

**American Institute of
Electrical Engineers**



FALL

GENERAL

MEETING

Program

*Please retain for use during
entire meeting*

CHICAGO, ILL.

OCTOBER 11-15

1954

Meeting Headquarters

MORRISON HOTEL

GENERAL INFORMATION

This meeting in Chicago, Illinois, is the eighth of the general meetings which are held annually each Fall in the Middle West. It is the first of three 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.

The General Session is scheduled for Monday morning, October 11th, when we will be welcomed by John W. Evers, President of the Commonwealth Edison Company. President A. C. Monteith will speak on "Your Institute—Its Problems." We are also honored with the presentation of an address entitled "Technology in Defense" by Donald A. Quarles, Assistant Secretary of Defense and former President of the Institute.

On the social side there will be a Get-Acquainted Tea, Sunday afternoon; a Smoker; and a Dinner-Dance, as well as 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 \$3.00 has been established for members and a fee of \$5.00 for non-members. This is to help make the meeting self-supporting and obviate the need for raising the annual dues. 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 in duplicate must be left with the chairman and/or sent to Edward C. Day, Assistant Secretary, Committee on Technical Operations, AIEE, 33 West 39th Street, New York 18, N. Y., before October 29, 1954. Discussions received later may have to be returned, depending upon the printing schedule of the paper to which the discussion is directed. The original typewritten double-spaced copy, together with original illustrations with 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 \$.30 each (\$.60 each to non-members). Special Publication S-66 will be \$2.00 per copy. 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 \$9.00 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. All of the numbered papers will ultimately be published in the Bimonthly Publications and in the TRANSACTIONS. Conference Papers denoted by CP.** are intended for presentation only and are not available.

Fall General Meeting

SCHEDULE OF EVENTS

SUNDAY, OCTOBER 10

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

MONDAY, OCTOBER 11

- 8:30 a.m. Registration
- 10:00 a.m. General Session
- 10:15 a.m. St. Peter's Cathedral (Ladies' Trip)
- 2:00 p.m. Air Transportation
 - Carrier Current
 - Induction Machinery
 - Magnetic Amplifiers
 - Metallic Rectifiers
 - Instrumentation

TUESDAY, OCTOBER 12

- 8:30 a.m. Trip to Western Electric Company
- 9:00 a.m. Industrial Power Systems, Transmission and Distribution, Production and Application of Light
 - Electrical Safety in College Laboratories
 - Air Transportation
 - Induction Machinery
 - The Author Meets the Publisher
 - Effect of Low Frequency and Low Voltage on Thermal Plant Capability
 - Magnetic Amplifiers
- 9:30 a.m. Swift and Company (Ladies' Trip)
- 12:15 p.m. Eta Kappa Nu Luncheon
- 1:30 p.m. Trip to Delta Star Division of H. K. Porter Co.
- 2:00 p.m. Air Transportation
 - Rotating Machinery Insulation
 - Load Relief During Power System Emergencies
 - Management
 - Industrial Control
 - Cathodic Protection
- 5:30 p.m. Kungsholm Restaurant for Dinner and Famous Miniature Grand Opera (Ladies' Trip)
- 5:15 p.m. Smoker

WEDNESDAY, OCTOBER 13

- 8:30 a.m. Trip to Ridgeland Station
- 9:00 a.m. Higher Distribution Voltage for Metropolitan Areas
 - Air Transportation
 - Nucleonics
 - Feedback Control Systems
 - Land Transportation
 - Visual Output Devices: Printers and Plotters
 - Rotating Machinery Insulation

- 10:30 a.m. Board of Trade (Ladies' Trip)
 12:00 noon Hull House (Ladies' Trip)
 1:30 p.m. Trip to Ridgeland Station
 Trip to Rauland Corporation
 2:00 p.m. Higher Distribution Voltage for Metropolitan Areas
 Communication Switching Systems
 Air Transportation
 Power Generation
 Visual Output Devices: Displays and Applications
 Feedback Control Systems
 6:00 p.m. Dinner Dance

THURSDAY, OCTOBER 14

- 8:30 a.m. Trip to University of Chicago Institute for Basic Research
 9:00 a.m. Air Transportation
 Relays and Transmission and Distribution Transformers
 International Communications
 Direct Current Machinery
 Basic Sciences
 10:15 a.m. On the North Shore as Far as Bahai Temple (Ladies' Trip)
 1:30 p.m. Trip to Republic Steel
 Trip to Motorola, Inc.
 2:00 p.m. Air Transportation
 Transmission and Distribution
 High Fidelity and Magnetic Recording
 Direct Current Machinery
 Relays and Transformers
 7:30 p.m. Forum of Technical Committee Chairmen

FRIDAY, OCTOBER 15

- 9:00 a.m. Air Transportation
 Insulated Conductors
 Switchgear
 Color Television and International Broadcasting
 Metal Industry
 Electric Circuit Theory
 2:00 p.m. Insulated Conductors
 Protective Devices
 Mining Industry
 Radio and Wire Communications
 Single Phase and Fractional HP Machinery

Monday, October 11

10:00 a.m.—General Session

Grand Ballroom

F. A. COX, General Chairman, Presiding

Address of Welcome, John W. Evers, President, Commonwealth Edison Co.

Your Institute—Its Problems, President A. C. Montieth.

Technology in Defense, Donald A. Quarles, Assistant Secretary of Defense.

2:00 p.m.—Air Transportation

Committee on Air Transportation

Venetian Ballroom

W. T. BEATSON, Presiding

- 54-355. Correlation of Rating Data for Rotating Electrical Machinery. E. O. A. Naumann, Wright-Patterson Air Force Base.
 54-346. Ten Years of Progress in Predicting the Aerodynamic, Thermodynamic and Output Characteristics of Blast-Cooled Aircraft Generators. D. H. Scott, Naval Research Lab.
 54-414. Thermal Developments in Aircraft Generators. C. G. Martin, Jack and Heintz, Inc.
 54-415. High Altitude Aircraft Inverters. P. W. Franklin, The Leland Electric Co.

2:00 p.m.—Carrier Current

Committee on Carrier Current

Room 427

T. A. CRAMER, Presiding

- 54-321. A Study of the Use of Tone Modulation over Complex Carrier Channels. J. C. G. Carter, Westinghouse Electric Corp.

"Application of Microwave Equipment to Power Systems."

This will be a group discussion covering application problems and experiences with microwave equipment guided by a panel composed of both users and manufacturers of microwave equipment.

2:00 p.m.—Induction Machinery

Committee on Rotating Machinery

Hollywood Room

J. G. NOEST, Presiding

- CP.** Dynamic Braking of Induction Motors with D-C Excitation. C. T. Button, National Pneumatic Co., Inc.
 54-323. Nonuniform Torque in Induction Motors Caused by Unbalanced Rotor Impedances. O. I. Elgerd, Washington University.
 54-349. Internal Fault Currents in Multi-Circuit Induction Machines. D. L. Lafuze, General Electric Co.
 54-381. An Equivalent Thermal Circuit for Non-Ventilated Induction Motors. R. L. Kotnik, Reliance Electric & Engineering Co.
 CP.** Predicting Temperature Rise in Electric Motors by the Use of an Equivalent Circuit. W. J. Wittke and C. H. Crouse, Robbins & Meyers, Inc.

2:00 p.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers

Grand Ballroom

W. J. DORNHOEFER, Presiding

- 54-375. Derivative Controlled Magnetic Amplifiers. A. D. Schnitzler, Naval Research Laboratory.

