

SCHEDULE OF LOCALLY  
SPONSORED EVENTS

SUNDAY—June 17

- 10:30 A.M. Registration
- 4-6:00 P.M. Welcoming Tea

MONDAY—June 18

- 9:00 A.M. Ladies' Coffee Hour
- 10:00 A.M. U. S. Mint Tour
- 10:00 A.M. Telephone Company Building Tour
- 12:30 P.M. Central City—Gold Mine Trip
- 1:30 P.M. Family—Lookout Mountain, Buffalo Bill Shrine, Mountain Trip
- 2:00 P.M. Annual Meeting

TUESDAY—June 19

- 8:00 A.M. Martin Company Missile Site Tour
- 8:30 A.M. Air Force Academy Trip.
- 9:00 A.M. Ladies' Coffee Hour
- 9:30 A.M. Martin Company Missile Site Tour
- 10:30 A.M. Ladies' and Children's Trip—"Day In The Rockies", Mountain Sightseeing and Luncheon
- 1:15 P.M. National Bureau of Standards—Boulder, Colorado Trip
- 1:30 P.M. U. S. Bureau of Reclamation Tour

WEDNESDAY—June 20

- 8:00 A.M. Martin Company Missile Site Tour
- 8:30 A.M. Ladies' Air Force Academy Trip
- 9:00 A.M. Family Mountain Trip To Central City
- 9:30 A.M. Martin Company Missile Site Tour
- 1:00 P.M. National Bureau of Standards—Boulder, Colorado Trip
- 2:00 P.M. Sundstrand Aviation, Solar Dynamic Engine Tour
- 7:30 P.M. University of Denver, Boettcher Engineering Center, Family Tour

THURSDAY—June 21

- 8:00 A.M. Martin Company Missile Site Tour
- 8:00 A.M. Leadville EHV Test Line Trip
- 8:30 A.M. National Bureau of Standards—Boulder, Colorado Trip
- 8:30 A.M. Air Force Academy Trip
- 9:00 A.M. Ladies' Coffee Hour
- 9:30 A.M. Ladies' Auxiliary,
- 9:30 A.M. Martin Company Missile Site Tour
- 12:30 P.M. Ladies' Colorado Carnation Luncheon
- 1:30 P.M. Denver City Tour
- 2:00 P.M. Sundstrand Aviation, Solar Dynamic Engine, Tour
- 6:30 P.M. Chuck-Wagon Dinner and Entertainment

FRIDAY—June 22

- 9:00 A.M. Ladies' Coffee Hour
- No Trips Scheduled.

# Summer General Meeting and Aero-Space Transportation Conference

June 17-22, 1962

DENVER, COLORADO

Headquarters  
The Denver Hilton



Points of interest for the members in the "Mile High City" are: (1) The Denver Hilton Hotel, (2) the Brown Palace West, (3) the Public Service Company of Colorado, (4) the Mountain States Telephone and Telegraph Company, (5) United States Mint, (6) Denver City & County Building, and (7) Colorado State Capitol Building.

This summer AIEE members, families, and guests have an opportunity to combine a colorful vacation for all with General Meeting business. Scheduled activities for the family are almost as broad in scope as are the technical papers and field trips for the delegates. Bring the family and enjoy the informal Western hospitality in cool Colorado.

Meeting headquarters will be the new Denver Hilton Hotel rising a mile above sea level with a panoramic view of the City and the Rocky Mountains. Supporting these accommodations will be the Cosmopolitan and Brown Palace Hotels.

Reciprocal registration has been arranged with The American Society for Engineering Education which is meeting the same week, at the United States Air Force Academy near Colorado Springs. Tickets for ASEE events will be available at AIEE Convention Headquarters. The Aero-Space Transportation Committee in conjunction with the Space Communications and Aero-Space Instrumentation Committees is taking advantage of the Summer General Meeting to provide a technical program of outstanding quality oriented to the needs of the aero-space engineer.

**INFORMAL TEA:** An informal tea will be held Sunday afternoon, June 17, 4:00 to 6:00 P.M. in the Assembly Rooms No. 2 and 3 in the Denver Hilton.

**REGISTRATION:** The registration fee for members will be \$6.00 and for non-members \$10.00. There will be a \$2.00 fee for each lady guest. No fee will be charged for students. **There will be no advance registration.**

The registration and ticket sales desks will be open Sunday, June 17, from 10:30 A.M. until 12:00 Noon and from 1:00 P.M. to 5:00 P.M. in the Denver Hilton for those who wish to avoid the Monday morning rush. Both desks will also be open from 8:00 A.M. to 12:00 Noon and from 1:00 P.M. to 5:00 P.M. Monday through Thursday, and from 8:00 A.M. to 12:00 Noon on Friday, June 22, 1962.

**HOTEL RESERVATIONS:** Requests for reservations should be sent to the hotel of your choice. Specifically refer to the AIEE meeting in your letter, and include the following information: 1st and 2nd choice of hotels, type of accommodations you require, number in your party, and time of arrival.

Accommodations will be assigned on a first-come-first-served basis. *Do not* send advance payment unless requested to do so when you receive your confirmation directly from the hotel or motel holding your reservation.

Hotel	Singles	Doubles	Twins	Suites
Denver Hilton .....	\$8.50-14.00	\$14.00-20.00	\$15.50-20.00	\$35.00-75.00
Cosmopolitan .....	8.50-11.00	13.00-18.00	14.00-20.00	22.00-48.00
Brown Palace .....	8.50-17.00	13.00-17.00	14.00-21.00	25.00-70.00

**MOTEL ACCOMMODATIONS:** There are many excellent motels located in metropolitan Denver with a wide range of rates. Write to Colorado Visitors Bureau, 225 West Colfax, Denver 2, Colorado, for a Directory of Colorado Accommodations. Accommodations at campgrounds, resorts, dude ranches, trailer parks, youth camps and housekeeping cottages are also described. Make your reservations *EARLY*.

Tourist travel in Colorado is always heavy in June.

**TOURIST ROOM RESERVATIONS:** All requests for Tourist room reservations should be directed to The Denver Housing Bureau, AIEE Summer General Meeting, 225 West Colfax Avenue, Denver 2, Colorado.

**INFORMATION DESK:** An information desk will be open from 10:30 A.M. to 5:30 P.M. on Sunday, June 17, 1962, in the Denver Hilton for all delegates and their families. Monday through Thursday the desk will be open from 8:30 A.M. to 5:30 P.M. and from 8:00 A.M. to 12:00 Noon on Friday, June 22, 1962.

Available here will be details on public transportation, rented car services, teen-ager activities, commercial baby sitting services for toddlers, restaurant facilities, dude ranch information for a longer stay in Colorado, and on recreation, parks, night clubs, fishing, opera, concerts, horse and dog racing, golfing, horseback riding, trips and tours.

**CLOTHING:** Light weight coats and sweaters are recommended for Colorado's cool evenings and for trips to the mountains. Also recommended are sports and casual clothes and comfortable walking shoes.

**TRANSPORTATION:** Denver is the "hub" of air, rail, and highway transportation. Aircraft arrive and leave from a modern jet airport to many Colorado cities as well as the states. Rail transportation is available in all directions, including through and over the mountains. Rent yourself a car or use the modern bus and taxi service. Many sight-seeing tours other than those scheduled by the AIEE are available by rail, bus, and limousine.

**CHUCK WAGON DINNER AND ENTERTAINMENT:** A real Western Chuck-wagon dinner will be held at the Jefferson County Fair Grounds from 6:30 P.M. to 11:00 P.M. Thursday, June 21, for all the family. There will be Prime Rib of Beef. The Westernaires, one of Colorado's crack equestrian drill teams, will put on a 1½-hour precision riding show during the evening. Adult tickets—\$5.00, Children (3-12)—\$3.00. Make reservations by 12:00 Noon Wednesday, June 20.

**INSPECTION TRIPS:**

**Monday, June 18, 10:00 A.M. to 11:30 A.M.—UNITED STATES MINT.** This will be a walk-over trip of two blocks from the Denver Hilton to tour the making and storing of our money and view a million dollar gold display. A fascinating, unusual visit. Family—Free admission.

**Monday, June 18, 10:00 A.M. to 11:30 A.M.—TELEPHONE COMPANY BUILDING.** The general offices for the Mountain States Telephone and Telegraph Company in Denver invites the inspection of the visiting delegates. This building, in Downtown Denver, serves as a key point on the transcontinental TV relay system and the direct distance dialing telephone system. It is the headquarters for the 7-State Rocky Mountain Region. These facilities are located 5 blocks from the Denver Hilton. Provide own transportation or stroll by the modern stores on the way. Limit 100 tickets—No charge—Family.

**Monday, June 18, 12:30 P.M. to 5:30 P.M., and Wednesday, June 20, 9:00 A.M. to 2:30 P.M.—CENTRAL CITY—GOLD MINE TRIP.** This is a leisurely trip to historic Central City, scene of Colorado's first gold rush. It is now famous for its



U. S. Air Force Academy, Colorado Springs.

quaint buildings, its summer operas, theatrical productions, old gold camps, and mines. Located 50 miles west of Denver at an altitude of about two miles, it is a true preserved Western gold mining town with beautiful mountain scenery on the way. This is a truly "different" visit and will long be remembered. A visit will be made to the Teller House and Opera House. The air here is thinner and cool. Walking shoes and a jacket are in order. Monday trip: Limit 175. Family—Tickets \$4.00. Board busses at 12:15 P.M. Wednesday trip: Limit 120. Family—Tickets \$6.00. Board busses at 8:45 A.M. Luncheon included. There is a small extra charge to visit the Teller House and Opera House.

