

AMERICAN
INSTITUTE
of
ELECTRICAL
ENGINEERS



Summer
and
Pacific
General
Meeting

JUNE 25 - 29
1956

● *at the*

FAIRMONT HOTEL

San Francisco, California

GENERAL INFORMATION

For those who attend the Summer and Pacific General Meeting this year in San Francisco, there awaits a full week of stimulating technical sessions and social entertainment. With the members of the San Francisco Section as hosts, we can assure our guests a most enjoyable and well spent week. Headquarters for the meeting is the Fairmont Hotel.

At our Annual Meeting, Monday afternoon June 25, Dr. Allen B. DuMont, Chairman of the Board of Directors of Allen B. DuMont Laboratories, will deliver the principal address. The Lamme Medal Presentation to C. R. Hanna will also take place at the Annual Meeting.

On the social side there will be an informal Sunday tea, formal luncheons Tuesday, Wednesday and Thursday, and a President's Reception and Banquet Thursday night.

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

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

TECHNICAL SESSIONS AND DISCUSSIONS are covered by the "Technical Sessions Guide" at the discretion of the presiding officers. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication, discussion on TRANSACTIONS Papers 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, New York, before July 13, 1956. Discussions received later may not be included, depending upon the printing schedule of the paper to which the discussion is directed. The original typewritten double-spaced copy, together with original illustrations as photographs or inked tracings should be submitted

ADVANCE COPIES OF PAPERS may be purchased by members at the technical papers desk at the uniform price of \$.40 each (\$.80 each to nonmembers). Only numbered papers are available. Mail orders, particularly from out-of-town members, are advisable inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon Books in \$10.00 denominations are available for those who wish to avoid remittance by check or otherwise. Mail orders should be addressed to the AIEE Order Department, 33 West 39th Street, New York 18, New York. The TRANSACTIONS Papers will also be published in the Bimonthly Publications. Note: Unnumbered Conference Papers (CP.*) may be available for sale at or after the meeting, if copies are provided by the author. They are not intended for publication in the TRANSACTIONS and are not presently scheduled for reproduction in any form by the Institute.

Summer and Pacific General Meeting

SCHEDULE OF EVENTS

For more detailed information see separate "Summer Meeting Activities" and "Ladies Events" Folders.

Sunday, June 24th

- 2:30 p.m. Registration
- 4:00 p.m. Welcome Tea — Fairmont Hotel

Monday, June 25th

- 8:30 a.m. Registration
- 9:00 a.m. Relays
 - Substations
 - Instruments and Measurements
 - General Industry Applications
 - Communication Theory
 - Ethics in Engineering Practice
- 12:00 noon Luncheon — Mayor Christopher
- 2:00 p.m. Opening Ceremony — Welcome by J. S. Moulton
- 2:30 p.m. Annual Meeting

Tuesday, June 26th

- 9:00 a.m. Section Delegates Conference
 - Trip to San Francisco Naval Shipyard
 - Transmission and Distribution
 - Rotating Machinery — Induction
 - Magnetic Amplifiers
 - Instruments and Measurements
 - Telegraph Systems
 - Domestic and Commercial Applications
 - Land Transportation
- 12:00 noon Luncheon — F. E. Terman
- 12:00 noon Ladies Fashion Show and Luncheon
- 12:00 noon Mens Golf Tournament
- 2:00 p.m. Section Delegates Conference
 - Trip to San Francisco International Airport and United Air Lines Maintenance Base
 - Industrial Power Systems
 - Transmission and Distribution
 - Rotating Machinery
 - Magnetic Amplifiers
 - Instruments and Measurements
 - Land Transportation
 - Computers in Business and Electric Utility Problems
- 7:00 p.m. Trip to University of California Radiation Laboratory, Berkeley

Wednesday, June 27th

- 5:30 a.m. Salmon Derby
- 9:00 a.m. Ladies Peninsula Trip
 - Trip to Westinghouse and Ford Motor Company Plants
 - Power Systems in Steel Industry
 - Communication Switching Systems
 - Industrial Power Rectifiers

Transmission and Distribution
Transformers
Magnetic Amplifiers
Management
Wire Communication Systems

- 12:00 noon Luncheon — George White
2:00 p.m. Communication Switching Systems
Transformers
Magnetic Amplifiers
Television and Aural Broadcasting Systems
Problems of Getting Young Engineers From
College Into Industry
Safety
Substations
Analog — Digital Converter and Combined
Computation

Thursday, June 28th

- 9:00 a.m. Trip to Ames Aeronautical Laboratories
and Stanford University
Ladies Chinatown Tour
Mining and Metal Industry
System Engineering
Switchgear
Carrier Current
Television and Aural Broadcasting Systems
Chemical Industry
Electronic Circuitry
Industrial Power Systems
12:00 noon Luncheon — John Kieby
2:00 p.m. Mining and Metal Industry
Power Generation
System Engineering and Computers
Switchgear
Basic Sciences
Television and Aural Broadcasting Systems
Chemical Industry
Radio Communication System
7:00 p.m. Presidents Reception and Banquet

Friday, June 29th

- 8:00 a.m. Boat Trip to Pacific Gas and Electric Company
Steam Plant — Pittsburg
9:00 a.m. Power Generation and System Engineering
Insulated Conductors
Computing Devices and Applications
Basic Sciences — Semi Conductors
Feedback Control Systems
Wire Communication Systems
Nucleonics
2:00 p.m. Power Generation
Analog Versus Digital Computers
Basic Sciences and Solid State Devices
Feedback Control System
Radio Communication Systems
Nucleonics

Monday, June 25

9:00 a.m.—Relays

Committee on Relays
Room of the Dons
Mark Hopkins Hotel
L. D. BARTER, Presiding

- CP.* New Relaying Developments. R. E. Cordray, General Electric Co.
CP.* A Transistorized Distance Relay. F. R. Bergseth, University of Washington.
CP56-632. The Protection of Pilot Wire Relay Circuits. Pacific Coast Subcommittee.
CP.* Tests and Operating Experience with Carrier Transfer Trip Relaying for Line Protection. A. W. Adams, Bonneville Power Administration.
CP56-652. Protecting A.C. Motors with Low-Voltage Air Circuit Breaker Series Trips. F. P. Brightman, P. J. Reifschneider and R. R. McGee, General Electric Co.

9:00 a.m.—Substations

Committee on Substations
Golden Empire Room
Mark Hopkins Hotel
I. S. MENDENHALL, Presiding

- 56-706. Present Practices in Electrical and Mechanical Design of III Buses for Extra High Voltage Substations. Working Group on Project 53.1.
CP56-707. Flexible Copper Braid for Electrical Buses and Connectors. Morris Brenner, Burndy Engineering Co.
56-647. Basic Designs for Large High Voltage Substations. E. G. III Norell, Sargent & Lundy.
CP.* Development of Automatic Dry Chemical Fire Protection Systems for Large Outdoor Transformers. E. F. Weaver, Pennsylvania Power and Light Co.

9:00 a.m.—Instruments and Measurements

Committee on Instruments and Measurements
California Room
C. F. SAVAGE, JR., Presiding

- CP56-794. VIAC: A Variable Interval Automation Controller. J. R. Wood, M. L. Klein and H. C. Morgan, North American Aviation, Inc.
CP56-795. Accurate Measurement of Phase Shift at Low Audio Frequencies. W. M. Meier, Westinghouse Electric Corp.
CP.* Precise Determination of the Watthour. L. E. Janetos and J. J. Hall, General Electric Co.

9:00 a.m.—General Industry Applications

Committee on General Industry Applications
San Francisco Room
FRED THOMPSON, Presiding

- CP.* The Selection of Electric Winder Drives for the Paper Industry. M. H. Fisher, Westinghouse Electric Corp.
CP.* Choosing the Right Conduit for Pulp and Paper Mills. V. S. Oaks, Hamermill Paper Co.
CP.* Automatic Control of a Uranium Slug Dejacketer. J. G. Bennett, General Electric Co.

9:00 a.m.—Communication Theory

Committee on Communication Theory
Vanderbilt Room
L. G. ABRAHAM, Presiding

- CP56-653. The Communication Engineer's Needs in Information Theory. W. T. Rea, Bell Telephone Labs., Inc.
- CP.* Reliable Circuits Using Less Reliable Relays. E. F. Moore and C. E. Shannon, Bell Telephone Labs., Inc.
- CP.* What Use is Delta Modulation to the Transmission Engineer? F. K. Bowers, Bell Telephone Labs., Inc.
- CP.* The Cash Value of Information Rate. J. L. Kelly, Jr., Bell Telephone Labs., Inc.

