



Winter General Meeting

February 1-6, 1959

NEW YORK, N. Y.

**Headquarters
Hotel Statler**

SCHEDULE OF LOCALLY SPONSORED EVENTS

Sunday—February 1

- 4:00 PM—Informal Tea—Statler-Penn Top
- 4:00 PM—Registration Starts

Monday—February 2

- 2:00 PM—General Session
- 4:00 PM—Ladies Get Acquainted Tea and Fur Fashion Show
- 7:00 PM—ETA KAPPA NU Dinner

Tuesday—February 3

- 7:30 AM—Canadian Breakfast
- 9:00 AM—Radio City Music Hall
- 9:00 AM—United Nations General Assembly
- 9:00 AM—Western Electric Company
- 9:30 AM—Ladies Sightseeing tour of lower Manhattan and luncheon in Chinatown
- 9:45 AM—*New York Times*
- 12:45 PM—Bell Telephone Laboratories
- 1:30 PM—General Motors
- 2:00 PM—Rambusch Decorating Company
- 7:00 PM—Smoker—Hotel Statler
- 7:00 PM—Ladies Dinner

Wednesday—February 4

- 8:00 AM—Leeds & Northrup Company
- 9:00 AM—Ladies United Nations Tour
- 9:30 AM—Underwriters' Laboratories
- 9:45 AM—*New York Times*
- 10:00 AM—International Business Machines Corp.
- 1:00 PM—Abilities Incorporated
- 1:15 PM—Astoria Generating Station, Consolidated Edison Company of N. Y., Inc.
- 2:00 PM—Holophane Light and Vision Institute

Thursday—February 5

- 8:00 AM—Brookhaven National Laboratory, Uptown, N. Y.
- 8:30 AM—Leviton Manufacturing Company, Inc.
- 8:45 AM—Astoria Generating Station, Consolidated Edison Company of N. Y., Inc.
- 9:00 AM—Ladies Breakfast at Altman's Department Store and Millinery Show
- 9:45 AM—*New York Times*
- 12:30 PM—Ladies Luncheon and Fashion Show at Waldorf-Astoria
- 1:00 PM—Steinway & Sons
- 2:00 PM—International Business Machines Corp.
- 7:00 PM—Dinner-Dance—Hotel Statler

Friday—February 6

- 10:00 AM—Ladies Visit to Gompertz to Fur Shop and Luncheon
- 12 noon

The A.I.E.E. Winter General Meeting to be held at the Hotel Statler (Meeting headquarters), the Hotel Sheraton-McAlpin and the Hotel Governor Clinton, New York, N. Y., February 1st to the 6th, 1959 will feature the largest technical program in the history of the Institute. The social activities, for which the Winter General Meeting is well known, will again be outstanding. A group of varied and interesting inspection trips has been arranged, closely allied with the technical sessions.

GENERAL SESSION: The featured speaker at the General Session on Monday afternoon, February 2nd will be James R. Killian, President of the Massachusetts Institute of Technology and Chairman of the President's Science Advisory Committee. During this Session the Institute's medal in electrical engineering education will be presented to Dr. John F. Calvert, Head of the Electrical Engineering Department, University of Pittsburgh. At this time also the Institute's Edison Medal will be awarded (posthumously) to Dr. Charles F. Kettering for inventions and research in the broad fields of engineering and industry. The A.I.E.E. prize paper awards will also be presented at this time. President L. F. Hickernell will open the Session with his report to the members of the Institute.

SPECIAL SESSION: At a Special Session at 1:45 P.M., Wednesday, February 4th, the John Fritz medal will be awarded to Dr. Mervin J. Kelly, President of the Bell Telephone Laboratories, Inc.

REGISTRATION FEES: The Board of Directors have arranged for a special registration fee to be tried out at this meeting for those wishing to attend only a few sessions. A one-day registration fee of \$2.00, for members and non-members alike, will be available on arrival at the Meeting. The full-week registration fee of \$5.00 for members and \$8.00 for non-members will remain unchanged. No advance fee will be accepted for either one-day or full-week registrations.

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, February 1, from 4 to 6 p.m., in the Penn Top 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 on the Hotel Statler mezzanine.

HOTEL RESERVATIONS: With the cancellation of the Fall General Meeting in Pittsburgh a good portion of the program intended for that meeting has been added to that of the Winter General Meeting and, therefore, it is anticipated that the attendance at this meeting will be considerably increased. Therefore, it is particularly important that your hotel reservations are made early.

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 to the hotel of your choice, specifically referring to the AIEE meeting in your letter. Please do not write to more than one hotel. If your request cannot be filled, the hotel will automatically refer your request to the Hotel Accommodations Committee whose duty it is to obtain a similar reservation at another of the convention hotels. The hotel will confirm directly to you. Reservations cannot be guaranteed unless your request is forwarded immediately.

Because of the crowded conditions in New York hotels, it is suggested that your reservation be made for arrival on Sunday, February 1, 1959, thereby avoiding delays in registration or unavailability of rooms in the early morning of subsequent days.

Rooms have been allotted for our use by the following hotels at the daily rates indicated below:

| | |
|--|--------------------|
| HOTEL STATLER (Meeting headquarters)—7th Avenue, 32nd to 33rd Streets | |
| Single Room | \$ 8.00 to \$14.00 |
| Double Room | 11.00 to 18.00 |
| Twin Bedroom | 15.00 to 22.00 |

| | |
|---|--------------------|
| HOTEL SHERATON-McALPIN (also used for meetings)—Broadway and 34th Street | |
| Single Room | \$ 8.00 to \$12.50 |
| Double Room | 11.00 to 15.50 |
| Twin Bedroom | 12.00 to 15.50 |

| | |
|--|--------------------|
| HOTEL NEW YORKER —8th Avenue at 34th Street | |
| Single Room | \$ 8.00 to \$14.50 |
| Double Room | 11.50 to 18.00 |
| Twin Bedroom | 12.00 to 15.50 |

| | |
|---|--------------------|
| HOTEL MARTINIQUE —Broadway and 32nd Street | |
| Single Room | \$ 6.50 to \$11.00 |
| Double Room | 9.50 to 14.50 |
| Twin Bedroom | 9.50 to 14.50 |

| | |
|--|--------------------|
| HOTEL GOVERNOR CLINTON —Seventh Avenue at 31st Street | |
| Single Room | \$ 7.50 to \$12.00 |
| Double Room | 11.00 to 14.00 |
| Twin Bedroom | 12.00 to 17.00 |

HOTEL COMMODORE—Lexington Avenue and 42nd Street
 Single Room \$ 7.00 to \$17.00
 Double Room 13.00 to 19.00
 Twin Bedroom 13.00 to 20.50

HOTEL ROOSEVELT—Madison Avenue and 45th Street
 Single Room \$ 8.50 to \$19.50
 Double Room 13.50 to 23.50
 Twin Bedroom 17.50 to 24.50

All rooms have private bath and the rates quoted are subject to a 5 percent New York City hotel room tax.

SMOKER: A highlight of the Winter General Meeting will be the Smoker to be held Tuesday evening, February 3, 1959. Good food, good fellowship, and top quality entertainment will be the feature of this event which will take place in the Hotel Statler.

Attendance will be limited for the comfort of guests. Ticket requests should be mailed at an early date. The price will be \$11 per ticket and requests should be addressed to "AIEE Smoker Committee," 33 W. 39th St., New York 18, N. Y., accompanied by checks made payable to "Special Account, Secretary, AIEE."

DINNER-DANCE: A Dinner-Dance will be held Thursday evening, February 5, in the Hotel Statler. Dress will be formal. Write soon for reservations for tables for 10. The price this year is \$12.50 per ticket and requests should be sent to "AIEE Dinner-Dance Committee" at 33 West 39th St., New York 18, N. Y., accompanied by checks 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. Because the number of persons who may be accommodated on each of these trips is limited, members who are interested are urged to make arrangements and obtain full details at the Inspection Trips Desk immediately after registering.

Abilities Incorporated, Albertson, N. Y. (Wednesday afternoon): Abilities Incorporated is a unique industry which employs only disabled people, normally lost to industry. Employees include heart cases through the range to quadruple amputees. The guided tour through the facilities will show these employees producing, competitively with other industries, such equipment as electronic printed circuits, coils, harnesses, and small mechanical assemblies. Equipment has been improved to permit most of the plant operations in a sedentary position. Abilities is a pioneer facility demonstrating to industry that the disabled can work competitively with others.

Bell Telephone Laboratories, Murray Hill, N. J. (Tuesday afternoon): The group will assemble in the Arnold Auditorium at 2 p.m. There will be a talk by A. R. Brooks, Publication Manager, New Jersey Operations to describe the Laboratories, their place in the Bell System and their method of operation in development and research fields. Following this, there will be a lecture on solid-state devices and their operation.

Groups will visit a cross-section of different laboratories, to present a broad picture of the scope of scientific fields covered by the Bell Telephone Laboratories.

Bus leaves Statler 12:45 p.m., returns 5:15 p.m. Reservation \$2.

Brookhaven National Laboratory, Uptown, N. Y. (all day Thursday): The facilities at this location are operated by Associated Universities, Incorporated, 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. Important exhibits which our members will see are the atomic pile, hot laboratory and cosmotron. A complete tour has been arranged and competent guides, engineers and scientists will be on hand to explain fully the extensive facilities and exhibits which have been erected at this most vast site.

Bus leaves Statler 8 a.m., returns 5:30 p.m. Reservations \$5.25, includes bus fare and lunch.

Astoria Generating Station, Consolidated Edison Company of New York, Inc., New York, N. Y. (Wednesday afternoon, Thursday morning and afternoon): Astoria station, newest and most efficient of Con Edison's nine steam-electric generating plants, is on the tidal East River in the Borough of Queens.

Ground was broken for the station in May 1951 at the height of the Korean War. Of the six generating units called for by its ultimate design, three are now in operation. Two of these are of 180 megawatt capacity (October 1953, March 1954) and the third (September 1958) has a nameplate rating of 335 megawatts. Foundation work has begun for a fourth unit of 340 megawatts which is tentatively scheduled for completion in 1961.

Astoria is equipped to burn coal, oil or natural gas. Of particular interest are the damper and nozzle arrangements to compensate for the station's relatively short stacks (because of nearby LaGuardia Airport) and the three-section DeLong prefabricated coal dock.

The electric station is part of a 312-acre complex of utility facilities which includes a major distribution point for natural gas from the Gulf Coast used by Con Edison and other gas utilities in the metropolitan area, extensive standby and peakload gas manufacturing facilities, the North Queens bulk-power electric switching station, a fuel oil tank farm and Con Edison's famous two-million ton capacity coal storage yard.

General Motors, Linden, N. J. (Tuesday afternoon): Here, at its Linden Plant, General Motors assembles Buick, Oldsmobile and Pontiac automobiles. On a two shift operation, this plant turns out approximately 154,000 cars per year, employing an average of 4,500 men and women. Payroll, service and material purchase from local suppliers, amount to approximately thirty million dollars a year. An average of 1,200 freight cars of material are received each month.

One of seven similar units of GM's Buick-Oldsmobile-Pontiac Assembly Division, this plant officially began production in April, 1937. During World War II, it produced fighter airplanes for the U. S. Navy.

The five main structures—manufacturing, administration, personnel and cushion buildings and the power house—enclose almost 1,375,000 square feet of floor space. The plant occupies a site of more than 85 acres on U. S. Highway No. 1.

This is an assembly point—not a fabricating plant. Here, the thousands of parts, metal stampings, and sub-assemblies manufactured in other GM and independent plants are brought together—each at exactly the right time and place on the assembly line—to produce nearly 40 different automobile models. These parts converge on Linden, not to be stockpiled for future use but, in many cases, to be moved directly from freight car to assembly line.

The Holophane Light and Vision Institute, New York, N. Y. (Wednesday afternoon): This trip offers visitors unusual insight into the science and art of lighting through the use of unique visual displays and demonstrations administered by a staff of competent engineers. Principles underlying quantity and quality of lighting, glare, color and many other interesting topics are effectively explained by means of visual models. Refreshments will be served.

International Business Machines Corp., New York, N. Y. (Wednesday morning and Thursday afternoon): IBM will demonstrate their type 705 electronic data processing machine and type 305 ramac with a unique disk memory. Also there will be a film and discussion on the recently announced transistorized 7070 computer.

Leeds & Northrup Company, North Wales, Pennsylvania (all day Wednesday): The newest L & N Plant, at North Wales, known as the "World's Most Modern Instrument Plant," manufactures various automatic instruments and controls, such as Speedomax Recorders and Recorder-Controllers, L&N Load-Frequency Controllers, Metermax Combustion Control, and Electromax Controllers which are ultimately used in power and switching stations, open-hearth furnaces, the metal working fields, atomic reactor installations, aircraft industries and others. The visitor will see the manufacture of many small parts and tools as well as the final assembly of units and the units into panels and consoles.

Bus leaves Statler 8 a.m., returns 5:30 p.m. Reservations \$3.50.

Leviton Manufacturing Company, Inc., Brooklyn, N. Y. (Thursday morning): This company manufactures a complete line of wiring devices, cable and fixtures. All component parts are made in the one plant, except wire and cable. A small testing laboratory is also on the premises.

New York Times, New York City, N. Y. (Tuesday, Wednesday and Thursday mornings): Visit, in midtown Manhattan, the home of what is probably the most widely read newspaper in the world, *The New York Times*. View the various devices in the communications room of the *Times* that make it possible to have news transmitted from all over the world. See how the news is edited as well as the mechanical operations that are required before the finished paper is put on the street.

In the composing room typesetting machines are used to get the copy in a form necessary to create a "mat" which will be sent to the pressroom. The automatic plate casting machines as well as the presses themselves are found in the stereotype department. The presses at *The New York Times* can print 375,000-48-page papers in an hour.

Radio City Music Hall, New York, N. Y. (Tuesday morning): 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

Continued on page 15

ADVANCED COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 40¢ each (80¢ 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 \$10 denominations are available to those who wish to avoid remittance, by check or otherwise. The Transactions Papers will also be published in the bimonthly publications.

Note: Unnumbered Conference Papers (CP.*) may be available at or after the meeting, if copies are provided by the author. They are not intended for publication in the Transactions and are not presently scheduled for reproduction in any form by the Institute.

Note: The TRANSACTIONS papers will be printed in the bimonthly publications as follows:

- I COMMUNICATION AND ELECTRONICS.
- II APPLICATIONS AND INDUSTRY.
- III POWER APPARATUS AND SYSTEMS.

Monday, February 2

10:00 a.m.—Industrial Mercury-Arc and Semiconductor Power Rectifiers

- CP.* Magnetic Amplifier Controlled Silicon Rectifier Motor Drives. W. W. Litfin, General Electric Co.
- CP.* Tests on a Main Mill Drive Ignitron Rectifier Power Supply. W. R. Hodgson, Westinghouse Electric Co.
- CP59-237. Silicon Rectifier Application to Low Voltage Electrolytic Processing. R. C. Scott, Canadian Westinghouse Co., Ltd.
- CP.* Medium-Power Silicon Rectifiers for General Industrial Power Supply. D. W. Borst and L. W. Burton, General Electric Co.