**Monday, June 18, 1:30 P.M. to 4:30 P.M.—RED ROCKS AND LOOKOUT MOUNTAIN.** In a mountain setting close to the city, Denver has preserved and dedicated to the pleasure of all a gorgeously colorful park with its incomparable Theatre of the Red Rocks. With a seating capacity of more than 9,000 and provided by nature with acoustics that stamp it as a new wonder of the world, this enclosure is walled by gigantic red rock formations that are responsible for the amazing transmission of sound from the stage. Because of its magnitude, the Theatre which has been acclaimed by famous opera stars and musicians must be seen to be appreciated... nowhere is there anything like it. Included will be a visit to Lookout Mountain with a panoramic view of Denver, the Buffalo Bill Shrine and Grave, and the Museum. Limit 175. Family—Tickets—\$3.50. Board Busses at 1:15 P.M.

**Tuesday, June 19, 8:00 A.M. to 11:00 A.M. Group 1, and 9:30 A.M. to 12:00 Noon Group 2. Wednesday, June 20, 8:00 A.M. to 11:00 A.M. Group 1 and 9:30 A.M. to 12:00 Noon Group 2. Thursday, June 21, 8:00 A.M. to 11:00 A.M. Group 1 and 9:30 A.M. to 12:00 Noon Group 2—MARTIN COMPANY MISSILE SITE TOUR.** Among the special plant tours for delegates to the convention will be the Martin Company plant just south of Denver. There the Titan missile was developed, tested and assembled for transportation to its test flights. Martin-Denver, a division set up primarily to ramrod the TITAN program, built a plant on the toe of the Rocky Mountain foothills southwest of Denver. Here the functions of engineering, production and check-out were brought together so that complete TITANS were shipped out fully ready for launch or long-term standby service in the Strategic Air Command retaliatory force.

Each of the nine cells in the Vertical Test Laboratory are

Continued on page 11

**ADVANCE COPIES OF PAPERS**

Members may obtain preprints of numbered papers at the uniform price of 50¢ each (\$1.00 each to non-members), by sending enclosed order form and remittance to the AIEE Order Department, 345 East 47th St., New York 17, 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 Transaction 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.

**Monday, June 18th**

**9:00 a.m.—Radiation Measurement**

- CP.\* Measurement of Bremsstrahlung Dose and Spectrum from a 600 Kvp Pulsed X-ray Generator Using Photographic Film. C. H. Bouchard, Sandia Corp.
- CP.\* Radiation Effects Dosimetry. W. L. Scaff, Jr., R. D. Loveland, A. B. Tyler, T. D. Hanscome, Hughes Aircraft Co.
- CP.\* Extended Application of a Cobalt Glass Dosimeter. W. T. K. Johnson, Diamond Ordnance Fuze Labs.
- CP.\* An Unbiased, Evacuated Fission Chamber for Fast-Response, Neutron Detection. E. C. Gooden, Sandia Corp.
- CP62-1074. A Fission Chamber and Calorimeter for Neutron and Gamma Dosimetry. R. F. Callaway, W. E. Austin, Lockheed-Georgia Co.
- CP.\* A Cerenkov Monitor for Reactor Levels; Pulse and Steady State. G. R. Hopkins, J. R. Shoptaugh, Jr., General Dynamics/General Atomic Div.

**9:00 a.m.—Basic Sciences**

- CP.\* Terminal Representations of Electro-Magnetic Systems and Properties of Inductance Networks. Y. Tokad, Michigan State University, H. K. Kesavan, University of Waterloo.
- CP.\* Time Domain Approximation Techniques. J. Chernof, ITT Fed. Labs.
- CP62-1047. The Analytical Solution of a Thin Film 4-Terminal Network. J. Rabin, Western Electric Co., Inc.
- 62-1048. Circuit Waveforms for Periodic Waves. D. L. Waideh, University of Missouri.
- 62-1049. Constricted Hysteresis Loops of Unpolarized Polycrystalline Barium Titanate Energy Loss, Coercivity and Remanent Polarization. G. W. Marks, D. A. Hanna, U. S. Navy Electronics Lab.

**9:00 a.m.—Switchgear**

- 62-1106. The Transistorized Circuit Breaker. C. F. Dalziel, University of California.
- 62-1107. A Study of the Effects of Convection Upon an Electric Arc. D. M. Benenson, Westinghouse Electric Corp.
- 62-1108. Single-Phase Auto-Reclosure on the 330 KV Kariba Transmission System. T. W. Wilcox, R. A. Hore, Merz and McLellan.
- 62-1109. Ultra-High Speed Ground Switch Application and Development. E. R. Perry, A. M. Frey Schwager-Wood Co.

**9:00 a.m.—Climate for Engineering Achievement—Role of Education**

- CP.\* Summary of Panel Discussion at Winter General Meeting. R. W. Shaw, Omaha Public Power District.
- CP.\* The Effect of Undergraduate Education. K. B. McEachron, Case Institute of Technology.

- CP.\* The Effect of Graduate Education. J. S. Johnson, Wayne State University.
- CP.\* The Effect of Continuing Education. G. E. Moore, Westinghouse Electric Corp.

**9:00 a.m.—Computer Simulation**

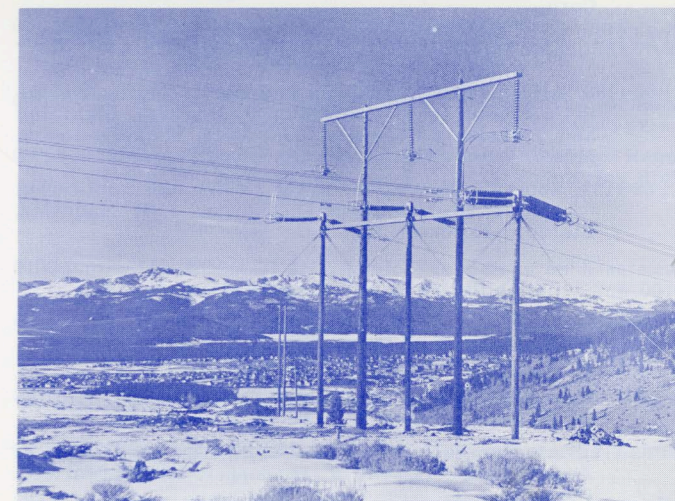
- CP62-1083. Resistance Network Analyzer. F. W. Schmidt, Pennsylvania State University.
- CP62-1084. Digital Simulation I: DYSAC, A Digitally Simulated Analog Computer. J. R. Hurley, The University of Wisconsin.
- CP62-1085. Digital Simulation II: Applications. J. J. Skiles, J. R. Hurley, The University of Wisconsin.
- 62-127. Digital Circuit Techniques for Speech Analysis. G. L. Clapper, IBM Corp. (Re-presented for Discussion only).

**9:00 a.m.—Nonlinear Magnetics**

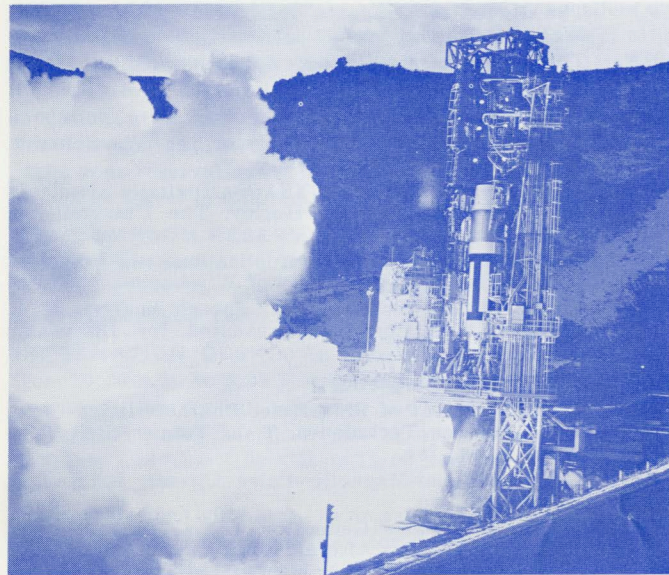
- CP62-1064. Measurement of Flux Reset Characteristics Using Ratio Balance Techniques. T. L. Tanner, Bell Telephone Labs., Inc.
- CP62-1027. A Non-Linear-Magnetic Pulse Circuit. E. S. Lee, Burroughs Corp.
- CP62-1065. Magnetic Pulse Generator. D. W. Tesdall, P. E. Lorentzen, Douglas Aircraft Co., Inc.
- 62-1066. Controlled Rectifier DC-DC 30 HP Motor Drive. F. G. Turnbull, General Electric Co.
- 62-1032. Pre-Natal Diagnosis of Congenital Cardiac Malformation: Criteria. S. D. Larks, Marquette University (Re-presented for Discussion only).
- 62-1033. Analog Computer Simulation of Heart Action. J. McLeod, General Dynamics/Astronautics, J. G. Defares, The Institute of Medical Sciences (Re-presented for Discussion only).

**2:00 p.m.—Annual Meeting**

- Welcome to Denver. Dr. Arlie E. Paige, General Chairman.
1. Report of the Treasurer, W. R. Clark.
  2. Report of the President and the Board of Directors, W. H. Chase.
  3. Report of the Committee of Tellers on the vote for the nominees for A.I.E.E. officers.
  4. a) Introduction of and presentation of President's Badge to B. R. Teare, Jr.  
b) Response by Mr. Teare.
  5. Presentation of District Student Paper Prizes.
  6. Presentation of the Lamme Medal to Dr. Charles Concordia.
  7. Membership Action on Proposal to Merge AIEE with IRE and form IEEE.
    - a) Vote on approval of merger agreement.
    - b) Vote on adoption of a new Constitution.
    - c) Vote on authorization of officers.
  8. Other Business.



Public Service Company of Colorado's high-altitude, high-voltage research project.



The TITAN ICBM at The Martin Company's Denver Division.

