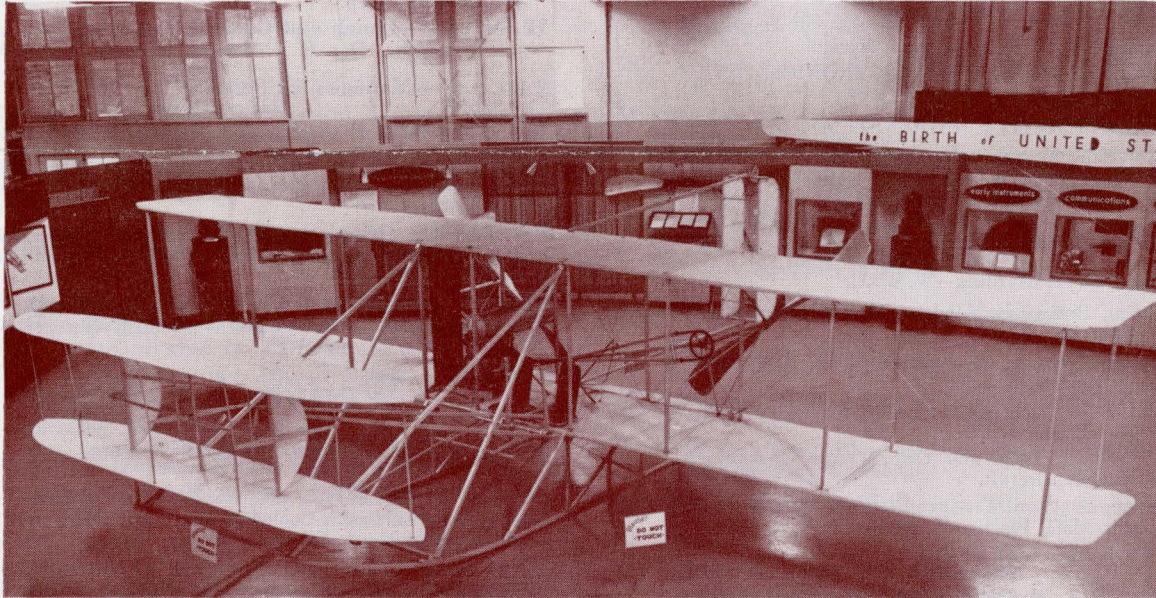


East Central and Middle Eastern District Meeting and Air Transportation Conference

May 7-9, 1957

Dayton, Ohio

Headquarters
Dayton-Biltmore Hotel



World's First Military Plane

Air Force Central Museum

An AIEE District Meeting will be held on May 7-9 at the Dayton-Biltmore Hotel, Dayton, Ohio. The East Central District 11, Middle Eastern District 2, and the Institute Air Transportation Committee have combined to present an unusually full program on Rotating Electrical Machinery, Air Transportation and Engineering Management.

No other section of the country can draw on so many companies involved in such widely diversified types of rotating electrical machinery, and the Air Force Installations and manufacturing concerns interested in aircraft cannot fail to interest the members of the Air Transportation Committee. In addition to the technical paper program, there will be ten inspection trips, a wide variety of industrial exhibits, and plenty of fun, food, and frolic.

GENERAL SESSION: The general session will be held in the main ballroom of the Dayton-Biltmore Hotel at 12:30 p.m. on Tuesday, May 7. Mr. Donald N. Warren, General Chairman of the combined district meeting will preside.

HOTEL RESERVATIONS: The facilities of the Dayton-Biltmore Hotel have been completely assigned to the American Institute of Electrical Engineers for this meeting. Requests for room reservations should be mailed to Reservation Clerk, Dayton-Biltmore Hotel, 210 N. Main Street, Dayton 2, Ohio. Hotel prices are: single \$6.50 and up; double \$9.00-\$11.00; twin \$11.50-\$14.50; suites \$28.50-\$39.50.

