

American Institute of
Electrical Engineers



FALL

GENERAL

MEETING

Program

*Please retain for use during
entire meeting*

CHICAGO, ILL.

OCTOBER 1-5

1956

Meeting Headquarters

MORRISON HOTEL

GENERAL INFORMATION

This meeting in Chicago, Illinois, is the tenth of the general meetings which are held annually each Fall in the Middle West. It is the third of four successive meetings to be held in Chicago. Both the technical program and the inspection trips were planned with the wide interests of the membership in mind.

Monday noon the Tesla Society is sponsoring a luncheon in the Hotel Morrison in honor of Nikola Tesla, who was born 100 years ago. At the General Session in the afternoon, this program will be continued with a report by Mr. R. C. Sogge, AIEE delegate to the centenary celebration in Yugoslavia. Dr. Samuel G. Hibben, Engineering Consultant, will make the principal address entitled, "Tesla's Contributions to Today's Arc and Vapor Illuminants." We will be welcomed to this General Session by the honorable Richard J. Daley, Mayor of Chicago. President M. D. Hooven will respond.

Tuesday, the newly created medal in electrical engineering education will be awarded to Dr. Frederick E. Terman, Provost of Stanford University. Wednesday, Eta Kappa Nu Association will sponsor a luncheon for AIEE members.

On Thursday, October 4, 1956, Dr. Charles F. Kettering will be honored at a luncheon in the Terrace Casino of the Hotel Morrison to celebrate his 80th birthday. All members are invited to attend. On the social side there will be a Get-Acquainted Tea on Sunday afternoon, the NEC Party Tuesday evening, our Fall Frolics Wednesday evening and special entertainment for the ladies.

Registration Fees Required. In accordance with the policy as set up by the Board of Directors, a registration fee of \$5.00 has been established for members and a fee of \$8.00 for nonmembers. This is to help make the meeting self-supporting. Student members and the immediate families of members will not be required to pay any fee.

Information on all features may be obtained at the registration desk. 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 19, 1956. 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 should be submitted.

Advance Copies of Papers may be purchased by members at the registration desk at the uniform price of \$.40 each (\$.80 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, N. Y. 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.

Fall General Meeting

SCHEDULE OF EVENTS

SUNDAY, SEPTEMBER 30

- 3:00 p.m. Registration
- 4:00 p.m. Get Acquainted Tea

MONDAY, OCTOBER 1

- 9:00 a.m. Rotating Machinery
 - Protective Devices
 - Metallic Rectifiers
 - Land Transportation
- 12:00 noon Luncheon—Honoring Nikola Tesla
- 2:00 p.m. General Session—Celebrating Birth of Nikola Tesla 100 years ago.

TUESDAY, OCTOBER 2

- 9:00 a.m. Rotating Machinery
 - Safety
 - Transformers
 - Experience with Conductor for Industrial Systems
 - TV and Aural Broadcasting
 - Trip to Acme Steel Company
- 11:00 a.m. Ladies Luncheon—Mrs. Purdie Meissner, monologist
- 1:45 p.m. Presentation of the Members-for-Life Fund Medal to Dr. Frederick E. Terman
- 2:30 p.m. TV and Aural Broadcasting
 - Insulated Conductors
 - Chemical Industry
 - Basic Sciences
 - Management
 - Trip to IBM for Digital Computer Demonstration

WEDNESDAY, OCTOBER 3

- 9:00 a.m. Rotating Machinery
 - Telegraph Systems
 - Mining and Metal Industry
 - Feedback Control Systems
 - Communication Theory
 - Trip to Ridgeland Station
- 12:00 noon Eta Kappa Nu Luncheon
- 1:45 p.m. Automation
- 2:30 p.m. Rotating Machinery
 - Switchgear

- 2:30 p.m. System Engineering
Mining and Metal Industry
Feedback Control Systems
Trip to Zenith Radio Company

6:00 p.m. Fall Frolics

THURSDAY, OCTOBER 4

- 9:00 a.m. Rotating Machinery
System Engineering
Ethics
Radio Communications
Trip to Swift and Company
- 12:00 noon Luncheon—Honoring Dr. Charles F. Kettering
Trip to Station WNBQ-TV
- 2:00 p.m. Rotating Machinery
System Engineering
Wire Communications Systems
The Science of Materials in Electrical Engineering Practice

FRIDAY, OCTOBER 5

- 9:00 a.m. Transmission and Distribution
Communication Maintenance
Power Generation
Industrial Control
- 2:00 p.m. Transmission and Distribution
Power Generation
Seminar on Education in Electronics
Communication Maintenance

Monday, October 1

9:00 a.m.—Rotating Machinery

Committee on Rotating Machinery
Embassy Room
W. L. RINGLAND, Presiding

- 56-935. A New Method for Determining Sequence Impedances of III Small Synchronous Machines. W. K. Gardner, Naval Research Lab.
- 56-936. Capacitive Loading of Saturated Synchronous Machines— III Part I. S. L. Mikhail and C. A. Keener, University of Illinois.
- 56-925. In-Service Temperature Measurement of the Amortisseur III Winding of Large Frequency Changers. P. K. Pavlides, Philadelphia Electric Co.
- CP56-1013. Synchronizing Out of Phase. A. J. Wood, General Electric Co.
- CP56-937. The Synchronous Double Fed Induction Machine. R. E. Bedford, Indian Institute of Technology.

