

Fall General Meeting

October 9-14, 1960

CHICAGO, ILLINOIS

Headquarters
Morrison Hotel



SCHEDULE OF LOCALLY SPONSORED EVENTS

Sunday—October 9

- 4:00 PM—Welcome Tea—Cotillion Room
- 4:00 PM—Registration Begins

Monday—October 10

- 9:00 AM—Ladies' Coffee Hour, Room 522
- 2:00 PM—General Session

Tuesday—October 11

- 9:00 AM—Trip to Commonwealth Edison Co.—Technical Center
- 10:00 AM—Ladies' Shopping Tour and Luncheon
- 2:00 PM—Trip to Cook Technological Center

Wednesday—October 12

- 8:30 AM—Trip to Acme Steel Co.
- 11:00 AM—Ladies' Fashion Show and Brunch
- 1:00 PM—Trip to Motorola, Inc.
- 2:30 PM—Trip to Commonwealth Edison IBM and Dispatch
- 6:00 PM—Fall Frolics

Thursday—October 13

- 9:30 AM—Trip to Illinois Bell System #2 Toll Office
- 12:00 Noon—Ladies' Surprise Luncheon
- 1:00 PM—Trip to Argonne Research Reactor CP-5
- 1:30 PM—Trip to Sun Times Building

Friday—October 14

No Functions Scheduled

The Fall General Meeting of AIEE will be held in Chicago this year from October 9 to 14 with headquarters at the Morrison Hotel. The Technical Program, Inspection Trips and Social Activities will occupy the entire facilities of the Morrison during the meeting. The meeting will be held concurrently with the **National Electronics Conference** with provision for joint registration. Registration at either meeting will be credited for registration at the other. Headquarters for the NEC will be in the Sherman Hotel.

The Chicago section extends a hearty welcome to all members, their families and guests. Chicago, being the transportation center of the country, is easily accessible by automobile, rail or air from all parts of the continent.

The **AIEE General Session** will be held **Monday afternoon, October 10.**

The Recognition Awards Committee has recommended that four AIEE Awards be presented to three AIEE members and one nonmember at the General Session of this Fall General Meeting. The awards and their recipients are as follows:

MEDAL IN ELECTRICAL ENGINEERING EDUCATION—Dr. Ernst Weber (AM '31, F '34), President, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

WILLIAM M. HABIRSHAW AWARD—Selden B. Crary (AM '31, F '45), system analysis engineer, Electric Utility Engineering Section, General Electric Company, Schenectady, N. Y.

MORRIS E. LEEDS AWARD—Perry A. Borden (AM '13, F '44, Member for Life), associate professor of electrical engineering, University of Dayton, Dayton, Ohio.

THE DAVID SARNOFF AWARD—Rudolf Kompfner, director of electronics and radio research, Bell Telephone Laboratories, Inc.

FIRST AWARD OF THE MERVIN J. KELLY AWARD—Dr. Mervin J. Kelly (M '26, F '31), retired Chairman of the Board, Bell Telephone Laboratories, Inc.

Dr. Kelly will receive his award at the 1961 Winter General Meeting because of his anticipated absence from the United States next October.

A Reception Tea and Hospitality Hour will open the social activities on Sunday afternoon, October 9 at 4 p.m. The Reception will be held in the Cotillion Room until 6 p.m. The Hospitality Hour is sponsored by the Chicago section, AIEE, for members and their families. Members of the Ladies' Activities Committee will be present to welcome the wives.

The Fall Frolics will be held on Wednesday, October 12, at the world famous Chez Paree nightclub. Top entertainment will be provided in addition to a good dinner. Taking over the entire nightclub, an exclusive cash bar for AIEE will be open at 6 p.m. Dinner will be served at 7:30 p.m. Showtime is 9 p.m. Dinner and the first show will be \$12.50 per person, including all taxes and gratuities. No cover or minimum will be charged for the midnight show.

TIPS AND NOTES ON MAKING HOTEL RESERVATIONS

1. Mr. W. E. Matchett is in charge of hotel room reservations and should be contacted in case you need assistance. Address your request to Mr. Matchett, Hotel Room Reservations Committee, Daystrom-Weston Instrument Division, 205 W. Wacker Drive, Chicago, Illinois.
2. Should any problems concerning your room accommodations arise during your visit, contact Mr. Matchett or one of his assistants.
3. To secure good accommodations, mail the reservation card enclosed with this announcement directly to the Morrison Hotel as soon as possible. If you mislay or lose the card, write to the Reservation Manager, Morrison Hotel, Madison and Clark Streets, Chicago 2, Illinois. Be sure to mention AIEE Meeting.
4. The Morrison has set aside a large number of rooms for this meeting. If you decide to attend at the last moment, there is still a good chance that rooms will be available at this hotel.
5. Definite rooms will not be reserved until you arrive. If rooms at rates requested are not available, you will be assigned a room at the closest available rate.
6. Please indicate on your reservation card the time of your arrival. If you plan to arrive after 6 p.m., a room will be held for late arrival only if requested. Payment for this night will be charged.
7. If you have to correspond with the hotel regarding room reservations, please mail a copy of your letter to Mr. Matchett so that matters can be expedited. The Morrison Hotel will acknowledge all room reservations. If you fail to receive an acknowledgement, please write to the hotel, sending a copy to Mr. Matchett.

ROOM RATES FOR FALL GENERAL MEETING AT MORRISON HOTEL

Single Room, 1 person: \$7.50 to 13.50
Double Room, double bed, 2 persons: \$10.50 to 17.50
Double Room, single twins, 2 persons: \$14.50 to 24.00
Suites: \$35.00 and up

Continued on page 2

LADIES' ACTIVITIES

Mrs. G. Leslie Welch, and co-chairmen Mrs. Frances Cox and Mrs. Pierre Cassidy have planned a full week of activities for the wives of AIEE members attending the Fall Meeting. A welcoming tea will be given from 4 to 6 p.m. in the Cotillion Room of the Morrison Hotel on **Sunday**, October 9th, for members, their wives and guests. On **Monday**, October 10th, Miss Mary Gordon, Trans-World Airlines, will give a talk in the Promenade Room on world travel. This will be followed by a party featuring a roving caricaturist, and music by Mrs. Edward Schneider.

Chartered busses will take the ladies to Old Orchard Shopping Center on **Tuesday**, October 11th. They may shop and browse before meeting for lunch at the Crabapple, and they will hear a review of a current book by Purdy Meissner.

Wednesday, October 12th, includes a showing of early-winter fashions at a brunch to be held high-in-the-sky in the Morrison Hotel's Carousel Room.

After luncheon at the Chicago Athletic Club on **Thursday**, October 13th, the ladies will be treated to a Surprise Program.

Each morning during the Fall General Meeting, **coffee** will be served in the Ladies' Headquarters-Hospitality Suite, Rooms 522-524-526 in the Morrison. This suite may be used during the week for cards, tele-viewing and lounging. Registration may be made on Sunday, October 9th, and tickets for each of the activities may be purchased at that time.

