

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS



FALL GENERAL MEETING



CHICAGO, ILLINOIS
OCTOBER 11-16, 1959



MORRISON HOTEL

GENERAL INFORMATION

For the fifth year, the Fall General Meeting of the AIEE is being held in Chicago. The Meeting Headquarters is again the Morrison Hotel. The social activities, technical sessions and committee meetings occupy the entire facilities of the Morrison during the five day meeting.

At the General Session to be held on Monday afternoon, October 12, the Institute's Medal for outstanding service in Electrical Engineering Education will be awarded to Gordon S. Brown, Dean of Engineering, Massachusetts Institute of Technology. In addition, the initial presentation of the William H. Habirshaw award to William A. Del Mar, Consulting Engineer, Phelps-Dodge Copper Products Corp. and the Morris E. Leeds award to Herbert B. Brooks, Retired, Chief Electrical Instruments Section, National Bureau of Standards, will be made. John G. Duba, the Mayor's Administrative Officer, City of Chicago, will give the welcoming address. President J. H. Foote will respond and Murray Joslin, Vice President in Charge of Engineering, Operating and Construction, Commonwealth Edison Company will give the principal address.

Registration Fees Required. Registration is joint with the National Electronics Conference this year. Those registering for the AIEE may also register for the NEC, if requested at the time of registration, without payment of additional fee. Those registering at NEC may also register for AIEE by payment of difference in registration fee. Registration Fees are \$6.00 for members and \$10.00 for nonmembers. Wives and women guests of members and nonmember registrants are paying a registration fee of \$2.00. Students, children and invited nonmember authors register without fee.

Information on all features may be obtained at the registration desk. Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail are asked to inquire frequently at the mail and registration desk.

Technical Sessions and Discussions are covered by the "Technical Sessions Guide" at the discretion of the presiding officers. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication, discussions on TRANSACTIONS Papers in duplicate must be left with the chairman and/or sent to Edward C. Day, Assistant Secretary, Technical Operations Department, AIEE, 33 West 39th Street, New York 18, New York before October 30, 1959. Discussions received later may not be included, depending upon the printing schedule of the paper to which the discussion is directed. The original typewritten double-spaced copy, together with original illustrations as photographs or inked tracings must be submitted.

Advance Copies of Papers may be purchased by members at the registration desk at the uniform price of \$.50 each (\$1.00 each to nonmembers). Only numbered papers are available. Mail orders, particularly from out-of-town members, are advisable inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon Books in \$10.00 denominations are available for those who wish to avoid remittance by check or otherwise. Mail orders should be addressed to the AIEE Order Department, 33 West 39th Street, New York 18, New York. The TRANSACTIONS Papers will also be published in the Bimonthly Publications. Note: Unnumbered Conference Papers (CP.*) may be available for sale 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.

SCHEDULE OF EVENTS

SUNDAY—OCT. 11

4:00 P.M.

Reception Tea—Cotillion Room

4:00 P.M.

Registration Begins

MONDAY—OCT. 12

9:00 A.M.

High Energy Plasmas and Particles—I

Rotating Machinery

Communication Theory

Protective Devices

Magnetics

Ladies Coffee Hour—Suite 705

1:00 P.M.

Ladies Dessert Card Party

2:00 P.M.

General Session

Perception and Recognition (NEC—Hotel Sherman)

TUESDAY—OCT. 13

8:30 A.M.

Trip to Fisk Station

9:00 A.M.

High Energy Plasmas and Particles—II

Electric Circuit Theory

Rotating Machinery

Transformers

Data Communication

Radio Communication Systems and TV & Aural Broadcasting

Switchgear

11:00 A.M.

Ladies Tour and Luncheon

2:00 P.M.

Industrial and Commercial Power Systems

High Energy Plasmas and Particles—III

Electric Circuit Theory

Rotating Machinery

Transformers

Switchgear

2:45 P.M.

Trip to Commonwealth Edison Dispatching Office

6:30 P.M.

Trip to Hubbard Electrical Research Laboratory

Trip to Hubbard Electrical Research Laboratory

WED.—OCT. 14

8:30 A.M.

Trip to GM Electro-Motive Division

9:00 A.M.

Nuclear Power Reactors—A Status Report—I

Rotating Machinery

Radio Communications Systems

Communication Switching Systems—I

Transmission and Distribution

Power System Communications

Industrial Control

9:30 A.M.

Ladies Brunch and Fashion Show

1:30 P.M.

Trip to Panellit Products Plant

2:00 P.M.

Nuclear Power Reactors—II, Discussion and Symposium of Morning
Session Papers

Applied Mathematics

Rotating Machinery

Communication Switching Systems—II

Telegraph Systems

Transmission and Distribution

Organization of Computer Activities for Electric Utility Engineering

2:15 P.M.

Trip to Chicago and North Western Railroad

6:30 P.M.

Fall Frolics

THURS.—OCT. 15

8:30 A.M.

Trip through Chicago Regional Port District

9:00 A.M.

Nuclear In-Core Instrumentation

Wire Communication

System Engineering Studies by Digital Computers

Mining

Semiconductor Switching Devices and Applications—Part I

Trip to Underwriter's Labs., Inc.

12:15 P.M.

Ladies Art Institute Luncheon

Eta Kappa Nu Luncheon

1:00 P.M.

Trip to Argonne Laboratories

1:30 P.M.

Trip to Automatic Electric Co.

2:00 P.M.

Engineering and Testing of Digital Computers

Wire Communication Systems

Excitation Systems

Mining

Semiconductor Switching Devices and Applications—Part II

FRIDAY—OCT. 16

9:00 A.M.

Logical Design of Digital Computers

Relays and System Engineering

New Computational Techniques in System Engineering—I

Feedback Control Systems

2:00 P.M.

Application and Theory of Computers and Computer Circuits

Relays

New Computational Techniques in System Engineering—II

Safety

MONDAY—OCT. 12

9:00 A.M.

COTILLION ROOM

Chairman:

W. F. Gauster, Oak Ridge National Laboratory

Sponsor:

Nucleonics Committee

9:00 A.M.

MADISON ROOM

Chairman:

R. C. Moore, Allis Chalmers Mfg. Co.

Sponsor:

Rotating Machinery Committee

9:00 A.M.

Room 427-432

Chairman:

R. L. Shuey, General Electric Co.

Sponsor:

Communication Theory Committee

9:00 A.M.

VENETIAN ROOM

Chairman:

H. R. Armstrong, Detroit Edison Co.

Sponsor:

Protective Devices Committee

TECHNICAL PROGRAM

HIGH ENERGY PLASMAS AND PARTICLES—I

- CP.* Modern Magnetic Accelerators. H. S. Snyder, Brookhaven National Laboratory.
- CP.* The Quest For Thermonuclear Power. R. G. Mills, Princeton University.
- CP.* Electric Space Propulsion. J. C. Evvard, National Aeronautics and Space Administration.

ROTATING MACHINERY

- 59-683. The Polyphase Induction Machine With Solid Iron Rotor. III N. Kesavamurthy and P. K. Rajagopalan, Indian Institute of Technology (Re-presented for Discussion only.)
- 59-131. Synthesis of Induction Motor Designs on a Digital Computer. III C. G. Veinott, Reliance Electric and Engineering Co. (Re-presented for Discussion only.)
- 59-1098. Equations for Induction Motor Slip. V. B. Honsinger, Allis-III Chalmers Mfg. Co.
- CP59-1134. Equivalent Circuit and Performance Prediction of the Double-Cage Induction Motor. M. N. Abdel-Hamid, Cairo University.

COMMUNICATION THEORY

- CP.* A Class of Multiple-Error-Correcting Binary Codes for Non-Independent Errors. P. Fire, Sylvania Electronics Systems.
- CP59-1076. On The Transmission of Information by Orthogonal Time Functions. H. F. Harmuth, Stromberg-Carlson Co.
- 59-1144. Network Responses To Transient FM Inputs. T. T. N. I Bucher, Radio Corp. of America.
- 59-1145. Effects of Nonlinearity On Propagation In Ionized Media. I G. I. Cohn, Illinois Inst. of Technology.
- 59-1146. Asynchronous Multiplexing. J. E. Taylor, General Electric I Co. (Re-presented for Discussion only.)