Tuesday, June 19th

9:00 a.m.—Section Delegates Conference

9:00 a.m.—Aero-Space Transducers and Sensing Elements

- CP.\* A Family of Digital Transducers. P. E. Brown, M. L. Feistman, RCA.
- CP62-1030 Eddy-Current Integrating Accelerometer. H. J. Huemmler, General Electric Co.
- CP.\* Design of a System for Amplifying the Output of Temperature Resistance Elements Used in Project Mercury Space Capsules. H. E. Perrey, McDonnell Aircraft Corp.
- CP62-1193. Surface Temperature Measurement Errors. E. W. Malone, The Boeing Co.
- CP62-1031. Use of Saturable Cores in Linear Differential Transformers. C. W. Clapp, General Electric Co.

9:00 a.m.—Electromagnetic Interference

- CP62-1130. A Rational Approach to Grounding and Shielding Problems for Space Vehicles. T. B. Owen, Douglas Aircraft Co., Inc.
- CP62-1131. Electromagnetic Susceptibility Testing Techniques for Airborne Equipment. C. B. Pearlston, Jr., Northrop Corp.
- CP62-1132. Electromagnetic Compatibility in Weapon Systems. F. J. Nichols, J. C. Senn, Genistron, Inc.
- CP62-1133. Aircraft Protection from Thunderstorm Electromagnetic Effects. M. M. Newman, J. D. Robb, Lightning and Transients Research Inst., E. H. Yonkers, Joslyn Mfg. & Supply Co.
- CP62-1134. Some Considerations in the Design and Application of a New Aircraft Static Discharger. J. E. Nanevicz, Stanford Research Inst.

9:00 a.m.—Reliability in Space Power Systems

- CP62-1135. Electrical System Dependability. R. Steiner, Lockheed Missiles and Space Co.
- CP62-1136. Reliability of Aerospace Electrical Equipment—How Much Does It Cost. J. A. Jennings, Jr., Westinghouse Electric Corp.
- CP62-1137. An Approach to the Reliability Determination of Aerospace Equipment. P. H. Zorger, Martin Marietta Corp.
- CP62-1187 Sterilization—An Example of Reliability Improvement Through Monitoring. W. F. Jemison, Sandia Corp.

9:00 a.m.—Radiation Effects I. Materials

- CP62-1075. Materials Testing at Cryogenic Temperatures in a Nuclear Reactor. A. M. Liebschutz, Lockheed-Georgia Co.
- CP.\* Gamma Induced Photoconductivity in Dielectrics. E. E. Conrad, S. M. Marcus, Diamond Ordnance Fuze Labs.
- CP.\* Measured Behavior of Gamma-Ray Photoconductivity in Organic Dielectrics. S. E. Harrison, Sandia Corp.
- CP.\* Transient Photoconductivity of Polystyrene and Polyisobutylene Exposed to Pulses of Neutron and Gamma-Radiations. F. N. Coppage, Sandia Corp.
- CP.\* Nuclear Pulse Effects in Cables. P. R. Arendt, K. Ikraht, U. S. Army Signal & Development Lab.
- CP62-1076. The effects of Radiation on Ferrites, S. I. Taimuty, J. S. Mills, Stanford Research Inst.

9:00 a.m.—Transformers—I

- 62-1123. Transient Temperature Rise of Transformers. L. C. III Whitman, J. E. Holcomb, General Electric Co.
- 62-239. A New Current Sensing Device. L. B. Stein, Jr., Sigma Instruments, Inc.
- CP62-1191. Molecular Sieve Dehydrators for Insulating Oil. A. M. Tuholsky, Union Carbide Corp.
- 62-1124. Reactance and Eddy Current Loss in Toroidal Transformer Devices—Part I. A. A. Halacsy, Radiation at Stanford (Re-presented for Discussion only).
- 62-1125. Reactance and Eddy Current Loss in Toroidal Transformer Devices—Part II. A. A. Halacsy, Radiation at Stanford.

9:00 a.m.—Radio Communication

- CP.\* Systems Aspects of the TH Radio Relay System. J. F. Laidig, Bell Telephone Labs, Inc.
- CP.\* TH Microwave Radio System Equipment. H. D. Griffiths, P. T. Sproul, Bell Telephone Labs, Inc.
- 62-1041 The Denver-Salt Lake City Radio Route Initial TH (6000 Megacycle) Installations. C. N. Fisher, R. W. Shane, American Telephone and Telegraph Co.
- CP62-1186. TL Microwave Applications in the Mountain States Telephone and Telegraph Co. C. D. Harrell, Mountain States Tel. & Tel. Co.

9:00 a.m.—Undergraduate Laboratory Courses and Equipment in the Field of Energy Conversion and Power Systems

- CP.\* Dynamic Circuit Theory—An Experimental Approach. T. H. Barton, McGill University.
- CP.\* An Undergraduate Systems Laboratory. H. R. Martens, H. E. Koenig, Michigan State University.
- CP.\* The Development of a Unitized Machines Laboratory. C. M. Summers, Oklahoma State University.
- CP62-1112. The Dependence Diagram—A Teaching Aid in the Presentation of Electrical Machine Theory. M. J. Jevons, Rice Institute.
- CP62-1195. Laboratory Equipment for a Generalized Approach to Magnetic Networks. N. A. Smith, The Ohio State University.
- CP.\* An Explanation of How Torque is Produced in a Dynamo. A. S. Langsdorf, Washington University.

9:00 a.m.—Computers

- 62-1086. The Design of a Magnetic Recording Tape Transport for Very High Timing Accuracy. G. V. Jacoby, Radio Corp. of America.
- CP62-1087. A Program for the Head-Type Magnetic Boundary Problem. B. F. Rozsnyai, IBM Corp.
- CP62-1088. A Set of Voltage Switched Magnetic Core Decoding Matrices. E. S. Lee, Burroughs Corp.
- 62-1089. A Development Study of the Print Mechanism on the

- I IBM 1403 Chain Printer. B. J. Greenblott, IBM Corp. (Re-presented for Discussion only).
- 62-1205. Design Automation—A Look at the Future. G. L. Baldwin, T. H. Crowley, Bell Telephone Labs. (Re-presented for Discussion only.)

2:00 p.m.—Section Delegates Conference

2:00 p.m.—Aero-Space Instrumentation Systems

- CP.\* Flight Test Temperature Monitoring and Recording. R. Johnson, R. Smith, Daystrom, Inc.
- CP.\* Advanced Concepts in System Evaluation Through Telemetry. W. A. Schanbacher, Space Technology Labs., Inc.
- CP.\* Real Time Telemetry Data Relay and Control from Down-Range Sites and Ships. E. C. Herrburger, Pan American World Airways, Inc.
- CP.\* Data Acquisition and Reduction in a Multiple Text Complex. I. S. Oscar, Epsco, Inc.
- CP62-1197. A Data Conversion System for a Topside Ionospheric Sounder. T. Bridgeman, Cutler-Hammer, Inc.
- CP.\* Capacitance Level Detection System. H. F. Houke, Aerojet-General Corp.

2:00 p.m.—Electroexplosive Devices

- CP62-1138. Control of Ordnance with the Exploding Bridge Wire (EBW). H. D. Golding, Douglas Aircraft Co., Inc.
- CP62-1139. Fundamental Design Concepts for an Exploding Bridgewire Electronic Ignition System. L. I. Knudson, R. E. Forbess, General Laboratory Associates, Inc.
- CP.\* Detection of Joule Heating in Bridge Wires of Electro-Explosive Devices. R. B. Feagin, J. G. Hewitt, Jr., University of Denver.
- CP62-1141. RF Sensitivity Specifications for Electroexplosive Devices. E. E. Hannum, The Franklin Inst. of the State of Pennsylvania.
- CP62-1142. Sensitivity Determination of Electroexplosive Devices for Reliable Circuit Designs. R. G. Amicone, The Franklin Inst. of the State of Pennsylvania.

2:00 p.m.—Static Conversion

- CP62-1143. Sealed Alkaline Batteries for Space Applications. J. E. Cooper, U.S. Air Force, W. Ingling, Cook Electric Co.
- CP62-1144. Lithium Hydride Energy Storage in Space Power



Denver Federal Center, U. S. Bureau of Reclamation.

Application. R. A. McKinnon, Sr., TPACO—A Division of Thompson Ramo Wooldridge, Inc.

- CP62-1145. Use of Electrets in Electrostatic Generators for Space. R. E. Mathew, U.S. Air Force.
- CP62-1146. Analysis of Series and Parallel Connected Solar Photovoltaic Energy Converters. R. W. Briggs, Westinghouse Electric Corp.
- 62-291 Generalized Theory of the Thermionic Plasma Energy Converter. M. E. Talaat, The Martin Co. (Represented for Discussion only).

2:00 p.m.—Radiation Effects II. Materials

- 62-1077. Radiation Effects in Ferroelectric Materials. L. G. I Wright, C. A. Rosen, S. I. Taimuty, Stanford Research Institute.
- CP.\* Pulsed High Energy Irradiation Effects in Sodium Chloride Crystals. V. R. Honnold, J. P. Nolta, Hughes Aircraft Co.
- CP.\* Degradation of Electrical Insulation from Reactor Irradiation. J. Rogers, C. L. Craig, Sperry Gyroscope Co.
- CP.\* The Effects of Combined Environments on PTFE. P. P. Morris, Jr., Lockheed Missiles and Space Co.
- CP.\* The Effects of Gamma Radiation at Elevated Temperatures on Silicone Dielectrics. J. F. Dexter, E. G. Curtindale, Dow Corning Corp.

2:00 p.m.—Insulated Conductors

- 62-1178. Report on the Revised Issue of American Institute of Electrical Engineers No. 48 Potheads Standards. AIEE Accessories Sub. of the AIEE Insulated Conductors Committee, J. H. Nicholas, Chairman.
- CP.\* A New Heat and Corona-Resistant Thermosetting Insulation for Power and Control Cables. R. B. Blodgett, R. G. Fisher, S. B. Neff, The Okonite Co.
- CP.\* A Stabilized Impregnated Paper Cable. F. W. Wakefield, American Steel and Wire Division of U.S.S. Corp.
- CP.\* Surface Thermal Characteristics of Weathered Aluminum Sheathed Cable. F. S. Oliver, F. A. Teti, Phelps Dodge Copper Products Corp.
- 62-1040. Determination of the Life to Fracture by Bending of III Lead Sheaths on Underground Power Cable. C. E. Betzer, Commonwealth Edison Co.

