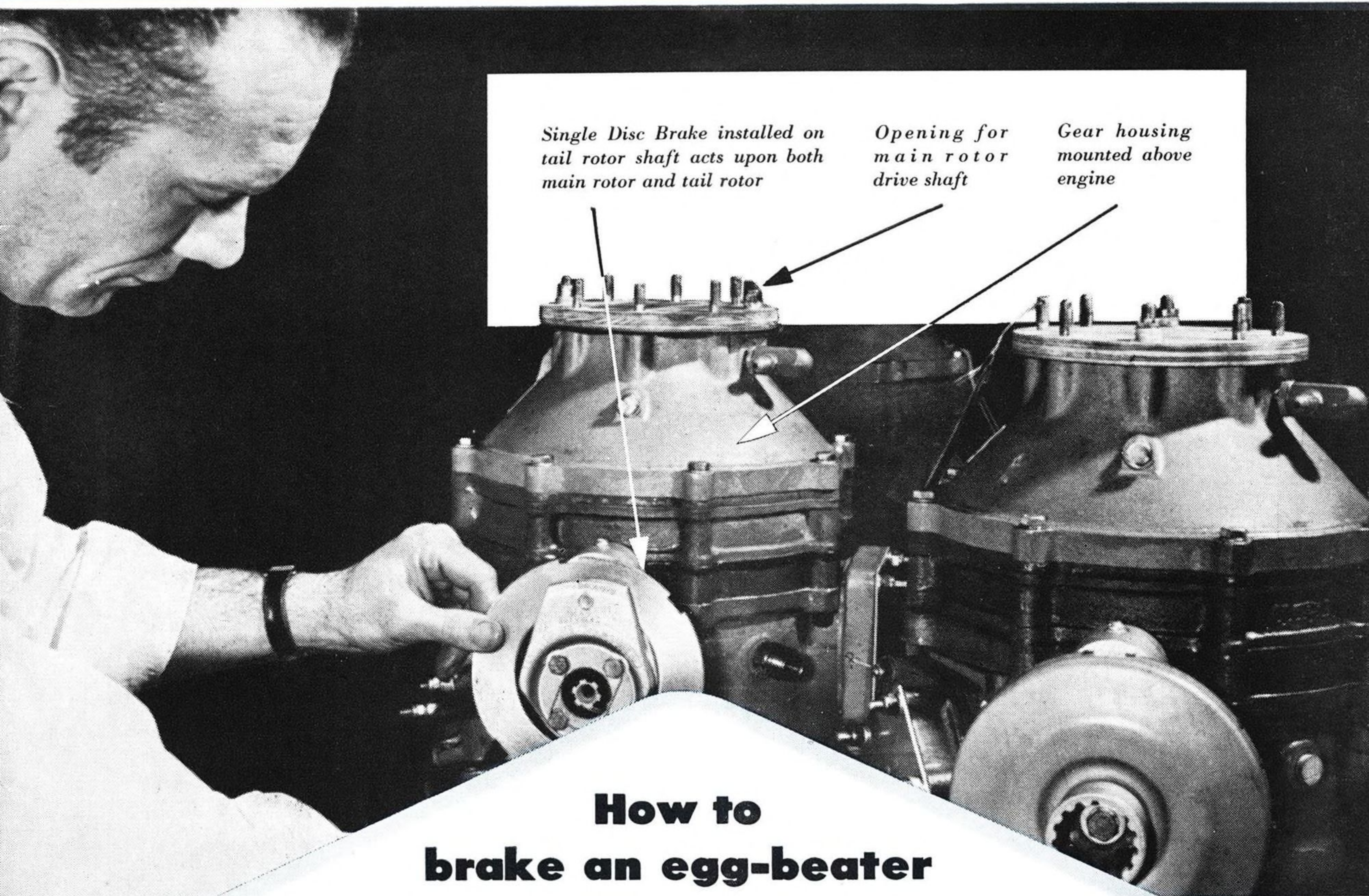


AVIATION WEEK

A MCGRAW-HILL PUBLICATION

JUNE 27, 1949



Single Disc Brake installed on tail rotor shaft acts upon both main rotor and tail rotor

Opening for main rotor drive shaft

Gear housing mounted above engine

How to brake an egg-beater

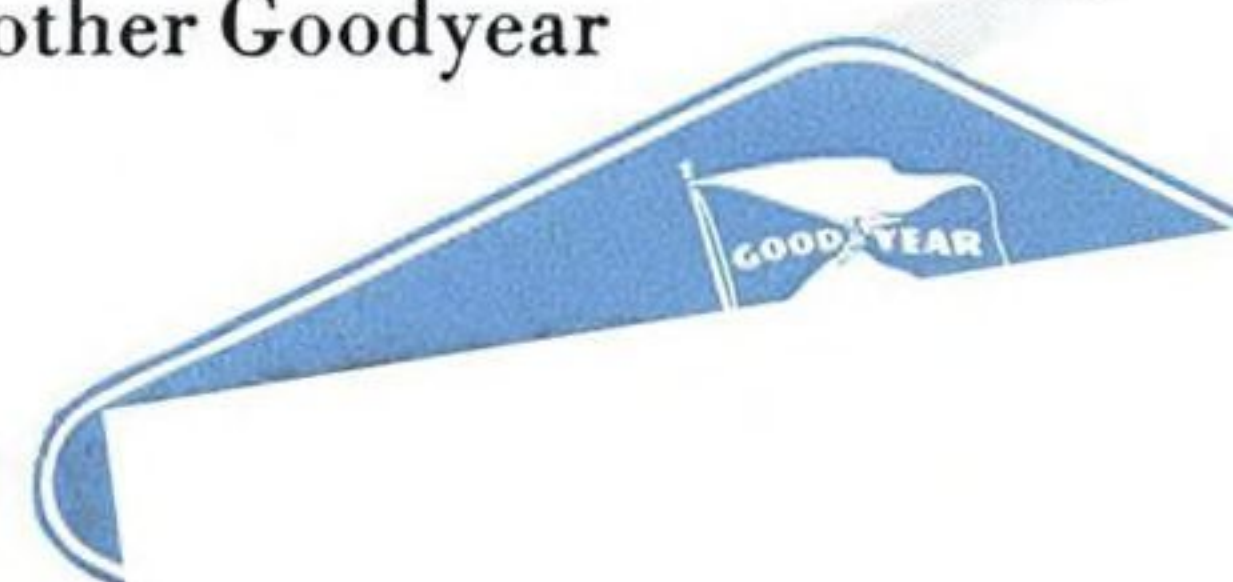
To prevent the main rotor and tail rotor from windmilling and to provide sure, smooth action and controlled deceleration necessary to prevent damaging torque stress loadings on rotor assemblies, the Bell 47-D helicopter is equipped with the new Goodyear Single Disc hydraulic rotor brake.

This new safety device for helicopters is an adaptation of the famous

Goodyear Single Disc aircraft brake — the landing gear brake preferred by many aircraft manufacturers and operators for safe, sure stopping power!

Other air-proved Goodyear products used on the Bell 47-D are Goodyear airplane tires, tubes, wheels, brakes and fan belts. For information about these, or other Goodyear products, write:

*Goodyear, Aviation Products Division,
Akron 16, Ohio, or Los Angeles
54, California.*



MORE AIRCRAFT LAND ON GOODYEAR TIRES, TUBES, WHEELS AND BRAKES THAN ON



*Dependable
controls cost
less than
service*



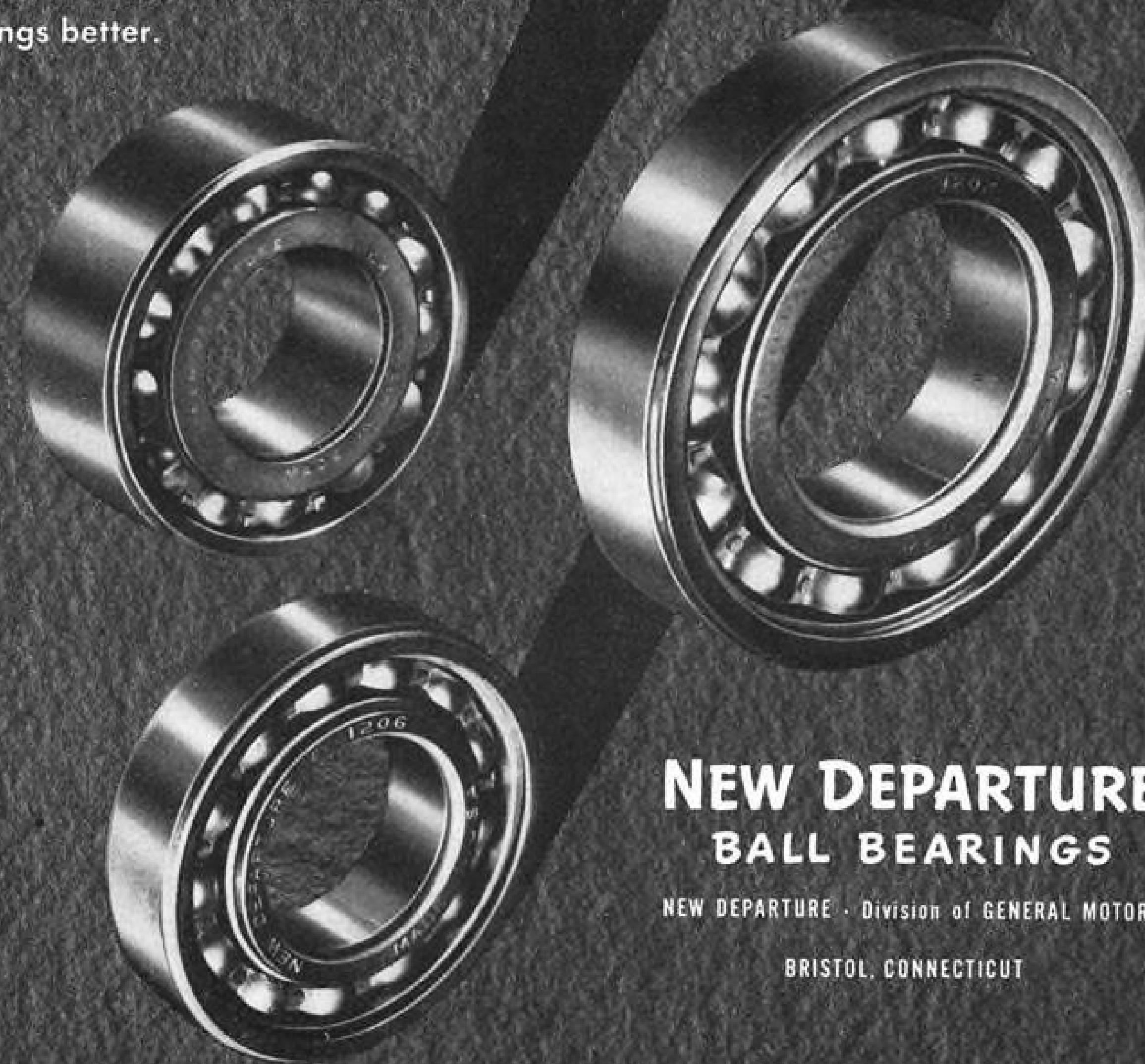
CREATIVE ENGINEERING

Makers of the Famous M-H
Electronic Autopilot, Fuel Gage,
and Turbo Supercharger
Controls, Standard on Many
Types of AAF Aircraft

MINNEAPOLIS
Honeywell
AERONAUTICAL CONTROLS

Nothing Rolls Like a Ball ...

60 years of pioneering over-
looks nothing that science or skill
can contribute to make fine bear-
ings better.



**NEW DEPARTURE
BALL BEARINGS**

NEW DEPARTURE • Division of GENERAL MOTORS

BRISTOL, CONNECTICUT

count on
Clary for

**AIRCRAFT CONTROL BEARINGS,
ROD-END BEARINGS AND PULLEYS**

Large stocks lubricated to current
AN specifications.

HARDWARE

Bolts Pins, Clevis
Cable Pins, Taper
Clamps Rod Ends
Cotter Keys Screws
Fittings Turnbuckles
Gang Channel Valves
Nuts Washers
Nuts, Self-locking

RELUBRICATION SERVICE

Bearing and Pulley Relubrication to Current
AN (AN-G-25) or Commercial Specifications.

REPRESENTING

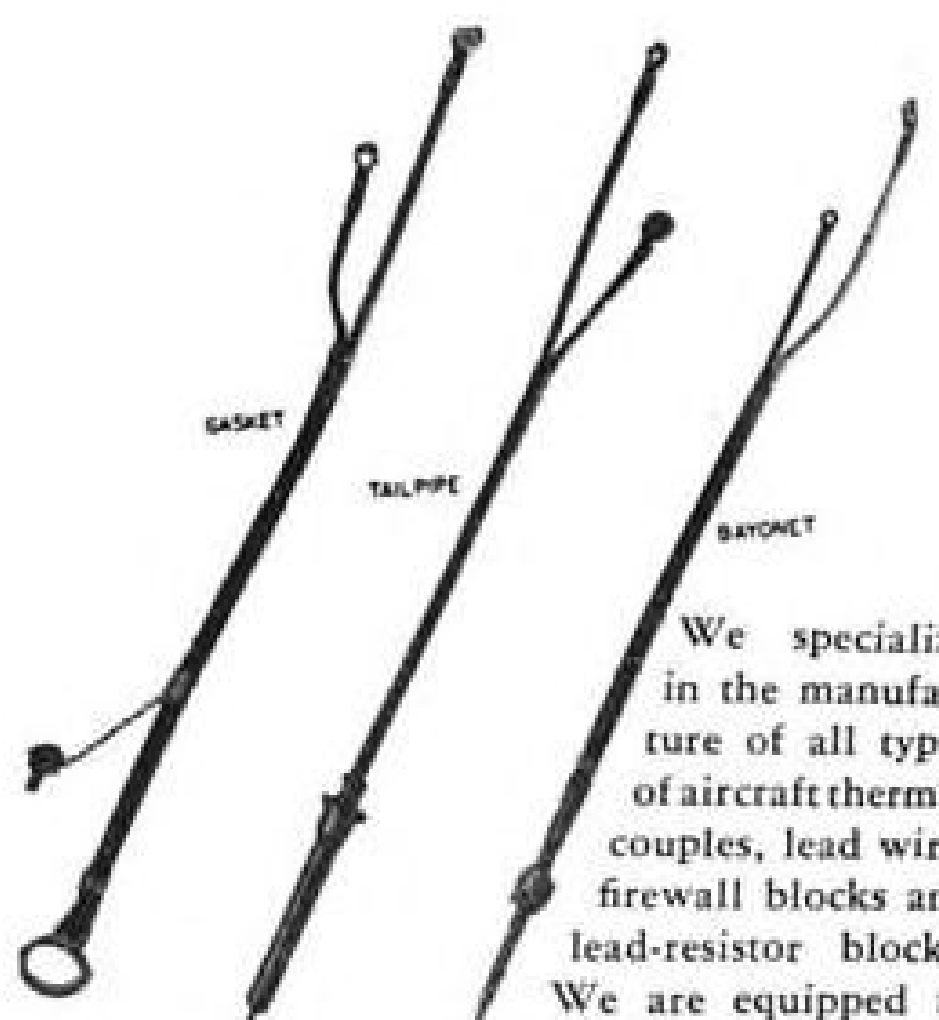
The Lamson & Sessions Co., Cleveland, Ohio
Bolts, Nuts, Screws (Aircraft Quality)
George K. Garrett Co., Inc., Philadelphia, Penn.
AN Washers and Lock Washers
The Atco Pulley Co., Pennsylvania
Aircraft Control Pulleys

Clary MULTIPLIER CORPORATION

AIRCRAFT HARDWARE DIVISION
425 E. 54th Street Los Angeles 11, Calif.
Telephone CEntury 2-9221

Ⓛ **LEWIS** Ⓛ

THERMOCOUPLES
FOR ENGINE TEMPERATURES



We specialize
in the manufac-
ture of all types
of aircraft thermo-
couples, lead wire,
firewall blocks and
lead-resistor blocks.
We are equipped to
fabricate jet engine
thermocouple-harness assemblies, connect-
ing-lead assemblies and special connector
blocks to your specifications. Bring your
temperature measuring problem to us,
whether it is a new thermocouple, harness,
or connecting lead, we are at your service.

THE LEWIS ENGINEERING CO.
CHURCH ST. • • • • NAUGATUCK, CONN.

**AVIATION
WEEK**

Vol. 50, No. 26

June 27, 1949

News Sidelights	7	Production	29
Aviation Calendar	8	New Products	33
News Digest	11	Sales & Service	35
Industry Observer	11	Air Transport	39
Headline News	12	Letters	45
World News	18	Strictly Personal	48
Engineering	20	What's New	48
Editorial	50		

Robert H. Wood
EDITOR

Merlin H. Mickel
MANAGING EDITOR

Robert B. Hotz.....News Editor
Irving Stone.....Technical Editor
William Kroger.....Manufacturing
Alexander McSurely.....Sales & Service
Charles L. Adams.....Transport Editor
Robert McLaren.....Engineering
Katherine Johnsen.....Congress
Stanley L. Colbert.....Production Editor
Marie Adams.....Editorial Assistant
Scott H. Reiniger.....Editorial Assistant
Victoria Giaculli.....Editorial Makeup
Henry Lefer.....Editorial Assistant

Executive and Editorial Offices: 330 W. 42d St., New York 18, N. Y., Phone
Longacre 4-3035; National Press Bldg., Washington 4, D. C., Phone National 3414

Domestic News Bureaus: Atlanta 3, Rhodes-Haverty Bldg.; Chicago 11, 520 N.
Michigan Ave.; Cleveland 15, Hanna Bldg.; Detroit 26, Penobscot Bldg.; Los
Angeles 14, 621 S. Hope St.; San Francisco 4, 68 Post St.; Houston, 514 South
St. **Correspondents:** Boston, Buffalo, Dallas, Dayton, Denver, Indianapolis,
Jacksonville, Kansas City, Knoxville, Lansing, Louisville, Memphis, Miami,
Milwaukee, New Orleans, Oklahoma City, Ogden, Philadelphia, Phoenix, Pitts-
burgh, Portland (Ore.), St. Louis, Salt Lake City, Seattle, Wichita and 43 other
cities.

Foreign News Bureaus: London, Paris, Frankfurt, Tokyo, Bombay, Melbourne,
Rio de Janeiro, Mexico City. **Correspondents in Athens, Moscow, Buenos
Aires, Shanghai, Zurich, Rome, Johannesburg and over 40 other cities.**

ECONOMICS STAFF

Dexter M. Keezer, Sanford S. Parker, William F. Butler, Robert P. Ulin.

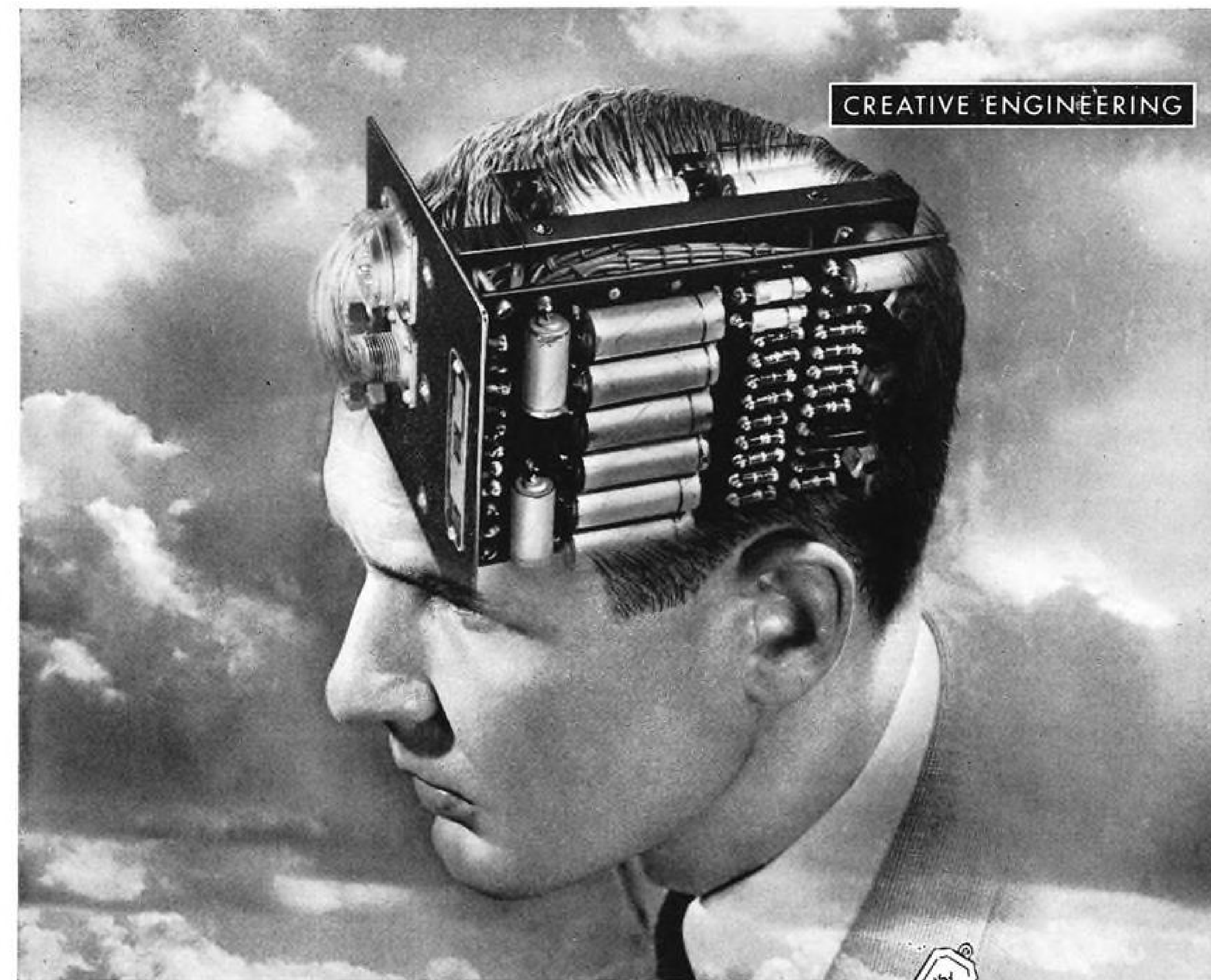
Robert F. Boger
PUBLISHER

J. G. Johnson, *Business Manager*; R. W. Martin, Jr., *Sales Manager*; Sales
Representatives: J. C. Anthony, New York; M. J. Storz, Philadelphia; V. K.
Dissette, Cleveland; L. J. Biehl, Chicago; W. E. Donnell, St. Louis; J. H. Allen,
Dallas; R. C. Maulsby, Atlanta; J. W. Otterson, San Francisco; C. F. McReyn-
olds, Los Angeles. Other sales offices in Pittsburgh, Detroit, Boston and London.

Member of Associated Business Papers, Inc., and the Audit Bureau of Circulations.

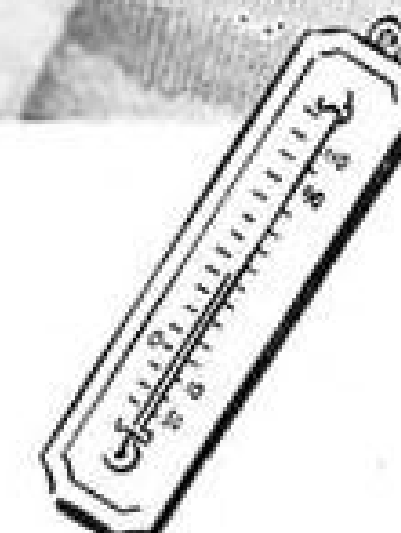
McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), Founder, Publishing Office, 55-129
N. Broadway, Albany, N. Y., Editorial and Executive offices: 330 W. 42nd St., New York 18; 520 N. Michigan
Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, London, W.C. 2; National Press Bldg., Washington
4, D. C.; Architects Bldg., 17th & Sansome Sts., Philadelphia 3; Hanna Bldg., Cleveland 15; 2980 Penobscot Bldg.,
Detroit 26; Continental Bldg., St. Louis 8; 1427 Statler Bldg., Boston 10; Rhodes-Haverty Bldg., Atlanta 3; 621
South Hope St., Los Angeles 14; 758-39 Oliver Bldg., Pittsburgh 22. JAMES H. McGRAW, Jr., President; CURTIS
W. McGRAW, Vice-President and Treasurer; EUGENE DUFFIELD, Senior Vice-President, Publications Division;
NELSON BOND, Vice-President and Director of Advertising; JOSEPH A. GERARDI, Secretary; J. F. BLACKBURN,
Jr., Vice-President and Director of Circulation. . . . Aviation Week, 330 W. 42nd St., New York 18. Published
weekly, price 50¢ a copy, 50¢ in Canada. Allow at least ten days for change of address. Address all communications
about subscriptions to Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Subscription rates—United
States and possessions, \$6 a year, \$9 for 2 yr., \$12 for 3 yr. Canada, \$7 for 1 yr., \$11 for 2 yr., \$14 for 3 yr.,
payable in Canadian currency at par. Pan American countries, \$10 for one yr., \$16 for 2 yr., \$20 for 3 yr. All
other countries, \$20 for 1 yr., \$30 for 2 yr., \$40 for 3 yr. Please indicate position and company connection on all
subscription orders. Entered as second class matter July 16, 1947, at Post Office, Albany, N. Y., under Act of March
3, 1879. Volume 50, Number 26. Printed in U.S.A. Cable address "McGraw-Hill New York." Member A.B.C.
Copyright, 1949, McGraw-Hill Publishing Co. Aviation Week is indexed in "Reader's Guide to Periodical Literature",
"Engineering Index" and "Industrial Arts Index". Publications combined with AVIATION WEEK are AVIATION,
AVIATION NEWS, AIR TRANSPORT, AERONAUTICAL ENGINEERING and AIRCRAFT JOURNAL. All rights
to these names are reserved by McGraw-Hill Publishing Co.

AVIATION WEEK, June 27, 1949



CREATIVE ENGINEERING

Weather Brain



**A new electronic answer to extreme tempera-
ture control problems. Designed by AiResearch,
this device anticipates temperature changes—
moves to correct them before they occur!**

Useful in maintaining aircraft cabin and engine
temperatures at a pre-selected level, the "Weather
Brain" can be adapted for use wherever extremely
close temperature regulation is required.

About the size of a human brain, the electronic
regulator receives signals from highly sensitive "pin
head" temperature anticipators . . . transforms them
into command signals to electrically actuated by-pass
valves which control the mixture of hot and cold air.
Thus, even if a plane is diving at supersonic speed from
the blue cold of 40,000 feet to 100-degree heat at sea

level, its cabin "weather" can be maintained precisely
at the temperature the pilot selects.

The "Weather Brain" is another example of the
ability of AiResearch to design and manufacture spe-
cialized equipment for hard-to-do jobs. It indicates
why nearly every type of high-altitude and jet aircraft
produced in the U.S. carries AiResearch equipment.

● **Whatever your field—AiResearch engineers**
—designers and manufacturers of rotors oper-
ating in excess of 100,000 rpm—invite your
toughest problems involving high speed wheels.
Specialized experience is also available in
creating compact turbines and compressors;
actuators with high speed rotors; air, gas
and liquid heat exchangers; air pressure,
temperature and other automatic controls.



✓ An inquiry on your company
letterhead will receive prompt attention.
AiResearch Manufacturing Company
Los Angeles 45, California

AVIATION WEEK, June 27, 1949

Sperry Firsts

- 1914 AUTOMATIC STABILIZER
- 1918 TURN INDICATOR
- 1929 GYRO-HORIZON
- 1929 DIRECTIONAL GYRO
- 1932 GYROPILOT
- 1938 AUTOMATIC RADIO DIRECTION FINDER
- 1944 GYROSYN COMPASS
- 1945 PRECISION GYROPILOT WITH AUTOMATIC APPROACH CONTROL
- 1948 ZERO READER®

TRADEMARK
PAT. PENDING

ZERO reader—ANOTHER SPERRY "FIRST"

✂ Man's first airplane instrument for automatic flight was the Automatic Stabilizer introduced by Sperry in 1914. Down through the years, Sperry has developed—through pioneering research and engineering—many added "firsts" in aviation equipment.

✂ Now, Sperry introduces the ZERO READER... the only manual system approaching the performance of

stabilized automatic flight control... another progressive step toward development of all-weather operations.

✂ Developed by Sperry with the cooperation and encouragement of All-Weather Flying Division, USAF and the Air Transport Association, the ZERO READER is an example of Sperry's never-ending search for new ways to improve flying techniques.



DIVISION OF THE SPERRY CORPORATION
GREAT NECK, NEW YORK
NEW YORK • CLEVELAND • NEW ORLEANS
LOS ANGELES • SAN FRANCISCO • SEATTLE

AVIATION WEEK, June 27, 1949

NEWS SIDELIGHTS

Military Changes

On the military front, the Hoover Commission recommended a vast increase in the Secretary of Defense's control over the services to promote unification. The National Military Establishment would be converted into a clear-cut executive department, "the Department of Defense." Legislation carrying out the proposed military reorganization, with some modifications, has been passed by the Senate (AVIATION WEEK, June 6).

House Armed Services Committee's chairman, Rep. Carl Vinson, (D., Ga.), was set to pigeonhole it. But promptly after the legislation giving the President new reorganizing authority was passed, Vinson announced hearings on the unification measure starting June 28. It was then clear that the President could accomplish the military reorganization without the approval of the House Armed Services Committee. Vinson's only chance now to defeat it is to whip up enough votes on the House floor to veto the President's proposals.

Tactical Demand

Watch for Air Force to make strenuous efforts to build up its tactical air power during the next fiscal year. Army is putting strong pressure on USAF to get adequate air support for its ground troops. USAF has been relying on the vote of Army boss, Gen. Omar Bradley for the 2-to-1 decisions against the Navy in Joint Chiefs of Staff battles.

Unless USAF delivers tactical air power for Army support it may lose the decisive Army vote in JCS. Both the Lockheed F-80 and Republic F-84 have shown up extremely well in accuracy of dive-bombing and strafing of ground targets, but they lack the endurance required for an effective ground support plane that must remain in the target area for some time to deliver sustained attacks. Tremendous firepower now possible in attack planes has the Army howling for USAF procurement of a modern attack plane.

Research Policy

Military and industry leaders are alarmed at the current Congressional trend toward heavy slashing of research and development funds. Congress seems to feel that the big need for aviation research and development ended with the war and that all agencies concerned can coast along on a wartime backlog of research. Among the aviation groups, Na-

Watch Missiles

Watch for the fur to fly when Dr. Clark Millikan, newly-appointed chairman of the Research and Development Board's guided missiles committee begins surveying the military missile program. Most observers concede the missile program needs a good overhauling and re-evaluation, and that Millikan is a good choice to do the job.

One of the big problems is weeding out a number of wartime missile research projects that still continue even though technical progress has indicated they no longer offer much promise. Typical of these is the program on missiles propelled by turbojets.

Also needed is a more thorough co-ordination of the missile programs now being conducted by U. S. Air Force, Navy's Bureau of Aeronautics and Bureau of Ordnance and the Army's Ordnance Department.

tional Advisory Committee for Aeronautics and Naval Aviation have taken the heaviest and most serious research fund cuts.

U. S. Air Force also got a whack from the Budget Bureau on its research and development funds before the fiscal 1950 budget was submitted. As a result, both USAF and Navy are having to use funds appropriated for other purposes, such as modifications, etc., to prevent critical research projects from stalling due to lack of funds.

Some military leaders feel the need for aviation research and development during the next few years is much more acute than for large scale procurement of tactical aircraft with a high rate of obsolescence.

Union Blast

"Ammunition," the monthly magazine put out by UAW-CIO's research department, fires full blast at the aircraft industry in ten solid pages of diatribe, charts and figures in the May issue. "Gold-plated panhandlers" is the tag the magazine tries to pin on the industry for accepting tax refunds and picking up good buys in government plants and equipment.

"The main business of the plane corporations is not producing planes but

holding out the tin cup in Washington," the article asserts in its opening paragraph. The aircraft worker is pictured as an individual much abused by the industry. He supports the industry with his taxes, providing pensions for executives but none for himself; he gets substandard wages; many are unemployed, and the industry is trying to take away his union—according to "Ammunition."

B-36 Expert

Washington observers are wondering whether Charles A. Lindbergh will be one of the witnesses called when the House Armed Services Committee opens its investigation into the Convair B-36 and other "corollary" matters.

Lindbergh recently spent some time at Convair's Ft. Worth division in his capacity as special consultant to USAF Chief of Staff, Gen. Hoyt S. Vandenberg. While at Ft. Worth Lindbergh flew copilot in the B-36D prototype, equipped with four Allison turbojet engines and six Pratt & Whitney Wasp Major piston engines.

Convair test pilot B. A. Erickson flew in the left hand seat on the B-36D test hop during which considerable time was spent above 40,000 ft. Lindbergh is now inspecting USAF bases in Germany.

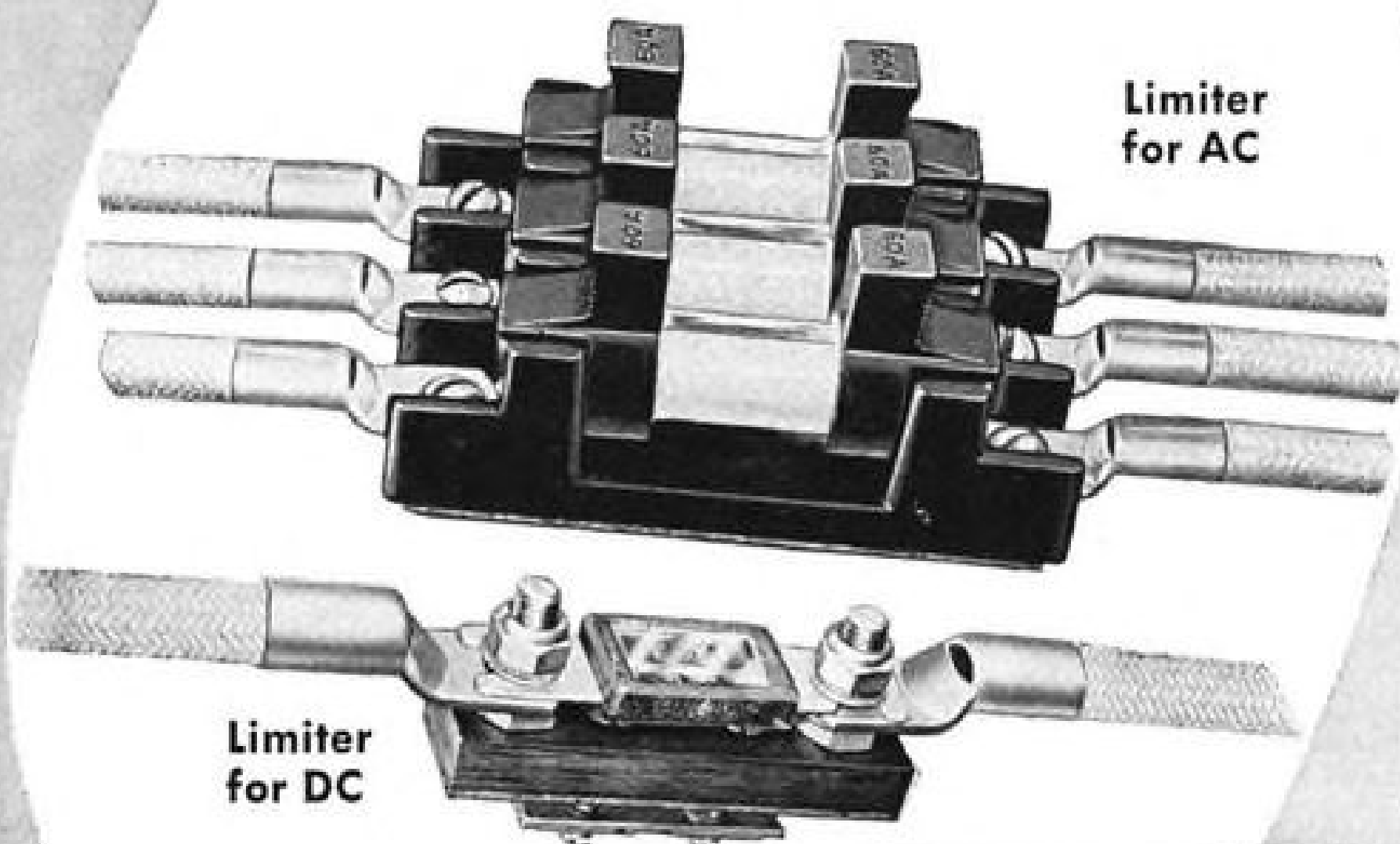
Economy Drive

The move to slash military funds (AVIATION WEEK, June 6) was in full swing in the Senate last week as the Appropriations Committee opened hearings on the 1950 fiscal year budgets for the services.

Sen. Elmer Thomas (D., Okla.), chairman of the armed services appropriations subcommittee, called for an overall \$1 billion slash in the \$16 billion military allocation voted by the House. He advocated the major reduction in Air Force funds, proposing a 46-group program for the coming year, instead of the 57-group program approved by the House and the 49-group program recommended by the Budget Bureau.

Air power advocates on the subcommittee, however, can be counted on to fight any sharp cutback in USAF funds. These include Sens. Burnet Maybank (D., S. C.), Pat McCarran (D., Nev.), Lister Hill (D., Ala.), Styles Bridges (R., N. H.). The subcommittee appears set to drop the \$43 million approved by the House for the Navy's supercarrier, United States, since cancelled by Defense Secretary Louis Johnson.

Safeguarding Aircraft Electrical Systems



BURNDY
*Aircraft
Limiters*

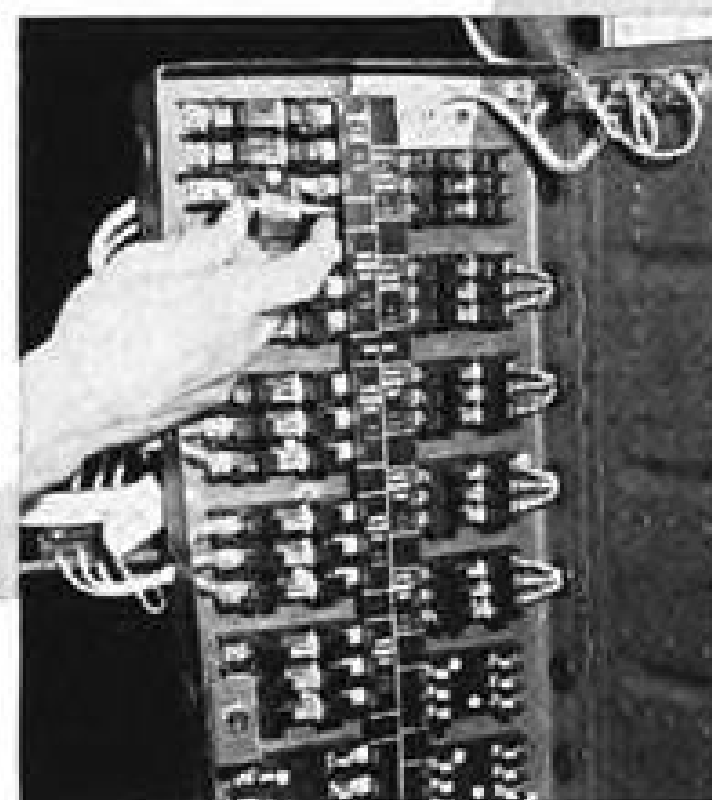


Photo shows how circuit protection is provided for the B-36 with the installation of Burndy Type F1L Limiters.