Hotel reservations should be made as far in advance as possible. Due to the presence in Dayton of another national meeting, and the possibilities that the Dayton-Biltmore might not be able to accommodate all visitors, the Hotel Committee would like time to locate any additional housing facilities that would be necessary.

REGISTRATION: The registration desk will be on the fourth floor of the Dayton-Biltmore Hotel and will open at 6:00 p.m. on Monday, May 6. During the meeting days, registrations will be received from 8:00 a.m. to 5:00 p.m. Advance registration will be helpful and appreciated. All fees for social functions and inspection trips will be collected upon registration. Registration fees will be \$3.00 for

members, \$5.00 for nonmembers and no fee for students and families of members.

EARLY BIRD RECEPTION: An early bird refreshment and get acquainted party for members, wives, and guests will be held in the Hilton Room of the Dayton-Biltmore Hotel on Monday evening from 8:00-10:00 p.m. All refreshments will be supplied by sponsors in conjunction with District 11.

SMOKER: Men's smoker will be held on Tuesday, May 7 at 7:00 p.m. in the Main Ballroom of the Dayton-Biltmore Hotel. You will "smoke" at this one whether you smoke or not.

BANQUET: A banquet for all members, wives, and guests will be held in the Main Ballroom of the Dayton-Biltmore Hotel at 7:00 p.m. on Wednesday, May 8. Good food and good entertainment are assured.

EXHIBITS: There will be many exhibits of industrial and commercial products and services pertaining to rotating electrical equipment and aircraft. All displays will be located in the Hotel Lobby and Garage and the technical meetings have been scheduled to allow adequate time for all visitors to see the exhibits with the least possible interference with technical papers and inspection trips. Exhibits open 2:30 p.m. Tuesday, May 7.

GOLF: The Community Country Club will be open for golf. Green's fees are \$1.00 per day. It is suggested that anyone wishing to play should be at the Club before 3 p.m. to avoid scheduled league play.

INSPECTION TRIPS: There will be ten inspection trips. Some are limited to fifty visitors and out-of-Dayton area visitors will be given preference. For trips to Wright-Patterson Air Force Base (excepting the Air Force Central Museum) and Aeroproducts Operations, Allison Division, GMC, some proof of citizenship will be required. A photostat of birth certificate, a company pass that certifies citizenship, or naturalization papers will be adequate. Proof is to be

Continued on page 4

AIEE EAST CENTRAL AND MIDDLE EASTERN DISTRICT MEETING AND AIR TRANSPORTATION CONFERENCE

ADVANCE COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 40c each (80c each to nonmembers), by sending enclosed order form and remittance to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. Mail orders (particularly from out-of-town members) are advisable, inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon books in \$10 denominations are available for those who wish to avoid remittance by check or otherwise. The Transactions Papers will also be published in the bimonthly publications.

Note: Unnumbered District Papers (DP.*) 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.

Tuesday, May 7

9:30 a.m.—Aeronautical Lighting

Main Ballroom

Presiding: W. T. Harding—W.A.D.C.

DP57-512. Lighting Design for Modern Aircraft. Paul H. Greenlee, Grimes Mfg. Co.

DP.* Lighting for Tomorrow's Aircraft. J. W. Tuttle and M. A. Mortenson, General Electric Co.

DP57-458. Lighting the Modern Commercial Aircraft. Philip E. Masie, Day-Ray Products, Inc.

DP57-459. Air Traffic Control and the Jet Age Cockpit. Dr. Stan Roscoe, Hughes Aircraft.

DP57-511. Development and Testing Plastic Lighting Plates. Ben George, Air Mark Plastics.

9:30 a.m.—Environmental Design

Junior Ballroom

Presiding: E. K. McMullin, North American Aviation.

DP.* Design of Liquid-Cooled Aircraft Generators. D. A. Wilhelmson, General Electric Co.

57-460. Prediction of Transient and Equilibrium Component Temperatures and Evaluation of Cumulative Insulation Damage of Blast-Cooled Machines. W. Robinson, Ohio State University.