- 54-364. The Biased Rectifier Amplifier—A Pulse Magnetic Amplifier. R. E. Morgan, General Electric Co.
- 54-388. Saturating Transformer Reference Circuit. W. G. Evans, Westinghouse Electric Corp.
- 54-376. Alteration of the Dynamic Response of Magnetic Amplifiers by Feedback Techniques. R. O. Decker, Westinghouse Electric Corp.
- 54-389. An Analog Computer Technique Using Magnetic Amplifiers. B. E. Davis and I. H. Swift, Naval Ordnance Test Station.

2:00 p.m.—Metallic Rectifiers

Committee on Metallic Rectifiers

Embassy Room

G. RAMSEY, Presiding

- CP.** Power Germanium Rectifiers for a High Current and Voltage Surge Application. E. F. Losco and H. R. Camp, Westinghouse Electric Corp.
- 54-416. A Magnetically Regulated Portable Battery Charger. R. E. D. Anderson, Bell Telephone Labs., Inc.
- 54-417. The Suitability of the Silicon Alloy Junction Diode as a Reference Standard in Regulated Metallic Rectifier Circuits. D. H. Smith, Bell Telephone Labs., Inc.
- 54-418. Some Applications of Semiconductor Devices in the Feedback Loop of Regulated Metallic Rectifiers. B. H. Hamilton, Bell Telephone Labs., Inc.
- CP.** Review of AIEE Metallic Rectifier Standards. E. A. Harty, General Electric Co.

2:00 p.m.—Instrumentation

Committee on Instruments and Measurements

Parlor F

A. H. WING, JR., Presiding

- CP.** Discussion of Precision in a Meter Checking Program. R. E. McCallum, Sandia Base.
- 54-354. A New Standard for Direct Current. F. C. Fitchen, F. P. Schweg, W. H. Tucker, General Electric Co.
- CP.** A Symmetrical Component Synthesizer and Analyzer. E. B. Kurtz and C. R. Lodge, State University of Iowa.
- CP.** A New Electrical Hygrometer. W. C. White, General Electric Research Lab.

Tuesday, October 12

9:00 a.m.—Industrial Power Systems, Transmission and Distribution, Production and Application of Light

SPONSORED BY THE ABOVE NAMED COMMITTEES

Room 427

J. V. McGUIRE, Presiding

- 54-329. Current Distribution in Paired-Phase Bus Bars under Unbalanced Load Conditions. J. B. Cataldo and N. Shackman, Bull Dog Electric Products Co.
- 54-333. A Field Method for Determining the Leading and Lagging Regulator in an Open Delta Connection. H. E. Lokay and R. L. Custard, Westinghouse Electric Corp.
- S-66 Network Application at 277/480 Volts for a Medium Density Area. E. A. Rothfus, Commonwealth Associates, Inc.; J. R. Oberholtzer, Commonwealth Services, Inc. and W. R. Folck, Central Illinois Light Co.

TUESDAY (continued)

- CP.** Hi-Volt-Cycle Lighting is Launched in a Hi-Wide Building. J. H. Campbell, H. D. Kurt and H. E. Schultz, General Electric Co.

9:00 a.m.—Electrical Safety in College Laboratories

Committees on Education and Safety

Embassy Room

S. R. WARREN, JR., Presiding

- CP.** The Need for Education in the Field of Safety. R. C. Peterson, Illinois Institute of Technology.
- CP.** Problems of Safety in College Electrical Laboratories. M. S. Coover, Iowa State College.
- CP.** Safety in Electrical Laboratories. R. L. Lloyd, National Bureau of Standards.
- CP.** Psychological Aspects of Accident Prevention. M. S. Viteles, Philadelphia Electric Co.

9:00 a.m.—Air Transportation

Committee on Air Transportation

Venetian Room

D. C. WHITE, Presiding

- 54-356. Carbon Pile Regulator Theory, Calibration, Adjustment and Factors Affecting its Operation. H. H. C. Richards, Westinghouse Electric Corp.
- CP.** A Static Exciter for Aircraft AC Generators. D. G. Scorgie, Naval Research Lab.
- CP.** Results of a Transient Stability Study on an Aircraft-Type Single Phase AC System. H. B. James, Westinghouse Electric Corp.
- 54-419. A High Power Servo Analyzer. Sterling Gorrill, Hanson-Gorrill-Brian, Inc. and O. C. Walley, Jack and Heintz, Inc.

9:00 a.m.—Induction Machinery

Committee on Rotating Machinery

Hollywood Room

F. C. RUSHING, Presiding

- CP.** Present-Day Techniques of Noise Measurement. B. G. Watters, Bolt Beranek and Newman, Inc.
- CP.** Techniques for Estimating Sound Levels in Industrial Areas. R. O. Fehr, General Electric Co.
- CP.** The Noise Levels of Some Typical Polyphase Induction Motors. R. L. Wall, General Electric Co.
- CP.** Techniques of Reducing Noise in Machinery with Particular Application to Electric Motors. B. J. Schweitzer and H. C. Hardy, Armour Research Foundation of Illinois Institute of Technology.
- CP.** Hysteresis Torque and Core Loss Variation in Induction Motors. J. F. H. Douglas and J. Frank, Marquette University.

9:00 a.m.—The Author Meets the Publisher

Committee on Electronics

Parlor F

W. C. WHITE, Presiding

Part I—So You're Thinking of Writing a Book.

- CP.** Words of Wisdom from a Book Publisher. J. S. Snyder, John Wiley and Sons, Inc.
- CP.** Comments from an Author. R. F. Shea, General Electric Co.
- Part II—Writing for a Scientific or Technical Journal.
- CP.** A Publisher Presents Some Ideas. Gerard Piel, Scientific American, Inc.

TUESDAY (continued)

CP.** An Editor's Viewpoint. W. W. MacDonald, McGraw-Hill Publishing Co.

CP.** Comments from an Author. E. H. Vedder, Westinghouse Electric Corp.

9:00 a.m.—Effect of Low Frequency and Low Voltage on Thermal Plant Capability

Committee on System Engineering
Grand Ballroom
A. C. HARTRANFT, Presiding

54-390. The Effect of Frequency and Voltage. Richard Holgate, Philadelphia Electric Co.

54-391. Operation at Low Frequency in Great Britain. P. J. Squire, British Electricity Authority.

54-370. The Effect of Frequency Reduction on Plant Capacity and on System Operation. H. A. Bauman, G. R. Hahn and C. N. Metcalf, Consolidated Edison Co. of N. Y., Inc.

54-368. Effect of Reduced Voltage and/or Frequency upon Steam Plant Auxiliaries. O. D. Butler and C. J. Swenson, Commonwealth Edison Co.

54-320. Forced Outage Rates of High Pressure Steam Turbines and Boilers. Joint Subcommittee on Application of Probability Methods to Power System Problems.

9:00 a.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Madison Room
H. W. LORD, Presiding

54-325. Techniques for Measuring Cascaded Self-Saturating Magnetic Amplifier Performance. Henry Kaplan and Gerald Wolf, Ford Instrument Co.

54-392. Magnetic Characteristics Pertinent to the Operation of Cores in Self-Saturating Magnetic Amplifiers. R. W. Roberts, Westinghouse Electric Corp.

54-393. Single-Ended Saturable Reactor Circuit with Quiescent Current Compensation. R. J. Radus, Westinghouse Electric Corp.

54-377. Magnetic Amplifier Control of R-F Generators. G. R. Mohr and Reuben Lee, Westinghouse Electric Corp.

54-509. Analysis of Magnetic Amplifiers by the Use of Difference Equations. P. R. Johannessen, Massachusetts Institute of Technology.

2:00 p.m.—Air Transportation

Committee on Air Transportation
Venetian Room
S. H. HANVILLE, JR., Presiding

54-420. The Nature of Voltage Ripple on D. C. Generators. F. N. Colamore, Jack and Heintz, Inc.

CP.** Aircraft AC Generator Electrical Machine Constants As Affected by Design Variations. R. P. Judkins, Westinghouse Electric Corp.