As a safeguard to flight, today's modern aircraft electrical system is Burndy-Limiter protected. These vital aircraft "fuses" carry temporary overloads but clear promptly under short circuits. They are particularly recommended for systems which use multiple conductors per phase for, when Limiter protected, a fault on a single wire is cleared without interruption of current in that leg of the circuit.

The close co-ordination of these highly accurate Limiters, unlike other thermal devices is little affected by the variation of ambient temperatures, thus they provide greater protection with the least weight and space.

Limiters and mountings are offered for 30-volt and 120-volt DC; and 120/208-volt, 400 cycle AC systems in various ampere ratings. Burndy Limiters meet the requirements of USAF Spec. Nos. 32552-A; 32506-B.

Complete engineering service is offered. For particulars, write for Bulletin 47F1.

Connect with
BURNDY

New York 54, N. Y.

WESTERN BRANCH: Vernon 11, California • CANADA: Canadian Line Materials, Ltd., Toronto 13

AVIATION CALENDAR

June 27-29—Formal dedication of Naval Ordnance Laboratory aeroballistics division, followed by five half-day technical sessions, White Oak, Silver Spring 19, Md.

June 27-July 1—1949 semi-annual meeting, American Society of Mechanical Engineers, University of California, Extension Bldg., 540 Powell St., San Francisco, Calif.

July 1-4—Third annual national convention and reunion Air Force Assn., Stevens Hotel, Chicago, Ill.

July 1-5—Florida State Air Tour.

July 2-4—Houston international air speed runs, Municipal Airport, Houston.

July 2-10—National soaring contest, Harris Hill, Elmira, N. Y.

July 3-4—National Air Fair, Orchard Airport, Chicago.

July 8—Second joint meeting, Institute of the Aeronautical Sciences and the Soaring Society of America, Elmira, N. Y.

July 10-13—Annual meeting, Natl. Assn. of University Administrators of Aviation Education, Kent State University, Kent, Ohio.

July 19-20—National Assn. of State Aviation Officials board of directors meeting, Grand Hotel, Mackinac Island, Mich.

July 21-22—IAS annual summer meeting, IAS Building, Los Angeles.

Aug. 6-14—1949 West Coast soaring championship, Palmdale Airport, Calif.

Aug. 25-28—Flying Farmers national convention, Fort Collins, Colo.

Aug. 29-Sept. 1—Aeromedical Assn. annual meeting, Statler Hotel, N. Y.

Sept. 1-7—International conference of Federation Aeronautique Internationale, Wade-Park Manor, Cleveland, Ohio.

Sept. 3-5—1949 National Air Races, Cleveland, Ohio.

Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

Sept. 7-11—10th Society of British Aircraft Constructors flying display and exhibition, Cranborough Airfield, Hampshire, England.

Sept. 9-12—Clinic on maintenance of industrial instruments, Instrument Society of America, Statler Hotel, St. Louis.

Sept. 12—IATA fifth annual general meeting, The Hague.

Sept. 18-20—International Northwest Aviation Council convention, Spokane, Wash.

Oct. 12-15—Air Reserve Assn. annual convention, Long Beach, Calif.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting, Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

PICTURE CREDITS

18—Aeroplane; 20—Science Illustrated; 21—British Combine; 21, 26—McGraw-Hill World News.

GRUMMAN FIGHTERS*



**Equipped with
Electrol
Hydraulic Devices**

*The top photo is the Panther, the one below is the Bearcat.

Electrol
INCORPORATED

KINGSTON, NEW YORK

CYLINDERS • SELECTOR VALVES • FOLLOW-UP VALVES
CHECK VALVES • RELIEF VALVES • HAND PUMPS
POWERPAKS • LANDING GEAR OLEOS • SOLENOID
VALVES • ON-OFF VALVES • SERVO CYLINDERS • TRANSFER
VALVES • CUT-OUT VALVES • SPEED CONTROL VALVES

FOR BETTER HYDRAULIC DEVICES

PLANE FAX

A page of service tips for private flyers and fixed-base operators

Take-off tips that cut down accidents



Don't retract your landing gear too soon

Sounds elementary... but you need more runway to take off on hot summer days because of the lighter atmosphere. So be sure you're airborne before you flip up the gear. To keep your landing gear and all control surfaces running smoothly, use RPM Aviation Grease No. 1. It reduces friction... sticks to exposed parts at high speed... stays put at all temperatures.

"We take better care of your plane"

Tie down loose equipment before warming up

Good pre-take-off tip is to fasten down loose accessories and safety belts securely. They can be serious hazards, jamming the controls and causing injury to you and your plane during maneuvers.

Dangerous when loose in a plane—

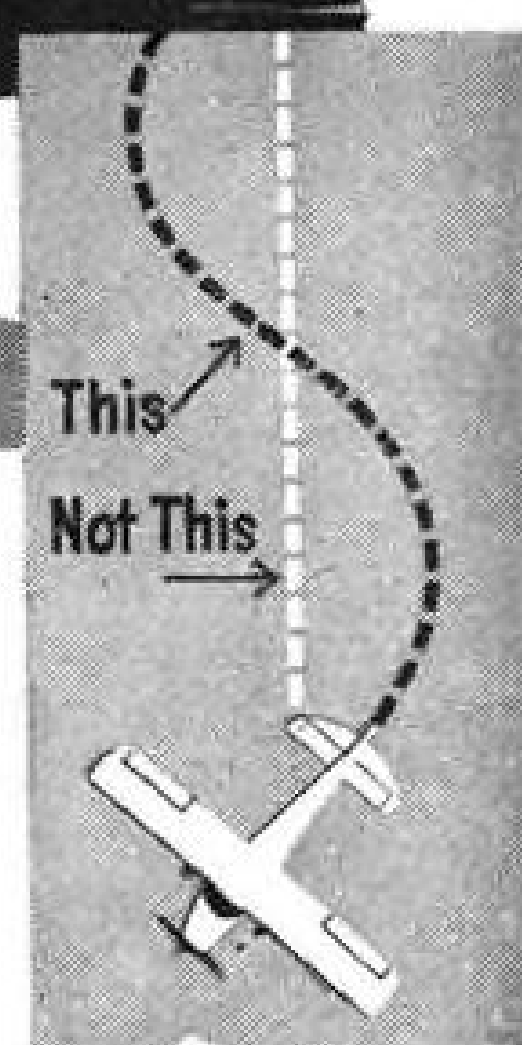


Take off with a clean engine

Hidden dangers to safe flying are the power-robbing gum deposits that can form in your engine when you use ordinary aviation oils. For deposits will clog engine parts... may cause stuck valves and rings, and even bearing failures. But RPM Aviation Oil cleans engines as it lubricates. It contains a detergent that gently loosens and removes carbon, soot, and sludge... and prevents new deposits from forming. This special chemical actually disperses tiny foreign particles, keeps them from building up on precision-made parts. So for a clean engine and peak performance on any flight, stick to "RPM."

"Fishtail" your plane while taxiing

Failure to S-turn on the taxi strip is a common cause of ground collisions. Be sure you have good visibility at all times. Remember: A high percentage of all aircraft accidents occur on the ground.



NEWS DIGEST

DOMESTIC

J. Carlton Ward, Jr., cancelled the retirement provisions of his employment contract with Fairchild Engine & Airplane Corp. This has been one of the main issues in Sherman Fairchild's fight on the corporation management. Sherman Fairchild hailed Ward's action as a victory; management said it reduced the proxy battle in the July 6 annual meeting to the single question of whether stockholders wanted to "return to the Sherman Fairchild era."

Bell Aircraft Corp. was accused by United Auto Workers of forcing the strike at Bell's plant in an effort to discourage minority stockholders and get them to sell their holdings to First York Corp. The strike continued last week with the union asking for an unannounced wage increase. Bell officials said the increase would average 15 cents an hour, putting average pay at \$1.78 per hour.

Personal aircraft exports in May for nine companies reporting to Aircraft Industries Assn. totaled 57 planes valued at \$241,450. In preceding month, totals for same companies were 60 planes and \$242,082. Brazil and Canada each imported 13 planes.

CAB received only 37 formal applications from large irregular carriers for exemption from the May 20 rules (AVIATION WEEK, Apr. 25), in advance of last week's filing deadline. At one time 111 carriers held letters of registration.

Air Coordinating Committee announced appointment of Stephen T. Early, Undersecretary of Defense, as the sole representative on the committee of the National Military Establishment. Previously, Navy and Air Force each had separate members on ACC.

Rohm & Haas Co., Philadelphia chemical manufacturer, has been given an Army Ordnance Department contract to organize and operate a laboratory for basic research and development in rocket and jet propulsion.

Honorary degrees were awarded Glenn L. Martin (doctor of science) by the University of Southern California; Hugh L. Dryden (doctor of science) by Brooklyn Polytechnic Institute; and Charles Yeager (bachelor of science) by West Virginia University.

FOREIGN

Sardar Hardit Singh Malik of India was elected president of International Civil Aviation Organization's third assembly, now meeting in Montreal.

INDUSTRY OBSERVER

► Pratt & Whitney's VDT power plant originally slated for installation in the B-36C, a tractor version of the giant Convair bomber, and the B-54 will now probably be used in the production version of the Convair C-99, transport counterpart of the B-36. Falling off of the VDT performance above 40,000 ft. killed the B-36C and B-54 projects but the 20 percent fuel saving over a given range or a 20 percent range increase using full fuel capacity would offer a strong attraction for a long-range transport that would operate well below 40,000 ft.

► Latest news on the B-36 situation is that the Air Force is now seriously considering proposals to sweep back the outer wing panels. (AVIATION WEEK, Mar. 14). This change would raise present Mach limitation of the big bomber. USAF pilot manuals put a limitation of Mach .66 on the B-36, but it has been flown as high as .69 without encountering any compressibility problems. Sweep back of the outer wing panels poses a simple construction problem and would raise the Mach limitation to about .75. Above 40,000 ft. this increase in Mach limitation would mean lifting the speed ceiling from 436 mph. to 503 mph. USAF has already indicated it hopes eventually to get the B-36 up to a performance peak of 500 mph. at 50,000 ft.

► McDonnell Aircraft Corp., St. Louis, probably will get a U. S. Air Force production order for its F-88 (Voodoo) twin jet fighter in fiscal 1950. F-88 is perhaps the longest ranged (1100 miles) of presently flying jet fighters. USAF has about given up on the McDonnell XF-85 Parasite fighter concluding that too high a degree of pilot skill is required to thread the barrel-shaped jet fighter onto the trapeze extended below the mother ship's belly.

► Grumman Panther (F9F) is now going into squadron service with the Navy at San Diego. Two Panthers were lost recently in forced landings after they ran short of fuel. One crashed in Ohio on a ferrying flight to California and the other after a test flight off San Diego.

Grumman will complete its Navy production contract for Bearcat (F8F-2) piston powered fighters in July. Production deliveries on the Guardian (AF-1) are scheduled to begin late this year.

► Boeing Stratocruiser sales prospects now include Air France, KLM and Swissair according to Fred B. Collins, Boeing vice president-sales manager. Collins has just returned from a European sales tour. Meanwhile, Pan American Airways took delivery of its ninth Stratocruiser at Seattle. Previously, deliveries were made at Portland, Ore., to escape a Washington state sales tax on aircraft that has just been removed.

► Polish Airlines (LOT) is considering replacing its 18 DC-3s with Russian equipment. Observers report the Polish equipment replacement problem is becoming acute.

► Ethyl Corp. is conducting tests at the University of Kentucky aimed at perfecting a scavenger to combat effect of lead in high octane fuel. Scavengers now available separate out with the result that some cylinders are cleaned while others remained fouled. Ethyl hopes to get a scavenger that will remove the lead in gaseous form.

► Shell Oil is scheduled to get from the U. S. Air Force an A-26F containing an Allison J-33 turbojet installed in the tail in addition to its two normal piston engines. Shell will use the plane for experimental research on jet fuels and lubricants.

► Fulton Airphibian is now well along the road toward certification by the Civil Aeronautics Administration after a long, drawn-out session of satisfying CAA requirements for the first commercial approval of a roadable airplane. Airphibian designer Robert Edison Fulton, Jr., is making the tests at Danbury, Conn.

► NACA is running tests for the Navy on Kaman Helicopter rotor system at Langley Field rotor test tower. Navy plans to buy several Kaman 190 helicopters for evaluation testing by Navy and Marine pilots.

CAA Plans \$213 Million Airways Program

Three-year development effort will fulfill RTCA interim phase outline.

By Robert Hotz

Civil Aeronautics Administration has blueprinted a three year program for spending \$213 million on electronic airways equipment. This represents CAA's part in the joint civil-military program for establishing an all-weather airways and traffic control system for the United States and the main aerial arteries to its foreign possessions.

The CAA airways equipment program involves \$30,645,503 in the fiscal 1950 appropriation still pending before Congress plus \$182,996,601 to be requested in the fiscal 1951 and 1952 CAA budgets. These funds will be used to purchase electronic equipment as indicated in the adjoining table. This equipment will be used to operate the interim phase of the all-weather airways program as outlined in the SC-31 report of the Radio Technical Commission for Aeronautics.

► **Horne's Plans**—Details on CAA's overall airways planning was revealed to AVIATION WEEK by Charles F. Horne, newly appointed head of the CAA Office of Federal Airways (AVIATION WEEK, June 13). Horne was named to the airways post by CAA Administrator Delos W. Rentzel to spark the new airways development program.

Horne came to CAA after a career in Navy communications and electronics dating back to 1926. During the war he was staff communications officer for Admiral Halsey in the South Pacific and later for Admiral Kelley Turner commanding the amphibious forces in the Central Pacific. After the war Horne was Deputy Director of Naval Communications until he joined CAA last year as Rentzel's special adviser on electronics.

Horne indicated that if the appropriations were forthcoming according to schedule it would be possible to have the interim system operating for airlines, private pilots and military aircraft by the winter of 1953-54. Status of the new airways equipment installation program as of June 1 is shown in table on opposite page.

Airways Progress Report

Facility	In Operation as of 6/1/49	Total Programmed Through Fiscal Year 1952
VOR (omni-range)	294	409
Instrument Landing Systems	92	320
High Intensity Approach Lights	1	320
Airport Surveillance Radar	3	150
Precision Approach Radar	3	82
Distance Measuring Equipment	3	731
ATC Towers	147	203
ATC Centers	26	30
Airways Communications	396	418

Implementation Schedule

Classification	Fiscal Years 1950	1951	1952
Basic Instrument Air Terminal Area	227	110	120
Class D	0	0	117
Class C	0	79	53
Class B	0	31	68
Class A	18	64	82
Total	245	284	440

The planned omni-range installation program is about three-quarters complete. There are indications that considerable modification work may be required on the omni-range to improve its accuracy characteristics.

► **GCA Program**—ILS is now in operational status at 92 airports. First installations of traffic control search radar and precision beam approach radar (GCA) specifically designed for civil airport use will be made before the end of 1949.

Major drive during the final half of this year will be concentrated on pushing distance measuring equipment (DME) out of the developmental stage into standardized production. International agreement on DME specifications was obtained at the recent ICAO communications meeting in Montreal. U. S. developmental DME equipment manufactured by Hazeltine Electronics Corp., and Federal Telecommunications Laboratories is now being modified to meet the international specifications.

► **DME Tests**—In the fall a joint CAA-Air Force-Navy program will begin to give the modified airborne DME equip-

ment a thorough service testing on the three ground DME stations now in operation at Wright Field, Indianapolis and Patuxent River, Md.

These tests are expected to provide data for evaluation of the airborne equipment and for writing of detailed production specifications for electronics manufacturers. Production quantities of airborne DME equipment will probably not be available to airlines and military services until some time in 1950.

► **Replace Beacons**—DME ground stations, of which 729 are planned in the CAA program, will be located at the sites of all omni-ranges and at the ends of instrument landing runways. These runway DME installations will eventually replace the ILS 75 megacycle marker beacons to indicate an approaching plane's distance from the runway's end.

Some work is expected to be done on lightweight airborne DME equipment for small executive-type planes but the cost and technical problems involved now indicate a limited market for this equipment.

► **System Planning**—Horne indicated that basic CAA planning for the new

CAA Airways Program

Type of facility	Total CAA requirements under Special Committee 31 program, number of facilities	Authorized through fiscal year 1949, number of facilities	Total 1950 program		Balance future years fiscal years 1951 and 1952	
			Number of facilities	Amount	Number of facilities	Amount
Continental United States:						
VHF-ILS equipment (includes LF locators)....	320	137	38	\$4,294,000	145	\$21,140,735
High intensity approach lights.....	320	12	13	1,335,685	295	41,716,152
Distance measuring equipment.....	729	16	560	15,043,226	153	5,314,670
Precision approach radar.....	82	15	13	2,340,000	54	17,613,522
Airport surveillance radar.....	150	25	19	4,332,000	106	39,791,987
Secondary radar.....	150				150	21,450,000
VHF-ADF equipment.....	150		44	601,392	106	1,707,118
VHF-omni-range.....	409	409				
Mechanical interlocks.....	50	8	30	442,200	12	229,944
Airport time utilization.....	50				50	3,403,125
Approach control timing devices.....	50	4	15	495,000	31	1,125,300
Alaska:						
VHF-ILS equipment (includes LF locators)....	16	7	4	560,000	5	931,230
High intensity approach lights.....	16				16	2,946,432
Distance measuring equipment.....	22		11	407,000	11	505,263
Precision approach radar.....	8	1	1	225,000	7	3,029,219
Airport surveillance radar.....	12	4	2	570,000	6	2,997,492
Secondary radar.....	12				12	2,287,992
VHF-ADF equipment.....	12				12	253,143
VHF-omni-range.....	6	1			5	421,505
Mechanical interlocks.....						
Airport time utilization.....						
Approach control timing devices.....						
Pacific area:						
VHF-ILS equipment (includes LF locators)....	8	1			7	1,303,722
High intensity approach lights.....	8				8	1,366,272
Distance measuring equipment.....	18				18	826,794
Precision approach radar.....	5				5	2,189,601
Airport surveillance radar.....	8	1			7	3,421,855
Secondary radar.....	8				8	1,525,328
VHF-ADF equipment.....	8				8	170,167
VHF-omni-range.....	10	6			4	337,204
Mechanical interlocks.....						
Airport time utilization.....						
Approach control timing devices.....						
Caribbean area:						
VHF-ILS equipment (includes LF locators)....	6				6	1,117,476
High-intensity approach lights.....	6				6	1,024,704
Distance-measuring equipment.....	12				12	551,196
Precision approach radar.....	1				1	419,809
Airport surveillance radar.....	2				2	949,018
Secondary radar.....	2				2	381,332
VHF-ADF equipment.....	2				2	41,488
VHF-omni-range.....	6				6	505,806
Mechanical interlocks.....						
Airport time utilization.....						
Approach control timing devices.....						
Total.....				\$30,645,503		\$182,996,601

airways system was aimed at getting main trunk lines completely equipped and operating first rather than installing all of a certain type of equipment all over the country and then moving on to another piece of equipment.

This planning aims at relieving the bad weather traffic pressure and congestions at major air terminals first and then working back through the airways system to segments where lower traffic densities make operational problems less urgent.

To facilitate this priority program CAA has drawn up an arbitrary airport classification.

- Basic instrument terminal area is an airport where instrument approaches can be made using en route airways facilities such as omni-range and DME.
- Class D area is an airport that has its own omni-range, DME and an instrument landing system (ILS) plus high intensity approach lights.
- Class C area has all the Class D equipment plus a traffic control tower.
- Class B area is characterized by the addition of traffic control search radar to the above facilities.
- Class A area has precision beam approach radar (GCA) in addition to everything provided in a Class B area.

Brazilian Crash

(McGraw-Hill World News)

RIO DE JANEIRO—All 26 aboard a Brazilian Air Force C-47 died when the craft smashed into a mountain in southern Brazil June 6, in one of Brazil's worst air tragedies.

The plane struck Cambirelas Peak in the state of Santa Catarina and burned, just after the pilot had radioed that he was flying on instruments.

All six crewmen were members of the Brazilian Air Force. The 20 passengers were all members of the armed forces except two women and two children.



Connie Modified For Radar Duty

Lockheed-built Navy PO-1W makes its first test flight; designed to meet new requirement in search planes.

Bulging with radomes and bristling with antenna spines, the Lockheed Constellation has joined the Navy's rapidly growing stable of radar picket planes. The specially-modified Constellation is called the PO-1W (P for patrol, O for Lockheed and W for warning).

First PO-1W of an experimental order for two made its initial test flight at Burbank, Calif., last week. Second is expected to be flying shortly after stability problems caused by the bulging radomes are thoroughly explored.

► **New Requirement**—The PO-1W is designed to fill a new Navy requirement for a combination long range radar picket plane and airborne combat communications center. As such the PO-1W can be used for four principal functions:

• **Radar Picket Plane**—The picket plane is far superior to the destroyer radar picket ships now in use since it can carry the search radar to an altitude where the line of sight difficulties that limit coverage from surface radar sets are eliminated. The Constellation can provide 360-degree coverage using radar antennae on top of the fuselage, slung under the belly and installed in especially elongated nose and the tail. The range of the Constellation can be added to radar range to provide extremely early warning of either air attack or submarine activity.

With the increasing speed of jet fighters and attack planes, the Navy faces an urgent need for extending its radar range beyond the 100 miles of ship-borne radar.

• **Anti-Submarine Patrol Plane**—The belly radar of the PO-1W is a special type developed by the Navy for use

against the "schnorkel" type submarine which exposes only a small breathing device on the surface. Again the range of the Constellation is important since it can cover large areas on search missions and can carry more powerful radar than can be crammed into a smaller plane.

• **Radar Ferret**—The PO-1W will be equipped with radar detection equipment and counter-radar equipment to jam enemy radar stations. Role of ferret planes in locating enemy radar installations and computing their operational frequencies preparatory to jamming them was an item of increasing importance in the closing months of the last war and is likely to be an even more important function in future air war.

• **Combat Communications Center**—Use of VHF radio requires an airborne relay station to maintain ground to air communications over long distances. The PO-1W can function in that capacity. It can also, by virtue of information obtained from its search radar, function as a combat control center for fighter control against enemy air attack or against submarine activity.

The Navy has three other models of radar picket and search planes—the Grumman TBM modified with a triple tail fin to stabilize the "guppy" belly radome; the Grumman AF-1S a later development of the TBM series; and the Douglas AD-3W which also has a triple tail to counteract the belly radome. However these three planes are powered by a single engine and have a relatively limited range. They are designed for operation from a carrier on search missions aimed primarily at enemy submarines and surface ships.

► **Changed Plans**—In contrast the PO-

1W is land-based, has far greater range and is capable of carrying much more powerful radar and communications equipment. Navy originally planned to use the two Lockheed Constellations for this type of work but later opened the project to competition that narrowed to the Constellation and the Douglas DC-6.

Navy preferred to buy off the shelf commercial transports for experimentation in this field to save money. Lockheed won the competition primarily because of a much lower price.

The two Lockheed PO-1Ws are strictly experimental. Since the Navy is venturing into a broad new field, it is likely that any future requirement for a tactical production line aircraft of this type will be relatively slow in crystallizing.

Bonanza Awarded Southwest Routes

Bonanza airlines has been awarded—with qualifications—the entire Reno-Phoenix route structure in the Civil Aeronautics Board's decision on California-Nevada service.

The Nevada carrier was selected for a temporary certificate permitting it to engage in scheduled transportation of persons, property and mail for three years between Reno, Nev., and Phoenix, Ariz., via the intermediate points Carson City-Minden, Hawthorne, Tonapah, Death Valley, Las Vegas, Boulder City, Kingman and Prescott.

Before certification becomes effective however, Bonanza must:

• **Show sufficient financial resources** to provide such transportation.
• **Acquire from TWA** all route authorizations between Las Vegas, Boulder City, Kingman, Prescott and Phoenix.

► **Experience**—One factor deciding the case in favor of Bonanza is that it has been successfully operating as a Nevada intrastate carrier between Reno and

Las Vegas since 1946. Initial service was three round-trips weekly which was gradually increased until 1947 when one round-trip daily was provided.

The carrier got more than it asked for in its original route proposal. CAB added five intermediate stops—Carson City-Minden, Death Valley, Boulder City, Kingman, and Prescott—while it took away only one, Needles, Calif.

Bonanza won out over Southwest Airways and Arizona Airways, each of which has offered slightly different route proposals.

► **Reasons**—CAB listed these reasons for awarding the route to Bonanza:

• **It has overcome many of the obstacles** encountered in establishing a new air service.

• **Sufficient private capital** evidently is possessed by its president and directors and this can be used to pay for new equipment. It is estimated \$405,869 will be needed.

• **Good will** which its operations already have won should generate more traffic.

• **Independent local organizations** can best serve Reno-Phoenix route through concentration on the area's needs.

The board pointed out that TWA has only partially reinstated service on its Las Vegas-Phoenix route since the end of the war, and said that TWA "faces difficulties in providing convenient . . . schedules due to the east-west pattern of its route system in that area."

► **Turndown**—CAB recommended that TWA transfer its Las Vegas-Phoenix route to Bonanza. It turned down Arizona Airways' application for a Phoenix-Reno route on the grounds of insufficient financial resources to expand. It also rejected Southwest's Phoenix-Reno application, saying the carrier's full efforts were needed to develop its present route structure.

In line with its award to Bonanza, the Board in a separate action refused a petition by TWA to transfer its Phoenix-Las Vegas certificate to Arizona Airways.

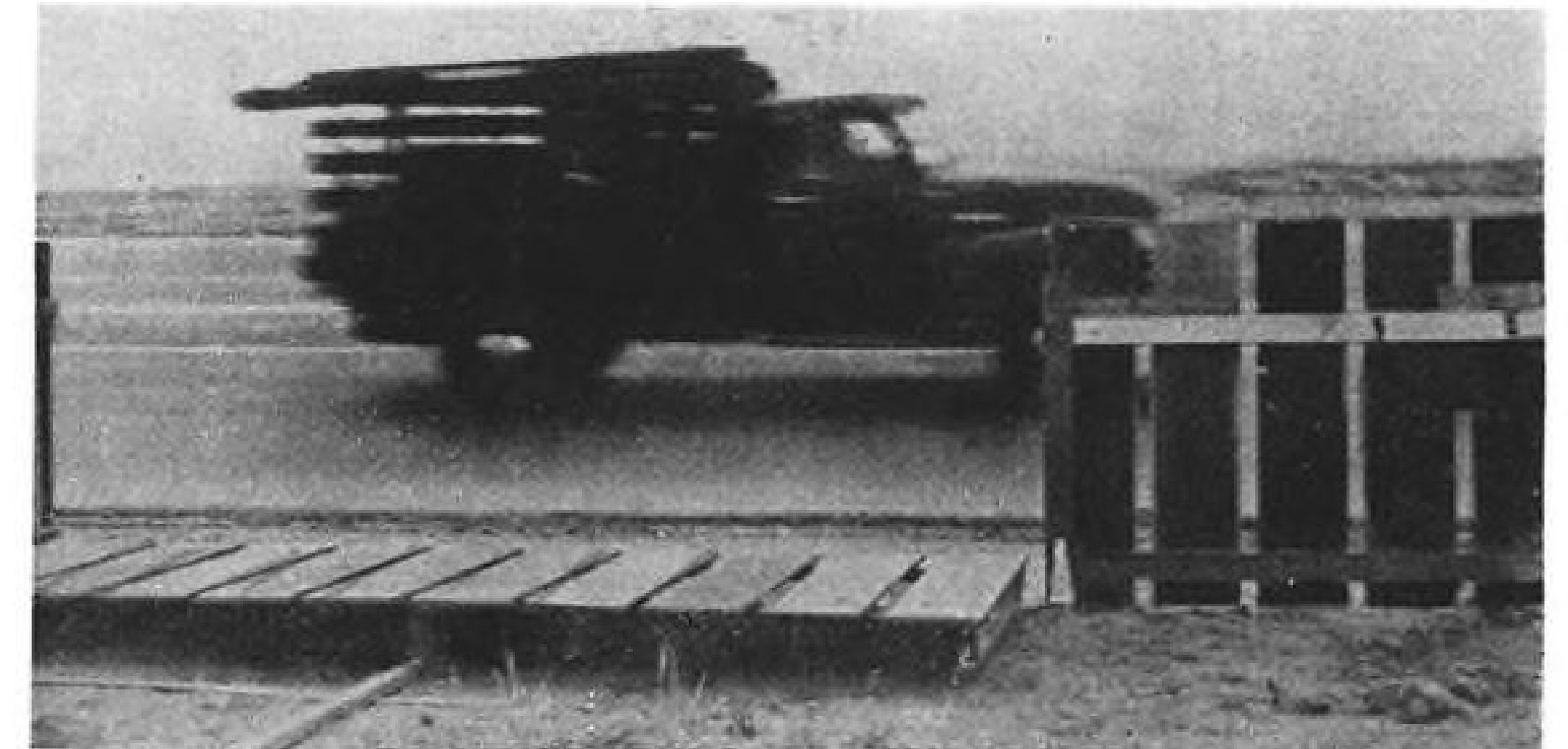
Vought Sues UAW

The United Auto Workers (CIO), which has been engaged in a running battle with the International Association of Machinists (Independent) to organize Chance Vought Aircraft's Dallas production force, obtained lists of employees improperly from the company's files to use in the UAW drive, according to a court action brought by Chance Vought.

The aircraft company sought return of the lists, allegedly furnished to UAW representatives by a former Chance Vought tabulating department employee, and asked an injunction to block the union's use of the names.



Safety margin for Stratocruiser at Los Angeles Airport was provided by replacing heavy wire fence at end of 6000-ft. runway with a wooden fence that is . . .



. . . Lowered when the big new transport takes off or lands. Across the road, beyond the passing truck, is a 2000-ft. cleared strip in line with the runway.

Stratocruiser Certification Hit

Behncke says "Rube Goldberg" schemes are used at Los Angeles as plane does not meet CAB rules.

Charges that the Civil Aeronautics Administration changed its safety regulations to permit certification of the Boeing Stratocruiser have been made by David L. Behncke, president of the Air Line Pilots Assn. Behncke testified before the Senate Interstate and Foreign Commerce Committee group which is investigating the airline financial picture.

Behncke blamed CAA's regional administering of safety regulations for what he termed the many concessions to air safety made in certifying airline transports. He said that because of the CAA's regional organization the safety picture was so confused that neither the CAA Administrator in Washington nor the regional administrators in the field could give a clear picture of what was going on in air safety regulation.

► **Charges Changes**—"Air safety regulations were created governing the construction of the new giant Boeing Stratocruiser," Behncke told the Senate group. "The plane is built and it is found that it will not meet federal regulations governing its engineering and performance so what happens—the regulations are changed to fit the plane,

instead of the plane fitting the regulations.

"This happens repeatedly. For example we recently inquired about the Boeing Stratocruiser to find out how things were going. We contacted the Administrator's CAA office. He didn't say so in so many words, but what he obviously did was to check up with the regional director in Seattle and learn that the regional director had permitted the Boeing Stratocruiser to be licensed even though it could not meet present Civil Aeronautics Board performance regulation requirements without permitting partial use of reverse propeller to assist the wheel braking action in bringing the plane to a stop to conform to 'accelerate and stop' runway lengths required on today's airports."

► **Lists Devices**—"Also, automatic propeller feathering replaced the original windmilling climb-out regulations. Further, water injection added an increment of horsepower to the engines which in turn added gross weight to the airplane. A selective center of gravity loading arrangement also permitted added gross weight. Apparently all this was done in one CAA region with Washington approval."

Behncke presented an exhibit to show the extraordinary measures being taken at Los Angeles Airport to accommodate the Stratocruiser. Behncke said that the Stratocruiser requires a 7000-ft. runway to meet current requirements of the transport category, Civil Air Regulations. The longest runway at Los Angeles Municipal Airport is 6000 ft.

► **Clear Strip**—To accommodate the Stratocruiser in emergencies, Behncke said a 2000-ft. strip has been cleared off the end of the 6000-ft. runway. In addition, a heavy wire boundary fence has been replaced at this runway's end by a light wooden fence, presumably because it would do less damage to a plane overrunning the runway.

Later, according to Behncke, hinges were added to the board fence to be used in connection with a highway traffic signal that regulates automobile traffic on the road that slices between the runway end and the beginning of the 2000-ft. emergency strip. Behncke told the Senate group that this signal is operated by the airlines using the Stratocruiser, since the CAA control tower refused to accept responsibility for its operation.

► **Take-off Routine**—Stratocruiser take-off procedure, according to Behncke, will involve: flash red lights to stop highway traffic; lower the board fence; and then clear the Stratocruiser for take-off. The same process will be repeated for landings, Behncke said.

Other proposals to give the Stratocruiser more runway length include sinking the highway below airport level and building a 250 ft. wide bridge over the road to connect the runway with the emergency strip; and re-routing the highway through a tunnel.

► **Wants Board**—"I cite this to show you the state of confusion that now exists and why an independent air safety board is necessary," Behncke said. "Such a board would look at the situation and how could it say anything but the following. 'We recommend that all these Rube Goldberg Los Angeles Municipal Airport runway lengthening schemes be abandoned, and unless the City of Los Angeles can supply a runway sufficiently long and constructed so as to permit the Boeing Stratocruiser to operate safely, the airport must be closed to the Boeing until the City of Los Angeles supplies such a runway.'"

Copter Road Boss

The Alaska Road Commission has leased a helicopter from Alaska Airlines to supervise a road survey from Paxson to Mount McKinley Park, permitting supervisors to cover a greater multitude of projects and eliminate communications, transportation and similar problems.

Standard's Operating Record

	Los Angeles To New York	New York To Los Angeles	Chicago To New York	New York To Chicago
	No. of Days Flights Operated	No. of Days Flights Operated	No. of Days Flights Operated	No. of Days Flights Operated
1947				
July	15	14	15	9
August	9	10	15	5
September	12	14	18	9
October	10	11	18	8
November	7	7	10	4
December	11	7	13	8
1948				
January	9	10	8	9
February	6	10	7	7
March	6	7	5	3
April	13	15	12	11
May	20	19	19	14
June	21	23	16	16
July	27	22	20	19
August	24	25	21	17
September	16	15	16	12

CAB Orders Standard To Quit

Revokes nonsked's registration letter and asks Justice Department to prosecute for alleged law violations.

In its most drastic action against non-scheduled passenger carriers, the Civil Aeronautics Board last week moved to put Standard Airlines out of business.

CAB took the following action against Standard:

- **Revoked its letter of registration.**
- **Ordered Standard to cease to engage** in any form of air transportation beginning 30 days from the date of the Board's order.
- **Requested Department of Justice** to institute criminal proceedings against Standard under section 902 of the Civil Aeronautics Act. This section makes any person who knowingly or willfully violates the act of any requirement thereunder guilty of a misdemeanor punishable by a fine of \$500 for the first offense and up to \$2000 for any subsequent offense.

The Board charged that such drastic action against Standard was necessary because the airline's action in the past "convinces us that no action short of revocation will succeed in eliminating the illegal services which the respondent (Standard) has stubbornly persisted in conducting. Its deliberate purpose to violate section 401A of the act and section 292.1 of the regulations, as revealed by the record, admits of no other conclusion."

► **Used DC-3s**—Standard Airlines was one of the larger non-scheduled pas-

senger carriers with headquarters at Long Beach, Calif. It operated six DC-3 transports and employed 85 persons. Its officers included L. Stanley Weiss, president; James Fishgrund, vice-president, and Mrs. G. Weiss, secretary-treasurer.

The Board issued Standard a letter of registration as a large irregular air carrier on Mar. 11, 1948 in accordance with section 292.1 of the Board's economic regulations.

CAB charged Standard with the following violations:

- **Conducting regular operations** not covered by the exemption provisions of section 292.1. The Board found that Standard's operation since Mar. 11, 1948, between Los Angeles-New York and Chicago-New York were of such frequency and regularity as to "violate beyond all question all standards relating to irregular air services."

The Board also noted that Standard's operations between June 10, 1947, and Sept. 20, 1948, were also more frequent than contemplated in non-scheduled exemptions although they did not approach the intensity of later operations.

The Board contended that Standard during June and July of 1948 operated a daily eastbound service between Los Angeles and New York (exclusive of Sunday) with the exception of six days.

Standard's operations during this same period from New York to Los Angeles were on substantially the same scale, according to the Board.

On the Chicago-New York run Standard operated flights on an average of 50 percent of the time during the last six months of 1947.

• **Willfully and knowingly offering** such regular service to the public. The Board contended that Standard consistently offered regular transcontinental air service by means of ticket agents, letters, advertisements and business cards. The Board held that Standard was responsible for the acts of its agents in so offering regular service to the public.

Board investigators were told by Standard ticket agents that the carrier operated daily service from San Francisco to Chicago and New York. Another CAB investigator was advised by Standard's Long Beach office that the carrier provided similar daily service from Long Beach to Kansas City. Authorized Standard ticket agents said they were selling tickets for daily except Sunday service by Standard from Long Beach to Chicago, New York, Kansas City and Cleveland.

► **Disregarded Notices**—CAB contended that Standard had consistently disregarded all attempts on the part of CAB representatives to point out the illegal phases of the airline's operations and made no attempt to re-adjust its operations to the scale indicated by CAB in the Trans-Caribbean case which outlined the frequency standards allowable for nonscheduled operations.

The Board issued an order to Standard on May 20, 1948, to show cause, which specifically informed the carrier that its operations were not within the limitations prescribed by the Board under section 292.1. Later the Board served another notification to Standard that its operations were still excessive under the regulations.

► **Violations Increased**—"Despite these notifications," the Board noted, "Standard made no attempt to curtail its operations. On the contrary its operations and representations to the public with regard to regularity of service actually increased."

