co.

55-98. Measurement of Resistance and Reactance of Expanded ACSR. J. Tompkins, B. L. Jones and P. D. Tuttle, Aluminum Co. of America.

54-501. Practical Application of Sag and Tension Calculations to Transmission Line Design. J. Lummis and H. D. Fischer, Jr., Southern California Edison Co.

55-149. Investigation of European Practices in Power Line Design. Eduard Fritz, Day & Zimmerman, Inc.

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

CP.** The Physical Effect of Thermal Cycling on Insulation for Long Stator Coils in Turbine Generators. J. S. Johnson, Westinghouse Electric Corp.

CP.** Experience in DC Testing of AC Generator Insulation. A. Pletenik, General Electric Co.

55-3. Effect of Synchronous-Machines Transient Rotor Saliency on Changes in Terminal Voltage. C. Concordia, General Electric Co.

55-124. A Transductor Type Field Ripple Detector for Synchronous Generators. H. M. McConnell, Carnegie Institute of Technology.

55-125. Detection of Grounds in Generator Field Windings. J. E. Barkle, C. C. Sterrett and L. L. Fountain, Westinghouse Electric Corp.

9:30 a.m.—Instruments

55-2. An Airborne Temperature Indicator. W. R. Clark, W. G. Amey and G. C. Mergner, Leeds and Northrup Co.

55-155. An Elliptical Polarization Synthesizer. G. H. Friedman, Franklin Institute Laboratories. Re-presented for discussion.

55-14. The Ring Modulator as a Polarized Rectifier. A. J. Hermont, Shell Development Co.

55-1. A Novel Circuit for Electronic Power-Factor Meters and Wattmeters and a Novel Division Device. M. Abdel-Halim Ahmed, Cairo University.

9:30 a.m.—Education

Panel Discussion: The ASEE Report on Evaluation of Engineering Education—Its Relationship to Electrical Engineering.

(1) The Background of the Report and Its Conclusions. L. E. Grinter, University of Florida.

(2) Implications for Electrical Engineering Curricula. J. F. Calvert, University of Pittsburgh.

(3) Implications for Industry. G. E. Moore, Westinghouse Electric Corp.

(4) Implications for the Professional Engineer. R. G. Warner, United Illuminating Co.

9:30 a.m.—Substations

55-127. Control Circuitry for Remotely Operated Electric Utility Substations. W. A. Derr and W. L. Metz, Westinghouse Electric Corp.

55-128. Supervisory Control and Associated Telemetering Equipment. Working Group of the Automatic and Supervisory Control Subcommittee.

CP55-17. Automatic Switching of Substation Static Capacitor Banks by a Current Biased Induction Disc Type Voltage Relay. W. C. Osteen and J. J. McCullough, Southern California Edison Co.

CP55-169. Methods of By-Passing Distribution Substation Equipment D. J. Hubert and J. A. Smith, General Electric Co.

9:30 a.m.—Electron Equipment Reliability—I

55-151. Science, Statistics and Reliability Engineering. J. C. Bear, Aeronautical Radio, Inc.

CP.** Integrating Statistical and Probability Methods to Engineering Design. E. B. Ferrell, Bell Telephone Labs., Inc.

CP.** The Application of Statistical Techniques to Electron Tubes for Use in a 4000-Mile Transmission System. W. VanHaste and B. J. Kinsburg, Bell Telephone Labs., Inc.

2:00 p.m.—Radio Communications

CP55-199. FDM Subcarrier. A. R. Vallarino and C. Greenwald. Federal Telecommunication Labs.

55-200. Coaxial Cavity Filters for Multiplexing of 900 Megacycle Radio Relay Systems. M. H. Kebby, Lenkurt Electric Co.

55-201. A Communications System for the New York State Thruway. D. S. DeWire, New York Telephone Co. and H. A. Evans, New York State Thruway Authority.

CP.** VHF Radio Link from Puerto Rico to the Virgin Islands. R. McSweeny, Mackay Radio and Telegraph Co.

2:00 p.m.—Industrial Control

55-84. An Eddy Current Braking Crane-Hoist Controller with Variable Brake Excitation. H. J. Rathbun, The Electric Controller & Mfg. Co.