INSPECTION TRIPS

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

Commonwealth Edison Company, Technical Center—Tuesday, October 11th, 9:00 a.m.: Located eleven miles west of Chicago's loop is the headquarters for the Construction, Distribution Engineering, Transportation, Testing and Meter Departments; and General Shops for this electric utility with over two million customers in Chicago and Northern Illinois.

The tour will include visits by small groups to the following:

TESTING DEPARTMENT LABORATORY: Instrument standards; electronics and communications; physical and electrical testing of materials, including insulating liquids and turbine oils, chemical analysis, including x-ray diffraction and spectrographic methods; metallurgical and non-destructive testing; system relay engineering and testing.

GENERAL SHOPS: Carpenter, machine, metal and tool repair shops; lineman's protective equipment, washing and testing; production line for distribution transformer reconditioning, including initial and final testing facilities; power transformer and switchgear inspection and testing; high voltage bushing repairing.

METER SHOP: Polyphase meter, demand meter and instrument transformer testing; photocell street light control testing and reconditioning; ultrasonic cleaning of meter parts.

Acme Steel Trip—Wednesday, October 12th, 8:30 a.m.: Acme Steel's new Chicago steel making plant is the first to combine continuous hot blast cupolas with oxygen converters. This new \$35 million plant with annual capacity of 450,000 tons has two converters and two cupolas. Scrap steel and pig iron are continuously melted in the hot blast cupolas. The molten metal flows into two holding furnaces. Metal is then ladled into the 50-ton capacity converter for a 40-minute steel making cycle. A lance using 100,000 cubic feet of 99.5% pure oxygen per heat burns off the carbon to make various grades of steel. We will also see the steel poured into ingots, the twelve automated soaking pits, and the 6500 HP blooming mill and motor control room. This "instant" steel making facility has attracted world wide interest and also yield lowest investment cost per annual ingot ton in the industry.

Motorola, Inc., Franklin Park, Ill.—Wednesday, October 12th, 1:00 p.m.: World's largest plant under one roof for assembly of electronic home-entertainment products. Final production and testing of consumer products, chiefly television and stereo hi-fi.

Commonwealth Edison Co. IBM and Dispatch—Wednesday, October 12th, 2:30 p.m.: A "walk-over" trip to the Commonwealth Edison Company's General Office will consist of three parts.

The Company's new seven hundred thousand dollar automatic dispatching system which controls 92% of the Company's 5000 MW capabilities will be open for inspection. The group will also be conducted through Edison's electronic computer which is used in preparing nearly twelve million bills annually, or approximately fifty thousand each day. The trip will be concluded with a movie of the Dresden Station, the nation's largest operating nuclear power plant.

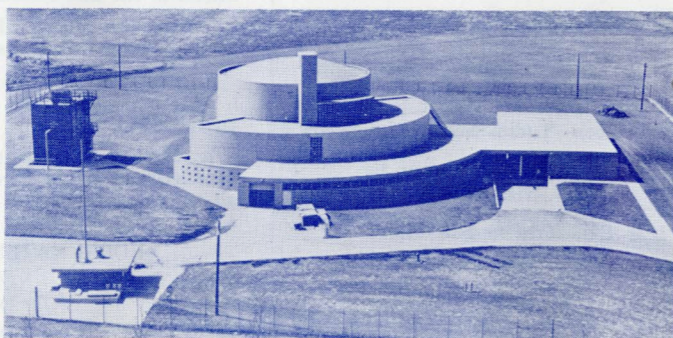
Inspection tour of the Illinois Bell System, Chicago, No. 2 Toll Office—Thursday, October 13th, 9:30 a.m.: Highlights of the tour will include voice frequency and carrier systems, traffic operating, video control center, card translators, radio rooms, switching center, power facility, emergency power facilities, and automatic message accounting.

Cook Technological Center—Tuesday, October 11th, 2:00 p.m.: Cook Technological Center, located 19 miles northwest of the Chicago Loop, conducts advanced research, development and test programs in electronics, mechanical engineering, aerodynamics, meteorology and allied fields for various defense agencies of the U. S. Government as well as for private industry. The tour begins with a short film, "First From Space", showing the launching of the Jupiter C Missile, the re-entry of the nose cone carrying the recovery system and the development activity, including rocket sleds, used to insure the completely reliable functioning of the system. Inspection of the parachute shop and a look at the recovery package will be followed by a visit to the reliability evaluation and testing section. Here, some 70,000 resistors, diodes and transistors are exposed to environmental cycling to simulate in-service conditions. The automated instrumentation used for programming and data taking will be described and explained briefly or at length as desired. The instrument calibration laboratory where the standards are periodically certified by the National Bureau of Standards and the instrumentation section, data handling systems and computers, will be visited. In the heavy environmental section, the wind tunnel and jet engines, both in and out of operation, will be inspected. Vibration testing will also be going on. Finally the nuclear testing facilities will be visited where one of the largest Cobalt 60 sources known (60,000 to 80,000 curies) is used to provide irradiation. The hot cell and manipulators may be seen.

Argonne Research Reactor CP-5—Thursday, October 13th, 1:00 p.m.: The Argonne Research Reactor, CP-5, has a vital assignment, to produce abundant radiation, primarily neutrons, for research. To make possible the wide variety of experiments for which CP-5 is used, more than 60 openings penetrate the sides and top of the reactor. Beam holes permit neutrons to emerge from the reactor. It is also possible to place materials inside the core, in areas where neutron density is high. A pneumatic tube called a "rabbit" is used to introduce a substance for irradiation and to withdraw it very quickly, before the results of irradiation are lost. The operating power level of CP-5 will soon be raised from 2,000 kilowatts to 10,000 kilowatts. This increase will make available greater concentrations of neutrons; samples then can be irradiated in a shorter period of time than was possible previously. CP-5, which uses heavy water as moderator and enriched uranium as fuel, is a direct descendant of CP-1, the reactor used to achieve history's first controlled nuclear chain reaction at the University of Chicago on December 2, 1942.

Chicago Sun Times Building—Thursday, October 13th, 1:30 p.m.: This is a walking trip through the printing plant of one of Chicago's principal daily newspapers. An unlimited number of persons will be permitted to see its comprehensive operations.

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Argonne Research Reactor CP-5

ADVANCED COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 50¢ each (\$1.00 each to nonmembers), by sending enclosed order form and remittance to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. Mail orders (particularly from out-of-town members) are advisable, inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon books in \$10 denominations are available to those who wish to avoid remittance, by check or otherwise. The Transactions Papers will also be published in the bimonthly publications.

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

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

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



Chicago's Lake Front

Monday, October 10

10:00 a.m.—Standards

10:00 a.m.—Insulated Conductors

- 60-1219. Continuous Extrusion of Lead Alloy Cable Sheathing. S. F. III Radtke, Lead Industries Asso.; C. J. Snyder, Anaconda Wire and Cable Co.; C. C. Childress, John Robertson Co., Inc.
- 60-1220. Calculation of Steady-State and Transient Ratings of Electric Wire. R. W. Stineman, G. W. McIntyre; Boeing Airplane Co.