9:00 a.m.—Ethics in Engineering Practice

Committee on Code of Principles of Professional Conduct
Hunt Room
D. I. CONE, Presiding

- CP.* The Consulting Engineer's Viewpoint, H. J. Brunner, Consulting Engineer.
- CP.* Professional Ethics and the Government Engineer. E. C. Starr, Oregon State College.
- CP.* Ethics for Organizations. C. A. Powel, Past President, San Mateo, Calif.

2:00 p.m.—Opening Ceremony

Gold Room

Address of Welcome. J. S. Moulton, General Chairman.

2:30 p.m.—Annual Meeting

Gold Room
President M. D. HOOVEN, Presiding

1. Report of the President, M. D. Hooven.
2. Report of the Board of Directors.
3. Report of the Treasurer, W. J. Barrett.
4. Report of the Committee of Tellers on:
 - (a) Votes for nominees for AIEE offices.
 - (b) Proposed Constitutional amendments.
5. (a) Introduction of, and presentation of President's badge to M. S. Coover.
(b) Response by Mr. Coover.
6. Presentation of the Lamme Medal to C. R. Hanna, Westinghouse Electric Corp.
 - (a) The Establishment of the Medal. J. J. Pilliod, Chairman, Lamme Medal Committee.
 - (b) The Career of the Medalist. Dr. J. A. Hutcheson, Vice-President, Engineering Research, Westinghouse Electric Corp.
 - (c) Presentation of the Medal and Certificate by President M. D. Hooven.
 - (d) Response by Mr. Hanna.
7. Any other business that may be presented.

ADDRESS: DR. ALLEN B. DUMONT.

Tuesday, June 26

9:00 a.m.—Section Delegates Conference

Sections Committee
Golden Empire Room
Mark Hopkins Hotel
DIXON LEWIS, Presiding

9:00 a.m.—Transmission and Distribution

Committee on Transmission and Distribution
Nob Hill Room
E. L. KANOUSE, Presiding

- CP56-708. Big Bend-Granite Falls 230-Kilovolt Transmission Line. T. M. Austin, Bureau of Reclamation.
- CP56-709. Transmission Planning for Mountain Sheep-Pleasant Valley Project. W. A. Morgan, G. R. George, R. C. Guse and and M. F. Hatch, The Washington Water Power Co.
- CP56-710. Economics of Var Supply in a Large Electric Power System. T. A. Bettersworth, Pacific Gas & Electric Co.
- 56-711. Short-Circuit Tests with Rapid Reclosing on the 220-KV Line III Mettlen-Lavorgo. F. Schaer, Olten, Switzerland and P. Baltenasperger, Baden, Switzerland.
- CP.* The Additional Service Life of Poles Obtained by Supplementary Treatment in the Field. J. W. Andrews and C. W. Leech, U. S. Steel Corp.

9:00 a.m.—Rotating Machinery—Induction

Committee on Rotating Machinery
California Room
J. H. VIVIAN, Presiding

- 56-712. The Schrage Motor as a Synchronous Tie Transmitter. J. P. III Landis, E. I. du Pont de Nemours & Co.
- CP.* Recent Trends in Pump Motor Design. W. B. Rice,
- CP56-648. Vibratory Systems in Vertical Motor Mountings. J. M. Shulman, Westinghouse Electric Corp.
- CP56-713. Vibration in Vertical Pumping Systems. J. H. McKendree and L. A. March, General Electric Co.

9:00 a.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Room of the Dons
Mark Hopkins Hotel
A. B. ROSENSTEIN and H. V. NUTTALL, Presiding

- 56-714. Dynamic Behavior of a Three-Phase Magnetic Amplifier. I F. J. Ellert, General Electric Co.
- 56-715. The Triductor. P. P. Biringer, University of Toronto. I
- CP56-716. Characteristic Properties of a Magnetic Frequency Multiplier. W. Leonhard, Westinghouse Electric Corp.
- CP56-649. A Delta-B Indicator. H. W. Lord, General Electric Co.
- 56-717. Superposed Magnetic Fields in Materials and Rectangular Hysteresis Loops. C. B. Wakeman, Magnetics, Inc. and F. J. Beck, Yale University.

9:00 a.m.—Instruments and Measurements

Committee on Instruments and Measurements
Vanderbilt Room
W. S. PRITCHETT, Presiding

- CP56-796. New DC Hysteresigraph. R. E. Tompkins and J. D. Young, General Electric Co.

TUES. (cont'd)

CP56-797. An Instrument to Record Voltage Flicker. V. H. Kraybill, Commonwealth Edison Co. and H. M. Jensen, Pennsylvania State University.

CP.* The Inductronic Double Bridge. J. H. Miller, Weston Electrical Instrument Co.

9:00 a.m.—Telegraph Systems

Committee on Telegraph Systems
Nob Hill Theatre
W. Y. LANG, Presiding

CP56-634. Electrical Teletypewriter Transmitter. N. N. Biswas, University of Roorkee, India.

56-654. Transmission of Business Machine Data Over Standard Telegraph Channels. F. B. Bramhall, Western Union Telegraph Co.

CP.* Error Checking with Particular Reference to Telegraph Systems. R. M. Gryb, Bell Telephone Labs., Inc.

56-655. Control System for Integrated Data Processing. P. R. Easterlin, Western Union Telegraph Co.

56-646. Automatic Dispatch System for Half-Duplex Teletypewriter I Lines. J. L. Maxwell and H. K. Farrar, The Pacific Tel. & Tel. Co.

9:00 a.m.—Domestic and Commercial Applications

Committee on Domestic and Commercial Applications
Hunt Room
R. G. SCOTT, Presiding

CP.* The Influence of Practical Considerations on the Use of Electric Heating for Homes. S. L. Forsyth, Westinghouse Electric Corp.

CP.* Favorable Economics of Resistance Heating. J. C. Beckett, Wesix Electric Heater Co.

CP56-690. A Study of the Electrical Characteristics of a 20-Suite Electrically-Heated Apartment. J. C. McAdam, British Columbia Electric Co., Ltd.

CP56-691. The Design and Operation of an Air-to-Air Heat Pump Air Conditioning. H. E. Burrier, Southern California Edison Co.

CP.* The Effect of Space Heating on Utility Systems on the Pacific Coast. C. E. Baugh, Pacific Gas & Electric Co.

9:00 a.m.—Land Transportation

Committee on Land Transportation
San Francisco Room
E. A. FOSTER, Presiding

CP56-762. Rapid Transit Progress in Toronto. J. G. Inglis, Toronto Transit Commission.

CP.* Rapid Transit Expands in Chicago. S. D. Forsythe, Chicago Transit Authority.

CP56-763. Adapting a Trolley Coach System to a Changing Traffic Pattern. S. M. Shockey, Seattle Transit System.

2:00 p.m.—Section Delegates Conference

Sections Committee
Golden Empire Room
Mark Hopkins Hotel
DIXON LEWIS, Presiding

TUES. (cont'd)

2:00 p.m.—Industrial Power Systems

Committee on Industrial Power Systems
Hunt Room
R. A. ERWIN, Presiding

CP56-718. Economics of Distribution Systems. P. F. Larson, Holmes & Narver, Inc.

CP56-719. Emergency Electrical Service for Hospitals. M. L. Beeson, County of Los Angeles and P. Belsky, Westinghouse Electric Corp.

CP56-720. Adequate Capacity in Electrical Services and Distribution Switchgear for the Cannery. R. S. Wilson, Processors and Growers Association.

CP.* Electrical Hazards in Distribution Systems. E. E. Carleton, California Division of Industrial Safety.

2:00 p.m.—Transmission and Distribution

Committee on Transmission and Distribution
Nob Hill Room
E. R. HENDRICKSON, Presiding

56-721. The Alconector—An All Weather Connector for Aluminum III to Copper Conductors. E. W. Greenfield and A. H. Selker, Kaiser Aluminum & Chemical Corp.

56-722. Emissivity and Its Effect on the Current Carrying Capacity III of Stranded Aluminum. C. S. Taylor and H. E. House, Aluminum Co. of America.

56-723. General Purpose Overhead Distribution Above 5,000 Volts III in Urban Areas. W. R. Bullard, Ebasco Services, Inc.

CP.* Protection and Application of Series Capacitors Used with Distribution Transformers. G. G. Auer, L. W. Robbins and N. M. Neagle, General Electric Co.