PROTECTIVE DEVICES

- 59-1100. Surge Protection of Unit-Connected Generators. K. H. Chang, III Devenco, Inc. and T. B. Thompson, Arizona State University.
- 59-1096. The International Standardization of Lightning Arresters. III H. R. Armstrong, Detroit Edison Co.; E. Beck, Westinghouse Electric Co.; G. F. Lincks, General Electric Co.
- CP59-1196. Lower Cost, Improved Standardization Procedure as Developed for Lightning Arresters. G. F. Lincks, General Electric Co.
- CP.* Field and Laboratory Testing of Valve-Type Lightning Arresters. R. C. Curto, Detroit Edison Co.
- 59-1101. Report on Field Experience With Aerial Power Cable. III Working Group of the Lightning Protective Devices Subcommittee of the Protective Devices Committee, H. O. Stoelting, Chairman.

MON. (Continued)

9:00 A.M.

HOLLYWOOD ROOM

Chairman:

V. E. Legg, Bell Telephone Laboratories

Sponsor:

Basic Sciences Committee

2:00 P.M.

GRAND BALLROOM

Chairman:

F. A. Cox, General Electric Co.

2:00 P.M.

HOTEL SHERMAN

Sponsor:

Communication Theory Committee

MAGNETICS

- 59-1117. Effects of Ultra High Temperature on Magnetic Properties I of Core Materials. M. Pasnak and R. Lundsten, U. S. Naval Ordnance Lab. (Re-presented for Discussion only.)
- 59-1204. The Effect of Flux Distribution on Iron Losses. M. Schindler, I Radio Corp. of America.
- 59-1187. Some Multihorned Dilemmas in the Magnetic Field. F. Av- I cin, University of Ljubljana.
- 59-1188. On Expressions of Magnetic Hysteresis Characteristics. S. III Ohteru, Waseda University.
- 59-1120. Relation between Permanent Magnet Configuration and per- I formance. P. P. Cioffi, Bell Telephone Labs., Inc.

GENERAL SESSION

Chicago Section Chairman, F. A. Cox, Presiding.

WELCOME: John G. Duba, Mayor's Administrative officer, City of Chicago.

ADDRESS: President J. H. Foote.

Presentation by S. Reid Warren, Jr. of:

- 1) The Institute's Medal for outstanding service in Electrical Engineering Education to Gordon S. Brown, Dean of Engineering, Massachusetts Institute of Technology.
- 2) The William M. Habirshaw Award to William A. Del Mar, Consulting Engineer, Phelps-Dodge Copper Products Corp.
- 3) The Morris E. Leeds Award to Herbert B. Brooks, Retired, Chief Electrical Instruments Section, National Bureau of Standards.

ADDRESS: Murray Joslin, Vice-President in charge of Engineering, Operating and Construction, Commonwealth Edison Co.

PERCEPTION AND RECOGNITION (NEC)

- CP.* Digital Simulation in Perceptual Research. E. E. David, Bell Telephone Labs.
 - CP.* Networks for Gestalt Perception. P. Greene, University of Chicago.
 - CP.* An Electronic Device to Measure the Intelligibility of Speech. J. C. R. Licklider, A. Bisberg and H. Schwartzlander; Bolt, Beranek and Newman, Inc.
 - CP.* Image Simulation and Interpretation. G. L. Meyers, Astro Electronics Products.
- A Review of the Perceptron Program. A. E. Murray, Cornell Aeronautical Lab.

TUESDAY—OCT. 13

9:00 A.M.
COTILLION ROOM

Chairman:
R. S. Livingston, Oak Ridge National Laboratory

Sponsor:
Nucleonics Committee

9:00 A.M.
EAST ROOM ONE

Chairman:
D. K. Reitan, University of Wisconsin

Sponsor:
Basic Sciences Committee

9:00 A.M.
EAST ROOM TWO

Chairman:
M. R. Lory, Westinghouse Electric Corp.

Sponsor:
Rotating Machinery Committee

9:00 A.M.
HOLLYWOOD ROOM

Chairman:
C. W. Miller, Westinghouse Electric Corp.

Sponsor:
Transformers Committee

HIGH ENERGY PLASMAS AND PARTICLES—II

- CP.* Principles of the Power Supply of a 12.5 Bev Proton Synchrotron. G. O. Calabrese, Argonne National Laboratory.
- CP.* The Brown Boveri Betatron For Cancer Therapy and Material-Testing. M. Sempert, Brown Boveri and Co., Ltd.
- CP.* Sector Focused Cyclotrons. H. G. Blosser, Michigan State University.
- CP.* Electrical Power for an Alternating Gradient Synchrotron. E. E. Shelton, Brookhaven National Laboratory.

ELECTRIC CIRCUIT THEORY

- 59-1179. Two-Oscillatory Scan Stability. H. M. Joseph. The Johns Hopkins University.
- 59-1180. The General Form of Some Common Network Theorems. I C. Adamson and S. M. El-Sobki, Manchester College of Science and Technology.
- CP.* Some Aspects of Singular Case of Parallel Resonance. P. E. Shields, The Pennsylvania State University.
- 59-1186. Subarea Determination of the Capacitance of Cocentric Annular-Plate Capacitors. D. K. Reitan and T. J. Higgins, The University of Wisconsin.
- 59-111. Capacitance of Parallel Rectangular Cylinders. J. D. Horgan, I Marquette University. (Re-presented for Discussion only.)

ROTATING MACHINERY

- 59-1095. Voltage Harmonics of Salient-Pole Generators Under Balanced Three-Phase Loads, Part I. D. Ginsberg, U. S. Army Research & Development Labs and A. L. Jokl, Continental Motors Corp.
- 59-567. Dynamic Circuit Theory. H. K. Messerle, University of Sydney. (Re-presented for Discussion only.)
- 59-1135. Reduction of Error and Null Voltage in Synchro Control III Systems. C. Lang, Kearfott Co., Inc. and C. Smith, Servo Dynamics.

TRANSFORMERS

- 59-1169. A New Approach to the Analysis of Impulse Voltages and III Gradients in Transformer Windings. L. Rabins, General Electric Co.
- CP.* Pseudo-Final Voltage Distribution in Impulsed Coils and Windings. P. A. Abetti, General Electric Co.
- 59-1170. Transformer Impedance Matching. G. W. Iliff and F. A. III Allehoff, U. S. Dept. of Interior, Bonneville Power Administration.

TUES. (Continued)

9:00 A.M.
Room 427-432

Chairman:
W. K. MacAdam, American Telephone & Telegraph Co.

Sponsor:
Data Communication Committee

9:00 A.M.
MADISON ROOM

Chairman:
C. E. Smith, Smith Electronics, Inc.

Sponsor:
Radio Communication Systems and TV & Aural Broadcasting Committees

9:00 A.M.
VENETIAN ROOM

Chairman:
C. E. Asbury, Commonwealth Assoc., Inc.

Sponsor:
Switchgear, Substations & Power Generation Committees

2:00 P.M.
Room 427-432

Chairman:
J. A. Hart, General Motors Corp.

Sponsor:
Industrial & Commercial Power Systems Committee

DATA COMMUNICATION

- 59-1106. An Error-Detection System for 5-Unit-Code Teletypewriter I Transmission. P. H. Barry, Teletype Corp. and A. L. Whittman, Bell Telephone Labs., Inc.
- 59-1147. Detection of Transmission Errors in 5-Level Punched Tape. I R. Steeneck and H. F. Caley, Western Union Telegraph Co.
- 59-1093. Data Processing as a Tool for Generalizing Communications I Systems. W. F. Luebbert, U. S. Army Signal Research and Development Lab.
- CP.* Parallel Transmission DATA-PHONE Subnet. M. A. Flavin, Bell Telephone Labs.
- CP.* Automatic Order Handling Using Low-Cost DATA-PHONE. L. L. Sevebeck and P. J. Grunfelder, Western Electric Co.

RADIO COMMUNICATION SYSTEMS AND TV & AURAL BROADCASTING

- CP.* A Microwave Radio Relay System with Demodulating Repeaters for Television and Multiplexed Telephony. J. J. Clarke, Radio Corporation of America.
- CP.* Solid State Lighting Equipment. A. W. Malang, American Broadcasting Co.
- CP.* A Transistorized Television Receiver. C. F. Otis, Philco Corp.
- CP.* The National Stereophonic Radio Committee. C. G. Lloyd, General Electric Co.

SWITCHGEAR

- CP59-1166. Induced Currents in Supporting Steel for a 10,000 Ampere Generator Open Bus. G. K. Sebold, Public Service Electric and Gas Co.
- 59-1124. Practical Solutions of Inductive Heating Problems Resulting III From High Current Buses. N. Swerdlow, General Electric Co. and M. A. Buchta, Gilbert Associates, Inc.
- 59-513. Experience With Methods of Extending the Capability of High III Voltage Air Break Switches. E. C. Rankin, Appalachian Electric Power Co. (Re-presented for Discussion only.)
- CP.* Current Limiting Characteristics of a High Interrupting Capacity Cutout. R. P. Bridges and R. D. Okerberg, Hubbard and Company.