57-461. Surface Heat Transfer Coefficients of Salient-Poles in a II. Blast-Cooled Alternator. W. Robinson and F. S. Tse, Ohio State University.

DP57-462. Existing and Ultimate Temperature Limitations in Rotating Electric Machinery. T. H. Putnam, Massachusetts Institute of Technology.

57-463. Thermal Consideration of Generators in High Speed Aircraft. Alexander Kusko, Massachusetts Institute of Technology.

9:30 a.m.—Rotating Electrical Machinery

Hilton Room

Presiding: L. W. Buchanon, Westinghouse Electric Corp.

DP57-464. A New Step Motor. S. Noodleman, B. A. Wesche Electric Co.

DP57-465. Calculation of Four, Six, and Eight Pole (Two Speed) Split Phase Motors Using Consequent Pole Windings. T. E. M. Carville and R. F. Fricke, Westinghouse Electric Corp.

57-466. A New Type of Multi Speed Motor. C. S. Siskind, Purdue III. University.

57-529. The Evaluation of Modified Silicone Insulation Systems in III. Motors. G. A. Mullen and H. R. Sheppard, Westinghouse Electric Corp.

12:30 p.m.—Lunch and General Session

Presiding: Donald N. Warren, General Chairman.

2:00 p.m.—Management Session

Junior Ballroom

Presiding: H. E. Deardoff, Dayton Power & Light Co.

DP57-515. Management in the Electrical Manufacturing Industry. Fred E. Harrel, Marquette Metal Prod. Div., Curtiss-Wright Corp.

DP57-467. The Use of Servo-mechanism Theory in Applying Linear Programming to Business Problems. Lt. William R. Greenwood, W.A.D.C.

DP57-519. Development of Management Capability Among Practicing Engineers. Adrian J. Morgan, University of Dayton.

Wednesday, May 8

9:30 a.m.—Jet Transport Electric Systems

Main Ballroom

Presiding: Mike Trbovich, Hartman Electric.

57-468. A Brushless-Air-Cooled Aircraft A-C Generator. R. E. Smith, II. Westinghouse Electric Corp.

57-469. Static Control and Protection of Aircraft Electric Power II. Systems. Ronald Hulsey and Niles F. Schuh, Westinghouse Electric Corp.

57-470. Voltage Modulation on Aircraft Electric Power Systems. II. R. E. Klokov and C. F. Yohe, Westinghouse Electric Corp.

DP.* Non-Parallel 240 KVA System for the Electra. A. J. Freeman and N. W. Thielman, Lockheed.

DP57-471. Design of Generating Equipment for Electra Turboprop Aircraft. J. M. Alger, W. E. Warden, W. O. Hanson, and Leon Klein, General Electric Co.

9:30 a.m.—Environmental Design

Junior Ballroom

Presiding: D. E. Fritz, Autron Mfg. Co.

57-472. Ram Air Cooling Systems for Aircraft Generators. R. M. II. Moroney, Massachusetts Institute of Technology.

DP57-473. Analytical Studies of the Steady State Off-Design Performance of Ram Air Cooling Systems for Aircraft Generators. A. K. Sen, Massachusetts Institute of Technology.

DP57-524. A Practical Method of Providing Dynamic Force Isolation for Airborne Equipment. R. C. Starkey, North American Aviation.

DP.* A Feasibility Study of Materials for Use in Ultra High Temperature Electronic Transformers. H. B. Harms, General Electric Co.

DP.* A Report on the Thermal Aspects of Applying Aircraft Rotating Electrical Equipment. P. B. McCloud, North American Aviation.

9:30 a.m.—Rotating Electrical Machinery

Hilton Room

Presiding: A. E. Hartman, Robbins & Myers, Inc.

DP57-474. Two-Reaction Theory of a General Induction Machine and its Equivalent Circuit. Dr. Y. H. Ku and Dr. D. W. C. Shen, University of Penna.

DP57-475. The Dilemma of Single-Phase Induction Motor Theory. P. L. Alger, General Electric Co.