10:00 a.m.—Transmission and Distribution

- 59-34. An Economic Study of D-C Versus A-C Overhead Transmission. A. J. Wood, S. B. Cray and C. Concordia, General Electric Co.
- 59-108. Progress in Extra-High Voltage Power Transmission. P. A. Abetti and S. B. Cray, General Electric Co.
- 59-66. Work Done in the Soviet Union on High-Voltage Long Distance D-C Power Transmission. A. M. Nekrasov, Ministry of Power Stations of the U.S.S.R. and A. V. Posse, Scientific Research Institute of Direct Current, U.S.S.R. (Re-presented for Discussion only)
- 59-4. Insulation Requirements of High-Voltage Transmission Lines for 115 kv to 460/500 kv. P. L. Bellaschi, Portland, Oregon.
- CP58-1256. Application of Electronic Computers to Structural Design of Transmission Towers. A. M. Lount, A. M. Lount and Associates.

10:00 a.m.—Transformers

- 59-243. Automatic Ratio Control Transformer and Regulator. J. S. Masbury, Wagner Electric Corp.
- 59-65. Static Relay Control for Three Phase Step Regulators. C. J. Kettler and R. L. Elliott, General Electric Co.
- 59-56. The Calculation and Measurement of Axial Electromagnetic Forces on Concentric Coils in Transformers. M. F. Beavers and C. M. Adams, General Electric Co.
- 59-72. Phasor Power Method of Determining Transformer Sequence Impedances. B. A. Cogbill, General Electric Co.

10:00 a.m.—Rotating Machinery

- 58-1218. Proposed Test Procedure for Noise Measurements on Rotating Electric Machinery. A Committee Report, C. G. Veinott, Chairman.
- 58-1179. How to Specify the Noise Rating of Large Electric Rotating Machines. M. E. Talatt, Elliott Company.
- CP58-1290. Effect of Air Gap Eccentricity on Motor Sound Level. J. J. Courtin, Westinghouse Electric Corp.
- 58-849. Sources of Electromagnetic Vibration in Single-Phase Induction Motors. L. W. Magyar. (Re-presented for Discussion only)
- 58-1320. Torque and Speed Control of Induction Motors Using Saturable Reactors. J. E. Szablya, University of British Columbia.

10:00 a.m.—Computers in Control Systems

- CP58-1182. Progress in Sampled-Data Systems. E. I. Jury, University of California.
- CP.* Survey of Sampled-Data Systems Analysis. J. V. Howell, Packard Bell Computer Corp.
- 59-52. The Stability and Compensation of Saturating Sampled-Data Systems. F. J. Mullin, California Institute of Technology.
- 58-1291. A General Approach for Obtaining Transient Response by the Use of a Digital Computer. P. E. Lego, Westinghouse Electric Corp. and T. W. Sze, University of Pittsburgh.

10:00 a.m.—Comparison of Electron Tubes With Semi-Conductor Devices

- CP.* Survey of the Relative Status of Solid State Devices and Tubes With Respect to Applications in Army Equipments. K. Garoff and D. P. Salvano, U.S. Army Signal Research and Development Lab.
- CP.* Shall An Electron Tube or a Semi-conductor Device Be Used? E. E. Scheneman and S. K. Waldorf, Westinghouse Electric Corp.
- CP.* Tubes versus Transistors—A Realistic Assessment. R. E. Moe, General Electric Co.
- CP.* Transistors and Tubes in Telecommunications. B. T. Howard, Bell Telephone Labs.

10:00 a.m.—Russian Education and Technology

- CP.* My Experience in the Soviet Educational System. V. Rudolph, New York City (J. A. Strelzoff, Interpreter)
- CP.* A Survey of Russian Education. W. W. Brickman, New York University.
- CP.* Russian Technology—Computers and Information. R. K. Honaman, Bell Laboratories.
- CP.* Russian Technology—Solid State and Transistors. W. C. Dunlap, Raytheon Mfg. Corp.
- CP.* Russian Technology—High-Voltage A.C. and D.C. Power Transmission. P. A. Abetti, General Electric Co. Panel discussion led by E. A. Walker, Pennsylvania State Univ.

10:00 a.m.—Electric Heating

- 59-31. Control of Infrared Radiation. I. J. Barber, The Fostoria Pressed Steel Corp.
- 59-77. Some Unusual Designs of Electrical Resistance Heating. L. P. Hynes, Haddonfield, N. J.
- 59-30. Rapid Heating of Dielectric Materials at 915 MC. G. E. Feiker and N. C. Gittinger, General Electric Co.
- 59-64. Electric and Magnetic Conditions Inside an Induction Heated Workpiece. C. A. Tudbury, New Rochelle Tool Corp.
- CP59-256. Three Phase Induction Heating Coils, N. V. Ross, Magnethermic Corp.

10:00 a.m.—Management

- CP.* Planning For Methods Improvement. G. A. Antonette, Detroit Edison Co.
- CP.* Work Measurement For The Engineer and For Management. J. F. McQuillin, West Penn Power Co.
- CP58-1031. Managing Research Laboratories. T. M. Linville, General Electric Co.
- CP.* Criteria For The Selection Of Engineers For Employment. L. H. Noggle, Westinghouse Electric Corp.

10:00 a.m.—Cathodic Protection

- CP.* The Effect of Electrical Grounding Systems on Underground Corrosion and Cathodic Protection. B. Husock, Harco Corp.
- CP.* Trends in Ground Bed Design for Cathodic Protection of Underground Structures. A. P. Landry and I. N. Howell, Jr., Southern Bell Telephone and Telegraph Co.
- CP.* Cathodic Protection Applications at the Hanford Works. C. S. Bucholz, General Electric Co.

10:00 a.m.—Modern Circuit Techniques I

- CP59-260. Transistor External Parameters. A. V. J. Martin, Carnegie Inst. of Technology and H. Schreiber, Paris University.
- CP.* Considerations for the Design of High-Gain, Low-Drift, Transistor Direct-Coupled Amplifiers. J. Kline, University of Rhode Island.
- CP.* A Low-Level Application of the Drift-Transistor. J. A. Forbes, Minneapolis-Honeywell Regulator Co.

- CP.* A Transistor Trigger Circuit Exhibiting An Accurately Defined Triggering Threshold. F. S. Goulding and L. B. Robinson, Atomic Energy of Canada, Ltd.
- CP59-257. A Proportional Transistor Switching Circuit. A. N. DeSautels, Minneapolis-Honeywell Regulator Co.

10:00 a.m.—Educational T.V.

- 59-194. A Design for Using Closed-Circuit Television in Education. I F. E. Almstead, New York State Education Dept.
- 59-229. A Talk-Back System for Educational Television. R. C. Norton, and J. B. Davidson, New York Telephone Co.
- CP59-200. A Transmission Design For Closed Circuit Educational Television. W. L. Wall, New York Telephone Co.
- CP.* Progress in Educational Television. C. M. Braum, Joint Council on Educational T.V.

10:00 a.m.—Data Communication

- 58-1181. Optimum Block Length for Data Transmission With Error Checking. F. B. Wood International Business Machines Corp.
- 58-300. Synchronized Clocks for Data Transmission. J. O. Edson, M. A. Flavin and A. D. Perry, Bell Telephone Laboratories (Re-presented for discussion only)
- CP.* Sync Recovery for Data Transmission. F. H. Shepard, Jr.

10:00 a.m.—Radio Communication Systems

- CP.* ABC's of PCM. J. Cohn, Motorola.
- CP.* UHF Exciter for Single Sideband. S. Kitces, Westinghouse Electric Corp.
- CP.* Automatic VHF Telecommunications for Oil Operations in Central Sumatra. V. J. Nexon, MSI Communications Consulting Engineers.
- 59-61. Synchronous Methods of Operation for Private Telegraph Networks. B. S. Diamond, Madison, N. J.
- 58-989. Systems Engineering of Personal Radio Signaling System. I W. Strack, Bell Tel. Labs. (Re-presented for Discussion only)

10:00 a.m.—Nuclear Power Plants—I

- 58-1199. Electrical and Control Features of the Shippingport Atomic III Power Station. H. G. Frus, H. A. Thompson, H. A. Van Wasen and E. J. Woolever, Duquesne Light Co.
- CP.* Operating Experience on Vallecitos Boiling Water Reactor. L. Kornblith, General Electric Co. and W. Raymond, Pacific Gas and Electric Co.
- 58-1273. Performance of the Sodium Reactor Experiment. J. E. I Owens, W. T. Morgan and L. E. Glasgow, Atomics International.
- CP.* Design Problems and Operating Experience on the APPR-1. K. Kasschau, ALCO Products, Inc.
- 58-1272. Organic Moderated Reactors for Central Station Power. II W. E. Parkins and E. F. Weisner, Atomics International.

10:00 a.m.—Electronics Transformers—I

- CP59-146. Active Network Equivalent Circuits for the Transformer. J. R. Alder, University of California.
- CP59-9. Small Current-Limiting Power Transformers. H. L. Garbarino, Armour Research Foundation and L. J. Stratton, Jack and Heintz, Inc.
- 59-148. Design of a Vertical Magnetic Recording Head With Large I Scale Models. J. T. Smith, IBM Corp.

10:00 a.m.—Rotating Machinery

- CP.* Basic Considerations for Ratings and Performance of Eddy Current Couplings. W. J. Cheronis, Harnischfeger Corp. and E. H. Frederick, Warner Electric Brake and Clutch Co.
- CP59-123. Performance of Electrically Operated Magnetic Particle Couplings. J. S. Barrett, Vickers Inc.
- CP.* Performance of Disc Type Friction Clutches in Oil. W. C. Pierce, Warner Electric Brake & Clutch Co.
- 58-1158. Polyphase Induction Motors With Unbalanced Rotor Connections. B. N. Garaduchar and N. L. Schmitz, University of Wisconsin.

2:00 p.m.—General Session

Presiding: Prof. R. T. Weil, Jr., General Chairman.
Address: President L. F. Hickernell.
Presentation of the Institute Prize Paper Awards.

Presentation of the Medal in Electrical Engineering Education to Dr. John F. Calvert.

Presentation of the Alfred Noble Prize Paper Award to Ghaffar Farman-Farmaian.

Presentation (posthumously) of the Edison Medal to Dr. Charles F. Kettering.

Report of the Nominating Committee.

Address: J. R. Killian, Chairman of the Corporation, MIT and Chairman of the President's Science Advisory Committee.

Tuesday, February 3

9:00 a.m.—Symposium on Conductor Vibration

- 59-105. A Mobile Vibration Laboratory Unit for Monitoring Dynamic III Characteristics of Overhead Transmission Lines—Dynalab. J. R. Ruhlman, J. C. Poffenberger and S. Grosshandler, Preformed Line Products Co.
- 59-209. Progress Towards Optimum Damping of Transmission Conductors. III J. E. Sproule and A. T. Edwards, Hydro-Electric Power Commission of Ontario.
- CP59-178. Improved Systems for Recording Conductor Vibration. C. B. Rawlins and J. R. Harvey, Aluminum Company of America.
- 59-208. Aeolian Vibration Tests on the 345 KV Muskingum-Tidd Line. III E. S. Zoble, American Electric Power Service Corp.; A. N. Shealy and F. W. DeMoney, Kaiser Aluminum and Chemical Corp.; R. R. Ruegamer, University of Wisconsin.
- 59-90. Automatic Electronic Control of Vibration Tests. R. A. III Schomburg, The Martin Co. and F. J. Trebby, Kaiser Aluminum and Chemical Corp.
- 59-96. Transmission Conductor Vibration Tests. M. B. Elton, III Bonneville Power Administration. A. R. Hard, Washington State College; A. N. Shealy, Kaiser Aluminum and Chemical Corp.

9:00 a.m.—Transformers

- 59-35. Equivalent Circuits for Overcurrent Calculations of Current III Transformers. E. E. Conner and T. R. Specht, Westinghouse Electric Corp.
- CP-59-242. The Presentation of Transformer Theory. T. H. Barton, McGill University.
- 58-936. Natural Frequencies in Power Transformer Windings. I. J. III hansen, Massachusetts Institute of Technology.
- 58-1325. Computers Change Transformer Design Philosophy. H. J. III Weber and G. Gallousis, Allis-Chalmers Mfg. Co.

9:00 a.m.—Rotating Machinery

- CP59-131. Synthesis of Induction Motor Designs on a Digital Computer. C. G. Veinott, Reliance Electric and Engineering Co.
- 59-57. Optimum Machine Design by Digital Computer. C. L. God- III win, Westinghouse Electric Corp.
- CP59-133. Motor Speed-Torque Curves by Digital Computers. J. M. Shulman, Westinghouse Electric Corp.

9:00 a.m.—Case Histories of Computers in Automatic Control

- CP59-230. The Closed-Loop Concept of Real Time Flight Analysis. G. Hintze, White Sands Missile Range.
- CP.* Heat Rate Computer Involving Digital and Analog Multiplexing Controls. G. Jacobi, General Electric Co.
- CP.* Application of Logic Techniques to a Steel Mill. W. D. Rowe, Westinghouse Electric Corp.
- CP.* Computer Control of a Butane Isomerization Process. T. Scout, Ramo Woolridge Corp.

9:00 a.m.—Electrical Insulation

- CP.* High Temperature Radiation Resistance of Several Silicon Insulation Systems. C. G. Currin and F. A. Smith, Dow Corning Corp.
- CP59-134. The Effects of Nuclear Radiation on the Dielectric Strength of Air. J. C. Fraser, B. Valachovic and G. I. Duncan, General Electric Co.

- CP.* The Interconversion of Radiological Units. C. H. Cheek, Naval Research Lab.

- 59-117. Effects of Gamma Radiation at 25C on Silicone Dielectrics. I C. G. Currin, Dow Corning Corp. (Re-presented for Discussion only)

- 58-878. Effects of Neutron and Gamma-Ray Irradiation on the Dielectric Constant and Loss Tangent of Some Plastic Materials. III R. A. Weeks, D. Binder, Oak Ridge National Lab. (Re-presented for Discussion only)

9:00 a.m.—Electronics Transformers—II

- CP59-119. Specifying a Pulse Transformer for Computer Use. R. R. Blessing, International Business Machines Corp.
- CP59-120. Electronics Transformer Design by Digital Computers. L. F. Deise, W. Etchison and R. Lee, Westinghouse Electric Corp.
- CP.* Design of Electronic Power Transformers by Digital Computers. G. Walters, General Electric Co.
- 59-48. Digital Computer Design of Pulse Transformers. P. E. Lego, I R. L. Greene and J. M. Banic, Westinghouse Electric Corp.

9:00 a.m.—Power Sources for Satellites

- CP.* New Developments in Solar Batteries. M. Wolf, Hoffman Semiconductor Div.
- CP.* Fuel Cells. D. Douglas, General Electric Labs.
- CP.* Considerations Concerning Power Sources for Satellites. J. Leisenring, General Electric Co.
- CP.* Parameter Measurements for Thermoelectric Generators. C. S. Duncan and S. J. Angello, Westinghouse Research Laboratories.