2:00 p.m.—Transformers—II.

- 62-1126. Transference of Test Results From Experiments on III Small Models to n Times Larger Test Objects with Insulation Under Oil. T. H. Sie, O. Wohlfahrt, Brown, Boveri & Co.
- 62-1127. Determination of Output Voltage in Cascade Connected III Transformers. B. N. Jayaram, D. J. Badkas, Indian Inst. of Science.
- CP62-1128. A New Frequency Multiplier. M. Camras, Armour Research Foundation of Illinois Inst. of Technology.
- CP62-1129. Auto-Booster for Distribution Feeder Voltage Regulation. W. N. Bovenizer, Line Material Industries, division of McGraw-Edison Co.

2:00 p.m.—The Effect of a Dynamic Technology on Electrical Engineering Education

- CP62-1113. Direct Energy Conversion in the Engineering Curriculum. R. C. Fellingner, A. A. Fouad, Iowa State University of Science and Technology.
- CP.\* Energy Conversion and Control Laboratories at Berkeley. R. M. Saunders, University of California.
- CP.\* The Changing Scientific Base for Engineering Education. F. S. Barnes, University of Colorado.
- CP.\* How Can the Objectives of Engineering Education Be Best Achieved. D. Rosenthal, A. B. Rosenstein, University of California, M. Tribus, Dartmouth College.

- CP.\* Theory and Experiment—The False Dichotomy. W. R. LePage, Syracuse University.
- CP.\* Lecture Demonstration of Teaching Aids. A. D. Moore, University of Michigan.

7:30 p.m.—Airline Jet Age Problems—Panel Discussion  
 Moderator—P. Duyan, Jr., Douglas Aircraft Co., Inc.  
 Panel members to be authoritative representatives of the Airlines Operating Jet Aircraft.

**Wednesday, June 20th**

**9:00 a.m.—Aero-Space Laboratory Test Instrumentation**

- CP.\* Instrumentation of Large Space Environmental Chambers. M. K. Kingery, U.S. Air Force, M. R. Mulkey, ARO, Inc.
- CP.\* A Data System for an Impulse Hypersonic Wind Tunnel. J. W. Clark, NASA.
- CP62-1209 Radio Telemetry of Stagnation Pressures from a Wind Tunnel Model Magnetically Supported in Supersonic Flow. P. L. Clemens, ARO, Inc.
- CP.\* Instrumentation for a Solar Simulator. C. F. Norman, ARO, Inc.
- CP.\* A High Speed Digital Data System for Engine Test Facilities. R. L. Reed, General Dynamics/Pomona.

**9:00 a.m.—Static Conversion**

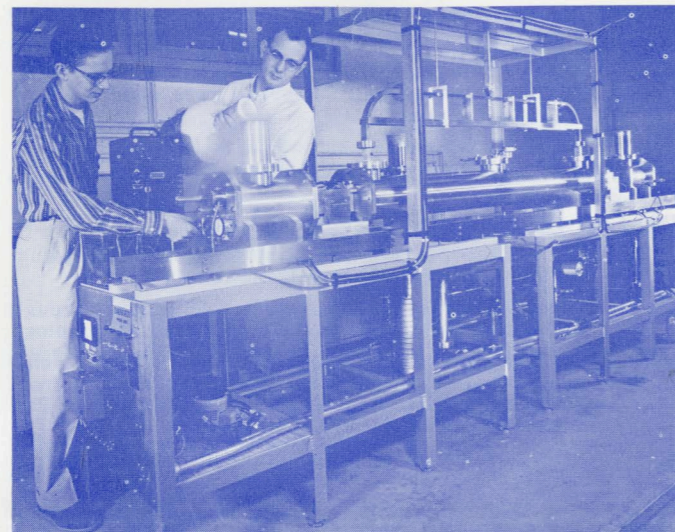
- CP62-1194. Design and Application Philosophy of Static Inverters. T. W. Moore, J. A. Martin, P. W. Franklin, Leland Airborne Products.
- CP62-1147. Methods for Optimizing the Waveform of Stepped-Wave Static Inverters. P. D. Corey, General Electric Co.
- CP62-1148. Static Power Inverter Utilizing Digital Techniques and Harmonic Cancellation. D. L. Anderson, A. E. Willis, C. E. Winkler, George C. Marshall Space Flight Center.
- CP62-1149. Controlled Rectifier Inverter with Saturable Transformer Regulation. L. H. Walker, General Electric Co.

**9:00 a.m.—Parameters for System Design**

- CP62-1150. Thermionic Energy Converters. E. F. Redden, A. E. Wallis, U.S. Air Force.
- CP62-1151. Design Parameters for Thermoelectric Generators. J. L. McCabria, N. F. Schuh, Westinghouse Electric Corp.
- CP62-1152. Bridge Measurements of Impedance and Determination of Equivalent Circuit of a Primary Silver-Zinc Battery. W. H. Cox, J. E. Partch, The Martin Co., H. E. Fletcher, Colorado School of Mines.
- CP62-1153. Design Considerations in the Use of Photovoltaic System. P. S. DuPont, Martin Marietta Corp.

**9:00 a.m.—Radiation Effects III. Devices**

- CP62-1078. Mechanism of Transient Radiation Effects in Electronic Parts. V. A. J. van Lint, General Atomic div. of General Dynamics Corp.
- CP.\* Transient Radiation Effects on Resistors. J. M. Hawkins, Diamond Ordnance Fuze Lab.
- 62-1079. Transient Radiation Effects in Coaxial Cables Due to Gamma-Neutron Radiation Pulses. H. W. Wicklein, The Boeing Co.
- CP.\* Electron and Proton Damage to Semiconductors and Devices. L. W. Aukerman, Battelle Memorial Inst.
- CP.\* Predicting Damage to Silicone Solar Cells Subject to Complex Radiation Spectra. B. W. Merchant, R. Bobone, General Electric Co.
- CP.\* Reactor Irradiation of a Magnetic Flux Value. R. D. Ingram, General Dynamics/Fort Worth.



Cesium Beam Clock at National Bureau of Standards.

**9:00 a.m.—Nonlinear Magnetics**

- CP.\* Small Signal Behavior of 50% Ni-Fe Tape Cores. F. J. Friedlaender, L. L. Ogborn, Purdue University.
- 62-1022. The Controlled Ferroresonant Transformer. L. A. Finzi, A. Lavi, Carnegie Institute of Technology.
- CP62-1067. Time Response of Bistable Magnetic Amplifier. H. C. Bourne, Jr., University of California, R. A. DeForest, Oakland, California.
- 62-1050. The Shunt-Loaded Magnetic Amplifier—Part I. Theory of Operation. E. W. Manteuffel, T. A. Phillips, General Electric Co.
- 62-1051. The Shunt-Loaded Magnetic Amplifier—Part II. Circuit Arrangements and Experimental Results. E. W. Manteuffel, T. A. Phillips, General Electric Co.

**9:00 a.m.—Relays**

- CP62-1090. Overcurrent Relay Characteristics in a Simple Form for Use in Digital Computers. A. H. Knable, Allis-Chalmers Mfg. Co.
- 62-1073. Voltage Induction in Paralleled Transmission Circuits. III J. L. Blackburn, Westinghouse Electric Corp.
- 62-1072. Negative Sequence Directional Ground Relaying. W. A. Elmore, J. L. Blackburn, Westinghouse Electric Corp.
- CP.\* Subcommittee Discussion of New Relay Standards ASA C37.1. J. R. Linders, R. E. Cordray, General Electric Co.

**9:00 a.m.—General Power System Engineering**

- 62-1110. An Alternate Method of Evaluating the Economics of III Engineering Projects. E. A. Church, Boston Edison Co.
- CP62-1111. Load Forecasting on the TVA System Part II—Commercial and Industrial. W. R. New, Tennessee Valley Authority.
- 62-1024. Transformer Circuits for Digital Studies. R. B. Shipley, III D. Coleman, C. F. Watts, Tennessee Valley Authority.
- CP62-1023. Scheduling Electric Generating Unit Operation With a Digital Computer. W. M. Menger, Houston Lighting and Power Co.
- DP62-618. Transmission Losses and Economy Loading by the Use of Admittance Constants. J. R. Tudor, University of Missouri, W. A. Lewis, Illinois Inst. of Technology.

**9:00 a.m.—Radio and Broadcasting**

- CP.\* URSI and CCIR International Radio Science and Engineering. J. Herbstree, Bureau of Standards.
- CP62-1042. An Improved Control Scheme for VHF Land Mobile

- Radio System. D. E. Johannson, Bonneville Power Administration.
- CP62-1182. A Centralized Metering and Billing Pay TV-System. I. Kamen, Teleglobe Pay TV System, Inc.
- 62-50. The RF/7 Transistorized 6 Gc Microwave System. I. T. Corbell, General Electric Co. (Re-presented for Discussion only).

**9:00 a.m.—Industrial Telemetry—I.**

- CP62-1044. PAM, PDM and PCM Techniques in Application to Digital Telemetry on Voice Bandwidth Facilities. C. Yanis, A. H. Miller, S. J. Halpern, Transitel International Corp.
- CP62-1174. Compatible Coding Scheme for Digital Telemetry and Control. P. L. Epstein, Quindar Electronics, Inc.
- CP62-1045. Statistical Evaluation of Standard Security Practices in Digital Data Transmission. A. Brothman, E. H. Brothman, R. D. Reiser, Transitel International Corp.