The Board also charged that Standard had failed to file a tariff until Dec. 18, 1947, although section 403 of the Civil Aeronautics Act required it by June 10, 1947. The Board charged that on a number of occasions Standard charged more and less than the tariff it filed with the Board.

► **Report Failures**—Violation of part 407A of the Act was charged because of failure of Standard to file flight reports on the frequency of flights during February and March, 1948. Standard contended that these were charter flights but the Board held that flights

chartered to a ticket agency were common carriage and not legitimate charter operations.

Standard was also charged with unfair and deceptive practices in soliciting military traffic in the San Francisco area. The Board contended that Standard's agents displayed signs in Navy ships in San Francisco harbor offering 10 to 20 percent discounts for service men and immediate airline reservations to all major cities. The Board said Standard's president and the agent in question testified that no such discount or special consideration for service men was actually intended and the signs really referred to the difference between rates charged by Standard and those of the scheduled certificated airlines.

In justification of its treatment of Standard, the Board stated that "the carrier by its bold and flagrant and persistent disregard of the Civil Aeronautics Act is in no position to plead for a lesser penalty. Failure to revoke the carrier's letter of registration and to apply all sanctions available for the prevention of further violations by it would make a mockery of the law, the enforcement of which has been entrusted to us by the Congress."

T-28 Test Model

North American Aviation Inc. is building the static test model of its T-28 trainer for the U. S. Air Force. Meanwhile production line for the balance of the USAF order for 268 T-28s is taking shape at NAA's Inglewood, Calif., plant.

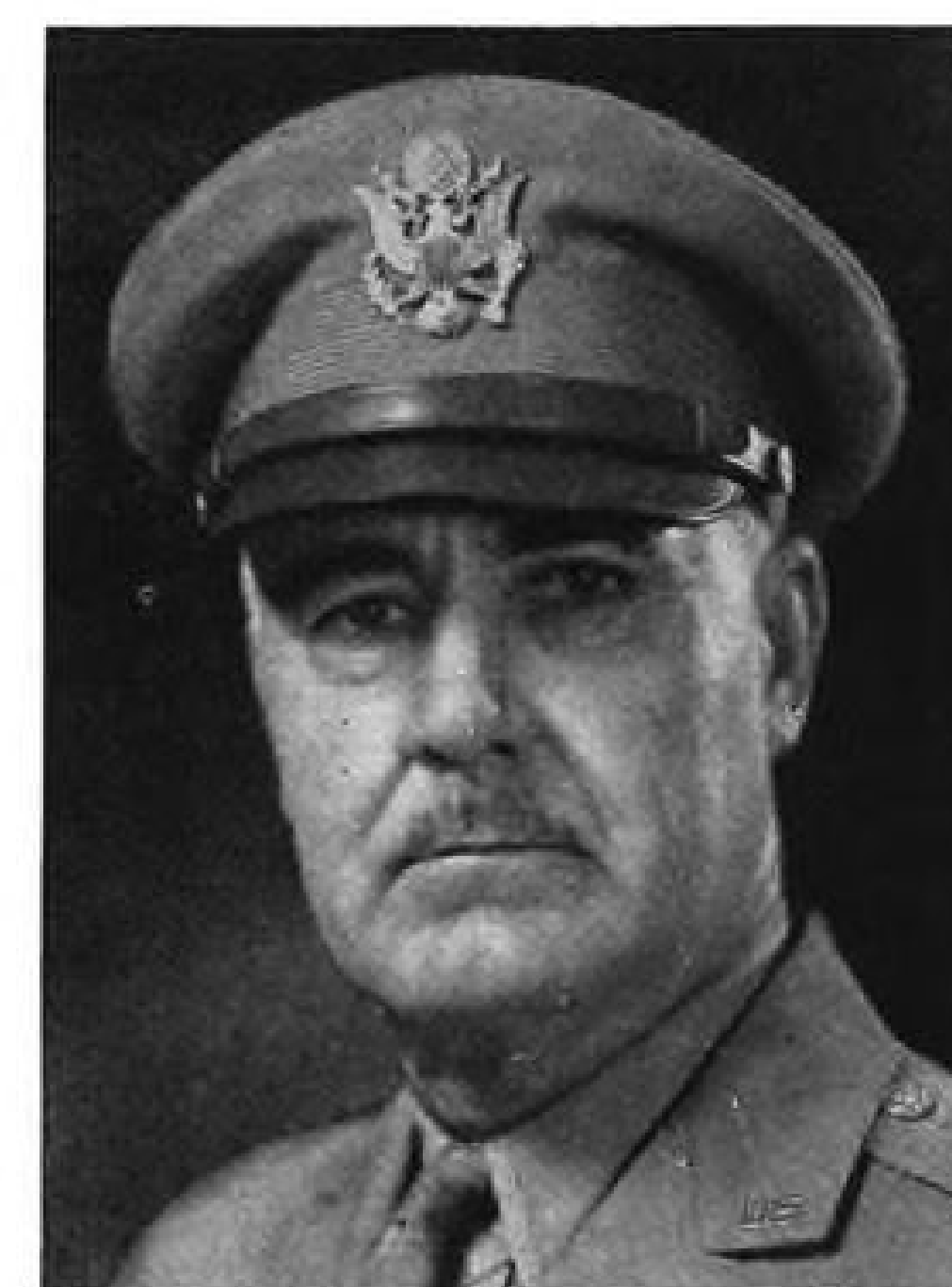
The T-28 will be powered by a Wright 800 hp. Cyclone 7, a new engine also used in a new model Good-year Navy blimp and the Northrop trimotor Raider. North American has received its first Cyclone 7 engine and twin-blade Aeroproducts propeller to be used on the T-28.

Meanwhile at NAA's Downey, Calif., plant, Navy pilots of Composite Squadron Five were receiving indoctrination on the AJ-1 carrier-based bomber. They will be first Navy squadron equipped with the AJ-1. It is powered by two Pratt & Whitney R-2800 piston engines and an Allison J-33 turbojet.

AOA's Stratocruiser

American Overseas Airlines has taken delivery on its first \$1.5 million Stratocruiser from Boeing Aircraft Co.

The craft is the first of eight purchased by AOA from Boeing. AOA will use the 60-passenger Stratocruisers for nonstop service between New York and London and New York and Shannon. First Stratocruiser is scheduled to go in passenger service on Aug. 17.



Maj. Gen. Edward M. Powers

Powers Gets New Curtiss-Wright Post

Creation of a new post at Curtiss-Wright Corp. and selection of Maj. Gen. Edward M. Powers (USAF, Ret.) to fill it were announced last week by Paul V. Shields, chairman.

As vice president and director of engineering, Powers will coordinate engineering activities at Wright Aeronautical Corp. and the propeller and airplane division of Curtiss-Wright.

Shields had written stockholders a few days earlier that selection of a president "to coordinate the manufacturing operations of the several Curtiss-Wright divisions" had been deferred pending management studies.

► **Production Emphasis**—In describing initial policy in management reorganization following retirement of Guy Vaughan, former president and board chairman, from active participation in the organization, Shields said greater emphasis would be put on engine production facilities of Wright Aeronautical.

He blamed first quarter loss \$759,864 principally on cost of experimental projects, some of which have been discontinued (AVIATION WEEK, May 30). Retroactive price decrease adjustments also were a factor.

Sales for the first three months of this year were improved over a year ago, he pointed out, and the unfilled orders backlog was increased by about \$19 million.

Shields described Powers' appointment as "another step in the realignment of Curtiss-Wright's board manufacturing and technical organization."

Powers spent more than 30 years with the air forces.

AVIATION WORLD NEWS

Shanghai Air Service to Resume

Chinese Communists also expected to permit internal air system, but some existing lines are in disfavor.

By A. W. Jessup

TOKYO—Chinese Communists last week were ready to let foreign airlines resume operations to Shanghai.

Shortly before the fall of the city to the Communists, all international airlines halted service. Northwest Airlines and Pan American Airways began routing their Tokyo flights via Okinawa to Hongkong and Manila. But both left representatives behind to make contact with the Chinese Communists and to explore methods of reopening service to Shanghai.

►Northwest's Aims—D. J. King, NWA's vice president for the Orient, who remained in Shanghai, has long expressed confidence that operations to Shanghai would continue, after a break during the takeover period. He also has been investigating possibilities of opening service to North China, into either Peiping or Tientsin, for which Northwest has been certificated.

One probable cause for the delay is the lack of official diplomatic relations with the new regime. The general view of the foreign powers was that they would grant de facto recognition to the Chinese Communists. So far the Chinese Communists have been scrupulously correct in their contact with foreigners but have left no opening for establishment of anything but de jure relations.

An encouraging development has been permission for foreign ships to return to the Whangpoo River anchorages.

►Internal Service—Internal air service in China is another matter. But it is highly probable that Central Air Transport Corp. (CATC) will soon operate in Chinese Communist areas. Moon Chin, American-born Chinese chief of CATC, is still taking delivery of six Convair-Liners at Hongkong. The only reason for so doing is that he plans to reopen internal service in China.

One of Chin's executives told AVIATION WEEK's correspondent in Shanghai last December, "There is every possibility that CATC will go on serving China. The country needs air transportation no matter who runs the government."

CATC, is a completely Chinese-

owned and operated company. It was a personal creation of Chin, who kept it Chinese. It compiled an excellent service record flying in China since the end of the Japanese war.

China National Aviation Corporation (CNAC) may have greater difficulty. For one thing it was partly owned (20 percent) by Pan American, and it was managed almost completely by foreign personnel. The Chinese Communists may say that if CATC can be a full Chinese operation, why can't CNAC? Also, for some reason, CNAC was considered more closely tied up with the Nationalist government than CATC.

►CAT Prospects Dim—Claire L. Chennault's Civil Air Transport (CAT) is about washed out of China. CAT has no hope of operating in Communist China. Chennault and his airline are considered by the Chinese Communists to have been part of Chiang Kai-shek's combat forces.

There was also great criticism of CAT in Chinese nationalist circles. One recent governor of the Central Bank of China months ago complained off the record, about the pressure which Chennault used to force allocation of U.S. dollar exchange to CAT. When Chennault did not get what he wanted he

threatened to go to Chiang. The governor's comment was: "What could I do?"

Proposals for CAT to operate in China's Mid- and South-west can only become reality if the U. S. grants dollar aid to warlords in those areas. The dollar expense would be phenomenal for such an airline. And CAT's primary objective throughout its operations was to earn dollar exchange.

The warlords and their possible backers aren't likely to utilize any balances they may hold in the United States to pay for a foreign airline. They will if the U. S. passes out the coin. Otherwise they will hold their deposits in the U. S. to retire on.

USAF Taking Part In RAF Exercises

LONDON — Britain's skies once again will be filled with planes, and aircraft spotters will be at their posts for the Royal Air Force's summer air defense exercises ending July 3.

Anti-aircraft guns and fighters will attempt to defend the country against an attacking force of RAF fighters, bombers and Superfortresses of the 3rd USAF Air Division. It will be the first time the Western Union air forces are represented in the exercises.

France, Belgium and the Netherlands are sending officers as observers, some of whom will have active tasks. The Netherlands will contribute a squadron of Meteors to the defending forces.

Fighter Command Hornets will make low-flying daylight raids on airfields and other targets. Photo recon Spitfires and Mosquitoes will also take part.



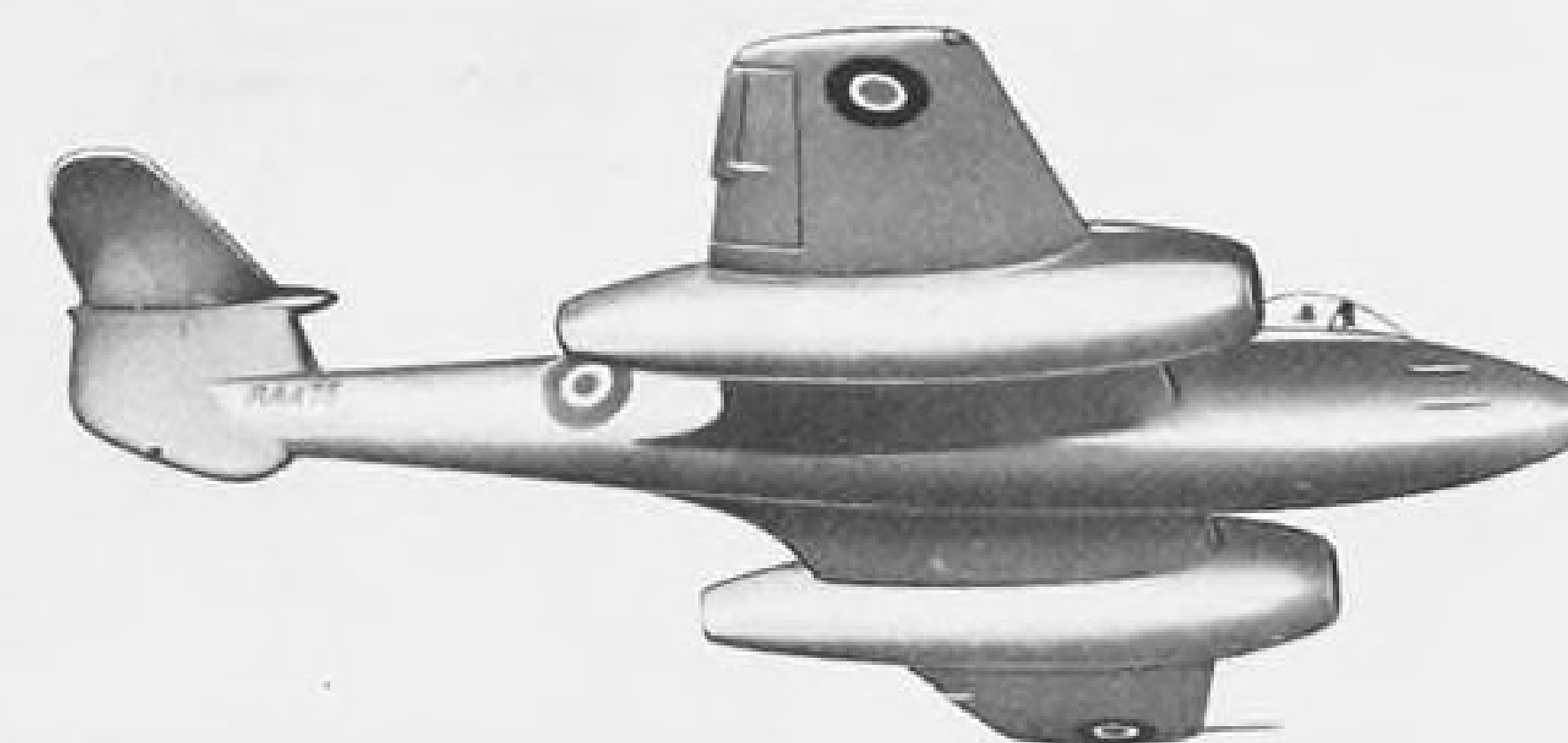
BALLIOL PRODUCTION LINE

First four planes of an RAF order for 17 Boulton Paul Balliol Mk. 2s are shown nearing completion at Wolverhampton, England. Balliol, a two-place fighter-trainer, is powered by a 1280-hp. Rolls-Royce Merlin

engine. Craft has a maximum speed of 305 mph., at 11,500 ft., and cruising speed of 280 mph., at 10,000 ft. Balliols will be sent to RAF units in Britain, India and Rhodesia for further testing.

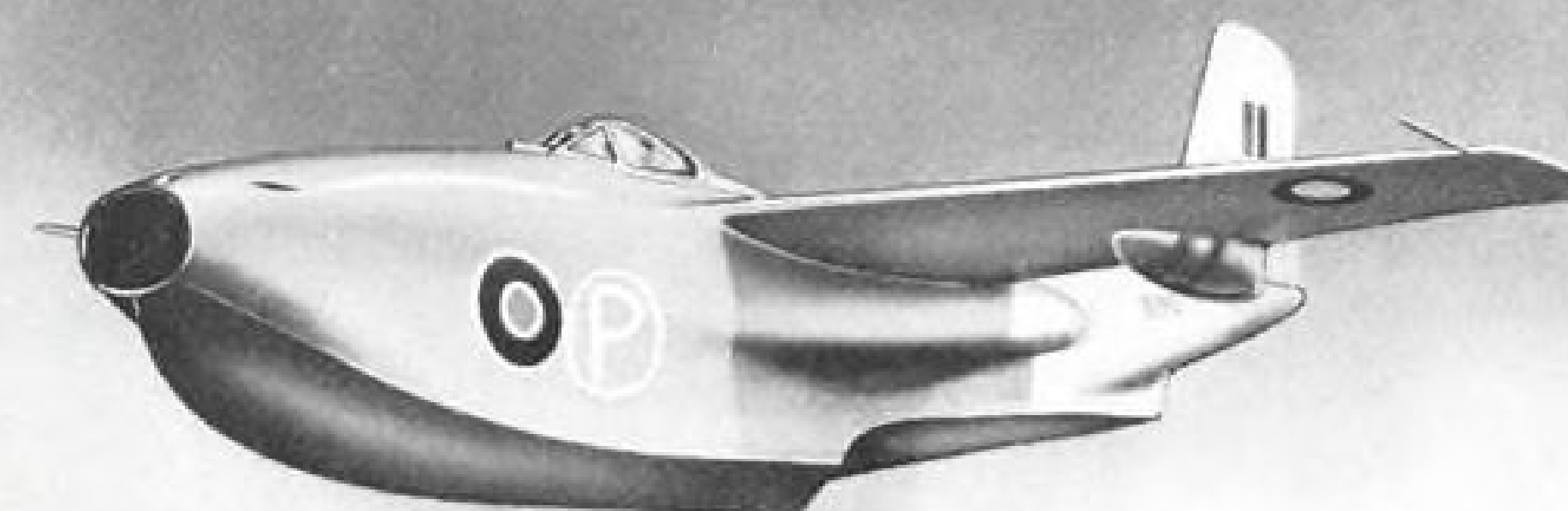
GLOSTER

METEOR IV



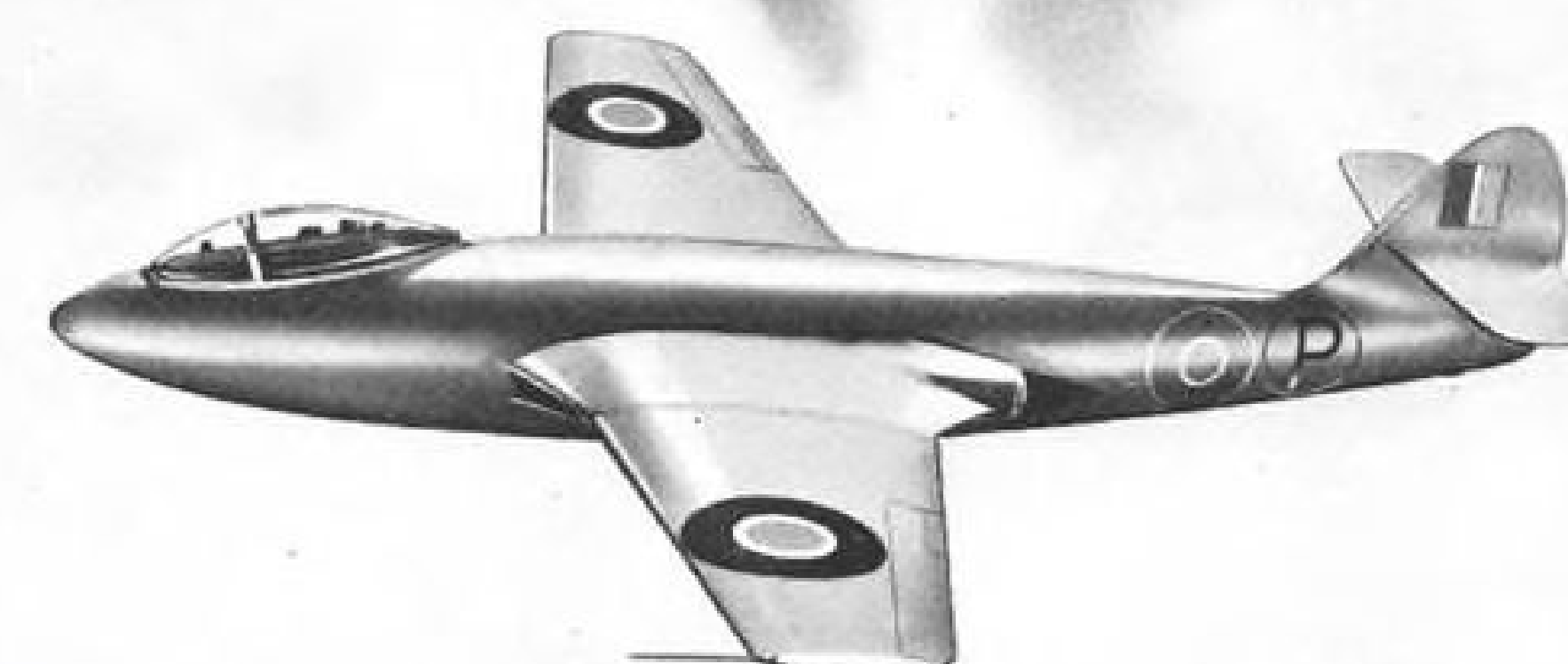
SAUNDERS-ROE

S. R. A1



HAWKER

N7/46



Famous jet fighter Aircraft

DOWTY
Equipped

DOWTY CORPORATION • 25 BEAVER STREET • NEW YORK 4, N. Y.
DOWTY EQUIPMENT LIMITED • CHELTENHAM • ENGLAND
DOWTY EQUIPMENT OF CANADA LIMITED • AJAX • ONTARIO • CANADA

ENGINEERING



BRITISH GIANT, 177-ft. Brabazon, world's largest commercial passenger-type plane, is being readied for flight trials. Craft is first of two being built. Second, turboprop powered, is slated for 1951 completion, to carry 100 passengers on trans-Atlantic run.

Big Bristol Brabazon Nears Flight Stage

First of two 100-passenger transports to be used as research craft. Views vary on plane's feasibility.

(McGraw-Hill World News)

LONDON—Following towing tests to determine turning radius, it is likely that Britain's giant Bristol Brabazon will begin its taxi trials by the end of this month.

And it is scheduled to fly in July, unless final checks reveal conditions that make additional work mandatory.

► **Not Largest**—The 290,000-lb.-gross weight of the "Brab" is topped only in current landplanes by the B-36's (320,000), is also below that of the Hughes flying boat (400,000), but exceeds those of the XC-99 (265,000), Constitution (184,000), French SE 2010 Armagnac (161,000) and Strato-cruiser (142,000).

Its 230-ft. span is equal to that of the XC-99 and B-36; its 177-ft. length is 5½ ft. less than the XC-99's, 15 ft. more than the B-36's.

► **Jet Competition**—Designed to carry 100 passengers in considerable luxury, non-stop, from London to New York in about 12 hr., the Brabazon is Britain's bet that there's room in the air for the counterpart of the "Queens" on the sea.

The British have a faster trans-Atlantic liner on the stocks—the de Havilland "Comet" four-jet job, which unofficially is expected to make the crossing in 6 hr., carrying 40 passengers. The Comet should be ready to fly about in September, this year.

British Overseas Airways—most likely customer for either plane—is markedly pro-Comet and rather cool toward the Brab.

► **Opinions Differ**—Most observers here think the Brab will not be a paying proposition. And they view the \$50 million which the British taxpayer has poured into its development so far (including cost of putting up the world's largest hangar-assembly hall to build it in, and a specially reinforced runway to try the plane) as a poor gamble.

Because, they argue, there will never be a demand for more than one Brab—or possibly two, as the airborne equivalents of the Cunard luxury-liners. The traffic, they say, just won't bear the fare that would have to be charged to make the craft pay their way.

Other, more bullish, enthusiasts of air transport, look ahead to the years when a large fleet of giant airliners will regularly span the ocean—and call the Brabazon a good investment.

► **No Chances Taken**—However, work on the first Brabazon goes forward. First of two "prototypes" has already received a new set of engines. In all, the Brabazon has 20,000 hp.—from eight 18-cylinder, radial, air-cooled, Centaurus 20 piston engines, also built by the Bristol Aeroplane Co.

First set of eight were not worn out, or defective, or in any other way of need of change. They had only been run up a few hours (relatively). It was just that the company felt it would leave nothing to chance—so they were changed.

► **First for Research**—But this first Brabazon is not intended to carry passengers—certainly not for fares. It is destined to be used entirely for research on the many problems involved

in building aircraft of this size.

The sister ship will start taking shape shortly. This craft may be the first of her size to cross the ocean—but probably not until 1951.

It will have one basic variation from the first craft. Instead of piston engines, it will have eight gas turbines.

The eight engines, in both planes, are to work in pairs to drive four contra-rotating (three-bladed) propellers.

A special gearbox links the engines to the propellers. In effect, one engine drives the forward propeller, another drives the rear prop.

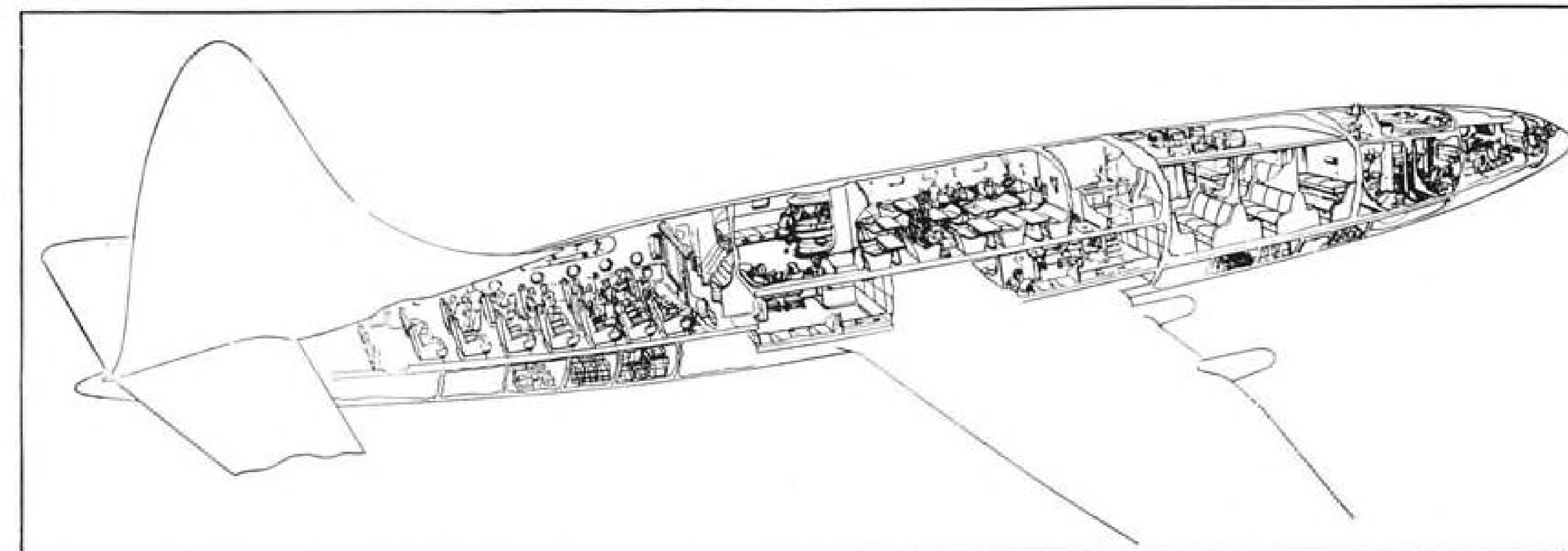
► **Compartmentation**—BOAC, obviously the only potential purchaser for the Brab of the two remaining British airlines, has not settled finally on the interior arrangements. One proposed arrangement is shown in the accompanying sketch.

Baggage and mail holds are below the two main cabin decks; dressing room and toilets are below the dining salon. Crew's sleeping quarters, rest room and toilet, and the bullion room and astro station—segregated entirely from passenger accommodations—are forward of the front cabin and immediately aft of the cockpit and flight deck.

► **Passenger Accommodations**—Main passenger compartment, seating about 30 to 40 people, is in the fuselage rear.

Since clouds will be the only view from the windows for the greater part of the journey, passengers will be able to follow the airliner's route by an illuminated chart on a screen. The compartment will also be used for showing motion pictures.

More passengers will be accommodated in two smaller compartments, one on each side of the fuselage just ahead of the wings.



ONE INTERIOR ARRANGEMENT for Bristol Brabazon has dining salon and bar on center upper deck, with rest rooms below. Passenger cabins are located fore and aft, with storage facilities below floor. Accommodations for crew members are behind the control cabin.

► **Double Deck**—Mid-section of the liner is divided into two decks. Entrance for passengers is by a door just behind the wings, opening to a wide staircase leading up to a spacious cocktail lounge. This is fitted with couch seats, and the small bar is compactly fitted into the corner.

Beyond is a large dining room with seating and tables for about 30. When meals are not being served it will provide a comfortable and roomy lounge and reading room.

A service hatch opens directly into the kitchen, positioned at the other end of the dining-room. On the opposite side of the fuselage is the food-store, which is also accessible by hatchway from the dining-room.

► **Airfoil Makeup**—The wing comprises three sections—a center section or inner wing and two outboard panels.

Extending completely through the fuselage, the inner wing has a span of 100 ft. and a maximum depth of approximately 6½ ft.

The two outboard panels, each 65 ft. long, contain 27 flexible fireproof tanks to carry the full fuel load of 13,500 gal. Wing area (gross) is 5317 sq.ft.

► **Fuselage, Pressurization**—The 177-ft. body has a maximum diameter of 16 ft. 9 in. Span of the tailplane is 75 ft., and height over rudder is 50 ft.

The craft will be pressurized to maintain an equivalent cabin altitude of 8,000 ft. while flying at 25,000 ft. It will be humidified and air-conditioned.

In addition to the 100 passengers, it will carry a flight crew of seven, and five stewards.

► **Estimated Performance**—With gross weight of 290,000 lb., the Mk. I aircraft will have an initial operating ceiling of 25,000 ft., increasing as fuel is consumed; maximum level speed of 300 mph. at 25,000 ft.; recommended economical cruising speed of 250 mph. at 25,000 ft.; and a rate of climb of 750 fpm.



CRAFT'S ROOMINESS is pointed up in this view of rear compartment. Fuselage diameter is 16½ ft. Construction shows conventional belt frame and stringer makeup.



HUGE contra-rotating propellers are driven by coupled Bristol Centaurus piston engines. Second Brabazon will be fitted with Bristol Proteus turbines, have smaller air intakes.

at operating altitudes of 20,000 ft. and above.

► **Second Craft Improvements**—The second Brabazon, to be powered by Bristol Proteus turboprops, will incorporate lessons learned as a result of experience with the first craft.

It is slated to have a cleaner configuration, eliminating the external observation dome and external mass balances on the controls. Main landing gear will retract completely and will obviate small protuberances in the fairing doors.

And air intakes for the turbine engines will be considerably smaller than the cooling scoops used for the Centaurus piston powerplants.

Fire Test Evaluates Aluminum Foil Suit

Pushing research to develop a heat- and flame-protective suit for aircraft fire-fighting, the Air Materiel Command recently conducted a test at Wright-Patterson Air Force Base which indicates that an aluminum foil-Fiberglass laminated garment possesses favorable characteristics.

Six suits under study by the Aero Medical Laboratory were similar in design, differing only in principal protective layer. All were lined with 22-oz., wool-knit material for insulation. Components included trousers, coat, gauntlets, helmet with heat-resistant Plexiglas window, and gaiters over arctic-type galoshes.

Intended to afford heat reflection in use against structural fires, the garments were not designed to be worn into flames although this could be done for a short period, in an emergency.

For test purposes, the suits were worn in fairly close proximity to a 2000-F. fuselage blaze.

Identified according to protective layer, the garments enabled the experimenters to withstand the intense heat for these periods:

- Untreated cotton duck (wetted)—29 sec. (Figure is considered high because wearer stood at edge of pit, was subjected to less heat than others.)
- Neoprene-coated Fiberglass—8.4 sec.
- Fire- and water-proofed cotton duck—25 sec.
- Aluminized Fiberglass—31 sec.
- Aluminized cotton duck—24.8 sec.
- Aluminum foil-Fiberglass laminate—45 sec.

With exception of the aluminum foil laminated garment, all suits were singed or burned through to the insulating lining.

Though the endurance periods clocked seem short for all garments, they undoubtedly would be extended with use of fire hose.

Joint Air Meeting Gives New Data

IAS-RAS second international conference assembles authorities to exchange wide range of information.

"When you lock the door on a research laboratory, you lock more information out than you lock in." With this quotation of C. F. Kettering, T. P. Wright summed up the real purpose and value of the second international conference recently sponsored jointly by the Institute of the Aeronautical Sciences and the Royal Aeronautical Society in New York.

But far more important than the mere interchange of formal papers is the personal contact and resulting friendships that produce intangible but invaluable benefits to the profession of both nations.

A vital function of the meetings is to bridge the obvious gap in "approach" between the engineers of the two nations. There remains little question that if the U.S. could use more of the British "practical" technique, and the British more of the U.S. "engineering" technique, both nations would profit enormously.

► **British Approach**—The British development of the turboprop is a classic example of this approach in which the problem was attacked by a veritable deluge of prototypes and succeeding models hammered out in a prolific and seemingly endless stream.

Throughout their extensive turboprop (and turbojet) program, they have taken the mechanical, experimental approach in which the wrench and the eye carry the burden of development, rather than the wind tunnel and computing machine, as in the U.S.

Their flight test program has been a parallel experimental approach with first one engine and then another installed in the outboard nacelles of first one bomber and then another.

Their program amasses an huge quantity of experimental data, through the scattered points of which a curve can be drawn that is created originally in the U.S. by computation. That this computed curve may be off a slight amount is more than justified in the light of the erratic scatter of experimentally derived curves.

► **Our Action**—But upon completion of such an experimental program, the British have a thoroughly tested engine ready for production installation, whereas the U.S. effort would have produced only a theoretically perfect prototype, whose basic arrangement was superior but whose mechanical parts contained innumerable "bugs" that only service test could remove.

This contrast in approach is paradoxical.

The U.S. approach is cheaper, but the British have far less money to spend. Thus, the money-poor British use the expensive approach, whereas the affluent Americans use the economical approach. Which facilitates more rapid progress is a moot question that partisanship cannot answer.

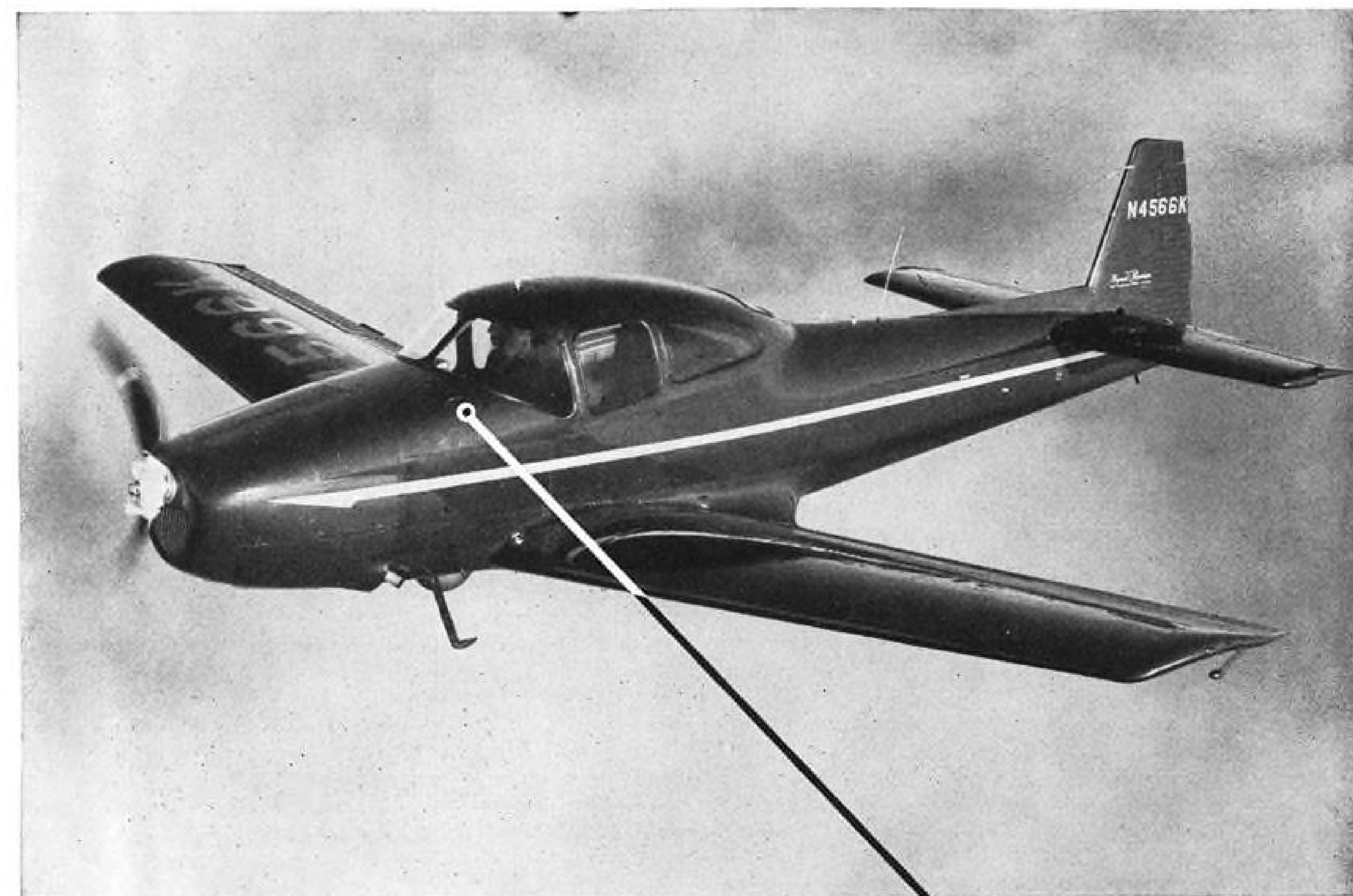
It is erroneous to answer this question on the basis of the turboprop, development in which has been determined more on the basis of policy than by technical progress. Only in those areas in which both national policies have been the same, such as in turbojet engines and highspeed airframes, can the relative effectiveness of the two approaches be compared directly. Assuredly there is comparatively little to choose between the results of the respective developments in these fields, although it is a fact that the U.S. holds both supersonic and subsonic aircraft speed records at the moment.

► **Opposing Statements**—It is only against this background of a duality of national policies and technical approaches that much of the significance of the Second International Conference can be accurately assessed. For example, both Frank Owner, Bristol, and George Edwards, Vickers-Armstrongs, expressed the view that there exists an optimum compressor pressure ratio and turbine inlet temperature beyond which economy falls off. This is in direct contrast to the view of Abe Silverstein, NACA, who believes that the higher these two quantities are, the greater the resulting efficiency.