55-85. Transient Analysis of a DC Electromagnet with Cut-Out Switch. T. H. Lee, General Electric Co.

CP.** Safety in Industrial Controls. T. C. Beeman and R. J. Kantner, Clark Controller Co.

55-86. An Adjustable Speed Power Selsyn System. S. Y. Merritt, Aluminum Co. of America.

2:00 p.m.—Nucleonics

2:00 p.m.—Computing Devices

CP.** Cyclic Decimal Codes for Analogue to Digital Converters. J. A. O'Brien, Radio Corp. of America.

CP.** Special Purpose Magnetic Core Circuits. R. D. Kodis, Raytheon Manufacturing Co.

CP.** Magnetic Elements in Arithmetic and Control Circuits. I. L. Auerbach and S. B. Disson, Burroughs Corp.

CP.** Junction Transistor Flip-Flop Design Methods for Computer Applications. T. P. Bothwell, Radio Corp. of America.

2:00 p.m.—Transmission and Distribution

CP.** 115 Kv Transmission Conductor Bundling—Pennsylvania Electric Company. P. L. Lumnitzer, Pennsylvania Electric Co.

CP55-153. Joint Testing for High Voltage Transmission Lines. A. S. Runciman, The Shawinigan Water & Power Co.

CP.** Field Treatment of Existing Poles. L. E. Lockwood and J. C. Bice, Commonwealth Edison Co.

CP.** Service Life of Creosoted Pine Poles. J. A. Rawls, Virginia Electric and Power Co.

CP.** The Physical Life of Wood Poles. G. Q. Lumsden, Bell Telephone Labs., Inc.

2:00 p.m.—Measurements

CP55-242. Temperature Errors in a Dragmagnet Eddy-Current Disk Type of Tachometer Indicator. L. T. Akeley and J. J. Fraizer, General Electric Co.

55-150. A New Test Board for Portable Watthour Meter Standards. F. J. Levitsky, New England Power Service Co.

55-211. Rapid Measurement of Impedance and Admittance. B. Salzberg and J. W. Marini, Naval Research Lab.

2:00 p.m.—Synchronous Machines

CP55-129. New Viewpoints on Old Machines. G. A. Bekey and D. L. Trautman, University of California.

55-6. A New Approach to the Calculation of Synchronous Machine Reactances—Part I. M. E. Talaat, Elliott Co.

55-130. Stray Losses in the Armature End Iron of Large Turbine Generators. R. L. Winchester, General Electric Co.

55-131. Improved Field Conductor Materials for Turbine-Generators. C. H. Holley and R. E. Savidge, General Electric Co.

55-132. Rewinding A.C. Generators for Improved Performance. W. G. Seline, The Shawinigan Water and Power Co.

2:00 p.m.—Relays

55-88. Line and Transformer Bank Relaying Systems. J. L. Blackburn and G. D. Rockefeller, Westinghouse Electric Corp.

55-99. Some Utility Ground-Relay Problems. H. C. Barnes, American Gas & Electric Co. and A. J. McConnell, General Electric Co.

55-97. Effect of Shock and Vibration on Relays. Project Committee Report.

55-100. Improved Fast-Acting Thermal Relay and Its Application as a Cage Winding Protective Relay for Synchronous Machines. John Baude, Allis-Chalmers Mfg. Co.

55-93. Bibliography of Relay Literature—1950-1952. E. T. B. Gross, Illinois Institute of Technology. Re-presented for discussion.

2:00 p.m.—Electron Equipment Reliability—II

55-154. Machine Testing for Deviation of Data from a Poisson Distribution. F. A. Hadden, The Rand Corp.

CP.** Complexity and Reliability in Automatic Equipment. Robert Lusser, Redstone Arsenal.

CP.** The Problem of Measurements Errors. R. G. Devine, Eastman Kodak Co.

2:00 p.m.—X-Ray Equipment

CP.** Use of Proportional Counters in X-Ray Diffraction. H. Laird and M. J. Zunick, General Electric Co.

CP.** A.C. X-Ray Tubes. Z. J. Atlee, Dunlee Corp.