9:00 a.m.—Industrial & Commercial Power Systems

- The price of S-108 is \$1.00 per copy.*
- S-108. Electrical Safety—Everybody's Problem. J. W. St. Andre, Kaiser Aluminum and Chemical Corp.
- S-108. Designing Industrial Electric Systems for Safety. R. H. Kaufman, General Electric Co.
- S-108. Designing Industrial Power Distribution Equipment With Safety In Mind. P. L. Camp, I-T-E Circuit Breaker.
- S-108. Lockout and Tag Procedure In An Industrial Plant Power System. C. E. Wilson of Bethlehem Steel Co.
- S-108. Safety Precautions On A Plant Electrical System. W. H. Brady, E. I. DuPont De Nemours and Co., Inc.

9:00 a.m.—Recognition in a Profession

- CP.* Professional Registration. N. L. Freeman, N. Y. State Education Dept.
- CP.* Engineering as a Profession. J. T. Tinnelly, St. John's Univ.

9:00 a.m.—Data Communications

- 58-1240. Assessment of Effects of Delay Distortion in Data Systems. I A. D. Fowler and R. A. Gibby, Bell Telephone Labs.
- 58-1241. Measurement of Narrow Band Noise on Telephone Facilities in Connection With Analog Data. J. O. Edson, F. E. Froelich and R. K. Townley, Bell Telephone Labs.
- 59-107. Application of Telegraph Techniques in Data Transmission. I A. Boggs and J. E. Boughtwood, Western Union Tel. Co.
- 58-1204. An FM Digital Subset for Data Transmission. L. A. Weber, I Bell Telephone Labs. (Re-presented for Discussion only)

9:00 a.m.—Radio Communications

- 59-86. Tests Conducted Over High Reflective Terrain At 4,000, 6,000 and 11,000 Megacycles. A. G. Oxehufwud, American Tel. & Tel. Co.
- 58-1236. Radio Attenuation at 11 KMC and Some Implications Affecting Relay System Engineering. S. D. Hathaway and H. W. Evans, Bell Telephone Labs.
- 59-6. The CCITT Multichannel Radio Relays and White Noise. I C. A. Parry, Page Communications Engineers, Inc.
- 59-87. The Design of the Corner Reflector Antenna. H. P. Neff, Jr. and J. D. Tillman, University of Tennessee.
- CP59-88. The MLD-4 Microwave Relay System. J. J. Lenehan, The Western Union Telegraph Co.

9:00 a.m.—Symposium on Today's Application Considerations—Mercury, Mechanical And Semi-Conductor Power Rectifiers

R. N. Wagner, Chairman.

9:00 a.m.—Travelling Waves Tube Development

- CP.* Periodically Focused Travelling-Wave Tubes for Operation Under Extreme Environmental Conditions. E. E. Bliss,
- CP.* Design for Travelling-Wave Tubes for Airborne Applications. M. Nowogrodzki,
- CP.* A New Backward Wave Oscillator for the 4 to 5 Millimeter Region. J. A. Noland and L. D. Cohen, Sylvania Electric Products, Inc.
- CP.* The RCA-7111—A Very High-Performance Tunable Magnetron. V. J. Stein
- CP.* Long-Life Characteristics of Travelling-Wave Tubes and Magnetrons. E. W. Kinaman and R. W. Kissinger.

9:00 a.m.—Nuclear Power Plants—II

- 58-1289. Electrical Features of the Yankee Atomic Electric Plant. III E. T. Witt, Stone and Webster; C. F. Obermesser, Westinghouse Electric Corp.; R. E. Minkwitz, New England Power Service Co.
- 58-1194. Electrical Features of Indian Point Nuclear Electric Generating Station. T. D. Reimers, Consolidated Edison Co. of N. Y., Inc.
- 58-1219. A Look at the Electrical Features—Dresden Nuclear Power III Station. W. J. Shewski, Commonwealth Edison Co.
- CP.* A Single Region Slurry Homogeneous Reactor—Pennsylvania Advanced Reactor Project—Design and Maintenance. S. C. Townsend, Pennsylvania Power and Light Co.; W. E. Johnson and D. H. Fax, Westinghouse Electric Corp.

9:00 a.m.—Taso Report and Stereo Hi-Fi

- CP.* Taso Report by Dr. Town, Iowa State College.
- CP.* The Development of a High Quality Stereophonic Pickup. W. O. Stanton, Pickering & Co. (Stereophonic Demonstration).
- CP.* Ampex Demonstration. J. Miller, Ampex Corp.
- CP.* The Design of a Mechanism to Handle Magnetic Tape in a Cartridge. A. D. Burt and D. R. Andrews, Radio Corp. of America (Stereophonic Demonstration).

9:00 a.m.—Modern Circuit Techniques—II

- CP.* Thyristor Monostable Rectangular and Sawtooth Pulse Generators. R. W. Ahrons and C. A. Von Urff, Radio Corp. of America.
- CP.* High Capacity Reversible Magnetic Counter For Real Time Systems. E. A. Fisch, B. Silverman and E. P. Stabler, General Electric Co.
- CP.* Design and Analysis of the Bi-Logical Computer Element. A. Lemack, Sylvania Electric Products, Inc.
- CP.* On the Design of Fractional Microsecond Magnetic Memories. J. E. Thomas, Sylvania Electronic Systems.
- CP.* Time-Base Computation Techniques. H. W. Abbott and V. P. Mathis, General Electric Co.

9:30 a.m.—Section Representatives Conference

2:00 p.m.—Symposium on Wood vs. Steel for EHV Transmission Lines

- CP.* Composite Poles for Extra High Voltage Wood Structures. W. A. Schultz and J. E. McKinster, Public Service Co. of Indiana, Inc.; L. T. Williams, Southwestern Electric Power Co.
- CP.* Wood Structures for 345 kv Transmission Construction. R. J. Yerck, Hughes Bros., Inc.
- CP.* The Use of Wood for 345 kv Transmission Construction. L. H. J. Cook, The British Columbia Electric Co., Ltd.
- 59-67. The British Columbia Electric Company's 360 kv and 230 kv III Transmission Line Designs. L. H. J. Cook, The British Columbia Electric Co., Ltd.

- CP.* The Place of Steel and Wood for High Voltage Transmission Lines. A. V. Price, Ebasco Services, Inc.
- 59-106. Steel Towers for the Extra-High Voltage System of the Bonneville Power Administration. F. W. Farr, Bonneville Power Administration.

2:00 p.m.—Transformers

- CP.* Accelerated Aging Characteristics of Formex and Paper-Insulated Wire in Transformer Oil. M. F. Beavers, H. H. Brustle, I. H. Carpenter and W. J. Degnan, General Electric Co.
- CP.* Report on Test Procedures for Thermal Evaluation of Oil-Immersed Transformers. AIEE Sub-Group on Thermal Evaluation of Oil-Immersed Transformers of the Insulation Life Committee of AIEE Transformer Committee. A. M. Lockie—Chairman.
- 59-43. Inner Cooled Shell Form Power Transformers. W. D. Albright and H. R. Moore, Westinghouse Electric Corp.
- 58-1150. The Relationship Between Operating Voltage and the Standard Dielectric Tests for Power and Distribution Transformers. AIEE Committee Report H. H. Wagner, Chairman.

2:00 p.m.—Rotating Machinery

- 59-122. The Application of Digital Computers to Rotating Machine Design. G. W. Herzog, O. W. Andersen, J. Scrimgeour and W. S. Chow, Canadian General Electric Co., Ltd.
- 59-54. The Analysis of Sudden-Short-Circuit Oscillograms of Steam Turbine Generators. D. Harrington and J. I. Whittlesey, General Electric Co.
- 59-40. Theory of End-Winding Leakage Reactance. V. B. Honsinger, Allis-Chalmers Mfg. Co.
- 59-39. Measurement of End-Winding Leakage Reactance. V. B. Honsinger, Allis-Chalmers Mfg. Co.
- 59-11. Constant Excitation Current-Locus Diagrams of Saturated Salient-Pole Synchronous Machines. S. A. Nasar, Ahsanullah Engineering College.

2:00 p.m.—Adaptive Control Systems

- CP.* Use of Mathematical Error Criteria in the Design of Adaptive Control Systems.
- CP.* Control by Stochastic Adjustment. J. E. Bertram, International Business Machines Corp.
- CP.* Control By Stochastic Adjustment. J. E. Bertram, IBM Corp.
- CP.* Is This An Adaptive System? G. F. Franklin, Stanford University.
- CP.* Executive-Controlled Adaptive Systems. R. Staffin, Polytechnic Institute of Brooklyn.

2:00 p.m.—Electrical Insulation

- 58-1239. Electric Breakdown of Gases and Vapors of Chlorofluorohydrocarbons. C. N. Works and E. W. Lindsay, Westinghouse Electric Corp.
- 59-114. Experience with the AIEE Subcommittee Test for Gaseous Insulation. M. L. Manning, McGraw Edison Co. (Re-presented for Discussion only).
- 59-74. Factors Controlling Electric Strength of Gaseous Insulation. I. P. Narbut, D. Berg, C. N. Works, and T. W. Dakin, Westinghouse Electric Corp.
- CP59-258. The Solubility of SF₆, C₂F₆, and N₂ in Transformer Oil. N. Vanderkooi, Allied Chemical Corp.
- CP.* Applications and Research Progress in Gaseous Dielectrics. T. W. Liao, H. G. Pfeiffer and R. E. Plump, General Electric Co.
- CP.* Arc Recovery Strength of Gases At High Current. G. A. Farrell and J. D. Cobine, General Electric Co.

2:00 p.m.—New Electron Tube Developments

- CP.* Development of Switch Tubes for Controlled Fusion Research. D. B. Cummings, University of California.
- CP.* The Effects of Bulb Temperature and Filament Voltage Variations on Subminiature Tube Life. M. W. Edwards, General Electric Co.
- CP.* The Development of a Front-End Tube for Reduced Cross-modulation and Noise. A. A. Jalajas and K. W. Uhler, Radio Corp. of America.

- CP.* A Frame-Grid Audio Pentode for Stereo Output. J. L. McKain and R. E. Schwab, Sylvania Electronic Tubes.

2:00 p.m.—Solid State Devices

- CP.* A Fast Thermoelectric Measuring Device. P. Klein, General Electric Co.
- CP.* Parametric Devices—Solid State Breaks the Microwave Barrier. W. R. Beam, Radio Corp. of America.
- 59-69. Remotely Controlled Electroluminescent Totaling Display. I. R. C. Lyman, C. I. Jones and A. Leger, Westinghouse Electric Corp.
- CP.* Exact and Approximate Methods for Calculating Thermoelectric Efficiencies. B. Sherman, R. R. Heikes and R. W. Ure, Westinghouse Research Laboratories.

2:00 p.m.—Industrial and Commercial Power Systems

- CP59-7. Electrical Maintenance of a Large Chemical Plant. W. A. Reece, The Dow Chemical Co.
- CP59-244. Education and Maintenance in the Operation of Industrial Power Systems. W. A. Weddendorf, Mutual Boiler & Machinery Insurance Co.
- CP59-19. Preventive Maintenance on Industrial Switchgear, Transformers and Cables. D. B. Kiefer, Bakelite Co.
- CP.* Designing and Selling to Management a Power Distribution System With Maintenance In Mind. R. Felch, Owens-Corning Fiberglass Corp.
- CP.* Role of Modern Switchgear in Preventing and Coping With Operating Emergencies. W. P. Burt and W. A. Fleishili, General Electric Co.

2:00 p.m.—Recording and Controlling Instrumentation

- CP59-156. Interchangeable Errors in Instrument Systems. G. M. Anderson, Thomas A. Edison Industries.
- CP59-160. A Transistor Oscillator Limit Switch for Indicating and Recording Instruments. J. T. Wintermute and S. G. Hayter, Westinghouse Electric Corp.
- 59-157. A Magnetic Amplifier Flow Controller. H. E. Darling, The Foxboro Company.

2:00 p.m.—Section Representatives Conference

2:00 p.m.—Chemical Industry

- CP.* Recharge Characteristics of Lead Acid Batteries. R. C. Shair, Bell Telephone Labs., Inc.
- CP.* Storage Batteries; Farads, Milliohms and Microhenries. E. Willihnganz, C. & D. Batteries, Inc.

2:00 p.m.—Modern Circuit Techniques—III

- CP.* Circuit Reliability Versus System Reliability in Transistor Switching Circuits—A Survey. J. J. Suran, General Electric Co.
- CP59-261. Back-Transient Diode Logic. G. Wolff, Univ. of Denver.
- CP.* Controlled-Current Transistor Logic. E. Powers & M. Rubinnoff, Philco Corp.
- CP.* SCTL—A Reliable Version of Transistor Logic Circuitry. W. E. Slusher and R. L. Jones, Transatron Electronic Corp.
- CP.* Complementary Transistor Resistor Logic. G. D. Bruce and M. J. Flynn, International Business Machines Corp.
- CP.* Fundamental Considerations Of Power Dissipation Limits In Transistor Pulse Circuits. H. Raillard, General Electric Co.

2:00 p.m.—Nuclear Power Plants—III

- 58-531. Electrical Engineering Aspects of the Enrico Fermi Atomic Power Plant. R. H. Logue, Power Reactor Development Co. (Re-presented for Discussion only)
- CP.* Horizontal Pressure Tube Nuclear Reactor—Canadian Approach to Minimum Fuel Cost Using Natural Uranium. V. V. Mason and S. M. Jones, Canadian Westinghouse, Ltd.
- 58-1299. Auxiliary Power System for Nuclear Plants. R. E. Frick, III Gilbert Associates, Inc.
- CP58-1300. Training Simulator for Nuclear Power Plant Reactor Operators. N. E. Bush, Westinghouse Electric Corp.

2:00 p.m.—Video Tape Facilities and T.V. Antennas

- CP.* Burbank Video Tape Facilities. R. Byloff, NBC.
- CP.* CBS New York Video Tape Installation. K. B. Benson, CBS.
- CP.* Video Automatic Gain Control. D. Taylor, RCA.
- CP.* Traveling Wave Antenna. M. Siukola, RCA.

2:00 p.m.—Radio Communications Systems

- 58-1293. Public Air-Ground Telephone Service Trial. L. M. Augustus, I Michigan Bell Tel. Co.
- 58-1292. Dial Telephone Service for Smith Island—An Isolated Community in the Chesapeake Bay. M. E. Littleton, The Chesapeake & Potomac Telephone Co. of Maryland.
- 58-1227. Expansion of Pacific Coast Microwave Network. R. G. Kuck, I Pacific Telephone & Telegraph Co.
- CP59-83. Optimum Design Considerations for Radio Relays Utilizing the Tropospheric Scatter Mode of Propagation. C. A. Parry, Page Communications Engineers, Inc.