DP57-476. The Steinmetz Conception of the Single-Phase Squirrel Cage Motor. Edward Bretch.

2:00 p.m.—Aircraft Systems

Main Ballroom

Presiding: G. W. Sherman—W.A.D.C.

DP57-477. Parallel A-C Generators on a Common Drive. William F. McDonnell, Lockheed Aircraft.

57-478. The Stability of Aircraft D-C Power Systems with Inverter II. Loads. Lt. R. E. Thomas, W.A.D.C.

57-479. A Method of Fault Analysis for A-C Aircraft Electric Power II. Systems. L. J. Rindt and R. D. Jessee, Westinghouse Electric Corp.

DP57-488. A Method of Determining the Input Power Requirements of Aircraft Generators. T. B. Owen, Douglas Aircraft.

DP.* Reactive Phenomena in Three-Phase Half-Wave Magnetic Amplifiers with Inductive Load. Dr. H. M. McConnell, Jack & Heintz.

2:00 p.m.—Aircraft Systems

Junior Ballroom

Presiding: Robert Lyman, Goodyear Aircraft.

DP57-522. How to Achieve Aircraft Electrical System Reliability. John Pierro, North American Aviation.

DP57-481. Some Applications of Magnetic Amplifiers in Aircraft Generator Protective Systems. D. L. Plette and John Butler, General Electric Co.

DP.* Coordination of Hydraulic Transmissions and Aircraft A-C Generators. S. C. Caldwell, R. T. Smith, and T. E. Coppinger, General Electric Co.

DP57-482. Development of Definitions and Limits for Frequency Transients and Frequency Modulations in 380 to 420 CPS Aircraft Electric Systems. O. Markowitz, N.A.D.C.

DP57-503. Design Considerations for Aircraft Relays. L. E. Massie and E. T. Kotnik, Convair.

2:00 p.m.—Rotating Electrical Machinery

Hilton Room

Presiding: E. C. Barnes, Reliance Electric & Eng. Co.

DP-57-484. Electro-Mechanical Technique for Evaluating Effective Insulation Life Under Periodic Temperature Variations. W. D. Munro, Spencer Thermostat Div., Metals and Controls Corp.

DP57-485. Ventilation and Induction Motors. F. Myers, Wagner Electric Corp.

DP57-486. Induced High-Frequency Currents in Squirrel-Cage Windings. P. L. Alger, General Electric Co.

DP57-487. Temperature Tests on Totally Enclosed Non-Ventilated Motors. R. F. Woll, Westinghouse Electric Corp.

Thursday May, 9

9:30 a.m.—Power Generation

Main Ballroom

Presiding: W. T. Beatson, BuAer.

DP.* Pulse Gate Control Applied to Three-Phase Magnetic Amplifiers. Dr. A. Krausz, Jack & Heintz.

DP57-489. High Speed Permanent Magnet Alternators. A. T. Puder and F. Strauss, General Tire & Rubber Co.

DP57-490. Sintered Plate Nickel Cadmium Batteries. L. Grant Hector, Sonotone Corp.

DP57-525. Regulator-Exciter Systems for Small Missile and Aircraft Power Supplies. H. S. Sechrist and H. G. Carlson, General Electric Co.

DP57-495. Generator Torque Calculations. D. F. Toffolo, Naval Research Laboratory.

9:30 a.m.—Power Generation

Junior Ballroom

Presiding: Ken Remington, North American Aviation.

DP57-491. Silver Zinc Batteries as a Source of Primary Electrical Power for a Pilotless Aircraft. Loyal T. Abrahamson, Boeing Aircraft.

DP.* Static Exciter for Aircraft Generators. H. A. Butten and D. L. Plette, General Electric Co.

57-492. Electrical Ignition for Conductive Fuels. S. J. Sheheen, II. Ithaca, New York.

57-493. Flat Work Coil Design. B. Matthews, Manhattan Beach, II. Calif.