9:00 a.m.—Protective Devices

Committee on Protective Devices
Venetian Room
A. M. OPSAHL, Presiding

- 56-939. Application of Expulsion Arresters on Cable-Connected Equipment. C. J. Baldwin, Jr. and J. M. Clayton, Westinghouse Electric Corp.
- CP56-973. Lighting Protection of Unit-Connected Turbine Generators—Field and Laboratory Studies. A. P. Hayward, Duquesne Light Co.; J. K. Dillard and A. R. Hileman, Westinghouse Electric Corp.
- 56-974. Design and Operating Features of an Expulsion Arrester III Without Follow Current. C. L. Stroup, Alex Vitkus and A. C. Westrom, Hubbard and Co.

9:00 a.m.—Metallic Rectifiers

Committee on Metallic Rectifiers
Cetillion Room
P. E. TRUCKSESS, Presiding

- 56-975. The Fused Silicon Rectifier. Herbert W. Henkels, Westinghouse Electric Corp.
- 56-934. Rating and Application of Germanium and Silicon Rectifiers. I F. W. Gutzwiller, General Electric Co.
- CP56-976. Direct Water-Cooled Germanium Power Rectifiers. Ralph E. Wahl, General Electric Co.
- CP.* A Comparison of Tests for Selenium Rectifiers. D. A. Klopfer, Westinghouse Electric Corp.
- CP.* Selenium Rectifiers and Their Aging Characteristics. C. E. Brigham, Richardson-Allen Co.

9:00 a.m.—Land Transportation

Committee on Land Transportation
Hollywood Room
E. A. FOSTER, Presiding

- 56-977. Power Supply for Commercial Frequency Railroad Electrification. II J. C. Price, General Electric Co.
- CP.* Design Fundamentals of Diesel-Electric Locomotive Control Systems. A. V. Johansson, General Electric Co.

MONDAY (continued)

- CP.* Development of Wiring Diagram Standards for Land Transportation Vehicles. C. W. Martin and H. S. Ogden, General Electric Co.
- CP56-978. Mobile Axle Flaw Detector Unit Carrier and Method Used to Ferret Out Defective Car Journals on the Chesapeake & Ohio. E. R. Hauer and C. M. Angel, Chesapeake & Ohio Railway Co.
- 56-979. Modernization of the Long Island Rail Road Passenger Car Fleet. P. H. Hatch, The Long Island Rail Road Company. Re-presented for discussion.
- 12:00 noon—Tesla Society Luncheon**
Madison Room
- 2:00 p.m.—General Session**
Cotillion Room
Dr. E. R. Whitehead, Chairman, Chicago Section, Presiding
1. INTRODUCTION OF GENERAL COMMITTEE. W. M. Ballenger, Chairman.
 2. ADDRESS OF WELCOME. The Honorable Richard J. Daley, Mayor of Chicago.
 3. RESPONSE. President M. S. Coover.
 4. REPORT ON NIKOLA TESLA CENTENNIAL CELEBRATION IN YUGOSLAVIA by R. C. Sogge, AIEE Delegate.
 5. "TESLA'S CONTRIBUTIONS TO TODAY'S ARC AND VAPOR ILLUMINANTS." Dr. Samuel G. Hibben, Engineering Consultant.

Tuesday, October 2

- 9:00 a.m.—Rotating Machinery**
Committee on Rotating Machinery
Madison Room
L. W. BUCHANAN, Presiding
- 56-938. Induction Machinery Design Being Revolutionized by the Digital Computer. C. G. Veinott, Reliance Electric & Engineering Co.
- CP56-956. Polyphase Induction Motor Design by Digital Computer. A. E. Hartman, Robbins & Myers, Inc.
- 56-922. The Application of Computers to the Solution of Induction Motor Thermal Circuits. A. E. Johnson, General Electric Co.
- CP56-940. Application of High Speed Electronic Computer to Generator Design Problems. W. C. Brenner, R. Schinzinger, and R. M. Suarez, Westinghouse Electric Corp.
- 9:00 a.m.—Safety**
Committee on Safety
Embassy Room
H. B. WHITAKER, Presiding
- CP56-947. The Use of Nickel Cadmium Batteries in Emergency Lighting Applications. Theodore Ulrich, Nickel Cadmium Battery Corp.
- CP.* Dry Batteries in Emergency Equipment. R. C. Clock, Burgess Battery Co.
- CP56-948. Electric Shock Hazard Analysis. K. S. Geiges, Underwriters' Laboratories, Inc.
- 9:00 a.m.—Transformers**
Committee on Transformers
Cotillion Room
J. R. MEADOR, Presiding
- 56-949. The Rigorous Solution of an Electrostatic Field by Means of the Card Programmed Calculator. J. R. Faillace and L. Rabins, General Electric Co. Re-presented for discussion.