**9:00 a.m.—Extra High Voltage**

- CP62-1094. Relation Between Stroke Current and Velocity of the Return Stroke. C. F. Wagner, Westinghouse Electric Corp.
- CP62-1181. Effect of Predischage Currents Upon Line Performance. C. F. Wagner, A. R. Hileman, Westinghouse Electric Corp.
- CP62-1095. Results from the First Year Operation of Project EHV. P. A. Abetti, J. J. LaForest, C. B. Lindh, D. D. MacCarthy, General Electric Corp.
- 62-1096. Leadville High Altitude EHV Test Project Single Conductor Tests. L. M. Robertson, J. C. Smith, Public Service Co. of Colorado, W. E. Pakala, J. E. O'Neil, Westinghouse Electric Corp.

**2:00 p.m.—Dynamic Conversion**

- CP62-1154. Laboratory Performance of a 600°F Aerospace Generation System. J. J. Pierro, North American Aviation, Inc.
- CP62-1155. Description and Performance of a 600°F Aircraft Electrical Control System. J. F. Scoville, General Electric Co.
- CP62-1183. A 400 KVA AC Generator for Spacecraft Power. S. J. Hancock, O. G. Smith, Westinghouse Electric Corp.
- CP62-1156. Excitation Control Systems for Synchronous Machines Used in Combination A-C Electric Power Generation and Engine Starting Systems for Aircraft. W. E. Hyvarinen, General Electric Co.

**2:00 p.m.—Parameters for System Design**

- CP62-1157. Dynamic Converters for Aerospace Use. J. T. Duane, General Electric Co.
- CP62-1158. Solid State Conversion Concepts. J. F. Wise, Wright-Patterson Air Force Base.
- CP62-1159. Fuel Cells for Astronautic Application. G. E. Starkey, U.S. Air Force.
- CP-62-1160. Thermionic AC Generation. C. L. Eisen, A. Schock, Republic Aviation Corp.
- CP62-1161. Consideration Factors for a Manned Space Vehicle Electrical Power System. A. Abrahamsen, General Dynamics/Astronautics.

**2:00 p.m.—Nonlinear Magnetics—III**

- CP62-1068. Bibliography of Thin Magnetic Films. H. Chang, G. C. Feth, International Business Machines Corp.
- CP.\* A Saturable-Core Modulation Differentiator. R. C. Barker, Yale University.
- CP62-1069. Cube-Law Detection of Asymmetric Voltage Modulation. E. T. Hooper, U.S. Naval Ordnance Laboratory.
- 62-1070. High Performance Servo Magnetic Amplifier for Severe

- I Environmental Applications. H. J. Jones, C. Sturzenbecker, Bell Telephone Labs., Inc.
- 62-1029. A Self-Oscillating Inverter Using a Saturable Two-Core Transformer To Turn Off Silicon Controlled Rectifiers. E. T. Moore, T. G. Wilson, R. W. Sterling, Duke University.

**2:00 p.m.—Relays**

- CP62-1091. Shaping the Time-Current Curve of a Static Overcurrent Relay. E. W. Kimbark, Seattle University.
- CP62-1092. Protective Relaying for Large Motors. H. J. Sutton, Gulf States Utilities Co.
- 62-1093. Protection of Circuits with Series Capacitors. J. Berdy, III General Electric Co. (Re-presented for Discussion only.)
- CP.\* Protective Relaying Practices for EHV Systems in Western Europe. R. A. Larner, Texas Electric Service Co.

**2:00 p.m.—Space Communication**

- CP.\* Tracking Performance of the Mercury Quad-Helix Acquisition Aid. J. G. Barry, G. F. Dalrymple, Massachusetts Inst. of Technology.
- CP.\* C-Band Radar-Beacon Tracking for Project Mercury. B. H. Labitt, Massachusetts Inst. of Technology.
- CP.\* Transit Navigation Satellite Ground Station. P. Rodgers, ITT Federal Labs.
- 62-1043. Inactive Doppler Acquisition Systems. C. H. Dawson, I Philco Corp.
- CP.\* System Engineering For Space Communication. D. L. LaBanca, S. M. Segner, U.S. Army Advent Management Agency.

**2:00 p.m.—Industrial Telemetry—II.**

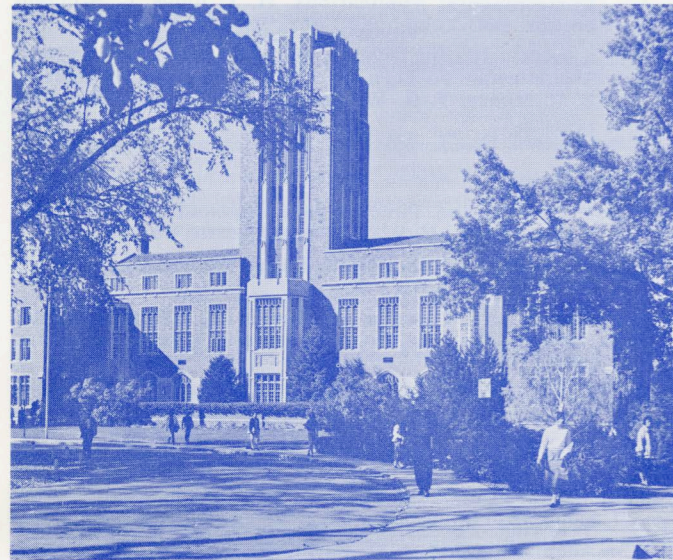
- CP62-1046. Solid-State Time Duration Analog Telemeter. L. Moore, Moore Associates, Inc.
- CP.\* "Anascan" Industrial Telemetry System. J. H. Porter, Crestmont Electronics.
- CP62-1175. Radio Telemetry for Industry. C. H. Hoepfner, Electronics Corp.
- CP62-1196. A Transistorized Variable Frequency, Telemetry System. T. H. Bean, D. W. Turrell, J. L. Shannon, Leeds & Northrup Co.

**2:00 p.m.—Radiation Effects IV. Transistors and Circuits**

- CP62-1080. Reactor Irradiation of Semiconductor Devices. L. Taylor, Texas Instruments Inc.



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- 62-1081. The Transient Behavior of Transistors Due to Ionizing Radiation Pulses. R. S. Caldwell, The Boeing Co., D. S. Gage, Northwestern University, G. H. Hanson, Univ. of Washington.
- CP.\* Analysis of the Transient Behavior of a Transistor When Exposed to a Pulse of Ionizing Radiation. S. C. Rogers, Sandia Corp.
- CP62-1082. Analog Computer Techniques for the Prediction of Transient Nuclear Radiation Effects on Transistor Circuits. L. Kosenkranius, The Boeing Co.
- CP62-1192. Radiation Effects on Transistorized Power Converters. P. A. Trimmer, Diamond Ordnance Fuze Labs.
- 2:00 p.m.—Switchgear and Transmission & Distribution
- CP.\* The Current Revolution in Outdoor Apparatus Insulators. H. W. Graybill, B. E. Alexander, I-T-E Circuit Breaker Co.
- CP62-1207. Hydraulic Operation of Power Disconnect Switches. E. R. Perry, J. C. W. Ransom, A. M. Frey, Schwager-Wood Co., Inc.
- CP62-1210. A Live-Line Transient Fault Locator. H. L. Garton, R. V. Sperlik, Commonwealth Edison Co., M. S. Helm, P. F. Schwarzlose, University of Illinois.

Thursday, June 21st

- 9:00 a.m.—Electric Propulsion
- CP.\* The Future of Electric Propulsion in Space. E. Stuhlinger, Marshall Space Flight Center.
- CP62-1162. An Ion Engine System for Flight Testing. G. R. Brewer, G. A. Work, Hughes Research Labs.
- CP62-1163. Application of an Integrated 30 KW Electrothermal Engine System. F. Martinek, General Electric Co.
- CP.\* Development Potential of the Plasma Engine. A. S. Penfold, Litton Systems, Inc.
- CP.\* Space Simulation for Electric Engine Testing. J. G. Mitchell, Arnold Engineering Development Center.
- 9:00 a.m.—Ground Support
- CP62-1164. Application of Relay Logic Techniques to Simplify Systems Simulation. R. A. Mosher, Aircraft Armaments, Inc.

- CP62-1165. Some Considerations in the Use of Synthetic Equipment for Operator and Maintenance Training. F. W. Brown, Aircraft Armaments, Inc.
- CP62-1166. Creating the Grounding Criteria for an Overall Aerospace System. T. A. Robinson, Northrop Corp.
- CP.\* Atlas Launcher Driver System—Part I. A. S. Bishay, AMF.
- CP.\* Atlas Launcher Driver System—Part II. L. R. Foote, General Electric Co.
- CP62-1188. An Incomplete Discussion of Automatic Testing Concepts. D. B. Dobson, RCA.

9:00 a.m.—Parameters for System Design

- CP62-1203. Nuclear Reactor Space Power Systems. J. R. Wetch, M. G. Coombs, North American Aviation.
- CP.\* Parameters for Radioisotope Generator Design. W. R. Corliss, The Martin Co.
- CP.\* Preliminary Shield Design for Nuclear Electric Space Power Plants. D. L. Cochran, S. T. Friedman, Aerojet General Corp.
- CP62-1202. Design Parameters for Photovoltaic Power Conversion in Space. K. A. Ray, Hoffman Electronics Corp.
- CP62-1204. Space Radiator Analysis and Design. D. B. Mackay, North American Aviation, Inc.

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

- 62-1105. An Approach to the Economic Evaluation of Electrical Power Generation in Continuous Process Plants. T. D. Higgins, Union Carbide Chemicals Co. (Re-presented for Discussion only).
- CP.\* An Electrical Power System Designed for Modern High Rise Apartment Buildings. J. D. Stolshek, Westinghouse Electric Corp.
- CP.\* Recharging Utility Expenditures to Departments and Laboratories Reduces Costs of Operating University Electrical Distribution Systems. T. M. C. Martin, El Cerrito, California.
- CP.\* Electrical Design Considerations for Underground Hardened Missile Bases. M. Cappel, Jr., Silas Mason Co.