57-494. The Presence of Informative Feedback in the Control-Stick II. Motion of a Pilot in Control of an Airplane. W. D. Diamantides, Goodyear Aircraft.

9:30 a.m.—Rotating Electrical Machinery

Hilton Room

Presiding: W. R. Appleman, Master Electric Co.

DP57-496. Stray Load Losses and Stray Torques in Induction Machines. A. M. Odok, Louis Allis Co.

DP57-497. Slip-Torque Relationship for Single-Phase Motors. Michael V. Jorgenson, Louis Allis Co.

DP57-498. A High Power Factor. One Running Capacitor, Two Motor System. S. S. L. Chang, New York University.

2:00 p.m.—General Topics—Aircraft

Main Ballroom

Presiding: Dan Forsythe, Lockheed.

DP57-499. Aircraft Application of High Starting Torque, Low Inrush Current, 400 Cycle Induction Motors. S. H. Vogt, BuAer.

57-500. Ground Power Equipment. T. B. Holliday, Breeze Corporation, Inc.

DP.* Radiation Effects on Electronic Components and Systems. Robert J. Milliron, W.A.D.C.

57-501. The Role of Analog Computers in Propeller Control Design. II. Lt. Roy K. Frick, W.A.D.C.

DP57-502. An Approach to Automatic Reduction of Propeller Stress Data. A Digest. Irving A. Peltier, W.A.D.C.

2:00 p.m.—General Topics—Aircraft

Junior Ballroom

Presiding: Jesse Keyes, McDonnell.

DP57-504. Development of High Temperature Aircraft Motor Components. Roy L. Balke, General Electric Co.

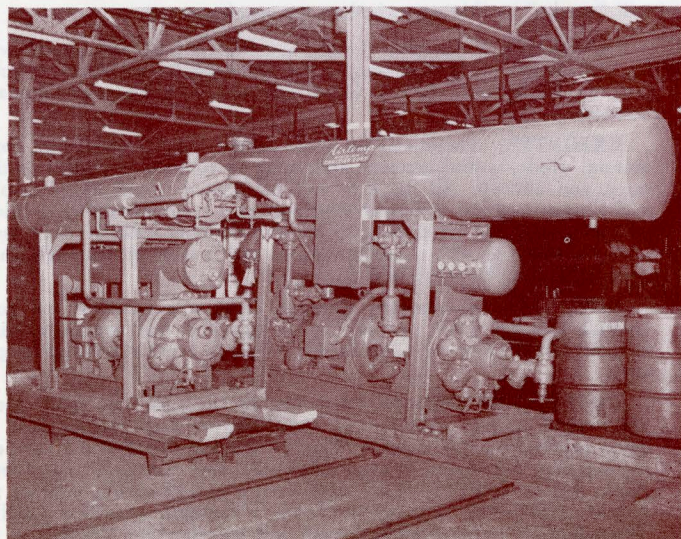
DP57-507. Solid State Rectifiers for Electrical Machinery. Richard Alberts, W.A.D.C.

DP57-505. An Analytical Study of the Design Parameters for Continuous Strip Fire Control Detection Systems. J. D. Andrew and Samuel Brand, Douglas Aircraft.

DP57-521. An Electrical Speed and Load Division Control for Constant Speed Air Turbine Drive. P. Dantowitz and L. G. Norris, General Electric Co.

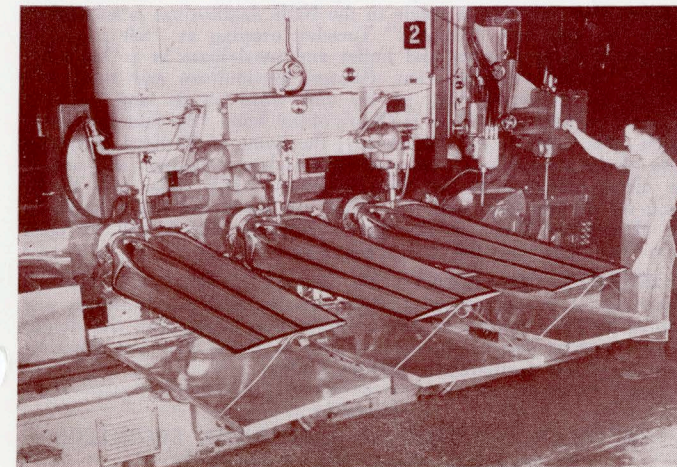
DP57-506. A Gas Turbine for a 7 KVA Generating Set. E. Ritz, Lear, Inc.