CP.** Some Design Criteria for Aircraft A-C Generating Systems. T. B. Owen, Hughes Aircraft Co.

CP.** Build Up Problems in AC Generators for Aircraft. R. M. Fisher and E. F. Hanson, General Electric Co.

2:00 p.m.—Rotating Machinery Insulation

Committee on Rotating Machinery
Room 427
C. L. SIDWAY, Presiding

54-366. New Performance Standards for Electrical Insulation of Rotating Machines. Working Group on Evaluation of Insulation for Rotating Machines.

TUESDAY (continued)

54-373. Insulation Systems for Random Wound Motors Evaluated by Motorette Tests. T. J. Gair, General Electric Co.

CP.** Comparison of Test Methods for Evaluating Motor Insulation. R. H. Rech and E. Topcozewski, A. O. Smith Corp.

CP.** Results of Co-operative Tests on Enameled Wire. J. F. Dexter, Dow-Corning Corp.

CP.** Progress Report of Insulation Functional Evaluation Program on Test Bars and Model Windings. G. L. Moses, Westinghouse Electric Corp.

2:00 p.m.—Load Relief During Power System Emergencies

Committee on System Engineering
Grand Ballroom
C. B. KELLEY, Presiding

54-369. Load Shedding Program in the Pacific Northwest. J. O. Swanson and J. P. Jolliffe, Bonneville Power Administration.

54-345. Load Reduction by Underfrequency Relays during System Emergencies. W. C. Gierisch, Houston Lighting & Power Co.

54-372. Application and Test of Frequency Relays for Load Shedding. L. L. Fountain and J. L. Blackburn, Westinghouse Electric Corp.

54-330. Automatic Digital Computer Solution of Load Flow Studies. J. M. Henderson, General Electric Co.

2:00 p.m.—Management

Committee on Management
Embassy Room
F. K. McCUNE, Presiding

CP.** Organization and Management of an Atomic Power Study. Titus LeClair, Commonwealth Edison Co.

CP.** Organization of a Small Company for Complex Engineering Work. John Logan, Cambridge Corp.

2:00 p.m.—Industrial Control

Committee on Industrial Control
Hollywood Room
H. L. PALMER, Presiding

54-387. Accurate Control of Relative Speed and Cut in a Continuous Process Line. E. G. Anger and D. L. Pettit, Square D Co.

CP.** Servo Type Speed Regulator. N. L. Peterson, Cutler-Hammer, Inc.

CP.** Ambient-Compensated Thermal Overload Relays for Outdoor Control Centers. R. M. Brokaw, General Electric Co.

CP.** Speed Regulation of Press with Eddy Current Clutch and Brake. A. E. Lewis and J. W. Fox, Clark Controller Co.

2:00 p.m.—Cathodic Protection

Committee on Cathodic Protection
Parlor F
R. M. WAINWRIGHT, Presiding

CP.** Electrical Grounding and Cathodic Protection at the Fairless Works. W. E. Coleman and H. G. Frostick, U. S. Steel Corp.

CP.** Magnetic Amplifier Control of Cathodic Protection Equipment. D. R. Werner, American Tel. & Tel. Co.

CP.** Cathodic Protection Circuits. E. W. Schwarz and R. M. Wainwright, University of Illinois.

CP.** Whether Cathodic Protection. L. M. Plym, Illinois Bell Telephone Co.

Wednesday, October 13**9:00 a.m.—Higher Distribution Voltage for Metropolitan Areas**

Committees on Industrial Power Systems and Transmission and Distribution
Grand Ballroom

E. R. HENDRICKSON, Presiding

Note: The papers in This Session Have Been Published as a Part of Special Publication S-66.

- S-66. A New Approach to the Problem of Higher Distribution Voltages. A. M. DeBellis, Consolidated Edison Co. of N.Y., Inc., and S. B. Griscom, Westinghouse Electric Corp.
- S-66. Economics of Various Secondary Voltages for Commercial Areas. T. C. Duncan, J. P. Neubauer, J. M. Comly, Consolidated Edison Co. of N. Y., Inc., R. F. Lawrence and Miles Maxwell, Westinghouse Electric Corp.
- S-66. Distribution Equipment Used on 265/460 Volt Networks and Its Operating Features. L. Brieger, C. P. Xenis, A. J. Bisson, J. DeLellis, Consolidated Edison Co. of N. Y., Inc.
- S-66. Secondary Network Equipment for 250 to 600 Volt Systems. R. L. Schwab and E. W. Stohr, Westinghouse Electric Corp.
- S-66. Future Utilization Voltages. L. G. Smith, Consolidated Gas, Electric Light & Power Co. of Baltimore.

9:00 a.m.—Air Transportation

Committee on Air Transportation
Venetian Room

D. W. EXNER, Presiding

- 54-327. Overvoltage Detection in Single and Multigenerator Aircraft A-C Systems. W. M. Tucker and M. Trbovich, Naval Research Lab.
- CP.** Protection of Aircraft Parallel AC Systems Against Excitation Failures. H. H. Britten, S. C. Caldwell and A. J. Wood, General Electric Co.
- 54-357. A Weight Analysis of Modern Aircraft Electric Systems. H. L. Garbarino, A. K. Hawkes and J. A. Granath, Armour Research Foundation of Illinois Institute of Technology.
- CP.** British Aircraft Electrical Engineering Practice. H. Zeffert.

9:00 a.m.—Nucleonics

Committee on Nucleonics
Room 427

W. E. BARBOUR, JR., Presiding

- CP.** Nuclear Reactors for the Production of Power. Stuart McLain, Argonne National Labs.
- CP.** Reactor Control. Joseph Harrer, Argonne National Labs.
- CP.** Instruments for Radiation Measurement. Dr. John Rose and Dr. L. D. Marinelli, Argonne National Labs.
- CP.** Legal Problems of Private Business Under the Atomic Energy Act of 1954. Stuart MacMackin, General Electric Co.
- CP.** Nondestructive Testing. Warren McGonnagle, Argonne National Labs.
- CP.** Electrical Instruments for Research and Control.
- 54-524. Measurements of Materials with High Dielectric Constant and Conductivity at Ultrahigh Frequencies. H. P. Schwan and Kam Li, University of Pennsylvania. Re-presented for discussion.

WEDNESDAY (continued)**9:00 a.m.—Feedback Control Systems**

Committee on Feedback Control Systems
Embassy Room

H. W. CORY, Presiding

- 54-521. Jitter in Instrument Servos. R. L. Hovious, Goodyear Aircraft Corp.
- 54-522. Evaluating the Effect of Non-Linearity in a 2-Phase Servo Motor. W. A. Stein and G. J. Thaler, U. S. Naval Postgraduate School.
- 54-520. A Magnetic Tape Memory for D-C Positional Servomechanisms. J. P. DeBarber, Altoona, Pa.
- CP.** Stability of Nonlinear Feedback Control Systems and Induction Motors with Series Capacitors. J. F. Koenig, National Bureau of Standards.

9:00 a.m.—Land Transportation

Committee on Land Transportation
Hollywood Room

P. H. HATCH, Presiding

- 54-350. Diesel-Electric Locomotive Wheel Slipping—Causes, Effects and Methods of Control. R. I. Fort, Illinois Central Railroad.
- 54-339. Maintenance Testing of Insulation Resistance on Diesel-Electric Locomotives. W. E. Kelley, Pennsylvania Railroad Co.
- 54-344. Operating Experience in Diesel-Electric Locomotives Results in Design Changes. L. E. Legg, Chicago & Northwestern R. R.
- 54-382. Gearing for Diesel-Electric Locomotives. G. T. Bevan, International General Electric Co.
- 54-343. The Toronto Subway. J. G. Inglis, Toronto Transit Commission.