9:00 a.m.—Distribution Systems

- CP62-1097. Planning Future Development of Distribution Substations in the Twin Cities Area. F. J. Vojta, Northern States Power Co., G. W. Alexander, J. A. Smith, General Electric Co.
- CP62-622. Load and Loss Factors of Urban Residential Distribution Transformer Loads. H. G. Meyer, Union Electric Co., P. J. McLafferty, Westinghouse Electric Corp.
- CP62-1098. A Linear Approach to the Problem of Planning New Feed Points Into A Distribution System. C. Morrison, The Potomac Edison Co.
- CP62-1104. Digital Computation of Short-Circuit Data. J. L. Cooke, Lamar State College of Technology.

9:00 a.m.—Developments in Hydro-Electric Power

- 62-1037. New Economical Trends for Hydro-Electric Power Schemes. M. Kamal Gohar, Cairo University.
- 62-1038. Electrical Features of the Glen Canyon Power Plant and Switchyard. C. L. Rose, L. W. Lloyd, U.S. Dept. of the Interior.
- CP62-1179. Benefits from International Development of the Columbia River. H. M. McIntyre, Bonneville Power Administration.
- 62-1039. Optimum Adjustment of Hydro Governors on Manitoba Hydro System. L. M. Hovey, Manitoba Hydro.
- CP62-1176. Effect of Hydraulic Turbine Speed Limiter Devices on Generator Characteristics. R. Erhard, Westinghouse Electric Corp., E. C. Metcalf, Public Utility District No. 1 of Chelan County.

9:00 a.m.—Data Communication

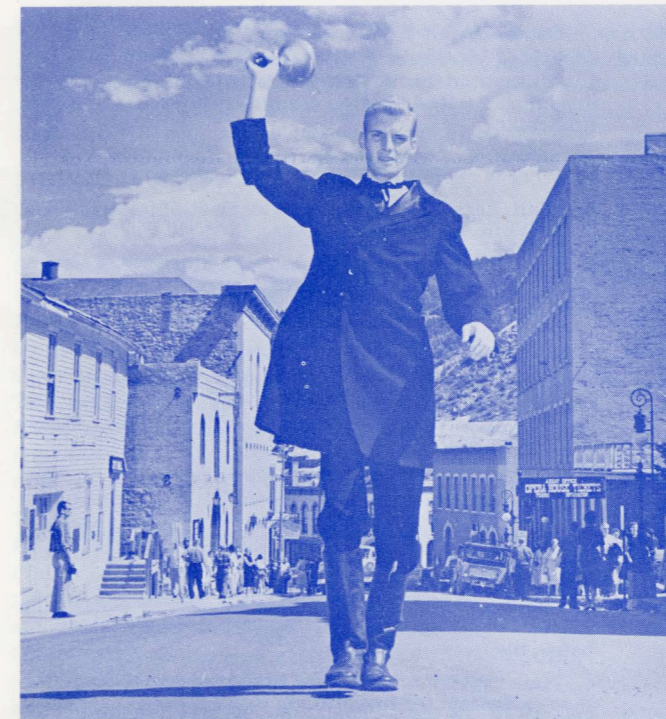
- CP.\* Wide Band Random Pulse Generator. D. L. Favin, Bell Telephone Labs., Inc.
- CP.\* A Medium-Speed Parallel Transmission Data System. M. A. Flavin, G. C. Prins, Bell Telephone Labs., Inc.
- CP.\* A Voice-Coordinated Data Set. J. E. Boughtwood, Western Union Telegraph Co.
- CP.\* Further Evaluation of Data Transmission on the Switched Telephone Network. R. Morris, Bell Telephone Labs., Inc.
- CP.\* Air Line Reservations by Electronics. D. K. Ritchie, Ferranti-Packard Corp.
- 62-1184. A Fast Response Data Communications System for Airline Reservations. S. Levine, E. Avakian, G. Harrison, Teleregister Corp. (Re-presented for Discussion only.)

9:00 a.m.—Radiation Effects V. Round Table Discussion

This open informal discussion will be directed at definition of the radiation effects areas in need of improvement, and other areas of interest as time permits. Authors of papers presented in the Radiation Effects Technical Sessions will attend and serve as an informal panel of experts. Questions, discussions, and opinions from the floor will be welcome.

9:00 a.m.—Linear Control Systems—I.

- 63-1052. The Analysis and Synthesis of a Class of Linear Time Varying Networks. H. Davis, University of California.
- 62-1053. A Method of Determining the Transfer Function of a Linear System in Terms of Its Poles and Zeros From the Frequency Response. S. Ganapathy, Regional College of Engineering, G. Krishna, Indian Institute of Science.
- CP.\* Optimal Control of Multivariable Systems. M. D. Mesarovic, Case Institute of Technology.
- CP62-1054. Acceptance Testing of Precision Motor Tachometer Generators. R. F. Savard, IBM Corp.
- 62-1185. Optimal Control for Linear Time-Invariant Plants With Time, Fuel and Energy Constraints. M. Athanassiades, Massachusetts Inst. of Technology.



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9:00 a.m.—Wire Communications—I

- CP62-1198. Transmission Characteristics of Bell System Subscriber Loop Plant. R. G. Hinderliter, Bell Telephone Labs., Inc.
- CP62-1199. Engineering Considerations of Subscriber Loop Testing. G. K. Helder, Bell Telephone Labs., Inc.
- CP62-1200. 24 Type Testing Equipment for Telephone Subscriber Loops. W. T. Cochran, Bell Telephone Labs., Inc.
- CP62-1201. 24 Type Loop Checking System—Application and Field Test Results in the Bell System. B. E. Brown, American Tel. & Tel. Co.
- 62-1114. One-Man Multi-Frequency Transmission Measurements. E. H. B. Bartelink, D. L. Knight, W. B. Wilkens, Northeast Electronics Corp.
- 62-1115. New Transmission Test Set for Exchange Type Trunks. E. H. B. Bartelink, Northeast Electronics Corp. (Re-presented for Discussion only).
- 62-1116. A Stable 1000-Cycle Tone Generator. J. J. Kokinda, P. J. Kaltenborn, Bell Telephone Labs., Inc. (Re-presented for Discussion only).
- 62-1021. An Accurate Voice Frequency Level Calibrating Set for Field Use. W. T. Cochran, Bell Telephone Labs., Inc. (Re-presented for Discussion only).

2:00 p.m.—Design Considerations

- CP62-1167. Printed Circuits in Airborne Electric Systems. G. W. Godfrey, North American Aviation, Inc.
- CP62-1168. High Temperature Electro Magnetic Component Design. M. J. Hansen, North American Aviation.
- CP62-1169. Assuring Compatibility of Acceptance Testing Procedures at Various Test Levels. R. R. Dye, D. A. Kenney, Northrup Corp.
- CP62-1170. A Proposed Dry Circuit Test Method for Military Relay Specifications. M. R. Swinehart, Cutler-Hammer, Inc.

2:00 p.m.—Space Vehicle Power Systems

- CP.\* Development of Transit Satellite Components. M. A. Schreiber, T. Wyatt, The Johns Hopkins University.
- CP62-1171. Power Conversion Systems for Ion-Engine Driven Space Vehicles. L. E. Unnewehr, North American Aviation, Inc.
- CP.\* Juno II Satellite Power Supplies. P. Youngblood, Marshall Space Flight Center.
- CP62-1172. Power Subsystem for the Courier Communication Satellite. J. T. Nawrocki, E. D. Cotterel, Philco Corp., R. J. Grant, Lenkurt Electric Co.
- CP62-1173. Radioisotope Power System Operation in the Transit Satellite. P. J. Dick, Martin Marietta Corp., R. E. Davis, The Johns Hopkins University.

2:00 p.m.—Towers, Poles and Conductors

- 62-284. Fault and Load Current Testing of a Bundle Conductor Spacer. R. L. Retallack, American Electric Power Service Corp., T. R. Fry, C. A. Popeck, A. B. Chance Co.
- 62-1026. Emissivity of Weathered Conductors After Service in Rural and Industrial Environments. W. S. Rigdon, Douglas Aircraft Co. H. E. House, Aluminum Co. of America, R. J. Grosh, Purdue University, W. B. Cottingham, Bell Telephone Labs., Inc.
- 62-1099. A Single-Degree-of-Freedom Damper for Overhead Conductors. R. R. Bouche, L. C. Ensor, R. Tengwall, Endeveco Corp.

2:00 p.m.—Substations

2:00 p.m.—Chemical Industry & Petroleum Industry

- CP.\* Economics of Selection of Large Motor Drivers and Problems in Their Application. H. C. Mayo, R. E. Daze, J. A. Stewart, M. W. Kellogg Co.
- CP.\* Contact Ignition of Hydrocarbon-Air Mixtures. R. S. James, U. S. Dept. of Interior.

CP.\* Survey of Motors Subject to Hazardous Environments. A. C. Varner, Allis-Chalmers Mfg. Co.

**2:00 p.m.—Wire Communication Systems—II**

CP.\* A Unique Solid State Supervisory & Data Handling System. W. E. Noller, B. W. Lee, Noller Control Systems, Inc., W. N. Dent, Artwell Electric Co.

CP62-1117. A New Concept in Electronic Component Packaging. A. J. Murabito, J. F. Russell, Western Electric Co., Inc.

CP62-1118. Asymptotic Transconductance Design of Transistor Amplifiers. J. P. Wittman, Lenkurt Electric Co., Inc.

CP62-1119. The Lenkurt In-Band Signaling System. J. C. Christensen, R. W. Ruth, S. A. Welk, Lenkurt Electric Co., Inc.

CP62-1120. A New Departure in Disaster Communication and Control Systems. I. Kamen, Teleglobe Cosmotronics Corp.