2:00 p.m.—The Motivation Multiplier in Electrical Engineering Education

- CP.* The Profile of an Engineer. G. D. Lobingier, Westinghouse Electric Corp.
- CP.* Techniques for Motivating Students. S. R. Warren, Jr., Univ. of Pennsylvania and B. R. Teare, Carnegie Institute of Technology.
- CP.* Motivation Through Challenge. W. C. Johnson and P. R. Clement, Princeton Univ.
- CP.* Opportunity and Responsibility as Motivators for Engineers. W. G. Amey, Leeds & Northrup Co.
- CP.* 1200 Case Studies of Engineering Motivation. G. E. Moore, Westinghouse Electric Corp.

2:00 p.m.—Rotating Machinery

- 58-1304. A Technique of Measuring the Amplitude and Harmonic Content of Surge Voltages in Machine Windings During Switching. F. A. Scheda, Westinghouse Electric Corp.
- CP59-139. A Surge Generator For Simulating Switching Transients in Induction Motors. F. A. Scheda, Westinghouse Electric Corp.
- CP58-1310. Tests and Life Expectancy of Generator Windings. V. S. McFarlin, Boston Edison Co.
- 59-137. Switching Transients in Single Phase Induction Motors With Speed Constant. P. Venkata Rao, Indian Institute of Science.
- CP59-138. Rotor Impedance Control of the Wound-Rotor Induction Motor. W. Shepherd and G. R. Slemon, University of Toronto.

Wednesday, February 4

9:00 a.m.—Transmission and Distribution

- 59-80. A Correlation of the Present with a Proposed Standard Method for RIV Measurements on High Voltage Devices. C. J. Miller, Jr., The Ohio Brass Co.
- 59-79. Development of a Square Law Radio Noise Meter—I. F. J. Trebby, Kaiser Aluminum and Chemical Corp.
- 59-94. The Effect of Rain on R.I.V. Characteristics of High Voltage Suspension Assemblies. J. Kaminski, B. E. Kingsbury and F. C. Vose, General Electric Co.
- CP.* Determination of Lightning Response of Transmission Lines By Means of Geometrical Models. F. A. Fisher, J. H. Hagen-guth and J. G. Anderson, General Electric Co.
- CP.* Response of a 345 KV Transmission Tower to a Simulated Lightning Stroke. H. R. Armstrong, Detroit Edison Co.; L. O. Barthold and A. J. Schultz, General Electric Co.

9:00 a.m.—Power System Communications

- 58-1228. Experience With Broad-Band Carrier Coupling. H. I. Dobson, Tennessee Valley Authority.
- 59-51. Practical Computation of Single-Frequency Coupling Losses for Representative Field Conditions. H. J. Fiedler, F. C. Krings and D. L. Willer, General Electric Co.
- 59-59. A Loop Microwave System Design. R. H. Davis, Motorola, Inc. III

- CP.* A New Look in Microwave. K. Ray, General Electric.

9:00 a.m.—Rotating Machinery

- 59-135. Current Loci of Permanent Magnet Synchronous Motors, III An Extension of Blondel Theory. J. F. H. Douglas, Marquette University.
- 59-136. A Novel Type of Smoothly Variable Speed A-C Motor Having III Widely Adjustable Power Factor Characteristics. P. K. Charlu, P.S.G. College of Technology.
- CP55-733. Advancements in Synchronous Motor Control and Protection. J. Baude, Allis-Chalmers Mfg. Co.
- 59-112. Differential Leakage of Three Phase Windings With Consequent Pole Connection. C. H. Lee, Westinghouse Electric Corp.

9:00 a.m.—Computers in Nuclear Systems

- 58-1314. Digital Calculation of Transient Performance of the Primary I Coolant System in A Water Reactor. D. G. Lewis, General Electric Co.
- 58-1315. Computational and Experimental Techniques in Nuclear Reactor Design. W. F. Witzig, M. R. Stuart and L. O. Herwig, Westinghouse Electric Corp.
- CP.* Present Status of Analog Representations of Nuclear Power Systems. J. M. Gallagher, Westinghouse Electric Corp.
- CP58-1316. Engineering Description of a Water-Moderated Flexible Critical Facility Using Metal Fuel. E. S. Lembersky, Westinghouse Electric Corp.
- CP.* Shielding Computer Program. J. T. Martin and J. P. Yalch, General Electric Co.

9:00 a.m.—Electrical Insulation

- 58-1205. Thermal Life of Enameled Magnet Wire. Electrical Insulation Committee Working Group Report, J. F. Dexter, Chairman.
- CP59-116. Study of Thermal Deterioration of Kraft Pulps Using a Mass Spectrometer. Y. Saito and T. Hino, Tokyo Institute of Technology.
- CP59-115. The Aging of Organic Varnish Films Upon Iron Surfaces. R. W. Nye, Minnesota Mining and Manufacturing Co.
- CP.* Comparison of Test Procedures for the Thermal Life Testing of Varnished Glass Cloth. C. J. Straka, E. W. Lindsay, G. W. Hewitt and T. W. Dakin, Westinghouse Electric Corp.
- CP.* Fluidized Coating—A Method of Slot Insulation. R. H. Thielking and D. L. McClenahan, Schenectady Varnish Co.

9:00 a.m.—Ceramic Tube Developments

- CP.* A New Ceramic Triode for VHF Applications. J. D. Campbell, General Electric Co.
- CP.* The 1802-A Ceramic-Metal Envelope Hydrogen Thyatron. D. F. Riley, Edgerton, Germeshansen & Grier, Inc.
- CP.* Color Photomicrographic Examination of Electron Tubes. E. W. Scott, General Electric Co.
- CP.* Stacked-Mount Vacuum Tubes with a Choice of Glass or Ceramic Envelopes. C. F. Douglas, Sylvania Electronic Products, Inc.

9:00 a.m.—Production and Application of Light

- CP.* A Progress Report of the Latest Developments in Equipment and Lighting Techniques. E. A. Lindsay, General Electric Co.
- CP.* Some Aspects of the Problems Concerning Group Replacements of Mercury and Fluorescent Lamps on Streetlighting Systems. R. C. Wey, Ohio Power Co.
- CP.* Luminaire and Light Conditioning Maintenance for Offices and Factories. E. I. Creed, Cleveland, Ohio.

9:00 a.m.—Nonlinear Control Systems

- 59-218. A Relay-Type Feedback Control System Designed For Random Inputs. A. M. Hopkin and P. K. C. Wang, University of California.
- CP59-147. A Study of Nonlinear Systems With Random Inputs. K. Chuang and L. F. Kazda, University of Michigan.

- 59-231. A Stability Criterion for Nonlinear Systems. Y. H. Ku and II A. A. Wolf, University of Pennsylvania.
 CP59-232. Describing Function Measurement With An Electronic Analog Computer. V. L. Larrowe and M. M. Spencer, University of Michigan.
 59-233. Limit-Cycle Stability Study of a Feedback Control System By II A New Describing Function Technique. H. J. Harrington, Convair-Astronautics.

9:00 a.m.—Industrial Power Rectifiers

- CP.* Report of Field Tests on Aluminum Pot Line Rectifier Systems. C. A. Langlois, Reynolds Metals Co.; V. N. Stewart and R. P. Stratford, General Electric Co.
 CP59-254. Some Improvements in High Speed Circuit Breakers. C. I. Clausing, I-T-E Circuit Breaker Co. and D. I. Bohn, Asheville, N. C.
 CP.* Specification of Rectifiers for Electrolytic Plants From The Users Point of View. C. Gardner, W. J. McCaig and C. F. Ruyon, Olin Mathieson Chemical Corp.
 CP.* Pneumatic Force-Balance System For Measuring Cell Line Currents. H. C. Behrens and B. J. Nankervis, Dow Chemical Co.

9:00 a.m.—Integrating Instruments

- 59-167. Statistical Approaches to Selecting Domestic Meters for Test. I L. Dwon and J. A. Morris, American Electric Power Service Corp.
 59-17. A Single-Stator Meter for Two Phases of 4-Wire Y. E. W. I Schwarz, Sangamo Electric Co.
 59-168. Polyphase Meter Connections Thirty Years After Woodson. I F. W. Warburton, New England Power Service Co.
 59-165. The Inductronic R. Electrodynamometer for the Precise Measurement of Voltage, Current, Power Energy. R. F. Estoppey, Daystrom, Inc.
 59-166. Precision Integrator for D-C Potentials. J. R. Pattee, Daystrom-Weston.

9:00 a.m.—The Road to Scientific Supremacy?

- CP.* The Navy and Research Progress. Admiral R. Bennett, Office of Naval Research.
 CP.* The Role of Government Research Laboratories. A. V. Astin, National Bureau of Standards.
 CP.* The Outlook on Science in Canada and England. B. G. Ballard, National Research Council of Canada.
 CP.* The National Academy of Sciences—National Research Council. D. W. Bronk, National Academy of Sciences.

9:00 a.m.—Transformers

- CP.* Tank Pressures Resulting from Internal Explosions. R. J. Ringlee and N. W. Roberts, General Electric Co.
 CP.* Internal Fault Characteristics of Gas Insulated Transformers. G. Camilli, L. J. Littlejohn and W. A. Wooldridge, General Electric Co.
 CP.* A 10,000 KVA, 69 KV Gas-Insulated Transformer. G. Camilli, General Electric Co.
 CP.* Design, Insulation and Thermal Performance Characteristics of a 7500 KVA Vapor-Cooled Transformer. P. Narbut and A. J. Maslin, Westinghouse Electric Corp.

9:00 a.m.—Semiconductor Switching Devices—I

- 58-1249. Theory of Transient Build-up In Avalanche Transistors. W. I Shockley and J. Gibbons, Shockley Semiconductor Labs.
 CP58-1359. PNP Switches. J. M. Goldey, Bell Telephone Labs., Inc.
 CP58-1378. Germanium PNP Switches. I. A. Lesk, General Electric Co.
 CP58-1223. High Gain Static A-C Switch. E. A. Petrocelli, Westinghouse Electric Corp.
 58-1248. A Silicon Controlled Rectifier—Its Characteristics and Ratings—I. D. K. Bisson and R. F. Dyer, General Electric Co.

9:00 a.m.—Telegraph Systems

- 59-37. Telex in New York. P. R. Easterlin, Western Union Telegraph Co.
 59-154. Properties of Modern Teleprinters With Regard to Signal I Transmission. H. Wustoney, Siemens and Halske AG.
 59-8. A Nonsynchronous System for Mobile Record Communications. C. H. Stewart II, Bell and Gossett Co.
 59-152. Reperforator-Teletypewriter TT-195()/FG. D. F. Frick, I Smith-Corona Marchant, Inc.
 58-443. The 83B1 Teletypewriter Selective Calling System. C. W. I Smith, American Telephone and Telegraph Co., Retired; C. J. Votaw and A. L. Whitman, Bell Telephone Labs., Inc. (Represented for Discussion only)

9:00 a.m.—Training in Communications

- CP58-1235. Industry Schools Its Engineers. C. E. Waldner, New York Telephone Co.
 58-1152. A New Approach to Training Telephone Engineers. W. C. I Burnett, Southern Bell Telephone and Telegraph Co.; L. C. Adams, Clemson College.
 CP58-1323. Telephone Engineering Management Conference. P. H. Henson, Lincoln Telephone and Telegraph Co.
 CP.* The Evaluation of Engineering Training in Industry. A. L. Charney, Bell Telephone Co. of Pennsylvania.

9:00 a.m.—Rotating Machinery

- 59-25. Evaluation of the Internal Insulation of Generator Coils Based III on Power Factor Measurements. D. A. Findley, R. G. Bready and C. C. Louttit, Aluminum Company of Canada, Ltd.
 58-1311. A Utility's Functional Evaluation Tests for High Voltage III Stator Insulation. A. W. W. Cameron and M. Kurtz, Hydro-Electric Power Commission of Ontario.
 58-1312. Experience in Analysis of D-C Insulation Tests for Maintenance Programs. F. R. Schleif and L. R. Engvall, U.S. Bureau of Reclamation.
 CP58-1391. Accelerated Voltage Endurance Tests. R. H. Rhudy and H. E. Mazanek, General Electric Co.

9:00 a.m.—Modern Circuit Techniques—IV

- CP.* A Technique For Drift Reduction in Semiconductor Direct-Coupled Circuitry. T. B. Martin, Radio Corp. of America and J. E. Lindsay, Cornell Aeronautical Laboratories.
 CP.* Transistor D. C. Amplifiers. R. H. Okada, Univ. of Pennsylvania.
 CP.* A Five-Watt, 14 mc Transistor Transmitter. J. Sevick, Bell Telephone Laboratories.
 CP.* The Design of Self-Balancing Diode-Ring Modulators and Their Extension to Several Unfamiliar Applications. P. M. Thompson, Defence Research Telecommunications Establishment.
 CP.* Low Level Silicone Transistor Chopper. F. Schlereth, General Electric Co.
 CP.* Transistorized Phase Modulator. C. S. Kim, General Electric Co.

1:45 p.m.—Presentation of Fritz Medal to Dr. M. J. Kelly

2:30 p.m.—Transmission and Distribution

- 59-82. Bundled Conductor Voltage Gradient Calculations. J. Reichman, III The Hydro-Electric Power Commission of Ontario.
 59-98. Relationship Between Corona and Radio Noise on Transmission Lines Part II—Conductor and Insulator Corona. T. W. Liao and J. J. LaForest, General Electric Co.
 59-49. Radio Noise Propagation and Attenuation Tests on Bonneville Power Administration McNary-Ross 345 KV Line. G. E. Adams and T. W. Liao, General Electric Co.; M. G. Poland, Bonneville Power Administration; F. J. Trebby, Kaiser Aluminum and Chemical Corp.
 59-95. Wave Propagation Along Unbalanced High Voltage Transmission Lines. III G. E. Adams, General Electric Co.

2:30 p.m.—System Engineering

- 59-225. Theory of Economic Operation of Interconnected Areas. R. H. III Kerr and L. K. Kirchmayer, General Electric Co.

- CP59-239. The Use of Power Transfer Equations to Derive Economic Coordination Relationships Expressed as Functions of Voltage Phase Angles. A. R. Miller, Lehigh University; H. R. Koen, Jr., Minneapolis-Honeywell Regulator Co.; J. S. Deliyannides, Rensselaer Polytechnic Institute.
 CP.* Measurement of the Transfer Functions in the Electric Power Systems Using Spontaneous Power Variations. M. Mesarovic, Massachusetts Institute of Technology and I. Obradovic, Institute "Nikola Tesla."
 58-952. Economic Complementary Operation of Hydro Storage and Steam Power in the Integrated TVA System. R. N. Brudenell and J. H. Gilbreath, Tennessee Valley Authority. (Represented for Discussion only)

2:30 p.m.—Switchgear

- 59-41. The X/R Method of Applying Power Circuit Breakers. J. E. III Skuderna, U.S. Bureau of Reclamation.
 CP59-186. Proposed Revision of American Standard—Alternating-Current Power Circuit Breakers C37.4. AIEE New Working Group on Methods of Rating Power Circuit Breakers.