TUESDAY (continued)

- 56-916. A Zero-Sequence Equivalent Circuit of Autotransformer Connections Which Yields Neutral Shift. B. A. Cogbill, General Electric Co.
- 56-950. Bushing-Type Current Transformers for High-Accuracy Revenue-Metering Equipment. J. M. Vanderleck, The Hydro-Electric Power Commission of Ontario.
- 56-926. Correlation Between the Breakdown Strength of Large Oil Gaps and Oil Quality Gauges. A. F. Rohlfs and F. J. Turner, General Electric Co.
- 56-918. Effects on Transformer Insulation Structures of Long Duration Waves Representative of Switching Surges. H. E. Fiegel and J. S. Kresge, General Electric Co.
- 9:00 a.m.—Experience with Conductor for Industrial Systems**
Committee on Industrial Power Systems
Hollywood Room
H. A. BERGEN, Presiding
- CP56-1002. Mineral Insulated Cable in Heavy Industry. F. E. Maurer, Olin Mathieson Chemical Corp.
- CP56-1003 Bus Duct—An Experience Report. J. B. Cataldo, BullDog Electric Products Co.; H. A. Geisendorfer, Chrysler Corporation and Nelson Keib, Albert Kahn Associates.
- CP.* Experiences in the Termination of Aluminum Wire and Cable in Industrial and Commercial Applications. Henry Esch, Kaiser Aluminum & Chemical Corp.
- CP.* Voltage Drop Calculations for AC Power Distribution Systems. R. T. Morgan, New York Shipbuilding Corp.
- 9:00 a.m.—TV & Aural Broadcasting**
Committee on Television and Aural Broadcasting Systems
Venetian Room
G. R. TOWN, Presiding
- CP.* Closed Circuit Color TV at Walter Reed Hospital. L. E. Anderson, Radio Corporation of America.
- 56-972. Field Experience with the A2A Video System. Raymond W. Gast, New York Telephone Co.
- CP.* R-F Diplexing in Color TV and Aural Relaying. T. G. Custin, General Electric Co.
- 1:45 p.m.—Presentation of the Members for Life Fund Medal in Electrical Engineering Education to Dr. Frederick E. Terman**
Cotillion Room
President M. S. Coover, Presiding
- 2:30 p.m.—TV & Aural Broadcasting**
Committee on Television and Aural Broadcasting Systems
Venetian Room
C. E. SMITH, Presiding
- CP.* Television Allocation Trends. O. W. B. Reed, Jr., Jansky & Bailey Consulting Engineers.
- CP.* System Aspects of Trospheric Scatter. William Collins, Page Communication Engineers.
- CP.* Maintenance of TV Antennas and Transmission Lines S. S. Sabeff, General Electric Co.
- CP.* The Zenith Royal 500 All-Transistor Radio. George Moore, Zenith Radio Corp.

TUESDAY (continued)

2:30 p.m.—Insulated Conductors

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

- 56-951. Aluminum Sheathed Cable—A Utilization Wiring System for Industrial and Domestic Distribution. Philip J. Croft, Canada Wire & Cable Co., Ltd.
- 56-952. The Heating and Mechanical Effects of Installing Insulated Conductors in Steel Raceways. M. M. Brandon, K. S. Geiges, L. M. Kline, F. V. Paradise, Underwriters' Laboratories, Inc.
- 56-953. The Properties of Tellurium Alloy Lead Sheath for Power Cable. H. A. Hoover, John A. Roebing's Sons Corporation.
- CP56-964. A Further Examination of Protective Coverings for Metallic Sheathed Cables and for Pipes. D. M. Farnham, Quebec Hydro-Electric Commission.
- CP56-988. Corrosion Control on the Underground System of the Philadelphia Electric Co. R. C. DeMarco, J. E. Johnson, Philadelphia Electric Company.

2:30 p.m.—Chemical Industry

Committee on Chemical Industry
Embassy Room
H. C. RIGGS, Presiding

- CP.* Modern Constant Voltage Chargers. W. D. Fletcher, Raytheon Mfg. Co.
- CP.* Grid Alloys and Battery Characteristics. F. J. Port, Willard Storage Battery Co.
- CP.* Some Charge Characteristics of Lead Acid Batteries. E. A. Hoxie, Electric Storage Battery Co.

2:30 p.m.—Basic Sciences

Committee on Basic Sciences
Hollywood Room
W. R. LE PAGE, Presiding

- 56-980. Accurate Determination of the Capacitance of a Thin Rectangular Plate. D. K. Reitan and T. J. Higgins, University of Wisconsin.
- 56-981. Integrated S—Plane Synthesis Using Two-Way Root Locus. I John Zaborszky, Washington University.
- 56-982. Analysis of Linear Sampled-Data Systems With Finite Pulse Width (Open Loop). G. Farmanfarma, University of California.
- 56-983. A New Method for Treating Non-Linear Problems with Applications to Iron-Cored Oscillatory Circuits: (I—Sub-Harmonics Do Not Exist). M. Kamal Gohar, Cairo University. For Discussion Only.
- 56-984. Electrical Units and Dimensions. Leo Young, Westinghouse Electric Corp.

2:30 p.m.—Education and Training Toward Development Abilities

Student Branches and Management Committees
S. A. LANGELL, Presiding

PANEL

1. Jesse W. Bowen, Allis-Chalmers Manufacturing Company.
2. John G. Duba, Administrative Engineer of Public Works, Chicago.
3. Joe H. Enenbach, Illinois Bell Telephone Company.
4. John A. Granath, Armour Research Foundation of Illinois.
5. Jim H. Kogen, Askania Regulator Company.
6. Ed F. Koncel, Commonwealth Edison Company.
7. John Tyner, Electric Light & Power Magazine.

Wednesday, October 3

9:00 a.m.—Rotating Machinery

Committee on Rotating Machinery
Embassy Room

Panel Discussion of the Use of Digital Computers in the Design of Rotating Machines.

Moderator: E. C. Barnes, Reliance Electric and Engineering Co.