Apparent impasse here lies in the airspeed at which these turbine engines are to be operated. At the 3-400-mph. speed, in terms of which these noted British engineers are thinking, their finding is probably quite accurate. But for the transonic speed in terms of which Silverstein is thinking, his findings are also accurate. Thus, the question of design policy determines the accuracy of these two statements, not simply the statements themselves.

► **New Slants**—There was much that is new at the conference, together with considerable ploughing of old ground, valuable, too, when properly done. A discussion of the effects of high altitude on various aircraft structural materials was offered by Maj. Philip Teed, Vickers-Armstrongs, a metallurgist of worldwide repute.

He projected various metals into conditions of very low pressure, low density, low moisture content and extremely



Ryan tried them all!
—and picked the **RCA One-Sixteen**.....
for the '49 Navion



THE RCA ONE-SIXTEEN is standard equipment in the '49 Navion.

In one of the most elaborate comparative tests ever made on personal or business plane radios, this compact, single-unit transceiver *outperformed everything in the field*. It passed all the rigid inspections in the Ryan laboratories. It stood up to every test in the air. And it was voted top choice by impartial engineers, flyers, and plane owners who were invited to fly it themselves.

Elaborate comparative testing is the ideal way to select your new personal plane radio—if you have the facilities. But you can save yourself the trouble. Benefit by the Ryan tests. SPECIFY THE ONE-SIXTEEN.

EVERYTHING IN ONE PACKAGE

- **Entertainment**—Complete coverage of standard broadcast band.
- **Four-Course Ranges**—Continuous tuning 200-400 kc. Built-in range filter.
- **Marker Beacons**—75-mc marker signals received clearly while flying the beam, or direction finding.
- **Tower Communications**—Covers 200-400 kc by manual tuning. Six VHF transmitter channels.
- **Loudspeaker Output**—For cabin loudspeaker—also headphone operation. Speaker switch on front panel.
- **Interphone**—For large cabins, or two cockpits.
- **Loop Direction-Finding**—Operates on either broadcast or beacon bands with any RCA loop.

See the ONE-SIXTEEN at your RCA distributor today. For illustrated folder, write Dept. 9F.



AVIATION SECTION
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

low temperature, and produced data both alarming and reassuring.

It was brought out that aluminum alloy simply gets stronger and tougher as conditions climb into the stratosphere. This process actually continues until the temperature of liquid nitrogen is reached, which is about as cold as any aircraft will ever get.

Generator commutator brushes do not fair so well, as is becoming increasingly clear in this country, although Maj. Teed offered a new explanation: The aqueous vapors at low altitude replace the cupric oxide worn off but at high altitudes, where the aqueous vapor content of the atmosphere is only 1/1000 of the sea level value, this action is impossible, resulting in rapid brush wear and consequent breakdown in generator output.

► **Notch Research**—Maj. Teed has done some important work on notch fatigue, which has vital bearing on the ominous cloud gathering over 75S alloy in this country.

Although his work was carried on with test specimens of welded fishplates, of interest to the shipbuilding industry, he obtained significant data of great interest to the aircraft industry on both sides of the Atlantic.

Sensitivity of various alloys to notches (representing discontinuities of all types) is only now becoming widely appreciated because previous data has been based on a variety of notch shapes and sizes. All agreed a "standard notch" would be helpful.

An important conclusion of his investigation was that the higher yield and ultimate strengths of 75S are simply not available to the design engineer, who must use notched elements to build an airplane, because of the notch sensitivity of the material seriously reducing its fatigue properties. Maj. Teed examined the internal structure of these materials and explored the well-known "slip" theory, developing the concept that small grain alloys have superior fatigue properties because the grain faces do not have as far to slip before catching hold at the next interstice.

► **Opinions On Etching**—A controversy was created by Teed's opinion, based on tests, that polishing and etching seriously damaged the fatigue resistance of 75S forgings and extrusions.

It was his view that the polishing of notches to .0001 destroyed the surface crystals and, furthermore, the caustic soda etch was extraordinarily destructive to fatigue resistance of a fitting.

This view was debated by both Martin and Convair representatives whose high-cycle tests indicated that etching actually improved fatigue resistance. Chromic acid anodic has no effect and sulphuric acid a 10-20 percent effect.

► **Chrome-Base Alloys**—An example of

an effective review of familiar data was the presentation by famed Dr. Clyde Williams director Battelle Memorial Institute, of the strength-temperature spectrum for aircraft alloys.

He examined the gamut of gas turbine materials with particular reference to the latest in a series of chrome-base alloys investigated at Battelle for the Navy. This new alloy, made of 60 percent chromium, 25 percent molybdenum and 15 percent iron, has double the rupture strength of present cobalt alloys at 1800 F. At 1600 F. it has a rupture strength of 30,000 psi., compared to 5-15,000 psi. for present turbine alloys operating at 1150-1500 F.

► **Magnesium-Lithium Evaluated**—Dr. Williams presented data on an exciting new magnesium-lithium alloy for aircraft structural work, which has enormous promise. It has a specific gravity of only 1.7. Compressive strength is nearly as great as its tensile strength of 65,000 psi., in sharp contrast to the wide difference in these characteristics of the familiar magnesium alloys.

Magnesium-lithium alloy has low density, exhibits excellent forming characteristics and has the highest elastic stability of any of the alloys examined thus far.

Because lithium is lighter than magnesium, the new alloy is lighter than the conventional magnesium alloys, now finding wide aircraft application, and this quality, plus its exceptionally high strength characteristics, combine to give it tremendous interest.

► **Strategic Metals and Design**—Emergence of comparatively rare metals, such as cobalt, columbium, titanium, etc., in the aircraft field has created serious problems of strategic supply, which has engendered divergent views on either side of the Atlantic.

Ted Wright believes, for example, that their use for design should be avoided and that only those materials that will be readily available during a war should be introduced even experimentally in new design work.

The British, on the other hand, believe that technical progress should determine the application of rare metals and that past experience indicates that if the need is truly great, even in war, that means can be found for supply or, if necessary, for substitution of less-strategic metals.

► **Hint on Turboprop**—The turboprop engine, quite naturally, came in for exhaustive discussion by the British delegates. In addition to complete listings and discussion of the myriad British turboprop engines and turboprop-powered planes, some interesting opinions were expressed as to the impact of such aircraft on the airlines.

While this is a hotly-debated subject in the U. S., George Edwards expressed

this interesting opinion: "If the air traveler chooses to travel in turbine aircraft to the exclusion of all other types when he has the choice, that factor must outweigh all others. He will turn his back on what he now accepts as first-class air travel."

This is an ominous warning that once air travelers have ridden the forthcoming British turboprop airliners, they may be highly critical of U. S. reciprocating engined transports.

Lack of noise and vibration, in addition to its pleasant effect on the customer, has an important bearing on aircraft fatigue. This has been shown to vary directly with vibration. Along with this is reduced maintenance.

► **Engine Comparisons**—Edwards included the turbojet in all of his comparisons, which showed the turboprop superior up to 1000 nautical mi., the turboprop, turbojet and compound engine about equal above 2000 mi. All this depends, of course, on his assumptions.

He emphasized the well-known problem of providing fuel for meeting present regulations for holding patterns and alternate airports, which severely penalizes the turbojet transport and, for short routes, requires considerably more fuel be carried for emergency conditions than is required to make the flight!

He reported that noise levels in gas turbine-powered transport cabins varied along the length and warned that passengers will be definitely uncomfortable when seated aft of the tailpipe on turbojet-engined craft. The astonishing quiet of the turboprop powerplant was shown graphically by the fact that the noise level in the piston-engined Viking is 95 db., whereas it is only 20 db. in the turboprop-engined Viscount.

► **View on Kerosene**—His remarks concerning the incomparable safety feature of kerosene as gas turbine fuel were of particular interest to U. S. engineers, in view of the recent Air Force decision to switch from kerosene to low-octane gasoline for all its jet aircraft (Navy has always used gasoline in its jets).

Edwards presented data indicating that kerosene will not burn at 40 C., or below, at sea level, whereas 100-octane gasoline burns at as low as -40 C.

This relationship continues, until at 60,000 ft., whereas kerosene will not burn below 12½ C., gasoline burns at temperatures as low as -65 C.

Edwards expressed his personal opinion that he would not fly in a gas turbine aircraft with any other fuel except kerosene and felt strongly that this safety feature was one of the prime advantages of gas turbine engines.

► **Turbine-Plane Assets**—Summing up on the turbine-engined transport, Edwards believes: The airframe must be

laid down originally for turbine engines; handling and flying characteristics are simpler; propeller controls are more simple; kerosene is a safer fuel than gasoline; lack of noise and vibration produces superior passenger comfort; serviceability of the airframe and engine is improved and maintenance reduced.

Also, first cost of the turbine engine is "not too bad" when compared with the first cost of a newly designed piston engine; dependence of gas turbine engines on altitude for economy places new emphasis on pressure-cabin design, and cabin windows must now be considered primary structure; the gas turbine engine, under comparable conditions, is as economical as the reciprocating engine; and, finally, lack of flexibility of the gas turbine plant is a problem of paramount importance, requires intensified effort.

► **Useful Chart**—An important presentation, centering about a single chart, was that made by Christopher Dykes, project engineer on BOAC. He and his associates have created an elaborate diagram containing all of the important performance variables in the operation of a transport. The chart is a noteworthy effort and should enjoy wider use in this country.

Using it as a basis, Dykes presented some of the airline factors unique to gas turbine transports, prominent in which is the necessity for flying at a prescribed high-altitude if maximum economy is to be obtained.

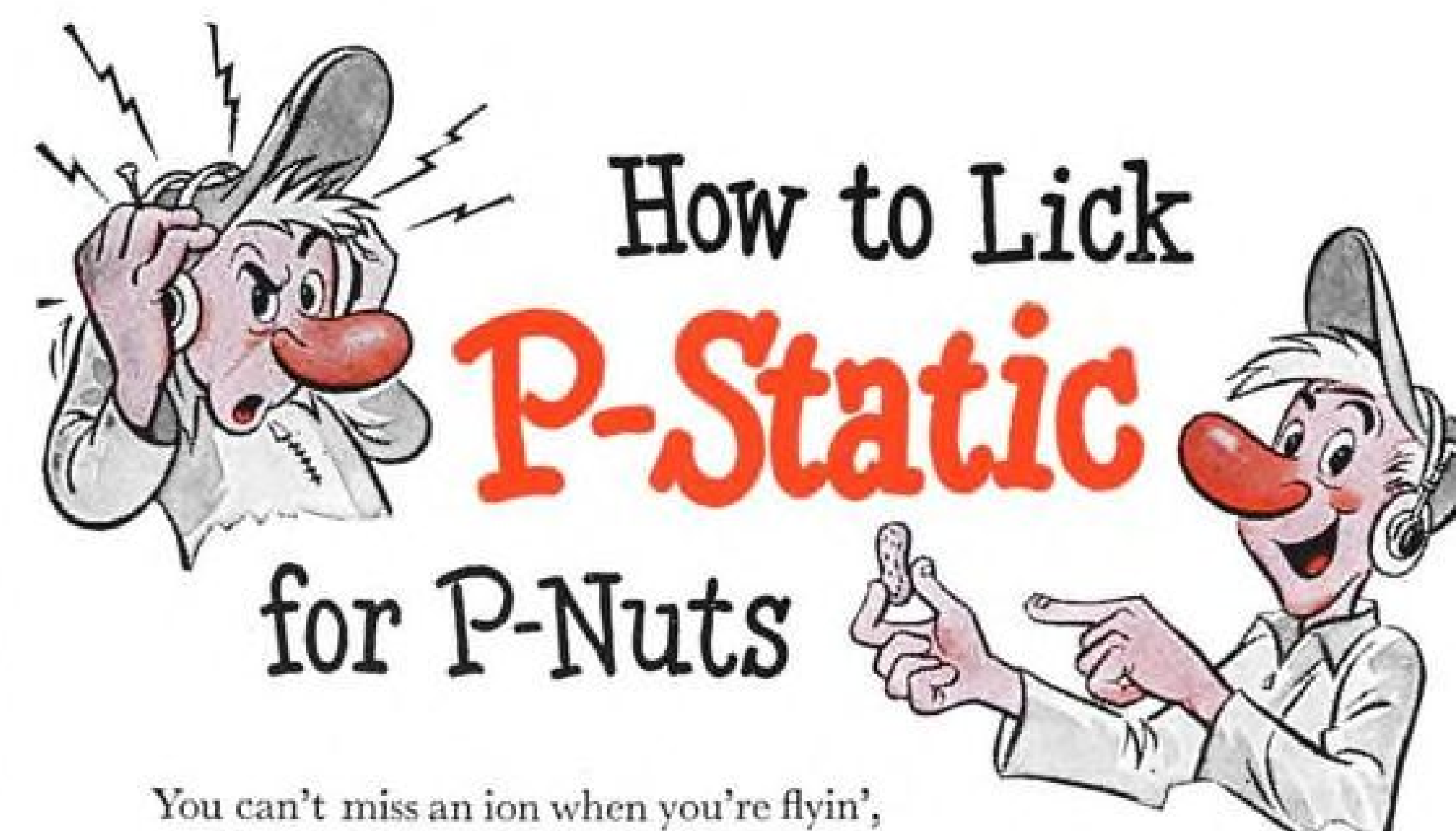
This prevents the turbine airliner from moving down with weather, air traffic control, etc., and makes it necessary for the type to adhere rigidly to its flight plan.

Actually, the turbine airliner obtains its best air-miles per gallon at an altitude only 1000 ft. under its absolute ceiling. Dykes' chart indicated that maximum economy will be obtained with the turbine airliner by making a slow climb throughout the course of its flight in order that constant airspeed be maintained.

Surface Protection

For reducing maintenance costs resulting from damage and wear, "Phenoplast" liquid finish is applied like varnish to make wood, leather, metal and many other surfaces practically impervious to scratches, flames, alcohol, ink, most acids, and effects of weather and temperature.

Offered by L. Sonneborn Sons, Inc., 80 Eighth Ave., New York City 11, the transparent product penetrates and hardens as a physical part of porous surfaces. With a companion undercoat, same adhesive quality can be given to non-porous surfaces.



You can't miss an ion when you're flyin', so keep your eye on Carbowicks. They discharge Precipitation Static quietly, B. C. (Before Corona)—give longer life and stable resistance without the periodic 100-hour trimming required by the USAF.

Carbowicks cost little to install—less to maintain. Unlike silver-impregnated dischargers (Spec. AN-D-18), Carbowick's polyethylene tubing contains fibres to which carbon has been chemically bonded with a synthetic resin. This surpasses present resistance specifications with closer limits. No washing out!



Carbowicks are manufactured exclusively by Dayton Aircraft Products—along with a complete line of Anti-Corona Shielded Antenna Fittings. All products have been thoroughly tested by Air Materiel Command. For clearer radio reception—better instrument performance—safer flying—see your dealer (listed below) or write the factory.

DAYTON AIRCRAFT PRODUCTS, INC.

342 Xenia Ave.
Dayton 10, Ohio

ARIZONA
Aircraft Radio Service Co., Phoenix

CALIFORNIA
Fred A. Becker Co., Palo Alto
Clover Field Radio Supply,
Santa Monica
Lush Aircraft Radio, Los Angeles
Qualitron, Inc., Burbank

COLORADO
Aircraft Radio & Accessory Co.,
Denver

DELAWARE
Atlantic Aviation Service,
Wilmington

FLORIDA
Aircraft-Radio-Marine, Miami
Florida Aviation College, Tampa
Strode Sales & Service, Jacksonville

GEORGIA
Southern Airways, Inc., Atlanta

ILLINOIS
Butler Company, Aviation Division
Chicago

INDIANA
Roscoe Turner Aeronautical
Corp., Indianapolis

IOWA
Collins Radio Co., Cedar Rapids

KANSAS
Mid-West Engineering & Supply,
Wichita

KENTUCKY
Kentucky Air Transport, Inc.,
Louisville

LOUISIANA
Aircraft Radio Supply Co.,
New Orleans

MAINE
Atlantic Aviation Corporation

MARYLAND
Atlantic Aviation Service, Baltimore

MASSACHUSETTS
Atlantic Aviation Corporation,
Bedford

MICHIGAN
Anderson Aircraft Radio Co., Detroit
Detroit Wayne-Major Radio Co.,
Romulus

MISSOURI
Great Lakes Airmotive, Inc., Ypsilanti

MISSOURI
Aircraft Radio Company, Kansas City
Remmert-Werner, St. Louis

NEW HAMPSHIRE
Atlantic Aviation Corporation

NEW JERSEY
Atlantic Aviation Corporation,
Teterboro

NEW YORK
Aeronautical Radio Mfg. Co.,
Inc., Mineola
Atlantic Aviation Corporation

NORTH CAROLINA
United Aero Service, Charlotte

OHIO
Airborne Communications,
Cincinnati
Chamberlain Aviation, Akron

Dayton Airradio, Dayton
Harrington's, Cleveland
H. H. Mills, Columbus

OKLAHOMA
Spartan Aero Repair, Tulsa

PENNSYLVANIA
Atlantic Aviation Service
Russell P. Hay, Pittsburgh

RHODE ISLAND
Atlantic Aviation Corporation

TENNESSEE
Capital Airways, Nashville

TEXAS
Dave Rumph Co., Fort Worth
Saxon Aircraft Radio Co.,
Longview

VERMONT
Atlantic Aviation Corporation

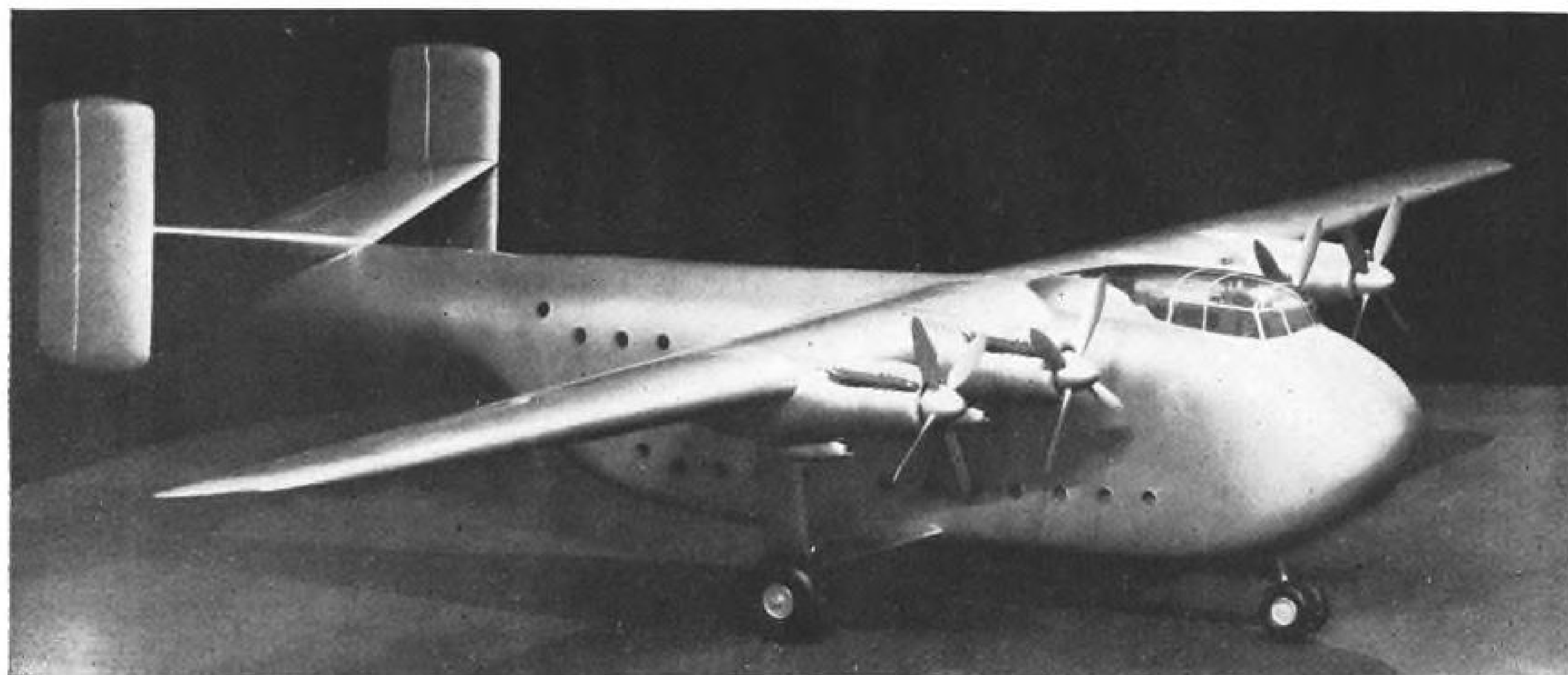
VIRGINIA
Aircraft Radio Service, Richmond

WASHINGTON
Angle Radio Company, Seattle

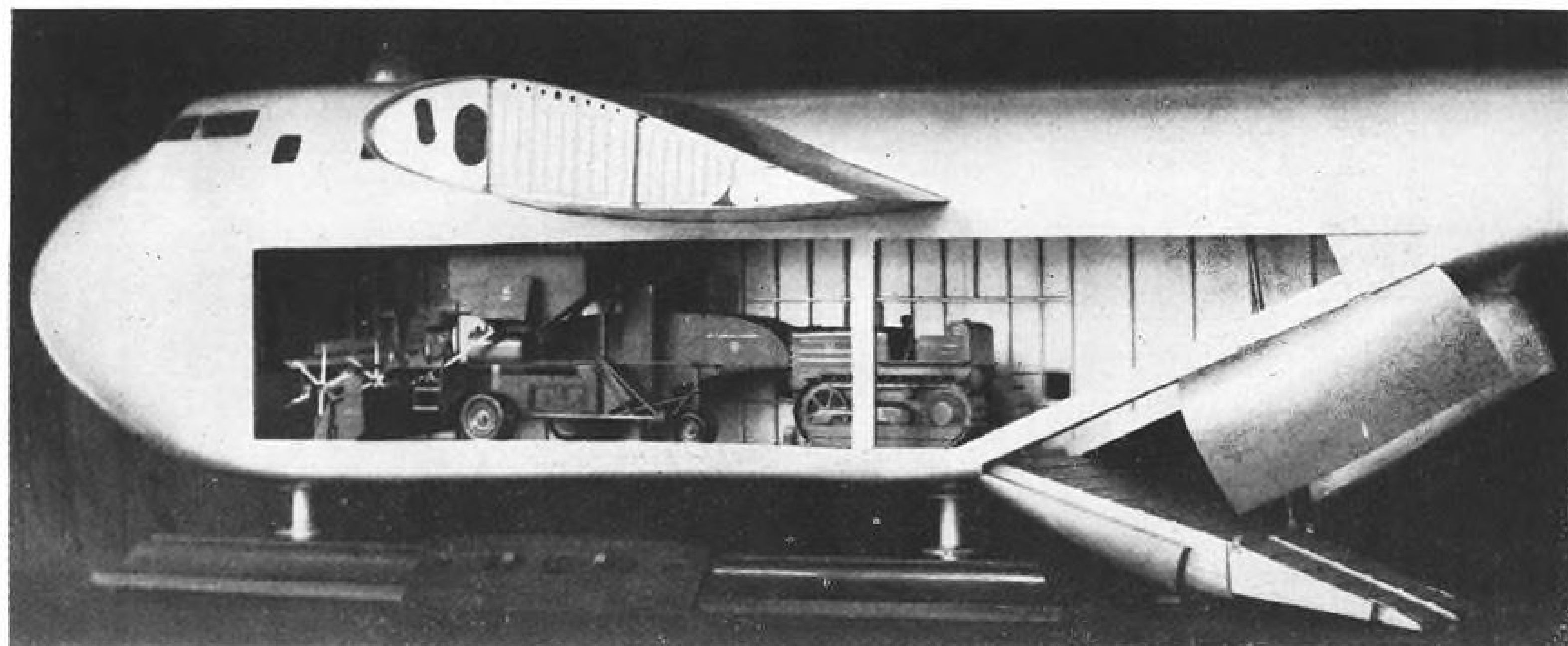
WISCONSIN
Anderson Air Activities,
Milwaukee

CANADA
MacDonald Bros. Aircraft
Limited, Winnipeg
Northwest Industries Limited,
Edmonton, Alberta

FOREIGN
International Standard Electric
Corporation, New York



NEW, FIFTY-TON-gross-weight freighter, shown in model form, is 242-mph.-maximum speed British "Universal" incorporating . . .



. . . CONVENTIONAL "soup ladle" fuselage profile. Unobstructed cargo hold is shown accommodating models of harvester and tractor.

British Approach to 50-Ton Cargo Plane

General Aircraft's "Universal" embodies the classic design criteria, which now are being changed in U. S.

By Robert McLarren

The British Blackburn & General Aircraft Co. Ltd.'s "Universal" is a proposed 50-ton gross weight all-cargo design that follows an approach now generally considered out-dated.

Formerly, the major consideration in all-cargo craft design was the achievement of low-cost air transportation through simplicity and conservative performance.

Most recent experience, together with extensive analysis, indicates that high performance offers the greater economy.

Evidence available from the Prototype Evaluation Board, studies by Mili-

tary Air Transport Service and numerous individual analyses tend to show that cargo can be carried more cheaply at 300 mph. than at 100 mph., within certain definitions.

► **Range Demands**—Thus, the familiar slab-sided, fixed-gear, "bush freighter" design would appear to have exhausted its potentialities in the face of a wholly new set of economic factors. One of these is the greater distance over which the all-cargo aircraft will normally operate.

It is all well and good for a plane to be designed specifically for maximum operating economy over a range of 300 mi., but postwar, nonscheduled experience indicates that despite the very

best intentions of the designer and the operator, the plane will ultimately be making 500-, 1000- and 1500-mi. flights as demanded by the customer.

► **Route Patterns**—Phrases such as "short runway requirements," "low landing speed," "great lifting capacity," etc., which have always characterized the specifications and promotional literature of the all-cargo plane, virtually have lost their meaning.

All-cargo aircraft have now reached such a state of respectability, that instead of finding their principal markets in the jungles of Central America or the crags and valleys of Alaska (for which the above specifications were laid down), they are now also flying wing-to-wing with scheduled airliners between the 5-10,000-ft. runways of the major cities of the world.

The design objective has been

changed by this decisive shift in economical route patterns. And today's all-cargo craft designer is thinking in terms of 50,000 lb. of payload carried at a speed of 300 mph. over a 2-3000-mi. route.

► **Design Weighed**—It is against this background that the new Universal would be considered obsolete in this country before its prototype has been flown.

This is not to indicate laxity on the part of the General Aircraft design team, who had to meet specifications laid down by the British government. Although this specification, in all probability, has been met in full, it would appear that the specification itself is now an antiquated document no longer economically sound.

General Aircraft engineers took the classic approach to all-cargo aircraft design: thick profile with large incidence angle; a slow cruising speed to produce L/D_{max} ; engines selected for economic cruise power, with takeoff requirements met by a multiplicity of engines rather than high power engines of fewer number; payment of a drag penalty in exchange for simplicity of both production and operational features; and heavy reliance on high-lift flaps for short runway operation at the expense of high rate-of-climb.

► **Airfoil Details**—The accompanying il-

"Universal" Freighter

4 Bristol Hercules 761
2000 hp. @ 2800 rpm.

Dimensions

Span162 ft.
Length99 ft. 1 in.
Height31 ft.
Wing area2916 sq. ft.

Weights

Empty weight62,860 lb.
Payload33,600 lb.
Gross weight (max.)....105,000 lb.

Performance (estimated)

Max. speed...242 mph. @ 15,000 ft.
Cruising speed, (55% power)
183 mph. @ 5000 ft.
Stalling speed, flaps extended

75 mph.
Takeoff distance at s.l....2520 ft.
Service ceiling.....23,300 ft.

Capacity

Total cargo volume....5760 cu. ft.
Total passenger capacity.....90

ustrations indicate the general arrangement of the airplane. Conventional construction is used throughout, with two spars, pressed-flange ribs, and riveted skin making up the R.A.F. 34 wing section.

The wing is set at $5\frac{1}{2}$ deg. incidence in order to allow cruise at the slow speed of 183 mph. at 5000 ft. The incidence is constant along the span, indicating no expectation of tip stalling or stability difficulties throughout the flight range, despite the use of 2.45:1 taper ratio and virtually no dihedral ($54\frac{1}{2}$ min.).

Future changes would be suspected in this configuration unless it is the intention to put heavier reliance on the power-driven controls than we do in this country.

► **Fuselage Factors**—Arrangement of the fuselage follows conventional "soup ladle" profile, in which the aft fuselage is cut away and the upper mold line held straight to clear the loading ramp in the rear.

It is to be noted that a bow loading ramp has not been provided, although it is readily agreed that the location of the nose wheel so far forward renders this job difficult.

► **Ramp Lock System**—One of the perennial design problems with this configuration is the inevitable location of the aft loading ramp hinge-line well aft of the main gear line-of-action, with the result that very heavy cargo, when moved to the aft hatch frame installation tends to tip the airplane back on its tail.

General Aircraft accommodated this

JUST LOOK AT THESE FEATURES ➤

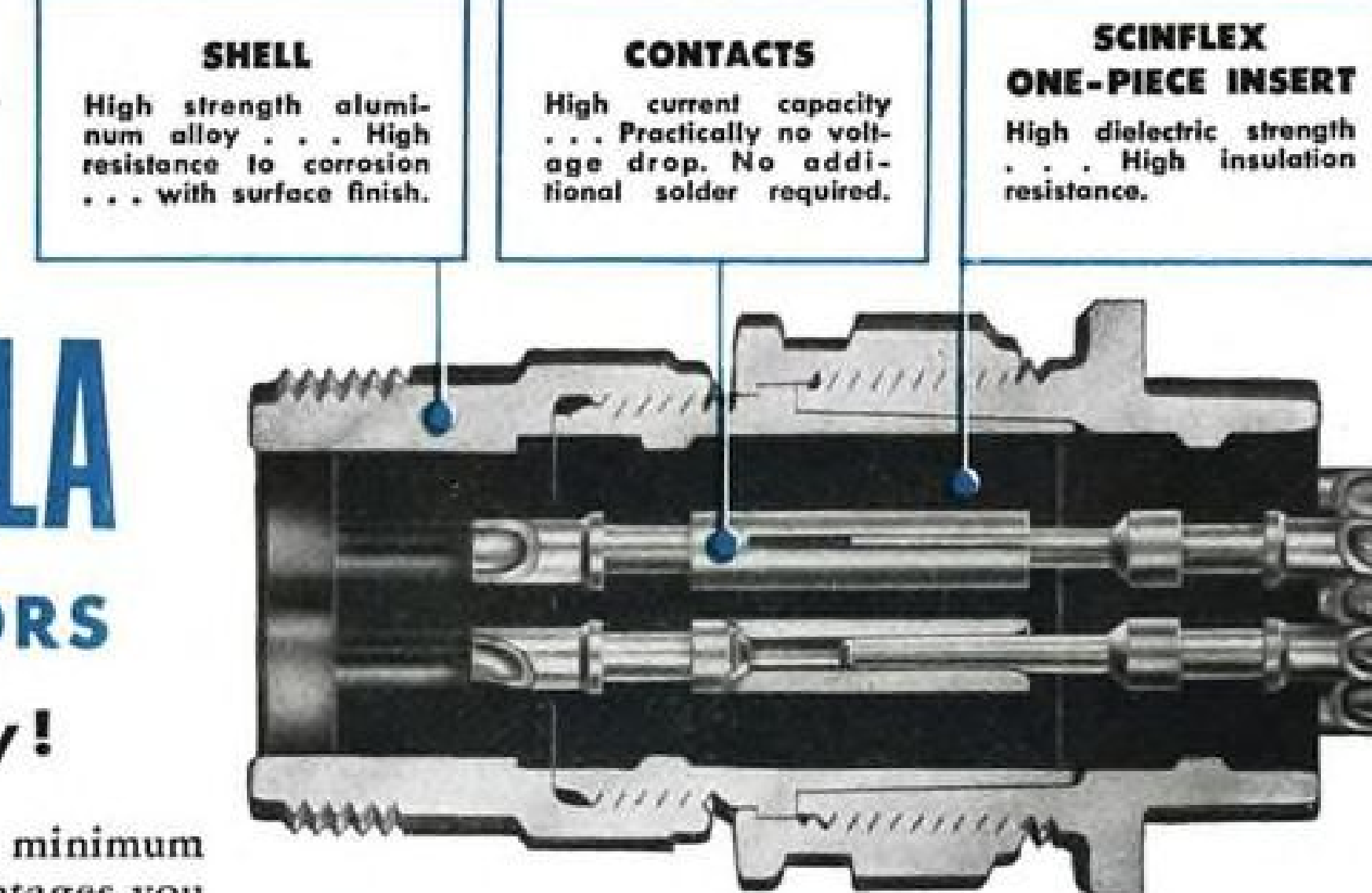
BENDIX-SCINTILLA ELECTRICAL CONNECTORS

the Finest money can buy!

Contacts that carry maximum currents with a minimum voltage drop are only part of the many new advantages you get with Bendix-Scintilla* Electrical Connectors. The use of "Scinflex" dielectric material, an exclusive new Bendix-Scintilla development of outstanding stability, increases resistance to flashover and creepage. In temperature extremes, from -67°F. to $+300^{\circ}\text{F.}$, performance is remarkable. Dielectric strength is never less than 300 volts per mil. Bendix-Scintilla Connectors have fewer parts than any other connector on the market—and that means lower maintenance costs and better performance.

WRITE DIRECT TO THE SALES DEPARTMENT

SCINTILLA MAGNETO DIVISION of
BENDIX-SCINTILLA
SIDNEY, NEW YORK
Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York

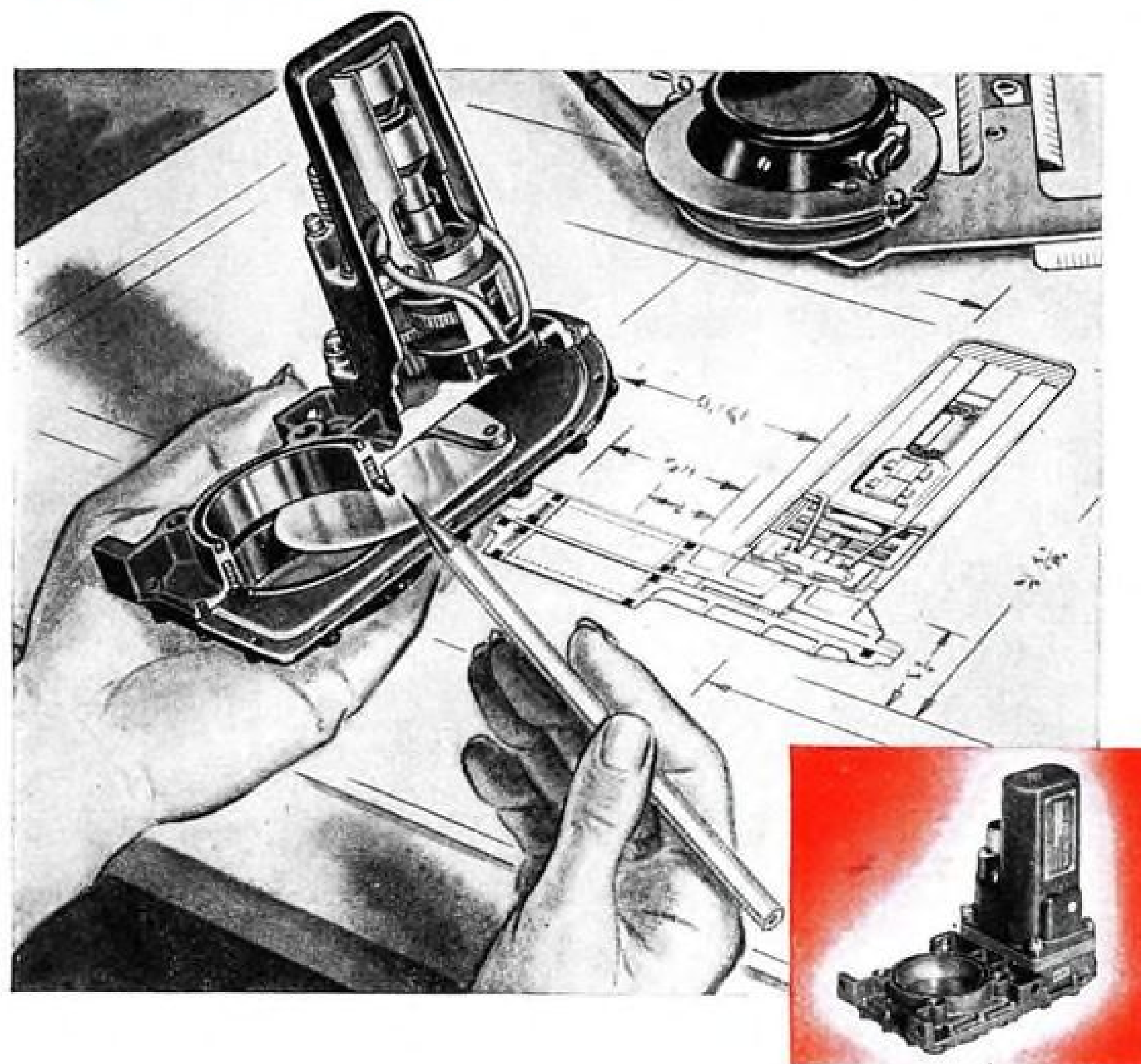


CHECK THESE OTHER ADVANTAGES

Moisture-proof . . . Pressure-tight . . . Radio Quiet
. . . Single-piece Inserts . . . Vibration-proof . . . Light Weight . . . High Insulation Resistance . . . Easy Assembly and Disassembly . . . Fewer Parts than any other Connector . . . No additional solder required



Whittaker MOTOR SLIDE VALVES...



DESIGNED TO WORK *Together!*

FROM THE MOMENT design begins—to final assembly and testing, WHITTAKER actuators and valve bodies are developed as one unit. They are designed to work together to assure a perfect relationship between working parts, and to provide an actuator unit that will operate most efficiently with a given valve body.

Both actuator and valve body are individually engineered for your specific installation. They are developed as a unit, made in the same plant, and assembled and tested together. WHITTAKER's integrated facilities save valuable, engineering, purchasing and assembly man-hours. Make your engineer's job easier by bringing your valve problems to WHITTAKER—the only manufacturer offering a completely integrated service from original design to final installation and servicing. Contact our Engineering-Sales Department. WM. R. WHITTAKER CO., LTD., 915 North Citrus Avenue, Los Angeles 38, California.