Note: Unnumbered District Papers (DP.*) 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.



Packaged Liquid Chilllers

Chrysler Air Temp. Div.



Milling Machine Operation on Propeller Ribs Allison Div. GMC



Modern Blast Furnace at Middletown Works *Armco Steel Corp.*

presented at registration desk when making reservations for the trips. It is requested that AIEE buses be used on all trips. Buses will leave from the Dayton-Biltmore Hotel.

Prices—All trips to Wright-Patterson Air Force Base	\$1.25 per person
Aeroproducts Operations, Allison Div., GMC	1.50 per person
A. O. Smith Corporation	1.50 per person
National Cash Register Company	0.75 per person
Airtemp Division, Chrysler Corporation	0.75 per person
ARMCO Steel Corporation	1.50 per person
Delco Products Division, GMC	0.75 per person

Air Force Central Museum. Tuesday morning, May 7. Bus leaves 8:45 a.m. Wives and guests welcome. From captured Japanese and German paintings to the original Wright Brothers glider, the museum will interest and delight all who attend. Its library contains over 675,000 separate documents and photographs. Startling and dramatic exhibits of aircraft and components will bring you up to date on the "Air Age."

Airtemp Division, Chrysler Corporation. Wednesday morning, May 8. Bus leaves 8:30 a.m. Airtemp, a division of Chrysler Corporation, makes air conditioning and heating units for homes, small and large buildings, and automobiles. All vital parts of these products (286 models) are machined and assembled in a 240,000 square foot building. The air in this windowless building is filtered clean and kept at 75 to 78 degrees F. the year round. This assures freedom from rust and precise fit of all moving parts. Every air conditioner uses two, and in many cases three electric motors plus overload, low voltage, and operating controls.

Computation Branch, Aeronautical Research Laboratory, Wright-Patterson Air Force Base. Wednesday morning, May 8. Bus leaves 8:15 a.m. Proof of citizenship required. The Computation Branch provides a complete computation center for the solution of very complex equations and the simulation of physical phenomena. A large digital facility provides high speed, very accurate means of solution of other types of problems.

Aeroproducts Operations, Allison Division, General Motors Corporation. Wednesday afternoon, May 8. Bus leaves 1:15 p.m. Proof of citizenship required. This is the major U. S. manufacturer of turbo propellers for prop jet aircraft. Special equipment and process utilized in the manufacturer of hollow steel propeller blades are shown the plant visitor. Also manufactured at Aeroproducts are specialized high temperature actuators, for after burner control on jet engines and the wing incidence control actuator for the Chance-Vought F8U aircraft. Other accessories include ram air driven emergency generators and hydraulic pumps.

A. O. Smith Corporation, Eastern Motor Division. Wednesday afternoon, May 8. Bus leaves 1:00 p.m. This is A. O. Smith's principal motor manufacturing facility—more than 200,000 square feet of floor space. Motors of frame size #215 and smaller are assembled in one of the country's most highly conveyORIZED motor plants. A separate section is devoted to the manufacture of hermetic motors.

National Cash Register Company. Thursday morning, May 9. Bus leaves 8:30 a.m. Guests will visit departments responsible for the engineering of electric motors and other electrical prod-

ucts. Among production operations to be viewed is assembly of the National Post-Tronic, the first electronic bank bookkeeping machine to be placed on the market. The Post-Tronic utilizes electro-mechanical and electronic principles to simplify the handling of checking accounts in banks. It magnetically "reads and writes" on both the depositor's monthly statement and the bank's records to achieve new levels of accuracy and speed. Production of electric motors will also be viewed. Another demonstration will be a National electronic computer system providing various record-keeping functions at high speed.