0:00 a.m.—Power Generation

10:00 a.m.—Chemical Industry

10:00 a.m.—Data Transmission

Scheduled at the National Electronics Conference

- CP.* Modulation and Signal Selection for Digital Communication. R. M. Lerner, Massachusetts Inst. of Technology.
- CP.* Binary Codes for Error Control. W. W. Peterson, Massachusetts Inst. of Technology.
- CP.* Notes on the Transmission of Data at 740 Bauds Over Practical Circuits. P. A. Chittenden, Signals Research and Development Establishment, United Kingdom.
- CP.* Data Transmission Performance on Long-Haul Telephone Facilities. P. V. Dimock, Bell Telephone Labs., Inc.
- CP.* Compandor Effects on Data Signals. E. Enriquez, Hughes Aircraft Co.
- CP.* The Testing of Digital Data Transmission Channels and Circuits. R. G. Enticknap, Massachusetts Inst. of Technology.
- CP.* Measured Error Distributions on Bell A-1 Facility Over Various Media. E. J. Hofman, Massachusetts Inst. of Technology.

10:00 a.m.—Linear Control Systems

- 60-1186. An Automatic Root Locus Plotter Using an Analog Computer. F. E. Liethen, USAF; C. H. Houppis, J. J. D'Azzo, Air Force Inst. of Technology.
- 60-1187. A Direct Method of Compensating Linear Feedback Systems. F. Mariotti, Hewlett-Packard Co.
- 60-1237. A Graphical Approach to Motors Time Response. J. Miro, II Case Inst. of Technology.
- 60-864. Application of Silicon Controlled Rectifiers in a Transistorized High-Response D-C Servo System. C. Cantor, U. S. Naval Weapons Plant (Re-presented for Discussion only).
- J-258. Investigation of the Relative Merits of the Transient Speed II Performance of Tachometer-Regulated and of Voltage-Regulated D.C. Drives for Both Compensated and Uncompensated Motors. H. L. Steinmetz, Allis-Chalmers Mfg. Co.; T. J. Higgins, University of Wisconsin (Re-presented for Discussion only).

2:00 p.m.—General Session

(See Page One)

2:00 p.m.—Data Transmission

Scheduled at the National Electronics Conference

- CP.* The Design of Data Transmission Systems. R. G. Enticknap, R. M. Lerner; Massachusetts Inst. of Technology.
- CP.* Model of Error-Burst Structure in Data Transmission. P. Mertz, Consultant to the RAND Corp. and Lincoln Laboratory.
- CP.* Coded Feedback Communication Systems. J. J. Metzner, K. C. Morgan; New York Univ.
- CP.* A High Capacity Data Transmission System for Conveying up to 5400 Bit/Sec Over Private Line, Voice Frequency Telephone Facilities. F. Morioka, A. Garabedian, D. Doubleday;
- CP.* Applications of Redundant Codes to a Digital Communication System. R. Lal Sharma, Collins Radio Corp.
- CP.* Transmission Frequency Characteristics of Sample Telephone Circuits. N. N. Ulguray, Hughes Aircraft Co.
- CP.* Some Results in the Measurement of Impulse Noise on Several Telephone Circuits. H. L. Yudkin, Massachusetts Inst. of Technology.

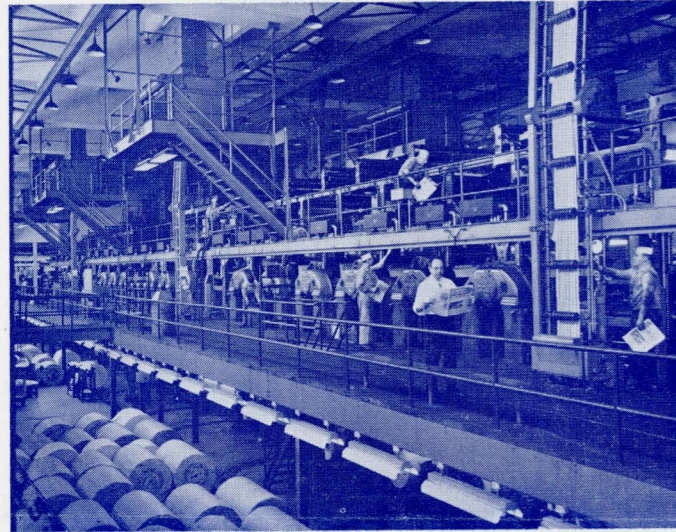
Tuesday, October 11

9:00 a.m.—Combination Logic

- 60-1199. Switching Function Canonical Forms Based on Commutative and Associative Binary Operations. P. Calingaert, Harvard Computation Lab.
- CP.* Some Methods for Simplifying Switching Circuits Using Don't Care Conditions. J. T. Chu, Radio Corp. of America.
- CP60-1223. Minimization of Multiple-Output Switching Circuits. R. B. Polansky, Massachusetts Inst. of Technology.
- CP.* Truth Functions Realizable by Single Threshold Organs. C. C. Elgot, IBM Corp.
- CP60-1261. Single Stage Threshold Logic. R. O. Winder, RCA Labs.
- 59-1123. An Algorithm for Determining Minimal Normal Forms of an Incomplete Truth Function. T. H. Mott, Jr., RCA Labs.
- 59-1191. Algorithms for Logical Design. A. E. Randlev, J. P. Roth, I. E. G. Wagner; IBM Research Center.

9:00 a.m.—Power Generation

- CP.* Thermionic Power Generation. J. Colman, Westinghouse Research Labs.
- CP.* Fuel Cell Developments. H. K. Ihrig, Allis-Chalmers Mfg. Co.
- CP.* Possibilities for Magnetohydrodynamic Power Generation. R. J. Rosa, Avco-Everett Research Lab.



Chicago Sun Times

9:00 a.m.—Substations

- CP60-1227. Cylindrical Cast-In-Place Foundations for Substations. C. B. Shell, Ohio Edison Co.; R. C. Adler, Commonwealth Associates, Inc.
- CP.* Standardization of Transformer Foundation Designs. A. H. Tiermann, Jr., Virginia Electric and Power Co.
- CP.* Planning and Design of Distribution Substations for Load Densities of 20 to 30 MW per Square Mile. R. M. McCuiston, E. F. Wilson, J. M. McReynolds; Houston Lighting and Power Co.

9:00 a.m.—Relays

- 60-1238. Protective Relaying Systems Using Pilot-Wire Channels. III H. W. Lensner, Westinghouse Electric Corp.
- CP60-1247. Coaxial Cable for Protective Relaying Communications. J. R. Linders, The Cleveland Electric Illuminating Co.
- 60-1267. A Relay Designed to Meet Automatic Reclosing Requirements of Ring Bus Substations. L. A. Davidson, V. M. Hines; Oklahoma Gas and Electric Co.
- CP60-1274. Protection of Multiterminal and Tapped Lines. W.G. Report, Line Relay Protection Subcommittee of AIEE Relay Committee, H. P. Sleeper, Chairman.
- CP60-1281. Distribution Circuit Protection Idaho Power Company. M. E. Byrne, J. N. Haroian, Idaho Power Co.