2:30 p.m.—Rotating Machinery

- 59-3. An Accurate Method of Calculation of Subtransient Reactances of Synchronous Machines. K. B. Menon, Indian Institute of Technology.
 59-140. A Hydrostatic Thrust Type Shaft Seal for Hydrogen Cooled III Generators. W. W. Gardner, A. Lehrkind and W. L. Ringland, Allis-Chalmers Mfg. Co.
 CP59-141. Application of the Piecewise Linear Method to the Analysis of Direct-Axis Transient Response of Saturated Alternators. S. L. Mikhail, Univ. of California.
 58-1151. Development of Device to Protect Turbogenerator From III Damage Because of Thrust Bearing Failure. R. Bruce, C. A. Roberts and K. C. Byram, Tennessee Valley Authority.
 59-121. Modern Large Steam Turbines and Generators. C. C. Franck, III Sr. and J. W. Batchelor, Westinghouse Electric Corp. (Represented for Discussion only)

2:30 p.m.—Digital Computer Techniques

- CP59-205. Symmetric Switching Functions (Matrix Logic V). E. J. Schubert, Burroughs Corp.
 CP59-204. Matrix Algebra of Sequential Logic. E. J. Schubert, Burroughs Corp.
 CP59-195. Digital Technique for Block Diagram Reduction. J. D. Ashley and L. P. Matthews, North American Aviation, Inc.
 59-196. System Synthesis With the Aid of Digital Computers. J. B. I Dennis, R. F. Nease and R. M. Saunders, University of California. (Represented for Discussion only)

2:30 p.m.—Electrical Insulation

- CP.* A New Test Method for Evaluating Fabrication Properties of Sheet Insulation. J. R. Huntsberger, E. I. duPont de Nemours & Co.
 CP59-113. Thermal Evaluation of Rigid Electrical Insulating Materials, a Proposed Test Procedure and Problems Related Thereto. AIEE Working Group on Rigid Materials. K. Wechsler, Chairman.
 58-1167. New Organic Insulation for a 500°C Electrical Equipment. I C. H. Vondracek and E. J. Croop, Westinghouse Electric Corp.
 59-118. Mathematics of Insulation Aging Calculations. L. C. Whitman, I General Electric Co.
 CP.* Parallel Electric Breakdown Tests of Rigid Electrical Insulating Materials in an Oil Medium. K. Wechsler and M. Riccitiello, Westinghouse Electric Corp.

2:30 p.m.—Transients in Rectifier Circuits

- CP.* Voltage Transients Due to Arc Extinction. H. C. Steiner and R. W. Strecker, General Electric Co.
 CP59-124. The Effects of Transformer Parameters on Commutation Transients in Rectifier Circuits. R. P. Massey, Bell Telephone Labs.
 59-149. Transient Voltages in Rectifier Transformers. B. C. Biega and II H. W. Lord, General Electric Co.
 CP59-150. High Voltage Rectifier Transformer Problems. T. L. Wilson, National Cylinder Gas Co.
 CP.* RC Transient Suppression Circuits for Silicon Rectifiers. R. G. Martin, Westinghouse Electric Corp.

2:30 p.m.—Theory and Practice of Reactor Control

- CP58-1362. A Digital Nuclear Reactor Control System. E. P. Gyftopoulos, Massachusetts Institute of Technology and P. M. Coble, Stevens, Davis, Miller & Mosher.
 CP.* The Effect of Feedwater Control on A Pressurized Reactor. E. F. Borner, General Electric Co.
 CP.* Automatic Control of Boiling Water Reactors. M. A. Head, General Electric Co.
 CP.* Variable Moderator Level Control of Boiling Water Reactor. S. R. Nixon, American Standard Corp.
 CP58-1332. A Stability Study of An Atomic Power Plant. R. W. Albrecht, University of Michigan.

2:30 p.m.—Power Systems Communications and Relays

- 59-58. Staged Fault Tests With Power Line Carrier Transferred Trip III Relaying For Line Protection. D. E. Jones, Hydro-Electric Power Commission of Ontario.
 CP.* A Ten-Watt All-Transistorized Transmitter-Receiver for Pilot Relaying. T. A. Cramer and P. R. Crooker, General Electric Co.
 58-1190. Protection of Pilot-Wire Relay Circuits. AIEE Subcommittee III on Pilot Wires. J. L. Blackburn, Chairman.
 59-81. Relaying for Synchronous Motor Pull-Out Protection. A. H. III Hoffman, C. Raczkowski and R. B. Squires, Westinghouse Electric Corp.

2:30 p.m.—Industrial Power Rectifiers

- CP.* Germanium Rectifiers for Electrochemical Processes. J. H. Michaels and E. T. Myslinsky, Columbia-Southern Chemical Corp.
 CP.* High Current Low Voltage Supply for Nuclear Power. A. E. Johnson, A. O. Smith Corp. and E. J. Diebold, International Rectifier Corp.
 CP59-253. Recent Application of Conversion Equipments to Electrolytic Processes. K. McCaskill and A. G. Forster, Hooker Chemical Corp.

2:30 p.m.—Drive Systems for Rolling Mills

- CP58-1340. The Electrical Characteristics of a Universal Slabbing Mill. C. J. Bevan, Bethlehem Steel Co.
 CP.* Industrial Control Designs for a Changing Technology. P. A. Travisano, General Electric Co.
 CP.* Control Equipment for Reversing Hot Mill Main Drives. G. A. Kaufman, General Electric Co.
 CP.* Operation of Rectifiers in Parallel With Existing Generators to Increase Power For Hot Strip Mill Operation. G. Eckentaler, Allis-Chalmers Mfg. Co.

2:30 p.m.—Semiconductor Switching Devices—II

- CP58-1397. High-Current Trinstors. F. S. Stein and E. W. Torok, Westinghouse Electric Corp.
 CP.* A Silicon High Current Transistor Switch of Low Saturation Resistance. D. Navon and P. DeBeurs, Transatron Electronic Corp.
 58-1260. Silicon Controlled Rectifiers from Oxide-Masked Diffused I Structures. R. W. Aldrich and N. Holonyak, Jr., General Electric Co.
 58-1206. Linear Power Amplifiers Using Dynistors or Trinstors. I F. J. Hierholzer, Jr., Westinghouse Electric Corp.
 CP58-1347. The Controlled Rectifier in Power Control Applications. W. D. Cockrell, C. S. Walker and J. D. Harnden, Jr., General Electric Co.
 58-1234. The Controlled Rectifier—Key to the Continuing Control I Renaissance. J. D. Harnden, Jr., General Electric Co. (Represented for Discussion only)

2:30 p.m.—Communications in Space

- Panel-type presentation and discussion by:
 CP.* Dr. R. L. Shuey, General Electric Co.
 CP.* Prof. R. M. Fano, Massachusetts Inst. of Technology.
 CP.* J. R. Pierce, Bell Telephone Labs., Inc.
 CP.* J. H. Vogelmann, Rome Air Development Center.

2:30 p.m.—Telegraph Systems

- 59-153. More About Non-Armored Submarine Cable. C. S. Lawton, I Western Union Telegraph Co.

Thursday, February 5

- 59-85. A Transistorized 20 Channel Carrier Telegraph Terminal. I. T. M. Grybowski and W. G. Veith, The Western Union Telegraph Co.
- CP.* Error Detecting, Servo Correcting Phasing System for Facsimile. A. G. Cooley and H. Strickholm, Times Facsimile Corp.
- CP.* Advances in the Printing Telegraph Art During 1958. E. F. Watson, Bell Telephone Labs. (Retired)
- CP.* Advances in the Facsimile Art During 1958. W. H. Bliss, RCA Laboratories.

2:30 p.m.—Wire Communication Systems

- 59-70. Engineering Aspects of TASI. K. Bullington and J. M. Fraser, I. Bell Telephone Labs.
- CP.* The Syncroplex Telephone Carrier System. B. G. Coetsee, ITT Laboratories.
- CP.* Applications and Maintenance Considerations of the K24 Syncroplex System. J. W. Halina and G. L. Curtis, ITT Laboratories.
- CP.* A General Description of the K24 Syncroplex Carrier System. J. W. Halina and G. L. Curtis, ITT Laboratories.
- 59-71. Electrical Protection for Transistorized Equipment. D. W. I. Bodle and J. B. Hays, Jr., Bell Telephone Labs.
- CP59-259. A New Field Telephone for Military Use in Four Wire Electronic Switching Systems. J. L. Faherty, U.S. Army Signal Research and Development Laboratories and A. S. Howell, Stromberg-Carlson Co.

2:30 p.m.—Indicating Instruments

- 59-161. A Wide-Range Volt-Ampere Converter for Current and Voltage Measurements. F. L. Hermach and E. S. Williams, National Bureau of Standards. (Re-presented for Discussion only)
- 59-158. An Impedance Bridge for Surface Temperature Measurement. I. R. J. Mouly, Corning Glass Works.
- 59-159. Taut Band Suspensions for 250 Degree Instruments. V. S. I. Thomander and R. C. MacIndoe, Westinghouse Electric Corp.
- CP59-125. An Electrical Indicating Instrument Designed to Use Molded Magnet Techniques. H. Otmann, Jr., Westinghouse Electric Corp.
- CP.* Advantages and Limitations of Plastic Bonded Magnets. C. A. Maynard, Indiana Steel Products Co.
- 59-22. A Method for Calibration of Precision Voltage Dividers. I. C. B. Pinckney, Hughes Aircraft Co. (Re-presented for Discussion only)

2:30 p.m.—Rotating Machinery

- CP59-142. The Establishment of a Base for Class A Random Wound Motor Insulation Life by AIEE No. 510 Test Procedure and Its Correlation With Field Experience. R. L. Balke and D. R. Blake, General Electric Co.
- 58-1280. Results of Motorette Evaluation of Insulation Systems. H. P. III Boettcher, A. O. Smith Corp.
- CP59-126. A Bridge Circuit for Measuring the Temperature of Alternating Current Energized Windings. R. E. Seely, General Electric Co.
- CP59-143. Synthesis of Double-Cage Induction Motor Design. H. E. Jordan, Reliance Electric & Engineering Co.

8:00 p.m.—Transients in Rectifier Circuits

8:00 p.m.—Automation in the Soviet Union

- Chairman of Panel is:
- G. C. Newton, Jr., Massachusetts Institute of Technology
- Members of the Panel are:
- S. W. Herwald, Westinghouse Electric Corp.
- N. Cohn, Leeds and Northrup Co.
- W. E. Vannah, McGraw Hill Publishing Co.
- R. J. Kochenburger, Univ. of Connecticut
- E. J. Kelly, Massachusetts Institute of Technology

9:00 a.m.—Power System Operation—Maintenance Costs

- 58-1308. Fundamental Concepts of Incremental Maintenance Costs as Used by Ohio Edison Company. D. B. Zelenka and R. H. Travers, Ohio Edison Co.
- CP58-1309. Determination of Output Maintenance Costs on the West Penn Electric System. R. L. Ballentine, Potomac Edison Co.; W. S. Schmidt and T. A. Lake, Monongahela Power Co.; H. T. McCarthy and R. F. Crim, West Penn Power Co.
- 58-1187. Application of Digital Computer Technique for Development of the Incremental Maintenance Cost. F. H. Light, Philadelphia Electric Co.
- 58-1336. Report on Present Day Practices of Handling Incremental Maintenance Costs as They Apply to Economic Dispatch of Power. AIEE Working Group on Application of Incremental Heat Rates for the Economic Dispatch of Power, Presented by L. T. Anstine.
- Panel Discussion:
- Moderator: G. H. McDaniel, American Electric Power Service Corp.
- L. T. Anstine, Baltimore Gas & Electric Co.
- W. S. Schmidt, Monongahela Power Co.
- R. H. Travers & D. B. Zelenka, Ohio Edison Co.
- F. H. Light, Philadelphia Electric Co.
- R. L. Ballentine, Potomac Edison Co.
- H. T. McCarthy, West Penn Power Co.

9:00 a.m.—Switchgear

- CP59-187. Twenty Years' Experience With Outdoor Single-Tank Oil Circuit Breakers. S. Clare and W. O. Rowan, The Hydro-Electric Power Commission of Ontario.
- 59-47. Development of a 230 kv 20,000 mva Oil Circuit Breaker. F. L. III Reese, Westinghouse Electric Corp.
- 59-63. A Line of 115 kv Through 460 kv Air-Blast Circuit Breakers. III R. B. Shores, J. W. Beatty, H. T. Seeley and W. R. Wilson, General Electric Co.
- 59-101. A New Concept in Power Circuit Breaker Design Utilizing SF-6. R. E. Friedrich and R. N. Yeckley, Westinghouse Electric Corp.

9:00 a.m.—Relays and Rotating Machinery

- 59-38. Factors Influencing Starting Duty of Large Induction Motors. III V. J. Picozzi, General Electric Co.
- 59-13. Squirrel Cage Motor Characteristics Useful in Setting Protective Devices. F. R. Karr, Westinghouse Electric Corp.
- 59-29. Heating of Induction Motors on Unbalanced Voltages. B. N. III Gafford and W. C. Duesterhoeft, Jr., Univ. of Texas; C. C. Mosher III, Stanford University.
- 59-28. Thermal-Synthesis Relay Is Best Replica of Motor Heating. III B. N. Gafford, The Univ. of Texas.

9:00 a.m.—Electrical Insulation

- 58-1186. On the Behavior of Natural and Artificial Voids in Insulation Under Internal Discharge. S. I. Reynolds, General Electric Co.
- CP.* Corona Tests on Oil Insulated Transformers. F. J. Vogel, Allis-Chalmers Mfg. Co.
- 59-151. The Relation of Capacitance Increase With High Voltages to Internal Electric Discharges. T. W. Dakin, Westinghouse Electric Corp.
- CP.* Corona Level Measurements on Insulated Cable. I. J. Marwick and R. C. Graham, Rome Cable Corp.
- CP.* Experiments in Corona Level Measurements on Hermetic Motors. R. T. Divers, Carrier Corp.

9:00 a.m.—Communication Theory

- CP.* Asynchronous Multiplexing. J. E. Taylor, General Electric Co.
- 58-1264. Marginal Utility and the Information Rate of Communication Systems. L. S. Schwartz, New York University. I
- CP.* Detection, Perception and Psychophysics. E. C. Carterette, University of California.
- CP.* A Mechanized Radar Observer. G. P. Dineen, Massachusetts Inst. of Technology.

9:00 a.m.—Electric Space Heating and Heat Pumps

- CP59-89. Earth Source Heat Pump Experiments. J. B. McDonald and G. H. West, The Hydro-Electric Power Commission of Ontario.
- CP.* Heat Pump Hermetic Motor Protection. G. I. Biehn and R. S. Stewart, Westinghouse Electric Corp.
- 59-20. Significance of Heat Pump COP. C. W. Bary, Philadelphia II Electric Co.
- CP.* School Heating—The Electrical Engineer's Opportunity. R. L. Boyd, Edwin L. Wiegand Co.
- CP.* Functional Evaluation of Hermetic Motor Insulation. J. L. Ditzler, Westinghouse Electric Corp.