CP*. Study of Twin Conductor Arrangements. E. T. B. Gross, Illinois Institute of Technology.

2:00 p.m.—Rotating Machinery

Committee on Rotating Machinery
California Room
A. A. KRONEBERG, Presiding

56-633. Experience with High Voltage D-C Insulation Testing of III Generator Stator Windings. E. C. Schurch, U. S. Bureau of Reclamation.

56-724. Analog Computer Representations of Synchronous Generators III in Voltage Regulation Studies. M. Riaz, Massachusetts Institute of Technology.

56-725. The Design of a Very Slow Speed Reluctance Motor for III Atomic Reactor Rod Mechanism Drive. D. A. Guerdan, Westinghouse Electric Corp.

CP56-806. A Note on the Speed-Torque Curves of AC Adjustable Speed Drives. J. E. Gibson, Yale University.

2:00 p.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Room of the Dons
Mark Hopkins Hotel
H. C. BOURNE and R. C. LEWIS, Presiding

56-726. Magnetic Amplifier Control of Switching Transistors. H. W. I Collins, Westinghouse Electric Corp.

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- 56-727. Magnetic Logic Circuit Control System Design Considerations. R. I. Van Nice, Westinghouse Electric Corp.
- 56-728. Magnetic Pulse Generator Practical Design Limitations. M. I. F. Thompson, R. R. Trautwein and E. R. Ingersoll, North American Aviation, Inc.
- CP56-729. The Efficiency of Magnetic Pulse Generators. B. M. Wolfram, Magnetic Research Corp.
- CP56-730. Instabilities of Push-Pull Magnetic Amplifiers Feeding the Field of an Electrical Machine. H. F. Storm, General Electric Co.
- 2:00 p.m.—Nuclear Instrumentation**
Committee on Instruments on Measurements
Vanderbilt Room
LESTER KORNBLITH, Presiding
- 2:00 p.m.—Land Transportation**
Committee on Land Transportation
San Francisco Room
E. A. FOSTER, Presiding
- CP56-764. Developing and Building Rapid Transit Rail Cars. E. C. Wrausmann, St. Louis Car Co.
- CP.* Modern Brakes for Modern Rapid Transit Cars. C. M. Hines, Westinghouse Air Brake Co.
- CP.* First Year's Operating Experience with New Control Equipment on 100 New York City Subway Cars. G. W. Weber, General Electric Co.
- CP56-765. Recent Developments in Light Weight Rapid Transit Equipment. H. S. Robinson and J. A. Schoch, Westinghouse Electric Corp.

2:00 p.m.—Computers in Business and Electric Utility Problems

Committees on Computing Devices and Research
Nob Hill Theatre
E. C. STARR, Presiding

- CP.* Some Opportunities for Operations Research in the Electric Power Industry, W. J. Platt.
- CP.* Computers in Business and Industrial Control Problems. E. M. Grabbe and Harry Larson.
- CP56-661. Quasi-Random Access Memory Systems. G. L. Hollander, Clevite-Brush Development Co.
- 56-693. Some Engineering Aspects of the Machine Translation of I Language. R. E. Wall, Jr., University of Washington.

Wednesday, June 27

9:00 a.m.—Power Systems in the Steel Industry

Committees on Industrial Power Systems and Mining and Metal Industry
San Francisco Room
W. C. BLOOMQUIST, Presiding

- 56-657. Electric Power Systems for Steel Plants. H. N. Cox and L. G. II Levoy, General Electric Co.

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- 56-731. Centralized Control of Power Systems in the Steel Industry. II W. A. Derr and W. L. Metz, Westinghouse Electric Corp.
- SYMPOSIUM—The Problem of Fluctuating Loads in the Steel Industry.
- 56-637. Voltage Dips and Flicker. A. A. Kroneberg, Southern California Edison Co.
- CP.* Operating Experience with a High Speed Turbine Load Regulator. D. E. Young, United States Steel Corp.
- CP.* The Power-Distribution System of an Integrated Steel Plant. Donald Stewart, Jr., Kaiser Steel Co.

9:00 a.m.—Communication Switching Systems

Committee on Communication Switching Systems
Vanderbilt Room
H. F. MAY, Presiding

- 56-662. Design Features of Bell System Wire Spring Relays. H. M. I Knapp, Bell Telephone Labs., Inc.
- 56-650. Manufacture of Wire Spring Relays for Communication I Switching Systems. J. W. Rice, Western Electric Co., Inc.
- 56-658. Capability of Sealed Contact Relays. O. M. Hovgaard, Bell I Telephone Labs., Inc.
- 56-663. The Development of Automatic Manufacturing Facilities for I Reed Switches. J. A. Hosford, Western Electric Co., Inc.
- 56-645. Traffic Considerations in Community Dial Offices. S. J. Lani- I gan and T. J. McDonough, Rural Electrification Administration.

9:00 a.m.—Industrial Power Rectifiers

Committee on Industrial Power Rectifiers
California Room
WALDO PORTER, Presiding

- CP56-664. Resistance Instrument for an Aluminum Reduction Pot Lines. L. H. Wolgast, Reynolds Metals Co.
- CP.* Measurements of Arc Drop on Mercury-Arc Rectifiers. J. E. Hudson, General Electric Co.
- CP.* Operating Experiences with the Mechanical Rectifier. Thomas Cootsona, Food Machinery and Chemical Corp.
- CP.* A Description of the Electrical Installation of the Anaconda Aluminum Plant at Columbia Falls, Montana. H. W. Kanzler, Anaconda Aluminum Co.

9:00 a.m.—Transmission and Distribution

Committee on Transmission and Distribution
Hunt Room
J. T. LUSIGNAN, Presiding

- 56-629. Simplified Method for Calculating Intermediate Faults on III Mutually Coupled Transmission Lines. M. J. Lantz, Bonneville Power Administration.
- 56-627. Electrical Resistance to the Earth of a Live Tree. F. M. III Defendorf, National Bureau of Standards.
- 56-732. Reduced Insulation in Power Systems at the Higher Voltages III —The Problems it Presents. P. L. Bellaschi, Portland, Oregon.

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WED. (cont'd)

56-733. A New Approach to the Calculation of the Lightning Performance of Transmission Lines. C. F. Wagner, Westinghouse Electric Corp.

9:00 a.m.—Transformers

Committee on Transformers
Room of the Dons
Mark Hopkins Hotel
C. H. BJORQUIST, Presiding

56-734. A Study of the Co-Ordination of Modern Arresters and Transformer Insulation. E. J. Adolphson and F. J. Vogel, Allis-Chalmers Mfg. Co. Re-presented for discussion.

56-735. Switching Surge and Long Duration Voltage Tests on Transformer Insulation. W. C. Farneth and F. J. Vogel, Allis-Chalmers Mfg. Co. Re-presented for discussion.

56-628. Minimum Cost Loading of Transformers. A. Klopfenstein, III Southern California Edison Co.

CP56-736. Reduction of Audible Sound of Transformers by the Suspension Method of Installation. C. P. Xenis, Consolidated Edison Co. of N. Y., Inc.

CP.* Low-Remanence High-Aluminum Iron. D. Pavlovic and K. Foster, Westinghouse Electric Corp.

CP56-805. A Field Survey of Transformer Oil Quality. W. J. Degnan and E. J. Shimanski, General Electric Co.

9:00 a.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers
Golden Empire Room
Mark Hopkins Hotel
H. F. ECKERLE, Presiding

CP.* Teaching Magnetic Amplifier Circuits. H. C. Bourne, R. M. Saunders, University of California.

56-626. Alternating Current Control of the Half-Wave Bridge Magnetic Amplifier. T. Bernstein, General Motors Corp. and N. L. Schmitz, University of Wisconsin.

CP56-737. A Stable Low-Level Magnetic Amplifier. R. Cockrell, Boeing Airplane Co.

CP.* Fast Response Low-Level Magnetic Amplifiers. A. Hoffman, Convair.

56-738. Inverse Time Underfrequency Relay. R. G. Hoft, General Electric Co.

9:00 a.m.—Management

Committee on Management
Nob Hill Room
H. H. GRANT, Presiding

CP.* Organizing to Build the Commonwealth Edison Nuclear Power Plant. J. E. Maider, Commonwealth Edison Co.

CP.* Management Development in the Communications Field. Glen Ireland, Pacific Tel. & Tel. Co.

CP.* How an Engineering Education Fits an Individual for a Management Position. G. C. S. Benson, Claremont Men's College.