Panel Members: Abraham Covo, Westinghouse Electric Corp.; E. L. Harder, Westinghouse Electric Corp.; A. E. Hartman, Robbins and Meyers, Inc.; Verner Kempinen, General Electric Co.; R. M. Saunders, University of California; C. G. Veinott, Reliance Electric and Engineering Co.; J. C. White, General Electric Co.

9:00 a.m.—Telegraph Systems

Committee on Telegraph Systems
Hollywood Room
R. B. SHANCK, Presiding

- 56-985. A Data Transmission Machine. C. R. Doty and L. A. Tate, International Business Machines Corp.
- CP56-986. A High-Speed Fully Automatic Teleprinter Switching System for Brokerage Firms. C. J. Holloman, Western Union Telegraph Company.
- 56-987. A Transistorized Time Division Multiplex Telegraph Set. F. I D. Biggam, Teletype Corporation.
- CP.* Transmission of Newspapers by Facsimile Over a Wide-Band Channel. A. G. Cooley and J. R. Shonnard, Times Facsimile Corporation.

9:00 a.m.—Mining and Metal Industry

Committee on Mining and Metal Industry
Madison Room
E. J. GLEIM, Presiding

- CP.* Predicting Performances of Large Power Shovels. L. A. Moucha and M. A. Neslin, General Electric Co.
- CP.* Lower Operating Costs Through Statistical Analysis of Motor Failures. J. M. Jenkins, Reliance Electric & Engineering Company.
- CP.* Automatic A. C. Mine Hoist at Trotter Coal Company. W. E. Thomas, Westinghouse Electric Corp.
- CP.* Report of AIEE Conversion Substation Committee on D.C. Grounding Practices. R. R. Godard, U. S. Steel Corporation.

9:00 a.m.—Feedback Control Systems

Committee on Feedback Control Systems
Venetian Room
H. CHESTNUT, Presiding

- 56-954. Analysis of Servomechanisms with Nonlinear Feedback Control. Y. H. Ku, University of Pennsylvania.
- 56-958. Variably Damped Servomechanisms. L. Schieber, International Business Machines Corp.
- CP56-959. The Design of a Completely Static Accurately Regulated Power Supply. R. G. Hoft and M. A. Head, General Electric Co.

9:00 a.m.—Communication Theory

Committee on Communication Theory
Cottillion Room
L. C. ABRAHAM, Presiding

- 56-928. The Technical Feasibility of Translating Languages by Machine. Victor H. Yngve, Massachusetts Institute of Technology.
- CP.* Some Studies of Visual Perception Speed. G. C. Sziklai, Radio Corporation of America.

WEDNESDAY (continued)

CP56-963. Moment Detection and Coding. J. J. Slade, Jr., S. Fich, L. F. Nanni and D. A. Molony, Rutgers University.

56-653. The Communication Engineer's Needs in Information Theory. W. T. Rea, Bell Telephone Laboratories, Inc. Re-presented for discussion.

12:00 noon—Eta Kappa Nu Luncheon
Madison Room

INTRODUCTION OF EMINENT MEMBERS

1:45 p.m.—Automation

Cotillion Room
C. W. HEUMANN, Presiding

1. Introduction. C. M. Rhoades, Jr., General Electric Co.

2. "This is Automation." (Motion Picture.)

2:30 p.m.—Rotating Machinery

Committee on Rotating Machinery
Embassy Room
C. G. VEINOTT, Presiding

CP56-1010. Calculation of Windage Noise Power Level in Large Induction Motors. M. E. Talaat, The Elliott Co.

CP.* Sound Power Measurements on AIEE Noise—Test Motor by Different Laboratories. A. F. Lukens, General Electric Co.

CP.* Noise Reduction in Electrical Machinery for Shipboard Installation. Samuel Feldman, Bendix Aviation.

CP.* Reduction of Motor Noise in the Field. R. H. Lee and Vaughn Hill.

2:30 p.m.—Switchgear

Committee on Switchgear
Hollywood Room
J. C. WOODS, Presiding

56-989. Isolated Phase Telescoping Bus Duct. S. C. Killian and K. III Boyajian, H. K. Porter Company, Inc.

CP56-990. Switching Properties of Vacuum. Mohamed Khalifa, University of Cairo.

CP56-991. A New 115 KV, 1000 MVA Gas-Filled Circuit Breaker. C. F. Cromer and R. E. Friedrich, Westinghouse Electric Corp.

CP56-992. Interruption of Capacitance Charging Currents in Sulfur Hexafluoride. T. E. Browne, Jr. and A. P. Strom, Westinghouse Electric Corp.

2:30 p.m.—System Engineering

Committee on System Engineering
Cotillion Room
R. T. PURDY, Presiding

56-921. The Depreciation Annuity. P. H. Jeynes, Public Service Electric & Gas Co.

56-923. The Solution of Power System Stability Problems by Means of Digital Computers. D. L. Johnson, University of Washington and J. B. Ward, Purdue University.

CP.* Committee Report on Current Status of Load-Frequency Control Methods and Equipment by the System Controls Subcommittee of System Engineering. Presented by C. N. Metcalf.

WEDNESDAY (continued)

2:30 p.m.—Mining and Metal Industry

Committee on Mining and Metal Industry
Madison Room
F. R. HUGUS, Presiding

CP.* Class H Insulation for Heavy-Duty D.C. Motors. F. C. Kreidler, General Electric Co.

CP.* Silicone Insulation in Mining Machine Motors. J. A. Buss, Reliance Electric & Engineering Co. and F. R. Hugus, Joy Manufacturing Co.