INDUSTRIAL AND COMMERCIAL POWER SYSTEMS

- CP.* Electrical Thinking in the Pharmaceutical Industry. L. E. Fickle, Eli Lilly & Co.
- CP59-1182. Matching Metalclad Switchgear to High-Voltage Industrial and Commercial Building Requirements. C. H. Baker and J. J. Mikos, S & C Electric Co.
- CP59-1116. Overcurrent Protection for Industrial Power Systems. D. V. Fawcett, Canadian Westinghouse Co. Ltd.
- CP59-1154. Electrical Record Drawings—Reams of Paper or Concise Up-To-Date Information. G. L. Frank, Polymer Corp. Ltd.

TUES. (Continued)

2:00 P.M.

COTILLION ROOM**Chairman:**

R. G. Mills, Princeton University

Sponsor:

Nucleonics Committee

2:00 P.M.

EAST ROOM ONE**Chairman:**

T. J. Higgins, University of Wisconsin

Sponsor:

Basic Sciences Committee

2:00 P.M.

MADISON ROOM**Chairman:**

L. O. Dorfman, Sanderson & Porter

Sponsor:

Rotating Machinery Committee

HIGH ENERGY PLASMAS AND PARTICLES—III

- CP59-1195. The Model C Stellarator Facility. N. W. Mather, R. G. Mills and J. G. Murray, Princeton University.
- CP.* Some Basic Concepts for Magnet Coil Design. W. F. Gauster, Oak Ridge National Lab.
- CP.* Design of a Twelve Mega Joule Capacitor Energy Storage Bank. E. L. Kemp and T. M. Putnam, U. C. Los Alamos Scientific Lab.
- CP.* The Electrical System for the Astron Injector. F. Voelker, U. C. Radiation Lab.
- CP.* Mega Joule Energy Sources for 10^{10} Watt Pulses. H. W. Van Ness, U. C. Radiation Lab.
- CP.* Transformer Design for Toroidal Discharge Systems. R. Caruthers, United Kingdom Atomic Energy Authority.

ELECTRIC CIRCUIT THEORY

- 59-1090. Criteria and Tests for Realizability of the Inductance Matrix. I Y. Tokad and M. B. Reed, Michigan State University.
- 59-1136. Electronic Network Synthesis of Linear Algebraic Matrix I Equations. R. E. Horn, Westinghouse Electric Corp. and P. M. Honnell, Washington University.
- CP59-1202. Switching Circuit Synthesis by Transmission Matrix Manipulation. C. A. Stapleton, The University of New South Wales.
- CP.* Transient Analysis of Discrete Electric Networks by Two-Sided Dirichlet Transforms. T. J. Higgins and M. Chen, University of Wisconsin.
- CP59-1185. Solution of D.C. Rotating Machinery Problems by the Block Diagram Method. H. Harrison, The New South Wales University of Technology and S. Hariharan, Trivandrum, India.

ROTATING MACHINERY

- CP59-1083. Functional Evaluation of High Voltage Turbine Generator Insulation Using a Generette Core Model. E. A. Boulter, General Electric Co.
- 59-976. A Variable-Speed Reversible Drive Using an Induction Motor. III G. Hausen, P. P. Biringer and G. R. Slemmon, University of Toronto. (Re-presented for Discussion only.)
- 59-651. An Unusual Method for Replacing a Rotor Spider in a Water Wheel Generator. W. R. Small, Jr., Pennsylvania Power and Light Co. and P. M. Bell, Westinghouse Electric Corp. (Re-presented for Discussion only.)

TUES. (Continued)

2:00 P.M.

HOLLYWOOD ROOM**Chairman:**

C. H. Bjorquist, Bonneville Power Administration

Sponsor:

Transformers Committee

2:00 P.M.

VENETIAN ROOM**Chairman:**

J. B. Owens, I-T-E Circuit Breaker Co.

Sponsor:

Switchgear Committee

WED.—OCT. 14

9:00 A.M.

COTILLION ROOM**Chairman:**

A. Y. Taylor, Jackson & Moreland, Inc.

Sponsor:

Nucleonics & Power Generation Committees

9:00 A.M.

MADISON ROOM**Chairman:**

J. E. Williams, University of Illinois

Sponsor:

Rotating Machinery Committee

TRANSFORMERS

- 59-1167. Internal Fault Characteristics of Gas Insulated Transformers. III G. Camilli, L. G. Littlejohn and W. A. Wooldridge, General Electric Co.
- 59-1168. Tank Pressures Resulting from Internal Explosions. R. J. III Ringlee and N. W. Roberts, General Electric Co.
- CP59-1133. Phase-Isolated LTC Transformers. F. P. Kaspar, Oklahoma Gas & Electric Co. J. S. Holtzinger and G. A. Wilson, Pennsylvania Transformer Co.

SWITCHGEAR

- CP.* The Effect of Current Chopping in Circuit Breakers on Networks and Transformers—I. Theoretical Considerations. T. H. Lee, General Electric Co.
- CP.* The Effect of Current Chopping in Circuit Breakers on Networks and Transformers—II. Experimental Techniques and Investigations. A. N. Greenwood, General Electric Co.
- CP.* Modern Instrumentation in a Short Circuit Research Laboratory. E. F. Veverka and G. H. Manke, Line Material Industries.
- 59-1150. Contact Erosion on a Capacitor Switch. V. E. Phillips, J. C. III Sofianek and A. L. Streater, General Electric Co.

NUCLEAR POWER REACTORS—A STATUS REPORT—I

- 59-1132. Designs for Large Organic Reactor Power Plants. G. H. I Bosworth, Bechtel Corp. and W. E. Parkins, Atomics International.
- CP.* Boiling Water Reactor Power Plants. L. F. C. Reichle, Ebasco Services and W. A. Hartman, General Electric Co.
- CP.* Nuclear Superheat Reactor Study. J. West, General Nuclear Engineering Corp.
- 59-1155. A Design Study of Heavy Water Moderated Power Reactors. III F. W. McCloska and C. A. Hatstat, Sargent & Lundy.
- CP.* Status of PWR Reactor Concepts and Summary. D. Coburn, Atomic Energy Commission.

ROTATING MACHINERY

- 59-1137. The Calculation of Shaded Pole Motor Performance by the III Use of a Digital Computer. G. H. Sherer and G. E. Herzog, Westinghouse Electric Corp.
- 59-1138. The Theory and Design of a Very Slow Speed Reluctance III Motor. C. H. Lee, Monroeville, Pa.
- CP59-1139. Analysis of Series Generator Series Motor Drive. R. W. Jones and A. U. Meyer, Northwestern University.
- 58-1279. Iron Loss Calculations on Fractional Horsepower Induction III Motors. P. H. Trickey, Wright Machinery Co. (Re-presented for Discussion only.)

WED. (Continued)

9:00 A.M.

GRAND BALLROOM**Chairman:**

D. Talley, General Telephone Svc. Corp.

Sponsor:

Radio Communication Systems Committee

9:00 A.M.

Room 427-432

Chairman:

H. F. May, Bell Telephone Laboratories

Sponsor:

Communication Switching Systems Committee

9:00 A.M.

VENETIAN ROOM**Chairman:**

J. K. Dillard, Westinghouse Electric Corp.

Sponsor:

Transmission and Distribution Committee

9:00 A.M.

EAST ROOM ONE**Chairman:**

E. W. Kenefake, General Electric Co.

Sponsor:

Power System Communications Committee

RADIO COMMUNICATIONS SYSTEMS

CP59-1242 Coordination of Microwave Stations in Congested Areas. B. A. Haynes, Pacific Tel. & Tel. Co.

59-1148. The Challenge of Universal Mobile Communications. A. F. I Culbertson, Lenkurt Electric Co., Inc.

CP59-1088. Utilities Radio Regulation and Technical Advances. J. C. Slothower, Northern States Power Co.

CP59-1194. Intermodulation Testing of Multi-Channel Radio Systems. M. E. Ferguson, Lenkurt Electric Co.

59-1085. A Circular Polarization Duplexer for Millimeter Waves. I R. G. Fellers, University of South Carolina. (Re-presented for Discussion only.)

59-1091. Considerations in SSB/ISB Systems for Long Distance Radiotelegraph Communications. W. Lyons, R.C.A. Communications, Inc.

COMMUNICATION SWITCHING SYSTEMS—I

59-1160. A Comparison of Sequential and Iterative Circuits. E. J. I McCluskey, Jr., Bell Telephone Labs., Inc.