9:00 a.m.—Non Linear Control Systems

- CP.* Self-Adaptive Systems for Automatic Control of Dynamic Performance by Controlling Gain, Phase Shift, Gain Margin, Phase Margin, or Slope. G. Vasu, National Aeronautics and Space Administration.
- CP.* A Linear Switching Condition for Third Order Positive-Negative Feedback Control Systems. S. J. Garrett, Westinghouse Electric Corp.
- CP60-1239. Saturated Instrument Servos with Discontinuous Damping. K. W. Han, G. J. Thaler; U. S. Naval Postgraduate School.
- 60-1266. Optimum Nonlinear Bang-Bang Control Systems with Complex Roots—Part I, System Synthesis. P. Chandaket, Royal Thai Navy; C. T. Leondes, University of California.

9:00 a.m.—Data Communications

- CP60-1221. A Quaternary Frequency-Shift Data Transmission Subset. N. A. Zellmer, Lenkurt Electric Co.
- CP.* A Four-Phase Data Transmission Modem. L. A. Weber, Bell Telephone Labs., Inc.
- CP.* A Word Generator Error Checker and Distortion Measuring Set. F. K. Becker, Bell Telephone Labs., Inc.
- CP.* A 1600 Bit/Sec Data Terminal for the Switched Telephone Network. C. W. Carter, (Retired) formerly with Bell Telephone Labs., Inc., S. Brand, Bell Telephone Labs., Inc.

- 60-790. "Datacom" Unit—An Experimental Data Transmission Subset. R. E. Stoeffels, Automatic Electric Labs., Inc. (Re-presented for Discussion only).
- CP.* Punched Card Transmission on Telegraph Switching Systems. R. Steeneck, Western Union Tel. Co.

9:00 a.m.—Management Planning Aspects of Future Man Power Shortages

- CP.* The Next Hundred Years. J. R. Weir, California Inst. of Technology.
- CP.* Immediate Problem and Suggested Solutions. S. B. Ingram, Bell Telephone Labs., Inc.

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

- 58-1258. Characteristics of an Electric Resistance Furnace Load. II W. A. Stelzer, The Dow Chemical Co.
- 60-1182. A-C System Voltage Nomenclature for Industrial and Commercial Power Systems. AIEE System Voltage Nomenclature W.G. of the Codes and Standards Subcommittee of the Industrial and Commercial Power Systems Com., D. S. Brenton, Chairman.
- CP.* Growing Electrical Pains in a Rapidly Expanding Chemical Plant. R. B. Russell, Westinghouse Electric Corp.; D. C. Richardson, S. A. Berry, U. S. Industrial Chemical Co.

2:00 p.m.—Suggested Computer Symbols and Notations

- 60-1224. Proposed Symbolology for Digital Systems. AIEE Report I Prepared by an Ad Hoc Group of the Subcommittee Logic and Switching Circuit Theory, E. J. Schubert, Chairman.
- 60-1225. A Dictionary of Switching Theory Terms: Preliminary Draft. I AIEE Report Prepared by an Ad Hoc Group of the Subcommittee Logic and Switching Theory, E. J. Schubert, Chairman.

2:00 p.m.—Semiconductor Rectifying Devices & Inverters—I

- CP.* High Voltage, High Current Silicon Transistors. C. Carroll, R. Roth, J. Steiner, Westinghouse Electric Corp.
- CP.* The Application of Silicon High Power Transistors in Inverter Circuits. T. E. Ebert, Westinghouse Electric Corp.
- CP.* 100 Ampere Silicon "Trinistor" Controlled Rectifier. T. C. New, E. W. Torok, J. Krawczykiewicz, R. Kuehn, Westinghouse Electric Corp.
- CP60-1278. Turn-Off Considerations for the Design of a High-Power Inverter Circuit Using the SCR. E. C. Olson, Power Equipment Co.
- CP.* Commutation and Destructive Oscillations in Diode Circuits. I. Somos, General Electric Co.

2:00 p.m.—Power Generation

- CP.* Power Generation and Cooling with Thermoelectric Materials. F. W. Rosi, RCA Labs.
- CP.* Power from Nuclear Reactions. J. J. Grebe, The Dow Chemical Co.
- CP.* The Development of "Income" Sources of Power. P. E. Benner, J. B. McClure, A. G. Mellor, General Electric Co.

2:00 p.m.—Supervisory Systems

- CP60-1233. Factors in the Design and Application of Digital Telemetering. E. W. Head, Control Corp.
- CP60-1234. A New Solid State Supervisory System. G. E. Guy, P. W. Schirmer; General Electric Co.
- CP.* Supervisory and Telemetering Equipment for the Laurel Pipeline. K. E. Willson, Laurel Pipeline Co.; P. W. Schirmer, H. N. Hickock, P. D. Woodruff, General Electric Co.
- 60-1235. Remote Control of Cooling Tower Fans. R. J. Davis, Black & Veatch (Re-presented for Discussion only).

2:00 p.m.—Protective Devices

- 60-1193. A Surge Impedance Analogue of a Large Generating Plant Switchyard. III H. R. Armstrong, B. D. Miller; The Detroit Edison Co.
- CP.* Lightning Protection in Multi-Line Stations. W. G. of AIEE Lightning Protective Devices Subcommittee, W. S. Price, Chairman.

- CP60-1262. Preliminary Report on System Classification and Voltage Rating Investigation for Application of Distribution-Type Lightning Arresters. AIEE W.G. of Lightning Protective Devices Subcommittee, W. S. Price, Chairman.
- CP60-1277. A Proposal to Use the Concept of the Coefficient of System Grounding in AIEE Standards. G. D. Breuer, General Electric Co.
- CP60-1275. Thermal Ratings and Temperature Limits for Neutral Grounding Devices. J. C. Russ, General Electric Co.

2:00 p.m.—Discrete Data Control Systems

- 60-1240. Statistical Analysis of Amplitude-Quantized Sampled-Data II Systems. B. Widrow, Stanford University.
- 60-1242. Optimum Linear Filtering of Signals Prior to Sampling. II P. M. DeRusso, Rensselaer Polytechnic Inst.
- 60-1243. Optimum Transmission of Continuous Signal Over a II Sampled Data Link. S.S.L. Chang, New York University.
- CP60-1241. Transient Response with Sampled-Data Control Systems by Use of a Sampling Time Locus. D. S. Childress, G. V. Lago, L. M. Benningfield; University of Missouri.

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

- CP.* Critical Process Synchronous Motor Drives and Their Power Supply. F. P. Brightman, General Electric Co.
- CP60-1245. Application Experience with Cable Having Corrugated Metal Sheaths. W. K. Freeman, P. H. Ware, Simplex Wire and Cable Co.
- CP.* Industrial Wiring Systems Incorporating Troughs, Trays and Ladders. L. H. Selden, Rome Cable Corp.