9:00 a.m.—Safety

- CP58-1252. An Objective Look at Electrode or Grounding Voltages for Safety on Industrial Machine Controls. H. E. Dow and R. W. Bradley, United Shoe Machinery Corp.
- CP59-92. Polarity Grounding of Direct-Connected Television Receivers. E. W. Bisson, General Electric Co. and L. H. Horn, Underwriters' Labs., Inc.
- CP.* Some Aspects of Grounding, Insulating and Bonding in the Problem of Shock Hazard. J. B. Hays, Bell Telephone Laboratories.
- 59-14. A.C. Shocks of Varying Parameters Affecting the Heart. I W. B. Kouwenhoven, G. G. Knickerbocker, R. W. Chestnut, W. R. Milnor, The Johns Hopkins University and D. J. Sass, The Martin Company.
- 57-1012. A Comparison of Mouth to Mouth and Manual Artificial I Respiration Techniques. A. S. Gordon and C. W. Frye, University of Illinois.

9:00 a.m.—Symposium on Conventional and Unit-Type Substations in Distribution Systems

9:00 a.m.—Controlled Semiconductor With Non-Linear Magnetic Devices

- CP.* Saturable Current Transformer—Transistor Multivibrator. R. E. Morgan, General Electric Co.
- CP.* Solid-State Power Inversion Techniques. B. D. Bedford, D. A. Paynter and J. D. Harnden, Jr., General Electric Co.
- CP59-217. An All-Solid-State Phase Controlled Rectifier System. F. W. Gutzwiller, General Electric Co.
- CP.* Saturable Cores and Transistors in Power Converters. T. M. Corry and R. P. Putkovich, Westinghouse Electric Corp.
- CP.* New Approaches to Static Inverters. G. C. Anderson, North American Aviation, Inc.

9:00 a.m.—Transmission and Distribution

- CP59-104. Digital Calculation of Short-Circuit Impedances By Network Subdivision Using Complex Impedances. R. J. Thomas, Tennessee Valley Authority.
- 59-241. Distribution System Primary-Feeder Voltage Control IV—A III Supplementary Computer Program for Main-Circuit Analysis. D. N. Reys and R. F. Cook, Westinghouse Electric Corp.
- 59-53. Ferroresonance in Series Capacitor-Distribution Transformer III Applications. E. F. Kratz, L. W. Manning and M. Maxwell, Westinghouse Electric Corp.
- 59-97. Ferroresonance of Grounded Potential Transformers on Un- III grounded Power Systems. R. F. Karlicek and E. R. Taylor, Jr., Westinghouse Electric Corp.
- 59-55. 240 Volts-to-Neutral Should Be Preferred for Utilization. A. S. III Anderson, C. Hutchinson and S. J. Pearson, Ebasco Services, Inc.
- CP59-181. New Distribution Connector for Standard Crimping Tools. L. S. Greer and C. Catania, Penn Union Electric Corp.

9:00 a.m.—Feedback Control Systems for Metal Rolling and Processing

- CP.* Feedback Control Systems in the Metal Rolling and Processing Industries. A. W. Smith and J. W. Cook, Westinghouse Electric Corp.
- 59-78. The Use of Frequency Response Tests in the Analysis of a II Foil Mill Automatic Gage Control. S. J. Jones, Aluminum Co. of America and R. M. Sills, General Electric Co.
- CP58-1390. Simulation of Steel Mill Control Systems. R. A. Phillips, General Electric Co.
- CP.* Hot Strip Mill Gage Control. O. C. Gochenour, Jones and Laughlin Steel Corp.

9:00 a.m.—Insulation Practices

- 58-1334. The Life Expectancy of Class A Random Wound Motor Insulation as Determined by AIEE No. 510 Test Procedure. II AIEE Working Group on Insulation for Rotating Machines of the Subcommittee on Insulation, of the Rotating Machinery Committee.
- CP58-1305. Pioneering Insulation Evaluation. C. M. Magers and J. S. Askey, Elliott Co.
- CP.* New Insulation Developments for Traction Motor and Generator Field Coils. W. Schneider and J. R. Shirley, Westinghouse Electric Corp.
- CP.* Glass Polyester Banding of Traction Motor Armatures. W. Schneider and W. H. Eunson, Westinghouse Electric Corp.
- CP.* A New Void Free Class H Insulation System For Rotating Machine Windings. G. L. Moses, Westinghouse Electric Corp.

9:00 a.m.—Rotating Machinery

- CP59-127. Extension of Coupled Circuit Analysis to D-C Machine Systems (Electro-Mechanical). J. C. Eidson, Scarsdale, N. Y.
- CP59-128. The Armature Current Form Factor of a D.C. Motor Connected to a Controlled Rectifier. E. F. Kubler, General Electric Co.
- 59-129. Numerical Method of Calculating Eddy Currents Resulting from Commutation. A. I. Dvoracek, General Electric Co. III
- 59-2. Contribution to the Theory of the Brush Collector Contact. III E. Holme, Stackpole Carbon Co.
- CP59-76. Printed Circuit Motors. J. Henry-Baudot, Societe D'Electronique et D'Automatisme. R. P. Burr, Circuit Research Co.

9:00 a.m.—Excitation Systems and Power Plant Auxiliaries

- 59-215. Auxiliary System for a Supercritical Unit: A Design Based III on a Tested System for a Subcritical Unit. J. P. Fitzgerald, C. F. Paulus and H. A. Vargas, The Cleveland Electric Illuminating Co.
- 59-110. Exciter Response Tests for Exciters Controlled by Dynamic III Type Voltage Regulators. V. C. Strode, General Electric Co.
- CP59-179. Proposed Excitation System Definitions For Synchronous Machines. AIEE Working Group On Excitation Systems Terms and Definitions. P. L. Dandeno, Chairman.
- 59-109. Performance of Motor-Driven Exciters With Mag-A-Stat Voltage III Regulators. T. J. Bliss and M. Enns, Westinghouse Electric Corp.
- 59-23. Automatic Control of Internal Angle On Synchronous Machines. V. A. Kinitsky, Ebasco International Corp. III

2:00 p.m.—Insulated Conductors

- 59-26. Jointing Polyethylene-Insulated Submarine Cables. D. W. III Kitchin and O. S. Pratt, Simplex Wire and Cable Co.
- 58-1175. Grounding and Cathodic Protection of Pipes for Pipe-Type III Feeders. F. E. Kulman, Consolidated Edison Co. of N. Y., Inc.
- 59-162. Experimental Fault Locating Work on Pipe-Type Cable. H. L. III Garton, C. Jasper, E. J. Steeve and H. R. Winemiller, Commonwealth Edison Co.

2:00 p.m.—Application of Computers to Power System Problems

- 59-224. Digital Computation of Power Flow—Some New Aspects. III H. W. Hale, Wayne State Univ. and R. W. Goodrich, U. S. Army Signal Corps.
- 59-103. Digital Computation of Short-Circuit Bus Stresses. C. A. III Imburgia, H. K. Amchin and S. G. Vassiliev, American Electric Power Service Corp.
- 59-99. Application of Row-By-Row Matrix Inversion to Power System III Problems. V. Converti, Arizona Public Service Co.
- CP59-263. 230 KV Versus 60KV Subtransmission. V. W. Ruskin and A. Langmur, B. C. Engineering Co. Ltd.

2:00 p.m.—Switchgear

- CP.* High Power Laboratory Tests on High Capacity High Voltage Oil Circuit Breakers. N. Reed, Kelman Electric Mfg. Co. and E. B. Rietz, I-T-E Circuit Breaker Co.
- 59-188. Field Tests on a 345-kv High Capacity Oil Circuit Breaker III at Philip Sporn Power Plant. O. Naef and J. D. M. Phelps, American Electric Power Service Corp.; W. R. Wilson and A. L. Streater, General Electric Co.
- CP59-100. A 15 kv Vacuum Capacitor Switch—Development and Field Experience. H. B. Balfour, Jr., Louisiana Power and Light Co.; H. M. Pflanz and G. N. Lester, Allis-Chalmers Mfg. Co.

CP59-221. Selective Silver Plating of Aluminum and Copper Bus, Switch-Gear and Related Components by the Powder Weld Hot Melt Process. R. A. Wiese, The Powder Weld Process Co.

2:00 p.m.—Analog Computer Techniques

59-10. Application of Finite Integral Transforms to Analog Simulations. W. J. Karplus, University of California and P. A. Stephens, Jr., Hughes Aircraft Co.

58-1198. The Operational Amplifier as a Laboratory Tool. P. E. Pfeiffer, The Rice Institute.

CP59-190. On the Measurement Problem in Adaptive Systems Utilizing Analog Computer Techniques. R. M. Corbin, U.S. Army.

CP.* Contour Tracing With An Analog Computer. H. K. Skramstad, National Bureau of Standards.

CP59-207. Real Time Simulation of a Jet Engine on an Analog Computer. S. J. Jennings, General Electric Co.

2:00 p.m.—Electrical Insulation

CP.* The Importance in Detecting Corona in Capacitor Dielectrics and Methods of Detection. H. H. Brustle and N. A. Sidnell, General Electric Co.

CP.* A Survey of Methods Used in Corona Measurement on Insulation Systems. O. X. Heinrich, J. G. Biddle Co.

CP.* Importance of Corona Suppression in Capacitors Insulated With Mylar Polyester Film. L. V. Baldwin, E. I. duPont de Nemours & Co.

CP.* Effects of Corona on Polyethylene, Progress Report, Part II. E. J. McMahon, D. E. Maloney and J. R. Perkins, E. I. duPont de Nemours & Co.

CP.* Motion Pictures of Tree Breakdowns Between Needle Points. D. W. Kitchin and O. S. Pratt, Simplex Wire and Cable Co.

59-24. Rapid Determination of Corona Loss from Voltage-Charge Diagrams. H. S. Dixon, Berkeley Laboratory. (Re-presented for Discussion only)

2:00 p.m.—Single-Sideband Theory and Techniques

CP.* Suppressed Carrier Single Sideband. E. W. Pappenfus, Collins Radio Co.

CP.* Single Sideband Using Re-Inserted Carrier. W. L. Firestone, Motorola, Inc.

CP.* Testing of Voice Communications Systems Using Phonetically Balanced Word Lists. G. E. Renaud, Human Engineering Laboratory.

CP.* Doppler Shift Versus the Intelligibility Score as a Function of Signal to Noise. J. Nickerson and D. K. Weaver, Jr., Montana State College.

2:00 p.m.—Programming and Data Processing in the Steel Industry

CP58-1399. An Automatic Numerical Data Logging System for Tinplate Lines. G. E. Terwilliger, General Electric Co.

CP.* Programming of Reversing Hot Mills. M. W. Brittain and E. H. Browning, Westinghouse Electric Corp.

CP.* A New System for Fully Card Programmed Blooming Slabbing Mill Operation. E. F. Boening, Allis-Chalmers Mfg. Co.

CP.* A Programming System for Reversing Hot Mill Drives. J. T. Bradford, General Electric Co.

2:00 p.m.—Symposium on Safety by Interlocking and by Intrinsic and Inherent Design

CP.* Conveyors and Passenger Ramps. J. C. Webb, J. C. Webb Co.

CP.* Elevators and Escalators. E. B. Dawson, Westinghouse Electric Corp.

CP.* Production Inspection and Test Equipment. E. T. Angell, General Electric Co.

CP.* High Voltage Laboratory Test Equipment. T. Brownlee, General Electric Co.

CP.* Machine Tools. D. L. Pierce, Westinghouse Electric Corp.

CP.* Utility Company Equipment. D. L. Greene, Gilbert Associates, Inc.

CP.* Flame Safeguarding. F. Deziel, Minneapolis-Honeywell Regulator Co.

CP.* Electrical Switchgear. W. C. Fulton, Westinghouse Electric Corp.

CP.* Printing Presses. H. R. Behr, Goss Printing Press.

CP.* Industrial Control. F. L. Fisher, Allen Bradley Co.

2:00 p.m.—Substations

CP59-193. Standard Substation Designs Are Not Permanent. W. R. Smith, Pennsylvania Power & Light Co.

58-1008. Zig-Zag Configuration in High Voltage Ring-Bus Substation. III R. N. Connelly, Sacramento Municipal Utility District and R. F. Gibbons, Federal Pacific Electric Co.

CP59-189. Rationalization of Electrical Clearances for Applications at EHV's 230 KV to 460/500 KV. P. L. Bellaschi, Portland, Ore.

CP59-213. The Corona and Radio Influence Voltage Characteristics of Substation Connectors and Bus Supports. N. L. Nilsson, K. A. Fleck, Anderson Electric Corp.; P. B. Jacob, Jr., Mississippi State University.

2:00 p.m.—Auxiliaries

CP58-1207. Car Accelerator For Railroad Classification Yards. J. D. Hughson, General Railway Signal Co.

58-1159. A Novel Generating System For Railroad Cabooses. L. B. Haddad, R. A. Vercella and D. W. Brown, Safety Industries, Inc.

CP59-247. Improved D-C High-Potential Testing of Insulation Systems in Low and Medium Voltage D-C Equipment. A. M. Odok, General Electric Co. and T. M. Soelaiman, Universitas Indonesia.

2:00 p.m.—Relays

59-93. A Device for Solving Mutual Induction Problems on a D-C Network Analyzer. T. Karlsen and H. A. Wallhausen, The Detroit Edison Co.

CP59-5. The Importance of High Voltage Transmission Line Mutual Coupling on Ground Fault Relaying. M. J. Lantz, Bonneville Power Administration.

59-44. The Coordination and Testing of Protective Relays in Industrial Plants. T. L. Bourbonnais II, E. I. du Pont de Nemours & Co.

59-21. Bibliography of Relay Literature 1955-1956. AIEE Subcommittee of Relay Literature of the Committee on Relays. R. W. Hirtler, Chairman.

2:00 p.m.—The Specifications of Components for Control Systems

CP.* Hydraulic Transfer Valves. J. Gibson.

CP.* Motor Tachometers. W. Sollicito.

CP.* Gyros. P. P. Fischer.

CP.* Magnetic Amplifiers. H. Trueblood.

CP.* Transformers. D. D. Pidhayny.

2:00 p.m.—Electrical Techniques in Medicine and Biology

CP.* A Six Channel Oscilloscope Switch. G. N. Webb and R. N. Glackin, Johns Hopkins Hospital.

CP59-236. Technical Solutions to the Problem of Reducing Patient Dosage. J. E. Jacobs, General Electric Co.

CP.* Use of Computers for Pedigree Problems in Human Genetics. J. H. Renwick, Johns Hopkins Hospital.

57-316. Standards for Measurement of Brightness Intensification in Fluoroscopic Image Intensifiers. W. S. Lusby, Westinghouse Electric Corp.

2:00 p.m.—Communication Switching Systems

59-185. Indialing to P.B.X. Extensions—Application in a Step-By-Step Central Office Area. G. N. Schleinkofer, The Bell Telephone Co. of Pennsylvania.

CP59-184. Calling Number Identification for Toll Ticketing Service. T. E. Ellis, Stromberg-Carlson Co.

CP59-183. Automatic Ticketing Systems As Applied To Medium-Sized Telephone Networks. M. A. Clement, Stromberg-Carlson Co.