Whittaker

First IN DESIGN

First IN PERFORMANCE

First WITH VALVES THAT ARE FIRST CHOICE IN INDUSTRY

problem in a very odd way: They devised a lock system which secures the ramp rigidly to the airframe automatically when a weight of 12,000 lb. or more is driven up the ramp.

Although details are not available, this indicates that the ramp itself acts as a cantilever leg at the extraordinary angle of about 15 deg. This would require quite high stressing of the lock system. A simpler method perhaps would be a pair of simple struts which could hinge down to the ground to provide compression members between the aft frame and the ground.

Northrop went one step further and permitted the main gear of the Pioneer cargo plane to be partially retracted, lowering the fuselage down to the ground.

► **Interior Makeup**—The Universal utilizes the removable mid-floor feature found on the Douglas C-124, in which the cargo compartment can be divided into an upper and lower deck.

Top deck is, of course, lightly loaded but can sustain 30 passengers. In this arrangement, 60 passengers are carried on the lower deck.

In addition, the lower deck has a removable flooring, which, although facilitating "replacement" appears an unnecessary design accommodation, since it must be assumed that this feature eliminates the floor as stiffening structure.

► **High-Ratio Boost**—The design team spared no pains in assuring incorporation of many of the latest mechanical features.

Thermal anti-icing is used on wing and empennage leading edges and the propeller blades incorporate electrical de-icing.

Power-boosted controls are used and this system has the inordinately high ratio of 10:1, which is 3-5 times as high as anything in this country.

However, the electrically-operated trim tabs on the elevator could take over some of the load in the event of emergency. Indicative of the emergency nature of this safeguard is the location of the trim tab buttons right on the pilot's control wheel.

Other features include reversible-pitch propellers and a steerable nose wheel.

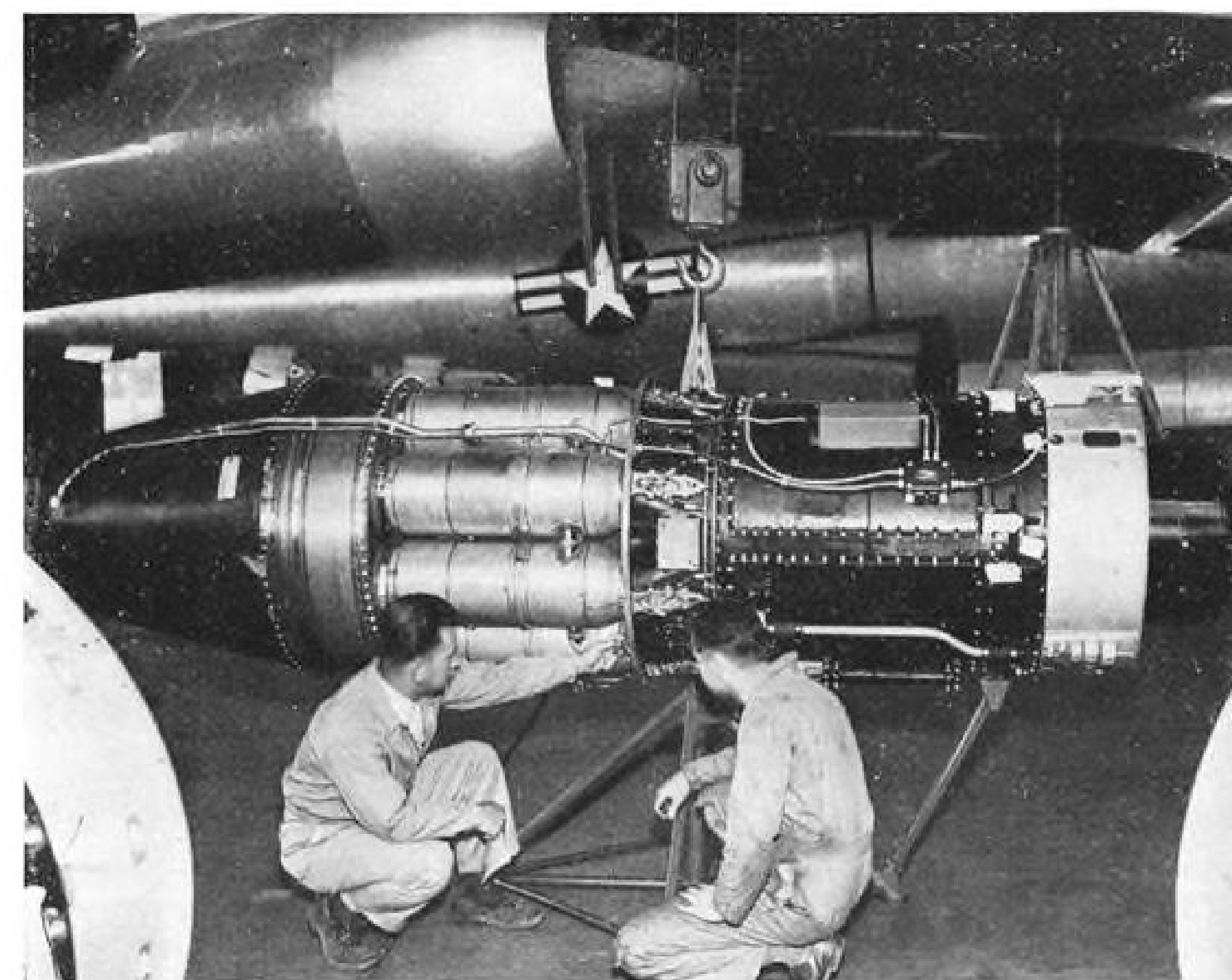
And an item which will be of interest to American designers is an electrical system of synchronization of flap panel travel. When one of the flap panels gets ahead of the other during operation, this system slows it down until both are in line.

Two prototype Universals are under construction for the Ministry of Supply. One is three-quarters completed, the other half-finished. A civil version is being offered to interested parties but apparently no commercial orders are yet in sight.

PRODUCTION



COMPRESSOR BLADES, scores of other items from subcontractors, go into . . .



. . . J-47 JET ENGINES such as this one being installed in Boeing's XB-47 Stratojet.

280 Subcontractors Feed GE Plant

Suppliers throughout country furnish components for final assembly into J-47 jet engines at Lockland.

Wide distribution of subcontracts to many small companies in many parts of the country has been achieved in production of General Electric's J-47 turbo-jet engine at the recently-activated Lockland, Ohio, assembly plant.

The engines, which develop more than 5000 lb. thrust, and which are slated for use in some of the fastest

USAF jet bombers and fighters—including the Boeing B-47 Stratojet, and the North American F-86 Sabre—are the assembled products of 280 major subcontractors, not including many other sub-subcontractors who supply the parts originally.

According to General Electric, the 280 subcontractors are:

► **Accessories** (Including fuel regulators, lube pumps, flow dividers, etc.)—A. C. Sparkplug division, General Motors Corp., Flint, Mich.; AiResearch Mfg. Co., Los Angeles; Auburn Sparkplug Co., Auburn, N. Y.; Champion Sparkplug Co., Toledo, Ohio; Clifford Mfg. Co., Waltham, Mass.; Ex-cell-o Corp., Detroit; Hydro-Aire Inc., Burbank, Calif.; Kohler Co., Kohler, Wis.; Lear Inc., Los Angeles; Lisle Corp., Clarinda, Iowa; W. H. Nichols & Sons, Waltham, Mass.; Parker Appliance Co., New York City.

Also, Pesco Products division, Borg-Warner Corp., Cleveland; Pierce Governor Co., Anderson, Ind.; Sundstrand Machine Co., Rockford, Ill.; Vinco Corp., Detroit; and Waldorf Instrument Corp., New York City.

► **Hardware** (Including bolts, nuts, fittings, gaskets, packings, etc.)—Active Screw & Mfg. Co., Chicago; Adel Precision Products Corp., Huntington, W. Va.; Aero Bolt & Screw Co., New York City; Aero Supply Mfg. Co., Corry, Pa.; Air Accessories, Inc., Ft. Worth; Air Associates, Inc., Teterboro, N. J.; Aircraft Fitting Co., Cleveland; Aircraft Hardware Mfg. Co., New York City; Aircraft Precision Products Corp., Detroit; Allmetal Screw Products Co., New York City; Allpax Co., Boston; American Brake Shoe Co., Rochester, N. Y.; Anchor Packing Co., Boston; Anti-Corrosive Metal Products Co., Albany, N. Y.; G. R. Armstrong Mfg. Supplies, Inc., Boston; Associated Aircraft Tool Mfg. Corp., Hamilton, Ohio; Avico, Inc., Providence, R. I.; Aviquipo Mfg. Co., New York City; Axelson Mfg. Co., Los Angeles; Avers Engineering Co., Indianapolis; Baldwin Mfg. Co., Waterbury, Conn.; Binks Mfg. Co., Chicago; Boots Aircraft Nut Corp., Stamford, Conn.

Also, C. G. Bostwick Co., Boston; Boulton Instrument Mfg. Co., New York City; Bowser Inc., Roxbury, Mass.; Camloc Fastener Corp., New York City; H. O. Canfield Co., Bridgeport, Conn.; Carr Brothers Co., Boston; Chrysler Corp., Amplex division, Detroit; R. A. Clark Co., Boston; R. H. Clark Co., Los Angeles; Columbus Engineering Co., Columbus, Ohio; Connecticut Hard Rubber Co., New Haven, Conn.; Continental Rubber Works, Erie, Pa.

Also, Continental Screw Co., New Bedford, Mass.; Dalton Peters Inc., Detroit; Danielson Mfg. Co., Danielson, Conn.; DeLaval Separator Co., Boston; Diffusion Alloys Corp., New York City; Dunbar Brothers Co., Bristol, Conn.; Durham Aircraft Service, Inc., Woodside, N. Y.; Elastic Stop Nut Corp. of America, Union, N. J.; Electric Maintenance Co., Boston; Electroloy Co., Bridgeport, Conn.; Electronic Control Corp., Detroit; Electronic Transformer Co., New York City; Farwick Airflex Co., Cleveland.

Also, Felters Co., Boston; Forest Products, Inc., Cambridge, Mass.; Fostoria Pressed Steel Corp., Boston; Garlock Packing Co., Boston; George K. Garrett Co., Philadelphia; George W. Gayle & Sons, Frankfort, Ky.; Greer Stop Nut Corp., Chicago; Guarantee Specialty Mfg. Co., Cleveland; Gundry Preston Metal Products, Boston; E. R. Hall Co., North Hollywood, Calif.; Hammond Machine Co., Kalamazoo.

Also, John Harvey Co., New York City;

John Hassall Inc., Brooklyn, N. Y.; Hays Corp., Boston; Heim Co., Fairfield, Conn.; Heli-Coil Corp., Long Island City, N. Y.; Hunter Pressed Steel Co., Lansdale, Pa.; Indiana Gear Works, Indianapolis; Indiana Bearing, Inc., Indianapolis; Johns-Manville Corp., Boston; King Fifth Wheel Co., Philadelphia; Otto Konigslow Mfg. Co., Cleveland; Leavitt Machine Co., Orange, Mass.; R. K. LeBlond Machine Tool Co., Cincinnati.

Also, Lehigh Metal Products, Inc., Somerville, Mass.; Leland Electric Co., Dayton, Ohio; Mason & Co., New York City; Massachusetts Machine Shop, Boston; Irvine W. Masters, Inc., Burbank, Calif.; Monarch Machine Tool Co., Sidney, Ohio; Moraine Products division, General Motors Corp., Dayton, Ohio; Mortimore Mfg. Co., Chestnut Hill, Mass.; Mutual Metal Products Co., Cleveland; Nathan Aircraft Services, Inc., New York City; National Rivet & Mfg. Co., Wauupun, Wis.; Ohio Ball Bearing, Cincinnati.

Also, Ohlson Empire division, Ohlson International Corp., Long Island City, N. Y.; Paramount Mfg. Corp., Hillsdale, Mich.; Plastic & Rubber Products, Inc., Dayton, Ohio; Rausch Nut Mfg. Co., Cleveland; Ravena Iron Foundry, Ravena, N. Y.; Resistoflex Corp., Belleville, N. J.; Rockford Screw Products Co., Rockford, Ill.; Russell & Co., Bay Shore, L. I.; S. K. F. Industries, Inc., Boston; Sealor Corp., Providence, R. I.; Shakeproof, Inc., Chicago; Simons Brothers Co., Boston; Standard Auto Gear Co., Boston.

Also, Standard Pressed Steel Co., Jenkintown, Pa.; Standard Thomson Corp., Inc., Dayton, Ohio; Strong, Carlisle & Hammond Co., Cambridge, Mass.; Supply Division, Inc., Robertson, Mo.; J. C. Tarbell Associates, Inc., Springfield, Mass.; Tek Bearing Co., Boston; H. A. Thrush & Co., Peru, Ind.; Tinius Olsen Testing Machine Co., Philadelphia; Tinnerman Products Inc., Cleveland; Titeflex Inc., Newark, N. J.; Lewis E. Tracy Co., Boston.

Also, Tubular Rivet & Stud Co., Wollaston, Mass.; United Screw & Bolt Co., New York City; Vellumoid Co., Worcester, Mass.; Victor Mfg. & Gasket Co., Chicago; Waldes Koh-I-Noor Inc., Long Island City, N. Y.; Waltham Screw Co., Waltham, Mass.; War Nagg Tool Supply Co., Inc., Bridgeport, Conn.; Weatherhead Co., Cleveland, and Wittek Mfg. Co., Chicago.

► **Parts and Subassembly** (Including turbine wheels, compressor rotors and stators, exhaust cones, combustion chambers, etc.)—Aeronca Aircraft Corp., Middletown, Ohio; Aeroquip Corp., Jackson, Mich.; Air Maze Corp., Cleveland; Airtron, Inc., Los Angeles; Allison division, General Motors Corp., Indianapolis; American Machine & Foundry Co., New York City; American Welding & Mfg. Co., Warren, Ohio; Atlantic India Rubber Works, Inc., Chicago.

Also, Austenal Laboratories, Inc., New York City; Barnes Gibson Raymond Division, Detroit; Bohn Aluminum & Brass Corp., Adrian, Mich.; Bower Roller Bearing Co., Philadelphia; Breeze Corp., Newark, N. J.; Bryant Chucking Grinder Co., Springfield, Vt.; B. G. Corp., New York City; Bendix Products division, Bendix Aviation Corp., South Bend, Ind.

Also, Canton Drop Forge, Newark, N. J.; G. O. Carlson, Inc., Thorndale, Pa.; Chandler Co., Hartford, Conn.; Chandler-

Evans Corp., West Hartford, Conn.; Chicago Gear Works, Chicago; Chicago Metal Hose Corp., Maywood, Ill.; Cooperative Industries, Inc., Chester, N. J.

Also, Dow Chemical Co., Bay City, Mich.; Dresser Mfg. division, Bradford, Pa.; Eaton Mfg. Co., Massillon, Ohio; Eclipse Pioneer division, Bendix Aviation Corp., Teterboro, N. J.; Etched Products Corp., Long Island City, N. Y.; Fafnir Bearing Co., New Britain, Conn.; Fulton Sylphon division, Robertshaw Fulton Controls Co., Boston; General Mills, Inc., Minneapolis; Greer Hydraulics, Inc., Brooklyn; Haynes Stellite Co., Kokomo, Ind.; Heintz Mfg. Co., Philadelphia; Hoover Ball & Bearing Co., Ann Arbor, Mich.; Hyatt Bearings division, General Motors Corp., Harrison, N. J.; Ite Circuit Breaker Co., Philadelphia; Charles L. Jarvis Co., Middletown, Conn.; Kropp Forge Co., Chicago.

Also, Linear Inc., Philadelphia; Lumen Bearing Co., Buffalo; Lyscoming division, Avco Mfg. Co., Williamsport, Pa.; Magnesium Fabricators division, Bohn Aluminum & Brass Corp., Adrian, Mich.; Marlin Rockwell Corp., Jamestown, N. Y.; Marman Products Co., Inc., Inglewood, Calif.; Monarch Mfg. Works, Inc., Philadelphia; New Departure Mfg. Co. division, General Motors Corp., Bristol, Conn.

Also, Nice Ball Bearing Co., Philadelphia; Norma Hoffman Bearing Co., Stamford, Conn.; Pratt & Whitney Co., Hartford, Conn.; Premier Metal Etching Co., Long Island City, N. Y.; Ranger Aircraft Engine division, Fairchild Engine & Airplane Corp., Farmingdale, L. I.; Raybould Coupling Co., Greenwich, Conn.; Robbins Engineering Co., Detroit; Ryan Aeronautical Co., San Diego; Scintilla Magneto division, Bendix Aviation Corp., Sidney, N. Y.; Solar Aircraft Co., San Diego; Sperry Products, Inc., Hoboken, N. J.; Star Porcelain Co., Trenton, N. J.; Steel Improvement & Forge Co., Cleveland.

Also, Thompson Products, Inc., Cleveland; United Aircraft Products Co., Dayton, Ohio; Utica Drop Forge & Tool Corp., Utica, N. Y.; Whitehead Metal Products Co., Inc., Cambridge, Mass.; Willys Overland Motors, Inc., Detroit; H. T. Wilson Machine Co., Salem, Mass.; Wright Aeronautical Corp., Wood-Ridge, N. J., and Wyman Gordon Co., Worcester, Mass.

► **Raw Materials** (Including castings, forgings, plates, etc.)—Accurate Die Casting Co., Cleveland; Achorn Steel Co., Boston; Alan Wood Steel Co., Boston; Allegheny Ludlum Steel Corp., Brackenridge, Pa.; Aluminum Co. of America, Boston; American Brass Co., Waterbury, Conn.; American Light Alloys, Inc., Little Falls, N. J.; Anchor Drawn Steel Co., Latrobe, Pa.; Armco Steel Corp., Boston; Atlantic Steel & Iron Co., Springfield, Mass.; Atlantic Steel & Trading Co., Boston; Austin-Hastings Co., Cambridge, Mass.; Braeburn Alloy Steel Corp., Boston; Bridgeport Brass Co., Boston.

Also, Brown-Wales Co., Boston; Bartlett Thompson Co., Wakefield, Mass.; Berium Metals Corp., Rochester, N. Y.; Bethlehem Steel Corp., Boston; Cape Ann Tool Co., Rockport, Mass.; G. O. Carlson, Inc., Thorndale, Pa.; Carnegie-Illinois Steel Corp., Boston; Carpenter Steel Co., Providence, R. I.; Chase Brass & Copper Co., South Boston, Mass.; Concord Steel Corp., Cambridge, Mass.; Copperweld Steel Co.,

Warren, Ohio; Crucible Steel Co., Cambridge, Mass.; Edgecomb Steel Co., Philadelphia; Fellows Gear Shaper Co., Springfield, Vt.

Also, Firth Sterling Steel Co., Hartford, Conn.; Ft. Pitt Steel Castings division, McKeesport, Pa.; Groisser & Shlager Iron Works, Somerville, Mass.; Handy & Harmon Co., New York City; A. C. Harvey Co., Allston, Mass.; Hawkridge Brothers Co., Boston; Heppenstall Co., Boston; Herrick Co., Boston; A. E. Hunt Co., Boston; Hy-Alloy Steel Co., Chicago; Industrial Steels, Inc., Cambridge, Mass.; Jessop Steel Co., Hartford, Conn.; Jones & Laughlin Steel Corp., Boston.

Also, Joslyn Steel Co., New York City; Latrobe Electric Steel Co., Boston; Lebanon Steel Foundry, Lebanon, Pa.; Lowell Iron & Steel Co., Lowell, Mass.; Merrill & Usher Co., Worcester, Mass.; Mueller Brass Co., Port Huron, Mich.; National Tube Co., Boston; Ontario Metals Co., Rochetser, N. Y.; Palmer-Mullen Co., Malden, Mass.; Penn Flexible Metallic Tubing Co., Boston; Permanente Products Co., New York City; Phillip A. Rand Co., Boston; Republic Steel Corp., Boston.

Also, Revere Copper & Brass Co., Boston; Reynolds Metals Co., Boston; Russell Mfg. Co., Middletown, Conn.; J. T. Ryerson & Son, Inc., Cambridge, Mass.; S.A.E. Steels, Cleveland; Stahleker Steel Corp., Cambridge, Mass.; Superior Bearing & Bronze Co., Brooklyn, N. Y.; Timken Roller Bearing Co., Steel & Tube division, Boston; Tubular Sales, Inc., Everett, Mass.; United Shoe Machinery Corp., Boston, and United States Steel Supply Co., Allston, Mass.

United Wire & Supply Co., Providence, R. I.; Universal Cyclops Steel Co., Worcester, Mass.; Vanadium Alloys Steel Co., Boston; Ward Steel Co., Boston; Washington Steel Co., Hartford, Conn.; Welder's Supply Co., Cambridge, Mass.; Wickwire Spencer Steel division, Boston; Benjamin Wolff & Co., Chicago; Worcester Wire Works, Worcester, Mass.; Youngstown Sheet & Tube Co., New York City, and L. E. Zurbach Steel Co., Somerville, Mass.

Renegotiation Rules

Issued by Military

Two new sections of renegotiation regulations of the National Military Establishment have been published in the Federal Register.

Part 425 (Register of May 18) deals with formal agreements, clearances and statements to be used in contract renegotiation. Part 426 (Register of June 3) details the procedures to be followed when there is disagreement between contractor and the Military Renegotiation and Policy Review Board of NME on the recovery of excess profits.

Copies of the Federal Register can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Military Aircraft Shipments Increase

Steadily increasing deliveries of military aircraft resulted in a sharp boost in U. S. aircraft production for the first quarter of 1949 compared with the same period in 1948.

U. S. Census Bureau reported production of 9,574,000 airframe lb. for 5,772,000 lb. during same 1948 the first quarter of 1949 compared with period. Airframe shipments increased 17 per cent in March over the previous month with a total of 3,937,500 lb. Military aircraft accounted for 3,220,900 lb. or 82 per cent of this total. This compares with 2,577,900 lb. of military airframes delivered in February.

► **Civil Planes**—Remaining 18 per cent of the March airframe total was divided between 7 percent for 376 personal planes and 11 percent for 23 airline type transports. Value of the 399 civil aircraft shipped during March totalled \$11.4 million, making the first quarter aggregate \$26.4 million as against \$18.3 million in the same period of 1948.

For the first quarter of 1949 shipments all civil planes numbered 816, compared with 1501 for the first quarter of 1948. Personal plane shipments for the quarter were 753, against 1460 in 1948. Transport shipment increased from 41 during the first quarter of 1947 to 63 for the same period this year.

► **Engine Increase**—Engine production also increased during March with a total output of 3,728,400 hp. compared with 2,915,200 hp. in February. Military shipment accounted for 97 percent of the March total. Total value of civil aircraft engines shipped was \$1.2 million compared with \$1.5 million in February.

Employment in both aircraft and engine factories increased slightly during March hitting a new post-war high of 169,094 employes in airframe plants and 40,761 in engine plants.

PRODUCTION BRIEFING

► **Boeing Airplane Co.** has completed its first C-97A Stratofreighter at its Renton, Wash., plant. Plane is first of an order for the U. S. Air Force.

► **Western Electric Co.** has received a lease extension from War Assets Administration on the war surplus Burlington, N. C. plant for manufacture of electronic equipment.

► **Bell Aircraft Corp.** reports its sale of commercial helicopters has now reached 237. Total of 105 have been sold to the U. S. Air Force and Navy.

Latest Air Force Bid Awards

Air Materiel Command procurement Division makes available to AVIATION WEEK the latest bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, ACM, Wright-Patterson AFB, Dayton, Ohio, attention: MCPPSX72, (AMC will resume in July the issuance of data on invitations for bids.)

ABSTRACTS

For detectors, carbon monoxide & tester assemblies (49-889):

Companies sharing—Marion Screw Products Co., Marion, Ind., on a bid of \$1820; Thwing-Albert Instrument Co., Philadelphia, on a bid of \$9150; Burton-Rogers Co., Cambridge, Mass., on a bid of \$3750; Jos. Weidenhoff, Inc., Algona, Ia., on a bid of \$374; Duellman Electric Co., Dayton, on a bid of \$405, and Magnaflux Corp., Chicago, on a bid of \$16,099.

For 59 drawing boards (49-2019):

Companies sharing—McConaughy Stationers, Inc., Springfield, O., on a bid of \$5697, and Eugene Dietzgen Co., Chicago, on a bid of \$200.

For 728 pumps (49-1156):

Utilities Supply Co., Los Angeles, on a bid of \$6734.

For photographic paper (49-1321):

Companies sharing—Haloid Co., Rochester, on a bid of \$99,947.70; Anken Chemical & Film Corp., Newton, N. J., on a bid of \$31,117.25, and Duophoto Corp., New York, on a bid of \$133,973.63.

For aircraft bolts (49-1430):

Companies sharing—E. W. Ferry Screw Products, Inc., Berea, O., on a bid of \$5574.38; Lamson & Sessions Co., Cleveland, on a bid of \$2048.74; Air Associates, Inc., Teterboro, N. J., on a bid of \$2281.67; National Lock Co., Rockford, Ill., on a bid of \$3616.12; Continental Screw Co., New Bedford, Mass., on a bid of \$1265.58; Aircraft Products Co., Clifton Heights, Pa., on a bid of \$840, and AeroCrafts, Austin, Texas, on a bid of \$6787.50.

For stand assemblies (49-1451):

Greer Hydraulics, Inc., Brooklyn, on a bid of \$43,200.

For oil filter elements (49-1523):

Fram Corp., Providence, on a bid of \$8323.28.

For 3177 rolls transparent tape (49-1561): Industrial Tape Corp., New Brunswick, N. J., on a bid of \$2954.61.

For 1430 lamps (49-1564):

General Motors Corp., Anderson, Ind., on a bid of \$2671.24.

For 610 lamp assemblies (49-1565):

Companies sharing — Gilbert Brothers, Inc., Portland, Oregon, on a bid of \$5695.90 and Baitinger Electric Co., Inc., New York, on a bid of \$1830.

For asbestos sheets (49-1613):

Companies sharing—Keasbey & Mattison Co., Ambler, Pa., on a bid of \$657.22; Ehret Magnesia Mfg. Co., Valley Forge, Pa., on a bid of \$2175, and Johns-Manville Sales Corp., Cleveland, on a bid of \$180.50.

For photographic paper (49-1639):

Companies sharing—Haloid Co., Rochester, on a bid of \$5775.92, and Anken Chemical & Film Corp., Newton, N. J., on a bid of \$5372.14.

For industrial cleanser (49-1679):

Companies sharing—West Disinfecting Co., Long Island City, N. Y., on a bid of \$25,516.40, and G. H. Packwood Mfg. Co., St. Louis, on a bid of \$23,284.68.

For 150 parachute assemblies (49-1899): Pioneer Parachute Co., Inc., Manchester, Conn., on a bid of \$44,199.

For aircraft cleaning brushes (49-1914):

Companies sharing—N. Brittingham & Sons, Philadelphia, on a bid of \$1935, and Laitner Brush Co., Detroit, on a bid of \$7560.

For cellulose dope (49-1324):

Companies sharing—Atlas Powder Co., Stamford, on a bid of \$44,785, and Andrew Brown Co., Los Angeles, on a bid of \$23,320.

For sealant patching (49-1295):

Pressite Engineering Co., St. Louis, on a bid of \$63,504.

For steel bars (49-1666):

Crucible Steel Co., New York, on a bid of \$19,376.

For 2370 electron tubes (49-1571):

Companies sharing—Raytheon Mfg., Co., Newton, Mass., on a bid of \$376.20; Mercury Electric Corp., Kansas City, Mo., on a bid of \$4080; Niagara Radio Supply Corp., New York on a bid of \$2416.50 and Continental Electric Co. Geneva Ill. on a bid of \$1480.

For aircraft batteries (49-1879):

Electric Storage Battery Co., Cleveland, on a bid of \$265,650.

For microphone headsets (49-1209):

Telephonics Corp., New York, on a bid of \$37,005.13.

For holder assemblies (49-1874):

Companies sharing—Graflex, Inc., Rochester, on a bid of \$1485; Eastman Kodak Co., Rochester, on a bid of \$1154, and Peck & Harvey, Chicago, on a bid of \$2216.

For photographic equipment (49-1595):

Arel, Inc., St. Louis, on a bid of \$22,-103.16.

For cans, cases, cement, liquids, reels (49-1739):

Companies sharing—Compeo Corp., Chicago, on a bid of \$28,926, and Neumade Products Corp., New York, on a bid of \$1120.

For silver anodes (49-1772):

American Platinum Works, Newark, N. J., on a bid of \$14,250.

For post binding, holders, clamps, & gaskets (49-1496):

Companies sharing—Standard Electrical Products Co., Dayton, on a bid of \$1286.50; Continental Electric, Brooklyn, on a bid of \$1777.50, and Garde Mfg. Co., Pawtucket, R. I., on a bid of \$200.60.

For portable analyzers (49-1397):

General Tire & Rubber Co., Pasadena, on a bid of \$24,922.

For 600 keys, switches & relays (49-1497):

Companies sharing—Kellogg Switchboard & Supply Co., Chicago, on a bid of \$1553; Federal Telephone & Radio Corp., Clifton, N. J., on a bid of \$328, and Continental Electronics, Brooklyn, on a bid of \$1420.

For tester assemblies (49-1511):

Pacific Airmotive Corp., Burbank, on a bid of \$18,108.20.

For 50,000 yards mercerized cotton cloth (49-1836):

William Whitman Co., Inc., New York, on a bid of \$59,500.

For interpreter kits (49-1586):

Companies sharing—Advertising Displays, Inc., Covington, Ky., on a bid of \$151,272.40, and Simmon Brothers, Inc., Long Island, N. Y., on a bid of \$27,699.10.

For 700 stand assemblies (49-1602):

Alco-Deree Co., Chicago, on a bid of \$93,100.

For 29 regulator assemblies (49-1625):

Lindberg Engineering Co., Chicago, on a bid of \$34,307.

For photographic paper (49-1638):

Companies sharing—Haloid Co., Rochester, on a bid of \$4406.88; Macintosh & Sheridan, Inc., Rochester, on a bid of \$46,297.20, and Anken Chemical & Film Corp., Newton, N. J., on a bid of \$1436.80.

For 1000 lamp assemblies (49-1645):

Companies sharing—Revere Electric Mfg. Co., Chicago, on a bid of \$5050, and American Gas Accumulator Co., Elizabeth, N. J., on a bid of \$18,760.

For body connectors (49-1646):

Companies sharing—Westinghouse Electric Supply Co., Dayton, on a bid of \$6164.85; Englewood Electrical Supply Co., Chicago, on a bid of \$31.50, and Graybar Electric Co., Inc., Dayton, on a bid of \$1358.56.

For personal clothing (49-1668):

Companies sharing—American Optical Co., Southbridge, Mass., on a bid of \$3761.10; Great Lakes Mfg. Co., Sheboygan, Mich., on a bid of \$42,789.70; Bristol Mfg. Corp., Bristol, Rhode Island, on a bid of \$10,625, and Pyramid Mfg. Co., Inc., New York, on a bid of \$27,441.46.

For photographic paper (49-1647):
Companies sharing—Gevaert Co., Inc., Williamstown, Mass., on a bid of \$111,755.14; Haloid Co., Rochester, on a bid of \$138,218.74; Eastman Kodak Co., Rochester, on a bid of \$163,355.38; Remington Rand, Inc., Dayton, on a bid of \$1365.24, and Anken Chemical & Film Corp., Newton, N. J., on a bid of \$67,446.30.

For container assemblies (49-1743):
Companies sharing—Mirax Chemical Products Corp., St. Louis, on a bid of \$83,890.32; Cleveland Steel Barrel Co., Cleveland, on a bid of \$31,085, and J & L Steel Barrel Co., Cleveland, on a bid of \$36,466.

For trainer flight equipment (49-1804):
G. W. Holmes Co., Columbus, on a bid of \$42,396.42.

For aluminum alloy tubing (49-1785):
Aluminum Co., Washington, D. C., on a bid of \$14,195.05.

For fibre packing (49-1814):
Companies sharing—Raybestos Manhattan Inc., Manheim, Pa., on a bid of \$7750;

Greene, Tweed & Co., North Wales, Pa., on a bid of \$4269.53; Braiding Packing Works, Brooklyn, on a bid of \$8800; Johns Manville Sales Corp., Cleveland, on a bid of \$3,506.25; F. D. Farmam Co., Chicago, on a bid of \$7,182.50, and Anchor Rubber Co., Dayton, on a bid of \$3331.90.

For cotter pins (49-1815):
Companies sharing—American Steel Co., Pittsburgh, on a bid of \$1136.30; American Chain & Cable Co., Inc., on a bid of \$3863.47; Lamson & Sessions Co., Cleveland, on a bid of \$5767.32.

For 1000 panel de-icers (49-1819):
Raymond De-Icer Co., Inc., Huntington Park, Calif., on a bid of \$16,000.

For 216 liquid containers (49-1820):
Landers, Frary & Clark, New Britain, Conn., on a bid of \$2689.20.

For 1108 heaters (49-1840):
Edwin L. Wiegand Co., Pittsburgh, on a bid of \$5033.64.

For brushes (49-1848):
Companies sharing—Delta Brush Mfg. Corp., New York, on a bid of \$721; Joseph

H. Frankle Co., Philadelphia, on a bid of \$6282; S. A. Felton & Son Co., Manchester, N. H., on a bid of \$652.50, and Ohio Brush Co., Cleveland, on a bid of \$1320.

For toluene (49-1849):
Companies sharing—Industrial Paint Mfg. Co., Birmingham, on a bid of \$5214, and Mobile Paint Mfg. Co., Inc., Mobile, on a bid of \$9,522.20.

For 400 stand assemblies (49-416):
Companies sharing—Aeronca Aircraft Co., Middletown, O., on a bid of \$232,000, and Welded Construction Engineering Co., Cleveland, on a bid of \$28,352.

For 1130 capacitors (49-498):
Companies sharing—Hammarlund Mfg. Co., Inc., on a bid of \$2403; Sangamo Electric Co., Springfield, Ill., on a bid of \$786, and Gudeman Co., Chicago, on a bid of \$525.

For control panels (49-1107):
Companies sharing—Specialty Assembling & Packing Co., Brooklyn, on a bid of \$27,346.44; Commercial Equipment Co., Kansas City, Mo., on a bid of \$3059.36; Dimco-Gray Co., Dayton, on a bid of \$14,483.70; Dayton Airradio Inc., Vandalia, O., on a bid of \$1827.08; Mercury Electric Corp., Kansas City, Mo., on a bid of \$35,545.12, and L. R. Dooley, Inc., New York, on a bid of \$3074.06.

For bolts, clamps, washers, etc. (49-1391):
Companies sharing—National Screw & Mfg. Co., Cleveland, on a bid of \$245.10; Clary Multiplier Corp., Los Angeles, on a bid of \$5053.96; Air Associates Inc., Teterboro, N. J., on a bid of \$650.94; Deutsch Co., Los Angeles, on a bid of \$2826.05; John A. Roebbing's Sons Co., Trenton, N. J., on a bid of \$2001; Wittek Mfg. Co., Chicago, on a bid of \$25,657.17; Adel Precision Products Corp., Huntington, W. Va., on a bid of \$7665.83; Aircraft Fitting Co., Cleveland, on a bid of \$683.50; Irving W. Masters, Inc., Burbank, on a bid of \$683; Aero Bolt & Screw Co., New York, on a bid of \$7505.40; Weatherhead Co., Cleveland, on a bid of \$9844.70; Aeroquip Corp., Jackson, Mich., on a bid of \$4350; L. J. Barwood Mfg. Co., Everett, Mass., on a bid of \$1403.24, and Western Washer & Stamping Co., Los Angeles, on a bid of \$203.29.

For asbestos sheets (49-1423):
Companies sharing—F. D. Farnam & Co., Chicago, on a bid of \$15,793.80; Greene, Tweed & Co., North Wales, Pa., on a bid of \$5597.54; Asbestos Textile Co., Inc., Chicago, on a bid of \$19,964; Cooper Mfg. Co., Marshalltown, Iowa, on a bid of \$7547.20; Clinton Mfg. Co., Inc., Brooklyn, on a bid of \$1500; Reliance Packing Co., Inc., Philadelphia, on a bid of \$18,040, and Johns Manville Sales Corp., Cleveland, on a bid of \$7010.50.

For resistors (49-1442):
Companies sharing—Chicago Telephone Supply Corp., Elkhart, Ind., on a bid of \$152.44; Ward Leonard Electric Co., Mt. Vernon, N. Y., on a bid of \$783.70; Shallcross Mfg. Co., Collingdale, Pa., on a bid of \$57.60; Ohio Carbon Co., Cleveland, on a bid of \$130.92; Sprague Electric Co., North Adams, Mass., \$117.90; Standard Electric Products Co., Dayton, on a bid of \$486.50, and Westinghouse Electric Corp., Dayton, on a bid of \$3554.06.

Canadair Sales

Canadair Ltd. accounted for 76.4 percent of consolidated net sales of its parent Electric Boat Co., according to the latter's annual report. Net sales for 1948 (AVIATION WEEK, May 30) were \$54,558,099. Canadair's share was \$41,704,709.

In March, 1949, the subsidiary delivered the first of 22 Canadair Fours to British Overseas Aircraft Corp. Canadian Pacific Air Lines has ordered four of the craft. Canadair expects delivery on both contracts to be completed by September, 1949. Total unfilled orders at 1948 year's end was \$26,352,000.

Electric Boat reported a \$10,834,396 inventory at Canadair's Montreal plant.

NEW AVIATION PRODUCTS

Aids Inspection

"Auto-Bridge," manufactured by Industrial Instruments, Inc., 17 Pollock Avenue, Jersey City 5, N. J., permits inspection testing and sorting of resistors, capacitors and other impedances at production speed with unskilled personnel.

Machine tests, sorts units mechanically into as many as eight groups according to standards predetermined by plug-in ratio-coils. Standards and jig fixtures are available to meet any specific requirements. Operator has only one control—the on-off switch. By holding test piece against the jig, he activates the testing and sorting mechanism. Chute with electrically-operated trapdoors automatically routes the piece to the proper bin.



Lightweight Valve

Four-way control valve, weighing less than .37 lb., has been developed by General Automotive Supply Co., 1141-43 Wyoming Ave., Scranton, Pa., for 3000-psi. hydraulic systems. Unit shown is for use with $\frac{3}{8}$ and $\frac{1}{2}$ in. tubing.

Designed to meet AN specifications, it has 20 lb.-in. handle torque with pressure applied and 11 lb.-in. without. Leakage is zero at 3000 psi., using AN-O-366 hydraulic fluid at room temperature.