Wednesday, October 12

9:00 a.m.—Introduction to Sequential Logic

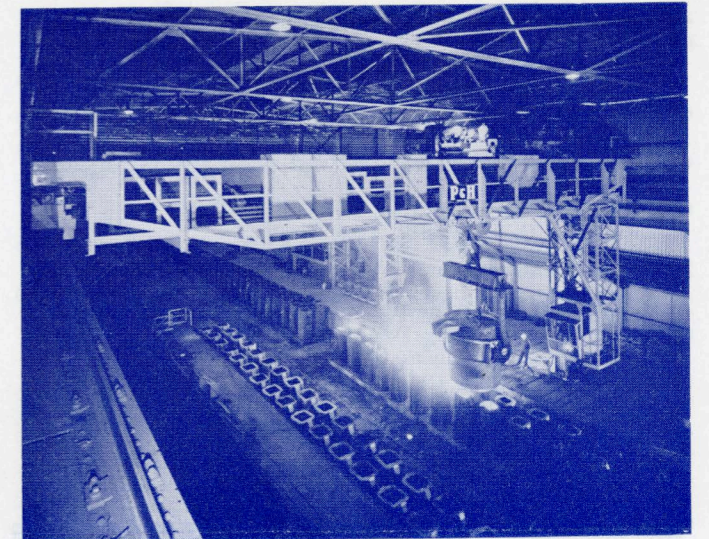
- CP.* Introduction to Sequential Circuits. I. S. Reed, Rand Corp.
- CP.* Introduction to State Diagrams and Tables. E. J. McCluskey, Princeton University.
- CP.* Derivation of Completely and Partially Specified State Tables. J. P. Runyon, Bell Telephone Labs., Inc.
- CP.* Simplification of State Tables. S. H. Unger, Bell Telephone Labs., Inc.
- CP.* Circuit Synthesis from State Tables. M. Phister, Jr., Thompson-Ramo-Woolridge.

9:00 a.m.—Semiconductor Rectifying Devices & Inverters—II

- CP60-1276. Design Considerations for the Transistor Saturable Current Transformer Amplifier (Morgan Circuit). S. P. Jackson, Power Equipment Co.
- CP.* A Silicon Controlled Rectifier with Improved Commutation. W. McMurray, D. P. Shattuck; General Electric Co.
- CP.* A Controlled Rectifier Static Inverter for Intermittent Aircraft Duty. P. D. Corey, A. L. Wellford; General Electric Co.
- CP60-1293. The SCR as a Building Block in Power Conversion Systems. J. L. Fink, T. W. Macie, General Electric Co.
- 60-211. Effective Value of Direct Voltage Ripple. E. J. Diebold, I Perkin Engineering Corp. (Re-presented for Discussion only).
- 60-69. Power Semiconductor Ratings Under Transient and Intermittent Loads. F. W. Gutzwiller, T. P. Sylvan; General Electric Co. (Re-presented for Discussion only).
- 60-68. Transient Thermal Impedance of Semi-Conductor Devices. I E. J. Diebold, W. Luft; International Rectifier Corp. (Re-presented for Discussion only).

9:00 a.m.—Communication Switching I

- CP.* Field Trial of an Experimental Electronic Telephone Switching System. A. E. Joel, W. B. Quirk; Bell Telephone Labs., Inc.
- CP.* Equipment Design for an Electronic Telephone System. D. C. Koehler, Bell Telephone Labs., Inc.
- CP.* A Gas-Tube Space Division Network for an Electronic Telephone System. K. S. Dunlap, R. L. Simms; Bell Telephone Labs., Inc.
- CP.* Logic Design and Programming an Electronic Telephone System. J. A. Harr, R. B. Smith; Bell Telephone Labs., Inc.



Producing Ingots at Acme Steel Company's New Steel making facilities at Riverdale, Ill.

- CP.* A 2.2 Megabit Photographic Store for an Electronic Telephone System. T. S. Greenwood, Bell Telephone Labs., Inc.
- CP.* A 16,000 Bit Temporary Memory for an Electronic Telephone System. J. E. Mack, Bell Telephone Labs., Inc.
- CP.* Maintenance and Administration Methods in an Electronic Telephone System. W. Ulrich, Bell Telephone Labs., Inc.
- CP.* Power Supply and Distribution for an Electronic Telephone System. D. H. Smith, Bell Telephone Labs., Inc.

9:00 a.m.—Symposium on "Use of Reclosers in Distribution Substations" L. M. Olmsted, Moderator

- CP.* R. B. Bailey, Southern Services Inc.
- CP.* W. L. Carey, Portland General Electric Co.,
- CP.* R. W. Flugum, Westinghouse Electric Corp.
- CP.* D. W. Gant, Commonwealth Edison Co.
- CP.* R. W. Jenkins, Baltimore Gas & Electric Co.
- CP.* L. F. Martin, Union Electric Co.

9:00 a.m.—Radio Communication Systems

- 60-1248. Interstitial Channels for Doubling TD-2 Radio System Capacity. I H. E. Curtis, T. R. D. Collins, Bell Telephone Labs., Inc.; B. C. Jamison, American Tel. & Tel. Co.
- 60-1207. The 57-A Microwave Path Protection System. D. H. Hesselgrave, M. H. Kebby; Lenkurt Electric Co., Inc.
- CP.* Transmissions of Radar Data Over Microwave Relay Facilities. P. Hertel, Jr., Collins Radio Co.
- CP.* A Microwave Radio Relay Link for High Definition Radar. F. H. Stelter, J. Sedik, Raytheon Co.

9:00 a.m.—Wire Communications

- CP.* The Subscriber Loop Bridge Lifting Problem and Some Methods of Solution. L. Hochgraf, Bell Telephone Labs., Inc.
- CP.* Exchange Plant Transmission Maintenance. I. M. Ellestad, Northwestern Bell Telephone Co.
- CP60-1250. A Speakerphone System for Large Conference Rooms. L. R. Huggler, The Bell Telephone Co. of Penna.
- CP60-1279. Transistor Control of Vacuum Tube Speakerphone Circuits. F. S. Ingraham, Michigan Bell Telephone Co.

2:00 p.m.—Sequential Logic

- CP.* Boolean Matrices Applied to Sequential Circuit Theory and Threshold Logics. R. S. Ledley, George Washington University.
- CP60-1272. A Method for Factoring the Action of Asynchronous Circuits. W. D. Frazer, D. E. Muller, University of Illinois.
- 60-1211. Assignment of Carry-Variables in Iterative Networks. E. J. I McCluskey, Princeton University.
- CP60-1226. E-Algebras in Switching Theory. W. Semon, Harvard University.
- CP.* The Decision and Synthesis Problems in Semi-Modular Switching Theory. J. H. Shelly, IBM Corp.

Friday, October 14

2:00 p.m.—Radio Communication Systems

- CP60-1280. Noise Loading Test of A Complete Frequency Division Multiplex Voice Point-to-Point Communication System. L. P. Yeh, Page Communications Engineers, Inc.
- CP60-1249. An Automatic Communications System for Air Traffic Control. C. V. Barnett, Radio Corp. of America.
- CP.* A Remote Outage Locator for VHF Radio Systems. M. Cooper, Motorola Inc.
- CP.* Antenna Matching Unit for H-F Vehicular Whip. J. R. Gruber, G. J. Seward; Avco Corp.