9:00 a.m.—Wire Communication Systems

Committee on Wire Communication Systems
Nob Hill Theatre
T. J. FLEMING, Presiding

CP56-799. A Subscriber Carrier System Using Single Sideband Suppressed Carrier Operation. W. E. Noller, Lynch Carrier Systems, Inc.

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WED. (cont'd)

CP56-798. Application of Single Sideband Subscriber Carrier to Rural Telephone Lines. G. L. Curtis, Lynch Carrier Systems, Inc.

CP56-800. FM Subscriber Carrier. Elvin Krasin, Panhandle Electrical Construction Co.

CP.* P1 Carrier System. R. C. Boyd and E. H. Perkins, Bell Telephone Labs., Inc.

CP56-802. A New 5 Channel Carrier System for Subscriber Use Employing Transistors. B. R. Stachiewicz, R. L. Layburn and D. F. Jamieson, Stromberg-Carlson Co.

2:00 p.m.—Substations

Committee on Substations
Nob Hill Room
W. S. SCHEERING, Presiding

CP56-739. Insulator Washing in Substations. R. S. Melville, Southern California Edison Co.

CP56-740. Cleaning Insulators in Energized Substations. C. L. Collins and J. H. Rutter, Dept. of Water & Power, Los Angeles.

56-636. New Lightning Arrester Standard. H. R. Armstrong, Detroit Edison Co.; F. M. Defendorf, National Bureau of Standards; and A. M. Opsahl, Westinghouse Electric Corp.

CP56-741. The Application of Lightning Arresters on a Large Power System. H. R. Armstrong, Detroit Edison Co.

2:00 p.m.—Communication Switching Systems

Committee on Communication Switching Systems
Vanderbilt Room
W. KEISTER, Presiding

56-631. Recent Developments in Four-Wire Switching of Long-Distance Telephone Circuits. Imre Molnar, Automatic Electric Co.

56-665. The Full Stature of the Crossbar Tandem Switching System. I John Meszar, Bell Telephone Labs., Inc.

56-668. Electronics in Telephone Switching Systems. A. E. Joel, Bell Telephone Labs., Inc.

CP56-666. A Magnetic Drum Storage System Considered for Use as a Common Sender in Nationwide Dialing. H. F. May, Bell Telephone Labs., Inc.

56-667. Recent New Features for the Number 5 Crossbar Switching System. J. W. Dehn and R. E. Hersey, Bell Telephone Labs., Inc. Re-presented for discussion.

2:00 p.m.—Transformers

Committee on Transformers
Room of the Dons
Mark Hopkins Hotel
C. P. XENIS, Presiding

56-742. Determination of Impulse Stresses Within Transformer Windings by Computers. J. H. McWhirter, C. D. Fahrkopf and J. H. Steele, Westinghouse Electric Corp.

56-743. Effect of Impulse Testing on Transformer Iron Loss. J. H. McWhirter, T. R. Specht and W. D. Albright, Westinghouse Electric Corp.

56-744. Ultrasonic Detection and Location of Electrical Discharges in Insulating Structures. J. G. Anderson, General Electric Co.

American Institute of Electrical Engineers

56-745. Evaluation of Dielectric Strength Gauges for Transformer III Oil. K. H. Weber and R. B. Kaufman, General Electric Co.

CP56-746. Use of Aluminum Strip Conductor in Dry Type Transformers. J. C. Meekins, T. E. Lewis, J. Staley, Reynolds Metals Co.

2:00 p.m.—Magnetic Amplifiers

Committee on Magnetic Amplifiers

Golden Empire Room

Mark Hopkins Hotel

K. D. JOHANSEN and R. C. BYLOFF, Presiding

56-747. The Series Magnetic Amplifier—Part I—The Four Modes of I Operation. R. C. Barker, Yale University.

56-748. The Series Magnetic Amplifier—Part II—The Mechanisms I of Gain and Time Constant. R. C. Barker, Yale University.

56-749. Diode Shunting in Magnetic Amplifiers. J. L. Lowrance and I J. E. Dolan, Bendix Aviation Corp.

CP.* A Silicon Diode Voltage Reference Unit. W. H. Woodworth and A. Pearson, Michelson Lab.

56-750. The Simple Reactor Circuit; Its Operation and Mode Tran- I sition. J. F. Ringelman and A. L. Fenaroli, Westinghouse Electric Corp.

CP.* Evaluation of Materials for Reducing Vibration Effects on Toroidal Cores. W. F. Horton, Lear, Inc.

2:00 p.m.—Television and Aural Broadcasting Systems

Committee on Television and Aural Broadcasting Systems

Hunt Room

J. B. EPPERSON, Presiding

CP.* Recent Developments in High Fidelity Amplifiers and Other Equipment. F. H. McIntosh, Frank H. McIntosh Consulting Radio Engineers.

CP.* Remote Control of Directional and High Power Standard Broadcast Stations. A. P. Walker, Association of Radio and TV Broadcasters.

CP.* The Impact of Recent Research on Television and Aural Broadcasting Systems. G. H. Brown and C. N. Hoyler, RCA Labs. (Demonstration)

2:00 p.m.—Problems of Getting Young Engineers from College into Industry

Committee on Education

Nob Hill Theatre

H. H. SKILLING, Presiding

Panel on Electronics: D. I. Cone, Pacific Tel. & Tel. Co.
F. E. Terman, Stanford University
J. M. Cage, Purdue University
W. R. Hewlett, Hewlett-Packard Co.

Panel on Power: R. O. Brosemer, General Electric Co.
J. C. Beckett, Wesix Electric Heater Co.
W. R. Johnson, Pacific Gas and Elec. Co.
M. S. Oldacre, Stanford Research Institute

2:00 p.m.—Safety

Committee on Safety

California Room

C. F. DALZIEL, Presiding

CP.* Field Treatment of Electric Shock Cases. W. B. Kouwenhoven, The Johns Hopkins University.

Summer and Pacific General Meeting

CP56-761. Emergency Lighting for Fire Safety. R. S. Moulton, National Fire Protection Association.

CP56-669. Testing for Safety—Safely. J. A. MacNabb, Underwriters' Labs.

2:00 p.m.—Analog-Digital Converter and Combined Computation

Committee on Computing Devices

San Francisco Room

STANLEY ROGERS, Presiding

CP.* Ad-da-verters I—Specifications for Analog-Digital-Analog Converting Equipment for Stimulation Use. R. M. Leger, Convaiv.

CP.* Logical and Functional Organization of the Ad-da-verter System. B. M. Gordon, EPSCO, Inc.

CP.* Design and Construction of Ad-da-verter System. Eli Anfenger, EPSCO, Inc.

CP.* Ad-da-verters IV—Combined Analog-Digital Computer Operation. J. L. Greenstein, Convaiv.

Thursday, June 28

9:00 a.m.—Mining and Metal Industry

Committee on Mining and Metal Industry

San Francisco Room

E. H. BROWNING, Presiding

CP.* This is Automation. A. C. Parsons, General Electric Co. (Movie)

CP56-675. Automatic Control Systems in Steel Processes. W. K. Scott, United States Steel Corp.

CP.* Computer Applications in the Metal Working Industries. L. F. Stringer, Westinghouse Electric Corp.

CP.* Automatic Control for Continuous Processing Lines. F. L. Reed, Westinghouse Electric Corp.

9:00 a.m.—System Engineering

Committee on System Engineering

Nob Hill Room

F. I. LAWSON, Presiding

CP56-642. The Connecticut Capacity Coordinating Plan. E. C. Brown, The Hartford Electric Light Co.; C. T. Hughes, Connecticut Light & Power Co.; and R. G. Warner, United Illuminating Co.

CP56-670. Some Aspects of Tie Line Bias Control on Interconnected Power Systems. Nathan Cohn, Leeds and Northrup Co.

CP.* Automatic Operation of Interconnected Areas. A. F. Glimm, L. K. Kirchmayer and H. H. Chamberlain, General Electric Co.

CP56-671. Penalty Factors from Power System Equations. P. G. Lubisich, Los Angeles Department of Water and Power.

56-672. Some General Theorems on Power Flow in Linear Networks. III J. F. Calvert and T. W. Sze, University of Pittsburgh. Represented for discussion.