9:00 a.m.—Visual Output Devices: Printers and Plotters

Committee on Computing Devices
Parlor F

F. L. MOSELEY, Presiding

- CP.** Servomechanical Devices as Aids to Analysis, Data Handling and Control. F. L. Moseley, F. L. Moseley Co.
- CP.** An X-Y Recording System for Computers. D. L. Pickens and B. L. Waddell, Librascope, Inc.
- CP.** History of X-Y Recorders. J. D. Kennedy, Electronic Associates.
- CP.** Ferromagnetography. J. P. Hanna, General Electric Co.

9:00 a.m.—Rotating Machinery Insulation

Committee on Rotating Machinery
Madison Room

M. L. SCHMIDT, Presiding

- 54-365. The Motorette as a Tool for the Development of Improved Insulation Systems. W. B. Penn, General Electric Co.
- CP.** The Evaluation of Modified Silicone Insulation Systems in Motors. Jack McDonald, Westinghouse Electric Corp.
- CP.** Insulation Systems Evaluated Using Motorettes and Formettes. Lanier Greer, Reliance Electric & Engineering Co.
- CP.** A Statistical Method for Predicting Insulation Life in Motors from Experimental Data. W. H. Horton, Westinghouse Electric Corp.
- CP.** Proposed Test Procedure for Evaluation Systems of Insulation for High Voltage Generators. G. L. Moses, Westinghouse Electric Corp.

WEDNESDAY (continued)

2:00 p.m.—Higher Distribution Voltage for Metropolitan Areas

*Committees on Industrial Power Systems and Transmission and Distribution
Grand Ballroom*

S. A. WARNER, Presiding

*Note: The papers in This Session Have Been Published as a Part of
Special Publication S-66.*

- S-66. The Relative Feasibility of 460 Volt or 208 Volt Service in Commercial Buildings. H. G. Barnett, R. A. Zimmerman and H. E. Lokay, Westinghouse Electric Corp.
- S-66. Progress in Power System Engineering for Commercial Buildings. H. D. Kurt and Donald Beeman, General Electric Co.
- S-66. Service Voltage Spread and its Effect on Utilization Equipment. H. G. Barnett and F. R. Lawrence, Westinghouse Electric Corp.
- S-66. 480Y/277 Volt Power System in Telephone Building at Menands, New York. D. S. Brereton, General Electric Co. and H. J. Donnelly, New York Telephone Co.
- S-66. The Advantages of 240/416 Volts as a Standard Secondary Voltage. J. B. Hodtum, Allis-Chalmers Mfg. Co.

2:00 p.m.—Communication Switching Systems

Committee on Communication Switching Systems

Room 427

A. E. FROST, Presiding

- 54-502. Interoffice Trunking and Signalling. F. H. Nolke, Rural Electrification Adm.
- 54-503. Some Recent Advances in the Economy of Routing Calls in Nationwide Toll Dialing. Imre Molnar, Automatic Electric Co.
- CP.** Nationwide Dialing. D. W. Haskins, American Tel. & Tel. Co.
- 54-347. Automatic Percussion Welding. A. L. Quinlan, Western Electric Co., Inc.

2:00 p.m.—Air Transportation

Committee on Air Transportation

Venetian Room

E. F. KOTNIK, Presiding

- 54-359. Calculations on Voltage Unbalance for Three-Phase Synchronous Systems. B. J. Wilson and W. K. Gardner, Naval Research Lab.
- 54-374. Experimental Determination of 400 Cycle Impedance of Wire in Aircraft Power Distribution Circuits. J. D. Andrew, Douglas Aircraft Co., Inc.
- CP.** Comparison of Solid and Split Bus Two Generator AC Systems. S. C. Caldwell and G. A. Phillips, General Electric Co.
- CP.** Evaluation of Selenium Rectifiers and Capacitors for Use in Aircraft. R. A. Yereance and A. A. Balafas.

2:00 p.m.—Power Generation

Committee on Power Generation

Hollywood Room

J. H. KINGHORN, Presiding

- 54-504. Underexcited Reactive Ampere Limit for Modern Amplidyne Voltage Regulator. A. S. Rubenstein and M. Temoshok, General Electric Co.
- 54-384. Synchronous Condenser Operation with Negative Field Currents. K. R. McClymont and P. L. Dandeno, Hydro Electric Power Commission of Ontario.
- 54-505. Motor-Driven Exciter Sets for Power Stations. J. B. Tice and M. Temoshok, General Electric Co.

- 54-506. The Gas Turbine Today. C. F. Kottcamp, Gulf Oil Corp. Re-presented for discussion.
- 54-507. The Success of the Steam Boiler. G. V. Williamson, Union Electric Co. of Missouri. Re-presented for discussion.
- 54-508. Turbine Generators—Present and Future. E. H. Krieg, Stone and Webster Engineering Corp. Re-presented for discussion.

2:00 p.m.—Visual Output Devices: Displays and Applications

Committee on Computing Devices

Parlor F

F. J. MAGINNISS, Presiding

- CP.** The Charactron as a Digital Computer Read-Out. J. T. McNaney, Consolidated Vultee Aircraft.
- CP.** A New Technique of Binary Addition. W. J. Schart, Consolidated Vultee Aircraft.
- CP.** Automatic Data Transfer and Display Boards. G. E. Fenimore, Civil Aeronautics Adm.
- CP.** Simultaneous Aircraft Position and Identification Display. J. T. McNaney, Consolidated Vultee Aircraft.

2:00 p.m.—Feedback Control Systems

Committee on Feedback Control Systems

Embassy Room

H. W. CORY, Presiding

- 54-371. The Maximum Response Ratio of Linear Systems. P. E. Pfeiffer, Rice Institute.
- 54-519. Phase-Plane Analysis of Automatic Control Systems with Nonlinear Gain Elements. R. E. Kalman, E. I. du Pont de Nemours & Co.
- CP.** A Simple Method for Calculating the Time Response of a System to an Arbitrary Input. G. A. Biernson, Massachusetts Institute of Technology.
- 54-523. Additions to z-Transformation Theory for Sampled-Data Systems. G. V. Lago, University of Missouri.

Thursday, October 14

9:00 a.m.—Air Transportation

Committee on Air Transportation

Venetian Room

W. C. BRYANT, Presiding

- CP.** Performance Characteristics of a Constant Speed Differential Hydraulic Transmission System. R. S. Conrad, Chance Vought Aircraft.
- CP.** Controlled Speed AC Generator Drive Selection for the Light Weight Combat Airplane. R. E. Thorn and T. E. Abraham.
- CP.** Accessory Design Problems. J. E. Wolf, Marquardt Aircraft Co.
- CP.** Air Turbine Drives—Performance and Limitations. L. Royce, Stratos, Div. of Fairchild Engine & Airplane Corp.

9:00 a.m.—Relays and Transmission and Distribution

Committees on Relays and Transmission and Distribution

Grand Ballroom

F. V. SMITH, Presiding

- 54-332. The Probability of Coincident Primary-Feeder Outages in Secondary Networks. D. N. Reys, Westinghouse Electric Corp.
- 54-363. Co-Ordination of Construction and Protection of Distribution Circuits—5 KV Class Based on Operating Data for Years 1949-50-51. Joint AIEE-EEI Working Group.

THURSDAY (continued)

- CP.** Fundamentals of Fuse-Breaker Coordination. L. D. Cronin, Chase Hutchinson and D. M. MacGregor, Ebasco Services, Inc.
- CP.** Coordination of Sectionalizing Devices for Primary Feeder Protection. H. B. Thacker, Westinghouse Electric Corp.
- CP.** Eight Years Experience with Oil Circuit Reclosures in Substations. A. C. Fagerlund and G. D. Stevens, Consumers Power Co.