**2:00 p.m.—Linear and Discrete Data Systems**

62-1055. Improving the Linearity of the Steady State Gain Characteristics By Use of Nonlinear Feedback. N. E. Nahi, University of Southern California, S. Plotkin, Hughes Aircraft Co.

62-1056. Design of Lead Networks for A-C Servos with Carrier Frequency Drift. I. J. Nagrath, V. K. Arya, Birla College of Engineering.

CP62-1057. A Generalized Synthesis Method for Noninteracting Control of Multivariable Systems. P. C. Chiu, C. R. Webb, University of London.

CP62-1058. Extensions to the Theory of Finite Settling-Time Designs. H. M. Estes, U. S. Air Force Academy.

CP62-1059. Complete and Exact Identification of Self-Sustained Oscillations in Relay Sampled-Data Control Systems. H. C. Torng, Cornell University.

**Friday, June 22nd**

**9:00 a.m.—Switching Surges**

CP62-1100. Single Pole Reclosing Tests on Long 275 KV Transmission Lines. K. H. Milne, The Electricity Trust of South Australia.

62-1101. Propagation of Switching Surge Wavefronts on EHV Transmission Lines. A. J. McElroy, American Electric Power Service Corp., H. M. Smith, Westinghouse Electric Corp.

CP.\* Selection of Switching Surges for Insulation Coordination. AIEE W.G. on Switching Surges, I. B. Johnson, Chairman.

**9:00 a.m.—Wire Communication Systems—III**

CP.\* Effects of Loaded and Non-Loaded Bridge-Tap Lines. P. P. LaBorde, E. J. Pross, General Telephone Co. of California.

CP62-1190. Multifrequency Expected Measured Loss—Calculations for Physical Communication Lines. L. M. Kelter, E. J. Pross, General Telephone Co. of California.

62-1121. Voice Frequency Telephone Circuit Design by Simulation. T. J. Talley, American Tel. and Tel. Co., O. E. Wiedmann, The Pacific Tel. and Tel. Co.

CP.\* Exchange Loop Distribution Systems. S. I. McCaron, General Telephone Co. of California.

CP62-1122. An Electronic Tone Ringer for Telephones. D. J. Suda, Automatic Electric Labs., Inc.

**9:00 a.m.—Communication Switching—I.**

CP.\* Mechanization of Central Office and PBX Equipment Ordering. D. J. Driscoll, A. T. & T. Co. G. E. Reifentuhl, Western Electric Co.

CP.\* Traffic Data Recorder. W. B. Callaway, Bell Telephone Labs., Inc.

62-1034. Electronic Pulse Corrector for D-C Dialing Circuits. I R. V. Burns, R. T. Cleary, Automatic Electric Labs., Inc.

CP.\* Expansion of Switching Facilities, for Data (MTWX) and for Bulk-Type (WATS) Traffic. R. J. Murphy, Automatic Electric Labs., Inc.

62-273. A New Voice Communication System for Air Traffic Control. I T. E. Allen, Laboratory for Electronics, Formerly with Bell Telephone Labs., Inc. (Re-presented for Discussion only)

**9:00 a.m.—Nonlinear Control Systems—II.**

CP62-1061. Nonlinear Compensation of a Second and Third Order System with Dry Friction. C. N. Shen, H. Wang, Rensselaer Polytechnic Inst.

CP62-1062. Switching Boundary Criteria and Response of Dual-Mode Systems. E. S. McVey, University of Virginia.

CP62-1063. A Discussion of Generalized Routh-Hurwitz Conditions for Nonlinear Systems. D. G. Schultz, Purdue University.

62-1189. Volterra Series Representation of Non-Linear Systems. II R. H. Flake, Washington University.

**2:00 p.m.—Electronic Transformers**

CP62-1177. Flux Current Relationships in Magnetic Materials. G. J. Hegedus, Ryan Electronics.

CP.\* Measurement of Pulse Inductance by the Current Ramp Method. R. M. Rowe, Carad Corp.

CP.\* The Hybrid Transformer as a Transmission Device. E. F. Sartori, Bell Telephone Labs., Inc.

CP62-1206. Design of a High Power Wide Band Balun for the HF Region. J. H. Hollman, F. A. Trenkle, Westinghouse Electric Corp.

CP.\* Philosophy of Testing Used in Wide Band Frequency Range Transformer Proposed Standard No. 453 and Comments on the IMEKO-1961 International Measurements Conference Held at Budapest, Hungary. A. D. Hasley, Bell Telephone Labs., Inc.

62-1211. A High Gain Ceramic Triode for Broadband Amplifiers. J. D. Campbell, General Electric Co.

**2:00 p.m.—Transmission & Distribution**

62-1102. Lightning Reference Bibliography 1950-1960. AIEE III Lightning and Insulation Subcommittee of the Transmission and Distribution Committee, P. H. McAuley, Chairman.

CP.\* Shielding of Transmission Lines. F. F. Young, J. M. Clayton, A. R. Hileman, Westinghouse Electric Corp.

62-1025. Rainfall Rate and Resistivity at East Pittsburgh, Pa. III D. L. Whitehead, Westinghouse Electric Corp.

CP62-1103. The Effect of Rain Intensity on the Prevention of Icing on Transmission Cables. C. Z. Kamien, Avco Corp., O. W. Witzell, Purdue University.

**2:00 p.m.—Communication Switching—II.**

CP62-1071. Time Division Multiplex Digital Supervisory Control, Telemetry & Alarm Systems; Principles and Applications. R. R. Ashman, W. E. Chainey, Moore Associates, Inc.

CP62-1180. Coding and Information Identification. L. S. Tuomenksa, W. Ulrich, Bell Telephone Lab., Inc.

62-1035. Automatic Trouble Diagnosis of Complex Logic Circuits. I S. H. Tsiang, W. Ulrich, Bell Telephone Labs., Inc.

62-1036. Experience With the Morris Electronic Switching System. I G. Haugk, E. J. Yokelson, Bell Telephone Labs., Inc.

CP62-1208. Time Division Multiplex Electronic Telephone Exchange System for Small PAX. K. Toyada, H. Arakawa, T. Yamamoto, T. Nakamura, M. Hashimoto, Fuji Communication Apparatus Co., Ltd.

**CONTINUED FROM PAGE 2**

equipped to handle the complete missile in an erect position. Simulated here are the numerous flight conditions of static wind loads, thrust, cryogenic cooling, aerodynamic heating, shift of center of gravity due to propellant outflow, and varying acceleration. Other cells, completely shielded from external radio interference, test electrical and electronic equipment and their compatibility with ground support equipment.

The Propulsion Laboratory engages in research and development and in environmental testing of propulsion system components and sub-systems. Much early development of such propulsion system units as the gas generator, the accessory power supply, the liquid-level sensors, and the helium heat exchanger was conducted here.

Mockups, including everything from the tanks to the propellant piping are built in order to test the missile's propellant system, under simulated flight conditions, without actually operating the engines. Such tests were necessary before the commencement of the captive test firing program and are still being conducted on a continuing basis in order to maintain and improve the reliability of the propellant system.

No cameras. No classification required. Limit 80 men delegates per trip. Tickets \$1.50. Group 1 board busses at 7:45 A.M. Group #2 board busses at 9:15 A.M.

**Tuesday, June 19, and Thursday, June 21, 8:30 A.M. to 4:00 P.M.—UNITED STATES AIR FORCE ACADEMY.** The United States Air Force Academy, the nation's newest service academy, is located on a 17,500-acre site near Colorado Springs in the shadows of the beautiful Rampart Range. Here cadets receive a four-year education including academic and airman-ship studies which provide a background for leadership in the Air Force. The Academy graduate receives a Bachelor of Science degree and a commission as a second lieutenant in the Regular Air Force. Visitors will view the spectacular Academy buildings and grounds from the North overlook and will be shown laboratories, class rooms, the chapel, and the gymnasium. Lunch will be served at the Academy. Men and boys only—a separate tour has been arranged for the ladies. Limit 200 each trip. Fare and lunch—\$4.00.

**Tuesday, June 19, 1:15 P.M. to 5:30 P.M.; Wednesday, June 20, 1:00 P.M. to 5:00 P.M.; Thursday, June 21, 8:30 A.M. to 2:30 P.M.—NATIONAL BUREAU OF STANDARDS.** The National Bureau of Standards laboratories at Boulder will conduct special tours for the AIEE delegates. This world-famous center conducts research in three areas: Cryogenic engineering, radio propagation and radio and electronic standards.

Depending upon the research in progress at the time of the convention, delegates will be able to see the work being done on the atomic frequency and time interval standard, which employs a cesium-beam standard accurate to 1.5 parts in 10 to the eleventh power; the electronic calibration center, tropospheric and ionospheric research, radio astronomy, radio systems, and properties of materials at cryogenic temperatures. This is the place where absolute accuracy is a constant goal. Limit 100 men delegates per trip. \$2.00 Tuesday, Wednesday trip. \$4.00 Thursday trip with luncheon at University of Colorado, Persian Room, Memorial Center.

**Tuesday, June 19, 1:30 to 4:30 P.M.—UNITED STATES BUREAU OF RECLAMATION.** Located in Denver's Federal Center are the U. S. Bureau of Reclamation laboratories. Here the delegates will be shown the hydraulics laboratories, the computer and system analyzer section, and materials testing laboratories. Scale models, many of them working models, of Reclamation projects completed and under construction, including the 710-foot-high Glen Canyon Dam, can be inspected. Typical of the scope of the Bureau's operations in

this facility is its five-million-pound universal testing machine, which stands 50 feet high and weighs 750,000 pounds. Limit 200 men delegates. \$1.00 each.