THURS. (cont'd)

9:00 a.m.—Switchgear

Committee on Switchgear
Hunt Room
J. D. WOOD, Presiding

- 56-751. Mechanical Features of New Frame Mounted Outdoor Oil III Circuit Breakers. E. R. Perry, J. F. Claffie, W. L. Vance, Allis-Chalmers Mfg. Co.
- 56-752. The Development and Testing of a 300 KV Air-Blast Circuit-Breaker for Severe Duties. J. Christie, D. F. Amer, A. F. B. Young, A. Reyrolle & Co., Ltd.
- CP56-701. A New Universal Mechanically Trip-Free, Four Bar Linkage Mechanism for Intermediate Voltage Power Circuit Breakers. H. L. Peek, Allis-Chalmers Mfg. Co.
- CP56-753. Gas Blast Switch—Tests on 230 kv System. P. E. Richardson, U. S. Bureau of Reclamation; Arem Foti, I-T-E Circuit Breaker Co.

9:00 a.m.—Carrier Current

Committee on Carrier Current
Vanderbilt Room
L. E. LUDEKENS, Presiding

- 56-651. Application of Transistors in Power Line Carrier Relaying. III W. C. Feaster, The Potomac Edison Co.; E. E. Scheneman, Westinghouse Electric Corp.
- 56-630. A Microwave Communication System for the Southern Colorado Power Co., G. D. Perry, Jr., Southern Colorado Power Co.; E. Langone, General Electric Co.
- CP56-754. Frequency Shift Microwave Channelizing Equipment for Line Protective Relaying. M. E. Strong, W. R. Robinson, Westinghouse Electric Corp.
- CP56-801. A Four-Channel Power Line Carrier System. F. F. Garzoli, Lynch Carrier Systems, Inc.

9:00 a.m.—Television & Aural Broadcasting Systems

Committee on Television and Aural Broadcasting
Golden Empire Room
Mark Hopkins Hotel
O. W. B. REED, JR., Presiding

- CP.* Television Networks for the San Francisco Convention. E. D. Barcus and A. E. MacMahon, Pacific Tel. & Tel. Co.
- CP.* Color Kinescope Recording on Embossed Film. C. H. Evans and R. B. Smith, Eastman Kodak Co. Presented by R. G. Hufford.
- 56-673. A Video Visual Measuring Set with Sync Pulses. P. T. I Sproul, Bell Telephone Labs., Inc.
- CP.* VHF Propagation Over Rough Terrain. A. G. Sparling, Stations KHQ AM & TV.

9:00 a.m.—Chemical Industry

Committee on Chemical Industry
California Room
F. J. MOLLERUS, Presiding

- CP56-674. Electrical System for a Nuclear Reactor. E. P. Peabody and D. S. Brereton, General Electric Co.
- CP.* Cathodic Protection for Steel Retention Tanks Containing Reactor Coolant Water. C. S. Bucholz, General Electric Co.

THURS. (cont'd)

- CP.* Minimizing the Fifth and Seventh Harmonics from A.C. Distribution System. W. R. Kiltz, The Dow Chemical Co.

- CP56-480. Expansion of Electrical Facilities in Chemical Plants Utilizing Existing Switchgear. H. N. Hickok, General Electric Co.

9:00 a.m.—Electronic Circuitry

Committee on Electronics
Green Room
H. L. FLOWERS, Presiding

- 56-756. Magnetic Regulation Transistor Power Supply. L. F. Lyons, I Bendix Aviation Corp.
- CP56-757. Keyed, Phase-Sensitive Demodulators. Robert B. Mark, P. R. Johannessen, W. X. Johnson, Massachusetts Institute of Technology.
- 56-758. Application of Junction Transistors to Carrier Frequency I Computing Amplifiers. W. A. Curtin, Radio Corp. of America.
- 56-759. Synchronization Accuracy Obtainable with Multiplier Photo-I tubes. L. Levi, Fairchild Controls Corp.
- CP56-760. A Comprehensive Timing System for Field Testing. C. K. Raynsford, Vitro Labs.
- 56-803. Styroflex Aluminum Sheathed Air-Dielectric Cable. E. J. I Merrell, A. L. McKean and J. Arbutnott, Jr., Phelps Dodge Copper Products Corp.

9:00 a.m.—Industrial Power Systems

Committee on Industrial Power Systems
Room of the Dons
Mark Hopkins Hotel
R. A. ERWIN, Presiding

- 56-625. Distributing Large Single Phase Loads in Limited Capacity II Three Phase Power Systems. G. F. Aroyan, University of California and K. G. Lakey, United States Navy.
- CP.* Petroleum Refinery Electrical Power Systems. G. R. Dunbar, Westinghouse Electric Corp.
- CP56-767. A Transient Stability and Voltage Study for a Modern Oil Refinery Distribution System. C. W. Boice, C. F. Braun & Co., S. R. Durand and D. Dalasta, Allis-Chalmers Mfg. Co.
- CP.* Power for Delaware Flying A Refinery. W. C. Cauthen, C. F. Braun & Co.

2:00 p.m.—Mining and Metal Industry

Committee on Mining and Metal Industry
San Francisco Room
W. E. MILLER, Presiding

- 56-639. Transient Characteristics of D-C Metal Rolling Motors and II Generators. E. P. Smith, General Electric Co.
- 56-638. Analysis of Tandem Cold Reduction Mill with Automatic II Gage Control. R. A. Phillips, General Electric Co.
- 56-656. Incremental Control Equations for Tandem Rolling Mills. II J. H. Courcoulas and J. M. Ham, University of Toronto.
- CP.* Modern Computer Analysis for the Design of Steel Mill Control Systems. J. E. Reider and P. Spergel, Industrial Nu-
cleonics Corp.

American Institute of Electrical Engineers

2:00 p.m.—Power Generation

Committee on Power Generation
Room of the Dons, Mark Hopkins Hotel
C. F. PAULUS, Presiding

- 56-768. Development of the Electrical Aspects in Outdoor Steam-
III Electric Generating Stations on the Pacific Gas and Electric
Company System. Einar Nilsson, Pacific Gas & Electric Co.
- 56-769. Outdoor versus Indoor Steam-Electric Stations in the Hous-
III ton Area. L. K. Del'Homme, Houston Lighting and Power Co.
- CP56-660. Salient Electrical Features of Muskingum River Plant.
V. P. Rader and C. P. Zimmerman, American Gas & Electric
Service Corp.
- CP56-770. Design Changes for Unit 3, Meramec Plant. R. W. Gas-
kins, Union Electric Co. of Missouri.
- CP56-771. Refinements in Design of Steam-Electric Generating Sta-
tions. J. L. Cohon, Southern California Edison Co.

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

Committees on Computing Devices and System Engineering
Nob Hill Room
A. P. HAYWARD, Presiding

- 56-676. Transient Stability Angular Increment Computer. H. Wood,
III Southern California Edison Co.
- 56-677. Digital Computer Solution to Determine Economical Use of
III Hydro Storage. D. L. Johnson, University of Washington.
- 56-678. Exact Economic Dispatch Digital Computer Solution. R. B.
III Shipley and Martin Hochdorf, Tennessee Valley Authority.
- 56-679. The Use of Computing Machines in the Statistical Evaluation
I of Electrical Components. W. E. Andrus, Jr., Interna-
tional Business Machines.
- 56-680. Analysis of a Sampled Data Servo-Mechanisms Performed on
I the IBM 650. B. M. Tostanoski, International Business Ma-
chines.

2:00 p.m.—Switchgear

Committee on Switchgear
Hunt Room
J. H. VIVIAN, Presiding

- 56-772. Current Limiting Fuses—Their Characteristics and Applica-
III tions. P. C. Jacobs, The Chase-Shawmut Co.
- 56-773. Co-ordination of Current Limiting Fuses and Low Voltage
III Air Circuit Breakers. M. S. Carlson and W. H. Edmunds,
I-T-E Circuit Breaker Co.
- CP56-774. A New High Interrupting Capacity Low Voltage Circuit
Breaker. W. H. Edmunds, I-T-E Circuit Breaker Co.
- 56-775. Testing Large Air Circuit Breaker Trip Devices. C. H. Titus
III and L. H. Sperow, General Electric Co. Re-presented for
discussion.

2:00 p.m.—Basic Sciences

Committee on Basic Sciences
Green Room
L. J. LEWIS, Presiding

- 56-681. Dynamax, A New Crystal and Domain Oriented Magnetic
I Core Material. G. H. Howe, General Electric Co.

Summer and Pacific General Meeting

- 56-682. Investigations Concerning Polarization in Barium Titanate
I Ceramics. G. W. Marks, USN Electronics Lab.; D. L. Waide-
lich, University of Missouri; and L. A. Monson, USN Elec-
tronics Lab.