CP59-180. Magnetic Tape Storage For Direct Distance Dialing. L. K. Armstrong, Stromberg-Carlson Co.

59-33. Evaluation of Solderless Wrapped Connections for Central Office Use. S. J. Elliott, Bell Telephone Labs., Inc.

Friday, February 6

9:00 a.m.—Distribution Transformer Load Management

59-240. Determination of Distribution Transformer Loading From III KWHR Consumption by Electronic Computation. C. F. Mitchell and J. A. Hughes, Commonwealth Edison Co.

CP59-201. A Method of Obtaining Distribution Transformer Load Data from Meter-Book Readings. L. J. Weed, Boston Edison Co.

CP.* The Use of Data Processing Machines for Distribution Transformer Load Management. L. J. Rankine, International Business Machines Corp.

59-32. Rural Distribution Transformer Loading. T. R. McDonald, III D. B. Price and H. W. Thiesfeld, Rural Electrification Administration.

CP59-192. Distribution Transformer Load Management. R. F. Lawrence and A. M. Lockie, Westinghouse Electric Corp.

59-155. Distribution Transformer Load Management. P. G. Brittain, III Dallas Power and Light Co.

9:00 a.m.—Insulated Conductors

59-27. Classification and Standardization of Cable and Limiters for III Secondary Network Systems. I. Matthisse, Burndy Corp.

CP59-163. Temperature Classification of Secondary Network Cable Insulations and Jackets. G. J. Crowdes and J. J. McNiff, Simplex Wire and Cable Co.

CP59-164. Potheadless Terminations of 38 KV Rubber Insulated Cable and Joint to 35KV Paper and Lead Cable. A. M. Gates, Philadelphia Electric Co.

9:00 a.m.—The Young Engineers in the Power Industry

CP58-1146. The Young Electrical Engineer in a Small Public Utility Company. H. W. Evers, Jr., Fitchburg Gas and Electric Co.

CP58-1147. The Young Electrical Engineer With a Consulting Engineering Firm. J. C. Hitt, Jackson and Moreland, Inc.

CP58-1148. The Electrical Engineer in Power Equipment Design. E. S. Coleman, Westinghouse Electric Corp.

CP58-1149. The Young Electrical Engineer in a Large Public Utility Company. C. F. Paulus, The Cleveland Electric Illuminating Co. and R. L. Webb, Consolidated Edison Co. of N. Y., Inc.

9:00 a.m.—Relays, Substations and Switchgear

59-212. Fuse Protection of High Voltage Power Transformers. R. A. III Larner and K. R. Gruesen, Texas Electric Service Co.

CP59-211. Distribution Feeder Protection Co-Ordination. W. Burch, Carolina Power and Light Co.

CP.* Application and Design Features of a New Two Cycle Air-Magnetic Power Circuit Breaker. A. W. Simpson and J. A. Smith, General Electric Co.

CP.* Use of Supervisory and Alarm Equipment for Small Distribution Substations. P. M. Black, Commonwealth Edison Co. and H. W. Buss, Rochester Gas and Electric Co.

CP.* Recent Developments in Supervisory Equipment for Utility and Industrial Use. G. E. Guy and P. W. Schirmer, General Electric Co.

9:00 a.m.—Electric Utility Application of Digital Computers

The price of S-109 is \$1.50 per copy.

59-62. Iteration Methods for Digital Load Flow Studies. J. E. Van III Ness, University of California.

59-222. A New Digital Transient Stability Program. M. S. Dyrkacz III and D. G. Lewis, General Electric Co.

59-73. Calculation of Transient Stability Problems Using a High-Speed Digital Computer. G. W. Stagg, A. F. Gabrielle, D. R. Moore and J. F. Hohenstein, American Electric Power Service Corp.

S109. Second Report on Survey of Electric Utility Applications of Digital Computers. AIEE Computer Application Subcommittee of System Engineering Committee and Applications Subcommittee of Computing Devices Committee.

9:00 a.m.—Magnetic Amplifiers

58-1232. On Feedback in Magnetic-Amplifiers Part II: Combined I Magnetic and Electric Feedbacks. L. A. Finzi, Carnegie Inst. of Technology and J. J. Suozzi, Bell Telephone Labs.

59-176. Long Time Delays From A Single Magnetic Storage Core. I C. E. Hardies, Magnetics, Inc.

59-174. Automatic Regulators With Self-Balancing Magnetic Amplifiers. W. A. Geyger, U.S. Naval Ordnance Lab.

59-177. Proposed Standard Test Codes for Magnetic Amplifiers. AIEE I Standards Subcommittee of the AIEE Magnetic Amplifier Committee, F. G. Timmel, Chairman.

59-175. Observation of Transients in the Series Connected Saturable I Reactor With High Impedance Control Source. H. L. Goldstein, Bell Telephone Labs. (Re-presented for Discussion only)

9:00 a.m.—Basic Sciences

59-12. Eddy-Current Losses in Solid and Laminated Iron. P. D. I Agarwal, University of Massachusetts.

59-235. Inductance of A-C Magnets From Simple Models. J. F. H. I Douglas and R. J. Voith, Marquette University.

CP.* Electrospherics and Magnetospherics. A. D. Moore, University of Michigan.

59-227. The Use of Iterated Laplace Transformations in the Solution I of Combined Circuit-Field Problems. J. H. Mulligan, Jr., New York University.

59-228. Basic Concepts of Multidimensional Space Filters. G. Kron, I General Electric Co.

CP59-18. A Modified Version and Demonstration of Routh's Stability Criteria. L. Pode, Sherman Oaks, California.

58-529. Electromechanical Impedance, Analogs and Duality. W. B. I Swift, University of Wisconsin. (Re-presented for Discussion only)

9:00 a.m.—Railroad Traffic Control

59-252. Traffic Control For Railroads. G. W. Baughman, Westing- II house Air Brake Co.

59-251. Modern Systems of Traffic Control As Applied to Seaboard II Airline R.R. Co. J. R. DePriest, Seaboard Airline R.R. Co.

59-249. Communication Systems For Railway Traffic Control. H. C. II Sibley, General Railway Signal Co.

CP59-250. Traffic Control on the New York Central System. J. W. Curran, New York Central System.

9:00 a.m.—Industrial Control

58-1176. Elements of Reactor Controlled, Reversible Induction Motor II Drives. W. Leonhard, Westinghouse Electric Corp.

CP59-84. Adjustable Speed Control of A.C. Motors. L. R. Foote, General Electric Co.

CP.* Transistorized Regulator for Battery Charging. E. E. Moyer, Acme Electric.

9:00 a.m.—Chemical Processes and Petroleum Industries

CP59-191. Variations Between The National Electrical And Canadian Electrical Codes On Hazardous Locations. K. V. Knudsen, Crouse Hinds Co. of Canada Ltd.

CP.* Large Squirrel Cage Induction Motors For Refinery Service. G. St. Onge, Esso Research & Engineering Co.

CP59-262. Repair, Reconditioning And Maintenance Of Explosion-Proof Electric Motors and Generators. J. Tindall, Reliance Electric & Engineering Co.

9:00 a.m.—Electronic Switching Systems—I

CP59-182. Considerations Pertaining to the Design of an Electronic Telephone Switching System. B. Brightman and M. P. Tubinis, Stromberg-Carlson Co.

CP59-210. Transmission Aspects of an Electronic Switchboard Employing Time Division Multiplexing. J. C. Perkins, Stromberg-Carlson Co.

CP.* An Experimental Switching System Using New Electronic Techniques. A. E. Joel, Jr., Bell Telephone Labs., Inc.

CP.* Semiconductor Circuit Design Philosophy for the Central Control of an Electronic Switching System. B. J. Yokelson, W. B. Cagle and M. D. Underwood, Bell Telephone Labs., Inc.

CP.* Fundamental Concepts in the Design of the Flying Spot Store. C. W. Hoover, R. E. Staehler and R. W. Ketchledge, Bell Telephone Labs., Inc.

9:00 a.m.—Feedback Control System—I

59-220. Notes on Complex Conjugate Singularity Compensation and Four Terminal Network Loading. P. Chandaket, Royal Thai Navy and A. B. Rosenstein, University of California.

59-219. Signal Stabilization of a Control System. R. Oldenburger, Purdue University and C. C. Liu, Taylor Instrument Co.

59-199. Probabilistic Error As Measure of Control System Performance. J. Zaborsky, Washington University and J. W. Diesel, McDonnell Aircraft Corp.

58-1026. Relay Type Feedback Control Systems With Dead Time and Sampling. K. Izawa, Purdue University and L. E. Weaver, University of Arizona. (Re-presented for Discussion only)

CP58-89. Application of Switching Transistors and Saturable Reactors in a High-Performance Servo. F. B. Cox, Jr. and P. R. Johannessen, Massachusetts Inst. of Technology. (Re-presented for Discussion only)

CP58-1269. Classified Bibliography on Feedback Control Systems Part I: Sampled-Data Systems. T. J. Higgins, University of Wisconsin and R. W. Greer, North American Aviation Corp.

CP58-1270. Classified Bibliography on Feedback Control Systems Part II: Root Locus and Associated Procedures. T. J. Higgins, University of Wisconsin.

CP.* Classified Bibliography on Feedback Control Systems Part III: Automatic Control of Nuclear Reactors. T. J. Higgins and R. F. Hill, University of Wisconsin.

9:00 a.m.—Reliability and Quality Control

59-144. Quality Assurance Program. R. A. Hulnick, H. G. Harding and J. T. Rowinski, IBM Corp.

59-145. Effects of Operation of Germanium Alloy Junction Transistors Above Rated Conditions. B. C. Spradlin, Battelle Memorial Institute.

59-36. Life Characteristics of Carbon-Film Resistors After 12,000 Hours of Operation. H. Braner and J. L. Easterday, Battelle Memorial Institute.

9:00 a.m.—Electrostatic Processes

CP.* Recent Progress in Automatic Energization of Electrical Precipitators. L. L. Little, Western Precipitation Corp.

CP59-223. Saturable Reactor Control of Full-Wave and Bi-Phase Rectifiers. J. B. Thomas, Princeton Univ. and J. W. Drenning, Koppers Co.

CP.* Sparkover as Influenced by Surface Conditions in D.C. Corona. G. W. Penney, S. E. Craig, Carnegie Inst. of Technology.

CP59-234. Power Relationships and Temperature Dependence in the D-C Corona Field. J. B. Thomas, T. R. Williams and T. Suzuki, Princeton Univ.

CP.* A Theory for Space Charge Limited Currents with Application to Electrical Precipitation. P. Cooperman, Univ. of Pittsburgh.

59-102. A Theoretical Analysis of the Effects of an Electric Field on the Charging of Fine Particles. A. T. Murphy, Univ. of Wichita, F. T. Adler and G. W. Penney, Carnegie Inst. of Technology. (Re-presented for Discussion only)

59-206. Field Strength Measurements in Parallel Plate Precipitators. J. S. LaGarias, Koppers Co. Inc. (Re-presented for Discussion only)

9:00 a.m.—Rotating Machinery

58-1318. Computing Iron Losses in Fractional Horsepower Induction Motor Design. C. E. Linkous, General Electric Co.

59-130. Stray Load Loss Measurement in Induction Machines. AIEE Stray Load Loss Working Group. H. E. Jordan, Chairman.

59-45. Stray-Load Losses in Polyphase Induction Machines. P. L. Alger, G. Angst and E. J. Davies, General Electric Co.

58-1180. A General Method for Slot Constant Calculation. K. J. Waldschmidt, A. O. Smith Corp.

59-1. Characteristics of Induction Motors With Permanent Magnet Excitation. J. F. H. Douglas, Marquette University.

9:00 a.m.—Electrical Insulation

59-75. Three Decades of Progress in Electrical Insulation. L. J. Berberich, Westinghouse Electric International Co.

CP.* Magnesium Oxide Films as Magnetic Tape Insulation. M. Lauriente, Westinghouse Electric Corp.

CP59-226. Glass Flake in Flexible Composite Insulation. M. P. Koerner, Jr., Owens-Corning Fiberglas Corp.

CP.* A New Supported Silicone Rubber Insulation System. W. J. Bobear and J. S. Hurley, Jr., General Electric Co.

58-1208. The Present Status and Anticipated Progress in the Field of Insulating Materials. T. D. Callinan, IBM Corp.

2:00 p.m.—Insulated Conductors

58-305. The St. Lawrence River High Voltage Submarine Cable Crossing—Part II—Experimental Programme and Cable Manufacture. D. M. Farnham and S. H. Cunha, Quebec Hydro-Electric Power Commission; G. B. Shanklin, Schenectady, N. Y.; H. D. Short, Canada Wire & Cable Co. (Re-presented for Discussion only)

CP58-1353. The St. Lawrence River High Voltage Submarine Cable Crossing—Part III—Installation. D. M. Farnham and S. H. Cunha, Quebec Hydro-Electric Power Commission; G. B. Shanklin, Schenectady, N. Y.; H. D. Short, Canada Wire & Cable Co.

CP58-1354. The St. Lawrence River High Voltage Submarine Cable Crossing—Part IV—Field Tests After Installation and Conclusion. D. M. Farnham and S. H. Cunha, Quebec Hydro-Electric Power Commission; G. B. Shanklin, Schenectady, N. Y.; H. D. Short, Canada Wire & Cable Co.

2:00 p.m.—Protective Devices

59-68. A Report on Performance Characteristics of Lightning Arresters. Working Group of AIEE Lightning Protective Devices Subcommittee of The Protective Devices Committee. W. F. Griffard, Chairman.

59-50. New Current-Limiting Gap Extends Valve-Type Lightning-Arrester Performance. J. W. Kalb and A. G. Yost, The Ohio Brass Co.

59-60. A New Electrical Research Laboratory. F. E. Andrews and A. Vitkus, Hubbard and Co.

59-216. Lightning Arrester Field Test Equipment and Results. H. Linck, The Hydro-Electric Power Commission of Ontario.

CP.* Lightning Protection of Equipment on Multiple Line Buses. A. H. Knable, Allis-Chalmers Mfg. Co.

CP.* A New Fust Cutout. A. C. Westrom, Hubbard & Co.

CP.* Surge Protection of Unit-Connected Generators. K. H. Chang and T. B. Thompson, Oklahoma State University.

2:00 p.m.—Magnetic Amplifiers

59-170. Analysis of a Series-Connected Saturable Reactor With Capacitive Loading and Finite Control Resistance by the Use of Difference Equations. H. C. Bourne, University of California and J. T. Salihi, Lenkurt Electric Co.

59-169. Graphical Analysis of the Full-Wave Magnetic Amplifier Control Characteristics Affected by Control Circuit Resistance. K. Murakami and T. Kikuchi, Tohoku University.

59-171. Analysis of Magnetic Amplifiers Without Diodes. P. R. Johannessen, Massachusetts Inst. of Technology.

59-172. Analysis of Magnetic Amplifiers With Diodes. P. R. Johannessen, Massachusetts Inst. of Technology.