CP.** Radiation Gages for Inspection and Control. J. W. Ranftl, General Electric Co.

CP.** A Survey of Industrial X-Ray Apparatus. T. H. Rogers, Machlett Labs.

CP.** Multi-Section High Voltage X-Ray and Electron Beam Vacuum Tubes. G. R. Mahn and M. J. Zunick, General Electric Co.

2:00 p.m.—Semi-Conductor Energy Converters

CP.** Properties of P-N Junctions. W. C. Dunlap, Jr., General Electric Co.

CP.** Solar Batteries. D. M. Chapin, Bell Telephone Labs., Inc.

CP.** Conversion of Nuclear Energy Using P-N Junctions. J. W. Moyer, Knolls Atomic Power Lab.

CP.** Thermoelectric Generators. Maria Telkes, New York University.

55-152. Properties of Silicon Power Rectifiers. E. F. Losco, Westinghouse Electric Corp. Re-presented for discussion.

Edgewater Assembly Plant, Ford Motor Co.

2:00 p.m.—Power Engineering

55-33. Coordination of Hydro and Steam Generation. C. W. Watchorn, Pennsylvania Water and Power Co.

55-183. An Investigation of the Economic Size of Steam-Electric Generating Units. L. K. Kirchmayer, A. G. Mellor, J. F. O'Mara, and J. R. Stevenson, General Electric Co.

55-184. A Look to the Future of Power Transmission in the West. H. D. Hunkins, Bureau of Reclamation. Re-presented for discussion.

Friday, February 4

9:30 a.m.—Physics in the Electrical Engineering Curriculum

CP.** Overall Problem with Special Attention to Pre-college Training. R. Seeger, National Science Foundation.

CP.** Point of View of the Electrical Engineering School, Including Graduate Study. E. Weber, Polytechnic Institute of Brooklyn.

CP.** The Physics Point of View. E. Hutchisson, Case Institute of Technology.

CP.** Physics in Engineering—A Problem in Appraisal. J. D. Ryder, Michigan State College.

9:30 a.m.—Basic Sciences

55-126. Equations for the Inductance and Short-Circuit Forces of Three-Phase Busses Comprised of 120° Angles. J. W. Maier, Bell Aircraft Corp. and T. J. Higgins, University of Wisconsin. Re-presented for discussion.

55-156. Junction Transistors Used as Switches. R. L. Bright, Westinghouse Electric Corp.

55-157. Switching Transistors Used as a Substitute for Mechanical Low-Level Choppers. A. P. Kruper, Westinghouse Electric Corp.

55-8. Theory of Magnetic Cross Valves. W. H. Higa, Jet Propulsion Lab.

9:30 a.m.—Transmission and Distribution

55-19. Power Distribution System Parameters. A. H. Kidder and J. H. Neher, Philadelphia Electric Co.

55-158. Distribution-Substation and Primary-Feeder Planning. W. J. Denton and D. N. Reps, Westinghouse Electric Corp.

55-159. A Method for Determining Economical ACSR Conductor Sizes for Distribution Systems. A. W. Funkhouser and R. P. Huber, Indianapolis Power & Light Co.

55-160. The Use of Probability in the Design and Operation of Secondary Network Systems. N. M. Neagle and D. R. Nelson, General Electric Co.

55-161. Coincident-Outage Probability in Secondary-Network Vaults. D. N. Reps, Westinghouse Electric Corp.

9:30 a.m.—Power Generation

55-162. Production and Installation of Vertical Waterwheel Generators. W. D. Houser, W. Hindle and J. A. Tyerman, Canadian Westinghouse Co., Ltd.

55-163. Mechanical Alignment of Vertical Shaft Hydroelectric Units as Practiced by Tennessee Valley Authority. C. L. Norris, Tennessee Valley Authority.

55-164. Pumped Storage and Hydro Generation at Flatiron Power Plant. S. M. Denton and H. O. Britt, Bureau of Reclamation.

55-28. Principles and Application of the Ultrasonic Flowmeter. R. C. Swengel and S. K. Waldorf, Pennsylvania Water and Power Co., W. B. Hess, Safe Harbor Water Power Corp.