- CP.* High-Permeability High-Aluminum Iron. D. Pavlovic and K.
Foster, Westinghouse Electric Corp.

- 56-787. The Analytical Design and Evaluation of Electromagnets.
I M. J. Kelly and J. E. Wallace, International Business Ma-
chines Corp.

- 56-684. Graphical Determination of the Fourier Series Coefficients.
I W. H. Middendorf, University of Cincinnati.

2:00 p.m.—Television and Aural Broadcasting Systems

Committee on Television and Aural Broadcasting
Golden Empire Room
Mark Hopkins Hotel
G. H. BROWN, Presiding

- CP.* Basic Colorimetry for Color TV. E. L. Michaels, Hughes Air-
craft Co.

- CP.* Adaptation of the CHROMATRON Tube for Military Ap-
plications. D. R. Cone, Chromatic TV Labs., Inc.

- CP56-688. New Slow Scan TV System for Closed Circuit Applica-
tions. G. H. Fathauer and R. H. Smith, Jr., Thompson Prod-
ucts, Inc.

2:00 p.m.—Chemical Industry

Committee on Chemical Industry
California Room
A. J. McCROCKLIN, Presiding

- CP.* The Germanium Rectifier is Growing Up. R. M. Crenshaw,
General Electric Co.

- CP56-689. Electric Cable Insulation in Chemical Plants. J. E. Parker,
Carbide and Carbon Chemicals Co.

- CP56-491. High Voltage D-C Testing of Cables and Cable Fault
Locations. B. J. Nankervis, The Dow Chemical Co.

- CP56-470. Corona in Metal-Clad Switchgear. H. O. Borque, Ethyl
Corp.

2:00 p.m.—Radio Communication Systems

Committee on Radio Communication Systems
Vanderbilt Room
R. D. CAMPBELL, Presiding

- CP.* Emergency Use of Microwave Radio in Northern California.
M. W. Walther and C. S. Watkins, Pacific Tel. & Tel. Co.

- 56-692. Impedance of Thin Wire Loop Antenna. J. E. Storer, Stan-
I ford University.

- CP.* Tacan. H. Busignies, Federal Telecommunications Labs.

Friday, June 29

9:00 a.m.—Power Generation and System Engineering

Committees on Power Generation and System Engineering
Room of the Dons
Mark Hopkins Hotel
R. T. PURDY, Presiding

- CP56-635. Probability Calculations for System Generation Reserves.
Carl Kist and G. J. Thomas, Department of Water and Power,
Los Angeles.

FRI. (cont'd)

- 56-643. Accuracy Considerations in Economic Dispatching of Power
III Systems—Part I. A. F. Glimm, L. K. Kirchmayer, General
Electric Co., V. R. Peterson and G. W. Stagg, American Gas
and Electric Service Corp.
- 56-641. A New Automatic Dispatching System for Electric Power
III Systems, K. N. Burnett, D. W. Halfhill and B. R. Shepard,
General Electric Co.
- 56-776. Eastlake Reappraised. C. F. Paulus, Cleveland Electric II-
III Illuminating Co.

9:00 a.m.—Insulated Conductors

Committee on Insulated Conductors

Nob Hill Room

M. W. GHEN, Presiding

- 56-702. An All Purpose Directional Impulse Method of Cable Fault
III Locating and Identification. E. K. Anderson, Jr., Consoli-
dated Edison Co. of N. Y., Inc.
- 56-703. High Temperature Power Cable with Silicone Insulation.
III C. T. Hatcher, Consolidated Edison Co. of N. Y., Inc. and
A. R. Lee, General Electric Co.
- CP56-704. Analysis of Conductor Economics. R. C. Blankenburg,
Southern California Edison Co.
- CP.* Jointing Aluminum Sheathed Power Cable. E. J. Merrell and
R. A. Russbach, Phelps Dodge Copper Products Corp.
- CP56-705. Aluminum Sheathed Cable with Welded Splice Sleeves.
C. T. Nicholson and G. P. Adams, Niagara Mohawk Power
Corp.

9:00 a.m.—Computing Devices and Aircraft Applications

Committee on Computing Devices

Vanderbilt Room

P. L. MORTON, Presiding

- CP56-694. Zero Signal Reliability in Magnetic Shift Registers. O. J.
Van Sant, U. S. Naval Ordnance Lab.
- 56-695. Magnetic Data Recording Theory; Head Design. A. S. Hoag-
I land, University of California.
- 56-696. Optimum Linear-Segment Function Generation. Howard
I Hamer, Electronic Associates.
- 56-766. Analog Computer Methods Applied to Steady State A-C Sys-
I tem Problems. H. A. Kahle and H. M. McConnell, Jack and
Heintz, Inc.

9:00 a.m.—Basic Sciences—Semiconductors.

Committee on Basic Sciences

Green Room

A. M. HOPKIN, Presiding

- CP.* Physics of Semiconductors. C. Kittel, University of Cali-
I fornia.
- CP.* Transistor Physics. W. Shockley, Shockley Semiconductor
I Lab.
- CP.* Junction Transistors. L. Valdes, Shockley Semiconductor Lab.
- CP.* Application of "3-5" Compounds to Devices. H. W. Henkels,
I Westinghouse Electric Corp.

FRI. (cont'd)

9:00 a.m.—Feedback Control Systems

Committee on Feedback Control Systems

Hunt Room

R. M. SAUNDERS, Presiding

- 56-777. An Experimental Treatment of Nonlinear Servomechanisms.
II R. S. Neiswander, Aerojet-General Corp.
- 56-778. A Time Dependent Nonlinear Compensating Network. J. C.
II Clegg, University of Utah.
- 56-779. A Step-by-Step Method for Transient Analysis of Feedback
II Systems with One Nonlinear Element. T. M. Stout, Ramo-
Wooldridge Corp.
- 56-640. A General Technique for Approximating Transient Response
II from Frequency Response Asymptotes. G. A. Biernson, Massa-
chusetts Institute of Technology.

9:00 a.m.—Wire Communication Systems

Committee on Wire Communication Systems

California Room

C. D. HOWE, Presiding

- 56-780. Where We Are and Where We Are Going in Telephone
I Transmission. H. R. Huntley, American Tel. & Tel. Co.
- 56-781. Transmission Rating of Telephone Sets. K. S. Johnson and
I J. B. Eppes, Jr., Rural Electrification Administration.
- CP56-782. Pacific Coast Tool Transmission Network. W. L. Carter
and R. L. Messner, Pacific Tel. & Tel. Co.
- 56-783. Telephone Carrier Frequency Networks. G. D. Wallenstein,
I Lenkurt Electric Co.
- 56-784. Influence of Noise on Telephone Signaling Circuit Perform-
I ance. L. A. Weber, Bell Telephone Labs., Inc.

9:00 a.m.—Nucleonics

Committee on Nucleonics

San Francisco Room

R. L. WITZKE, Presiding

- CP.* Progress in the Development and Design of the Dresden Nu-
I clear Power Plant. C. H. Robbin, General Electric Co.
- CP.* Control and Instrumentation of the Dresden Nuclear Power
I Plant. E. P. Peabody, General Electric Co.
- CP.* Description of the Pressurizer Water Reactor (PWR) Power
I Plant at Shippingport, Pennsylvania. (a) Nuclear Power
Generation, J. W. Simpson, Westinghouse Electric Corp. and
M. Shaw. (b) Turbine Generator Plant. R. B. Donworth and
W. J. Lyman, Duquesne Light Co. (c) Core Design. I. H.
Mandil and N. J. Palladino.
- CP.* Sodium Graphite Reactor. Sidney Siegel, North American
I Aviation.
- CP.* A Development Fast Neutron Breeder Reactor. W. N. Mc-
I Daniel, A. Amorosi, A. P. Donnell and H. A. Wagner,
A.P.D.A.

2:00 p.m.—Power Generation

Committee on Power Generation

Nob Hill Room

K. J. GRANBOIS, Presiding

- CP56-785. Hydroelectric Development on the North Fork of the
I Kings River. W. R. Johnson, D. P. Dinapoli and J. B. Cooke,
Pacific Gas & Electric Co.

FRI. (cont'd)

- 56-786. Electrical Features of the Sir Adam Beck-Niagara Generating Station #2 the Hydro-Electric Power Commission of Ontario. W. E. Taylor, Hydro-Electric Power Commission of Ontario.
- CP.* Single-Line Diagrams—Hydro Stations of Aluminum Company of Canada, Ltd. J. T. Madill and W. O. Codrington, Aluminum Co. of Canada, Ltd.
- CP.* Round-Table Discussion—Cloud Seeding. C. P. Smith.