CP.* A Ferrite Core Distributor and Memory System for a Small Electronic Telephone Switching System. P. E. Osborn, General Telephone Labs., Inc.

CP59-1131. Restrictors for Controlling Direct Distance Dialing Calls. C. W. Freeman, North Electric Co.

58-1243. A New Small Crossbar Telephone System for P.B.X.'s. H. H. I Abbott, Bell Telephone Labs.

TRANSMISSION AND DISTRIBUTION

CP.* Another Look at Distribution Transformer Loss Ratios. K. W. Klein, The Cleveland Electric Illuminating Co.

CP59-1087. Distribution System Conversion to 4160 Volts. L. H. Herendeen, Jackson & Moreland, Inc.

59-1174. Distribution Secondary Conductor Economics. A. S. Anderson and V. A. Thieman, Ebasco Services, Inc. (Re-presented for Discussion only.)

CP.* A New Concept in Capacitor Design. E. G. Hammer and G. A. Rynders, Line Materials Industries.

59-1162. The Effect of Elevated Temperatures on Flash-Welded Aluminum-Copper Joints. C. R. Dixon, Alcoa Process Development Labs. and F. G. Nelson, Alcoa Research Labs. (Re-presented for Discussion only.)

POWER SYSTEM COMMUNICATIONS

59-1099. Microwaves and Their Use In Power Systems. S. C. Bartlett, I American Electric Power Service Corp.

WED. (Continued)

9:00 A.M.

HOLLYWOOD ROOM**Chairman:**

E. E. Moyer, Acme Electric Co.

Sponsor:

Industrial Control Committee

2:00 P.M.

COTILLION ROOM**Chairman:**

H. E. Vann, Atomic Energy Commission

Sponsor:

Nucleonics and Power Generation Committees

2:00 P.M.

EAST ROOM ONE**Chairman:**

J. A. Strelzoff, Michigan State University

Sponsor:

Basic Sciences Committee

2:00 P.M.

MADISON ROOM**Chairman:**

F. W. Brandt, Ebasco Services, Inc.

Sponsor:

Rotating Machinery Committee

INDUSTRIAL CONTROL

CP59-1097. Fuseless Starters with 100,000 KVA and 150,000 KVA Interrupting Rating for 2300 Volt and 4600 Volt Motors. C. A. Lister, Square D Company.

CP.* A Package Control System for Wide Speed Range Shipboard Cargo Winch. G. H. Piethe and R. S. Hamby, Reliance Electric and Engineering Co.

CP.* Dynamic Positioning System as Applied to a Radar Antenna. G. O. Pfeffer and F. G. Auch, Reliance Electric and Engineering Co.

CP59-1171. A Straight Forward Design Method of a Thyatron D.C. Motor System. R. Cosaert, University of Toronto.

59-1112 Proposed Recommended Practices for Medium-voltage Motor II Controllers for Rubber and Plastic Industries. W. S. Watkins, The Ohio Rubber Co.

NUCLEAR POWER REACTORS—II, DISCUSSION AND SYMPOSIUM OF MORNING SESSION PAPERS**APPLIED MATHEMATICS**

59-1086. The A.C. Resistance of Solid Magnetic Wires. M. Kamal I Gohar, Cairo, Egypt.

59-1102. Conducting Sphere in Alternating Magnetic Fields. H. Poritsky, General Electric Co.

59-1128. The Computation of Correlation and Spectral Functions by I Orthogonal Filtering. E. G. Gilbert, University of Michigan.

CP59-1189. The Generalization of Thevenin's Theorem, and its Application to the Analysis and Representation of Large Networks. C. Adamson and B. D. Nellist, The Manchester College of Science and Technology.

ROTATING MACHINERY

59-1114. An Analysis of Solid Rotor Machines—I: Operational Impedances and Equivalent Circuits. A. J. Wood, Hughes Aircraft Co. formerly with General Electric Co.

59-1115. An Analysis of Solid Rotor Machines—II: The Effects of III Curvature. A. J. Wood, Hughes Aircraft Co., formerly with General Electric Co. and C. Concordia, General Electric Co.

59-1121. Synchronous Machine with Solid Cylindrical Rotor—Part II. III C. Concordia, General Electric Co.

CP59-1082. Synchronous Motors with Permanent Magnets and Quadrature Flux Barriers. J. F. H. Douglas, Marquette University.

59-1140. Short Circuit Torques in Turbine Generators. P. I. Nippes, III Carrier Corp.

WED. (Continued)

2:00 P.M.
Room 427-432

Chairman:
C. F. Ffolliott, General Telephone Laboratories, Inc.

Sponsor:
Communication Switching Systems Committee

2:00 P.M.

HOLLYWOOD ROOM

Chairman:
F. W. Smith, Western Union Telegraph Co.

Sponsor:
Telegraph Systems Committee

2:00 P.M.

VENETIAN ROOM

Chairman:
H. A. Frey, General Electric Co.

Sponsor:
Transmission & Distribution Committee

2:00 P.M.

GRAND BALLROOM

Chairman:
P. L. Dandeno, Hydro Electric Power Commission of Ontario

Sponsor:
System Engineering Committee

COMMUNICATION SWITCHING SYSTEMS—II

- CP.* Reconditioning a Water Damaged P.B.X. R. E. Lindholm and J. L. Preston, Illinois Bell Telephone Co.
- CP58-1244. Mobile Telephone Switching Equipment. L. F. Bernhard and E. N. Duff, Illinois Bell Telephone Co.
- CP.* Electronic P.A.B.X. Equipment Utilizing Parametrons and Transistors. K. Toyoda, Fuji Tsushinki Seizo K.K.
- CP.* Private Telephone Exchanges with Push Button Selection and Minimized Maintenance. J. L. de Kroes, N. V. Philips Telecommunicatie Industrie.

TELEGRAPH SYSTEMS

- 59-1111. Design Features of a New Frequency Shift Carrier Telegraph I System. M. L. Stephens, Lenkurt Electric Co., Inc.
- 59-1107. Application of a New Carrier Telegraph System. T. B. I Collins, Jr., Automatic Electric Sales and J. E. Pitts, Lenkurt Electric Co.
- 59-1105. A Small Automatic Teletypewriter Switching System. E. R. I Shimmin, Pacific Tel. & Tel. Co.; R. A. Vanderlippe and A. L. Whitman, Bell Telephone Labs., Inc.
- CP.* Eddy Current Speed Control For Facsimile Telegraph Apparatus. H. F. Burroughs, The Western Union Telegraph Co.
- 58-1143. A Character-Metered Transatlantic Switching System. I. S. I Coggeshall and P. Holcomb, Jr., The Western Union Telegraph Co. (Re-presented for Discussion only.)

TRANSMISSION AND DISTRIBUTION

- 59-1178. The Teinograph—A New High-Voltage Surge Recorder. J. III G. Anderson and R. U. Giacomoni, General Electric Co.
- 59-1142. Determination of Lightning Response of Transmission Lines III By Means of Geometrical Models. F. A. Fisher, J. G. Anderson and J. H. Hagenguth, General Electric Co.
- 59-1122. Ice Build-Up on Conductors of Different Diameter. E. K. III Lancot and H. E. House, Aluminum Co. of America; E. L. Peterson and E. S. Zobel, American Electric Power Service Corp.
- CP59-1089. Digital Complex Arithmetic Analysis of Power System Problems. A. J. Wood, Hughes Aircraft Co. formerly with General Electric Co.
- CP.* Bibliography on Extra-High-Voltage Systems—First Supplement. P. A. Abetti, General Electric Co.

ORGANIZATION OF COMPUTER ACTIVITIES FOR ELECTRIC UTILITY ENGINEERING

- CP.* Organizing to Use Computers. H. N. Cantrell, General Electric Co.
- CP.* Practicability of Computer Usage for Utility Engineering. L. L. Coombe, The Detroit Edison Co.
- CP59-1197. Some Experiences in System Engineering Computing. R. J. Brown, U. S. Dept. of the Interior, Bonneville Power Administration.
- CP.* Computer Problem Analysis. R. Bruce Shipley, Tennessee Valley Authority.

THURS.—OCT. 15

9:00 A.M.

HOLLYWOOD ROOM

Chairman:
J. M. Harrer, Argonne National Laboratory

Sponsor:
Nucleonics & Radiation Instruments and Nucleonics Committees

9:00 A.M.

Room 427-432

Chairman:
J. B. Eppes, Jr., Rural Electrification Adm.

Sponsor:
Wire Communication Committee

9:00 A.M.

COTILLION ROOM

Chairman:
J. A. Smith, General Electric Co.