CP.* Rewinding Electrical Equipment with Silicone Class H Insulation. R. L. Bogardus, Westinghouse Electric Corp.

2:30 p.m.—Feedback Control Systems

Committee on Feedback Control Systems
Venetian Room
J. TRUXAL, Presiding

56-924. Non-Linear Control System Response to Random Signals. P. II N. Nikiforuk, Canadian Armament Research and Development Establishment.

56-960. A Note on the Describing Function of an Element with Coulomb, Static and Viscous Friction. M. Y. Silberberg, Yale University.

CP56-961. Sampled-Data Analysis of a Drift-Stabilization System. P. G. Pantazelos, Massachusetts Institute of Technology.

56-962. A Technique for the Analysis of Time-Varying Sampled Data II Systems. Bernard Friedland, Columbia University.

Thursday, October 4

9:00 a.m.—Rotating Machinery

Committee on Rotating Machinery
Hollywood Room
M. A. BAKER, Presiding

56-941. Thermal Analysis of a Small D.C. Motor Part I Dimensional Analysis of Combined Thermal and Electrical Processes. J. Kaye and S. W. Gouse, Jr., Massachusetts Institute of Technology.

56-942. Thermal Analysis of a Small D.C. Motor Part II Experimental Study of Steady-State Temperature Distribution in a D.C. Motor with Correlations Based on Dimensional Analysis. J. Kaye, S. W. Gouse, Jr., and E. C. Elgar, Massachusetts Institute of Technology.

56-930. Losses in Idle Conductors in D-C Machine Armature Slots. III Edward Erdelyi and Frank T. DeWolf, General Electric Co.

CP56-943. Carbon Brush Capacity Calculations. J. G. Wilhite, Westinghouse Electric Corp.

CP.* Problems in Standardizing Per Unit Quantities. R. M. Fisher, Jr., General Electric Co.

9:00 a.m.—System Engineering and Computers

Committees on System Engineering and Computing Devices
Cotillion Room
L. B. LEVESCONTE, Presiding

CP56-1008. Digital Computers Can Aid Utilities. F. J. Maginniss, General Electric Co.

THURSDAY (continued)

CP56-1006. What Is a Digital Computer? H. A. Peterson, University of Wisconsin.

CP56-965. Elementary Problem Preparation—Flow Diagrams. E. L. Harder, Westinghouse Electric Corp.

CP56-966. Organization and Personnel. E. R. Moore, The Detroit Edison Co.

9:00 a.m.—Ethics

Committee on Professional Conduct
Venetian Room
P. L. ALGER, *Presiding*

CP.* "A Proposed NSPE Brochure on Rules of Professional Conduct for Engineers." Otto H. Hall, Chairman of the National Committee on Ethical Practices of the NSPE.

CP56-1012. "The ECPD Program in the Field of Engineering Ethics." Dean C. J. Freund, University of Detroit, Chairman of the ECPD Committee on Ethics.

9:00 a.m.—Radio Communications

Committee on Radio Communications Systems
Madison Room
R. D. CAMPBELL, *Presiding*

56-968. Propagation Test On 955.5 MC, 1965 MC, and 6700 MC.
I H. R. Mathwich, Radio Corporation of America, E. D. Nuttall, A. M. Randolph, United Gas Corp. and J. E. Pitman, Philco Corp.

CP56-969. A Method of Designing Small Power Transformers for Communication Equipment. H. S. Sear, M.D.

CP56-970. Design of Wide-Band RF Transformers Utilizing A Synthesized Equivalent Network. Hitoshi H. Kajihara, Headquarters, Signal Corps Engineering Laboratories.

CP56-1001. Some Results with Frequency Diversity in a Microwave Radio System. F. H. Willis, Bell Telephone Labs., Inc.

12:30 p.m.—Charles F. Kettering Award Luncheon
Terrace Casino

2:00 p.m.—Rotating Machinery

Committee on Rotating Machinery
Hollywood Room
I. M. LEVY, *Presiding*

56-944. An Electric Speed-Torque Device Based on Magnetic Principles. W. L. Probert, A. O. Smith Corp.

56-945. Performance Calculations on Capacitor Motors by the Cross-Field Theory. P. H. Trickey, Wright Machinery Co.

56-917. Graphical Determination of Starting Performance of Capacitor Motors. A. Covo, Westinghouse Electric Corp. and L. E. Lingo, Syracuse University.

56-915. Performance Calculations for Part-Winding Starting of Three-Phase Motors. P. L. Alger, General Electric Co.

56-946. Speed Control of Induction Motors Using Saturable Reactors. P. L. Alger, General Electric Co. and Y. H. Ku, University of Pennsylvania.

2:00 p.m.—System Engineering and Computers

Committees on System Engineering and Computing Devices
Cotillion Room
E. E. GEORGE, *Presiding*

CP56-967. Principles of Programming. J. B. Ward, Purdue University.

CP.* Electro Mechanical Accounting Machines for Power Engineering. L. A. Dunstan, Diginetics, Inc.

THURSDAY (continued)

CP56-1000. Use of Digital Computers in Coordination of System Generation. P. L. Dandeno, Hydro-Electric Power Commission of Ontario.

56-920. Digital Calculation of Short-Circuit Currents in Large Complex-Impedance Networks. L. W. Coombe, Detroit Edison Co. and D. G. Lewis, General Electric Co.