2:00 p.m.—The Place of Analog Versus Digital Computers in the Solution of Engineering Problems

Committee on Computing Devices
Vanderbilt Room
E. L. HARDER, Presiding

- CP56-687. Analog Versus Digital Techniques for Engineering Design Problems. D. B. Breedon, Westinghouse Electric Corp.
- 56-697. Numerical Integration of Differential Equations on the 704 I EDPM. H. H. Anderson and J. R. Johnson, International Business Machines.
- CP.* The Use of Analog Computers in Engineering Design. R. Favreau.
- CP.* Some Relationships Between Analog and Digital Computers. R. Hamming.
- CP.* Panel discussion.

2:00 p.m.—Basic Sciences and Solid State Devices

Committees on Basic Sciences and Solid State Devices
Green Room
C. F. SPITZER, Presiding

- CP56-788. Two Simple Solid State Analog Dividers. E. A. Sack, Pittsburgh, Pa.
- CP56-789. Discontinuous Transition Time Between Stable States in Ferromagnetic Circuits. Sheldon Plotkin, University of California.
- 56-686. Subharmonic Response of the Ferromagnetic Circuit with I Coil Hysteresis. Egon Brenner, The City College of New York.
- 56-685. Computation of the Impedances of Nonuniform Lines by a I Direct Method. L. A. Pipes, University of California.
- CP56-683. Series Circuit Incorporating a Nonlinear Reactor. R. P. Evans, North American Aviation, Inc.
- 56-804. A Phasor Method of Nonlinear Network Analysis. J. P. Neal, I University of Illinois.
- 56-755. Signals from Switched Ferroelectric Memory Condensers. C. I F. Pulvari and G. E. McDuffie, Jr., The Catholic University of America.

2:00 p.m.—Feedback Control Systems

Committee on Feedback Control System
Hunt Room
T. M. STOUT, Presiding

- 56-644. Discrete Compensation of Sampled-Data and Continuous Control Systems. E. I. Jury and Wm. Schroeder, University of California.

FRI. (cont'd)

- 56-790. Hidden Oscillations in Sampled-Data Control Systems. E. I. II Jury, University of California.
- 56-791. Feedback Techniques Applied to the Single Phase Transformer. E. Mishkin, Polytechnic Institute of Brooklyn.
- 56-792. Envelope Transfer Function Analysis in A.C. Servomechanisms. II Marvin Panzer, Polytechnic Institute of Brooklyn.
- CP56-793. Theory of A-C Servomechanisms. C. W. Hewlett, Jr., General Electric Co.

2:00 p.m.—Radio Communication Systems

Committee on Radio Communication Systems
California Room
C. A. WELLS, Presiding

- 56-659. Microwave Facilities with Built-In Reliability. R. G. Kuck, I The Pacific Tel. & Tel. Co.
- 56-698. Automatic Protection Switching for TD-2 Radio System. I G. H. Klemm, Bell Telephone Labs., Inc.
- 56-699. Microwave for Telephone Companies. W. C. Fisher, Lenkurt I Electric Co., Inc.
- 56-700. Southwest Oregon Radio System for Bonneville Power Administration. D. J. Marihart, Bonneville Power Administration and D. L. Wylie, Chicago, Milwaukee, St. Paul & Pacific R.R. Co.

2:00 p.m.—Nucleonics

Committee on Nucleonics
San Francisco Room
J. V. KRESSER, Presiding

- CP.* General Purpose Electronic Areas for Nuclear Research. A. J. Stripeika.
- CP.* The Problems of Making Major Repairs to Production Reactors. E. E. Weyerts and W. J. Dowis, General Electric Co.
- CP.* The Westinghouse Testing Reactor. A. R. Jones, Westinghouse Electric Corp.
- CP.* The Belgian Thermal Reactor. R. L. Witzke and G. Tavernier, Westinghouse Electric Corp.

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

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

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

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McGraw-Hill Publ. Co., San Francisco, Calif.

A. A. Tufford, *Vice-Chairman*
Allis Chalmers Mfg. Co., San Francisco, Calif.

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William F. Black, Pacific Gas & Elec. Co.,	Edwin H. Stewart, Electronic Processes Co.,
Joel Kitchens, Pacific Gas & Elec. Co.,	Sherwin Wright, Bechtel Corp.,
George Dunbar, Westinghouse Elec. Corp.,	Harold S. Robinson, Westinghouse Elec. Corp.,

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Pacific Gas & Elec. Co., San Francisco, Calif.

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R. L. Blink, Garland Affolter Eng. Co.,	Harry Weingarten, Westinghouse Elec. Corp.,
S. F. Cassasa, Pacific Tel. & Tel. Co.,	W. N. Lindblad, Pacific Gas & Elec. Co.,
S. R. Durand, Allis Chalmers Mfg. Co.,	M. A. Moler, Bechtel Corp.,
William Nodder, George Honn Co.,	S. J. Schwarz, Sverdrup & Parcel, Inc.,

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General Electric Co., San Francisco, Calif.

H. L. Hussey, *Vice-Chairman*
Phelps-Dodge Copper Prod. Corp., San Francisco, Calif.

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K. N. Sather, Pacific Gas & Elec. Co.,	H. Skow, Westinghouse Elec. Corp.,
C. H. Sedam, Pacific Gas & Elec. Co.,	H. C. Verwoert, General Electric Co.,

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University of California, Berkeley, Calif.

Prof. H. C. Bourne, *Vice-Chairman*
University of California, Berkeley, Calif.

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Prof. E. C. Glover, San Jose State College,	Prof. Robert M. Saunders, University of California,
Prof. Wm. G. Hoover, Stanford University,	Prof. Chas. B. Oler, U. S. Naval Post Graduate

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W. G. Collins, *Chairman*
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A. R. Dole, *Vice-Chairman*
Pacific Tel. & Tel. Co., San Francisco, Calif.

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L. F. Fuller, Bechtel Corp.,	F. I. Lawson, Pacific Gas & Elec. Co.,

Hotel

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General Electric Co., San Francisco, Calif.

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T. A. Bettersworth, Pacific Gas & Elec. Co.,	A. H. Barauck, Standard Wire & Cable Co.,
D. Dinapoli, Pacific Gas & Elec. Co.,	Gordon F. Black, Rome Cable Corp.,
G. E. Jamart, De Leuw, Cather & Co.,	R. E. Ingalls, C. E. Ingalls & Sons,
Williard M. Nott, Sangamo Electric Co.,	E. A. Nickelsen, Calif.-Pacific Utilities Co.,
F. H. Rose, Allis Chalmers Mfg. Co.,	

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Mrs. James S. Moulton, *Chairman*
Berkeley, Calif.

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Mrs. Arthur Bragg, Piedmont, Calif.	Mrs. W. L. Carter, Burlingame, Calif.
Mrs. W. G. Collins, Oakland, Calif.	Mrs. D. I. Cone, San Francisco, Calif.
Mrs. C. F. Dalziel, Berkeley, Calif.	Mrs. O. A. Gustafson, San Mateo, Calif.
Mrs. F. J. Kovalcik, Redwood City, Calif.	Mrs. R. H. Miller, Berkeley, Calif.
Mrs. W. F. Poynter, San Francisco, Calif.	Mrs. E. F. Sixtus, San Francisco, Calif.
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Wm. L. Winter, *Vice-Chairman*
Westinghouse Elec. Corp., San Francisco, Calif.