Sponsor:
Substations Committee

NUCLEAR IN-CORE INSTRUMENTATION

- CP59-1141. In-core Ion Chambers for Reactor Safety and Control. L. R. Boyd, General Electric Co.
- 59-1184. Delayed Neutron Detection Methods Applied to the Detection and Location of Reactor Fuel Element Failures. R. A. Dewes and J. C. Childs, General Electric Co.
- CP59-1110. Three-Dimensional Flux Distribution Measurements in a Power Reactor. J. C. Childs and E. B. Fehr, General Electric Co.
- CP.* Design Approach to a Miniature Ion Chamber. E. B. Hubbard, General Electric Co.
- CP59-1198. Methods of Improving In-Core Temperature, Flow and Pressure Measurements. J. A. McCann, General Electric Co.
- CP.* Design of Neutron Sensitive Thermopiles. D. Robertson, Leeds & Northrup Co.
- CP.* Small Fission Chamber Suitable for Reactor Flux Mapping in the Interior of the Core. G. Bouricius, General Electric Co.
- CP59-1199. Performance of In-core Neutron Thermopiles for Power Reactors. K. E. Watkins, General Electric Co.

WIRE COMMUNICATION

- 59-1175. Transistorized Multi-Frequency Ringing Generator. J. F. I Kostelich and B. W. Howald, Lorain Products Corp.
- CP.* An All-Transistorized Trunk Carrier System. F. H. Gardner, Stromberg-Carlson.
- CP.* A Transistorized Repeater for the K31 Rural Subscriber Carrier System. W. S. Woods, Kellogg Switchboard and Supply Co. and A. R. Denz, ITT Laboratories.
- 59-1104. The K24A Syncroplex Telephone Carrier System. B. G. Coetsee, G. L. Curtis and J. W. Halina, ITT Laboratories (Re-presented for Discussion only.)

SUBSTATIONS

- CP59-1205. Large Downtown Substation. M. L. Byrne, Potomac Electric Power Co.
- 59-1126. New Distribution Substation for Direct 230 KV to 12 KV III Transformation on the B. C. Electric Company System. M. B. Callander, B. C. Engineering Co., Ltd.
- 59-1084. Automatically Programmed Remote Indication Logging for III Use With Supervisory Equipment. G. E. Guy and P. W. Schirmer, General Electric Co.
- CP59-1201. Ground Electrode Potential Gradients From Model Tests. H. R. Armstrong and L. J. Simpkin, Detroit Edison Co.

THURS. (Continued)

9:00 A.M.

GRAND BALLROOM*Chairman:*

J. B. Ward, Pacific Power & Light Co.

Sponsor:

System Engineering Committee

9:00 A.M.

MADISON ROOM*Chairman:*

R. M. Buckeridge, Goodman Mfg. Co.

Sponsor:

Mining Industry Committee

9:00 A.M.

VENETIAN ROOM*Chairman:*

H. W. Henkels, Westinghouse Electric Corp.

Sponsor:

Semiconductor Metallic Rectifier Committee

2:00 P.M.

GRAND BALLROOM*Chairman:*

G. L. Hollander, Philco Corp.

Sponsor:

Computing Devices Committee

SYSTEM ENGINEERING STUDIES BY DIGITAL COMPUTERS

59-1081. A New Method of Making Transmission Loss Formulas Directly From Digital Power Flow Studies. E. E. George, Ebasco Services, Inc.

CP.* Machine Processing of Data for DC and AC Digital Load Flow Studies. H. D. Hurlless and W. G. Hegg, Bonneville Power Administration.

59-1092. Convergence of Iterative Load-Flow Studies. J. E. Van Ness, III Northwestern University.

59-1127. Transient Stability Studies—III Improved Computational III Techniques. L. J. Rindt, R. W. Long, R. T. Byerly, Westinghouse Electric Corp.

MINING

CP.* A Review of Open Pit Mine Power Distribution Practices. R. B. Bennett and M. A. Neslin, General Electric Co.

CP.* Power Shovel Generator Excitation Systems. D. E. Barber, Bucyrus-Erie Co.

CP59-1173. Mining With A-C Power In Dosco Mines. J. J. Laffin, Dominion Steel and Coal Corp., Ltd.

CP.* Remote Control of Underground Mining Machinery. F. R. Hugus, Joy Mfg. Co.

SEMICONDUCTOR SWITCHING DEVICES AND APPLICATIONS—PART I

CP.* Factors in the Design and Application of Static Power Converters. R. P. Putkovich, Westinghouse Electric Corp.

59-1203. Ultrasonic Frequency Power Generator Using Transistors. I Yin-Min Wei, Westinghouse Electric Corp.

CP.* High Power Static Frequency Changers. J. F. Boesel, Jr. and A. F. Relation, Westinghouse Electric Corp.

CP.* Controlled Rectifier Frequency Multipliers. C. W. Flairty and B. D. Bedford, General Electric Co.

ENGINEERING AND TESTING OF DIGITAL COMPUTERS

CP59-1123. An Algorithm for Determining Minimal Normal Forms of an Incomplete Truth Function. T. H. Mott, Jr., RCA Labs.

CP59-1129. An Approach to the Simulation of Computer Logic. R. C. Baldwin, Burroughs Corp.

CP59-1190. A Magnetic Tape-to-Paper Tape Converter. M. Ringer and L. Mintzer, Minneapolis-Honeywell Regulator Co.

CP59-1172. Geometrical Positioning of Circuit Elements in a Computer. U. R. Kodres, IBM Corp.

THURS. (Continued)

2:00 P.M.

Room 427-432

Chairman:

J. N. Petrie, Automatic Electric Co.

Sponsor:

Wire Communication Systems Committee

2:00 P.M.

COTILLION ROOM*Chairman:*

M. Temoshok, General Electric Co.

Sponsor:

Power Generation Committee

2:00 P.M.

MADISON ROOM*Chairman:*

R. S. James, U. S. Bureau of Mines

Sponsor:

Mining Industry Committee

2:00 P.M.

VENETIAN ROOM*Chairman:*

H. P. Weirich, Fansteel Metallurgical Corp.

Sponsor:

Semiconductor Metallic Rectifiers Committee

WIRE COMMUNICATION SYSTEMS

59-509. A Transposition System for Carrier Systems Up to 156 KC. I B. M. Kirkland, Southern Bell Tel. & Tel. Co.

CP.* Effects of Cable Irregularities on the Operation of Telephone Repeaters. S. I. McCaron, General Telephone Company of California.

CP.* Telephone Circuit and Equipment Impedances as They Affect Transmission Performance. P. F. Radue, Automatic Electric Co.

CP.* A Voice Band Transmission Measuring Set Using Swept-Band Techniques. W. C. Lent, Hallamore Electronics Co.

EXCITATION SYSTEMS

59-1113. An Electric Utility Brushless Excitation System. E. C. Whitney, D. B. Hoover, P. O. Bobo, Westinghouse Electric Corp.

59-1108. Analytical Studies of the Brushless Excitation System. R. W. III Ferguson, R. Herbst and R. W. Miller, Westinghouse Electric Corp.

59-1109. New Instrument Systems for Recording Turbine Speed, Eccentricity. Expansion and Vibration. H. A. Harriman and D. M. Longenecker, General Electric Co.

CP.* A New Excitation System for Turbine Generators. W. F. Eagan and W. L. Ringland, Allis-Chalmers Mfg. Co.

MINING

CP.* Electrical Systems for Modern Coal Preparation Plants. A. L. Reed, Allen & Garcia Co.

CP.* Progress Toward On-Line Analysis of Raw Materials. W. F. Loranger, General Electric Co.

CP.* Electric Motor Maintenance & Field Testing. L. L. Lipanye, Reliance Elec. & Engineering Co.

CP.* Portable Silicon Rectifiers for Mining Service. W. A. Hodgson, R. G. Clark and P. H. Westermeyer, Westinghouse Electric Corp.

SEMICONDUCTOR SWITCHING DEVICES AND APPLICATIONS—PART II

CP59-1292. Trinistor A-C Switch. E. Petrocelli, Westinghouse Electric Corp.

CP.* Application of Controlled Semiconductors in the Paper Industry. J. D. Grady, Oxford Paper Co. and R. I. Goodwin, General Electric Co.

CP.* Performance of Semiconductor Rectifiers in a Pulse Radiation Environment. N. F. Bechtold, U. S. Army Signal Research and Development Laboratory.

CP59-1200. Proposed Definitions for Semiconductor Rectifier Components and Equipments. AIEE Rectifying Devices W.G. of the Service Subcommittee of the Semiconductor Metallic Rectifiers Committee, J. R. Thurell, Chairman.