9:00 a.m.—Transformers

Committee on Transformers
Embassy Room
J. A. ADAMS, Presiding

- 54-324. Auto Transformers for Power Systems. O. T. Farry, Wagner Electric Corp.
- 54-395. A Proposed New Standard Control Scheme for Paralleling Transformers with Under-Load Tap Changers. J. Cosar, Hydro Electric Power Commission of Ontario.
- 54-379. Electrostatic Voltage Distribution and Transfer in Three-Winding Transformers. P. A. Abetti, General Electric Co.
- 54-380. Surge Transfer in Three-Winding Transformers. P. A. Abetti, General Electric Co. and H. F. Davis, Massachusetts Institute of Technology.

9:00 a.m.—International Communications

Committees on Wire Communications Systems and Communication Switching Systems
Hollywood Room
H. I. ROMNES, Presiding

- CP.** A Transatlantic Telephone Cable. M. J. Kelly, G. W. Gilman, Bell Telephone Labs., Inc.; Sir W. Gordon Radley, R. J. Halsey, Post Office of the United Kingdom.
- 54-424. Rural Automation in the Swedish Telephone System. Bertil Bjurel, Presented by Dr. Hakon Sterky, Direction Generale des Telecommunications de Suede.

9:00 a.m.—Direct Current Machinery

Committee on Rotating Machinery
Room 427
A. T. McCLINTON, Presiding

- 54-322. An Improved Wide-Range Adjustable-Speed Drive. A. G. Conrad, A. R. Perrins, R. R. Shank, Yale University.
- 54-367. A Method of Finding Equalizer Section for D-C Armature Winding. T. C. Tsao, Ebasco International Corp., and N. F. Tsang, University of Arkansas.
- 54-319. Equations Depicting the Operation of the Direct-Current Motor. R. W. Ahlquist, University of Detroit.
- 54-351. Air Humidity and Brush Contact Drop: The Effect of Water Vapor, Sulfur, Dioxide and Hydrogen Sulfide. H. M. Elsey, L. E. Moberly and J. L. Johnson, Westinghouse Electric Corp. Re-presented for discussion.

9:00 a.m.—Basic Sciences

Committee on Basic Sciences
Parlor F
L. J. BERBERICH, Presiding

- 54-361. A Comparison of Metals and Ferrites for High-Speed Pulse Operation. D. R. Brown, D. A. Buck and N. Menyuk, Massachusetts Institute of Technology. Re-presented for discussion.

THURSDAY (continued)

- 54-510. Characteristics of the High Current Argon Arc with Various Electrode Materials. J. W. Dzimianski, Allis-Chalmers Mfg. Co. and T. B. Jones, The Johns Hopkins University.
- 54-511. The Measurement of Electrostatic Potential Due to Net Ion Space Charge in Air. J. S. Carroll and S. B. Hammond, Stanford University.
- 54-512. Harmonic Analysis for Non-Linear Characteristics. L. J. Lewis, University of Washington.

2:00 p.m.—Air Transportation

Committee on Air Transportation
Venetian Room
E. P. BARLOW, Presiding

- CP.** Use of Analogs in Jet Engine Control Development. S. Crowell.
- CP.** An Airborne Transceiver. K. E. Vaughn.
- CP.** A Simplified Omni-Range System for Terminal Navigation (TVOR). D. O. McCoy.
- 54-358. Aircraft Tachometer Indicator—An Analysis of Design Factors Affecting Starting Performance. L. T. Akeley, General Electric Co.
- 54-525. Aircraft Windshields Heated by Means of Transparent Conductive Films. J. W. Ward, Boeing Airplane Co. Re-presented for discussion.

2:00 p.m.—Transmission and Distribution

Committee on Transmission and Distribution
Grand Ballroom
C. E. PARKS, Presiding

- 54-337. Economics of Switched Shunt Capacitors and Synchronous Condenser Kilovar Supply for Transmission Systems. P. G. Brown, G. W. Otte, L. E. Saline and V. C. Talley, General Electric Co.
- 54-385. An Evaluation of Power Factor Correction on a System Basis. H. R. Tomlinson and R. O. Bigelow, New England Power Service Co.
- 54-331. Transient Stability Studies—I Synchronous and Induction Machines. D. F. Shankle, C. M. Murphy, R. W. Long and E. L. Harder, Westinghouse Electric Corp.
- 54-501. Practical Application of Sag and Tension Calculations to Transmission Line Design. J. Lummis and H. D. Fischer, Jr., Southern California Edison Co.

2:00 p.m.—High Fidelity and Magnetic Recording

Committee on Television and Aural Broadcasting Systems
Hollywood Room
C. E. DEAN, Presiding

- CP.** A New High-Fidelity High-Powered Amplifier and Speaker Reproducing System. F. H. McIntosh, Consulting Engineer.
- CP.** General Problems of Standardization in the Electronic Industries with Reference to the Definition of High Fidelity. F. H. Slaymaker, Stromberg-Carlson Co.
- 54-383. A Survey of Magnetic Recording. S. J. Begun, Clevite-Brush Development Co.

2:00 p.m.—Direct Current Machinery

Committee on Rotating Machinery
Room 427
W. J. PRISE, Presiding

- 54-326. A New Method of Investigating Commutation as Applied to Automotive Generators. E. I. Shobert II and J. E. Diehl, Stackpole Carbon Co.

CP.** Reconditioning of Electrical Equipment Which has been Submerged in Salt Water. W. H. Fifer, Bureau of Ships, U. S. Navy.

CP.** Plant Maintenance for Brushes and Commutators. L. D. Cook, Commonwealth Edison Co.

CP.** Field Problems in DC Machinery. H. Q. Griffith, Belyea Co., Inc.

2:00 p.m.—Relays and Transformers

Committees on Relays and Transformers

Embassy Room

D. L. LEVINE, Presiding

54-396. Detection of Corona in Oil at Very High Voltages. T. W. Liao and J. S. Kresge, General Electric Co.

54-397. The Effect of Reclosing Practice on Short Circuit Thermal Limits of Transformers. J. E. Clem, Consulting Engineer.

54-398. Operating Experience with 230 Kv Automatic Reclosing on BPA System. D. A. Gillies, Bonneville Power Administration.

54-518. Bibliography on Transformer Noise. AIEE Transformer, Subcommittee on Subject No. 30, Working Group No. 1.

Friday, October 15

9:00 a.m.—Air Transportation

Committee on Air Transportation

Venetian Room

P. DUYAN, JR., Presiding

CP.** Aircraft Equipment Electrical Insulation Problems. L. B. Kilman and J. P. Dallas, Hughes Tool Co.

54-422. Environmental Testing of Small Electronic Components at High Sound Intensities. F. Mintz and M. B. Levine, Armour Research Foundation of Illinois Institute of Technology.

54-423. Development of Large-Ratio Release Circuit-Breaker Mechanism. J. A. Scarcelli and R. Steiner, U. S. Naval Air Development Center.

54-352. Comments on Aircraft Switch Testing. T. R. Stuelpnagel and J. P. Dallas, Los Angeles, Calif.

54-353. Reliability Improvement—A Plan to Achieve and Measure Reliability of Aircraft Equipment. J. E. Luckman, U. S. Naval Air Development Center.

9:00 a.m.—Insulated Conductors

Committee on Insulated Conductors

Embassy Room

M. H. McGRATH, Presiding

CP.** A Classified Bibliography for Insulated Conductors—A Committee Report. A. S. Brookes, Chairman Standards and Publications Subcommittee.

54-399. Moisture Studies on Ozone Resisting and Type RHRW Rubber Insulations. E. C. DeBaene and C. A. Anderson, The Detroit Edison Co.

CP.** The Effects of High-Energy Gamma Radiation on Dielectric Solids. P. H. Klein and C. Mannal, General Electric Co.