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E. M. Calderwood,	Geo. K. Koernig, General Electric Co.,
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B. D. Dexter,	Robert D. Miller, Engineering Design Corp.,
W. A. Howe, Westinghouse Elec. Corp.,	D. F. Roach, Westinghouse Elec. Corp.,
A. B. King, Jr., General Electric Co.,	A. J. Swank, Pacific Gas & Elec. Co.,
E. M. Wright,	

COMMITTEE MEETINGS

Monday, June 25

9:00 a.m.—SectionsFrontier Room
9:00 a.m.—Vice-Presidents and District Secretaries...Empire Room
9:00 a.m.—Planning and CoordinationGreen Room
12:00 noon—Luncheon—Pacific Coast Relay
SubcommitteeFrontier Room
12:00 noon—Luncheon—Public RelationsCrystal Room

Tuesday, June 26

9:00 a.m.—Section Delegates Conference....Golden Empire Room*
9:00 a.m.—Power DivisionGreen Room
9:00 a.m.—Communication TheoryCrystal Room
9:00 a.m.—Automatic and Supervisory Control
SubcommitteeInternational Room
12:00 noon—Luncheon—Electric Space Heating
SubcommitteeFrontier Room
12:00 noon—Luncheon—Chemical IndustryInternational Room
12:00 noon—Luncheon—Instruments and
MeasurementsCrystal Room
2:00 p.m.—Chemical IndustryInternational Room
2:00 p.m.—Electric Space Heating Subcommittee...Frontier Room

2:00 p.m.—Section Delegates Conference.....Golden Empire Room*
2:00 p.m.—Instruments and MeasurementsCrystal Room
2:00 p.m.—Science and Electronics Division.....Green Room
2:00 p.m.—Communication DivisionEmpire Room
2:00 p.m.—Substations West Coast
SubcommitteeSecond Floor Suite
4:00 p.m.—Land TransportationHunt Room
7:30 p.m.—Section Delegates Conference....Golden Empire Room*

Wednesday, June 27

9:00 a.m.—Corona and Radio Interference
Working GroupFrontier Room
9:00 a.m.—Student BranchesEmpire Room
9:00 a.m.—SubstationsInternational Room
9:00 a.m.—Television and Aural BroadcastingPhoenix Room*
12:00 noon—Luncheon W. C. Industrial Power
Rectifiers SubcommitteeInternational Room
2:00 noon—West Coast Industrial Power
Rectifiers SubcommitteeInternational Room
2:00 p.m.—Technical OperationsConquistador Room*
2:00 p.m.—Towers, Poles and Conductors
SubcommitteePhoenix Room*
2:00 p.m.—Student BranchesEmpire Room
2:00 p.m.—Industrial Power System Pacific
SubcommitteeFrontier Room
2:00 p.m.—Basic Sciences West Coast Subcommittee..Crystal Room
4:00 p.m.—System EngineeringInternational Room
4:00 p.m.—Communication Sswitching SystemsCrystal Room

Thursday, June 28

9:00 a.m.—Board of DirectorsEmpire Room
9:00 a.m.—Radio Communication SystemsFrontier Room
9:00 a.m.—Magnetic AmplifiersConquistador Room*
9:00 a.m.—Computing DevicesInternational Room
2:00 p.m.—Board of DirectorsEmpire Room
2:00 p.m.—Carrier CurrentConquistador Room*
4:00 p.m.—Wire Communication SystemsFrontier Room
4:00 p.m.—Power GenerationInternational Room
4:30 p.m.—Electronics Planning Subcommittee....Phoenix Room*
6:30 p.m.—Dinner—ElectronicsGolden Empire Room*

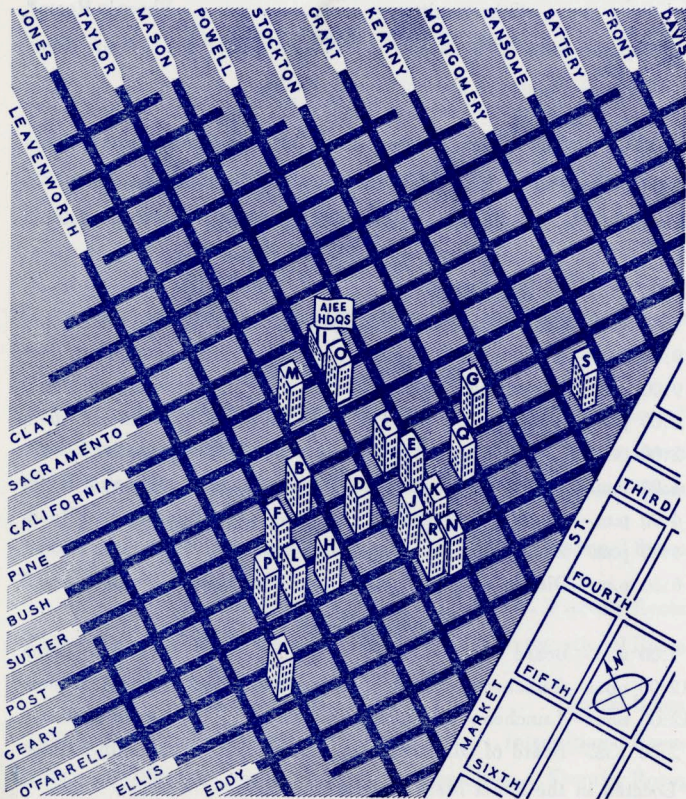
Friday, June 29

9:00 a.m.—Board of DirectorsEmpire Room
12:00 noon—Luncheon—Board of Directors.....Green Room
12:00 noon—Luncheon—NucleonicsFrontier Room
2:00 p.m.—Board of DirectorsEmpire Room

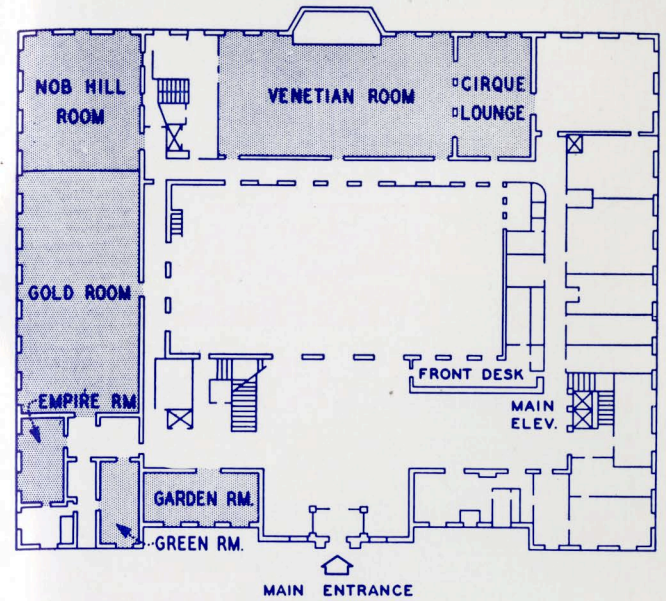
*Located in the Hotel Mark Hopkins.

American Institute of Electrical Engineers

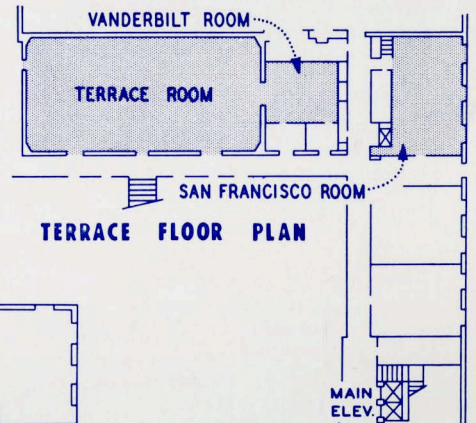
CODE	HOTEL	ADDRESS
A	ALEXANDER HAMILTON	631 O'Farrell
B	CANTERBURY	750 Sutter
C	CARTWRIGHT	524 Sutter
D	CECIL	545 Post
E	CHANCELLOR	433 Powell
F	COMMODORE	825 Sutter
G	DRAKE-WILTSHIRE	340 Stockton
H	EL CORTEZ	550 Geary
I	FAIRMONT	950 Mason
J	FIELDING	386 Geary
K	FRANCISCAN	350 Geary
L	GAYLORD	620 Jones
M	HUNTINGTON	1075 California
N	MANX	225 Powell
O	MARK HOPKINS	999 California
P	MAURICE	761 Post
Q	PLAZA	Post & Stockton
R	STEWART	351 Geary
S	SUTTER	191 Sutter



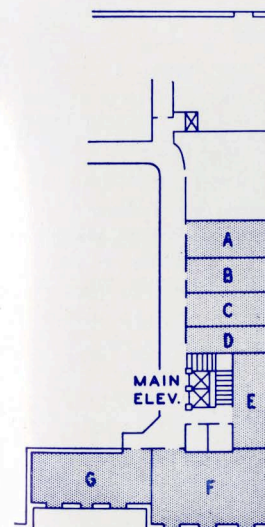
FAIRMONT HOTEL



MAIN FLOOR PLAN



TERRACE FLOOR PLAN



MEZZANINE FLOOR PLAN

- A. TWENTIETH CENTURY ROOM
- B. CRYSTAL ROOM
- C. FRONTIER ROOM
- D. INTERNATIONAL ROOM
- E. FAR EAST ROOM
- F. HUNT ROOM
- G. CALIFORNIA ROOM