Unit has aluminum alloy body. Central removable cartridge incorporating steel rotor and square sleeve is interchangeable between valves. Extremely close fit of sleeve-rotor assembly eliminates need for packings for internal sealing.

Only other parts to valve are nameplate which helps retain cartridge, pin providing internal stop action, O-ring seals for ports, and two screws. No snap-rings are used.

The neutral position is marked outside body and ports are similarly identified.

box; all-helical, heat-treated gears cut from steel forgings; precision-type bearings; and oil reservoir equipped with magnetic plug.

Gearshift lever and shifting diagram, showing the speed ratios, provide quick, easy speed selection. Gear ratios are: Low, 4 to 1; second, 2 to 1; third, 1.33 to 1; high, 1 to 1. Units are built with 4 speeds rated at 3 hp. at 900 rpm. to 10 hp. at 1800 rpm.

Operation is on 2- or 3-phase, 25-, 50-, or 60-cycle, 220/440 or 550v., alternating current.



Facilitates Tube Jobs

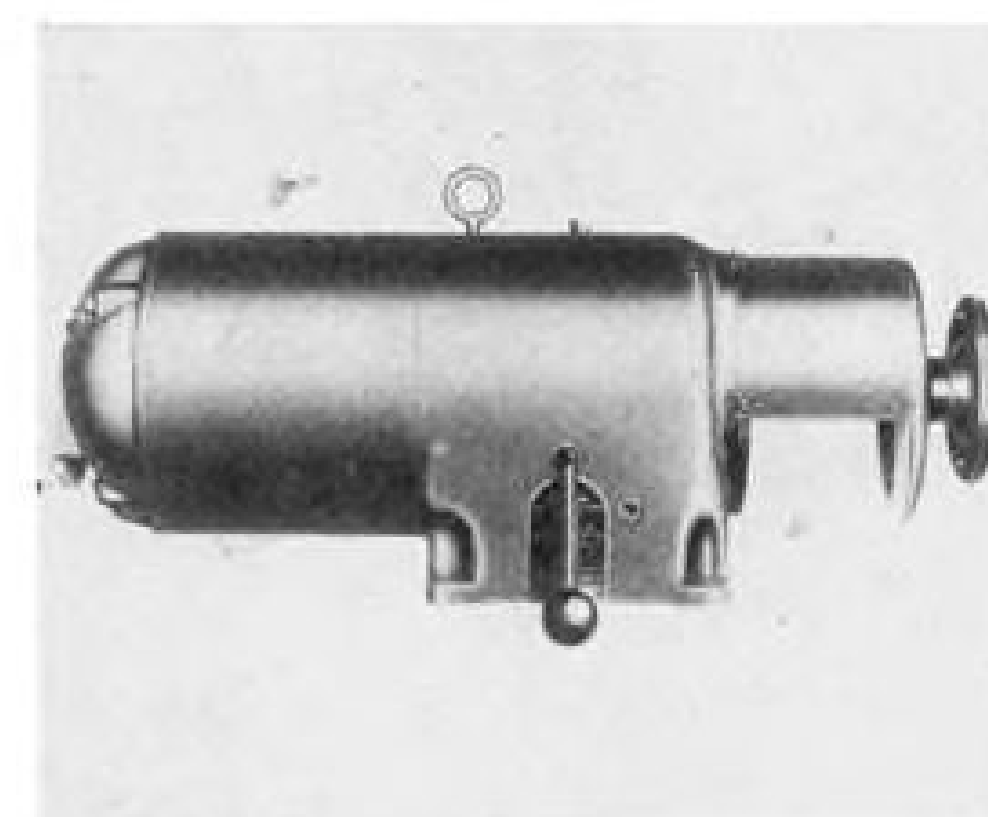
Larger capacity "Tubemaster," developed by Leonard Precision Products Co., Garden Grove, Calif., will flare, flange, square and burr $\frac{1}{8}$ to 5-in. ferrous or non-ferrous tubing.

Adaptors furnished with the new model permit users of smaller capacity machines to utilize present tools and dies. Tooling also is available for beading operations.

Device is powered with 2-hp. motor and vari-speed drive giving 70-550-rpm. range for handling various materials.

Improves Doping

Solvent for minimizing sanding and preventing blushing in dope jobs is manufactured by Potter Paint Co., Inc., Cortland, N. Y. Known as Dope-Solv, product is distributed by Van Dusen Aircraft Supplies, Teterboro Air Terminal, Teterboro, N. J. and is recommended for use with final coat on all finishing operations. As little as $\frac{1}{2}$ pt./gal. of dope is required. Material permits dope to flow on smoothly, and imparts enamel-like finish with virtual elimination of orange-peeling. It makes dope penetrate through previous coats to blend all into integral tough, longer-lasting finish. Claim is that when used in final coat, solvent eliminates blushing even if previous coats of regular dope have blushed.



Machine Tool Drive

For individually motorizing machine tools formerly driven from lineshaft, multispeed Type R4 gearshift drive, made by Lima Electric Motor Co., Lima, Ohio, is self-contained unit combining integrally mounted motor and four-speed transmission.

Features of device are unit-cast gear-


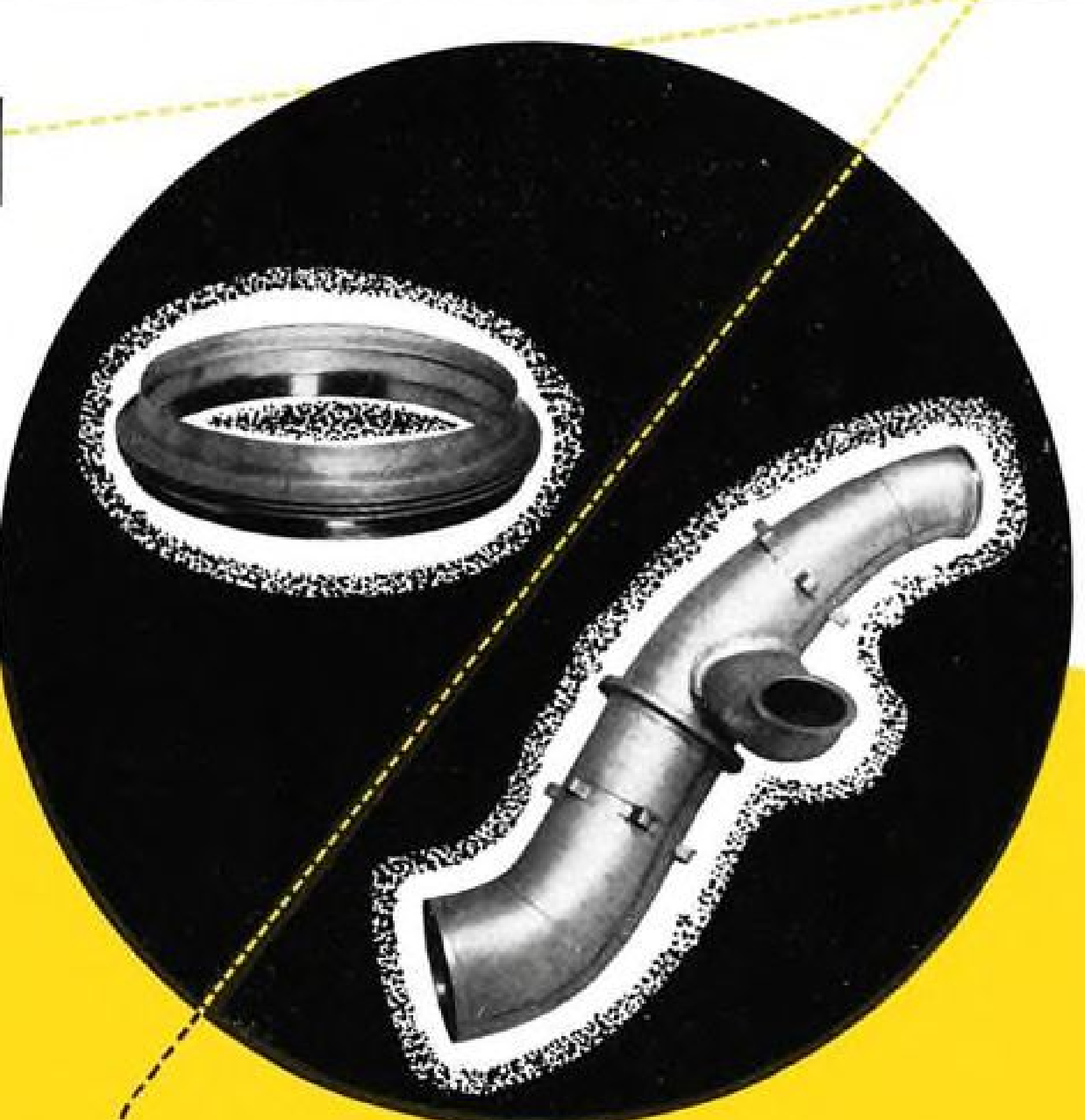
Cabin Extinguisher

Lightweight, rechargeable, water-extinguisher for fighting fires in carbonaceous material on planes, is offered by Walter Kidde & Company, Inc., Belleville, N. J.

CAA approved, unit contains 1 $\frac{1}{2}$ qt. of anti-freeze solution. Full extinguisher weighs under 7 lb. and operates at temperatures down to -40 F. Pressure for squirting 20-ft. stream is provided by carbon dioxide gas released from small cartridge contained in threaded extinguisher handle.

Device is intended particularly to put out fires in seat upholstery, curtains, paper or other ordinary combustible material.

Extinguisher can be recharged by removing top, refilling from available water supply, unscrewing handle, and inserting new carbon dioxide cartridge.

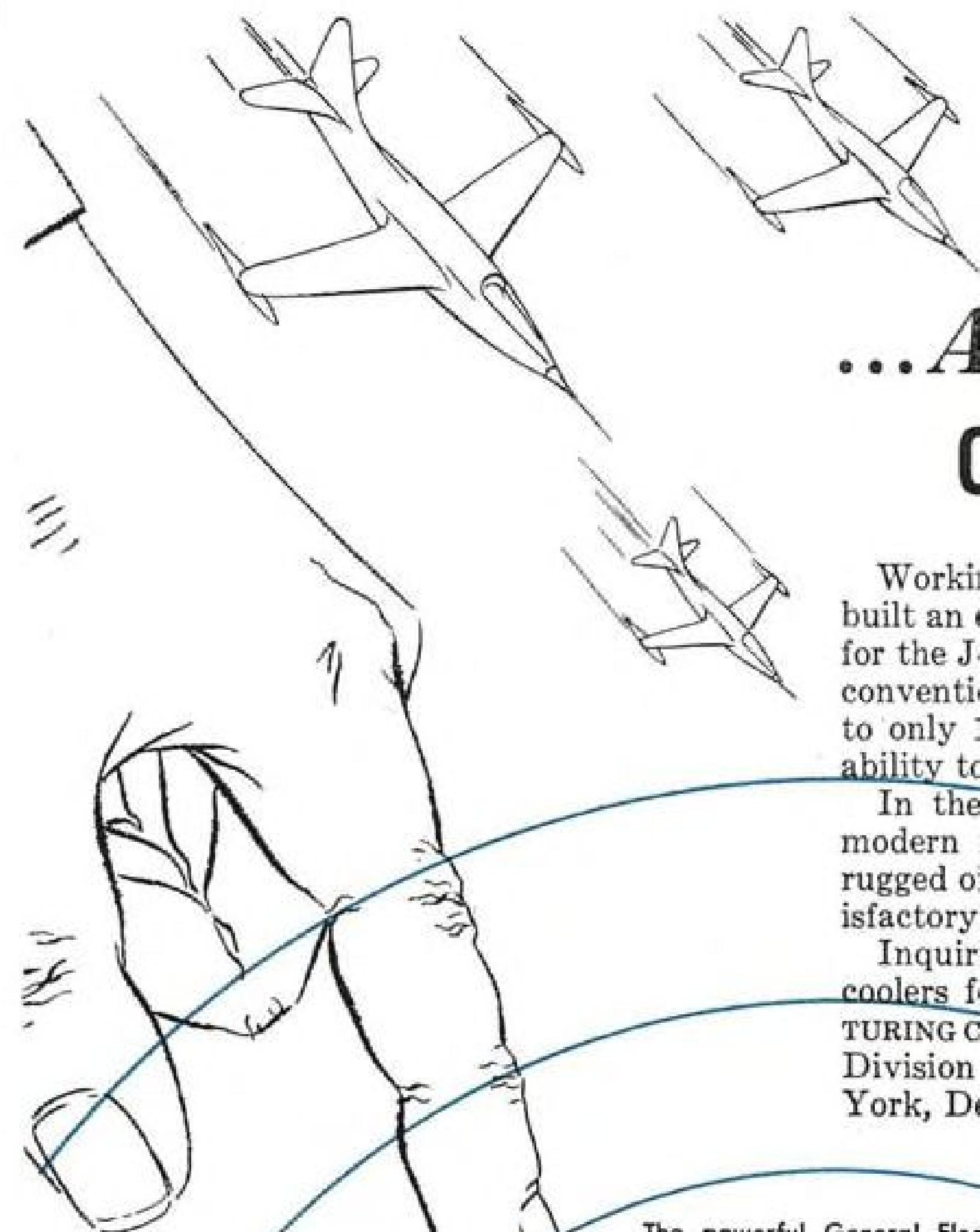
High Temperature Alloy FABRICATIONS

- Complex weldment or intricate form—your problem is simplified by Smith-Morris.
- Whether your requirement is an experimental stamping or a production assembly, our staff of engineers, metalsmiths, certified welders, and precision machinists can smooth the way to better schedules and lower costs.

SMITH-MORRIS COMPANY

AIRCRAFT EXHAUST MANIFOLD SYSTEMS
GAS TURBINE PARTS AND ASSEMBLIES

FERNDALE 20, MICHIGAN



J47 Axial-Flow Turbojet Engine

...Another FEATHER-WEIGHT OIL COOLER Application

Working closely with General Electric, Clifford designed and built an entirely new FEATHER-WEIGHT all-aluminum oil cooler for the J47 axial-flow turbojet engine. Whereas oil coolers for conventional type aircraft engines generally require resistance to only 100 lb. surface pressure, these new coolers called for ability to withstand 500 lb. pressure or even more.

In the Clifford wind tunnel laboratory, largest and most modern in the aeronautical heat exchanger industry, these rugged oil coolers are tested at 1000 lb., extra assurance of satisfactory performance under actual flying conditions.

Inquiries concerning FEATHER-WEIGHT all-aluminum oil coolers for your application are invited. CLIFFORD MANUFACTURING COMPANY, 136 GROVE ST., WALTHAM 54, MASSACHUSETTS. Division of Standard-Thomson Corporation. Offices in New York, Detroit, Chicago, Los Angeles.

The powerful General Electric J47 axial-flow turbojet engine, rated more than 5000 lb. static thrust, is designed to give exceptional power and speed to U. S. military aircraft.

CLIFFORD

FeatherWeight

ALL-ALUMINUM OIL COOLERS
FOR AIRCRAFT ENGINES
HYDRAULICALLY-FORMED BELLOWS
AND BELLOWS ASSEMBLIES



SALES & SERVICE

Wholesalers Fight To Keep Outlets

Proposal that plane distributors be permitted to handle accessories and parts get support at ADMA meeting.

By Alexander McSurely

COLORADO SPRINGS—Trend to swing more aircraft accessory business to the airplane distributors, short-circuiting the big regional wholesalers of accessories and parts, is meeting with strong opposition from the wholesalers, who up until now have been the principal outlets for this equipment.

In the unenviable position of being "in the middle" in this controversy are the manufacturers of the propellers, engines, tailwheels, radio equipment, etc., who have to deal both with the airplane manufacturers and with their own independent distributors.

Controversy which has been smoldering almost since the first postwar personal planes were marketed, was brought out in the open at the summer meeting of the Aviation Distributors and Manufacturers Assn. here when Don Flower, Cessna Aircraft Co. sales manager and a leading proponent of the new trend, presented a frank discussion of the problem. He got a rise out of several of the big independent distributors in the discussion which followed.

► **Help to Distributors**—Flower told ADMA that Cessna wanted to distribute as much as possible of equipment that goes on Cessna planes through its own distributor system.

"The personal plane industry is not selling enough new planes today to replace the ones which are used up, and we are afraid this condition will continue through 1950," Flower told the group. "But unless we keep a good sales organization to sell the planes, the market also drops off for the accessories. The sale of the plane must come first, but we want to help our distributors by giving them this supplementary business, also."

Flower said his company preferred to have Cessna distributors deal as distributors directly with accessory manufacturers except for original equipment. But he said his company was willing to provide the accessories to its distributors for a nominal carrying charge covering actual costs of handling if an accessory manufacturer preferred to make a single deal with Cessna rather than appoint the Cessna distributors as his distributors.

Such an arrangement, he thinks, would answer the criticism that the program would entail setting up too many distributors with whom each accessory manufacturer would have to deal.

► **Other Experience**—Continental Motors has appointed approximately 75 percent of the Cessna distributors as its distributors also. Exceptions are mainly due to lack of service facilities.

Sensenich propellers has an arrangement where distributors of airplanes can act as distributors of propellers which fit those planes.

McCauley propellers, after trying out a system under which airplane distributors also acted as its distributors, recently changed its distribution plan to distribute through the big regional supply houses. A McCauley representative told AVIATION WEEK that it was found the airplane distributors with few exceptions made insufficient efforts to push sales of McCauley propellers on

any other make of airplanes than the ones they were selling.

Goodyear's aviation sales division has agreed to let Cessna have exclusive distribution of the crosswind landing gear for Cessna planes, to be handled through Cessna distributors.

Flower told AVIATION WEEK that he considered the trend a growing one, and that he believed other personal plane manufacturers would agree with him. However, he believes that the present personal plane market trend will eliminate additional plane manufacturers until the market will be shared by three or four surviving companies. So the new distribution trend will not mean a wide fanning out of additional distributor outlets through many plane companies. ► **Add Planes to Accessories**—The Cessna sales manager indicated that one simple solution would be to have the accessory suppliers take on personal plane distributor franchises, and pointed out that some suppliers were already doing this.

Larry Zygmunt, head of General Aircraft Supply, Detroit, replied to Flower that he believed his company and other independent distributors were doing more to promote sale of personal planes by not confining themselves to representing one particular plane.

I. W. Trees, service manager of Scintilla Magneto division, Bendix Aviation Corp., pointed out that Bendix had withdrawn a proposed entry in the per-



NEW ROADABLE

Automobile component of the new Aerocar, three-place roadable aircraft which Moulton B. Taylor is developing at Longview, Wash., is shown with the designer. Car weighs under 850 lb. Frame and landing gear have been drop-tested with CAA approval. The 100 hp. Franklin airplane engine has cross-over exhaust, helicopter-type air cooling, and uses a steel cable power takeoff for

automotive drive. Comfortable road speed is reported at 45 mph. which is achieved at 2000 rpm. Company has applied for approval to sell a stock issue to build 10 roadable units, after completion and test of the flight component prototype now under construction. Highwing flight component attaches to rear of auto, with extension shaft running back to pusher propeller.

BRIEFING FOR DEALERS & DISTRIBUTORS

NOT TOO BAD—Despite that dark grey paint with which a lot of people are daubing the current picture of personal aviation, a poll of the 70-odd distributors and manufacturers at the recent Colorado Springs summer meeting of Aviation Distributors and Manufacturers Assn. showed that many of them are still "doin' all right."

Some specimen quotations:

- **Don Flower, Cessna:** So far, our dollar volume in airplane sales is higher in 1949 than in 1948.
- **Earle Scott, Scott Aviation Corp.:** Sales are up 13.5 percent this year for the first five months, with most of the new volume from our new tail wheel assembly and new oxygen equipment.
- **Phelps Lane, Precision Airmotive, Houston:** We're doing overhauls now for Bell on their Franklin helicopter engines but most of our volume is still in Pratt & Whitney Wasp Jr. engines.

FAINT CHEERS FOR CODE—Attempt of the ADMA to get its members and customers to save money by telegraphic code isn't working too well judging by the weak praise for the code heard at Colorado Springs. Consensus was that the code is a fine thing if people use it but most aren't taking the trouble.

Members decided to defer a proposed code revision, and save the revision expense, pending further study about the worthwhileness of the whole project. Sample codes:

- **ACBAD**—The account has been charged off as a bad debt.
- **IFNOT**—If not collected we intend to refer to Dun & Bradstreet.
- **DABAL**—Please advise shipping date balance due on our order.

WHOSE BABY?—Problem of obsolescence of aircraft supplies lies somewhere in the no-man's land between the manufacturer who makes the stuff and the distributor and dealer who stock it, but neither group seemed to want to claim it at the ADMA discussions.

Henry Podgorny, Pacific Airmotive, speaking for the distributors, proposed a plan for manufacturers to take back obsolescent stuff, with distributor sharing the loss. George Jalonick of Southwest Airmotive reported that one manufacturer allowed his company an extra discount to cover his responsibility for obsolescence, and that it then became Southwest's responsibility entirely. Some of the manufacturers seemed loath to assume any definite responsibility, although none voiced a definite "buyer beware" policy.

MIDGET ORDERS—Fixed base operators who continually buy tiny orders of supplies from the distributors, are hurting both parties in the transaction, it was concluded at the ADMA meeting. H. L. Wheeler of Buffalo Aeronautical Corp. reported that analysis of his orders from the operators showed approximately 73 percent amounted to \$5 or less and that these constituted less than 25 percent of his total dollar volume. Cases were cited by distributors, of purchases of little more than a dollar made by operators who flew in from adjoining towns to get the commodities.

Discussion ended on note of more education needed to get customers to plan orders in advance, eliminate many of the junior-sized orders which cost more to handle than the profit involved, and often could be prevented by planning.

ANOTHER TRADE SHOW—Dick Bomberger, ADMA president, is sounding out the aviation industry on the chances for another aviation trade show at the next ADMA convention, at French Lick Springs, Ind., Nov. 9-11. Last year's show at the Cleveland ADMA meeting was reasonably successful, marred principally by a mixup in convention schedules of National Aviation Trades Assn., which prevented that group from being at show during much of open time.

ADMA would like to have personal plane manufacturers get in on the French Lick show if it is held, and make it something bigger and better than last year. Invitation will again be extended to NATA to join with ADMA in the November meetings.

—ALEXANDER McSURELY

sonal plane field, because it had been felt that Bendix could not sell its accessories to other plane manufacturers if it was a direct competitor. The same reasoning might apply he said, to supply houses which supplied several different plane distributors, if they, too, took on plane distributorships.

Tom Davis, head of Piedmont Aviation, Inc., Winston-Salem, N. C., which distributes planes in addition to its supply business, indicated his company had not experienced serious difficulty in supplying other airplane distributors. **► Inventory Problem**—Other supply house representatives believed that the amount of inventory required to serve as an accessory distributor could be expected to limit severely the number of plane distributors who would undertake to carry such a stock.

"The plane distributor will be up against the same problems of stock obsolescence and warehouse space that we are," one big independent supplier predicted to AVIATION WEEK, "and in most cases he will be putting secondary emphasis on the accessory business. Meanwhile, his competitor across the airport will be letting us carry his parts and accessories inventory for him, and calling on us for deliveries as he needs them."

"He won't have his capital tied up and can use it for his main business, selling airplanes."

Spin Tests Out

Spin tests will no longer be required of student pilots effective Aug. 15 as a result of a change made last week by CAB in part 43 of the Civil Air Regulations. The new ruling provides for instruction of the student pilot in recovery from power-on and power-off stalls entered from all normal attitudes.

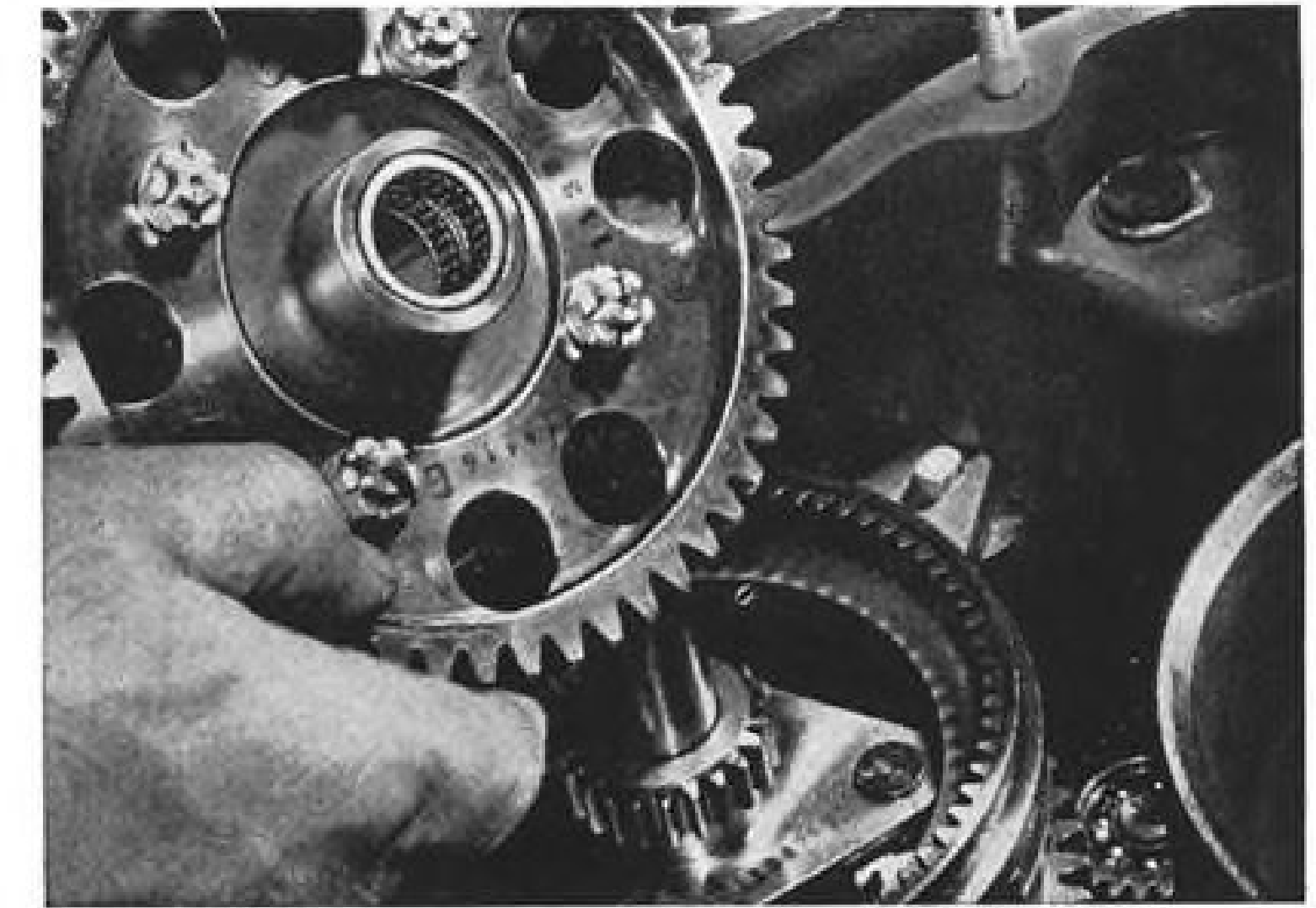
The subject of spin tests for private pilot licenses has been the subject of controversy for the last two years or more, advocates of eliminating the tests contend that many middle-aged business men who might otherwise become pilots are discouraged by this test. It is reported by CAB accident analysts that the only stall fatalities are those in which pilot was so close to ground that recovery was impossible even if he knew how to recover. Spin test has been compared to teaching a student automobile driver how to run his car into a skid on a wet pavement.

Elimination of the spin test on light airplane design is expected to lead toward more spinproof airplanes. Since a large part of the light plane market has been for trainer planes, which had to be spinnable in order to be used in instruction, it is believed that many spinnable planes will soon be redesigned as spinproof.

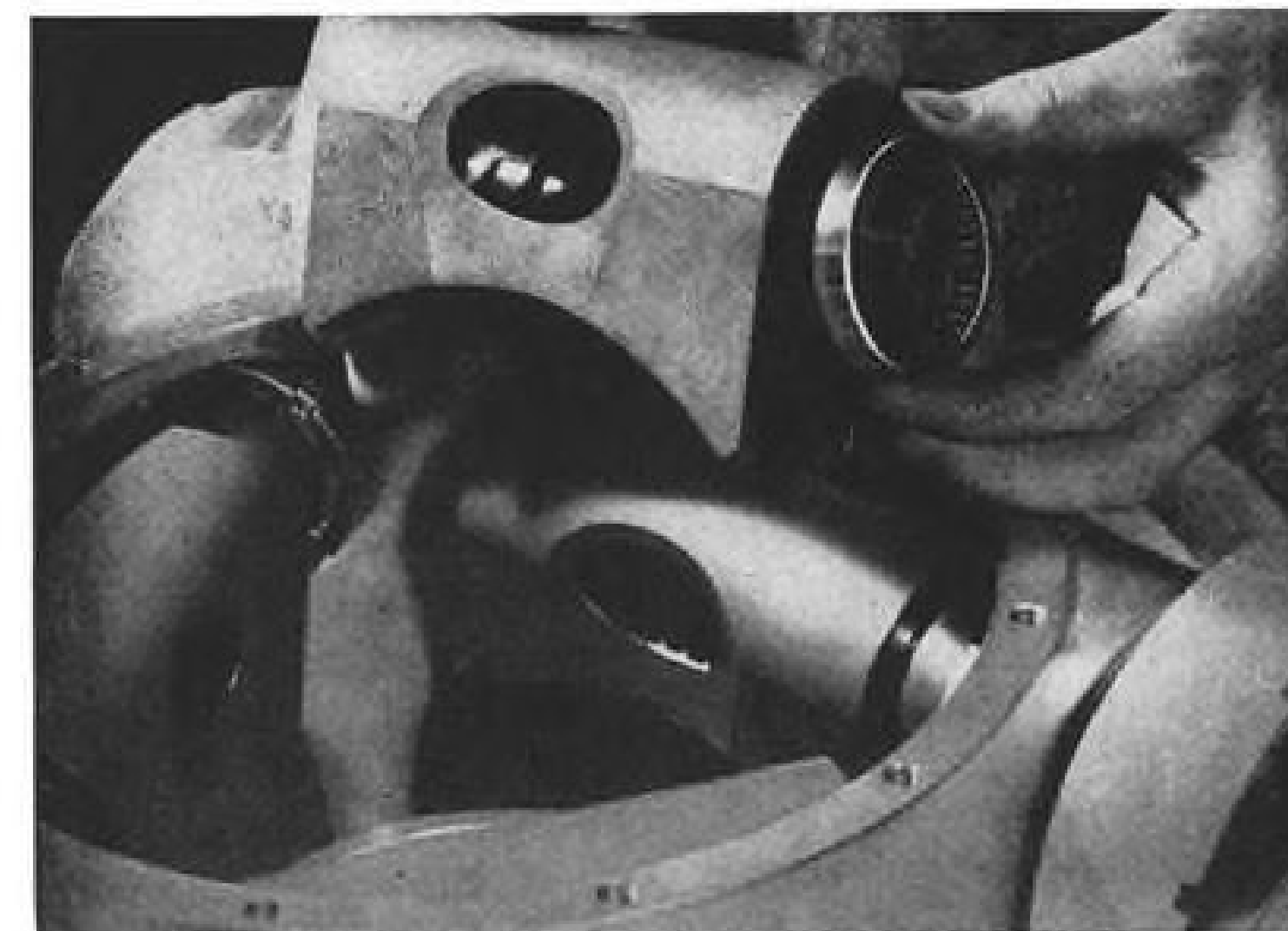
Torrington Needle Bearings provide compact, rugged design for Curtiss-Wright B-36 propellers



Space is at a premium in the pitch control mechanism of the Curtiss-Wright C636S propellers used on the B-36. Essential, too, are lightweight design and rugged construction. Torrington Needle Bearings are used in this mechanism because they provide exceptional compactness and load capacity.



Rotating continuously at 1600 rpm, the drive gear assembly operates efficiently on high-capacity Needle Bearings. During pitch change, each bearing carries radial loads of nearly 400 pounds. The full complement of rollers provides a high factor of reliability and assures long service life.

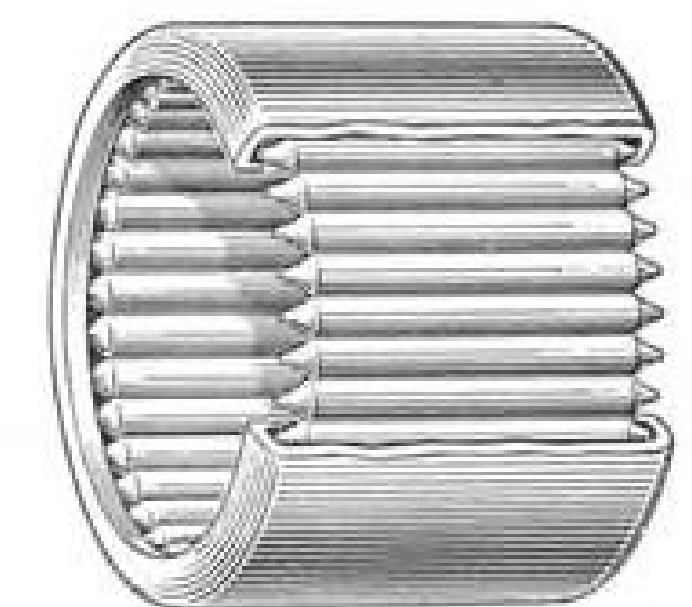


Three large worm gear shafts are mounted on Needle Bearings, and housings are kept relatively small. Stationary during fixed pitch operation, these gears need the high static non-brinell capacity of Needle Bearings—plus their smooth anti-friction operation at 1200 rpm during blade feathering.



Lubrication is no problem with Needle Bearings. Take this braking assembly as an example. The lips of the bearing ride close to the shaft and help conserve lubricant. The Needle Thrust Bearing, at the left, is specially designed for this application to provide compactness and high thrust capacity.

To keep *your* aircraft light for flight, rugged for safety and efficient for low maintenance and long service, use Torrington Needle Bearings. Let our engineers help you with any related design or installation problems. Write us today. THE TORRINGTON COMPANY, Torrington, Conn., or South Bend 21, Ind. District offices in principal cities.



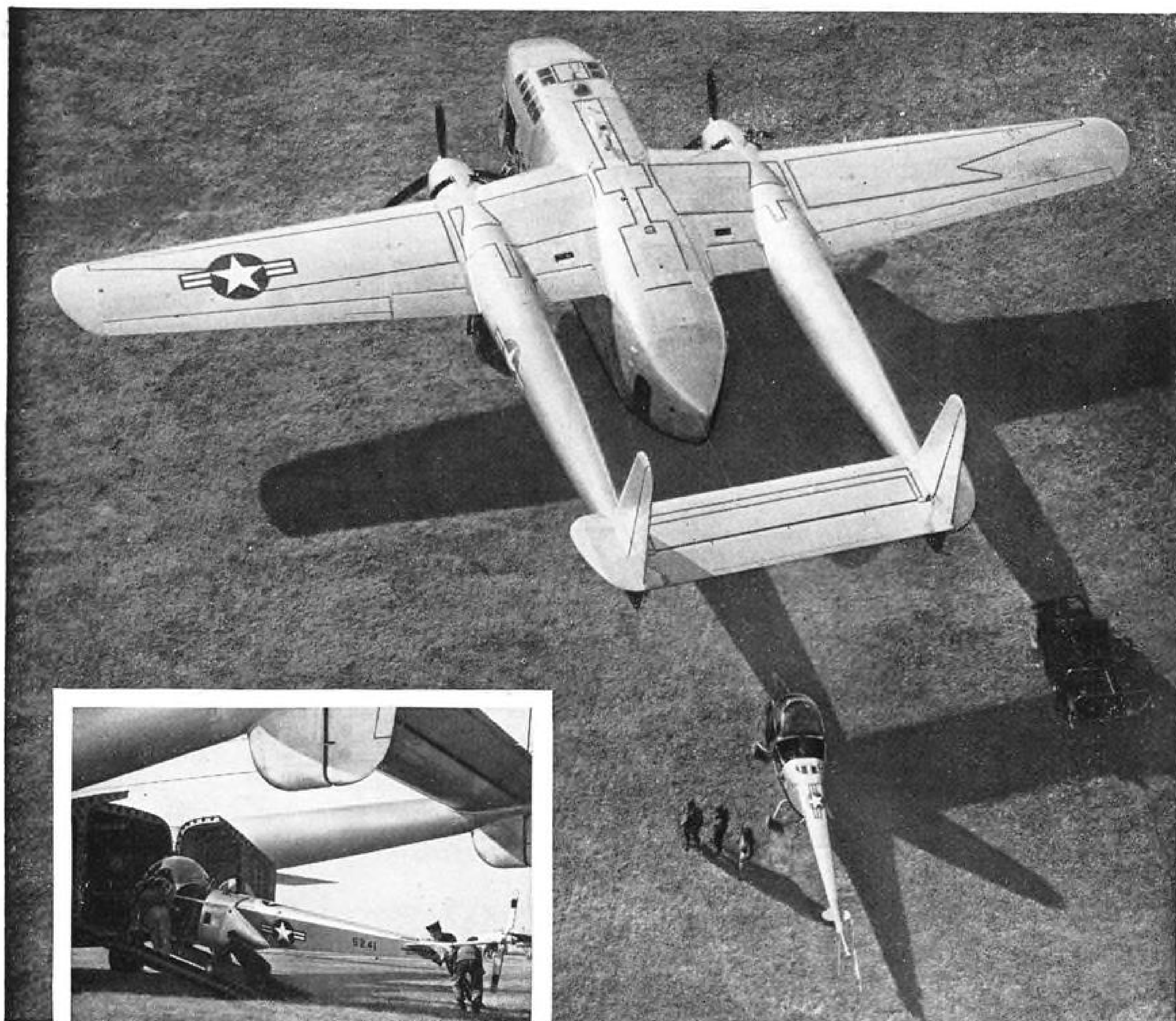
TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller

Straight Roller • Ball • Needle Rollers

AIR RESCUE

Over faraway jungles, deserts and mountains, helicopters of the USAF Air Rescue Service have flown in search of stranded airmen and passengers. The helicopters got there because they have been given a "mother" ship—the Fairchild Packet—that transports them over distances far beyond their range. Thus, our Air Force has added a new ability to the versatile Fairchild Packet—increasing the importance of its part in the development of modern airborne military tactics.



Mission of Mercy—Air Rescue personnel load a helicopter into the spacious cargo hold of a Fairchild Packet.