2:00 p.m.—Wire Communications Systems

Committee on Wire Communications Systems
Madison Room
F. B. MORGAN, *Presiding*

CP.* Treatment of Wire Lines for Radio and Multiplex Application. E. E. Combs, Lynch Electric Company.

CP.* A Frequency Converting Telephone Carrier Repeater for Military Use. G. Goltsos and J. H. Johnston, Signal Corps Engineering Laboratory, and R. B. Anderson, Lenkurt Electric Co.

56-929. Multi-Unit Neutralizing Transformers. T. F. Palmquist, Bell Telephone Company of Canada.

56-971. Lightning Protection on the Stevens Point-Wisconsin Rapids Inter-City. R. C. Dowling, Wisconsin Telephone Co.

2:00 p.m.—The Science of Materials in Electrical Engineering Practice

Committee on Education
Venetian Room
E. M. WILLIAMS, *Presiding*

CP.* A Material Producers' Views of the Electrical Equipment Manufacturing Industry. A. Pechukas, General Electric Co.

CP56-1009. Influence of Materials on the Electrical Product. P. S. Potts, General Electric Co.

CP56-1007. Semiconductor Materials and the Electrical Engineer. Gene Strull, Westinghouse Electric Corp.

CP56-1014. The Modern Science of Materials for Electrical Engineers. W. W. Mullins, Westinghouse Electric Corp.

Friday, October 5

9:00 a.m.—Transmission & Distribution

Committee on Transmission and Distribution
Cotillion Room
I. B. JOHNSON, *Presiding*

56-993. A New Approach to the Study of Simultaneous Unbalances. H. A. Peterson, J. J. Skiles, I. J. Nagrath, The University of Wisconsin.

56-994. An Analysis of the Radio Interference Characteristics of Bundled Conductors. G. E. Adams, General Electric Co.

CP56-999. Switching Surges Due to De-energization of Capacitive Circuits. Working Group on Switching Surges.

FRIDAY (continued)

9:00 a.m.—Communication Maintenance
Communication Division Committee
Madison Room
H. R. HUNTLEY, Presiding

- CP56-1005. The New Emphasis in Maintenance for Communications Systems. W. K. MacAdam, American Telephone & Telegraph Co.
- CP.* Maintenance Problems and Considerations in the Independent Telephone Industry. B. L. Arnold, Lenkurt Electric Co., Inc.
- CP.* Manufacturer's Program for Equipment Maintenance. G. D. Wallenstein.

9:00 a.m.—Power Generation
Committee on Power Generation
Venetian Room
L. F. LISCHER, Presiding

- CP56-995. Excitation Voltage Response Definitions and Significance in Power Systems. M. Temoshok and F. S. Rothe, General Electric Co.
- CP56-996. Excitation System Response—A Utility Viewpoint. P. L. Dandeno and K. R. McClymont, The Hydro-Electric Power Commission of Ontario.
- CP.* Tests of Excitation System Transient Performance. R. W. Ferguson and T. J. Bliss, Westinghouse Electric Corp.
- CP.* Defining Excitation System Response. H. W. Cory and W. F. Eagan, Allis-Chalmers Mfg. Co.

9:00 a.m.—Industrial Control
Committee on Industrial Control
Hollywood Room
J. W. PICKING, Presiding

- 56-652. Protecting A.C. Motors with Low-Voltage Air Circuit Breaker Series Trips. F. P. Brightman, P. J. Reifschneider, R. R. McGee, General Electric Co.
- CP56-955. Application of Magnetic Logic Elements to the Control of an Automatic Bus Duct Welder. J. P. Conner, Westinghouse Electric Corp.
- 56-932. A Pressure-Control Switch with a Pulsation Filter. L. P. II Schaefer, The Hinchman Corporation.
- CP.* An Improved Method of Phase Failure Protection. W. Kniel.

2:00 p.m.—Transmission & Distribution
Committee on Transmission and Distribution
Cotillion Room
J. T. LUSIGNAN, Presiding

- 56-933. Report of a Survey on Controls for Automatically-Switched III Capacitors. Working Group of the AIEE Subcommittee on Capacitors.
- CP56-1004. Computer Simulates Water Heater Operation for Demand Analysis. H. E. Campbell and R. Habermann, Jr., General Electric Company.
- CP.* The Influence of Airborne Particles on the Radio and Corona Characteristics of Smooth Conductors. C. J. Miller, Jr.

FRIDAY (continued)

2:00 p.m.—Power Generation
Committee on Power Generation
Venetian Room
C. F. PAULUS, Presiding

- CP56-997. Steam Station Auxiliary Systems for Large High-Pressure Turbine-Generator Units. A. C. Dolbec, J. J. Heagerty, and A. G. Mellor, General Electric Co.
- CP56-998. Simplicity of Station Design and Operation with Cross-Compound Turbine Generator Sets. P. E. Benner, P. G. Brown, R. C. Buell, and A. G. Mellor, General Electric Co.

2:00 p.m.—Seminar on Education in Electronics
Committee on Electronics
Hollywood Room
J. M. CAGE, Presiding

2:00 p.m.—Communication Maintenance
Communication Division Committee
Madison Room
I. S. COGGESHALL, Presiding

- CP.* Over-all Aspects of Telegraph Maintenance. R. Hoover, Western Union Telegraph Co.
- CP.* Transmission and Reliability Maintenance of Type TD2 Radio Relay Systems. E. T. Fruhner and R. D. Service.
- CP.* Importance of Fringe Tests in Vacuum Tube Maintenance. D. S. Wise, Hickok Electrical Instrument Co.
- CP56-1011. A Discussion of Radio Relay Maintenance. G. B. Woodman, Western Union Telegraph Co.