FRIDAY—OCT. 16

9:00 A.M.

MADISON ROOM*Chairman:*R. M. Kalb, Remington
Rand UNIVAC*Sponsor:*Computing Devices
Committee

9:00 A.M.

COTILLION ROOM*Chairman:*H. C. Barnes, American
Electric Power
Service Corp.*Sponsor:*Relays and System
Engineering
Committees

9:00 A.M.

VENETIAN ROOM*Chairman:*E. S. Loane, General
Public Utilities Corp.*Sponsor:*System Engineering and
Power Generation
Committees**LOGICAL DESIGN OF DIGITAL COMPUTERS**

- CP59-1119. Automatic Synthesis of Multi-Function Networks. T. C. Bartee, Massachusetts Inst. of Technology.
- CP59-1191. Algorithms for Logical Design. A. E. Randlev, J. P. Roth and E. C. Wagner, IBM Research Center.
- 59-1192. Simultaneous Logical Equations (Matrix Logic IV). E. J. Schubert, Monitor Systems, Inc.
- CP.* Simplification of Logic Functions Containing a Large Number of Variables. T. W. Sze, University of Pittsburgh.

RELAYS AND SYSTEM ENGINEERING

- 59-1163. Recent Practices and Trends in Protective Relaying. Survey of Practices Subcommittee of the Relays Committee, H. J. Sutton, Chairman.
- 59-1164. Digital Solution of Short Circuit Currents for Networks Including Mutual Impedances. A. L. Toalston, Commonwealth Associates, Inc.
- CP59-1206. Application of Digital Computer Program for Power System Fault Studies. W. E. Marter and J. L. Koepfinger, Duquesne Light Co., C. W. King, Westinghouse Electric Corp.
- 59-1094. Bushing Potential Device With Multiple Ratings and Universal Application. K. W. Eissmann, General Electric Co.

NEW COMPUTATIONAL TECHNIQUES IN SYSTEM ENGINEERING—I

- 59-1159. The Application of Planning Criteria to the Determination of Generator Service Dates By Operational Gaming. C. A. DeSalvo, Westinghouse Electric Corp.; C. H. Hoffman and R. G. Hooke, Public Service Electric & Gas Co.
- 59-1176. Production Cost Calculations for System Planning By Operational Gaming Models. K. M. Dale, W. H. Ferguson, Westinghouse Electric Corp.; C. H. Hoffman; J. A. Rose, Public Service Electric and Gas Co.
- 59-1143. Mathematical Models for Use in the Simulation of Power Generation Outages-III. Models for a Large Interconnection. C. J. Baldwin, D. P. Gaver, Westinghouse Electric Corp.; C. H. Hoffman, J. A. Rose, Public Service Electric and Gas Co.
- 59-1130. A Model for Transmission Planning By Logic. C. J. Baldwin, C. A. DeSalvo, Westinghouse Electric Corp.; C. H. Hoffman, W. S. Ku, Public Service Electric and Gas Co.

FRI. (Continued)

9:00 A.M.

HOLLYWOOD ROOM*Chairman:*T. J. Higgins, University
of Wisconsin*Sponsor:*Feedback Control
Systems Committee

2:00 P.M.

MADISON ROOM*Chairman:*E. J. Schubert,
Burroughs Corp.*Sponsor:*Computing Devices
Committee

2:00 P.M.

COTILLION ROOM*Chairman:*L. F. Ferri,
Commonwealth Assoc.*Sponsor:*

Relays Committee

FEEDBACK CONTROL SYSTEMS

- 59-1183. A Method for the Symbolic Representation and Analysis of Linear Periodic Feedback Systems. E. O. Gilbert, University of Michigan.
- 59-1151. Transient Response and the Stabilization of Feedback Amplifiers. J. H. Mulligan, Jr., New York University.
- 59-1157. Analysis of AC Servomotors Operated From Unbalanced, Non-Sinusoidal Voltage Sources and Nonlinear Discontinuous Source Impedances. E. R. Lind, General Electric Co. and N. L. Schmitz, The University of Wisconsin.
- 59-1153. A Suppressed Carrier Signal Generator for Servo Instrumentation. P. J. Pollard, Chrysler Corp. (formerly with Vickers, Inc.).
- 59-1152. Investigation of the Feasibility of Designing Homing Aircraft Flight Control Systems for Minimum Probabalistic Error. J. Zaborszky, Washington University and McDonnell Aircraft Corp. and J. W. Diesel, McDonnell Aircraft Corp.
- 59-1156. Control By Stochastic Adjustment. J. E. Bertram, IBM Corp. (Re-presented for Discussion only.)
- 59-1158. Use of a Mathematical Error Criterion in the Design of Adaptive Control Systems. C. Merriam, III, Massachusetts Inst. of Technology. (Re-presented for Discussion only.)
- 59-1181. Executive Controlled Adaptive Systems. R. Staffin, Polytechnic Inst. of Brooklyn. (Re-presented for Discussion only.)

APPLICATION AND THEORY OF COMPUTERS AND COMPUTER CIRCUITS

- CP.* Synthesis of Symmetric Logic Functions Containing a Large Number of Variations. T. W. Sze, University of Pittsburgh.
- CP59-1118. Automation of the Generation of Computer Diagnostic Routines. K. Jacoby and H. Layton, Philco Corp.
- 59-1193. Ripple-Type Time Delay Networks Using Elliptic Functions. J. R. Kiseda, IBM Corp. and D. J. Ford, University of Pittsburgh.
- 59-1125. Use of High-Speed Digital Computers to Study Performance of Complex Switching Networks Incorporating Time Delays. Y. N. Chang and O. M. George, North American Aviation, Inc.

RELAYS

- 58-1183. Improved Protection of 4 KV Feeders on the Baltimore Gas & Electric System. W. W. Ward, Jr., Baltimore Gas & Electric Co.
- 58-1222. Distribution Circuit Protection American Electric Power Co., W. H. Johnson and T. J. Meler, American Electric Power Service Corp.
- CP59-1165. Negative Phase Sequence Relays Applied to Paralleled Generators for Back-Up Protection. W. J. Kerchner, Jr., Gilbert Associates, Inc. and C. T. Abbott, New England Gas & Electric Service Corp.

FRI. (Continued)

2:00 P.M.

VENETIAN ROOM

Chairman:

J. H. Rixse, Rural
Electrification Admn.

Sponsor:

System Engineering and
Power Generation
Committees

2:00 P.M.

HOLLYWOOD ROOM

Chairman:

W. T. Rogers, Ebasco
Services, Inc.

Sponsor:

Safety Committee

NEW COMPUTATIONAL TECHNIQUES IN SYSTEM ENGINEERING—II

59-1177. Theory of Economic Selection of Generating Units. K. L.
III Hicks, Sargent & Lundy.

CP.* Automatic Load Projection and Substation Planning by Com-
puter. V. W. Ruskin, J. H. Drinnan and J. B. Claydon, B. C.
Engineering Co., Ltd.

59-1161. Strategy for Expansion of Utility Generation. D. N. Reys,
III Westinghouse Electric Corp. and J. A. Rose, Public Service
Electric & Gas Co.

SAFETY

CP58-1209. Higher Residential Voltages—Safety Considerations. H. H.
Watson, General Electric Co.

CP.* Electric Power and Common Sense. (Film), Bay State Film
Productions.

CP.* Mouth-to-Mouth Resuscitation. (Film), A. S. Gordon, Chil-
dren's Hospital.

CP.* Fire Hazards and Safety Techniques in Wiring Homes, Offices
and Factories. R. Beach, Robin Beach Engineers Associates.

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 re-
production in any form by the Institute.

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

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

A RECEPTION TEA AND HOSPITALITY HOUR

THE FALL FROLICS

COFFEE HOUR 9 A.M.-10:30 A.M.

LADIES' CALENDAR

SOCIAL ACTIVITIES

A Reception Tea and Hospitality Hour opens the social activities
on Sunday afternoon, October 11, 1959 from 4:00 to 6:00 PM in the
Cotillion Room. The Hospitality Hour is sponsored by the Chicago
section of the AIEE for members and their families. Members of the
Ladies Activities Committee are present to welcome the wives.

The Fall Frolics will be held on Wednesday, October 14, 1959 in
the Terrace Casino and, as in previous years, top entertainment will
be provided in addition to a good dinner. Dancing will follow the
entertainment. Dress will be informal. Tickets are \$12.50 per person.