CP.** X-Ray Cable—Its Design for Long Service. L. A. Duna, American Steel and Wire Co.

9:00 a.m.—Switchgear

Committee on Switchgear

Hollywood Room

J. D. WOOD, Presiding

54-342. Adaptation of a Conventional Oil Circuit Breaker to Capacitance Switching. E. J. Simmons, Long Island Lighting Co. and V. A. Treat, Pacific Electric Mfg. Corp.

FRIDAY (continued)

54-341 Maintenance Testing of Oil Circuit Recloser Insulation with High Voltage D-C. R. W. Bethke and L. C. Westphal, Line Material Co.

54-340. A New 69 Kv Oil Circuit Breaker for High Interrupting Duty. V. E. Phillips and K. G. Darrow, General Electric Co.

CP.** The Design of Industrial Distribution Systems: An Epitomization of Available Data—Part II. T. J. Higgins, University of Wisconsin.

9:00 a.m.—Color Television and International Broadcasting

Committee on Television and Aural Broadcasting Systems

Grand Ballroom

J. B. EPPERSON, Presiding

54-334. Differential Phase and Gain Measurements in Color Television Systems. H. P. Kelly, Bell Telephone Labs., Inc.

CP.** Recording Color Television Programs. E. D. Goodale, National Broadcasting Co.

CP.** The Engineering Development of the Voice of America. E. T. Martin, Julius Ross and George Jacobs, U. S. Information Service.

CP.** Very-High-Powered Long-Wave Broadcasting Station. C. E. Smith, Carl E. Smith Consulting Radio Engineers; J. R. Hall and J. O. Weldon, Continental Electronics Mfg. Co.

9:00 a.m.—Metal Industry

Committee on Mining and Metal Industry

Room 427

W. E. MILLER, Presiding

CP.** A New Method of Calculating D. C. Dynamic Braking for Wound Rotor Motors. B. H. Carlisle, Clark Controller Co.

54-348 A-C Power System at the Fairless Works. S. S. Watkins, Gibbs & Hill Inc.; W. A. Derr, L. L. Fountain and R. B. Squires, Westinghouse Electric Corp.

CP.** Modern Tinplate Annealing. John Soyring, U. S. Steel Corp. and A. C. Parsons, General Electric Co.

CP.** Modern Controls for New 4-Stand Cold Mill at Youngstown Sheet and Tube Co. C. E. Homer, Youngstown Sheet and Tube Co. and R. E. Manko, General Electric Co.

9:00 a.m.—Electric Circuit Theory

Committee on Basic Sciences

Parlor F

W. R. LePAGE, Presiding

54-513. The Transmission-Matrix of N Alike Cascaded Networks. Leo Storch, Hughes Aircraft Co.

54-514. Acceleration Plane Method for Analysis of a Circuit with Nonlinear Inductance and Nonlinear Capacitance. Y. H. Ku, Moore School of Electrical Engineering.

54-515. Analysis of Nonlinear Coupled Circuits. Y. H. Ku, Moore School of Electrical Engineering.

54-516. A Rectifier Algebra. D. H. Schaefer, Naval Research Lab.

54-394. A Symbolic Method for Synthesis of Two-Terminal Switching Circuits. D. Zeheb and W. P. Caywood, Carnegie Institute of Technology.

2:00 p.m.—Insulated Conductors

Committee on Insulated Conductors

Grand Ballroom

M. W. GHEN, Presiding

54-338. Economics and Comparison of Reliability of Leaded and Non-Leaded Secondary Distribution Systems. E. L. Leinbach, The Detroit Edison Co. and C. P. Xenis, Consolidated Edison Co. of N. Y., Inc.

FRIDAY (continued)

54-378. A Progress Report on Performance of Secondary Network Cables. E. C. DeBaene, F. M. Hull and R. H. Hiester, The Detroit Edison Co.

54-335. High Pressure Self-Contained Gas-Filled Cable Installation. G. B. Shanklin, General Electric Co.

2:00 p.m.—Protective Devices

Committee on Protective Devices
Venetian Room
E. G. NORELL, Presiding

54-360. Grounding of Sub-Transmission Systems. G. D. Breuer, I. B. Johnson and S. V. Lyon, General Electric Co.

54-400. Protective Spark Gaps with Radio-Active Substances. D. R. Hardy, The University of Manchester.

2:00 p.m.—Mining Industry

Committee on Mining and Metal Industry
Room 427
J. G. IVY, Presiding

CP.** Modern Electric Power Shovels. J. F. Weis, Marion Power Shovel Co.

CP.** Magnetic Amplifier Regulator Control for Mine Hoist. R. E. Peterson, Westinghouse Electric Corp.

CP.** Substitutes for Frame Grounding of Mining Machinery. E. J. Gleim, U. S. Bureau of Mines.

CP.** Special Motor Applications for Underground Mining Machinery. C. C. Boesewetter and R. M. Buckeridge, Goodman Mfg. Co.

2:00 p.m.—Radio and Wire Communications

Committees on Radio and Wire Communications
Embassy Room
E. D. BECKEN, Presiding

54-407. A Private Microwave Radio System for Power Company Use. D. F. Hazen, Illinois Power Co. J. W. Danser and G. S. Zilis, Illinois Bell Telephone Co.

54-411. Simplified Transmission Engineering in Exchange Cable Plant Design. L. B. Bogan, and K. D. Young, American Tel. & Tel. Co.

A Single Presentation Will Be Made of the Following Four Papers.

54-408. Considerations for Development of New Military Carrier Telephone Systems. R. S. Boykin, J. H. Johnson and S. D. Bedrosian, Signal Corps Engineering Labs.

54-409. A New Cable Design for Military Carrier Telephone Systems. H. F. X. Kingsley, Signal Corps Engineering Labs.

54-386. New Military Carrier Telephone Systems. G. H. Huber, W. R. Miller and C. W. Schramm, Bell Telephone Labs., Inc.

54-410. New Military Carrier Telephone Systems Equipment Features. J. P. Hoffmann, Bell Telephone Labs., Inc.

A Single Presentation Will Be Made of the Following Six Papers.

54-401. A New Multichannel Teletype Terminal for Use on Long Rang HF Radio Systems. A. Mack and R. H. Levine, Signal Corps Engineering Labs.

54-402. Telegraph Terminal AN/FGC-29 Equipment Features. F. H. Cusack, Western Union Telegraph Co.

54-403. Telegraph Terminal AN/FGC-29 Circuit Design Aspects. J. E. Boughtwood, Western Union Telegraph Co.

FRIDAY (continued)

54-404. Considerations for a New Military Radio Relay System. M. L. Ribe and S. P. Brown, Signal Corps Engineering Labs.

54-405. A New UHF Multichannel Military Radio Relay System. J. G. Nordahl, Bell Telephone Labs., Inc.

54-406. Equipment and Mechanical Features of the AN/TRC-24 Radio Set. V. I. Crusier, Bell Telephone Labs., Inc.

2:00 p.m.—Single Phase and Fractional HP Machinery

Committee on Rotating Machinery
Hollywood Room
E. P. CODLING, Presiding

54-336. Space Harmonics Generated by Concentric Windings. A. J. Berman, G. Farmanfarma and R. Schinzing, University of California.

54-328. Iron Loss in Universal Motors. W. E. Wier, Westinghouse Electric Corp.

54-412. Permanent Magnet Excited Synchronous Motors. F. W. Merrill, General Electric Co.

54-413. Unbalanced Magnetic Pull in Induction Motors with Eccentric Rotor. A. Covo, Westinghouse Electric Corp.

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

INSPECTION TRIPS

Transportation for the Ridgeland Station inspection trips will be furnished by the Commonwealth Edison Company. There will be no charge for this trip. Other inspection trips—\$2.00 each.