2:00 p.m.—Substations

2:00 p.m.—Rotating Machinery

- 60-1254. Auxiliary Winding Design for Split-Phase Motors. L. W. Buchanan, N. Maupin; Westinghouse Electric Corp.
- CP60-1255. Performance Calculations on Phase Converters, Single Phase A-C Drag Cup Tachometer Generators and Single Phase Brakes. P. H. Trickey, Wright Machinery Co.
- 60-1208. Digital Techniques in Commutation Design. H. K. Kesavan, III H. E. Koenig; Michigan State University. (Re-presented for Discussion only).
- 60-1209. A New Criterion for Satisfactory Commutation. H. K. Kesavan, H. E. Koenig; Michigan State University. (Re-presented for Discussion only).
- 60-1256. Computer Design of Capacitor-Start Motor Start Windings. III A. E. Hartman, G. V. Mueller; Robbins & Myers, Inc.

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

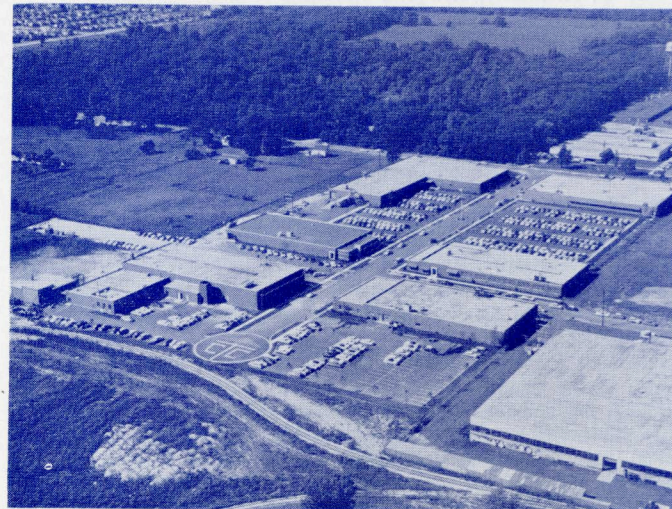
- 60-1195. Telephone Influence Factor (TIF) and its Measurement. I W. C. Ball, Bell Telephone Labs., Inc.; C. K. Poarch, Edison Electric Inst.
- 60-1251. A Transistorized Cable Carrier Repeater. C. G. Griffith, I Lenkurt Electric Co.
- CP.* Standard Data Transmission Tests. F. T. Andrews, Bell Telephone Labs., Inc.
- CP60-1217. Precision Envelope Delay Measurements at Audio Frequencies. T. M. Stump, Stromberg-Carlson Co.
- CP60-1252. A Low-Pass Gaussian-Response Filter Design. J. Otterman, International Tel. & Tel. Co.

Thursday, October 13

9:00 a.m.—Electronics

9:00 a.m.—Computer Application to Power System Engineering

- 60-1214. A Digital Approach to Power System Engineering—I. M. B. Reed, G. B. Reed, Michigan State University; J. L. McKinley, H. K. Polk, R. V. Hugo, W. J. Martin, Public Service Co. of Colorado.



Cook Technical Center

- 60-1215. A Digital Approach to Power System Engineering—II. M. B. Reed, G. B. Reed, Michigan State University; J. L. McKinley, H. K. Polk, R. V. Hugo, W. J. Martin, Public Service Co. of Colorado.
- CP60-1201. Optimized Transmission Tower Spotting on Digital Computer. V. Converti, E. J. Hyland, D. E. Tickle; Arizona Public Service Co.
- 60-1263. Loss Formula Determination by a New Method Which III Locates the Equivalent System Load Point. D. R. Hockman, Consumers Power Co.; A. L. Toalston, D. C. Harker, Commonwealth Associates, Inc.

9:00 a.m.—Switchgear and Substations

- CP60-1183. A New Automatic High Speed Grounding Switch. K. A. Thallner, I-T-E Circuit Breaker Co.
- 60-1213. Power Circuit Breaker Insulation Coordination—The Required Minimum Volt-Time Characteristics for Power Circuit Breakers. O. Naef, American Electric Power Service Corp.; C. E. Asbury, Commonwealth Associates, Inc.
- 60-1189. Proposed AIEE Standard for Low Voltage Cartridge Fuses III 600 Volts or Less. AIEE Low Voltage Cartridge Fuse. W.G. of the Switchgear Committee, J. C. Lebens, Chairman.
- CP60-1236. Line Entrance Gaps for Protection of Substation Insulation. T. F. Watson, Jr., R. Hiatt; Commonwealth Associates, Inc.

9:00 a.m.—Rotating Machinery

- 60-1191. Saturation Factors for Leakage Reactance of Induction III Motors. P. D. Agarwal, University of Massachusetts; P. L. Alger, Rensselaer Polytechnic Inst.
- 60-1257. Reclosing Transients in Induction Motors with Terminal III Capacitors. F. P. deMello, G. W. Walsh; General Electric Co.
- 60-165. Equivalent Circuits and Performance Calculations of Canned III Motors. P. D. Agarwal, University of Massachusetts. (Re-presented for Discussion only).
- CP60-1258. Intermittent Duty Motors. S. Noodleman, B. A. Wesche Electric Co.
- CP.* Direct Temperature Sensing For Motor Overload Protection. W. J. Martiny, General Electric Co.

9:00 a.m.—Industrial Control

- CP.* Electronic Timing and Control Device as Used in Short-Circuit Testing. H. W. Mikulecky, Line Material Industries.
- 60-1204. Design of an Inductive Load for D-C Control Circuit Devices. C. T. Evans (Retired), (formerly with Cutler-Hammer Inc.) R. Hyink, Cutler-Hammer, Inc.
- DP59-645. Electro-Magnetic Brake with Controllable Torque. C. A. Lister, Square D Co.
- CP60-1244. High Accuracy Speed Control of a Paper Machine. L. R. Hulls, R. Tickell; Remington Rand Univac (Both authors formerly with Canadian Westinghouse Co. Ltd.)

9:00 a.m.—Solid State Devices

9:00 a.m.—Communication Switching II

- CP.* Design of Basic Circuits for Electronic Switching Systems. A. F. Perkins, Stromberg-Carlson Co.
- CP60-1292. Role of Test Engineer in Assuring Reliability of Electronic Switching Systems. G. A. Power, Stromberg-Carlson Co.
- CP60-1269. Logic Schematic Drawings for Electronic Switching Systems. H. Pitlik, Stromberg-Carlson Co.
- CP.* A Survey of Methods of Sorting Letters by Machine. M. M. Levy, Levy Associates.