Static Test Branch, Aircraft Laboratory and Test Branch, Equipment Laboratory, Wright-Patterson Air Force Base. Thursday morning, May 9. Bus leaves 8:15 a.m. Proof of citizenship required. The Static Test Branch has facilities for determining the structural integrity of air frames. Equipment is available for applying, varying, and controlling both fixed and distributed loadings and for measuring stresses and deflections at numerous points on the airplane. By properly varying loadings dynamic characteristics are simulated.

The Laboratory and Test Branch maintains a very complete and up-to-date environmental test facility. Provisions are available for determining the effects upon equipment of practically any existing natural environment such as heat, cold, moisture, low atmospheric pressure, fungus, vibration, etc. Natural combinations such as heat, moisture, and fungi, or temperature and altitude can be simultaneously achieved. Equipment being tested can either be operated or not depending upon the conditions being simulated.

Delco Products Division, General Motors Corporation. Thursday afternoon, May 9. Bus leaves 1:15 p.m. The new Kettering Plant is one of the most modern of electrical manufacturing units having nearly one-half million square feet of floor space. The plant sits on 308 acres which eventually will be developed with additional manufacturing units. Here are complete manufacturing facilities for polyphase and single phase industrial and hermetic motors, AC and DC generators, and component parts for single phase fractional motors.

Power Plant Laboratory, Wright-Patterson Air Force Base. Thursday afternoon, May 9. Bus leaves 1:00 p.m. Proof of citizenship required. The Power Plant Laboratory has the responsibility for all prime power equipment including jet engines, turbines, and reciprocating engines. A wide variety of equipment is maintained and operated to determine conformance of power sources to specified requirements.

Armco Steel Corporation, Middletown, Ohio. Thursday evening, May 9. Bus leaves 6:30 p.m. Founded in 1900, Armco is the nation's seventh largest steel company, with a capacity of 5,950,000 tons of steel a year. The company is a leading producer of special purpose steels. It is an early developer and one of the country's top producer of electrical steels. Armco's headquarters, general research laboratories, and largest plant are located in Middletown.

STUDENT PROGRAM: A District II student prize paper contest is scheduled for Wednesday, May 8. First prize \$50.00 and the District cup, second prize \$40.00 and third prize \$25.00 will be awarded at the banquet, Wednesday evening. The three winners and their counselors will be guests of the Cleveland Illuminating Company on an all-expense paid visit to Cleveland, Ohio.

LADIES' EVENTS: Hats and clothing will be covered in short talks and style shows Tuesday and Wednesday. On Tuesday afternoon there will be a visit to one of the manufacturing units of Frigidaire Div., GMC, and a color movie of "The Kitchen of Tomorrow." On Wednesday afternoon a trip through a section of National Cash Register Company and a movie in the NCR Auditorium is scheduled. While the men are "smoking" Tuesday evening at 7:00 p.m., the ladies will enjoy a party and buffet and participate in a "Let's Arrange Flowers" demonstration. Houses, horticulture and hotel will provide an enjoyable visit at the old stage coach stop town of Lebanon on Thursday. Here is Ohio's oldest hotel (the famous Golden Lamb—where lunch will be served), the home of Mulford Nurseries (one of the country's largest producers of house plants), and one of the oldest mansions in the Ohio territory. AIEE buses will be on hand for all the trips and the ladies can meet and get a snack in the Hospitality Room at the Dayton-Biltmore which will be open from 9:00 a.m. to 5:00 p.m. each day.

GENERAL CHAIRMAN: Mr. Donald N. Warren is General Chairman of this combined District meeting and any inquiries pertaining to the business or other information concerning the details of the meeting can be directed to him at Delco Products Division, General Motors Corporation, Dayton 1, Ohio.

Issued by
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
33 West 39th Street, New York 18, N. Y.

PRINTED IN U.S.A.