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 COMMUNICATIONS AND ELECTRONICS.
- II APPLICATIONS AND INDUSTRY.
- III POWER APPARATUS AND SYSTEMS.

LADIES PROGRAM

An interesting program for the ladies attending the fall meeting has been planned by Mrs. Foster A. Larson and her committee. On Monday afternoon the ladies will meet in the Walnut Room of the hotel for bridge or canasta and tea. This event is courtesy of Allis-Chalmers Mfg. Co.

On Tuesday at 11 a.m., General Electric Co. has cordially invited the ladies to attend a delightful program presented by Mrs. Purdie Meissner, one of the foremost monologists in the midwest. She has promised us highlights from a new Broadway play. After the program, luncheon will be served. The program and luncheon will be held in the library of the Furniture Club of America overlooking Lake Michigan.

Wednesday is reserved for shopping, and tours of some of Chicago's most interesting attractions. Among them are the Art Institute of Chicago, the Field Museum, the Adler Planetarium, the new Prudential Building, etc. Guests are invited to name the place they would like to visit, and small tours will be organized by the hostesses.

On Thursday noon the committee has planned a luncheon at the Merchant's and Manufacturer's Club in the Merchandise Mart, followed by a tour of many of the Mart's home furnishings show rooms and NBC's new color studio while a program is in progress.

The Merchandise Mart, nicknamed "The City within a City", is internationally known as the world's biggest wholesale buying center. The tour will offer a fascinating glimpse of home fashions of the future. Tickets for this event are \$4.50.

Coffee Hours—Each morning from 9:00 to 10:30 coffee and rolls will be served in Ladies' Headquarters. Hostesses will be in attendance to explain each day's program, and help guests plan the day's entertainment.

FALL FROLICS

The committee is taking last year's Smoker, adding dancing and, they hope, your beautiful wives at each and every table and calling it the Fall Frolics. This colossal affair is scheduled for Wednesday night, Oct. 3. There will be a small group of musicians playing when you arrive in the Terrace Casino and they will continue playing while you enjoy an excellent dinner. An unusual show for your after-dinner entertainment is planned. Afterwards there will be music for your dancing or listening pleasure. Dress will be informal. Tickets are \$10.00 each.

INSPECTION TRIPS

A number of varied and interesting inspection trips are planned for the week of the meeting. Among these are tours of the Acme Steel Co., Ridgeland Station of Commonwealth Edison Co., Zenith Radio Co. plant, Swift and Co., WNBQ color TV, Prudential Building, Kellogg Switchboard Co., and International Business Machines Office.

Members are asked to *register in advance* for all trips as the number that can be accommodated on the various trips is limited.

Transportation will be by chartered bus in each case, except for the Prudential Building, WNBQ-TV studios, and IBM, which are within easy walking distance of the Morrison Hotel. Bus fare will be \$2.00 for each trip.

Acme Steel—Tuesday, Oct. 2. A trip by special bus in the morning to the Acme Steel Co. located in Riverdale where there will be an opportunity to see mill-type electrical equipment and to witness the operation of hot mills, cold strip mills, and galvanizers. Lunch will be available at nominal cost in the Acme cafeteria.

In the afternoon there will be a walking trip to the IBM office in the loop where a demonstration of rotating machine calculations will be made on a digital computer. (IBM 650).

Ridgeland Station—Wednesday, Oct. 3 (a.m.). A bus trip to the Ridgeland Station of the Commonwealth Edison Co. located in nearby Stickney. This is a very modern 600,000 kw station with four generators located on the Illinois Waterway which supplies condensing water and provides for delivery of coal by barge to a unique gantry crane. Of particular interest are the cyclone furnaces in the boilers and the modern coal-handling equipment.

Zenith Radio Co.—Wednesday, Oct. 3 (p.m.). A trip by bus to the plant of the Zenith Radio Co., one of the largest in the industry, where there will be an opportunity to see modern methods of production of both radio and television receivers and, it is hoped, hearing aids.

Swift & Co.—Thursday, October 4 (a.m.)—A bus trip to the famous Chicago Stock Yards and a tour through the facilities of Swift & Co. where each may see the processing of "Premium" products.

WNBQ-TV—Thursday, October 4 (Noon). A short walking trip to the color studios of WNBQ-TV located atop the Merchandise Mart where it will be possible to see studios, equipment, and also an actual program as it is being broadcast during the noon hour.

Prudential Building—Thursday, October 4 (p.m.). A short walk to the Prudential Building, the newest of Chicago's skyscrapers, which has the fastest automatic elevators, the highest lighting intensity, an observation platform at the 600-ft. level, available for a nominal 50-cent fee, and a popular cocktail lounge.

Kellogg Switchboard Co.—Friday, October 5 (a.m.). A trip by bus to the Kellogg Switchboard Co., one of the oldest independent manufacturers of telephone, central-office-to-subscriber equipment. Kellogg recently became a division of the International Telephone and Telegraph Co.