FAIRCHILD

ENGINE AND AIRPLANE CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Divisions: Fairchild Aircraft, Hagerstown, Md. • Ranger Aircraft Engines, Farmingdale, N. Y. • Nepo, Oak Ridge, Tenn. • Fairchild Pilotless Plane, Farmingdale, N. Y.
Al-Fin, Farmingdale, N. Y. • Subsidiaries: Stratos Corporation, Farmingdale, N. Y. • Duramold Aircraft Corporation, New York 20, N. Y.

AIR TRANSPORT



PASSENGER-PLEASING ideas such as this modified baggage hold are stock in trade of . . .



. . . TPA EXECUTIVES Richard H. King, Ruddy F. Tongg, Allen A. Barrie and H. K. Hee.

TPA Battles for Hawaiian Traffic

Efforts to sell itself as "people's airline" combat greater experience and equipment of rival Hawaiian Airlines.

Four blue-trimmed DC-3s took to Hawaii's skies earlier this month and ended a 20-year monopoly in one of air transportation's most lucrative fields.

With beaming Ruddy F. Tongg, its president, aboard one of the planes, Trans-Pacific Airlines, Ltd., began offering Hawaiian Airlines, Ltd., its first scheduled competition—bidding for a corner of the 400,000 air riders who will travel through the archipelago this year.

The new David takes on a sturdy giant.

► **Few Planes, Many Ideas**—The giant has twelve DC-3s, including two used for air freight, and a record of nearly

20 years' service without a passenger or crew fatality.

TPA, which celebrated its third birthday June 4, has four DC-3s, several more coming, some rough-and-ready toughness and a bag of tricks of its own. Trans-Pacific has opened the bag twice, and both times scored heavily.

When Hawaiian Airlines reduced its fares to the level of Trans-Pacific fares, local newspapers quoted Stanley King, TPA traffic superintendent as paying tribute to the "obvious desire" of Hawaiian Airlines to join TPA in giving the people of Hawaii convenient service at economical rates.

► **Salutes to Rival**—Said King: "Our

fares were on a par with Hawaiian Airlines' at the start of operations. However, early in 1948, Hawaiian found itself compelled to raise its fares. TPA's fares were not raised then—and have not been raised since.

"TPA is happy now to have Hawaiian Airlines operating on the same basic fare schedule as TPA. It would otherwise be confusing to the public to have similar air service available on different terms."

When Hawaiian Airlines won the National Safety Council 1948 safety award, TPA president Tongg was quoted in the local press as offering "sincere congratulations" to HAL president Stanley C. Kennedy. Said Tongg: "We shall do our utmost to continue to maintain the high standard of safety on island air routes; we look forward to matching your excellent record of performance."

► **DC-3 Modified**—Trans-Pacific's DC-3s can carry 28 passengers, and the baggage compartment is modified to handle luggage. The conversion was designed by William Randall, TPA's vice president-operations, and the compartment has two entrances—one for major terminal points where the rear cargo door swings open, and an additional entrance into the seating section through a small bulkhead door which provides in-flight access.

The baggage compartment is only one in a series of ideas aimed at aiding the passenger and establishing Trans-Pacific as "the people's airline."

► **Stock for All**—Another is broad-base stock ownership. To attain its \$1 million capitalization TPA is offering 1 million shares of common stock at par value of \$1 each. So far, no single shares have been sold but blocks of 50 are being spread around, with stockholders restricted to Hawaii residents. TPA apparently hopes to prove that a stockholder with 50 \$1 shares will feel like a bigger stockholder than if he holds five shares at \$10 each.

President Tongg, son of a Chinese immigrant laborer, owns some 5 percent of the stock and has effective control of the corporation. There are more than 2200 stockholders, and the carrier is reaching out for more. Last month, some 840,000 shares had been subscribed—the last 340,000 under the dollar-a-share plan set up last October.

► **Prospects**—TPA and Hawaiian agree that TPA should catch more than 100,000 of the inter-island airplane riders in its first year—perhaps a quarter or a third of the whole pie.

And CAB, in granting TPA its charter, agreed that (1) it was high time to end the monopoly in Hawaiian transportation, and (2) both lines could operate profitably (AVIATION WEEK, Mar. 7).

The CAB report certifying TPA commented:

"The award would have the incidental advantage of providing a competitive spur to Hawaiian, and of assuring the continuation of improved services which may have been instituted by Hawaiian as a result of the service of non-certificated carriers.

"The record shows that about the time Trans-Pacific and other non-scheduled carriers started service, Hawaiian instituted a number of improvements in its service.

Hawaiian and TPA fought a hard legal battle in TPA's first three years—Hawaiian getting a court injunction to stop TPA from virtually scheduled operations, TPA filing a \$2 million anti-trust suit against Hawaiian which is still pending.

But they'll cooperate on at least one point. Federal officials have directed that TPA will use Hawaiian's communication network, and the two will share the costs.

Rails On Air

Airlines are formidable competitors, so AAR would cut off subsidy.

The Assn. of American Railroads laid its case against the airlines, before the Senate Interstate and Foreign Commerce Committee last week. Railroad spokesmen claimed that airlines are now "formidable" competitors in mail and freight as well as passenger business.

Carter Fort, AAR counsel, and J. H. Parmelee, AAR vice president, proposed a three-step program.

AAR's program involved:

- **Ascertainment** of "all" government subsidies to commercial airlines. In addition to subsidization through mail payments, AAR called for a determination of "subsidization through promotional programs"—construction and maintenance of airports; installation and operation of air navigation facilities; traffic regulation and control services; special weather services; safety regulation services; airman and aircraft licensing and inspection services; maintenance of "promotional" agencies—CAA, CAB, and National Advisory Committee for Aeronautics.

- **Removal** of all government airline subsidization now causing an "unnatural" and "uneconomic" transportation system. AAR commented: "To the extent airlines are encouraged by government subsidy to enter fields and perform services not economically justified by the test of voluntary public support in the form of payments for and service used, the resulting diversion of traffic from surface carriers is an injury to

... the commerce interests of the United States. U. S. commerce needs surface transportation in much greater volume than it needs air transportation, and it is not the part of wisdom to promote air transportation to the detriment of surface transportation."

- **Big boosts** in air rates both for passenger and freight rates. If government subsidization were withdrawn, rate boosts would be forced, AAR maintained, since "artificially" low airline passenger and freight rates are now possible only because of government support. AAR said that the 1948 ton-mile revenue of the domestic trunk lines was only 57 cents for passengers and 19.65 cents for freight, but 126 cents for government mail.

- ▶ **Insignificant Value**—Commercial aviation, the AAR spokesmen argued, is of "insignificant" value to the military air services. The total personnel of all domestic and overseas air carriers at the end of 1948 was only 79,989, of whom 6666 were pilots and co-pilots, it was said. So even if the government took over the scheduled air transport system, in toto, down to file clerks, AAR protested, it would amount to only three percent of the total military aviation personnel at the peak of the last war. Its pilot supply would amount to only slightly more than three percent of the number of pilots required at the peak of the last war. AAR urged that national defense air power be developed directly by the services, and not "indirectly and inadequately" through support of commercial aviation.

- ▶ **Witnesses Listed**—Other witnesses before the committee—scheduled to wind up the hearings phase of its comprehensive investigation of airline finances June 30—were:

- **Sam Solomon**, aviation consultant, who urged aggressive development of low-cost mass air transportation. He opposed separation of service and subsidy mail payments to carriers, claiming it was aimed at affording the big lines, with choice self-supporting routes, an argument for coercing acquisition of small struggling carriers;

- **Robert Six**, president of Continental Airlines, who pointed to "excessive competition" by feeder lines as a major cause for airline losses. He reported Continental has had discussions with Pioneer Air Lines and Trans-Texas Airways, looking to their acquisition;

- **Sigmund Janas**, president of Colonial Airlines, who charged CAB with discrimination against Colonial, authorizing an "illogical and inefficient" route structure for the carrier and denying it segment links which would make possible an economic operation. Colonial's financial headaches are "here to stay," he declared, unless a plan is worked out for its acquisition of Northeast

Airlines' trunk routes and it is given New York-Washington and New York-Buffalo-Syracuse-Toronto routes.

He flung the charge of "government subsidization" back at Eastern Air Lines, claiming that the lush route pattern bestowed on EAL by CAB gave it a competitive advantage over other carriers.

Countering EAL President Eddie Rickenbacker's proposal to save the taxpayers \$1,468,000 annually in mail pay by taking over Colonial routes, Janas offered to take over EAL's operation and donate \$25,000 to charity if he failed to both reduce its mail pay requirements and at the same time increase its earnings;

- **Mil Senior**, chairman of Flight Radio Officers Air Safety Committee, representing the communications employees of eleven scheduled and two non-scheduled airlines, who charged CAB and CAA with laxity in insisting upon adequate communications facilities and personnel in operations. He designated Radio Technical Committee for Aeronautics' long-range program for all weather flying as a wastage of approximately \$1 billion, since its objective could be accomplished with known facilities and by adequately staffing stations.

ICAO Approves ILS and GCA

International Civil Aviation Organization has approved ILS and GCA as international standard equipment for low approaches to airports under instrument conditions.

Council of ICAO recently voted to follow U. S. CAA policy of making ILS (a very high frequency radio beam) the standard instrument landing system for international airports with GCA (search and precision beam approach radar) a supplementary aid for air traffic control and for aircraft not equipped with ILS receivers.

Other standards approved by the council also reflected a victory for U. S. policy with the VHF omni-directional range adopted as the standard short-range aid to navigation and provisions made for adding a standardized version of distance measuring equipment (DME) when it becomes available.

No standards were approved for long range navigational aids. ICAO determined that no completely satisfactory long-range navigation equipment has been sufficiently developed to warrant international standardization. Basic interim long range equipment will continue to be low frequency Loran.

- ▶ **Assembly Meeting**—Meanwhile, delegates representing 33 contracting states at ICAO's third assembly required less than two weeks to dispose of adminis-

trative and budgetary matters on the agenda for the meeting, which concluded early last week.

As the result of their deliberations:

- **Voting power** in the Assembly, Council and subsidiary bodies, excluding regional meetings, was suspended for Bolivia, Nicaragua, Paraguay, Poland and the Hashemite Kingdom of the Jordan because of their failure to meet ICAO financial obligations. Provision was made for reinstatement on payment of dues.

- **The Council** is to consider readjustment of staff salaries and report thereon to the Assembly in 1950.

- **A U. S. proposal** for consolidation of the joint support emergency fund with the working capital fund was approved, with Council transfers from the latter authorized up to \$100,000 for unforeseen expenses occurring in any one financial year.

- **The Council decided** to study the feasibility of holding the fourth assembly outside of Montreal, with particular reference to an invitation from Argentina to meet at Buenos Aires.

- ▶ **Financing**—On the first of these, the Council was instructed to discuss with defaulting states the whole question of their relations with ICAO. Payment of outstanding contributions will be obtained where possible. Failing settlement, other courses of action will be considered and recommendations submitted to the fourth assembly.

Because of dollar shortages, member states in certain circumstances may be permitted to pay a proportion of their 1950 contributions in other currencies than dollars.

If the assembly meets at Buenos Aires, next year, it probably will do so in combination with Caribbean, South American and South Atlantic regional air navigation meetings.

CAB Acts on Northwest Financing

Civil Aeronautics Board has asked the Reconstruction Finance Corp. to guarantee a \$12 million loan to Northwest Airlines for purchase of ten Boeing Stratocruisers.

The loan would be made by a group of 12 private banks and would be part of a \$21 million loan to Northwest to finance flight equipment. CAB asked RFC to guarantee four-sevenths of the total \$21 million loan. Northwest already has received \$9 million from private banks with which it bought Martin Model 2-0-2 transports.

CAB in a letter signed by Board Chairman Joseph O'Connell told RFC that it would approve Northwest's application for the bank loan if RFC would participate in the guarantee to the amount of \$12 million.

Air Pact Stirs Senate Tempest

Commerce Committee wants future agreements in form of treaties requiring Senate ratification.

Legislation requiring that all future international air agreements take the form of treaties, making them subject to Senate ratification, was reported out of the Senate Interstate and Foreign Commerce Committee last week.

The action was a response to the tempest that followed the recent U. S.-Canada bilateral pact, (AVIATION WEEK, June 13) which Colonial Airlines claimed "exchanged one U. S. horse for one Canadian rabbit."

- ▶ **Chances Good**—Enactment of the measure, which must be passed on by the House as well as Senate appears probable. But it will have little effect on the overall international air picture for the foreseeable future. Only major agreement still to be negotiated is with Mexico.

Here the legislation, if enacted, could mean a congressional fight. In event of renegotiation of existing agreements—a possibility although observers consider it unlikely—it would assume additional importance.

- ▶ **McCarran's Bill**—The bill (S. 12) is one of several aviation measures introduced Jan. 5 by Sen. Pat McCarran (D., Nev.).

Similar legislation has now been going to the same Senate committee regularly for the last five years. A previous committee endorsed the treaty idea several years ago by a 17-1 vote.

After presenting Colonial's case against the pact to the Senate committee, James M. Landis, a director, reported to AVIATION WEEK that the carrier as a next step would consider a court contest on the grounds that the executive branch over-stepped its authority and that the agreement should be a treaty.

Legal experts till now have never agreed on where to draw the line between the subject matter for an executive pact and a treaty.

- ▶ **Agreement Defended**—J. Paul Barringer, deputy director of the State Department's office of transport and communications, Joseph O'Connell, chairman of the Civil Aeronautics Board, and CAB member Russell Adams staunchly defended the agreement at the committee session as "a good agreement in the national interest."

Landis argued that the U. S. obtained rights of "only negligible value" in exchange for the lucrative Montreal-New York route, paralleling Colonial's operation, granted Canada. Diversion of this traffic to Trans-Canada Air Lines, he estimated, will lose Colonial \$800,000 to \$1 million annually in non-

mail revenue. Adams termed the estimate "rather exaggerated."

- ▶ **Landis Challenge**—Landis challenged CAB calculations that (1) traffic rights obtained by the U. S. at Edmonton will furnish \$400,000 additional Orient traffic annually for Northwest Airlines, and (2) that rights at Gander will provide \$1 million in traffic annually for U. S. carriers (Pan American Airways, American Overseas Airlines, and TWA).

The only advantage of the Edmonton stop is that it will permit Northwest to carry traffic to Anchorage. At present this traffic goes by rail from Edmonton and boards Northwest planes at Anchorage for the Orient, he said. U. S. carriers will handle only an insignificant share of Gander traffic from now on, he maintained.

He declared virtually all of it should go by TCA, which only recently obtained Gander traffic rights (in April, when Newfoundland became a part of Canada).

- ▶ **Traffic Rights**—The New York-Toronto route obtained by the U. S., Landis viewed as "worth something, but not what the Montreal-New York route is worth to Canada." Under the pact, Canada also obtained traffic rights at Honolulu on a through route from Vancouver to Australasia, and traffic rights at Tampa-St. Petersburg, on a through route to the Bahamas and Caribbean points.

- ▶ **Smith Happy**—C. R. Smith, president of American Airlines which got the new nonstop Toronto-New York route, views it in a different light. "We have suffered a severe competitive disadvantage," Smith said, "because the Canadian government airline has been able to operate faster service due to its non-stop privileges. The Canadian line has been carrying better than 80 percent of the traffic."

American is asking CAB to permit it to begin the new service July 1.

ICAO Tracks Down Meaning of Course

When is a heading a course, and a course a track? The International Civil Aviation Organization's Air Navigation Commission recently tried to answer the question, which arose from different meanings for the words by flight crews of various countries.

The commission's decision: use the word "track" when referring to the direction of the path flown or intended to be flown by an aircraft; use the word

"heading" when referring to the direction in which an aircraft must be headed, having due regard for wind, yaw, etc., in order to follow an intended path.

The term "course," according to the commission's recommendation to ICAO, should no longer be used in certain official documents where there is a possibility of misunderstanding what is meant by the expression.

► **Translation Gives Trouble**—Originally Western Europe based its terminology upon the ICAN definitions used in aeronautical technology in 1919. In these definitions, the French text was the authentic one. It defined an "angle de Cap," which the British translated as "course angle" and the Americans, not a member of ICAN, translated as "heading." ICAN also defined an "angle de Route," which the British translated as "track angle" and the U. S. translated as "course."

Result has been some misunderstanding and confusion when American crews have contacted British stations and vice versa.

But thus far, no fatal accidents have occurred because of the confusion. ICAO's acceptance of the commission's report will eliminate the word "course" in air navigation terminology and standardize on "track" and "heading."

IATA Would Change Weather Terminology

A change in concept and detail of present regulations on weather minimums was recommended at the third annual International Air Transport Assn. technical conference, recently concluded at Burgenstock, Switzerland.

The conference felt that declaring an airport open or closed for landing and takeoff purely on the basis of what the pilot could see for himself has been outmoded by new developments in landing aids.

► **Critical Height**—One recommendation: A change in terminology—instead of ceiling, the conference advocated the use of "critical height," defined as the altitude at which instrument approaches should be abandoned if the ground is not visible.

The conference also asked IATA to study the extent to which these critical heights could be reduced.

► **Lights**—The Burgenstock meeting estimated there are now about 300 international airports equipped with approach-light systems and recommended that lights be installed at about 1100 other airports in order to increase schedule reliability.

No attempt was made to standardize on a single approach-light system, but the committee made these recommendations: Low intensity approach lights for night landings—either left sideline or centerline systems; and high intensity lighting for bad weather approaches—either the slope line system or the Calvert (dash and crossbar) system.

Early implementation by ICAO of a regulation calling for 500 ft. separations between traffic levels was voted by the conference, which also endorsed the idea of a new instrument—an airborne flight level indicator—and asked governments and manufacturers to define the desirable characteristics for such an instrument.

Parts Prices Cut

Douglas Aircraft Co. has made a 10 percent reduction in the net price of manufactured spare parts for the DC-3, DC-4 and DC-6.

New price policy is effective for all orders received at the Douglas Santa Monica plant after July 4, according to W. S. Fryer, parts sales manager, who made the announcement at the recent Air Transport Assn. purchasing committee meeting which took place in Denver, Colo.

Nonskeds Get More European Traffic

Uncertificated airlines, which have been barred from making nonscheduled passenger flights to foreign points since September, 1947, are going to make scores of them this summer.

The Civil Aeronautics Board, usually stingy with its special exemptions, has changed its position temporarily because of the heavy demand for trans-Atlantic transportation during the next few months. As a result, students and other groups will be able to make flights to Europe and the Middle East for considerably less than the regular airline fare.

Other government agencies have strongly endorsed CAB's action, since it will help spread more U. S. dollars abroad and, presumably, promote good international relations.

► **Orders Issued**—Early this month, CAB gave Transocean Air Lines authority to make 44 roundtrip flights between the U. S. and Europe from June 1 to Sept. 30. Student groups will be carried on the eastbound run, and displaced persons will be brought to the U. S. on many of the return flights.

Seaboard & Western Airlines was granted similar permission to make 35 roundtrip flights between the U. S. and Europe.

Previously, CAB had authorized Trans Caribbean Air Cargo Lines, Alaska Airlines and Coastal Air Lines to make passenger flights to Israel. The Flying Tiger Line was given an exemption to carry several planeloads of Catholic students to Rome this summer in connection with the Holy Year celebration (AVIATION WEEK, May 30).

► **Diversion Minimized**—These flights, CAB declared, will not adversely affect the interests of U. S. certificated trans-Atlantic carriers. It said the certificated lines will not be able to provide adequate charter or regular scheduled service to accommodate the student movements during the peak summer season.

Transocean and Seaboard & Western will make their eastbound trips with students under an agreement with Youth Argosy, Inc.

► **Pact With IRO**—Youth Argosy made an agreement with the International Refugee Organization (a division of the United Nations) so that about 27 of Transocean's westbound trips and 22 of Seaboard & Western's westbound trips can be used for transporting displaced persons to the United States. This arrangement cuts down materially the number of non-revenue ferry flights that the two carriers will have to make.

In return for the westbound plane space made available by Youth Argosy in the early summer, IRO will give an

equivalent amount of steamship space to the students when they wish to return to the U. S. in the late summer. Through the transportation exchange, IRO will be able to advance by several months its timetable for DP movements; and the student groups will not have to bear the expense of deadhead westbound flights.

and a new record for the year. Air freight was up 24.8 percent over May, 1948, with 2,398,002 ton miles carried last month. . . AA will start direct nonstop flights between New York and Toronto July 1, under the new U. S.-Canada agreement. Previously, all N. Y.-Toronto flights had to stop at Buffalo.

► **BOAC**—This week will reduce its round-the-world fare to \$1886 from \$1979.70, a reduction of \$93.70.

► **Canadian Pacific Air Lines**—Inaugurated weekly service between Winnipeg and Churchill, on the west shore of Hudson Bay. Carrier will use Lockheed Lodestars to carry express and freight in addition to passengers.

SHORTLINES

► **American Airlines**—Reported 143,534,479 passenger-miles for May, 1949, 16.5 percent higher than May, 1948,

"Play it safe"

ON CONVERSION, OVERHAUL
AND MAINTENANCE. . .

You'll score bigger profits when American Airmotive handles your airframe, engine, instrument, radio or accessory problem. Trained specialists working in modern, completely equipped shops guarantee fast, dependable service on every aircraft component. Save time, save money . . . with American Airmotive's facilities—engineering—craftsmanship . . . for one aircraft or a fleet!

Aviation's Most Reliable Label

cable:
AMAIRCO

MIAMI INTERNATIONAL AIRPORT
P.O. Box 6, Miami Springs, Fla.

Phone: 88-3445

"C-46 SPECIALISTS"



"Undoubtedly
the best . . ."

says
Alexander Klemin about this
valuable reference for high-
speed aircraft engineering.



Elements of
Aerodynamics
of Supersonic
Flows

by Antonio Ferri
Chief of Gas Dynamics
Section, Langley Field

The first comprehensive, up-to-date, authoritative explanation of the engineering applications of supersonic theory, this new book provides specific guidance on such matters as the design of supersonic wings, instruments, wind tunnels and other aspects of the development and testing of high-speed aircraft and projectiles. Dr. Klemin, in his unqualified recommendation of the book, says: "Mr. Ferri makes the mathematics perfectly clear; the physical discussion, fascinating. This combination of sound mathematics and physical realities makes his book invaluable."

— SEE IT ON APPROVAL —

The Macmillan Co., 60 Fifth Ave., New York 11

Please send me a copy of *Elements of Aerodynamics of Supersonic Flows*. I will either remit \$10. or return the book at the end of 10 days.

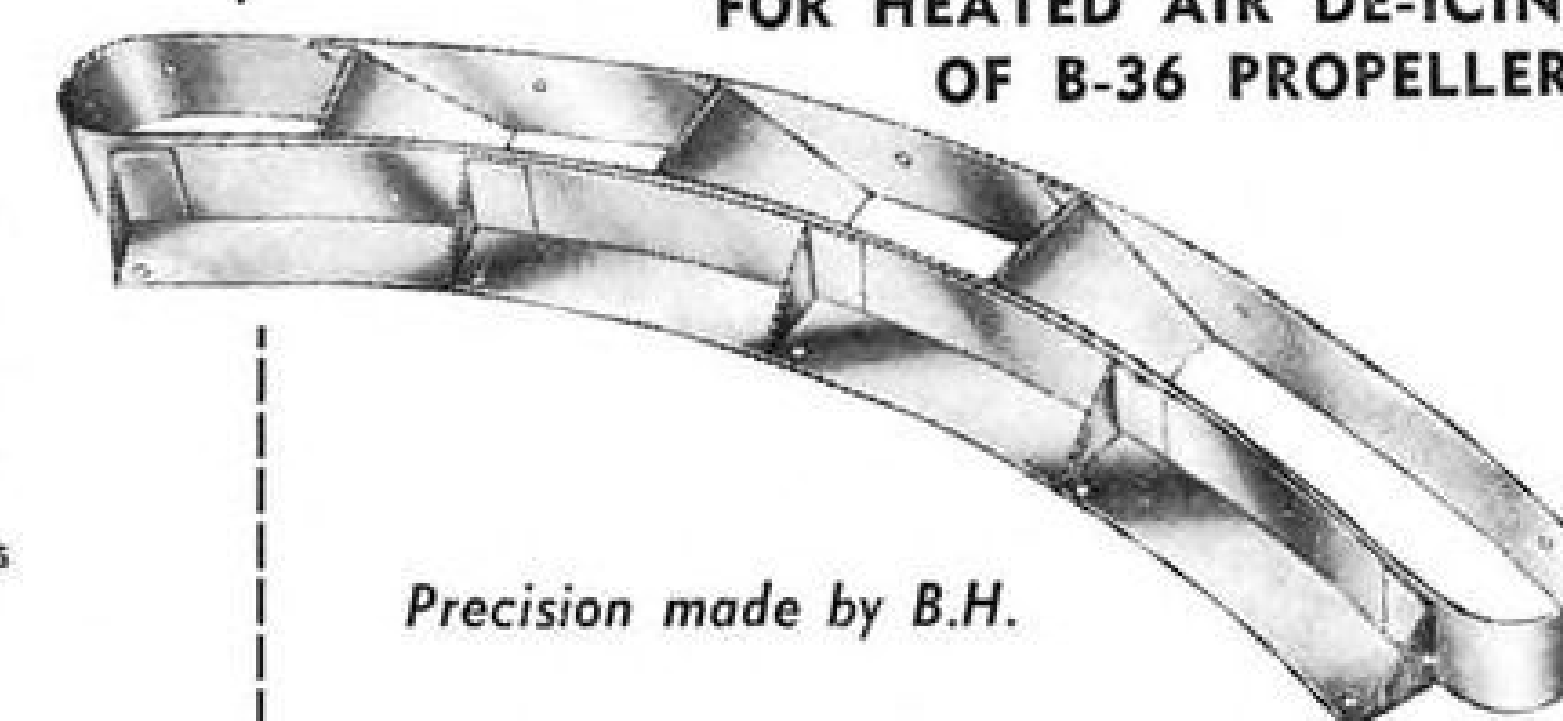
Signed

Address



BH

CURTISS-WRIGHT TRANSFER ASSEMBLY
FOR HEATED AIR DE-ICING
OF B-36 PROPELLERS



Precision made by B.H.

- Gas Turbine Components
- Intake Pipes
- Propeller Cuffs
- Cowls
- Collector Rings
- Engine Mounts
- Aluminum Tanks
- Sheet Metal Fabrication
- Sheet Metal Stampings

LET US KNOW YOUR REQUIREMENTS
Suppliers to manufacturers only



B. H. AIRCRAFT COMPANY, Inc.
Metal Fabrication to Aircraft Precision Standards
FARMINGDALE 5, NEW YORK

► **Capital Airlines**—Signed contracts with representatives of four North Carolina colleges to fly their football teams to various games during the coming season. Carrier already has contracts with 40 major college teams.

► **Eastern Air Lines**—Designed a stretcher-type bed which can be installed in private compartment on Constellations for use by crippled or incapacitated passengers. Bed occupies three of the four seats, leaving one available for attendant.

► **Icelandic Air Lines**—Flew a DC-4 6000 miles from Reykjavik, Iceland, to Oakland, Calif., for an 8000-hr. over-

haul by Aircraft Engineering and Maintenance Co., a Transocean Air Lines subsidiary.

► **National Airlines**—Appointed Herbert Drew station manager at Baltimore, H. J. Langford station manager at Valdosta, Ga., and J. D. Tilford station manager at Marietta, Ga.

► **Northeast Airlines**—Carried more passengers during May, 1949, than any previous May in the company's history, according to George F. Scott, general sales manager. Revenue passengers totaled 27,782 last month, and passenger revenue was \$335,934.

► **Northwest Airlines**—Air freight reve-

nues now exceed passenger revenues of a decade ago, reported E. I. Whyatt, vice president and comptroller. Freight revenues reached \$260,000 in April, representing 820,000 ton miles. Figures show 170 percent revenue increase and 207 percent volume increase over April, 1948.

► **Pan American Airways**—Recently took delivery of its tenth Stratocruiser from Boeing Airplane Co. Ten more are on order. First Stratocruiser has already had engine change and general checkup at PAA's Miami overhaul base. . . PAA appointed Ernest L. Foss sales and advertising manager of the Latin American division, Frank H. Sheldon assistant division sales manager, James C. Oliver assistant advertising manager and William Ryder advertising production manager.

► **Pioneer Air Lines**—Reported 9675 passengers, 20,438 lb. of air express and 35,240 lb. of air freight during April. Vice President Harding L. Lawrence predicted May business would be even higher.

► **Southern Airways**—Inaugurated service to Atlanta, Ga., Gadsden, Birmingham and Tuscaloosa, Ala., Columbus, Miss., and Memphis, Tenn. President Frank W. Hulse was on the first flight.

► **Swissair**—Will operate nine additional trans-Atlantic roundtrip flights this summer, four to be flown between the last week of June and the middle of July, the other five scheduled during September.

► **Western Air Lines**—Reported operating efficiency of 99.67 percent for April, when 700,763 miles were flown out of a total of 703,050 scheduled miles. . . Carrier began nonstop Los Angeles-Portland, Ore., service June 16, with Convair-Liners. Trip will take four hours to Portland, then continue on to Seattle.

why CHICAGO & SOUTHERN likes EDISON FIRE DETECTION

"...have the utmost confidence in it..."



Mr. Marshall H. Jones,
Engineering & Maintenance Manager
of Chicago and Southern Air Lines, Inc.



"WE HAVE been using the Edison Aircraft Fire Detection System on our planes for over a year," writes Mr. Jones, "and have the utmost confidence in it as a means of fire detection. The installation of this system further emphasizes Chicago and Southern's policy of equipping its planes with the best flight equipment available."*

Edison Fire Detection is used on the major U.S. airlines and has been approved by the U.S. Air Force for all reciprocating engine installations.



*Copy of Mr. Jones' letter will
be gladly sent on request.

EDISON

FIRE DETECTION

INSTRUMENT DIVISION
Thomas A. Edison, Incorporated
152 Lakeside Avenue,
West Orange, N. J.

CAB SCHEDULE

June 27—Hearing on renewal of Southwest Airways' feeder certificate and suspension of United Air Lines' service at four California points. (Docket 3718)

June 28—Hearing in Val-Air Lines and Trans-Texas Airways route case. (Dockets 3645, 3646 and 3667)

July 6—Resumption of hearings on seasonal service to Lake Tahoe. (Docket 3623)

July 18—Hearing on Mid-Continent Airlines' proposed acquisition of Parks Air Lines. (Docket 3782)

July 18—Hearing on renewal of Pioneer Air Lines' feeder certificate and suspension of service at points on routes of Braniff, Continental and American. (Docket 3719)

Aug. 8—Hearing on Carco Air Service's lightplane route application. Postponed from June 20. (Docket 3629)

Aug. 15—Hearing on Hughes Tool Co. control of TWA. Postponed from July 13. (Docket 2796)

Sept. 26—Hearing on Seaboard & Western and Transocean Air Lines applications for all-cargo certificates between the U. S. Europe and the Middle East. (Dockets 3041 and 3818)

LETTERS

"Shepherd vs. Simon"

Following is an abstract of a letter written to W. W. Shepherd, General Manager of Shepherd Tractor & Equipment Co., Los Angeles. It is Ryan Aeronautical Co.'s reply to a letter written by Mr. Shepherd to AVIATION WEEK, and published Apr. 25. The published letter described a "take-off and climb" competition between a Navion and Bonanza.)

Your interesting letter to AVIATION WEEK, which appeared in their Apr. 25 issue, created a great deal of attention here at the Ryan factory.

You, as the pilot of the Bonanza, are certainly to be congratulated on the excellent demonstration you gave against Marlin Simon in that, as he so aptly put it, you certainly put him in his place.

Frankly, we believe the letter in AVIATION WEEK should have been titled "Shepherd versus Simon," rather than the heading which did appear, "Bonanza versus Navion." By this, I mean we feel you won a deserved victory in piloting technique over Mr. Simon, but on two points of performance we can hardly agree that the Bonanza is superior to the Navion.

For short takeoff and short landing run, we just don't believe it's technically possible for the Bonanza to beat the Navion—piloting technique being equal. For cruising speed we'll concede to the Bonanza, for this airplane was designed for high cruising performance, while the Navion was designed for not quite such high cruising speed but with superlative shortfield performance and ease of flying. And, I believe, too, the Bonanza should perhaps have better sustained climb after the initial takeoff.

You'll be interested to know, I'm sure, that only yesterday a Bonanza dealer was here at the plant on a purely friendly, personal visit, and we had the occasion to demonstrate Navion short-field performance to him. After a demonstration of takeoff and landing characteristics, he readily conceded that the Bonanza simply can't touch the Navion in these two respects.

The background of how the Bonanza-Navion competitive performance got started is, I think, interesting. Some months ago, Beech issued a very detailed analysis of the three leading four-place planes, which had the effect of discounting Navion short-field performance. Looking at the two airplanes from a strictly engineering point of view, it seems impossible to believe that, all things being equal, the Bonanza should exceed the Navion on takeoff and landing. Accordingly, without any knowledge whatever of the Ryan factory, Carl Logan, a Navion owner of Leoti, Kansas, entered into a competition with the Bonanza at Albuquerque, with results which have since come to the attention of many owners of both planes.

More recently, our distributor at Dayton, Ohio, invited the Bonanza dealer on the field to enter into a takeoff competition, with the Ryan Navion to be a 1948 model using 185 hp. for takeoff—not the 205 hp.

When you're glad you have a



SPEEDS LANDING GEAR SERVICE...
and keeps 'em flying!

EXTRA powerful leverage . . . precision-built, reversible ratcheting mechanism . . . year-after-year dependability . . . these are the features you find in a Snap-on Heavy Duty Ratchet. It's husky enough to break loose the tightest of those large nuts and bolts . . . its efficient, smooth-working action helps cut "down-time" to a minimum.

When your "Snap-on man" calls with his complete line of quality tools for aviation maintenance, ask to see this ratchet and other Snap-on heavy duty tools. Available through a nationwide, direct-to-user tool service.



SNAP-ON TOOLS CORPORATION

8020-F 28th Avenue
Kenosha, Wisconsin

of the 1949 model. We have the figures with supporting photographs here in the office. In three separate takeoffs, the Navion was able to defeat the Bonanza by approximately 50 feet each time. The best Navion takeoff was 210 feet, and the best Bonanza takeoff was 260 feet.

Getting back to the Albuquerque competition, the Navion involved was one of the early North American jobs, two years old and with 1000 hours logged time. It of course had the 185 hp. engine.

All this is the long way of getting to the point that we feel you did an excellent job of demonstrating the Bonanza, while Mr. Simon, whom we do not know at all, probably did not obtain the performance of which the Navion is capable. Incidentally, our records indicate that the airplane was Serial No. 297, built by North American, and was first sold July 1, 1947.

Of course, we don't feel the Bonanza-Navion competitive angle should be run into the ground to the detriment of personal aviation, because, admittedly, these are the two finest planes in the air today, both of which have excellent records for operating efficiency and utility. We concede advantages to the Bonanza—principally speed—and are convinced that the Navion, for short-field performance, is without a peer. So, in a strictly friendly way we'd like very much to have William P. Sloan, assistant to our vice president, stop in at Rosemead Airport some time when you are there, in order that you may learn for yourself the Navion's truly remarkable qualities. We'd like very much to have you fly around on a short hop with Sloan. I feel certain we can guarantee that you will be amazed at the performance of which the Navion is capable when properly flown.

And a word about Guntert and Zimmerman. True, they have disposed of their North American Navion and now have a big Cessna. However, no dissatisfaction with the Navion was involved since they wanted a new one. It was simply that Jerry Guerard, their pilot, could not get together with our distributor on a mutually agreeable turn-in figure on the North American Navion which they wanted to trade for a Ryan Navion.

WILLIAM WAGNER, Public Relations Manager
Ryan Aeronautical Company
Lindberg Field
San Diego 12, Calif.

Irresistible Urge

We are very much interested to note the paragraph in a recent issue on the "Armchair Ticketing" to be offered in The Hague by KLM Royal Dutch Airlines. We regret that we have no picture available which would show you Capital Airlines Ticket Office in the Peabody Hotel in Memphis, where we have for some time offered our public a chance to sit in comfortable chairs at a low counter while being served.

Practically every person who has entered this Ticket Office has succumbed to an irresistible urge to sit.

JIM FLYNN, Publicity
Capital Airlines
Detroit 26, Mich.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : "OPPORTUNITIES" : EQUIPMENT
BUSINESS : (Used or Resale)

UNDISPLAYED — RATES — DISPLAYED

(Not available for equipment advertising)
90¢ a line, minimum 4 lines. To figure advance payment count 5 average words as a line.
Individual Employment Wanted advertising rate is 1/2 the above rates payable in advance.
Box Numbers—Care of publication New York, Chicago or San Francisco offices count as one line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is \$10.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured 1/4" vertically on one column, 3 columns—36 inches—to a page.

GRADUATE ENGINEERS FOR DESIGN AND DEVELOPMENT

of rocket motors and missile launching equipment. Positions open for experienced design, development, and instrumentation engineers in growing research development, and production organization. Salary open.

P-9267, Aviation Week
621 S. Hope St., Los Angeles 14, Calif.

CABLE ASSEMBLIES for DOUGLAS AIRCRAFT

Complete Stock on Hand Discounts Start at — 50% — 10%.
Listings on Request.

HOSE ASSEMBLIES

Prices on Request

A. J. MOORE CO.
241 7th Ave. N. Y. 11, N. Y.
Phone WAtkins 4-0701

BEECHCRAFT D18S

Complete Bendix Airline type radio installation—ARC-VHF transmitter and receiver—De-icer boots—Anti-icing—80 Gallon nose tank—5 Hardman chairs—Folding cabin table—Constant speed propellers—Windshield wipers
Recently relicensed and in excellent condition. \$37,500.

BEECHCRAFT AT-11

Beautiful interior—divan, folding cabin table. Bendix Airline type radio installation. Low time engines. Used by corporation. \$15,500.

PAGE AIRWAYS, INC.
Rochester Airport Rochester 11, N. Y.

SCHOOLS

Rising Sun SCHOOL OF AERONAUTICS
ESTABLISHED 1930
"Built Upon the Success of its Graduates"
GOVT. C.A.A. and VETERANS APPROVED
ENROLL NOW FOR NEXT CLASS
Write for Illustrated Catalog
2206-16 E. HUNTINGDON ST., PHILA., PA.

Need A Pilot? Need A Job?

Are you qualified to fly the Atlantic, to instruct, to fly charter, to dust, or to help organize a new airline. We can help you find the job you need, or the man you need. No registration fee.
PILOTS EMPLOYMENT AGENCY
Box 152, Whippany, N. J.