55-165. Development of Small Hydro Electric Sites in Western North Carolina. H. H. Gnuse, Jr., Nantahala Power & Light Co. Re-presented for discussion.

9:30 a.m.—Telegraph Systems

55-166. A Portable Telegraph Bias and Distortion Measuring Instrument. W. D. Cannon, Western Union Telegraph Co.

55-38. A New Telegraph Serviceboard Using Electronic Circuits. J. R. Davey, M. R. Purvis, Bell Telephone Labs., Inc., and F. H. Hanley, American Telephone & Telegraph Co.

55-167. A Fully-Selective Telemetering System Employing Telegraph Facilities. C. W. Smith, American Telephone and Telegraph Co. and M. E. Forrest, Jr., Southern Bell Telephone & Telegraph Co.

55-94. A New Audio Telegraph Carrier Terminal. C. A. Higgins and E. A. Gilbert, Radio Frequency Laboratories, Inc.

9:30 a.m.—Induction Machines

55-133. Vibration in 2-Pole Induction Motors Related to Slip Frequency. E. W. Summers, Westinghouse Electric Corp.

CP55-134. Noise Reduction in Large Rotating Machines. J. M. Shulman, Westinghouse Electric Corp.

CP.** International Motor Standards. C. W. Falls, General Electric Co.

CP55-135. Comments on the NEMA Suggested Standards for Future Design of Integral Horsepower Induction Motors. F. W. Baumann, General Electric Co.

CP.** The "How" and "Why" of the Rerate Program. S. F. Henderson, Westinghouse Electric Corp.

9:30 a.m.—Instrumentation

55-168. A Survey of Non-Contacting Vibration Pickups Using Electric Fields. H. F. Clarke, Boeing Airplane Co.

55-23. A Circuit for Measuring the Resistance of Energized AC Windings. R. E. Seely, General Electric Co.

S-68. A Bibliography on Telemetering. AIEE Group Subcommittee on Telemetering. Re-presented for discussion.

CP.** A Glossary of Some Telemetering Terms. October 1954. Report of the Joint AIEE/IRE Subcommittee on Telemetering Terminology.

55-4. Eddy-Current Mutual-Inductance Transducers with High-Conductivity Reference Plates. H. M. Joseph, ACF Electronics and N. Newman, National Bureau of Standards.

9:30 a.m.—Electronic Circuitry

CP.** A Static-Magnetic Data-Storage Unit. R. H. Fuller, Massachusetts Institute of Technology.

CP.** An Automatic Random Programmer. G. A. Roberts, University of Michigan.

55-197. Cold-Cathode Counting Circuits. H. L. Foote, Stromberg-Carlson Co.

55-7. On the Optimum Design of Cathode Followers. L. M. Vallese, Polytechnic Institute of Brooklyn.

CP.** Stable Transistor Oscillator. E. Keonjian, General Electric Co.

CP55-18. Low Frequency Amplifier Design. S. I. Rambo, Westinghouse Electric Corp.

55-198. Shielding of Communication Cables. F. H. Gooding and H. B. Slade, The Okonite Co. Re-presented for discussion.

2:00 p.m.—Basic Sciences

55-170. Some Properties of Magnetic Fluids. J. E. Coolidge and R. W. Halberg, Borg-Warner Central Research Lab.

55-171. Effects of Transverse Compressional Stress on Magnetic Laminations. R. E. Fischell, Naval Ordnance Lab.

CP55-172. A Simple Electrical Analogy of Heat Transfer. F. L. Putzrath, Radio Corp. of America.

CP.** Accurate Determination of the Capacitance of a Thin Rectangular Plate. D. K. Reitan and T. J. Higgins, University of Wisconsin.

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

55-101. Direct Stroke Protection of High-Voltage Switching Stations and Transformers. S. B. Griscom, J. K. Dillard and A. R. Hileman, Westinghouse Electric Corp.

55-136. Transient Durability Testing of Valve Type Lightning Arresters. J. W. Kalb and A. G. Yost, Ohio Brass Co.

CP.** Surge Attenuation in Power Cables. W. W. Valentine, Potomac Electric Co., J. K. Dillard, J. M. Clayton, Westinghouse Electric Corp.