Morning trips will be from 8:30 to 12:30. Afternoon trips will be from 1:30 to 5:30.

Certain plants have security regulations. Aliens should register in advance for trips.

Western Electric Company—Hawthorne Plant—Tuesday morning—This is the oldest of Western Electric Company's manufacturing plants, starting in 1905. More than half the world's telephones have been made here. This is one of the largest industries in the Chicago Area, employing nearly 20,000 people. Total annual payroll last year was \$94,000,000.

Main products are: panel, step-by-step and cross-bar central office equipment, lead-covered and Alpth exchange cable, copper line wire, loading coils, message registers, automatic message accounting equipment, steel wire and strand, pole line hardware, apparatus cabinets, power boards and fuse panels, keys, jacks, and heat coils.

Delta Star Division of H. K. Porter Co., Tuesday afternoon—This plant manufactures high tension electrical switching equipment, heavy duty, metal enclosed bus runs, outdoor substations and allied equipment.

The main office and factory in Chicago include a steel fabricating shop, sheet metal shop, galvanizing machine shop, switch assembly and laboratory.

Production machinery consists essentially of metal cutting, forming, drilling, tapping, welding, and heat treating equipment. Laboratory and test facilities include: a 1,000,000-v, 60 cycle transformer bank for dielectric tests, 7,000 and 12,000-amp, 3-phase, 60-cycle transformer banks for conducting heat run tests, a 50,000 lb. mechanical testing machine, transformers for short-time current testing at values up to 100,000 RMS amp, and an ice chest for simulating ice condition on outdoor switches.

Buses for this trip will go via Commonwealth Edison's Jefferson St. Substation affording guests a brief opportunity to see this unusual installation.

Ridgeland Station, Wednesday morning and afternoon. This is the newest and most modern of all generating plants of the Commonwealth Edison Company. It is located on the Illinois Waterway which supplies condensing water and provides for delivery of coal by barge. The station will have an ultimate generating capacity of 600,000 kw. Of particular interest at Ridgeland are the cyclone furnaces with which the boilers are equipped.

Ridgeland has one of the largest coal storage piles in the middle west. Space is provided for a reserve stockpile which might reach 1,300,000 tons and modern coal handling equipment and operations alone are worth the trip to Ridgeland.

University of Chicago Institutes for Basic Research—Thursday morning—Chicago University's Institutes of Basic Research include the Institute for Nuclear studies and the Institute for the study of metals. Guests on this trip will visit the Radio Carbon Laboratory, the Coincidental Counting Laboratory, the Low Temperature Laboratory, and the Cyclotron and Betatron Laboratory. They will have an opportunity to see the 450 million electron volt cyclotron, the 100 million electron volt betatron, electronic circuits for millimicrosecond coincidence counting, determining the age of ancient objects with C14, and the low-temperature laboratory, one degree K.

Republic Steel—Thursday afternoon—The visit to the Republic Steel Company plant at South Chicago will provide members with an opportunity to see the complete steel-making operation in a single plant.

Visitors to the South Chicago plant will have an opportunity to see the blast furnace, coke ovens, 44-inch blooming mill, 36-32 inch bar-mill, 21-inch billet mill, seamless tube mill, 10-inch combination bar and rod mill, 12-inch bar mill, tube mill finishing operations, tilting open hearth and electric furnace melt shop, wire mill, and ore, coal and limestone dock.

Motorola, Inc.—Thursday afternoon—Motorola, Inc. is one of the world's largest radio manufacturers, a leader in the manufacture of two-way radio communications equipment, and one of the big-four television set producers. The Motorola plant is unique because of its astounding growth. At the start of World War II, Motorola occupied 185,000 sq. ft. of plant area in Chicago. Today it occupies over 1,000,000 sq. ft. It is the world's largest independent manufacturer of automobile radios.

Rauland Corporation—Wednesday afternoon—At the Rauland Corporation plant visitors will see complete facilities for development and mass production of special tubes and other electronic devices to military specifications.

There is large special purpose automatic and semi-automatic production equipment, much of it designed and built by Rauland, for metal-to-glass sealing, high vacuum pumping and sealing, baking and annealing, washing, and handling of gases.

There are complete research facilities in the field of higher electronics, ceramics, photosensitive and infrared devices, thin films, gases, metal welding, and metal-to-glass sealing, and tri-color tubes.

SOCIAL AND ENTERTAINMENT

GET ACQUAINTED TEA—On Sunday afternoon from 4:00 to 6:00 there will be an informal get-acquainted tea for early arrivals. Members and their wives are cordially invited.

A SMOKER for the members has been planned for Tuesday evening, October 12th, in the Terrace Casino Room of the Morrison Hotel. A delicious dinner and a fine program of entertainment will be preceded by a hospitality hour. Price \$10.00.

DINNER DANCE—Wednesday evening, members and their wives will enjoy a dinner in the Ballroom of the Morrison Hotel. The dance will be preceded by a "get acquainted" social hour. Formal dress is optional. Tickets are \$8.00 per person.

ETA KAPPA NU ACTIVITIES—This year is the Fiftieth Anniversary of the founding of Eta Kappa Nu Association, Electrical Engineering Honor Society. A Golden Jubilee Celebration will be held on the University of Illinois campus at Urbana the weekend of October 15th and 16th with most of the alumni activity on Saturday. Luncheon will be served in the Cotillion Room, Morrison Hotel, Tuesday, October 12th, 12:15 p.m. Speaker, Dr. W. L. Everitt.

LADIES PROGRAM—Mrs. Roger R. O'Conner and her committee have plans for many interesting activities and trips for the ladies including a "you pick it—we'll take you" promise. There are planned tours to:

St. Peter's Cathedral, Monday, 10:15 a.m., no charge.

Swift and Company, Tuesday, 9:30 a.m., \$1.50.

Kungsholm Restaurant for Dinner and Famous Miniature Grand Opera, Tuesday, 5:30 p.m., \$5.50.

Board of Trade, Wednesday, 10:30 a.m., \$0.50.

Hull House, Wednesday, 12:00 noon, \$1.25.

On the North Shore as far as Bahai Temple, Thursday, 10:15 a.m., \$3.00.

Night Tour of Chicago, \$2.50.

Free radio and TV tickets will be available for all days of the convention.

Breakfast Club TV Broadcast tickets will be available. This broadcast is from the Convention Headquarters Hotel. It is the coast-to-coast Don McNeil show that only this spring went on TV.

Coffee Hours each morning—From 9:00 a.m. to 10:30 a.m. coffee and rolls will be served in the Ladies Headquarters. Hostesses will be there to explain the program and help the ladies choose their entertainment for the day.

You Pick It—We'll Take You—Ladies are invited to name the places they would like to see. Hostesses will be available to see that it is possible for the visiting ladies to make the trips of their choice.

THEATER AND SPORTING EVENTS—Tickets for all theatrical and sporting events will be available at the ticket desk throughout the entire week of the convention. Tickets for the following events scheduled during the week of the meeting will be available in the registration area.

Theatre

"Wonderful Town"—Carol Channing — Musical

"Picnic"—Ralph Meeker — Drama

"Mrs. Patterson"—Eartha Kitt — Drama with Music

"This is Cinerama"—Special Motion Picture

Sporting Events

College Football

Northwestern University vs University of Michigan,
October 16

Professional Football

Chicago Bears vs Baltimore Colts, October 10

Chicago Bears vs San Francisco 49ers, October 17

TELEVISION AND RADIO—Tickets for those TV and radio programs which are showing during the week of the convention will be available at the desk. Tickets for these programs will be available at no charge. The two television shows for which tickets will be available are "Breakfast Club" with Don McNeil and "Welcome Travelers" with Tommy Bartlett.