2:00 p.m.—Transmission, Distribution and Substations

- CP.* NEAR—A Mass Warning and Signalling System Operating Through the Electric Utility Network. H. L. Stout, Midwest Research Inst.
- CP.* NEAR System Signal Generators at Substations. R. I. Kopan, Midwest Research Inst.; T. J. Twomey, General Electric Co.
- CP.* Transmission and Distribution of the NEAR Signal. A. Laudel, Jr., Midwest Research Inst.
- CP60-1284. Project EHV—System Design & North Station Equipment. C. B. Lindh, General Electric Co., and S. H. Law, Western Mass Electric Co.

2:00 p.m.—Basic Sciences

2:00 p.m.—Economics of System Planning and Operation

- 60-1194. The Effect of Unit Size, Reliability, and System Service III Quality in Planning Generation Expansion. C. J. Baldwin, C. A. DeSalvo, Westinghouse Electric Corp.; H. D. Limmer, Public Service Electric and Gas Co.
- 60-1265. Hydro-Thermal Economic Scheduling Computational Experience with Co-ordination Equations. P. L. Dandeno, The Hydro-Electric Power Commission of Ontario. (Re-presented for Discussion only).
- 60-181. Digital Calculation of Three-Phase Short-Circuits by Matrix III Method. H. E. Brown, C. E. Person, Commonwealth Edison Co.; L. K. Kirchmayer, General Electric Co.; G. W. Stagg, American Electric Power Service Corp. (Re-presented for Discussion only).
- 60-1185. Application of Probability Methods to Generating Capacity III Problems. AIEE Probability Applications W. G., L. K. Kirchmayer, Chairman. (Re-presented for Discussion only).

2:00 p.m.—Substations

2:00 p.m.—Rotating Machinery

- CP60-1202. Simple Equivalent Electric Circuit for Synchronous Motors Under Synchronous Operation. J. F. H. Douglas, J. K. Sedivy, Marquette University.
- 60-1259. Digital Computer Study of the Resynchronizing of a Turbo-III Alternator. R. N. Sudan, Cornell University. (Re-presented for Discussion only).
- 60-1196. Some Characteristics of Ionization Under Direct Voltage III Stress. B. V. Bhimani, General Electric Co. (Re-presented for Discussion only).
- 60-639. New Contactless Precision DC Hoist Has Wide Speed II Range and Torque Control. A. Hansen, J. H. Karlson, R. Mierendorf; The Louis Allis Co.
- CP60-1270. A Brushless D-C Excited A-C Generator Having Inherent Voltage Regulation. K. M. Sparrow, Lima Electric Motor Co., Inc.

2:00 p.m.—Industrial Control

2:00 p.m.—Communication Switching III

- CP.* General Survey of Direct Distance Dialing. A. E. Ritchie, Bell Telephone Labs., Inc.
- CP.* Independent's Conversion to D.D.D. F. L. Kahn, Automatic Electric Labs.
- 60-1210. The New Nationwide Telephone Numbering Plan. O. Myers, I Bell Telephone Labs., Inc.
- CP60-1222. All-Number Calling and World-Wide Dialing. C. M. Conway, American Telephone & Telegraph Co.
- CP.* Automatic Number Identification. D. H. Pennoyer, Bell Telephone Labs., Inc.
- CP60-1253. Direct Distance Dialing of Telephone Calls in the Panel and No. 1 Crossbar Systems. E. L. Erwin, Bell Telephone Labs., Inc.

2:00 p.m.—Digital Computer Techniques

- 60-1184. Teaching the Uses of Digital Computers at the Technical I University of Denmark. O. I. Franksen, Rensselaer Polytechnic Inst.
- 60-654. Error Correcting Codes for Correcting Bursts of Errors. I J. E. Meggitt, IBM Research Labs. (Re-presented for Discussion only).
- CP.* The Design of a High-Speed General Purpose Digital Computer Using Magnetostrictive Lines. M. Palevsky, R. M. Beck, J. Mitchell; Packard Bell Computer Corp.
- 60-1200. Magnetic Memory Drum Design. E. B. Carne, Melpar, I Inc.
- CP60-1205. Information Storage and Retrieval Part II—Equipment Applications. A. F. Glimm and R. D. Greenway, General Electric Co.
- CP.* Optimization of Computer Capability Through Programming and Logical Design. G. H. Smith, Autonetics.

9:00 a.m.—Basic Sciences

9:00 a.m.—Transmission and Distribution

- CP60-1198. Concrete Guy Anchor Tests. C. S. Bucholz, General Electric Co.
- CP60-1268. Transmission Line Construction in Lakes. A. V. Price, Ebasco Services, Inc.
- CP60-1273. Effect of Bundle-Conductor Field Influence on EHV Transmission Line Design. R. W. Harmon, Ohio Brass Co.
- 60-1206. Decoupling of Transmission Lines to Radio Influence Volt-III ages. S. B. Griscom, D. F. Shankle, E. R. Taylor, Jr., Westinghouse Electric Corp.; R. H. Schломann, American Electric Power Service Corp.

9:00 a.m.—Transformers

- CP60-1197. A Special Control Scheme for Load Tap Changers on a Rectifier Transformer. J. F. Brubaker, C. C. Haley; Westinghouse Electric Corp.
- 60-1246. The Analytical and Graphical Determination of Complete III Potential Transformer Characteristics. J. L. Settles, W. R. Farber, E. E. Conner; Westinghouse Electric Corp.
- 60-1190. Thermal Limits of Transformers for Short Circuit Conditions. AIEE W.G. on Methods of Making Temperature Rise Tests, S. Bennon, Chairman.

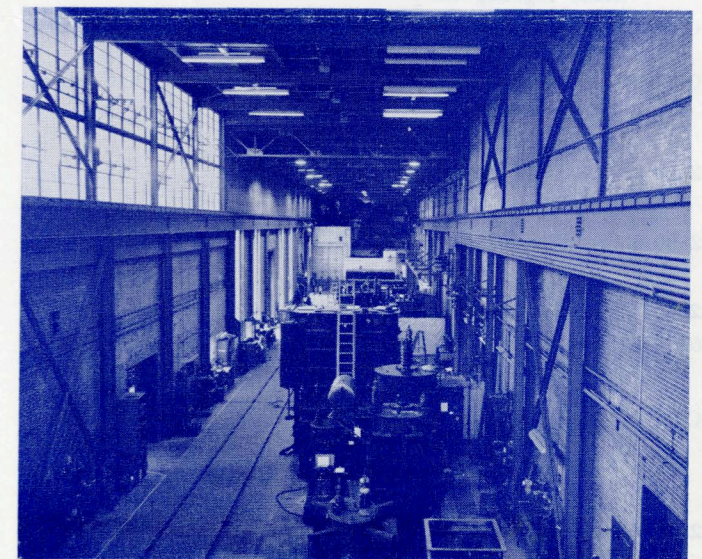
9:00 a.m.—Switchgear

9:00 a.m.—Mining Industry

- CP.* Design and Application of Synchronous Motors for Torque Limited Ball Mill Drive. H. S. Robinson, D. R. McAllister; Westinghouse Electric Corp.
- CP.* Wheel Excavator for Open Pit Mines. A. M. Vance, Westinghouse Electric Corp.
- CP.* Single Versus Dual Voltage Systems in Open Pit Mines. R. T. Taylor, Peabody Coal Co.