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C. W. Shade	

Signs Subcommittee

John Scott, <i>Chairman</i>	R. L. Swartwout
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Sleeping Accommodations Subcommittee

R. S. Roeing, <i>Chairman</i>	W. A. Briggs
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COMMITTEE MEETINGS

Monday, October 1

9:00 a.m.—Standard 32 Revision Working Group	Room 426
10:00 a.m.—Relay Committee Scope	Room 424
4:00 p.m.—Land Transportation	Room 434

Tuesday, October 2

9:00 a.m.—Admissions and Advancements Department	Parlor G
9:00 a.m.—General Applications Division	Room 432
9:00 a.m.—Lightning Protection of Rotating Machinery Working Group	Room 426
9:00 a.m.—Metallic Rectifiers	Parlor F
9:00 a.m.—District No. 5 Executive	Suite 440
9:00 a.m.—Power Division	Room 427
9:00 a.m.—Chemical Industry	Room 532
9:00 a.m.—Members-for-Life Fund	Room 424
9:00 a.m.—Edison Medal	Room 429
10:00 a.m.—Communication Division	Room 434
10:00 a.m.—Management	Room 530
12:00 noon—Luncheon—General Industry Applications	Room 432
12:00 noon—Luncheon—Membership	Parlor G
12:00 noon—Luncheon—Communication Division	Room 434
12:00 noon—Luncheon—District No. 5 Executive	Suite 440
2:30 p.m.—Science and Electronics Division	Parlor F
2:30 p.m.—District No. 5 Executive	Suite 440
2:30 p.m.—Safety	Room 530
2:30 p.m.—Communication Division	Room 434
2:30 p.m.—Industrial Power Systems	Room 427
2:30 p.m.—Relay Committee Scope	Room 424
2:30 p.m.—Membership	Parlor G
2:30 p.m.—Random Wound Coil Insulation Subcommittee	Room 426

Wednesday, October 3

9:00 a.m.—System Controls & Planning Subcommittees	Parlor G
9:00 a.m.—S.E. Computer Application Subcommittee	Room 530
9:00 a.m.—System Economics Subcommittee	Room 532
9:00 a.m.—Professional Conduct	Room 424
9:00 a.m.—Power Generation	Parlor F
9:00 a.m.—Insulated Conductors Administrations Subcommittee	Room 429
9:00 a.m.—Research	Suite 440
9:00 a.m.—Chemical Processes Subcommittee	Room 632
9:00 a.m.—Industry Division	Room 427
9:00 a.m.—TV and Aural Broadcasting	Room 426
9:00 a.m.—System Operations Subcommittee	Room 634

American Institute of Electrical Engineers

9:00 a.m.—Electronic Instruments Subcommittee	Room 432
10:00 a.m.—System Engineering	Parlor G
10:00 a.m.—Education in Electronics Subcommittee	Room 434
12:00 noon—Luncheon—Technical Operations	Suite 440
12:00 noon—Luncheon—Dielectrics Devices Subcommittee	Room 427
2:30 p.m.—Technical Operations	Suite 440
2:30 p.m.—High Frequency Instruments Subcommittee	Room 432
2:30 p.m.—Communication Theory	Room 424
2:30 p.m.—Telegraph Systems	Room 426
2:30 p.m.—Industrial Power Systems Designations	Room 434
4:00 p.m.—Basic Sciences	Room 429
4:00 p.m.—Single Phase & Fractional HP Machinery Subcommittee	Parlor G
4:30 p.m.—Electronics Planning Subcommittee	Room 427
6:30 p.m.—Dinner—Electronics	Room 427

Thursday, October 4

8:00 a.m.—Breakfast—Eastern Mining Subcommittee	Room 432
9:00 a.m.—Planning and Coordination	Suite 440
9:00 a.m.—F.C.S. Subcommittee on Components Specifications	Room 532
9:00 a.m.—Joint Division Committee on Automation	Room 434
9:00 a.m.—Metallic Rectifiers Magnetic Amplifiers Subcommittee	Room 632
9:00 a.m.—Education	Room 427
9:00 a.m.—Working Group on Noise Measurement	Room 530
9:00 a.m.—Charles F. Kettering Award Committee	Parlor G
12:00 noon—Luncheon—Induction Machinery Subcommittee	Room 429
12:00 noon—Luncheon—D-C Machinery Subcommittee	Room 432
2:00 p.m.—Conference on Vice Presidents	Suite 440
2:00 p.m.—F.C.S. Subcommittee on Components Specifications	Room 532
2:00 p.m.—Charles F. Kettering Award Committee	Parlor G
2:00 p.m.—Radio Communications Systems	Room 424
2:00 p.m.—Metallic Rectifiers Magnetic Amplifiers Subcommittee	Room 632
2:00 p.m.—Electronics High Frequency Instruments	Room 427
2:00 p.m.—Industrial Control	Room 434
4:00 p.m.—Wire Communications Systems	Room 429
4:00 p.m.—Rotating Machinery Administrative Subcommittee	Room 426
7:30 p.m.—Forum of Technical Committee Chairmen	Venetian Room

Friday, October 5

9:00 a.m.—Board of Directors	Suite 440
12:00 noon—Luncheon—Board of Directors	Suite 440
2:00 p.m.—Board of Directors	Suite 440
2:00 p.m.—Switching Surges Working Group	Room 432

LOCATION OF ALL MEETING ROOMS

Lower Level

Terrace Casino

Street Level

Hotel Lobby

Mezzanine Floor

Burgundy Room

Cotillion Room

Embassy Room

Hollywood Room

Second Floor

Venetian Room

Parlor F, G

Walnut Room

Third Floor

Madison Room

Fourth Floor

Rooms 424 to 440

Fifth Floor

Rooms 530 and 532

Sixth Floor

Rooms 632 and 634