59-173. Recommended Symbols for Magnetic Amplifier Papers, A Report, Theory Subcommittee of AIEE Magnetic Amplifiers Committee, H. F. Storm, Chairman. (Re-presented for Discussion only)

2:00 p.m.—Electric Circuit Theory

59-46. Current Distribution In The Cylindrical Source Plane-Electrode Configuration. W. D. Comstock, Syracuse University Research Corp. and E. M. Williams, Carnegie Inst. of Technology.

CP59-111. Capacitance Of Parallel Rectangular Cylinders. J. D. Horgan, Marquette Univ.

CP.* Transient Solution of Systems By Multiple Z Transformers. T. J. Higgins & M. Chen.

59-266. The Characteristic Impedance and Phase Velocity Of A Shielded Helical Transmission Line. H. S. Kirschbaum, Battelle Memorial Inst.

59-16. The Optimum Transmission-Line Pulse Transformer. F. J. Young, E. R. Schatz and J. G. Woodford, Carnegie Inst. of Technology.

59-15. The Transient Response of Tapered Transmission Lines. F. J. Young, E. R. Schatz and J. B. Woodford, Carnegie Inst. of Technology.

59-264. Spectral Output Of Piecewise Linear Nonlinearity. O. J. M. Smith, Univ. of California.

59-265. Statistical Spectral Output Of Power Law Nonlinearity. O. J. M. Smith, Univ. of California.

2:00 p.m.—Railroad Rolling Stock

CP59-245. A Full-Range Two-In-One (Diesel-Electric, Third-Rail) Locomotive. B. F. Hefner, General Motors Corp.

CP59-248. Prototype Alternating-Current Multiple-Unit Train of the Pennsylvania Railroad. K. H. Gordon, The Pennsylvania Railroad Co.; V. F. Dowden, The Budd Co.; E. W. Ames, Westinghouse Electric Corp.

CP59-246. Control for an 8500-HP Gas Turbine-Electric Locomotive. R. M. Smith and W. B. Zelina, General Electric Co.

2:00 p.m.—Industrial Control

58-1166. The Application of Shift Register Techniques to Materials Handling. H. C. Diener, Jr., Westinghouse Electric Corp.

59-91. New Methods of Simplifying Boolean Functions. R. L. Howard, Westinghouse Electric Corp.

CP58-1284. Logic Design Techniques of Static Switching Control for Transfer Machines. J. W. Stuart, Industrial Nucleonics Corp. and R. A. Manning, Westinghouse Electric Corp.

58-1285. Static Control in Automatic Warehousing. L. L. Bosch, A. J. Fanthorp, Bosch & LaTour; J. W. Stuart, Industrial Nucleonics Corporation. (Re-presented for Discussion only)

2:00 p.m.—Substations and Switchgear

59-238. Design Features of 40,000 KVA Underground Distributing Station. C. M. Short and F. C. Osborn, Los Angeles Dept. of Water and Power.

59-42. Large Metropolitan Distribution Substations. T. D. Reimers, Consolidated Edison Co. of N. Y., Inc.

CP59-202. Lombard 66-13.2 KV Substation in Central Philadelphia. J. A. Krawchuk, Philadelphia Electric Co.

CP.* New 13.8 KV 1000 MVA Air Magnetic-Type Power Circuit Breaker With Stored Energy Operating Mechanism in Metal-Clad Switchgear. R. M. Korte, W. T. Sharp and R. E. McDaniel, General Electric Co.

2:00 p.m.—Chemical Processes and Petroleum Industries

CP.* The Use Of Aluminum Conduit In Industrial and Chemical Plants. E. G. Fox, Kaiser Aluminum and Chemical Sales Inc.

CP.* The Development Of Reliable Electrical Systems In Petroleum Refineries. J. C. Howard, Standard Oil of Indiana.

Group Dynamics Discussion On Designing For Reliability Of Power Systems. Discussion Leader L. B. Eddy.

2:00 p.m.—Electronic Switching Systems—II

CP.* A High Speed Barrier Grid Store. T. S. Greenwood and R. E. Staehler, Bell Telephone Labs., Inc.

CP.* Application of Breakdown Devices to Large Multistage Switching Networks. T. Feldman and J. W. Rieke, Bell Telephone Labs., Inc.

CP.* A High Speed Line Scanner For Use In An Electronic Switching System. A. Feiner and L. F. Goeller, Bell Telephone Labs., Inc.

CP.* A Signal Distributor For Electronic Switching Systems. L. Freimanis, Bell Telephone Labs., Inc.

CP.* Functional Design of a Stored Program Electronic Switching System. H. N. Seckler and J. J. Yostville, Bell Telephone Labs., Inc.

2:00 pm.—Feedback Control Systems—II

59-197. Effect of Closed-Loop Transfer Function Pole and Zero Locations on the Transient Response of Linear Control Systems. O. I. Elgerd, University of Florida and W. C. Stephens, U.S. Army Combat Surveillance Agency.

59-255. Evaluation of Transient System Response. F. P. de Mello, General Electric Co.

59-198. The Optimum Control of Multi-Actuator Systems. I. McCausland, University of Toronto.

59-214. The Linear Least Squares Synthesis of Multivariable Control Systems. R. C. Amara, Stanford Research Institute.

58-796. Transfer Functions of Loaded Synchronous Machine. D. Hamdi-Sepen, Technical University of Istanbul. (Re-presented for Discussion only)

58-1083. Application of Continuous System Design Concepts to the Design of Sampled Data Systems. S. F. Schmidt, Ames Aeronautical Lab. (Re-presented for Discussion only)

Bibliography On Control Systems.

CP.* Classified Bibliography on Feedback Control Systems: Part IV, Obtaining Transient Response from Frequency Response. T. J. Higgins, University of Wisconsin.

CP.* Classified Bibliography on Feedback Control Systems: Part V, Obtaining Frequency Response from Transient Response. T. J. Higgins, University of Wisconsin.

CP.* Classified Bibliography on Feedback Control Systems: Part VI, Time-Lag Systems. T. J. Higgins, University of Wisconsin.

CP.* Classified Bibliography on Feedback Control Systems: Part VII, Stability Theory. T. J. Higgins, University of Wisconsin.

2:00 p.m.—Engineering Science and the Demands of Industry

Panel Members are:

H. W. Gouldthorpe, General Electric Co.

S. Seely, Case Inst. of Technology

D. B. Sinclair, General Radio Co.

H. H. Skilling, Stamford Univ.

Moderator: D. K. Reynolds, Seattle University

CONTINUED FROM PAGE 2

orchestra pit, motorized curtains and the multitude of electric and mechanical controls required for the special stage and lighting effects. **Rambusch Decorating Company, New York, N. Y. (Tuesday afternoon):** The most diversified representation of artistry and craft work is found here. Designers, craftsmen and lighting engineers work in complete shops and studios under one roof to serve architects and decorators with all phases of original design and execution of the decorative arts. Working in metal, wood, marble, glass, plastic, terracotta, and with light, paint, and mosaic, using all types of carving,

AIEE WINTER GENERAL MEETING

paneling, and finishing equipment, skilled artisans create anything from medallions, candlesticks and altars to murals, statues and great stained, polished, or carved glass windows, using the most original lighting effects.

Some of Rambusch's many creations are: the lighting of the St. Louis Air Terminal Building; carved plate-glass windows in St. Thomas Moore Chapel of Yale University; bronze sculpture for the S/S United States; the United Nations Metal Map in the World Assembly Hall; sand blasted tinted glass in the U.S. Coast Guard Academy Chapel, New London, Conn.; and the colored maparium glass enamel sphere of the Christian Science Publishing House, Boston.

Steinway & Sons, Astoria, N. Y. (Thursday afternoon): Visitors will see skilled craftsmen fitting the sound boards and iron frames of pianos, and stringing, installing and regulating the keys and actions. They will also see finishing, polishing and other specialized handwork which is the heart of the piano. An unusual opportunity to witness the work of the master artisan.

Underwriters' Laboratories, New York, N. Y. (Wednesday morning): The Laboratories, sponsored by the National Board of Fire Underwriters, are operated for service, not for profit. They examine and test for public safety, write standards for safety and control identification of their tested items with markers, labels, lists, and listing cards.

The New York Laboratories tests electric equipment and fire alarm and signaling apparatus.

The tour will include viewing a short color movie showing some of the spectacular tests in slow motion. Interesting tests, such as destruction of new television sets, as well as routine tests will be programmed.

The opportunity to observe the interest and concern these men have in public safety coupled with their thoroughness is sure to offer an interesting tour.

The Underwriter's Laboratories is a foremost safety testing laboratory whose clients operate 6,500 plants turning out an estimated 1,000,000,000 safe guarded articles each year.

United Nations General Assembly, New York City, N. Y. (Tuesday morning): A guided tour of the United Nations General Assembly Building. The tour will be slightly over one hour covering various special facilities and functions of this building and descriptions of special details. Includes a trip through the Visitors' Gallery of the General Assembly Hall if the Assembly is in session. (Present UN schedule lists committee sessions only, and admission tickets, at no charge, will be available for optional group attendance after lunch about 2 p.m.). Arrangements made for group luncheon (not included in ticket) in the Delegates' Dining Room. The lunch is recommended but optional.

(The site of the new United Engineering Center Building will be pointed out, opposite the North end of the United Nations Plaza.)

Western Electric Company, Kearney, N. J. (All day Tuesday): This is one of the largest manufacturing plants of this supply organization for the Bell System. Included in this tour will be the multi-conductor cable shop, relay blade manufacturing, and assembly of manual and automatic switchboard equipment.

Bus leaves Statler 9 a.m., returns 4 p.m. Reservation \$2.50.

LADIES' ENTERTAINMENT: The Ladies' Entertainment Committee hopes that it may greet many ladies at the Winter General Meeting and has arranged an interesting program for the week.

Registration: Ladies register with their husbands and obtain their name badges which are required when registering for events of the Ladies' Program. Registration for Ladies' Events starts on Sunday afternoon from 2 to 4 in Ladies' Headquarters and continues each day of the meeting.

Ladies' **Headquarters** in the Washington Room of Hotel Statler will be open throughout the week for registration, coffee hours, meeting friends, relaxing and playing cards.

Coffee Hour in Ladies' Headquarters will be each morning Monday through Friday.

Program: **Monday**—Get Acquainted Tea sponsored by Phelps Dodge Copper Products Corporation, during which there will be a Fur Fashion Show presented by L. F. Gompertz, Inc. **Tuesday**—Sight-seeing tour to lower Manhattan with a visit to the new Stock Exchange and a luncheon in Chinatown. Total cost \$4.00. In the evening, Dinner with valuable door prizes preceded by a Cocktail Hour sponsored by I.T.E. Circuit Breaker Company. Following dinner there will be a program of Musical Portraits sponsored by Waterbury Company, Inc. Dinner tickets \$7.00. **Wednesday**—United Nations Tour with the op-

tion of having lunch in the Delegates Dining Room. Children over 9 years old may be taken on this tour. Cost of tour and transportation \$2.00.

Thursday—Breakfast at Altman's Department Store followed by a Millinery Show. Breakfast tickets \$1.50. 12:30 Luncheon and Fashion Show at the Waldorf-Astoria. There will also be doorprizes. **Note:** Fashion Show courtesy of Federal Pacific Electric Company. Since the luncheon is not sponsored, the number of tickets will not be limited, so that it will be possible to accommodate all ladies registered at the meeting. Luncheon Price is \$5.00. **Friday**—Arrangements can be made for a visit to the Interior Design Center or to Gompertz Fur Shop and luncheon at an interesting restaurant.

WINTER GENERAL MEETING COMMITTEE: Members of the 1959 Winter General Meeting Committee are: R. T. Weil, Jr., chairman; R. W. Gillette, vice-chairman; J. J. Anderson, secretary; J. R. Kerner, budget co-ordinator and AIEE vice-president for District No. 3; C. T. Hatcher, vice-chairman, Technical Operations Department; J. A. Parrott, public relations; W. T. Rea, general session; D. E. Winslow, hotel accommodations; T. C. Oliver, registration; H. G. Koch, inspection trips; Arvin Grabel, monitors; D. Halloran, smoker; E. J. Doyle, dinner-dance; Mrs. D. M. Quick, ladies' entertainment; D. M. Quick, ex-officio member (past-chairman).

ETA KAPPA NU: A particularly significant event associated with the Winter General Meeting of the American Institute of Electrical Engineers will be held on Monday evening, February 2, 1959. On that night, electrical engineers both young and old will gather to honor Dr. Malcolm R. Currie of Hughes Aircraft Co., recipient of the 1958 Outstanding Young Electrical Engineer Award and Dr. Dudley A. Buck of M.I.T. who received Honorable Mention in this year's selection.

The annual search for the outstanding young electrical engineer is conducted by the Eta Kappa Nu Association, the national electrical engineering honor society. This year's Jury of Award consisted of the following engineering leaders: Chairman, C. H. Linder, Vice-President, General Electric Co.; Larry Dwon, President of Eta Kappa Nu, American Electric Power Service Corp.; A. N. Goldsmith, Consulting Engineer; L. F. Hickernell, President AIEE, Anaconda Wire and Cable Co.; J. A. Hutcheson, Vice-President, Westinghouse Electric Corp.; C. T. Koerner, Past President of Eta Kappa Nu, American Telephone and Telegraph Co.; Haraden Pratt, Secretary, IRE, Dulacx Corp.; R. B. Shank, Vice-President, Hughes Aircraft Co.; and G. J. Taylor, President I.E.S., Daybrite Lighting, Inc.

The annual Eta Kappa Nu award banquet, which by now has become a traditional part of the AIEE Winter General Meeting, has many facets of interest to all members of the electrical engineering profession including the recent graduate as well as the experienced professional. There will be opportunities to renew friendships with your colleagues in the profession as well as to become acquainted with some of the leaders in electrical engineering. At the banquet you will hear remarks by the two men being honored, and in addition, Mr. C. H. Linder, Vice-President of the General Electric Co., widely known for his scientific and engineering accomplishments, will deliver the principal address.

The banquet will be held at the Hotel Governor Clinton, 31st Street and 7th Avenue, New York City. The dinner itself will commence at 7:00 p.m. although it will be preceded by a cocktail hour. All electrical engineers, whether members of Eta Kappa Nu or not, are invited to this important event. Ladies are also cordially invited.

Reservations for the banquet should be mailed to William Levidow, Room 3B-154, Bell Telephone Laboratories, Inc., Whippany, New Jersey. For reservations postmarked on or before January 27, 1959, the cost of the banquet will be \$5.90 per person. For reservations postmarked later, or those made at AIEE Registration Headquarters during the Winter General Meeting, the cost will be \$7.00 per person. Checks or money orders should be made payable to the New York Alumni Chapter, Eta Kappa Nu. Attendance at the banquet is limited and reservations will be accepted in the order received up to the limit of space available.

The **Canadian Breakfast** will be held in the Pennsylvania and Cornell rooms of the Hotel Statler at 7:30 a.m. on Tuesday, February 4th. Price per plate including tax and gratuities will be \$3.75. Ladies Welcome.

Issued by
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
33 West 39th Street, New York 18, N. Y.

PRINTED IN U.S.A.