CP55-137. Analysis of Gradient Data Under Thunder Clouds. J. F. H. Douglas, Marquette University.

2:00 p.m.—Power Generation

55-96. Transfer of Steam-Electric Generating Station Auxiliary Buses. D. G. Lewis and W. D. Marsh, General Electric Co.

CP55-92. Transfer Tests on Station Auxiliary Buses. L. E. Backer, P. Barth, R. A. Huse and D. W. Taylor, Public Service Electric & Gas Co.

55-173. Maximum Short Circuit and Faulty Synchronizing Torques on Generator Foundations. V. W. Ruskin, Canadian-Brazilian Services, Ltd. Represented for discussion.

2:00 p.m.—Telegraph Facsimile Systems

55-174. Textile Automation by Signal Control. Louis Casper, Electrotext Corp.

CP55-175. A Polar Relay Using Momentum Transfer. H. L. Garbarino and K. E. Bisshopp, Armour Research Foundation of Illinois Institute of Technology.

CP.** Electrolytic Recording for Facsimile. J. W. Smith, A. H. Mones and J. V. L. Hogan, Hogan Labs., Inc.

CP.** Times Facsimile Recording Papers. H. R. Dalton and A. G. Cooley, Times Facsimile Corp.

2:00 p.m.—Dielectric Measurements

55-176. Progress in the Evaluation of Solid Core High Voltage Bushings. H. H. Brustle, D. L. Johnston and A. L. Scheideler, General Electric Co.

CP.** Corona Tests in the Field on High Voltage Insulation. F. C. Doble, F. S. Oliver and E. H. Povey, Doble Engineering Co.

CP.** Corona Studies—In Relation to Insulation. T. W. Liao, J. R. Nye, J. G. Anderson and H. H. Brustle, General Electric Co.

CP55-235. Measurement Pitfalls Encountered in D-C Dielectric Testing in the Field. C. W. Ross and E. B. Curdts, James G. Biddle Co.

CP55-236. Report of Dielectric Tests on a Large Hydro Generator. C. A. Duke, Tennessee Valley Authority; C. W. Ross, James G. Biddle Co.; and J. S. Johnson, Westinghouse Electric Corp.

CP55-16. A Versatile High Voltage D-C Insulation Tester. H. T. McLean, General Electric Co.

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

CONTINUED FROM PAGE 2

The 36 acre site of this plant includes the main assembly, steam power plant and oil house.

Westinghouse Television Center, Metuchen, N. J.—(Thursday A.M.)—This modern plant, devoted to fabricating television, radio and high fidelity phonograph sets has 415,000 square feet of manufacturing area. Modern production and manufacturing practices are utilized and every television set travels over 5,000 feet of conveyor system. Quality control is stressed continuously throughout each operation. At the conclusion of the tour there will be a demonstration on color television reception.

Material Laboratory of N. Y. Navy Yard, Brooklyn, N. Y.—(Thursday P.M.)—This trip will include a visit to the sections devoted to cable, instruments, power, a-c and d-c short circuit testing. Equipment used for determining the limits of shear, cold bend, dielectric strength, flame resistance and water tightness of cable will be seen. Test stands and apparatus for life tests of silicone insulated motors, dry rectifiers, carbon brushes and fuses will be shown. The a-c and d-c testing sections include equipment capable of producing 100,000 amperes, three phase at 450 volts as well as the d-c equipment capable of producing 150,000 amperes at 500 volts. U.S. citizens only.

Bell Telephone Laboratories, Murray Hill, N. J.—(Thursday P.M.)—This laboratory is one of the most modern research facilities in the country. The trip will include an inspection of laboratory areas devoted to metals processing, wood preservation, outside plant, microwave transmission and acoustic studies. A series of special displays illustrating a number of the newer developments of the Bell Telephone Laboratories which are contributing to better telephone service will also be shown.