LADIES PROGRAM

The Ladies Activity Committee extends a cordial welcome to the
wives of members attending the AIEE Fall General Meeting. The
Ladies Hospitality Headquarters is in Suite 7 (Room 705) at the
Morrison Hotel. Starting Monday morning, it will be open from
9 AM each day except during special Ladies Functions. Coffee and
rolls will be served each morning until 10:30 AM. In addition, a
variety of special activities has been planned.

Sunday—Reception in the Cotillion Room in the Morrison Hotel
—4:00 PM-6:00 PM.

Monday—A Dessert Card Party in the Walnut Room at 1:00 PM.
Tickets are \$1.50 each.

Tuesday—A sightseeing tour of the south side of the City of
Chicago, terminating at the South Shore Country Club. A luncheon
will be served, followed by Sulie Harand presenting the musical
play "Flower Drum Song." Busses will provide transportation back
to the hotel. Tickets are \$3.50 including transportation.

Wednesday—From 9:30 AM until 11:00 AM there will be a
brunch and fashion show in the Carousel Room atop the Morrison
Hotel overlooking Chicago. Tickets are \$1.75.

Thursday—A luncheon at the Art Institute at 12:15 PM followed
by a conducted tour of and lecture on the world-famous Museum.
Tickets are \$2.25.

The generosity of many manufacturers has made these special
activities available at a price of only half the actual cost. Tickets
are available at the Ladies Hospitality Headquarters. A registration
fee of \$2.00 will be charged for the ladies.

INSPECTION TRIPS

Many varied and informative trips have been planned for the AIEE
members attending the Fall General Meeting.

**Fisk Station of
Commonwealth
Edison Company**
Tuesday, October 13
8:30 A.M.-12:15 P.M.)

Fisk Station, located on the Chicago River, is the oldest generating plant of the Commonwealth Edison Company. The first unit, a 5,000 KW, General Electric vertical turbine generator, was put in regular operation on October 2, 1903. In 1910, the station consisted of ten (10) 10,000 KW vertical units. Since then all of these units have been retired. At present, the station consists of six (6) units, ranging in size from 25,000 KW, installed in 1914, to a 325,000 KW ultra-modern cross compound turbine generator and a boiler of 2,100,000 pounds per hour steaming capacity featuring any combination of pulverized coal and gas firing. The tour will also include an auditorium session at which the Dresden project will be discussed. This 180 MW nuclear unit is scheduled for service July 1, 1960. Tickets are \$2.00 each. This is a bus trip, the maximum is 40 persons.

**Commonwealth
Edison Company
Dispatching Office**
Tuesday, October 13
(2:00 P.M.-3:00 P.M.)

Commonwealth Edison Company's new \$700,000 automatic dispatching system which controls 92 per cent of this Company's 5000 MW capability will be open for inspection to small groups. The equipment to be seen is an automatic dispatch system which economically controls 37 turbine generators, maintains proper flow of power interchange with connecting utilities and continually matches output to system demand. This office is the control center for major transmission and generation on the entire Commonwealth Edison system and switching operations inside the City of Chicago. Tickets—No Charge. This is a walking trip with a maximum of 15 persons. (Additional trips will be scheduled if required.)

**Hubbard & Company
Electrical Research
Laboratory**
Tuesday, October 13
(2:45 P.M.-6:45 P.M.
and 6:30 P.M.-
9:30 P.M.)

Hubbard and Company opened its new high voltage Electrical Research Laboratory during 1958. The laboratory is located in McCook, a southwest Chicago suburb, about 13 miles from the loop. The laboratory is designed for developing and testing high capacity and high voltage equipment for power systems, and includes extensive mechanical facilities for designing and testing pole line construction items. The tour will feature demonstrations utilizing impulse generators, a 600 KV 60 cycles test set, and short circuit testing equipment in the outdoor power laboratory. Transportation will be by bus starting from and returning to the Morrison Hotel. Two trips are offered limited to 40 persons each. Total trip time will be about two and one-half hours. Tickets are \$2.00 each.

**Electro-Motive
Division of
General Motors
Manufacturing
Facilities at
La Grange, Illinois**
Wednesday, October 14
(8:30 A.M.-
12:30 P.M.)

Those visiting the La Grange, Illinois, plant of Electro-Motive Division of General Motors will see in operation the 6,000 KW automatic generating plant developed by Electro-Motive for economic handling of utility system peak loads. Features of the compact plant, including fast start (on the line at full load in less than 90 seconds) and unattended operation will be demonstrated to AIEE visitors as part of the scheduled Plant Tour. Prior to the MU60 demonstration, visitors will be taken on a tour of Electro-Motive's manufacturing facilities housed on a 331-acre tract of land near La Grange where they will see various electrical manufacturing processes developed by Electro-Motive including machine taping of traction motor armature coils, silicone insulation of main field and interpole coils and machine forming of cross connectors and armature coils. Tickets are \$2.00 each. This is a bus trip and the maximum is 80 persons.

**Panellit Products
Plant at Skokie,
Illinois**
Wednesday, Oct. 14
(1:30 P.M.-5:30 P.M.)

Panellit, Incorporated, Skokie, Illinois who has pioneered in many other firsts, such as the industrial multiple alarm system (PANALARM), Graphic Process Panel, industrial digital logger-scanner (PANASCAN), and others. With an engineering staff specialized in centralized control rooms, Panellit is composed of several sections, namely:

Control Systems and Panels: In this division, one will see boards under construction for Boiler, Turbine, and Generator controls.

Panalarm Annunciators: In a shop uniquely designed for this application, one will see Panalarm Annunciators being assembled, wired, and individually tested, before going through the final functional test.

Information Systems (ISI): The visitor will then tour a recently completed section where a functional test will be made on the newest product—609 *Information and Computer System*. This is the ultimate in combining data reduction with an internally programmed general purpose Computer for static scanning, computing, and controlling of the process.

Tickets are \$2.00 each. This is a bus trip with a maximum of 40 persons.

**New Equipment of the
Chicago & North
Western Railroad**
Wednesday, Oct. 14
(2:15 P.M.-3:15 P.M.)

An inspection of America's push-pull suburban train and of a unique "bi-level" streamliner is planned during this tour. The inspection will be staged by the Chicago and North Western Railway Company at their terminal, Canal and Madison Streets, with L. E. Legg, Electrical Engineer of the railway as host and sponsor. Both are "electric trains" in every sense of the word, with energy provided by diesel engines in the locomotive. Auxiliary generators in the locomotives of both trains provide power for lighting, air-conditioning and even electric heating in the coaches. Undercar generators and troublesome steam pipes have been eliminated in the new trains. In operation, the "push-pull" train moves toward Chicago with the locomotive at the rear end pushing the train. The engineer controls the train from a cab located at the head end of the leading car. Outbound from Chicago, the engineer transfers to the locomotive and the train is pulled in the conventional manner. Tickets—no charge. This is a walking trip with a maximum of 40 persons.

**The Chicago Harbor
Authority**
Thursday, Oct. 15
(8:30 A.M.-
12:30 P.M.)

The Chicago Regional Port District facilities at Lake Calumet which unites the St. Lawrence Seaway with Chicago, the gateway to America's farm, business and industrial heart. The Calumet Harbor also links the nation's two main arteries of waterborne commerce—the Great Lakes—St. Lawrence Seaway system with the Illinois Waterway—Mississippi River System. The harbor expects to handle 500 foreign ships this year. It has about 6,000 ft. of ship dockage and 500,000 sq. ft. of warehouse. Products from steel and autos to beer and olives are unloaded to be replaced by innumerable products including machinery, hides and bubble gum. The Calumet Harbor at present has two grain elevators with capacity for 13 million bushels of grain. Visitors will inspect the fully automated dumping, conveying, storage temperature measurement, and ship loading control rooms. Tickets are \$2.00 each. This is a bus trip with a maximum of 40 persons.

Underwriters' Laboratories, Incorporated
Thursday, October 15
(9:00 A.M.-10:00 A.M.)

Automatic Electric Company—North Lake, Illinois
Thursday, October 15
(1:30 P.M.-5:30 P.M.)

Argonne National Laboratories
Thursday, October 15
(1:00 P.M.-6:00 P.M.)

Underwriters' Laboratories, Incorporated is chartered as a nonprofit organization without capital stock to establish, maintain, and operate Laboratories for the examination and testing of devices, systems, and materials to help reduce and prevent loss of life and property from fire, crime and casualty. During the inspection of the various laboratories, the AIEE members will see the testing of clothes driers and automatic washing machines; stalled rotor tests on inherent overload protection of motors; arc-rupture tests on motor controllers, enclosed switches, service equipment; endurance tests on thermostats; impact and implosion tests on TV tubes; temperature tests on fluorescent lamp fixtures; normal and abnormal temperature tests on various types of cooking appliances and heaters; short circuit tests on fuses; temperature tests on signalling appliances and battery chargers. In other laboratories, the members will see tests on air conditioners, refrigerators, explosion-proof electrical equipment, fire retardant paints, fire doors and many other types of materials and equipment. Tickets are \$.50 each. This is a walking trip, with a maximum of 20 persons.