INDUSTRIAL PILOT

Large N. Y. corporation wants pilot for Grumman Wildcat amphibian. Must be married, and have extensive experience this type of aircraft; also instrument proficiency and rating as well as three years' experience scheduled air transportation. Position permanent, minimum amount of travel away from home. Include adequate references in reply.

P-9237, Aviation Week
330 W. 42nd St., New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 550 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS WANTED

MATHEMATICIAN (MATHEMATICAL Statistics). Eight years experience in: design and analysis of engineering investigations, quality control, research in mathematical statistics, evaluation of weapons and fire control systems, some work in noise theory. Education: course requirements for doctorate completed at Columbia University. PW-9273, Aviation Week.

MECHANICAL ENGINEER—BME, Cornell June 49, aged 26, married. 2 years chemical laboratory assistant. 4 years aircraft maintenance. Desires position offering a future in design and development. PW-9285, Aviation Week.

BUSINESS OPPORTUNITY

Financing available
for Government Aviation Engineering and Development Contracts. Can also supply Engineering, Test, Laboratory or Manufacturing assistance. BO-9280, Aviation Week.

FOR SALE

1949 Maroon Stinson
Stationwagon, 360 hours like new, just relicensed, 2-way radio, always hangared, no trades. Will sacrifice \$3250. Wire or call, J. Kenneth Marr, Box 336, Warrensburg, Missouri.

4R-2600-23 C-14A Cyclone
Engines. Approx. 8 hours each. Removed from A-20 aircraft. Personally preserved and boxed. Subject to inspection. Price \$1200 each. Address R. A. Darnell, 1321 Ashland, Santa Monica, California.

If you don't see

what you want . . . ask for it

If you don't see the equipment advertised that you want, ask for it—ask the advertisers—or we will gladly ask them for you.

Classified Advertising Division

AVIATION WEEK
330 W. 42nd St. New York 18, N. Y.

AIRCRAFT & ELECTRONIC EQUIPMENT

As a leading supplier we offer a complete line of

BRAND NEW INSTRUMENTS

- FLIGHT & NAVIGATION INSTRUMENTS
- ENGINE INSTRUMENTS
- AUTOMATIC PILOTS
- INVERTERS
- AUTOSYNS
- PRECISION AUTOSYNS
- RATE GENERATORS
- SINE-COSINE GENERATORS
- SYNCHROS
- ALNICO FIELD MOTORS
- GYRO
- A.C. MOTORS
- D.C. MOTORS
- SERVO MOTORS
- TORQUE UNITS
- TORQUE AMPLIFIERS
- FREQUENCY METERS
- BLOWER ASSEMBLIES

Write for complete listings

All Instruments May Be Purchased
C.A.A. Certified
U. S. Export License-2140

WUX Flushing, N. Y.

INSTRUMENT ASSOCIATES

147-57 41st AVENUE, FLUSHING, N. Y.
Tele: INdependence 3-1919

AIRPLANES

DOUGLAS—DC—3 TYPE

\$25,000—\$90,000

LOCKHEED—LODESTAR

\$6,500—\$40,000

Eight of Each

Choice of: Cargo—Passenger—Executive—Interiors.
Optional: Radio—Engine—Propeller Combinations
Engines — Propellers — Accessories — Interiors — Supplies. Large Stock of Douglas and Lockheed Parts and Components

LBS AIRCRAFT CORP.

"Specializing in Finest Quality Transport Aircraft"

Located at: Mailing Address:
International Airport 556 N.E. 69th St.
Miami, Fla. Miami, Fla.
Phone 88-3961 Cable: Terryco, Miami

FOR SALE

1946 Stinson 150

Color: Maroon and Grey
Equipped with: Aeromatic Propeller and G.E. two-way radio
Total time on plane and engine: 565 hours
Total time on propeller: 265 hours
Total time since major overhaul on engine: 38 hrs.
Total time since factory overhaul on propeller: 24 hrs.

All CAA Bulletins and AD Notes complied with. Plane has always been used for transportation of aviation representative of a large insurance company. Always hangared and never damaged. Condition is perfect and an excellent buy.

Address:

SEIBELS, BRUCE & CO., Mgrs.
P. O. Box 1199, Columbia, S. C.

2 Douglas C-47

Cargo 24V

Total airframe 2340 and 0 since army paint removal and overhaul, the other 2960 total and 22 hours since airframe and engine overhaul. Both large doors, no patches, repairs or corrosion. Both Bendix 100 W 8 channel transmitters and 2 Bendix receivers, VHF, ADF and autopilots. Priced under \$25,000.

AEROCARGA

P.O. Box 5142, Miami, Fla. Phone 5-1727

FOR SALE

4 BEECHCRAFT D-18-C(T)—CAR 04b

1 BEECHCRAFT D-18-S—CAR 03

4 CONTINENTAL R9A ENGINES

Overhauled, Pickled and Boxed

1 PRATT & WHITNEY R-985—14-B

Drilled for Hydramatics

Aircraft and Engines low time since major overhauled—Polished—Waxed. In near new condition. Licensed spring 1950.

Engine and Instrument Overhaul Shops—Signal Generators, ARC-1's, MN-26-K's, Marker Beacons, Link Trainer, Beech spares. Aircraft approved—4500 hrs. between overhaul Engines approved—700 hrs. between overhaul Propellers approved—1400 hrs. between overhaul

This excellent equipment permitted over 3 million passenger mile accident free air carrier operation and the highest schedule completion (99.6%) of ANY certificated airline in the world—Contact . . .

JOSEPH L. DYER

M. D. HOLMAN

FLORIDA AIRWAYS, INC.

BOX 591

ORLANDO, FLA.

FOR SALE!

DC-4 (C-54-B-DC) 50-PASSENGER AIRPLANES

\$175,000⁰⁰ each

plus 2% sales tax



- Equipped with P. & W. R-2000-13 (2SD13G) Engines.
- Recently removed from scheduled passenger service.
- Standard airline interior.

"AS IS" MUNICIPAL AIRPORT, TULSA, OKLAHOMA

Address all inquiries to:

AMERICAN AIRLINES, INC.

Attn: Director of Surplus Sales

43-02 Ditmars Boulevard, Astoria, Long Island, N. Y.

(Telephone RAvenswood 8-1000)

Your inquiry will have special value . . .

if you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important, it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

STRICTLY PERSONAL

IF YOU'VE TIME TO SPARE—Bouquets to Dick Rummel's publicity gang at United Air Lines for the story of the week. Let Dick tell it; nobody else could improve it:

An airline passenger rushed into a UAL San Francisco ticket office the other day clasp ing a ticket in one hand and a hat in the other.

"Has the limousine for the flight to New York left yet?" he clamored, all out of breath.

Unruffled, the ticket girl replied in her most soothing tones, "No sir. It's just outside the door."

The man rushed out and all was serene for several hours.

Then who should appear at the check-in counter but the same passenger, no longer panting, but with resignation written all over his face.

"I have just," he announced, "had a two-hour tour of Chinatown. What do I do now?"

* * *

PAGING PASSENGER PUPS—The Delta Digest confides that Freddie Pharo, Ft. Worth division communications supervisor, noticed that every time he had read the teletype at Dallas reservations he would notice Dallas was either canceling, not holding, or inquiring about Passenger Pups. Finally, he could keep quiet no longer, and his face was very red when advised Passenger Pups is Dallas' code-word for pickup passengers.

* * *

IT'S A PLANE OF MISSING PARTS—Although it's been weeks since he asked us to help, we finally get around to telling you that there is or was a good reason why the highly touted Beechcraft owned by E. Winsor Reed's International Aeromarine, Inc., at Miami was grounded by parts shortage. This, despite the fact Mr. Reed calls his firm "the finest operations, consulting and purchasing agents." Reed maintains stoutly that the parts were lost in transit, and he's sticking, or is stuck, with the story.

* * *

COMPETITION, IT'S WONDERFUL—Claude Witze, AVIATION WEEK's correspondent in Providence, says one recent sunny day an American Convair-Liner was delayed at Boston by a mechanical. It arrived late at Rhode Island State Airport to pick up Providence passengers for New York.

Just as it arrived on the ramp, Eastern's agent announced proudly over the speaker system EAL's "on time departure" for New York. The Convair captain heard this.

En route from Providence to New York he flew the AA plane past the EAL DC-3 and passed a note back to his passengers. It read about like this:

"We are now over . . . On our left you will see we are passing the Eastern Air Lines DC-3 which left Providence 10 minutes before we did. We will arrive in New York at least five minutes before the Eastern plane. We hope you enjoy your ride and will be with us again."

* * *

SHORT, SHORT STORY—Hank Lefer, our new makeup editor at our printers in Albany, asks for more short paragraphs so this column can be put together easier. So we report that Slick Airways News quotes this description on a company injury report: "Bit into steak in company cafeteria. Broke my tooth."

* * *

CONTRIBUTIONS WANTED—This column needs your whimsical contributions. It does not write itself. Help, help! Address AVIATION WEEK, 330 West 42nd St., New York 18, N. Y. (Contributors will be paid absolutely nothing.)

* * *

BITS OF HISTORY—R. C. Spurgeon, Viking first officer, comes through with some lore. Says he:

"Ask Dudley Steele (formerly old time Richfield Oil Co. pilot) if he remembers the time he landed his Wasp Stearman at Santa Rosa airport during an air tour and, on opening his baggage compartment, found a stowaway guinea pig in a box. On the box was written: 'This is Oscar. Treat him like a brother.'"

"Ask Glenn Messner, old timer from down Birmingham way, if he remembers the time some of them were up together one day 'playing around a little' when some practical joker in the back seat crushed a thin wooden box with his foot as they were making a sharp pull-up. Oh, Brother!"

R.H.W.

WHAT'S NEW

Trade Literature

"Follow Me, A Guide for Selling to the United States Air Force," intended particularly to aid small concerns that have not previously established sales relations with the armed forces, available upon request to Commanding General, Air Materiel Command, Wright-Patterson AFB, Dayton, Ohio (Att: Procurement division). Also available: "Selling to the Navy," from Superintendent of Documents, Government Printing Office, Wash. 25, D. C., price 15 cents; "Purchased Items and Purchasing Locations," upon request to Procurement Information Center, Office of the Assistant Secretary of the Army, The Pentagon, Wash. 25, D. C.

"Lightplane Tires on Turf and Concrete," sixth in a series of bulletins, available on request to University of Illinois Institute of Aviation, Urbana, Ill.

"The Inside Story," a booklet on "safety-circle" motor protection, available from Allis-Chalmers dealers.

"National Pallets," a booklet describing and illustrating many types of wooden pallets, available on request to National Pallet Corp., Oliver Building, Pittsburgh 22, Pa.

"UCON Brand Fluids and Lubricants," describing products and their uses, available on request to Carbide and Carbon Chemical Corp., 30 E. 42 St., New York 17, N. Y.

"Catalog 1949," a list of books and periodicals published or to be published during the year by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y.

"Books for Summer and Early Fall 1949," a listing of books from William Morrow & Co., Inc., 425 Fourth Ave., New York 16, N. Y.

"Industrial Air Power Catalog," covering products which utilize air power, available upon request to Mead Specialties Co., 4114 North Knox Ave., Chicago 41, Ill.

"Bulletin 934," describing O-rings specially compounded for aircraft use in sealing fuel systems, available upon request to The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.

New Books

"Principles of Wage and Salary Administration," by A. W. Barbour, 128 pages, cloth-bound, indexed. Published by National Foremen's Institute, Deep River, Conn., price \$2.50.

ADVERTISERS INDEX

AVIATION WEEK

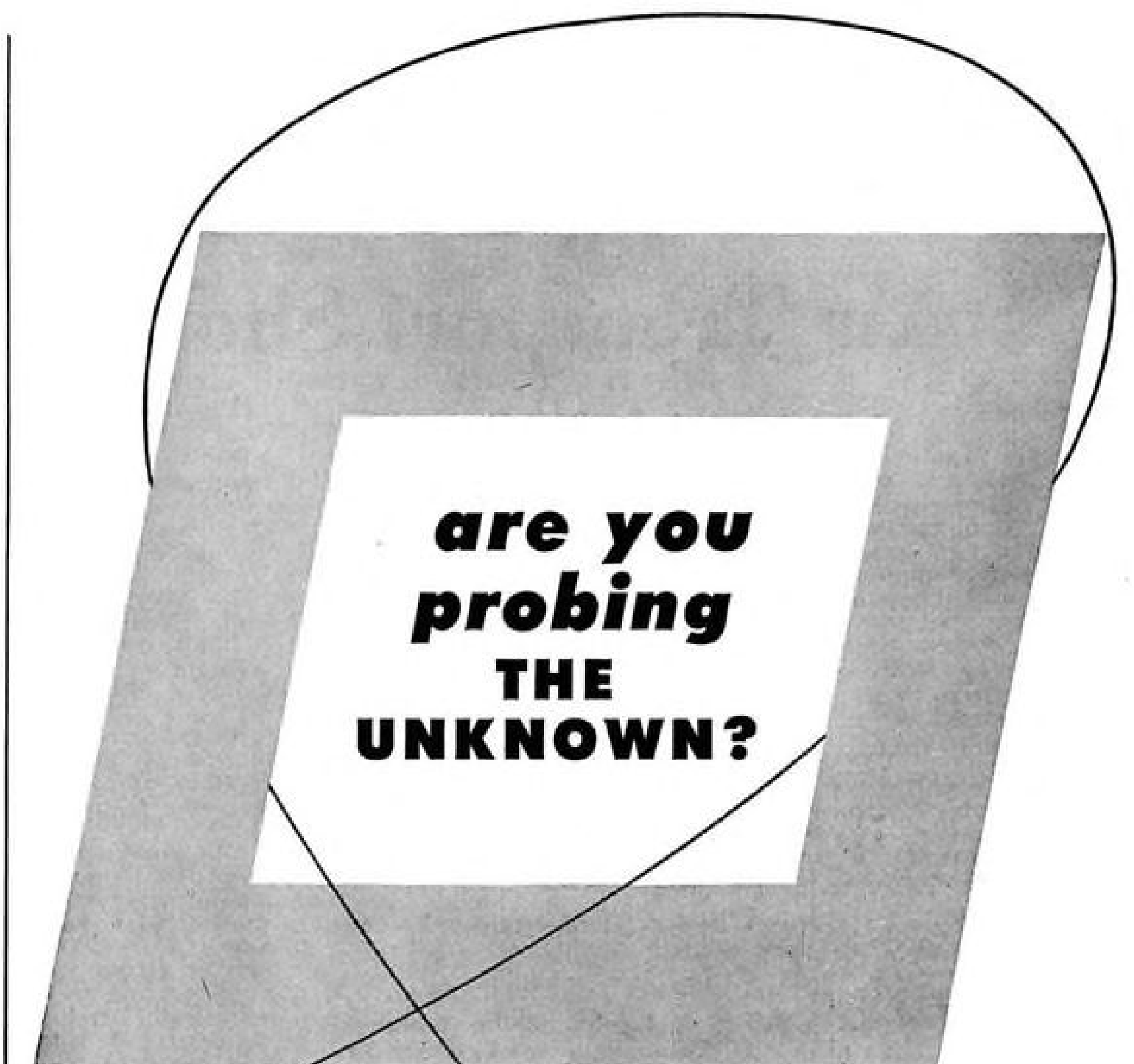
JUNE 27, 1949

Allison Division, G.M.C.	Fourth Cover
Agency—Kudner Agency, Inc.	
American Airmotive Corp.	42
Agency—Houck & Co. of Florida	
Bendix Products Div. of Bendix Aviation Corp.	Third Cover
Agency—MacManus, John & Adams, Inc.	
B. H. Aircraft Co., Inc.	43
Agency—Harold Marshall Adv. Co.	
Burndy Engineering Co., Inc.	8
Agency—G. M. Basford Co.	
Clary Multiplier Corp.	4
Agency—Dana Jones Co.	
Clifford Manufacturing Company	34
Agency—James Thomas Chirurg Co.	
Dayton Aircraft Products, Inc.	25
Agency—Kircher, Helton & Collett, Inc.	
Dowty Equipment Ltd.	19
Agency—Hamill, Toms Ltd.	
Edison, Inc., Thomas A.	44
Agency—The Schuyler Hopper Co.	
Electrol, Inc.	9
Agency—G. B. Woodin Co.	
Fairchild Engine & Airplane Corp.	38
Agency—Cecil & Presbrey, Inc.	
Garrett Corporation, The	5
Agency—J. Walter Thompson Co.	
Goodyear Tire & Rubber Co., Inc.	Front Cover
Agency—Kudner Agency, Inc.	
Lewis Engineering Co., The	4
Macmillan Co., The	42
Agency—Atherton & Currier, Inc.	
Minneapolis-Honeywell Regulator Co.	Second Cover
Agency—Addison, Lewis & Associates	
New Departure Div., G.M.C.	3
Agency—J. M. Hickerson, Inc.	
Radio Corp. of America	23
Agency—J. Walter Thompson Co.	
Scintilla Magneto Div. of Bendix Aviation Corp.	27
Agency—MacManus, John & Adams, Inc.	
Searchlight Section	46, 47
Smith-Morris Company	32
Snap-On Tools Corp.	45
Agency—Scott Incorporated	
Sperry Gyroscope Co.	6
Agency—Charles Dallas Reach Co., Inc.	
Standard Oil Co. of California	10
Agency—Batten, Barton, Durstine & Osborn, Inc.	
Torrington Co., The	37
Agency—Hazard Adv. Co.	
Western Gear Works	49
Agency—West-Marquis, Inc.	
Whittaker Co., Ltd., Wm. R.	28
Agency—The McCarty Co.	

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT	
Positions Vacant	46
Positions Wanted	46
Employment Agencies	46
EDUCATIONAL	
Schools	46
BUSINESS OPPORTUNITIES	
Offered	46
PLANES-EQUIPMENT	
(Used or Surplus New)	
For Sale	46-47



Are you faced with gearing problems beyond the scope of present experience? We have long realized that an extensive program of research and experiment is vital, in order to make an effective contribution to the progress and development of the aviation industry. Pacific-Western technicians, backed by the knowledge gained in over a half century operation of our companies, are continuously engaged in extending known practices and design by such programs. They have available unusual specialized knowledge on the subject of mechanical power transmission based on actual experience. You will find them taking important roles in nearly every major development in the aviation industry.

Let us demonstrate what we can do to help you solve your mechanical power transmission problems. Consult us now!

Write on your company letterhead for your copy of the new Pacific-Western Aircraft Equipment Catalog.

Good Gears for over 50 years

WESTERN GEAR WORKS, Seattle 4, Washington
WESTERN GEAR WORKS, Box 192, Lynwood, California
PACIFIC GEAR & TOOL WORKS, San Francisco 3, California
SALES REPRESENTATIVES: Portland...Salt Lake City



PACIFIC GEAR & TOOL WORKS WESTERN GEAR WORKS

PACIFIC-WESTERN

GEAR PRODUCTS



EDITORIAL

Air Transport Should Grow Up

This is a page of opinion. This page last week gave space to the Air Transport Assn.'s president, Admiral Emory S. Land, to express the association's views of an editorial here April 25, "Cream Skimming and Progress." The admiral contended that the editorial was "expressing opinions and stating them as facts." We place the "editorial" label over this page to warn you that this is a page of opinions. We hope there is no future misunderstanding on this point. Naturally, like most editors, we like to think our opinions are based on facts. But we know that our news pages are as free of opinion as careful, fair-minded human beings can make them. And, as in the case of the Air Transport Assn. last week, anyone is entitled to space in this magazine to state "the other side."

With the exception of one error of fact (which referred to separating subsidy and service "carriers" instead of "service") we stand behind the original editorial. Admiral Land's claim that our criticism has been unfair we deny; we feel that some segments, at least, of the industry consider any criticism as unfair.

Now, we present a letter from Robert S. Six, president of Continental Air Lines, on the same subject:

I read with amazement your editorial . . . April 25 . . . I realize that the editorial is primarily directed against Transcontinental carriers, but I feel in all fairness that certain statements contained therein should not go unchallenged.

Your statement that air carriers have wide freedom in setting passenger rates seems somewhat naive. Continental and many other certificated carriers have filed many low-fare promotional tariffs designed to tap the mass traffic potential only to have the CAB reject them wholly or at least raise them enough so that the original purpose is defeated. This happened to Continental on the air coach service it is providing between Denver and Kansas City, where the Board held us to 4-cents-per mile fare rather than the 3.6-cents-fare as requested. We later asked for a 3.3-cents-fare . . . what would you have the carriers do—operate with tariffs in violation of the law?

Disregarding the fact that many so-called non-scheduled carriers openly violate the law, it should be obvious to one of your experience why they can operate at less cost. They give service only between large cities and are not obligated to also serve smaller communities at a loss. They pay lower wages and are not unforgotten to any extent. They operate under lower safety standards and consequently at a lower cost. Furthermore, they have not borne the burden of technical and other developments with which the scheduled airlines have helped make air transportation what it is today.

Your editorial seems to ignore the fact that certificated airlines are regulated as are the railroads and other utilities. If all carriers were permitted to operate only where they pleased, fares would be lower between the big cities but what about the rest of the country? Clearly, the small cities would be without air service. The masses do not live exclusively in New York, Chicago, and Los Angeles.

This letter is not written with the purpose of engaging in fruitless argument. I agree that the scheduled carriers should work toward self sufficiency and lower fares. However, I feel that this can be achieved only by working within the framework of the Civil Aeronautics Act and not by violating its provisions.

I feel that the public interest requires that all sections of the country receive air service if it can be done economically. I think you will agree that the "irregulars" cannot meet this requirement.

Bob Six is right. The transcontinentals were much in mind, when the editorial was written. As to rates, the industry is given wide leeway. It sets its own rates, files them with the Board and they become effective unless the Board denies them. But the

initiative is the industry's. If the industry were ever able to get together and stand united for the rates it wanted, even though they were considerably lower, we doubt if CAB would protest. CAB has, indeed, been cautious on air coach approvals, but when the industry really wants air coaches, it will get them.

Too many top executives in the industry still are unwilling to make the necessary changes of procedure, or to take the gamble on the mass market. Obviously, it is a square look at facts (by both CAB and the industry) that is needed, and not permitting the carriers to operate with tariffs in violation of the law.

AVIATION WEEK has never condoned violation of the law but don't forget that CAB made it possible for the non-skeds to start. If CAB was really convinced the irregulars were violating the law, why did it permit them to continue operating for so long?

The amazing operation of the transcontinental non-skeds at low fares, attracting literally thousands of new customers, without siphoning a cent of mail pay from the government, is a phenomenon of great importance. The naive traveling and tax-paying public is tremendously impressed. Further, the non-skeds have set the old-line industry some vitally important lessons in frill-stripping and in common-sense cooperation and economy. It is our opinion that the ATA group has much to learn from those they ridicule. The non-skeds with their low fares have made it possible for thousands to make their first flight. Instead of fighting each other, the non-skeds have worked together to get customers away from trains and buses, and into the air. All aviation will gain, including the ATA.

As to the cost of serving small cities, let it be remembered that the airlines fervently pleaded for the cities they got. As CAB Chairman O'Connell asked a few weeks ago in New York, how many carriers have asked to be relieved of any of these costly stopping points?

As to wages, perhaps a thorough study of manpower utilization by the airlines would prove that if they released needless employees they could continue to pay higher wages than the non-skeds. The argument that the non-skeds operate under lower safety standards than the skeds has not yet been proven to our satisfaction, but we are investigating this. It is true that the non-skeds have not spent important amounts on "technical and other developments." In all fairness to what the scheduled airlines have accomplished, it must still be said that this category of "development" expense should be carefully finecombed in any investigations of the airlines. "Development" that results in more efficient, safer operation is worth every dollar spent on it. But too often "development" hides a mass of expenditures which have no place in that classification.

The certificated airlines are regulated for sure. As long as they are guaranteed freedom from bankruptcy by Uncle Sam's dollars they must expect regulation. If they will struggle manfully to get out of the "coddling" stage, to quote Capt. Eddie Rickenbacker, they will have more independence—but also, more responsibility for staying solvent. Nevertheless, even under present circumstances, it is our conviction that the industry—if it could agree on a forward-looking, even though radical, policy of serving the masses—would not have the opposition of CAB that it thinks it would.

Speaking of the Civil Aeronautics Act, we agree that air transportation must abide by the law. But too many carriers are using the law (and CAB) as an alibi. The 1938 law has never worked against maximum development of business, whether passenger, mail, freight or express. All of the low-cost excursion rates of the past year would have been legal all these years since 1938. There was never anything in the 1938 act that mitigated against air coaches. Yet it took the independent air freight carriers and the non-sked passenger operators to open at least a segment of the old industry's eyes to the potential in the low priced field. Why? Because Uncle Sam's ever present purse made it easier to play it safe, really unnecessary to fight for business.

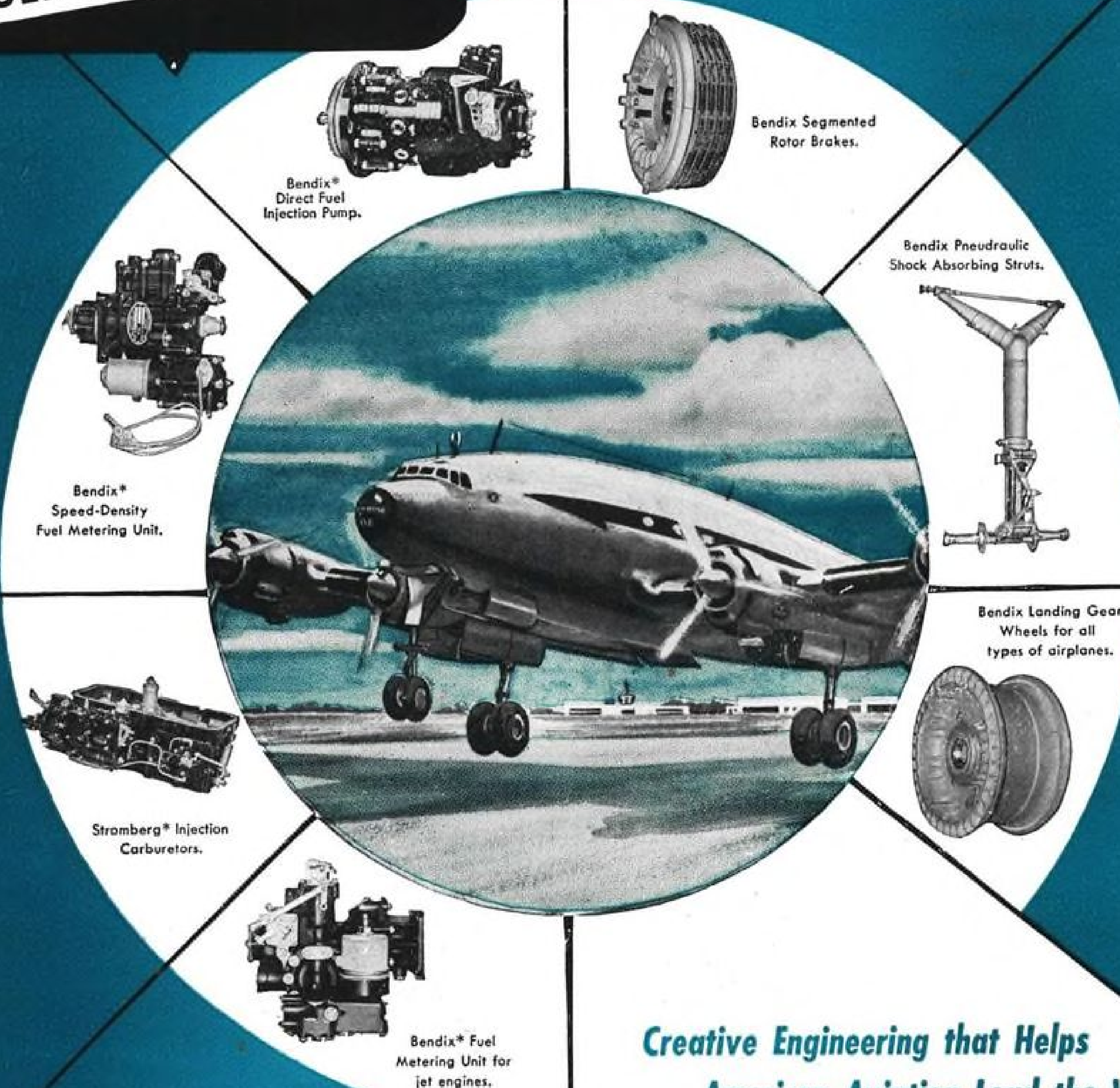
Air transportation under the protection of the 1938 act has become so tied to the federal apron strings that it needs weaning. That means legislation that considers air transportation no longer an infant but something approaching an adult with an adult's responsibilities.

ROBERT H. WOOD

AVIATION WEEK, June 27, 1949

Bendix Products

FUEL METERING SYSTEMS and COMPLETE LANDING GEAR



**Creative Engineering that Helps
American Aviation Lead the World**

Building complete landing gear for the world's largest land plane, or developing fuel metering systems for the latest jets is all part of the job for Bendix Products Division of the great Bendix Aviation Corporation. For here under one roof are the men and machines that have over the years furnished the landing gear and fuel systems which help American aviation lead the world.

Engine builders and airframe manufacturers are urged to let this matchless combination of engineering experience and manufacturing facilities help solve their problems.

*REG. U. S. PAT. OFF.

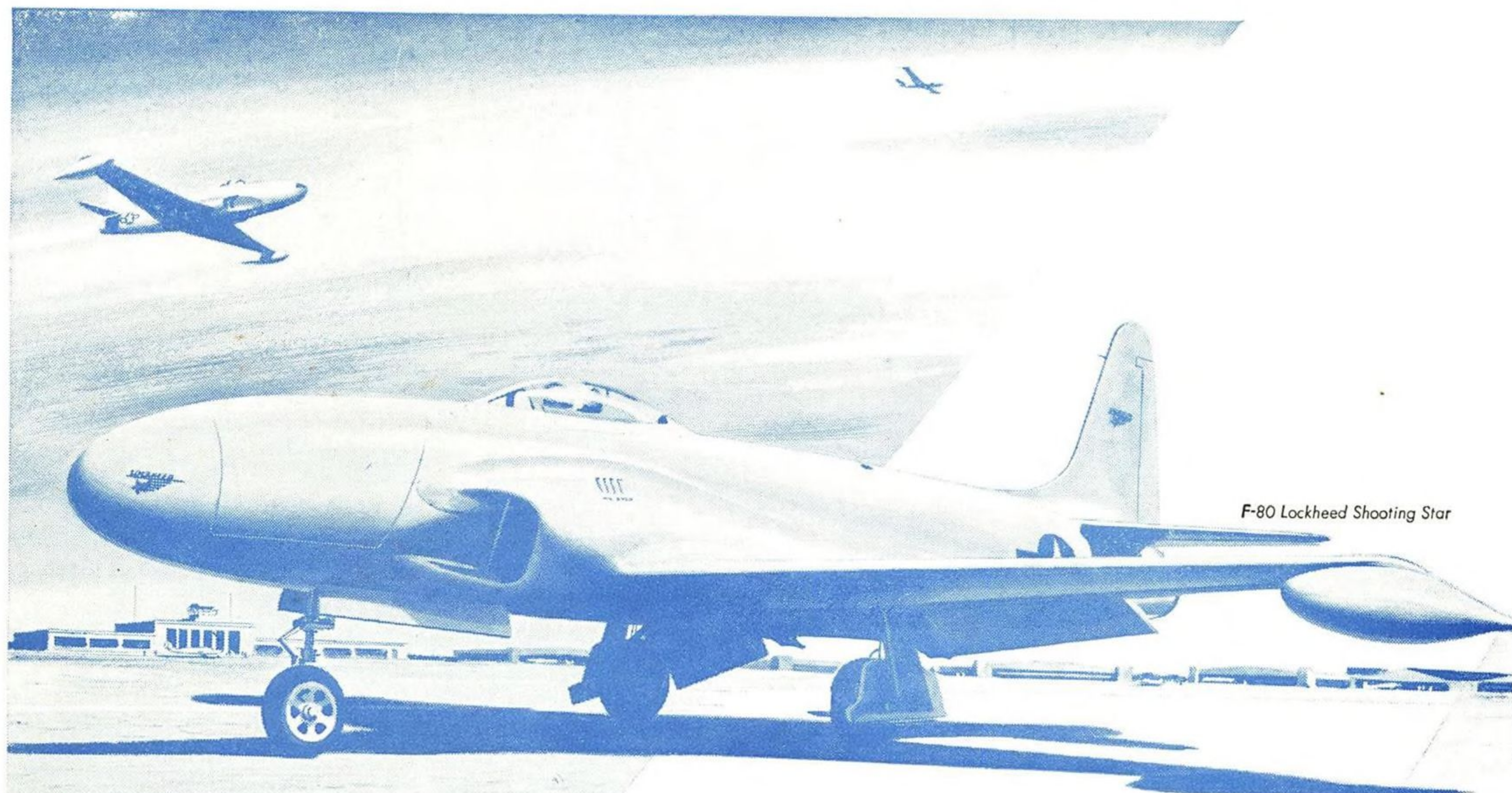
BENDIX PRODUCTS

DIVISION of



SOUTH BEND 20, INDIANA

Export Sales: Bendix International Division, 72 Fifth Ave.
New York 11, N. Y.



F-80 Lockheed Shooting Star

PROVED PERFORMANCE

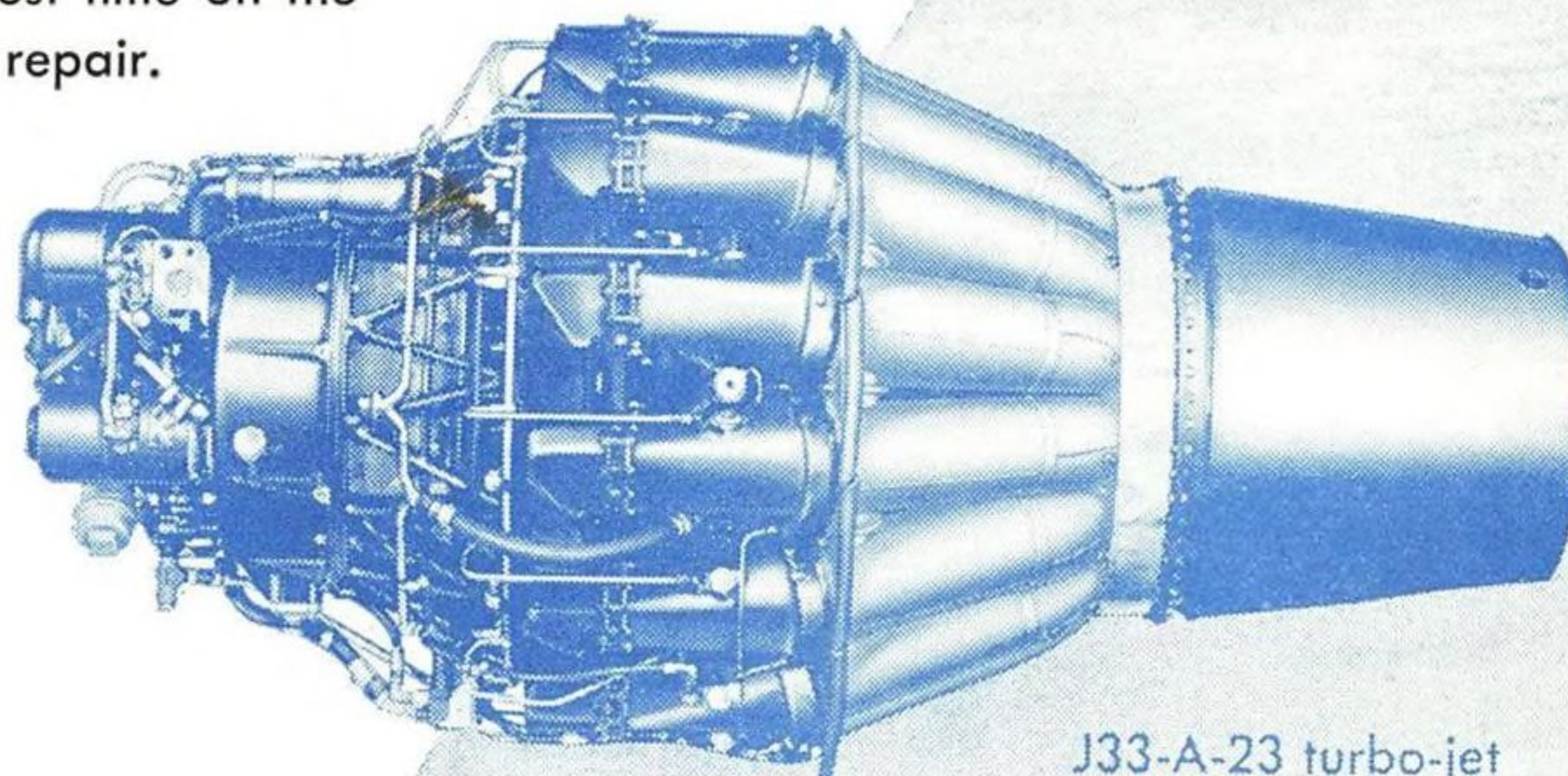
With a total of more than 100,000 hours of actual flight time in their log book, Allison aircraft turbine engines have proved themselves with dependable performance under many varying conditions of service and of weather.

Now operating 300 hours before overhaul, Allison J33 jet engines offer more useful service in the air with less lost time on the ground for service and repair.

Air Power is Peace Power



Other Allison-powered airplanes:
Republic F-84 Thunderjet
North American FJ-1 Fury
Northrop YB-49 Flying Wing
Grumman F9F-3 Panther

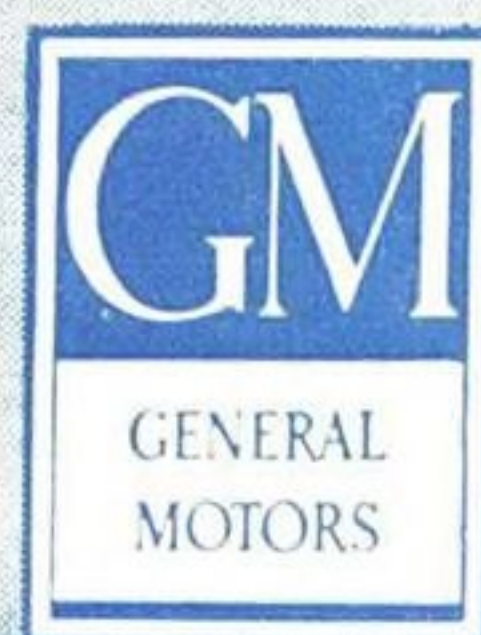


J33-A-23 turbo-jet

Allison

Builder of axial and centrifugal
flow turbine engines

DIVISION OF



Indianapolis,
Indiana