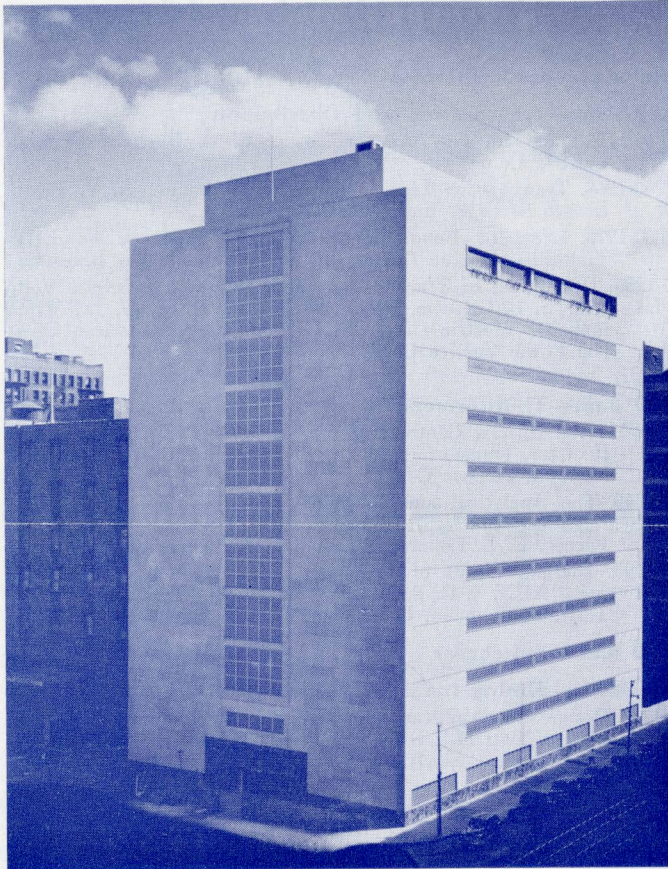
9:00 a.m.—Logical Design of Digital Computers

- 60-1228. Computer Design Using Index Arithmetic. A. S. Fraenkel, I University of California.
- CP.* A 4-Megacycle, 24-Bit Checked Binary Adder. M. E. Homan, IBM Corp.
- CP.* Forcing Circuitry-Sequential Building Blocks for Logical Design. R. M. Meade, IBM Corp.
- 60-1188. Current-Operated Diode Logic Gates. H. Reinecke, Jr., Non-Linear Systems, Inc. (Formerly with Massachusetts Inst. of Technology).
- CP60-1229. Logical Design by Regression (Matrix Logic VII). E. J. Schubert, Monitor Systems Inc.



The high room at Commonwealth Edison's Technical Center

AIEE FALL GENERAL MEETING



Hedrich-Blessing

Illinois Bell Telephone No. 2 Toll Building

60-1181. Universal Modulus (Matrix Logic VI). E. J. Schubert, I Monitor Systems Inc.

60-805. Analog and Threshold Building Blocks for Variable-Radix I Adders and Other Logic Networks. J. Sklansky, RCA Labs. (Re-presented for Discussion only).

9:00 a.m.—Economics of Peaking Sources

CP60-1264. Comparison of Peaking Sources. A. C. Sugden, Long Island Lighting Co.

CP.* Economics of Hydro Peak Plants. H. Teekman, Hydro-Electric Power Commission of Ontario.

CP60-1271. System Economics of Peaking Sources. R. D. Camburn and O. A. Lentz, Commonwealth Associates, Inc.

2:00 p.m.—Basic Sciences

2:00 p.m.—Transmission and Distribution

2:00 p.m.—Transformers

60-1192. Some Aspects of Ground Current Measurements During III Transformer Impulse Tests. L. C. Aicher, Allis-Chalmers Mfg. Co.

CP.* Hydro-Mechanical Shunting Networks for Sound Reduction in Transformers. L. R. Toothman, Pennsylvania Transformer Division of the McGraw-Edison Co.

2:00 p.m.—Mining Industry

CP.* Design of a Power System for a New A-C Mine. F. G. Hamner, R. B. Bailey, Southern Services Inc.

CP.* The Use of Storage Batteries in Underground Mines. E. Harding, Exide Industrial Division.

CP.* Trolley Charging of Batteries. R. B. Driesbach, General Electric Co.

2:00 p.m.—Communication Theory

2:00 p.m.—Analog and Simulation Techniques

60-1203. A New Function Generator. C. W. Eggers and T. W. Sze; I University of Pittsburgh.

60-1230. The Analog Solution of Some Functional Analysis Problems. K. K. Graupe, Boeing Airplane Co.

CP60-1212. Information Presentation Systems. H. G. McGuire, T. L. Stoddard; General Electric Co.

CP60-1231. System Simulation for Performance Analysis: Reliability, Loads, and Queues. L. P. Farmer, A. F. Glimm, H. P. Lee; General Electric Co.

CP60-1232. Bibliography on Analog-To-Digital Conversion. M. E. Frank, Thompson-Ramo-Wooldridge Products Co.

60-122. A Comparison of Digital Differential Analyzer and General I Purpose Equipment in Guidance Systems. M. M. Dickinson, IBM Corp. (Re-presented for Discussion only).

Continued from page 2

REGISTRATION: The **Registration Fees** at the Fall General Meeting will be \$6.00 for members and \$10.00 for nonmembers. Wives and women guests of members and nonmember registrants will pay a registration fee of \$2.00. Students, children and invited nonmember authors register without fee. There will be no advance registration.

AUTUMN VISIT TO MEXICO

An all-expense tour leaves the Chicago airport October 13th and returns from Mexico City October 22nd. Included in the tour are round-trip air transportation (Tourist Class) from Chicago, 8 nights at luxury hotels: Mexico City, Hotel Alfer 4 nights; Hacienda Vista Hermosa 1 night; Acapulco, Hotel El Presidente 2 nights; Taxco, Hotel De La Borda 1 night, all meals outside of Mexico City, transportation by private cars, English-speaking guides, all admissions during sightseeing, bullfights and cocktail parties. Address all correspondence to Mr. J. H. Theilig, President, Theilig International Tours, Inc., 400 West Madison St., Chicago 6, Illinois. The total cost is \$364.50 per person on the basis of double room occupancy at the hotel.

COMMITTEE: The members of the **1960 Fall General Meeting Committee** are General Chairman, L. E. Randall; Vice-Chairman, D. W. Gilman; Secretary, E. C. Carlson; Treasurer, J. Agosta; Fall Frolics, D. R. Whitlow; Hospitality, J. A. Schneider; Hotel Arrangements, G. L. Landgren; Finance & Budget, T. Donaldson; Sale of Papers, J. B. O'Brien; Technical Program, John Armbrust; Ladies Activities, Mrs. G. L. Welch; Ticket Sales, P. R. Cassidy; Registration, F. D. Hurd; Trips and Transportation, J. A. Schwenke; General Session, J. H. Evenback; Publicity, H. A. Bergen.

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