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COMMITTEE MEETINGS

Monday, October 11

- 2:00 p.m.—Industrial ControlRoom 424
- 4:00 p.m.—Carrier CurrentRoom 427
- 7:00 p.m.—Rating of Airborne Electric ApparatusRoom 426
- 7:00 p.m.—Di-Electric Testing Procedures (Aircraft)....Room 434
- 8:00 p.m.—Aircraft Electrical SystemsRoom 424

Tuesday, October 12

- 9:00 a.m.—District #5 ExecutiveBurgundy Room
- 9:00 a.m.—Metallic RectifiersRoom 632
- 9:00 a.m.—Carrier Current Measurement Methods
SubcommitteeRoom 424
- 9:00 a.m.—Power DivisionRoom 434
- 9:00 a.m.—Rotating Machinery Insulation Subcommittee.Room 426
- 9:00 a.m.—Planning and Coordination Room 440
- 9:30 a.m.—Edison MedalRoom 634
- 10:30 a.m.—Management
- 12:00 noon—Luncheon—Production and Application
of LightMadison Room East
- 12:00 noon—Luncheon—District #5 Executive.....Burgundy Room
- 12:00 noon—Luncheon—Planning and CoordinationRoom 440
- 2:00 p.m.—Induction Machinery Subcommittee.....Room 426
- 2:00 p.m.—Industrial Power SystemsRoom 424
- 2:00 p.m.—Science and Electronics Division.....Room 634
- 2:00 p.m.—SafetyRoom 434
- 2:00 p.m.—Metallic Rectifiers SubcommitteeRoom 632
- 2:00 p.m.—District #5 ExecutiveBurgundy Room
- 2:00 p.m.—Planning and CoordinationRoom 440
- 2:00 p.m.—Working Group on Device Function
NumbersMadison Room West
- 4:30 p.m.—Carrier Current Executive.....Madison Room East

Wednesday, October 13

- 8:30 a.m.—Breakfast—Industry DivisionRoom 424
- 9:00 a.m.—Electric Coupling SubcommitteeRoom 632
- 9:00 a.m.—Working Group on Guide for Operation and
Maintenance of Turbine Generators.....Room 634
- 9:00 a.m.—System EngineeringBurgundy Room
- 9:00 a.m.—Communication DivisionRoom 426
- 9:00 a.m.—EducationRoom 434
- 10:30 a.m.—Power GenerationRoom 424

- 12:00 noon—Luncheon—Technical Operations.....Burgundy Room
- 12:00 noon—Luncheon—Public RelationsRoom 424
- 12:00 noon—Luncheon—Communication DivisionRoom 426
- 12:00 noon—Luncheon—NucleonicsRoom 434
- 2:00 p.m.—Technical OperationsBurgundy Room
- 2:00 p.m.—Land TransportationRoom 426
- 2:00 p.m.—Rotating Machinery Administrative
SubcommitteeRoom 632
- 2:00 p.m.—Basic SciencesRoom 634
- 2:00 p.m.—NucleonicsRoom 434
- 2:00 p.m.—Automatic and Supervisory Control
SubcommitteeMadison Room West

Thursday, October 14

- 8:30 a.m.—Breakfast—Working Group on DC Machine
Test Code #501Room 632
- 8:30 a.m.—Breakfast—Working Group on Guide for Deter-
mining Short Circuit Characteristics of DC
MachinesRoom 634
- 9:00 a.m.—Board of DirectorsRoom 440
- 9:00 a.m.—Radiant Heating SubcommitteeBurgundy Room
- 9:00 a.m.—Television and Aural Broadcasting Systems...Room 426
- 9:00 a.m.—Excitation Systems Subcommittee ..Madison Room East
- 9:00 a.m.—Working Group on Functional Evaluation of
InsulationRoom 434
- 9:00 a.m.—Magnetic Amplifier Rectifier Subcommittee...Room 424
- 12:00 noon—Luncheon—Board of DirectorsRoom 440
- 12:00 noon—Luncheon—General ApplicationsRoom 424
- 12:00 noon—Luncheon—Television and Aural Broadcasting
SystemsRoom 426
- 12:00 noon—Luncheon—Radiant Heating Subcommittee
Burgundy Room
- 12:00 noon—Luncheon—Direct Current Subcommittee...Room 434
- 2:00 p.m.—Chemical, Electrochemical & Electrothermal
ApplicationsRoom 426
- 2:00 p.m.—Board of DirectorsRoom 440
- 2:00 p.m.—Feedback Control SystemsRoom 634
- 2:00 p.m.—Radio Communications SystemsRoom 632
- 2:00 p.m.—Radiant Heating SubcommitteeBurgundy Room
- 2:00 p.m.—Working Group for Reviewing Factors
Concerned With Use of Protective Devices
Shunting ReactorsMadison Room East
- 7:00 p.m.—Aircraft Electrical Control, Protective Devices
and Cable SubcommitteeRoom 424
- 7:30 p.m.—Forum of Technical Committee Chairmen..Venetian Rm.

Friday, October 15

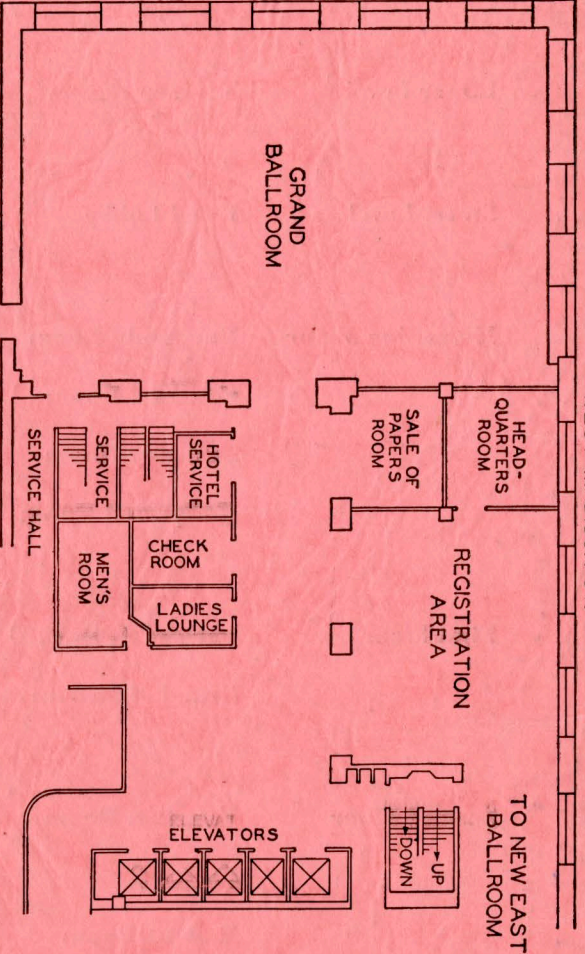
- 9:00 a.m.—Single Phase and Fractional HP Subcommittee..Rm. 424
- 9:00 a.m.—Professional EthicsRoom 426
- 9:00 a.m.—Wire Communications SystemsRoom 434
- 2:00 p.m.—Air TransportationParlor F

LOCATION OF ALL MEETING ROOMS

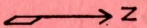
Lower Level	Terrace Casino
Street Level	Hotel Lobby
Mezzanine Floor	Burgundy Room Cotillion Room Embassy Room Hollywood Room
First Floor	Parlors A, B, C, D Grand Ballroom
Second Floor	Venetian Room Parlor F Walnut Room
Third Floor	Madison Room
Fourth Floor	Rooms 424 to 440
Sixth Floor	Rooms 632 and 634

SOUTH CLARK ST.

WEST MADISON ST.



TO NEW EAST BALLROOM



SEE INSIDE COVER FOR LOCATION OF ALL MEETING ROOMS

FIRST FLOOR PLAN MORRISON HOTEL