This plant is located on a 167-acre site, 15 miles west of Chicago's Loop, in North Lake with a main building which covers 35 acres. The company manufactures and installs automatic telephone and other communication systems for independent telephone companies, for business and industry, and also designs and manufactures a wide variety of electrical control components and systems for use in the products and processes of industries in every field. The company is part of General Telephone and Electronics which operates one of the world's largest telephone systems serving more than 4 million telephones. The proposed trip will include a visit to the General Telephone Laboratories which occupy a large area of the plant where products are designed and developed, and a trip through the main plant where these products are manufactured for telephone and industrial use. Tickets are \$2.00 each. This is a bus trip with a maximum of 80 persons.

The Argonne National Laboratory, the nation's senior atomic energy research and development center, is located approximately 25 miles southwest of downtown Chicago. Argonne's research laboratories and other facilities are spread over a 3700-acre tract and are valued at more than \$100,000,000. The scheduled trip to Argonne will give you an opportunity to become acquainted with the Experimental Boiling Water Reactor (EBWR), a "prototype" for the electric-power-producing reactors. Originally designed for 20 MW thermal output, the EBWR has been operated at more than 60 MW (thermal) and with modifications now in progress is expected to produce 100 MW (thermal). You will also become acquainted with the Zero Gradient Synchrotron (ZGS), a proton synchrotron accelerator now under construction. The ZGS will be capable of producing ultra-high energy particles in the 10 to 15 Bev range and will be used as a laboratory tool in the field of high-energy physics research. Visits to some of the experimental facilities and research reactors will be included as time permits. Tickets are \$2.00 each. This is a bus trip with a maximum of 80 persons.

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COMMITTEE MEETINGS

MONDAY, OCTOBER 12th

9:00 A.M.-NOON

Public Relations Committee
Midwest Subcommittee of T.O.D.
Methods of Measurements Subcommittee
Microwave Subcommittee
Equipment Design Standards
Wire Line Protection
W.G. for the Advancement of Power Engineering P.G.

12:00 NOON-2:00 P.M.

Luncheon—General Session

2:00 P.M.-5:00 P.M.

General Session

3:00 P.M.-5:00 P.M.

Electronics Committee

5:00 P.M.-6:30 P.M.

Communication Theory Committee

TUESDAY, OCTOBER 13th

9:00 A.M.-11:30 A.M.

Frequency Range Transformer W.G.

9:00 A.M.-NOON

Executive Subcommittee (I.&C.P.S.)
S.M.R. Administrative Subcommittee
T.O.D. Manual Subcommittee
Nuclear Power Subcommittee of P.G.
Electric Coupling Subcommittee of R.M.
Publications Dept.
Power System Communication Committee

9:00 A.M.-5:00 P.M.

Student Branches Committee

12:00 NOON-2:00 P.M.

Luncheon—Communication Division Committee
Luncheon—TV and Aural Broadcasting Systems Committee
Luncheon—Station Design Subcommittee P.G.

2:00 P.M.-5:00 P.M.

AIEE—IRE Education Committee
Edison Medal Committee
Power Generation Committee
Industrial Control Committee
Electric Coupling Subcommittee of R.M.
Communication Division Committee
Electrochemical Standard WG of the SMR Committee

ROOM 528
ROOM 530
ROOM 526
ROOM 532
ROOM 628
ROOM 630
ROOM 714

SUITE 440

GRAND BALLROOM

SHERMAN HOTEL
LIFE ROOM NO. 108

ROOM 526

ROOM 526

ROOM 528
ROOM 530
ROOM 534
ROOM 626
ROOM 628
ROOM 632
ROOM 630

SUITE 440

ROOM 532
ROOM 526
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ROOM 636

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ROOM 532

ROOM 528

ROOM 714
EAST ROOM 2

WALNUT ROOM
ROOM 530
ROOM 526
ROOM 534
ROOM 536
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3:30 P.M.-5:30 P.M.

Substation W.G. on Project 57.1

4:00 P.M.-6:00 P.M.

Induction Machinery Subcommittee
Data Communication Committee

7:30 P.M.-10:30 P.M.

Computing Devices Committee

WEDNESDAY, OCTOBER 14th

9:00 A.M.-11:30 A.M.

District T.O.D. Representatives Subcommittee
System Economics Subcommittee S.E.
Research Committee

9:00 A.M.-NOON

Pulse Transformer W.G.
Substation Round Table Meeting
Power Semiconductor Rectifier Subcommittee (Joint S.M.R.&I.P.R.)
Science and Electronics Division
Working Group on Voltage Nomenclature
Industry Division Committee
Computer Application Subcommittee S.E.
Professional Development and Recognition Department

9:00 A.M.-5:00 P.M.

General Administration Department
W.G. on Extreme Environmental Conditions of M.A.

10:00 A.M.-12:00 NOON

System Controls Subcommittee of S.E.

12:00 NOON-2:00 P.M.

Luncheon—Radio Communication Systems Committee

12:00 NOON-5:00 P.M.

Luncheon—General Applications Division
Luncheon—R.M. Administrative Subcommittee

1:00 P.M.-3:00 P.M.

Power Transformer W.G.

2:00 P.M.-3:30 P.M.

Instrumentation for Resistance Welding Subcommittee

2:00 P.M.-5:00 P.M.

Semiconductor Metallic Rectifier Committee
Substation Round Table Meeting

2:00 P.M.-5:00 P.M.

Industrial and Commercial Power Systems Committee
Man-Machine Integration Committee
Application of Probability Methods Subcommittee of S.E.
Computer Standards Subcommittee C.D.
Constitution and By-Laws Committee
Power Division

ROOM 532	3:00 P.M.-5:00 P.M. Electronic Transformer Subcommittee
ROOM 528	3:30 P.M.-5:00 P.M. Electric Welding Committee
ROOM 626	5:00 P.M.-6:00 P.M. Communication Switching Systems Committee
ROOM 636	Telegraph Systems Committee
ROOM 526	7:30 P.M.-10:30 P.M. 1960 Workshop Committee (Computer Systems)
THURSDAY, OCTOBER 15th	
ROOM 528	9:00 A.M.-11:30 A.M. Nucleonics Committee
ROOM 628	9:00 A.M.-NOON Logic and Switching Circuits Theory
ROOM 534	Design Automation Subcommittee of S.D.
SUITE 440	Technical Operations Department
ROOM 530	Computer Systems Subcommittee
ROOM 532	Single Phase and Fractional Horsepower Subcommittee
ROOM 526	9:00 A.M.-5:00 P.M. Electric Systems for Commercial Buildings Subcommittee
SUITE 440	12:30 P.M.-2:00 P.M. Luncheon—Technical Operations Department
ROOM 528	Luncheon—D.C. Machinery Subcommittee (R.M.)
ROOM 532	1:30 P.M.-3:30 P.M. Administrative Subcommittee of S.E.
ROOM 530	2:00 P.M.-5:00 P.M. Educational Publications Committee
SUITE 440	Planning and Coordination Committee
ROOM 714	3:30 P.M.-5:30 P.M. System Engineering Committee
ROOM 532	4:30 P.M.-6:30 P.M. Wire Communication Systems Committee
VENETIAN ROOM	7:30 P.M.-10:00 P.M. Forum of Technical Committee Chairmen
FRIDAY, OCTOBER 16th	
SUITE 440	9:00 A.M.-NOON Board of Directors
ROOM 534	W.G. on Semiconductor Rectifier Equipment for Electronic Loads
ROOM 528	Safety Committee
ROOM 530	Mining Industry Committee
SUITE 440	12:00 NOON-2:00 P.M. Luncheon—Board of Directors
SUITE 440	2:00 P.M.-5:00 P.M. Board of Directors

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Lower Level	Terrace Casino
Street Level	Hotel Lobby
Mezzanine	Burgundy Room Cotillion Room Embassy Room Hollywood Room
First Floor	Ballroom
Second Floor	Venetian Room Walnut Room
Third Floor	Madison Room East Room 1 & 2
Fourth Floor	Rooms 427 - 432 Suite 440
Fifth Floor	Rooms 526 - 536
Sixth Floor	Rooms 626 - 636
Seventh Floor	Room 714 Suite 705
Roof	Carousel Room



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