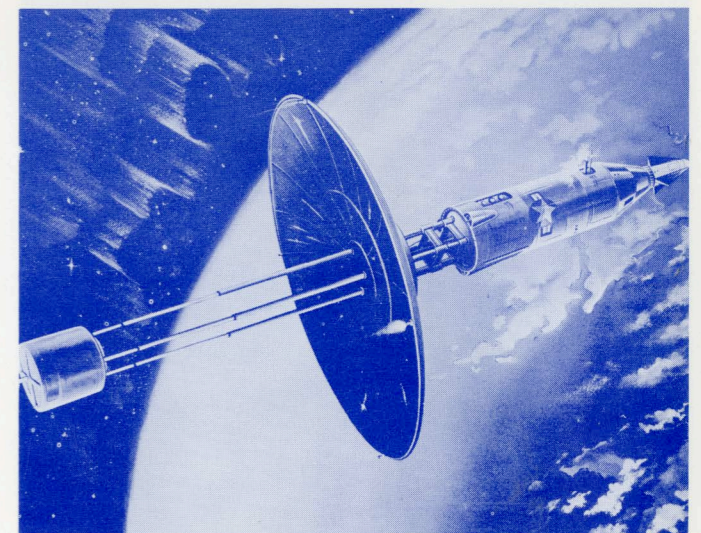
**Wednesday, June 20, and Thursday, June 21, 2:00 P.M. to 5:00 P.M.—SUNDSTRAND AVIATION.** This is an important, interesting plant tour of the company's plant manufacturing and test facilities north of Denver. This plant, began in 1954, now contains over 200,000 square feet of floor space for factory and offices. Additional extensive test facilities are growing in remote areas on the 32 acre site surrounding the plant. The entry of Sundstrand Aviation, Denver, into the field of missile and space vehicle power systems was a natural outgrowth of its aircraft accessory work.

Visitors will have an opportunity to inspect the remote testing facilities. Included will be a ten foot diameter solar collector mounted on a pedestal type tracking rig, testing the collection efficiency of the aluminized Mylar parabolic surface. Other test installations include a breadboard torpedo propulsion unit, a liquid metal heat transfer apparatus, liquid hydrogen vapor separator unit, and a liquid hydrogen pumping setup.

Sundstrand's government contracts include a photogalvanic power conversion system, several cryogenic turbine driven machines, a storable propellant flight vehicle power unit, and a solar dynamic space power system. These units are designed to provide power for space missions ranging from hours to years in duration. Limit 60 men delegates per trip. \$1.00.

**Wednesday, June 20, 7:30 P.M. to 10:00 P.M.—UNIVERSITY OF DENVER—BOETTCHER ENGINEERING CENTER.** A cool evening visit to this campus is open to all the family. Formerly located southeast of the City, this campus is now encompassed by rapidly growing Denver. In this facility is being conducted basic and applied research in physics, mechanics, chemistry, metallurgy, industrial economics and electronics.

Work is presently being conducted at The Denver Research Institute in the development of ceramets, combinations of ceramics and metals, in an effort to achieve the properties of both in one substance. These are to be used in missiles and other high-heat applications. In the past, the Institute has developed a thin-film thermocouple for extra sensitive heat measuring, several digital and analogue computers, and has done considerable developmental work on a process for extracting oil from shale. Family. Limit 80. \$1.00.



A Solar Dynamic Generator by Sundstrand Aviation.

## AIEE SUMMER GENERAL MEETING AND AERO-SPACE TRANSPORTATION CONFERENCE

**Thursday, June 21, 8:00 A.M. to 5:00 P.M.—LEADVILLE. PUBLIC SERVICE COMPANY OF COLORADO HIGH ALTITUDE ULTRA HIGH VOLTAGE TRANSMISSION.** A special trip to Leadville, Colorado, some 120 miles west of Denver, has been arranged so that visiting engineers will be able to inspect the high-altitude ultra high-voltage electric transmission testing facilities of Public Service Company of Colorado.

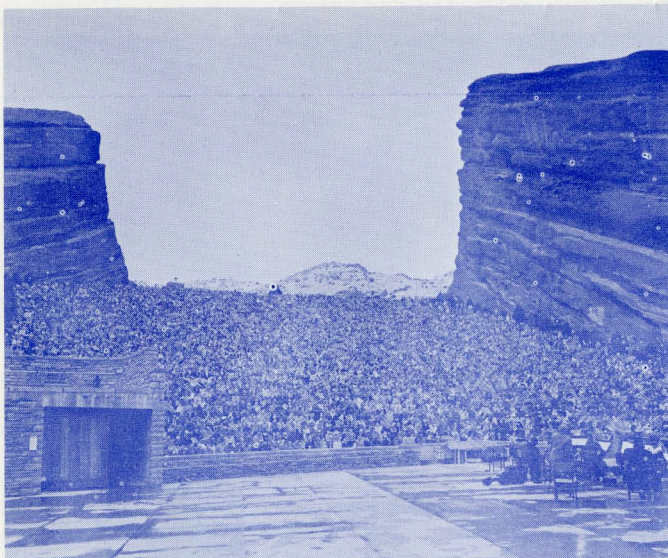
In 1956, the utility company and five manufacturing companies built the  $1\frac{1}{2}$  mile test line to study corona loss and radio interference on various sizes of conductors at voltages ranging from 200,000 to 500,000 volts at altitudes over 10,000 feet. Data gathered in these tests has resulted in lower construction costs on the Company's first 230 KV line. On 16 miles of the new 230 KV line it was possible to reduce conductor size by one-third of an inch, with a corresponding reduction in the size of hardware. On the conductor alone, incorporation of the data brought a substantial saving.

Situated at more than 10,000 feet above sea level, Leadville claims the distinction of being the highest incorporated city in the world. This old mining town, where fortunes were extracted from silver mines, is well worth the trip for itself. Family. Limit 80. \$7.50. (Lunch included.)

**Thursday, June 21, 1:30 P.M. to 3:00 P.M.—DENVER CITY TOUR.** An interesting, casual bus tour of the City has been planned for all the family. Here is your opportunity to see the sights of the City without traffic worries. Family. Limit 160. \$2.50.

**LADIES' ACTIVITIES:** Throughout the week the Denver Room of the Hilton Hotel will serve as your headquarters. Plan to meet your friends for the day's activities in this room, and enjoy a cup of coffee and friendly chatter with your hostesses. Messages may be left here, and lost and found articles will be kept for their owners at our desk. Tickets for all events will be sold at the registration desk in the lobby only. *None will be sold at the door.* Since our numbers are limited on some events, be sure to obtain *all* your desired tickets early.

Information will be on hand for teen age activities, for commercial baby sitting facilities, and for making individual arrangements. In addition to the Welcoming Tea, coffee hours, and the many previously described "Family" activities and trips which are open to all and which are almost a vacation in themselves, there are numerous special meetings and trips for the ladies.



Theatre of the Red Rocks.

**Tuesday, June 19, 10:30 A.M. to 4:00 P.M.—"DAY IN THE ROCKIES."** Casual dress will be the order of the day. You will enjoy this ride through the Rockies and will have lunch at Troutdale-in-the-Pines. This is one of Colorado's outstanding resort hotels, located in the beautiful mountain area, west of Denver. The children are most welcome and a special outdoor picnic will be served them on the grounds of Troutdale. Sweaters or coats should be taken with you no matter how warm it seems. Colorado mountains are always cool and often slightly breezy. Following luncheon, those who desire may shop in the picturesque mountain village of Evergreen, Colorado. Others who desire to do so may take the bus directly back to Denver. Limit 300 ladies, 100 children. Tickets \$4.50 ladies, \$3.50 children. Ticket sales close 6:00 P.M. Monday, June 18.

**Wednesday, June 20, 8:30 A.M.—4:00 P.M.—UNITED STATES AIR FORCE ACADEMY TOUR.** A delightful bus ride south of Denver with grand views of our front range of mountains to the U. S. Air Force Academy will begin at 8:30 A.M. and will be the only opportunity for ladies to visit this academy. Only ladies and girls will be able to go. The Air Force Personnel will conduct the tour, and they are serving luncheon in the main cadet dining room for us. A film will be seen explaining the Academy, and a tour made of the kitchen facilities, library, social center, and the three-in-one building chapel for Protestant, Jew and Catholic. Limit 400. Tickets \$4.00, luncheon included.

**Thursday, June 21, 10:00 A.M.—LADIES AUXILIARY MEETING AT THE DENVER HILTON.**

**Thursday, June 21, 12:30 P.M. to 3:00 P.M.—COLORADO CARNATION LUNCHEON, BROWN PALACE HOTEL, WEST BANQUET ROOM.** This luncheon, with the entertainment to follow "America's First Fashion Originals," is sure to please the ladies. Children cannot be accommodated. The fashion show is one that is extremely unique to Denver and nearby areas, and we are sure you will be delightfully surprised by this show. Limit 250. \$3.50. Ticket sales close 12:00 Noon Wednesday.

### SPECIAL EVENTS FOR ALL:

Elitch Gardens and Lakeside Amusement Park are located in Denver. Entertainment here varies from little "Kiddy" rides to roller coasters. There is swimming, dancing to "Name Bands," beautiful flower gardens, boat rides, and entertainment for all ages at nominal prices. Tickets are available when you arrive.

The Members of the 1962 Summer General Meeting Committee are:

A. E. Paige, Chairman; J. E. Martin, Vice Chairman; S. W. Hannah, Secretary; G. B. Steuart, Treasurer. Members at Large, L. A. Bingham, W. C. Du Vall, W. H. Edmunds, Dean H. S. Evans, M. H. Kight, L. N. McClellan. Special Committee Chairmen: L. R. Patterson, Finance; A. S. Anderson, Registration; K. F. Hodson, Hotels; L. M. Robertson, Program; W. H. Hinch, Properties; H. R. Lee, Entertainment; J. F. Fuller, Publicity; A. M. Spaulding, Transportation; L. R. Larson, Aero-Space Transportation Conference; J. C. Livesay, Trips; C. W. Keller, Sports; H. B. Palmer, Student Activities; Mrs. C. W. Keller, Ladies' Entertainment.

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