LADIES' ENTERTAINMENT: The committee is arranging an attractive program which includes a "Get Acquainted" Tea on Monday afternoon in Ladies' Headquarters at the Hotel Statler, a dinner and entertainment Tuesday night in the Penn Top, Breakfast at Altman's, Luncheon and Fashion Show in the Jade Room, Waldorf-Astoria on Thursday, tour through United Nations Building, as well as tours of ships. Coffee will be served each morning from 9 to 11 a.m. Registration will open in the Georgian Room on Sunday, January 30 from 2 to 4 p.m., and thereafter each day beginning at 8:30 a.m. in the Ladies' Headquarters.

THEATER TICKETS: As in the past, tickets to the following shows currently playing in New York will be available to AIEE members during the week of the meeting:

	Evenings M,T,W,T	Evenings F,S,	Matinee*
The Boyfriend	8.00	8.00	5.70
Caine Mutiny Court Martial L. Nolan, J. Hodiak, B. Sullivan	5.70	6.60	4.95
Can-Can	8.00	8.00	5.70
Comedy in Music Victor Borge	5.70	6.85	5.15
Fanny Ezio Pinza, Walter Slezak	8.00	8.00	5.70
Kismet Alfred Drake	7.70	7.70	4.95
On Your Toes Vera Zorina, Bobby Van	8.00	8.00	5.70
The Pajama Game J. Raitt, J. Page, E. Foy, Jr.	8.00	8.00	5.70
The Reclining Figure Mike Wallace, Martin Gabel	5.70	6.85	4.55
The Solid Gold Cadillac Loring Smith	5.70	6.85	5.15
The Teahouse of the August Moon David Wayne, John Forsythe	5.70	7.32	5.13
The Wedding Breakfast Lee Grant	5.70	6.85	5.15

*All shows have matinees only on Wednesdays and Saturdays.

All prices shown are brokers' prices.

Checks should be made payable to: "Theater Ticket Committee, AIEE." Requests also should include first and second choice of both name and date of show, and should be sent to: Theater Ticket Committee, AIEE, c/o S. Friend, Jr., 75 Buena Vista Drive, Dobbs Ferry, N. Y.

ETA KAPPA NU AWARD DINNER: The Annual Recognition Award Dinner of the Eta Kappa Nu Association for the Outstanding Young Electrical Engineer of 1954 will be held Monday evening, January 31, 1955 at the Tudor Room of the Henry Hudson Hotel. The Award will be presented to Dr. Ruben F. Mettler of the Hughes Aircraft Company, now temporarily in Washington as Special Consultant to the Secretary of Defense. Honorable Mention citations will be presented to E. E. David, Jr., of the Bell Telephone Laboratories and Lindon E. Saline, L. K. Kirchmayer and J. F. Fuller, all of the General Electric Company.

Winners of the award were selected on their meritorious service in the interest of their fellow men as evidenced not only by outstanding technical achievement but also by their civic and social activities, cultural and aesthetic development and participation in outside activities. Selection was made by a jury consisting of Ralph Bown, Bell Telephone Laboratories, L. R. Gaty, Philadelphia Electric Company, E. M. Strong, Cornell University, G. Edward Pendray, Pendray and Company, E. T. B. Gross, Illinois Institute of Technology, and Reid Warren, University of Pennsylvania.

All AIEE members and guests, including the ladies, are invited to this event. Reservations should be sent to E. F. Schuster, Treasurer, 117-08 109th Avenue, South Ozone Park 20, N.Y., with checks payable to the New York Alumni Chapter, Eta Kappa Nu. Charge will be $5.00 per person.

WINTER GENERAL MEETING COMMITTEE: Members of the 1955 Winter General Meeting Committee are: A. J. Cooper, chairman; D. M. Quick, vice-chairman; J. J. Anderson, secretary; C. S. Purnell, budget co-ordinator; J. P. Neubauer, Vice-President, District 3; J. D. Tebo, chairman, Committee on Technical Operations; R. T. Ferris, public relations; J. R. Kerner, general session; Avery Gould, dinner-dance; W. G. Vieth, hotel accommodations; J. V. O'Connor, inspection trips; Morris Brenner, registration; R. W. Gillette, smoker; R. T. Weil, monitors; S. Friend, Jr., theater and broadcast tickets; Mrs. Merwin Brandon, ladies' committee; C. T. Hatcher, ex-officio member (past chairman).

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